

# 4317 & 4320

# 4317 & 4320

Diag. Cht. No. 4116

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

## DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. H-4317  
Office No. H-4320

### LOCALITY

State HAWAII

General locality ISLAND OF MAUI

Locality LAHAINA ROADS-PAPAWAI PT. TO HEKILI

LAHAINA ROADS-HEKILI PT. TO PUONA PT.

1942

CHIEF OF PARTY

E. R. Hand

LIBRARY & ARCHIVES

DATE .....

4320  
4317

To accompany hydrographic sheets Nos. 1 and 2, Lahaina Roads, Maui, T.H. Party surveyed Oct-Nov. 1923, Eoline R. Hand, USC&GS., Chief of

1. The area that was under examination extends from Puuona Point at the northwest end to Papawai Point on the southeast and is plotted on two sheets which join at Hekili Point, sheet No. 1 starting at the point first named. Soundings were carried out to at least twenty fathoms, and in many cases much further in order to be certain that the water did not again shoal. This will explain the great number of "no bottom" soundings, generally regarded as objectionable; but the party was not equipped for taking soundings much over the required twenty. The development was accomplished by lines run normal to the shore and 100 metres apart, and much less at critical places - like points and landings - and in localities where the unevenness of bottom suggested the possible existence of dangers. The scale was 1:10000 and the control the adjusted triangulation of this area.

2. No dangers of any kind were discovered. Minute investigation of each and every suspicious sounding was made, bringing to light nothing more than bottom irregularities, and in two or three instances undoubtedly erroneous leadline readings. Particular attention was given to the coral reef which starts off Launiupoko Point (the one midway between Hekili and Makila points) and trends northwest, roughly paralleling the shore. For a vessel is said recently to have struck here, and the danger reported as quite some distance offshore; and because of this report I believe that some vessels have been giving the point a wide berth - a mile at least - which is quite unnecessary, since a close double-spaced development brings out the edge of the coral shelf as a slightly convexing line with its SE end three hundred (300) metres off the Launiupoko Point proper (now marked temporarily by a large white tripod signal) and its NW end a little over a half mile further along, and four hundred and fifty (450) metres from the shore of the bight there; and it defines the six fathom curve but fifty yards or so outside this shelf edge, with consistently deepening water outside of that. The ten fathom curve itself is but five hundred metres off the point proper - where the signal stands.

3. But of known dangers attention is directed to the foul water south of Hekili Point (Olowalu). The six fathom curve is seven hundred yards off this point, and inside of this is full of coral heads. Small craft should beware of seeking a lee in the bight to the eastward because of them and they persist eastward - making smallboat landing dangerous - all the way to the beginning of the pali, where the shore changes abruptly from beach to cliffs. But there is one place in this stretch fairly free from these coral heads, and that is off the great concrete bridge that is over the stream draining Ukumehame Gulch. This suggests a possible landing midway between Oluwalu and the beginning of cliffs. Probably the fresh water from the gulch keeps down the coral growth. The bridge, by the way, is one of the landmarks listed. It is called "brid" on sheet 2.

4. Olowalu, which is marked by a sugar mill with prominent stack, offers an indifferent landing. There is a pier there and vessels approach it from the southwest - thus avoiding the dangerous reef off Hekili Point - and anchor rather close in, sending smallboats, in fair weather, to the east side of it, at the derrick. But the landing is through shoal water which seems nearly always breaking.

5. Between Puuona Point and Olowalu the bottom is quite regular, and the

twenty fathom curve parallels the shore about two-thirds of a mile out: though off Lahaina and Puuona Point the bottom is a little uneven, and the same curve runs in a most erratic manner, and much further offshore directly off the point a loop juts out nearly two miles. A possible explanation of this shoaling in such a peculiar manner is in my statement about the currents, where I mention the interesting fact about the current shooting sharply to the west from Puuona Point a long ways for a short time around high water. Silt is doubtless dropped along that line of flow. But on sheet 2 (Helili Point to Papawai Point) the bottom is more irregular, and the twenty fathom curve rapidly approaches the coast towards the east, till at Papawai Point it is but two hundred yards off. Along the pali westward from this point the water is deep rather close to, but with the beach line the dangerous coral heads commence, as I have mentioned in paragraph 3.

6. The regularly used landings are at Lahaina and Mala. Steamers formerly discharged off Lahaina, but no longer. The dock is now used by sampans and other small boats in a more or less regular service to and from the island of Lanai. There is an opening in the reef through which they pass by keeping in line with the white buoy outside and the light (Fl. red) that stands at inner end of wharf face. There is about three feet alongside this wharf. begin The new concrete pier at Mala is now the landing for the steamers that formerly used Lahaina. It is a substantial structure three hundred metres out from the west side of Puuona Point, lies NW and SE, about 25 metres by 80 metres, and is connected with the beach by a narrower viaduct that is a continuation of the NE face. There is thirty feet of water at outer end, shoaling to about twenty five at inner. The regular passenger steamers will not, however, come alongside this wharf. They have in my opinion good reasons behind their contention that the currents in that vicinity render coming alongside, and lying alongside, the wharf as at present constituted a dangerous proposition.

7. During the course of the work I have observed a number of things relative to currents in this vicinity, and particularly in their action about the wharf at Mala. It has been noticed for some time that with a falling tide the free current outside runs north, and with a rising tide the current flows south: though inshore at one or two places - notably Mala and on south side of Hekili Point (Olowalu) the configuration of the shore is such that the inshore current may at times go in the opposite direction, swirls and eddy currents being most noticeable. Now at Mala wharf with a rising tide the current outside is (as I have just stated) running south: and at the wharf itself it is also running south, and with considerable strength. These various currents flow along, the inner ones tending to follow the curve of the bight, and converge at the coral reef off Puuona Point, around which they sweep with ever-increasing strength. With the continued rising tide the current sweeps around this point and continues south or southeast, roughly paralling the coast. But as the slack is approached this stiff current from Mala bight, meeting the banked waters to the south of point, shoot directly offshore past the gas buoy and to the westward a mile or more, when with the tide fully turned the increasing ebb makes it bend sharply back at the point and afterwards join the northerly flow from there. But with a falling tide there is no longer such orderly and consistent behavior of the resulting northerly current as we have observed with the other. For at the turn - or a half hour or so after HW - the current about the pier becomes confused, periods of no current alternating with uncertain attempts at a northward flow till finally, at around half tide, it gets its stride, so to speak, and settles down to a flow that is actually southerly as before, with about the same velocity, the which counter-current appears to persist unchanged and unabated in direction and force right on into the next tide (rising) and its normal southerly flow. Summing up, then, there is the greater part of the time a current passing under Mala wharf and in a southerly direction, diagonal to it. It is liable to set a steamer down hard upon it, if attemptingt the north side. Once suc-

cessfully alongside here the current under the dock would doubtless cause undue chafing; and if tied up on the other side there is danger of being pulled away, with the lines parting, and being set over on the reef. The best time to come alongside Mala wharf as at present constructed is just at flood tide and for an hour or so afterwards, i.e., when the water outside is slack (high) and just beginning to fall, flowing north, as I have shown. If an ell were built out from the present end, running north around two or three hundred feet, vessels could get alongside and clear away parallel with the prevailing currents, and would possibly lay better in respect to the winds and the southerly swell.

8. There are two lights on sheet 1, none on sheet 2. A gas buoy, Fl.R., marks the reef at Puuona Point, and a light at Lahaina, Fl.R., stands behind the wharfshed, on a square slender tapering tower. This last is listed as flashing every three seconds, but when I arrived in Lahaina last October it was flashing every four, and now in December it is nearly five seconds between flashes. By several tests it was observed to flash twelve times in fifty eight seconds.

\* has since been read 4/25/23 12/1/23

9. A number of landmarks are separately listed, in order that the exceptionally close development may be utilized to the fullest extent by the ability to obtain accurate fixes from them over any part of the water area. Those marked with a (Tr) are triangulation determinations; the others are locations by plane-table methods. They are as follows, starting at northwest end: 1. Stonecrusher, (on the shore 1 1/2 mi. beyond Mala wharf) 2. Laina Hill (Tr), (smooth, symmetrically shaped dome just west of Lahainaluna) 3. Lahainaluna School, (gable of main building, yellow; flagpole in front; marked further by straight line heavy trees running from it down toward sea) 4. Stack, (on pumping station of Pioneer Mill Co., half mile east of Mala wharf) 5. Mala Wharf, (the outer gable) 6. Mill Stack (Tr) (highest and largest of three on sugar mill of Pioneer Mill Co.) 7. Lighthouse (at Lahaina) 8. Flagstaff (Tr) (front of courthouse, Lahaina) 9. Stack, (on pumping station of Pioneer Mill Co. east of Lahaina, similar to No. 4) 10. Cairn, (whitewashed cairn on Makila Point; hyd. sig. "Try") 11. Launiupoko Village; (the upper end of long straight road marked by line of ironwood trees; forms a conspicuous "T" where it enters village) 12. Launiupoko, (Tr) (tripod on hill of same name that is a mile back from point, between Makila Point and Olowalu; not to be confused with lower and sharper hill just SE of it) 13. Tripod, (large tripod, cloth covered, on Launiupoko Point) 14. Cliff (whitewash on isolated cliff patch just east of above point; hyd. sig. "Tas") 15. Quarry, (conspicuous white scar on slope of Launiupoko hill, between tripod on top and Cliff, Nos. 12 and 14) 16. Kilea (Tr) (low hill back of Olowalu, has tripod) 17. Stack (slender stack on sugar mill at Olowalu) 18. Cupola, (on ruined church in light east of Olowalu; at present inconspicuous because weatherworn; named "Cup" on sheet) 19. Bridge, (large concrete bridge near beach, over stream from Ukumehame Gulch; smaller bridge to east; named "Brid" on hyd. sheet) 20. Crevice (deep angular cleft at top isolated cliff patch where beach ends, four miles east of Olowalu; many niches or caves seen below; road runs along base; hyd. sig. "Crev" on sheet) 21. Papawai Point (whitewashed point, extreme end; hyd. sig. "Pau") The Radio Tower at other end work was not listed, as it may be taken down soon, there being no station now at that place. Photos of these landmarks are submitted with my Semi-Annual Report for 1923. Copies may be obtained from me.

10. From signal "End" to Mala Wharf the shore is sand beach, and smallboat landings are possible. From the wharf around Puuona Point to Makila Point is coral reef, with but two openings, at Lahaina wharf, and opposite hyd. signal "Wire" From Makila Point past Makila village (made prominent by a grove of ironwood trees) for one mile the shore is sand and shingle alternating, with one rock point at signal "Dad", and smallboats ought to be able to effect safe landing if surf

not high. But there is coral all around Launiupoko Point. From this point to Olowalu is apparently free from coral; the beach is sand and shingle, and appears steepest (this affording best smallboat landing) just east from the isolated cliff patch that is whitewashed. See landmark No. 14. Smallboats can generally get in to Olowalu landing, as I said in paragraph 4 (not launches; however) but from there to the beginning of cliff (see par. 3) landing is a dangerous undertaking because of the coral heads, with the possible exception I mentioned at Ukumehame bridge. The water is deep at the base of the cliffs, and, due regard being had for possible sunken rocks, landings may be made on many of the ledges, with a favorable condition of the sea.

11. The report is concluded with a brief description of the appearance of this coast: At Mala, in addition to the recently built wharf, is seen the new pineapple cannery of the Baldwin Packers, a long, low structure rendered most prominent by roof and sides of galvanized corrugated iron. To the west along the beach is an extensive coconut grove, while behind from here to Lahaina and beyond the land rises in a gentle smooth cane covered slope running back several miles, ~~the~~ the which cane area becomes more constricted the further east, till it disappears entirely at the base of the prominent Launiupoko Hill. But a short distance beyond this hill - and its sister hill alongside - the cane commences again: now it is but a narrow band, and on an almost level strip. It extends (excepting a short break at the church in the bight, signal "Cup") two miles beyond Olowalu, to the big concrete bridge over the Ukumehame Gulch drainage. From here on the familiar algeroba that hitherto had held but a scant foothold along the shores, now runs riot over the flats back to the steep rise of the mountains, and east as far as the beginning of the cliffs that constitute the coast to Papawai Point and around into the bay: while behind these cliffs - on top of which the road is seen to meander precariously - the barren land rises rugged and steep.

Colin G. Land.

Owing to the fact that the Naval personnel and boats were on the ground and waiting to go to work, before my stationery and data arrived the shoreline and stations were located geographically on paper purchased locally. Later the shoreline and stations and what scant revision it was found necessary to make, was adjusted and transferred to smooth sheet from this paper, which also served as the base sheet.

The order called for a Hydrographic Survey, so the only enough land features are shown to enable to tie in with existing records. Such changes as were found were of course shown.

In compiling it is recommended, among other sources, that the Geological Survey sheets be used for details, and also our topog. sheet. 3268  
Recommend plot all the positions given.  
PKH

## STATISTICS SHEET NO. 2.

(Hekili Point to Papawai Point, Island of Maui, T.H.)

Eoline R. Hand, Chief of Party.

date, 1923	letter	volume	positions	soundings	miles, stat.	vessel
Oct. 24	a	1	115	284	15.0	motor sailer
" 25	b	1	141	347	14.0	" "
" 26	c	1	24	34	3.0	" "
Nov. 6	d	1	127	298	12.0	" "
" 8	e	1	85	178	11.0	" "
" 13	f	1	106	205	11.0	" "
" 14	g	1	55	70	4.0	" "
" 14 (cont)	g	2	64	92	4.75	" "
TOTAL			718	1517	74.75	

LIST OF POSITIONS

4317

(planetable locations; for landmarks)

Sheet No. 2, Hekili Pt. to Papawai Pt. Maui, T.H. Eoline R. Hand, C. of Party.

Name	Lat.	D.M.	Long.	D.P.	Description
"Cup"	No. 18	20° 48'	156° 36'	1234 (501)	Cupola on old church in cove east of Olowalu.
				1845 (1481)	
"Brid"	No. 19	20 48	156 35	* 1486 (350)	Large concrete bridge over drainage from Ukumehame Gulch.
"Crev"	No. 20	20 47	156 34	90 (1645)	Deep cleft in top cliff patch where beach ends; 4 mi. E. of Olowalu; many niches or caves seen below; road runs along base.
"Pau"	No. 21	20 46	156 32	590 (1136)	Whitewash patch on Papawai Point.

Values should be

D.M.      D.P.  
360      1155  
(1485)      (580)

E.P.

STATISTICS SHEET NO. 1.  
(Puuona Point to Hekili Point, Island of Maui, T.H.)  
Edline R. Hand, Chief of Party.

date, 1923	letter	volume	positions	soundings	miles(stat)	vessel
Oct. 16	a	1	37	105	7.25	motor sailer
" 17(rej't'd)	b	1	0	0	0	" "
" 18	c	1	172	283	16.0	" "
" 19	d	1	165	387	16.5	" "
" 22"	e	1	162	391	18.0	" "
" 23	f	2	152	322	15.5	" "
" 24	g	2	47	97	4.0	" "
" 30	h	2	64	107	2.5	" "
" 31	i	2	127	242	12.0	" "
Nov. 1	k	2	137	293	18.0	" "
" 2	l	2	99	266	7.5	" "
" 2 (cont)	l	3	31	66	2.5	" "
" 3	m	3	104	241	9.0	" "
" 7	n	3	57	129	5.50	" "
" 9	o	3	20	49	1.50	" "
" 15	p	3	59	112	1.0	" "
" 16	q	3	91	152	4.0	" "
" 17	r	3	104	200	11.5	" "
" 19	s	3	108	196	10.5	" "
" 20	t	3	85	143	4.2	" "
" 20 (cont)	t	4	34	57	2.8	" "
" 21	u	4	195	330	15.0	" "
TOTALS			2051	4168	184.75	

Tide staff at Lahaina

Plane of Reference, MLLW.

Datum on staff, present survey, 0.577

## LIST OF POSITIONS

4320

(planetable locations: for landmarks)

Sheet No. 1, Puuona Pt. to Hekili Pt., Maui, T.H. Eoline R. Hand, Chief of Party.

Name	Lat	D.M.	Long	D.P.	Description
"Crush" No. 1 Stonecrushed	20°54'	1440 (405)	156°41'	803 (832)	On the shore 1 1/2 mi. N. of Mala wharf.
Lahaina - No. 3 School	20 53	930 (915)	156 39	1253 (482)	Gable of main bldg., yellow: flag- pole in front.
"Pup" No. 4 Stack	20 53	730 (1115)	156 40	1707 (28)	On pumping sta. of Pioneer Mill Co. 1/2 mi. east of Mala wharf.
"Mal" No. 5 Mala Wharf	20 53	741 (1104)	156 41	791 (944)	Outer gable wharf shed.
"Burn" No. 7 Lahaina Lt.	20 52	922 (923)	156 40	1509 (226)	Slender tapering square struct- ure, wh. At wharf. FL.R. ev. 3 sec.
Stack No. 9	20 52	947 (908)	156 40	471 (1264)	On pumping sta. Pioneer Mill Co. E. of Lahaina; similar to No. 4.
"Try" No. 10 Cairn	20 51	1358 (487)	156 40	556 (1179)	Whitewashed cairn at Makile Pt.
Launiupoko Vil- lage No. 11	20 51	668 (1177)	156 39	20 (1715)	Where the long, straight, ironwood tree lined road runs into camp, forming a distinct "T" (at r.r.)
"Gab" No. 13	20 50	570 (1275)	156 39	47 (1688)	Large tripod signal, white, on Launiupoko Pt.
"Tas" No. 14	20 50	203 (1642)	156 38	986 (749)	White spot on isolated cliff patch east of Launiupoko Pt.
Quarry No. 15	20 50	595 (1250)	156 38	726 (1009)	Conspicuous white scar on slope between Laun. sig. and "Tas"
Buoy, Lahaina	20 52	614 (1231)	156 41	317 (1418)	White can, marking reef opening to wharf, for smallboats.
Gas Buoy Puuona Pt.	20 53	260 (1585)	156 41	1183 (552)	No. 2, FL.R.

POST-OFFICE ADDRESS:

223 Federal Bldg. Honolulu, T.H.

TELEGRAPH ADDRESS:

EXPRESS OFFICE:

STATION  
TELEPHONE  
SALES  
GEODESIC



DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

JAN 17 8 52 AM '24

OFFICE  
LIBRARY  
MAGNETIC

Honolulu, Jan. 3, 1924.

*Charts*

To: The Director, U.S.Coast & Geodetic Survey,  
From: Eoline R. Hand, H&GE.,  
Subject: Records Lahaina Roads Survey.

FIELD RECORDS (C)

I have to inform this Office that Sheet 2, Hekili Pt. to Pawai Pt., which was mailed yesterday, lacks the "bottom symbols" as required. The sheet was wrapped up before my instructions had been complied with, and in the final inspection the fact that the bottom characteristics had not been placed on smooth sheet escaped my notice.

*Eoline R. Hand*

Eoline R.Hand, H&GE.

Hydrographic Sheet No. 4317  
Island of Maui - Hawaii

The area surveyed covered by this sheet appears sufficiently well developed and no additional work will be required. The line are run about 100 metres apart and quite evenly spaced and while some open area appear the adjacent lines do not indicate possible shoaling or dangers.

The projection made by the field party was not verified, or at least not so recorded: This should have been done. Verification shows a large shrinkage

The paper used for the smooth sheet is of poor quality and its use should be prohibited as good work is quite out of question.

The plotting by field party found generally good but position holes are pricked too large and letters and numbers too large and not clear; This evidently due to paper.

Plotting not so good as irregular time recorded appears to have been ignored and soundings evenly spaced.

Records require no criticism.

John D. Torrey Sr  
3/15/24

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY  
WASHINGTON

March 27, 1924.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4320

Island of Maui, Hawaii  
Lahaina Roads-Hekili Pt. to Punona Pt.

Instructions dated August 31, 1923.

Chief of Party. E. R. Hand.

Surveyed by E. R. Hand.

Protracted and soundings plotted by E. R. Hand, S.R. Acharo & D.K. Kahanu.

Verified and inked by H. R. Edmonston.

1. The sounding records are complete but a good many corrections have been made in the angles.
2. As most of the ends of long lines were out about 20 to 50 meters it appears that the protractor was not checked before the work was started.
3. There was no effort made to plot the soundings according to time. They were all evenly spaced.
4. The area surveyed appears to be sufficiently well developed with investigations made of shoal spots.
5. The sheet is very clean but badly ruffled up. The position numbers were not placed north and south and were poorly inked evidently due to the poor paper used.
6. All of the soundings plotted by the use of  $\odot$  Pup (pumping station stacks) were left uninked due to the fact that this station was changed about 50 meters after the work was plotted.
7. The boat <sup>sheet</sup> shows this station on the northeast side of the pumping station as it was used in plotting up the sheet.
8. After the smooth sheet was plotted this station was moved to the south east side of the pumping station.
9. The true position should be found before the rest of the work is inked.

May 13, 1924

*H.R. Edmonston*  
As the information received from the field  
verified the new position of  $\odot$  Pup the work  
left uninked was replotted by the undersigned  
*H.R.E.*

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

WASHINGTON

April 28, 1924.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4317

Lahaina Roads, Maui

Surveyed in 1923.

Instructions dated August 31, 1923.

Chief of Party, E. R. Hand.

Surveyed by E.R. Hand.

Protracted by S. R. Aclaro.

Soundings plotted by E. R. Hand.

Verified and inked by J. D. Torrey.

Shoreline and topography surveyed by E.R. Hand in 1923.

1. The records conform to the requirements of the General Instructions.
2. The plan and character of development conform to the requirements of the General Instructions.
3. The plan and extent of development satisfy the specific instructions.
4. The sounding line crossings are adequate.
5. The information is sufficient for drawing the usual depth curves except just east of Hekili Pt. where the development is too open. As this area is too foul for navigation the omission is unimportant.
6. The field plotting was completed to the extent prescribed by the General Instructions. Owing to the poor quality of paper used considerable difficulty and loss of time was caused the office draftsman in inking the sheet. Many of the soundings were taken at uneven time intervals, but these unequal intervals were ignored in the field plotting. The position holes were pricked too large and the position numbers also are too large.
7. The junction with the adjoining work on the west is satisfactory.
8. No further surveying is required within the area of the sheet.
9. The character and scope of the surveying are excellent and the field drafting fair.
10. Reviewed by E. P. Ellis, April, 1924.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

WASHINGTON May 21, 1924.

SECTION OF FIELD RECORDS

Report on Hydrographic Sheet No. 4320

Lahaina Roads, Maui

Surveyed in 1923

Instructions dated August 31, 1923

Chief of Party, E. R. Hand.

Surveyed by E. R. Hand

Protracted by E. R. Hand, S. R. Aclaro and D. K. Kahanu.

Soundings plotted by E. R. Hand and S. R. Aclaro.

Verified and inked by H. R. Edmonston.

Shoreline and topography by E. R. Hand in 1923.

1. The sounding records conform to the requirements of the General Instructions except that bottom characteristics were omitted on two days.
2. The plan and character of development conform to the requirements of the General Instructions.
3. The plan and extent of development satisfy the specific instructions.
4. The sounding line crossings are adequate.
5. The information is sufficient for drawing the usual depth curves.
6. The field plotting was completed to the extent prescribed by the General Instructions. Owing to the poor quality of paper used considerable difficulty and loss of time was caused the office draftsman in inking the sheet. The position numbers and letters do not face the north. The soundings were plotted at uniform distances apart, instead of spacing them to agree with the uneven time intervals. Uniform errors of 20 to 50 meters in plotting the outer ends of the sounding lines indicate that the protracting was done with an instrument that was out of adjustment.

7. The junction with the adjoining work on the south is satisfactory.
8. No further surveying is required within the limits of the sheet.
9. The character and scope of the surveying are excellent and the field drafting fair.
10. Reviewed by E. P. Ellis, May 20, 1923.

February 26, 1924.

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in  
2 volumes of sounding records for

HYDROGRAPHIC SHEET 4317

Locality: Island of Maui, T. H.

Chief of Party: E. R. Hand in 1923

Plane of reference is mean lower low water reading  
0.6 ft. on tide staff at Lahaina

For reduction of soundings, condition of records satisfactory  
except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.



Chief, Division of Tides and Currents.

February 26, 1924.

Division of Hydrography and Topography:

Division of Charts:

Tide reducers are approved in  
4 volumes of sounding records for

HYDROGRAPHIC SHEET 4520

Locality: ~~Mani~~ Island, T. H.

Chief of Party: E. R. Hand in 1923

Plane of reference is mean lower low water reading  
0.6 ft. on tide staff at Lahaina.

For reduction of soundings, condition of records satisfactory  
except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of each day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.



Chief, Division of Tides and Currents.

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

4317

4317

HYDROGRAPHIC TITLE SHEET

Sheet No. 2.

The finished Hydrographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Register No. (2) 4317

State ~~For~~ Hawaii

General locality ~~Island of Maui~~

Locality Lahaina Roads — Papawai Point to Hekili Point  
~~Hekili Point to Papawai Point (Lahaina Roads)~~

Chief of party Eoline R. Hand

Surveyed by Eoline R. Hand

Date of survey October - November, 1923

Scale 1:10000

Soundings in feet

Plane of reference \* mean lower low water

Protracted by S.R. Aclaro . Soundings in pencil by Eoline R. Hand

Inked by J. D. Torrey . . . Verified by J. D. Torrey . . .

Records accompanying sheet (check those forwarded):

Des. report, X Tide books, 1 Marigrams,        Boat sheets,  
1 Sounding books, 2 Wire-drag books,        Photographs.

Data from other sources affecting sheet

in compiling consideration should be given

Remarks: to topographic sheet No. 3268, and to  
U.S. Geol. Survey Sheet of MAALAE A QUADRANGLE, which last  
sheet is enclosed.

\* Tide Staff at Lahaina: used datum determined 1900 by Perkins.

Plane of Reference on my staff was 0.577  
 Lowest tide, on my staff was 0.58  
 Highest " " " " 2.95

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

SHEET NO. 1.

~~Confidential~~

The finished Hydrographic Sheet is to be accompanied by the following title sheet, filled in as completely as possible, when the sheet is forwarded to the Office.

U. S. Coast and Geodetic Survey.

Register No. 4320

State ~~ex.~~ Hawaii

General locality ~~Island of Maui~~

Locality ~~Puuna Point to Hekili Point~~ <sup>no:</sup> Lahaina Roads - Hekili Pt. to Puuona Pt.

Chief of party Eoline R. Hand,

Surveyed by " " "

Date of survey Oct. - Nov. 1923.

Scale 1:10000

Soundings in feet

Plane of reference mean lower low water

Protracted by <sup>E.R.H.</sup> S.R. Aclero Soundings in pencil by <sup>E.R.H.</sup> S.R.A.  
<sub>D.K. Kahanu</sub>

Inked by . . . . . Verified by . . . . .

Records accompanying sheet (check those forwarded):

Des. report, \* Tide books, \* Marigrams, ~~1~~ Boat sheets,

~~4~~ Sounding books, Wire-drag books, Photographs.

# U.S. Geol. Survey map - Mauniupoko Quadrangle  
Data from other sources affecting sheet

above Geol. Survey map

USC&GS topographic sheet No. 3268

Remarks:

\* Descriptive Report, and tide book, covering both sheets, went in with Sheet No. (1.) - ?

π under separate cover

Tide Staff at Lahaina: datum on this staff = 0.577

a descriptive report came with sheet 2 - S.R.