JOHN WAIHEE
GOVERNOR

CHARLES T. TOGUCHI
SUPERINTENDENT

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

OFFICE OF BUSINESS SERVICES

January 14, 1993

'93 JAN 20 A9:33

OFC. OF ENVIRONMENTAL
QUALITY CONTROL

MEMO TO: Mr. Brian J. J. Choy, Director
Office of Environmental Quality Control

F R O M: Alfred K. Suga, Assistant Superintendent
Office of Business Services

SUBJECT: Negative Declaration Waikoloa Elementary School
Waikoloa, South Kohala, Island of Hawaii
TMK: 6-8-02:38 (por.)

The Department of Education has reviewed the comments received during the 30-day public comment period which began on December 8, 1992. The Department of Education has determined that this project will not have a significant environmental effect and has issued a negative declaration. Please publish this notice in the February 8, 1993, OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the final EA. Please call me at 586-3444 if you have any questions and copy the project consultant on all correspondence.

AKS:LC:hy

Enclosures

cc: C. Toguchi, Supt.
A. Garson, HIDO
S. Serikaku, DLNR
K. Higaki, HI Dist., DAGS
K. Melrose, WDC

1993-02-08-HI-FEA-Waikoloa Elementary School

FINAL ENVIRONMENTAL ASSESSMENT

PROPOSED WAIKOLOA ELEMENTARY SCHOOL

Waikoloa, Hawaii

TMK: 6-8-02:38 (por.)

PREPARED FOR:
STATE OF HAWAII
DEPARTMENT OF EDUCATION

PREPARED BY:
WAIKOLOA DEVELOPMENT CO.

JANUARY 1993

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JANUARY 1993

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*From "Environmental Assessment and Site Selection Analysis, Waikoloa County Housing, Waikoloa, Hawaii", March 1989

Introduction

Waikoloa Development Co. (WDC) and the State of Hawaii (the State), through its Department of Education and Department of Land and Natural Resources, have entered into a Real Estate Transaction Agreement whereby WDC is to dedicate an elementary school site and implement the design and construction of Increment 1 of the elementary school and the State is to purchase the Increment 1 improvements. WDC and the State have jointly selected a 12-acre site in Waikoloa Village, District of South Kohala, Island of Hawaii (Figures 1 and 2). Since the land will be dedicated to the State and State funds will be used to pay for the design and construction of the school, it has been determined by the Department of Land and Natural Resources that the requirements of Chapter 343, Hawaii Revised Statutes, must be fulfilled. This Environmental Assessment covers the entire 12-acre site and all six increments of the school construction to accommodate the ultimate design enrollment.

Project Technical Description

Site Location

The selected site is located at the southwest corner of the intersection of Paniolo Avenue and Ho'oko Street, at the north end of the existing Unit 1 of Waikoloa Village. The site was included within the 580-acre Waikoloa Affordable Housing study area when the environmental assessment and site selection analysis for that project was performed in 1989.

The site is currently vacant. It is bounded to the north by Paniolo Estates, the County of Hawaii's demonstration affordable housing project; to the east by a residential section of Waikoloa Village; and to the south and west by vacant, residential-zoned lands. The tax map key identification is 6-8-02:por. 38.

Development Plan

The elementary school site will be subdivided out of the existing 34-acre Lot 2 of File Plan 2038 (Figure 3), as shown on the preliminary subdivision map (Figure 4). Tentative approval for the subdivision (Application No. 91-169) was granted on February 4, 1992, and final subdivision approval is being pursued.

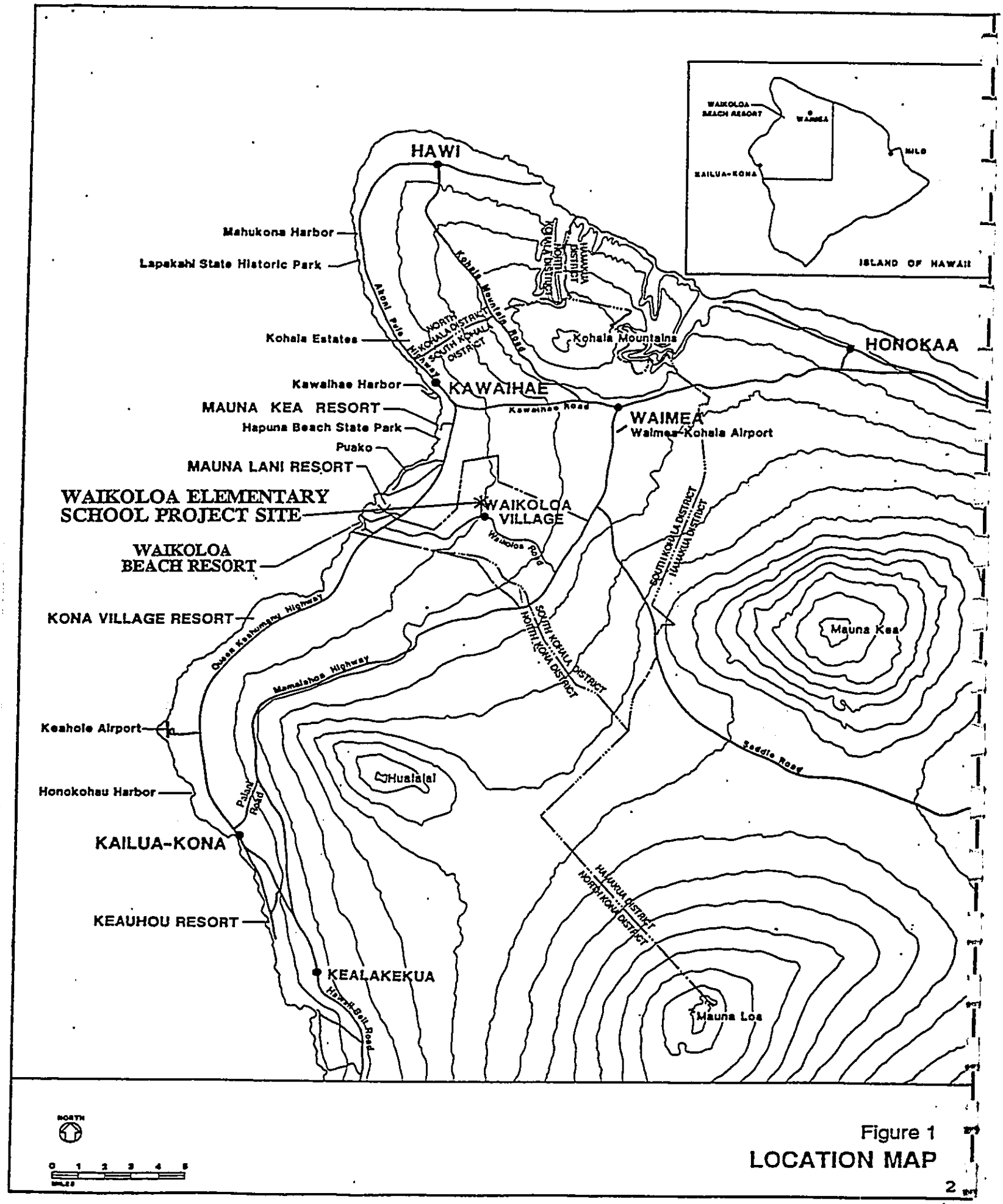

Figure 1
LOCATION MAP

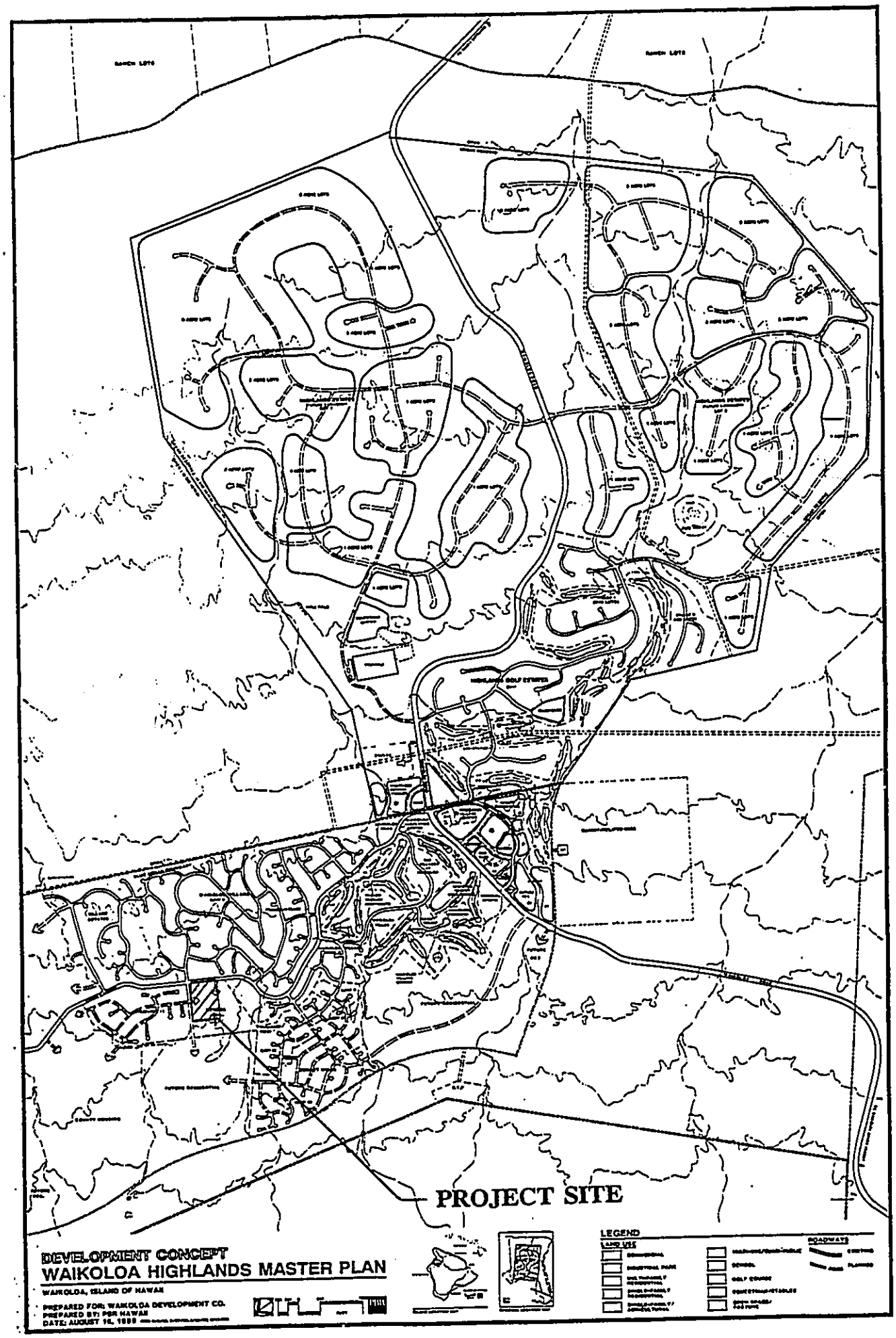
PROJECT SITE
DEVELOPMENT CONCEPT
WAIKOLOA HIGHLANDS MASTER PLAN
WAIKOLOA, ISLAND OF HAWAII
PREPARED FOR: WAIKOLOA DEVELOPMENT CO.
PREPARED BY: PBR HAWAII
DATE: AUGUST 16, 1989
LEGEND
LAND USE
ROADWAYS

Figure 2

File Plan 2038

WAIKOLOA VILLAGE SCHOOL SITE SUBDIVISION

LAND SITUATED ON THE NORTHWESTERLY SIDE OF PANIOLO AVENUE
AT WAIKOLOA, SOUTH KOHALA, ISLAND OF HAWAII, HAWAII

Being a portion of Royal Patent 5671, Land
Commission Award 8521-B, Apana 1 to C. D. Hueu

Being, also, all of Lots 1 and 2
of Waikoloa Lot 4 Subdivision (File Plan 1967)

BEING SUBDIVIDED INTO LOTS 1 TO 5, INCLUSIVE
AND DESIGNATION OF EASEMENTS "A" TO "C", INCLUSIVE

TOTAL AREA = 561.321 ACRES

OWNER: TRANSCONTINENTAL DEVELOPMENT CO.
ADDRESS: 1001 BISHOP STREET, SUITE 2810
HONOLULU, HAWAII 96813

LOT 5
280.750 Acs.

LOT 3
53.840 Acs.

LOT 4
180.879 Acs.

LOT 2

LOT 1

LOT 1
12.361 Acs.

PROJECT SITE

EASEMENT "A"

EASEMENT "B"

EASEMENT "C"

INSET

Figure 3

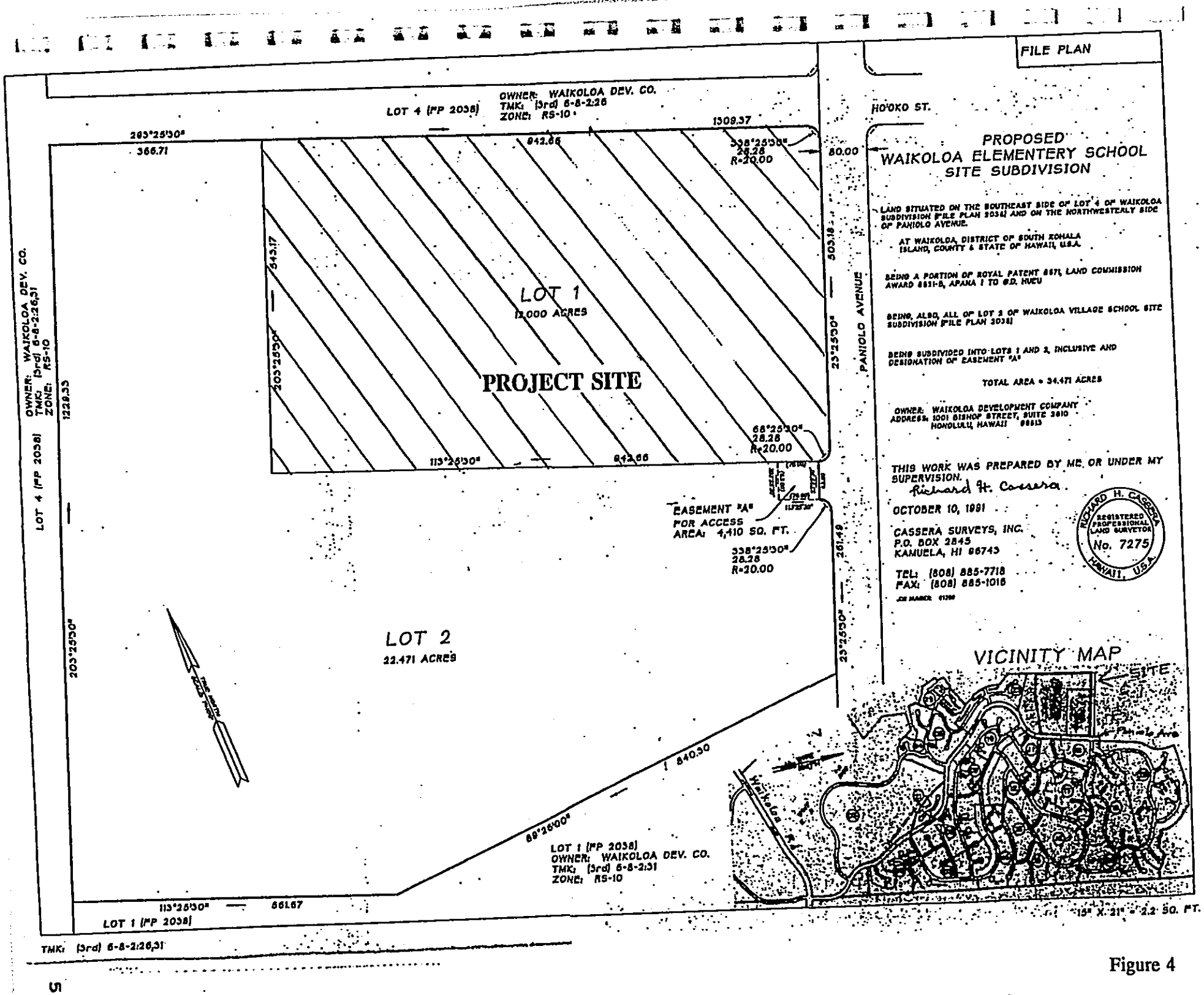
FILE PLAN
LOT 4 (FP 2038)
OWNER: WAIKOLOA DEV. CO.
TMK: (3rd) 6-8-2:26
ZONE: RS-10
HO'OKO ST.
PROPOSED
WAIKOLOA ELEMENTERY SCHOOL
SITE SUBDIVISION
LAND SITUATED ON THE SOUTHEAST SIDE OF LOT 4 OF WAIKOLOA SUBDIVISION (FILE PLAN 2038) AND ON THE NORTHWESTERLY SIDE OF PAHOLO AVENUE.
AT WAIKOLOA, DISTRICT OF SOUTH KOHALA ISLAND, COUNTY & STATE OF HAWAII, U.S.A.
BEING A PORTION OF ROYAL PATENT 8671, LAND COMMISSION AWARD 8531-B, APANA 1 TO W.D. HUEU
BEING, ALSO, ALL OF LOT 2 OF WAIKOLOA VILLAGE SCHOOL SITE SUBDIVISION (FILE PLAN 2038)
BEING SUBDIVIDED INTO LOTS 1 AND 2, INCLUSIVE AND DESIGNATION OF EASEMENT "A"
TOTAL AREA = 34.471 ACRES
OWNER: WAIKOLOA DEVELOPMENT COMPANY
ADDRESS: 1001 BISHOP STREET, SUITE 3610
HONOLULU, HAWAII 96813
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Richard H. Cassera
OCTOBER 10, 1991
CASSERA SURVEYS, INC.
P.O. BOX 2845
KAMUELA, HI 96743
TEL: (808) 885-7718
FAX: (808) 885-1016
RICHARD H. CASSERA
REGISTERED PROFESSIONAL LAND SURVEYOR
No. 7275
HAWAII, U.S.A.
LOT 1
12.000 ACRES
PROJECT SITE
LOT 2
22.471 ACRES
EASEMENT "A"
FOR ACCESS
AREA: 4,410 SQ. FT.
PANIOLO AVENUE
VICINITY MAP
SITE
Waikoloa Rd.
LOT 1 (FP 2038)
OWNER: WAIKOLOA DEV. CO.
TMK: (3rd) 6-8-2:31
ZONE: RS-10
TMK: (3rd) 6-8-2:26,31
15" X 21" = 2.2 SQ. FT.

Figure 4

The school, as defined in the Department of Education-approved Master Plan (Figure 5), will accommodate approximately 825 students in grades Kindergarten through 5 from the Waikoloa, Puako and Kawaihae areas. It is to be constructed in six increments and at build-out will include an administration building; a library; a cafeteria; 16 classrooms in four 1-story buildings; 23 classrooms in three 2-story buildings; 8 portable classrooms in two clusters of four each; one computer resource center; two faculty centers; a paved play court; two playfields; and a parking area (see Appendix A, Facilities Assessment and Development Schedule).

The proposed incrementation and completion schedule for the school is as follows:

A. Increment 1. Grading of entire twelve acre site; infrastructure improvements, including water, sewer, electric, telephone, and cable television; paving of entry drive and parking lot; circulation walkways and crosswalks; administration building with temporary library and serving kitchen; twelve classrooms and a teachers' workroom in three one-story buildings; a playfield; and landscaping. Complete in August 1994.

B. Increment 2. Cafeteria; four classrooms in one one-story building; play court; lower playfield; and additional walks, paving and parking stalls. Complete in August 1995.

C. Increment 3. Library; administration building renovation; seven classrooms and one computer resource center in one two-story building; and additional walks and paving. Complete in August 1996.

D. Increment 4. Nine classrooms and a faculty workroom in one two-story building; and additional walks and paving. Complete in August 1997.

E. Increment 5. Seven classrooms in one two-story building; and additional walks and paving. Complete in August 1998.

F. Increment 6. Eight portable classrooms in two clusters of four each; and additional walks and paving. Complete when required.

A detailed schedule for design and construction of Increment 1 improvements is attached as Figure 6.

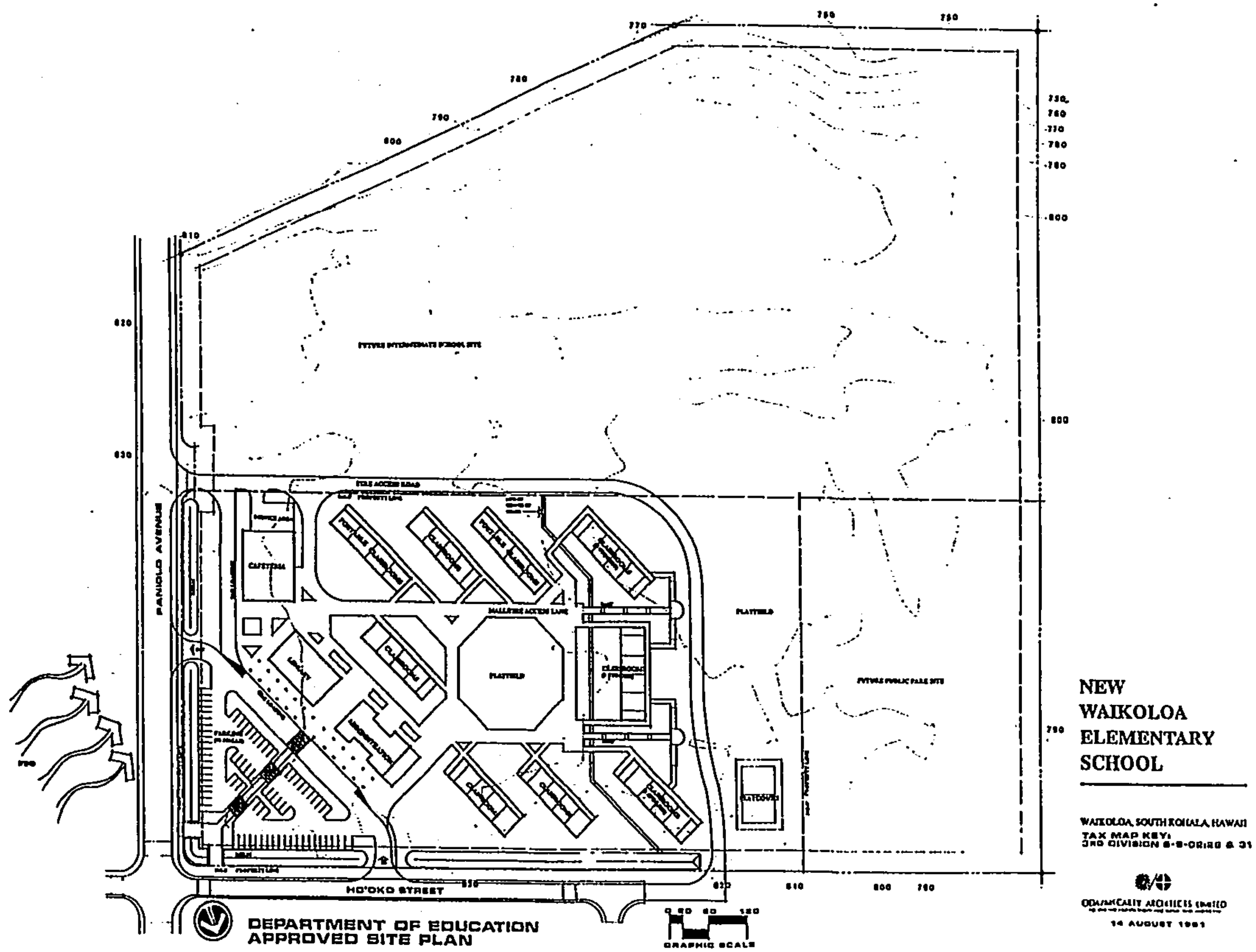
PANIOLO AVENUE
HO'OKO STREET
DEPARTMENT OF EDUCATION
APPROVED SITE PLAN
GRAPHIC SCALE
NEW
WAIKOLOA
ELEMENTARY
SCHOOL
WAIKOLOA, SOUTH KOHALA, HAWAII
TAX MAP KEY:
14 AUGUST 1991

Figure 5

Waikoloa Elementary School Increment 1
Project Schedule

Draft
9-Nov-92

Task Name	Start Date	Duratn (mths)	End Date
Site Plan (Critical)	1-Jul-91	2	31-Aug-91
Negotiate Agreement	1-Jul-91	5	28-Nov-91
Negotiate Financing	1-Jul-91	6	28-Dec-91
FUND CONSTRUCTION LOAN	1-Jul-93	0	1-Jul-93
BOE Approve Agreement	1-Aug-91	3	30-Oct-91
BLNR Approve Agreement	1-Oct-91	2	30-Nov-91
Use Permit	1-Oct-91	4	29-Jan-92
Parcel Subdivision	1-Oct-91	5	28-Feb-92
Leg-App. Agree/Res of Support	1-Nov-91	4	29-Feb-92
Legis. Authorize CIP Funds	1-Nov-91	20.3	1-Jul-93
'92 Supplemental-CIP Design	1-Nov-91	6	29-Apr-92
GOVERNOR RELEASE MONEY-$200K	1-Jul-92	0	1-Jul-92
FY '93-'95 Biennium-CIP Purch.	1-Nov-92	6	30-Apr-93
GOVERNOR RELEASE MONEY-$9.0MIL	1-Jul-93	0	1-Jul-93
Master Plan	1-Apr-92	4	30-Jul-92
Design Increment 1	1-Aug-92	8	29-Mar-93
DOE/DAGS Approve Const. Plans	1-Apr-93	1	1-May-93
Building Permits	1-Apr-93	3	30-Jun-93
Bid	1-May-93	1	31-May-93
Grading Permits	1-May-93	2	1-Jul-93
Negotiate and Award	1-Jun-93	1	1-Jul-93
DOE Approve Budget	1-Jun-93	1	1-Jul-93
NOTICE TO PROCEED	1-Jul-93	0	1-Jul-93
Mass Grading of Site	1-Jul-93	3	29-Sep-93
Construction of Inc. 1	1-Jul-93	13.7	15-Aug-94
Punchlist	1-Jul-94	1.5	15-Aug-94
Furnishings-by DOE	5-Jul-93	13.5	15-Aug-94
Order	5-Jul-93	12	30-Jun-94
Install	1-Jul-94	1.5	15-Aug-94
Landscaping	1-Oct-93	10.6	15-Aug-94
Planting	1-Oct-93	6	30-Mar-94
Post-Construction Maint.	1-Apr-94	3	30-Jun-94
Draw-in	1-Apr-94	4.5	15-Aug-94
DOE-DAGS/BOC Prep. for BLNR	1-Jun-94	1	1-Jul-94
Notice of Completion	1-Jun-94	1	1-Jul-94
Lien Period	1-Jul-94	1.5	15-Aug-94
Acceptance/Turnover	1-Jul-94	1.5	15-Aug-94
BLNR Approval for Conveyance	1-Jul-94	1.5	15-Aug-94
Set up to Operate-by DOE	1-Jul-94	2	30-Aug-94
CONVEY LAND TO STATE	15-Aug-94	0.5	30-Aug-94
SCHOOL IN OPERATION	1-Sep-94	0	1-Sep-94

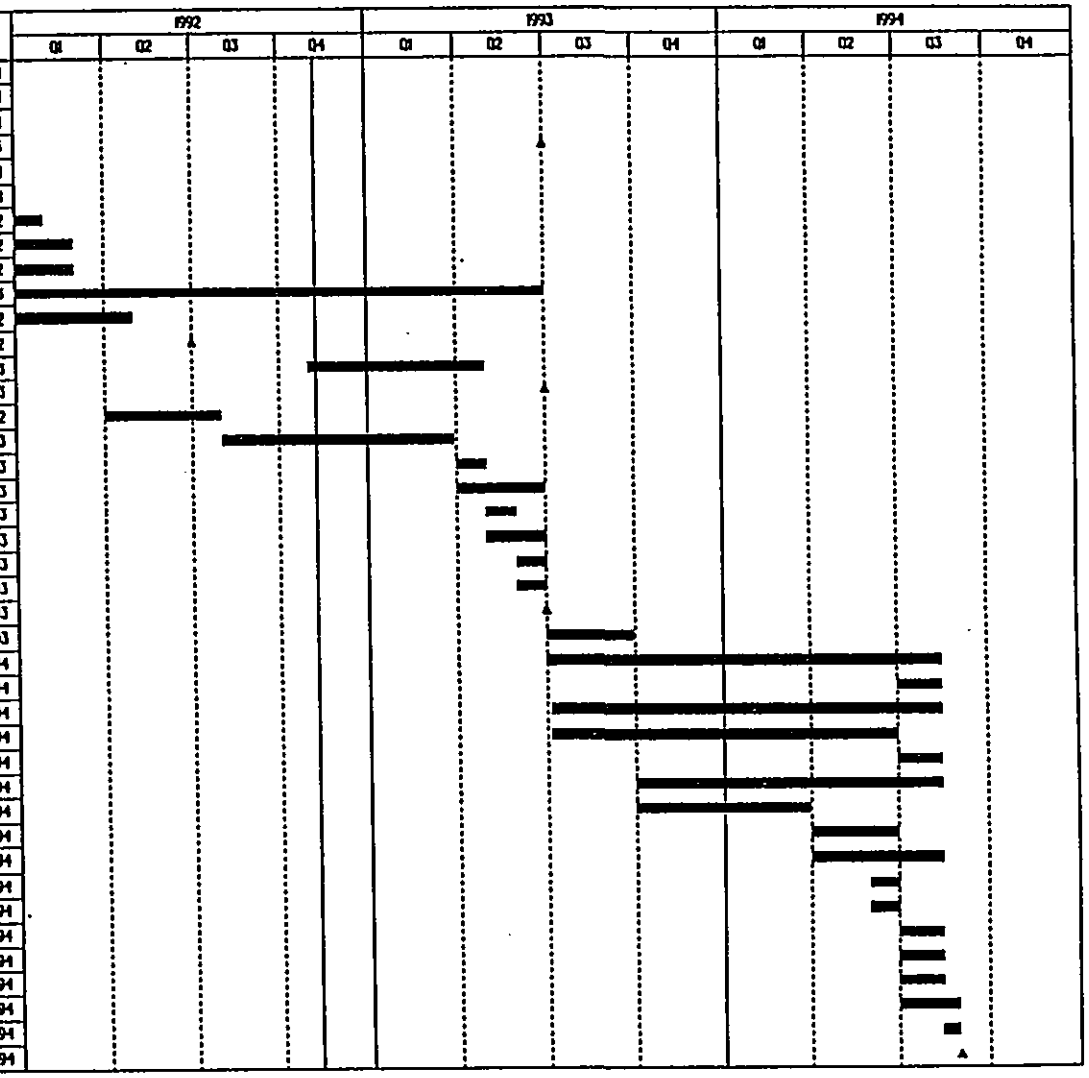

Figure 6

Socio-Economic Considerations

General

The new Waikoloa Elementary School will become a feeder school in the Honokaa Complex and is a critical element in the Department of Education's facility plans for this Complex. By virtue of WDC dedicating the 12-acre site and completing the design and construction of the Increment 1 improvements at cost for the State, the capital and manpower requirements for the State will be reduced and the State will acquire a new school several years ahead of what existing procedures could produce.

Project Cost

The cost of the construction of all six increments of the school, in 1992 dollars, is estimated to be $19.8 million. The estimated cost of Increment 1 improvements is $8.65 million. The land is being dedicated by WDC to the State.

Impacts on the Community/Proposed Mitigation

The school site is located at the center of a one-mile radius within which are existing and proposed residential developments, including Waikoloa Village Unit 1, Sunset Ridge, Pheasant Ridge, Kipona Hills, Paniolo Estates (the County's demonstration affordable housing project), Waikoloa Heights, Waikoloa Village Estates, and the remainder of the County's affordable housing project. In addition to serving the future needs of the growing community, the school will reduce the commuting time for Waikoloa, Puako and Kawaihae elementary school students; reduce traffic on both the mauka portion of Waikoloa Road and on Kawaihae Road; and will serve to relieve the current overcrowding which exists at Waimea Elementary School.

Adjacent uses include the Paniolo Estates housing project to the north, Unit 1-D of Waikoloa Village to the east and vacant land to the south and west. The adjoining parcel to the south has been purchased by the Hawaii Baptist Convention and is the site of the future Waikoloa Baptist Church and Keikiland day care center. The parcel to the west is zoned RS-10 and is master-planned for single

family residential use. The Waikoloa Community Church is situated to the east, directly across Paniolo Avenue from the site. The school is expected to compliment these adjoining uses and no adverse impacts to any of these projects is anticipated. During the application process for the Use Permit, the Waikoloa Village Association (the homeowners association for Waikoloa Village), the Waikoloa Community Church, the County of Hawaii, and adjacent property owners expressed their support of the project.

As part of the Use Permit which allows the construction of the school on County-zoned residential land, traffic signals are required to be installed at the intersection of Paniolo Avenue and Ho'oko Street prior to occupancy of the first classrooms. These traffic signals will mitigate traffic impacts at the main intersection providing access to the school.

Landscaping will be used to emphasize entries and circulation routes and to soften the mass of the buildings from adjoining streets. Trees will be placed at the perimeter of the site to serve as a buffer between the school and the residential community. The playfields are situated to minimize noise impacts on the adjoining residential projects.

Police and Fire Services

The existing police station is located in Waimea, approximately 20 miles away. Police services are provided by patrols, the frequency of which may need to be increased. There is a police substation located at the community park in Waikoloa Village, within 1 mile of the school, for the use of the patrols. An emergency medical and fire facility is scheduled to open in Waikoloa in January 1993. This facility, which will be located approximately 1-1/2 miles from the school, should be more than adequate to provide service for the school.

Environmental Characteristics

Existing Land Use

The site area is presently classified Urban on the State Land Use District Maps, designated Low Density Urban Development on the County General Plan Land Use Pattern Allocation Guide Map and zoned RS-10, Residential Single-Family, on the County Zone Maps. Use Permit No. 92 to allow for the elementary school and related improvements within the County's RS-10 zoned district was approved on December 18, 1991 (see Appendix B).

Topography

The topography is undulating, with slopes in the area ranging from 1% to 10% (refer to Figure 7). Gentle rolling hills, low-lying grasslands with scattered kiawe trees and rock outcroppings characterize the surface terrain of the study area. Elevations range from 790 feet above sea level near the west boundary of the site to 830 feet near the east boundary (see Figure 8).

Soils

The site is located on a prehistoric lava flow and is sparsely covered with fountain grass and some kiawe trees. The site is not considered suitable for grazing or other agricultural uses.

United States Department of Agriculture, Soils Conservation Service, identified and mapped two soil types, Kawaihae series (KNC) and Very Stony Land series (rVS), as shown on Figure 9.

A small portion of the site is covered by the Kawaihae series which is an excessively drained, extremely stony soil that has a thin surface layer of fine sandy loam over silt loam. Permeability and erosion are moderate, runoff is medium and the shrink-swell potential is low. Kawaihae series land is commonly used for pasture, wildlife habitat and recreation areas.

The major portion of the study area is covered with Very Stony Land series which is a miscellaneous land type consisting of very shallow soil material and a high proportion of a'a lava outcrops. Erosion hazard is slight. Very Stony Land series is commonly used for pasture, watershed and wildlife habitat.

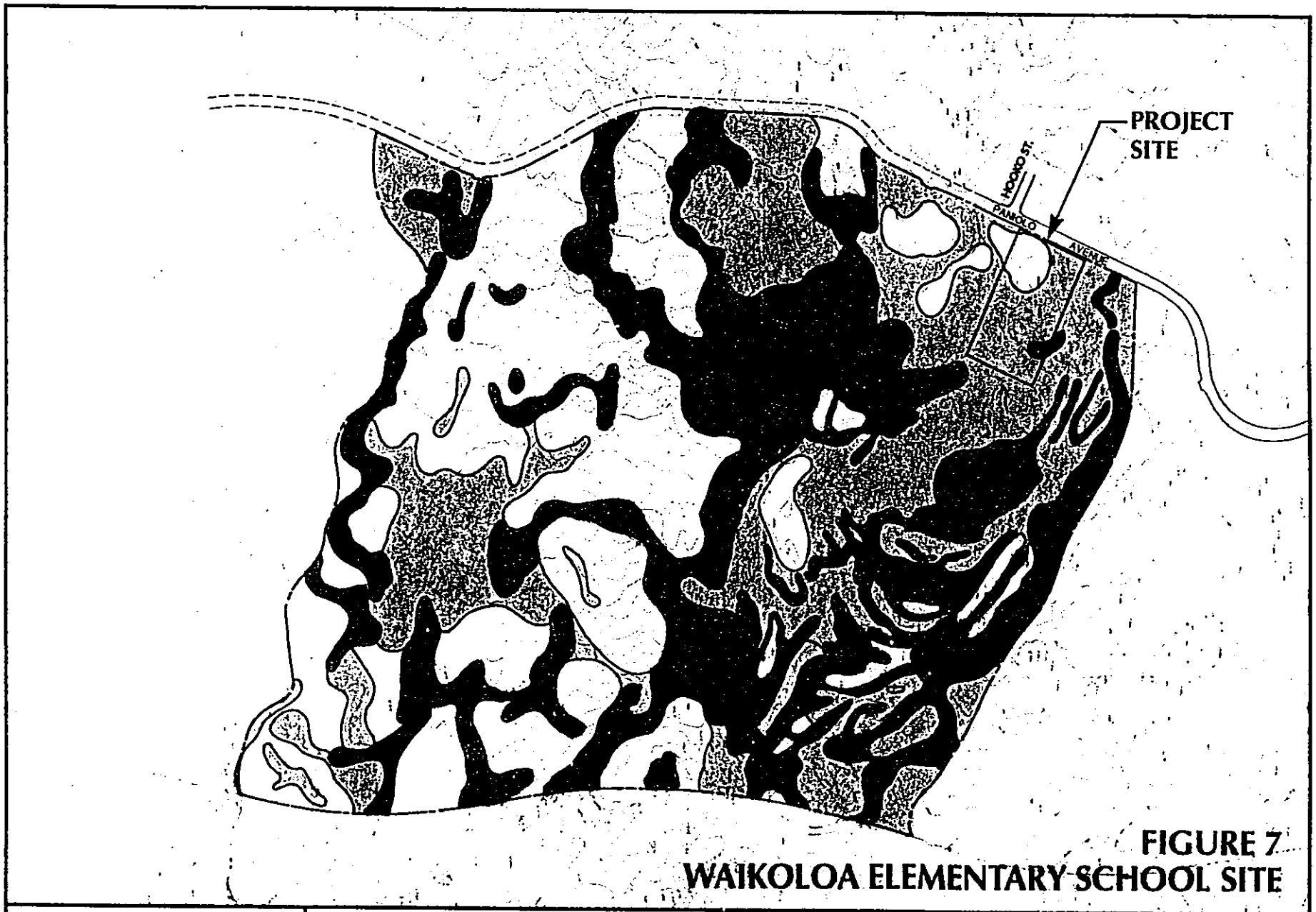

FIGURE 7
WAIKOLOA ELEMENTARY SCHOOL SITE

COUNTY HOUSING SITE
WAIKOLOA VILLAGE • SOUTH KOHALA, HAWAII

Prepared For:
COUNTY OF HAWAII/TRANSCONTINENTAL DEVELOPMENT CO.
Prepared By:
BELT COLLINS & ASSOCIATES

LEGEND:
0 - 5%
6 - 10%
11 - 20%
20% & Over

SLOPE
300 0 300 600 900
SCALE IN FEET
NORTH

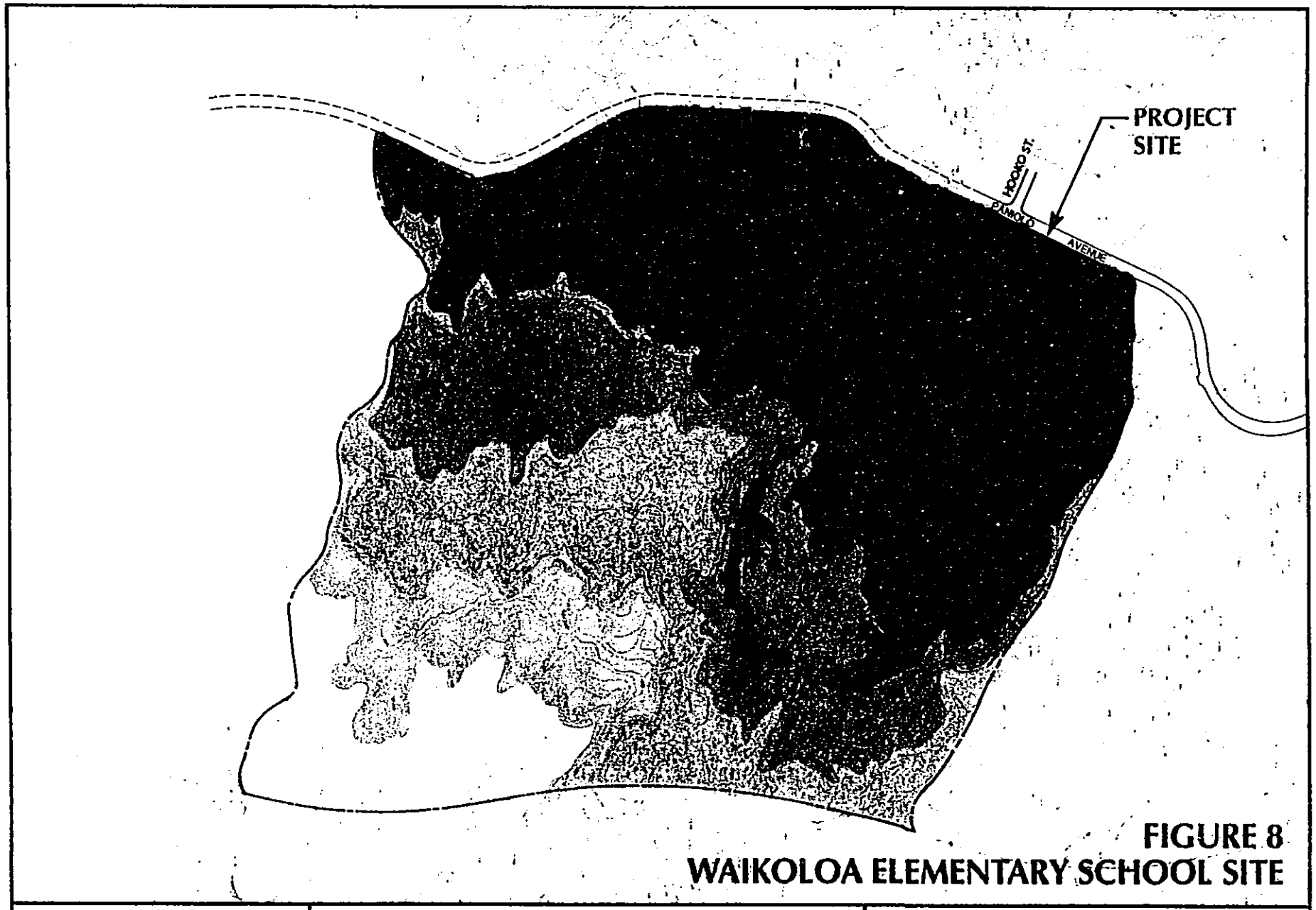

FIGURE 8
WAIKOLOA ELEMENTARY SCHOOL SITE

COUNTY HOUSING SITE
WAIKOLOA VILLAGE • SOUTH KOHALA, HAWAII

Prepared For:
COUNTY OF HAWAII/TRANSCONTINENTAL DEVELOPMENT CO.
Prepared By:
BELT COLLINS & ASSOCIATES

LEGEND:

550' - 600'	700' - 750'	850' - 900'
600' - 650'	750' - 800'	
650' - 700'	800' - 850'	

ELEVATIONS

300 0 300 600 900
SCALE IN FEET

NORTH

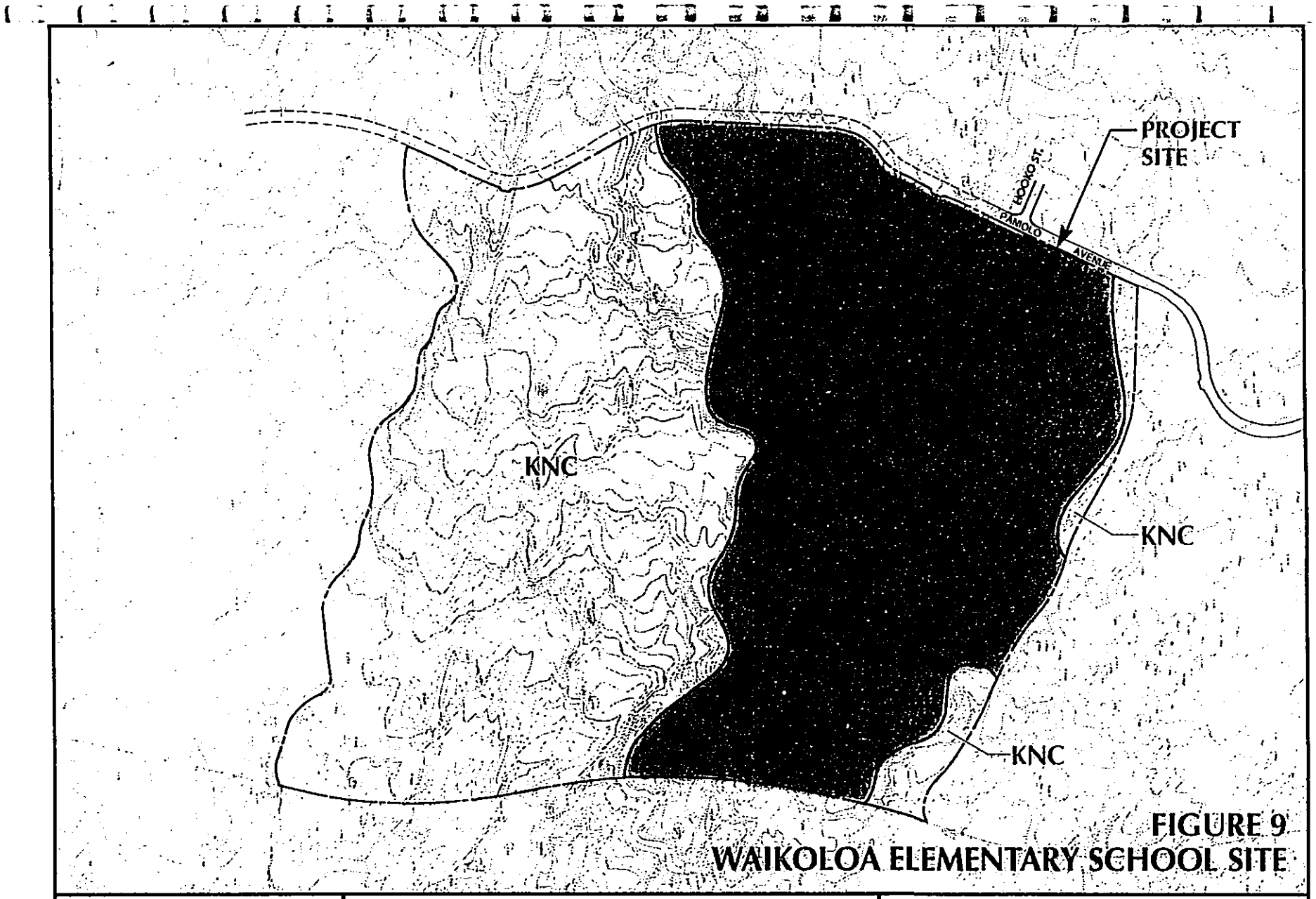

FIGURE 9
WAIKOLOA ELEMENTARY SCHOOL SITE

COUNTY HOUSING SITE
WAIKOLOA VILLAGE • SOUTH KOHALA, HAWAII

Prepared for:
COUNTY OF HAWAII/TRANSCONTINENTAL DEVELOPMENT CO.
Prepared By:
BELT COLLINS & ASSOCIATES

LEGEND:

KNC Kawaihae extremely stony, very fine sandy loam - 6 - 12% slope.

Very stony land

SOILS

300 0 300 600 900
SCALE IN FEET

NORTH

Climate

Situated on the island's leeward coastline, the site is located in one of the driest areas in the state. Average rainfall is a low 10 inches. Most of the year's rainfall occurs during winter storms from October to April.

Average temperatures range from a daytime high of about 88 degrees Fahrenheit (F) to a low of about 63 degrees F. The mean annual temperature is 78 degrees F, with relatively small seasonal fluctuations.

Wind direction at the site usually consists of northeast tradewinds directed between the Kohala Mountains and Mauna Kea which sweep down toward the coastline.

Humidity at the site is relatively constant year round. It is generally below 40% during the late morning and afternoon hours.

Surface Drainage

Based on a drainage report prepared by Engineers Surveyors Hawaii, Inc. for the County's Affordable Housing Project, no surface flows enter the project site. On-site generated drainage will be collected and disposed of on-site using swales, sumps, retention basins and drywells.

Flora

Char & Associates conducted a botanical survey in August of 1988 (attached as Appendix C). Figure 10 shows the distribution of the vegetation density within the site. The vegetation is savannah-scrubland dominated by fountain grass and kiawe trees, the only tree species on the site. No endemic or endangered or threatened species, or any species proposed or candidate for such status, were found on the site.

Fauna

Phillip Brewer conducted a survey for avifauna and feral mammals in August of 1988 (attached as Appendix D). The site provides a limited range of habitats which are utilized by the typical array of exotic bird species, nine species of which were recorded during the field survey of the entire 580-acre County

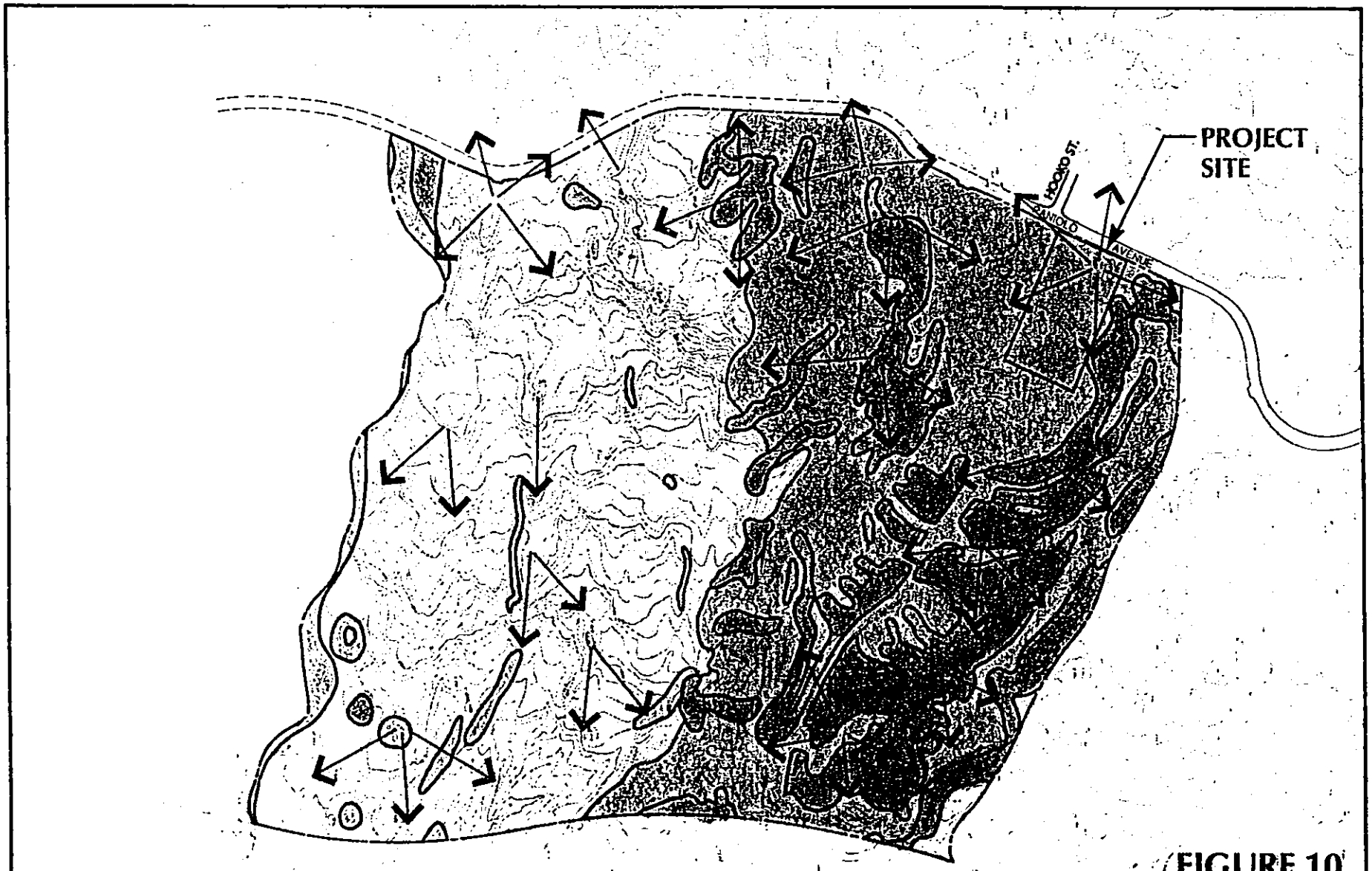

FIGURE 10
WAIKOLOA ELEMENTARY SCHOOL SITE

COUNTY HOUSING SITE
WAIKOLOA VILLAGE • SOUTH KOHALA, HAWAII

Prepared For:
COUNTY OF HAWAII/TRANSCONTINENTAL DEVELOPMENT CO.
Prepared By:
BELT COLLINS & ASSOCIATES

LEGEND:
DENSE
SPARCE
OPEN
INDICATES DIRECTION OF GOOD VIEWS

VEGETATION & VIEWS

300 0 300 600 900
SCALE IN FEET
NORTH

Housing Site. No particular species was abundant. No endemic birds or seabirds were recorded. Also, no threatened or endangered species were encountered and there was no evidence suggesting such species being at the study area. Feral mammals observed were Small Indian Mongoose, dogs and goats. Though not observed, rats, mice and cats most likely occur at the site.

Archaeology

William J. Bonk performed an archaeological reconnaissance survey of the site in August of 1988 (attached as Appendix E). No sites of prehistoric or historic significance were found and no further archaeological work was recommended for the site.

The site was further inspected by a Department of Land and Natural Resources' staff member in January 1992 and, again, no sites were found, leading the State Historic Preservation Division to conclude that the project will have "no effect on historic sites" (see Appendix E).

Views

The site is located at about the 800-foot elevation of the Kohala region, approximately 6 miles from the coastline. The predominant views from the study area are the Kohala Mountains to the north, the peaks of Mauna Kea to the east and Mauna Loa and Hualalai to the south, and the Kohala Coastline to the west. Southeast of the study area are residential housing units nestled in the rolling hills of Waikoloa Village. The south slope of Haleakala Crater on Maui is visible to the northwest on a clear day. The major vantage points within the study area for these views are identified on Figure 10.

Natural Hazards

The site is located within Flood Zone X, areas outside the 500-year flood plain, on the Flood Insurance Rate Maps (FIRM) prepared by the U. S. Army Corps of Engineers.

The Island of Hawaii is classified as Risk Zone 3 for earthquakes, on a scale of 1 to 4 (4 being higher). The earthquake of 1968 was estimated to have a magnitude of 7.25 to 7.75 on the

Richter scale at its epicenter along the Kau District coast. Intensities were only slightly less at the Waikoloa Beach Resort, located 5.5 miles west of the site. The 1951 and 1975 earthquakes were estimated to have intensities of about 5 at the Waikoloa Beach Resort.

The site's location on the flank of Mauna Loa places the property in "Overall Volcanic Risk Zone E" on an increase scale ranging from A through F. However, Dames and Moore (December 1969) concluded that the risk damage from new lava flows within the next 100 years is remote.

Development Constraints

Figure 11 shows a summary of significant physical characteristics which includes the project area. Shown on the figure are areas with slopes greater than 20%; preliminary flood water limits which abut major drainageways; Kamakoa Gulch tributary areas; the location of ridge lines which could influence surface water runoff; and the absence of significant historical and archaeological sites. The entire elementary school site is located outside any of these constraint areas.

Existing Infrastructure

Sewer

Projected sewage flow from the school is based on the average flow of 20 gallons per student (WPCF Manual of Practice No. 9, Design and Construction of Sanitary and Storm Sewers, Table III, page 27). Thus, based on a design enrollment of 825 students, the projected average sewage flow from the school, at build-out, is 16,500 gallons per day (gpd). Projected average sewage flow from Increment 1 of the school is 8,000 gpd.

The Waikoloa Sanitary Sewer Company will provide service to the site. Currently, the Waikoloa Sanitary Sewer Co. operates a temporary treatment facility located northwest of the site which serves the 177-unit Paniolo Estates project, and which has the capacity to handle 60,000 gpd. Design of the first phase of the

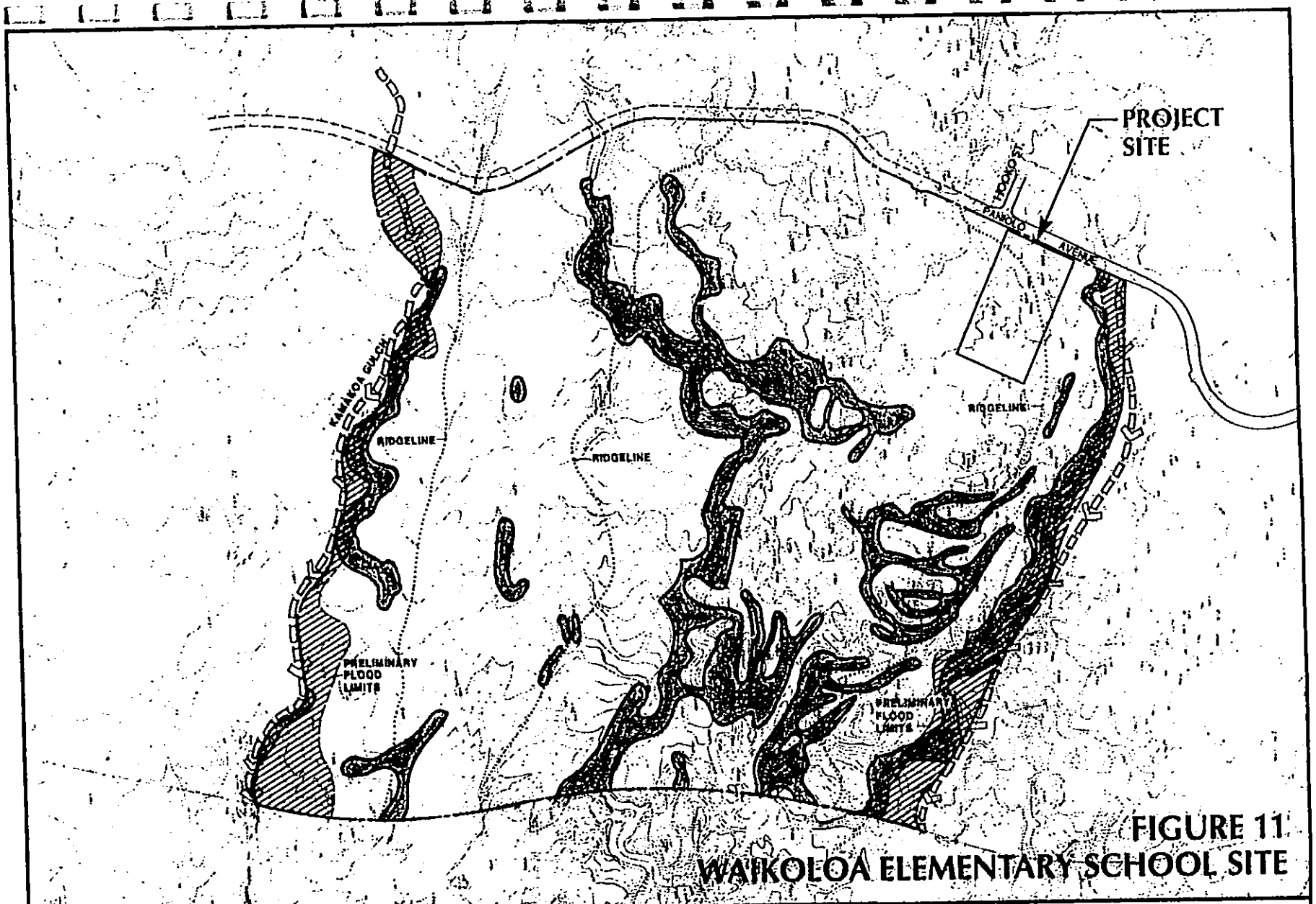

FIGURE 11
WAIKOLOA ELEMENTARY SCHOOL SITE

permanent Kamakoa Water Reclamation Plant, which is to replace the interim facility, has been completed. The first phase of the permanent facility will have the capacity to handle 125,000 gpd which equates to the projected outflow, based on City and County of Honolulu design standards of 80 gallons per capita per day, from over 430 single family units and all six increments of the Waikoloa Elementary School. Construction of Phase 1 of the Kamakoa plant is projected to be complete prior to the completion of Increment 1 of the school in August, 1994.

An on-site gravity system will be connected to sewer lines at the northwest corner of the project. An on-site pump station will be necessary to transfer sewage to the neighboring collection system. The off-site 6 inch sewer force main and the 8 inch collection lines are already in place, constructed as part of the Paniolo Estates and Ho'oko Street extension projects. A Contribution-in-Aid-of-Construction (CIAC) fee will be paid to Waikoloa Sanitary Sewer Co., as provided in its Public Utilities Commission-approved tarriffs, as part of each increment of this project for the prorata share of costs of off-site requirements.

Water

The Waikoloa Water Company owns the wells, reservoirs and primary transmission lines that supply potable water to the Waikoloa area. The potable water wells, know as Parker Wells No. 4 and 5 and Waikoloa Wells No. 1 and 2, draw from the Waikoloa aquifer. The wells are located at the 1,200-foot level, about two miles upslope from the proposed school project. All of these wells tap high-quality water.

The four potable wells currently furnish approximately 3.0 mgd to both Waikoloa Village and the Waikoloa Beach Resort. These wells have an operating capacity of 3.5 mgd, plus a County of Hawaii-required standby capacity of 2.0 mgd. A fifth well, to be known as Waikoloa Well No. 3, is under construction and expected to be in operation in 1993. When completed, the system capacity will increase to 5.0 mgd, plus a standby capacity of 2.0 mgd. In

and striping and signalization of the Paniolo Avenue/Ho'oko Street intersection will be installed prior to occupancy of the first classrooms.

Impacts and Mitigation

Construction

Construction activities could result in short term impacts on air quality (namely fugitive dust), acoustical conditions, and traffic. Proposed mitigation measures are:

A. Air Quality/Dust Control. Dust control measures to minimize impacts on air quality will follow Department of Health guidelines or standards and will include frequent watering of exposed soil and the landscaping of completed areas as early as possible.

B. Noise. Again, Department of Health guidelines and standards will be followed. As much as possible, construction activity will be scheduled for between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday. Construction activity may also occur on Saturdays and Sundays, but is not expected to commence prior to 7:00 a.m. or to continue past 6:00 p.m.

B. Traffic. The project site is located at the end of the major arterial through Waikoloa Village. Thus, the majority of the traffic through Waikoloa Village will not be affected by construction activity. During construction activities affecting traffic on Paniolo Avenue or Ho'oko Street, including the installation of access roads, re-striping of centerlines, and installation of traffic signals, Department of Public Works' standards will be followed. Appropriate signage and barricades will be employed to warn drivers and to direct them around the affected area.

Construction vehicle traffic is expected to have little or no impact on current traffic volumes.

CORRECTION

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

permanent Kamakoa Water Reclamation Plant, which is to replace the interim facility, has been completed. The first phase of the permanent facility will have the capacity to handle 125,000 gpd which equates to the projected outflow, based on City and County of Honolulu design standards of 80 gallons per capita per day, from over 430 single family units and all six increments of the Waikoloa Elementary School. Construction of Phase 1 of the Kamakoa plant is projected to be complete prior to the completion of Increment 1 of the school in August, 1994.

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The four potable wells currently furnish approximately 3.0 mgd to both Waikoloa Village and the Waikoloa Beach Resort. These wells have an operating capacity of 3.5 mgd, plus a County of Hawaii-required standby capacity of 2.0 mgd. A fifth well, to be known as Waikoloa Well No. 3, is under construction and expected to be in operation in 1993. When completed, the system capacity will increase to 5.0 mgd, plus a standby capacity of 2.0 mgd. In

addition to these potable wells, the existing water system includes two one million-gallon (mg) reservoirs near the wells and 14- and 20-inch transmission mains connecting the sources to the distribution system.

Water service to the school site comes from an 8-inch lateral connected off of a 12-inch main, upstream of a pressure reducing valve, in Ho'oko Street, on the north side of the project. Meters and valves will be installed at the property line as part of the project. The on-site water distribution system will provide fire flow and service requirements. A CIAC fee will be paid to Waikoloa Water Company, as provided in its Public Utilities Commission-approved tarriffs, as part of each increment of this project for the prorata share of costs of off-site requirements.

Electric/Telephone/CATV

An existing underground duct bank which contains a 750 MCM cable (14.47 KVY) originates from a substation located mauka of the Waikoloa Village Post Office and runs along Paniolo Avenue to the project site. Conduits to accommodate cable and telephone lines are also located within this same duct bank. During the design phase of the project, specific requirements for cabling and transformers to serve the project will be identified and provided as part of the project.

An underground, on-site distribution system will provide service to each building, meeting the requirements of Department of Education's Educational Specifications, as amended February 6, 1992.

Roads

The school site is fronted on the east by Paniolo Avenue, an 80-foot wide, fully improved secondary arterial dedicated to the County of Hawaii, and on the north by Ho'oko Street, a 60-foot wide collector road, which was completed in conjunction with the opening of the first phase of Paniolo Estates and is to be dedicated to the County. As part of Increment 1 construction, sidewalks will be constructed along the frontages of Paniolo Avenue and Ho'oko Street

and striping and signalization of the Paniolo Avenue/Ho'oko Street intersection will be installed prior to occupancy of the first classrooms.

Impacts and Mitigation

Construction

Construction activities could result in short term impacts on air quality (namely fugitive dust), acoustical conditions, and traffic. Proposed mitigation measures are:

A. Air Quality/Dust Control. *Dust control measures* to minimize impacts on air quality will follow Department of Health guidelines or standards and will include frequent watering of exposed soil and the landscaping of completed areas as early as possible.

B. Noise. Again, Department of Health guidelines and standards will be followed. As much as possible, construction activity will be scheduled for between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday. Construction activity may also occur on Saturdays and Sundays, but is not expected to commence prior to 7:00 a.m. or to continue past 6:00 p.m.

B. Traffic. The project site is located at the end of the major arterial through Waikoloa Village. Thus, the majority of the traffic through Waikoloa Village will not be affected by construction activity. During construction activities affecting traffic on Paniolo Avenue or Ho'oko Street, including the installation of access roads, re-striping of centerlines, and installation of traffic signals, Department of Public Works' standards will be followed. Appropriate signage and barricades will be employed to warn drivers and to direct them around the affected area.

Construction vehicle traffic is expected to have little or no impact on current traffic volumes.

Traffic

The engineering firm of M&E Pacific, Inc. has prepared a Traffic Impact Analysis Report (Appendix F) which analyzes and evaluates projected future traffic impacts at the intersection of Paniolo Avenue and Ho'oko Street and at the intersection of Ho'oko Street and a future 80-foot roadway which will serve as a second connector to Waikoloa Road, makai of and parallel to Paniolo Avenue. The evaluation of the total forecast volumes as shown in the TIAR indicate that the proposed project will not have a significant traffic impact. However, traffic degradation is expected to occur in future years, necessitating the traffic signals which are to be installed as part of this project.

In addition, delineation of a separate left turn lane for traffic turning left onto Ho'oko Street from the Paniolo Avenue northbound approach will be included in the plans for the school.

Primary vehicle ingress to the site will be off of Ho'oko Street. A one way on-site circulation system is proposed, with separate loading/unloading areas for automobiles and buses. Automobiles will exit via the northern access of Paniolo Avenue. On-site parking for 98 vehicles is proposed. Buses will exit at the southern access of Paniolo Avenue. This southern access will also provide the ingress and egress for service vehicles to the service yard proposed behind the cafeteria.

Pedestrians will enter the project from crosswalks at the Paniolo Avenue/Ho'oko Street intersection and from sidewalks along the Ho'oko Street extension. Pedestrian crossing of the parking lot and vehicular travel-ways on-site will be via raised sidewalks, which will also serve as speed bumps to control vehicular speeds on-site.

The school use was considered in the Waikoloa Mauka Traffic Element Master Plan submitted to the Department of Public Works in April 1990. Therefore, improvements at off-site intersections have been addressed independently of this Assessment. A school zone

speed limit will be requested for portions of Paniolo Avenue and Ho'oko Street fronting the project.

Project Alternatives

Site

Various other sites within Waikoloa Village were considered and the subject site was deemed to meet all requirements, including the minimum requirements of size; access; and availability of utility services. No other site within Waikoloa Village meets these minimum requirements. The only alternative available as regards the site is the no-action alternative.

Development Plan

Alternative master site plans are attached hereto as Figures 12 and 13, however both have been previously considered and rejected in favor of the Master Site Plan shown on Figure 5.

The selected Master Plan is based upon Department of Education criteria. The administration building, cafetorium and library, being the most impacted by public use, have been sited nearest the entry and parking area, allowing them to also be most convenient for after school and community use; the cafetorium has been placed downwind from a majority of the classrooms to minimize potential odor and noise problems; the library has been sited so as to provide a quiet buffer between the school and the parking area; every effort has been made to site buildings so that they will receive full benefit from prevailing tradewinds; and roadway and walkway circulation has been designed to minimize impacts on traffic and between pedestrians and vehicles.

Increases or decreases in the scope of each increment and/or delay in the construction of each increment are alternatives. The incrementation and the scheduling have been carefully calculated based on current and projected future enrollment. Variations could result either in overcrowding or empty classrooms.

Delays in construction would impact the entire Honokaa Complex Development Plan and result in increased overcrowding at Waimea

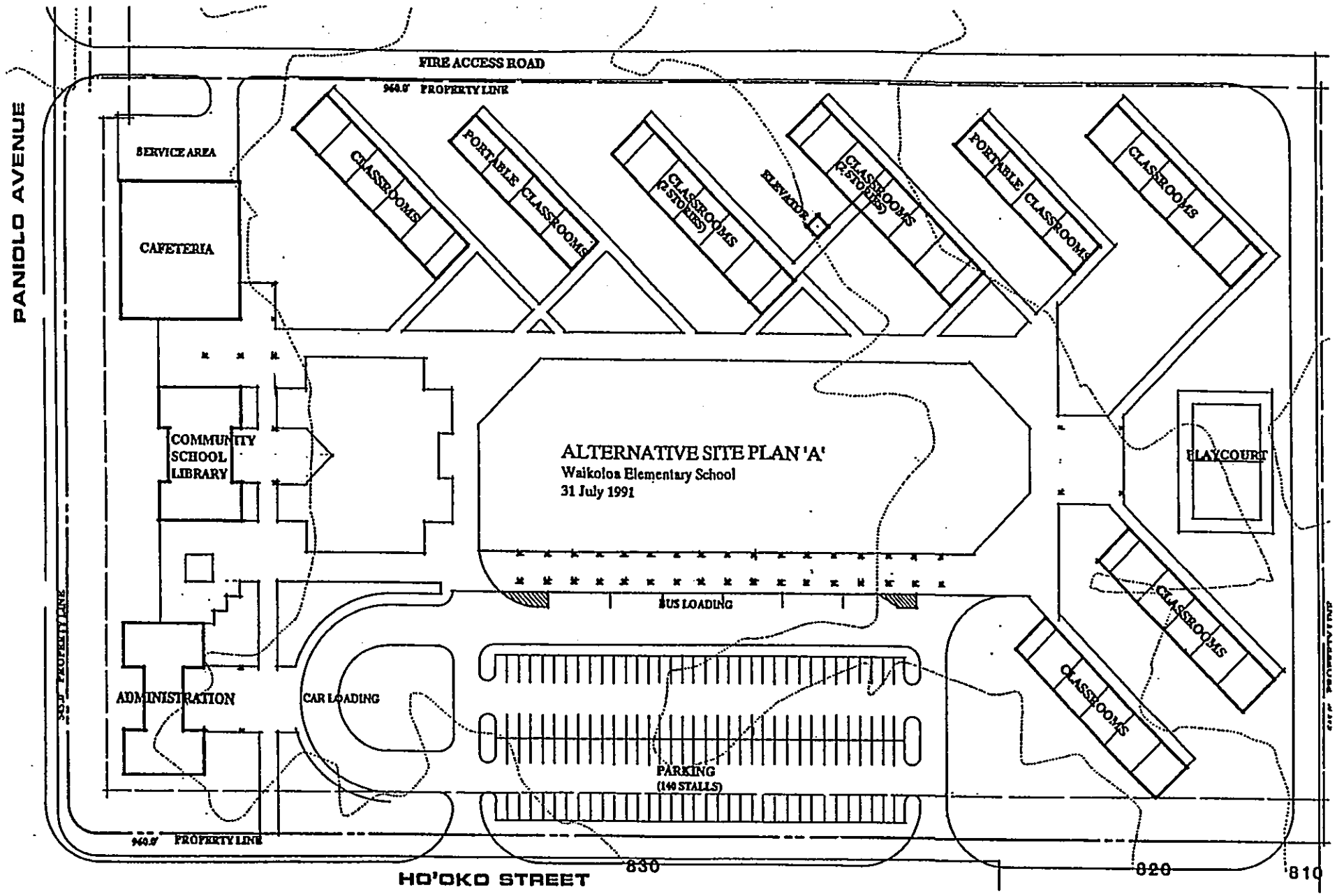
FIRE ACCESS ROAD
960.0' PROPERTY LINE
PANIOLO AVENUE
SERVICE AREA
CAFETERIA
CLASSROOMS
PORTABLE CLASSROOMS
CLASSROOMS (2 STORIES)
ELEVATOR
CLASSROOMS (2 STORIES)
PORTABLE CLASSROOMS
CLASSROOMS
COMMUNITY SCHOOL LIBRARY
ALTERNATIVE SITE PLAN 'A'
Waikoloa Elementary School
31 July 1991
PLAYCOURT
BUS LOADING
CLASSROOMS
CLASSROOMS
ADMINISTRATION
CAR LOADING
PARKING
(140 STALLS)
960.0' PROPERTY LINE
HO'OKO STREET
830
820
810

Figure 12

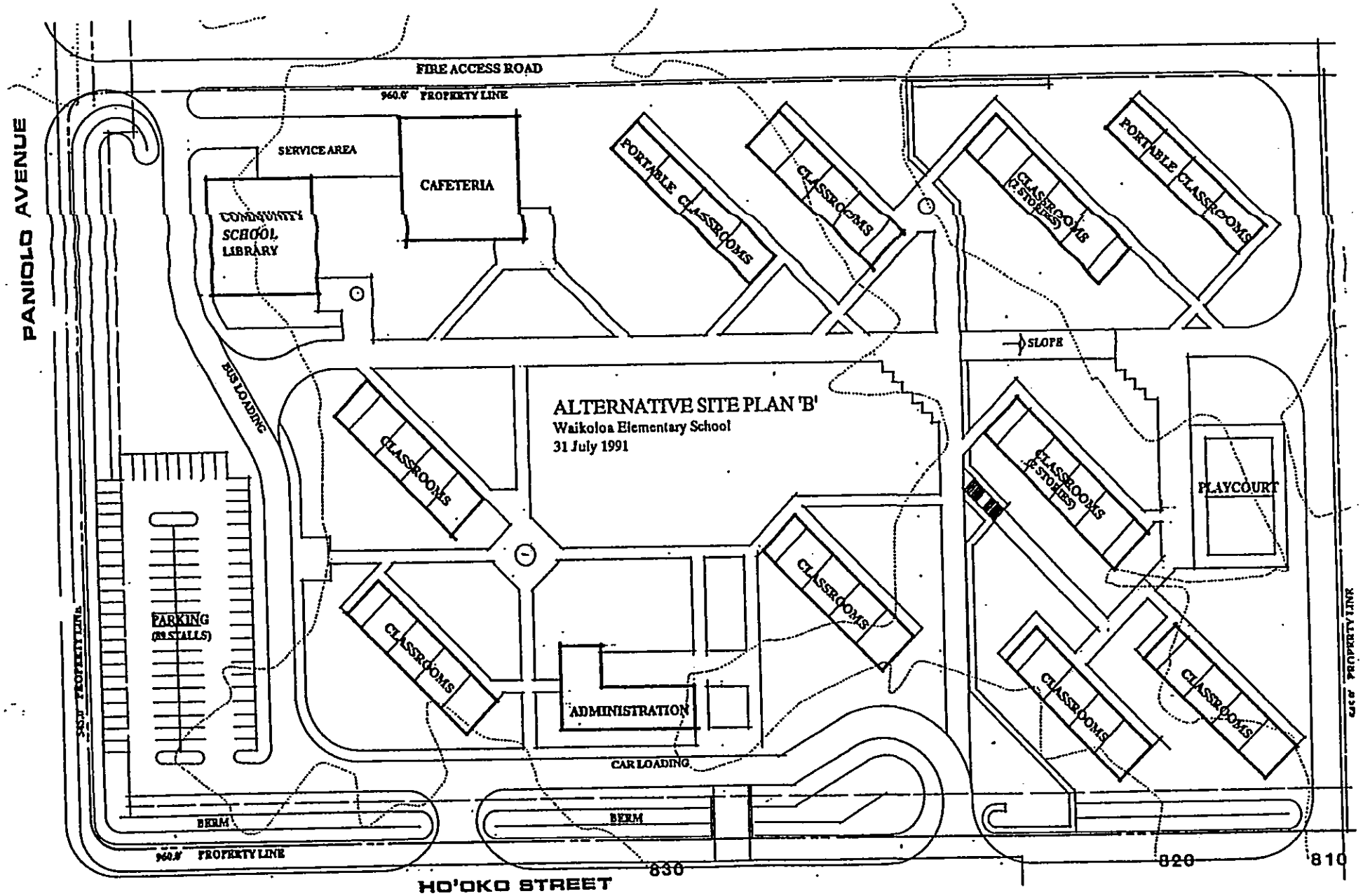
FIRE ACCESS ROAD
960.0' PROPERTY LINE
PANIOLO AVENUE
SERVICE AREA
CAFETERIA
COMMUNITY SCHOOL LIBRARY
PORTABLE CLASSROOMS
CLASSROOMS
CLASSROOMS (2 STORIES)
PORTABLE CLASSROOMS
SLOPE
BUS LOADING
CLASSROOMS
ALTERNATIVE SITE PLAN 'B'
Waikoloa Elementary School
31 July 1991
PLAYCOURT
CLASSROOMS (2 STORIES)
PARKING (93 STALLS)
CLASSROOMS
CLASSROOMS
ADMINISTRATION
CLASSROOMS
CLASSROOMS
CAR LOADING
BERM
BERM
960.0' PROPERTY LINE
830
820
810
HO'OKO STREET

Figure 13

Elementary School, in addition to depriving the Waikoloa community of its own elementary school and necessitating the continued bussing of its youngest children the approximate 20 miles to and from Waimea each day.

Agencies Consulted

Department of Accounting and
General Services
1151 Punchbowl Street
Honolulu, Hawaii 96813

Department of Land and
Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Department of Health
Hawaii District
P. O. Box 916
Hilo, Hawaii 96721-0916

Department of Transportation
Highways Division
P. O. Box 4277
Hilo, Hawaii 96720

County of Hawaii
Planning Department
25 Aupuni Street
Hilo, Hawaii 96720

County of Hawaii
Department of Public Works
25 Aupuni Street
Hilo, Hawaii 96743

County of Hawaii
Department of Water Supply
25 Aupuni Street
Hilo, Hawaii 96720

County of Hawaii
Civil Defense Agency
920 Ululani Street
Hilo, Hawaii 96720

County of Hawaii
Office of Housing and
Community Development
50 Wailuku Avenue
Hilo, Hawaii 96720

County of Hawaii
Police Department
349 Kapiolani Street
Hilo, Hawaii 96720-3998

County of Hawaii
Fire Department
466 Kinoole Street
Hilo, Hawaii 96720

Mauna Kea Soil and Water
Conservation District
Box 1089
Kamuela, Hawaii 96743

Hawaii Electric Light
Company, Inc.
P. O. Box 1027
Hilo, Hawaii 96721

GTE Hawaiian Telephone Company
P. O. Box 4249
Hilo, Hawaii 96720

Waikoloa Sanitary Sewer Co.
HC02 Box 5050
Waikoloa, Hawaii 96743

Waikoloa Water Company
HC02 Box 5050
Waikoloa, Hawaii 96743

Waikoloa Community Church
P. O. Box 383382
Waikoloa, Hawaii 96738

Waikoloa Village Association
P. O. Box 383910
Waikoloa, Hawaii 96720

DRAFT ENVIRONMENTAL ASSESSMENT

COMMENTS & RESPONSES

State of Hawaii
DEPARTMENT OF EDUCATION
FACILITIES & SUPPORT SERVICES BRANCH
P. O. Box 2360
Honolulu, Hawaii 96804

TELECOPIER PHONE NUMBER: (808) 737-5231

DATE: 12/4

TO: NAME: Ken Melrose/
OFFICE: Waikoloa Land Company
TELECOPIER PHONE NUMBER: 885-8565

FROM: NAME: Hide Nichols PHONE: (808) 737 3867
PAGES: 13 (including this cover sheet)

COMMENTS OR SPECIAL INSTRUCTIONS: Review Environment on EIS & Master Plan documents & 1st Increment P-E-S, Call me to review this w/ you if necessary

Mahalo,
Nick

R&C E[illegible]

for the subdivision (Application No. 91-169) was granted on February 4, 1992, and final subdivision approval is being pursued.

The school, as defined in the Department of Education-approved Master Plan (Figure 5), will accommodate approximately 825 students in grades Kindergarten through 5 from the Waikoloa, Puako and Kawaihae areas. It is to be constructed in six increments and at build-out will include an administration building; a library; a cafeteria; 16 classrooms in four 1-story buildings; 24 classrooms in three 2-story buildings; 8 classrooms in two portable buildings; the computer resource center; two faculty centers; a paved play court; two playfields; and a parking area.

The proposed incrementation and completion schedule for the school is as follows:

A. Increment 1. Grading of entire twelve acre site; infrastructure improvements, including water, sewer, electric, telephone, and cable television; paving of entry drive and parking lot; circulation walkways and crosswalks; administration building with temporary library and serving kitchen; 12 classrooms and a teachers' workroom in three one-story buildings; a playfield; and landscaping. Complete in August 1994.

B. Increment 2. Cafeteria; four classrooms in one one-story building; play court; lower playfield; and additional walks, paving and parking stalls. Complete in August 1995.

C. Increment 3. Library; administration building renovation; eight classrooms in one two-story building; and additional walks and paving. Complete in August 1996.

D. Increment 4. Nine classrooms and a faculty workroom in one two-story building; and additional walks and paving. Complete in August 1997.

E. Increment 5. Seven classrooms in one two-story building; and additional walks and paving. Complete in August 1998.

F. Increment 6. Eight classrooms in two portable buildings; and additional walks and paving. Complete when required.

A detailed schedule for design and construction of Increment 1 improvements is attached as Figure 6.

R&C EIS

FACILITIES ASSESSMENT AND DEVELOPMENT SCHEDULE
Facilities Branch, Office of Business Services

DATE May 16, 199

SCHOOL Waikoloa Elementary School GRADE ORGANIZATION K-5

DISTRICT Hawaii COMPLEX Honokaa

PREPARED BY JB REVIEWED BY _____
(District Superintendent)

_____
Date

PURPOSE: This information is provided to assist the principal and the District in determining the school's facilities requirements as it may relate to the enrollment projected for the school. Please use as a guide in determining CIP needs on a timely basis. Will be updated as required.

1. CAMPUS DEVELOPMENT PLAN

Architect/Planner _____

Date Prepared _____

Comments: Waikoloa Elementary is a proposed new school and the Master plan has not been prepared.

2. ENROLLMENT INFORMATION

Actual Enrollment N/A Date _____

Projected Enrollment 327 19 94 to 19 95
_____ 19 95 to 19 96
515 19 96 to 19 97
_____ 19 ____ to 19 ____
_____ 19 ____ to 19 ____
_____ 19 ____ to 19 ____

Design Enrollment ~~800~~ 825 Date Established 5/13/1991 OBS

Peak Enrollment ~~800~~ 908

R&C EIS

Classroom Utilization Report Dated N/A

Classroom Count _____

Regular Teachers	_____	Classrooms Required	_____
Special Ed. Teachers	_____	Classrooms Required	_____
Suppl. Teachers	_____	Classrooms Required	_____
Tutors/Others	_____	Classrooms Required	_____
TOTAL	_____	TOTAL	_____

Comments _____

_____

_____

Existing Capacity of School (Vol III, OBS Fac.) N/A Students

Classroom requirements for design enrollment of ~~800~~ 825

Regular, K-2: Students 384 / 20 = 19 Teachers = 1920 Classroom
396

Regular, 3-12: Students 384 / 25 = 15 Teachers = 1516 Classroom
396

Special Ed. : Students 33 / 12 = 3 Teachers = 3 Classroom
39

10% Suppl. CR allowance: Regular & Special CR x 10% = 4 Classroom

Peak Allowance: 10% of Regular & Special Classrooms = 4 Classroom

Total required for design enrollment = 45 47 Classroom

* 10% of classrooms (other than peak) must be in portables. Classrooms for peak enrollment must be portables.

No. of permanent classrooms 33 39

No. of portable classrooms 8

3. Facilities Assessment and Needs:

An analysis of the types of projects which are within the current educational Specifications (See Attachment No. 1 for details).

a. Capital Improvement Program Projects:

A suggested list of projects considered for this school. Project scope and matrix priority number listed for your information. When available, the school master plan will be used with revisions as necessary.
(See Attachment No. _____)

R&C ES.

Waikoloa Elementary
Design Enrollment : 825

Attachment "A"
Page 1 of 2

FACILITIES SUMMARY: (May 16, 1991)

FACILITIES TYPE	REQUIREMENTS sf / facility	EXISTING facilities	REMARKS
CLASSROOMS:			
General Classrooms	36		
Permanent	34 @	918 sf	
Portables	0 @	Std sf	
Special Education			
Self Contained	@	1292 sf	
Resource	1 @	810 sf	
Itinerant	1 @	330 sf	Non-classroom
SUPPORT FACILITIES:			
Administration	1 @	3361 sf	
Library	1 @	5760 sf	
Food Service			
Kitchen	1 @	2740 sf	
Student Dining	1 @	4500 sf	4845 sf including Staff Dining.
Staff Dining	1 @	345 sf	
Custodial Center	1 @	316 sf	
Computer Resource	1 @	900 sf	
Faculty Center	2 @	770 sf	

December 28, 1992

Mr. Theron Nichols
Facilities & Support Services Branch
Department of Education
State of Hawaii
P. O. Box 2360
Honolulu, Hawaii 96804 '

RE: Waikoloa Elementary School
Draft Environmental Assessment

Dear Nick:

Thank you for your comments on the Draft Environmental Assessment for the Proposed Waikoloa Elementary School. Enclosed is page 6 of the EA, revised to incorporate your comments. This page will replace the existing page 6 when the Final Environmental Assessment is published.

The Facilities Assessment and Development Schedule which you marked up was provided by the DOE and is part of the Planning Department's Background Report on the Waikoloa Elementary School's Use Permit Application, attached to the Draft EA as Addendum A. As such, we cannot revise that FADS. However, if the Department of Education wishes to provide us with an updated FADS, we could attach it as an addendum, with reference to it at the end of the first full paragraph on page 6.

If you wish us to include an updated FADS in the Final Environmental Assessment, please furnish us with a clean copy no later than January 11, 1993.

Sincerely,

Ann Cobb
Planning Assistant

Enclosure
cc: Mr. Lester Chuck, CIP Planner, Facilities & Support Services Branch, DOE (w/encl)
Mr. Kaoru Higaki, Hawaii District Engineer, DAGS (w/encl)
Mr. Alfred K. Suga, Assistant Superintendent, Office of Business Services, DOE (w/encl)
Mr. Herbert Watanabe, Hawaii District Business Specialist, DOE (w/encl)

PLANNING OFFICE
HC02 Box 5100 Waikoloa, Hawaii 96743 Phone (808) 885-0023 Fax (808) 885-8565

WAIKOLOA

FAXED 3:15 pm

January 12, 1993

FAX: 1-737-5231

Mr. Theron Nichols
Facilities & Support Services Branch
Department of Education
State of Hawaii
P. O. Box 2360
Honolulu, Hawaii 96804

RE: Waikoloa Elementary School
Draft Environmental Assessment

Dear Nick:

Per your telephone conversation with Ken Melrose and Harrell McCarty this morning, I have again revised page 6 of the Environmental Assessment. The changes are as follows:

1. In Increment 3, the two-story building will contain seven, rather than eight, classrooms and one computer resource center; and

2. In Increment 5, the two-story building will contain seven, rather than six, classrooms.

In addition, the revised FADS dated January 4, 1993, will be revised as shown on the enclosed and included as Appendix A in the Final Environmental Assessment.

Sincerely,

Ann Cobb
Planning Assistant

Enclosure

cc: Mr. Lester Chuck, CIP Planner, Facilities & Support Services Branch, DOE (w/encl)
Mr. Kaoru Higaki, Hawaii District Engineer, DAGS (w/encl)
Mr. Alfred K. Suga, Assistant Superintendent, Office of Business Services, DOE (w/encl)
Mr. Herbert Watanabe, Hawaii District Business Specialist, DOE (w/encl)

PLANNING OFFICE
HC02 Box 5100 Waikoloa, Hawaii 96743 Phone (808) 885-0023 Fax (808) 885-8565

APPENDIX A

Facilities Assessment and
Development Schedule
for Waikoloa Elementary School

Prepared By:
Department of Education
Facilities Branch, Office of Business Services

Revised January 4, 1993

FACILITIES ASSESSMENT AND DEVELOPMENT SCHEDULE
Facilities Branch, Office of Business Services

Revised January 4,1993
DATE May 16,1992

SCHOOL Waikoloa Elementary School GRADE ORGANIZATION K-5

DISTRICT Hawaii COMPLEX Honokaa

PREPARED BY JB REVIEWED BY _____
(District Superintendent)

_____
Date

PURPOSE: This information is provided to assist the principal and the District in determining the school's facilities requirements as it may relate to the enrollment projected for the school. Please use as a guide in determining CIP needs on a timely basis. Will be updated as required.

1. CAMPUS DEVELOPMENT PLAN

Architect/Planner _____

Date Prepared _____

Comments: Waikoloa Elementary is a proposed new school and the Master plan is being prepared.

2. ENROLLMENT INFORMATION

Actual Enrollment N/A Date _____

Projected Enrollment

205	19 94	to 19 95
263	19 95	to 19 96
338	19 96	to 19 97
512	19 97	to 19 98
	19	to 19
	19	to 19

Design Enrollment 825 Date Established 4/92 OBS

Peak Enrollment 908

3. INVENTORY INFORMATION

T.M.K. No. _____ Acres _____

T.M.K. No. _____ Acres _____

T.M.K. No. _____ Acres _____

Comments: Request developer contribution of 12 acres for school site. Adjoining County park is desirable. Land area to be suitable for meeting State and Federal accessibility standards. Master Plan for one story facilities with connecting walkways complying to UFAS.

b. Classroom Summary:

BLD'G I.D.	ROOM NAME	DATE COMP	EXIST'G SQ. FT.	ED. SPEC. SQ. FT.	PERCENT ED. SPEC	REMARKS
N/A	N/A	N/A	N/A	N/A	N/A	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

c. Support Facilities:

Administration

Bldg. Designation A — Existing ---- Sq.ft.

Year Constructed ---- — Ed. Spec. 3361 Sq.ft.

100 Percent (%) of Ed. Spec.

Comments To be built in Increment 1 with provisions for temporary serving kitchen and dining area and library uses.

Library

Bldg. Designation B — Existing ---- sq.ft.

Year Constructed ---- — Ed. Spec. 5760 sq.ft.

100 Percent (%) of Ed. Spec.

Comments To be constructed at a later date.

Food Service

Bldg. Designation C — Year Constructed ----

Kitchen Type Conventional — Existing ----- sq.ft.

Ed. Spec. 2740 sq.ft.

100 Percent (%) of Ed. Spec.

Dining Area Student/Staff — Existing ----- sq.ft.

Ed. Spec. 4970 sq.ft.

100 Percent (%) of Ed. Spec.

Comments To be constructed at a later date.

Student Dining: 4625 sq.ft.

Staff Dining : 345 sq.ft.

c. Support Facilities:

Others : Custodial Service Center

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 316 sq.ft.

100 Percent (%) of Ed. Spec.

Comments Recommend that this facility be integrated into the Food Service Facilities to be constructed at a later date.

Others : Computer Resource Center

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 900 sq.ft.

100 Percent (%) of Ed. Spec.

Comments Recommend that this facility be integrated into a facility which includes General or Elementary Classrooms, in the 3rd Increment.

Others : Faculty Center #1

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 770 sq.ft.

100 Percent (%) of Ed. Spec.

Comments Recommend that this facility be integrated into a facility which includes General or Elementary Classrooms in the 1st Increment. Provide Kiln room in the Faculty Center.

Others : Faculty Center #2

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 770 sq.ft.

100 Percent (%) of Ed. Spec.

Comments Recommend that this facility be integrated into a facility which includes General or Elementary Classrooms in the 4th Increment.

c. Support Facilities:

Others : Paved Playcourt

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 6912 sq.ft.

100 Percent (%) of Ed. Spec.

Comments To be constructed at a later date.

Others : Staff Parking

Bldg. Designation ---- Existing ---- Stalls

Year Constructed ---- Ed. Spec. 55 Stalls

100 Percent (%) of Ed. Spec.

Comments To be constructed at a later date.

Others : Visitor Parking

Bldg. Designation ---- Existing ---- Stalls

Year Constructed ---- Ed. Spec. 10 Stalls

100 Percent (%) of Ed. Spec.

Comments To be constructed at a later date. Provide additional marked parking stalls as required by County of Hawaii Land Use Ordinances.

Others : _____

Bldg. Designation _____ Existing _____ sq.ft.

Year Constructed _____ Ed. Spec. _____ sq.ft.

_____ Percent (%) of Ed. Spec.

Comments _____

4. Classroom Utilization Report Dated N/A

Classroom Count _____

Regular Teachers	_____	Classrooms Required	_____
Special Ed. Teachers	_____	Classrooms Required	_____
Suppl. Teachers	_____	Classrooms Required	_____
Tutors/Others	_____	Classrooms Required	_____
TOTAL	_____	TOTAL	_____

Comments _____

5. Existing Capacity of School (Vol III, OBS Fac.) N/A Students

6. Classroom requirements for design enrollment of 825

Regular, K-2: Students 396 / 20 = 20 Teachers = 20 Classrooms

Regular,3-12: Students 396 / 25 = 16 Teachers = 16 Classrooms

Special Ed. : Students 33 / 12 = 3 Teachers = 3 Classrooms

10% Suppl. CR allowance: Regular & Special CR x 10% = 4 Classrooms

Peak Allowance: 10% of Regular & Special Classrooms = 4 Classrooms

Total required for design enrollment = 47 Classrooms*

* 10% of classrooms (other than peak) must be in portables. Classrooms for peak enrollment must be portables.

No. of permanent classrooms 39

No. of portable classrooms 8

7. Facilities Assessment and Needs:

An analysis of the types of projects which are within the current educational Specifications (See Attachment No. A for details).

8. Capital Improvement Program Projects:

A suggested list of projects considered for this school. Project scope and matrix priority number listed for your information. When available, the school master plan will be used with revisions as necessary. (See Attachment No. _____)

Waikoloa Elementary
Design Enrollment : 825

FACILITIES SUMMARY: (December 31, 1992)

FACILITIES TYPE	REQUIREMENTS sf / facility	EXISTING facilities	REMARKS
CLASSROOMS:			
General Classrooms			
Permanent	36 @ 918 sf		
Portables	8 @ Std sf		
Special Education			
Self Contained	1 @ 1292 sf		
Resource	2 @ 810 sf		
Itinerant	1 @ 330 sf		
			Non-classroom
SUPPORT FACILITIES:			
Administration	1 @ 3361 sf		
Library	1 @ 5760 sf		
Food Service			
Kitchen	1 @ 2740 sf		
Student Dining	1 @ 4625 sf		4970 sf including Staff Dining.
Staff Dining	1 @ 345 sf		
Custodial Center	1 @ 316 sf		
Computer Resource	1 @ 900 sf		
Faculty Center	2 @ 770 sf		Non-classroom

Waikoloa Elementary
Design Enrollment : 825

FACILITIES TYPE	REQUIREMENTS sf / facility	EXISTING facilities	REMARKS
P.E. Outdoor			
Playfield (K)	1 @ 2520 sf		
Apparatus (K)	1 @ 2684 sf		
Playfield (1-5)	1 @ 98800 sf		
Apparatus (1-5)	1 @ 6000 sf		
Paved Court	1 @ 6912 sf		
Parking			
Staff Stalls	55 marked stalls		
Visitors Stalls	10 marked stalls		
Addn'l Stalls	As req'd by Land Use Ordinances		

NOTES:

1. Make provisions to meet the requirements of all Federal, State of Hawaii, and Hawaii County, laws, ordinances, codes, and regulations.
2. This school does not qualify for covered walkways.

APPENDIX B

Use Permit No. 92
(Application No. 91-13)
for Elementary School and Related Improvements
Hawaii County Planning Commission
Letter of Approval Dated December 30, 1991

and

County of Hawaii Planning Department
Background Report and Recommendation
for
Use Permit Application No. 91-13
for Elementary School and Related Improvements

Planning Commission
25 Aupuni Street, Rm. 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor

CERTIFIED MAIL

December 30, 1991

Mr. Ken Melrose
Waikoloa Development Company
HCO2, Box 5050
Waikoloa, HI 96743

Dear Mr. Melrose:

Use Permit Application (91-13)
Applicant: Waikoloa Development Company
Request: Elementary School and Related Improvements
Tax Map Key: 6-8-2: Por of 26 & 31

The Planning Commission at its duly held public hearing on December 18, 1991, voted to approve your application, Use Permit No. 92, to allow for an elementary school and related improvements on 12± acres of land situated within the County's Single-Family Residential-10,000 square foot (RS-10) zoned district. The project site is situated on the west (makai) side of Paniolo Avenue immediately south of the Paniolo Estates affordable housing project, Waikoloa, South Kohala, Hawaii.

Approval of this request is based on the following:

The establishment of an elementary school within an area zoned Single-Family Residential-10,000 square foot (RS-10) will not be inconsistent with the general purpose of that zoned district, the intend and purpose of the Zoning Code, and the General Plan. The granting of such a facility would complement the goal of the General Plan's Land Use Element which states that "The county shall encourage the development and maintenance of communities meeting the needs of its residents in balance with the physical and social environment." This approval would also support the goal and course of action in the Public Facilities Element of the General Plan which read "Encourage the provision of public facilities that effectively service community needs and seek ways of improving public service through better and more functional facilities which are in keeping with the environmental and aesthetic concerns of the community" and "Encourage the expansion of the public school and

library facilities as needs arises." This project has been coordinated with the Department of Education, although it will be built by the applicant on its lands. According to a Board of Education resolution, the "timely development of the first increment of the proposed Waikoloa Elementary School is a critical element in the realization of the Honokaa Complex Development Plan". Therefore, this approval serves the needs of the Waikoloa residential population in addition to widespread regional educational facility demands.

The granting of the proposed use will not be materially detrimental to the public welfare nor cause substantial adverse impact to the community's character or to surrounding properties. The project site is located adjacent to a growing residential community. The school will be located in close proximity to the new and existing residential development areas such as the County's affordable housing project, the Schuler housing project, Sunset Ridge, Waikoloa Heights and Waikoloa Village Estates. The Office of Housing and Community Development, the Waikoloa Community Church and the Waikoloa Village Association all support the proposed elementary school.

The granting of the proposed use will not adversely affect similar or related existing uses within the surrounding area, community or region. On the contrary, constructing the Waikoloa Elementary School in a timely manner will serve to relieve pressures felt in Honokaa and Waimea.

The proposed development is not anticipated to have any substantial adverse environmental or ecological effects. The area is not a habitat for any endangered plant or animal species. An archaeological survey found no historic sites of significance.

The granting of the permit to allow the establishment of an elementary school will not unreasonably burden public agencies to provide the necessary utilities and services. Traffic improvements, including channelization, traffic signals, crosswalks and appropriate pedestrian measures, will be required as a condition of this approval. It is felt that these improvements must be installed prior to issuance of a certificate of occupancy for the school in the interest of public safety and welfare. The extension of Ho'oko Street to the fire access road is being required as a condition of this approval. With regards to internal traffic circulation which

directly affects the public roadway network, this permit will require the submittal of a parking and interior traffic circulation pattern for buses and cars for loading/unloading children to the Planning Department and the Department of Public Works for review and approval. Curbs, gutters and sidewalk improvements are being imposed on the frontage of Paniolo Avenue and Ho'oko Street. All essential utilities and services are or will be available to the property.

Approval of this request is subject to the following conditions:

1. The petitioner, its successors or assigns shall be responsible for complying with all conditions of approval.

2. Final Plan Approval for Increment I and related improvements shall be secured from the Planning Department within one year from the effective date of the permit. To assure adequate time for plan approval review and in accordance with Chapter 25-244 (Zoning Code), plans shall be submitted a minimum of forty-five days prior to the date by which plan approval must be secured. Detailed landscaping, parking, and interior traffic circulation patterns for buses and cars for loading/unloading of children shall be provided meeting with the approval of the Planning Department, in consultation with the Department of Public Works.

3. Construction of Increment I shall commence (building permit) within one year from the date of receipt of Final Plan Approval and shall be completed within two years thereafter (certificate of occupancy).

4. Final Plan Approval for successive increments shall be secured prior to proceeding with each future increment.

5. Intersection improvements, including traffic signals and a turning lane, shall be installed at Paniolo Avenue-Ho'oko Street intersection, meeting with the approval of the Department of Public Works prior to issuance of a certificate of occupancy for any classrooms in Increment I.

6. Ho'oko Street shall be extended to the fire access road connection at such time the fire access road is required by the Fire Department and in a manner meeting with the approval of the Department of Public Works.

7. Curbs, gutters and sidewalk improvements shall be installed along the frontage of Paniolo Avenue and Ho'oko Street for each increment meeting with the approval of the Department of Public Works prior to issuance of a certificate of occupancy for any classroom in each increment.

8. Should future roadway improvements be warranted based on an assessment of traffic impacts conducted by the applicant and approved by the Department of Public Works, additional improvements shall be constructed meeting with the approval of the Department of Public Works prior to issuance of a certificate of occupancy for any building in future increments.

9. A drainage system meeting with the approval of the Department of Public Works shall be provided.

10. A wastewater disposal system shall be installed meeting with the requirements of the Department of Health.

11. Should any unidentified sites or remains such as artifacts, shell, bone, or charcoal deposits, human burials, rock or coral alignments, pavings or walks be encountered, work in the immediate area shall cease and the Planning Department shall be immediately notified. Subsequent work shall proceed upon an archaeological clearance from the Planning Department when it finds that sufficient mitigative measures have been taken.

12. Comply with all other applicable laws, rules, regulations and requirements.

13. An annual progress report shall be submitted to the Planning Director prior to the anniversary date of the approval of the permit. The report shall include, but not be limited to, the status of the development and to what extent the conditions of approval are being complied with. This condition shall remain in effect until all of the conditions of approval have been complied and the Planning Director acknowledges that further reports are not required.

14. An extension of time for the performance of conditions within the permit may be granted by the Planning Director upon the following circumstances: a) the non-performance

is the result of conditions that could not have been foreseen or are beyond the control of the applicant, successors or assigns, and that are not the result of their fault or negligence; b) granting of the time extension would not be contrary to the general plan or zoning code; c) granting of the time extension would not be contrary to the original reasons for the granting of the permit; and d) the time extension granted shall be for a period not to exceed the period originally granted for performance (i.e., a condition to be performed within one year may be extended for up to one additional year). Further, should any of the conditions not be met or substantially complied with in a timely fashion, the Director shall initiate procedures to revoke the permit.

This approval does not, however, sanction the specific plans submitted with the application as they may be subject to change given specific code and regulatory requirements of the affected agencies.

Please feel free to contact the Planning Department if there are any questions on this matter.

Sincerely,

Donald L. Mamiya

for Mike Luce, Chairman
Planning Commission

6994d
jdk

xc: Department of Public Works
Department of Water Supply
County Real Property Tax Division
West Hawaii Office
DLNR
Plan Approval Section
Fire Department
Department of Education - Hilo
Department of Education - Honolulu
Office of Housing and Community Development
Mayor
Planning Director

DRAFT

SUBJECT TO CHANGE

COUNTY OF HAWAII PLANNING DEPARTMENT
BACKGROUND REPORT

3749QC-12/8/91

WAIKOLOA DEVELOPMENT COMPANY
USE PERMIT APPLICATION 91-13

WAIKOLOA DEVELOPMENT COMPANY has submitted a Use Permit to allow for an elementary school and related improvements on 12± acres of land situated within the County's Single-Family Residential-10,000 square foot (RS-10) zoned district. The project site is situated on the west (makai) side of Paniolo Avenue immediately south of the Paniolo Estates affordable housing project, Waikoloa, South Kohala, TMK: 6-8-2: Portion of 26 & 31.

PROJECT DESCRIPTION

1. Parcels 26 and 31 are 340.00 and 221.3 acres in size. The applicant proposes to consolidate and resubdivide these parcels to create a 12-acre school site, which is the subject of this application. A subdivision application has been submitted to the Planning Department.

2. The applicant will be constructing a public elementary school facility on its land to accommodate a design enrollment of 800 students for kindergarten through 5th grade. This will require a total of 45 classrooms, a school library, a cafetorium, and administration building. The Department of Education has approved the master site plan for the ultimate build-out as shown on the attached Figure 5.

3. The project will be constructed in increments with the first increment to be opened in the fall of 1994 for 320 to 400 students. The first increment will contain 12 classrooms, a permanent administration building with temporary provisions to house the library and serving kitchen, a teacher workroom, a custodial center, play field, and site improvements to facilitate the designed expansion of the facilities.

4. A Facilities Assessment and Development Schedule has been prepared for the school and is attached.

5. Waikoloa Development Company is preparing to enter into a Real Estate Transaction Agreement with the State of Hawaii whereby Waikoloa Development Company will dedicate the 12-acre site at no cost to the State and construct the first increment improvements. At completion, the State will purchase the improvements from Waikoloa Development Co. at a price which will be the actual cost of the improvements.

6. In support of the request, the applicant has stated, in part, the following:

> "At completion, the State will purchase the improvements from Waikoloa Development Co. at a price which will be the actual cost of the improvements. This innovative approach has benefits for all parties concerned.
>
> * The State acquires a completed school many years ahead of a timetable that existing procedures could produce and at an anticipated lower cost, thereby reducing the facilities shortage in the rapidly growing Honokaa Complex.
>
> * Waikoloa Development Co. will receive satisfaction of school-related conditions of previous State and County land use reclassifications and will recover its costs for the project.
>
> * The community gains a local school for the young students which is within a one mile radius of 90% of all of the eventual residents of Waikoloa Village.
>
> * The site is adjacent to the County's affordable housing project and should assist in the sales and occupancy of the units."

COUNTY AND STATE PLANS

7. The General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the area for Low Density Urban Development.

8. The State Land Use classification is Urban.

9. The properties are zoned Single-Family Residential-10,000 (RS-10) by the Hawaii County Zoning Code.

10. A Use Permit may be obtained from the Planning Commission for schools within the RS district provided that:

> (A) The proposed use will still be consistent with the general purpose of the zoned district, the intent and purpose of this chapter, and the County General Plan;

(B) The proposed use will not be materially detrimental to the public welfare nor cause substantial, adverse impact to the community's character or to surrounding properties;
(C) The proposed use will not adversely affect similar or related existing uses within the surrounding area, community or region; and
(D) The proposed use will not unreasonably burden public agencies to provide roads and streets, sewer, water, drainage, schools, police and fire protection and other related infrastructure.

11. The property is not within the Special Management Area of the County of Hawaii.

DESCRIPTION OF THE PROPERTY AND SURROUNDING AREA

12. The site is currently vacant of any uses.

13. The topography is undulating with 1-10 percent slopes.

14. Average rainfall is about 10 inches annually.

15. The mean annual temperature is 78 degrees Fahrenheit.

16. Northeast trade winds dominate the typically leeward diurnal wind patterns.

17. The U.S.D.A. Soil Conservation Service's Soil Survey Report, the soils are of the Kawaihae Series. In a representative profile the surface layer is dark reddish-brown extremely stony very fine sandy loam about 2 inches thick. Below this is dark reddish-brown and dusky-red stony silt loam and loam. Hard pahoehoe lava bedrock is at a depth of about 33 inches. Permeability is moderate, runoff is medium and erosion hazard is moderate.

18. The U.S. Army Corps of Engineers Flood Insurance Rate Map (FIRM) denotes the area as Zone "X"--areas outside of the 500-year flood plain. There are no defined drainage ways on the properties.

19. A botanical survey was conducted in August 1988 by Char and Associates which found no endemic or endangered species on the site. Vegetation consisted of savannah-scrubland dominated by fountain grass and kiawe trees.

20. An avifauna and feral mammal survey was performed by Phillip Bruner, which found no endemic or endangered bird or animal species. Feral mammals include mongoose, dogs, goats and mice.

21. An archaeological survey was conducted by William J. Bonk in August 1988, which identified no sites.

22. Surrounding lands are similarly zoned RS-10.

23. Lands to the north are being developed affordable housing by James Schuler & Associates; to the east is Unit II of Waikoloa Village and to the northeast is the "Village Estates". Lands to the south is being proposed for church and pre-school uses, for which a Use Permit was submitted to the Planning Department and is currently under review.

FACILITIES AND SERVICES

24. Access to the project site is gained from Paniolo Avenue and then from Ho'oko Street. Paniolo Avenue is a County roadway having an 80-foot wide right-of-way with a pavement width of 64 feet. Ho'oko Street, which intersects Paniolo Avenue, has a 60-foot wide right-of-way and is to be constructed with the Schuler housing project. [see attached Figure 1-Location Map from Traffic Impact Analysis Report]

25. A Traffic Impact Analysis Report for the Waikoloa Elementary School was prepared by M & E Pacific, Inc. dated November 15, 1991. The Report concluded that the project would have minimal impact on traffic operations in the vicinity. The following improvements were recommended to accommodate the project:

"1. Provide a separate turning lane for the Paniolo Drive northbound approach.

"2. Appropriate facilities and traffic control measures should be implemented to accommodate the students walking and biking to school."

26. Water is available from a private water system.

27. All other utilities and services are available to the project site.

AGENCIES' COMMENTS

28. Department of Education:

"We have reviewed the subject application and fully endorse the proposed project to develop a new elementary school in the Waikoloa area. An elementary school is needed to accommodate the projected enrollment generated by the various residential developments in Waikoloa. Schools which are currently serving these communities are operating beyond capacity and will not be able to accommodate such growth.

"The developer will be working with the Department of Education to ensure that the proposed elementary school conforms to the Department's educational specifications and standards.

"We request that the County approve this application so the subject project can proceed without delay and the first increment of the school can be completed by the fall of 1994."

29. Department of Public Works:

"1. Building shall conform to all requirements of code and statutes pertaining to building construction.

"2. All development generated runoff shall be disposed of on site and shall not be directed toward any adjacent properties.

"3. Applicant shall be informed that if drywells are included in the subject improvements, Chapter 23, Underground Injection Control (UIC) Administrative Rules, Dept. of Health, prohibit any person from operating, constructing or modifying an injection well (drywell) unless authorized by a permit issued by the Director of Health, State of Hawaii. Furthermore, should dedication of roadways, including drywells be

contemplated, the Dept. of Public Works will not approve dedication of roadways prior to compliance with Chapter 23, UIC, Administrative Rules.

"4. The TIAR did not consider traffic generated by the proposed Intermediate School & Public Park. Both the Elementary School & Intermediate should access from Ho'oko Street, if not, the Intermediate School access to Paniolo Avenue would have to be signalized in the future when Paniolo Avenue connects to the new Kawaihae Road. Signalized intersections should be minimized on Paniolo Avenue.

"5. The TIAR assumes no future connection between Paniolo Avenue and Kawaihae Road. Once this happens, the through traffic will increase maybe substantially.

"6. The TIAR states that signals are not yet warranted. Does this mean that an elementary school student can safety cross Paniolo Avenue with its 64' wide pavement? We suggest that it be installed before the school opens.

"7. Stripe Paniolo Avenue for channelization of traffic.

"8. Install traffic signals at the North/South Road and Ho'oko Street intersection when warranted and requested by the Department of Public Works.

"9. When detailed plans for the school entrance, exit, loading/unloading have been developed, submit plans to the Traffic Division for review and approval.

"10. Extend Ho'oko Street to entrance of Fire Access Road. If this road is to be heavily used then it is too close to the existing intersection."

30. <u>Real Property Tax Division:</u>

"1. There are no delinquent taxes due.

"2. The property is not in the agriculture use program.

"3. The property is not dedicated to agriculture."

31. Soil Conservation Service, Department of Transportation-Highways Division, Department of Land and Natural Resources, Office of Housing and Community Development, Fire, Civil Defense, the Department of Water Supply, the Department of Health, Department of Parks and Recreation and the Police Department had no objections to the application.

OTHER COMMENTS

32. SEE LETTER FROM THE WAIKOLOA COMMUNITY CHURCH DATED 12/10/91.

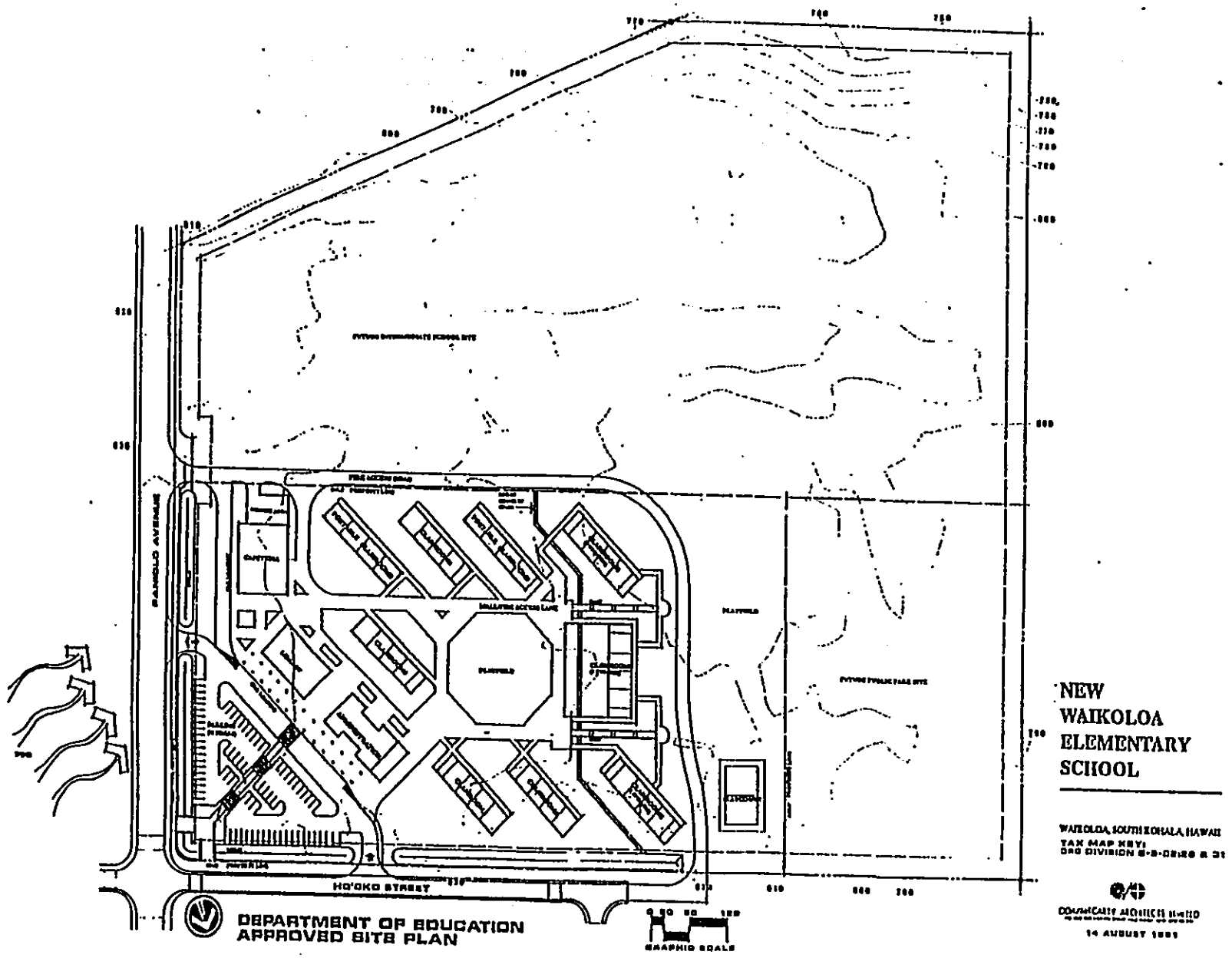
HO'OKO STREET
DEPARTMENT OF EDUCATION
APPROVED SITE PLAN
GRAPHIC SCALE
NEW
WAIKOLOA
ELEMENTARY
SCHOOL
WAIKOLOA, SOUTH KOHALA, HAWAII
14 AUGUST 1991

Figure 5

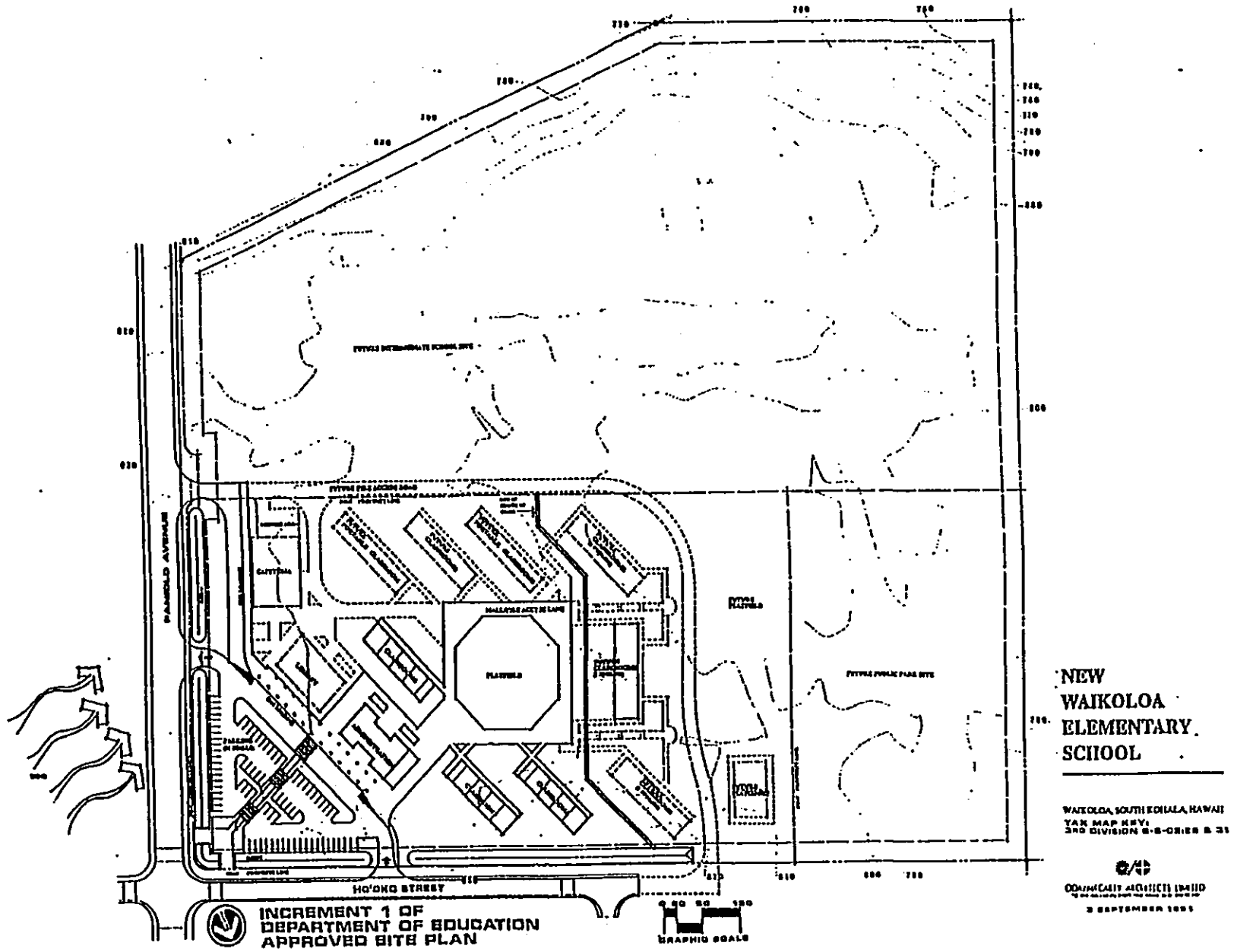
NEW
WAIKOLOA
ELEMENTARY
SCHOOL
WAIKOLOA, SOUTH KOHALA, HAWAII
TAX MAP KEY:
3RD DIVISION 6-6-08:88 & 31
HO'OKO STREET
INCREMENT 1 OF
DEPARTMENT OF EDUCATION
APPROVED SITE PLAN
GRAPHIC SCALE

Figure 6

APPENDIX B

DEPARTMENT OF EDUCATION FACILITIES ASSESSMENT AND DEVELOPMENT SCHEDULE FOR WAIKOLOA ELEMENTARY SCHOOL

FACILITIES ASSESSMENT AND DEVELOPMENT SCHEDULE
Facilities Branch, Office of Business Services

DATE May 16, 1991

SCHOOL Waikoloa Elementary School GRADE ORGANIZATION K-5

DISTRICT Hawaii COMPLEX Honokaa

PREPARED BY JB REVIEWED BY _____
(District Superintendent)

_____
Date

PURPOSE: This information is provided to assist the principal and the District in determining the school's facilities requirements as it may relate to the enrollment projected for the school. Please use as a guide in determining CIP needs on a timely basis. Will be updated as required.

I. CAMPUS DEVELOPMENT PLAN

Architect/Planner _____

Date Prepared _____

Comments: Waikoloa Elementary is a proposed new school and the Master plan has not been prepared.

II. ENROLLMENT INFORMATION

Actual Enrollment N/A Date _____

Projected Enrollment 327 19 96 to 19 97

_____ 19____ to 19____

_____ 19____ to 19____

_____ 19____ to 19____

_____ 19____ to 19____

_____ 19____ to 19____

Design Enrollment 800 Date Established 5/13/1991 OBS

Peak Enrollment 880

3. INVENTORY INFORMATION

T.M.K. No. _____ Acres _____

T.M.K. No. _____ Acres _____

T.M.K. No. _____ Acres _____

Comments: Request developer contribution of 12 acres for school site. Adjoining County park is desirable. Land area to be suitable for meeting State and Federal accessibility standards. Master Plan for one story facilities with connecting walkways complying to UFAS.

b. Classroom Summary:

BLD'G I.D.	ROOM NAME	DATE COMP	EXIST'G SQ. FT.	ED. SPEC. SQ. FT.	PERCENT ED. SPEC	REMARKS
N/A	N/A	N/A	N/A	N/A	N/A	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

c. Support Facilities:

Administration

Bldg. Designation A — Existing ---- Sq.ft.

Year Constructed ---- — Ed. Spec. 3361 Sq.ft.

100 Percent (%) of Ed. Spec

Comments To be constructed at a later date.

Library

Bldg. Designation B — Existing ---- sq.ft.

Year Constructed ---- — Ed. Spec. 5760 sq.ft.

100 Percent (%) of Ed. Spec

Comments To be constructed at a later date.

Food Service

Bldg. Designation C — Year Constructed ----

Kitchen Type Conventional — Existing ----- sq.ft.

Ed. Spec. 2740 sq.ft.

100 Percent (%) of Ed. Spec

Dining Area Student/Staff — Existing ----- sq.ft.

Ed. Spec. 4845 sq.ft.

100 Percent (%) of Ed. Spec

Comments To be constructed at a later date.

Student Dining: 4500 sq.ft.

Staff Dining : 345 sq.ft.

c. Support Facilities:

Others : Custodial Service Center

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 316 sq.ft.

100 Percent (%) of Ed. Spec

Comments Recommend that this facility be integrated into the Food Service Facilities to be constructed at a later date.

Others : Computer Resource Center

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 900 sq.ft.

100 Percent (%) of Ed. Spec

Comments Recommend that this facility be integrated into a facility which includes General or Elementary Classrooms.

Others : Faculty Center #1

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 770 sq.ft.

100 Percent (%) of Ed. Spec

Comments Recommend that this facility be integrated into a facility which includes General or Elementary Classrooms. Provide Kiln Room in the Faculty Center.

Others : Faculty Center #2

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 770 sq.ft.

100 Percent (%) of Ed. Spec

Comments Recommend that this facility be integrated into a facility which includes General or Elementary Classrooms.

c. Support Facilities:

Others : Paved Playcourt

Bldg. Designation ---- Existing ---- sq.ft.

Year Constructed ---- Ed. Spec. 6912 sq.ft.

100 Percent (%) of Ed. Spec

Comments To be constructed at a later date.

Others : Staff Parking

Bldg. Designation ---- Existing ---- Stalls

Year Constructed ---- Ed. Spec. 53 Stalls

100 Percent (%) of Ed. Spec.

Comments To be constructed at a later date.

Others : Visitor Parking

Bldg. Designation ---- Existing ---- Stalls

Year Constructed ---- Ed. Spec. 10 Stalls

100 Percent (%) of Ed. Spec.

Comments To be constructed at a later date. Provide additional marked parking stalls as required by County of Hawaii Land Use Ordinances.

Others : _____

Bldg. Designation _____ Existing _____ sq.ft.

Year Constructed _____ Ed. Spec. _____ sq.ft.

_____ Percent (%) of Ed. Spec.

Comments _____

4. Classroom Utilization Report Dated N/A

Classroom Count _____

Regular Teachers	_____	Classrooms Required	_____
Special Ed. Teachers	_____	Classrooms Required	_____
Suppl. Teachers	_____	Classrooms Required	_____
Tutors/Others	_____	Classrooms Required	_____
TOTAL	_____	TOTAL	_____

Comments _____

_____

_____

5. Existing Capacity of School (Vol III, OBS Fac.) N/A Students

6. Classroom requirements for design enrollment of 800

Regular, K-2: Students 384 / 20 = 19 Teachers = 19 Classrooms

Regular,3-12: Students 384 / 25 = 15 Teachers = 15 Classroc

Special Ed. : Students 32 / 12 = 3 Teachers = 3 Classrooms

10% Suppl. CR allowance: Regular & Special CR x 10% = 4 Classrooms

Peak Allowance: 10% of Regular & Special Classrooms = 4 Classrooms

Total required for design enrollment = 45 Classrooms

* 10% of classrooms (other than peak) must be in portables.
Classrooms for peak enrollment must be portables.

No. of permanent classrooms 37

No. of portable classrooms 8

7. Facilities Assessment and Needs:

An analysis of the types of projects which are within the current educational Specifications (See Attachment No. A for details).

8. Capital Improvement Program Projects:

A suggested list of projects considered for this school. Project scope and matrix priority number listed for your information. When available, the school master plan will be used with revisions as necessary.
(See Attachment No. _____)

Aikoloa Elementary
Design Enrollment : 800

FACILITIES SUMMARY: (May 16, 1991)

FACILITIES TYPE	REQUIREMENTS sf / facility	EXISTING facilities	REMARKS
CLASSROOMS:			
General Classrooms			
Permanent	34 @ 918 sf		
Portables	8 @ Std sf		
Special Education			
Self Contained	@ 1292 sf		
Resource	3 @ 810 sf		
Itinerant	1 @ 330 sf		Non-classroom
SUPPORT FACILITIES:			
Administration	1 @ 3361 sf		
Library	1 @ 5760 sf		
Food Service			
Kitchen	1 @ 2740 sf		
Student Dining	1 @ 4500 sf		4845 sf including Staff Dining.
Staff Dining	1 @ 345 sf		
Custodial Center	1 @ 316 sf		
Computer Resource	1 @ 900 sf		
Faculty Center	2 @ 770 sf		

Waikoloa Elementary
Design Enrollment : 800

FACILITIES TYPE	REQUIREMENTS sf / facility	EXISTING facilities	REMARKS
P.E. Outdoor			
Playfield (K)	1 @ 2520 sf		
Apparatus (K)	1 @ 2684 sf		
Playfield (1-6)	1 @ 98800 sf		
Apparatus (1-6)	1 @ 6000 sf		
Paved Court	1 @ 6912 sf		
Parking			
Staff Stalls	53 marked stalls		
Visitors Stalls	10 marked stalls		
Addn'l Stalls	As req'd by Land Use Ordinances		

NOTES:

1. Make provisions to meet the requirements of all Federal, State of Hawaii, and Hawaii County, laws, ordinances, codes, and regulations.

2. This school <u>does not qualify</u> for covered walkways.

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

Resolution Supporting Real Estate Transaction For Waikoloa Elementary School

WHEREAS, the Board of Education has reviewed the Honokaa Complex Development Plan prepared by the Hawaii District of the Department of Education and finds that the timely development of the first increment of the proposed Waikoloa Elementary School is a critical element in the realization of the Honokaa Complex Development Plan; and

WHEREAS, Waikoloa Development Company is willing to dedicate the approximately 12 acre school site to the State of Hawaii and the Department of Education is willing to accept such dedication in compliance with existing State and County land use conditions of reclassification; and

WHEREAS, Waikoloa Development Company and the Department of Education are willing to enter into a Real Estate Transaction Agreement, as initiated by the Board of Education and supported by the 1991 Hawaii State Legislature during its regular session as set forth in House Concurrent Resolution No. 20 adopted by the House of Representatives and concurred with by the Senate; and

WHEREAS, Waikoloa Development Company and the Department of Education have agreed upon a master site plan for the proposed Waikoloa Elementary and the scope of the improvements for the first increment in compliance with with the Department of Education's Educational Specifications and Standards for Facilities; and

WHEREAS, the parties desire to have the first increment improvements completed to allow enrollment for the school year beginning in the fall of 1994. Now, therefore,

BE IT RESOLVED that the Board of Education hereby approves of the master site plan together with the concept of the Real Estate Transaction Agreement to implement the plan and hereby instructs and authorizes the Department of Education to work with the Board of Land and Natural Resources and the Department of Accounting and General Services to refine the terms of and enter into such agreement and to perform all obligations to be performed by it under such agreement; and

NOW BE IT RESOLVED that the Board of Education hereby approves of the dedication of the 12 acre school site in complete satisfaction of existing State and County of Hawaii land use reclassification at Waikoloa in lieu of school-related impact fees; and

BE IT FURTHER RESOLVED, that certified copies of this resolution be transmitted to the Governor, President of the Senate, Speaker of the House of Representatives, the State Comptroller, the Finance Director, the Chairperson of the Board of Land and Natural Resources, the Superintendent of the Department of Education, and the Waikoloa Development Company.

Dated this third day of October, 1991.

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

Resolution Commending the Waikoloa Land Company For Participation in a Real Estate Transaction

WHEREAS, the Waikoloa Land Company has participated with the Department of Education in identifying school enrollment increases resulting from its planned affordable housing projects; and

WHEREAS, the Waikoloa Land Company has donated twelve acres of land in Waikoloa for an elementary and intermediate school; and

WHEREAS, the Waikoloa Land Company has proposed to build the first increment of the Waikoloa Elementary School as a Real Estate Transaction as supported by the Board of Education; and

WHEREAS, the proposed real estate transaction will accelerate construction of the first increment of the Waikoloa Elementary School at least one year ahead of the normal state construction schedule and the Real Estate Transaction could result in cost savings from the accelerated completion schedule; and

WHEREAS, the Waikoloa Land Company has fully cooperated with the Department of Education in developing the Real Estate Transaction concept to fruition; and

WHEREAS, the Board of Education, on recommendation from its Facilities Committee, has endorsed the proposed Real Estate Transaction as developed with Waikoloa Land Company; now, therefore,

BE IT RESOLVED, that the Board of Education commend the Waikoloa Land Company for participating with the Board of Education in promoting the Real Estate Transaction as a method to facilitate construction of Phase One of the Waikoloa Elementary and Intermediate Schools and extend best wishes that the project will be a successful venture; and

BE IT FURTHER RESOLVED, that copies of this resolution be transmitted to the Governor, President of the Senate, Speaker of the House of Representatives, the State Comptroller, the Finance Director, the Chairperson of the Board of Land and Natural Resources, the Superintendent of Education, and the Waikoloa Development Company.

Dated this third day of October, 1991.

MITSUGI NAKASHIMA, Ed. D.
Chairperson

DEBI HARTMANN
First Vice-Chairperson

WILLIAM A. K. WATERS
Second Vice-Chairperson

(REV.) DARROW L. K. AIONA

MARGARET K. APO

KAREN KNUDSEN

DENISE MATSUMOTO

FRANCIS R. McMILLEN

BETTY LOU MIURA

RONALD B. Y. NAKANO

CHARLES NORWOOD

SIVIA SASA

MEYER M. UEOKA

(EXCUSED)
RANDAL S. YOSHIDA

Aloha
June & George
Baker
Box 3221 WVS
Kamuela, Hi.
96743

TESTIMONY FOR 10/03/91
BOARD OF EDUCATION HEARING

I'm George Baker a retired educator and 10 year resident of Waikoloa.

I'm speaking for a group of concerned citizens supporting an elementary school in Waikoloa. We knocked on doors of over 1,100 households in Waikoloa and counted children. Our total confirmed the need for a local elementary school.

We would like to stress the importance of timing so a school will be ready in 1994 for our counted children plus the projected children expected from current and planned construction.

The Waikoloa community has been involved in planning and site selections. We fully approve and support the proposed Waikoloa Elementary School.

George W Baker,

Lorraine R. Inouye
Mayor

Barry T. Mizuno
Managing Director

David Fuertes
Deputy Managing Director

Office of the Mayor

County of Hawaii · 25 Aupuni Street, Rm. 213 · Hilo, Hawaii 96720 · (808) 961-8211 · Fax (808) 961-6553

September 18, 1991

Dr. Mitsugi Nakashima, Chairman
State Board of Education
P.O. Box 2360
Honolulu, HI 96804

Subject: Waikoloa Land Company's proposal for a new elementary school in Waikoloa Village, Hawaii

Dear Dr. Nakashima and members:

The County of Hawaii wholeheartedly supports Waikoloa Land Company's proposal for a new elementary school in Waikoloa Village, Hawaii. The County of Hawaii began construction of the Waikoloa Affordable Housing development this year. This ambitious project will be adding approximately 1,400 new housing units to meet the needs of the growing West Hawaii population. This is a 100% affordable housing project, which means that all units for sale and rental will be targeted to serve the needs of families whose incomes are between 50% and 140% of the County's median income. This means that the number of households with children in Waikoloa will be increasing tremendously.

The Department of Education anticipates the Waikoloa Affordable Housing development will result in enrollment increases of 425 to 475 in kindergarten to fifth grades; 175 to 225 in grades six through eight and 275 to 325 in grades nine through twelve. The D.O.E. has recommended an elementary school to serve the needs of the County's housing project. The County supports the effort of the Waikoloa Development Company to construct the first school before our affordable housing project is completed. This is because both Waimea Elementary and Intermediate School and Honokaa High School are already seriously overcrowded and both facilities have constraints that limit adding more classrooms.

Families with children has increased rapidly and the area is evolving into a well-rounded community with churches, a shopping center and other amenities. A new elementary school will be a tremendous boost to the families living and working in the rapidly-expanding South Kohala district.

A door to door survey in October 1990 by the Waikoloa School Support Group counted 495 children from infants to high school age already residing in Waikoloa. The tallies indicated a steadily increasing elementary enrollment within the next three years based upon existing Waikoloa households alone. Projections for new private residential development in Waikoloa show nearly 500 single and multi-family units this year and another 400 plus units in 1992.

The County will be delivering the first of 80 homes in January, 1992 and will be completing a total of 177 units by December, 1992. During the first quarter of 1992, we also expect to begin construction of the infrastructure for the remaining 1,200 plus units. These units will be completed over a 5 to 6 year development timetable.

Based upon the needs of the existing community and expected housing increases, Waikoloa will be needing an elementary school sooner than the normal 7 to 10 years for planning and constructing a D.O.E. facility. Therefore, we support Waikoloa Land Company's offer to build the first increment of an elementary school for Waikoloa by 1994. We respectfully ask for your support of this proposal to expedite the development of an elementary school to serve the needs of existing and future residents of this fast-growing community.

Aloha,

Lorraine R. Inouye

Lorraine R. Inouye, Mayor
County of Hawaii

cc: Ken Melrose, Waikoloa Development Co. ✓
Tom Yamamoto, Nansay Hawaii

JOHN WAIHEE
GOVERNOR

CHARLES T. TOGUCHI
SUPERINTENDENT

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

OFFICE OF THE SUPERINTENDENT

September 26, 1991

MEMO TO: Mr. Meyer M. Ueoka, Chairperson
Facilities Committee, Board of Education

F R O M: Charles T. Toguchi
Superintendent Charles T Toguchi

SUBJECT: Waikoloa Elementary School
Capital Improvements Program (CIP)
Supplementary Budget Request
Fiscal Biennium 1991-1993

We request that the Board of Education approve the following additional change to the Capital Improvements Appropriations in the 1991 Hawaii Session Laws Act 296.

To reflect the intent of the Department of Education and the Board of Education to enter a real estate transaction with the Waikoloa Land Company, the following change is proposed in addition to the previous changes approved by the Board at its September 19, 1991 meeting:

1. From

Item 6. Lump Sum CIP - Project Adjustment Fund

Design, Construction, and Equipment for a contingency fund for project adjustment purposes subject to the provisions of the appropriations act. Other DOE projects within this act with unrequired balances may be transferred into this item.

	(In Thousands) FY 91/92	FY 92/93
Design	400	[400] 200
Construction	2,500	3,500
Equipment	100	100
Total Funding	3,000	[4,000] 3,800

To

Item Waikoloa Elementary School

Design, construction for first increment classrooms; administration building; parking; ground and site improvements; equipment and appurtenances.

	(In Thousands) FY 91/92	FY 92/93
Design		200
Total Funding		200

Justification:

Required to relieve Waimea Elementary and Intermediate School due to the large projected enrollment increase in the Waikoloa area including an affordable County housing project.

CTT:LC:jl

cc: A. Suga
A. Garson

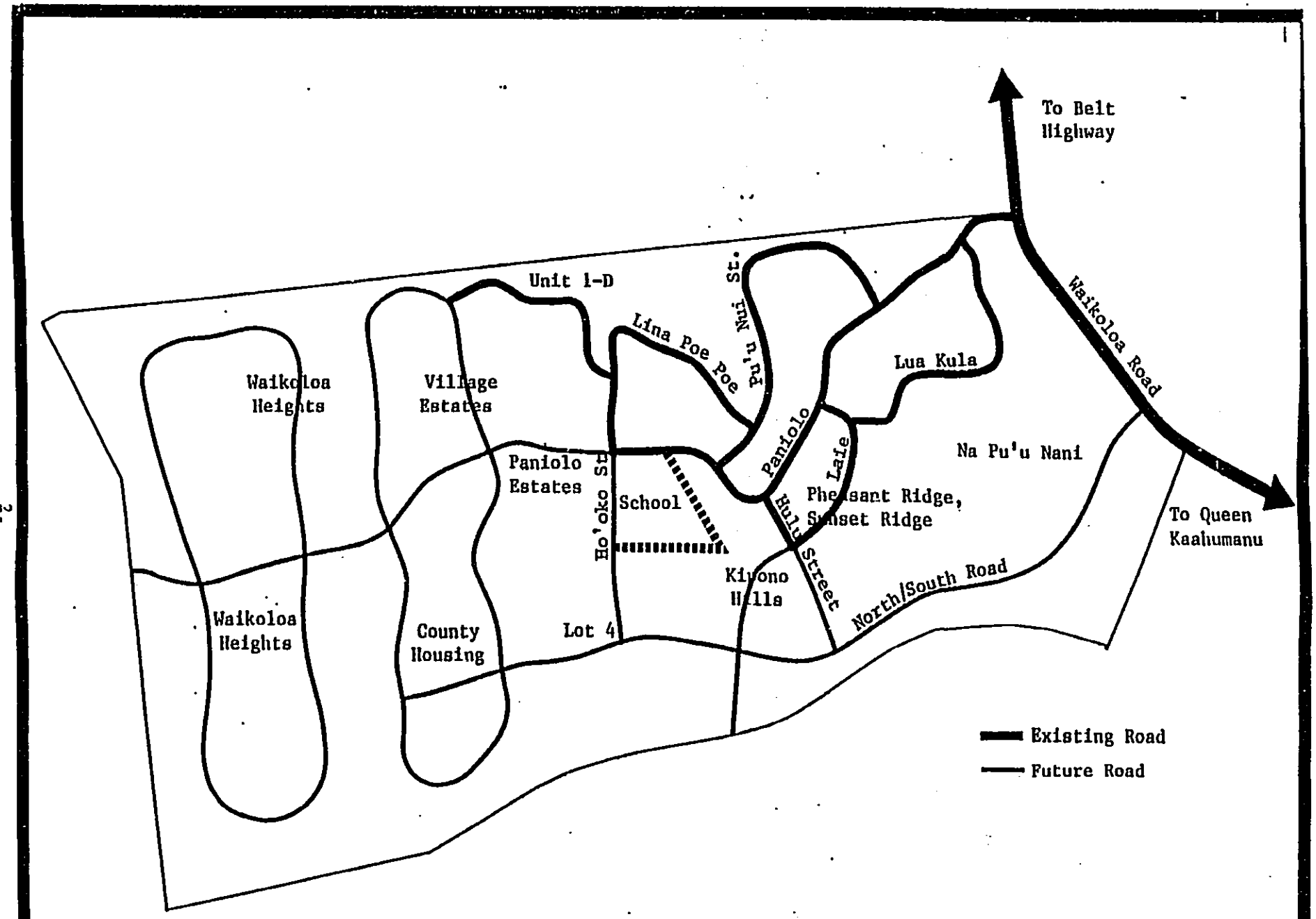

FIGURE 1
LOCAT' ON MAP

WAIKOLOA COMMUNITY CHURCH

P.O. Box 3382 • Waikoloa, Hawaii 96743

December 10, 1991

Mr. Mike Luce
Planning Commission
County of Hawaii
75-5706 Kuakini Highway, Suite 108
Kailua-Kona, HI 96740

Dear Sir:

At the monthly meeting held on December 9, 1991, the Church Council of the Waikoloa Community Church took action on the proposed elementary school for the Waikoloa area.

We would like to state that the Waikoloa Community Church endorses the construction of the school on the makai side of Paniolo Avenue immediately south of the Paniolo Estates affordable housing project.

Sincerely,

George Baker
Acting President
Waikoloa Community Church Council

DRAFT

SUBJECT TO CHANGE

3767QC-12/14/91

COUNTY OF HAWAII PLANNING DEPARTMENT
RECOMMENDATIONS

WAIKOLOA DEVELOPMENT COMPANY
USE PERMIT APPLICATION 91-13

Upon review of the request against the guidelines for granting a Use Permit, the Planning Director is recommending that it be approved. This recommendation does not, however, sanction the specific plans submitted with the application as they may be subject to change given specific code and regulatory requirements of the affected agencies. Since this recommendation is made without the benefit of public testimony, the Director reserves the right to modify and/or alter his position based upon additional information presented at the public hearing. The favorable recommendation is based on the following findings:

The establishment of an elementary school within an area zoned Single-Family Residential-10,000 square foot (RS-10) will not be inconsistent with the general purpose of that zoned district, the intend and purpose of the Zoning Code, and the General Plan. The granting of such a facility would complement the goal of the General Plan's Land Use Element which states that "The county shall encourage the development and maintenance of communities meeting the needs of its residents in balance with the physical and social environment." This approval would also support the goal and course of action in the Public Facilities Element of the General Plan which read "Encourage the provision of public facilities that effectively service community needs and seek ways of improving public service through better and more functional facilities which are in keeping with the environmental and aesthetic concerns of the community" and "Encourage the expansion of the public school and library facilities as needs arises." This project has been coordinated with the Department of Education, although it will be built by the applicant on its lands. According to a Board of Education resolution, the "timely development of the first

increment of the proposed Waikoloa Elementary School is a critical element in the realization of the Honokaa Complex Development Plan". Therefore, this approval serves the needs of the Waikoloa residential population in addition to widespread regional educational facility demands.

The granting of the proposed use will not be materially detrimental to the public welfare nor cause substantial adverse impact to the community's character or to surrounding properties. The project site is located adjacent to a growing residential community. The school will be located in close proximity to the new and existing residential development areas such as the County's affordable housing project, the Schuler housing project, Sunset Ridge, Waikoloa Heights and Waikoloa Village Estates. The Office of Housing and Community Development, the Waikoloa Community Church and the Waikoloa Village Association all support the proposed elementary school.

The granting of the proposed use will not adversely affect similar or related existing uses within the surrounding area, community or region. On the contrary, constructing the Waikoloa Elementary School in a timely manner will serve to relieve pressures felt in Honokaa and Waimea.

The proposed development is not anticipated to have any substantial adverse environmental or ecological effects. The area is not a habitat for any endangered plant or animal species. An archaeological survey found no historic sites of significance.

The granting of the permit to allow the establishment of an elementary school will not unreasonably burden public agencies to provide the necessary utilities and services. Traffic improvements, including channelization, traffic signals, crosswalks and appropriate pedestrian measures, will be required as a condition of this approval. It is felt that these improvements must be installed prior to issuance of a certificate of occupancy for the school in the interest of

public safety and welfare. The extension of Ho'oko Street to the fire access road is being required as a condition of this approval. With regards to internal traffic circulation which directly affects the public roadway network, this permit will require the submittal of a parking and interior traffic circulation pattern for buses and cars for loading/unloading children to the Planning Department and the Department of Public Works for review and approval. Curbs, gutters and sidewalk improvements are being imposed on the frontage of Paniolo Avenue and Ho'oko Street. All essential utilities and services are or will be available to the property.

Approval of this request is subject to the following conditions:

1. The petitioner, its successors or assigns shall be responsible for complying with all conditions of approval.
2. Final Plan Approval for Increment I and related improvements shall be secured from the Planning Department within one year from the effective date of the permit. To assure adequate time for plan approval review and in accordance with Chapter 25-244 (Zoning Code), plans shall be submitted a minimum of forty-five days prior to the date by which plan approval must be secured. Detailed landscaping, parking, and interior traffic circulation patterns for buses and cars for loading/unloading of children shall be provided meeting with the approval of the Planning Department, in consultation with the Department of Public Works.
3. Construction of Increment I shall commence (building permit) within one year from the date of receipt of Final Plan Approval and shall be completed within two years thereafter (certificate of occupancy).
4. Final Plan Approval for successive increments shall be secured within one year from the date of completion ~~of completion~~ of the preceding increment.

5. Intersection improvements, including traffic signals and a turning lane, shall be installed at Paniolo Avenue-Ho'oko Street intersection, meeting with the approval of the Department of Public Works prior to issuance of a certificate of occupancy for any building in Increment I.
6. Ho'oko Street shall be extended to the fire access road connection in a manner meeting with the approval of the Department of Public Works.
7. Curbs, gutters and sidewalk improvements shall be installed fronting Paniolo Avenue and Ho'oko Street meeting with the approval of the Department of Public Works prior to issuance of a certificate of occupancy for any building in Increment I.
8. Should future roadway improvements be warranted based on an assessment of traffic impacts conducted by the applicant and approved by the Department of Public Works, additional improvements shall be constructed meeting with the approval of the Department of Public Works prior to issuance of a certificate of occupancy for any building in Increment II.
9. A drainage system meeting with the approval of the Department of Public Works shall be provided.
10. A wastewater disposal system shall be installed meeting with the requirements of the Department of Health.
11. Should any unidentified sites or remains such as artifacts, shell, bone, or charcoal deposits, human burials, rock or coral alignments, pavings or walks be encountered, work in the immediate area shall cease and the Planning Department shall be immediately notified. Subsequent work shall proceed upon an archaeological clearance from the Planning Department when it finds that sufficient mitigative measures have been taken.
12. Comply with all other applicable laws, rules, regulations and requirements.

13. An annual progress report shall be submitted to the Planning Director prior to the anniversary date of the approval of the permit. The report shall include, but not be limited to, the status of the development and to what extent the conditions of approval are being complied with. This condition shall remain in effect until all of the conditions of approval have been complied and the Planning Director acknowledges that further reports are not required.

14. An extension of time for the performance of conditions within the permit may be granted by the Planning Director upon the following circumstances: a) the non-performance is the result of conditions that could not have been foreseen or are beyond the control of the applicant, successors or assigns, and that are not the result of their fault or negligence; b) granting of the time extension would not be contrary to the general plan or zoning code; c) granting of the time extension would not be contrary to the original reasons for the granting of the permit; and d) the time extension granted shall be for a period not to exceed the period originally granted for performance (i.e., a condition to be performed within one year may be extended for up to one additional year). Further, should any of the conditions not be met or substantially complied with in a timely fashion, the Director shall initiate procedures to revoke the permit.

APPENDIX C

Botanical Survey
580-Acre Residential Development, Waikoloa Village
District of South Kohala
Hawaii

Prepared By:
Char & Associates
Botanical/Environmental Consultants
August 1988

BOTANICAL SURVEY

580-ACRE RESIDENTIAL DEVELOPMENT, WAIKOLOA VILLAGE

DISTRICT OF SOUTH KOHALA

HAWAI'I

by

George K. Linney
Winona P. Char

CHAR & ASSOCIATES
Botanical/Environmental Consultants
Honolulu, Hawaii

Prepared for: BELT COLLINS & ASSOCIATES

August 1988

TABLE OF CONTENTS

SUMMARY

A botanical survey was carried out on a parcel of approximately 580 acres proposed for future residential development adjacent to, and just north of Waikoloa Village. The site is divided into two almost equal halves by soil type. In the northeast, the soil is a deep, yellow ash with occasional rock outcroppings. In the southwest, this substrate is overlain by a thick, weathered 'a'a. The soil is thinner and rock outcroppings predominate. Vegetation in the northeast consists of rolling grasslands with widely scattered trees. In the southwest, vegetation is a savannah-scrubland. Differences in vegetation represent little more than shifts in relative abundance of the constituent plants. For the most part, the species composition is the same throughout the site. Only 46 species of vascular plants were found growing on the site, an extremely low number for an area of this size. Of these, 40 (87%) were exotic weeds or deliberately introduced plants, and 6 (13%) native, or presumed-native plants. None of the species found on the site are officially listed as endangered or threatened; nor are any species proposed or candidate for such status.

SURVEY METHODS

A walk-through method was used for this survey, with plants identified on sight. Plants that could not be positively identified were collected for later determination by comparison with known specimens in the herbarium and reference to standard taxonomic literature. Taxonomy of ferns is based on Wagner and Wagner (1987). Taxonomy and nomenclature of the flowering plants follows Wagner et al. (in press). Species composition recorded for the site is subject to the problem of identifying small annuals and perennials that were sterile, dormant, or dead at the time of the survey. Access to the site was from a dirt road, representing an extension of Paniolo (or Panicla, according to maps) Avenue. An abandoned ranch road running through the site also facilitated access for short portions of the transects.

DESCRIPTION OF THE SITE

The study site consisted of approximately 580 acres contiguous with Waikoloa Village and located just to the north of the presently developed land. The upper boundary of the site corresponded to a dirt road extending beyond the paved Paniolo (or Paniola) Avenue, at an elevation of approximately 880-780 feet. The lower boundary was at an elevation of approximately 580-600 feet. The northern boundary was Kamakoa Gulch, while the southern boundary was an apparently unnamed gulch that serves as the drainage for central Waikoloa Village. Throughout the site, metal fragments were common, decreasingly so to the south. These were tentatively identified as ordnance. At least some of the site disturbance (change of species composition, serious erosion) may be attributable to this former bombing, as well as to browsing by animals, and range fires.

The entire site is prehistoric lava field, though the substrate was of two distinct types. In the northeast portion of the site, the soil was a fine yellowish ash, with occasional rock outcroppings. Erosional features revealed that the ash was, at least in some places, more than three feet thick and divided into two soil zones marked by a change in color. The upper layer was approximately one foot deep. A herd of approximately 50 goats was found in a large cave in the south bank of Kamakoa Gulch. Browsed plants, tracks, and droppings indicated that they travel widely through the site, and may contribute to the composition of the vegetation. They certainly appeared to have an impact on soil erosion. This portion of the site was covered by grassland, with very widely scattered trees. Along the road and in the bottom of Kamakoa Gulch, fountain grass (Pennisetum setaceum) predominated, with many patches of 'aheahea (Chenopodium oahuense) and wild zinnia occurring along the road. Away from the road, the predominant grass was native hard-stemmed love-grass (Eragrostis atropioides). Where erosion or disturbance by animals was heaviest, the exotic buffel grass (Cenchrus ciliaris) replaced the native grass. The only tree on the site was kiawe (Prosopis pallida). Generally a minor component of the vegetation in this part of the study site, there were some large groves along Kamakoa Gulch. Shrubs were not a major component of the

vegetation, but were represented by 'aheahea, 'ilima (Sida fallax), and 'uha-loa (Waltheria indica var. americana). The native prostrate vines pa'u-o-hi'i'aka (Jacquemontia ovalifolia subsp. sandwicensis), and alena (Boerhavia diffusa) were occasional between tussocks of the love-grass. Peppergrass (Lepidium hyssopifolium) and centaurium (Centaurium erythraea) were the only widespread weedy annuals. In low areas, where water persisted longest, ageratum (Ageratum conyzoides), sowthistle (Sonchus oleraceus), and threadstem carpetweed (Mollugo cerviana) were found. Weedy annuals were also common on the cliff-faces above Kamakoa Gulch.

In the southwestern portion of the study site, a more recent 'a'a flow, or series of flows, overlay the substrate that was exposed in the northeastern portion. This flow rose above the northeastern ash-plain by 20-80 or more feet, and was marked by boulders of various sizes with little intervening soil. Walking in this area was very treacherous. Vegetation was similar to that in the northeastern portion, with a relative decrease in grass-cover and increase in shrubs and trees. On the rocky hillsides, the diminutive fern 'iwa'iwa was occasional. Only single occurrences of nehe (Lipochaeta lavarum), uhiuhi (Senna gaudichaudii), and pua-kala (Argemone glauca) were noted. Spider flower (Cleome sp.) and hairy merremia (Merremia aegyptia) were locally common. The shrubs lantana (Lantana camara) and koa-haole (Leucaena leucocephala) were characteristic of this part of the site. The latter formed a very dense stand along the dry stream bottom that marked the southern boundary of the study site. Kiawe trees were found in increasingly denser stands toward the south, at times approaching a scrub-forest situation.

Along the road at the upper boundary of the site, there were numerous piles of landscape rubbish. For the most part, the plant materials were dying, posing little threat to the future composition of the vegetation of the site. At least three exotic species, however, were observed to have established: bittermelon (Momordica charantia), an unknown bean (Phaseolus sp.), and California pepper tree (Schinus molle). Bittermelon is probably of little significance, as it is already widely established in the Islands where there is somewhat more soil moisture. The bean will probably not be able to

persist indefinitely, and so may also be ignored. California pepper tree, on the other hand, is not widely established as an escaped plant, but has the potential to do so. The related Christmas berry (Schinus terebinthifolius) has escaped from cultivation and has become an extremely serious noxious weed in wetter parts of the Islands.

THREATENED AND ENDANGERED SPECIES

No listed, proposed, or candidate threatened and endangered species, as designated by the Federal and/or State governments (US Fish and Wildlife Service 1985; Herbst 1987) were found on the site. The Eragrostis grassland appears to be a remnant native plant community, but is so disturbed that essentially only the grass remains. Most other native plants associated with this grassland community are either so uncommon on the site as to have all but disappeared, or like wiliwili (Erythrina sandwicensis) and a'ali'i (Dodonaea viscosa), were observed a short distance outside of the site, but were not found on the site itself.

RECOMMENDATIONS

It is suggested that native plants be used in future landscaping of the site. A number are both attractive and adapted to the present climate, while others would thrive with common landscape practices. Some control should be exercised in bringing in exotic species. A number of undesirable weedy species (toxic, invasive, or both) could potentially escape from cultivation and become serious problems in the future. Examples are a cactoid euphorbia (perhaps Euphorbia lactea) and Aloe, both of which were seen in rubbish piles along the roadside.

The presence of exploded ordnance on the site suggests that unexploded ordnance may be present, though none was seen during the survey. Another problem is that the ash-soil in the northeastern half of the site appears to be subject to rapid and severe erosion. It should be landscaped as soon as possible after disturbance. This would also mitigate problems with dust.

LITERATURE CITED

Herbst, D. 1987. Status of endangered Hawaiian plants. Hawaiian Botanical Society Newsletter 26(2): 44-45.

U.S. Fish and Wildlife Service. 1985. Endangered and threatened wildlife and plants; Review of plant taxa for listing as Endangered and Threatened Species; Notice of review. Federal Register 50(188): 39526-39527 + 57 page table.

Wagner, W. H., Jr., and F. S. Wagner. 1987. Revised Checklist of Hawaiian Pteridophytes. Unpublished manuscript.

Wagner, W. L., D. Herbst, and S. Sohmer. In press. Manual of the Flowering Plants of the Hawaiian Islands. B. P. Bishop Museum Press.

SPECIES LIST

A list of all the vascular plants found on the site follows. Plants are organized in three groups -- ferns, monocots, and dicots. Within each group, they are further arranged in alphabetical order by family and genus. For each species, an accepted common name is given. For Hawaiian plants, the Hawaiian name is given if known. Biogeographic status is indicated by a letter code. An explanation of abbreviations used (other than author citations) is given below.

SCIENTIFIC NAME

sp. - correct species name not determined

STATUS

E - endemic, native only to the Hawaiian Islands

I - indigenous, native to the Hawaiian Islands, but also native elsewhere.

P - Polynesian, not considered native, but thought to have been introduced by the Polynesians prior to 1778

X - exotic, not native, introduced after 1778

SPECIES LIST

SCIENTIFIC NAME	COMMON NAME	BIOGEOGRAPHIC STATUS
FERNS AND FERN ALLIES		
Adiantaceae		
Doryopteris decora Brack.	'iwa'iwa	I
FLOWERING PLANTS		
MONOCOTS		
Gramineae		
Aristida adscendsionis L.	aristida	X
Cenchrus ciliaris L.	buffel grass	X
Eragrostis atropioides Hillebr.	hard-stemmed love-grass	E
Heteropogon contortus (L.) Beauv. ex R. & S.	pili	P
Pennisetum setaceum (Forsk.) Chiov.	fountain grass	X
Rhynchelytrum repens (Willd.) C. E. Hubb.	Natal redtop	X
DICOTS		
Anacardiaceae		
Schinus molle L.	California pepper tree	X
Cactaceae		
Hylocereus undatus (Haw.) Britt. & Rose	night-blooming cereus	X
Opuntia ficus-indica (L.) Mill.	panini	X

SCIENTIFIC NAME	COMMON NAME	STATUS
Capparaceae		
Cleome sp.	spider flower	X?
Chenopodiaceae		
Chenopodium murale L.	chenopodium	X
Chenopodium oahuense (Meyen) Aellen	'aheahea, 'aweoweo	E
Compositae		
Ageratum conyzoides L.	ageratum	X
Bidens cynapifolia HBK.	beggars' ticks	X
Bidens pilosa L.	Spanish needle	X
Cirsium arvense (L.) Scop.	Canada thistle	X
Lipochaeta lavarum (Gaud.) DC.	nehe	E
Pluchea symphytifolia (Miller) Gillis	pluchea	X
Sonchus oleraceus L.	sowthistle	X
Zinnia pauciflora L.	wild zinnia	X
Undetermined composite		X
Convolvulaceae		
Jacquemontia ovalifolia (Choisy) H. Hallier subsp. sandwicensis (Gray) Robertson	pa'u-o'hi'i'aka	E
Merremia aegyptia (L.) Urban	hairy merremia	I?
Cruciferae		
Lepidium hyssopifolium Desv.	peppergrass	X

SCIENTIFIC NAME	COMMON NAME	STATUS
Cucurbitaceae		
Momordica charantia L.	bittermelon	X
Euphorbiaceae		
Chamaesyce hirta (L.) Millsp.	hairy spurge	X
Ricinus communis L.	castorbean	X
Gentianaceae		
Centaurium erythraea Rafn.	centaurium	X
Labiatae		
Hyptis pectinata (L.) Poit.	comb hyptis	X
Leguminosae		
Chamaecrista nictitans (L.) Moench.	partridge pea, lau-ki	X
Desmanthus virgatus (L.) Willd.	desmanthus	X
Desmodium tortuosum (Sw.) DC.	beggars' ticks	X
Indigofera suffruticosa Mill.	indigo	X
Leucaena leucocephala (Lam.) deWit	koa-haole	X
Phaseolus sp.	bean	X
Prosopis pallida (Humb. and Bonpl. ex Willd.) HBK	kiawe, mesquite	X
Senna gaudichaudii (H. & A.) Irwin & Barneby	uhiuhi, kolomona	I
Malvaceae		
Sida fallax Walp.	'ilima	I

SCIENTIFIC NAME	COMMON NAME	STATUS
Molluginaceae		
Mollugo cerviana (L.) Ser.	threadstem carpetweed	X
Nyctaginaceae		
Boerhavia diffusa L.	alena	I
Papaveraceae		
Argemone glauca Pope	pua-kala	E
Portulacaceae		
Portulaca pilosa L.	'ihi	X
Solanaceae		
Datura stramonium L.	Jamestown (Jimson) weed	X
Solanum americanum Mill.	popolo	I?
Sterculiaceae		
Waltheria indica L. var. *americana* (L.) R. Br. ex Hosaka	'uhaloa, hi'aloa	I?
Verbenaceae		
Lantana camara L.	lantana	X

APPENDIX E

State Historic Preservation Division
Letter Dated January 9, 1992

and

An Archaeological Reconnaissance Survey
at Waikoloa Village, South Kohala, Hawaii

Prepared By:
William J. Bonk
University of Hawaii at Hilo
December, 1988

JOHN WAIHEE
GOVERNOR OF HAWAII

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

COUNTY OF HAWAII

RECEIVED
JAN 28 1992
at WAIKOLOA
HIGHLANDS OFFICE

January 9, 1992

LOG NO: 4423
DOC NO: 0049X

Mr. Norman Hayashi, Director
Planning Department
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Hayashi:

SUBJECT: County of Hawaii, Use Permit Application (91-13) --
Waikoloa Development Co., Elementary School and Related
Improvements (OCEA File No: 92-325)
Waikoloa, South Kohala, Island of Hawaii
TMK: 6-8-2: por. 26 and 31

This follows further to our letter of January 7, 1992, concerning the subject application. Our Hilo Office Field staff member, Marc Smith, was able to inspect the subject parcel. He observed no historic sites in the property. Hence, our historic sites concerns are met. The subject permit application will have "no effect" on historic sites.

If you have any further questions, please contact Kanalei Shun at 587-0007.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

KS:jle

c: OCEA (File No. 92-325)

AN ARCHAEOLOGICAL RECONNAISSANCE SURVEY AT WAIKOLOA VILLAGE, SOUTH KOHALA, HAWAI'I

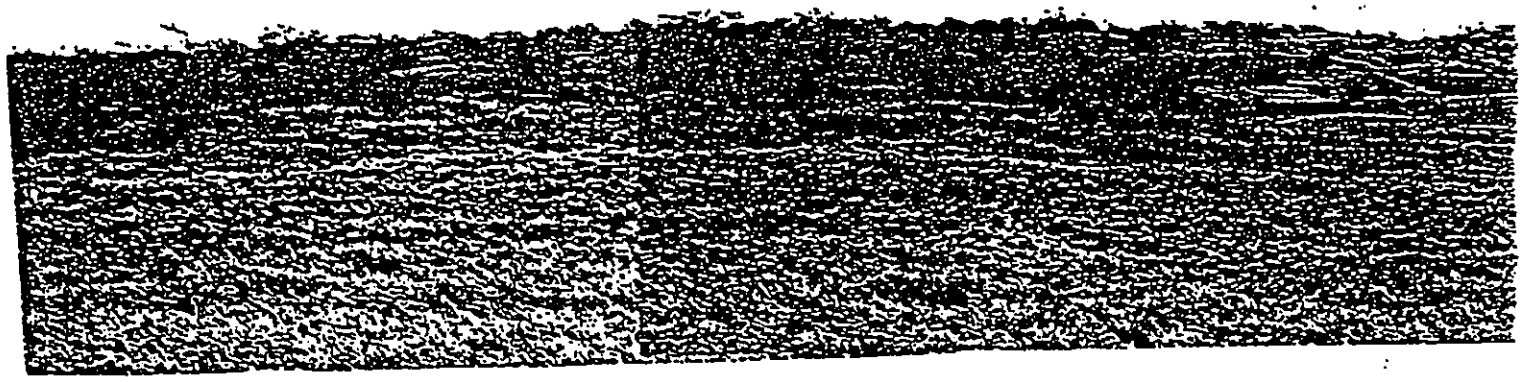
by

WILLIAM J. BONK

UNIVERSITY OF HAWAII AT HILO

prepared for

BELT, COLLINS & ASSOCIATES



Hilo, Hawaii

December, 1988

INTRODUCTION

During the early part of May, 1966 this writer was contacted and asked to submit a proposal for an archaeological reconnaissance survey and report for a parcel of land in the Waikoloa area of Hawaii. After examining the particulars regarding area, access, etc. a proposal was drafted and sent to Belt, Collins and Associates of Honolulu. Early in July I received authorization to proceed with the project and the following pages of this report provide the results of the investigation and the recommendations that result from that research.

Prior to completion of this report a preliminary letter statement of my findings was communicated to Belt, Collins and Associates, to pertinent State and County offices, and to the Director of Planning at Waikoloa.

AREA

The area surveyed and reported on in this report is in the *ahupua'a* of Waikoloa, South Kohala District, on the island of Hawaii. It consists of a 580 acre parcel of land at the north end of Waikoloa Village (See Figure 1.) In addition, it may be further identified through its Tax Map Key: 6-8-02:26, which places its location to the north and west of Paniolo Drive (See Figure 2.)

The general shape of the project area is slightly longer in its north-south axis than in its east-west direction although there is a slight bulge in the center of its eastern margin. A rough dirt road extends northward from the end of Paniolo Drive and so forms the 6000± feet eastern boundary of the plot. The northern border follows the center of Kamakoa Gulch for approximately 4600 feet, whereas a smaller, unnamed gulch is at the southern perimeter. Here the study area is at its narrowest, with only about 4000 feet separating the southeast corner of the parcel from that of the southwest. The 5000 feet of the western borderline curves slightly in a northwest direction thereby allowing for a greater width in the northern portion of the parcel in comparison to that of the southern portion of the plot.

The surface gradient within the tract exhibits a general downward slope toward the west. In the north the terrain drops some 213 feet from east to west, with the lowest elevation, some 567 feet above sea level, recorded in the northwest corner of the project area. In contrast, a drop of only 135± feet was noted for the southern margin. The highest points within the tract are usually along or just within the eastern border. In the northeast we recorded 780± feet above sea level, in the southeast approximately 785 feet, and at a point roughly one-third of the distance north of the southeast corner we recorded the highest elevation in the parcel at 893 feet above sea level.

The region in and around Waikoloa Village is noted for its savanna-like quality of the physical environment. Rainfall is light, probably no more than 35 to 40 inches a year. As a result course grasses with scattered scrub tree growth, most often *keawe*, dominate within the ecosystem. In addition, there are numerous days during the year when the wind is quite strong and sometimes gusty. The project area is very typical of that just described for the broader region (See Title Page illustration and Figures 3-6.)

The ground surface varies somewhat from place to place

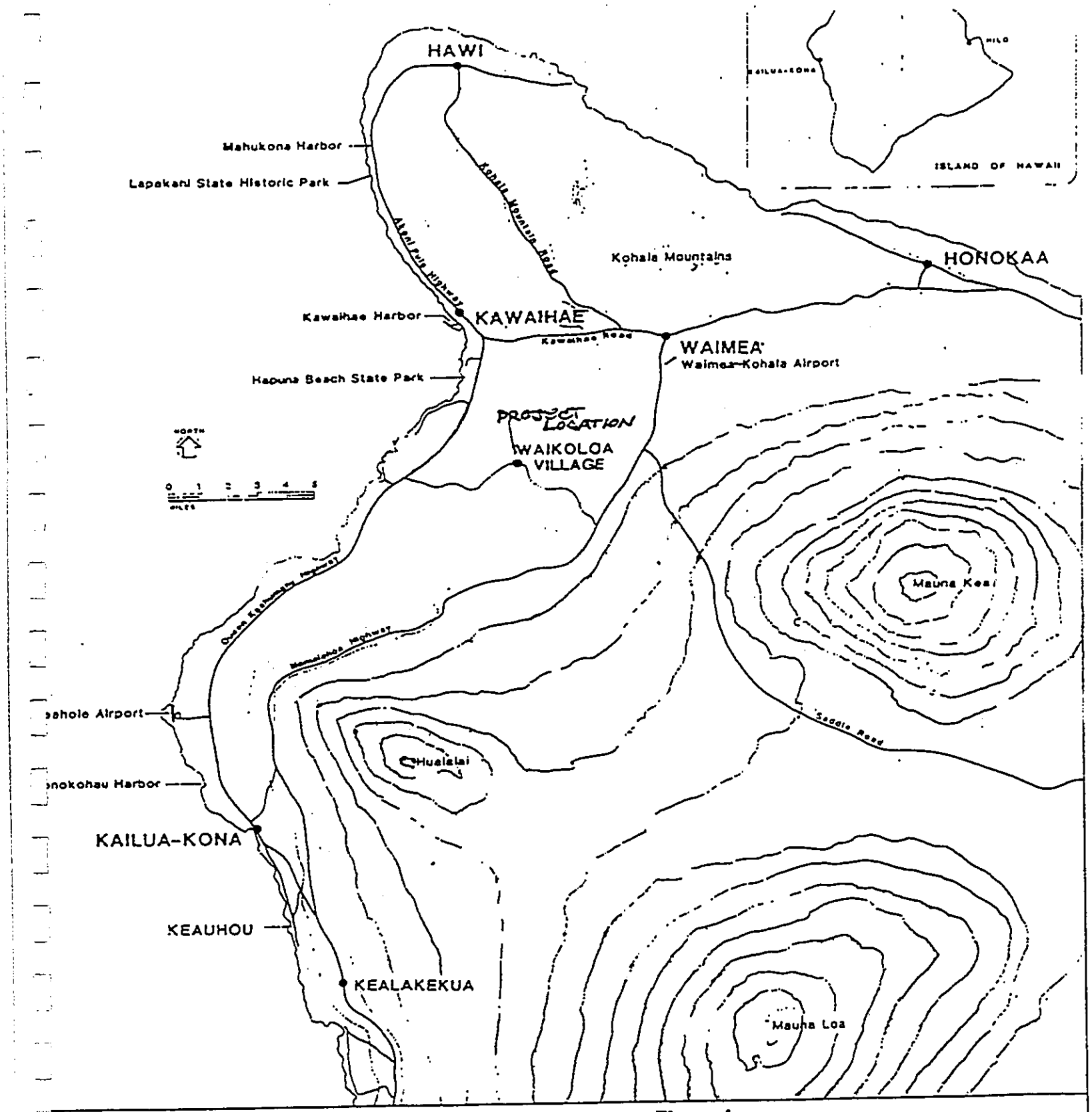


Figure 1

REGIONAL MAP

Kohala and Kona, Hawaii

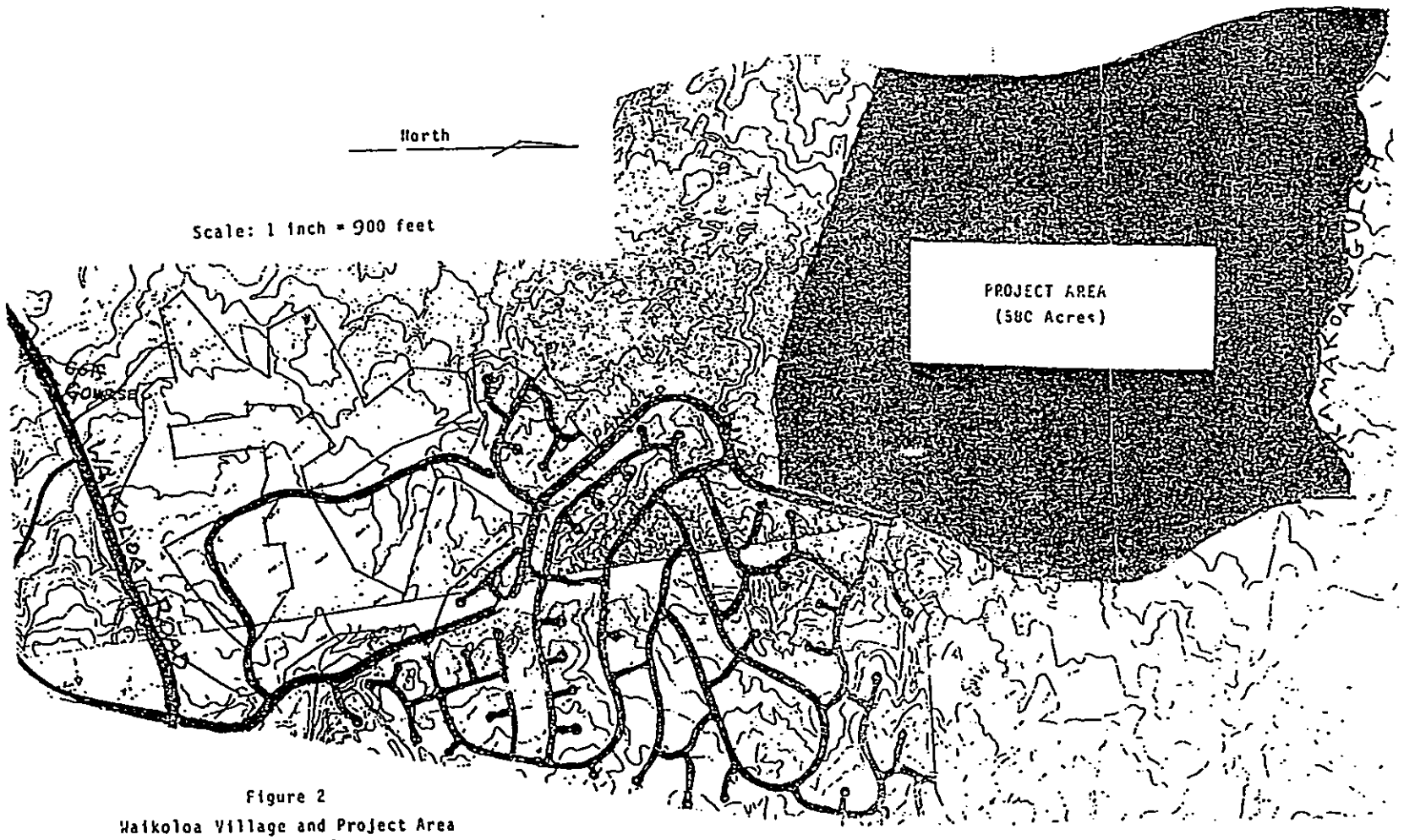


Figure 2
Waikoloa Village and Project Area

Figure 3

At Southeast of the Project Area (Looking westward)

Figure 4

At Northeast of the Project Area (Looking westward)

Figure 5

At Southeast of the Project Area (View South and Southwestward)

F: ure 6

At Northeast of the Project Area (View west and Nor. stward)

within the study area but for most of the northern half of the tract it tends to effectuate a visual appearance of that best described as a rolling or slightly undulating expanse (See Figures 4 and 6.) This northern section was much more readily traversed, for the ground underfoot was more secure than that to the south. The southern half of the project area includes places where the ground surface drops more precipitously as well as where rock outcroppings hinder steady movement. Furthermore, localized tracts covered with *'a'ā* resulted in difficulty of movement and a reasonable time for examination. More difficult yet were the *'a'ā* tracts covered by grass. Here both footing as well as sight were limited. One result was the sharp increase in time required to examine a particular section of the study area. On numerous occasions while in the field this writer struggled and eventually fell or stumbled because of the terrain.

METHODOLOGY

This report is the end product of a field investigation commonly referred to as a reconnaissance survey. Visual observation and record keeping while walking through an area to be investigated is normally part of the methodology used in the field for this type of survey. In this case notes were recorded in a field book and photographs were taken in both black and white and color film. Many times when cultural data or material is encountered the survey leads to additional stages of investigation. When this takes place it usually is the result of recommendations included as part of the reconnaissance survey.

For this investigation the field survey was carried out by myself with the aid of my son, Ken, who quite often accompanies me in the field.

Approximately 115 hours went into the field portion of this survey. Eight transects in an east-west/west-east direction were first carried out, followed by four transects in a south-north/north-south direction. With this amount of detailed coverage of the area we feel quite confident that no portion of the study area was overlooked.

FINDINGS AND RECOMMENDATIONS

Throughout the field examination we found nothing to indicate past use of the project area other than some scattered shrapnel fragments indicative of use as a military target area in the recent past. However, these fragments were quite limited and therefore it is surmised that this use was of an accidental or sporadic nature rather than one of a regular occurrence. Perhaps the event that led to the presence of these metal fragments in this area dates to the period of World War II when large numbers of U.S. servicemen were based and trained at Waimea and used the surrounding region for training purposes.

In conclusion, and as a result that we found nothing of prehistoric or historic significance within the area investigated, we therefore must recommend that no further archaeological work be required. In addition, it is further recommended that, based on the above, any land transformation would not be archaeologically detrimental and therefore can proceed.

ADDENDUM

The following additional remarks to my report of December 1988 should be viewed as a form of clarification and addition. This is so as to add to what has originally been set down as well as to illuminate that which may have been questionable.

The first two figures (maps) are both descriptive and interrelated, in that the study area is to be found north of Waikoloa Village and west of the northernmost end of Paniolo Drive. This road is paved and completed for somewhat less than one-third the distance along the east border of the study area. Beyond that an unpaved "jeep" trail extends along the east border and beyond the northern limits of the study area.

An additional map, originally drafted by Engineers Surveyors Hawaii, Inc. is included in this supplement so as to illustrate the lay of the land. As one can see from a perusal of this map only two gullies are found and these delineate the southern and northern ends of the area examined. Nowhere were we restricted from examining the ground surface although the banks of the gullies are somewhat more difficult to view, as was a region in the south-west where thin slabs of clinker *'a'ā*, partially covered by grass, produced unsure footing. This portion of the area examined also has the greatest incidence of surface declivity, hence the need for more time in coverage.

No recorded lava flows are within the area examined. A brownish patination on the rock surface also supports a minimal age of more than 200 years for the flow. How much beyond this time, however, is fathomless. The northern half of the tract was walked over more readily and with less difficulty, for all but the immediate locale of Kamakoa gulch. The northern portion of the area examined exhibits no steep slopes and very little rough ground surface.

In terms of climate and vegetation the land is quite arid. Mean annual temperature is about 24°C (75°F) and mean annual rainfall is a little over 250 m (about 10 in.) If we use the Koeppen classification system we have to refer to this area as Hot Desert (BWh.)

The Waikoloa Village area is noted for its windy conditions. Land breezes tend to sweep across this open region, predominantly from the northeast, but occasionally during the winter months there is a shift and they then blow from the southwest.

With this reversal of wind pattern comes most of the moisture during the winter months.

The subject area falls within McEldowney's Vegetation Zone III (1983: 410). Grasses form the dominant vegetation interspersed with scattered stands of *kiawe*. Buffelgrass and *pili* predominate over other grasses, and shrubs are seen more often than in lower elevations. Fountain grass is seen here and there and seems to be gaining in significance over time.

In the northern half of the study area, soils are shallow aridsols of the Kawaihae series (KNC). Well drained, gritty, and stony, they tend to be moderately eroded by wind and water. Formation is from aeolian fine sand and silt, although weathering of volcanic ash is also part of the formative process. An upper horizon of very fine sandy loam overlays loam or silt loams with a weak medium and/or coarse prismatic structure. Calcium carbonate collections are seen as coatings on rocks (USDA Soil Conservation Service; 1973:26.) Hard *pahoehoe* bedrock is at a depth of between 20 to 40 inches, permeability is moderate and runoff is medium. Roots usually penetrate to bedrock. This soil is used mostly for pasture although no cattle were seen in the area during the field investigation.

The southern half of the area examined is classified as Very Stony Land (rVS.) It shows very shallow soil material and a high proportion of *'a'a* lava outcroppings. Slope increases here with a range of between 10 and 15 percent. Between lava outcrops and in the cracks of the lava, the soil extends to a depth of 5 to 20 inches. Erosion here is slight. (USDA Soil Conservation Service, 1973:52.)

The prehistoric land use pattern in the Waimea-Waikoloa area was originally subsistence horticulture and a subsistence marine exploitation. By the later half of the 16th century, we see changes in this pattern with an increase, through time, of what I have called a "subsistence-support" economy. This reaches its peak in the late prehistoric of the second half of the 18th century (Bonk, 1985:6.) As foreign ships increased in numbers at Kawaihae, in the early historic period, we see a further development to a "subsistence-trade" economy for the environs of Waimea. Through the 19th century, cattle became a greater and more important part of the economic base, the transporting of products, and a money-based economic system gradually substituted for that of a subsistence base.

As was mentioned previously (Bonk, 1985:6) these cultural changes went hand in hand with a related environmental evolution in the form of botanical and zoological change. Subsequently, this had an effect on the land surface. Exotic animals

and plants substituted for endemic varieties, which furthermore set off a new ecological movement that changed the physical as well as the cultural environment.

The above cultural-ecological overview, although originally written with respect to the Waimea area, has implications as well for Waikoloa. It was Soehren (1980) who pointed out that:

> "At the Mahele of 1848, the land, Waikoloa, was awarded to George Huen Davis, son of Isaac Davis, the English companion and advisor to Kamehameha I."

The viewing of a present day tax map tends to over state this award to Davis by the king. Because of the nature of the land many "commonly regarded" Waikoloa not "as an *ahupua'a* but as "an *'ili'aina* of Waimea." Soehren goes on to say that Waikoloa' gargantuan size is in inverse proportion to its value to the ancient Hawaiian economy." Because of the availability of water and the productive soils of the Waimea area, the development depicted previously (Bonk, 1985) allowed Waimea to become the "food-basket" of South Kohala. It became more significant as time passed and the surrounding areas became more subordinate to its power. This could well account for the interpretation of Waikoloa as an *'ili'aina*. It could also be the reason for its large size, for value is not necessarily based upon size alone, nor size of great value. In fact we might better evaluate on the basis of other criteria, such as the effectiveness of cultural and population support criteria. This discussion leads one to sum up by quoting Soehren (1984) who says, "In aboriginal times, before cattle, these lands (Waikoloa) were marginal to the Hawaiian economy, serving as a reservoir of material products such as *pili* grass and birds." Certainly, without an assured source of water, as the people of Waimea provided through the building of their extensive irrigation system, the midlands of Waikoloa were not able to support horticulture. A yearly rainfall of 10 inches and a soil base inherent with limitations of a cultural nature would not allow permanent settlement at the time. This can account for the paucity of archaeological remains in the midlands of Waikoloa and explains as well why we found nothing of prehistoric cultural significance in the region that we scrutinized. As cultural evolution proceeds, however, cultural transformation can substitute for the lack of use in the past. Today, the village of Waikoloa, is fast growing. However, only the cultural "umbilical cords" of piped water, financial support from elsewhere, speedy transportation, and a national-international economic/cultural base is this possible at this time.

Marine exploitation was more readily available for the coastal inhabitants of Waikoloa and its neighboring *ahupua'a*.

This is readily noted by a examination of the archaeological and historical literature. Starting with Reinecke in 1930 and extending to the present, we see an increasing number of reports covering the lowland regions. The summarization and analysis of this data shows the use of these coastal, inshore and offshore areas as of economic importance in the prehistoric period. If the midlands were marginal, the coastal regions were of import. This produced a drawing attraction for people and cultural development within the coastal region, but not in the midlands. Here, only off and on incursions were made for the gathering of *pili* grass for the thatching of homes and other structures, and the passage through these lands on travels elsewhere, hardly a reason for settlement, or even lingering long enough to leave their cultural marks on the surface of the ground. Only in recent years do we see the accumulation of cultural debris. Prior to the development of the village of Waikoloa in the early 1970's only the military left their mark on the study area. There is no question that some military personnel were in the region, perhaps during WW II, for we found the remains of field communication wire as well as a fair number of examples of schrapnel fragments. The latter showed clumping about centers of dispersal, just what would be expected if shells were fired into the area

Finally, and with regard to methodology, we made use of aerial photos and walked the length of the gullies to examine for the presence of cultural transformation, but to no avail. Nothing of a cultural nature, other than recent fence-lines, showed on the aerials.

As my son was with me in the field and aided in the transects, we were able to make eight passages each in a north-south, south-north direction. With these 16 north-south crossings combined with a larger number of east-west, west-east transects we were able to pass a given point on the landscape at no greater distance than approximately 80 to 90 feet. Even with this rather close proximity to previous passages we often times diverted if something caught our eye. In all cases what caught our attention proved to be nothing more than at best, an outcropping of rock.

REFERENCES CITED

Bonk, William J.

1985 "An Archaeological Survey in the Waimea-Paauilo Watershed Area of Portions of the Districts of South Kohala and Hamakua, County of Hawaii, Hawaii" (With Addendum.) Papers in Ethnic and Cultural Studies, 85-3, University of Hawaii at Hilo.

McEldowney, Holly

1983 "A Description of Major Vegetation Patterns in the Waimea-Kawaihae Region During the Early Historic Period." Report 16 in Jeffrey T. Clark and Patrick V. Kirch, eds., Archaeological Investigations of the Mudlane-Waimea-Kawaihae Road Corridor, Island of Hawai'i. Report 83-1, Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu, Hawai'i.

Reinecke, John E.

1930 Survey of Hawaiian Sites from Kailua, Kona, to Kalahuipua'a, Kohala. Manuscript at B.P. Bishop Museum, Honolulu.

Soehren, Lloyd J.

1980 Tax Map Key 6-8-03:28 Waikoloa. A Reconnaissance Survey.

1984 Archaeological Reconnaissance Survey of the Proposed Lalamilo Wind Farm Site. TMK: 6-6-01:2

US Dept. of Agricultuture, Soil Conservation Service

1973 Soil Survey of the Island of Hawaii, State of Hawaii. Government Printing Office, Washington.

GLOSSARY OF HAWAIIAN WORDS

'a'ā	Lava, stony, rough clinker type.
ahupua'a	A land division usually extending from the uplands to the sea. So called because the boundary was marked by a heap (*ahu*) of stones.
kiawe	The algaroba tree. (Prosopis Sp.)
'ili 'āina	An *'ili* land division whose chief pays tribute to the chief of the *ahupua'a* of which it is a part, rather than directly to the king.
pāhoehoe	Smooth, unbroken type of lava, contrasting with *'a'a*

APPENDIX F

Traffic Impact Analysis Report
Waikoloa Elementary School

Prepared By:
M&E Pacific, Inc.
November 15, 1991

TRAFFIC IMPACT ANALYSIS REPORT

WAIKOLOA ELEMENTARY SCHOOL

By:

M&E PACIFIC, INC.
100 Pauahi Street, Suite 212
Hilo, Hawaii 96720
(808)961-2776

November 15, 1991

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APPENDIX D – TRAFFIC CALCULATIONS FOR THE UNSIGNALIZED INTERSECTIONS LEVEL OF SERVICE (LOS) ANALYSIS – AM AND PM PEAKS

TRAFFIC IMPACT ANALYSIS REPORT

WAIKOLOA ELEMENTARY SCHOOL

An elementary school is being proposed for Waikoloa Village in South Kohala, Hawaii. This report documents the results of a study conducted to evaluate the traffic impacts of the proposed project. The study included the forecast of future traffic conditions and its analysis to determine the need for any mitigating actions which would result from the proposed project.

PROJECT DESCRIPTION

The proposed project site is located on the southwest corner of the Paniolo Avenue-Ho'oko Street intersection, approximately two miles north of Waikoloa Road, as shown on Figure 1. The adjacent land uses are residential, including the County's affordable housing projects.

Waikoloa Development Company proposes to develop and construct the elementary school, and turn it over to the State of Hawaii Department of Education for operation. The school is expected to open in 1994 with 327 students in Grades K through 5. The Department will then expand the school until it reaches 800 students in Grades K through 5 by 2004. In addition to students living in Waikoloa Village, the school is expected to serve students living at Puako and Kawaihae Village. In consonance with Department policy, all students living further than one mile from the school will be provided with school bus transportation.

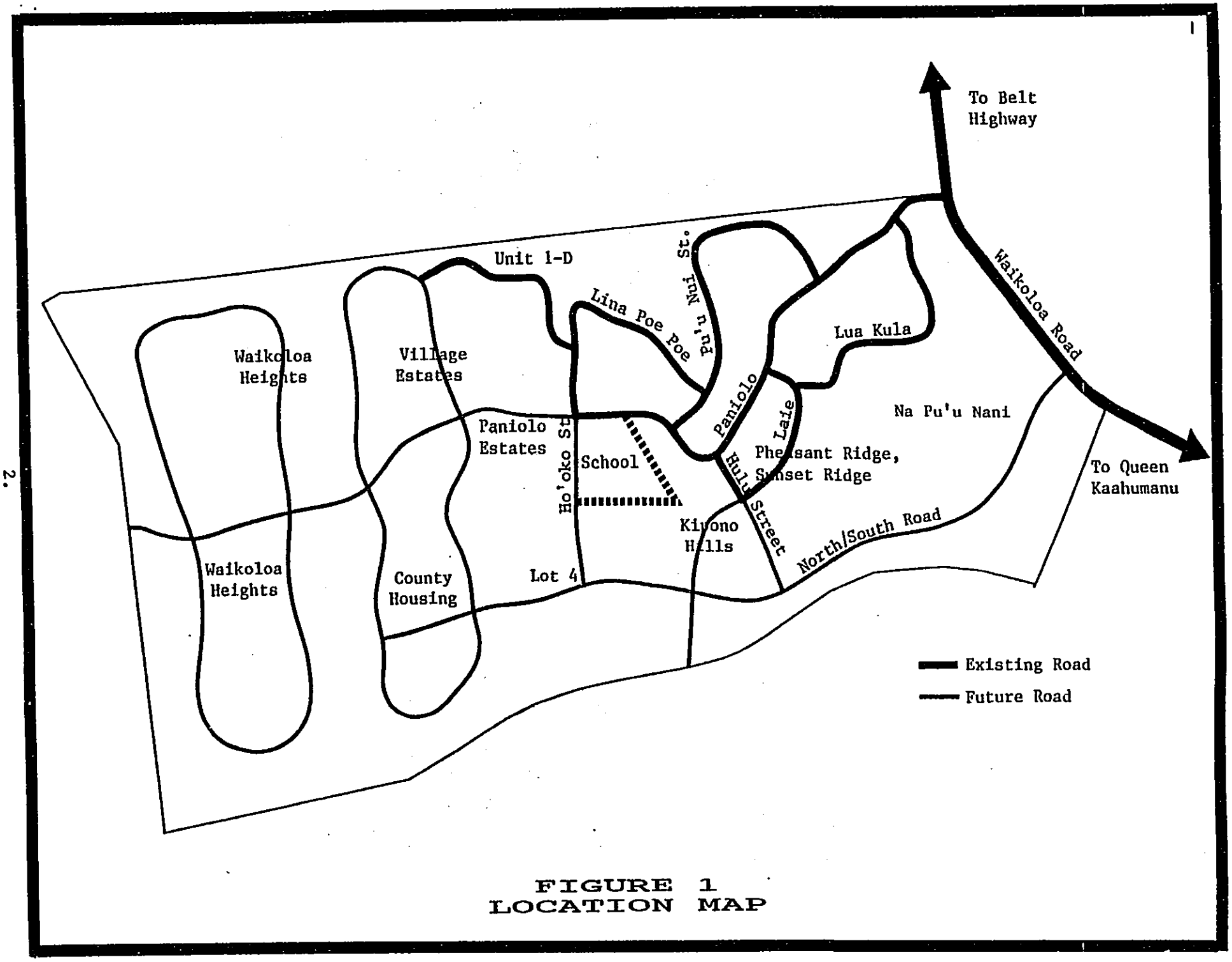


FIGURE 1
LOCATION MAP

The proposed site plan on Figure 2 shows the parking lot at the Paniolo Avenue-Ho'oko Street intersection corner, and a one-way circulation pattern. Traffic will enter via Ho'oko Street and egress via Paniolo Avenue. A separate bus loading area will be provided.

PROPOSED CONDITIONS

Current conditions were not evaluated because of major land use changes taking place in the vicinity of the project site. The future land uses proposed by the developers of the various projects for 1995 and 2005 are summarized on Figure 1 and Table 1. Many large residential projects are being proposed, including the County's affordable housing projects. Additional roadways are also being proposed to support the new projects. The major addition will be an unnamed circulation roadway makai of and parallel to Paniolo Avenue providing north-south access to Waikoloa Road. Ho'oko Street is one of several roadways providing mauka-makai access between Paniolo Drive and the new north-south road.

Due to the nature of the project and the future roadway system, traffic impacts were analyzed at two intersections on Ho'oko Street: Paniolo Avenue and the new unnamed north-south road makai of the project site. Traffic impacts were analyzed for the years 1995 and 2005, one year after the initial opening and the buildout condition are reached.

TRAFFIC FORECASTS

The traditional sequential procedure of trip generation, distribution, and assignment was used to estimate the number

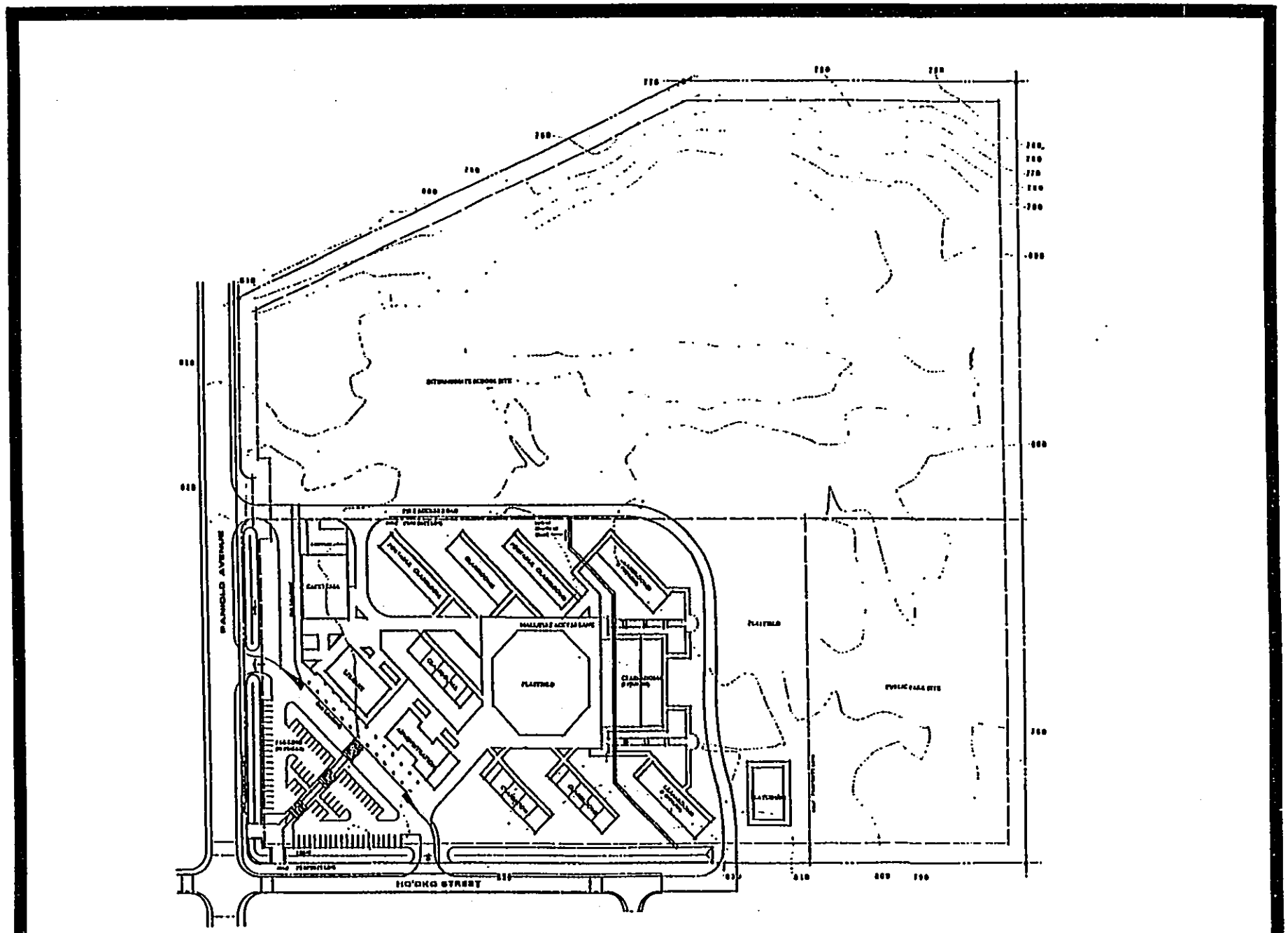


FIGURE 2
SITE PLAN

TABLE 1

PROJECTED LAND USES

Project	Forecast Year and Land Uses 1995	2005
Waikoloa Village, Unit 1-D*	194 sfu	228 sfu
Paniolo Estates	180 sfu	180 sfu
County Housing Project	575 sfu	800 sfu
County Housing Project	300 mfu	360 mfu
Village Estates	100 sfu	310 sfu
Waikoloa Heights	90 sfu	820 sfu
Lot 4	0	300 sfu
Elementary School	327 students	800 students

Notes:

*Units access Ho'oko Street

sfu = single-family units

mfu = multi-family units

of vehicle trips which would be generated by the proposed residential and school projects in both peak hours, the distribution of these trips, and the specific turning movements affected. The traffic which would be generated by the proposed project was added to the residential generated traffic forecasts to obtain the total forecast traffic volumes.

Trip generation rates for single-family and apartment (for multi-family) dwelling units were obtained from the ITE Trip Generation, (Fourth Edition, 1987). The ITE trip generation rates for elementary schools in the A.M. peak shows inbound traffic to be slightly higher than the outbound traffic. The additional inbound trips were assumed to be employee trips, since parents dropping off students were expected to have the same inbound and outbound volumes. The ITE rates for the A.M. peak were adjusted so that volumes of student drop-off trips were doubled. The ITE rates were assumed to be more reflective of urban area schools where more students are expected to walk or take transit. Also, many students can be expected to bike or walk to school as the school grades increase. The elementary school is expected to generate very small traffic volumes in the P.M. peak which occurs after school is let out. The trip generation rates are shown on Table 2 and the results of the analysis are shown on Table 3.

Separate trip distribution percentages were used for the residential and school traffic. The distribution and

TABLE 2

TRIP GENERATION RATES

Land Use	AM Peak Hour Inbound	AM Peak Hour Outbound	PM Peak Hour Inbound	PM Peak Hour Outbound
Single-family units	0.20	0.55	0.63	0.37
Multi-family units*	0.10	0.43	0.46	0.21
Elementary School**	0.23	0.184	0	0.015

Notes:

*ITE apartment land use rates

**ITE rates for AM peak adjusted to double student drop-off traffic

TABLE 3

PEAK HOUR TRIP GENERATION ANALYSIS

	1995				2005			
	AM PEAK HOUR		PM PEAK HOUR		AM PEAK HOUR		PM PEAK HOUR	
	In	Out	In	Out	In	Out	In	Out
Waikoloa Village, Unit 1-D	39	107	122	77	46	125	144	84
Paniolo Estates	36	99	113	67	36	99	113	67
County Housing	145	445	500	276	196	595	670	372
Village Estates	20	55	63	37	62	170	195	115
Waikoloa Heights	18	50	57	33	164	451	517	303
Lot 4	0	0	0	0	60	165	189	111
Elementary School	75	60	0	5	184	145	0	12

assignment of residential trips would be affected by the direction of travel on Waikoloa Road, whether mauka or makai. The percentages assumed for the two forecast years are shown on Table 4. The distribution of school drop-off trips were assumed to be proportional to the distribution of residences in Waikoloa Village, as shown on Table 5.

The results of assigning the residential and school-generated traffic volumes to the specific turning movements at the two study intersections are shown on Figures 3 and 4, respectively. The ambient (residential) traffic forecasts were added to the school-generated volumes to obtain the total forecast volumes on Figure 5. This addition would tend to overstate the total traffic which would be generated since some of the school drop-off traffic can be expected to be parents dropping their children off at school on their way to work. However, this conservative assumption was used.

TRAFFIC IMPACT ANALYSIS

The total forecast volumes from Figure 5 were analyzed using the TRB Highway Capacity Manual (1985) methodology for unsignalized intersections. The methodology yields levels of service for critical turning movements at the intersection ranging from A (best) to F (worst). Traffic improvements are generally considered for level of service F conditions.

The results of the analysis are summarized on Table 6. The evaluation of the results indicate that the proposed project will not have a significant traffic impact. Traffic improvements are not required for 1995. However, the major

TABLE 4

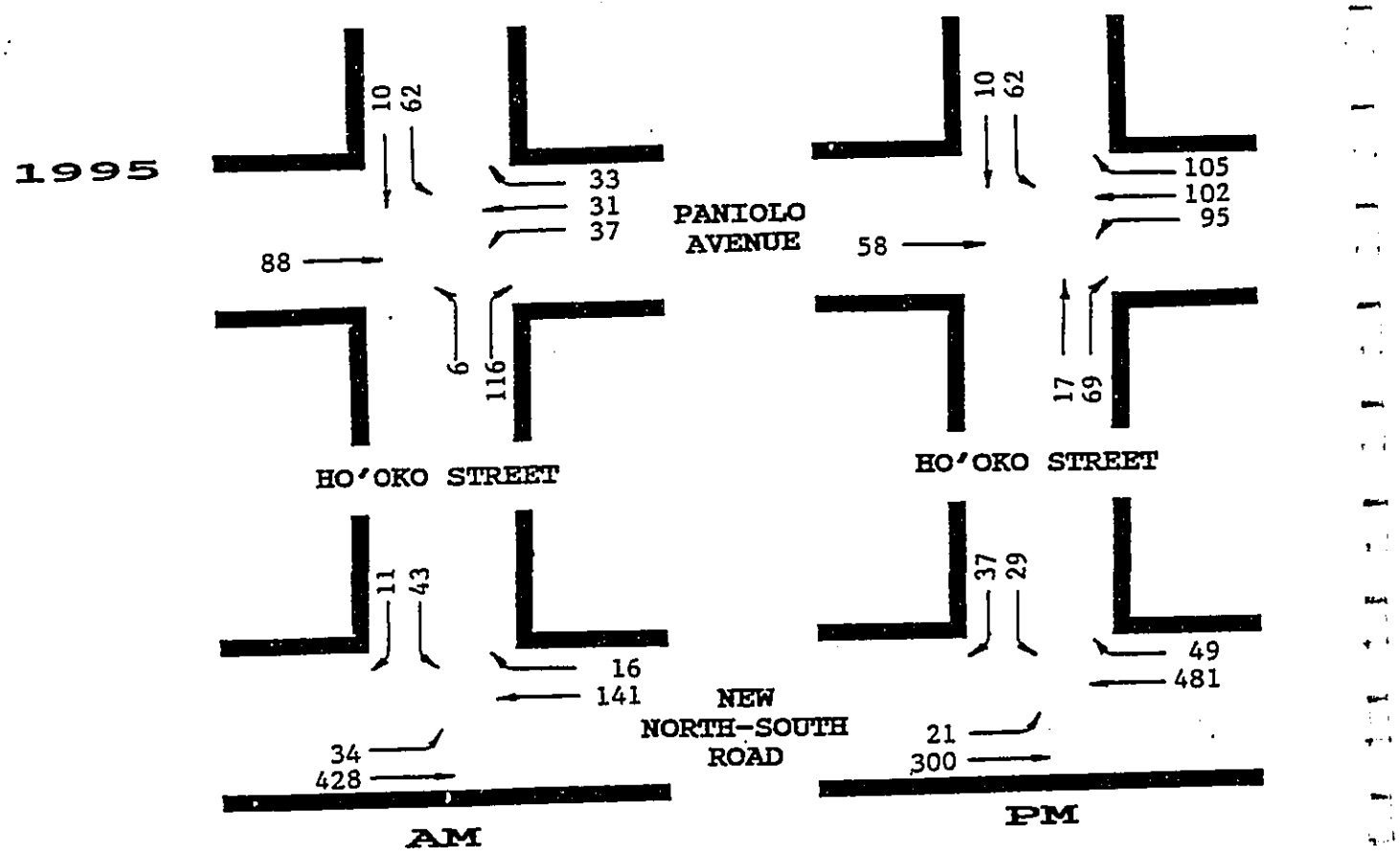
TRIP DISTRIBUTION ASSUMPTIONS

Direction of Travel	Travel 1995	2005
Mauka on Waikoloa Road	30%	25%
Makai on Waikoloa Road	70%	75%

TABLE 5

DISTRIBUTION OF WAIKOLOA RESIDENCES
FOR DISTRIBUTION OF A.M. PEAK HOUR STUDENT TRIPS

Roadway Direction of Travel	1995 Number of Residences	1995 Number of Trips	2005 Number of Residences	2005 Number of Trips
Paniolo Ave. South of Ho'oko St.	1282	25	1454	42
Paniolo Ave. North of Ho'oko St.	190	4	1130	33
New North-South Rd. South of Ho'oko St.	732	14	1204	35
New North-South Rd. North of Ho'oko St.	875	17	1160	35



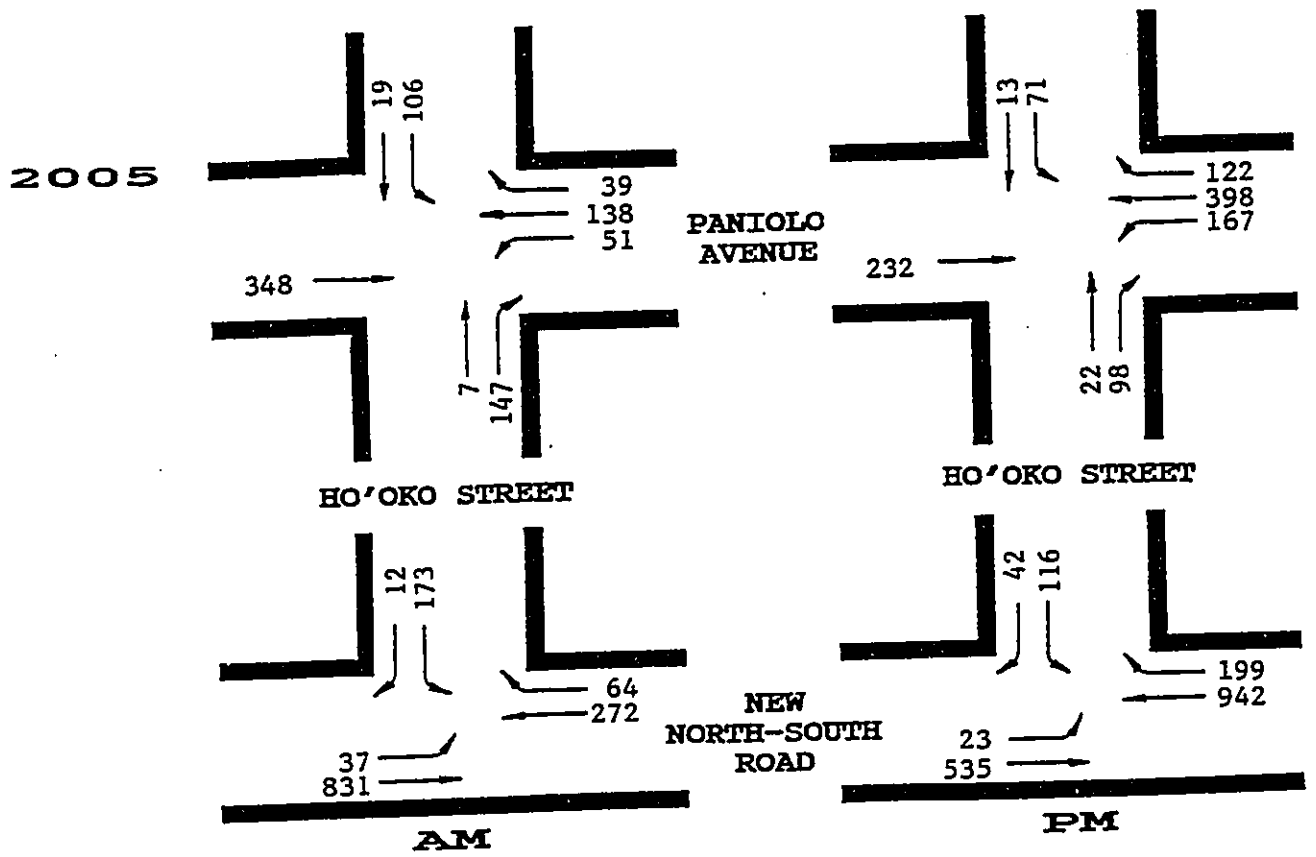


FIGURE 3
AMBIENT TRAFFIC FORECAST

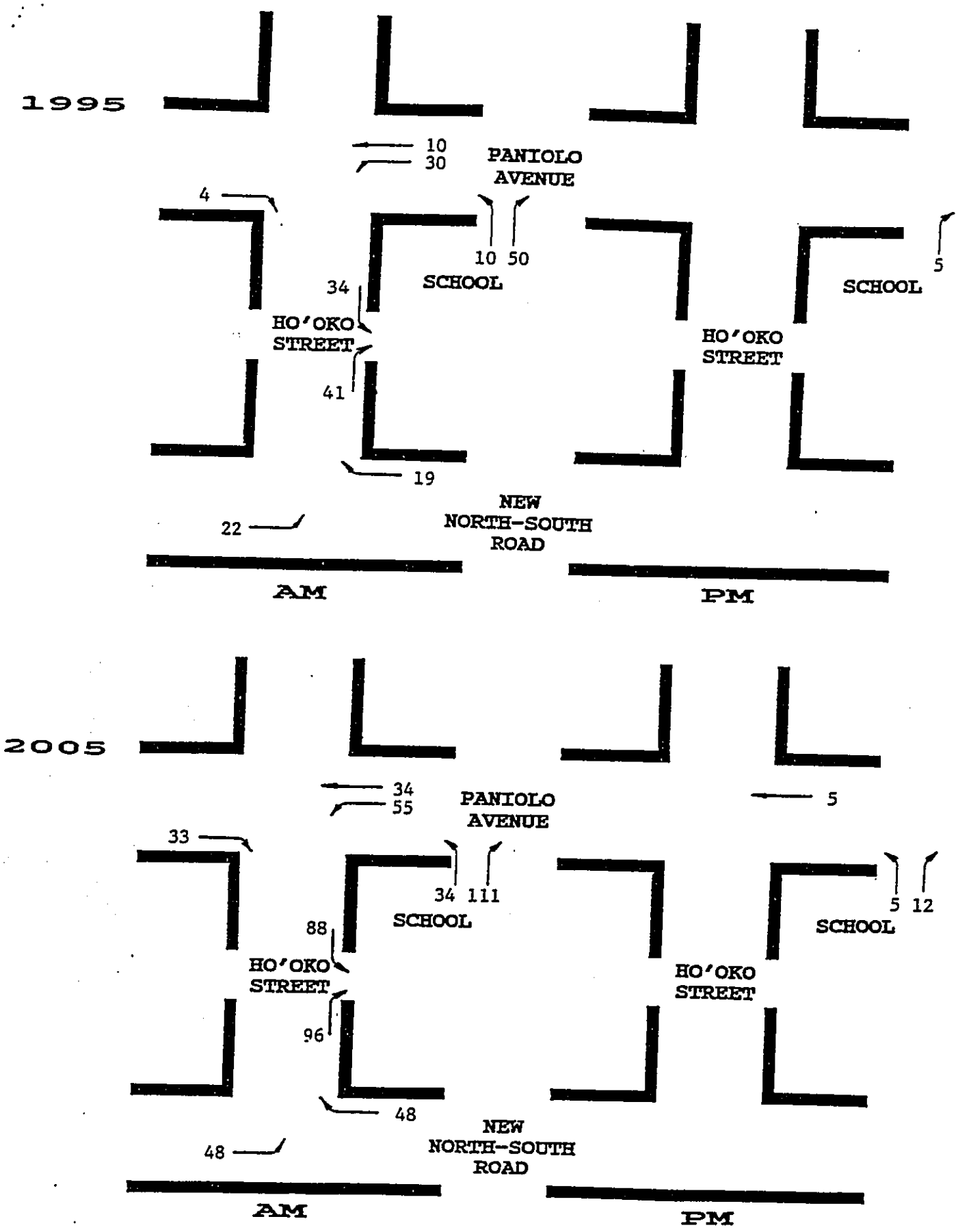
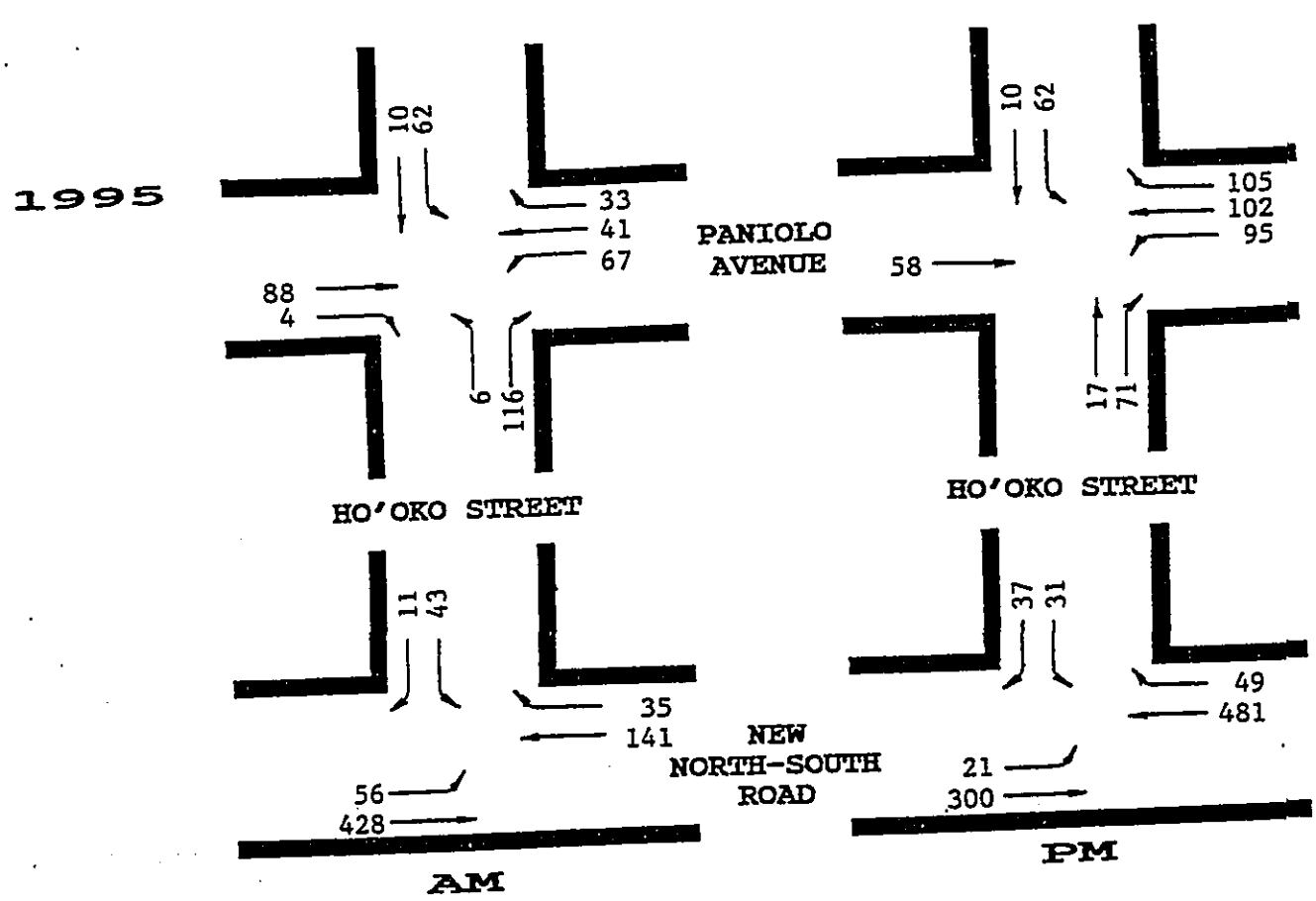


FIGURE 4
PROJECT GENERATED TRAFFIC



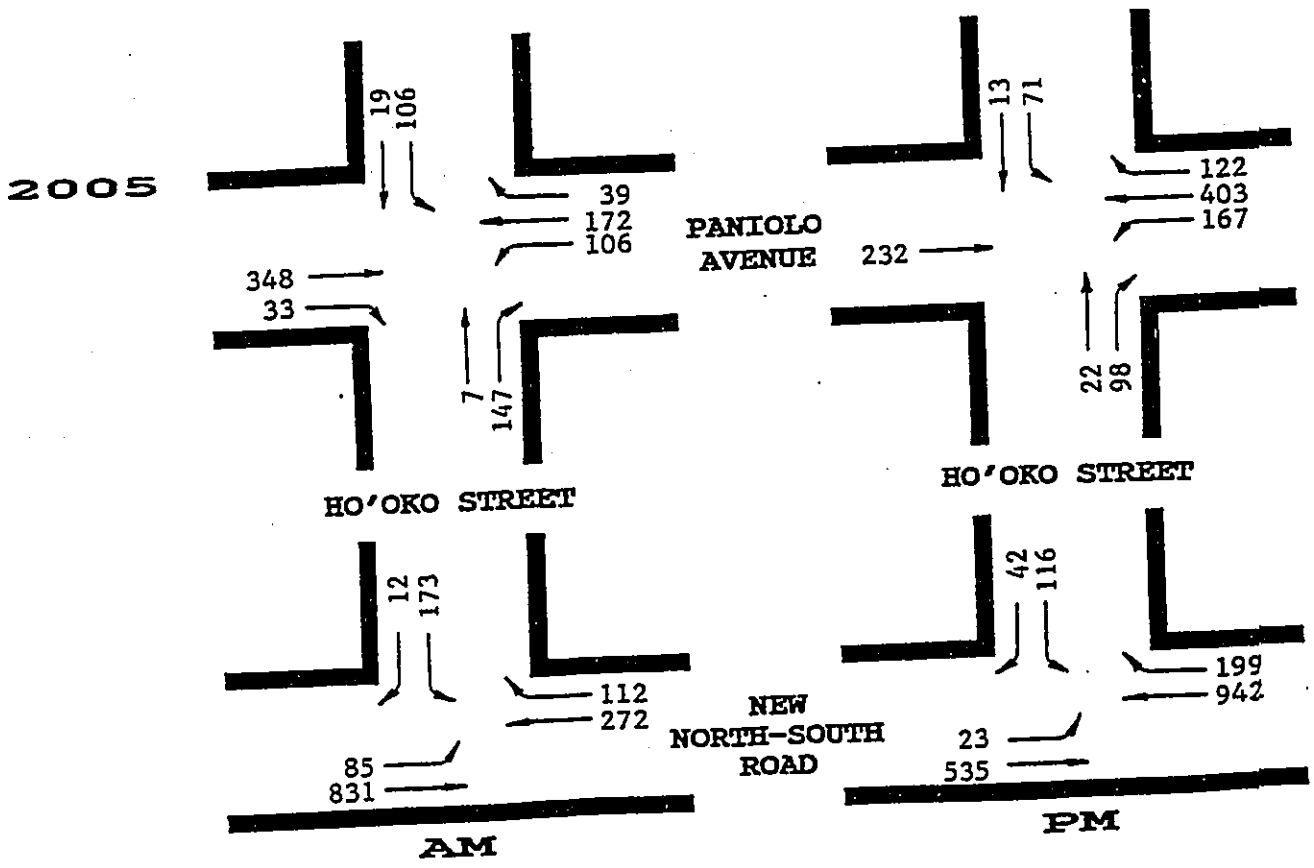


FIGURE 5
TOTAL TRAFFIC FORECASTS

TABLE 6

LEVEL OF SERVICE ANALYSIS

Intersection and Movement	1995 A.M.	1995 P.M.	2005 A.M.	2005 P.M.
PANIOLO AVENUE. - HO'OKO ST.				
-- Ho'oko St. makaibound left turn	C	C	E	E
-- Ho'oko St. maukabound left turn	A	A	A	D
-- Paniolo Dr. northbound left turn	A	A	A	A
-- Paniolo Dr. southbound left turn	A	A	A	A
NEW NORTH-SOUTH RD. - HO'OKO ST.				
-- Ho'oko St. makaibound left turn	C	D	F	F
-- Paniolo Dr. southbound left turn	A	A	A	C

cause of traffic degradation at the new north-south road/Ho'oko Street intersection in future years will be the general increase in ambient traffic. The level of service F values obtained for unsignalized turning movements at the intersection indicate the need for traffic improvements. The most applicable improvement at both intersections would be traffic signals. Traffic signals would be installed at the intersection when established warrants for this purpose are met.

A separate left turn lane is recommended for the northbound approach of Paniolo Drive with Ho'oko Street by 2005.

The proposed elementary school will generate walking and bicycle trips in the project vicinity, especially as the school is expanded to include the higher grade levels. Appropriate traffic control measures should be implemented to accommodate the students walking and biking to school. Crosswalks should be striped at the appropriate locations to encourage safe street crossings. Reduced speed limits and caution signs in the school zone may be appropriate.

CONCLUSION

The proposed project is expected to have minimal impact on traffic operations in the project site vicinity. The following improvements are recommended to accommodate the proposed project:

1. Provide a separate turning lane for the Paniolo Drive northbound approach.

2. Appropriate facilities and traffic control measures should be implemented to accommodate the students walking and biking to school.

A P P E N D I X A

ABSTRACT OF METHODOLOGY

for the

CAPACITY ANALYSIS FOR UNSIGNALIZED INTERSECTIONS

ABSTRACT FOR METHODOLOGY
for the
CAPACITY ANALYSIS OF UNSIGNALIZED INTERSECTIONS

This abstract summarizes the procedures for analyzing the capacities of unsignalized intersections. These procedures are described in the Highway Capacity Manual, Special Report 209 (1985) by the Transportation Research Board. This manual "is a collection of techniques for estimating highway capacity that have been judged, through consensus, as the best available at the time of publication." This manual does not set legal standards for highway design but the procedures have become widely accepted and used in the traffic engineering profession.

The capacity analysis procedure is based on a German method originally published in 1972 and translated in 1974, and modified for U. S. conditions by the TRB. It is intended for two-way STOP- and YIELD-controlled intersections and calculates the capacities of movements which cross or turn through the major traffic stream. The capacity of each movement is based on two factors: the gap distribution in conflicting traffic streams and the gap acceptance behavior of drivers at such intersections.

The basic steps in methodology are as follows:

1) Define intersection geometry and traffic volumes.

2) Determine the "conflicting conflicts" through which every minor street movement and major street left turn must cross.

3) Determine the size of the gap in the conflicting stream needed by vehicles in each movement crossing a conflicting traffic stream.

4) Determine the capacity of the gaps in the major traffic stream to accommodate each of the subject movements that will utilize these gaps.

5) Adjust the capacities to account for impedance and the use of shared lanes.

Tables and charts, as well as computer programs, have been developed to facilitate using this methodology.

INTERSECTION DATA

Key geometric factors include: number and use of lanes, channelization, percent grade, curb radii and approach angle, and sight distances. One hour volumes are specified by movement and converted to passenger cars per hour using the passenger car equivalents in TABLE 10-1.

CONFLICTING TRAFFIC

The conflicting movements each turning movement faces is summarized on Figure 10-2. The right turn movement from the minor street faces the least number of conflicting movements, the left turn movement from the minor street the most. Adjustments to the conflicting traffic volumes are shown on Figure 10-2.

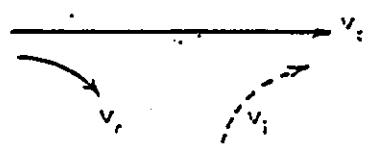
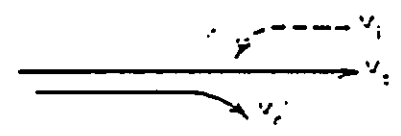
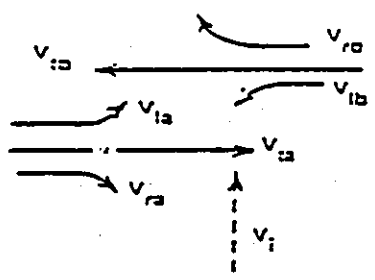
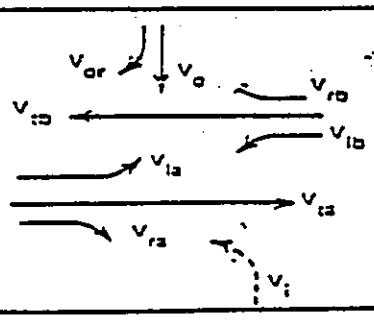
CRITICAL GAP SIZE

"The 'critical gap' is defined as the median time headway between two successive vehicles in the major traffic stream that is accepted by drivers in a subject movement that must cross and/or emerge with the major street traffic." It is dependent upon a number of factors, including:

TABLE 10-1. PASSENGER-CAR EQUIVALENTS FOR UNSIGNALIZED INTERSECTIONS

TYPE OF VEHICLE	GRADE (%)				
	−4%	−2%	0%	+2%	+4%
Motorcycles	0.5	0.4	0.5	0.6	0.7
Passenger Cars	0.8	0.9	1.0	1.2	1.4
SU/RV's*	1.0	1.2	1.5	2.0	3.0
Combination Veh.	1.2	1.5	2.0	3.0	6.0
All Vehicles*	0.9	1.0	1.1	1.4	1.7

*Single-unit trucks and recreational vehicles.
**If vehicle composition is unknown, these values may be used as an approximation.

Subject Movement	Conflicting Traffic, V_{ci}	Illustration
1. RIGHT TURN from minor street.	$1/2(V_r)^{**} + V_t^{*}$	
2. LEFT TURN from major street.	$V_t^{***} + V_t$	
3. THROUGH MVT from minor street.	$1/2(V_{ra})^{**} + V_{ta} + V_{la} + V_{ro} + V_{tb} + V_{lb}$	
4. LEFT TURN from minor street.	$1/2(V_{ra})^{**} + V_{ta} + V_{la} + V_{ro}^{***} + V_{tb} + V_{lb} + V_o + V_{or}$	

* V_r includes only the volume in the right hand lane.
** Where a right-turn lane is provided on major street, eliminate V_r or V_{ra}.
*** Where the right-turn radius into minor street is large and/or where these movements are STOP/YIELD-controlled, eliminate V_r (Case 2), and V_{ta} and/or V_{ro} (Case 4). V_{ro} may also be eliminated on multilane major streets.

Figure 10-2. Definition and computation of conflicting traffic volumes.

1) The type of maneuver being executed.

2) STOP or YIELD sign control.

3) The average running speed on the major street.

4) The number of lanes on the major street.

5) The geometrics and environmental conditions at the intersection.

The value of the critical gap is selected from Table 10-2. The basic critical gap is selected and adjustments and modifications made.

POTENTIAL CAPACITY FOR MOVEMENT

"The potential capacity is defined as the 'ideal' capacity for a specific movement," and is selected from Figure 10-3. It is based on the conflicting traffic volume and the critical gap. The result is read in passenger cars per hour.

IMPEDANCE EFFECTS

The methodology assumes that vehicles use gaps at an unsignalized intersection in a prioritized manner. Thus, when traffic becomes congested in a high-priority movement, it can reduce the potential capacity of lower priority traffic movements. Given the priority of gap usage:

1) Left turn from the major street impede both through movements and left turns from the minor street.

2) Through movements from the minor streets impede left turns from the minor street.

The impact of impedance is addressed by multiplying the potential capacity of a movement by a series of impedance

TABLE 10-2. CRITICAL GAP CRITERIA FOR UNSIGNALIZED INTERSECTIONS

BASIC CRITICAL GAP FOR PASSENGER CARS, SEC				
VEHICLE MANEUVER AND TYPE OF CONTROL	AVERAGE RUNNING SPEED, MAJOR ROAD			
	30 MPH		35 MPH	
	NUMBER OF LANES ON MAJOR ROAD			
	2	4	2	4
RT from Minor Road				
STOP	5.5	5.5	6.5	6.5
YIELD	5.0	5.0	5.5	5.5
LT from Major Road	5.0	5.5	5.5	6.0
Cross Major Road				
STOP	6.0	6.5	7.5	8.0
YIELD	5.5	6.0	6.5	7.0
LT from Minor Road				
STOP	6.5	7.0	8.0	8.5
YIELD	6.0	6.5	7.0	7.5

ADJUSTMENTS AND MODIFICATIONS TO CRITICAL GAP, SEC	
CONDITION	ADJUSTMENT
RT from Minor Street: Curb radius > 50 ft or turn angle < 60°	−0.5
RT from Minor Street: Acceleration lane provided	−1.0
All movements: Population ≥ 250,000	−0.5
Restricted sight distance*	up to −1.0

NOTES: Maximum total decrease in critical gap = 1.0 sec.
Maximum critical gap = 8.5 sec.
For values of average running speed between 30 and 35 mph, interpolate.
*This adjustment is made for the specific movement impacted by restricted sight distance.

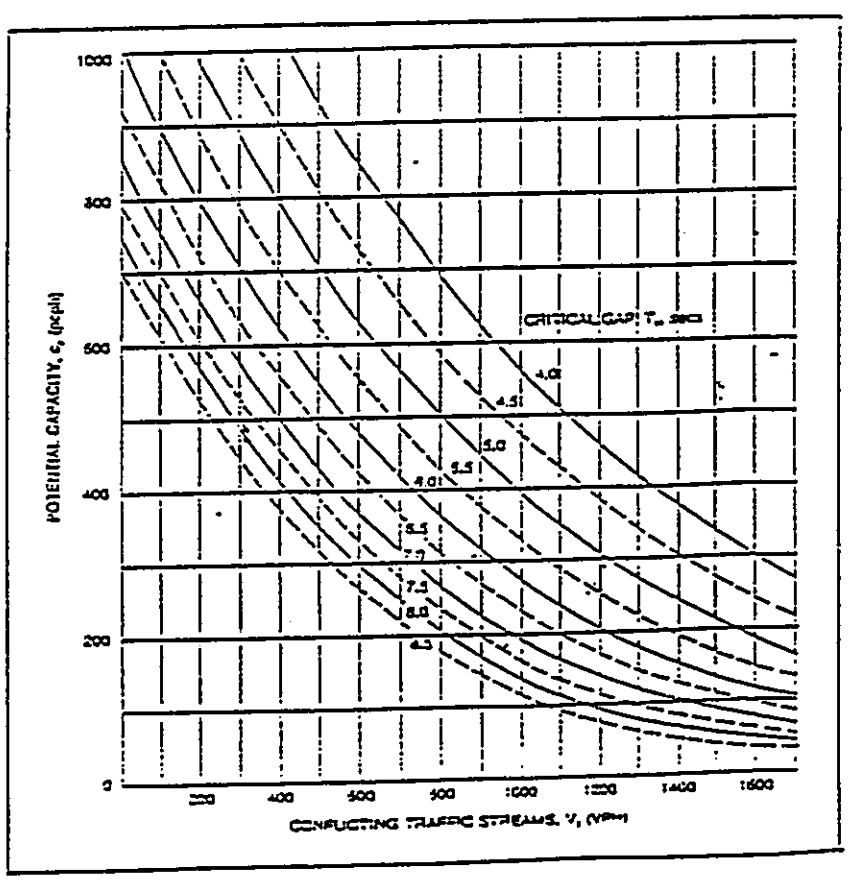


Figure 10-3. Potential capacity based on conflicting traffic volume and critical gap size.

factors for each higher priority impeding movement. Impedance factors are derived using Figure 10-5.

SHARED LANE CAPACITY

The methodology has assumed to this point that each minor street movement has an exclusive lane. In reality, most minor street approaches have two or three movements sharing one lane. An equation is used to compute the capacity of the shared lane.

LEVEL OF SERVICE CRITERIA

The above computations yield a capacity solution for each lane on the minor street approaches and for left turn movements from the major streets. This figure is used to derive the reserve capacity, the difference between the capacity solution and the volume of traffic using the lane. Level of service criteria are stated in general terms for general ranges of reserve capacity and delay, as follows:

Reserve Capacity	Level of Service	Expected Delay
> 400	A	Little or no delay
300-399	B	Short traffic delays
200-299	C	Average traffic delays
100-199	D	Long traffic delays
0- 99	E	Very long traffic delays
a/	F	a/

---

a/ 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 to the intersection.

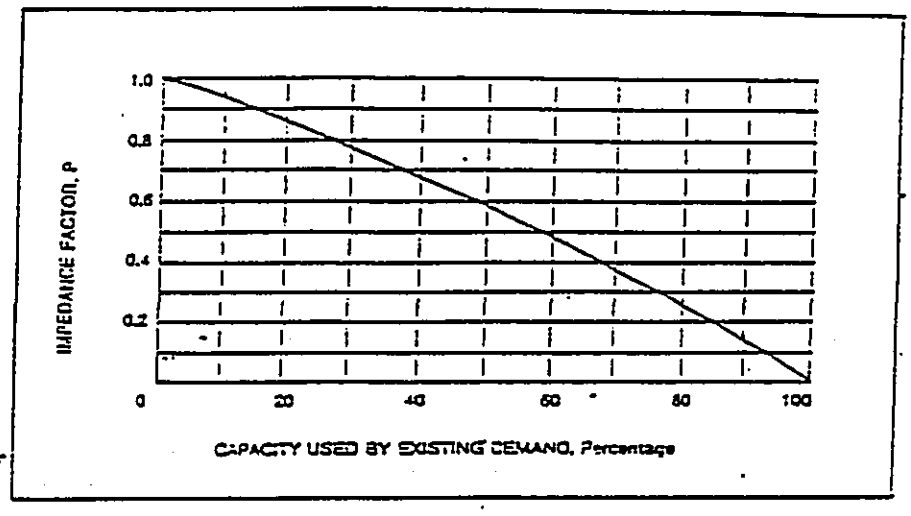


Figure 10-5. Impedance factors as a result of congested movements.

A P P E N D I X B

LEVELS OF SERVICE (LOS)
FOR MULTILANE AND TWO LANE HIGHWAYS

LEVELS OF SERVICE (LOS)
FOR MULTILANE AND TWO LANE HIGHWAYS

LOS A: Free flow conditions where the operations of vehicles are virtually unaffected by the presence of other vehicles and operations are constrained only by geometric features and driver preferences. The maximum density of 12 passenger cars/mile/lane.

LOS B: Free flow conditions but the presence of other vehicles begins to be noticeable. Average speed diminished from LOS A, and maximum density of 20 passenger cars/mile/lane.

LOS C: Influence of traffic density on operations becomes marked and the ability to maneuver within the traffic stream, select an operating speed, is affected by other vehicles. Minor disruptions may be expected to cause serious deterioration in service. The maximum density is 30 passenger cars/mile/lane.

LOS D: Borders on unstable flow, speed and ability to maneuver severely restricted due to traffic congestion. The maximum density is 42 passenger cars/mile/lane.

LOS E: Unstable operations at or near capacity. The minimum spacing at which uniform flow can be maintained. The maximum density is 67 passenger cars/mile/lane.

LOS F: Forced or breakdown flow where vehicles arrive either at a rate greater than that which they are discharged or at a point where demand exceeds capacity. Queues form behind breakdowns and operations within queues are highly unstable. The density exceeds 67 passenger cars/mile/lane.

SOURCE: Transportation Research Board, Highway Capacity Manual, Special Report 209, Page 7-6 (1985).

APPENDIX C

LEVEL OF SERVICE (LOS) DEFINITIONS FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE (LOS) DEFINITIONS FOR SIGNALIZED INTERSECTIONS

Level of Service	Stopped Delay per Vehicle (Seconds)
A	$\leq$ 5.0
B	5.1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.1 to 60.0
F	$\geq$ 60.0

A P P E N D I X D

TRAFFIC CALCULATIONS

1) UNSIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS) CALCULATIONS (AM AND PM PEAKS)

UNSIGNALIZED INTERSECTION

LEVEL OF SERVICE (LOS) CALCULATIONS

(AM AND PM PEAKS)

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

NAME OF THE EAST/WEST STREET..... Hooko St

NAME OF THE NORTH/SOUTH STREET..... Paniolo Drive

NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... am peak

OTHER INFORMATION: 1995

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	92	67	0
THRU	6	15	41	88
RIGHT	116	0	33	4

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	2	2	2

ADJUSTMENT FACTORS Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS					
	WB	5.70	5.70	0.00	5.70
	EB	5.70	5.70	0.00	5.70
MAJOR LEFTS					
	SB	5.60	5.60	0.00	5.60
	NB	5.60	5.60	0.00	5.60
MINOR THROUGHS					
	WB	6.80	6.80	0.00	6.80
	EB	6.80	6.80	0.00	6.80
MINOR LEFTS					
	WB	7.30	7.30	0.00	7.30
	EB	7.30	7.30	0.00	7.30

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R SH		LOS
MINOR STREET								
WB LEFT	112	473	404		404		292	C
THROUGH	18	628	596	>	596	>	578	> A
RIGHT	0	998	998	> 424	998	> 293	998	>C A
MINOR STREET								
EB LEFT	0	551	515	> 964	515	> 815	515	>A A
THROUGH	7	615	584	>	584	>	577	> A
RIGHT	142	997	997		997		856	A
MAJOR STREET								
NB LEFT	82	993	993		993		911	A
SB LEFT	0	996	996		996		996	A

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

NAME OF THE EAST/WEST STREET..... Hooko St

NAME OF THE NORTH/SOUTH STREET..... Paniolo Drive

NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... pm peak

OTHER INFORMATION: 1995

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	62	95	0
THRU	17	10	102	58
RIGHT	71	0	105	0

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	2	2	2

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
WB	5.70	5.70	0.00	5.70
EB	5.70	5.70	0.00	5.70
MAJOR LEFTS				
SB	5.60	5.60	0.00	5.60
NB	5.60	5.60	0.00	5.60
MINOR THROUGHS				
WB	6.80	6.80	0.00	6.80
EB	6.80	6.80	0.00	6.80
MINOR LEFTS				
WB	7.30	7.30	0.00	7.30
EB	7.30	7.30	0.00	7.30

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
WB LEFT	76	430	369	369	293	C
THROUGH	12	547	507	507	494	A
RIGHT	0	979	979	383 / 979	295 / 979	C / A
MINOR STREET						
EB LEFT	0	448	410	816 / 410	709 / 410	A / A
THROUGH	21	500	463	463	443	A
RIGHT	87	998	998	998	912	A
MAJOR STREET						
NB LEFT	116	997	997	997	881	A
SB LEFT	0	860	860	860	860	A

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

NAME OF THE EAST/WEST STREET..... Hooko St

NAME OF THE NORTH/SOUTH STREET..... Paniolo Drive

NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... am peak

OTHER INFORMATION: 2005

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	106	39	0
THRU	7	19	172	348
RIGHT	147	0	39	33

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	2	2	2

ADJUSTMENT FACTORS Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS					
	WB	5.70	5.70	0.00	5.70
	EB	5.70	5.70	0.00	5.70
MAJOR LEFTS					
	SB	5.60	5.60	0.00	5.60
	NB	5.60	5.60	0.00	5.60
MINOR THROUGHS					
	WB	6.80	6.80	0.00	6.80
	EB	6.80	6.80	0.00	6.80
MINOR LEFTS					
	WB	7.30	7.30	0.00	7.30
	EB	7.30	7.30	0.00	7.30

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M		SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R SH		LOS
MINOR STREET									
NB LEFT	130	216	174		174		45		E
THROUGH	23	328	315	>	315	>	291	>	C
RIGHT	0	977	977	>	187 977	>	34 977	>E	A
MINOR STREET									
EB LEFT	0	281	257	>	812 257	>	623 257	>A	C
THROUGH	9	327	313	>	313	>	304	>	B
RIGHT	180	878	878		878		699		A
MAJOR STREET									
NB LEFT	48	683	683		683		635		A
SB LEFT	0	856	856		856		856		A

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

NAME OF THE EAST/WEST STREET..... Hooko St

NAME OF THE NORTH/SOUTH STREET..... paniolo drive

NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... pm peak

OTHER INFORMATION: 2005

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	71	167	0
THRU	22	13	403	232
RIGHT	98	0	122	0

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	2	2	2

ADJUSTMENT FACTORS Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-----	---	---	-
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	---	---	---
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS WB	5.70	5.70	0.00	5.70
MAJOR LEFTS SB	5.60	5.60	0.00	5.60
MINOR LEFTS WB	7.30	7.30	0.00	7.30

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
WB LEFT	142	60	55	55	-86	F
RIGHT	51	533	533	533	482	A
MAJOR STREET						
SB LEFT	28	233	233	233	205	C

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
NB LEFT	53	276	263	263	211	C
RIGHT	13	995	995	995	982	A
MAJOR STREET						
SB LEFT	68	895	895	895	826	A

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

NAME OF THE EAST/WEST STREET..... Hooko St

NAME OF THE NORTH/SOUTH STREET..... new north-south rd

NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... pm peak

OTHER INFORMATION: 1995

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	--	31	167	21
THRU	--	13	481	300
RIGHT	--	37	49	0

NUMBER OF LANES

	EB	WB	NB	SB
LANES	--	2	2	2

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-----	---	---	-
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	---	---	---
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	HB	5.70	5.70	0.00	5.70
MAJOR LEFTS	SB	5.60	5.60	0.00	5.60
MINOR LEFTS	HB	7.30	7.30	0.00	7.30

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
WB LEFT	38	191	185	185	148	D
RIGHT	45	796	796	796	750	A
MAJOR STREET						
SB LEFT	26	563	563	563	537	A

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

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NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... am peak

OTHER INFORMATION: 1995

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	--	43	167	56
THRU	--	13	141	428
RIGHT	--	11	35	0

NUMBER OF LANES

	EB	WB	NB	SB
LANES	--	2	2	2

ADJUSTMENT FACTORS Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-----	---	---	-
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	---	---	---
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	WB	5.70	5.70	0.00	5.70
MAJOR LEFTS	SB	5.60	5.60	0.00	5.60
MINOR LEFTS	WB	7.30	7.30	0.00	7.30

ADJUSTMENT FACTORS Page-2

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
WB	5.70	5.70	0.00	5.70
EB	5.70	5.70	0.00	5.70
MAJOR LEFTS				
SB	5.60	5.60	0.00	5.60
NB	5.60	5.60	0.00	5.60
MINOR THROUGHS				
WB	6.80	6.80	0.00	6.80
EB	6.80	6.80	0.00	6.80
MINOR LEFTS				
WB	7.30	7.30	0.00	7.30
EB	7.30	7.30	0.00	7.30

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M		SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R SH		LOS
MINOR STREET									
WB LEFT	87	139	95		95		9		E
THROUGH	16	205	169	>	169	>	153	>	D
RIGHT	0	798	798	>	798	>	798	>F	A
MINOR STREET	102					-0			
EB LEFT	0	151	118	>	118	>	118	>B	D
THROUGH	27	183	151	>	151	>	124	>	D
RIGHT	120	965	965		965		845		A
MAJOR STREET	485					339			
NB LEFT	204	832	832		832		628		A
SB LEFT	0	567	567		567		567		A

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

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NAME OF THE NORTH/SOUTH STREET..... new north-south rd

NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... am peak

OTHER INFORMATION: 2005

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	--	173	167	85
THRU	--	13	272	831
RIGHT	--	12	112	0

NUMBER OF LANES

	EB	WB	NB	SB
LANES	--	2	2	2

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-----	---	---	-
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	---	---	---
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	WB	5.70	5.70	0.00	5.70
MAJOR LEFTS	SB	5.60	5.60	0.00	5.60
MINOR LEFTS	WB	7.30	7.30	0.00	7.30

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 35

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 40000

NAME OF THE EAST/WEST STREET..... Hooko St

NAME OF THE NORTH/SOUTH STREET..... new north-south rd

NAME OF THE ANALYST..... wy

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/11/91

TIME PERIOD ANALYZED..... pm peak

OTHER INFORMATION: 2005

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	--	116	167	23
THRU	--	13	942	535
RIGHT	--	42	199	0

NUMBER OF LANES

	EB	WB	NB	SB
LANES	--	2	2	2

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
WB LEFT	211	83	75	75	-137	F
RIGHT	15	877	877	877	862	A
MAJOR STREET						
SB LEFT	104	681	681	681	577	A