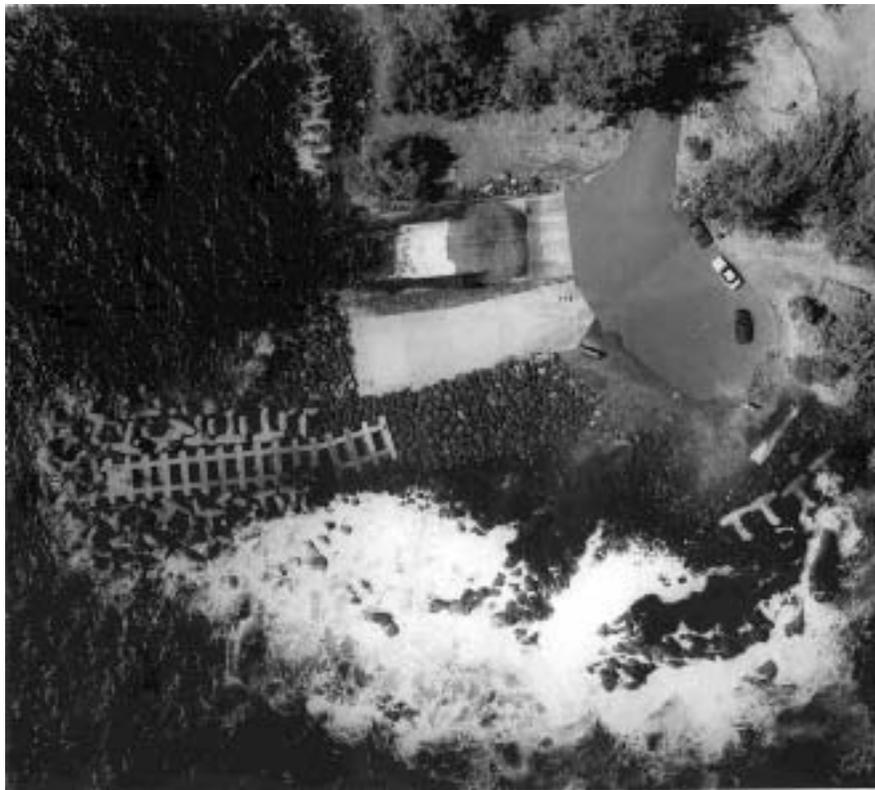


O & M INSPECTION REPORT
FOR NAVIGATION AND SHORE PROTECTION PROJECTS

1. Project Name: Laupahoehoe Navigational Improvements
2. Date of Inspection: May 1, 2002
3. Inspection Personnel:

	<u>Name</u>	<u>Agency/Office</u>	<u>Telephone No.</u>
a.	<u>Dan Meyers</u>	<u>COE</u>	<u>438-8875</u>



4. Discussion:

The inspected portion of the project consists of a 60 linear foot (LF) wave absorber and a 200 LF concrete armor unit breakwater. The following are deficiencies noted during the inspection:



a. Wave Absorber (60 LF): The wave absorber is in good condition. There appears to be minimal change in the structure since our last inspection.

b. Breakwater (200 LF):



Sta. 0+00, Overview of breakwater.



Sta. 0+77, harbor side (HS), 5'L x 20'W x 5'D void from dislodged armor stones; several perched stones located adjacent to void.



Sta. 0+80, HS, Overview of Ribcap / Dolos. Sta. 0+77 to 1+25 (first 6 ribs), HS, 500 pound stones lodged between ribs and dispersed among dolos;



Sta. 0+80, OS, Overview of Ribcap / Dolos.



Sta. 0+85, HS, Appears to missing armor stones adjacent the boat ramp.



Sta. 0+90, HS, Small rocks washed up on dolos (reference photo).

Cells are numbered 1 - 14 starting at the root.



Cell 1 - Minor underlayer loss



Cell 2 - Minor underlayer loss. Large armor stone on HS.



Cell 3 - Minor underlayer loss



Cell 4 - Minor underlayer loss



Cell 5 - Minor underlayer loss



Cell 6 - Underlayer loss, 1 1/2' deep



Cell 7 - Underlayer loss, 2' deep



Cell 8 - Minor underlayer loss



Cell 9 - Underlayer loss, 1 1/2 to 2' deep



Cell 10 - Major underlayer loss, OS



Cell 11 - Underlayer loss, 3' deep, getting worse.



Cell 11 - Underlayer loss, 3' deep, getting worse.



Cell 12 - Major underlayer loss, 3' deep, getting worse.



Cell 13 - Concrete capped but eroding under cap.



Cell 14 - Concrete capped but eroding under cap.



Sta. 1+77, 1+84, 1+91, HS, spalling at the tip of the rib.

Sta. 2+00, HS, spalling at the tip of the longitudinal beam.

There has been a loss of underlayer material in the cells of the rib cap between the ribs and beams. The typical section depicts two layers of 5 to 7 ton stone directly below the concrete cap and 1 to 3 ton stone underneath. Apparently, the specified stones were replaced with greatly undersized stone during construction. That undersized stone is slowly being washed away, creates a more porous structure that allows more energy into the harbor, and could ultimately threaten the stability of the breakwater:

5. Conclusion:

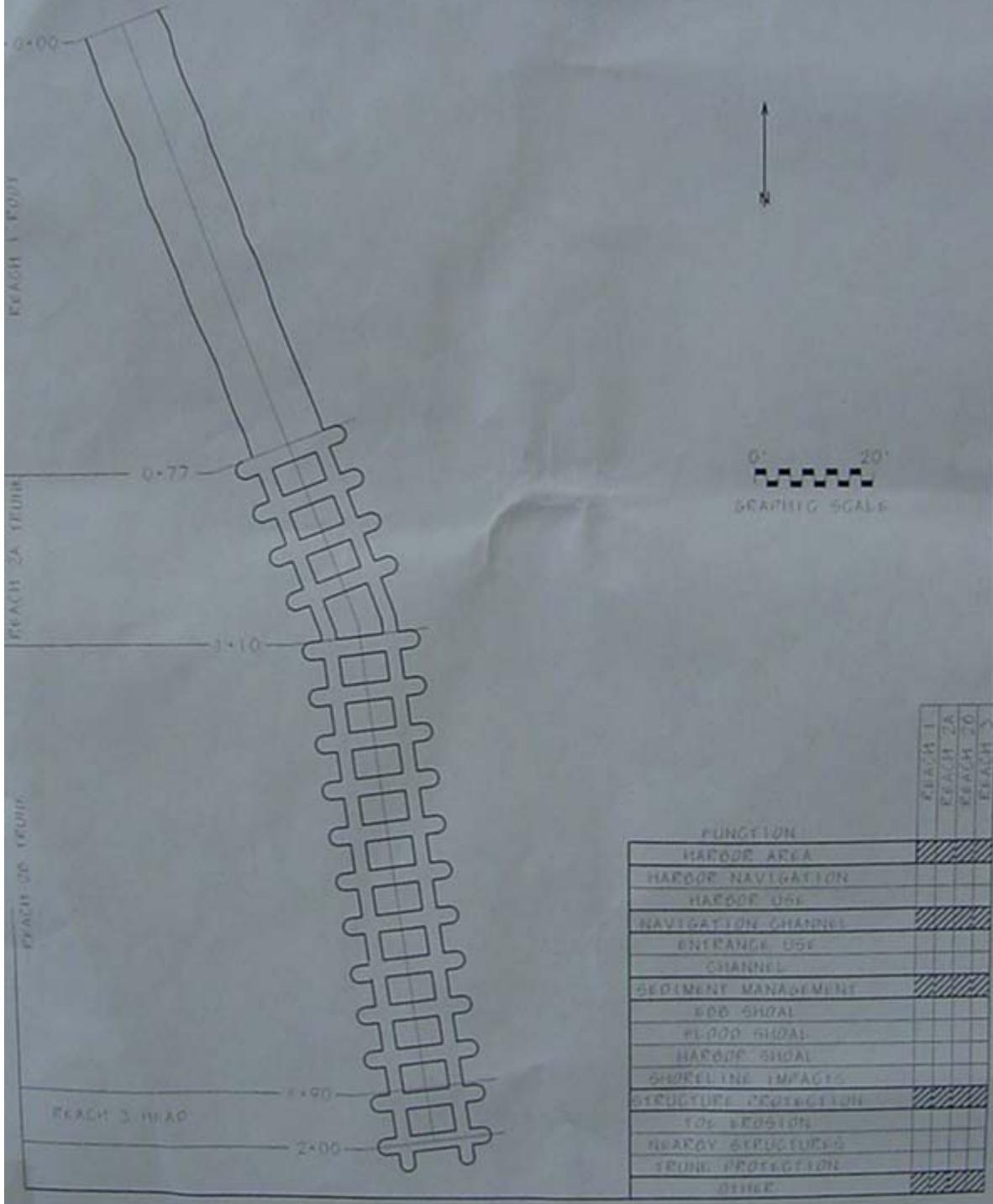
The Breakwater and wave absorber function as designed however it appears additional material has washed out from under the rib cap cells and should be closely monitored. The void at Sta. 0+77, HS, is getting worse, additional armor stones have been displaced. Overall the project is in GOOD condition, however suggest repairs be planned for the near future as the dislodged armor stones may impact the turning basin.

Signed: _____
Dan Meyers, CEPOH-EC-T

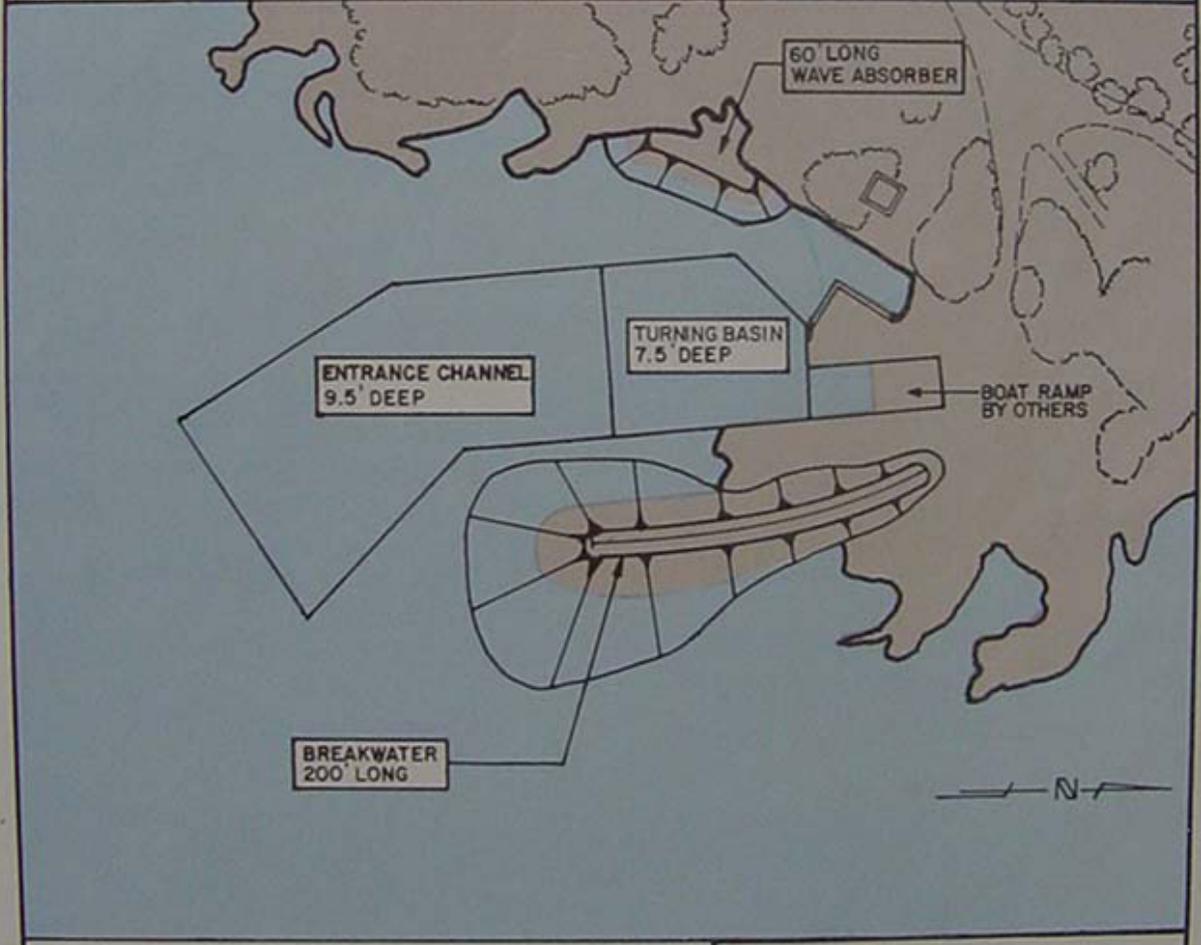
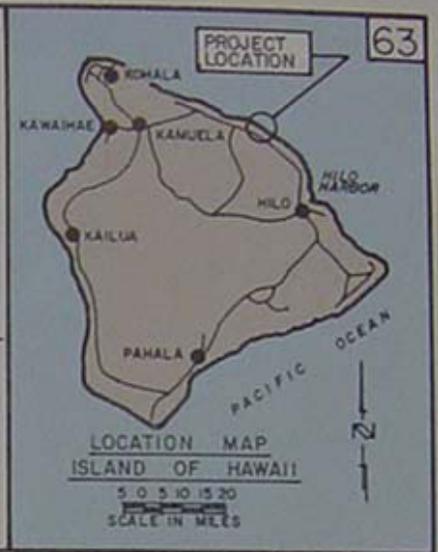
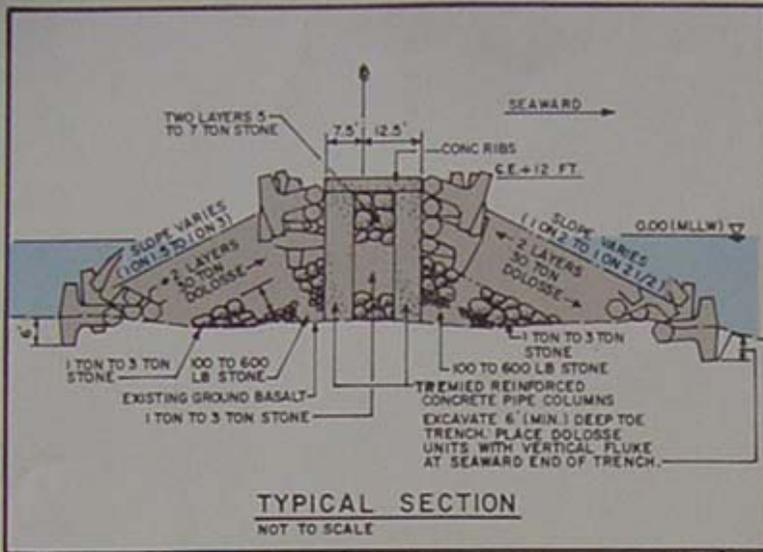
Signed: _____
Jim Pennaz P.E., Ch, CEPOH-EC-T

Enclosures
B/W Reach Plan

LAUPAHOEHOE - BREAKWATER



FUNCTION	REACH 1	REACH 2A	REACH 2B	REACH 3
HARBOUR AREA				
HARBOUR NAVIGATION				
HARBOUR USE				
NAVIGATION CHANNEL				
ENTRANCE USE				
CHANNEL				
SEDIMENT MANAGEMENT				
ROCK SHOUL				
FLOOD SHOUL				
HARBOUR SHOUL				
SHORELINE IMPACTS				
STRUCTURE CONNECTION				
TIDE EROSION				
NEARBY STRUCTURES				
TRUNK PROTECTION				
OTHER				



NAVIGATION IMPROVEMENT
LAUPAHOEHOE HARBOR
ISLAND OF HAWAII, HAWAII

50 0 50 100

SCALE IN FEET

REVISED: 30 SEP. 1989
DATE AUTH: 13 JUN 1987
U. S. ARMY

ENGINEER DIVISION, PACIFIC OCEAN
CORPS OF ENGINEERS

LAUPAHOEHOE HARBOR, HAWAII, HAWAII

CONDITION OF IMPROVEMENT 30 SEPTEMBER 1991

PREVIOUS PROJECTS: None.

EXISTING PROJECT: Authorized for construction on 15 June 1987 under Section 107 of the River and Harbor Act of 1960, as amended. Provides for a breakwater 200 feet long, a wave absorber 60 feet long, an entrance channel 9.5 feet deep, and a turning basin 7.5 feet deep.

PROGRESS OF WORK

Completed and Under Maintenance: A construction contract awarded in November 1987 was completed in August 1988 for \$3,074,948. Modification to the harbor under a separate contract, awarded in September 1989, was completed in February 1990 for \$251,000.

Work Remaining: None

COST OF CONSTRUCTION:

	<u>New Work</u>
<u>Completed Works:</u>	
United States Funds	
Corps of Engineers	\$3,511,809
Coast Guard	6,747
Contributed Funds	
Required	364,757
Other	<u>105,154</u>
Total Costs	\$3,988,467