

JAMES "KIMO" APANA  
Mayor

JOHN E. MIN  
Director

CLAYTON I. YOSHIDA  
Deputy Director



COUNTY OF MAUI  
DEPARTMENT OF PLANNING

September 11, 2000

*Nancy*  
RECEIVED

'00 SEP 13 P12:10

OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

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

Dear Ms. Salmonson:

RE: Final Environmental Assessment (FEA) for the Makena Estates  
Resort Condominium Project at TMK: 2-1-007:101, Makena,  
Maui, Hawaii (EA 2000/0007)

The Maui Planning Department (Department) has reviewed the comments received during the 30-day public comment period, which began on July 23, 2000. The Department has determined that this project will not have any significant environmental effects and has issued a Findings of No Significant Impact (FONSI) determination. Please publish this notice in the September 23, 2000 OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form and four (4) copies of the FEA.

Should you have any questions, please call Mr. Daren Suzuki, Staff Planner, of this office at 270-7735, or Mr. Rory Frampton of Chris Hart & Partners at 242-1955.

Very truly yours,

Handwritten signature of Clayton I. Yoshida.

*for* JOHN E. MIN  
Planning Director

Ms. Genevieve Salmonson, Director  
September 11, 2000  
Page 2

JEM:DMS:cmb

Enclosures

c: Clayton Yoshida, AICP, Deputy Director of Planning  
Martin Quill, Makena Estates, LLC  
Rory Frampton, Chris Hart & Partners  
Daren Suzuki, Staff Planner  
Project File  
General File  
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Mr. John E. Min  
August 9, 2000  
Page 5

97-099A/epo

Vector Control

The property may be harboring rodents which will be dispersed to the surrounding areas when any buildings are demolished or the site is cleared. The applicant is required by Hawaii Administrative Rules, Chapter 11-26, "Vector Control" to eradicate any rodents prior to demolition or site clearing activities and to notify the Department of Health by submitting Form VC-12 to the local Vector Control Branch when such action is taken. Rodent traps and/or rodenticides should be set out on the project site for at least a week or until the rodent activity ceases.

The Vector Control Branch phone numbers are as follows:

Oahu: 831-6767

Kauai: 241-3306

Hawaii--Hilo: 974-4238, Kona: 322-7011

Maui (includes Molokai and Lanai): 873-3560

Swimming Pools

The construction and operation of the swimming pool will have to meet the requirements of Chapter 11-13A, "Public Swimming Pools." Swimming pool plans will have to be reviewed and approved by the Maui District Health Office (MDHO). If there are any questions regarding this matter, please contact Mr. Herbert Matsubayashi, District Environmental Program Chief at 984-8230.

Sincerely,



GARY GILL  
Deputy Director  
Environmental Health Administration

Enclosure

c: MDHO w/enclosure  
OSWM  
NRFAQ  
VCB  
CWB  
CAB

THE FOLLOWING ARE A FEW WASTE MINIMIZATION MEASURES FOR IMPLEMENTATION IN DESIGN AND CONSTRUCTION OF NEW DEVELOPMENTS:

I. WASTE REDUCTION DURING CONSTRUCTION/DEMOLITION

GREENWASTE - SOD AND TOP SOIL COMPOSTING  
CONCRETE OR ASPHALT RECYCLING - ROCK & BOULDER  
SEPARATION  
SALVAGE OF DIMENSIONAL LUMBER  
METALS RECOVERY

WASTE MINIMIZATION PLAN - USUAL PRACTICE BUT  
EMPHASIZE  
SALVAGE BY LOCAL NON-PROFIT  
HAZWASTE MINIMIZATION - ESPECIALLY SUB-CONTRACTORS

II. USE OF RECYCLED MATERIALS

LOCAL COMPOST - SOIL AMENDMENTS  
CRUSHED GLASS IN PAVING - BASE - BACKFILL  
CONSTRUCTION BOARD WITH RECYCLED CONTENT  
RECYCLED CONCRETE OR ASPHALT IN BASE  
RECYCLED PLASTIC "LUMBER" IN OUTDOOR FURNITURE,  
FENCING, ETC.

III. DESIGN AND OPERATIONAL REQUIREMENTS

CONSIDER SPACIAL REQUIREMENTS AT INTERNAL  
COLLECTION AND EXTERNAL STORAGE AREAS  
REVIEW OPERATIONAL REQUIREMENTS WITH MAINTENANCE  
AND CUSTODIAL STAFF  
PROVIDE COLLECTION CAPABILITIES FOR SEPARATED  
GREENWASTE  
DISCUSS EQUIPMENT AND CONTAINER REQUIREMENTS WITH  
HAULERS AND VENDORS  
MULTI-MATERIAL CHUTES IN HIGH RISES  
CONVENIENT DROP-OFF SITES IN TOWN HOUSES  
INTERNAL TENANT RECYCLING IN SHOPPING CENTERS





September 5, 2000

Mr. Gary Gill  
Deputy Director, Environmental Health Administration  
State of Hawaii  
Department of Health  
P.O. Box 3378  
Honolulu, Hawaii 96801

Dear Mr. Gill:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated August 9, 2000, regarding the above-referenced  
Special Management Area Permit Application.

In response to your letter, we offer the following comments:

1. Solid Waste. Green waste from the site will be either mulched on site or deposited at the Central Maui landfill's green waste recycling facility. It is envisioned that some of the green waste may also be used as mulch for other projects in South Maui. In the event that bulky materials such as concrete rubble are encountered during grading or grubbing activities, such materials will be disposed of at a facility approved for handling such waste, such as the Maalaea Construction and Demolition Landfill.  
  
During construction the applicant will incorporate a job site recycling plan in order to reduce the amount of construction related waste generated by the project. Any materials that cannot be reused or recycled will be deposited in an appropriately designated facility.
2. Noise Concerns. Activities associated with the construction phase of the project, as well as all stationary equipment installed in the proposed buildings,

LANDSCAPE ARCHITECTURE AND PLANNING  
1955 MAIN STREET, SUITE 200 • WAILUKU, MAUI, HAWAII 96793-1706 • PHONE: 808-242-1955 • FAX: 808-242-1956

will comply the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

3. Polluted Runoff Control. A National Pollution Discharge Elimination System (NPDES) permit will be required for the project since the site is greater than 5 acres. The NPDES permit, which is essentially an erosion control plan for construction activities, will incorporate Best Management Practices (BMP's) designed specifically to reduce the potential for non-point sources of pollution from impacting nearshore water quality. Project plans call for long-term, as well as short-term measures, which will minimize the potential impacts from runoff from the property. These measures include the following:

**Long-term**

Additional onsite runoff generated by the project will be directed into sub-surface detention facilities. These facilities will not only keep the post development peak flow volumes at predevelopment rates, but will also serve as sedimentation traps and filters to prevent sediments or pollutants from migrating into coastal waters.

The drainageway will be maintained in a vegetative state in order to act as a filter to trap sediments in runoff.

**Short-term**

Stormwater control structures will be constructed prior to initiation of major site improvements. This will include installation of the permanent stormwater retention/siltation facilities as well as temporary retention/siltation basins throughout the site.

Temporary berms to divert storm runoff to the retention basins will be constructed.

Temporary silt screens will be installed along Makena Keoneoio Road and within drainage swales along the project limits. Temporary silt screens will also be installed around or within new catch basins and drain inlets. Topsoil stockpiles will be covered or stabilized.


The amount of construction time spent in streambeds will be minimized. Sediment and debris from construction activities will be properly disposed of. Bare areas will be replanted or covered as soon as grading or construction is completed.

Mr. Gary Gill  
September 5, 2000  
Page 2

4. Control of Fugitive Dust. Adequate dust control measures that comply with provisions of Hawaii Administrative Rules, Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33, Fugitive Dust, will be implemented during all phases of construction.
5. Vector Control. Pursuant to Hawaii Administrative Rules, Chapter 11-26, "Vector Control", all rodents will be eradicated prior to demolition or site clearing activities.
6. Swimming Pools. The proposed construction and operation of the swimming pool will comply with the requirements of Chapter 11-13A, "Public Swimming Pools."

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Erampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Mr. Warren Unemori, Warren S. Unemori Engineering, Inc.  
Project File

4933

JAMES "KIMO" APANA  
Mayor

CHARLES JENCKS  
Director

DAVID C. GOODE  
Deputy Director

Telephone: (808) 270-7845  
Fax: (808) 270-7855



RECEIVED  
2000 AUG -3 AM 8:21

WASTE RECLAMATION DIVISION  
COUNTY OF MAUI  
DEPARTMENT OF PUBLIC WORKS  
AND WASTE MANAGEMENT  
200 SOUTH HIGH STREET  
WAILUKU, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.  
Land Use and Codes Administration

RON R. RISKA, P.E.  
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.  
Engineering Division

BRIAN HASHIRO, P.E.  
Highways Division

ANDREW M. HIROSE  
Solid Waste Division

August 2, 2000

MEMO TO: JOHN E. MIN, DIRECTOR OF PLANNING  
FROM: CHARLES JENCKS, DIRECTOR OF PUBLIC WORKS  
AND WASTE MANAGEMENT

SUBJECT: SPECIAL MANAGEMENT AREA PERMIT APPLICATION  
MAKENA ESTATES CONDOMINIUM PROJECT  
TMK: (2) 2-1-007:101  
SM1 2000/0020

RUSH

WWRD	INFO	ACTION	DRAFT RESP	SELF-REVIEW	COMMENTS	FILE	COPY
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PLANNING	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESIGN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ACCOUNTANT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SECRETARY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OPERATIONS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Return to: \_\_\_\_\_

We reviewed the subject application and have the following comments.

1. The Wastewater Reclamation Division cannot insure that wastewater system capacity will be available for this project.
2. The developer is required to fund any necessary off-site improvements to the collection system and wastewater pump stations and shall pay assessment fees for treatment plant expansion costs and wastewater transmission line upgrades. The assessment fee noted on page 25 was in error and should be \$6.03/gallon.
3. The portion of Makena Keoneoio Road fronting this project is constructed of a thin layer of oil and chips "pavement" and shall be reconstructed to meet County standards.
4. The proposed use of coconut palms for landscaping along the Makena Keoneoio Road right-of-way should not be permitted as they are a maintenance and liability problem.
5. The report does not address an 18" or 24" diameter CMP culvert that takes flows from Makena Keoneoio Road near the South entrance of the project across the makai property into the ocean. Will proposed improvements affect the drainage basin affecting this culvert?

Mr. John E. Min  
August 2, 2000  
Page 2

6. Makena Keoneoio Road fronting the subject parcel shall be improved per the provisions of Chapter 18.26A.4601, "Improvements to Public Streets" and Title 18, "Subdivisions" of the Maui County Code and as specified on page 32 of the Kihai-Makena Community Plan in regards to rural roadway standards. These cited standards call for curb, gutter, and sidewalk on Makena Alanui and rolled curb and the ford crossing on Makena Keoneoio Road.
7. A detailed final drainage report and site specific erosion control plan shall be submitted with the construction plans for review and approval prior to the issuance of grading or building permits. The drainage report shall include hydrologic and hydraulic calculations and the schemes for disposal of runoff waters. It must comply with the provisions of the "Rules for Design of Storm Drainage Facilities in the County of Maui" and must provide verification that the grading and runoff water generated by the project will not have an adverse effect on adjacent and downstream properties. The site specific erosion control plan shall show the location and details of structural and non-structural Best Management measures.

If you have any questions, please call David Goode at 270-7845.

DG:msc/mt

S:\LUCIA\C2M\makenaestates.wpd



September 6, 2000

Mr. Charlie Jencks  
Director of Public Works and Waste Management  
Department of Public Works and Waste Management  
200 South High Street  
Wailuku, Hawaii 96793

Dear Mr. Jencks:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated August 2, 2000, regarding the above-referenced  
Special Management Area Permit Application.

In response to your letter, we offer the following comments:

Comment Nos. 1 and 2

The applicant is aware that the County's Waste Water Reclamation Division  
cannot insure that wastewater system capacity will be available for this project.  
We also note that the assessment fee noted on page 25 of the SMA Application  
should have read \$6.03 per gallon.

Comment No. 3

Road frontages along Makena Alanui and Makena Keoneoio Road will be  
improved per the provisions of Chapter 46 "Improvements to Public Streets",  
Section 4601 of the Uniform Building Code as amended.

Comment No. 4

Coconut Palms are not proposed within close proximity to the future Makena  
Keoneoio Road right-of-way and therefore will not create a maintenance and

Mr. Charles Jencks  
September 6, 2000  
Page 2

liability problem. Lower maintenance Manila and Fan Palms are proposed within the subject property, adjacent to the future right-of-way.

Comment No. 5

The project site is divided into three drainage areas. Each area will be designed to retain the additional runoff generated by the project in an onsite subsurface system. Therefore, the proposed improvements will not "affect the drainage basin affecting this culvert."

Comment No. 6

Makena Keoneoio Road, fronting the subject parcel, will be improved per the provisions of Chapter 16.26A.4601, "Improvements to Public Streets" and Title 18, "Subdivisions" of the Maui County Code and as specified on page 32 of the Kihei-Makena Community Plan in regards to rural roadway standards. Makena Alanui will be improved per these standards with curb, gutter, and sidewalk while improvements along Makena Keoneoio Road will include rolled curb and grassed shoulders.

Comment No. 7

A detailed final drainage report and erosion control plan will be submitted with construction plans, for review and approval prior to issuance of grading or building permits.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Brampton  
Land Use Planner

cc. Mr. Marty Quill, Makena Estates L.L.C.  
Mr. Warren Unemori, Warren S. Unemori Engineering, Inc.  
Project File  
Mr. John E. Min, Department of Planning

913

BENJAMIN J. CAYetano  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
Kakuhine Building, Room 355  
601 South High Street  
Honolulu, Hawaii 96807

DEPT OF LAND AND NATURAL RESOURCES  
COUNTY OF MAUI  
RECEIVED

TIMOTHY E. JOHNS, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES  
JANET E. KAWILO

- AQUATIC RESOURCES
- BOATING AND OCEAN RECREATION
- CONSERVATION AND RESOURCES
- ENFORCEMENT
- CONVEYANCES
- FORESTRY AND WILDLIFE
- HISTORIC PRESERVATION
- LAND
- STATE PARKS
- WATER RESOURCE MANAGEMENT

July 26, 2000

Mr. John E. Min, Director  
County of Maui  
Department of Planning  
250 South High Street  
Wailuku, Hawaii 96793

LOG NO: 25820 ✓  
DOC NO: 0007CD18

Dear Mr. Min:

**SUBJECT:** Chapter 6E-42 Historic Preservation Review of a Special Management Area Permit for the Proposed Makena Estates (SUBJECT I.D.: SM1 2000/0020) Papa'anui Ahupua'a, Makawao District, Island of Maui **TMK: 2-1-07:101 (previously designated 2-1-07:012)**

Thank you for the opportunity to review the Special Management Area Permit (SMA) for the proposed Makena Estates. Our review is based on reports, maps, and aerial photographs maintained at the Historic Preservation division; no field inspection was made of the subject property.

From the submitted document we understand the proposed undertaking consists of the construction of a 40-unit resort condominium, including a manager's residence, cabana, pool, associated site improvements, and landscaping.

We have commented previously on proposed undertakings involving the subject property over the years: Preliminary Plat Review of the Chang Subdivision (SHPD DOC NO: 1879a/3660); Historic Preservation Review of the Chang Subdivision (SHPD DOC NO: 9212AG10/LOG NO: 6976); Historic Preservation Review of the Draft Archaeological Inventory Survey Report (SHPD DOC NO: 9408KD51/LOG NO: 12614); Historic Preservation Review of the Chang Subdivision (SHPD DOC NO: 9412KD22/LOG NO: 13471); Historic Preservation Review of the Chang Subdivision (SHPD DOC NO: 9501KD12/13661); Historic Preservation Review of a State Land Use District Boundary Amendment for the Chang Property (SHPD SDOC NO: 9712BD34/20747).

In 1995, Archaeological Consultant Services conducted an archaeological inventory survey of the subject property. The report documenting the findings (Chafee and Spear 1995) has been



John E. Min  
Page 2

reviewed and accepted by this office (SHPD DOC NO: 9501KD12/LOG NO: 13661). Significant historic sites are located in the project area. Based on the inventory survey report, we previously requested mitigation actions (including data recovery of sites 3513, 3514, and 3516-3518 and a preservation plan for Pohakunahanaha Heiau, (which is located on an adjacent parcel) to ensure "no adverse effect" to the significant sites. To date this office has not received the data recovery plan, the data report, or the preservation plan for the heiau.

Therefore, in order for the proposed undertaking to have "no adverse effect" on significant historic sites, we recommend the following conditions be attached to the SMA permit application, should it be accepted:

1. Archaeological data recovery is to occur at sites 3513, 3514, and 3516-35618 prior to any land alteration. The applicant must submit an acceptable data recovery plan to the State Historic Preservation Office for review prior to the commencement of the data recovery work. The State Historic preservation Office shall verify in writing to the Maui County Planning Department when the data recovery plan has been successfully executed. An acceptable report documenting the findings of the data recovery work shall be submitted to the State Historic Preservation Office for review prior to the commencement of any land alterations.
2. Although Pohakunahanaha Heiau (site 197) is located on an adjacent property, it is in close proximity to the proposed project area and needs to be protected. Therefore, the applicant must establish an acceptable buffer zone around the Pohakunahanaha Heiau (site 197), such as protective orange construction fencing. This fencing must be in place prior to the commencement of any ground activities. The placement of the fencing will be verified in writing by the State Historic Preservation Office prior to the commencement of any land alteration.
3. In the event that unrecorded historic remains (i.e. artifacts, architecture, burials, etc.) are inadvertently encountered during ground altering activities, all work needs to cease in the immediate vicinity of the find and the find needs to be protected from further damage. The contractor should immediately contact the State Historic Preservation Office at 243-5169 on Maui. If burials are encountered please also notify Kanai Kapeliela at 692-8037 on O'ahu. The Division will assess the significance of the find and recommend mitigation measures, if necessary.

Please call Cathleen Dagher at 692-8023 if you have any questions.

Aloha,



DON HIBBARD, Administrator  
State Historic Preservation Division

CD



September 5, 2000

Mr. Don Hibbard, Administrator  
State of Hawaii, Department of Land and Natural Resources  
State Historic Preservation Division  
Kakuhihewa Building, Suite 555  
601 Kamokila Blvd.  
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated July 26, 2000, regarding the above-referenced  
Special Management Area Permit Application.

In response to your letter, we offer the following comments:

1. Data Recovery. Your letter states that your office has not received the data recovery plan, or the data report and that before land alteration may occur these documents must be received by your office. However, please note that our archaeological consultant, Scientific Consultant Services (SCS), did conduct data recovery work in the project area and submitted an end-of-field work letter to your office dated April 4, 2000 (See Attachment "A"), which your office reviewed and commented on in a letter dated May 26, 2000. In your May 26 letter you state that "the archaeological data recovery fieldwork portion of the data recovery work is concluded", that our client "could begin land altering development", and that the "sites no longer need to be protected" (See Attachment "B").

SCS has also submitted a draft data recovery report to SHPD which we understand is currently being reviewed by your staff.

Mr. Don Hibbard, Administrator

September 5, 2000


Page 2

2. Pohakunahanaha Heiau. The project plans have incorporated measures to ensure protection of the above-referenced heiau, which is located on an adjacent property. As noted in the SMA Application, Section III.B.3 "Cultural Resources", project plans have incorporated a 75-foot buffer zone to the nearest building around the heiau on all sides as recommended by Kapiioho Lyons Naone the project's cultural resources consultant. The proposed buffer should protect the heiau during and after the construction period. Per your letter, we will also erect construction fencing along the affected property boundary line during the construction phase of the project in order to further protect the site. We hereby request your approval of the above-referenced mitigation measures via this letter.
  
3. Unrecorded Historic Remains. Should unrecorded historic remains be inadvertently encountered during ground altering activities, all work will cease in the immediate vicinity of the find, and the State Historic Preservation Office will be contacted.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Enclosures

Sincerely,

  
Rory Frampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Mr. Bob Spear, Scientific Consultant Services  
Project File



April 4, 2000

Dr. Ross Cordy  
 Branch Chief-Archaeology  
 State Historic Preservation Division  
 Kapolei, HI  
 cc: Marty Quill, CMI Group

re: End of Fieldwork Letter, Data Recovery, Papa'anui Ahupua'a, Makena, Maui, Hawai'i (SCS-199)

Dear Ross:

This letter is to inform you that Data Recovery fieldwork on a 6 acre parcel in Papa'anui Ahupua'a, Makena has been completed. We thank you for your comments regarding the Data Recovery Plan. In total, three sites (composed of 21 features) were subject to various levels of testing between March 6, 2000 through April 4, 2000 by a variably-sized fieldcrew. Both test units (screened) and stratigraphic trenches (not screened) were utilized during excavation.

The greatest concentration of excavations occurred within Feature 2A of Site 3513 (enclosure). Testing was accomplished at this site to address questions of intra-site activity areas. Briefly, the feature measures 22.70 m by 15.1 m (342.77 sq. m.). Excavations in the form of Test Units and Stratigraphic Trenches allowed for investigating some 34 sq. m. of the feature (about 10% of the feature). Additionally, shovel probes/horizontal shovel stripping were utilized across a bisecting section of the feature to judge the presence/absence of *'ili 'ili* pavement throughout the entirety of the feature. Block excavations proceeded from the southwest corner of the structure to the northeast, the block being 5 m by 5 m with another 1 m by 5 m extension along the eastern flank of the block.

Briefly, over 65 subsurface features of varying depths and breadth were recorded within the block, the feature exhibiting intensive occupation over time. The subsurface features were represented by hearths, postmolds, charcoal concentrations, and ash lens'. Many artifacts and remains were recovered during excavations of the block, including a large quantity of shell, faunal remains (fish vertebrae, etc.), lithics (adze fragments, flakes, and debitage), several fishhooks, worked *vanna*, and coral abraders, among other classes. Ample charcoal samples were acquired from each feature and thus, precisely dating utilization of the enclosure should be non-problematical. Additionally, *'ili 'ili* pavement stones were measured per cubic meter of rock per excavation unit within the block.

TEL 808-597-1152    **SCS... SERVING ALL YOUR ARCHAEOLOGICAL NEEDS**    FAX 808-597-1153  
 ALSO ON MAUI • P.O. BOX 1074 • PUUNENE, HAWAII 96784 • 808-244-1134

ATTACHMENT "A"

Site 3514 Features 2 and 3 (agricultural features) were subject to minimal testing (test units), as were Site 3516 Features 1 and 4 (terrace and lithic scatter). Again, sufficient charcoal was acquired from various depths of these features to appropriately address the first research design question pertaining to the chronology of sites within the project area. Additionally, a modest amount of artifacts (e.g., lithics, volcanic glass, etc.) and midden (shell, Echinoderm, etc.) were obtained through excavations of these features.

All materials, including cultural resources, notes, and photographs have been curated within the Honolulu office of SCS, Inc. Once laboratory analysis (including radiocarbon dating), drafting, and writing have been completed, a draft report will be submitted to you for review. If you have any questions or concerns, please do not hesitate to call myself or Dr. Robert Spear at (808) 597-1182. We again thank you for your comments prior to the Data Recovery work and look forward to presenting you with a concise and informational report.

Best Regards,



Michael Dega  
Senior Archaeologist  
Scientific Consultant Services, Inc.



BENJAMIN J. CAYETANO  
GOVERNOR  
STATE OF HAWAII



RAYNARD C. SOON  
CHAIRMAN  
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI  
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879 00 JUL 28 12:36  
HONOLULU, HAWAII 96805

July 26, 2000

The Honorable John E. Min, Director  
County of Maui, Department of Planning  
250 South High Street  
Wailuku, Maui, Hawaii 96793

Dear Mr. Min:

Subject: Makena Estates, 40-unit Resort Condominium Project,  
SM1 2000/0020, TMK 2-1-7:101, Makena, Maui, Dated May,  
2000

Thank you for the opportunity to review the subject application.  
The Department of Hawaiian Home Lands has no comment to offer.

If you have any questions, please call Daniel Ornellas of our  
Planning Office at 586-3836.

Aloha,

*Raynard C. Soon*  
Raynard C. Soon, Chairman  
Hawaiian Homes Commission



September 5, 2000

Mr. Raynard C. Soon, Chairman  
State of Hawaii  
Department of Hawaiian Home Lands  
P.O. Box 1879  
Honolulu, Hawaii 96805


Dear Mr. Soon:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated July 26, 2000, regarding the above-referenced Special Management Area Permit Application, which stated that you have no comment regarding the subject application.

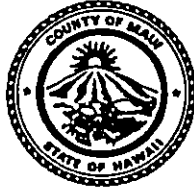
Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Frampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Project File

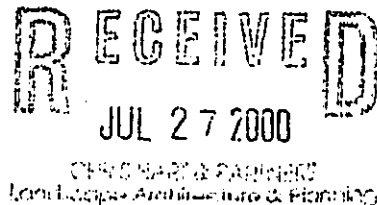




**DEPARTMENT OF WATER SUPPLY  
COUNTY OF MAUI  
P.O. BOX 1109  
WAILUKU, MAUI, HAWAII 96793-6109  
Telephone (808) 270-7816 • Fax (808) 270-7833**

July 24, 2000

Mr. John Min, Director  
County of Maui  
Planning Department  
250 South High Street  
Wailuku, Maui, Hawaii 96793



I.D.: SM 1 2000/0020  
TMK: 2-1-07:101  
Project Name: Makena Estates, 40-unit Resort Condominium Project

Dear Mr. Min,

Thank you for the opportunity to provide comments on this application. We provide the following information:

Based on system per-unit standards, domestic consumption for this project would be approximately 23,000 gallons per day (gpd). Using empirical water use data for Makena multi-family development, consumption would be approximately 26,000 gpd.

The applicant is required to provide fire and domestic service according to standards. Installation of fire hydrants will be required along Makena Alanui Road and Makena Keoneio Road. Water system and fire protection improvements to standards will be reviewed during building permit application.

The Makena Resort is served by the Central Maui System. The major source of water for this system is the Iao Aquifer. Rolling annual average groundwater withdrawals from the Iao Aquifer as of July 1, 2000 were 17.948 MGD. The regulatory sustainable yield of this aquifer is 20 MGD. If rolling annual average withdrawals exceed 20 MGD, the State Commission on Water Resource Management will designate Iao Aquifer. The Department is implementing a plan to bring new sources on-line and to mitigate withdrawals. Two wells in North Waihee were brought on-line in July 1997. Another well producing about 1 MGD was brought on-line during the first quarter of 2000. The Department is continuing to implement a plan to bring new sources on-line and to mitigate withdrawals. Nevertheless, the applicants should be made aware that the timing of this project may be affected with possible delays until new sources can be brought on-line. No guarantee of water is granted or implied as a result of these comments. Water availability will be reviewed at the time of application for meter or meter reservation. Domestic, fire, and irrigation calculations will be reviewed in detail during the development process.

Brackish and/or reclaimed water sources should be used for dust control during construction and for irrigation

and other non-potable uses if such alternative sources are available. We recommend that water conservation measures listed in the project material, including use of low flow fixtures, drought tolerant plants and efficient irrigation such as drip, be implemented. To further conserve water resources, the applicant should refer to the attached documents and consider these additional measures:

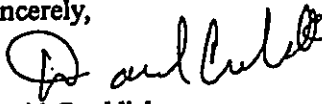
Eliminate Single-Pass Cooling: Single-pass, water-cooled systems should be eliminated per Maui County Code Subsection 14.21.20. These units pass water once-through for cooling, and then dispose of the water into the drain. Although prohibited by code, single-pass water cooling is still manufactured into some models of air conditioners, freezers, and commercial refrigerators.

Maintain Fixtures to Prevent Leaks: A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day. Refer to the attached handout, "The Costly Drip". The applicant should establish a regular maintenance program.

Prevent Over-Watering By Automated Systems: Provide rain-sensors on all automated irrigation controllers. Check and reset controllers at least once a month to reflect the monthly changes in evapotranspiration rates at the site.

Should you have any questions, please call our Water Resources and Planning Division at 270-7199.

Sincerely,



David Craddick  
Director  
emb

cc: engineering division  
applicant, with attachments:

"The Costly Drip"

"Maui County Planting Plan"

Ordinance 2108 - An ordinance amending Chapter 16.20 of the Maui County Code, pertaining to the plumbing code"

"A Checklist for Water Conservation Ideas for Cooling"

"A Checklist for Water Conservation Ideas for Condominiums"

"A Checklist for Water Conservation Ideas for the Home"

*By Water All Things Find Life*



September 6, 2000

Mr. David Craddick  
Director  
Department of Water Supply  
County of Maui  
P.O. Box 1109  
Wailuku, Hawaii 96793-6109

Dear Mr. Craddick:

RE: Special Management Area (SMA) Permit Application for the Makena  
Estates Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated July 24, 2000, regarding the above-referenced  
Special Management Area Permit Application.


In response to your letter, we offer the following comments:

1. Water and Fire Protection Improvements. The applicant will provide fire and domestic service improvements that comply with County standards.
2. Water Availability. We note that your Department, at the time of application for water meter or meter reservation, will review water availability for our project. We will provide final domestic, fire, and irrigation calculations at the time that building permits are submitted. It is not anticipated that brackish and/or reclaimed water will be used for irrigation due to the lack of availability of these sources at an economically viable cost.
3. Dust Control. Use of brackish and/or reclaimed water sources will be encouraged for dust control during the construction period.
4. Conservation Measures. The project will incorporate the conservation measures you have listed with regards to elimination of single pass cooling, low flow fixtures and devices; maintenance of leaks, climate adapted plants, efficient irrigation systems, and prevention of over watering.

Mr. David Craddick  
September 6, 2000  
Page 2

Should you have any questions, please contact myself, or Mr. Michael Summers,  
Chris Hart & Partners, at 242-1955.

Sincerely,



Rory Frampton.  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Mr. Warren Unemori, Warren S. Unemori Engineering, Inc.  
Project File



DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96858-8440

REPLY TO  
ATTENTION OF

September 7, 2000

RECEIVED  
SEP - 8 2000

CHRIS HART & PARTNERS  
Landscape Architecture & Planning

Regulatory Branch

Mr. Rory Frampton  
Chris Hart & Planners  
1955 Main Street, Suite 200  
Wailuku, Maui, Hawaii 96793-1706

Dear Mr. Frampton:

This responds to your letter dated August 31, 2000 regarding determination of Department of the Army (DA) permit requirements for the proposed Makena Estates Residential Condominium Project (TMK 2-2-1-07:101) at Makena, Maui. The photographs and other information accompanying your letter indicate that the portion of the unnamed stream which lies within the project area is ephemeral and does not exhibit an ordinary high water mark.

Based upon the information you have provided, I have determined that the proposed project will not involve any work in waters of the U.S., including wetlands, and a DA permit is therefore not required.

Should you have any questions regarding this determination, please contact Peter Galloway of my staff (telephone 438-8416; fax 438-4060) and refer to file number 200000239.

Sincerely,

George P. Young, P.E.  
Chief, Regulatory Branch

Copies Furnished:

Clean Water Branch, State of Hawaii Department of Health,  
P.O. Box 3378, Honolulu, HI 96801-3386  
State of Hawaii, Department of Land and Natural Resources,  
Commission on Water Resource Management, P.O. Box 621,  
Honolulu, HI 96809  
County of Maui, Department of Planning, 250 South High Street,  
Wailuku, Maui, Hawaii 96793

TOTAL P.01



DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96858-5440

REPLY TO  
ATTENTION OF

July 21, 2000

Civil Works Technical Branch

'00 JUL 25 P1 00

Mr. Daren M. Suzuki, Staff Planner  
County of Maui  
Department of Planning  
250 South High Street  
Wailuku, Maui, Hawaii 96793

DEPT OF PLANNING  
COUNTY OF MAUI  
RECEIVED

Dear Mr. Suzuki:

Thank you for the opportunity to review and comment on the Special Management Area Application (SMA) and Draft Environmental Assessment (DEA) for the Makena Estates Resort Condominium Project, Makawao, Maui (TMK 2-1-7: 101). The following comments are provided in accordance with Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. The existing drainage ways which cross the project parcel are considered waters of the U.S. subject to the Corps regulatory authority. The applicant's plans to grade portions of these drainage ways and to discharge geocell matting, soil, or other fill material below the ordinary high water mark of these drainage ways may require a DA permit. Discharge of fill material for construction of the road crossings shown in Figure 6 of the SMA may also require a DA permit. Determination of permit requirements can be made when the applicant's plans are further developed. For further information, please contact Mr. Peter Galloway at (808) 438-8416 and refer to file number 20000239.

b. The flood hazard information provided on page 14 of the DEA is correct.

Should you require additional information, please contact Ms. Jessie Dobinchick of my Civil Works Technical Branch staff at (808) 438-8876.

Sincerely,

*James Pennaz*  
James Pennaz, P.E.  
Chief, Civil Works  
Technical Branch



August 31, 2000

Mr. James Pennaz, P.E.  
Chief, Civil Works Technical Branch  
Department of the Army  
U.S. Army Engineer District  
Honolulu, Fort Shafter, Hawaii 96858-5440

REMARKS: Attn: Mr. Peter Galloway  
File No. 20000239

Dear Mr. Pennaz:

RE: Draft Environmental Assessment (DEA) and Special Management Area  
(SMA) Permit for the Makena Estates Residential Condominium Project  
(TMK: (2) 2-1-007:101)

Thank you for your letter dated July 21, 2000, regarding the above-referenced  
Draft Environmental Assessment (DEA) and Special Management Area Permit (SMA)  
Application.

Responding to your letter, and pursuant our telephone conversation of Tuesday,  
August 29, 2000, we are providing you with more specific information for your use in  
determining whether the subject drainageway is considered waters of the U.S. Included  
herewith, are a photo key map, topographic survey, and photos of the subject  
drainageway. The photo key shows the approximate position from where the photos  
were taken.

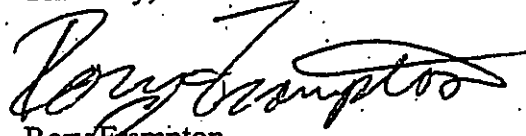
In consideration of the enclosed materials, and from our personal experience at  
the site, it appears that the subject drainageway is typically dry, except during sporadic  
periods of heavy rainfall and flooding, and could therefore be considered an ephemeral  
drainageway with no aquatic value. In the event, however, that you determine that the  
subject drainageway is considered waters of the U.S. and subject to the Corps regulatory  
authority, we will either modify our plans to avoid any work within the drainageway  
and/or obtain the required Department of the Army permits.

LANDSCAPE ARCHITECTURE AND PLANNING  
1955 MAIN STREET, SUITE 200 • WAILUKU, MAUI, HAWAII 96793-1706 • PHONE: 808-242-1955 • FAX: 808-242-1936

Mr. James Pennaz, P.E.  
August 31, 2000  
Page 2

Should you have any questions, please contact myself, or Mr. Michael Summers,  
Chris Hart & Partners, at 242-1955.

Sincerely,



Rory Frampton  
Land Use Planner

cc. Mr. Marty Quill  
Project File ✓





PLANT LEGEND

----- CHALKER FENCE  
 = LAVA ROCK WALL  
 = 4" FENCE  
 ■ ENTRY COLLAR

TREES

- \* COCONUT PALM
- \* HAWAII PALM
- \* LOULU PALM
- MONKEY POD
- CORAL TREE
- BEACH HELIOTROPE
- HAWAIIAN KOU
- \* ARECA PALM
- \* MACARTHUR PALM

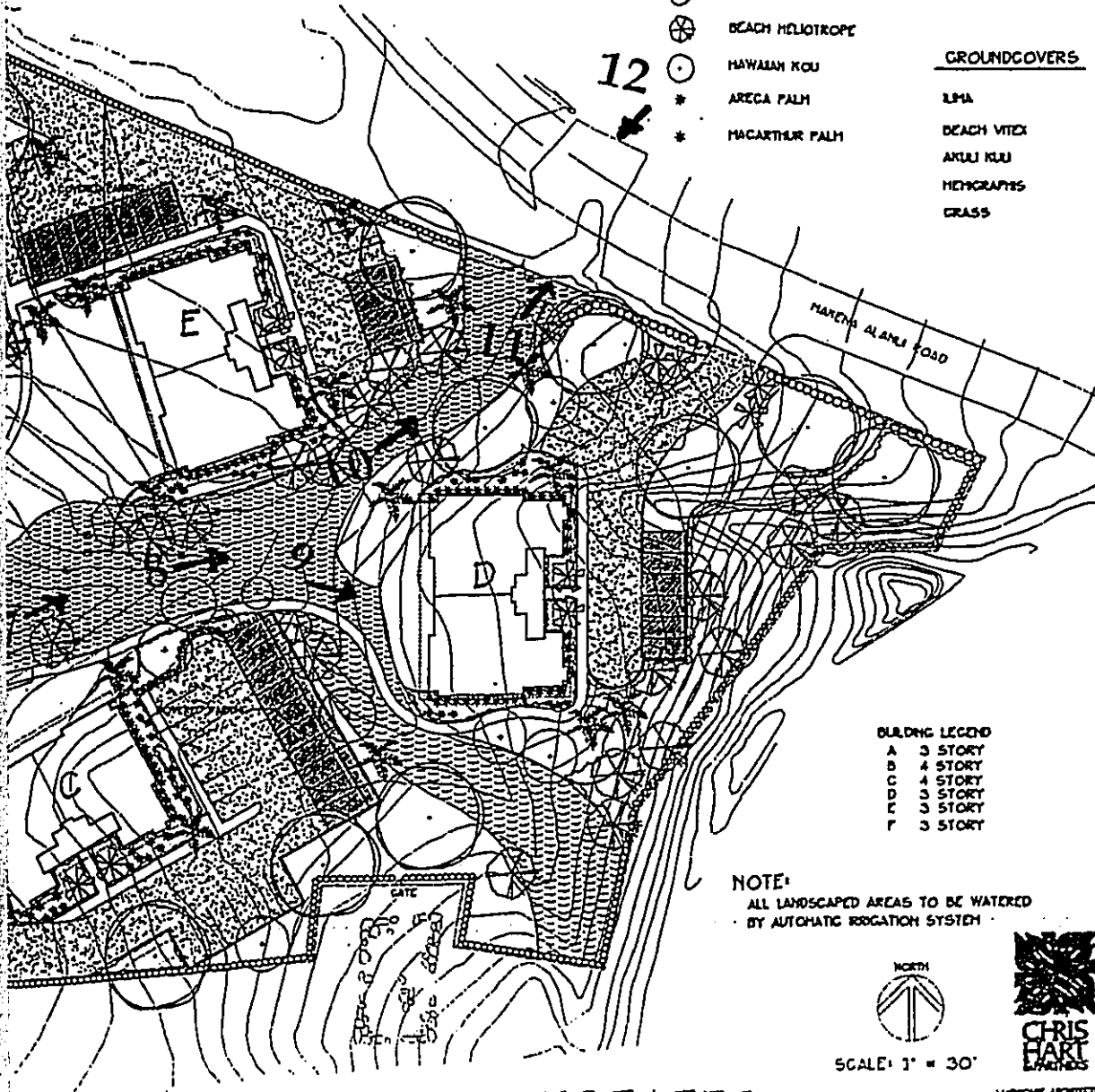
SHRUBS

- YELLOW Hibiscus
- P.P. OLEANDER
- PINK OLEANDER
- ◆ QUEEN EDITH LILY
- AFRICAN IRIS
- BOUGHAYLLEA

GROUNDCOVERS

- LMA
- BEACH VITEX
- AKULI KULU
- HEMIGRAPHIS
- GRASS

12



BUILDING LEGEND  
 A 3 STORY  
 B 4 STORY  
 C 4 STORY  
 D 3 STORY  
 E 3 STORY  
 F 3 STORY

NOTE:  
 ALL LANDSCAPED AREAS TO BE WATERED  
 BY AUTOMATIC IRRIGATION SYSTEM



SCALE: 1" = 30'



CHRIS HART  
 LANDSCAPE ARCHITECTURE  
 AND PLANNING

MAKENA ESTATES  
 LANDSCAPE/SITE CONCEPT PLAN

JUNE 1, 2000

CHP 008 00/013

FIGURE 6



Photo No. 1

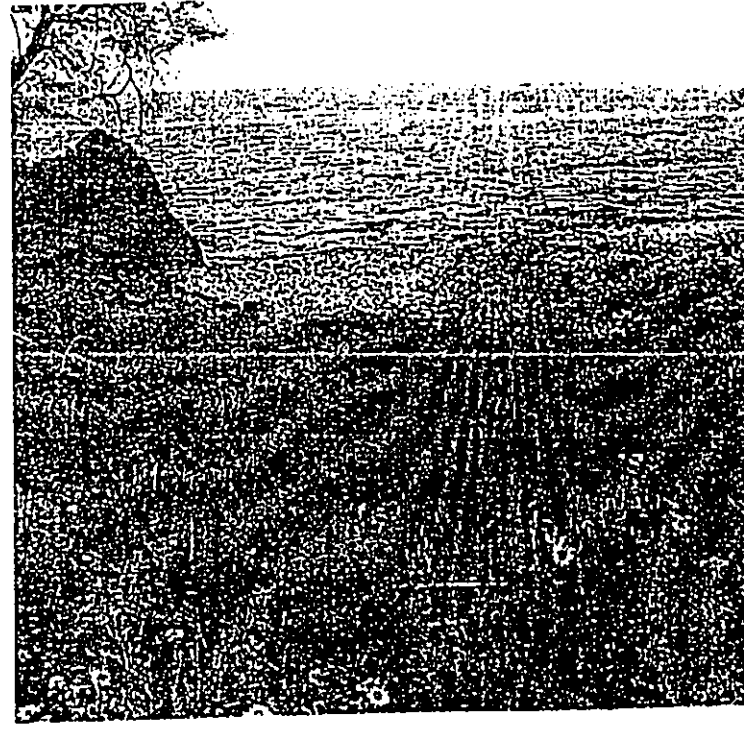


Photo No. 2



Photo No. 4

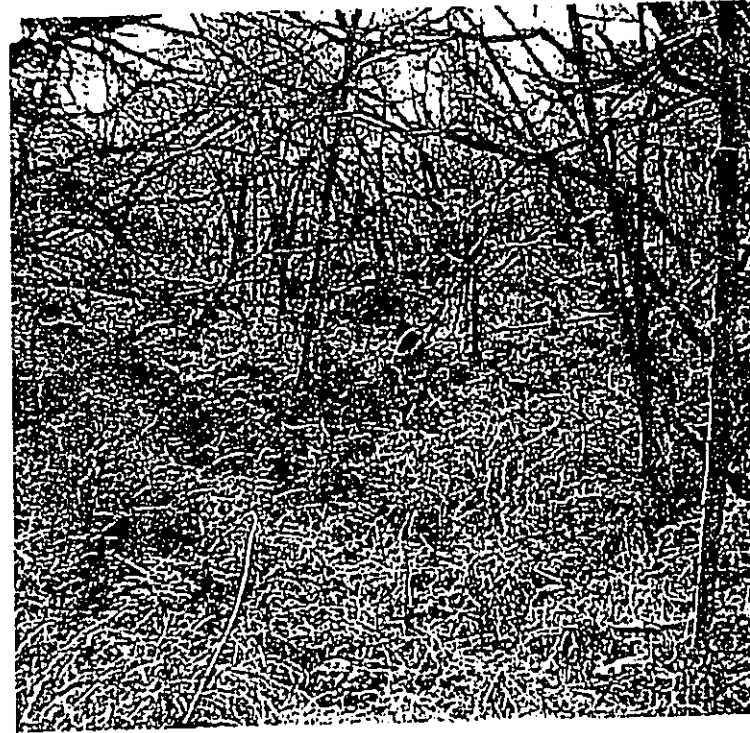


Photo No. 5

PHOTOS TAKEN ON AUGUST 29, 2000

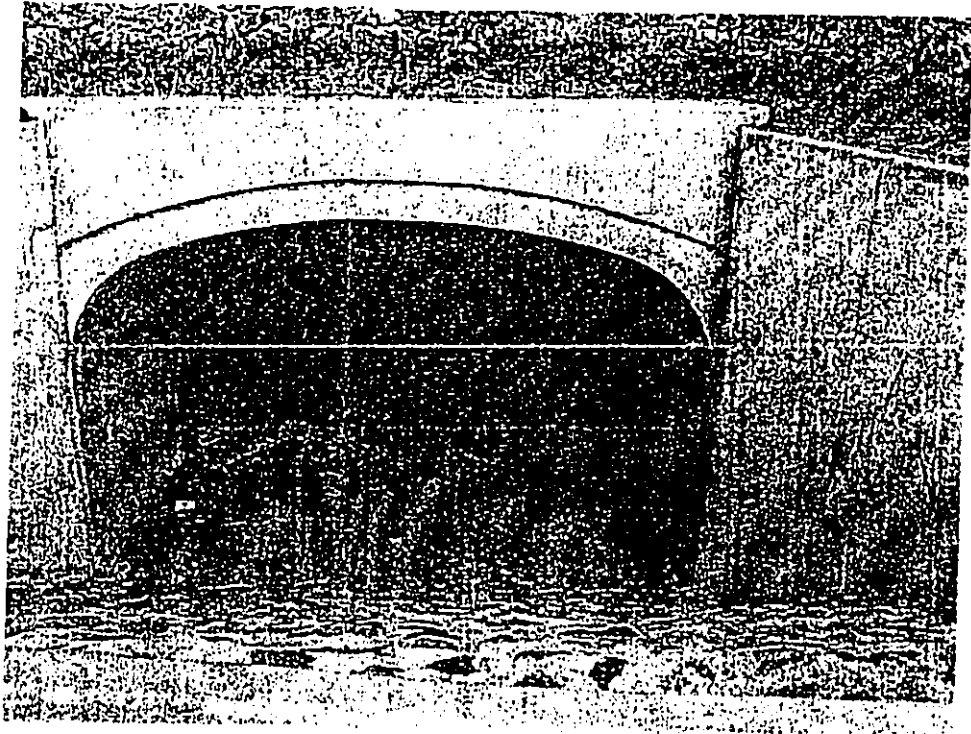
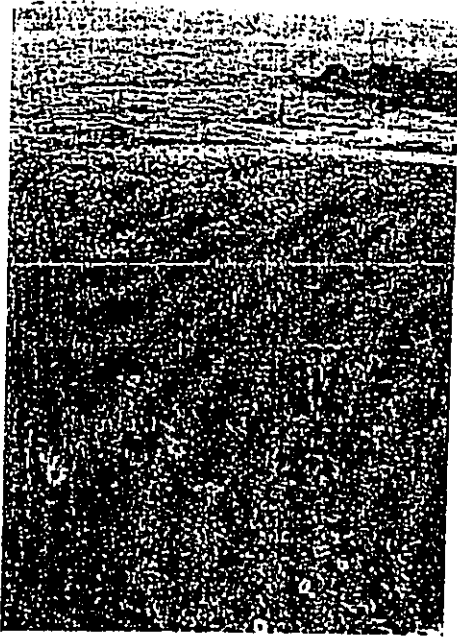


Photo No. 3

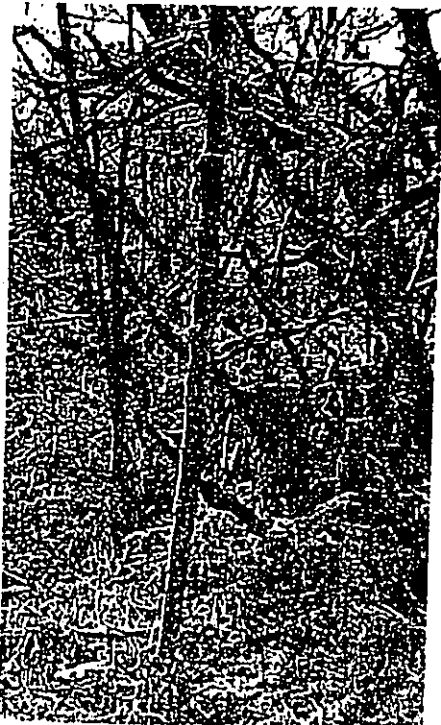


Photo No. 6

# CORRECTION

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





Photo No. 1



Photo No. 2



Photo No. 4



Photo No. 5

PHOTOS TAKEN ON AUGUST 29, 2000

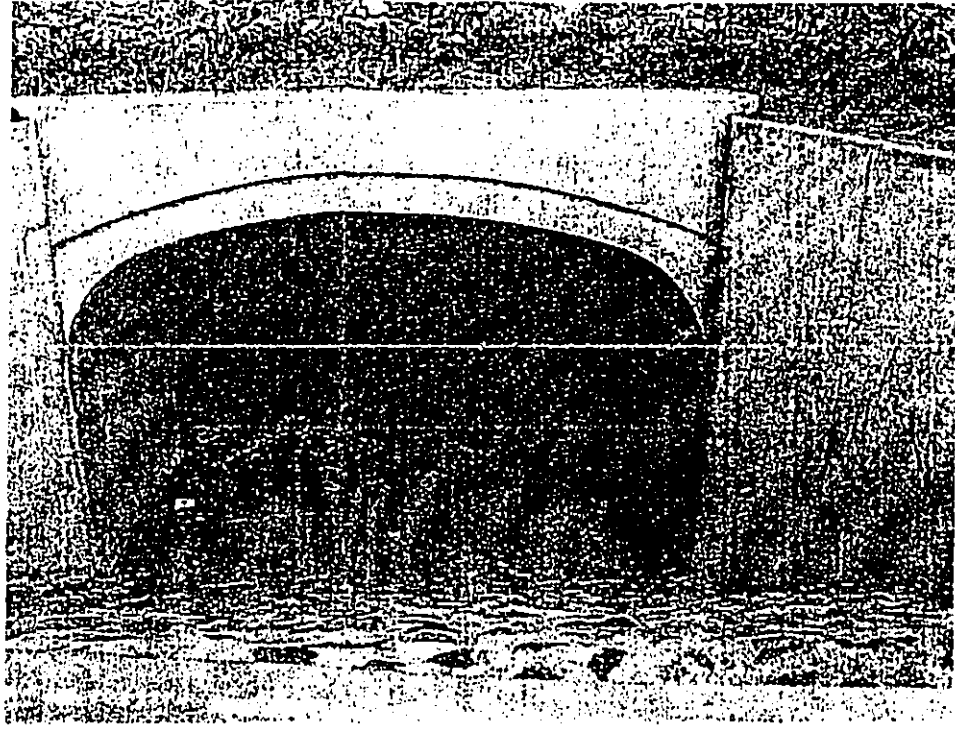
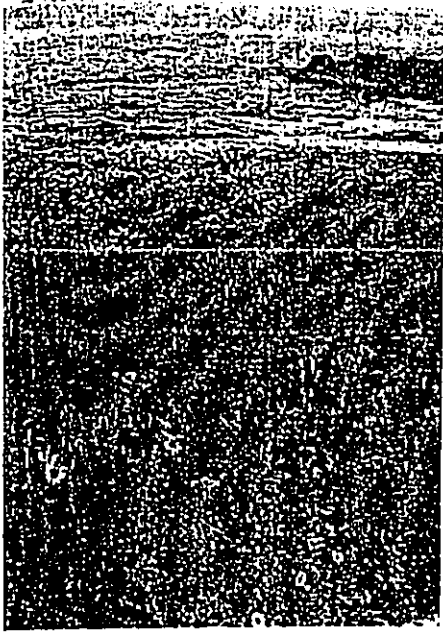


Photo No. 3



Photo No. 6



Photo No. 7



Photo No. 8



Photo No. 10

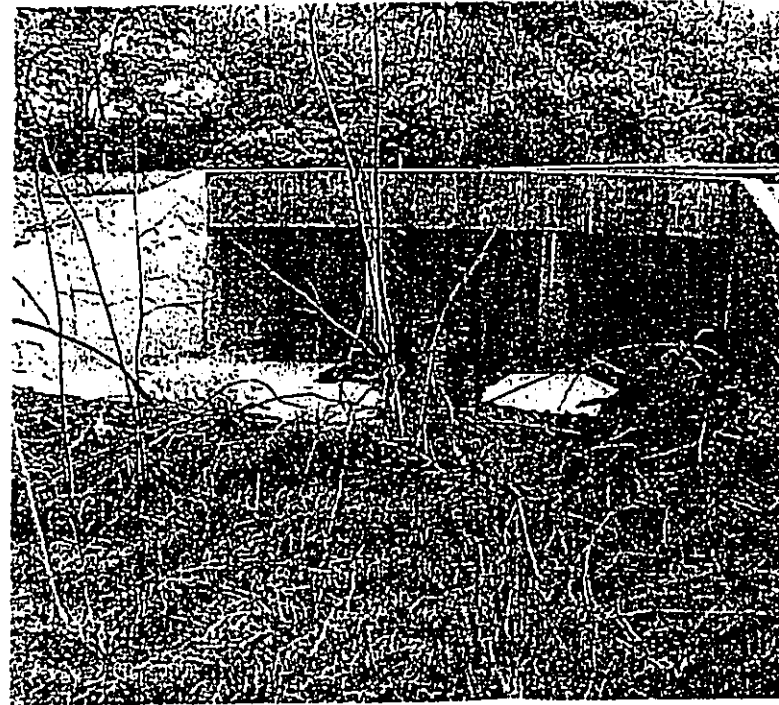


Photo No. 11

PHOTOS TAKEN ON AUGUST 29, 2000





Photo No. 9

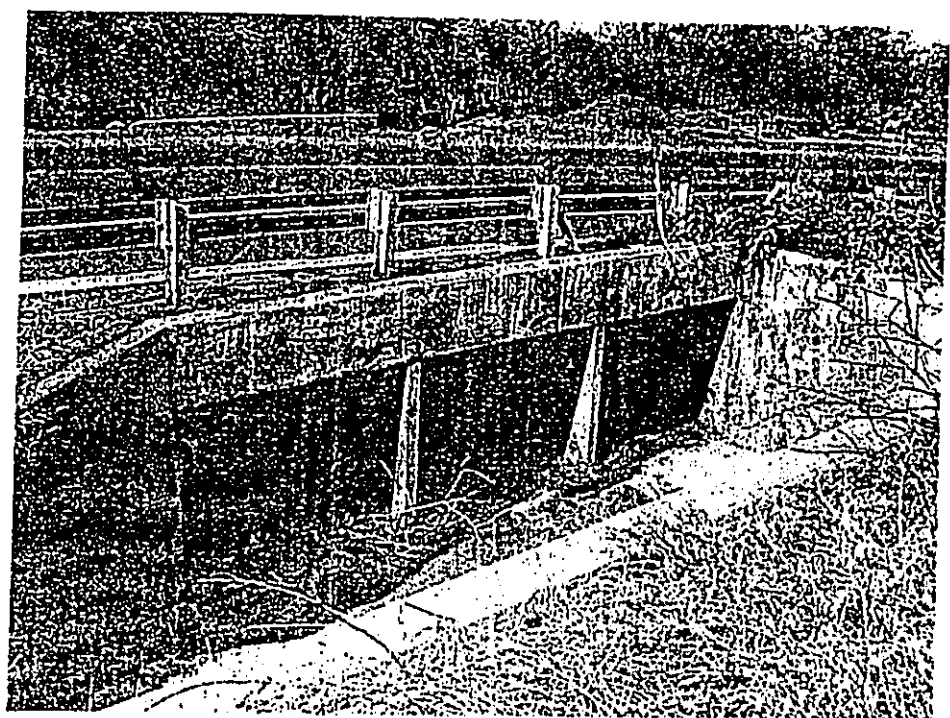


Photo No. 12

BENJAMIN J. CAYETANO  
GOVERNOR



GENEVIEVE SALMONSON  
DIRECTOR

STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET  
SUITE 702  
HONOLULU, HAWAII 96813  
TELEPHONE (808) 586-4185  
FACSIMILE (808) 586-4186

July 18, 2000

RECEIVED  
JUL 20 2000

CHRIS HART & PARTNERS  
Landscape Architecture & Planning

John Min  
Maui Planning Department  
205 South High Street  
Wailuku, HI 96793

Attn: Daren Suzuki

Dear Mr. Min:


Subject: Draft environmental assessment (EA) for Makena Estates

We have the following comments to offer:

1. Figures: In the final EA please add legends to figures 3, 4 and 5 that indicate what the abbreviations used in the figures represent. Also in figure 5, the 100 year flood map, it is difficult to determine which part of the parcel lies in zone C. In the final EA enclose a clear copy of this map.
2. Coastal hazard analysis: In Section IV, E. 6, the discussion on flood zones references Exhibit 3, which is missing from draft EA. Include it in the final EA.
3. Sustainable Building Design: Please consider applying sustainable building techniques presented in the enclosed "Guidelines for Sustainable Building Design in Hawaii." In the final EA include a description of any of the techniques you will implement.

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

Sincerely,

  
GENEVIEVE SALMONSON  
Director

Enc.

c: Chris Hart  
Martin Quill, Makena Estates (w/o enc.)

# Guidelines for Sustainable Building Design in Hawai'i

## *A planner's checklist*

(Adopted by the Environmental Council on October 13, 1999)

### Introduction

Hawai'i law calls for efforts to conserve natural resources, promote efficient use of water and energy and encourage recycling of waste products. Planning a project from the very beginning to include sustainable design concepts can be a critical step toward meeting these goals.

The purpose of the state's environmental review law (HRS Ch. 343) is to encourage a full, accurate and complete analysis of proposed actions, promote public participation and support enlightened decision making by public officials. The Office of Environmental Quality Control offers the following guidelines for preparers of environmental reviews under the authority of HRS 343 to assist agencies and applicants in meeting these goals.

These guidelines do not constitute rules or law. They have been refined by staff and peer review to provide a checklist of items that will help the design team create projects that will have a minimal impact on Hawai'i's environment and make wise use of our natural resources. In a word, projects that are *sustainable*.

A sustainable building is built to minimize energy use, expense, waste, and impact on the environment. It seeks to improve the region's sustainability by meeting the needs of Hawai'i's residents and visitors today without compromising the needs of future generations. Compared to conventional projects, a resource-efficient building project will:

- I. Use less energy for operation and maintenance
- II. Contain less *embodied* energy (e.g. locally produced building products often contain less *embodied* energy than imported products because they require less energy-consuming transportation.)
- III. Protect the environment by preserving/conserving water and other natural resources and by minimizing impact on the site and ecosystems
- IV. Minimize health risks to those who construct, maintain, and occupy the building
- V. Minimize construction waste
- VI. Recycle and reuse generated construction wastes

- VII. Use resource-efficient building materials (e.g. materials with recycled content and low embodied energy, and materials that are recyclable, renewable, environmentally benign, non-toxic, low VOC (Volatile Organic Compound) emitting, durable, and that give high life cycle value for the cost.)
- VIII. Provide the highest quality product practical at competitive (affordable) first and life cycle costs.

In order to avoid excessive overlapping of items, the checklist is designed to be read in totality, not just as individual sections. This checklist tries to address a range of project types, large scale as well as small scale. Please use items that are appropriate to the type and scale of the project.

Although this list will help promote careful and sensitive planning, mere compliance with this checklist does not confirm sustainability. Compliance with and knowledge of current building codes by users of this checklist is also required.

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XI.	Resources	Page 12

## I. Pre Design

1. Hold programming team meeting with client representative, Project Manager, planning consultant, architectural consultant, civil engineer, mechanical, electrical, plumbing (MEP) engineer, structural engineer, landscape architect, interior designer, sustainability consultant and other consultants as required by the project. Identify project and sustainability goals. Client representatives and consultants need to work together to ensure that project and environmental goals are met.
2. Develop sustainable guideline goals to insert into outline specifications as part of the Schematic Design documents. Select goals from the following sections that are appropriate for the project.
3. Use Cost-Benefit Method for economic analysis of the sustainability measures chosen. (Cost-Benefit Method is a method of evaluating project choices and investments by comparing the present and life cycle value of expected benefits to the present and life cycle value of expected costs.)
4. Include "Commissioning" in the project budget and schedule. (Building "Commissioning" is the process of ensuring that systems are designed, installed, functionally tested, and capable of being operated and maintained in accordance with specifications that meet the owner's needs, and recognize the owner's financial and operational capacity. It improves the performance of the building systems, resulting in energy efficiency and conservation, improved air quality and lower operation costs. Refer to Section IX.)

## II. Site Selection & Site Design

### A. Site Selection

1. Analyze and assess site characteristics such as vegetation, topography, geology, climate, natural access, solar orientation patterns, water and drainage, and existing utility and transportation infrastructure to determine the appropriate use of the site.
2. Whenever possible, select a site in a neighborhood where the project can have a positive social, economic and/or environmental impact.
3. Select a site with short connections to existing municipal infrastructure (sewer lines, water, waste water treatment plant, roads, gas, electricity, telephone, data communication lines and services). Select a site close to mass transportation, bicycle routes and pedestrian access.

### B. Site Preparation and Design

1. Prepare a thorough existing conditions topographic site plan depicting topography, natural and built features, vegetation, location of site utilities and include solar information,

- rainfall data and direction of prevailing winds. Preserve existing resources and natural features to enhance the design and add aesthetic, economic and practical value. Design to minimize the environmental impact of the development on vegetation and topography.
2. Site building(s) to take advantage of natural features and maximize their beneficial effects. Provide for solar access, daylighting and natural cooling. Design ways to integrate the building(s) with the site that maximizes and preserves positive site characteristics, enhances human comfort, safety and health, and achieves operational efficiencies.
  3. Locate building(s) to encourage bicycle and pedestrian access and pedestrian oriented uses. Provide bicycle and pedestrian paths, bicycle racks, etc. Racks should be visible and accessible to promote and encourage bicycle commuting.
  4. Retain existing topsoil and maintain soil health by clearing only the areas reserved for the construction of streets, driveways, parking areas, and building foundations. Replant exposed soil areas as soon as possible. Reuse excavated soils for fill and cut vegetation for mulch.
  5. Grade slopes to a ratio of less than 2 : 1 (run to rise). Balance cut and fill to eliminate hauling. Check grading frequently to prevent accidental over excavation.
  6. Minimize the disruption of site drainage patterns. Provide erosion and dust controls, positive site drainage, and siltation basins as required to protect the site during and after construction, especially, in the event of a major storm.
  7. Minimize the area required for the building footprint. Consolidate utility and infrastructure in common corridors to minimize site degradation, and cost, improve efficiency, and reduce impermeable surfaces.
  8. For termite protection, use non toxic alternatives to pesticides and herbicides, such as Borate treated lumber, Basaltic Termite Barrier, stainless steel termite barrier mesh, and termite resistant materials.

### III. Building Design

1. Consider adaptive re-use of existing structures instead of demolishing and/or constructing a new building. Consult the State Historic Preservation Officer for possible existing historic sites that may meet the project needs.
2. Plan for high flexibility while designing building shell and interior spaces to accommodate changing needs of the occupants, and thereby extend the life span of the building.
3. Design for re-use and/or disassembly. (For recyclable and reusable building products, see Section VII).
4. Design space for recycling and waste diversion opportunities during occupancy.
5. Provide facilities for bicycle and pedestrian commuters (showers, lockers, bike racks, etc.) in commercial areas and other suitable locations.
6. Plan for a comfortable and healthy work environment. Include inviting outdoor spaces, wherever possible. (Refer to Section VIII.)

- ✓ 7. Provide an Integrated Pest Management approach. The use of products such as Termi-mesh, Basaltic Termite Barrier and the Sentricon "bait" system can provide long term protection from termite damage and reduce environmental pollution.
- ✓ 8. Design a building that is energy efficient and resource efficient. (See Sections IV, V, VII.) Determine building operation by-products such as heat gain and build up, waste/gray-water and energy consumption, and plan to minimize them or find alternate uses for them.
- ✓ 9. For natural cooling, use
  - a. Reflective or light colored roofing, radiant barrier and/or insulation, roof vents
  - b. Light colored paving (concrete) and building surfaces
  - c. Tree Planting to shade buildings and paved areas
  - d. Building orientation and design that captures trade winds and/or provides for convective cooling of interior spaces when there is no wind.

#### IV. Energy Use

- \_\_\_ 1. Obtain a copy of the State of Hawai'i Model Energy Code (available through the Hawai'i State Energy Division, at Tel. 587-3811). Exceed its requirements. (Contact local utility companies for information on tax credits and utility-sponsored programs offering rebates and incentives to businesses for installing qualifying energy efficient technologies.)
- ✓ 2. Use site sensitive orientation to :
  - a. Minimize cooling loads through site shading and carefully planned east-west orientation.
  - b. Incorporate natural ventilation by channeling trade winds.
  - c. Maximize daylighting.
- ✓ 3. Design south, east and west shading devices to minimize solar heat gain.
- ✓ 4. Use spectrally selective tints or spectrally selective low-e glazing with a Solar Heat Gain Coefficient (SHGC) of 0.4 or less.
- ✓ 5. Minimize effects of thermal bridging in walls, roofs and window systems.
- ✓ 6. Maximize efficiencies for lighting, Heating, Ventilation, Air Conditioning (HVAC) systems and other equipment. Use insulation and/or radiant barriers, natural ventilation, ceiling fans and shading to avoid the use of air conditioning whenever appropriate.
- ✓ 7. Eliminate hot water in restrooms when possible.
- ✓ 8. Provide tenant sub-metering to encourage utility use accountability.
- \_\_\_ 9. Use renewable energy. Use solar water heaters and consider the use of photovoltaics and Building Integrated Photovoltaics (BIPV).
- ✓ 10. Use available energy resources such as waste heat recovery, when feasible.

## **A. Lighting**

1. Design for at least 15% lower interior lighting power allowance than the Energy Code.
2. Select lamps and ballasts with the highest efficiency, compatible with the desired level of illumination and color rendering specifications. Examples that combine improved color rendering with efficient energy use include compact fluorescent and T8 fluorescent that use tri-phosphor gases.
3. Select lighting fixtures which maximize system efficacy and which have heat removal capabilities
4. Reduce light absorption on surfaces by selecting colors and finishes that provide high reflectance values without glare.
5. Use task lighting with low ambient light levels.
6. Maximize daylighting through the use of vertical fenestration, light shelves, skylights, clerestories, building form and orientation as well as through translucent or transparent interior partitions. Coordinate daylighting with electrical lighting for maximum electrical efficiency.
7. Incorporate daylighting controls and/or motion activated light controls in low or intermittent use areas.
8. Avoid light spillage in exterior lighting by using directional fixtures.
9. Minimize light overlap in exterior lighting schemes.
10. Use lumen maintenance procedures and controls.

## **B. Mechanical Systems**

1. Design to comply with the Energy Code and to exceed its efficiency requirements.
2. Use "Smart Building" monitor/control systems when appropriate.
3. Utilize thermal storage for reduction of peak energy usage.
4. Use Variable air volume systems to save fan power.
5. Use variable speed drives on pumping systems and fans for cooling towers and air handlers.
6. Use air-cooled refrigeration equipment or use cooling towers designed to reduce drift.
7. Specify premium efficiency motors.
8. Reduce the need for mechanical ventilation by reducing sources of indoor air pollution. Use high efficiency air filters and ultraviolet lamps in air handling units. Provide for regular maintenance of filtration systems. Use ASHRAE standards as minimum.
9. Locate fresh air intakes away from polluted or overheated areas. Locate on roof where possible. Separate air intake from air exhausts by at least 40 ft.
10. Use separate HVAC systems to serve areas that operate on widely differing schedules and/or design conditions.
11. Use shut off or set back controls on HVAC system when areas are not occupied.
12. Use condenser heat, waste heat or solar energy. (Contact local utility companies for information on the utility-sponsored Commercial and Industrial Energy Efficiency



Programs which offer incentives to businesses for installing qualifying energy efficient technologies.)

- 13. Evaluate plug-in loads for energy efficiency and power saving features.
- 14. Improve comfort and save energy by reducing the relative humidity by waste reheat, heat pipes or solar heat.
- 15. Minimize heat gain from equipment and appliances by using:
  - a. Environmental Protection Agency (EPA) Energy Star rated appliances.
  - b. Hoods and exhaust fans to remove heat from concentrated sources.
  - c. High performance water heating that exceeds the Energy Code requirements.
- 16. Specify HVAC system "commissioning" period to reduce occupant exposure to Indoor Air Quality (IAQ) contaminants and to maximize system efficiency.

## V. Water Use

### A. Building Water

- 1. Install water conserving, low flow fixtures as required by the Uniform Plumbing Code.
- 2. If practical, eliminate hot water in restrooms.
- 3. Use self closing faucets (*infrared sensors or spring loaded faucets*) for lavatories and sinks.

### B. Landscaping and Irrigation (See Section VI.)

## VI. Landscape and Irrigation

- 1. Incorporate water efficient landscaping (*xeriscaping*) using the following principles:
  - a. Planning, Efficient irrigation: Create watering zones for different conditions. Separate vegetation types by watering requirements. Install moisture sensors to prevent operation of the irrigation system in the rain or if the soil has adequate moisture. Use appropriate sprinkler heads.
  - b. Soil analysis/improvement: Use (locally made) soil amendments and compost for plant nourishment, improved water absorption and holding capacity.
  - c. Appropriate plant selection: Use drought tolerant and/or slow growing hardy grasses, native and indigenous plants, shrubs, ground covers, trees, appropriate for local conditions, to minimize the need for irrigation.
  - d. Practical turf areas: Turf only in areas where it provides functional benefits.

- e. Mulches: Use mulches to minimize evaporation, reduce weed growth and retard erosion.

Contact the local Board of Water Supply for additional information on xeriscaping such as efficient irrigation, soil improvements, mulching, lists of low water-demand plants, tours of xeriscaped facilities, and xeriscape classes.

2. Protect existing beneficial site features and save trees to prevent erosion. Establish and carefully mark tree protection areas well before construction.
3. Limit staging areas and prevent unnecessary grading of the site to protect existing, especially native, vegetation.
4. Use top soil from the graded areas, stockpiled on the site and protected with a silt fence to reduce the need for imported top soil.
5. Irrigate with non-potable water or reclaimed water when feasible. Collect rainwater from the roof for irrigation.
6. Sub-meter the irrigation system to reduce water consumption and consequently water and sewer fees. Contact the local county agency to obtain irrigation sub-metering requirements and procedures. Locate irrigation controls within sight of the irrigated areas to verify that the system is operating properly.
7. Use pervious paving instead of concrete or asphalt paving. Use natural and man-made berms, hills and swales to control water runoff.
8. Avoid the use of solvents that contain or leach out pollutants that can contaminate the water resources and runoff. Contact the State of Hawai'i Clean Water Branch at 586-4309 to determine whether a NPDES (National Pollutant Discharge Elimination System) permit is required.
9. Use Integrated Pest Management (IPM) techniques. IPM involves a carefully managed use of biological and chemical pest control tactics. It emphasizes minimizing the use of pesticides and maximizing the use of natural process
10. Use trees and bushes that are felled at the building site (i.e. mulch, fence posts). Leave grass trimmings on the lawn to reduce green waste and enhance the natural health of lawns.
11. Use recycled content, decay and weather resistant landscape materials such as plastic lumber for planters, benches and decks.

## VII. Building Materials & Solid Waste Management

### A. Material Selection and Design

1. Use durable products.
2. Specify and use natural products or products with low embodied energy and/or high recycled content. Products with recycled content include steel, concrete with glass,

drywall, carpet, etc. Use ground recycled concrete, graded glass cullet or asphalt as base or fill material.

- \_\_\_ 3. Specify low toxic or non-toxic materials whenever possible, such as low VOC (Volatile Organic Compounds) paints, sealers and adhesives and low or formaldehyde-free materials. Do not use products with CFCs (Chloro-fluoro-carbons).
- \_\_\_ 4. Use locally produced products such as plastic lumber, insulation, hydro-mulch, glass tiles, compost.
- \_\_\_ 5. Use advanced framing systems that reduce waste, two stud corners, engineered structural products and prefabricated panel systems.
- \_\_\_ 6. Use materials which require limited or no application of finishing or surface preparation. (i.e. finished concrete floor surface, glass block and glazing materials, concrete block masonry, etc.).
- \_\_\_ 7. Use re-milled salvaged lumber where appropriate and as available. Avoid the use of old growth timber.
- \_\_\_ 8. Use sustainably harvested timber.
- \_\_\_ 9. Commit to a material selection program that emphasizes efficient and environmentally sensitive use of building materials, and that uses locally available building materials. (A list of Earth friendly products and materials is available through the Green House Hawai'i Project. Call Clean Hawai'i Center, Tel. 587-3802 for the list.)

#### **B. Solid Waste Management, Recycling and Diversion Plan**

- \_\_\_ 1. Prepare a job-site recycling plan and post it at the job-site office.
- \_\_\_ 2. Conduct pre-construction waste minimization and recycling training for employees and sub-contractors.
- \_\_\_ 3. Use a central area for all cutting.
- \_\_\_ 4. Establish a dedicated waste separation/diversion area. Include Waste/Compost/Recycling collection areas and systems for use during construction process and during the operational life cycle of the building.
- \_\_\_ 5. Separate and divert all unused or waste cardboard, ferrous scrap, construction materials and fixtures for recycling and/or forwarding to a salvage exchange facility. Information on "Minimizing C&D (construction and demolition) waste in Hawai'i" is available through Department of Health, Office of Solid Waste Management, Tel. 586-4240.
- \_\_\_ 6. Use all green waste, untreated wood and clean drywall on site as soil amendments or divert to offsite recycling facilities.
- \_\_\_ 7. Use concrete and asphalt rubble on-site or forward the material for offsite recycling.
- \_\_\_ 8. Carefully manage and control waste solvents, paints, sealants, and their used containers. Separate these materials from C&D (construction and demolition) waste and store and dispose them of them carefully.
- \_\_\_ 9. Donate unused paint, solvents, sealants to non-profit organizations or list on HIMEX (Hawai'i Materials Exchange). HIMEX is a free service operated by Maui Recycling

Group, that offers an alternative to landfill disposal of usable materials, and facilitates no-cost trades. See web site, [www.himex.org](http://www.himex.org).

- \_\_\_10. Use suppliers that re-use or recycle packaging material whenever possible.

## VIII. Indoor Air Quality

- \_\_\_1. Design an HVAC system with adequate supply of outdoor air, good ventilation rates, even air distribution, sufficient exhaust ventilation and appropriate air cleaners.
- \_\_\_2. Develop and specify Indoor Air Quality (IAQ) requirements during design and contract document phases of the project. Monitor compliance in order to minimize or contain IAQ contaminant sources during construction, renovation and remodeling.
- \_\_\_3. Notify occupants of any type of construction, renovation and remodeling and the effects on IAQ.
- \_\_\_4. Inspect existing buildings to determine if asbestos and lead paint are present and arrange for removal or abatement as needed.
- \_\_\_5. Supply workers with, and ensure the use of VOC (Volatile Organic Compounds)-safe masks where required.
- \_\_\_6. Ensure that HVAC systems are installed, operated and maintained in a manner consistent with their design. Use UV lamps in Air Handling Units to eliminate mold and mildew growth. An improperly functioning HVAC system can harbor biological contaminants such as viruses, bacteria, molds, fungi and pollen, and can cause Sick Building Syndrome (SBS).
- \_\_\_7. Install separate exhaust fans in rooms where air polluting office equipment is used, and exhaust directly to the exterior of the building, at sufficient distance from the air intake vents.
- \_\_\_8. Place bird guards over air intakes to prevent pollution of shafts and HVAC ducts.
- \_\_\_9. Control indoor air pollution by selecting products and finishes that are low or non-toxic and low VOC emitting. Common sources of indoor chemical contaminants are adhesives, carpeting, upholstery, manufactured wood products, copy machines, pesticides and cleaning agents.
- \_\_\_10. Schedule finish application work to minimize absorption of VOCs into surrounding materials e.g. allow sufficient time for paint and clear finishes to dry before installing carpet and upholstered furniture. Increase ventilation rates during periods of increased pollution.
- \_\_\_11. Allow a flush-out period after construction, renovation, remodeling or pesticide application to minimize occupant exposure to chemicals and contaminants.

## **IX. Commissioning & Construction Project Closeout**

1. Appoint a Commissioning Authority to develop and implement a commissioning plan and a preventative maintenance plan. Project Manager's responsibilities must include coordination of commissioning activities during project closeout.
2. Commissioning team should successfully demonstrate all systems and perform operator training before final acceptance.
3. Provide flush-out period to remove air borne contaminants from the building and systems.
4. Provide as-built drawings and documentation for all systems. Provide data on equipment maintenance and their control strategies as well as maintenance and cleaning instructions for finish materials.

## **X. Occupancy and Operation**

### **A. General Objectives**

1. Develop a User's Manual for building occupants that emphasizes the need for Owner/Management commitment to efficient sustainable operations.
2. Management's responsibilities must include ensuring that sustainability policies are carried out.

### **B. Energy**

1. Purchase EPA rated, Energy Star, energy-efficient office equipment, appliances, computers, and copiers. (Energy Star is a program sponsored by U.S. Dep. Of Energy. Use of these products will contribute to reduced energy costs for buildings and reduce air pollution.)
2. Institute an employee education program about the efficient use of building systems and appliances, occupants impact on and responsibility for water use, energy use, waste generation, waste recycling programs, etc.
3. Re-commission systems and update performance documentation periodically per recommendations of the Commissioning Authority, or whenever modifications are made to the systems.

### **C. Water**

1. Start the watering cycle in the early morning in order to minimize evaporation.
2. Manage the chemical treatment of cooling tower water to reduce water consumption.

### **D. Air**

1. Provide incentives which encourage building occupants to use alternatives to and to reduce the use of single occupancy vehicles.

- \_\_\_2. Provide a location map of services within walking distance of the place of employment (child care, restaurants, gyms, shopping).
- \_\_\_3. Periodically monitor or check for indoor pollutants in building.
- \_\_\_4. Provide an IAQ plan for tenants, staff and management that establishes policies and documentation procedures for controlling and reporting indoor air pollution. This helps tenants and staff understand their responsibility to protect the air quality of the facility.

#### **E. Materials and Products**

- \_\_\_1. Purchase business products with recycled content such as paper, toners, etc.
- \_\_\_2. Purchase Furniture made with sustainably harvested wood, or with recycled and recycled content materials, which will not off gas VOC's.
- \_\_\_3. Remodeling and painting should comply with or improve on original sustainable design intent.
- \_\_\_4. Use low VOC, non-toxic, phosphate and chlorine free, biodegradable cleaning products.

#### **F. Solid Waste**

- \_\_\_1. Collect recyclable business waste such as paper, cardboard boxes, and soda cans.
- \_\_\_2. Avoid single use items such as paper or Styrofoam cups and plates, and plastic utensils.

### **XI. Resources**

Financing: Energy Efficiency in Buildings. U.S. Department of Energy, DOE/EE-0152, May, 1998 (Call Tel. 1-800-DOE-EREC or visit local office)

Building Commissioning: The Key to Quality Assurance. U.S. Department of Energy, DOE/EE-0153, May, 1998 (Call Tel. 1-800-DOE-EREC or visit local office)

Guide to Resource-Efficient Building in Hawaii. University of Hawai'i at Manoa, School of Architecture and Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, October 1998. (Call Tel. 587-3804 for publication)

Hawaii Model Energy Code. Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, November 1997 (Call Tel. 587-3810 for publication)

Photovoltaics in the Built Environment: A Design Guide for Architects and Engineers. NREL Publications, DOE/GO #10097-436, September 1997 (Call Tel. 1-800-DOE-EREC or visit local office)

Building Integrated Photovoltaics: A Case Study. NREL Publications #TP-472-7574, March 1995 (Call Tel. 1-800-DOE-EREC or visit local office)

Solar Electric Applications: An overview of Today's Applications. NREL Publications, DOE/GO #10097-357, Revised February, 1997 (Call Tel. 1-800-DOE-EREC or visit local office)

Green Lights: An Enlightened Approach to Energy Efficiency and Pollution Prevention. U.S. Environmental Protection Agency, Pacific Island Contact Office (Call Tel. 541-2710 for publication.)

Healthy Lawn, Healthy Environment. U.S. Environmental Protection Agency, Pacific Island Contact Office. (Call Tel. 541-2710 for this and related publications)

How to Plant a Native Hawaiian Garden. Office of Environmental Quality Control (OEQC), Department of Health, State of Hawai'i (Call Tel. 586-4185 for publication)

Buy Recycled in Hawai'i. Clean Hawai'i Center, Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, November 1997. (Call Tel. 587-3802 for publication)

Hawai'i Recycling Industry Guide and other recycling and reuse related fact sheets. Clean Hawai'i Center, Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, July 1999. (Call Tel. 587-3802 for publication)

Minimizing Construction and Demolition Waste. Office of Solid Waste Management, Department of Health and Clean Hawai'i Center, Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, February 1998. (Call Tel. 586-4240 for publication)

Contractor's Waste Management Guide and Construction and demolition Waste Management Facilities Directory. Clean Hawai'i Center, Energy, Resources and Technology Division, Department of Business, Economic Development and Tourism, 1999. (Call Tel. 587-3802 for publication)

Waste Management and Action: Construction Industry. Department of Health, Solid and Hazardous Waste Branch (Call Tel. 586-7496 for publication)

Business Guide For reducing Solid Waste. U.S. Environmental Protection Agency, Pacific Island Contact Office, Tel. 541-2710 (Call for publication.)

The Inside Story: A Guide to Indoor Air Quality. U.S. Environmental Protection Agency, Pacific Island Contact Office, Tel. 541-2710 (Call for this and related publications.) Additional information is available from the American Lung Association, Hawai'i, Tel. 537-5966

Selecting Healthier Flooring Materials. American Lung Association and Clean Hawai'i Center, February 1999. (Call Tel. 537-5966 x307)

Office Paper Recycling: An Implementation Manual. U.S. Environmental Protection Agency, Pacific Island Contact Office, Tel. 541-2710 (Call for publication.)

### **Acknowledgments**

OEQC and the Environmental Council would like to thank Allison Beale, Gary Gill, Nick H. Huddleston, Gail Suzuki-Jones, Purnima McCutcheon, Virginia B. MacDonald, Steve Meder, Ramona Mullahey, Thomas P. Papandrew, Victor Olgay, Howard Tanaka, and Howard Wiig for their assistance with this project.





September 5, 2000

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

Dear Ms. Salmonson:

RE: Draft Environmental Assessment for the Makena Estates Residential  
Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated July 18, 2000, regarding the above-referenced  
Draft Environmental Assessment.

In response to your letter, we offer the following comments:

1. Figures 3, 4, and 5. Legends will be added to Figures 3, 4, and 5 indicating what the abbreviations in each figure represents. In addition, a clear copy of Figure 5, "100 Year Flood", will be enclosed in the Final EA.
2. Exhibit 3. In Section IV, E. 6, of the SMA Application, the discussion of flood zones should have referenced Figure 5, "100 Year Flood", instead of Exhibit 3.
3. Sustainable Building Design. A number of sustainable building design techniques have or will be implemented, including but not limited to the following:
  - Assessment of site characteristics such as vegetation, topography, geology, climate, natural access, solar orientation patterns, water and drainage, and existing utility and transportation infrastructure to determine the appropriate use of the site.
  - Selection of a site with short connections to existing municipal infrastructure systems.
  - Placement of buildings to take advantage of natural features and to maximize their beneficial effects. Building placement maximizes and preserves positive site characteristics, enhances human comfort, safety and health, and achieves operational efficiencies.

LANDSCAPE ARCHITECTURE AND PLANNING  
1955 MAIN STREET, SUITE 200 • WAILUKU, MAUI, HAWAII 96793-1706 • PHONE: 808-242-1955 • FAX: 808-242-1956

Ms. Genevieve Salmonson  
September 5, 2000  
Page 2

- Minimizing disruption of drainage channels.
- Provision of erosion and dust control measures.
- Retaining existing topsoil and maintain soil health by minimizing clearing of natural vegetation.
- Designing space for recycling and waste diversion opportunities.
- Utilizing energy and resource efficient building design.
- Tree planting to shade buildings and paved areas.
- Utilizing site sensitive orientation to:
  - Minimize cooling loads through site shading and carefully planned east-west orientation.
  - Incorporate natural ventilation by channeling trade winds.
  - Maximize daylighting.
- Designing south, east and west shading devices to minimize solar heat gain.
- Using spectrally selective tints or spectrally selective low-e glazing with a Solar Heat Gain Coefficient of 0.4 or less.
- Maximizing efficiencies for lighting, heating, ventilation, air conditioning systems and other equipment.
- Providing tenant sub-metering to encourage utility use accountability.
- Installing water conserving, low flow fixtures.
- Incorporating water efficient landscaping (xeriscaping) into the landscape design.
- Utilizing properly planned and efficient irrigation systems.
- Selecting appropriate plants for the Makena area, thereby minimizing need for irrigation.
- Using topsoil from the graded areas, stockpiled on the site and protected with a silt fence to reduce the need for imported topsoil.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Frampton  
Land Use Planner

Enclosure

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Mr. Mel Choy, Media Five  
Project File

United States  
Department of  
Agriculture



Natural  
Resources  
Conservation  
Service

210 Ima Kala St.  
Suite 209  
Wailuku, HI 96783

*Our People...Our Islands...In Harmony*

'00 JUL 14 P 1:49

DEPT OF AGRICULTURE  
DATE: July 12, 2000  
RECEIVED

Mr. John E. Min, Director  
Department of Planning  
County of Maui  
250 S. High Street  
Wailuku, Hawaii 96793

Dear Mr. Min,

SUBJECT: ~~Makana Estates~~; 40-unit Resort Condominium Project  
TMK: 2-1-007: 101  
LD. SM1 2000/0020

We have no comment on the subject application.

Thank you for the opportunity to comment.

Sincerely,

  
Neal S. Fujiwara  
District Conservationist



September 5, 2000

Mr. Neal S. Fujiwara  
District Conservationist  
United States Department of Agriculture  
210 Imi Kala Street, Suite 209  
Wailuku, Hawaii 96793

Dear Mr. Fujiwara:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated July 12, 2000, regarding the above-referenced Special Management Area Permit Application. Your letter indicated that you have no comments on the subject application.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Frampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Project File

BENJAMIN J. CAYETANO  
GOVERNOR



RAYMOND H. SATO  
COMPTROLLER

STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING  
AND GENERAL SERVICES  
SURVEY DIVISION  
P. O. BOX 119  
HONOLULU, HAWAII 96810

00 JUL 14 P1:46

RESPONSE REFER TO:

DEPT. OF ACCOUNTING  
AND GENERAL SERVICES  
RECEIVED

FILE NO. \_\_\_\_\_

July 12, 2000

MEMORANDUM

TO: Mr. John E. Min, Planning Director  
Maui County Planning Department

ATTN.: Mr. Daren Suzuki, Staff Planner

FROM: Randall M. Hashimoto, State Land Surveyor

SUBJECT: I.D.: SM1 2000/0020  
TMK: 2-1-7:101  
Project Name: ~~Makona Estates~~ 40-unit  
Resort Condominium Project  
Applicant: Martin W. Quill, Makona Estates LLC.

The subject proposal has been reviewed and confirmed that no Government Survey Triangulation Stations and Benchmarks are affected. The Survey Division has no objections to the proposed project.

Should you have any questions, please call me at 586-0390.

RANDALL M. HASHIMOTO  
State Land Surveyor

No. 7877 P. 4

JUL 12 2000 3:04PM CMI GROUP



September 5, 2000

Mr. Randall M. Hashimoto  
State Land Surveyor  
State of Hawaii  
Department of Accounting and General Services  
Survey Division  
P.O. Box 119  
Honolulu, Hawaii 96810

Dear Mr. Hashimoto:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated July 12, 2000, regarding the above-referenced Special Management Area Permit Application. Based upon your letter, we understand that your Division has no objections to the proposed project.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Frampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Project File



DEPARTMENT OF  
**PARKS AND RECREATION**  
COUNTY OF MAUI

1580-C KAAHUMANU AVENUE WAILUKU, HAWAII 96793

JAMES "KIMO" APANA  
Mayor

FLOYD S. MIYAZONO  
Director

ELIZABETH D. MENOR  
Deputy Director

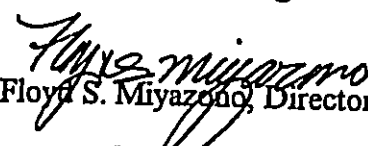
(808) 270-7230  
FAX (808) 270-7934

'00 JUL 11 P2:43

DEPT OF PLANNING  
COUNTY OF MAUI  
**MEMORANDUM**  
RECEIVED

July 10, 2000

**TO:** John E. Min, Planning Director

**FROM:**   
Floyd S. Miyazono, Director

**SUBJECT:** ~~Maunaloa Estates~~ 407- Unit Resort Condominium Project  
SM1 2000/0020  
TMK: 2-1-007:101

Thank you for the opportunity to review and comment on the Application for Special Management Area Use Permit for the above subject project. At this time we have no comment to offer concerning this action.

Should you have any questions or need of further information, please call me or Patrick Matsui, Chief of Parks Planning & Development at extension 7931.

FSM:PTM:rh

c: Patrick Matsui, Chief of Parks Planning & Development  
SMA/Subdivision Files



September 5, 2000

Mr. Floyd S. Miyazono, Director  
County of Maui  
Department of Parks and Recreation  
1580-C Kaahumanu Avenue  
Waikuku, Hawaii 96793


Dear Mr. Miyazono:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated July 10, 2000, regarding the above-referenced Special Management Area Permit Application. Your letter indicated that you have no comments on the subject application at this time.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Frampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Project File





DEPARTMENT OF  
**HOUSING AND HUMAN CONCERNS**  
 COUNTY OF MAUI

JAMES "KIMO" APANA  
 Mayor  
 ALICE L. LEE  
 Director  
 PRISCILLA P. MIKELL  
 Deputy Director

200 SOUTH HIGH STREET • WAILUKU, HAWAII 96793 • PHONE (808) 270-7805 • FAX (808) 270-7165

June 30, 2000

DEPT OF PLANNING  
 COUNTY OF MAUI  
 RECEIVED  
 00 JUL -3 P3:58

TO: John E. Min  
 Director of Planning

FROM: Alice L. Lee *[Signature]*  
 Director of Housing and Human Concerns

SUBJECT: I.D. SM1 2000/0020  
 TMK: 2-1-7:101  
 Project Name: ~~Makena Estates~~ 40-Unit Resort  
 Condominium Project  
 Applicant: Martin W. Quill, Makena Estates, LLC.

We have reviewed the Special Management Area Use Permit application for the subject project and have no comments to offer as the A-2 Apartment Zoning for the project site will require that the units be occupied on a long-term residential basis. We are returning the application for your use.

Thank you for the opportunity to comment.

ETO:hs

c: Housing Administrator



September 5, 2000

Ms. Alice L. Lee, Director  
County of Maui  
Department of Housing and Human Concerns  
200 South High Street  
Wailuku, Hawaii 96793

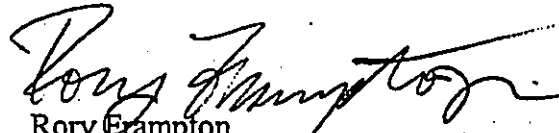
Dear Ms. Lee:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated June 30, 2000, regarding the above-referenced Special Management Area Permit Application, which noted that the A-2 Apartment Zoning for the project site will require that the units be occupied on a long-term residential basis.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

  
Rory Erampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C  
Project File

LANDSCAPE ARCHITECTURE AND PLANNING

1955 MAIN STREET, SUITE 200 • WAILUKU, MAUI, HAWAII 96793-1706 • PHONE: 808-242-1955 • FAX: 808-242-1956

BENJAMIN J. CAYETANO  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
889 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813-5007



KAZU HAYASHIDA  
DIRECTOR  
DEPUTY DIRECTORS  
BRIAN K. MINAAI  
GLENN M. OKIMOTO

June 28, 2000

JUN 30 12:19

IN REPLY REFER TO:  
STP 8.9593

Mr. John E. Min  
Director  
Department of Planning  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

Dear Mr. Min:

Subject: ~~Mohana Beach~~ Resort Condominium Project  
Special Management Area Permit (SMA) SM1 2000/0020  
TMK: 2-1-7: 101

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

The subject development is not anticipated to have a significant impact on our State transportation facilities in the area.

We appreciate the opportunity to provide comments.

Very truly yours,

KAZU HAYASHIDA  
Director of Transportation



September 5, 2000

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


Dear Mr. Hayashida:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated June 28, 2000, regarding the above-referenced Special Management Area Permit Application, which stated that the proposed project is not anticipated to have a significant impact on State transportation facilities.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

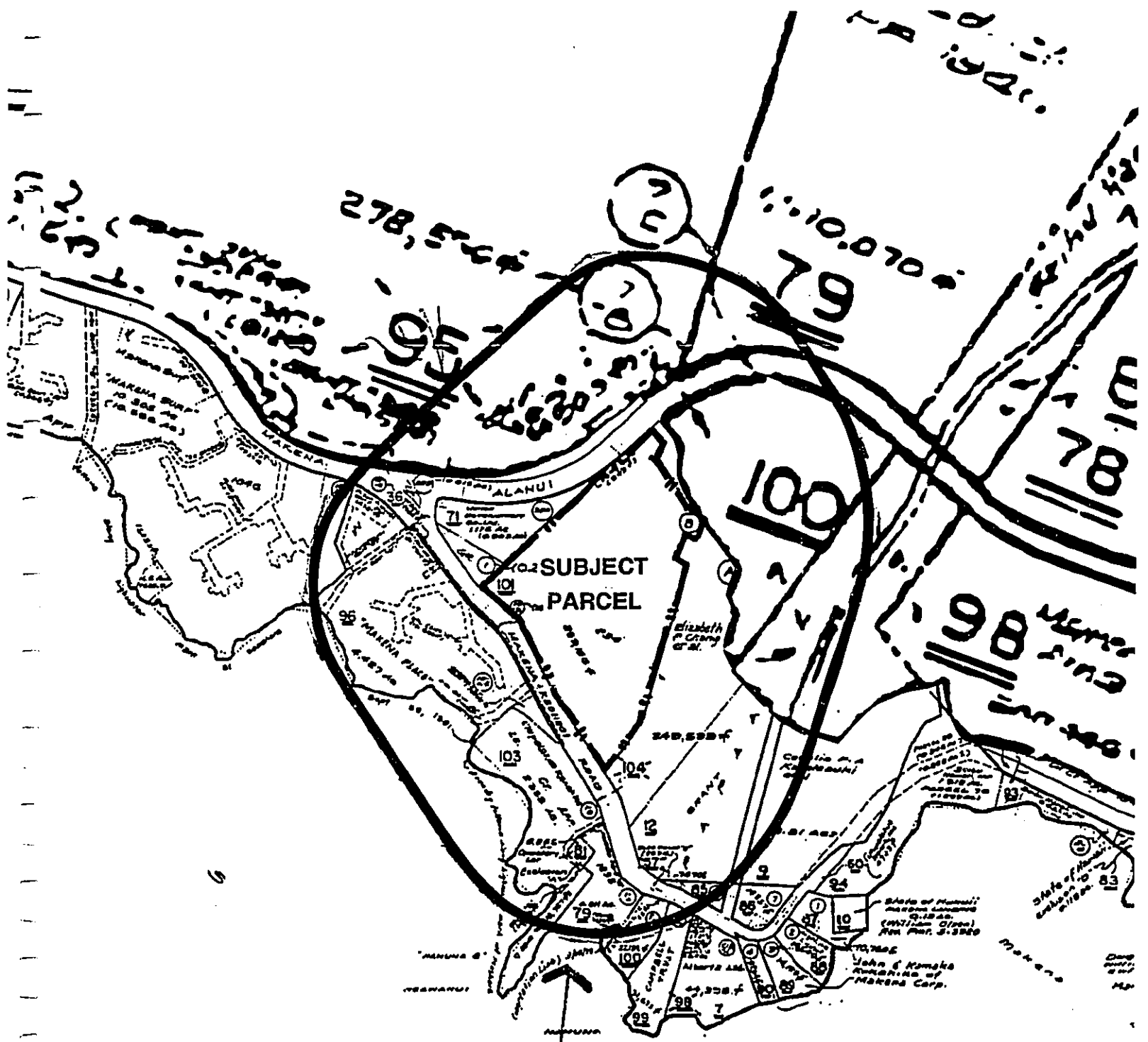
Sincerely,



Rory Frampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Project File

3. LIST OF OWNERS AND LESSEES  
WITHIN 500 FEET OF SUBJECT PROPERTY



500' foot Notification Line

NOTE: Parcel 87, 88, 89 owned by James S. Conkoff et al. (Hawaii P. Trust) unless otherwise noted.

**Makena Estates  
Owners & Lessees within  
500 feet of the Subject Property**

TMK 2-1-7-100  
Fonseca, Roger William / Tr  
1239 Lola Place  
Kailua, HI 96734

TMK 2-1-7-95:0002  
Boullioun/Tr  
7223 W Mercer Way  
Mercer Island, WA 98040-5533

TMK 2-1-7-95:0011  
Sullivan, Paul G./Sue M  
79 Milk St, Suite 606  
Boston, MA 02109-3903

TMK 2-1-7-103  
Ulupalakua Ranch Inc.  
P.O. Box 901  
Kula, HI 96790

TMK 2-1-7-95:0003  
Wilde/Tr  
Wilde, Clarence/Elaine  
3751 122nd Ave NE  
Bellevue, WA 98005-1231

TMK 2-1-7-95:0012, 0049  
Kawashima, Kenji  
Terrace Okamoto 8408 1-7-17  
Okamoto Setagaya-Ku 157  
JAPAN

TMK 2-1-7-12  
Chang, Frank T S  
59-523 Alapio Rd.  
Haleiwa, HI 96712

TMK 2-1-7-95:0004  
Lyko, Lewis Lane Etal  
P.O. Box 2231  
Menlo Park, CA 94026-2231

TMK 2-1-7-95:0013  
Sun, Edward Yen-Sheng  
1-50 Naitocho Shinjuku-Ku  
Tokyo 160-0014  
JAPAN

TMK 2-1-7-36  
Makena Surf  
Roadway

TMK 2-1-7-95:0005  
Freyer, John Evans  
350 Gilpin St  
Denver, CO 80218-4014

TMK 2-1-7-95:0014  
Smith, J & M Family Ltd. Ptsp  
1320 N 16th Ave  
Yakima, WA 989002-1390

TMK 2-1-7-71  
Rush, Dennis /Tr  
P.O. Box 959  
Kihei, HI 96753

TMK 2-1-7-95:0006  
Olson, Lloyd Henry  
16 Roadrunner Rd  
Rolling Hills, CA 90274-5139

TMK 2-1-7-95:0015  
Morris, Kathleen  
1001 Kupulua Dr  
Kihei, HI 96753

TMK 2-1-7-79, 81  
John/Kamaka Kukahiko of MC  
4800 Makena Alanui  
Kihei, HI 96753

TMK 2-1-7-95:0007  
Strand, Thomas M/Bonnie L  
9 Oriole Ln  
North Oaks, MN 55127-6334

TMK 2-1-7-95:0016  
Pearl, Michael Evans  
2870 Pharr Court South NW AP  
Atlanta, GA 30305-2179

TMK 2-1-7-85  
Campbell, James S. Etal  
2440 Halelea Pl  
Honolulu, HI 96822

TMK 2-1-7-95:0008  
Michaels, Richard/Judith D  
1934 Westridge Road  
Los Angeles, CA 90049-2218

TMK 2-1-7-95:0017, 0061  
Ishiyama Corporation  
465 California St.  
San Francisco, CA 94104-1804

TMK 2-1-7-9  
Kalawaiianui, Hooleia Etal  
3200 Akala Drive  
Kihei, HI 96753

TMK 2-1-7-95:0009  
Shibaura, Sangyo Kabushiki  
1-6-41 Konan  
Minato-Ku Tokyo  
JAPAN

TMK 2-1-7-95:0018  
Jamison, James W Etal  
3223 SW Naito Pkwy  
Portland, OR 97201-4623

TMK 2-1-7-95:0001  
Lee, Joseph Allen Etal  
P.O. Box 478  
Peeble Beach, CA 93953-0478

TMK 2-1-7-95:0010  
Davis, Jane M  
One Bellevue Ctr #1960  
Bellevue, WA 98004

TMK 2-1-7-95:0019  
Four Makena  
106 S. Bayfront  
New Port Beach, CA 92662-1045

**Makena Estates  
Owners & Lessees within  
500 feet of the Subject Property**

TMK 2-1-7-95:0020  
Crocker, Gary LA Mar Etal  
3764 thousand Oaks Cir  
Salt Lake City, UT 84124-3905

TMK 2-1-7-95:0029  
Gardner Management Inc.  
4301 E McKellips Rd  
Mesa, AZ 85215-2415

TMK 2-1-7-95:0038  
Warland Investments Ltd  
1299 Ocean Ave Ste 300  
Santa Monica, CA 90401-1040

TMK 2-1-7-95:0021  
Tschetter, Clifford/Tr Etal  
5 Bell Waver Way  
Oakland, CA 94619-2405

TMK 2-1-7-95:0030  
Kinn, Jerry Michael Etal  
10600 Schuss Dr  
Anchorage, AK 99516-1140

TMK 2-1-7-95:0039  
Carson, Ernest P  
6434 Woodgrove Way RRS  
Duncan BC V9I5R4  
CANADA

TMK 2-1-7-95:0022  
Rancho Manana Golf Club  
121 Yellow Brick Road  
Telluride, CO 81435

TMK 2-1-7-95:0031  
Hawaii Trust Co Ltd Trs  
499 Fletcher Dr  
Atheron, CA 94027-6411

TMK 2-1-7-95:0040  
Smith, Marcia Daniel  
1320 N 16th Ave  
Yakima, WA 98902-1390

TMK 2-1-7-95:0023  
Kepler, Paul Charles  
163 Tiburon Ct  
Aptos, CA 95003-5833

TMK 2-1-7-95:0032  
Harris, Donald Stuart Etal  
10 D Headland Road  
Repulse Bay  
Hong Kong

TMK 2-1-7-95:0041  
Throne, Bennie J Etal  
12921 53rd Ave NW  
Gig Harbor, WA 98332-8800

TMK 2-1-7-95:0024  
Buehner Makena Properties  
P.O. Box 17286  
Salt Lake City, UT 84117-0286

TMK 2-1-7-95:0033  
Anderson, Roy William Sr/Etal  
E 10111 Hwt 106  
Union, WA 98592

TMK 2-1-7-95:0042  
Hummelt, Harold B/Tr Etal  
10836 SW Morey Ln  
Wilsonville, OR 97070-9503

TMK 2-1-7-95:0025  
McMillen, John Fisher  
6610 Mutual Dr  
Fort Wayne, IN 46825-4236

TMK 2-1-7-95:0034  
Kilkenny, William H/Doris P  
1701 SE Columbia river Dr St  
Vancouver, WA 98661-8029

TMK 2-1-7-95:0043  
Paramont Holding Inc.  
4100 1st Candn 250 7 Ave  
SW Calgary T2P3EW5  
CANADA

TMK 2-1-7-95:0026  
Harris, Christopher J Etal  
17 Ferndell Circle  
Unionville, Ontario L3R 3X7  
CANADA

TMK 2-1-7-95:0035  
McCampbell, Christopher Etal  
4728 Stonebriar Cir  
College Station, TX 77845-8987

TMK 2-1-7-95:0044  
Green, Bruce G Etal  
6365 River Chase Cir NW  
Atlanta, GA 30328-3548

TMK 2-1-7-95:0027  
Makena Holdings  
2540 Point Grey Road  
Vancouver BC V6K 1A3  
CANADA

TMK 2-1-7-95:0036, 0050  
Whiting, Mark S  
20 La Ferrera Ter  
San Francisco, CA 94133-2413

TMK 2-1-7-95:0045  
Mannschrack, Stephen Lester  
1361 Oak Forest Rd  
Salt Lake City, UT 84103-2258

TMK 2-1-7-95:0028  
Frank, Robert/Gymme  
303 Deer Hollow Dr  
Napa, CA 94558-1252

TMK 2-1-7-95:0037  
Beeve/Tr  
Beeve, Jerold/Dorothy  
1287 Journey's End Dr  
La Canada, CA 91011-1710

TMK 2-1-7-95:0046  
Hunt, Arlene  
Shore Ln SE  
Issaquah, WA 98029



**Makena Estates  
Owners & Lessees within  
500 feet of the Subject Property**

TMK 2-1-7-95:0047  
Kawashima, Kenji  
Kashima Kenji  
1-7-17 Okamoto Setagay-Ku  
Tokyo 157 JAPAN

TMK 2-1-7-95:0058  
Lambert, Paul Thomas  
103 Elk Run Way  
Telluride, CO 81435

TMK 2-1-7-95:0068  
Dilsaver, Jerry W/ Sumiko O  
47-338 Mahakea Rd  
Kaneohe, HI 96744

TMK 2-1-7-95:0048  
Encrantz, S & M / Tr  
655 Montgomery St., Suite 810  
San Francisco, CA 94111-2628

TMK 2-1-7-95:0059  
Shirota, Shinichi Etal  
5-5-2 Minaminagasaki  
Toshimaku, Tokyo 171  
JAPAN

TMK 2-1-7-95:0069  
Pannier, Roger W/Tr  
P.O. Box 1276  
Kihei, HI 96753

TMK 2-1-7-95:0051  
Yokouchi, Masaru / Tr  
2145 Wells Stret, Suite 301  
Wailuku, HI 96793

TMK 2-1-7-95:0060  
Ziegler, George/Carolyn /Tr  
1247 Talbryn Dr  
Belmont, CA 94002-3755

TMK 2-1-7-95:0070  
Mamiya Family Limited Ptnshp  
6015 Kalanianole Hwy  
Honolulu, HI 96821

TMK 2-1-7-95:0052  
Geary, Thomas D/Anne C / Tr  
1577 Manzanita Ave  
Santa Rosa, CA 95404-2021

TMK 2-1-7-95:0062  
The Papsco 1985 Trust  
Papsco, william/Carol  
P.O. Box 7547  
Menlo Park, CA 94026-7547

TMK 2-1-7-95:0071  
Klompert, George Jay/Patricia  
30230 Ford Rd  
Garden City, MI 48135-2371

TMK 2-1-7-95:0053  
Makena Surf /Tr  
Kennedy, Louis J Jr/ Donna  
7135 SW Chapel Ln  
Portland, OR 97233-7510

TMK 2-1-7-95:0063  
Makena Surf F301 Property  
20039-96th Ave  
Langley BC V1M 3C6  
CANADA

TMK 2-1-7-95:0072  
Yugen, Gaisha Yuko  
Chikubu Shigyo 1-12-6  
Kudankita Chiyoda-Ku Tokyo  
JAPAN

TMK 2-1-7-95:0054  
Geipel, Peter K Etal  
Gereutstr 3  
Gruenwald 82031 00000  
GERMANY

TMK 2-1-7-95:0064  
280955 Alberta Ltd  
1011 Prospect Ave S W  
Calgary Alberta T2T 0W8  
CANADA

TMK 2-1-7-95:0073  
Stark, Robert Gage/Mary Ann  
735 NE 198th St.  
Seattle, WA 98155-1024

TMK 2-1-7-95:0055  
Johynson, florence M ?tr  
96 Makena Alanui #F-205  
Kihei, HI 96753

TMK 2-1-7-95:0065  
Whitcombe Construction Ltd  
140 Hochana St., Suite 320  
Kahului, HI 96732

TMK 2-1-7-95:0074  
Brock, Linda/Tr  
P.O. Box 9220  
Scottsdale, AZ 85252-9220

TMK 2-1-7-95:0056  
Wheelon, Robert L  
1610 SE 113th Ct  
Vancouver, WA 98664-5431

TMK 2-1-7-95:0066  
No Syt Ltd  
19661 SE 24th Wat  
Issaquah, WA 98029-7460

TMK 2-1-7-95:0075  
Scott, Joseph I/Tr Etal  
Joseph I /Constance Scott/Tr  
5912 E Bay Shore Walk  
Long Beach, CA 90803-4465

TMK 2-1-7-95:0057  
Paxton / Lt  
P.O. Box 880069  
Steamboat Springs, CO 80488-0069

TMK 2-1-7-95:0067  
Almquist, Edward E/Sally K  
10E Roanoke #4  
Seattle, WA 98122

TMK 2-1-7-95:0076  
Barbieri, Donald K Etal  
201 W North River Dr  
Spokane, WA 99201-2284

**Makena Estates  
Owners & Lessees within  
500 feet of the Subject Property**

TMK 2-1-7-95:0077  
Morgan/Tr  
27321 Lost Trail Dr  
Laguna Hills, CA 92653-5848

TMK 2-1-7-95:0087  
Golling, Eric Joseph  
P.O. Box 9481  
Gaithersburg, MD 20898-9481

TMK 2-1-7-95:0098  
Kaisha, toake Jimusho  
7-17-6 Koyama  
Shingawa-Ku Tokyo  
JAPAN

TMK 2-1-7-95:0078  
Foley, Thomas Gayle Jr Etal  
575 Braemar Ranch Ln  
Sant Barbara, CA 93109-1064

TMK 2-1-7-95:0088  
Olson, Ronald James/Susan Kay  
8810 Deer Ridge Ln  
Bloomington, MN 55438-1519

TMK 2-1-7-95:0099  
Amesen, Wayne Newell Etal  
96 Makena Rd #C-105  
Kihei, HI 96753

TMK 2-1-7-95:0079  
Burns, Jeffrey Lyn Etal  
Orange 101  
Shibuya-Ku Tokyo 151  
JAPAN

TMK 2-1-7-95:0089  
Hedreen, Richard Castel  
P.O. Box 9006  
Seattle, WA 98109-0006

TMK 2-1-7-95:0100  
Dugas, Gregory  
2024 Nursery Hwy  
Saint Martinville, LA 70582-6218

TMK 2-1-7-95:0080  
Goldsmith/Tr Etal  
6942 E Caballo Dr  
Paradise Valley, AZ 85253-2711

TMK 2-1-7-95:0091  
Ashley, David Bryan Etal  
3-5-43 Minami Azabu  
Tokyo 106  
JAPAN

TMK 2-1-7-95:0101  
Sergeant, Gary William Etal  
4711 01st Ave NE  
Yarrow Point, WA 98004-1217

TMK 2-1-7-95:0081  
New City Corporation  
5-23-15 Imaike Chikusa-Ku  
Nagoya-Shi Aichi 464  
JAPAN

TMK 2-1-7-95:0092, 0094  
Tokyo Screw Kabushiki Kash  
1261 Nippacho Kohoku-Ku  
Yokohama City Kanagawa 223  
JAPAN

TMK 2-1-7-95:0102  
Carlson, Victor Edward etal  
800 Del Norte Blvd  
Oxnard, CA 93030-8971

TMK 2-1-7-95:0082  
Shrenzel, Ernest H/Yasuko Y  
14 Onslow Ave  
Richmond Surrey TWIO6QB  
ENGLAND

TMK 2-1-7-95:0093  
McFarland, Joan NMN  
11777 Bernardo Plaza Ct Ste  
San Diego, CA 92128-2451

TMK 2-1-7-95:0103  
Hoscheit, Donald Charles/Etal  
4202 Royal Saint Anne Ct  
St. Charles, IL 60174-8727

TMK 2-1-7-95:0083, 0084  
Barrett/Tr  
3731 Augusta National Dr S  
Salem, OR 97302-9777

TMK 2-1-7-95:0095  
Inkley, Ronald W Family Tr  
1899 27th St  
Ogden, UT 84403-0505

TMK 2-1-7-95:0104  
Kral, Reinhard R Etal  
P.O. Box 13291  
Oakland, CA 94661-0291

TMK 2-1-7-95:0085  
Urquhart, John Duncan Etal  
617 3rd Ave W Apt 115  
Seattle, WA 98119-4401

TMK 2-1-7-95:0096  
Howerton/Lt  
969 Folson St  
San Francisco, CA 94107-1020

TMK 2-1-7-95:0105  
Adlawan, Del / Tr  
96 Makena Alanui C204  
Kihei, HI 96753

TMK 2-1-7-95:0086  
Hawaiian Trust Co Ltd Trs  
Hawn Tr Co Ltd 89465  
222 N La Salle St, Suite 800  
Chicago, IL 60601-1011

TMK 2-1-7-95:0097  
Timberlake, Morgan  
P.O. Box 577  
Honolulu, HI 96809

TMK 2-1-7-95:0106  
Debenedetti, John L III  
2191 E Bayshore Rd #220  
Palo Alto, CA 94303-3218

**Makena Estates  
Owners & Lessees within  
500 feet of the Subject Property**

TMK 2-1-7-95:0107  
Baron, Donald Joseph Etal  
283 Old Mountain Rd  
Farmington, CT 06032-1618

TMK 2-1-7-95:0108  
Assenmacher, William Robert  
5225 N Via Entrada  
Tucvson, AZ 85718-4825

TMK 2-1-7-96:0001, 0002, 0003, 0004, 0005  
0006, 0007, 0008, 0009, 0010, 0011  
F/B Development LLC  
96 Makena Alanui Rd #G101  
Kihei, HI 96753

TMK 2-1-7-99  
Baird, William Jay Etal  
8484 Page Hill Road  
Harbor Springs, MI 49740-9506

TMK 2-1-8-79, 100, 106  
Makena Aina Corp  
5415 Makena Alanui Rd  
Kihei, HI 96753

SEP 23 2000

2000-09-23-MA-~~FEA~~-

**FILE COPY**

FINAL  
ENVIRONMENTAL ASSESSMENT  
FOR

**\*MAKENA ESTATES\***

TMK: 2-1-007:101  
Makena, Maui, Hawai`i



SEPTEMBER 2000

FINAL  
ENVIRONMENTAL ASSESSMENT  
FOR  
**MAKENA ESTATES**

'00 SEP 11 P3:26

NELE...  
COUNTY OF MAUI  
SEP 11 2000

Prepared for  
Makena Estates  
3620 Baldwin Avenue, Suite 107  
Makawao, Hawaii 96793

Prepared by  
Chris Hart & Partners  
1955 Main Street  
Wailuku, Maui, Hawaii 96793

TMK: 2-1-007:101  
Makena, Maui, Hawai'i



SEPTEMBER 2000

## **PREFACE**

This Environmental Assessment has been prepared in support of an application for a Special Management Area Permit for the proposed Makena Estates, L.L.C. "Makena Estates" resort condominium project. The assessment was prepared in accordance with the following rules and regulations:

- 1) Chapter 343, Hawaii Revised Statutes, and the Environmental Impact Statement Rules, Chapter 200, Department of Health, Hawaii Administrative Rules; and
- 2) Chapter 205A, Hawaii Revised Statutes, and the Special Management Area Rules for the Maui Planning Commission, Chapter 202, Subtitle 02, Title MC-12.



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Figure No. 5	100-Year Flood Map
Figure No. 6a	Conceptual Site and Landscape Planting Plan
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Figure No. 8	Aerial Photograph
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### APPENDICES

Appendix A	Agency Pre-Consultation Letters
Appendix B	Letters between Scientific Consultant Services, Inc. and the State Historic Preservation Division
Appendix C	Cultural Impact Assessment
Appendix D	Maui Coastal Scenic Resources Study, Kihei-Makena Map
Appendix E	Preliminary Engineering and Drainage Report
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## I. PROJECT INFORMATION

### A. PURPOSE OF THE REQUEST

This environmental assessment has been prepared in support of an application for a Special Management Area Permit (SMA) in order to allow for the establishment of a 40 unit resort condominium project with a manager's unit on undeveloped land at Makena, Maui, Hawaii; TMK: (2) 2-1-007:101.

### B. PROJECT PROFILE

Proposed Project:	40 Resort Condominium Units Manager's Residence Cabana Swimming pool
Existing Land Use:	Undeveloped
Lot Size:	6.180 acres
Access:	Makena-Keoneoio Road & Makena Alanui Road

### C. IDENTIFICATION OF THE APPLICANT

Owner:	Makena Estates, L.L.C.
Address:	3620 Baldwin Avenue, Suite 107 Makawao, Hawaii 96768
Phone/Fax:	Phone: 808-573-1559 Fax: 808-573-1631
Contact:	Mr. Martin W. Quill

### D. CONSULTANT

Land Use Planners:	Chris Hart & Partners 1955 Main Street, Suite 200 Wailuku, Maui, Hawaii 96793-1706
--------------------	--



Phone/Fax  
Contact:

Phone: 808-242-1955, Fax: 808-242-1956  
Mr. Christopher L. Hart

**E. ACCEPTING AGENCY**

Agency:

Department of Planning  
County of Maui  
250 South High Street  
Wailuku, Maui, Hawaii 96793

Phone/Fax:

Phone: 808-270-7735, Fax: 808-270-7634

**F. PRE-CONSULTED AGENCIES**

**A. COUNTY OF MAUI (See Appendix A, Agency and Pre-consultation Letters)**

1. Department of Planning
2. Department of Public Works and Waste Management
3. Department of Water Supply
4. Department of Housing and Human Concerns

**B. STATE OF HAWAII**

1. Department of Land and Natural Resources, Historic Preservation Division

**C. PRIVATE INTERESTS (See Appendix A, Agency and Pre-consultation Letters)**

1. Makena Community Association
2. Neighboring property owners

**D. DRAFT EA COMMENT AND RESPONSE LETTERS**

1. See Appendix G



## II. DESCRIPTION OF THE PROPERTY AND PROPOSED ACTION

### A. PROPERTY LOCATION

The subject property is located within the resort destination area of Makena, approximately 300 feet south of the intersection of Makena-Keoneoio Road and Makena Alanui, Makena, Honuauia, Hawaii; TMK: (2) 2-1-007:101 (See Figure No. 1 and 2, Regional Location and Tax Map).

### B. EXISTING LAND USE

The subject property is undeveloped and overgrown with Keawe trees, shrubs, weeds, bushes, and grasses. The recent historical use of the property was cattle grazing and other agricultural based activities.

### C. BACKGROUND INFORMATION

The County's Land Zoning Map No. 5, adopted in 1969, identified the subject site as A-2, Apartment District. However, on May 15, 1996, the County's Deputy Corporation Counsel determined that the property's A-2, Apartment District zoning was invalid since the property was zoned for a use which was not permitted within the State Agricultural District at that time. In response, the previous owners of the subject property filed an application with the County for a State Land Use District Boundary Amendment from Agricultural to Urban on November 20, 1996. The subject request was approved by Ordinance No. 2755, which became effective on March 18, 1999. An accompanying measure, Ordinance No. 2756, also became effective on March 18, 1999, which ratified previous A-2, Apartment Zoning.

**D. LAND USE DESIGNATIONS**

State Land Use Classification: Urban

Kihei-Makena Community Plan: Multi-Family  
(See Figure No. 3, Community Plan Map)

County Zoning: A-2, Apartment  
(See Figure No. 4, Zoning Map)

Flood Zone Designation: A, C  
(See Figure No. 5, 100 Year Flood Zone)

Special Designations: Special Management Area (SMA)

**E. DESCRIPTION OF PROPOSED ACTION**

The applicant, Makena Estates, LLC., is proposing to develop a 40-unit resort condominium project, and manager's residence, on approximately 6.180-acres of land community planned and zoned for multi-family use. Table 1 shows the project's design specifications.

Project Design Specifications		
Lot Area		6.180 Acres
No. of Resort Condo. Units		40
No. of Single-Family Units		1
Density	41/6.180	6.63 Units per Acre
Unit Type	2- or 3-bedroom, 2 ½ bath, at approximately 2,500 SF	40
	2-bedroom, 2-bath, at 1,000 SF Manager's Residence	1
Number of Buildings	3-Story Buildings	4
	4-Story Buildings	2
	Single-Family Dwelling	1
	Recreation Cabana	1
No. Units per Building	3-Story Building	6
	4-Story Building	8
Building Height	4-Story Buildings	60 Feet



	3-Story Building	45 Feet
	Manager's Residence	16 Feet
	Cabana	19 Feet
Building Footprint	3 and 4-Story Buildings	5,624 SF
	Manager's Residence	1,000 SF
	Cabana	1,000 SF
	Covered Carport/Storage	10,000 SF
Floor Area-Lot Area Ratio	Allowable = 90%	Proposed = 44.94%
Gross Covered Floor Area	3-Story Buildings (4)	65,486 GSF
	4-Story Buildings (2)	43,492 GSF
	Covered Parking (40)	10,000 GSF
	Manager's Residence (1)	1,000 GSF
	Cabana (1)	1,000 GSF
	Total	120,980 GSF
Impervious Surfaces		2.530 Acres or 41%
Pervious Surfaces (Open Space)		3.575 Acres or 59%
Lot Coverage	Allowable = 94,220 SF or 35%	Proposed = 45,744 SF or 16.99%
Parking	Provided	82 Stalls
	Required @ 2 Stalls/Unit	82 Stalls

Figure No. 4 shows the proposed conceptual site and landscape-planting plan for the subject development. The following is a description of the project's major components.

**Resort Condominium Buildings.** The project will consist of 4 three-story and 2 four-story multi-unit buildings. The main design objective is to create an exclusive residential community, which maximizes the open space character of the 6.18-acre site. The high quality multi-unit buildings will be constructed of concrete slab on grade and frame construction with an exterior plaster finish. The plaster walls will be painted with bands of earth-toned colors. The exterior is designed to have large wall surfaces articulated with cut-out plaster grills, corbels and lintels. Plaster and glass railings are designed to allow light and maximize views to the outdoors. The building is topped off with deep five-foot overhangs that will provide protection and shade from the exterior elements. The double-hipped roof constructed of glazed concrete tile will reflect the "vintage Hawaiian architecture" of the 1930's with the addition of dormer windows (See Figure Nos. 6 and 7).



**Unique Features of the Interior Units.** Each building will feature a stone paved lobby that offers a card swipe front door and elevator controls to limit access to each floor. There will be only two units per floor with the flexibility to have either a 2-bedroom/3 bath or a 3-bedroom/3-bath unit. The open views from the bedrooms will take advantage of the tradewinds that create a natural cross ventilation throughout the unit should the respective resident choose not to use the central air-conditioning system. Technically, the units will feature sophisticated electronic wiring to enhance communications for all the residents along with enhanced electrical wiring capacity (See Figure No. 7).

**Manager's Residence.** The manager's residence will reflect the architectural style of the adjacent buildings and is situated on the north corner of the project site near the north entrance. The residence will consist of 2 bedrooms and 2 bathrooms, a living/dining room and kitchen. The exterior fenestration and color palette will be similar and compatible to the multi-unit buildings (See Figure No. 7).

**Recreation Cabana & Swimming Pool.** The recreational cabana is a shared facility for the occupants of the estates. This building will again reflect the architectural style of the adjacent buildings. It is centrally located at the lower west portion of the project site. This one-story structure will house a small gym with aerobic and weight machines directly adjacent to men's and women's restroom. A kitchenette with a gas grille and a covered open area for casual seating for approximately 20 people will also be a component of this Cabana. The walls of the structure will open up to the pool deck and take advantage of the ocean views beyond. The swimming pool is designed to take on an organic form, which lends itself to the natural surroundings with natural rock outcropping at the pool's edge with a waterfall or similar active water play. The exterior fenestration also will be in harmony with the other buildings in this development (See Figure No. 7).

**Open Space Features.** The subject property is being developed in a roughly V-shaped pattern. The mauka portion of the property contains one building while the northern and southern boundaries contain two and three buildings, respectively. The natural drainage system, which runs through the center of the property, will be largely maintained in its natural condition and will serve as an intact open space system providing recreational and visual relief into and from the property. The landscape concept plan proposes xeriscaping and planting of primarily Polynesian species within the natural drainage system to enhance the project's aesthetics, reduce water consumption, and minimize sediments or pollutants from migrating into the coastal waters. The plan also proposes the use of a variety of trees, shrubs, and groundcovers in



order to beautify the property and to soften the visual impacts of the project from neighboring properties and public roads. Prominent trees will include coconut palms, manila palms, monkey pods, and Hawaiian kou among others. The natural drainage feature encompasses approximately 0.85 acres and the remaining landscape ground cover encompasses 2.725 acres, providing a total of 3.575 acres of open space. Building setbacks will be provided along the perimeter of the property and will range from approximately 34 feet to 45 feet along the southern boundary, approximately 62 feet along the eastern boundary, and from approximately 41 feet to 51 feet along the northern boundary. The front yard setback from the manager's residence and the nearest condominium building to the makai boundary is 18 feet and 59 feet respectively (See Figure No. 6).

**Sustainable Building Design Techniques.** A number of sustainable building design techniques have or will be implemented, including but not limited to the following:

- Assessment of site characteristics such as vegetation, topography, geology, climate, natural access, solar orientation patterns, water and drainage, and existing utility and transportation infrastructure to determine the appropriate use of the site.
- Selection of a site with short connections to existing municipal infrastructure systems.
- Placement of buildings to take advantage of natural features and to maximize their beneficial effects. Building placement maximizes and preserves positive site characteristics, enhances human comfort, safety and health, and achieves operational efficiencies.
- Minimizing disruption of drainage channels.
- Provision of erosion and dust control measures.
- Retaining existing topsoil and maintain soil health by minimizing clearing of natural vegetation.
- Designing space for recycling and waste diversion opportunities.
- Utilizing energy and resource efficient building design.
- Tree planting to shade buildings and paved areas.
- Utilizing site sensitive orientation to:
  - Minimize cooling loads through site shading and carefully planned east-west orientation.
  - Incorporate natural ventilation by channeling trade winds.
  - Maximize daylighting.
- Designing south, east and west shading devices to minimize solar heat gain.





- Using spectrally selective tints or spectrally selective low-e glazing with a Solar Heat Gain Coefficient of 0.4 or less.
- Maximizing efficiencies for lighting, heating, ventilation, air conditioning systems and other equipment.
- Providing tenant sub-metering to encourage utility use accountability.
- Installing water conserving, low flow fixtures.
- Incorporating water efficient landscaping (xeriscaping) into the landscape design.
- Utilizing properly planned and efficient irrigation systems.
- Selecting appropriate plants for the Makena area, thereby minimizing need for irrigation.
- Using topsoil from the graded areas, stockpiled on the site and protected with a silt fence to reduce the need for imported topsoil.

**Parking.** Parking lots and roadways within the project site will be designed and constructed in accordance with the provision of Section 19.36 Offsite Parking Ordinance of the Maui County Code. As such, 82 parking stalls will be provided on the property. Each resort condominium unit will be provided with one covered carport that will also provide additional storage space for the units (See Figure No. 6).

**Access.** Since the project is bisected by drainageways, the project will be provided with two accesses off of Makena-Keoneoio Road and one access off of Makena Alanui. Rolled curb will be provided along the frontage of Makena-Keoneoio Road and improved to County Rural Standards while concrete curb, gutter, and sidewalks will be provided along Makena Alanui. An eight (8) foot road widening strip along the Makena-Keoneoio Road frontage will be improved and dedicated to the County in accordance with the provisions of Section 16.26A4601 of the Maui County Code.

**Site Improvements.** Site improvements will consist of, but are not limited to, asphalt paved driveways and parking lots, concrete sidewalks, concrete curb and gutters, and landscaping. Underground utility improvements will consist of underground drainage, sewer, and water distribution and fire protection systems, along with an underground electrical, telephone, and cable distribution systems.

**Construction.** Construction is anticipated to begin once all of the required State and County Permits have been issued. It is anticipated that full build-out of the site will require approximately 12 to 18 months to complete. There will be short-term construction related impacts to the surrounding environment. Standard mitigation measures to control these impacts are described in Section II of this report.



## F. ALTERNATIVES

### 1. No action

*Analysis.* The subject property is currently undeveloped and is not being used. In recent history, Makena area lands were used for low intensity grazing and other agricultural activities. However, due to unfavorable topographical conditions, climate, soils, and increasing urbanization, agricultural land uses in the area have largely been abandoned. Moreover, the construction of Makena Alanui and Makena-Keoneoio Roads created an oddly configured parcel that is impractical to utilize for agricultural purposes. Surrounding properties are either being developed for resort type uses or are zoned and community planned for such uses. Thus, active agricultural operations in this area would be largely incompatible.

In summary, the No Action alternative would leave the landowner with little reasonable use of the property, since economically feasible non-urban uses for the property are scarce.

### 2. Alternative styles, size, and configuration

*Analysis.* Various alternative configurations were considered in the design phase of the project. A summary of these alternatives is presented below:

*More Units.* The subject project could be designed to maximize development of the site. As mentioned, the subject property is County zoned A-2 Apartment District, which allows for 4-story building heights, a maximum lot coverage of 35%, and Floor Area Lot Area Ratio of 90%. The proposed lot coverage is just 16.99% and the Floor to Lot Area Ratio is 44.94%. Maximizing development of the property might include building more and higher buildings with a greater number of units per building. For example, if 7 four-story buildings were constructed, each with 1,000 sq. ft. units, a total of approximately 135 units could be built on the property. However, adding additional units would require more land being allocated towards building and parking space thereby significantly reducing the amount of open space landscaping within the project area and degrading the quality of the built environment. Moreover, more units would also produce greater environmental impacts and place greater burdens upon public infrastructure and service systems.



In conclusion, more units would result in greater negative environmental impacts to the community, increase development costs, and produce a less desirable living environment for the project's residents.

*Fewer Units.* Reducing the height and number of buildings, and/or increasing the size of the units per building would produce fewer units. However, decreasing the number of units would require that certain fixed development costs, i.e. land acquisition, planning and design studies, and on-site infrastructure improvements, be amortized over fewer units thereby increasing the cost per unit and resulting in a less profitable or an economically unviable project.

*Alternative Styles.*

*Massing.* Massing affects the size and separation between buildings and is an important consideration in urban design. Generally speaking, massing of buildings within a proposed development should be architecturally compatible with adjacent development and future land use patterns. In comparison to what is proposed, the same number of units could be created within a single 4-story, 60-foot high building, with a footprint of approximately 28,100 square feet and a gross floor area of approximately 108,000 square feet. However, such a large building, i.e. 28,100 square feet footprint versus 5,624 square feet footprint, would create a very visible building and would significantly alter the character of the proposed project and may produce greater impacts to adjacent land uses.

In contrast, the same number of units could be provided within a two-story resort condominium project. For example, 40 units could be provided within 10 two-story buildings, each with a footprint of approximately 5,624 square feet. However, this scenario would require that considerable more land be dedicated to lot coverage, i.e. 56,240 square feet versus 45,744 square feet or a 23% increase, and would thereby significantly reduce the amount of open space within the project area. The additional buildings may also result in more significant visual impacts into and from the property since more buildings would be visible. Moreover, a 2-story project would eliminate the opportunity to create ocean view units from third and fourth floor units thereby significantly reducing the value of the project.

*Alternative Architectural Design.* The project has been designed to reflect the "vintage Hawaiian architecture" of the 1930's. The buildings will be constructed of plaster walls and painted with bands of earth-toned colors to blend naturally with the earthy shades



and topography characteristic of Makena. In contrast, the project could be designed at a height of 4-stories with flat roof and painted with non earth-toned colors but would then be out of character with the Makena region's Hawaiian culture and sense of place.



### III. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

#### A. PHYSICAL ENVIRONMENT

##### 1. Land Use

*Existing Conditions.* The subject property is located on the leeward facing shore of Maui, in the resort area of Makena, approximately 2 miles south of Wailea. A patchwork of undeveloped urban-zoned land, intermixed with high-end visitor oriented development that includes condominiums, hotels, golf courses, and residential beach estates characterizes the Makena area (See Figure Nos. 8, 9, and 11). Development generally occurs in a linear pattern between the shoreline and Makena Alanui Road, a major County roadway connecting Makena and Wailea. Zoning throughout Makena, and in the immediate vicinity of the subject property, is predominantly urban with a significant amount of land community planned for apartment, hotel, residential, and recreational uses (See Figure Nos. 3, 4, and 9). Beyond the urban-zoned areas are arid agricultural lands being used for low intensity cattle grazing. Makena is still largely undeveloped and therefore a significant amount of urban-zoned land remains in open space.

The subject parcel maintains approximately 585 feet of frontage along Makena-Keoneoio Road and runs mauka-makai approximately 665 feet. Properties to the north and south of the project site are undeveloped. To the west, across Makena-Keoneoio Road, is the Makena Place single-family development, and a single-family residence. To the east, across Makena Alanui, is the Wailea Gold Golf Course. The Community Plan map presents an illustration of the range of potential future land uses planned within the immediate area (See Figure Nos. 3 and 9). The following is a description of zoning, community plan designations, and existing land uses adjacent to the subject property:



**North:**                    Zoning: A-2, Apartment; Open Zone  
Community Plan: Multi-Family; Park  
State Land Use: Urban  
Existing uses. Undeveloped land zoned for multi-family development. Makena Alanui Road, Makena Surf Condominiums, and Wailea Golf Course are further north.

**South:**                    Zoning: Interim  
Community Plan: Multi-Family  
State Land Use: Agriculture  
  
Existing uses. Undeveloped pasture/grazing land, and a single-family farm dwelling.

**East:**                    Zoning: A-2, Apartment  
Community Plan: Multi-Family  
State Land Use: Agriculture  
  
Existing uses. Undeveloped pasture/grazing land zoned for Multi-Family development.

**West:**                    Zoning: A-2, Apartment  
Community Plan: Single-Family  
State Land Use: Urban  
  
Existing uses. Makena-Keoneoio Road, the Makena Place development, and a single-family residence. The Pacific Ocean is approximately 200 feet west of the subject property.

*Potential Impacts and Mitigation Measures.* The proposed 40-unit condominium project is located within an area that is zoned and community planned for single and multi-family resort/residential development. However, the subject property, as well as adjacent properties to the north, south, and east, is presently undeveloped. In the context of the Kihei-Makena Community Plan, which was adopted in order to guide future development in the area, there should be no conflict with future land use patterns in the area.



## 2. Topography and Soils

*Existing Conditions.* The project site is presently undeveloped and not being used for any particular purpose. Natural vegetation includes but is not limited to bristly foxtail, feather fingergrass, ilima, and keawe.

The existing ground slopes from an elevation of (+) 66± feet M.S.L. to (+) 14± feet M.S.L. in an east to west direction with an average slope of 7.4%. According to the "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii (August, 1972)", prepared by the United States Department of Agriculture, Soil Conservation Service, the soil on the project site is Makena Series, Makena loam, stony complex, 3 to 15 percent slopes (MXC). This soil is characterized as having slow to medium runoff, moderately rapid permeability, and slight to moderate erosion hazard. These complexes are on the lower leeward slopes of Haleakala, between Makena and Kamaole. It consists of Makena loam and Stony land. Stony land occurs on low ridges and makes up 30 to 60 percent of the complex. Makena loam occurs as gently sloping areas between the low ridges of stony land. Areas containing these Makena Series soils are used for pasture and wildlife habitat.

The University of Hawaii Land Study Bureau designates the agricultural suitability of the project site "E". Lands designated "A" are considered to be of highest production, with "E" rated lands ranked lowest.

Rainfall in this area of Makena is between 20 and 30 inches annually, most of which occurs in winter.

*Potential Impacts and Mitigation Measures.* The topographic and soil analysis suggests that the proposed land uses are suitable for the site, including driveways and parking, buildings, and pool area.

## 3. Terrestrial Biota (Flora and Fauna)

*Existing Conditions.* The subject property has previously been used for animal grazing and as such has been considerably altered from its natural state. Existing vegetation on the property primarily consists of bristly foxtail, feather fingergrass, ilima, and keawe along with various grasses and weeds, such as honohono, nut grass, and buffalo grass. No known rare, endangered, or threatened species of fauna were discovered on the subject 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 fauna were discovered on the subject property.

*Potential Impacts and Mitigation Measures.* There are no known significant habitats of rare, endangered or threatened species of flora and fauna located on the subject property. Thus, rare, endangered, or threatened species of flora and fauna will not be impacted by the proposed project.

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

*Existing Conditions.* According to Panel Numbers 150003 0330B of the Flood Insurance Rate Maps, prepared by the U.S. Federal Emergency Management Agency, Federal Insurance Administration, the project site is situated within Flood Zones A and C (See Figure No. 5). Zone A is designated as an area of 100-year flood where flood elevations and flood hazard factors have not been determined. Zone C is designated as an area of minimal flooding.

*Potential Impacts and Mitigation Measures.* Flood zone designations have been a primary consideration during site planning of the property. All habitable structures have been located outside of the designated flood zones. Appropriate measures will be taken to accommodate increased runoff generated by the project. (See Section III.D.4 and Appendix E for a discussion of stormwater runoff). Thus, the proposed project should not be affected by or have adverse impacts upon its neighbors or downstream properties with regards to flood hazard potential.

#### **5. Air Quality**

*Existing Conditions.* Air quality refers to the presence or absence of pollutants in the atmosphere. It is the combined result of the natural background and emissions from many pollution sources. The impact of land development activities on air quality in a proposed development's locale differs by project phase (site preparation, construction, occupancy) and project type. In general, air quality in the Makena region is considered relatively good. Non-point source emissions (automobile) are not significant to generate high concentration of pollutants. The relatively high quality of air can also be attributed to the region's exposure to wind, which quickly disperses concentrations of emissions. The Makena area is currently in attainment of all criteria pollutants established by the Clean Air Act, as well as the State of Hawaii Air Quality Standards.





*Potential Impacts and Mitigation Measures.* Air quality impacts attributed to the proposed project could include dust generated by the short-term construction related activities. Site work such as grading and building construction, for example, could generate airborne particulate. Standard dust control measures such as regular watering, sprinkling, and the installation of dust screens will be implemented to minimize the potential impact from wind-blown emissions.

The increase in the number of residents may result in a slight increase in the volume of traffic in the region, which would increase vehicular emissions such as carbon monoxide. However, this increase is not considered significant when compared to the overall number of vehicles in Kihei-Makena and in consideration of existing ambient conditions. Thus, the proposed project is not anticipated to be detrimental to local air quality.

## **6. Noise Characteristics**

*Existing Conditions.* The noise level is an important indicator of environmental quality. In an urban environment, noise is due primarily to vehicular traffic, air traffic, heavy machinery, and heating, ventilation, and air-conditioning equipment. Ramifications of various sound levels and types may impact health conditions and an area's aesthetic appeal. Noise levels in the vicinity of the project area are generally low. Traffic noise from Makena Keoneoio Road and Makena Alanui Road is the predominant source of background noise in the vicinity of the subject property.

*Potential Impacts and Mitigation Measures.* 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. To minimize construction related impacts to the surrounding neighbors, the developer will limit construction activities to normal daylight hours, and adhere to the State Department of Health's noise regulations for construction equipment. In the longer-term, the proposed project should not significantly impact existing noise conditions in the area due to the relatively small increase in traffic generated by the project.

## **7. Archaeological/Historical Resources**

*Existing Conditions.* Scientific Consultant Services, Inc. (SCS) completed an archaeological inventory survey in October 1994. The survey covered approximately 6



acres. The fieldwork was carried out January 18 through 31, 1994. A total of six sites (Sites 50-14-3513 through 3518), with 25 component features, were recorded within the project area. Feature functions within the six sites included temporary and permanent habitation, activity areas, and agriculture. All six sites are significant under Criterion "D" for the data they have yielded or are likely to yield. The survey report recommended that: "further data recovery be carried out at Sites 3513, 3516 for the purpose of identifying and documenting any additional features that might be present." All other sites were decided to have been adequately documented. The data recovery work for site nos. 3153 and 3516 has been completed and an end-of-field work letter submitted by SCS to the State Historic Preservation Division (SHPD) (See Appendix B). SHPD reviewed and commented on the end-of-field work letter in a letter dated May 26, 2000. In the May 26 letter, SHPD concluded that "the archaeological data recovery fieldwork portion of the data recovery work is concluded", that the applicant "could begin land altering development", and that the "sites no longer need to be protected" (See Appendix B). SCS submitted a draft data recovery report to SHPD which is currently being reviewed. The final archeological data recovery report should be submitted to the SHPD once carbon dating tests are completed.

In addition to the on-site features, an ancient heiau, Pohakunahaha Heiau (Site 50-14-197) is located adjacent to the subject parcel, on the original Parcel 12.

*Potential Impacts and Mitigation Measures.* Development of the property will alter the natural terrain and will disturb existing archeological features on the property. In order to mitigate impacts to these features, all required data recovery, identification, and documentation of sites has been completed as prescribed by the State of Hawaii, Historic Preservation Division. In order to provide protection to the Pohakunahaha Heiau site, project plans have incorporated a 75-foot buffer zone to the nearest building around the heiau on all sides. The proposed buffer should protect the heiau during and after the construction period. Construction fencing will also be erected along the affected property boundary line during the construction phase of the project in order to further protect the heiau. In the event that sub-surface historic/cultural remains are encountered during construction, work will be stopped and the State Historic Preservation Office will be contacted to assess the significance of the find and recommend appropriate mitigation measures, if necessary.

## 8. Visual Resources

*Existing Conditions.* The subject property is located within the destination resort area of Makena, which is renowned for its significant views of the Pacific Ocean and Haleakala.



The Pacific Ocean and the islands of Molokini, Lana`i, and Kaho`olawe are visible from the property.

The project site is visible from both Makena-Keoneoio Road and Makena Alanui. The subject property is currently undeveloped, thickly vegetated with keawe trees, bushes, and shrubs and contains no unique scenic resources. Mauka views from Makena-Keoneoio Road are currently obstructed due to the presence of existing ground cover.

Public views of the Pacific Ocean and Haleakala exist in various locations from Makena Alanui, which is a major County roadway connecting Makena and Wailea. However, views of the Pacific Ocean from Makena Alanui, immediately adjacent to the mauka boundary of the subject property, are completely obstructed due to road topography in relation to the project site and the presence of extensive ground cover.

Numerous scenic resources have been identified in the Kihei-Makena area, which are identified and discussed in the Maui Scenic Coastal Resources Study, August 1990 (See Appendix D). Appendix D in this report appears to identify makai ocean views occurring across the subject property. However, as illustrated in Figure No. 10, Visual Impact Assessment, which is discussed below, no existing coastal or ocean views across the property exist.

*Potential Impacts and Mitigation Measures.* A visual impact assessment was conducted in order to determine the project's impact to mauka and makai view corridors from public roadways (See Figure No 10). The analysis shows that existing views across the property towards the ocean from Makena Alanui are currently obscured due to existing residential structures, extreme topography and vegetation and as such there will be negligible impacts to ocean view corridors along this road (See Figure No. 10, Photo Nos. 2.a and b and 4.a and b). Similarly, mauka views from Makena-Keoneoio Road are also obscured and therefore there will be minimal impacts to mauka views of Haleakala (See Figure No. 10, Photo No. 6.a and b). However, the conceptual landscape-planting plan for the project may create enhanced mauka and makai view opportunities through the natural drainage channel.

From an urban design perspective, the proposed development will alter the character of the property and surrounding area by creating a more built environment that is reflective of an urbanized resort area. To soften the visual impacts into the project area, the natural drainage system, which runs through the center of the property, will be largely maintained in its natural condition and will serve as an intact open space system providing visual relief. The landscape concept plan proposes xeriscaping and planting of primarily Polynesian species within the natural drainage system to enhance the



project's aesthetics. Prominent trees identified in the conceptual landscaped plan include coconut palms, manila palms, monkey pods, and Hawaiian kou among others (See Figure No. 6, Conceptual Site and Landscape Planting Plan). The natural drainage system encompasses approximately 0.85 acres and the remaining landscape ground cover encompasses 2.725 acres, providing a total of 3.575 acres of open space. To be sensitive to the site's topography, the two (2) proposed 4-story buildings are to be built inland from Makena-Keoneoio Road, along the southerly boundary line, at the base of a steep tree lined parallel ridge which visually reduces the scale and screens the southerly view thereby establishing a visually appealing project.

As such, the proposed project is not anticipated to significantly impact public view corridors and will not produce significant adverse impact upon the visual character of the site and its immediate environs.

## **B. SOCIO-ECONOMIC ENVIRONMENT**

### **1. Population**

*Existing Conditions.* Maui County experienced relatively strong population growth during the past decade with the 1990 population expanding to 100,504, a 41.6% increase over the 1980 population of 70,991. Population growth is projected to continue with the year 2010's population projected to reach 140,060. Similarly, visitor growth has increased significantly in the County over the last decade with the average daily visitor count increasing from 15,363 in 1980 to 43,270 in 1997, a 280% increase in visitors per day. Likewise, Kihei-Makena experienced high growth rates as the population grew to 15,365 in 1990, up from 7,263 in 1980 and 1,636 in 1970. The average daily visitor population of the region in 1990 was 16,079 (Kihei-Makena Community Plan, March 1998). The resident population of Wailea-Makena in 1990 was 3,799 (County of Maui, Department of Economic Development, 1999).

*Potential Impacts and Mitigation Measures.* Using national demographic multipliers for standard housing types (American Housing Survey, 1987), the proposed project may increase the population of the immediate Makena area by approximately 88 persons. However, it is expected that many of the units will be sold as vacation homes to buyers from outside of Maui County, who wish to regularly return to this vacation area, thereby reducing the number of people at the project at any given time.



## 2. Economy

*Existing Conditions.* The Wailea-Makena economy is based primarily upon the visitor industry. Visitor accommodations are located along the shoreline along with various support facilities, multi-family, and single-family residential developments. Wailea has developed into an important visitor destination anchor. Makena is significantly less developed. Makena maintains one destination resort facility, along with a limited amount of condominium, residential, and golf course developments intermixed with open space and beach parks. A significant amount of undeveloped urban-zoned land exists in Makena.

*Potential Impacts and Mitigation Measures.* The project will generate construction-phase economic impacts that are generally short-term effects. They include employment, income, and expenditure impacts that are created by on-site and off-site construction employment, on-site and off-site trade/transportation/service employment, and manufacturing employment in support of construction. The post-construction, operational economic impacts are long-term consequences generated by the project. They encompass employment, income, and expenditure impacts created by the project's employees including management, maintenance, and landscape workers. The proposed project will produce a limited number of full and part-time jobs in support of the development.

## 3. Cultural Resources

*Existing Conditions.* A Cultural Impact Assessment Report was prepared by Kapiioho Lyons Naone Cultural Consulting, Inc., which describes the potential impact on cultural practices and beliefs resulting from the proposed action (See Appendix C). The assessment covered the entire project site. The methods used to conduct the assessment included:

- Walking and feeling the property;
- Interviewing Mr. Edward L. Chang, Jr., a former owner of the property;
- Interviewing Mr. Ronnie Ka'alakea, a former long-time resident of the area and local fisherman;
- Interviewing Mr. Leslie Kuloloio, a well-known native Hawaiian cultural specialist knowledgeable of the local area and history;
- Referencing Mr. David B. Chaffee's and Robert L. Spear's archaeological report for the subject property entitled "An archaeological Inventory Survey of 6 acres in the Ahupua'a of Papa'anui, Makawao District, Makena, Island of Maui," October 1994, and letter dated April 4, 2000, and conversation on May 26, 2000.



- Consulting the following maps: Makena Estates Regional Location Map, Makena Estates Tax Map Key, Makena Estates Topography, Makena Estates Metes and Bounds, Makena Estates Community Plan, Makena Estates Zoning, Makena Estates Site Analysis, and illustrative site plan.

From a cultural practices and beliefs perspective, it appears that the subject property was part of a much larger area known as Ahupua`a of Papa`anui. Cultural practices today are mainly makai of the roadway. These practices include: fishing, gathering seaweed of many kinds, gathering sea urchins, etc. There are no apparent signs of cultural practices or gatherings currently taking place on the subject property. Cattle and goats have been roaming the land for a long time. There were only three medicinal plant species found on the property and the vitality of these plants was not of a quality for good medicine. The area hosts mainly keawe trees and grass.

Although the heiau is located outside the physical borders of the proposed Makena Estates Project, the heiau appears to be significant and to have significance to the community at large. There is no evidence that the heiau is currently in use. There are several smaller structures around the heiau that indicate damage to the heiau from erosion, nature, cattle, etc. There is a common belief that bones could be buried around the entire general area of the heiau. One of the concerns among Hawaiian people is the location of the King's Trail in relationship to any project. According to the testimony of Leslie Kuloloio, the ancient King's Trail actually followed exactly where the Makena-Keoneoio Road is now. It is believed that the King's Trail never entered the property proposed for Makena Estates.

Based on the analyst's time spent on the Makena Estates site and based on the way the heiau is oriented (appears to be facing the ocean), the heiau appears to be a Ko`a (fishing shrine). The existing structure appears to be only a portion of the original structure. It is believed that the heiau had a lot of influence and spiritual interest over the larger Ahupua`a of Papa`anui area. The analyst believes that ancestral spirits are very active in the area.

*Potential Impacts and Mitigation Measures.* The analyst provided several recommendations, all of which are accommodated by the project's site plan and burial plan. These include:

1. Space is required around the heiau to allow free, flowing movement of ancestral spirits and Night Marchers.



2. The ancestral spirits should always have a clear view of the mountaintops and the ocean from the heiau along the southerly property line to ensure this free flowing movement.
3. A 75-foot buffer zone to the nearest building should be established around the heiau on all sides.
4. Within that 75 foot buffer zone on the Makena Estates side, an area should be set aside as close to the heiau as possible for reinterment of bones if any are found during construction of the project.
5. A cultural specialist should be called to assist the developer each time skeletal remains or any artifacts are found.
6. The cultural specialist and/or developer should contact the State Historic Preservation Division of the Department of Land and Natural Resources for the State of Hawaii and the Maui Burial Council if bones are found.
7. Such skeletal remains and/or any artifacts should be temporarily stored and then reinterred at one ceremony near the time of project completion.
8. A cultural specialist should perform a significant Hawaiian cultural blessing ceremony of the area once the building is done and the bones are all reinterred to appease long time local residents and the ancestral spirits.

## **C. PUBLIC SERVICES**

### **1. Recreational Facilities**

*Existing Conditions.* Kihei-Makena has a wide reputation as a recreational destination, particularly for ocean related activities. Ocean sports and recreation available in the region include golfing, swimming, fishing, surfing, scuba diving, snorkeling, sailing, and kayaking. State and County beach parks within close proximity to the project area include Polo Beach, Big Beach, Makena Landing, Poolenalena Beach Park, Wailea Beach, and Kamaole Beach Parks, and numerous other beach parks along the Kihei coastline. A popular dive spot, referred to as "Five Graves" is located approximately 350 feet to the south of the project site. The Wailea Emerald and Gold Golf Courses are located mauka of the project site.

*Potential Impacts and Mitigation Measures.* The proposed project will offer a recreation cabana and swimming pool for its occupants. A gym with aerobic and weight machines, and outside kitchenette with a gas grille and a covered open area for casual seating and dining will be available. Moreover, the owners of the project will comply with the requirements for Parks and Playground, pursuant to Maui County



Code Section 18.16.320, in order to satisfy park assessment requirements. Thus, the proposed project is not anticipated to impact public recreational facilities in the region.

## 2. Police and Fire Protection

*Existing Conditions.* There is one fire station serving this community. The fire station is located at 11 Wamahaihai Street at Kalama Park, which is about four miles north of the subject site. The Kihei Fire Station is equipped with a 1,500-gallon pumper, and is staffed by one captain and five firefighters per twenty-four hour shift. Fire flow requirements are addressed in Section III.D.1.

Patrol officers on assignment provide police services for the Kihei-Makena sub district from a new police sub-station at Kihei Town Center

*Potential Impacts and Mitigation Measures.* Since it is anticipated that the proposed project will not result in an overall significant increase in population levels, the proposed project is not anticipated to have an adverse impact upon existing police and fire protection services.

## 3. Schools

*Existing Conditions.* There are two elementary schools and one intermediate school in the area. Kihei and Kamalii Elementary and Lokelani Intermediate Schools serve the Makena region. Until recently, Kihei students attended H.P. Baldwin High School in Wailuku but are now required to attend Maui High School in Kahului. The newly constructed Kamalii Elementary School is the closest elementary school to the project site, and is located about 5 miles from the project. The Department of Education provided enrollment figures but did not provide capacity information.

The enrollment figures are:

	<u>1996</u>	<u>1997-98</u>
Kihei Elementary School	911	903
Kamalii Elementary School	583	677
Lokelani Intermediate	660	691

Figures for 1997 and 1998 for the two high schools serving the area are as follows:

Maui High	1,708 (475 Kihei students)
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Baldwin High

1,832 (250 Kihei students)

*Potential Impacts and Mitigation Measures.* Using national demographic multipliers for standard housing types of school aged children (American Housing Survey, 1987), the proposed project could increase the student population of the affected schools by approximately:

Grade	Students
K-6	7.05
JHS	2.79
HS	2.54

However, since retirees and vacation-home buyers are anticipated to purchase many of the Makena Estate units the total number of school aged children residing within the project may be significantly less. It is not anticipated that the proposed project will significantly impact public education facilities, given the projected demographic profile of prospective purchasers and given the minimal population increase generated by the project.

#### 4. Medical Facilities

*Existing Conditions.* The Wailuku based Maui Memorial Medical Center provides centralized medical services for the Island. Medical and dental offices are located in Kihei and Wailea to serve the Makena region's residents.

*Potential Impacts and Mitigation Measures.* As noted, since it is anticipated that the proposed project will not result in an overall significant increase in population levels, the proposed project is not anticipated to have an adverse impact upon existing medical facilities.

#### 5. Solid Waste

*Existing Conditions.* Only two landfills are currently operating on Maui, the Central Maui Landfill in Puunene, and the Hana landfill. Residential solid waste collection is provided by the County and taken to the Central Maui Landfill, which also accepts waste from private refuse collection companies.

*Potential Impacts and Mitigation Measures.* Based upon national standards for solid waste production the subject project will generate approximately 0.00175 tons/day per

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resident (A Primer on Industrial Environmental Impact, 1979). Thus, the project will generate approximately 0.154 tons or 308 pounds/day of solid waste. However, since it is anticipated that a considerable number of the Makena Estates units will be purchased as vacation homes, and therefore only occupied for part of the year, the amount of solid waste generated per day may be significantly less. Solid waste collection for the proposed project will be contracted to a private collection company. Green waste from the site will be either mulched on site or deposited at the Central Maui landfill's green waste recycling facility. It is envisioned that some of the green waste may also be used as mulch for other projects in South Maui. During construction the applicant will incorporate a job site recycling plan in order to reduce the amount of construction related waste generated by the project.

#### D. INFRASTRUCTURE

A Preliminary Engineering Report was prepared by Warren S. Unemori Engineering, Inc., which analyzes existing infrastructure systems accessible to the subject property and probable improvements to accommodate the proposed development. The report addresses water, sewer, drainage, roadway, and electrical and telephone systems (See Appendix E).

##### 1. Water

*Existing Conditions.* The source of water for the Makena area is deep wells located in Upper Waiehu at elevation 458 feet above sea level. These deep wells draw water from the basal lens referred to as the Iao Aquifer.

The Department of Water Supply also developed two new wells in Waihee. These deep wells draw water from heretofore untapped Waihee aquifer. The new wells are interconnected to the Upper Waiehu system by means of a 24-inch transmission line and a pair of booster pumps.

A series of 42-, 36- and 30-inch lines convey water from the Upper Waiehu well site to South Maui, feeding into numerous storage facilities en route. This high pressure line feeds into a 1.5 MG storage reservoir in Makena Resort located 4200 feet southeast of the project site at elevation 265 feet. An 18-inch outflow line conveys water back down to Makena Alanui to an 8-inch distribution line on Makena-Keoneoio Road. This line loops back towards Makena Alanui and ties back to a 12-inch distribution system located along the frontage of the project and on Makena Alanui. This distribution system can



also be fed directly from the 30-inch high pressure transmission line through a pressure reducing valve assembly. There are three (3) fire hydrants, Nos. 101, 841 and 840 on the makai side of Makena-Keoneoio Road fronting the project site.

*Potential Impacts and Mitigation Measures.* According to the "Domestic Consumption Guideline" in the Water System Standards for Department of Water Supply (DWS), the average daily demand for multi-family projects is 560 gallons per unit. For single family residential it is 600 gallons per unit. Therefore, for the 40 multi-family units and one manager's residence, the total average daily domestic demand is estimated at 32,000 gpd.

A new waterline will be extended into the project site from the 12-inch line on Makena-Keoneoio Road for domestic use and to provide fire flow. Fire hydrants will be installed within a radius of 150 feet of all buildings to ensure coverage as required by the Fire Department and Fire Marshall. In accordance with current DWS policy, each building will be metered separately. Low flow fixtures, draught tolerant plants, and efficient irrigation such as drip will be implemented in order to conserve water. Use of reclaimed water will be encouraged for dust control during the construction phase of the project.

## 2. Sewer

*Existing Conditions.* The project site is not presently sewerred. However, there is a sewer pump station located on the northwest side of the Makena Alanui/Makena-Keoneoio intersection that is owned and maintained by the County. Wastewater collected from Makena Surf and Makena Place is being pumped to SPS 10 in Wailea, located southwest of the Grand Wailea Hotel, through a 6" force main. A 12-inch force main then conveys wastewater from SPS 10 into an 18-inch gravity line on Wailea Alanui. A series of gravity interceptor pump stations and force mains then conveys the wastewater to the Kihei Reclamation Facility located south of the Silversword Golf Course above Piilani Highway.

*Potential Impacts and Mitigation Measures.* The Makena Estates multi-family condominium project is projected to generate 14,350 gallons of wastewater per day. A gravity system will be installed onsite to collect wastewater from each building and direct it into a private onsite wet-well mounted pump station located at the southwest corner of the project site. A 4- or 6-inch force main will also be installed to convey wastewater from the onsite pump station to the existing County pump station located at the northwest corner of the Makena Alanui / Makena-Keoneoio Road intersection.



The existing collection and transmission system along Kihei Road up to and including the Kihei Wastewater Reclamation Facility (KWRF) were recently upgraded. According to Division of Wastewater Management, the KWRF has approximately 2.2 million gallons of capacity left.

The developer will be contributing his prorata share of cost for the upgrade of the transmission system and reclamation facility by paying a one-time assessment of approximately \$6.03 per gallon of wastewater generated by the Makena Estates project as required by County ordinance.

### 3. Drainage

*Existing Conditions.* The project site is bisected by a drainageway that extends from its northeasterly boundary to its westerly boundary on Makena-Keoneoio Road. Three 5'x6' box culverts convey the offsite runoff across Makena Alanui into the project site. Flow in this channel presently sheet flows across Makena-Keoneoio Road into a 10' x 18' con span drainage system located in the adjoining makai property (Makena Place) into the ocean.

A second drainage channel conveys runoff into this drainageway from a small contributory drainage area located south of the project site. The existing runoff from the contributory drainage area located to the east and south of the project site for a 100-year 24 hr. storm is estimated to be 936 cfs. Current runoff for a 50-year 1 hr. recurrence rainfall from the project site is estimated to be around 10 cfs.

*Potential Impacts and Mitigation Measures.* The post development onsite surface runoff volume generated by the project site will be approximately 18.8 cfs. Accordingly, there will be a net increase of approximately 8.8 cfs due to the increase of impervious areas throughout the project site. In accordance with the County's "Rules for the Design of Storm Drainage Facilities" the offsite runoff of 936 cfs will be allowed to flow in the existing drainageway across the project site and Makena-Keoneoio Road as it is currently doing. The existing inundation limits for a 100-year 24-hour storm will be respected. However, portions of the existing drainageway may be lowered to increase its capacity and to reduce the inundation limits. Areas of the existing drainageway that are disturbed will be lined with geocell matting filled with topsoil and grassed with St. Augustine or buffel grass to stabilize it. The grassed channel will be integrated with the general grading of the site to blend with the existing topography and retain its natural appearance. The existing at-grade drainage pattern across Makena-Keoneoio Road will be retained.



Additional onsite runoff generated by the project estimated at 8.8 cfs will be directed into onsite subsurface detention facilities. These facilities will not only keep the post development peak flow volumes at predevelopment rates, but will also serve as sedimentation traps and filters to prevent sediments or pollutants from migrating into the coastal waters. Landscape planting within the drainageway will also serve to retain and desilt runoff from the site.

A National Pollution Discharge Elimination System (NPDES) permit will be required for the project since the site is greater than 5 acres. The NPDES permit, which is essentially an erosion control plan for construction activities, will incorporate Best Management Practices (BMP's) designed specifically to reduce the potential for non-point sources of pollution from impacting nearshore water quality. Project plans call for long-term, as well as short-term measures, which will minimize the potential impacts from runoff from the property. These measures include the following:

#### **Long-term**

Additional onsite runoff generated by the project will be directed into sub-surface detention facilities. These facilities will not only keep the post development peak flow volumes at predevelopment rates, but will also serve as sedimentation traps and filters to prevent sediments or pollutants from migrating into coastal waters.

The drainageway will be maintained in a vegetative state in order to act as a filter to trap sediments in runoff.

#### **Short-term**

Stormwater control structures will be constructed prior to initiation of major site improvements. This will include installation of the permanent stormwater retention/siltation facilities as well as temporary retention/siltation basins throughout the site.

Temporary berms to divert storm runoff to the retention basins will be constructed.

Temporary silt screens will be installed along Makena Keoneio Road and within drainage swales along the project limits. Temporary silt screens will also be installed around or within new catch basins and drain inlets. Topsoil stockpiles will be covered or stabilized.



The amount of construction time spent in streambeds will be minimized. Sediment and debris from construction activities will be properly disposed of. Bare areas will be replanted or covered as soon as grading or construction is completed.

#### 4. Roadways and Traffic

*Existing Conditions.* A Traffic Impact Analysis Report was prepared by Phillip Rowell and Associates which describes the traffic characteristics of the proposed project and likely impacts to the adjacent roadway network. The report analyzed existing conditions in the area, projected cumulative traffic conditions, analyzed project-related traffic conditions, and discussed traffic impacts and mitigation measures (See Appendix F, Traffic Impact Assessment Report).

The project consists of 40 residential condominiums plus one unit for an on-site resident manager. The project will have three driveways. One driveway will be along Makena Alanui (Driveway 'A') and the remaining two will be along Makena-Keoneoio Road (Driveways 'B' and 'C').

The following is a summary of the major roadways in the study area:

##### **Makena Alanui**

Makena Alanui is a major County roadway connecting Makena and Wailea. In the vicinity of the proposed project, the highway is a two-lane, two-way facility. No separate left turn lanes are provided. The posted speed limit is 30 miles per hour in the vicinity of the project.

##### **Makena-Keoneoio Road**

Makena-Keoneoio Road is a two-way street providing access to the beach from Makena Alanui. The intersection with Makena Alanui is a 'T' intersection and is unsignalized. No speed limit is posted.

The process of identifying the traffic-related impacts of the proposed project generally involves the determination of weekday peak-hour trips that would be generated by the proposed project, distribution and assignment of these trips on the approach and departure routes, and determination of the levels-of-service at affected intersections and driveways subsequent to implementation of the project. Future traffic volumes generated by a project are typically estimated using the procedure described in *Trip*



Generation published by the Institute of Transportation Engineers. Trip rates for low-rise residential condominiums were used to estimate the trips generated by this project. The peak hour of the project coincides with the peak hour of the adjacent street. The calculated AM and PM peak hour trips are shown in the table below.

#### Trip Generation Summary

Time Period	Direction	Peak Hour Trips
AM Peak Hour	Inbound	7
	Outbound	20
	Total	27
PM Peak Hour	Inbound	19
	Outbound	15
	Total	34

The project related trips were distributed along the anticipated approach routes to the project site based on the directional distribution of peak hour traffic along Makena Alanui. Project-related traffic was assigned to the various traffic movements at the intersection of Makena Alanui at Makena-Koeneoio. Project trips were distributed for a scenario with three driveways as described in the project description.

Cumulative plus project traffic conditions are defined as 2005 background conditions plus project related traffic. The incremental difference between cumulative and cumulative plus project is the traffic impact of the project under study.

**Potential Impacts and Mitigation Measures.** The assumptions for the LOS analysis are:

1. The intersection of Makena Alanui Road at Old Makena Road and the driveways will be unsignalized.
2. The intersection configuration will be unchanged.

The results of the LOS analysis for the Makena Alanui and Makena-Keoneoio roads are shown in the table below.

#### Level-of-Service Analysis for 2005 Peak Hour Conditions

Intersection and Movement	Cumulative		Cumulative Plus Project		Changes
	Delay (s)	LOS (4)	Delay	LOS	Delay Change
Intersection Total	0.3	A	0.6	A	0.3
Northbound Left & Right	5.0	A	5.5	B	0.5



Westbound Left	2.8	A	2.9	A	0.1
	<b>PM PEAK HOUR</b>				
Intersection Total	0.4	A	0.6	A	0.2
Northbound Left & Right	6.6	B	7.0	B	0.4
Westbound Left	2.8	A	2.8	A	0.0

**NOTES:**

1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the generator.
2. Delay is in seconds per vehicle.
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. See Tables 1 and 2 for definitions.

The conclusion of the level-of-service analysis is that there is no change in the level-of-service as a result of the proposed project and that the intersection will operate at level-of-service A during the morning and afternoon peak hour.

A level-of-service analysis was performed for the three proposed driveways to confirm that the proposed configurations will operate acceptably. The analysis concluded that all the driveways will operate at good levels-of-service during peak traffic hour using the lane configurations.

The sight distance along Makena Alanui from Driveway A was examined and determined to be acceptable for the posted speed limits. For Case IIIb, which is the minimum sight distance required for a vehicle to turn left from the proposed driveway and accelerate to the 85<sup>th</sup> percentile speed, and a design speed of 35 MPH, a sight distance of 350 feet is required. The sight distance for traffic approaching from the south of Drive A was measured in the field at 408 feet, which exceeds the minimum required sight distance of 350 feet.

The conclusions of the LOS analysis for 2005 conditions are:

1. There is no change in the LOS at the intersection of Makena Alanui at Makena-Keoneoio road as a result of the proposed project. The intersection will operate at LOS A during both morning and afternoon peak hours.
2. No roadway improvements are required to accommodate estimated traffic generated by the project.
3. The driveways for the project should be one lane in and one lane out.
4. Landscaping should be designed to not restrict sight distances along side streets.

Rolled curb and gutter will be installed along the frontages of Makena Keoneoio Road while curb, gutter, and sidewalk will be installed along Makena Alanui and improved to County Rural standards. An eight (8) foot road widening strip along the Makena-Keoneoio Road frontage will be improved and dedicated to the County in accordance with the provisions of Section 16.26A.4601 of the Maui County Code.





Parking lots and roadways within the project site will also be designed and constructed in accordance with the provision of Section 19.36 Offsite Parking Ordinance of the Maui County Code.

#### **5. Electrical and Telephone**

*Existing Conditions.* Electrical, telephone and cable TV services will be extended underground into the project site from the underground distribution on Makena-Keoneoio Road. The parking lots and walkways will be lighted in accordance with the provisions of the Maui County Code. To the extent feasible, non-glare fixtures will be used for this purpose.

*Potential Impacts and Mitigation Measures.* The proposed project will not have any adverse impact upon the existing electrical or telephone systems that will serve the subject property.



## IV. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

### A. STATE LAND USE LAW

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes four major land use districts into which all lands in the State are placed. These districts are designated Urban, Rural, Agricultural, and Conservation. The subject property is within the Urban District. The proposed improvements are permitted within the Urban District.

### B. MAUI COUNTY ZONING

The subject property is situated within the County of Maui's A-2, Apartment District. The A-2 district allows for multi-family dwellings, which may be built up to four stories in height, on lots with a minimum lot size of 10,000 square feet. The proposed improvements are permitted within the A-2, Apartment District.

### C. GENERAL PLAN OF THE COUNTY

The General Plan of the County of Maui (1990 update) provides long-term goals, objectives, and policies directed toward improving living conditions in the County. The following General Plan Objectives and Policies are applicable to the proposed project:

#### I.A. Population

Objective No. 2: To use the land within the County for the social and economic benefit of all the County's residents.

*Policies:*

- (c). *Encourage land use methods that will provide a continuous balanced inventory of housing types in all price ranges.*



**Goal:**            Urban Design

**Objective No. 1.:**    To see that all developments are well designed and are in harmony with their surroundings.

*Policies:*

(a) *Require that appropriate principles of urban design be observed in the planning of all new developments.*

#### **D. KIHEI-MAKENA COMMUNITY PLAN**

Nine 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 Maui County General Plan. The purpose of the community plan is to outline a relatively detailed agenda for carrying out these objectives.

The subject property is located within the Kihei-Makena Community Plan region. The Community Plan was recently adopted by ordinance No. 2641 on March 6, 1998.

The following Kihei-Makena Community Plan goals, objectives, and policies are applicable to the proposed action:

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

*Objectives and Policies:*

c. *Upon adoption of this plan, allow no further development unless infrastructure, public facilities, and services needed to service new development are available prior to or concurrent with the impacts of new development.*

*Analysis.* Section III of this report addressed the impact that the proposed project would have upon existing public infrastructure, facilities, and service systems. Based



upon the analysis, public infrastructure and services will not be significantly impacted by the project. Thus, the necessary infrastructure, public facilities, and services will be available prior to and/or concurrent with development of the site.

**Goal:**            Environment.    Preservation, protection, and enhancement of Kihei-Makena's unique and fragile environmental resources.

**Objectives and Policies:**

- c.    *Require that new shoreline development respect shoreline resources and maintain public access:*
  - a.    *Storm water run-off from proposed developments shall not adversely affect the marine environment and nearshore and offshore water quality.*

*Analysis:* As described in Section III of this report, the increase in impervious surfaces created by the project will result in increased runoff estimated at 8.8 cfs, which will be directed into onsite subsurface detention facilities. These facilities will not only keep the post development peak flow volumes at predevelopment levels, but will also serve as sedimentation traps and filters to prevent sediments or pollutants from migrating into the coastal waters. In addition, the natural drainage system will be largely maintained in its natural condition and landscape planting within the drainageway will also serve to retain and desilt runoff from the site.

Thus, it is not anticipated that the proposed project will adversely affect the marine environment and/or nearshore and offshore water quality. Public access to the shoreline will not be impacted by the proposed development.

**Goal:**            Housing and Urban Design

*Objectives and Policies*

- (c.)    Preserve Kihei-Makena's significant views of the Pacific Ocean and the broad vista to the Central Maui and Upcountry region. Prohibit the use of walls higher than 4 feet in front yard setbacks especially in areas close to the shoreline where view corridors can be blocked.

*Analysis:* As described in Section III of this report, the subject property is located within the destination resort area of Makena, which is renowned for its significant views of the



Pacific Ocean and Haleakala. The Pacific Ocean and the islands of Molokini, Lana'i, and Kaho'olawe are visible from the property.

Numerous scenic resources have been identified in the Kihei-Makena area which are identified and discussed in the Maui Scenic Coastal Resources Study, August 1990 (See Appendix D). Appendix D in this report appears to identify makai ocean views occurring across the subject property. However, as described in Section III.A.8 of this report, and as illustrated in Figure No. 10, Visual Impact Assessment, no existing coastal or ocean views across the property exist.

From an urban design perspective, the proposed development will alter the character of the property and immediate area since adjacent properties to the north, south, and east are undeveloped. To soften the visual impacts into the project area, the natural drainage system, which runs through the center of the property, will be largely maintained in its natural condition and will serve as an intact open space system providing visual relief. Prominent trees including coconut palms, manila palms, monkey pods, and Hawaiian kou among others will be planted throughout the property and along the boundary lines. The natural drainage system encompasses approximately 0.85 acres and the remaining landscape ground cover encompasses 2.725 acres, providing a total of 3.575 or approximately 58% of the property in vegetated open space.

As such, the proposed project is not anticipated to significantly impact public view corridors and will not produce significant adverse impact upon the visual character of the site and its immediate environs.

- (d.) Provide for integration of natural physical features with future development of the region. New development shall incorporate features such as gulches and wetlands into open space and pedestrian pathway and bikeway systems.

*Analysis:* The subject property maintains a natural drainage system which flows through the center of the property. The drainage system will be largely retained in its natural condition and will serve as an open space buffer between buildings.

- (e.) Implement landscaped setbacks for future multi-family and commercial areas. Developments shall provide space for landscaped pedestrian ways and bikeways.



*Analysis:* The project will incorporate setbacks along the perimeter of the property which are predominantly greater than what is required pursuant to MCC Section 19.12.070. In addition, a rolled curb and 8-foot wide grassed shoulder along the project's frontage will serve as a pedestrian way.

- (f.) Incorporate the principles of xeriscaping in all future landscaping.

*Analysis:* The proposed landscaping plans incorporate the principles of xeriscaping into the design.

- (g.) Encourage the use of native plants in landscaping in the spirit of Act 73, Session Laws of Hawaii, 1992.

*Analysis:* Native plants will be used to the greatest extent practical in the proposed landscape design.

**Goal:**            Physical and Social Infrastructure

Transportation

*Objectives and Policies:*

- (f.) Protect and preserve the traditional rural scale and character of existing portions of old Makena Road in a manner similar to that existing at Keawalai Church.

*Analysis:* As discussed in the Preliminary Engineering Report (See Appendix E), Makena-Keoneoio Road (Old Makena Road) is described as a minor County collector road. County roadway standards require that a right-of-way width of 56 feet, pavement width of 36 feet, and curb gutter and sidewalk be provided for minor urban collector streets. However, in order to protect the traditional rural scale and character of Makena-Keoneoio Road, which the County's Department of Public Works and Waste Management supports, rural standards are proposed, which require a 50 feet right-of-way and pavement width of 24 feet. A rolled curb with grassed shoulder will be provided along the project frontage in order to soften the project's frontage and maintain a rural character.

**Goal:**            Liquid and Solid Waste

Drainage




*Objectives and Policies*

- a. Design drainage systems that protect coastal water quality by incorporating best management practices to remove pollutants from runoff. Construct and maintain, as needed, sediment retention basins and other best management practices to remove sediments and other pollutants from runoff.
- b. Construct necessary drainage improvements in flood prone areas. Where replacement drainage are required for flood protection, these systems shall be designed, constructed, and maintained using structural controls and best management practices to preserve the functions of the natural system that are beneficial to water quality. These functions include infiltration, moderation of flow velocity, reduced erosion, uptake of nutrients and pollutants by plants, filtering, and settlement of sediment particles. The use of landscaped swales and unlined channels shall be urged.
- c. Minimize the increase in discharge of storm water runoff to coastal waters by preserving flood storage capacity in low-lying areas, and encouraging infiltration of runoff.

*Analysis.* As discussed in the Preliminary Engineering Report (See Appendix E), alteration to the natural drainage pattern of the surface runoff volumes will be kept to a minimum. Additional onsite runoff generated by the project estimated at 8.8 cfs will be directed into onsite subsurface detention facilities. These facilities will not only keep the post development peak flow volumes at predevelopment rates, but will also serve as sedimentation traps and filters to prevent sediments from migrating into the coastal waters. In accordance with the County's "Rules for the Design of Storm Drainage Facilities" the offsite runoff of 936 cfs will be allowed to flow across the project as it is currently doing. The existing inundation limits for a 100-year 24-hour storm flow will be respected. Only the major storm runoff will flow over Makena-Keoneoio Road as it is presently doing. In addition, the natural drainage system will be largely maintained in its natural condition and landscape planting within the drainageway will also serve to retain and desilt runoff from the site.

Goal: Recreation

*Objectives and Policies*

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- 
- b. Provide for a range of park sizes and types at neighborhood, community and regional scales. New residential developments shall provide recreational facilities on-site to meet the immediate needs of project residents.

*Analysis:* The Makena Estates development will offer an on-site recreation cabana and swimming pool for its residents. Moreover, the owners will comply with the requirements for Parks and Playground, pursuant to Maui County Code Section 18.16.320, in order to satisfy park assessment requirements. Thus, the proposed project is not anticipated to impact public recreational facilities in the region.

C. **Planning Standards**

3. **Urban Design Standards**

a. **Building Form**

3. Limit resort development throughout the region to thirty-five (35) feet in building height for sights near the shoreline. Building height limits may gradually be increased up to seventy-five (75) feet for inland resort development provided that important mauka/makai vistas are maintained, and impacts to coastal resources are minimized. Resort community planning and design shall integrate recreational amenities with adequate shoreline setback and public shoreline access provisions.

*Analysis:* The proposed conceptual site plan incorporates a mixture of 3- and 4-story buildings with heights not exceeding 45-feet and 60-feet, respectively. The A-2, Apartment District, allows for a maximum building height of 4-stories or 60 feet. Thus, the proposed building heights conform to the established zoning standards.

The Kihei-Makena Community Plan recommends a maximum building height of 75-feet for inland resort development. The Makena Estates project is situated immediately north of the Makena resort destination area, makai of the Wailea Golf Courses, and in proximity to other resort uses including the Makena Surf Condominiums across Makena-Keoneoio Road. In this context, the proposed project is considered a resort development and is consistent with the maximum 75-foot inland resort height limit.





As discussed in Section III of this report, the proposed building heights will not impact existing ocean and Haleakala Mountain views (See Section III.B.8 and Figure No. 10 for a discussion of the visual impacts). To be sensitive to the site's topography, the two (2) proposed 4-story buildings are to be built inland from Makena-Keoneoio Road, along the southerly boundary line, at the base of a steep tree lined parallel ridge which creates a visually appropriate scale and screens the southerly view.

## **E. SPECIAL MANAGEMENT AREA OBJECTIVES AND POLICIES**

The subject project is located within the Special Management Area (SMA). As such, the proposed improvements will require an SMA Use Permit. Pursuant to Chapter 205A, Hawaii Revised Statutes, and the Rules and Regulations of the Planning Commission of the County of Maui, 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 Planning Commission.

### **1. Recreational Resources**

Objective: Provide coastal recreational resources accessible to the public.

Policies:

- (A) Improve coordination and funding of coastal recreation planning and management; and
- (B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:
  - (i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
  - (ii) Requiring placement of coastal resources having significant recreational value, including but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or require reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;
  - (iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;
  - (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;



- (v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having standards and conservation of natural resources;
- (vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;
- (vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing;
- (viii) Encourage reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, county planning commissions; and crediting such dedication against the requirements of Section 46-6, HRS.

*Analysis.* The subject property is separated from the ocean by Makena-Keoneio Road and residential homes fronting the coastline and thus, will have no direct impact on the public's use of the shoreline area. In order to protect the recreational value of nearshore resources, Best Management Practices, will be employed during construction activities to minimize the potential of erosion and silt movement. Moreover, due to the presence of the proposed on-site drainage and retention system, which will keep the post development peak flow volumes at predevelopment levels and will serve as sedimentation traps and filters to prevent sediments or pollutants from migrating into the coastal waters, there will be minimal impacts to nearshore waters due to runoff or other potential sources of non-point sources of pollution.

## **2. Historical/Cultural Resources**

**Objective:** Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

**Policies:**

- (a) Identify and analyze significant archeological resources;
- (b) Maximize information retention through preservation of remains and artifacts or salvage operations; and
- (c) Support state goals for protection, restoration, interpretation, and display of historic structures.



*Analysis.* As discussed in Section III of this report, Scientific Consultant Services, Inc. completed an archaeological inventory survey in October 1994. The survey covered approximately 6 acres. The fieldwork was carried out January 18 through 31, 1994. A total of six sites (Sites 50-14-3513 through 3518), with 25 component features were recorded within the project area. Feature functions within the six sites included temporary and permanent habitation, activity areas, and agriculture. All six sites are significant under Criterion "D" for the data they have yielded or are likely to yield. The survey report recommended that: "further data recovery be carried out at Sites 3513, 3516 for the purpose of identifying and documenting any additional features that might be present." All other sites were decided to have been adequately documented. The data recovery work for site nos. 3153 and 3516 has been recently completed (See letter dated April 4, 2000, from Scientific Consultant Services, Inc. to the State Historic Preservation Division in Appendix B).

In addition to the on-site features, an ancient heiau, Pohakunahaha Heiau (Site 50-14-197) is located adjacent to the subject parcel, on the original Parcel 12. This heiau site is separated from the nearest proposed building by approximately 95 feet.

All required data recovery, identification, and documentation of sites has been completed as prescribed by the State of Hawaii, Historic Preservation Division. In the event that sub-surface historic/cultural remains are encountered during construction, work will be stopped and the State Historic Preservation Office will be contacted to assess the significance of the find and recommend appropriate mitigation measures, if necessary. A 75-foot buffer, which was recommended in the Cultural Impact Assessment Report (See Appendix C, Cultural Impact Assessment Report), will be established around the heiau to the nearest building and a clear view from the mountains to the ocean along the southerly property line will be maintained to preserve the integrity of the heiau.

Thus, all impacts have been addressed through the prescribed mitigation measures thereby minimizing any potential for impact to archeological sites on the property.

### **3. Scenic and Open Space Resources**

Objective: Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

- (a) Identify valued scenic resources in the coastal zone management area;



- (b) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
- (c) Preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources; and
- (c) Encourage those developments that are not coastal dependent to locate in inland areas.

*Analysis.* As described in Section III of this report, the subject property is located within the destination resort area of Makena, which is renowned for its significant views of the Pacific Ocean and Haleakala. The Pacific Ocean and the islands of Molokini, Lana'i, and Kaho'olawe are visible from the property.

Numerous scenic resources have been identified in the Kihei-Makena area which are identified and discussed in the Maui Scenic Coastal Resources Study, August 1990 (See Appendix D). Appendix D in this report appears to identify makai ocean views occurring across the subject property. However, as described in Section III.A.8 of this report, and as illustrated in Figure No. 10, Visual Impact Assessment, no existing coastal or ocean views across the property exist. However, the conceptual landscape planting plan for the project may create enhanced mauka and makai view opportunities through the natural drainage channel.

From an urban design perspective, the proposed development will alter the character of the property and immediate area since adjacent properties to the north, south, and east are undeveloped. To soften the visual impacts into the project area, the natural drainage system, which runs through the center of the property, will be largely maintained in its natural condition and will serve as an intact open space system providing visual relief. Prominent trees including coconut palms, manila palms, monkey pods, and Hawaiian kou among others will be planted throughout the property and along the boundary lines. The natural drainage system encompasses approximately 0.85 acres and the remaining landscape ground cover encompasses 2.725 acres, providing a total of 3.575 or approximately 58% of the property in vegetated open space.

As such, the proposed project is not anticipated to significantly impact public view corridors and will not produce significant adverse impact upon the visual character of the site and its immediate environs.



#### 4. Coastal Ecosystems

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

- (a) Improve the technical basis for natural resource management;
- (b) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
- (c) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
- (d) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

*Analysis.* As described in Section III of this report, the increase in impervious surfaces created by the project will result in increased runoff estimated at 8.8 cfs, which will be directed into onsite subsurface detention facilities. These facilities will not only keep the post development peak flow volumes at predevelopment levels, but will also serve as sedimentation traps and filters to prevent sediments or pollutants from migrating into the coastal waters. Thus, the project will not have a significant direct impact on the region's coastal ecosystem, and with the incorporation of appropriate measures during construction, there should be no significant adverse impacts to nearshore waters from point and non-point sources of pollution.

#### 5. Economic Uses

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

Policies:

- (a) Concentrate coastal dependent development in appropriate areas;
- (b) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area;
- (c) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such development and permit reasonable long-



term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

- (i) Use of presently designated locations is not feasible;
- (ii) Adverse environmental impacts are minimized; and
- (iii) The development is important to the State's economy.

*Analysis.* The subject project is consistent with the State land use designation, zoning and community plan designations for the property and is within an area that supports other similar types uses, including single-family residences, resorts, and resort residential type developments. As such, the proposed project is within an area that is presently used and designated for coastal development.

#### **6. Coastal Hazards**

**Objective:** Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.

**Policies:**

- (a) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and non-point source pollution hazards;
- (b) Control development in areas subject to storm wave, tsunami, flood, erosion, subsidence, and point and non-point pollution hazards;
- (c) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
- (d) Prevent coastal flooding from inland projects; and
- (e) Develop a coastal point and nonpoint source pollution control program.

*Analysis.* According to Panel 330 of 400 of the Flood Insurance Rate Maps, prepared by the U.S. Federal Emergency Management Agency, Federal Insurance Administration, which was revised on July 18, 1997, portion of the project site is situated within Flood Zone A and C (See Figure No. 5). Zone A is designated as an area of 100 year floods where flood elevations and flood hazard factors have not been determined. Zone C is designated as an area of minimal flooding. No habitable structure will be built within Flood Zone A. The proposed project should not be affected by or have adverse impact upon its neighbors or downstream properties with regards to flood hazard potential (See Appendix D , Preliminary Drainage Report).

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As described in Section III of this report, the proposed project will incorporate drainage control mitigation measures in order to minimize the impact of non-point source pollution to adjacent properties and coastal waters.

## **7. Managing Development**

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

**Policies:**

- (a) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- (b) Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and
- (c) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning process and review process.

**Analysis.** The development of the subject property is being conducted in accordance with applicable State and County requirements. Opportunity for review of the proposed action is provided through the County's Special Management Area (SMA) permitting processes as well as through the environmental review process established by Chapter 343, HRS.

## **8. Public Participation**

**Objective:** Stimulate public awareness, education, and participation in coastal management.

**Policies:**

- (a) Maintain a public advisory body to identify coastal management problems and to provide policy advise and assistance to the coastal zone management program.
- (b) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and
- (c) Organize workshops, policy dialogues, and site-specific medications to respond to coastal issues and conflicts.



*Analysis.* Prior to submittal of the application, pre-consultation was conducted with adjacent property owners, the Makena Community Association, and governmental agencies (See Appendix A, Agency and Pre-consultation Letters). These activities included personnel meetings, mailouts, and informational meetings in order to describe the proposed project and solicit issues that need to be addressed through the environmental assessment process. During the scheduled public hearings, the public will have opportunity to review and comment on the proposed project. Surrounding land owners will be notified of the scheduled public hearing dates. Public hearing dates and location maps will also be published in the Maui News. The public will be allowed to participate in the public hearing portion of the Maui Planning Commission's review process and during the 30-day public comment period for the Draft Environmental Assessment.

#### **9. Beach Protection**

Objective: Protect beaches for public use and recreation.

Policies:

- (a) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;
- (b) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
- (c) Minimize the construction of public erosion-protection structures seaward of the shoreline.

*Analysis.* Makena-Keoneoio Road, as well as residential structures along the shoreline, separates the subject property from the shoreline. Accordingly, the project will not involve the construction of any structures within the shoreline area and the subject property will not have a direct physical impact upon any public beaches, due to its separation from the coastline.

#### **10. Marine Resources**

Objective: Implement the State's ocean resources management plan.

Policies:





- (a) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- (b) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
- (c) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;
- (d) Assert and articulate the interest of the state as a partner with federal agencies in the sound management of the ocean resources within the United States exclusive economic zone;
- (e) Promote research, study, and understanding of ocean processes, marine life, and other ocean development activities relate to and impact upon the ocean and coastal resources; and
- (f) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

*Analysis.* The proposed project does not involve the direct use or development of marine resources. The project will produce no direct impact on the region's coastal or marine resources, and with the incorporation of erosion and drainage control measures during construction and after construction as identified in this report, there should not be significant adverse impacts to nearshore waters from point and non-point sources of pollution. Therefore, the subject project will not have any significant impacts upon any coastal or marine resources.

#### **F. ENVIRONMENTAL ASSESSMENT SIGNIFICANCE CRITERIA**

A finding of no significant impact (FONSI) is anticipated and therefore an environmental impact statement will not be required for the project. This determination has been made based on the detailed analyses contained within this document and in accordance with the following significance criteria, which are outlined in section 11-200-12 of the Department of Health's rules relating to environmental impact statements.

1. The proposed action will *not* result in an irrevocable commitment to loss or destruction of natural or cultural resources.

*Analysis.* As documented in this report, the proposed project will not involve the loss or destruction of any natural or cultural resource (See Section III.A.B.C.D).

2. The proposed action will *not* curtail the range of beneficial uses of the environment.



*Analysis.* The subject property is within the State's Urban District and is zoned and community planned for multi-family development. The subject property was once used for animal grazing but is no longer being used for that purpose. The State's and County's land use policies support urbanization of the parcel. Thus, the proposed action will not curtail the range of beneficial uses of the environment.

3. The proposed action will *not* conflict with State or County long-term environmental policies and goals as expressed in Chapter 344, HRS, and those which are more specifically outlined in the Conservation District Rules.

*Analysis.* The project is being developed in compliance with the State's long-term environmental goals. As documented in this report, adequate mitigation measures will be implemented to minimize the potential for negative impact to the environment.

4. The proposed action will *not* substantially affect the economic or social welfare and activities of the community, county or state.

*Analysis.* Short-term economic impacts will result from the increase in activity associated with the construction of the project. A small number of full and part-time jobs will be created in order to support the operation phase of the development.

5. The proposed action will *not* substantially affect public health.

*Analysis.* There are no special or unique aspects of the project that will have a direct impact on public health. It is anticipated that occupants of the project will utilize existing medical facilities located in Kihei, Kahului, and Wailuku and these facilities will not be significantly impacted by the project.

6. The proposed action will *not* result in substantial secondary impacts.

*Analysis.* There will be a slight affect on local population levels upon buildout of the project with the addition of 40 resort condominium units and the manager's unit. Using national demographic multipliers for standard housing types (American Housing Survey, 1987), the proposed project may increase the population of the immediate Makena area by approximately 88 persons. However, it is anticipated that many of the units will be sold as vacation homes to buyers from outside of Maui County thereby reducing the number of people at the project at any given time. The projected increase in population is not significant in relation to existing population levels in Kihei-Makena and will not result in substantial secondary impacts.



7. The proposed action will *not* involve substantial degradation of environmental quality.

*Analysis.* Mitigation measures will be implemented during the construction phase in order to minimize negative impacts on the environment, especially with regards to construction runoff. Also, the design of the project has incorporated mitigation measures to minimize impacts to nearshore waters that could arise from an increase in runoff generated on the site as a result of the project (See Section III.D.3 for a discussion of drainage). Other environmental resources such as flora and fauna, air and water quality, and topography and soils will not be impacted by the subject project.

8. The proposed project will not produce cumulative impacts and does *not* have considerable effect upon the environment or involve a commitment for larger actions.

*Analysis.* The proposed project does not involve a commitment for larger action on behalf of the applicant or any public agency. The subject property is State and County zoned and community planned for urban development. As described in this report, the project will not significantly impact public infrastructure and services including roadways, drainage facilities, water systems, sewers, educational facilities, and parks. In addition, the project is not anticipated to produce considerable effect on the environment and will involve a commitment for larger actions.

9. The proposed project will *not* affect a rare, threatened, or endangered species, or its habitat.

*Analysis.* As described in Section III of this report, there are no rare, threatened, or endangered species or habitat at the project site.

10. The proposed action will *not* substantially or adversely affect air and water quality or ambient noise levels.

*Analysis.* As described in Section III of this report, there is a potential for negative impacts to air or water quality and ambient noise levels related to short-term construction activities. Air, noise and dust impacts will be mitigated through implementation of standard mitigation measures as identified previously in this report. It is not anticipated that there will be significant long-term impacts to air or water quality and ambient noise levels due to the operation phase of the development.



11. The proposed action will *not* substantially affect or be subject to damage by being located in an environmentally sensitive area, such as flood plain, shoreline, tsunami zone, erosion-prone areas, estuary, fresh waters, geologically hazardous land or coastal waters.

*Analysis.* According to Panel Numbers 150003 0330B revised June 1, 1981, of the Flood Insurance Rate Maps, prepared by the U.S. Federal Emergency Management Agency, Federal Insurance Administration, the project site is situated within Flood Zones A and C (See Figure No. 5). Zone A is designated as an area of 100 year flood where flood elevations and flood hazard factors have not been determined. Zone C is designated as an area of minimal flooding. The portion of the project site located within areas designated as Zone A will have habitable structures built above designated flood plain elevations. The proposed project should not be affected by or have adverse impact upon its neighbors or downstream properties with regards to flood hazard potential (See Appendix E, Preliminary Drainage Report).

12. The proposed action will *not* substantially affect scenic vistas or view planes identified in county or state plans or studies.

*Analysis.* As discussed in Section III.A.8 of the report, the proposed project is not anticipated to significantly impact public view corridors and will not produce significant adverse impact upon the visual character of the site and its immediate environs (See Section III.A.8 and Figure No. 8 for an analysis of visual impacts).

13. The proposed action will not require substantial energy consumption

*Analysis.* Upon buildout of the project, energy consumption will be increased, however, given existing levels of usage in the area the increase is considered insignificant. The project will incorporate use of energy efficient fixtures and lighting as appropriate. It is anticipated that a significant number of project occupants will either be second home buyers or retirees and will therefore not be required to travel to and from work by automobile. The majority of automobile usage is envisioned to occur between the project and recreational facilities, shopping and entertainment areas within Kihei-Makena. Thus, it is not anticipated that the resultant increase in energy consumption will be significant in the context of existing levels of vehicular energy usage in Kihei-Makena, and on Maui.



## V. FINDINGS AND CONCLUSIONS

This environmental assessment has examined the environmental and socio-economic impacts associated with the applicant's proposal to develop a 40 unit residential condominium project and managers residence on an approximate 6.180-acre parcel located in Makena, Maui, Hawaii.

The analysis concludes that the project should not result in significant environmental impacts to surrounding properties, nearshore waters, natural resources, or archaeological and historic resources on the site or in the immediate area. Public infrastructure and services including roadways, sewer and water systems, medical facilities, police and fire protection, parks, and schools, are, or will be adequate to serve the project and will not be significantly impacted by the project. The proposed project will not impact public view corridors and will not produce significant adverse impact upon the visual character of the site and its immediate environs.

The subject property is situated within the State's Urban District and is County zoned and community planned for multi-family development. Therefore, the proposed project is in conformance with State and County land use plans and policies including Chapter 205A, HRS, as well as the Kihei-Makena Community Plan Land Use Map.

In light of the foregoing, it is hereby concluded that the proposed project will not result in significant impacts to the environment and a Finding of No Significant Impact (FONSI) is warranted.

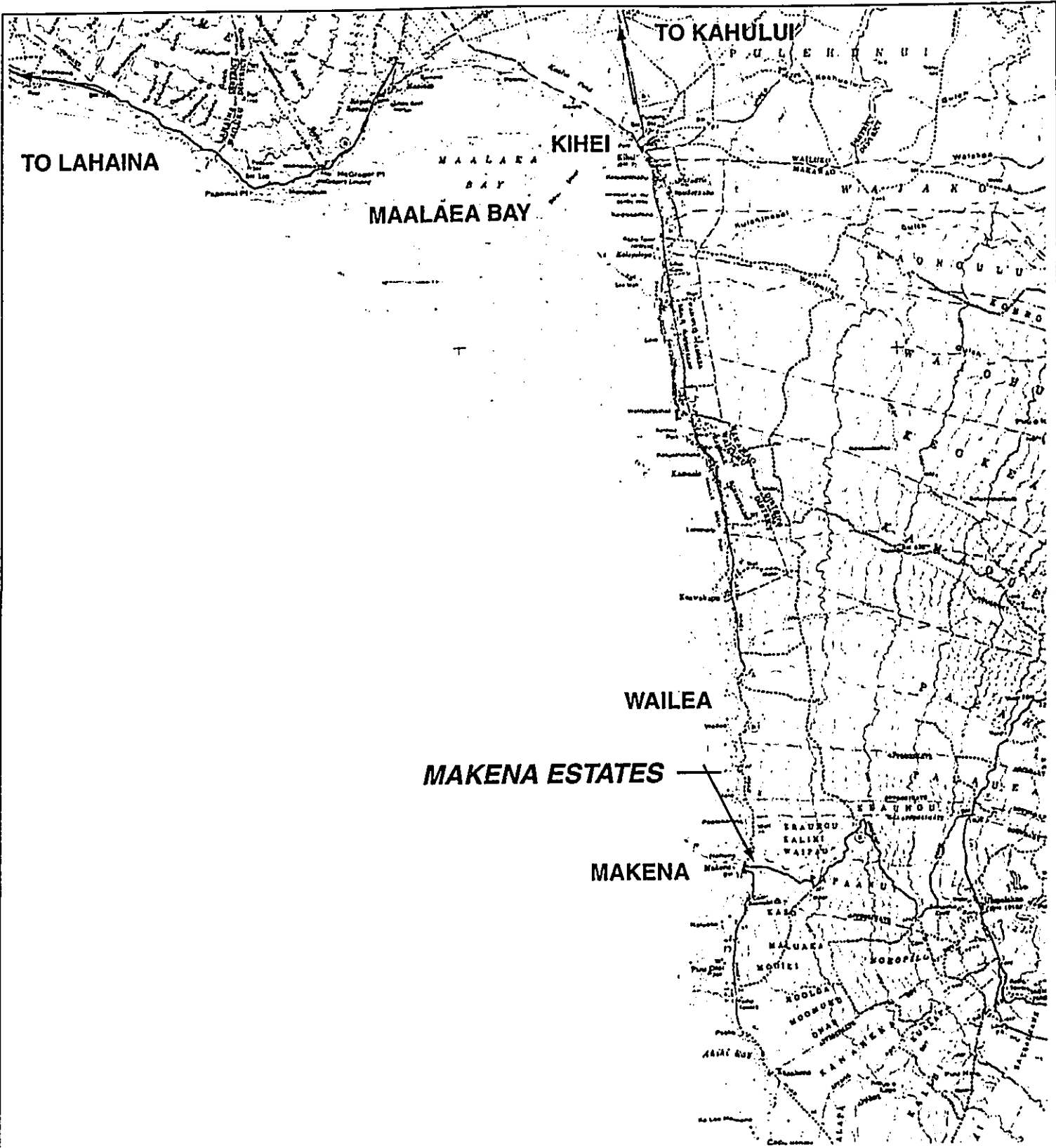


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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86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

FIGURES

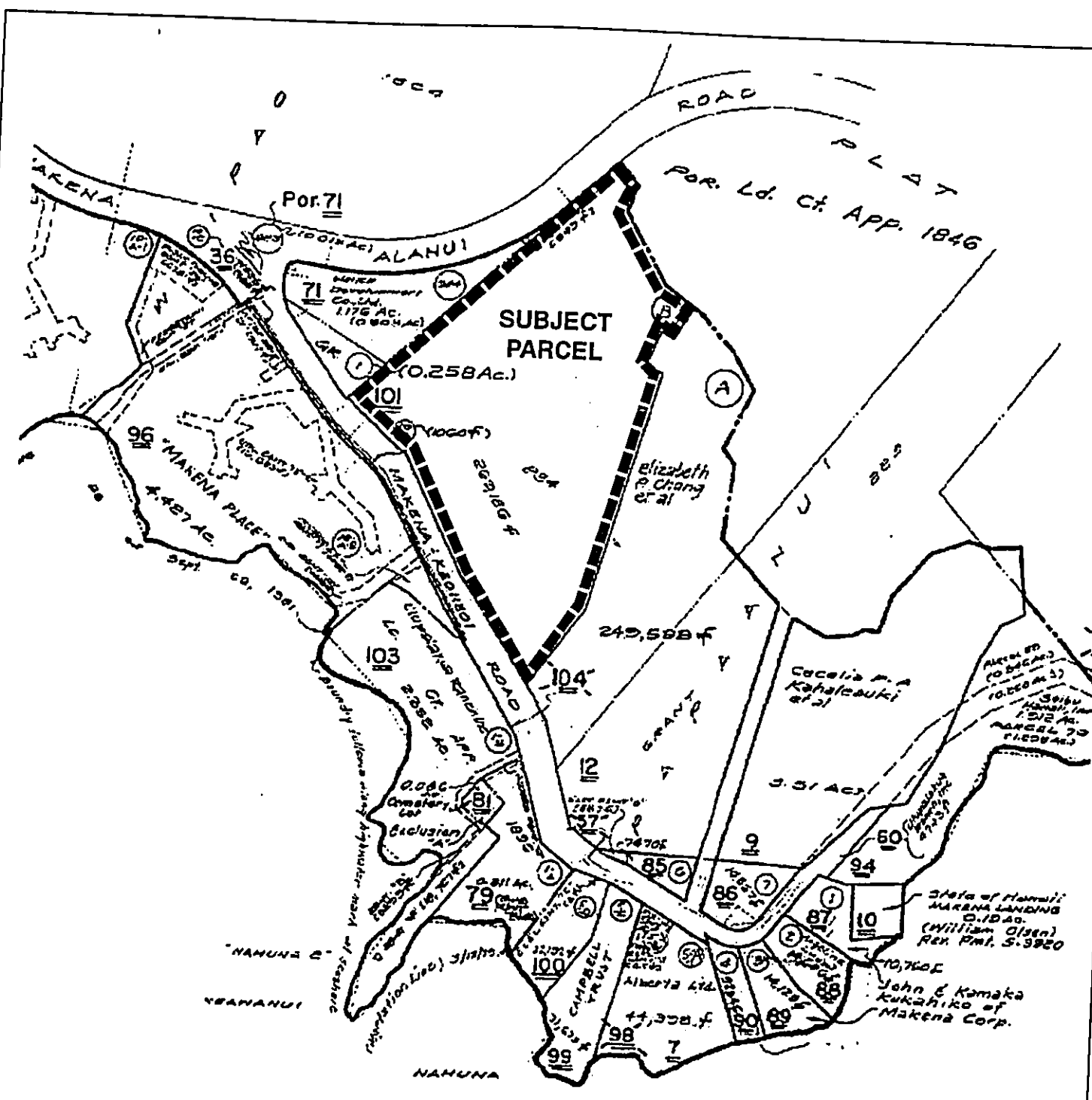


**FIGURE 1**

<p>NOT TO SCALE</p>  <p>FEET</p>	<p>MAY 2000</p>		
<p>REGIONAL LOCATION Makena Estates</p>		<p><b>CHRIS HART &amp; PARTNERS</b></p>	

SOURCE: UNITED STATES GEOLOGICAL SURVEY

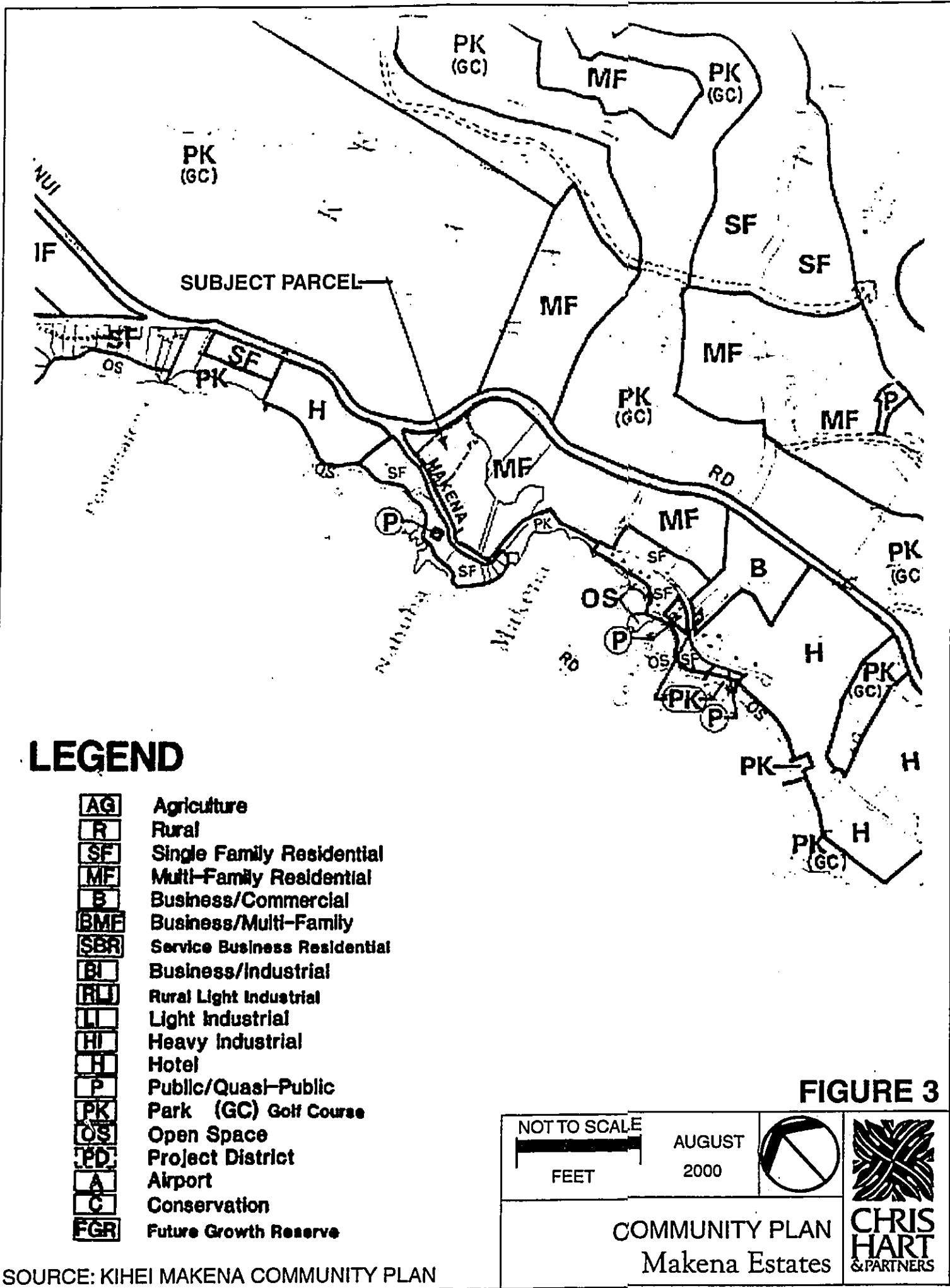


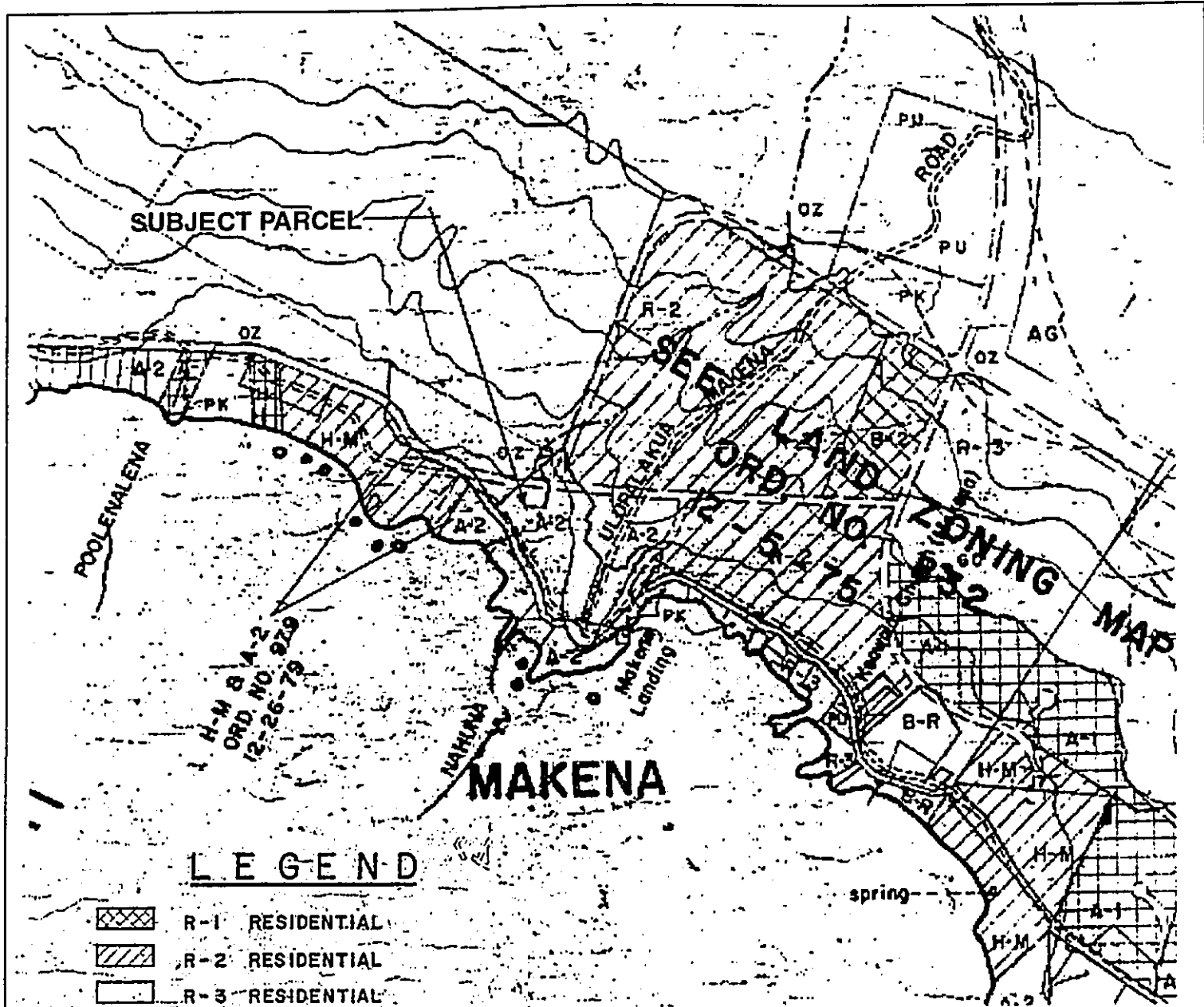


**FIGURE 2**

DEPARTMENT OF TAXATION  
 PROPERTY ASSESSMENT DIVISION  
 TAX MAPS BRANCH  
 STATE OF HAWAII  
**TAX MAP**  
 SECOND TAXATION DIVISION  
 SIDE SEC. PLAT  
**2 1 07**  
 SCALE: 1 IN. = AS NOTED

NOT TO SCALE FEET	MAY 2000		
TAX MAP KEY Makena Estates			<b>CHRIS HART &amp; PARTNERS</b>





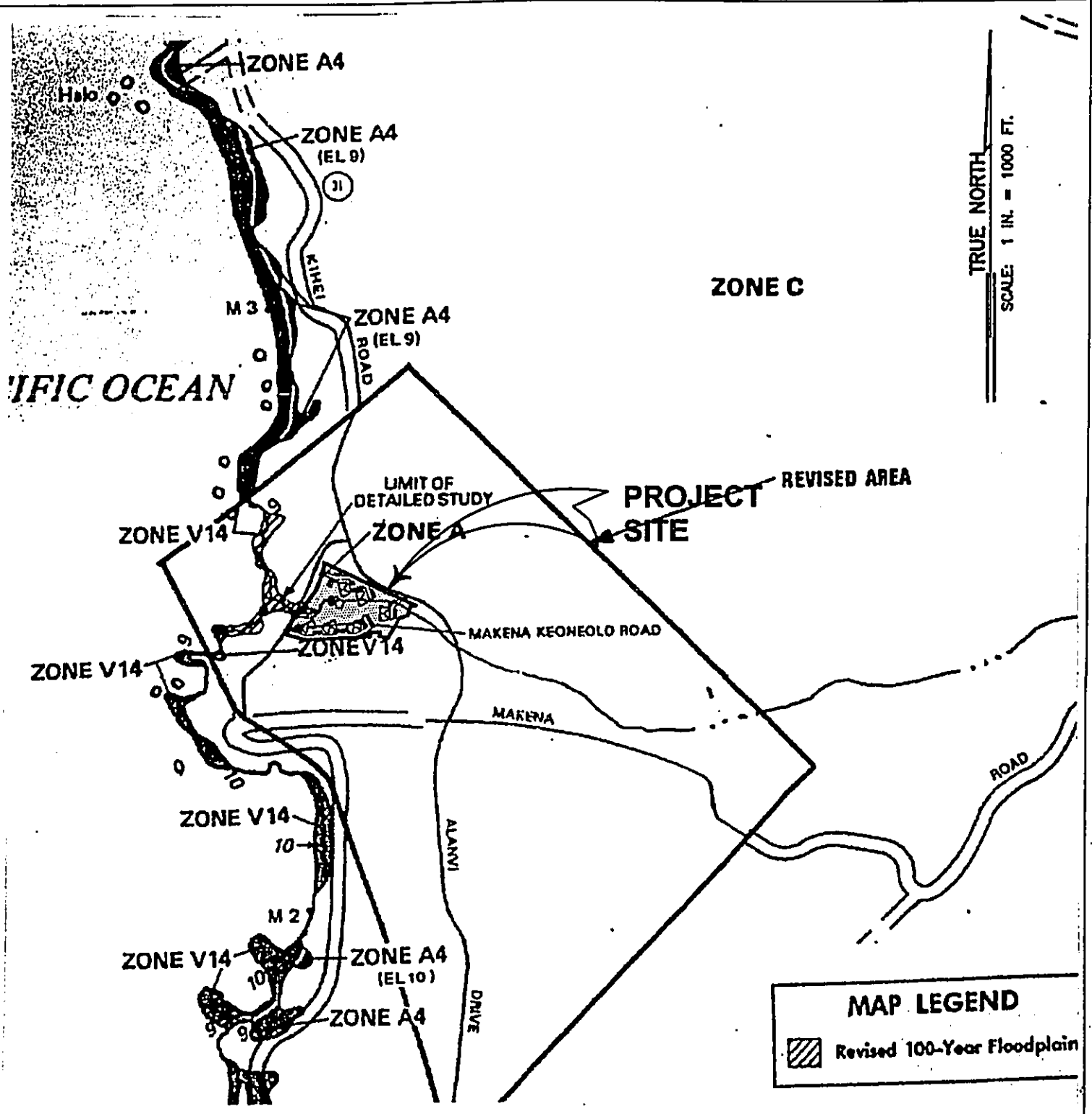
**LEGEND**

- R-1 RESIDENTIAL
- R-2 RESIDENTIAL
- R-3 RESIDENTIAL
- A-1 APARTMENT
- A-2 APARTMENT
- H-J HOTEL
- H-M HOTEL MEDIUM
- H-2 HOTEL
- B-2 BUSINESS
- B-R RESORT COMMERCIAL
- M-1 LIGHT INDUSTRIAL
- M-2 HEAVY INDUSTRIAL
- A-G AGRICULTURAL
- R-U RURAL
- BR/W BEACH RIGHT OF WAY
- G-C GOLF COURSE
- O-Z OPEN ZONE
- P-U PUBLIC USE
- P-K PARK

SOURCE: COUNTY OF MAUI LAND ZONING MAP #5

**FIGURE 4**

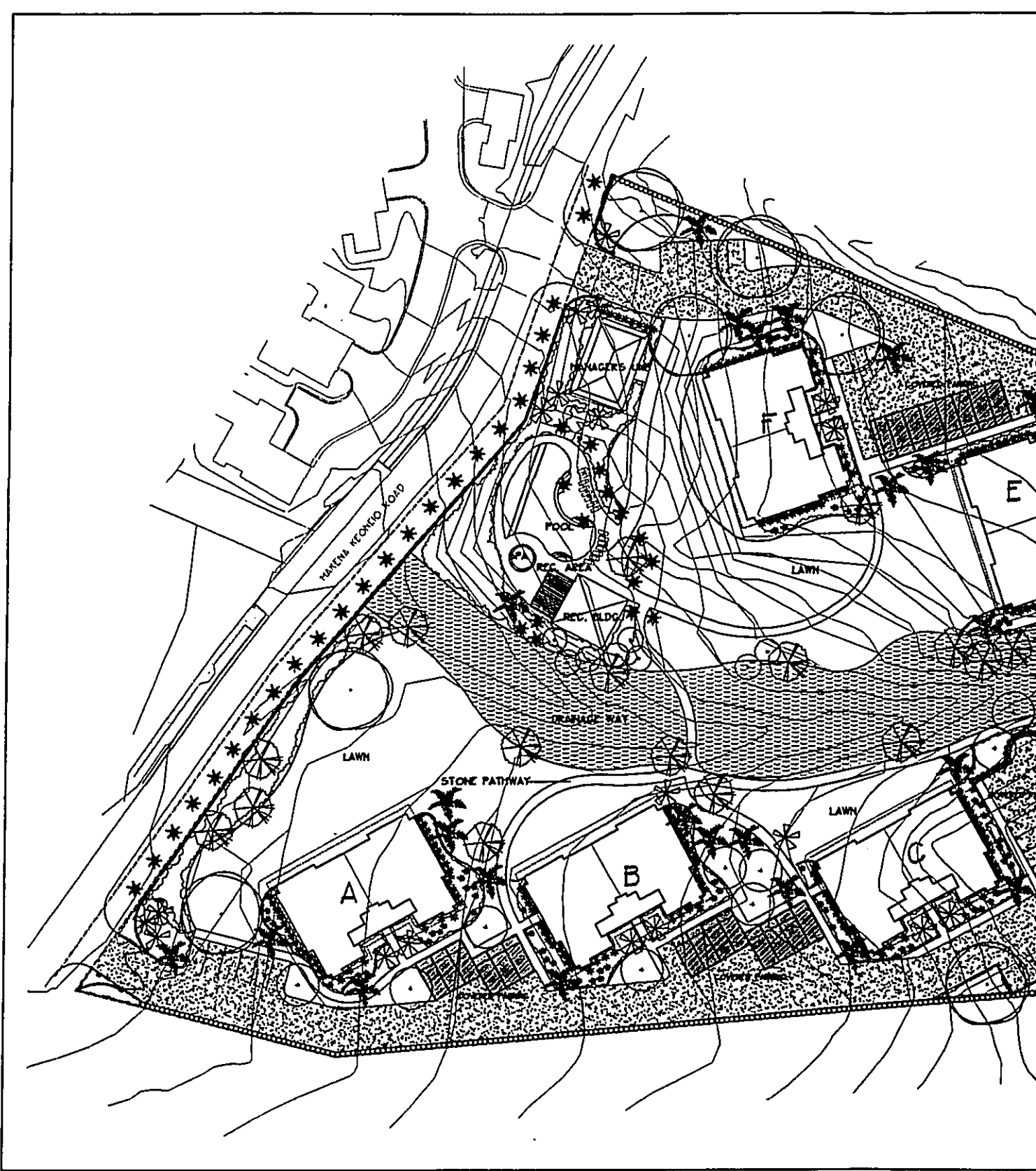
<p>0 1000' FEET</p>	<p>AUGUST 2000</p>		
<p>ZONING Makena Estates</p>			<p><b>CHRIS HART &amp; PARTNERS</b></p>



**FIGURE 5**

SOURCE:  
WARREN S. UNIMORI ENGINEERING, INC.

<p>NOT TO SCALE</p> <p>FEET</p>	<p>MAY 2000</p>		
<p>100 YEAR FLOOD Makena Estates</p>		<p><b>CHRIS HART &amp; PARTNERS</b></p>	

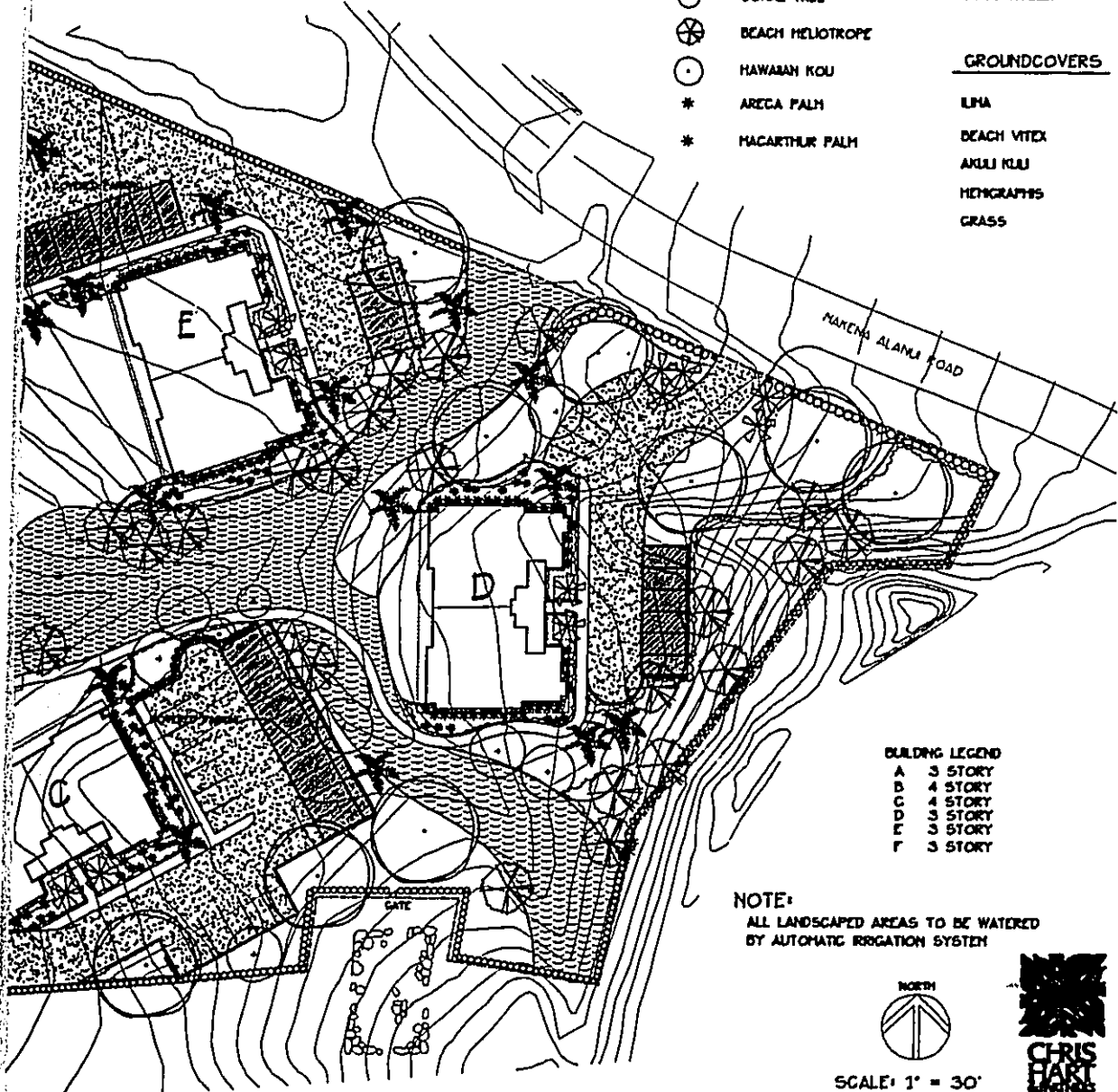


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**PLANT LEGEND**

--- CHAIN LINK FENCE  
 = 2' LAVA ROCK WALL w/ 4" FENCE  
 ■ ENTRY COLUMNS

- | TREES |                  | SHRUBS            |
|-------|------------------|-------------------|
| ✱     | COCONUT PALM     | ● YELLOW NERSCUS  |
| *     | HAWAII PALM      | ○ P.P. OLEANDER   |
| ✱     | LOULU PALM       | ○ PINK OLEANDER   |
| ○     | HONEY POD        | ◆ QUEEN EMMA LILY |
| ○     | CORAL TREE       | • AFRICAN IRIS    |
| ⊗     | BEACH HELIOTROPE | BOUGANVILLEA      |
| ○     | HAWAIIAN KOU     | GROUNDCOVERS      |
| *     | ARECA PALM       | ELMA              |
| *     | MACARTHUR PALM   | BEACH VITEX       |
|       |                  | AKULI KULU        |
|       |                  | HENIGRAPHIS       |
|       |                  | GRASS             |



- BUILDING LEGEND**
- A 3 STORY
  - B 4 STORY
  - C 4 STORY
  - D 3 STORY
  - E 3 STORY
  - F 3 STORY

**NOTE:**  
 ALL LANDSCAPED AREAS TO BE WATERED  
 BY AUTOMATIC IRRIGATION SYSTEM



SCALE: 1" = 30'



**MAKENA ESTATES**  
**LANDSCAPE/ SITE CONCEPT PLAN**

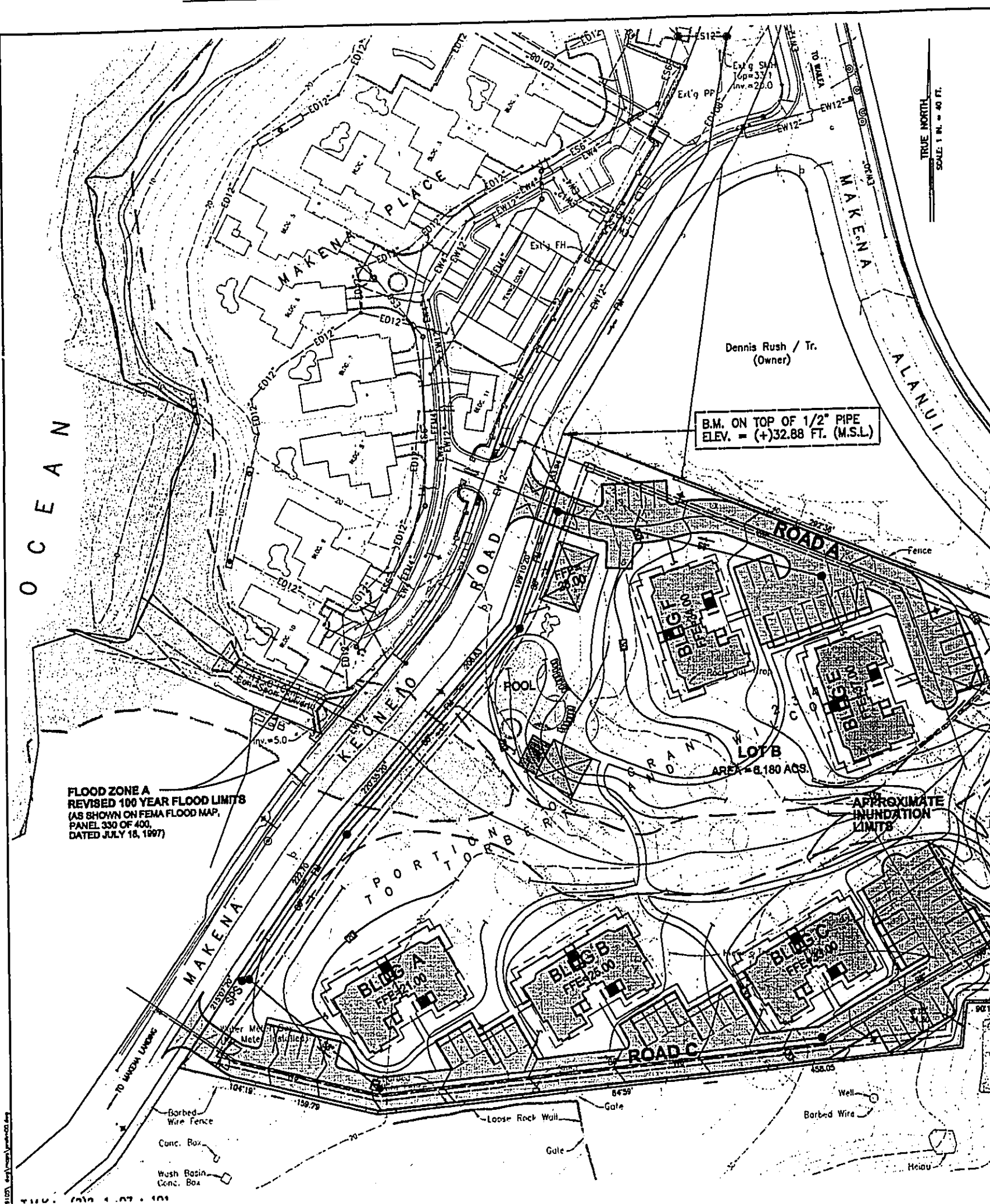
JUNE 1, 2000

LANDSCAPE ARCHITECTURE  
 AND PLANNING  
 CHRIS EAST  
 1000 KALANANAKUHIWA DRIVE  
 HONOLULU, HI 96813  
 (808) 943-1111  
 FAX (808) 943-1112  
 WWW.CHRIS-EAST.COM

CHP JOB# 00/013

FIGURE G

FIGURE 6a



**FLOOD ZONE A**  
 REVISED 100 YEAR FLOOD LIMITS  
 (AS SHOWN ON FEMA FLOOD MAP,  
 PANEL 330 OF 400,  
 DATED JULY 18, 1997)

B.M. ON TOP OF 1/2" PIPE  
 ELEV. = (+)32.88 FT. (M.S.L.)

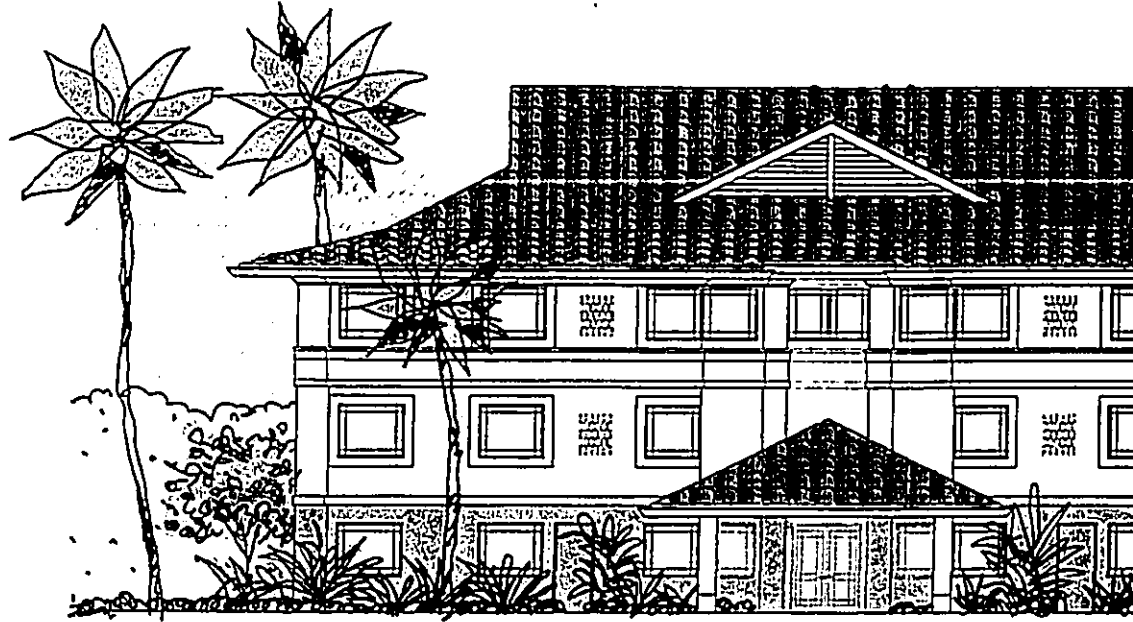
TRUE NORTH  
 SCALE: 1 IN. = 40 FT.

11/27/01 4:47:30pm \\p01\c01.dwg

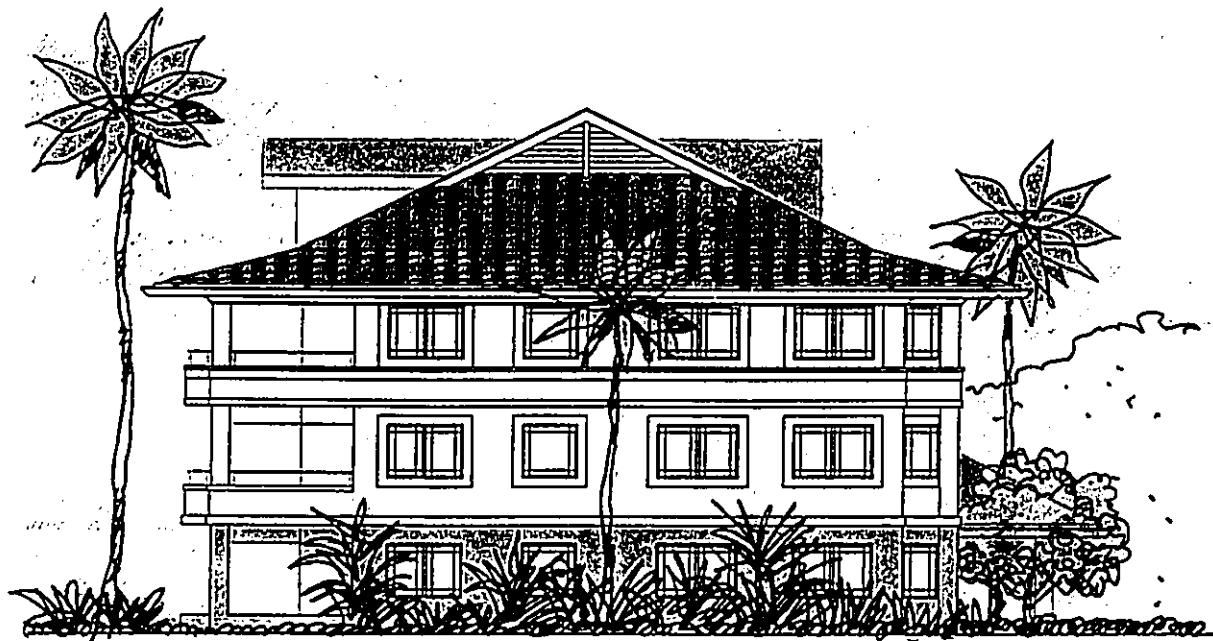
11/27/01 4:47:30pm







FRONT ELEVATION

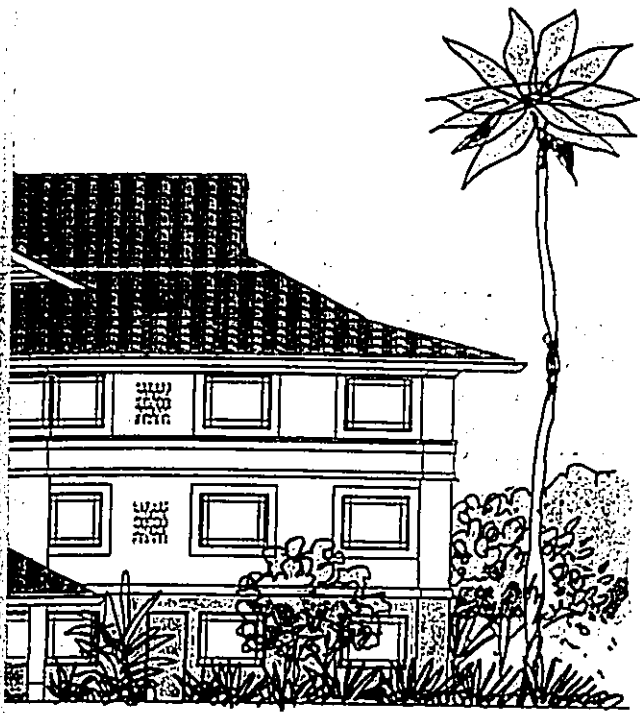


LEFT ELEVATION

The CMI Development, Inc.

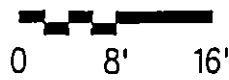
**5** Media Five  
A Design Corporation

**Makena Estate**  
Maui, Hawaii



RIGHT ELEVATION

**Estates**  
a w a i i



ELEVATIONS - 3 STORY

June 2000

**FIGURE 7 A**



FRONT ELEVATION

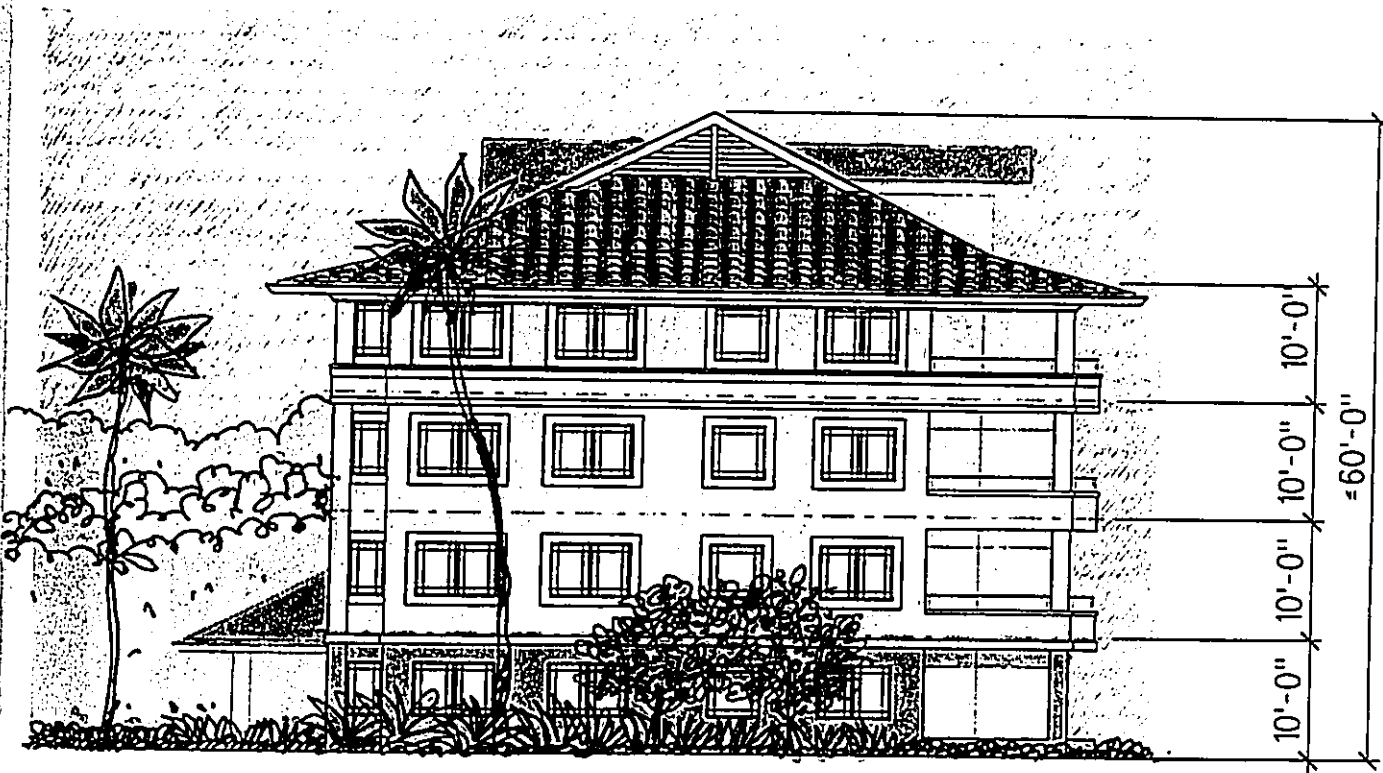
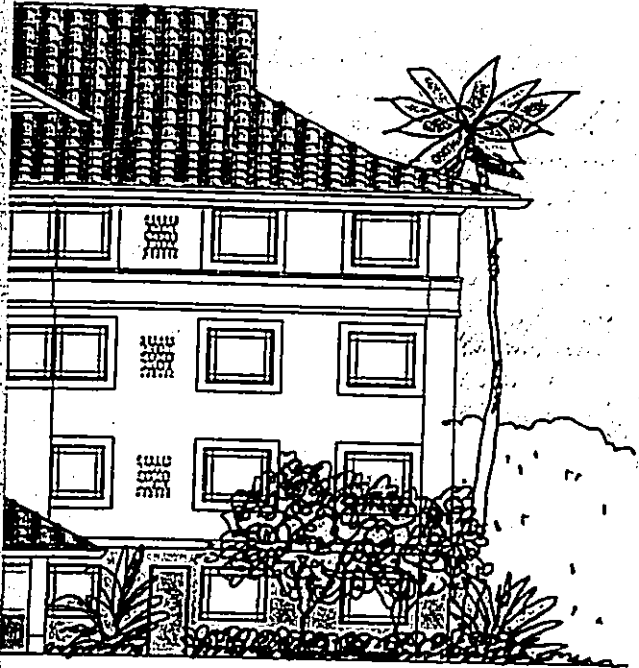


LEFT ELEVATION

The CMI Development, Inc.

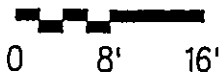
**5** Media Five  
A Design Corporation

**Makena Estate**  
Maui, Hawaii



RIGHT ELEVATION

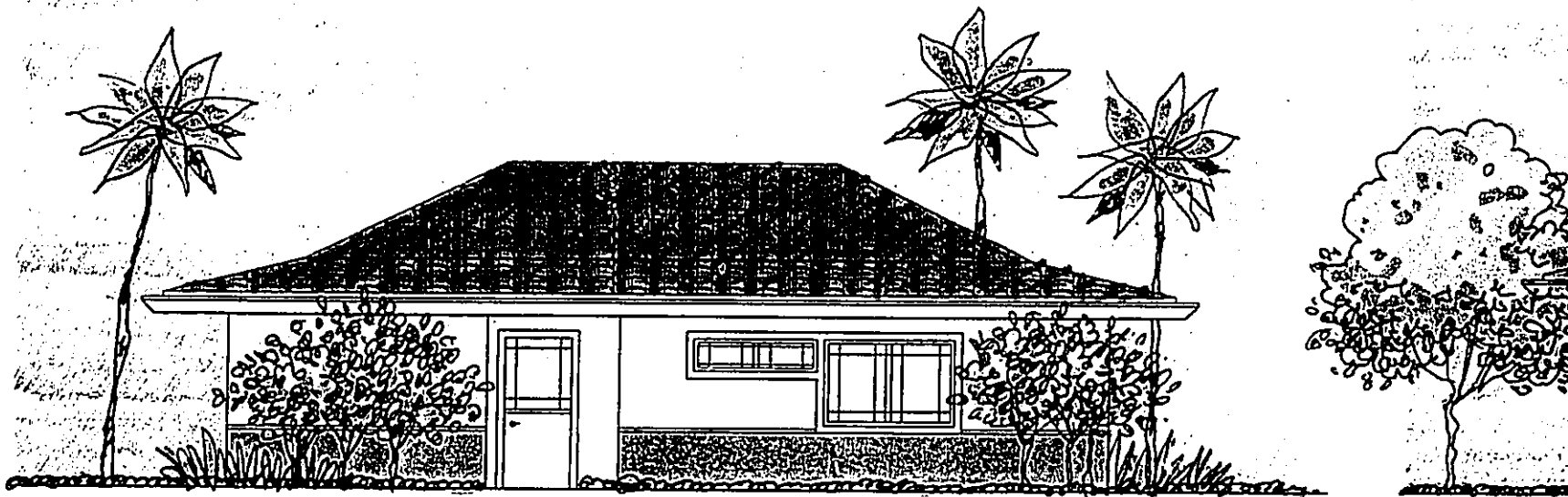
**Estates**  
a w a i i



ELEVATIONS - 4 STORY

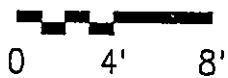
June 2000

FIGURE 7 B



FRONT ELEVATION - RESIDENT MANAGER'S UNIT

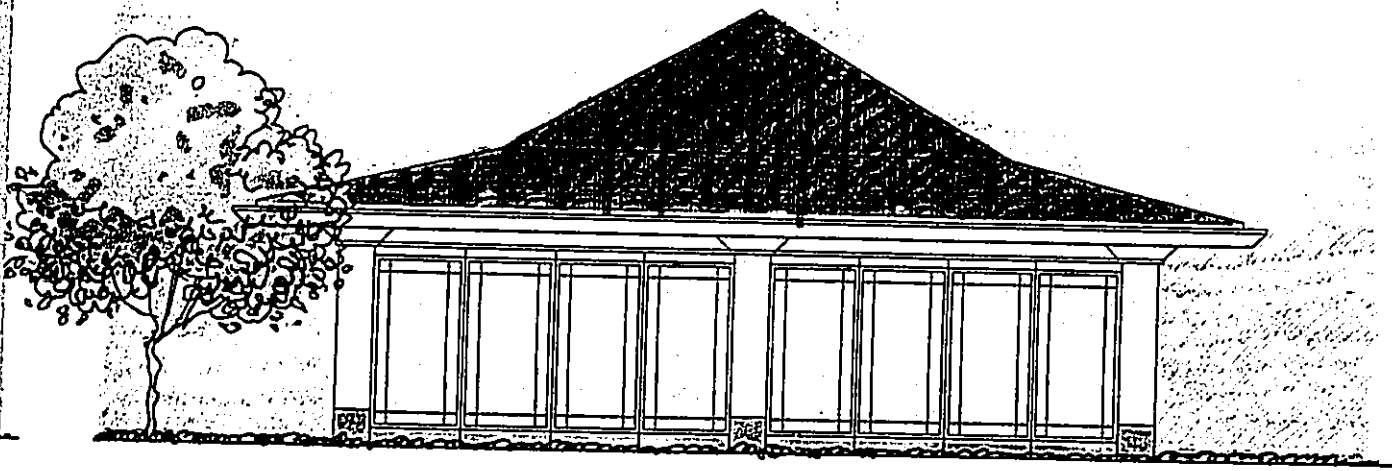
EXTERIOR ELEVATION



The CMI Development, Inc.

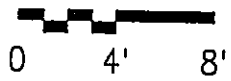
 Media Five  
A Design Corporation

**Makena Estate**  
Maui, Hawaii



REAR ELEVATION - RECREATION CABANA

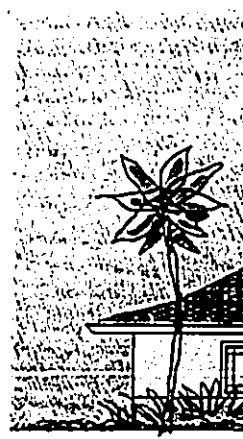
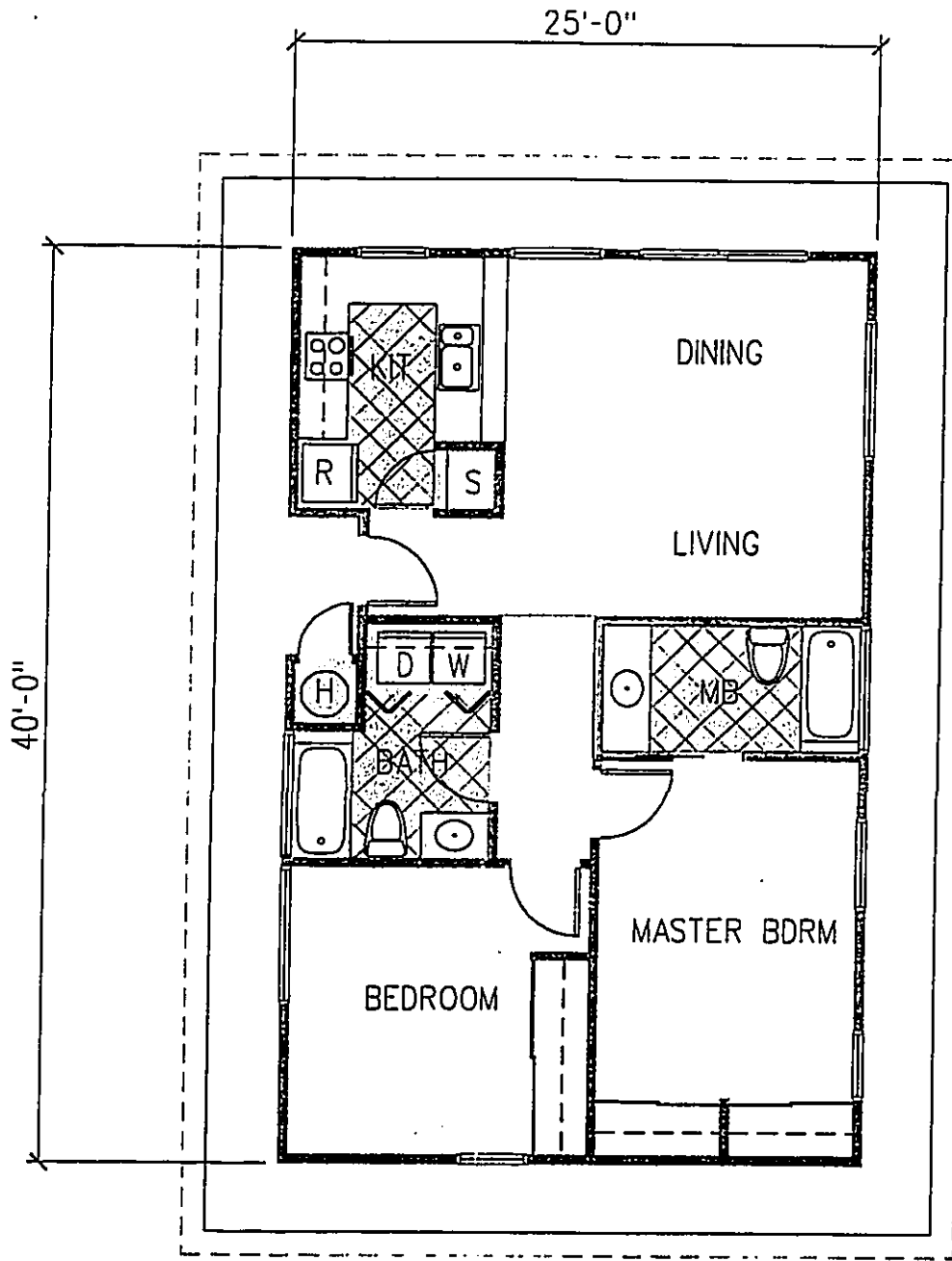
EXTERIOR ELEVATION



**Estates**  
a w a i i

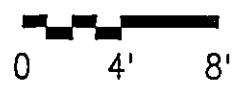
RESIDENT MANAGER'S UNIT/  
RECREATION CABANA  
June 2000

**FIGURE 7 C**



RIGHT E

FLOOR PLAN



The CMI Development, Inc.



Makena Estate  
Maui, Hawaii



RIGHT ELEVATION

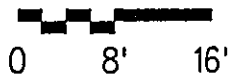


LEFT ELEVATION

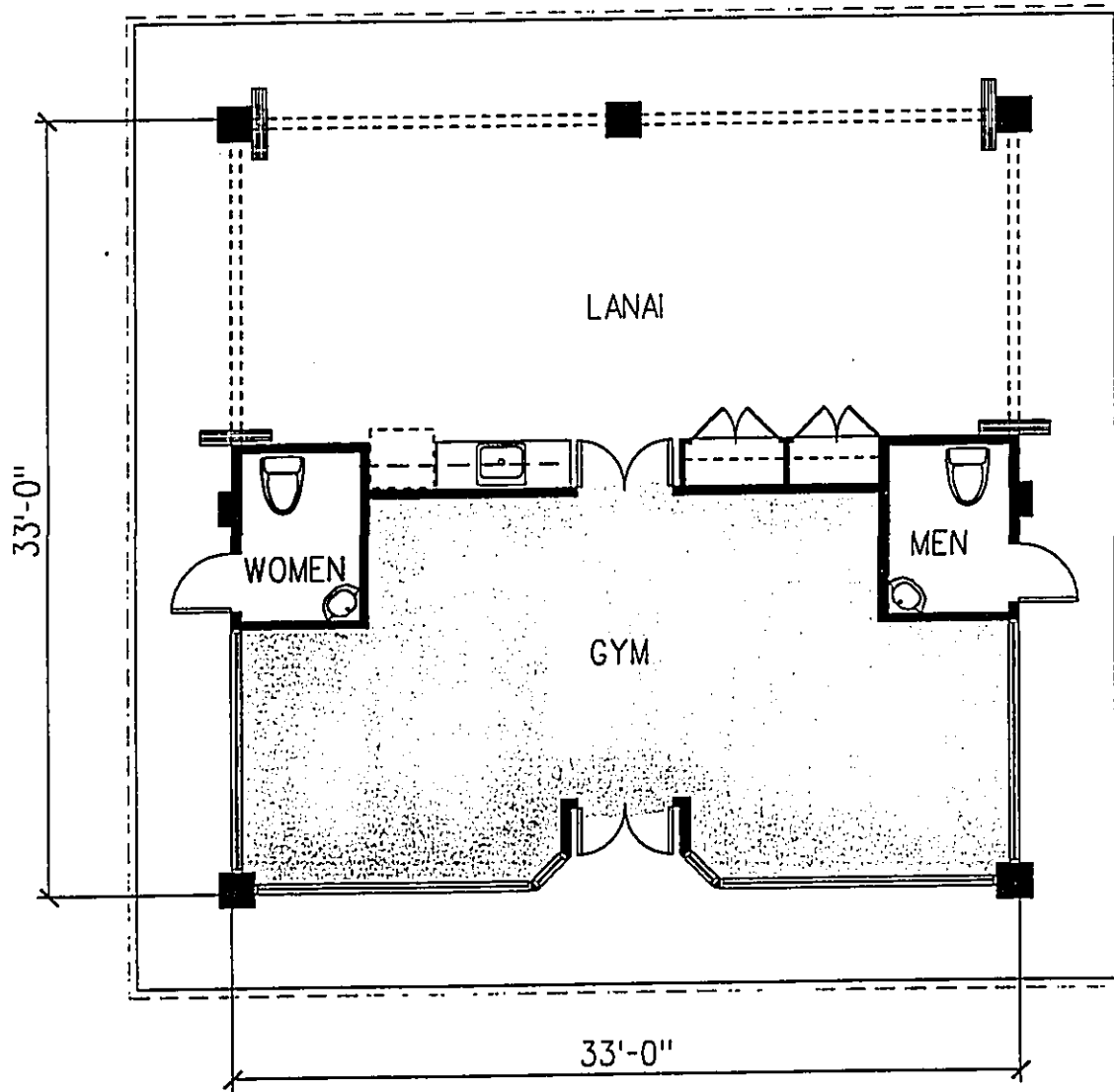


REAR ELEVATION

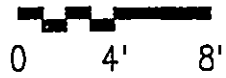
EXTERIOR ELEVATIONS







FLOOR PLAN

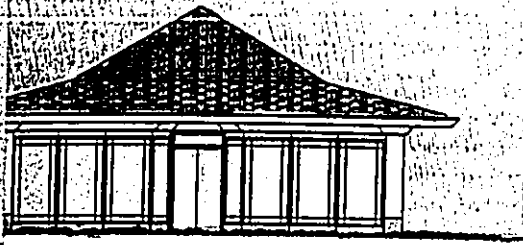


FRONT ELEVATION

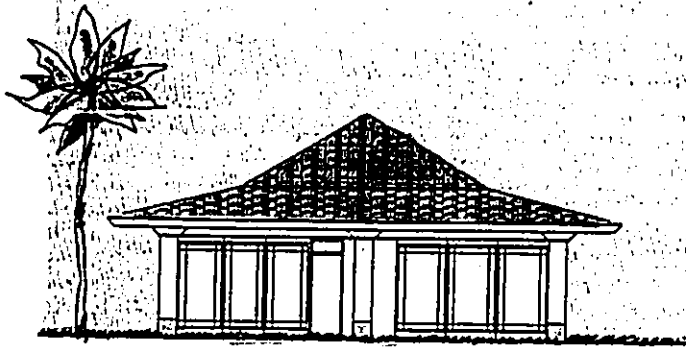
The CMI Development, Inc.

**5** Media Five  
A Design Corporation

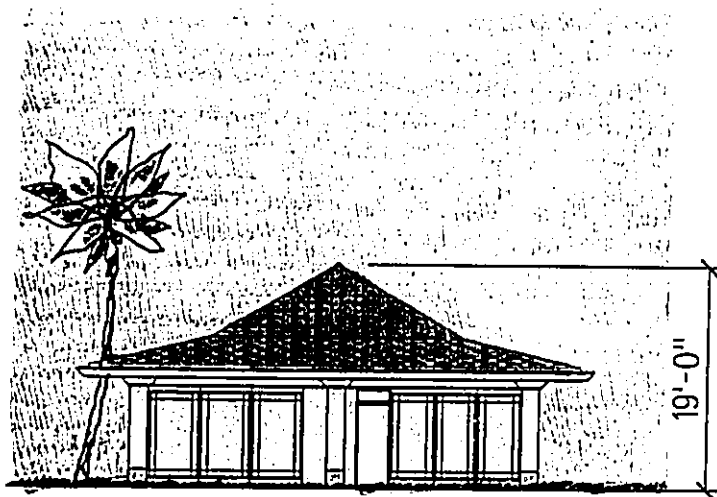
**Makena Estate**  
Maui, Hawaii



FRONT ELEVATION

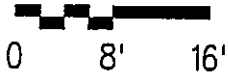


RIGHT ELEVATION



LEFT ELEVATION

EXTERIOR ELEVATIONS



**Estates**

**l a w a i i**

RECREATION CABANA

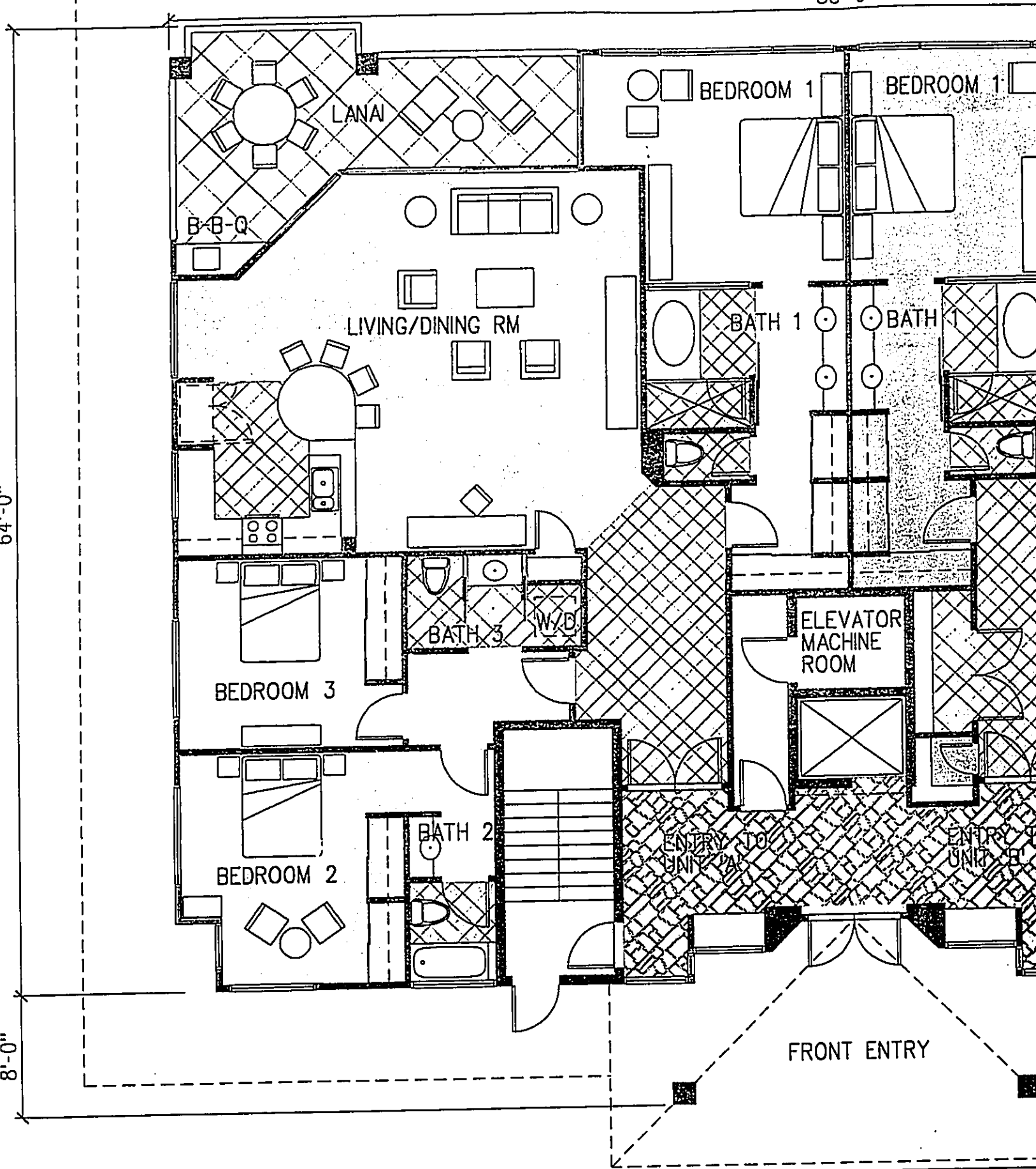
June 2000

**FIGURE 7 E**

88'-0"

64'-0"

8'-0"

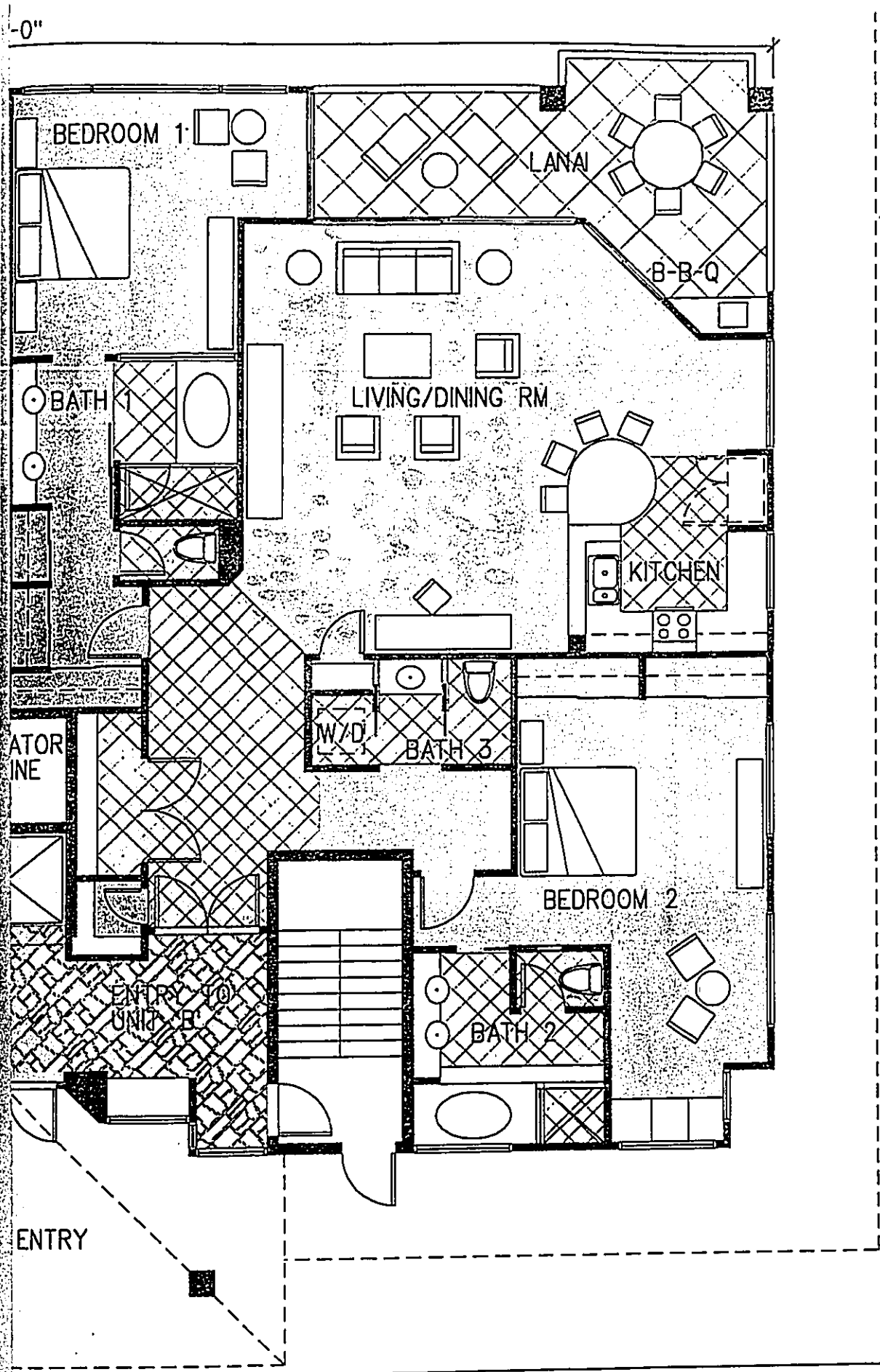


The CMI Development, Inc.

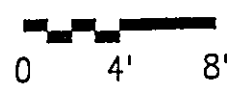
**5** Media Five  
A Design Corporation

# Makena Estate

M a u i , H a w a i i



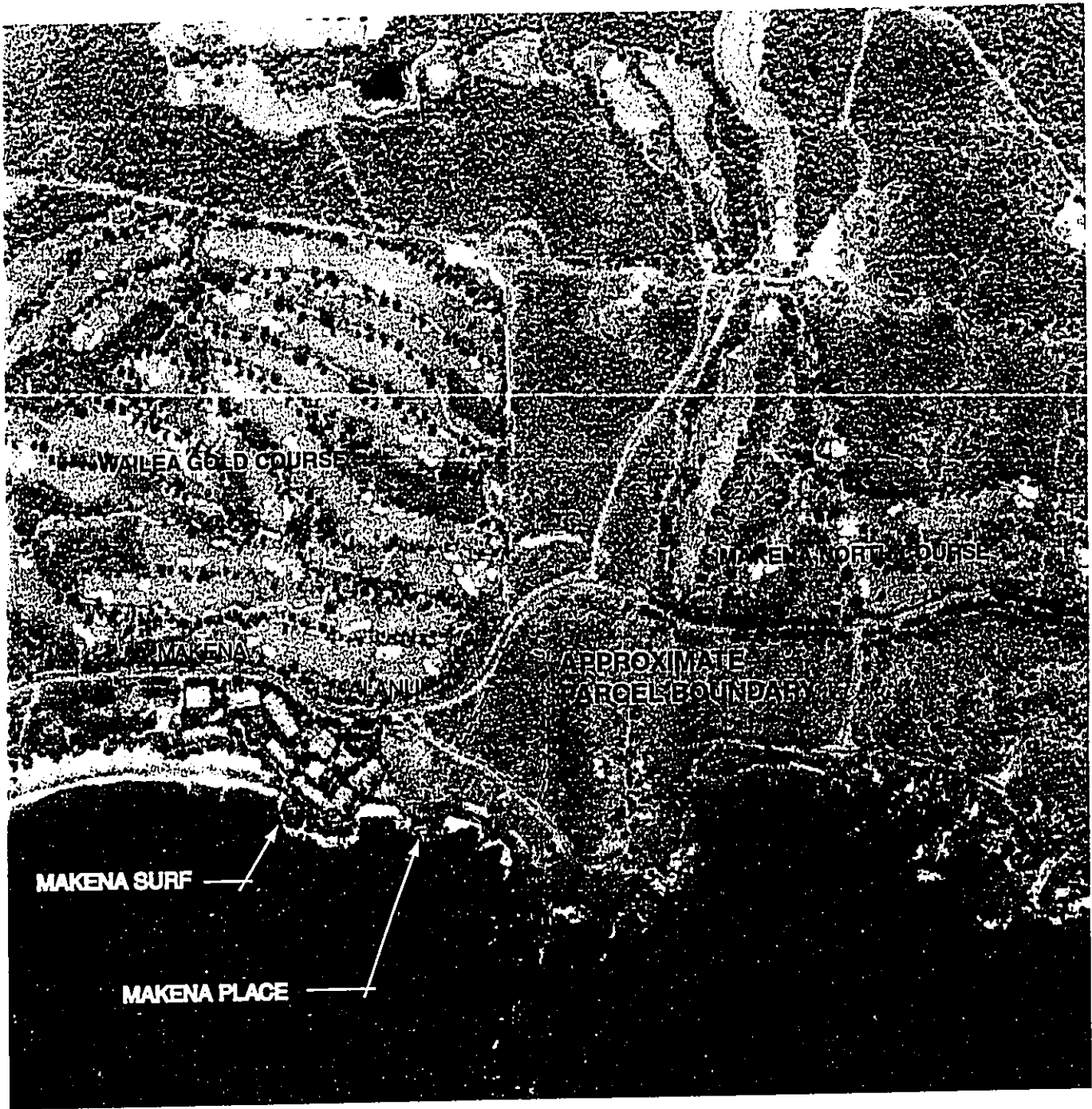
**Estates**  
a w a i i






TYPICAL FLOOR PLAN

June 2000

**FIGURE 7 F**






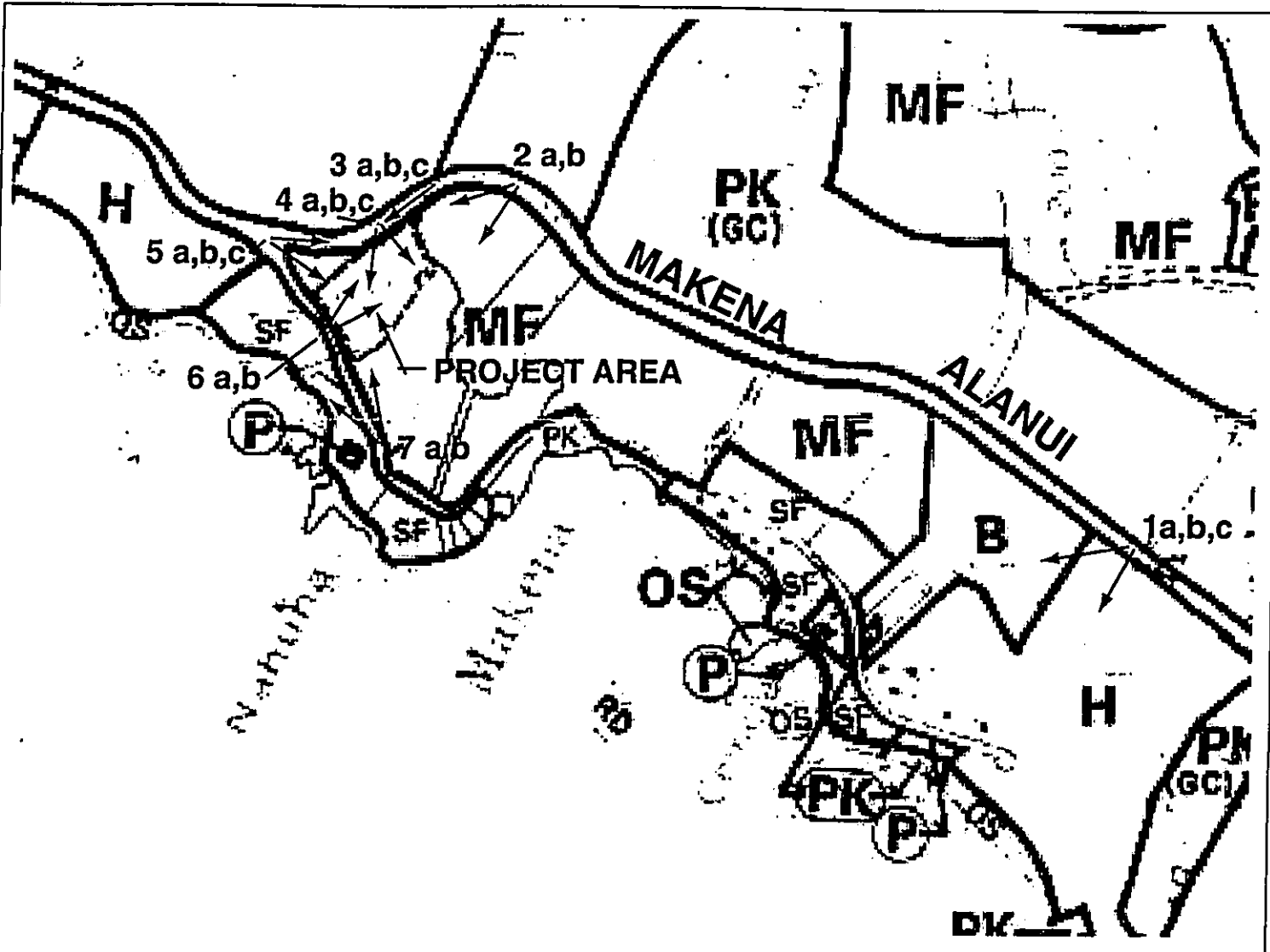
**FIGURE 8**

<p>0 2000'</p>  <p>FEET</p>	<p>MAY 2000</p>		
<p>AERIAL PHOTOGRAPH Makena Estates</p>			<p><b>CHRIS HART</b> &amp; PARTNERS</p>



**FIGURE 9**

<p>0 2000'</p>  <p>FEET</p>	<p>MAY 2000</p>	 
<p>AERIAL PHOTOGRAPH Makena Estates</p>		<p><b>CHRIS HART</b> &amp; PARTNERS</p>

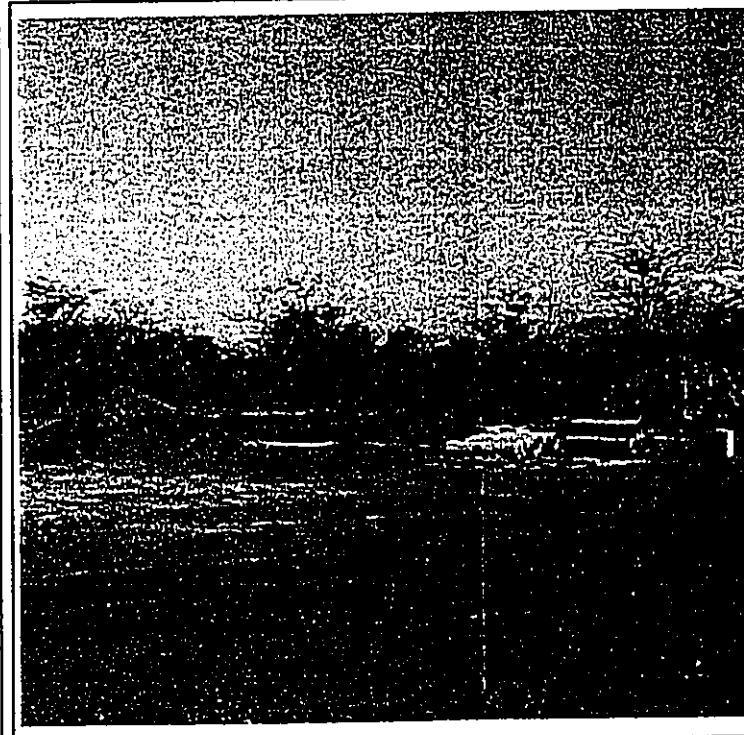
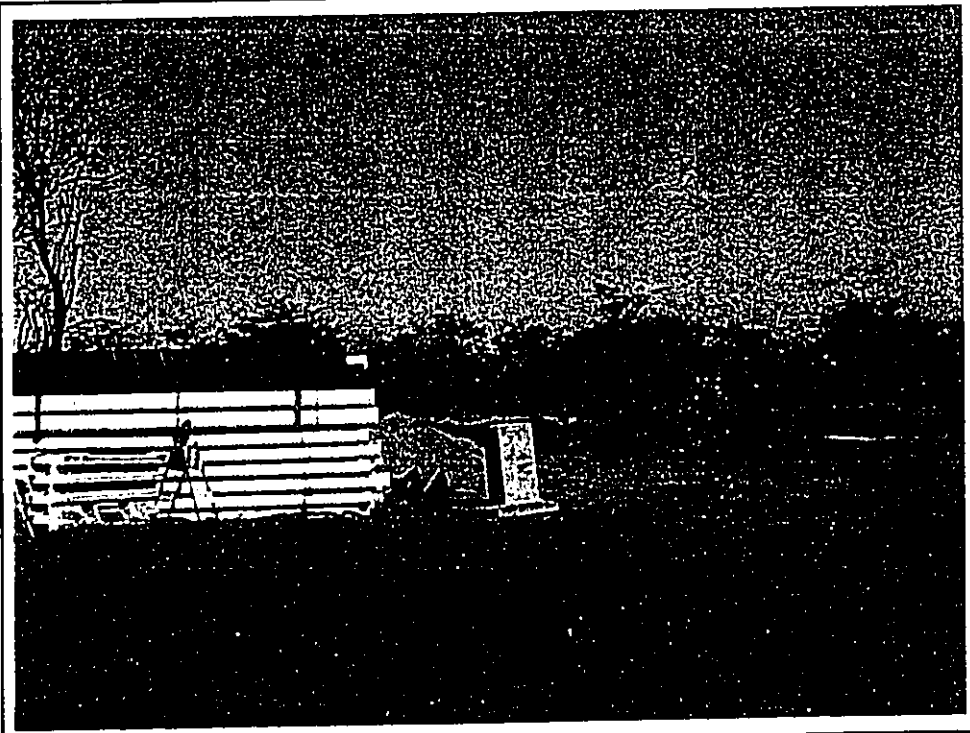


**FIGURE 10A**

<p>NOT TO SCALE</p> <p>FEET</p>	<p>MAY 2000</p>		
<p>VISUAL ANALYSIS KEY MAP Makena Estates</p>			<p><b>CHRIS HART &amp; PARTNERS</b></p>



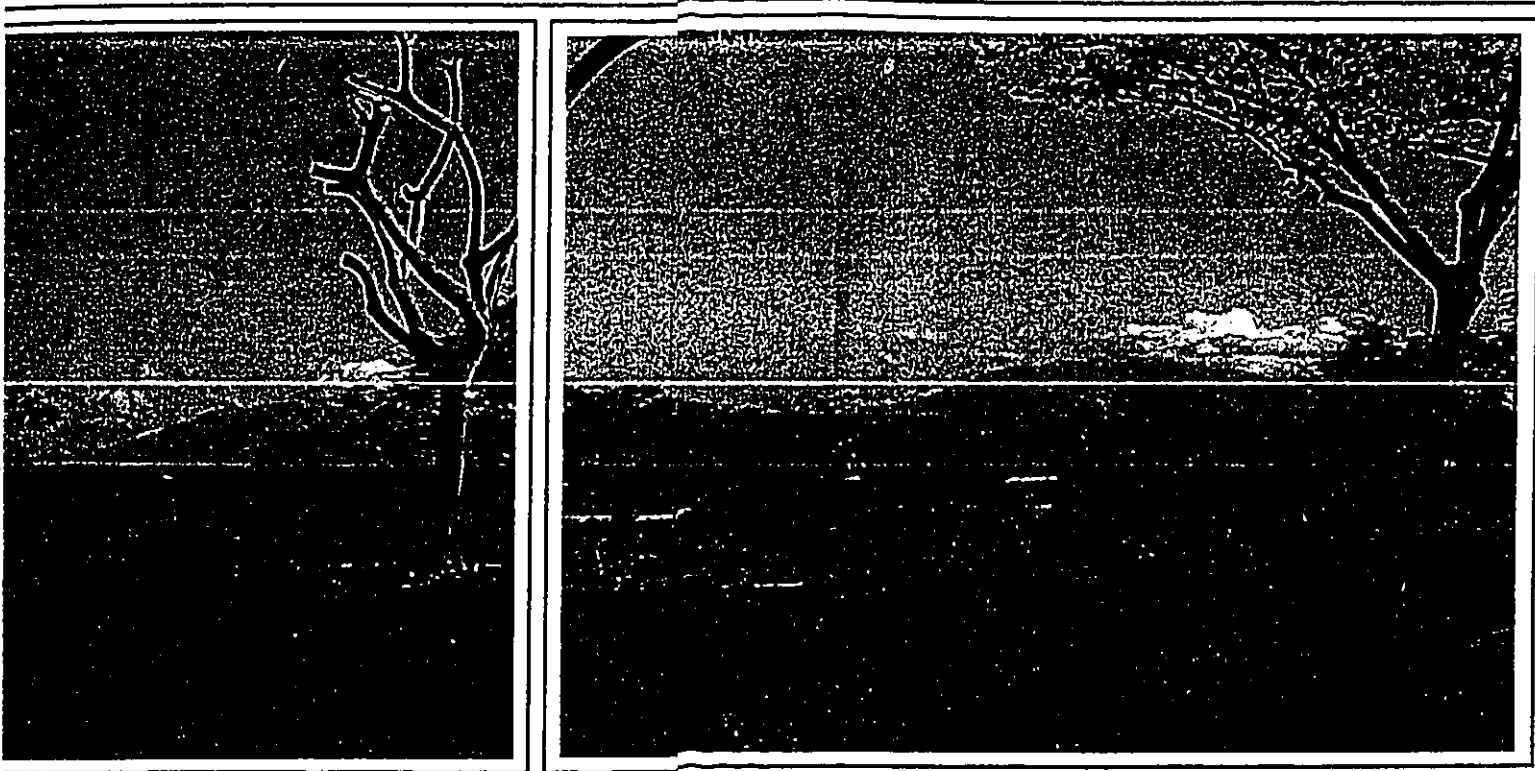
1a. Photographs a, b, and c are looking from Makena Alanui near the entrance of the Makena Prince Resort and are reflective of makai view corridors which exist intermittently in the area. As shown in subsequent photos, makai view corridors do not exist in the immediate vicinity of the project.



2a. Photographs a and b are from Makena Alanui looking towards the ocean over property that is mauka of the subject parcel. The photographs illustrate that ocean views do not exist from this location (See Figure 10 A).

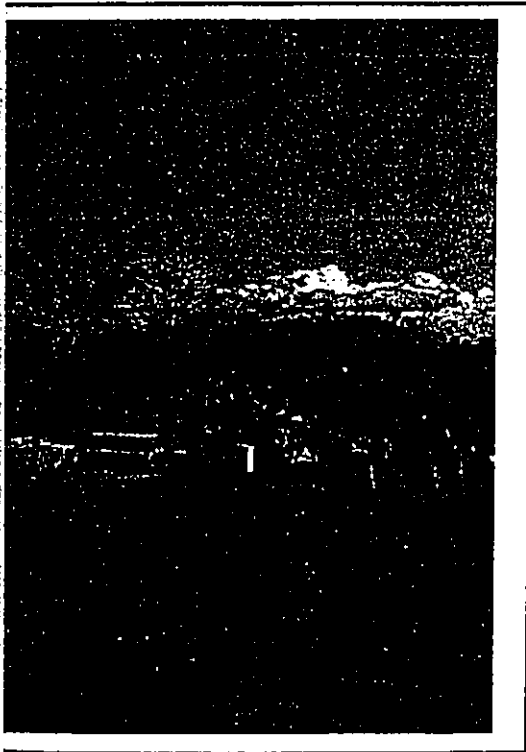
2b.





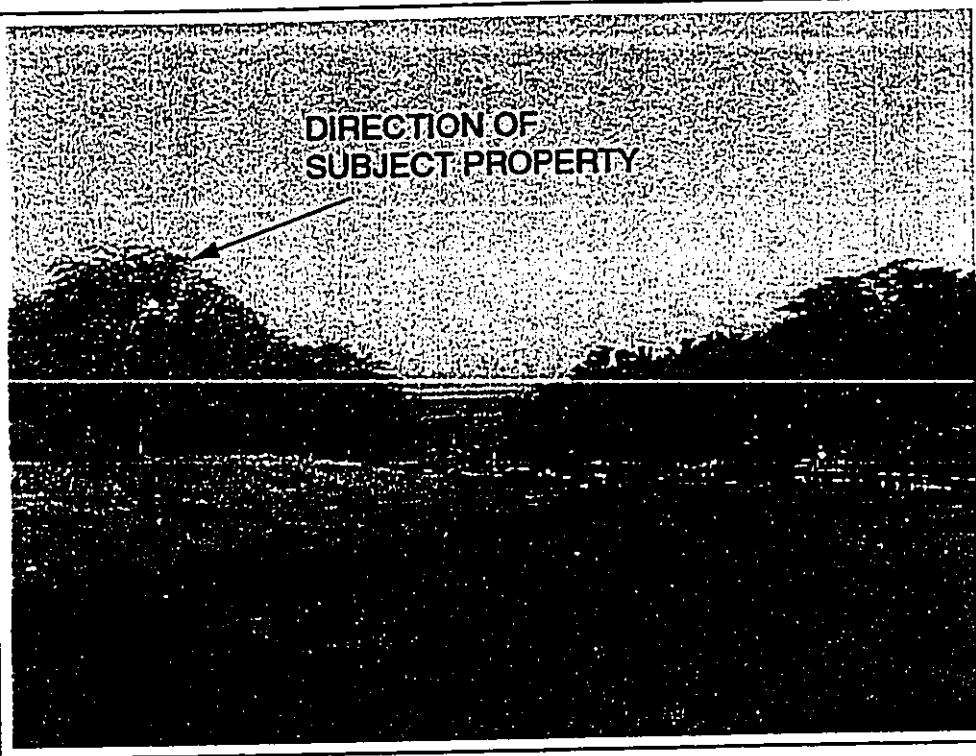
1c.

exist intermittently  
vicinity of the project site.

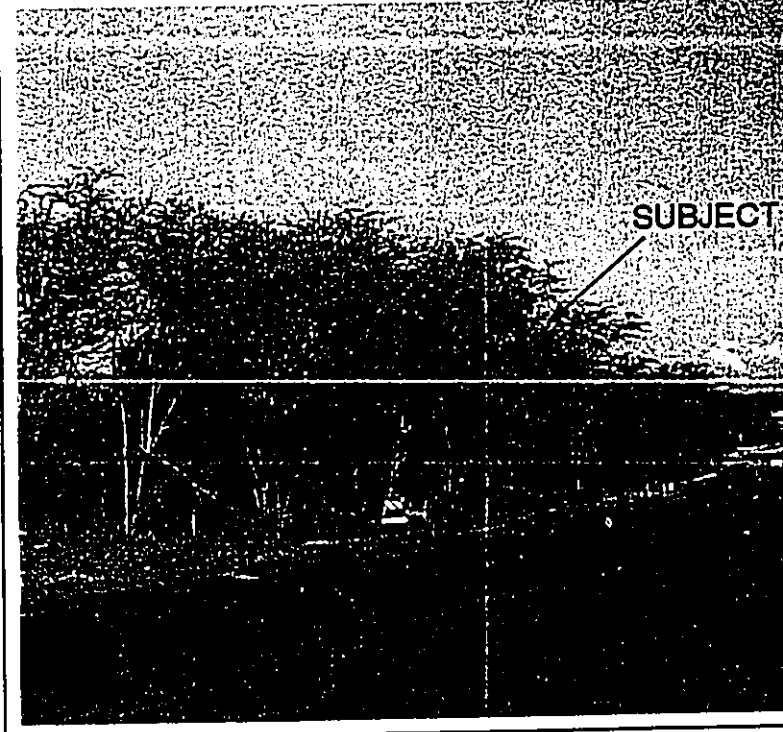


Makena Estates  
VISUAL ANALYSIS

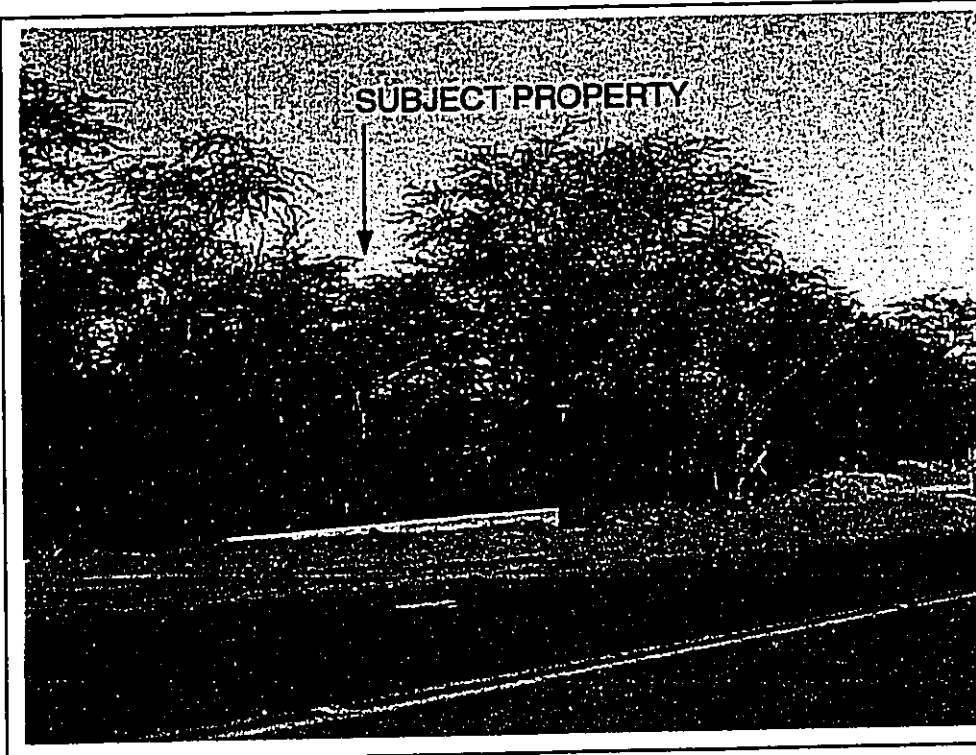
FIGURE  
10B



3a. Photographs a, b, and c are looking from Makena Alanui as it curves down toward Makena Keoneoio Road (See Figure 10 A).



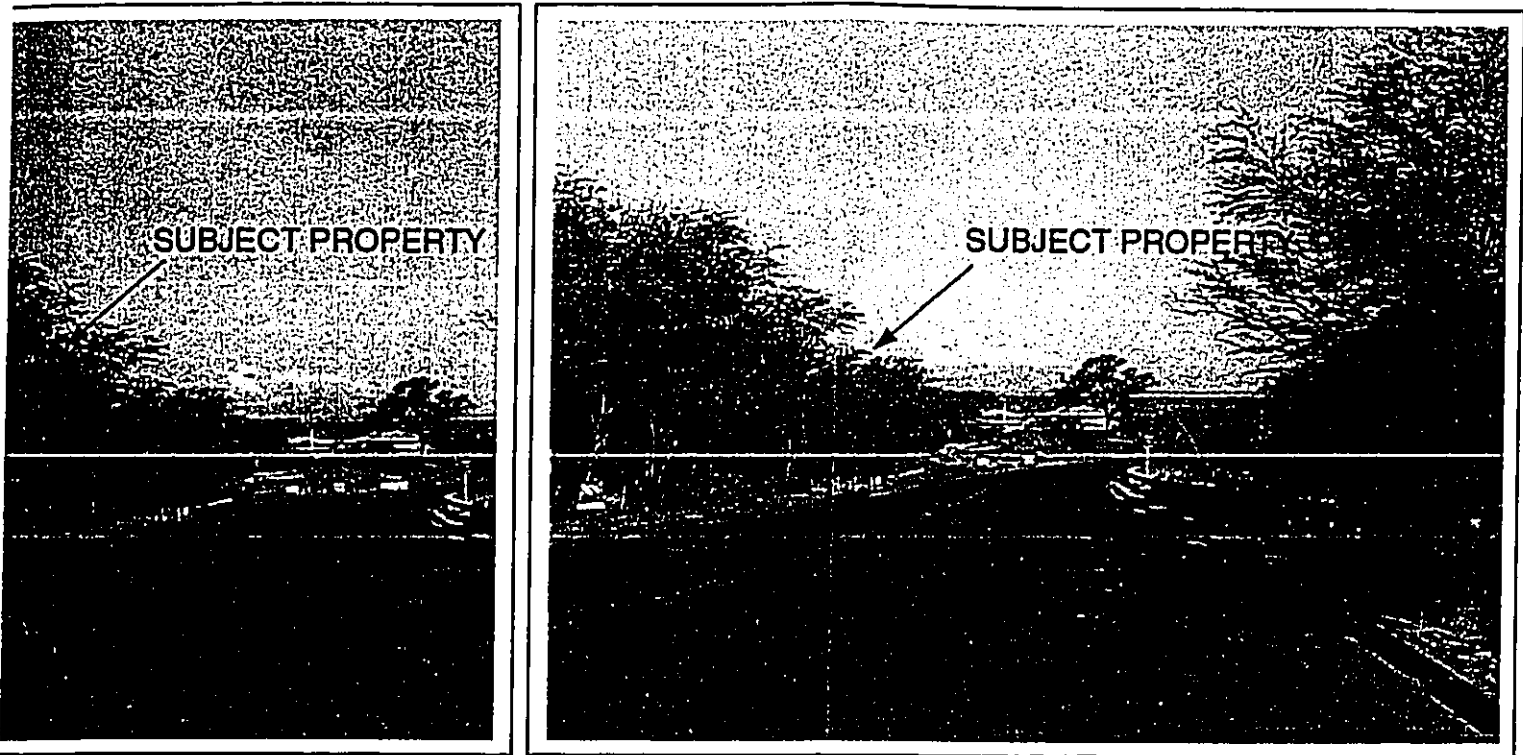
3b.



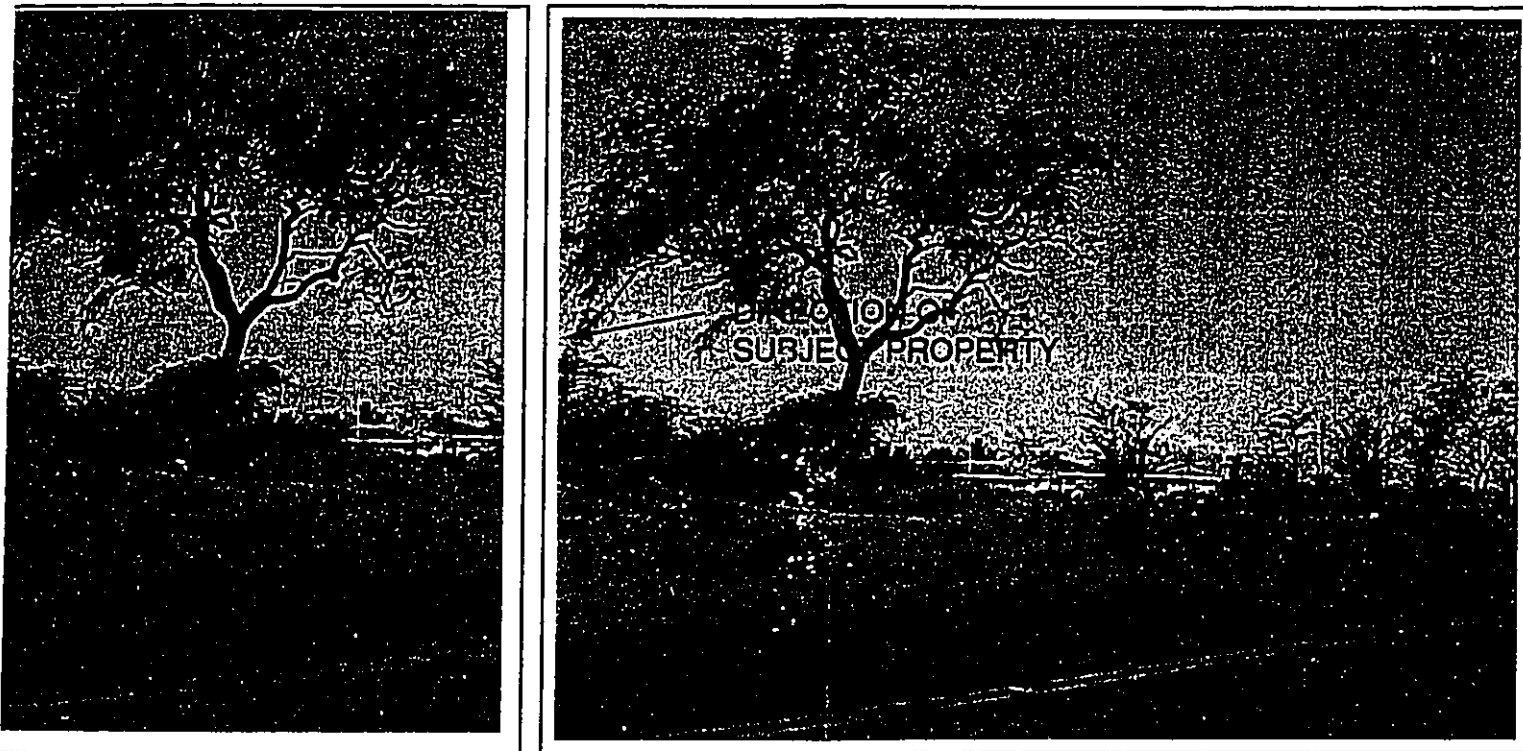
4a. Photograph a is from Makena Alanui looking over the drainage culvert at the subject property and toward the ocean (See Figure 10 A).



4b. Photographs b and c are from Makena Alanui northwest from the northern boundary of the subject property toward an adjacent property toward the ocean (See Figure 10 A).



3c.



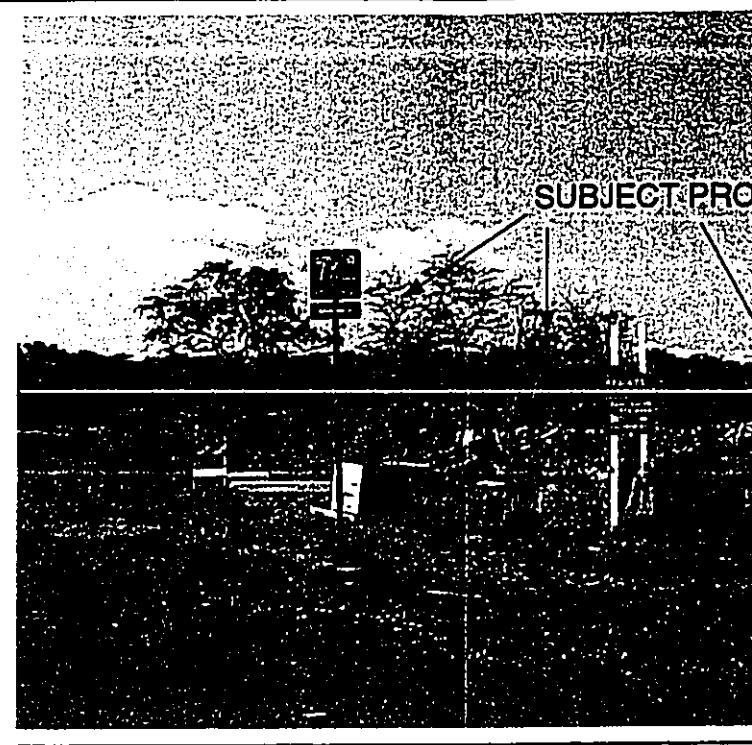
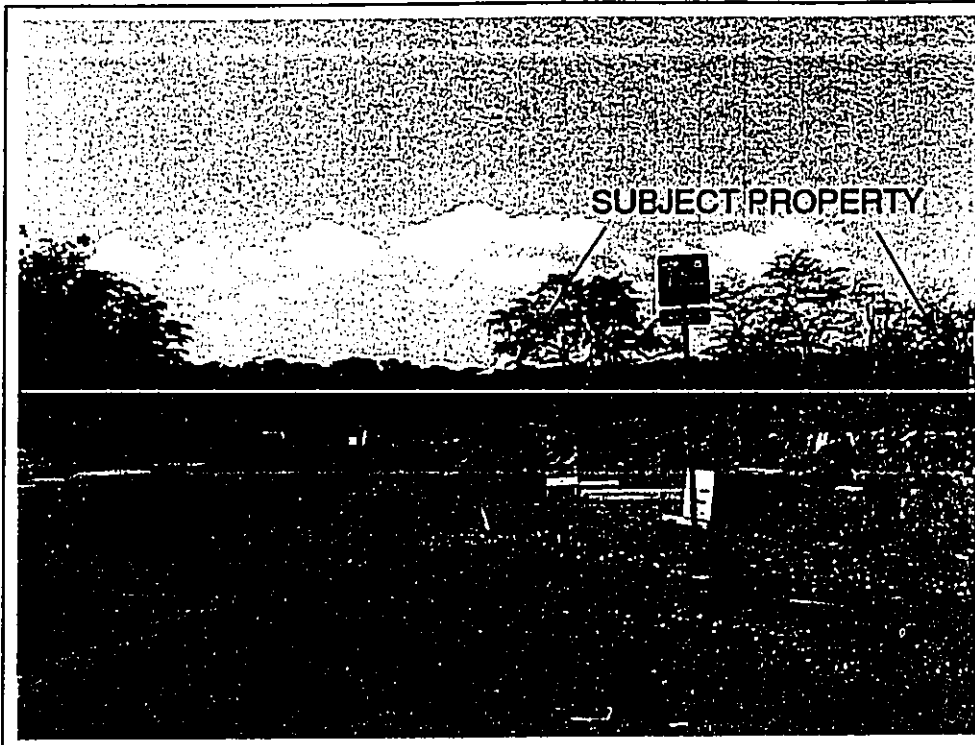
4c.

om Makena Alanui looking  
 oundary of the subject property across  
 e ocean (See Figure 10 A).



Makena Estates  
 VISUAL ANALYSIS

FIGURE  
 10C

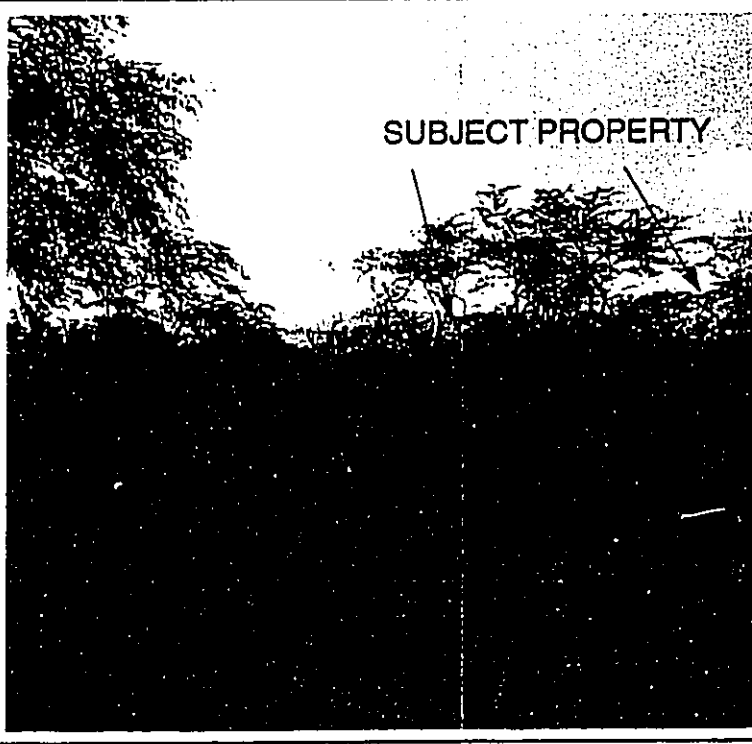


5a. Photographs a, b, c, and d are looking from Makena Alanui and Makena Keoneio Road from southeast to south (See Figure 10 A).

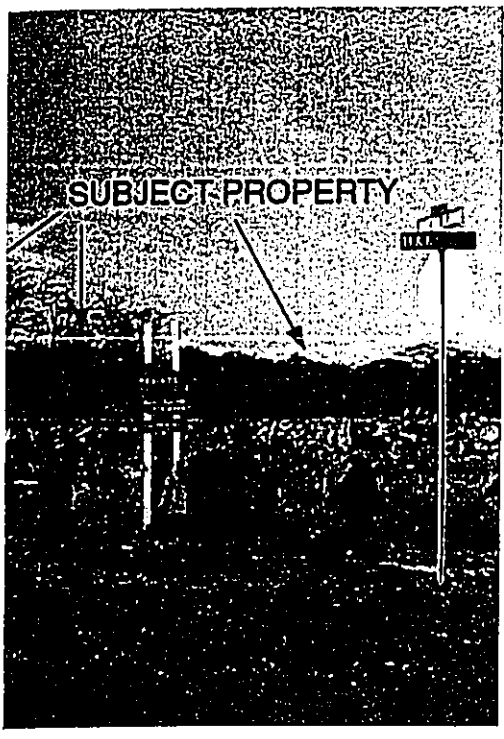
5b.



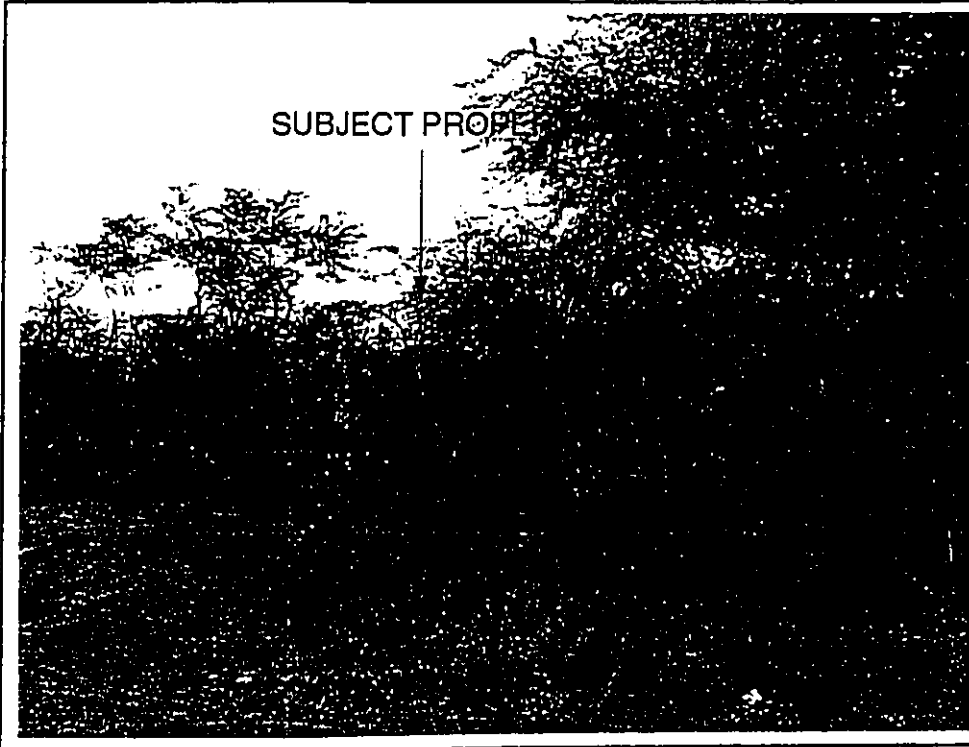
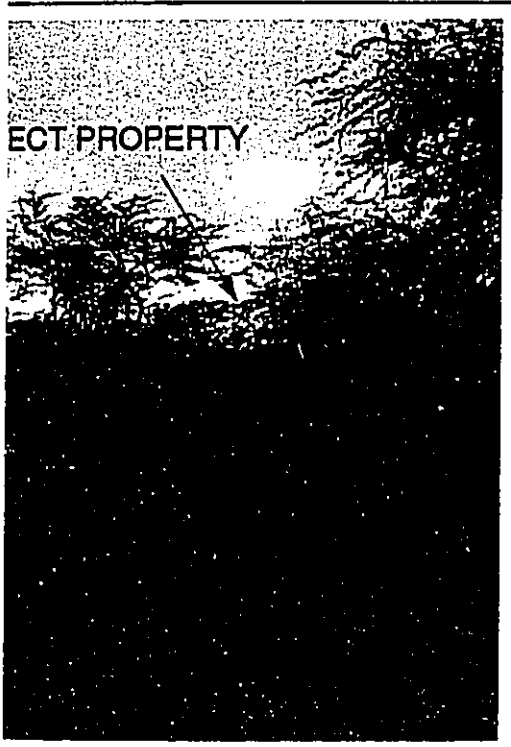
5d.



6a. Photographs a and b are from the driveway of looking east across the subject parcel (See Figure 10 B).



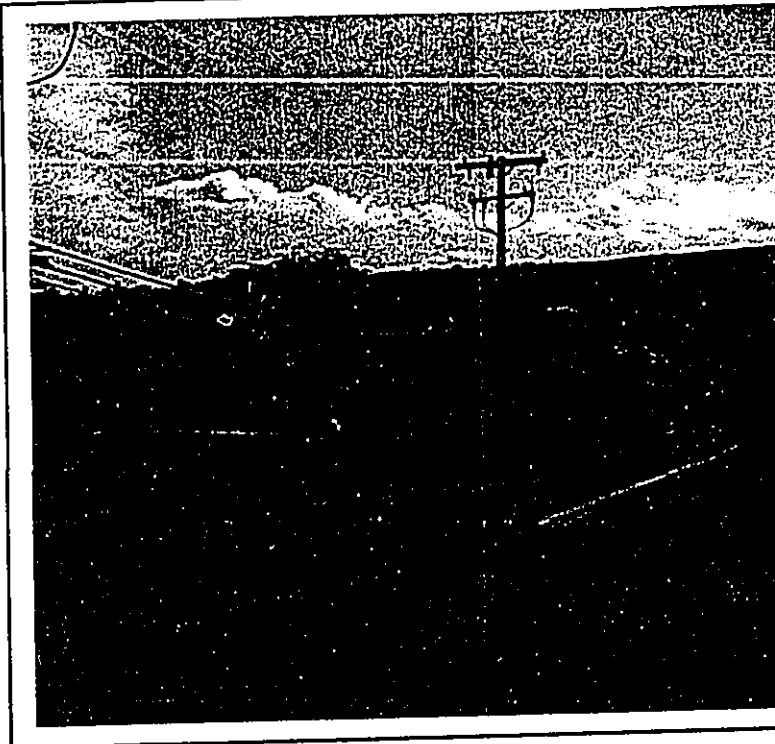
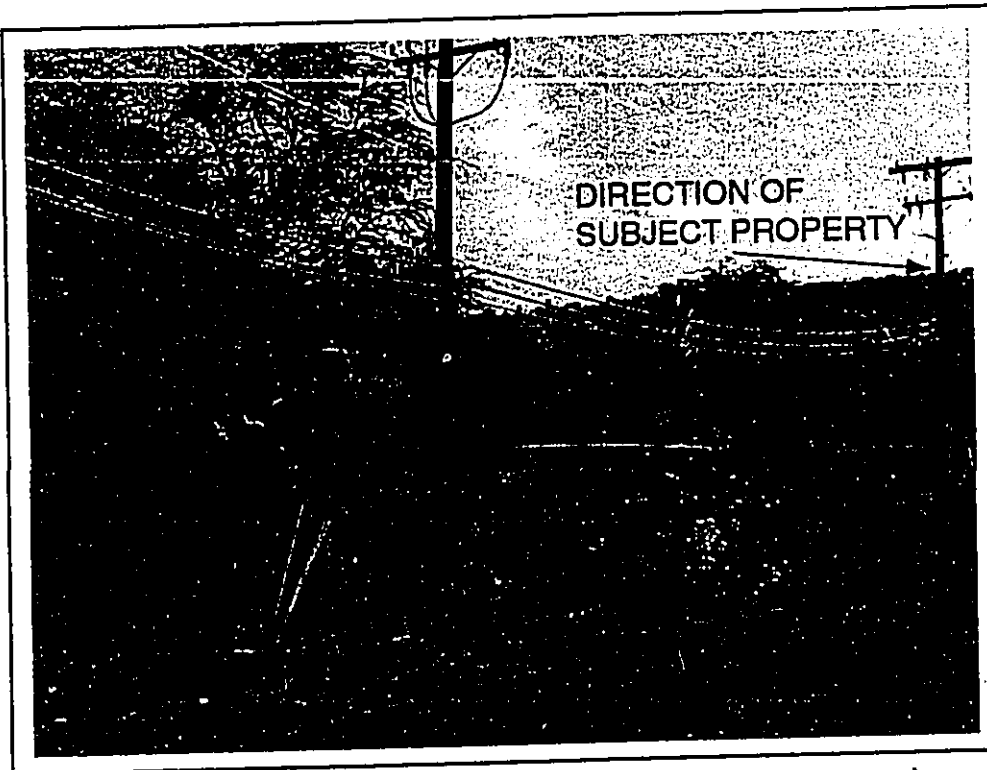
5c.



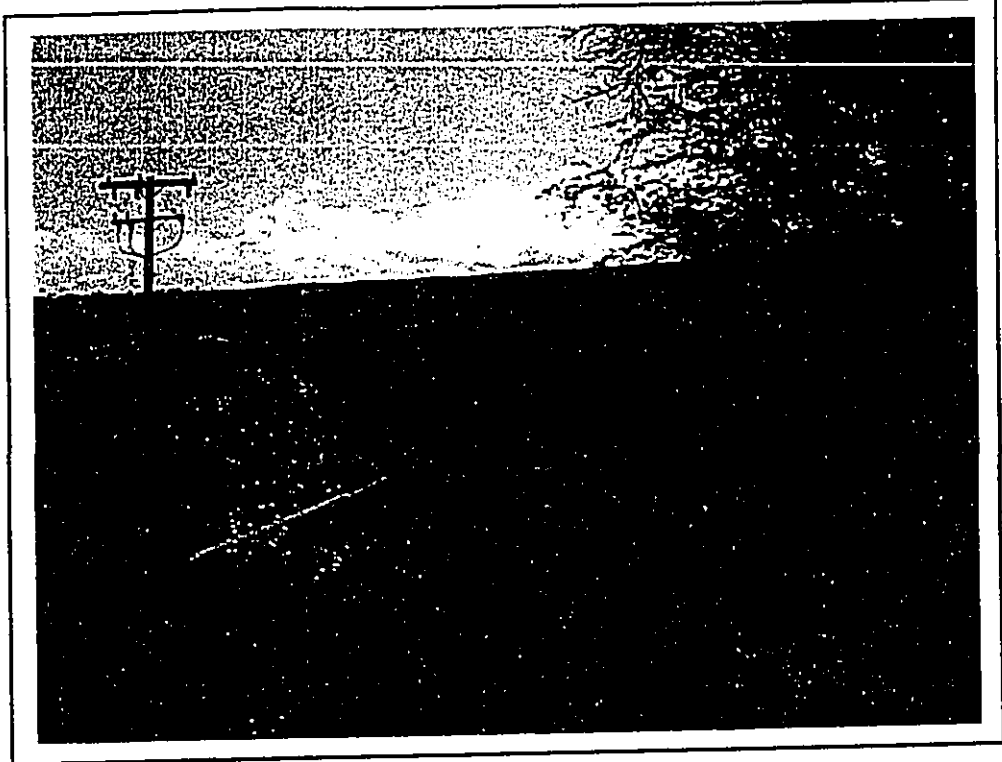
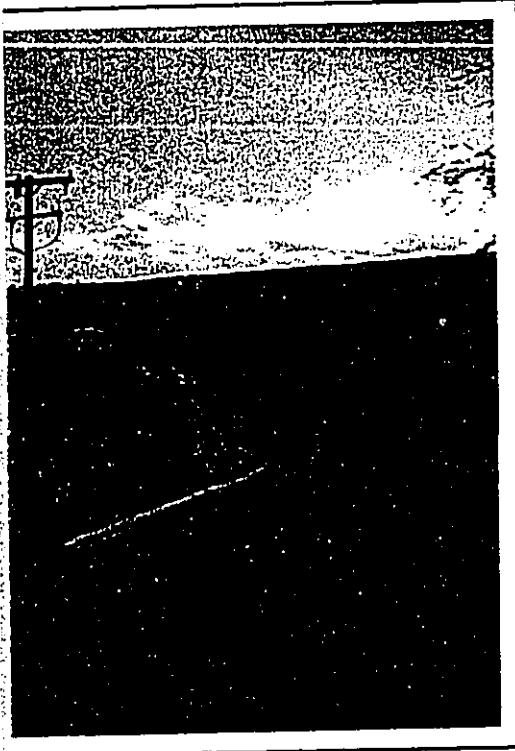
6b.

from the driveway of Makena Place parcel (See Figure 10 A).





7a. Photographs a, b, and c are taken from Makena Keoneoio Road south of the project area looking northeast with the subject parcel about the middle of photo "c" on the right (See Figure 10 A). 7b.

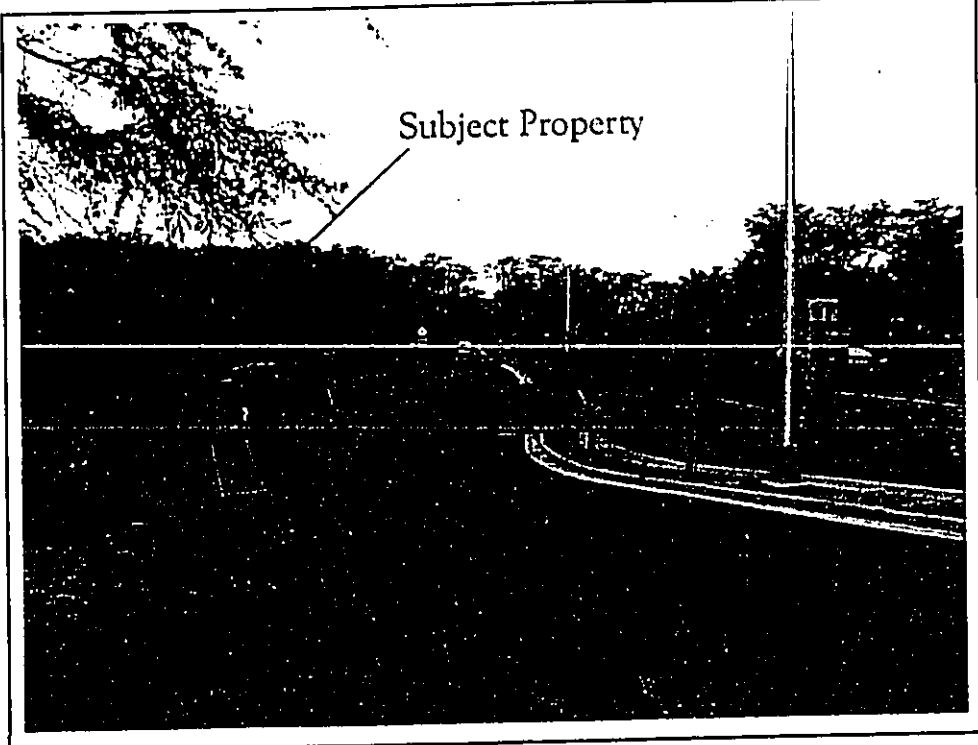


7c.



Makena Estates  
VISUAL ANALYSIS

FIGURE  
10E



Subject Property

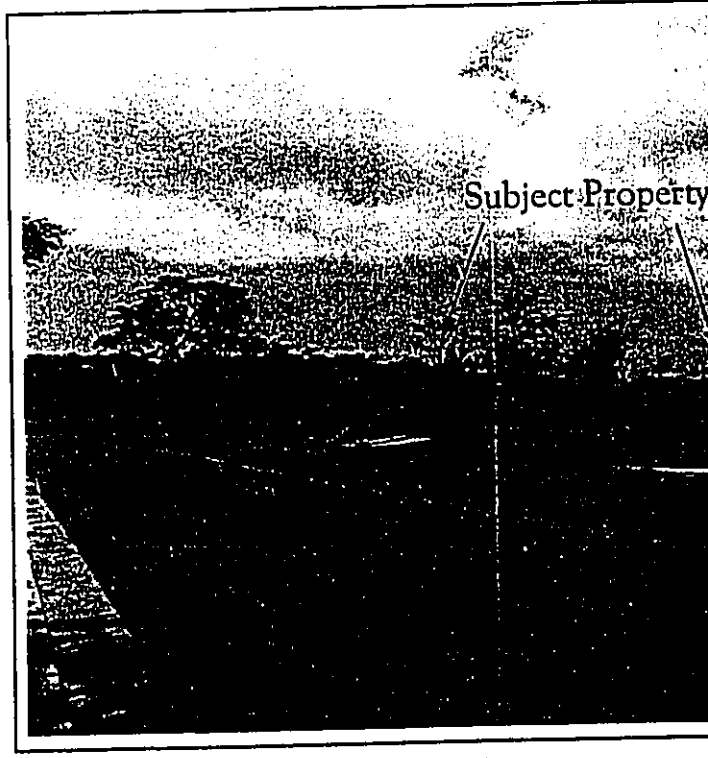
Looking south along Makena-Keoneoio Road



Looking across Makena-Keoneoio Road towards single-f



Looking southwest from Makena Alanui in the direction of Makena-Keoneoio Road and Makena Place



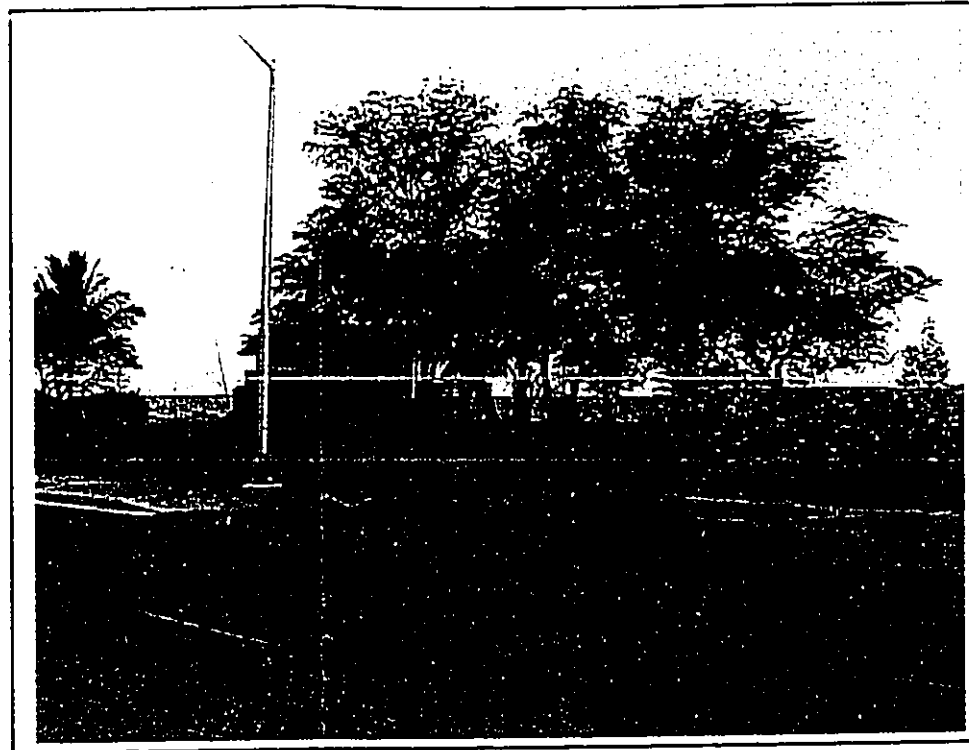
Subject Property

Looking south along Makena Alanui

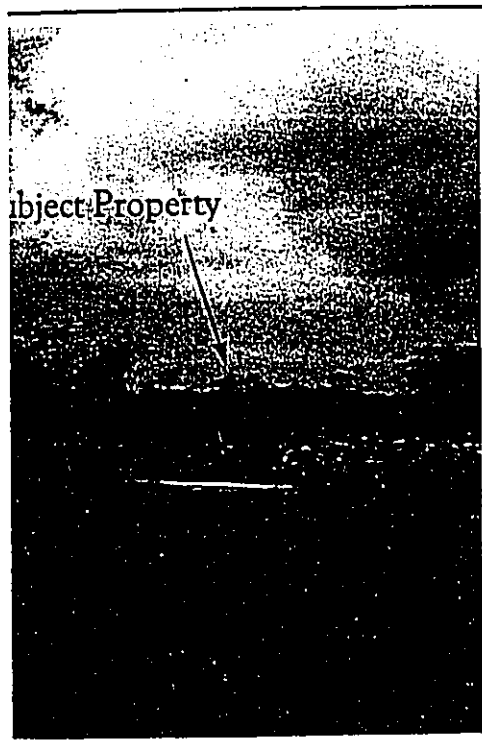




Road towards the Makena Place single-family development



Looking across Makena-Keoneoio Road from makai boundary of property



nui



Looking from across Makena-Keoneoio Road near "Five Graves"

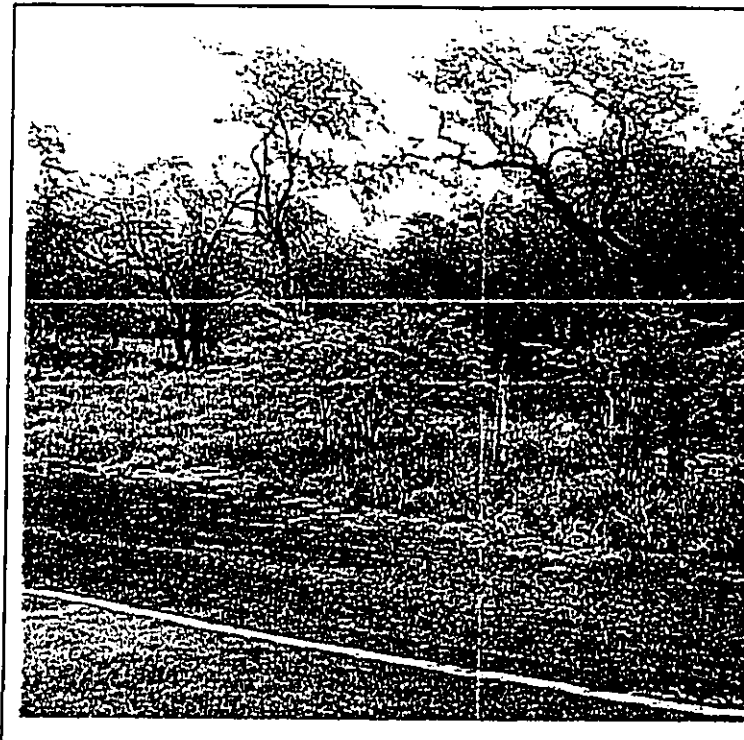
FIGURE 11 A      MAY  
2000

SITE PHOTOGRAPHS  
MAKENA ESTATES





Looking east into subject property



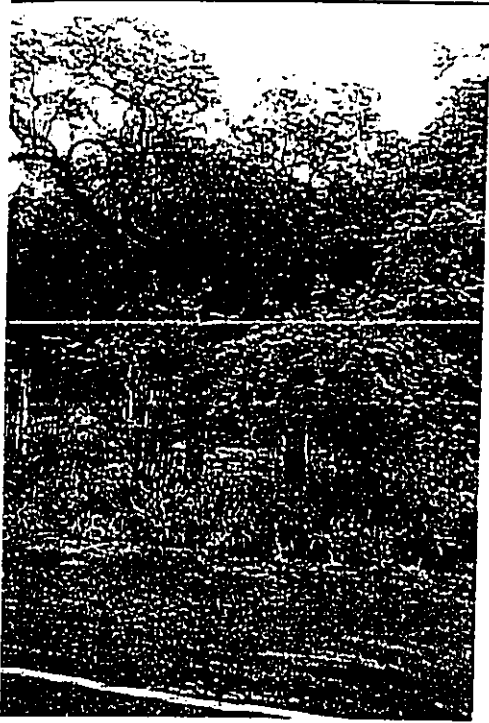
Looking into the subject property from Makena-K



Looking south from Makena Alanui with Makai  
views blocked by vegetation and topography

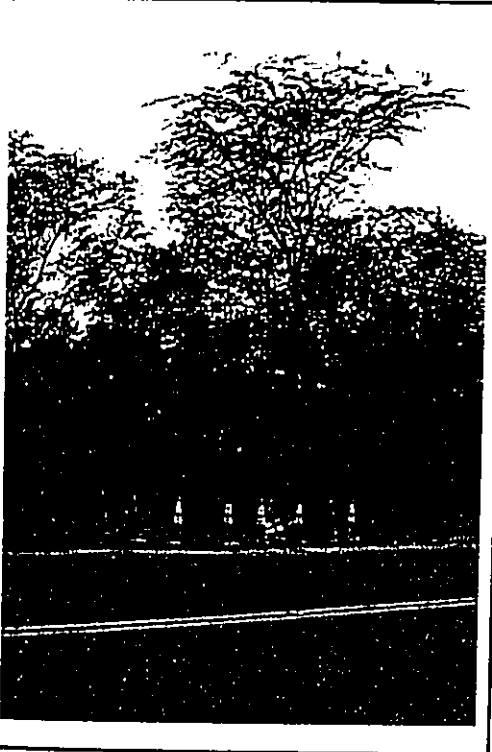


Looking west from Makena Alanui in the  
direction of the subject property

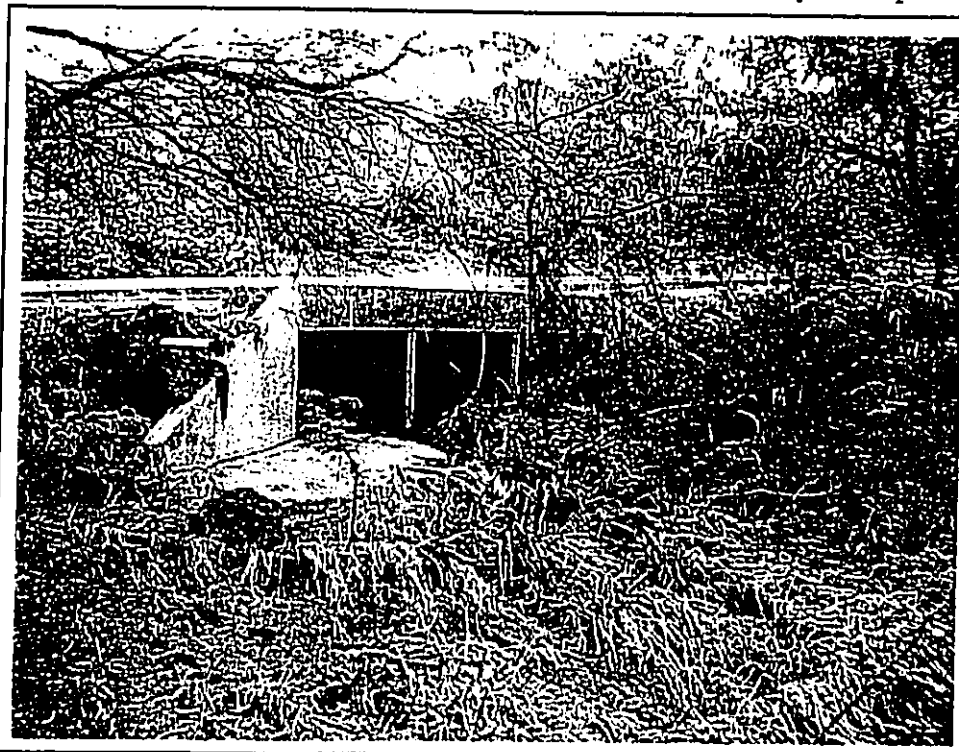


ty from Makena-Keoneoio Road

Pohakunahaha Heiau (Site 50-14-197) located on adjacent parcel



ui in the  
: property



Culvert from Makena-Alanui providing drainage  
into the subject property

FIGURE 11 B

MAY  
2000

SITE PHOTOGRAPHS  
MAKENA ESTATES



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APPENDICES

Appendix - A  
Agency and Pre-Consultation Letters



May 30, 2000

Mr. John E. Min, Director  
Department of Planning  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

Dear Mr. Min:

RE: Pre-Consultation meeting regarding the Draft Environmental Assessment (DEA) for the Proposed Makena Estates resort condominium project at Makena, Maui, Hawaii; TMK: 2-1-007:101

Thank you for meeting with us on May 2, 2000, in order to discuss the Draft Environmental Assessment (DEA) for the proposed Makena Estates resort residential development.

Per our discussion, the DEA addresses the applicable objectives and policies of the Kihei-Makena Community Plan. We have also provided detailed design specifications to show how the project relates to the County's zoning and development standards. The report also assesses the environmental, infrastructure, and socio-economic impacts resulting from the development and proposes mitigation measures, if warranted.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Sincerely,

Christopher L. Hart, ASLA  
Landscape Architect-Planner

cc. Mr. Marty Quill  
Project File



May 30, 2000

Mr. David Goode  
Deputy Director  
Department of Public Works and Waste Management  
200 South High Street  
Wailuku, Maui, Hawaii 96793

Dear Mr. Goode:

RE: Pre-Consultation meeting regarding the Draft Environmental Assessment (DEA) for the Proposed Makena Estates resort condominium project at Makena, Maui, Hawaii; TMK: 2-1-007:101

Thank you for meeting with us on May 2, 2000, in order to discuss the Draft Environmental Assessment (DEA) for the proposed Makena Estates resort residential development.

Per our discussion, the following issues have been addressed in the DEA:

1. Kihei-Makena Community Plan as it relates to Makena Keoneoio Road (Old Makena Road). The plan states that the rural scale and character along Makena Keoneoio Road should be protected. As such, we are proposing roadway improvements that conform to rural standards for this roadway.
2. Driveway Alignments. As you requested, we have relocated the driveway proposed on the northwest corner of the property so that it is located directly across from the driveway entrance to Makena Place.
3. Right-of-Way Dedications. Right-of-Way dedications along Makena-Keoneoio Road were made by the previous owner at time of subdivision and will be improved to rural roadway standards.

The report also assesses the environmental, infrastructure, and socio-economic impacts resulting from the development and proposes appropriate mitigation measures, if warranted.

Mr. David Goode  
May 30, 2000  
Page 2

Should you have any questions, please contact myself, or Mr. Michael Summers,  
Chris Hart & Partners, at 242-1955.

Sincerely,



Rory Frampton  
Associate Planner

cc. Mr. Marty Quill  
Project File



**CHOUTEAU CONSULTING**  
CREATIVE SOLUTIONS ← SMART DEVELOPMENT

MEMORANDUM TO: Marty Quill  
FROM: ~~Michelle Chouteau~~  
RE: Makena Estates  
DATE: April 20, 2000

The following information provides a summary of the meeting I had with the County Administration about the Makena Estates project.

**November 22, 1999: Meeting with Alice L. Lee**  
Director, Department of Housing and Human Concerns

Ms. Lee expressed no concerns over the proposed project.

Her Department usually provides comments to the Department of Planning, relating to affordable housing requirements, when a subject property receives its land use entitlements (i.e., during the change in zoning process). However, the subject property received its entitlements under a "no development" scenario, which resulted in the Department of Housing and Human Concerns providing no comments relating to affordable housing.

Ms. Lee has developed a proposed new County policy relating to affordable housing requirements, which would provide a uniform standard to all applicable developments. This new policy would replace the above-referenced policy of assessing developments on a case-by-case basis during land use entitlement processes.

In consideration of the above, the Department will not impose affordable housing requirements on the proposed project during the Special Management Area permit application process.

Please do not hesitate to contact me if you require additional information or if you have any questions.

c: Chris Hart and Partners

**CHOUTEAU CONSULTING**  
CREATIVE SOLUTIONS ↔ SMART DEVELOPMENT

MEMORANDUM TO: Marty Quill  
FROM: Michele Chouteau  
RE: Makana Estates  
DATE: April 20, 2000

The following information provides a chronology and summary of the discussions you and I have had with the Makana community regarding the proposed Makana Estates project.

**November 8, 1999:** Meeting with Clyde Murashige  
Senior Vice President, Wailea Resort Company, Ltd.

Mr. Murashige expressed no concerns over the proposed project.

**November 10, 1999:** Meeting with Roy Figueiroa  
Assistant General Manager, Makana Resort Corp.

Mr. Figueiroa expressed no concerns over the proposed project.

**November 11, 1999:** Telephone conversation with Sam and Doris Molina

The Molinas provided information about the status of the sale of the subject property. They also indicated that the Chang family (both the family members who are selling the subject property and the family members who are keeping the adjacent property) understands that the subject property will likely be developed. While there is no commitment to support development, it is likely that the family, in general, will not oppose any "reasonable" development plans.

**December 6, 1999:** Sent preliminary site plan to Bob Brooks  
Resident Manager, Makana Surf

*See December 13, 1999 for information.*

**December 7, 1999:** Meeting with Tim Farrington  
Developer, Makana Place

Mr. Farrington expressed no concerns over the proposed project.

Memo to Marty Quill  
April 20, 2000  
Page 2

**December 9, 1999:** Meeting with Eddie and Laurie Chang at the subject property

The Changs offered several comments about the proposed development, particularly mauka views, traffic and drainage. Their concerns over views and traffic seemed to be assuaged when the building heights, setbacks and densities were discussed. They were told that the development would comprise approximately 40 units with heights no greater than three stories. Their concerns over drainage include the general area (not just the subject property), as there was a vigorous storm in early November that resulted in large amounts of stormwater run-off and debris flowing into the ocean along the Makena coast. They agreed that the subject property's drainage channel is very active when such storms occur, though they are infrequent. Therefore, they also agreed that the drainage channel should not be substantially reconfigured or improved.

**December 13, 1999:** Letter submitted to Bob Brooks for inclusion in the Makena Surf's December newsletter

Copy attached. No questions or comments were received in response to this letter.

**February 1, 1999:** Proposed project was presented to the Makena Community Association

Questions and concerns were expressed relating to walls and gates; buffers around the heiau on the adjacent property; drainage; roadway access; lighting; and County requirements. Because the proposed project was in a preliminary stage, and issues such as drainage had not yet been analyzed, we agreed to attend a future meeting to provide more specific and current information.

*See February 3, 1999 for information.*

**February 3, 1999:** Follow-up letter sent to Makena Community Association

Copy attached. The Makena Community Association will next meet on May 2, 2000. We are tentatively scheduled to present the final site plan at the following meeting, on June 6, 2000.

Please do not hesitate to contact me if you require additional information or if you have any questions.

Attachments (2)  
c: Chris Hart and Partners

**CHOUTEAU CONSULTING**  
CREATIVE SOLUTIONS ↔ SMART DEVELOPMENT

December 13, 1999

Dear Makena Surf Residents and Owners,

We appreciate this opportunity to familiarize you with a Makena property that may be developed in the near future. The 6.2-acre property was recently subdivided from a 12-acre parcel owned by the Chang family. It is located between Makena Alanui and Old Makena Road, mauka of the Makena Place development, between the Chang family's parcel and the wedge-shaped parcel situated at the intersection of Makena Alanui and Old Makena Road.

The property is zoned A-2 Apartment District, which allows a maximum of four stories and approximately 240,000 square feet of floor area. Given topographical and other development restrictions, however, it is unlikely that the development of the property would approach these figures.

The potential buyer and developer of the property, CMI Development of Makawao, is pursuing a condominium development with approximately 42 units containing approximately 84,000 square feet of residential living area.

This project will have to submit a County Special Management Area (SMA) permit application, during which you would be notified and be able to offer comments. We would like to make ourselves available to you before this process begins so that we could answer any questions and try to address any concerns you may have before our site final plans are prepared, rather than after.

Bob Brooks, your resident manager, has a copy of a preliminary site plan sketch that is available for you to review.

Please feel free to contact me at 572-2233 if you have any questions or would like additional information about the potential development of this property. Again, thank you for this opportunity. Happy Holidays!

Sincerely,



Michele N. Chouteau  
Chouteau Consulting

**CHOUTEAU CONSULTING**  
CREATIVE SOLUTIONS ↔ SMART DEVELOPMENT

February 3, 2000

Mr. Boogie Lu'uwai  
Makena Community Association  
5100 Makena Road  
Kihei, Hawai'i 96753

Dear Boogie,

Thank you for letting me present the proposed Makena Estates project to the Makena Community Association on Tuesday evening.

As we discussed, Marty Quill with CMI Development would be happy to attend upcoming meetings in order to meet the Association's members and discuss the proposed project in greater detail.

Here is some information in response to a few of the questions that were raised on Tuesday evening:

➤ Will there be any walls or gates built around the project?

Yes, in some areas. The project will likely be bordered on the north and south sides (running mauka-makai) by chain link or similar fencing, which would then be bordered with hedges and other landscaping. The east and west sides (fronting Makena Road and Makena Alanui) will likely be bordered by a low lava rock wall with open iron fencing on top. The roadway entrances to the project will probably have gates.

➤ Does the data recovery plan (approved by the State Historic Preservation Division) call for a specific buffer around the heiau on the adjacent property?

No. It is our understanding that SHPD addresses development issues and imposes these types of requirements once the data recovery work has been performed. While SHPD does not have a specific minimum buffer or set-back requirement, it appears that 30 feet is relatively standard. The property line that borders the heiau provides a buffer or set-back of approximately 10 to 20 feet. Additionally, as depicted by the proposed site plan and 3-D model, the distance between the heiau and the closest structure of the proposed project is approximately 80 feet.

Other questions and concerns relating to drainage, roadway access, lighting and other County requirements would probably be best discussed at an upcoming meeting, rather than in writing, as answering one question about these issues can often raise other questions.

Mr. Boogie Lu'uwai  
February 3, 2000  
Page Two

Please let me know when you would like for Marty and me to attend the next Association meeting, and we will let you know if any family events will keep us from being there!

Again, mahalo for letting me join you on Tuesday. It was a pleasure to meet you and the Association members.

Sincerely,



Michele N. Chouteau

c: Eddie Chang

Appendix - B  
Letters between Scientific Consultant Services, Inc. and the State  
Historic Preservation Division



April 4, 2000

Dr. Ross Cordy  
Branch Chief-Archaeology  
State Historic Preservation Division  
Kapolei, HI  
cc: Marty Quill, CMI Group

re: End of Fieldwork Letter, Data Recovery, Papa'anui Ahupua'a, Makena, Maui, Hawai'i (SCS-199)

Dear Ross:

This letter is to inform you that Data Recovery fieldwork on a 6 acre parcel in Papa'anui Ahupua'a, Makena has been completed. We thank you for your comments regarding the Data Recovery Plan. In total, three sites (composed of 21 features) were subject to various levels of testing between March 6, 2000 through April 4, 2000 by a variably-sized fieldcrew. Both test units (screened) and stratigraphic trenches (not screened) were utilized during excavation.

The greatest concentration of excavations occurred within Feature 2A of Site 3513 (enclosure). Testing was accomplished at this site to address questions of intra-site activity areas. Briefly, the feature measures 22.70 m by 15.1 m (342.77 sq. m.). Excavations in the form of Test Units and Stratigraphic Trenches allowed for investigating some 34 sq. m. of the feature (about 10% of the feature). Additionally, shovel probes/horizontal shovel stripping were utilized across a bisecting section of the feature to judge the presence/absence of 'ili 'ili pavement throughout the entirety of the feature. Block excavations proceeded from the southwest corner of the structure to the northeast, the block being 5 m by 5 m with another 1 m by 5 m extension along the eastern flank of the block.

Briefly, over 65 subsurface features of varying depths and breadth were recorded within the block, the feature exhibiting intensive occupation over time. The subsurface features were represented by hearths, postmolds, charcoal concentrations, and ash lens'. Many artifacts and remains were recovered during excavations of the block, including a large quantity of shell, faunal remains (fish vertebrae, etc.), lithics (adze fragments, flakes, and debitage), several fishhooks, worked *vanna*, and coral abraders, among other classes. Ample charcoal samples were acquired from each feature and thus, precisely dating utilization of the enclosure should be non-problematical. Additionally, 'ili 'ili pavement stones were measured per cubic meter of rock per excavation unit within the block.

TEL. 808-597-1192

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FAX. 808-597-1193

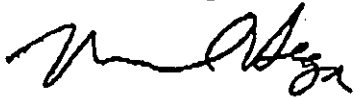
ALSO ON MAUI • P. O. BOX 1974 • FULWINE, HAWAII 96784 • 808-244-1134



Site 3514 Features 2 and 3 (agricultural features) were subject to minimal testing (test units), as were Site 3516 Features 1 and 4 (terrace and lithic scatter). Again, sufficient charcoal was acquired from various depths of these features to appropriately address the first research design question pertaining to the chronology of sites within the project area. Additionally, a modest amount of artifacts (e.g., lithics, volcanic glass, etc.) and midden (shell, Echinoderm, etc.) were obtained through excavations of these features.

All materials, including cultural resources, notes, and photographs have been curated within the Honolulu office of SCS, Inc. Once laboratory analysis (including radiocarbon dating), drafting, and writing have been completed, a draft report will be submitted to you for review. If you have any questions or concerns, please do not hesitate to call myself or Dr. Robert Spear at (808) 597-1182. We again thank you for your comments prior to the Data Recovery work and look forward to presenting you with a concise and informational report.

Best Regards,



Michael Dega  
Senior Archaeologist  
Scientific Consultant Services, Inc.

BENJAMIN J. CAYetano  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
Kekuhihewa Building, Room 555  
601 Kamehale Boulevard  
Honolulu, Hawaii 96807

TIMOTHY E. JOHNS, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

DEPUTEE  
JANET E. KAWELO

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

May 26, 2000

Dr. Robert Spear  
SCS  
711 Kapiolani Boulevard, Suite 777  
Honolulu, Hawaii 96813

LOG NO: 25540  
DOC NO: 0005RC52

Dear Dr. Spear:

**SUBJECT: Conclusion of Archaeological Data Recovery Fieldwork &  
Approval for Land Altering Development to Proceed  
Papa'anni, Makawao (Honua'ula moku), Maui  
TMK: 2-1-07: 12, Lot B**

Michael Dega of your staff spoke to Ross Cordy, our Branch Chief for Archaeology, earlier this week requesting this review. He had submitted an end-of-field work letter some time ago on this project, but we were not aware that the letter was a request for a review.

Clearly, the fieldwork has been adequately completed, meeting the scope of the data recovery plan. Thus, at this point, we can conclude that the archaeological data recovery fieldwork portion of the data recovery work is concluded. Your client, from our perspective, thus could begin land altering development. The sites need no longer be protected.

It is important to realize that the laboratory and report write-up report portions of the data recovery work still need to be completed. However, construction can begin while those portions of the data recovery work are being completed.

Aloha,

A handwritten signature in black ink, appearing to read "Don Hibbard".

Don Hibbard, Administrator  
State Historic Preservation Division

RC:dnm

c: Public Works Department, County of Maui  
Planning Department, County of Maui

ATTACHMENT "B"

Appendix - C  
Cultural Impact Assessment

# Kapiioho Lyons Naone Cultural Consulting, Inc.



## Makena Estates Cultural Impact Assessment

### Introduction

The author of this Cultural Impact Assessment Report is Kapiioho Lyons Naone III, a native Hawaiian who was born and raised in the Kipahulu and Hana areas of Maui. Kapiioho has been teaching cultural traditions and language in Maui and internationally for several years and currently holds a position as one of the third highest chiefs of the Royal Order of Kamehameha. This author is familiar with cultural practices and features throughout the Hawaiian Islands. In addition, he has professional and cultural access to other people of similar stature who have specific knowledge of the general Ahupua`a of Papa`anui area.

The methods used to conduct this assessment included: walking and feeling the property for the proposed Makena Estates; interviewing a former owner of the property, Eddie Chang, Jr.; interviewing another long-time former resident and local fisherman, Ronnie Ka`alakea; interviewing a third cultural person, Leslie Kulaloia, with extensive knowledge of the general Ahupua`a of Papa`anui area; consulting with Leslie Kulaloia about the King's Trail in relationship to the subject property as well as burials in the area. Kapiioho consulted "An Archaeological Inventory Survey of 6 Acres in the Ahupua`a of Papa`anui, Makawao District, Makena, Island of Maui, Hawaii," revised October 1994. That report was authored by David B. Chaffee and Robert L. Spear. He consulted maps provided by Chris Hart & Partners as follows: Makena Estates Regional Location map, Makena Estates Tax Map Key, Makena Estates Topography, Makena Estates Metes and Bounds, Makena Estates Community Plan, Makena Estates Zoning, Makena Estates Site Analysis, and a top level blueprint of Makena Estates.

### Location of Proposed Makena Estates

The property lies between Makena-Alanui Road and Makena-Keoneoi Road according to most of the materials reviewed. However, the author believes the name of the second road should be Makena-Keoneo'io.

### Summary of Interview Results

From a cultural practices and beliefs perspective, it appears that the proposed Makena Estates project was part of a much larger area known as Ahupua'a of Papa'anui. Cultural practices today are mainly makai of the roadway. Those practices include fishing, gathering seaweed of many kinds, gathering sea urchins, etc. There are no apparent signs of cultural practices or gatherings currently taking place on the proposed project property. Cattle and goats have been roaming the land for a long time. There were only about three medicinal plants growing anywhere on the property and the vitality of these plants was not of a quality for good medicine. The area hosts mainly keawe trees and grass.

Although the heiau is located outside the physical borders of the proposed Makena Estates project, the heiau appears to be significant and to have significance to the community at large. There is no evidence that the heiau is currently in use. There are several smaller structures around the heiau that indicate damage to the heiau from erosion, nature, cattle, etc.

There is evidence that there is a common belief that bones could be buried around the entire general area of the heiau. It is known that some bones have already been found in this general area and were reinterred closer to the ocean. There are at least 2 burial sites on the makai side of the road in areas called Popoki and Kawahine. These remains are believed to be pre-contact remains and were found throughout the project area. They were probably associated with the heiau.

Near the northwest corner of the property close to the house site where excavation is currently underway, and outside the Makena Estates property, is a site of a shallow cave in which the bones of a female person was found inside an ancient canoe sometime in the 1970s. Those remains were taken to Keawalai Church and reinterred there. The whereabouts of the remains of the canoe is unknown by those who provided testimony.

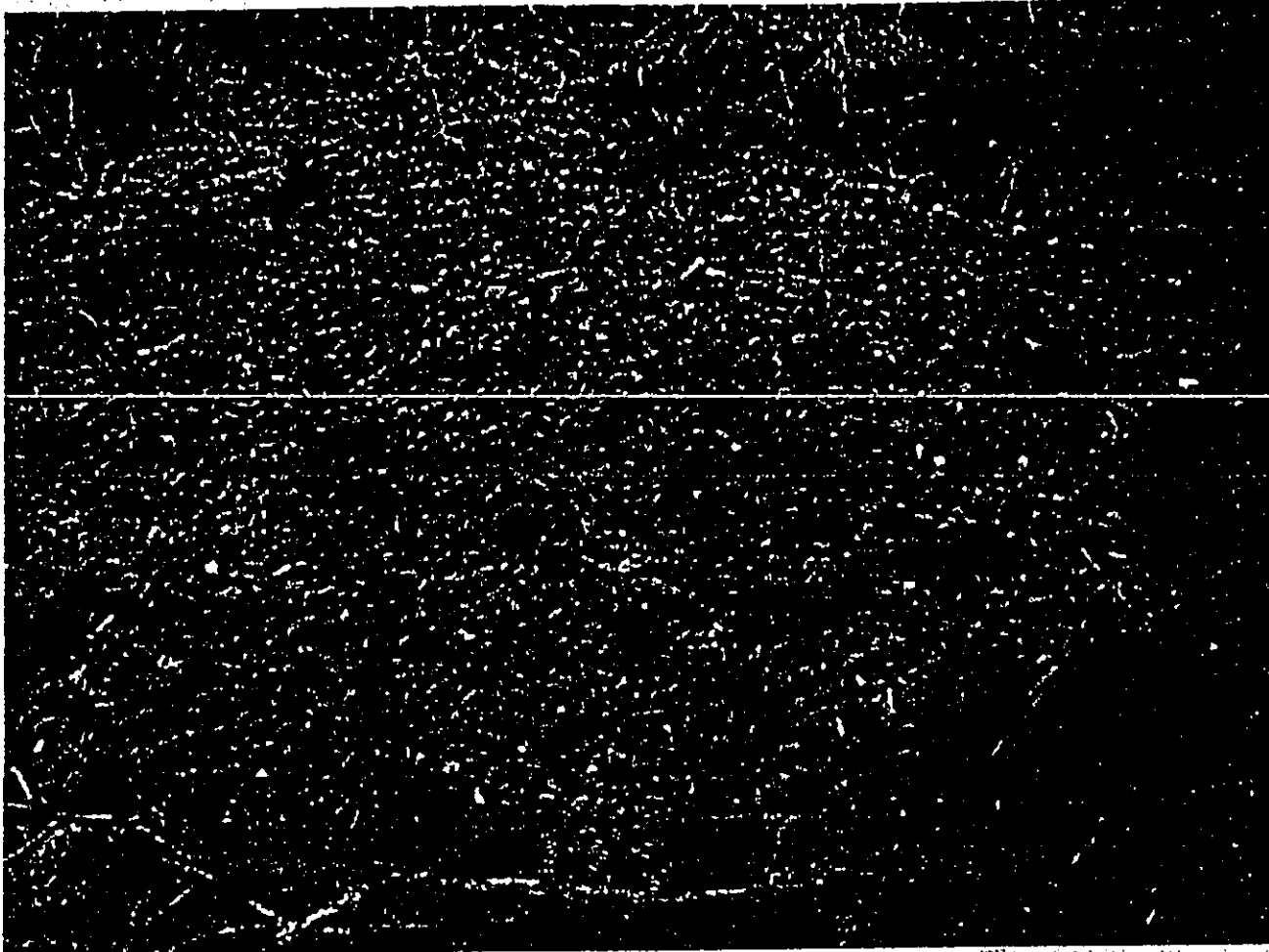
Also, within the property boundaries, near the southern border, there are reports of



House site photo by Mr. Naone

a large partially sunken keawe tree believed to have sunk due to a cave (probable lava tube) or the drying of an underwater spring/source. Mr. Naone had not yet seen the tree himself at the time this report was being prepared (May 8) but intended to observe it for further recommendations about the area.

One of the concerns among Hawaiian people is the location of the King's Trail in relationship to any project. According to the testimony of Leslie Kuloloio, the ancient King's Trail actually followed exactly where the Makena-Keoneoio Road is now. It is believed that the King's Trail never entered the property proposed for Makena Estates.



Additional photo by Mr. Naone showing ili ili rocks and coral chips taken out of the house site

Common beliefs that need to be observed in the opinion of Mr. Naone follow:

1. A typical heiau would normally be erected to service the area from the mountain top to the ocean. The heiau would be the major spiritual/religious center of that immediate area (Ahupua'a of Papa anui). Therefore, space would be required around the heiau to allow free movement of ancestral spirits and Night Marchers.
2. A buffer zone should be implemented—recommend 75 feet out from the heiau in all directions—including on the proposed Makena Estates project property.
3. A clear view to the mountain top and to the ocean should be maintained for the heiau.
4. Some type of reinterment or burial treatment plan should be put in place for bones discovered during the project building. The reinterment area should be as near as possible to the heiau on the Makena Estates property. Bones and any other artifacts should be temporarily stored and then all buried at one time with a significant cultural Hawaiian blessing ceremony after construction is finished.



5. Because there have been bones found throughout the area, including the woman in the canoe, this appears to have been a significant burial area. Bones or artifacts found should not be removed from the island. Reinterment should be as close as possible to the heiau.
6. If bones are found to be of a chiefly nature, significant accommodations need to be made. An adjustment in the building plan may be needed.

#### Methods, Interviews & Related Biographical Information

Mr. Naone went to the land for the proposed Makena Estates and walked it to feel the land, conducted a cultural survey of the entire area: fishing areas, graveyards, adjacent lands, and both roadways. He took a detailed walk through the land and made a detailed survey of all identified significant sites. He visited all known structures (the heiau and the house site) as well as all sub-surface area testing that they did.

Mr. Naone interviewed Edward Chang, Jr., one of the former owners who was born and raised on the property. In addition, Mr. Naone interviewed Ronnie Ka'alakea, a fisherman and former resident of the area; and Leslie Kuloloia, who was born and raised in Makena.

#### Interview with Edward Chang, Jr.

Edward Chang, Jr. was interviewed on May 5 at 3:00 p.m. at 4800 Makena-Alanui Road which is his residence. He is approximately 65 years of age and agreed that his testimony could be quoted or used in this assessment. He is now in retirement and running his own nursery at his residence. He does not recall how long the property was owned by Edward Chang, Sr. Eddie is the son of Edward Chang, Sr. who owned the entire property. In recent years, there were some disagreements in the family. Part of the family wanted to sell all the property; other members of the family wanted to subdivide the property and sell only part of it. He is part of the members of the family who subdivided and sold some of the property to the current developer. He stated that his father was very concerned about the disposition of the heiau and had stated that if the land was ever subdivided and sold, arrangements should be made to care for the heiau. The son, Eddie, remembers his early childhood on the property and along the shoreline. He remembers fishing and playing in the area as a child. As a child and young adult, he remembers feeling the presence of the spirits of the ancestors. He remembers many stories of other people experiencing the same things, especially in the area of the Night Marchers—the stories about the Night Marchers.

He was aware that there were many burial sites in the approximate area, but he could not specifically identify which area. According to Eddie, the family would like to see a buffer zone around the heiau of between 20 and 50 feet or even more. There is



not agreement among his family about how large the buffer zone should be—there is agreement that there should be a buffer zone.

As a child, he remembers that there was a lot of fresh water coming out of the rocks at the beach. His family believed that this fresh water ran under this particular Makena Estates property. However, he feels that the well-drilling in the uplands is what caused the water to stop. He also remembers a large keawe tree that may still be located on the project property. The tree sank into the ground many years ago and many of the old residents believe the tree sank either into a dried up well or a cave of some type. Because of time constraints, a further survey of the land for the sunken tree was not completed at the time of this writing.

Mr. Naone visited Mr. Chang's house to try to see him and told him he was gathering information for this assessment report. Because this interview was not done by appointment, it was conducted in a "talking story" fashion.

Because Mr. Chang spent more than 20 years on the mainland, he could not remember the different types of plants or family names for the area. But, he identified the same types of fish as Mr. Leslie Kuloloio.

He was not aware of any cultural practices on the heiau at any time in his memory.

Eddie was able to recall that the project property had pig pens which were located on the north side of the Makena Estates property; that there is an existing small wooden shack along the north side of the planned project property that was used for storage of feed and salt.

#### Interview with Ronnie Ka'alakea

Ronnie Ka'alakea was interviewed on May 2 at 3:00 pm, at the Makena Landing. He was at the Landing fishing with his children and grandchildren when Mr. Naone spotted him and asked permission to interview him. Ronnie is now a construction equipment operator presently residing in Waiehu.

He has been doing subsistence fishing in the whole Makena area (Ahupua'a of Papa'anui) all of his life. He related that he was not familiar with any present cultural practices on the project lands but he is aware of the strong ancestral spirit presence and spirit roaming in the area. He has heard many stories of the Nightwalkers there and has had many experiences of what he believes to be brief contacts himself.

Mr. Naone sought him out at the landing because he knew Ronnie had broad knowledge of the general area.

Interview with Leslie Kuloloio

Leslie Kuloloio was born and raised in Makena. He was interviewed by appointment on May 2 at 7:00 p.m. at the Kapiioho Lyons Naone Cultural Consulting office at 145 Wakea Avenue, Kahului, Hawaii. Mr. Kuloloio is approximately 62 years old and is a founding member of Hui Ala Nui O Makena. This hui is the one that spearheaded the saving of the King's Trail during the building of the Maui Prince Hotel and it is the most knowledgeable Hawaiian organization regarding the location and preservation of the ancient King's Trail.

Mr. Kuloloio is a member of the Maui Burial Council and a cultural specialist on cleanup activities of Kaho'olawe and the Maui Lani subdivision in Kahului.

He is part of the Kukahiko clan which has a graveyard just makai of the Makena Estates property (and makai side of the road). The residence of his great-grandmother, Auwaloa, was located adjacent to the graveyard on the north side. Leslie was very familiar with the Makena Estates property. As a child he was very familiar with the property which was then owned by Edward Chang, Sr. and family. The property was used at that time as a cow pasture and for pig pens. He is aware of the heiau site and knew of its significance to the area during pre-contact. He is not aware of any current cultural practices on the heiau site.

Leslie related that he personally participated in reinterring bones found in the area. He is not sure exactly where the bones were found, but he knows exactly where they were reinterred and he knows the reinterment was very close to the area where they were found. He did not wish to make public the exact location of the reinterment. However, the reinterment location was makai of the road and immediately makai of the project site.

There are two burial reinterment sites in that particular area. He knows the bones were found mauka of the reinterment sites. He does not know when the bones were found because in those days of treatment of bones, bones were held in storage for awhile.

He is also aware of the finding of skeletal remains of a woman in an ancient wooden canoe that was accidentally excavated by construction equipment sometime in the 1970s. The skeletal remains and the canoe were removed and the

skeletal remains were reinterred at the Keawalai Church. The whereabouts of the canoe is unknown.

Mr. Kuloloio believes that there is the possibility of more skeletal remains within the area but felt that "with a burial treatment plan, identifying a reinterment location near the heiau, and the designation or availability of a cultural advisor, any remains found could be interred at that location."

Leslie also expressed hope that any structures would not block the free flow of ancient spirits and ancestral energies; and the hope that an adequate buffer zone be recognized around the heiau.

Mr. Naone specifically asked Mr. Kuloloio about the King's Trail because he knew there is some concern in that broad, general area about the preservation of the Trail. Based on over a decade of knowledge and work to preserve the King's Trail, Mr. Kuloloio stated that the Makena-Keoneoio Road follows the King's Trail and he did not believe any portion of the King's Trail falls within the principal portion of the project area (Makena Estates).

Mr. Naone also asked specifically about the names of families of the area. Leslie recognized the Lu'uwai family, the Moloa family, the Kukahiko family, the Auwaloa family, the Kukoloio family, the Changs, and the Ferreira family. As far as he knew, only the Changs, the Lu'uwai and the Ferreira families continue to live in that area. He knew that there were more families but could not remember more names.

He knew that fishing in the area was abundant. Fishes caught that he remembers fishing for in this area are: hinaled, kala, manini, weke, palani, and moi. The area was abundant for seaweed of all types as well as for a ama crab, opihia, pipipi, and many others.

Leslie recommends a *generous* buffer zone around the heiau and recommends against blocking the view of the mountaintop or the ocean from the heiau.

#### Constraints

There were really no constraints. Because the family property locations of other area families are at least a quarter mile from the project area, the Lu'uwai and Ferreira families were not contacted. Mr. Naone believes that those parties who were contacted have given definitive testimony about area cultural beliefs and practices for the property.

### Cultural Resources, Practices and Beliefs

Based on Mr. Naone's time spent on the Makena Estates site and based on the way the heiau is oriented (appears to be facing the ocean), the heiau appears to be a Ko`a (fishing shrine) and possibly a luakini heiau where sacrifices may have been made. The existing structure appears to be only a portion of the original structure. It is the opinion of Mr. Naone that the heiau had a lot of influence and spiritual interest over the larger Ahupua`a of Papa`anui area. Kapiioho's feeling is that the ancestor presence on the spirit side is very active in the area. He could feel their presence as well as being told about it by those interviewed. (An interesting note: Mr. Naone felt the presence of the spirits prior to talking to any of the folks who were interviewed.) The absence of a generous buffer zone could cause discomfort for the local residents as well as make the spirits uncomfortable.



Photo of large heiau by Mr. Naone

The field archaeological studies of the house site which is located in the northwest area of the project plan are complete. Though it is only prudent to wait for the final report before saying certainly that there is no need to preserve the site, it appears that the site is not significant enough to be preserved.



The author's own observations and sensory feelings around the heiau indicate that there is no need to preserve this site. Mr. Naone's conversation with Mr. Michael Dega on May 26, 2000 confirmed that his own observations are in alignment with their findings. (Should the evaluation of the artifacts from the site unexpectedly discover something significant, then some efforts should be made to preserve the site.)

Because of the significance of the heiau, the past history of burials, and the active ancestral spirits, a significant Hawaiian cultural blessing ceremony of the area should be conducted to appease local long-time residents that may have strong cultural and spiritual feelings about the area and to appease the ancestor spirits that are believed to be active in the area.

#### Confidential Information

No documentation is being presented separately from this report. All information was shared freely and willingly. The only exception was that Mr. Kuloloio did not wish to be exact about the location of two burial sites. He was however, sufficiently forthcoming to be able to satisfy the needs of this assessment.

#### Conflicts

There are no known conflicts or unresolved issues regarding this assessment.

#### Analysis/Recommendations

1. Space is required around the heiau to allow free, flowing movement of ancestral spirits and Night Marchers.
2. The ancestral spirits should always have a clear view of the mountaintops and the ocean from the heiau along the southerly property line to ensure this free flowing movement. The cultural concern here is that the spirits require a free flow of movement in certain directions and that flow must be protected. Blueprint Number 00/013 of Chris Hart & Partners titled Makena Estates Landscape/ Site Concept Plan and dated May 22, 2000 which was provided to the author on May 23, 2000 indicates a density and building design that allows for this free flow.
3. A 75 foot buffer zone to the nearest building should be established around the heiau on all sides. The blueprint referenced above as well as a site visit with the developer on May 23, 2000 to confirm points of reference indicate that the nearest residential building will be between 96 and 100 feet from the heiau. The low (12 ft), vine-covered roof of a carport which comes to within 55-65 feet of the heiau should not be obstructive of the heiau and its

surrounding spirit energy as shown on the blueprint and as described on site on May 23, 2000.

4. Within that 75 foot buffer zone and on the Makena Estates side, an area for reinterment of bones found during the project should be established as close to the heiau as possible. The "Proposed Burial Plan for Makena Estates Project" (document No. TMK No. 2-1-007: 101) that was provided to us on May 23, 2000 appears to satisfy this requirement and should be reviewed by the Burial Commission.
5. A cultural specialist should be called to assist the developer each time skeletal remains or any artifacts are found. The "Proposed Burial Plan for Makena Estates Project" (document No. TMK No. 2-1-007: 101) that was provided to us on May 23, 2000 appears to satisfy this requirement.
6. The cultural specialist and/or the developer should contact the State Historic Preservation Division of the Department of Land and Natural Resources for the State of Hawaii and the Maui Burial Council. The "Proposed Burial Plan for Makena Estates Project" (document No. TMK No. 2-1-007: 101) that was provided to us on May 23, 2000 appears to satisfy this requirement.
7. Such skeletal remains and/or any artifacts should be temporarily stored and then reinterred at one ceremony near the time of project completion. The "Proposed Burial Plan for Makena Estates Project" (document No. TMK No. 2-1-007: 101) that was provided to us on May 23, 2000 appears to satisfy this requirement.
8. A cultural specialist should perform a significant Hawaiian cultural blessing ceremony of the area once the building is done and the bones are all reinterred to appease long time local residents and the ancestral spirits. The "Proposed Burial Plan for Makena Estates Project" (document No. TMK No. 2-1-007: 101) that was provided to us on May 23, 2000 appears to satisfy this requirement.
9. Although it is necessarily prudent to wait for the final report from the archaeologists before saying certainly that there is no need to preserve the site, the author's own observations and sensory feelings around the hale indicate that there is no need to preserve this site. Mr. Naone spoke with Mr. Michael Dega, Senior Archaeologist with Scientific Consulting Services, Inc., on May 26, 2000 and confirmed that their field study has shown nothing they believe to be of significance at the hale site.

**Bibliography**

"An Archaeological Inventory Survey of 6 Acres in the Ahupua'a of Papa'anui, Makawao District, Makena, Island of Maui, Hawaii," revised October 1994, David B. Chaffee and Robert L. Spear

Blueprint by Chris Hart & Partners dated May 22, 2000 and numbered CHP Job # 00/013, entitled Makena Estates Landscape/Site Concept Plan.

Conversation between Mr. Michael Dega, Senior Archaeologist at Scientific Consulting Services, Inc. and Mr. Kapi'oho Lyons Naone on May 26, 2000.

Letter from Michael Dega, Senior Archaeologist, Scientific Consulting Services, Inc. dated April 4, 2000.

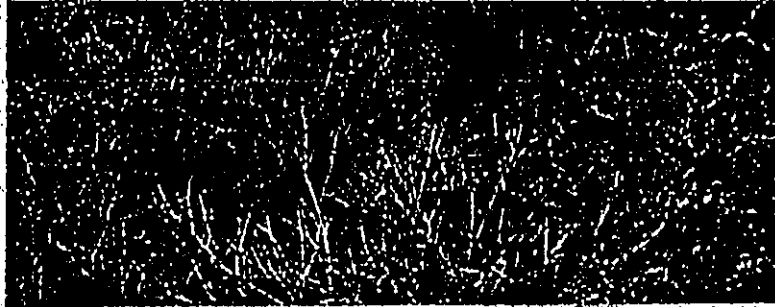
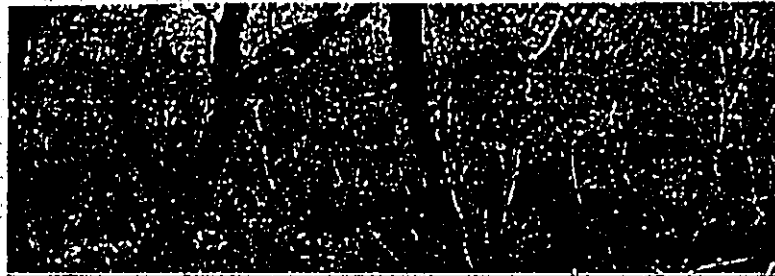
Maps provided by Chris Hart & Partners as follows: Makena Estates Regional Location map, Makena Estates Tax Map Key, Makena Estates Topography, Makena Estates Metes and Bounds, Makena Estates Community Plan, Makena Estates Zoning, Makena Estates Site Analysis, and a top level blueprint of Makena Estates.

Proposed Burial Plan For Makena Estates Project, TMK No. 2-1-007-101, provided by Michelle Choteau on May 23, 2000.

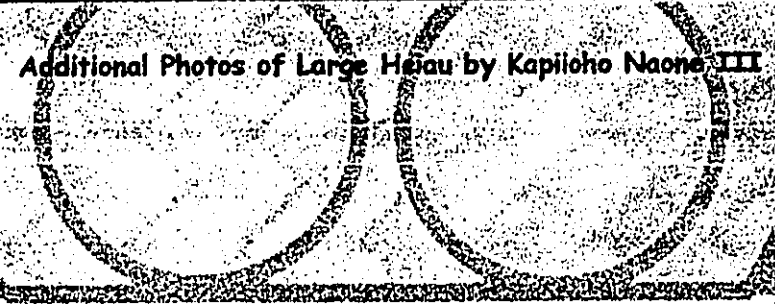
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Supporting Photos



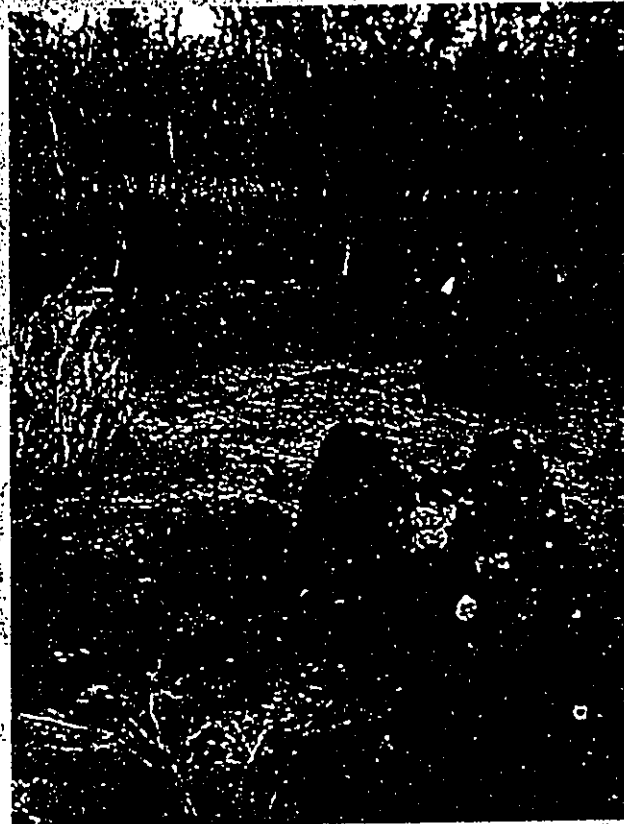
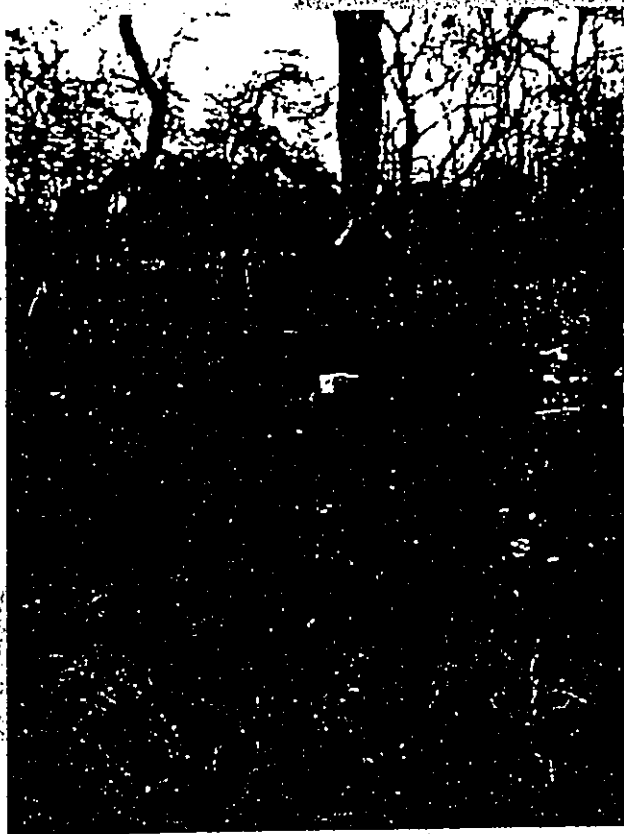
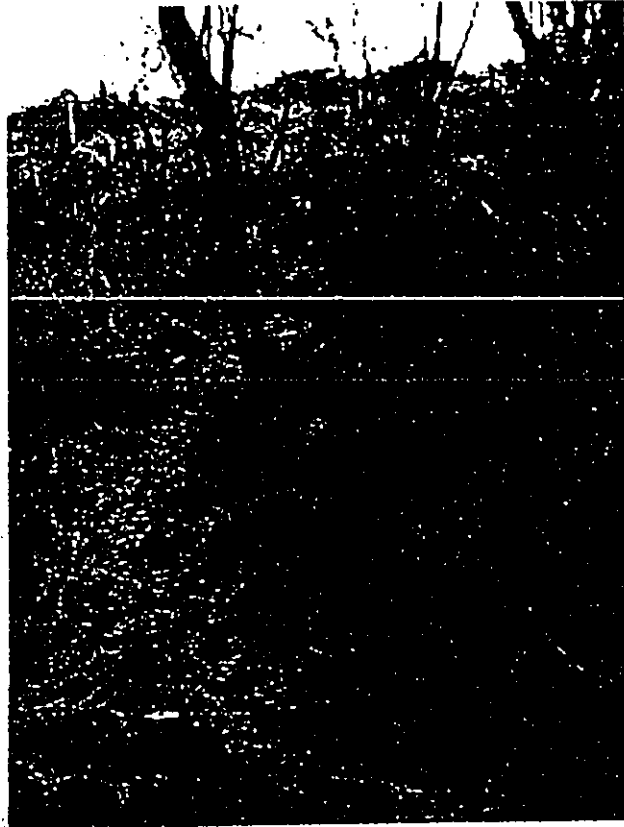
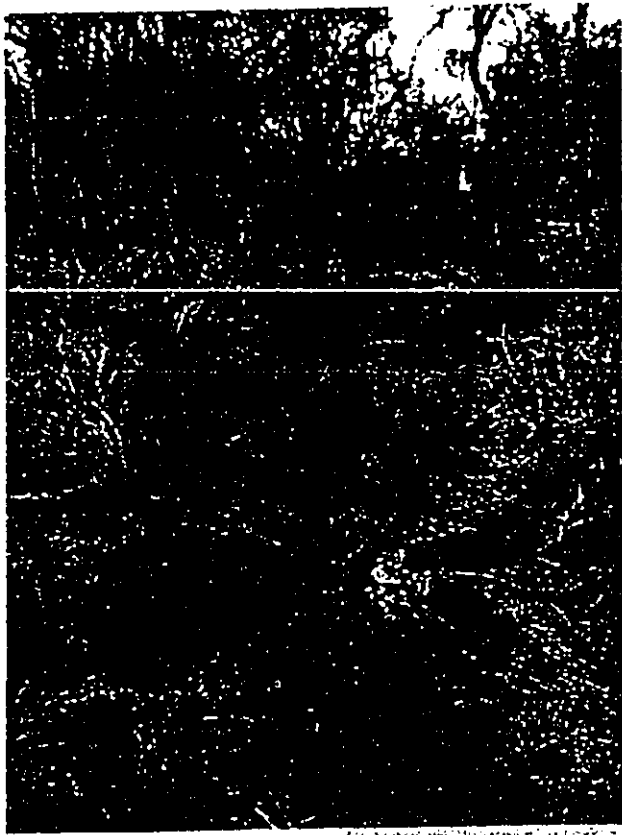
Additional Photos of Large Heiau by Kapiiolo Naone III







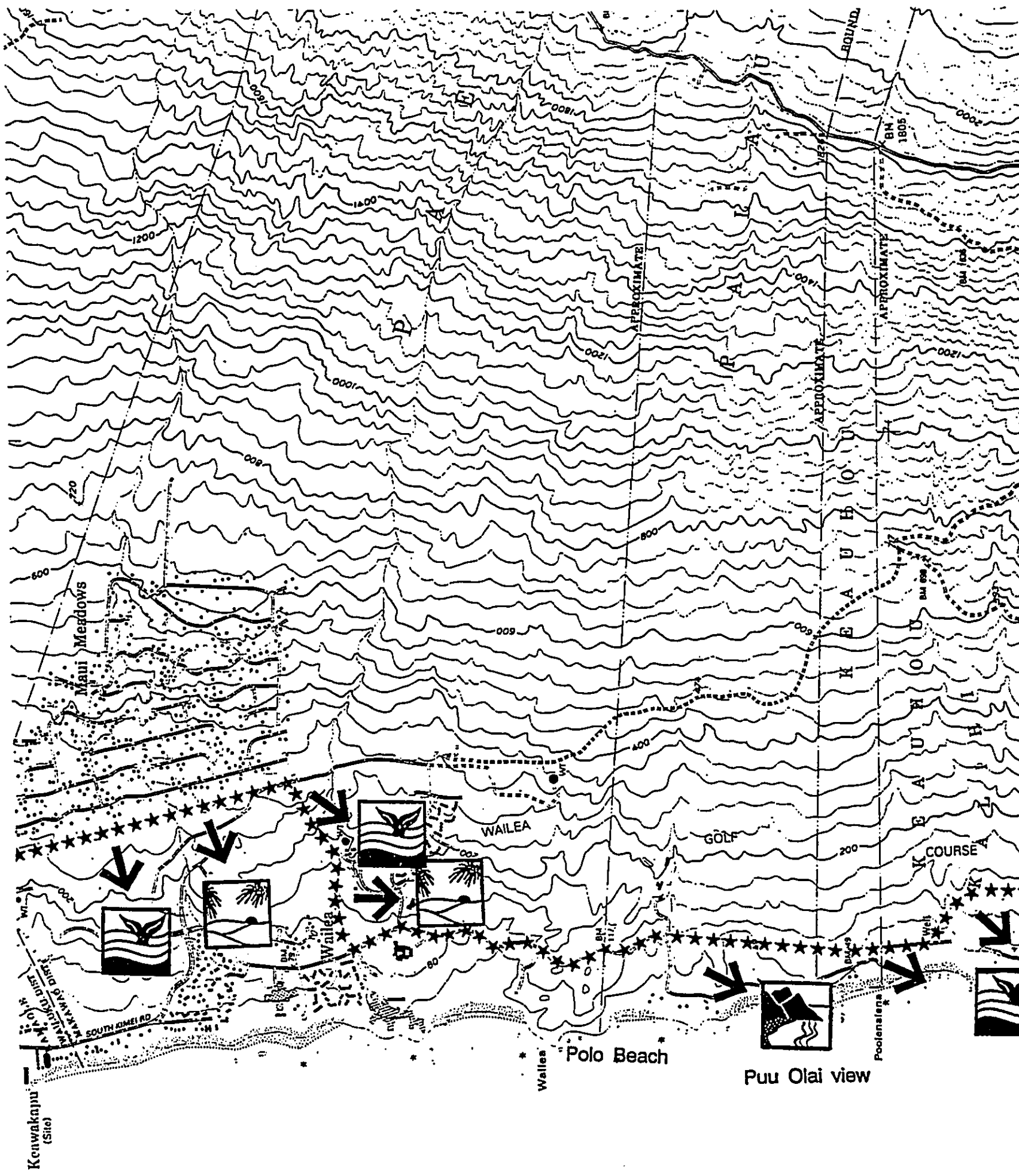
Photos of Small Heiau near the Larger Heiau by Kapihohe Naone III

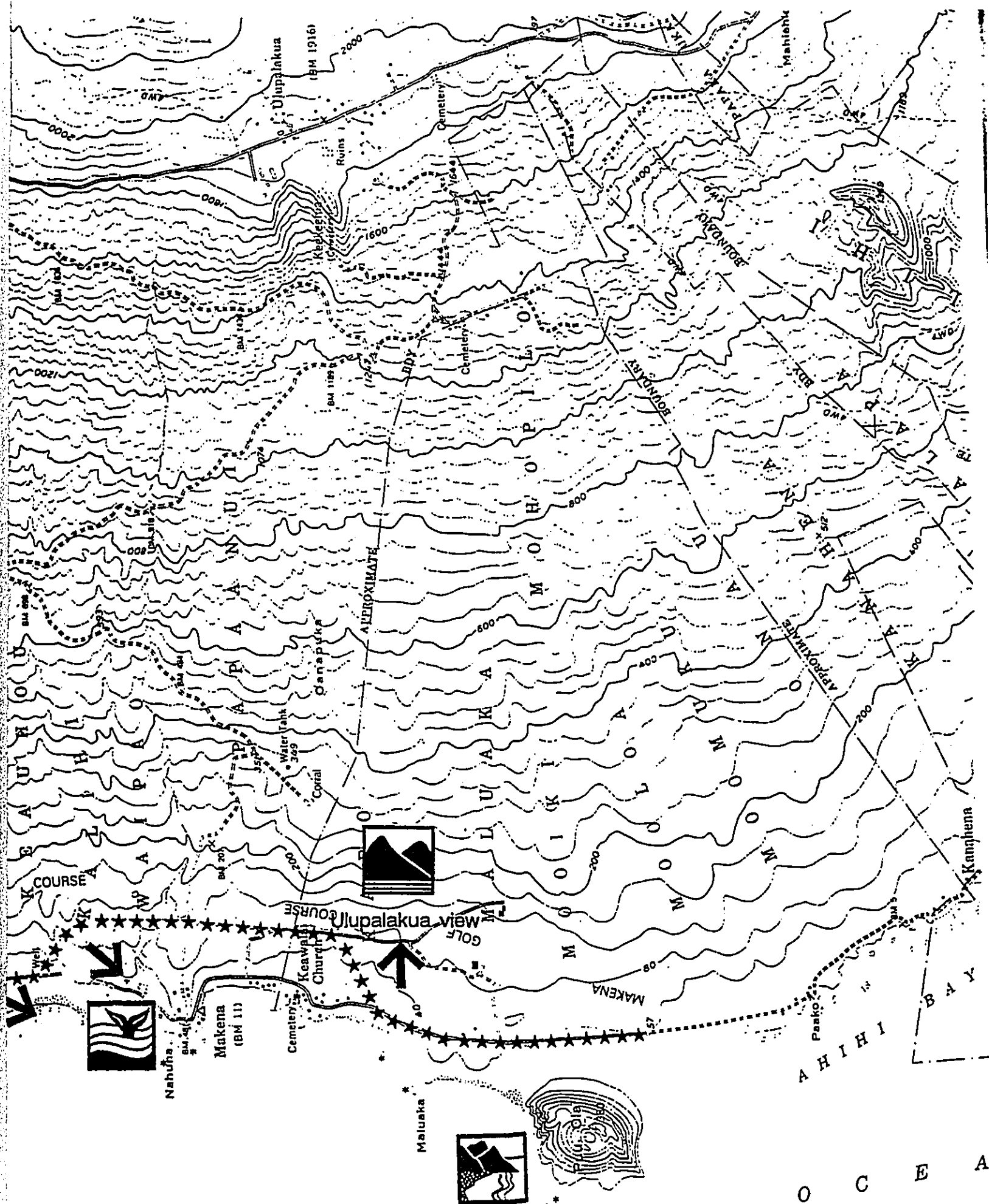


Additional Photos of House Site by Kapiioho Naone III



Appendix - D  
Maui Coastal Scenic Resources Study, Kihei-Makena Map





P A C I F I C P U U O L A I

O C E A N  
8.15 KIHEI-MAKENI

Appendix - E  
Preliminary Engineering and Drainage Report

Established 1969

# Preliminary Engineering Report

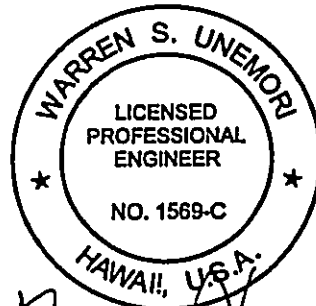
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## MAKENA ESTATES

Wallea, Maui, Hawaii  
TMK: (2) 2-1-07: 101

Prepared For:

Makena Estates LLC  
3612 Baldwin Avenue, Suite 106  
Makawao, Hawaii 96768



A handwritten signature in black ink, appearing to read "Warren S. Unemori", written over a horizontal line.

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

Revised Date: May 10, 2000

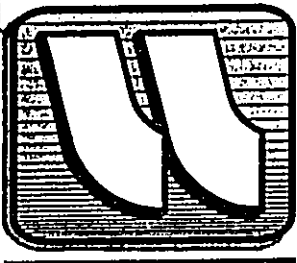


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**PRELIMINARY ENGINEERING REPORT  
FOR  
MAKENA ESTATES**

**1. INTRODUCTION**

Makena Estates LLC (MELLC) recently purchased the project site TMK: 2-1-07:parcel 101, containing an area of 6.180 acres. MELLC is planning to develop a 40-unit condominium project on the site.

This report briefly describes and evaluates the existing infrastructure in the vicinity of the project site. It also provides a brief summary of probable infrastructural improvements needed to support the proposed condominium project.

**2. EXISTING INFRASTRUCTURE**

**2.1 Water System**

The source of water for the Makena area are deep wells located in Upper Waiehu at elevation 458 feet above sea level. These deep wells draw water from the basal lens referred to as the Iao Aquifer.

The Department of Water Supply also developed two new wells in Waihee. These deep wells draw water from heretofore untapped Waihee aquifer. These new wells are interconnected to the Upper Waiehu system by means of a 24-inch transmission and a pair of booster pumps.

A series of 42-, 36- and 30-inch lines convey water from the Upper Waiehu well site to South Maui, feeding into numerous storage tanks en route. This high pressure line feeds into a 1.5 MG storage reservoir in Makena Resort located 4200 feet southeast of the project site at elevation 265 feet. An 18-inch outflow line conveys water back down to Makena Alanui to an 8-inch distribution line on Makena-Keoneoio Road. This line loops back towards Makena Alanui and ties back to a 12-inch distribution system located along the frontage of the project and on Makena Alanui. This distribution system can also be fed directly from the 30-inch high pressure transmission line through a pressure reducing valve assembly. There are three (3) fire hydrants, Nos. 101, 841 and 840 on the makai side of Makena-Keoneoio Road fronting the project site.

## 2.2 Sewer System

The project site is not presently sewered. However, there is a sewer pump station located on the northwest side of Makena Alanui / Makena-Keoneoio intersection that is owned and maintained by the County. Wastewater collected from Makena Surf and Makena Place is being pumped to SPS 10 in Wailea located southwest of Grand Wailea Hotel through a 6" force main. A 12-inch force main then conveys wastewater from SPS 10 into an 18-inch gravity line on Wailea Alanui. A series of gravity interceptors pump stations and force mains

then conveys the wastewater to the Kihei Reclamation Facility located south of the Silversword Golf Course above Piilani Highway.

### 2.3 Drainage

The project site is bisected by a drainageway that extends from its northeasterly boundary to its westerly boundary on Makena-Keoneoio Road. Three 5' x 6' box culverts convey the offsite runoff across Makena Alanui into the project site. Flow in this channel presently sheet flows across Makena-Keoneoio Road into a 10' x 18' concrete span drainage system located in the adjoining makai property (Makena Place) into the ocean.

A second drainage channel conveys runoff into this drainageway from a small contributory drainage area located south of the project site. The existing runoff from the contributory drainage area located to the east and south of the project site for a 100-year 24 hour storm is estimated to be 936 cfs. Current runoff for a 50-year 1 hour recurrence rainfall from the project site is estimated to be around 10 cfs.

### 2.4 Roadway

Piilani Highway is the main State arterial highway linking south Maui including Kihei, Wailea and Makena to the urban areas on Maui. It is a two lane, undivided highway, owned and maintained by the State. Piilani Highway begins at Mokulele Highway and ends at its intersection with Wailea Ike Drive.

Wailea Ike Drive, Wailea Alanui and Makena Alanui are County-owned streets that provide access to the project site which is located southwest of the intersection of Makena Alanui and Makena-Keoneoio Road.

Wailea Ike Drive is a four-lane divided east-west collector road that connects Piilani Highway to Wailea Alanui.

Wailea Alanui is a four-lane, divided north/south collector roadway between Okulani Drive on the north and Kaukahi Street on the south. Wailea Ike Drive intersects Wailea Alanui at its midpoint near the Shops of Wailea. This intersection has been redesigned and will be signalized in conjunction with The Shops at Wailea project which is presently under construction.

Makena Alanui is a two-lane rural collector with one 12-foot lane in each direction. This road is expected to be upgraded to rural collector standards.

Makena-Keoneoio Road. This is a rural County collector road. It has a right-of-way of 50 feet and a curb to curb paved travelway of approximately 20 feet. The makai half of this road along the recently completed Makena Place condominium project has been improved with curb, gutter and sidewalk to urban standards.

## 2.5 Electricity and Telephone

The electrical and telephone distribution systems have been placed underground along the makai or north shoulder of Makena-Keoneoio Road.

## 3.0 PROBABLE INFRASTRUCTURAL IMPROVEMENTS

### 3.1 Water System

According to the "*Domestic Consumption Guideline*" in the Water System Standards for Department of Water Supply (DWS), the average daily demand for multi-family projects is 560 gals per unit. For single family residential it is 600 gallons per unit. Therefore, for the 40 multi-family units and one manager's residence, the total average daily domestic demand is estimated at 23,000 gpd.

A new waterline will be extended into the project site from the 12-inch line on Makena-Keoneoio Road for domestic use and to provide fire flow. Fire hydrants will be installed within a radius of 150 feet of all buildings to ensure coverage as required by the Fire Department and Fire Marshall. In accordance with current DWS policy, each building will be metered separately.

### 3.2 Sewer System

The Makena Estates multi-family condominium project is projected to generate 14,350 gallons of wastewater per day.

A gravity system will be installed onsite to collect wastewater from each building and direct it into a private onsite wet-well mounted

pump station located at the southwest corner of the project site. A 4- or 6-inch force main will also be installed to convey wastewater from the onsite pump station to the existing County pump station located at the northwest corner of the Makena Alanui / Makena-Keoneoio Road intersection.

The existing collection and transmission system along Kihei Road up to and including the Kihei Wastewater Reclamation Facility (KWRF) were recently upgraded. According to Division of Wastewater Management, the KWRF has approximately 2.2 million gallons of capacity left.

The developer will be contributing his prorata share of cost for the upgrade of the transmission system and reclamation facility by paying a one-time assessment of approximately \$5.88 per gallon of wastewater generated by the Makena Estates project as required by County ordinance.

### 3.3 Drainage

In accordance with the County's "*Rules for the Design of Storm Drainage Facilities*" the offsite runoff of 936 cfs will be allowed to flow in the existing drainageway across the project site and Makena-Keoneoio Road as it is currently doing. The existing inundation limits for a 100-year 24-hour storm flow will be respected. However, portions of the existing drainageway may be lowered to increase its capacity and to reduce the inundation limits. Areas of the existing drainageway

that are disturbed will be lined with geocell matting filled with topsoil and grassed with St. Augustine or buffel grass to stabilize it. The grassed channel will be integrated with the general grading of the site to blend with the existing topography and retain its natural appearance. The existing at-grade drainage pattern across Makena-Keoneoio Road will be retained.

Additional onsite runoff generated by the project estimated at 8.8 cfs will be directed into onsite subsurface detention facilities. These facilities will not only keep the post development peak flow volumes at pre-development rates, but will also serve as sedimentation traps and filters to prevent sediments or pollutants from migrating into the coastal waters.

#### 3.4 Roadway

Since the project is bisected by drainageways, the project will be provided with two accesses off of Makena-Keoneoio road and one access off Makena Alanui.

In order to preserve the traditional rural scale and character of Makena Road as specified on page 32 of the Kihei-Makena Community Plan, the road widening strip along the Makena-Keoneoio Road frontage that was set aside at the time of subdivision by the previous owner will be improved to rural roadway standards. The travelway will be widened to 24 feet. Rolled curbs will be installed

along the project frontage. The shoulder area will be fully grassed with an irrigation system.

Parking lots and roadways within the project site will also be designed and constructed in accordance with the provision of Section 19.36 *Offsite Parking Ordinance* of the Maui County Code.

### 3.5 Electricity and Telephone

Electrical, telephone and cable TV services will be extended underground into the project site from the underground distribution on Makena-Keoneoio Road. The parking lots and walkways will be lighted in accordance with the provisions of the Maui County Code. To the extent feasible, non-glare fixtures will be used for this purpose.

## 4. CONCLUSION

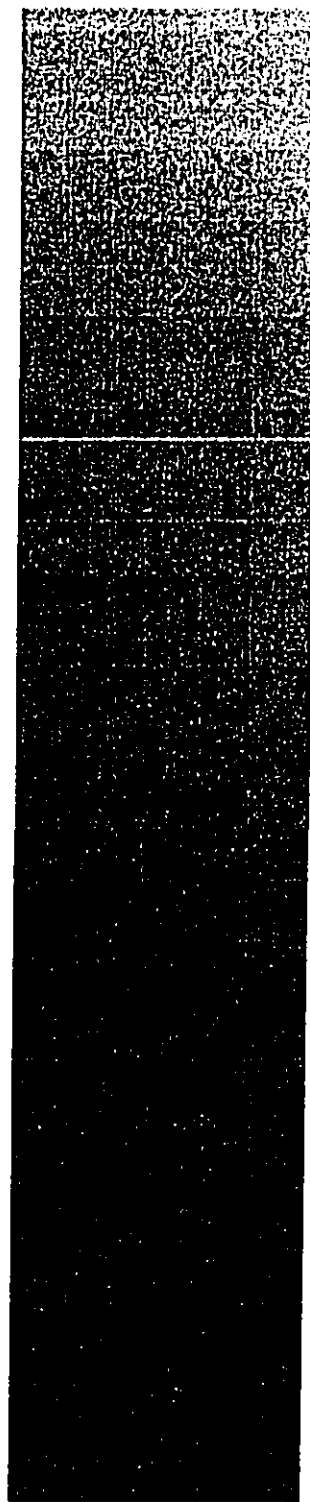
Based on the foregoing, it is our professional opinion that project related impacts on existing infrastructure will be minimal and can be readily mitigated with the installation of the improvements proposed.



**APPENDIX A**

**Preliminary Drainage and Soil Erosion Control Report**

Established 1969



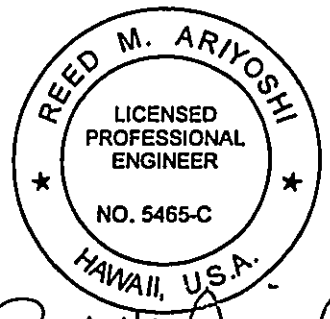
# Drainage Report for

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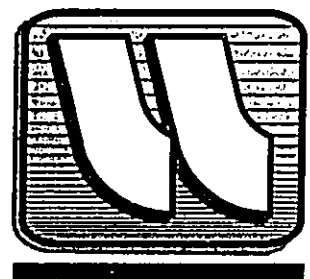
## Makena Estates

Kihei, Maui, Hawaii  
TMK: (2) 2-1-07: 101

DEVELOPER: Makena Estates LLC  
ADDRESS: 3612 Baldwin Avenue, Suite 106  
Makawao, Maui, Hawaii 96768



*Reed M. Ariyoshi*



**WARREN S. UNEMORI ENGINEERING, INC.**  
Civil and Structural Engineers - Land Surveyors  
Wells Street Professional Center - Suite 403  
2145 Wells Street  
Wailuku, Maui, Hawaii 96793

May, 2000

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### EXHIBITS

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

### APPENDICES

- A Hydrologic Calculations
  - A-1 50-year Surface Runoff Before Development
  - A-2 50-year Surface Runoff After Development
  - A-3 100-year Offsite Surface Runoff
- B Subsurface Drainage System Calculations

**Drainage Report  
for  
Makena Estates**

**I. INTRODUCTION**

The purpose of this report is to evaluate both the existing site drainage conditions and the proposed 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, and in the State of Hawaii. It is bordered by Makena Keoneoio Road to the west, vacant land to the north and south, and Makena Alanui Drive to the east. It is also situated approximately 300 feet south west of the intersection of Makena Alanui Drive and Makena Keoneoio Road (see Exhibit 1).

The project site encompasses an area of approximately 6.18 acres.

**B. Project Description:**

The development plan for the Makena Estates project is a condominium development which will consist of 40 multi-family residential units with a manager's residence. Site improvements will consist of, but is not limited to, asphalt paved driveways and parking lots, concrete sidewalks, concrete curb and gutters, and landscaping. Underground utility improvements will consist of underground drainage, sewer, and water distribution and fire protection systems, along with an underground electrical, telephone, and cable distribution systems.

II. EXISTING CONDITIONS:

A. Topography and Soil Conditions:

The project site is presently undeveloped and not being used for any particular purpose. Natural vegetation includes but is not limited to bristly foxtail, feather fingergrass, ilima, and kiawe.

The existing ground slopes from an elevation of (+) 66± feet M.S.L. to (+) 14± feet M.S.L. in a east to west direction with an average slope of 7.4%.

According to the "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii (August, 1972)", prepared by the United States Department of Agriculture, Soil Conservation Service, the soil on the project site is Makena Series, Makena loam, stony complex, 3 to 15 percent slopes (MXC) (see Exhibit 2). This soil is characterized as having slow to medium runoff, moderately rapid permeability, and slight to moderate erosion hazard.

B. Drainage:

Presently, the onsite surface runoff volume generated on the project site is calculated to be approximately 10.0 cfs (see Appendix A). This surface runoff volume presently sheet flows off the project site into an existing natural drainageway, which runs through the project site in a east to west direction. The runoff then flows across Makena Keoneoio Road, into an existing 12'x8' conspan culvert and ultimately discharges into the Pacific Ocean.

The offsite surface runoff volume generated west (mauka) of the project site is calculated to be approximately 936 cfs (see Appendix A). This runoff will continue to flow

through the project site by means of the previously mentioned existing natural drainageway as it is presently doing.

C. Flood and Tsunami Zone:

According to Panel 330 of 400 of the Flood Insurance Rate Maps, prepared by the U.S. Federal Emergency Management Agency, Federal Insurance Administration, which was revised on July 18, 1997, portion of the project site is situated within Flood Zones A and C (See Exhibit 3). Zone A is designated as an area of 100 year flood where flood elevations and flood hazard factors have not been determined. Zone C is designated as an area of minimal flooding. No habitable structure will be built within Flood Zone A.

IV. DRAINAGE PLAN

A. General:

According to our calculations, the post development onsite surface runoff volume generated by the project site will be approximately 18.8 cfs. Accordingly, there will be a net increase of approximately 8.8 cfs due to the proposed development (see Appendix A). This increase in surface runoff is mainly due to the increase of impervious area throughout the project site.

In designing the drainage system for the proposed development, alteration to the natural drainage pattern of the surface runoff volumes will be kept to a minimum.

As part of the proposed drainage improvements, new grated inlet type catch basins and three (3) separate new underground drainage systems will be constructed throughout the project site to accommodate the additional post development surface runoff (see

Exhibit 6). The onsite surface runoff will sheet flow across the project site, as it is presently doing, into the new grated inlet type catch basins, where the surface runoff will then be conveyed by means of three (3) separate new underground drainage systems to three (3) new subsurface drainage systems. Each of the individual subsurface drainage systems were designed to accommodate the additional surface runoff generated by the project site utilizing a 50 year-1 hour recurrence interval storm (see Appendix B). The subsurface drainage systems will temporarily store, and slowly release the surface runoff generated from the project site at a rate equal to the current pre-development peak runoff rate. These subsurface drainage systems were designed in accordance with the provisions of Chapter 4, "Rules for the Design of Storm Drainage Facilities in the County of Maui". The pre-development surface runoff released from the subsurface systems will be discharged into the existing natural drainageway where it will be conveyed across Makena Keoneio Road, into existing 12'x8' conspan culverts, and into the ocean as it is presently doing.

B. Hydrologic Calculations:

The hydrologic calculations are based on the "Rules for the Design of Storm Drainage Facilities in the County of Maui", and the "Rainfall Frequency Atlas of the Hawaiian Islands", Technical Paper No. 43, U.S. Department of Commerce, Weather Bureau and the procedures developed by the U.S. Department of Agriculture, Soil Conservation Service (SCS). This procedure is described in detail in the SCS National Engineering Handbook, Section 4, Hydrology (NEH-4). Hydrologic calculations were computed by utilizing the "SCS Computer Program for Project Formulation, Hydrology (TR-20)", which is based on the procedures outlined in NEH-4.

Rational Formula Used:  $Q = CIA$

Where Q = rate of flow (cfs)  
A = area (acres)  
I = rainfall intensity for a duration equal to the time of concentration (in./hr.)  
C = runoff coefficient

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

C. Conclusion:

The after-development surface runoff volume generated by the Makena Estates project is calculated to be 18.8 cfs. Accordingly, there will be a net increase of 8.8 cfs due to the proposed development. However, the majority of the onsite surface runoff volume generated by the proposed development will be intercepted by new grated inlet type catch basins which will be installed as part of the proposed improvements. Three (3) separate new underground drainage systems will also be constructed to convey the surface runoff intercepted by the new grated inlet catch basins into three (3) new subsurface



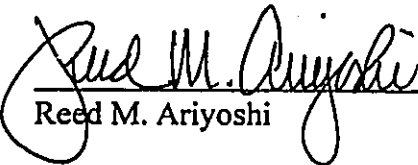
drainage systems, which were sized to accommodate the additional post-development runoff from the project site. Storm water released from the subsurface drainage systems will be discharged into the existing natural drainageway at a rate equal to the pre-development surface runoff.

Since the peak runoff into the existing natural drainageway and downstream properties will not exceed the pre-development surface runoff as a result of the proposed improvements, it is our professional opinion that the proposed Makena Estates project will not adversely affect the adjoining and downstream properties.

Report Prepared By:

  
Eric A. Nakagawa

Report Checked By:

  
Reed M. Ariyoshi

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 0330B. Revised June 1, 1981. Federal Emergency Management Agency, Federal Insurance Administration.
3. *Drainage and Soil Erosion Control Report for Drainage Improvements for Makena Place.* Revised December, 1996. Warren S. Unemori Engineering, Inc.
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.* 1995. Department of Public Works and Waste Management, County of Maui.

**EXHIBITS**

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



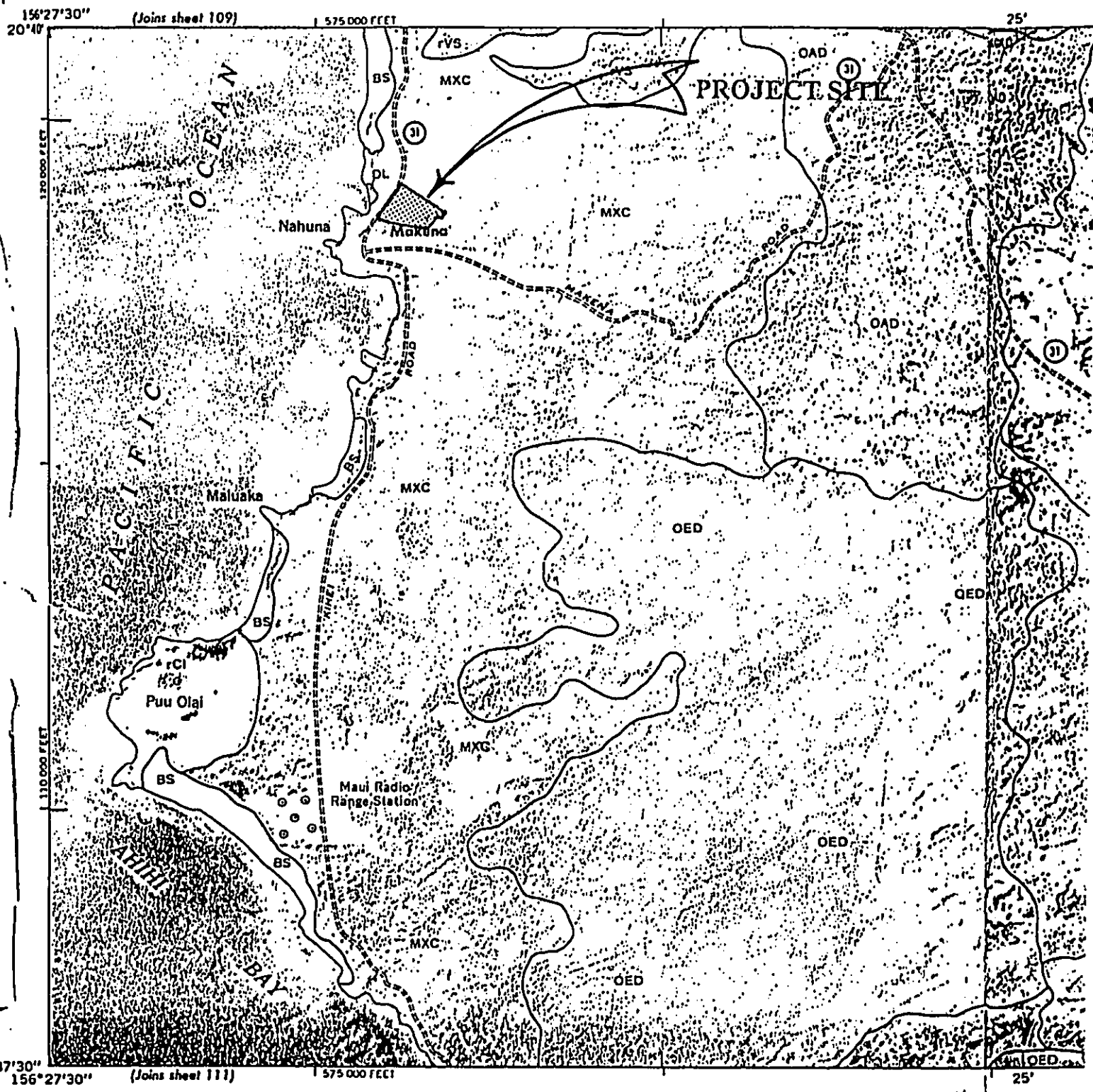
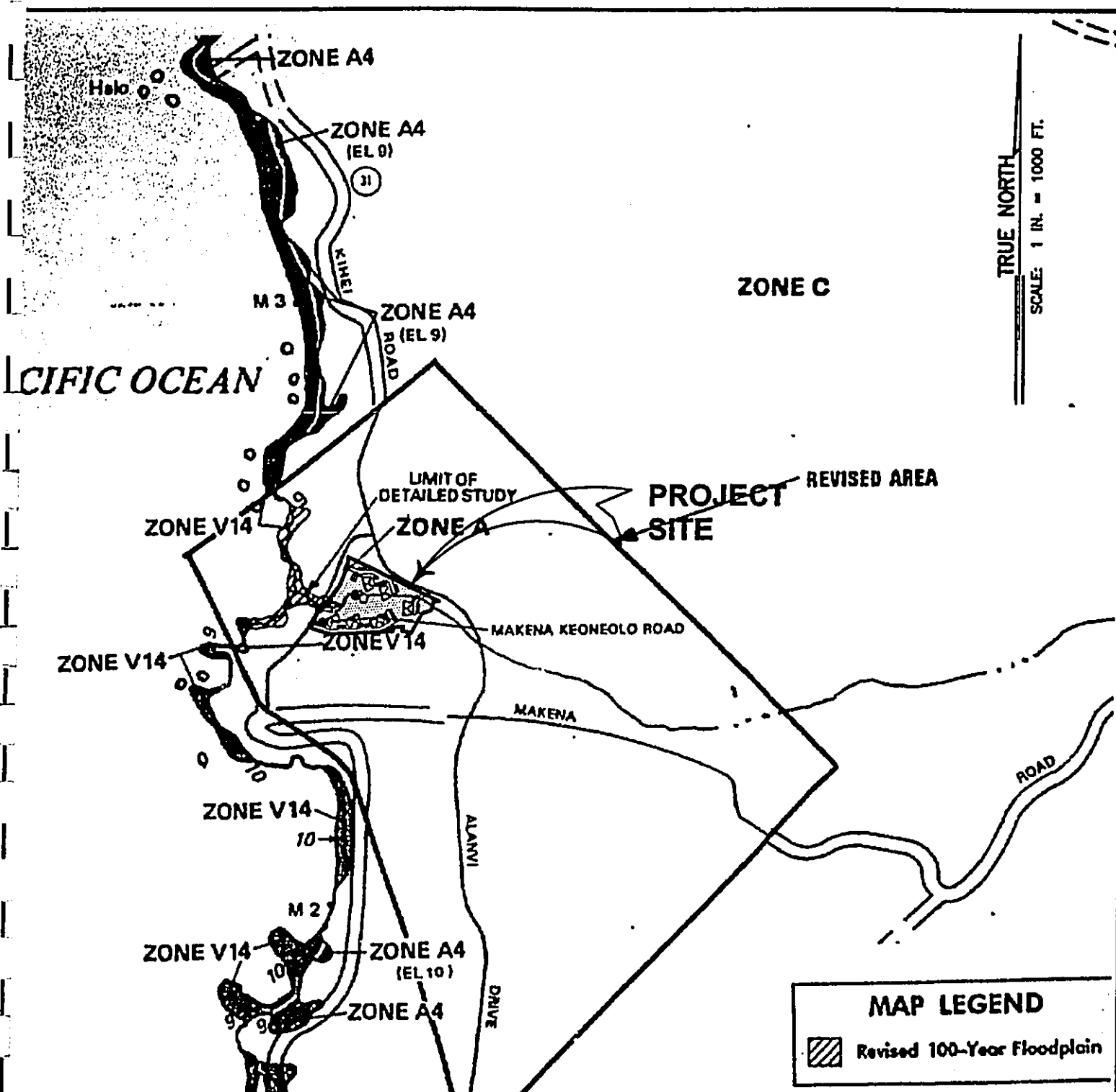


EXHIBIT 2  
SOIL SURVEY MAP



### EXHIBIT 3 FLOOD INSURANCE RATE MAP

PANEL 330 OF 400  
REVISED TO REFLECT LOMR DATED 7/18/97

99nri/99111/exhibits/exhibit3.dwg

**APPENDIX A**

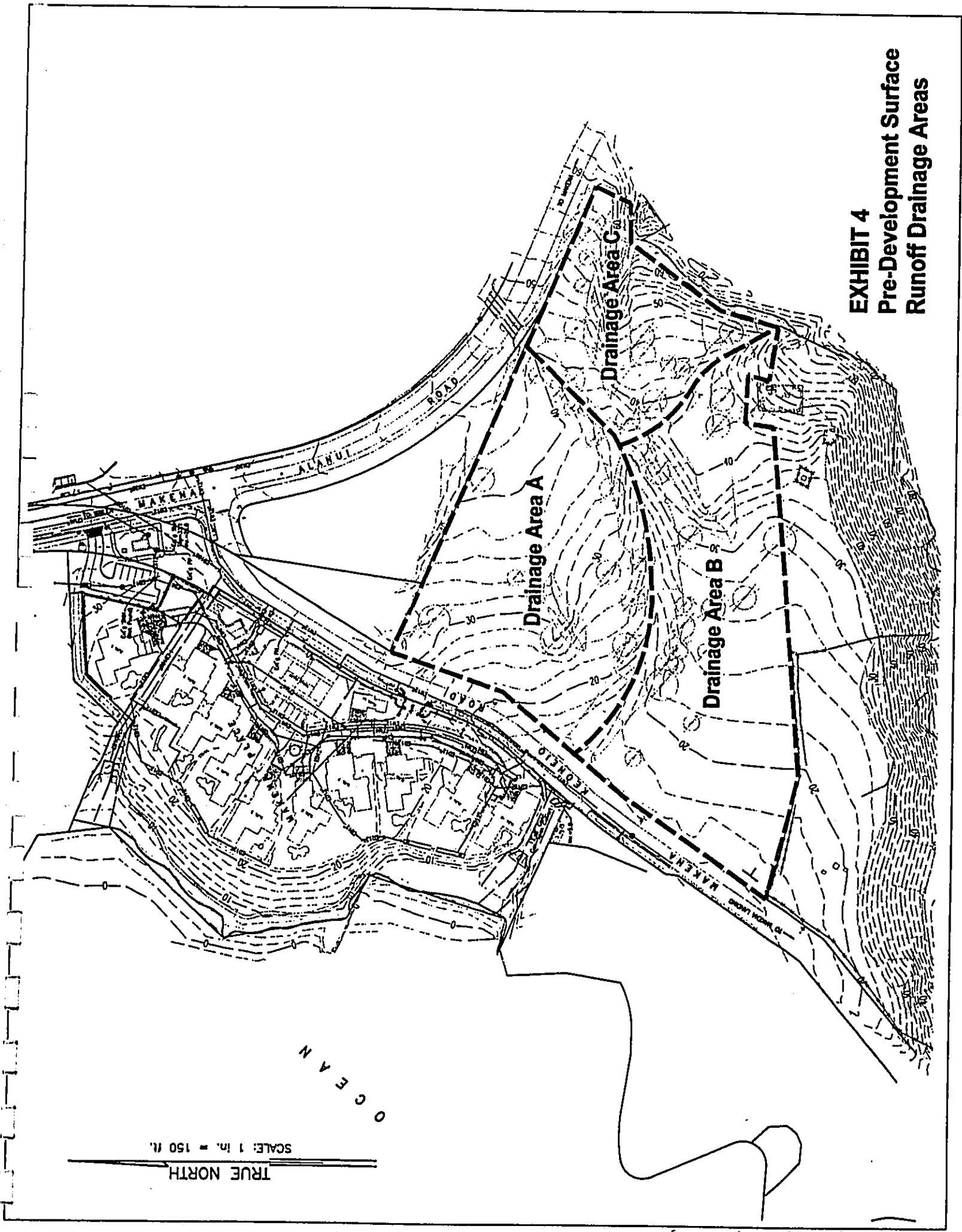
**HYDROLOGIC CALCULATIONS**

**APPENDIX A-1**

**50-year Surface Runoff Before Development**



**EXHIBIT 4**  
**Pre-Development Surface**  
**Runoff Drainage Areas**



Engineering Department, City of Honolulu



BY: ean  
DATE: May 1, 2000

MAKENA ESTATES  
[continued]

TABULATION OF RUNOFF COEFFICIENTS & AREAS:

SUB-BASIN 1 OF 1 :

INFILTRATION:	High .....	0.00	
RELIEF:	Rolling (5-15%) .....	0.03	>>> COMPOSITE C = 0.380
VEGETAL COVER:	Good (10-50%) .....	0.05	>>> AREA = 2.380 acres
DEVELOPMENT:	Rural .....	0.30	



BY: ean  
DATE: May 1, 2000

**MAKENA ESTATES**  
[continued]

**TABULATION OF RUNOFF COEFFICIENTS & AREAS:**

SUB-BASIN 1 OF 1 :

INFILTRATION:	High .....	0.00	
RELIEF:	Rolling (5-15%) .....	0.03	>>> COMPOSITE C = 0.380
VEGETAL COVER:	Good (10-50%) .....	0.05	>>> AREA = 2.700 acres
DEVELOPMENT:	Rural .....	0.30	



BY: ean  
DATE: May 1, 2000

MAKENA ESTATES  
[continued]

TABULATION OF RUNOFF COEFFICIENTS & AREAS:

SUB-BASIN 1 OF 1 :

INFILTRATION:	High .....	0.00	
RELIEF:	Rolling (5-15%) .....	0.03	>>> COMPOSITE C = 0.380
VEGETAL COVER:	Good (10-50%) .....	0.05	>>> AREA = 1.100 acres
DEVELOPMENT:	Rural .....	0.30	

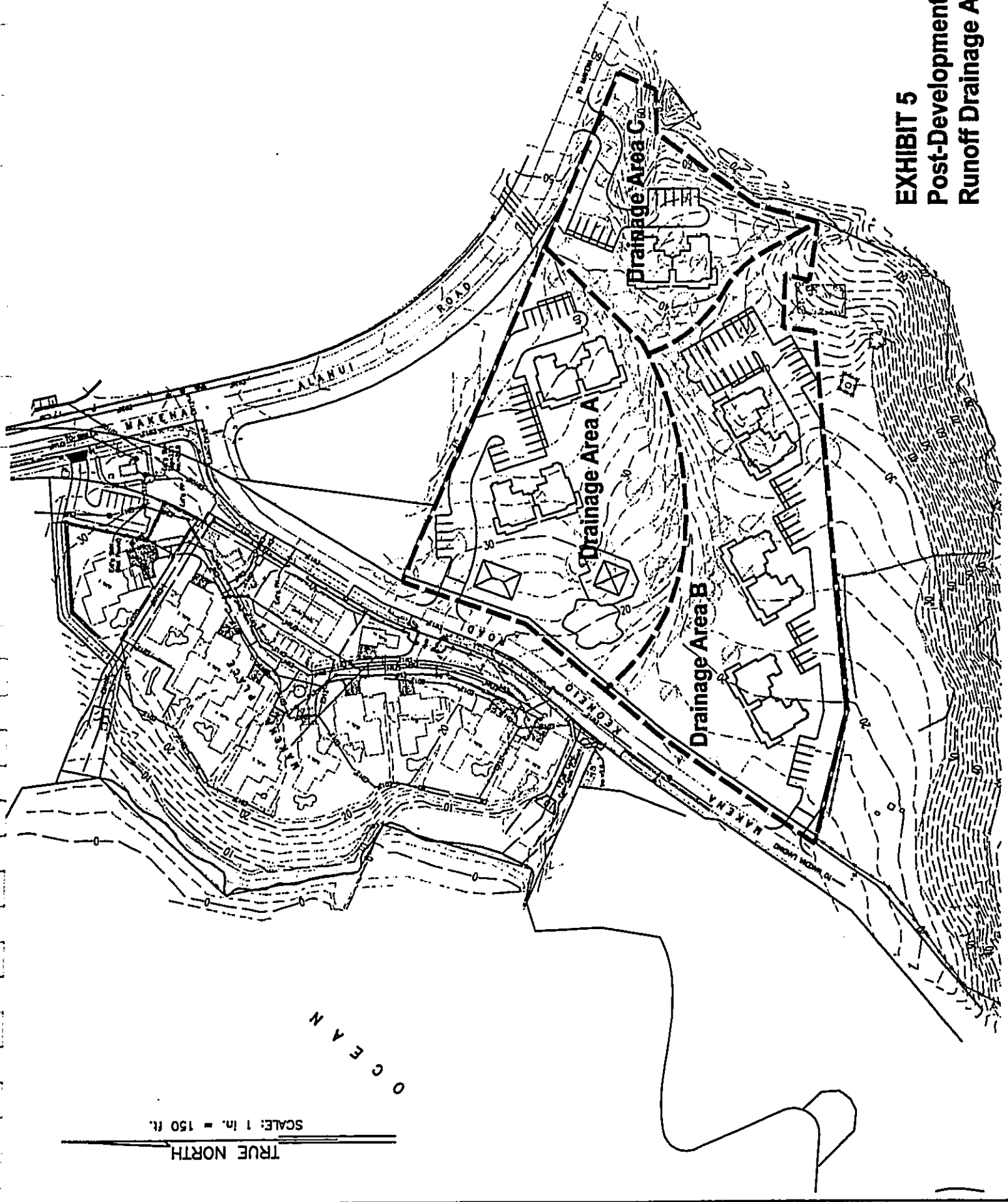
**APPENDIX A-2**

**50-year Surface Runoff After Development**

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**EXHIBIT 5  
Post-Development Surface  
Runoff Drainage Areas**



TRUE NORTH  
SCALE: 1 in. = 150 ft.

Environmental Resources, Inc. (a) (4) (b) (5) (D)



Page 2 of 2  
W.S. UNEMORI ENGINEERING, INC.  
2145 Wells Street Suite 403  
Wailuku, Maui, Hawaii 96793

BY: ean  
DATE: May 1, 2000

**MAKENA ESTATES**  
[continued]

**TABULATION OF RUNOFF COEFFICIENTS & AREAS:**

**SUB-BASIN 1 OF 1 :**

INFILTRATION:	High .....	0.00	
RELIEF:	Rolling (5-15%) .....	0.03	>>> COMPOSITE C = 0.620
VEGETAL COVER:	Good (10-50%) .....	0.03	>>> AREA = 2.380 acres
DEVELOPMENT:	Hotel/Apt. ....	0.56	



BY: ean  
DATE: May 1, 2000

MAKENA ESTATES  
[continued]

TABULATION OF RUNOFF COEFFICIENTS & AREAS:

SUB-BASIN 1 OF 1 :

INFILTRATION:	High .....	0.00	
RELIEF:	Rolling (5-15%) .....	0.03	>>> COMPOSITE C = 0.600
VEGETAL COVER:	Good (10-50%) .....	0.03	>>> AREA = 2.700 acres
DEVELOPMENT:	Hotel/Apt. ....	0.54	



Page 2 of 2  
W.S. UNEMORI ENGINEERING, INC.  
2145 Wells Street Suite 403  
Wailuku, Maui, Hawaii 96793

BY: ean  
DATE: May 1, 2000

**MAKENA ESTATES**  
[continued]

**TABULATION OF RUNOFF COEFFICIENTS & AREAS:**

**SUB-BASIN 1 OF 1 :**

INFILTRATION:	High .....	0.00	
RELIEF:	Rolling (5-15%) .....	0.03	>>> COMPOSITE C = 0.630
VEGETAL COVER:	Good (10-50%) .....	0.03	>>> AREA = 1.100 acres
DEVELOPMENT:	Hotel/Apt. ....	0.57	

APPENDIX A-3

100-year Offsite Surface Runoff

100-year Offsite Surface Runoff





### Worksheet 3: Time of concentration ( $T_c$ ) or travel time ( $T_t$ )

Project Makana Estates By EAN Date \_\_\_\_\_

Location Makana, Maui, Hawaii Checked \_\_\_\_\_ Date \_\_\_\_\_

Circle one: Present Developed Offsite Drainage Area

Circle one:  $T_c$   $T_t$  through subarea \_\_\_\_\_

NOTES: Space for as many as two segments per flow type can be used for each worksheet.

Include a map, schematic, or description of flow segments.

Sheet flow (Applicable to  $T_c$  only)

	Segment ID			
1. Surface description (table 3-1) .....				
2. Manning's roughness coeff., n (table 3-1) ..		0.4		
3. Flow length, L (total L $\leq$ 300 ft) .....	ft	300		
4. Two-yr 24-hr rainfall, $P_2$ .....	in	4.0		
5. Land slope, s .....	ft/ft	0.16		
6. $T_t = \frac{0.007 (nL)^{0.8}}{P_2^{0.5} s^{0.4}}$ Compute $T_t$ .....	hr	0.34	+	= 0.34

Shallow concentrated flow

	Segment ID			
7. Surface description (paved or unpaved) .....				
8. Flow length, L .....	ft	6000		
9. Watercourse slope, s .....	ft/ft	0.167		
10. Average velocity, V (figure 3-1) .....	ft/s	6.7		
11. $T_t = \frac{L}{3600 V}$ Compute $T_t$ .....	hr	0.25	+	= 0.25

Channel flow

	Segment ID			
12. Cross sectional flow area, a .....	ft <sup>2</sup>	3750		
13. Wetted perimeter, $P_w$ .....	ft	304.14		
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r .....	ft	12.33		
15. Channel slope, s .....	ft/ft	0.12		
16. Manning's roughness coeff., n .....		0.40		
17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V .....	ft/s	6.89		
18. Flow length, L .....	ft	13,090		
19. $T_t = \frac{L}{3600 V}$ Compute $T_t$ .....	hr	0.53	+	= 0.53
20. Watershed or subarea $T_c$ or $T_t$ (add $T_t$ in steps 6, 11, and 19) .....	hr			= 1.12

```

.....
TR 20
Project Formulation Hydrology
.....
* TR 20 S/N :
* HMVersion : 3.40
* Date : 4/28/**
* Time : 8:25:57
* Input file : 99111000.dat
* Output file : 99111000.out
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XXXXXXXX XXXXXX XXXXXX XXXXXX
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.....
Full Microcomputer Implementation
by
Haestad Methods, Inc.
.....

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37 Brookside Road \* Waterbury, Connecticut 06708 \* (203) 755-1666

□

\*\*\*\*\*80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY\*\*\*\*\*

```

JOB TR-20
TITLE 001 Winn Suddivision (Offsite Drainage Area)
TITLE 24 HR HYDROGRAPH (100 YEAR)
6 RUNOFF 1 001 1 0.991 . 65.0 1.12 1 1 1 1
ENDATA
7 LIST
7 INCREM 6 0.10
7 COMPUT 7 001 001 0.0 10.0 1.0 1 2 01 01
ENDCMP 1
ENDJOB 2

```

\*\*\*\*\*END OF 80-80 LIST\*\*\*\*\*

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TR20 XEQ 4/28/** Winn Suddivision (Offsite Drainage Area) JOB 1
PASS 1 24 HR HYDROGRAPH (100 YEAR)
REV 09/01/83
PAGE 1

```

FILE NO. 1

COMPUTER PROGRAM FOR PROJECT FORMULATION - HYDROLOGY USER NOTES

THE USERS MANUAL FOR THIS PROGRAM IS THE MAY 1982 DRAFT OF TR-20. CHANGES FROM THE 2/14/74 VERSION INCLUD

E:

REACH ROUTING - THE MODIFIED ATT-KIN ROUTING PROCEDURE REPLACES THE CONVEX METHOD. INPUT DATA PREPARED FO  
Page 1

R  
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 ING.  
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 ERS:

PREVIOUS PROGRAM VERSIONS USING CONVEX ROUTING COEFFICIENTS WILL NOT RUN ON THIS VERSION.

THE PREFERRED TYPE OF DATA ENTRY IS CROSS SECTION DATA REPRESENTATIVE OF A REACH. IT IS RECOMMENDED THAT THE OPTIONAL CROSS SECTION DISCHARGE-AREA PLOTS BE OBTAINED WHENEVER NEW CROSS SECTION DATA IS ENTERED. THE PLOTS SHOULD BE CHECKED FOR REASONABLENESS AND ADEQUACY OF INPUT DATA FOR THE COMPUTATION OF "M" VALUES USED IN THE ROUTING PROCEDURE.

GUIDELINES FOR DETERMINING OR ANALYZING REACH LENGTHS AND COEFFICIENTS (X,M) ARE AVAILABLE IN THE USERS MANUAL. SUMMARY TABLE 2 DISPLAYS REACH ROUTING RESULTS AND ROUTING PARAMETERS FOR COMPARISON AND CHECKING.

HYDROGRAPH GENERATION - THE PROCEDURE TO CALCULATE THE INTERNAL TIME INCREMENT AND PEAK TIME OF THE UNIT HYDROGRAPH HAVE BEEN IMPROVED. PEAK DISCHARGES AND TIMES MAY DIFFER FROM THE PREVIOUS VERSION. OUTPUT HYDROGRAPHS ARE STILL INTERPOLATED, PRINTED, AND ROUTED AT THE USER SELECTED MAIN TIME INCREMENT.

INTERMEDIATE PEAKS - METHOD ADDED TO PROVIDE DISCHARGES AT INTERMEDIATE POINTS WITHIN REACHES WITHOUT ROUTING.

OTHER - THIS VERSION CONTAINS SOME ADDITIONS TO THE INPUT AND NUMEROUS MODIFICATIONS TO THE OUTPUT. USER OPTIONS HAVE BEEN MODIFIED AND AUGMENTED ON THE JOB RECORD, RAINTABLES ADDED, ERROR AND WARNING MESSAGE EXPANDED, AND THE SUMMARY TABLES COMPLETELY REVISED. THE HOLDOUT OPTION IS NOT OPERATIONAL AT THIS TIME.

PROGRAM QUESTIONS OR PROBLEMS SHOULD BE DIRECTED TO HYDRAULIC ENGINEERS AT THE SCS NATIONAL TECHNICAL CENTER:

CHESTER, PA (NORTHEAST) -- 215-499-3933, FORT WORTH, TX (SOUTH) -- 334-5242 (FTS)  
 LINCOLN, NB (MIDWEST) -- 541-5318 (FTS), PORTLAND, OR (WEST) -- 423-4099 (FTS)  
 OR HYDROLOGY UNIT, ENGINEERING DIVISION, LANHAM, MD -- 436-7383 (FTS).

## PROGRAM CHANGES SINCE MAY 1982:

12/17/82 - CORRECT PEAK RATE FACTOR FOR USER ENTERED DIMHYD  
 CORRECT REACH ROUTING PEAK TRAVEL TIME PRINTED WITH FULLPRINT OPTION

5/02/83 - CORRECT COMPUTATIONS FOR ---  
 1. DIVISION OF BASEFLOW IN DIVERT OPERATION  
 2. HYDROGRAPH VOLUME SPLIT BETWEEN BASEFLOW AND ABOVE BASEFLOW  
 3. CROSS SECTION DATA PLOTTING POSITION  
 4. INTERMEDIATE PEAK WHEN "FROM" AREA IS LARGER THAN "THRU" AREA  
 5. STORAGE RATED REACH TRAVEL TIME FOR MULTIPLE PEAK HYDROGRAPH  
 6. ORDERING "FLOW-FREQ" FILE FROM SUMMARY TABLE #3 DATA  
 7. BASEFLOW ENTERED WITH READHYD  
 8. LOW FLOW SPLIT DURING DIVERT PROCEDURE #2 WHEN SECTION RATINGS START AT DIFFERENT ELEVATIONS

ENHANCEMENTS ---  
 1. REPLACE USER MANUAL ERROR CODES (PAGE 4-9 TO 4-11) WITH MESSAGES  
 2. LABEL OUTPUT HYDROGRAPH FILES WITH CROSS SECTION/STRUCTURE, ALTERNATE AND STORM NUMBER

09/01/83 - CORRECT INPUT AND OUTPUT ERRORS FOR INTERMEDIATE PEAKS  
 CORRECT COMBINATION OF RATING TABLES FOR DIVERT  
 CHECK REACH ROUTING PARAMETERS FOR ACCEPTABLE LIMITS  
 ELIMINATE MINIMUM REACH TRAVEL TIME WHEN ATT-KIN COEFFICIENT EQUALS ONE

TR20 XEQ 4/28/\*\* Winn Suddivision (Offsite Drainage Area) JOB 1  
 PASS 1  
 REV 09/01/83 24 HR HYDROGRAPH (100 YEAR)  
 PAGE 2

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TR20 XEQ 4/28/\*\* Winn Suddivision (Offsite Drainage Area) JOB 1  
 PASS 1  
 REV 09/01/83 24 HR HYDROGRAPH (100 YEAR)  
 PAGE 3

EXECUTIVE CONTROL OPERATION LIST RECORD  
 ID

LISTING OF CURRENT DATA

		TIME INCREMENT			
4 DIMHYD		.0200			
8	.0000	.0300	.1000	.1900	.3100
8	.4700	.6600	.8200	.9300	.9900
8	1.0000	.9900	.9300	.8600	.7800
8	.6800	.5600	.4600	.3900	.3300
8	.2800	.2410	.2070	.1740	.1470
8	.1260	.1070	.0910	.0770	.0660
8	.0550	.0470	.0400	.0340	.0290
8	.0250	.0210	.0180	.0150	.0130
8	.0110	.0090	.0080	.0070	.0060
8	.0050	.0040	.0030	.0020	.0010
8	.0000	.0000	.0000	.0000	.0000

9 ENDTBL

COMPUTED PEAK RATE FACTOR = 484.00

		TIME INCREMENT			
5 RAINFL 1		.5000			
8	.0000	.0080	.0170	.0260	.0350
8	.0450	.0550	.0650	.0760	.0870
8	.0990	.1120	.1260	.1400	.1560
8	.1740	.1940	.2190	.2540	.3030
8	.5150	.5830	.6240	.6550	.6820
8	.7060	.7280	.7480	.7660	.7830
8	.7990	.8150	.8300	.8440	.8570
8	.8700	.8820	.8930	.9050	.9160
8	.9260	.9360	.9460	.9560	.9650
8	.9740	.9830	.9920	1.0000	1.0000

9 ENDTBL

		TIME INCREMENT			
5 RAINFL 2		.2500			

CD

TR20 XEQ 4/28/\*\*  
PASS 1  
REV 09/01/83  
PAGE 4

Winn Sudivision (Offsite Drainage Area)  
24 HR HYDROGRAPH (100 YEAR)

JOB 1

8	.0000	.0020	.0050	.0080	.0110
8	.0140	.0170	.0200	.0230	.0260
8	.0290	.0320	.0350	.0380	.0410
8	.0440	.0480	.0520	.0560	.0600
8	.0640	.0680	.0720	.0760	.0800
8	.0850	.0900	.0950	.1000	.1050
8	.1100	.1150	.1200	.1260	.1330
8	.1400	.1470	.1550	.1630	.1720
8	.1810	.1910	.2030	.2180	.2360
8	.2570	.2830	.3870	.6630	.7070
8	.7350	.7580	.7760	.7910	.8040
8	.8150	.8250	.8340	.8420	.8490
8	.8560	.8630	.8690	.8750	.8810
8	.8870	.8930	.8980	.9030	.9080
8	.9130	.9180	.9220	.9260	.9300
8	.9340	.9380	.9420	.9460	.9500
8	.9530	.9560	.9590	.9620	.9650
8	.9680	.9710	.9740	.9770	.9800
8	.9830	.9860	.9890	.9920	.9950
8	.9980	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

		TIME INCREMENT			
5 RAINFL 3		.5000			
8	.0000	.0100	.0220	.0360	.0510
8	.0670	.0830	.0990	.1160	.1350
8	.1560	.1790	.2040	.2330	.2680
8	.3100	.4250	.4800	.5200	.5500
8	.5770	.6010	.6230	.6440	.6640
8	.6830	.7010	.7190	.7360	.7530
8	.7690	.7850	.8000	.8150	.8300
8	.8440	.8580	.8710	.8840	.8960
8	.9080	.9200	.9320	.9440	.9560
8	.9670	.9780	.9890	1.0000	1.0000

9 ENDTBL

TABLE NO.	TIME INCREMENT				
5 RAINFL 4	.5000				
8	.0000	.0040	.0080	.0120	.0160
8	.0200	.0250	.0300	.0350	.0400
8	.0450	.0500	.0550	.0600	.0650
8	.0700	.0750	.0810	.0870	.0930
8	.0990	.1050	.1110	.1180	.1250
8	.1320	.1400	.1480	.1560	.1650
8	.1740	.1840	.1950	.2070	.2200

TR20 XEQ 4/28/\*\*  
PASS 1  
REV 09/01/83  
PAGE 5

Winn Sudivision (Offsite Drainage Area)  
24 HR HYDROGRAPH (100 YEAR)

JOB 1

8	.2360	.2550	.2770	.3030	.4090
8	.5150	.5490	.5830	.6050	.6240
8	.6400	.6550	.6690	.6820	.6940
8	.7050	.7160	.7270	.7380	.7480
8	.7580	.7670	.7760	.7840	.7920
8	.8000	.8080	.8160	.8230	.8300
8	.8370	.8440	.8510	.8580	.8640
8	.8700	.8760	.8820	.8880	.8940
8	.9000	.9060	.9110	.9160	.9210
8	.9260	.9310	.9360	.9410	.9460
8	.9510	.9560	.9610	.9660	.9710
8	.9760	.9800	.9840	.9880	.9920
8	.9960	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

TABLE NO.	TIME INCREMENT				
5 RAINFL 5	.5000				
8	.0000	.0020	.0050	.0080	.0110
8	.0140	.0170	.0200	.0230	.0260
8	.0290	.0320	.0350	.0380	.0410
8	.0440	.0470	.0510	.0550	.0590
8	.0630	.0670	.0710	.0750	.0790
8	.0840	.0890	.0940	.0990	.1040
8	.1090	.1140	.1200	.1260	.1330
8	.1400	.1470	.1540	.1620	.1710
8	.1810	.1920	.2040	.2170	.2330
8	.2520	.2770	.3180	.3880	.6980
8	.7290	.7520	.7700	.7850	.7980
8	.8090	.8190	.8290	.8380	.8460
8	.8540	.8610	.8680	.8740	.8800
8	.8860	.8920	.8970	.9020	.9070
8	.9120	.9170	.9210	.9250	.9290
8	.9330	.9370	.9410	.9450	.9490
8	.9530	.9570	.9600	.9630	.9660
8	.9690	.9720	.9750	.9780	.9810
8	.9840	.9870	.9900	.9930	.9960
8	.9980	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

TABLE NO.	TIME INCREMENT				
5 RAINFL 6	.0200				
8	.0000	.0080	.0162	.0246	.0333
8	.0425	.0524	.0630	.0743	.0863
8	.0990	.1124	.1265	.1420	.1595
8	.1800	.2050	.2550	.3450	.4370

□□

TR20 XEQ 4/28/\*\*  
PASS 1  
REV 09/01/83  
PAGE 6

Winn Sudivision (Offsite Drainage Area)  
24 HR HYDROGRAPH (100 YEAR)

JOB 1

8	.5300	.6030	.6330	.6600	.6840
8	.7050	.7240	.7420	.7590	.7750
8	.7900	.8043	.8180	.8312	.8439
8	.8561	.8678	.8790	.8898	.9002
8	.9103	.9201	.9297	.9391	.9483
8	.9573	.9661	.9747	.9832	.9916

8 1.0000 1.0000 1.0000 99111000.out  
 9 ENDTBL 1.0000 1.0000  
 □□

TR20 XEQ 4/28/\*\* Winn Suddivision (Offsite Drainage Area) JOB 1  
 PASS 1  
 REV 09/01/83 24 HR HYDROGRAPH (100 YEAR)  
 PAGE 7

STANDARD CONTROL INSTRUCTIONS

6 RUNOFF 1 1 1 .9910 65.0000 1.12001 1 0 1 0 1  
 ENDATA

END OF LISTING  
 □□

TR20 XEQ 4/28/\*\* Winn Suddivision (Offsite Drainage Area) JOB 1  
 PASS 1  
 REV 09/01/83 24 HR HYDROGRAPH (100 YEAR)  
 PAGE 8

EXECUTIVE CONTROL OPERATION INCREM RECORD  
 ID □ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD  
 ID □ FROM XSECTION 1D  
 TO XSECTION 1  
 STARTING TIME = .00 RAIN DEPTH = 10.00 RAIN DURATION = 1.00 RAIN TABLE NO. = 1 ANT. MOIST. COND = 2  
 ALTERNATE NO. = 1 STORM NO. = 1 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1

	PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)								
	10.58	935.57	(RUNOFF)								
	19.33	124.34	(RUNOFF)								
TIME (HRS)	FIRST HYDROGRAPH POINT	TIME INCREMENT	DRAINAGE AREA								
	.00 HOURS	.10 HOURS	.99 SQ.M								
5.00	DISCHG	.00	.00	.00	.00	.00	.02	.07	.19	.40	.75
6.00	DISCHG	1.27	1.96	2.81	3.83	4.98	6.25	7.62	9.09	10.65	12.33
7.00	DISCHG	14.12	16.03	18.05	20.19	22.46	24.85	27.35	29.96	32.68	35.52
8.00	DISCHG	38.48	41.63	44.98	48.62	52.64	57.10	62.07	67.65	73.97	81.20
9.00	DISCHG	89.44	98.74	109.15	120.82	134.00	149.07	170.64	205.17	258.76	339.32
10.00	DISCHG	446.82	569.49	692.57	801.01	880.94	925.37	935.14	915.30	873.60	818.70
11.00	DISCHG	757.44	696.21	640.93	592.69	548.57	508.33	472.09	440.40	412.88	388.73
12.00	DISCHG	367.40	348.74	332.66	318.74	306.37	295.28	285.28	276.44	268.60	261.47
13.00	DISCHG	254.88	248.77	243.09	237.81	232.84	228.11	223.66	219.52	215.56	211.63
14.00	DISCHG	207.72	203.91	200.30	196.93	193.71	190.68	187.86	185.29	182.90	180.61
15.00	DISCHG	178.39	176.30	174.42	172.76	171.34	170.14	169.11	168.21	167.34	166.39
16.00	DISCHG	165.33	164.12	162.81	161.39	159.84	158.19	156.47	154.74	152.99	151.18
17.00	DISCHG	149.33	147.51	145.82	144.30	142.96	141.82	140.82	139.93	139.04	138.04
18.00	DISCHG	136.89	135.61	134.21	132.69	131.06	129.35	127.70	126.25	125.13	124.39
19.00	DISCHG	124.06	124.04	124.19	124.34	124.30	124.01	123.44	122.60	121.52	120.22
20.00	DISCHG	118.76	117.24	115.77	114.40	113.18	112.12	111.23	110.53	110.00	109.59
21.00	DISCHG	109.27	109.03	108.84	108.70	108.61	108.52	108.40	108.18	107.80	107.21
22.00	DISCHG	106.40	105.43	104.38	103.34	102.37	101.51	100.80	100.23	99.80	99.47
23.00	DISCHG	99.21	99.00	98.85	98.73	98.65	98.57	98.46	98.25	97.87	97.27
24.00	DISCHG	96.44	94.91	92.35	88.37	82.48	74.78	65.91	56.64	47.53	39.05
25.00	DISCHG	31.51	25.11	20.02	16.07	12.90	10.36	8.29	6.65	5.33	4.27
26.00	DISCHG	3.41	2.71	2.16	1.72	1.36	1.07	.83	.65	.49	.37
27.00	DISCHG	.27	.20	.13	.08	.05	.02	.00			

RUNOFF VOLUME ABOVE BASEFLOW = 5.56 WATERSHED INCHES, 3555.84 CFS-HRS, 293.85 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD  
 ID □ COMPUTATIONS COMPLETED FOR PASS 1

□□

TR20 XEQ 4/28/\*\* Winn Sudivision (Offsite Drainage Area) JOB 1  
 PASS 2  
 REV 09/01/83 24 HR HYDROGRAPH (100 YEAR)  
 PAGE 9

EXECUTIVE CONTROL OPERATION ENDJOB RECORD  
 ID  
 □□

TR20 XEQ 4/28/\*\* Winn Sudivision (Offsite Drainage Area) JOB 1  
 SUMMARY  
 REV 09/01/83 24 HR HYDROGRAPH (100 YEAR)  
 PAGE 10

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED  
 (A STAR(\*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH  
 A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION			RUNOFF AMOUNT (IN)	PEAK DISCHARGE		
						BEGIN (HR)	AMOUNT (IN)	DURATION (HR)		ELEVATION (FT)	TIME (HR)	RATE (CFS)
ALTERNATE 1 XSECTION 1 944.1	1 STORM RUNOFF	.99	1	2	.10	.0	10.00	24.00	5.56	---	10.58	935.57

TR20 XEQ 4/28/\*\* Winn Sudivision (Offsite Drainage Area) JOB 1  
 SUMMARY  
 REV 09/01/83 24 HR HYDROGRAPH (100 YEAR)  
 PAGE 11

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....
XSECTION 1 ALTERNATE 1	.99	1 935.57

□□ END OF 1 JOBS IN THIS RUN  
 Stop - Program terminated.



**APPENDIX B**

**SUBSURFACE DRAINAGE SYSTEM CALCULATIONS**

Date: April 27, 2000

**SUBSURFACE DRAINAGE SYSTEM ANALYSIS AND DESIGN**

**Project:** TMK: 2-1-07: 101 - Drainage System I (Drainage Area A)  
**Location:** Makena, Maui, Hawaii  
**Job Number:** 99111  
**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 Makena, Maui,  
 R(50 Yr.-1Hr.) = 2.50 inches

**II. Determine Pre-Development Runoff:**

**Pre-Development Component Areas:**

Total Area (Ac.): 2.38

**Pre-Development Runoff Coefficients:**

Infiltration:	High	0.00
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.05
Development Type:	Rural	0.30
<b>Composite Runoff Coefft., C:</b>		<b>0.38</b>

**Pre-Development Time of Concentration:**

Approx. Elev. Diff. (feet):		27.00
Higher Elev. (ft.):	42.0	
Lower Elev. (ft.):	15.0	
Approx. Runoff Length (ft.):		420
Average Slope:		6.4%
Ground Character:		Ave. grass

Time of Concentration (min.): 18

**Pre-Development Intensity:**

Intensity (in./hr.): 4.3

**Pre-Development Runoff:**

$Q$  (pre-dev.) =  $C \times I \times A$  (cfs): 3.89

**III. Determine Post-Development Runoff:**

Total Area (Ac.): 2.38

**Post-Development Runoff Coefficient:**

Weighted Runoff Coeff.,  $C$ : 0.62

$C \times A$  (post development): 1.48

**IV. Establish Initial Trench Cross Section Parameters:**

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

**V. Determine Exfiltration:**

**Assume Exfiltration Limited to Sides of Trench Only:**

Assumed Initial Length of Pipe / Trench (ft.): 70.00

**VI. Determine Adequacy of Storage Volume Provided:**

**Determine Required Storage Volume:**

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

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	6.40	1.48	2,833	1,167	1,666	
10	5.10	1.48	4,515	2,333	2,182	
15	4.60	1.48	6,109	3,500	2,609	
20	4.20	1.48	7,437	4,667	2,770	Peak Storage
30	3.50	1.48	9,296	7,000	2,296	
40	3.10	1.48	10,978	9,333	1,645	
60	2.50	1.48	13,280	14,000	-720	
80	2.20	1.48	15,582	18,667	-3,084	
100	1.95	1.48	17,265	23,334	-6,069	
120	1.75	1.48	18,593	28,000	-9,408	
180	1.40	1.48	22,311	42,000	-19,689	

(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)

**Maximum Storage Required (cf):**

**Determine Provided Storage Volume:**

Pipe Storage Capacity (cf):	1,979.2
Net Aggregate Cradle Storage Capacity (cf):	6,300.0
Gross Aggregate Cradle Volume (40% void ratio) (cf):	1,728.3
50% of void volume (cf):	864.2
<b>Total Storage Capacity Provided (cf):</b>	<b>2,843.4</b>

{Storage Provided = 2,843 cf} > {Storage Required = 2,770 cf}; therefore initial assumptions based on 70 l.f. of 72-inch diameter pipe are acceptable.

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

Date: April 27, 2000

**SUBSURFACE DRAINAGE SYSTEM ANALYSIS AND DESIGN**

**Project:** TMK: 2-1-07: 101 - Drainage System 2 (Drainage Area B)

**Location:** Makena, Maui, Hawaii

**Job Number:** 99111

**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 Makena, Maui,  
 R(50 Yr.-1Hr.) = 2.50 inches

**II. Determine Pre-Development Runoff:**

**Pre-Development Component Areas:**

Total Area (Ac.): 2.70

**Pre-Development Runoff Coefficients:**

Infiltration:	High	0.00
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.05
Development Type:	Rural	0.30
Composite Runoff Coefft., C:		0.38

**Pre-Development Time of Concentration:**

Approx. Elev. Diff'l. (feet):	29.00
Higher Elev. (ft.):	44.0
Lower Elev. (ft.):	15.0
Approx. Runoff Length (ft.):	520
Average Slope:	5.6%
Ground Character:	Ave. grass

Time of Concentration (min.): 20

**Pre-Development Intensity:**

Intensity (in./hr.): 4.1

**Pre-Development Runoff:**

$Q$  (pre-dev.) =  $C \times I \times A$  (cfs): 4.21

**III. Determine Post-Development Runoff:**

Total Area (Ac.): 2.70

**Post-Development Runoff Coefficient:**

Weighted Runoff Coeff.,  $C$ : 0.60

$C \times A$  (post development): 1.62

**IV. Establish Initial Trench Cross Section Parameters:**

Cover Over Pipe (ft.): 1.00

Pipe Diameter (ft.): 6.00

Cradle Depth Below Pipe (ft.): 2.00

Cradle Thickness on Sides of Pipe (ft.): 2.00

Total Trench Depth (ft.): 9.0

Total Trench Width (ft.): 10.0

Gross Trench Cross Sectional Area (sf/lf): 90.0

Pipe Cross Sectional Area (sf/lf): 28.3

Trench Aggreg. Cross Sectional Area (sf/lf): 61.7

**V. Determine Exfiltration:**

**Assume Exfiltration Limited to Sides of Trench Only:**

Assumed Initial Length of Pipe / Trench (ft.): 85.00

**VI. Determine Adequacy of Storage Volume Provided:**

**Determine Required Storage Volume:**

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

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	6.40	1.62	3,110	1,262	1,848	
10	5.10	1.62	4,957	2,524	2,433	
15	4.60	1.62	6,707	3,786	2,921	
20	4.20	1.62	8,165	5,048	3,117	Peak Storage
30	3.50	1.62	10,206	7,572	2,634	
40	3.10	1.62	12,053	10,096	1,957	
60	2.50	1.62	14,580	15,144	-564	
80	2.20	1.62	17,107	20,192	-3,084	
100	1.95	1.62	18,954	25,240	-6,286	
120	1.75	1.62	20,412	30,288	-9,876	
180	1.40	1.62	24,494	45,431	-20,937	

(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)

**Maximum Storage Required (cf):**

**Determine Provided Storage Volume:**

Pipe Storage Capacity (cf):	2,403.3
Net Aggregate Cradle Storage Capacity (cf):	7,650.0
Gross Aggregate Cradle Volume (40% void ratio) (cf):	2,098.7
50% of void volume (cf):	1,049.3
<b>Total Storage Capacity Provided (cf):</b>	<b>3,452.7</b>

{Storage Provided = 3,453 cf} > {Storage Required = 3,117 cf}; therefore initial assumptions based on 85 l.f. of 72-inch diameter pipe are acceptable.

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

Date: April 27, 2000

**SUBSURFACE DRAINAGE SYSTEM ANALYSIS AND DESIGN**

**Project:** TMK: 2-1-07: 101 - Drainage System 3 (Drainage Area C)  
**Location:** Makena, Maui, Hawaii  
**Job Number:** 99111  
**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 Makena, Maui,  
 R(50 Yr.-1Hr.) = 2.50 inches

**II. Determine Pre-Development Runoff:**

**Pre-Development Component Areas:**

Total Area (Ac.): 1.10

**Pre-Development Runoff Coefficients:**

Infiltration:	High	0.00
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.05
Development Type:	Rural	0.30
Composite Runoff Coeff't., C:		0.38

**Pre-Development Time of Concentration:**

Approx. Elev. Diff'l. (feet):	32.00
Higher Elev. (ft.):	64.0
Lower Elev. (ft.):	32.0
Approx. Runoff Length (ft.):	320
Average Slope:	10.0%
Ground Character:	Ave. grass



Time of Concentration (min.): 15

**Pre-Development Intensity:**

Intensity (in./hr.): 4.6

**Pre-Development Runoff:**

$Q$  (pre-dev.) =  $C \times I \times A$  (cfs): 1.92

**III. Determine Post-Development Runoff:**

Total Area (Ac.): 1.10

**Post-Development Runoff Coefficient:**

Weighted Runoff Coeff't.,  $C$ : 0.57

$C \times A$  (post development): 0.63

**IV. Establish Initial Trench Cross Section Parameters:**

Cover Over Pipe (ft.): 1.00

Pipe Diameter (ft.): 6.00

Cradle Depth Below Pipe (ft.): 2.00

Cradle Thickness on Sides of Pipe (ft.): 2.00

Total Trench Depth (ft.): 9.0

Total Trench Width (ft.): 10.0

Gross Trench Cross Sectional Area (sf/lf): 90.0

Pipe Cross Sectional Area (sf/lf): 28.3

Trench Aggreg. Cross Sectional Area (sf/lf): 61.7

**V. Determine Exfiltration:**

**Assume Exfiltration Limited to Sides of Trench Only:**

Assumed Initial Length of Pipe / Trench (ft.): 25.00

**VI. Determine Adequacy of Storage Volume Provided:**

**Determine Required Storage Volume:**

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

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	6.40	0.63	1,204	577	627	
10	5.10	0.63	1,919	1,154	765	
15	4.60	0.63	2,596	1,731	865	Peak Storage
20	4.20	0.63	3,160	2,307	853	
30	3.50	0.63	3,950	3,461	489	
40	3.10	0.63	4,665	4,615	50	
60	2.50	0.63	5,643	6,922	-1,279	
80	2.20	0.63	6,621	9,229	-2,608	
100	1.95	0.63	7,336	11,537	-4,201	
120	1.75	0.63	7,900	13,844	-5,944	
180	1.40	0.63	9,480	20,766	-11,286	

(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)

**Maximum Storage Required (cf):**

**Determine Provided Storage Volume:**

Pipe Storage Capacity (cf):	706.9
Net Aggregate Cradle Storage Capacity (cf):	2,250.0
Gross Aggregate Cradle Volume (40% void ratio) (cf):	617.3
50% of void volume (cf):	308.6
<b>Total Storage Capacity Provided (cf):</b>	<b>1,015.5</b>

{Storage Provided = 1,015 cf} > {Storage Required = 865 cf}; therefore initial assumptions based on 25 l.f. of 72-inch diameter pipe are acceptable.

Appendix F  
Traffic Impact Analysis Report

TRAFFIC IMPACT ANALYSIS REPORT

# **MAKENA ESTATES RESIDENTIAL CONDOMINIUMS**

IN MAKENA, MAUI, HAWAII

Prepared For

**MAKENA ESTATES, LLC**

Makawao, Maui, Hawai'i

**Phillip Rowell and Associates**  
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May 15, 2000

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## **1. INTRODUCTION**

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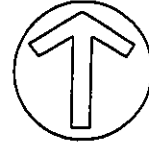
Phillip Rowell and Associates has been retained by Makena Estates, LLC of Makawao to perform a traffic impact analysis for a proposed residential condominium development in the Makena area of Maui, Hawaii. The purpose of this study is to identify the traffic impacts of the proposed project.

This introductory chapter discusses the location of the project, the proposed development, and the study methodology.

### **Project Location and Description**

The proposed project is located along the west side of Makena Alanui Road south of the intersection of Makena Alanui Road at Old Makena Road in Makena, Maui. See Figure 1.

The project consist of 40 residential condominiums plus one unit for an on-site resident manager. The project will have three driveways. One driveway will be along Makena Alanui Road (Driveway 'A') and the remaining two will be along Old Makena Road (Driveways 'B' and 'C'). A schematic of the project indicating the proposed driveways are shown in Figure 2.



NOT TO SCALE



**PROJECT  
LOCATION**

Figure 1

## PROJECT LOCATION MAP

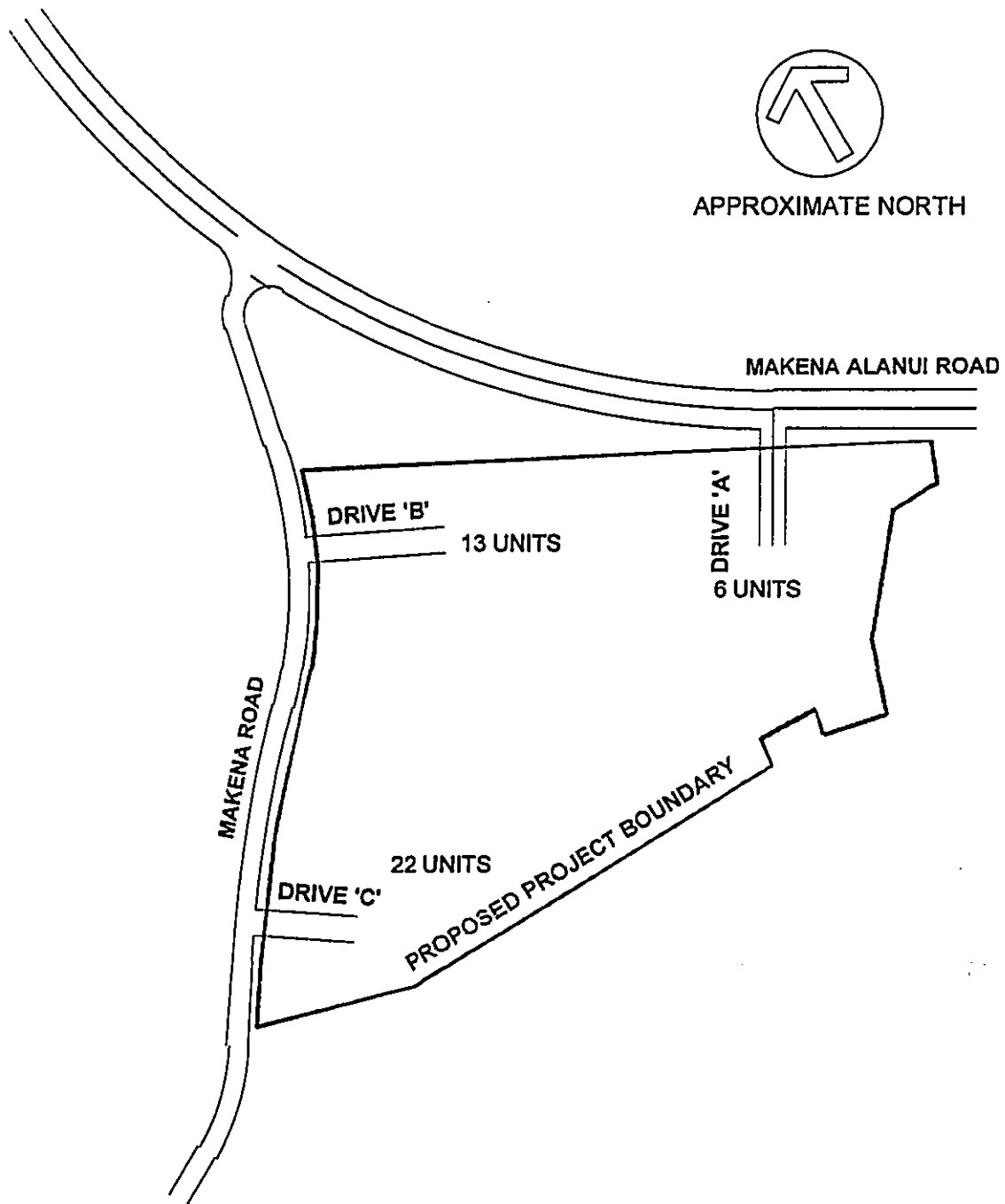


Figure 2

## SCHEMATIC OF PROPOSED PROJECT ACCESS



## **Study Methodology and Order of Presentation**

### **1. *Analysis of Existing Traffic Conditions***

Existing traffic volumes at the study intersections were determined from traffic counts performed during March, 2000. Intersection configurations and traffic control information were also collected in the field at the time of the traffic counts. Other data collected included speed limits and right-of-way controls.

Using the data collected, existing traffic operating conditions in the vicinity of the project were determined. The methodology for unsignalized intersections described in the 1997 *Highway Capacity Manual* (HCM)<sup>1</sup> was used to determine the level-of-service (LOS) at the study intersections.

Existing traffic conditions, the LOS concept and the results of the LOS analysis for existing conditions are presented in Chapter 2.

### **2. *Determination of Cumulative Traffic Projections***

The year 2005 was used as the design year. This does not necessarily represent the project completion date. It represents occupancy for purposes of conducting the impact analysis. Cumulative traffic conditions are defined as future traffic conditions without the proposed project. A description of the process used to estimate 2005 cumulative traffic volumes and the resulting cumulative traffic projections is presented in Chapter 3.

### **3. *Analysis of Project-Related Traffic Impacts***

The next step in the traffic analysis was to estimate the peak-hour traffic that would be generated by the proposed project. This was done using standard trip generation procedures outlined in *Trip Generation*<sup>2</sup>. The procedure is described in Chapter 4.

These trips were distributed based on the available approach and departure routes. The project-related traffic was then superimposed on 2005 cumulative traffic volumes at the subject intersections. The HCM methodology was used again to conduct a LOS analysis for cumulative plus project conditions. The results of this analysis were compared to 2005 cumulative conditions to determine the incremental impacts of this project.

The 2005 cumulative plus project traffic projections are presented in Chapter 4. The analysis of the project-related impacts and the conclusions of the analysis are presented in Chapter 5.

---

<sup>1</sup> *Highway Capacity Manual*, Institute of Transportation Engineers, Washington, D.C., 1997

<sup>2</sup> *Trip Generation*, Institute of Transportation Engineers, Washington, D.C., 1997

## **2. ANALYSIS OF EXISTING CONDITIONS**

---

This chapter presents the existing traffic conditions on the roadways adjacent to the proposed project. The level-of-service (LOS) concept and the results of the LOS analysis for existing conditions are also presented. The purpose of this analysis is to establish the base conditions for the determination of the impacts of the project which are described in a subsequent chapter.

### **Description of Existing Streets and Intersection Controls**

The following is summary of the major roadways in the study area:

#### ***Makena Alanui Road***

Makena Alanui Road is a major County roadway connecting Makena and Wailea. In the vicinity of the proposed project, the highway is a two-lane, two-way facility. No separate left turn lanes are provided. The posted speed limit is 35 miles per hour in the vicinity of the project.

#### ***Old Makena Road***

Old Makena Road is a two-way street providing access to the beach from Makena Alanui Road. The intersection with Makena Alanui Road is a 'T' intersection and is unsignalized. No speed limit is posted.

Figure 3 is a schematic of the roadway conditions adjacent to the project. Photographs of the study intersections are presented as Appendix A

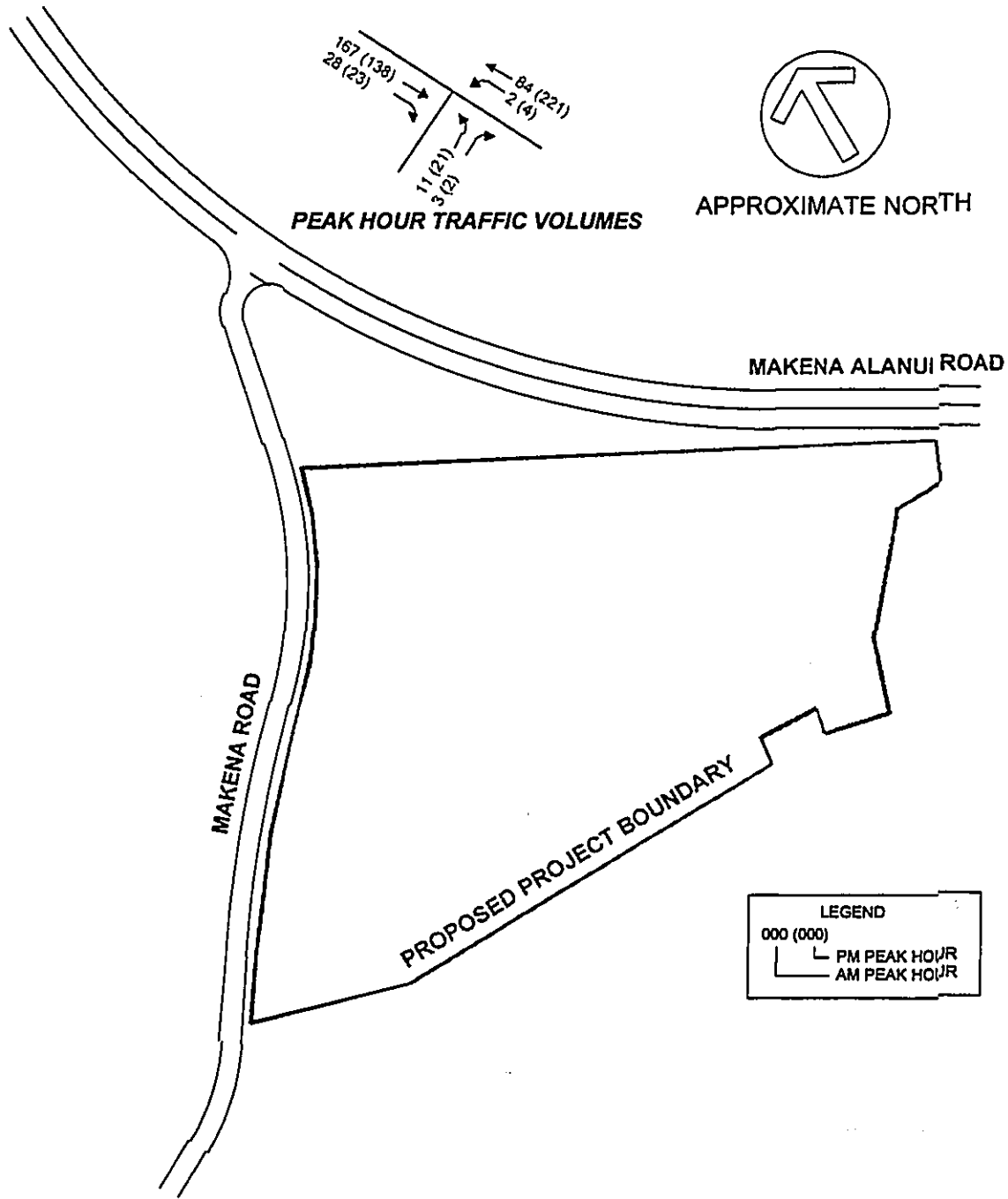


Figure 3

### SCHEMATIC OF EXISTING LANE CONFIGURATION AND EXISTING PEAK HOUR TRAFFIC VOLUMES

**Existing Peak Hour Traffic Volumes**

The AM and PM peak hour traffic volumes at the intersection of Makena Alanui Road at Old Makena Road are also shown in Figure 2. These counts were performed during March, 2000. The traffic volumes include large trucks, buses and motorcycles. They do not include mopeds or bicycles.

**Level-of-Service Concept**

*Signalized Intersections*

The operations method described in the 1997 *Highway Capacity Manual* (HCM) was used to analyze the operating efficiency of the signalized intersections adjacent to the study site. This method involves the calculation of a volume-to-capacity (V/C) ratio which is related to a level-of-service.

"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.

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<sup>(1)</sup>**

Level of Service	Interpretation	Volume-to-Capacity Ratio <sup>(2)</sup>	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<15.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	15.1-25.0
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	25.1-40.0
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	40.1-60.0
F	Total breakdown with stop-and-go operation	>1.001	>60.0

Notes:  
(1) Source: *Highway Capacity Manual*, 1997.  
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

**Unsignalized Intersections**

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<sup>(1)</sup>**

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	>5
B	Short traffic delays	5.1 to 10.0
C	Average traffic delays	10.1 to 20.0
D	Long traffic delays	20.1 to 30.0
E	Very long traffic delays	30.1 to 45.0
F	See note (2) below	>45.1

**Notes:**

- (1) Source: *Highway Capacity Manual*, 1997.
- (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.

**Level-of-Service Analysis of Existing Conditions**

The results of the Level-of-Service analysis for the study intersections Table 3. The calculation worksheets are presented in Appendix C.

**Table 3 Existing Levels-of-Service Makena Alanui Road at Old Makena Road**

Intersection and Movement	AM Peak Hour		PM Peak Hour	
	Delay <sup>(1)</sup>	LOS <sup>(2)</sup>	Delay	LOS
<b>Intersection Total</b>	0.2	A	0.4	A
Northbound Left & Right	4.7	A	6.3	B
Westbound Left	2.8	A	2.7	A

**NOTES:**

- (1) Delay is in seconds per vehicle.
- (2) LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*.

The conclusions of the level-of-service analysis are:

1. The intersection operates at level-of-service A during both morning and afternoon peak hours, which indicates good traffic operating conditions.
2. The LOS calculations accurately reflect traffic conditions observed in the field during the traffic counts.

### **3. PROJECTED CUMULATIVE TRAFFIC CONDITIONS**

The purpose of this chapter is to discuss the assumptions and data used to estimate 2005 cumulative traffic conditions. Cumulative traffic conditions are defined as future traffic volumes without the proposed project.

Future 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 Land Transportation Study* estimated that peak hour traffic volumes would increase an average of 1.6 % per year between 1990 and 2020. Therefore, the peak hour traffic volumes along Old Haleakala Highway were increased by 1.6 % per year (compounded) for 2000 to 2005, approximately 8%.

#### **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.

For this traffic report, only traffic associated with the future development of adjacent residential parcels was considered. Information was provided that a potential of 12 additional residential units may be constructed on adjacent parcels. Therefore, traffic generated by 12 condominium units was added to background growth to estimate cumulative traffic volumes.

**2005 Cumulative Traffic Projections**

2005 cumulative traffic projections are calculated by expanding existing traffic volumes by the appropriate growth rates and then superimposing traffic generated by related projects. In summary, the assumptions used to estimate the cumulative traffic volumes are:

1. Existing traffic was increased by 1.6% per year from 2000 to 2005 as background growth based on data provided in the *Maui Long Range Land Transportation Plan*.
2. Future traffic generated by 12 additional condominium units on adjacent parcels was added to the traffic stream.



## **4. PROJECT-RELATED TRAFFIC CONDITIONS**

---

This chapter discusses the methodology used to identify the traffic-related impacts of the proposed project. Generally, the process involves the determination of weekday peak-hour trips that would be generated by the proposed project, distribution and assignment of these trips on the approach and departure routes, and finally, determination of the levels-of-service at affected intersections and driveways subsequent to implementation of the project.

### **Project Trip Generation**

Future traffic volumes generated by a project were estimated using the procedures described in *Trip Generation* published by the Institute of Transportation Engineers. Trip rates for low-rise residential condominiums were used to estimate the trips generated by this project. "Low-rise residential condominiums/townhouses are units located in buildings that have one or more levels (floors)."<sup>3</sup>

The calculated number of AM and PM peak hour trips is shown in Table 4. The trips shown are the peak hourly trips generated by the project during the morning and afternoon peak hours. For this project, the peak hour of the project coincides with the peak hour of the adjacent street. Therefore, a worse-case scenario is analyzed because the peak hourly volumes of the project are superimposed on peak hourly background traffic volumes.

---

<sup>3</sup> Institute of Transportation Engineers, *Trip Generation*, Washington, D.C., 1997, p. 388.

**Table 4 Trip Generation Summary<sup>(1)</sup>**

Time Period	Direction	Peak Hour Trips
AM Peak Hour	Inbound	7
	Outbound	20
	Total	27
PM Peak Hour	Inbound	19
	Outbound	15
	Total	34

NOTES:  
(1) See Appendix B for calculations.

The traffic generated by the project was not discounted for internal, multi-purpose trips or pass-by trips. Discounts would have a negligible minimal impact on the results of the trips generation analysis.

**Trip Distribution and Assignments**

The project-related trips were distributed along the anticipated approach routes to the project site based on the directional distribution of peak hour traffic along Makena Alanui Road.

Using the trip generation and trip distribution previously discussed, project-related traffic was assigned to the various traffic movements at the intersection of Makena Alanui Road at Old Makena Road. Project trips were distributed for a scenario with three driveways as described in the project description.

The project related trip distribution and assignments are also shown in Figure 4.

**2005 Cumulative Plus Project Projections**

Cumulative plus project traffic conditions are defined as 2005 background traffic conditions plus project related traffic. The incremental difference between cumulative and cumulative plus project is the traffic impact of the project under study.

2005 cumulative plus project traffic volumes with the project were estimated by superimposing the peak hourly traffic generated by the proposed project on the 2005 cumulative peak hour traffic volumes presented in Chapter 3. The traffic projections for 2005 cumulative plus project conditions are shown on Figure 5.

The traffic projection worksheets are presented as Appendix B.

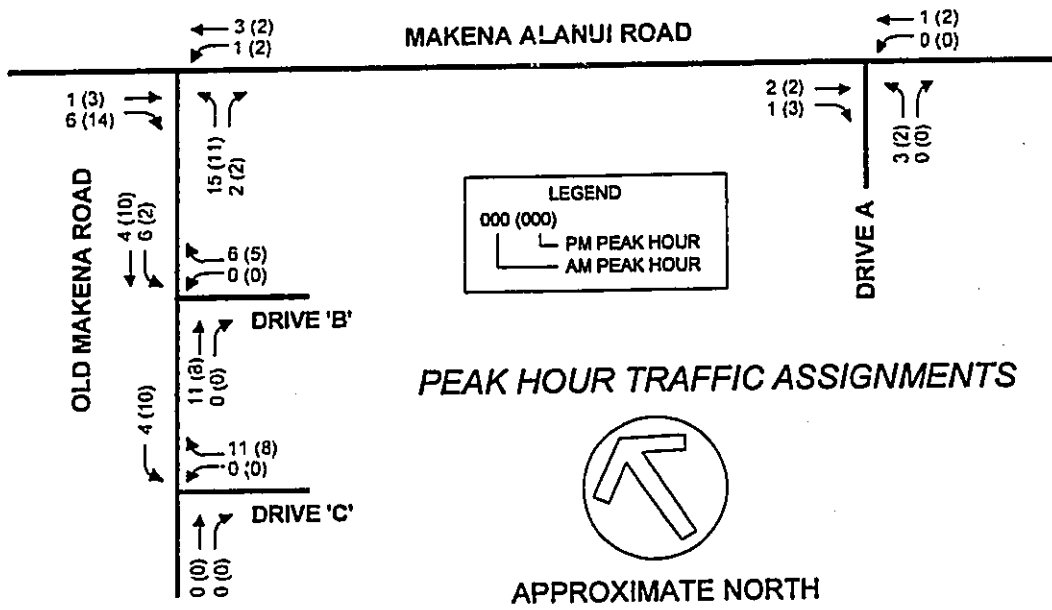
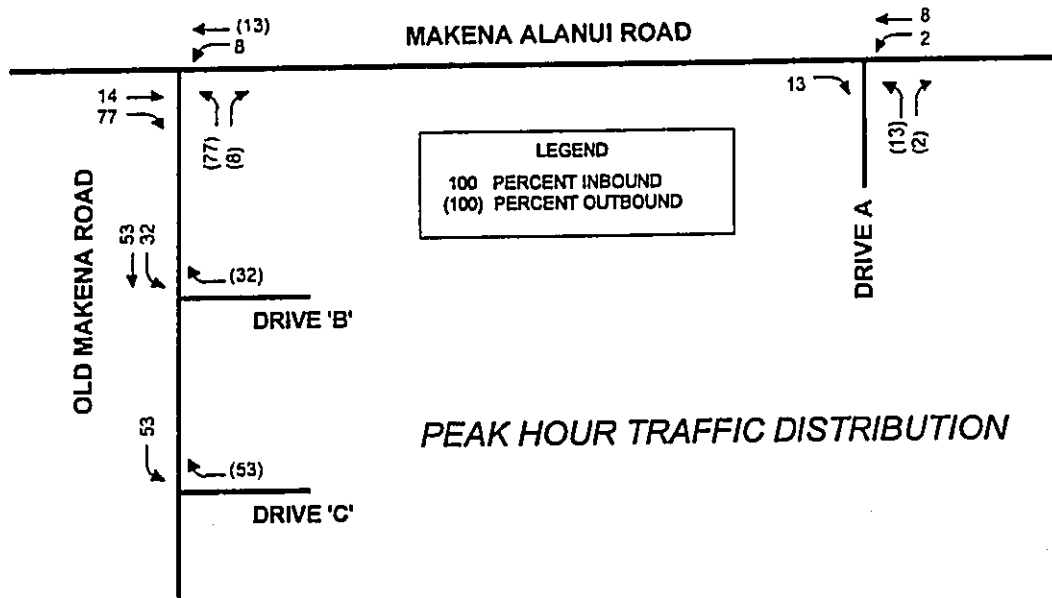


Figure 4

**PROJECT TRAFFIC DISTRIBUTION AND ASSIGNMENTS**

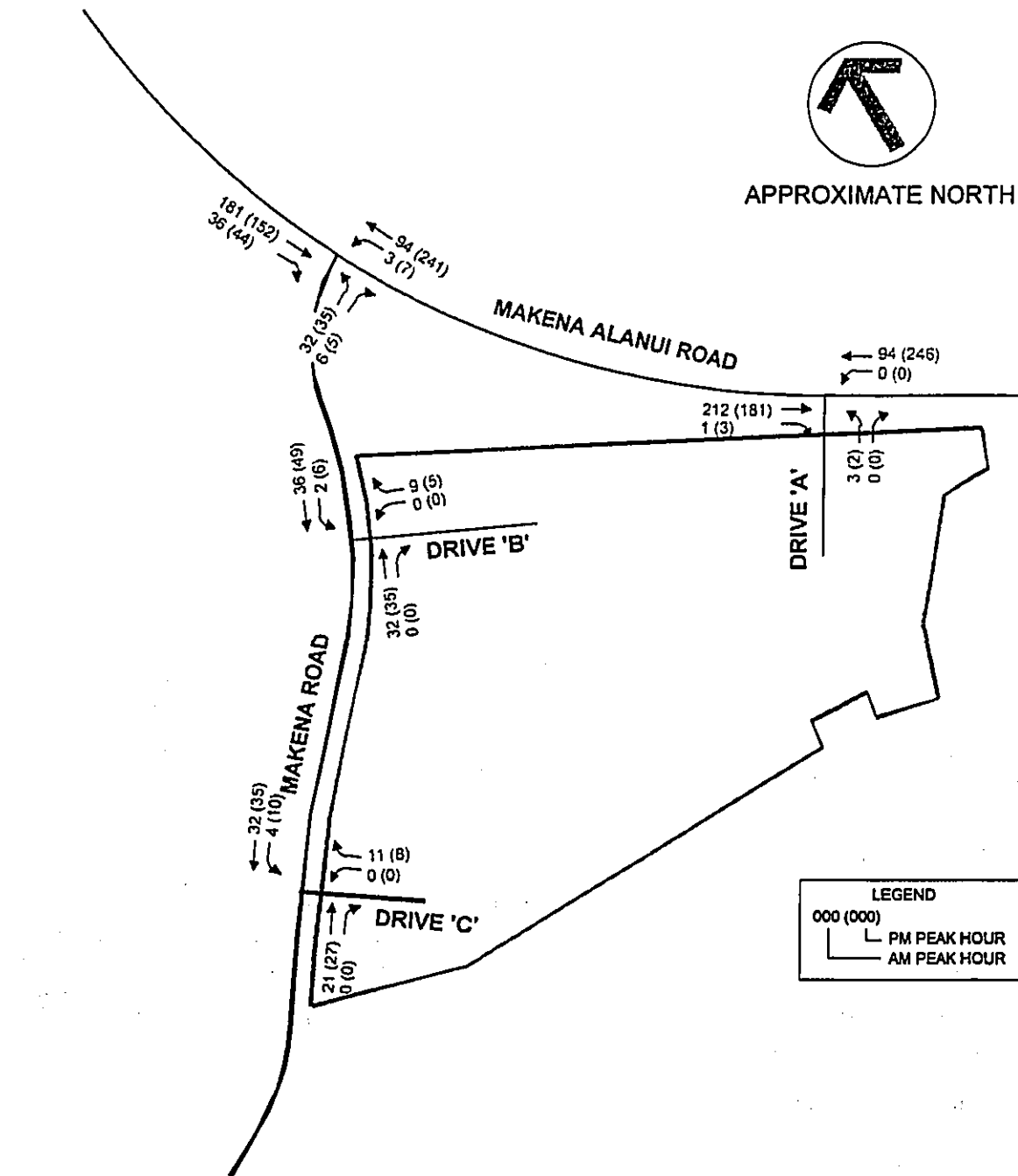


Figure 5

## CUMULATIVE PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES

## **5. CONCLUSIONS AND RECOMMENDATIONS**

The purpose of this chapter is to summarize the results of the level-of-service analysis, which identifies the project-related impacts. In addition, any mitigation measures necessary and feasible are identified and other access, egress and circulation issues are discussed.

### **Definition of Significant Impacts**

Criteria for determining if a project has a significant traffic impact for which mitigation measures must be investigated have been established based on traffic impact study guidelines used in other traffic studies. Generally, the criteria are as follows: if the level-of-service (LOS) without the project is E or F and the volume/capacity (V/C) ratio changes less than 0.020, the project's traffic impacts are considered insignificant. However, if the V/C ratio change is greater than 0.020, then mitigation measures which will reduce the V/C ratio change to less than 0.020 must be identified.

### **Project Related Traffic Impacts**

The assumptions used for the LOS analysis are:

1. The intersection of Makena Alanui Road at Old Makena Road and the driveways will be unsignalized.
2. The intersection configuration will be unchanged.

The results of the LOS analysis for the intersections studied are shown in Table 5.

**Table 5 Level-of-Service Analysis for 2005 Peak Hour Conditions<sup>(1)</sup>**

Intersection and Movement	Cumulative		Cumulative Plus Project		Delay Change
	Delay <sup>(2)</sup>	LOS <sup>(3)</sup>	Delay	LOS	
<b>AM PEAK HOUR</b>					
<i>Intersection Total</i>	0.3	A	0.6	A	0.3
Northbound Left & Right	5.0	A	5.5	B	0.5
Westbound Left	2.8	A	2.9	A	0.1
<b>PM PEAK HOUR</b>					
<i>Intersection Total</i>	0.4	A	0.6	A	0.2
Northbound Left & Right	6.6	B	7.0	B	0.4
Westbound Left	2.8	A	2.8	A	0.0

NOTES:  
1. Peak hour conditions analyzed are "worst-case" conditions, which is the sum of the peak hour of the adjacent street plus the peak hour of the generator.  
2. Delay is in seconds per vehicle.  
3. LOS denotes Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. LOS is based on delay. See Tables 1 and 2 for definitions.

The conclusion of the level-of-service analysis is that there is no change in the level-of-service as a result of the proposed project and that the intersection will operate at level-of-service A during the morning and afternoon peak hour.

### Driveways

#### Lane Configurations

A level-of-service analysis was performed for the three proposed driveways to confirm that the proposed configurations will operate acceptably. The analysis was performed using the following assumptions:

1. All the driveways are one lane inbound and one lane outbound.
2. All driveways are "STOP" sign controlled.
3. There are no separate left turn storage lanes for traffic turning into the driveways.

The analysis concluded that all the driveways will operate at good levels-of-service during the peak traffic hour using the lane configurations described above.

#### Sight Distances

The sight distance along Makena Alanui Road from Driveway A was examined because of the sight restrictions created by the horizontal curvature of Makena Alanui Road. A photograph from the approximate location of the proposed driveway is included in Appendix A.

a minimum sight distance of 350 feet along Makena Alanui should be maintained.

The sight distance appears to be acceptable for the posted post limits. There may be potential problems during early morning and dusk when drivers do not have their vehicle's headlights on, yet light levels are low.

**Conclusions**

The conclusions of the LOS analysis for 2005 conditions are:

1. There is no change in the LOS at the intersection of Makena Alanui at Old Makena Road as a result of the proposed project. The intersection will operate at LOS A during both morning and afternoon peak hours.
2. No roadway improvements are required to accommodate estimated traffic generated by the project.
3. The driveways for the project should be one lane in and one lane out.
4. Landscaping should be designed to not restrict sight distances along side streets.

**APPENDIX A**

**PHOTOGRAPHS OF INTERSECTIONS AND ADJACENT  
ROADWAY**



**APPENDIX B**

**TRIP GENERATION AND TRAFFIC PROJECTION  
WORKSHEETS**

**APPENDIX C**  
**LEVEL-OF-SERVICE ANALYSIS WORKSHEETS**

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Streets: (N-S) Old Makena Road  
 Major Street Direction: EW  
 Length of Time Analyzed: 15 (min)  
 Analyst: FVR  
 Date of Analysis: 4/15/0  
 Other Information: Existing AM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes	167	28		2	84		11		3			
PHF	.8	.78	.25	.88	.69	.25						
Grade	0			0								
MC's (%)												
SU/RV's (%)							1.10		1.10		1.10	
PCE's												

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWS Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	227	
Potential Capacity: (pcph)	1062	
Movement Capacity: (pcph)	1062	
Prob. of Queue-Free State:	0.99	
Step 2: LT from Major Street	NB	SB
Conflicting Flows: (vph)	245	
Potential Capacity: (pcph)	1310	
Movement Capacity: (pcph)	1310	
Prob. of Queue-Free State:	0.99	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	0.99	
Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	330	
Potential Capacity: (pcph)	682	
Major LT, Minor TH Impedance Factor:	0.99	
Adjusted Impedance Factor:	0.99	
Capacity Adjustment Factor due to Impeding Movements:	0.99	
Movement Capacity: (pcph)	677	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	18	677	>	798	4.7	0.0	A
NB R	13	1062	>				
WB L	9	1310		2.8	0.0	A	0.1

Intersection Delay = 0.2 sec/veh

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Streets: (N-S) Old Makena Road (E-W) Makena Alanui Road  
 Major Street Direction... EW  
 Length of Time Analyzed... 15 (min)  
 Analyst... RJR  
 Date of Analysis... 4/15/0  
 Other Information... Existing PM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes	138	23		4	221		21		2			
PHF	.75	.72		.5	.82		.66		.25			
Grade	0			0			0					
MC's (%)												
SU/RV's (%)												
PC's (%)				1.10			1.10		1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street NB SB

Conflicting Flows: (vph) 200  
 Potential Capacity: (pcph) 1096  
 Movement Capacity: (pcph) 1096  
 Prob. of Queue-Free State: 0.99

Step 2: LT from Major Street NB EB

Conflicting Flows: (vph) 216  
 Potential Capacity: (pcph) 1353  
 Movement Capacity: (pcph) 1353  
 Prob. of Queue-Free State: 0.99  
 RT Saturation Flow Rate: (pcphpl) 1700  
 LT Saturation Flow Rate: (pcphpl) 0.99  
 Major LT Shared Lane Prob. of Queue-Free State: 0.99

Step 4: LT from Minor Street NB SB

Conflicting Flows: (vph) 478  
 Potential Capacity: (pcph) 560  
 Major LT, Minor TH  
 Impedance Factor: 0.99  
 Adjusted Impedance Factor: 0.99  
 Capacity Adjustment Factor due to Impeding Movements: 0.99  
 Movement Capacity: (pcph) 556

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	35	556 >		6.3	0.1	B	6.3
NB R	9	1096 >		2.7	0.0	A	0.0
WB L	9	1353					

Intersection Delay = 0.4 sec/veh

Worksheet for TWS Intersection  
 Step 1: RT from Minor Street NB SB  
 Conflicting Flows: (vph) 244  
 Potential Capacity: (pcph) 1042  
 Movement Capacity: (pcph) 1042  
 Prob. of Queue-Free State: 0.98  
 Step 2: LT from Major Street NB EB  
 Conflicting Flows: (vph) 263  
 Potential Capacity: (pcph) 1285  
 Movement Capacity: (pcph) 1285  
 Prob. of Queue-Free State: 0.99  
 RT Saturation Flow Rate: (pcphpl) 1700  
 Major LT Shared Lane Prob. of Queue-Free State: 0.99  
 Step 4: LT from Minor Street NB SB  
 Conflicting Flows: (vph) 355  
 Potential Capacity: (pcph) 660  
 Major LT, Minor TH Impedance Factor: 0.99  
 Adjusted Impedance Factor: 0.99  
 Capacity Adjustment Factor due to Impeding Movements: 0.99  
 Movement Capacity: (pcph) 655

Movement	Flow Rate (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
NB L	28	655 >	5.0	0.1	A
NB R	18	1042 >	2.8	0.0	A
NB L	9	1285	2.8	0.0	A

Intersection Delay = 0.3 sec/veh

Streets: (N-S) Old Makena Road (E-W) Makena Alanui Road  
 Major Street Direction: EN  
 Length of Time Analyzed: 15 (min)  
 Analyst: RJR  
 Date of Analysis: 4/15/0  
 Other Information: Cumulative AM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield			N			N						
Volumes	180	30		2	91		17			4		
PHF	.8	.78		.25	.88		.69			.25		
Grade	0			0			0					
MC's (%)												
SU/RV's (%)												
PCB's				1.10			1.10			1.10		

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Streets: (N-S) Old Makena Road (E-W) Makena Alanui Road  
 Major Street Direction: EW  
 Length of Time Analyzed: 15 (min)  
 Analyst: PJR  
 Date of Analysis: 4/15/0  
 Other Information: Cumulative PM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	1	0	0	0	0	0	0	0
Stop/Yield			N			N			0			0
Volumes	149	30		5	239		24	3				
PHF	.75	.72		.5	.82		.66	.25				
Grade	0			0			0					
MC's (%)												
SU/RV's (%)												
FCB's				1.10			1.10	1.10				

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street NB SB  
 Conflicting Flows: (vph) 220  
 Potential Capacity: (pcph) 1071  
 Movement Capacity: (pcph) 1071  
 Prob. of Queue-Free State: 0.99  
 Step 2: LT from Major Street NB SB  
 Conflicting Flows: (vph) 241  
 Potential Capacity: (pcph) 1316  
 Movement Capacity: (pcph) 1316  
 Prob. of Queue-Free State: 0.99  
 TH Saturation Flow Rate: (pcphpl) 1700  
 RT Saturation Flow Rate: (pcphpl) 1700  
 Major LT Shared Lane Prob. of Queue-Free State: 0.99  
 Step 4: LT from Minor Street NB SB  
 Conflicting Flows: (vph) 521  
 Potential Capacity: (pcph) 529  
 Major LT, Minor TH Impedance Factor: 0.99  
 Adjusted Impedance Factor: 0.99  
 Capacity Adjustment Factor due to Impeding Movements: 0.99  
 Movement Capacity: (pcph) 524

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Delay (sec/veh)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	40	524	>				
NB R	13	1071	>	6.6	0.2	B	6.6
WB L	11	1316		2.8	0.0	A	0.1

Intersection Delay = 0.4 sec/veh

Worksheet for TWS Intersection

Step 1: RT from Minor Street NB SB  
 Conflicting Flows: (vph) 249  
 Potential Capacity: (pcph) 1036  
 Movement Capacity: (pcph) 1036  
 Prob. of Queue-Free State: 0.97  
 Step 2: LT from Major Street WB EB  
 Conflicting Flows: (vph) 272  
 Potential Capacity: (pcph) 1272  
 Movement Capacity: (pcph) 1272  
 Prob. of Queue-Free State: 0.99  
 TH Saturation Flow Rate: (pcphpl) 1700  
 RT Saturation Flow Rate: (pcphpl)  
 Major LT Shared Lane Prob. of Queue-Free State: 0.99  
 Step 4: LT from Minor Street NB SB  
 Conflicting Flows: (vph) 368  
 Potential Capacity: (pcph) 548  
 Major LT, Minor TH  
 Impedance Factor: 0.99  
 Adjusted Impedance Factor: 0.99  
 Capacity Adjustment Factor due to Impeding Movements: 0.99  
 Movement Capacity: (pcph) 541

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	51	641	>	736	5.5	0.3	B
NB R	26	1036	>				
WB L	13	1272		2.9	0.0	A	0.1

Intersection Delay = 0.6 sec/veh

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 Streets: (N-S) Old Makena Road (E-W) Makena Alamui Road  
 Major Street Direction: EW  
 Length of Time Analyzed: 15 (min)  
 Analyst: RJR  
 Date of Analysis: 4/15/0  
 Other Information: Cumulative Plus Project AM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield												
Volumes	181	36		3	94		32		6			
PHP	.8	.78		.25	.88		.69		.25			
Grade	0			0			0					
MC's (%)												
SU/RV's (%)												
PC's (%)				1.10			1.10		1.10			1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.50
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

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 Ph: (808) 239-8206  
 Streets: (N-S) Old Makana Road (E-W) Makana Alanui Road  
 Major Street Direction... EW  
 Length of Time Analyzed... 15 (min)  
 Analyst... PJR  
 Date of Analysis... 4/15/0  
 Other Information... Cumulative Plus Project PM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield												
Volumes	152	44	N	7	241	N	35	5				
PHF	.75	.72		.5	.82		.66	.25				
Grade												
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's				1.10			1.10	1.10	1.10			

Adjustment Factors

Vehicle Maneuver	Critical Gap (cg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street NB SB

Conflicting Flows: (vph) 334  
 Potential Capacity: (pcph) 1054  
 Movement Capacity: (pcph) 1054  
 Prob. of Queue-Free State: 0.98

Step 2: LT from Major Street WB EB

Conflicting Flows: (vph) 264  
 Potential Capacity: (pcph) 1283  
 Movement Capacity: (pcph) 1283  
 Prob. of Queue-Free State: 0.99  
 TH Saturation Flow Rate: (pcphpl) 1700  
 RT Saturation Flow Rate: (pcphpl) 1700  
 Major LT Shared Lane Prob. of Queue-Free State: 0.99

Step 4: LT from Minor Street NB SB

Conflicting Flows: (vph) 542  
 Potential Capacity: (pcph) 514  
 Major LT, Minor TH  
 Impedance Factor: 0.99  
 Adjusted Impedance Factor: 0.99  
 Capacity Adjustment Factor due to Impeding Movements: 0.99  
 Movement Capacity: (pcph) 507

Intersection Performance Summary

Movement	Rate (pcph)	Cap (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Total Delay (sec/veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
NB L	58	507	>				
NB R	22	1054	>				
WB L	15	1283		591	7.0	0.5	B 7.0
WB R	15	1283			2.8	0.0	A 0.1

Intersection Delay = 0.6 sec/veh



Streets: (N-S) Drive A  
 Major Street Direction... EW  
 Length of Time Analyzed... 15 (min)  
 Analyst... FJR  
 Date of Analysis... 4/15/0  
 Other Information... Cumulative Plus Project AM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield												
Volumes	212	1	0	94	0	3	0					
PHP	.8	.8	.8	.88	.8	.8	.8					
Grade	0			0		0						
MC's (%)												
SU/RV's (%)												
PCV's (%)												
	1.10			1.10			1.10			1.10		

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	266	
Potential Capacity: (pcph)	1280	
Movement Capacity: (pcph)	1280	
Prob. of Queue-Free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	1.00	
Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	266	
Potential Capacity: (pcph)	1280	
Movement Capacity: (pcph)	1280	
Prob. of Queue-Free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	1.00	
Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	372	
Potential Capacity: (pcph)	645	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	645	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
NB L	4	645	>				
NB R	0	1015	>	5.6	0.0	B	5.6
WB L	0	1280		2.8	0.0	A	0.0
Intersection Delay = 0.1 sec/veh							

Phillip Rowell And Associates  
 47-273 'D' Rui Iwa Street  
 Kaneohe, HI 96744  
 Ph: (808) 239-8206

Streets: (N-S) Drive A  
 Major Street Direction... EW  
 Length of Time Analyzed... 15 (min)  
 Analyst... PUR  
 Date of Analysis... 4/15/0  
 Other Information... Cumulative Plus Project PM Peak Hour  
 Two-way Stop-controlled Intersection

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	> 0	< 0	0	0	0
Stop/Yield												
Volumes	181	3	0	246			2	0				
PHF	.75	.75	.82	.82			.8	.8				
Grade	0			0			0					
MC's (t)												
SU/RV's (t)							1.10	1.10	1.10	1.10	1.10	1.10
PCB's												

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street	NB	SB
Conflicting Flows: (vph)	243	
Potential Capacity: (pcph)	1043	
Movement Capacity: (pcph)	1043	
Prob. of Queue-Free State:	1.00	
Step 2: LT from Major Street	WB	EB
Conflicting Flows: (vph)	245	
Potential Capacity: (pcph)	1310	
Movement Capacity: (pcph)	1310	
Prob. of Queue-Free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	1.00	
Step 4: LT from Minor Street	NB	SB
Conflicting Flows: (vph)	543	
Potential Capacity: (pcph)	513	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	513	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Avg. Delay (sec/veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
NB L	2	513 >	513	7.0	0.0	B 7.0
NB R	0	1043 >				
WB L	0	1310		2.7	0.0	A 0.0

Intersection Delay = 0.0 sec/veh

Phillip Rowell And Associates  
 47-273 'D' Hui Iwa Street  
 Kaneohe, HI 96744-  
 Ph: (808) 239-8206

Streets: (N-S) Old Makana Road (E-W) Drive B  
 Major Street Direction... NS  
 Length of Time Analyzed... 15 (min)  
 Analyst... FJR  
 Date of Analysis... 4/15/0  
 Other Information... Cumulative Plus Project AM Peak Hour  
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	0	0	0	> 0	< 0
Stop/Yield Volumes	32	0	0	2	36	0	0	0	0	0	6	0
PHP	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
Grade	0			0			0			0		
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's				1.10						1.10		1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWS Intersection

Step 1: RT from Minor Street	WB	EB
Conflicting Flows: (vph)	46	
Potential Capacity: (pcph)	1312	
Movement Capacity: (pcph)	1312	
Prob. of Queue-Free State:	0.99	
Step 2: LT from Major Street	SB	NB
Conflicting Flows: (vph)	46	
Potential Capacity: (pcph)	1630	
Movement Capacity: (pcph)	1630	
Prob. of Queue-Free State:	1.00	
TH Saturation Flow Rate: (pcphpl)	1700	
RT Saturation Flow Rate: (pcphpl)		
Major LT Shared Lane Prob. of Queue-Free State:	1.00	
Step 4: LT from Minor Street	WB	EB
Conflicting Flows: (vph)	100	
Potential Capacity: (pcph)	927	
Major LT, Minor TH Impedance Factor:	1.00	
Adjusted Impedance Factor:	1.00	
Capacity Adjustment Factor due to Impeding Movements	1.00	
Movement Capacity: (pcph)	925	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	0	925 >					
WB R	10	1312 >					
SB L	3	1630	1312	2.8	0.0	A	2.8
SB R	3	1630	1312	2.2	0.0	A	0.1

Intersection Delay = 0.3 sec/veh

Phillip Rowell and Associates  
 47-273 'D' Rui Iwa Street  
 Kaneohe, HI 96744-  
 Ph: (808) 239-8206

Streets: (N-S) Old Makana Road (E-W) Drive B  
 Major Street Direction... NS  
 Length of Time Analyzed... 15 (min)  
 Analyst... FJR  
 Date of Analysis... 4/15/0  
 Other Information... Cumulative Plus Project PM Peak Hour  
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	0	0	0	0	> 0 < 0
Stop/Yield				N			N					
Volumes	35	0		6	45							5
PHF	.7	.7		.7	.7							.7
Grade	0			0								0
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCE's				1.10						1.10		1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street WB EB

Conflicting Flows: (vph) 50  
 Potential Capacity: (pcph) 1306  
 Movement Capacity: (pcph) 1306  
 Prob. of Queue-Free State: 0.99

Step 2: LT from Major Street SB NB

Conflicting Flows: (vph) 50  
 Potential Capacity: (pcph) 1623  
 Movement Capacity: (pcph) 1623  
 Prob. of Queue-Free State: 0.99  
 TH Saturation Flow Rate: (pcphpl) 1700  
 RT Saturation Flow Rate: (pcphpl) 1700  
 Major LT Shared Lane Prob. of Queue-Free State: 0.99

Step 4: LT from Minor Street WB EB

Conflicting Flows: (vph) 123  
 Potential Capacity: (pcph) 899  
 Major LT, Minor TH Impedance Factor: 0.99  
 Adjusted Impedance Factor: 0.99  
 Capacity Adjustment Factor due to Impeding Movements: 0.99  
 Movement Capacity: (pcph) 893

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	95% Queue Length (veh)	Approach Delay (sec/veh)
WB L	0	893 >				
WB R	8	1306 >	1306	2.8	0.0	A 2.8
SB L	10	1623		2.2	0.0	A 0.3

Intersection Delay = 0.3 sec/veh

Phillip Rowell And Associates  
 47-273 'D' Hui Iwa Street  
 Kaneohe, HI 96744  
 Ph: (808) 239-8206  
 Streets: (N-S) Old Makena Road (E-W) Drive C  
 Major Street Direction... NS  
 Length of Time Analyzed... 15 (min)  
 Analyst... FJR  
 Date of Analysis... 4/15/0  
 Other Information... Cumulative Plus Project AM Peak Hour  
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	0	0	0	0	0
Stop/Yield			N			N						
Volumes	21	0	4	32			0	0	0	0	0	11
PHF	.7	.7	.7	.7			.7	.7	.7	.7	.7	.7
Grade	0			0			0			0		0
MC's (t)												
SU/RV's (t)												
CV's (t)												
PCB's							1.10			1.10		1.10

Adjustment Factors

Vehicle Manuever	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street WB EB

Conflicting Flows: (vph) 30  
 Potential Capacity: (pcph) 1337  
 Movement Capacity: (pcph) 1337  
 Prob. of Queue-Free State: 0.99

Step 2: LT from Major Street SB NB

Conflicting Flows: (vph) 30  
 Potential Capacity: (pcph) 1659  
 Movement Capacity: (pcph) 1659  
 Prob. of Queue-Free State: 1.00  
 TH Saturation Flow Rate: (pcphpl) 1700  
 RT Saturation Flow Rate: (pcphpl)  
 Major LT Shared Lane Prob. of Queue-Free State: 1.00

Step 4: LT from Minor Street WB EB

Conflicting Flows: (vph) 82  
 Potential Capacity: (pcph) 949  
 Major LT, Minor TH Impedance Factor: 1.00  
 Adjusted Impedance Factor: 1.00  
 Capacity Adjustment Factor due to Impeding Movements: 1.00  
 Movement Capacity: (pcph) 945

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	0	945	>				
WB R	18	1337	>	2.7	0.0	A	2.7
SB L	7	1659		2.2	0.0	A	0.2

Intersection Delay = 0.6 sec/veh

Phillip Rowell And Associates  
 47-273 'D' Hui Iwa Street  
 Kaneohe, HI 96744-  
 Ph: (808) 239-8206

Streets: (N-S) Old Makana Road (E-W) Drive C  
 Major Street Direction... NS  
 Length of Time Analyzed... 15 (min)  
 Analyst... PJR  
 Date of Analysis... 4/15/0  
 Other Information... Cumulative Plus Project PM Peak Hour  
 Two-way Stop-controlled Intersection

	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	< 0	0	> 1	0	0	0	0	0	0	> 0
Stop/Yield												
Volumes	27	0	10	35								8
PHP	.7	.7	.7	.7								.7
Grade	0			0								0
MC's (%)												
SU/RV's (%)												
CV's (%)												
PCB's												
			1.10									1.10

Adjustment Factors

Vehicle Maneuver	Critical Gap (tg)	Follow-up Time (tf)
Left Turn Major Road	5.00	2.10
Right Turn Minor Road	5.50	2.60
Through Traffic Minor Road	6.00	3.30
Left Turn Minor Road	6.50	3.40

Worksheet for TWSC Intersection

Step 1: RT from Minor Street		WB	EB
Conflicting Flows: (vph)		39	
Potential Capacity: (pcph)		1323	
Movement Capacity: (pcph)		1323	
Prob. of Queue-Free State:		0.99	
Step 2: LT from Major Street		SB	NB
Conflicting Flows: (vph)		39	
Potential Capacity: (pcph)		1642	
Movement Capacity: (pcph)		1642	
Prob. of Queue-Free State:		0.99	
TH Saturation Flow Rate: (pcphpl)		1700	
RT Saturation Flow Rate: (pcphpl)			
Major LT Shared Lane Prob. of Queue-Free State:		0.99	
Step 4: LT from Minor Street		WB	EB
Conflicting Flows: (vph)		103	
Potential Capacity: (pcph)		923	
Major LT, Minor TH Impedance Factor:		0.99	
Adjusted Impedance Factor:		0.99	
Capacity Adjustment Factor due to Impeding Movements		0.99	
Movement Capacity: (pcph)		914	

Intersection Performance Summary

Movement	Flow Rate (pcph)	Move Cap (pcph)	Shared Cap (pcph)	Total Delay (sec/veh)	Queue Length (veh)	LOS	Approach Delay (sec/veh)
WB L	0	914	>				
WB R	12	1323	>	2.7	0.0	A	2.7
SB L	15	1642		2.2	0.0	A	0.5

Intersection Delay = 0.6 sec/veh

Appendix G  
Comment and Response Letters



JAMES "KIMO" APANA  
MAYOR

OUR REFERENCE

YOUR REFERENCE

# POLICE DEPARTMENT COUNTY OF MAUI

55 MAHALANI STREET  
WAILUKU, HAWAII 98793  
(808) 244-6400  
Fax (808) 244-6411



THOMAS M. PHILLIPS  
CHIEF OF POLICE

KEKUHAUPIO R. AKANA  
DEPUTY CHIEF OF POLICE

'00 AUG 16 P2:33

August 14, 2000 DEPT OF PLANNING  
COUNTY OF MAUI  
RECEIVED

## MEMORANDUM

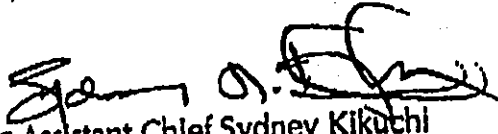
TO : JOHN E. MIN, PLANNING DIRECTOR  
DEPARTMENT OF PLANNING

FROM : THOMAS M. PHILLIPS, CHIEF OF POLICE  
MAUI POLICE DEPARTMENT

SUBJECT : I.D. : SM1 2000/0020  
TMK : 2-1-7:101  
Project Name: Makena Estates, 40-Unit Resort Condominium  
Project  
Applicant : Martin W. Quill, Makena Estates, LLC.

\_\_\_\_\_ No recommendation or special condition is  
necessary or desired.

  X   Refer to attachment.

  
Acting Assistant Chief Sydney Kikuchi  
For: THOMAS M. PHILLIPS  
Chief of Police

Attachment

AUG. 24. 2000 1:09PM CMI GROUP



TO : THOMAS M. PHILLIPS, CHIEF OF POLICE  
VIA : CHANNELS  
FROM : O. NONEZA, JR., COMMUNITY POLICE OFFICER  
SUBJECT : MAKENA ESTATES

*CHANNELS  
THIS IS A SECOND  
COPY.  
M/ 8/8/00*

This officer has reviewed the Application For Special Management Area Permit for MAKENA ESTATES as submitted by Makena Estates LLC.

Based on this review, this officer makes the following comments and recommendations.

TRAFFIC IMPACT ANALYSIS REPORT

GENERAL:

The applicant recognizes that the proposed project will be served by Makena Alanui Drive, which this officer states is only a renamed extension of Wailea Alanui Drive; therefore, the project will impact the Wailea community.

The Wailea community has an on-going concern about speeding vehicles with this officer knowing, based upon enforcement interviews, that a large portion of those vehicles are destined for Makena. The applicant proposes to add more vehicle traffic towards Makena without assessing its impact on Wailea.

The applicant will state that by itself, the project will not generate traffic that the roadway is incapable of handling but this project is only part of a continuing development of the Makena area. In their study, the applicant "attempted" to study additional development in the area by accounting for "12-condominium units" even though the applicant is probably aware that MAKENA RESORT is planning for an additional 1,100 condominiums and single-family homes plus another hotel. MAKENA RESORT is already building the infrastructure improvements for this expansion.

The Makena community, of which this project will be a part, needs another access road for public safety reasons as well as to alleviate the traffic on Makena Alanui Drive. Therefore, this officer recommends that the applicant "join" with other community groups in "building" Piilani Highway to extend to Makena.

TRIP GENERATION CLASSIFICATION:

The project has been classified as a "low-rise residential condominium" for purposes of this traffic impact study. This officer disputes this classification based upon similar developments in the area contending that for purposes of estimating trip generations, the recreational homes category should be used instead. While it may be the intention

to market this project as residences, it has been this officer's experience that these "high-end" dwellings are secondary homes for their owners, many of which become part of a rental pool when the owner is absent. The recreational home category would also account for additional interior maintenance-type traffic that would be generated by this "high-end" project.

### PROJECT DESIGN

#### **ROAD "B":**

The project is designed to include the construction of "Road B" to provide access onto Makena Alanui Drive for a single building, Building D. The applicant states that adequate sight distance for this driveway is maintained based upon the road's posted speed limit, which is 30-MPH, not 35-MPH as stated in the application.

Makena Alanui Drive experiences speeding vehicles evidenced by continuing complainants from area residents. While the applicant may state that this situation is a police enforcement concern, the applicant should realize that speeding vehicles occur whether enforcement is happening or not. Therefore, they must consider that fact in their design.

MAKENA RESORT intends to remedy the "slope" of Makena Alanui Drive in the area of "Road B". This officer anticipates that upon completion, this will increase the likelihood of speeding. A prime example of the effect of driveway placement is the situations occurring at the GRAND WAILEA Main Lobby entryway and the FOUR SEASONS Security/Delivery entrances. Those driveways are situated too close to uphill-downhill curves thereby causing a potential safety hazard.

Therefore, this officer recommends that "Road B" be deleted from accessing Makena Alanui Drive.

#### **BUILDING & LANDSCAPING DESIGN / CONSTRUCTION:**

This officer's experience with condominiums and dwellings in the South Maui area, particularly Wailea/Makena has caused this officer to conclude that certain matters dealing with building design/construction needs to be in place prior to occupancy. The purpose of these requirements is crime prevention.

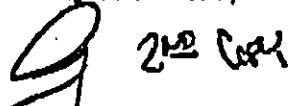
These items are as follows-

- a. Track locks need to be installed on all sliding glass doors, sliding windows, and on louvered windows;
- b. Motion detector lights need to be installed around the perimeter of each building illuminating ground level areas not directly associated with "primary building/dwelling" entry points;

- c. Defensive landscaping should be utilized along all ground floor windows by the growth of "thorny" bushes/hedges. The use of such plantings could be expanded to the general project perimeter to preclude easy access onto the property.

All other matters contained within this application have been addressed by the applicant or is not within the jurisdiction of the Department. If there are any questions about the contents herein, please call me at 250-6830.

Respectfully submitted,



Oriino NONEZA, Jr.  
July 22, 2000

E-0885  
2410-Hours

NOTED: 8/8/00  
Sgt. WOODS KAUCZ



September 5, 2000

Mr. Thomas M. Phillips  
Chief of Police  
Police Department  
County of Maui  
55 Mahalani Street  
Wailuku, Hawaii 96793

Dear Mr. Phillips:

RE: Special Management Area (SMA) Permit for the Makena Estates  
Residential Condominium Project (TMK: (2) 2-1-007:101)

Thank you for your letter dated August 14, 2000, regarding the above-referenced Special Management Area Permit Application.

Per your concerns regarding traffic and safety issues, please find the attached letter from our traffic engineer, Philip Rowell and Associates. We hope that the letter addresses your traffic related concerns.

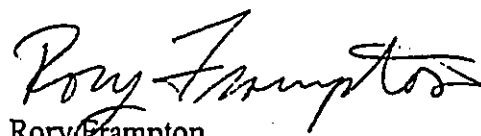
As for your comments regarding crime prevention measures, we will consider the following:

1. Installing track locks on all sliding glass doors, sliding windows, and on louvered windows;
2. Installing motion detector lights around the perimeter of each building and illuminating ground level areas not directly associated with "primary building/dwelling entry points; and
3. Planting defensive landscaping along all ground floor windows.

Should you have any questions, please contact myself, or Mr. Michael Summers, Chris Hart & Partners, at 242-1955.

Mr. Thomas M. Phillips  
September 5, 2000  
Page 2

Sincerely,



Rory Frampton  
Land Use Planner

cc. Mr. John E. Min, Department of Planning  
Mr. Marty Quill, Makena Estates, L.L.C.  
Mr. Phillip Rowell, Phillip Rowell and Associates  
Project File

**Phillip Rowell and Associates**

47-273 'O' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8208 FAX: (808) 239-4175 Email:prowell@glia.net

September 6, 2000

Chris Hart & Partners  
1955 Main Street, Suite 200  
Wailuku, Maui, Hawaii 96793

Attn: Michael Summers

Re: Makena Estates  
Comments from Maui Police Department

Dear Michael:

The following is my response to comments from Maui Police Department dated July 22, 2000:

- As discussed on pages 10 and 11 of the traffic report, traffic was expanded by 1.6% per year for five years to account for background growth. This growth rate was taken from the *Maui Long-Range Land Transportation Plan* and includes traffic generated by the planned development of Makena Resort and Wallea. In addition, development of adjacent parcels was added to this growth. Therefore, the adjacent development was double counted.
- Trip generation units for low-rise condominiums and recreational homes are:

Time Period	Trips per unit <sup>1</sup>	
	Low Rise Condominiums (Land Use Code 231)	Recreational Homes (Land Use Code 260)
AM Peak Hour of Adjacent Street	0.66	0.16
PM Peak Hour of Adjacent Street	0.83	0.26
AM Peak Hour of Generator	0.51	0.30
PM Peak Hour of Generator	0.54	0.31

Since the trip generation rates for recreational homes are much lower than low rise condominiums, use of recreational home trip generation rates would underestimate traffic generated when all, or most, of the units are occupied. Therefore, the low rise condominium trip rates are more appropriate.

- At the time of the traffic study, there was only one speed limit sign posted along Makena Alanui Road south of Makena Road. This sign is located in the vicinity of Maui Prince Hotel and is a 35 MPH sign. Therefore, 35 MPH was used for the study. As of August 29, this sign had been removed. Any 30 MPH sign between Maui Prince Hotel and Makena Road may have been taken down for construction of curb, gutter and sidewalks. The sight distance analysis was based on a design speed of 40 MPH since the design speed of a

<sup>1</sup> Institute of Transportation Engineers, *Trip Generation*, Washington, D.C., 1997, pages 384, 392 and 468 - 473.

**RECEIVED**  
SEP - 6 2000

CHRIS HART & PARTNERS  
Landscape Architecture & Planning

Chris Hart & Partners  
September 6, 2000  
Page 2


roadway is based on 5 to 10 MPH above the posted speed limit. The sight distance for 40 MPH is greater than the sight distance for either 30 and 35 MPH. Therefore, if the posted speed is 30 MPH as stated by MPD, the minimum sight distance should be based on a design speed of 35 MPH.

The sight distance to for traffic approaching from the south of Drive A was measured in the field as 408 feet. For Case IIIb, which is the minimum sight distance required for a vehicle to turn left from the proposed driveway and accelerate to the 85<sup>th</sup> percentile speed, and a design speed of 35 MPH, a sight distance of 350 feet is required.<sup>2</sup> Therefore, adequate sight distance is available and there is no reason to delete Drive A from the proposed plan.

Lastly, it should be noted that this driveway serves only six units and therefore will not have heavy traffic volumes.

4. Lastly, the recommendations for the intersection of Makena Alanui Road and Road A are to maximize the sight distance for drivers exiting the project and will not cause traffic along Makena Alanui Road to increase speed. The recommendations are not proposed to remedy the speeding problem as the comment letter implies.

Very truly yours,  
PHILLIP ROWELL AND ASSOCIATES

  
Phillip J. Rowell, P.E.  
Principal

---

<sup>2</sup> American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, 1980, pages 739 - 763.

BENJAMIN J. CAYetano  
GOVERNOR OF HAWAII



BRUCE S. ANDERSON, Ph.D., M.P.H.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 3478 HONOLULU, HAWAII 96801

In reply, please refer to:  
File:

August 9, 2000  
AUG 17 P2:10

97-099A/epo

Mr. John E. Min, Director  
Planning Department  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

Dear Mr. Min:

Subject: Special Management Area Permit Application  
(SMI 2000/0020)  
Makena Estates  
Makena, Maui  
TMK: 2-1-07: 101

Thank you for allowing us to review and comment on the subject permit application. We have the following comments to offer:

Solid Waste

We encourage the project developer to develop a solid waste management plan incorporating principles of waste reduction and diversion, as embodied in the State Integrated Solid Waste Management Plan. The plan should cover both the construction and operational phases of the project and should seek to minimize waste generation and maximize reuse and recycling opportunities. We are enclosing some recommendations for waste minimization that could be implemented in the design and construction of new developments such as this one.

Specifically, the Office of Solid Waste Management (OSWM) urges the applicant to direct any vegetation removed from the property during construction to a permitted greenwaste recycling facility instead of the landfill or incinerator. In addition to this, the developer shall ensure that all solid waste generated during the project's construction shall be directed to permitted solid waste disposal, processing or recycling facilities.

Please contact Mr. Lane Otsu of the Office of Solid Waste Management at 586-4240 with any questions regarding these comments.

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Noise Concerns

1. Activities associated with the construction phase of the project must comply with the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."
  - a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in Section 11-46-6(a).
  - b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A).
  - c. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit as stated in Section 11-46-7(d)(4).
2. Through facility design, sound levels emanating from stationery equipment such as air conditioning systems, exhaust fans, refrigeration compressors or generators must be attenuated to comply with the provisions of the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

Should there be any questions on this matter, please call Mr. Russell Takata, Environmental Health Program Manager of the Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Polluted Runoff Control

Proper planning, design and use of erosion control measures and management practices will substantially reduce the total volume of runoff and limit the potential impact to the coastal waters from polluted runoff. Please refer to the *Hawaii's Coastal Nonpoint Source Control Plan*, pages III-117 to III-119 for guidance on these management measures and practices for specific project activities. To inquire about receiving a copy of this plan, please call the Coastal Zone Management Program in the Planning Office of the Department of Business, Economic Development and Tourism at 587-2877.

The following practices are suggested to minimize erosion during construction activities:

1. Conduct grubbing and grading activities during the low rainfall months (minimum erosion potential).

2. Clear only areas essential for construction.
3. Locate potential nonpoint pollutant sources away from steep slopes, water bodies, and critical areas.
4. Protect natural vegetation with fencing, tree armoring, and retaining walls or tree wells.
5. Cover or stabilize topsoil stockpiles.
6. Intercept runoff above disturbed slopes and convey it to a permanent channel or storm drain.
7. On long or steep slopes, construct benches, terraces, or ditches at regular intervals to intercept runoff.
8. Protect areas that provide important water quality benefits and/or are environmentally sensitive ecosystems.
9. Protect water bodies and natural drainage systems by establishing streamside buffers.
10. Minimize the amount of construction time spent in any stream bed.
11. Properly dispose of sediment and debris from construction activities.
12. Replant or cover bare areas as soon as grading or construction is completed. New plantings will require soil amendments, fertilizers and temporary irrigation to become established. Use high planting and/or seeding rates to ensure rapid stand establishment. Use seeding and mulch/mats. Sodding is an alternative.

The following practices are suggested to remove solids and associated pollutants in runoff during and after heavy rains and/or wind:

1. Sediment basins.
2. Sediment traps.
3. Fabric filter fences.
4. Straw bale barriers.
5. Vegetative filter strips.

Any questions regarding these matters should be directed to the Polluted Runoff Control Program in the Clean Water Branch at 586-4309.

**Control of Fugitive Dust**

There is a significant potential for fugitive dust emissions during the construction activities. Implementation of adequate dust control measures during all phases of construction is warranted.

Construction activities must comply with provisions of Hawaii Administrative Rules, Chapter 11-60.1, "Air Pollution Control," Section 11-60.1-33, Fugitive Dust.

The contractor should provide adequate measures to control dust from the road areas and during the various phases of construction. These measures include, but are not limited to:

- a. Planning the different phases of construction, focusing on minimizing the amount of dust generating materials and activities, centralizing on-site vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;
- b. Providing an adequate water source at the site prior to start up of construction activities;
- c. Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- d. Controlling of dust from shoulders and access roads;
- e. Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
- f. Controlling of dust from debris being hauled away from project site.

If you have any questions regarding these issues on fugitive dust, please contact the Clean Air Branch at 586-4200.