

DATE: 8/14/84

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SHEET

Marine Center: Pacific

OPR: T126

Hydrographic Sheet: H-10117

Locality: Penguin Bank, Offshore SE Coast Oahu, HI

Time Period: October 25, 1983 - November 21, 1983

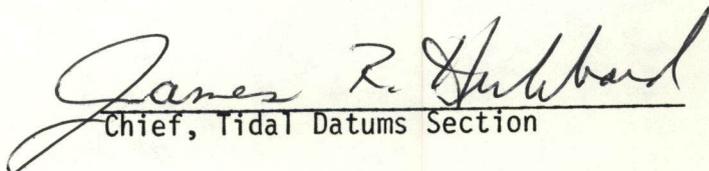
Tide Station Used: 161-2340 Honolulu, HI

Plane of Reference (Mean Lower Low Water): 3.69 ft.

Height of Mean High Water Above Plane of Reference: 1.5 ft.

Remarks: Recommended Zoning:

Zone Direct.


Chief, Tidal Datums Section

Field Tide Note
OPR-T126-FA-83
Oahu Island, Hawaii

The primary tide gauge (161-2340) at Honolulu, Hawaii, served as reference station for the predicted tides used on the Oahu Island project as stated in the Project Instructions, OPR-T126-FA-83.

Predicted tide correctors for the field sheets were interpolated aboard the FAIRWEATHER using the program AM 500 dated 10 NOV 72. Zone correctors from Project Instructions were applied to the reference station for hydrography on the inshore sheet FA-20-3-83 (H-10061) only. Due to the surveyed depths (between 100 & 2000 fathoms) of the offshore sheet FA-80-1-82 (H-10068), tide correctors were not applied to this survey. Since Project Instructions did not specify zoning correctors for the Penguin Bank area, correctors for the closest subordinate tide station (Hanauma Bay) were used to obtain the predicted tidal data used on the final field sheet of the offshore survey FA-40-1-83 (H-10117).

All times of both predicted and recorded tides are expressed in Universal Coordinated Time (UTC or Z). All predicted tides were acceptable for hydrography with no discrepancies in data attributable to tide errors.

Four tide gauges were used to support hydrographic operations of the Hawaiian Islands project, OPR-T126-FA-83. These gauges consisted of the primary reference gauge at Honolulu (161-2340); the primary gauge at Mokuoloe Island in Kaneohe Bay (161-2480); and the two field gauges established by FAIRWEATHER personnel; Laiemaloo (161-2702) and Haleiwa (161-2668). Installed at Laiemaloo was a Metercraft analog tide gauge, S/N 7602-705-101. The Haleiwa gauge was also a Metercraft analog recorder, S/N 7601-7536-29.

Levels

Third order levels were performed at all four tide stations before the beginning of hydrographic operations and again before departing the working grounds in accordance with Project Instructions, OPR-T126-FA-83, dated 31 AUG 83.

Levels were performed at the primary reference gauge in Honolulu, Hawaii (161-2340) on 29 SEP 83 (JD 272) and again on 22 NOV 83 (JD 236) between the reference mark of the electric tape gauge and three bench marks. Comparison of opening and closing levels to historic data showed no indication of any vertical movement in the marks or the tape gauge reference mark. The maximum deviation between present and historic levels was 2 mm. ✓

Levels were performed at the primary tide station on Mokuoloe Island, Kaneohe Bay, Hawaii, (161-2480) on 28 SEP 83 (JD 271) and again on 21 NOV 83 (JD 325) between the tide staff and three bench marks. Comparison of opening and closing levels showed no indication of any vertical movement in the marks or the staff. Present levels agreed to historic levels to within 1 mm. ✓

Levels at the Laiemaloo field tide gauge were conducted on 3/4 OCT 83 (JD 276/277) and again on 22 NOV 83 (JD 326) to the five existing bench marks from the staff. Closing levels agreed within 4 mm to opening levels indicating no vertical movement in the marks or the staff. The maximum deviation between present and historic levels was 2 mm. ✓

Levels for the Haleiwa tide gauge were conducted on five separate occasions during survey operations: 13 OCT (JD 286), 21 NOV (JD 325), 25 NOV (JD 329), 28 NOV (JD 332), and 1 DEC (JD 335), 1983. Opening levels were conducted on 13 OCT 83 to establish initial elevations for the five bench marks used.

The first set of closing levels were conducted on 21 NOV 83. Two problems were encountered during these levels. First, the onset of darkness precipitated the loss of the rod level bubble in the water near the staff thus preventing the closure of the level loop to the staff. The second problem was the discovery of a 0.802 meter discrepancy in the elevation of bench mark "2668 D 1983".

On 25 NOV 83, two level loops were run from bench mark "C&GS No. 5 1969" to "2668 D 1983" in an effort to resolve the 0.802 meter discrepancy. These levels confirmed that an error was made during the 13 OCT 83 opening levels.

On 28 NOV 83, one level loop was run from the staff stop to BM "2668 A 1983" in an effort to close out the levels begun on 21 NOV 83. These levels failed to confirm the opening elevation for BM A.

After piecemealing the levels to agree, the complete level run from the staff to all five bench marks were releveled on 1 DEC 83. These final closing levels agreed with the 13 OCT 83 opening levels for bench marks A, B, C, and No. 5 with a maximum variance of 3 mm. ✓ They also confirmed the run from C&GS No. 5 to BM D obtained from levels conducted on 21 and 25 NOV 83.

Operational Problems

The bubbler gauge at Laiemaloo only experienced two problems during the course of survey operations. The first problem detected was a minor inconsistency with the speed of the chart drive. This required only that the clock mechanism be reset several times during survey operations. The second problem occurred on 18 OCT 83 at 0135Z when high surf conditions tore the bubbler tubing apart at the surf zone. The bubbler tubing was replaced and the gauge was restarted at 0121Z on 26 OCT 83. No hydrographic data was lost due to this problem as ship survey operations were being conducted in water depths that ranged from approximately 100 to 2000 fathoms during the time of the gauge failure.

The Haleiwa bubbler gauge failed to collect tidal data on two occasions as a result of a dry pen. The first gap is from 0110Z on 9 OCT 83 to 2200Z on 13 OCT 83. The second gap is on 17 OCT 83 from 1130Z to 1902Z.

No hydrographic data was lost as a result of the 117 hour gap between 9 OCT and 13 OCT since only deep water ship hydrography was being conducted during this period of time. Interpolation can be used to provide tidal information for the 9.5 hour gap in tidal data on 17 OCT 83.

One additional problem was encountered with the Haleiwa tide record. The printed time on the chart paper was centered between time lines in such a way as to cause confusion for different observers as to the actual gauge time of observations. This problem was corrected during the final scan of the marigram.

No other problems were encountered with this or the other tide gauges.

For processing information the 0.24 foot mark of the staff at Haleiwa (161-2668) was found to be equal to the zero foot mark on the gauge. At Laiemaloo (161-2702), the 6.9 foot mark on the staff was equal to the zero foot mark on the gauge.