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2509

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

DESCRIPTIVE REPORT

Topographic } Sheet No. 2509
Hydrographic }

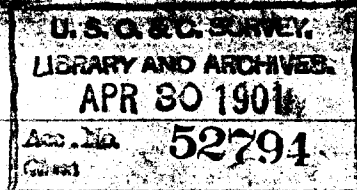
State California
LOCALITY

1899-1901
193

CHIEF OF PARTY
West



APR 25 1901 08907



Descriptive Report

to accompany hydrographic sheet entitled
Treasury Department
U. S. Coast and Geodetic Survey
• O. H. Tittmann, Superintendent
Vicinity of Brooks Island and Point Richmond
San Francisco Bay
California

Ferdinand Westdahl, Assistant, Chief of Party
Steamer "Gedney"

May 3rd to May 19th, 1899

Steamer "McArthur"

March 26th to April 3rd 1901

Scale $\frac{1}{10,000}$

This is a re-survey of a re-survey and, for that and other reasons stated below, the most troublesome hydrographic sheet I have ever had anything to do with.

The projection was sent out from the Office with two spaces upon it surrounded by soundings in red ink, presumably accepted by the Office, but the areas bounded by them to be resurveyed. I had no intimation of what was the matter with the preceding work except that it was not satisfactory. Thinking that it might possibly be

owing to the signals used I carefully redetermined by triangulation nearly all of those I found standing and established more where needed. About the time the first sounding work was done on this sheet I was personally busy with computing these signals, and also plotting the hydrographic sheet of San Pedro Bay for which I expected an early call from the U. S. Engineers, as it was at their request the San Pedro examination had been extended to cover the area to be improved by the proposed break-water at that place. I had therefore no time to personally set the tide-gauge, plot up the smooth sheet, and keep a close watch on the crossing of the soundings. About May 18, 1899, I was directed by the Superintendent to immediately plot up the San Diego hydrographic sheet and transmit a copy to the U. S. Engineer officer in charge of improvements at that place, and to suspend work in San Francisco Bay if in my judgment it would interfere with the carrying out of his instructions. As I had already received preliminary instructions for work in Alaska and the "Gedney" needed some repairs before sailing I concluded to suspend field-work on May 19th.

For reasons not necessary to state here the proposed work for my party in Alaska was postponed, the "Gedney" ordered there under command of Assistant Dickins, and myself and party transferred to the "McArthur" to com-

- plots repairs to the latter and then to lay the ship up in ordinary and bring up the office work. When I accordingly found time to plot the soundings on this sheet I discovered that the crossings were very unsatisfactory on the mudflats inside the 12 ft. curve, some of the lines giving from one to two feet less water than the crossings. A tracing of the sheet as plotted was sent to Washington for inspection and returned to me with the lines to be run over again marked upon it. The earliest opportunity for this re-examination was when the repairs to the ship were completed, in latter part of March, 1901, almost two years after work was first begun upon the sheet. Not only the lines indicated by the Officer have been run over again but also parts of a great many other lines. To my utter astonishment and confusion instead of finding more water on these re-run lines I found from one to two feet less than the original lines, and they, as stated above, gave less water than all the crossings. I then personally inspected the tide-gauge and re-examined the level readings between it and the Benchmark, which I found absolutely correct, so the discrepancy did not lie there. A few additional lines were run to cross as many of the lines run this year as possible, then all the work done this year, or rather as much as I could find room for without scraping, was plotted in blue ink to contrast it.

with the former work. It will be seen at a glance that the work done this year, plotted in blue, agrees with itself very well. It may also be seen that the work done in 1899 in the deeper water and firmer bottom beyond the 12 ft. curve also agrees with itself as well as any hydrographic work can do. The captain of the Santa Fe R. R. ferry steamer running between Point Richmond and San Francisco informs me that in the short time, (about one year,) he has been running here he has noticed that the water was shoaling near the point, not by actual sounding, however, but merely by the so-called "sucking" of the engine when the steamer keel approaches the bottom. I do not believe it possible that the shoaling can amount to so much in two years, and, besides, such shoaling would not account for the first discrepancy found in 1899. After much studying over this strange difference in the soundings I believe I have hit upon the true cause which I submit herewith.

The bottom consists of soft mud, so soft that a true designation for it would be liquid mud. Even when the ship was anchored, to the southward of the point in fourteen feet of water, the lead would sink down three feet or more in it, indicated by the mud adhering to the line. When the lines of soundings were run with the launch in 1899 a ten or twelve pound lead was used out in the deeper water and strong current. Sometimes, but not always, the leadman

would change to a six pound lead when the shoaler water was reached. In all the shoal area to the Eastward of Brooks Island the lighter lead was used altogether and the work there crosses fairly well. It crosses very well also in the deeper water and firmer bottom near the Southampton shoal where the heavier lead was used altogether. In the work of 1901 the light lead was used entirely both in the steam launches and in the whaleboat work around the wharves and close inshore.

The only way to test this explanation of the discrepancy in the soundings is to re-survey the entire area and to use leads of the same weight; or to use a pole for all depths less than twelve feet. The guard or button on the foot of such a pole to keep it from being driven into the mud would have to be made so large as to be well nigh unmanageable with the launch going at even very slow speed. There is no time now to re-survey this area by either method as the ship must be prepared for the seasons work in Alaska. Furthermore I do not consider the locality worth the expenditure.

The plane of reference to which all the soundings upon this sheet are reduced is derived from comparisons with the automatic gauge at the Presidio station and computed by the formula sent by the tidal division. It is 6.th 78 below the Bench Mark established by the party of Lieut. Com. Osborn. The plane used by that party is given as being 6.th 35 below

the B. M. According to a copy of a letter from the tidal division, dated August 2, 1900, the Office plane at Brooks Island is 6.^{ft}03 below the B. M. This information came long after I had plotted the soundings of 1899, and for convenience in comparison the soundings of 1901 were reduced to the same plane as those of 1899, namely 6.^{ft}78 below the Benchmark.

The wharves and the filled embankment at Point Richmond are determined by sextant angles aided in the details by a blue-print furnished by the Engineers office of the Santa Fe R. R. Company. There is no culvert in the embankment and the surface of the water remaining in the area enclosed by it stands at a lower level than the waters of the bay at high tide.

As an instance of the ravages of the teredo and limnoria in this locality it is worth while to note that in 1899 when the first soundings were made there was not yet a pile driven at Point Richmond and the blasting of the point only partially effected. When this ship anchored off the point in 1901 the wharves which had stood for about eighteen months only were considered unsafe and were being reconstructed of crooked piles. Nobody evidently suspected such quick destruction of the piles of the wharf as the first intimation the R. R. company's Engineer received of its condition was from a locomotive crashing through the westernmost pier into the

deep water off the point.

The town of Richmond, on East side, where the machine shops, round-house, and about one hundred dwellings of R. R. employes mainly are located, is at the eastern end of the tunnel driven through the ridge, reaching from San Pablo Point towards Brooks Island.

Respectfully submitted

Ferdinand Westdahl

Asst. C. & G. Survey, Comdg