

5853

Form 504  
Rev. Dec. 1933  
DEPARTMENT OF COMMERCE  
U.S. COAST AND GEODETIC SURVEY  
R. S. PATTON, DIRECTOR

## DESCRIPTIVE REPORT

~~Topographic~~ } Sheet No. 15  
Hydrographic } Includes Wire Drag

State California

LOCALITY

Golden Gate

Bonita Channel & Cove

1935

CHIEF OF PARTY

F. H. Hardy

DEPARTMENT OF COMMERCE  
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY  
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REG. NO.

AUG 2 1935

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HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 13

REGISTER NO. **5853**

State California

General locality California Coast

Locality Bonita Channel

Scale 1-10,000 Date of survey Jan. 10 to June 13, 1935

Vessel Point Reyes and Motorsailer

Chief of Party E. H. Hardy

Surveyed by Wire Dragging by W. J. Chovan  
L. P. Raynor

Protracted by T. M. Means, N. G. Korneeff, T. A. Renton

Soundings penciled by T. M. Means

Soundings in ~~fathoms~~ feet Drag Depths in feet

Plane of reference M. L. L. W.

Subdivision of wire dragged areas by T. M. Means

Inked by Wire Drag inked by T. M. Means *us. by James Carmick*  
James Carmick

Verified by James Carmick

Instructions dated May 31, 1934 Letter of Feb. 4, 1935

Remarks: Visual Fix Hydrography. Soundings by Wire and

Hand Lead. Wire Drag to Supplement Hydrography.

DESCRIPTIVE REPORT  
to  
accompany  
HYDROGRAPHIC FIELD SHEET NO. 13  
SHIP GUIDE  
F. H. HARDY

*Letter pertains to the close  
development in the locality of  
Centissima Rk and in the  
immediate locality of the 38 fms  
sounding approx. 1/2 mile west of  
Bonita Pt. Q*

AUTHORITY:

The authority for this work is contained in Par. 6b of  
INSTRUCTIONS- Project HT 184, 22 RS, 1995 GU 1, dated May 31,  
1934, and in letter 22 - SG 1995 GU 4 of February 4, 1935;

Subject: Field Work.

LIMITS; SCALE.

A complete hydrographic survey was made from Point Diablo  
westward to Point Bonita, thence northwestward to a junction  
with sheet H 4975, O. W. Swainson, 1929. It extends approximately  
 $1\frac{1}{2}$  miles offshore, to conform with line shown on chart 5532, ( as  
drawn in Washington Office), and to a satisfactory junction with  
H 2504 (1900), except that in the Golden Gate, the hydrography  
was not carried much beyond the 20 fathom curve.

The work was done on a scale of 1:10,000

PARTY, VESSELS; DATES.

The work was done by the usual complement required for launch  
hydrography, and in charge of L. P. Raynor, H. & G. Engineer. H. G.  
Conerly, Aid, was assigned to the party for the latter part of  
the work, while N. G. Korneeff, Observer, took left angle for  
the rest of the time. In addition to the regular personnell needed  
for the hydrography, a cook was assigned while the work was  
being done from the chartered launch POINT REYES.

The field work was done in January, February, March and

April, 1935, using the chartered launch POINT REYES from January 10 to March 14. The motor-sailer from the ship GUIDE was used for all the other work, except a small development with dory.

#### CONTROL

The signals used by the hydrographic party were either located by triangulation or with a planetable using an aluminum mounted paper sheet. The topographic survey was made just before the hydrography was started.

#### METHODS

Boat positions were obtained when the leadline or wire was vertical, by the usual sextant three point fix, using as objects, targets over triangulation stations or signals, which had previously been located by the topographic party. At the end of a few inshore lines, it was necessary to use a tangent of point or a rock which had been located by the topographer, but had not been determined especially for a hydrographic signal.

The sounding clock with electric buzzer was used for most of the time when sounding with boat underway. When because of changing interval, it became necessary to use the voice; the order to sound, was given, "on the second", in the same manner as with the buzzer. In general, soundings were taken underway for depths less than 12 fathoms; using 12# lead with leadline marked in fathoms and feet. For soundings greater than 12 fathoms, the vessel was backed and stopped, and vertical casts were obtained with a 25 # lead attached to stranded sounding wire, running over stand-

and registering heave. The leadline was read in fathoms and feet, except when the sea and swell was such that it was possible to read with some certainty in fathoms, feet and tenths. Wire soundings were recorded in fathoms and tenths of fathoms.

DANGERS, SHOALS.

1) Centissima Rock which is a large rocky patch of considerable extent, is the main offlying danger. The bottom is uneven with many sharp pinnacles. Two soundings each of 37 feet, were found close together, on this rock and adjacent to Bonita Channel. A least depth of 33 feet was found <sup>about 150 meters</sup> to the north of Sears Rock, and agrees with the depth as shown on chart.

2) A least depth of 16 feet was found in Lat. 37 50.3, Long. 122 33.35, where a depth of 20 feet is shown on the chart.

3) A least depth of 28 feet in Lat. 37 50.5, Long. 122 33.35 and about 150 meters offshore was found in generally deeper water.

4) Two sunken rocks with depths of 5 and 6 feet respectively, were found in Lat. 37 51.2, Long. 122 34.1 and somewhat southeast of a 4 ft spot shown on the chart.

5) A sunken rock which is 2 feet below MLLW (by estimation) was located in Lat. 37 51.6, Long. 122 35.3, by bearing and distance from sounding line. Hyd. signal "Breaker".

*Blotted as rocks washed by surfers*

<sup>shoals</sup>  
All the above are already charted with the exception of Nos. 3 and 4 above.

## TIDE RIPS

East of Long. 1220, 33' and immediately south of the Four Fathom Bank, tide rips were experienced frequently. They were increasingly heavy as the lower end of Bonita Channel, and Bonita Point were approached. They were noted out to a point about  $\frac{3}{4}$  miles southeast of Point Bonita, where on one sounding day, moderate rips with a strong current whirl were experienced. Rips were often noted close to Point Diablo, when an ebb current was met by the eddy current coming out of Bonita Cove.

## BREAKERS, SWELLS.

With a moderate to strong ebb current running out the Golden Gate, breakers were seen on the Four Fathom Bank, on several occasions, when only moderate or light swells were experienced in the deeper water, immediately north of Potato Patch Shoal. With a strong ebb current, heavy swells were experienced close to Point Diablo, when on one occasion only moderate swells were noted about one half mile south of this point.

## DISCREPANCIES.

The few discrepancies noted in the present survey, are practically all just south of the Four Fathom Bank. This is the area where tide rips are frequent and often heavy, and the bottom appears irregular and spotted with potholes, probably caused by the current whirls. It is quite probable that the bottom, which is in general, composed of fine sand, is changed

slightly from day to day, and considerably, after storms and heavy swells.

STATION "SLIDE U.S. E."

The location of this station, which also appears on sheet H 4975 was computed from data furnished by the U. S. Engineer Office in San Francisco. The geographic position as computed by this party is Lat.  $37^{\circ} 52' 22.35''$  Long.  $122^{\circ} 35' 48.94''$  Computations and data are being submitted with this report.

TIDAL DATA

Portable automatic tide gage No. 147 was installed on the wharf of the U. S. Coast Guard in Bonita Cove on January 4, 1935 and is still being operated there. The data from this gage was used for determining tide reducers on all of this sheet. No time or height correction was made for any part of the sheet. M. LLW on the staff was found to be 1.3 as determined by levels to bench marks which had <sup>been</sup> previously established. Data on elevations of the bench marks was obtained from the publication "Tidal Bench Marks, State of California." The highest tide observed was on March 2<sup>nd</sup> and was 9.0 on the staff, the lowest tide observed was 0.0 on the staff and on February 2, and January 6. Tide reducers were entered in half feet in the records, in accordance with table on the following page.

See page 11 par. 5 - 23 for only not mentioned below.

6

COMPARISONS WITH PREVIOUS SURVEYS- Sheet 2284

1) A least depth of 16 feet was found on the  $3\frac{1}{4}$  fathom shoal shown in Lat.  $37^{\circ} 50.3'$ , Long.  $122^{\circ} 33.3'$

2) The  $4\frac{1}{2}$  fathom shoal, <sup>*26 1/2 ft in record*</sup> rocky, in Lat.  $37^{\circ} 50.3'$ , Long.  $122^{\circ} 33.2'$  was not found by this party. This area is rocky, with uneven bottom, and many sharp pinnacles and it is recommended that the  $4\frac{1}{2}$  fathom sounding be charted unless disproved by wire drag.

*Carried forward as 26 feet. See D.R. p 8, item 10*

3) The sunken rock shown in Lat.  $37^{\circ} 50.4'$ , Long.  $122^{\circ} 33.05'$  agrees with the one noted by the launch party on line ending at 113d (motor-sailer)

4) The  $5\frac{3}{4}$  fathom sounding in Lat  $37^{\circ} 49.95'$ ; Long.  $122^{\circ} 32.9'$  <sup>*34 ft. (records)*</sup> was not found by this party, but for same reasons noted in No. 2 above, it is recommended that the sounding be charted. *retained as 34 ft.*

5) The same note applies to the  $4\frac{3}{4}$  fathom sounding in Lat.  $37^{\circ} 49.95'$ , Long.  $122^{\circ} 32.8'$  *retained as 29 ft.*

The soundings mentioned in Pars. 2 to 5, incl. are comparatively near shore, and it was not considered that more intensive development was warranted.

6) Since the survey on sheet H 2284. was made, Centissima Rock was blasted and the  $4\frac{1}{2}$  fathoms shown on the sheet no longer exist.

*See Review par. 7i-(1)*

7) ~~Sears~~ Rock one which a depth of 18 feet is shown, was covered with wire drag by this party; a separate report covering the wire drag work is attached to this report.

*See Review par. 7i(2)*

*See page 11 par. 5 - 23 for only not mentioned below. orig. with H-2284.*



COMPARISONS WITH PREVIOUS SURVEYS: Sheet H 2283

1. 16 feet was the least depth found on the shoal lying just southeast of the triangulation station Shore Cone Rock, while 15 feet is shown on H 2283. It is recommended that the 15 feet be charted, for altho considerable search was made, using a pulling boat, it is easily possible that the least depth was not obtained, as the bottom is rocky and irregular. *see Review par. 7 h (1)*
  
2. Only one of the two 18 ft. spots just east of Bonita Point Light house was found, and this is slightly inshore from the one shown on H 2283. It is recommended that both of these spots be retained, for reasons noted in above paragraph. *See Review par. 7 h (2)*
  
3. The 13 ft spot shown just southeast of triangulation station Bonita Outer Rock, was not searched for, because it is so close to generally foul area. *see Review par. 7 h (2)*
  
4. The above note applies to the 14 and 16 ft spots just west of triangulation station Bonita Wash Rock. *See Review par. 7 h (5)*
  
5. The rock shown about 170 meters west of Bonita Point Light house is apparently triangulation station Bonita Wash Rock 1892, and should be shown as a rock awash at MLLW. There is no rock showing above MHW in that location. *see Review par. (7h-4)*
  
6. The 18<sup>17</sup> and 28 ft spots in Lat 37° 48.9; Long. 122° 31.8 were not found and no special search was made, as these soundings are so close to dangerous foul areas. *See Review par. 7 h (5)*
  
7. The rock awash\* in Lat 37° 49.1, Long. 122° 31.9 has been carefully located by this party, and is slightly further offshore from the location on this sheet. *\* sunken Rock See Review par. 7 e (2)*

COMPARISONS WITH PREVIOUS SURVEYS: Sheet H. 2283 continued.

8. The 2 foot spot, about 0.1 mile northwest of Bird Island does not exist. The launch POINT REYES drawing about 6 feet passed over this spot on a sounding line. During moderate swells, the area was watched carefully for breaks, by both the topographic and hydrographic parties, but none were noticed at any time. The least depth determined by this party was <sup>13</sup> 21 feet, although an intensive <sup>(2)</sup> development was not made, nor thought warranted as the area is quite close to shore. *1 1/2 hr development and drift soundings.*

*Review  
p. 7h (6)*

*(Records show 2 fath. 1 foot - unreduced) = 9 ft. reduced*

9. The 27 foot spot shown as Centissima Rock has since been removed by blasting. See Descriptive Report of Wire Drag work for additional notes on this area as well as Sears Rock. (page 19)

10. The 27 foot spot <sup>26 in records, plotted as 4 1/2 fms.</sup> in Lat 37° 50.3, Long. 122° 33.1 was not found. A depth of 34 feet in generally deeper water was found just south of this. From Tennessee Point northward, this inshore area is rocky, irregular bottom, with many pinnacles and it is the experience of this party that it is easily possible to miss such spots as this one. It is so close to shore that an intensive development was not thought warranted. <sup>26</sup> 27 feet should be retained for charting purposes unless later disproved by wire drag. *Carried forward as 26' depth.*

11. The above note applies to the 19 and 28 ft spots in Lat. 37° 50.7; Long. 122° 33.5, where 24 feet and 36 feet were obtained by this party. *19 carried forward*  
*28 is close to the 24' sdg.*

12. On the 28 <sup>(29 ft in record)</sup> ft. spot in Lat 37° 51.0, Long. 122° 33.9; a depth of 36 feet was obtained, but for reasons as given ~~above~~, before, it is recommended that the <sup>29</sup> 28 ft be retained. *29 carried forward*

13.

COMPARISONS WITH PREVIOUS SURVEYS Sheet H. 2283 continued.

13. A sunken rock and a rock above high water are shown in Lat. 37° 51.15, Long. 122° 33.9 on H 2283. The sunken rock has been located by the topographic party as a rock awash at MLLW, and checked by the hydrographic party. A thorough search by both parties failed to find any rock showing above high water in this spot, and it should not be charted as such.

✓  
see Review  
par. 7 h (7)

14. The junction of the present work with H 2283 south of Bonita Cove appears adequate. It should be noted that some shoaling has apparently occurred just southwest of the junction of Lat. 37° 48' and Long. 122° 31'.

COMPARISONS WITH PREVIOUS SURVEYS Sheet H 4555 WIRE DRAG.

1. The comparison with this sheet and the present work in the vicinity of Centissima and Seats Rocks, is made in the report on Wire Drag on the present sheet.

2. The area in the immediate vicinity of the 38 foot sounding approximately one half mile west of Bonita Point has been developed, and several soundings of 38 feet or less were obtained.

COMPARISONS WITH PREVIOUS SURVEYS Sheet H 4975

1. The junction of the present sheet with H 4975 appears adequate. The rock shown awash in Lat. 37° 51.6, Long. 122° 35.27 was located by the hydrographic party by approximate bearing and distance, when the launch passed close by. It appeared to be covered by about 2 feet at MLLW, and is shown as sunken rock on the sheet of the present work.

rock awash

Several  
conflicting  
notes.  
Verbal  
plans as  
rock awash

## COMPARISONS WITH PREVIOUS SURVEYS- Chart 5532.

1. A rock awash in Lat.  $37^{\circ} 51.45$ , Long.  $122^{\circ} 34.5$  was located by the topographic party and checked by the hydrographic party. It is not shown on the chart. ✓
2. Rock shown as above high water in Lat.  $37^{\circ} 50.95$ , Long.  $122^{\circ} 33.7$  is too far offshore to agree with locations made in the present survey. /
3. The 14 foot spot in Lat.  $37^{\circ} 50.8$ ; Long.  $122^{\circ} 33.6$  is in foul area where no craft should attempt to go. ✓

## TRACINGS OF PREVIOUS WORK.

The tracings of previous survey work on a scale of 1:10,000, which were made in the field for the above comparisons are being submitted with the smooth sheet. /

NOTES TO COMPILER.

1. The following triangulation stations in Bonita Cove and vicinity of Bonita Point are rocks showing above high water and are correctly located on the topographic sheet. Some of them appear to be slightly in error in position on chart 5532.

Grayback 1892,  
Grayback White Tip 1892  
Shore Cone Rock 1887  
White Top Rock 1887

Cluster Rock 1892 ✓  
West Diablo Under Rock 1892  
Bonita Rock 1887  
Bonita Outer Rock 1892

Grayback Double End 1892 is a rock awash at high water, while Bonita Wash Rock 1892 is a rock awash at about mean lower low water. This latter is incorrectly shown on the chart and on H 2283 as a rock above high water and is in error in position. *See Review par. 7h (H)*

2. The wreck charted southeast of Bonita Point is no longer in existence and should be deleted from the chart. *wreck should be removed from chart. Discussed in review #2283 7h (8)*

3. The outer rock shown awash just wouthwest of the wreck is too far offshore. Several sounding lines were run close to and inside of this location and its existence was not noted. *See Review Par. 7e(2) should be sunken rock.*

4. The 34 foot sounding in Lat.  $37^{\circ} 49.95$ , Long.  $122^{\circ} 32.9$  from H 2284 should be charted for reasons noted in comparison made with this sheet. *See page 6 Item 4*

5. The 23 foot sounding just off Tennessee Point taken from H 2284 should be retained on the chart for same reasons. *See Review par. 7d*

6. The 26 foot sounding in Lat.  $37^{\circ} 50.3$ , Long.  $122^{\circ} 33.2$  is apparently the  $4\frac{1}{2}$  fathom sounding shown on H 2284, and should be retained on the chart for reasons noted previously. *see D.R. Page 6, Item 2.*

## NOTES TO COMPILER Continued.

7. ✓ The 16 foot sounding obtained on the shoal in Lat.  $37^{\circ} 50.3$ ; Long.  $122^{\circ} 33.3$  should be charted in place of the 20 foot sounding now shown on the chart and apparently obtained from the  $3\frac{1}{2}$  fathom sounding shown on H 2284.

8. Soundings of 5 feet and 6 feet should be shown in Lat.  $37^{\circ} 51.2$ ; Long.  $122^{\circ} 33.1$  as they were obtained in this survey. ✓

9. Sounding of 28 feet in Lat.  $37^{\circ} 50.5$ ; Long.  $122^{\circ} 33.35$  was obtained in the field and should be charted. ✓

## LANDMARKS FOR CHARTS

Lists of Landmarks Form 567, covering this area are being submitted separately, and a copy is attached to the Descriptive Report on Topographic Sheet N.

## TABLE OF STATISTICS

Table of statistics for this sheet is attached. ✓

## GEOGRAPHIC NAMES

Information on geographic names is contained in the Descriptive Report on Topographic Sheet N. ✓

## FLOATING AIDS TO NAVIGATION

All navigation buoys that lie in the area covered by this sheet were located by sextant three point fixes. In each case the angles were taken from the bow of the launch which had been placed within a few meters of the buoy. At Spar Buoy No. 5 west of Bonita Point two fixes were taken, while all the other buoys were checked by bearings and distances from sounding lines that passed close by. These checks gave a close agreement with the previously plotted position, after considering the fact that the buoys undoubtedly swing to a considerable scope of chain, and changes position as the current changes.

### ADDITIONAL COMPILATION NOTES

The following triangulation stations, which from their name appear to be rocks showing above high water; were carefully searched for, by the topographer, and found non-existent. They should not be charted as rocks.

Tick Rock 1892

North Point Rock 1892

### SPACING OF SOUNDING LINES, POSITION INTERVAL

The general spacing of sounding lines on this sheet was intended to be 100 meters, with about half that spacing in Bonita Cove. In the locality of Centissima Rock, the development was as close as could be shown clearly on the scale of the sheet, and near the 38 foot sounding, about one half mile west of Bonit Point, additional lines were run. With the vessel underway, positions were taken about every two minutes when using either the POINT REYES.

or the motor-sailer. Due to difficulty in handling the POINT REYES, a position was taken on practically all vertical casts. With the motor -sailer, positions were taken at every other vertical cast, except where due to varying or strong current it was thought necessary to take a position on each sounding. No regular system of cross lines was run, as it was believed that the close spacing of lines would indicate any gross errors. Further it is believed that in the uneven bottom found near the shore in most cases, the crosslines would have little value as checks.

Approved -  
J. H. Sturdy

L. P. Rayner  
H. G. Ennis



ADDITIONAL WORK  
June 11-12 & 13, 1934.

As the smooth sheet was being plotted while the field party was still in operation several questions as to rocks, their position and height, and the bottom characteristics found by one leadsman on several sounding lines.

2 Three days additional work was done in which all rocks of importance located by the topographic party were checked, both as to position and elevation. In addition numerous other rocks were located and the elevations of many located by the topographic party, were determined by estimation. All rocks whose positions or elevations were determined by the hydrographic party alone are shown on the smooth sheet in pencil. A tracing of the rocks located by the topographic party was taken to the field and notes as to elevation and position of some are shown on this tracing. This is forwarded with the field sheet. Several notes relative to rocks are also on the boat sheet itself. This tracing, boat sheet, and such notes as were recorded in the sounding volumes are the authority for all the rocks and elevations shown in pencil.

3 On "q" day from position 17 to 41, bottom samples were taken over an area where an inexperienced leadsman had called the bottom "rocky". It was felt by the hydrographer that such bottoms were in error. His suspicions were justified as proven on this day, the bottom over this area is hard and sandy with broken shell and small gravel. Such rocky bottoms as were recorded by the leadsman in this vicinity are not plotted on the smooth hydrographic sheet and are noted as such in the sounding volumes. *Bottom characteristics are marked (?) in the records*

4 NW On "f" day a thorough search was made for the two foot spot about 0.1 mile southwest of Bird Island. As noted under Comparison with Previous Surveys, Sheet H-2283, Paragraph No. 8, body of this report, this two foot spot does not exist for reasons mentioned there. However, a reduced sounding of 9 feet was obtained on this development.

5 Comparison with Previous Surveys, Sheet H-4975, Paragraph No. 1 body of this report. The position of the rock in Latitude 37° 51.6', Longitude 122° 35.27' was determined on "p" day, This is the position that is plotted and named as hydrographic signal "Breaker" for several fixes in this vicinity.

*L. P. Raynor*  
*10/12/34*

TABLE OF STATISTICS SHEET 13

Date 1935	Vol	Letter	Positions	Soundings		Miles statute	Vessels
				Wire	Hand lead		
Jan. 10	1	a	26	26		1.5	POINT REYES
11	1	b	147	80	141	8.3	" "
12	1	c	121	44	223	9.3	" "
14	1	d	53	140		4.8	" "
15	1	e	131	10	355	12.2	" "
16	1	f	14	12	4	1.0	" "
16	2	f	72		208	8.9	" "
17	2	g	83	11	197	5.6	" "
22	2	j	165		589	15.1	" "
21	2	h	119		363	9.6	" "
23	3	k	178	22	584	16.0	" "
24	3	l	121		419	8.5	" "
25	3	m	125	3	390	10.3	" "
28	4	n	101		281	8.6	" "
29	4	p	115	72	119	8.5	" "
30	4	q	62		170	6.0	" "
Feb. 4	4	r	97	21	246	8.2	" "
5	4	s	131		415	12.7	" "
5	5	s	57		180	6.2	" "
6	5	t	130		403	11.3	" "
25	5	u	139		438	11.0	" "
Mar 1	1	a	82	86	85	6.9	Motorsailer
4	5	v	137		334	11.1	POINT REYES
5	6	w	140		408	9.8	" "
8	6	x	191		487	12.9	" "
11	6	y	136	201	10	7.1	" "
14	1	b	139		606	10.5	Motorsailer
15	7	z	34	34		2.4	POINT REYES
16	1	c	111		365	8.8	Motorsailer
17	2	d	128		346	6.8	"
17	2	e	115		255	7.1	"
27	2	f	114	201	20	7.1	"
28	2	g	89	154		6.2	"
28	3	g	91		221	7.1	"
29	3	h	164	157	220	11.9	"
Apr. 1	3	j	135	244		10.1	"
2	4	k	56	96		5.2	"
3	4	l	85	162		7.3	"
4	4	m	220	275		10.9	"
5	4	n	69	128	v	5.2	"
Totals	37 days	11	4423	2159	9082		
June							
Add. Stat.	11	4 & 5	p	62		338.7	
	12	5	q	48	171	3.4	"
	13	5	r	27	54	3.0	"
Totals	40	12		4560	2159	9360	346.2

9360  
2159  
11719

STATION SLIDE U. S. E.

17

The data below was obtained from the U. S. Engineer Office in San Francisco. From this data, the attached computations were made for determining the location of the target over station SLIDE, U. S. E. and which was used as a signal for the hydrography. Since complete information as to the methods by which the signal was located are not available, it is suggested that filing be made in the Division of Hydrography and Topography and with this sheet.

Ridge Point U.S.E.

F C

E

SLIDE  
U.S.E.

D

B

A

Coyote Ridge 2

Little Lagoon

A	25°	40'	20."5
B	98	42	22. 9
C	55	37	16.6

D	26	53	48.4
E	74	51	45.8
F	78	14	25.8

The co-ordinates of the following stations on U. S. E. system, which uses as the origin of co-ordinates, Fort Miley High Tank, Lat 37° 46' 58.492" Long. 122° 30' 18.650"; were also furnished.

SLIDE USE	N	32,764.02	Little Lagoon	N	29,049.05
	W	26,484.72		W	22,910.44
Bird Island	N	14,925.20			
Radio Comapss	W	9,005.93			

LIST OF SIGNALS  
to accompany

HYDROGRAPHIC SHEET FIELD NO. 13

TRIANGULATION

Hydrographic Name.	Location.
Slide	<u>Slide</u> U.S.E.
Lag	<u>Little Lagoon</u> 1916,1929
Elk	<u>Elk</u> 1916,1929
Bird	<u>Bird Island</u> Radio Compass Station 1921
Bonita	<u>Bonita Point</u> Lighthouse 1909
Nita	<u>Bonita</u> Rock 1887
Cone	<u>Shore Cone</u> 1887
White	<u>White Top</u> Rock 1882
Clus	<u>Cluster</u> Rock 1892
Diablo	Point <u>Diablo</u> Light 1928
Fort	<u>Fort Point</u> Lighthouse 1916,1929
Mile	<u>Mile Rock</u> Lighthouse 1916,1920
Tank	<u>Fort Miley High Tank</u> 1909,1910

	<i>Gray Tip Shore</i>		
Cross	TOPOGRAPHIC	<i>Gray back 1892</i>	
Up	Sun	<i>Gray back White Tip 1892</i>	Lad
Bee	Val	<i>Shore Cone Rock 1887</i>	Left Gable
Ant	Rip		Right Gable
Zed	Qui		Ga
Yap	Pun		Hot
Xl	Oar		Gin
Ray	Nut		Fin
Wind	Man		Eat
Vex	Lu		Dum
Uno	Kit		Cat
Tan	Junk		Bar
Scar	Ham		Able
	Pole		Pole 8
	HYDROGRAPHIC		
Rock	Lime		Rock No.2
Wash Rock	Poor		Rock No.3
	<i>Breaker</i>		<i>Rock No.4</i>
Tangent Point	<i>Tom</i>		<i>Rock No.5</i>
	<i>Tab</i>		

Topo

The above signals are in order from north to south.

SUPPLEMENTAL WIRE DRAG DATA.

Sears and Centissimo Rocks were wire dragged, to supplement the hydrography. The bottom in the vicinity of these rocks is very irregular, with many sharp pinnacles.

Four days of dragging were attempted; "C" day was rejected, and is not plotted, as a ratchet on one of the bouys slipped and the upright ran out. Work could not be continued after the drag was cleared because of poor weather.

On A day a drag 2100 feet long, made up of seven 300 foot sections was used. B and D days a drag 1200 feet long, made up of four 300 foot sections was used.

The following are the groundings on this work.

Latitude & Longitude	Pos. No. & Day	Grounded at Eff. Depth of	Reduced Sdg. obtained	Cleared with Eff. Depth of	Remarks.
37-49.7 122-32.88	13A	23.5ft.		19.5ft.	Drag slipped off grounding before sdg. could be taken.
Same	18A	24.0ft.	23.4ft.	19.5ft.	Sdg. plotted as 24.0.
37-49.67 122-32.85	20B	39.5	36.4	23.0	" " " 36.0 ✓
37-49.8 122-32.94	31B	35.5	32.8	24.0	" " " 33.0 +
37-49.73 122-32.96	31B	35.5	36.9	24.0	" " " 35.5 ✓ the effective depth of Drag.
37-49.64 122-33.0	8D	38.0	37.4	36.5	Sdg. plotted as 37.0 ✓

In comparing this drag work with that of H4555, only a relatively small area is common to both surveys.

The grounding at position 8 D day is within 15 or 20 meters of a 35 foot and 37 foot sounding on H4555. This shoal was cleared with an effective depth of 36.5 feet. The least depth found with the lead was 37.4 feet.

The grounding at position 31 B day where a least depth found with the lead was 36.9 feet at the time of grounding, and is plotted as the effective depth of the drag, 35.5 feet, is near a sounding of 35.0 feet on H 4555. It is felt this sounding is correct. A 36 foot sounding was gotten here by the hydrographic party.

The grounding on position 20 B day, with a least depth found of 36 feet was cleared with an effective depth of 23 feet on this survey. This sounding was cleared on H 4555 with a depth of 33 feet as determined from photostat of that sheet.

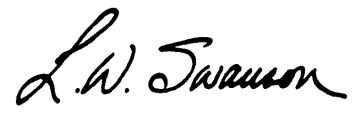
The grounding of 40 feet as shown on H 4555, was cleared with an effective depth of 36.5 feet, by this survey.

It should be noted that the Guide launch on the several lines near Lighted Bell Buoy No.3, changed course enough to go inside the buoy, then immediately returned to its normal course. The work has been plotted and inked as recorded in the volumes, making no allowance of this momentary change of course, by the Guide launch.

Because this work was supplemental to the hydrographic survey, this work has been plotted on an insert, on the hydrographic sheet. Wire Drag records were made in the usual manner and are forwarded with this sheet.

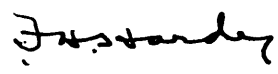
This work was done by the motorsailer (End Launch); in charge Lieutenant L.P. Rayner and the chartered launch Pt. Reyes (Guide Launch),

Lieut.(j.g.) W.J.Chovan in charge.



L.W.Swanwen  
Jr. H & G.E.  
Coast & Geodetic Survey.

Forwarded,  
Approved



F.H.Hardy,  
Chief of Party, C & G. S.  
Commanding Ship GUIDE.

LIST OF SIGNALS  
to accompany  
HYDROGRAPHIC SHEET FIELD NO. 17  
*Wire Drag*  
TRIANGULATION

Hydrographic Name	Location
Bird	Bird Island Radio, Compass Station 1921
Bonita	Bonita Pt. Lighthouse 1909, 1922

TOPOGRAPHIC

Located on Topographic Sheet Field No. N. (T-6336(1434-35))

Xl	Rip	Oar
Tan	Qui	Nut
Sun	Pun	Junk

STATISTICS

Date 1935	Day Letter	Vol.	Drag Length	Positions		Stat. Mi. Drag	Sdgs.
				Drag	Tender		
Mar. 12	A	1	2100	50	8	1.7	8
13	B	1	1200	47	20	1.2	20
14	C	1			5		5
15	D	1	1200	12	7	0.4	7
			TOTAL	109	40	3.3	40

Area in Sq. Stat. miles. 0.46

TIDES

The Point Bonite portable automatic tide gage was used to reduce the soundings and drag depths for this work. Detailed information can be found in the tidal report for this station, which is the subject of a supplemental report.



HYDROGRAPHIC SURVEY NO. 5853

Smooth Sheet 1

Boat Sheet 3

Sounding Records 15 Vols. includes 3 Vols. Wire Drag

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes in Vols. 1 & 13

Landmarks for Charts (Form 567) ~~None~~ *yes*

Statistics Yes

Approved by Chief of Party F. H. Hardy

Recoverable Station Cards (Form 524) None

Special Chart for Lighthouse Service None  
(Circular Nov. 30, 1933)

Remarks \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **5853**  
*Wire Drag*

The following statistics will be submitted with the  
cartographer's report on the sheet:

Number of positions on sheet	... <sup>9</sup> <del>13</del> ..
Number of positions checked	... <sup>17</sup> ..
Number of positions revised	..... <sup>0</sup> ..
Number of soundings recorded	... <sup>30</sup> ..
Number of soundings revised	..... <sup>1</sup> ..
Number of signals erroneously plotted or transferred	..... <sup>0</sup> ..

Date: *Aug. 14, 1935*

Verification by *J. A. McCune*

Time: *3 hr.*

Review by *G. Risegari and  
R. J. Christman*

Time: *-*

*52 3/4 hrs*



Verifier's Report on H-5853.

Records: Latitude and longitude og beginnings of lines are not given. It was necessary for the verifier to plot a far greater number of positions than should have been necessary. ✓

Protracting: Protracting was excellent. Positions found in error were about one per cent of the total number plotted by the verifier. ✓

Drafting: Drafting was extremely poor. Although the field draftsman showed that he was capable of extremely neat work he used such poor judgment in penciling of soundings that verifier's time on this sheet was at least double what it would have been with the average sheet received from the field. In almost all cases where the field draftsman made any attempt to omit superfluous soundings he omitted the shoaler soundings. Penciled soundings were too large and were penciled on top of each other. Position numbers were lettered in so small and with such a watery ink that they were of little use in many places. Transfer of rocks from topo sheet was carelessly done. In one case the arrowhead on a leader was transferred as a rock awash. ✓

Remarks: Soundings of <sup>126</sup> ~~fathoms~~ <sup>feet</sup> and <sup>137</sup> ~~fathoms~~ <sup>feet</sup> on positions 78 and 79Y (blue) look to be 10 fathoms too shoal. Lat. 37-49.1 Long. 122-30.3.

Rock awash 100 meters west by south from Signal Lu and sunken rock 240 meters west by south of Signal Lu are sketched from hydro notes. Field party sketched a group of sunken rocks and rocks awash where verifier has shown a single rock awash. Lat. 37-49.5 Long. 122-32.1 ✓

Hydro note says "Rock 20 mters on starboard beam" at pos. 54b (red). Verifier has plotted a rock awash to agree with the boat sheet. There is a rock located by topo about 50 meters north. It is probably the same rock. Lat. 37-50.1. Long. 122-33.0. ✓

Sunken rock is shown on topo sheet at Lat. 37-51.3 Long. 122-34.4. Hydro party refers to it as a rock awash on pos. 94p (blue) and pos. 46c (red) <sup>covered 1 ft at MLLW (H-2283/1894)</sup> ✓

Hydro party has encircled in blue several topographic (locations) <sup>features</sup> With the exception of Signal Breaker there are no cuts or positions for these signals in the hydro records. (See Desc. Rep. page 2)

Field party transferred heights of rocks above high water from the topo sheet in black ink. Verifier removed heights transferred from topo sheet and inked in red additional heights shown in pencil. There are no notes in the records for these heights. ✓

Hydro party has sketched sunken rocks and rocks awash in some places without noting same in records. Verifier has indicated these cases by inked notes reading, "Sketched by hydro party." Three rocks above H.W. are shown at Lat. 37-49.4 Long. 122-30.3. These rocks are not shown on the boat sheet. they were inked by the verifier over penciled locations shown on smooth sheet. See par. 2, page 15, Desc. Rep. ✓

the tracing referred to on page 15 par 2 of the Desc. Rep. lists this rock as "anwash L W" and it is so indicated on the smooth sheet. The symbol on the Topo sheet has been changed to Rfb a rock ledge.

A rock shown as above water on the topo sheet at Lat. 37-50.9  
long. 122-33.6, 100 meters North by west of Signal Uno has a penciled  
→ note on the smooth sheet "Awash at MLLW". There is nothing in the ✓  
records concerning it.

The boat sheet is in very bad condition. In many cases it was ✓  
of very little use in straightening out questionable points.

*Topography is from T-6336. ✓*

*There are no junctions. ✓*

February 25, 1936.

Submitted,

*J. A. McCormick*

J.A. McCormick.

POST-OFFICE ADDRESS: P. O. Box 1197, Oakland, Calif.

TELEGRAPH ADDRESS:

EXPRESS ADDRESS:

*82-CKG*  
*9 FEB 9 1936*

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY  
Steamer GUIDE, Oakland, Calif.,  
December 4, 1936.

To: The Director, U. S. Coast and Geodetic Survey,  
Washington, D. C.

From: The Commanding Officer, U.S.C. & G.S.S. GUIDE.

Subject: Wire drag work on Sears Rock.

Reference: Director's letter, File No.80-DRM, dated 11-27-36.

The equipment used for this drag work was standard gear with heavy weights, and was the identical equipment previously used by the wire drag party in charge of Lieut.-Comdr. G. C. Jones. The end buoy weights were 180 lb. while the small buoy weights were 35 lb.

As mentioned in the descriptive report the POINT REYES, one of the wire drag launches, was used as the guide launch, and the ship's motorsailer was used as end launch. The latter has comparatively so little power that it appears quite impossible that there could have been any lift from that source. Could it not be possible that the top of Sears Rock was shaken off by the blasting mentioned in your letter, File No. 22-SG 1995 GU 4 of February 4, 1935 ?

*F. H. Hardy*  
F. H. Hardy,  
Chief of Party, C. & G. S.,  
Commanding Ship GUIDE.

*note taken of this in review*  
*A. I. S.*

Verifier's Report on Wire-Dray on H-5853.

Records:

Records are in fair shape.

Drafting:

Drafting is good.

Remarks:

All soundings were verified and inked. It has been left to the verifier of the hydrography to transfer the shoalest of these to the hydrographic sheet.

Dray party did not get a sounding shallower than the effective depth at 31 B. Verifier has plotted a grounding just inside the path of the near buoy in the bright of the dray as shown by the field party.

Detached position 2c has a note opposite which is illegible. It seems to refer to a buoy. Position is plotted on the sheet but verifier did not ink in a buoy.

Soundings obtained after grounding at 8 D are not in a position to take up the length of the dray between end buoys. It is possible however that the dray might have sagged on the end launch side after hanging tight in two places on the guide launch side.

Aug. 14, 1935.

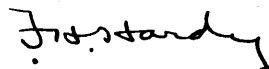
Submitted,  
Jamilcormick



STATEMENT  
to accompany  
HYDROGRAPHIC SHEET FIELD NO. 13

The smooth protracting of this sheet was done through "H" day by Mr. N. G. Korneeff, Draftsman, through "T" day by Mr. T.A. Renton, Draftsman, and completed by Mr. T.M. Means, Draftsman. The penciling of sounding, plotting and inking of wire drag work was done by Mr. T.M. Means, under the supervision of Lieut. (j.g.) L.W. Swanson.

The completed smooth sheet has been inspected and is approved.



F.H. Hardy,  
Chief of Party, C. & G.S.  
Commanding Ship GUIDE.

Oakland, California.

August 14, 1935.

## TIDE NOTE FOR HYDROGRAPHIC SHEET

Division of Hydrography and Topography:

✓ Division of Charts: Attention: Mr. E. P. Ellis

Tide Reducers are approved in  
13 volumes of sounding records for  
2 wire drag

HYDROGRAPHIC SHEET 5853

Locality Bonita Channel and Cove, California.

Chief of Party: F. H. Hardy in 1935.  
Plane of reference is mean lower low water reading  
1.3ft. on tide staff at Bonita Cove  
11.3ft. below B.M. 2

Height of mean high water above plane of reference is 5.1 ft.

Condition of records satisfactory except as noted below:

*Atty* *Ham*  
Chief, Division of Tides and Currents.

Field Records Section (Charts).

HYDROGRAPHIC SHEET NO. 5853

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	<u>4560</u>
Number of positions checked	<u>303</u>
Number of positions revised	<u>3</u>
Number of soundings recorded	<u>11519</u>
Number of soundings revised	<u>many</u>
Number of signals erroneously plotted or transferred	<u>0</u>

Date: Feb. 25, 1936.

Verification by J. A. Mc Cormick

Time: 105 hr.

Review by

Time:

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 5853 (1935) FIELD NO. 13.

Bonita Channel, California Coast, Cal.

Surveyed in Jan.-June, 1935. Scale 1-10,000

Instructions dated May 31, 1934, Letter dated Feb. 4, 1935.

Hand Lead and Machine Soundings. 3 Point fixes on shore signals.

Chief of Party - F. H. Hardy.

Surveyed by - L. P. Raynor, Wire dragged by W. J. Chovan.

Protracted by - T. M. Means, N. G. Korneeff, T. A. Renton.

Subdivision of wire dragged areas by - T. M. Means.

Inked by - T. M. Means (W. D.) J. A. McCormick (Hyd.)

Verified by - J. A. McCormick.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

- a. A part of the records of the motor sailer are too faint for easy legibility.
- b. Geographic positions were not noted at the beginning and end of sounding lines, or day's work. (See par. 75-a of the Hydrographic Manual.)
- c. Position numbers and day letters on the smooth sheet were too small and faint to be legible.
- d. The general drafting on the smooth sheet was not good. It showed carelessness in the transfer of rocks and other detail from the topographic sheet.

The Descriptive Report is detailed and comprehensive and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The plan and extent of development are in accordance with the instructions for the project.

3. Shoreline and Signals.

The shoreline and topographic signals originate with plane table survey, T-6336 (1934-35). The hydrographic signals encircled in blue are topographic features not specially located as signals. With the exception of hydrographic signal "Breaker", (north limit of sheet) which was determined by 4

cuts, all hydrographic signals were spotted on topographic features and are not recorded in the sounding volumes. Signal Breaker is recorded in Vol. 11.

4. Sounding Line Crossings.

No general system of cross lines was run. However, those that result from the work as well as the adjacent parallel lines are in good agreement.

5. Depth Curves.

Within the limits of the survey, the usual depth curves may be satisfactorily drawn in the offshore areas. In inshore areas most of the 30 foot curve and portions of the 18 and 12 foot curves can be satisfactorily drawn.

6. Junctions with Other Surveys.

No contemporary surveys join this sheet.

A satisfactory junction is made with H-4975 (1929) to the northward. Overlaps with H-2504 (1900) to the southwest and with H-2283 (1894-7) to the southward are carried to a satisfactory agreement. (see par. 7-k and 7-h).

7. Comparison with Prior Surveys.

a. H-290 (1851)	H-462 (1855)
H-241 (1851)	H-562 (1857)
<u>H-456 (1855)</u>	<u>H-721 (1858-59-60)</u>

The 1851 surveys are reconnaissance surveys on very small scales (1-375,000 and 1-1,000,000) and show very little hydrographic information within the limits of the present survey.

The 1855 to 1860 surveys are on scales 1-20,000, 1-10,000, 1-80,000 and 1-100,000. Their agreement with the present survey is fair except in some small areas where a general change of as much as 3 feet, deeper or shoaler has taken place. The most noticeable change is on the northeastern portion of Four Fathom Bank where a general deepening of about 5 feet has occurred. All of the information from the above surveys has been superseded on the charts by later and more detailed surveys and they need not be considered in future charting.

b. H-1201 (1873).

This survey, on a scale of 1-20,000 covers the entire area of the present survey. In general, it is in fair

agreement with the present survey, except for the changes that have taken place at the eastern end of Four Fathom Bank and in the adjacent area south of Point Bonita. In the former, a general deepening of as much as 6 feet has occurred which has resulted in moving the eastern tip of the 30 foot curve to the northwestward approximately 450 meters. In the latter, a shoaling in the area has moved the 60 foot curve offshore approximately 150 meters to the southward.

Special attention is directed to the following inshore details:

- (1) The rock awash (charted) in lat.  $37^{\circ} 49.1$ , long.  $122^{\circ} 31.9$  originates with the above survey where it is shown by a rock awash symbol in red, defined in a note on the sheet as meaning "sunken rocks visible at low tide". The present survey shows two sunken rocks in the vicinity. A sounding line passed close to the outer rock at a 0.5 stage of tide but as the rocks had already been located by the topographer as "Breakers" no note of them was entered in the sounding record. The representation on the present survey should be followed in future charting.
- (2) The rock awash (charted) in lat.  $37^{\circ} 48.85'$ , long.  $122^{\circ} 31.60'$  originates with the above survey where it also is shown by the rock awash symbol in red. Both H-2283 (1894-97) and the present survey show a sunken rock in this location. During the present survey, a line of soundings at 0.5 tide passed close to northward of this rock without mentioning it in the records though the rock awash to the northward of the line was noted. The representation on H-5853 (1935) should be accepted for future charting.

Because of the changes noted, the lapse of time since the survey was made and the larger scale and closer development of the later surveys, H-5853 (1935) should supersede the above survey for future charting purposes.

c. H-1214a (1871-1873).

This survey on a scale of 1-20,000, covers the offshore area of the present survey between Point Diablo and Point Bonita with a few widely spaced soundings. In general the agreement in depths with the present survey is fair. This area has been adequately developed by the present survey and H-1214a (1871-73) should not be used for charting the area.

d. H-1628 (1884).

This survey is on a scale of 1-20,000 and covers the area

of the present survey in the general vicinity of Four Fathom Bank with a few widely spaced sounding lines. A comparison of the soundings with those of the present survey shows in general a good agreement. There are no outstanding features that need further discussion and since the present survey has adequately covered the area the old survey need not be considered for charting purposes.

e. H-2283 (1894-1897).

This survey on a scale of 1-10,000 covers the area of the present survey southward of Bonita Point, and that portion of the area to the northward of Bonita Point to about  $\frac{1}{2}$  mile offshore. In general the agreement in depth is good except in the vicinity of lat.  $37^{\circ} 48.7'$ , long.  $122^{\circ} 32'$  which shows a considerable shoaling, the 60 foot curve now extending about 300 meters farther to the SSE.

The following are other important differences between the above survey and the present survey.

- (1) The 15 foot depth (charted) in lat.  $37^{\circ} 49.4'$ , long.  $122^{\circ} 30.62'$  was searched for but the least depth found was 16 feet. The bottom is "rocky and irregular" and in view of the recommendation of the field party the 15 and also several other soundings in the vicinity, have been retained from the 1894 survey. (Descriptive Report page 7, Item 1.)
- (2) The 18 foot spot (charted) in lat.  $37^{\circ} 48.97'$ , long.  $122^{\circ} 31.50'$  was found by the present survey to be located about 20 meters closer inshore. The position on the present survey should be accepted as it is based on a good angle fix (pos. 104 1, blue) whereas an examination of the original records of the 1894 survey shows that the 18 was plotted between positions 9 and 10a, blue with the left angle of the latter position questioned.

The 18 foot spot (not charted) about 80 meters northwest of the above 18 foot spot was not found by the present survey. An examination of the original record shows that it is the first sounding on the line 1-2-3-4a, blue on which positions the right angle is a tangent to Seal Rocks on the south side of the Golden Gate. The positions are weak and if plotted back from pos. 2 by time the 18 would fall within the 18 foot curve on the present survey. The 18 has therefore not been carried forward to H-5853 (1935). (See Descriptive Report page 7, Item 2.)

- (3) The 13 foot spot charted as a detached shoal about 40 meters SSE of Bonita Outer Rock 1892 (lat.  $37^{\circ} 48.85'$ , long.  $122^{\circ} 31.7'$ ) was not searched for during the present survey. However as it may be considered the outer danger of this foul area it has been carried to H-5853 (1935) as a detached 13 foot shoal. (See Descriptive Report page 7, Item 3).
- (4) The bare rock (charted) in lat.  $37^{\circ} 48.95'$ , long.  $122^{\circ} 31.82'$  was erroneously plotted in that the original record (pos. 9i green) gives it as a rock awash. This supports the statement by the field party that "there is no rock showing above MHW in that location". (Descriptive Report page 7, Item 5). The position agrees with Triangulation Station Bonita Wash Rk 1892 as shown on the present survey.
- (5) A number of shoal soundings westward and northwestward of Bonita Wash Rock 1892 of which the 17 in lat.  $37^{\circ} 48.97'$ , long.  $122^{\circ} 31.92'$  was charted, were not investigated during the 1935 survey. They have been carried forward to H-5853 (1935). (See Descriptive Report page 7, Items 4 and 6.)
- (6) The 2 foot spot (charted) in lat.  $37^{\circ} 49.52'$ , long.  $122^{\circ} 32.27'$  was searched for during the present survey and the least depth found was 9 feet (pos. 19r, red). An examination of the original record shows an 18 foot and a 5 foot sounding questioned in the record. The draftsman accepted 2 feet (5 reduced for tide) as the least depth on the rock although a special development of the area on "n day" showed a least depth of 10 feet (pos. 29n, green) with the note "Right over Rock". In view of the close agreement of this special development with the 1935 survey it is probable that the 5 foot sounding should have been recorded as 5 fathoms and the statement in the Descriptive Report (page 8, Item 8) that the 2 foot spot does not exist is justified. The present survey should be accepted for future charting.
- (7) The sunken rock and bare rock (charted) in approximate lat.  $37^{\circ} 51.15'$ , long.  $122^{\circ} 33.95'$  fall near a rock awash on the present survey. The bare rock originates with T-400(1853) where it is represented by an indefinite symbol. The sunken rock originates with the sounding records of the 1895 survey being plotted from the note at pos. 34f, green, observed during a 3.7 foot stage of tide "Submerged rock distant 80 meters SW". The records make no reference to a bare rock in this vicinity and it is probable that only one rock existed.



The representation on H-5853 (1935) should be accepted for future charting. (See Descriptive Report page 9, Item 13).

- (8) The wreck charted southeast of Point Bonita (lat.  $37^{\circ} 48.9'$ , long.  $122^{\circ} 31.5'$ ) originates with H-2283 (1894-97). The field party states that it is no longer in existence. The wreck should be expunged from the chart. (See Descriptive Report page 11, Item 2).

f. H-2284 (1895-97).

This survey on a scale of 1-3,333.+ covers Centissima Reef and the inshore area to the northward. In general the agreement with the present survey is good but the bottom is very irregular and a number of soundings have been carried forward to H-5853 (1935). Several of the soundings, where signals fell off the sheet, were plotted on H-2283 (1894-97) and transferred to H-2284 (1895-97) among them being the  $4\frac{1}{2}$  fathom and the  $5\frac{3}{4}$  fathom spots described as Item 2 and 4 page 6 of the Descriptive Report. A number of discrepancies result from faulty enlarging of inshore details on T-400 (1853). Special attention is directed to the following features:

- (1) The depth over Centissima Reef (lat.  $37^{\circ} 49.64'$ , long.  $122^{\circ} 33.0'$ ) was changed by blasting since the above survey was made (see Chart Letter 246 of 1925) and therefore the representation on H-5853 (1935) should be accepted for charting.
- (2) A least depth of 23 feet was found over Sears Rock (lat.  $37^{\circ} 49.72'$ , long.  $122^{\circ} 32.88'$ ) during the 1935 survey. The 18 foot depth (charted) from the 1895 survey when carefully plotted on the present survey with the original angles (pos. 60d', green and pos. 3ln, green) falls about 40 meters W by S of the 23, close southward of the 25 on the sheet. This position however was covered by the 1935 wire drag at an effective depth of  $23\frac{1}{2}$  feet. A detailed survey of the rock was made by the U. S. Engineers in 1921 (Bp. 17908) which shows the rock about 50 feet in diameter within the 24 foot curve and a least depth of  $20\frac{1}{2}$  feet in about the position of the 18 mentioned above. The 1926 drag work did not cover the area but a marker buoy was placed on it as indicated by the note "Planted buoy on 18 foot shoal, Sears Rock". The reference is probably, to the 18 on the chart as no such depth was recorded in the sounding volume. The existence of an 18 foot spot is very doubtful as the 1935 survey cleared the entire area with the wire drag set at an effective depth of  $19\frac{1}{2}$  feet.

- (3) The 5  $\frac{3}{4}$  fathom sounding (charted 34 feet) in lat.  $37^{\circ} 49.95'$ , long.  $122^{\circ} 32.90'$  about 25 meters to the westward of its proper location. It has been carried forward in its corrected position. (See Descriptive Report page 6, Item 4).
- (4) The two  $6\frac{1}{2}$  fathom soundings (not charted) in approximate lat.  $37^{\circ} 49.88'$ , long.  $122^{\circ} 32.95'$  are probably errors in recording 7 fathoms for 11 fathoms as the field party rejected similar soundings for this reason about two minutes later. This supposition is supported by the present survey.
- (5) The feature charted as a bare rock near the head of the bight in lat.  $37^{\circ} 50.5'$ , long.  $122^{\circ} 33.1'$  originates with the above survey where it is shown as a hydrographic signal. Neither T-400 (1853) nor the 1935 survey show any indication of a rock or breaker in this locality although a sounding line of the latter survey at a 0.5 stage of tide begins less than 20 meters from the place. It is probable that the feature was a piece of wreckage embedded in the sand which was used as signal "Small" during the 1895 survey but has now entirely disintegrated and disappeared. It should no longer be charted.
- (6) A 16 foot sounding "rky" (charted as a detached sanded area) in lat.  $37^{\circ} 50.47'$ , long.  $122^{\circ} 33.18'$  falls inshore of a 24 on the present survey but because it helps to define the foul area in this vicinity it has been carried forward to H-5853 (1935).
- (7) The two bare rocks charted about 180 meters northwest of Tennessee Point (lat.  $37^{\circ} 50.1'$ , long.  $122^{\circ} 32.9'$ ) apparently originate with the 1895 surveys. They appear to be the result of a wrong interpretation of the rock symbols on T-400 (1853) together with faulty enlargement and transfer. The Descriptive Report of T-6336 states definitely that there are no rocks bare at high water in this vicinity. The representation shown on the 1935 survey should be followed in future charting.

Because of discrepancies introduced through the enlarging of inshore details and control points to three times the scale of the original survey, and because the present survey with indicated additions is adequate for charting, H-5853 (1935) should supersede the above survey.

g. H-2291 (1896).

This is a copy of Chart 5581, Entrance to San Francisco Bay, on which some information relative to Aids to Navigation was plotted. It has no current charting value.

h. H-2504 (1900).

This survey on a scale of 1-20,000 overlaps the southwest part of the present survey. The agreement in depth in the overlapping area is very good. The only difference appears to be a slight shifting of the 30 foot curve at the southeast end of the Four Fathom Bank. Changes in detail on the bank itself are only such as may be expected from the larger scale and closer development of the present survey, and H-5853 (1935) should supersede the above survey for charting the area common to them.

i. H-3968 W D (1917), H-4555 W D (1926).

These surveys on scales of 1-20,000 and 1-10,000 respectively are wire drag surveys, the first a general survey of Bonita Channel, the second a special examination of Centissima Reef and a portion of Bonita Channel to the southeast. The depths on the present survey are consistent with these wire drag surveys. A number of actual soundings from the drag surveys that fall between soundings of the present survey have been carried forward to H-5853 (1935).

The least depth on Centissima Reef (34.8 feet, plotted 35) in lat.  $37^{\circ} 49.65'$ , long.  $122^{\circ} 33.00'$  is from the 1926 survey. The 1935 survey cleared the area with the wire drag set at an effective depth of 36.5 feet and the least depth obtained by sounding was 37.4 feet (Descriptive Report, page 20). Possibly there was more lift than estimated, or the wire slipped over the rock without catching on it. The record of the 1926 survey states "Small area, Lead only hit it twice sounding in the vicinity 30 min". The 35 should be continued as the least depth over this reef.

8. Comparison with Chart 5532 (New Print dated Jan. 24, 1936).a. Hydrography.

Within the area of the present survey the chart is based on surveys discussed in the foregoing paragraphs and contains no other information that needs consideration in this review except as follows:

The 32 foot depth charted in lat.  $37^{\circ} 49.68'$ , long.  $122^{\circ} 32.80'$  comes from a U. S. Engineers survey in 1921 (Bp. 17908) where it is shown as a small shoal area surrounded by depths of 47 to 52 feet. The 32 should be retained on the chart until definitely disproved by the wire drag or otherwise.

b. Aids to Navigation.

The charted aids to navigation are in agreement with the positions given on the present survey.

9. Field Plotting.

The protracting of positions was excellent, but position numbers were too small and not legible.

The penciled soundings were too large and poor judgment was used in selection where soundings were omitted to avoid crowding, in many instances the shoaler sounding or other characteristic sounding being disregarded.

10. Wire Drag Work.

The results of an examination of Centissima Reef and Sears Rock with the wire drag are shown on H-5853 (1935) as an insert. Standard wire drag equipment was used in the work. (See letter attached to the Descriptive Report.)

- a. The least depth obtained on Centissima Reef was 37 feet but it is recommended that 35 feet be charted from H-4555 (1926) for reasons stated in par. 7i of this review.
- b. The least depth found over Sear's Rock during the 1935 survey was 23 feet, two drag strips of  $23\frac{1}{2}$  and 24 feet effective depth hanging up from opposite directions. The 23 is approximately 60 meters from the 18 foot depth shown on H-2284 (1894-97), and the 20.5 foot depth from the 1921 U. S. Engineers survey (Bp. 17908), and it is not certain whether either of the drag strips actually covered the location of the 18 or the 20.5. However a  $19\frac{1}{2}$  foot drag definitely covered the area and this together with the possibility of one of the deeper drag strips having covered the spot is considered sufficient to disprove the existence of the 18, but not the engineer 20.5. The latter should therefore be accepted for future charting. (See also paragraph 7i(2) this review).

11. Additional Field Work Recommended.

The survey is satisfactory and no further work is required.

12. Note to Compiler.

The attention of the Compiler is called to paragraph 10b of this review relative to the charting of 20 feet as the least depth over Sears Rock.

13. Superseding Old Surveys.

Within the area covered the present survey with indicated additions supersedes the following surveys for charting purposes.

H-241 (1851)	in part
H-290 (1851)	" "
H-456 (1855)	" "
H-721 (1858-59-60)	" "
H-462 (1855)	" "
H-562 (1857)	" "
H-1201 (1873)	" "
H-1214a (1871-3)	" "
H-1628 (1884)	" "
H-2283 (1894-7)	" "
H-2284 (1895-7)	entirely
H-2291 (1896)	in part
H-2504 (1900)	" "

14. Reviewed by G. Risegari and R. J. Christman. Aug. 31, 1936.

Inspected by A. L. Shalowitz.

Examined and approved:

C. K. Green, *C. K. Green*  
Chief, Section of Field Records.

*L. O. Tolbert*  
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Chief, Division of H. & T.

*Applied to chart 5532  
Apr 2, 1937 g.H.S.*