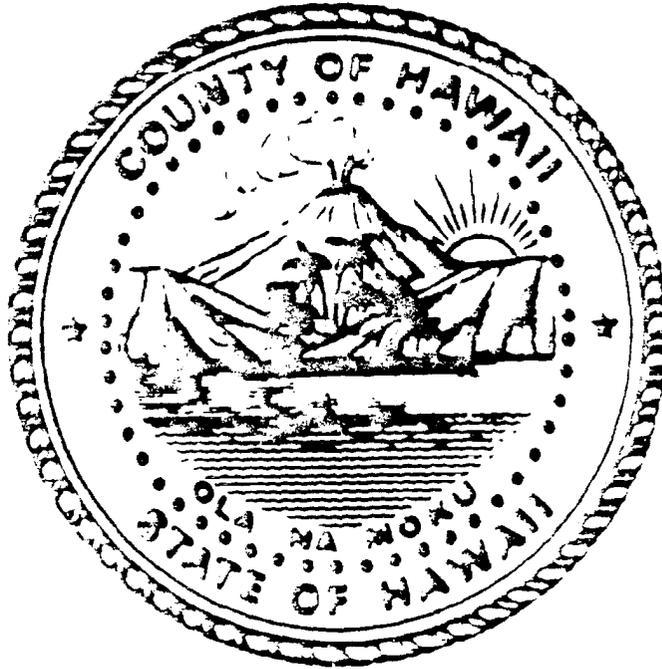
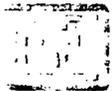


ALENAIO STREAM
FLOOD CONTROL PROJECT
HILO, HAWAII



GENERAL DESIGN MEMORANDUM
AND
ENVIRONMENTAL ASSESSMENT



MARCH 1990

U.S. Army Corps
of Engineers
Hawaii District

SYLLABUS

Alenaio Stream is located in Hilo, Hawaii and flows through the central part of the city. The Alenaio basin drains an area of 8.72 square miles. It is about 11 miles long and averages about 0.8 miles in width. Flood damages in the Alenaio Stream basin result from inadequate stream capacity and undersized culvert openings. Seven occurrences of significant flooding have occurred since 1920. The maximum flood of record occurred on July 25, 1966 with damages of \$4,819,000. Floods in the Alenaio drainage basin have extensively damaged the residential and commercial developments in the floodplain and will continue to do so unless protective measures are taken.

Based on coordination and discussion with residents of the study area and local government officials, the District Engineer recommends construction of flood control improvements to protect residential and commercial developments and floodplain management regulations on undeveloped areas as discussed herein. The improvements would provide a 1 percent (100-year) level of flood protection within the lower Alenaio Stream Flood Plain.

The recommended plan discussed in this General Design Memorandum consists of 1,787 feet of rectangular concrete channel, a 200-foot wedge-shaped concrete entrance transition, 832 feet of earth levee, 487 feet of concrete floodwall, 453 feet of cement-rubble-masonry (CRM) floodwall, four bridge replacements, removing one public, one business, and six residential structures and incorporating flood plain management regulations on undeveloped areas. An earth channel connects the concrete channel to the Waiolama Canal.

The estimated project first cost is \$11,030,000 of which \$6,980,000 would be paid by the Federal Government and \$4,050,000 would be assumed by the local sponsor. Based on estimated annual benefits of \$1,392,000 and estimated average annual charges of \$1,009,000 including \$30,000 in annual operation and maintenance costs, the benefit-to-cost ratio is 1.4.

The Alenaio Stream Flood Control Project was specifically authorized in the Water Resources Development Act of 1986 (P.L. 99-662) at a total cost of \$7,860,000. The project would be implemented when local cooperation requirements can be met and project construction funds are available. The District Engineer recommends that this General Design Memorandum for Alenaio Stream be approved as presented herein.

**GENERAL DESIGN MEMORANDUM
ALENAIO STREAM FLOOD CONTROL PROJECT
HILO, COUNTY OF HAWAII, HAWAII
PERTINENT DATA OF THE RECOMMENDED PLAN**

1. PROJECT FEATURES

a. Temporary Unlined Trapezoidal Channel

(1) Width	60 feet
(2) Length	338 feet
(3) Depth	5-6 feet

b. Concrete Channel

(1) Width	30-51 feet
(2) Length	1987 feet
(3) Depth	10.8 feet

c. Levee

(1) Length	832 feet
(2) Height	3-9 feet

d. Floodwalls

(1) Length	940 feet
(2) Height	2-10 feet

2. PROJECT FIRST COST

a. Apportioned Project First Cost

(1) Federal	\$ 6,980,000
(2) Non-Federal	\$ 4,050,000
(3) Estimated Project First Cost	\$11,030,000

b. Average Annual Costs and Benefits

(1) Total Average Annual Costs (based on a 8 7/8 percent interest rate and a 100-year project life)	\$ 1,009,000
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(2) Total Average Annual Benefits (based on a 8 7/8 percent interest rate and a 100-year project life. CRF = 0.08877)	\$ 1,392,000
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c. Average Annual Net Benefits **\$ 383,000**

d. Benefit to Cost Ratio **1.4**

**GENERAL DESIGN MEMORANDUM
ALENAIO STREAM FLOOD CONTROL IMPROVEMENTS
HILO, HAWAII**

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