LINDA CROCKETT LINGLE
Mayor

CHARLES JENCKS
Director

DAVID C. GOODE
Deputy Director

AARON SHINMOTO, P.E.
Chief Staff Engineer

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

EASSIE MILLER, P.E.
Wastewater Reclamation Division

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

DAVID WISSMAR, P.E.
Solid Waste Division

BRIAN HASHIRO, P.E.
Highways Division

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

July 27, 1995

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

SUBJECT: NEGATIVE DECLARATION FOR THE
POOPOO BRIDGE REPLACEMENT
FEDERAL AID PROJECT NO. BR-0900(40)
MAUI, HAWAII

Dear Mr. Gill:

The County of Maui, Department of Public Works has reviewed the comments received during the 30-day public comment period which began on June 23, 1995. The agency has determined that this project will not have a significant environmental effect and has issued a negative declaration. Please publish this notice in the August 8, 1995 OEQC Bulletin.

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

If you have any questions, please contact Cary Yamashita of the County of Maui, Department of Public Works, Engineering Division at (808) 243-7745 or Loren Lau of Sato & Associates, Inc. the design consultant at (808) 955-4441.

Thank you for your attention to this matter.

Very truly yours,

CHARLES JENCKS
Director of Public Works
and Waste Management

CY:ch(ED95-960)
Poopoo.Neg

Enclosures

FINAL

ENVIRONMENTAL ASSESSMENT

NEGATIVE DECLARATION

for the

POOPOO BRIDGE REPLACEMENT

MAUI, HAWAII

Prepared for:

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

Prepared by:

SATO & ASSOCIATES, INC.
2046 SOUTH KING STREET
HONOLULU, HAWAII 96826

JULY 1995

POOPOO BRIDGE REPLACEMENT PROJECT

MAUI, HAWAII

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I PROJECT OVERVIEW

A. INTRODUCTION

Piilani Highway is the only highway between population centers around the southeastern part of Maui, Hawaii. Many bridges along Piilani Highway are old, deteriorated and require frequent maintenance or repair. Their capacities are less than HS 20 (20 ton truck or 36 ton truck/trailer), which is required by the American Association of State Highway and Transportation Officials (AASHTO) for Rural Collector Roads. The County of Maui is in a program of replacing old and deteriorating bridges with new bridges with adequate roadway width and load capacity. The Poopoo Bridge is one of the bridges that require replacement. Refer to Figures 1, 2 and 3.

B. DESCRIPTION OF OBJECTIVES AND PROPOSED ACTION

The proposed project is an agency action by the County of Maui Department of Public Works and Waste Management.

1. Objectives

The Poopoo Bridge is in need of repair or replacement. The County of Maui has evaluated the condition and projected repair cost, and has determined that replacement of the bridge is required. Refer to Exhibit A.

2. Proposed Action

The existing Poopoo Bridge is a one lane timber structure with intermediate wood supports which span over Poopoo Stream. The project proposes a new two lane concrete bridge structure without intermediate supports which will span over Poopoo Stream. After the new bridge is activated, the wood bridge will be removed.

Roadway adjustments to the one lane Piilani Highway will be made at the bridge. Adjustments will be made to provide proper sight distances, horizontal and vertical roadway profiles, and transitions to Piilani Highway.

C. PARTIES INVOLVED

1. Applicant
County Of Maui, Dept. Of Public Works And Waste Management
Mr. Charles Jencks, Director of Public Works

2. Approving Agency
County Of Maui, Dept. Of Public Works And Waste Management
Mr. Charles Jencks, Director of Public Works

3. Consulted Agencies and Parties

Federal
- Department of Agriculture, Soils Conservation Service
- Army Corps of Engineers
- Department of the Interior, Fish and Wildlife Services
- Department of Transportation, Federal Highway Administration

State of Hawaii
- Department of Business, Economic Development and Tourism
- Department of Hawaiian Home Lands
- Department Of Land And Natural Resources
- State Historical Preservation Division - DLNR
- Environmental Management Division - DOH
- Department of Transportation
- Office of State Planning
- Office of Hawaiian Affairs
- Office of Environmental Quality Control
- University of Hawaii at Manoa - Environmental Center

County Of Maui
- Planning Department
- Department of Parks and Recreation
- Department of Public Works and Waste Management

Others
- Sierra Club - Maui Chapter
- The Nature Conservancy - Maui
- Kipahulu Community Association
- Hana Community Association
- Hana Advisory Commission
- Hana Public Library

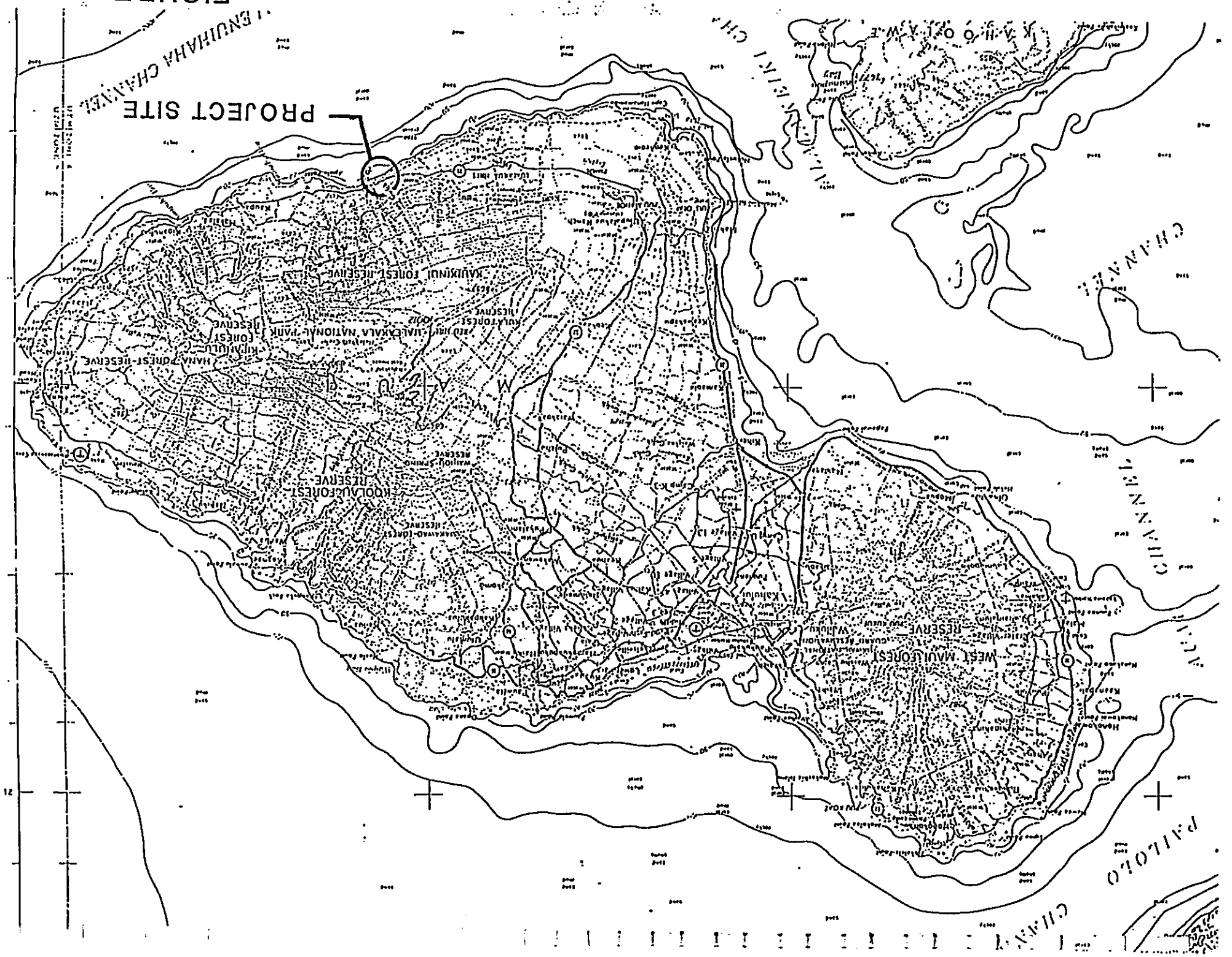

FIGURE 1

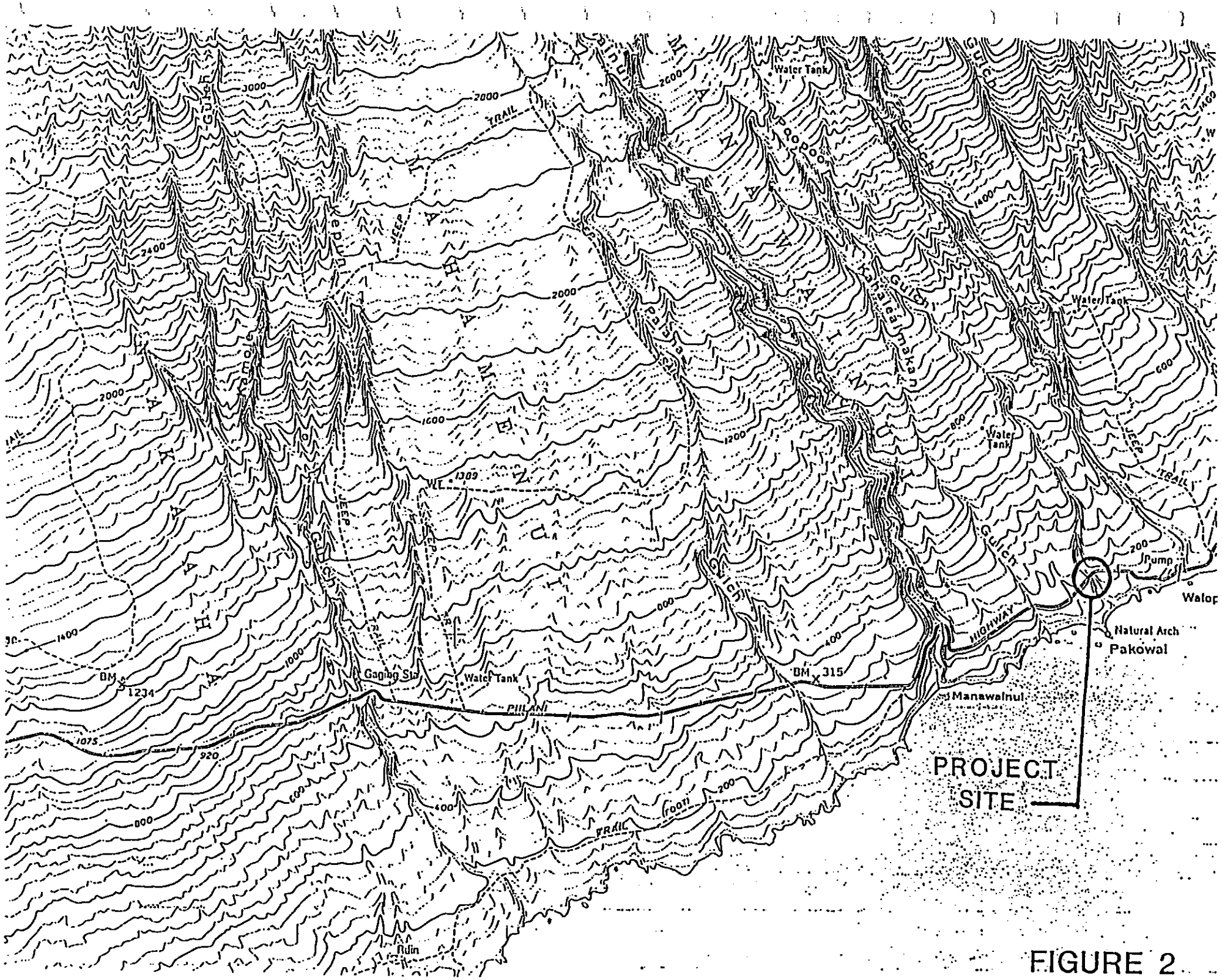

FIGURE 2

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DOCUMENT CAPTURED AS RECEIVED

PARTIAL AERIAL PHOTO
FIGURE 3
SCALE 1" : 100'

II DESCRIPTION OF PHYSICAL ENVIRONMENT

A. SURROUNDING LAND USES

The existing Poopoo Bridge is located on Piilani Highway along the southeastern coast line on the island of Maui. Piilani Highway is on the lower slopes of Mount Haleakala. The bridge carries Piilani Highway over Poopoo Stream, and connects Kaupo to Ulupalakua.

Piilani Highway and the Poopoo Bridge crosses the southern portion of the Haleakala Ranch Company property. Ranching and pasture grazing is the primary activity in this area. Refer to Figure 4.

B. BRIDGE STRUCTURE

The existing Poopoo Bridge is a one lane timber structure, with intermediate wood supports, which spans over Poopoo Stream. The bridge was constructed in 1948 and reconstructed in 1977. The bridge is approximately thirty eight feet above the stream bed. The structural supports consists of concrete abutments and wing walls at both ends, along with two intermediate heavy timber posts on concrete footings supports. Refer to Exhibit A.

C. ROADWAY

Piilani Highway is a lightly traveled, narrow and winding highway. The roadway widths vary from two lanes to one lane, depending on the extent of the highway improvement and topography. At the project site, the roadway is a single lane with asphaltic surface treatment on granular rocky material.

Average Daily Traffic Calculations and Traffic Count was provided by the County of Maui Department of Public Works and is included as Exhibit F.

D. CLIMATE AND AIR QUALITY

The climate is relatively uniform year round due to the proximity to the ocean and tropical latitude. Average temperatures range between 65 degrees and 88 degrees Fahrenheit. Historically the warmest months are July and August, while the coolest months are December and January.

Rainfall is seasonal. Most precipitation occurs between November and February as a result from winterstorms.

Wind patterns vary on a daily basis. Winds blow onshore during the day towards the warm land mass, then towards the warm ocean during the evening.

The lack of residential and commercial development, and the wind conditions would indicate air quality is good in the area. Sources of pollution occurs from vehicles traveling in the area. Degradation of the air quality is not anticipated due to the low vehicular traffic.

E. FLOOD AND TSUNAMI ZONE

The National Flood Insurance Rate Map (FIRM) for this area of the island designates the project site as being within Zone C, indicating an area of minimal flooding. Refer to Figures 5 and 5A.

F. TOPOGRAPHY AND SOILS

The bridge site consists of gently rolling hills with steep banks along both sides of Poopoo Stream. The area is blanketed by basaltic flows of the Kula Volcanic Series. The Kula flows form the surface over most of the northwestern and southeastern segments of Haleakala Mountain. The flows characteristically average twenty feet in thickness at the summit and fifty feet near the coast.

The bottom and sides of Poopoo Gulch consists of massive basalt flows with little or no soil cover. A minor amount of erosion is apparent at the stream bed, but there is little indication of lateral expansion of the stream bed or erosion of the side walls. The basalt was deposited in thick flows with few inclusions of ash or clincker as exhibited in the nearly forty foot vertical exposure on the sides of the gulch. Refer to Site Reconnaissance Report Exhibit B.

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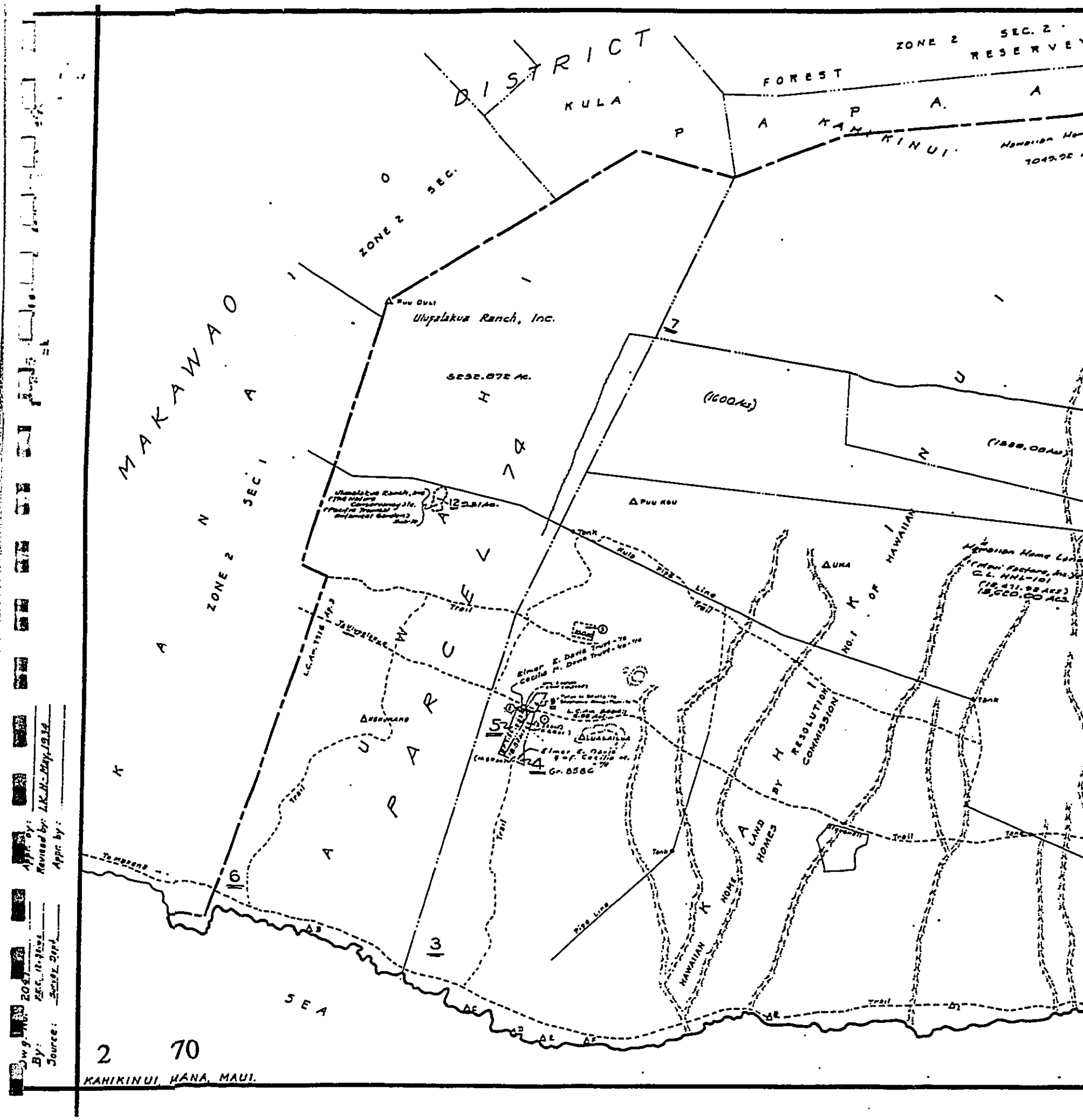

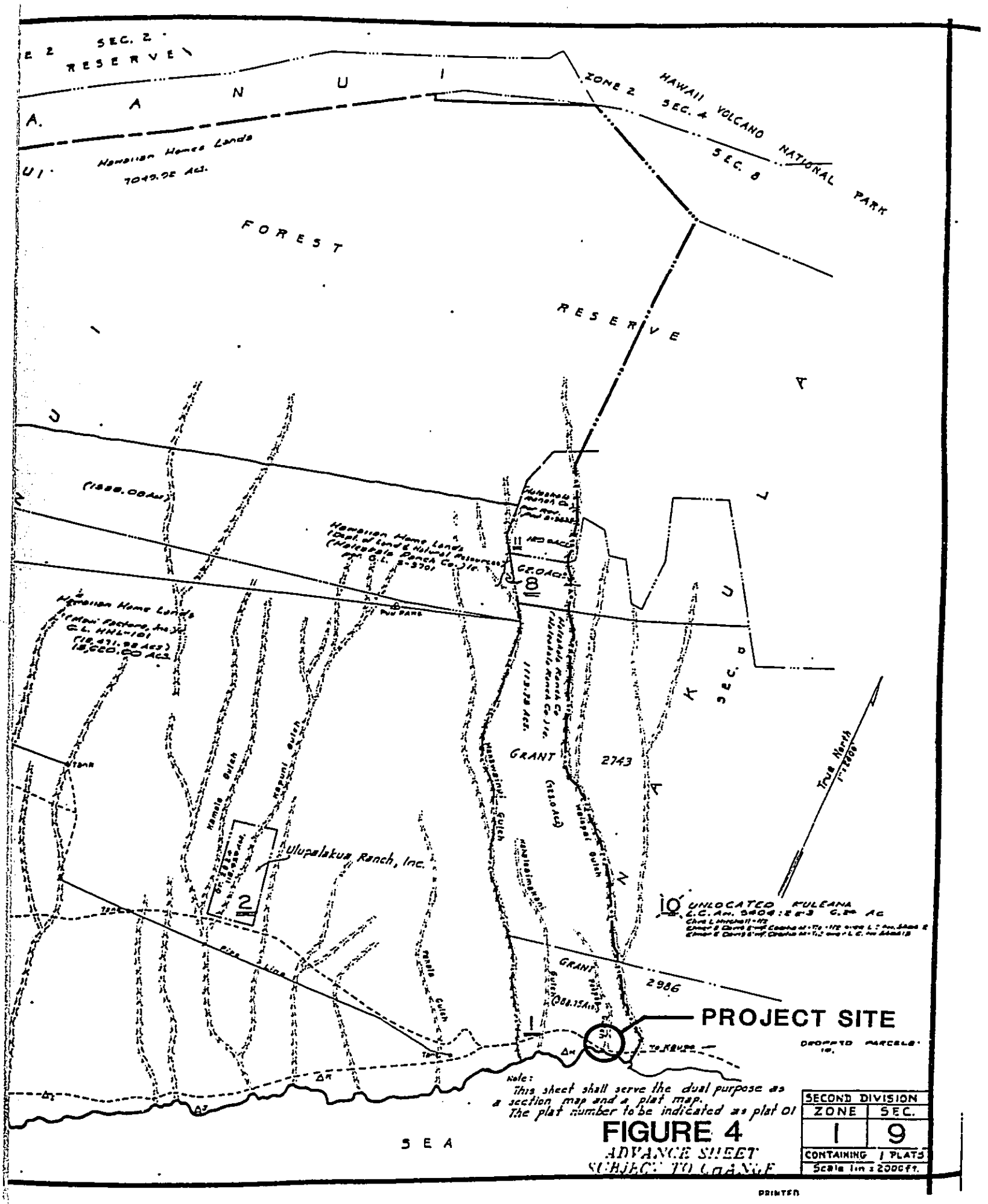

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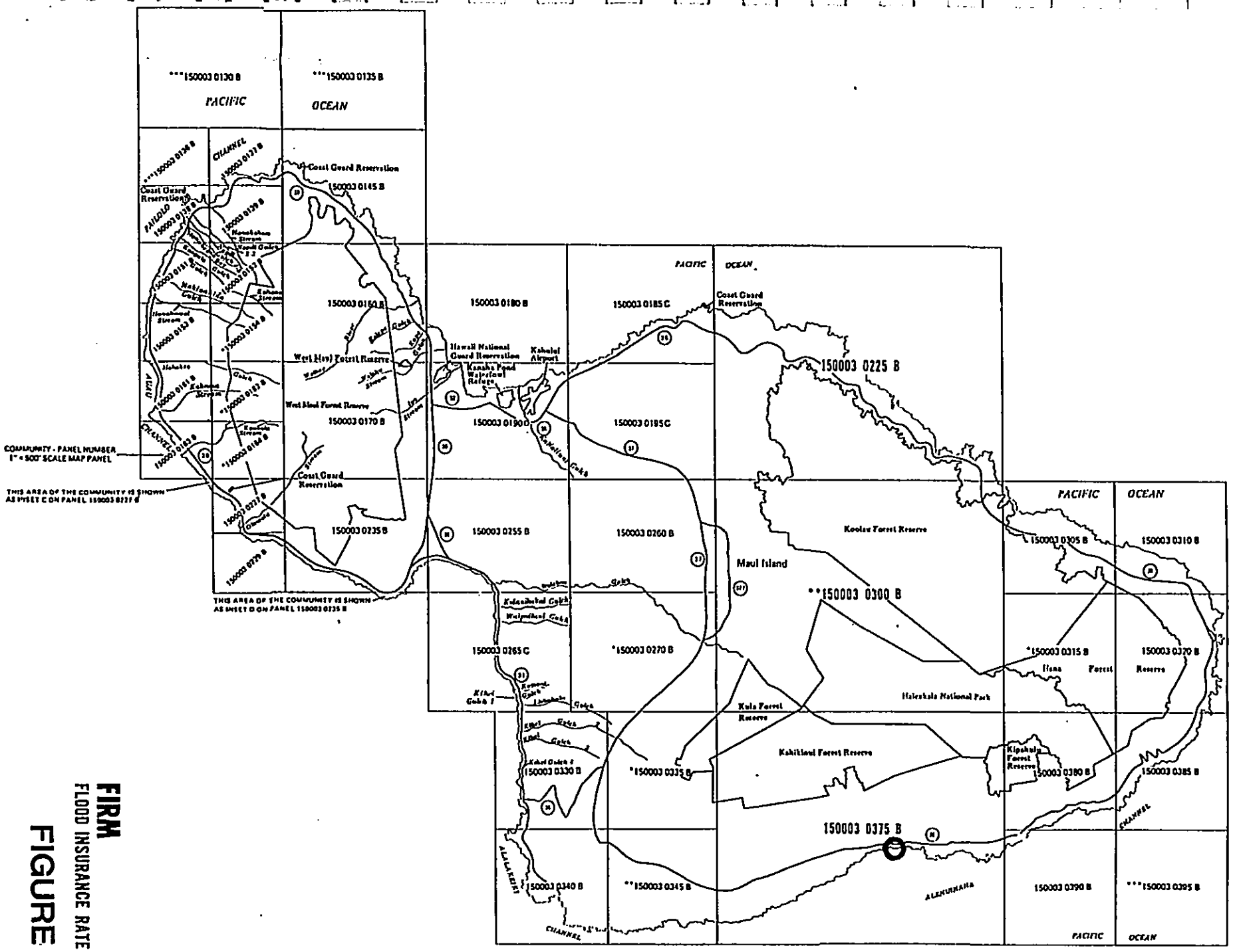
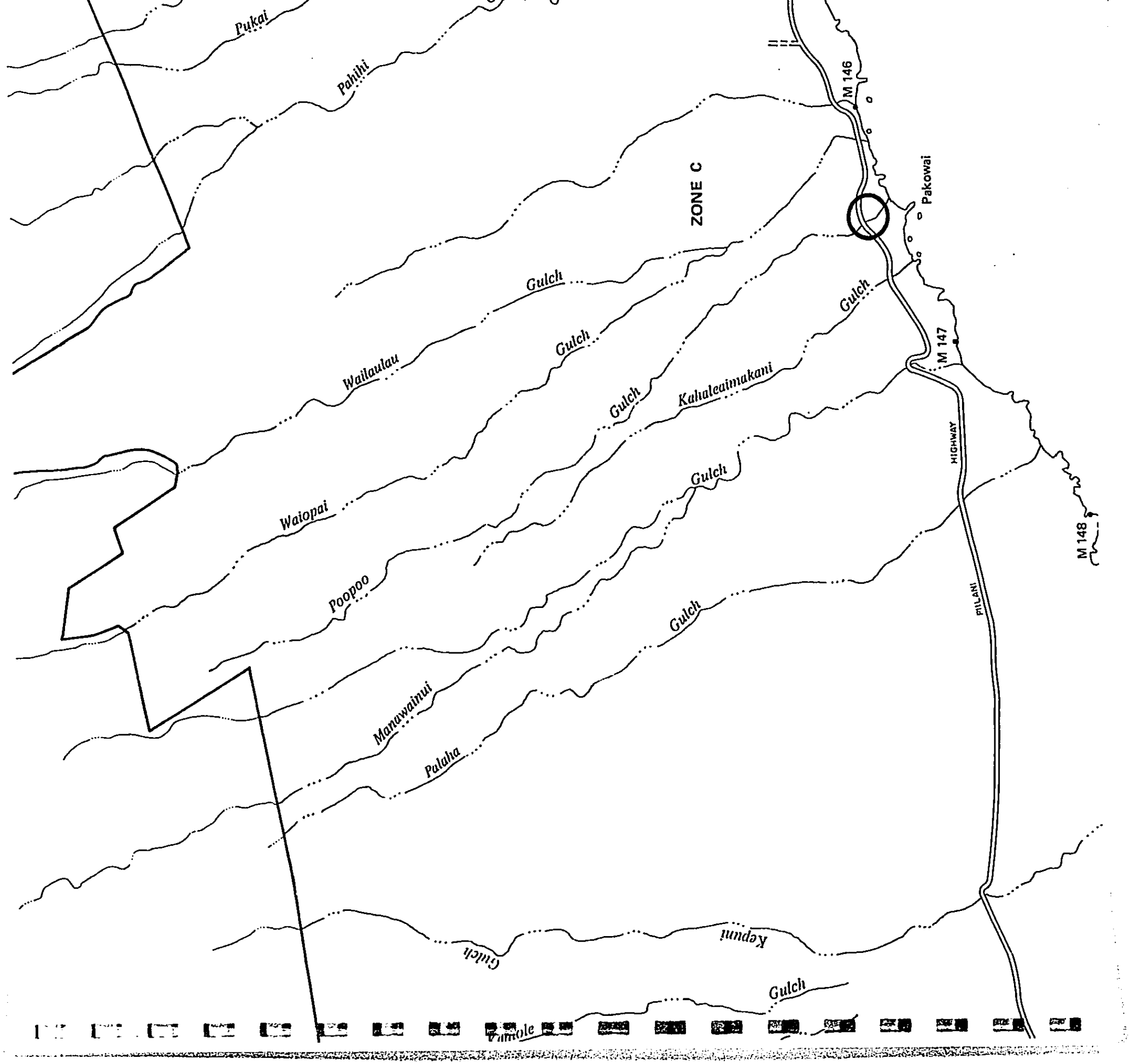
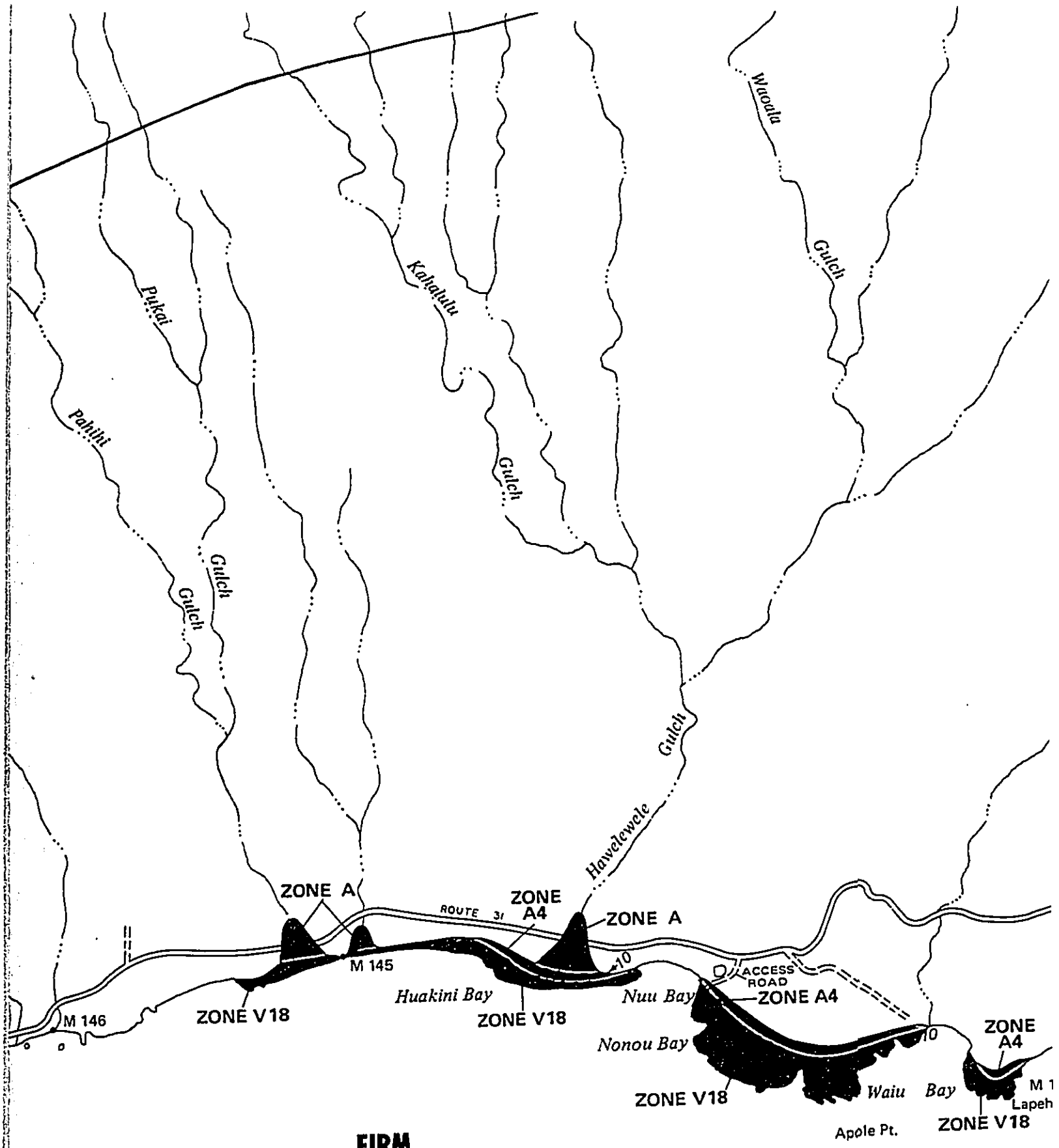


FIRM
FLOOD INSURANCE RATE MAP

FIGURE 5


Pukai
Pahihi
Gulch
Wailaulau
Gulch
Gulch
Kahaleaimakani
Gulch
Waiopai
Poopoo
Gulch
Manuwainui
Palaha
Gulch
Kepuni
Gulch
Pumole
ZONE C
M 146
Pakowai
M 147
HIGHWAY
PIILANI
M 148



FIRM
FLOOD INSURANCE RATE MAP

150003 0375 B

FIGURE 5A

G. FLORA AND FAUNA

Flora

The vegetation on the project site and immediate surrounding area consists of buffelgrass grassland on very stony soil. The land is used for pasture. Where the shallow soil is stonier or where there are rocky outcroppings, pitted beardgrass, fuzzy top, and pili grass are codominant with the buffelgrass.

The steep walls of the gulch support scattered patches of buffelgrass, but large rocky outcrops predominate. The native 'akoko is common on the gulch walls. A few patches of 'ihi occur on the rocky slopes and gulch walls makai of the existing bridge. The gulch bottom consists primarily of basalt bedrock with large boulders and gravel piles. A few small scattered patches of buffelgrass and koa-haole occur on the bottom of the gulch.

None of the plant on the project site is a listed, proposed or candidate threatened and endangered species, nor is any plant considered rare or vulnerable. Refer to Botanical Resources Assessment Exhibit C.

Fauna

The surrounding area has been extensively alter and/or leveled by earthmoving equipment and by animal grazing activity. The area is essentially pasture land for the Haleakala Ranch Company.

The project site is not a natural habitat for any federally listed, proposed, and candidate endangered and threatened species within the area. Refer to Appendix A - U.S. Department of the Interior Fish and Wildlife Service letters.

H. AQUATIC ENVIRONMENT

Poopoo Stream is an intermittent steam which is normally dry during most of the year. During the rainy season, the stream carries rain water from the lower portions of Mount Haleakala to the ocean. The bridge is approximately 750 feet from the ocean. This environment does not support aquatic life in the project area.

I. HISTORICAL AND ARCHAEOLOGICAL RESOURCES

The area has been extensively altered and/or leveled. Several jeep trails are present and bulldozer scars are seen on many of the rocks. Bull dozer piles are present along the sides of the roadway. It is likely that some of the previously disturbed ground observed in the project area is associated with the construction, maintenance and improvement of Piilani Highway and Poopoo Bridge. Ranching activities is also likely to have contributed to the ground disturbance.

A historic stone wall is present within the gulch and is approximately 480 feet mauka of the bridge. A jeep trail crosses the gulch at that point.

Remnant segments of the Hoapili Trail (Site 50-50-15-572) is present in the vicinity and crosses the gulch approximately 500 feet on the mauka side of the existing bridge. In the immediate project area, previous disturbances have destroyed and obliterated all surface indications of the trail and its alignment. The proposed project is not expected to have an adverse impact on any of the intact segments of this trail. Refer to Archaeological Inventory Survey - Exhibit D.

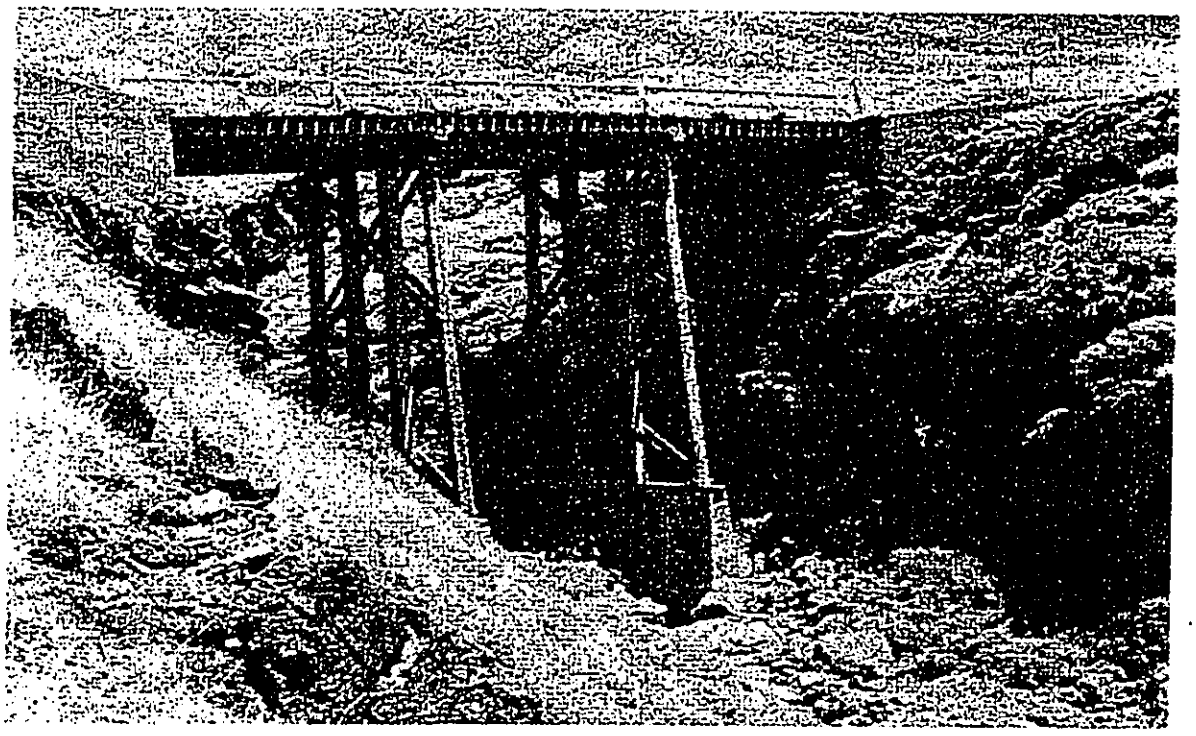
Should inadvertent findings occur during construction activities, work in the immediate area will be halted and the State Historic Preservation Division of the Department of Land and Natural Resources will be notified.

J. NOISE CHARACTERISTICS

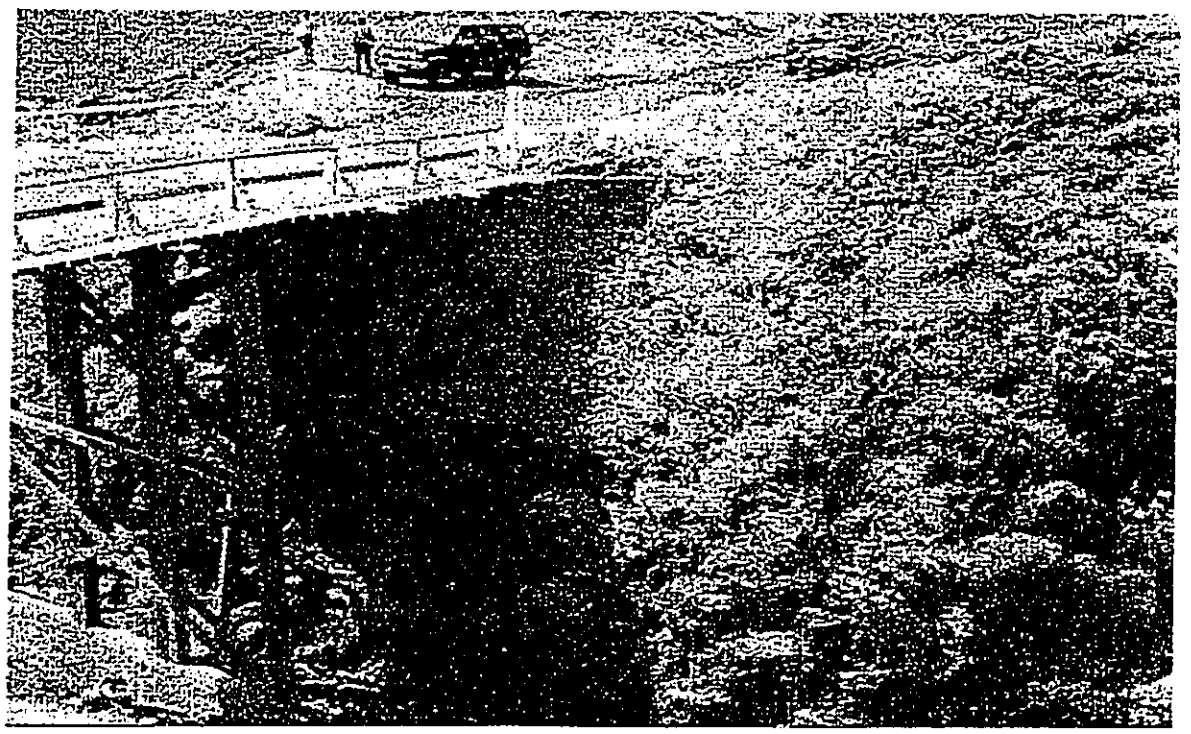
Wind and ocean surf noise is the prominent source of noise in the area. Other noise source is generated by light vehicular traffic along the highway.

K. SCENIC AND OPEN SPACE RESOURCES

Scenic resources include Mount Haleakala on the mauka (mountain) side, low rolling hills stretching towards the ocean, and steep cliffs along the shoreline. There are no significant view corridors affected by the bridge project. Refer to Figures 6A, 6B, 6C and 6D.

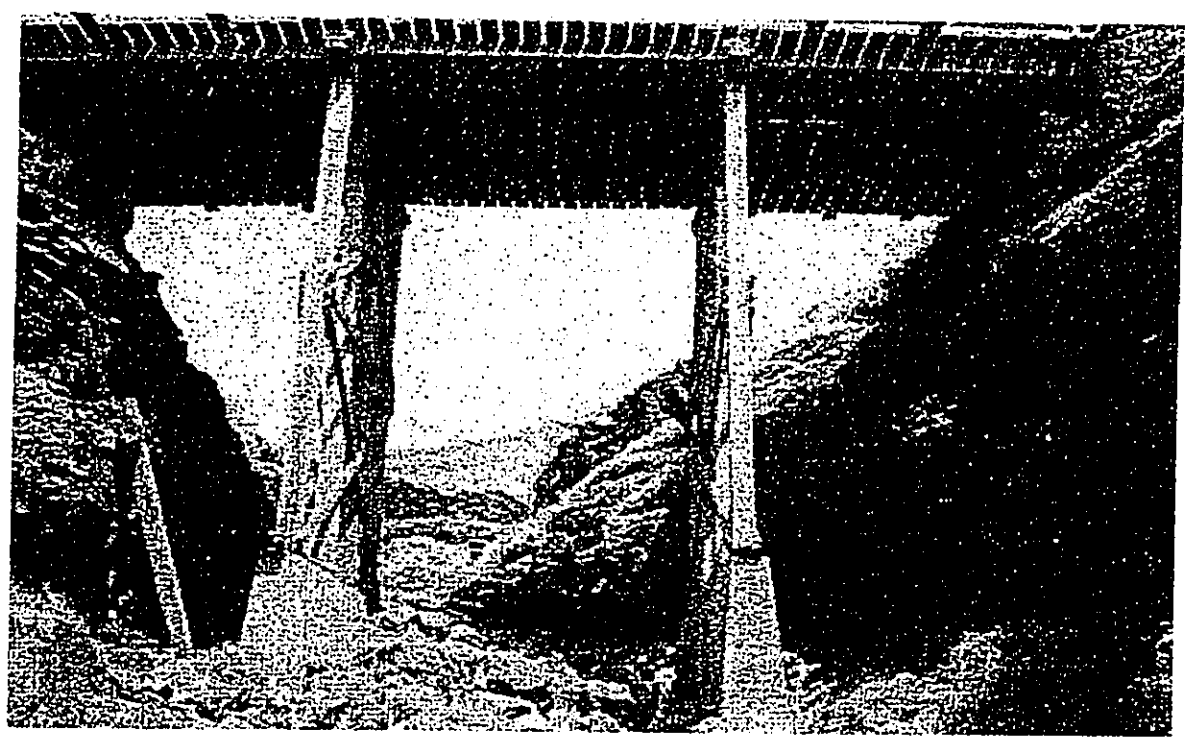


VIEW TOWARDS THE MOUNTAINS



VIEW TOWARDS ULUPALAKUA SIDE OF BRIDGE

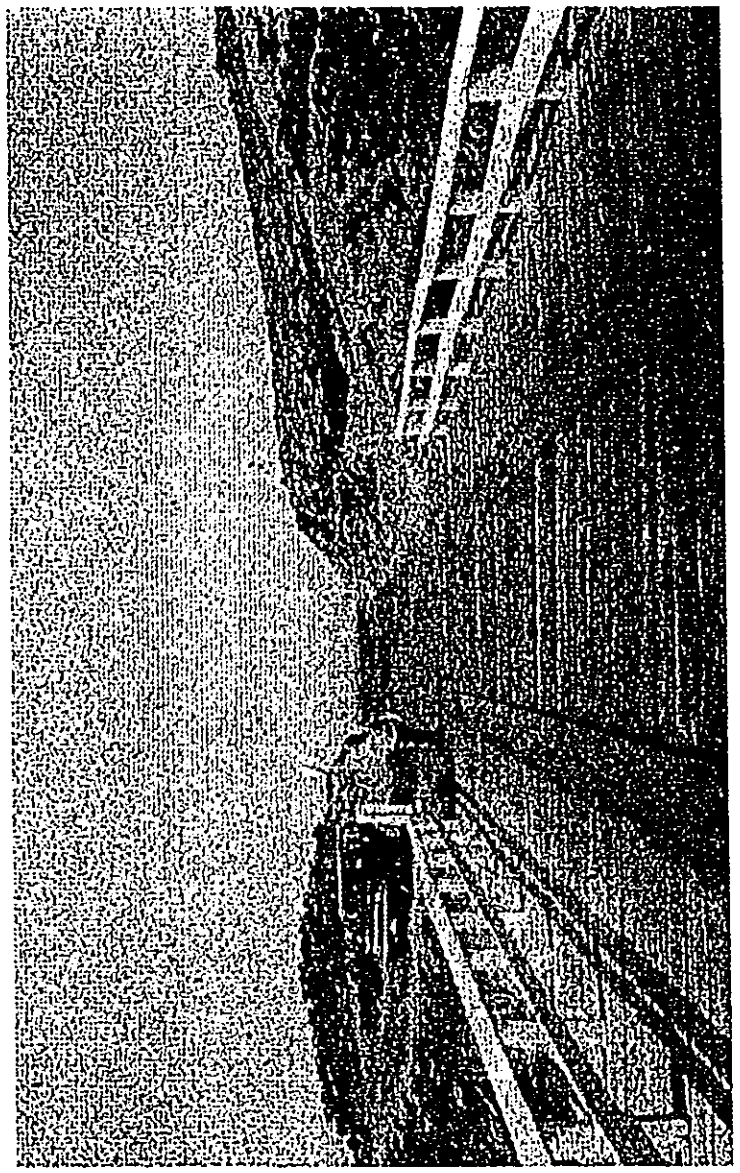
FIGURE 6A



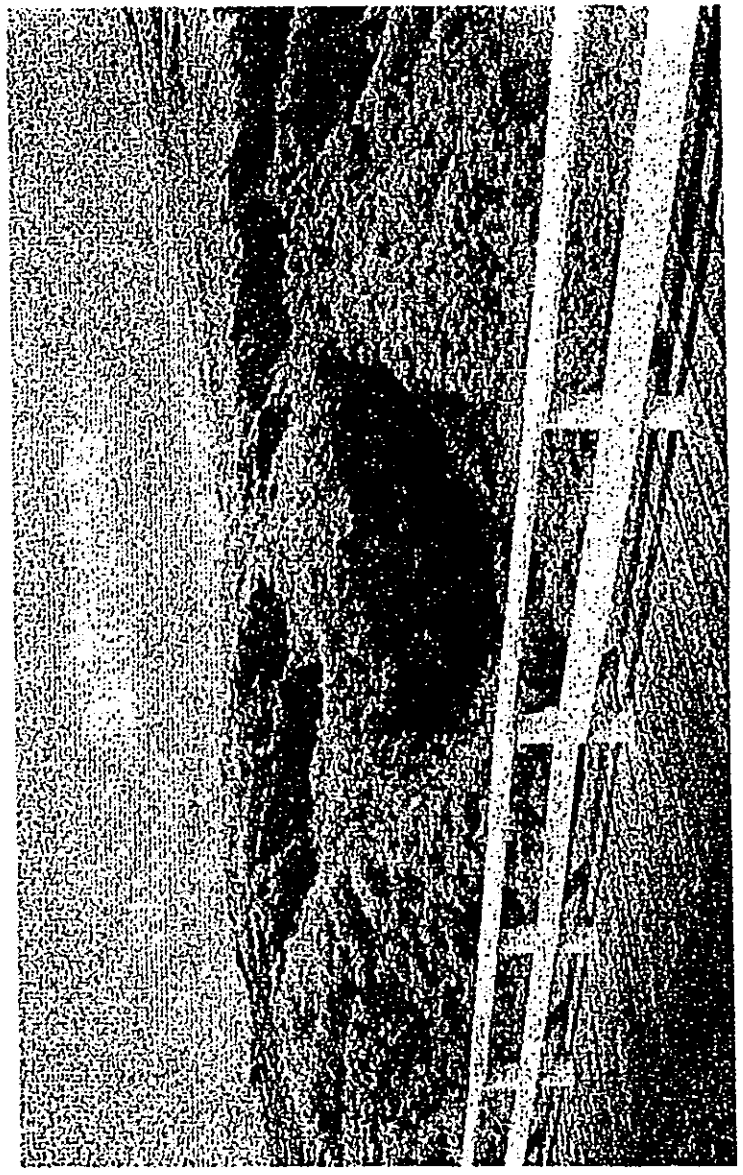
VIEW OF POOPOO GULCH TOWARDS THE MOUNTAINS

VIEW OF POOPOO GULCH TOWARDS THE OCEAN

FIGURE 6B



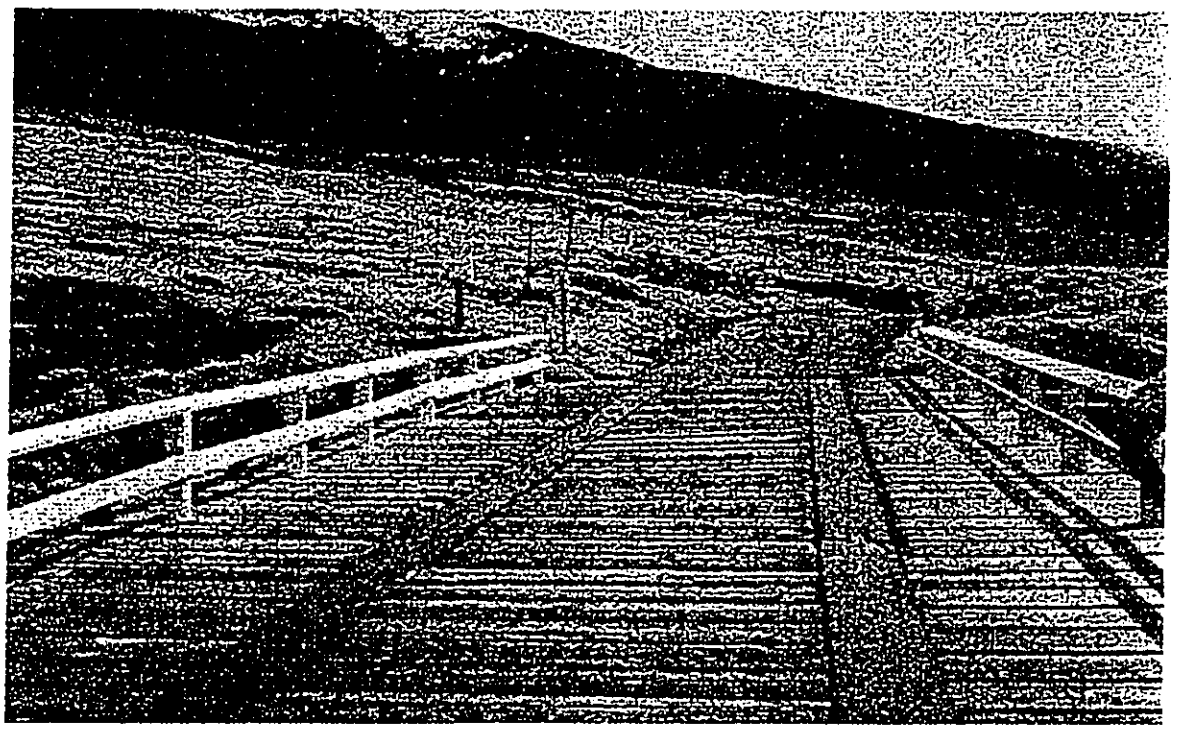
VIEW TOWARDS ULUPALAKUA



VIEW TOWARDS ULUPALAKUA

FIGURE 6C

VIEW TOWARDS MOUNTAINS



VIEW TOWARDS KAUPO

FIGURE 6D

III DESCRIPTION OF PROJECT CHARACTERISTICS

A. SITE PLAN

The new concrete bridge would be constructed on the mauka (mountain) side, and parallel, to the existing wood bridge. Traffic would travel along the existing roadway and bridge while the new two lane bridge and roadway approaches are under construction. Grading and cutting into existing hillsides is required to maintain the proper roadway transition to the bridge. Refer to Figure 7.

B. NEW BRIDGE REPLACEMENT STRUCTURE

The bridge deck would be cast-in-place concrete deck on prestressed precast concrete girders. The span is approximately 63 feet. Tall abutments and wingwalls are required due to the steep face of the gulch. Refer to Figure 7A.

Cast-in-place concrete girders were considered. However, design and construction analysis was not initiated since placement of the formwork within the stream bed during construction may be severely impacted during rain/wet conditions. Also, precautions to prevent debris (construction formwork eroded by heavy stream waters during rainy periods) from entering the ocean appeared to be excessive.

The bridge designed will comply with the 1991 Edition of the Uniform Building Code. Construction cost is estimated to be approximately $1.5 million.

In the future, stream scours beneath the new bridge will be filled with concrete to minimize erosion. Filling of the stream scours will occur after a Federal Nationwide Permit 13 for Bank Stabilization and a State of Hawaii Section 401 Water Quality Certification is obtained.

C. EXISTING BRIDGE REMOVAL

In the future, the existing wood bridge will be removed. The bridge removal would occur after a State of Hawaii Department of Land and Natural Resources Conservation District Use Application Departmental Permit is obtained, and after the activation of the new concrete bridge.

Removal of the existing bridge would not involve explosives. Bridge removal would involve cutting of the bridge wood and steel material into sections which could be lifted from the site with an overhead crane. Debris materials which fell into the gulch would be promptly removed. The concrete wingwalls at the upper banks of the gulch and concrete pier supports within the gulch would remain. Removal of the concrete may cause deterioration of the gulch area and may increase the potential of debris material entering the gulch.

Restoration of the adjacent landscaping due to the bridge removal activities is not anticipated. The bridge removal process would not adversely. effect the adjacent landscaping.

D. LANDOWNERSHIP

The existing roadway and bridge is located within the Haleakala Ranch Company property. Existing Piilani Highway Right-Of-Way Easement documents are not available. Therefore, the new bridge and roadway approaches require establishment of a Roadway Right-Of-Way Easement for the existing and new bridge and roadway. Refer to Figure 4.

E. PERMITS AND APPROVALS REQUIRED

1. Federal

Federal Permits are not required for the bridge replacement project.

Concrete filling of the stream scours below the new bridge will occur independently of the new bridge construction work, since this item is not critical to the new bridge operations. Filling of the stream scours will require a Federal Nationwide Permit (NWP) 13 for Bank Stabilization from the U.S. Army Corps of Engineers. The NWP 13 does not initiate Section 106 National Historical Preservation Act.

Federal Highway Administration has indicated that a Federal Environmental Assessment is not required since the project qualifies for a Code of Federal Regulation 23 Chapter I Part 771.117 Categorical Exclusions (d) (3).

2. State of Hawaii

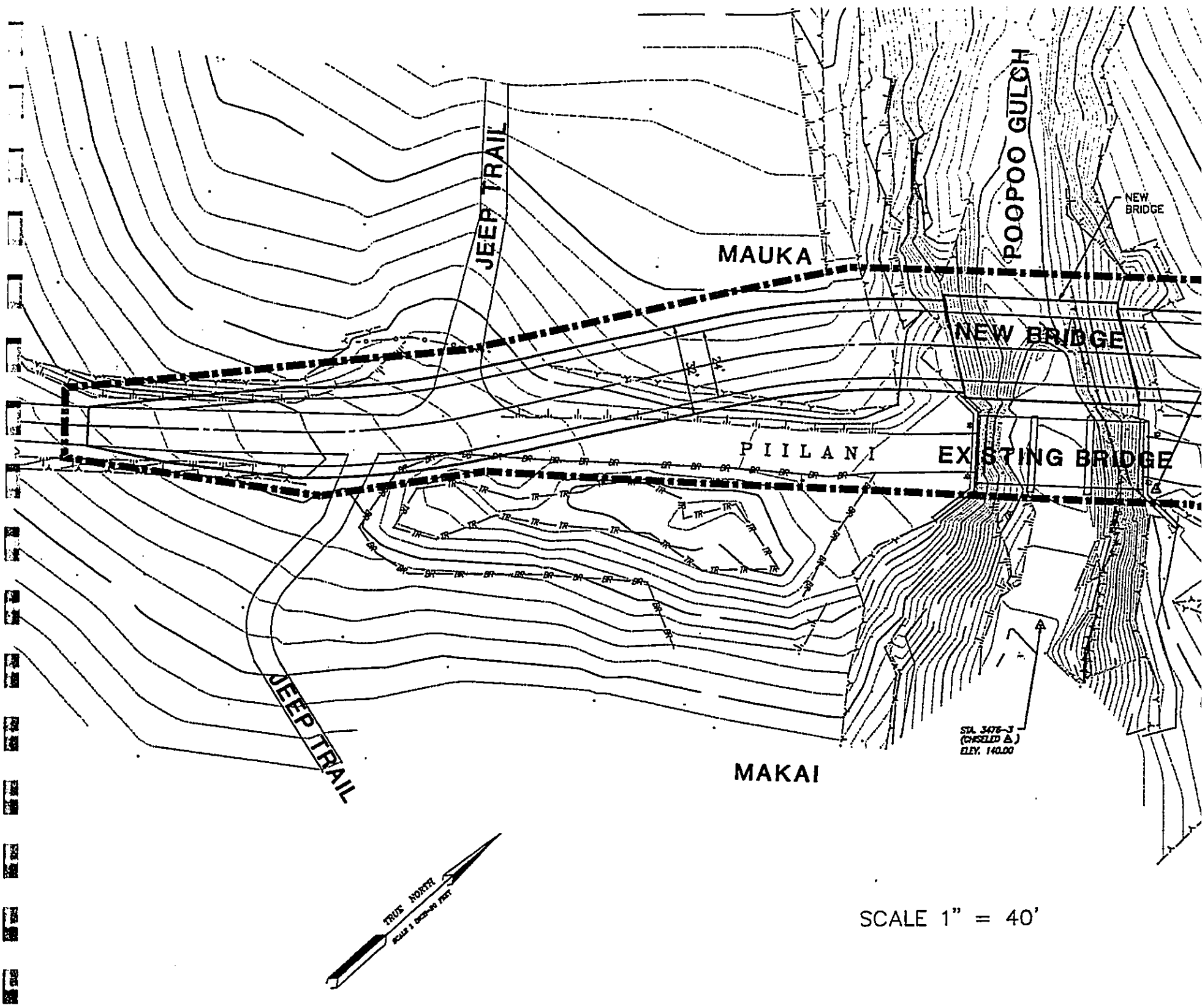
The Department of Land and Natural Resources Commission On Water Resource Management has determined that a Stream Channel Alteration Permit is not required.

Concrete filling of the stream scours will occur independently of the new bridge construction work, since this item is not critical to the new bridge operations. Filling of the stream scours below the new bridge will require a Department of Health Section 401 Water Quality Certification since a Federal NWP 13 is required for bank stabilization work.

A Conservation District Use Application Departmental Permit is required from the Department of Land and Natural Resources for the work which will occur within the Conservation District. The Conservation District boundary follows the mauka edge of the existing Piilani Highway. Work involved in the Conservation District includes roadway modification and bridge removal. Refer to Figures 7B and 7C.

3. County of Maui

A Special Management Area (SMA) Assessment is required from the Planning Department since portions of Piilani Highway roadway approaches to the new bridge is within the Special Management Area. The SMA boundary follows the makai edge of the existing Piilani Highway. Roadway modification within the SMA is approximately 500 square feet and is estimated to be approximately $3,000 of the total $1.5M project cost estimate. Refer to Figure 7D.


JEEP TRAIL
MAUKA
POOPOO GULCH
NEW BRIDGE
NEW BRIDGE
PIILANI
EXISTING BRIDGE
JEEP TRAIL
MAKAI
STA. 3478+3
(CHISELED Δ)
ELEV. 140.00
TRUE NORTH

SCALE 1" = 40'

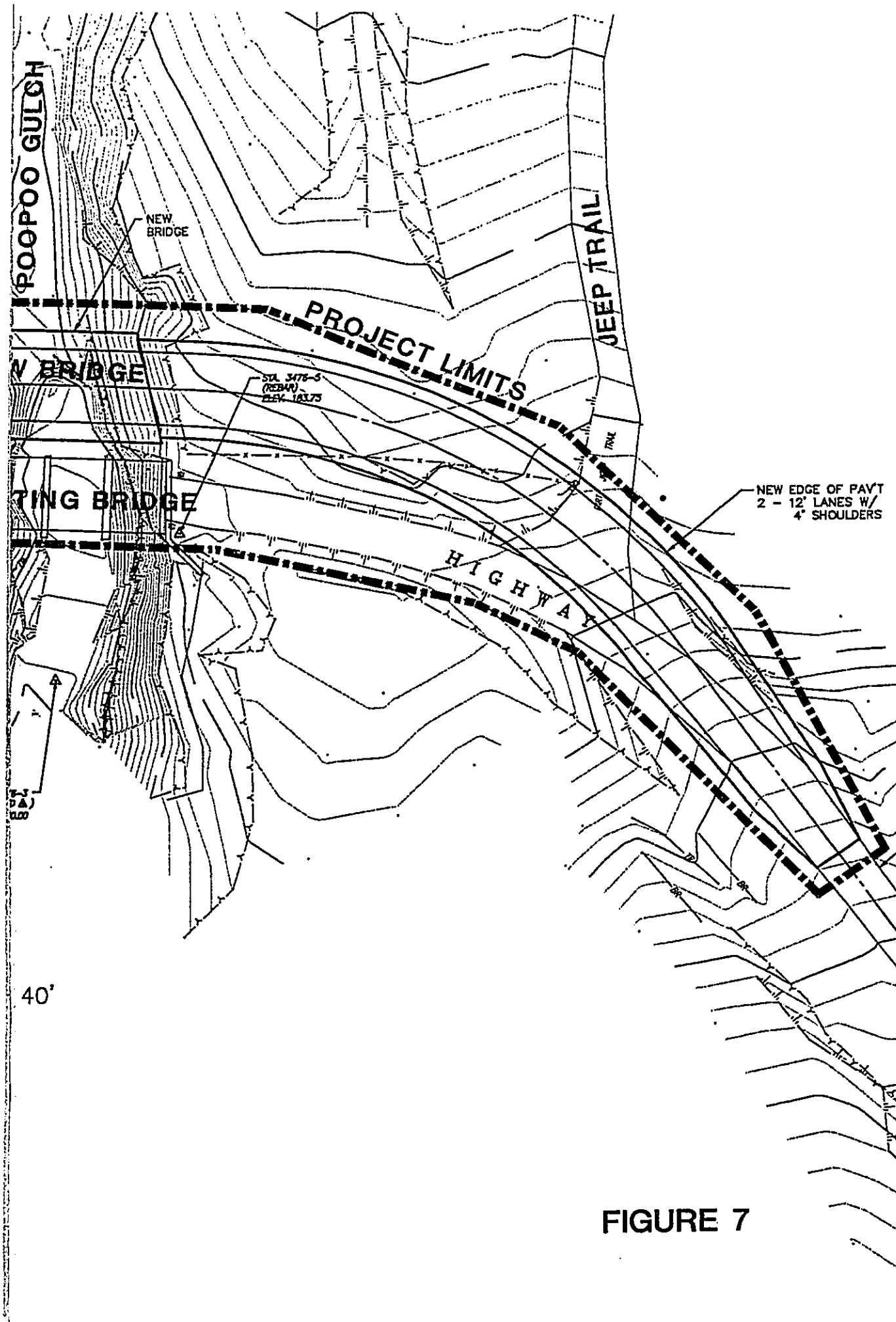
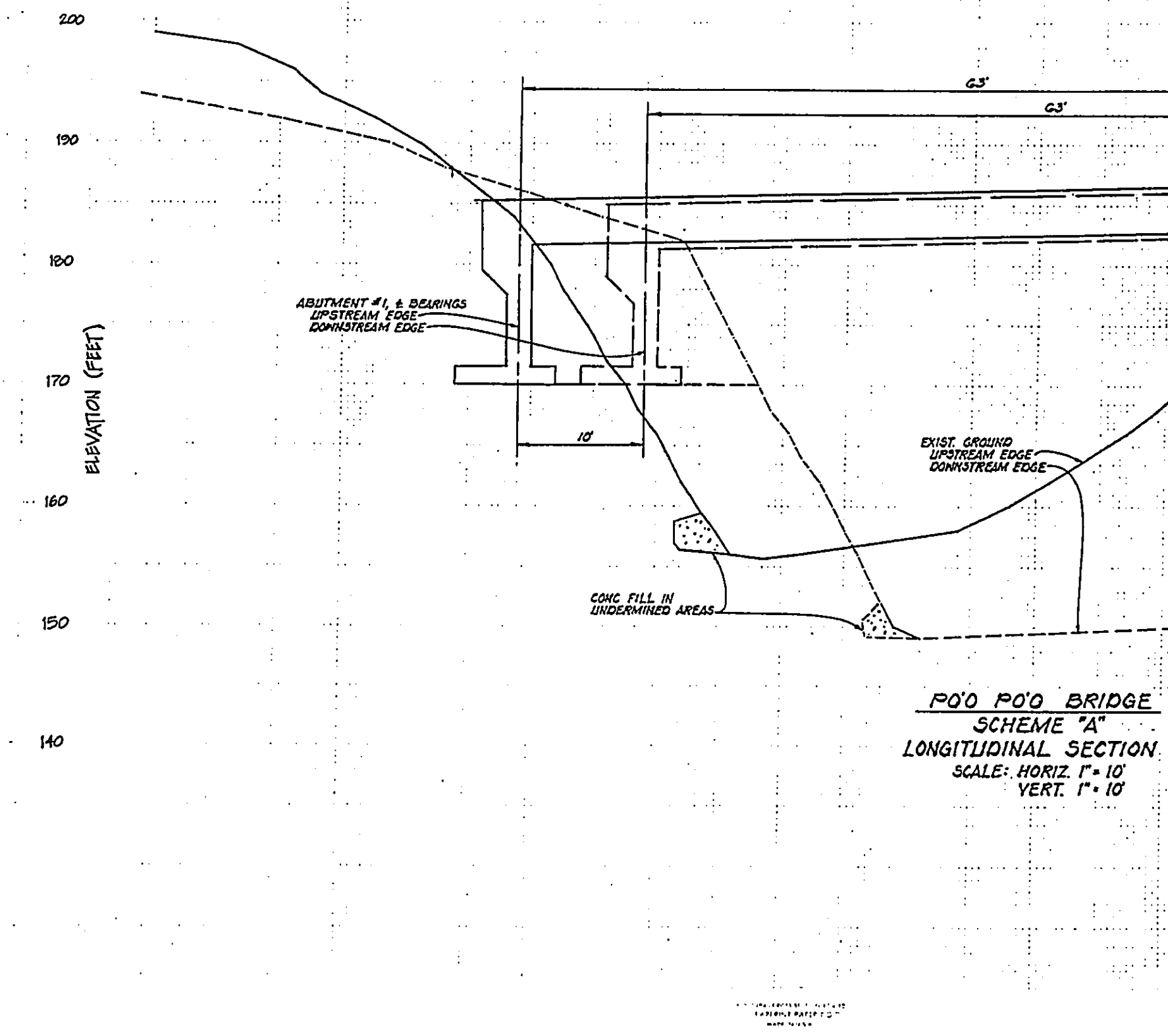
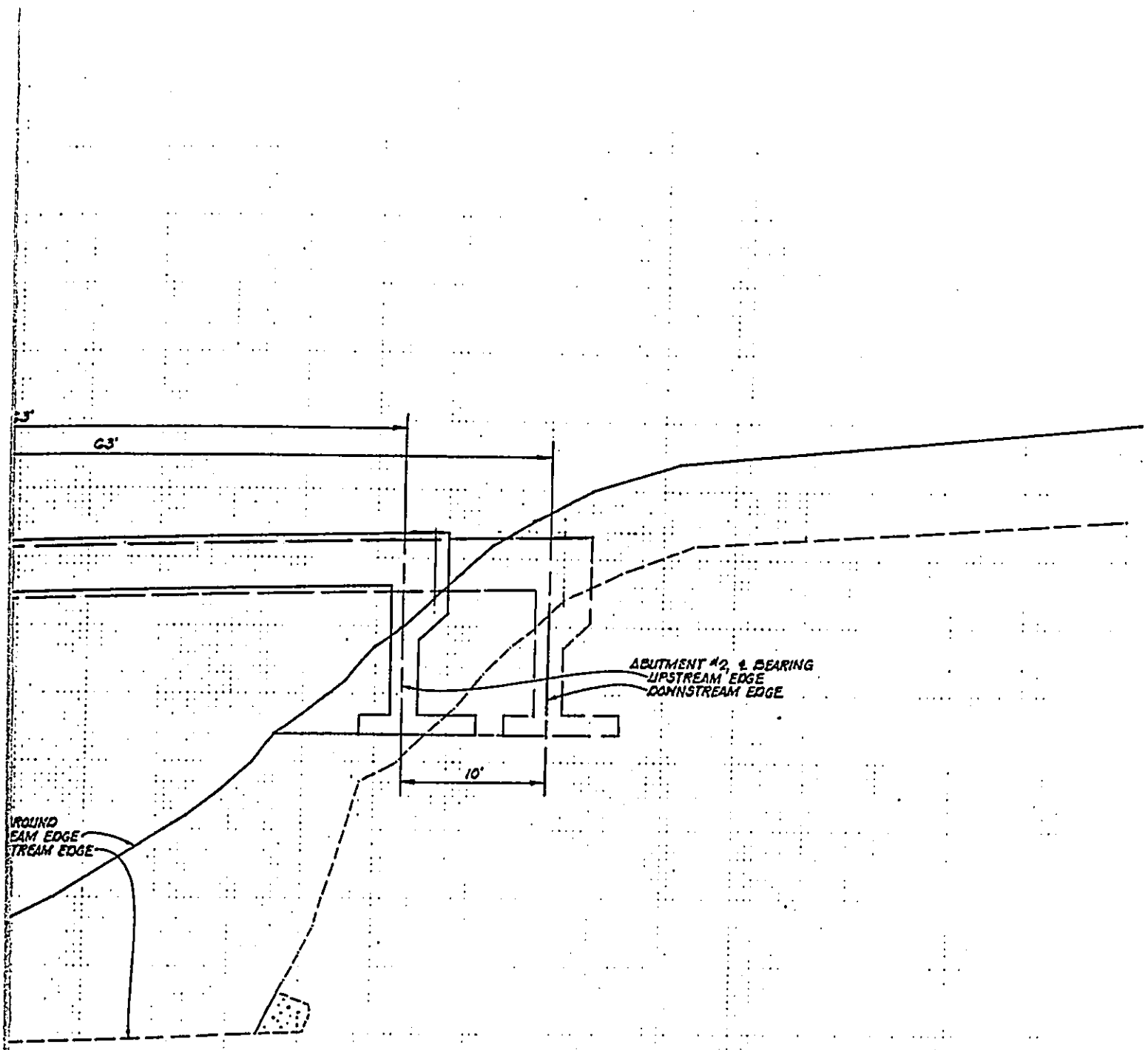

POOPOO GULCH
NEW BRIDGE
PROJECT LIMITS
JEEP TRAIL
N BRIDGE
STA. 3475-5
(REBAR)
ELEV. 183.73
TING BRIDGE
HIGHWAY
NEW EDGE OF PAV'T
2 - 12' LANES W/
4' SHOULDERS
EXIST. EDGE
OF PAVT.
40'

FIGURE 7

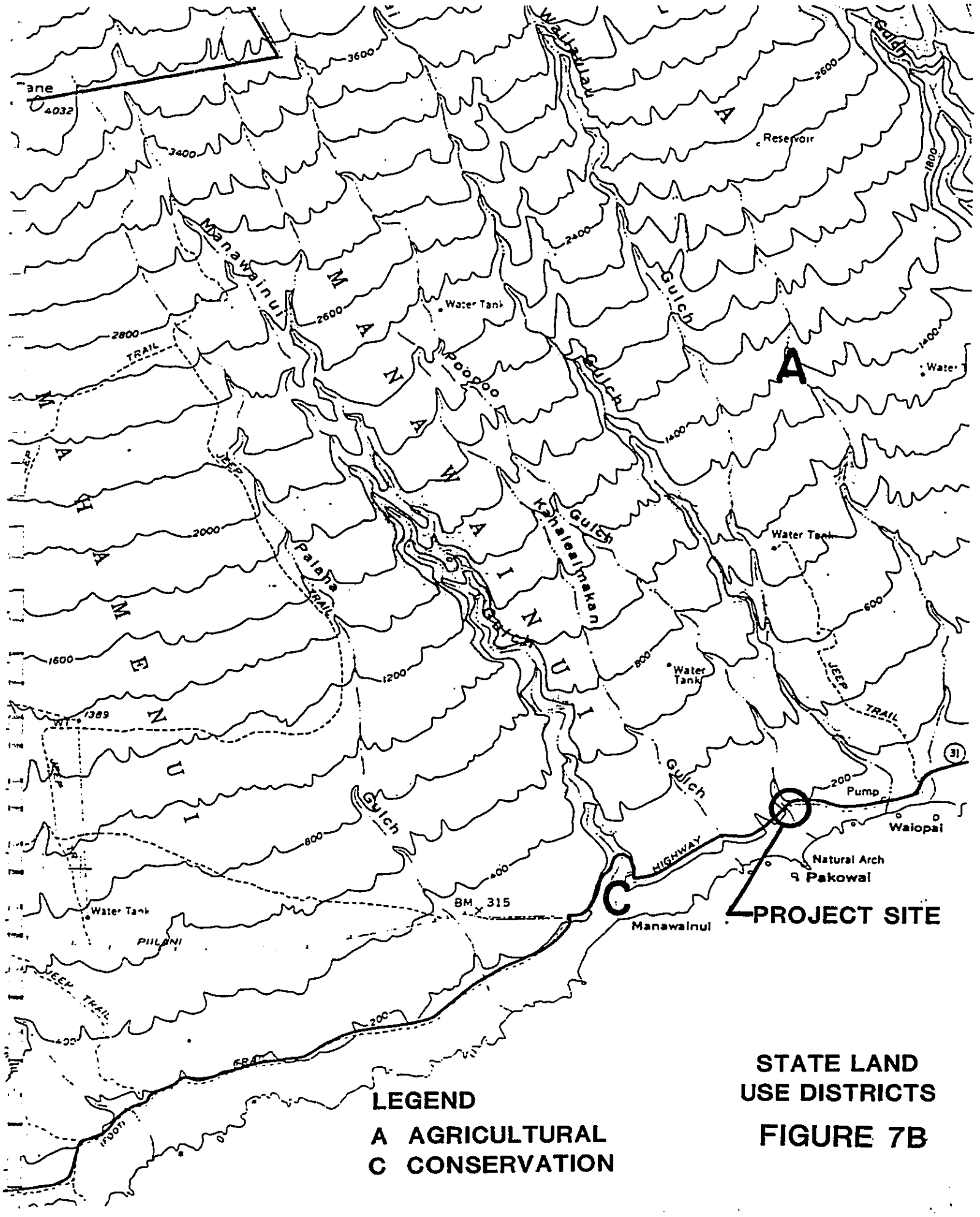


P0'0 P0'0 BRIDGE
SCHEME "A"
LONGITUDINAL SECTION
SCALE: HORIZ. 1" = 10'
VERT. 1" = 10'



O PO'O BRIDGE
SCHEME "A"
UDINAL SECTION
ALE: HORIZ. 1" = 10'
VERT. 1" = 10'

FIGURE 7A



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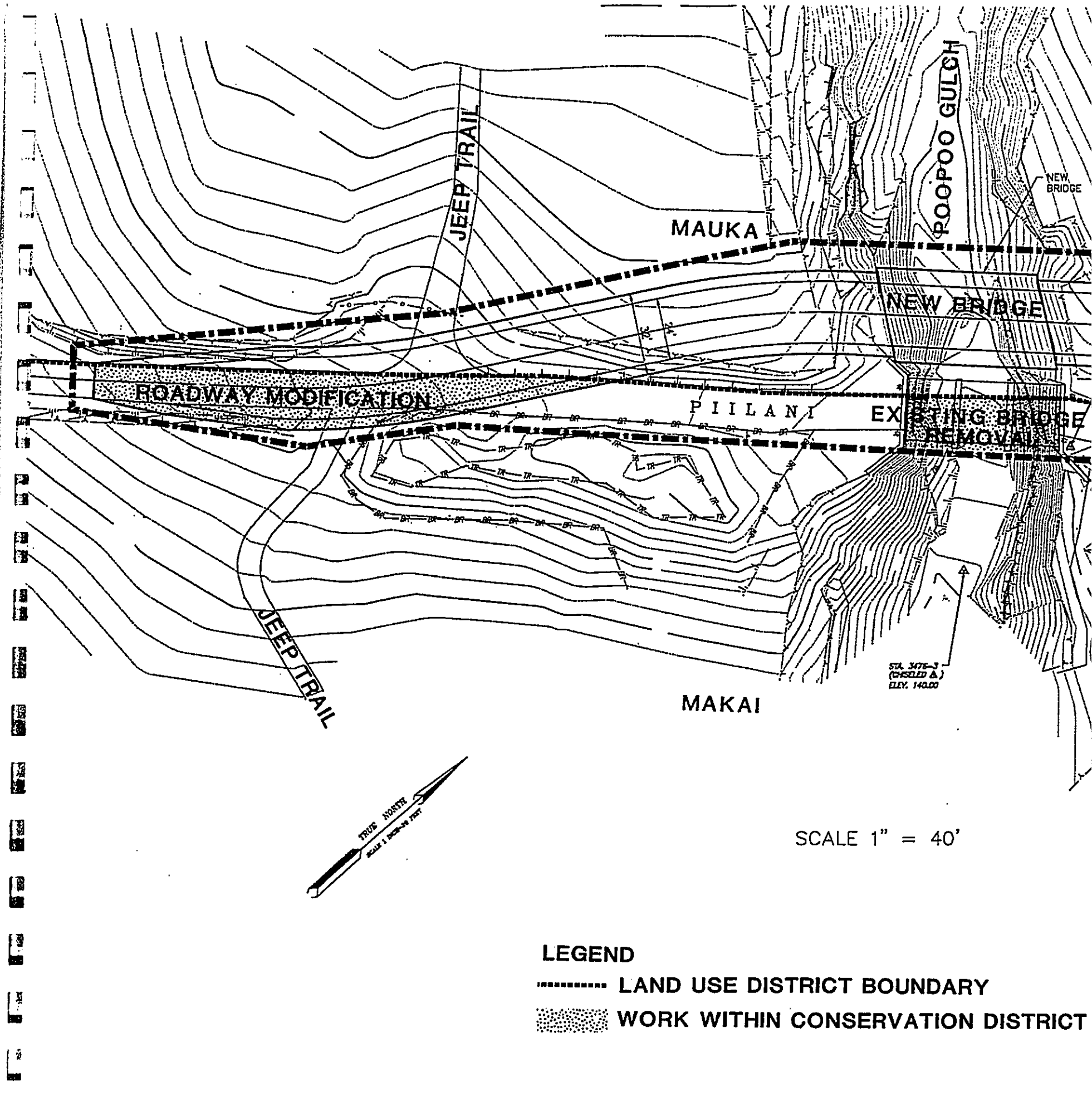

LEGEND

LAND USE DISTRICT BOUNDARY

WORK WITHIN CONSERVATION DISTRICT

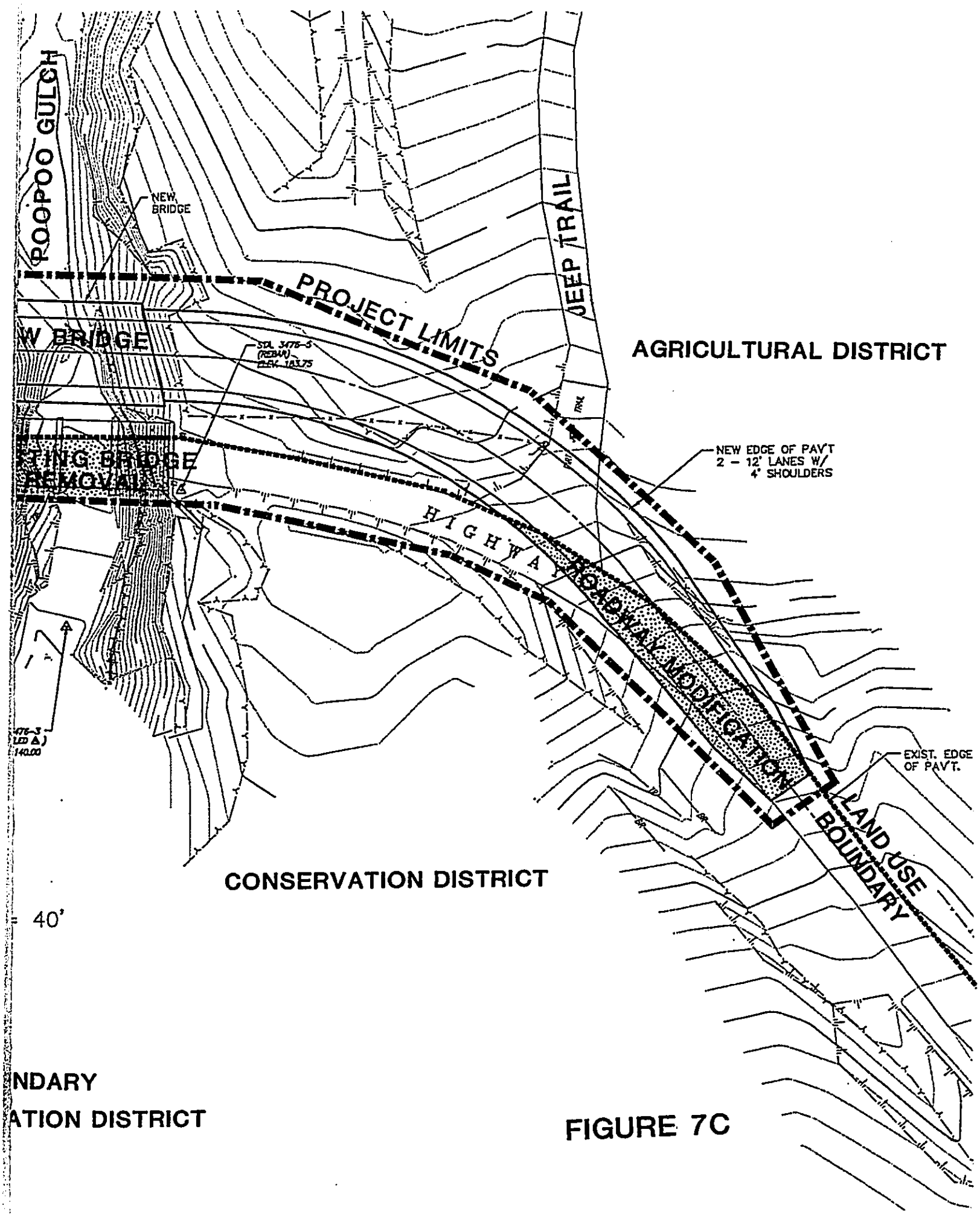

FIGURE 7C

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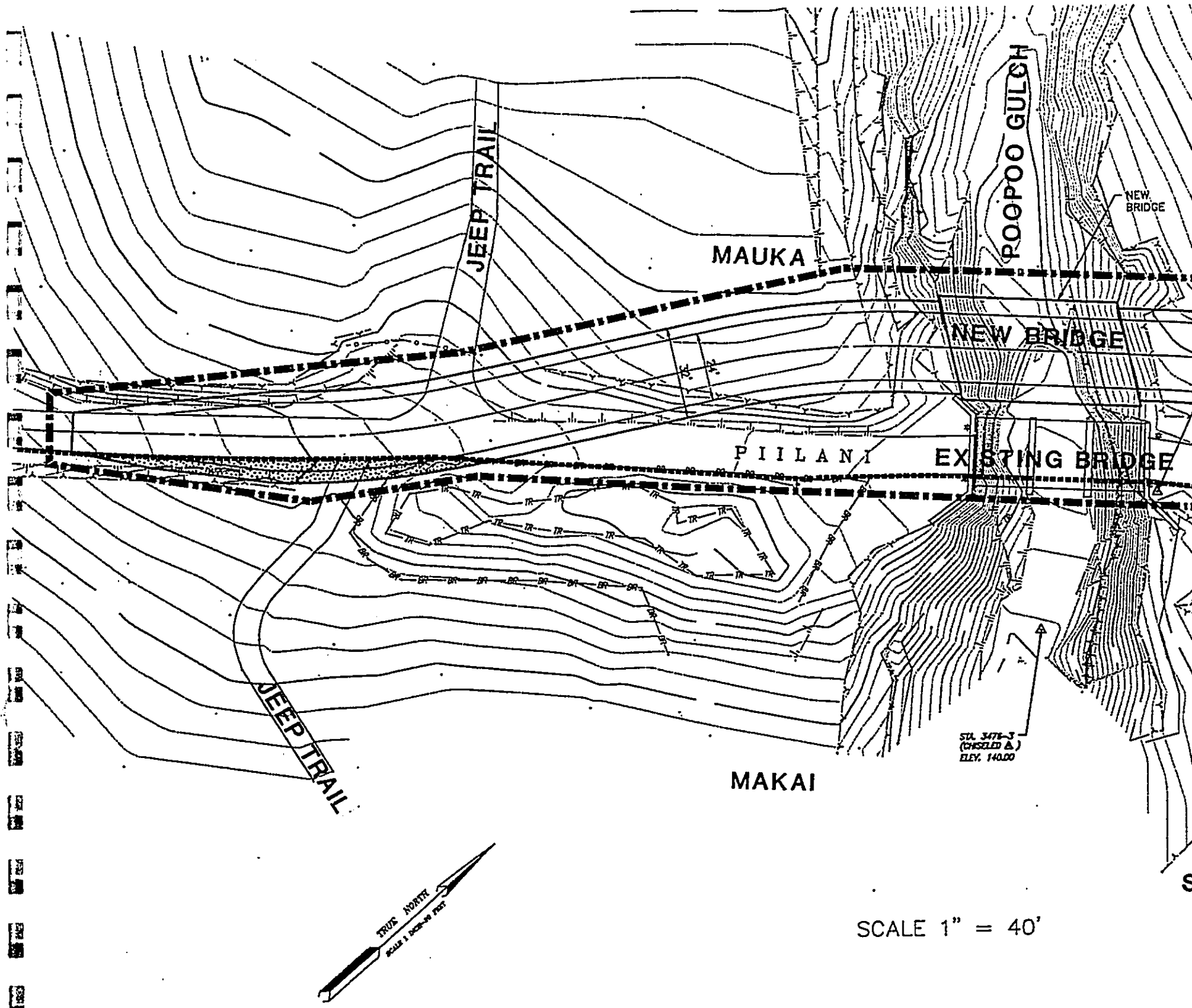


SCALE 1" = 40'

LEGEND

SPECIAL MANAGEMENT AREA BOUNDARY

WORK WITHIN SPECIAL MANAGEMENT AR

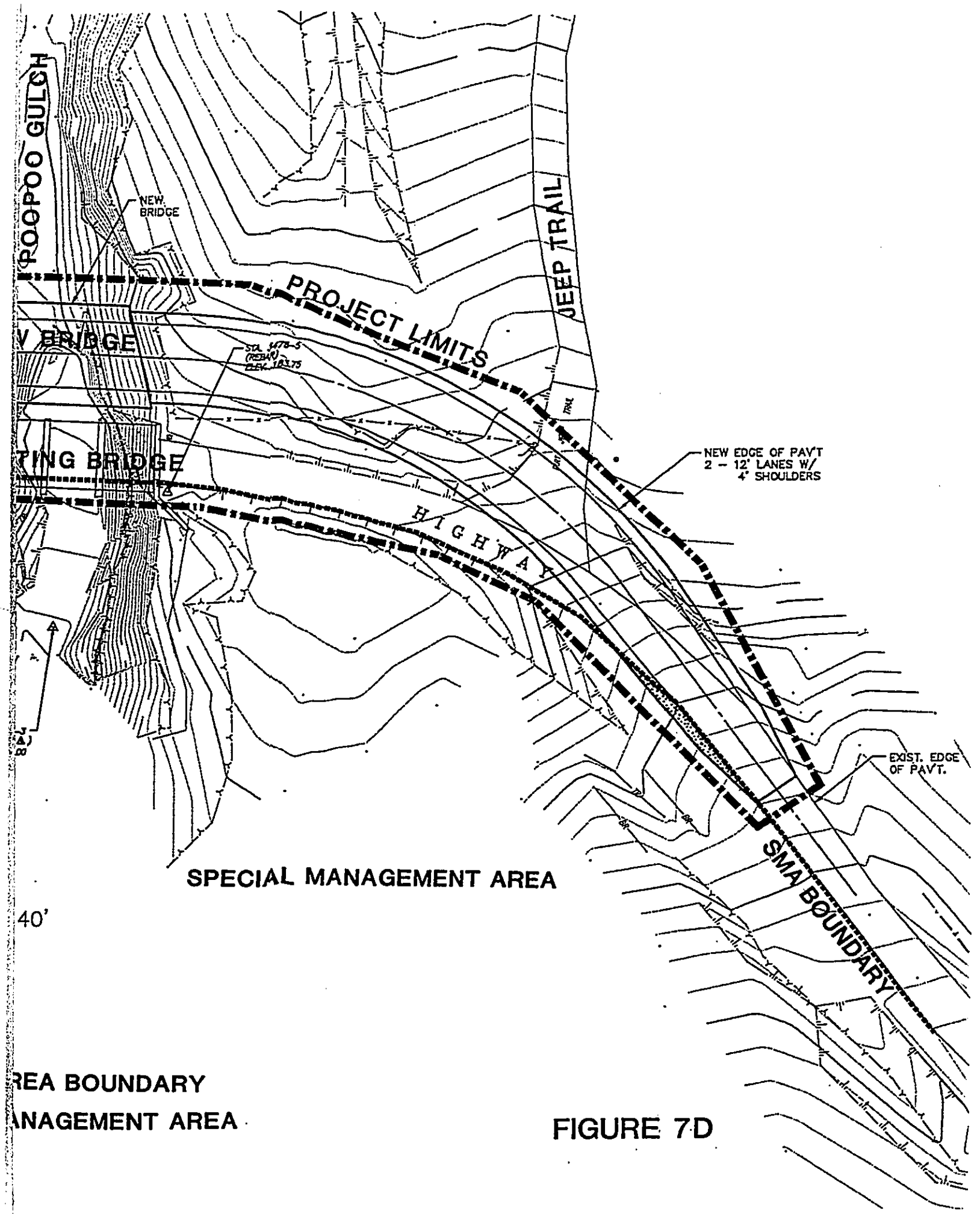


FIGURE 7D

IV AFFECTED ENVIRONMENT

A. AIR QUALITY

The air quality is good in the area. The only sources of pollution occurs from vehicles traveling in the area. Increase vehicular traffic is not anticipated to occur with the bridge replacement project. Therefore, degradation of the air quality is not anticipated due to the low vehicular traffic.

B. HYDROLOGIC AND HYDRAULIC ANALYSIS

Hydrologic and hydraulic analysis were completed and indicate that the 100 year and 500 year storms would flow below the new bridge concrete superstructure. Refer to Exhibit E.

C. TOPOGRAPHY

Grading and cutting into the existing hillside is required to maintain proper roadway transition to the new bridge. The grading and cutting involves approximately 600 lineal feet. The cut into the hillside would taper from existing grade to approximately 15 foot vertical sloped cut into the hillside, on the Ulupalakua side of the bridge.

D. FLORA AND FAUNA

Flora located within the construction site would be removed to allow access and placement of construction materials. Affect to fauna is not anticipated.

E. NOISE CHARACTERISTICS

Construction related noise would be introduced into the area. Duration of the noise is actually limited to the short construction period and limited to daily working hours. Noise would be generated from vehicles and equipment delivering and placing the construction materials. Peak noise impact would occur during the grading and cutting process, and placement of the concrete materials.

V POTENTIAL IMPACTS AND PROPOSED MITIGATION MEASURES

A. SURROUNDING LAND USES

Impact to the existing land uses is minimal since encroachment into the pasture land area is minimal and would not adversely impact the adjacent ranching operations.

B. ROADWAY

Impact to the Piilani Highway vehicular traffic would be minimal since the existing roadway and bridge would be operational while the replacement bridge is under construction. The highway would be closed during short periods to facilitate placement of the new bridge structural members. These periods would be of short duration to minimize affect to the surrounding communities.

Increase vehicular traffic to the area is not anticipated since the population of the area is small. The area is rural in nature with large ranching communities without large activity centers.

C. AIR QUALITY

Pollution from construction vehicles and equipment would be introduced at the site. However, this source of pollution would be limited to daily working hours for various construction related vehicles and equipment. Degradation of the air quality is not anticipated since the number of construction vehicles and equipment is relatively small. Dispersion of the pollution is also accelerated by the trade wind activity and the open space at the project site.

D. FLOOD

Poopoo Stream 100 year and 500 year storm water drainage will not be impacted since the water flow is below the new bridge concrete superstructure. Refer to Hydrologic and Hydraulic Analysis Exhibit E.

E. SOILS

Soils erosion is anticipated to be minimal since the existing top soils coverage is minimal over the massive basalt rock material. While a National Pollutant Discharge Elimination System (NPDES) Permit is not required since the project does not exceed five acres, an Erosion Control Plan will be developed to ensure that construction related debris, including construction related soil erosion, is prevented from entering the stream and ocean.

F. FLORA and FAUNA

Impact to the flora and fauna will be negligible since the project site is relatively small and does not contain endangered plant or animal species.

G. AQUATIC ENVIRONMENT

No impact is anticipated to the aquatic environment at the project site since none exists. Construction measures will be taken to prevent construction debris and construction related soil erosion from entering the stream and ocean.

H. HISTORICAL AND ARCHAEOLOGICAL RESOURCES

No impact is anticipated to the historical and archaeological resources since none are in close proximity to the project site.

I. NOISE CHARACTERISTICS

Construction related noise impact to the environment is not anticipated since the construction site is distant from residential, commercial and resort population areas.

J. SCENIC AND OPEN SPACE RESOURCES

Impact to the scenic and open space resources is minimal since the bridge project will not adversely affect the view corridors.

VI ALTERNATIVE ACTIONS

A. MAKAI (OCEAN) PLACEMENT OF THE NEW BRIDGE

Placement of the new concrete bridge on the makai side, and parallel, of the existing wood bridge was evaluated. Traffic would travel along the existing roadway and bridge while the new two lane bridge and roadway approaches are under construction. Grading and cutting into an existing hillside is required to maintain the proper roadway transition to the bridge. Refer to Figure 8.

The bridge deck would be cast-in-place concrete deck on prestressed precast concrete girders. The span varies from approximately 63 to 85 feet. Placement of the abutment and wingwalls will dictate the actual bridge span. Tall abutments and wingwalls are required due to the steep face of the gulch. Existing stream bed scours beneath the new bridge would be filled with concrete to minimize further erosion. Refer to Figure 8A.

This alternative is more costly than mauka side placement of the bridge since the longer spans require longer concrete structural beams, and the bridge concrete wingwalls are expected to be wider and deeper due to the gulch's steeper face. Delivery of the longer structural beams is also more difficult due to the existing narrow and windy roadway system, which increases the construction cost. Construction cost is estimated to be approximately $1.9 million.

This alternative is not recommended.

B. PLACEMENT OF THE NEW BRIDGE AT THE EXISTING BRIDGE LOCATION

Placement of the new concrete bridge would be at the existing bridge location. During construction, vehicular traffic would travel along a one lane detour roadway on the mauka side of the bridge. Grading, filling and cutting into the existing hillside is required to provide detour vehicular access. Refer to Figure 9.

The detour road would be a one lane oil topped gravel road, with a covered culvert and concrete ford crossing over Poopoo Stream at the location of an abandoned and washout jeep trail ford. Extensive site work

would be required to provide proper sight distances and vertical and horizontal roadway profiles to accommodate various motor vehicles. Removal of the detour road would occur after activation of the new bridge.

The bridge deck would be cast-in-place concrete deck on prestressed precast concrete girders. The span is approximately 63 feet. The existing abutment and wingwalls would be removed and replaced with new structure. Existing stream bed scours beneath the new bridge would be filled with concrete to minimize further erosion.

This bridge will have more adverse impact to the environmental due to the installation and deactivation of the temporary detour roadway over Poopoo Stream. Construction cost is estimated to be approximately $1.7 million.

This alterative is not recommended.

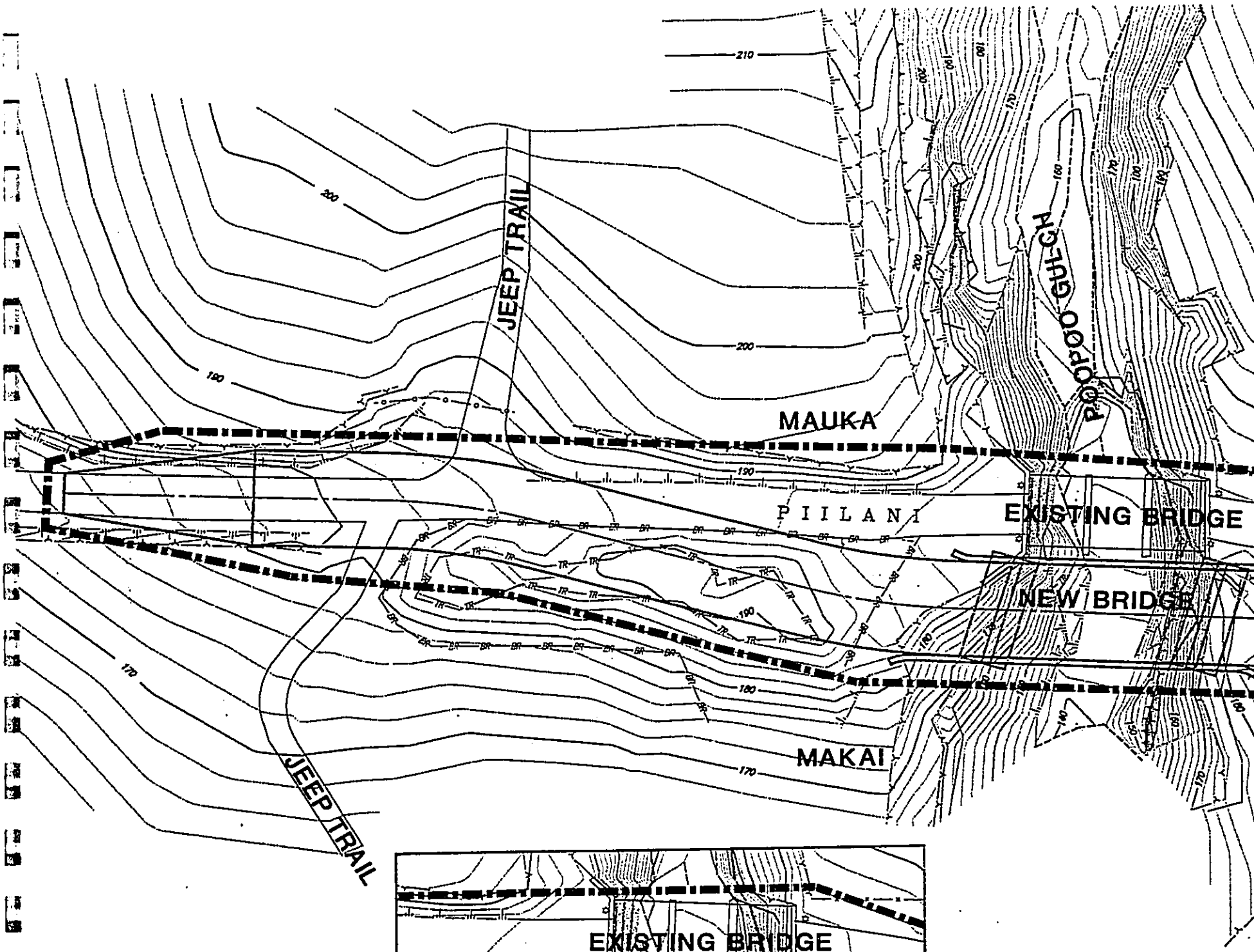
C. NO ACTION

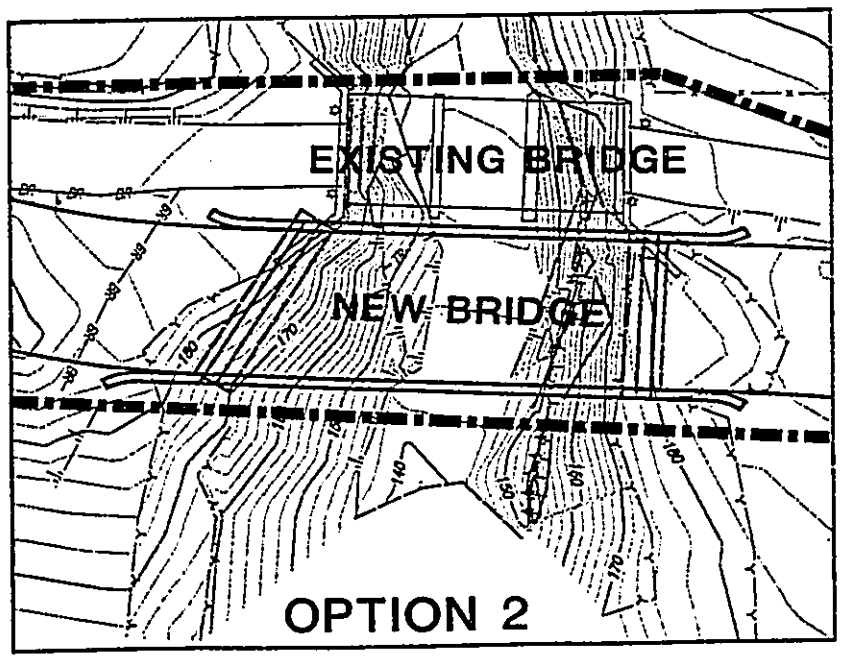
Under the No Action alternative, no new bridge replacement or repair would occur. Future access to areas beyond the bridge by vehicles with heavy loads would be limited to the existing six ton bridge limit. The bridge would continue to degrade.

Further degradation of the bridge may cause the bridge to close in the future, should the bridge no longer be able to provide safe support for vehicular traffic. This scenario would require the communities, beyond Poopoo Bridge, to use the Hana Highway for vehicular access to the rest of Maui. This would increase the traffic load onto Hana Highway and significantly increase the commute time. Should Hana Highway be closed for a period of time, the communities between Hana and the Poopoo Bridge would be isolated from vehicular access.

Under the No Action alternative, the potential for vehicular isolation to communities between Hana and Poopoo Bridge increase with time. Therefore, the No Action alternative is not considered a feasible option.

DOCUMENT CAPTURED AS RECEIVED





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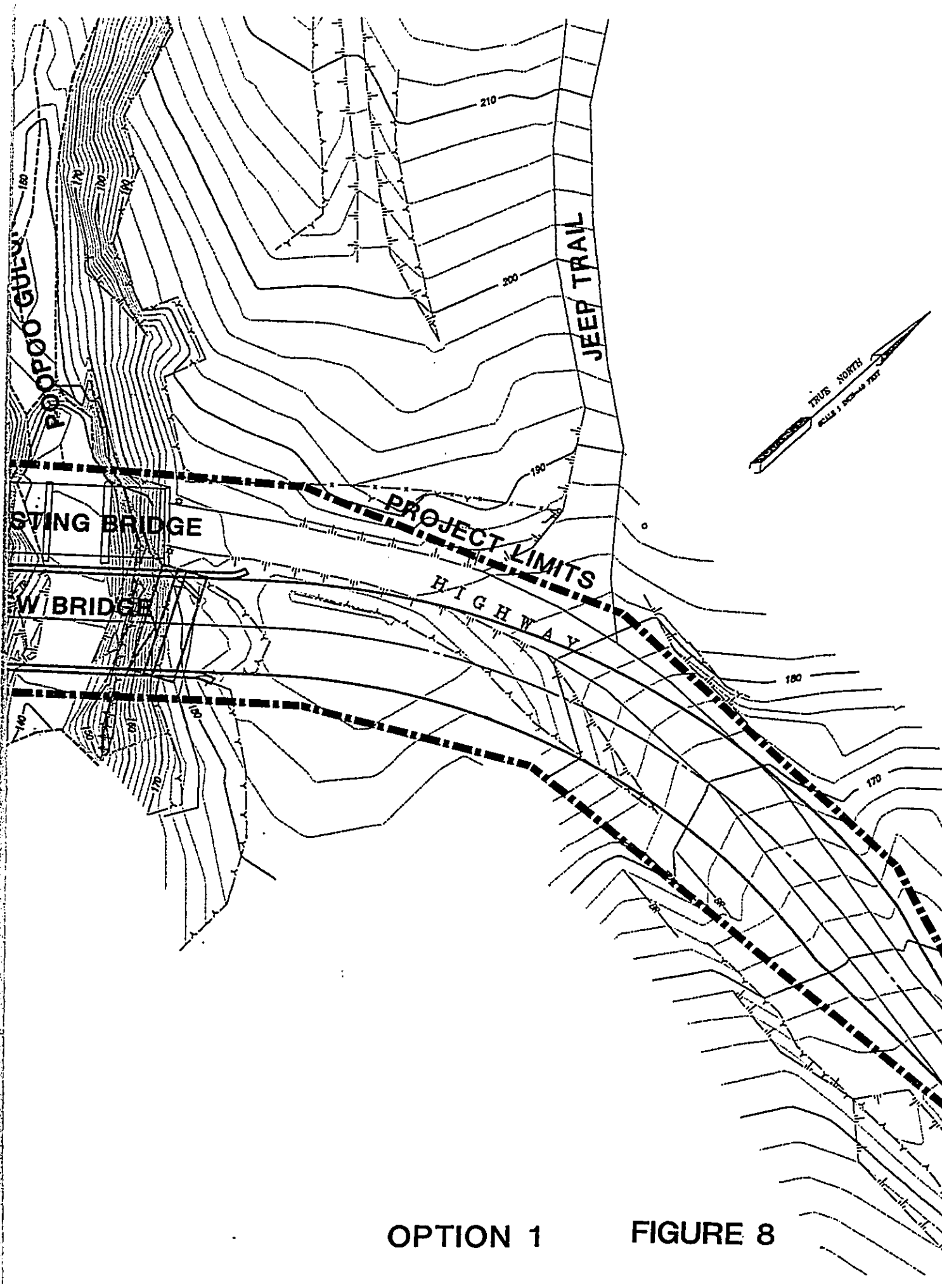
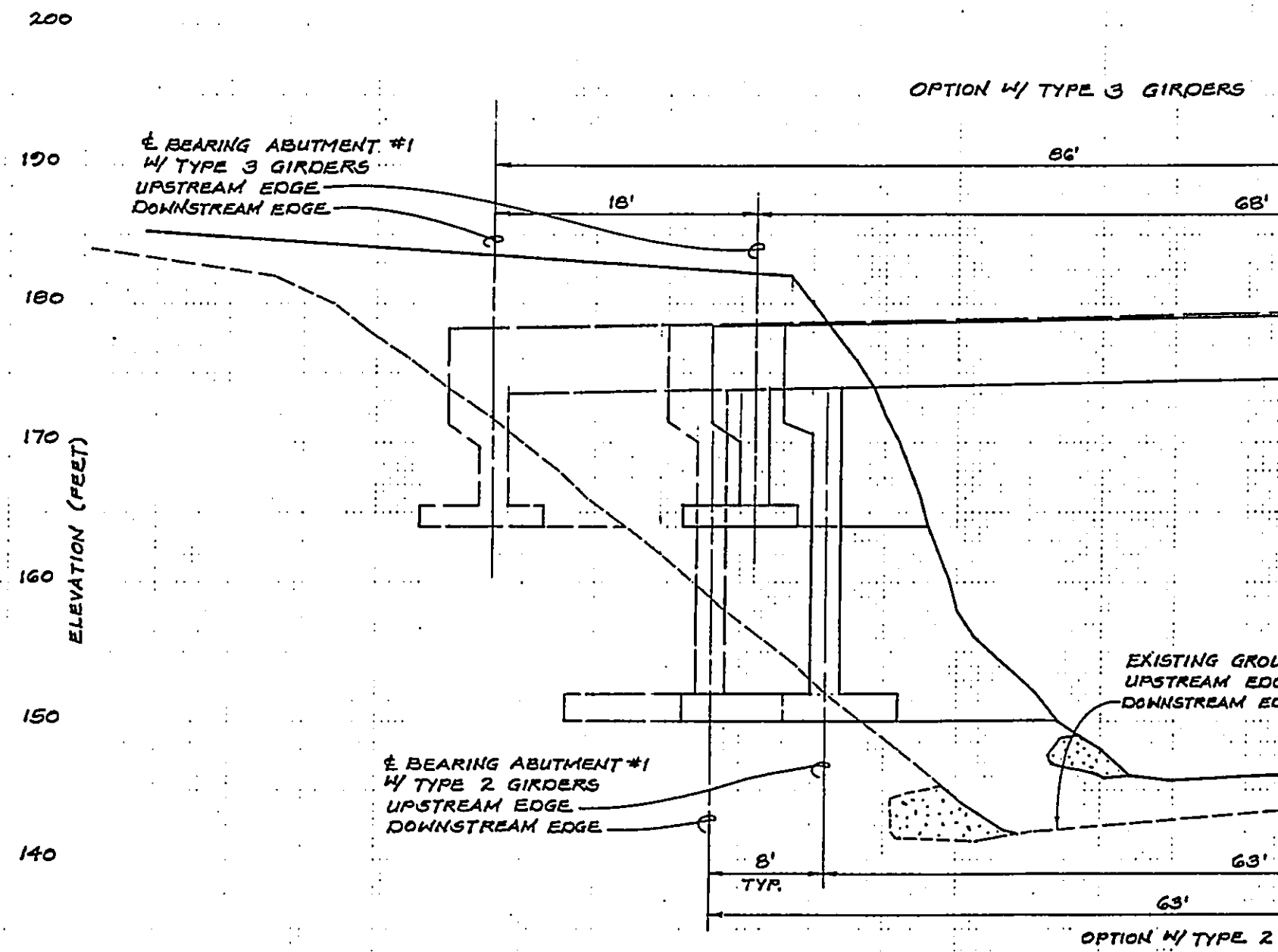


OPTION 1 FIGURE 8

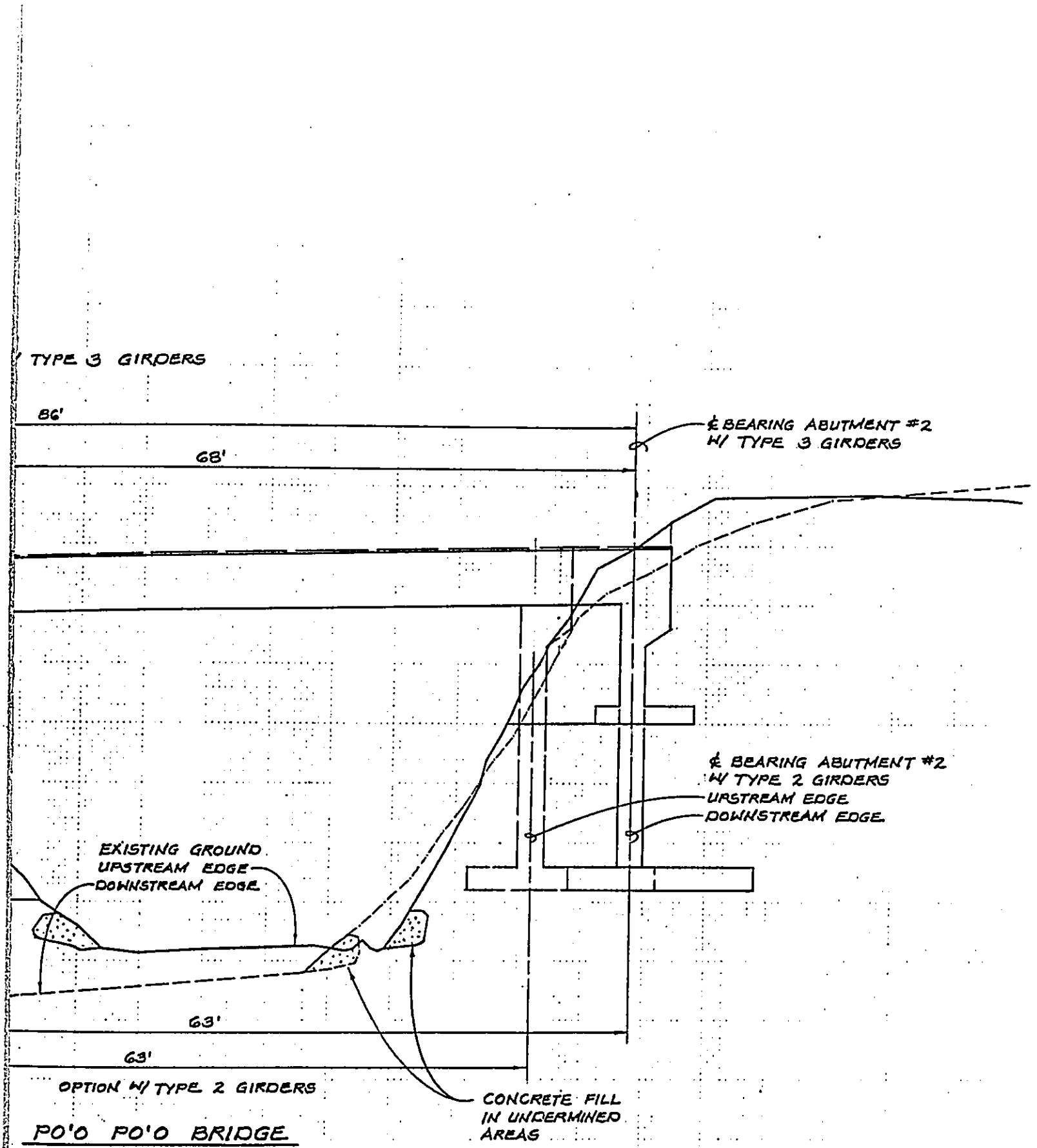


PO'O PO'O BR

SCHEME "B"

LONGITUDINAL SEC

SCALES: HORIZ. 1"
VERT. 1"



PO'O PO'O BRIDGE

SCHEME "B"

LONGITUDINAL SECTION

SCALES: HORIZ. 1" = 10'
VERT. 1" = 10'

FIGURE 8A

DOCUMENT CAPTURED AS RECEIVED

DOCUMENT CAPTURED AS RECEIVED

FIGURE 9

D. DEFERRED ACTION

Under the Deferred Action alternative, no new bridge replacement would occur. This would require extensive repair and maintenance effort by the County of Maui. This effort would be continued in the future and would be a constant expenditure of manpower and financial resources.

Vehicular access to areas beyond the bridge would be limited to the existing six ton limit. This may significantly limit and degrade potential future improvements to areas beyond the bridge site.

This deferred alternative causes future expenditure of manpower and financial resources without improvement of the bridge structure or performance. This Deferred Action is also not considered a feasible option.

VII FINDINGS AND CONCLUSION

The project involves the replacement of an existing one lane timber bridge structure over Poopoo Stream with a two lane concrete bridge structure. The new bridge provides a more permanent, low maintenance, and wider bridge structure on the Piilani Highway.

The replacement bridge does not introduce new activities or land usage in the general vicinity. Increase vehicular traffic is not anticipated. However, the new bridge allows easier vehicular traffic movement over the bridge and facilitates future Piilani Highway roadway improvements to areas beyond the Poopoo Bridge.

Rare, vulnerable or endangered flora and fauna species would not be affected.

Impact to historical and archaeological elements are not anticipated. Should any cultural material be found during construction, work in the immediate area will be halted and the State Historic Preservation Office will be notified.

Impacts to environmentally sensitive areas, such as flood plains, tsunami inundation zones, erosion prone zones, and pristine coastal waters is not anticipated.

Long term environmental effects as not expected from the new bridge replacement project.

COUNTY OF MAUI

BRIDGE REPORT

EXHIBIT A

```
********** IDENTIFICATION **********
  1 State              : Hawaii          159
  8 STRUCTURE NUMBER:  009000310902825
    Inventory Route : on       141000311
    Highway Dist.   :                 20
    County Code: 009      4 Place code:
  6 Features Intrsct: POOPOO STRM-STRUC #10
  7 Facility Carried: PIILANI HWY
  9 Location          : 12.99MI E/KULA HWY
 11 Milepoint         :          028.300
 16 Lat: 20deg 37.7'   17 Long: 156deg 13.0'
 98 Border Br State :
 99 Border Br Stru #:

****** STRUCTURE TYPE & MATERIAL ******
 43 Stru Main Material- Timber
    Type- Stringer/Multibeam/Girder 702
 44 Stru App  Material- Other
    Type- Other                      000
 45 # of Main Spans :                003
 46 # of App Spans  :               0000
107 Deck Stru      - 8
108 Wearing Surf/Protective Sys type
    A Wearing Surface - Timber        7
    B Membrane        - Other         9
    C Deck Protection - None          0

********** AGE & SERVICE **********
 27 Year Built          :          1948
    Year Reconstructed  :          1977
    Type of Service on -Highway
     under: Waterway                 15
 28 Lanes On Stru: 01    Under Stru: 00.
 29 ADT                 :        002000
 30 Yr of ADT : 89  109 Truck ADT :    %
 19 Bypass, Detour Length (miles)    99

********** GEOMETRIC DATA **********
 48 Length of Max Span (ft)    :   0018
 49 Structure Length   (ft)    : 000060
 50 Curb/Sidewalk Width  L: 00.0    R:  00.0
 51 Bridge Width, Curb-to-Curb :018.0ft
 52 Deck Width, out-to-out     :022.0ft
 32 Approach Rdwy Width        :  022ft
 33 Bridge median - No median          0
 34 Skew : 00 deg     35 Stru Flared: 0
 10 Inventory Rt Min Vert Clrn : 99'99"
 47 Inv. Rt Total Horz Clrn    :  18.0ft
 53 Min Vert Clrn over Rdwy    :   9999
 54 Min Vert Underclearance    :N0000ft
 55 Min Lateral R Underclrnc   : N000ft
 56 Min Lateral L Underclrnc   :  000ft

********* NAVIGATION DATA **********
 38 Navigation Control         :      N
    Pier Protection-functioning:
    Navigation Vert Clrn       :  000ft
116 Vert Lift Br Min Clrn      :     ft
 40 Navigation Horz Clrn       : 0000ft
ata Recorded   11/02/93
```

```
NBI   SI&A sheet          11/02/9

Sufficiency Rating = 015.0
Status = Structurally deficient

********* CLASSIFICATION *******
112 NBIS Bridge Length         :
104 Hwy System of Inventory Rt:
 26 Functional Classification :
100 Defense Hwy Designation   :
101 Parallel Stru Designation :
102 Direction of Traffic      :
103 Temperary Stru Designation:
110 Designated Natl Network   :
 20 Toll                      :
 21 Main - :County highway    :
 22 Owner- County highway     :
 37 Historical Significance   :

********** CONDITIONS *********
 58 Deck                      :
 59 Superstructure            :
 60 Substructure              :
 61 Channel Protection        :
 62 Culverts                  :

****** LOAD RATING & POSTING ***
 31 Design Load      - H 10   :
 64 Operating Rating          :
 66 Inventory Rating          :
 70 Posting - Unknown         :
 41 Stru Open/Posted/Closed:
    - Open, posting recommended

********** APPRAISAL *********
 67 Structure Evaluation      :
 68 Deck Geometry             :
 69 Underclearance Vert/Horz  :
 71 Waterway Adequacy         :
 72 Approach Roadway Alignmen :
 36 Traffic Safty Features    :00
113 Scour Critical Bridges    :

****** PROPOSED  IMPROVEMENTS ***
 75 Type of Work              :    0
 76 Length of Stru Imprvmt    : 0000
 94 Bridge Improvement Cost   : 0000
 95 Roadway Imprvmnt Cost     : 0000
 96 Total Project Cost (K)    : 0000
 97 Year of Imprvmnt Cost Est. :
114 Future ADT                : 0000
115 Year of Future ADT        :

********* INSPECTIONS **********
 90 Insp Date: 09/93  91 Freq: 24
 92 Critical Feature Insp   93 Dat
  A Frac. Crit Detail :N        /
  B Underwater Insp   :N        /
  C Other Special Insp:N        /
  pload to Mainframe   /  /
```

Department of Public Works
Engineering Division

BRIDGE INSPECTION REPORT

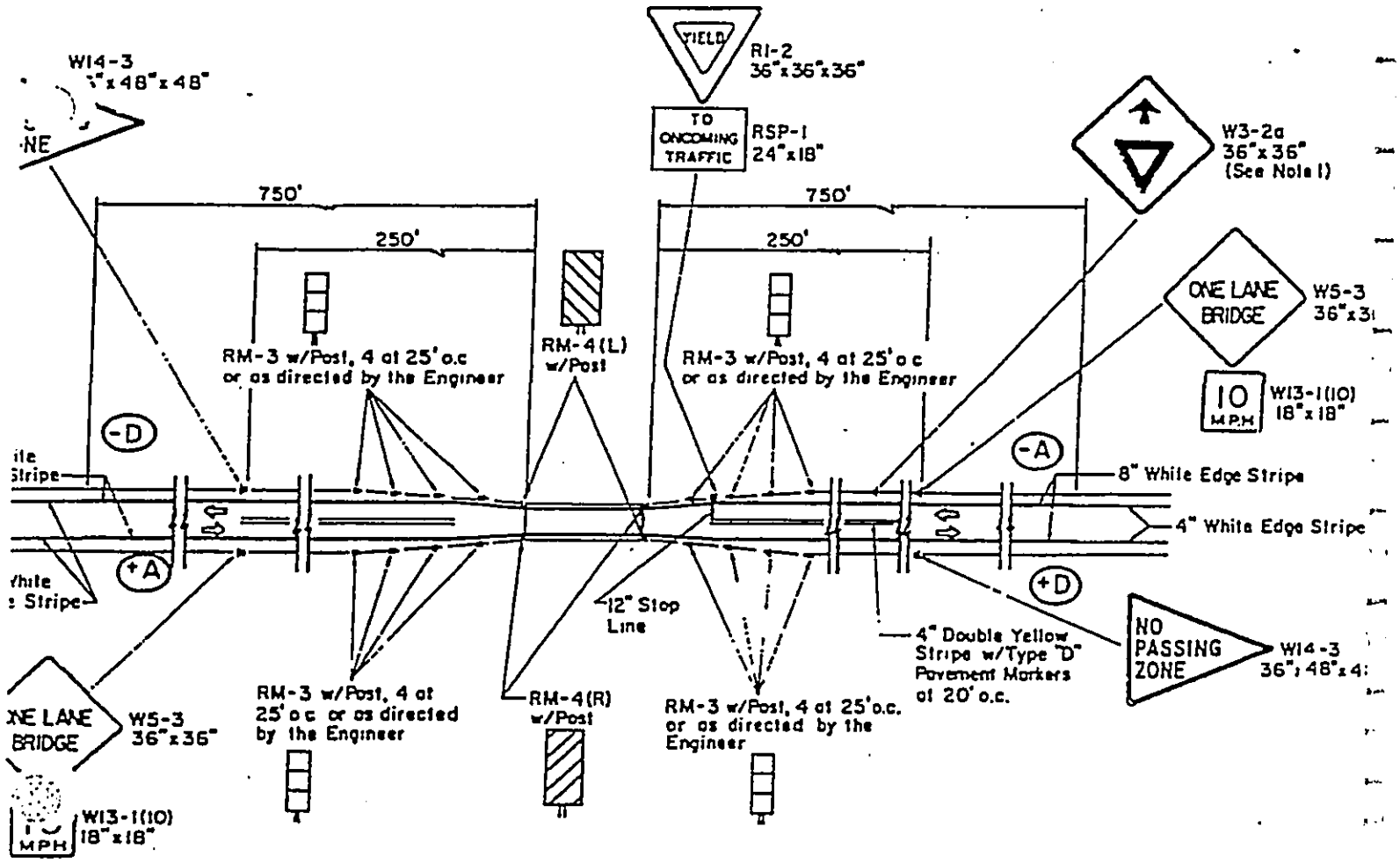
Date of Inspection 9-22-93
Bridge Number 009000?-10907P25 Bridge Name POOPOO #10
Number of Spans 3
Location: Island MAUI Route No. 31 Highway PILANI
Feature Intersected POOPOO STREAM
Bridge Material: Superstructure TIMBER Substructure CONC. ABUTT/TIMBE PIER

36	TRAFFIC SAFETY FEATURES	Indicate if feature meets currently acceptable standards. 0–No 1–Yes 2–Not Applicable
1.	Bridge Railings	0
2.	Transitions	0
3.	Approach Guardrail	0
4.	Approach Guardrail Ends	0

	CONDITION RATING	REMARKS
58	**DECK**	
1.	Wearing Surface	5
2.	Deck – Structural Condition	5
3.	Curbs	N
4.	Median	—
5.	Sidewalks	—
6.	Parapet	N
7.	Railing	5
8.	Paint	2
9.	Drains	N
10.	Lighting Standards	
11.	Utilities	
12.	Joint Leakage	
13.	Expansion Joints or Devices	
	COND. RATING	5
59	**SUPERSTRUCTURE**	
1.	Bearing Devices	N
2.	Stringers	7
3.	Girders, Beams, or Arches	N
4.	Floor Beams and Diaphragms	—
5.	Trusses – General	—
	– Portals	—
	– Bracing	—
6.	Paint	—
7.	Machinery (Movable Spans)	—
8.	Rivets and /or Bolts	—
9.	Welds – Cracks	—
10.	Rust	5
11.	Timber Decay	N
12.	Concrete Cracking and /or Spalling	7
13.	Collision Damage	6
14.	Deflection Under Load	6
15.	Alignment of Members	5
16.	Vibrations Under Load	N
17.	Flat Slab	6
	Inspectors Condition Rating	

DEFECTS CODING GUIDE

Material	Code No.	Description of Defect
Concrete	1	Hairline Cracks in Concrete
Concrete	2	Cracks in Concrete
Concrete	3	Spalled Concrete
Concrete	4	Spalled Concrete with reinforcing exposed
Concrete	5	Scaling
Concrete	6	Honeycomb Voids
Concrete	7	Efflorescence
Concrete	8	Rust Stains
Concrete	9	Weathered/Waterstained
Timber	10	Split Timber
Timber	11	Decayed Timber
Timber	12	Crushed Timber
Timber	13	Splintered Timber
Timber	14	Weathered/Worn Timber
Timber	15	Insufficient Nailing or Bolting
Steel	16	Rusted Steel
Steel	17	Corroded Steel
Other	18	Erosion
Other	19	Undermining
Other	20	Footing exposed
Other	21	Settlement of Pavement
Other	22	Vegetation Growth
Other	23	Debris
Other	24	Scour
Other	25	Cracks on Pavement



TYPICAL ONE LANE BRIDGE DELINEATION

OTES:

YIELD AHEAD sign (W3-2a) shall be installed only on approaches to a YIELD sign (R1-2) that is not visible for a sufficient distance to permit a driver to bring his vehicle to a stop at the YIELD sign. Final location will be determined in the field by the Engineer.

Stop line and YIELD signs shall be installed on the approach that has the longer or better sight distance. Final location will be determined in the field by the Engineer.

Signs shall be spaced a minimum of 125 feet apart in the same direction of traffic.

reatment

DATE	REVISION	APP'D

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD PLAN TE-67

DELINEATION AND PAVEMENT MARKINGS AT BRIDGES

Eiichi Tanaka — APPROVED
2/28/86 — DATE

STANDARD PLAN TE-67 07/01/8

Date of Inspection 9-22-82
Bridge Number [illegible] Bridge Name [illegible]

		CONDITION RATING	REMARKS
60	SUBSTRUCTURE		
1.	Abutment – Wings	7	
	– Backwall	7	
	– Footing	7	
	– Piles	N	
	– Erosion	6	
	– Settlement	7	
2.	Piers or Bents – Caps	6	
	– Column	5	
	– Footing	6	
	– Piles	N	
	– Scour	6	
	– Settlement	7	
3.	Pile Bents	N	
4.	Concrete Cracking and /or Spalling	7	
5.	Steel Corrosion	5	
6.	Timber Decay, etc.	5	
7.	Debris on Seats	7	
8.	Paint	N	
9.	Collision Damage	6	
	Inspectors Condition Rating	6	

		CONDITION RATING	REMARKS
61	CHANNEL & CHANNEL PROTECTION		
1.	Channel Scour	6	
2.	Embankment Erosion	7	
3.	Drift	7	
4.	Vegetation	7	
5.	Channel Change	7	
6.	Fender System	N	
7.	Spur Dikes & Jetties	N	
8.	Rip Rap	N	
9.	Adequacy of Opening	8	
	Inspectors Condition Rating	7	

		CONDITION RATING	REMARKS
62	CULVERT & RETAINING WALLS		
1.	Barrel:		
	Concrete	N	
	Steel		
	Timber		
2.	Headwall		
3.	Cutoff Wall		
4.	Adequacy		
5.	Debris		
	Inspectors Condition Rating	N	

Date of Inspection 9-27-93
Bridge Number [illegible] Bridge Name POOPOO #10

93	CRITICAL FEATURE INSPECTION DATE

1. Fracture Critical Details N
2. Underwater Inspection N
3. Other Special Inspection N

CONDITION RATING REMARKS

RESTRICTIONS:

	Condition Rating
1. Posted Loading	6
2. Legibility	7
3. Visibility	7

REPAIRS AND IMPROVEMENTS: SEE ATTACHED SHEET

1. List all work done to this bridge since the last inspection including cost.

2. Indicate proposed and /or recommended improvements including estimated cost.

3. List any existing temporary conditions.

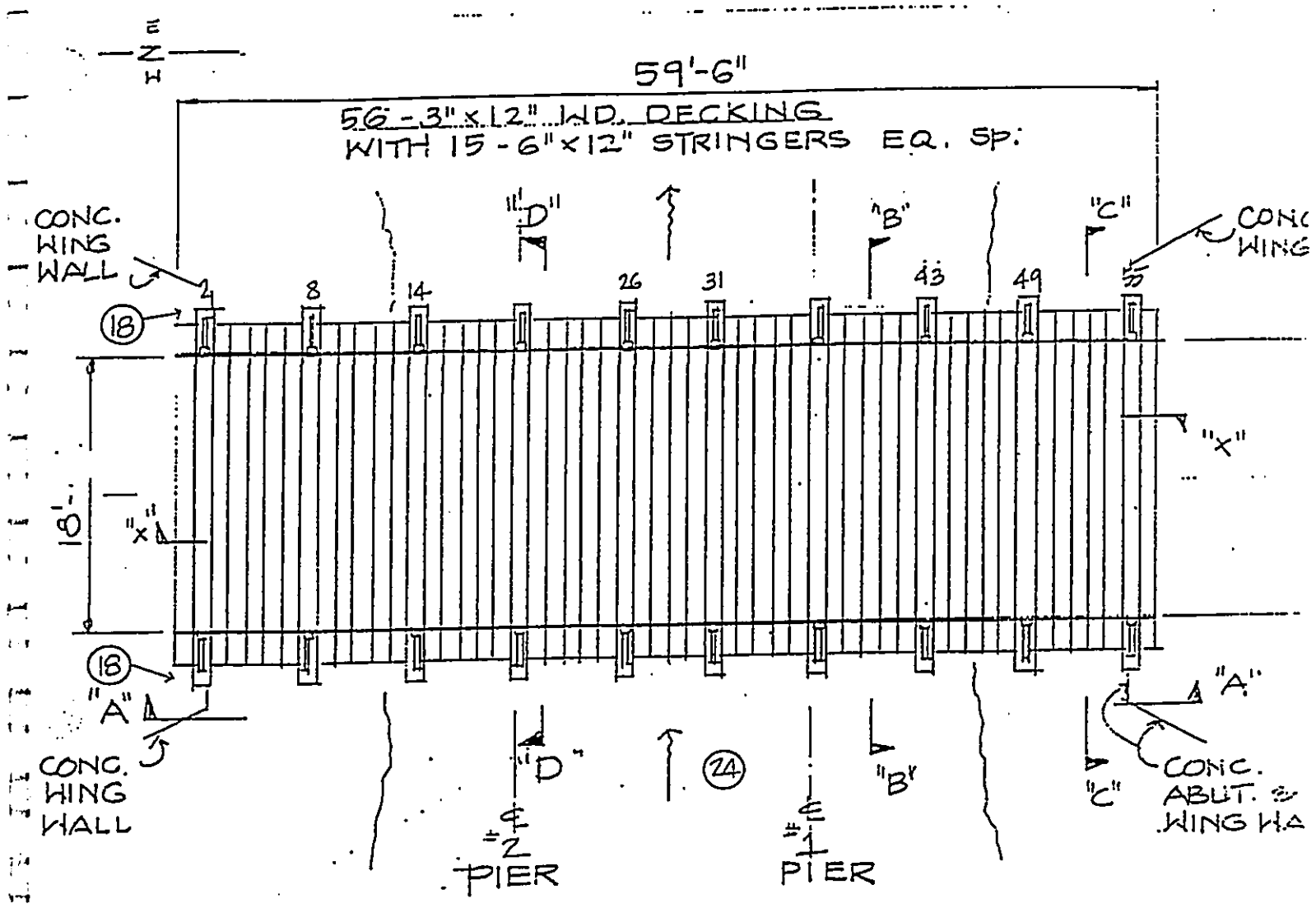
REMARKS AND RECOMMENDATIONS:

1. Does this bridge require inspection by Bridge Design Section? Yes ____ No ✓

2. Remarks: Describe defects. Use sketches, diagrams, and /or photographs where possible.

Inspected by: Signature A. Niwa
Title Const. Engr. II

Supervised by: Signature [signature]
Title Asst. Engr. Prog. Mgr.



PLAN

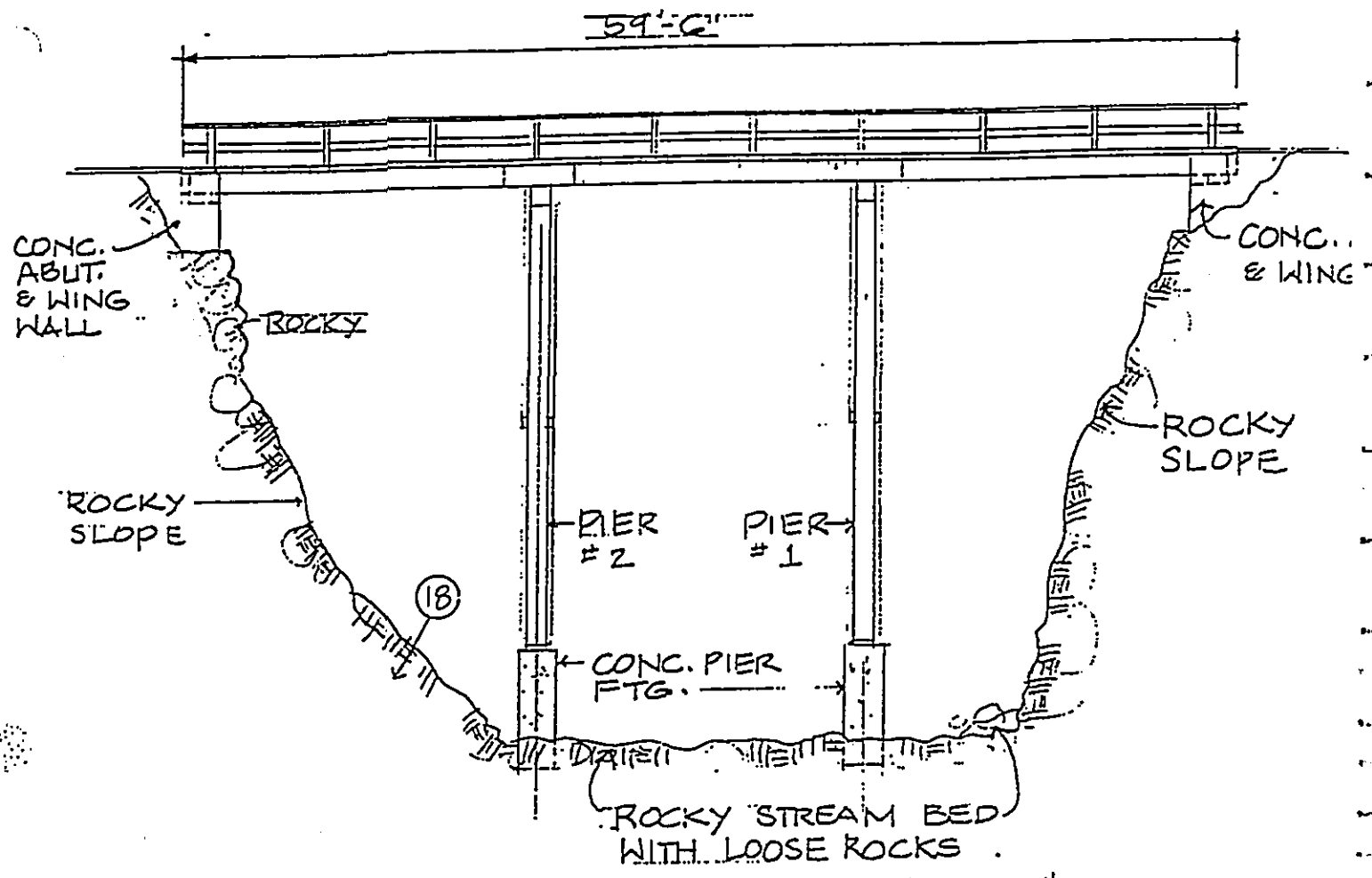
SCALE: 1" = 10'

○ DEFECTS

○* UNDERSIDE OF BRIDGE

PIILANI HWY / POOPOO STREAM

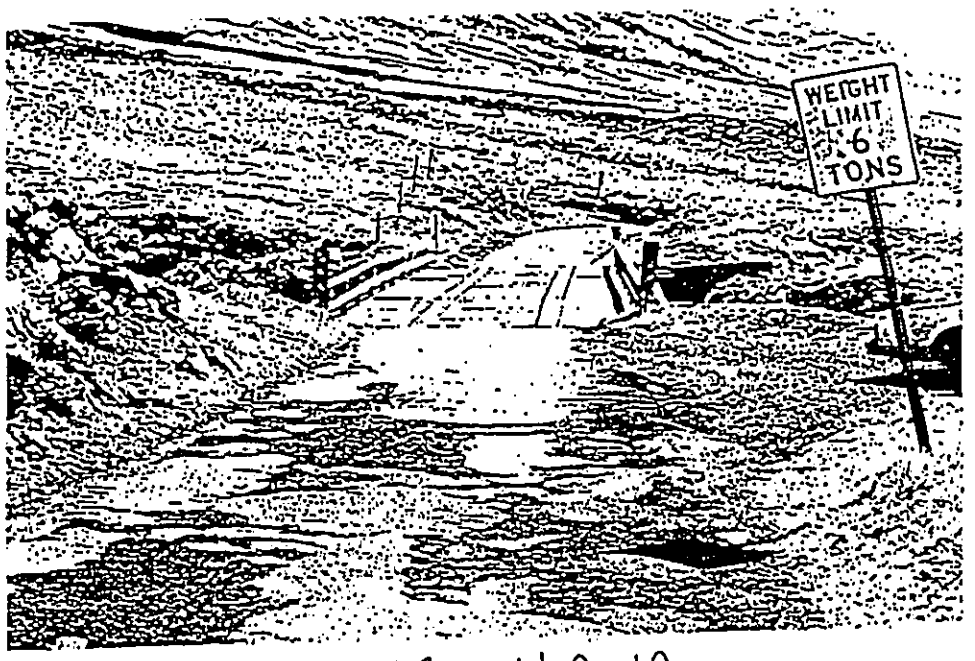
STRUCTURE NO.: 10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAUI DEPT. of PUBLIC WOR
DISTRICT: S. HANA		INVENTORY OF BRIDG
LOCATION (T.M.K.): 1-9:01		
INVENTORY ROUTE: PIILANI HWY.	DATE: 7-24-80 / PREP. BY: KN	SHEET 1 of 5 SH



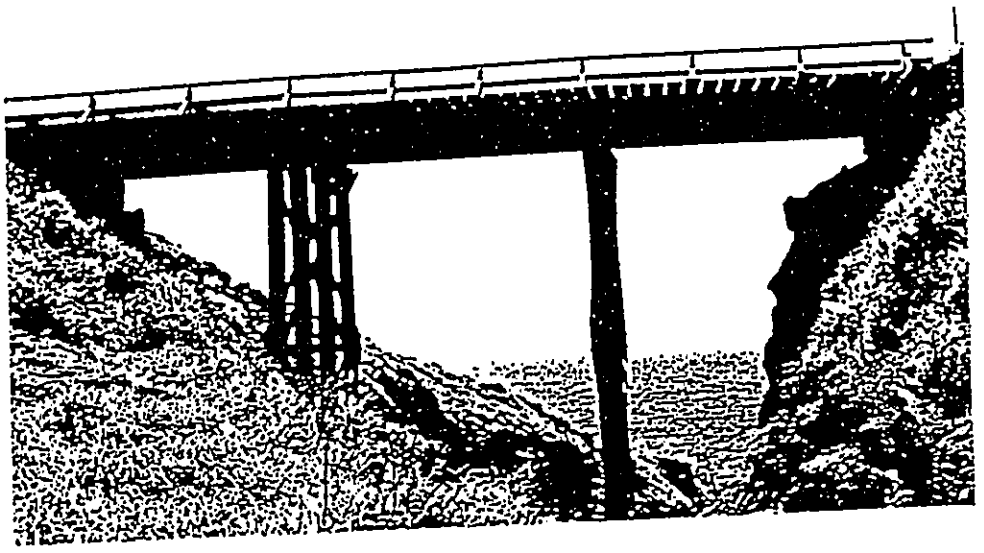
WEST ELEVATION "A-A"

SCALE: 1" = 10'

STRUCTURE NO.: 10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAUI DEPT. of PUBLIC WOF
DISTRICT: S. HANA		INVENTORY OF BRID(
LOCATION (T.M.K.): 1-9:01		
INVENTORY ROUTE: PIILANI HWY.	DATE: 7-24-80 / PREP. BY: KN.	SHEET 2 of 5 Sh

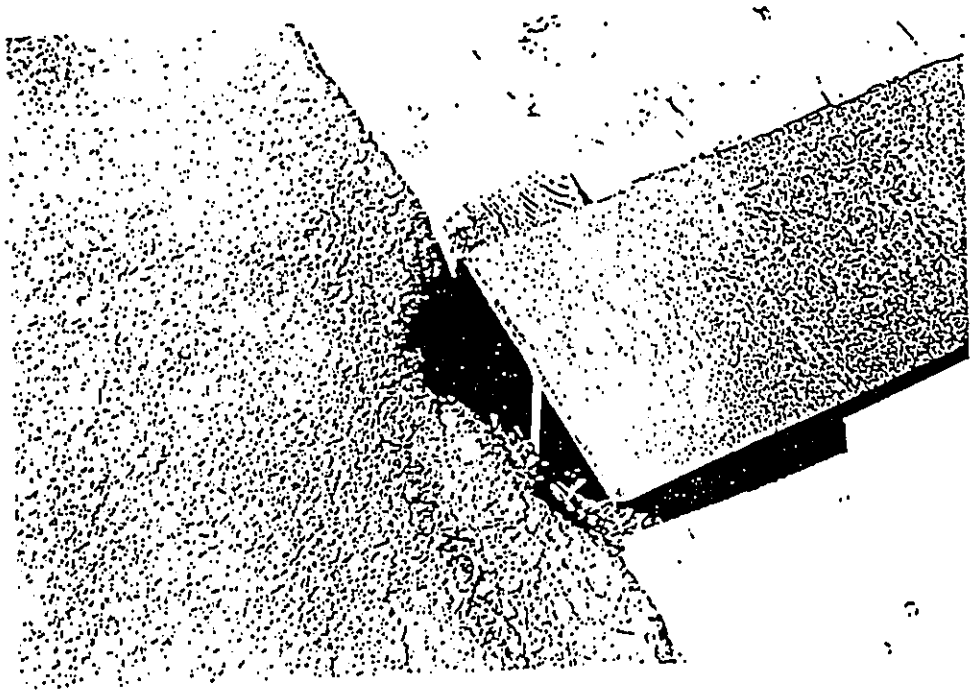


APPROACH, LOOKING HANA



ELEVATION, LOOKING DOWNSTREAM

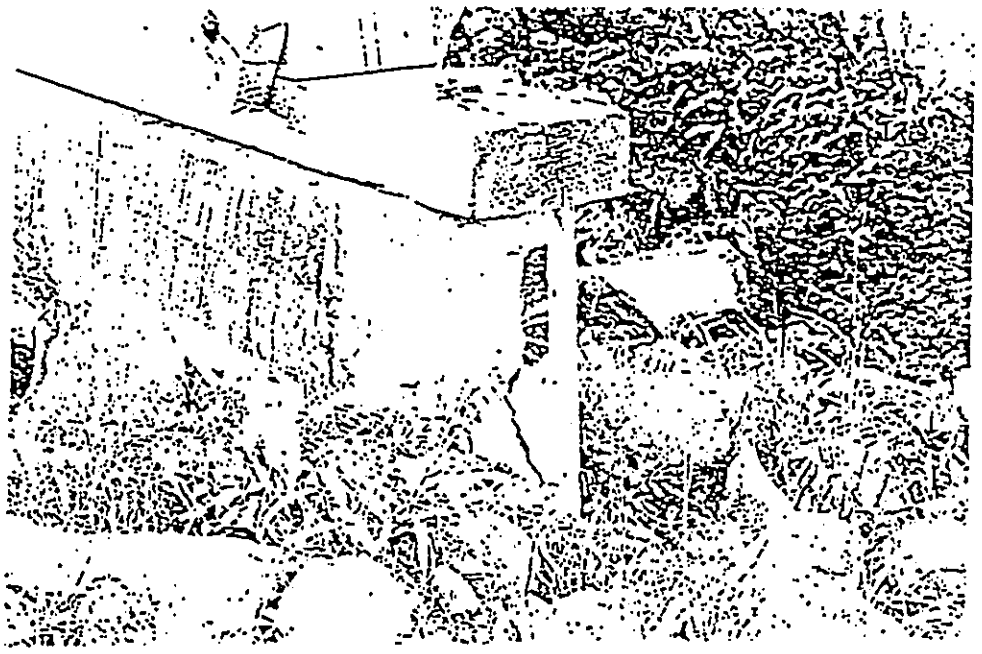
STRUCTURE: POOPOO #10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAU DEPT. of PUBLIC WOI
DISTRICT: HANA		
LOCATION (T.M.K.): 1-9-01		INVENTORY OF BRIDG
INVENTORY ROUTE: PILANI HWY	DATE: 9/20/93 PREP. BY: S.P.N.	SHEET 1 of 4 SHEE



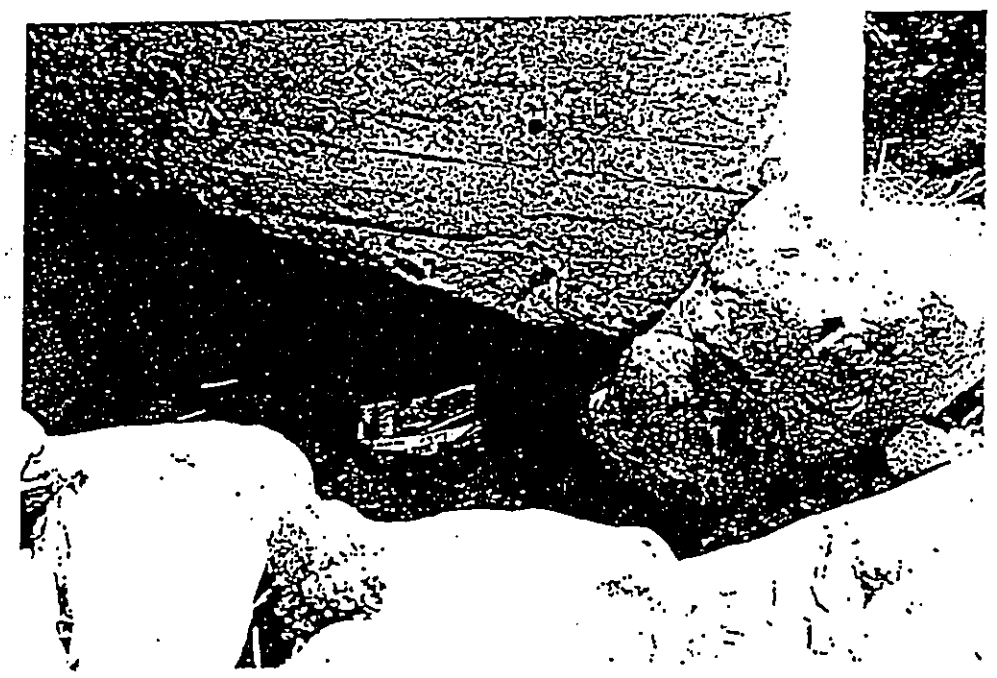
APPROACH, HANA SIDE, DOWNSTREAM
A.C. W/ STEEL BEAM

CRACKED COLUMN, KAUPO, UPSTREAM

STRUCTURE: POOPOO #10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAUI DEPT. of PUBLIC WORK
DISTRICT: HANA		
LOCATION (T.M.K.): 1-9-01		INVENTORY OF BRIDGE
INVENTORY ROUTE: PIILANI HWY	DATE: 9/20/93 PREP. BY: S.P.N.	SHEET 2 of 4 SHEETS



COLLISION DAMAGE, KAUPO PIER, UPSTREA

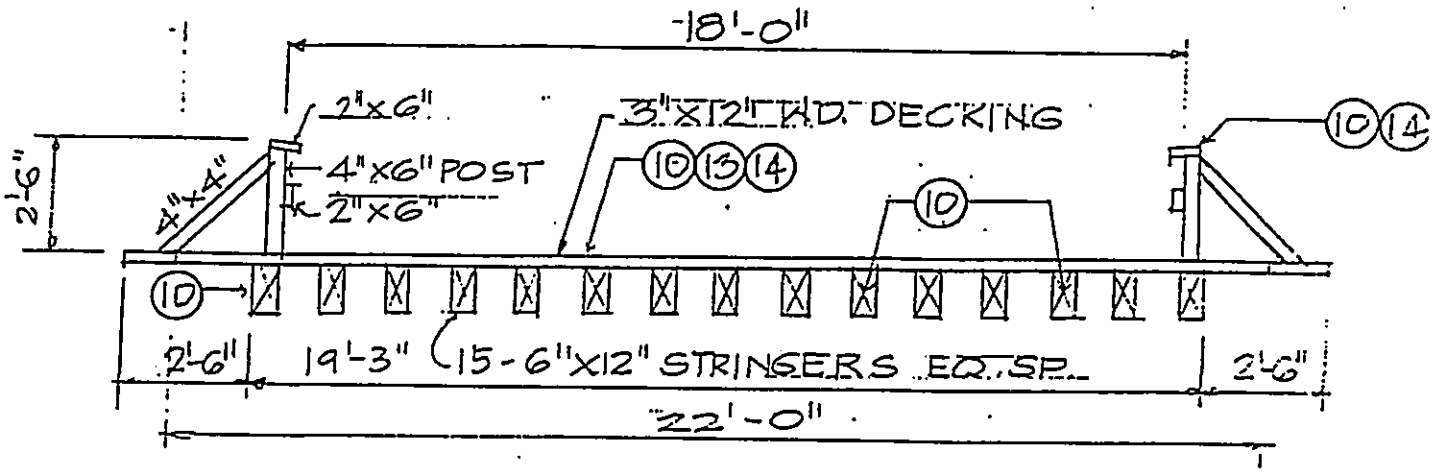


UNDERMINE, HANA PIER, DOWNSTREAM

STRUCTURE: POOPOO #10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAUI DEPT. of PUBLIC WORK
DISTRICT: HANA		
LOCATION (T.M.K.): 1-9-01		INVENTORY OF BRIDGE
INVENTORY ROUTE: PILANI HWY	DATE: 9/20/93 PREP. BY: S.P.N.	SHEET 3 of 4 SHEETS

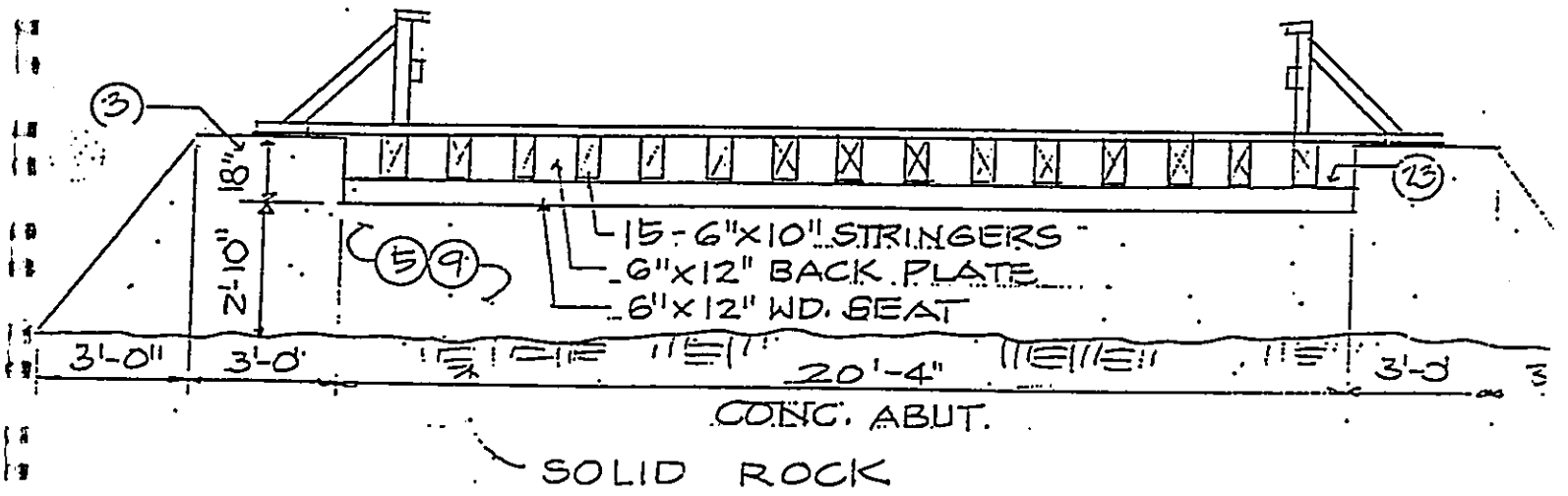
DEBRIS IN CHANNEL, DOWNSTREAM

STRUCTURE: POOPOO #10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAUI DEPT. of PUBLIC WOR
DISTRICT: HANA		
LOCATION (T.M.K.): 1-9-01		INVENTORY OF BRIDGE
INVENTORY ROUTE: PILANI HWY	DATE: 9/20/93 PREP. BY: S.P.N.	SHEET 4 of 4 SHEE



TYPICAL CROSS SECTION "B-B"

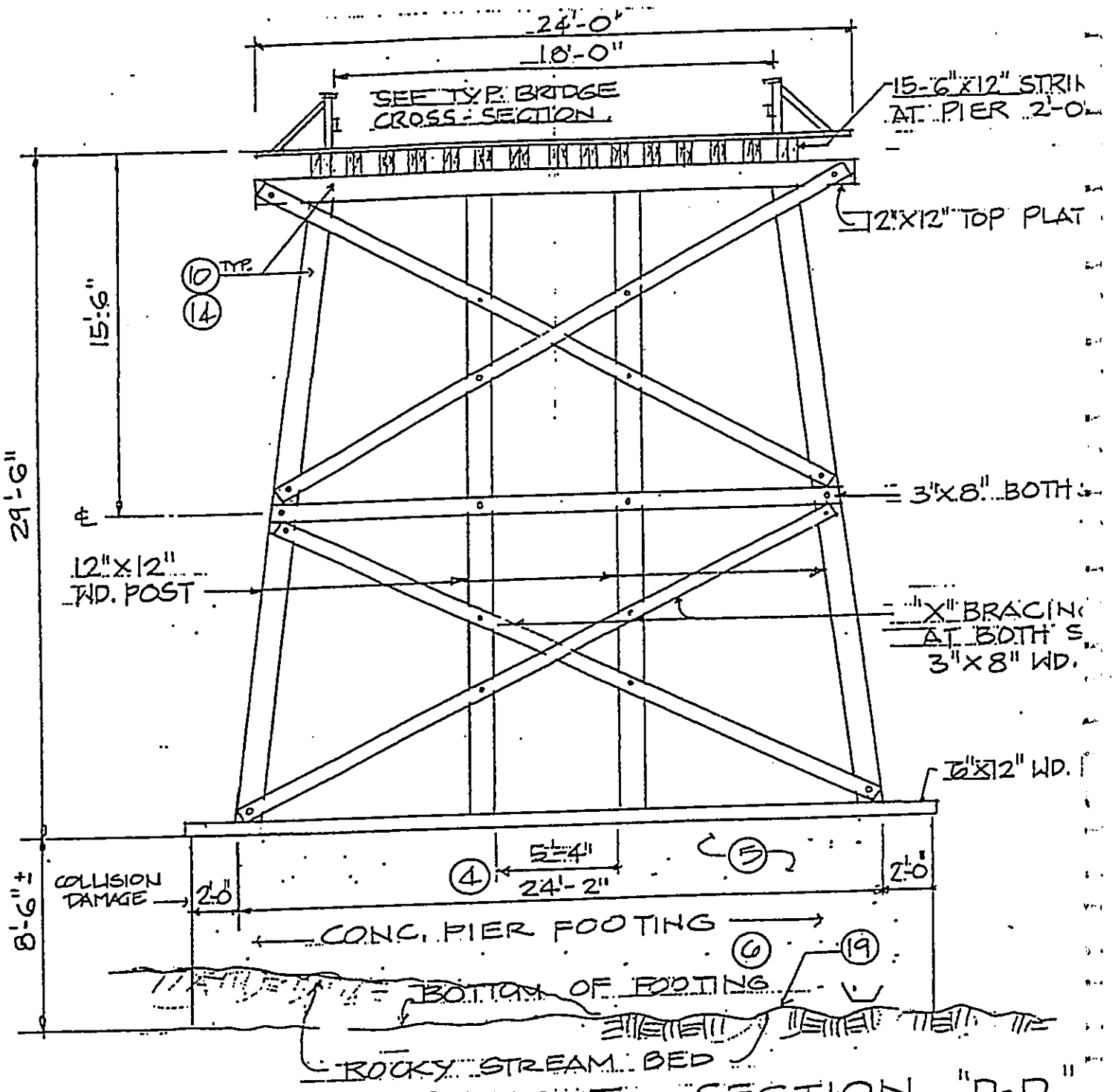
SCALE: 1/4" = 1'-0"



TYPICAL ABUTMENT SECTION "C-C"

SCALE: 1/4" = 1'-0"

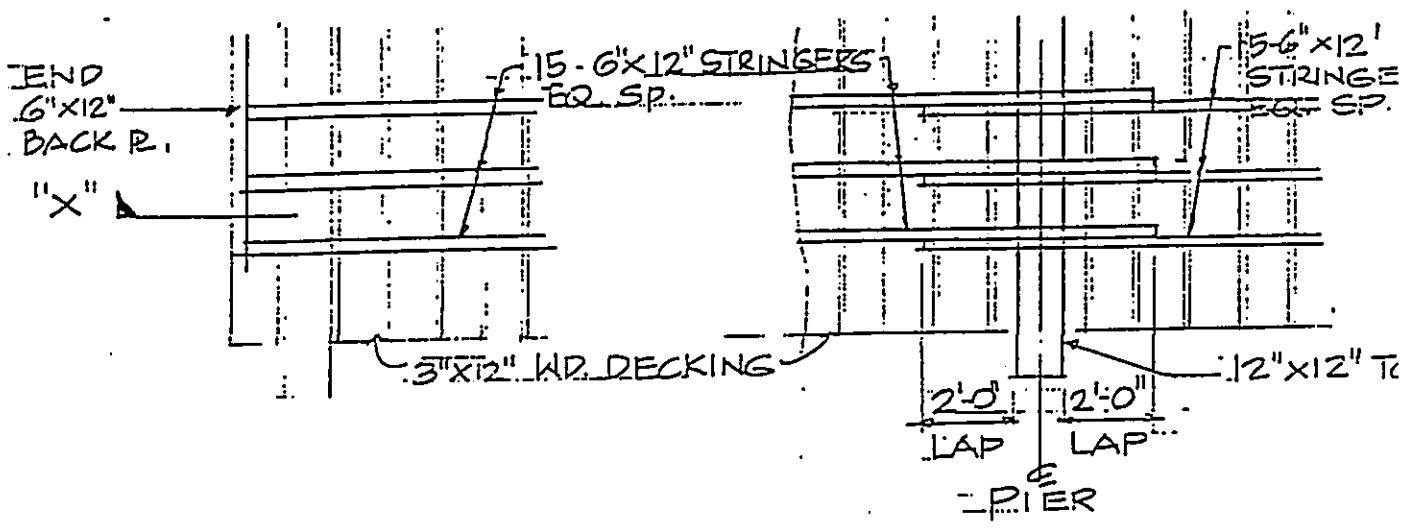
STRUCTURE NO.: 10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAUI DEPT. of PUBLIC WORI
DISTRICT: S. HANA		
LOCATION (T.M.K.): 1-9:01		INVENTORY OF BRIDGI
INVENTORY ROUTE: PILANI HWY.	DATE: 7-24-80 / PREP. BY: KN.	SHEET 3 of 5 SHT



TYPICAL PIER BENT - SECTION "D-D"

SCALE: 1" = 6' PIER #2 (PIER #1 SIMILAR)

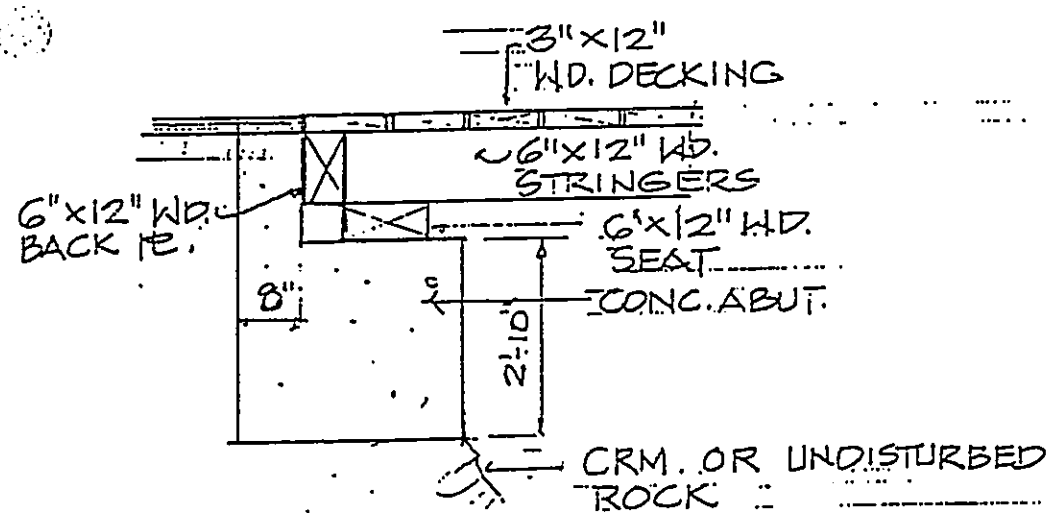
STRUCTURE NO.: 10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAU... DEPT. of PUBLIC WO...
DISTRICT: S. HANA		INVENTORY OF BRI...
LOCATION (T.M.K.): 1-9;01		
INVENTORY ROUTE: PIILANI HWY.	DATE: 7-24-80 / PREP. BY: KN.	SHEET 4 of 5 S...



AT ABUT. AT PIER

PLAN - SHOWING 6"x12" STRINGERS

N.T.S.



ABUTMENT DETAIL "X"

N.T.S.

STRUCTURE NO.: 10	FEATURES INTERSECTED: POOPOO STREAM	COUNTY of MAUI DEPT. of PUBLIC WOI
DISTRICT: S. HANA		INVENTORY OF BRID
LOCATION (T.M.K.): 1-9:01		
INVENTORY ROUTE: PIILANI HWY.	DATE: 7-24-80 / PREP. BY: KN.	SHEET 5 of 5 SI

Recommended Repair of cracks and spalls in concrete

Cracks

1. Rout crack with concrete saw or chipping tools
2. Flush out crack with water or solvent
3. Allow surface to dry (use hot-air jet, if required)
4. Drill 3/4" ø holes, approximately 3/4" deep @ 6" to 12" o.c., into crack
5. Surface seal crack with joint sealant & install epoxy injection valves in 3/4" ø holes, secured with epoxy bonding compound.
6. Inject epoxy bonding compound into crack until the compound flows out of adjacent sections of the crack or begins to bulge out of the surface sea

Spalls

1. Remove all unsound, damaged and undersirable concrete.
2. If reinforcing is exposed, remove undesirable concrete around reinforcing to a sound substrate. Clean reinforcing steel free of rust, scales, oils and other foreign matter deleterious to bonding. (Sandblasting is desireable).
3. Clean surface to be joined free of moisture, dust, rust, etc.
4. Apply epoxy bonding compound to surface to be joined.
5. Apply lean, stiff mix concrete to repair area. If form work is involved, concrete can be applied pneumatically.

Poopoo Bridge

STRUCTURE NO.: 10	FEATURES INTERSECTED: Poopoo Stream	COUNTY of MAU
RICT: S. Hana		DEPT. of PUBLIC WO
LOCATION (T.M.K.): 1-9:01		INVENTORY OF BRID
INVENTORY ROUTE:	DATE:	PREP. BY:

County of Maui
Dept. of Public Works
Engineering Division

POOPOO #10
REPAIRS & IMPROVEMENTS

1. Work completed since last inspection.

   a. In 1992, the split stringers and defected decking were replaced by County crews.

2. Proposed or recommended improvements.

   a. Repair all concrete defects as recommended on Repair of Spalls and Cracks sheet.

   b. All timber bent members are split and weathered, and should be replaced or repaired.

   c. Install approach guardrails as per Standard Details for Public Works Construction R-22, R-23 & R-24.

   d. Install "Narrow Bridge" signs, RM-3's and "No Dumping" signs at approaches.

Inspected By: Signature A. Nieva

Title Const. Insp. II

Reviewed By: Signature Clay Yamashita

Title Asst. Engr. Prog. Mgr.

COST OF IMPROVEMENTS

DESCRIPTION	QUANTITY	UNIT COST	COST
Repair cracks	20 L.F.	$ 76.00/L.F.	$ 1,520.00
Install additional G.R.	50 L.F.	$ 65.00/L.F.	$ 3,250.00
Repair spalls	42 SF	$ 250.00/SF	$10,500.00
Repair columns	All	$1,500.00/LS	$ 1,500.00
*Repair bents			
*Install RM-3's, "Narrow Bridge" signs and "No Dumping" signs at approaches			
*Repair erosion at upstream/Ulupalakua shoulder			
*Replace rusty bolts on parapet railing			

SUBTOTAL:	$16,770.00
20% CONTINGENCY:	$ 3,354.00
TOTAL:	$ 20,124.00
CALL:	$ 21,500.00

*Work to be done by County Maintenance forces.

STRUCTURE NAME & NO. POOPOO # 10	FEATURES INTERSECTED: POOPOO STREAM		COUNTY OF MAUI DEPT. OF PUBLIC WORKS INVENTORY OF BRIDGES
DISTRICT: HANA			
LOCATION (TMK): 1-09-01			
INVENTORY ROUTE: PIILANI HWY.	DATE: 11/03/93	PREP BY: A.N.	SHEET 1 OF 1

County of Maui
Dept. of Public Works
Engineering Division

POOPOO #10
SUMMARY OF RECOMMENDATIONS

This bridge is structurally in fair condition, but because of continous maintenance repairs and existing condition of all bents, replacement is recommended.

☐ ARCHITECTURAL
☒ STRUCTURAL
☐ CIVIL
☐ PLANNING

WILSON OKAMOTO & ASSOCIATES
ENGINEERS, ARCHITECTS AND PLANNERS

COMPUTED BY RWI
CHECKED BY
DATE July 1982

POO POO STREAM
#10

PROJECT 82365-01
SHEET NO. 1 OF 1 SHE

3 SPAN TIMBER BRIDGE
3X12 DECKING L = 1.3' f_b = 1500 psi f_v = 95 psi
6X12 STRINGERS C 13'o/c L = 17.6' f_b = 1350 psi f_v = 85 psi

CHECK DECKING:

$M = \frac{1.5 \times 12 \times 3^2}{12 \times 6} = 2.25^{K-1}$ $M_{LL} = \frac{16 \times 1.3}{4} = 5.2^{K-1}$

INVENTORY
$\frac{2.25}{5.2} \times 20 = H\ 8.65$

OPERATING
$1.3 \times 8.65 = H\ 11.25$

SHEAR CHECK
$V = \frac{2}{3} \times .085 \times 3 \times 12 = 2.28$ $V = 8^K$

INVENTORY
$\frac{2.28}{8} \times 20 = H\ 5.7$

OPERATING
$1.3 \times 5.7 = H\ 7.41$

POSTED GVW
$\frac{7.41}{1.05} \times 0.85 =$ 6 TONS

CHECK 6X STRINGER
$W_{DL} = 16 + 1.3 \times 8 = 28.4^{\#/'}$ $M_{DL} = \frac{.028(17.8)^2}{8} = 1.37$

$M_{LL} = \frac{1.35 \times 6 \times 12^2}{6 \times 12} = 16.2$ $M_T = 16.2 - 1.37 = 14.83^{K-1}$

$H_{20} = \frac{1.3}{4} = .33$ $P = 16 \times .33 = 5.2$ $M = \frac{5.2(17.8)}{4} = 25.74^{K-1}$

INVENTORY
$\frac{14.83}{25.74} \times 20 = H\ 11.52$

OPERATING
$\frac{17.62}{25.74} \times 20 = H\ 15.30$

SHEAR CHECK
$V = \frac{2}{3} \times .085 \times 6 \times 12 = 4.1^K$ $V_{DL} = .028(\frac{17.8}{2}) = .25$ $V_T = 4.10 + 2 = 3.32^K$

$V = 5.2^K$

INVENTORY
$\frac{3.82}{2} \times 20 = H\ 14.69$

OPERATING
$\frac{5.05}{52} \times 20 = H\ 19.42$

FEWELL GEOTECHNICAL ENGINEERING, LTD.

SITE RECONNAISSANCE REPORT

17 FEBRUARY 1995

EXHIBIT B

FEWELL
GEOTECHNICAL
ENGINEERING, LTD.

Oahu Office
96-1416 Waihona Place
Pearl City, Hawaii 96782-1973
Telephone (808) 455-6569 • Facsimile 456-7062

Maui Office
P.O. Box 1073
Puunene, Maui, Hawaii 96784
Telephone (808) 572-2672 • Facsimile 572-2672

File 1386.01
February 17, 1995

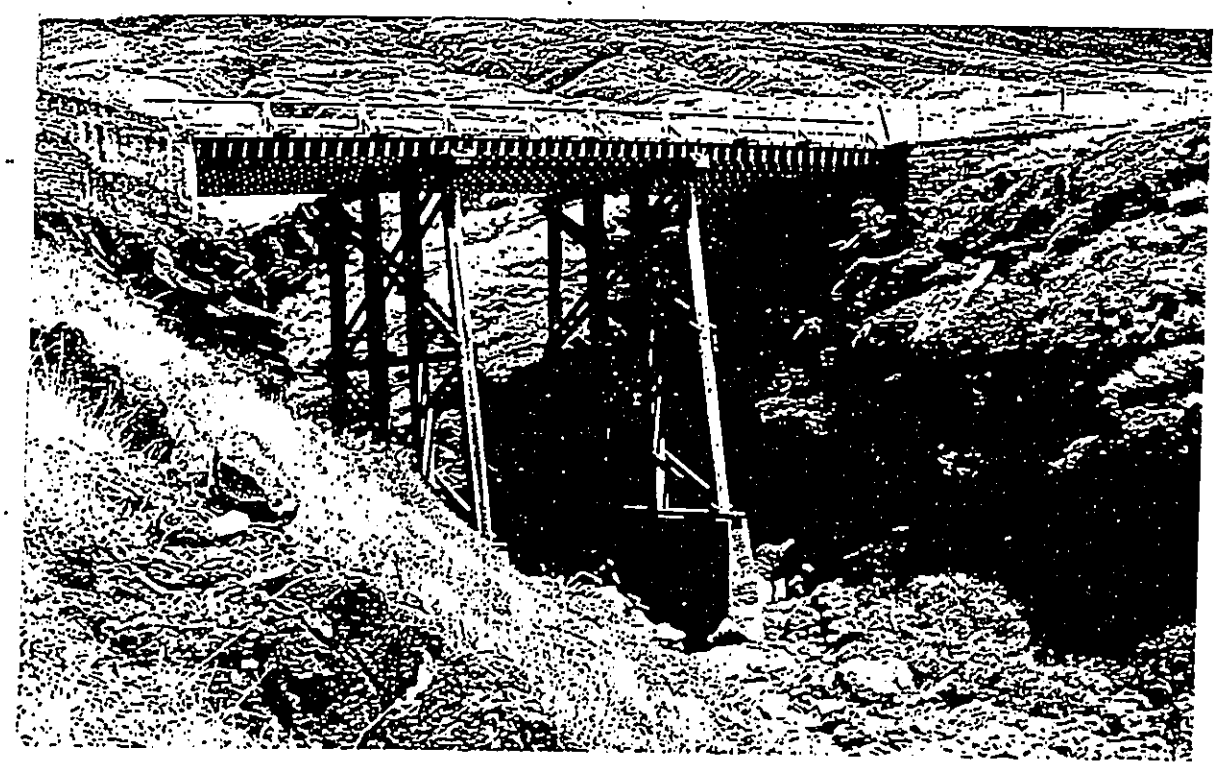
Sato & Associates, Inc.
2046 South King Street
Honolulu, Hawaii 96826

Attention: Mr. Loren G. S. Lau, AIA
Project Manager

Subject: Site Reconnaissance Report
Po'opo'o Bridge Replacement
County of Maui, Hawaii

We have completed our site reconnaissance to develop geotechnical recommendations for the design and construction of the proposed Po'opo'o Bridge Replacement in Maui, Hawaii. This letter summarizes our findings and conclusions and was performed in general accordance with our April 20, 1994 proposal and your Agreement dated October 18, 1994.

Introduction - The existing bridge crossing Po'opo'o Stream at approximately mile post 28.31 along Piilani Highway will be replaced with a new structure. Po'opo'o Stream is on the southern flank of Haleakala and is an intermittent stream within a deeply eroded gulch which has created nearly vertical rock sides approximately 40 feet in height. Piilani Highway in this area, is a narrow roadway and is the only access to the Kaupo area and on to Hana where it connects with Hana Highway.



Existing Po'opo'o Bridge

The existing bridge, shown in the photograph above, is a single-lane timber structure approximately 60 feet in length. It has two separate intermediate concrete supporting piers. The abutments for the bridge are founded on massive basalt at the top of the gulch. The foundations for the intermediate piers are founded within the eroded stream bed on concrete piers resting upon massive basalt which forms the base of the stream.

The approximate location of the bridge and Po'opo'o Gulch is shown on the enclosed Project Location Map, Figure 1.

Project Description - It is our understanding that the new bridge will be a two-lane concrete structure using precast girders. At the present time, three replacement schemes are being evaluated. Scheme A is for a 60- to 70-foot single span bridge located immediately upstream of the existing bridge. This would permit the new structure to be constructed while the existing bridge is kept in service. Scheme A would involve a slight shifting of the roadway alignment to provide access to the new structure.

Scheme B is similar to Scheme A but with the new bridge being located downstream of the existing bridge at a location where the single span would vary from 60 to 85 feet. This alignment would also permit the existing bridge to remain in service while the new bridge is constructed and would require a slight realignment of the existing roadway.

Under Scheme C, the existing bridge would be demolished and a new single 60-foot span bridge constructed at the same location. This scheme would require a temporary detour road on the upstream side with a temporary ford crossing approximately 500 feet upstream from the existing bridge.

It is anticipated that the abutment loads for the three proposed schemes would not exceed 23 kips per linear foot.

Geologic Conditions - Po'opo'o Stream and the proposed new bridge site is on the southern flank of Haleakala Mountain in an area blanketed by basaltic flows of the Kula Volcanic Series. The Kula flows form the surface over most of the northwestern and southeastern segments of Haleakala Mountain. The flows characteristically average 20 feet in thickness at the summit and 50 feet near the coast. Aa lava is predominant but some Pahoehoe is present near vents.

Site Reconnaissance and Discussion - Our site reconnaissance of the proposed bridge locations disclosed that the bottoms and sides of Po'opo'o Gulch consists of massive basalt flows (the Kula Volcanic Series) with little or no soil cover. The existing bridge abutments are supported by massive basalt and show no indications of movements or loss of support. The western abutment is supported upon a dense mass of basalt with columnar jointing.

A minor amount of erosion apparently is occurring at the stream bed level, but there is little indication of lateral expansion of the stream bed or erosion of the side walls. The stream has undercut the sidewalls of the stream channel. The rock should have sufficient strength and rock formation thickness separating the foundations and the undercut locations so that there should be no effect on the foundations. The undercut areas could be filled with concrete to remove any possibility of movement.

A plunge pool has developed on the upper side of the existing bridge at a small waterfall. We do not foresee any problems with this conditions.

The basalt was deposited in thick flows with few inclusions of ash or clinkers as shown in the nearly 40-foot vertical exposure on the sides of the gulch.

The same foundation conditions exist at the three proposed bridge locations. The bridges would be supported upon the same massive basalt formations that has supported the existing bridge. The surrounding conditions consist entirely of rock with little or no soil cover.

The proposed bridge abutments should therefore be supported upon the massive basalt where the foundations can be designed for very high bearing pressures with essentially no anticipated settlements or movements.

The bridge abutments should be set back in the slope to assure that should any future erosion occur, the abutment foundations would not be undermined.

It is anticipated that the abutments would be backfilled with imported granular material since no on-site fill sources are available.

It is our understanding that the roadway pavement will be subjected to only light traffic consisting primarily of automobiles and light trucks and with an occasional heavy truck. The bridge is to be designed for HS 20 loading which is for a 20-ton truck or a 36-ton truck with trailer. Since the roadway will be supported also by rocky formations, a minimal pavement section will be required.

Recommendations - The exposed conditions show that the bridge abutments will be supported by competent basalt. The bridge abutments and pavements should be designed in accordance with the following recommendations.

1. The abutment foundations should be designed as spread foundations bearing upon the massive basalt where they may be designed for allowable bearing pressures of up to 20 kips per square foot. The foundations should maintain a minimum width of 3 feet.

2. The foundations should be set back into the slope so that there is a minimum 5-foot setback from the slope face to the outside bottom edge of the abutment foundations.

3. The foundations should be situated on a level bench cut into the basalt with the concrete poured in direct contact with the basalt subgrade. No granular fill should be used beneath the abutment foundations.

4. The backfill for the abutments should be an imported granular material such as Select Borrow or Base Course that can be readily compacted and will minimize the pressures against the abutments.

5. The backfill should be compacted to between 90 and 95 percent of its maximum density. Overcompaction of the backfill should be avoided since this can significantly increase the lateral pressures against the retaining walls.

6. The backfill material should conform to Section 30 of the Standard Specifications for Public Works Construction, 1986.

7. The abutment walls should be designed for at-rest lateral backfill pressures of 45 pounds per cubic foot (p.c.f.) equivalent fluid pressure, if constructed in accordance with the above recommendations. An active pressure of 35 p.c.f. can be used during construction.

8. A friction factor of 0.65 can be used for massive concrete against clean sound rock.

9. The abutment wall backfills should provide a passive pressure of 450 p.c.f. equivalent fluid pressure for the recommended granular backfill.

10. Positive drainage should be provided for the abutment walls to prevent the buildup of hydrostatic pressures behind the abutments or wing walls.

11. The pavement should be based upon a roadway section consisting of a minimum of 2 inches of asphaltic concrete and 6 inches of base course, unless significantly higher traffic volumes than presently occurring on the roadway are anticipated. This pavement section is based upon a "Rural Collector Road" but with a reduced pavement section due to rocky subgrade.

12. All work for the roadway and embankments should be performed in accordance with the Standard Specifications for Public Works Construction, 1986.

Limitations - This report has been prepared for the exclusive use of Sato & Associates, Inc. and the County of Maui, for the design of the Po'opo'o Bridge Replacement. In accordance with generally accepted soil and foundation engineering practices. No other warranty expressed or implied, is made.

The analysis, conclusions, and recommendations of this report are based upon the exposed rock conditions and did not include test borings at the abutment locations. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the present time, FGE, Ltd. should be notified so that supplemental recommendations can be given, if necessary. Should significant changes in the project occur, the conclusions and recommendations contained in this report shall not be considered valid unless they are reviewed and the conclusions of the report verified in writing.

Unanticipated soil conditions are commonly encountered and cannot be fully determined by soil samples, test borings, or test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. Some contingency funds are recommended to accommodate such potential extra costs.

FGE, Ltd. should be provided the opportunity for a general review of the final design drawings and specifications to verify that the earthwork and foundation recommendations were properly interpreted and implemented in the design and specification. If FGE, Ltd. is not accorded the privilege of making this recommended review, it can assume no responsibility for misinterpretations of the recommendations.

Should you have any questions pertaining to any aspect of this report or if we can be of any further assistance to you, please do not hesitate to contact us.

Respectfully submitted,

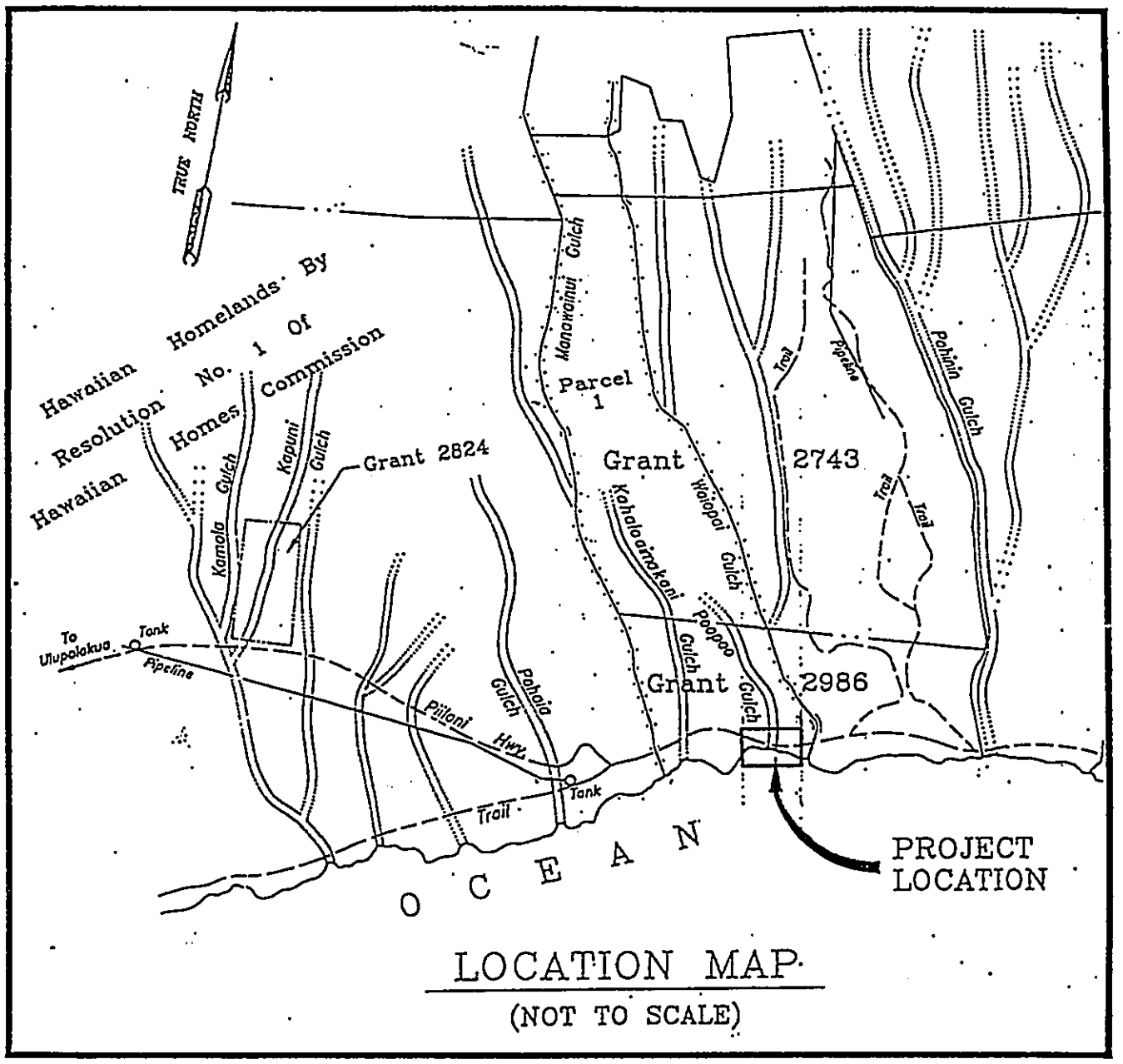
FEWELL GEOTECHNICAL ENGINEERING, LTD.

By Richard B. Fewell, P.E.

RBF/tb

Enclosure: Figure 1

RICHARD B. FEWELL
REGISTERED PROFESSIONAL ENGINEER
No. 3611-C
HAWAII, U.S.A.



LOCATION MAP

(NOT TO SCALE)

LEGEND:

PROJECT LOCATION

SCALE: NOT TO SCALE

GENERAL AREA:

HANA, MAUI, HAWAII

REFERENCE:

PROJECT LOCATION MAP (12-1-94) BY NEWCOMER-LEE LAND SURVEYORS, INC.

F.G.E. Ltd.

PROJECT LOCATION MAP

Poopoo Bridge Replacement
County of Maui
Hana, Maui, Hawaii

File: 1386.01

Date: January 1995

Figure 1

CHAR & ASSOCIATES

BOTANICAL RESOURCES ASSESSMENT

NOVEMBER 1994

EXHIBIT C

BOTANICAL RESOURCES ASSESSMENT
PO'OPO'O STREAM BRIDGE REPLACEMENT
HANA DISTRICT, ISLAND OF MAUI

by

Winona P. Char

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: Sato & Associates, Inc.

November 1994

BOTANICAL RESOURCES ASSESSMENT
PO'OPO'O STREAM BRIDGE REPLACEMENT
HANA DISTRICT, ISLAND OF MAUI

INTRODUCTION

The Po'opo'o Stream Bridge is located at milepost 28.30 on the Pi'ilani Highway and crosses Po'opo'o Gulch and Stream, near Pakowai Point. Elevation is roughly 160 ft. The existing bridge is a timber structure which is structurally deficient and will be demolished. The new replacement bridge will be constructed immediately mauka (inland) of the existing structure, and the highway will be realigned on both side of the new bridge.

The new bridge and the realignment areas were flagged and staked by the survey engineers prior to our field studies. The field studies to assess the botanical resources found on the project site were conducted on 26 October 1994. A survey was also made of the area makai (seaward) of the existing bridge since it may be impacted by the construction and demolition activities. The primary objectives of the survey were to: 1) describe the vegetation; 2) search for threatened and endangered species as well as rare and vulnerable plants; and 3) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

DESCRIPTION OF THE VEGETATION

In the following discussion, the plant names used are in accordance with Wagner et al. (1990) for the flowering plants and Lamoureux (1988) for the ferns.

The vegetation on the project site and the immediately surrounding lands consists of buffelgrass grassland on very stony soils -- Waiakoa extremely stony silty clay loam, 3 to 25% slopes, eroded (WID2). The land is used for pasture.

Typically, the vegetation consists of somewhat dense mats of buffelgrass (Cenchrus ciliaris), 1 to 2 ft. tall. Buffelgrass is native to Africa and tropical Asia; in Hawai'i it is common in dry areas and sandy soil. Smaller shrubs and herbaceous components associated with this grassland include 'ilima (Sida fallax), 'uhaloa (Waltheria indica), partridge pea (Chamaecrista nictitans), coatbuttons (Tridax procumbens), and cowpea (Macroptilium lathyroides). Where the shallow soil is stonier or where there are rocky outcroppings, pitted beardgrass (Bothriochloa pertusa), fuzzy top (Bothriochloa barbinodis), and pili grass (Heteropogon contortus) are codominant with the buffelgrass. Other species found on these more eroded or stonier spots include Portulaca pilosa, three-flowered beggarweed (Desmodium triflorum), and pa'u o Hi'i'aka (Jacquemontia ovalifolia subsp. sandwicensis).

The steep walls of Po'opo'o Gulch support scattered patches of buffelgrass, but large rocky outcrops predominate. The native 'akoko (Chamaesyce celastroides var. laehiensis), a woody, low-spreading shrub with milky sap and blusih-green, somewhat waxy leaves, is common on the gulch walls. A few small patches of 'ihi (Portulaca lutea), a succulent plant with lemon-yellow flowers, occur on the rocky slopes and gulch walls makai of the existing bridge. Other species found in the gulch area include shrubs of pluchea (Pluchea symphytifolia), 'ilima, and koa-haole, 4 to 5 ft. tall; grasses such as sourgrass (Digitaria insularis), Guinea grass (Panicum maximum), and green panicgrass (Panicum maximum var. trichoglume); herbaceous species such as Australian salt-bush (Atriplex semibaccata), coatbuttons, wild cucumber (Cucumis dipsaceus), red pualele (Emilia fosbergii), 'aheahea (Chenopodium

murale), and yellow wood-sorrel (Oxalis corniculata); and two ferns -- hairy sword fern (Nephrolepis multiflora) and wood-fern (Christella parasitica). A few plants of 'ilihe'e (Plumbago zeylanica), a sprawling native shrub with white flowers, are also found on the gulch walls.

The gulch bottom consists primarily of dark grayish-colored basalt bedrock with large boulders and gravel piles. A few small scattered patches of the plants found on the gulch walls, mostly buffelgrass and koa-haole, occur on the bottom of the gulch.

DISCUSSION AND RECOMMENDATIONS

The proposed Po'opo'o replacement bridge and highway realignment will cross over vegetation dominated primarily by buffelgrass, an introduced or alien species (i.e. all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact -- Cook's discovery of the islands in 1778). Other introduced plants common on the project site are pitted beardgrass, koa-haole, coatbuttons, partridge pea, and fuzzy top grass. Rocky outcroppings and the Po'opo'o Gulch walls support some native species, the most common of which is the 'akoko (Euphorbia celastroides var. laehiensis), an endemic species, that is, it is native only to the Hawaiian Islands. The other endemic encountered on the project site is pa'u o Hi'i'aka (Jacquemontia ovalifolia subsp. sandwicensis). Indigenous native species, that is, species which are native to the Hawaiian Islands and elsewhere, are 'ihi (Portulaca lutea), 'ilima (Sida fallax), 'uhaloa (Waltheria indica), 'ilihe'e (Plumbago zeylanica), and pili (Heteropogon contortus).

None of the plants found on the project site is a listed, proposed, or candidate threatened and endangered species (U.S.

Fish and Wildlife Service 1992, 1994a, 1994b); nor is any plant considered rare or vulnerable (Wagner et al. 1990). This is not surprising as the lower elevations of leeward East Maui have been disturbed in the past; disturbances include anthropogenic fires, grazing by feral ungulates such as goats and cattle, and displacement of native species by introduced plant species, especially the grasses (Medeiros et al. 1986).

Given the findings above and the limited nature of the project, the proposed Po'opo'o bridge replacement and highway realignment should not have a significant negative impact on the botanical resources. There are no botanical reasons to impose any impediments, restrictions, or conditions to the proposed project. No recommedations are proposed at this time.

LITERATURE CITED

Lamoureux, C.H. 1988. Draft checklist of the Hawaiian pteridophytes, "Kupukupu O Hawai'i Ne'i". Lyon Arboretum, University of Hawai'i, Manoa.

Medeiros, A.C., Jr., L.L. Loope, and R.A. Holt. 1986. Status of native flowering plant species on the south slope of Haleakala, East Maui, Hawaii. University of Hawai'i Cooperative National Park Resources Studies Unit Technical Report 59. Botany Department, University of Hawai'i, Manoa.

U.S. Fish and Wildlife Service. 1992. Endangered and threatened wildlife and plants; Determination of endangered or threatened status for 15 plants from the island of Maui, HI. Federal Register 57(95): 20772-20788.

_____. 1994a. Endangered and threatened wildlife and plants. 50 CFR 17.11 & 17.12.

_____. 1994b. Plants, Hawaiian Islands, Listed, proposed or candidate species under the U.S. Endangered Species Act, Updated: November 2, 1994. Unpublished list, Pacific Islands Office, Honolulu.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and B.P. Bishop Museum Press, Honolulu. B.P. Bishop Museum Special Publication No. 83.

ARCHAEOLOGICAL INVENTORY SURVEY

EXHIBIT D

ASC95-1

AN ARCHAEOLOGICAL INVENTORY SURVEY FOR THE PROPOSED POOPOO BRIDGE REPLACEMENT MANAWAINUI, HANA, MAUI (TMK 1-9-01)

by

Berdena Burgett
Jeffrey Pantaleo
and
Aki Sinoto

Prepared for

Sato and Associates, Inc.
2046 South King Street
Honolulu, Hawai'i 96826

July 1995

Aki Sinoto Consulting
2333 Kapiolani Blvd. No. 2704
Honolulu, Hawai'i 96826

ABSTRACT

An archaeological inventory survey was completed for the proposed Maui County bridge replacement project. The existing Poopoo Bridge timber structure, slated to be replaced, is located at milepost 28.3 on the Piilani Highway at Poopoo Stream, Manawainui, Hana, Maui Island (TMK 1-9-01). The project area is located in Kahikinui, an archaeologically *significant region in southeast Maui. Although several important sites* have been previously identified in the neighboring vicinity, none have been recorded within the impact area of the current project.

During the course of the background archival search, neither the historic land use documents or the archaeological literature produced any significant data specifically pertaining to the subject area. The fieldwork also resulted in largely negative findings within a c.16 acre area surrounding the bridge location. The surface survey included the existing bridge and the locations for the proposed temporary bridge and possible staging areas. Subsurface testing was considered unwarranted due to prior disturbances and the exposed bedrock over much of the gulch areas under the bridge location.

Site 50-50-15-572, the Hoapili Trail, is present in remnant segments in the vicinity of the project area and crosses the gulch about 500 ft. (152 m) north of the bridge. Remnanat segments of this trail have been documented in this report. In the immediate project area, previous disturbances have destroyed and obliterated all surface indications of the trail and its alignment. The proposed project is not expected to have an adverse impact on any of the intact segments of this trail.

No further work is recommended, based on the absence of significant remains in this project area. The construction plans, which call for the replacement or temporary bridges to be built alongside, immediately *mauka*, of the existing bridge, will minimize the realignment of the present roadway. However, if inadvertent findings occur during construction activities, the State Historic Preservation Division of the Department of Land and Natural Resources should be contacted.

INTRODUCTION

An archaeological inventory survey was undertaken by Aki Sinoto Consulting of Honolulu, at the request of Sato and Associates, Inc. The project was conducted in conjunction with the proposed replacement of the Poopoo Stream bridge on the Hana Highway. The project area (TMK 1-9-01) is located in Poopoo Gulch, Manawainui *ahupua'a*, Kahikinui, Hana District, Maui Island (Figs. 1 and 2). Fieldwork was conducted by Berdena Burgett on Monday, 11 April 1994, during an on-site inspection of the project area with representatives from Sato and Associates, Inc. The authors made another site visit on Thursday, June 29, 1995 accompanied by Ms. Amy Dunn, in order to determine the potential adverse impact of the proposed project to the Hoapili Trail, State Site 505-50-15-572.

PROJECT LOCATION

The project area is located on the coast of southeast Maui. The existing timber bridge spans Poopoo Gulch at milepost 28.3 on Piilani Highway, roughly 700 feet (213 m) from the ocean (Fig. 3). The project limits encompass approximately 1.4 acres (5665 sq. m). The surface survey covered roughly 16.5 acres (6.7 ha) surrounding the bridge and included the possible staging areas (Fig.4).

ENVIRONMENT

Much of leeward, southeast Maui is characterized by the arid, sparsely vegetated, southern slopes of Haleakala. Lying in the rain shadow of Haleakala, the mean annual rainfall is below 20 inches with the highest occurring during the winter months of December through March.

The region surrounding the project area has long been used for cattle grazing as reflected in the vegetation. Low dry grasses comprise the dominant flora with intermittent stands of *koa haole* (*Leucaena leucocephala*), christmasberry (*Schinus terebinthifolius*), *kiawe* (*Prosopis pallida*), lantana (*Lantana camara*), and other low shrubs.

The gulch areas consist of Rock land, where exposed rock covers 25 to 90% of the ground surface. Outcrops and very shallow soils characterize this classification. Soils in the area surrounding the gulch is classified as Waiakoa extremely stony silty clay loam and characterized as eroded with stones covering 3 to 15% of the surface. In most areas, about 50% of the surface layer has been eroded away.

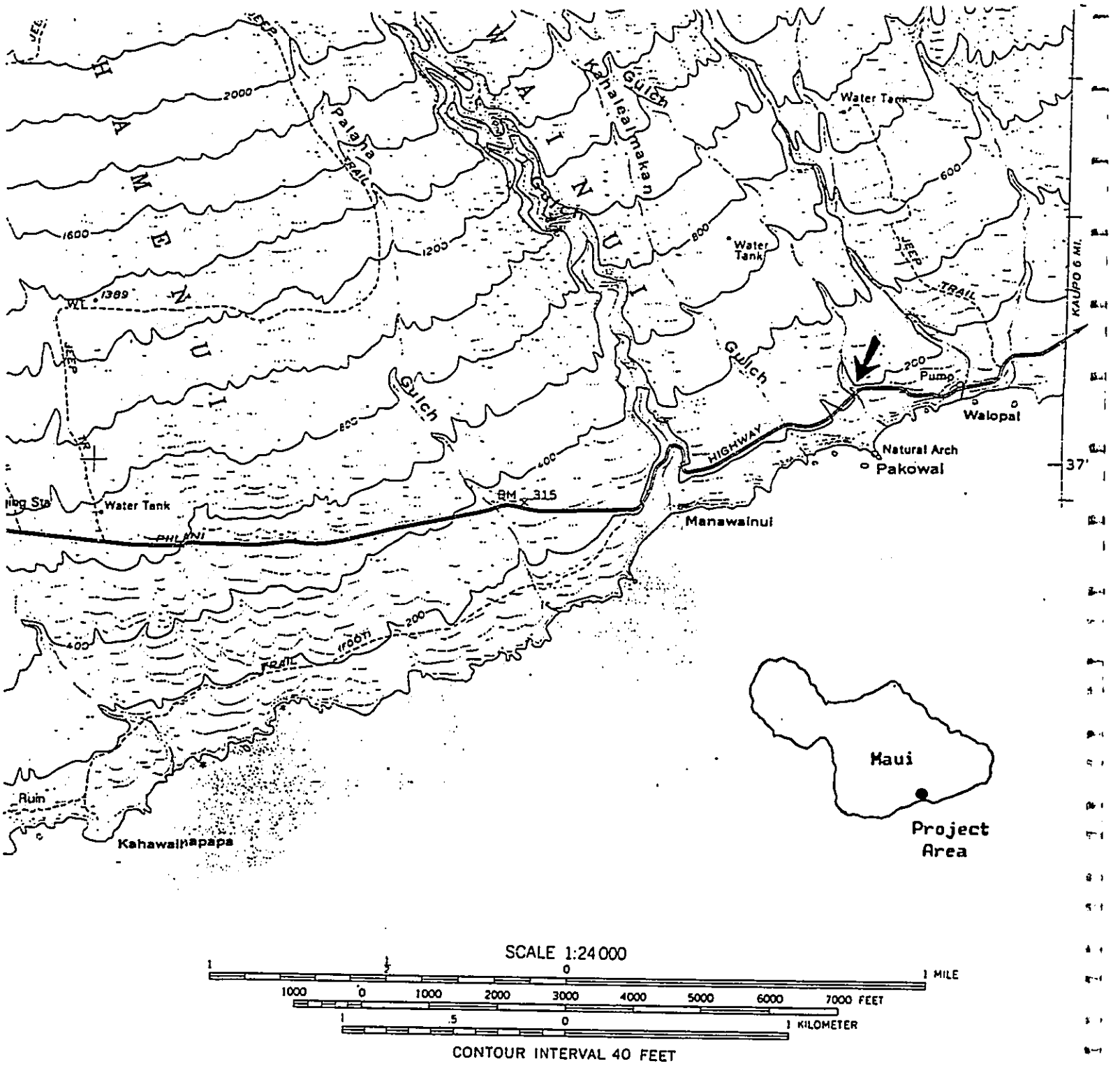


Figure 1. Location of Project Area on a Portion of the USGS Lualailua Quadrangle.

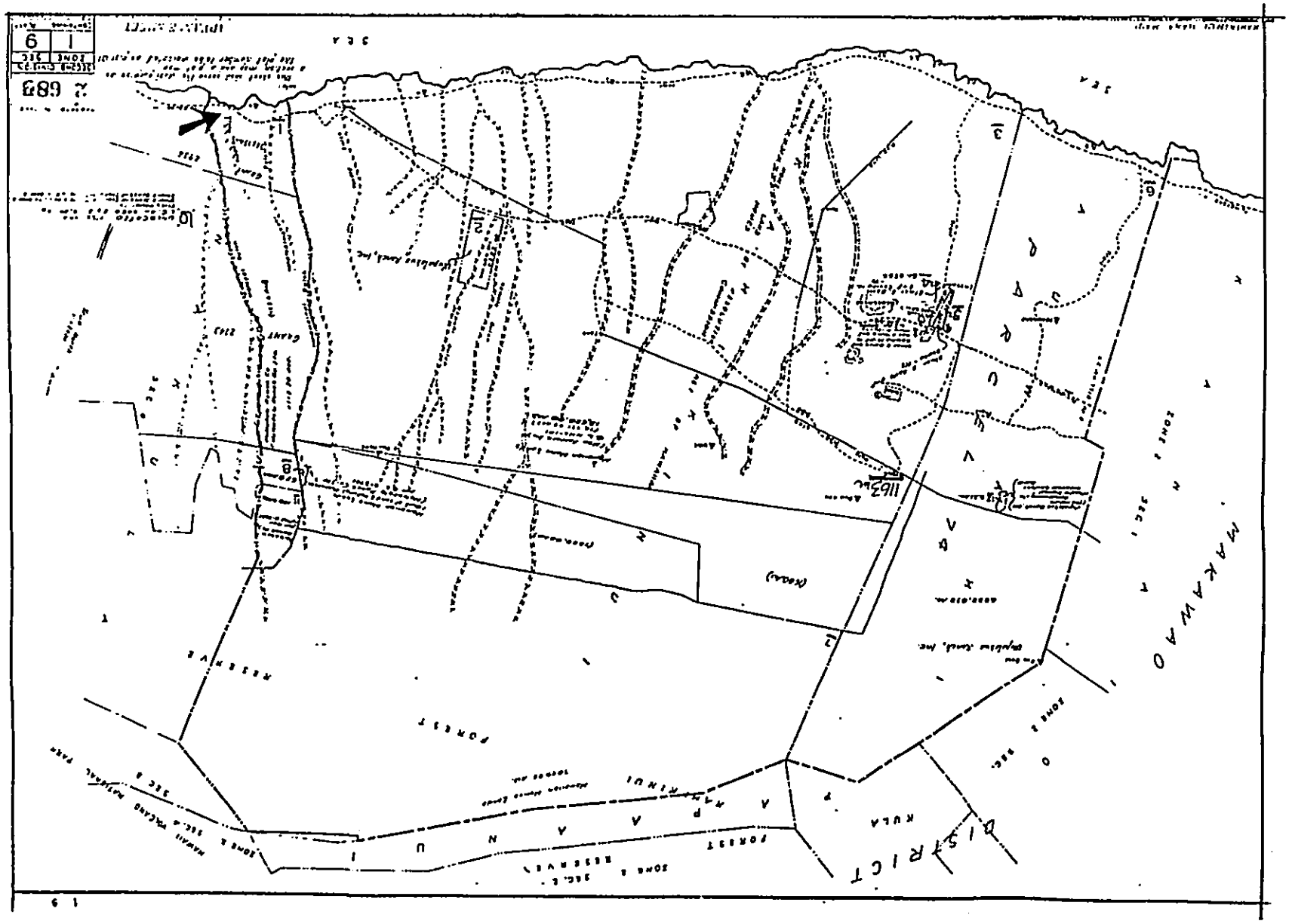


Figure 2. The Project Area, LCA, and Grants in Kahikinui as Shown on the Tax Map.

Figure 3. Overview of the Existing Timber Bridge at Poopoo Gulch, View SE.

DOCUMENT CAPTURED AS RECEIVED

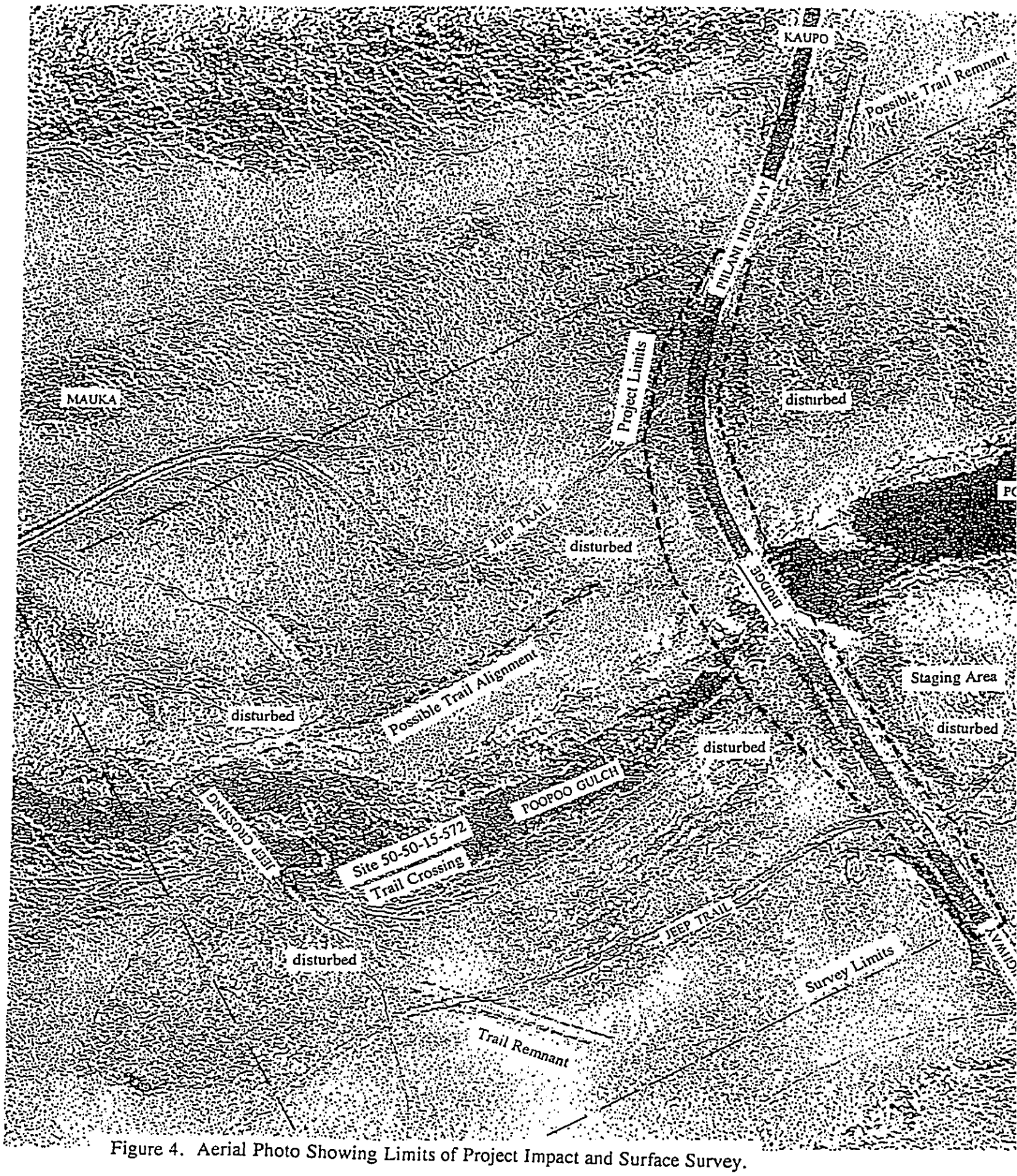
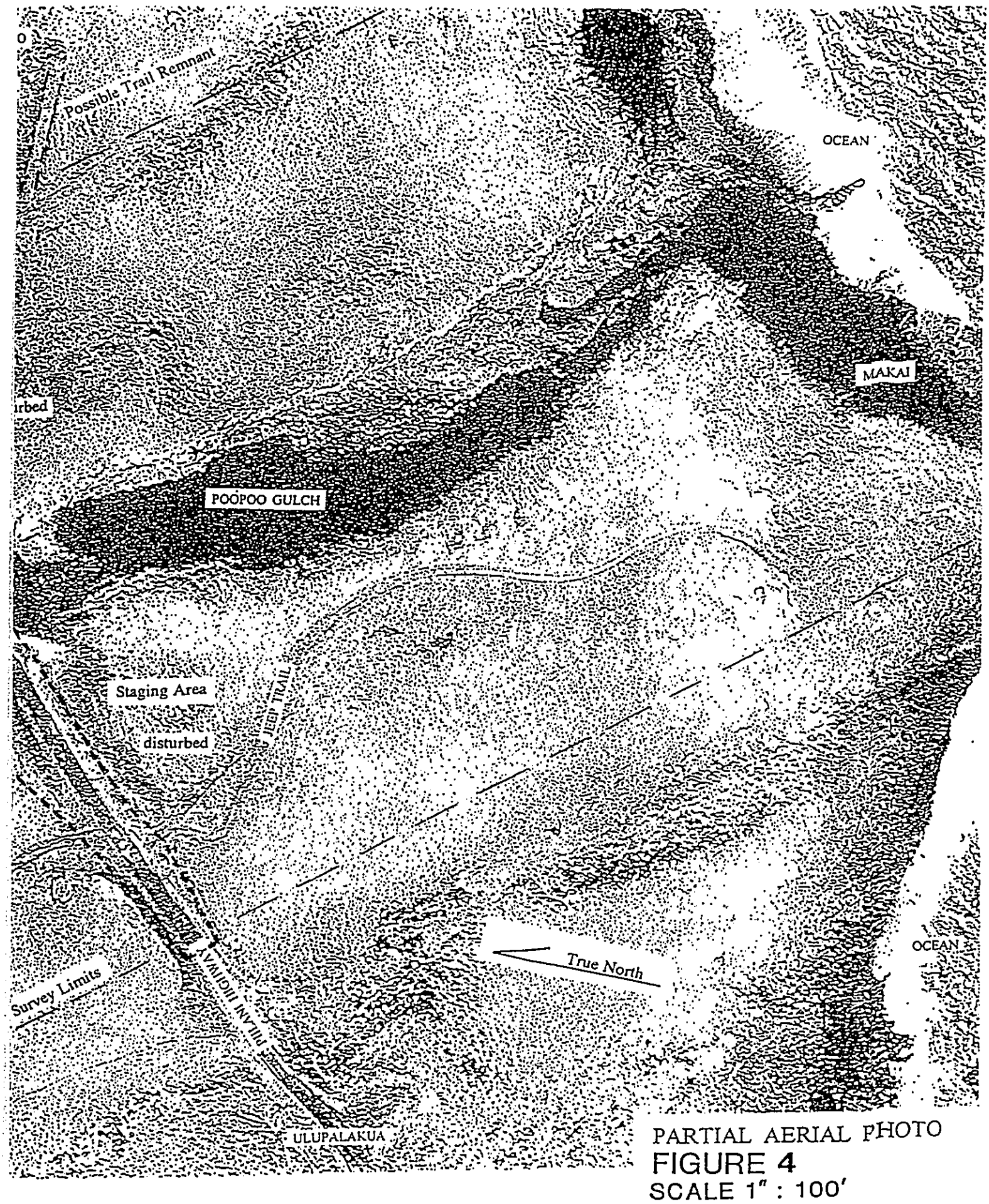


Figure 4. Aerial Photo Showing Limits of Project Impact and Surface Survey.

DOCUMENT CAPTURED AS RECEIVED



PARTIAL AERIAL PHOTO
FIGURE 4
SCALE 1" : 100'

HISTORIC LAND USE

The project area is located in the eastern extremity of the traditional district of Kahikinui. This district is important in Hawaiian mythology and is associated with the early peopling of the Hawaiian Islands from Kahiki (Tahiti). Repeated references to this region infer that it was occupied during prehistoric and early historic times. The inhabitants were probably fishermen and may also have practiced dry land agriculture in the inland areas. With the introduction of cattle and the ensuing deforestation and decrease in available rainfall and water, the populace moved out of this region into neighboring, more favorable, areas such as Hana and Makena. *The cattle ranching has continued into modern times.*

The Pi'ilani Trail a prehistoric transportation route was known to have traversed this portion of Maui. In the early 1800s, Ulumaheihei or Hoapili ("the close companion" of Kamehameha I), who was Governor of Maui from 1836 to 1840, improved the portion of the old trail between Keone'o'io and Kaupo. Segments of the Hoapili Trail are still visible along the present day Pi'ilani Highway and also in the vicinity of the current project.

During the Great Mahele, most of the area was retained by the government or awarded to family members of the Monarchy. Only one *kuleana* claim, by Makaole, was made. Three small parcels, consisting of 8 potato patches, other gardens, and a house lot, were awarded as LCA 5404 in 1848. Only one of these parcels is identified today and located to the west of Lualailua. The other two are labeled as unlocated on the current tax map.

Two grants occur near the project area. Grant 2743, a 2394 acre parcel, was awarded to William G. Needham and Thomas E. Cook in 1861. The project area is located within Grant 2986, a 792.75 acre parcel awarded to Elisha H. Allen in 1865.

The bridge spanning Poopoo Gulch was first constructed in 1948 and reconstructed in 1977 (SHPD/DLNR Letter 4-24-95, LOG NO:14273/DOC NO:9504SC04). Thus, some of the ground disturbances observed in the surrounding areas may be attributed to these events.

PREVIOUS ARCHAEOLOGY

Site 50-50-15-572, the aforementioned Hoapili Trail traverses the vicinity of the current project area. No other previously recorded sites occur within the current survey area. However, several regional archaeological studies have taken place in the vicinity over the past 65 years including Walker (1931), Chapman (1966), The Statewide Inventory (1973), and Hammatt and Folk (1994).

Walker surveyed the Kahikinui area as part of his island-wide survey of Maui in 1930. His study primarily documented prominent sites such as *heiau* and trails. Two Walker sites, 170 and 172 (50-50-15-170 and 172), both *heiau*, occur about 2 miles west and northwest of the project area. The Statewide Inventory conducted in 1973 revisited the sites recorded by Walker and documented their condition.

In 1966, Chapman and other archaeologists from Bishop Museum conducted a settlement survey in Kahikinui. This survey identified dense clusters of various site and feature types including enclosures, platforms, caves, burials, walls, and *heiau*. Thirteen site categories were identified. Chapman's study became the basis of the Kipapa Archaeological District that was established during the Statewide Inventory (Site 50-50-15-1170). This large complex is located approximately 4 miles west of the current project area.

Hammatt and Folk's recent survey covered an 8,300 acre area for the Department of Hawaiian Home Lands. This reconnaissance survey identified forty-five sites and site complexes, primarily in the *mauka* sections of Kahikinui to about the 4000 foot elevation. The eastern boundary of the survey area ended at Manawainui Gulch, roughly 1/2 mile west of the current project area. Although the eastern end of the survey area (Area B) approached the coast, all of the recorded sites occurred at or above the 600 foot elevation. Site density in this area was characterized as extremely low. The excellent surface visibility led the authors to believe that virtually all of the sites have been located. Interestingly, no sites were recorded in the gulch areas, even in relatively large gulches like Manawainui. However, whether this represents the traditional land use patterns of the area or simply a sampling error imposed by the use of helicopter for the survey remains unanswered.

Although, a number of other projects have been completed in the Kahikinui region, these tend to be limited in scope and isolated, much like the current Poopoo Bridge survey.

SETTLEMENT PATTERN

The data from the regional studies reviewed above infers a traditional settlement pattern for Kahikinui consisting of large complexes of high feature density that occurs around Kipapa and Lualailua *ahupua'a*. The components consist of habitation, agricultural, trails, and religious features. Also the frequency of *heiau* sites increases near the complex. The marginal areas, especially towards the east, including the subject project area are relatively devoid of sites and consist of infrequent isolated relatively small sites. The absence of sites in gulch areas are indicated, although the factors that caused this finding is still in question.

Historic period sites associated with ranching such as walls, roads, and corrals occur with a wider distribution than the traditional Hawaiian sites. However, these too appear to cluster in the central to western sections of Kahikinui.

SITE EXPECTABILITY

Based on the settlement pattern assessment presented in the preceding section, no significant remains are expected in the subject project area, especially in the immediate gulch areas. The probability for isolated sites and historic period features are higher in the plateau/ridge areas on either side of the gulch. These would include; trails, *ahu*, small temporary habitation sites, and cattle walls, pens, and ranch roads.

METHODS

The surface walk-through survey covered an area within 360 meters (c.1200 ft.) in a NW/SE direction and 180 meters (c. 600 ft.) in a NE/SW direction from the bridge. Due to the negative results of the surface survey, the limited impact area of the proposed construction, and the character of the area with exposed bedrock and outcrops over much of the ground surface; subsurface testing was considered to be unwarranted. Besides photography, no recording or mapping was done, due to the absence of any findings within the project area.

A literature and documents search was conducted for the specific locality as well as for Kahikinui to determine previous land use, ownership, and to aid in the predictability of site types that may exist within the subject project area. This research was conducted in Honolulu at the State Historic Preservation Division Library, the Hawaii State Archives, Department of Accounting and General Services Survey Office, the Hawaii State Bureau of Conveyances, and the Bishop Museum Library.

RESULTS OF SURVEY

No significant surface cultural remains were located during the current archaeological survey within the project area limits. The area to the north and *mauka* of the bridge has been extensively altered (Fig. 5). Several jeep roads are present and caterpillar scars may be observed on many of the rocks.

Roughly 500 ft. (152 m) north of the bridge, where a jeep road crosses the gulch, a stone retaining wall is located on the western bank of the gulch (Fig. 6). This feature is a segment the Hoapili Trail, Site 50-50-15-572. More recent modifications are evident from mortared sections of retaining wall at the gulch bottom (Fig. 7). Remnant trail segments

Figure 5. Overview of Disturbed Area Parallelling Gulch to East, View NW.

Figure 6. Upper: Overview of Hoapili Trail at Gulch Crossing, View W.
Lower: Closeup of Trail at Crossing, View SW.

Figure 7. Mortared Retaining Wall Section at Gulch Bottom at Crossing, View N.

are present in the plateau area west of the crossing and appear to traverse the landscape in a gradual southwesterly alignment towards the shoreline (Fig. 8). The area east of the crossing is extensively disturbed with the trail poorly defined. It becomes undiscernible beyond the first few meters and its original alignment cannot be ascertained. A bulldozed path roughly parallels the gulch towards the Highway (see Fig. 4). Within the project limits, the area where the Hoapili Trail may have traversed has been extensively disturbed with no observable evidence of the route.

To the south or *makai* of the bridge, no remains were observed. Bulldozer berms are present along the sides of the highway. In an area roughly 300 ft. (91 m) to the east of the existing bridge is another possible remnant segment of the Hoapili Trail (Fig. 8).

Along the western bank of the gulch, roughly halfway to the crossing, 250 ft. (76m) *mauka* of the bridge is an overhang shelter located 3 to 4 meters above the gulch bottom. This natural feature is unmodified, but shell midden is scattered on the interior floor and the area fronting the shelter. Due to its location well beyond the project limits, no further work was undertaken.

DISCUSSION AND RECOMMENDATIONS

The current phase of work has resulted in no significant archaeological findings within the project area. Site 50-50-15-572, the Hoapili Trail, is manifested by several remnant segments in the vicinity of the project area. These remains are all well beyond the impact area of the proposed bridge replacement activities. Neither the bridge construction or preparation of the staging area, southwest of the bridge, will impact any cultural resources. The potential for encountering any significant subsurface remains is also minimal.

No further work is recommended prior to commencement of bridge and staging area construction. Archaeological monitoring during construction also appears to be unwarranted. However, following standard procedure, if any unanticipated discoveries are encountered during the course of construction, the Maui Office of the State Historic Preservation Division should be contacted at 243-5169, and activities in the immediate area of the find should be temporarily halted until an archaeological inspection can be made.

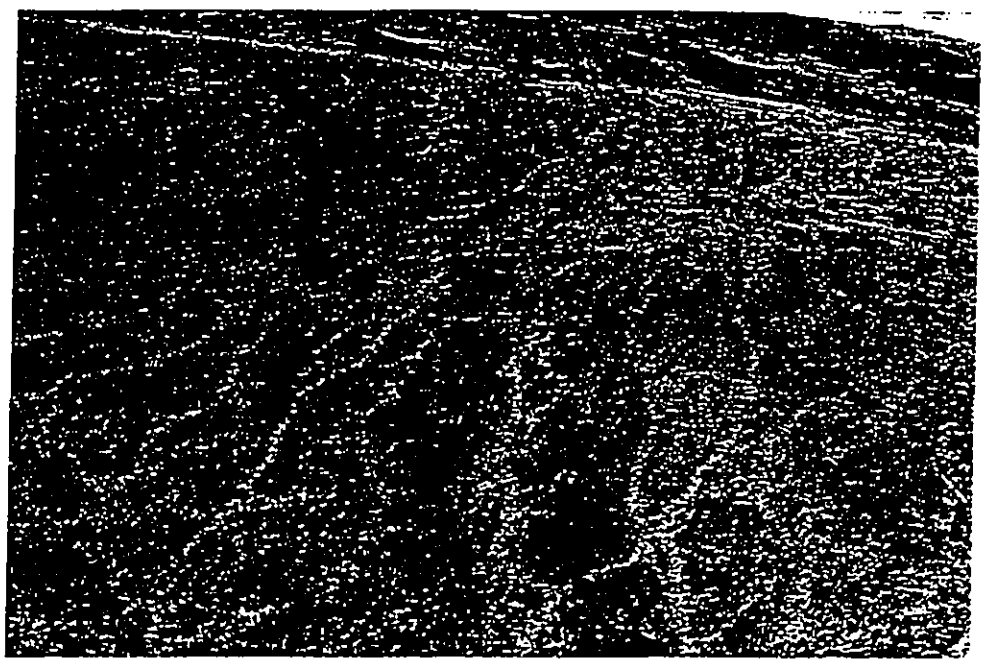


Figure 8. Upper: Trail Remnant in Plateau Area West of Crossing, View E.
Lower: Possible Trail Remnant in Area East of Bridge, View E.

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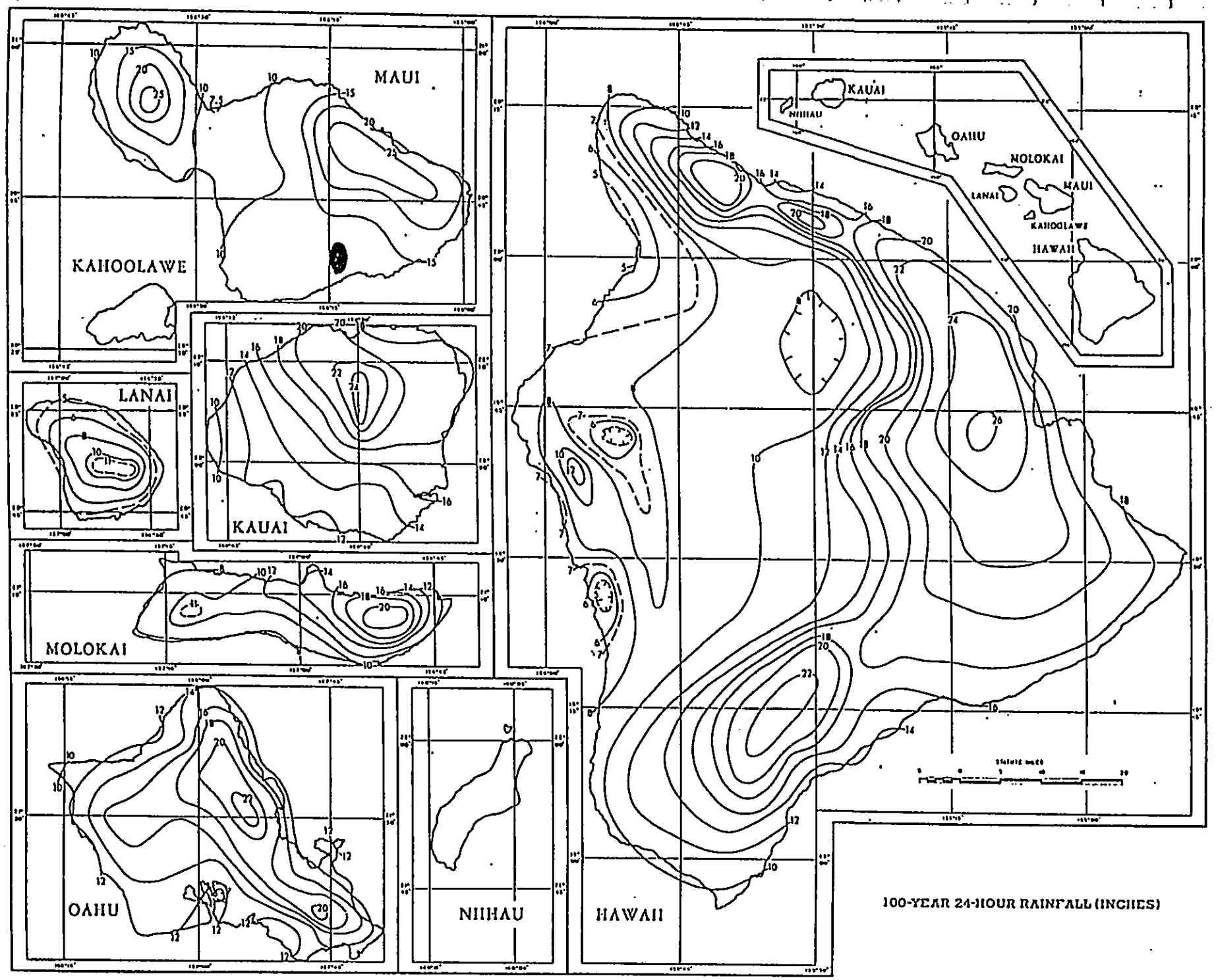
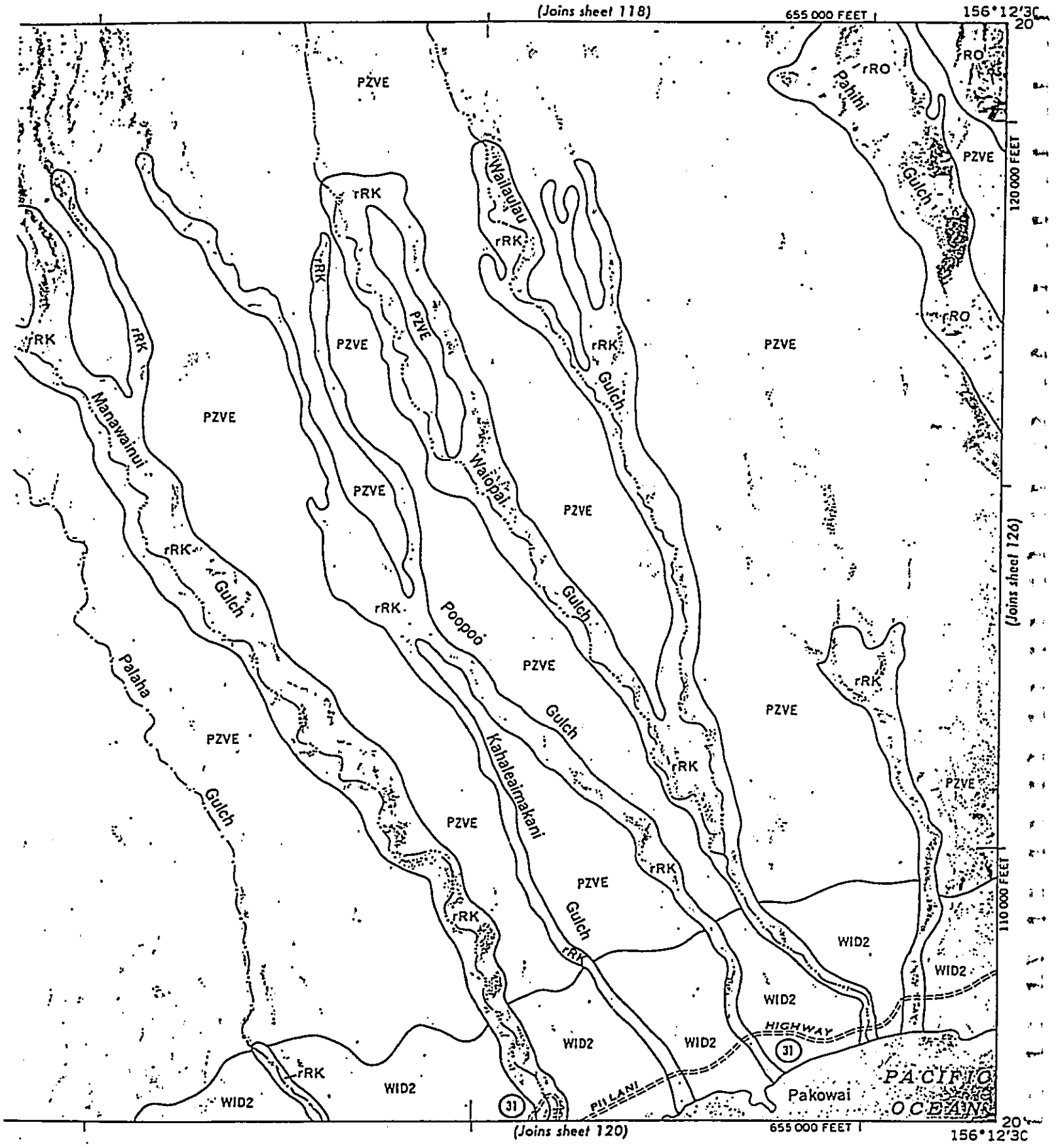
HYDROLOGICAL AND HYDRAULIC

CALCULATIONS

EXHIBIT E



100-YEAR 24-HOUR RAINFALL (INCHES)


(Joins sheet 118)
655 000 FEET
156°12'30"
20
120 000 FEET
(Joins sheet 126)
PZVE
rRK
rRO
WID2
Manawainui Gulch
Palaha Gulch
Poopoo Gulch
Kahaleaimakani Gulch
Waiopai Gulch
Naiiaulau Gulch
Pahihi Gulch
HIGHWAY
31
PILLANI
Pakowai
PACIFIC OCEAN
110 000 FEET
(Joins sheet 120)

RUNOFF CALCULATIONS:

Area Calculations (from USGS Map of Maui):

Map Scale: 1" = 2000'
Therefore: 1 in^2 = 4000000 ft^2 = 91.83 acres

Planimeter Area = 6.5 in^2
Catchment Area = 6.5 (91.83) = 596.6 acres

Total Catchment Area for Po'o Po'o Gulch = 597 acres

Runoff Hydrograph Calculations:

Use Storm Recurrence Intervals of 100 & 500 yrs for 24 hrs.

Rainfall Depth = 14.0" (see Fig. 1)

Soil Types: (See Fig. 2)	Puu Pa (PZVE)	-- Hyd. Group A
	Rock Land (rRK)	-- Hyd. Group C
	Waiakoa (WID2)	-- Hyd. Group C

Area Percentages for Soil:
Puu Pa - 70%
Rock Land - 25%
Waiakoa - 5%

Ground Slopes:
Average Slope of Stream = h / L
where: h = 6200'
L = 22800'
Avg. Slope of Stream = 0.272 = 27.2%

Average Slope from edge of area to stream = h / L
where: h = 100'
L = 300'

Avg. Slope = 0.333 = 33.3%

Curve Number, Time of Concentration, and Watershed Hydrograph calculations performed using the TR-55 program developed by the Soil Conservation Service.

See following pages for program output.

Peak Runoff Q = 1261 cfs (100 yr., 24-hr. Storm)

For 500 yr. storm, Q = 1.7 * Q(100 yr.)
Q = 1.7 * 1261
Q = 2143 cfs (500 yr., 24-hr. Storm)

Quick TR-55 Ver.5.46 S/N:
Executed: 15:20:25 07-25-1995

PO'O PO'O BRIDGE
WEIGHTED CURVE NUMBER CALCULATIONS
NOTE: USE FARMSTEAD AS CONSERVATIVE
ESTIMATE FOR ROCK LAND & WAIAKOA

RUNOFF CURVE NUMBER DATA

Composite Area: POO POO GULCH

SURFACE DESCRIPTION	AREA (acres)	CN	
PUU PA SOIL (PZVE) GOOD COND.	418.00	30	
ROCK LAND (rRK) USE FARMSTEAD	149.00	82	
WAIAKOA (WID2) USE FARMSTEAD	30.00	82	
COMPOSITE AREA --->	597.00	45.6	(46)

Quick TR-55 Ver.5.46 S/N:
Executed: 15:20:54 07-25-1995 C:\PP\POND\TC.TCT

PO'O PO'O BRIDGE Tc CALCULATIONS
100-YR, 24-HR STORM
-SHEET FLOW FOR EDGE OF AREA TO GULCH FLOW
-SHALLOW CONCETRATED FLOW FOR GULCH FLOW TO BRIDGE

Tc COMPUTATIONS FOR: POO POO GULCH

SHEET FLOW (Applicable to Tc only)

Segment ID		A	
Surface description		GRASS/ROCK	
Manning's roughness coeff., n		0.1300	
Flow length, L (total < or = 300)	ft	300.0	
Two-yr 24-hr rainfall, P2	in	5.000	
Land slope, s	ft/ft	0.3330	
$T = \frac{.007 * (n*L)^{0.8}}{P2^{0.5} * s^{0.4}}$	hrs	0.09	= 0.09

SHALLOW CONCENTRATED FLOW

Segment ID		B	
Surface (paved or unpaved)?		Unpaved	
Flow length, L	ft	22800.0	
Watercourse slope, s	ft/ft	0.2720	
$Avg.V = Csf * (s)^{0.5}$	ft/s	8.4147	
where: Unpaved Csf = 16.1345			
Paved Csf = 20.3282			
T = L / (3600*V)	hrs	0.75	= 0.75

CHANNEL FLOW

Segment ID			
Cross Sectional Flow Area, a	sq.ft	0.00	
Wetted perimeter, Pw	ft	0.00	
Hydraulic radius, r = a/Pw	ft	0.000	
Channel slope, s	ft/ft	0.0000	
Manning's roughness coeff., n		0.0000	
$V = \frac{1.49 * r^{2/3} * s^{1/2}}{n}$	ft/s	0.0000	
Flow length, L	ft	0	
T = L / (3600*V)	hrs	0.00	= 0.00

TOTAL TIME (hrs) 0.84

TR-55 TABULAR HYDROGRAPH METHOD
Type I Distribution
(24 hr. Duration Storm)

Executed: 07-25-1995 15:25:22
Watershed file: --> C:\PP\POND\PPB .WSD
Hydrograph file: --> C:\PP\POND\PPB .HYD

PO'O PO'O BRIDGE HYDROGRAPH FOR
100 YR., 24 HR. STORM
TOTAL AREA = 597 ACRES

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
POO POO GULCH	597.00	46.0	0.75	0.00	14.00	5.80	.17 .10

* Travel time from subarea outfall to composite watershed outfall point.
Total area = 597.00 acres or 0.9328 sq.mi
Peak discharge = 1261 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
POO POO GULCH	0.84	0.00	0.75	0.00	No	--

* Travel time from subarea outfall to composite watershed outfall point.

TR-55 TABULAR HYDROGRAPH METHOD
Type I Distribution
(24 hr. Duration Storm)

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Hydrograph file: --> C:\PP\POND\PPB .HYD

PO'O PO'O BRIDGE HYDROGRAPH FOR
100 YR., 24 HR. STORM
TOTAL AREA = 597 ACRES

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
POO POO GULCH	1261	10.7
Composite Watershed	1261	10.7

TR-55 TABULAR HYDROGRAPH METHOD
Type I Distribution
(24 hr. Duration Storm)

Executed: 07-25-1995 15:25:22
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Hydrograph file: --> C:\PP\POND\PPB .HYD

PO'O PO'O BRIDGE HYDROGRAPH FOR
100 YR., 24 HR. STORM
TOTAL AREA = 597 ACRES

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
9.0	87	12.8	262
9.1	98	12.9	256
9.2	108	13.0	249
9.3	119	13.1	245
9.4	133	13.2	240
9.5	148	13.3	236
9.6	162	13.4	231
9.7	182	13.5	227
9.8	202	13.6	223
9.9	222	13.7	219
10.0	254	13.8	214
10.1	319	13.9	210
10.2	444	14.0	206
10.3	644	14.1	201
10.4	904	14.2	195
10.5	1131	14.3	190
10.6	1239	14.4	184
10.7	1261	14.5	179
10.8	1147	14.6	177
10.9	1009	14.7	175
11.0	871	14.8	172
11.1	765	14.9	170
11.2	660	15.0	168
11.3	592	15.1	166
11.4	525	15.2	164
11.5	479	15.3	161
11.6	433	15.4	159
11.7	403	15.5	157
11.8	373	15.6	156
11.9	354	15.7	155
12.0	335	15.8	153
12.1	324	15.9	152
12.2	314	16.0	151
12.3	303	16.1	150
12.4	294	16.2	150
12.5	285	16.3	150
12.6	276	16.4	149

TR-55 TABULAR HYDROGRAPH METHOD
Type I Distribution
(24 hr. Duration Storm)

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Hydrograph file: --> C:\PP\POND\PPB .HYD

PO'O PO'O BRIDGE HYDROGRAPH FOR
100 YR., 24 HR. STORM
TOTAL AREA = 597 ACRES

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
16.6	148	20.4	115
16.7	148	20.5	114
16.8	147	20.6	113
16.9	146	20.7	111
17.0	146	20.8	110
17.1	145	20.9	109
17.2	144	21.0	108
17.3	143	21.1	107
17.4	142	21.2	106
17.5	140	21.3	105
17.6	139	21.4	104
17.7	138	21.5	103
17.8	137	21.6	102
17.9	136	21.7	101
18.0	135	21.8	100
18.1	134	21.9	99
18.2	133	22.0	98
18.3	133	22.1	96
18.4	132	22.2	95
18.5	131	22.3	94
18.6	130	22.4	93
18.7	129	22.5	92
18.8	129	22.6	91
18.9	128	22.7	90
19.0	127	22.8	89
19.1	126	22.9	88
19.2	125	23.0	87
19.3	125	23.1	86
19.4	124	23.2	85
19.5	123	23.3	84
19.6	122	23.4	82
19.7	121	23.5	81
19.8	121	23.6	80
19.9	120	23.7	79
20.0	119	23.8	78
20.1	118	23.9	77
20.2	117		
20.3	116		

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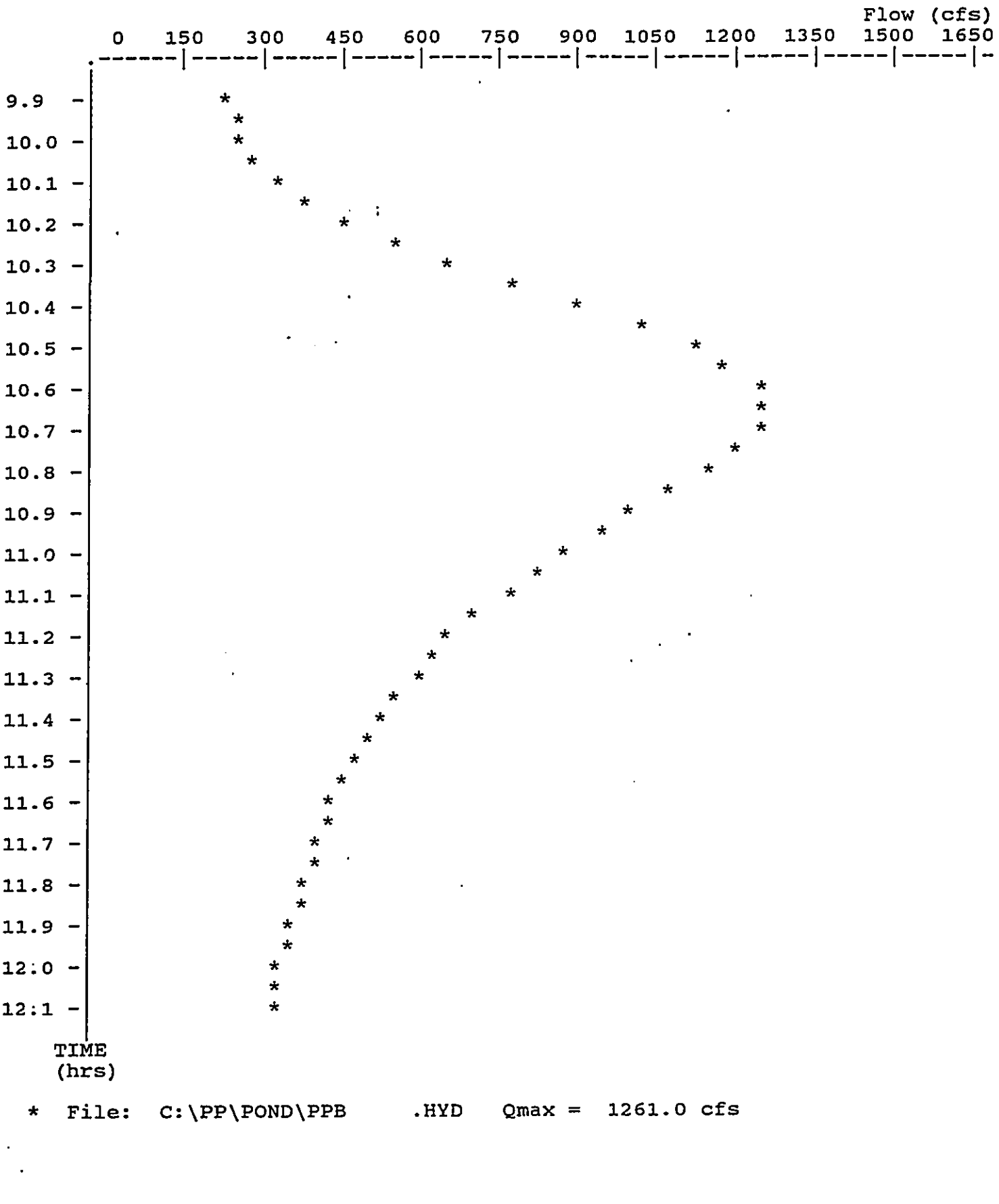


* File: C:\PP\POND\PPB .HYD Qmax = 1261.0 cfs

AVERAGE DAILY TRAFFIC CALCULATIONS
AND TRAFFIC COUNT

EXHIBIT F

ADT CALCULATIONS

TRAFFIC AT
PIILANI HWY 6.4 mi EAST OF THOMPSON RD & KULA HWY
(Oct 28-29, 1985)

$ADT_{1985} = 253$

Normal traffic growth 19%/10yr. or 1.9%/yr.

$ADT_{1987} = 262$

Normal traffic growth = 1.9%/yr.

generated traffic = 0%

development traffic = 10%/20yr.

20 yr. traffic projection factor = 1.48*

$ADT_{2007} = 262 (1.48) = 388$

$T \cong 5\%$ (estimated)

$D = \frac{50}{65} \times 100 = 76.9\%$

V should be anywhere from 25-45 MPH.

Note:
This computation was provided by the County of Maui Dept. of Public Works.

TRAFFIC COUNT

STATION NO.:C-20-B STATION DESCRIPTION: PIILANI HWY 6.4 MILES EAST OF KULA HWY AND THOMPSON RD. JCT (KANAIO)
POLLING DATE OCTOBER 28-29, 1985
CHAN A: E BD TO KIPAHULU - MR #5633
CHAN B: W BD TO ULUPALAKUA RANCH - MR #4963

TIME-AM	CH-A	CH-B	TOTAL
12:00-12:15	0	0	0
12:15-12:30	0	0	0
12:30-12:45	0	0	0
12:45- 1:00	0	0	0
1:00- 1:15	0	0	0
1:15- 1:30	1	0	1
1:30- 1:45	0	0	0
1:45- 2:00	0	0	0
2:00- 2:15	0	0	0
2:15- 2:30	0	0	0
2:30- 2:45	0	0	0
2:45- 3:00	0	0	0
3:00- 3:15	0	0	0
3:15- 3:30	0	0	0
3:30- 3:45	0	0	0
3:45- 4:00	1	1	2
4:00- 4:15	0	0	0
4:15- 4:30	0	0	0
4:30- 4:45	0	0	0
4:45- 5:00	0	0	0
5:00- 5:15	1	0	1
5:15- 5:30	0	0	0
5:30- 5:45	0	0	0
5:45- 6:00	0	0	0

TIME-AM	CH-A	CH-B	TOTAL
6:00- 6:15	0	1	1
6:15- 6:30	0	1	1
6:30- 6:45	0	1	1
6:45- 7:00	0	1	1
7:00- 7:15	0	1	1
7:15- 7:30	0	0	0
7:30- 7:45	3	1	4
7:45- 8:00	3	2	5
8:00- 8:15	3	1	4
8:15- 8:30	0	0	0
8:30- 8:45	0	1	1
8:45- 9:00	1	0	1
9:00- 9:15	0	2	2
9:15- 9:30	0	0	0
9:30- 9:45	1	0	1
9:45-10:00	0	0	0
*10:00-10:15	2	0	2
*10:15-10:30	1	3	4
*10:30-10:45	4	3	7
*10:45-11:00	1	1	2
11:00-11:15	0	2	2
11:15-11:30	1	1	2
11:30-11:45	0	1	1
11:45-12:00	3	5	8

	CH-A	CH-B	TOTAL
AM-TOTAL	26.	29.	55.
6:00-12:00 TOT	23.	28.	51.
AM-PEAK HR TIME	10:00-11:00		
*PEAK-HR TOTAL	8.	7.	15.
AM D-% (PEAK-HR)	53.3	46.7	100.0
AM D-% (MN-12N)	47.3	52.7	100.0
AM K FACTOR			5.9
DIRECTIONAL TOTALS	CHAN-A =	82.	CHAN-B = 171.
	CH-A DX =	32.4	CH-B DX = 67.6

TIME-PM	CH-A	CH-B	TOTAL
12:00-12:15	1	1	2
12:15-12:30	3	5	8
12:30-12:45	1	2	3
12:45- 1:00	1	0	1
1:00- 1:15	2	1	3
1:15- 1:30	2	1	3
1:30- 1:45	2	4	6
1:45- 2:00	4	2	6
S 2:00- 2:15	5	1	6
2:15- 2:30	1	5	6
2:30- 2:45	1	8	9
2:45- 3:00	1	2	3
* 3:00- 3:15	6	10	16
* 3:15- 3:30	1	8	9
* 3:30- 3:45	3	20	23
* 3:45- 4:00	5	12	17
4:00- 4:15	2	10	12
4:15- 4:30	4	4	8
4:30- 4:45	0	4	4
4:45- 5:00	0	3	3
5:00- 5:15	2	3	5
5:15- 5:30	2	8	10
5:30- 5:45	1	8	9
5:45- 6:00	2	4	6

TIME-PM	CH-A	CH-B	TOTAL
6:00- 6:15	0	5	5
6:15- 6:30	2	3	5
6:30- 6:45	0	5	5
6:45- 7:00	1	1	2
7:00- 7:15	1	1	2
7:15- 7:30	0	0	0
7:30- 7:45	0	0	0
7:45- 8:00	0	0	0
8:00- 8:15	0	0	0
8:15- 8:30	0	0	0
8:30- 8:45	0	0	0
8:45- 9:00	0	0	0
9:00- 9:15	0	0	0
9:15- 9:30	0	0	0
9:30- 9:45	0	0	0
9:45-10:00	0	0	0
10:00-10:15	0	1	1
10:15-10:30	0	0	0
10:30-10:45	0	0	0
10:45-11:00	0	0	0
11:00-11:15	0	0	0
11:15-11:30	0	0	0
11:30-11:45	0	0	0
11:45-12:00	0	0	0

	CH-A	CH-B	TOTAL
PM-TOTAL	56.	142.	198.
12:00-6:00 TOT	52.	126.	178.
PM-PEAK HR TIME	3:00- 4:00		
*PEAK-HR TOTAL	15.	50.	65.
PM D-% (PEAK-HR)	23.1	76.9	100.0
PM D-% (12N-MN)	28.3	71.7	100.0
PM K FACTOR			25.7
24-HOUR TOTAL =	253.		

CONSULTATION LETTERS

APPENDIX A

CONSULTED AGENCIES AND PARTIES

The following list of agencies and organizations were consulted in the preparation of the Final Environmental Assessment. Those parties who responded are noted with an asterisk (*). A double asterisk (**) indicates parties with substantive comments. Letters received, along with responses, are shown on the following pages.

Federal

- Department of Agriculture, Soils Conservation Service
** - Army Corps of Engineers
* - Department of the Interior, Fish and Wildlife Services
- Department of Transportation, Federal Highway Administration

State of Hawaii

** - Department of Business, Economic Development and Tourism
** - Land Use Commission - DBEDT
- Department of Hawaiian Home Lands
* - Department Of Land And Natural Resources
* - Commission On Water Resource Management - DLNR
** - State Historical Preservation Division - DLNR
** - Environmental Management Division - DOH
** - Department of Transportation
- Office of State Planning
- Office of Hawaiian Affairs
- Office of Environmental Quality Control
** - University of Hawaii at Manoa - Environmental Center

County Of Maui

* - Planning Department
* - Department of Parks and Recreation
* - Department of Public Works and Waste Management

Others

- Sierra Club - Maui Chapter
- The Nature Conservancy - Maui
- Kipahulu Community Association
- Hana Community Association
- Hana Advisory Commission
- Hana Public Library

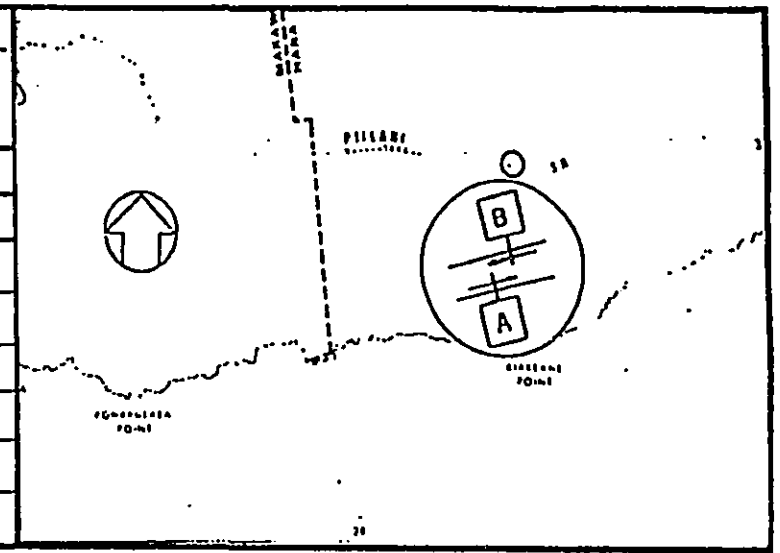
24-HOUR TRAFFIC COUNT-STATION SUMMARY

HAWAII STATE DOT, HIGHWAYS DIVISION — TRAFFIC BRANCH

Station No: C-20-B Count Type: ____ Group: ____ Old No: ____

Location: Piilani Hwy 6.4 Miles East of Kula Hwy and Thompson Rd Jct (at Kanaio)

STATION CHARACTERISTICS	ROAD SECTION				
	D-1		D-2		
Number of Lanes					
Lane Width (Ft)					
Lateral Clearance (Ft) Left/Right					
Detection Method (Loops/Hose)					
Special Conditions:					
Hwy Divided: No__Yes__Type:					



Col. I.D.	24-HOUR TRAFFIC VOLUMES															
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	
Traffic I.D	D-1	D-2	TOTAL													
DATE																
Nov 1976	-	-	165													
Mar 1979	-	-	389													
Oct 1981	59	170	229													
*Sep 19-20, 1983	117	62	179													
Oct 28-29, 1985	82	171	253													

Form TI 85-3 MID BLOCK * L.S. Meters used.

STATION NO: C-20-B

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

REPLY TO ATTENTION OF

MAY 04 1995

Regulatory Branch

Mr. Loren G.S. Lau, AIA
Project Manager
Sato & Associates Consulting Engineers
2046 South King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

This letter is in response to a proposal by the County of Maui concerning the replacement of the existing one lane Poopoo bridge with a new two lane concrete bridge located on the Piilani Highway, between Ulupalakua and Kaupo, Maui, Hawaii.

Based on the information submitted, I have determined that this project can be authorized by nationwide permit (NWP) 13, for Bank Stabilization as described at 33 CFR, Part 330, Appendix A, Paragraph B.13. No further Department of the Army processing is necessary. However, this authorization becomes valid only after you have obtained the required Section 401 Water Quality Certification or waiver thereof from the State Department of Health and a Coastal Zone Management Consistency determination from the Office of State Planning.

Until the certification or waivers are received, I am issuing a provisional nationwide authorization for the proposed work. If the State issues the certifications or waivers, this authorization will take effect from the later issuance date and will remain valid for two years, unless the NWP is modified, suspended, or revoked. If, within this two year period, the NWP authorization is reissued without modification or if the activity complies with any subsequent modification of the NWP authorization, this verification will continue to be valid for the remainder of the two year period.

Excerpts from the regulations which list the conditions and management practices of this authorization are enclosed for your information and compliance. In addition to these conditions and management practices, you are advised that:

a. Nationwide permits do not obviate the need to obtain other Federal, state or local authorizations required by law.

b. Nationwide permits do not grant any property rights or exclusive privileges.

c. Nationwide permits do not authorize any injury to the property or rights of others.

d. Nationwide permits do not authorize interference with any existing or proposed Federal project.

Furthermore, the following special condition has been included:

Upon completion of the project, all excess material not used during construction of the new bridge or removal of the existing bridge will be disposed of at a Corps approved upland site.

File number NW95-040 is assigned to this authorization. Please refer to this number in any future inquires or correspondence. Call Terrell Kelley or Jim Herrington, at 438-9258, ext. 13 or 14, if you have any questions.

Sincerely,

Jim Herrington
Project Manager

Copies Furnished (without attachments):

Clean Water Branch, Environmental Management Division, State Department of Health, Honolulu, Hawaii.

Office of State Planning, CZM Program Office, Honolulu, Hawaii.

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

REPLY TO ATTENTION OF

May 3, 1995

Planning Division

Ms. Loren G.S. Lau, Project Manager
Sato and Associates
2046 South King Street
Honolulu, Hawaii 96826

Dear Ms. Lau:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Poopoo Bridge Replacement Project, Maui. The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. A DA permit may be required for work in waters of the U.S. including wetlands. Further information and a possible field site visit will be required. Please contact Mr. Jim Herrington of our Regulatory Branch for further information at 438-9258.

b. The flood hazard information provided on page 4 of the environmental assessment is correct.

Sincerely,

Ray H. Jyo, P.E.
Director of Engineering

FILE/PROJ NO. 19412

RH
LL

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

REPLY TO ATTENTION OF
Regulatory Branch

28 June, 1995

Mr. Loren G.S. Lau
Sato & Associates
2046 King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

This letter is in response to your request for a no permit confirmation letter on the Poopoo Bridge Replacement Project dated June 23, 1995.

The Poopoo Bridge Project involves replacing the existing bridge which spans the Poopoo Gulch as part of the Piilani Highway, at TMK 1-9-01, on Maui. As your plans indicate, the replacement bridge is to be constructed immediately adjacent to the existing bridge. Based the information you provided, no discharge of fill or excavation in waters of the United States shall occur, thus no Department of the Army (DA) permit is required. As per your conversation with Ms. Terrell Kelley of this office, we will expect your request for a Corps permit for the stream bank protection work, to be done at this same site, at a later date.

File number NP 95-086 is assigned to this project. Please contact Terrell Kelley or myself at 438-9258, extension 13 or 14, if you have any questions.

Sincerely,

Walter T. Michel
Captain, U.S. Army
Project Manager

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Ecoregion
300 Ala Moana Blvd, Room 6307
P.O. Box 50167
Honolulu, Hawaii 96850

In Reply Refer To: DLB

FEB 15 1995

Mr. Loren G. S. Lau, AIA
Project Manager
Sato & Associates
2048 S. King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

The U.S. Fish and Wildlife Service (Service) has received your February 1, 1995, letter requesting information on the presence of federally listed, proposed, and candidate endangered and threatened species within the area of the Poopoo Bridge on the island of Maui. It is our understanding that your company has been contracted by the County of Maui, Department of Public Works and Waste Management ,to conduct environmental investigations for purposes of obtaining a U.S. Army Corps of Engineers Bank Stabilization Permit.

The Service has reviewed the maps provided with your request and pertinent information in our files, including maps prepared by the Hawaii Heritage Program of the Nature Conservancy. To the best of our knowledge, the only federal trust species that may occur within the project area is the Pacific megalagrion damselfly (*Megalagrion pacificum*), which is a category 1 candidate species. This species of damselfly, which breeds in overflow pools along the main channels of streams, is known to occur just northeast of the project location. We recommend you survey the project area for the presence of this damselfly.

The Service appreciates your concern for endangered species. If you have any questions, please contact our Branch Chief for Interagency Cooperation, Ms. Margo Stahl, or Fish and Wildlife Biologist Diane Bowen at 808/541-2749.

Sincerely,

for Brooks Harper
Field Supervisor
Ecological Services

RECEIVED
FEB 21 1995
SATO & ASSOC., INC.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Blvd, Room 6307
P.O. Box 50167
Honolulu, HI 96850

MAR 02 1995

In Reply Refer To: MSS

Mr. Loren G.S. Lau, AIA
Project Manager
Sato & Associates
2046 S. King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

This letter serves to follow-up the U.S. Fish and Wildlife Service's February 15, 1995 letter and subsequent phone conversations regarding the presence of federally listed, proposed, and candidate endangered and threatened species within the area of the Poopoo Bridge on the island of Maui. The Service was able to determine from a site visit to the proposed project that the habitat previously available to the Pacific megalagrion damselfly (*Megalagrion pacificum*) is no longer present in the project vicinity. Therefore, our recommendation for a survey is no longer necessary.

Thank you for your interest in protecting trust resources. If you have any further questions, please feel free to contact me at 808\541-2749.

Sincerely,

Margo Stahl
Branch Chief
Interagency Cooperation

RECEIVED
MAR - 6 1995
SATO & ASSOC., INC.

CORPS PROJECT NO. MA12-00

RE
LL

United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE
500 ALA MOANA BLVD, SUITE 3-580
HONLULU, HI 96813
tel:(808) 541-3441 fax:(808) 541-3470

IN REPLY REFER TO: CAW

Mr. Loren G.S. Lau
Project Manager
Sato & Associates
2046 South King Street,
Honolulu, Hawaii 96826

JUN 07 1995

Re: Draft Environmental Assessment for the Poopoo Bridge Replacement Project, Maui, Hawaii

Dear Mr. Lau:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment for the Poopoo Bridge Replacement Project, Maui, Hawaii. The applicant is the County of Maui Department of Public Works. The proposed project involves construction of a new two-lane, concrete bridge to replace the existing one-lane, wooden bridge.

The Service does not anticipate adverse impacts to fish and wildlife resources to result from the proposed project. We appreciate the opportunity to comment. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Christine Willis at 808/541-3441.

Sincerely,

Brooks Harper

Brooks Harper
Field Supervisor
Ecological Services

cc: DLNR, Hawaii
DAR, Hawaii
CZMP, Hawaii
CWB, Hawaii

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIKE
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD/CWB

May 11, 1995

C0511EC

Mr. Loren G.S. Lau, AIA
Project Manager
Sato & Associates Consulting Engineers
2046 South King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

Subject: Section 401 Water Quality Certification (WQC)
Requirements for County of Maui/Replacement of the
Existing One-Lane Poopoo Bridge with a New Two-Lane
Concrete Bridge located on Piilani Highway between
Ulupalakua and Kaupo, Maui
Army File No. NW 95-040

Reference is made to the May 4, 1995 letter from the U.S. Army Corps of Engineers (COE), Honolulu District, to you, regarding the Department of the Army (DA) permit determination for the subject project.

As a pre-requisite to the DA permit, a Section 401 WQC is required. Enclosed is a copy of the Section 401 WQC Guidelines and Section 401 WQC Application Form. The application form may *be used as the application, if desired. Please read the* guidelines before completing the application form.

In accordance with the Hawaii Administrative Rules, Department of Health, Title 11, Chapter 54, Water Quality Standards, an application filing fee in the amount of $100.00 is required. The filing fee in the form of a certified check or money order shall be made payable to the State of Hawaii.

The application form and filing fee should be submitted to either of the addresses listed under the "Contact Addresses" of the Section 401 WQC Guidelines.

Should you have any questions, please contact Mr. Edward Chen, Engineering Section of the Clean Water Branch, at 586-4309.

Sincerely,

DENIS R. LAU, P.E., CHIEF
Clean Water Branch

EC/sl

Enclosures: Section 401 WQC Guidelines
Section 401 WQC Application Form

c: U.S. Army COE, Operations Branch (w/o encls.)
State Dept. of Land and Natural Resources, CWRM (w/o encls.)
DHO, Maui (w/o encls.)

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIKE
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD

May 1, 1995

P05102KA

Mr. Loren G.S. Lau, AIA
Project Manager
Sato & Associates, Inc.
2046 S. King Street
Honolulu, HI 96826

RECEIVED
MAY - 3 1995
SATO & ASSOC., INC.

Dear Mr. Lau:

Subject: Draft Environmental Assessment for the Poopoo Bridge Replacement Project Maui, Hawaii

The Department of Health acknowledges the receipt of the draft environmental assessment for the subject project and has the following comments:

1. The applicant should contact the Army Corps of Engineers (COE) to identify whether a Federal permit (including a Department of Army (DA) permit) is required for this project. A Section 401 Water Quality Certification (WQC) is required for "Any applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters...," pursuant to Section 401(a)(1) of the Federal Water Pollution Act (commonly known as the "Clean Water Act (CWA)").

2. If the project involves the following activities with discharges into State waters, an NPDES permit is required for each activity:

   a. Discharge of storm water runoff associated with construction activities, including clearing, grading, and excavation that result in the disturbance of equal to or greater than five (5) acres of total land area;

   b. Construction dewatering effluent;

   c. Non-contact cooling water;

   d. Hydrotesting water; and

   e. Treated contaminated groundwater from underground storage tank remedial activity.

Should you have any questions regarding this matter, please contact Ms. Kris Aruga, Engineering Section of the Clean Water Branch, at 586-4309.

Sincerely,

DENIS R. LAU, P.E., CHIEF
Clean Water Branch

KA:sl

Sato & Associates
Consulting Engineers
2045 S. King Street, Honolulu, Hawaii 96826 Tel. (808) 955-4441
OFFICES IN HONOLULU AND MAUI Fax: (808) 942-2027

8 June 1995

Mr. Denis R. Lau, P.E., Chief
State of Hawaii, Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Poopoo Bridge Replacement Project
Draft Environmental Assessment
Manawainui, Hana, Maui, Hawaii

Dear Mr. Lau,

Thank you for your 1 May 1995 comments on the Poopoo Bridge Replacement Project Draft Environmental Assessment. The new bridge design and construction is not anticipated to activate a Federal Permit. However, stream scours below the new bridge will be filled with concrete to minimize further stream bank erosion.

Filling of the stream scours will activate a Nationwide Permit (NWP) 13 for Bank Stabilization from the U.S. Army Corps of Engineers. This NWP activates the Section 401 Water Quality Certification from the State of Hawaii Department of Health. Documents associated with the concrete filling of the stream scours, along with the appropriate submittal forms and plans, will be forwarded to the County of Maui Department of Public Works and Waste Management for processing to your department.

A National Pollutant Discharge Elimination System (NPDES) Permit is not anticipated since the project does not exceed 5 acres, and also does not anticipate any construction dewatering effluent, non-contact cooling water, hydrotesting water and underground storage tank activity.

We appreciate your assistance on this project. Should you have any questions, please do not hesitate to contact us.

Very truly yours,
SATO & ASSOCIATES, INC.

Loren G.S. Lau, AIA
Project Manager

cc: Cary Yamashita - County of Maui, DPW
Terrell Kelley - COE

BENJAMIN CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
SAM CALLEJO
GLENN M. OKIMOTO

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
HWY-PS
2.5726

May 17, 1995

Mr. Loren G. S. Lau, AIA
Project Manager
Sato & Associates, Inc.
2046 South King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

Subject: Draft Environmental Assessment for the Poopoo Bridge Replacement Project, Piilani Highway Ulupalakua, Maui; TMK: 1-9-1

Thank you for requesting our comments on the Draft Environmental Assessment (EA). Since the Poopoo Bridge was reconstructed in 1977, the existing structure probably does not qualify for any special historic recognition.

We suggest that additional information be included in the Final EA about (1) the volume and type of traffic that is generated on the existing bridge and (2) the proposed source of funds for the bridge replacement. If Federal funds are to be used, the EA must be a Federal Highway Administration EA and not just for the County of Maui.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

RECEIVED
MAY 18 1995
SATO & ASSOC., INC.

Sato & Associates
Consulting Engineers

2046 S. King Street, Honolulu, Hawaii 96826 Tel: (808) 955-4441
OFFICES IN HONOLULU AND MAUI Fax: (808) 942-2027

8 June 1995

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

Re: Draft Environmental Assessment for the Poopoo Bridge Replacement Project
Maui, Hawaii

Dear Mr. Hayashida,

Thank you for your 17 May 1995 comments on the Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement Project.

The volume and type of traffic that is generated from the existing bridge will be included into the Final EA as suggested.

We reviewed your comments, relative to the source of funds and the requirement for a Federal Highway Administration EA, with Mr. Pat Phung at the U.S. Department of Transportation Federal Highway Administration on 31 May 1995. Mr. Phung reported that the project is a Categorical Exclusion and does not require a Federal EA. Mr. Phung also reported that he was unable to respond directly to consultants but would be informing the appropriate State DOT and County of Maui Department of Public Works representative.

We appreciate your assistance with this project. Should you have any questions, please contact us or Mr. Cary Yamashita of the County of Maui Department of Public Works at 243-7745.

Very truly yours,
SATO & ASSOCIATES, INC.

Loren G.S. Lau, AIA
Project Manager

cc: Pat Phung - Highway Administration
Cary Yamashita - County of Maui DPW

FILE FOLDER NO. H9412-00 LL

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
ALBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

April 24, 1995

Mr. Loren G.S. Lau, Project Manager
Sato & Associates Consulting Engineers
2046 South King Street
Honolulu, Hawaii 96826

LOG NO: 14273
DOC NO: 9504SC04

Dear Mr. Lau:

SUBJECT: Historic Preservation Review of an Inventory Survey for the Proposed Poopoo Bridge Replacement.
Manawainui, Hana, Maui TMK: 1-9-01

Thank you for the submission of the inventory survey report on the proposed Poopoo Bridge replacement project (*An Archaeological Inventory Survey for the Proposed Poopoo Bridge Replacement. Manawainui, Hana, Maui.* [TMK: 1-9-01]. 1995. Burgett et al.). We have reviewed the document and provide the following comments.

While we believe that it is likely the project area has been adequately surveyed, finding no historic sites, we cannot be sure until an accurate map of the project area is provided. Once we receive the additional information itemized in Attachment I, we anticipate concluding that the proposed undertakings will have "no effect" on significant historic sites.

If you or your archaeological consultant disagree with any of the review comments made, please let us know, and we can schedule a consultation meeting to resolve any differences. Please feel free to call Sara Collins at 587-0013, if you have any questions.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jen

RECEIVED
APR 27 1995
SATO & ASSOC., INC.

ATTACHMENT I: SPECIFIC COMMENTS ON THE INVENTORY SURVEY OF THE PROPOSED POOPOO BRIDGE REPLACEMENT

DESCRIPTIONS

Page 1, Project Location: Please provide an approximate figure for the total land area covered by the inventory survey.

Page 4, HISTORIC LAND USE: It should be noted at the end of this section that the Poopoo Bridge was first constructed in 1948 and reconstructed in 1977. It is likely that some of the previously disturbed ground observed in the project area is associated with these events.

Pages 5 - 6, METHODS and RESULTS OF SURVEY: Please provide a map, to scale, of the project area. This map should show the project area boundaries, location of the temporary bridge, proposed limits of construction, the staging area(s), and, last but not least, the limits of the inventory survey.

RECOMMENDATIONS

Page 6, Paragraph 4: Please include a statement on the disposition and curation of any documents, field notes, photographs, etc. resulting from this project.

FHWA PROJ NO. M9412-00

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

May 4, 1995

Mr. Loren G.S. Lau, Project Director
Sato & Associates
2046 S. King Street
Honolulu, Hawaii 96826

LOG NO: 14416
DOC NO: 9504SC19

Dear Mr. Lau:

SUBJECT: Historic Preservation Review of a Draft Environmental Assessment for the Poopoo Bridge Replacement Project
Manawainui, Hana, Maui TMK: 1-9-01

Thank you for the submission of the draft environmental assessment (EA) prepared for the proposed Poopoo Bridge Replacement project at Manawainui, Hana District, Maui. As you know, we have recently reviewed the archaeological inventory survey report included as "Exhibit D" in the draft EA. A copy of our review letter of 24 April 1995 is attached (Hibbard to Lau, LOG NO 14273, DOC NO 9504SC04).

Once we receive the requested revisions and information, we anticipate concluding that the proposed undertakings will have "no effect" on significant historic sites.

Please feel free to call Sara Collins, at 587-0013, if you have any questions.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jen

FILE PROJECT NO: 97069-00

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

RECEIVED
MAY 31 1995
SAITO & ASSOC., INC.

May 25, 1995

MEMORANDUM

LOG NO: 14636
DOC NO: 9505KD43

TO: ROGER C. EVANS, Administrator
Office of Conservation and Environmental Affairs

FROM: DON HIBBARD, Administrator
State Historic Preservation Division

SUBJECT: Historic Preservation Review of the Draft Environmental Assessment: Po'opo'o Bridge Replacement Project, Manawainui, Hana District, Maui
TMK: 1-9-01 (OCEA File No: 95-521)

In a previous review of this project for the County of Maui, our office recommended that an archaeological inventory survey be conducted of the project area and a report of the survey findings be submitted for review. The inventory survey report was completed and a draft report was attached to the Draft Environmental Assessment (DEA) for this project. Our office has reviewed the draft report (letter to L. Lau, April 24, 1995), and requested additional information in order to determine the actual area surveyed and whether or not the survey identified all historic sites within the proposed bridge replacement project area. To date, we have not received a revised report.

The information in the DEA regarding project impacts to historic sites was derived from the draft inventory survey report for the project (*An Archaeological Inventory Survey for the Proposed Poopoo Bridge Replacement, Manawainui, Hana, Maui*, Burgett et al. 1995). According to the draft report, no significant historic sites were located within an area 150 m in any direction from the present bridge. A stone retaining wall was observed c. 100 m north of the bridge, and was assumed to be associated with a jeep road.

Our office was recently contacted by a concerned citizen who alerted us to the presence of the Hoapili Trail in the vicinity of the bridge. The project site was subsequently inspected by State Historic Preservation Division staff archaeologist Theresa K. Donham (May 19, 1995). The inspection confirmed that the stone retaining wall described in the draft report as a jeep trail is

actually a section of the Hoapili Trail (SIHP Site 50-15-572). Two retaining walls c. 24.0 and 14.0 m long define the downhill side of the trail switchback along the west face of the gulch. The causeway which once crossed the stream channel at this location has been washed away. A jeep trail and ford occurs immediately north of the Hoapili Trail switchback on the west side of the gulch. The trail corridor which goes up the east side of the gulch has been impacted by modern jeep traffic.

The Hoapili Trail was determined to be eligible for listing in the National Register of Historic Places in 1978. This historic transportation route is believed to follow the course of the precontact Pi'ilani Trail; the section of the trail between Keone'o'io and Kaupo was improved by Governor Hoapili during the early 1800's. In areas east of Manawainui Gulch, the existing Pi'ilani Highway closely follows the earlier route of the Hoapili Trail. Undisturbed trail remnants are visible in a number of locations a short distance north from the existing Highway corridor.

In the area of the Poopoo Bridge replacement project, it appears that the Hoapili Trail corridor turned northward along the west side of the gulch, made the crossing and turned south, following the east rim of the gulch back to a corridor route that is near the present highway. Additional sections of stone retaining walls were observed along the east side of the gulch, as well as a clearly defined traffic scar which parallels the gulch. If the Hoapili Trail followed this route, it may be well within the bridge replacement project area.

The archaeological inventory survey of the project area needs to be revised, and the location of the Hoapili Trail needs to be accurately plotted in relation the proposed project area before we can fully determine the potential impacts of the project on this significant historic site.

We recommend that approval of this project be deferred until the EA can be accurately updated regarding the presence of historic sites within the project area and potential impacts to these sites. If intact portions of the Hoapili Trail occur within or near the project area, a plan for avoidance and possibly long term preservation will be needed in order to insure that the project will have "no adverse effect" on this significant historic site.

KD:jen

c: Loren Lau, Sato & Associates

BENJAMIN J. CAYETANO
Governor of Hawaii

EROL NO. M9412-00

245

Chairperson
MICHAEL D. WILSON
Board of Land and Natural Resources

Deputy Director
GILBERT COLOMA-AGARAN

Aquaculture Development
Aquatic Resources
Boating and Ocean Recreation
Bureau of Conveyances
Conservation and Environmental Affairs
Conservation and Resources Enforcement
Forestry and Wildlife
Historic Preservation
Land Management
State Parks
Water and Land Development

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. Box 621
Honolulu, Hawaii 96809

REF:OCEA:TES

FILE NO. 95-521

JUN 6 1995

RECEIVED
JUN - 7 1995
SATO & ASSOC., INC.

Mr. Loren G.S. Lau, AIA
Project Manager
Sato & Associates
2046 South King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

SUBJECT: Draft Environmental Assessment (DEA): Poopoo Bridge Replacement Project, Nakula, Hana, Maui, TMK: 1-9: por. 1

We have reviewed the DEA for the subject project received on April 25, 1995, and have the following comments:

Division on Aquatic Resources

Our Division of Aquatic Resource (DAR) comments that the proposed project is not expected to have significant adverse impact on aquatic resource values in the area since Poopoo Stream is an intermittent stream which is normally dry during most of the year. However, during flood conditions, the stream carries water from the lower portion of Mount Haleakala to the ocean. Therefore, the applicant should take precautions to prevent contaminants such as sediment, pollutants, petroleum products and debris from entering the aquatic environment. Finally, DAR suggests that site work be scheduled for periods of minimal rainfall and lands denuded of vegetation be replanted or covered as quickly as possible to control erosion.

Division of Water and Land Development

Our Division of Water and Land Development (DOWALD) comments that although no hydraulic calculations were provided to show how high the water surface elevations would be at the bridge site during a 100-year and 500-year rain storm, based on Q100 = 1,261 cfs and Q500 = 2,143 cfs, the water flow area under the bridge is greater than 1,000 sf. Therefore, the bridge would not block the water flow during a 100-year or 500-year rainstorm.

Historic Preservation Division

Our Historic Preservation Division (HPD) comments were previously forwarded to you by a copy of their memoranda dated May 25, 1995.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to call Steve Tagawa of our Office of Conservation and Environmental Affairs at 587-0377, should you have any questions.

Aloha,

Gilbert S. Coloma-Agaran
for MICHAEL D. WILSON

ST:tes

Sato & Associates
Consulting Engineers
2046 S. King Street, Honolulu, Hawaii 96826 Tel: (808) 955-4441
OFFICES IN HONOLULU AND MAUI Fax: (808) 942-2027

8 June 1995

Mr. Michael D. Wilson, Chairperson
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Re: Draft Environmental Assessment for the Poopoo Bridge Replacement Project
Maui, Hawaii

Dear Mr. Wilson,

Thank you for your 6 June 1995 comments on the Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement Project.

Division on Aquatic Resources comments relative to preventing contaminants from entering the aquatic environment and to promptly replant or cover areas denuded of vegetation to control erosion will be integrated into the Construction Documents.

Response to the 25 May 1995 Historic Preservation Division memoranda will be forthcoming in a separate letter in the near future.

We appreciate your assistance with this project. Should you have any questions, please contact us or Mr. Cary Yamashita of the County of Maui Department of Public Works at 243-7745.

Very truly yours,
SATO & ASSOCIATES, INC.

Loren G.S. Lau, AIA
Project Manager

cc: Cary Yamashita - County of Maui DPW

RSEA PROJ NO. M9412-00

RS
LL

EDWARD J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

MICHAEL D. WILSON
CHAIRPERSON

ROBERT S. NAKATA
ROBERT G. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIKE
RICHARD H. COX

RAE M. LOUI, P.E.
DEPUTY

MAY 16 1995

Mr. Loren G.S. Lau, AIA
Sato & Associates
2046 S. King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

This is in response to your letter requesting whether the Poopoo Bridge Replacement Project requires a stream channel alteration permit, pursuant to Section 13-169-50, Hawaii *Revised Statutes*.

We contacted the Division of Aquatic Resources and a biologist of the Haleakala National Park to determine whether the Poopoo watercourse supports "instream uses". Both agencies indicate that it is unlikely that the Poopoo watercourse supports instream uses because of infrequent flows.

We concur that the Poopoo watercourse is not likely to support instream uses. Therefore, a stream channel alteration permit pursuant to Section 13-169-50, Hawaii Administrative Rules, will not be required for the proposed bridge replacement.

If you have any questions regarding this letter, please call David Higa at 587-0249. We apologize for not responding to you sooner.

Sincerely,

RAE M. LOUI
Deputy Director

DH:ss

RECEIVED
MAY 16 1995
SATO & ASSOC., INC.

Sato & Associates
Consulting Engineers
2046 S. King Street, Honolulu, Hawaii 96826
OFFICES IN HONOLULU AND MAUI
Tel: (808) 955-4441
Fax: (808) 942-2027

8 June 1995

Mr. Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawaii 96809

Re: Draft Environmental Assessment for the Poopoo Bridge Replacement Project
Maui, Hawaii

Dear Mr. Loui,

Thank you for your 16 May 1995 comments on the Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement Project. Per your recommendation, the project will not be applying for a stream alteration permit.

We appreciate your assistance with this project. Should you have any questions, please contact us or Mr. Cary Yamashita of the County of Maui Department of Public Works at 243-7745.

Very truly yours,
SATO & ASSOCIATES, INC.

Loren G.S. Lau, AIA
Project Manager

cc: Cary Yamashita - County of Maui DPW

DEPT PROJ NO M9412-00

LL

BENJAMIN J. CAYETANO
GOVERNOR
SELM F. NAYA
DIRECTOR
RICK EGGED
DEPUTY DIRECTOR

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 11th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 586-2355
Fax: (808) 586-2377

June 1, 1995

Mr. Loren G.S. Lau, AIA
Project Manager
Sato & Associates
2046 S. King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

Subject: Poopoo Bridge Replacement Project, Maui

The Land Use Commission offers the attached comments on the subject project.

Thank you for the opportunity to present our comments.

Sincerely,

Shelley M. Mark
Senior Advisor to Director

Enclosure

RECEIVED
JUN 15 1995
SATO & ASSOC, INC.

BENJAMIN J. CAYETANO
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822

May 1, 1995

SUBJECT: Director's Referral No. 95-050-A
Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement Project, Maui, Hawaii

We have reviewed the subject draft EA and have the following comments to offer:

1) The State Land Use Agricultural/Conservation District Boundary is located on the mauka side of the existing Piilani Highway easement, in the vicinity of the project site. Based on figures 2 and 7 of the draft EA, the areas of the project site located on the mauka side of the mauka boundary of the existing Piilani Highway easement are located in the State Land Use Agricultural District, while the areas located on the makai side of the mauka boundary of the existing highway easement are located in the State Land Use Conservation District.

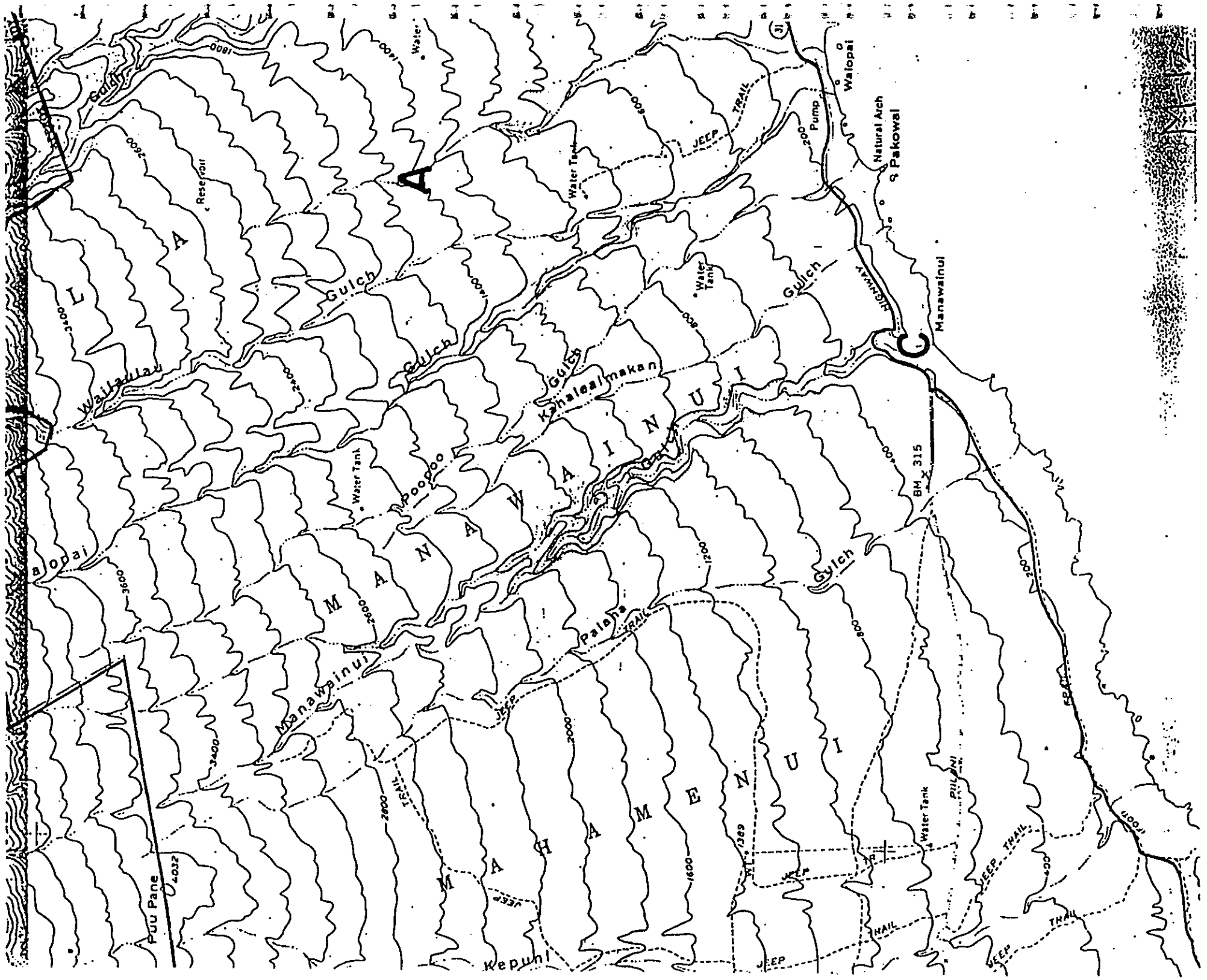
2) We suggest that the State Land Use Districts of the subject project be clearly identified, and a map illustrating the State Land Use Districts in relation to the subject project be included in the final EA.

3) We have enclosed for your information a copy of the State Land Use District Boundaries, specifically portion of USGS quad M-12 (Lualailua Hills).

We have no other comments to offer at this time.

EU:KY:th

enc.



DOCUMENT CAPTURED AS RECEIVED

M9412-00

BC
LL

BENJAMIN J. CAYETANO
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822

June 9, 1995

Mr. Loren G.S. Lau, AIA
Project Manager
Sato & Associates
2046 South King Street
Honolulu, Hawaii 96826

RECEIVED
JUN 13 1995
SATO & ASSOC., INC.

Dear Mr. Lau:

Subject: Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement Project, Maui, Hawaii

We have received your letter dated June 5, 1995 transmitting a portion of the draft EA and the plans for the subject project pursuant to the request of Fred Talon of my staff.

Based on our review of the information, we have the following comments:

1) As shown on your plans, the project appears to be located within both the State Land Use Agricultural and Conservation Districts. For your information, the Agricultural/Conservation District boundary in the area follows the mauka side of Piilani Highway as shown on the enclosed State land use district boundaries map (M-12, Lualailua Hills).

2) We suggest that the Final EA include a map showing the project site in relation to the State land use districts.

3) Inasmuch as a portion of the subject project is located within the State Land Use Conservation District, we suggest that you contact the Department of Land and Natural Resources, Office of Conservation and Environmental Affairs, which is responsible for the administration of Conservation District lands, at the following address:

Department of Land and Natural Resources
Office of Conservation and Environmental Affairs
P. O. Box 621
Honolulu, Hawaii 96809

Tel: 587-0377

We have no further comments to offer at this time. We appreciate the opportunity to provide comments on this matter.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

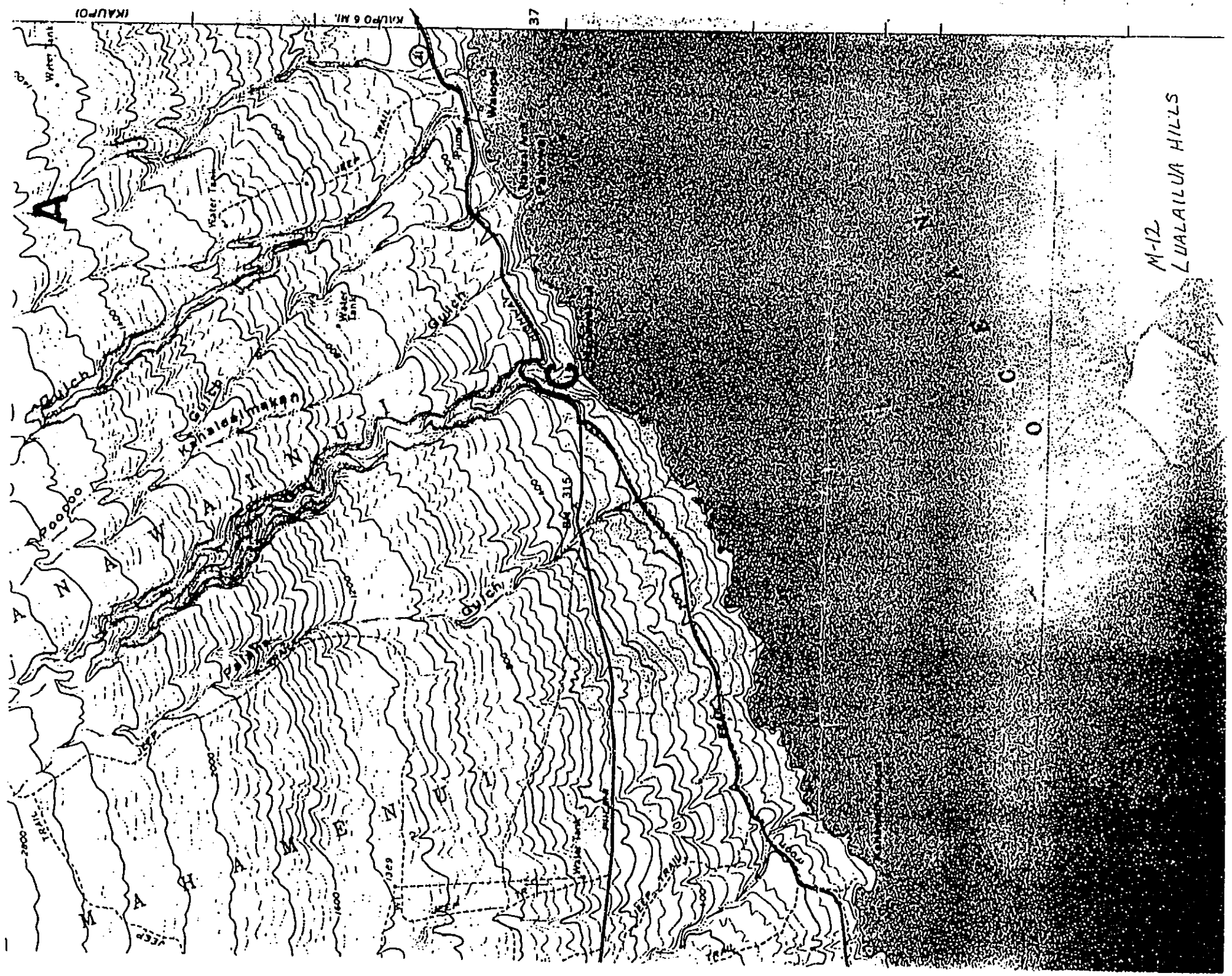
Sincerely,

ESTHER UEDA
Executive Officer

EU:th

encl.

cc: Dept. of Land and Natural Resources
Attn: OCEA



M-12
LUALAILUA HILLS

Sato & Associates
Consulting Engineers
2045 S. King Street, Honolulu, Hawaii 96826 Tel: (808) 955-4441
OFFICES IN HONOLULU AND MAUI Fax: (808) 942-2027

15 June 1995

Mr. Michael D. Wilson, Chairperson
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Re: Draft Environmental Assessment for the Poopoo Bridge Replacement Project
Maui, Hawaii

Dear Mr. Wilson,

We received a 9 June 1995 letter from the State of Hawaii, Department of Business, Economic Development & Tourism Land Use Commission (LUC) which suggest that we contact your office relative to the project site and the State Land Use Conservation District. A copy of the LUC letter is attached for your use.

LUC has identified the Agricultural/Conservation District boundary as the mauka side of the existing Piilani Highway. The proposed new Poopoo Bridge is located on the mauka side in the Agriculture District. However, roadway approaches to the new bridge and removal of the existing bridge will require work within the Conservation District. Figure 7, from the Draft EA, has been highlighted to indicate the project area within the Conservation District.

Roadway Approach Modification

Roadway modifications within the Conservation District is required to widen the existing one lane Piilani Highway to merge with the new two lane Poopoo Bridge. The work involves minor grading to blend the existing roadway elevation to the new bridge elevation. The roadway work within the Conservation District involves approximately 4,000 square feet area.

Chapter 13-5, HAR Conservation District, Subchapter 3, P-9 (A-1) Structures, Existing indicates that replacement or reconstruction of existing structures and facilities may be exempt where the new structure will be located predominately on the same site and will have substantially the same purpose, capacity, density, height, and dimensions as the structure replaced. This may be applicable to the portion of Piilani Highway (within the Conservation District) which will be modified to merge with the new Poopoo Bridge (within the Agricultural District). We therefore request confirmation that the roadway modification does not require a departmental or board permit.

Existing Bridge Removal

The project proposes to remove the existing bridge after the activation of the new bridge. This would involve the removal of the wood bridge structure and supports, steel beams, and concrete pier supports within the gulch. Existing concrete wingwalls, at the top of the gulch will remain. All removal actions will not utilize explosives and will be conducted to minimize debris material from entering the gulch. Should debris materials inadvertently fall into the gulch, the debris materials will be promptly removed from the gulch.

Chapter 13-5, HAR Conservation District, Subchapter 3, P-9 (C-1) Structures, Existing indicates that demolition, removal, or alteration of existing structures, facilities and equipment may require a departmental permit. The State Historical Preservation Department and State Department of Transportation has indicated that the existing bridge is not historically significant - refer to attached letters. We therefore request confirmation that the bridge removal work requires a departmental permit.

Please review the above and inform us if our review of Conservation District Permitting is correct, and inform us of the permitting requirements. The above items were briefly discussed with Mr. Steve Tagawa of your office.

We appreciate your assistance with this project. Should you have any questions, please contact us or Mr. Cary Yamashita of the County of Maui Department of Public Works at 243-7745.

Very truly yours,
SATO & ASSOCIATES, INC.

Loren G.S. Lau, AIA
Project Manager

cc: Cary Yamashita - County of Maui DPW

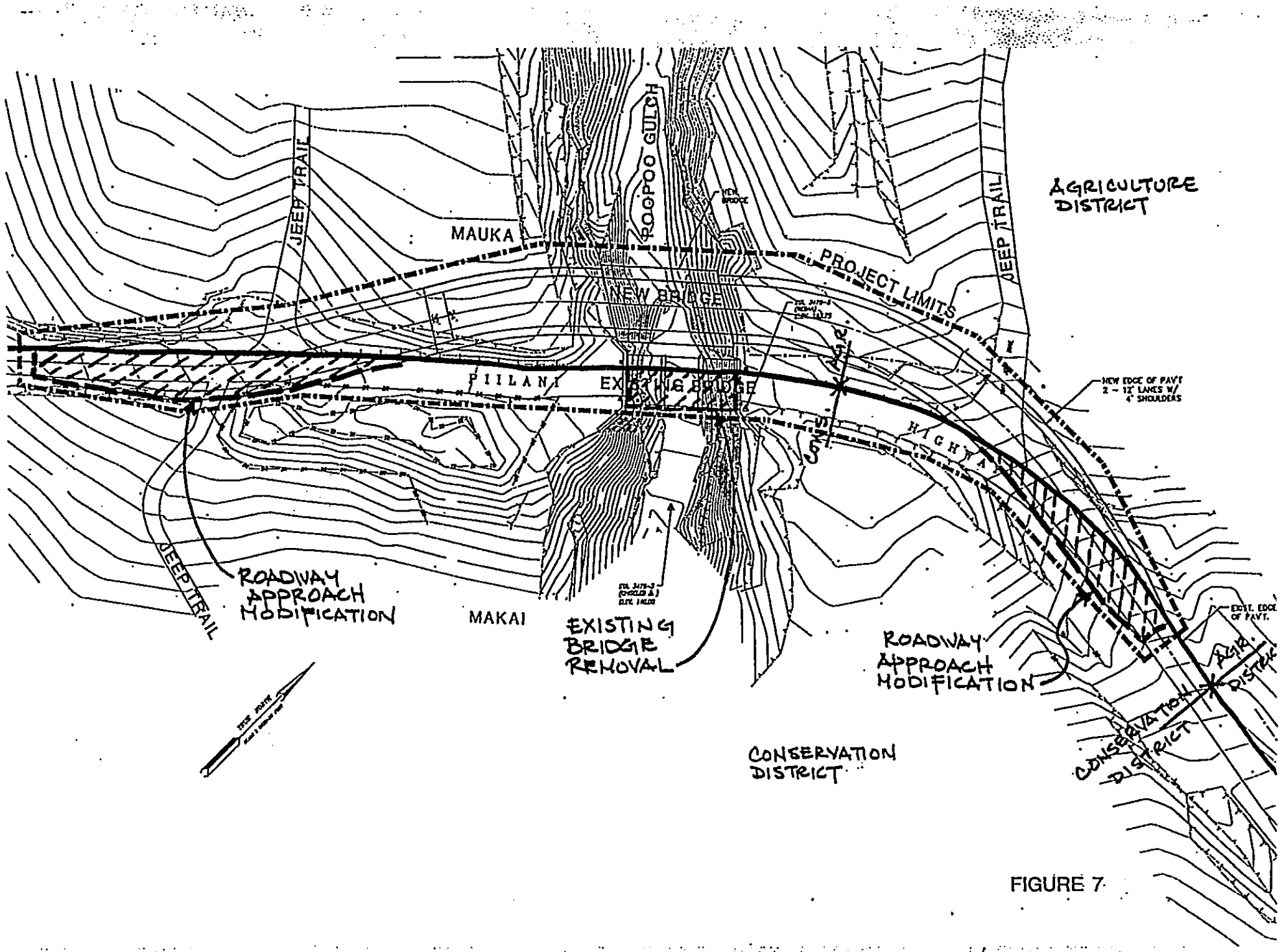


FIGURE 7

LINDA CROCKETT LINGLE
Mayor

PROJ. NO. M9412-00

BRIAN W. MISKAE
Director

GWEN Y. OHASHI
Deputy Director

COUNTY OF MAUI
PLANNING DEPARTMENT
250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

June 22, 1995

Mr. Loren Lau
Sato & Associates
2115 Wells Street
Wailuku, Hawaii 96793

RECEIVED
JUN 30 1995
SATO & ASSOC., INC.

Dear Mr. Lau:

Re: Poopoo Bridge Replacement

This letter will acknowledge your letter dated June 2, 1995, requesting clarification on Special Management Area ("SMA") requirements for the above-mentioned project. We apologize for the delay in our response.

Based on the draft environmental assessment and preliminary plans, it appears that only a minor portion of the road re-alignment to accommodate the new bridge is located within the SMA boundaries. Therefore, said project would probably require an SMA minor permit.

However, please submit a complete application for an SMA Assessment when construction plans have been finalized. At such time, the Director will evaluate the project valuation, whether the proposed action is or is not a development, and potential environmental or ecological effects. Based on this evaluation, an official determination will be made as to whether the project is exempt, requires an SMA Minor Permit, or requires a SMA Use Permit.

Should additional clarification be necessary, please contact Mr. Daren Suzuki of my staff at 243-7735.

Yours truly,

GWEN OHASHI
Acting Director of Planning

DMS:tm
cc: Daren Suzuki
File
s:\ltrs\lr

LINDA CROCKETT LINGLE
Mayor
GEORGE N. KAYA
Director
CHARLES JENCKS
Deputy Director
AARON SHINMOTO, P.E.
Chief Staff Engineer

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration
EASSIE MILLER, P.E.
Wastewater Reclamation Division
LLOYD P.C.W. LEE, P.E.
Engineering Division
DAVID WISSMAR, P.E.
Solid Waste Division
BRIAN HASHIRO, P.E.
Highways Division

EMDA PROJ. NO. M9412-00

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
LAND USE AND CODES ADMINISTRATION
250 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

May 31, 1995

Mr. Loren G.S. Lau, AIA
SATO & ASSOCIATES
2046 S. King Street
Honolulu, Hawaii 96826

SUBJECT: Draft Environmental Assessment
POOPOO BRIDGE REPLACEMENT PROJECT

Dear Mr. Lau:

We reviewed the subject draft environmental assessment and have no comment.

If you have any questions regarding this letter, please call me at 243-7845.

Very truly yours,

CHARLES JENCKS
Director of Public Works & Waste Management

cy
xc: Engineering Division
Solid Waste Division

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RECEIVED
JUN - 6 1995
SATO & ASSOC., INC.

LINDA CROCKETT LINGLE
Mayor

* M9417

BRIAN W. MISKAE
Director

GWEN Y. OHASHI
Deputy Director

LL
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DT

COUNTY OF MAUI
PLANNING DEPARTMENT
250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

May 19, 1995

Mr. Loren Lau, AIA
Sato & Associates, Inc.
2046 South King Street
Honolulu, Hawaii 96826

Dear Mr. Lau:

Re: Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement, TMK: 1-9-1:1, Maui, Hawaii

We have reviewed the above-mentioned Environmental Assessment (EA) received on April 24, 1995, and offer the following comments:

1. Portions of the new road alignment for the bridge replacement is located within the Special Management Area boundaries; therefore, is subject to the SMA rules and regulations; and

2. The existing bridge was constructed in 1948, some 47 years ago, and is proposed to be demolished after the construction of the new bridge. Although the structure may not be historically significant, a photographic analysis (preferably black and white) should be submitted to our department for our archives.

Thank you for the opportunity to comment. Should you have any questions, please contact Mr. Daren Suzuki of my staff at 243-7735.

Yours truly,

BRIAN MISKAE
Planning Department

DMS:tm
cc: Daren Suzuki
File
:POOPOO.LTR

RECEIVED
MAY 24 1995
SATO & ASSOC. INC.

M9417

Sato & Associates
Consulting Engineers

2046 S King Street, Honolulu, Hawaii 96826 Tel: (808) 955-4441
OFFICES IN HONOLULU AND MAUI Fax: (808) 942-2027

2 June 1995

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

Attn: Mr. Brian Miskae, Director

Subject: Draft Environmental Assessment for the Poopoo Bridge Replacement Project
Maui, Hawaii

Dear Mr. Miskae,

Thank you for your 19 May 1995 comments on the Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement Project. As requested, a set of photo's will be forwarded to your office in the near future.

We are unclear about the Special Management Area (SMA) requirements for the project. We briefly discussed our concerns with Ms. Lynette Zakabi of your office on this date. We request a clarification if this project is considered a major or a minor SMA action, or if the project qualifies for an exemption. Attached are portions of the April 1995 Draft EA which may assist you.

Please review the above and contact us should you have any question.

Very truly yours,
SATO & ASSOCIATES, INC.

Loren G.S. Lau, AIA
Project Manager

cc: Cary Yamashita

DEPARTMENT OF
PARKS AND RECREATION
COUNTY OF MAUI

1580 KAAHUMANU AVENUE, WAILUKU, HAWAII 96793

(808) 243-7230

LINDA CROCKETT LINGLE
Mayor
CHARMAINE TAVARES
Director
LEE DODSON
Deputy Director

July 11, 1995

Ms. Loren G.S. Lau, AIA
Project Manager
Sato & Associates
2046 S. King Street
Honolulu, HI 96826

Subject: Draft Environmental Assessment (EA)
Poopoo Bridge Replacement Project

Dear Ms. Lau:

We have no objections to the subject Draft EA. We support the improvements as proposed for the Poopoo Bridge.

Thank you for allowing us to comment on the Draft EA.

Sincerely,

CHARMAINE TAVARES
Director

CT/rt

M9412-00

RS
LL

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

July 24, 1995
EA:0124

Mr. Cary Yamashita
County of Maui
Department of Public Works
200 South High Street
Wailuku, Hawaii 96763

RECEIVED
JUL 25 1995
SATO & ASSOC., INC.

Dear Mr. Yamashita:

Draft Environmental Assessment
Poopoo Bridge Replacement
Poopoo Gulch, Maui

The existing one-lane timber bridge, which spans Poopoo Stream on the Piilani Highway, is in need of repair or replacement. The Department of Public Works proposes to construct a new two lane concrete bridge on the mauka side of the old bridge, parallel to the existing structure. The project site crosses the southern portions of Haleakala Ranch Company property in an area of ranching and pasture grazing.

We reviewed this Draft Environmental Assessment (EA) with the assistance of Paul Ekern, Emeritus, Agronomy and Soils Sciences; and Paul Berkowitz of the Environmental Center.

Seismic Hazards

For any infrastructure project in Hawaii, some assessment must be made of the earthquake danger. All projects must comply with the building codes for their respective seismic zone. Preferably projects should be built conservatively rather than at the minimum standard. For the proposed Poopoo Bridge Replacement, seismic hazards are ignored completely in the EA. This represents a major deficiency in the document.

Hydrological Calculations

Exhibit E provides several maps of the area; however the watershed boundary is not delineated on any of the maps. This information is critical in assessing the validity of the calculations. Furthermore, it appears that the Waiakoa soil type (WID2), which is found directly adjacent to Poopoo Gulch, is not used in any of the runoff calculations. Why is this soil type not considered?

Climatic Regime

Some ambiguity exists about the type of climate found in the region. Section 2D (page 4) describes the wind pattern as diurnal, with sea breezes during the day and land breezes at night. Later in this section, it is stated that the region's air quality is good due to trade wind conditions. These two statements are inconsistent. Is the project site in an area affected by trade winds or does the wind direction vary throughout the day?

Economic Analysis

Given the State's financial crisis and the recent national emphasis on cost-benefit analysis, it seems appropriate to include a cost-benefit analysis for the project.

Conclusion

In general, the project appears to be environmentally benign. Before proceeding further, the seismicity hazards need to be considered. We are also somewhat concerned about the watershed boundaries and the soil types used in the hydrological calculations.

Thank you for the opportunity to review this Draft EA.

Sincerely,

John T. Harrison
Environmental Coordinator

cc: OEQC
Sato and Associates, Inc.
Roger Fujioka
Paul Ekern
Paul Berkowitz

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26 July 1995

Mr. John T. Harrison, Environmental Coordinator
University of Hawaii at Manoa
Environmental Center, Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Re: Draft Environmental Assessment for the Poopoo Bridge Replacement Project
Maui, Hawaii

Dear Mr. Harrison,

Thank you for your 24 July 1995 comments on the Draft Environmental Assessment (EA) for the Poopoo Bridge Replacement Project. The following are responses to the comments:

Seismic Hazards
The new concrete bridge will be designed to comply with the 1991 Edition of the Uniform Building Code.

Hydrological Calculations
Waiakoa soil type (WID2) will be incorporated into Hydrological and Hydraulic Calculations.

Climatic Regime
Wind pattern information will delete "trade" wind.

Economic Analysis
Federal highway program will fund 80% of the project, with the 20% balance being funded by the County of Maui. The County of Maui Department of Public Works has determined that the County's cost is acceptable. The project will improve public transportation along Piilani Highway while also reducing future bridge maintenance cost.

We appreciate your comments on this project. Should you have any questions, please contact us or Mr. Cary Yamashita of the County of Maui Department of Public Works at 243-7745.

Very truly yours,
SATO & ASSOCIATES, INC.

Loren G.S. Lau, AIA
Project Manager

cc: Cary Yamashita - County of Maui DPW