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COUNTY OF MAUI
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Wastewater Reclamation Division

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

Solid Waste Division

August 30, 2005

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

Dear Ms. Salmonson:

Re: Final Environmental Assessment (DEA) for Kihei Recycling and Redemption Center at Piilani Villages, Kihei,Maui, Hawaii

The Department of Public Works and Environmental Management (DPWEM), County of Maui, has reviewed the Final Environmental Assessment for the subject project, and is issuing a Finding of No Significant Impact (FONSI) determination. Please publish notice of availability for this project in the September 8, 2005, OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, four copies of the Final EA, and the project summary on disk. Please call Alan L. Unemori at (808) 242-4403 if you have any questions.

Sincerely,

Milton Arakawa
Director, DPWEM

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2005-09-08 MA FONSI KIHEI RECYCLING & REDEMPTION CENTER

Final Environmental Assessment Report

Kihei Recycling and Redemption Center at South Maui Community Park

Prepared For:

Department of Public Works and
Environmental Management
200 S. High Street
Wailuku, Hawaii 96793

Prepared By:

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

August 2005

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PREFACE

The County of Maui, Department of Public Works and Environmental Management (DPWEM), proposes to relocate the Kihei Recycling and Redemption Center at the northwest corner of the intersection of Piilani Highway and Welakahao Road in Kihei, Maui, Hawaii.

Pursuant to Chapter 343, Hawaii Revised Statute; and Chapter 200 of Title 11, Hawaii Administrative Rules; this Environmental Assessment documents the project's technical characteristics, environmental impacts and alternatives, and advances finding and conclusions relative to the project.

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT
PROPOSED KIHEI RECYCLE AND REDEMPTION CENTER AT PIILANI VILLAGES

Agency: County of Maui, Department of Public Works and Environmental Management

Project Description:

The County of Maui, Department of Public Works and Environmental Management (DPWEM), proposes to construct a new Kihei Recycling and Redemption Center at Piilani Villages to replace the existing Recycling Center approximately 1700 ft south of the proposed project site.

The project involves land owned by the County of Maui, and participating funds from the County of Maui.

The DPWEM has prepared the present Final Environmental Assessment (EA) pursuant to Chapter 343, Hawaii Revised Statues. In the Final EA, three (3) alternatives were considered:

(1) ***Alternative "1"***: the Proposed Action;

(2) ***Alternative "2"***: the Alternate Sites alternative; and

(3) ***Alternative "3"***: the "No-Build" alternative.

Project Summary:

The existing Recycling Center is being displaced by the development of the Hale Mahaolu Senior Center (which will occupy that same location) when construction begins as scheduled for August, 2005. In the interim, the Proposed Action has been selected as the most feasible alternative.

Based on the EA and supporting analyses, the DPWEM is satisfied that potential improvement and long-term impacts have been identified and addressed.

For further information, contact: Mr. Milton Arakawa, Director, Department of Public Works and Environmental Management, County of Maui, 200 South High Street, Wailuku, Maui Hawaii 96793; telephone: (808) 270-7845

8-23-05
Date

Milton Arakawa, Director
Department of Public Works and
Environmental Management

I. PROJECT OVERVIEW

A. Applicant

The applicant is the Department of Public Works and Environmental Management, County of Maui (hereinafter referred to as DPWEM).

B. Location

The proposed project is located on part of a triangular-shaped area at the southeast end of TMK 2-2-02:042 bordered by Piilani Highway, Welakahao Road and Keokea Gulch as shown in ***Figure 1*** and ***Figure 1A***. TMK 2-2-02:042is currently planned to be developed as South Maui Community Park, a regional park to be conceptually developed with tennis courts, baseball and soccer fields.

C. Land Ownership

TMK 2-2-02:042 is owned by the County of Maui

D. Existing Land Use

The project site is currently vacant and vegetated with buffelgrass

E. Proposed Need

The existing Recycling Center which is located approximately 1700 ft south of the proposed project site will be displaced by the construction of Hale Mahaolu Senior Center Project, which is scheduled to begin construction around August, 2005. For this reason, the Applicant needs to replace the existing Recycling Center with the proposed Kihei Recycling and Redemption Center. The proposed site was selected since the property is owned by the County of Maui, is within a short distance from Piilani Highway, and is also the close to the existing Recycling Center. It is also closer to the heart of Central Kihei.

The need for the Kihei Recycling and Redemption Center is further catalyzed by the passing of the State "Bottle Bill", which mandates the existence of Redemption Centers for bottles and cans. The "Bottle Bill" was made effective January 1, 2005.

F. Proposed Action

The Applicant is proposing to construct a new Kihei Recycling and Redemption Center at this project site. The existing Recycling Center is located near Old Welakaho Road across Piilani Highway from the Kihei Wastewater Treatment Center approximately 1700 ft south of the proposed Kihei Recycling and Redemption Center (see ***Figure 2***).

II. ALTERNATIVES ANALYSIS

A. Alternative "1"

Alternative "1" represents the "Proposed Action". This site was selected for a number of reasons as follows (see ***Figures 4*** and ***4E***):

(1) It is already owned by the County of Maui and earmarked to be the South Maui Community Park, although there are no Park improvements planned for the next five years.

(2) It is on the makai (west) side of Piilani Highway, which is where most of the residents of Kihei, Wailea and Makena live.

(3) It is close to the existing Recycling Center (which is approximately 1700 feet south of the proposed site)

(4) It has direct access off of Welakahao Road and is visible from Piilani Highway

(5) This is the site approved by the Kihei Community Association after considering several other sites

(6) It is relatively close to an existing R-1 irrigation line along the future North South Collector Road which extends all the way to the Piilani Commercial Center, and can be tapped into for irrigation of the landscaping for the project

(7) This site can be more easily accessed from County roadways than the existing site, which is situated at the end of a bumpy cul-de-sac road.

B. Alternative "2"

Alternative "2" represents the "Alternate Sites" alternative. It actually represents several sites which were considered as possible sites by the Kihei Community Association, including:

(1) Road Remnant Parcel off Kanakanui Road, no TMK, it is part of a State ROW (see ***Site No. 1***, ***Figures 4*** and ***4A***)

This site has an impact on school traffic, poor visibility and uneven terrain

(2) ***Site Nos. 2 and 3*** next to Wastewater Plant on Piilani Highway across from existing Recycling Center, TMK 2-2-02:54 (see ***Figures 4*** and ***4B***)

This site is across the 4-lane Highway and undesirable as it is on the opposite side of where most people live. Also, it would be treacherous for young people to cross Piilani Highway on bicycles. This land is privately owned by Pacific Rim Land,

Inc. The Property Manager stated that the property was going to be used for other purposes

(3) ***Site No. 4***, the road remnant parcel of Old Welakahao Road, adjacent to the Hale Mahaolu parcel (see ***Figures 4*** and ***4B***).

This parcel is deemed too narrow for container storage, traffic flow, and truck turning radius. Would also require relocating utility poles. Additional property would need to be acquired from parcel owners on either side to make this property usable as a recycling center.

(4) ***Site Nos. 5 and 6*** across from Kamalii School, no TMK, it is part of a State ROW (see ***Figures 4*** and ***4C***)

This site is long and narrow and not conducive to traffic flow. Also, the school traffic would impair access to the Recycling Center, and vice versa. This site was judged to be too far south of the center of Piilani Village. This parcel is too narrow to accommodate a sufficient number of recycling bins.

(5) Hope Chapel ***Site No. 7***, TMK 2-2-02:72 (see ***Figures 4*** and ***4B***)

The directors of Hope Chapel suggested that the new Recycling and Redemption Center be built on property owned by the County of Maui instead, and there is a large drainage channel on the Hope Chapel site near the existing Recycling Center.

(6) ***Site No. 8*** by the Safeway Shopping area on Liloa Street, TMK 3-9-02:76 (see ***Figures 4*** and ***4D***)

Parking and site space would be marginal, and the parcel is too small to accommodate the needs of a modern Recycling and Redemption Center. Also, a portion of the Piilani Bikeway and Multi-Use Trail will be constructed between Liloa Street and the eastern boundary of this parcel

For these reasons, ***Alternative "2"*** was eliminated in favor of ***Alternative "1"***.

C. Alternative "3"

Alternative "3" represents the "No Build" alternative. As the existing Recycling Center is going to be displaced around August, 2005, the "No Build" alternative will leave the residents of South Maui without any Recycling or Redemption Center, which, in turn, would be contrary to the objectives of the State's "Bottle" Bill. Also, this would mean more solid waste would have to be transported and dumped at the existing Central Maui Landfill. It is likely that increased illegal dumping could also occur.

For these reasons, ***Alternative "3"*** was eliminated in favor of ***Alternative "1"***.

III. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. Physical Environment

1. Surrounding Environment

The triangular-shaped area is bordered by a portion of Keokea Gulch to the north, Piilani Highway to the east (mauka) and Welakahao Road to the south (see ***Figure 1*** and ***Figure 1A***). Further north is the existing Kihei Elementary and Intermediate School. Immediately east across Piilani Highway is the Elleaire Golf Course. Across Welakahao Road to the south is a vacant lot which is currently being developed by Hope Chapel. To the immediate west of this triangular-shaped area are private homes and some vacant, undeveloped parcels. The future North-South Collector Road will be constructed along the western border of the entire length of TMK 2-2-02:042.

2. Climate

The Kihei Coast is generally sunny, warm and dry during the entire year. Average monthly rainfall varies from 4 inches in January down to 0 in June and July (Atlas of Hawaii, Third Edition, 1998).

In Kihei Town, the annual high temperature averages in the high 80's with the low temperatures averaging in the high 60's (Atlas of Hawaii, 1983). June through August are historically the warmer months of the year, while the cooler months are January through March.

3. Topography and Soils

The subject site is located immediately west of Piilani Highway. The site itself runs east to west from elevation 72 ft to 50 ft. ***Figure 3*** shows the site-specific soil classification map for the subject property. It indicates that the proposed Kihei Recycling and Redemption Center sits entirely on "PZUE" soils, which is Puuone sand, 7 to 30 percent slope. This soil is on sandhills near the ocean. This soil is used for pasture and homesites.

An extensive Subsurface Investigation was conducted by Fewell Geotechnical Engineering, Ltd., and a Report issued on December 30, 2004. Test Pits 23 and 24, taken beneath the proposed area show basalt rock at a depth of 1.5 ft and 0.9 ft, respectively, overlain by brown silty gravel (see ***Exhibits "A", "B", "C"*** and ***"D"***). Therefore, the area has extremely competent soil.

4. Flood and Tsunami Hazard

According to the Flood Insurance Rate Map, Panel150003 0265C, revised September 6, 1989, the project is in Zone "C", which indicates an area of minimal

flooding (see ***Exhibit "E"***). ***Exhibit "F"*** shows the results of an extensive HEC-RAS flood inundation study which was completed in order to ascertain the 100-year flood inundation limits within Keokea Gulch.

The project site is also not located within any Tsunami Hazard Zone.

5. ***Flora and Fauna***

As part of an earlier SMA Permit and Project District Phase II Applications for Piilani spanning approximately the area (see ***Exhibit "G"***) from Kulanihakoi Street (north) to Old Welakahao Road (south) completed in November, 1989 (Revised March, 1990), a **"Biological and Archaeological Reconnaissance"** was performed in July, 1982, by Environment Impact Study Corporation (Marvin T. Miura, Ph.D., Principal).

Excerpts taken from that report regarding flora and fauna are given below:

*"1. **Flora***

The vegetation on the project site can be characterized as an area containing grassland with scattered kiawe trees, kiawe forest within the gulch areas and kiawe thickets.

The flora of the project area include native and introduced species of plants common to arid, lowland coastal areas. The majority of the plants observed are classified as exotics, plants introduced to Hawaii. The endemic plant (native to Hawaii) observed within the project area was a wiliwili tree found growing in Keokea Gulch. Wiliwili trees are also found throughout the Makena area and in some of the other gulches within the Kihei area.

None of the plants observed on the project site are rare or endangered species of plants. The site has been previously disturbed and exotic species are the.... dominant plant forms.

*2. **Fauna***

The birds observed on the project site include barred dove, northern cardinal, myna, house sparrow, Japanese white-eye and spotted munia. The project site primarily affords habitat for urban and lowland birds.

The lack of a permanent standing body of water precludes the site as a unique wildlife area. The vegetation cover and type of vegetation limits the area as a lowland wildlife habitat and therefore is not unique. None of the animals seen or observed during the reconnaissance are considered rare or endangered species.

3. ***Conclusion***

None of the biota observed or believed to be normally present in the project area is considered rare or endangered. The flora and fauna species found on the project site are primarily exotic species and commonly found throughout the island and state. No significant adverse impacts to the flora and fauna are expected from the proposed development."

More recently, a Site Reconnaissance Survey was conducted by the staff of Chris Hart & Partners on August 2, 2005. A facsimile summarizing their findings is included as ***Exhibit "N"***. The following excerpts are taken from that facsimile:

"Based upon a site reconnaissance survey of the subject property conducted by CH&P staff o August 2, 2005, it appears that existing vegetation primarily consists of Ilima (Sida cordifolia), Haole Koa (Leucaena levcocephala), Kiawe (Prosopis pallida), and Wiregrass (Elevsine indica). No wetland indicator plants were found on the property.

Avifauna typically found in the area includes the common myna, several species of dove, cardinal, house finch, and house sparrow. Mammals common to this area include cats, dogs, rats, mice and mongoose. No known rare, endangered, or threatened species of flora or fauna were discovered on the subject property."

6. ***Archaeological Resources***

On May 12, 2004, Michael Dega, Ph.D., Senior Archaeologist of Scientific Consultant Services prepared the Field Inspection Letter specifically for the Kihei Community Park Project (South Maui Community Park) shown as ***Exhibit "H"***). The following excerpts are taken from that Letter:

"Per the scope of work for this project provided by yourself and Dr. Robert Spear of Scientific Consultant Services, Inc., (SCS), we conducted a field check of the proposed community park project area in Kihei, Maui, Hawaii. The field inspection was conducted on May 5 and May 6, 2004 by Michael Dega, Ph.D. of SCS. The goal of the inspection was to re-identify the six archaeological sites slated for Data Recovery (site verification) and to assess their preservation condition. If significantly altered, SCS was to re-evaluate the Data Recovery program.

The results of the field inspection were positive. All six sites and their component features slated for Data Recovery (Site-1710, -2512, -2514, -2516, -2519 and -2522) were identified in the field and clearly marked for future reference ... none of the six sites or their component features appeared to have been adversely impacted since the last archaeological project was conducted in 1990 ...

Upon completion of the Data Recovery work, a Data Recovery Report will be submitted to SHPD for review (Dr. Melissa Kirkendall). Based on our assessment of these sites at this time, after Data Recovery work has been completed, the sites will no longer be significant. As such, and if this pattern holds true, any landscape altering activities may occur at any location on the parcel."

7. Air Quality

There are no point sources of airborne emissions on the immediate vicinity of the project site. The air quality of the Kihei area is considered good with existing airborne pollutant attributed primarily to automobile exhaust from the region's roadways and construction activities. Another source of airborne emissions may include smoke from sugar cane burning which occurs in the Central Maui isthmus. The source is intermittent, however, and prevailing trade winds quickly disperse particulates which are generated.

8. Noise Characteristics

Traffic nosie from Piilani Highway is the predominant source of noise in the locality of the project. Other background noise levels are attributed to natural (e.g., wind) conditions.

9. Scenic and Open Space Resources

The proposed project area is bordered by a portion of Keokea Gulch to the north, Piilani Highway to the east (mauka) and Welakahao Road to the south (see ***Figure 1***). Further north is the existing Kihei Elementary and Intermediate School. Immediately east across Piilani Highway is the Elleaire Golf Course. Across Welakahao Road to the south is a vacant lot which is currently being developed by Hope Chapel. To the immediate west of the project site are private homes and some vacant, undeveloped parcels. The future North-South Collector Road will be constructed along the west border of the entire length of TMK 2-2-02:042.

B. Community Setting

1. Population

The population of the County of Maui has steadily increased from 70,847 in 1980 to 100,504 in 1990 to 128,094 in 2000, a ***28.0% increase*** between 1990 and 2000 (U. S. Census Bureau, see ***Exhibit "I"***).

The 1990 population of the South Maui District was 15,635, which at the time was 16.82% of Maui Island's population. South Maui's de facto population in 1990 was 31,444 (Community Resources, Inc., March, 1994). In 2000, the population of the South Maui District increased to 22,420, with 16,749 in Kihei and 5,671 in Wailea-

Makena (U.S. Census Bureau, see ***Exhibit "J"***). This represents a ***43.4% increase*** between 1990 and 2000.

2. *Economy*

The South Maui economy is based primarily upon the visitor industry. Visitor accommodations are located near the shoreline along with necessary support facilities and residential communities. Wailea has developed into an important visitor destination anchor while Kihei has developed into the region's visitor, service, commercial and residential center.

Support for the visitor industry is found in Kihei, where numerous retail commercial centers are found. New commercial centers in Kihei, such as the Piilani Commercial Center and The Shops at Wailea in Wailea, have lent further support to the region's economy.

3. *Police and Fire Protection*

Based on a recent phone call to the Maui Police Department (MPD), as of May, 2005, the MPD consisted of five (5) patrol divisions and included 401 employees. These divisions provide police services through its Hana, Lahaina, Lanai, Molokai and Wailuku Districts.

Police Services for the Kihei-Makena subdistrict are currently provided by patrol officers on assignment from the Wailuku Patrol Division. Each eight (8) hour watch is staffed by a minimum of four (4) patrol officers.

Fire prevention, protection and suppression services are provided by the Maui Fire Department's (MF) Kihei Station and the more recently opened Wailea Fire Station on Kilohana Drive (see ***Exhibit "K"***).

4. *Recreational Facilities*

The South Maui area has a wide reputation as a recreational destination, particularly for ocean-related activities. Ocean sports and recreation available in the South Maui District include swimming, fishing, surfing, scuba diving, snorkeling, sailing and para-sailing. State and County beach parks in the South Maui District include the Maipoina Oe Iau Beach Park, Kalama Beach Park, Kamaole Beach Park, Ulua Beach, Wailea Beach, Polo Beach, Makena Beach Park and Ahihi-Kinau Marine Reserve, including the norther portion of La Perouse Bay.

Wailea Resort offers numerous recreational amenities including three (3) golf courses, a tennis center and two (2) public beach parks and an approximately 1.75 mile long coastal path. Makena offers an additional golf course, and tennis center.

Immediately east of the proposed site is the Elleaire Golf Course (see Figure 1).

Just across Lipoa Drive from Kihei Elementary and Intermediate School is the Kihei Community and Aquatic Center, which also offers a 40-meter swimming pool.

5. *Solid Waste*

Only two landfills are currently operating on Maui, the Central Maui Landfill in Pulehu, and the Hana landfill. Single-family residential waste collection service is provided by the County of Maui on a once-a-week basis. Residential solid waste collected by County crews are disposed at the County's 55-acre Central Maui Landfill located four miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill accepts commercial waste from private collection companies.

6. *Schools*

The Kihei District is served by both private and public schools, which provide education for preschool through intermediate school age children. High schools are located in Wailuku and Kahului. There are various private schools in the Kihei District for grades kindergarten through eight along with several preschools.

C. Infrastructure

1. *Roadways and Traffic*

Piilani Highway is the main north/south arterial highway linking Kihei to other urban areas of Maui. Piilani Highway is a four-lane undivided highway owned and maintained by the State. It contains two 12-foot wide travel lanes in each direction. South Kihei Road is a two-lane collector that parallels Piilani Highway along a more coastal route serving most of the commercial and residential communities located along its corridor.

Welakahao Road is the nearest east-west collector that connects South Kihei Road to Piilani Highway. Although paved, this road is substandard in terms of County standards. Welakahao Road will be used to provide access to the proposed Kihei Recycling and Redemption Center.

The Engineering Division, Department of Public Works and Environmental Management, is currently planning and designing the Liloa Drive (N-S Collector) roadway improvements which will link the bisecting east-west corridors (e.g., Lipoa St., Halekuai St., East Welakahao St., etc.)

2. *Wastewater*

An 8" sewerline has recently been extended up East Welakahao Street, up to Liloa Drive (N-S Collector) by the Hope Chapel project.

3. *Water*

Since potable water service is not required for the Kihei Recycling and Redemption Center, no water improvements are expected for the project.

4. *Drainage and Erosion Control*

All development components within Piilani Village - South are located above the Kihei Flood Plain district. Runoff generally sheet flows across the site in an easterly (mauka) to westerly (makai) direction, ultimately being conveyed to low areas and wetlands.

Offsite drainage basins contributing runoff to the existing drainage ways typically are relatively slender and a few may extend up towards the summit of Haleakala.

A major existing drainage way, Keokea Gulch, crosses Piilani Village - South (and abuts the north end of the project site) in an easterly to westerly (mauka to makai) direction. In addition, several smaller drainage ways cross Piilani Village - South and are typically associated with culvert crossings at Piilani Highway. No existing Piilani Highway culvert crossings discharge into the project site.

5. *Electrical/Telephone/CATV Systems*

Maui Electric Company, Ltd.'s main transmission line is located along the westerly (makai) edge of Piilani Village, with a substation located at the corner of Welakahao St. and the N-S Collector Roadway corridor, at the south (makai) tip of the project site.(see ***Construction Sheet C-5 - Utility Plan***)

The Verizon telephone and Oceanic Time Warner Cable cable television distribution systems are also generally located along this utility corridor as well as along the existing E-W (mauka-makai) roadway connections leading to South Kihei Road (e.g., Lipoa St., Welakahao St., etc.)

IV. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. Impacts to the Physical Environment

1. *Surrounding Environment*

Given the existing land uses as described above, the proposed project should have no significant negative impact with regards to land use patterns in the area.

2. ***Climate***

The proposed Kihei Recycling and Redemption Center will have no adverse effect on the Climate

3. ***Topography and Soils***

As the soil is extremely competent, with Soil Boring Profiles showing a very shallow depth to basalt, the proposed development will be no adverse potential impacts to the topography or soil.

4. ***Flood and Tsunami Hazard***

The proposed project should have no adverse impact upon the subject property, its neighbors or downstream properties with regards to flood hazard potential since the existing flow pattern will be maintained, and no improvements will be made within the area inside of the calculated inundation limits (see ***Exhibit "E"***)

5. ***Flora and Fauna***

Per the discussion above, vegetation types found on this site consist primarily of introduced species and does not include any rare, threatened or endangered native plants. There are no known endangered or threatened wildlife species in this region.

6. ***Archaeological Resources***

Per the discussion above, in Dr. Michael Dega's opinion, ***"... after Data Recovery work has been completed, the sites will no longer be significant. As such, and if this pattern holds true, any landscape altering activities may occur at any location on the parcel"***

> "Per the discussion above, in Dr. Michael Dega's opinion, ***'... after Data.... Recovery work has been completed, the sites will no longer be significant. As such, and if this pattern holds true, any landscape altering activities may occur at any location on the parcel.'***

Data Recovery was conducted during a five week period in March and April of 2005. A complete copy of the Archaeological Data Recovery Report is included in Appendix C. The Report "Recommendations" states the following:

> *'As a result of this and earlier studies of the project area, it is recommended that no further work be conducted within the project area excepting Site 2512. As Site 2512 is now interpreted as a ceremonial location, it is recommended that this site be preserved based on a Preservation Plan. The SHPD will review this Preservation Plan prior to construction work in this portion of the parcel.'*

This one site (Site 2512) which may be preserved is in Keokea Gulch and not within the boundaries of the project site. Therefore, there should be no adverse impacts to the project by the proposed development.

A draft letter dated August 16, 2005, from SHPD states the following (see ***Exhibit "O"***):

> *"Given the above information, we understand that the proposed work as part of the Kihei Recycling and Redemption Center at South Maui Community Park will focus on the southern half of the parcel, in an area in which no historic properties were identified. The site to be preserved (SIHP 2512) is located in the central portion of the parcel, and all sites covered under the data recovery work are in the northern portion of the parcel.*
>
> *Therefore, we believe that activities associated with the Kihei Recycling and Redemption Center project will have "no effect" on historic properties. We do, however, recommend no action be taken on subsequent undertakings until an acceptable preservation plan for SIHP 2512 has been reviewed by this office and is in place."*

7. *Air Quality*

Air quality impacts attributed to the proposed project could include dust generated by the *short-term* construction-related activities. Site work such as grading, for example, could generate airborne particulate. The provisions of the County Grading Ordinances currently limits clearing and grubbing activities to no more than 15 acres at a time. The project itself will involve 1.693 acres, significantly smaller than the 15 acre threshold. Dust control measures such as regular watering, sprinkling and the installation of dust screens will be implemented to minimize the potential impact from wind-blow emissions.

In the *long-term*, the proposed Kihei Recycling and Redemption Center will... increase the volume of traffic in the project's vicinity, which in turn could affect the air quality. However, this increased is not considered significant when compared to the overall amount of vehicles on the Piilani Highway and current ambient air quality. As such, the proposed project is not anticipated to be detrimental to local air quality.

8. *Nuisances*

The level of odor and flies constitutes a minimal nuisance. The beverage containers collected at the redemption center are immediately placed in large plastic bags then put in the large dropbox container which are hauled out daily. The beverage containers are not accepted at the Redemption Center unless they are empty. There is nothing there that would generate flies or odors.

9. Noise Characteristics

In the *short-term*, the proposed project could generate some adverse impacts during construction. Noise from heavy construction equipment, such as bulldozers, front-end loaders and material-carrying trucks and trailers, would be the dominant source of noise during the construction period. Heavy construction equipment will be equipped with mufflers to keep decibel levels within allowable limits.

To minimize construction-related impact to the surrounding property owners, the developer proposes to limit construction activities to normal daylight working hours, and to adhere to the State Department of Health's noise regulations for construction equipment. In addition, the site plan has been designed to follow existing topography to the greatest extent practical. This lessens the need for extensive cut and fill operations, which in turn lessens the potential for negative noise impacts.

In the *long-term*, the project, once completed, is not expected to have any adverse impact upon the existing noise conditions from the adjacent Piilani Highway.

10. Scenic and Open Space Resources

The proposed project is not in a view corridor of any kind. Also, as there will be no buildings constructed, only a paved parking lot and pavement for the recycling and redemption containers, there will be no adverse impact to scenic and open space resources.

11. Cultural Impact Assessment

A Cultural Impact Assessment Study was conducted by Scientific Consultant Services Archaeology in July and August, 2005. A full copy of the Report is included in Appendix D. In "Project Area and Vicinity" on page 6, the Report states the following"

> *"... The local Fire Department indicated that the entire project area had been completely burned four times since 1999. Several more partial burns have occurred and heavy equipment was brought into extinguish the fires, affecting the terrain and destroying what vegetation was left and seriously impacting the integrity of the parcel for cultural activities."*

In the "Summary and Cultural Assessment", on page 14, the Report states the following:

> *"Based on organizational response, and archival research it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on a portion of plot 42. However, it is*

recommended that Cultural Advisors be consulted during the planning process. In this way, appropriate mitigation measures, if needed, can be put in place before development occurs. Because there were no activities identified within the project area, there are no adverse effects."

B. Impacts to Community Setting

1. Population

As this project involves no housing, it will have no effect on the population of the area.

2. Economy

As this project is being built to replace the existing Kihei Recycling Center on Old Welakahao Road (approximately 1700 ft south of the proposed site), this project will have no significant adverse effect on the South Maui economy (see ***Figure 2***).

3. Police and Fire Protection

As this site involves a Recycling and Redemption Center, and not a residence or structure for public assembly, it should not require any Police or Fire services, and therefore should not have any adverse impact on emergency services.

4. Recreational Facilities

As this project involves replacing the existing Kihei Recycling Center, it should have a ***positive impact*** on reducing litter in the vast recreational facilities in the South Maui area.

5. Solid Waste

The proposed project will not generate any solid waste. Rather, as this project involves replacing the existing Kihei Recycling Center, it will serve as a collection center for solid waste that would otherwise have to be transported and dumped into the Central Maui Landfill. It will therefore have a ***positive impact*** on reducing litter in the South Maui District.

6. Schools

The proposed project to replace the existing Kihei Recycling Center should have no impact on the Schools in the area. If any, the students at the nearby Kihei Elementary and Intermediate School may be encouraged to use the proposed Kihei Recycling and Redemption Center and thereby reduce the amount of solid waste that would otherwise have to be transported and dumped into the Central Maui Landfill.

C. Impacts to Infrastructure

1. Roadways and Traffic

Construction Sheet C-3 - Site Plan, shows the location of the proposed access driveway.

In order to enter/exit the proposed site, the Department of Public Works and Environmental Management, who will operate and maintain the new Recycling and Redemption Center, will design and construct an east (mauka)-bound left turn storage lane for the Kihei Recycling and Redemption Center in conjunction with this project..

This will be complemented by a future west (makai)-bound left turn storage lane for the Hope Chapel project, which is expected to be constructed by Hope Chapel in the future in conjunction with its proposed Phase II improvements, which includes a driveway connection to East Welakahao Street, across the driveway proposed for the Kihei Recycling and Redemption Center. The proposed intersection improvements at Welakahao Street are shown in ***Exhibit "G"*** in the Preliminary Engineering Report

A Traffic Impact Assessment Report (TIAR) was recently completed by Phillip Rowell and Associates (see Appendix B). The TIAR concluded:

"5. *The level-of-service analysis for background plus project conditions concluded the intersection of Welakahao Road at the Recycling Center driveway will operate at Level-of-Service C or better with the following lane configuration:*

a. *The intersection should be unsignalized.*

b. *Separate left turn lanes should be provided along the eastbound and westbound approaches.*

c. *The driveway approaches to Welakahao Road can be one-lane approaches providing for left turns, through movements and right turns.*

d. *The left turn storage lane for eastbound left turns into the recycling center should be at least 75 feet in length.*

e. *The left turn storage lane for westbound left turns into the Kihei Hope Chapel parking lot should be at least 175 feet in length. This is based on the number of trips estimated to use this driveway during Sunday morning peak hour as reported in the TIAR for Kihei Hope Chapel, which is 210 vehicles per hour."*

2. *Wastewater*

Since sewer service is not required for the Kihei Recycling and Redemption Center, the sewerline along East Welakahao Street is not expected to be extended to the site along East Welakahao Street until Phase III of the South Maui Community Park is developed.

However, a short section of 8" sewerline will be installed under the proposed paved access driveway and capped at both ends to avoid having to excavate across the access driveway in the future (see ***Construction Sheet C-5 - Utility Plan***).

An R1 reclaimed water service lateral will be extended from the County's 12" R1 reclaimed water transmission main along Liloa Drive (N-S Collector) to the project site to furnish R1 reclaimed water for landscape irrigation. A landscape irrigation system will be installed within the site that will be served exclusively off of R1 reclaimed water (see ***Construction Sheet L-2 - Irrigation Plan***).

3. *Water*

Current plans for the proposed project will not have a potable water system. As such, there will be no consumption of potable water at the site until such time that the Department of Parks and Recreation decides to improve this area with Tennis Courts and bathroom facilities (not in the proposed scope of work). Therefore, there will be no adverse potential impacts to the water system.

However, potable water service is expected to be brought to the site along East Welakahao Street in the future, when Phase III of the South Maui Community Park is developed. Again, oversized sleeves will be installed under the proposed paved access driveway and capped at both ends to avoid having to excavate across the access driveway in the future (see ***Construction Sheet C-5 - Utility Plan***).

4. ***Drainage and Erosion Control***

An extensive hydraulic analysis of Keokea Gulch based on a 100-year design flow of ***8008 cfs*** was performed in order to establish the inundation limits within Keokea Gulch.

A total of 5.1 cfs (50 year - 1 hour runoff) of onsite surface runoff will be generated by the developed project site. Accordingly, a net increase of 1.7 cfs would have been expected as a result of the proposed improvements in the absence of any onsite subsurface detention. However, an onsite subsurface detention system (capacity based on 50 year - 1 hour runoff) is being proposed to limit the peak onsite runoff being discharged to pre-development levels. Accordingly, there will be no net increase in onsite peak surface runoff, based on a 50-year recurrence interval.

The majority of the onsite surface runoff from the paved surfaces will be intercepted by a grated drain inlet and be conveyed directly underground to the proposed subsurface detention system, which will have an overflow to the existing Keokea Gulch natural drainageway (see ***Construction Plan C-2 - General Plan***). The balance of the onsite surface runoff will sheetflow, as it is currently doing, to the adjoining existing Keokea Gulch natural drainageway.

All improvements are proposed outside of the 100-year inundation limits of the existing Keokea Gulch natural drainageway.

5. ***Electrical/Telephone/CATV Systems***

As there will be no Electrical/Telephone/CATV System improvements made to the proposed Kihei Recycling and Redemption Center, there will be no adverse potential impacts to the same in the Kihei area.

Lighting for the project is expected to be provided by solar-powered, pole-mounted lights. Thus, electrical, telephone and CATV are not expected to be brought to the site along Est Welakahao Street until Phase III of the South Maui Community Park is developed.

V. RELATIONSHIP TO GOVERNMENT PLANS, POLICIES AND CONTROLS

A. State Land Use Districts

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes the four major land use districts in which all lands in the State are placed. These districts are designated "Urban", "Rural", "Agricultural", and "Conservation". The subject property is within the "Urban" Districts. The proposed improvements are considered permissible uses within the "Urban" District, and therefore, are consistent with the State Land Use Law.

B. Maui County General Plan

The General Plan of the County of Maui (1990), updated in 1991, provides long term goals, objectives and policies directed toward the betterment of living conditions in the County. Addressed are social, environmental, and economic issues that influence future growth in Maui County. The subject property's use is consistent with the following General Plan objectives and policies:

Objectives:

To see that all developments are well designed and are in harmony with their surroundings

Policies:

- o Require that appropriate principles of urban design be observed in the planning of all new developments

Objectives:

To encourage development which reflects the character and culture of Maui County's people

C. Kihei-Makena Community Plan

Nine (9) community plan regions have been established in Maui County. Each region's growth and development is guided by a Community Plan, which contains objectives and policies in accordance with the County General Plan. The purpose of the Community Plan is to outline a relatively detailed agenda for carrying out the General Plan's objectives.

The most recent Kihei-Makena Community Plan was adopted on March 6, 1998. The subject property is designated as part of Piilani Village Project District 5 in the Plan's Land Use Map (see ***Exhibit "L"***). Thus, the proposed project is consistent with the 1998 Kihei-Makena Community Plan.

The project is also consistent with the March 6, 1998 Update of the Kihei-Makena Community Plan's recommended goals, objectives and policies:

Goal: *A well-planned community with land use and development patterns designed to achieve the efficient and timely provision of infrastructural and community needs while preserving and enhancing the unique character of Maalaea, Kihei, Wailea and Makena as the region's natural environment, marine resources and traditional shoreline uses.*

Objectives and Policies:

b. *Identify priority growth areas to focus public and private efforts on the provision of infrastructure and amenities to serve existing residents and to accommodate new growth.*

f. *Establish a distribution of land uses which provides housing, jobs, shopping, open space and recreation areas in close proximity to each other in order to enhance Kihei's neighborhoods and to minimize dependence on automobiles.*

Within the Piilani Village Project District 5, the previously identified anticipated Land Use for the proposed project site is identified as **"Parks"** (see ***Exhibit "L"***). The **"Parks"** Land Use designation ***does not currently allow*** construction of Recycling and Redemption Center. However, the **"Residential - Single Family"** Land Use designation

such as that which exists for the balance of TMK: 2-2-02:042 to the north of Keokea Gulch (between the project site and Kihei Elementary and Lokelani Intermediate Schools) ***does allow*** construction of the Recycling and Redemption Center.

For this reason, an Exchange of Land Use of **"Parks"** with that of **"Residential - Single Family"** is concurrently being proposed with this SMA Permit and Project District Development Approval Application (see ***Exhibit "L"***).

Ironically, the Department of Planning has already circulated a Draft Copy of a Memorandum entitled **"Exemption List for the County of Maui for Chapter 343, HRS, Environmental Impact Statements"** (see ***Exhibit "M"***). In that Draft Memorandum, on page 4 of 9, under ***"Exemption Class 3"***, the following item is proposed to be exempt from the EA process:

> *"6. Recycling drop-off and redemption centers serving the surrounding residential community including, but not limited to: paving, fencing, containers for material, small equipment, and accessory or appurtenant structures used for storage and shelter (DPWEM)"*

D. Special Management Area Objectives and Policies

The subject property is located within the County of Maui's Special Management Area. Pursuant to Chapter 205A, Hawaii Revised Statutes, and the Rules and Regulations of the Maui Planning Commission, projects located within the SMA are evaluated with respect to SMA objectives, policies and guidelines. This section addresses the project's relationship to applicable coastal zone management considerations, as set forth in Chapter 205A and the Rules and Regulations of the Maui Planning Commission

The following is a description and evaluation of the anticipated impacts, as follows:

1. ***Affects natural or cultural resources (i.e. historic site, excavation on vacant land):***

   Response:

   No, see discussion in the following Sections in this Draft EA Report

   (a) Section IV.A.6. "Impacts to the Physical Environment", "Archaeological Resources"

2. ***Curtails the range of beneficial uses of the environment:***

   Response:

   No, see discussions in the following Sections in this Draft EA Report

(a) Section IV.B.4. "Impacts to Community Setting", "Recreational Facilities"
(b) Section IV.B.5. "Impacts to Community Setting", "Solid Waste"

3. ***Conflicts with the county's or the state's long-term environmental policies or goals (i.e., State Plan, County General Plan, and Community Plan):***

Response:

No, see discussions in the following Sections in this Draft EA Report

(a) Section V.A. "State Land Use District"
(b) Section V.B. "Maui County General Plan"
(c) Section V.C. "Kihei-Makena Community Plan"

4. ***Affects the economic or social welfare and activities of the community, county, or state:***

Response:

No, see discussions in the following Sections in this Draft EA Report

(a) Section IV.B.2., "Impacts to Community Setting", "Economy"

5. ***Substantially affects public health***

Response:

No, the proposed Kihei Recycling and Redemption Center will encourage the sanitary collection of bottles, cans, cardboard and other items which could otherwise end up as litter on the streets, highways and parks. To the contrary, uncollected litter and trash would contribute to potential problems with public health.

6. ***Involves secondary impacts, such as population changes (i.e., increase/decrease) and increased effects on public facilities, streets, drainage, sewage and water systems, and pedestrian walkways (i.e., increased demands and deficiencies):***

Response:

No, see discussions in the following Sections in this Draft EA Report

(a) Section IV.B.1. "Impacts to Community Setting", "Population"
(b) Section IV.B.3. "Impacts to Community Setting", "Police and Fire Protection"
(c) Section IV.B.4. "Impacts to Community Setting", "Recreational Facilities"

(d) Section IV.B.5. "Impacts to Community Setting", "Solid Waste"
(e) Section IV.B.6. "Impacts to Community Setting", "Schools"
(f) Section IV.C.1. "Impacts to Infrastructure", "Roadways and Traffic"
(g) Section IV.C.2. "Impacts to Infrastructure", "Wastewater"
(h) Section IV.C.3. "Impacts to Infrastructure", "Water"
(I) Section IV.C.4. "Impacts to Infrastructure", "Drainage and Erosion Control"
(j) Section IV.C.5. "Impacts to Infrastructure", "Electrical/Telephone/CATV"

7. ***Involves a substantial degradation of environmental quality***

Response:

See Item (5) above.

8. ***By itself has no significant adverse effects but cumulatively has considerable effect upon the environment (i.e., increased traffic and deficiencies in services) or involves a commitment for larger actions (i.e., more public infrastructure, such as roads, waterlines, sewers, etc.):***

Response:

No. Refer to the same sections in Item 5. above. No other Recycling and Redemption Centers are planned for the Kihei area in the foreseeable future once this one is constructed.

9. ***Affects a rare, threatened or endangered species of animal or plant, or its habitat (i.e., wetlands, natural area reserve, refuge):***

Response:

No, see discussions in the following Sections in this Draft EA Report

(a) Section IV.A.5 "Impacts to the Physical Environment", "Flora and Fauna"

10. ***Is contrary to the state plan, county's general plan, appropriate community plans, zoning and subdivision ordinances:***

Response:

No, see discussions in the following Sections in this Draft EA Report

(a) Section V.A. "State Land Use Districts"
(b) Section V.B. "Maui County General Plan"
(c) Section V.C. "Kihei-Makena Community Plan"

11. ***Affects air or water quality or ambient noise levels (i.e., construction impacts):***

Response:

No, see discussions in the following Sections in this Draft EA Report

(a) Section II.A.7. "Air Quality", "Potential Impacts"
(b) Section II.A.8. "Noise Characteristics", "Potential Impacts"

12. ***Located in and does it affect an environmentally sensitive area, such as flood plain, shoreline, dunes, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh waters, or coastal waters:***

Response:

No, see discussions in the following Sections in this Draft EA Report

(a) Section IV.A.3. "Impacts to the Physical Environment, "Topography and Soils"
(b) Section IV.A.4. "Impacts to the Physical Environment, "Flood and Tsunami Hazards"

The project site is approximately 2600 feet inland from the nearest shoreline (see ***Exhibit "E"***).

13. ***Requires substantial energy consumption***

Response:

As there will be no Electrical/Telephone/CATV System improvements made to the proposed Kihei Recycling and Redemption Center, there will be no adverse potential impacts to the same in the Kihei area.

Lighting for the project is expected to be provided by solar-powered, pole-mounted lights (see ***Exhibit "N"***). Thus, electrical, telephone and CATV are not expected to be brought to this site along East Welakahao Street until Phase III of the South Maui Community Park is developed.

14. ***Alters natural land forms (i.e., cut and fill, retaining walls) and existing public views to and along the shoreline:***

Response:

No, the project site is approximately 2600 feet inland from the nearest shoreline (see ***Exhibit "E"***).

15. Is contrary to the objectives and policies of chapter 205A, HRS:

Response:

No, we have prepared this Draft EA Report to demonstrate full compliance with the objectives, policies and guidelines of projects in the Special Management Area locations.

VI. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The proposed development will result in some unavoidable construction-related impacts as described in Chapter IV, 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. However, mitigation measures such as silt and dust fences will be used to control dust and erosion. All construction will occur during normal daylight hours.

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

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed project will result in the "loss" of approximately 1.7 acres of undeveloped and vacant land to be replaced by a new Kihei Recycling and Redemption Center at Piilani Villages with minimal improvement to the existing infrastructure outside of a paved area for the recycling bins and parking, landscaping and fencing. A makai-bound right-hand turn lane will also be constructed on Welakahao Road to provide access into the Recycling Center.

No other irreversible and irretrievable commitments of resources have been identified in connection with the proposed action.

VIII. FINDINGS AND CONCLUSIONS

The proposed Project involves the construction of a Recycling and Redemption Center to replace the existing Recycling Center which is approximately 1700 feet south of the project site.

Every phase of the proposed action, expected consequences, both primary and secondary,

and the cumulative as well as the short-term and long-term effects of the action have been evaluated herein in accordance with the "Significance Criteria" of Section 11-200-12 of the Administrative Rules. The project has also been evaluated with respect to Special Management Area Objectives and Policies in Chapter V of this Report.

Based on the analysis, the proposed project will not result in any adverse impacts.

IX. AGENCIES CONTACTED IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT

The following agencies and organizations were contacted during the Environmental Assessment review process:

1. Department of Public Works and Environmental Management
   Engineering Division
   200 S. High Street
   Wailuku, HI 96793

2. Department of Planning
   250 S. High Street
   Wailuku, HI 96793

3. Department of Parks and Recreation
   Parks Planning and Development Division
   700 Hali'a Nakoa Street, Unit 2
   Wailuku, HI 96793

4. Kihei Community Association
   P. O. Box 662
   Kihei, HI 96753

5. 47+ owners and lessees within 500 feet of the project site TMK parcel as required for the Application for Special Management Area Permit.

X. COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD AND APPLICABLE RESPONSES

The following is an outline of the chronology of Kihei Community Association Meetings held with representatives of the Solid Waste Division of the Department of Public Works and Environmental Management (Exhibits follow on next pages).

Kihei Community Association Meetings

December 8, 2003	**Exhibit A**	Met with KCA Planning Committee to request relocating recycling center to parcel in South Maui Regional Park. Design was requested.
April 19, 2004	**Exhibit B**	E-mail sent requesting a meeting to make a presentation to the KCA Planning Committee with design changes as requested
June 7, 2004	**Exhibit C**	Met with KCA Planning Committee. Other requests were made concerning the design of the site
June 28, 2004	**Exhibit D**	Discussed all the concerns of the last meeting (see **Exhibit C**). New design submitted.
July 20, 2004	**Exhibit E**	Presented design to the general membership of KCA. Answered all questions by the membership. Site was approved by the membership.

Comments were received from the Office of Environmental Quality Control (OEQC), in a letter dated July 14, 2005 (see **Exhibit F**)

Pursuant to the instructions, these comments are addressed directly in this Final Environmental Assessment Report and in the response to the OEQC (see **Exhibit G**)

Comments were also received from Dr. John Cusick, Assistant Specialist of the University of Hawaii at Manoa Environmental Center on July 22, 2005 (see **Exhibit H**). The response to that letter is shown in **Exhibit I**.

Comments were also received from Michael Foley, Director, Department of Planning, County of Maui, on August 4, 2005 (**see Exhibit J**). The response to that letter is shown as **Exhibit K**.

KCA MEETING , 12/8/03 5:00 PM

C:\Documents and Settings\alu\Local Settings\Temporary Internet Files\OLKCC\KCAmtg12803.wpd

Purpose: Evaluate proposed new recycling drop box location and get feedback from KCA

Why move? Proposed senior housing development
County property leased to Hale Mahaolu
Project Manager: Roy Katsuda 872-4108
Senior Housing still in the permitting process
No discussion of moving drop box site
No money set aside
Drop box site not included in overall housing plan

Time Frame: Housing project 1- 1/2yrs
Recycling Site: expansion in to redemption center
Container Deposit Bill - effective 1/1/05

Need to upgrade site in the next year

Move: Land designation: Park no time frame
Property is separated from other area by gulch, good use of that property
Enough space to include other services to the community: bulky items, used oil compost demo site.

Support: Need KCA support to move forth with project.

EXHIBIT A

From: Irene Cordell
To: Kihei Community Association
Subject: Re: KCA meetings

Hi Ruby,
I work for the County's Solid Waste Division, Recycling Section. Our division did a presentation to the Board concerning the Kihei Recycling Center a couple of months ago. We need to move the center to another location because there is a senior housing project being developed at the current location. We did a presentation to the board concerning the relocation to the parcel off Welakahao road as part of the South Maui Regional Park. We are currently working on a redesign, as asked by the board and would like to do another presentation. Perhaps we should be working with the planning committee. Please let me know what our next step should be. We are on a tight time frame as we need to be off that property . construct a new site and get it up and running by January, 2005thanks for your help.

>>> Kihei Community Association <kca@southmaui.org> 4/19/04 4:28:57 PM >>>
Irene: The Board will decide on when and if you can make a presentation. Often they will refer you to a comittee. That committee will decide on when you might appear. You can communicate your intention via email but you should be clear as to what you wish to do. Since I do not know what your intention is, I have no idea what committee you should address. If you want to make a submission to the Planning Committee, there is an application and a fee that I can send to you if I am directed to do so by the committee chair. If you are interested in making a presentation at the Community Meetings you should let me know of your interest, what you wish to present, your credentials and I will submit that to the committee in charge of the Community Meetings. We like to book one or two months in advance. Here is the latest newsletter. Ruby

"Irene Cordell" <Irene.Cordell@co.maui.hi.us>
To:
<kca@southmaui.org>

EXHIBIT B

Thanks Ruby. How far in advance do we have tell you when we want to do a presentation to the Board? to the Community meeting?

>>> Kihei Community Association <kca@southmaui.org> 4/16/04 1:22:58 PM >>>
Irene:
The KCA Board meets on the first Thursday of every montha at 5:45pm. The
Community meeting is every third Tuesday of every month. I send out an
email prior to the Community Meeting to each member of the association.
Aloha,
Ruby at the KCA

[Image]
Aloha :

Mahalo Nui Loa to all who came to our Friend and Fundraiser Lu'au last

KCA Meeting 6/7/04

The following items were discussed by the KCA planning committee.

The committee seemed to support the relocation of the recycling bins with the following stipulations:

1. Get agreement from Parks Dept to put the bins in South Maui Regional Park
2. Make sure there is water to the site for irrigation of wind break trees
3. Adequate landscaping around the site
4. Protection against wind gusts to keep material from flying around area
5. Contact police for security lighting requirements
6. Address other recycling issues: paint and x-mas trees
7. Must go through design and planning commission
8. SMA requirements
9. Make presentation to KCA membership in July possibly July 20, 2004.
10. Address run off water from parking lots etc

Action Steps:
Set up meeting with parks and wastewater
Contact police about security lighting required
Ask Milton for recommendations to design and go for permits for this project
Get larger design made from GIS

Will meet planning committee next on June 28, 2004

EXHIBIT C

Kihei Community Association Planning Meeting #2 6/28/04

Topics:
Concerns from last meeting:

1. Agreement from Parks -
   - Met with Glenn Correa, Director Parks & Rec
   - Verbal ok to be responsible for the property
   - Drafted Memorandum of Agreement between DPWEM and Parks and Rec
   - Will work with Parks if they have certain criteria

2. Water for Irrigation
   - Met with wastewater:
     - There is reclaimed water that runs all along collector Road. Can tap in to water there.
   - Work with Munikiyo and Hiraga, designer for Hope Chapel, may be able to get closer hook up

3. Windbreak and Landscape
   - Will work with Chris Hart and windbreak surrounding center
   - To fit with the landscape design of Park.

4. Will provide solar lighting at the site

5. Other recycling activities: may not work with redemption center there.

6. Run off - will meet engineering criteria concerning run off.

7. Flying debris should be minimized by fences and having the center manned. There will also be monitoring by the recycling hauler.

Would like to set date for general membership meeting.

EXHIBIT D

KIHEI COMMUNITY ASSOCIATION

P.O. Box 662, Kihei, HI 96753 Phone/Fax: (808) 879-5390 E-Mail: kca@southmaui.org

Working together to shape our community's future

GENERAL MEMBERSHIP MEETING
July 20, 2004
AGENDA

EXHIBIT E

PRESIDENT DAVE MACKWELL

- Opening comments

- **Presentation by Robert Parsons, Irene Cordell & John Harder**

  Robert Parsons, Executive Assistant, Environmental Concerns, Office of the Mayor, Irene Cordell, Recycling Specialist, Solid Waste Division, County of Maui and John Harder, Solid Waste Division Chief, County of Maui will present a proposal for a new recycling facility in Kihei to replace the existing drop box location on Welakahao Road. Proposed new location would be on the opposite site of Welakahao Road, between that and the Keokea Gulch.

- **Presentation by Sterling Kim and Leslie Owara**

  Sterling Kim of K.N. Kaminaka, Inc. and Leslie Owara, Developer will present a proposal to construct a Carquest Retail Outlet on Halekaui Street between Marco's Restaurant and Goodyear, on the same side of the street.

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

EXHIBIT F

July 14, 2005

Milton Arakawa
Department of Public Works & Environmental Management
200 South High Street
Wailuku, HI 96793

Dear Mr. Arawaka:

Subject: Draft Environmental Assessment (EA)
Kihei Recycling & Redemption Center

We have the following comments:

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

Page numbers: The EA lacks page numbers from both the body of the text and the table of contents. This makes reviewing the document very difficult. In the final EA insert page numbers in both.

Flora and fauna study: The study cited is quite old. In the final EA include an updated study.

Archeological and historic resources: In the final EA enclose a letter from the Historic Preservation Division of DLNR showing its concurrence with Dr. Dega's conclusion that the sites will no longer be significant after completion of data recovery.

Nuisances: There was no discussion of the possible nuisances of flies or odors. Include such a discussion in the final EA, along with proposed mitigation measures.

Cultural impacts assessment:

Act 50 was passed by the legislature in April 2000. This mandates an assessment of impacts to current cultural practices by the proposed project. In the final EA include such an assessment.

If the subject area is in a developed urban setting, cultural impacts must still be assessed. Many incorrectly assume that the presence of urban infrastructure effectively precludes consideration of current cultural factors. For example, persons are known to gather kauna'oa,

'ilima, 'uhaloa, noni or ki on the grassy slopes and ramps of the H-1 freeway and some state highways on the neighbor islands. Certain landmarks and physical features are used by Hawaiian navigators for sailing, and the lines of sight from landmarks to the coast by fisherman to locate certain fishing spots. Blocking these features by the construction of buildings or tanks may constitute an adverse cultural impact.

For assistance in the preparation refer to our *Guidelines for Assessing Cultural Impacts.* Contact our office for a paper copy or go to our homepage at *http://www.state.hi.us/health.oeqc/guidance/index.html.* You will also find the text of Act 50 linked to this section of our homepage.

Significance criteria:

Section V, part D of the draft EA lists the analysis of impacts as relating to the Special Management Area. The majority of these are in fact the significance criteria found in OEQC's HAR 11-200-12.

The following analyses are missing. Please include them in the final EA:

Criterion #5: *Substantially affects public health;*
Criterion #7: *Involves a substantial degradation of environmental quality;*
Criterion #13: *Requires substantial energy consumption.*

For a complete list of significance criteria go to http://www.state.hi.us/health/about/rules/11-200.html#sec_12 or call our office for a paper copy.

Permits and approvals: List all required permits and approvals for this project and the status of each.

Consultation: Enclose copies of all correspondence received during the pre-consultation phase. If there was none, please note this in section IX, and indicate how your pre-consultations were carried out.

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

Sincerely,

GENEVIEVE SALMONSON
Director

c: Alan Unemori

WARREN S. UNEMORI ENGINEERING, INC. Civil & Structural Engineers • Land Surveyors
Wells Street Professional Center • 2145 Wells Street, Suite 403 • Wailuku, Maui, HI 96793 TEL: (808) 242-4403 FAX: (808) 244-4856

August 24, 2005

EXHIBIT G

Genevieve Salmonson
Director
Office Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Re: Response to Your Letter to Milton Arakawa, Dated July 14, 2005, for the Draft Environmental Assessment (EA) of the Kihei Recycling and Redemption Center

Dear Ms. Salmonson:

Thank you for your comments on the Draft Environmental Assessment Report. Your comments have been directly addressed within the Final Environmental Assessment Report.

For your convenience, however, they will be addressed on an item-by-item basis herein as well:

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

Response

The Final Environmental Assessment Report has been printed on two-sided pages. The Exhibits, Figures, Construction Sheets and the Consultants Reports (by others) in the Appendices, however, remain on single-sided pages.

Page numbers: ***The EA lacks page numbers from both the body of the text and the table of contents. This makes reviewing the document very difficult. In the final EA insert page numbers in both.***

Response

Page numbers have been inserted in the Final EA Report and in the Table of Contents

Flora and fauna study: ***The study cited is quite old. In the final EA include an updated study.***

Response

A Site Reconnaissance Survey was conducted by the staff of Chris Hart & Partners on August 2, 2005. A facsimile summarizing their findings is included in the Final EA Report as *Exhibit "N"*. The following excerpts are taken from that facsimile:

"Based upon a site reconnaissance survey of the subject property conducted by CH&P staff o August 2, 2005, it appears that existing vegetation primarily consists of Ilima (Sida cordifolia), Haole Koa (Leucaena levcocephala), Kiawe (Prosopis pallida), and Wiregrass (Elevsine indica). No wetland indicator plants were found on the property.

Avifauna typically found in the area includes the common myna, several species of dove, cardinal, house finch, and house sparrow. Mammals common to this area include cats, dogs, rats, mice and mongoose. No known rare, endangered, or threatened species of flora or fauna were discovered on the subject property."

***Archaeological and historic resources:** In the final EA enclose a letter from the Historic Preservation Division of DLNR showing its concurrence with Dr. Dega's conclusion that the sites will no longer be significant after completion of data recovery.*

Response

Section IV.A.6 "Archaeological Resources" of the Final EA Report states the following:

"Per the discussion above, in Dr. Michael Dega's opinion, *'... after Data Recovery work has been completed, the sites will no longer be significant. As such, and if this pattern holds true, any landscape altering activities may occur at any location on the parcel.'*

Data Recovery was conducted during a five week period in March and April of 2005. A complete copy of the Archaeological Data Recovery Report is included in Appendix C. The Report "Recommendations" states the following:

'As a result of this and earlier studies of the project area, it is recommended that no further work be conducted within the project area excepting Site 2512. As Site 2512 is now interpreted as a ceremonial location, it is recommended that this site be preserved based on a Preservation Plan. The SHPD will review this Preservation Plan prior to construction work in this portion of the parcel.'

This one site (Site 2512) which may be preserved is in Keokea Gulch and not within the boundaries of the project site. Therefore, there should be no adverse impacts to the project by the proposed development."

A draft letter dated August 16, 2005, from SHPD states the following (see ***Exhibit "O"***):

"Given the above information, we understand that the proposed work as part of the Kihei Recycling and Redemption Center at South Maui Community Park will focus on the southern half of the parcel, in an area in which no historic properties

were identified. The site to be preserved (SIHP 2512) is located in the central portion of the parcel, and all sites covered under the data recovery work are in the northern portion of the parcel.

Therefore, we believe that activities associated with the Kihei Recycling and Redemption Center project will have "no effect" on historic properties. We do, however, recommend no action be taken on subsequent undertakings until an acceptable preservation plan for SIHP 2512 has been reviewed by this office and is in place."

Nuisances: There was no discussion of the possible nuisances of flies or odors. Include such a discussion in the final EA, along with proposed mitigation measures.

Response

Section IV.A.8 "Nuisances" of the Final EA Report states the following:

"The level of odor and flies constitutes a minimal nuisance. The beverage containers collected at the redemption center are immediately placed in large plastic bags then put in the large dropbox containers which are hauled out daily. The beverage containers are not accepted at the Redemption Center unless they are empty. There is nothing there that would generate flies or odors."

Cultural impacts assessment: Act 50 was passed by the legislature in April, 2000. This mandates an assessment of impacts to current cultural practices by the proposed project. In the final EA include such an assessment.

If the subject area is in a developed urban setting, cultural impacts must still be assessed. Many incorrectly assume that the presence of urban infrastructure effectively precludes consideration of current cultural factors. For example, persons are known to gather kauna'oa, 'ilima, 'uhalo, noni or ki on the grassy slopes and ramps of the H-1 freeway and some state highways on the neighbor islands. Certain landmarks and physical features are used by Hawaiian navigators for sailing, and the lines of sight from landmarks to the coast by fisherman to locate certain fishing spots. Blocking these features by the construction of buildings or tanks may constitute an adverse cultural impact.

Response

A Cultural Impacts Assessment Study was performed by Scientific Consultants Services Archaeology (SCS) in July and August, 2005. The Cultural Impacts Assessment Study Report is included in its entirety in Appendix D. In "Project Area and Vicinity" on page 6, the Report states the following"

"... The local Fire Department indicated that the entire project area had been

completely burned four times since 1999. Several more partial burns have occurred and heavy equipment was brought into extinguish the fires, affecting the terrain and destroying what vegetation was left and seriously impacting the integrity of the parcel for cultural activities."

In the "Summary and Cultural Assessment", on page 14, the Report states the following:

"Based on organizational response, and archival research it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on a portion of plot 42. However, it is recommended that Cultural Advisors be consulted during the planning process. In this way, appropriate mitigation measures, if needed, can be put in place before development occurs. Because there were no activities identified within the project area, there are no adverse effects."

***Significance criteria**: Section V, part D of the draft EA lists the analysis of impacts as relating to the Special Management Area. The majority of these are in fact the significance criteria found in OEQC's HAR 11-200-12.*

The following analyses are missing. Please include them in the final EA:

Criterion #5: Substantially affects public health;
Criterion #7: Involves a substantial degradation of environmental quality;
Criterion #13: Requires substantial energy consumption

Response

Section V.D.5 "Substantially affects public health" of the Final EA Report states the following:

"No, the proposed Kihei Recycling and Redemption Center will encourage the sanitary collection of bottles, cans, cardboard and other items which could otherwise end up as litter on the streets, highways and parks. To the contrary, uncollected litter and trash would contribute to potential problems with public health."

Section V.D.7 "Involves a substantial degradation of environmental quality" of the Final EA Report states the following:

"See Item (5) above."

Section V.D.13 "Requires substantial energy consumption" of the Final EA Report states the following:

"As there will be no Electrical/Telephone/CATV System improvements made to the proposed Kihei Recycling and Redemption Center, there will be no adverse potential impacts to the same in the Kihei area.

Lighting for the project is expected to be provided by solar-powered, pole-mounted lights (see ***Exhibit "N"***). Thus, electrical, telephone and CATV are not expected to be brought to this site along East Welakahao Street until Phase III of the South Maui Community Park is developed."

Permits and approvals: List all required permits and approvals for this project and the status of each.

Response

Special Management Area (SMA): Has been submitted to the Planning Department, who has distributed copies to the appropriate agencies for the 30-day comment period. Comments have been received from the following agencies and responses have been made where warranted:

Dept. of Health, Maui:

DAGS, Survey Division

Dept. of Water Supply:

Dept. of Parks and Recreation:

Dept. of Fire & Public Safety:

Police Department:

Natural Resource Conservation Service (NRCS), Maui:

U.S. Army Corp of Engineers:

Comments are still outstanding from the following agencies although the 30-day comment period expired on August 22, 2005:

Dept. of Transportation (DOT), Statewide Planning Office:

Dept. of Land and Natural Resources (DLNR):

State Historic Preservation Division (SHPD):

DPWEM, Development Services Administration (DSA):

Building: This will be submitted by the General Contractor when he receives the Notice to Proceed (after the SMA permit is approved)

Grading: The Grading Permit has been sent from the DPWEM Engineering Division to the Development Services Administration (DSA).

NPDES: This was resubmitted to the Department of Health, Maui District, on August 16, 2005

R1 Recycling: The R1 Recycling Permit has been returned to DPWEM, Recycling Division, pending minor corrections to the Construction Notes on the Irrigation Plan.

Noise: This was submitted to the Department of Health, Maui District on August 15, 2005

Consultation: Enclose copies of all correspondence received during the pre-consultation phase. If there was none, please note this in Section IX and indicate how your pre-consultations were carried out.

Response

Section X. "Comments Received During Pubic Comment Period and Applicable Responses" of the Final EA Report gives a chronology of Kihei Community Association (KCA) Meetings held with representatives of the Solid Waste Division of the Department of Public Works and Environmental Management as follows:

"December 8, 2003	Exhibit A	Met with KCA Planning Committee to request relocating recycling center to parcel in South Maui Regional Park. Design was requested.
April 19, 2004	Exhibit B	E-mail sent requesting a meeting to make a presentation to the KCA Planning Committee with design changes as requested
June 7, 2004	Exhibit C	Met with KCA Planning Committee. Other requests were made concerning the design of the site
June 28, 2004	Exhibit D	Discussed all the concerns of the last meeting (see Exhibit C). New design submitted.

July 20, 2004	Exhibit E	Presented design to the general membership of KCA. Answered all questions by the membership. Site was approved by the membership."

Please feel free to call me at (808) 242-4403 if you have any further questions on this matter.

Sincerely,

Alan L. Unemori
Vice-President

cc Milton Arakawa, Director, DPWEM
Irene Cordell, Recycling Division

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UNIVERSITY OF HAWAI I AT MANOA
Environmental Center

EXHIBIT H

July 22, 2005
EA: 0318

Mr. Milton Arakawa
Director, Department of Public Works
and Environmental Management
County of Maui
200 South High Street
Wailuku, HI 96793

Dear Mr. Arakawa:

Draft Environmental Assessment
Kihei Recycling and Redemption Center
at South Maui Community Park
Kihei, Maui, Hawai'i

This Draft Environmental Assessment (EA) submitted for the Department of Public Works and Environmental Management by Warren S. Unemori Engineering, Inc. proposes the construction of a new recycling and redemption center at Piilani Villages to replace an existing center. In accordance with Chapter 343, Hawai'i Revised Statutes (HRS) and the Department of Health's Hawai'i Administrative Rules Title 11-200, this EA evaluates and identifies technical, environmental, social, and economic aspects of the project and possible impacts. The anticipated determination is a Finding of No Significant Impact (FONSI).

The proposed project is located within the Special Management Area on a parcel of Urban District land owned by the County of Maui. The County plans to use the area for the South Maui Community Park and the Recycling and Redemption Center will occupy a portion of the parcel. Adjacent land uses include existing and planned transportation corridors through South Maui, public school facilities, a golf course, residential, and vacant land that is currently being developed.

The Environmental Center is in general agreement that the project has the potential to be an important community asset in consideration of the recent initiation of the State Bottle Bill. The "No Build" alternative addresses the likelihood of more solid waste ending up in the Central Maui Landfill and potential for increased litter on the island. The Draft EA addresses the required components but there is need for pagination to make the document more readable. The addition of a complete South Maui map would also benefit the reader not familiar with the immediate project site.

2500 Dole Street, Krauss Annex 19, Honolulu, Hawai'i 96822-2313
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

Thank you for the opportunity to review this Draft EA.

Sincerely,

John Cusick, Ph.D.
Assistant Specialist

Cc: OEQC
Department of Public Works and Environmental Management
Warren S. Unemori Engineering, Inc.
James Moncur

WARREN S. UNEMORI ENGINEERING, INC. Civil & Structural Engineers • Land Surveyors
Wells Street Professional Center • 2145 Wells Street, Suite 403 • Wailuku, Maui, HI 96793 TEL. (808) 242-4403 FAX. (808) 244-4856

August 5, 2005

EXHIBIT I

Mr. John Cusick, Ph.D
Assistant Specialist
UNIVERSITY OF HAWAII AT MANOA
Environmental Center
2500 Dole Street, Krauss Annex 18
Honolulu, HI 96822-2313

Re: Draft Environmental Assessment - Kihei Recycling and Redemption Center at South Maui Community Park, Kihei, Maui, Hawaii

Dear Dr. Cusick:

Thank you for your prompt review of our Draft EA Report. You commented that there is a need for pagination to make the document more readable. This has been done for the Final EA Report, which is targeted to be published in the September 8, 2005, issue of the Environmental Notice.

You also stated that "addition of a complete South Maui map would also benefit the reader not familiar with the immediate project site. We have therefore added a map of Maui Island in the upper left corner of Figure 1 to show readers where the Kihei Region is located, and added a new Figure 1A, which shows the project location. Both Figures are attached for your review.

Please do not hesitate to call me if you have any further comments on this project.

Sincerely,

Alan L. Unemori
Vice-President

cc Milton Arakawa, Director, DPWEM (w/ encls.)
Irene Cordell, DPWEM, Recycling Div. (W/ encls.)

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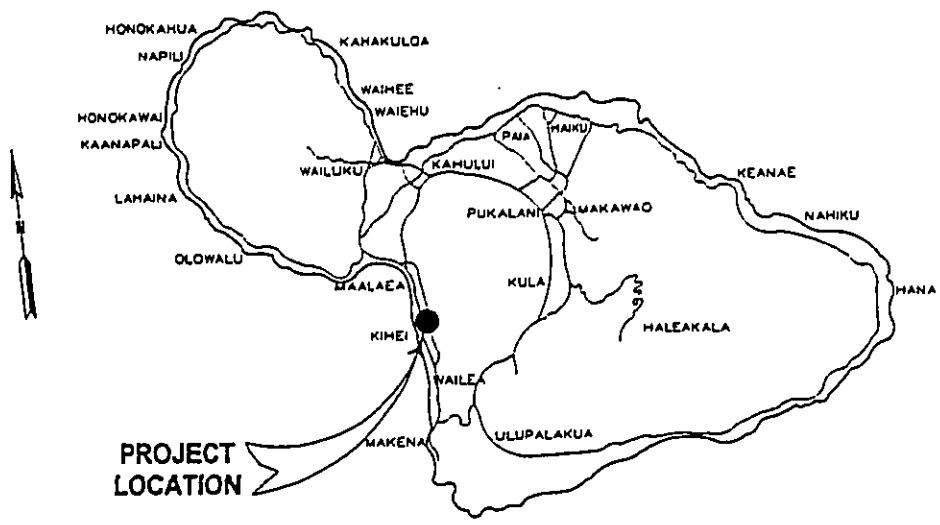


ISLAND OF MAUI

NOT TO SCALE

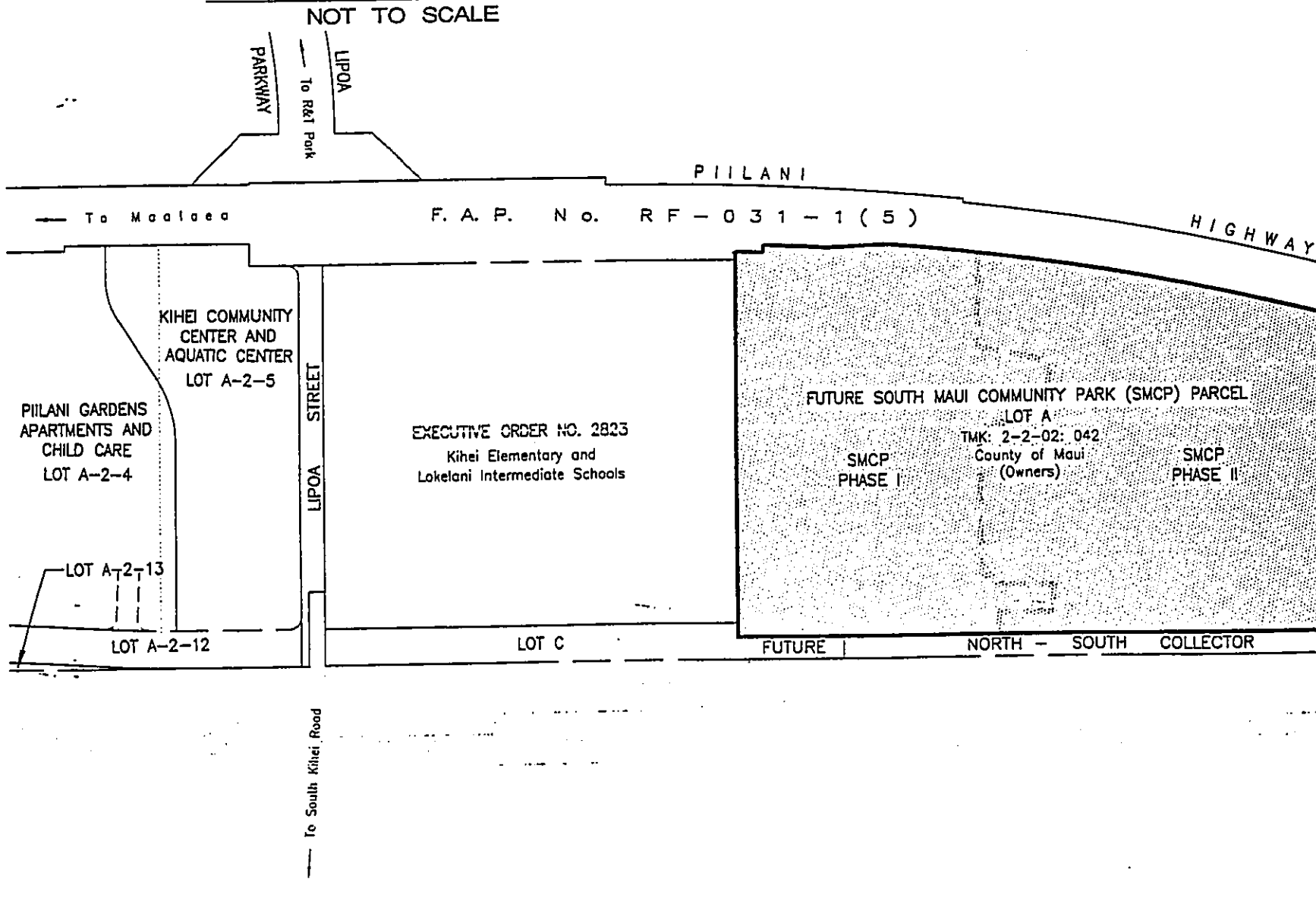
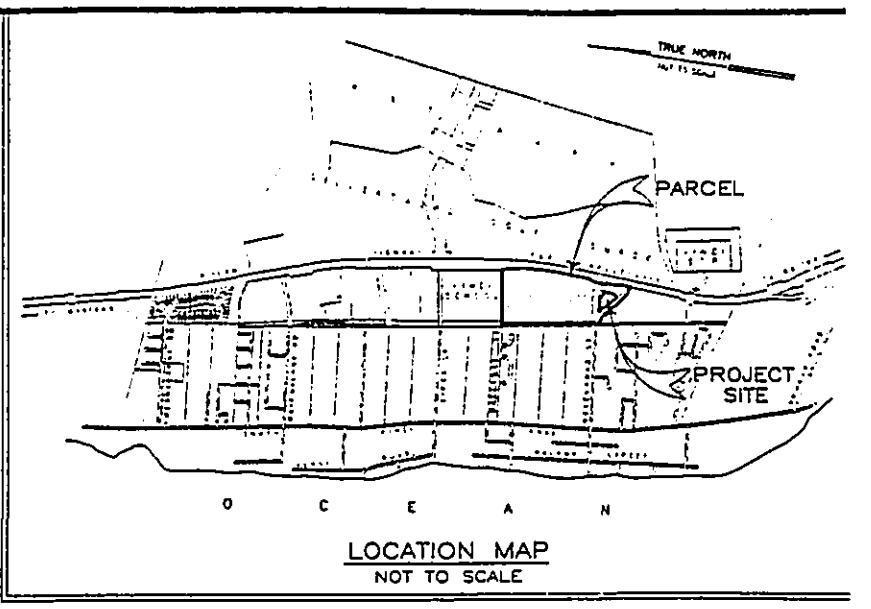


FIGURE 1 - PROJECT LOCATION MAP SHO
PROJECT SITE WITHIN FUTURE SOUTH MAUI CO



LOCATION MAP
NOT TO SCALE

TRUE NORTH
NOT TO SCALE

KIHEI SEWAGE TREATMENT PLANT

KIHEI RECYCLING &
REDEMPTION CENTER
PROJECT SITE

HIGHWAY

P) PARCEL

SMCP
PHASE II

KEOKEA GULCH
(DRAINAGE RESERVE)

SMCP
PHASE III

NEW WELAKAHAO ROAD

LOT B
TMK: 2-2-02: 72
Hope Chapel
(Owners)

OLD WELAKAHAO ROAD

To Wailea

Hale Mahaolu
(Owners)

OLLECTOR

To South Kihei Road

ON MAP SHOWING RECYCLING
TH MAUI COMMUNITY PARK PARCEL

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

August 4, 2005

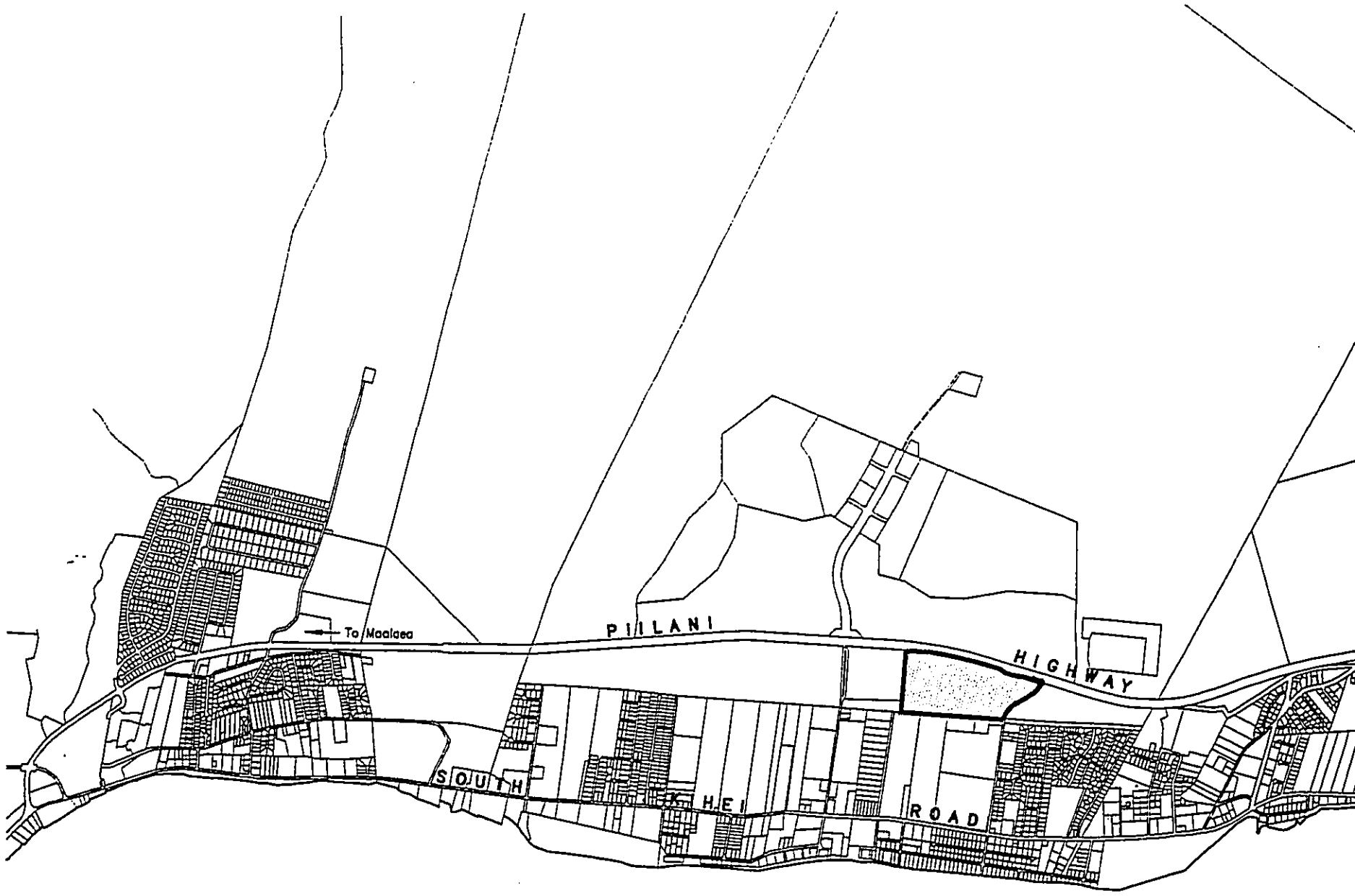


FIGURE 1A - PROJECT LOCATION
FUTURE SOUTH MAUI COMMUNITY PAR

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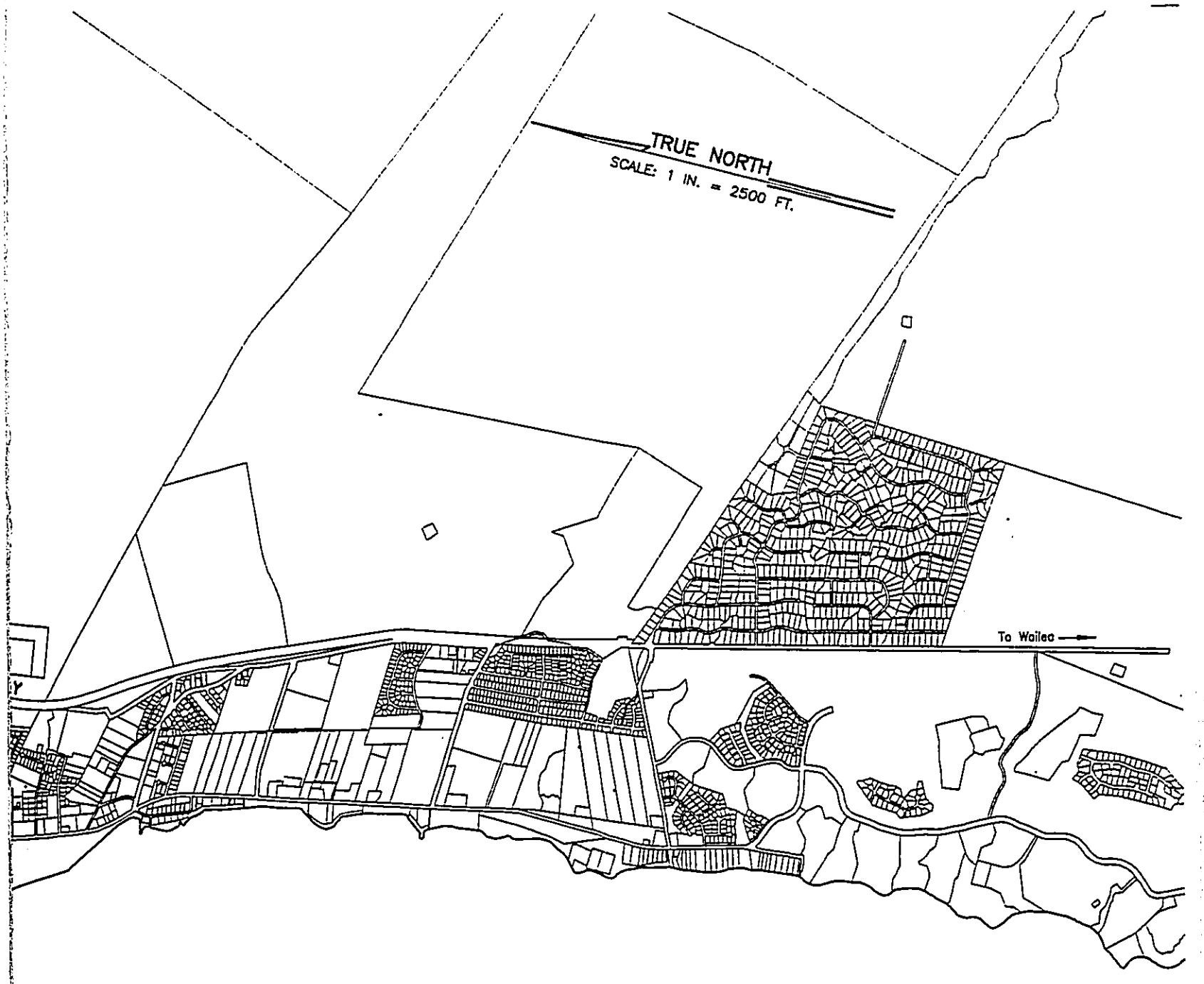

A N

OCATION MAP SHOWING
UNITY PARK PARCEL IN KIHEI

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

August 4, 2005

11" x 17"

ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

August 4, 2005

Mr. Alan Unemori
Warren S. Unemori Engineering
2145 Wells Street, Suite 403
Wailuku, Hawaii 96793

EXHIBIT J

Dear Mr. Unemori:

RE: Draft Environmental Assessment for the Proposed Kihei Recycling and Redemption Center located at TMK: 2-2-002: 042, Piilani Highway and Welakahao Road, Kihei, Island of Maui, Hawaii (LTR 2005/1753)

The Maui Planning Department (Department) has reviewed the Draft Environmental Assessment (EA) for the proposed Kihei Recycling and Redemption Center located at the intersection of Piilani Highway and Welakahao Road in Kihei, Maui.

The proposed action involves relocating and constructing the recycling and redemption center. The existing recycling center, which is located approximately 1,700 feet south of the proposed project area will be displaced with the construction of Hale Mahaolu Senior Center in August 2005.

The Department provides the following comments on the Draft EA document:

1. Section I, Project Overview

   a. Provide a description of the proposed construction materials. Is the project anticipated to use recycled or sustainable building materials?

   b. The proposed action requires a Special Management Area Use Permit, Project District Phase 2, and Project District Phase 3. The Department is currently processing the applications for the SMA Use Permit and Project District Phase 2.

2. Section IV, Potential Impacts and Mitigation Measures

   a. Recycling centers, if improperly designed and managed, have the potential to become a visual nuisance from overflowing receptacles and windblown litter. Discuss how the proposed design will mitigate this potential.

   b. Discuss how the proposed design accommodates for adequate parking and traffic circulation within the project boundaries for users of the facility.

3. Section IV.C.4, Drainage and Erosion Control

   a. Discuss the alternative of designing the on-site subsurface detention system to manage more storm-water runoff thereby further reducing the quantity discharged.

   b. Discuss incorporating appropriate filtration measures into the drainage plan to separate petroleum products and other potential contaminants from storm-water runoff.

4. Section V.C, Kihei-Makena Community Plan

   Please be advised that to date, the proposed amendments to the County's Exemption List for Chapter 343, HRS, has not been reviewed by the State Environmental Council.

5. Section VIII, Findings and Conclusions

   Provide a discussion of the proposed action as evaluated in accordance with the significance criteria established in Section 11-200-12, HAR.

6. Section IX, Consultation in Preparation of the Draft EA

   Summarize any discussions with Hope Chapel or other neighboring property owners regarding the proposed action.

7. Construction Sheets - include a proposed landscape planting plan.

As a general recommendation and to assist in future reviews, please include page numbers and a table of contents.

Thank you for the opportunity to comment. Should you require further clarification, please contact Ms. Kivette Caigoy, Environmental Planner, at 270-7735.

Sincerely,

MICHAEL W. FOLEY
Planning Director

MWF:KAC:lar
c: Wayne Boteilho, Deputy Planning Director
Kivette Caigoy, Environmental Planner
Colleen Suyama, Staff Planner
DPWEM
OEQC
TMK Folder (w/report)
General File
K:\WP_DOCS\PLANNING\EA\DEAComments\2005\1753_KiheiRecyclingCtr.wpd

WARREN S. UNEMORI ENGINEERING, INC. Civil & Structural Engineers • Land Surveyors
Wells Street Professional Center • 2145 Wells Street, Suite 403 • Wailuku, Maui, HI 96793 TEL: (808) 242-4403 FAX: (808) 244-4856

August 18, 2005

EXHIBIT K

Mr. Michael W. Foley
Director
Department of Planning
250 South High Street
Wailuku, HI 96793

Re: Response to Your Comments on Draft Environmental Assessment for the Proposed Kihei Recycling and Redemption Center, Letter Dated August 4, 2005

Dear Mr. Foley:

Thank you for your comments dated August 4, 2005, on the proposed project. The following is an item-by-item response to your comments:

1. Section I, Project Overview

a. Provide a description of the proposed construction material. Is the project anticipated to use recycled or sustainable building materials?

Response

Since the Project Overview is a summary of the location, proposed need, and proposed action, information on materials are included in the Preliminary Engineering Report, Chapter I, Introduction, Section C, Project Description.

Anticipated onsite infrastructure improvements and recycled materials include:

- Roadway improvements consisting of: asphalt and recycled glass "glassphalt" pavement and concrete curbing.
- Utility improvements consisting of: grated drain inlets, an underground drainage system, a subsurface drainage system, and a recycled water landscape irrigation system.
- Landscape improvements consisting of perimeter ground cover and hedges, and supporting recycled water landscape irrigation.

Anticipated offsite infrastructure improvements along Welakahao Street include:

- A dedicated left turn pocket, and appurtenant asphalt pavement widening, pavement markings and striping, and signage

b. ***The proposed action requires a Special Management Area Use Permit, Project District Phase 2, and Project District Phase 3. The Department is currently processing the applications for the SMA Use Permit and Project District Phase 2.***

Response

The applications are in process.

2. ***Section IV, Potential Impacts and Mitigation Measures***

a. ***Recycling centers, if improperly designed and managed, have the potential to become a visual nuisance from overflowing receptacles and windblown litter. Discuss how the proposed design will mitigate this potential.***

Response

Visual impacts and litter are mitigated by both the design with fencing and landscaping and by the management of the center. The proposed Kihei Recycling Center will have 10' high fences with slats as well as being landscaped planting on the exterior of the fence line. By contract the County will have the center monitored twice a day - once in the morning and once in the afternoon to control the overflow of receptacles and windblown litter. The monitors are required to report overflowing drop boxes to the contractor's main office, where a driver will be dispatched to pick up the full boxes and drop off empty boxes. The monitor is also responsible for picking up all loose trash inside and outside the fence lane and in the surrounding areas.

b. ***Discuss how the proposed design accommodates for adequate parking and traffic circulation within the project boundaries for users of the facility.***

Response

The footprint of the Center is based on the 50 ft radius shown on the Construction Plans, Sheet C-2, which provides adequate room for roll-off trucks to pick up and deliver dropboxes. There is capacity for 15 vehicles to drive into the Center, park, and unload recyclable and redeemable items. There is queue capacity for 10 vehicles along the driveway. The proposed center is larger than the current center it replaces.

3. *Section IV.C.4, Drainage and Erosion Control*

a. ***Discuss the alternative of designing the on-site subsurface detention system to manage more storm-water runoff thereby further reducing the quantity discharged.***

Response

The storm water system is designed in accordance with current County Drainage Standards. Per the Drainage Report contained in Appendix A of the Draft EA, the current scope of subsurface drainage system improvements will ensure that there will be no net increase in onsite peak runoff, even at a 50-year recurrence interval, in compliance with County drainage standards.

Furthermore, even the 1.7 c.f.s. of additional onsite runoff that would have been generated is negligible (0.02%) compared to the 8,008 c.f.s. that is anticipated alongside the project within the existing Keokea Gulch drainageway.

Attempting to reduce peak runoff to levels even below that required by the County drainage standards by enlarging the subsurface drainage system is not feasible at this location due to the difficulty of excavation in solid blue rock.

b. ***Discuss incorporating appropriate filtration measures into the drainage plan to separate petroleum products and other potential contaminants from storm-water runoff.***

Response

According to Irene Cordell, a Recycling Specialist for the Maui County Recycling Section of the DPWEM, she has not observed any visible petroleum product on the pavement of the existing Kihei Recycling Center in the past 10 years. Since vehicular access is intermittent and short term, to drop off and pick up the recyclables, we do not believe this is a significant problem compared to any potential contaminant runoff from Piilani Highway or Welakahao Road. We are also currently researching filtration measures.

4. ***Please be advised that to date, the proposed amendments to the County's Exemption List for Chapter 343, HRS, has not been reviewed by the State Environmental Council.***

Response

We are advised of the status of Chapter 343, HRS, Exemption List.

5. *Section VII, Findings and Conclusions*

Provide a discussion of the proposed action as evaluated in accordance with the significance criteria established in Section 11-200-12, HAR.

Response

All the significance criteria established in Section 11-200-12, HAR will be discussed in the Final EA. Attached as ***Exhibit F*** is a letter from Genevieve Salmonson, Director, OEQC, dated July 14, 2005, that acknowledges the SMA application addressed the majority of the significance criteria, excluding only #5, #7 and #13. These three will be included in the Final EA scheduled for publication in the September 8, 2005, issue of the Environmental Notice.

6. ***Section IX, Consultation in Preparation of the Draft EA***

Summarize any discussions with Hope Chapel or other neighboring property owners regarding the proposed action.

Response

The County contacted Hope Chapel before considering the proposed site. Hope Chapel recommended the proposed site because it was on County property. Hope Chapel had no objection to putting the proposed site at this location.

There have also been numerous meetings by the County with the Kihei Community Association. Meeting minutes and correspondence have been documented in ***Exhibits A*** through ***E***.

7. ***Conclusion Sheets - include a proposed landscape planting plan.***

Response

A Landscape Planting Plan will be included in the Final EA Report. Construction Sheet L-1, the Landscape Planting Plan, was included in the Special Management Area Permit Application Report (see attached).

As a general recommendation and to assist in future reviewed, please include page numbers and a table of contents.

Response

Page numbers and a Table of Contents with the page numbers shown will be included in the Final EA Report.

Please call me at 242-4403 if you have any further questions or comments.

Sincerely,

Alan L. Unemori
Vice-President

cc Milton Arakawa, DPWEM (w/ encls.)
Irene Cordell, DPWEM (w/ encls.)

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Kihei Community Association Meetings

December 8, 2003	**Exhibit A** Met with KCA planning committee to request relocating recycling center to parcel in South Maui Regional Park. Design was requested.
April 19, 2004	**Exhibit B** E-mail sent requesting a meeting to make a presentation to the KCA Planning committee with design changes as requested .
June 7. 2004	**Exhibit C** Met with KCA Planning Committee. Other requests were made concerning the design of the site See Exhibit C for items discussed.
June 28, 2004	**Exhibit D** Discussed all the concerns of the last meeting (Exhibit C). New design submitted.
July 20, 2004	**Exhibit E** Presented design to the general membership of KCA. Answered all questions by the membership. Site was approved by the membership.

KCA MEETING , 12/8/03 5:00 PM

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Purpose: Evaluate proposed new recycling drop box location and get feedback from KCA

Why move? *Proposed senior housing development*
County property leased to Hale Mahaolu
Project Manager: Roy Katsuda 872-4108
Senior Housing still in the permitting process
No discussion of moving drop box site
No money set aside
Drop box site not included in overall housing plan

Time Frame: Housing project 1- 1/2yrs
Recycling Site: expansion in to redemption center
Container Deposit Bill - effective 1/1/05

Need to upgrade site in the next year

Move: Land designation: Park no time frame
Property is separated from other area by gulch, good use of that property
Enough space to include other services to the community: bulky items, used oil compost demo site.

Support: Need KCA support to move forth with project.

EXHIBIT A

From: Irene Cordell
To: Kihei Community Association
Subject: Re: KCA meetings

Hi Ruby,
I work for the County's Solid Waste Division, Recycling Section. Our division did a presentation to the Board concerning the Kihei Recycling Center a couple of months ago. We need to move the center to another location because there is a senior housing project being developed at the current location. We did a presentation to the board concerning the relocation to the parcel off Welakahao road as part of the South Maui Regional Park. We are currently working on a redesign, as asked by the board and would like to do another presentation. Perhaps we should be working with the planning committee. Please let me know what our next step should be. We are on a tight time frame as we need to be off that property , construct a new site and get it up and running by January, 2005thanks for your help.

>>> Kihei Community Association <kca@southmaui.org> 4/19/04 4:28:57 PM >>>
Irene: The Board will decide on when and if you can make a presentation. Often they will refer you to a comittee. That committee will decide on when you might appear. You can communicate your intention via email but you should be clear as to what you wish to do. Since I do not know what your intention is, I have no idea what committee you should address. If you want to make a submission to the Planning Committee, there is an application and a fee that I can send to you if I am directed to do so by the committee chair. If you are interested in making a presentation at the Community Meetings you should let me know of your interest, what you wish to present, your credentials and I will submit that to the committee in charge of the Community Meetings. We like to book one or two months in advance. Here is the latest newsletter. Ruby

"Irene Cordell" <Irene.Cordell@co.maui.hi.us>
To:
<kca@southmaui.org>

EXHIBIT B

Thanks Ruby. How far in advance do we have tell you when we want to do a presentation to the Board? to the Community meeting?

>>> Kihei Community Association <kca@southmaui.org> 4/16/04 1:22:58 PM >>>
Irene:
The KCA Board meets on the first Thursday of every montha at 5:45pm. The
Community meeting is every third Tuesday of every month. I send out an
email prior to the Community Meeting to each member of the association.
Aloha,
Ruby at the KCA

[Image]
Aloha :

Mahalo Nui Loa to all who came to our Friend and Fundraiser Lu'au last

KCA Meeting 6/7/04

The following items were discussed by the KCA planning committee.

The committee seemed to support the relocation of the recycling bins with the following stipulations:

1. Get agreement from Parks Dept to put the bins in South Maui Regional Park
2. Make sure there is water to the site for irrigation of wind break trees
3. Adequate landscaping around the site
4. Protection against wind gusts to keep material from flying around area
5. Contact police for security lighting requirements
6. Address other recycling issues: paint and x-mas trees
7. Must go through design and planning commission
8. SMA requirements
9. Make presentation to KCA membership in July possibly July 20, 2004.
10. Address run off water from parking lots etc

Action Steps:
Set up meeting with parks and wastewater
Contact police about security lighting required
Ask Milton for recommendations to design and go for permits for this project
Get larger design made from GIS

Will meet planning committee next on June 28, 2004

EXHIBIT C

Kihei Community Association Planning Meeting #2 6/28/04

Topics:
Concerns from last meeting:

1. Agreement from Parks -
   Met with Glenn Correa, Director Parks & Rec
   Verbal ok to be responsible for the property
   Drafted Memorandum of Agreement between DPWEM and Parks and Rec
   Will work with Parks if they have certain criteria

2. Water for Irrigation
   Met with wastewater:
   There is reclaimed water that runs all along collector Road. Can tap in to water there.
   Work with Munikiyo and Hiraga, designer for Hope Chapel, may be able to get closer hook up

3. Windbreak and Landscape
   Will work with Chris Hart and windbreak surrounding center
   To fit with the landscape design of Park.

4. Will provide solar lighting at the site

5. Other recycling activities: may not work with redemption center there.

6. Run off - will meet engineering criteria concerning run off.

7. Flying debris should be minimized by fences and having the center manned. There will also be monitoring by the recycling hauler.

Would like to set date for general membership meeting.

EXHIBIT D

KIHEI COMMUNITY ASSOCIATION

P.O. Box 662, Kihei, HI 96753 Phone/Fax: (808) 879-5390 E-Mail: kca@southmaui.org

Working together to shape our community's future

GENERAL MEMBERSHIP MEETING
July 20, 2004
AGENDA

EXHIBIT E

PRESIDENT DAVE MACKWELL

- Opening comments

- **Presentation by Robert Parsons, Irene Cordell & John Harder**

  Robert Parsons, Executive Assistant, Environmental Concerns, Office of the Mayor, Irene Cordell, Recycling Specialist, Solid Waste Division, County of Maui and John Harder, Solid Waste Division Chief, County of Maui will present a proposal for a new recycling facility in Kihei to replace the existing drop box location on Welakahao Road. Proposed new location would be on the opposite site of Welakahao Road, between that and the Keokea Gulch.

- **Presentation by Sterling Kim and Leslie Owara**

  Sterling Kim of K.N. Kaminaka, Inc. and Leslie Owara, Developer will present a proposal to construct a Carquest Retail Outlet on Halekaui Street between Marco's Restaurant and Goodyear, on the same side of the street.

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

EXHIBIT F

July 14, 2005

Milton Arakawa
Department of Public Works & Environmental Management
200 South High Street
Wailuku, HI 96793

Dear Mr. Arawaka:

Subject: Draft Environmental Assessment (EA)
Kihei Recycling & Redemption Center

We have the following comments:

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

Page numbers: The EA lacks page numbers from both the body of the text and the table of contents. This makes reviewing the document very difficult. In the final EA insert page numbers in both.

Flora and fauna study: The study cited is quite old. In the final EA include an updated study.

Archeological and historic resources: In the final EA enclose a letter from the Historic Preservation Division of DLNR showing its concurrence with Dr. Dega's conclusion that the sites will no longer be significant after completion of data recovery.

Nuisances: There was no discussion of the possible nuisances of flies or odors. Include such a discussion in the final EA, along with proposed mitigation measures.

Cultural impacts assessment:

Act 50 was passed by the legislature in April 2000. This mandates an assessment of impacts to current cultural practices by the proposed project. In the final EA include such an assessment.

If the subject area is in a developed urban setting, cultural impacts must still be assessed. Many incorrectly assume that the presence of urban infrastructure effectively precludes consideration of current cultural factors. For example, persons are known to gather kauna'oa.

'ilima, 'uhaloa, noni or ki on the grassy slopes and ramps of the H-1 freeway and some state highways on the neighbor islands. Certain landmarks and physical features are used by Hawaiian navigators for sailing, and the lines of sight from landmarks to the coast by fisherman to locate certain fishing spots. Blocking these features by the construction of buildings or tanks may constitute an adverse cultural impact.

For assistance in the preparation refer to our *Guidelines for Assessing Cultural Impacts.* Contact our office for a paper copy or go to our homepage at *http://www.state.hi.us/health.oeqc/guidance/index.html.* You will also find the text of Act 50 linked to this section of our homepage.

Significance criteria:

Section V, part D of the draft EA lists the analysis of impacts as relating to the Special Management Area. The majority of these are in fact the significance criteria found in OEQC's HAR 11-200-12.

The following analyses are missing. Please include them in the final EA:

Criterion #5: *Substantially affects public health;*
Criterion #7: *Involves a substantial degradation of environmental quality;*
Criterion #13: *Requires substantial energy consumption.*

For a complete list of significance criteria go to http://www.state.hi.us/health/about/rules/11-200.html#sec_12 or call our office for a paper copy.

Permits and approvals: List all required permits and approvals for this project and the status of each.

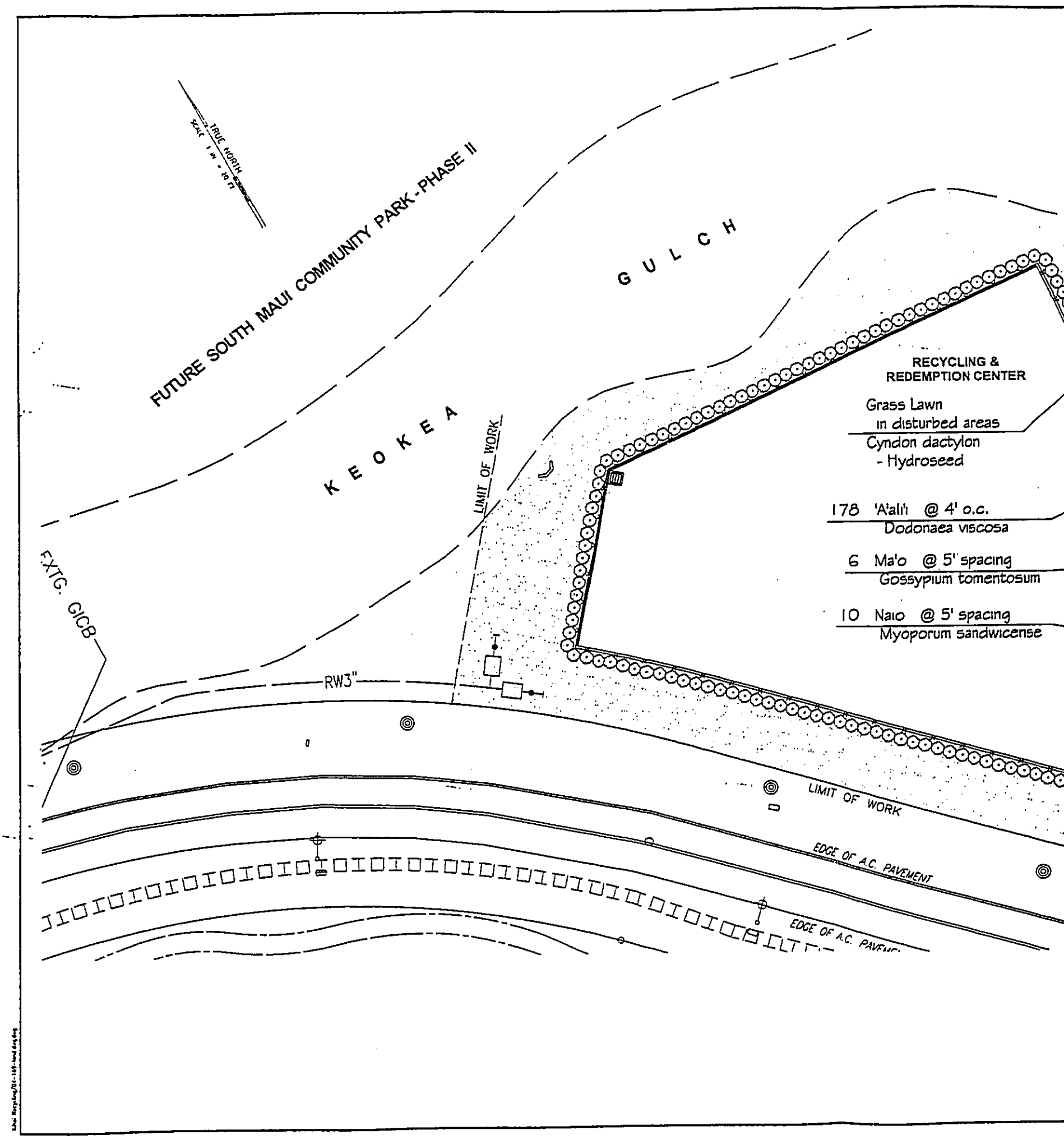
Consultation: Enclose copies of all correspondence received during the pre-consultation phase. If there was none, please note this in section IX, and indicate how your pre-consultations were carried out.

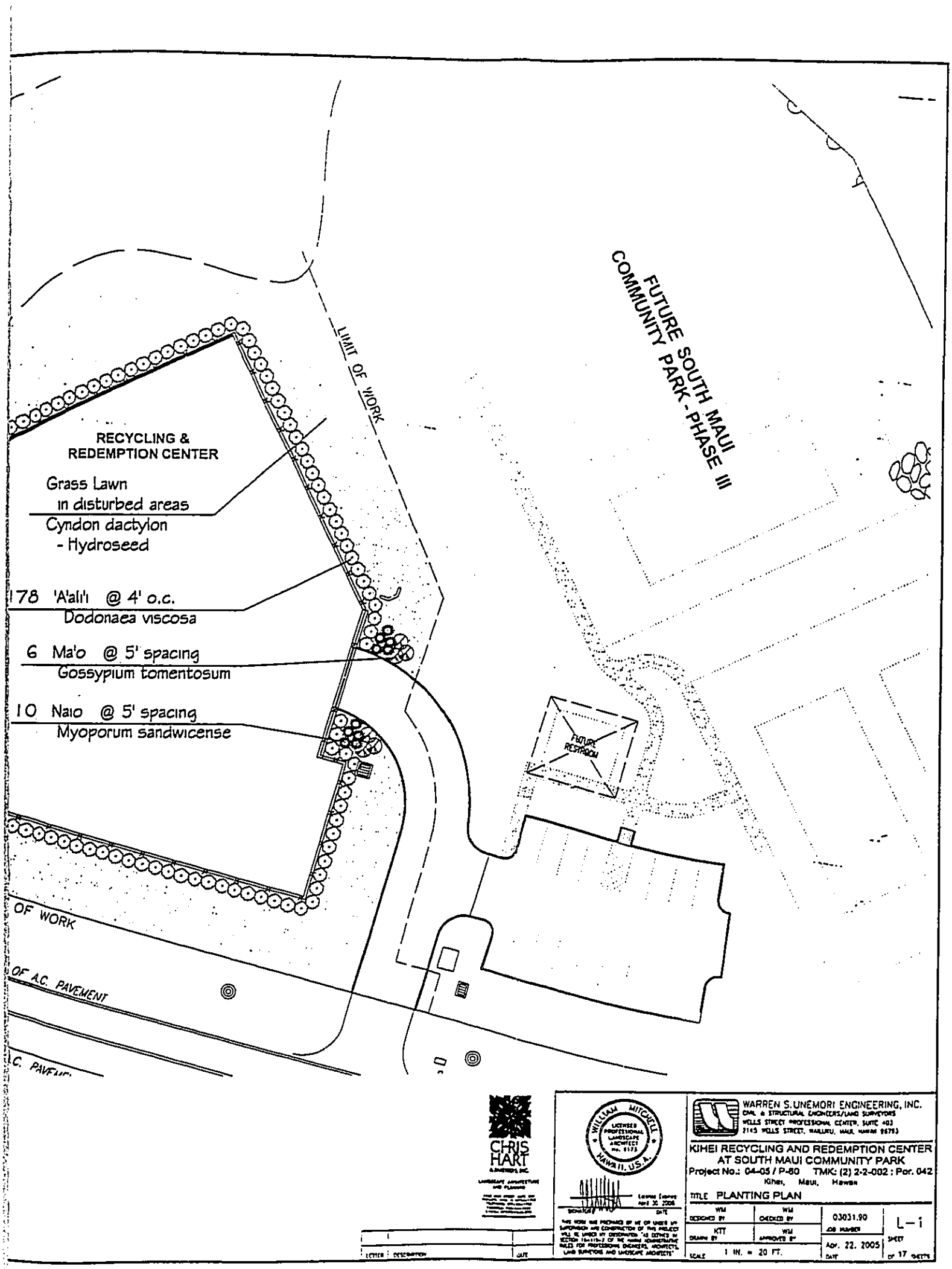
If you have any questions, please call Nancy Heinrich at 586-4185.

Sincerely,

GENEVIEVE SALMONSON
Director

c: Alan Unemori


TRUE NORTH
SCALE 1 IN = 20 FT
FUTURE SOUTH MAUI COMMUNITY PARK - PHASE II
K E O K E A
G U L C H
LIMIT OF WORK
EXTG. GICB
RW3"
RECYCLING &
REDEMPTION CENTER
Grass Lawn
in disturbed areas
Cyndon dactylon
- Hydroseed
178 'A'ali'i @ 4' o.c.
Dodonaea viscosa
6 Ma'o @ 5' spacing
Gossypium tomentosum
10 Naio @ 5' spacing
Myoporum sandwicense
LIMIT OF WORK
EDGE OF A.C. PAVEMENT
EDGE OF A.C. PAVEMENT



CHRIS HART & PARTNERS INC
LANDSCAPE ARCHITECTURE AND PLANNING

WILLIAM MITCHELL
LICENSED PROFESSIONAL LANDSCAPE ARCHITECT
No. 0173
HAWAII, U.S.A.

License Expires April 30, 2006
SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE LIMITED BY DESIGNATION "AS DEFINED IN SECTION 16-115-7 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

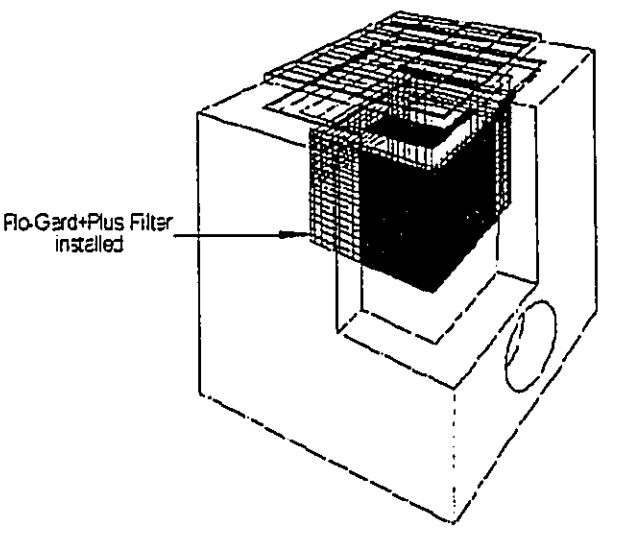
LETTER	DESCRIPTION	DATE
1		

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-80 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

TITLE PLANTING PLAN

DESIGNED BY: WM	CHECKED BY: WM	JOB NUMBER: 03031.90	SHEET: L-1
DRAWN BY: KTT	APPROVED BY: WM	DATE: Apr. 22, 2005	OF 17 SHEETS
SCALE: 1 IN. = 20 FT.			



Flo-Gard™ +Plus

A multipurpose catch basin insert designed to capture sediment, debris, trash & oils/grease from low (first flush) flows.

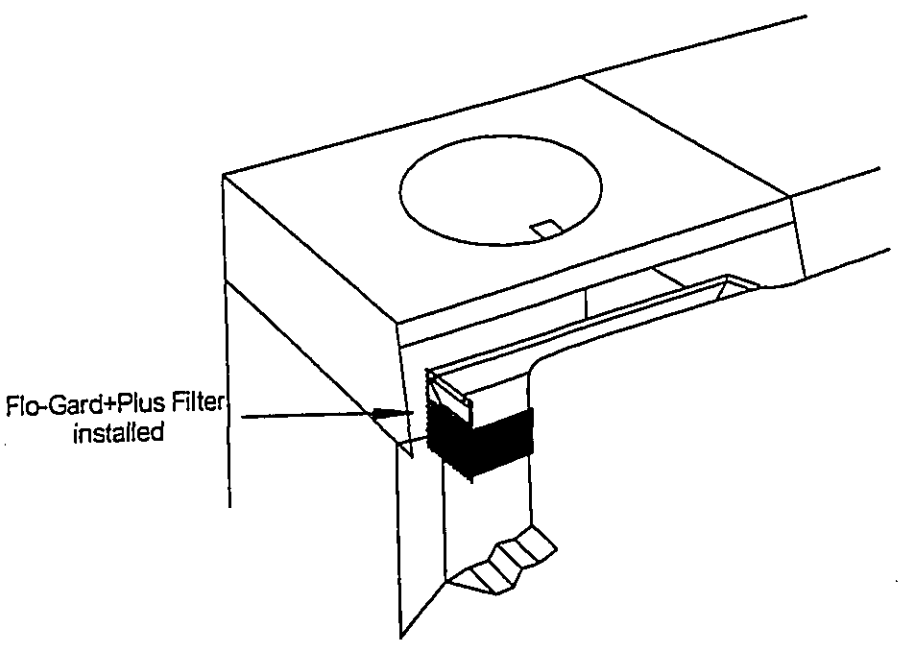
A dual) high-flow bypass allows flows to bypass the device while retaining sediment and larger floatables (debris & trash) AND allows sustained maximum design flows under extreme weather conditions.

Flo-Gard™ +Plus inserts are available in sizes to fit most industry-standard drainage inlets (...flat grated, combination, curb and round inlets).

Flo-Gard™ +Plus catch basin inserts are recommended for areas subject to silt and debris as well as low-to-moderate levels of petroleum hydrocarbon (oils and grease). Examples of such areas are vehicle parking lots, aircraft ramps, truck and bus storage yards, corporation yards, subdivision streets and public streets.

Questions? Contact Kristar at (800) 579-8819.

05/03/04



SPECIFIER CHART

Model No.	Inlet Width (in)	Solids Storage Capacity (cu ft)	Filtered Flow (cfs)	Total Bypass Cap. (cfs)
FGP-24CI	24	0.9	0.8	5.6
FGP-30CI	30	1.1	1.0	6.7
FGP-36CI	36	1.4	1.2	7.9
FGP-42CI	42	1.6	1.4	8.8
FGP-48CI	48	1.9	1.5	9.9
FGP-5.0CI	60	2.3	1.8	11.6
FGP-6.0CI	72	2.8	2.2	13.8
FGP-7.0CI	84	3.2	2.5	15.9
FGP-8.0CI	96	3.7	2.9	18.0
FGP-10.0CI	120	4.6	3.5	21.9
FGP-12.0CI	144	5.6	4.2	26.2
FGP-14.0CI	168	6.5	4.9	30.1
FGP-16.0CI	192	7.5	5.6	34.4
FGP-18.0CI	216	8.3	6.2	38.2
FGP-21.0CI	252	9.7	7.2	44.3
FGP-28.0CI	336	13.0	9.5	58.6

NOTES:

1. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
2. Filtered flow rate includes a safety factor of 2.
3. Flo-Gard+Plus Catch Basin Filter Inserts are available in the standard sizes (see above) or in custom sizes. Call for details on custom size inserts.
4. Available with recessed mount package including fg tray allowing maintenance access from manhole.
5. Flo-Gard+Plus filter inserts should be used in conjunction with a regular maintenance program. Refer to manufacturer's recommended maintenance guidelines.

US PATENT

FLO-GARD™ +PLUS

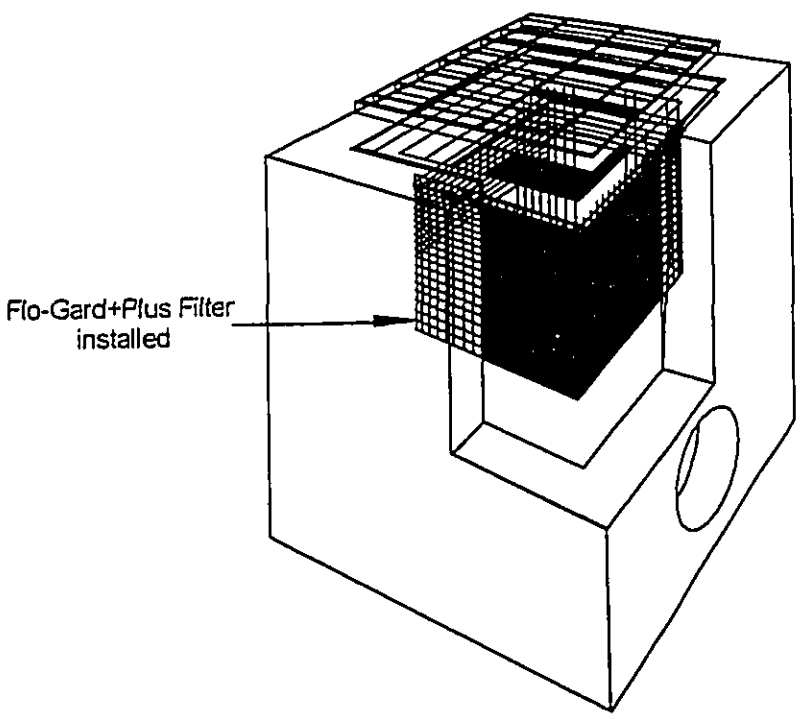
CATCH BASIN FILTER INSERT

(Curb Mount)

CURB INLET

KriStar Enterprises, Inc., Santa Rosa, CA (800) 579-8819

05/04



Model No.	Inlet ID (in x in)	Grate OD (in x in)	Solids Storage Capacity (cu ft)	Filtered Flow (cfs)	Total Bypass Cap. (cfs)
FGP-12F	12 x 12	14 x 14	0.3	0.4	2.8
FGP-1530F	15 x 30	16 x 36	2.3	1.6	6.9
FGP-16F	16 x 16	18 x 18	0.8	0.7	4.7
FGP-18F	18 x 18	20 x 20	0.8	0.7	4.7
FGP-1822F	20 x 24	18 x 22	2.1	1.4	5.9
FGP-1824F	16 x 22	20 x 24	1.5	1.2	5.0
FGP-1836F	18 x 36	18 x 40	2.3	1.6	6.9
FGP-2024F	20 x 24	22 x 24	1.2	1.0	5.9
FGP-21F	22 x 22	24 x 24	2.2	1.5	6.1
FGP-2142F	21 x 42	26 x 42	4.3	2.4	9.1
FGP-24F	24 x 24	26 x 26	2.2	1.5	6.1
FGP-2436F	24 x 36	24 x 40	3.4	2.0	8.0
FGP-2445F	24 x 45	26 x 47	4.4	2.4	9.3
FGP-2448F	24 x 48	26 x 48	4.4	2.4	9.3
FGP-28F	28 x 28	30 x 30	2.2	1.5	6.3
FGP-30F	30 x 30	30 x 34	3.6	2.0	8.1
FGP-36F	36 x 36	36 x 40	4.6	2.4	9.1
FGP-3648F	36 x 48	40 x 48	6.8	3.2	11.5
FGP-48F	48 x 48	48 x 52	9.5	3.9	13.2

NOTES:

1. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
2. Filtered flow rate includes a safety factor of 2.
3. Flo-Gard+Plus Catch Basin Filter Inserts are available in the standard sizes (see above) or in custom sizes. Call for details on custom size inserts.
4. Flo-Gard+Plus filter inserts should be used in conjunction with a regular maintenance program. Refer to manufacturer's recommended maintenance guidelines.

US PATENT

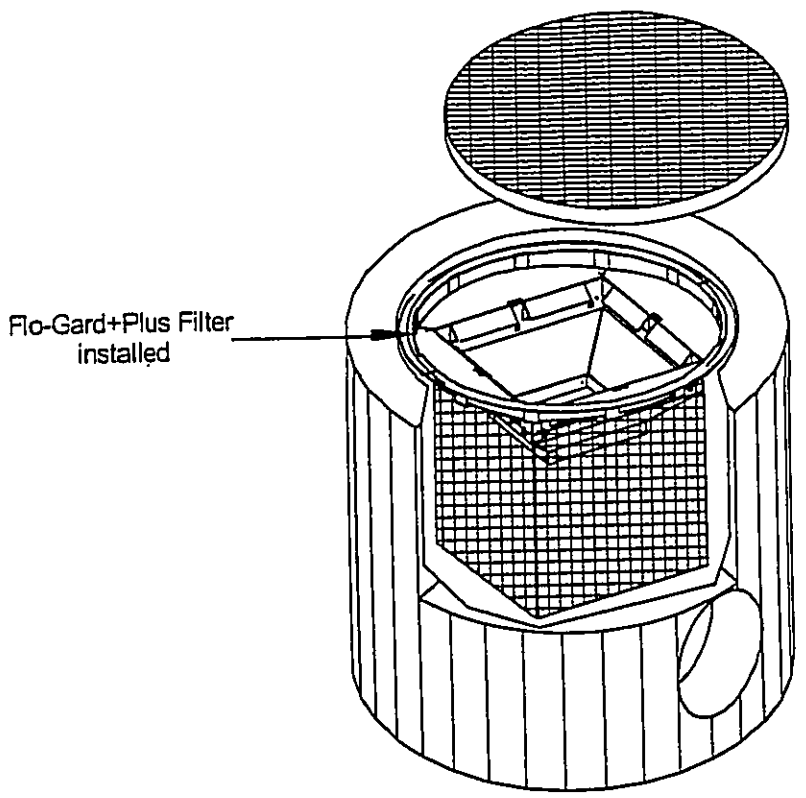
FLO-GARD™ +PLUS

CATCH BASIN FILTER INSERT

(Frame Mount)

FLAT GRATED INLET

KriStar Enterprises, Inc., Santa Rosa, CA (800) 579-8819 05/04



Model No.	Inlet ID (in dia.)	Grate OD (In dia.)	Solids Storage Capacity (cu ft)	Filtered Flow (cfs)	Total Bypass Cap. (cfs)
FGP-RF15F	16	18	0.3	0.4	2.8
FGP-RF18F	18	19	0.3	0.4	2.8
FGP-RF20F	20	22	0.8	0.7	4.7
FGP-RF22F	22	24	0.8	0.7	4.7
FGP-RF23F	23	25.5	0.8	0.7	4.7
FGP-RF24F	24	26	0.8	0.7	4.7

NOTES:

1. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.
2. Filtered flow rate includes a safety factor of 2.
3. Flo-Gard+Plus Catch Basin Filter Inserts are available in the standard sizes (see above) or in custom sizes. Call for details on custom size inserts.
4. Flo-Gard+Plus filter inserts should be used in conjunction with a regular maintenance program. Refer to manufacturer's recommended maintenance guidelines.

US PATENT

FLO-GARD™ +PLUS

CATCH BASIN FILTER INSERT

(Frame Mount)

ROUND GRATED INLET

KriStar Enterprises, Inc., Santa Rosa, CA (800) 579-8819

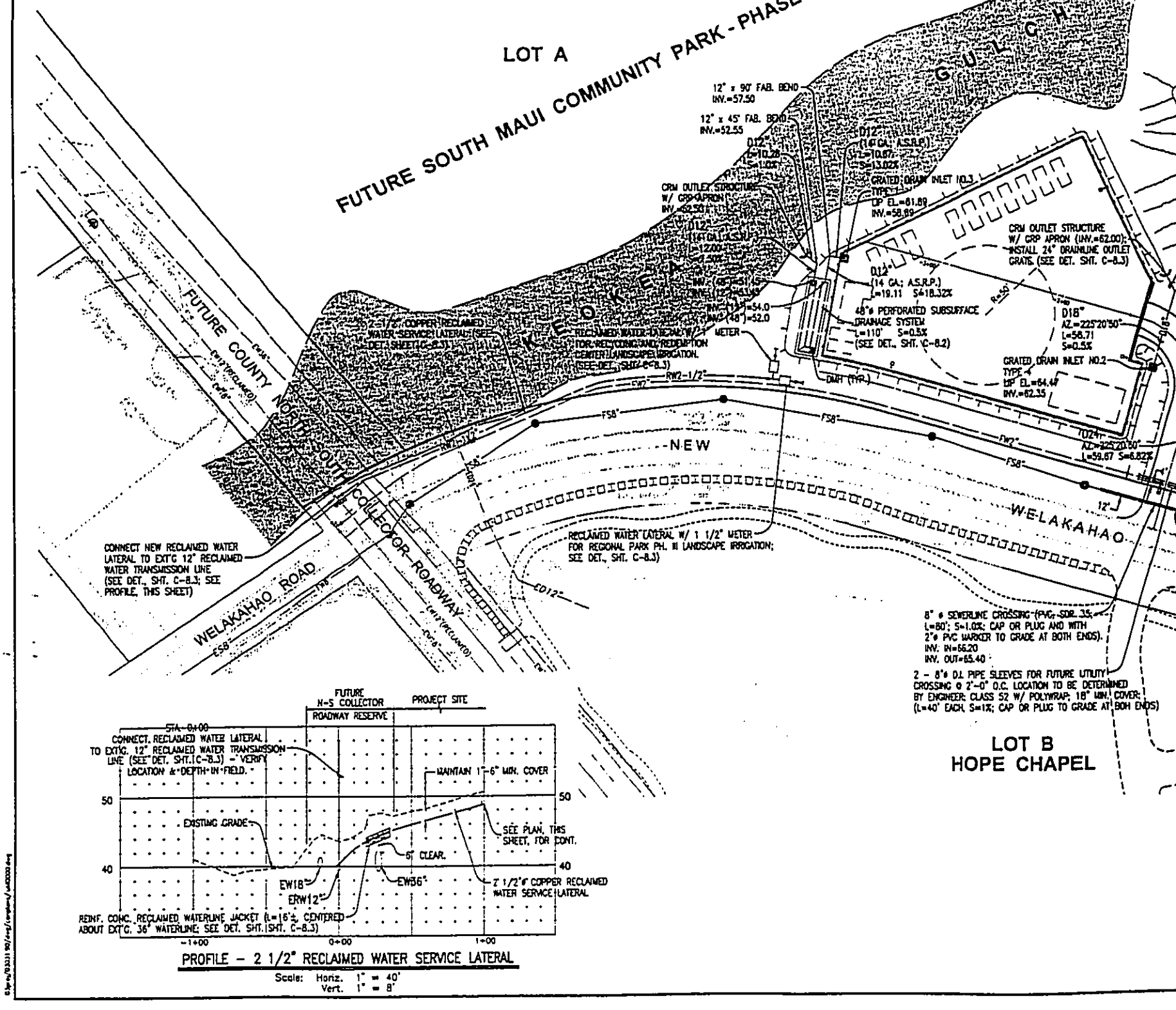
05/04

LEGEND:

- FUTURE SEWER MANHOLE
- GRATED INLET CATCH BASIN
- HEADWALL WITH WINGWALL
- RW3"— RECLAIMED WATERLINE W/ SIZE
- D24"— DRAINLINE W/ SIZE
- FS8"— FUTURE SEWERLINE W/ SIZE
- FW2"— FUTURE WATERLINE W/ SIZE
- EW8"— EXISTING WATERLINE W/ SIZE
- ED24"— EXISTING DRAINLINE W/ SIZE
- ES8"— EXISTING SEWERLINE W/ SIZE
- EXISTING STREET LIGHT
- NO VEHICULAR ACCESS PERMITTED
- VEHICULAR ACCESS PERMITTED
- PROPOSED IMPROVEMENTS (BY OTHERS)
- FUTURE IMPROVEMENTS (BY OTHERS)
- SIDEWALK
- TOP BANK
- BOTTOM BANK
- CENTERLINE SWALE
- EXISTING ARCHAEOLOGICAL SITES
- 100 YEAR FEMA INUNDATION LIMITS (Q_{100} = 8,008 c.f.s.)
- CONCEPTUAL SCHEMATIC LAYOUT OF RECYCLING & REDEMPTION CENTER ONSITE IMPROVEMENTS (BY OTHERS)
- SELF-CONTAINED SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)

NOTES:

1. ALL RECLAIMED WATER IMPROVEMENTS SHALL CONFORM TO ALL REQUIREMENTS CONTAINED IN:
   - "GUIDELINES FOR THE TREATMENT AND USE OF RECYCLED WATER" BY THE DEPARTMENT OF HEALTH, STATE OF HAWAII, DATED MAY 15, 2002, AND ALL AMENDMENTS THERETO; AND,
   - "RULES FOR RECLAIMED WATER SERVICE" BY THE COUNTY OF MAUI, DATED JUNE 1997, AND ALL AMENDMENTS THERETO.
2. SEE SHT. C-1 FOR ADDITIONAL NOTES PERTAINING TO RECLAIMED WATERLINE.
3. OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST ALONG, ACROSS, AND IN THE VICINITY OF THE PROPOSED IMPROVEMENTS AND MAY NOT BE SHOWN ON THE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE RESPECTIVE COUNTY OR STATE AGENCIES, UTILITIES (INCLUDING WITHOUT LIMITATION MAUI ELECTRIC COMPANY, LTD., VERIZON HAWAII INC., AND OCEANIC TIME WARNER CABLE OF HAWAII), EXAMINING ANY AVAILABLE RECORD DRAWINGS, TONING OF UNDERGROUND UTILITIES, AND CONFIRMING THE PRESENCE OF ANY EXISTING UTILITIES ALONG AND ACROSS THE PROPOSED IMPROVEMENTS. CONTRACTOR SHALL NOTIFY AND COORDINATE CONSTRUCTION ACTIVITIES, AND ANY REQUIRED RELOCATION, WITH RESPECTIVE AGENCIES AND UTILITIES.



PROFILE – 2 1/2" RECLAIMED WATER SERVICE LATERAL

Scale: Horiz. 1" = 40'
Vert. 1" = 8'

REMENTS CONTAINED IN:
BY THE
AND ALL

DATED

DERLINE.
AND IN THE
ON THE
RESPECTIVE
I MAUI
NTHER CABLE
UNDERGROUND
ALONG AND
AND
L WITH

TRUE NORTH
SCALE: 1 IN. = 40 FT.

ELLEAIR GOLF COURSE

PIILANI HIGHWAY

F.A.P. NO. RF-031-1 (5)

FUTURE SOUTH MAUI COMMUNITY PARK PHASE III (CONCEPTUAL ONLY)
FUTURE MULTI-USE COURTS
FUTURE MULTI-USE COURTS
FUTURE RESTROOM

CRM OUTLET STRUCTURE
W/ GRP APRON (INV.=62.00);
INSTALL 24" DRAINLINE OUTLET
GRATE. (SEE DET. SHT. C-8.3)

D24°
AZ.=183°59'48"
L=13.61
S=0.5%
INV.=62.07

D24
AZ.=183°59'48"
L=89.30
S=0.5%

D18°
AZ.=225°20'50"
L=56.71
S=0.5%

GRATED DRAIN INLET NO.2
TYPE
UP EL.=64.48
INV.=62.35

INV.=62.51

D24°
AZ.=225°20'50"
L=59.67 S=6.82%

W-E-LA-KA-HA-O STREET

GRATED DRAIN INLET NO.1
TYPE 61614
UP EL.=70.58
INV.=66.58

DRUNE CROSSING (PVC, SDR 35;
1.0%; CAP OR PLUG AND WITH
MARKER TO GRADE AT BOTH ENDS).
3.20
65.40

PIPE SLEEVES FOR FUTURE UTILITY
2'-0" O.C. LOCATION TO BE DETERMINED
CLASS 52 W/ POLYWRAP; 18" MIN. COVER;
S=1%; CAP OR PLUG TO GRADE AT BOTH ENDS)

FUTURE DOMESTIC WATER
LATERAL W/ WATER METER

LOT B
OPE CHAPEL

CLIFFORD K. MUKAI
LICENSED PROFESSIONAL ENGINEER
NO. 8467-C
HAWAII, U.S.A.

Licensed Expires
April 30, 2006
SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-3 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

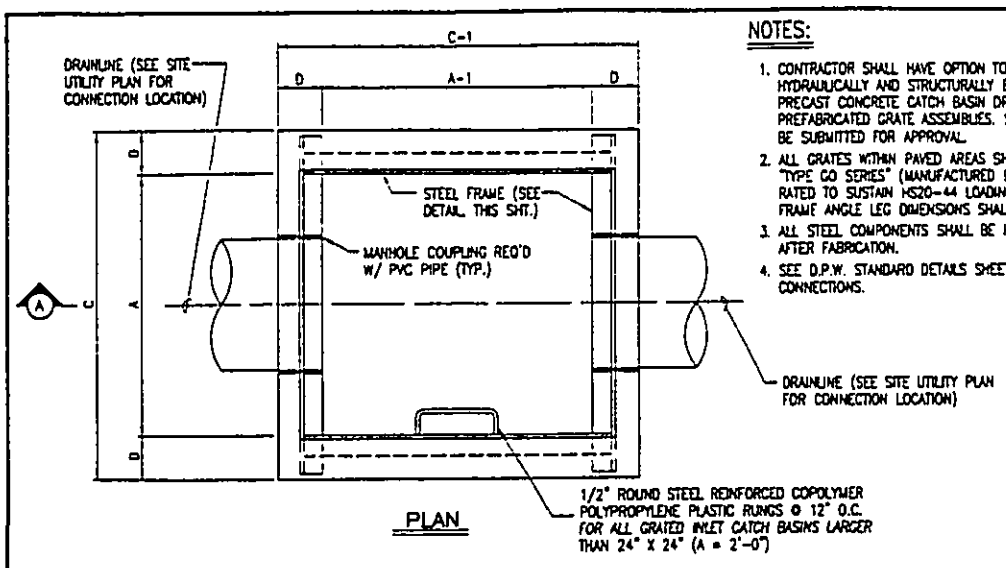
LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

TITLE UTILITY PLAN

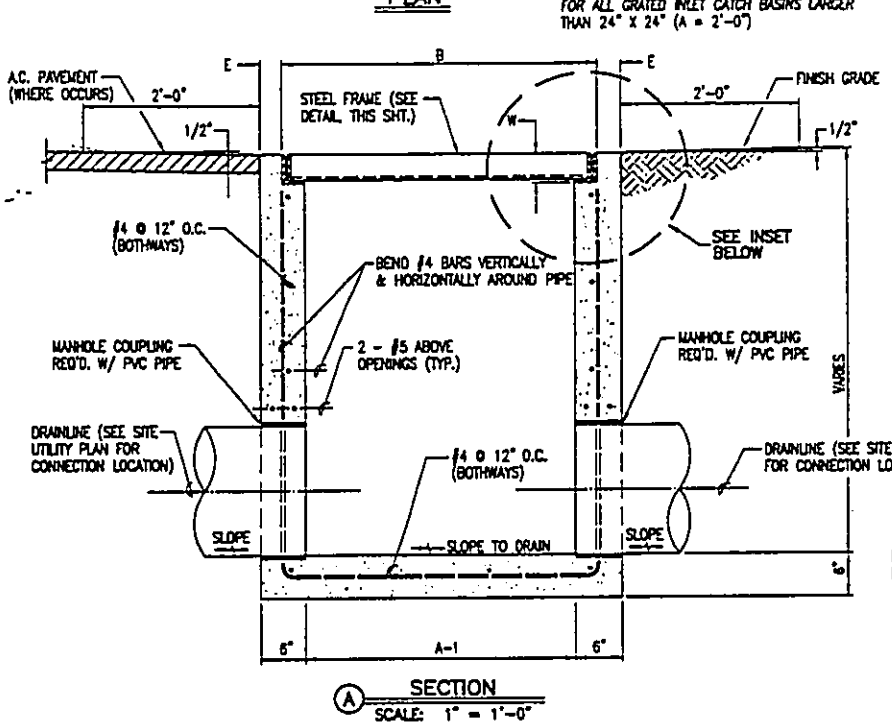
C.N.M. DESIGNED BY	C.N.M. CHECKED BY	03031.90 JOB NUMBER	C-5 SHEET
W.S.K. DRAWN BY	W.S.U. APPROVED BY	Apr. 22, 2005 DATE	OF 17 SHEETS
SCALE 1 IN. = 40 FT.			



PLAN

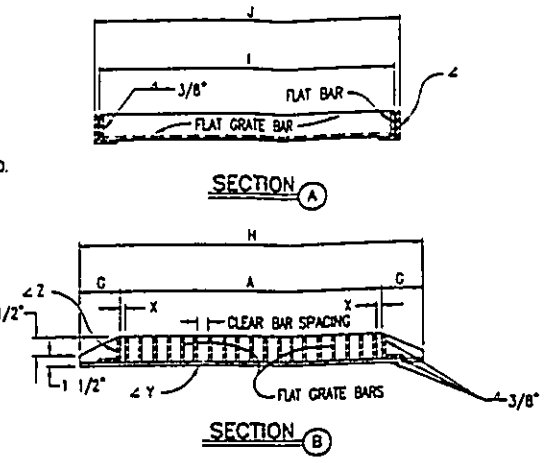
NOTES:

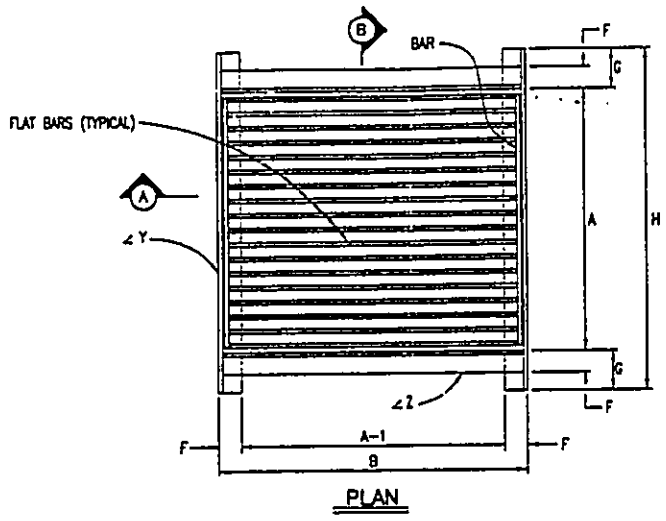
1. CONTRACTOR SHALL HAVE OPTION TO SUBSTITUDE APPROVED HYDRAULICALLY AND STRUCTURALLY EQUIVALENT OR BETTER PRECAST CONCRETE CATCH BASIN DROP INLETS AND PREFABRICATED GRATE ASSEMBLIES. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.
2. ALL GRATES WITHIN PAVED AREAS SHALL BE CARY GRATING "TYPE GO SERIES" (MANUFACTURED BY IKG INDUSTRIES, RATED TO SUSTAIN HS20-44 LOADING, OR APPROVED EQUAL. FRAME ANGLE LEG DIMENSIONS SHALL BE ADJUSTED AS REQUIRED.
3. ALL STEEL COMPONENTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
4. SEE D.P.W. STANDARD DETAILS SHEET "D-44" FOR CORNER CONNECTIONS.



A SECTION
SCALE: 1" = 1'-0"

CATCH BASIN DETAILS TYPE 1 THRU 6
SCALE: 1" = 1'-0"

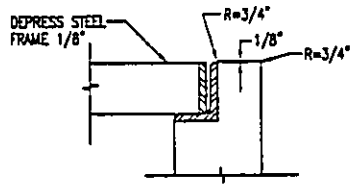




PLAN

DETAILS - GRATE & FRAME
SCALE: 1" = 1'-0"

NOTE:
ALL ANCHORS, INSERTS, FRAMES & COVERS SHALL BE HOT-DIPPED GALVANIZED, AFTER FABRICATION.



SEE INSET

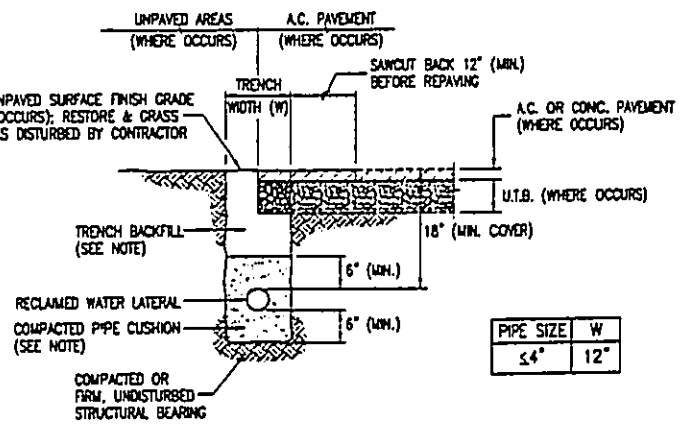
TABLE OF DIMENSIONS FOR CATCH BASIN & GRADE																			
TYPE	DIMENSION	A	A-1	B	C	C-1	D	E	F	G	H	I	J	FLAT GRADE BAR	W	X	Y	Z	NO. BARS	CLEAR BAR SPACING
1	24" x 24"	2'-0"	2'-0"	2'-6"	3'-0"	3'-0"	6"	3"	2 1/2"	5 1/2"	2'-11"	2'-4 1/4"	2'-6"	-+/2" x 3"	3 1/2"	3/4"	3 1/2" x 2 1/2" x 1/2"	3" x 2 1/2" x 1/2"	- 23	1/2"
2	36" x 36"	3'-0"	3'-0"	3'-6"	4'-0"	4'-0"	6"	3"	3"	5 1/2"	3'-11"	3'-4 1/4"	3'-6"	1/2" x 3 1/2"	4"	3/4"	4" x 3" x 1/2"	3 1/2" x 3" x 1/2"	35	1/2"
3	24" x 36"	3'-0"	2'-0"	2'-6"	4'-0"	3'-0"	6"	3"	3"	5 1/2"	3'-11"	2'-4 1/4"	2'-6"	1/2" x 3"	3 1/2"	3/4"	3 1/2" x 2 1/2" x 1/2"	3" x 2 1/2" x 1/2"	35	1/2"
* 4	18" x 18"	1'-6"	1'-6"	1'-10"	2'-6"	2'-6"	6"	4"	2"	5 1/2"	2'-5"	1'-8 1/4"	1'-10"	1/2" x 2 1/2"	3"	3/4"	3" x 2" x 1/2"	2 1/2" x 2" x 3/8"	9	1 1/2"

* DENOTES GRATED INLET CATCH BASINS TO BE USED ONLY WITHIN LANDSCAPED AREAS.

NOTES:

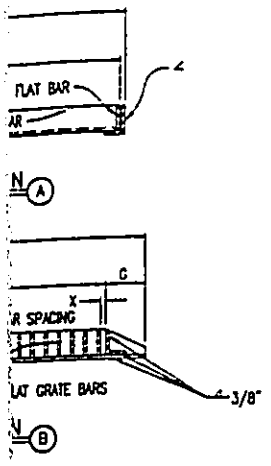
1. TRENCH BACKFILL MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 703 - AGGREGATE OF "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION", 1994 DEPARTMENT OF TRANSPORTATION.
2. PIPE CUSHION SHALL CONSIST OF BLACK SAND, MANUFACTURED SAND, CORAL AND CRUSHER SCREENINGS S4C CONTAINING NO PARTICLES LARGER THAN 1 INCH IN DIAMETER AND SUBJECT TO THE APPROVAL OF THE ENGINEER.

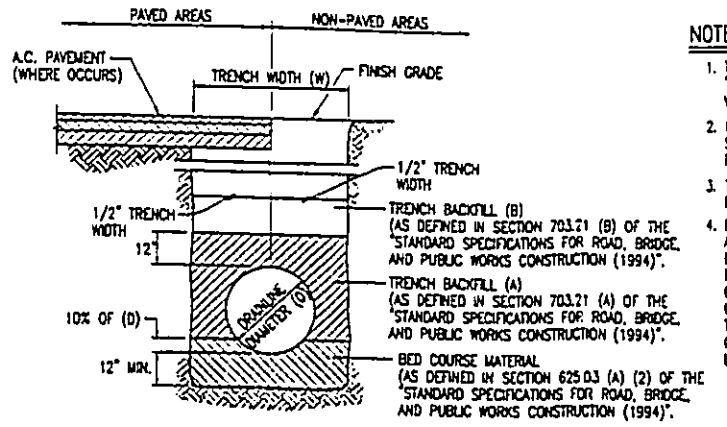
   THE PIPE CUSHION MATERIAL SHALL HAVE A RESISTIVITY OF 5,000 OHM-CENTIMETERS OR GREATER WHEN MEASURED USING THE SOIL BOX METHOD IN ACCORDANCE WITH ASTM G-57.



PIPE SIZE	W
≤4"	12"

TYPICAL TRENCH SECTION - RECLAIMED WATER LATERAL
NOT TO SCALE





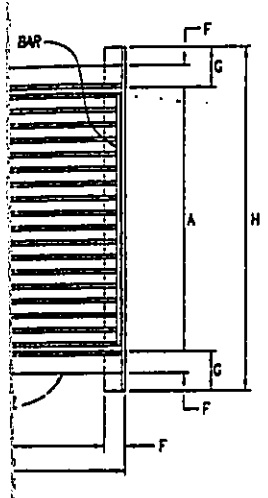
TYPICAL TRENCH SECTION FOR CAP & SRAP DRAINLINE

NOT TO SCALE

NOTES:

1. TRENCH BACKFILL AND BED COURSE MATERIAL SHALL CONFORM TO SECTION 703 "AGGREGATES" OF THE "STANDARD SPECIFICATION FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION (1994)".
2. INSTALLATION OF CULVERTS SHALL CONFORM TO SECTION 603, "CULVERTS AND STROM DRAINS" OF THE "STANDARD SPECIFICATION FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION (1994)".
3. TRENCH WIDTHS SHALL CONFORM TO TABLE 625-1 OF THE "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION (1994)".
4. LOADS IMPOSED BY CONSTRUCTION VEHICLES WITH AXLE LOADS IN EXCESS OF THE AASHTO HS-20-44 VEHICLE (32,000 LBS./AXLE) SHOULD BE MINIMIZED BY DESIGNATED CONSTRUCTION VEHICLE CROSSINGS. ADDITIONAL FILL SHOULD BE PLACED OVER THE DRAINLINES AT THE DESIGNATED CONSTRUCTION VEHICLE CROSSINGS IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, OR STRUTTING TO SUPPORT THE PIPE SHOULD BE PLACED IN ACCORDANCE WITH THE CURRENT "STANDARD SPECIFICATION FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION (1994)". ALL DRAINLINES DAMAGED BY CONSTRUCTION VEHICLE LOADING SHALL REPLACED AT THE CONTRACTOR'S EXPENSE.

TRENCH WIDTH	
PIPE SIZE	W
18"	54"
24"	60"
30"	66"
36"	72"
42"	78"
48"	84"
54"	90"
60"	96"
66"	102"
72"	108"

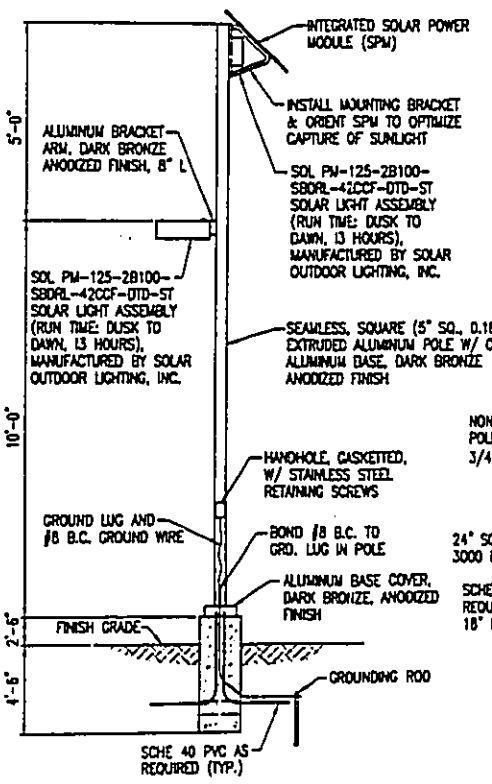


TE & FRAME
= 1'-0"

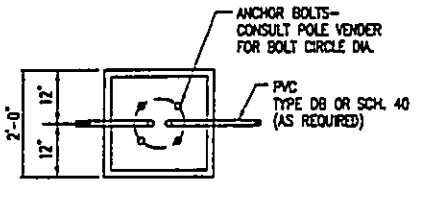
SERTS, FRAMES & COVERS
PPED GALVANIZED, AFTER

NC

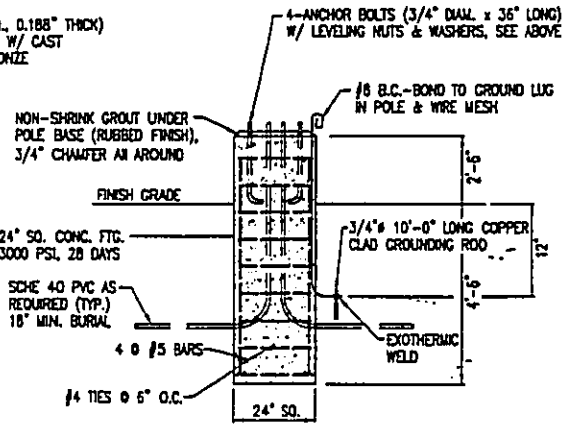
MENT



POLE LIGHT DETAIL



PLAN



ELEVATION

DETAIL - SOLAR POWERED AREA LIGHTING

NOT TO SCALE

NOTES:

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
2. CUT OFF LENS (MODEL 88CO) SHALL BE USED ALONG ALL PERIMETER LOCATIONS.
3. CONTRACTOR SHALL SUBMIT MANUFACTURER'S CERTIFICATION THAT AREA LIGHT ASSEMBLY, INCLUDING POLE, LUMINAIRE AND FOUNDATION SHALL WITHSTAND WINDS UP TO 108 MPH GUSTING WITHOUT PERMANENT DEFORMATION.
4. SEE PLAN FOR LOCATION.

CLIFFORD H. NAKAO
LICENSED PROFESSIONAL ENGINEER
NO. 6847-C
HAWAII, U.S.A.

Licensed Engineer
April 30, 2008
SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-7 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

TITLE MISCELLANEOUS DETAILS

C.N.M. DESIGNED BY	C.N.M. CHECKED BY	03031.90 JOB NUMBER	C-8.1 SHEET
W.S.K. DRAWN BY	W.S.U. APPROVED BY	Apr. 22, 2005 DATE	OF 17 SHEETS
AS NOTED SCALE			

REFERENCES

- Kihei-Makena Community Plan (1998), March, 1998
- U. S. Department of Agriculture, Soil Conservation Service, "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii", 1972
- Special Management Area Use Permit and Project District Phase II Application, Piilani Village Commercial Center, July, 1997, Munekiyo & Arakawa, Inc.
- Atlas of Hawaii, Third Edition, 1998, University of Hawaii Press, Honolulu
- Application for Special Management Area Permit, Kilohana Hema Subdivision, May, 2000
- U. S. Census Bureau Website
- Piilani Village Multifamily SMA/PD Phase II Application, March, 1990 Revision, Belt Collins & Associates, Inc.

Appendix A - Preliminary Engineering and Drainage Report

Preliminary Engineering

TABLE OF CONTENTS

APPENDICES:

A. Hydrologic Calculations
B. Keokea Gulch 100-Year Inundation Limits Analysis
C. Subsurface Drainage Detention System Calculations

I. INTRODUCTION

A. OBJECTIVE:

This treatise has been prepared as a brief evaluation and summary of both existing infrastructure in the vicinity of the project site and anticipated project improvements.

B. SITE LOCATION:

Kihei, on the island of Maui, is located on the leeward side of Mount Haleakala, a dormant shield volcano rising to approximately 10,000 feet above mean sea level (M.S.L.). Piilani Village is a master-planned project district that ultimately is expected to include single-family, multi-family, and commercial developments, parks, landscaped bike and jogging paths, and open spaces.

The South Maui Community Park site [TMK (2) 2-2-02:Por. 42] encompasses an area of approximately 44.833 Acres and is part of what is commonly referred to as Piilani Village - South, a portion of Piilani Village that lies to the south of Lipoa Street (see EXHIBIT A: Location Map).

Piilani Village - South is located in Kihei, on the island of Maui, and in the State of Hawaii. Located approximately 2,000 feet to the east (mauka) of the South Kihei Road, it is situated immediately west (makai) of Piilani Highway, immediately east (mauka) of the proposed N-S Collector, and immediately south Kihei Elementary and Lokelani Intermediate Schools (which abuts the south side of Lipoa St.).

The Kihei Recycling and Redemption Center project site is located at the southernmost end of Tax Map Key parcel (2) 2-2-02:Por. 42. This triangular-shaped parcel is abutted by:

- Piilani Highway on its east (mauka) side;
- Welakahao Street on its southerly side (the Hope Chapel development, currently under construction is across Welakahao Street, on the southerly side of Welakahao St.);
- The future N-S Collector roadway reserve and a Maui Electric Company power substation on its west (makai) side; and,
- Keokea Gulch natural drainageway on its north side.

The western (makai) approximately 1.69 Acres of this triangular parcel is expected to be occupied by the proposed Kihei Recycling and Redemption Center. The balance (eastern or mauka 1.75 Acres) of this triangular parcel is expected to be

developed in the future by the County of Maui as Phase III of its South Maui Community Park.

The balance of the overall parcel, to the north of Keokea Gulch (up to Kihei Elementary and Lokelani Intermediate Schools at the north end), is expected to be developed by the County of Maui in the future as Phases I and II of the South Maui Community Park.

Piilani Village is approximately 300 feet inland and varies in elevation from approximately 10 feet to approximately 100 feet M.S.L. The Kihei Recycling and Redemption Center project site varies in elevation from approximately 46 feet to approximately 86 feet M.S.L. (see EXHIBIT "C": TOPOGRAPHIC MAP AND GRADING CONCEPT PLAN).

The balance of Piilani Village - South consists of:

- Hope Chapel project (currently under construction) located to the south (across East Welakahao St.) from the project site.
- Proposed Hale Mahaolu Senior Residence located at the extreme south end (between Hope Chapel project and Keala Hills Subdivision).

C. PROJECT DESCRIPTION:

The Kihei Recycling and Redemption Center project proposes to construct an approximately 31,000 s.f. recycling and redemption facility.

Anticipated onsite infrastructure improvements include:

- Roadway improvements consisting of: asphalt and recycled glass "glassphalt" pavement and concrete curbing;
- Utility improvements consisting of: grated drain inlets, an underground drainage system, an subsurface drainage system, and a recycled water landscape irrigation system;
- Landscape improvements consisting of perimeter ground cover and hedges, and supporting recycled water landscape irrigation.

Anticipated offsite infrastructure improvements along Welakahao Street include:

- A dedicated left turn pocket, and appurtenant asphalt pavement widening, pavement markings and striping, and signage.

While the mass-grading for Phase III of the South Maui Community Park within the eastern (mauka) 1.75 Acres of this triangular parcel are expected to be done in conjunction with this project, other future anticipated onsite improvements for Phase III of the South Maui Community Park and all supporting infrastructure will be defined at a later date and are not within the scope of this analysis.

II. ROADWAY IMPROVEMENTS AND TRAFFIC ASSESSMENT

A. EXISTING CONDITIONS:

Piilani Highway borders the easterly (mauka) side of Piilani Village - South. Although a controlled access highway, access is permitted in the vicinity of the Kihei Recycling and Redemption Center project site at the following general locations (see EXHIBIT A: Location Map):

1. Lipoa Street.
2. Halekuai Street.
3. East Welakahao St.

Access is also generally available to Piilani Village South from South Kihei Road via Lipoa Street and East Welakahao Street.

The project side abuts the north side of East Welakahao Street, from which access is directly available.

The Engineering Division, Department of Public Works and Environmental Management, is currently planning and designing the Liloa Drive (N-S Collector) roadway improvements which will link the bisecting east-west corridors (e.g., Lipoa St., Halekuai St., East Welakahao St., etc.).

B. PROPOSED ROADWAY IMPROVEMENTS:

Improvements along East Welakahao Street by the Engineering Division, DPWEM, include an east (mauka)-bound left turn storage lane for the Kihei Recycling and Redemption Center. This will be complemented by a future west (makai)-bound left turn storage lane for the Hope Chapel project, which is expected to be constructed by Hope Chapel in the future in conduction with its proposed Phase II improvements, which includes a driveway connection to East Welakahao Street, across the driveway proposed for the Kihei Recycling and Redemption Center. The proposed intersection improvements at Welakahao Street are shown in EXHIBIT G.

An existing streetlight is located immediately to the east (mauka) of the proposed access along East Welakahao Street. Furthermore, the existing Welakahao Street does not have any paved shoulders. Thus no additional roadway shoulder improvements are expected to be constructed by the Engineering Division, DPWEM.

C. PRELIMINARY TRAFFIC ASSESSMENT:

A preliminary traffic assessment has been conducted (see APPENDIX "B": PRELIMINARY TRAFFIC ASSESSMENT).

The proposed left turn storage lane improvements at the proposed access intersection along East Welakahao Street are based on and are consistent with the preliminary traffic assessment.

III. DRAINAGE SYSTEM:

A. EXISTING CONDITIONS:

All development components within Piilani Village - South are located above the Kihei Flood Plain district. Runoff generally sheet flows across the site in an easterly (mauka) to westerly (makai) direction, ultimately being conveyed to low areas and wetlands.

Offsite drainage basins contributing runoff to the existing drainageways typically are relatively slender and a few may extend up towards the summit of Haleakala.

A major existing drainageway, Keokea Gulch, crosses Piilani Village - South (and abuts the north end of the project site) in an easterly to westerly (mauka to makai) direction. In addition, several smaller drainageways cross Piilani Village - South and are typically associated with culvert crossings at Piilani Highway. No existing Piilani Highway culvert crossings discharge into the project site.

A total of approximately 3.4 cfs (50 year - 1 hour storm) of onsite surface runoff is currently generated by the undeveloped project site (see APPENDIX C: Subsurface Drainage Detention System Calculations). Onsite surface runoff generally sheet flows in a southeasterly to northwesterly direction, into the existing Keokea Gulch natural drainageway, which abuts the northern edge of the project site.

Approximately 2.4 cfs (50 year - 1 hour storm) of offsite surface runoff from Piilani Highway sheetflows onto the project site and sheetflows into the existing Keokea Gulch natural drainageway (see APPENDIX A: Hydrologic Calculations).

Approximately 4.6 cfs (50 year - 1 hour storm) of offsite surface runoff from abutting Welakahao St. sheetflows into and is conveyed along a grassed swale along the shoulder of Welakahao St. for the entire abutting frontage of the project site, is intercepted by an existing grated drain inlet at the downstream end of the shoulder, and is conveyed by an underground culvert to the existing Keokea Gulch natural drainageway (see APPENDIX A: Hydrologic Calculations).

A 100-year inundation limits analysis (using the U.S. Army Corps of Engineers' HEC-RAS water surface profile model for modeling both steady and unsteady, one-dimensional, gradually varied flow in both natural and man-made river channels) was undertaken for Keokea Gulch, based on a 100-year runoff of 8,008 c.f.s. (see EXHIBIT E: Keokea Gulch 100-Year Inundation Limits).

According to the Flood Insurance Rate Map, effective September 6, 1989, prepared by the United States Federal Emergency Managements Agency, Federal Insurance Administration, the project site is situated in an area designated as Zone C, which is prone to minimal flooding (see EXHIBIT C: Flood Insurance Rate Map).

Furthermore, the project site is not within a tsunami zone.

B. PROPOSED DRAINAGE IMPROVEMENTS:

A total of 5.1 c.f.s. (50 year - 1 hour runoff) of onsite surface runoff will be generated by the developed project site. Accordingly, a net increase of 1.7 c.f.s. would have been expected as a result of the proposed improvements in the absence of any onsite subsurface detention (see APPENDIX C: Subsurface Drainage Detention System Calculations). However, an onsite subsurface detention system (capacity based on 50 year - 1 hour runoff) is being proposed to limit the peak onsite runoff being discharged to pre-development levels. Accordingly, there will be no net increase in onsite peak surface runoff, based on a 50-year recurrence interval

The majority of the onsite surface runoff from the paved surfaces will be intercepted by a grated drain inlet and be conveyed directly underground to the proposed subsurface detention system, which will have an overflow to the existing Keokea Gulch natural drainageway. The balance of the onsite surface runoff will sheetflow, as it is currently doing, to the adjoining existing Keokea Gulch natural drainageway.

All improvements are proposed outside of the 100-year inundation limits of the existing Keokea Gulch natural drainageway.

IV. WASTEWATER SYSTEM

A. EXISTING CONDITIONS:

An 8" sewerline has recently been extended up East Welakahao Street, up to Liloa Drive (N-S Collector) by the Hope Chapel project.

B. PROPOSED WASTEWATER IMPROVEMENTS:

Since sewer service is not required for the Kihei Recycling and Redemption Center, the sewerline along East Welakahao Street is not expected to be extended to the site along East Welakahao St. until Phase III of the South Maui Community Park is developed.

However, a short section of 8" sewerline will be installed under the proposed paved access driveway and capped at both ends to avoid having to excavate across the access driveway in the future.

An R1 reclaimed water service lateral will be extended from the County's 12" R1 reclaimed water transmission main along Liloa Drive (N-S Collector) to the project site to furnish R1 reclaimed water for landscape irrigation. A landscape irrigation system will be installed within the site that will be served exclusively off of R1 reclaimed water.

V. WATER SYSTEM:

A. EXISTING CONDITIONS:

Since potable water service is not required for the Kihei Recycling and Redemption Center, no water improvements are expected for the project.

B. PROPOSED WATER IMPROVEMENTS:

However, potable water service is expected to be brought to the site along East Welakahao Street in the future, when Phase III of the South Maui Community Park is developed. Again, oversized sleeves will be installed under the proposed paved

access driveway and capped at both ends to avoid having to excavate across the access driveway in the future.

VI. ELECTRICAL, TELEPHONE AND CATV SERVICE

A. EXISTING CONDITIONS:

Maui Electric Company, Ltd.'s main transmission line is located along the westerly (makai) edge of Piilani Village, with a substation located at the corner of Welakahao St. and the N-S Collector Roadway corridor, at the south (makai) tip of the project site.

The Verizon telephone and Oceanic Time Warner Cable cable television distribution systems are also generally located along this utility corridor as well as along the existing E-W (mauka-makai) roadway connections leading to South Kihei Road (e.g, Lipoa St., Welakahao St., etc.).

B. PROPOSED IMPROVEMENTS:

Lighting for the project is expected to be provided by solar-powered, pole-mounted lights. Thus electrical, telephone, and CATV services are not expected to be brought to the site along East Welakahao St. until Phase III of the South Maui Community Park is developed.

EXHIBITS

A. Location Map
B. Site Concept Plan
C. Topographic Map & Grading Concept Plan
D. Drainage Area Map
E. Keokea Gulch 100-Year Inundation Limits
F. Photographic Analysis of Existing Conditions
G. Proposed Welakahao Street Intersection Improvements

TRUE NORTH

NOT TO SCALE

ELLEAIRE GOLF COURSE

TMK: 2-2-24: 013

Maui Highlands Properties LLC

Haleakala Ranch Company

Elleaire Maui Golf Club LLC

(Owners)

PIILANI

To Maalaea

F. A. P. No. RF-031-1(5)

HIGHWAY

To R&T Park

PARKWAY

LIPOA

KIHEI COMMUNITY CENTER AND AQUATIC CENTER

LOT A-2-5

PIILANI GARDENS APARTMENTS AND CHILD CARE

LOT A-2-4

LOT A-2-13

LOT A-2-12

LIPOA STREET

EXECUTIVE ORDER NO. 2823

Kihei Elementary and Lokelani Intermediate Schools

FUTURE SOUTH MAUI COMMUNITY PARK (SMCP) PARCEL

LOT A

TMK: 2-2-02: 042

County of Maui

(Owners)

SMCP PHASE I

SMCP PHASE II

KEOKEA GULCH

(DRAINAGE RESERVE)

LOT C

FUTURE NORTH - SOUTH COLLECTOR

To South Kihei Road

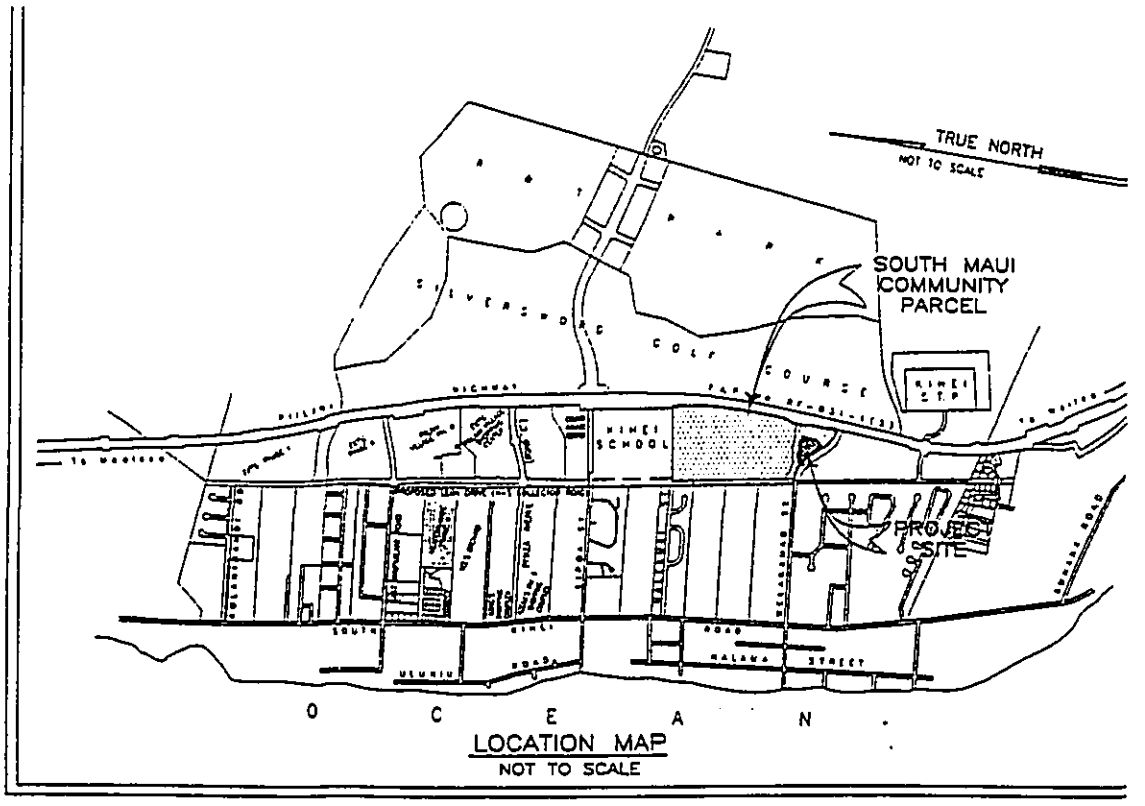
To South Kihei Road

LOCATION MAP

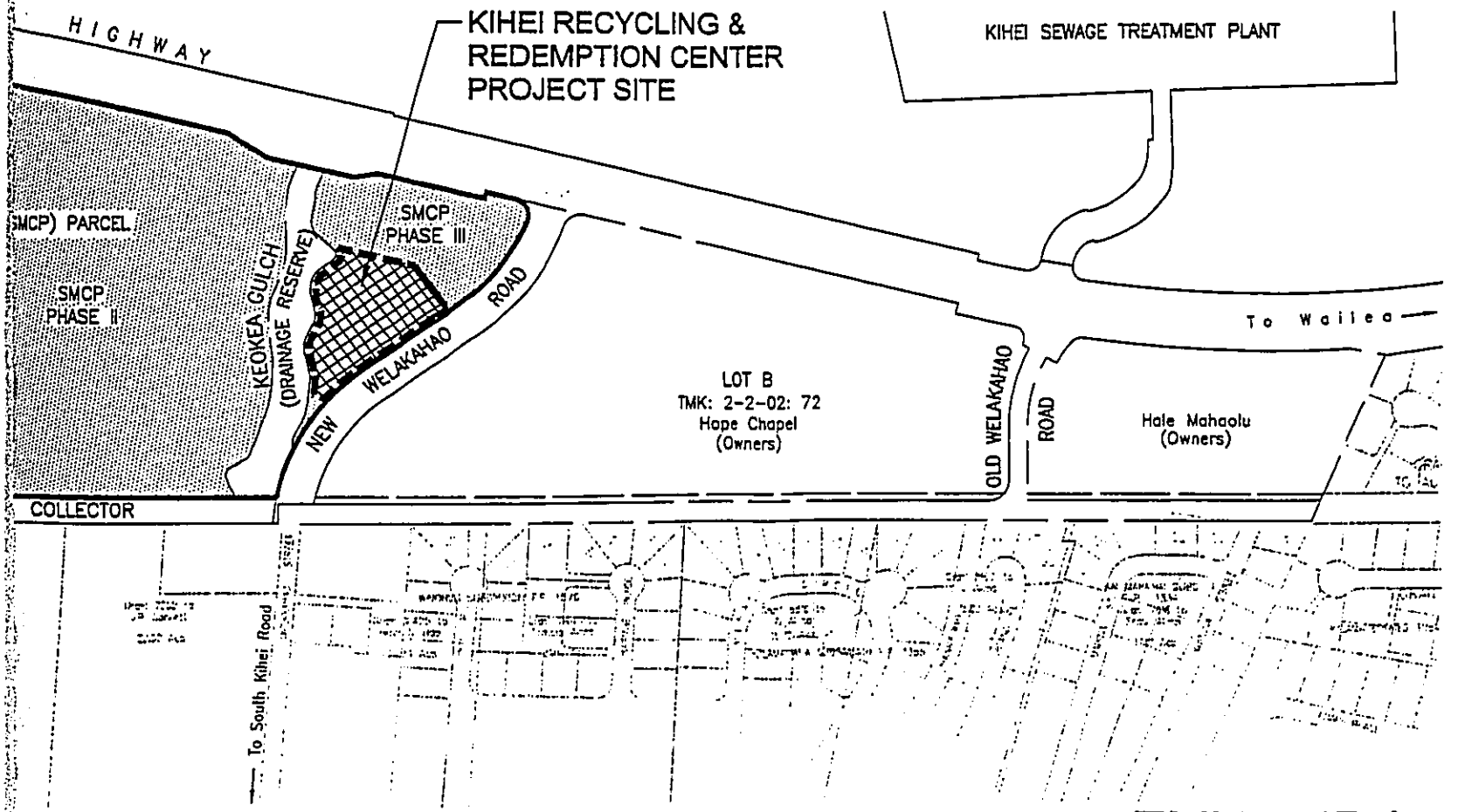
/03proj/03031.90/dwg/exhibits/drainage/exh-locmap00.dwg

TRUE NORTH
NOT TO SCALE

URSE



LOCATION MAP
NOT TO SCALE



ION MAP

EXHIBIT A

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

May 25, 2005

LEGEND:

- FUTURE SEWER MANHOLE
- GRATED INLET CATCH BASIN
- HEADWALL WITH WINGWALL
- RW3"—— RECLAIMED WATERLINE W/ SIZE
- D24"—— DRAINLINE W/ SIZE
- FS8"—— FUTURE SEWERLINE W/ SIZE
- FW2"—— FUTURE WATERLINE W/ SIZE
- EW8"—— EXISTING WATERLINE W/ SIZE
- ED24"—— EXISTING DRAINLINE W/ SIZE
- ES8"—— EXISTING SEWERLINE W/ SIZE
- EXISTING STREET LIGHT
- NO VEHICULAR ACCESS PERMITTED
- VEHICULAR ACCESS PERMITTED
- PROPOSED IMPROVEMENTS (BY OTHERS)
- FUTURE IMPROVEMENTS (BY OTHERS)
- SIDEWALK
- TOP BANK
- BOTTOM BANK
- CENTERLINE SWALE
- EXISTING ARCHAEOLOGICAL SITES
- 100 YEAR FEMA INUNDATION LIMITS (Q_{100} = 8,008 c.f.s.)
- CONCEPTUAL SCHEMATIC LAYOUT OF RECYCLING & REDEMPTION CENTER ONSITE IMPROVEMENTS (BY OTHERS)
- SELF-CONTAINED SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)
- A.C. DRIVEWAY PAVEMENT (SEE SECTION, SHT. C-8.2)
- GLASPHALT RECYCLING & REDEMPTION CENTER PAVEMENT (SEE SECTION, SHT. C-8.2)

NOTES:

1. OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST ALONG, ACROSS, AND IN THE VICINITY OF THE PROPOSED IMPROVEMENTS AND MAY NOT BE SHOWN ON THE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE RESPECTIVE COUNTY OR STATE AGENCIES, UTILITIES (INCLUDING WITHOUT LIMITATION MAUI ELECTRIC COMPANY, LTD., VERIZON HAWAII INC., AND OCEANIC TIME WARNER CABLE OF HAWAII), EXAMINING ANY AVAILABLE RECORD DRAWINGS, TONING OF UNDERGROUND UTILITIES, AND CONFIRMING THE PRESENCE OF ANY EXISTING UTILITIES ALONG AND ACROSS THE PROPOSED IMPROVEMENTS. CONTRACTOR SHALL NOTIFY AND COORDINATE CONSTRUCTION ACTIVITIES, AND ANY REQUIRED RELOCATION, WITH RESPECTIVE AGENCIES AND UTILITIES.
2. OWNERS OF ADJOINING LANDS, SHOWN ON PLAN, ARE TAKEN FROM RECORDS FILED IN THE REAL PROPERTY MAPPING BRANCH, & ARE SUBJECT TO VERIFICATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL REQUIRED COUNTY PERMITS (INCLUDING FEES) FOR:
   - FENCE & GATE
   - LIGHT POLE & APPURTENANCES
4. SEE SHEET C-6 FOR DRIVEWAY PROFILE.

KEOKEA GULCH

FUTURE SOU

FUTURE MULTI-USE COURTS

10 FEET HIGH BLACK VINYL COATED GALVANIZED CHAIN LINK FENCING WITH GREEN PLASTIC SLATS (SEE STD. PLANS D-01 & D-02 FOR APPLICABLE DETAILS; CONTRACTOR SHALL SUBMIT SHOP DRAWINGS STAMPED BY LICENSE STRUCTURAL ENGINEER FOR REVIEW & APPROVAL PRIOR TO FABRICATION)

SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)

REINF. CONC. CURB (SEE DET. SHT. C-8.2)

215°59'45"

190.00

12" (TYP.)

REDWOOD OR RECYCLED PLASTIC HEADER ALONG ALL EDGES OF PAVEMENT WITH NO CURB (TYP.; SEE DET. SHT. C-8.2)

114.00

10 FEET HIGH X 28 FT. WIDE, BLACK VINYL COATED, GALVANIZED, ROLLING CHAIN LINK FENCE GATE WITH LOCKING MECHANISM & GREEN PLASTIC SLATS (SEE STD. PLANS D-01 & D-02 FOR APPLICABLE DETAILS; CONTRACTOR SHALL SUBMIT SHOP DRAWINGS STAMPED BY LICENSE STRUCTURAL ENGINEER FOR REVIEW & APPROVAL PRIOR TO FABRICATION)

AZ.=45°20'50"
L=59.00

135°20'50"

203.99

(27.00)

180°20'50"

FUTURE RESTROOM

REINF. CONC. SLAB FOR ROLLING CHAINLINK FENCE GATE (SEE DET. SHT. C-8.2; COORDINATE EXACT LOCATION IN FIELD TO ALIGN WITH LOCATION OF SLIDING GATE)

(32.00)

12'-0"

307°21'19"

R=10'

R=5'

315°20'50"
10.00

52.00

℄ CURVE DATA
Δ=90°00
R=50.00
L=78.54
T=50.00
C=70.71
Ch.Az.=180°20'50"

R=50.00

8'-0"

45°20'50"

171.56

315°20'50"
22.00

64.85
42.85

5.70

5.00

18'-0"

12'-0"

R=315.50

REDWOOD OR RECYCLED PLASTIC HEADER ALONG ALL EDGES OF PAVEMENT WITH NO CURB (TYP.; SEE DET. SHT. C-8.2)

REINF. CONC. CURB (SEE DET. SHT. C-8.2)

219.18

135°20'50"

132°34'25"

40.31

30'-0"

12'-0"

℄ SWALE

TEMP. EDGE OF DRIVEWAY A.C. PAVEMENT

93.07

52.00

12'-0"

52.85

225°20'50"

26.07

R=50.00

NEW WELAKAHAO STREET

INTERSECTION IMPROVEMENTS BY ENGINEERING DIVISION, DEPT. OF PUBLIC WORKS & ENVIRONMENTAL MANAGEMENT, COUNTY OF MAUI (NOT IN CONTRACT)

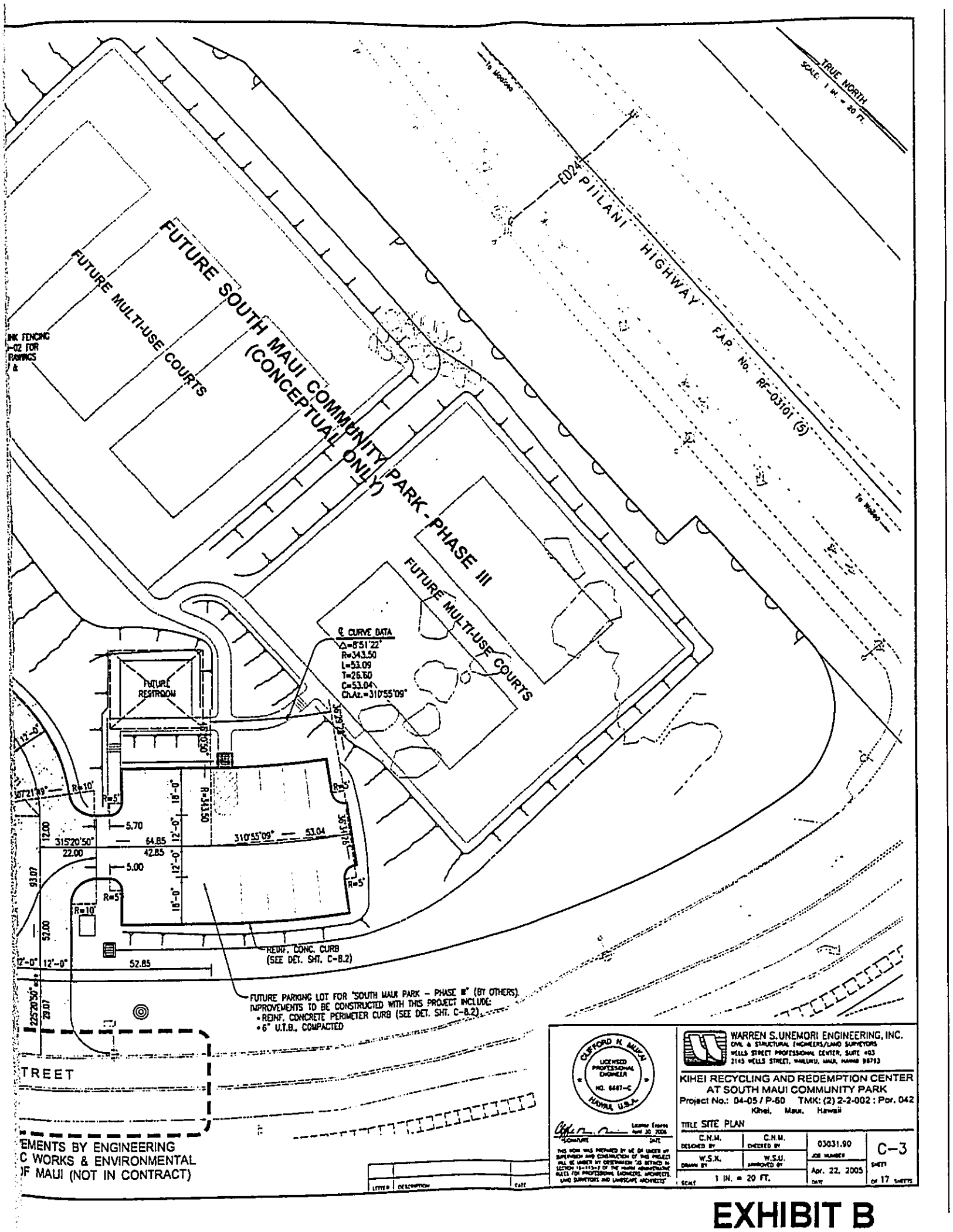

TRUE NORTH
SCALE: 1 IN. = 20 FT.
ED24 PIILANI HIGHWAY F.A.P. No. RF-03101 (5)
To Wailea
To Makena
FUTURE SOUTH MAUI COMMUNITY PARK - PHASE III
(CONCEPTUAL ONLY)
FUTURE MULTI-USE COURTS
FUTURE MULTI-USE COURTS
INK FENCING
I-02 FOR
RAILINGS
&
FUTURE RESTROOM
℄ CURVE DATA
Δ=8°51'22"
R=343.50
L=53.09
T=26.60
C=53.04
ChAz.=310°55'09"
307°21'39"
R=10'
R=5'
18'-0"
R=343.50'
12'-0"
5.70
315°20'50"
64.85
22.00
42.85
310°55'09"
53.04
5.00
R=5'
R=10'
93.07
52.00
12'-0"
12'-0"
52.85
225°20'50"
29.07
REINF. CONC. CURB
(SEE DET. SHT. C-8.2)
FUTURE PARKING LOT FOR "SOUTH MAUI PARK - PHASE III" (BY OTHERS).
IMPROVEMENTS TO BE CONSTRUCTED WITH THIS PROJECT INCLUDE:
• REINF. CONCRETE PERIMETER CURB (SEE DET. SHT. C-8.2).
• 6" U.T.B., COMPACTED
TREET
EMENTS BY ENGINEERING
C WORKS & ENVIRONMENTAL
F MAUI (NOT IN CONTRACT)
CLIFFORD N. MAUNA
LICENSED PROFESSIONAL ENGINEER
NO. 6447-C
HAWAII, U.S.A.
WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-50 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii
TITLE SITE PLAN
C.N.M. DESIGNED BY
C.N.M. CHECKED BY
03031.90 JOB NUMBER
W.S.K. DRAWN BY
W.S.U. APPROVED BY
Apr. 22, 2005 DATE
1 IN. = 20 FT. SCALE
C-3 SHEET
OF 17 SHEETS

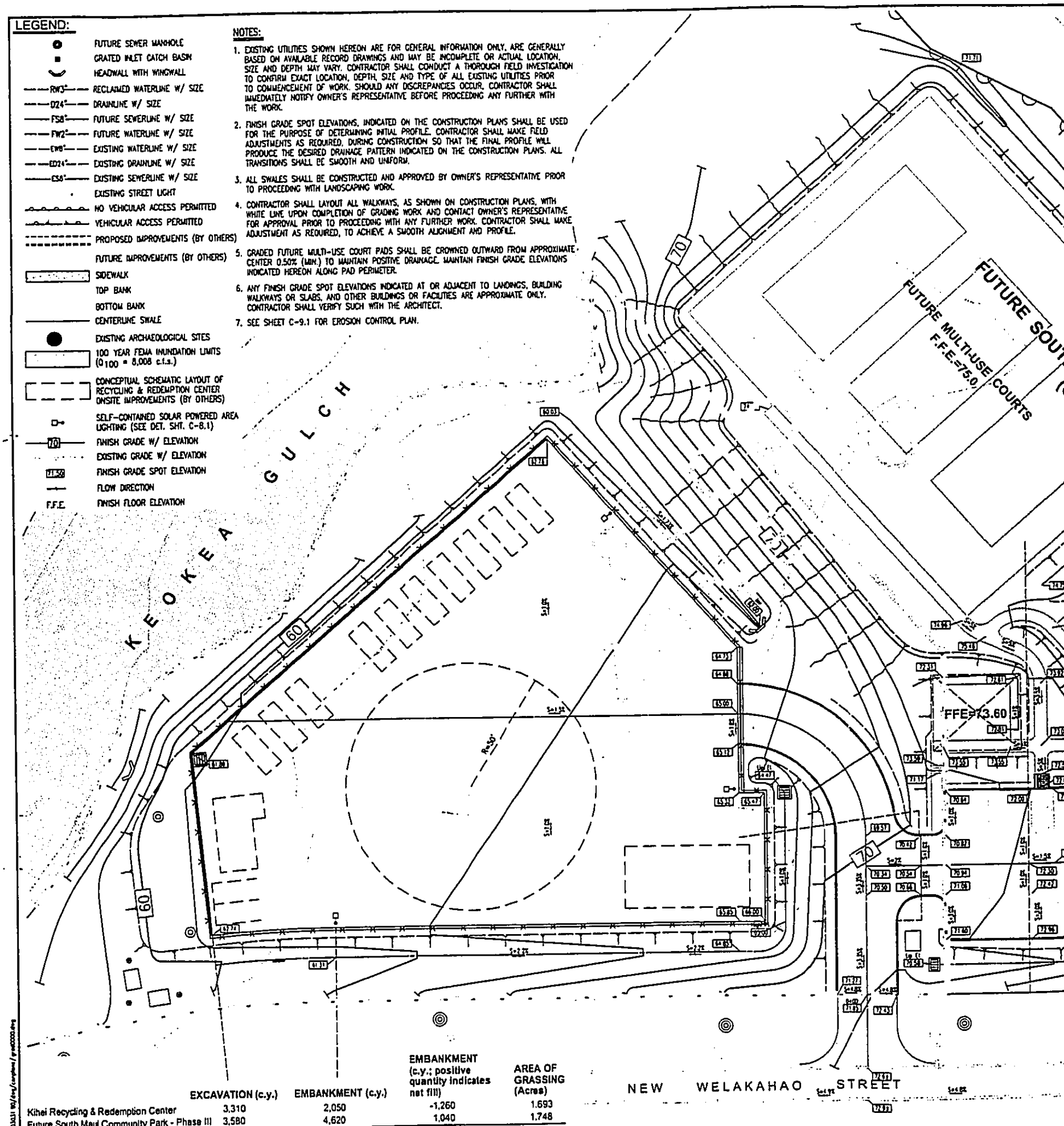
EXHIBIT B

LEGEND:

- FUTURE SEWER MANHOLE
- GRATED INLET CATCH BASIN
- HEADWALL WITH WINGWALL
- RW3"— RECLAIMED WATERLINE W/ SIZE
- D24"— DRAINLINE W/ SIZE
- FS8"— FUTURE SEWERLINE W/ SIZE
- FW2"— FUTURE WATERLINE W/ SIZE
- EW8"— EXISTING WATERLINE W/ SIZE
- ED24"— EXISTING DRAINLINE W/ SIZE
- ES8"— EXISTING SEWERLINE W/ SIZE
- EXISTING STREET LIGHT
- NO VEHICULAR ACCESS PERMITTED
- VEHICULAR ACCESS PERMITTED
- PROPOSED IMPROVEMENTS (BY OTHERS)
- FUTURE IMPROVEMENTS (BY OTHERS)
- SIDEWALK
- TOP BANK
- BOTTOM BANK
- CENTERLINE SWALE
- EXISTING ARCHAEOLOGICAL SITES
- 100 YEAR FEMA INUNDATION LIMITS (Q_{100} = 8,008 c.f.s.)
- CONCEPTUAL SCHEMATIC LAYOUT OF RECYCLING & REDEMPTION CENTER ONSITE IMPROVEMENTS (BY OTHERS)
- SELF-CONTAINED SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)
- 70 — FINISH GRADE W/ ELEVATION
- EXISTING GRADE W/ ELEVATION
- 71.50 FINISH GRADE SPOT ELEVATION
- FLOW DIRECTION
- F.F.E. FINISH FLOOR ELEVATION

NOTES:

1. EXISTING UTILITIES SHOWN HEREON ARE FOR GENERAL INFORMATION ONLY, ARE GENERALLY BASED ON AVAILABLE RECORD DRAWINGS AND MAY BE INCOMPLETE OR ACTUAL LOCATION, SIZE AND DEPTH MAY VARY. CONTRACTOR SHALL CONDUCT A THOROUGH FIELD INVESTIGATION TO CONFIRM EXACT LOCATION, DEPTH, SIZE AND TYPE OF ALL EXISTING UTILITIES PRIOR TO COMMENCEMENT OF WORK. SHOULD ANY DISCREPANCIES OCCUR, CONTRACTOR SHALL IMMEDIATELY NOTIFY OWNER'S REPRESENTATIVE BEFORE PROCEEDING ANY FURTHER WITH THE WORK.
2. FINISH GRADE SPOT ELEVATIONS, INDICATED ON THE CONSTRUCTION PLANS SHALL BE USED FOR THE PURPOSE OF DETERMINING INITIAL PROFILE. CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS REQUIRED, DURING CONSTRUCTION SO THAT THE FINAL PROFILE WILL PRODUCE THE DESIRED DRAINAGE PATTERN INDICATED ON THE CONSTRUCTION PLANS. ALL TRANSITIONS SHALL BE SMOOTH AND UNIFORM.
3. ALL SWALES SHALL BE CONSTRUCTED AND APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH LANDSCAPING WORK.
4. CONTRACTOR SHALL LAYOUT ALL WALKWAYS, AS SHOWN ON CONSTRUCTION PLANS, WITH WHITE LINE UPON COMPLETION OF GRADING WORK AND CONTACT OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO PROCEEDING WITH ANY FURTHER WORK. CONTRACTOR SHALL MAKE ADJUSTMENT AS REQUIRED, TO ACHIEVE A SMOOTH ALIGNMENT AND PROFILE.
5. GRADED FUTURE MULTI-USE COURT PADS SHALL BE CROWNED OUTWARD FROM APPROXIMATE CENTER 0.50% (MIN.) TO MAINTAIN POSITIVE DRAINAGE. MAINTAIN FINISH GRADE ELEVATIONS INDICATED HEREON ALONG PAD PERIMETER.
6. ANY FINISH GRADE SPOT ELEVATIONS INDICATED AT OR ADJACENT TO LANDINGS, BUILDING WALKWAYS OR SLABS, AND OTHER BUILDINGS OR FACILITIES ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY SUCH WITH THE ARCHITECT.
7. SEE SHEET C-9.1 FOR EROSION CONTROL PLAN.



	EXCAVATION (c.y.)	EMBANKMENT (c.y.)	EMBANKMENT (c.y.; positive quantity indicates net fill)	AREA OF GRASSING (Acres)
Kihei Recycling & Redemption Center	3,310	2,050	-1,260	1.693
Future South Maui Community Park - Phase III	3,580	4,620	1,040	1.748
Net Earthwork (entire site)	6,890	6,670	-220	3.441

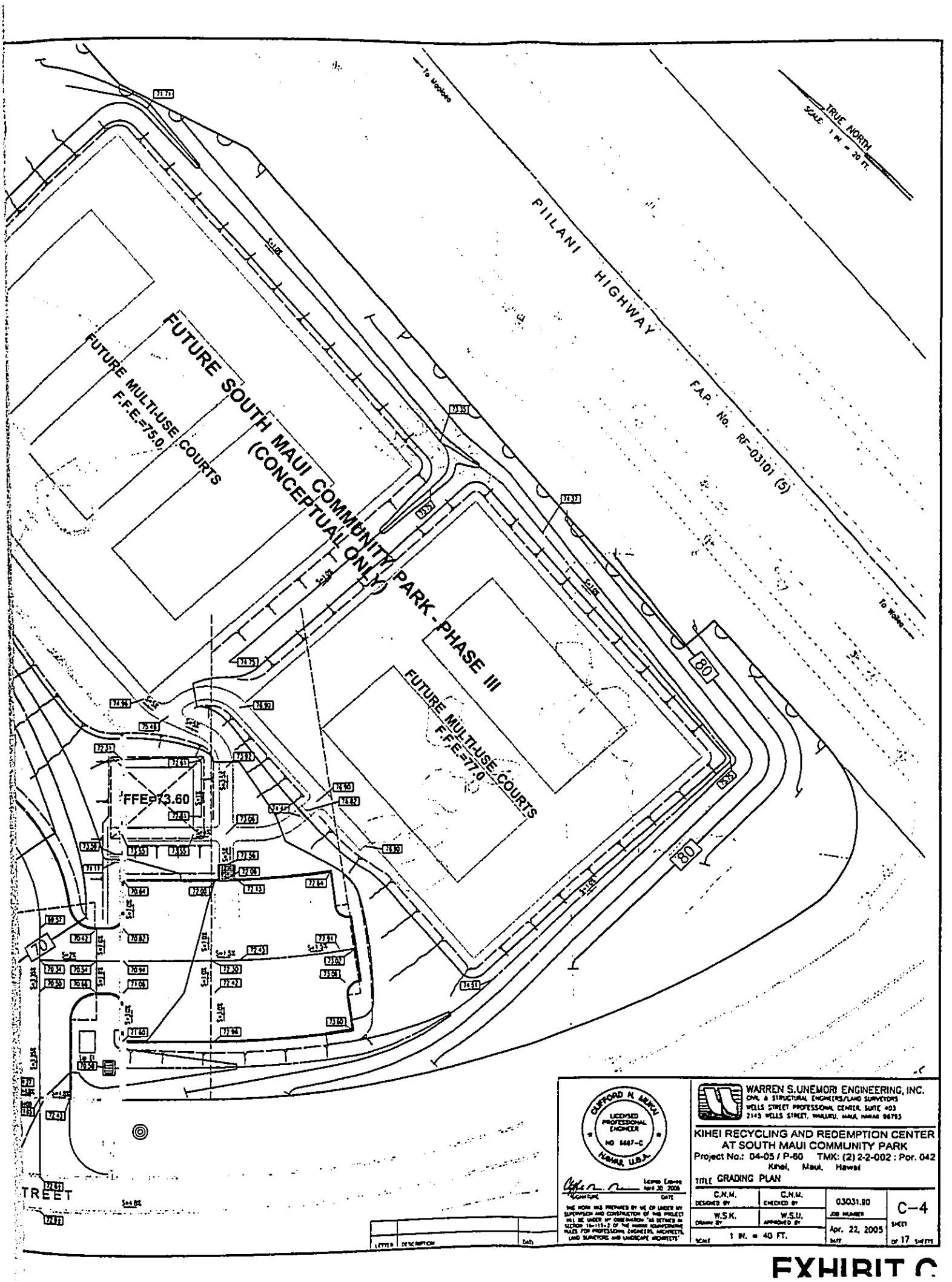

PIILANI HIGHWAY
F.A.P. No. RF-0310 1 (5)
TRUE NORTH
SCALE: 1 IN. = 20 FT.
FUTURE SOUTH MAUI COMMUNITY PARK - PHASE III
(CONCEPTUAL ONLY)
FUTURE MULTI-USE COURTS
F.F.E.=75.0
FUTURE MULTI-USE COURTS
F.F.E.=77.0
FFE=73.60
TREET
CLIFFORD N. MIKAU
LICENSED PROFESSIONAL ENGINEER
NO. 8487-C
Kahului, U.S.A.
WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793
KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii
TITLE GRADING PLAN
C.N.M. DESIGNED BY
C.N.M. CHECKED BY
03031.90 JOB NUMBER
W.S.K. DRAWN BY
W.S.U. APPROVED BY
Apr. 22, 2005 DATE
1 IN. = 40 FT. SCALE
C-4 SHEET
OF 17 SHEETS

EXHIBIT C

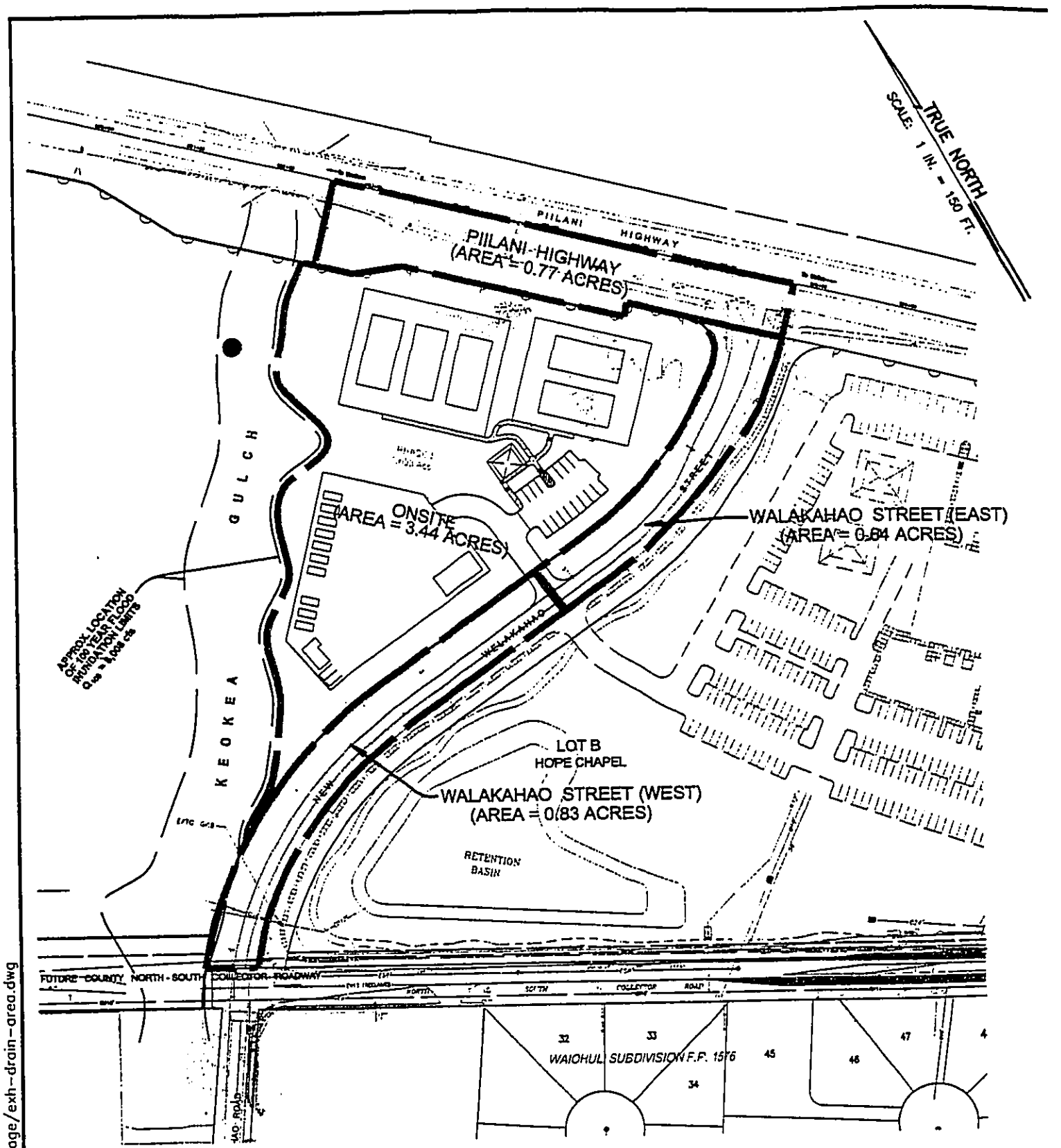
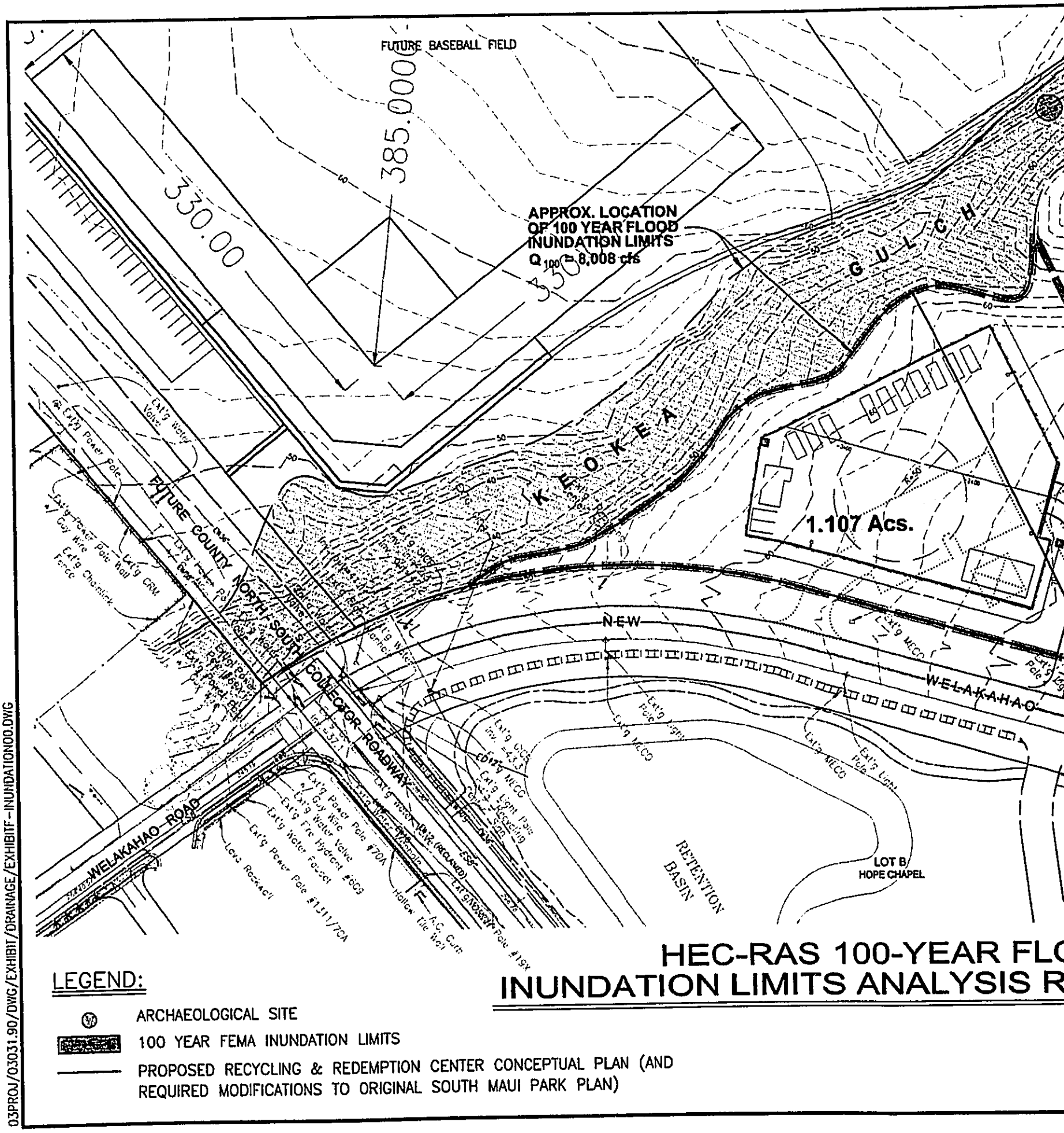


EXHIBIT D - DRAINAGE AREA MAP

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

May 25, 2005

03proj/03031.90/dwg/exhibits/drainage/exh-drain-area.dwg

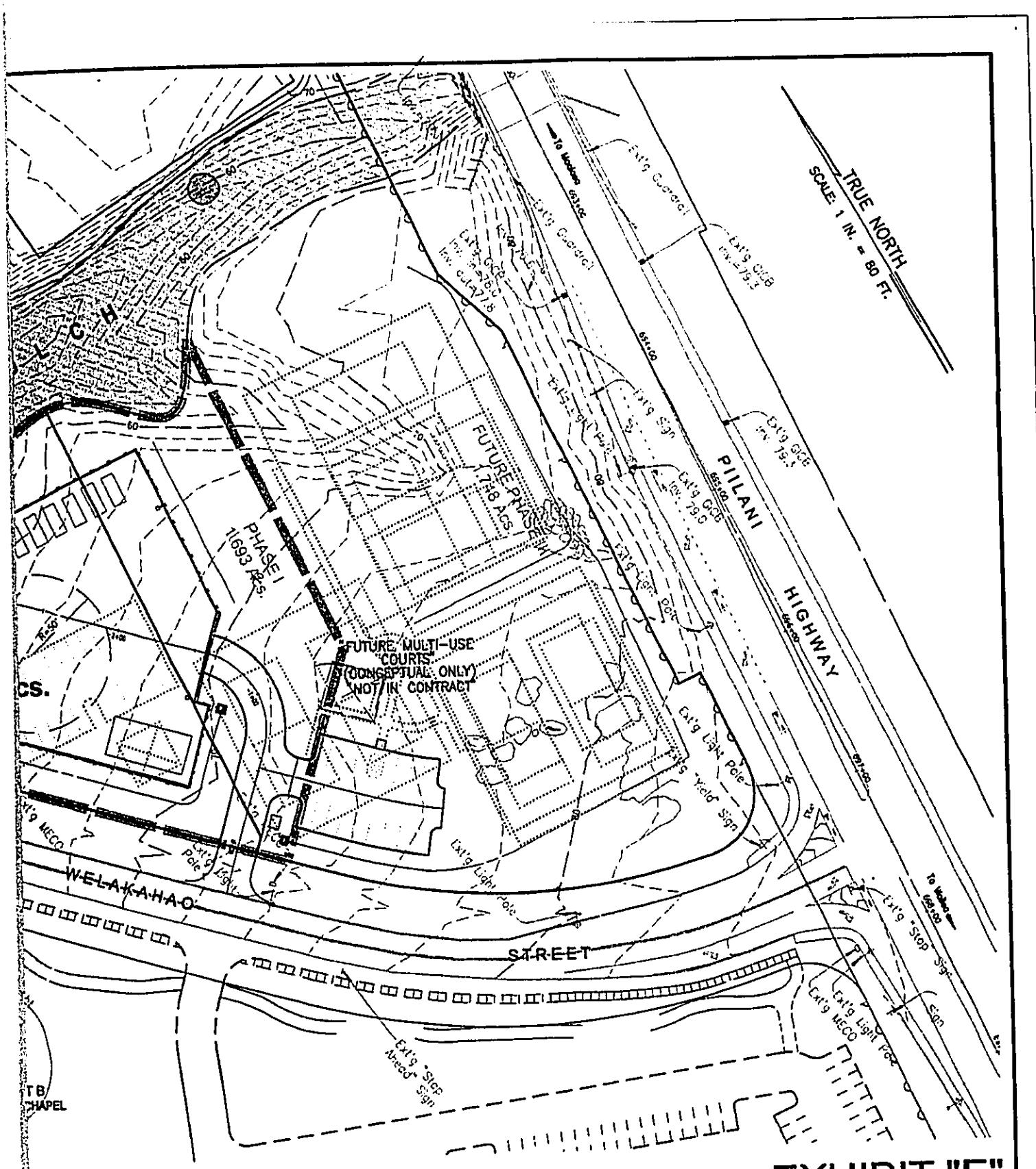


HEC-RAS 100-YEAR FLO
INUNDATION LIMITS ANALYSIS R

LEGEND:

- ARCHAEOLOGICAL SITE
- 100 YEAR FEMA INUNDATION LIMITS
- PROPOSED RECYCLING & REDEMPTION CENTER CONCEPTUAL PLAN (AND REQUIRED MODIFICATIONS TO ORIGINAL SOUTH MAUI PARK PLAN)

03PROJ/03031.90/DWG/EXHIBIT/DRAINAGE/EXHIBITF-INUNDATIONOO.DWG



-YEAR FLOOD
NALYSIS RESULTS

EXHIBIT "E"

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

May 25, 2005

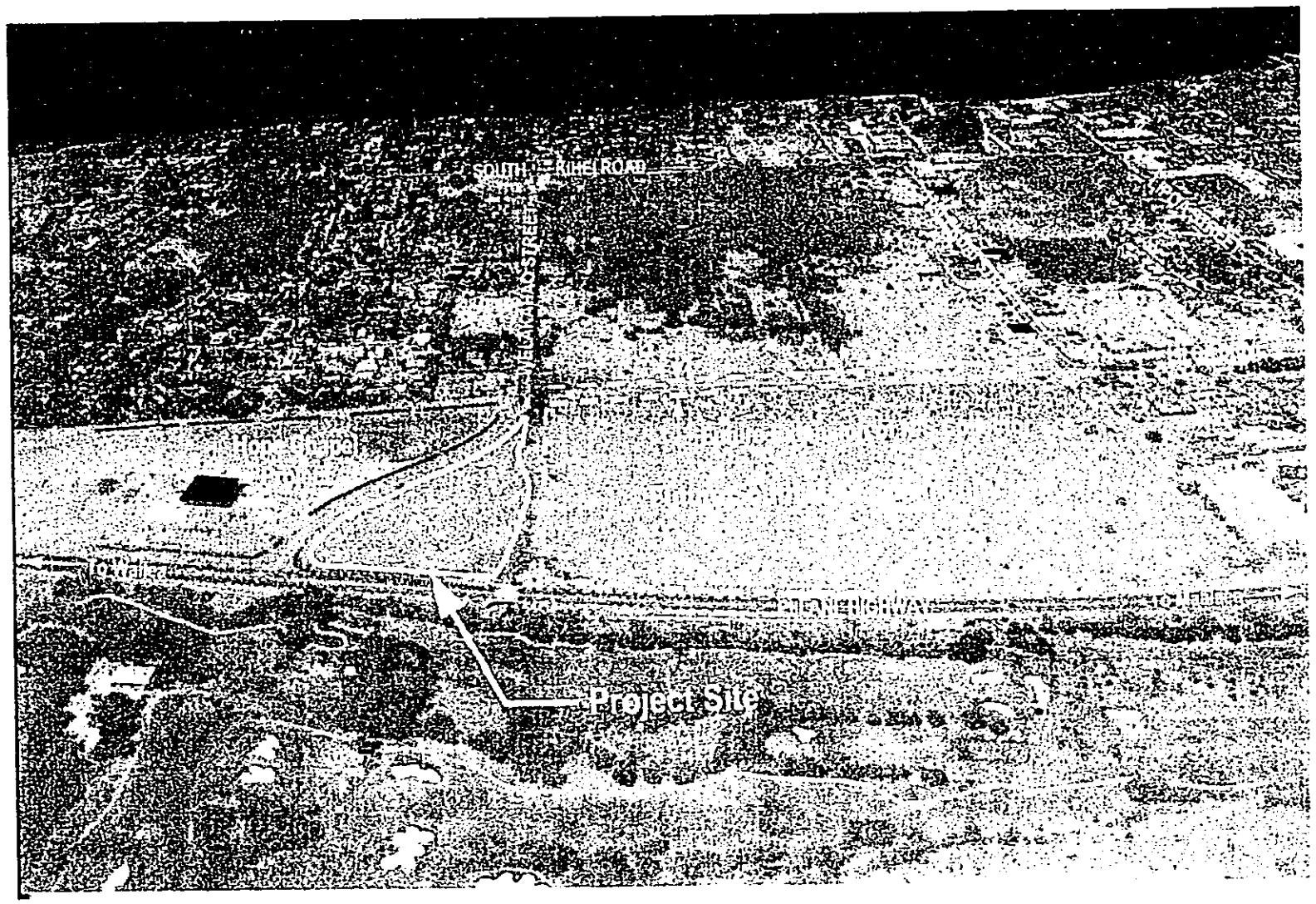
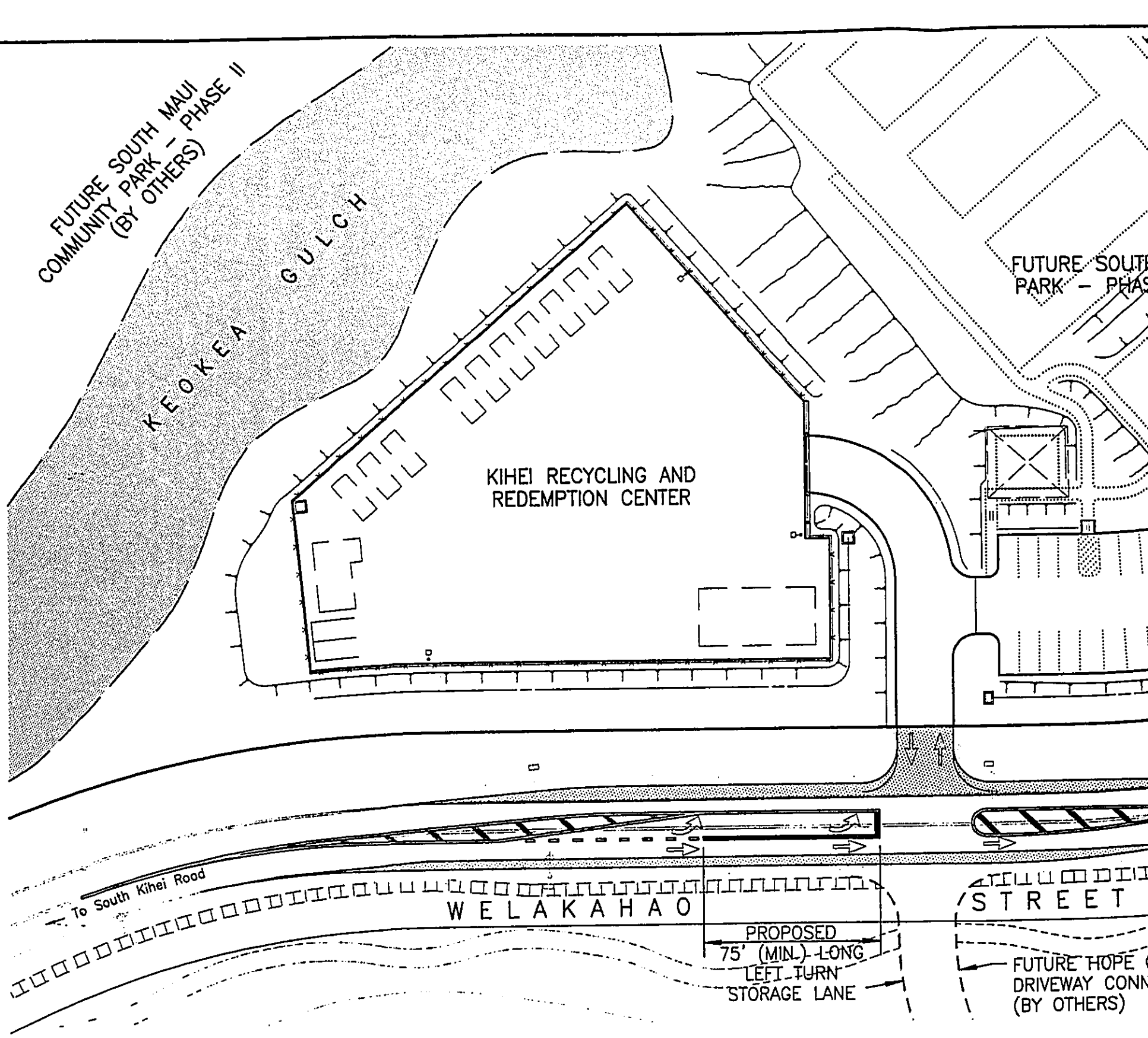


EXHIBIT F – Photographic Analysis

V:\projdata\03pro\C3031 SC\Reports\Drainage\Exhibits\EXHIBIT F – Photo Analysis of Existing Conditions.ppt

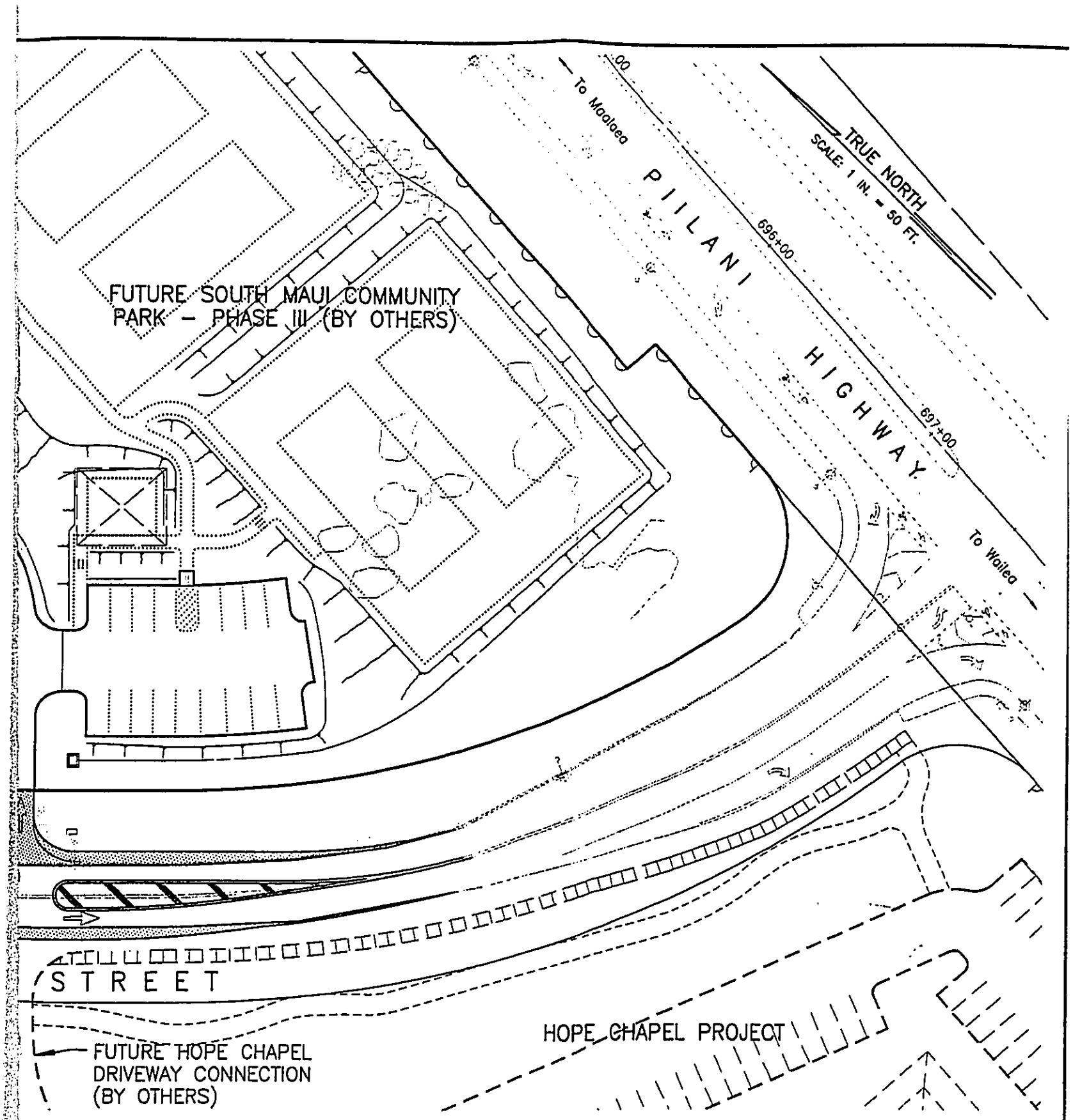


LEGEND:

PROPOSED PAVEMENT WIDENING

APPROX. LIMITS OF WELAKAHAO STREET IMPROVEMENTS

EXHIBIT "G" - PROPOSED WELAKAHAO STREET



O STREET INTERSECTION IMPROVEMENTS

APPENDIX A: HYDROLOGIC CALCULATIONS

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM WELAKAHAO STREET (TOTAL)

Objective: To determine the post-development onsite surface runoff.

1. *50-Yr. - 1 Hr. Rainfall:*

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):		1.47

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.43
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		1.04
Runoff Coeff., $C_{WEIGHTED}$:		0.75

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		40.50
Higher Elev. (ft.):	85.50	
Lower Elev. (ft.):	45.00	
Approx. Runoff Length (ft.):		1012.00
Average Slope:		4.00%
Time of Concentration (min.):		16.00

5. Intensity:

Intensity (in./hr.):	4.18

6. Total Runoff:

Q = C x I x A (cfs):	4.63

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM WELAKAHAO STREET (WEST)

Objective: To determine the post-development onsite surface runoff.

1. 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):		0.83

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.27
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		0.56
Runoff Coeff., $C_{WEIGHTED}$:		0.73

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		28.00
Higher Elev. (ft.):	73.00	
Lower Elev. (ft.):	45.00	
Approx. Runoff Length (ft.):		560.00
Average Slope:		5.00%
Time of Concentration (min.):		12.00

5. Intensity:

Intensity (in./hr.):	4.56

6. Total Runoff:

Q = C x I x A (cfs):	2.77

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM WELAKAHAO STREET (EAST)

Objective: To determine the post-development onsite surface runoff.

1. 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):		0.64

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.48
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		0.16
Runoff Coeff., $C_{WEIGHTED}$:		0.45

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		12.50
Higher Elev. (ft.):	85.50	
Lower Elev. (ft.):	73.00	
Approx. Runoff Length (ft.):		460.00
Average Slope:		2.72%
Time of Concentration (min.):		12.50

5. Intensity:

Intensity (in./hr.):	4.51

6. Total Runoff:

Q = C x I x A (cfs):	1.29

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM PIILANI HIGHWAY

Objective: To determine the post-development onsite surface runoff.

I. 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):		0.77

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.45
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		0.32
Runoff Coeff., $C_{WEIGHTED}$:		0.56

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		12.80
Higher Elev. (ft.):	84.80	
Lower Elev. (ft.):	72.00	
Approx. Runoff Length (ft.):		80.00
Average Slope:		16.00%
Time of Concentration (min.):		4.50

5. Intensity:

Intensity (in./hr.):	5.65

6. Total Runoff:

Q = C x I x A (cfs):	2.43

APPENDIX B: Keokea Gulch 100-Year Inundation Limits Analysis

HEC-RAS Plan: Plan 01 River: KeokeaGulch Reach: PiilaniHighway Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PiilaniHighway	900	PF 1	8008.00	63.00	72.389	76.44	85.98	0.056004	29.58	270.71	49.27	2.22
PiilaniHighway	850	PF 1	8008.00	60.20	68.505	73.07	82.72	0.072928	30.26	264.65	59.33	2.52
PiilaniHighway	800	PF 1	8008.00	58.60	67.695	71.36	78.79	0.050027	26.73	299.62	60.62	2.12
PiilaniHighway	750	PF 1	8008.00	56.90	66.729	70.06	76.10	0.037973	24.57	325.94	60.32	1.86
PiilaniHighway	700	PF 1	8008.00	55.20	65.035	68.17	74.19	0.035923	24.28	329.78	59.11	1.81
PiilaniHighway	650	PF 1	8008.00	52.70	58.445	61.26	71.03	0.101176	31.26	295.96	110.10	2.88
PiilaniHighway	600	PF 1	8008.00	48.80	56.499	59.51	66.62	0.055578	25.53	313.62	74.84	2.20
PiilaniHighway	550	PF 1	8008.00	47.40	56.653	59.37	63.95	0.025766	21.93	385.77	89.12	1.57
PiilaniHighway	500	PF 1	8008.00	45.80	55.013	57.43	62.55	0.029610	22.75	389.50	100.25	1.68
PiilaniHighway	450	PF 1	8008.00	44.60	54.359	56.59	61.05	0.021167	22.30	421.81	94.05	1.46
PiilaniHighway	400	PF 1	8008.00	43.70	51.881	54.39	59.60	0.035530	22.30	359.16	75.21	1.80
PiilaniHighway	350	PF 1	8008.00	43.00	51.831	53.61	57.55	0.024258	19.19	417.27	82.24	1.50
PiilaniHighway	300	PF 1	8008.00	41.00	52.386	52.79	56.22	0.011160	15.73	513.32	82.93	1.06
PiilaniHighway	250	PF 1	8008.00	40.80	47.920	50.20	54.98	0.034334	21.33	375.46	82.22	1.76
PiilaniHighway	200	PF 1	8008.00	37.90	45.165	47.66	53.08	0.038626	22.57	354.74	77.82	1.86
PiilaniHighway	150	PF 1	8008.00	36.40	49.404	47.16	51.36	0.004451	11.22	714.18	88.75	0.69
PiilaniHighway	131.7	PF 1	8008.00	36.00	48.995		51.25	0.005166	12.07	673.44	92.72	0.74
PiilaniHighway	100	PF 1	8008.00	35.10	48.940		51.04	0.004821	11.82	726.94	126.44	0.72
PiilaniHighway	50	PF 1	8008.00	34.60	49.070	49.07	50.68	0.003764	11.12	984.87	300.00	0.64
PiilaniHighway	0	PF 1	8008.00	33.10	42.461	45.42	49.71	0.028020	21.61	370.54	66.76	1.62
PiilaniHighway	-50	PF 1	8008.00	30.60	39.179	41.96	47.85	0.043606	23.63	338.89	74.26	1.95

APPENDIX C: Subsurface Drainage Detention System Calculations

Date: March 15, 2005

SUBSURFACE DRAINAGE SYSTEM ANALYSIS AND DESIGN

Project:	Kihei Recycling and Redemption Center at South Maui Community Park
Location:	Kihei, Maui, Hawaii
Job Number:	3031.90
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 fifty (50) years is used.

I. Determine 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kahului, Maui,
R(50 Yr.-1Hr.) = 2.1 inches

II. Determine Pre-Development Runoff:

Pre-Development Component Areas:

Total Area (Ac.):		3.44

Pre-Development Runoff Coefficents:

Unimproved Areas:	(from Table 2)	0.30
	Composite Runoff Coeff't., C:	0.30

Pre-Development Time of Concentration:

Approx. Elev. Diff'l. (feet):		40.00
Higher Elev. (ft.):	86.0	
Lower Elev. (ft.):	46.0	
Approx. Runoff Length (ft.):		800
Average Slope:		5.0%
Ground Character:		Ave. Grass
Time of Concentration (min.):		23

Pre-Development Intensity:

Intensity (in./hr.):	3.30

Pre-Development Runoff:

Q (pre-dev.) = C x I x A (cfs):	3.41
Allowable Release Rate(cfs):	3.41

III. Determine Post-Development Runoff:

Total Area (Ac.):	3.44

Post-Development Runoff Coefficents:

Subarea 1 - Onsite Phase I Paved Areas:

Streets:	Asphaltic	0.95
	Component Runoff Coeff't., C:	0.95
	Component Area (Acres):	0.82

Subarea 2 - Onsite Phase I & Phase III Landscaped Areas:

Lawns:	Hvy. Soil, Avg., 2	0.22
	Component Runoff Coeff't., C:	0.22
	Component Area (Acres):	2.62
	Composite Runoff Coeff't., C:	0.39

Post-Development Time of Concentration:

Approx. Elev. Diff'l. (feet):		28.00
Higher Elev. (ft.):	86.0	
Lower Elev. (ft.):	58.0	
Approx. Runoff Length (ft.):		600
Average Slope:		4.7%
Ground Character:		24% Paved
Time of Concentration (min.):		16

Post-Development Intensity:

Intensity (in./hr.):	3.75

Post-Development Runoff:

Q (post-dev.) = C x I x A (cfs):	**5.08**

IV. Establish Initial Trench Cross Section Parameters:

Cover Over Pipe (ft.):	1.00
Pipe Diameter (ft.)	4.00
Cradle Depth Below Pipe (ft.):	2.00
Cradle Thickness on Sides of Pipe (ft.):	2.00
Total Trench Depth (ft.):	7.0
Total Trench Width (ft.):	8.0
Gross Trench Cross Sectional Area (sf/lf):	56.0
Pipe Cross Sectional Area (sf/lf):	12.6
Trench Aggreg. Cross Sectional Area (sf/lf):	43.4
Assumed Initial Length of Pipe/Trench (ft.):	110.00

V. **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 (cf)	Storage Required. (cf)	Comments
(1)	(2)	(3)	(4)	(5)	(6)	
5	6.20	1.36	2,521	1,023	1,498	
10	5.00	1.36	4,066	2,046	2,020	
15	4.40	1.36	5,367	3,069	2,298	Peak Storage
20	3.90	1.36	6,343	4,092	2,251	
30	3.40	1.36	8,295	6,138	2,157	
40	3.00	1.36	9,759	8,184	1,575	
60	2.40	1.36	11,711	12,276	-565	
80	2.20	1.36	14,313	16,368	-2,055	
100	1.90	1.36	15,452	20,460	-5,008	
120	1.65	1.36	16,102	24,552	-8,450	
180	1.30	1.36	19,030	36,828	-17,798	

(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)

Storage Required (c.f.):	2298.00

Determine Provided Storage Volume:

Pipe Storage Capacity (c.f.):	1,382.3
Net Aggregate Cradle Storage Capacity (c.f.):	6,160.0
Gross Aggregate Cradle Volume (40% of voids) (c.f.):	1,911.1
Void Ratio (50% of voids) (c.f.):	955.5
Total Storage Capacity Provided (cf):	2,337.8

{Storage Provided = 2,338 cf} > {Storage Required = 2,298 cf}; therefore initial assumptions based on 110 l.f. of 48 - inch diameter pipe are acceptable.

Drainage Report

TABLE OF CONTENTS

I. INTRODUCTION

The purpose of this report is to evaluate the existing drainage conditions and develop a grading and drainage plan for the proposed project.

II. PROPOSED PROJECT

A. Site Location:

The project site is located in Kihei, on the island of Maui, in the State of Hawaii, at the southernmost end of Tax Map Key parcel (2) 2-2-02:Por. 42 (see EXHIBIT A: Location Map). This triangular-shaped parcel is abutted by:

- Piilani Highway on its east (mauka) side;
- Welakahao Street on its southerly side (the Hope Chapel development, currently under construction is across Welakahao Street, on the southerly side of Welakahao St.);
- The future N-S Collector roadway reserve and a Maui Electric Company power substation on its west (makai) side; and,
- Keokea Gulch natural drainageway on its north side.

The western (makai) approximately 1.69 Acres of this triangular parcel is expected to be occupied by the proposed Kihei Recycling and Redemption Center. The balance (eastern or mauka 1.75 Acres) of this triangular parcel is expected to be developed in the future by the County of Maui as Phase III of its South Maui Community Park.

The balance of the overall parcel, to the north of Keokea Gulch (up to Kihei Elementary and Lokelani Intermediate Schools at the north end), is expected to be developed by the County of Maui in the future as Phases I and II of the South Maui Community Park.

B. Project Description:

The Kihei Recycling and Redemption Center project proposes to construct an approximately 31,000 s.f. recycling and redemption facility.

Anticipated onsite infrastructure improvements include:

- Roadway improvements consisting of: asphalt and recycled glass "glasphalt" pavement and concrete curbing;

- Utility improvements consisting of: grated drain inlets, an underground drainage system, an subsurface drainage system, and a recycled water landscape irrigation system;

- Landscape improvements consisting of perimeter ground cover and hedges, and supporting recycled water landscape irrigation.

Anticipated offsite infrastructure improvements along Welakahao Street include:

- A dedicated left turn pocket, and appurtenant asphalt pavement widening, pavement markings and striping, and signage.

While the mass-grading for Phase III of the South Maui Community Park within the eastern (mauka) 1.75 Acres of this triangular parcel are expected to be done in conjunction with this project, other future anticipated onsite improvements for Phase III of the South Maui Community Park and all supporting infrastructure will be defined at a later date and are not within the scope of this analysis.

III. EXISTING CONDITIONS

A. Topography and Site Conditions:

The project site is presently undeveloped and is not being used for any particular purpose (see EXHIBIT F: Photographic Analysis).

The existing ground slopes in a southeasterly to northwesterly direction from elevation $^{(+)}$86± feet M.S.L. to approximately $^{(+)}$46± feet M.S.L., with an average slope of approximately 5%.

The site is presently covered with buffelgrass (the density of which varies seasonally and with rainfall) and a scattering of kiawe trees. Upon completion of the proposed grading and improvements, all disturbed areas that are still exposed (and not paved or otherwise landscaped) will be grassed as required to minimize soil erosion.

According to the "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii (August 1972)" (see EXHIBIT B - Soil Survey Map), the predominant soil type at the project site is Puuone Sand (PZUE). This soil is characterized as excessively drained, light grayish-brown, non-plastic, calcareous sand, underlain by light grayish-brown, non-plastic, cemented sands. Permeability is rapid above the cemented layer, runoff slow and the hazard of wind erosion is moderate to severe.

This soil series are commonly geographically associated with Iao and Jaucas soils.

B. Drainage:

A total of approximately 3.4 cfs (50 year - 1 hour storm) of onsite surface runoff is currently generated by the undeveloped project site (see APPENDIX C: Subsurface Drainage Detention System Calculations). Onsite surface runoff generally sheet flows in a southeasterly to northwesterly direction, into the existing Keokea Gulch natural drainageway, which abuts the northern edge of the project site.

Approximately 2.4 cfs (50 year - 1 hour storm) of offsite surface runoff from Piilani Highway sheetflows onto the project site and sheetflows into the existing Keokea Gulch natural drainageway (see APPENDIX A: Hydrologic Calculations).

Approximately 4.6 cfs (50 year - 1 hour storm) of offsite surface runoff from abutting Welakahao St. sheetflows into and is conveyed along a grassed swale along the shoulder of Welakahao St. for the entire abutting frontage of the project site, is intercepted by an existing grated drain inlet at the downstream end of the shoulder, and is conveyed by an underground culvert to the existing Keokea Gulch natural drainageway (see APPENDIX A: Hydrologic Calculations).

A 100-year inundation limits analysis (using the U.S. Army Corps of Engineers' HEC-RAS water surface profile model for modeling both steady and unsteady, one-dimensional, gradually varied flow in both natural and man-made river channels) was undertaken for Keokea Gulch, based on a 100-year runoff of 8,008 c.f.s. (see EXHIBIT E: Keokea Gulch 100-Year Inundation Limits).

C. Flood and Tsunami Zone:

According to the Flood Insurance Rate Map, effective September 6, 1989, prepared by the United States Federal Emergency Managements Agency, Federal Insurance Administration, the project site is situated in an area designated as Zone C, which is prone to minimal flooding (see EXHIBIT C: Flood Insurance Rate Map).

Furthermore, the project site is not within a tsunami zone.

IV. DRAINAGE PLAN

A. General:

A total of 5.1 c.f.s. (50 year - 1 hour runoff) of onsite surface runoff will be generated by the developed project site. Accordingly, a net increase of 1.7 c.f.s. would have

been expected as a result of the proposed improvements in the absence of any onsite subsurface detention (see APPENDIX C: Subsurface Drainage Detention System Calculations). However, an onsite subsurface detention system (capacity based on 50 year - 1 hour runoff) is being proposed to limit the peak onsite runoff being discharged to pre-development levels. Accordingly, there will be no net increase in onsite peak surface runoff, based on a 50-year recurrence interval

The majority of the onsite surface runoff from the paved surfaces will be intercepted by a grated drain inlet and be conveyed directly underground to the proposed subsurface detention system, which will have an overflow to the existing Keokea Gulch natural drainageway. The balance of the onsite surface runoff will sheetflow, as it is currently doing, to the adjoining existing Keokea Gulch natural drainageway.

All improvements are proposed outside of the 100-year inundation limits of the existing Keokea Gulch natural drainageway.

B. Hydrology Calculations:

Hydrology calculations were undertaken pursuant to:

- "Rules for the Design of Storm Drainage Facilities for the County of Maui", Title MC-15, Chapter 4;
- "Rainfall Frequency Atlas of the Hawaiian Islands", Technical Paper No. 43, U.S. Department of Commerce, Weather Bureau; and,
- U.S. Department of Agriculture, Natural Resources Conservation Service [NRCS (formerly Soil Conservation Service or SCS)] procedure as described in the SCS National Engineering Handbook, Section 4, Hydrology (NEH-4). Hydrologic calculations were computed by utilizing computer software simulating "SCS Computer Program for Project Formulation, Hydrology (TR-20)", which is based on the procedures outlined in NEH-4.

The Rational Method, pursuant to the "Rules for the Design of Storm Drainage Facilities for the County of Maui" was used in calculating the onsite runoff and portions of the immediately abutting offsite areas.

Rational Formula used: $Q = CiA$

Where: Q = Rate of Flow (cfs)
C = Runoff Coefficient
i = Rainfall Intensity (inches/hour)
A = Area (Acres)

Rational Method calculations are based on a 10 year recurrence interval, 1-hour duration storm (with the exception of the subsurface drainage detention system, which is based on a 50-year recurrence interval, 1-hour duration storm).

The NRCS method was used in calculating the anticipated runoff along the existing Keokea Gulch natural drainageway. NRCS method calculations are based on a 100-year recurrence interval, 24-hour storm.

The hydrologic calculations for this project may be found in APPENDIX A: Hydrologic Calculations and APPENDIX C: Subsurface Drainage Detention System Calculations.

The 100-year inundation limits analysis may be found in APPENDIX B: Keokea Gulch 100-Year Inundation Limits Analysis.

C. Conclusion:

All drainage improvements are expected to be implemented pursuant to County of Maui standards. Furthermore, a subsurface drainage detention system is being implemented such that there will be no net increase in onsite peak surface runoff, based on a 50-year recurrence interval. Existing surface runoff will be allowed to continue to ultimately sheetflow into the existing Keokea Gulch natural drainage, as it is currently doing.

Accordingly, it is our professional opinion that the proposed improvements are not expected to have an adverse effect on downstream properties.

V. 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 0153C, September 17, 1997 and 150003 0161C, August 3, 1998. 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. *Rules for the Design of Storm Drainage Facilities in the County of Maui, Title MC-15, Chapter 4.* July 14, 1995. Department of Public Works, County of Maui.
6. *Modern Sewer Design.* 1980. American Iron and Steel Institute.

Prepared by:

Clifford N. Mukai, P.E.

Reviewed by:

Clifford N. Mukai, P.E.

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EXHIBITS

A. Location Map

B. Soil Survey Map

C. Flood Insurance Rate Map

D. Drainage Area Map

E. Keokea Gulch 100-Year Inundation Limits

F. Photographic Analysis

G. Grading Plan

TRUE NORTH

NOT TO SCALE

ELLEAIRE GOLF COURSE
TMK: 2-2-24: 013
Maui Highlands Properties LLC
Haleakala Ranch Company
Elleaire Maui Golf Club LLC
(Owners)

PARKWAY

To R&T Park

LIPOA

PIILANI

To Maalaea

F. A. P. No. RF-031-1(5)

HIGHWAY

KIHEI COMMUNITY CENTER AND AQUATIC CENTER
LOT A-2-5

PIILANI GARDENS APARTMENTS AND CHILD CARE
LOT A-2-4

LOT A-2-13

LOT A-2-12

LIPOA STREET

EXECUTIVE ORDER NO. 2825
Kihei Elementary and
Lokelani Intermediate Schools

FUTURE SOUTH MAUI COMMUNITY PARK (SMCP) PARCEL
LOT A
TMK: 2-2-02: 042
County of Maui
(Owners)

SMCP PHASE I

SMCP PHASE II

KEOKEA GULCH (DRAINAGE RESERVE)

NEW

LOT C

FUTURE NORTH - SOUTH COLLECTOR

To South Kihei Road

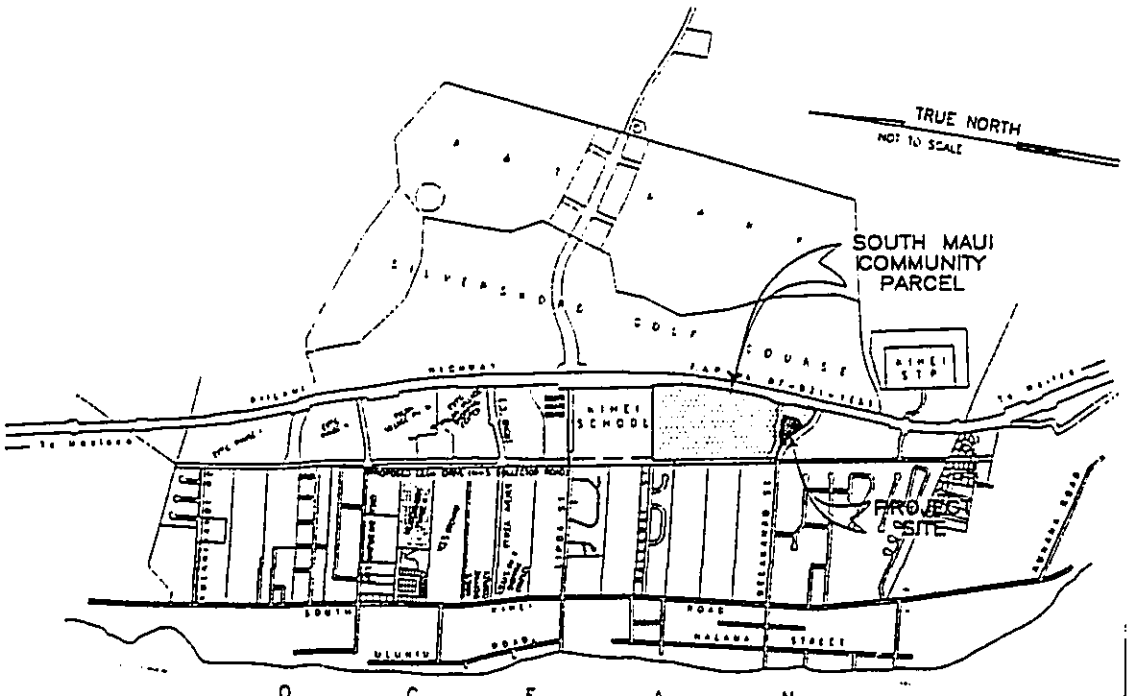
To South Kihei Road

/03proj/03031.90/dwg/exhibits/drainage/exh-locmap00.dwg

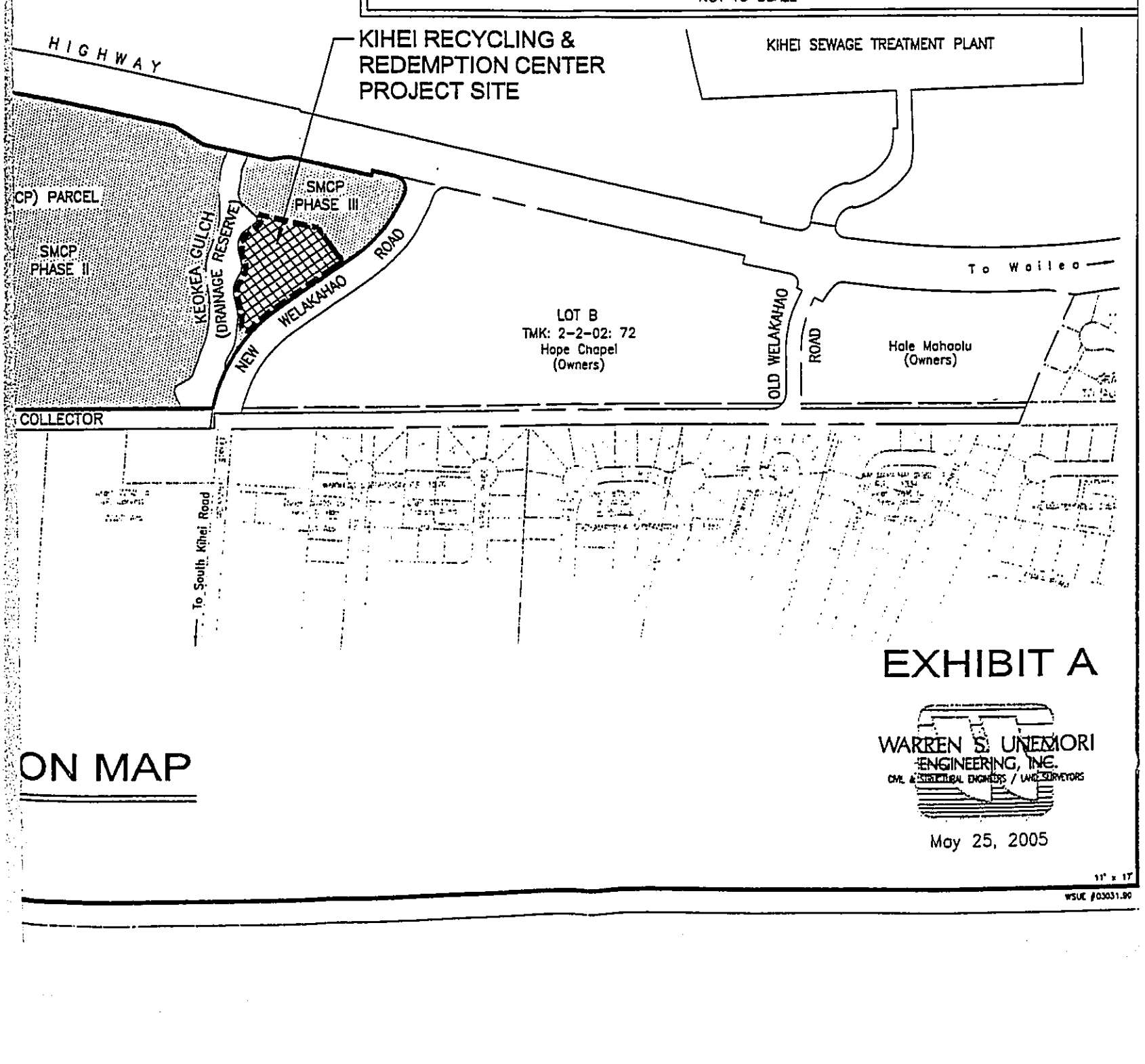
LOCATION MAP

TRUE NORTH
NOT TO SCALE

U R S E



LOCATION MAP
NOT TO SCALE



ON MAP

EXHIBIT A

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

May 25, 2005

11" x 17"

WSUE #03031.90

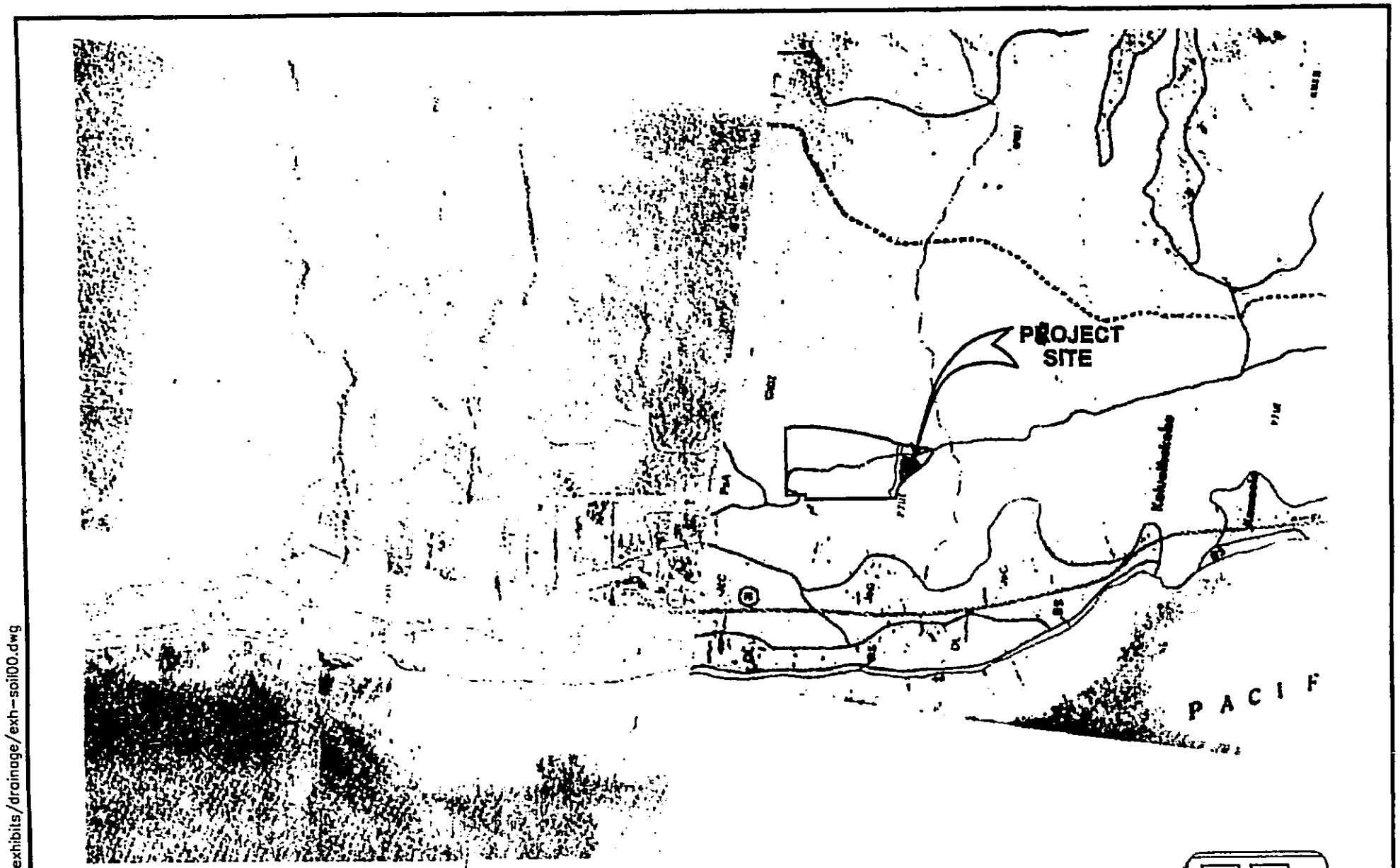


EXHIBIT B
SITE SPECIFIC SOIL CLASSIFICATION MAP

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

May 25, 2005

03proj/03031.90/dwg/exhibits/drainage/exh-soil00.dwg

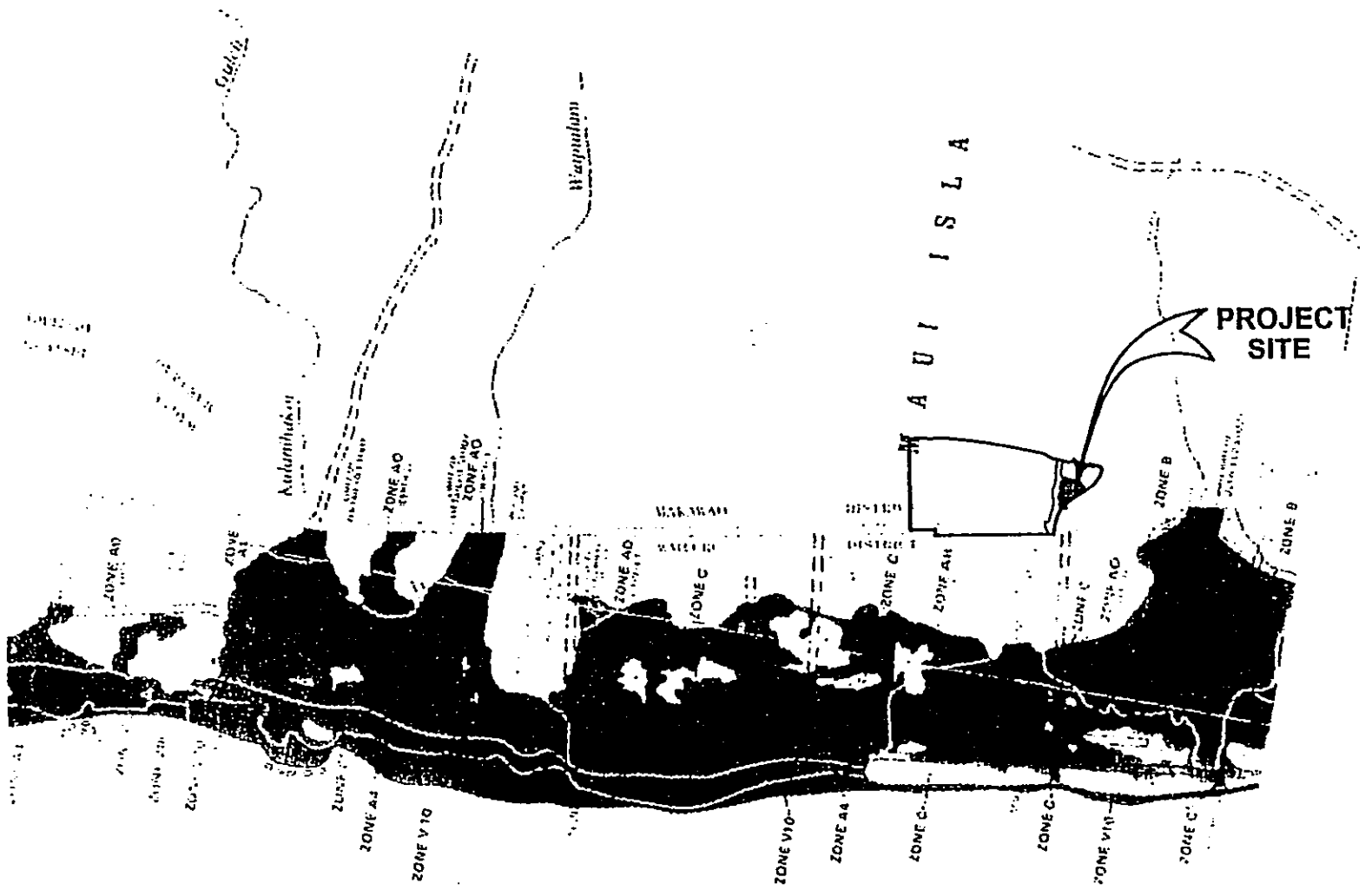


EXHIBIT C - FLOOD INSURANCE RATE MAP

WARREN S. UNEMORI ENGINEERING, INC.

May 25, 2005

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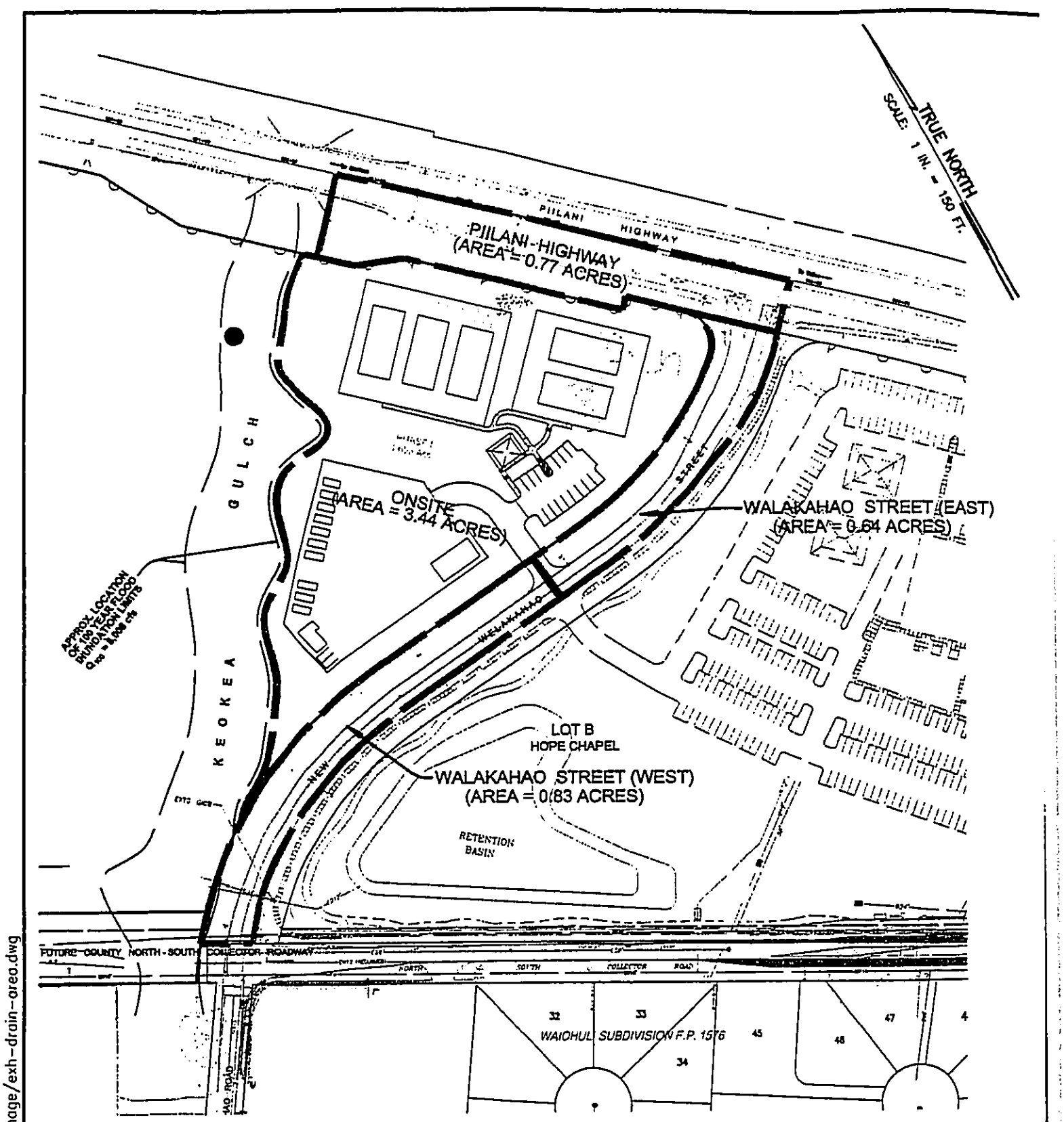

EXHIBIT D - DRAINAGE AREA MAP

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

May 25, 2005

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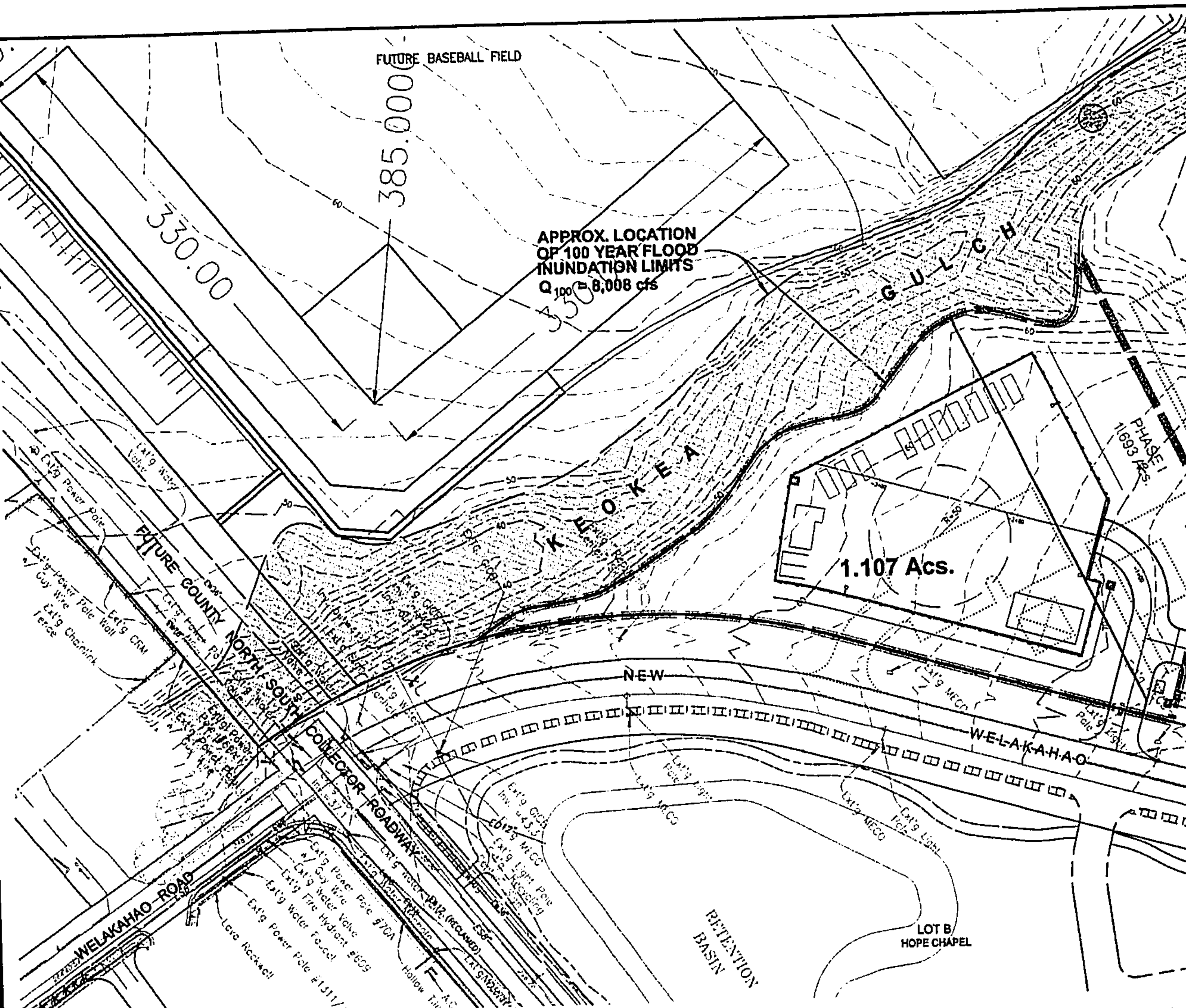
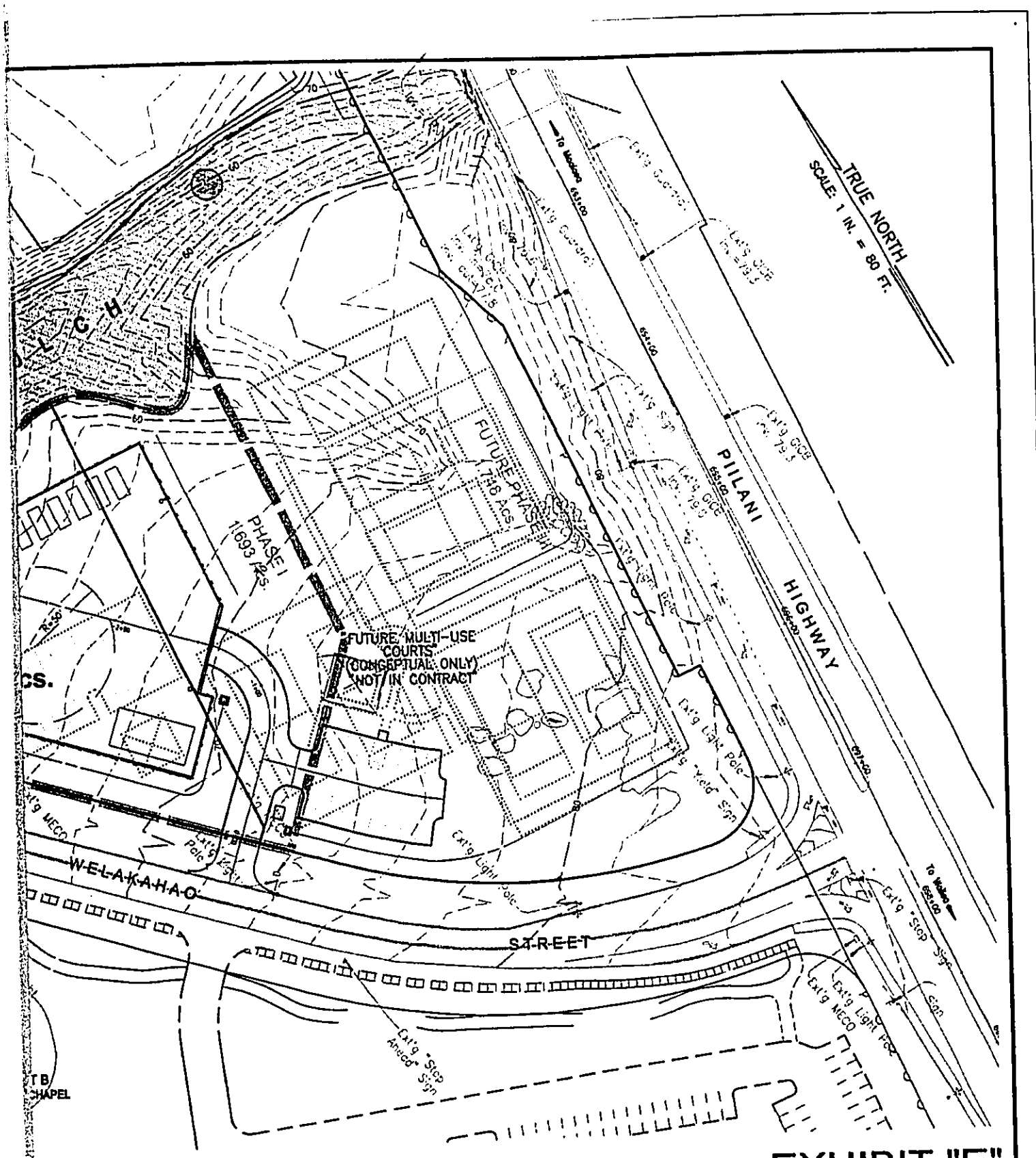


HEC-RAS 100-YEAR FLOOD INUNDATION LIMITS ANALYSIS RESU

LEGEND:

- ARCHAEOLOGICAL SITE
- 100 YEAR FEMA INUNDATION LIMITS
- PROPOSED RECYCLING & REDEMPTION CENTER CONCEPTUAL PLAN (AND REQUIRED MODIFICATIONS TO ORIGINAL SOUTH MAUI PARK PLAN)

03PROJ/03031.90/DWG/EXHIBIT/DRAINAGE/EXHIBITF-INUNDATION00.DWG



-YEAR FLOOD
NALYSIS RESULTS

EXHIBIT "E"

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

May 25, 2005

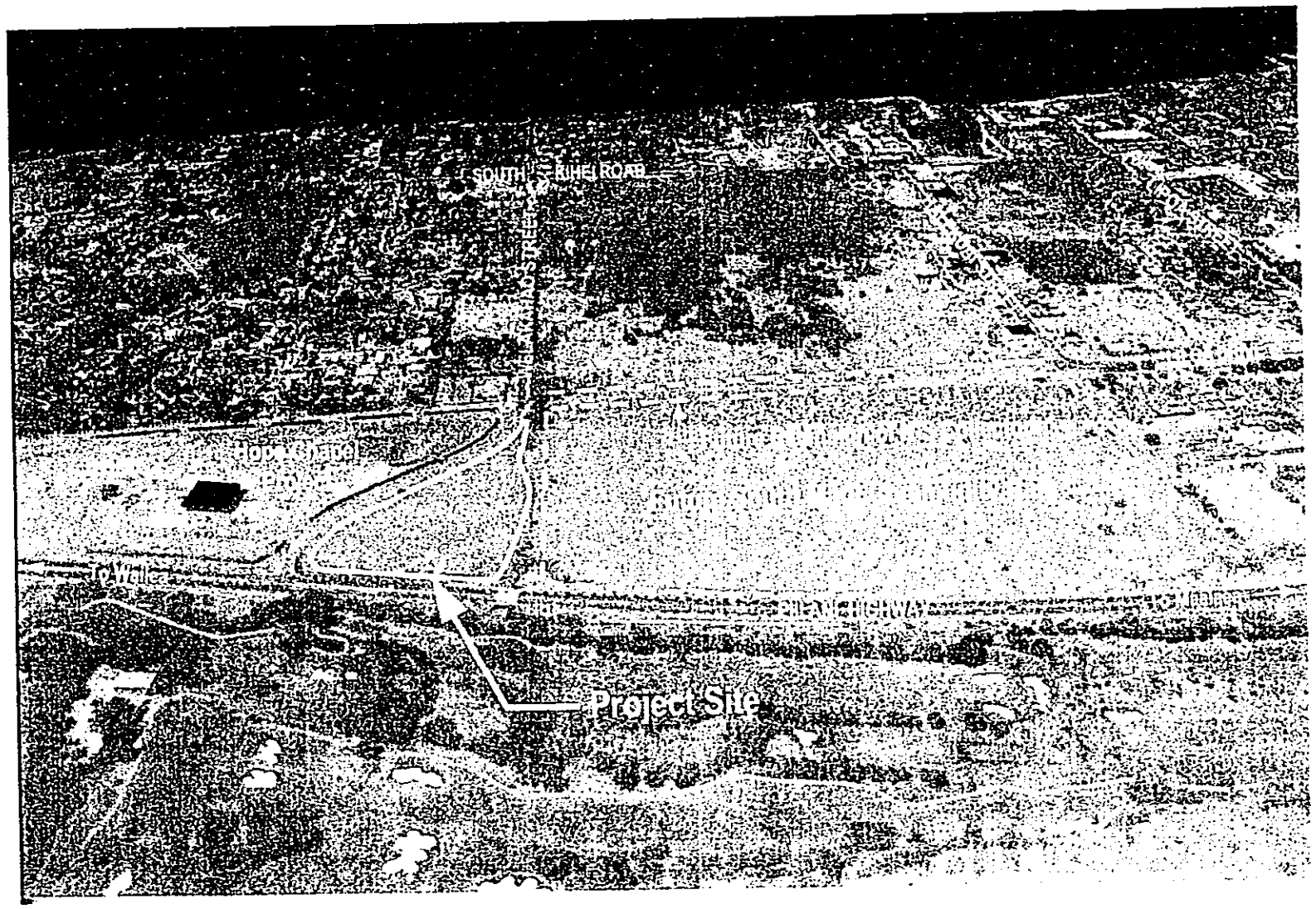


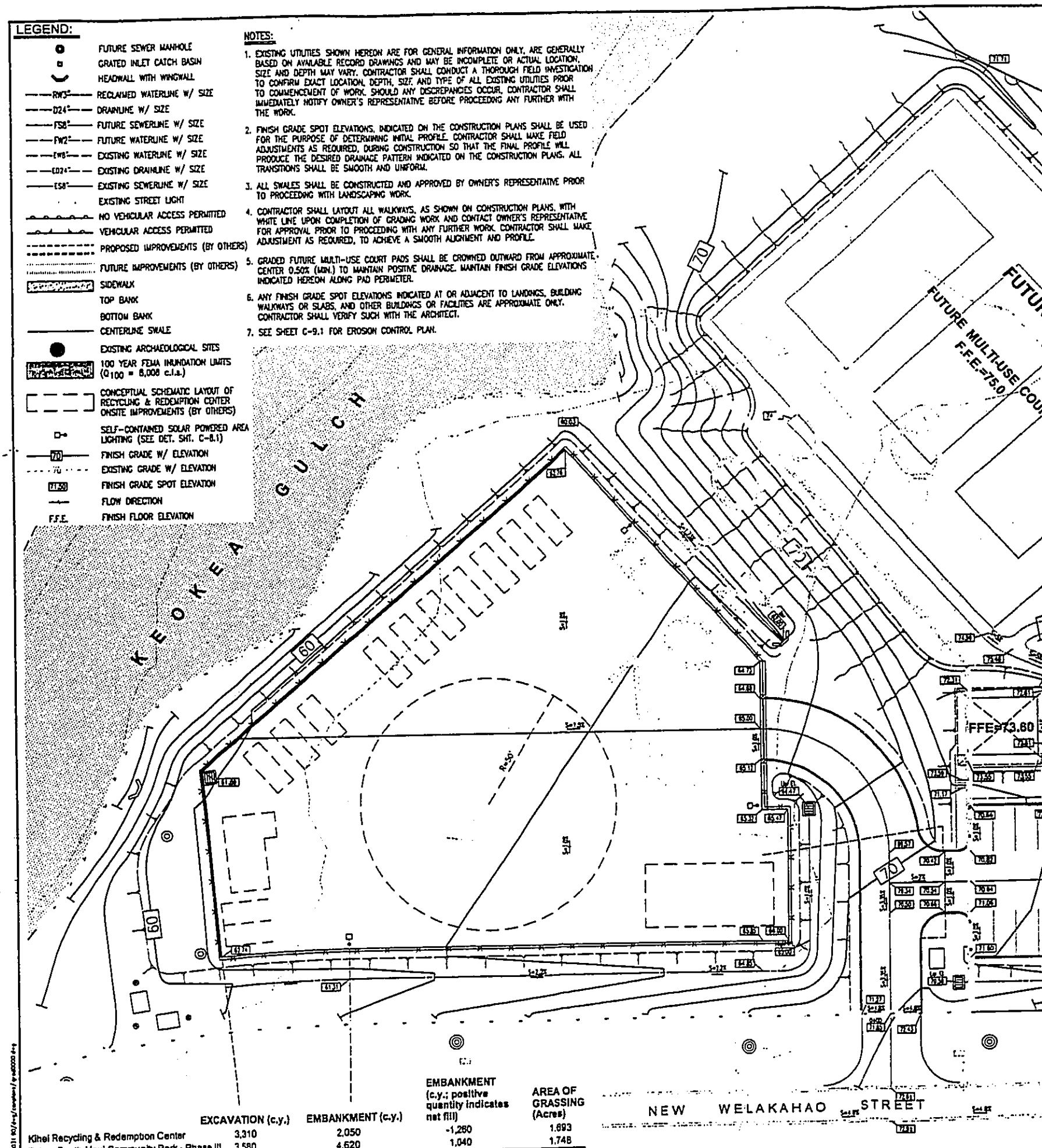
EXHIBIT F – Photographic Analysis

LEGEND:

- FUTURE SEWER MANHOLE
- GRATED INLET CATCH BASIN
- HEADWALL WITH WINGWALL
- RW3"—— RECLAIMED WATERLINE W/ SIZE
- D24"—— DRAINLINE W/ SIZE
- FS8"—— FUTURE SEWERLINE W/ SIZE
- FW2"—— FUTURE WATERLINE W/ SIZE
- EW8"—— EXISTING WATERLINE W/ SIZE
- ED24"—— EXISTING DRAINLINE W/ SIZE
- ES8"—— EXISTING SEWERLINE W/ SIZE
- EXISTING STREET LIGHT
- NO VEHICULAR ACCESS PERMITTED
- VEHICULAR ACCESS PERMITTED
- PROPOSED IMPROVEMENTS (BY OTHERS)
- FUTURE IMPROVEMENTS (BY OTHERS)
- SIDEWALK
- TOP BANK
- BOTTOM BANK
- CENTERLINE SWALE
- EXISTING ARCHAEOLOGICAL SITES
- 100 YEAR FEMA INUNDATION LIMITS (Q_{100} = 8,008 c.f.s.)
- CONCEPTUAL SCHEMATIC LAYOUT OF RECYCLING & REDEMPTION CENTER ONSITE IMPROVEMENTS (BY OTHERS)
- SELF-CONTAINED SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)
- 70 FINISH GRADE W/ ELEVATION
- 70 EXISTING GRADE W/ ELEVATION
- FT.GR. FINISH GRADE SPOT ELEVATION
- FLOW DIRECTION
- F.F.E. FINISH FLOOR ELEVATION

NOTES:

1. EXISTING UTILITIES SHOWN HEREON ARE FOR GENERAL INFORMATION ONLY, ARE GENERALLY BASED ON AVAILABLE RECORD DRAWINGS AND MAY BE INCOMPLETE OR ACTUAL LOCATION, SIZE AND DEPTH MAY VARY. CONTRACTOR SHALL CONDUCT A THOROUGH FIELD INVESTIGATION TO CONFIRM EXACT LOCATION, DEPTH, SIZE AND TYPE OF ALL EXISTING UTILITIES PRIOR TO COMMENCEMENT OF WORK. SHOULD ANY DISCREPANCIES OCCUR, CONTRACTOR SHALL IMMEDIATELY NOTIFY OWNER'S REPRESENTATIVE BEFORE PROCEEDING ANY FURTHER WITH THE WORK.
2. FINISH GRADE SPOT ELEVATIONS, INDICATED ON THE CONSTRUCTION PLANS SHALL BE USED FOR THE PURPOSE OF DETERMINING INITIAL PROFILE. CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS REQUIRED, DURING CONSTRUCTION SO THAT THE FINAL PROFILE WILL PRODUCE THE DESIRED DRAINAGE PATTERN INDICATED ON THE CONSTRUCTION PLANS. ALL TRANSITIONS SHALL BE SMOOTH AND UNIFORM.
3. ALL SWALES SHALL BE CONSTRUCTED AND APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH LANDSCAPING WORK.
4. CONTRACTOR SHALL LAYOUT ALL WALKWAYS, AS SHOWN ON CONSTRUCTION PLANS, WITH WHITE LINE UPON COMPLETION OF GRADING WORK AND CONTACT OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO PROCEEDING WITH ANY FURTHER WORK. CONTRACTOR SHALL MAKE ADJUSTMENT AS REQUIRED, TO ACHIEVE A SMOOTH ALIGNMENT AND PROFILE.
5. GRADED FUTURE MULTI-USE COURT PADS SHALL BE CROWNED OUTWARD FROM APPROXIMATE CENTER 0.50% (MIN.) TO MAINTAIN POSITIVE DRAINAGE. MAINTAIN FINISH GRADE ELEVATIONS INDICATED HEREON ALONG PAD PERIMETER.
6. ANY FINISH GRADE SPOT ELEVATIONS INDICATED AT OR ADJACENT TO LANDINGS, BUILDING WALKWAYS OR SLABS, AND OTHER BUILDINGS OR FACILITIES ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY SUCH WITH THE ARCHITECT.
7. SEE SHEET C-9.1 FOR EROSION CONTROL PLAN.



	EXCAVATION (c.y.)	EMBANKMENT (c.y.)	EMBANKMENT (c.y.; positive quantity indicates net fill)	AREA OF GRASSING (Acres)
Kihei Recycling & Redemption Center	3,310	2,050	-1,260	1.693
Future South Maui Community Park - Phase III	3,580	4,620	1,040	1.748
Net Earthwork (entire site)	6,890	6,670	-220	3.441

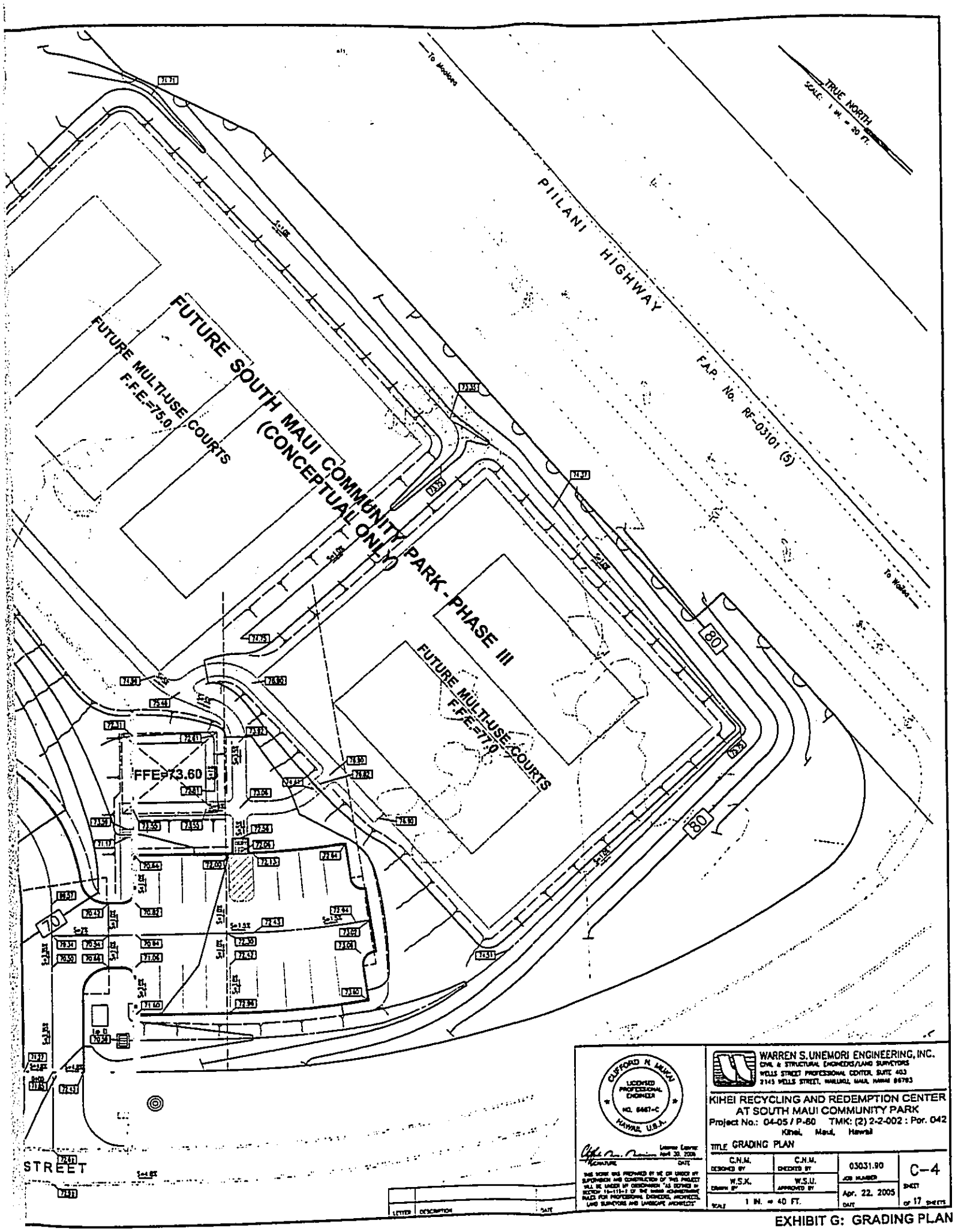


EXHIBIT G: GRADING PLAN

APPENDICES:

A. Hydrologic Calculations

B. Keokea Gulch 100-Year Inundation Limits Analysis

C. Subsurface Drainage Detention System Calculations

APPENDIX A: Hydrologic Calculations

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM WELAKAHAO STREET (TOTAL)

Objective: To determine the post-development onsite surface runoff.

1. 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):	1.47

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.43
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		1.04
Runoff Coeff., $C_{WEIGHTED}$:		0.75

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		40.50
Higher Elev. (ft.):	85.50	
Lower Elev. (ft.):	45.00	
Approx. Runoff Length (ft.):		1012.00
Average Slope:		4.00%
Time of Concentration (min.):		16.00

5. Intensity:

Intensity (in./hr.):	4.18

6. Total Runoff:

Q = C x I x A (cfs):	4.63

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM WELAKAHAO STREET (WEST)

Objective: To determine the post-development onsite surface runoff.

1. 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):		0.83

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.27
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		0.56
Runoff Coeff., $C_{WEIGHTED}$:		0.73

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		28.00
Higher Elev. (ft.):	73.00	
Lower Elev. (ft.):	45.00	
Approx. Runoff Length (ft.):		560.00
Average Slope:		5.00%
Time of Concentration (min.):		12.00

5. Intensity:

Intensity (in./hr.):	4.56

6. Total Runoff:

Q = C x I x A (cfs):	2.77

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM WELAKAHAO STREET (EAST)

Objective: To determine the post-development onsite surface runoff.

1. 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):		0.64

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.48
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		0.16
Runoff Coeff., $C_{WEIGHTED}$:		0.45

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		12.50
Higher Elev. (ft.):	85.50	
Lower Elev. (ft.):	73.00	
Approx. Runoff Length (ft.):		460.00
Average Slope:		2.72%
Time of Concentration (min.):		12.50

5. Intensity:

Intensity (in./hr.):	4.51

6. Total Runoff:

Q = C x I x A (cfs):	1.29

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

Date: February 28, 2005

HYDROLOGIC CALCULATIONS: OFFSITE CONTRIBUTION FROM PIILANI HIGHWAY

Objective: To determine the post-development onsite surface runoff.

I. 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui,
R(50 Yr.-1Hr.) = 2.30 inches

2. Total Area:

Area (Ac.):		0.77

3. Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
Runoff Coeff., $C_{UNPAVED}$:		0.28
Area (Ac), $A_{UNPAVED}$:		0.45
Runoff Coeff., C_{PAVED}:		0.95
Area (Ac), A_{PAVED}:		0.32
Runoff Coeff., $C_{WEIGHTED}$:		0.56

4. Time of Concentration:

Approx. Elev. Diff'l. (ft.)		12.80
Higher Elev. (ft.):	84.80	
Lower Elev. (ft.):	72.00	
Approx. Runoff Length (ft.):		80.00
Average Slope:		16.00%
Time of Concentration (min.):		4.50

5. Intensity:

Intensity (in./hr.):	5.65

6. Total Runoff:

Q = C x I x A (cfs):	2.43

APPENDIX B: Keokea Gulch 100-Year Inundation Limits Analysis

HEC-RAS Plan: Plan 01 River: KeokeaGulch Reach: PiilaniHighway Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PiilaniHighway	900	PF 1	8008.00	63.00	72.389	76.44	85.98	0.056004	29.58	270.71	49.27	2.22
PiilaniHighway	850	PF 1	8008.00	60.20	68.505	73.07	82.72	0.072928	30.26	264.65	59.33	2.52
PiilaniHighway	800	PF 1	8008.00	58.60	67.695	71.36	78.79	0.050027	26.73	299.62	60.62	2.12
PiilaniHighway	750	PF 1	8008.00	56.90	66.729	70.06	76.10	0.037973	24.57	325.94	60.32	1.86
PiilaniHighway	700	PF 1	8008.00	55.20	65.035	68.17	74.19	0.035923	24.28	329.78	59.11	1.81
PiilaniHighway	650	PF 1	8008.00	52.70	58.445	61.26	71.03	0.101176	31.26	295.96	110.10	2.88
PiilaniHighway	600	PF 1	8008.00	48.80	56.499	59.51	66.62	0.055578	25.53	313.62	74.84	2.20
PiilaniHighway	550	PF 1	8008.00	47.40	56.653	59.37	63.95	0.025766	21.93	385.77	89.12	1.57
PiilaniHighway	500	PF 1	8008.00	45.80	55.013	57.43	62.55	0.029610	22.75	389.50	100.25	1.68
PiilaniHighway	450	PF 1	8008.00	44.60	54.359	56.59	61.05	0.021167	22.30	421.81	94.05	1.46
PiilaniHighway	400	PF 1	8008.00	43.70	51.881	54.39	59.60	0.035530	22.30	359.16	75.21	1.80
PiilaniHighway	350	PF 1	8008.00	43.00	51.831	53.61	57.55	0.024258	19.19	417.27	82.24	1.50
PiilaniHighway	300	PF 1	8008.00	41.00	52.386	52.79	56.22	0.011160	15.73	513.32	82.93	1.06
PiilaniHighway	250	PF 1	8008.00	40.80	47.920	50.20	54.98	0.034334	21.33	375.46	82.22	1.76
PiilaniHighway	200	PF 1	8008.00	37.90	45.165	47.66	53.08	0.038626	22.57	354.74	77.82	1.86
PiilaniHighway	150	PF 1	8008.00	36.40	49.404	47.16	51.36	0.004451	11.22	714.18	88.75	0.69
PiilaniHighway	131.7	PF 1	8008.00	36.00	48.995		51.25	0.005166	12.07	673.44	92.72	0.74
PiilaniHighway	100	PF 1	8008.00	35.10	48.940		51.04	0.004821	11.82	726.94	126.44	0.72
PiilaniHighway	50	PF 1	8008.00	34.60	49.070	49.07	50.68	0.003764	11.12	984.87	300.00	0.64
PiilaniHighway	0	PF 1	8008.00	33.10	42.461	45.42	49.71	0.028020	21.61	370.54	66.76	1.62
PiilaniHighway	-50	PF 1	8008.00	30.60	39.179	41.96	47.85	0.043606	23.63	338.89	74.26	1.95

APPENDIX C: Subsurface Drainage Detention System Calculations

Date: March 15, 2005

SUBSURFACE DRAINAGE SYSTEM ANALYSIS AND DESIGN

Project:	**Kihei Recycling and Redemption Center at South Maui Community Park**
Location:	**Kihei, Maui, Hawaii**
Job Number:	**3031.90**
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 fifty (50) years is used.

I. Determine 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kahului, Maui,
R(50 Yr.-1Hr.) = 2.1 inches

II. Determine Pre-Development Runoff:

Pre-Development Component Areas:

Total Area (Ac.):		3.44

Pre-Development Runoff Coefficents:

Unimproved Areas:	(from Table 2)	0.30
	Composite Runoff Coefft., C:	0.30

Pre-Development Time of Concentration:

Approx. Elev. Diff'l. (feet):		40.00
Higher Elev. (ft.):	86.0	
Lower Elev. (ft.):	46.0	
Approx. Runoff Length (ft.):		800
Average Slope:		5.0%
Ground Character:		Ave. Grass
Time of Concentration (min.):		23

Pre-Development Intensity:

Intensity (in./hr.):	3.30

Pre-Development Runoff:

Q (pre-dev.) = C x I x A (cfs):	3.41
Allowable Release Rate(cfs):	3.41

III. Determine Post-Development Runoff:

Total Area (Ac.):	3.44

Post-Development Runoff Coefficents:

Subarea 1 - Onsite Phase I Paved Areas:

Streets:	Asphaltic	0.95
	Component Runoff Coeff't., C:	0.95
	Component Area (Acres):	0.82

Subarea 2 - Onsite Phase I & Phase III Landscaped Areas:

Lawns:	Hvy. Soil, Avg., 2	0.22
	Component Runoff Coeff't., C:	0.22
	Component Area (Acres):	2.62
	Composite Runoff Coeff't., C:	0.39

Post-Development Time of Concentration:

Approx. Elev. Diff'l. (feet):		28.00
Higher Elev. (ft.):	86.0	
Lower Elev. (ft.):	58.0	
Approx. Runoff Length (ft.):		600
Average Slope:		4.7%
Ground Character:		24% Paved
Time of Concentration (min.):		16

Post-Development Intensity:

Intensity (in./hr.):	3.75

Post-Development Runoff:

Q (post-dev.) = C x I x A (cfs):	**5.08**

IV. Establish Initial Trench Cross Section Parameters:

Cover Over Pipe (ft.):	1.00
Pipe Diameter (ft.)	4.00
Cradle Depth Below Pipe (ft.):	2.00
Cradle Thickness on Sides of Pipe (ft.):	2.00
Total Trench Depth (ft.):	7.0
Total Trench Width (ft.):	8.0
Gross Trench Cross Sectional Area (sf/lf):	56.0
Pipe Cross Sectional Area (sf/lf):	12.6
Trench Aggreg. Cross Sectional Area (sf/lf):	43.4
Assumed Initial Length of Pipe/Trench (ft.):	110.00

V. 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 (cf)	Storage Required. (cf)	Comments
(1)	(2)	(3)	(4)	(5)	(6)	
5	6.20	1.36	2,521	1,023	1,498	
10	5.00	1.36	4,066	2,046	2,020	
15	4.40	1.36	5,367	3,069	2,298	Peak Storage
20	3.90	1.36	6,343	4,092	2,251	
30	3.40	1.36	8,295	6,138	2,157	
40	3.00	1.36	9,759	8,184	1,575	
60	2.40	1.36	11,711	12,276	-565	
80	2.20	1.36	14,313	16,368	-2,055	
100	1.90	1.36	15,452	20,460	-5,008	
120	1.65	1.36	16,102	24,552	-8,450	
180	1.30	1.36	19,030	36,828	-17,798	

(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)

Storage Required (c.f.): 2298.00

Determine Provided Storage Volume:

Pipe Storage Capacity (c.f.): 1,382.3

Net Aggregate Cradle Storage Capacity (c.f.): 6,160.0

Gross Aggregate Cradle Volume (40% of voids) (c.f.): 1,911.1
Void Ratio (50% of voids) (c.f.): 955.5

Total Storage Capacity Provided (cf): 2,337.8

{Storage Provided = 2,338 cf} > {Storage Required = 2,298 cf}; therefore initial assumptions based on 110 l.f. of 48 - inch diameter pipe are acceptable.

Appendix B - Traffic Impact Analysis Report

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8206 FAX: (808) 239-4175 Email:prowell@gte.net

DRAFT REPORT

May 20, 2005

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

Attn: Mr. Clifford N. Mukai

Re: **Traffic Impact Assessment Report**
County of Maui Kihei Recycling and Redemption Center at Piilani Village
Kihei, Maui, Hawaii

Dear Mr. Mukai:

Phillip Rowell and Associates have prepared the following Traffic Impact Assessment Report for the proposed relocation of the Kihei Recycling Center currently located along Welakahao Road in Kihei. The report is presented in the following format:

A. Project Location and Description
B. Purpose and Objective of Study
C. Methodology
D. Description of Existing Streets and Intersection Controls
E. Existing Peak Hour Traffic Volumes
F. Level-of-Service Concept
G. 2010 Background Traffic Projections
H. Project Trip Generation
I. 2010 Background Plus Project Traffic Projections
J. Impact Analysis of 2010 Conditions
K. Left Turn Storage Lane Requirements
L. Summary and Conclusions

A. Project Location and Description

The location of the project is shown as Attachment A.

The proposed project under study is the relocation and expansion of the Kihei Recycling Center. The center is currently located along the south side of Welakahao Road between Piilani Highway and the future Liloa Street, which is also known as the North-South Collector Road. The recycling center will be relocated to the north side of Welakahao Road. The relocation will make way for the Hale Mahaolu Senior Residential Project and will be located on a site that will also provide space for part of the South Maui Community Park.

One of the first task was to determine the number of and the approximate location of the project driveways in relation to the future driveway for Kihei Hope Chapel. First, it was decided that the driveway for the recycling center and the future multi-use courts should be a single driveway and that this driveway and Kihei Hope Chapel driveway should be one intersection in order to minimize the number of driveways along the subject section of Welakahao Road.

The remaining area of the parcel on which the recycling center will be located will be a parking lot and future multi-use courts. The future multi-use courts are part of the South Maui Community Park project and are discussed in this report as the driveway serving the recycling center will also serve the parking lot for the future multi-use courts. There will be up to 6 multi-use courts and the parking lot will have 17 spaces. The tennis court portion of the project is a later phase of the South Maui Community Park project and will not be

developed concurrently with the recycling center. It will included in the impact analysis of the South Maui Community Park which is a separate study. The future multi-use courts are relevant only because the traffic associated with the future multi-use courts should be included in the traffic projections for the driveway to insure that the driveway provides sufficient capacity for both projects and will not have to be reconstructed in the near future.

B. Purpose and Objective of Study

1. Determine and describe the traffic related characteristics of the existing recycling center.

2. Assess and document the traffic related impacts associated with relocating the recycling center.

3. Identify and assess traffic related improvements required to provide adequate access to and egress from the proposed project and to mitigate the project's traffic impacts.

4. Determine the left turn storage lane requirements for the project's driveway along Welakahao Road.

5. Provide support of the SMA Permit Application.

C. Methodology

1. Define the Study Area

The intersections to be analyzed were identified based on our understanding and knowledge of the area and is consistent with the study areas of previously completed traffic studies for projects in the Welakahao area. As the project is the relocation of an existing recycling center from the south side of Welakahao Road to the north side and because it is anticipated that peak hour use of the recycling center will remain relatively constant, the study area is limited to the intersection of Welakahao Road at the Project Driveway. The approximate location of this intersection is shown on Attachment A.

2. Analyze Existing Traffic Conditions

Existing traffic volumes using the recycling center were obtained from traffic counts completed in March 2005. The purpose of these counts were to establish the amount of traffic into and out of the recycling center during a typical weekday morning and afternoon peak hour. As the intersection of Welakahao Road and the Project Driveway will be a new intersection, the level-of-service analysis of existing conditions that is typically performed was omitted in this study.

3. Estimate Horizon Year Background Traffic Projections

Background traffic conditions are defined as future traffic conditions without the proposed project. Background traffic volumes were estimated by superimposing traffic generated by related projects in the vicinity onto existing traffic volumes.

The year 2010 was used as the horizon year. This does not necessarily represent the project completion date. It represents a date for which future background traffic projections were estimated. The year 2010 is also consistent with the horizon years used in previous traffic studies for projects within the area. These projects will be discussed later in the section on related projects.

4. Estimate Project-Related Traffic Characteristics

The next step was to estimate the peak-hour traffic that the proposed project will generate. This was done using standard trip generation procedures outlined in the *Trip Generation Handbook*[1] and data provided in *Trip Generation*[2]. These trips were then distributed and assigned based on the observed approach and departure routes.

5. Analyze Project-Related Traffic Conditions

The project-related traffic was then superimposed on 2010 background traffic volumes at the study intersections and driveways. The methodology described in the 2000 *Highway Capacity Manual* (HCM)[3] was used to conduct a level-of-service analysis for background plus project conditions. The purpose of this analysis was to identify potential operational deficiencies in the vicinity of the proposed project.

D. Description of Existing Streets and Intersection Controls

Welakahao Road is a two-lane, two-way roadway with an east-west orientation between Piilani Highway and South Kihei Road. Currently, there is residential development along the south side between South Kihei Road and Liloa Street. The remaining frontage is undeveloped but the Kihei Hope Chapel is constructing a Church facility along the south side between Liloa Street and Piilani Highway.

The intersection of Welakahao Road at South Kihei Road is signalized. The remaining intersections are unsignalized.

E. Existing Peak Hour Traffic Volumes

The existing traffic volumes are based on traffic counts completed in March 2005. The morning and afternoon peak hour traffic volumes are summarized in Appendix B.

F. Level-of-Service Concept

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 1. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.

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[1] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998

[2] Institute of Transportation Engineers, *Trip Generation*, Washington, D.C., 2003

[3] Institute of Transportation Engineers, *Highway Capacity Manual*, Washington, D.C., 2000

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Table 1 Level-of-Service Definitions for Signalized Intersections[1]

Level of Service	Interpretation	Volume-to-Capacity Ratio[2]	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<20.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	20.1-35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	35.1-55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	55.1-80.0
F	Total breakdown with stop-and-go operation	>1.001	>80.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 2 summarizes the definitions for level-of-service and the corresponding delay. A subsequent calculation to determine an overall LOS was made, and these results are presented in tables to summarize traffic conditions using parameters similar to those used for signalized intersections.

Table 2 Level-of-Service Definitions for Unsignalized Intersections[1]

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.1

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

G. 2010 Background Traffic Projections

2010 background traffic projections are defined as future background traffic conditions without the proposed project. Traffic growth consists of two components. The first is ambient background growth that is a result of regional growth and cannot be attributed to a specific project. The second component is estimated traffic that will be generated by other development projects in the vicinity of the proposed project.

Background Traffic Growth

The *Maui Long Range Transportation Plan*[4] concluded that traffic in Maui would increase an average of 1.6% per year from 1990 to 2020. This growth rate was used to estimate the background growth between 2005 and 2010, which is the design year for this project. The growth factor was calculated to be 1.08 using the following formula:

$$F = (1 + i)^n$$

where F = Growth Factor
i = Average annual growth rate, or 0.016
n = Growth period, or 5 years

This growth factor was applied to the major traffic movements at the study intersections. The growth rate was not applied to turning movements into and out of driveways or minor traffic movements at the study intersections.

Related Projects

The second component in estimating background traffic volumes is traffic resulting from other proposed projects in the vicinity. Related projects are defined as those projects that are under construction or have been approved for construction and would significantly impact traffic in the study area. Related projects may be development projects or roadway improvements.

The projects that were identified as related projects and the estimated number of peak hour trips generated by each are summarized in Table 3. The approximate locations of these projects is shown in Attachment C.

[4] Kaku Associates, October 1996

Table 3 Trip Generation Summary of Related Projects

	Related Project	Description	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
A	Keala Village	49 Single Family Units	38	10	48	50	32	82
B	Cove Beach Condos	32 Multi-Family Units	21	5	26	27	15	42
C	Ke Alii Villas	160 Multi-Family Units	98	26	124	108	60	168
D	Kalama Heights	40 Senior Units	23	12	35	27	15	42
E	Hale Kanani	72 Multi-Family Units	48	12	60	60	34	94
F	Kamaole Hotel	280 Units	115	72	187	143	72	215
G	Kamaole Condos	65 Condo Units	29	5	34	35	23	58
H	Ke Alii SF Subdivision	90 Single Family Units Plus 45 Ohana Units	89	21	110	116	75	191
I	Aloha Village	78 Multi-Family Units	34	6	40	42	27	69
J	Liloa Village	65 Family + 65 Ohana	19	64	83	68	38	106
K	Azeka Retail	Retail & Offices	145	74	219	190	356	546
L	Aina Development	Commercial Retail	47	51	98	40	32	72
M	Kai Ani Village	100 Condos + 10,000 SF Retail/Office	24	54	78	49	30	79
N	Maui Dive Lodge	18 Apartments	3	7	10	7	5	12
O	Kihei Hope Chapel	Church & Classrooms	20	0	20	0	20	20
P	Multi-Use/Future multi-use courts	6 Courts & Parking	48	48	96	48	48	96
Q	Hale Mahaolu Sr. Residential Project	113 Residential Units	4	5	9	8	5	13
		TOTALS	805	472	1,277	1,018	887	1,905

The traffic generation data shown in the table were obtained from the respective traffic studies for all the projects except Project D, Aina Development. For this project, the number of trips that the project will generated was calculated using the development plan. A trip generation analysis was performed to estimate the traffic generated by each. The trips were then distributed and assigned to the street network.

The 2010 background traffic projections are shown in Attachment D.

H. Project Trip Generation

Future traffic volumes generated by the project were estimated using the procedures described in the *Trip Generation Handbook.*[5] Typically, this method uses trip generation rates to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent street. However, in this case, there are no trip generation rates available for either the recycling center or the future multi-use courts. Accordingly, a different approach had to be used.

For the recycling center, it was assumed that peak hour use of the recycling center would remain at the current level. Therefore, traffic counts were performed to determine the number of recycling center users during the morning and afternoon peak hours. The counts determined that there are five (5) users during the morning peak hour and 31 users during the afternoon peak hour. The counts also determined that the number of inbound trips equal the outbound trips. Therefore, there are 5 inbound plus 5 outbound trips during the morning peak hour and 31 inbound plus 31 outbound trips during the afternoon peak hour.

[5] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 1998, p. 7-12

The Institute of Transportation Engineers recommends that a traffic impact study should be performed if, in lieu of another locally preferred criterion, development generates an additional 100 vehicle trips in the peak direction (inbound or outbound) during the site's peak hour.[6] Based on the criterion, a traffic impact study is not warranted since the project will generate only 31 inbound or outbound trips during the afternoon peak hour.

I. 2010 Background Plus Project Projections

Background plus project traffic conditions are defined as 2010 background traffic conditions plus project generated traffic. The project generated traffic was distributed and assigned based on the existing approach and departure pattern of traffic along Welakahao Road. The project trip assignments are shown in Attachment D.

2010 background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the 2010 background (without project) peak hour traffic projections. This assumes that the peak hourly trips generated by the project coincide with the peak hour of the adjacent street and therefore represents a worse-case condition. The resulting 2010 background plus project peak hour traffic projections are shown in Attachment D.

J. Impact Analysis of 2010 Conditions

Based on criteria recommended by the Institute of Transportation Engineers, a traffic impact study is not warranted because the project generates only 31 trips per hour during the afternoon peak hour, which is less than 100 trip per hour required to warrant a traffic impact analysis. However, a level-of-service was performed to identify potential traffic operational deficiencies adjacent to the project for 2010 background plus project conditions.

Level-of-Service Analysis

The level-of-service analysis was performed using the following assumptions:

1. The approaches to Welakahao Road at one-lane driveways. Separate left turn lanes are provided along Welakahao Road.

2. The peak hour of the project generated traffic coincides with the peak hour of traffic along the adjacent streets.

3. All project generated traffic will use the parking lot on the project site. This will result in a worse-case analysis of the driveways.

The results of the Level-of-Service analysis for 2010 conditions are summarized in Table 4. Shown in the table are average vehicle delays and the levels-of-service of the controlled movements. Volume-to-capacity ratios are not calculated for the unsignalized intersection.

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[6] Institute of Transportation, Traffic Access and Impact Studies for Site Development, A Recommended Practice, 1991, page 5.

Table 4 Existing (2004) Levels-of-Service

Intersection and Movement	AM Peak Hour V/C [1]	AM Peak Hour Delay [2]	AM Peak Hour LOS [3]	PM Peak Hour V/C	PM Peak Hour Delay	PM Peak Hour LOS
Welakahao Road at Project Driveway						
Eastbound Left		7.7	A		8.1	A
Westbound Left		7.7	A		7.6	A
Northbound Left, Thru & Right		10.7	B		12.9	B
Southbound Left, Thru & Right		12.0	B		15.0	C

NOTES:
(1) V/C denotes volume-to-capacity ratio. Volume-to-capacity ratios are not calculated for unsignalized intersections.
(2) Delay in seconds per vehicle.
(3) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.

The conclusions of the level-of-service analysis is that all controlled traffic movements will operate at Level-of-Service C or better. This implies minimum delays and good operating conditions.

K. Left-Turn Storage Lane Requirements

The left turn storage lengths required to accommodate estimated traffic volumes were calculated using guidelines in *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials, 1990 edition. There are separate policies for signalized and unsignalized intersections. Based on this policy, the assumptions used to determine the required lengths of the left turn storage lanes are:

(1) For unsignalized intersections, the length of the left turn storage lane should be1.5 to 2.0 times the average number of vehicles arriving during a 60-second period.

(2) The average length required per vehicle is 25 feet.

(3) The minimum length of a left turn storage lane should be 50 feet, which is sufficient to accommodate two vehicles.

Using the above criteria and the estimated peak hour traffic volumes, the turn storage lane requirements along Welakahao Road at the project entrance were calculated and the results are summarized in Table 5. The number of peak hour left turns along the westbound (210) approach is the number of peak hour trips for the peak hour of Kihei Hope Chapel, which does not coincide with the peak hours of the adjacent streets as used in this traffic study. However, the 210 vehicles per hour will control the length of the left turn storage lane.

Table 5 Turn Storage Lane Requirements

Intersection	Approach	Design Volume	Cycle Length (Seconds)	Cycles per Hour	Vehicles per Cycle	Recommended Length [1]				Recommended (Ft)
						Minimum		Maximum		
						Veh[2]	Ft	Veh[2]	Ft	
Welakahao Rd at Project Driveway	EB	79	60	60	1	2	50	2	50	75
	WB	210	60	60	4	5	125	7	175	175

NOTE:
(1) Minimum queue length is 1.5 time average number of vehicles.
(2) Maximum queue length is 2.0 time average number of vehicles.

L. Summary and Conclusions

The conclusions of the traffic impact assessment are:

1. The proposed project will generate 5 inbound and 5 outbound trips during the morning peak hour. During the afternoon peak hour, the project will generate 31 inbound and 31 outbound trips.

2. The Institute of Transportation Engineers recommends that a traffic impact study should be performed if, in lieu of another locally preferred criterion, development generates an additional 100 vehicle trips in the peak direction (inbound or outbound) during the site's peak hour. Based on the criterion, a traffic impact analysis is not warranted.

3. Because the new recycling center will be relocated from the south side of Welakahao Road to the north side and because peak hour use of the recycling center will relatively constant, the study area was limited to the intersection of Welakahao Road at the Recycling Center driveway. This driveway will be shared with the future multi-use courts and parking that will be developed as a future phase of the South Maui Community Park. The multi-use/future multi-use courts are not part of the recycling center project and are not being developed with the recycling center.

4. The driveway serving the recycling center will be aligned with the future driveway for the Kihei Hope Chapel. Thus, there will be only one intersection along Welakahao Road between Piilani Highway and Liloa Street.

5. The level-of-service analysis for background plus project conditions concluded the intersection of Welakahao Road at the Recycling Center driveway will operate at Level-of-Service C or better with the following lane configuration:

    a. The intersection should be unsignalized.

    b. Separate left turn lanes should be provide along the eastbound and westbound approaches.

    c. The driveway approaches to Welakahao Road can be one-lane approaches providing for left turns, through movements and right turns.

    d. The left turn storage lane for eastbound left turns into the recycling center should be at least 75 feet in length.

e. The left turn storage lane for westbound left turns into the Kihei Hope Chapel parking lot should be at least 175 feet in length. This is based on the number of trips estimated to use this driveway during the Sunday morning peak hour as reported in the TIAR for Kihei Hope Chapel, which is 210 vehicles per hour.

Respectfully submitted,
PHILLIP ROWELL AND ASSOCIATES

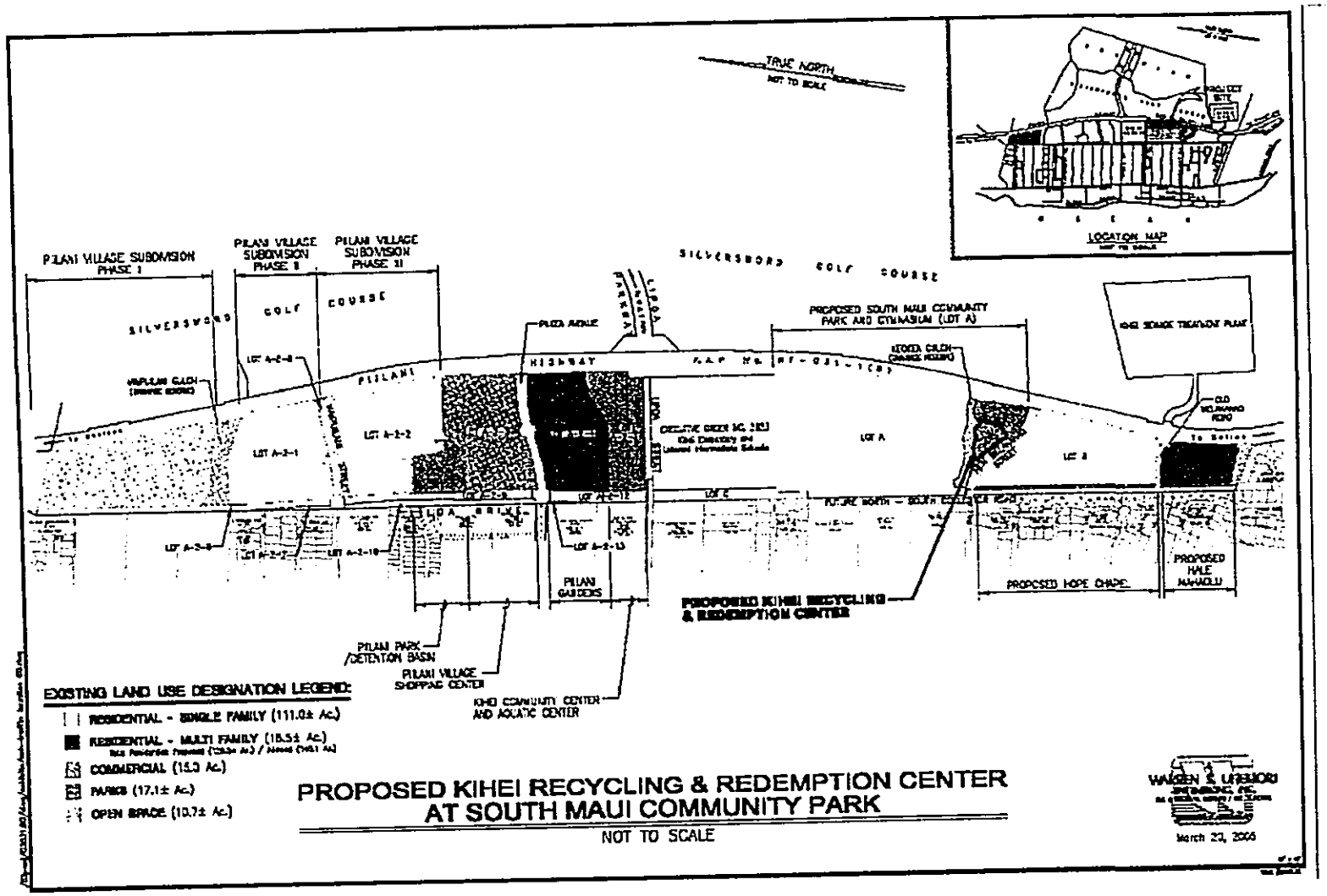
Phillip J. Rowell

Phillip J. Rowell, P.E.
Principal

List of Attachments

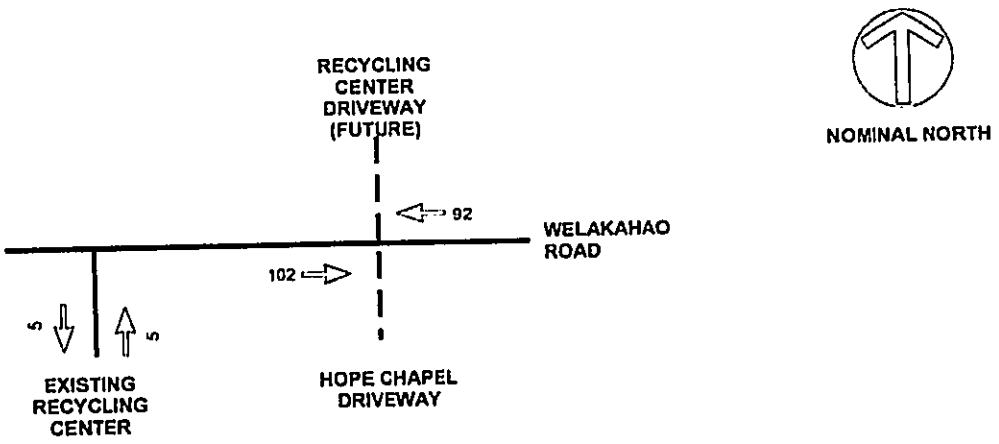
Attachment A	Project Location Map
Attachment B	Existing (2005) Peak Hour Traffic Volumes
Attachment C	Locations of Related Projects
Attachment D	2010 Peak Hour Traffic Projections Without and With Project

Attachment A
PROJECT LOCATION MAP

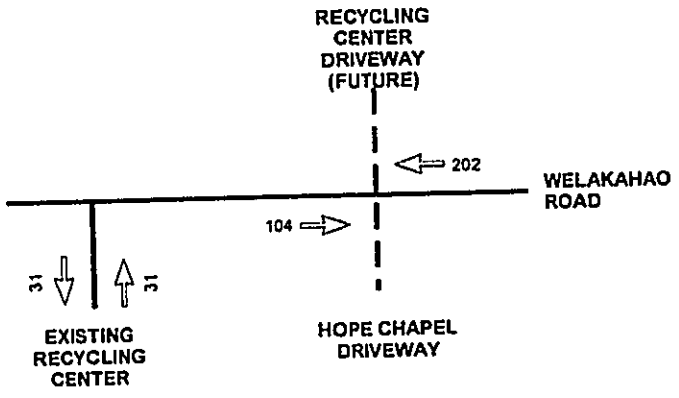


SOURCE: WARREN S. UNEVORI ENGINEERING, INC.

Attachment B
EXISTING (2005) PEAK HOUR TRAFFIC VOLUMES



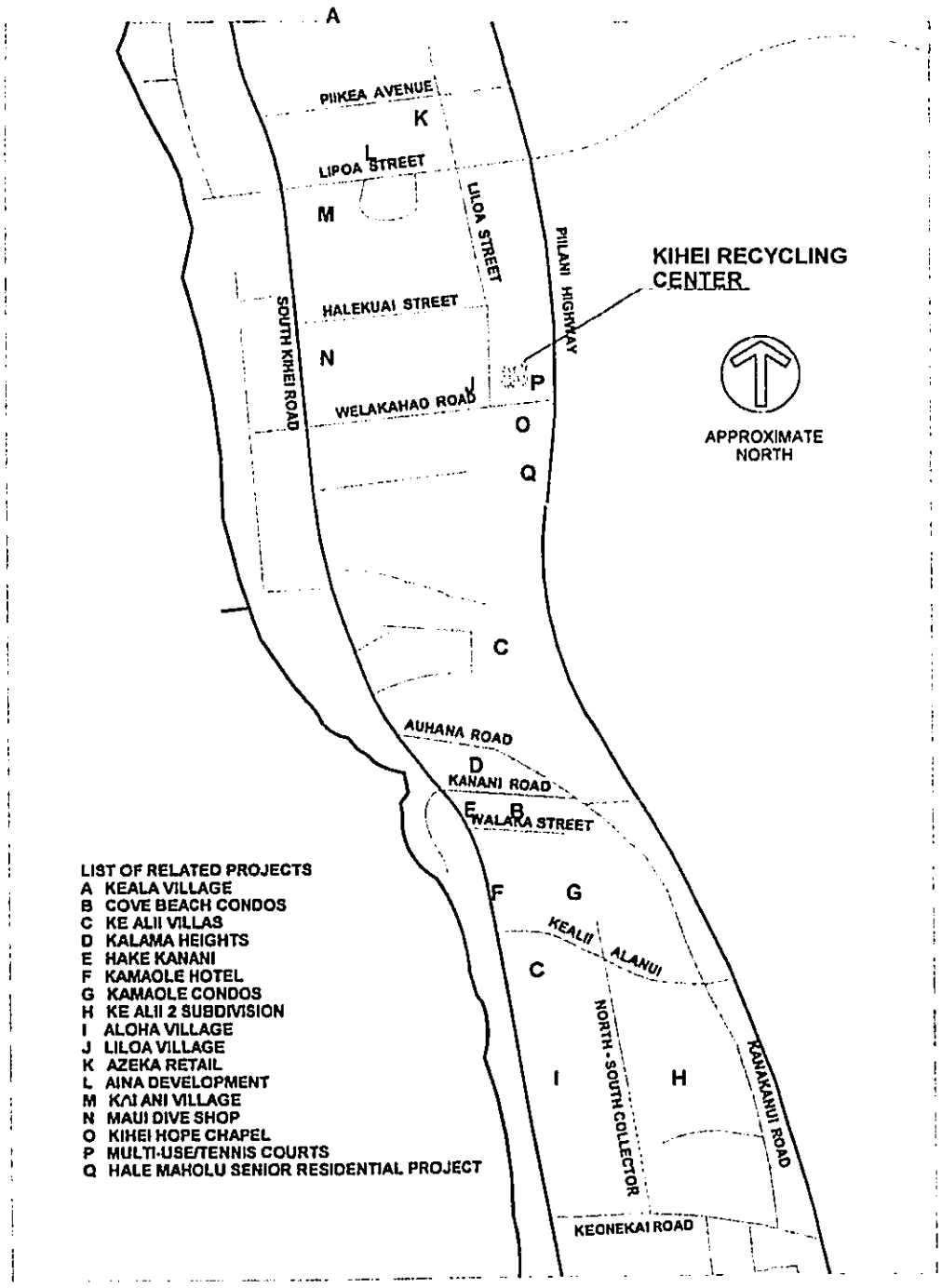
AM PEAK HOUR



PM PEAK HOUR

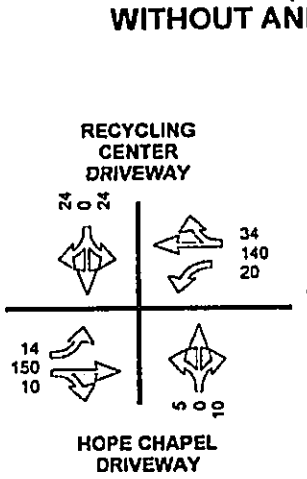
NOTE:
(1) COUNTS WERE PERFORMED ON FRIDAY, MARCH 5, 2005.

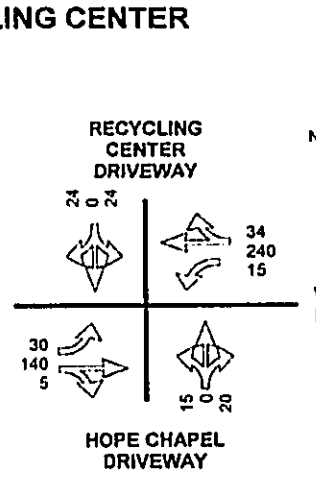
Attachment C
LOCATIONS OF RELATED PROJECTS



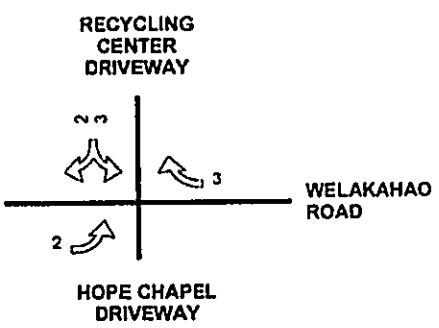
LIST OF RELATED PROJECTS
- A KEALA VILLAGE
- B COVE BEACH CONDOS
- C KE ALII VILLAS
- D KALAMA HEIGHTS
- E HAKE KANANI
- F KAMAOLE HOTEL
- G KAMAOLE CONDOS
- H KE ALII 2 SUBDIVISION
- I ALOHA VILLAGE
- J LILOA VILLAGE
- K AZEKA RETAIL
- L AINA DEVELOPMENT
- M KAIANI VILLAGE
- N MAUI DIVE SHOP
- O KIHEI HOPE CHAPEL
- P MULTI-USE/TENNIS COURTS
- Q HALE MAHOLU SENIOR RESIDENTIAL PROJECT

Attachment D
BACKGROUND (2010) PEAK HOUR PROJECTIONS WITHOUT AND WITH RECYCLING CENTER

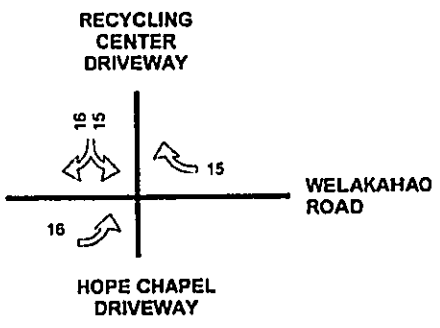




BACKGROUND (2010) AM PEAK HOUR WITHOUT RECYCLING CENTER

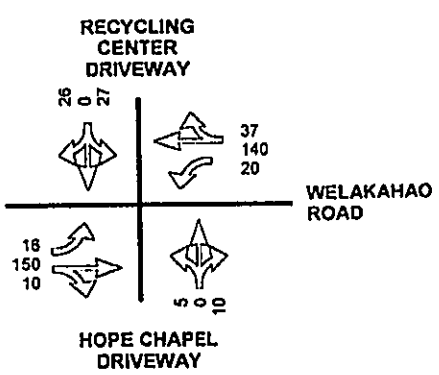


BACKGROUND (2010) PM PEAK HOUR WITHOUT RECYCLING CENTER

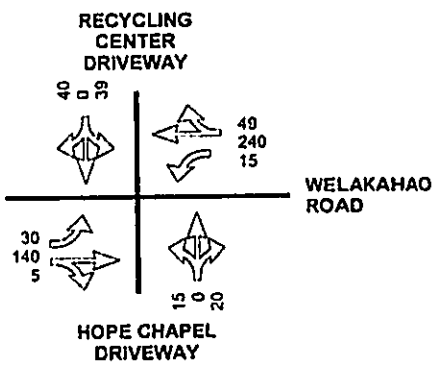


AM PROJECT TRIP ASSIGNMENTS

PM PROJECT TRIP ASSIGNMENTS



BACKGROUND (2010) AM PEAK HOUR WITH RECYCLING CENTER



BACKGROUND (2010) PM PEAK HOUR WITH RECYCLING CENTER

Appendix C - Archaeological Data Recovery Report

SCS Project Number 463-1

ARCHAEOLOGICAL DATA RECOVERY REPORT FOR PI`ILANI I AND II KĪHEI COMMUNITY PARK PROJECT, KĪHEI, KEOKEA AHUPUA'A, MAKAWAO DISTRICT, ISLAND OF MAUI, HAWAI'I [TMK 2-2-02:42]

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June 2005

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ABSTRACT

Data recovery was conducted following an "Archaeological Data Recovery Plan, Piilani Residential Community – Phase II", authored by T. Donham (1990), in which a total of six archaeological sites were designated for investigation. Field work for the Data Recovery was performed during a five week period in March and April of 2005 by Field Director Kirk Johnson, B.S. and Field Assistant Eric Pope, B.S. Project Principle Investigator was M. Dega, Ph.D.

The current investigations began by relocating the designated sites identified in the 1990 study. Of these, all but site 2519 were found, with this site believed to be impacted beyond recognition by post-1999 fire suppression activities.

Five sites comprised of ten features were studied and excavated. The only feature investigated that may represent permanent habitation is the platform at Site 2514. This feature yielded the highest density of cultural material of all excavated features.

The radiometric dates obtained from two of the sites this project (Sites 2512 and 2516) and the historic artifacts from Site 1710 demonstrate that most of the sites in the project area were utilized in the late pre-Contact to early post-Contact periods.

Research goals for this present study were to either support or refute the assumption that utilization of the project area was post 1550, and to shed light on the actual prehistoric use patterning for the project area.

As a result of this and earlier studies of the project area, it is recommended that no further work be conducted within the project area excepting Site 2512. As Site 2512 is now interpreted as a ceremonial location, it is recommended that the site be preserved based on a Preservation Plan.

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LIST OF FIGURES

INTRODUCTION

At the request of Chris Hart and Partners, Inc., and pursuant to recommendations by the Hawai'i State Historic Preservation Division (SHPD), Scientific Consultant Services, Inc. (SCS) conducted Archaeological Data Recovery on property proposed for the development of community recreation areas. The property on which these investigations were performed is *located within the city limits of Kīhei, Keokea Ahupua'a, Makawao District, Island of Maui,* Hawai'i (TMK 2-2-02:Por.42). Data recovery was conducted following acceptance of an "Archaeological Data Recovery Plan, Piilani Residential Community – Phase II", authored by T. Donham (1990), in which a total of six archaeological sites were designated for investigation. Field work for the Data Recovery was performed during a five week period in March and April of 2005 by Field Director Kirk Johnson, B.S. and Field Assistant Eric Pope, B.S. Project Principle Investigator was M. Dega, Ph.D.

PROJECT AREA DESCRIPTION

The physical nature of the project area has not changed dramatically since the study conducted by Donham, with the exception of its southern boundary, now the eastern extension of Welakahao Road. The research area is bordered on the North by Kihei Elementary and Intermediate School, to the west by Waiohuli-Keokea Beach Homesteads, and to the east by Piilani Highway (Figures 1 and 2). The coastline is located less than one mile to the west of the project area.

The climatic and edaphic regimes for the area generally correspond to the regime known as the "Barren" zone. The specific location of this project, however, puts it on the seaward margin of this zone. The topography of the project area is primarily a gentle east to west descending slope, although a large, notable basin into which several ephemeral drainages flow is present in its northwest portion. A steeply-incised intermittent drainage is located in the southern portion of the project area and is lined with natural bedrock outcrops. Exposed bedrock and bedrock outcrops are also common across the breadth of the parcel and are often visible on low knolls. Bedrock has been exposed on these knolls due to Aeolian transport of existing sediment. Waiakoa extremely stony silty clay loam is the major soil series in the project area (Foote *et al.* 1972: 127). This soil is prone to erosion and exposed rock composes up to 15% of its surface. Much of this exposed rock also exhibits a calcium carbonate crust. Puuone sand is the only other soil found in the project area (Foote *et al.* 1972: 115), and primarily occurs in its western portion. This series consists of grayish brown calcareous sand frequently underlain by a calcium carbonate hardpan.

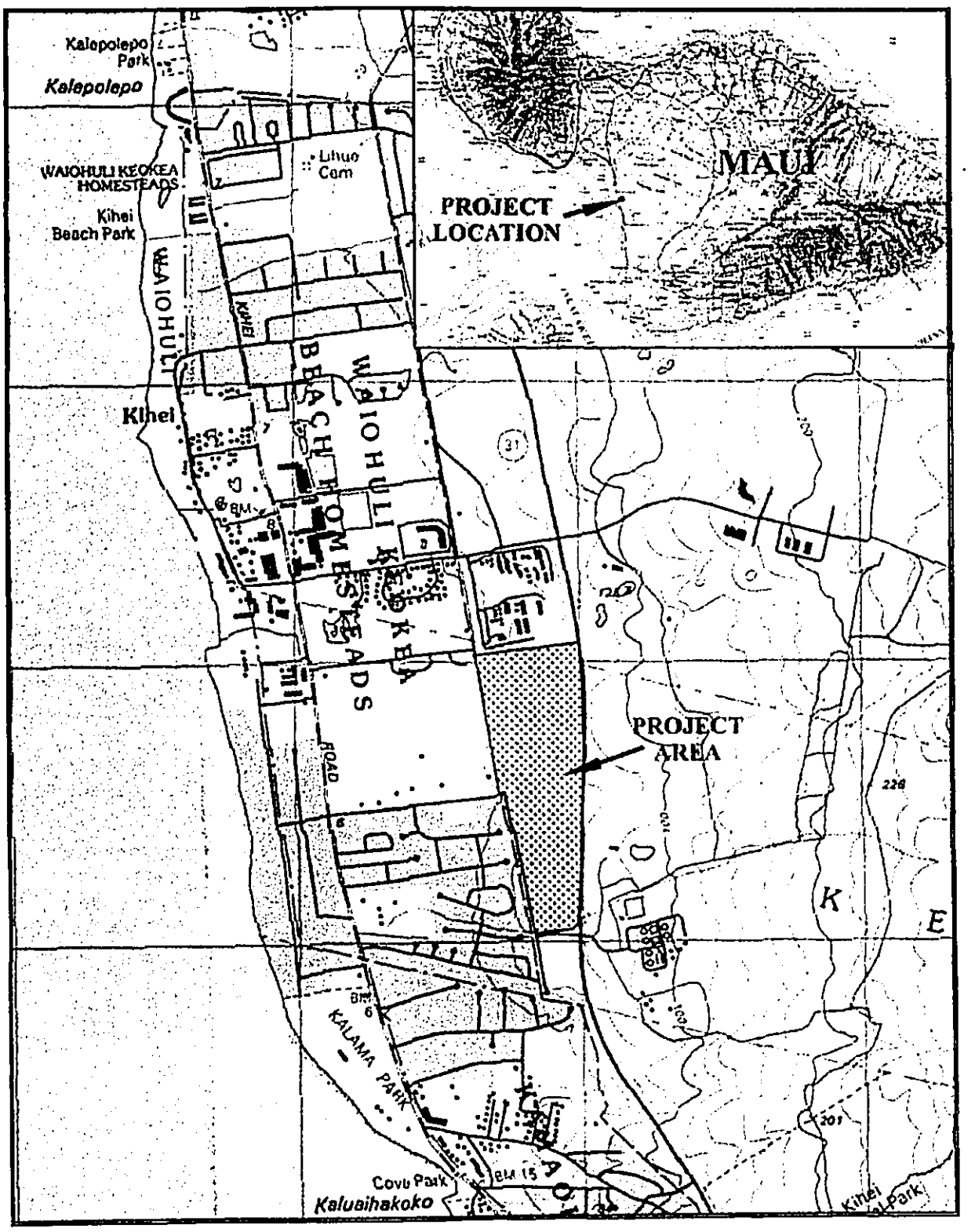

Figure 1: USGS Quadrangle Showing Project Location.

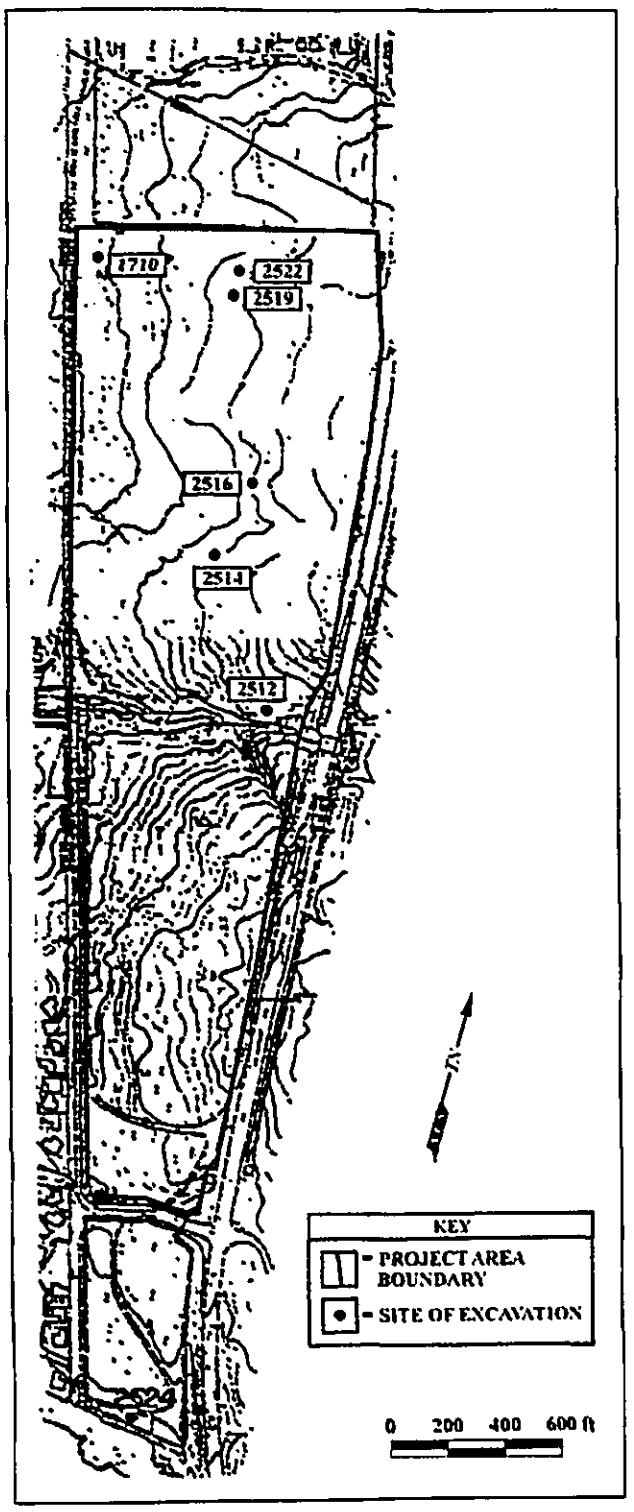

Figure 2: Plan View of Project Area with Site Locations.

The present vegetation regime in the project area differs somewhat from that of Donham's 1990 survey. Although the amount and condition of the observed *kiawe* appears to be similar, the composition of grass species has changed. The chief grass in the project area is now wiregrass (*Eleusine indica*), a bunchgrass occurring in disturbed areas that in several places, allows a moderate amount of surface visibility.

A discussion of the present condition of the project area cannot conclude without mention of fire. While Donham mentions that the northern portion of the project area had been burned in 1978 (Donham 1990:2), personal communication with the Kihei Fire Dept indicated that the entire project area has been completely burned four times since 1999 alone. In addition, several partial burns have occurred within this recent period also. If one considers heavy equipment brought into the area to counteract these frequent conflagrations, coupled with the erosion-prone soils of the property, it comes as somewhat of a surprise that there are any cultural resources surviving in the area at all.

RESEARCH PROBLEMS AND PROCEDURES

RESEARCH PROBLEMS

In the Data Recovery Plan, Donham (1990) identifies two major problems to be addressed through Data Recovery: site chronology and settlement/subsistence patterns. Although subsequent work in the area has contributed more information toward a better understanding of these problems, these remain not completely realized.

In 1990, all radiometric dates in the Kīhei/Makena area were post-dated AD 1550, while dates from upland locations in Keokea were somewhat earlier, beginning as early as AD 680 (Donham, 1990:10). Although these dates supported the assumption that upland occupation was conditional to, and occurred prior to, the occupation of more arid environments along the coast, work conducted in the area after 1969 refuted an earlier assumption that this coastal use was transient. From these studies it was therefore expected that dates from the project area would also post-date AD 1550. If earlier dates were to be located, they were expected to be from a single site in the area that appeared to exhibit two temporal components (Site 2512).

A study performed in 1977 (Cordy in Donham, 1990:11) postulated that permanent coastal residency was more likely to occur in this region where the distance between the coastline and the inland agricultural zone was minimal. In addition, it was proposed that the permanent occupations in the coastal zone (defined as extending 0.25 miles inland of the shoreline) would exhibit evidence of fishing, aquaculture, livestock maintenance and small-scale

agriculture. No provisions in this study, however, were provided for the "Kula" zone. While the findings from the initial survey of this area (Donham 1990) could neither support nor refute the first of these assumptions, information was generated which pertained to the second assumption. Donham's survey identified 15 sites in the project area, comprised of 30 features. These included nine terraces, six low walled enclosures, four "C" shapes, four rock piles, two platforms, two midden scatters, an alignment, a high walled enclosure, and a modified outcrop. Not only was the density of these features surprising, but the fact that any prehistoric sites were located in the project area was remarkable, considering the distance from the coast. Most of these features were considered to be agricultural in function, but seven were thought to indicate at least temporary habitation. This would indicate use of the Kula zone, at least on its margins, for agricultural purposes, extending subsistence catchments further inland than previously thought, in addition to indicating an intensity of use not expected. In her Data Recovery Plan, Donham further writes:

"On the basis of the current survey data it appears that agricultural activities within the project were selectively located on low knolls and along the slopes of these knolls. What is not clear is whether this patterning is caused by selective preservation of the surface features, or actual site selection patterns. The topographic features where agricultural terraces are located are generally the areas of least soil, and appear today to be the least productive for growing plants of any sort. If these locales were of marginal productivity at the time of utilization, then we should expect that the more productive soil flats would have also been utilized, perhaps with only minor modifications that have since eroded away or have been otherwise destroyed. This assumption significantly changes the picture of small scale or limited agriculture to one of relatively extensive use of all available land, and the range of plants being grown" (Donham, 1990:11).

Research goals for this present study would consequently be to either support or refute the assumption that utilization of the project area was post 1550 ad, and to shed light on the actual prehistoric use patterning for the project area.

METHODOLOGY

While site specific field methods are discussed later, general field methods are discussed below.

The current investigations began by relocating the designated sites identified in the 1990 study. Of these, all but site 2519 were found, with this site believed to be impacted beyond recognition by post-1999 fire suppression activities. After site relocation, a two-person crew,

contracted locally, performed vegetation clearing. Areas having the highest potential for data recovery were then identified, and excavation commenced.

Excavation unit placement is dealt with in individual site discussions. It should be noted, however, that study of site architecture during this project was not a high priority. This was due to almost all surface architecture being of piled and/or stacked rock, and soils being obviously shallow, precluding extensive sub-surface architecture. In other words, "What you saw is what you got".

General excavation methods included photographing units both before and after excavation, the removal of unit matrix by either trowel or shovel, and, with the exception of the single shovel probe (SP) at site 2512, the drawing of profiles from at least one exposed wall. Units designated as stratigraphic trenches (STs) were excavated solely to expose profiles, and as such were neither controlled vertically nor screened. Diagnostic artifacts identified during their excavation, however, were collected for analysis. Units designated as test units (TUs) were excavated by natural layers, with arbitrary 10 cm levels. All matrix removed from TUs was screened through 1/8th inch screen, with all cultural material recovered for subsequent analysis. Besides the previously mentioned SP, Almost every unit excavated had two walls profiled. Exceptions, however, were the adjacent units of Trench 1, Site 1710, which had only one wall profiled, and ST-1 and TU-6 at Site 2512, which also had a single wall drawn (this was due to the exposure and removal of Sub-surface Feature 2512-B.1). All formally identified sub-surface features were bisected, their profiles drawn, and one half of their matrix screened separately, the other half collected as a soil sample.

Laboratory analysis involved lithic analysis and midden analysis. Lithic analysis was conducted by Robert L. Spear, Ph.D. Midden analysis was performed identifying species and their respective volumetrics.

Before concluding this section, it should be noted that this report draws heavily from Donham's 1990 report for PHRI. Its excellence in description needs little improvement and has provided the author with a solid basis to which current site conditions can be compared.

FIELD WORK RESULTS

SITE 1710 DESCRIPTION

State Site 1710 is a single feature site comprised of a quadrilateral enclosure located on the west side of a prominent rock outcrop, and measuring 15.00 m N-S by 13.00 m E-W. In 1990, it was described by Donham:

"This roughly square enclosure has three free-standing walls and one (east) wall that is mostly a natural rock face. The walls consist of boulders and cobbles and are generally bi-faced with core filling of small cobbles and pebbles.

The eastern portion of the south wall is 0.85 m wide and 0.9 m high on the interior side, 0.40 m high on the exterior side. The faced sides are stacked up to six courses high. At the west end of the south wall, interior height is 0.42 m and exterior height is 0.15 m. This section of the wall appears to be disturbed.

The western wall is vertically stacked and faced on the interior side, 0.65 to 0.37 m above the interior surface. The exterior side of this wall slopes outward and downhill, and is 0.90 to 0.30 m high. Overall wall width from base to base is 1.50 m; the top to the wall is 1.00 m wide. At the northwestern corner, the wall is level with the interior surface and 0.60 m above the exterior surface.

The north wall has a narrow (0.60 m) entrance in the center. Interior wall height at the entrance is 0.20 m and exterior wall height is 0.60 m. At the northeastern corner, the wall is 0.80 m high on the exterior side and 0.70 m high on the interior side.

A 3.00 m long section of the eastern wall is free-standing; the remainder consists of alignments and stacked cobbles placed in cracks or open areas along the bedrock face. This is the highest portion of the enclosure; interior heights range from 1.56 to 1.35 m. Exterior height of the stacked portion averages 0.10 m along the top of the rock face.

The interior of the enclosure is a sloping surface, with the highest portion along the north wall. Very few partially buried cobbles are present inside. The soil consists of sandy loam mixed with aeolian beach sand. No portable remains were observed on the surface inside the enclosure.

A terrace alignment is present at the base of the southeastern corner and south wall. The alignment consists of boulders and cobbles and is raised 0.50 m above the adjacent surface to the

south. The area between the alignment and the enclosure wall is relatively flat, with small cleared patches.

Immediately to the south of the enclosure is a linear arrangement of bulldozed boulders and cobbles, intermixed with ceramic drainage tile. The relationship between this disturbed feature and the enclosure (if any) cannot be determined until additional vegetation clearing is conducted. It is possible that additional terraces are also present nearby." (Donham 1990: A-1-3)

Current investigations found the site 1710 to be well described by Donham, with the exception of post-1990 disturbance. At the time of the present study, the majority of the exterior of the western wall had been obscured by dozer push, much of it consisting of large boulders. In addition, much of the architecture of the north wall, both the exterior and interior, had been obscured by sediment, assumed to be aeolian.

SITE 1710 METHODS

After clearing, four stratigraphic units and five test units were excavated in this site (Figure 3).

Excavation began with laying out a 1.00 m by 10.00 m trench, running parallel to, and about 0.50 m from the interior of the enclosures west wall (Figure 4). This trench consisted of three 1.00 m by 2.00 m stratigraphic units (STs 1-3), separated by two 1.00 m by 2.00 m test units (TUs 1-2), placed on the lowest area of the features interior. Placement of this trench was determined by the belief that both cultural and natural processes would lead to cultural remains concentrating in this area, and that after excavation; a 10.00 long profile would generate a representative cross section of the sites stratigraphy. In addition, the south profile of the trench would also expose the base of the features south wall, establishing its layer of origin. Excavation of these units was taken an average of about 0.50 m below the occurrence of cultural material in order to ascertain the presence of multiple occupations and better understand the geomorphology of the site. TUs were excavated in layers established from the profiles observed in the STs.

After excavation of the trench, a third 1.00 m by 2.00 m TU (TU-3) was excavated in the southeast corner of the enclosure, parallel to the south wall and cutting across the features internal terrace. This unit was placed in order to better understand the nature of the small terrace, and also to compare the unit's stratigraphy with that of the trench. TU-3 was excavated in natural layers to bedrock.

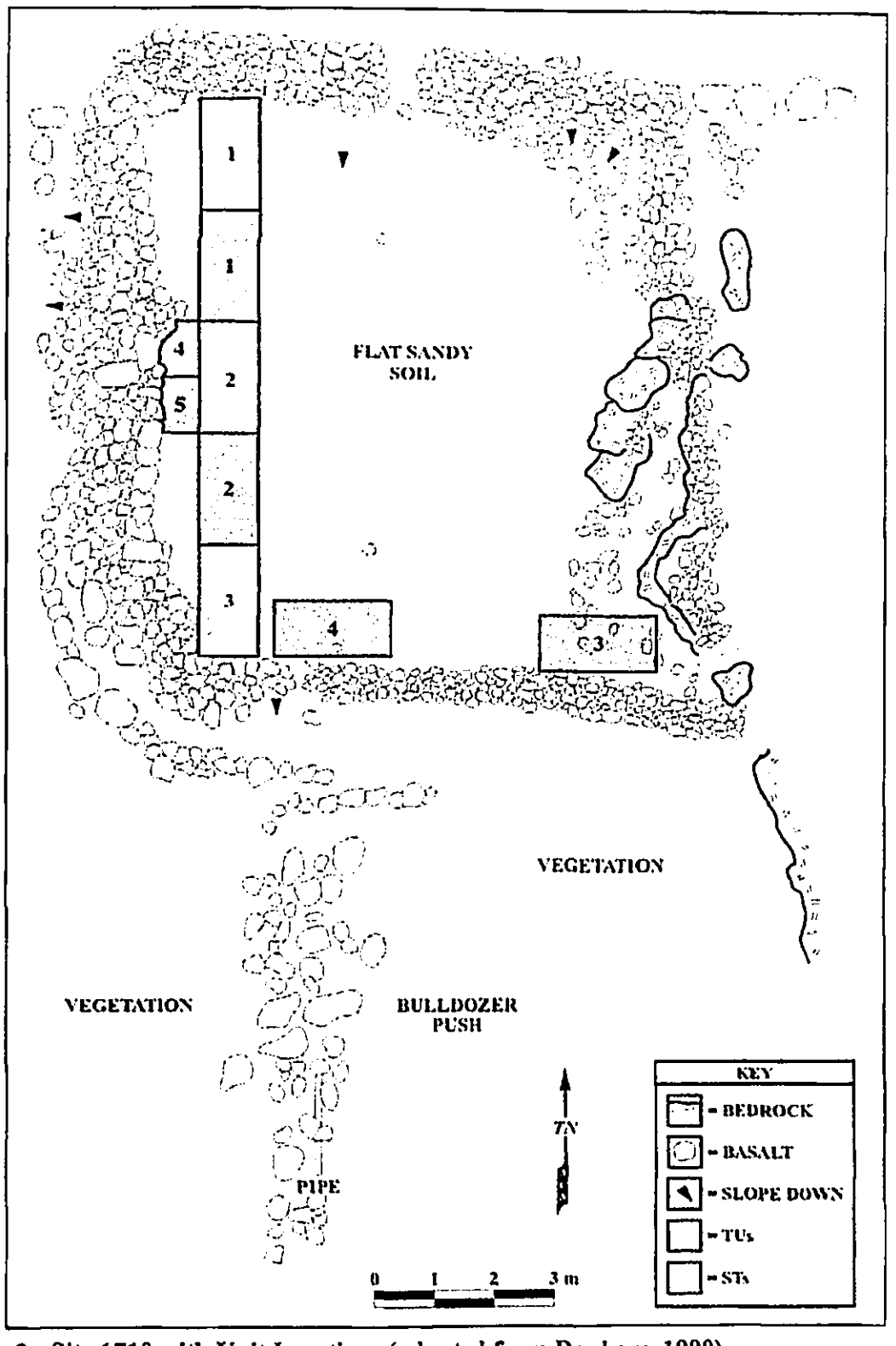

Figure 3: Site 1710 with Unit Locations (adapted from Donham, 1990).

Figure 4: Site 1710, Trench 1 (TUs 1 & 2; STs 1 – 3). View to Southwest.

TU-4 was a 1.00 m by 2.00 m unit also placed parallel to the enclosures south wall, toward the southwest corner of the feature and about 0.30 m east of the south end of the trench. This unit was excavated in hopes of finding subsurface features, this location, on the leeward side of the enclosures south wall, being protected from the prevailing wind direction. Excavation of this unit was conducted by layers and terminated approximately 0.10 m below the cultural layer established by the trench excavations.

The final two units excavated were ST-4 and TU-5. These 1.00 m by 0.70 m units were located adjacent to each other, off of the trenches west wall, between it and the enclosures west wall. Units were limited in their west extent by the presence of a very large boulder, used as internal facing in this wall. Excavation was undertaken in order to locate temporally diagnostic material, and further document the features layer of origin. Units were terminated approximately 0.15 m underneath the base of the wall, in the layer beneath the cultural layer established by trench stratigraphy. Only TU-5 was excavated in layers.

A total of between 16.00 and 17.00 square m of surface area was excavated at the site (9%), completed in approximately 20 person days.

SITE 1710 RESULTS

STRATIGRAPHY: Excavation at the site quickly demonstrated that it was located in a dune environment with its matrix primarily composed of sands.

The profile of units in trench 1, STs 1-3 and TUs 1-2 ranged in depth 1.10 m to 0.60 m, and demonstrated five major layers, further divided into several sub-layers (Figure 5; Appendix A). One layer, Layer II, was limited to the north portion of the trench, in ST-1 and TU-1. The primary cultural layer was Layer III, a level, reddish brown loamy sand averaging around 0.10 m in thickness containing the majority of the units rock (mostly angular). Cultural material, however, also occurred in the lower portion of Layer I, and the upper portion of Layer IVa. In addition, the profile of the south wall of ST-3 demonstrated that the Feature's architecture originated at the bottom of Layer III (Figure 6). Of note was the occurrence of a hard, cemented calcium carbonate layer directly underneath Layer III. This layer, Layer IVa, ranged in thickness from 0.8 to 0.4 m and differed little from the underlying layer, except for this calcium carbonate. Also of note were several thick lenses (sub-layers) lightly stained with ash or carbon which occurred in Layer V. A coating of calcium carbonate was also found on exposed rock (bedrock?) at the bottom of TU-2, a unit taken slightly deeper than the rest of the trench (Figure 7).

The O Horizon in these units was a very dark gray (10 YR 3/1) sandy loam with about 3% small pebbles and about 60% organic material. Layer I was a dark reddish brown (5 YR 3/3) loamy medium grained sand with about 1% small pebbles. The layer was structureless and non-sticky and non-plastic with many fine roots. The lower boundary was very abrupt. Layer IIa was a very dark yellowish brown (10 YR 4/4) loamy coarse sand with no rock. The layer was structureless and non-sticky and non-plastic with many fine roots. The lower boundary was very abrupt. Layer IIb was a dark brown (10 YR 3/3) loamy medium sand with about 2% small pebbles. The layer was structureless and non-sticky and non-plastic with many fine roots. The lower boundary was abrupt. Layer IIc was a brown (10 YR 4/3) sandy loam with no rock. The layer was structureless and non-sticky and non-plastic with moderate to fine roots. The lower boundary was abrupt. Layer III was a dark reddish brown (5 YR 3/3) loamy medium sand. The layer was structureless and non-sticky and non-plastic with many fine roots. The lower boundary was very abrupt. Layer IVa was a very dark grayish brown (10 YR 3/2) loamy fine sand with no rock. The sand was cemented with few large to fine roots. Layer IVb was a dark brown (7.5 YR 3/2) medium sand with no rock. The layer was structureless and non-sticky and non-plastic with few large to fine roots. The lower boundary was abrupt. Layer Va was a dark yellowish brown (10 YR 4/4) fine to medium sand with no rock. The layer was structureless and non-sticky and non-plastic with large to fine roots. Layer Vb, which was a lens within Layer Va,

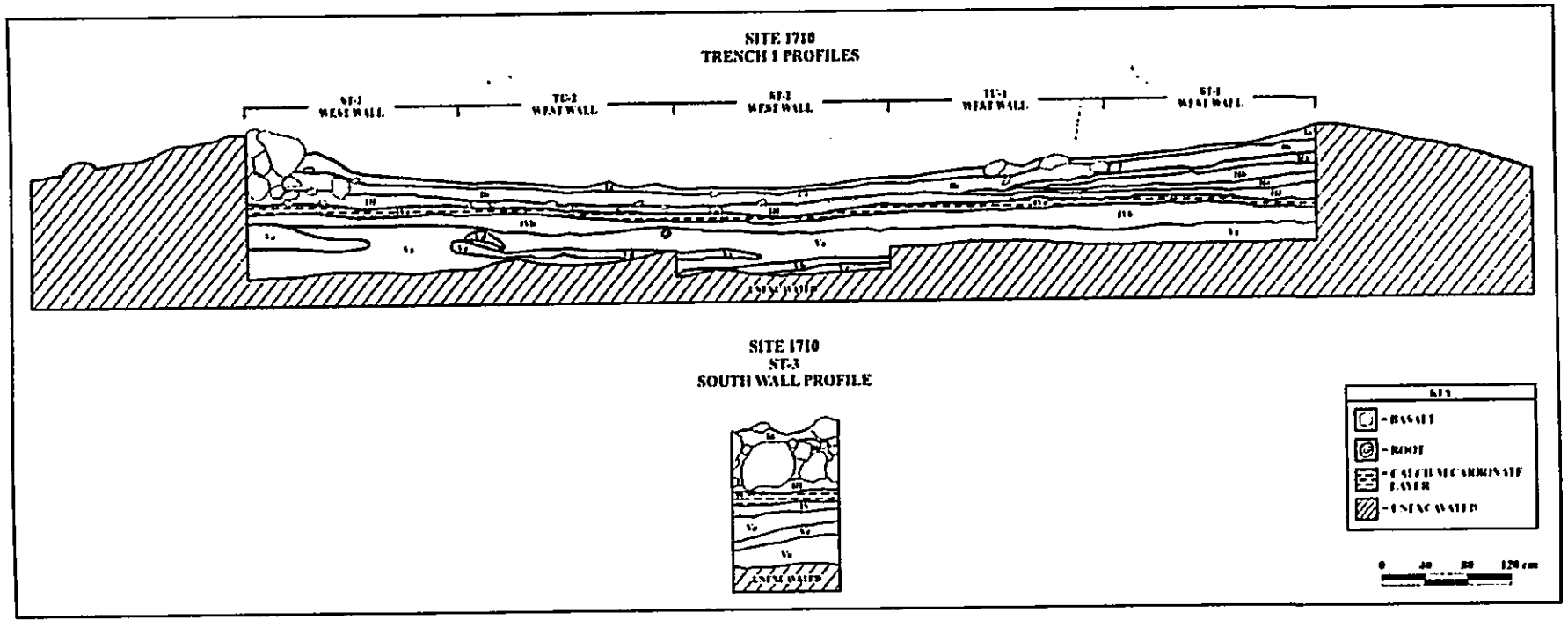

Figure 5: Site 1710, Trench 1 (TUs 1 & 2; STs 1 – 3), Profiles.

Figure 6: Site 1710, Trench 1, ST 3, South Wall.

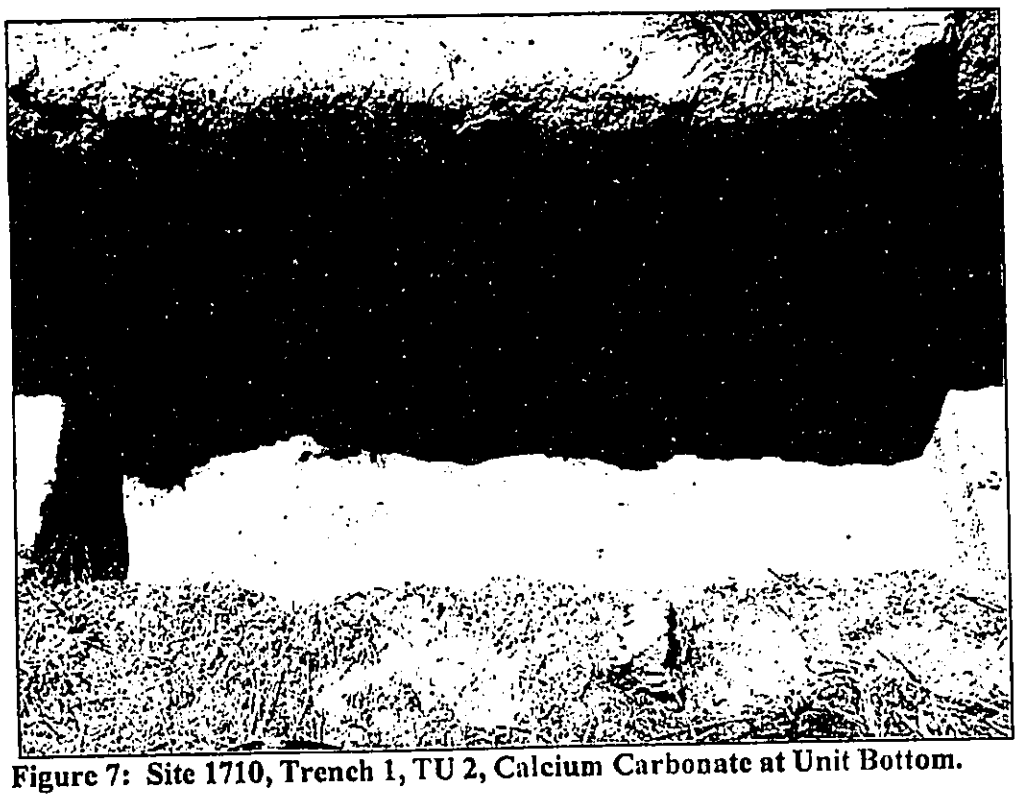

Figure 7: Site 1710, Trench 1, TU 2, Calcium Carbonate at Unit Bottom.

was a yellowish brown (10 YR 5/4) fine to medium sand with no rock. The layer was structureless and non-sticky and non-plastic with large to fine roots. Layer Vc, which is also a lens within Layer Va, was a gray to light gray (10 YR 7/1 to 6/1) ashy fine to medium sand with no rock. The layer was structureless and non-sticky and non-plastic with large to fine roots. Layer Vd, which is also a lens within Layer Va, was a dark gray (10 YR 4/1) carbon-stained fine to medium sand with no rock. The layer was structureless and non-sticky and non-plastic with large to fine roots.

The stratigraphy of TU-3 differed from that of the trench (Figure 8). In this unit, two layers were identified overlying bedrock. Both layers contained cultural material, although the majority of this material occurred toward the bottom of Layer I. Architecture of the enclosure was exposed in the units south wall, and occurred only in layer I, lying near its surface at the west half of the unit and resting on bedrock at its east half (Figure 9). Layers differed little on either side of the terrace's retaining element, although deposits were deeper on its west side.

Layer I was a brown (7.5 YR 4/3) fine sand with about 25% pebbles and cobbles. The layer was structureless and non-sticky and non-plastic with medium to fine roots. The lower boundary was abrupt. Layer II was a dark brown (7.5 YR 3/4) loamy sand with about 25% pebbles and cobbles. The lower boundary was bedrock.

TUs 4 and 5, with ST-4 exhibited stratigraphy similar to that of Trench 1, and were terminated toward the bottom of Layer IVa. Layers I and III in TU-4 both contained cultural material, although the cultural material in Layer I occurred only toward its bottom (Figure 10). Layer IVa of this same unit also contained cultural material, but this was isolated in a small ash deposit, located in its northeast portion. TU-5 and ST-4, extending west of the trench and exposing the sub-surface architecture of the feature's west wall, further demonstrated the architecture to originate at the bottom of Layer III (Figure 11).

For the soil descriptions of these units see ST-1, 2 and 3 and TU-1 and 2, above.

CULTURAL MATERIAL: Both items generally attributed to native Hawaiians and euro-American artifacts were recovered from the site.

Traditional hawaiian items primarily consisted of marine gastropod shell, although bivalve and echinoderm shell was also well represented. Small mammal bone was recovered from several of the units, which contrasted with the recovery of only a single fish bone. Small

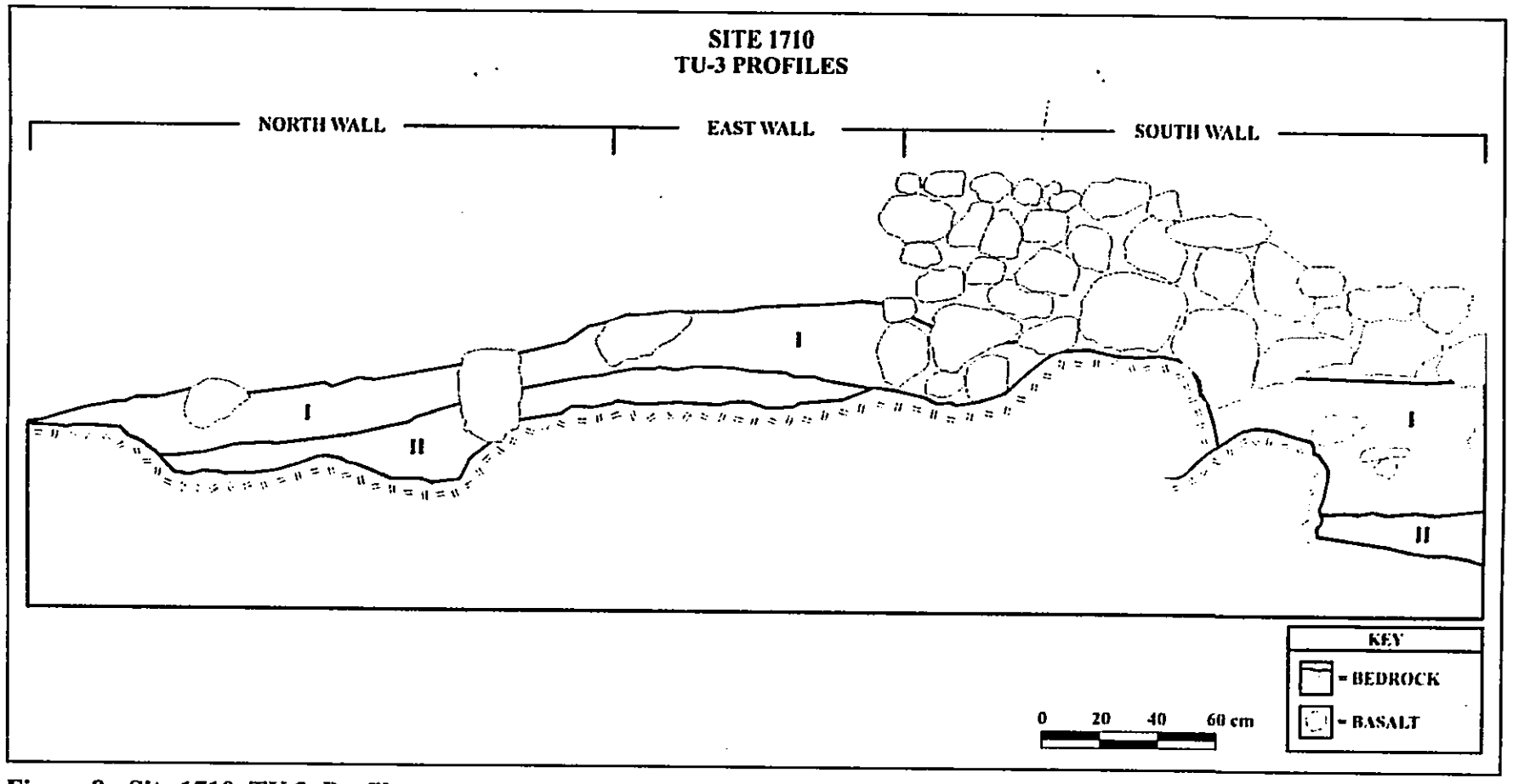

Figure 8: Site 1710, TU 3, Profiles.

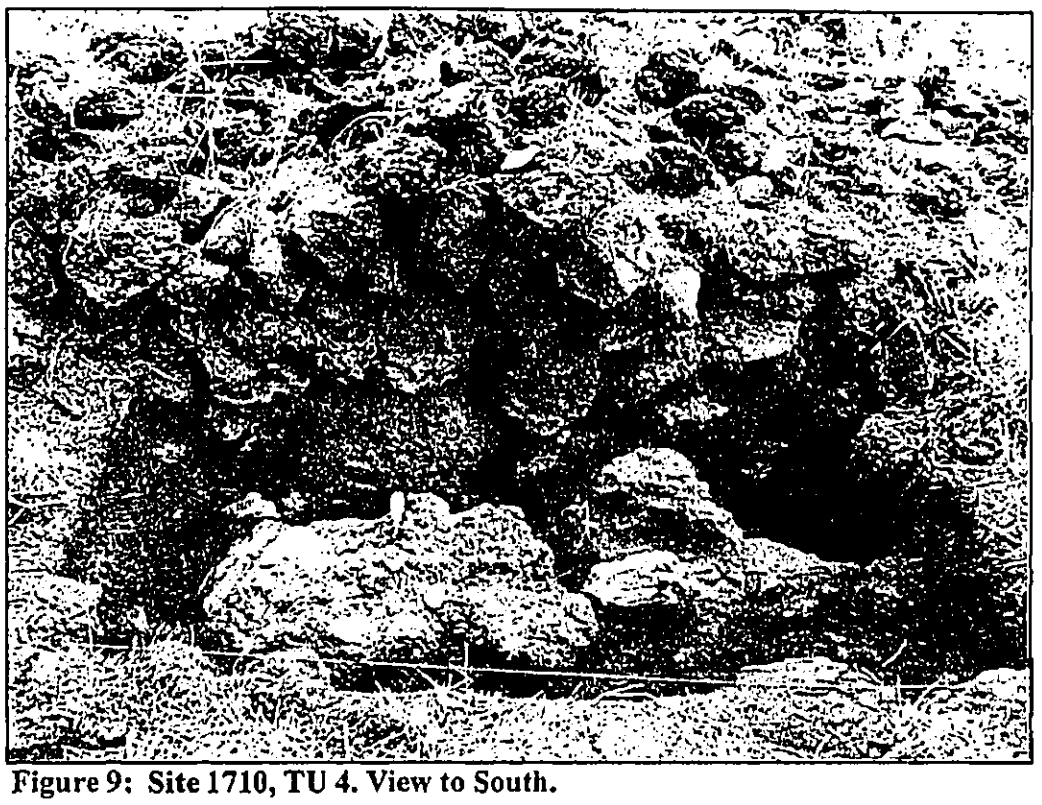

Figure 9: Site 1710, TU 4. View to South.

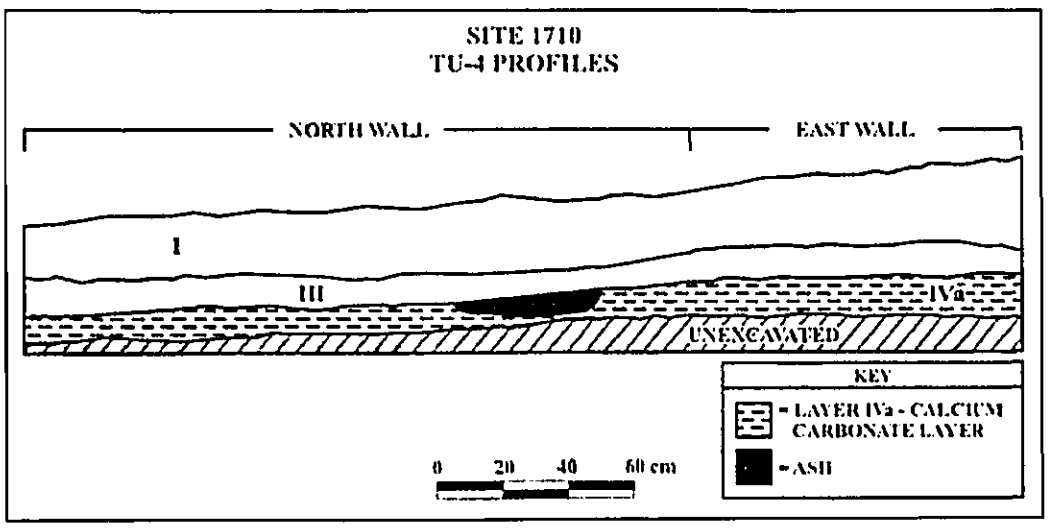

Figure 10: Site 1710, TU 4, Profiles

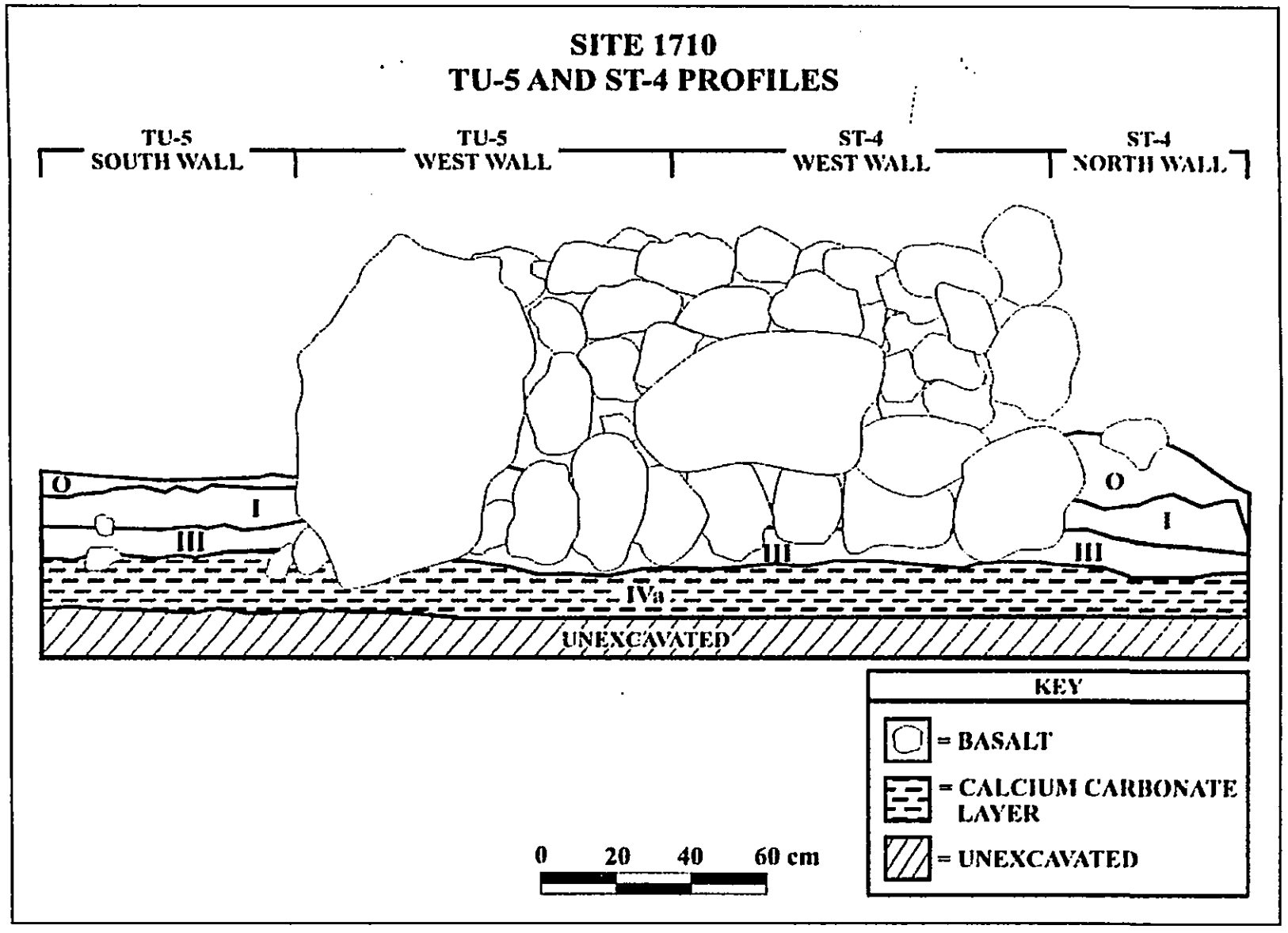

Figure 11: Site 1710, TU 5 & ST 4, Profiles.

amounts of non-worked coral were also recovered from several units. A single possible basalt flake was identified in TU-3, and an unworked volcanic glass pebble was recovered in TU-2. Possible thermally altered, angular rock was ubiquitous in Layer III. Most material was concentrated around Layer III and occurred in all test units excavated. The majority of material, however, occurred in TUs 2 and 4, located in the southwestern portion of the feature.

Recovered euro-American artifacts consisted of several fragments of non-diagnostic bottle glass, two machine-cut nails, one of which was hand headed, and unidentifiable flat metal fragments, probably from a single can. Some of the bottle fragments may be recent, occurring in the upper portion of the profile. Others, however, are firmly associated with Layer III.

Four charcoal samples were collected from this site but none were submitted for radiocarbon dating.

SUBSURFACE FEATURES: The single formal sub-surface feature identified at the site was a possible post-hole, initially observed at the bottom of Layer III in TU-4. It was tapered in profile, 0.35 m in diameter, and extended to 0.61 m in depth from the surface at which it was first identified. Fill was of soft, light colored sand, contrasting sharply with the hard calcium carbonate layer into which it intruded (Figure 12).

Although not formally recorded another possible sub-surface feature was the previously mentioned ash deposit, also located in TU-4. It contained no rock, was somewhat amorphous in plan view, and appeared basin shaped in profile, intruding 0.04 m into the underlying layer. This layer in the unit, Layer IVa, was otherwise culturally sterile.

SITE 2512 DESCRIPTION

State site 2512 is a complex of associated constructions located on the top of a small knoll, immediately north of a deeply incised, intermittent stream gully. With the exception of a possible feature to the east (Feature F), the complex measures 15.00 m N-S by 14.00 m E-W. Investigations conducted by Donham in 1990 divided this complex into 5 component features, described as follows:

"This complex consists of a low, eroded platform (Feature (A) that has a small enclosure (Feature B) at the southeastern corner. Two sets of terraces (Features C and D) are located below the western sides of the platform, along the slope of the knoll. A small rock mound (Feature E) is present on the platform.

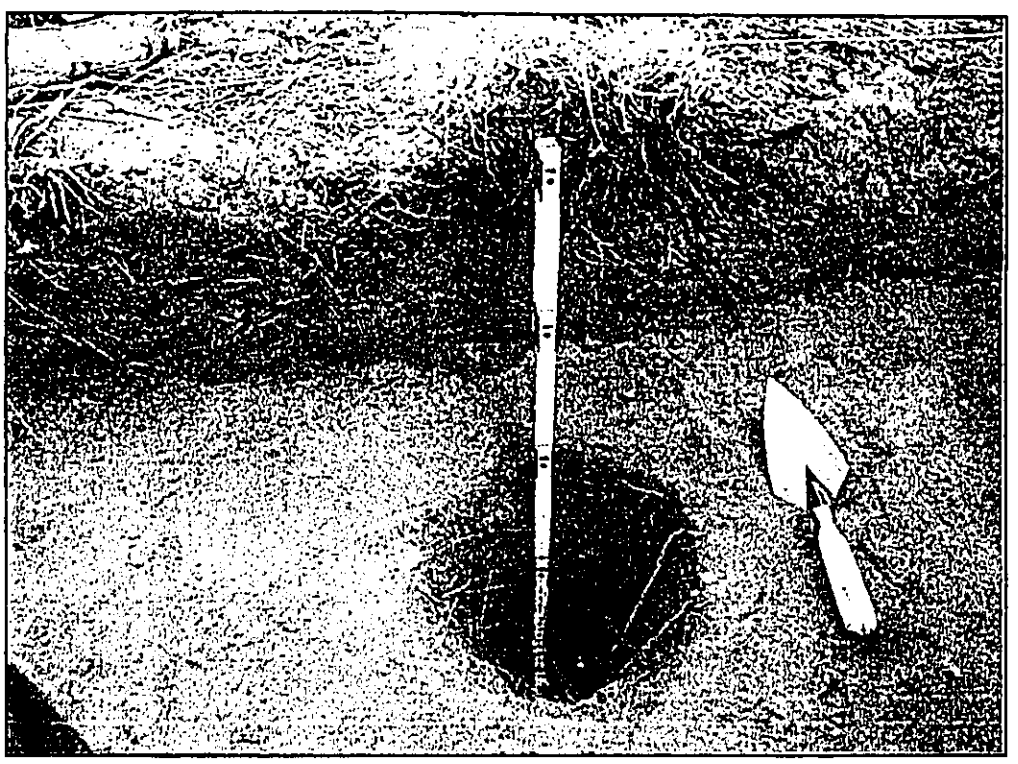

Figure 12: Site 1710, TU 4, SSF 1710.1.

The drainage gulch adjacent to the site has vertical, rock-faced sides. The streambed is c. 24 ft below the level of the site. At the time of survey, two water pools were visible in the streambed from the site. This is the only location of surface water observed within the project area.

FEATURE A: Platform;
FUNCTION: Habitation or shrine
DIMENSIONS: 9.00 m NE-SW by 6.50m NW-SE by 0.90 m maximum height

DESCRIPTION: Feature A appears to have been a rectangular platform situated on the crest of a small knoll, c. 1.20 m above surrounding terrain. The perimeter is intact at northern, western and southern corners, and along the northeast-facing side. Other sections of the perimeter have been washed out by slope erosion or possibly moved during later modifications. Intact portions of the perimeter consist of stacked boulders and cobbles that average 0.25-0.30 m in height. The western corner incorporates a bedrock face, and is 0.90 m high. The surface of the feature is level; the western half is covered with small gravels and the eastern half is dark reddish-brown gravely silt loam, leveled in places.

A small D-shaped terrace is present at the southern corner of the platform. This terrace is defined by a curved perimeter alignment along the west side, which raises the surface 0.15 m above the surrounding platform surface. The small terrace surface is littered with boulders and cobbles, some of which appear to be disturbed.

Down slope from the platform on the northern and southeastern side is a scattered deposit of small gravels and sparse fragments of *Cypraeidae* shell that appear to have washed off the platform. A considerable amount of soil also appears to have eroded from the top of the feature.

Three pieces of branch coral are present at the southwestern edge of the platform, adjacent to the Feature D terraces, which contains additional pieces of coral.

FEATURE B; Low enclosure
FUNCTION: Possible agriculture
DIMENSIONS: Interior area 2.90m N-S by 2.40m E-W; overall, 4.20m N-S by 3.40 m E-W by 0.35 m maximum

DESCRIPTION: Feature B is situated at the eastern corner of Feature A, and may represent a later modification to the original structure. The eastern wall of Feature B connects with the platform perimeter at the northern end of the enclosure. The southern side of the enclosure is also the southeastern side of the platform. Portions of the enclosure wall are up to 0.70 m wide and consist of two parallel boulder alignments with core filling. Other portions of the wall are loosely piled cobbles and boulders, or a single alignment of boulders.

The interior of the enclosure is cleared of all stones, and consists of level, light reddish-brown sandy loam with little to no gravel. The soil here contrasts with the soil present on most of the adjacent features. No portable remains were observed inside the enclosure. The interior surface is raised slightly above the platform surface and the adjacent ground to the east.

No opening is apparent in the low wall. The western side is in poor preservation, and the interior surface is nearly level with the top of the wall along this side.

FEATURE C: Terrace
FUNCTION: Agriculture/landscaping
DIMENSIONS: 8.90 m N-S by 1.50 m E-W by 0.30 m
FUNCTION: Agriculture

DESCRIPTION: Feature C is a long, narrow terrace situated along the western slope of the knoll, immediately down slope from the Feature A platform. The terrace may have extended around the northern base of the platform at one time; this area is presently much eroded and only traces of a possible perimeter are currently discernable. The terrace riser (along the downhill side) is defined by aligned boulders and stacked cobbles. The back of the terrace (uphill side) is defined by a vertical bedrock face with stacked boulders and cobbles on the north end and by the Feature D terraces on the south end.

Most of the interior surface area of the terrace is cleared of surface stone and leveled, with reddish-brown silty loam soil. No portable remains were observed on this terrace

FEATURE D: Terraced slope
FUNCTION: Agriculture/landscaping; possible shrine
DIMENSIONS: 7.00 m NW-SE by 4.00 m NE-SW by 1.02 m maximum height

DESCRIPTION: At the southern end of Feature C, immediately upslope is a series of small semicircular alignments arranged in five levels along a relatively steep portion of the knoll slope. The upper level of the feature is a small soil flat (2.00 by 0.50m) adjacent to and just below the platform (Feature A) surface. The perimeter for this level is raised 0.20 m above the lower level to the west, and consists of cobbles and branch coral heads. A narrow flat is present around the base of this perimeter (3.00 by 0.30m), which is defined by aligned cobbles 0.35 m above the adjacent, lower level. A single large branch coral head is incorporated into this riser.

A third soil flat (3.00 by 0.80m) is present below the narrow terrace. This level is raised 0.32 m above the level below. At the northern end of this flat are two positioned upright slabs, both of which are 0.60 m high< The slabs are 0.40 m apart and define the southern end of a fourth small soil flat, which is raised 0.22m above the Feature C terrace. Coral is scattered around the uprights and on the lower level soil flats. The lower terrace alignments are positioned exposed bedrock.

FEATURE E: Rock mound
FUNCTION: Indeterminate/possible clearing pile
DIMENSIONS: 1.50 m NE-SW by 1.20m NW-SE by 0.20 m maximum height

DESCRIPTION: This low rock mound (or pile) is located near the center of the Feature A platform, along the northwestern side. It consists of loosely piled boulders and cobbles, and is

situated along the western edge of the cleared portion of the platform surface. The feature may represent a clearing pile; as such, it would probably be a later modification to the original platform." (Donham 1990).

The present investigations found Donham's description of the site open to interpretation. First, the assertion that Feature B may be a later modification to Feature A brings into question its division into a separate feature. While indeed its level surface is a few centimeters higher than the adjacent surface of Feature A, the surface of Feature A is not completely level, the alignment separating the two not very pronounced, and that the surface soil of Feature B adjacent to Feature A contains only slightly more sand. Second, the nature of Features C and D can be questioned with the uppermost terrace of Feature D actually being a continuation of the retaining element of Feature A. In addition, several of the lower terraces of Feature D presently appear ephemeral, possibly the result of colluvial processes. Portions of these lower terraces, however, may also be steps to a trail. This would make Feature C the western manifestation of this trail, which continues through the uprights identified in Feature D, wraps around the south portion of Feature A, and increases in elevation to join Feature A at its southeast corner.

A sixth possible feature, ephemeral at best, was not noted by Donham and lies about 5 m to the east of the previously described complex. This is Feature F, a possible trail which runs for about 18 m along the bedrock overlooking the north side of the drainage (Figure 13). It is oriented in a rough east-west direction and incorporates three possible uprights into the bedrock, above the drainage's steep drop-off (Figure 14).

SITE 2512 METHODS

Site 2512 was excavated with five test units, one stratigraphic unit, and one shovel probe (Figure 15).

Excavation of the site began with the placement of two 2.00 m by 2.00 m test units placed in Feature A, TU-1 located toward the western edge of the feature, and TU-2 located toward the center of the feature, about 0.50 m to the east of TU-1. These units were excavated in order to open up large surface areas of the feature in hopes of maximizing the recovery of cultural remains while anticipating shallow soil depth. Both units were excavated in natural layers, TU-1 taken to bedrock, and TU-2 exposing bedrock in the majority of the unit, while being terminated 0.10 m into the culturally sterile substrate overlying bedrock in its northeastern quarter.

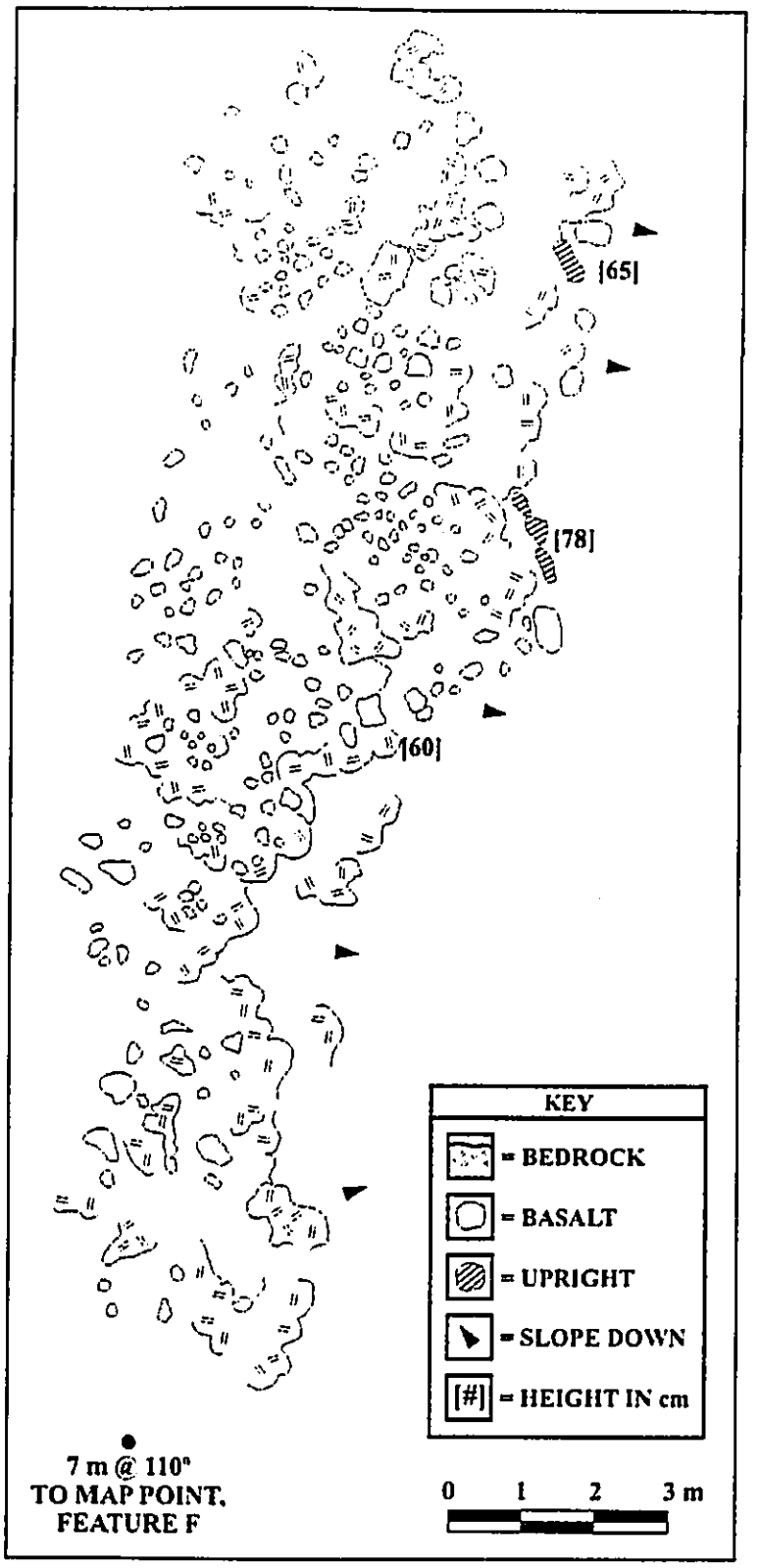

Figure 13: Site 2512, Feature F.

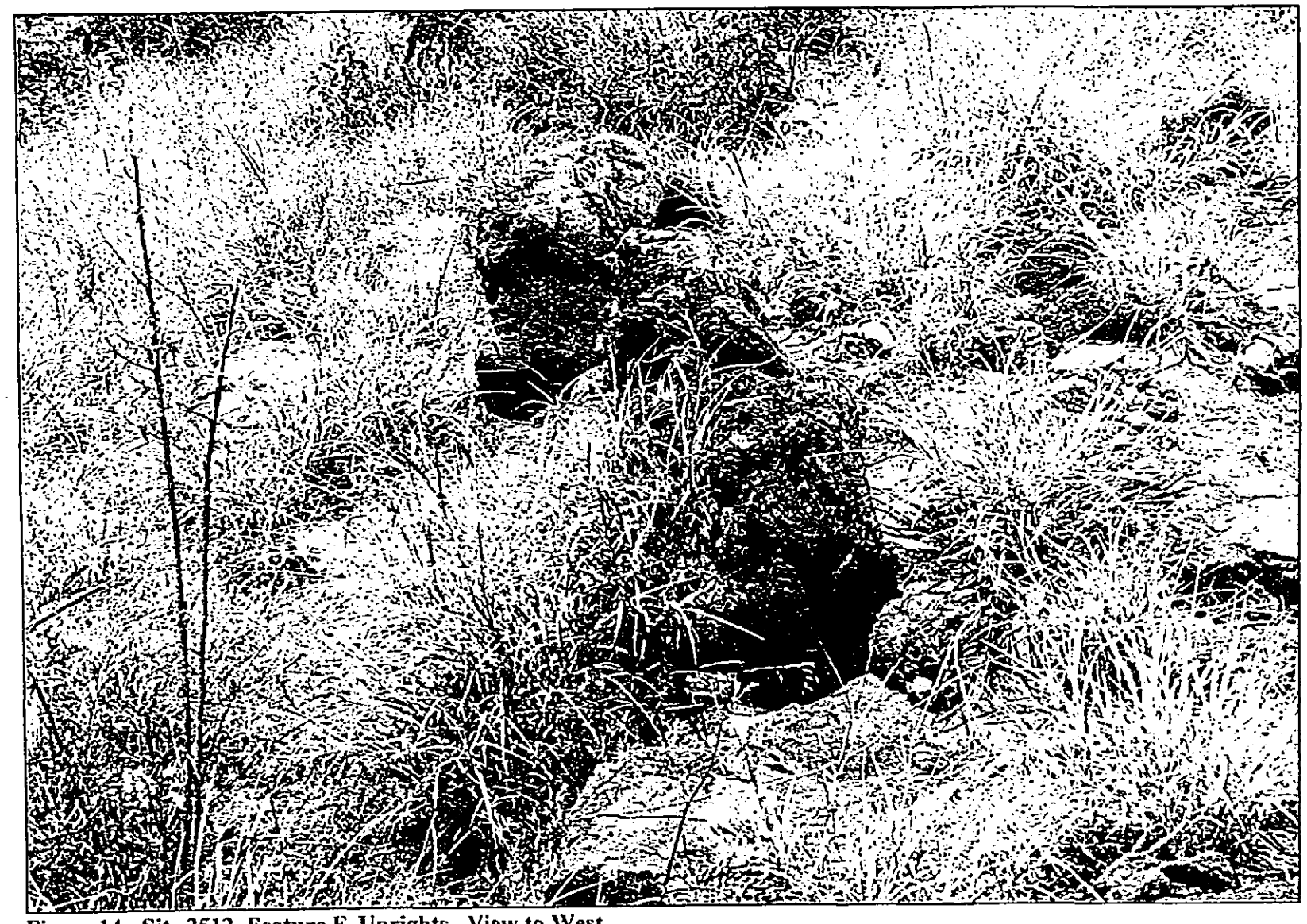

Figure 14: Site 2512, Feature F, Uprights. View to West.

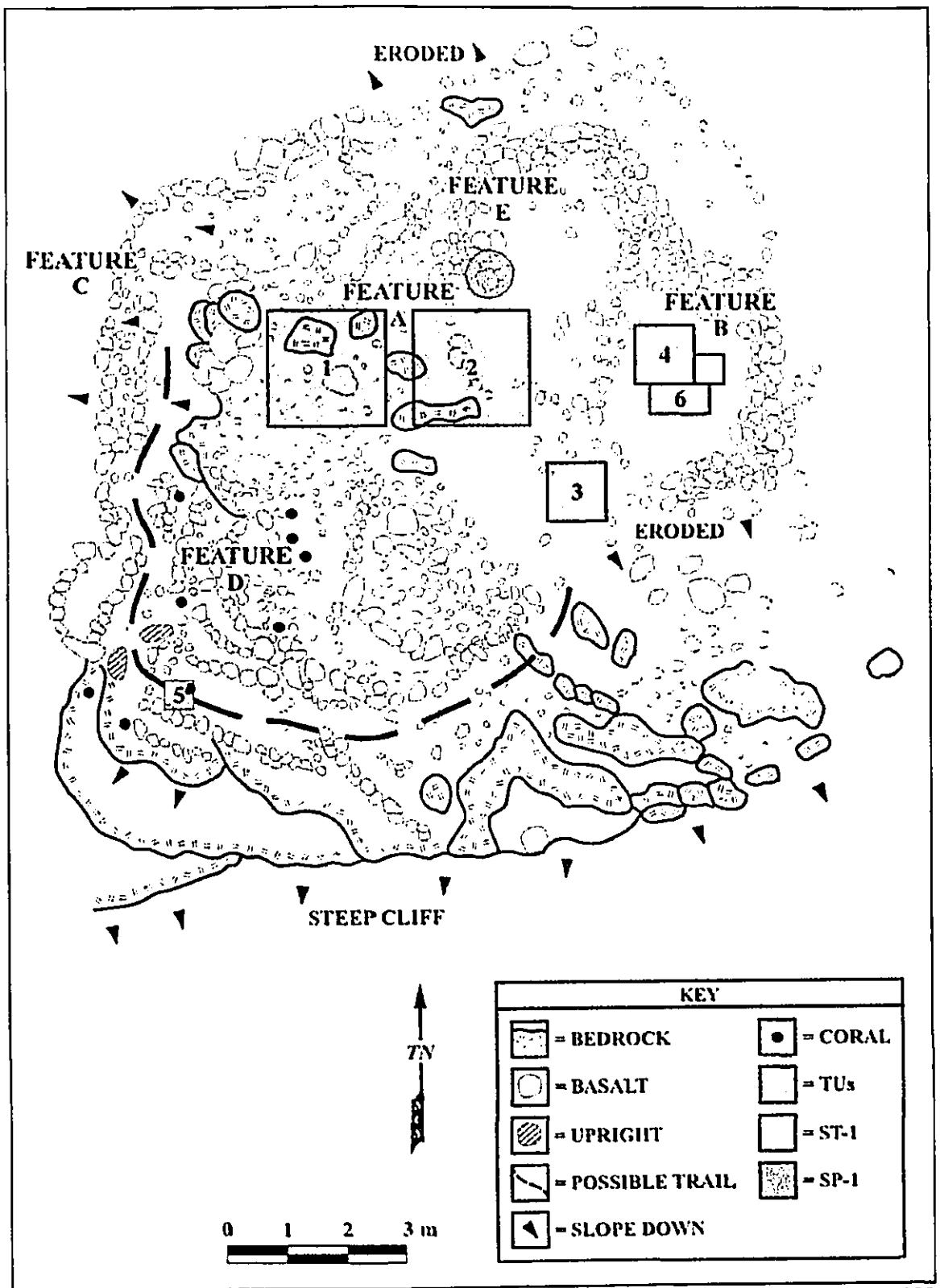

Figure 15: Site 2512, Features A – E with Unit Locations (adapted from Donham, 1990).

The next unit excavated was TU-3, a 1.00 m by 1.00 m unit placed in the southeastern portion of Feature A, in a soil filled area having apparent depth. The unit was located here to explore this apparent depth, and was excavated to bedrock according to natural layers.

The fourth unit excavated was TU-4, another 1.00 m by 1.00 m unit located in the northwest portion of Feature B, placed in order to explore this feature's nature. This unit was excavated according to natural layers, and exposed the northwestern portion of Subsurface Feature 2512-B.1, which then generated the excavation of ST-1 and TU-6. ST-1 was a 0.50 m by 0.50 m unit placed adjacent to TU-4, to the east, in order to completely expose the profile of SSF B-1. TU-6, a 1.00 m by 0.50 m unit, was located to the south of TU-4 and ST-1 in order to remove the southern half of the SSF, its fill collected in its entirety. TU-4 was terminated about 0.10 m below the bottom of the SSF, well into the sterile substrate identified in TU-2, while both ST-1 and TU-6 were terminated once they reached this same level. TUs 4 and 6 were excavated by natural layers.

TU-5 was a 0.50 m by 0.50 m unit located on the largest terrace-like component of Feature D, placed here in an attempt to determine its function. It was excavated in natural layers and taken to bedrock.

SP-1, the final excavation at the site, was a 0.80 m diameter shovel probe located in Feature E to determine the presence or absence of human remains. This unit was also terminated at bedrock.

A total of 11.80 square m of surface area was exposed at the site (6 % of Features A-D), and completed in approximately 11 person days.

SITE 2512 RESULTS

STRATIGRAPHY: Profiles at site 2512 were fairly consistent depending on depth of bedrock. They do, however, suggest deflation (see Appendix A).

The stratigraphy of the three units excavated in Feature A differed according to their position on the feature. The profile of TU-1 exhibited a single layer of soil overlying bedrock, the unit reaching a maximum depth of 0.14 m below surface. Indeed, approximately 20% of the surface of this unit was exposed bedrock (Figure 16). TU-2, however, exhibited three soil layers, with the second and third discontinuous. This is primarily due to the slope of the bedrock, which increases in depth across the feature to the north and east. While Layer Ia was ubiquitous across

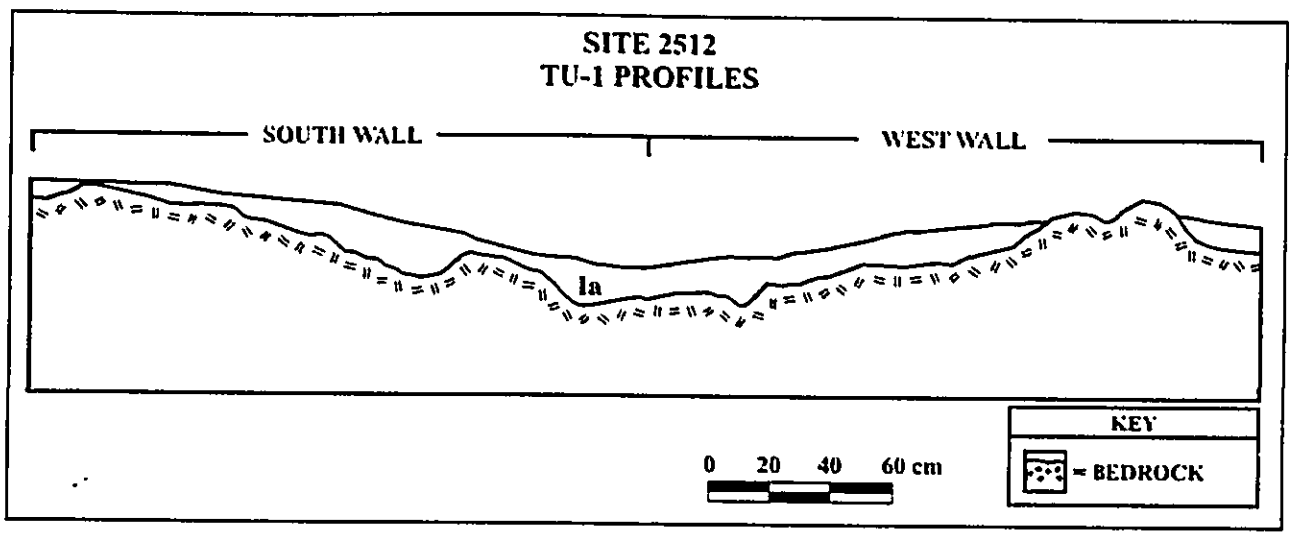

Figure 16: Site 2512, Feature A, TU 1, Profiles.

the unit, Layer IIb, a thin darker layer, was seen only the southern portion of the unit and overlay bedrock. Layer III only occurred in the northeastern portion of the unit, directly under Layer Ia, and was the reddish clay dominant substrate visible in the areas exposed by disturbance beyond the site. As such, where bedrock had not already been exposed, the unit was terminated approximately 0.10 m into this layer, with the unit reaching a maximum depth of about 0.25 m (Figure 17). TU-3 was located about a meter to the southeast of TU-2 and only exhibited 2 layers: Ia and IIb. Layer Ia was ubiquitous while IIb was isolated to a small area in the north portion of the unit. This unit was taken to a maximum depth of 0.23 m below surface, with the entire unit terminated at bedrock (Figure 18).

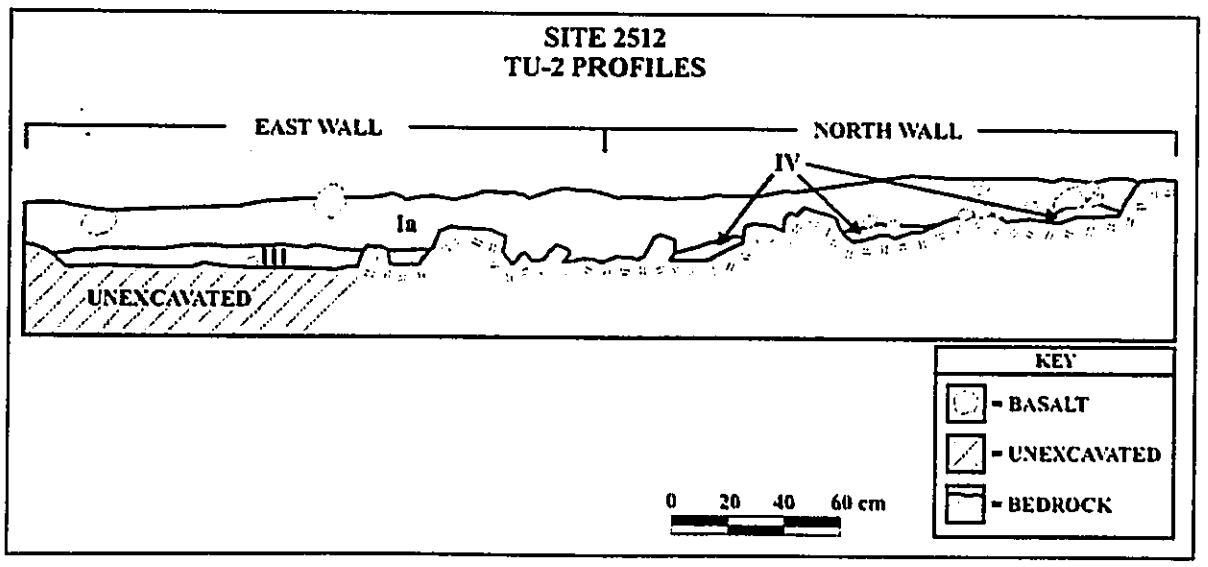

Figure 17: Site 2512, Feature A, TU 2, Profiles.

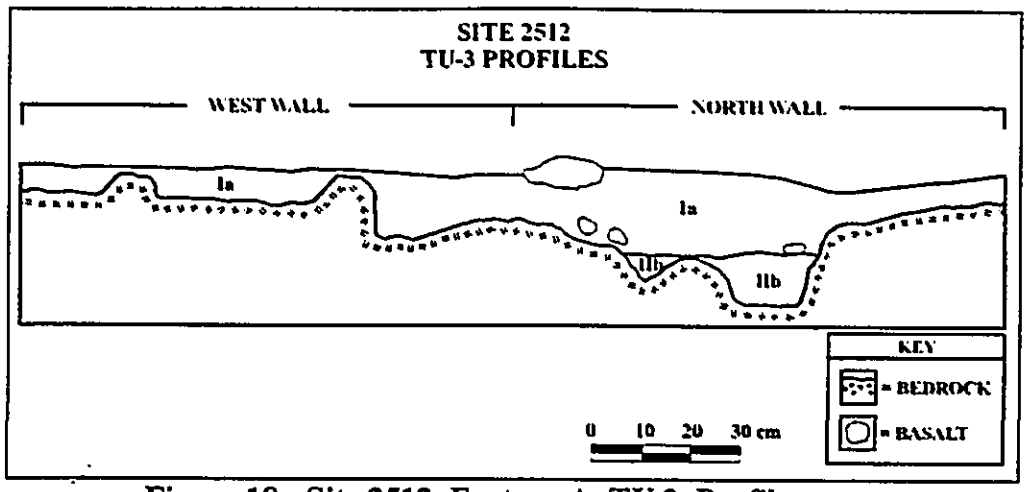

Figure 18: Site 2512, Feature A, TU 3, Profiles.

Three layers were also observed in Feature B, and occurred in all the three units excavated in a similar fashion. The major difference between the layers of Feature A and Feature B were the occurrence of Layer Ib, which was ubiquitous to all these units and up to 0.15 m thick, and Layer IIa, also ubiquitous and up to 0.18 m thick. Again, as in TU-2, where bedrock was not exposed, units were terminated after significant profile exposure was achieved in the culturally sterile Layer III (below Sub-Surface Feature 2512-B.1) (Figure 19).

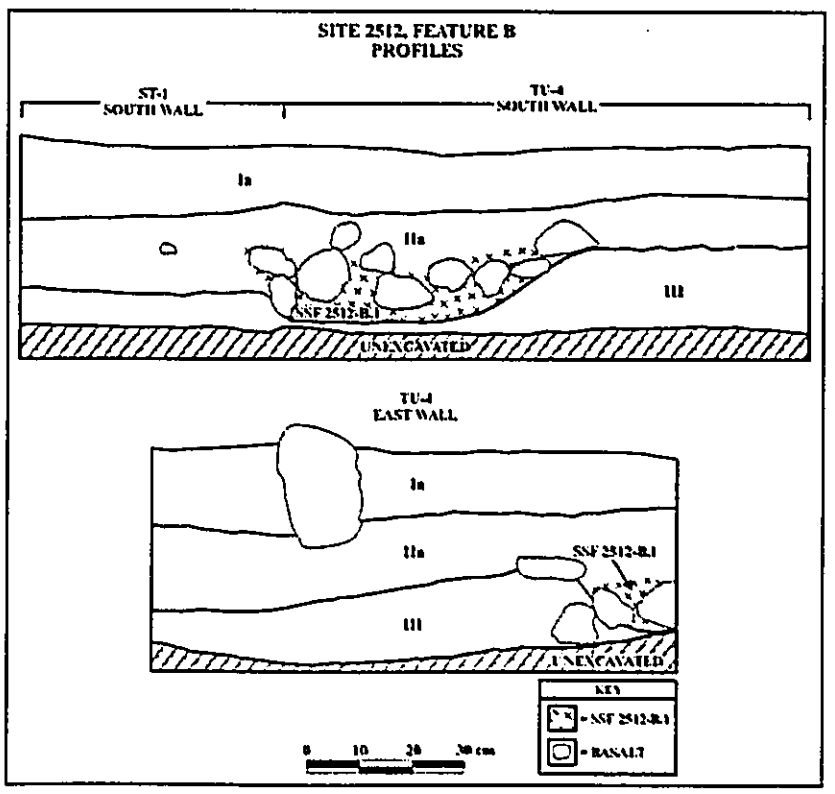

Figure 19: Site 2512, Feature B, TU 4 & ST 1 Profiles with SSF 2512-B.1.

The profile of the 0.50 m by 0.50 m unit excavated in Feature D, TU-5 exhibited two layers before being terminated 0.20 m below surface, at bedrock. The majority of the unit was comprised of Layer Ia, with the second layer being Layer IV. Layer IV reached a maximum of 0.05 m in thickness and appeared lighter in color with a diffuse boundary (Figure 20).

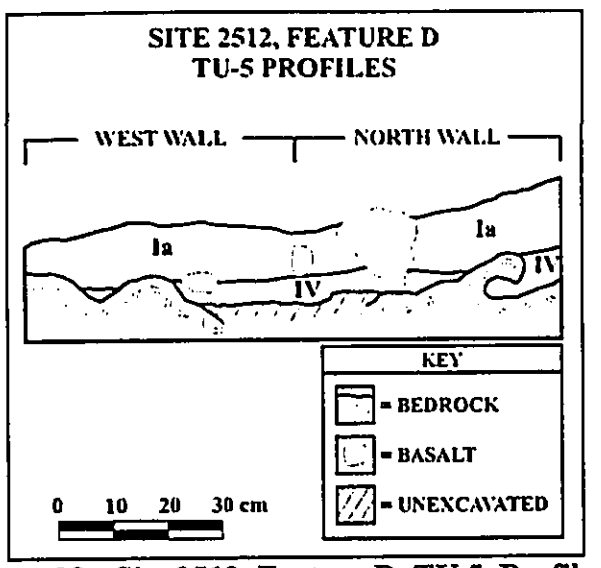

Figure 20: Site 2512, Feature D, TU 5, Profiles.

The soil layers at this site were consistent throughout all of the units. Layer Ia was a brown (7.5 YR 4/3) fine loamy sand to fine sandy clay loam with about 10% pebbles. The layer was structureless and non-sticky and non-plastic with many medium roots. The lower boundary is abrupt, and in some areas the layer bounds on bedrock. Layer Ib was a brown (7.5 YR 4/3) fine sand with about 5% pebbles. The layer is structureless and non-sticky and non-plastic with medium roots. The lower boundary was abrupt. Layer IIa was a dark brown (7.5 YR 3/3) fine sandy loam with about 5% pebbles. The layer was structureless and non-sticky and non-plastic with few medium roots. The lower boundary was abrupt. Layer IIb was a dark brown (7.5 YR 3/3) fine sandy loam with about 25% pebbles. The layer was structureless and non-sticky and non-plastic with few medium roots. The lower boundary was abrupt. Layer III was reddish brown (5 YR 4/4) silty clay loam with about 5% pebbles. The layer was structureless and non-sticky and non-plastic with few fine roots. The layer rested on bedrock. Layer IV was a brown (7.5 YR 5/4) silty clay loam with about 35% small pebbles. The layer consists of fine crumb peds with a weak structure and was slightly sticky and slightly plastic with many very fine to fine roots. The layer bounds on bedrock.

CULTURAL MATERIAL: All cultural material recovered from the site was attributable to native Hawaiians, and other than coral, was minimal. Many large pieces of non-worked

branch coral were identified on the site and coral was the only item found in TUs 1 and 5 (Figure 21). Both coral (much of it burnt) and marine invertebrate shell were recovered from TU-2, primarily occurring in the northeastern portion of the unit, at the bottom of Layer I. TU-3 also yielded coral and marine invertebrate shell, all invertebrate shell recovered from the eighth inch screen and all material deriving from Layer I. All cultural material recovered from the units in Feature B was derived from Layer II, with the majority being from a single, fragmented echinoderm shell occurring in SSF 2512-B.1.

Figure 21: Site 2512, Feature D, TU 5, Showing Coral on Surface.

SUBSURFACE FEATURES: SSF 2512-B.1 was the single subsurface feature was identified at the site, located in Feature B in all three units excavated (see Figure 19; Figure 22). This SSF originated at the bottom of Layer II, intruding 0.12 m into Layer III, and was a 0.70 m diameter pit filled with rock, charcoal and carbon stained soil (Figures 23 and 24). Also recovered from this SSF was a large fragmented echinoderm shell. The feature fill was a very dark brown (10 YR 2/2) sandy silt clay with about 60% pebbles and cobbles and charcoal and carbon staining throughout. The soil was structureless and slightly sticky and slightly plastic with few fine roots. The lower boundary was abrupt.

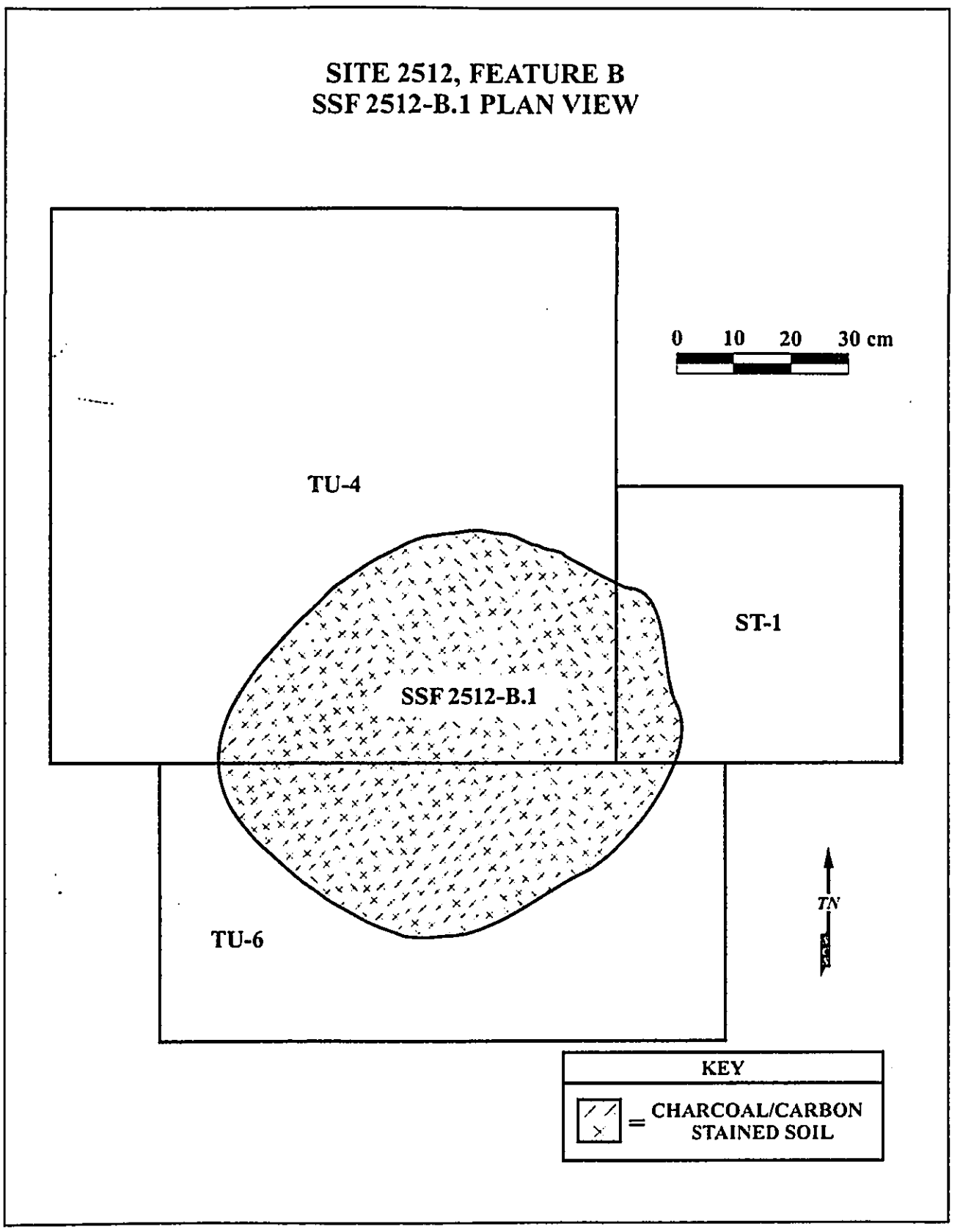

Figure 22: Site 2512, Feature B, SSF 2512-B.1, Plan View.

Figure 23: Site 2512, Feature B, SSF 2512-B.1. View to Southeast.

Figure 24: Site 2512, Feature B, TU 6, SSF 2512-B.1.

The large amount of charcoal was subsequently submitted for a radiocarbon date (Beta sample 204583/SCSRC422). The conventional radiocarbon age obtained from SCSRC422 was 20±60 BP. OxCal v3.5 provided a calibrated date, at 2 sigma, of 1680 (0.23)1740AD, 1800 (0.64) 1930AD, and 1940 (0.13) 1955 AD.

SITE 2514 DESCRIPTION

State Site 2514 is a platform located on a flat-topped knoll, overlooking a broad drainage area (Figure 25). It measures approximately 10.00 m N-S by 8.00 m E-W, and in 1990 was described by Donham as follows:

"The platform is situated on a level knoll and incorporates natural bedrock outcrops present along the slope and crest of the knoll. The perimeter consists of a'a boulders and vesicular pahoehoe boulders and cobbles. The western side is terraced, and extends horizontally 5.25 m out from the platform surface. The eastern side is vertically stacked, with a maximum width of 0.75 m.

Figure 25: Site 2514, Site Overview. View to North.

The platform surface is level, but irregular, due to protruding, partially buried stones. No pavement is evident. Sparsely scattered Cypraeidae shell fragments are present on the platform, in addition to several waterworn basalt pebbles. Pockets of reddish-brown sandy loam are present on and adjacent to the platform.

Additional terrace alignments may well be present along the natural terrace slope, to the north and south sides of the platform. These features will only be identified through extensive vegetation clearing" (Donham, 1990).

The present investigations observed further details. Mapped, but not described was the occurrence of a sub-feature at the southern end of the site. This consisted of a near perfect semicircular arrangement of rocks surrounding an approximately 0.50 m diameter area containing dense small echinoderm fragments. Also mapped but not described was a cluster of small waterworn cobbles on the sites eastern margin. In addition, it should be noted that the entire area surrounding the platform appears quite disturbed, although a fair amount of scattered midden was observed extending out into this disturbance, from the eastern and northeastern side of the feature.

Terrace alignments beyond this feature were not observed.

SITE 2514 METHODS

Excavation at site 2514 was conducted with three test units (Figure 26).

TU-1 was a 1.00 m by 2.00 m unit placed in the southern half of the platform in an area of surface soil within its interior, with the south end of this unit also overlaying a portion of the features south retaining element. The unit was placed to help understand the temporal and functional nature of the feature, in addition to expose its architecture. TU-1 was excavated by natural layers and terminated at bedrock.

TU-2 was a 1.00 m by 0.50 m unit placed over the sub-feature (SF 2514.1) located on the southern margin of the site in order to explore the nature of this sub-feature. This unit was positioned so that it could divide the SSF in half, bisecting it across its center. Excavation began with the east half of the sub-feature being removed and screened separately, followed by the excavation and screening of non-feature matrix, which was taken to bedrock. A profile of this bisect was then drawn, followed by the removal of the sub-features west half, collected in its

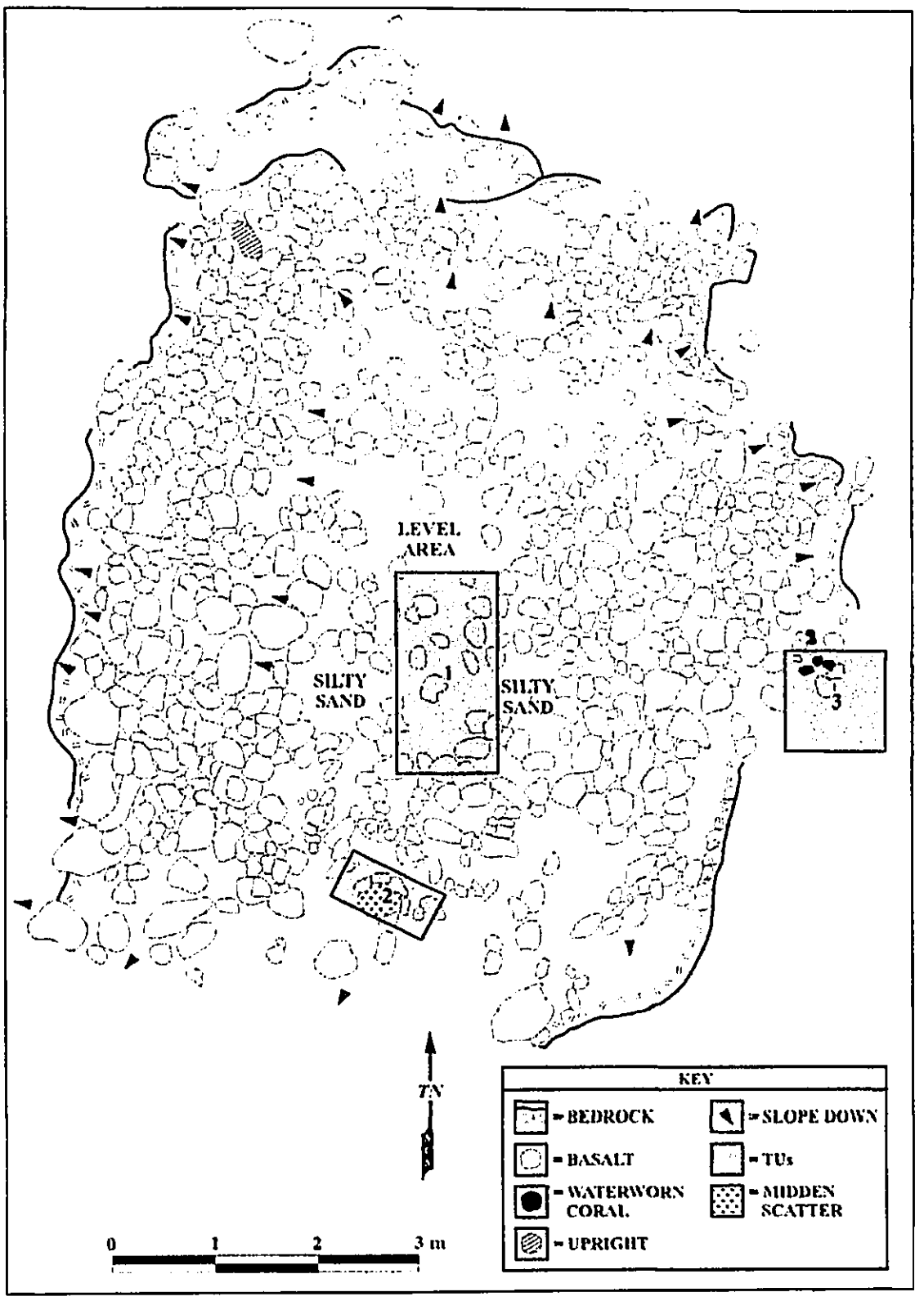

Figure 26: Site 2514 with Unit Locations (adapted from Donham, 1990).

entirety. Non-feature matrix in the units west half was not excavated, and the unit terminated. Material from this SSF was submitted for radiocarbon dating.

The final unit excavated, TU-3, was a 1.00 m by 1.00 m unit placed along the features east edge in the area containing several water-worn cobbles. This unit was excavated to see if the area contained additional subsurface cultural material, although much of the unit appeared to be in disturbed area. TU-3 was excavated in natural layers and taken to bedrock.

A total of 3.5 m of surface area was excavated at this site (4%), and completed in about 5 person days.

SITE 2514 RESULTS

STRATIGRAPHY: Only a single layer was recorded in all three of the units excavated at the site, and all were shallow, excavated to bedrock (see Appendix A). The soil of TU-1 was slightly different than the other units, containing more sand toward its surface and more silt toward its bottom. In addition, a poorly defined carbon stained area was identified in its northwest portion. Otherwise, the soils of all three units were remarkably similar. Maximum depths were 0.23 m for TU-1, 0.10 m for TU-2, and 0.20 for TU-3 (Figures.27 and 28).

Layer I was a brown (10 YR 4/3) loamy fine sand with about 25% pebbles and cobbles. The layer was structureless and non-sticky and non-plastic with medium to fine roots. The layer bounds on bedrock.

The southern portion of TU-1 was also situated so that it penetrated the interior of the features retaining element (Figure 29). Excavation revealed that this architecture consisted of a single course of cobbles resting on bedrock.

CULTURAL MATERIAL: Gastropod shell formed the majority of the cultural material at the site, followed by echinoderm shell. Densities of marine shell were similar between TUs 1 and 3, units located within and outside of the features retaining element, although TU-3 also contained several small water worn cobbles. A single piece of volcanic glass debitage was recovered from TU-1, while a single piece of basalt debitage was recovered from TU-3. These were the only other manufactured artifacts recovered from the site. A fairly large quantity of echinoderm shell was also found in the sub-feature in TU-2.

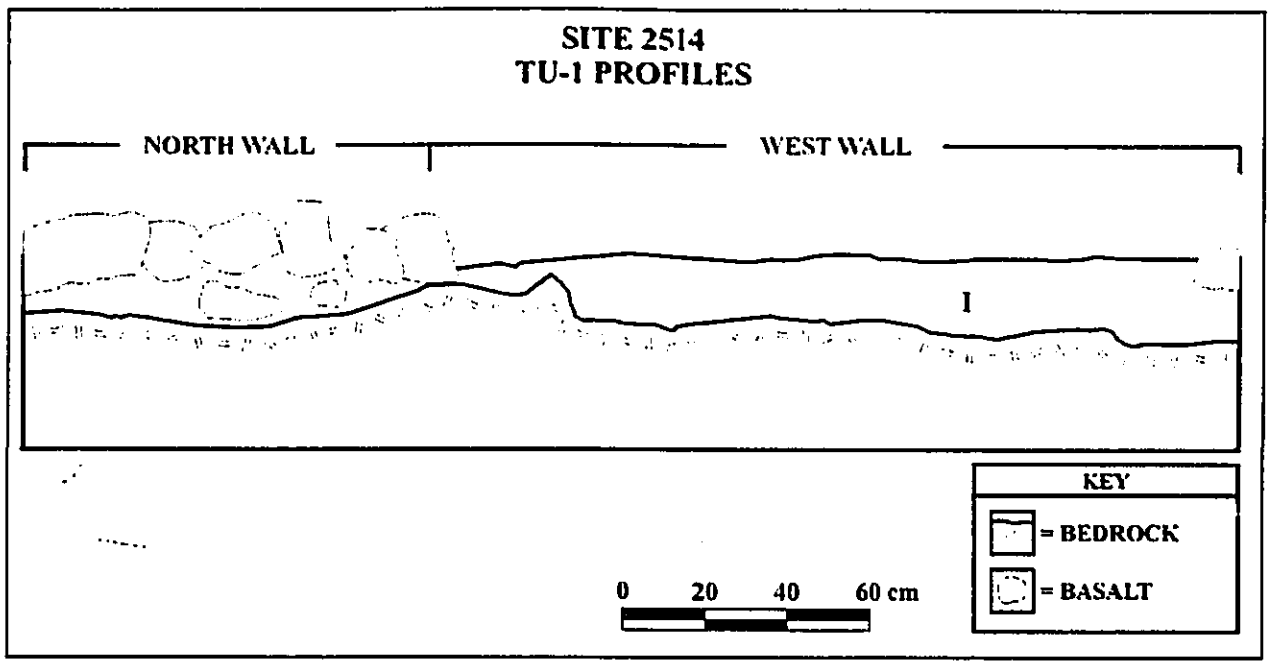

Figure 27: Site 2514, TU 1, Profiles.

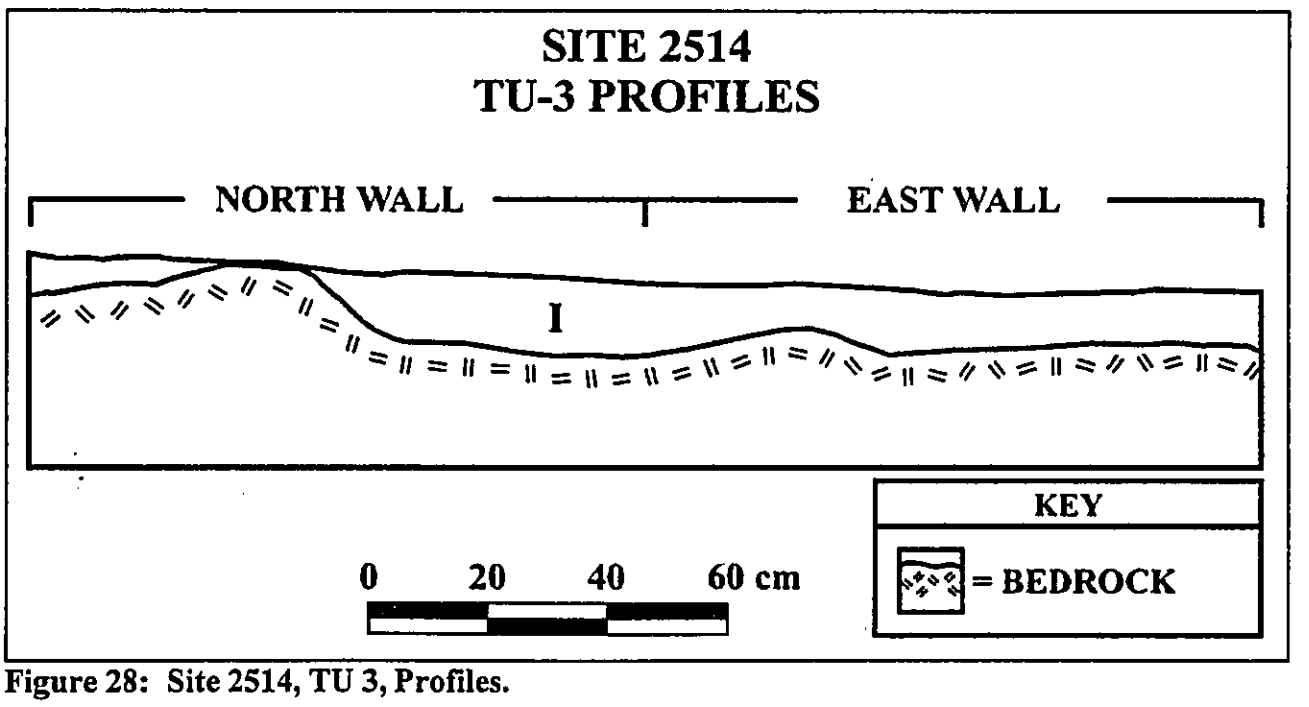

Figure 28: Site 2514, TU 3, Profiles.

Figure 29: Site 2514, TU 1, View to North

SUBFEATURES: Identified at the southern end of the site, immediately outside of the platforms retaining element was sub-feature 2514.1 (Figure 30). On the surface this sub-feature appeared as a semi-circular alignment of large cobble slabs, delineating the northern boundary of a 0.80 m diameter area containing many small echinoderm shell fragments. Excavation subsequently revealed it to be less than 0.10 in depth, rested on bedrock, and did not contain additional buried rocks in the alignment (Figure 31). The matrix was ashy silt with and enough charcoal recovered to be submitted for a radiocarbon date.

The feature fill was a brown (10YR 4/3) loamy fine sand with about 25% pebbles and cobbles. The soil was structureless and non-sticky and slightly plastic with few medium to fine roots. SSF 2514.1 rests on bedrock.

The radiocarbon dating sample (Beta sample 204585/SCSRC424) provided a conventional radiocarbon age of 320±40 BP. OxCal v3.5 provided a calibrated date, at 2 sigma, of 1460 (1.00)1660AD.

Figure 30: Site 2514, TU 2, SSF 2514.1.

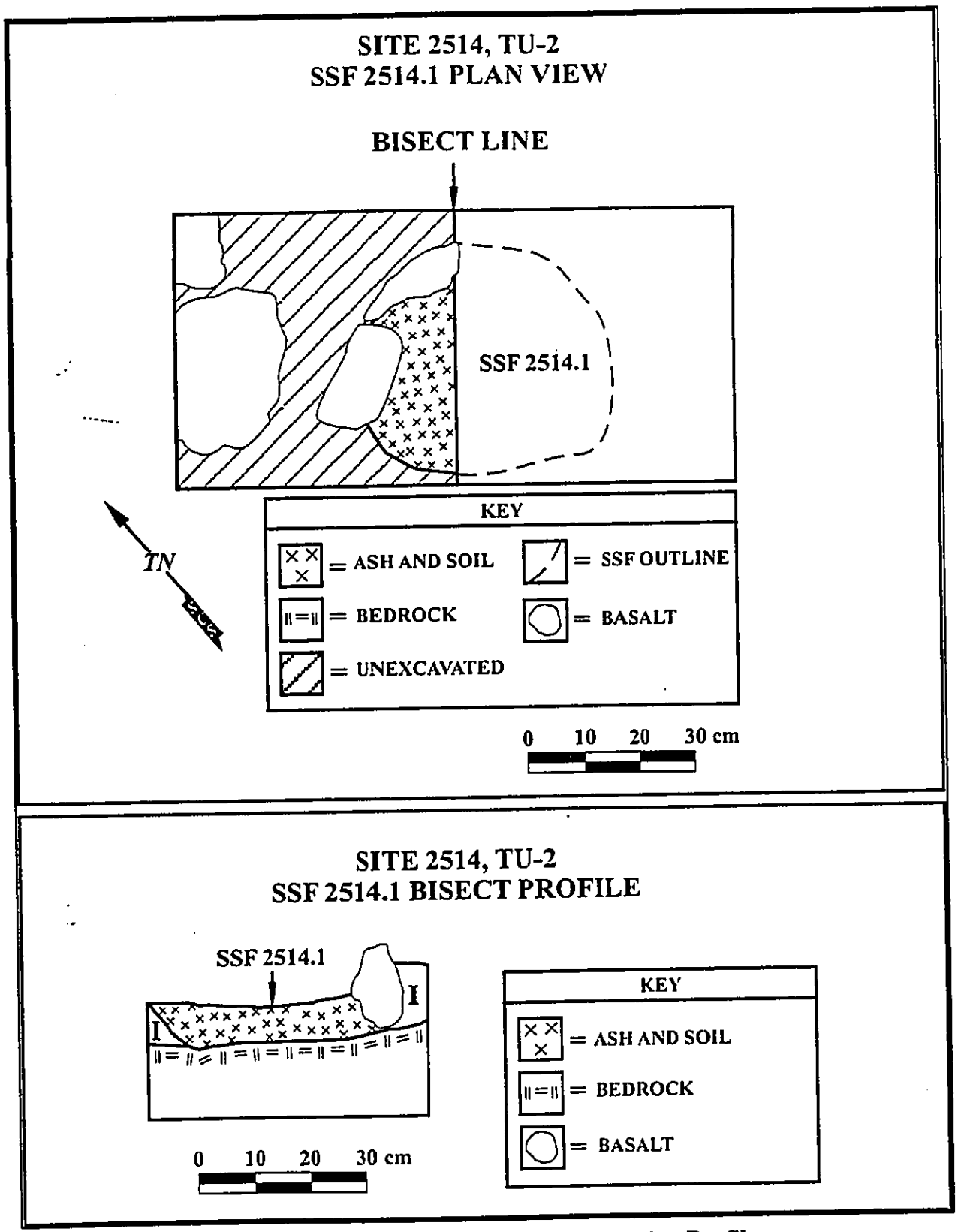

Figure 31: Site 2514, TU 2, SSF 2514.1, Plan View & Bisection Profile.

SITE 2516 DESCRIPTION

State site 2516 consists of two features located on a flat area, just below the steep west-facing slope of a large natural terrace. Overall site dimensions are 16.00 m N-S by 5.00 m E-W. In 1990 it was described by Donham:

"Two low enclosures were identified at this site. Feature A is a circular enclosure and Feature B is roughly rectangular. They are located 6.50 m apart, along a N-S line. Feature A is the northernmost enclosure. Subsurface midden remains were collected from Feature B.

FEATURE A: Low enclosure
FUNCTION: Agriculture
DIMENSIONS: Interior, 2.05 m N-S by 2.00 m E-W; overall 3.80 m N-S by 4.70 m E-W by 0.45 m maximum wall height

DESCRIPTION: Feature A is a doughnut-shaped wall consisting of loosely piled or mounded a`a cobbles. A portion of the wall (northwest side) is stacked up to four courses high, but is not formally faced. This section has the highest exterior wall height (0.45 m). Average exterior wall height is 0.10 m, and average interior wall height is 0.20 m. Width of the wall varies from 0.90 to 1.40 m.

The interior area is level and free of surface stones, however, numerous buried stones are slightly protruding. Reddish-brown silty loam that is slightly darker than exterior soil is present inside the feature. No portable remains were found inside, however, two Cypraeidae fragments were observed outside, along the adjacent hillside to the east.

No obvious opening is present in the wall; however, there is a 2.00 m wide section at the south side that consists of a partially buried alignment with few surface stones. This section of the wall is considerably narrower than other sections.

FEATURE B: Low enclosure
FUNCTION: Temporary habitation
DIMENSIONS: Interior 4.80 m N-S by 2.70 m E-W; overall 6.00 m N-S by 4.40 m E-W by 0.40 m maximum wall height

DESCRIPTION: This enclosure is roughly rectangular in plan view, with the major axis oriented N-S. The wall consists of stacked cobbles and a single course of boulders turned on edge. Portions of the wall appear to have been double alignments (possibly bi-faced) with core filling. Maximum wall height (0.40 m) is on the exterior side of a large boulder set on edge. This

boulder is located at the southeastern corner of the wall, where four large boulders are concentrated. A 1.75 m wide opening is present in the center of the west side of the enclosure. Large boulders are set on end at both sides of this opening.

The interior area is flat and cleared of nearly all surface stones: no buried stones are indicated under the leveled soil floor. A 0.50 by 0.50 m square test unit was excavated near the center of the enclosure. Three soil layers were encountered, one of which (Layer II) contained cultural remains.

Layer I extends from the surface to 0.10 m below surface and consists of dark reddish-brown silty clay loam with a moderate amount of pebble-size gravel. Layer II extends from 0.10 to 0.19 – 0.21 m below surface and consists of dark reddish-brown silty clay with very few pieces of gravel. The boundary between Layers I and II is very diffuse, as is the boundary between Layers II and III. Layer III extends from 0.19-0.21 to 0.26 m below surface and consists of reddish-brown silty clay with densely packed large pebbles and small cobbles. This layer overlies impenetrable decomposing bedrock.

Portable remains recovered from screened Layer II soil include minute basalt and volcanic glass waste flakes (one of each), wood charcoal, *Echinoidea, Crustacea, Cypraedae,* and *Brachidontes* c.. All of the recovered portable remains are less than 1/4 inch in sizs. A single minute piece of *Crustacea* was recovered from the Layer III soil" (Donham, 1990).

The current investigations found Donham's description accurate, with the exception of subsequent disturbance. At present, the southern portion of Feature A has been quite disturbed with a short wall section built, approximately 0.70 m in height, located about 4.00 m to the northwest. A moderate sized dozer push pile is also located in this area (Figure 32). Evidence of recent disturbance additionally occurs to the southeast of Feature B. In this area, two mounds of rocks have been constructed, about 0.70 m high and about 1.00 m in diameter (Figure 33).

Donham's 1990 test unit in feature A was easily identified.

SITE 2516 METHODS

After extensive clearing exposing both site features and the area around them, two test units were excavated (Figure 34).

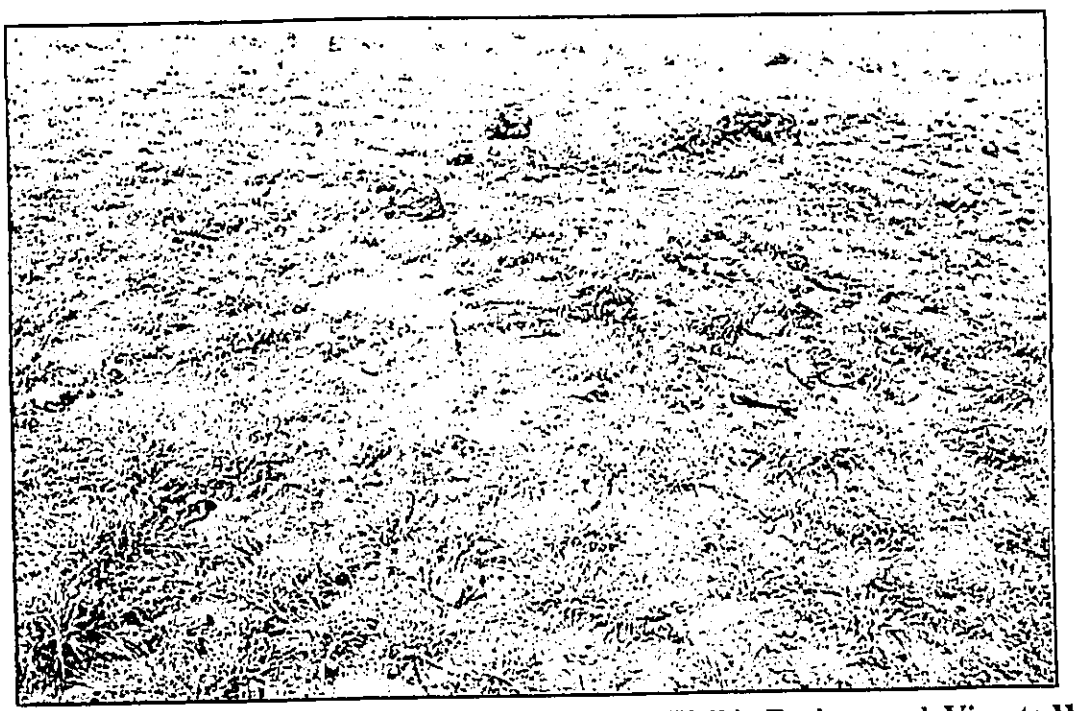

Figure 32: Site 2516, Feature A Overview with Recent Wall in Background. View to West.

Figure 33: Site 2516, Feature B Overview with Recent Rock Piles in Background. View to Southeast.

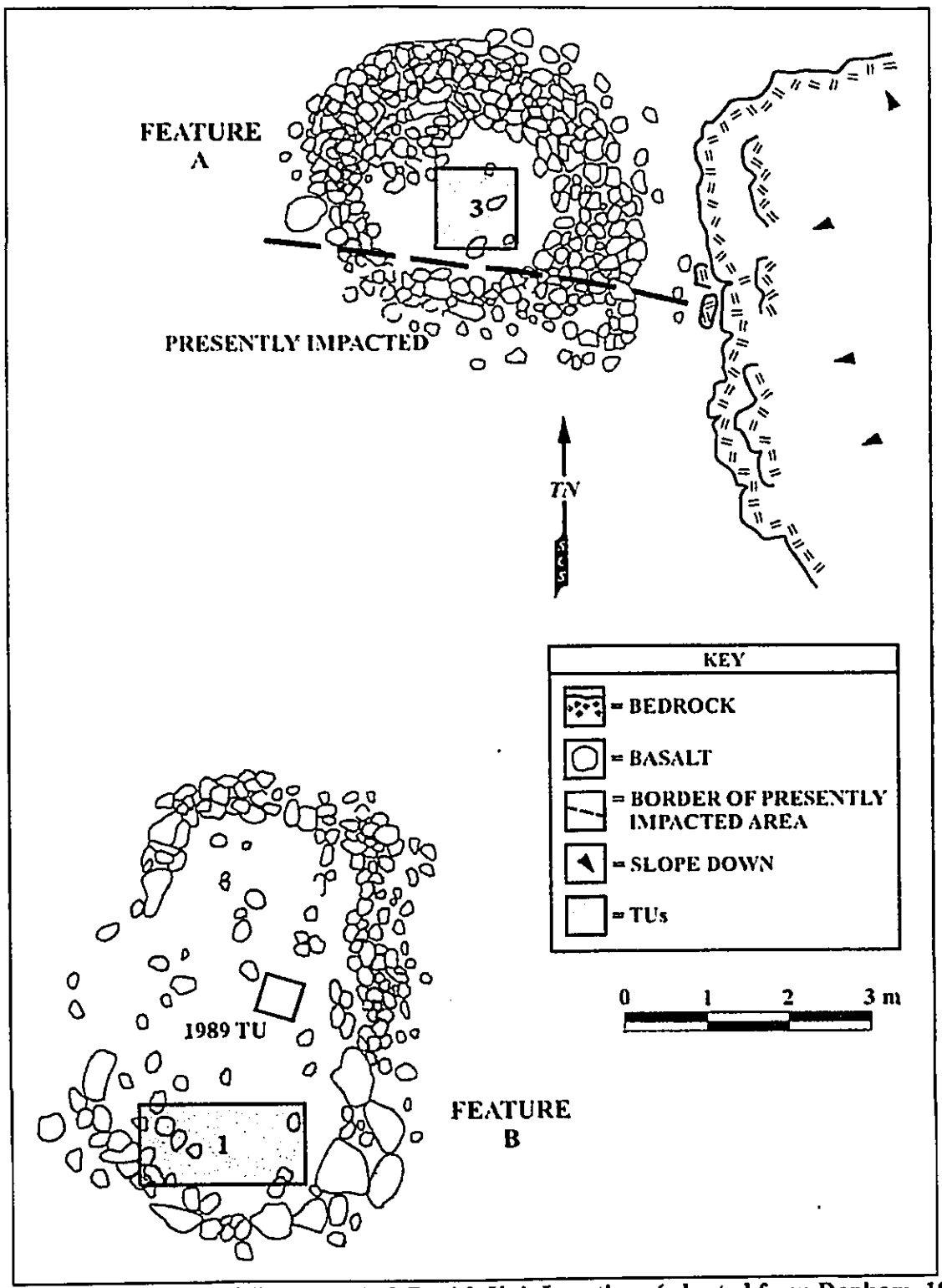

Figure 34: Site 2516, Features A & B with Unit Locations (adapted from Donham, 1990).

TU-1 was a 1.00 m by 2.00 m unit placed in the interior of Feature B, along its southern margin, adjacent to its south wall. This unit was located in hopes of finding subsurface features, being placed on the leeward side of the features south wall, with this portion of the feature apparently least affected by the prevailing winds. The unit was excavated in layers and levels, the data from the 1990 test unit indicating the unclear nature of natural layer boundaries. TU-1 was terminated at contact with a layer of dense, hard packed colluvial gravel mixed with decomposing bedrock, which corresponded to the 1990 units layer III, a nearly sterile layer under laying its primary cultural layer.

The second unit excavated at this site was TU-2, a 1.00 m by 1.00 m unit placed in the center of Feature A, and encompassing approximately a third of its soil filled interior. Placement of this unit was implemented to investigate feature function and temporal position. Excavation was conducted in natural layers, with the unit terminated at its contact with the same substrate identified in TU-1. A sub-surface feature was identified in this unit and bisected on a N-S axis. Fill from the south half of this subsurface feature was screened separately, while the fill from its north half was collected in its entirety.

A total of 3.00 m of surface area was excavated at this site, comprising 7% of its feature area and completed in about 5 person days.

SITE 2516 RESULTS

STRATIGRAPHY: Stratigraphy differed between Features A and B, with the stratigraphy in TU-1, differing from the 1990 test unit excavated in the same feature (see Appendix A).

TU-1 was located in Feature B and demonstrated two soil layers before reaching a maximum depth of 0.27 m (Figure 35). Because layer boundaries were ephemeral, however, and the unit was excavated in three arbitrary levels, the thickness' of these layers being problematic. The primary difference between layers in TU-1 and the first two layers in the 1990 TU is that Layer I, a silty clay loam, is the primary cultural bearing layer in TU-1, while Layer II is the primary cultural bearing layer in the 1990 TU. An ill defined lightly carbon stained area containing much charcoal was observed toward the Layer I/IIIa interface in the southern portion of TU-1, and a fair amount of charcoal and cobble sized rock also observed in the vicinity. This charcoal was collected and combined with that of the carbon stained area and subsequently submitted for a radiocarbon date.

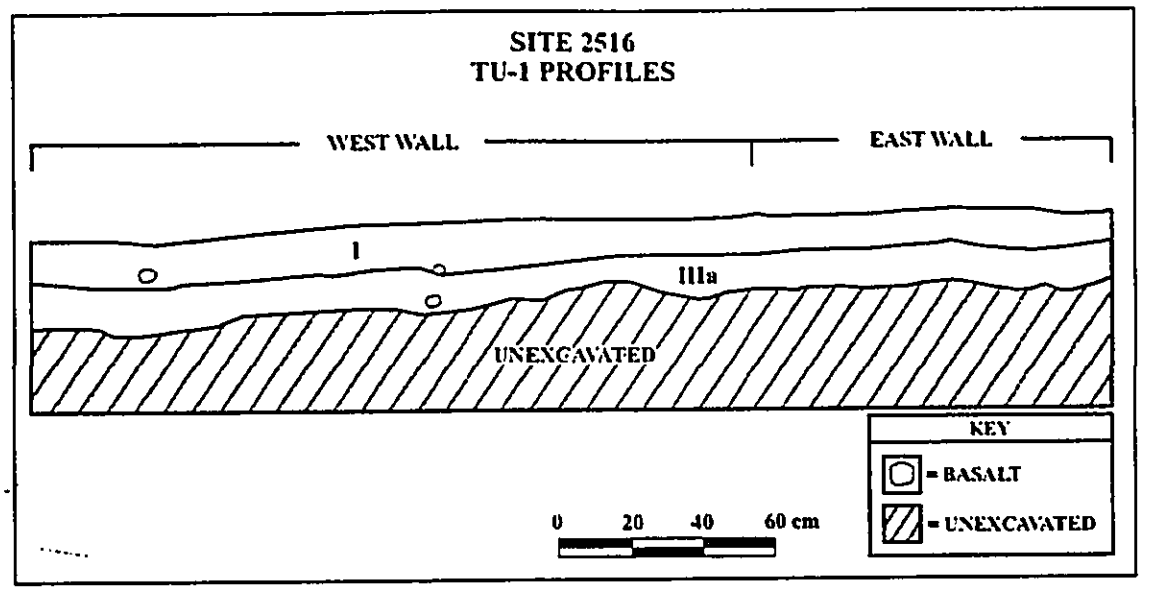

Figure 35: Site 2516, Feature B, TU 1 Profiles.

TU-2, located in Feature A, demonstrated three well-defined layers before being terminated at its contact with a pavement similar to that of TU-1 (0.35 m below surface) (Figure 36). All layers contained cultural material, with Layer II containing the overwhelming majority. Layer IIIb, with the exception of an intrusive sub-surface feature, corresponded well with Layer II in the 1990 unit of Feature B, in its relative lack of rock.

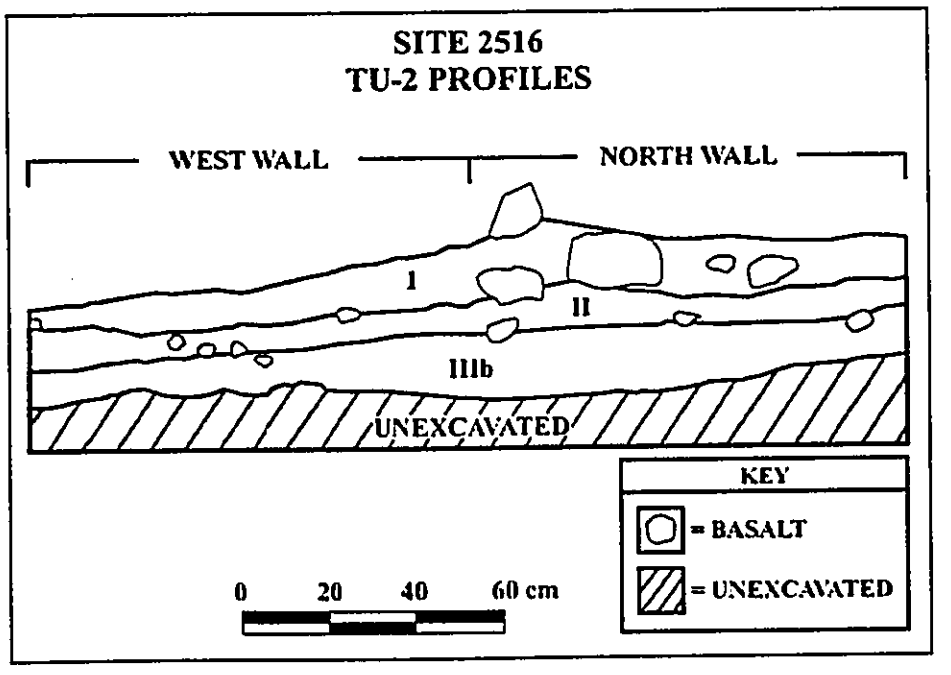

Figure 36: Site 2516, Feature A, TU 2 Profiles.

CULTURAL MATERIAL: All cultural material recovered is attributable to native Hawaiians and consisted primarily of marine gastropod shell, although coral is well represented, especially in TU-1. Echinoderm remains were minimal in this unit with the exception of a large *Heterocentrotus* spine, which may be a tool. This situation contrasts with the 1990 TU, where echinoderm shell was the dominant remains.

Cultural remains from Layer I in TU-2 were minimal, although the recovery of a piece of volcanic glass is noteworthy. Another piece of volcanic glass was also recovered from Layer II, but gastropod shell remains were common. The midden recovered from Layer IIIb outside of the intrusive sub-surface feature was greater than that of Layer I, but less than Layer II, and also dominated by marine gastropod shell. Coral is poorly represented in this unit.

SUBSURFACE FEATURES: Sub-surface Feature 2516-A.1 was not completely excavated, extending into the east wall of TU-2. About four fifths of it was exposed in plan view, however, and this exposure showed it to be a hearth lined with large cobbles with a north-south diameter of 0.60 m (Figures 37 and 38). A bisection revealed the feature to be 0.12 m in depth and filled with brown loamy silt containing large pebbles/small cobbles (Figure 39). Although several burnt shell fragments were recovered, the feature yielded little charcoal. Rock in the fill appeared to be thermally altered

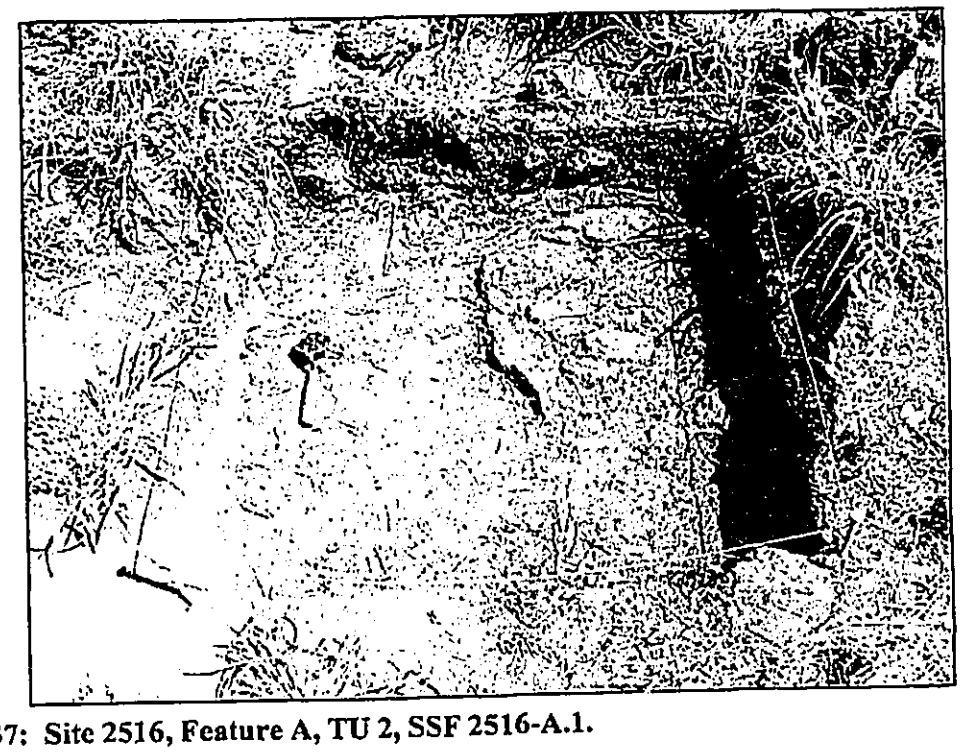

Figure 37: Site 2516, Feature A, TU 2, SSF 2516-A.1.

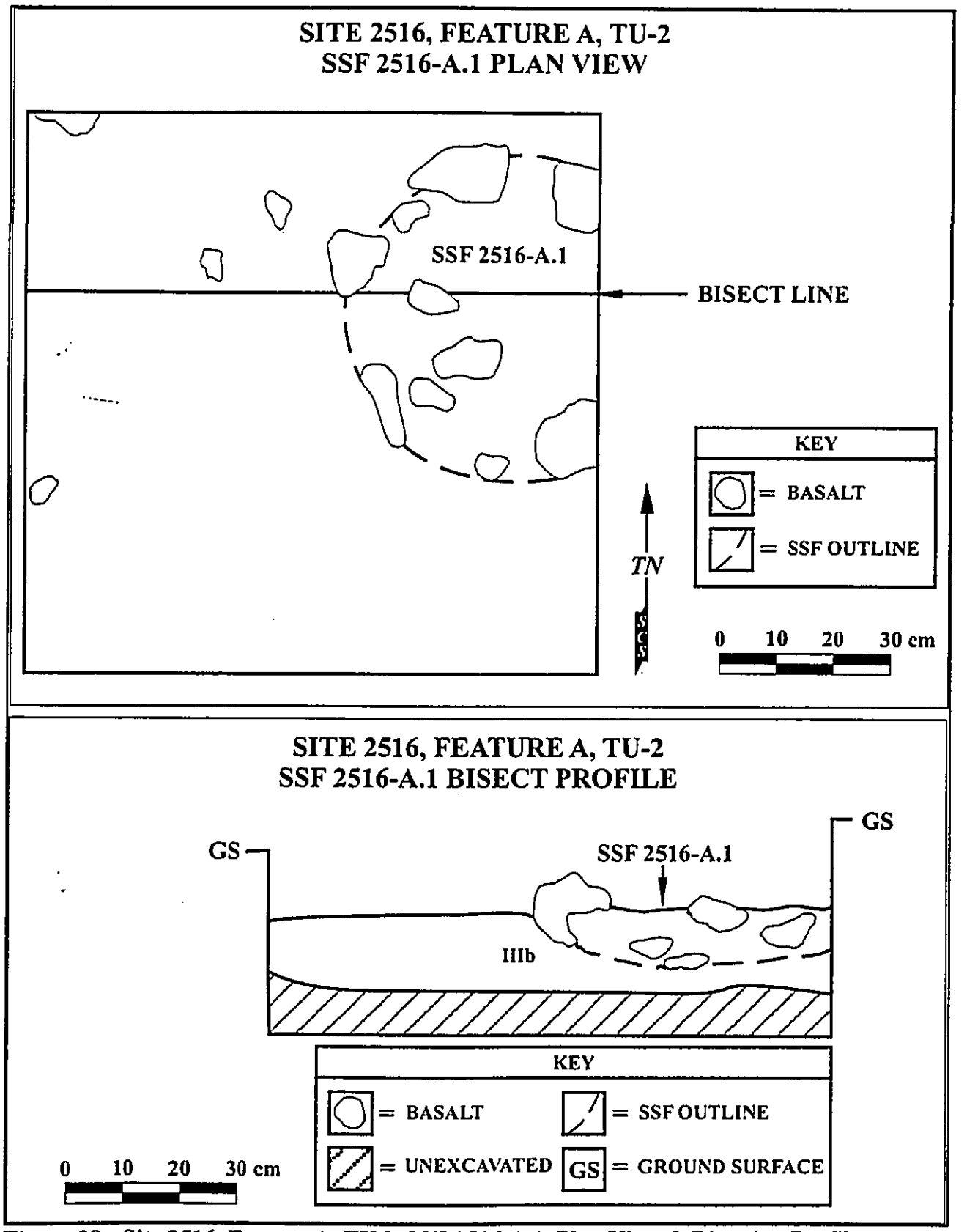

Figure 38: Site 2516, Feature A, TU 2, SSF 2516-A.1, Plan View & Bisection Profile.

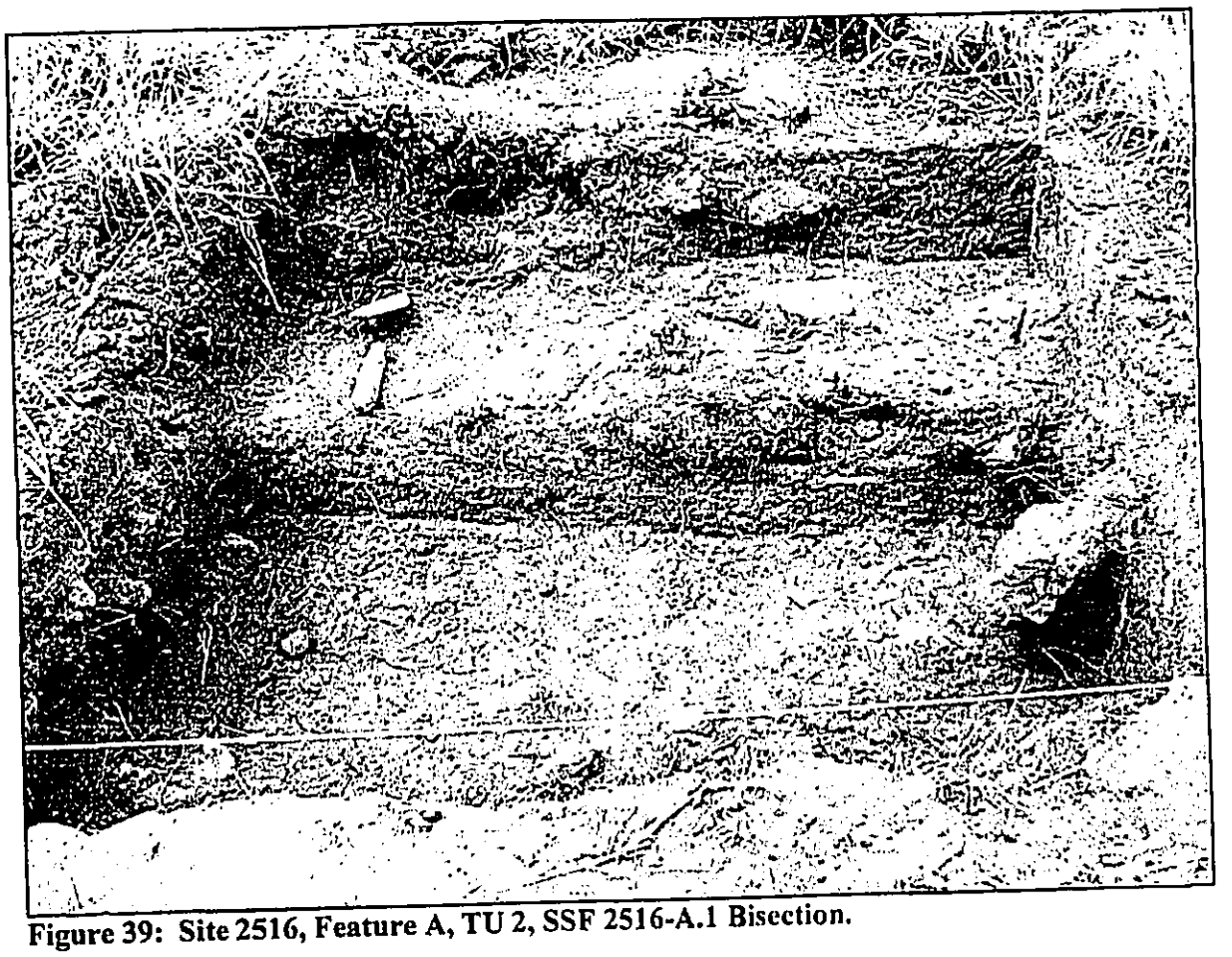

Figure 39: Site 2516, Feature A, TU 2, SSF 2516-A.1 Bisection.

The previously mentioned ill-defined carbon stained area noted in TU-1 was also once a probable hearth. Charcoal from this feature and the associated portion of the layer was submitted for radiocarbon dating analysis (Beta sample 204584/SCSRC423). The conventional radiocarbon age obtained from this sample was 70±50 BP. Using OxCal v3.5, this age provided a calibrated date of 1670 (0.30) 1780 AD and 1800 (0.70) 1955 AD.

The soil layers were consistent throughout the site. Layer I was a brown (7.5 YR 4/4) silty clay loam with about 15% pebbles and cobbles. The layer was structureless and slightly sticky and slightly plastic with many fine to medium roots. The lower boundary was abrupt to clear. Layer II was a brown (7.5 YR 4/4) silty clay with about 35% cobbles. The layer has a weak structure with very fine granular peds and is slightly sticky and slightly plastic with many fine to very fine roots. The lower boundary is abrupt to clear. Layer IIIa was a dark reddish brown (5 YR 3/4) silty clay loam with about 15% pebbles and cobbles. The layer consists of very fine granular peds with a weak structure and was slightly sticky and slightly plastic with medium to fine roots. The lower boundary was abrupt. Layer IIIb was a strong brown (7.5 YR

4/6) silty clay loam with about 15% pebbles and cobbles. The layer consists of very fine granular peds with a weak structure and was slightly sticky and slightly plastic with many fine to medium roots. The lower boundary was abrupt to clear. Subsurface Feature 2516-A.1 fill was a brown (7.5 YR 4/4) silty clay with about 15% large pebbles and small cobbles. The soil was structureless and slightly sticky and slightly plastic with charcoal flecks scattered throughout and many fine roots. The lower boundary was abrupt.

SITE 2519 DESCRIPTION

State site 2519 is a terrace system located along the upper west facing slope of a knoll, situated at the edge of a natural terrace overlooking a small drainage basin. It measures 7.5 m E-W by 5.0 m N-S, and in 1990 was described by Donham:

"This site consists of a stepped terrace system constructed around the contours of a natural terrace and knoll. Three levels were identified at the time of this survey, and it appears that additional levels are present, obscured by vegetation. The lower level contains a triangular rock-filled terrace 0.15 m high, adjacent to a narrow drainage channel (possibly artificial). This terrace is 3.00 m long and 1.80 m wide. The two upper levels consist of aligned cobbles and small boulders; narrow soil flats are present immediately behind (upslope) the risers.

Additional vegetation clearing is needed in order to determine the extent and structure of this site. It may adjoin Site T-14, currently located c. 20 m to the north" (Donham, 1990).

After considerable effort, the present study failed to relocate this site. It appears to have been a casualty of post-1990 disturbance.

SITE 2522 DESCRIPTION

State site 2522 consists of two conjoined features located on the top of a low knoll, overlooking a small drainage to the north, and a small drainage basin to the west (Figure 40). It measures 6.0 m N-S by 7.5 m E-W and was described in 1990 by Donham as follows:

"A box C-shape (Feature A) and a terrace (Feature B) were identified at this site. The two features are immediately adjacent to one another, with Feature B to the east side of Feature A. It appears that additional hillside terracing is present at the site, obscured by vegetation. This site may be connective with Site 2519, located c. 20.0 m to the south on the same ridge formation.

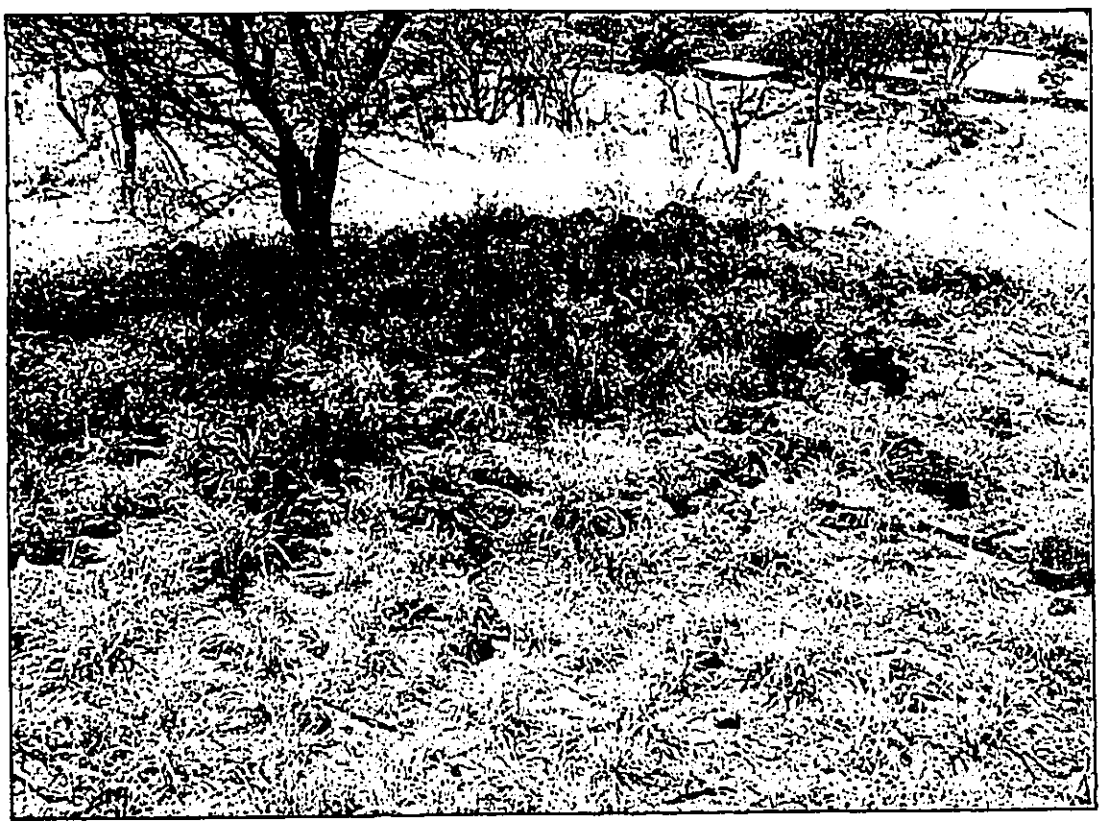

Figure 40: Site 2522, Site Overview, View to West.

FEATURE A: Box C-shape
FUNCTION: Agriculture or temporary habitation
DIMENSIONS: Interior area 2.60 m NW-SE by 1.40 m NE-SW; overall 4.40 m NW-SE by 2.80 m NE-SW; maximum wall height 0.30m

DESCRIPTION: This feature consists of a straight-sided square cornered C-shape that opens to the south side. The walls consist of loosely stacked cobbles set in parallel alignments an average of 0.50 m apart. The walls are filled with additional cobbles; no faced portions are present. The east and west sides incorporate exposed bedrock, and the two corners are squared. Maximum wall height is at natural bedrock areas; the stacked portions average 0.15 m in height (2-3 courses). The interior area is level and generally cleared of loose rubble, with a few cobbles scattered on the surface. The soil deposit appears to be at least 0.10 thick in places: no portable remains were observed in or around the feature.

FEATURE B: Terrace
FUNCTION: Agriculture
DIMENSIONS: 3.00 m N-S by 3.00 m E-W

DESCRIPTION: Feature B abuts Feature A along the east wall, where exposed bedrock is present. It is a rock filled terrace with perimeters defined by large aligned cobbles. It is triangular in plan view, with the broad side adjacent to Feature A and the point to the northeast. The surface of the terrace is level with the tops of the perimeter stones consists of rough cobbles and pebbles. A second terrace may be present to the northwest; additional vegetation clearing is necessary in order to determine the actual extent of the site" Donham, 1990).

The current investigations at this site found it somewhat different.

At the present, Feature A is a C shape, with one possible squared corner located in its southeast. Walls occur on its north, east and west sides, are of stacked cobbles and boulders, incorporate bedrock and reach a maximum height of 0.31 m. Low pahoehoe exposures form a southern perimeter, which drops off moderately to the south, although it may also incorporate at least one ephemeral alignment. The entire feature measures 3.50 m N-S by 4.00 m E-W, with its interior being somewhat level, but strewn with small boulders and cobbles. The differences between the 1990 description and this present one may be due to interim disturbances.

Feature B is a low, oval enclosure, attached to Feature A on its east side. It utilizes the east wall of Feature A as its west wall and is constructed of loosely stacked boulders and cobbles one to two courses high. Construction is best preserved on its north and northeast sides, while its south side is somewhat ephemeral and quite deteriorated. It measures 4.00 m N-S by 3.50 m E-W and has a level soil interior with a few scattered cobbles. The low pahoehoe exposures noted on the south side of Feature A, also continue along the south side of Feature B, although less frequently.

SITE 2522 METHODS

Because Site 2522 was the only site relocated in the present study that had not been previously mapped, following clearing, the site was mapped with two test units subsequently excavated (Figure 41).

The first test unit to be excavated (TU-1) was a 0.50 m by 0.50 m unit placed in Feature A, in the center of its soil filled interior. The unit was located with consideration toward retrieving data leading to an understanding feature function and temporal placement. TU-1 was excavated by natural layers and terminated at its contact with decomposing bedrock.

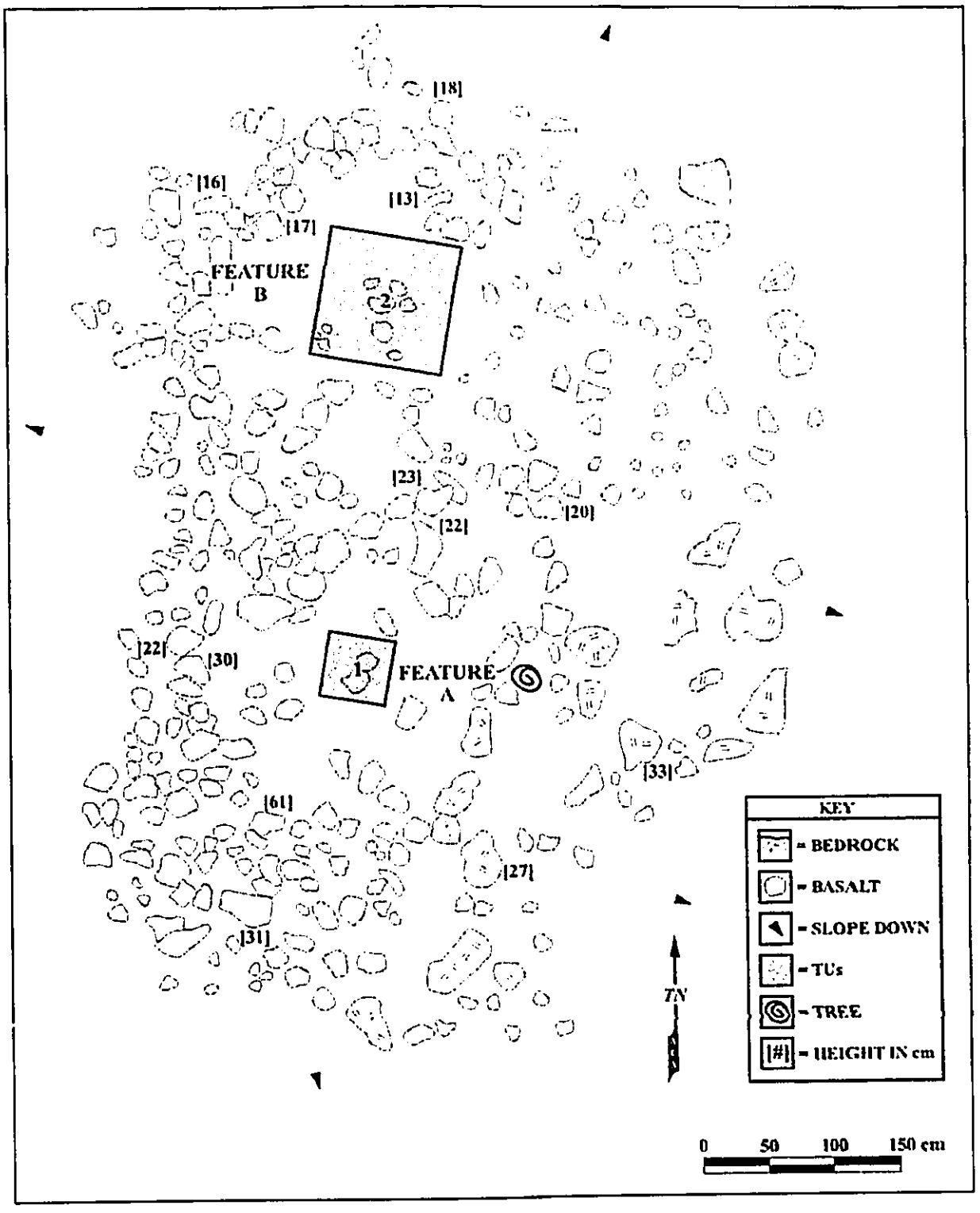

Figure 41: Site 2522 with Unit Locations.

The second test unit (TU-2) was a 1.00 m by 1.00 m unit placed in Feature B, also in the center of its soil filled interior. Again, it was placed to better understand feature function and temporality, and terminated at bedrock or 0.10 m into a dense, hard packed substrate demonstrated to be culturally sterile in exposure in disturbed areas throughout the project area.

A total of 1.50 m of surface area was excavated at this site (5%) with mapping and excavation completed in approximately 2 person days.

SITE 2522 RESULTS

STRATIGRAPHY: The profile of TU-1 revealed a single shallow layer of brown silty clay loam extending to 0.05 m below surface before the unit was terminated. Termination was at a pavement of decomposing bedrock (Figure 42). The profile of TU-2 revealed a thin dark brown layer extending about 0.05 m below surface, underlain by a reddish brown silty clay loam. This unit was terminated after excavating 0.10 m into this substrate due to its lack of cultural material (Figure 43; see Appendix A).

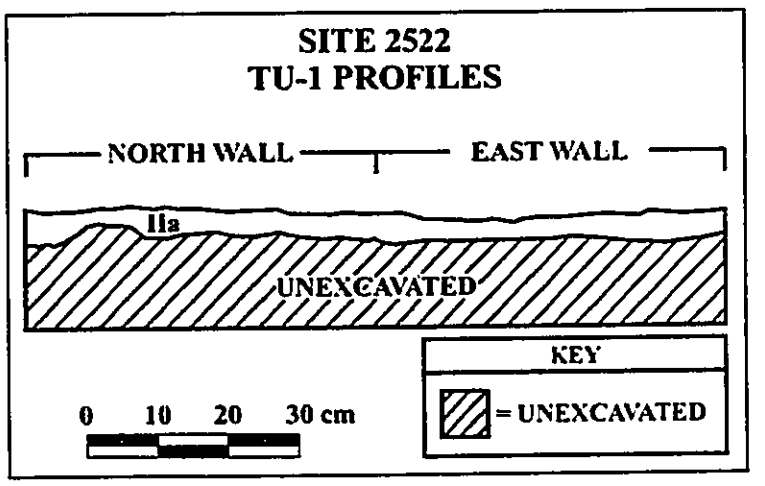

Figure 42: Site 2522, Feature A, TU 1 Profiles.

Layer I was a dark brown (7.5 YR 3/2) sandy clay loam with about 10% small pebbles. The layer consisted of very fine granular peds with a weak structure and was non-sticky and non-plastic with medium to fine roots. The lower boundary was abrupt. Layer IIa was a brown (7.5 YR 4/4) silty clay loam with about 20% pebbles. The layer was structureless and slightly sticky and slightly plastic with medium to fine roots. The lower boundary was abrupt. Layer IIb was a dark reddish brown (5 YR 3/4) silty clay loam with about 35% pebbles and cobbles. The layer consists of very fine granular peds with a weak structure with fine to medium roots. The lower boundary was abrupt.

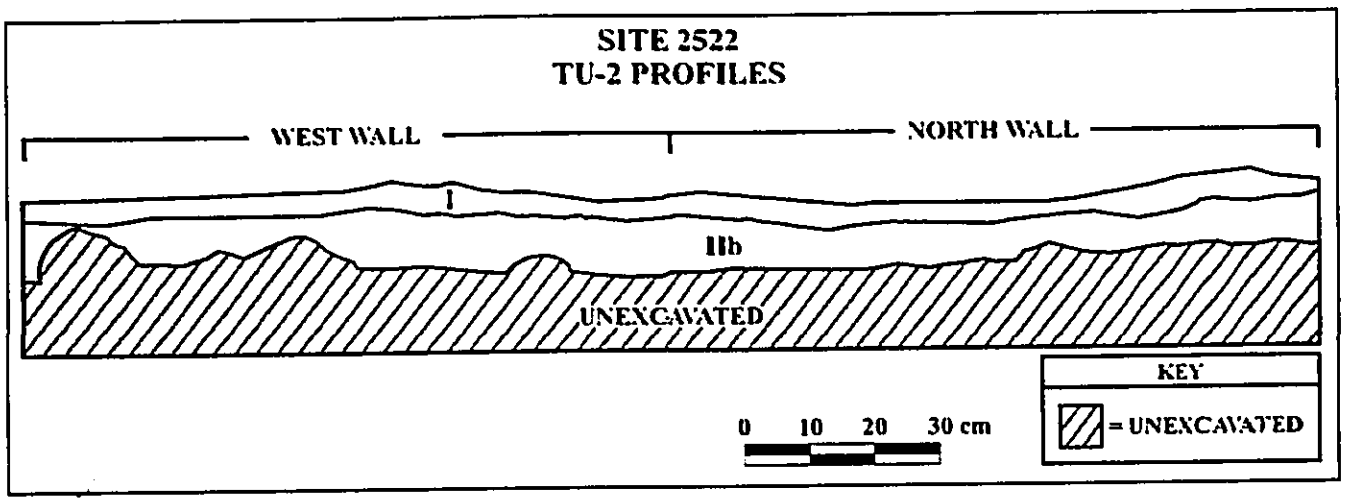

Figure 43: Site 2522, Feature B, TU 2 Profiles.

CULTURAL MATERIAL: Three small unidentifiable marine shell fragments were the only cultural items recovered from this site, occurring near the top of the silty clay loam in TU-2

DISCUSSION

SITE 1710

The evidence from these investigations indicates site 1710 to be historic. Although some euro-American material is probably recent, the majority of it, at least from trench 1, was firmly associated with both the site's architecture and its primary cultural bearing layer. This layer, Layer III, was also a well defined, discreet deposit overlain by considerable recent deposition. The recovery of traditionally manufactured items was limited to large thick items of coarse grained basalt and a single large primary flake with use wear. Although there is the possibility that the large thick items may be thermally altered rock, if they are manufactured stone artifacts, the continuation of this technology into the historic period is not unusual, especially for rough casual use. An unmodified volcanic glass pebble was also recovered, but is easily attributable to historic activities. Unfortunately, none of the euro-American material from the site is temporally diagnostic.

SITE 2512

The presence of several small boulder/large cobble sized pieces of unmodified branch coral at this site points toward ceremonial use. Its position on one of the highest knolls in the surrounding area, overlooking its largest drainage, also gives it a ceremonial functional. The presence of ceremonial trails leading to shrines and heiau are well documented. If the reinterpretation of Feature D as a trail is correct, it further substantiates the assertion that this site had ceremonial functions.

The stratigraphy of TUs 4 and 6 and ST-5 deserves some comment. Layer IIa in these profiles is a moderately thick, dark brown deposit of sandy silt that appears anthropogenic, being the origin of the only SSF located at the site. While Layer III correlates reasonably well with the other units at the site, Layer IIa was observed no where else. Consequently, it would seem that either Feature B was the primary use area at the site, other areas having little depositional activity, or that this deposit was once more widespread, and has since been eroded away.

The hypothesis that site 2512 may have multiple occupations remains a question. Although cultural material was collected from Feature A, it was minimal at best, with units quickly reaching bedrock and exhibiting no definite cultural layer. Feature B, however, exhibited a well defined cultural layer and provided a late pre-Contact to post-Contact date for the site. Given the recent date for Feature B, it seems most likely that the site represents a single, late occupation, and that it functioned as a ceremonial site.

SITE 2514

Site 2514 yielded the highest densities of cultural material of all sites excavated in the project area. Like most of the other sites located on knolls, however, it exhibited only thin soils overlying bedrock. It is interesting that TU-3 yielded as much material as it did considering its disturbed appearance. This may be the result of deflation. The density of echinoderm shell in SSF 2514.1, in contrast to other marine shell, is also interesting, appearing to indicate a specific feature function. The calibrated date for this site of 1460 to 1660 AD clearly places this site in the pre-Contact period and, as such, it appears to have been utilized and abandoned before the other sites identified in the project area.

SITE 2516

The contrast between the stratigraphy in TU-1 and the 1990 test unit is significant. While the differences in the density of cultural material between Layers I in these two units is somewhat interesting, the differences between Layer II and IIIa in the two units is more so. Layer IIIa in TU-1 is a dark reddish brown clay loam/loamy clay with relatively little rock and little cultural material, while Layer II in the 1990 test unit, also a dark reddish brown silty clay, is its primary cultural bearing layer. Cultural material from this layer in the 1990 TU, however, may point toward an explanation of this discrepancy. Echinoderm remains account for over half of the material recovered in this TU, and considering the shell content of the SSF at Site 2514, it is quite possible that this small TU may have encountered a subsurface feature. This is also suggested by the occurrence of a Layer IIa in the unit's profile (Donham 1990: Figure A-7).

Layer III in this 1990 unit, a culturally sterile layer of densely packed gravel corresponds well to the layer at which TU-1 was terminated.

TU-2 contrasts with TU-1 in at least two ways. First, Layer I of TU-2 is relatively devoid of cultural material, indicating a post-occupational deposit, which TU-1 appears not to have. Second, Layer IIIb of TU-2 contains a moderate amount of cultural material, which Layer IIIb in TU-1, the corresponding layer, does not. The explanation for the presence of this cultural material, however, may lie with a possibly incomplete removal of SSF 2516-A.1.

As with Site 2512, the radiocarbon date for this site indicates its occupation sometime in the very late pre-Contact to post-Contact periods.

SITE 2522

Other than the shallow soils and the lack of cultural material described above, there is not much to discuss at this site.

PROJECT CONTEXT

Putting this project into the overall contexts of the areas history and prehistory is difficult. The lack of temporally diagnostic artifacts is a hindrance not only for the present study, but for Hawaiian archaeology as a whole. The retrieval of charcoal samples during the present study, two of which came from restricted areas in sub-surface features, however, somewhat alleviates this situation. The radiometric dates obtained from two of the sites this project (Sites 2512 and 2516) and the historic artifacts from Site 1710 demonstrate that most of the sites in the project area were utilized in the late pre-Contact to early post-Contact periods. On the other hand the clear pre-Contact occupation of Site 2514 indicates the utilization of the project area perhaps as early as the mid-15th century.

Investigation of the Kula, or barren zone, a dry region of xeric vegetation extending about 7 miles inland in the Kīhei area, is a relatively recent development. Formerly it was dismissed as being generally unimportant during prehistoric times, and having limited archaeological potential. Modern expansion of coastal communities into its seaward fringe, however, have necessitated a closer inspection of this zone and proven this earlier belief false. Whether or not this holds true to the entire zone is as yet unknown.

The project area is located adjacent to the Kīhei coastal zone, a low area formerly dominated by freshwater ponds, and on the edge of the terminal seaward terrace of a vast area of Waiakoa extremely stony silty clay loam. Although this soil is prone to erosion, having up to 50% of its surface removed (Foote *et al.* 1971:127), and not very amenable to agriculture, runoff along this terrace edge has created numerous small drainages and drainage basins (Figures 44 and 45). Of the 15 sites located in the project area by the previous 1990 study, 9 are either located on the upslope edge of one of these basins, overlooking one of them, or overlooking the end of a channel that drains into them. While Donham postulates the importance of the low knolls that surround these basins, if one includes sites within these basins, this association becomes even more prominent. In addition to having more mesic conditions than adjacent soils, these basins also have soil depth. Although, in contrast with previous ideas, it has already been observed that the Kula zone was utilized for agricultural purposes, it is proposed here that the majority of sites in this zone represent use by permanent coastal settlements of specific, stable areas along the its margin conducive to agriculture. Identification of these drainage basins further inland in the Kula zone, and identification of sites clustering in and around them, would be a test of this idea.

The recovery of midden from six out of the 10 features excavated would seem to point toward their use as at least temporary habitations. This concurs with Donham's predictions for four of the 10 features, but indicates non-agricultural activities at Feature B at Site 2512 (ceremonial), and Feature A at Site 2516 (habitation). Both of these features were assessed as agricultural or possible agricultural, yet both yielded sub-surface hearths. In contrast, both features at Site 2522 assessed as possible habitations, yielded less than a gram of cultural material. The only feature investigated that may represent permanent habitation is the platform at Site 2514. This feature yielded the highest density of cultural material of all excavated features.

RECOMMENDATIONS

As a result of this and earlier studies of the project area, it is recommended that no further work be conducted within the project area excepting Site 2512. As Site 2512 is now interpreted as a ceremonial location, it is recommended that the site be preserved based on a Preservation Plan. The SHPD will review this Preservation Plan prior to construction work in this portion of the parcel.

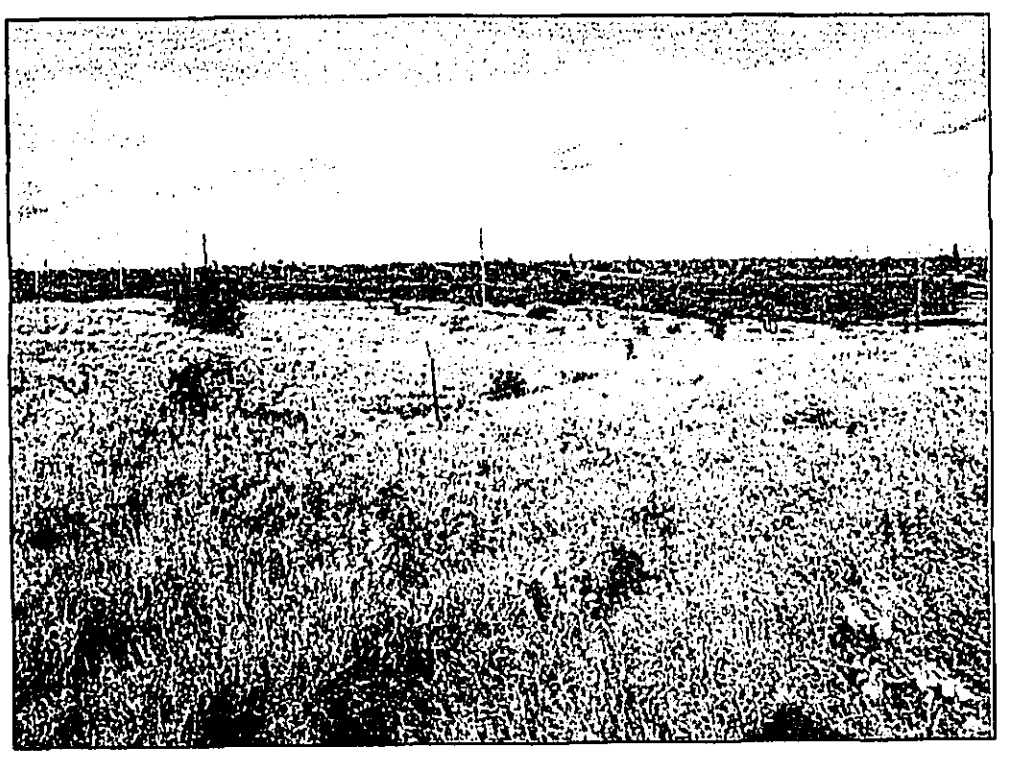

Figure 44: Drainage Basin Southwest of Site 2516. View to West.

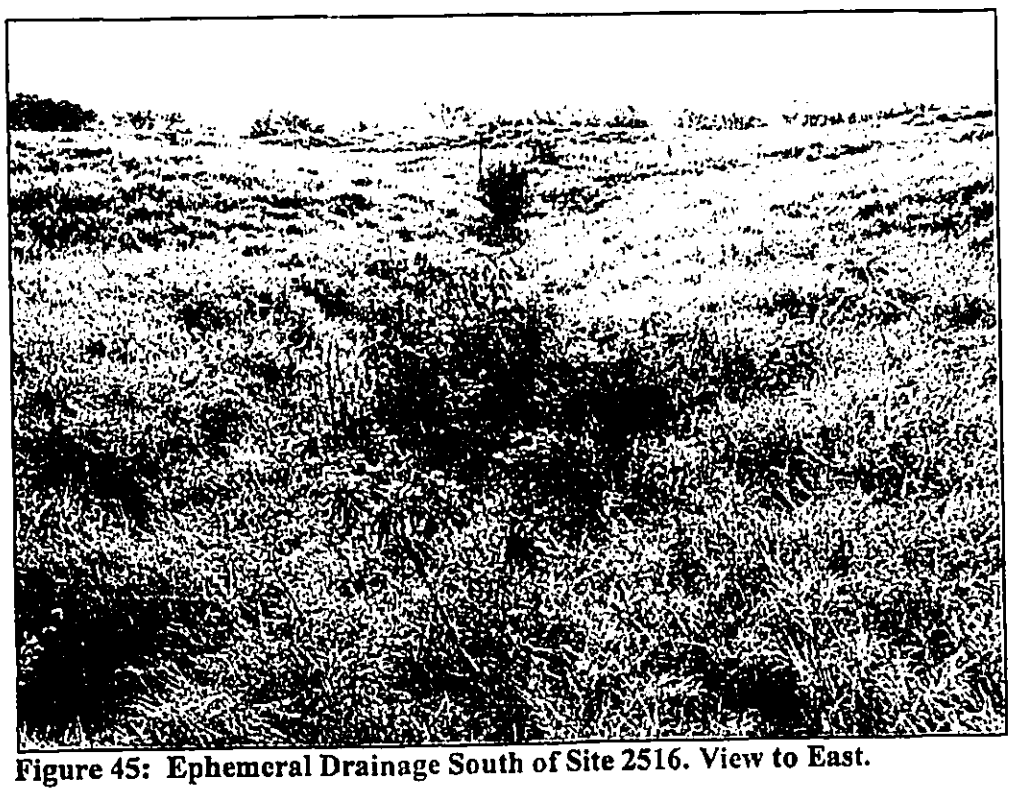

Figure 45: Ephemeral Drainage South of Site 2516. View to East.

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APPENDIX A SOIL DESCRIPTIONS

SITE 1710 SOIL DESCRIPTIONS

TEST UNITS 1, 2, 4 & 5; STRATIGRAPHIC UNITS 1, 2, 3 & 4

O - Very dark gray (10 YR 3/1) sandy loam with about 3% small pebbles: about 60% organic material – "O" horizon.

I – Dark reddish brown (5 YR 3/3) loamy medium grained sand with about 1% small pebbles; non-plastic; non-sticky; no structure; many fine roots; very abrupt lower boundary.

IIa – Dark yellowish brown (10 YR 4/4) loamy coarse sand to coarse sand with no rock: non-plastic; non-sticky; no structure; many fine roots; very abrupt lower boundary.

IIb – Dark brown (10 YR 3/3) loamy medium sand with about 2% small pebbles: non-plastic; non-sticky; no structure; many fine roots; abrupt lower boundary.

IIc – Brown (10 YR 4/3) sandy loam with no rock: non-plastic; non-sticky; no structure; moderate fine roots; abrupt lower boundary.

III – Dark reddish brown (5 YR 3/3) loamy medium sand with about 15% pebbles and cobbles; : non-plastic; non-sticky; no structure; many fine roots; very abrupt lower boundary.

IVa- Very dark grayish brown (10 YR 3/2) loamy fine sand with no rock; non-plastic; non-sticky; cemented; few fine to large roots; clear lower boundary.

IVb – Dark brown (7.5 YR 3/2) medium sand with no rock; non-plastic; non-sticky; no structure; few fine to large roots; abrupt lower boundary.

Va – Dark yellowish brown (10 YR 4/4) fine to medium sand with no rock; non-plastic; non-sticky; no structure; moderate fine to large roots.

Vb* - Yellowish brown (10 YR 5/4) fine to medium sand with no rock; non-plastic; non-sticky; no structure; moderate fine to large roots

Vc* - Gray to light gray (10 YR 7/1 to 6/1) ashy fine to medium sand with no rock; non-plastic; non-sticky; no structure; moderate fine to large roots

Vd* - Dark gray (10 YR 4/1) carbon stained fine to medium sand with no rock; non-plastic; non-sticky; no structure; moderate fine to large roots.

Note – "*" denotes lenses within **Va**

TEST UNIT 3

I – Brown (7.5 YR 4/3) fine sand with about 25% pebbles and cobbles: non-plastic; non-sticky; no structure; moderate fine to medium roots; abrupt lower boundary.

II – Dark brown (7.5 YR ¾) loamy sand with about 25% pebbles and cobbles; non-plastic; non-sticky; no structure; moderate fine to medium roots; bedrock as lower boundary.

SITE 2512 SOIL DESCRIPTIONS

Ia - Brown (7.5 YR 4/3) fine loamy sand to fine sandy clay loam with about 10% pebbles: non-sticky; non-plastic; no structure; many medium roots; abrupt or bedrock lower boundary.

Ib - Brown (7.5 YR 4/3) fine sand with no about 5% pebbles; non-sticky; non-plastic; no structure; moderate medium roots; abrupt lower boundary.

IIa – Dark brown (7.5 YR 3/3) fine sandy loam with about 5% pebbles; non-sticky; non-plastic; no structure; few medium roots; abrupt lower boundary.

IIb – Dark brown (7.5 YR 3/3) fine sandy loam with about 25% pebbles; non-sticky; non-plastic; no structure; few medium roots; abrupt lower boundary

III – Reddish brown (5 YR 4/4) silty clay loam with about 5% pebbles; slightly sticky; slightly plastic; no structure; few fine roots; bedrock lower boundary.

IV - Brown (7.5 YR 5/4) silty clay loam with about 35% small pebbles; slightly sticky; slightly plastic; very weak small crumb peds; many very fine to small roots; bedrock lower boundary.

SSF 2512-B.1 – Very dark brown (10 YR 2/2) sandy silt clay with about 60% pebbles and cobbles; slightly sticky; non-plastic; no structure; few fine roots; charcoal and carbon staining; abrupt lower boundary.

SITE 2514 SOIL DESCRIPTIONS

I – Brown (10 YR 4/3) loamy fine sand with about 25% pebbles and cobbles; non-sticky; non-plastic; no structure; few to moderate fine to medium roots; bedrock lower boundary.

SSF 2514.1 – Dark gray (10 YR 4/1) ashy, loamy fine sand with about 10% small pebbles; non-sticky; slightly plastic; no structure; few fine roots; abrupt lower boundary.

SITE 2516 SOIL DESCRIPTIONS

I – Brown (7.5 YR 4/4) silty clay loam with about 15% pebbles and cobbles; slightly sticky; slightly plastic; no structure, many fine to medium roots; abrupt to clear lower boundary.

II – Brown (7.5 YR 4/4) silty clay with about 35% cobbles; slightly sticky; slightly plastic; small weak granular peds; many fine to very fine roots; abrupt to clear lower boundary.

IIIa – Dark reddish brown (5 YR ¾) silty clay loam with about 15% pebbles and cobbles; ; slightly sticky; slightly plastic; small weak granular peds; many fine to medium roots; abrupt lower boundary.

IIIb – Strong brown (7.5 YR 4/6) silty clay loam with about 15% pebbles and cobbles; slightly sticky; slightly plastic; small weak granular peds; many fine to medium roots; abrupt to clear lower boundary.

SSF 2516-A.1- Brown (7.5 4/4) silty clay with about 15% large pebbles and small cobbles; slightly sticky; slightly plastic; no structure; many fine roots; charcoal flecks; abrupt lower boundary.

SITE 2522 SOIL DESCRIPTIONS

I – Dark brown (7.5 YR 3/2) sandy clay loam with about 10% small pebbles; non-sticky; non-plastic; small weak granular peds; moderate fine to medium roots; abrupt lower boundary.

IIa – Brown (7.5 YR 4/4) silty clay loam with about 20% pebbles; slightly sticky; slightly plastic; no structure; moderate fine to medium roots; abrupt lower boundary.

IIb – Dark reddish brown (5 YR ¾) silty clay loam with about 35% pebbles and cobbles; slightly sticky; slightly plastic; small weak granular peds; moderate fine to medium roots; abrupt lower boundary.

Appendix D - Cultural Impact Assessment Report

SCS Project Number 604-CIA-1

A CULTURAL IMPACT ASSESSMENT ON A PIECE OF PROPERTY LOCATED IN KĪHEI, KĒŌKEA AHUPUA`A, MAKAWAO DISTRICT, MAUI ISLAND, HAWAI`I [TMK 2-2-02: POR. 042]

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INTRODUCTION

At the request of Chris Hart and Partners, Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment, on a piece of property (TMK: 2-2-02: por. 042) located in Kīhei, Kēōkea Ahupua`a, Makawao District, Maui Island (Figure 1). Documents submitted by Chris Hart and Partners describe the proposed project as the Kīhei Recycling and Redemption Center and the Kīhei Community Park.

The Constitution of the State of Hawai`i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua`a* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778" (2000). Beginning in 1850 with establishment of Hawai`i Revised Statutes (HRS) 7-1, native Hawaiians were given access rights to undeveloped private property and waterways in order to gather specific natural resources for customary uses. In 1992, the State of Hawai`i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, "native Hawaiian rights...may extend beyond the *ahupua`a* in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawaii (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes that:

> ...there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights... [H.B. NO. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the "cultural practices of the community and State" as part of the HRS Chapter 343 environmental review process (2001). Its purpose has broadened, "to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other ethnic groups, and it also amends the definition of 'significant effect' to be re-defined as "the sum of effects on the quality of the environment including actions that are...contrary to the

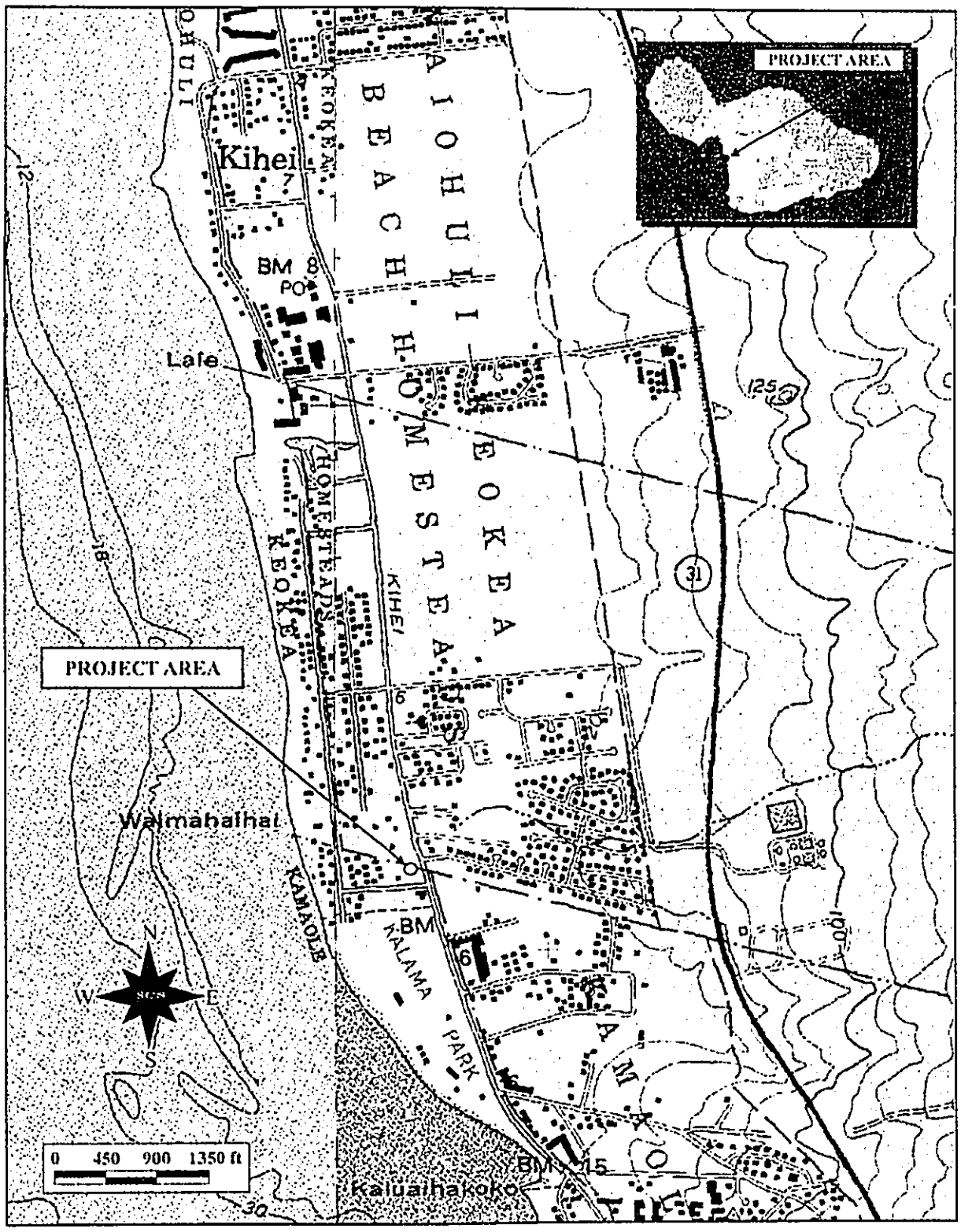

Figure 1: USGS Quadrangle Map Showing Project Area.

State's environmental policies...or adversely affect the economic welfare, social welfare, or cultural practices of the community and State" (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized by using, as an example, "the broad geographical area, e.g. district or *ahupua`a*" (OEQC 1997). It was decided that the process should identify 'anthropological' cultural practices, rather than 'social' cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

This Cultural Impact Assessment involves evaluating the probability of impacts on cultural values and rights within the project area and its vicinity.

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the "Cultural Impact Assessment Methodology", the OEQC state:

> ...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories... (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and

content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

(1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints of limitations with might have affected the quality of the information obtained;

(2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;

(3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;

(4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;

(5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;

(6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;

(7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;

(8) an explanation of confidential information that has been withheld from public disclosure in the assessment;

(9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;

(10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed

action to introduce elements which may alter the setting in which cultural practices take place, and;

(11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

INTERVIEW METHODOLOGY

When appropriate, interviews are conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information. Often people are recommended for their expertise or can be located by visiting the area. Organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, historical societies, Island Trail clubs, and Planning Commissions are invited to contribute their input and suggest further avenues of inquiry, as well as specific individuals to interview.

Personal interviews are taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. Key topics discussed with the interviewees vary from project to project, but usually include: personal association to the *ahupua`a*, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; evidence of previous activities identified while in the project vicinity.

In this case, letters briefly outlining the development plans along with maps of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Consultation was sought from Lance Foster, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O`ahu; Thelma Shimaoka, Coordinator of the Maui branch of the Office of Hawaiian Affairs; the Central Maui Hawaiian Civic Club; Kīhei Community Association; and the Maui Planning Department. Based on this information, an assessment of the potential effects on identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

PROJECT AREA AND VICINITY

The project area is located in Kēōkea Ahupua`a, but near its boundary with Kama`olė Ahupua`a. It is bordered on the north by Kīhei Elementary and Intermediate School, to the west by Waiohuli- Kēōkea Beach Homesteads, and to the east by Pi`ilani Highway. The coastline is located less than one mile to the west of the project area (Figure 2). The local Fire Department indicated that the entire project area had been completely burned four times since 1999. Several more partial burns have occurred, and heavy equipment was brought into extinguish the fires, affecting the terrain and destroying what vegetation was left and seriously impacting the integrity of the parcel for cultural activities.

CULTURAL HISTORICAL CONTEXT

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. The Island was formed by two volcanoes, Mount Kukui in the west and Haleakalā in the east. The younger of the two volcanoes, Haleakalā, soars 2,727 m (10,023 feet) above sea level and embodies the largest section of the island. Unlike the amphitheater valleys of West Maui, the flanks of Haleakalā are distinguished by gentle slopes. Although it receives more rain than its counterpart in the east, the permeable lavas of the Honomanū and Kula Volcanic Series prevent the formation of rain-fed perennial streams. The few perennial streams found on the windward side of Haleakalā originate from springs located at low elevations. Valleys and gulches were formed by intermittent water run-off. The environment factors and resource availability heavily influenced pre-Contact settlement patterns. Although an extensive population was found occupying the uplands above the 30-inch rainfall line where crops could easily be grown, coastal settlement was also common (Kolb *et al.* 1997). The existence of three fishponds at Kalepolepo, north of the project area, and at least two *heiau* identified near the shore

confirm the presence of a stable population relying mainly on coastal and marine resources. Agriculture may have been practiced behind the dune berms in low-lying marshland or in the vicinity of Kealia Pond. It is suggested that permanent habitation and their associated activities occurred from A.D 1200 through the present in both the uplands and coastal regions (*ibid*).

PAST POLITICAL BOUNDARIES

Traditionally, the division of Maui's lands into districts (*moku*) and sub-districts was performed by a *kahuna* (priest, expert) named Kalaiha`ōhia, during the time of the *ali`i* Kaka`alaneo (Beckwith 1940:383; Fornander places Kaka`alaneo at the end of the 15th century or the beginning of the 16th century [Fornander 1919-20, Vol. 6:248]). Land was considered the property of the king or *ali`i `ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. The title of *ali`i `ai moku* ensured rights and responsibilities to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms, such as *moku*, *ahupua`a*, *`ili* or *`ili`āina* were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*), which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili `āina* or *`ili* were smaller land divisions next to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was located (*ibid*:33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *`ili*. The land holding of a tenant or *hoa `āina* residing in an *ahupua`a* was called a *kuleana* (Lucas 1995:61). The project area is located in the *ahupua`a* of Kēōkea, which translated means literally "the white sand", as the *ō* is short for *one*, or sand (Pukui *et al.*:107).

TRADITIONAL SETTLEMENT PATTERNS

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua`a*. Within the *ahupua`a*, residents were able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111).

During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinaruma*) and *mai`a* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *`uala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985). Agricultural development on the leeward side of Maui was likely to have begun early in what is known as the Expansion Period (AD 1200-1400, Kirch 1985). According to Handy, there was "continuous cultivation on the coastal region along the northwest coast" of Maui. He writes:

> On the south side of western Maui the flat coastal plain all the way from Kihei and Ma`alaea to Honokahua, in old Hawaiian times, must have supported many fishing settlements and isolated fishermen's houses, where sweet potatoes were grown in the sandy soil or red lepo [soil] near the shore. For fishing, this coast is the most favorable on Maui, and, although a considerable amount of taro was grown, I think it is reasonable to suppose that the large fishing population, which presumably inhabited this leeward coast, ate more sweet potatoes than taro with their fish...[1940:159].

There is little specific information pertaining directly to Kīhei, which was originally a small area adjacent to a landing built in the 1890s (Clark 1980). Presently, Kīhei refers a six-mile section along the coast from the town of Kīhei to Keawakapu. Scattered amongst the agricultural and habitation sites were places of cultural significance to the *kama`āina* of the district including at least two *heiau*. In ancient times, there was a small village at Kalepolepo based primarily on marine resources. It was recorded that occasionally the blustery Kaumuku Winds would arrive with amazing intensity along the coast (Wilcox 1921).

There were several fishponds in the vicinity of Kīhei; Waiohuli, Kēōkea-kai, and Kalepolepo Pond (also known by the ancient name of Kō`ie`ie Pond; Kolb *et al.* 1997). Constructed on the boundary between Ka`ono`ulu and Waiohui Ahupua`a, these three ponds were some of the most important royal fishponds on Maui. The builder of Kalepolepo and two other ponds (Waiohuli and Kēōkea-kai) has been lost in antiquity, but they were reportedly rebuilt at least three times through history, beginning during the reign of Pi`ilani (1500s; *ibid*; Cordy 2000).

Oral tradition recounts the repairing of the fishponds during the reign of Kiha-Pi`ilani, the son of the great chief Pi`ilani, who had bequeathed the ponds to Umi, ruler of Hawai`i Island.

Umi's *konohiki* (land manager) ordered all the people from Maui to help repair the walls of Kalepolepo's fishponds. A man named Kikau protested that the repairs couldn't be done without the assistance of the *menehune* who were master builders (Wilcox 1921:66-67). The *konohiki* was furious and Kikau was told he would die once the repairs had been made. Kēōkea-kai was the first to be repaired. When the capstone was carried on a litter to the site, the *konohiki* rode proudly on top of the rock as it was being placed in the northeast corner of the pond. When it was time for repairs on Waiohuli-kai, the *konohiki* did the same. As the last pond, then known as Ka`ono`ulu-kai, was completed, the *konohiki* once again rode the capstone to its resting place. Before it could be put into position, the capstone broke throwing both the rock and *konohiki* into the dirt. The workers reportedly said "*Ua konohiki Kalepolepo, ua eku i ka lepo,*" or, "the manager of Kalepolepo, one who roots in the dirt" (*ibid*:66). That night a tremendous storm threw down the walls of the fishponds. The *konohiki* implored Kikau to help him repair the damage. Kikau called the *menehune* who rebuilt the walls in one night. Umi sent for Kikau who lived in the court of Waipi`o valley from then on. The region o Kēōkea-kai and Ka`ono`ulu-kai fishpond became known as Kalepolepo fishpond (*ibid*).

The Kalepolepo fishponds were rebuilt by Kekaulike, chief of Maui in the 1700s, at which time it supplied *`ama`ama* (mullet) to Kahekili II. Again, it was restored by Kamehameha I when he ruled as governing chief over Maui and for the last time in the 1840s when prisoners from Kaho`olawe penal colony were sent to do repairs (Kamakau 1961; Wilcox 1921). At this time, stones were taken from Waiohuli-kai pond for the reconstruction of Kalepolepo. It was here at Kalepolepo that Kamehameha I reportedly beached his victorious canoes after subduing the Maui chiefs. The stream draining into Kealia pond (north of the project area) became sacred to royalty and *kapu* to commoners (Stoddard 1894).

Trails extended from the coast to the mountains, linking the two for both economic and social reasons. A trail known as the *alanui* or "King's trail" built by Kihapi`ilani, extended along the coast passing through all the major communities between Lāhainā and Mākena, including Kīhei . One trail, named "*Kekuawaha`ula`ula*" or the "red-mouthed god", extended from Kīhei inland to Kēōkea. Another, the Kaleplepo trail, began at the Kalepolepo fishpond and continued to upland Waiohuli. These trails were not only used in the pre-Contact era, but were expanded to accommodate wagons bringing produce to the coast in the 1850s (Kolb *et al.* 1997:61).

WESTERN CONTACT

Early records, such as journals kept by explorers, travelers and missionaries, Hawaiian traditions that survived long enough to be written down, and archaeological investigations have assisted in the understanding of past cultural activities. Unfortunately, early descriptions of this portion of the Maui coast are brief and infrequent. Captain King, Second Lieutenant on the *Revolution* during Cook's third voyage briefly described what he saw from a vantage point of "eight or ten leagues" (approximately 24 miles) out to sea as his ship departed the islands in 1779 (Beaglehole 1967). He mentions Pu`u Ōla`i south of Kīhei and enumerates the observed animals, thriving groves of breadfruit, the excellence of the taro, and almost prophetically, says the sugar cane is of an unusual height. Seen from this distance and the mention of breadfruit suggest the uplands of Kīpahulu-Kaupo and `Ulupalakua were his focus.

In the ensuing years, LaPérouse (1786), Nathaniel Portlock and George Dixon, (also in 1786), sailed along the western coast, but added little to our direct knowledge of Kīhei. During the second visit of Vancouver in 1793, his expedition becalmed in the Ma`alaea Bay close to the project area. (A marker commemorating this visit is located across from the Maui Lu Hotel). He reported:

> The appearance of this side of Mowee was scarcely less forbidding than that of its southern parts, which we had passed the preceding day. The shores, however, were not so steep and rocky, and were mostly composed of a sandy beach; the land did not rise so very abruptly from the sea towards the mountains, nor was its surface so much broken with hills and deep chasms; yet the soil had little appearance of fertility, and no cultivation was to be seen. A few habitations were promiscuously scattered near the waterside, and the inhabitants who came off to us, like those seen the day before, had little to dispose of [Vancouver 1984:852].

Archibald Menzies, a naturalist accompanying Vancouver stated, "...we had some canoes off from the latter island [Maui], but they brought no refreshments. Indeed, this part of the island appeared to be very barren and thinly inhabited" (Menzies 1920:102). According to Kahekili, then chief of Maui, the extreme poverty in the area was the result of the continuous wars between Maui and Hawai`i Island causing the land to be neglected and human resources wasted (Vancouver 1984:856).

MĀHELE

In the 1840s a drastic change in traditional land tenure resulted in a division of island lands. This system of private ownership was based on western law. While a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kuykendall Vol. I, 1938:145 footnote 47, 152, 165-6, 170; Daws 1968:111; Kelly 1983:45; Kame`eleihiwa 1992:169-70, 176).

Among other thing, foreigners demanded private ownership of land to insure their investments (Kuykendall Vol. I, 1938:138, 145, 178, 184, 202, 206, 271; Kame`eleihiwa 1992:178; Kelly 1998:4). Once lands were made available and private ownership was instituted the *maka`āinana* (commoners) were able to claim the plots on which they had been cultivating and living, if they had been made aware of the foreign procedures (*kuleana* lands, Land Commission Awards, LCA). These claims could not include any previously cultivated or presently fallow land, *`okipū* (on O`ahu), stream fisheries or many other resources necessary for traditional survival (Kelly 1983; Kame`elehiwa 1992:295; Kirch and Sahlins 1992). This land division, or Māhele, occurred in 1848. The awarded parcels were called Land Commission Awards. If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA, issued a Royal Patent number, and could then take possession of the property (Chinen 1961: 16). Kēōkea became Crown land in which 46 LCA claims were made. No land claims were in or near the project area.

As western influence grew, Kalepolepo in Kīhei became the important provisioning area. Europeans were now living or frequently visiting the coast and several churches and missionary stations were established. A Mr. Halstead left medical school on the East coast of the continent to become a whaler and after marrying the granddaughter of Issac Davis, settled in Kalepolepo on land given him by Kamehameha III (Kolb et al. 1997). His residence and store situated at Kalepolepo landing was known as the Koa House having been constructed of *koa* logs brought from the uplands of Kula. The store flourished due to the whaling and potato industry and provided an accessible port for exported produce. Several of Hawai`i's ruling monarchs stayed at the Koa House, including Kauikeaouli (Kamehameha III), Kamehameha the 1V, Lot Kamehameha (V), and Lunalilo. Wilcox, giving a glimpse of the surroundings before abandonment stated, "...Kalepolepo was not so barren looking a place. Coconut trees grew beside pools of clear warm water along the banks of which grew taro and ape..." (1921:67). However, by 1887 this had changed. Wilcox continues:

> ...the Kula mountains had become denuded of their forests, torrential winter rains were washing down earth from the uplands, filling with silt the ponds at Kalepolepo...ruins of grass huts [were] partly covered by drifting sand, and a few weather-beaten houses perched on the broad top of the old fish pond wall at the edge of the sea, with the Halstead house looming over them dim and shadowy in the daily swirl of dust and flying sand..." [1921]

As early as 1828, sugar cane was being grown on Maui (Speakman 1981:114). Sugar was established in the Makawao area in the late 1800s and by 1899, the Kihei Plantation Company (KPC) was growing cane in the plains above Kīhei. The Kihei Plantation was absorbed by the Hawaiian Commercial and Sugar Company (HC&SC) in 1908, and they continued cultivating what had been the KPC fields into the 1960s. A 200-foot-long wharf was constructed in Kīhei at the request of Maui plantation owners and farmers and served inter-island boats for landing freight and shipping produce to Honolulu (Clark 1980). In 1927, Alexander and Baldwin became the agents for the plantation (Condé and Best 1973). A landing was built at Kīhei around 1890.

With the introduction of a dependable water supply in 1952, came overseas investment and development, which has continued up to, and including this time.

SUMMARY AND CULTURAL ASSESSMEMNT

As suggested in the "Guidelines for Accessing Cultural Impacts" (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

The "level of effort undertaken" (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be a "good faith effort". However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort would undoubtedly mean an entirely different level of research activity.

In the case of the present parcel, letters of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from Lance Foster, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O`ahu; Thelma Shimaoka, Coordinator of the Maui branch of the Office of Hawaiian Affairs; the Central Maui Hawaiian Civic Club; Kīhei Community Association; and the Maui Planning Department. The response obtained plus the archival and historic research provides a good faith and in-depth level of effort.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as Beckwith, Chinen, Kame`eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku`i and Elbert, Thrum, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai`i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona `Aina 2005 Data base.

Analysis of the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). The project area has not been used for traditional cultural purposes within recent times. Based on historical research and the above listed contacts, it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs as long as coastal access is insured. The visual impact of the project from surrounding vantage points, e.g. the highway, mountains, and the ocean is minimal as open space will be created by the proposed Kīhei Community Park that can be accessed by everyone.

Based on organizational response, and archival research it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on a portion of plot 42. However, it is recommended that Cultural Advisors be consulted during the planning process. In this way, appropriate mitigation measures, if needed, can be put in place before development occurs. Because there were no activities identified within the project area, there are no adverse effects.

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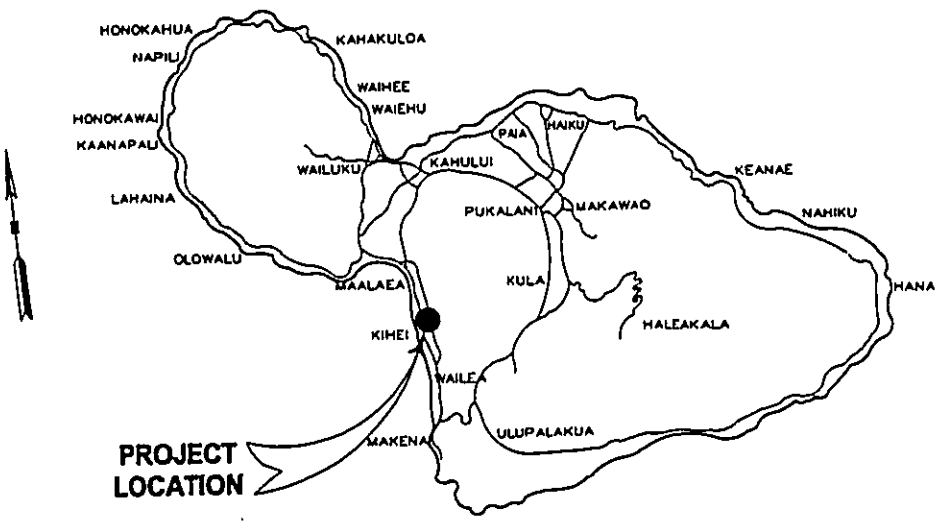
Figures



ISLAND OF MAUI

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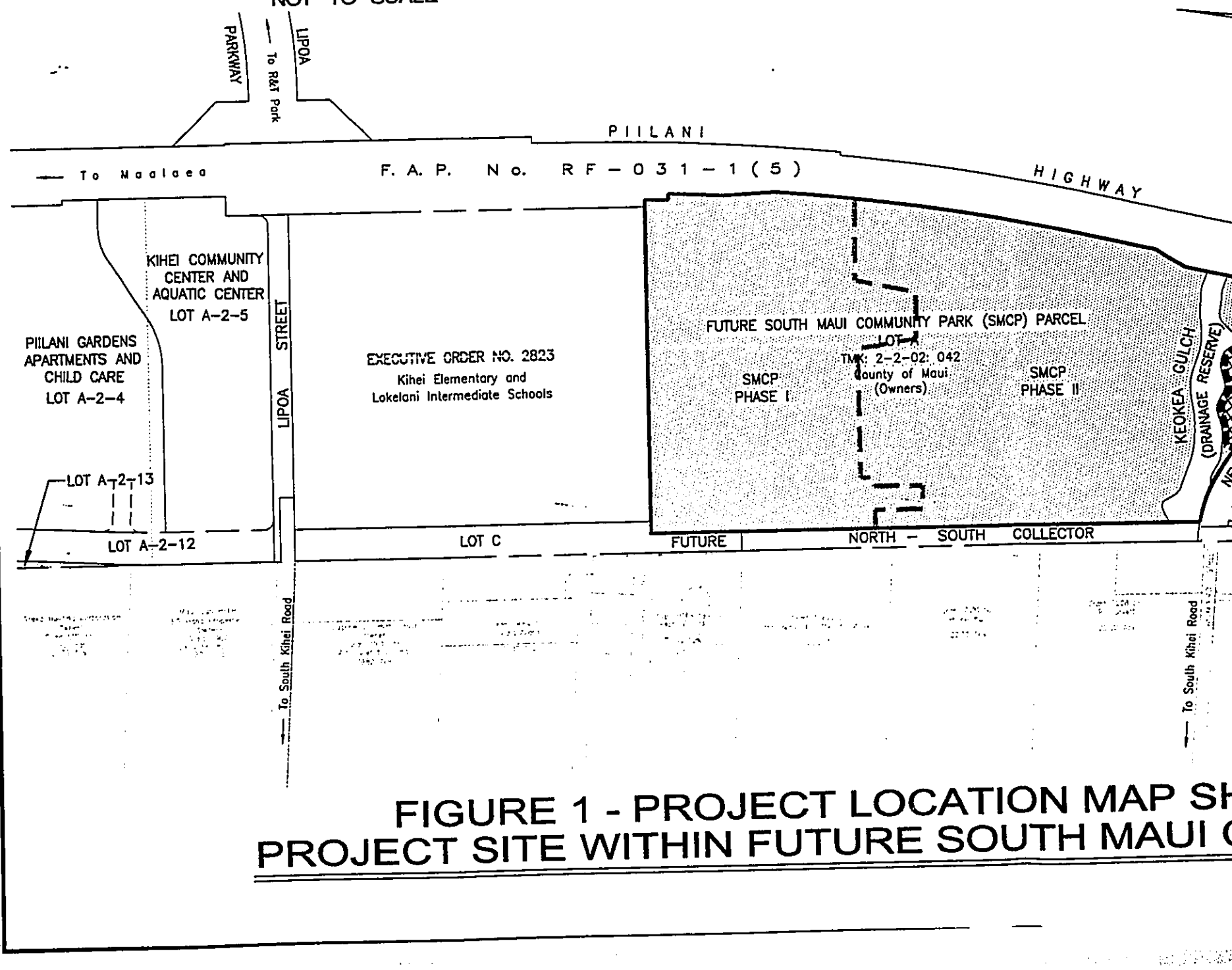

FIGURE 1 - PROJECT LOCATION MAP SH
PROJECT SITE WITHIN FUTURE SOUTH MAUI C

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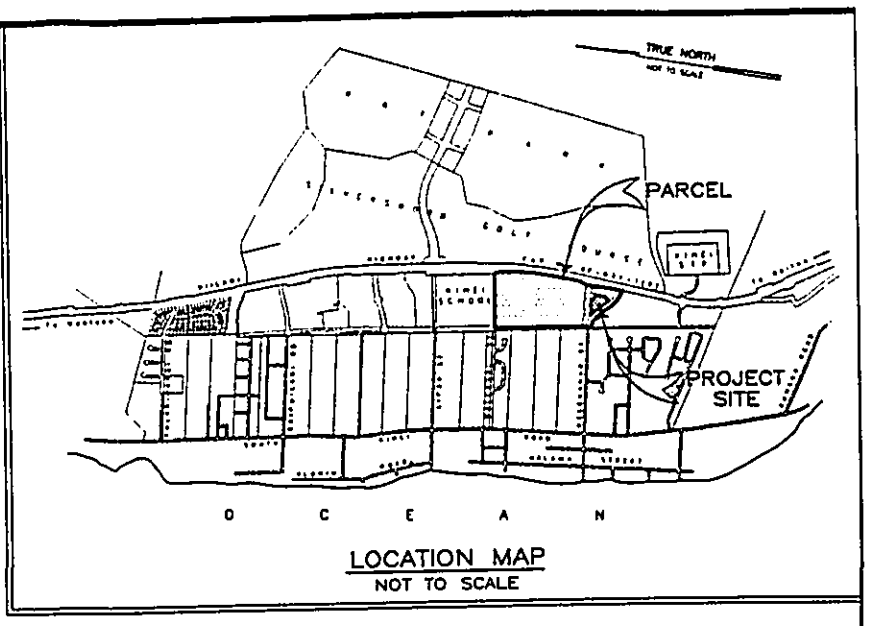

LOCATION MAP
NOT TO SCALE

TRUE NORTH
NOT TO SCALE

KIHEI SEWAGE TREATMENT PLANT

KIHEI RECYCLING &
REDEMPTION CENTER
PROJECT SITE

HIGHWAY

P) PARCEL

SMCP
PHASE II

KEOKEA GULCH
(DRAINAGE RESERVE)

SMCP
PHASE III

NEW WELAKAHAO ROAD

To Wailea

LOT B
TMK: 2-2-02: 72
Hope Chapel
(Owners)

OLD WELAKAHAO ROAD

Hale Mahdola
(Owners)

COLLECTOR

To South Kihei Road

ON MAP SHOWING RECYCLING
ITH MAUI COMMUNITY PARK PARCEL

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

August 4, 2005

11" x 17"

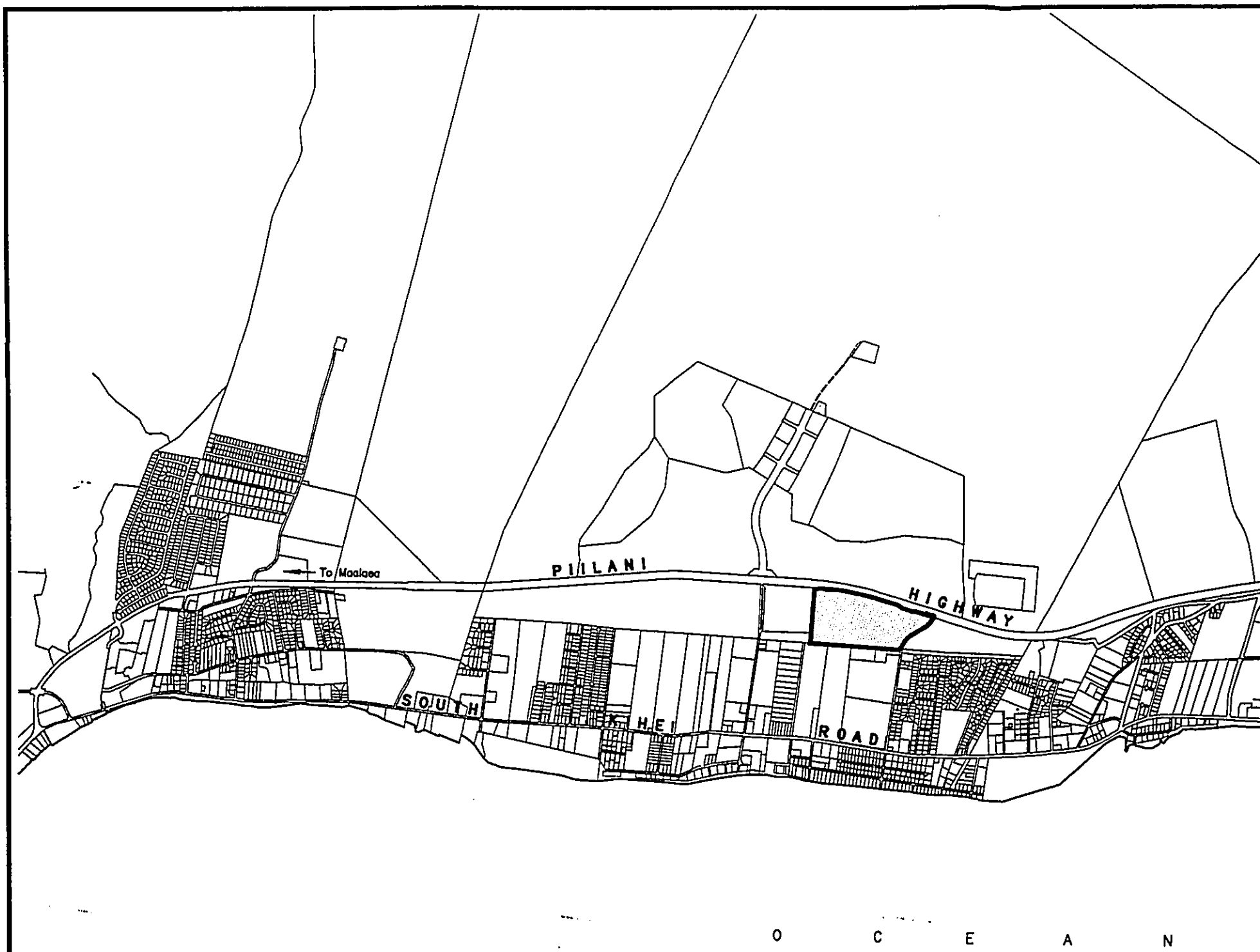

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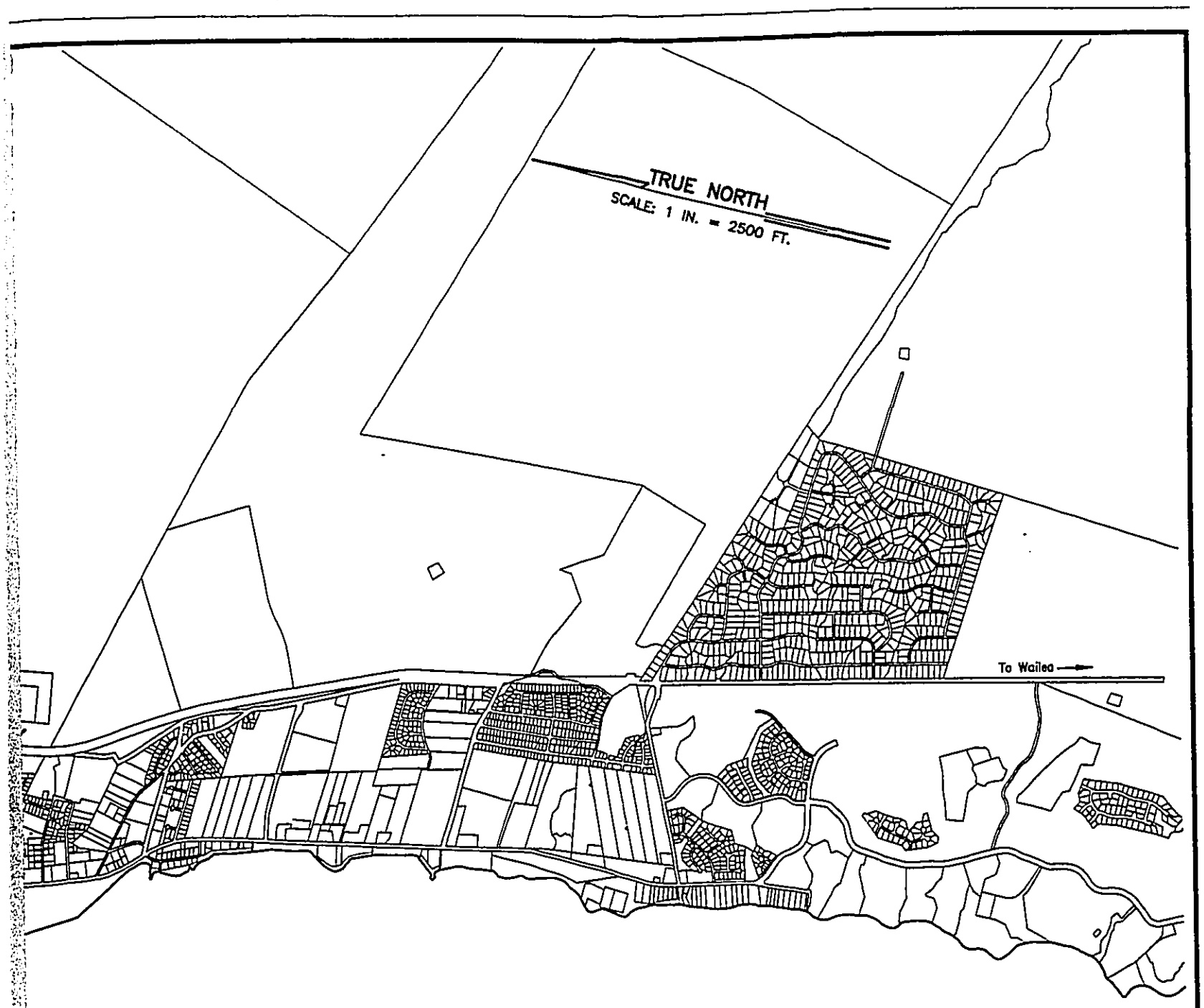
FIGURE 1A - PROJECT LOCATION MA
FUTURE SOUTH MAUI COMMUNITY PARK



A N

OCATION MAP SHOWING
UNITY PARK PARCEL IN KIHEI

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

August 4, 2005

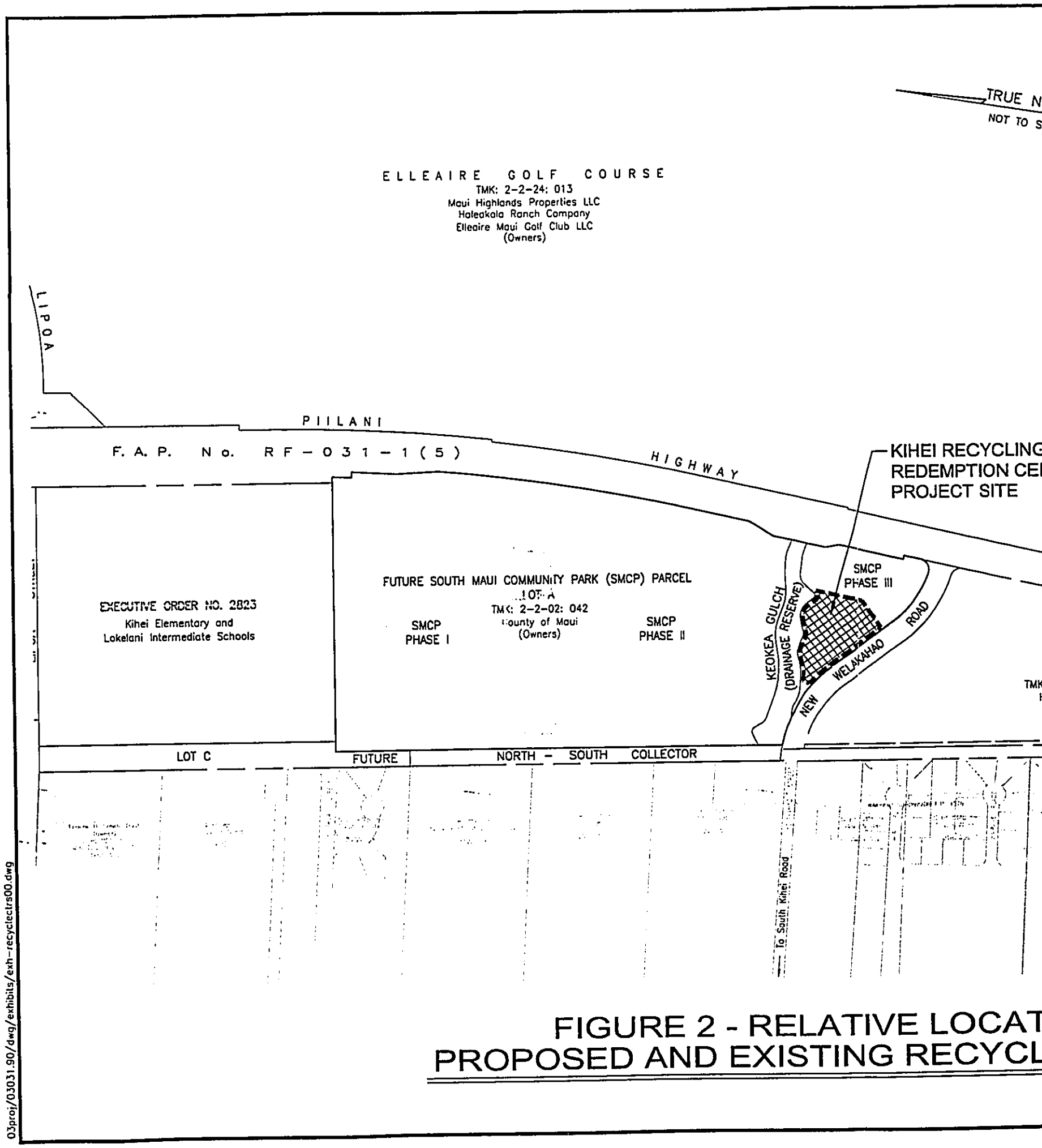
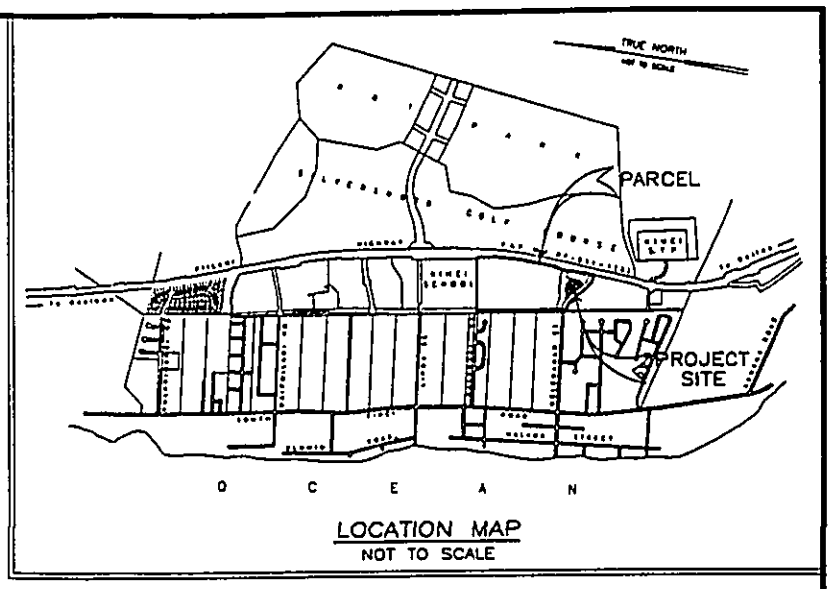


FIGURE 2 - RELATIVE LOCAT
PROPOSED AND EXISTING RECYCL

TRUE NORTH
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

KIHEI SEWAGE TREATMENT PLANT

KIHEI RECYCLING &
REDEMPTION CENTER
PROJECT SITE

OLD RECYCLING
CENTER

SMCP
ASE III

AHAO ROAD

To Wailea

LOT B
TMK: 2-2-02: 72
Hope Chapel
(Owners)

OLD WELAKAHAO ROAD

Hale Mahaolu
(Owners)

IVE LOCATION OF
G RECYCLING CENTERS

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

March 1, 2005

11" x 17"

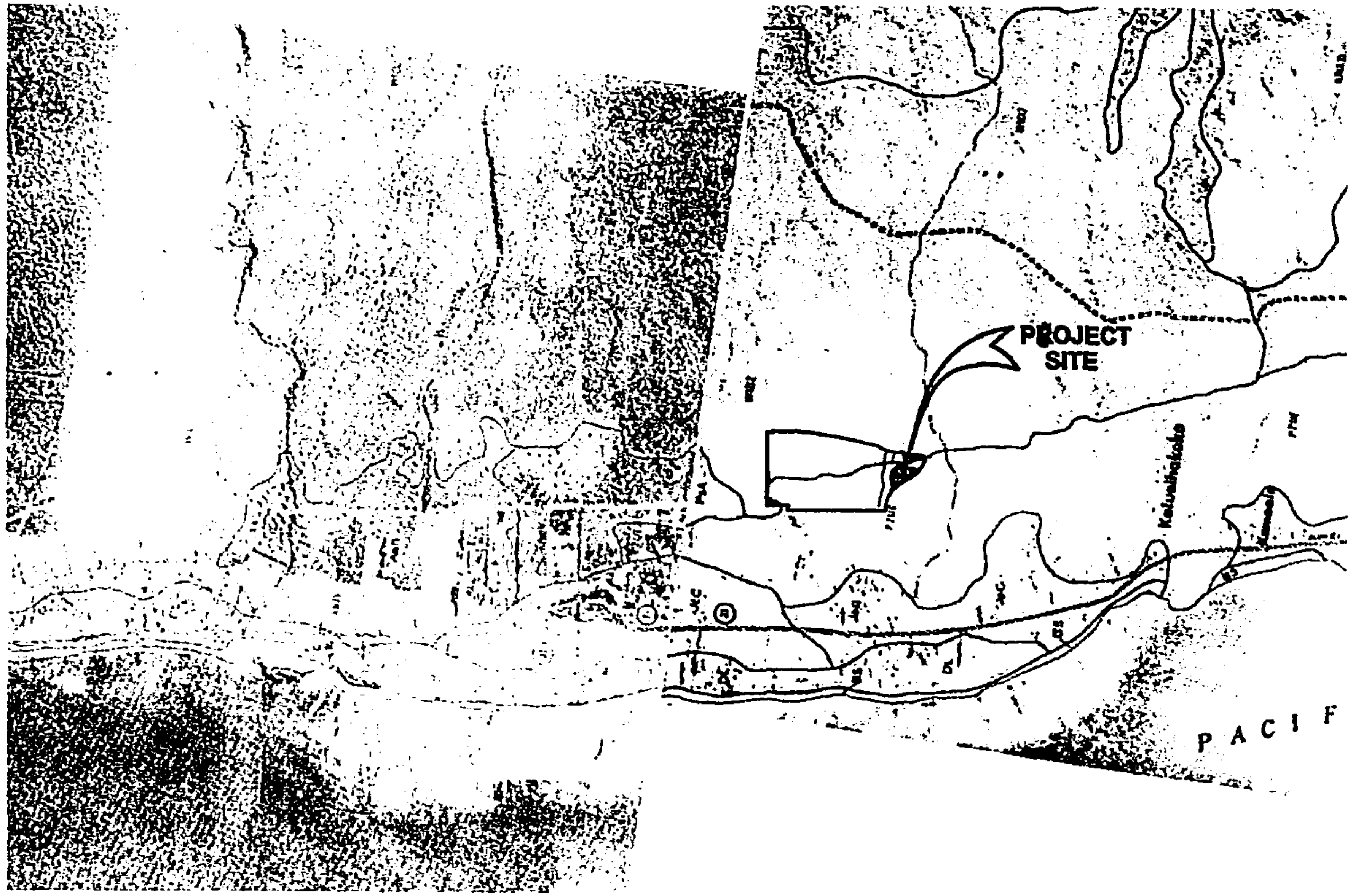


FIGURE 3
SITE SPECIFIC SOIL CLASSIFICATION MAP

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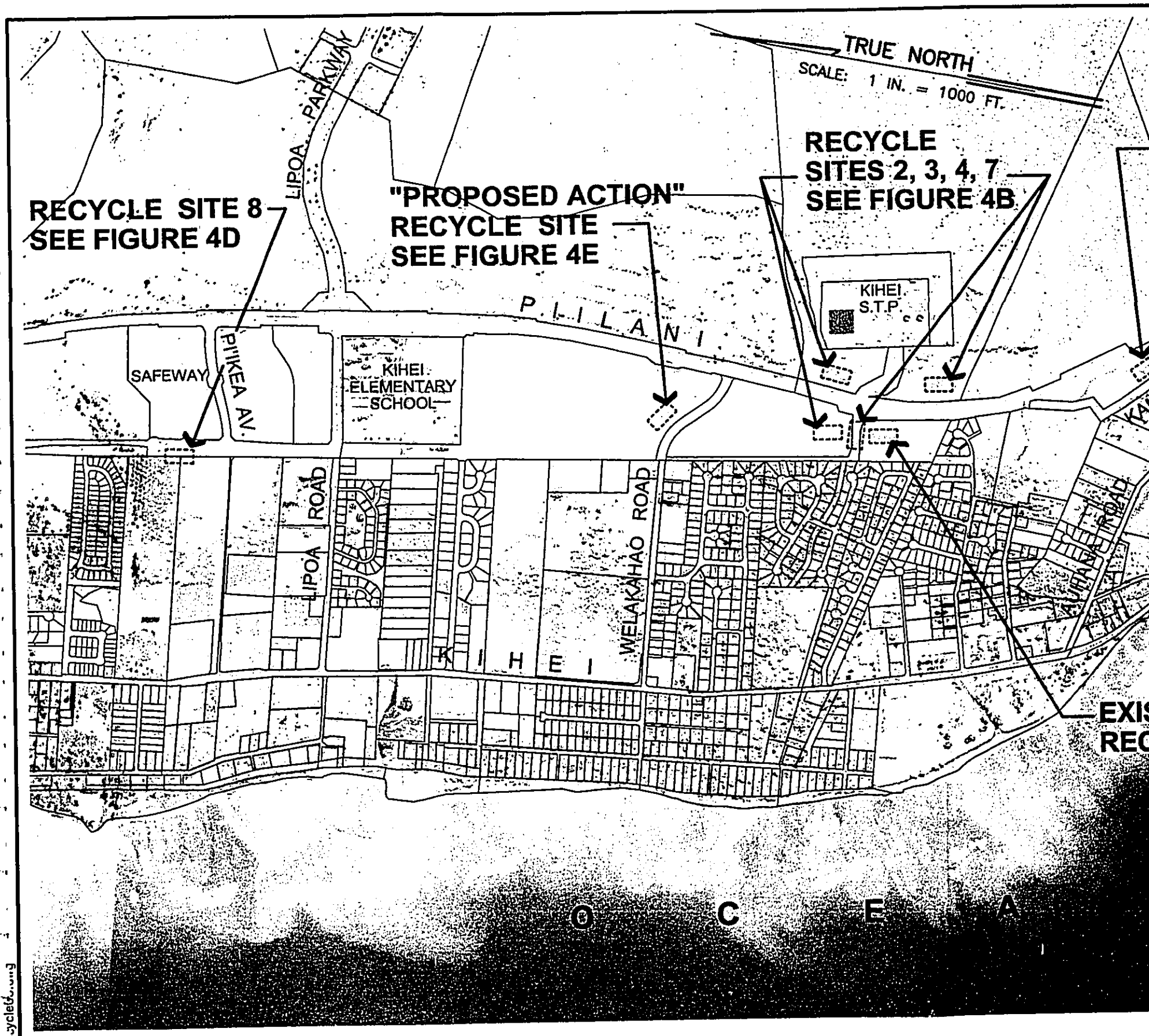
March 1, 2005



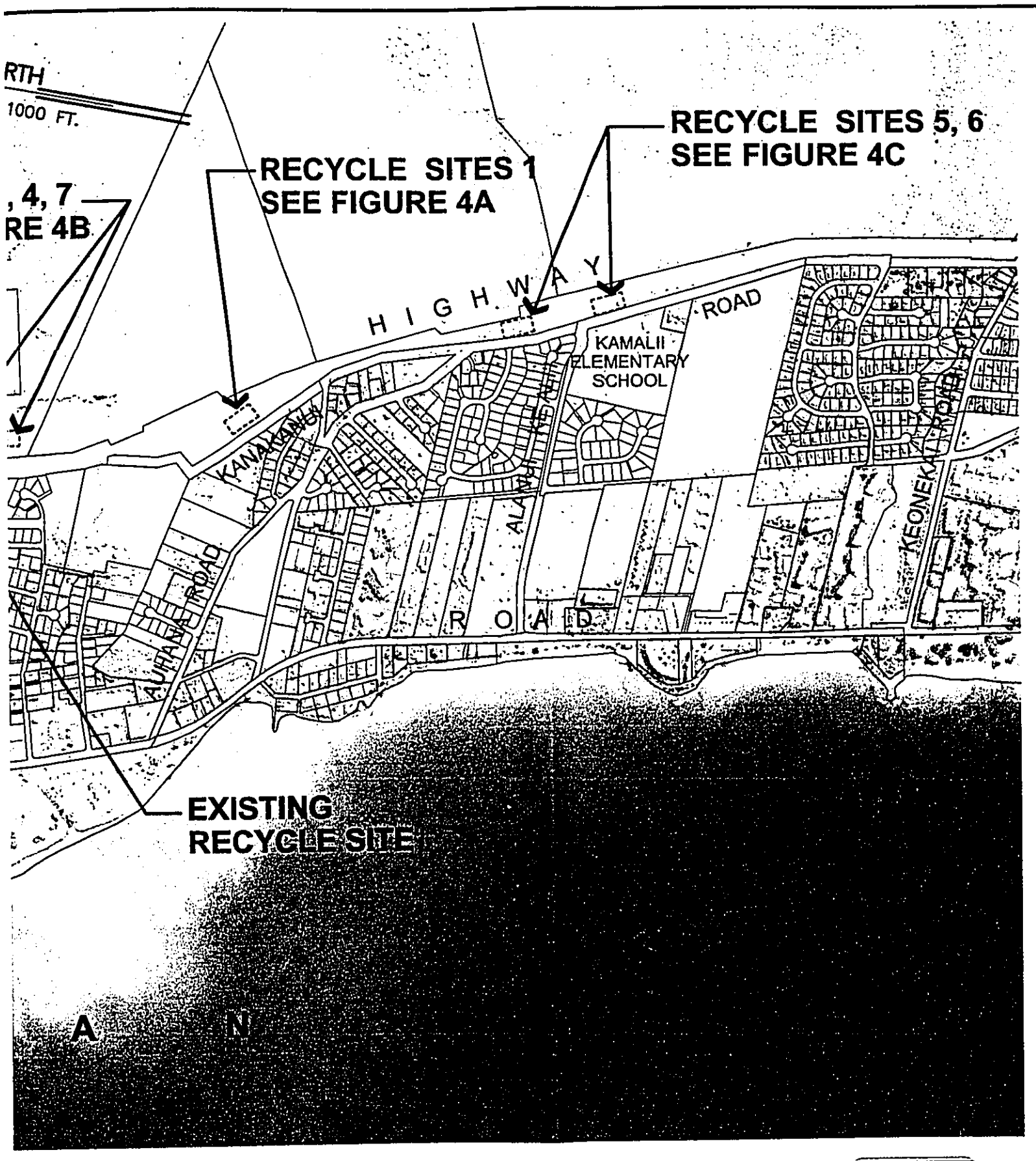
MAP SHOWING PROPOSED RECYCLING SITE

LEGEND:

- EXISTING RECYCLING SITE
- PROPOSED RECYCLING SITE

0 1000 2000 3000

SCALE: 1 IN. = 1000 FT.



CYCLING SITES CONSIDERED

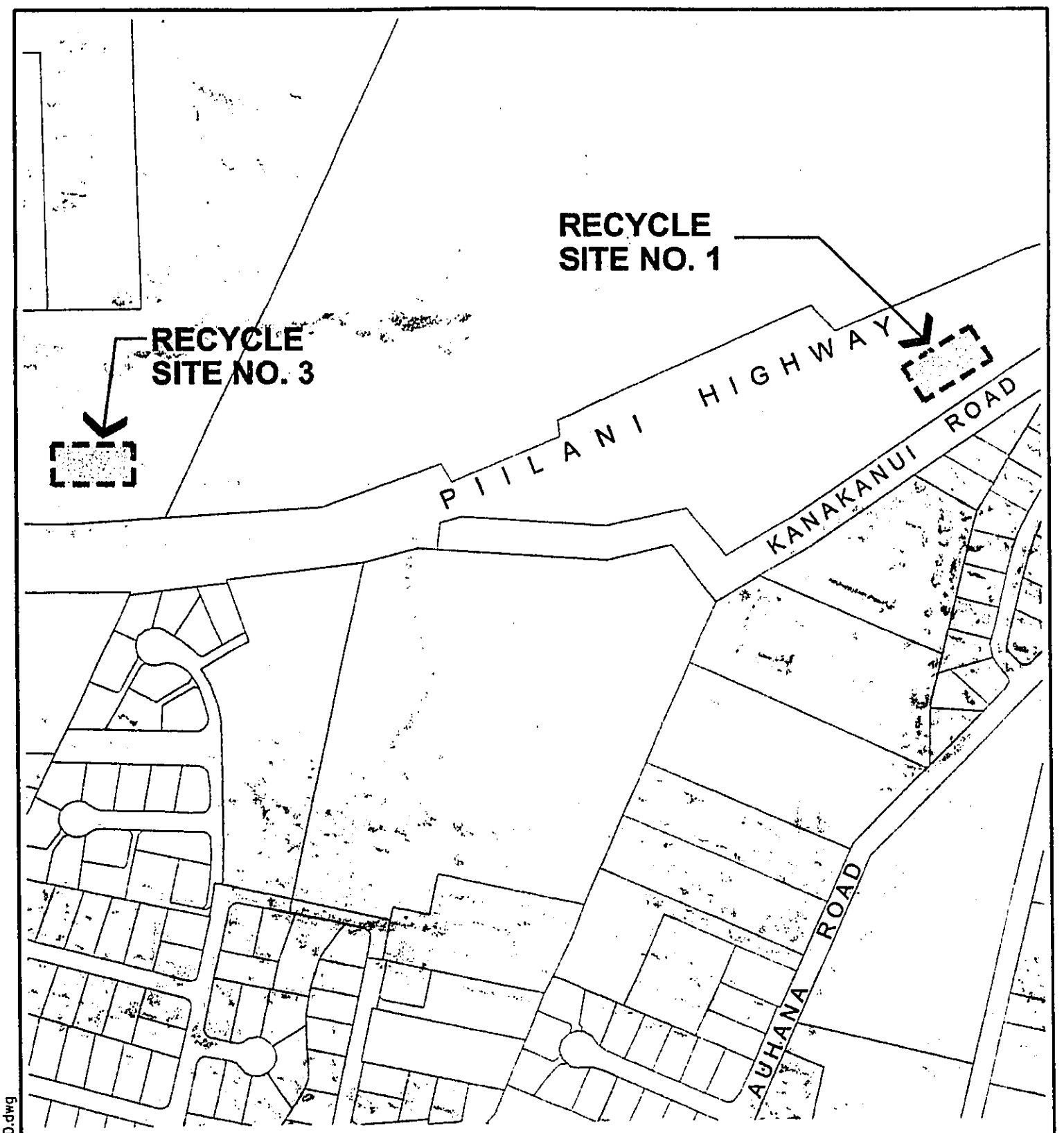
3000 4000

= 1000 FT.

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

FIGURE 4

March 2, 2005



PROPOSED
RECYCLING SITES NO. 1, 3

0 300 600 900 1200

SCALE: 1 IN. = 300 FT.

LEGEND:

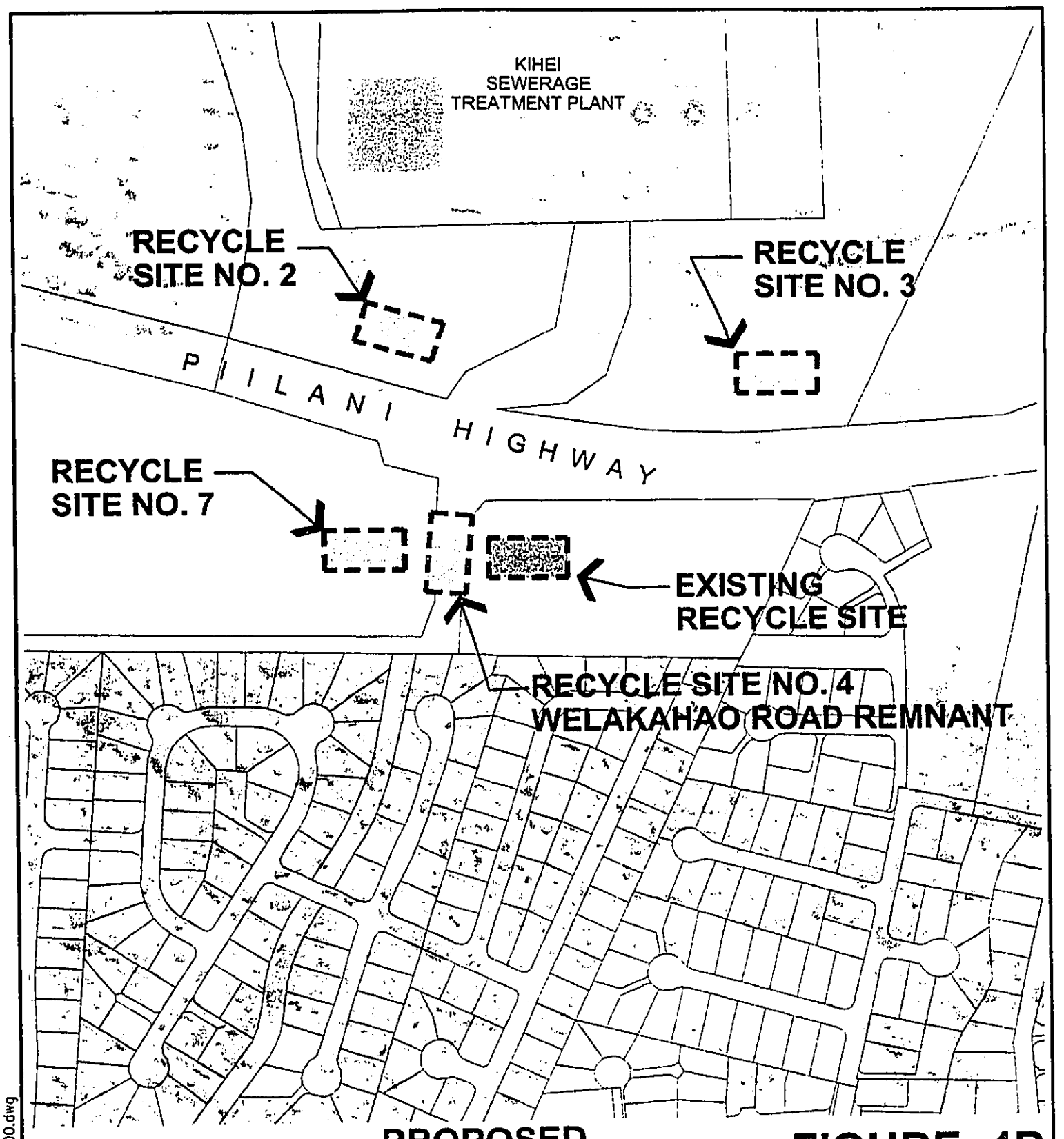
PROPOSED RECYCLING SITE

FIGURE 4A

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

March 2, 2005

03031\dwg\exhibits\recycle00.dwg



PROPOSED
RECYCLING SITES NO. 2, 3, 4, 7

0 300 600 900 1200

SCALE: 1 IN. = 300 FT.

LEGEND:

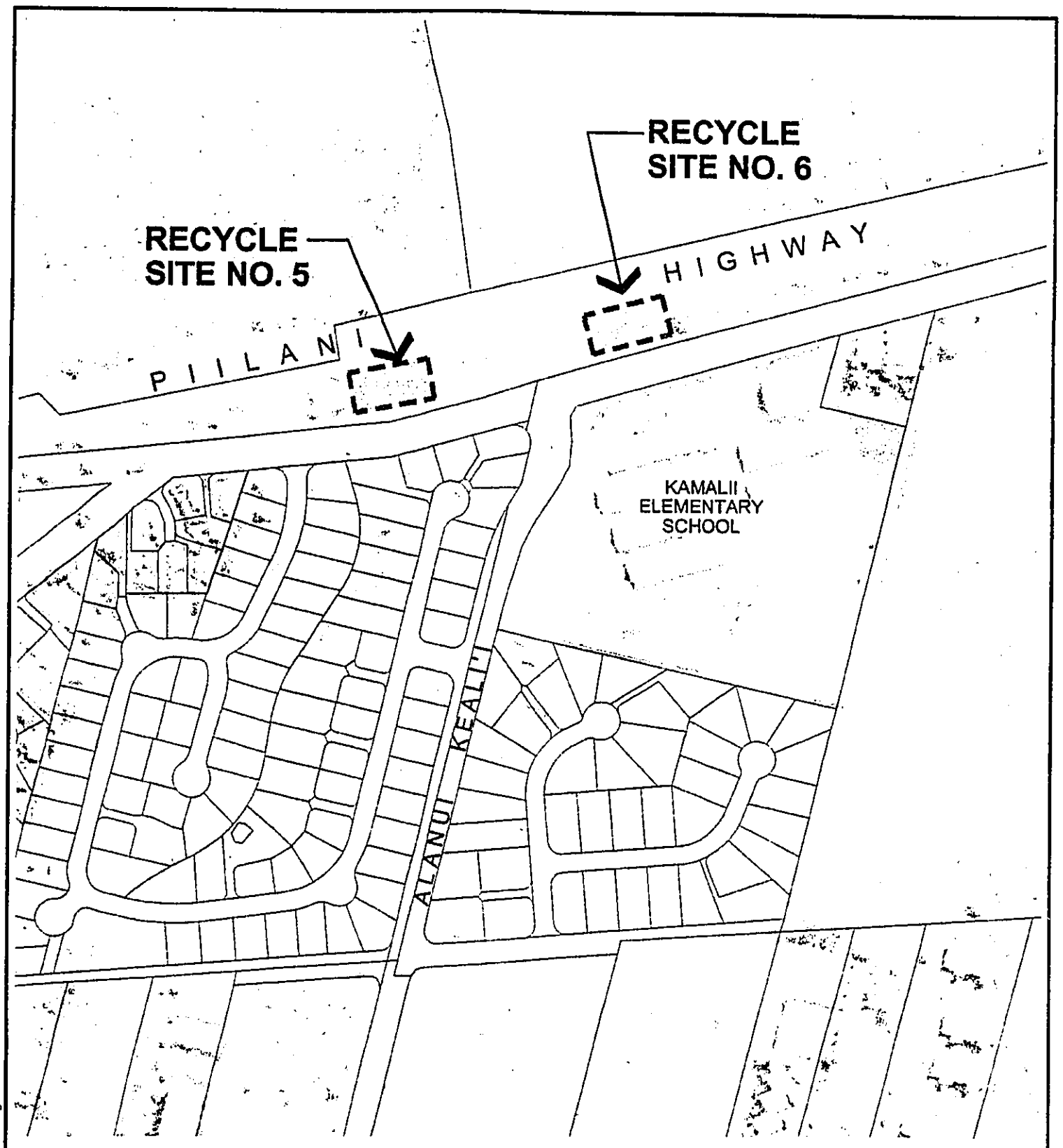
- EXISTING RECYCLING SITE
- PROPOSED RECYCLING SITE

FIGURE 4B

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

March 2, 2005

03031\dwg\exhibits\recycle00.dwg



PROPOSED RECYCLING SITES NO. 5, 6

0 300 600 900 1200

SCALE: 1 IN. = 300 FT.

LEGEND:

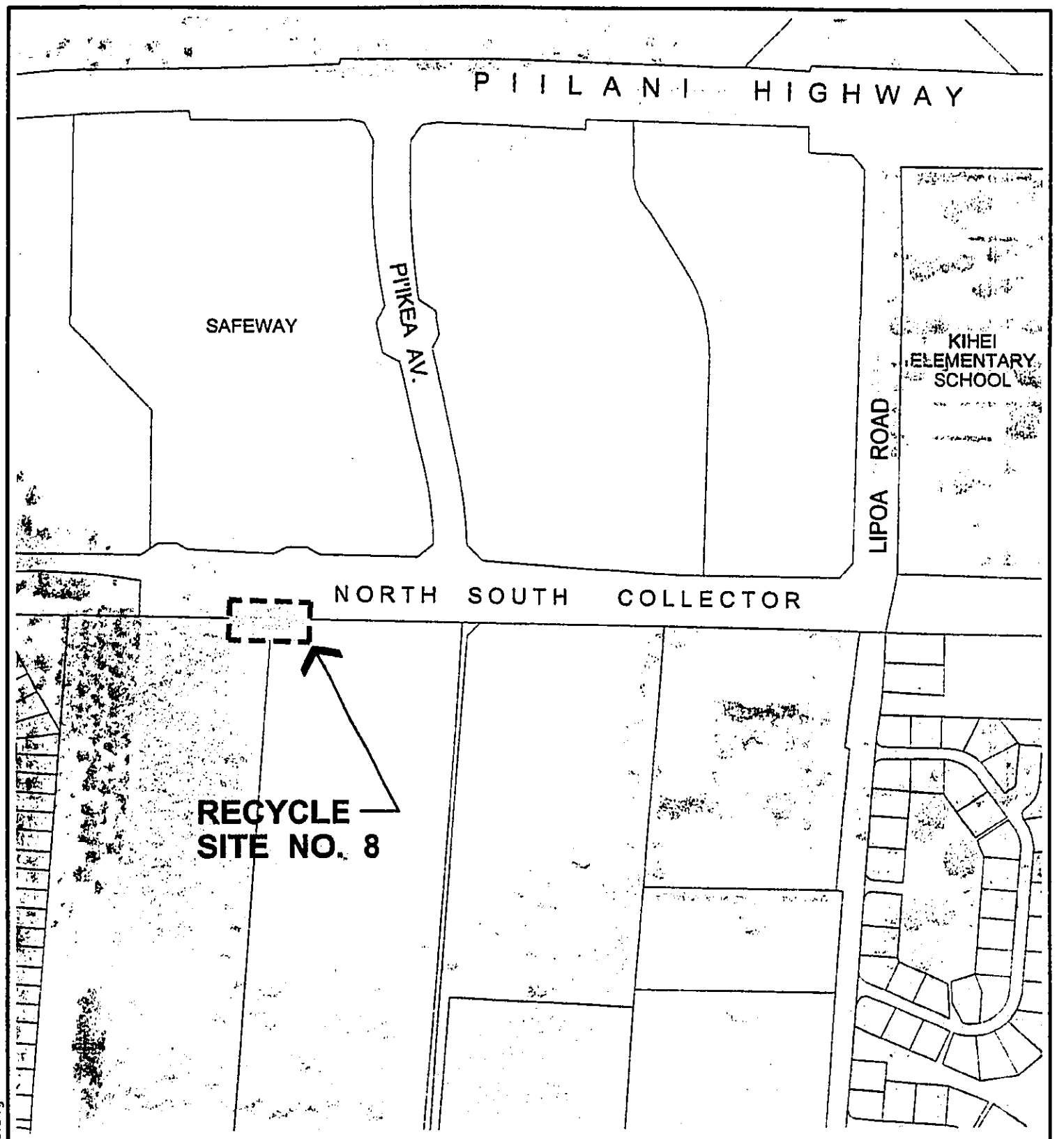
PROPOSED RECYCLING SITE

FIGURE 4C

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

March 2, 2005

03031\dwg\exhibits\recycle00.dwg



PROPOSED RECYCLING SITE NO. 8

0 300 600 900 1200

SCALE: 1 IN. = 300 FT.

LEGEND:

PROPOSED RECYCLING SITE

FIGURE 4D

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

March 2, 2005

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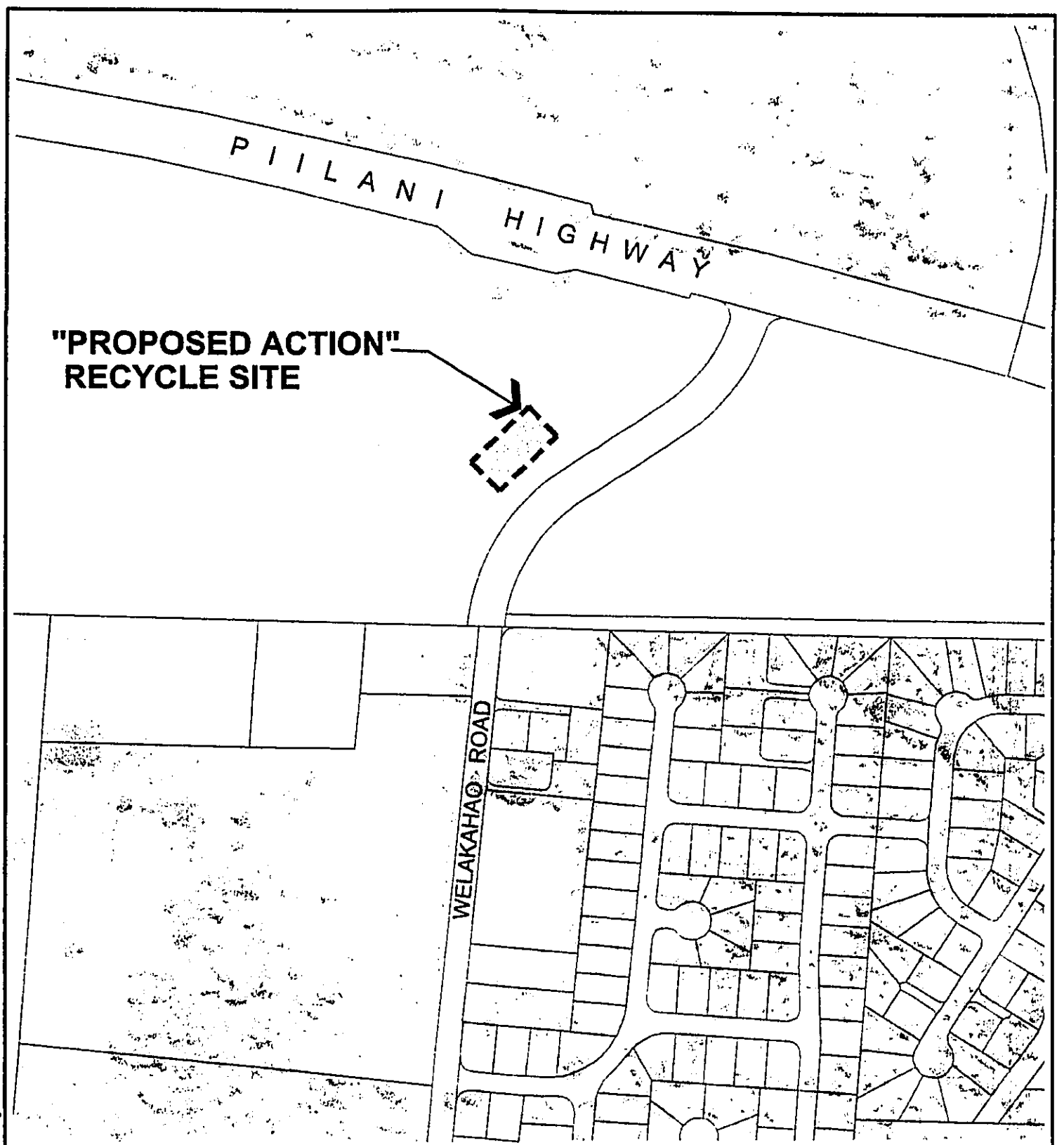

PROPOSED RECYCLING SITE

FIGURE 4E

0 300 600 900 1200

SCALE: 1 IN. = 300 FT.

LEGEND:

PROPOSED RECYCLING SITE

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

March 2, 2005

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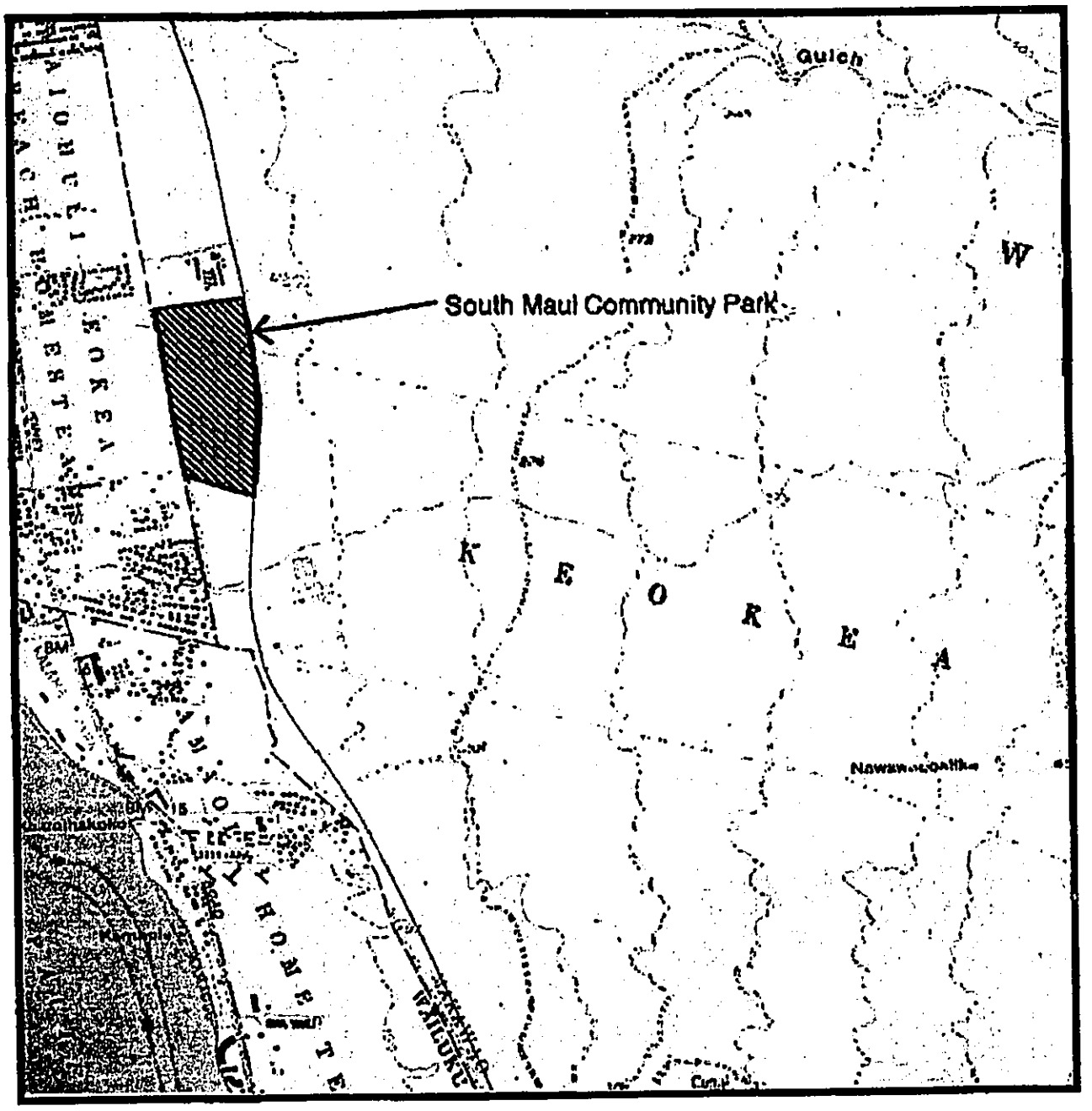
Exhibits



LEGEND:

PROJECT LOCATION

SCALE: 1: 24000

GENERAL AREA:

KIHEI, MAUI, HAWAII

REFERENCE:

PUU O KALI QUADRANGLE
U.S.G.S. TOPOGRAPIC MAP

F.G.E. Ltd.

PROJECT LOCATION MAP

South Maui Community Park
Kihei, Maui, Hawaii

File: 2389.01

December 2004

Figure 1

Exhibit "A" - South Maui Community Park Location Map by FGE

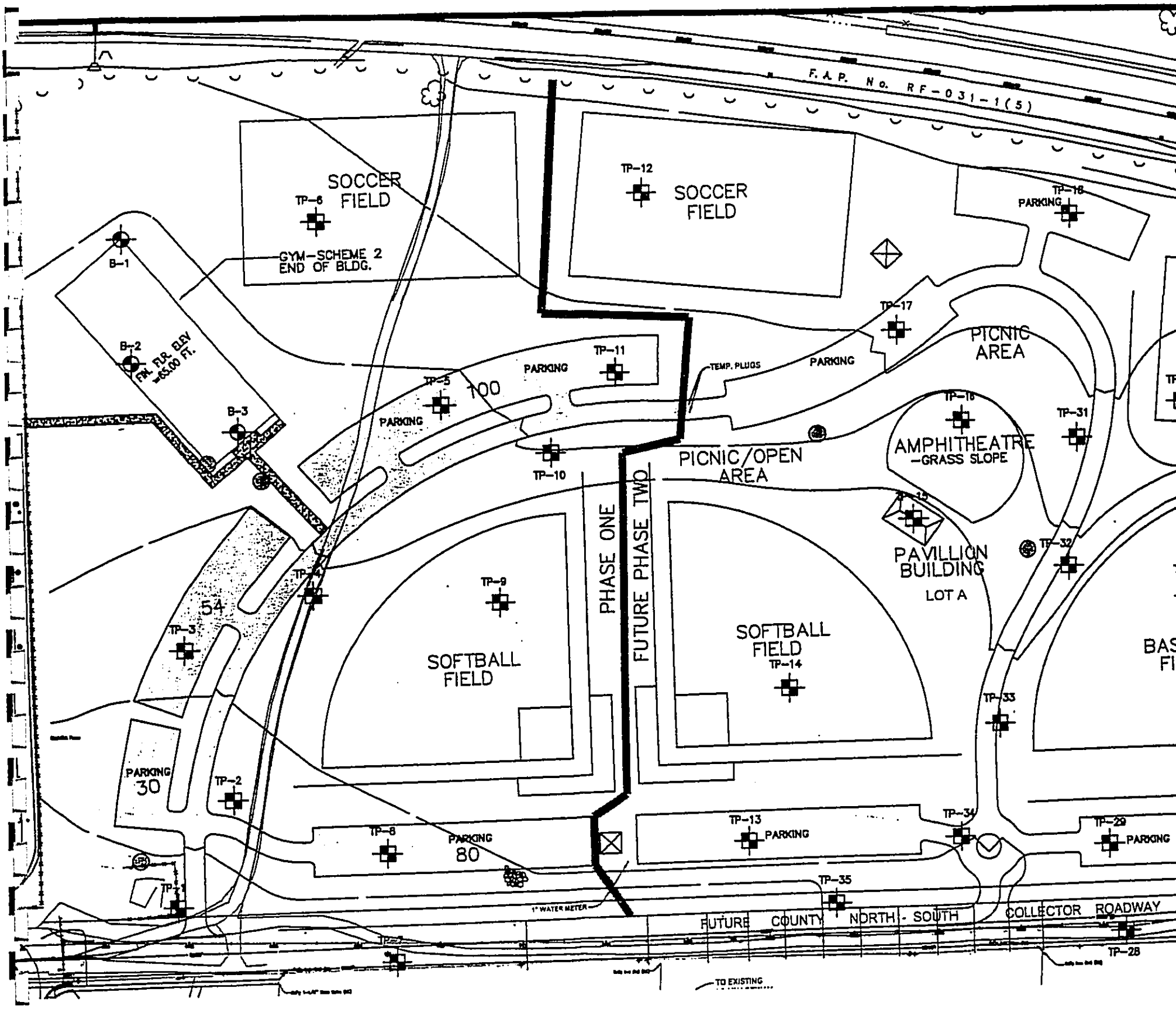
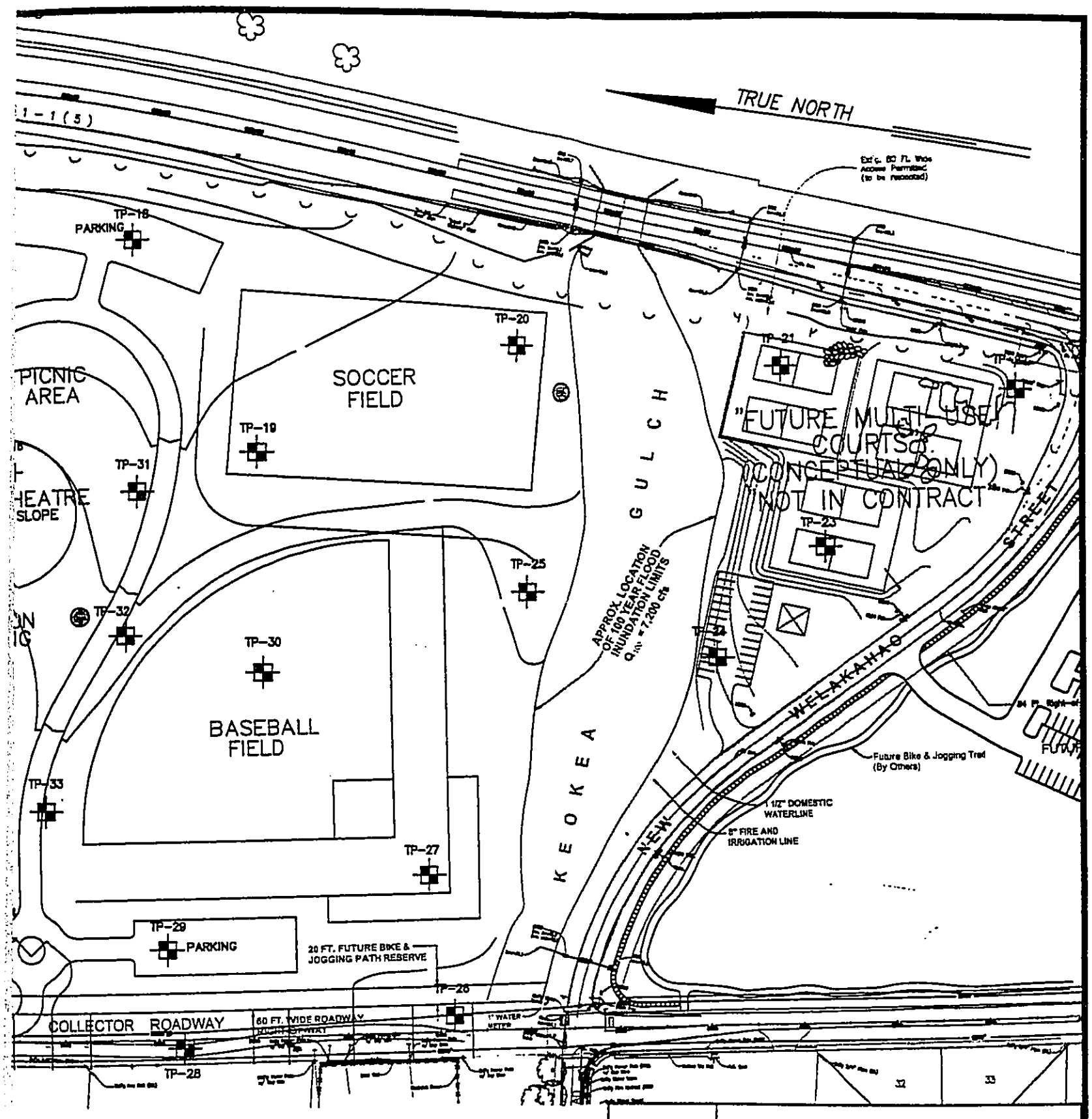


Exhibit "B" - FGE Site and Boring Location Plan

SCALE IN FEET

0 140 280

REFERENCE: PLAN PROVIDED BY: WARREN S. UNEMORI ENGINEERING, INC. (9/4/04)



g Location Plan

LEGEND

FGE BORING LOCATION

FGE TEST PIT LOCATION

280

FEWELL GEOTECHNICAL ENGINEERING, LTD.

SITE AND BORING LOCATION PLAN

SOUTH MAUI COMMUNITY PARK
KIHEI, MAUI, HAWAII

FILE: 2389.01 DECEMBER 2004

FIGURE 2

F.G.E. Ltd.
96-1416
VAHOMA PLACE
PEARL CITY
HAWAII
96782-1973

F.G.E. Ltd.
96-1416 Waihona Place
Pearl City, Hawaii

Test Pit: TP23
Project: South Maui Community Park
Location: Kihei, Maui, Hawaii
Surface Elevation: 73' ±
Depth to Water: None Encountered
Date Completed: 9-29-04

File: 2389.01
Project Engineer: AS
Field Engineer: TSK
Drafted by: CPD
Date of Drawing: December 2004

LAB TEST RESULTS	MOIST CONT. %	DRY DENS. PCF	BLOWS PER FT.	SAMPLE	DEPTH	CLASSIFICATION
	7			1	0	Reddish Silty GRAVEL/Gravelly SILT (GM-ML), with Sand Cobbles, and Boulders, hard, dry
					5	BOH @ 1.5' (REFUSAL ON BASALT)
					10	
					15	

Exhibit "C" - FGE Test Pit 23 Soil Boring Profile

Figure 28

F.G.E. Ltd.
96-1416 Waihona Place
Pearl City, Hawaii

Test Pit: TP24
Project: South Maui Community Park
Location: Kihei, Maui, Hawaii
Surface Elevation: 64' ±
Depth to Water: None Encountered
Date Completed: 9-29-04

File: 2389.01
Project Engineer: AS
Field Engineer: TSK
Drafted by: CPD
Date of Drawing: December 2004

LAB TEST RESULTS	MOIST CONT. %	DRY DENS. PCF	BLOWS PER FT.	SAMPLE	DEPTH	CLASSIFICATION
Non-Plastic	6			1	0	Brown Silty GRAVEL (GM) with Cobbles and Boulders, dense, dry
						BOH @ 0.8" (REFUSAL ON BASALT)
					5	
					10	
					15	

Figure 29

Exhibit "D" - FGE Test Pit 24 Soil Boring Profile

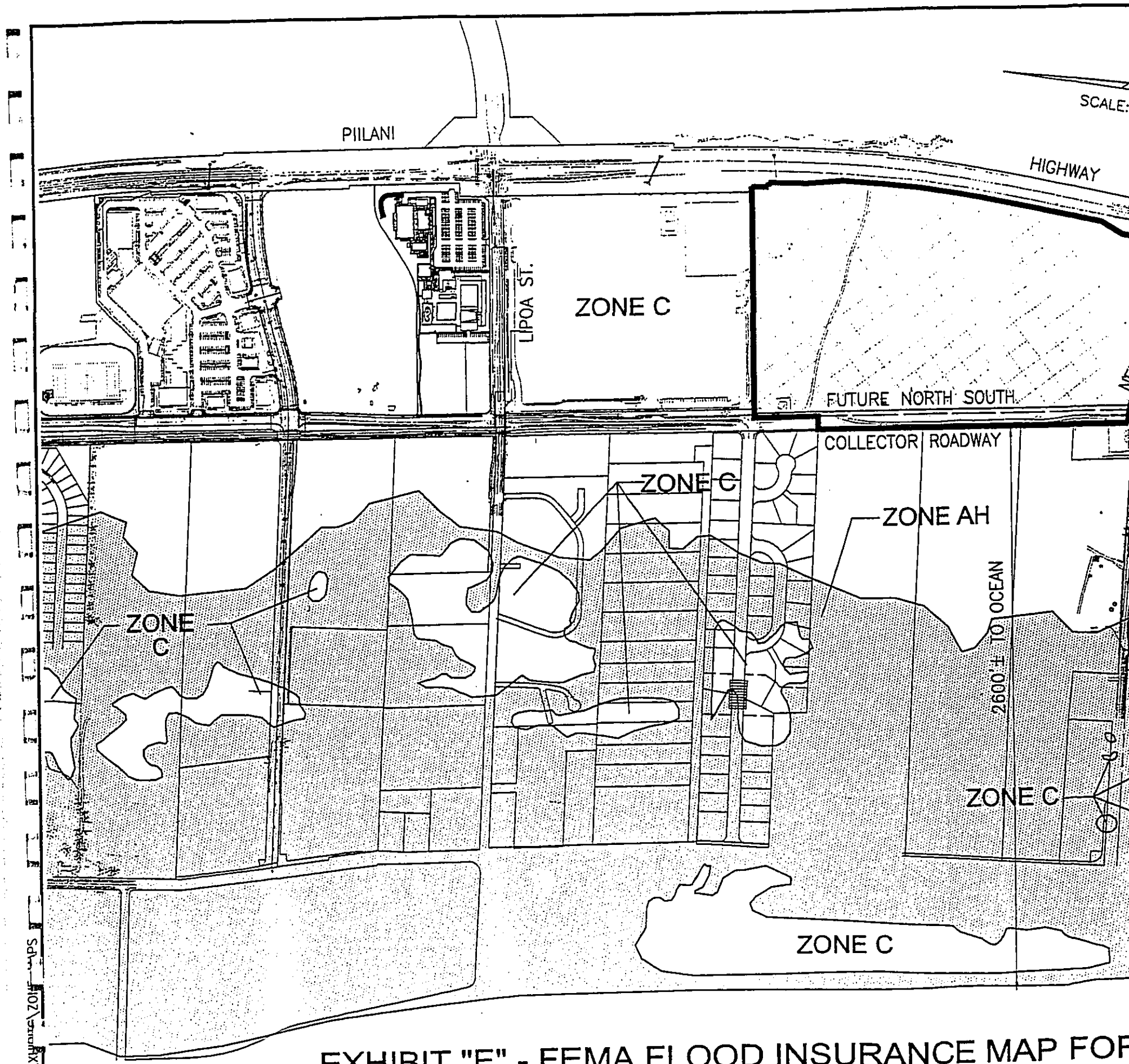
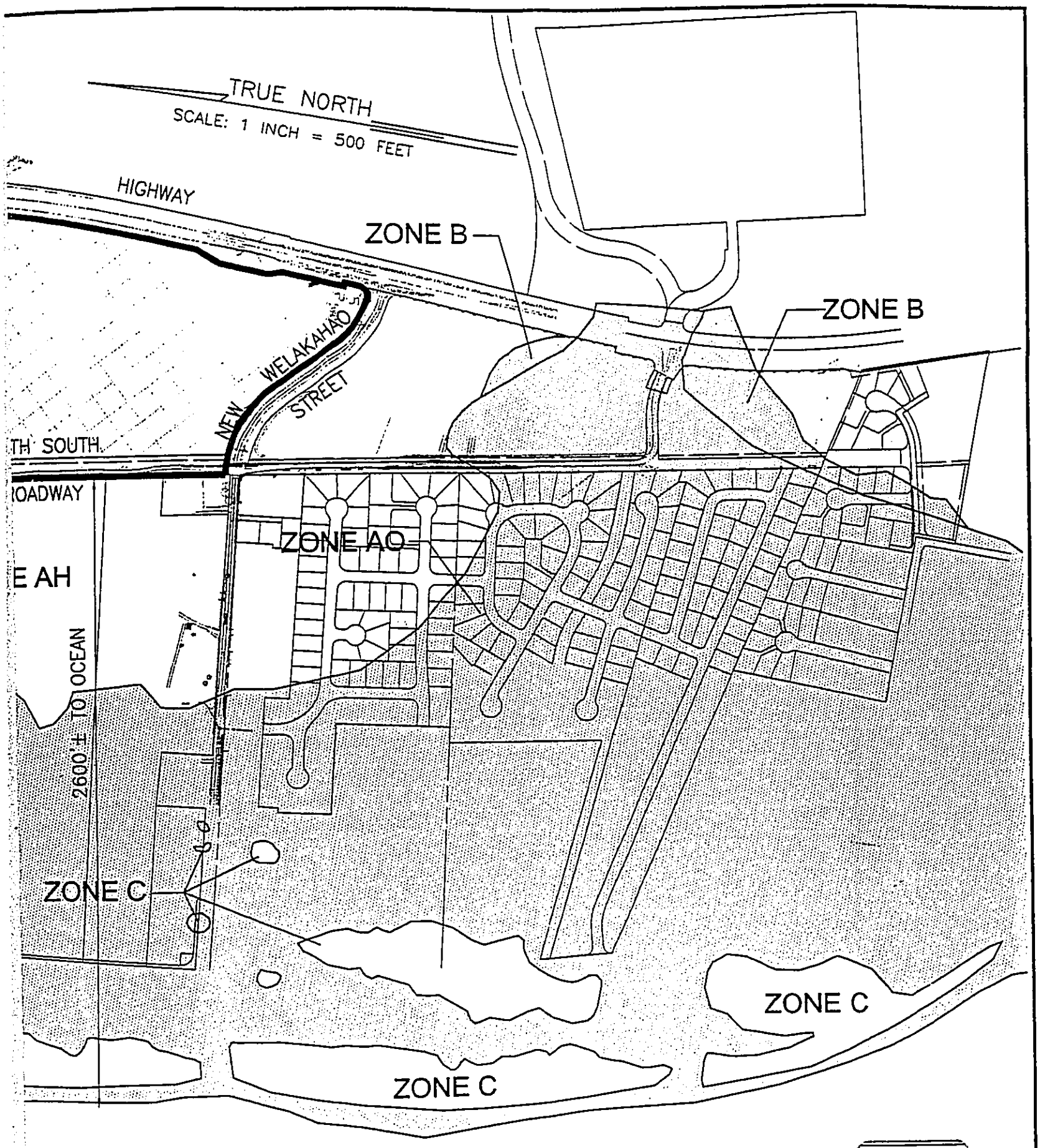


EXHIBIT "E" - FEMA FLOOD INSURANCE MAP FOR

0 500 1000 1500 2000

SCALE: 1 IN. = 500 FT.



E MAP FOR PROJECT SITE

500 2000

FT.

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

February 21, 2005

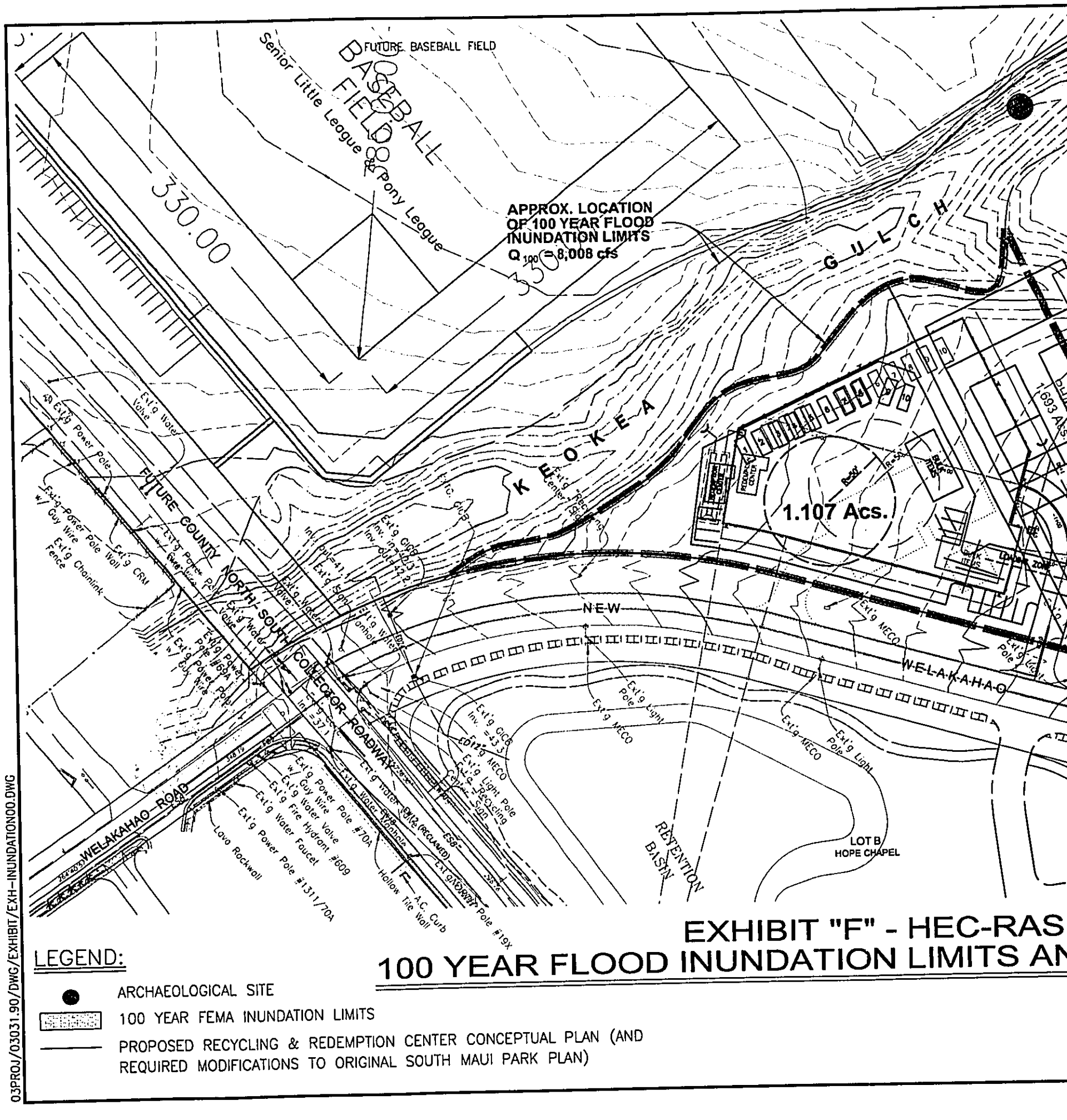


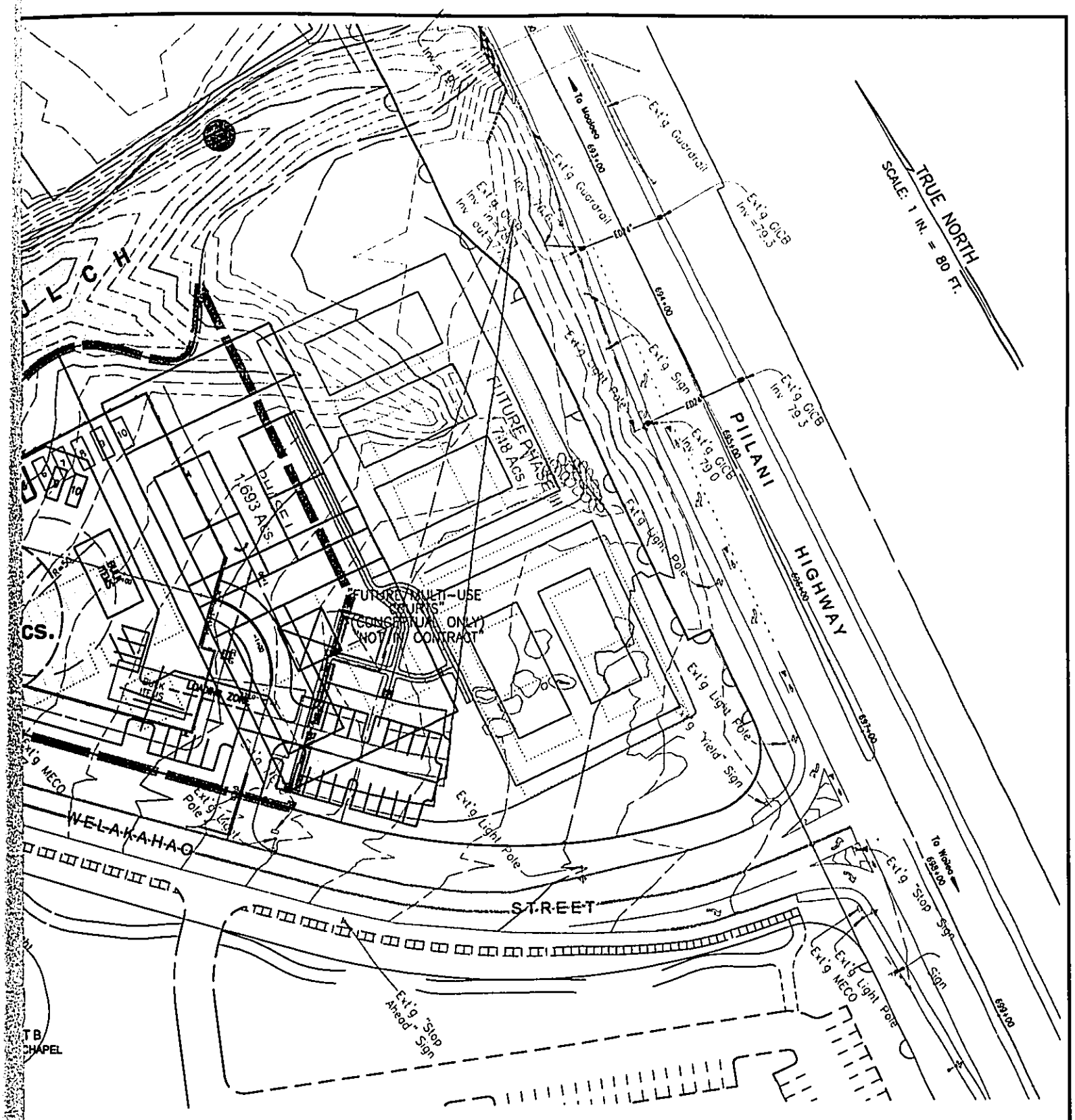
EXHIBIT "F" - HEC-RAS

100 YEAR FLOOD INUNDATION LIMITS AN

LEGEND:

- ARCHAEOLOGICAL SITE
- 100 YEAR FEMA INUNDATION LIMITS
- PROPOSED RECYCLING & REDEMPTION CENTER CONCEPTUAL PLAN (AND REQUIRED MODIFICATIONS TO ORIGINAL SOUTH MAUI PARK PLAN)

03PROJ/03031.90/DWG/EXHIBIT/EXH-INUNDATION00.DWG



' - HEC-RAS
N LIMITS ANALYSIS RESULTS

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

February 24, 2005

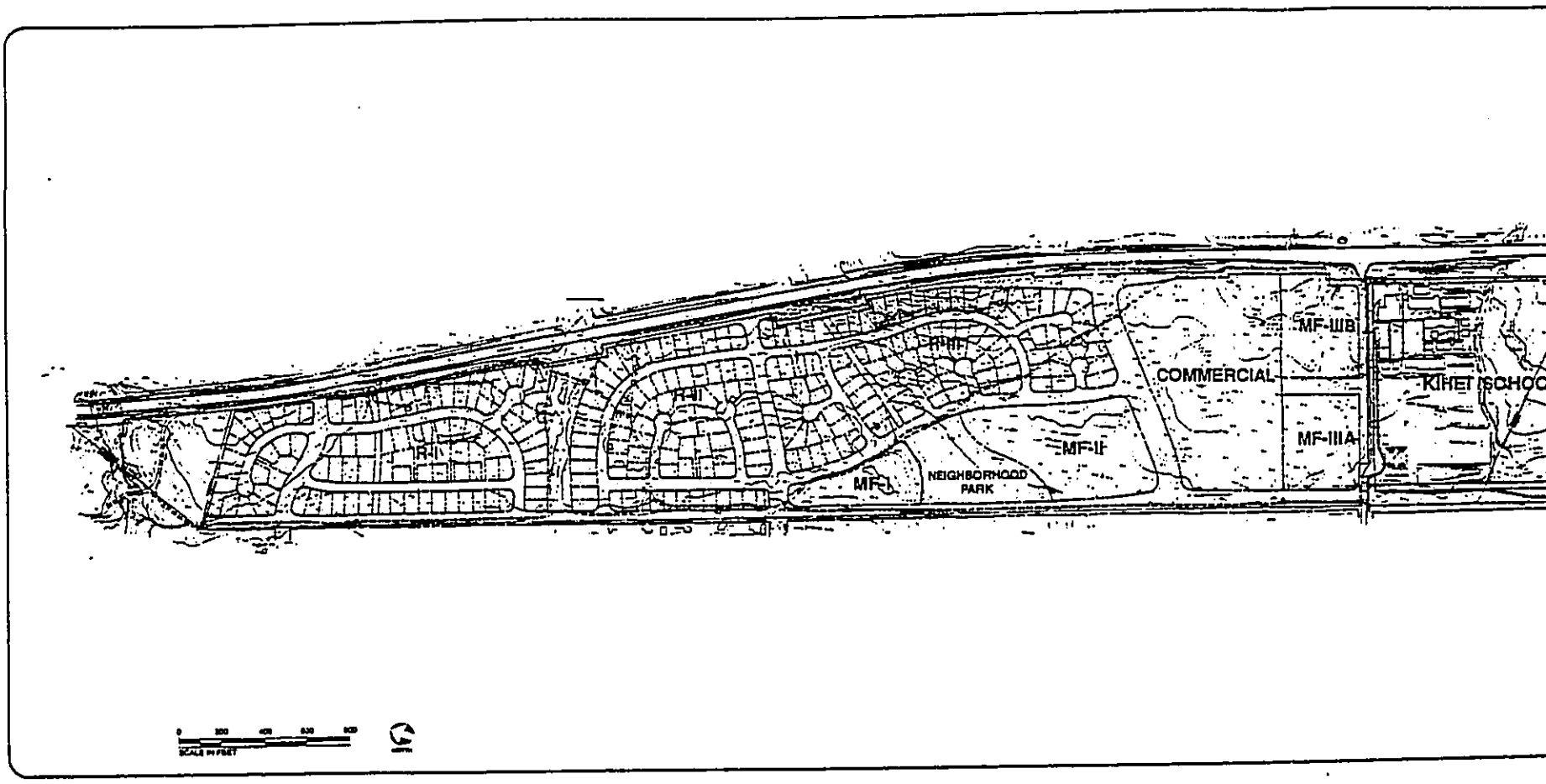


Exhibit "G" - Extent of Biological and Archaeological Reconnaissance S

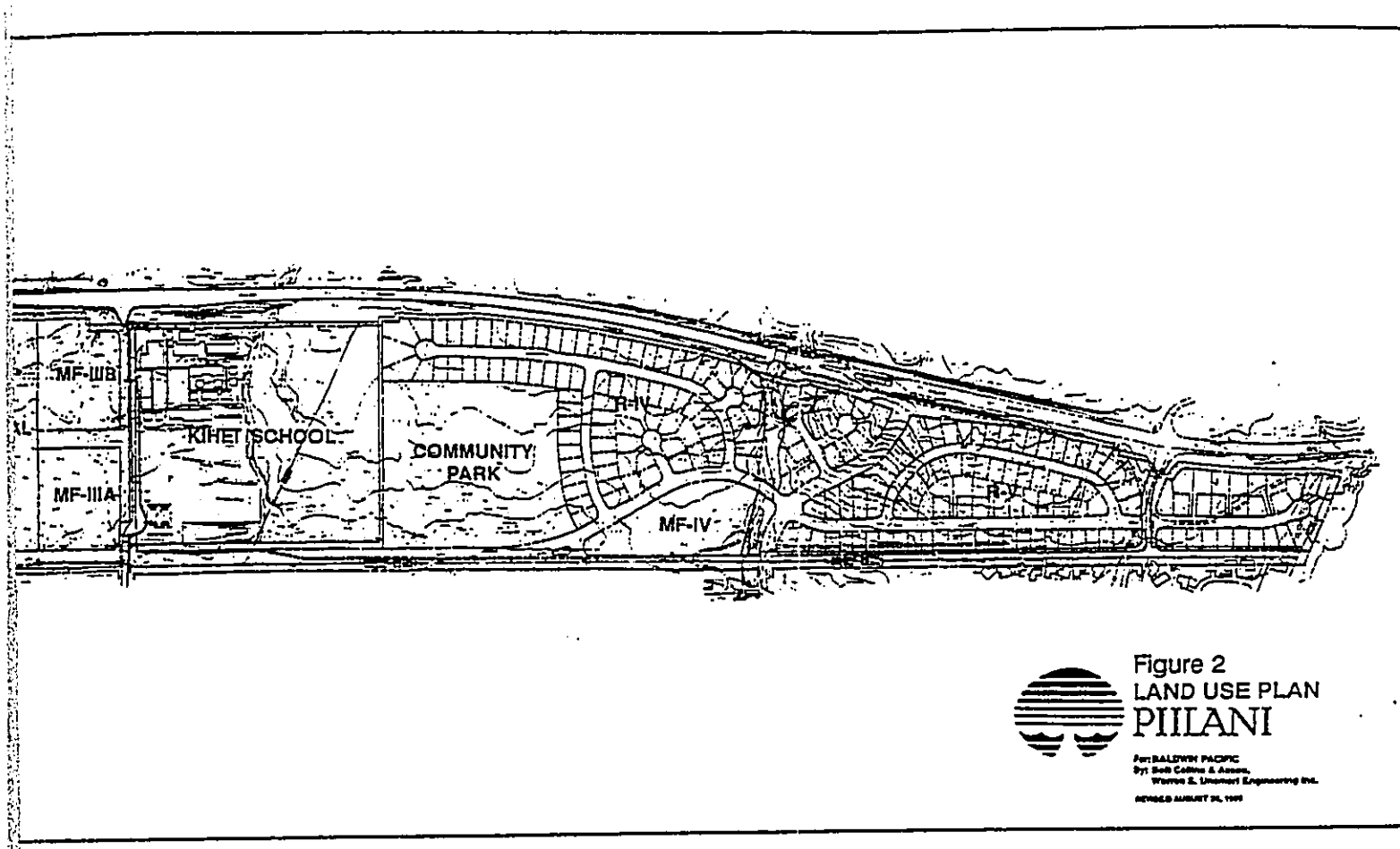


Figure 2
LAND USE PLAN
PIILANI

For: BALDWIN PACIFIC
By: Belt Collins & Assoc.
Warren S. Unemori Engineering Inc.

REVISED AUGUST 30, 1982

ogical Reconnaissance Study in July, 1982

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

David Sereda
Chris Hart and Partners, Inc.
1955 Main Street, Ste. 200
Wailuku, HI 96793

Re: Field Inspection Letter, Piilani I and II, Kihei Community Park Project

Dear Mr. Sereda:

Per the scope of work for this project provided by yourself and Dr. Robert Spear of Scientific Consultant Services, Inc. (SCS), we conducted a field check of the proposed community park project area in Kihei, Maui, Hawai'i. The field inspection was conducted on May 5 and May 6, 2004 by Michael Dega, Ph.D. of SCS. The goal of the inspection was to re-identify the six archaeological sites slated for Data Recovery (site verification) and to assess their preservation condition. If significantly altered, SCS was to re-evaluate the Data Recovery program.

The results of the field inspection were positive. All six sites and their component features slated for Data Recovery (Site-1710, -2512, -2514, -2516, -2519, and -2522) were identified in the field and clearly marked for future reference. The sites were marked with non-destructive flagging tape. All six sites are fairly identifiable on the landscape. Second, none of the six sites or their component features appeared to have been adversely impacted since the last archaeological project was conducted in 1990 (Donham 1990). It is our assessment that the Data Recovery Plan produced by Donham (1990) is still valid for each of the six sites and could continue as planned. While minor land disturbances of a recent nature were noted in some portions of the project area (e.g., small fire clearance, dumping), none of these disturbances have adversely impacted the six sites.

Upon completion of the Data Recovery work, a Data Recovery Report will be submitted to SHPD for review (Dr. Melissa Kirkendall). Based on our assessment of these sites at this time, after Data Recovery work has been completed, the sites will no longer be significant. As such, and if this pattern holds true, any landscape altering activities may occur at any location on the parcel. SHPD may concur with the likely recommendation that no further archaeological work is necessary for the project area.

If you have any questions about the field inspection, please do not hesitate to contact me (597-1182; mike@sceshawaii.com). We look forward to conducting the Data Recovery work for you at your convenience. Thank you.

Regards,

Exhibit "H" - Field Inspection Letter for Piilani I and II, Kihei Community Park Project

Michael Dega. Ph.D.
Senior Archaeologist
Scientific Consultant Services, Inc.

U.S. Census Bureau
American FactFinder

GCT-PH1. Population, Housing Units, Area, and Density: 2000
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data
Geographic Area: **Hawaii -- County**

NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://factfinder.census.gov/home/en/datanotes/expsf1u.htm.

Geographic area	Population	Housing units	Area in square miles			Density per square mile of land area	
			Total area	Water area	Land area	Population	Housing units
Hawaii	1,211,537	460,542	10,930.98	4,508.36	6,422.62	188.6	71.7
COUNTY							
Hawaii County	148,677	62,674	5,086.70	1,058.69	4,028.02	36.9	15.6
Honolulu County	876,156	315,988	2,126.85	1,527.08	599.77	1,460.8	526.9
Kalawao County	147	172	52.33	39.12	13.21	11.1	13.0
Kauai County	58,463	25,331	1,266.37	643.93	622.44	93.9	40.7
Maui County	128,094	56,377	2,398.74	1,239.54	1,159.20	110.5	48.6

(X) Not applicable
Source: U.S. Census Bureau, Census 2000 Summary File 1

Exhibit "I" - 2000 U. S. Census Bureau Population for State of Hawaii by County

U.S. Census Bureau
American FactFinder

GCT-PH1. Population, Housing Units, Area, and Density: 2000
Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data
Geographic Area: **Hawaii -- Place**

NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://factfinder.census.gov/home/en/datanotes/expsf1u.htm.

Geographic area	Population	Housing units	Area in square miles: Total area	Water area	Land area	Density per square mile of land area: Population	Housing units
Hawaii	1,211,537	460,542	10,930.98	4,508.36	6,422.62	188.6	71.7
PLACE							
Ahuimanu CDP, Honolulu County	8,506	2,681	1.79	0.00	1.79	4,745.1	1,495.6
Aiea CDP, Honolulu County	9,019	2,831	1.75	0.10	1.65	5,463.5	1,714.9
Ainaloa CDP, Hawaii County	1,910	722	1.78	0.00	1.78	1,074.2	406.0
Anahola CDP, Kauai County	1,932	606	3.94	0.18	3.75	514.8	161.5
Barbers Point Housing CDP, Honolulu County	67	127	0.26	0.00	0.26	260.0	492.9
Captain Cook CDP, Hawaii County	3,206	1,223	12.16	0.00	12.16	263.6	100.6
Eden Roc CDP, Hawaii County	451	241	7.02	0.00	7.02	64.2	34.3
Eleele CDP, Kauai County	2,040	652	1.02	0.19	0.83	2,463.5	787.4
Ewa Beach CDP, Honolulu County	14,650	3,515	1.87	0.45	1.42	10,341.4	2,481.2
Ewa Gentry CDP, Honolulu County	4,939	1,843	0.32	0.00	0.32	15,627.7	5,831.5
Ewa Villages CDP, Honolulu County	4,741	1,274	0.98	0.00	0.98	4,838.6	1,300.2
Fern Acres CDP, Hawaii County	756	319	6.27	0.00	6.27	120.6	50.9
Fern Forest CDP, Hawaii County	480	289	12.53	0.00	12.53	38.3	23.1
Haiku-Pauwela CDP, Maui County	6,578	2,454	18.00	2.25	15.76	417.5	155.8
Halaula CDP, Hawaii County	495	158	2.98	0.31	2.67	185.1	59.1
Halawa CDP, Honolulu County	13,891	4,289	2.33	0.00	2.33	5,974.5	1,844.7
Haleiwa CDP, Honolulu County	2,225	867	2.53	0.71	1.83	1,218.1	474.6
Haliimaile CDP, Maui County	895	260	1.70	0.03	1.68	534.0	155.1
Hana CDP, Maui County	709	253	3.48	1.31	2.17	326.0	116.3
Hanalei CDP, Kauai County	478	303	0.82	0.17	0.65	736.7	467.0
Hanamaulu CDP, Kauai County	3,272	947	1.28	0.16	1.13	2,907.8	841.6
Hanapepe CDP, Kauai County	2,153	757	0.97	0.10	0.87	2,469.8	868.4
Hauula CDP, Honolulu County	3,651	1,020	6.82	0.79	6.03	605.9	169.3
Hawaiian Acres CDP, Hawaii County	1,776	843	19.23	0.00	19.23	92.3	43.8
Hawaiian Beaches CDP, Hawaii County	3,709	1,383	25.57	0.12	25.45	145.8	54.4
Hawaiian Ocean View CDP, Hawaii County	2,178	1,382	106.48	4.47	102.01	21.4	13.5
Hawaiian Paradise Park CDP, Hawaii County	7,051	2,671	15.20	0.16	15.05	468.6	177.5
Hawi CDP, Hawaii County	938	333	1.22	0.00	1.21	773.1	274.4
Heeia CDP, Honolulu County	4,944	1,604	2.29	0.25	2.04	2,419.4	784.9
Hickam Housing CDP, Honolulu County	5,471	1,718	1.52	0.28	1.24	4,419.0	1,387.7
Hilo CDP, Hawaii County	40,759	16,026	58.44	4.15	54.29	750.8	295.2
Holualoa CDP, Hawaii County	6,107	3,330	15.16	1.01	14.15	431.6	235.3
Honalo CDP, Hawaii County	1,987	798	29.31	0.00	29.31	67.8	27.2
Honaunau-Napoopoo CDP, Hawaii County	2,414	944	40.23	2.20	38.03	63.5	24.8
Honokaa CDP, Hawaii County	2,233	835	1.28	0.00	1.28	1,739.5	650.5

Exhibit "J" - 2000 U. S. Census Bureau Population of State of Hawaii by Place

Geographic area	Population	Housing units	Area in square miles: Total area	Water area	Land area	Density per square mile of land area: Population	Housing units
Honolulu CDP, Honolulu County	371,657	158,663	105.05	19.35	85.70	4,336.6	1,851.3
Honomu CDP, Hawaii County	541	213	0.49	0.03	0.46	1,172.8	461.7
Iroquois Point CDP, Honolulu County	2,462	1,035	0.64	0.10	0.54	4,585.0	1,927.5
Kaaawa CDP, Honolulu County	1,324	550	1.10	0.51	0.59	2,250.6	934.9
Kaanapali CDP, Maui County	1,375	1,775	5.72	0.86	4.86	282.8	365.1
Kahaluu CDP, Honolulu County	2,935	980	2.28	1.06	1.22	2,410.8	805.0
Kahaluu-Keauhou CDP, Hawaii County	2,414	2,339	7.64	1.71	5.93	407.2	394.6
Kahuku CDP, Honolulu County	2,097	518	2.28	1.31	0.97	2,150.9	531.3
Kahului CDP, Maui County	20,146	6,079	16.34	1.17	15.16	1,328.7	400.9
Kailua CDP, Hawaii County	9,870	4,322	39.76	4.26	35.50	278.0	121.7
Kailua CDP, Honolulu County	36,513	12,780	9.53	2.89	6.64	5,495.8	1,923.6
Kalaheo CDP, Kauai County	3,913	1,509	3.00	0.06	2.95	1,328.5	512.3
Kalaoa CDP, Hawaii County	6,794	2,541	43.83	4.35	39.48	172.1	64.4
Kalihiwai CDP, Kauai County	717	394	7.41	1.10	6.31	113.7	62.5
Kaneohe CDP, Honolulu County	34,970	11,472	8.51	1.94	6.57	5,320.7	1,745.5
Kaneohe Station CDP, Honolulu County	11,827	2,388	5.82	1.44	4.39	2,696.2	544.4
Kapaa CDP, Kauai County	9,472	3,632	9.99	0.24	9.75	971.2	372.4
Kapaau CDP, Hawaii County	1,159	443	2.16	0.00	2.16	536.1	204.9
Kapalua CDP, Maui County	467	831	2.34	0.63	1.71	272.9	485.6
Kaumakani CDP, Kauai County	607	234	1.05	0.09	0.95	635.7	245.1
Kaunakakai CDP, Maui County	2,726	962	3.12	1.09	2.03	1,342.7	473.8
Kawela Bay CDP, Honolulu County	410	424	2.01	1.43	0.58	701.1	725.1
Keaau CDP, Hawaii County	2,010	659	2.47	0.00	2.47	813.8	266.8
Kealakekua CDP, Hawaii County	1,645	692	7.54	0.00	7.54	218.1	91.7
Kekaha CDP, Kauai County	3,175	1,162	1.22	0.22	1.00	3,178.2	1,163.2
Kihei CDP, Maui County	16,749	9,170	11.89	1.73	10.16	1,648.6	902.6
Kilauea CDP, Kauai County	2,092	743	1.51	0.01	1.50	1,395.0	495.5
Koloa CDP, Kauai County	1,942	748	1.19	0.00	1.19	1,629.5	627.6
Kualapuu CDP, Maui County	1,936	592	30.70	0.23	30.46	63.5	19.4
Kukuihaele CDP, Hawaii County	317	124	2.00	0.32	1.69	187.7	73.4
Kurtistown CDP, Hawaii County	1,157	452	5.81	0.00	5.81	199.1	77.8
Lahaina CDP, Maui County	9,118	3,027	6.97	1.22	5.75	1,584.7	526.1
Laie CDP, Honolulu County	4,585	1,010	2.14	0.87	1.27	3,601.7	793.4
Lanai City CDP, Maui County	3,164	1,343	3.57	0.00	3.57	885.5	375.9
Laupahoehoe CDP, Hawaii County	473	196	2.26	0.19	2.08	227.9	94.4
Lawai CDP, Kauai County	1,984	747	3.90	0.10	3.80	521.7	196.4
Leilani Estates CDP, Hawaii County	1,046	474	4.16	0.00	4.16	251.5	114.0
Lihue CDP, Kauai County	5,674	2,399	7.11	0.79	6.32	898.3	379.8
Maalaea CDP, Maui County	454	600	7.67	2.91	4.77	95.3	125.9
Maili CDP, Honolulu County	5,943	1,502	2.04	1.09	0.95	6,241.5	1,577.5
Makaha CDP, Honolulu County	7,753	3,208	5.24	2.91	2.33	3,324.7	1,375.7
Makaha Valley CDP, Honolulu County	1,289	604	1.10	0.00	1.10	1,176.0	551.0
Makakilo City CDP, Honolulu County	13,156	4,119	3.14	0.00	3.14	4,188.0	1,311.2
Makawao CDP, Maui County	6,327	2,222	4.67	0.00	4.67	1,353.8	475.5
Maunaloa CDP, Maui County	230	91	0.17	0.00	0.17	1,374.6	543.9
Maunawili CDP, Honolulu County	4,869	1,491	3.48	0.00	3.48	1,399.0	428.4
Mililani Town CDP, Honolulu County	28,608	9,280	3.93	0.02	3.91	7,319.1	2,374.2
Mokuleia CDP, Honolulu County	1,839	883	5.10	3.11	1.99	923.2	443.3
Mountain View CDP, Hawaii County	2,799	1,110	56.63	0.00	56.62	49.4	19.6
Naalehu CDP, Hawaii County	919	332	2.16	0.00	2.16	426.1	153.9
Nanakuli CDP, Honolulu County	10,814	2,504	5.75	3.22	2.52	4,287.6	992.8
Nanawale Estates CDP, Hawaii County	1,073	433	1.91	0.00	1.91	560.5	226.2

Geographic area	Population	Housing units	Area in square miles: Total area	Water area	Land area	Density per square mile of land area: Population	Housing units
Napili-Honokowai CDP, Maui County	6,788	4,681	6.65	0.77	5.88	1,153.9	795.7
Omao CDP, Kauai County	1,221	422	1.22	0.02	1.20	1,018.9	352.1
Orchidlands Estates CDP, Hawaii County	1,731	668	9.50	0.00	9.50	182.3	70.4
Paauilo CDP, Hawaii County	571	198	1.17	0.02	1.15	496.3	172.1
Pahala CDP, Hawaii County	1,378	487	0.84	0.00	0.84	1,635.9	578.1
Pahoa CDP, Hawaii County	962	352	2.27	0.00	2.27	424.4	155.3
Paia CDP, Maui County	2,499	890	6.76	0.68	6.08	410.8	146.3
Pakala Village CDP, Kauai County	478	172	2.60	0.26	2.34	204.7	73.6
Papaikou CDP, Hawaii County	1,414	502	2.04	0.57	1.47	964.3	342.4
Paukaa CDP, Hawaii County	495	215	0.47	0.05	0.42	1,174.4	510.1
Pearl City CDP, Honolulu County	30,976	9,181	5.81	0.83	4.98	6,215.5	1,842.2
Pepeekeo CDP, Hawaii County	1,697	650	1.15	0.00	1.15	1,476.3	565.4
Poipu CDP, Kauai County	1,075	1,969	2.78	0.33	2.45	437.9	802.2
Princeville CDP, Kauai County	1,698	1,640	2.38	0.28	2.10	806.7	779.1
Puako CDP, Hawaii County	429	702	15.85	5.54	10.31	41.6	68.1
Puhi CDP, Kauai County	1,186	297	0.36	0.00	0.36	3,328.7	833.6
Pukalani CDP, Maui County	7,380	2,522	4.42	0.00	4.42	1,671.1	571.1
Punaluu CDP, Honolulu County	881	439	1.23	0.44	0.80	1,106.0	551.1
Pupukea CDP, Honolulu County	4,250	1,690	6.09	2.69	3.40	1,250.5	497.2
Schofield Barracks CDP, Honolulu County	14,428	3,733	2.75	0.00	2.75	5,251.5	1,358.7
Village Park CDP, Honolulu County	9,625	2,776	0.92	0.00	0.92	10,490.0	3,025.5
Volcano CDP, Hawaii County	2,231	1,229	56.68	0.00	56.68	39.4	21.7
Wahiawa CDP, Honolulu County	16,151	5,900	2.38	0.27	2.11	7,642.8	2,791.9
Waialua CDP, Honolulu County	3,761	1,219	1.44	0.19	1.25	3,007.6	974.8
Waianae CDP, Honolulu County	10,506	2,925	5.10	1.69	3.40	3,086.0	859.2
Waihee-Waiehu CDP, Maui County	7,310	1,909	5.27	1.01	4.25	1,718.5	448.8
Waikane CDP, Honolulu County	726	198	7.17	0.35	6.82	106.4	29.0
Waikapu CDP, Maui County	1,115	360	11.00	0.02	10.98	101.6	32.8
Waikoloa Village CDP, Hawaii County	4,806	2,057	19.14	0.00	19.14	251.1	107.5
Wailea-Makena CDP, Maui County	5,671	5,099	26.82	4.19	22.63	250.6	225.3
Wailua CDP, Kauai County	2,083	1,211	1.43	0.14	1.29	1,618.6	941.0
Wailua Homesteads CDP, Kauai County	4,567	1,758	7.14	0.10	7.04	648.6	249.7
Wailuku CDP, Maui County	12,296	4,780	5.44	0.37	5.07	2,427.4	943.6
Waimalu CDP, Honolulu County	29,371	10,999	6.11	0.20	5.91	4,972.1	1,862.0
Waimanalo CDP, Honolulu County	3,664	904	0.39	0.00	0.39	9,319.0	2,299.2
Waimanalo Beach CDP, Honolulu County	4,271	1,046	3.05	1.42	1.63	2,617.1	640.9
Waimea CDP, Hawaii County	7,028	2,589	38.80	0.06	38.75	181.4	66.8
Waimea CDP, Kauai County	1,787	676	1.29	0.24	1.05	1,707.2	645.8
Wainaku CDP, Hawaii County	1,227	453	1.41	0.09	1.32	932.9	344.4
Waipahu CDP, Honolulu County	33,108	8,033	2.63	0.06	2.57	12,882.8	3,125.7
Waiplo CDP, Honolulu County	11,672	4,110	1.20	0.00	1.20	9,700.5	3,415.8
Waiplo Acres CDP, Honolulu County	5,298	1,951	1.05	0.00	1.05	5,061.9	1,864.0
Wheeler AFB CDP, Honolulu County	2,829	855	2.29	0.00	2.29	1,235.6	373.4
Whitmore Village CDP, Honolulu County	4,057	991	0.93	0.01	0.92	4,411.5	1,077.6

(X) Not applicable
Source: U.S. Census Bureau, Census 2000 Summary File 1

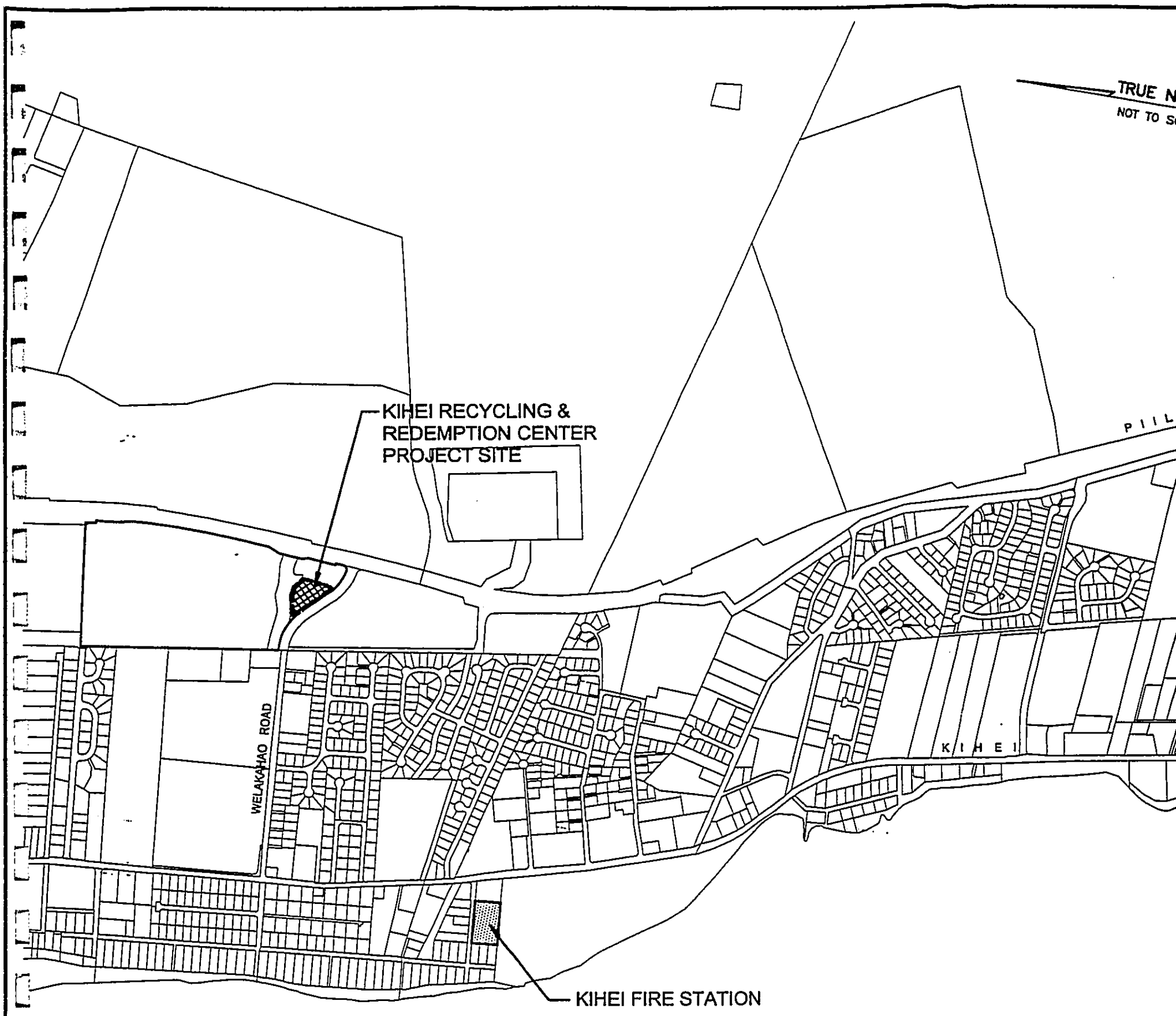
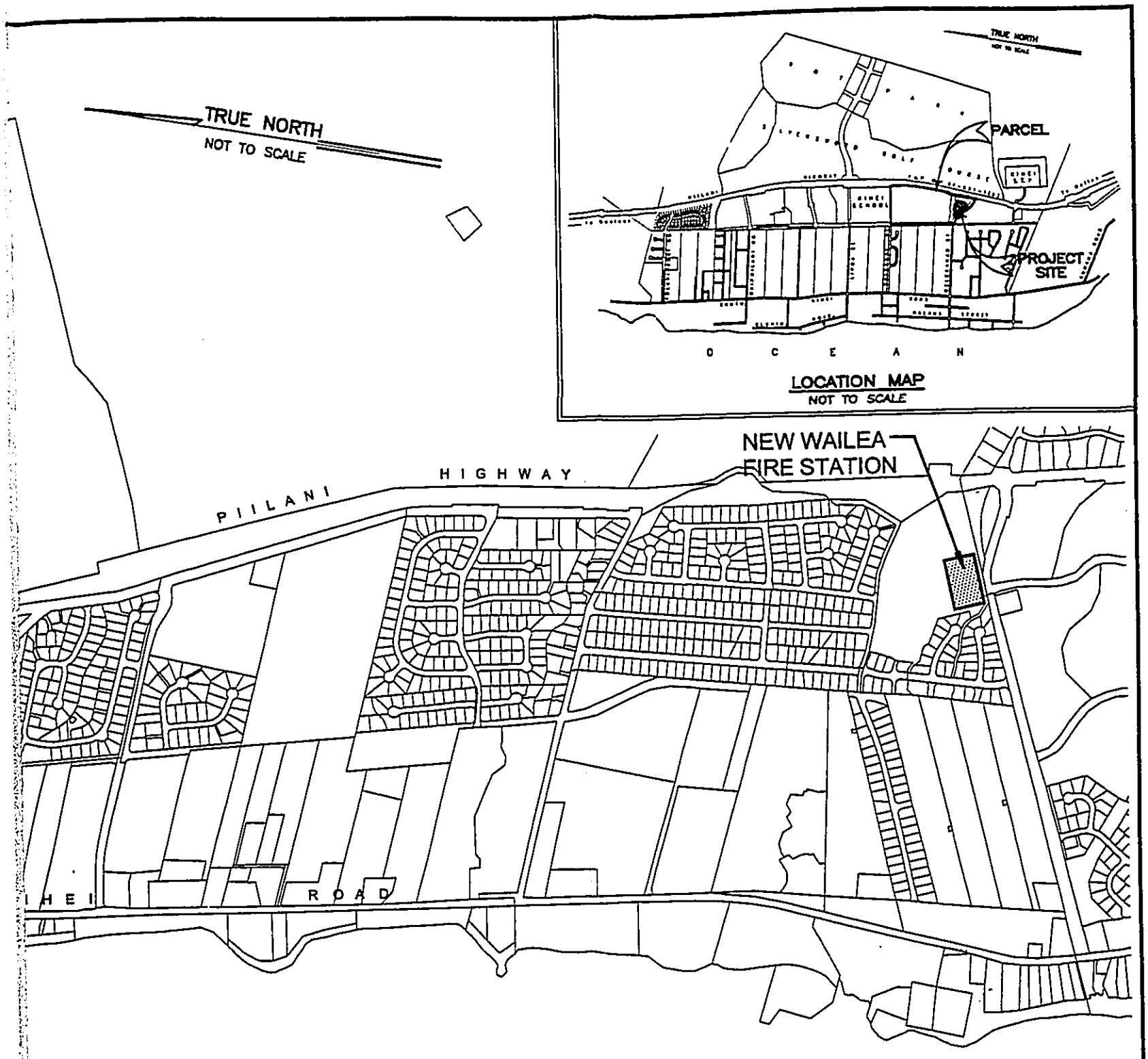


EXHIBIT "K" - LOCATION MA
KIHEI AND NEW WAILEA FIRE S

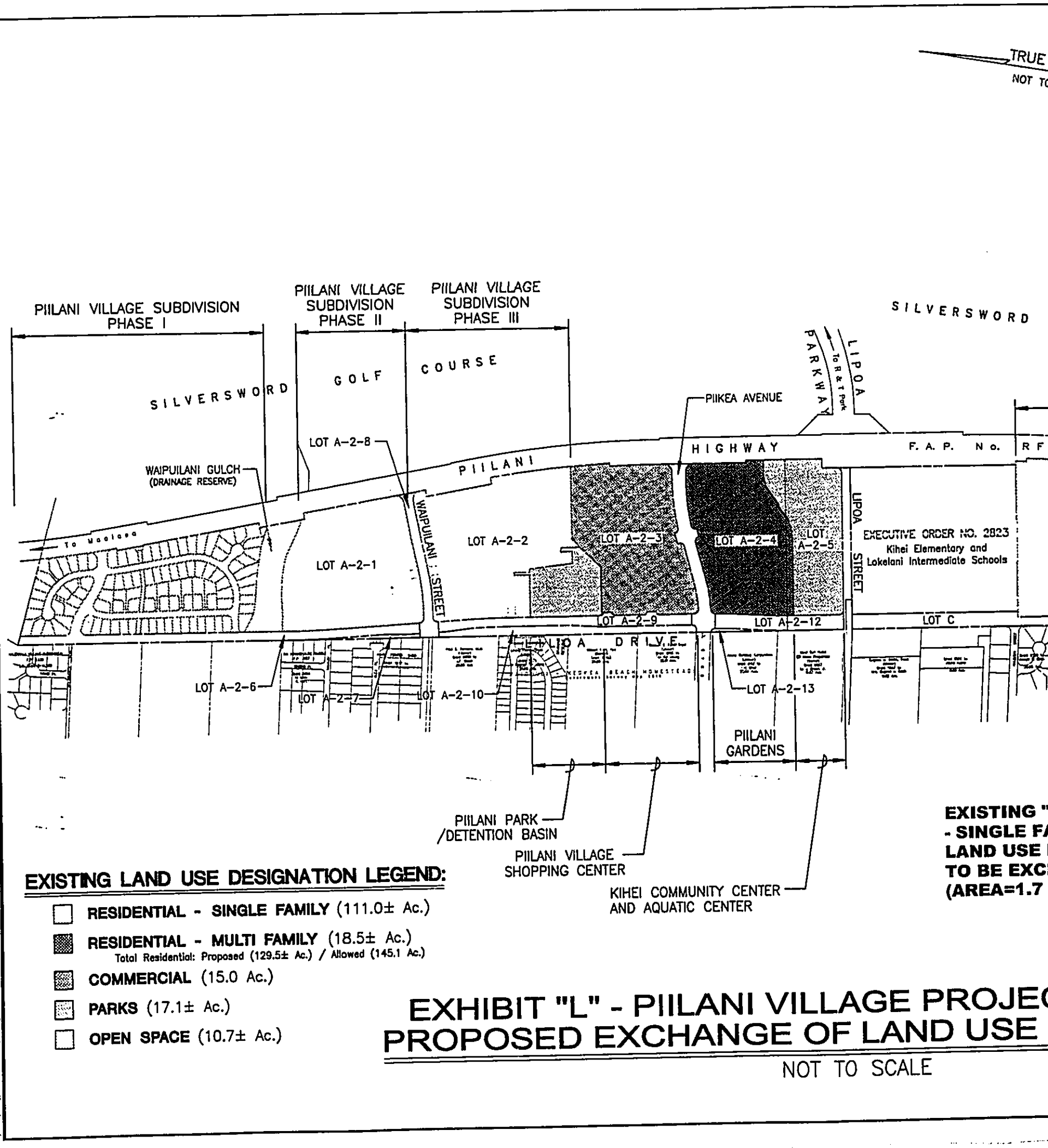


CATION MAP OF
LEA FIRE STATIONS

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

March 1, 2005

11" x 17"



EXISTING LAND USE DESIGNATION LEGEND:

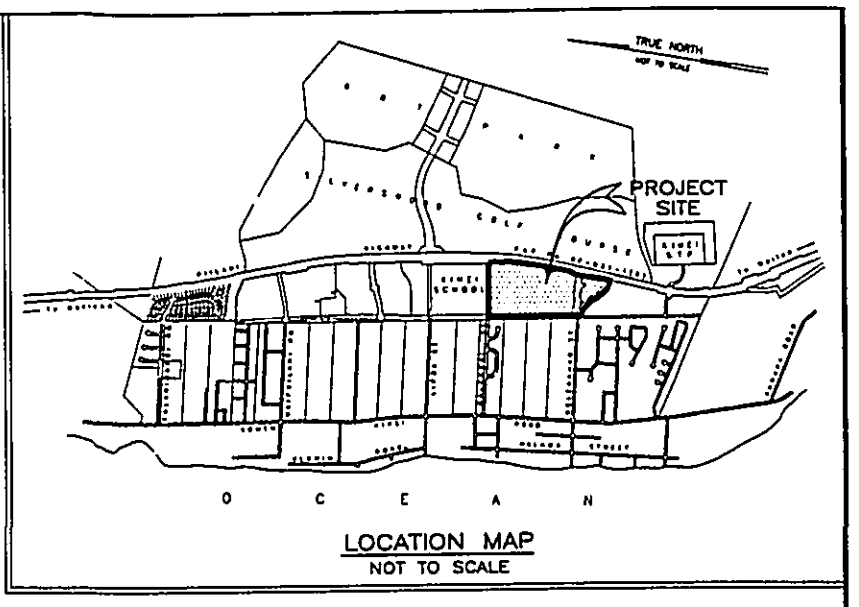
- **RESIDENTIAL - SINGLE FAMILY** (111.0± Ac.)
- **RESIDENTIAL - MULTI FAMILY** (18.5± Ac.)
  Total Residential: Proposed (129.5± Ac.) / Allowed (145.1 Ac.)
- **COMMERCIAL** (15.0 Ac.)
- **PARKS** (17.1± Ac.)
- **OPEN SPACE** (10.7± Ac.)

EXHIBIT "L" - PIILANI VILLAGE PROJEC
PROPOSED EXCHANGE OF LAND USE

NOT TO SCALE

/03proj/03031.90/dwg/exhibits/exh-landuse00.dwg

TRUE NORTH
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

SILVERSWORD GOLF COURSE

LIPOA STREET

PROPOSED SOUTH MAUI COMMUNITY PARK AND GYMNASIUM (LOT A)

KIHEI SEWAGE TREATMENT PLANT

KEOKEA GULCH (DRAINAGE RESERVE)

F. A. P. No. RF-031-1(5)

OLD WELAKAHAO ROAD

To Wailea

EXECUTIVE ORDER NO. 2823
Kihei Elementary and Lokelani Intermediate Schools

LOT A

LOT B

NEW WELAKAHAO STREET

LOT C

FUTURE NORTH - SOUTH COLLECTOR ROAD

PROPOSED HOPE CHAPEL

PROPOSED HALE MAHAOLU

EXISTING "RESIDENTIAL - SINGLE FAMILY" LAND USE PROPOSED TO BE EXCHANGED (AREA=1.7 Ac.)

PROPOSED KIHEI RECYCLING & REDEMPTION CENTER

EXISTING "PARKS" LAND USE PROPOSED TO BE EXCHANGED (AREA=1.7 Ac.)

AGE PROJECT DISTRICT 5
LAND USE DESIGNATIONS

) SCALE

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

February 25, 2005

30" x 60"

ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director

ALL - FYI
Cm 1/27/05

RECEIVED
2005
WARREN S. UNAGA ENGINEERING, INC.

COUNTY OF MAUI
DEPARTMENT OF PLANNING

January 19, 2005

MEMORANDUM

TO: ALL DEPUTY DIRECTORS

FROM: MICHAEL W. FOLEY
Planning Department

RE: EXEMPTION LIST FOR THE COUNTY OF MAUI FOR CHAPTER 343, HRS, ENVIRONMENTAL IMPACT STATEMENTS

By Memorandum dated February 18, 2004, the Maui Planning Department (Department) requested your department's comments on revising the County of Maui's Exemption List from Chapter 343, HRS. A copy of this list, as reviewed and concurred upon by the Environmental Council (April 26, 1995), has been attached for your convenience (refer to Attachment A).

Please find attached a draft revision (refer to Attachment B). Text which has been added is underscored, and text which has been deleted is [bracketed]. Explanations, as provided by other Departments, have been included and are *italicized*.

In preparation of the draft, the Department became aware of inconsistencies in applying the list to proposed actions. The inconsistency was whether the list could be applied to county *and* private applicant actions. Based upon consultation with the Office of Environmental Quality Control (OEQC), the Department confirmed that the county exemption list may be applied to both types of actions, and as such, the Department is requesting your review considering this application. Should your Department conclude that certain exemptions be limited to agency actions, please reference the specific exemption in your comments.

The Department is requesting your final comments on the draft revision by **February 28, 2005.** Upon receipt of all comments, the Department will incorporate any necessary changes and initiate the filing and review process with the Office of Environmental Quality Control (OEQC). Please be advised that a representative from your department may be asked to provide technical support at any necessary meetings required by OEQC staff and the Environmental Council.

Exhibit "M" - Draft Exemption list for the County of Maui for Chapter 343, HRS, Environmental Impact Statements

Should you need additional clarification, please contact Ms. Kivette Caigoy, *Environmental Planner, at extension 7811.*

Attachments
MWF:KAC:lar
c: Wayne Boteilho, Deputy Planning Director
Clayton Yoshida, AICP, Planning Program Administrator
Kivette A. Caigoy, Environmental Planner
Don Couch, Executive Assistant
Dave DeLeon, Executive Assistant
Rob Parsons, Executive Assistant
Brian Moto, Corporation Counsel
Cindy Young, Deputy Corporation Counsel
General File
S:\ALL\Kivette\CH343\Memos\ExempList11705.wpd

title transfers between the state and county involving no monetary consideration (DPWEM)

DPWEM Comments: Some existing roadway structures were constructed in the past outside of the county's right-of-way on private or state property; corrections may require land exchanges or other land transactions.

EXEMPTION CLASS 3

Construction and location of single, new small facilities or structures and the alteration and modification of same and installation of new, small, equipment and facilities and the alteration and modification of same including but not limited to: (a) single family residences not in conjunction with the building of two or more such units; (b) multi-unit structures designed for not more than four dwelling units if not in conjunction with building of two or more such structures; (c) stores, offices and restaurants designed for total occupant load of twenty persons or less, if not in conjunction with the building of two or more such structures; (d) water, sewage electrical, gas, telephone, and other essential public utility services extensions to serve such structures or facilities; and (e) accessory or appurtenant structures including garages, carports, patios swimming pools, and fences.

1. Additions to buildings or structures not exceeding 500 square feet

2. Extension of or installation of additional water and sewer laterals for a single or several residential units or commercial establishments

3. Utility support systems for exempt landscaping projects

4. Life Guard Towers (Parks & Rec)

5. Handicapped accessibility improvements (Parks & Rec)

6. Recycling drop-off and redemption centers serving the surrounding residential community including, but not limited to: paving, fencing, containers for material, small equipment, and accessory or appurtenant structures used for storage and shelter (DPWEM)

DPWEM Comments: Recycling and redemption drop-off boxes are usually located on County property.

EXHIBIT N

CHRIS HART & PARTNERS

FACSIMILE

TO: Mr. Alan Unemori
Warren S. Unemori Engineering, Inc.
2145 Wells, Suite 403
Wailuku, HI 96793

DATE: August 23, 2005

PROJECT: Kihei Community Park

SUBJECT: Flora & Fauna

FAX NO: 244-4856

ATTENTION: Mr. Alan Unemori

We are sending 1 pages including this header.

( ) FOR YOUR USE ( ) FOR REVIEW AND COMMENT ( ) FOR YOUR INFORMATION
(X) AS REQUESTED

Originals to be mailed: (X) Yes ( ) No

REMARKS:

Dear Alan,

Based upon a site reconnaissance survey of the subject property conducted by CH&P staff on August 2, 2005, it appears that existing vegetation primarily consists of Ilima (Sida cordifolia), Haole Koa (Leucaena levcocephala), Kiawe (Prosopis pallida), and Wiregrass (Elevsine indica). No wetland indicator plants were found on the property.

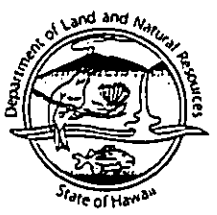
Avifauna typically found in the area includes the common myna, several species of dove, cardinal, house finch, and house sparrow. Mammals common to this area include cats, dogs, rats, mice, and mongoose. No known rare, endangered, or threatened species of flora or fauna were discovered on the subject property.

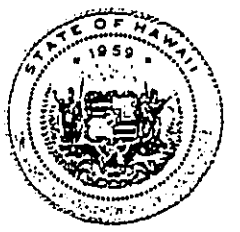
If you have any questions, please call me at (808) 242-1955, ext. 22.

COPY TO: Project File

BY: Michael J. Summers

LANDSCAPE ARCHITECTURE AND PLANNING
1955 MAIN STREET, SUITE 200 • WAILUKU, MAUI, HAWAII 96793 • PHONE (808) 242-1955 • FAX (808) 242-1956





STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

August 16, 2005

Mr. Michael Foley, Planning Director
Department of Planning - Maui
250 South High Street
Wailuku, Hawaii 96793

EXHIBIT O

Log N.: 2005.1702
Doc No.:0507CD14

Dear Mr. Foley:

SUBJECT: **Chapter 6E-42 Historic Preservation Review – Special Management Area Application Use Permit and Project District Amendment for the Proposed Kihei Recycling an Redemption Center at South Maui Community Park (Subject I.D.: SM1 20050020, PH2 2005/0006)**
Keokea Ahupua'a, Makawao District, Island of Maui
TMK: (2) 2-2-002:042

Thank you for the opportunity to review and comment on the Special Management Area Application Use Permit and Project District Amendment for the Proposed Kihei Recycling and Redemption Center at South Maui Community Park, which was received by our staff on July 22, 2005.

Based on the submitted documents, we understand the proposed undertaking consists of the development of the new Kihei Recycling and Redemption Center at Piilani Village. The subject property is currently vacant and undeveloped.

In 1990 an archaeological inventory survey was conducted of the subject property. During the survey sixteen historic sites were identified. Of these sixteen sites, six were recommended for archaeological data recovery. Scientific Consulting Services (SCS) recently completed the data recovery field work (letter report *End of Field Work for the Pi'ilani Park Area, Kihei, Keokea Ahupua'a, Makawao District, Island of Maui, Hawai'i, TMK: 2-2-02: Por. 42*...Dega 2005). We have received a copy of the archaeological report documenting the findings of the data recovery field work and will be reviewed under separate cover. Based on the findings of the data recovery end of field report, SIHP 2512 has now been interpreted as a ceremonial location, determined to be significant under multiple criteria, and recommended for preservation. We look forward to reviewing an acceptable preservation plan for this site.

Given the above information, we understand that the proposed work as part of the Kihei Recycling and Redemption Center at South Maui Community Park will focus on the southern half of the parcel, in an area in which no historic properties were identified. The site to be preserved (SIHP 2512) is located in the central portion of the parcel, and all sites covered under the data recovery work are in the northern portion of the parcel.

Therefore, we believe that activities associated with the Kihei Recycling and Redemption Center project will have "no effect" on historic properties. We do, however, recommend no action be taken on subsequent undertakings until an acceptable preservation plan for SIHP 2512 has been reviewed by this office and is in place.

If you have any questions, please call Cathleen A. Dagher at 692-8023.

Aloha,

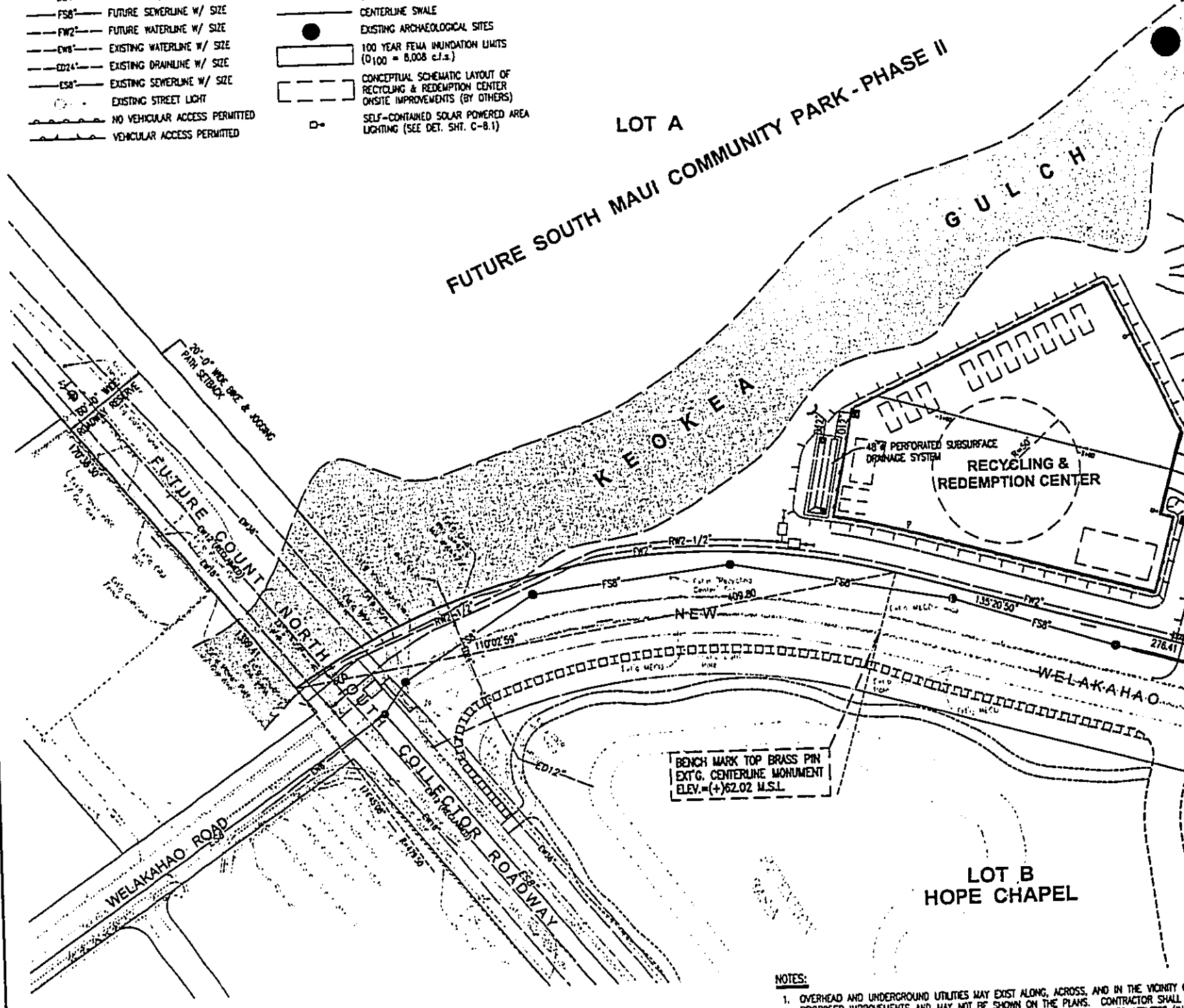
Melanie Chinen, Administrator
State Historic Preservation Division

CD:jen

Construction Sheets

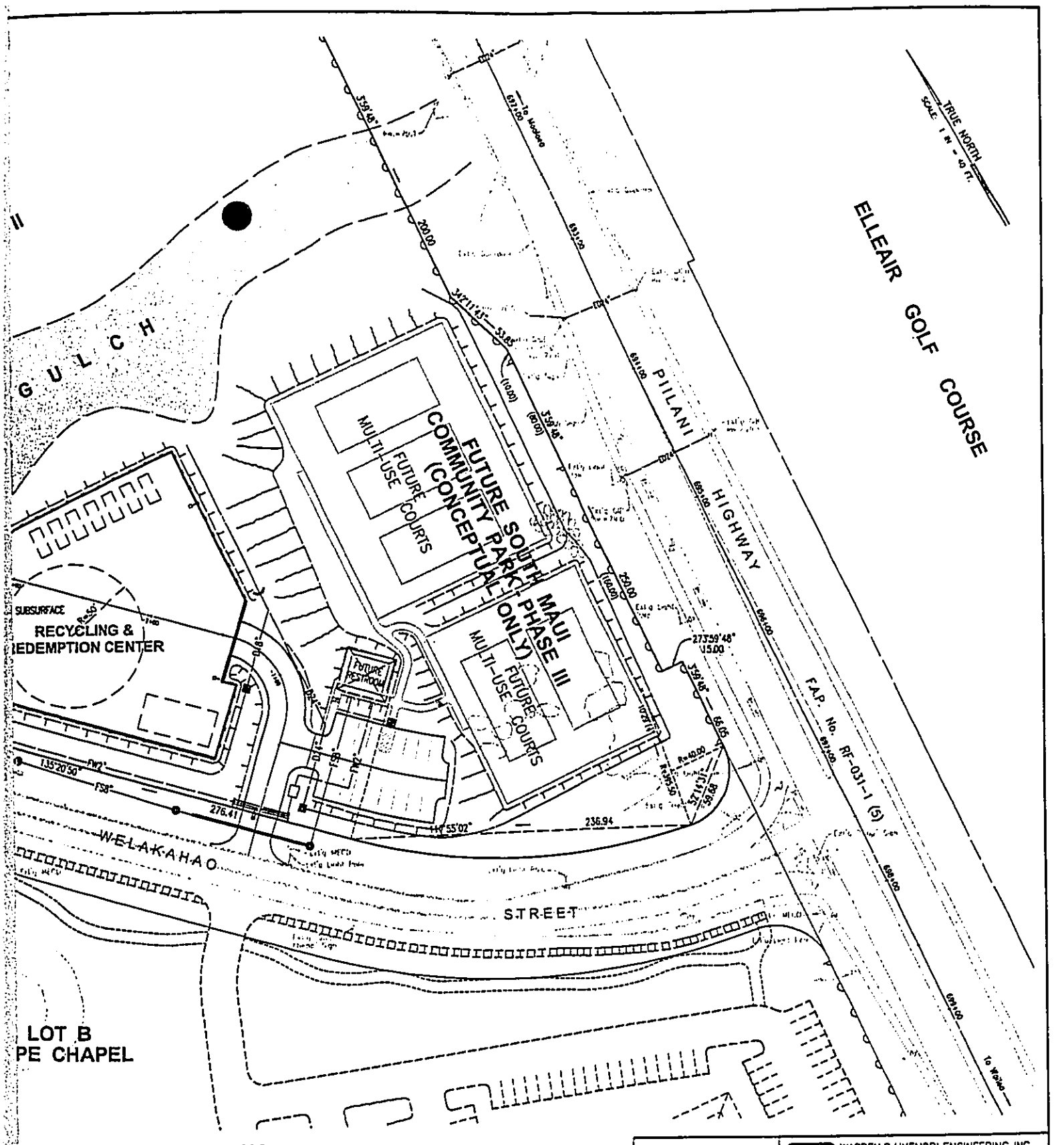
LEGEND:

- FUTURE SEWER MANHOLE
- GRATED INLET CATCH BASIN
- HEADWALL WITH WINGWALL
- RW3"— RECLAIMED WATERLINE W/ SIZE
- D24"— DRAINLINE W/ SIZE
- FS8"— FUTURE SEWERLINE W/ SIZE
- FW2"— FUTURE WATERLINE W/ SIZE
- EW8"— EXISTING WATERLINE W/ SIZE
- ED24"— EXISTING DRAINLINE W/ SIZE
- ES8"— EXISTING SEWERLINE W/ SIZE
- EXISTING STREET LIGHT
- NO VEHICULAR ACCESS PERMITTED
- VEHICULAR ACCESS PERMITTED
- PROPOSED IMPROVEMENTS (BY OTHERS)
- FUTURE IMPROVEMENTS (BY OTHERS)
- SIDEWALK
- TOP BANK
- BOTTOM BANK
- CENTERLINE SWALE
- EXISTING ARCHAEOLOGICAL SITES
- 100 YEAR FEMA INUNDATION LIMITS (Q_{100} = 8,008 c.f.s.)
- CONCEPTUAL SCHEMATIC LAYOUT OF RECYCLING & REDEMPTION CENTER ONSITE IMPROVEMENTS (BY OTHERS)
- SELF-CONTAINED SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)



NOTES:

1. OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST ALONG, ACROSS, AND IN THE VICINITY PROPOSED IMPROVEMENTS AND MAY NOT BE SHOWN ON THE PLANS. CONTRACTOR SHALL RESPONSIBLE FOR CONTACTING THE RESPECTIVE COUNTY OR STATE AGENCIES, UTILITIES (IN WITHOUT LIMITATION MAUI ELECTRIC COMPANY, LTD., VERIZON HAWAII INC., AND OCEANIC TI WARNER CABLE OF HAWAII), EXAMINING ANY AVAILABLE RECORD DRAWINGS, TONING OF UND UTILITIES, AND CONFIRMING THE PRESENCE OF ANY EXISTING UTILITIES ALONG AND ACROSS PROPOSED IMPROVEMENTS. CONTRACTOR SHALL NOTIFY AND COORDINATE CONSTRUCTION AND ANY REQUIRED RELOCATION, WITH RESPECTIVE AGENCIES AND UTILITIES.
2. OWNERS OF ADJOINING LANDS, SHOWN ON PLAN, ARE TAKEN FROM RECORDS FILED IN TH PROPERTY MAPPING BRANCH, & ARE SUBJECT TO VERIFICATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL REQUIRED COUNTY PERMITS (INC
   - FENCE & GATE
   - LIGHT POLE & APPURTENANCES
4. SEE SHEET C-6 FOR DRIVEWAY PROFILE.



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OR SHALL NOTIFY AND COORDINATE CONSTRUCTION ACTIVITIES,
RESPECTIVE AGENCIES AND UTILITIES.

ON PLAN, ARE TAKEN FROM RECORDS FILED IN THE REAL
SUBJECT TO VERIFICATION.

FOR SECURING ALL REQUIRED COUNTY PERMITS (INCLUDING FEES) FOR

LE.

LETTER	DESCRIPTION	DATE

CLIFFORD N. MUNN
LICENSED PROFESSIONAL ENGINEER
NO. 6667-C
HAWAII, U.S.A.

License Expires April 30, 2008
SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-7 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE #03
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

TITLE GENERAL PLAN

C.N.M. DESIGNED BY	C.N.M. CHECKED BY	03031.90 JOB NUMBER	C-2 SHEET
W.S.K. DRAWN BY	W.S.U. APPROVED BY	Apr. 22, 2005 DATE	OF 17 SHEETS
SCALE 1 IN. = 40 FT.			

LEGEND:

- FUTURE SEWER MANHOLE
- GRATED INLET CATCH BASIN
- HEADWALL WITH WINGWALL
- RW3"— RECLAIMED WATERLINE W/ SIZE
- D24"— DRAINLINE W/ SIZE
- FS8"— FUTURE SEWERLINE W/ SIZE
- FW2"— FUTURE WATERLINE W/ SIZE
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- TOP BANK
- BOTTOM BANK
- CENTERLINE SWALE
- EXISTING ARCHAEOLOGICAL SITES
- 100 YEAR FEMA INUNDATION LIMITS (Q_{100} = 8,008 c.f.s.)
- CONCEPTUAL SCHEMATIC LAYOUT OF RECYCLING & REDEMPTION CENTER ONSITE IMPROVEMENTS (BY OTHERS)
- SELF-CONTAINED SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)
- A.C. DRIVEWAY PAVEMENT (SEE SECTION, SHT. C-8.2)
- GUASPHALT RECYCLING & REDEMPTION CENTER PAVEMENT (SEE SECTION, SHT. C-8.2)

NOTES:

1. OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST ALONG, ACROSS, AND IN THE VICINITY OF THE PROPOSED IMPROVEMENTS AND MAY NOT BE SHOWN ON THE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE RESPECTIVE COUNTY OR STATE AGENCIES, UTILITIES (INCLUDING WITHOUT LIMITATION MAUI ELECTRIC COMPANY, LTD., VERIZON HAWAII INC., AND OCEANIC TIME WARNER CABLE OF HAWAII), EXAMINING ANY AVAILABLE RECORD DRAWINGS, TONING OF UNDERGROUND UTILITIES, AND CONFIRMING THE PRESENCE OF ANY EXISTING UTILITIES ALONG AND ACROSS THE PROPOSED IMPROVEMENTS. CONTRACTOR SHALL NOTIFY AND COORDINATE CONSTRUCTION ACTIVITIES, AND ANY REQUIRED RELOCATION, WITH RESPECTIVE AGENCIES AND UTILITIES.
2. OWNERS OF ADJOINING LANDS, SHOWN ON PLAN, ARE TAKEN FROM RECORDS FILED IN THE REAL PROPERTY MAPPING BRANCH, & ARE SUBJECT TO VERIFICATION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL REQUIRED COUNTY PERMITS (INCLUDING FEES) FOR:
   - FENCE & GATE
   - LIGHT POLE & APPURTENANCES
4. SEE SHEET C-6 FOR DRIVEWAY PROFILE.

KEOKEA GULCH

FUTURE MULTI-USE COURTS

FUTURE

10 FEET HIGH BLACK VINYL COATED GALVANIZED CHAIN LINK FENCING WITH GREEN PLASTIC SLATS (SEE STD. PLANS D-01 & D-02 FOR APPLICABLE DETAILS; CONTRACTOR SHALL SUBMIT SHOP DRAWINGS STAMPED BY LICENSE STRUCTURAL ENGINEER FOR REVIEW & APPROVAL PRIOR TO FABRICATION)

SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)

REINF. CONC. CURB (SEE DET. SHT. C-8.2)

REDWOOD OR RECYCLED PLASTIC HEADER ALONG ALL EDGES OF PAVEMENT WITH NO CURB (TYP.; SEE DET. SHT. C-8.2)

10 FEET HIGH X 28 FT. WIDE, BLACK VINYL COATED, GALVANIZED, ROLLING CHAIN LINK FENCE GATE WITH LOCKING MECHANISM & GREEN PLASTIC SLATS (SEE STD. PLANS D-01 & D-02 FOR APPLICABLE DETAILS; CONTRACTOR SHALL SUBMIT SHOP DRAWINGS STAMPED BY LICENSE STRUCTURAL ENGINEER FOR REVIEW & APPROVAL PRIOR TO FABRICATION)

REINF. CONC. SLAB FOR ROLLING CHAINLINK FENCE GATE (SEE DET. SHT. C-8.2; COORDINATE EXACT LOCATION IN FIELD TO ALIGN WITH LOCATION OF SLIDING GATE)

℄ CURVE DATA
Δ=90°00'
R=50.00
L=78.54
T=50.00
C=70.71
ChAz.=180°20'50"

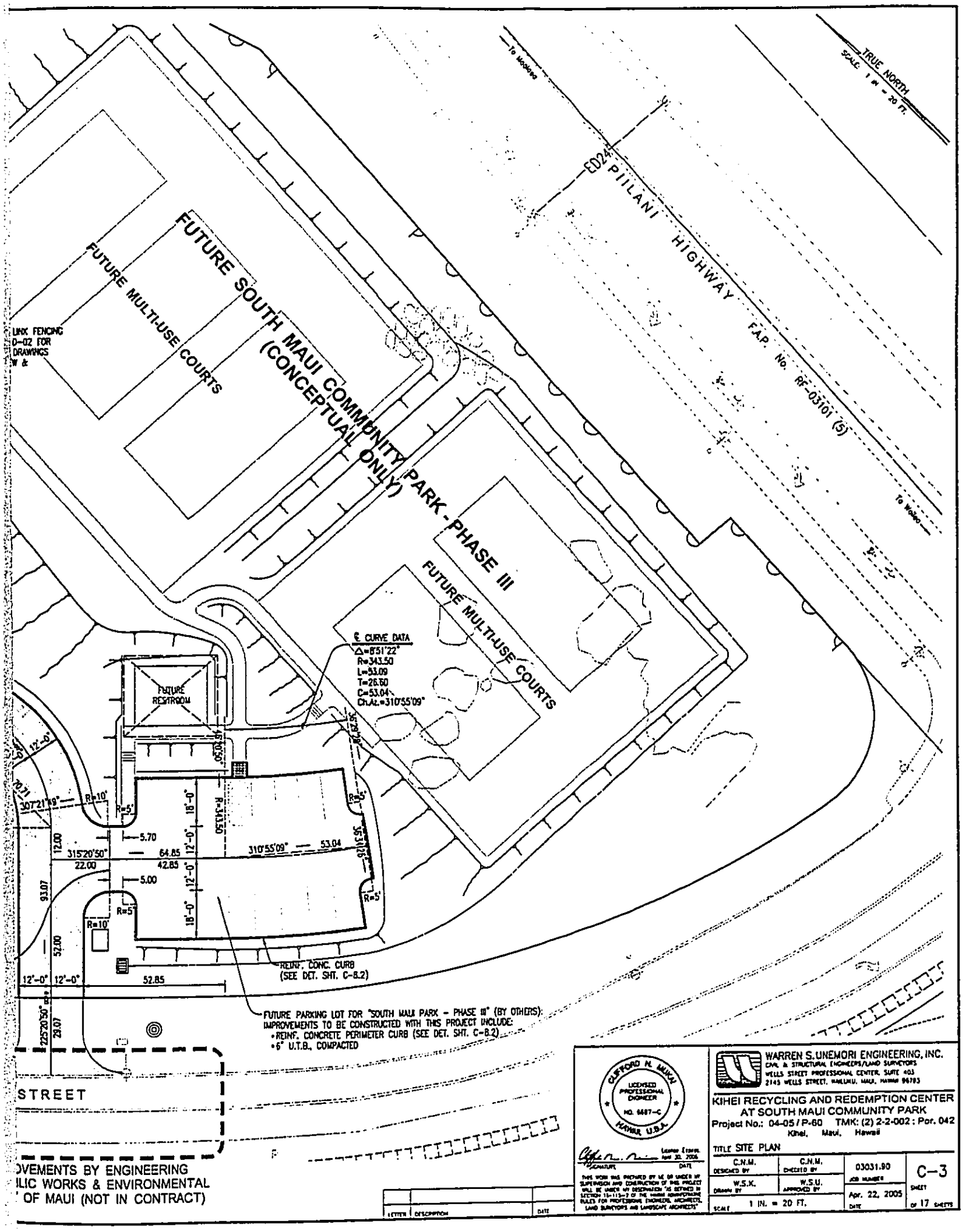
FUTURE RESTROOM

TEMP. EDGE OF DRIVEWAY A.C. PAVEMENT

℄ SWALE

NEW WELAKAHAO STREET

INTERSECTION IMPROVEMENTS BY ENGINEERING DIVISION, DEPT. OF PUBLIC WORKS & ENVIRONMENTAL MANAGEMENT, COUNTY OF MAUI (NOT IN CONTRACT)



CLIFFORD N. MUKAI
LICENSED PROFESSIONAL ENGINEER
NO. 6687-C
HAWAII, U.S.A.

Licensed Engineer
Signature Date: April 30, 2006

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION "AS DEFINED IN SECTION 16-115-7 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

TITLE SITE PLAN

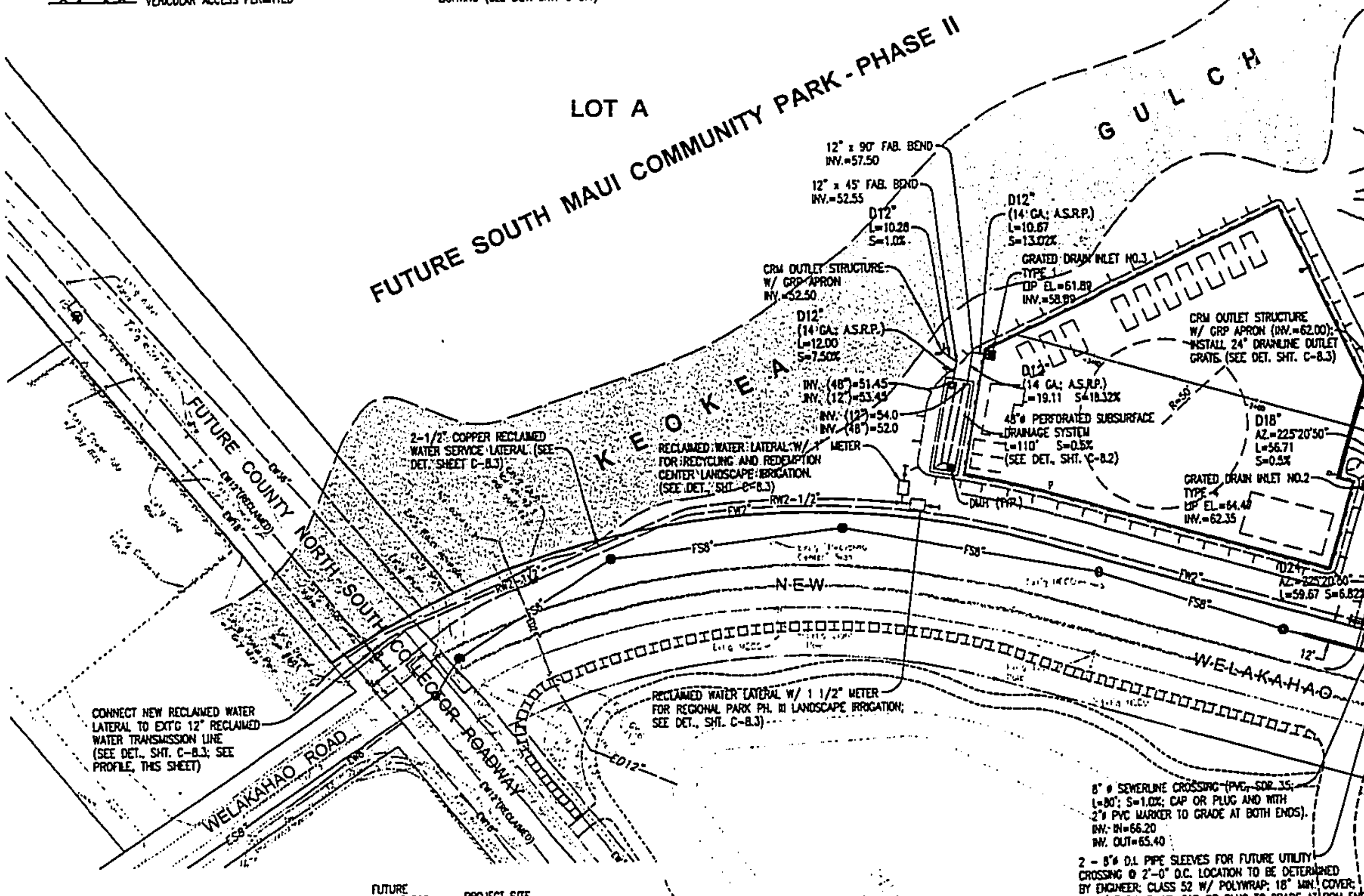
C.N.M. DESIGNED BY	C.N.M. CHECKED BY	03031.90 JOB NUMBER	C-3 SHEET
W.S.K. DRAWN BY	W.S.U. APPROVED BY	Apr. 22, 2005 DATE	OF 17 SHEETS
1 IN. = 20 FT. SCALE			

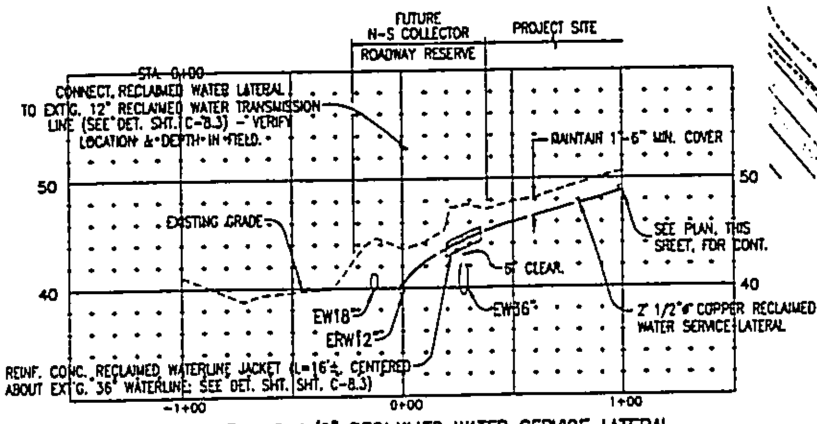
LEGEND:

- FUTURE SEWER MANHOLE
- GRATED INLET CATCH BASIN
- HEADWALL WITH WINGWALL
- RW3" RECLAIMED WATERLINE W/ SIZE
- D24" DRAINLINE W/ SIZE
- FS8" FUTURE SEWERLINE W/ SIZE
- FW2" FUTURE WATERLINE W/ SIZE
- EW8" EXISTING WATERLINE W/ SIZE
- ED24" EXISTING DRAINLINE W/ SIZE
- ES8" EXISTING SEWERLINE W/ SIZE
- EXISTING STREET LIGHT
- NO VEHICULAR ACCESS PERMITTED
- VEHICULAR ACCESS PERMITTED
- PROPOSED IMPROVEMENTS (BY OTHERS)
- FUTURE IMPROVEMENTS (BY OTHERS)
- SIDEWALK
- TOP BANK
- BOTTOM BANK
- CENTERLINE SWALE
- EXISTING ARCHAEOLOGICAL SITES
- 100 YEAR FEMA INUNDATION LIMITS (Q_{100} = 8,008 c.f.s.)
- CONCEPTUAL SCHEMATIC LAYOUT OF RECYCLING & REDEMPTION CENTER ONSITE IMPROVEMENTS (BY OTHERS)
- SELF-CONTAINED SOLAR POWERED AREA LIGHTING (SEE DET. SHT. C-8.1)

NOTES:

1. ALL RECLAIMED WATER IMPROVEMENTS SHALL CONFORM TO ALL REQUIREMENTS CONTAINED IN:
   - "GUIDELINES FOR THE TREATMENT AND USE OF RECYCLED WATER" BY THE DEPARTMENT OF HEALTH, STATE OF HAWAII, DATED MAY 15, 2002, AND ALL AMENDMENTS THERETO; AND,
   - "RULES FOR RECLAIMED WATER SERVICE" BY THE COUNTY OF MAUI, DATED JUNE 1997, AND ALL AMENDMENTS THERETO.
2. SEE SHT. C-1 FOR ADDITIONAL NOTES PERTAINING TO RECLAIMED WATERLINE.
3. OVERHEAD AND UNDERGROUND UTILITIES MAY EXIST ALONG, ACROSS, AND IN THE VICINITY OF THE PROPOSED IMPROVEMENTS AND MAY NOT BE SHOWN ON THE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE RESPECTIVE COUNTY OR STATE AGENCIES, UTILITIES (INCLUDING WITHOUT LIMITATION MAUI ELECTRIC COMPANY, LTD., VERIZON HAWAII INC., AND OCEANIC TIME WARNER CABLE OF HAWAII), EXAMINING ANY AVAILABLE RECORD DRAWINGS, TONING OF UNDERGROUND UTILITIES, AND CONFIRMING THE PRESENCE OF ANY EXISTING UTILITIES ALONG AND ACROSS THE PROPOSED IMPROVEMENTS. CONTRACTOR SHALL NOTIFY AND COORDINATE CONSTRUCTION ACTIVITIES, AND ANY REQUIRED RELOCATION, WITH RESPECTIVE AGENCIES AND UTILITIES.





PROFILE - 2 1/2" RECLAIMED WATER SERVICE LATERAL

Scale: Horiz. 1" = 40'
Vert. 1" = 8'

REQUIREMENTS CONTAINED IN:
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NOTIFY AND
OCATION, WITH

TRUE NORTH
SCALE: 1 IN. = 40 FT.

ELLEAIR GOLF COURSE

G U L C H

PI'ILANI HIGHWAY

F.A.P. No. RF-031-1 (5)

To Kihei

To Wailuku

FUTURE SOUTH MAUI COMMUNITY PARK (CONCEPTUAL) PHASE III

MULTI-USE FUTURE COURTS

FUTURE COMMUNITY PARK (CONCEPTUAL)

MULTI-USE FUTURE COURTS

FUTURE RESTROOM

INLET NO.3

CRM OUTLET STRUCTURE W/ GRP APRON (INV.=62.00): INSTALL 24" DRAINLINE OUTLET GRATE. (SEE DET. SHT. C-8.3)

D24" AZ.=183°59'46" L=13.61 S=0.5%

INV.=62.07

D24" AZ.=183°59'48" L=89.30 S=0.5%

D18" AZ.=225°20'50" L=56.71 S=0.5%

SUBSURFACE

GRATED DRAIN INLET NO.2 TYPE C DIP EL.=64.40 INV.=62.35

INV.=62.51

D24" AZ.=225°20'50" L=59.67 S=6.82%

W-E-L-A-K-A-H-A-O

S-T-R-E-E-T

GRATED DRAIN INLET NO.1 TYPE 61614 LIP EL.=70.58 INV.=66.58

" SEWERLINE CROSSING (PVC, SDR 35; 80'; S=1.0%; CAP OR PLUG AND WITH) PVC MARKER TO GRADE AT BOTH ENDS).
IN=66.20
OUT=65.40

3/4" D.I. PIPE SLEEVES FOR FUTURE UTILITY SING @ 2'-0" O.C. LOCATION TO BE DETERMINED IGINEER: CLASS 52 W/ POLYWRAP; 18" MIN. COVER; EACH; S=1%; CAP OR PLUG TO GRADE AT BOTH ENDS)

FUTURE DOMESTIC WATER LATERAL W/ WATER METER

LOT B
HOPE CHAPEL

CLIFFORD N. MUKAI
LICENSED PROFESSIONAL ENGINEER
NO. 6447-C
HAWAII, U.S.A.

License Expires: April 30, 2006
SIGNATURE DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-2 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

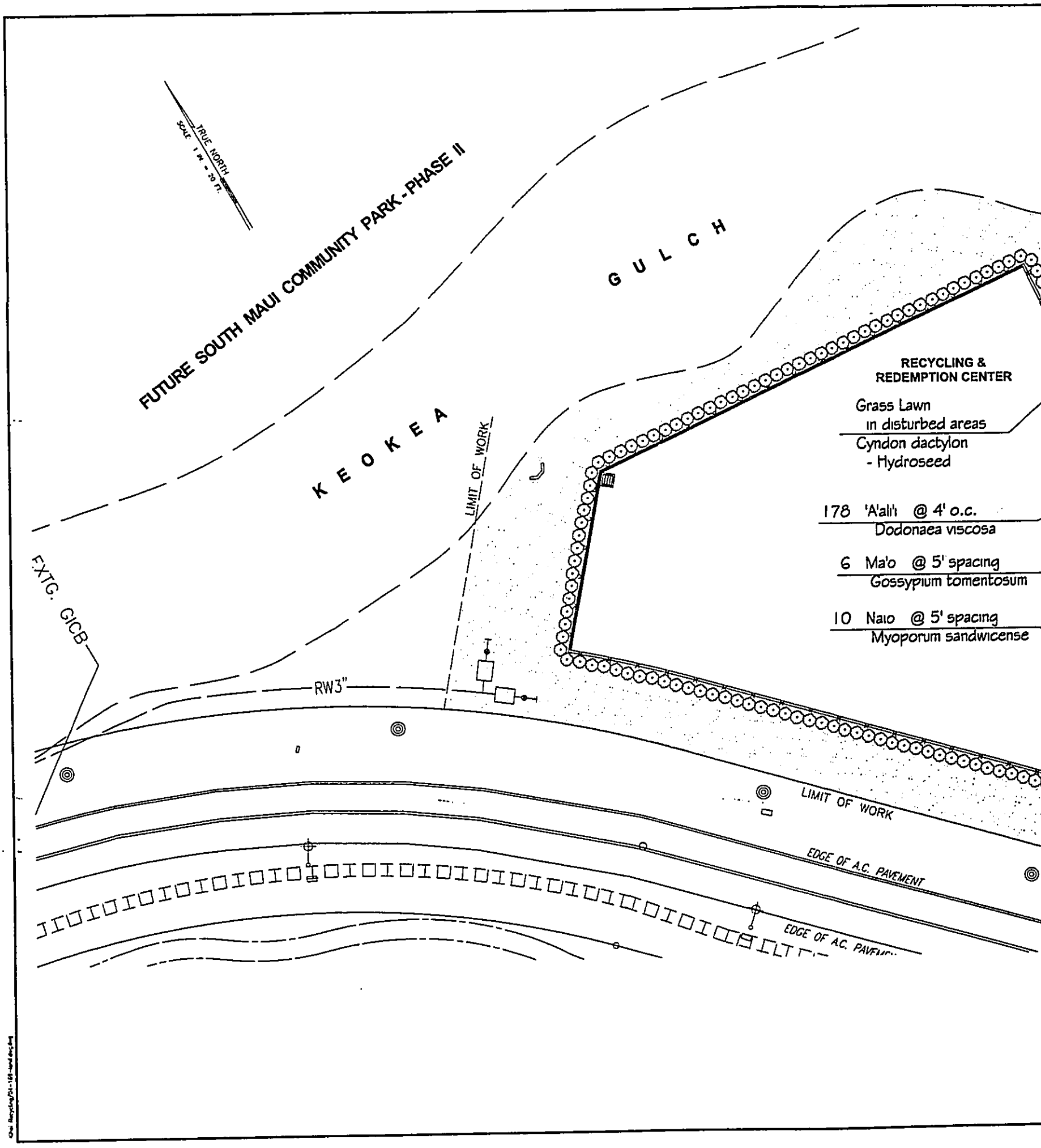
LETTER	DESCRIPTION	DATE

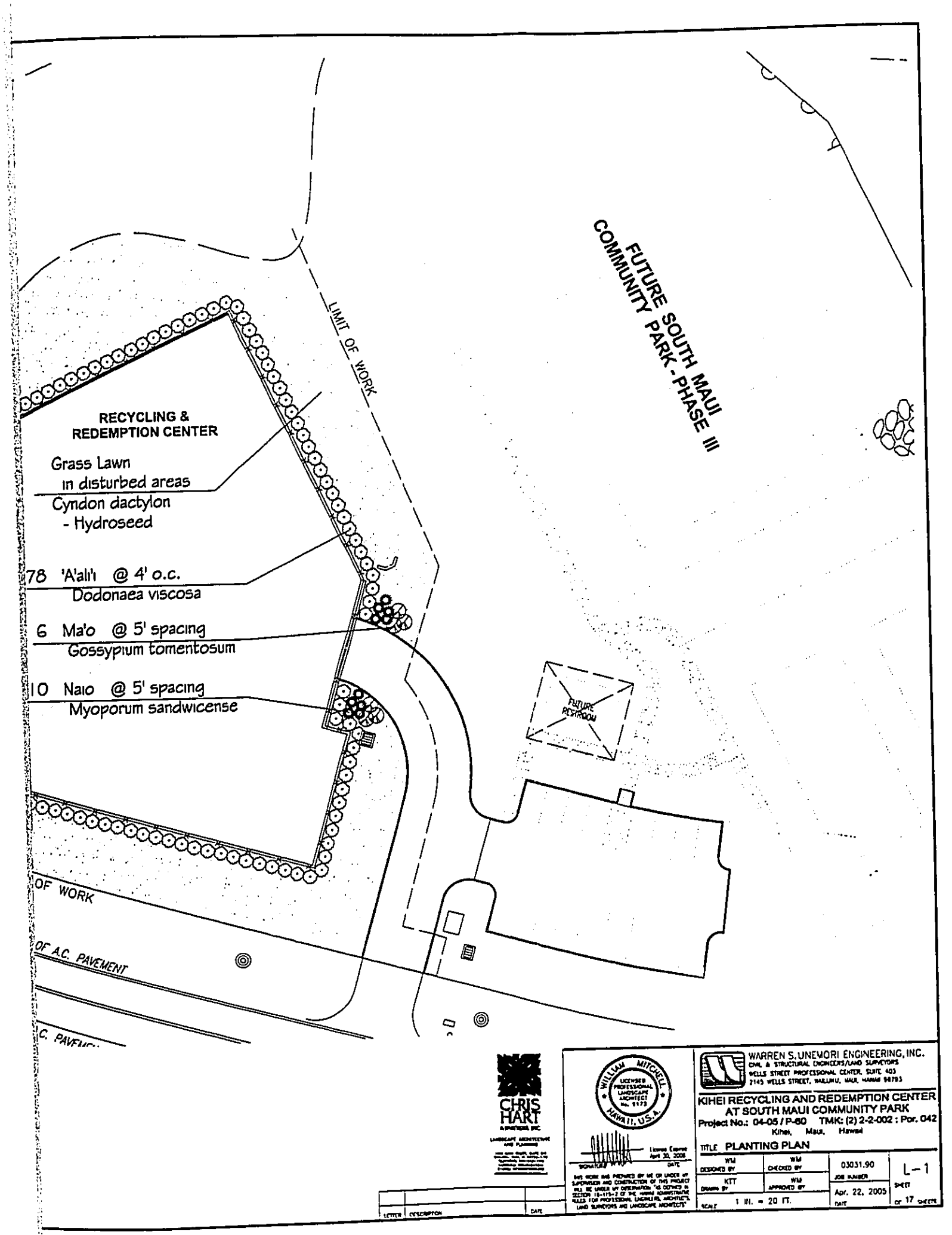
WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

TITLE UTILITY PLAN

C.N.M. DESIGNED BY	C.N.M. CHECKED BY	03031.90 JOB NUMBER	C-5 SHEET
W.S.K. DRAWN BY	W.S.U. APPROVED BY	Apr. 22, 2005 DATE	OF 17 SHEETS
SCALE 1 IN. = 40 FT.			


TRUE NORTH
SCALE 1 in = 20 Ft.
FUTURE SOUTH MAUI COMMUNITY PARK - PHASE II
G U L C H
K E O K E A
LIMIT OF WORK
RECYCLING &
REDEMPTION CENTER
Grass Lawn
in disturbed areas
Cyndon dactylon
- Hydroseed
178 'A'ali'i @ 4' o.c.
Dodonaea viscosa
6 Ma'o @ 5' spacing
Gossypium tomentosum
10 Naio @ 5' spacing
Myoporum sandwicense
EXTG. GICB
RW3"
LIMIT OF WORK
EDGE OF A.C. PAVEMENT
EDGE OF A.C. PAVEMENT



CHRIS HART & PARTNERS, INC.
LANDSCAPE ARCHITECTURE AND PLANNING

WILLIAM MITCHELL
LICENSED PROFESSIONAL LANDSCAPE ARCHITECT
No. 0179
HAWAII, U.S.A.
License Expires April 30, 2008
SIGNATURE
DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-2 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-05 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

TITLE **PLANTING PLAN**

DESIGNED BY: WM	CHECKED BY: WM	JOB NUMBER: 03031.90	SHEET: L-1
DRAWN BY: KTT	APPROVED BY: WM	DATE: Apr. 22, 2005	OF 17 SHEETS
SCALE: 1 IN. = 20 FT.			

RECLAIMED WATER SYSTEM NOTES:

1. The reclaimed water irrigation system shall conform to all requirements of "Guidelines for the Treatment and Use of Reclaimed Water" by the Department of Health, State of Hawaii, dated November, 1993 and the County of Maui's Rules for Reclaimed Water Service, dated June 1997.

2. All new buried irrigation piping in the reclaimed water system, including service lines, valves, and other appurtenances shall both be colored purple, suggested color pantone 512 or equal, and embossed or be integrally stamped/marked "Reclaimed Water – Do Not Drink", or be installed with purple identification tape, or a purple polyethylene wrap, suggested color pantone 512 or equal.

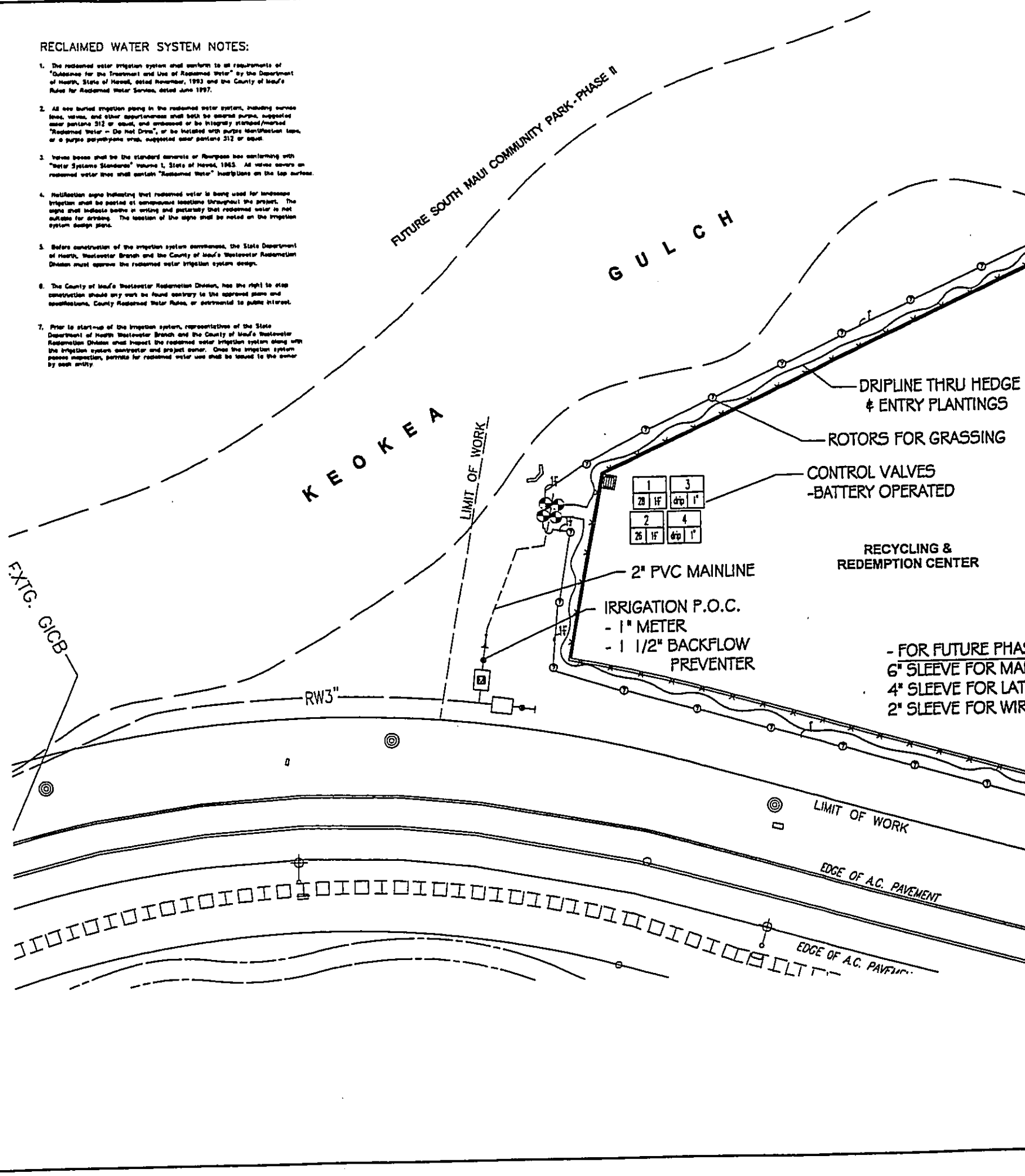
3. Valves boxes shall be the standard concrete or fiberglass box conforming with "Water Systems Standards" Volume 1, State of Hawaii, 1985. All valves covers on reclaimed water lines shall contain "Reclaimed Water" inscriptions on the top surfaces.

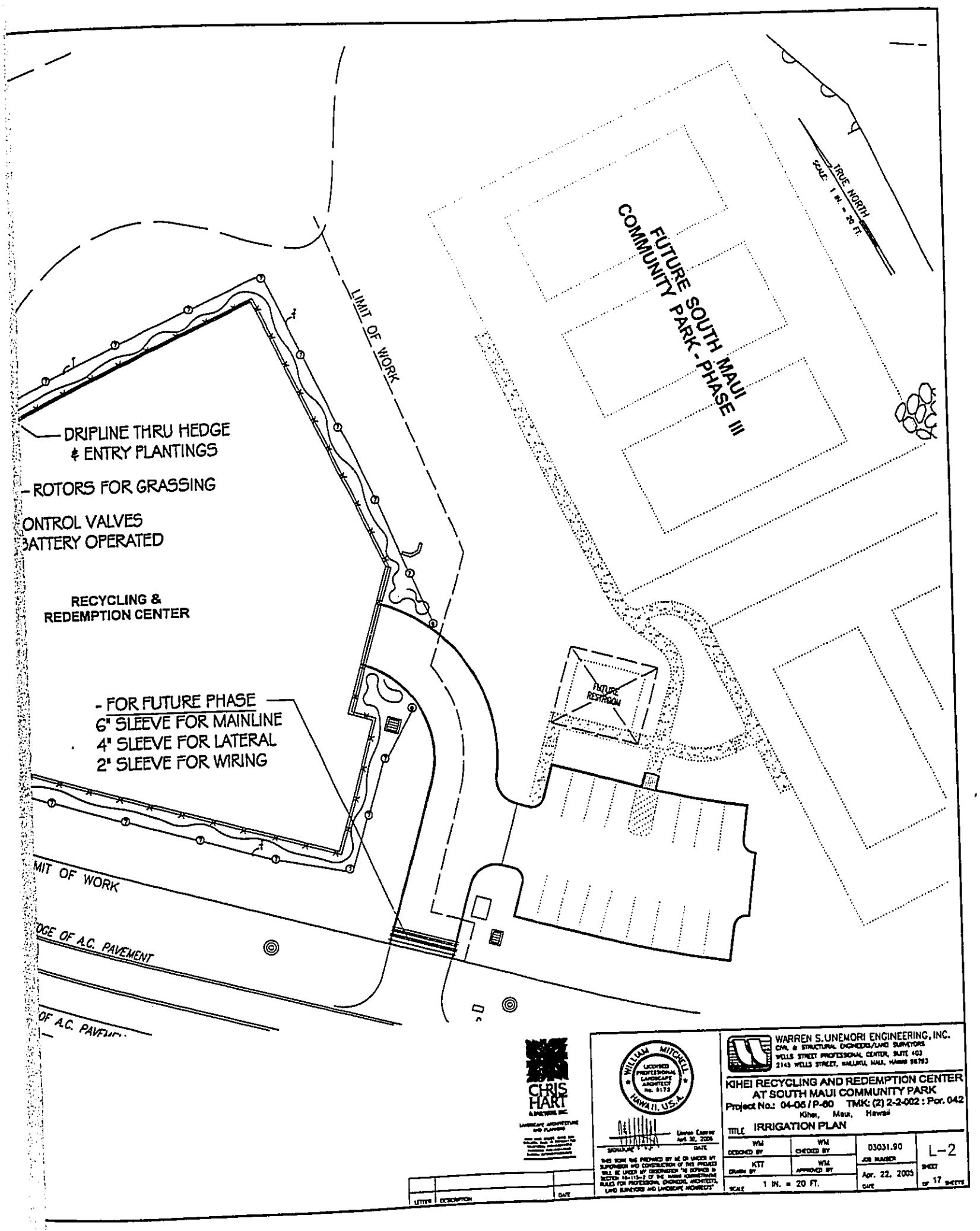
4. Notification signs indicating that reclaimed water is being used for landscape irrigation shall be posted at conspicuous locations throughout the project. The signs shall indicate both in writing and pictorially that reclaimed water is not suitable for drinking. The location of the signs shall be noted on the irrigation system design plans.

5. Before construction of the irrigation system commences, the State Department of Health, Wastewater Branch and the County of Maui's Wastewater Reclamation Division must approve the reclaimed water irrigation system design.

6. The County of Maui's Wastewater Reclamation Division, has the right to stop construction should any work be found contrary to the approved plans and specifications, County Reclaimed Water Rules, or detrimental to public interest.

7. Prior to start-up of the irrigation system, representatives of the State Department of Health Wastewater Branch and the County of Maui's Wastewater Reclamation Division shall inspect the reclaimed water irrigation system along with the irrigation system contractor and project owner. Once the irrigation system passes inspection, permits for reclaimed water use shall be issued to the owner by each entity.





CHRIS HART & PARTNERS INC
LANDSCAPE ARCHITECTURE AND PLANNING

WILLIAM MITCHELL
LICENSED PROFESSIONAL LANDSCAPE ARCHITECT
No. 0173
HAWAII, U.S.A.

License Expires April 30, 2006
SIGNATURE
DATE

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION "AS DEFINED IN SECTION 16-115-7 OF THE HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS AND LANDSCAPE ARCHITECTS"

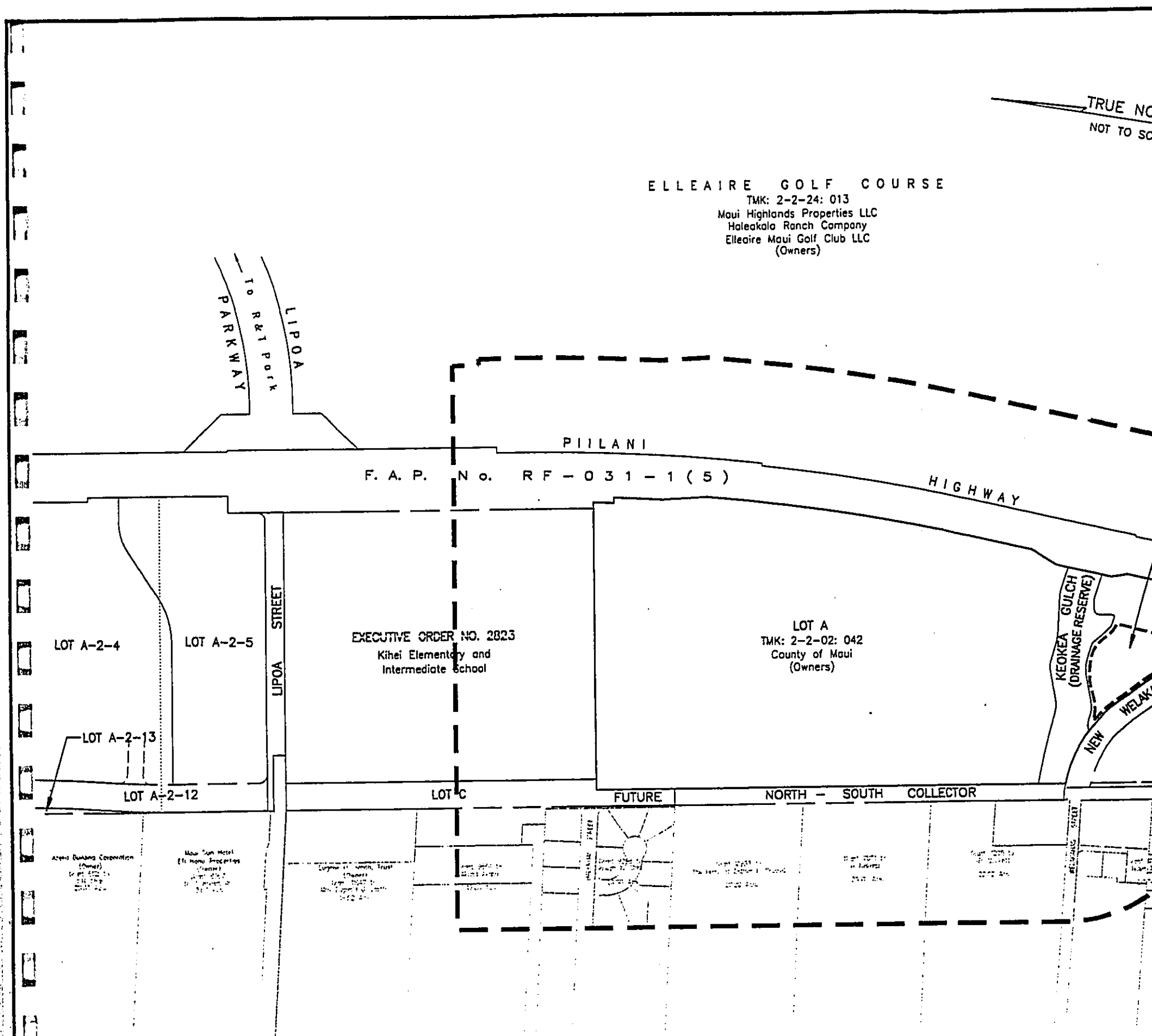
LETTER	DESCRIPTION	DATE

WARREN S. UNEMORI ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS/LAND SURVEYORS
WELLS STREET PROFESSIONAL CENTER, SUITE 403
2145 WELLS STREET, WAILUKU, MAUI, HAWAII 96793

KIHEI RECYCLING AND REDEMPTION CENTER
AT SOUTH MAUI COMMUNITY PARK
Project No.: 04-06 / P-60 TMK: (2) 2-2-002 : Por. 042
Kihei, Maui, Hawaii

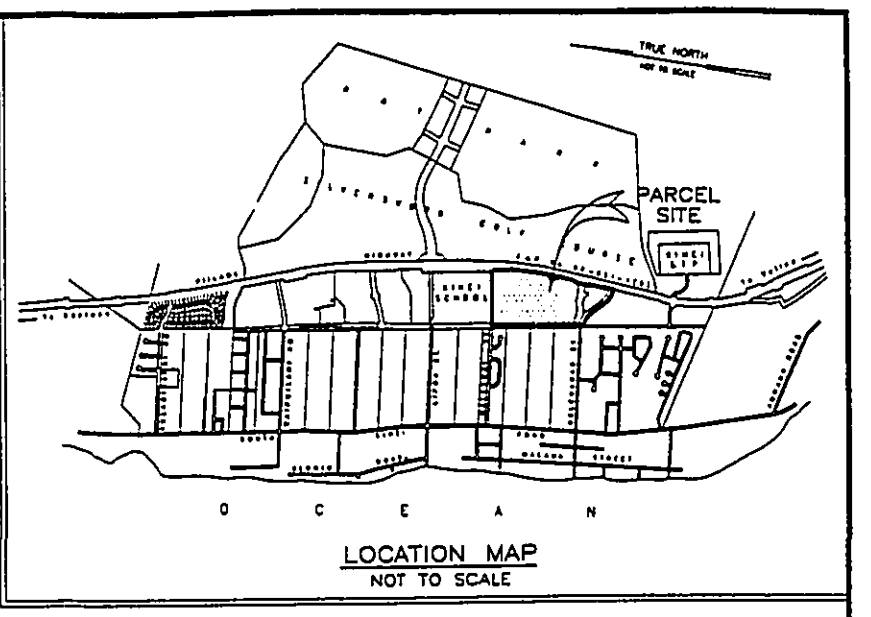
TITLE IRRIGATION PLAN

DESIGNED BY: WM	CHECKED BY: WM	JOB NUMBER: 03031.90	SHEET: L-2
DRAWN BY: KTT	APPROVED BY: WM	DATE: Apr. 22, 2005	OF 17 SHEETS
SCALE: 1 IN. = 20 FT.			



PIILANI VILLAGE PROJECT DIS
TMK PARCELS WITHIN 500 FT. OF TMK: 2-2-

TRUE NORTH
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

KIHEI SEWAGE TREATMENT PLANT

I G H W A Y

RECYCLING PROJECT SITE

KEOKEA GULCH (DRAINAGE RESERVE)

NEW WELAKAHAO LOT D

LOT B
TMK: 2-2-02: 72
Hope Chapel
(Owners)

OLD WELAKAHAO ROAD

To Wailea

CTOR

ROJECT DISTRICT 5
)F TMK: 2-2-02:042 BOUNDARIES

WARREN S. UNEMORI
ENGINEERING, INC.
CIVIL & STRUCTURAL ENGINEERS / LAND SURVEYORS

February 22, 2005