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FINAL  
ENVIRONMENTAL IMPACT STATEMENT  
FOR  
WAIMEA RIVER FORD CROSSING  
WAIMEA, KAUAI, HAWAII

BY THE  
COUNTY OF KAUAI  
DEPARTMENT OF PUBLIC WORKS

October 24, 1974

KA

108

Office of Environmental Quality Control  
235 S. Beretania #702  
Honolulu HI 96813  
586-4185

DATE DUE

June 12, 2002

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## WAIMEA RIVER FORD CROSSING

### PROJECT DESCRIPTION AND LOCATION

The proposed project is to be located approximately 1.3 miles north of Waimea Town, Kauai (Plate I). The project proposes to construct a ford crossing of approximately 250 feet in length across the Waimea River. The purpose of the project is to provide an access facility across the Waimea River.

The proposed improvement consists of a roadway in embankment with a series of culverts that crosses the Waimea River between the flood levees. This project will replace an existing earth and gravel ford crossing. The proposed alignment is shown in Plate II. The roadway embankment will have an earth core with a reinforced concrete slope and roadway surfacing. The roadway along the flood levee will have a combination of concrete and asphalt concrete surfacing with rock slope protection. The project proposes to provide a single 12-foot-wide traveling lane.

The proposed ford crossing will follow the alignment of the existing crossing. As a result, the existing crossing will be demolished during the construction period. Temporary access during this construction period will be provided by the construction of a temporary earth and gravel crossing adjacent to the project. Refer to Plate IV which is a plan and profile view of the proposed project.

Presently, the residents and farmers have access across the river through a dirt and gravel roadway. The combination of the present roadway profile and natural flow of water prohibits access during high tidal conditions and periods of higher rainfall.

During periods of extremely high storm flows, the roadway materials are transported downstream. Consequently, vehicular access is prohibited to the east bank until a new roadway is reconstructed by maintenance crews of the County of Kauai. This operation is required almost yearly. The area east of the river is presently being used for diversified agriculture. A few residential structures also occupy the area.

The destruction of the access facility by storm flows has resulted in economic loss and personal inconvenience to the residents and farmers, and in expenses to the County of Kauai in maintenance and reconstruction of the crossing.

#### PROPOSED PROJECT

To alleviate the poor access problem, a ford crossing has been proposed, and final design has been initiated.

The proposed ford crossing will provide a single 12-foot-wide reinforced concrete roadway at an approximate elevation of 2.0 feet above mean sea level. A series of approximately 15 - 30-inch diameter culverts will be provided under the roadway to discharge low volumes of normal and flood flows.

It is anticipated that approximately 400 cfs can be accommodated by this design. The average discharge for 33 years is 136 cfs according to the "Water Resources Data for Hawaii and Other Pacific Areas" by the U.S. Department of the Interior, Geological Survey, dated '1971 for Waimea River. Plate III indicates that approximately 28 days in a year can be expected to have flows exceeding 400 cfs.

Previously, the road crossing was an earth and gravel embankment with no consideration of conveying the normal flow of the river without restriction. This earth and gravel roadway is at elevation 2.2 feet above mean sea level and, consequently, restricts the normal flows of the Waimea River.

The side slopes and the traveled way surface of the proposed ford crossing will be of reinforced concrete. The upstream and downstream batter slope of the crossing will have slopes of 4:1 and 2:1, respectively to reduce erosion and inertia forces. Cutoff walls that extend to elevation -10.00 feet below mean sea level and 2 ton rock slope protection upstream and downstream of the structure will be provided to reduce scouring and erosion damages. Select fill material will be used within the embankment cove for the crossing. These measures are provided to minimize damages to the ford crossing.

The crossing will be inundated during periods of high flows and vehicular access may not be possible. Signs will be posted to warn and prohibit the use of the crossing during periods of deep flows.

The roadway surfacing will be texturized with an eighth of an inch broom finish. This will insure adequate wheel friction under wet and slippery conditions. This finish should help traction even if a film of algae develops.

The proposed ford crossing will be constructed at elevation 2.0 feet which is lower than the existing crossing presently at an elevation of 2.2 feet. The flood capacity of the flood levees should not be decreased with the construction of the proposed facility. If any, it should improve the present situation by eliminating the impoundment of

water upstream caused by the existing ford. Under an unusual and infrequent rainstorm there is a possibility of overtopping of the east bank of the flood levees. However, under this situation the flood flows will flow toward the Makaweli - Waimea River Junction, which area is already prone to flooding from the Makaweli River. This overtopping situation during unusual and infrequent storms can be expected under present conditions. These areas are undeveloped and zoned agricultural by the State of Hawaii and classified open by the County of Kauai due to flood constraints. Development of these areas will be governed by the County Developmental Plans. Problems such as erosion and siltation during periods of unusual floods which overtop the levee could be restored by maintenance projects.

The installation of a series of culverts for the proposed ford crossing should not present hazards upstream or downstream of the project site. These culverts are designed to permit normal flows and low volume flood flows to pass through the crossing rather than be impounded or retarded as is the case of the existing crossing. The flood levees of the Waimea River confines flood flows within the flood control channel.

#### COST OF PROJECT

The cost for this project is estimated at \$170,000. This will be funded from County of Kauai revenues and State of Hawaii Capital Improvement Project Allotments.

#### SITE DESCRIPTION

Land Use: The project site is within an area of diversified agri-

cultural and pasture land uses. The project will involve the Waimea River waterway area and the flood levees. There are no residences within the project site or in its immediate proximity. Access will be provided for the diversified agricultural operations and the residential structures which are located east of the river.

Zoning: The site is zoned by the County as an Open District. Permitted uses within the district are diversified agriculture, livestock and grazing, recreation, parks, resource management, single family detached dwellings, and undeveloped campgrounds.

The State Land Use Commission has zoned portions of this area as an agricultural district to protect lands with high capacity for intensive agricultural uses from urban uses.

The ford crossing will not permit the development of the area into an undesirable urban sprawl due to access limitations.

Soil: The soils east of the Waimea River are suitable for taro, pasture, sugar cane, and truck crop uses. The surface layer of the soil is predominantly dark gray and very dark gray silty clay that has dark brown and reddish mottles. These soils are judged as productive for truck crops such as banana and taro.

To the north, which is the uplands, the soil is well drained, very shallow, and extremely rocky. These soils are suitable for pasture, wild life habitat, and water supply.

Topography: Slopes within the project area range from 0 percent to over 60 percent. The gently sloping lowland areas are used for diversified agricultural purposes.

Drainage: The Waimea River and the Makaweli River meander through

the project area. These perennial streams provide irrigation waters for the diversified agricultural uses.

The intakes for the irrigation water from the Waimea and Makaweli River are located upstream of the proposed crossing. The impounded waters from the existing crossing are not being used for irrigation purposes. These irrigation water intakes are located at a considerable higher elevation than the ford crossing and are not affected by the proposed improvement.

Climate: The mean annual rainfall in this area is 25 inches as measured by Rain Gauge Station Number 950 which is located east of the Makaweli River.

Temperature varies within a very narrow range during the year. Temperature records from Lihue Airport indicate mean daily temperature at 74.5°F.

Animal and Plant Life: A detailed wildlife survey was not conducted since the project is not expected to significantly affect species living in the area. With the existing ford crossing and the diversified agricultural development and residential homes in the area, wildlife is not abundant. The new crossing is not expected to modify the surrounding area from the present situation.

There are horses, pigs, cattle, and domestic cats and dogs in this area. In addition, rats, and birds are known to visit the site. However, no unique habitants were found.

The plants found in this site include paragrass, sensitive plant, honohono, Java plum, and guava. None of these are considered to be endangered. Aquatic life within the project site have functioned in the past generations with the existing crossing.



Archaeological and Historical Sites: There are no known sites that are of archaeological or historical value. However, if during the construction of the road, any evidence of archaeological interest is noted, it will be reported to the Department of Land and Natural Resources. Operations over a period of many years have not uncovered any evidences of mankind earlier.

Plate IV is a plan and profile view of the proposed ford crossing. The construction of the ford crossing is limited within the flood channel area and should not adversely affect the Menehune Ditch.

Hazards: The construction of a permanent ford crossing may increase the flow depths of flood waters. However, it is anticipated that the height of the flood levees will contain the peak discharge of the more infrequent rain falls.

During the construction period, the site may be subject to flooding and damages. Staging construction to reduce damages will become necessary.

Noise and Air Pollution: The project, when completed, will not increase noise and pollution problems. The ford crossing will permit access across the Waimea River for most of the year. The number of vehicles will not significantly increase.

During construction, internal combustion engines will contribute to noise and air pollution. Staged construction within the river area will help to reduce water pollution. Provisions within the project specifications will minimize pollution to air and water and inconveniences to residents in the area.

Displacement of Structures: There are no structures that will need to be relocated.

#### ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

There will be temporary problems of soil erosion, noise, dust and air pollution during the construction period. The problems will be temporary as the construction period should not exceed six months.

Some increase in the silt content may occur during construction due to the scope of the project. This should not cause any deleterious effects to marine life. The problem will be temporary until the permanent construction is completed.

#### ALTERNATIVES TO THE PROPOSED PROJECT

Two alternatives were considered before it was decided to proceed with this project. The alternatives considered were:

1. No change or improvement:

This proposal was rejected because access to the east bank of the Waimea River was impractical and created financial hardship to the residents and the County of Kauai. In addition, the present roadway restricted flow of the Waimea River.

2. Provide a concrete pavement at the river's flowline:

This proposal was rejected because access would be severely restricted and would be impractical. Surveys have shown that a water depth of four feet can be expected during normal flood tides.

3. A new site for the crossing:

The proposed ford crossing abuts the government roadway and meets a vehicular travel way that has been used by the residents for many years. The proposed crossing follows the alignment of the existing crossing which also has been used many years.

A new site for the ford crossing would require costly land acquisition and would create a loss in agricultural lands for other owners who are not affected by this proposal. A bridge structure because of its high cost is not warranted due to the limited use of this crossing.

#### LONG TERM EFFECTS OF THIS PROJECT ON THE ENVIRONMENT AND PRODUCTIVITY

This project will not cause severe impact on the environment. The construction will cause temporary disturbances such as siltation and water pollution. Upon completion of the construction activity, the permanent ford crossing will discharge the normal flows of the Waimea River and provide access to the east bank.

#### IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES INVOLVED IN THE PROPOSED PROJECT

The most significant irretrievable commitment for this ford crossing project would be the reduction in the flood capacity of the flood levees. A permanent structure at elevation 2.0 feet above mean sea level will increase the flood heights of frequent and infrequent storm flows. The expected increase of flood heights has been experienced with the present crossing until the embankment is transported downstream.

The project will require soil, base material, rocks, asphalt concrete and concrete materials that must be hauled from other locations. The soil, base material and rocks will be retrievable material. However, the asphalt concrete and concrete materials, reinforcing steel, metal railings, wire fabrics, fuel and labor will be irretrievable when used and expended.

#### ECONOMIC ANALYSIS

The immediate effect of providing access to the area east of the Waimea

River will allow increased production for the farmers. In turn, income and farm produce will contribute to the economic and food supply of the County, State and Federal governments.

The improved driving conditions will greatly aid in transporting and marketing the farm produce. It will reduce costly vehicle repairs to the farmers and eliminate maintenance costs to the County of Kauai.

REFERENCES

1. U.S. Department of Agriculture, Soil Conservation Service  
"Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and  
Lanai, State of Hawaii" 1972.
2. State of Hawaii, Department of Land and Natural Resources  
"Climatologic Stations in Hawaii" Report R42, 1973.
3. County of Kauai  
"General Plans"  
"Comprehensive Zoning Ordinance"



0 2 4 6 8  
SCALE IN MILES

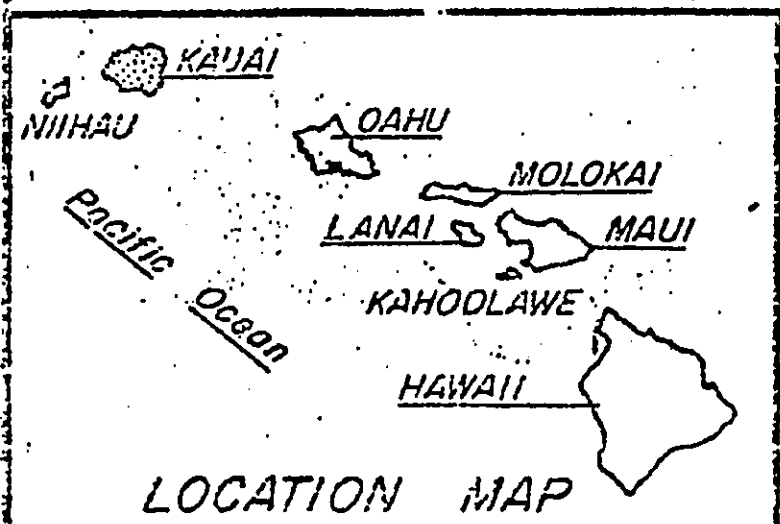
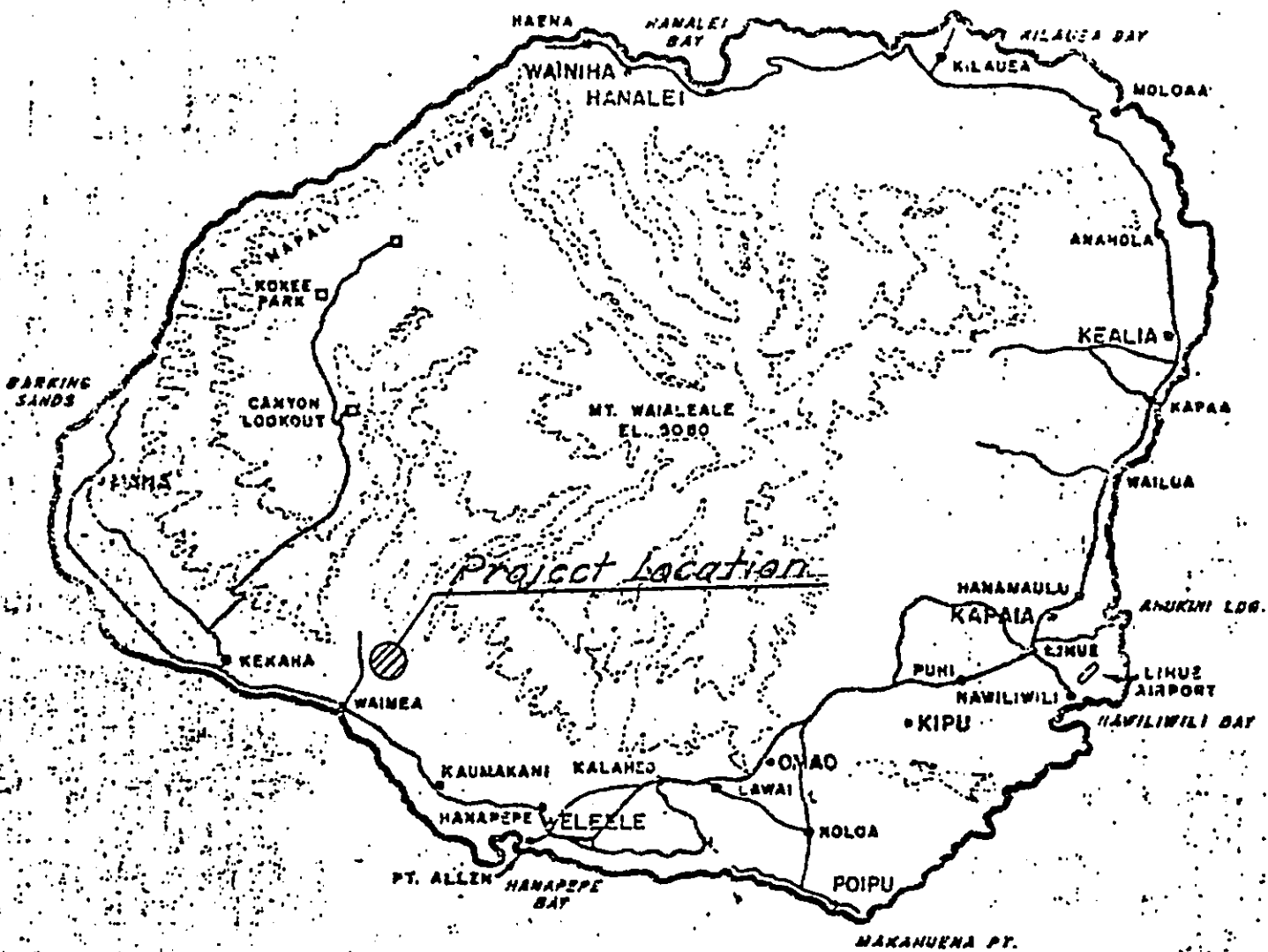
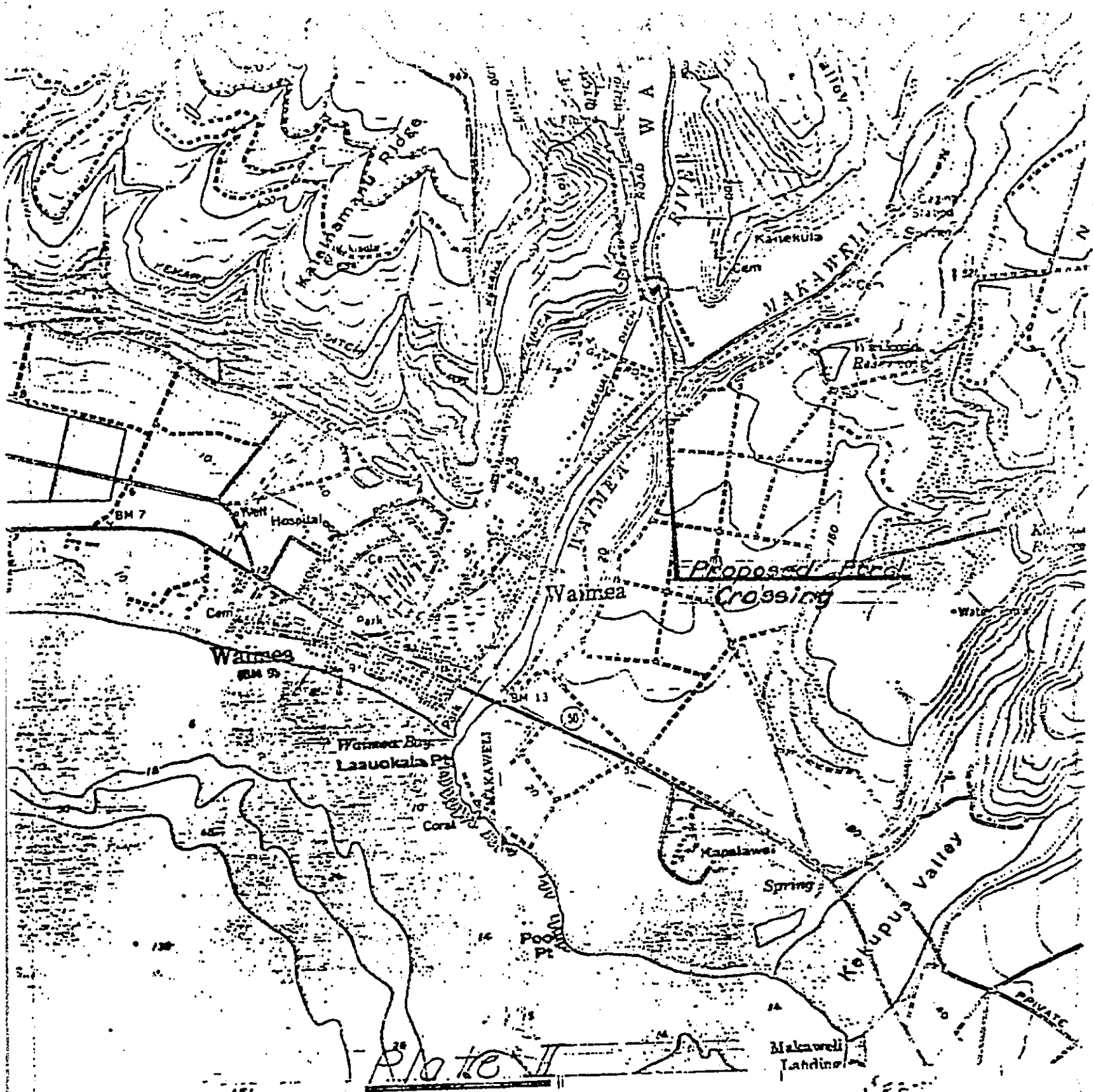


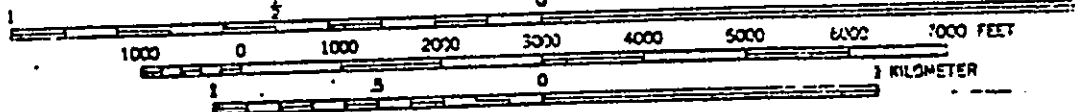
Plate 1

**ISLAND OF KAUAI  
KAUAI COUNTY, HAWAII**

**PLANNING AND TRAFFIC COMMISSION  
COUNTY OF KAUAI  
LIHUE, KAUAI, HAWAII**



SCALE 1:24 000



CONTOUR INTERVAL 40 FEET

DOTTED LINES REPRESENT 10-FOOT CONTOURS  
DATUM IS MEAN SEA LEVEL

DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOWER LOW WATER  
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN WATER  
THE MEAN RANGE OF TIDE IS APPROXIMATELY 1 FOOT

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS  
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON  
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

HAWAII, ISLAND OF KAUAI

16031000 Waimea River near Waimea

LOCATION.--Lat 21°59'02", long 159°39'46", on right bank 1.2 miles upstream from Makaweli River and 1.8 miles north of Waimea.

DRAINAGE AREA.--57.8 sq mi.

PERIOD OF RECORD.--July 1910 to June 1918, July to October 1919, November 1943 to September 1968, October 1969 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 25 ft (by hand levels from mouth of Makaweli River). Prior to Oct. 5, 1911, nonrecording gage at site 1 mile downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, nonrecording gage at present site at different datum.

AVERAGE DISCHARGE.--33 years (1910-17, 1944-69, 1969-71), 136 cfs (98,530 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 12,600 cfs Jan. 31 (gage height, 12.60 ft), from rating curve extended above 3,000 cfs on basis of slope-area measurement at gage height 18.7 ft; minimum, 3.7 cfs Aug. 13, 14.

Period of record: Maximum discharge, 37,100 cfs Feb. 7, 1949 (gage height, 19.3 ft), from rating curve extended above 5,200 cfs on basis of slope-area measurements at gage heights 10.28 and 18.7 ft; practically no flow occasionally owing to upstream diversions.

Flood of Nov. 29, 1965, which destroyed the station, reached a stage of 16.50 ft, from floodmarks (discharge, 25,800 cfs, from rating curve extended as explained above).

REMARKS.--Records fair. Several upstream diversions for power and irrigation. Records of chemical analyses for the water year 1971 are published in Part 2 of this report.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

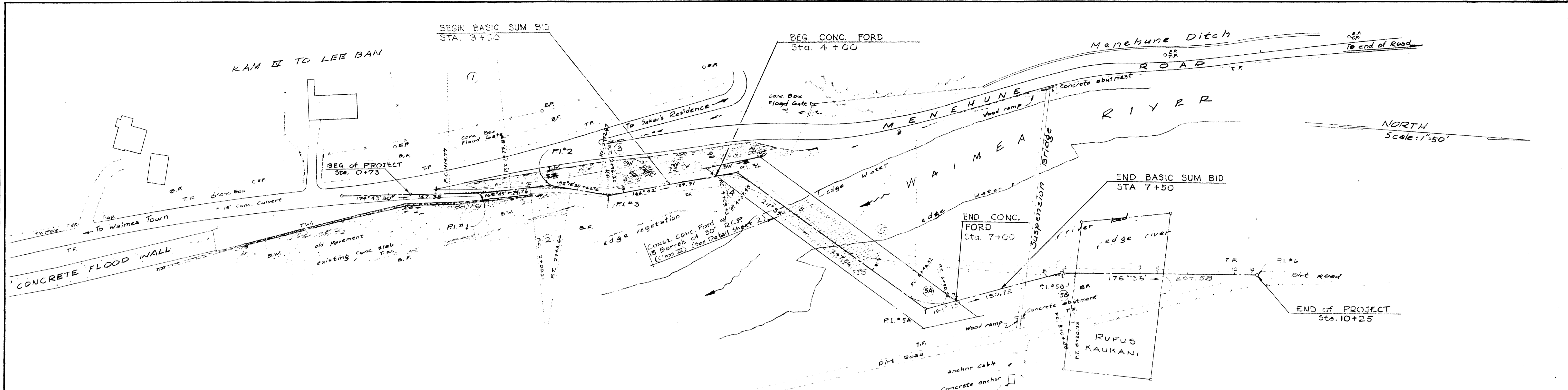
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	37	129	86	1,130	22	102	107	22	10	7.4	5.5
2	164	20	539	63	271	28	91	109	9.8	11	6.0	5.7
3	361	11	212	48	257	72	147	62	9.0	11	6.2	5.5
4	45	9.8	187	36	199	60	118	47	8.5	11	6.2	6.4
5	14	9.8	172	2,060	149	97	688	40	8.5	10	6.8	7.4
6	9.2	15	78	622	118	37	878	41	8.5	10	7.0	9.5
7	8.1	35	50	283	99	89	1,480	40	8.3	11	8.3	7.0
8	8.1	17	39	274	85	87	163	38	8.8	47	8.1	15
9	8.1	10	78	744	63	42	119	31	29	59	11	12
10	8.1	9.8	137	230	58	74	94	39	26	271	15	5.0
11	5.5	10	60	502	51	30	81	29	10	57	8.8	4.7
12	7.5	47	36	577	44	48	68	24	9.0	12	4.7	5.1
13	8.5	167	24	386	41	20	58	20	8.8	7.2	4.1	5.1
14	8.8	74	21	292	39	15	99	18	8.5	6.6	4.3	5.3
15	9.2	24	21	812	28	16	91	17	9.5	6.4	4.4	4.7
16	9.5	132	20	1,230	26	14	88	16	10	6.4	4.3	4.5
17	9.5	76	20	314	24	13	76	15	9.8	6.4	5.0	4.7
18	10	86	20	212	22	76	62	15	10	6.4	5.7	5.0
19	10	33	327	161	22	276	607	14	9.0	6.6	4.7	4.8
20	10	959	375	192	93	1,240	927	13	9.0	6.8	5.7	4.7
21	14	765	130	572	44	328	396	16	14	7.4	5.0	4.8
22	10	213	161	186	27	354	262	12	11	7.2	5.1	4.5
23	22	232	505	119	329	536	923	11	11	7.0	4.8	12
24	16	74	240	98	436	501	1,810	11	11	6.8	4.8	4.8
25	11	48	385	91	126	1,590	623	20	13	6.6	5.1	4.3
26	18	114	558	261	54	524	274	12	15	6.4	5.0	5.7
27	14	72	563	2,780	40	193	196	10	12	7.0	5.0	5.1
28	39	44	170	2,400	34	131	119	9.8	12	7.7	5.5	4.4
29	86	46	183	508	-----	107	88	9.8	12	8.3	5.3	4.0
30	21	98	202	251	-----	236	78	21	11	8.1	5.5	6.0
31	25	-----	107	1,220	-----	241	-----	53	-----	26	5.5	-----
TOTAL	1,023.3	2,986.4	5,949	17,553	3,307	7,095	10,783	920.6	354.0	671.3	190.3	273.7
MEAN	33.0	99.5	192	566	140	229	359	29.7	11.8	21.7	6.14	9.12
MAX	361	959	563	2,780	1,130	1,590	1,810	109	29	271	15	95
MIN	8.1	9.8	20	36	22	13	58	9.8	8.3	6.4	4.1	4.0
AC-FT	2,030	5,920	11,900	34,820	7,750	14,070	21,370	1,830	702	1,330	377	543

CAL YR 1970 TOTAL 31,638.9 MEAN 86.7 MAX 2,130 MIN 8.1 AC-FT 62,760  
 WTR YR 1971 TOTAL 51,706.6 MEAN 142 MAX 2,780 MIN 4.0 AC-FT 102,600

PEAK DISCHARGE (BASE, 3,700 CFS).--Jan. 31 (2200) 12,600 cfs (12.60 ft); Apr. 7 (0030) 11,700 cfs (12.26 ft).



DATE: \_\_\_\_\_  
 BY: \_\_\_\_\_  
 SURVEYED \_\_\_\_\_  
 PLOTTED \_\_\_\_\_  
 ALIGNMENT CHECKED \_\_\_\_\_  
 RT. OF WAY CHECKED \_\_\_\_\_  
 PLAN NO. \_\_\_\_\_



**CURVE DATA**

Curve No.	Δ	Δ/2	R	T	Ch	Lc
①	4°58'30"	2°29'15"	7500'	32.58'	65.10'	65.12'
②	15°33'30"	7°46'45"	1600'	21.86'	43.31'	43.45'
③	19°16'30"	9°38'15"	7000'	11.89'	23.44'	23.55'
④	45°52'	22°56'	3500'	14.81'	27.28'	28.02'
⑤	35°18'	17°39'	14000'	44.55'	84.90'	86.25'
5A	50°41'	25°20'30"	50.00'	23.68'	42.80'	44.23'
5B	15°23'	7°41'30"	100.00'	13.51'	26.77'	26.85'

**PLAN**  
 SCALE: 1"=50'

DATE: \_\_\_\_\_  
 BY: \_\_\_\_\_  
 SURVEYED \_\_\_\_\_  
 PLOTTED \_\_\_\_\_  
 GRADES CHECKED \_\_\_\_\_  
 STRUCTURE NOTATIONS CHECKED \_\_\_\_\_  
 PROFILE NO. 555

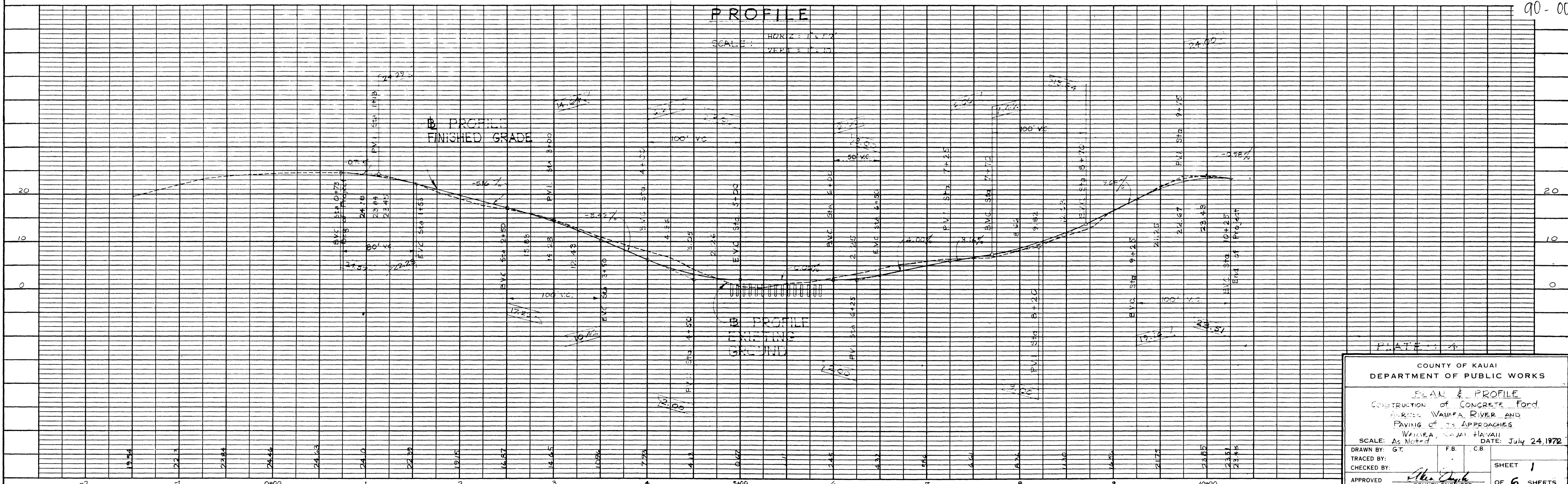


PLATE 1-4

COUNTY OF KAUAI  
 DEPARTMENT OF PUBLIC WORKS

PLAN & PROFILE  
 CONSTRUCTION OF CONCRETE FORD  
 BRIDGING WAIMEA RIVER AND  
 PAVING OF ITS APPROACHES  
 WAIMEA, KAUAI HAWAII  
 SCALE: As Noted DATE: July 24, 1972

DRAWN BY: GT. FB. CB.  
 TRACED BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 APPROVED: *Alan Durb* COUNTY ENGINEER

SHEET 1 OF 6 SHEETS

APPENDIX A

REVIEW COMMENTS RECEIVED ON THE  
DRAFT ENVIRONMENTAL IMPACT STATEMENT

JOHN A BURNS  
GOVERNOR



RICHARD E. MARLAND, Ph.D.  
INTERIM DIRECTOR  
TELEPHONE NO.  
548-6915

STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
OFFICE OF THE GOVERNOR  
550 HALEKALANUIA ST  
ROOM 301  
HONOLULU HAWAII 96813

September 27, 1974

MEMORANDUM

TO: Akira Fujita, Chief Engineer  
Department of Public Works  
County of Kauai

FROM: *js* Richard E. Marland, Interim Director  
Office of Environmental Quality Control *Raymond S. Tabuti*

SUBJECT: Draft Environmental Impact Statement for the  
Proposed Waimea River Ford Crossing, Waimea, Kauai

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As of this date, this Office has received a total of ten (10) responses to the draft environmental impact statement indicated above. A list of the responding agencies is provided in attachment I and a copy of each response from these agencies is compiled in Attachment II.

After evaluating the responses received, this Office finds that the following five (5) agencies provided relatively important recommendations and comments: the Water Resources Research Center of the University of Hawaii, the Soil Conservation Service, Corps of Engineers, and the Department of the Army. We suggest that individual responses be sent to these agencies with a carbon copy transmitted to this Office for our information and files. Furthermore, the disposition of each comment from these agencies should be incorporated into an appendix of the final environmental impact statement as evidence that all comments received on the draft statement were considered.

For your consideration, we have provided below, a brief discussion on those areas of the draft statement which we feel needs revision. This discussion incorporates the most significant recommendations from the responding agencies and this Office's own comments on the subject statement.

### PROJECT DESCRIPTION AND LOCATION

The project description provided on page one, should be expanded to describe the method of replacing the existing ford. For example, will the existing ford be demolished prior to construction of the proposed ford? If so, how will access be temporarily handled? Will the new ford be sited on the exact location of the present facility? If the existing ford is to remain until the new crossing is completed, will the existing facility be demolished? if so, when?

### PROPOSED PROJECT

Page two of the statement indicates that the design of the proposed facility will accommodate for flows of 400 cfs. Plate III shows that within the period from December 1970 to April 1971, twenty-eight days had flows exceeding 400 cfs and about twelve days had flows of 900-2700 cfs. Accommodating for the average flow of 136 cfs or the high of 400 cfs is not of concern as is the infrequent and very high flows greater than 900 cfs. For this reason we request that the following points be discussed in the final impact statement:

- a. What design measures will be taken to minimize damage to the crossing and structural supports on days of very high flows.
- b. What safety and precautionary measures will be utilized on days of high flows to prevent injury to those motorists using the ford? Dr. Grace from the University of Hawaii anticipates that a film of algae will develop on the road surface and suggests that the road surface be built with transverse striations. We hope that your agency will look seriously into this possible design.
- c. What is the capacity of the total flood control facility, including levees? What is the likelihood of the levees being overtopped? What possible damage can occur if the flood waters overtopped the levees?
- d. Will the installation of culverts increase the flood hazard below the project area and upstream of the project site?

### DRAINAGE

The impact statement indicates (on page four) that the Waimea River provides irrigation waters for agricultural uses. We question whether the installation of the culvert system will

make it more difficult to obtain water from the river? If so, this section must be expanded to include an assessment of measures to relieve this inconvenience, and possible secondary impacts resulting from installation of culverts.

#### ARCHAEOLOGICAL AND HISTORICAL SITES

Contact was informally made with the Department of Land and Natural Resources to check if possible adverse effects could occur to the menhune ditches and other archaeological sites downstream of the project. We found it difficult to assess possible impacts without knowing more information on the design of the ford. Thus, we request that the final statement include basic information and diagrams for the construction of the ford. We also wish the right to reserve comment on this particular concern until we have received a copy of the design plans.

#### ALTERNATIVES TO THE PROJECT.

The brief discussion on alternatives indicates to the reviewer that very limited investigation was conducted on this matter. This Office recommends that this section be expanded to include possible alternatives such as: the possibility of choosing a new site for the ford, construction of a higher elevated facility to overcome the concern of high flood waters, etc.

We hope that the above comments will prove useful in preparing the final environmental impact statement. Should you have questions on the comments, please do not hesitate to contact this office. Thank you for the opportunity to review this statement.

ATTACHMENT I

List of Responding Agencies

STATE AGENCIES

1. Department of Health (July 30)
2. Department of Transportation (August 15)
3. Environmental Center, University of Hawaii (August 15)
4. Department of Agriculture (August 15)
5. Water Resources Research Center (August 20)
6. Department of Land & Natural Resources (August 21)

FEDERAL AGENCIES

1. Corps of Engineers (August 22)
2. Soil Conservation Service (August 26)
3. Department of the Army (August 22)
4. Department of the Air Force (August 26)



## University of Hawaii at Manoa

Environmental Center  
Maile Bldg. 10 • 2540 Maile Way  
Honolulu, Hawaii 96822  
Telephone (808) 948-7361

Office of the Director

August 15, 1974

### MEMORANDUM

TO: Richard E. Marland  
FROM: Jerry M. Johnson  
SUBJECT: Draft EIS for Waimea River Ford Crossing,  
Waimea, Kauai, Hawaii

The Center was assisted by Robert Grace, Civil Engineering, and Frank Peterson, Geology and Geophysics, in reviewing the subject EIS.

We believe that the statement is adequate in its description of the possible deleterious effects of the proposed project on the physical environment. We concur that those effects will be minor.

Dr. Grace has two suggestions dealing with the proposed design of the project:

1. Since a film of algae will in all likelihood develop on the road surface, the surface should be built with transverse striations to improve traction for the vehicles using the ford.
2. The use of stone-filled gabions should be strongly considered for the side slopes of the ford. These will not erode readily and will tolerate a certain amount of settlement with no problems.

  
Jerry M. Johnson  
Assistant Director

cc: R. Grace  
F. Peterson

**UNIVERSITY OF HAWAII**

Water Resources Research Center  
Office of the Director

**MEMORANDUM**

August 20, 1974

MEMO TO: Richard E. Marland  
Interim Director, OEQC

FROM: Reginald H. F. Young [RM]  
Asst. Director, WRRC

SUBJECT: Review of Draft EIS, Waimea River Ford Crossing

This draft EIS was reviewed in this office by Henry Gee and myself. The following comments are submitted for your consideration:

A. Debris Control

What provisions will be made for debris control? Will the culverts be designed to pass expected debris using several maximum diameter culverts instead of a series of small diameters? Can debris racks be used to screen out unwanted material? What kind of maintenance program will be undertaken for debris removal following each flood?

B. Flood Capacity

The installation of a permanent crossing will create a higher headwater pool and will reduce the flood capacity of the levees. What peak discharge will the levees handle and what possible damages can occur if the flood waters overtopped the levees?

RHIFY:jmn

cc: H. Gee  
J. M. Johnson





DEPARTMENT OF THE ARMY  
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII  
APO SAN FRANCISCO 96557

HCSG-E

22 August 1974

Office of Environmental Quality Control  
Office of the Governor  
550 Halekauwila Street, Room 301  
Honolulu, Hawaii 96813

Dear Sirs:

Thank you for the opportunity to comment on the Environmental Impact Statement for the Waimea River Ford Crossing, Waimea, Kauai, Hawaii. The following comments which are keyed to the document are offered:

1. The description for this project and the projected environmental effects do not appear to warrant an Environmental Impact Statement. An Environmental Impact Assessment should be sufficient.
2. Generally, the whole statement is weak and lacks detailed data/descriptions in many areas. It is very hard to believe that no indigenous birds (Page 4, Section on Animal and Plant Life) exist in this rural river area. In the section on Archaeological and Historic Sites on page 4, a statement is made that "there are no known sites that are of archaeological or historic value." However, this is not backed up by references and a letter from the present State Historic Preservations Officer, Mr. Sunao Kido.
3. A section on aesthetics needs to be added to address the appearance of the structure itself and how it visually affects the terrain. Can it be built to blend into the environment particularly since this is an area of great scenic beauty and attracts large numbers of people every year because of the menehune ditches tourist attraction.

It is hoped that the comments are accepted and the Environmental Impact Statement is revised to strengthen it before the project is started.

Sincerely,

LEE C. HERWIG, JR.  
LTC, MSC  
Chairman, Environmental Working  
Committee

1050-E

22 August 1974

Office of Environmental Quality Control  
Office of the Governor  
555 Halekuanila Street, Room 301  
Honolulu, Hawaii 96813

Dear Sirs:

Thank you for the opportunity to comment on the Environmental Impact Statement for the Waimea River Ford Crossing, Waimea, Kauai, Hawaii. The following comments which are keyed to the document are offered:

1. The description for this project and the projected environmental effects do not appear to warrant an Environmental Impact Statement. An Environmental Impact Assessment should be sufficient.
2. Generally, the whole statement is weak and lacks detailed data/descriptions in many areas. It is very hard to believe that no indigenous birds (Page 4, Section on Animal and Plant Life) exist in this rural river area. In the section on Archaeological and Historic Sites on page 4, a statement is made that "there are no known sites that are of archaeological or historic value." However, this is not backed up by references and a letter from the present State Historic Preservations Officer, Mr. Sunao Kido.
3. A section on aesthetics needs to be added to address the appearance of the structure itself and how it visually affects the terrain. Can it be built to blend into the environment particularly since this is an area of great scenic beauty and attracts large numbers of people every year because of the menehune ditches tourist attraction.

It is hoped that the comments are accepted and the Environmental Impact Statement is revised to strengthen it before the project is started.

Sincerely,

LEE C. HERWIG, JR.  
LTC, MSC  
Chairman, Environmental Working  
Committee

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

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440 Alexander Young Building, Honolulu, HI 96813

August 26, 1974

Dr. Richard E. Marland  
Office of Environmental  
Quality Control  
550 Halekauwila St., Room 301  
Honolulu, HI 96813

Dear Dr. Marland:

Subject: Draft Environmental Impact Statement - Waimea River Ford  
Crossing, Waimea, Kauai, Hawaii

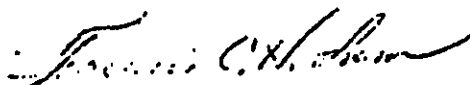
We have reviewed the above-mentioned draft as you requested and offer  
the following comments for consideration by the developer:

The project is designed for a maximum flow of 400 cfs. The  
statement also indicates that flows can be expected to exceed  
400 cfs approximately 28 days in a year. However, during the  
period October 1, 1970 to September 30, 1971, peaks in excess  
of 2000 cfs occurred three times. Flows of this magnitude  
could cause damage to the road that would require expensive  
annual maintenance.

Damages to the upstream areas because of backwater are mentioned.  
However, it is not clear to what extent these damages might occur.  
It appears the flood hazard will be increased upstream and possibly  
downstream.

Thank you for the opportunity to comment on this draft.

Sincerely,



Francis C. H. Lum  
State Conservationist





DEPARTMENT OF THE ARMY  
HONOLULU DISTRICT, CORPS OF ENGINEERS  
BUILDING 96, FORT ARMSTRONG  
HONOLULU, HAWAII 96813

PODED-P

22 August 1974

Dr. Richard E. Marland, Interim Director  
Office of Environmental Quality Control  
550 Halekaiwila Street  
Honolulu, Hawaii 96813

Dear Dr. Marland:

We have reviewed the draft environmental impact statement for Waimea River Ford Crossing, Waimea, Kauai, Hawaii, and have the following comments:

a. The proposed ford crossing may be considered a causeway across navigable waters, and the action should be coordinated with the U.S. Coast Guard to determine whether a permit from them would be required.

b. As discussed on page 2 and shown on Plate III, flows at the Waimea gage exceeded 400 cfs 29 times during the 1971 water year. It must be pointed out that these are mean daily flows. Peak flows exceeding 400 cfs can be expected much more frequently.

Sincerely yours,

ELROY CHINN  
Acting Chief, Engineering Division

DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 15th AIR BASE WING (PACAF)  
APO SAN FRANCISCO 96353



DEEE (Mr Kimura, 4492158)

26 AUG 1974

Draft Environmental Impact Statement

Office of Environmental Quality Control  
Office of the Governor  
550 Halekiauila Street  
Tani Office Building, Third Floor  
Honolulu, Hawaii 96813

We have no comments to render relative to the draft environmental impact statements for the following projects:

- ✓ a. Waimea River Ford Crossing, Waimea, Kauai
- b. Weliweli Subdivision
- c. Keaahala Stream Flood Control
- d. Military Assistant to Safety and Traffic (MAST)

ALLAN M. YAMADA  
Asst Dep Comdr for Civil Engrg

JOHN A. BURNS  
GOVERNOR OF HAWAII



DIVISIONS:  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
P. O. BOX 621  
HONOLULU, HAWAII 96809

August 21, 1974

MEMORANDUM

To: R. E. Marland, Interim Director  
Office of Environmental Quality Control

From: Sunao Kido, Chairman and Member

Subject: Comments on Environmental Impact Statements

Draft Environmental Statement of Non-Impact for Kamehameha  
Bridge over Kahaluu Stream, Oahu.

This Department has no objection to the renovation and additional widening of the existing Kamehameha Bridge over Kahaluu Stream, as proposed by the City and County of Honolulu, Department of Public Works. The project will have no adverse effects on any DLNR projects in the Kahaluu area.

Environmental Impact Statement for the East-West Center Facility,  
University of Hawaii, Manoa Campus, Oahu.

This Department has no objection to the proposed new facility to be constructed on the corner of Dole Street and the East-West Road in the University of Hawaii Manoa Campus, TMK 2-8-23:por 3. The area has been designated by the Board of Regents of the University for use in perpetuity for East-West Center programs.

Environmental Impact Statement for Waimea River Ford Crossing,  
Waimea, Kauai, Hawaii.

This proposal, by the County of Kauai Department of Public Works, to construct a ford crossing of approximately 250 feet in length across the Waimea River, Kauai, will have no adverse effects on areas under jurisdiction of the DLNR. We have no objection to the proposal as presented.

A handwritten signature in cursive script, appearing to read "Sunao Kido".  
SUNAO KIDO  
Chairman and Member

JOHN A. BURNS  
GOVERNOR OF HAWAII



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

WALTER B. QUISENBERRY, M.P.H., M.D.  
DIRECTOR OF HEALTH

WILBUR S. LUMMIS JR., M.S., M.D.  
DEPUTY DIRECTOR OF HEALTH

RALPH B. BERRY, M.P.H., M.D.  
DEPUTY DIRECTOR OF HEALTH

HENRI P. MINETTE, M.P.H., DR.P.H.  
DEPUTY DIRECTOR OF HEALTH

July 30, 1974

To: The Honorable Richard E. Marland, Interim Director  
Office of Environmental Quality Control

From: Director of Health

Subject: Draft Environmental Impact Statement (EIS) for Waimea  
River Ford Crossing, Waimea, Kauai, Hawaii

Thank you for allowing us to review and comment on the subject  
EIS. Please be informed that we have no objections to this project.

We realize that the statements are general in nature due to  
preliminary plans being the sole source of discussion. We, therefore  
reserve the right to impose future environmental restrictions on the  
project at the time final plans are submitted to this office for review.

  
WALTER B. QUISENBERRY, M.D.

JOHN A. BURNIS  
GOVERNOR



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

E. ALVEY WRIGHT  
DIRECTOR  
LAWRENCE P. CHUNG  
DEPUTY DIRECTOR  
MUNNY Y. LEE  
DEPUTY DIRECTOR  
DOUGLAS S. SAKAMOTO  
DEPUTY DIRECTOR

IN REPLY REFER TO:  
ATP 8.2691

August 15, 1974

Dr. Richard E. Marland  
Interim Director  
Office of Environmental  
Quality Control  
550 Halekauwila Street, Room 301  
Honolulu, Hawaii 96813

Dear Dr. Marland:

Subject: Draft Environmental Impact Statement  
Waimea River Ford Crossing  
Waimea, Kauai, Hawaii

We have reviewed the subject environmental statement and have no comments to offer as it relates to and affects our Department's transportation program.

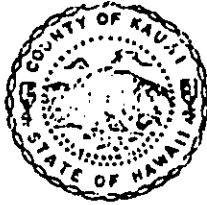
Sincerely,

*Douglas S. Sakamoto*  
for E. ALVEY WRIGHT  
Director



APPENDIX B

RESPONSES TO REVIEW COMMENTS



LIHUE, KAUAI, HAWAII 96766

October 24, 1974

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Mr. Elroy Chinn  
Acting Chief, Engineering Division  
Department of the Army  
Honolulu District, Corps of Engineers  
Building 96, Fort Armstrong  
Honolulu, Hawaii 96813

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT  
WAINA RIVER FORD CROSSING

Dear Mr. Chinn:

Reference is made to your letter dated August 22, 1974 that was submitted to the Office of Environmental Quality Control with comments for the captioned project.

Our response to your comments are as follows:

- a. We will coordinate this work with the U.S. Coast Guard and obtain any necessary permit.
- b. The ford crossing will not permit vehicular access with flows exceeding 400 cfs. However, this crossing should be a far greater improvement than the present situation of a crossing which restricts storm flows and creates access problems.

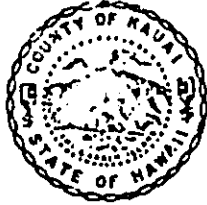
Thank you very much for your comments on the Draft Environmental Statement.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Akira Fujita", is written over a horizontal line.

AKIRA FUJITA  
County Engineer

KK:h  
cc: O.E.Q.C.



LIHUE, KAUAI, HAWAII 96766

October 24, 1974

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University of Hawaii at Manoa  
Environmental Center  
Maile Bldg. 10 - 2540 Maile Way  
Honolulu, Hawaii 96822

Attention: Mr. Jerry M. Johnson

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE WAIMEA  
RIVER FORD CROSSING, WAIMEA, KAUAI

Dear Sir:

Reference is made to your letter dated August 15, 1974, that was submitted to the Office of Environmental Quality Control with comments for the captioned project.

Our response to your comments are as follows:

1. We have specified in the construction specifications, a one-eighth (1/8) inch deep, transverse broom finish to increase vehicular traction for the wet and slippery condition. We expect that these striations will improve traction when the surface is covered by a film of algae.
2. The side slopes and cutoff wall of the crossing will be an integral part of the reinforced concrete road surface for structural stability. We have provided two (2) ton rock slope protection at the upstream and downstream toe of the crossing for erosion and settlement purposes.

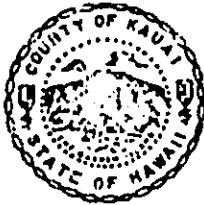
Thank you for your comments on the Draft Environmental Impact Statement.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Akira Fujita", is written over a horizontal line.

AKIRA FUJITA  
County Engineer

KK:h  
cc: O.E.Q.C.



LIHUE, KAUAI, HAWAII 96766

October 24, 1974

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University of Hawaii  
Water Resources Research Center  
Manoa Campus  
Honolulu, Hawaii

Attention: Reginald H.F. Young

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT  
FOR THE WAINEA RIVER FORD CROSSING, WAINEA, KAUAI

Dear Sir:

Reference is made to your letter dated August 20, 1974 that was submitted to the Office of Environmental Quality Control with comments for the captioned project.

Our response to your comments are as follows:

- A. There will be a debris rack upstream of the crossing to limit large debris from constricting the culvert - inlet. These culvert sizes were selected to maintain the surface elevation of the existing crossing and hydraulic conditions. Larger culverts and a crossing at a higher elevation will create higher backwater problems and should be avoided.
- B. This installation of a permanent crossing with a series of culverts should not create a higher headwater pool than the present condition. The proposed crossing will be constructed at elevation 2.0 feet which is lower than the existing crossing at elevation 2.2 feet. It is anticipated that there will be a reduction of the headwater pool.

Under an unusual and infrequent rainstorm there is a possibility of overtopping of the east bank of the flood levees. However, under this situation, the flood flow will be toward the Makaweli-Wainea River Junction, which

University of Hawaii

- 2 -

October 24, 1974

is presently undeveloped and which lands are zoned agricultural by the State of Hawaii and open by the County of Kauai due to flood constraints. These areas are prone to flooding from the Makaweli River. Problems such as erosion and siltation during periods of unusual floods could be restored by maintenance projects.

Thank you very much for your comments on the Draft Statement.

Very truly yours,

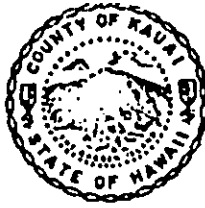


AKIRA FUJITA  
County Engineer

KK:h

cc: O.E.Q.C.

P. O. BOX 111



LIHUE, KAUAI, HAWAII 96766

October 24, 1974

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Department of the Army  
Headquarters, United States Army Support  
Command, Hawaii  
APO, San Francisco 96557

Attention: Lee C. Berwig, Jr., LTC, MSC

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT  
WAIMEA ROAD CROSSING, WAIMEA, KAUAI

Dear Sir:

Reference is made to your letter dated August 26, 1974 that was submitted to the Office of Environmental Quality Control with comments for the captioned project.

Our response to your comments are as follows:

1. The crossing will be a low profile structure within the waterway section and along the flood levees of the Waimea River. This situation should create the least possible visual impacts. Attached is Plate IV, which shows the plan and profile of the project. The flood control project that was constructed previously may have destroyed or damaged any existing Archaeological Site if it previously existed. This project should not disrupt any existing Archaeological and Historical Site.

Thank you for your comments on the Draft Environmental Impact Statement.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Akira Fujita".

AKIRA FUJITA  
County Engineer

IKK:h  
cc: O.E.Q.C.



LIHUE, KAUAI, HAWAII 96766

October 24, 1974

Dr. Richard E. Marland,  
Interim Director  
Office of Environmental Quality Control  
550 Halekauwila Street, Room 301  
Honolulu, Hawaii 96813

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT  
WAHITA RIVER FORD CROSSING, WAIMEA, KAUAI

Dear Dr. Marland:

Reference is made to your letter dated September 27, 1974 with comments for the captioned project.

Our response to your comments are as follows:

1. Project Description and Location  
The proposed ford crossing will follow the alignment of the existing crossing. As a result, the existing crossing will be demolished during the construction period. Temporary access during this construction period will be by a temporary earth and gravel section until the proposed project can accommodate vehicular traffic. Refer to plate IV which is a plan and profile view of the proposed project.
2. Drainage  
The intakes for the irrigation water from the Waimea and Makaweli River are located upstream of the proposed crossing. The impounded waters from the existing crossing are not affected by the proposed improvement.
3. Archaeological and Historical Sites  
Plate IV is a plan and profile view of the proposed ford crossing. The construction of the ford crossing is limited within the flood channel area and should not adversely affect the Menchuna Ditch.

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Dr. Richard E. Marland

- 2 -

October 24, 1974

4. Alternatives to the Project

The proposed ford crossing abuts the government roadway and meets a vehicular travel way that has been used by the residents for many years. The proposed crossing follows the alignment of the existing crossing which has been used many years.

A new site for the ford crossing would create a loss in agricultural lands for other owners who are not affected by this proposal. A Bridge structure because of it's high cost is not warranted due to it's limited use. Detailed investigation and consideration of an alternate site will not be possible due to the lapsing of State Funds during this calendar year.

We are enclosing a copy of the construction plans for your information and use.

Thank you for your comments on the Draft Environmental Impact Statement.

Very truly yours,



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AKIRA FUJITA  
County Engineer

KK:h

Att'd: Construction Plans





LIHUE, KAUAI, HAWAII 96766

October 24, 1974

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United States Department of Agriculture  
Soil Conservation Service  
440 Alexander Young Building  
Honolulu, Hawaii 96813

Attention: Mr. Francis C.H. Lum

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT  
WAIMEA RIVER FORD CROSSING, WAIMEA, KAUAI

Dear Mr. Lum:

Reference is made to your letter dated August 26, 1974 that was submitted to the Office of Environmental Quality Control with comments for the captioned project.

Our response to your comments are as follows:

1. The site slopes and the traveled way surface of the proposed ford crossing will be a reinforced concrete section. The upstream and downstream batter slope of the crossing will have slopes of 4:1 and 2:1, respectively to reduce erosion and inertia forces. Cutoff walls that extend to elevation -10.0 feet below mean sea level and 2 ton rock slope protection upstream and downstream of the structure will be provided for scour and erosion. Select fill material will be used as the embankment core. These measure are provided to minimize damages to the crossing.
2. The proposed ford crossing will be constructed at elevation 20 feet which will be lower than the existing crossing which is at an elevation of 2.2 feet. The flood capacity of the flood levees should not be decreased with the proposed facility, under the normal, low flow condition. The unusual and infrequent floods may overtop the east bank of the flood levee and flow towards the Waimea River

United States Dept. of Agriculture  
Page 2  
October 24, 1974

Makaweli River Junction area which would be inundated by  
the Makaweli River under these extraordinary conditions.

Thank you very much for your comments on the Draft Environmental  
Impact Statement.

Very truly yours,



AKIRA FUJITA  
County Engineer

KK:h  
cc: O.E.Q.C.