8027

Diag. Cht. Nos. 5402-2, 5530-2 & 5502-2.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. HO-2154 *Office No.* H-8027

LOCALITY

State California

General locality South San Francisco Bay

Locality Oakland Airport to San Mateo-Hayward Bridge

19 55-56

CHIEF OF PARTY

H. G. Conerly

LIBRARY & ARCHIVES

DATE May 2, 1956

B-1870-1 (1)

1688

Form 537
(Ed. June 1946)

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

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.

REGISTER No. H-8027

Field No. BO-2154

State California

General locality South San Francisco Bay

Locality Oakland Airport to San Mateo-Hayward Bridge
~~North of San Francisco-San Mateo Bridge~~

Scale 1:20000 Date of survey Jan. 1955 ~~March 1955~~ 1955-6 and Dec. 1955 - Jan. 1956

Instructions dated Feb. 25, 1954

Vessel Launch 123

Chief of party ~~C. A. Sprague~~ Horace G. Conerly

Surveyed by K.A. MacDonald, C.D. Upham and H.L. Runge.

Soundings taken by fathometer, ~~graphic recorder, hand lead, wire~~

Fathograms scaled by various

Fathograms checked by various

Protracted by H. C. Parsons

Soundings penciled by H. C. Parsons

Soundings in ~~fathoms~~ feet at ~~MLW~~ MLLW ~~True depths~~ AND ARE TRUE DEPTHS.

REMARKS:

U. S. GOVERNMENT PRINTING OFFICE 16—66520-1

Also see addendum

NOTES FOR DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY

REGISTERY NO. H-8027, FIELD NO. BO-2154

SAN FRANCISCO BAY, CALIFORNIA

PROJECT CS-256 SCALE 1:20,000

WEST COAST SHORE PARTY; C. A. GEORGE, H. G. CONERLY, CHIEF OF PARTY

SURVEYED BY: K. A. MACDONALD, C. D. UPHAM, H. L. RUNGE

PROJECT

This survey was executed in accordance with Director's instructions dated 20 January 1947, Supplemental instructions dated 24 April 1947 and 25 February 1954.

SURVEY LIMITS AND DATES

The general locality of this survey is South San Francisco Bay. That part of this survey which has been completed extends along the eastern shore of the bay from Latitude 37° 43' 42" N. south to the San Mateo Bridge thence west south west along the north side of the Bridge to Longitude 122° 12' W. thence north to Latitude 37° 39' N. thence east to Longitude 122° 17' 20" W. thence in a northwesterly direction along the junction with Hydrographic Survey Registery No. H-6723, 1941, (1:10,000) to Latitude 37° 41' 30" N. Longitude 122° 19' 12" W. thence west to Longitude 122° 19' 36" thence north along the junction with Hydrographic Survey Registery No. H-8025, Field No. BO-1254 (H-8023, 1954) to Latitude 37° 43' 42" N. thence east along the junction with Hydrographic Survey Registerey No. 8024, Field No. BO-1154 (H-8024, 1954) to the east shore of the Bay.

Field work commenced on 11 January 1955 and continued intermittently until 23 March 1955. ~ 6 Jan 1956 (See addendum)

VESSELS AND EQUIPMENT

USC&GS Launch CS-123 was used for all sounding on this survey.

No turning radius was determined for this launch.

808 J type graphic recording fathometers Nos. 152 SPX and 154 SPX, calibrated to 800 fm/sec were used. Acoustic units were fish mounted.

TIDE AND CURRENT STATIONS

Two tide stations maintained for the purpose of obtaining tide reducers for this survey were located at Point San Bruno, California and San Mateo Bridge, California. See TIDE NOTE this report.

No current stations were observed.

CONTROL STATIONS

Triangulation control was furnished in the publications: "Geographic Positions of Triangulation Stations, California Part VII, San Francisco and Vicinity" and "Geographic Positions, Plane Coordinates, and Description of Triangulation and Traverse Stations, Alameda and Contra Costa Counties, California, Vol. No. 943". Additional Triangulation control was furnished by 1953 Field Positions of the photogrammetric party and 1954 and 1955 field positions of this party.

Signal Mat was located by traverse and G. P. computations by this party; See DESCRIPTIVE REPORT - Hydrographic Survey Registery No H-8026, Field No. BO-1354. (H-8026-1955-56)

Signal Obi was located by theodolite cuts and G. P. computations by USC&GS Ship BOWIE; See DESCRIPTIVE REPORT - Hydrographic Survey Registery No. H-8025, Field No. BO-1254. (H-8025-1954-55)

Signal Blu was obtained from Topo Sheet BO-B-54.

Signal Cul was located by 3 point sextant fix by the hydro. party.

Photogrammetric locations of signals were taken from T-11065, T-11066, T-11067.

SHORELINE AND TOPOGRAPHY

The shoreline was transferred from T-11064, T-11065, T-11066 and T-11070.

SOUNDINGS

All soundings were made with 808 J type graphic recording fathometers, calibrated to 800 fm/sec. An abstract of corrections is appended to this report. Also EDO (See Addenda to Descriptive Report.

CONTROL OF HYDROGRAPHY

The hydrography was controlled by three point sextant fixes taken on signals located by triangulation, photogrammetry and 3 point sextant fixes.

ADEQUACY OF SURVEY

That part of the survey which has been done by this party up to this date may be considered complete and adequate to supersede prior surveys for charting. It is believed that the remainder of this survey will be completed by this party during the 1955 - 1956 Winter Field Season.

CROSSLINES

A total of approximately 5 % crosslines were run in the area surveyed with adequate agreement on the boat sheets.

DANGERS AND SHOALS

No new dangers or shoals were found. The wreck charted at Lat. 37° 38.~~74~~ 64' N, Long. 122° 17.~~56~~ 38' W. (approx. 1/4 mi. south of the area covered by sounding lines) was investigated and not found. ✓ Par. 6A. Review

Taken Jan. to March 1955.

AIDS TO NAVIGATION

The following new fixed aids to navigation were located by triangulation:

Aid	Depth (ft)	Latitude °	"	m.	Longitude °	"	m.
Signal Pil (large dolphins)	8	37	38	1342.6	122	17	912.8
Signal Dol (large dolphins)	18	37	41	353.6	122	18	1130.7

Location of the above have been forwarded to the Director on Form 567.

The following floating aids were located by the hydrographic party:

Buoy	Date Located	Pos.no.	Depth(ft)	Latitude	Longitude
"14 EX" White (Fl W)	10 Feb. 1955	52 h	44	37°43.48'N	122°19.58'W
"5" (Fl W)	23 Feb. 1955	I 1	30	37°39.73'N	122°19.31'W
"3" (Fl W)	23 Feb. 1955	2 1	28	37°40.73'N	122°19.82'W
"1" (Fl W) Bell	25 Feb. 1955	1 m	32	37°41.77'N	122°20.36'W
C"1A" Black Ref	28 Feb. 1955	1 n	26	37°41.14'N	122°18.93'W
"15 EX" White N Ref	2 Mar. 1955	28 q	20	37° 41.01'N	122°16.40'W
"7" (Fl W) Bell	23 Mar. 1955	1 x	30	37°38.75'N	122°18.75'W
C"5a" Black Ref	23 Mar. 1955	2 x	23	37°38.89'N	122°18.35'W

LANDMARKS FOR CHARTS

No additional landmarks are recommended.

VELOCITY CORRECTIONS

Velocity corrections were determined from bar checks and simultaneous pole - fathometer soundings during hydrographic operations. A copy of the abstract of echo corrections is appended to this report. See FATHOMETER REPORT, WCSP, Project C. S. 1954 - 1955 Field Season.

25c

MISCELLANEOUS

It will be noted that no comparison with prior surveys or with the chart have been made in this report. It was felt that this should be done after smooth plotting of the survey was completed.

No mention is herein made as to the smooth sheet as it will be made by the Seattle Processing Office at a later date.

TABULATION OF APPLICABLE DATA

Applicable Data	Forwarded To	Date
TIDAL DATA		
Level Records, Point San Bruno, California	The Director	
Level Records, San Mateo Bridge, California	The Director	
Tide Marigrams, Point San Bruno, California	The Director	
Tide Marigrams, San Mateo Bridge, California	The Director	
Smooth tide curves and reducers, Point San Bruno and San Mateo Bridge, California	Seattle Processing Office	
PHOTOGRAMMETRIC DATA		
Field Photographs	The Director	
Office Photographs	The Director	
Manuscripts T-11064, T-11065, T-11066, T-11067 and T-11070	Seattle Processing Office	

TABULATION OF APPLICABLE DATA (Contd)

Applicable Data	Forwarded To	Data
HYDROGRAPHIC DATA		
Fathograms	Seattle Processing Office.	
Boat Sheet, Fathometer Report, Control Data	Seattle Processing Office	
Fathometer Report	The Director	

Respectfully Submitted
Clinton D. Upham
Clinton D. Upham
Ensign, USC&GS

Approved & Forwarded

Horace G. Conerly
Horace G. Conerly
Commander, USC&GS
OinC., West Coast Shore Party

ABSTRACT OF VELOCITY CORRECTIONS

FOR HYDROGRAPHIC SURVEY

REGISTERY NO. H-8027, FIELD NO. BO-2154

Depth (ft)	Corrections (ft)	Dates	Day Letter
0-11	-0.4	11, 12 Jan. 1955	a day
17	-0.2		b day
37	0.0		
		Fathometer 152 SPX	
0-38	-0.2	26 January	c thru h days
44	0.0	1, 2, 3, 4 and 10 February	
51.5	+0.2	1955	
51.5 -	+0.4	Fathometer 154 SPX	
		+ 0.4 ft. Phase Correction "B" Scale	
0-39	-0.2	18, 21, 23, 25, 28	j thru 14 n
44	0.0	February 1955	days
53	+0.2	Fathometer 154 SPX	
		+0.4 ft. Phase Correction "B" Scale	
0-4	-0.2	28 February	15 n thru u
10.5	-0.4	1, 2, 3, 4, 7, 8, March	days
34	-0.6	1955	
44	-0.4		
52	-0.2	Fathometer 154 SPX	
55	0.0		
		+0.4 Ft. Phase Correction "B" Scale	
0-10.5	-0.4	9, 11, 23 March 1955	v thru x days
32.5	-0.6		
39	-0.4		
46	-0.2		
55	0.0	Fathometer 154 SPX	
55 -	+0.2		
		+0.4 ft. Phase Correction "B" Scale	

STATISTICS FOR HYDROGRAPHIC SURVEY

REGISTERY NO. H-8027, FIELD NO. BO-2154

WEST COAST SHORE PARTY

PROJECT CS-256

Vol.No.	Day Ltr.	Date	HL Sdgs	No.Pos.	Stat.Mi.Sdg.
1	a	11 January 1955		62	20.4
1	b	12 January 1955		14	5.2
2	c	26 January 1955		129	43.4
3	d	1 February 1955		62	22.1
3	e	2 February 1955		103	38.9
4	f	3 February 1955		104	36.4
5	g	4 February 1955		101	33.9
5 & 6	h	10 February 1955		118	45.1
6	j	18 February 1955		31	10.3
6	k	21 February 1955		110	41.3
7	l	23 February 1955		93	27.5
7	m	25 February 1955		102	40.2
8	n	28 February 1955		138	40.2
8	p	1 March 1955		39	10.1
9	q	2 March 1955		169	45.3
9 & 10	r	3 March 1955		153	42.4
10	s	4 March 1955		149	42.3
11	t	7 March 1955		82	22.1
11	u	8 March 1955		156	38.2
12	v	9 March 1955		157	42.2
12 & 13	w	11 March 1955		172	47.8
13	x	23 March 1955		107	27.0
		TOTAL		2349 53	742.3

Total Area 44.2 Square Statute Miles.

TIDE NOTE TO ACCOMPANY DESCRIPTIVE REPORT

HYDROGRAPHIC SURVEY

REGISTERY NO. H-8027, FIEID NO. BO-2154

WEST COAST SHORE PARTY

PROJECT CS-256

Portable automatic tide gages were maintained at Point San Bruno, California, at Latitude 37° 40.06'N, Longitude 122° 23.42'W and San Mateo Bridge, California at Latitude 37° 35.02'N, Longitude 122° 15.01'W to furnish tide reducers in this area. Mean Lower Low corresponds to a staff reading of 3.7 ft. at Point San Bruno and 4.0 ft. at San Mateo Bridge.

Point San Bruno tide reducers were applied directly to soundings in the area bounded as follows: North of a line at Latitude 37° 39.30'N extending from the west limit of the survey to Longitude 122° 11.80'W, thence south to Latitude 39° 00.05'N, thence east to the east shore of the bay.

In the area south of the area defined in paragraph two, San Mateo Bridge tide reducers were applied directly with the exception of x day. Soundings in this south area taken on x day were reduced using Point San Bruno tides to which a 1.1 range ratio has been applied in addition to a 10 min. time correction.

APPROVAL SHEET

HYDROGRAPHIC SURVEY, REGISTERY NO H-8027, FIELD NO. BO-2154

WEST COAST SHORE PARTY

The work done on this survey thus far is considered complete and adequate and no additional field work is recommended. The records have been examined and are approved.

Horace G. Conerly
Commander, USC&GS
OinC., West Coast
Shore Party

LIST OF SIGNALS USED

Name Used in Hydro Survey	Origin of Signal
Air	T-11065
Ate	TRANSMISSION TOWER NO. 8, 1955
Bay	SAN FRANCISCO BAY RADAR TOWER, 1955
Beacon	AIR BEACON ON SAN FRANCISCO AIRPORT CONTROL TOWER, 1954
Bla	T-11066
Blu	BO-B-54
Brick	RED BRICK CHIMNEY, 1938
Cat	SAN LEANDRO, CATERPILLAR TRACTOR CO., TANK, 1947
Cin	T-11065
Con	TRANSMISSION TOWER NO. 14, 1955
Cup	CUPOLA ON WEATHERED COLORED WHAREHOUSE, 1931
Dia	TRANSMISSION TOWER NO. 15, 1955
Dol	Dol, 1955
Dos	TRANSMISSION TOWER NO. 2, 1955
East	EAST SPAN OF SAN MATEO BRIDGE, RED LIGHT, 1932
Fez	T-11066
For	TRANSMISSION TOWER NO. 4, 1955
Gul	Hydro Fix
Hay	Hayward, California Home Brand Tank, 1931
Hid	T-11067
How	T-11067
Irb	TRANSMISSION TOWER NO. 3, 1955
Ive	TRANSMISSION TOWER NO. 5, 1955
Jan	T-11067
KYA	KYA RADIO TOWER, 1937
Lev	TRANSMISSION TOWER NO. 11, 1955

LIST OF SIGNALS USED
(Continued)

Name Used in Hydro Survey	Origin of Signal
Luk	T-11065
Mat	Mat 1954 (traverse) see This report
Mount	SAN BRUNO MOUNTAIN MIDDLE TRANSMISSION TOWER, 1932
Mul	T-11065
Nin	TRANSMISSION TOWER NO. 9, 1955
Oak	OAKLAND MUNICIPAL AIRPORT BEACON, 1953
Obi	Obi, 1954
Pil	Pil, 1955
Port	OAKLAND MUNICIPAL AIRPORT RADAR TOWER, 1953
Red	T-11065
Roof	ELEVATED TANK, CONICAL ROOF, 1938
Set	TRANSMISSION TOWER NO. 6, 1955
Sew	T-11067
Six	TRANSMISSION TOWER NO. 16, 1955
Stack	OAKLAND SCAVENGER CO., BLACK STACK, 1953 T-11065 and Form 524
Tab	T-11065
Tan	T-11067 (see pg 29, Vol 3)
Ten	TRANSMISSION TOWER NO. 10, 1955
Tow	Green Tower, General Foods Plant. 1953 T-11065 and Form 524
Tra	TRA, 1955
Two	TRANSMISSION TOWER NO. 12, 1955
Uno	TRANSMISSION TOWER NO. 1, 1955
Ven	TRANSMISSION TOWER NO. 7, 1955
Via	TRANSMISSION TOWER NO. 13, 1955
West	WEST SPAN OF SAN MATEO BRIDGE, RED LIGHT, 1932

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
Form 27
Ed. April 1945

POSITION COMPUTATION, THIRD-ORDER TRIANGULATION

			°	′	″
α	2	to 3			
$2^d \angle$		&	+		
α	2	to 1			
$\Delta\alpha$					
			180	00	00.0
α'	1	to 2			

			°	′	″
α	3	to 2			
$3^d \angle$		&	−		
α	3	to 1			
$\Delta\alpha$					
			180	00	00.0
α'	1	to 3			

First Angle of Triangle

	°	′	″			°	′	″
ϕ				2	λ			
$\Delta\phi$					$\Delta\lambda$			
ϕ'				1	λ'			

	°	′	″			°	′	″
ϕ				3	λ			
$\Delta\phi$					$\Delta\lambda$			
ϕ'				1	λ'			

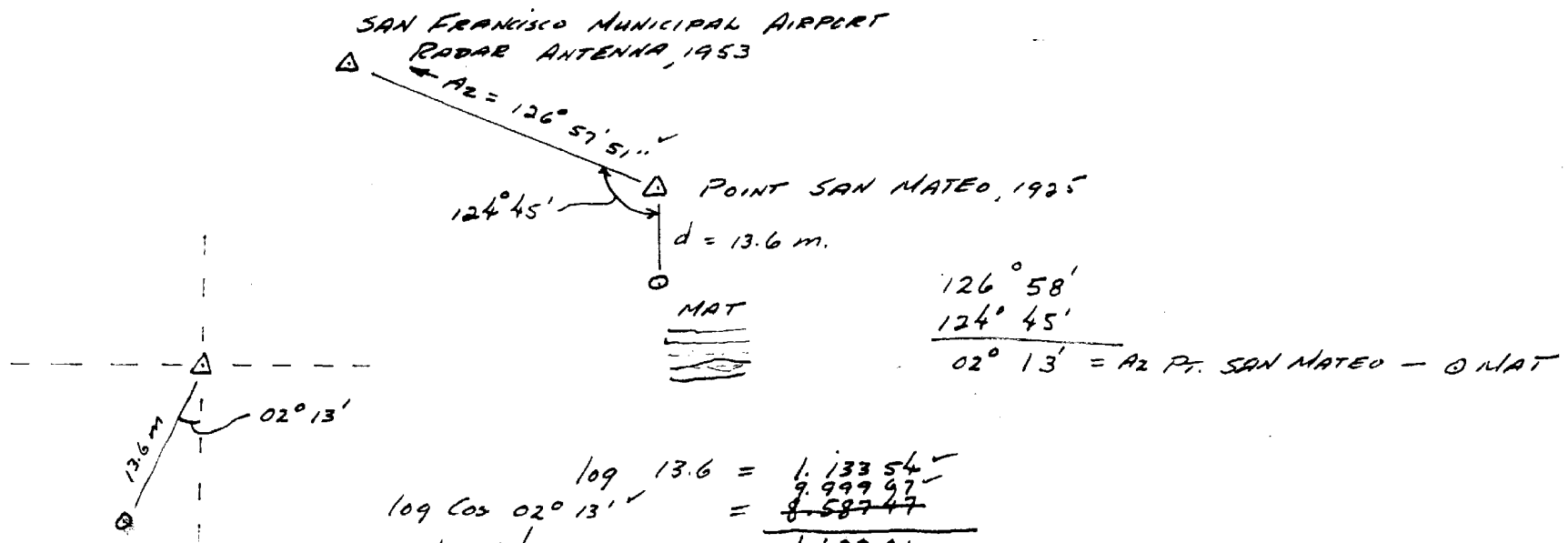
	Logarithms	Values in seconds
s		
$\cos\alpha$		
B		
h		1st term ″
s^2		
$\sin^2\alpha$		
C		
		2d term +
h^2		
D		
		3d term +
		$-\Delta\phi$

$\frac{1}{2}(\phi+\phi')$ ° ′ ″	Logarithms	Values in seconds
s		
$\sin\alpha$		
A'		
$\sec\phi'$		″
$\Delta\lambda$		
$\sin\frac{1}{2}(\phi+\phi')$		
$-\Delta\alpha$		

	Logarithms	Values in seconds
s		
$\cos\alpha$		
B		
h		1st term ″
s^2		
$\sin^2\alpha$		
C		
		2d term +
h^2		
D		
		3d term +
		$-\Delta\phi$

$\frac{1}{2}(\phi+\phi')$ ° ′ ″	Logarithms	Values in seconds
s		
$\sin\alpha$		
A'		
$\sec\phi'$		″
$\Delta\lambda$		
$\sin\frac{1}{2}(\phi+\phi')$		
$-\Delta\alpha$		

16—44238-1 U. S. GOVERNMENT PRINTING OFFICE



126° 58'
124° 45'
02° 13' = Az Pt. SAN MATEO — ⊙ MAT

log 13.6 = 1.13354
log Cos 02° 13' = 9.99997
= 8.58747
log Δφ = 1.13321
Δφ = 13.59 m. S

Pt SAN MATEO, 1925
φ 37° 35' 28.848"
λ 122 19' 06.017"

log 13.6 = 1.13354
log sin 02° 13' = 8.58747
log Δλ = (−)9.72101
Δλ = 0.53 m. W

Plotting 1:10,000

⊙ NAT
φ 37° 35' + (49.1 m) 875.8 m.

λ 122 19' + (587.9 m) 148.1 m

ADDENDA TO DESCRIPTIVE REPORT

TO ACCOMPANY HYDROGRAPHIC SURVEY

SHEET NO. BO-2154 - REGISTERY NO. H-8027

SURVEY LIMITS AND DATES

The limits of the survey have been extended south to the San Mateo - Hayward Bridge and to a junction with Sheet BO-1354 Registery No. H-8026.

The sheet was completed on 6 January 1956.

VESSELS AND EQUIPMENT

For the additional work launch CS-160 with EDO fathometer no. 203 was used.

TIDE AND CURRENT STATIONS

For tide reducers from November 1955 to January 1956 a tide gage was maintained at the San Mateo - Hayward Bridge.

CONTROL STATIONS

No additional control has been added to the sheet since the work was discontinued in March 1955.

SHORE LINE AND TOPOGRAPHY

See Descriptive Report.

SOUNDINGS

Soundings were taken with an EDO fathometer. Corrections will be computed in separate fathometer report.

CONTROL OF HYDROGRAPHY

Hydrography was controlled by three point fixes on previously located objects ashore.

ADEQUACY OF SURVEY

The survey is considered adequate to supersede previous surveys, for charting.

CROSS LINES

The number of crosslines run is considered adequate. There is good agreement.

DANGERS AND SHOALS

In the area surveyed no new shoals or dangers were found.

The two snags and one pile shown on Chart 5531, approx. 2 miles north of the draw span of San Mateo - Hayward Bridge, were looked for when the tide was 1.4 feet above MLLW but were not seen. It is possible they were still below the surface but were not visible above the water.
White dolphin charted in lat. 37°40.6' long 122°11.5' "is no longer there" - Ref. Vol 5 page 21. Br. CA Rep.

LANDMARKS FOR CHARTS

No additional landmarks are recommended.

VELOCITY CORRECTIONS

Velocity corrections were determined from bar checks, pole and lead-line comparisons. See special fathometer report.

MISCELLANEOUS

Only a rough comparison with the soundings on previous surveys has been made. It is believed that comparison should be made after the smooth sheet has been completed.

The Ideal Cement Co. has been authorized by the Corps of Engineer, U. S. Army to dredge for oyster shells in the area north of the San Mateo Bridge and inclosed by broken green lines on the boat sheet. They usually work to about 20 feet from the surface regardless of the tide, and do not work a pattern. Some of the spoil falls overboard as the shells are pumped into the barge alongside the dredge.

Horace G. Conerly
Commander, USC&GS
OinC., West Coast
Shore Party

TIDAL NOTE

TO ACCOMPANY DESCRIPTIVE REPORT

SHEET NO. BO-2154 - REGISTERY NO. H-8027

Tide reducers for the area surveyed from November 1955 to January 1956 were taken from a tide gage installed on the fender at the lift span of the San Mateo - Hayward Bridge. No corrections for height, or distance from the gage were made.

MLLW on the staff was 2.4 feet.

ADDENDUM

STATISTICS FOR HYDROGRAPHIC SURVEY

SHEET NO. BO-2154 - REGISTERY NO. H-8027

Vol. No.	Day Letter	Date	H.L. Sdgs.	No.Pos.	Stat.Miles Sdg.
13 & 14	y	2 Dec. 1955		156	34.5
14	z	5 Dec. 1955		44	10.6
14	a a	6 Dec. 1955		120	30.8
15	b b	7 Dec. 1955		184	48.8
15 & 16	c c	16 Dec. 1955		181	48.8
16	d d	4 Jan. 1956		46	10.8
				731	184.3
	Total to 25 March 1955			2,349	742.3
	Total Sheet			3,080	926.6

Area square statute miles 25 March 1955	44.2
Area after 15 November 1955	15.9
Total whole sheet	60.1

ABSTRACT OF SMOOTH TIDE REDUCERS

Tide Gage at San Mateo Bridge

SHEET NO. BO-2154

2 December 1955
"y" day

0936 -	0945	-4.2
	0955	-4.4
	1003	-4.6
	1010	-4.8
	1017	-5.0
	1024	-5.2
	1032	-5.4
	1040	-5.6
	1048	-5.8
	1057	-6.0
	1103	-6.2
	1112	-6.4
	1121	-6.6
	1130	-6.8
	1140	-7.0
	1150	-7.2
	1200	-7.4
	1212	-7.6
	1224	-7.8
	1238	-8.0
	1300	-8.2
	1417	-8.4
	1433	-8.2
	1446	-8.0
	1457	-7.8
	1505	-7.6
	1513	-7.4
	1521	-7.2
	1528	-7.0
	1535	-6.8
	1542	-6.6
	1548	-6.4

5 December 1955
"z" day

1327 -	1336	-3.6
	1344	-3.8
	1352	-4.0
	1400	-4.2
	1409	-4.4
	1420	-4.6
	1430	-4.8
	1441	-5.0
	1452	-5.2
	1505	-5.4

6 December 1955
"aa" day

0958 -	1005	-4.0
	1015	-3.8
	1024	-3.6
	1034	-3.4
	1044	-3.2
	1054	-3.0
	1108	-2.8
	1120	-2.6
	1138	-2.4
	1200	-2.2
	1323	-2.0
	1343	-2.2
	1400	-2.4
	1415	-2.6
	1430	-2.8
	1443	-3.0

7 December 1955
"bb" day

0906 -	0918	-5.8
	0930	-5.6
	0941	-5.4
	0951	-5.2
	1000	-5.0
	1011	-4.8
	1020	-4.6
	1029	-4.4
	1038	-4.2
	1047	-4.0
	1057	-3.8
	1105	-3.6
	1114	-3.4
	1123	-3.2
	1133	-3.0
	1144	-2.8
	1154	-2.6
	1207	-2.4
	1218	-2.2
	1230	-2.0
	1243	-1.8
	1300	-1.6
	1314	-1.4
	1335	-1.2
	1430	-1.0
	1453	-1.2
	1506	-1.4

7 Dec."bb" day
Continued

1506 -	1519	-1.6
	1532	-1.8
	1544	-2.0
	1555	-2.2
	1605	-2.4
	1615	-2.6

16 December 1955
"cc" day

0905 -	0916	-4.2
	0926	-4.4
	0937	-4.6
	0947	-4.8
	0956	-5.0
	1005	-5.2
	1014	-5.4
	1025	-5.6
	1034	-5.8
	1044	-6.0
	1055	-6.2
	1105	-6.4
	1117	-6.6
	1132	-6.8
	1150	-7.0
	1210	-7.2
	1300	-7.4
	1326	-7.2
	1344	-7.0
	1400	-6.8
	1410	-6.6
	1418	-6.4
	1425	-6.2
	1434	-6.0
	1443	-5.8
	1451	-5.6
	1500	-5.4
	1508	-5.2
	1516	-5.0
	1526	-4.8
	1535	-4.6
	1544	-4.4
	1552	-4.2
	1600	-4.0
	1608	-3.8
	1616	-3.6
	1624	-3.4

ABSTRACT OF SMOOTH TIDE REDUCERS

SHEET NO. BO-2154

Continuation

16 December 1955
"cc" day
continued

1624 -	1632	- 3.2
	1639	- 3.0
	1646	- 2.8
	1654	- 2.6

6 January 1956
"dd" day

0930 -	0939	- 5.6
	0947	- 5.4
	0955	- 5.2
	1004	- 5.0
	1012	- 4.8
	1021	- 4.6
	1030	- 4.4
	1039	- 4.2
	1047	- 4.0
	1056	- 3.8
	1105	- 3.6

APPROVAL SHEET

HYDROGRAPHIC SHEET BO-2154 - REGISTERY NO. H-8027

WEST COAST SHORE PARTY

The work done on the sheet is considered adequate and no additional work is recommended. The records have been examined and approved.

Horace G. Conerly
Commander, USC&GS
CinC., West Coast
Shore Party

PROCESSING OFFICE NOTES
H-8027 (BO-2154)

SMOOTH SHEET

The smooth sheet was prepared by hand in the Seattle Processing Office, using standard methods.

CONTROL STATIONS

Since signal ANT was only used in three fixes on this survey, instead of plotting it on a dogear, the signal was plotted off the sheet and rays were drawn to it.

Signal TAN was located by photogrammetry and relocated by a round of sextant angles on page 49 volume 13. There was some confusion between this signal and a nearby tower of the same shape. This other tower was located by the same means and called TAN2.

Siganl TRA,1955 has a no check triangulation location. A position about 20 meters toward HAYWARD, 1925 gives better spacing and direction to the hydrography, and , since the angle of intersection is only about 10 degrees, this error could be possible.

ADEQUACY OF SURVEY

The junction between H-8027 (1955-56) and H-8026 (1955-56) shows a discrepancy in an area about 1¼ miles north of the San Mateo - Hayward Bridge. A dredge was reported working in this area during the later field work.

The junctions between H-8027 (1954-56) and H-8024 (1954) and H-8025 (1954) are satisfactory and the depth curves can be adequately drawn.

COMPARISON WITH PRIOR SURVEYS

The junction with H-6726 (1941) was compared and the depth curves around San Bruno Shoal can be adequately drawn.

A comparison with H-4137 was made. The two sheets show fair agreement except for some minor shoaling and deepening in shoaler depths.

Respectfully submitted

Harvey C. Parsons

Harvey C. Parsons
Cartographer, C&GS

Examined and Approved

William M. Martin

William M. Martin
Cartographer-in-Charge, S.P.O.

Approved and Forwarded

L. S. Hubbard

L. S. Hubbard, Captain, C&GS
Seattle District Officer

GEOGRAPHIC NAMES ON H-8027

BAY SHORE

BRISBANE

BURLINGAME

HAYWARD LANDING

HUNTERS POINT

JOHNSON LANDING

MULFORD LANDING

OAKLAND AIRPORT

POINT SAN BRUNO

POINT SAN MATEO

ROBERTS LANDING

SAN BRUNO

SAN BRUNO SHOAL

SAN FRANCISCO

SAN FRANCISCO BAY

SAN MATEO ✱ HAYWARD BRIDGE

SOUTH SAN FRANCISCO

See Descriptive Report
for approved Names.
L.S.S. 4/10/59.

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-8027...

Records accompanying survey:

Boat sheets .1...; sounding vols. ..16..; wire drag vols. .....;

bomb vols. .....; graphic recorder rolls 15-Envelopes

special reports, etc. 1-Smooth sheet, and 1-Descriptive report.....

.....

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

Number of positions on sheet		3080
Number of positions checked		229
Number of positions revised		3
Number of soundings revised (refers to depth only)		0
Number of soundings erroneously spaced		37
Number of signals erroneously plotted or transferred		0
Topographic details	Time	4
Junctions	Time	40
Verification of soundings from graphic record	Time	8

Verification by J. B. Chambers Total time 180' Date 2/16/59

Reviewed by [illegible] Time 54 Date 4/24/59

(Descriptive Report in Two parts)

M-2232-1

DIVISION OF CHARTS

REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. 8027 FIELD NO. BO-2154

Oakland Airport to San Mateo - Hayward Bridge

Surveyed - Jan.-March 1955
Dec.-Jan. 1956

Scale: 1:20,000

Project No. CS-256

Soundings:

808 Depth Recorder
EDO Depth Recorder

Control:

Sextant fixes on shore signals

Chief of Party - H. G. Conerly
Surveyed by - K. A. MacDonald, C. D. Upham and H. L. Runge
Protracted by - H. C. Parsons
Soundings plotted by - H. C. Parsons
Verified and inked by - J. C. Chambers
Reviewed by - L. S. Straw
Inspected by - R. H. Carstens

Date: 24 April 1959

1. Shoreline and Control

The shoreline originates with unreviewed manuscripts of airphotographic surveys T-11064, T-11065, T-11066, T-11067, T-11068, T-11069 and T-11070 of 1952-53.

The source of the control is given in the Descriptive Report.

2. Sounding Line Crossings

The depths at sounding line crossings are in adequate agreement. Crosslines were run to the extent of about 5% of the regular system of sounding lines instead of 8% as called for in the instructions; they are, however, considered adequate for this area.

3. Depth Curves and Bottom Configuration

The portion of San Francisco Bay covered by the present survey slopes gradually Westward from the shoal flats on the east to deep natural channel first west of the survey limits.

The rectangular area in lat. 37°36.00', long. 122°15.00' outlined by the 12 and 6-foot curves is the result of dredging for shells. Along the southwest side of this area the depths drop abruptly to 30 feet and more into the deep natural channel of San Francisco Bay.

A portion of the San Bruno Shoal falls at the western limits of the survey.

The usual depth curves are adequately delineated with the addition of the 3-foot curve to accentuate the irregularities on the shoal flats.

4. Junctions with Contemporary Surveys

Adequate junctions were effected with H-8024(1955) on the north, H-8025 (1955-56), H-8026 (1955-56) and H-6726 (1941) on the west; and with H-8210 (1956) and H-8275 (1956) on the south.

5. Comparison with Prior Surveys

a.	H-628 (1857-58)	1:20,000	H-2304 (1897)	1:20,000
	H-2315 (1897)	1:20,000	H-2411 (1898) (1899)	1:20,000

A comparison of the early surveys with the present survey reveals very little change in depths less than 18 feet. An exception, however, occurs in the locality of San Bruno Shoal lat. 37°38.50', long. 122°17.30' where the shoalest portion of the shoal has shifted 100-150 m. eastward and spots have deepened 2-4 feet. In addition, the present survey shows a gap of over a mile in the shoal in latitude 37°37.70', long. 122°16.6' with depths 3 to 5 feet deeper, whereas the earlier surveys show the San Bruno Shoal connected and included within the 6 foot curve.

A 1½ foot sounding in lat. 37°38.03' long. 122°17.02' on H-2315 (1897) was discredited in the review of H-6726 (1941) and further discredited by the present development.

North of San Bruno Shoal in the vicinity of lat. 37°43.00', long. 122°19.5' an area of about one and a half square miles has deepened unevenly from 2 to 5 feet.

Except for the construction of the San Mateo-Hayward bridge the changes in depths and shoreline are attributed to natural forces.

The present survey supersedes these earlier surveys in the common area.

b. H-4137 (1919-20) 1:20,000
H-5129 (1930-31) 1:20,000
H-6794 (1941-42) 1:20,000

---

(1) Only in a few places do differences between depths on these prior surveys and the present survey exceed one foot. Changes in depths and shoreline south of the Oakland Airport are due to dredging and filling operations subsequent to the prior surveys.

(2) The investigation of the charted pile from H-5129 (1930-31) in lat. 37°36.96' long. 122°15.02'; the snag in lat. 37°37.09' long. 122°14.47' and the snag in lat. 37°36.68' long. 122°14.91' mentioned in the Pre-survey Review dated March 29, 1954 is not considered thorough enough to prove or disprove their existance. It is noted that the snags are from 20 to 40 meters from the closest sounding lines on the present survey that the tide was 3.6 and 1.4 feet above MLLW at the time, and finally that the prior depths agree with the present within one foot which indicates no appreciable change in the bottom. In view of these circumstances the pile and the snags are carried forward to the present survey.

(3) San Bruno Shoal has shifted 20 to 30 meters eastward in the past 29 years.

(4) The present survey with the indicated additions is adequate to supersede these prior surveys in the common area.

6. Comparison with Chart 5531 (Reconstruction Dwg. No. 18)

A. Hydrography

The hydrography applied to the reconstruction drawing originates principally with the present survey applied before verification and review supplemented by information obtained by Federal, State and Municipal agencies subsequent to the present survey.

The following deletions and/or corrections should be made on the reconstruction drawing.

(1) The least depth of 1 foot on San Bruno Shoal lat. 37°38.49, long. 122°17.29' which falls within the limits of the present survey and originates with H-6726 (1941) also a basic survey should be applied.

(2) The location of the concrete piles in lat. 37°40.18', long. 122°11.52' was corrected during review. The position on the present survey agrees with the original determination on T-4610 (1930-31) having the note "10 concrete piles remains of oyster house, covers at h.w.". The reconstruction drawing should be corrected accordingly. ok on chf 5531 ma

(3) The white dolphin charted from chart letter 821 (1937) in lat. 37°40.6', long. 122°11.57' and the wreck on San Bruno Shoal in lat. 37°38.68', long. 122°17.38' (Print dated 8-4-58) charted from H-6726 (1941) were searched for and not found. They should not be charted in the future.

B. Dredging and Filling

Changes in depths and shoreline south of Oakland Airport are due to extensive dredging and filling operations since the present survey was made.

C. Aids to Navigation

The survey positions of floating aids to navigation including the white buoy marking the "Anchorage for Explosives" charted in lat. 37°41.00', long. 122°16.40' are in substantial agreement with the charted positions and properly mark the features intended. Buoy "EX 14" on the present survey in lat. 37°43.48' long. 122°19.59' has been superseded by re-marking the Anchorage for Explosive Area 14 - Authority N to M No. 34 1955.

7. Condition of Survey

a. The sounding records and the Descriptive Report are complete and comprehensive.

b. The smooth plotting was accurately done.

c. Very few bottom characteristics were obtained south of lat. 37°39'; sufficient coverage has been carried forward from prior surveys.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions except as noted in paragraphs 2 and 5b (2) above.

9. Additional Field Work

This is a good basic survey and no additional field work is recommended.

Examined and Approved:

Max G. Ricketts
Chief, Nautical Chart Branch

Ernest B. Lewey
Chief, Chart Division

Lorin F. Woodcock
Chief, Hydrographic Branch

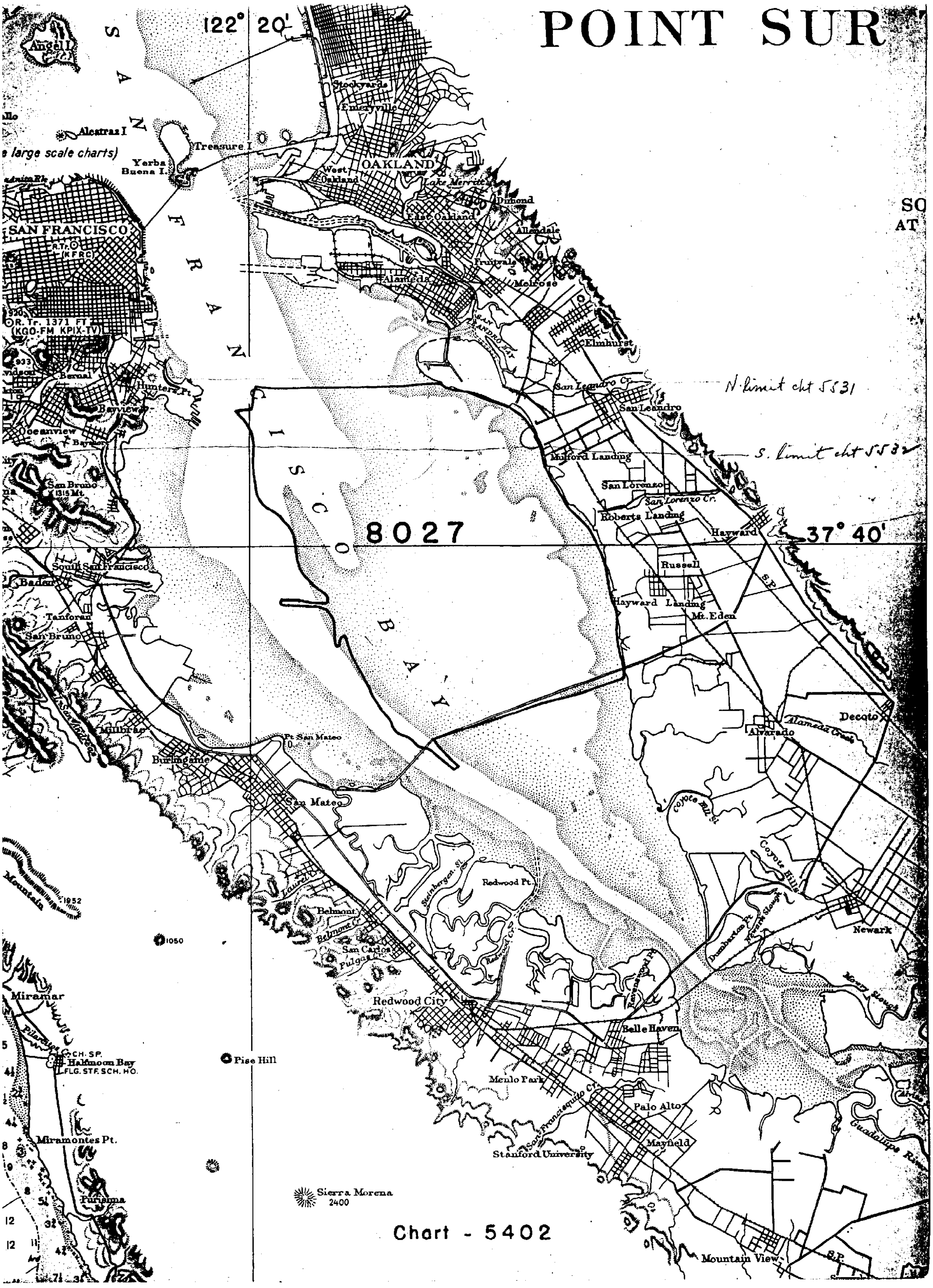
Samuel B. Grenell
Chief, Coastal Surveys Division

GEOGRAPHIC NAMES

Survey No. H-8027

Name on Survey	On Chart No. A	On previous survey No. B	On U. S. quadrangle Maps C	From local information D	On local Maps E	P. O. Guide or Map F	Rand McNally Atlas G	U. S. Light List H	K	
California									BFHY	1
San Francisco Bay										2
Hunters Point									HHY	3
Point San Bruno			(tide station)							4
San Bruno Shoal										5
Point San Mateo										6
San Mateo-Hayward Bridge (tide station)										7
Oakland Airport										8
										9
			Names approved							10
Additional Names			5-22-56. L. Heck							11
on sheet, all approved										12
if desired:										13
San Francisco										14
Bayshore										15
Brisbane										16
South San Francisco										17
San Bruno										18
Burlingame										19
Johnson Landing										20
Hayward Landing										21
Roberts Landing										22
Mulford Landing										23
										24
										25
										26
										27

M 234


POINT SUR
122° 20'
SAN FRANCISCO BAY
Angel I.
Alcatraz I
(see large scale charts)
Treasure I
Yerba Buena I.
Stockyards
Emeryville
OAKLAND
West Oakland
Lake Merritt
Dimond
East Oakland
Allendale
Fruitvale
Alameda
Melrose
San Leandro Bay
Elmhurst
SAN FRANCISCO
R. Tr. 1371 FT
(KGO-FM KPIX-TV)
Bernal
Hunters Pt.
Bayview
Oceanview
San Bruno
San Leandro Cr.
San Leandro
N. limit cht 5531
S. limit cht 5532
Mulford Landing
San Lorenzo
San Lorenzo Cr.
Roberts Landing
Hayward
8027
37° 40'
South San Francisco
Baden
Russell
Hayward Landing
Mt. Eden
Tanforan
San Bruno
S.P.
Millbrae
Pt San Mateo
Burlingame
Decoto
Alameda Creek
Alvarado
San Mateo
Coyote Hill Sl.
Coyote Hills
Newark
Redwood Pt.
Steinberger Sl.
Belmont
Belmont Cr.
San Carlos
Redwood Cr.
Dumbarton Pt.
Newark Slough
Mowry Slough
1050
1952
Miramar
Redwood City
Belle Haven
Halfmoon Bay
Pise Hill
Menlo Park
Palo Alto
San Francisquito Cr.
Guadalupe River
Miramontes Pt.
Stanford University
Mayfield
Sierra Morena
2400
Purisima
Chart - 5402
Mountain View

RHC

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Rev. Apr. 1950

TIDE NOTE FOR HYDROGRAPHIC SHEET

~~Division of Coast and Survey~~ 31 May 1956

Division of Charts: R. H. Carstens

Plane of reference approved in
16 volumes of sounding records for

HYDROGRAPHIC SHEET 8027

Locality South San Francisco Bay, California

Chief of Party: ~~C. A. George~~ H. G. Conerly in 1955-56
Plane of reference is mean lower low water, reading
3.7 ft. on tide staff ~~xx~~ (1955) at Point San Bruno
10.4 ft. below B. M. 6 (1952)

4.0 ft. on tide staff (1954-55) at San Mateo Bridge
2.4 ft. on tide staff (1955-56) at San Mateo Bridge
15.4 ft. below B. M. 3 (1930)

Height of mean high water above plane of reference is as follows:
Point San Bruno = 6.3 feet
San Mateo Bridge = 7.0 feet

Condition of records satisfactory except as noted below:

William Shafer

Chief, ~~Division of~~ Tides Branch

U. S. GOVERNMENT PRINTING OFFICE 877933

NAUTICAL CHARTS BRANCH

SURVEY NO. H-8027
Reviewed 4-24-'59
Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
5-14-56	5531	J.J. Walker	Before ~~After~~ Verification and Review Partially jmo
6/7/56	5535	H.E. MacEwen	Before ~~After~~ Verification and Review Partially applied.
30 Aug '56	5532	H.E. MacEwen	Before [redacted] Verification and Review Partially applied.
12/31/56	5532 Rev	W. Evans	Before [redacted] Verification and Review
9/12/57	Recreate 5535	S.G. McGann	Before ~~After~~ Verification and Review
12/10/57	Recreate 5531	S.G. McGann	Before ~~After~~ Verification and Review jmo
6/10/59	5532	J.J. Walker	~~Before~~ After Verification and Review Completely applied Revised 6' curve – otherwise no correction
1-12-60	5531	J.M. Albert	Completely ~~Before~~ After Verification and Review
4/6/60	5535	W. Evans	~~Before~~ After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.