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Form 504

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

....., Director

G. & D. SURVEY
L & A.

State: California Acc. No.
 Acc. No.

DESCRIPTIVE REPORT

Topographic } Sheet No.
Hydrographic }

LOCALITY

San Francisco Bay

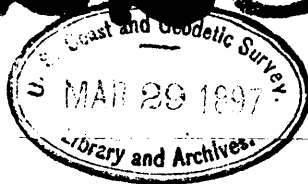
1894-1897

CHIEF OF PARTY

F.H.Crosby, J.H.Sears

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U. S. COAST AND GEODETIC SURVEY.

Gen. W. W. Duffield, Superintendent.

State: *California.*

DESCRIPTIVE REPORT.

Hydrographic Sheet No. 2283.

LOCALITY:

San Francisco Bay.

1896-97.

CHIEF OF PARTY:

Lieut. James H. Sears, U.S.N.

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H 2283

Description Report

to accompany proj. #1,

"San Francisco Bay Entrance."
Scale 1/10000.

W. S. & G. S. for Mr. Deane,

March 19th 1897.

Write me at: San Francisco, Cal.,
 Telegraph me at: do
 My Express Office is: do

U. S. Coast and Geodetic Survey, Mr. "McArthur,"
San Francisco, Cal.,

March, 1897.

2-547

Gen. W. W. Duffiel,
 Superintendent, U. S. C. & G. Survey,
 Washington, D. C.

Sir,

In accordance with par. #209, "Gen. Instructions for Hydrographic Parties," I have the honor to submit the following Description Report to accompany the finished sheets and records, prof. #1, (Off. Number), "San Francisco Bay Entrance."

The western limit of the projection passes outside the Head in a line extending between Frank's Lagoon on the N.W. and a point below the Cliff House, on the S.E.

By agreement with the Commanding Officer of the "Idney," whose sheets overlapped on ours, the eastern limit is

2

a line between Fort Point on the
south and Aqueduct Rock on the north.

This projection includes the important
Point, or North Channel, a portion of
the inner, northern horn of the bay
and the Mile Rock channel. It was
originally furnished to Lt. Crosby in the
Spring of 1894, with instructions to
develop only the inshore portions. In
accordance, a portion of the inshore
was developed by him from Point Point
on the west to Point Barlow on the
east. Work was then discontinued and
the party transferred to the Coast of
Washington. Subsequently, instructions
were issued, Dec. 27th, 1894, directing
a complete survey of San Francisco Bay,
under which instructions, work has been
carried on, interrupted only by the winter.

necessary repairs, and the trial trip of the U.S. "Ceylon" in Santa Barbara Channel.

The difficulties in the hydrography upon the projection are to be found in the irregular and excessive currents, the lack of good soundings, the prevalent fog, the high winds, and the tidal sea.

Using the Automatic gauge at Anzalito, as a standard, Comparisons were made with box gauges at Point Diablo, and in the Cor-off Poles Lagoon. The gauge at Point Diablo was maintained for several months, but Comparisons only were secured from the outside gauge.

No difficulty was met in the matter of signals, and the work should be plotted without difficulty.

In the deeper portions of the entrance

When the currents, surface and subsurface are the strongest, the vessel was necessarily stopped for many soundings which precluded the maintaining of straight lines of soundings. It is believed, however, that the number of positions will fully develop the bottom. Throughout the area covered, the bottom is very irregular both in the depths and in character, which is fully indicated by the sounding country. Any suspicious discrepancy in the soundings has been investigated, and it is believed that the projection and records represent as near as may be the actual bathographic features.

So far as a comparison of our work with the published chart reveals, the changes in depth since the last survey are inconsiderable, though the chart does

not offer a good means for comparison.

It will be noticed, however, that the fine features seen on the edge of the bar included on the projection, has receded from the shore line, and from the 6 fm curve as well. Rocky bottom has also developed at this point, and I am informed that at certain times after winter gales, or extraordinary currents, the sand is washed away, exposing the rock. At other points the lead found rocky bottom, not indicated upon the chart, which is not surprising from a consideration of the surrounding country.

The development so far as conditions permitted, was made on lines normal and parallel to the shore, and spaced at 125 yds; lines on range in Pomite

Channel, and, when the formation in-
dicated, especial close development
was made at large scales.

As might be expected the currents
in the declivity are excessive in strength,
and erratic in course, a great volume
of water requiring to be transferred four
times a day across the natural dam
between Points Bonita, and Lopez, subject
to the irregular influence of the Sacramento
and San Joaquin Rivers. When these rivers
are full and rapid the effect upon
the direction and force of the flood
currents is extreme, water are constrained
to flow side by side, above and beneath
in a manner for which those navigating
the entrance have only general rules.

Understanding that the currents of
the Bay and Gulf of Sanallone were to be

subject to an especial investigation,
 and the development of the bottom,
 requiring all the favorable time of the
 party. No systematic series of current
 observations were undertaken.

In British North Channel the
 current nearly always sets to the eastward,
 and southward, the exceptions being at
 the beginning of the straits and for a
 short period only, so short that I have
 not observed this vessel to lie to an
 opposite current for more than one hour.

But on the North shore and the
 South shore inside the heads, there
 is an eddy favorable for vessels entering. It is
 stated that under the influence of the
 tide outflow, forming through Racoon
 Pass and limited at the narrow necks
 between Lime Pt, and Fort Pt, by Point

Canal, Lime Pt, and Diablos itself,
 the straits take two directions; one
 volume of water setting direct
 from Lime Pt. on to Mile Rocks,
 thence around Pt. Loma, and to
 the Oriskany, another passing direct
 to seaward by Point Bonita, to
 and setting on to the Mile Rocks,
 the pilots endeavor to get sailing
 vessels across the line between Lime
 Pt. and Mile Rocks as near to the
 former as possible, where the current
 is found finer for getting to sea.

This line of division is fully
 indicated on the water itself, a
 distinct color division can also
 be noted extending from Point
 Bonita seaward, the muddy
 water being outlined against

the clear sea water of Bonita Channel. This line seems so permanent as almost to amount to a landmark.

From the behavior of the lead in sounding it is certain that subcurrents exist in great strength.

In Bonita Channel in ten and eleven fathoms of water, the propeller turns up muddy water in the clear surface water.

About Fort Point, the currents are swirling and violent.

For about one hour after high water the currents, along the South shore between Fort Point and Mile Rocks will set seaward, at other times to the S. by E.

Tide differences in time are to be noted in the setting of

Current on the north shore, and the extent
 of the entrance. I have observed the surface
 current sets, setting near Point Barrow, two
 hours after flood has made off the City point.
 Also the flood making near Mile Rocks one
 hour after H. W. at the standard gauge in
 Anaktulok. While tidal observations were in progress
 at Point Diablo, it was observed that the
 flood and ebb currents continued to
 run off the Point, for, from an hour to
 one hour and a half after high and low water
 respectively. These considerations together with
 those of wind, govern the actions of sailing vessels
 in making or leaving the harbor. The wind
 is liable to fall between the heads, and
 its anchorage being difficult it is
 not a comfortable passage for such
 vessels, without the assurance of
 a steady wind.

The winds about the entrance are peculiar, and I have not seen any explanation of the causes. The fishing Colony, Italian and Portuguese, put to sea when all the conditions appear unfavorable from the inside. Strong winds blow the hills with driving mist, and this is roughly, good judgment. The wind from the N. W. inside, strong in gusts, appears to strike the coast between Point Bonita and Richardson's Bay. On leaving the harbor this wind subsides off Point Diablo, until off Point Bonita it amounts to nothing more than a light or gentle breeze. This apparently reverses the rule of land and sea breezes unless the dry, hot interior portion of the state is taken into consideration. I am informed

that these gusts after striking
Richardson's Bay, recur again
towards "Benicia". It is generally
true that the winds inside Point
Diablo give no indication of those outside.
With a strong N. W. gale blowing outside, the
wind may be quite inside from South.

Fogs are prevalent during summer, though
the seasons are not well marked, about
the entrance. They extend to the
Bukely shore with frequently clear
mounts on either side, being blown from
or South with the prevailing winds.

A vessel entering, if caught in a
fog near the entrance has little choice
but to proceed, with the currents it is not safe
to trust to speed, courses and time without assistance.
The fog signals at Benita and Simo Pt, with the bold North
shore are good guides. I have found also that
the South shore can be made out

at a safe distance in ~~rather~~ thick fog.

A recent decision of the Courts in the case of the "City of Chester" and the "Oceanic," has settled that vessels entering must keep the port hand, the north side, while vessels leaving shall keep the starboard hand or south side, - a reversal of the ordinary rules.

Vessels find good shelter with moderate currents in Bonita Cove, in six and seven fathoms. There are also good anchorages in South Bay.

The "Pacific Coast Pilot" includes all that can be said in description of the shores, winds, currents and navigation of this section.

The ranges for entering and leaving are all that can be desired as now

upon the published chart, with the single exception of the one through Pomita Channel. In this connection, I beg to refer to my letters of the 11th, and 12th February, and to restate the recommendations therein made. Owing to the location of the dangers in Pomita Channel the present range has become an unsafe guide, and there exist no marks sufficiently defined for the establishment of one direct range.

I would first suggest the erection on the west shore of range ~~marks~~ which would enable vessels to keep one course through the channel. Failing this, I would urge a broken range, as follows;

On leaving keep "Windmill" on with "Blue Mountain Peak" until the edge of "Pomita Bluff" is on with the "Cross" on

"Iron Mountain," when carrying the latter
 range out? The reverse should be
 followed in entering. Should the
 storm of the sea be heavy, vessels
 should, and must, give the red buoy
 a wide berth, there being plenty of
 room and water inside to Landroes.

"Windmill" is not a good guide, at
 present, and I have been informed by
 Assistant Dickins, that the owner of
 the Mill is willing that a structure
 may be erected on his Mill for a
 distinct mark.

Pilgrage is not Compulsary, though
 vessels refusing the services of a pilot,
 when offered, are compelled to pay
 one half fee.

The buoys on projection #1, are as follows:
 a red buoy off Tennessee Co., on the

edge of the four (4) fathom bank; a black buoy, marking dangerous rocks, about one half mile east of the red buoy; a black and red horizontal stripes buoy, at the inner edge of the four fathom bank, locally known as the "Potato Patch." A red ball buoy indicating the danger in Mile Rock channel, to seaward of Mile Rocks, and a red buoy off Fort Point.

The positions of these main buoys - as at present located, are shown upon the projection, and in the records.

There is complaint that aids to navigation are lacking on the coast side of the entrance. In my opinion a fog signal on Point Lobos, and a light on Mile Rocks, an electric light, would be desirable.

I would further urge, that the black buoy #3, in Pomito channel be replaced with a bell buoy. The difference may be vital, in case of sudden fog, as was the case with the "Centesima," which recently struck there.

"Pacific Coast Pilot," summarizes the dangers the dangers to navigation previously noted accurately, with the exception of the rock, described on page 173-711 line from the bottom, under head "Point Pomito," This is in error, in distance, 460 yds, it should be 285 yds.

In localizing the machine notes, position were occupied on the bluffs, - and the visible dangers, entered and noted, were cut in. Along the shore bordering Pomito channel, the results have been entered in reference to the projection, no changes from the projection were observed, ^{from and} along the entrance there. Pomito channel is not too heavy weather

offers the great depth of water for the largest steamers, and sailing vessels in tow. The low bottom banks break the force of the swell, leaving, except in the heaviest weather, a smooth, stretch outside the breakers on Point Bonita.

The channel should be avoided in foggy weather. In some weather, seas break across the channel.

✓ On Aug 5th, 1845, I reported the location of a rock in Bonita Channel, and on Feb. 11th, 1847, the location of a rock still further out in the channel, and narrowing the channel considerably.

✓ The former rock is the culminating pinnacle of a group of rocks. It bears $N. \frac{5}{8} N.$ Mag. from outer tangent of Bird Island, and distant 1200 yds. The reduced depth on it is 18' 5".

The other cropping of the group, bears from

this one, S. x W³/₄ W. (Mag.), - distant 190 yds.
 bearing N 87° 44' East, (Mag.) from the outer
 Tangent of Bird Island, - distant 1277 yds.
 with a reduced depth of 4⁵/₈ m² ft.

Black buoy #3, bears S. W. (Mag) from this
 rock, - distant 35 yds.

The group forms an irregular area,
 - about 500 yds, in a North and South direction,
 300 yds, East and West, approximately.

Careful and repeated observations have not
 shown any other dangers to navigation, in the
 vicinity with so little water, the depths on
 the other side or ledges, varying, and between
 the cropping (as small) (as 10 fms, with
 sandy bottom is found.

A rock in the entrance to the cove to
 the North of Bird Island has been previously
 reported and appears upon the recent charts.
 The other dangers, sunken and marks,

upon the projection as located by the party, are as follows, with data for location,

Sunken rock (1, 3) ^(pos. 108 d') bearing $E 7^{\circ} 11' S$, mag. dist. 660 yds from the western headland of the Con off Frank's dogon.

Sunken rock (4, 5) ^(pos. 218 f') bearing $E 15^{\circ} 46' S$, mag. dist. 1450 yds from same pt., and 430 yds broad off shore.

This rock is about 40 yds N. E + S. W x 20 yds N. W + S. E. in extent

Crash Rock, bearing $E 18^{\circ} 25' S$, mag. distant 2050 yds from the same pt., and 240 yds broad off shore

Sunken Rock (3, 17) ^(pos 255') bearing $S 2^{\circ} 56' W$ (mag) distant 2350 yds from same pt., and 100 yds broad off shore.

Sunken Rock (8, 21) bearing $E 27^{\circ} 26' S$, mag distant, 2970 yds from same pt., and 390 yds broad off shore.

Sunken rock (47^{ft}-2.5') bears $\Sigma 25^{\circ}00'S$, mag. distant
3190 m. from same point, and 250 m
✓ broad off shore.

Sunken rock (8^{ft}-5') bears $\Sigma 25^{\circ}41'S$, mag. dist.
3625 m from same point, and 215 m
✓ broad off shore.

Arrock rock (low water) bears $\Sigma 65^{\circ}34'W$, mag.
✓ distant 470 m from Point Benito Light, and
185 m broad off shore

Sunken rock (17.5') bears $\Sigma 5^{\circ}00'S$, mag. distant
✓ 210 m. from same pt. and 210 m broad off
shore.

Arrock rock bears $\Sigma 20^{\circ}02'S$ mag. dist 145 m
✓ from same pt., with another rock arrock distant
about 25 m from it $\Sigma 10^{\circ}01'E$, mag.

The 17' spot in the bottom of
 Banta Cove, does not exist
 -according to the work of St. Antony,
 and a careful examination by
 this party establishes the same
 fact.

No new developments are apparent
 along the bold northern shore of the
 entrance.

St. Antony's hydrography caused the mistake
 made on this shore across the line
 dividing our work from that of
 the "Gedney"

A Sunken rock, 4 fms. 0.5, bears $S. 19^{\circ} 54' N.$
 Mag. from Fort Point light, distant
 1000 M, and 380 M broad off
 shore.

Mile Rock Channel

- Smken rock 15' bears $S 33^{\circ} 28' E$ mag. from
 Mile rock, distant 300 yds, Report + tracing Oct 11, 1898.
- Smken rock, 7' 9, bears $S 2^{\circ} 41' S$ mag. from
 Little Mile rock, distant 70 yds. It is the
 highest point of a ledge 25 yds long,
 lying off the Mile rocks and in line with
 them.
- Smken rock, 4 fms. 3' 5, bears $N 6^{\circ} 56' E$ mag.
 from Lotus rock, distant 65 yds.
- Smken rock, 4 fms. 5' 5, bears $N. 29-45 W$ mag.
 from Pyramid rock, distant 45 yds.
- Smken rock, 3 fms. 2' 7 bears $N 85^{\circ} 30'$ mag. from
 Flat rock, distant 75 yds.
- Smken rock, 13' 7 bears $N 10^{\circ} W$ mag. from
 Flat rock, distant 55 yds.
- Smken rock, 6 fms. 4' 5 bears $S. 59^{\circ} - 30' E$
 mag. from Mile rock, distant 290 yds.

24

With respect to the pinnacle rock
in this channel, depth reduced, 15'

Subsequent examinations confirm my
former report, with the exception of
the depth. The proper depth is as
given here 15'. The rock is a
sharp pinnacle so sharp as to
make it difficult to hold the
lead on its point, if not impossible.

It is steep to, to the North and
East, and sloping slightly
to the South and West.

The sunken rock, reduced depth
7' 9", is the one given upon the
published chart as having a depth
of 6'. It could not find so little
water even at mid or tidal reductions.

There are other rocks in the channel, but with
little less water than characteristic of the locality.

Boats can land in ordinary water any where within the limits of the projection where the rocks do not preclude a foreshore, the surf in heavy water is too much for ordinary boats.

Frank's Bay, Temmenan Cove and the Cove off Peter's Bay are the best landings north of the entrance.

The nomenclature of the section is as given upon the charts.

The Bay between Mile Rocks and Ant Point is known as Smith Bay.

The bight off the Water Battery to the Wd. of Lime Pt. is known as "Pinefight" Cove by the pilots, having been the place where pine fights took place formerly.

Through the Courtesy of Capt. W. C. Coulson, U. S. R. M. Superintendent of Construction of Life Saving Stations I am able to offer the following information as to the Life Saving Stations in general and in particular of the two (2) now upon the projection.

One is located midway between Fort Point and Point Stora on Baker's Beach. The equipment is complete in boats, beach apparatus, etc. to be used in difficulty by the Fort Point Station or Golden Gate Park Station crews.

There is a lookout tower back of Fort Winfield Scott, and one near the Lookout maintained by the Merchants Exchange on Point Stora, where men are always stationed.

There is also a lookout down the

beach on the bluffs south of the "South Side" Station about $3\frac{1}{2}$ miles south of Golden Gate Park Station which itself is $\frac{3}{4}$ of a mile south of Point Arbores.

The boats are self righting and self emptying, and the outfit include light dingy boats, mist head cut filter and the Lyde guns to be used when wrecks cannot be reached by grab.

All stations are connected by telephone with Central Office in Appraisers Building, near the Sub Office of the Coast Survey.

Point Reyes and Drake Bay are also in ^{the} telephonic district.

A station is to be established in the Em-off Prader Lagoon, which

will bring Point Bonita into telephonic communication, the want of which was much felt in the prosecution of this work.

The life saving crew are provided with the International Code and drilled in its use.

In developing the bottom about the rocks in Bonita Channel, in Mile Rock Channel, and off Fort Point, numerous lines were run and reeled, dragging was also resorted to. The lines will prove confusing to a draughtsman unless plotted upon large scale in these localities. In studying them I used large scale drawings for the purpose of entering the soundings where the lines were close together. The projections used, I have furnished with the

reads

The projection is entitled
"San Francisco Bay Entrance."

Scale, 1/10000.

Very respectfully
James H. Sears,

Lieut. U.S.A.

Asst. C. of G. Army.

2285

Diag. Ch. No. 5530-3

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

DESCRIPTIVE REPORT

~~TOPOGRAPHIC~~ } Sheet No. 2285
Hydrographic }

State California

LOCALITY

San Francisco Bay Entrance

Mile Rock Channel & Vicinity of

Fort Point

1895 - 97
XXI

CHIEF OF PARTY

J.H. Sears

2285

Volumes for H 2285 are combined with the Volumes of H 2283