



O&M INSPECTION REPORT FOR NAVIGATION PROJECTS

MANELE SMALL BOAT HARBOR

Honolulu Engineer District

CEPOH-EC-T

Manele 04rpt-sbh.doc

1. Project Name: Manele SBH
2. Date of Inspection: October 17, 2003
3. Inspection Personnel:

Name	Agency/Office	Telephone No.
a. Dan Meyers	CEPOH-EC-T	438-8875
b. LTC David Press	CEPOH-DE	438-1069

4. Discussion:

The breakwater has poor contact and armor sizing throughout the structure. This breakwater is not typical of the keyed and fitted construction used on other POH projects. The construction style is more of the random dumped armor stone type. New deficiencies were noted on this inspection and are indicated.

Conducted site inspection and noted the following:



- a. Overview at start of the existing Stub Breakwater from trunk to root. Ocean side is to the right, and harbor side is to the left.



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b. Overview at end of project from trunk to head. Ocean side is to the right, and harbor side is to the left.



c. Sta. 1+09, HS, dislodged armor stone 3' from toe. Void is half way up side slope.



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d. Sta. 1+15, OS, dislodged armor stone w/ voids, lower sideslope failure. No change 2003 Photo.



e. Sta. 1+40, OS, sideslope failure. 8 LF hinge to toe under layer exposed.



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f. Sta, 2+00, Reference stake.



g. Sta. 2+20, OS, 2 flipped armor stones on side slope.



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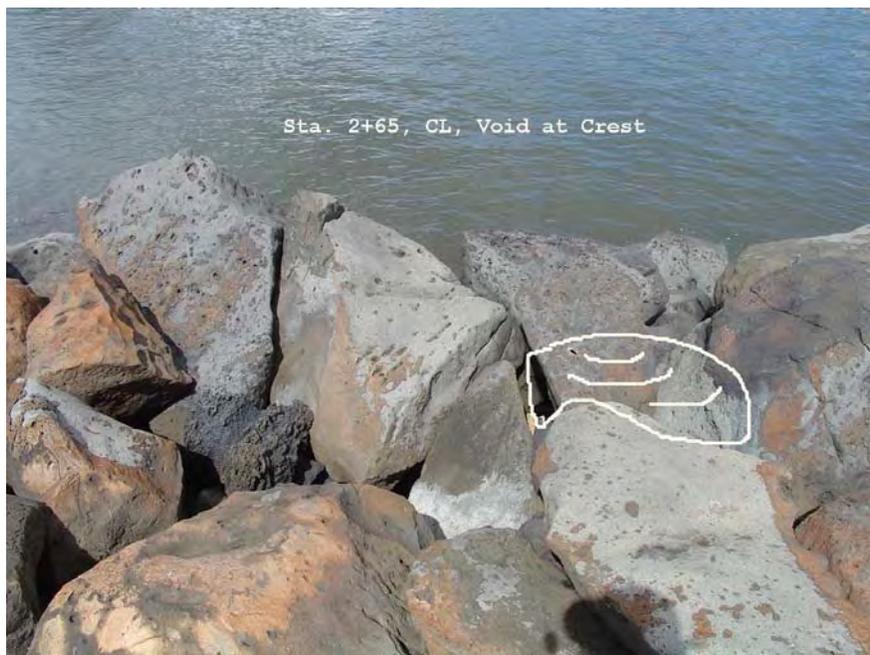
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h. Sta. 2+44, OS, side slope steepening. Void under side slope. Under layer not exposed. (Adjacent white cross)



i. Sta. 2+65, Crest, void.



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j. Sta. 2+65, HS, dislocated armor stones from sideslope, new this inspection.



k. Sta. 2+80, OS, Dislodged armor stones at water line.



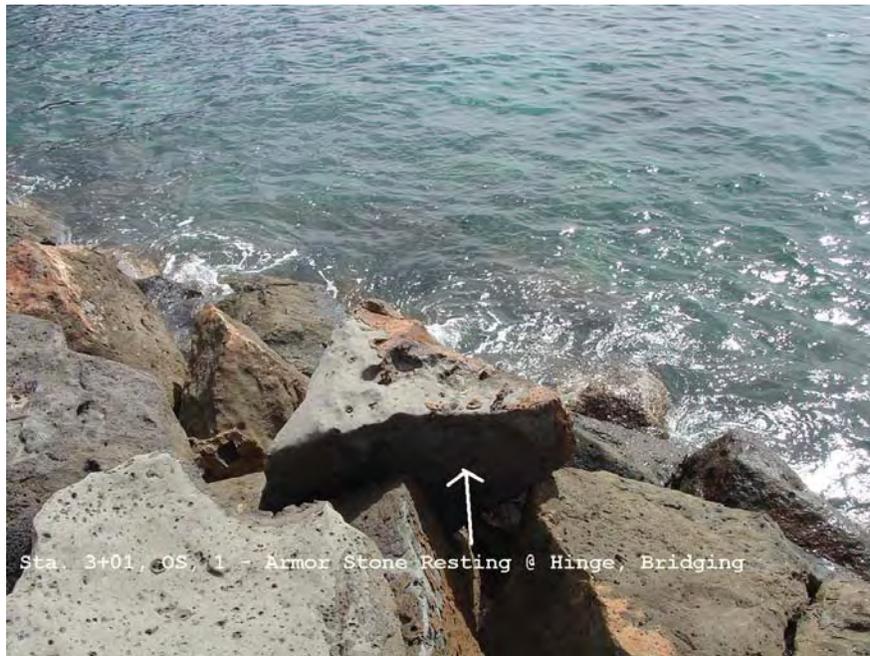
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1. Sta. 3+01, OS, 1 armor stone resting at hinge, bridging.



- m. Sta. 3+10, Void centerline of crest, new this inspection, adjacent white cross.



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- n. Sta. 3+40, 2 large voids at center line of crest.



- o. Sta. 3+55, HS, Large void/depression on sideslope.
- p. Sta. 3+74, OS, 3 dislodged armor stones at toe. 1 flipped armor stone at hinge.



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- r. Sta. 3+75, HS, 2 - voids on sideslope.
- s. Sta. 4+01, OS, 1 fracture armor stone at hinge.



- t. Sta. 4+22, OS, 1 armor stone dislodged resting on side slope, 1 fractured armor stone, void at waterline.



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u. Sta. 4+23, OS, hinge, void.



v. Sta. 4+51, OS, large void with exposed under layer. Dislocated armor stone is resting on side slope, which is also steepening.



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- w. Sta. 4+95, OS, sideslope movement, 1 - split armor stone.



- x. Sta. 5+00, HS, 1 armor stone at toe w/o contact, (possibly from void on the sideslope at Sta. 4+85, new this inspection).



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y. Sta. 5+05, HS, Void on sideslope, 2003 photo.



z. Sta. 5+14 to Sta. 5+42, OS, side slope steepening. Dislodged armor stone at toe with poor contact.



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aa. Sta. 5+60, OS, 1 - dislodged armor stone w/void.



bb. Sta. 5+67, HS, structure flattening and steepening at water line.



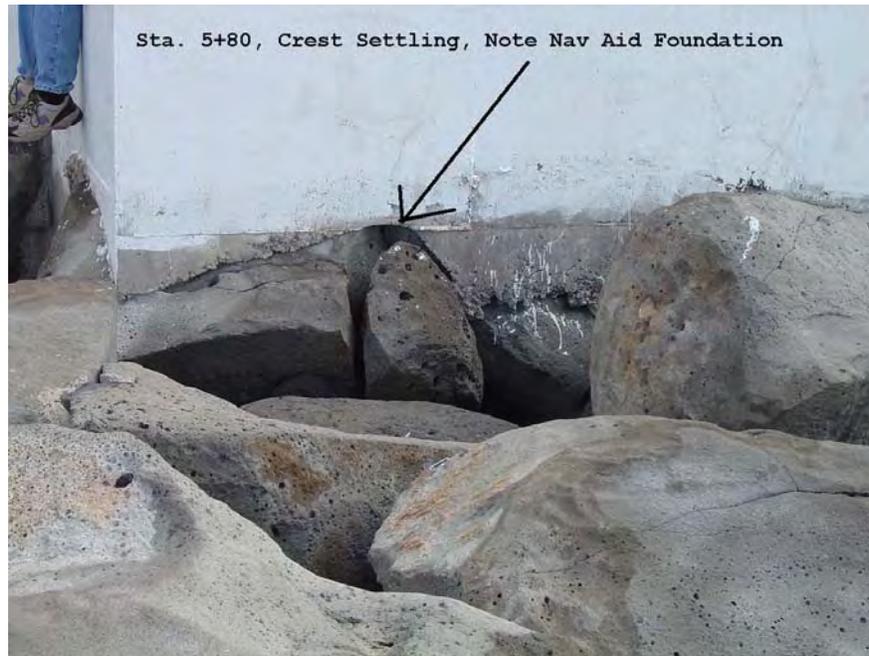
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cc. Sta 5+80, crest settling, note NavAid foundation.



dd. Sta. 5+87, picture taken from 22 degrees HS to 22degrees OS at the head of the structure. There is a possibility of a missing layer of armor stones at water line.



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ee. Sta. 5+87, picture taken from top of monument at 20 degrees HS to centerline of head at 0 degrees. There is a possibility of a missing layer of armor stones at water line.



ff. Sta. 5+87, picture taken from top of monument at center line of head at 0 degrees to 22 degrees OS. There is a possibility of a missing layer of armor stones at water line.



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gg. Sta. 5+87, Head, OS, Void, 90 deg.



hh. Reference Photo, Head to Root OS.



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ii. Reference Photo, Head to Root HS.

5. Conclusion:

After review of the past O&M inspections it appears the project was constructed with "extreme" randomness with respect to the armor stone placement and the noted items, while not the result of wave energy, are being exacerbated by wave action. The armor stones are not keyed and fitted resulting in loose and undersized which cause rocking. The lack of interlocking stones has created large voids, bridging, perched rocks, and exposed under layers and cores to direct wave action. The past photos reveal a steady decline in the contact of the armor stones. There has been some change in deficiencies.

Signed: _____
Dan Meyers, CEPOH-EC-T

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

Enclosure(s)

1. Site Plan (8½"x11")
2. Fact Sheet Dated June 2002 (8½"x11")