

QB  
275  
.035  
no. 141  
1928

**FILE COPY**  
**DEPARTMENT OF COMMERCE**  
**U. S. COAST AND GEODETIC SURVEY**  
E. LESTER JONES, Director

# TIDAL BENCH MARKS

STATE OF  
**CALIFORNIA**

G. & G. SURVEY  
L. & A.  
JUN 19 1928  
Acc. No.

By

**E. A. LE LACHEUR**

Assistant Mathematician, U. S. Coast and Geodetic Survey

95183  
035

Special Publication No. 141



LIBRARY  
AUG 20 1992  
U.S. Dept. of Commerce

PRICE 15 CENTS

Sold only by the Superintendent of Documents, U. S. Government Printing Office  
Washington, D. C.

UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON

1928

# National Oceanic and Atmospheric Administration

## ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages

Faded or light ink

Binding intrudes into the text

This has been a co-operative project between the NOAA Central Library and the Climate Database Modernization Program, National Climate Data Center (NCDC). To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or [www.reference@nodc.noaa.gov](mailto:www.reference@nodc.noaa.gov).

LASON

Imaging Contractor

12200 Kiln Court

Beltsville, MD 20704-1387

January 1, 2006



# TIDAL BENCH MARKS, STATE OF CALIFORNIA

By E. A. LE LACHEUR, *Assistant Mathematician, United States Coast and Geodetic Survey*

## CONTENTS

	Page
Introduction.....	1
Standard datum.....	2
Datum planes used.....	2
Explanation of tables.....	5
Accuracy of the elevations.....	5
Standard bench mark.....	6
Changes in elevation.....	6
Elevations and descriptions of bench marks:	
Section A.—San Diego to Golden Gate.....	29
Section B.—City of San Francisco.....	37
Section C.—San Francisco Bay and vicinity.....	56
Section D.—Golden Gate to Crescent City.....	61
Index.....	61

## ILLUSTRATIONS

Frontispiece.—Map of California.....	1
Figure 1.—Standard bench mark.....	6
Figure 2.—Standard marks of the United States Coast and Geodetic Survey.....	7

## INTRODUCTION

In connection with its hydrographic operations, the United States Coast and Geodetic Survey has established from time to time many tidal bench marks along our coasts. Numerous requests from engineers and others for descriptions and elevations of these bench marks have led the bureau to begin publishing the data which are in manuscript form in the files, in order to be able to furnish the information more promptly and economically. In addition to the bench marks established by this survey it is proposed to include in these publications the descriptions and elevations of any well-determined bench marks which have been furnished by other organizations, such as municipal, State, and Federal engineers.

This information is being made available by sections of the coast. Because of the many requests for this information for the vicinity of New York City, the first section to be published was that for the State of New York, as given in Special Publication No. 83, issued in 1922. The second section, covering the District of Columbia, is given in Special Publication No. 119; the third section, for the State of Rhode Island, is given in Special Publication No. 128; and the

fourth section, for the State of Connecticut, is given in Special Publication No. 136. The present volume is the fifth of the series and will be followed from time to time by similar volumes covering other sections of the Atlantic and Pacific coasts of the United States.

### STANDARD DATUM

In all engineering work in which it is necessary to determine differences in elevation by spirit levels, and especially in those in which it is desired to coordinate the work of various surveys, it is in the interest of efficiency and economy that a uniform datum be used. It has frequently happened that the various engineers operating in the same locality have used different arbitrary datums, which has led to confusion. This condition can be obviated by the adoption of a single, reliable datum. Datums based on tidal definition are the best for both practical and scientific work, since they may be recovered even though all bench-mark connections be destroyed.

Of all the tidal datums mean sea level is the most nearly fixed and therefore the best. It is now used by this bureau as the datum for all land surveys. By a network of first-order levels it has been carried to many parts of the interior of the country, and new lines are being added to this level net each year.

Mean sea level, as determined at the primary tide stations on the open coast, may be considered for all practical engineering and surveying purposes to be in the same equipotential surface and may be defined as the level about which the tide oscillates. As determined by this bureau, it is derived from the hourly heights of the tide as referred to the zero of a fixed tide staff which has been connected with a primary bench mark by spirit levels. Because of the disturbing influences of wind and weather, an accurate determination of mean sea level must be based on observations extending over a considerable period of time. In general, a series of tidal observations three years in length will, when corrected by comparison with the results from a suitably located primary station, determine mean sea level within 0.02 foot; observations covering a period of a year will determine it to 0.05 foot, and a month of observations may be considered to determine it within 0.10 foot.

### DATUM PLANES USED

While mean sea level is the standard datum for land surveys and is the primary datum through which different surveys may be coordinated, other datums are more immediately useful for hydrographic work and in harbor engineering. Therefore the elevations of the bench marks in this publication are referred to seven different tidal datums. Those marks which have been connected with the first-order level net are referred to mean sea level, which is the standard datum for that work. All other bench marks are referred to mean tide level. In addition to either mean sea level or mean tide level, as the case may be, the elevations are also referred to higher high water, mean high water, mean low water, lower low water, highest tide, and lowest tide.

Mean tide level is determined from the high and low water readings and is a datum midway between mean high water and mean

low water. It should be carefully distinguished from mean sea level, which is determined from the hourly heights of the tide.

For most places on the open coast mean tide level does not differ much from mean sea level, and for practical purposes the two planes may be used as if there were no difference between them. On inside waters, especially on the upper reaches of tidal rivers, there may be a considerable difference in the elevations of the two planes. The relation between these two planes is fairly constant, and for places where the relation has been accurately determined the one datum may be readily derived from the other.

In the vicinity of San Diego Bay, based on 19 years of automatic gauge readings at the United States Quarantine Station, mean tide level has been determined to be approximately 0.05 foot above mean sea level, or 0.07 foot above standard mean sea level datum of the first-order level net for this region, while the results of a 26-year series of tidal observations at the Presidio of San Francisco show the plane of mean tide level to be about 0.06 foot above that of mean sea level, or 0.09 foot above standard mean sea level datum of the first-order level net for this region. In general, the plane of mean tide level is slightly higher than that of mean sea level along the coast of California. In addition to the data given for the above-mentioned localities, observations show that at Los Angeles Harbor (San Pedro), Sausalito, Mare Island, and Humboldt Bay mean tide level is higher than mean sea level by approximately 0.03, 0.04, 0.04, and 0.03 foot, respectively.

Standard values for mean sea level and mean lower low water have been adopted for San Diego and San Francisco in order to avoid the confusion which would result from frequent changes in datum and also that similar surveys by the various engineering organizations operating in those localities may be in accord.

At San Diego the value for standard mean sea level is based on three years' tidal observations (1906-1908) at the United States Quarantine Station and was adopted on January 29, 1916. All bench marks connected by first-order leveling in this region are referred to that datum. The value for standard lower low water, based on four years of tidal observations (1906-1909), was also adopted on January 29, 1916, as the standard datum for hydrographic work.

The following table shows the relation of the various datums to standard sea level datum as determined at the San Diego (U. S. Quarantine Station) tide station:

*Height relations*

	Feet
City datum above standard sea level.....	6.13
Highest tide (Dec. 17 and 18, 1914) above standard sea level.....	5.29
Higher high water (19 years) above standard sea level.....	2.77
Mean high water (19 years) above standard sea level.....	2.03
Mean tide level (19 years) above standard sea level.....	0.07
Mean sea level (19 years) above standard sea level.....	0.02
Mean low water (19 years) below standard sea level.....	1.89
Standard lower low water (4 years) below standard sea level.....	2.89
Lowest tide (Feb. 1 and 2, 1916) below standard sea level.....	5.00

<sup>1</sup> Obtained from "City" Bench Mark, pp. 145 and 188 of Special Publication No. 18, U. S. Coast and Geodetic Survey.

At San Francisco the value for standard sea level is based on 16 years of observations at the Presidio tide station and was adopted in 1914 as the datum for the first-order level net in that region. The value for standard lower low water was adopted in March, 1907. The series of observations upon which the value is based is not definitely known, but, since it had been in general use for a number of years prior to that date, it was considered best to retain it.

The following table shows the relation of the various datums to standard sea level datum as determined at the San Francisco (Presidio) tide station:

*Height relations*

	Feet
City datum above standard sea level.....	8.69
Highest tide (Nov. 18, 1918) above standard sea level.....	5.18
Higher high water above standard sea level.....	2.64
Mean high water above standard sea level.....	2.08
Mean tide level above standard sea level.....	0.09
Mean sea level (26 years) above standard sea level.....	0.03
Mean low water below standard sea level.....	1.87
Standard lower low water below standard sea level.....	2.97
Lowest tide (Dec. 24, 1897; Dec. 5, 1912; Dec. 9, 1923) below standard sea level.....	5.32

On the Pacific coast of the United States the tides exhibit considerable diurnal inequality in the high waters and also in the low waters. The higher high waters may be considerably above the plane of mean high water, while the lower low waters may fall considerably below the plane of mean low water. In this publication tabulations show the elevations of bench marks above various datum planes, such as higher high water, mean high water, mean low water, and lower low water.

Higher high water is the mean height of all the higher high waters for the period of observations, while mean high water is the mean height of all the high waters, including higher high waters and lower high waters. Lower low water is the mean height of all the lower low waters for the period of observations, while mean low water is the mean height of all the low waters, including lower low waters and higher low waters.

The difference in height between mean high water and mean low water corresponds to the mean range of tide. The relation of mean high water and mean low water to mean tide level at any point is equal to one-half the mean range of tide above and below that datum. The mean range of tide varies considerably from place to place, depending in a large measure on the location, depth of water, and configuration of the coast line. Therefore mean high water and mean low water are not uniform datums over a large area, like mean sea level and mean tide level, but vary in accordance with the differences in the range of the tide over that area. Mean lower low water on the Pacific coast of the United States is of importance as the hydrographic datum to which all soundings on charts and the predicted heights in tide tables are referred.

The highest and lowest tides represent the probable extreme heights for each locality and in places where long series of observations are

\* Furnished by the San Francisco city engineer, Nov. 9, 1927.

not available have been estimated to the nearest half foot based on the highest and lowest values observed in that region.

### EXPLANATION OF TABLES

For convenience of reference the bench marks in this publication have been divided into four groups or sections, each section being designated by a letter of the alphabet from south to north along the coast. The marks have also been given consecutive serial numbers and arranged in a general way in accordance with their order of occurrence in the sections.

The table of elevations at the beginning of each section gives the elevations of the bench marks above seven principal tide planes. Following the table of elevations a detailed description of each bench mark is given under the same serial number as is used in the table of elevations. In addition to the serial number, there is also given the number assigned to the bench mark by the organization which established it or has furnished its description and elevation. Except in cases where the bench mark is a standard disk, suitably inscribed, the initials of the organization establishing the bench mark are given in parentheses, as follows:

Name	Initials
United States Coast and Geodetic Survey-----	(C. & G. S.)
United States Geological Survey-----	(U. S. G. S.)
United States Army Engineers-----	(U. S. A. E.)
United States Navy Engineers-----	(U. S. N. E.)
San Francisco, Calif., city engineer-----	(S. F. C. E.)
Southern Pacific Railway Co.-----	(S. P.)

For convenience the mean lower low water elevation and the mean tide level or mean sea level elevation of each bench mark are also given at the end of each description.

### ACCURACY OF THE ELEVATIONS

In general, the accuracy of the elevations of the bench marks above the different tide planes will vary in accordance with the length of the tidal series upon which they depend. The elevations of the bench marks which have been connected with the first-order level net are based on the standard datum of mean sea level as used in the adjustment of the first-order level net for this region. A well-determined plane of reference is thus afforded for all such bench marks. Bench marks not connected with the first-order level net are referred to mean tide level as determined independently at each locality from observed high and low waters. Bench marks referred to mean tide level in different localities have not been, in general, connected by spirit levels. Elevations referred to mean sea level or to mean tide level are given to hundredths of a foot.

The elevations above the planes of higher high water, mean high water, mean low water, and lower low water are obtained from mean sea level or mean tide level through the local mean range and inequalities of the tide and are given to the nearest tenth of a foot.

The elevations above the planes of highest and lowest tides are based on values estimated to the nearest half foot above and below

mean lower low water. These values have been adopted after consideration of all the highest and lowest observed values for the region. The purpose of these elevations is to give the engineer an approximation of the extreme stages of the water that may occur in that locality.

If accurate differences in elevation between bench marks are desired, the values for the elevations above mean sea level and mean tide level, which are given to hundredths of a foot, should be used. Mean sea level, being the datum of the first-order level net, shows the relative elevations of all bench marks referred to it, while mean tide level in some cases is based on local tidal observations without any level connection with other localities and will give accurate relations only for bench marks in the same group and approximate relations for bench marks in different groups.

#### STANDARD BENCH MARK

Various kinds of bench marks have been used to indicate the point of which the elevation was determined. Among these are nails in piles or other structures; small crosses and squares cut in curbstones and doorsteps, bolts in ledges, boulders, and the foundations of buildings; and in some cases simply a well-defined point on a fixed object has been used. Since such marks may lack permanence and may often be difficult of identification, this bureau has adopted a standard brass disk identification mark. The standard brass disk is  $3\frac{5}{8}$  inches in diameter and has a shank or stem on the back 3 inches long for insertion in a building or other substantial support.

At present there are two types of the standard disk bench mark, as shown in Figures 1 and 2. The type shown in Figure 1 was formerly used in all leveling work of the bureau, but is now used chiefly by hydrographic parties running short lines of levels, while the type shown in Figure 2, which provides a place for inserting the elevation above mean sea level, is used for lines of the first-order level net of the United States. The other forms of the standard brass disk shown in Figure 2, though not intended primarily for bench marks, may be used as such when their elevations have been determined.

#### CHANGES IN ELEVATION

Although a bench mark may appear to be quite permanent in character and correspond with its description, the elevation may have changed materially since its determination because of settling of the immediate locality from construction work, earth movements, or from other causes. Engineers are therefore cautioned to make use of at least two bench marks where possible. They will confer a favor on the profession and on this bureau by reporting to the Director, United States Coast and Geodetic Survey, any changes in elevation or destruction of bench marks noted, in order that information in regard to these marks may be kept up to date and this publication revised when necessary.

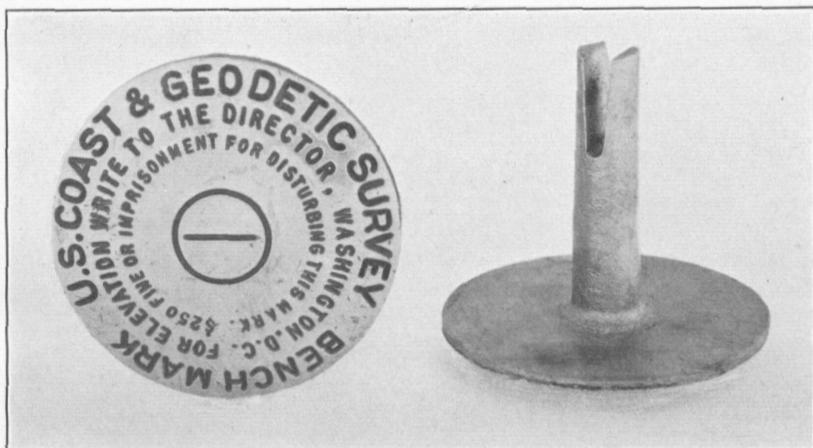


FIG. 1.—STANDARD BENCH MARK

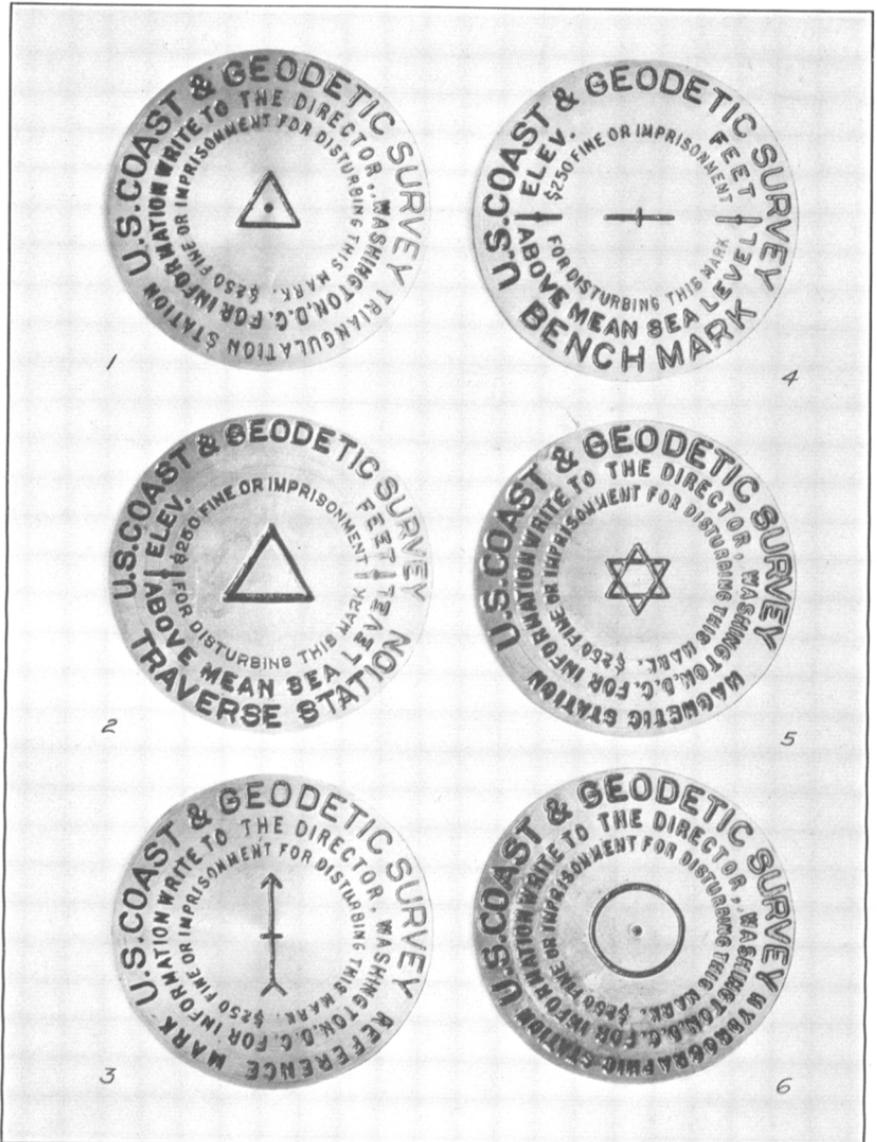


FIG. 2.—STANDARD MARKS OF THE U. S. COAST AND GEODETIC SURVEY

- 1. Triangulation station mark
- 2. Traverse station mark
- 3. Reference mark
- 4. Bench mark
- 5. Magnetic station mark
- 6. Hydrographic station mark

## SECTION A.—ELEVATIONS OF BENCH MARKS, SERIAL NOS. 1 TO 218, SAN DIEGO TO GOLDEN GATE, STATE OF CALIFORNIA

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	Higher high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Lowest tide
		<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	
1	San Diego, Zuniga Jetty.....	-0.7	1.4	2.3	4.23		6.2	7.2	9.3
2	do.....	3.6	5.7	6.6	8.54		10.5	11.5	13.6
3	do.....	1.6	3.7	4.6	6.51		8.5	9.5	11.6
4	San Diego, U. S. Quarantine Station.....	3.4	6.0	6.7		8.72	10.6	11.6	13.7
5	do.....	4.8	7.3	8.1		10.08	12.0	13.0	15.1
6	do.....	7.2	9.7	10.5		12.49	14.4	15.4	17.5
7	do.....	2.5	5.0	5.8		7.78	9.7	10.7	12.8
8	do.....	-3.3	-0.8	0.0		1.98	3.9	4.9	7.0
9	do.....	1.3	3.8	4.6		6.60	8.5	9.5	11.6
10	do.....	7.7	10.2	11.0		12.97	14.9	15.9	18.0
11	do.....	26.4	29.0	29.7		31.72	33.6	34.6	36.7
12	do.....	35.2	37.8	38.5		40.56	42.4	43.4	45.5
13	do.....	29.8	32.4	33.1		35.13	37.0	38.0	40.1
14	do.....	28.0	30.6	31.3		33.32	35.2	36.2	38.3
15	do.....	27.0	29.6	30.3		32.36	34.2	35.2	37.3
16	do.....	22.9	25.5	26.2		28.23	30.1	31.1	33.2
17	do.....	21.0	23.6	24.3		26.32	28.2	29.2	31.3
18	do.....	1.3	3.8	4.6		6.58	8.5	9.5	11.6
19	San Diego (Old Town).....	19.9	22.7	23.4		25.44	27.4	28.4	30.9
20	San Diego (municipal pier).....	4.6	7.2	7.9		10.06	12.1	13.1	15.6
21	San Diego.....	9.1	11.7	12.4		14.59	16.6	17.6	20.1
22	do.....	36.8	39.4	40.1		42.28	44.3	45.3	47.8
23	do.....	16.6	19.2	19.9		22.07	24.1	25.1	27.6
24	do.....	24.2	26.8	27.5		29.64	31.7	32.7	35.2
25	do.....	2.8	5.4	6.1		8.27	10.3	11.3	13.8
26	do.....	21.3	23.7	24.4	26.55		28.8	29.8	32.3
27	do.....	13.1	15.5	16.2		18.44	20.6	21.6	24.1
28	do.....	28.7	31.1	31.8	33.98		36.2	37.2	39.7
29	do.....	2.9	5.3	6.0	8.21		10.4	11.4	13.9
30	do.....	18.4	21.0	21.7		23.86	25.9	26.9	29.4
31	do.....	8.0	10.6	11.3		13.42	15.5	16.5	19.0
32	do.....	3.7	6.3	7.0		9.14	11.2	12.2	14.7
33	Vicinity of Atwood, San Diego County.....	57.7	60.4	61.1		62.96	64.8	65.7	68.2
34	Vicinity of Ladrillo, San Diego County.....	91.8	94.5	95.2		97.06	98.9	99.8	102.3
35	American Park, San Diego County.....	20.2	22.9	23.6		25.45	27.3	28.2	30.7
36	La Jolla, Scripps Institution.....	18.3	21.0	21.7		23.54	25.4	26.3	28.8
37	do.....	27.2	29.9	30.6		32.38	34.3	35.2	37.7
38	do.....	26.1	28.8	29.5		31.30	33.2	34.1	36.6
39	do.....	6.9	9.6	10.3		12.09	14.0	14.9	17.4
40	do.....	22.9	25.6	26.3	28.15		30.0	30.9	33.4
41	Vicinity of Selwyn, San Diego County.....	227.2	229.9	230.6		232.47	234.3	235.2	237.7
42	Balboa, Newport Bay.....	-1.2	2.0	2.7	4.38		6.0	6.8	9.3
43	do.....	-0.8	2.4	3.1	4.80		6.4	7.2	9.7
44	do.....	-1.3	1.9	2.6	4.27		5.9	6.7	9.2
45	North Lagoon, Newport Bay.....	-4.4	-0.5	0.2	1.60		3.1	3.6	6.1
46	do.....	-3.1	0.8	1.5	2.94		4.4	4.9	7.4
47	do.....	2.9	6.8	7.5	8.93		10.4	10.9	13.4
48	Newport Bay Entrance.....	2.7	5.6	6.3	8.09		9.9	10.7	13.2
49	do.....	2.5	5.4	6.1	7.86		9.7	10.5	13.0
50	do.....	-1.9	1.0	1.7	3.49		5.3	6.1	8.6
51	Avalon, Santa Catalina Island.....	3.3	5.7	6.4	8.42		10.4	11.3	13.8
52	do.....	3.8	6.2	6.9	8.94		10.9	11.8	14.3
53	do.....	7.9	10.3	11.0	13.05		15.0	15.9	18.4
54	do.....	4.8	7.2	7.9	9.92		11.9	12.8	15.3
55	Catalina Harbor, Santa Catalina Island.....	14.7	17.3	17.9	19.82		21.7	22.7	25.2

## Section A.—Elevations of bench marks, Serial Nos. 1 to 218, San Diego to Golden Gate, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	Higher high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Lowest tide
56	Catalina Harbor, Santa Catalina Island	Feet 11.6	Feet 14.2	Feet 14.8	Fret 16.73	Feet	Feet 18.6	Feet 19.6	Feet 22.1
57	Long Beach	3.7	6.1	6.8	8.84	-----	10.8	11.7	14.2
58	do	22.8	25.2	25.9	27.92	-----	29.9	30.8	33.3
59	do	23.7	26.1	26.8	28.85	-----	30.8	31.7	34.2
60	do	26.9	29.3	30.0	32.01	-----	34.0	34.9	37.4
61	do	28.9	31.3	32.0	34.04	-----	36.0	36.0	39.4
62	do	31.0	33.4	34.1	36.09	-----	38.1	39.0	41.5
63	Los Angeles Harbor, San Pedro	2.7	5.2	5.9	-----	7.85	9.7	10.7	13.2
64	do	8.9	11.4	12.1	-----	14.04	15.9	16.9	19.4
65	do	2.5	5.0	5.7	-----	7.58	9.5	10.5	13.0
66	do	3.1	5.6	6.3	-----	8.19	10.1	11.1	13.6
67	do	2.8	5.3	6.0	-----	7.94	9.8	10.8	13.3
68	do	6.1	8.6	9.3	-----	11.20	13.1	14.1	16.6
69	Dolores	28.2	30.7	31.4	-----	33.31	35.2	36.2	38.7
70	Thenard Junction	27.7	30.2	30.9	-----	32.81	34.7	35.7	38.2
71	Wilmington	22.8	25.3	26.0	-----	27.98	29.8	30.8	33.3
72	do	7.2	9.7	10.4	-----	12.33	14.2	15.2	17.7
73	San Pedro	24.9	27.4	28.1	-----	30.05	31.9	32.9	35.4
74	do	67.0	69.5	70.2	-----	72.17	74.0	75.0	77.5
75	do	98.5	101.0	101.7	-----	103.63	105.5	106.5	109.0
76	Redondo Beach, Santa Monica Bay	13.6	16.0	16.8	18.72	-----	20.6	21.6	24.1
77	do	13.4	15.8	16.6	18.51	-----	20.4	21.4	23.9
78	do	13.1	15.5	16.3	18.17	-----	20.1	21.1	23.6
79	do	12.5	14.9	15.7	17.60	-----	19.5	20.5	23.0
80	do	39.4	41.8	42.6	-----	44.58	46.4	47.4	49.9
81	do	14.4	16.8	17.6	-----	19.49	21.4	22.4	24.9
82	Hermosa Beach, Santa Monica Bay	8.1	10.5	11.3	-----	13.20	15.1	16.1	18.6
83	do	8.9	11.3	12.1	-----	14.07	15.9	16.9	19.4
84	do	19.2	21.6	22.4	-----	24.34	26.2	27.2	29.7
85	Manhattan Beach, Santa Monica Bay	19.0	21.4	22.2	-----	24.09	26.0	27.0	29.5
86	Pecks Beach, Santa Monica Bay	21.3	23.7	24.5	-----	26.43	28.3	29.3	31.8
87	El Segundo, Santa Monica Bay	99.7	102.1	102.9	-----	104.82	106.7	107.7	110.2
88	do	99.9	102.3	103.1	-----	105.00	106.9	107.9	110.4
89	Vicinity of Playa del Rey, Santa Monica Bay	113.8	116.2	117.0	-----	118.96	120.8	121.8	124.3
90	do	74.8	77.2	78.0	-----	79.88	81.8	82.8	85.3
91	Playa del Rey, Santa Monica Bay	8.0	10.4	11.2	-----	13.16	15.0	16.0	18.5
92	Vicinity of Playa del Rey, Santa Monica Bay	10.0	12.4	13.2	-----	15.12	17.0	18.0	20.5
93	Vicinity of Venice, Santa Monica Bay	10.0	12.4	13.2	15.14	-----	17.0	18.0	20.5
94	Venice, Santa Monica Bay	10.4	12.8	13.6	-----	15.54	17.4	18.4	20.9
95	do	9.6	12.0	12.8	-----	14.72	16.6	17.6	20.1
96	do	12.4	14.8	15.6	17.52	-----	19.4	20.4	22.9
97	Ocean Park, Santa Monica Bay	20.3	22.7	23.5	25.44	-----	27.3	28.3	30.8
98	Santa Monica	105.9	108.5	109.2	-----	111.16	113.0	113.9	116.4
99	do	54.2	56.8	57.5	-----	59.42	61.3	62.2	64.7
100	do	39.9	42.5	43.2	-----	45.18	47.0	47.9	50.4
101	do	22.5	25.1	25.8	-----	27.74	29.6	30.5	33.0
102	do	339.5	342.1	342.8	-----	344.75	346.6	347.5	350.0
103	do	342.5	345.1	345.8	-----	347.78	349.6	350.5	353.0
104	do	188.4	191.0	191.7	-----	193.67	195.5	196.4	198.9
105	do	198.7	201.3	202.0	-----	203.95	205.8	206.7	209.2
106	do	99.0	101.6	102.3	-----	104.23	106.1	107.0	109.5
107	do	157.1	159.7	160.4	-----	162.32	164.2	165.1	167.6
108	do	220.5	223.1	223.8	-----	225.75	227.6	228.5	231.0
109	Hueneume, Ventura County	5.3	7.9	8.7	-----	10.49	12.3	13.3	15.8
110	Vicinity of Ventura, Ventura County	58.6	61.2	62.0	-----	63.79	65.6	66.6	69.1
111	Ventura, Ventura County	11.0	13.6	14.4	-----	16.26	18.0	19.0	21.5
112	do	35.5	38.1	38.9	-----	40.76	42.5	43.5	46.0
113	do	43.7	46.3	47.1	-----	48.96	50.7	51.7	54.2
114	do	43.6	46.2	47.0	-----	48.88	50.6	51.6	54.1
115	Ventura Junction, Ventura County	5.0	7.6	8.4	-----	10.21	12.0	13.0	15.5

## Section A.—Elevations of bench marks, Serial Nos. 1 to 218, San Diego to Golden Gate, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		High- est tide	High- er high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Low- est tide
116	Vicinity of Ventura, Ventura County.	12.4	15.0	15.8	17.58	17.58	19.4	20.4	22.9
117	do.	7.4	10.0	10.8	12.58	12.58	14.4	15.4	17.9
118	Dulah, Ventura County.	9.5	12.1	12.9	14.77	14.77	16.5	17.5	20.0
119	Vicinity of Ventura, Ventura County.	16.7	19.3	20.1	21.94	21.94	23.7	24.7	27.2
120	do.	18.1	20.7	21.5	23.33	23.33	25.1	26.1	28.6
121	Seacliff, Ventura County.	12.2	14.8	15.6	17.41	17.41	19.2	20.2	22.7
122	Vicinity of Seacliff, Ventura County.	23.4	26.0	26.8	28.62	28.62	30.4	31.4	33.9
123	Punta Gorda, Ventura County.	19.8	22.4	23.2	25.00	25.00	26.8	27.8	30.3
124	Vicinity of Punta Gorda, Ventura County.	25.8	28.4	29.2	31.03	31.03	32.8	33.8	36.3
125	Vicinity of Benham, Ventura County.	35.0	37.6	38.4	40.21	40.21	42.0	43.0	45.5
126	do.	41.8	44.4	45.2	47.05	47.05	48.8	49.8	52.3
127	Vicinity of Carpinteria, Santa Barbara County.	35.2	37.8	38.6	40.45	40.45	42.2	43.2	45.7
128	do.	14.4	17.0	17.8	19.60	19.60	21.4	22.4	24.9
129	Carpinteria, Santa Barbara County.	9.2	11.8	12.6	14.45	14.45	16.2	17.2	19.7
130	Vicinity of Summerland, Santa Barbara County.	8.1	10.7	11.5	13.36	13.36	15.1	16.1	18.6
131	do.	37.0	39.6	40.4	42.26	42.26	44.0	45.0	47.5
132	do.	51.8	54.4	55.2	57.06	57.06	58.8	59.8	62.3
133	do.	58.0	60.6	61.4	63.20	63.20	65.0	66.0	68.5
134	Vicinity of Miramar, Santa Barbara County.	24.4	27.0	27.8	29.68	29.68	31.4	32.4	34.9
135	Vicinity of Montecito, Santa Barbara County.	31.7	34.3	35.1	36.97	36.97	38.7	39.7	42.2
136	Vicinity of Santa Barbara, Santa Barbara County.	31.8	34.4	35.2	36.99	36.99	38.8	39.8	42.3
137	do.	23.0	25.6	26.4	28.20	28.20	30.0	31.0	33.5
138	do.	10.7	13.3	14.1	15.94	15.94	17.7	18.7	21.2
139	Santa Barbara, Santa Barbara County.	35.2	37.8	38.6	40.44	40.44	42.2	43.2	45.7
140	do.	5.1	7.7	8.5	10.34	10.34	12.1	13.1	15.6
141	do.	8.7	11.3	12.1	13.96	13.96	15.7	16.7	19.2
142	Vicinity of Santa Barbara, Santa Barbara County.	54.9	57.5	58.3	60.15	60.15	61.9	62.9	65.4
143	do.	126.8	129.4	130.2	132.03	132.03	133.8	134.8	137.3
144	Vicinity of Oliva, Santa Barbara County.	144.7	147.3	148.1	149.90	149.90	151.7	152.7	155.2
145	Hope Ranch, Santa Barbara County.	158.3	160.9	161.7	163.50	163.50	165.3	166.6	168.8
146	Vicinity of Hope Ranch, Santa Barbara County.	120.7	123.3	124.1	125.97	125.97	127.7	128.7	131.2
147	Vicinity of Goleta, Santa Barbara County.	72.0	74.6	75.4	77.26	77.26	79.0	80.0	82.5
148	Goleta, Santa Barbara County.	41.1	43.7	44.5	46.32	46.32	48.1	49.1	51.6
149	La Patera, Santa Barbara County.	21.6	24.2	25.0	26.82	26.82	28.6	29.6	32.1
150	Coromar, Santa Barbara County.	28.5	31.1	31.9	33.69	33.69	35.5	36.5	39.0
151	Vicinity of Elwood, Santa Barbara County.	80.8	83.4	84.2	86.07	86.07	87.8	88.8	91.3
152	do.	55.4	58.0	58.8	60.58	60.58	62.4	63.4	65.9
153	Naples, Santa Barbara County.	93.8	96.4	97.2	99.04	99.04	100.8	101.8	104.3
154	Vicinity of Naples, Santa Barbara County.	68.4	71.0	71.8	73.61	73.61	75.4	76.4	78.9
155	Vicinity of Capitan, Santa Barbara County.	107.5	110.1	110.9	112.69	112.69	114.5	115.5	118.0
156	do.	103.0	105.6	106.4	108.21	108.21	110.0	111.0	113.5
157	Vicinity of Orella, Santa Barbara County.	35.8	38.4	39.2	41.03	41.03	42.8	43.8	46.3
158	Tajiguas, Santa Barbara County.	58.0	60.6	61.4	63.18	63.18	65.0	66.0	68.5
159	Vicinity of Gaviota, Santa Barbara County.	85.8	88.4	89.2	91.02	91.02	92.8	93.8	96.3
160	do.	90.7	93.3	94.1	95.92	95.92	97.7	98.7	101.2
161	Gaviota, Santa Barbara County.	3.4	6.0	6.8	8.59	8.59	10.4	11.4	13.9
162	do.	78.2	80.8	81.6	83.46	83.46	85.2	86.2	88.7

## Section A.—Elevations of bench marks, Serial Nos. 1 to 218, San Diego to Golden Gate, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	High-er high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Low-est tide
153	Gaviota, Santa Barbara County	92.2	94.8	95.6	-----	97.39	99.2	100.2	102.7
164	Vicinity of Gaviota, Santa Barbara County	77.3	79.9	80.7	-----	82.51	84.3	85.3	87.8
165	do	94.0	96.6	97.4	-----	99.23	101.0	102.0	104.5
166	Vicinity of Sacate, Santa Barbara County	100.9	103.5	104.3	-----	106.16	107.9	108.9	111.4
167	do	83.2	85.8	86.6	-----	88.38	90.2	91.2	93.7
168	Vicinity of Drake, Santa Barbara County	40.2	42.8	43.6	-----	45.43	47.2	48.2	50.7
169	Vicinity of Gato, Santa Barbara County	54.9	57.5	58.3	-----	60.17	61.9	62.9	65.4
170	Anacapa, Santa Barbara County	44.6	47.2	48.0	-----	49.81	51.6	52.6	55.1
171	Conception, Santa Barbara County	110.8	113.4	114.2	-----	116.05	117.8	118.8	121.3
172	Vicinity of Conception, Santa Barbara County	108.2	170.8	171.6	-----	173.48	175.2	176.2	178.7
173	Vicinity of Jalama, Santa Barbara County	175.4	178.0	178.8	-----	180.66	182.4	183.4	185.9
174	do	94.2	96.8	97.6	-----	99.38	101.2	102.2	104.7
175	do	97.2	99.8	100.6	-----	102.46	104.2	105.2	107.7
176	Sudden, Santa Barbara County	82.8	85.4	86.2	-----	88.06	89.8	90.8	93.3
177	do	82.9	85.5	86.3	-----	88.09	89.9	90.9	93.4
178	Vicinity of Arguello, Santa Barbara County	110.0	112.6	113.4	-----	115.18	117.0	118.0	120.5
179	do	126.4	129.0	129.8	-----	131.66	133.4	134.4	136.9
180	do	135.5	138.1	138.9	-----	140.77	142.5	143.5	146.0
181	Arguello, Santa Barbara County	159.1	161.7	162.5	-----	164.29	166.1	167.1	169.6
182	Arlight, Santa Barbara County	54.9	57.5	58.3	-----	60.10	61.9	62.9	65.4
183	do	161.6	164.2	165.0	-----	166.85	168.6	169.6	172.1
184	Vicinity of Arlight, Santa Barbara County	180.0	182.6	183.4	-----	185.18	187.0	188.0	190.5
185	Vicinity of Honda, Santa Barbara County	108.4	111.0	111.8	-----	113.66	115.4	116.4	118.9
186	Honda, Santa Barbara County	109.0	111.6	112.4	-----	114.24	116.0	117.0	119.5
187	Lompoc Junction, Santa Barbara County	45.0	47.6	48.4	-----	50.23	52.0	53.0	55.5
188	Vicinity of Lompoc Junction, Santa Barbara County	12.8	15.4	16.2	-----	18.07	19.8	20.8	23.3
189	Surf, Santa Barbara County	33.8	36.4	37.2	-----	39.00	40.8	41.8	44.3
190	Lompoc Landing, Santa Barbara County	156.7	159.3	160.1	-----	161.63	163.7	164.7	167.2
191	Port San Luis, San Luis Obispo County	8.0	9.8	10.2	12.08	-----	14.0	14.9	17.4
192	do	6.5	8.3	8.8	10.62	-----	12.5	13.4	15.9
193	do	12.7	14.5	15.0	16.86	-----	18.8	19.7	22.2
194	do	11.0	12.8	13.2	15.08	-----	17.0	17.9	20.4
195	Morro, Morro Bay	-4.1	-1.8	-1.1	0.52	-----	2.1	2.9	5.4
196	do	-4.1	-1.8	-1.1	0.47	-----	2.1	2.9	5.4
197	do	19.9	22.2	22.9	24.51	-----	26.1	26.9	29.4
198	do	67.9	70.2	70.9	72.47	-----	74.1	74.9	77.4
199	do	74.3	76.6	77.3	78.87	-----	80.5	81.3	83.8
200	The Strand, southwest shore, Morro Bay	-1.3	1.1	1.8	3.42	-----	5.0	5.7	8.2
201	do	-0.9	1.5	2.2	3.85	-----	5.4	6.1	8.6
202	do	-2.8	-0.4	0.3	1.87	-----	3.5	4.2	6.7
203	Cayucos, Estero Bay	29.4	32.1	32.6	34.47	-----	36.4	37.4	39.9
204	do	12.5	15.2	15.7	17.59	-----	19.5	20.5	23.0
205	do	13.1	15.8	16.3	18.16	-----	20.1	21.1	23.6
206	do	14.7	17.4	17.9	19.82	-----	21.7	22.7	25.2
207	San Simon, San Luis Obispo County	6.9	9.4	9.9	11.90	-----	13.9	14.9	17.4
208	Monterey, Monterey County	1.6	4.1	4.7	6.63	-----	8.5	9.6	11.6
209	do	7.6	10.1	10.7	12.60	-----	14.5	15.6	17.6
210	do	14.0	16.5	17.1	18.99	-----	20.9	22.0	24.0

## Section A.—Elevations of bench marks, Serial Nos. 1 to 218, San Diego to Golden Gate, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	Higher high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Lowest tide
211	Monterey, Monterey County.....	Feet 21.6	Feet 24.1	Feet 24.7	Feet 26.60	Feet -----	Feet 28.5	Feet 29.6	Feet 31.6
212	Santa Cruz, Monterey Bay.....	7.0	9.5	10.1	12.03	-----	13.9	15.0	17.0
213	do.....	6.8	9.3	9.9	11.83	-----	13.7	14.8	16.8
214	do.....	7.3	9.8	10.4	12.28	-----	14.2	15.3	17.3
215	do.....	38.5	41.0	41.6	43.48	-----	45.4	46.5	48.5
216	Half Moon Bay, San Mateo County..	6.7	8.6	9.3	11.23	-----	13.2	14.2	16.2
217	do.....	7.6	9.5	10.2	12.13	-----	14.1	15.1	17.1
218	do.....	13.6	15.5	16.2	18.12	-----	20.1	21.1	23.1

## SECTION A.—DESCRIPTIONS OF BENCH MARKS, SERIAL NOS. 1 TO 218, SAN DIEGO TO GOLDEN GATE, STATE OF CALIFORNIA

**Serial No. 1. San Diego, Zuninga Jetty.**—B. M. 1 (C. & G. S.) is a drill hole about  $\frac{1}{4}$  inch deep in the top of a large granite rock at the intersection of Zuninga Jetty was a short wing dam at right angles to the jetty. The letters "B. M." are rudely chiseled near the hole. Elevation: 7.2 feet above lower low water; 4.23 feet above mean tide level.

**Serial No. 2. San Diego, Zuninga Jetty.**—B. M. 2 (C. & G. S.) is the top of the concrete wall surrounding the pit for large scales used for weighing rock, located in front of a house near the inner end of Zuninga Jetty and at the reentrant angle on the northeast side of the pit. Elevation: 11.5 feet above lower low water; 8.54 feet above mean tide level.

**Serial No. 3. San Diego, Zuninga Jetty.**—B. M. 3 (C. & G. S.) is the top of the concrete post marking the northeast corner of the United States military reservation at Zuninga Point, opposite Ballast Point. The post is 9 inches square on top, with a  $1\frac{1}{2}$ -inch hole in the middle. Elevation: 9.5 feet above lower low water; 6.51 feet above mean tide level.

**Serial No. 4. San Diego, U. S. Quarantine Station.**—B. M. 1 (C. & G. S.) is the center of the 10 by 10 inch top of a granite block set with nearly its entire length in the ground and bearing on its top the letters "U. S." The surface is not level, the easterly side being  $\frac{3}{4}$  inch lower than the westerly side and the southerly side  $\frac{1}{2}$  inch lower than the northerly side. The north boundary fence of the quarantine station passes directly over this B. M., crossing it between the letters "U." and "S." (It is reported that this B. M. is apparently settling.) Elevation: 11.6 feet above lower low water; 8.72 feet above mean sea level.

**Serial No. 5. San Diego, U. S. Quarantine Station.**—B. M. 2 (C. & G. S.) is the upper surface of a granite slab 4 by 4 feet by 7 inches, covering a sewer 5 paces east of the northeast corner of the residence of the United States quarantine physician, at a point marked by a drill hole 1 inch deep filled with lead. The slab rests on a brick foundation and has an iron-covered manhole, 2 feet in diameter, in its center. The lead plug is 18 inches from the northeast corner of the slab and  $3\frac{1}{2}$  inches from the nearest point on the edge of the manhole. Elevation: 13.0 feet above lower low water; 10.08 feet above mean sea level.

**Serial No. 6. San Diego, U. S. Quarantine Station.**—B. M. 4 (C. & G. S.) is the center of the 1-foot-square top of a cement monument, buried in the ground with about 1 foot protruding at a point about 110 feet north of the northwest corner of the quarantine fence. The top is marked "U. S. C. S. 1906" and has two diagonal lines and a dot marking the center. This B. M. monument is well established upon a base of rock and cement in a firmly packed gravelly clay. Elevation: 15.4 feet above lower low water; 12.49 feet above mean sea level.

**Serial No. 7. San Diego, U. S. Quarantine Station.**—B. M. 5 (C. & G. S.) is the upper surface of a granite slab, 4 by 4 feet by 7 inches, covering a sewer near the southeast corner of the Cottage Hospital, at a point marked by a drill

hole filled with Babbitt metal. The slab rests on masonry and has an iron-covered manhole in its center, 2 feet in diameter. The mark is on the southeast corner,  $6\frac{1}{2}$  inches from the manhole. Elevation: 10.7 feet above lower low water; 7.78 feet above mean sea level.

**Serial No. 8. San Diego, U. S. Quarantine Station.**—B. M. 7 (C. & G. S.) is the upper surface of a cement collar or encasement built around a pile on the north side of the long pier at a point about 12 feet east of the north-and-south line passing along the west side of the barracks. The B. M. is located by a  $\frac{3}{4}$ -inch drill hole filled with Babbitt metal, toward the northwest corner of the encasement. A rod held on the mark clears the north side of the pier. The mark is at about mean high-water level and about 1 foot above the sand. Elevation: 4.9 feet above lower low water; 1.98 feet above mean sea level.

**Serial No. 9. San Diego, U. S. Quarantine Station.**—B. M. 9 is a Coast and Geodetic Survey standard disk set on top of the concrete base surrounding the electric-light pole on line with the southern end of the dock at the quarantine station and 74.3 feet from the edge of the runway leading to the dock. The concrete base is about 8 inches high above the roadway and measures 9 inches square on top; the mark is located on the southeast corner. This B. M. is marked "No. 9." Elevation: 9.5 feet above lower low water; 6.60 feet above mean sea level.

**Serial No. 10. San Diego, U. S. Quarantine Station.**—B. M. 10 is a Coast and Geodetic Survey standard disk marked "No. 10," located on top of the concrete base surrounding the flagpole in front of the surgeon's residence. The base measures 3 feet square on top and is 1.8 feet high, and the mark is located on the northeast corner, 0.6 foot from the flagpole. Elevation: 15.9 feet above lower low water; 12.97 feet above mean sea level.

**Serial No. 11. San Diego, U. S. Quarantine Station.**—B. M. 11 is a Coast and Geodetic Survey standard disk marked "No. 11," located on top of the granite stone on the west side of the old abandoned culvert about 113 feet south of the main gate of the quarantine station, on the old dirt road directly west of the station. The stone is 13 feet west of the center of this old dirt road. Elevation: 34.6 feet above lower low water; 31.72 feet above mean sea level.

**Serial No. 12. San Diego, U. S. Quarantine Station.**—B. M. 12 is a Coast and Geodetic Survey standard disk marked "No. 12," located on top of the concrete manhole 13.6 feet east of the northeast corner of the United States Navy concrete fuel-oil tank located on the opposite side of the concrete road to Fort Rosecrans from the quarantine station. It is located on the northeast corner of the manhole, 3.1 feet from the center of the iron manhole plate, which opens up on an electric conduit. The top of the manhole is in two levels; this is the lower one, which measures about 6 feet square and is about 9 inches lower than the top level. Elevation: 43.4 feet above lower low water; 40.56 feet above mean sea level.

**Serial No. 13. San Diego, U. S. Quarantine Station.**—B. M. 13 is a Coast and Geodetic Survey standard disk marked "No. 13," set on the north face of the west side of the culvert over the concrete ditch directly south of the quarantine station. The west side of this culvert is about 12.7 feet from the edge of the concrete road leading to Fort Rosecrans. Elevation: 38.0 feet above lower low water; 35.13 feet above mean sea level.

**Serial No. 14. San Diego, U. S. Quarantine Station.**—B. M. 14 is a Coast and Geodetic Survey standard disk marked "No. 14," set on top of the eastern side of the culvert over the concrete ditch directly south of the quarantine station. The east side of this culvert is 24.6 feet east of the edge of the concrete road leading to Fort Rosecrans. Elevation: 36.2 feet above lower low water; 33.32 feet above mean sea level.

**Serial No. 15. San Diego, U. S. Quarantine Station.**—B. M. 15 is a Coast and Geodetic Survey standard disk marked "No. 15," located on top of the concrete manhole about 200 feet north of the United States naval power plant at La Playa and 27.3 feet west of the edge of the concrete road to Fort Rosecrans. The concrete manhole measures 2.6 feet square on top, and the mark is placed on the northeast corner, 1.4 feet from the center of the iron manhole plates, 1.8 feet in diameter, opening onto the electric conduit. Elevation: 35.2 feet above lower low water; 32.36 feet above mean sea level.

**Serial No. 16. San Diego, U. S. Quarantine Station.**—B. M. 16 is a Coast and Geodetic Survey standard disk marked "No. 16," located on the north face of the United States naval power plant at La Playa; mark is set in the brick wall 1.5 feet west of the northeast corner of the building and 2 feet above the ground. The building is about 300 feet south of the quarantine station, on the west side

of the concrete road to Fort Rosecrans. Elevation: 31.1 feet above lower low water; 28.23 feet above mean sea level.

**Serial No. 17. San Diego, U. S. Quarantine Station.**—B. M. 17 is a Coast and Geodetic Survey standard disk marked "No. 17," set on top of the concrete manhole located 5.6 feet south of the southeast corner of the United States naval power plant at La Playa; the mark is on the northeast corner of the manhole, 1.4 feet from the center of the iron manhole plate opening up on the electric conduit. Elevation: 29.2 feet above lower low water; 26.32 feet above mean sea level.

**Serial No. 18. San Diego, U. S. Quarantine Station.**—B. M. 18 is a Coast and Geodetic Survey standard disk marked "No. 18," set in the north face of the third step of the concrete pier at the end of the naval fuel-oil dock at La Playa. This dock is the first dock south of the quarantine station dock. Elevation: 9.5 feet above lower low water; 6.58 feet above mean sea level.

**Serial No. 19. San Diego (Old Town).**—B. M. D (C. & G. S.) is located about 100 meters east of the Atchison, Topeka & Santa Fe Railway, set in hardpan, in the southwest corner of the public-school grounds; stone post 4 feet long and 6 inches square, projecting 6 inches above ground, with a hole cut in top 2.5 centimeters square and about 4 millimeters deep, bottom of which is B. M. The top of the stone post is lettered "U. S. B. M." Elevation: 28.4 feet above lower low water; 25.44 feet above mean sea level.

**Serial No. 20. San Diego (municipal pier).**—B. M. 13 is a Coast and Geodetic Survey standard disk set flush with the concrete deck of Municipal Pier No. 1. It is on the southern edge of the dock opposite a midway position between loading doors Nos. 33 and 34. It is directly over the fixed staff. This position is 600 feet out from the bulkhead line. Elevation: 13.1 feet above lower low water; 10.06 feet above mean sea level.

**Serial No. 21. San Diego.**—B. M. 12 is a Coast and Geodetic Survey standard disk set on the bay side of the headquarters building of the eleventh naval district of San Diego, foot of Broadway, and near the northwest corner of the building. Elevation: 17.6 feet above lower low water; 14.59 feet above mean sea level.

**Serial No. 22. San Diego.**—B. M. 10 is a Geological Survey standard disk set in the east face of the foundation wall of the San Diego County courthouse on the Front Street side. The mark is 13 inches below the water table and 20.75 feet north from the southeast corner of the building. Elevation: 45.3 feet above lower low water; 42.28 feet above mean sea level.

**Serial No. 23. San Diego.**—B. M. 8 (C. & G. S.) is a  $\frac{1}{2}$ -inch brass plug set into the curb at the southwest corner of F and State Streets, San Diego,  $4\frac{1}{2}$  inches from the north edge of the F Street curb and 11 feet 9 inches west of the east face of the State Street curb. Elevation: 25.1 feet above lower low water; 22.07 feet above mean sea level.

**Serial No. 24. San Diego.**—B. M. 9 is a Coast and Geodetic Survey standard disk set 4 inches below the water table and 4 feet above the ground, in the sandstone foundation at the northwest corner of the Federal building at the intersection of F and State Streets. The B. M. is at the west entrance and 1 foot east of the west face of the west wall of the building, and it is located 8 meters east of the west edge of the east curb on State Street and 14.72 meters south of the north edge of the south curb on F Street. Elevation: 32.7 feet above lower low water; 29.64 feet above mean sea level.

**Serial No. 25. San Diego.**—B. M. 11 is a Coast and Geodetic Survey standard disk set in the curb in the vicinity of where the approach to Coronado Ferry meets Market Street. Elevation: 11.3 feet above lower low water; 8.27 feet above mean sea level.

**Serial No. 26. San Diego.**—B. M. 7 is a Coast and Geodetic Survey standard disk set in the south concrete foundation wall of the warehouse of the Standard Oil Co. at the foot of Twenty-sixth Street. The B. M. is 7 inches below the brickwork, 2 feet above the ground, and 1 foot from the southeast corner of the building. Elevation: 29.8 feet above lower low water; 26.55 feet above mean tide level.

**Serial No. 27. San Diego.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in the south face of the east abutment of the San Diego & Arizona Railway concrete bridge on an approximate line with Twenty-seventh Street extended. Elevation: 21.6 feet above lower low water; 18.44 feet above mean sea level.

**Serial No. 28. San Diego.**—B. M. 5 (C. & G. S.) is a cross cut on the concrete curb on the east side of Twenty-eighth Street, 8.4 meters north of the north curb line on Main Street and about 4 feet north of a fire plug. Elevation: 37.2 feet above lower low water; 33.98 feet above mean tide level.

**Serial No. 29. San Diego.**—B. M. 6 is a Coast and Geodetic Survey standard hydrographic station disk set in a rectangular concrete pier, 3 feet square and 3 feet deep, on the east side of Twenty-eighth Street, 3.7 meters north of the center of the main line of the Santa Fe Railway. The surface of the pier is marked "B. M. 3 E. B. L. 1916." The B. M. is in line with the inner line of sidewalk extended. Elevation: 11.4 feet above lower low water; 8.21 feet above mean tide level.

**Serial No. 30. San Diego.**—B. M. N-57 is a Coast and Geodetic Survey standard disk set in the top of a concrete block at the end of the steps, at the east side of the main entrance to the Y. M. C. A. building, which is located  $1\frac{1}{2}$  blocks east of the Union Depot on Broadway. Elevation: 26.9 feet above lower low water; 23.86 feet above mean sea level.

**Serial No. 31. San Diego.**—B. M. P-57 is a Coast and Geodetic Survey standard disk set in a concrete post on the San Diego & Arizona Railway,  $3\frac{1}{2}$  miles east of the Union Depot, 100 feet east of road crossing the track that leads to the destroyer base, 40 feet south of the San Diego & Arizona Railway track and 75 feet north of the Santa Fe Railway track, near an old brewery. Elevation: 16.5 feet above lower low water; 13.42 feet above mean sea level.

**Serial No. 32. San Diego.**—B. M. Q-57 is a Coast and Geodetic Survey standard disk set in a concrete post on the destroyer base property, about  $3\frac{1}{2}$  miles east of the Union Depot, opposite the marine barracks, 75 feet south of building No. 10, 4 feet inside of wire fence, and west of an old brewhouse and bottling works. Elevation: 12.2 feet above lower low water; 9.14 feet above mean sea level.

**Serial No. 33. Vicinity of Atwood, San Diego County.**—B. M. E (C. & G. S.) is a  $\frac{3}{8}$ -inch copper bolt 2 inches long, set flush with the surface in the center of the horizontal surface at the west end of concrete culvert F-260 on the Atchison, Topeka & Santa Fe Railway right of way about 1 mile north of Atwood. Elevation: 65.7 feet above lower low water; 62.96 feet above mean sea level.

**Serial No. 34. Vicinity of Ladrillo, San Diego County.**—B. M. F (C. & G. S.) is a 3-inch red-metal cap, somewhat curved, and lettered "U. S. Coast & Geodetic Survey B. M.," screwed upon a 4 or  $4\frac{1}{2}$  foot iron pipe set in the ground, from 4 to 6 inches being exposed above the ground. The base of the pipe is split and spread to a diameter of about 1 foot. This B. M. is about  $1\frac{1}{4}$  miles northwest of Ladrillo and about 25 meters northwest of milepost 258, set in clay, in the corner of a fence  $\frac{1}{2}$  meter east of the Atchison, Topeka & Santa Fe Railway right of way. Elevation: 99.8 feet above lower low water; 97.06 feet above mean sea level.

**Serial No. 35. American Park, San Diego County.**—B. M. 25 S. D. (U. S. G. S.) is a 3-inch aluminum or bronze cap, lettered "U. S. Geological Survey B. M. 25 S. D.," riveted upon a 3-inch iron pipe, 5 or 6 inches being exposed above the ground. A cross cut in the center of the top is the B. M. The B. M. is located at American Park race track, 710 feet north of station, at the southwest angle of junction of road to Pacific Beach. Elevation: 28.2 feet above lower low water; 25.45 feet above mean sea level.

**Serial No. 36. Scripps Institution, La Jolla.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in the concrete cap of the third bent of piles from west end of pier and is directly over the tide staff. Elevation: 26.3 feet above lower low water; 23.54 feet above mean sea level.

**Serial No. 37. Scripps Institution, La Jolla.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in the top of a concrete wall at entry to basement on west side of museum, 6 inches above the road level. Elevation: 35.2 feet above lower low water; 32.38 feet above mean sea level.

**Serial No. 38. Scripps Institution, La Jolla.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in top of concrete wall at rear entry (west side) of Scripps Laboratory, 2 feet above the surface of the ground. Elevation: 34.1 feet above lower low water; 31.30 feet above mean sea level.

**Serial No. 39. Scripps Institution, La Jolla.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in top of concrete wall 10 feet south of east end of pier and 14 feet below level of deck. Elevation: 14.9 feet above lower low water; 12.09 feet above mean sea level.

**Serial No. 40. Scripps' Institution, La Jolla.**—B. M. 5 (C. & G. S.) is on the northeast corner of seismograph block (concrete) and is marked with blue crayon; museum basement, north side. Elevation 30.9 feet above lower low water; 28.15 feet above mean tide level.

**Serial No. 41. Vicinity of Selwyn, San Diego County.**—B. M. G (C. & G. S.) is located near Selwyn on the Atchison, Topeka & Santa Fe Railway right of way, about 80 meters west of signboard "Selwyn," 16 meters north of track; stone post 4 feet long by 6 inches square, projecting 6 inches above ground, with a hole cut in top 2.5 centimeters square and about 4 millimeters deep, bottom of which is B. M. The top of the stone post is lettered "U. S. B. M." Elevation: 235.2 feet above lower low water; 232.47 feet above mean sea level.

**Serial No. 42. Balboa, Newport Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "No. 1, 1926," set on the top of the sea wall at the foot of the city dock, and about 6 inches west of the foot of an ornamental street light. Elevation: 6.8 feet above lower low water; 4.38 feet above mean tide level.

**Serial No. 43. Balboa, Newport Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk, stamped "No. 2, 1926," set in the west curb of Washington Street and about 150 feet from the sea wall. Elevation: 7.2 feet above lower low water; 4.80 feet above mean tide level.

**Serial No. 44. Balboa, Newport Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk, stamped "No. 3, 1926," set in the top of the sea wall about 6 inches west of an ornamental lamp-post, about 250 feet east of the foot of the city dock. Elevation: 6.7 feet above lower low water; 4.27 feet above mean tide level.

**Serial No. 45. North Lagoon, Newport Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "No. 1, 1926," located at "The Narrows," and is set in a large flat rock to the west of the road which follows the lagoon shore, and somewhat under the side of the road embankment. It is covered at very high tides. Elevation: 3.6 feet above lower low water; 1.60 feet above mean tide level.

**Serial No. 46. North Lagoon, Newport Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk, stamped "No. 2, 1926," located at "The Narrows," and about 150 feet northeast of B. M. No. 1 (Serial No. 45), and is set in a sewer pipe (bell end up) projecting about 1 foot above the ground on the west side of the road. Elevation: 4.9 feet above lower low water; 2.94 feet above mean tide level.

**Serial No. 47. North Lagoon, Newport Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk, stamped "No. 3, 1926," located at "The Narrows," and is about 75 feet east of B. M. No. 2 (Serial No. 46), on the east side of the road. It is set in a sewer pipe (plain end up) projecting about 1 foot above the ground and is about 3 feet above the road level. Elevation: 10.9 feet above lower low water; 8.93 feet above mean tide level.

**Serial No. 48. Newport Bay Entrance.**—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "No. 1, 1926," located on the seaward side of a proposed concrete retaining wall, and about 40 feet from the tower of the Palisades Clubhouse, which is now being built upon the rocky point. Elevation: 10.7 feet above lower low water; 8.09 feet above mean tide level.

**Serial No. 49. Newport Bay Entrance.**—B. M. 2 is a Coast and Geodetic Survey standard disk, stamped "No. 2, 1926," and is set on one of the "fingers" on the seaward side of the rocky point upon which the Palisades Clubhouse is being built, and about 20 feet from B. M. No. 1 (Serial No. 48). Elevation: 10.5 feet above lower low water; 7.86 feet above mean tide level.

**Serial No. 50. Newport Bay Entrance.**—B. M. 3 is a Coast and Geodetic Survey standard disk, stamped "No. 3, 1926," set on the rocky point upon which the Palisades Clubhouse is being built, about 25 feet southeast of B. M. No. 2 (Serial No. 49), on the seaward side of the rocky point south of the tower. B. M. No. 3 is covered at high tide. It is set horizontally in a hole on the face of this point. Elevation: 6.1 feet above lower low water; 3.49 feet above mean tide level.

**Serial No. 51. Avalon, Santa Catalina Island.**—B. M. 1 is a Coast and Geodetic Survey standard disk set just inside the curb on the southeast corner of Claressa and Crescent Avenues, and on a line with the fronts of the buildings facing on Crescent Avenue. Elevation: 11.3 feet above lower low water; 8.42 feet above mean tide level.

**Serial No. 52. Avalon, Santa Catalina Island.**—B. M. 2 is a Coast and Geodetic Survey standard disk set just inside the curb at the corner of Catalina and

Crescent Avenues, and on a line with the fronts of the buildings facing on Crescent Avenue. Elevation: 11.8 feet above lower low water; 8.94 feet above mean tide level.

**Serial No. 53.** *Avalon, Santa Catalina Island.*—B. M. 3 is a Coast and Geodetic Survey standard disk set on the southeast corner of Whittley and Crescent Avenues, just inside the curb and about 8 feet from the curb line. A telephone pole is within 6 inches of the B. M. Elevation: 15.9 feet above lower low water; 13.05 feet above mean tide level.

**Serial No. 54.** *Avalon, Santa Catalina Island.*—"City Bench Mark," established by the city engineer, is a large nail driven into the sidewalk and is located on the left (on entering) of the automobile and wagon entrance to the Wilmington Transportation Co.'s pier. The B. M. is in front of and within 4 inches of the wooden column which supports the roof at the left of the entrance. Elevation: 12.8 feet above lower low water; 9.92 feet above mean tide level.

**Serial No. 55.** *Catalina Harbor, Santa Catalina Island.*—B. M. 1 (C. & G. S.) is a lead bolt with copper tack in center, driven into a hole drilled in a rocky bluff on the west shore of Catalina Harbor, opposite Ballast Point. It is marked "U. S. ⊙ C. S." Elevation: 22.7 feet above lower low water; 19.82 feet above mean tide level.

**Serial No. 56.** *Catalina Harbor, Santa Catalina Island.*—B. M. 2 (C. & G. S.) is a cross cut in the rock of the bluff on the west shore of Catalina Harbor, opposite the extreme end of Ballast Point. It is marked "U. S. C. S. 1878." Elevation: 19.6 feet above lower low water; 16.73 feet above mean tide level.

**Serial No. 57.** *Long Beach.*—B. M. 1 is a Coast and Geodetic Survey standard disk set in curb at sewer drain on the east side of Pine Avenue, about 30 feet north of curb corner at Seaside Boulevard and Pine Avenue. B. M. is set in drill hole in concrete curb, flush with top of curb and cemented in place. The drain is a grating set flush in the street and not in the curb. Elevation: 11.7 feet above lower low water; 8.84 feet above mean tide level.

**Serial No. 58.** *Long Beach.*—B. M. 2 (C. & G. S.) is the highest point on elbow of 5-inch iron pipe, where vertical pipe of west side of Pine Avenue makes right-angle bend into retaining wall for top deck of Pine Avenue Pier. This pipe rises vertically from the street about 1 foot out from the wall to a height of about 3½ feet. Elevation: 30.8 feet above lower low water; 27.92 feet above mean tide level.

**Serial No. 59.** *Long Beach.*—B. M. 3 is a Coast and Geodetic Survey standard disk set in the northwest corner of base of W. C. T. U. drinking fountain. Drinking fountain is located at inner end of top deck of pier near edge of bluff. B. M. is set in cement in drill hole in concrete base of fountain. Elevation: 31.7 feet above lower low water; 28.85 feet above mean tide level.

**Serial No. 60.** *Long Beach.*—B. M. 4 (C. & G. S.) is a cross cut in the ledge of cast-iron light pole on the southeast corner of Pine and Ocean Avenues. The light pole is near the Ocean Avenue curb. The cross is on the horizontal base about 2.2 feet above the sidewalk; the cut is about 1½ inches long. Elevation: 34.9 feet above lower low water; 32.01 feet above mean tide level.

**Serial No. 61.** *Long Beach.*—B. M. 5 (C. & G. S.) is a cross cut in an iron light pole on the southeast corner of Pine Avenue and First Street, about 10 feet from corner of curb along First Street. Elevation: 36.9 feet above lower low water; 34.04 feet above mean tide level.

**Serial No. 62.** *Long Beach.*—B. M. "A-10, 1923," is a United States Geological Survey bronze tablet set in a concrete post 25 feet north and 50 feet west of the intersection of Anaheim Street and Atlantic Avenue. Elevation: 39.0 feet above lower low water; 36.09 feet above mean tide level.

**Serial No. 63.** *Los Angeles Harbor, San Pedro.*—B. M. 1 is a Coast and Geodetic Survey standard disk set in the center of the second concrete pier or foundation block from the southwest corner of the warehouse leased by the Outer Harbor Wharf & Dock Co. from the city of Los Angeles. The distance to the southwest corner of the warehouse is approximately 5 meters. Elevation: 10.7 feet above lower low water; 7.85 feet above mean sea level.

**Serial No. 64.** *Los Angeles Harbor, San Pedro.*—B. M. 2 (C. & G. S.) is the highest point of a concrete mooring pile with a sheet-iron casing. This is the last mooring pile before reaching the end of the warehouse dock and is about 2 meters from the end of the warehouse dock. Beyond this point there is an old dock which may be destroyed in the near future. This old dock is about 2 feet higher than the warehouse dock, so the end of the warehouse dock can be easily distinguished. This pile is about 25 meters southeast of the southeast

corner of the warehouse. Elevation: 16.9 feet above lower low water; 14.04 feet above mean sea level.

**Serial No. 65. Los Angeles Harbor, San Pedro.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in the top of upright of concrete culvert and flush with same. This is the first culvert on Miner Street inshore from the inner end of the warehouse. B. M. sets in the top of the east concrete wing wall. Elevation: 10.5 feet above lower low water; 7.58 feet above mean sea level.

**Serial No. 66. Los Angeles Harbor, San Pedro.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in the center of the top of the right-hand upright of the second concrete culvert on Miner Street inshore from the Outer Harbor Wharf & Dock Co. warehouse. This culvert is about 200 meters northerly of the first culvert. B. M. sets in the top of the east concrete wing wall. Elevation: 11.1 feet above lower low water; 8.19 feet above mean sea level.

**Serial No. 67. Los Angeles Harbor, San Pedro.**—B. M. 5 is a Coast and Geodetic Survey standard disk set in the center of the top of the right-hand upright of the first concrete culvert of Twenty-second Street, about 15 meters east of the point where Miner Street turns into Twenty-second Street. About 2 meters west of this culvert Twenty-second Street is crossed by a private-railroad track. This culvert is located about 25 meters northerly of the northwest corner of the slip and about 18 meters northerly of a large oil tank owned by the Outer Harbor Wharf & Dock Co. Elevation: 10.8 feet above lower low water; 7.94 feet above mean sea level.

**Serial No. 68. Los Angeles Harbor, San Pedro.**—B. M. 8 (Los Angeles Harbor Department) is a brass-cap spike and washer embedded in the concrete floor at the southwest corner of wharf called Municipal Dock No. 1, on the south end of the dock. This dock is used by the United States Navy as a subbase. The B. M. is near a boat landing used by officers and their guests. It is marked "H. D. B. M.—14." Elevation: 14.1 feet above lower low water; 11.20 feet above mean sea level.

**Serial No. 69. Dolores.**—B. M. F-33 (U. S. G. S.) is a bronze tablet, stamped "33—1914—68," located on the Southern Pacific Railroad at mileage 498.3, in the west concrete wall of the Dominguez Water Co.'s power house, 18 inches south of the central door and 5 feet above the ground. Elevation: 36.2 feet above lower low water; 33.31 feet above mean sea level.

**Serial No. 70. Thenard Junction.**—B. M. G-33 (U. S. G. S.) is an iron post, stamped "Elev. 33 No. 67," located on the Southern Pacific Railroad at mileage 501.4, 180 feet south of a switch head on the north end of the wye, 20 feet east of the track at the base of a telegraph pole. Elevation: 35.7 feet above lower low water; 32.81 feet above mean sea level.

**Serial No. 71. Wilmington.**—B. M. A-51 is a Coast and Geodetic Survey standard disk set in the northwest cornerstone of stone foundation of Wilmington City Hall, 6 inches above sidewalk, 60 feet east of Canal Avenue, and 50 feet south of East First Street. Elevation: 30.8 feet above lower low water; 27.98 feet above mean sea level.

**Serial No. 72. Wilmington.**—B. M. (U. S. G. S.) is a chiseled square on curb, painted "U. S. B. M. 12-4," in northeast corner of Harbor Boulevard and West B Street. Elevation: 15.2 feet above lower low water; 12.33 feet above mean sea level.

**Serial No. 73. San Pedro.**—B. M. I-33 (U. S. G. S.) is a bronze tablet located on the top face of the banister post of the main entrance on the north side of the city hall on Beacon Street, about 5 feet above the ground. Elevation: 32.9 feet above lower low water; 30.05 feet above mean sea level.

**Serial No. 74. San Pedro.**—B. M. J-33 (U. S. G. S.) is a brass disk located at the summit of the hill on Beacon Street near the city hall, on the east end of the first step at the left side of the main entrance to the city library. Elevation: 75.0 feet above lower low water; 72.17 feet above mean sea level.

**Serial No. 75. San Pedro.**—B. M. K-33 (U. S. G. S.) is a brass disk located in the banister on the left side of the main entrance to a public-school building on Center Street and about 2 feet above the ground. Elevation: 106.5 feet above lower low water; 103.63 feet above mean sea level.

**Serial No. 76. Redondo Beach, Santa Monica Bay.**—B. M. 1 (C. & G. S.) is the highest part of the head of a copper bolt cemented into the concrete wall separating the Santa Fe Railway and the Los Angeles & Redondo Railroad tracks from Alameda Street near the approach to Pier No. 1. The mark is 0.38 foot from the top of the wall and 9.35 feet north of the second runway from the south end of the wall. Elevation: 21.6 feet above lower low water, 18.72 feet above mean tide level.

**Serial No. 77. Redondo Beach, Santa Monica Bay.**—B. M. 2 (C. & G. S.) is similar to B. M. 1 (Serial No. 76) and located in the same wall 0.29 foot from the top and 16.0 feet north of the first runway from the south end of the wall. Elevation: 21.4 feet above lower low water; 18.51 feet above mean tide level.

**Serial No. 78. Redondo Beach, Santa Monica Bay.**—B. M. 3 (C. & G. S.) is similar to B. M. 1 (Serial No. 76) and located in the same wall 0.26 foot from the top and 14.9 feet from the south end of the wall. Elevation: 21.1 feet above lower low water; 18.17 feet above mean tide level.

**Serial No. 79. Redondo Beach, Santa Monica Bay.**—B. M. 4 (C. & G. S.) is the top of an iron bolt driven in the flooring on the north side of Pier No. 1, a few feet east of the tool house and 16.5 feet from its southeast corner. Elevation: 20.5 feet above lower low water; 17.60 feet above mean tide level.

**Serial No. 80. Redondo Beach, Santa Monica Bay.**—"City of Redondo Beach B. M. 46.48" is a brass disk (marked accordingly) set in a cement sidewalk 200 feet south from the southwest corner of old Redondo Hotel on the north edge of Ainsworth Court, at top of cement steps leading to the ocean, near base of north concrete-railling post. Elevation: 47.4 feet above lower low water; 44.58 feet above mean sea level.

**Serial No. 81. Redondo Beach, Santa Monica Bay.**—B. M. (U. S. G. S.) is a bronze tablet, stamped "21, 1922," set in an 8 by 8 by 30 inch concrete post, 108 feet north of Santa Fe Railway passenger station, on city property 25 feet north of city flagpole, on east side of El Paso Street and 30 feet east of the Santa Fe tracks. Elevation: 22.4 feet above lower low water; 19.48 feet above mean sea level.

**Serial No. 82. Hermosa Beach, Santa Monica Bay.**—B. M. (U. S. G. S.) is a chiseled cross on curbstone, painted "U. S. 14. B. M.," in southeast corner of Second Street and Hermosa Avenue. Elevation: 16.1 feet above lower low water; 13.20 feet above mean sea level.

**Serial No. 83. Hermosa Beach, Santa Monica Bay.**—B. M. (U. S. G. S.) is a chiseled cross on curbstone in front of city hall building, opposite entrance to Chamber of Commerce. Elevation: 16.09 feet above lower low water; 14.07 feet above mean sea level.

**Serial No. 84. Hermosa Beach, Santa Monica Bay.**—B. M. (U. S. G. S.) is a spike in base of trolley pole, painted "U. S. 25. B. M.," 180 feet south of Pacific Electric Hermosa substation 42. Elevation: 27.2 feet above lower low water; 24.34 feet above mean sea level.

**Serial No. 85. Manhattan Beach, Santa Monica Bay.**—B. M. (U. S. G. S.) is a bronze tablet, stamped "20, 1922," set in an 8 by 8 by 30 inch concrete post on south edge of Center Street, 75 feet east from pier abutment, 18 feet east of northbound car track and 2 feet west of the Strand cement railing. Elevation: 27.0 feet above lower low water; 24.09 feet above mean sea level.

**Serial No. 86. Pecks Beach, Santa Monica Bay.**—B. M. (U. S. G. S.) is a spike in the base of a trolley pole, painted "U. S. 27. B. M.," 0.8 mile northwest of Manhattan Beach, opposite beach dance hall on east side of Redondo car tracks. Elevation: 29.3 feet above lower low water; 26.43 feet above mean sea level.

**Serial No. 87. El Segundo, Santa Monica Bay.**—B. M. (U. S. G. S.) is a bronze tablet, stamped "14, 1922," set in an 8 by 8 by 30 inch concrete post, 192 feet east of El Segundo State Bank, 108 feet east from end of trolley track, 10 feet north of track, opposite south entrance to El Segundo garage. Elevation: 107.7 feet above lower low water; 104.82 feet above mean sea level.

**Serial No. 88. El Segundo, Santa Monica Bay.**—B. M. (U. S. G. S.) is a spike in the base of a telephone pole, painted "U. S. 105. B. M.," at north edge of city limits, junction of Coast Boulevard and Collingwood Street, in the northwest corner of the streets. Elevation: 107.9 feet above lower low water; 105.00 feet above mean sea level.

**Serial No. 89. Vicinity of Playa del Rey, Santa Monica Bay.**—B. M. (U. S. G. S.) is a spike in the base of a telephone pole, painted "U. S. 119 B. M.," 1.6 miles south of Playa del Rey and 2.2 miles north of El Segundo, on south side of Coast Boulevard. Elevation: 121.8 feet above lower low water; 118.96 feet above mean sea level.

**Serial No. 90. Vicinity of Playa del Rey, Santa Monica Bay.**—B. M. (U. S. G. S.) is a spike in the base of a telephone pole, painted "U. S. 80 B. M.," 0.8 mile south of Playa del Rey, on east side of Coast Boulevard. Elevation: 82.8 feet above lower low water; 79.88 feet above mean sea level.

**Serial No. 91. Playa del Rey, Santa Monica Bay.**—B. M. (U. S. G. S.) is a bronze tablet, stamped "10, 1922," set in an 8 by 8 by 30 inch concrete post

150 feet south of Pacific Electric substation 41, on south side of Redondo Road. Elevation: 16.0 feet above lower low water; 13.16 feet above mean sea level.

**Serial No. 92.** *Vicinity of Playa del Rey, Santa Monica Bay.*—B. M. (U. S. G. S.) is a spike in the base of a trolley pole, painted "U. S. 16, B. M.," 1.2 miles north of Playa del Rey and 1.4 miles south of Venice, at trolley way and Forty-fifth Place. Elevation: 18.0 feet above lower low water; 15.12 feet above mean sea level.

**Serial No. 93.** *Vicinity of Venice, Santa Monica Bay.*—B. M. N-50 is a Coast and Geodetic Survey standard disk set in a standard concrete monument at the northwest angle of the intersection of Forty-second Avenue and Pacific Electric tracks midway between Venice and Del Ray. Elevation: 18.0 feet above lower low water; 15.14 feet above mean tide level.

**Serial No. 94.** *Venice, Santa Monica Bay.*—B. M. (U. S. G. S.) is a spike in the base of a trolley pole, painted "U. S. 16 B. M.," 2,100 feet south of Pacific Electric passenger station, 1,400 feet north of Florence Nightingale School, on trolley way, one pole north of Avenue 27. Elevation: 18.4 feet above lower low water; 15.54 feet above mean sea level.

**Serial No. 95.** *Venice, Santa Monica Bay.*—B. M. (U. S. G. S.) is a bronze tablet, stamped "11, 1922," set in an 8 by 8 by 30 inch concrete post 1,500 feet south of Pacific Electric passenger station, at crossing of Virginia Avenue and trolley way, 10 feet east of northbound track, on south edge of Virginia Avenue. Elevation: 17.6 feet above lower low water; 14.72 feet above mean sea level.

**Serial No. 96.** *Venice, Santa Monica Bay.*—B. M. M-50 is a Coast and Geodetic Survey standard disk set in the top of the concrete railing of stairs which lead down to Venice Lake. B. M. is on west side of lake opposite canal openings. Elevation: 20.4 feet above lower low water; 17.52 feet above mean tide level.

**Serial No. 97.** *Ocean Park, Santa Monica Bay.*—B. M. L-50 is a Coast and Geodetic Survey standard disk set in the concrete steps of north entrance to Pacific Southwest Bank, Ocean Park Branch, on Pier Avenue at Ocean Beach. The building is of red brick, built in 1902, and is called Ocean Park Bank also. Elevation: 28.3 feet above lower low water; 25.44 feet above mean tide level.

**Serial No. 98.** *Santa Monica.*—B. M. (U. S. G. S.) is a spike in base of trolley pole located 1 mile east of Pacific Electric station, at Fourteenth Street crossing, painted "U. S. 112 B. M." Elevation: 113.9 feet above lower low water; 111.16 feet above mean sea level.

**Serial No. 99.** *Santa Monica.*—B. M. (U. S. G. S.) is a bronze tablet, stamped "2, 1922," located 83 feet west of west end, 60 feet south of center of main line track, 180 feet east of Ocean Avenue, in an 8 by 8 by 30 inch concrete post. Elevation: 62.2 feet above lower low water; 59.42 feet above mean sea level.

**Serial No. 100.** *Santa Monica.*—B. M. (U. S. G. S.) is a chiseled cross on curbstone, painted "U. S. 46 B. M.," located at the junction of Ocean Avenue and Pico Boulevard, in northwest corner of streets. Elevation: 47.9 feet above lower low water; 45.18 feet above mean sea level.

**Serial No. 101.** *Santa Monica.*—B. M. (U. S. G. S.) is a spike, painted "U. S. 28 B. M.," in base of trolley pole at Ocean Park, 300 feet south of Southern Pacific ticket office and Pacific Electric passenger station, at crossing of Navy Street with trolley way. Elevation: 30.5 feet above lower low water; 27.74 feet above mean sea level.

**Serial No. 102.** *Santa Monica.*—B. M. (U. S. G. S.) is a spike, painted "U. S. 345 B. M.," in base of trolley pole at intersection of Twenty-third Street with San Vicente Boulevard, 90 feet southeast of center of Twenty-third Street. Elevation: 347.5 feet above lower low water; 344.75 feet above mean sea level.

**Serial No. 103.** *Santa Monica.*—B. M. (U. S. G. S.) is a bronze tablet, stamped "4, 1922," in an 8 by 8 by 30 inch concrete post, at junction of Twenty-sixth Street with San Vicente Boulevard, in southwest corner of streets, between curb and sidewalk, east city limit. Elevation: 350.5 feet above lower low water; 347.78 feet above mean sea level.

**Serial No. 104.** *Santa Monica.*—B. M. (U. S. G. S.) is a spike, painted "U. S. 194 B. M.," in base of telegraph pole at intersection of Twenty-sixth Street with Wilshire Boulevard, in northwest corner of streets. Elevation: 196.4 feet above lower low water; 193.67 feet above mean sea level.

**Serial No. 105.** *Santa Monica.*—B. M. (U. S. G. S.) is a painted square on curbstone, painted "U. S. 204 B. M.," at intersection of Anita Avenue, or Cambridge Street, with Santa Monica Boulevard, in southeast corner of streets. Elevation: 206.7 feet above lower low water; 203.95 feet above mean sea level.

**Serial No. 106. Santa Monica.**—B. M. (U. S. G. S.) is a chiseled square on curbstone, painted "U. S. 105 B. M.," on west side of Ocean Avenue at junction of California and Ocean Avenues. Elevation: 107.0 feet above lower low water; 104.23 feet above mean sea level.

**Serial No. 107. Santa Monica.**—B. M. (U. S. G. S.) is a bronze tablet, stamped "3, 1922," in northeast corner of streets at junction of San Vicente Boulevard and Ocean Avenue, in an 8 by 8 by 30 inch concrete post, between curb and sidewalk. Elevation: 165.1 feet above lower low water; 162.32 feet above mean sea level.

**Serial No. 108. Santa Monica.**—B. M. (U. S. G. S.) is a nail driven into crack between two adjoining curbstones in a painted square, "U. S. 226 B. M." painted on curbstone, in southwest corner of streets, at junction of Ninth Street and San Vicente Boulevard. Elevation: 228.5 feet above lower low water; 225.75 feet above mean sea level.

**Serial No. 109. Hueneme, Ventura County.**—B. M. (U. S. G. S.) is a bronze tablet, stamped "8 L. A.," located at the junction of Market and Main Streets, on the west side of the Bank of Hueneme, in the eighth row of bricks above the sidewalk and the second row from the corner. Elevation: 13.3 feet above lower low water; 10.49 feet above mean sea level.

**Serial No. 110. Vicinity of Ventura, Ventura County.**—B. M. O-30 is a Coast and Geodetic Survey standard disk set in the west end of cement culvert 400, located  $2\frac{1}{2}$  miles southeast of Ventura. B. M. is 4 meters west of the center line of the track, 1 meter below, railroad mileage 400.4. Elevation: 66.6 feet above lower low water; 63.79 feet above mean sea level.

**Serial No. 111. Ventura, Ventura County.**—B. M. N-30 is a Coast and Geodetic Survey standard disk stamped "13 L. A.," located on the east side of the main entrance to the old county courthouse, 2.4 feet west of the northeast corner of tower and 1.4 feet above the sidewalk. Elevation: 19.0 feet above lower low water; 16.26 feet above mean sea level.

**Serial No. 112. Ventura, Ventura County.**—B. M. M-30 is a Coast and Geodetic Survey standard disk set in the southeast corner of the First National Bank, northeast of the main entrance, in the horizontal surface of the footing and 0.8 meter above the sidewalk. Elevation: 43.5 feet above lower low water; 40.76 feet above mean sea level.

**Serial No. 113. Ventura, Ventura County.**—B. M. L-30 is a Coast and Geodetic Survey standard disk set on a concrete post in the southwest corner of city park. Elevation: 51.7 feet above lower low water; 48.96 feet above mean sea level.

**Serial No. 114. Ventura, Ventura County.**—B. M. K-30 is a Coast and Geodetic Survey standard disk set on a concrete post in the Southern Pacific Park, northwest of the station, directly east of two water tanks, 20 meters east of the center line of the track, level with the track at railroad mileage 398.2. Elevation: 51.6 feet above lower low water; 48.88 feet above mean sea level.

**Serial No. 115. Ventura Junction, Ventura County.**—B. M. J-30 is a Coast and Geodetic Survey standard disk set on a concrete post between the main line of the Southern Pacific Railroad and the spur line to Ojai, 8 meters east of the center line of the track and 1 meter below the track at mileage 397.2. Elevation: 13.0 feet above lower low water; 10.21 feet above mean sea level.

**Serial No. 116. Vicinity of Ventura, Ventura County.**—B. M. I-30 is a Coast and Geodetic Survey standard disk set in the east end of the north abutment of Ventura River bridge (north), railroad structure 396-D, 1.4 miles northwest of Ventura. B. M. is 4 meters below track and 3 meters east of track at railroad mileage 396.6. Elevation: 20.4 feet above lower low water; 17.58 feet above mean sea level.

**Serial No. 117. Vicinity of Ventura, Ventura County.**—B. M. H-30 is a Coast and Geodetic Survey standard disk set in the south end of highway sea wall located 2.8 miles northwest of Ventura. B. M. is 15 meters west of center line of track and 3.5 meters below track at railroad mileage 395.2. Elevation: 15.4 feet above lower low water; 12.58 feet above mean sea level.

**Serial No. 118. Dulah, Ventura County.**—B. M. G-30 is a Coast and Geodetic Survey standard disk set in the east head wall of highway culvert, opposite railroad structure at railroad mileage 393. B. M. is 15 meters west of the center line of the track and is level with the track. Elevation: 17.5 feet above lower low water; 14.77 feet above mean sea level.

**Serial No. 119. Vicinity of Ventura, Ventura County.**—B. M. F-30 is a Coast and Geodetic Survey standard disk set in the east head wall of highway culvert at railroad mileage 391, 7 miles northwest of Ventura, opposite railroad structure 301-A and 10 meters south of milepost 391. B. M. is 8 meters

west of center line of track and 1.5 meters below track. Elevation: 24.7 feet above lower low water; 21.94 feet above mean sea level.

**Serial No. 120.** *Vicinity of Ventura, Ventura County.*—B. M. E-30 (C. & G. S.) is the surface within an outlined square in the east head wall of concrete-box culvert 390-I, 7.7 miles northwest of Ventura. B. M. is 4 meters east of center line of track and 1 meter below track at railroad mileage 390.3. Elevation: 26.1 feet above lower low water; 23.33 feet above mean sea level.

**Serial No. 121.** *Seacliff, Ventura County.*—B. M. D-30 is a Coast and Geodetic Survey standard disk set in a concrete post just west of the waiting room of the Southern Pacific Railroad station, 10 meters west of the center line of the track at mileage 388.8. Elevation: 20.2 feet above lower low water; 17.41 feet above mean sea level.

**Serial No. 122.** *Vicinity of Seacliff, Ventura County.*—B. M. B-30 is a Coast and Geodetic Survey standard disk set in the west end of the north abutment of stone culvert 387-A2, located 0.8 mile northwest of Seacliff at Southern Pacific Railroad mileage 388. B. M. is 4 meters west of center line of track and 0.7 meter below the track. Elevation: 31.4 feet above lower low water; 28.62 feet above mean sea level.

**Serial No. 123.** *Punta Gorda, Ventura County.*—B. M. C-30 (C. & G. S.) is an iron post, stamped "21 L. A.," located 600 feet east of schoolhouse at Punta Gorda, 100 feet west of milepost 386, in the north corner of fence at road crossing. 25 feet east of road at Southern Pacific Railroad mileage 386. Elevation: 27.8 feet above lower low water; 25.00 feet above mean sea level.

**Serial No. 124.** *Vicinity of Punta Gorda, Ventura County.*—B. M. A-30 is a Coast and Geodetic Survey standard disk set in the west end of concrete culvert 385-H, 1.6 miles northwest of Punta Gorda at Southern Pacific Railroad mileage 385.4. B. M. is 3 meters west of center line of track and 0.7 meter below the track. Elevation: 33.8 feet above lower low water; 31.03 feet above mean sea level.

**Serial No. 125.** *Vicinity of Benham, Ventura County.*—B. M. F-29 (C. & G. S.) is a roundheaded bolt set in the top block, north side, of the west end of stone culvert 384-F, located 0.1 mile south of Benham at Southern Pacific Railroad mileage 384.5. Elevation: 43.0 feet above lower low water; 40.21 feet above mean sea level.

**Serial No. 126.** *Vicinity of Benham, Ventura County.*—B. M. E-29 is a Coast and Geodetic Survey standard disk set in cement on top of west portal of under-grade crossing 0.2 mile north of Benham at Southern Pacific Railroad mileage 384.4, about 200 feet south of county line. Elevation: 49.8 feet above lower low water; 47.05 feet above mean sea level.

**Serial No. 127.** *Vicinity of Carpinteria, Santa Barbara County.*—B. M. D-29 (C. & G. S.) is a roundheaded bolt in south sandstone abutment of Southern Pacific Railroad culvert 381-C, on east side of track, 0.8 mile south of Carpinteria, 100 feet north of milepost 382. Elevation: 43.2 feet above lower low water; 40.45 feet above mean sea level.

**Serial No. 128.** *Vicinity of Carpinteria, Santa Barbara County.*—B. M. C-29 (C. & G. S.) is a roundheaded bolt on north concrete abutment of Southern Pacific Railroad trestle 381-B over Carpinteria Creek, 0.4 mile southeast of Carpinteria and on the east side of the track. Elevation: 22.4 feet above lower low water; 19.60 feet above mean sea level.

**Serial No. 129.** *Carpinteria, Santa Barbara County.*—B. M. B-29 (C. & G. S.) is a Geological Survey iron post, stamped "11 L. A.," located about 30 feet east of southeast corner of Southern Pacific Railroad station at Carpinteria, 35 feet north of the main track and 2 feet east of a telegraph pole. Elevation: 17.2 feet above lower low water; 14.45 feet above mean sea level.

**Serial No. 130.** *Vicinity of Summerland, Santa Barbara County.*—B. M. A-29 is a Coast and Geodetic Survey standard disk set in south abutment of highway concrete bridge with stone railing, opposite Southern Pacific Railroad culvert 378-L, 2.6 miles southeast of Summerland. B. M. is on west side of roadway at mileage 378.7. Elevation: 16.1 feet above lower low water; 13.36 feet above mean sea level.

**Serial No. 131.** *Vicinity of Summerland, Santa Barbara County.*—B. M. Z-28 (C. & G. S.) is a roundheaded bolt on south abutment of Southern Pacific Railroad culvert 378-C, east of track, in top face of stone block, 1.9 miles southeast of Summerland, at mileage 378.1. Elevation 45.0 feet above lower low water; 42.26 feet above mean sea level.

**Serial No. 132.** *Vicinity of Summerland, Santa Barbara County.*—B. M. Y-28 (C. & G. S.) is a rounded knob cut in the south end of highway bridge stone

railing, 1.4 miles southeast of Summerland, at Southern Pacific Railroad mileage 377.6, east of track and opposite railroad culvert 377-D. Elevation: 59.8 feet above lower low water; 57.06 feet above mean sea level.

**Serial No. 133.** *Vicinity of Summerland, Santa Barbara County.*—B. M. W-28 is a Coast and Geodetic Survey standard disk set on south end of concrete retaining wall 375-Q, on west side of track, 0.5 mile west of Summerland, at Southern Pacific Railroad mileage 375.8. Elevation: 66.0 feet above lower low water; 63.20 feet above mean sea level.

**Serial No. 134.** *Vicinity of Miramar, Santa Barbara County.*—B. M. V-28 (C. & G. S.) is the surface within an outlined square on rounded knob on south end of stone railing of highway culvert, 0.4 mile southeast of Miramar station of the Southern Pacific Railroad. B. M. is 15 meters east of railway culvert 375-A over creek, at mileage 375.1. Elevation: 32.4 feet above lower low water; 29.68 feet above mean sea level.

**Serial No. 135.** *Vicinity of Montecito, Santa Barbara County.*—B. M. U-28 (C. & G. S.) is a round-headed bolt, about  $\frac{1}{2}$  mile south of the station at Montecito, on the Southern Pacific Railroad, at mileage 374.3 east of track, in the top masonry block of the south abutment to the steel deck-girder bridge No. 374 A. Elevation: 39.7 feet above lower low water; 36.97 feet above mean sea level.

**Serial No. 136.** *Vicinity of Santa Barbara, Santa Barbara County.*—B. M. T-28 is a Coast and Geodetic Survey standard disk, located about  $2\frac{1}{3}$  miles south of Santa Barbara on the Southern Pacific Railroad, at milepost 373, west of the track, on the end of the extension provided for a double track, on the north abutment of the concrete under grade crossing No. 372 E. Elevation: 39.8 feet above lower low water; 36.99 feet above mean sea level.

**Serial No. 137.** *Vicinity of Santa Barbara, Santa Barbara County.*—B. M. S-28 (C. & G. S.) is a round-headed bolt, about 2 miles south of Santa Barbara on the Southern Pacific Railroad, at mileage 372.8, east of track, in the top sandstone block on the south end of the under grade crossing No. 372 C. Elevation: 31.0 feet above lower low water; 28.20 feet above mean sea level.

**Serial No. 138.** *Vicinity of Santa Barbara, Santa Barbara County.*—B. M. R-28 is a Coast and Geodetic Survey standard disk at Santa Barbara, about  $1\frac{1}{2}$  miles south of the depot on the Southern Pacific Railroad, at mileage 372.2, east of the track, on the south abutment of the plate-girder bridge over Sycamore Creek. Elevation: 18.7 feet above lower low water; 15.94 feet above mean sea level.

**Serial No. 139.** *Santa Barbara, Santa Barbara County.*—B. M. P-28 (U. S. G. S.) is a reestablished Geological Survey iron post, stamped "37 L. A.," at Santa Barbara,  $8\frac{1}{2}$  feet southeast of the northeast corner of the city hall. Elevation: 43.2 feet above lower low water; 40.44 feet above mean sea level.

**Serial No. 140.** *Santa Barbara, Santa Barbara County.*—B. M. O-28 is a Coast and Geodetic Survey standard disk in the center of top of stone post at Santa Barbara, about 1 foot above the sidewalk, at the end of the sea wall at the southwest corner of the Boulevard and State Street. Elevation: 13.1 feet above lower low water; 10.34 feet above mean sea level.

**Serial No. 141.** *Santa Barbara, Santa Barbara County.*—B. M. N-28 is a Coast and Geodetic Survey standard disk set in the top of a stone post 6 by 6 inches by  $4\frac{1}{2}$  feet long at Santa Barbara, in the hedge-enclosed park just east of the Southern Pacific Railroad depot, in the corner nearest the depot near a small fir tree. Elevation: 16.7 feet above lower low water; 13.96 feet above mean sea level.

**Serial No. 142.** *Vicinity of Santa Barbara, Santa Barbara County.*—B. M. K-28 is a Coast and Geodetic Survey standard disk located about 1 mile north of Santa Barbara, on the Southern Pacific Railroad, east of the track, on the north abutment of the second bridge over Mission Creek. Elevation: 62.9 feet above lower low water; 60.15 feet above mean sea level.

**Serial No. 143.** *Vicinity of Santa Barbara, Santa Barbara County.*—B. M. J-28 (U. S. G. S.) is a Geological Survey iron post, stamped "128 L. A.," located about  $1\frac{1}{2}$  miles north of the Victoria Street station at Santa Barbara, on the Southern Pacific Railroad, at mileage 368.5, in the corner of the fence at a private-road crossing, 300 feet east of the east end of a through cut, 40 feet north of the track and 30 feet east of a lone cottonwood tree. Elevation: 134.8 feet above lower low water; 132.03 feet above mean sea level.

**Serial No. 144.** *Vicinity of Olwa, Santa Barbara County.*—B. M. I-28 (C. & G. S.) is the surface within an outlined square on a culvert near block signal No. 367.6 on west side of track on Southern Pacific Railroad, at mileage 367.5,

about  $\frac{1}{2}$  mile north of Oliva. Elevation: 152.7 feet above lower low water; 149.90 feet above mean sea level.

**Serial No. 145.** *Hope Ranch, Santa Barbara County.*—B. M. H-28 is a Coast and Geodetic Survey standard disk set on the southwest corner of highway bridge which parallels the track of the Southern Pacific Railroad at milepost 367 opposite 366-F, about 4 meters east of track at elevation of roadway, just outside of railing. Elevation: 166.3 feet above lower low water; 163.50 feet above mean sea level.

**Serial No. 146.** *Vicinity of Hope Ranch, Santa Barbara County.*—B. M. M-28 (C. & G. S.) is the surface within an outlined square on roundheaded knob in top face of sandstone block on south abutment of undergrade crossing Hollister Avenue, railway structure 365-E, 0.8 mile west of Hope Ranch. B. M. is east of track at mileage 365.7 of Southern Pacific Railroad. Elevation: 128.7 feet above lower low water; 125.97 feet above mean sea level.

**Serial No. 147.** *Vicinity of Goleta, Santa Barbara County.*—B. M. G-28 is a Coast and Geodetic Survey standard disk on the north-end abutment of railway culvert over Maria Ygnacia Creek, 0.9 mile east of Goleta at mileage 363.6, Southern Pacific Railroad. B. M. is on east side of track and 1 meter below track. Elevation: 80.0 feet above lower low water; 77.26 feet above mean sea level.

**Serial No. 148.** *Goleta, Santa Barbara County.*—B. M. F-28 (C. & G. S.) is a Geological Survey iron post, stamped "43 L. A.," located 70 feet east of windmill frame at mileage 362.8, 120 feet south of center line of Southern Pacific Railroad track, 2 feet east of corner of fence and east of road. A tree has grown over the B. M. Elevation: 49.1 feet above lower low water; 46.32 feet above mean sea level.

**Serial No. 149.** *La Patera, Santa Barbara County.*—B. M. E-28 is a Coast and Geodetic Survey standard disk set on north end of concrete culvert 261-G, 0.2 mile east of La Patera at mileage 361.9, Southern Pacific Railroad, on west side of track. Elevation: 29.6 feet above lower low water; 26.82 feet above mean sea level.

**Serial No. 150.** *Coromar, Santa Barbara County.*—B. M. D-28 (C. & G. S.) is a square cut in top face of west end of concrete culvert 360-A at mileage 360.2, Southern Pacific Railroad. Elevation: 36.5 feet above lower low water; 33.69 feet above mean sea level.

**Serial No. 151.** *Vicinity of Elwood, Santa Barbara County.*—B. M. C-28 is a Coast and Geodetic Survey standard disk set in the southerly one of two concrete piers supporting concrete overhead road crossing, on west side of track and about 5 feet above track of Southern Pacific Railroad, 1 mile north of Elwood at mileage 357.8. B. M. is near middle of heavy cut north of milepost. Elevation: 88.8 feet above lower low water; 86.07 feet above mean sea level.

**Serial No. 152.** *Vicinity of Elwood, Santa Barbara County.*—B. M. B-28 (C. & G. S.) is a Geological Survey iron post, stamped "57 L. A.," located 1.7 miles west of Elwood, 660 feet east of old milepost 358 (present mileage 357.4), at road crossing, near fence, and 20 feet north of track of the Southern Pacific Railroad. Elevation: 63.4 feet above lower low water; 60.58 feet above mean sea level.

**Serial No. 153.** *Naples, Santa Barbara County.*—B. M. A-28 is a Coast and Geodetic Survey standard disk on central concrete base of support to east one of two large tanks beside Southern Pacific Railroad track opposite Naples station. Elevation: 101.8 feet above lower low water; 99.04 feet above mean sea level.

**Serial No. 154.** *Vicinity of Naples, Santa Barbara County.*—B. M. Z-27 (C. & G. S.) is a square cut in masonry on north-end abutment of trestle over Dos Pueblos Canyon, on top face of top stone block, 0.6 mile north of Naples at mileage 354.4, Southern Pacific Railroad. B. M. is west of track. Elevation: 76.4 feet above lower low water; 73.61 feet above mean sea level.

**Serial No. 155.** *Vicinity of Capitan, Santa Barbara County.*—B. M. L-28 (C. & G. S.) is a Geological Survey iron post, stamped "109 L. A.," located 1.8 miles east of Capitan, 1 foot west of old milepost 352 (present mileage 351.4), Southern Pacific Railroad, and 25 feet north of the track. Elevation: 115.5 feet above lower low water; 112.69 feet above mean sea level.

**Serial No. 156.** *Vicinity of Capitan, Santa Barbara County.*—B. M. Y-27 (C. & G. S.) is the surface within an outlined square on masonry, a rounded knob on top face of top stone block on south-end abutment of railroad trestle over El Capitan Canyon, structure 350-E, at mileage 350.8, Southern Pacific Railroad, 0.9 mile east of Capitan. B. M. is west of track. Elevation: 111.0 feet above lower low water; 108.21 feet above mean sea level.

**Serial No. 157.** *Vicinity of Orella, Santa Barbara County.*—B. M. X-27 is a Coast and Geodetic Survey standard disk set in cement on railroad bridge 348-A over Refugio Canyon, east of track, on top of stone block of north abutment, 0.5 mile north of Orella at milepost 348, Southern Pacific Railroad. Elevation: 43.8 feet above lower low water; 41.03 feet above mean sea level.

**Serial No. 158.** *Tajiguas, Santa Barbara County.*—B. M. W-27 (C. & G. S.) is a Geological Survey iron post, stamped "59 L. A.," located 135 feet east of northeast corner of fence around Southern Pacific Railroad section-house lot, 200 feet north of center of track, 50 feet south of road, and 30 feet west of gate in fence. Elevation: 66.0 feet above lower low water; 63.18 feet above mean sea level.

**Serial No. 159.** *Vicinity of Gaviota, Santa Barbara County.*—B. M. V-27 is a Coast and Geodetic Survey standard disk set on top of south-end ornamental railing post of large concrete highway bridge over Arroyo Honda, about 20 meters east of railroad bridge (Southern Pacific Railroad) over same canyon, 4.3 miles east of Gaviota. B. M. is on west side of roadway at mileage 343.7. Elevation: 93.8 feet above lower low water, 91.02 feet above mean sea level.

**Serial No. 160.** *Vicinity of Gaviota, Santa Barbara County.*—B. M. U-27 is a Coast and Geodetic Survey standard disk in the west end of small culvert under highway, 2.8 miles east of Gaviota. B. M. is opposite Southern Pacific Railroad culvert 342-A at mileage 342.2. Elevation: 98.7 feet above lower low water; 95.92 feet above mean sea level.

**Serial No. 161.** *Gaviota, Santa Barbara County.*—B. M. M-27 is a Coast and Geodetic Survey standard disk set in solid rock at rocky bluff at head of the Associated Oil Co.'s wharf at Gaviota, about 2 meters above low water, 15 feet on the south side of head of wharf. Elevation: 11.4 feet above lower low water; 8.59 feet above mean sea level.

**Serial No. 162.** *Gaviota, Santa Barbara County.*—B. M. T-27 is a Coast and Geodetic Survey standard disk on top face of top sandstone block on north abutment of steel trestle over Omentero Canyon at Aoco (Gaviota), a refinery of the Associated Oil Co. B. M. is on east side of Southern Pacific Railroad track at mileage 339.9. Elevation: 86.2 feet above lower low water; 83.46 feet above mean sea level.

**Serial No. 163.** *Gaviota, Santa Barbara County.*—B. M. S-27 (C. & G. S.) is a Geological Survey iron post, stamped "94 L. A.," located 125 feet south of southwest corner of station at Gaviota and 80 feet south of center line of Southern Pacific Railroad track, against fence on edge of bluff over track. Elevation: 100.2 feet above lower low water; 97.39 feet above mean sea level.

**Serial No. 164.** *Vicinity of Gaviota, Santa Barbara County.*—B. M. R-27 (C. & G. S.) is a roundheaded bolt on top face of top block on north abutment of steel trestle over Gaviota Canyon, 0.7 mile west of Gaviota, on west side of Southern Pacific Railroad track. Elevation: 85.3 feet above lower low water; 82.51 feet above mean sea level.

**Serial No. 165.** *Vicinity of Gaviota, Santa Barbara County.*—B. M. P-27 is a Coast and Geodetic Survey standard disk set in top face of top stone block on north abutment of steel trestle over Agua Caliente Canyon, 2.2 miles north of Gaviota. B. M. is on east side of Southern Pacific Railroad track at mileage 337.2. Elevation: 102.0 feet above lower low water; 99.23 feet above mean sea level.

**Serial No. 166.** *Vicinity of Sacate, Santa Barbara County.*—B. M. O-27 (C. & G. S.) is the top of a roundheaded bolt on south abutment of steel trestle over Alegria Canyon, 1.4 miles east of Sacate. B. M. is on east side of Southern Pacific Railroad track at mileage 336.2. Elevation: 108.9 feet above lower low water; 106.16 feet above mean sea level.

**Serial No. 167.** *Vicinity of Sacate, Santa Barbara County.*—B. M. N-27 is a Coast and Geodetic Survey standard disk on the east end of concrete culvert 335-C, opposite section gang's small log houses, 1 mile east of tunnel 13. Elevation: 91.2 feet above lower low water; 88.38 feet above mean sea level.

**Serial No. 168.** *Vicinity of Drake, Santa Barbara County.*—B. M. L-27 (C. & G. S.) is the surface within an outlined square on masonry, in the center of "9" in "1918" on culvert 333-A, 1 mile west of Drake. B. M. is west of the Southern Pacific Railroad track at mileage 333.2. Elevation: 48.2 feet above lower low water; 45.43 feet above mean sea level.

**Serial No. 169.** *Vicinity of Gato, Santa Barbara County.*—B. M. K-27 (C. & G. S.) is the surface within an outlined square on masonry in top of large granite rock at culvert 330-D, 3 meters east of Southern Pacific Railroad track,

just north of farm-road crossing, 0.2 mile south of Gato, at mileage 330.2. Elevation: 62.9 feet above lower low water; 60.17 feet above mean sea level.

**Serial No. 170.** *Anacapa, Santa Barbara County.*—B. M. J-27 is a Coast and Geodetic Survey standard disk set on concrete railway culvert 327-K, west of Southern Pacific Railroad track at mileage 327.8 at Anacapa siding. Elevation: 52.6 feet above lower low water; 49.81 feet above mean sea level.

**Serial No. 171.** *Conception, Santa Barbara County.*—B. M. I-27 (C. & G. S.) is a Geological Survey iron post, stamped "112 L. A.," located 200 feet northwest of Southern Pacific Railroad station and 6 feet east of northeast support of water tank. Elevation: 118.8 feet above lower low water; 116.05 feet above mean sea level.

**Serial No. 172.** *Vicinity of Conception, Santa Barbara County.*—B. M. H-27 (C. & G. S.) is the surface within an outlined square on masonry in the southeast corner of concrete drainage tunnel which parallels the Southern Pacific Railroad track and ends at milepost 323, 2.3 miles north of Conception. B. M. is on the east side of the track at milepost 323. Elevation: 176.2 feet above lower low water; 173.48 feet above mean sea level.

**Serial No. 173.** *Vicinity of Jalama, Santa Barbara County.*—B. M. G-27 is a Coast and Geodetic Survey standard disk on concrete drainpipe 322 C, at elevation of track, and on east side of Southern Pacific Railroad track at mileage 322.2, 1.4 miles south of Jalama. Elevation: 183.4 feet above lower low water; 180.66 feet above mean sea level.

**Serial No. 174.** *Vicinity of Jalama, Santa Barbara County.*—B. M. F-27 (C. & G. S.) is a Geological Survey iron post, stamped "96 L. A.," located 50 feet north of north end of bridge over Jalama Creek, opposite two large red water tanks beside small log house and 30 feet west of Southern Pacific Railroad track. Elevation: 102.2 feet above lower low water; 99.38 feet above mean sea level.

**Serial No. 175.** *Vicinity of Jalama, Santa Barbara County.*—B. M. E-27 is a Coast and Geodetic Survey standard disk set on top face of north abutment of steel railroad bridge over Jalama Creek, on east side of Southern Pacific Railroad track, 0.5 mile north of Jalama. Elevation: 105.2 feet above lower low water; 102.46 feet above mean sea level.

**Serial No. 176.** *Sudden, Santa Barbara County.*—B. M. D-27 is a Coast and Geodetic Survey standard disk set in northwest concrete pier supporting steel water tank, 100 meters north of Southern Pacific Railroad station and about 50 meters east of the track, at mileage 317.3. Elevation: 90.8 feet above lower low water; 88.06 feet above mean sea level.

**Serial No. 177.** *Sudden, Santa Barbara County.*—B. M. (U. S. G. S.) is an iron post, stamped "85 L. A.," located at west end of gate leading into Southern Pacific Railroad station and 250 feet west of telegraph office. Elevation: 90.9 feet above lower low water; 88.09 feet above mean sea level.

**Serial No. 178.** *Vicinity of Arguello, Santa Barbara County.*—B. M. C-27 (C. & G. S.) is a roundheaded bolt set in the east end of concrete culvert 314-J, 0.2 mile north of milepost 315, Southern Pacific Railroad, and about 2½ miles south of Arguello. Elevation: 118.0 feet above lower low water; 115.18 feet above mean sea level.

**Serial No. 179.** *Vicinity of Arguello, Santa Barbara County.*—B. M. B-27 (C. & G. S.) is the head of a spike set in top face of top sandstone block on north abutment of stone culvert 313-D, 0.8 mile south of Arguello signpost. B. M. is east of Southern Pacific Railroad track at mileage 313.4. Elevation: 134.4 feet above lower low water; 131.66 feet above mean sea level.

**Serial No. 180.** *Vicinity of Arguello, Santa Barbara County.*—B. M. A-27 is a Coast and Geodetic Survey Standard disk set in the center of the east end of concrete culvert 313-A, 0.5 mile south of Arguello, at milepost 313, Southern Pacific Railroad. Elevation: 143.5 feet above lower low water; 140.77 feet above mean sea level.

**Serial No. 181.** *Arguello, Santa Barbara County.*—B. M. (U. S. G. S.) is an iron post, stamped "161 L. A.," located 30 feet east of east end of switch and 30 feet north of Southern Pacific Railroad track, opposite white post. Elevation: 167.1 feet above lower low water; 164.29 feet above mean sea level.

**Serial No. 182.** *Arlight (Point Arguello Light Station), Santa Barbara County.*—B. M. Y-26 is a Coast and Geodetic Survey standard disk set in cement in outcropping bedrock, 70 meters east of Point Arguello Lighthouse, 15 meters east of board walk leading from keepers' houses to lighthouse, immediately west of two small storehouses. Elevation: 62.9 feet above lower low water; 60.10 feet above mean sea level.

**Serial No. 183. Arlight (Point Arguello Light Station), Santa Barbara County.**—B. M. X-26 is a Coast and Geodetic Survey standard disk set in the top of flat-topped concrete reservoir, beside path leading from railroad station to lighthouse, halfway downhill, 2 feet from manhole on west side of reservoir and 2½ feet above the ground. Elevation: 169.6 feet above lower low water; 166.85 feet above mean sea level.

**Serial No. 184. Vicinity of Arlight (Point Arguello Light Station), Santa Barbara County.**—B. M. W-26 (C. & G. S.) is the surface within an outlined square on masonry, 0.3 mile north of Point Arguello Light Station, near block signal 3111. B. M. is the top knob of "8" in "1918," on concrete culvert west of Southern Pacific Railroad track. Elevation: 188.0 feet above lower low water; 185.18 feet above mean sea level.

**Serial No. 185. Vicinity of Honda, Santa Barbara County.**—B. M. V-26 is a Coast and Geodetic Survey standard disk on top face of top block on south abutment of steel deck-girder bridge over Canada Honda, 0.4 mile south of Honda. B. M. is east of Southern Pacific Railroad at mileage 308.3. Elevation: 116.4 feet above lower low water; 113.66 feet above mean sea level.

**Serial No. 186. Honda, Santa Barbara County.**—B. M. (U. S. G. S.) is an iron post, stamped "110 L. A.," located 900 feet south of signpost, 300 feet north of south end of switch, and 3 feet southwest of crossing signpost, Southern Pacific Railroad. Elevation: 117.0 feet above lower low water; 114.24 feet above mean sea level.

**Serial No. 187. Lompoc Junction, Santa Barbara County.**—B. M. P-26 (C. & G. S.) is the head of a bolt attaching pier to concrete base on the more southerly of two piers nearest the main track of the Southern Pacific Railroad, opposite station building, at mileage 302.7. Elevation: 53.0 feet above lower low water; 50.23 feet above mean sea level.

**Serial No. 188. Vicinity of Lompoc Junction (Surf post office), Santa Barbara County.**—B. M. S-26 is a Coast and Geodetic Survey standard disk set inside west end post on north brick abutment of steel railroad bridge over Santa Inez River, 0.7 mile north of Lompoc Junction. B. M. is 2 feet above seat and 1 meter below Southern Pacific Railroad track on west side at mileage 301.95. Elevation: 20.8 feet above lower low water; 18.07 feet above mean sea level.

**Serial No. 189. Surf, Santa Barbara County.**—B. M. (U. S. G. S.) is an iron post, stamped "36 L. A.," located 300 feet north of Southern Pacific Railroad station, north side of wagon road, near southwest point of wye and 6 feet northeast of crossing signpost. Elevation: 41.8 feet above lower low water; 39.00 feet above mean sea level.

**Serial No. 190. Lompoc Landing, Santa Barbara County.**—B. M. (U. S. G. S.) is an iron post, stamped "158 L. A." located at corner of fence at road crossing 60 feet west of crossing signpost. Elevation: 164.7 feet above lower low water; 161.93 feet above mean sea level.

**Serial No. 191. Port San Luis, San Luis Obispo County.**—B. M. 2 (C. & G. S.) is located on the large rock 100 meters from shore along the Pacific Coast Railway Co.'s wharf and is on the surface of the rock on the southwest side of the wharf where the rock extends out from under the wharf for several meters in a southwesterly direction. The B. M. is cut in the bottom of a slight depression extending across the smooth top of the rock. It is hollow square cut with a chisel, 3 inches on a side. The rock inside the cut, left at the same level as the surrounding rock, is the B. M. Elevation: 14.9 feet above lower low water; 12.08 feet above mean tide level.

**Serial No. 192. Port San Luis, San Luis Obispo County.**—B. M. 3 (C. & G. S.) is on the northeast corner of the concrete sea wall under the hotel at the inshore end of the wharf. About 1 meter down from the top of this wall is a berm about 6 inches wide. The B. M. is on this berm at the corner of the wall, the point measured to being near the face of the wall which rises from this berm. No mark was made. Elevation: 13.4 feet above lower low water; 10.62 feet above mean tide level.

**Serial No. 193. Port San Luis, San Luis Obispo County.**—B. M. 4 (C. & G. S.) is on a red rock north from the hotel and which sticks up through the planking of the wharf where the latter butts against the hill, here bordered by a rough boulder wall. The rock is apparently part of the mother rock; it sticks up about 8 inches above the planking. A ring 2 inches in diameter was cut around a point on the rock (not the top), and the B. M. is on the point of rock within this ring. Elevation: 19.7 feet above lower low water; 16.86 feet above mean tide level.

**Serial No. 194. Port San Luis, San Luis Obispo County.**—B. M. 5 (C. & G. S.) is on the southeast corner of the flat-topped concrete pier under the railroad turntable 40 meters north of the hotel. Pier is 12 by 12 feet and lies north of the railroad track (main line). B. M. is 7 inches from the east side and 5 inches from the south side, measuring to the outside of the 3-inch plank around the pier. No mark was made. Elevation: 17.9 feet above lower low water; 15.08 feet above mean tide level.

**Serial No. 195.**—*Morro, Morro Bay.*—B. M. 1 (C. & G. S.) is the highest point of a rock cropping out from the beach on the east side of Morro Bay, about 20 meters south of the south line of Fourth Street in the town of Morro. A cross is cut on the northern face of the rock below the B. M. Elevation: 2.9 feet above lower low water; 0.52 foot above mean tide level.

**Serial No. 196. Morro, Morro Bay.**—B. M. 1 (a) is a Coast and Geodetic Survey standard disk set into the rock on which B. M. 1 (Serial No. 195) is located. It is below the high-water line and about 20 meters south of the south line of Fourth Street in the town of Morro. Elevation: 2.9 feet above lower low water; 0.47 foot above mean tide level.

**Serial No. 197. Morro, Morro Bay.**—B. M. 2 (C. & G. S.) is the lowest part of the lowest crevice in Pillar Rock as seen from the vicinity of B. M. 1 (Serial No. 195). Elevation: 26.9 feet above lower low water; 24.51 feet above mean tide level.

**Serial No. 198. Morro, Morro Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in a circular concrete pier 20 inches in diameter and 3 feet deep. The top of the pier is level with the surface of the ground in the northwest corner of the school yard in Morro. The school is east of Main Street one block on an unnamed street and between First and Second Streets. Elevation: 74.9 feet above lower low water; 72.47 feet above mean tide level.

**Serial No. 199. Morro, Morro Bay.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in a circular concrete pier 18 inches in diameter and 3 feet deep. It is level with the surface of the ground on the west side of Main Street and 22 meters north of the northwest corner of Main and Seventh Streets in the town of Morro. Elevation: 81.3 feet above lower low water; 78.87 feet above mean tide level.

**Serial No. 200. The Strand, Southwest Shore, Morro Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "B. M. 1," set in concrete. It is located on the sand spit on the west side of Morro Bay, just above the high-water line, in approximately latitude 35° 20' N. Elevation: 5.7 feet above lower low water; 3.42 feet above mean tide level.

**Serial No. 201. The Strand, Southwest Shore, Morro Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk, stamped "B. M. 2," set in concrete and located about 15 feet above the extreme high-water mark on the west side of Morro Bay in approximately latitude 35° 20' N. Elevation: 6.1 feet above lower low water; 3.85 feet above mean tide level.

**Serial No. 202. The Strand, Southwest Shore, Morro Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk, stamped "B. M. 3," set in concrete just below the high-water line on the west side of Morro Bay in approximately latitude 35° 20' N. Elevation: 4.2 feet above lower low water; 1.87 feet above mean tide level.

**Serial No. 203. Cayucos, Estero Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk set near the southeast corner of the Central Creamery main building. It is 1.8 feet from the southeast corner and about 2 feet above the foundation. It is on the eastern face of the building. Elevation: 37.4 feet above lower low water; 34.47 feet above mean tide level.

**Serial No. 204. Cayucos, Estero Bay.**—B. M. 2 (C. & G. S.) is the doorsill of the Tognini & Ghezzi general store, at the south side of the door leading to the second story of the store. The building is of concrete and is located on the east side of Main Street. Elevation: 20.5 feet above lower low water; 17.59 feet above mean tide level.

**Serial No. 205. Cayucos, Estero Bay.**—B. M. 3 (C. & G. S.) is the granite door-sill, southeast side of door, of the Ocean View meat market. The building is on the east side of Main Street. Elevation: 21.1 feet above lower low water; 18.16 feet above mean tide level.

**Serial No. 206. Cayucos, Estero Bay.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in the top of the concrete rail of bridge over the creek in the southeast part of Cayucos. B. M. is in center of rail near middle of bridge. Elevation: 22.7 feet above lower low water; 19.82 feet above mean tide level.

**Serial No. 207. San Simeon.**—B. M. 1 (C. & G. S.) is a cross marked in a piece of lead to the right upper hand and north of the first cove to the southward of Clark's, or Whaler's Wharf on the west side of San Simeon Bay. Elevation: 14.9 feet above lower low water; 11.90 feet above mean tide level.

**Serial No. 208. Monterey.**—B. M. 1 (C. & G. S.) is a shelf cut into the face of the rock under the shore end of the Pacific Coast Steamship Co.'s wharf (now the Municipal Wharf), on the eastern side of the wharf and about 6 feet below the southwest corner of the fish and game commission office. Above and to the left at a distance of 1 foot a large "H" is cut in the rock. Elevation: 9.6 feet above lower low water; 6.63 feet above mean tide level.

**Serial No. 209. Monterey.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in the top of a rocky outcrop, about 6 feet southeast of B. M. 1 (Serial No. 208). It is about 6 inches south of fish and game commission office at shore end of Municipal Wharf. Elevation: 15.6 feet above lower low water; 12.60 feet above mean tide level.

**Serial No. 210. Monterey.**—B. M. B-21 is a Coast and Geodetic Survey standard disk set in the base of the concrete retaining wall at the northwest corner of the Old Customhouse, about 1 foot above the floor of the north porch about 3 feet from the corner. The Old Customhouse is a historic landmark. Elevation: 22.0 feet above lower low water; 18.99 feet above mean tide level.

**Serial No. 211. Monterey.**—B. M. C-21 is a Coast and Geodetic Survey standard disk set in wall, north side of front door, about 5 feet above the ground, of the old First National Bank Building, now occupied by the Monterey Investment Co., street address being 431 Elvarado Street, Monterey, Calif. The new First National Bank Building is the first building north across the street. Elevation: 29.6 feet above lower low water; 26.60 feet above mean tide level.

**Serial No. 212. Santa Cruz, Monterey Bay.**—B. M. 1 (C. & G. S.) is a bench on the small circle, about 2 feet in diameter, of hard dark-colored stone, on the point about 150 yards northeast of the wharf, marked "B. M. U. S. C. S." B. M. is 79 meters southwest of center line of car tracks on Municipal Wharf. Surrounding rock has eroded, leaving B. M. projecting about 1 foot (B. M. is about 3 feet above sandy beach, 1924). Elevation: 15.0 feet above lower low water; 12.03 feet above mean tide level.

**Serial No. 213. Santa Cruz, Monterey Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in top of concrete wall 225 meters northeast of center line (extended) of Municipal Wharf and 29 meters southeast of center line of Southern Pacific Railroad tracks running northeast along water front. Concrete wall is a curved retaining wall extending from Municipal Wharf northeast to Casino, a bathing pavilion. Elevation: 14.8 feet above lower low water; 11.83 feet above mean tide level.

**Serial No. 214. Santa Cruz, Monterey Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in an isolated concrete block 6 feet by 1 foot and set flush with the surface of the ground, 14.2 meters southeast of the center line of the Southern Pacific Railroad tracks, 12.05 meters southwest of derailing-switch target on branch track out to wharf. B. M. is about 110 meters west-northwest of shore end of Municipal Wharf. Elevation: 15.3 feet above lower low water; 12.28 feet above mean tide level.

**Serial No. 215. Santa Cruz, Monterey Bay.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in the top of a guard wall, 1.3 meters from southwest end. The wall is a 3-foot concrete wall, with 5-foot concrete post at end and with a 2-foot pipe railing set in top. Guard wall is located on north side of Third Street near the junction of Third Street and Pacific Avenue. Elevation: 46.5 feet above lower low water; 43.48 feet above mean tide level.

**Serial No. 216. Half Moon Bay.**—B. M. 1 (C. & G. S.) is a cross in a block of concrete flush with the surface of the ground at the southwest corner of a wooden building facing the Denison Pier. Elevation: 14.2 feet above lower low water; 11.23 feet above mean tide level.

**Serial No. 217. Half Moon Bay.**—B. M. 2 (C. & G. S.) is a cross cut in a square block of concrete flush with the ground surface at the southwest corner of a small white house which stands about 100 feet northwest of the pier building. Elevation: 15.1 feet above lower low water; 12.13 feet above mean tide level.

**Serial No. 218. Half Moon Bay.**—B. M. 3 (C. & G. S.) is on the point of curvature of the street curbing at the northeast corner of Broadway and Prospect Way. The point is on the outside edge of the curbing. Elevation: 21.1 feet above lower low water; 18.12 feet above mean tide level.

## SECTION B.—ELEVATIONS OF BENCH MARKS, SERIAL NOS. 219 TO 283, CITY OF SAN FRANCISCO, STATE OF CALIFORNIA

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	Higher high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Lowest tide
219	San Francisco, south of Golden Gate Park	Feet 25.8	Feet 28.4	Feet 29.0	Feet 29.0	Feet 31.02	Feet 32.9	Feet 34.0	Feet 36.3
220	do	90.7	93.3	93.9	93.9	95.94	97.8	98.9	101.2
221	do	205.7	208.3	208.9	208.9	210.85	212.8	213.9	216.2
222	do	151.4	154.0	154.6	154.6	156.62	158.5	159.6	161.9
223	San Francisco, Golden Gate Park	17.6	20.2	20.8	20.8	22.76	24.7	25.8	28.1
224	San Francisco, Ocean Beach	19.4	22.0	22.7	22.7	24.72	26.7	27.9	30.4
225	do	36.3	38.9	39.6	39.6	41.64	43.6	44.8	47.3
226	do	21.2	23.8	24.5	24.5	26.60	28.5	29.7	32.2
227	San Francisco, Sutro Heights	201.9	204.5	205.1	205.1	207.06	209.0	210.1	212.4
228	San Francisco, Fort Miley Reservation	223.2	225.8	226.4	226.4	228.41	230.3	231.4	233.7
229	do	184.9	187.5	188.1	188.1	190.12	192.0	193.1	195.4
230	San Francisco, the Presidio	194.1	196.7	197.3	197.3	199.37	201.2	202.3	204.6
231	do	23.1	25.7	26.3	26.3	28.32	30.2	31.3	33.6
232	do	7.6	10.2	10.8	10.8	12.86	14.7	15.8	18.1
233	do	156.0	158.6	159.2	159.2	161.23	163.1	164.2	166.5
234	do	6.4	9.0	9.6	9.6	11.67	13.5	14.6	16.9
235	do	8.8	11.4	12.0	12.0	13.99	15.9	17.0	19.3
236	do	77.4	80.0	80.6	80.6	82.60	84.5	85.6	87.9
237	do	2.1	4.7	5.3	5.3	7.28	9.2	10.3	12.6
238	do	1.3	3.9	4.5	4.5	6.52	8.4	9.5	11.8
239	do	2.1	4.7	5.3	5.3	7.34	9.2	10.3	12.6
240	do	3.3	5.9	6.5	6.5	8.63	10.4	11.5	13.8
241	do	4.4	6.9	7.5	7.5	9.67	11.5	12.6	14.9
242	do	1.7	4.3	4.9	4.9	6.90	8.8	9.9	12.2
243	do	8.0	10.6	11.2	11.2	13.23	15.1	16.2	18.5
244	San Francisco, vicinity of La Fayette Square	163.6	166.2	166.8	166.8	168.84	170.7	171.8	174.1
245	do	274.4	277.0	277.6	277.6	279.59	281.5	282.6	284.9
246	do	271.8	274.4	275.0	275.0	277.07	278.9	280.0	282.3
247	do	328.7	331.3	331.9	331.9	333.91	335.8	336.9	339.2
248	San Francisco, vicinity of Fort Mason	91.2	93.8	94.4	94.4	96.45	98.3	99.4	101.7
249	do	78.4	81.0	81.6	81.6	83.58	85.5	86.6	88.9
250	San Francisco, Fort Mason	101.6	104.2	104.8	104.8	106.84	108.7	109.8	112.1
251	do	98.8	99.4	100.0	100.0	101.97	103.9	105.0	107.3
252	San Francisco, vicinity of Rincon Point	3.9	6.5	7.1	7.1	9.11	11.0	12.1	14.4
253	do	35.1	37.6	38.2	38.2	40.38	42.5	43.6	46.1
254	do	8.2	10.7	11.3	11.3	13.51	15.6	16.7	19.2
255	do	23.2	25.7	26.3	26.3	28.51	30.6	31.7	34.2
256	San Francisco, vicinity of City Hall	36.7	39.2	39.8	39.8	42.01	44.1	45.2	47.7
257	do	37.0	39.5	40.1	40.1	42.37	44.4	45.5	48.0
258	do	24.6	27.0	27.6	27.6	29.86	31.9	33.0	35.5
259	San Francisco, vicinity of Rincon Point	16.0	18.5	19.1	19.1	21.35	23.4	24.5	27.0
260	do	9.0	11.5	12.1	12.1	14.33	16.4	17.5	20.0
261	do	3.9	6.4	7.0	7.0	9.26	11.3	12.4	14.9
262	do	4.1	6.6	7.2	7.2	9.40	11.5	12.6	15.1
263	do	12.6	15.1	15.7	15.7	17.97	20.0	21.1	23.6
264	do	3.6	6.1	6.7	6.7	8.93	11.0	12.1	14.6
265	do	4.3	6.8	7.4	7.4	9.63	11.7	12.8	15.3
266	do	3.4	5.9	6.5	6.5	8.78	10.8	11.9	14.4
267	San Francisco, vicinity of Central Basin	12.9	15.1	15.7	15.7	17.98	20.2	21.4	23.9
268	do	7.1	9.3	9.9	9.9	12.24	14.4	15.6	18.1
269	San Francisco, Union Iron Works	9.4	11.6	12.2	12.2	14.57	16.7	17.9	20.4
270	do	8.0	10.2	10.8	10.8	13.12	15.3	16.5	19.0
271	do	6.6	8.8	9.4	9.4	11.73	13.9	15.1	17.6
272	San Francisco, vicinity of Central Basin	67.7	69.9	70.5	70.5	72.83	75.0	76.2	78.7
273	do	31.9	34.1	34.7	34.7	36.99	39.2	40.4	42.9

Section B.—Elevation of Bench Marks, Serial Nos. 219 to 283, City of San Francisco, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		High-est tide	High-er high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Low-est tide
274	San Francisco, vicinity of Central Basin	Feet 59.5	Feet 61.7	Feet 62.3	Feet -----	Feet 64.58	Feet 66.8	Feet 68.0	Feet 70.5
275	do	59.4	61.6	62.2	-----	64.56	66.7	67.9	70.4
276	do	71.4	73.6	74.2	-----	76.51	78.7	79.9	82.4
277	do	44.5	46.7	47.3	-----	49.71	51.8	53.0	55.5
278	San Francisco, north of Holly Park	71.1	73.3	73.9	-----	76.30	78.4	79.6	82.1
279	San Francisco, west of Holly Park	154.2	156.4	157.0	-----	159.31	161.5	162.7	165.2
280	San Francisco, vicinity of Balboa Park	187.4	189.6	190.2	-----	192.46	194.7	195.9	198.4
281	San Francisco, Hunters Point	3.4	5.3	5.9	8.30	-----	10.7	11.9	14.4
282	do	3.8	5.7	6.3	8.69	-----	11.1	12.3	14.8
283	do	4.0	5.9	6.5	8.94	-----	11.3	12.5	15.0

SECTION B.—DESCRIPTIONS OF BENCH MARKS, SERIAL NOS. 219 TO 283, CITY OF SAN FRANCISCO, STATE OF CALIFORNIA

**Serial No. 219.** *South of Golden Gate Park, San Francisco.*—B. M. 134 (S. F. C. E. No. 278) is a cut in the top surface of a concrete retaining wall on south side of north entrance of the private grounds surrounded by a high fence and located on Great Highway, 175 feet south of Ulloa Street. The B. M. is 2 feet west of the gate and about 4 feet above the ground in gateway. Elevation: 34.0 feet above lower low water; 31.02 feet above mean sea level.

**Serial No. 220.** *South of Golden Gate Park, San Francisco.*—B. M. 148 (S. F. C. E. No. 465) is a cross at the northeast corner of 2 feet 6 inches square concrete base of large round-iron gatepost on each side of gate on the south side of Sloat Boulevard, 700 feet west of Thirty-fifth Avenue. Elevation: 98.9 feet above lower low water; 95.94 feet above mean sea level.

**Serial No. 221.** *South of Golden Gate Park, San Francisco.*—B. M. 143 (S. F. C. E. No. 372) is a triangular mark on cement sidewalk at southeast corner of Lincoln Way Street and Twentieth Avenue, close to building on Lincoln Way side and 9 feet east of the east line of Twentieth Avenue. Elevation: 213.9 feet above lower low water; 210.85 feet above mean sea level.

**Serial No. 222.** *South of Golden Gate Park, San Francisco.*—B. M. 147 (S. F. C. E. No. 440) is a nail in the center of a triangular mark at the northeast corner of a concrete culvert on the east side of Junipero Serra Boulevard at Stanley Street Creek. Elevation: 159.6 feet above lower low water; 156.62 feet above mean sea level.

**Serial No. 223.** *Golden Gate Park, San Francisco.*—B. M. 133 (S. F. C. E. No. 253) is a ½-inch copper bolt, 3 inches long (spread at bottom), cemented in concrete foundation slab of Old Dutch Windmill, 300 feet south of Fulton Street between lines of Forty-eighth and La Playa Avenues. The top of the bolt is flush with the concrete surface. This foundation slab is said to be 6 feet thick and to extend 6 feet beyond the tower. B. M. is at the base of south retaining wall of the entrance and about 3½ feet from the base of the windmill tower. Elevation: 25.8 feet above lower low water; 22.76 feet above mean sea level.

**Serial No. 224.** *Ocean Beach, San Francisco.*—B. M. 183 is a Coast and Geodetic Survey standard disk set in the northwest foundation block of the signal tower in the front yard of the Golden Gate Coast Guard Station. It is close to the leg of the signal tower. The station is at the corner of Ocean Beach and Fulton Street. Elevation: 27.9 feet above lower low water; 24.72 feet above mean sea level.

**Serial No. 225.** *Ocean Beach, San Francisco.*—B. M. 184 is a Coast and Geodetic Survey standard disk set in the north end of the first step of the Commercial Cable Co.'s landing house on Forty-seventh Avenue between Fulton and Cabrillo Streets. Elevation: 44.8 feet above lower low water; 41.64 feet above mean sea level.

**Serial No. 226.** *Ocean Beach, San Francisco.*—B. M. 182 is a Coast and Geodetic Survey standard disk set in the front brick wall of the Lurline Bath pumping station at Ocean Beach, San Francisco. Elevation: 29.7 feet above lower low water; 26.60 feet above mean sea level.

**Serial No. 227.** *Sutro Heights, San Francisco.*—B. M. 132 (S. F. C. E. No. 240) is a ½-inch copper bolt, 2½ inches long (spread at bottom), cemented in the top surface of the rock retaining wall of the Sutro Rotunda on the west side of Forty-eighth Avenue, 300 feet south of Point Lobos Avenue. Elevation: 210.1 feet above lower low water; 207.06 feet above mean sea level.

**Serial No. 228.** *Fort Miley Reservation, San Francisco.*—B. M. 135 (S. F. C. E. No. 280) is a small cross at the southwest corner of a granite monument standing 8 inches above the ground in the southwest corner of Fort Miley Reservation. The small cross was cut at the corner of the block on account of the corner of the fence interfering with the leveling rod at the center of the monument. The monument is said to be set in the sand about 4 feet deep and is very solid. Elevation: 231.4 feet above lower low water; 228.41 feet above mean sea level.

**Serial No. 229.** *Vicinity of Fort Miley Reservation, San Francisco.*—B. M. 137 (S. F. C. E. No. 286) is a cut on the cement surface of a concrete retaining wall at head of steps on southwest side of Land's End waiting room on U. R. R. right of way, north of Fort Miley Reservation. Elevation: 193.1 feet above lower low water; 190.12 feet above mean sea level.

**Serial No. 230.** *The Presidio, San Francisco.*—B. M. 9 (C. & G. S.) is the center of a brass plate set in the concrete of emplacement No. 12 on top of parapet of Marcus Miller Battery at Fort Point. The top of this plate is 1¼ inches square, and the base is a little over 3 inches square, the sides being corrugated horizontally to hold the cement in which it is set. The following marks are stamped in the brass plate: "U. S. C. & G. S. 'Mendel,' 1892, B. M., 202.261 Ft.," the figures indicating its elevation above the plane of mean lower low water at that time. The top of this emplacement has been built up about 2½ feet, but a well has been left around the mark, and an iron plate about 15 by 18 inches covers the top. Elevation: 202.3 feet above lower low water; 199.37 feet above mean sea level.

**Serial No. 231.** *The Presidio, San Francisco.*—B. M. 64 (C. & G. S.) is a copper bolt embedded in cement on a dark-gray rock about 100 feet east from garage so that its top is just flush with the highest point of a large, prominent rock standing on the edge of the steep incline of a hill, southeast of Fort Winfield Scott. The rock is about 10 feet in diameter, standing about 7 feet high on the side next to the road. The rock is about 23 meters from the sea wall and can not be mistaken, as it is the only prominent rock in this vicinity. It is about 15 feet above the level of the road and is in range with a prominent rock in the water and Lime Point. A footpath leads up around B. M. Elevation: 31.3 feet above lower low water, 28.32 feet above mean sea level.

**Serial No. 232.** *The Presidio, San Francisco.*—B. M. 6 (C. & G. S.) is a copper bolt set with its head slightly below the upper surface of the granite sea wall surrounding Fort Point, at the angle where the wall changes abruptly to run toward the point. The head of the bolt has a slightly rounded face 1½ inches in diameter, with a small silver pin in its center. The top of the silver pin is the reference mark. This B. M. is about 375 feet S. 23° E. of the northeast corner of the fort. Elevation: 15.8 feet above lower low water; 12.86 feet above mean sea level.

**Serial No. 233.** *The Presidio, San Francisco.*—B. M. 66 (C. & G. S.) is a 2½-inch triangle drilled at the southwest corner of a cement sewer cap, which stands a few inches above the ground, and located 17 meters north of the earth embankment in front of cement emplacement of gun No. 2 fortifications. The sewer cap is about 3 by 4 feet outside, and the inner iron cap is about 2 by 3 feet. B. M. is about 250 meters in a southeasterly direction from Fort Point Lighthouse. It is in range with Fort Point Lighthouse and the northernmost corner of gable of old Coast Guard station at Fort Point. Elevation: 164.2 feet above lower low water; 161.23 feet above mean sea level.

**Serial No. 234.** *The Presidio, San Francisco.*—B. M. 175 is a Coast and Geodetic Survey standard disk set in the top surface of the sea wall about 2½ feet south of the north edge of the wall; about 365 feet west of the west line of the engineer's dock where it crosses the Marina Drive, about 270 feet west of B. M. 174 (Serial No. 235); on the north side of the Marina Drive road between the engineer's dock and Fort Point. It is set flush with the top of the sea wall. Elevation: 14.6 feet above lower low water; 11.67 feet above mean sea level.

**Serial No. 235.** *The Presidio, San Francisco.*—B. M. 174 is a Coast and Geodetic Survey standard disk set in a concrete block about 125 feet west of the west line of the engineer's dock (Torpedo Dock) where it crosses the Marina Drive. It is located at the intersection of the Marina Drive and Long Avenue, the road leading up the hill to Fort Winfield Scott from in front of the engineer's dock. B. M. is flush with the surface of the ground. Street-intersection sign marks location of B. M. Elevation: 17.0 feet above lower low water; 13.99 feet above mean sea level.

**Serial No. 236.** *The Presidio, San Francisco.*—B. M. 63 (C. & G. S.) is a 3-inch circle circumscribing a triangle, drilled upon the top at its center, located on a granite monument 3 feet long, 17 inches wide, and 8 inches above the ground, and alongside the road leading to the engineer's quarters. It is 67 meters (paces) west of a large brick culvert. Directly across the road to the northward and 15 feet away is a large eucalyptus tree in which, facing the monument, are driven three large nails in the form of a triangle with a 3-inch base, the nails standing out about  $\frac{1}{2}$  inch. On the opposite (north) side of the tree, only 6 inches above the ground, is an old blaze with nail driven to head. Elevation: 85.6 feet above lower low water; 82.60 feet above mean sea level.

**Serial No. 237.** *The Presidio, San Francisco.*—B. M. 173 is a Coast and Geodetic Survey standard disk set in a concrete block in the southeast corner of the yard of the United States Coast Guard station (Fort Point Station), about 65 feet southeast of the southeast corner of the crew's quarters building. It is located about 5 feet north of the north edge of the Marina Drive and is set flush with the surface of the ground. Elevation: 10.3 feet above lower low water; 7.28 feet above mean sea level.

**Serial No. 238.** *The Presidio, San Francisco.*—B. M. 172 is a Coast and Geodetic Survey standard disk set in a concrete block about 1,500 feet west-southwest of the quartermaster's wharf; it is about 3 feet southeast of the southeast side of the Marina Drive, in the edge of Crissy Aviation Field, and about 75 feet from the high-water mark. It is flush with the surface of the ground. Elevation: 9.5 feet above lower low water; 6.52 feet above mean sea level.

**Serial No. 239.** *The Presidio, San Francisco.*—B. M. 165 (C. & G. S.) is the top horizontal tangent of a  $\frac{3}{4}$ -inch copper bolt,  $3\frac{1}{2}$  inches long, placed in a horizontal hole drilled in the side face of a cement abutment wall which forms the shore end of the Presidio wharf. It is 1.17 feet lower than the top of said wall and is 25.37 feet distant from where the wall meets the wharf. Elevation: 10.3 feet above lower low water; 7.34 feet above mean sea level.

**Serial No. 240.** *The Presidio, San Francisco.*—B. M. 166 (C. & G. S.) is the top of a  $\frac{3}{4}$ -inch brass bolt, 4 inches long, placed in a vertical hole drilled in the top surface of the abutment wall which forms the shore end of the Presidio wharf. It is 0.49 foot from the face of the wall and just above B. M. 165 (Serial No. 239). Elevation: 11.5 feet above lower low water; 8.53 feet above mean sea level.

**Serial No. 241.** *The Presidio, San Francisco.*—B. M. 167a (C. & G. S.) is on a granite post formerly used for B. M. 15 and also for B. M. 167, but which was moved by the military authorities to a new location about October, 1926, when Crissy Aviation Field was being improved. B. M. is now located on the northerly side of Marina Drive at easterly side of intersection with road leading to dock. It is set back from both roads about 5 feet and is about 100 feet back of the high-water line. The B. M. is the top of the rounded head of a copper bolt set into the top of a granite post which is 12 by 12 by 36 inches, and the top of the post has the following inscription cut into the granite: "U. S. C. S. 1897 B. M." Elevation: 12.6 feet above lower low water; 9.57 feet above mean sea level.

**Serial No. 242.** *The Presidio, San Francisco.*—B. M. 177 is a Coast and Geodetic Survey standard disk set in a concrete block flush with the surface of the ground about 25 feet easterly from the northwest corner of the close-woven iron-wire fence around the motor transport shops and about 1 foot north of the fence line. It is about 30 feet south of the southern edge of Mason Street and about 2,000 feet east of Crissy Aviation Field headquarters building. Elevation: 9.9 feet above lower low water; 6.90 feet above mean sea level.

**Serial No. 243.** *The Presidio, San Francisco.*—B. M. 176 is a Coast and Geodetic Survey standard disk set flush with the surface of the concrete step on the west side of the lowest step to the main entrance of the porch of Crissy Aviation Field headquarters building. It is about 8 inches above the level of the sidewalk around the building. Elevation: 16.2 feet above lower low water; 13.23 feet above mean sea level.

**Serial No. 244.** *Vicinity of La Fayette Square, San Francisco.*—B. M. 21 (C. & G. S.) is the outer corner of curb of cement sidewalk at the northwest corner of Buchanan and Vallejo Streets. B. M. is a cross drilled in an iron cess plate. Elevation: 171.8 feet above lower low water; 168.84 feet above mean sea level.

**Serial No. 245.** *Vicinity of La Fayette Square, San Francisco.*—B. M. 76 (C. & G. S.) is the top of a granite post at the northwest corner of Jackson and Buchanan Streets, being at the southeast corner of a lot on which is an elegant mansion, numbered 2501 Buchanan Street. The post stands 2 feet 8 inches above the cement sidewalk and 14 inches above the granite wall of which this post forms the corner. Elevation: 282.6 feet above lower low water; 279.59 feet above mean sea level.

**Serial No. 246.** *Vicinity of La Fayette Square, San Francisco.*—B. M. 23 (C. & G. S.) is on the northeast corner of Jackson and Buchanan Streets. B. M. is a cross cut about  $\frac{1}{2}$  inch wide between middle stars next to street, on iron cess plate at curb. Elevation: 280.0 feet above lower low water; 277.07 feet above mean sea level.

**Serial No. 247.** *Vicinity of La Fayette Square, San Francisco.*—B. M. 77 (C. & G. S.) is the top of a granite post at the northwest entrance to Lafayette Park, being the northeast of two such posts at the southeast corner of Washington and Laguna Streets. The post is  $2\frac{1}{2}$  feet in diameter and  $3\frac{1}{2}$  feet high and seems to be on very substantial ground. Elevation: 336.9 feet above lower low water; 333.91 feet above mean sea level.

**Serial No. 248.** *Vicinity of Fort Mason, San Francisco.*—B. M. 81 (C. & G. S.) is an iron cess plate at the southeast corner of Van Ness and Lombard Streets. B. M. is the southwest star nearest the street; that is, in row of stars along the outer edge of the plate. Elevation: 99.4 feet above lower low water; 96.45 feet above mean sea level.

**Serial No. 249.** *Vicinity of Fort Mason, San Francisco.*—B. M. 83 (C. & G. S.) is the letter "M" on iron cess plate at the southwest corner of Van Ness and Bay Streets. The inscription is at the northwest corner of the cess plate. Elevation: 86.6 feet above lower low water; 83.58 feet above mean sea level.

**Serial No. 250.** *Fort Mason, San Francisco.*—B. M. 28 (C. & G. S.), also known as Fort Mason Triangulation Station, is a granite block 10 by 10 by 30 inches, buried flush with the surface of the ground upon the western verge of "Black Point" upon the parapet of Battery Fort Mason. The top of the stone is marked "C. S., 1892, Ft. M., Arty." The middle of the top of the stone is the reference point. It is on sod embankment or parapet of Fort Mason and is about 300 feet from the present (1907) flagstaff and about 250 feet northwest of the northwest corner of the present (1907) guardhouse. Since the time of the old description, the height of the embankment has been increased about 3 feet, so that the surface of the monument is at the bottom of a well 3 feet deep, protected by a terra cotta pipe or tube 8 inches in diameter. In rainy weather this becomes partially filled with water. Elevation: 109.8 feet above lower low water; 106.84 feet above mean sea level.

**Serial No. 251.** *Fort Mason, San Francisco.*—B. M. 29 (C. & G. S.) is the upper surface of a granite block, over a drill hole in center filled with lead. The block is about 6 inches square and of unknown depth. It is set in the terraced lawn, 43 feet from the northwest corner of the post commander's quarters at Fort Mason and back of Quarters No. 2. It projects a few inches above the sloping surface of the lawn and can be readily seen. It is  $5\frac{1}{2}$  feet west of a cement walk and  $3\frac{1}{2}$  feet above the level of the walk. Elevation: 105.0 feet above lower low water; 101.97 feet above mean sea level.

**Serial No. 252.**—*Vicinity of Rincon Point, San Francisco.*—B. M. 90 (C. & G. S.) is at the southwest corner of Lombard and Battery Streets on cement water table on the east side of the large brick building occupied by the Merchants Ice & Cold Storage Co. The B. M. is a  $3\frac{1}{2}$ -inch circle inclosing a  $2\frac{1}{2}$ -inch triangle which is drilled upon the cement water table on the south side of the main office door, being about 30 feet from the northeast corner of the building, on the Battery Street side. Elevation. 12.1 feet above lower low water; 9.11 feet above mean sea level.

**Serial No. 253.** *Vicinity of Rincon Point, San Francisco.*—B. M. 124 (S. F. C. E. No. 25) is a triangle drilled on granite water table under north window of United States bonded warehouse, a three-story brick building on the west side of Sansome Street a little south of Broadway Street. B. M. is 6 inches above the sidewalk and about 50 feet south of Broadway Street. The building is at

855 Sansome Street. Elevation: 43.6 feet above lower low water; 40.38 feet above mean sea level.

**Serial No. 254.** *Vicinity of Rincon Point, San Francisco.*—B. M. 92 (C. & G. S.) is a 3-inch circle, circumscribing a triangle, drilled upon the granite water table of the appraisers building at the northeast corner on the Jackson Street side, between Sansome and Battery Streets. The building occupies the west half of the square bounded by Sansome, Jackson, Battery, and Washington Streets. As the water table is not level but slants downward toward the street, the surface within the triangle from the center up to the vertex was leveled with a chisel. The water table is narrow and at this point is about 3 feet above the ground. Elevation: 16.7 feet above lower low water; 13.51 feet above mean sea level.

**Serial No. 255.** *Vicinity of Rincon Point, San Francisco.*—B. M. 125 (S. F. C. E. No. 36) is a triangle drilled at the northwest corner of granite step in entrance to the Balboa Building on Market Street, 40 feet northeast of Second Street. Elevation: 31.7 feet above lower low water; 28.51 feet above mean sea level.

**Serial No. 256.** *Vicinity of City Hall, San Francisco.*—B. M. 104 (C. & G. S.) is a triangle inscribed in a 3-inch circle drilled at the base of a granite pillar on the south side of the Seventh Street entrance to building at southeast corner of Seventh and Mission Streets. This entrance is about 30 feet from the west corner of the building. Elevation: 45.2 feet above lower low water; 42.01 feet above mean sea level.

**Serial No. 257.** *Vicinity of City Hall, San Francisco.*—B. M. 105 (C. & G. S.) is a triangle inscribed in a 3-inch circle drilled at the base of a granite pillar on the south side of the Seventh Street entrance to building at northeast corner of Seventh and Mission Streets. This entrance is about 30 feet from the north end of the building. Elevation: 45.5 feet above lower low water; 42.37 feet above mean sea level.

**Serial No. 258.** *Vicinity of City Hall, San Francisco.*—B. M. 103 (C. & G. S.) is a triangle inscribed in a 3-inch circle drilled upon the granite step next to bottom, at north end of steps leading up to the main entrance of the United States mint on Fifth Street near Mission Street. B. M. is 13 inches from stone wall, being set out on account of a projecting cornice above interfering with level rod. The bottom step at this point is flush with the sidewalk, so the second step was used. This step is  $7\frac{1}{2}$  inches higher than the first one. Elevation: 33.0 feet above lower low water; 29.86 feet above mean sea level.

**Serial No. 259.** *Vicinity of Rincon Point, San Francisco.*—B. M. 156 (S. F. C. E. No. 572) is a small cross cut on marble step 5 feet from side of building at southeast corner of Second and Minna Streets, formerly a cigar store and saloon. The building is 135-137 Second Street. B. M. is about 2 inches above sidewalk. Elevation: 24.5 feet above lower low water; 21.35 feet above mean sea level.

**Serial No. 260.**—*Vicinity of Rincon Point, San Francisco.*—B. M. 155 (S. F. C. E. No. 569) is a small faint cross cut on an iron sill  $8\frac{1}{2}$  inches from southwest end and 2 inches from front edge of entrance to building at No. 461 Mission Street. B. M. is 8 feet northeast of the First Street line. Elevation: 17.5 feet above lower low water; 14.33 feet above mean sea level.

**Serial No. 261.** *Vicinity of Rincon Point, San Francisco.*—B. M. 153 (S. F. C. E. No. 559) is a triangle on cement walk at the north corner of a large brick building (J. A. Folger & Co.) at the corner of Howard and Spear Streets. B. M. is on the Howard Street side, 9 inches from corner. Elevation: 12.4 feet above lower low water; 9.26 feet above mean sea level.

**Serial No. 262.** *Vicinity of Rincon Point, San Francisco.*—B. M. 158 (S. F. C. E. No. 593) is a cross on concrete sill just to the left of entrance to E. C. Atkins & Co. (Inc.) (Saws), Nos. 151-155 Main Street, on the northeast side of Main Street about 270 feet northwest of Howard Street. B. M. is 6 inches above walk and 17 inches from the northwest end of the sill. Elevation: 12.6 feet above lower low water; 9.40 feet above mean sea level.

**Serial No. 263.** *Vicinity of Rincon Point, San Francisco.*—B. M. 44 (C. & G. S.) is the top of a granite post set into the wall of a brick warehouse, known as The Sunset Terminal, No. 224 Folsom Street, between Main and Beale Streets. The block is on the west side of the doorway and is set into the wall to prevent wagons from striking the wall. A similar post is on the other side of the door. Elevation: 21.1 feet above lower low water; 17.97 feet above mean sea level.

**Serial No. 264.** *Vicinity of Rincon Point, San Francisco.*—B. M. 179 is a Coast and Geodetic Survey standard disk set in the northwest side of the fire-depart-

ment building between Piers Nos. 22 and 24, 10 inches from the north corner of the building and 6 inches above the sidewalk. Elevation: 12.1 feet above lower low water; 8.93 feet above mean sea level.

**Serial No. 265.** *Vicinity of Rincon Point, San Francisco.*—B. M. 180 is a Coast and Geodetic Survey standard disk set vertically just east of the large iron mooring cleat in the concrete bulkhead between Piers Nos. 24 and 26, 3 feet from the corner of Pier 26. Elevation: 12.8 feet above lower low water; 9.63 feet above mean sea level.

**Serial No. 266.** *Vicinity of Rincon Point, San Francisco.*—B. M. 181 is a Coast and Geodetic Survey standard disk set 6 inches below pavement level in the south side of Pier 26, 15 feet from the sidewalk and directly over the first row of concrete piling. (The chief engineer of the State Harbor Commission advises that the concrete piling of Pier 26 rests on solid rock, and that the general settling characteristic of this part of the San Francisco water front should not be experienced here.) Elevation: 11.9 feet above lower low water; 8.78 feet above mean sea level.

**Serial No. 267.** *Vicinity of Central Basin, San Francisco.*—B. M. 126 (S. F. C. E. No. 67) is a triangle drilled on granite sill of large doorway of the Consolidated Milling Co. on the east side of Harrison Street between Fourteenth and Fifteenth Streets, 125 feet north of Fifteenth Street. The doorway is near the south end of the building, next to the office. B. M. is 9 inches from the north end of the doorway, being 18 inches above the ground. Elevation: 21.4 feet above lower low water; 17.98 feet above mean sea level.

**Serial No. 268.** *Vicinity of Central Basin, San Francisco.*—B. M. 127 (S. F. C. E. No. 93) is a triangle on the northeast end of lower granite step of main entrance to the three-story brick building occupied by Baker, Hamilton & Pacific Co. on Seventh Street between King and Townsend Streets, 125 feet southeast of Townsend Street. Elevation: 15.6 feet above lower low water; 12.24 feet above mean sea level.

**Serial No. 269.** *Union Iron Works, San Francisco.*—B. M. 47 (C. & G. S.) is the lower window-shutter socket on the south side of the second window from the southwest corner of the pattern shop of the Union Iron Works, on its west side. Just above B. M., on a part of the wall that is painted white, the words "PATTERN SHOP—NO SMOKING" are painted. This part of the building stands on solid ground, excavated from the bluff. The Union Iron Works are located between Eighteenth and Twentieth Streets and between Illinois Street and San Francisco Bay. Elevation: 17.9 feet above lower low water; 14.57 feet above mean sea level.

**Serial No. 270.** *Union Iron Works, San Francisco.*—B. M. 112 (C. & G. S.) is a 2¼-inch circle inclosing a triangle, drilled upon the granite step next to the bottom, at the west end, in the main entrance to the building occupied by the Union Iron Works on the north side of Twentieth Street. Elevation: 16.5 feet above lower low water; 13.12 feet above mean sea level.

**Serial No. 271.** *Union Iron Works, San Francisco.*—B. M. 113 (C. & G. S.) is the top of a brass plate 2 feet high and 4 inches wide at the northeast corner of the new office building of the Union Iron Works. The plate is on the east side of the building 6 inches from the north side and is just above the ground. The top of the plate above the word "Levels" is the B. M. This is the reference mark used by the Union Iron Works for purposes of construction and of testing levels. Elevation: 15.1 feet above lower low water; 11.73 feet above mean sea level.

**Serial No. 272.** *Vicinity of Central Basin, San Francisco.*—B. M. 116 (C. & G. S.) is a 2½-inch triangle drilled upon the surface of the concrete abutment at the west end, north side, of the large steel bridge on Eighteenth Street between Iowa and Minnesota Streets. Elevation: 76.2 feet above lower low water; 72.83 feet above mean sea level.

**Serial No. 273.** *Vicinity of Central Basin, San Francisco.*—B. M. 121 (C. & G. S.) is the top of the threaded end of a ½-inch iron rod projecting out from the south wall of the Maypole Dye Works building on the north side of Nineteenth Street between Bryant and York Streets, being 5½ inches above the bituminized sidewalk and 5 feet from the southeast corner of the building on the Nineteenth Street side. The rod, or bolt, has a 3-inch cast-iron washer and a hexagonal nut upon it. The bolt stands out ⅞ inch from the nut and 2¼ inches from the wall. Elevation: 40.4 feet above lower low water; 36.99 feet above mean sea level.

**Serial No. 274.** *Vicinity of Central Basin, San Francisco.*—B. M. 59 (C. & G. S.) is iron guard No. 1 on the south side of gate opening to road running

along the south side of Magdalen Asylum, or St. Catherine's Home, on Potrero Avenue between Twentieth and Twenty-second Streets. Elevation: 68.0 feet above lower low water; 64.58 feet above mean sea level.

**Serial No. 275.** *Vicinity of Central Basin, San Francisco.*—B. M. 60 (C. & G. S.) is iron guard No. 2 on the south side of gate opening to road running along the south side of Magdalen Asylum, or St. Catherine's Home, on Potrero Avenue between Twentieth and Twenty-second Streets. Elevation: 67.9 feet above lower low water; 64.56 feet above mean sea level.

**Serial No. 276.** *Vicinity of Central Basin, San Francisco.*—B. M. 61 (C. & G. S.) is the intersection of a cross cut on the slightly rounded head of a copper bolt cemented into the brick wall of the Magdalen Asylum, or St. Catherine's Home, on Potrero Avenue between Twentieth and Twenty-second Streets. The bolt is about 8.5 feet above the ground and is in the western face of the building, 18 inches from its southwest corner. The head of the bolt, which is  $1\frac{5}{8}$  inches in diameter, is flush with the outer surface of the bricks and is engraved as follows: "B. M. U. S. C. & G. S. 1896." Elevation: 79.9 feet above lower low water; 76.51 feet above mean sea level.

**Serial No. 277.** *Vicinity of Central Basin, San Francisco.*—B. M. 130 (S. F. C. E. No. 306) is a triangle at the southwest end of bottom concrete step at the entrance to Garfield Square. B. M. is at the northwest corner of Twenty-sixth and Harrison Streets. Elevation: 53.0 feet above lower low water; 49.71 feet above mean sea level.

**Serial No. 278.** *North of Holly Park, San Francisco.*—B. M. 140 (S. F. C. E. No. 313) is a faint cross cut on cement step at 3605 Army Street, 3 inches above walk and  $8\frac{1}{2}$  inches south of corner post of grocery store at the southwest corner of San Jose Avenue and Army Street. Elevation: 79.6 feet above lower low water; 76.30 feet above mean sea level.

**Serial No. 279.** *West of Holly Park, San Francisco.*—B. M. (S. F. C. E. No. 635) is a cross on the head of an iron spike embedded in the top of the dome at the east end of the east concrete retaining wall at the entrance to the culvert under the Southern Pacific Railroad viaduct on the north side of Bosworth Street opposite Lyell Street. Elevation: 162.7 feet above lower low water; 159.31 feet above mean sea level.

**Serial No. 280.** *Vicinity of Balboa Park, San Francisco.*—B. M. 144 (S. F. C. E. No. 386) is a cross cut at the west end of bottom artificial-stone step to the side entrance to a building formerly used as a saloon on the south side of Ocean Avenue about 40 feet east of San Jose Avenue. The address of the building is 2101 San Jose Avenue. It is reported that the side entrance referred to has been covered up, but the steps are still in place. Elevation: 195.9 feet above lower low water; 192.46 feet above mean sea level.

**Serial No. 281.** *Hunters Point, San Francisco.*—B. M. 168 is a Coast and Geodetic Survey standard disk, inscribed "Hunters Point B. M. 1, 1917," set horizontally and cemented in a drill hole on the top of the north granite wall of the south dry-dock entrance. The B. M. is 5 inches from the edge and 24 feet outside of the sill or cut in the wall against which the floating gate of the dry dock rests. It is 180 feet east (true) of B. M. 170 (Serial No. 283). The granite wall has been covered over by a plank walk, making B. M. rather inaccessible. Elevation: 11.9 feet above lower low water; 8.30 feet above mean tide level.

**Serial No. 282.** *Hunters Point, San Francisco.*—B. M. 169 is a Coast and Geodetic Survey standard disk, inscribed "Hunters Point B. M. 2, 1917," set vertically in the brick wall of the small house just north from the northeast corner of the power house. The mark is on the west side of the house, 8 inches south of the northwest corner. It is 3 inches north of a large nail set in a crack between the bricks. This is a city engineer's mark. B. M. is 6 inches above bottom of wall and about 7 meters inside the present gate of the dry dock. The distance from B. M. 168 (Serial No. 281) to B. M. 169 (Serial No. 282) is about 100 meters. Elevation: 12.3 feet above lower low water; 8.69 feet above mean tide level.

**Serial No. 283.** *Hunters Point, San Francisco.*—B. M. 170 is a Coast and Geodetic Survey standard disk, inscribed "Hunters Point B. M. 3, 1917," set vertically 8 inches above the ground in the south side of brick power house and directly alongside a high brick chimney rising from the roof. The building is 39 meters long, and B. M. is just one-third of the way from the outer end. The building stands 9 meters from the edge of the dry dock to the southward. Elevation: 12.5 feet above lower low water; 8.94 feet above mean tide level.

## SECTION C.—ELEVATIONS OF BENCH MARKS, SERIAL NOS. 284 TO 473, SAN FRANCISCO BAY AND VICINITY, STATE OF CALIFORNIA

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	Higher high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Lowest tide
284	Holy Cross, San Mateo County.....	83.5	84.7	85.4	-----	88.20	90.8	92.0	94.5
285	Point San Bruno, San Mateo County.....	6.7	7.9	8.6	11.26	-----	14.0	15.2	17.7
286	South San Francisco Canal.....	1.4	2.6	3.3	5.98	-----	8.7	9.9	12.4
287	.....do.....	5.6	6.8	7.5	10.19	-----	12.9	14.1	16.6
288	.....do.....	15.8	17.0	17.7	20.37	-----	23.1	24.3	26.8
289	.....do.....	12.3	13.5	14.2	16.93	-----	19.6	20.8	23.3
290	San Bruno, San Mateo County.....	22.1	23.3	24.0	-----	26.71	29.4	30.6	33.1
291	.....do.....	12.6	13.8	14.5	-----	17.24	19.9	21.1	23.6
292	Milbrae, San Mateo County.....	13.8	15.0	15.7	-----	18.43	21.1	22.3	24.8
293	Burlingame, San Mateo County.....	25.9	27.1	27.8	-----	30.54	33.2	34.4	36.9
294	.....do.....	26.3	27.5	28.2	-----	30.95	33.6	34.8	37.3
295	San Mateo, San Mateo County.....	21.2	22.4	23.1	-----	25.84	28.5	29.7	32.2
296	.....do.....	22.7	23.9	24.6	-----	27.39	30.0	31.2	33.7
297	.....do.....	22.7	23.9	24.6	-----	27.37	30.0	31.2	33.7
298	.....do.....	22.4	23.6	24.3	-----	27.02	29.7	30.9	33.4
299	Beresford, San Mateo County.....	16.2	18.7	19.7	-----	22.92	25.8	27.2	29.7
300	Belmont, San Mateo County.....	28.1	30.6	31.6	-----	34.81	37.7	39.1	41.6
301	San Carlos, San Mateo County.....	19.0	21.5	22.5	-----	25.74	28.6	30.0	32.5
302	Redwood, San Mateo County.....	6.0	8.5	9.5	-----	12.71	15.6	17.0	19.5
303	Redwood Creek, San Mateo County.....	-2.8	0.2	0.8	3.89	-----	6.9	8.2	10.7
304	Menlo Park, San Mateo County.....	64.1	66.4	67.3	-----	70.63	73.7	75.1	77.6
305	Near Palo Alto, San Mateo County.....	67.0	69.3	70.2	-----	73.52	76.6	78.0	80.5
306	Palo Alto, Santa Clara County.....	55.6	57.9	58.8	-----	62.08	65.2	66.6	69.1
307	Ravenswood, San Mateo County.....	-0.4	1.9	2.8	-----	6.06	9.2	10.6	13.1
308	Mayfield, Santa Clara County.....	26.3	28.6	29.5	-----	32.84	35.9	37.3	39.8
309	Mountain View, Santa Clara County.....	71.1	73.4	74.3	-----	77.60	80.7	82.1	84.6
310	Alviso, Santa Clara County.....	1.4	2.9	3.5	-----	7.25	11.0	12.4	14.9
311	.....do.....	1.2	2.7	3.3	-----	7.08	10.8	12.2	14.7
312	.....do.....	1.1	2.6	3.2	-----	6.93	10.7	12.1	14.6
313	Warm Springs, Alameda County.....	35.4	38.2	38.8	-----	42.06	45.1	46.4	48.9
314	.....do.....	25.5	28.3	28.9	-----	32.14	35.2	36.5	39.0
315	Dumbarton Point, Alameda County.....	3.8	6.4	7.0	10.37	-----	13.5	14.8	17.3
316	.....do.....	-0.6	2.0	2.6	5.92	-----	9.1	10.4	12.9
317	Dumbarton Bridge.....	6.6	9.4	10.0	13.19	-----	16.3	17.6	20.1
318	.....do.....	6.4	9.2	9.8	12.95	-----	16.1	17.4	19.9
319	.....do.....	7.3	10.1	10.7	13.84	-----	17.0	18.3	20.8
320	.....do.....	6.5	9.3	9.9	13.00	-----	16.2	17.5	20.0
321	.....do.....	6.3	9.1	9.7	12.83	-----	16.0	17.3	19.8
322	.....do.....	6.4	9.2	9.8	12.92	-----	16.1	17.4	19.9
323	Alameda.....	2.2	4.0	4.6	7.11	-----	9.6	10.7	13.2
324	.....do.....	6.6	8.4	9.0	11.53	-----	14.0	15.1	17.6
325	.....do.....	2.2	4.0	4.6	7.15	-----	9.6	10.7	13.2
326	.....do.....	5.7	7.5	8.1	10.64	-----	13.1	14.2	16.7
327	.....do.....	2.9	4.7	5.3	7.79	-----	10.3	11.4	13.9
328	San Antonio Creek (Tidal Canal).....	2.2	4.4	5.0	7.34	-----	9.6	10.7	13.2
329	.....do.....	2.3	4.5	5.1	7.40	-----	9.7	10.8	13.3
330	.....do.....	4.0	6.2	6.8	9.07	-----	11.4	12.5	15.0
331	San Antonio Creek, Oakland.....	3.8	6.3	6.9	9.07	-----	11.2	12.3	14.8
332	Oakland.....	3.0	5.1	5.7	7.92	-----	10.4	11.5	14.0
333	.....do.....	8.9	11.3	11.9	14.09	-----	16.3	17.4	19.9
334	.....do.....	19.1	21.5	22.1	-----	24.34	26.5	27.6	30.1
335	Oakland Mole.....	6.6	9.0	9.6	11.84	-----	14.0	15.1	17.6
336	.....do.....	6.7	9.1	9.7	11.87	-----	14.1	15.2	17.7
337	.....do.....	5.2	7.6	8.2	10.38	-----	12.6	13.7	16.2
338	Goat Island.....	0.4	2.9	3.5	5.54	-----	7.7	8.9	11.4
339	.....do.....	2.1	4.6	5.2	7.26	-----	9.4	10.6	13.1
340	.....do.....	5.0	7.5	8.1	10.22	-----	12.3	13.5	16.0
341	.....do.....	-0.7	1.8	2.4	4.51	-----	6.6	7.8	10.3
342	.....do.....	4.6	7.1	7.7	9.79	-----	11.9	13.1	15.6
343	West Berkeley.....	0.7	3.2	3.8	5.86	-----	8.0	9.2	11.7

Section C.—Elevations of bench marks, Serial Nos. 284 to 473, San Francisco Bay and vicinity, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	High-er high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Low-est tide
344	West Berkeley.....	2.3	4.8	5.4	7.50	-----	9.6	10.8	13.3
345	do.....	4.2	6.7	7.3	9.37	-----	11.5	12.7	15.2
346	Brooks Island.....	-1.9	0.7	1.3	3.38	-----	5.4	6.6	9.1
347	Ellis Landing, Richmond.....	2.5	5.1	5.7	7.73	-----	9.8	11.0	13.5
348	do.....	2.5	5.1	5.7	7.73	-----	9.8	11.0	13.5
349	Point Richmond.....	4.6	7.2	7.8	9.81	-----	11.9	13.1	15.6
350	do.....	4.5	7.1	7.7	9.78	-----	11.8	13.0	15.5
351	Point San Pablo.....	-1.2	1.4	2.0	4.10	-----	6.1	7.3	9.8
352	do.....	-0.9	1.7	2.3	4.37	-----	6.4	7.6	10.1
353	Pinole Point, San Pablo Bay.....	28.3	30.4	31.0	33.31	-----	35.6	36.8	39.3
354	Pinole, Contra Costa County.....	6.1	8.1	8.7	11.07	-----	13.4	14.6	17.1
355	Refugio Landing, Contra Costa County.....	4.5	6.6	7.2	9.58	-----	11.9	13.0	15.5
356	do.....	2.8	4.9	5.5	7.80	-----	10.2	11.3	13.8
357	do.....	-1.5	0.6	1.2	3.54	-----	5.9	7.0	9.5
358	do.....	6.2	8.3	8.9	11.25	-----	13.6	14.7	17.2
359	Crockett, Carquinez Strait.....	6.8	8.3	8.9	11.24	-----	13.6	14.8	16.3
360	do.....	5.9	7.4	8.0	10.31	-----	12.7	13.9	15.4
361	do.....	5.9	7.4	8.0	10.36	-----	12.7	13.9	15.4
362	Martinez, Carquinez Strait.....	182.6	184.1	184.7	-----	187.19	189.4	190.6	192.1
363	do.....	18.6	20.1	20.7	-----	23.20	25.4	26.6	28.1
364	Suisun Point, Suisun Bay.....	6.4	8.3	8.8	11.06	-----	13.4	14.4	15.9
365	do.....	11.1	13.0	13.5	15.78	-----	18.1	19.1	20.6
366	do.....	9.3	11.2	11.7	13.96	-----	16.3	17.3	18.8
367	do.....	16.2	18.1	18.6	20.86	-----	23.2	24.2	25.7
368	Bay Point, Suisun Bay.....	1.3	3.0	3.5	5.87	-----	8.3	9.3	11.3
369	do.....	1.8	3.5	4.0	6.39	-----	8.8	9.8	11.8
370	do.....	4.1	5.8	6.3	8.71	-----	11.1	12.1	14.1
371	do.....	10.0	11.7	12.2	14.64	-----	17.0	18.0	20.0
372	do.....	7.1	8.8	9.3	11.71	-----	14.1	15.1	17.1
373	do.....	9.1	10.8	11.3	13.68	-----	16.1	17.1	19.1
374	Ryer (Kings) Island, Suisun Bay.....	1.4	3.2	3.7	6.00	-----	8.2	9.4	11.4
375	Pittsburg, Suisun Bay.....	21.8	24.7	25.2	27.19	-----	29.1	29.8	31.3
376	do.....	5.1	8.0	8.5	10.49	-----	12.4	13.1	14.6
377	do.....	12.3	15.2	15.7	17.68	-----	19.6	20.3	21.8
378	do.....	14.7	17.6	18.1	20.05	-----	22.0	22.7	24.2
379	Stockton, San Joaquin River.....	8.1	9.7	9.9	10.92	-----	11.9	12.1	13.6
380	Collinsville, Sacramento River.....	5.3	8.8	9.2	11.38	-----	13.6	14.3	16.3
381	do.....	2.9	6.4	6.8	8.99	-----	11.2	11.9	13.9
382	do.....	1.1	4.6	5.0	7.21	-----	9.4	10.1	12.1
383	do.....	-1.1	2.4	2.8	-----	4.97	7.2	7.9	9.9
384	Riovista, Sacramento River.....	18.3	19.5	20.0	21.44	-----	22.8	23.3	24.8
385	Sacramento, Sacramento River.....	23.7	24.7	24.8	25.16	-----	25.6	25.7	26.7
386	Motetzuma Slough Entrance.....	-0.6	1.4	1.9	4.29	-----	6.6	7.4	9.4
387	do.....	0.8	2.8	3.3	5.63	-----	8.0	8.8	10.8
388	do.....	-0.2	1.8	2.3	4.69	-----	7.0	7.8	9.8
389	Benicia, Carquinez Strait.....	1.4	2.9	3.5	-----	5.97	8.2	9.4	10.9
390	do.....	2.3	3.8	4.4	-----	6.89	9.1	10.3	11.8
391	do.....	2.4	3.9	4.5	-----	7.01	9.2	10.4	11.9
392	do.....	2.2	3.7	4.3	-----	6.80	9.0	10.2	11.7
393	do.....	8.6	10.1	10.7	-----	13.16	15.4	16.6	18.1
394	Vallejo, Mare Island Strait.....	7.3	8.7	9.3	-----	11.77	14.1	15.3	17.3
395	do.....	-2.9	-1.5	-0.9	-----	1.54	3.9	5.1	7.1
396	Mare Island.....	3.6	5.1	5.6	8.01	-----	10.4	11.6	13.6
397	do.....	3.6	5.1	5.6	7.98	-----	10.4	11.6	13.6
398	do.....	3.0	4.5	5.0	7.42	-----	9.8	11.0	13.0
399	do.....	3.4	4.9	5.4	7.79	-----	10.2	11.4	13.4
400	Napa Junction, Napa County.....	69.9	70.9	71.4	-----	74.17	76.9	77.9	79.4
401	do.....	65.5	66.5	67.0	-----	69.81	72.5	73.5	75.0
402	Napa River, railroad trestle.....	2.4	3.4	3.9	-----	6.65	9.4	10.4	11.9
403	do.....	2.3	3.3	3.8	-----	6.62	9.3	10.3	11.8

## Section C.—Elevations of bench marks, Serial Nos. 284 to 473, San Francisco Bay and vicinity, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		High- est tide	High- er high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Low- est tide
404	Brazos drawbridge, Napa River.....	1.7	2.7	3.2	5.91	-----	8.7	9.7	11.2
405	do.....	2.0	3.0	3.5	6.25	-----	9.0	10.0	11.5
406	do.....	9.4	10.4	10.9	13.68	-----	16.4	17.4	18.9
407	Napa, Napa River.....	14.8	15.7	16.1	18.99	-----	21.9	22.8	24.3
408	do.....	16.2	17.1	17.5	-----	20.47	23.3	24.2	25.7
409	Merazo, Sonoma County.....	9.3	10.8	11.4	-----	13.86	16.2	17.3	19.3
410	do.....	9.8	11.3	11.9	-----	14.30	16.7	17.8	19.8
411	Sonoma Creek, railroad trestle.....	2.7	4.2	4.8	-----	7.26	9.6	10.7	12.7
412	Tubbs Island Wharf, Sonoma Creek.....	0.3	1.8	2.4	4.84	-----	7.2	8.3	10.3
413	do.....	-2.7	-1.2	-0.6	1.82	-----	4.2	5.3	7.3
414	do.....	-1.8	-0.3	0.3	2.70	-----	5.1	6.2	8.2
415	Petaluma Creek Entrance.....	-0.2	2.0	2.6	-----	4.93	7.1	8.3	10.3
416	do.....	6.7	8.9	9.5	-----	11.75	14.0	15.2	17.2
417	do.....	1.6	3.8	4.4	6.66	-----	8.9	10.1	12.1
418	do.....	0.9	3.1	3.7	5.98	-----	8.2	9.4	11.4
419	do.....	1.1	3.3	3.9	6.18	-----	8.4	9.6	11.6
420	do.....	4.8	7.0	7.6	9.84	-----	12.1	13.3	15.3
421	Lakeville, Petaluma Creek.....	13.6	15.0	15.6	18.27	-----	20.9	22.1	24.1
422	do.....	7.0	8.4	9.0	11.66	-----	14.3	15.5	17.5
423	do.....	3.8	5.2	5.8	8.47	-----	11.1	12.3	14.3
424	Upper drawbridge, Petaluma Creek.....	5.7	6.7	7.3	10.10	-----	13.0	14.2	15.7
425	do.....	12.9	13.9	14.5	17.39	-----	20.0	21.4	22.9
426	do.....	4.1	5.1	5.7	8.60	-----	11.4	12.6	14.1
427	do.....	15.5	16.5	17.1	19.93	-----	22.8	24.0	25.5
428	do.....	11.3	12.3	12.9	15.71	-----	18.6	19.8	21.3
429	McNears Landing, San Pablo Bay.....	4.5	6.6	7.2	9.22	-----	11.3	12.5	15.0
430	do.....	-1.2	0.9	1.5	3.57	-----	5.6	6.8	9.3
431	do.....	3.4	5.5	6.1	8.19	-----	10.2	11.4	13.9
432	do.....	11.5	13.6	14.2	16.26	-----	18.3	19.5	22.0
433	do.....	-1.2	0.9	1.5	3.51	-----	5.6	6.8	9.3
434	San Rafael, Marin County.....	4.5	6.7	7.3	-----	9.34	11.3	12.5	15.0
435	Point San Quentin.....	3.9	6.0	6.6	8.69	-----	10.7	11.9	14.4
436	do.....	-1.0	1.1	1.7	3.71	-----	5.8	7.0	9.5
437	do.....	-2.8	-0.7	-0.1	1.90	-----	4.0	5.2	7.7
438	El Campo, Marin County.....	-2.1	0.2	0.8	2.74	-----	4.7	5.9	8.4
439	California City, Marin County.....	-1.9	0.3	0.9	2.93	-----	4.9	6.1	8.6
440	do.....	2.4	4.6	5.2	7.24	-----	9.2	10.4	12.9
441	do.....	2.0	4.2	4.8	6.78	-----	8.8	10.0	12.5
442	Tiburon, Marin County.....	2.8	5.6	6.2	8.19	-----	10.1	11.3	14.3
443	Quarantine station, Angel Island.....	-1.3	1.1	1.7	3.59	-----	5.5	6.7	9.2
444	do.....	1.1	3.5	4.1	5.96	-----	7.9	9.1	11.6
445	do.....	45.1	47.5	48.1	50.00	-----	51.9	53.1	55.6
446	do.....	36.3	38.7	39.3	41.20	-----	43.1	44.3	46.8
447	Quarry Point, Angel Island.....	0.9	3.2	3.8	6.74	-----	7.7	8.9	11.4
448	do.....	-1.3	1.1	1.7	3.60	-----	5.5	6.7	9.2
449	Sausalito, Marin County.....	-0.6	1.9	2.5	-----	4.44	6.2	7.4	9.9
450	do.....	26.1	28.6	29.2	-----	31.06	32.9	34.1	36.6
451	do.....	26.1	28.6	29.2	-----	31.06	32.9	34.1	36.6
452	do.....	1.9	4.4	5.0	-----	6.92	8.7	9.9	12.4
453	do.....	8.4	10.9	11.5	-----	13.44	15.2	16.4	18.9
454	do.....	9.8	12.3	12.9	-----	14.78	16.6	17.8	20.3
455	do.....	2.3	4.8	5.4	-----	7.32	9.1	10.3	12.8
456	do.....	39.2	41.7	42.3	-----	44.24	46.0	47.2	49.7
457	do.....	93.5	96.0	96.6	-----	98.45	100.3	101.5	104.0
458	do.....	98.6	101.1	101.7	-----	103.64	105.4	106.6	109.1
459	do.....	102.0	104.5	105.1	-----	107.04	108.8	110.0	112.5
460	do.....	98.8	101.3	101.9	-----	103.79	105.6	106.8	109.3
461	Lime Point, Golden Gate.....	10.4	12.8	13.4	-----	15.39	17.3	18.4	20.9
462	do.....	4.5	6.9	7.5	-----	9.45	11.4	12.5	15.0
463	do.....	4.8	7.2	7.8	-----	9.83	11.7	12.8	15.3

Section C.—Elevations of bench marks, Serial Nos. 284 to 473, San Francisco Bay and vicinity, State of California—Continued

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	Higher high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Lowest tide
464	Lime Point, Golden Gate.....	12.7	15.1	15.7	-----	17.65	19.6	20.7	23.2
465	do.....	20.5	22.9	23.5	-----	25.50	27.4	28.5	31.0
466	do.....	23.6	26.0	26.6	-----	28.54	30.5	31.6	34.1
467	do.....	2.8	5.2	5.8	-----	7.80	9.7	10.8	13.3
468	do.....	8.0	10.4	11.0	-----	13.02	14.9	16.0	18.5
469	Diablo Cove, Golden Gate.....	2.5	4.9	5.5	7.43	-----	9.4	10.5	13.0
470	Bonita Cove, Golden Gate.....	3.3	5.6	6.2	8.17	-----	10.2	11.3	13.8
471	do.....	7.8	10.1	10.7	12.68	-----	14.7	15.8	18.3
472	do.....	1.7	4.0	4.6	6.60	-----	8.6	9.7	12.2
473	do.....	9.5	11.8	12.4	14.41	-----	16.4	17.5	20.0

SECTION C.—DESCRIPTIONS OF BENCH MARKS, SERIAL NOS. 284 TO 473, SAN FRANCISCO BAY AND VICINITY, STATE OF CALIFORNIA

**Serial No. 284.** *Holy Cross, San Mateo County.*—B. M. W. is a Coast and Geodetic Survey standard disk set in the eastern side of a large conical rock on the east side of the fountain north of the stone building at the entrance to Holy Cross Cemetery. Elevation: 92.0 feet above lower low water; 88.20 feet above mean sea level.

**Serial No. 285.** *Point San Bruno, San Mateo County.*—B. M. 3 is a Coast and Geodetic Survey standard disk set in cement between two crosses, 4 inches long, in the southeast corner of the engine house of the Western Meat Co. packing works. The crosses are about 10 inches apart and about 3 feet above the ground. The B. M. is about 40 meters from the main or largest square brick chimney of the packing house. Elevation: 15.2 feet above lower low water; 11.26 feet above mean tide level.

**Serial No. 286.** *South San Francisco Canal.*—B. M. 1 (C. & G. S.) is the upper part of an iron bolt near the top of the first pile on the bulkhead just west of the wharf on which the tide gauge was formerly located. A triangle of nails was driven into the pile and around the bolt. Elevation: 9.9 feet above lower low water; 5.98 feet above mean tide level.

**Serial No. 287.** *South San Francisco Canal.*—B. M. 2 (C. & G. S.) is the uppermost part of the iron bolt at the southwest corner of a concrete block 16 by 40 inches which looks as though it was used to support a porch pillar. B. M. is one of four iron bolts and has a small triangle chiseled around it in the concrete. The concrete block is located near the ruins of a small concrete building just back from the easternmost of the two small wharves fronting on the Steiger Terra Cotta Works. Elevation: 14.1 feet above lower low water; 10.19 feet above mean tide level.

**Serial No. 288.** *South San Francisco Canal.*—B. M. 3 (C. & G. S.) is located on a large brick building standing at the extreme northwest corner of the W. P. Fuller paint plant. This building has a covered driveway at the west end. A concrete wall on the outer part of the drive supports a frame on which the covering of the drive rests. The wall has four concrete posts, and the B. M., a very small chiseled triangle, is on the underside of the molding on top of the southernmost post and on the south side of it. Elevation: 24.3 feet above lower low water; 20.37 feet above mean tide level.

**Serial No. 289.** *South San Francisco Canal.*—B. M. 4 (C. & G. S.) is the upper part of the lowest iron bar on the right-hand side on entering the brick building just across a driveway and south of the building described in B. M. 3 (Serial No. 288). This building lies alongside and east of a long shed of corrugated iron. At the northernmost end there is an entrance which has "No. 3" above it. The upper part of the entrance is arched. On each side of the entrance there are three iron bars driven into the building on which a door

could be fastened. Elevation: 20.8 feet above lower low water; 16.93 feet above mean tide level.

**Serial No. 290.** *San Bruno, San Mateo County.*—B. M. X<sub>a</sub> (C. & G. S.) is the top of the southern inside base bolt of signal tower 108, about 15 meters northeast of the Southern Pacific Railroad station. Elevation: 30.6 feet above lower low water; 26.71 feet above mean sea level.

**Serial No. 291.** *San Bruno, San Mateo County.*—B. M. 3 (or J) (C. & G. S.) is on last post of bulkhead on south side of bridge at San Bruno. Elevation: 21.1 feet above lower low water; 17.24 feet above mean sea level.

**Serial No. 292.** *Milbrae, San Mateo County.*—B. M. Y<sub>a</sub> is a Coast and Geodetic Survey standard disk set in the east wall of the power substation, about 1 meter from the northeast corner and about 1.5 meters above the brick pavement. Elevation: 22.3 feet above lower low water; 18.43 feet above mean sea level.

**Serial No. 293.** *Burlingame, San Mateo County.*—B. M. Z<sub>a</sub> is a Coast and Geodetic Survey standard disk set in the foundation on the east side of the Southern Pacific Railroad station, in front of the ticket window, about 0.15 meter above the pavement. Elevation: 34.4 feet above lower low water; 30.54 feet above mean sea level.

**Serial No. 294.** *Burlingame, San Mateo County.*—B. M. 1 (or N) (C. & G. S.) is on the concrete base of the Southern Pacific Railroad depot at Burlingame, at south side of passageway through building. It is about 7 inches above the pavement. Elevation: 34.8 feet above lower low water; 30.95 feet above mean sea level.

**Serial No. 295.** *San Mateo, San Mateo County.*—B. M. A<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the south side of the F. A. A. M. Building on Ellsworth Avenue about ½ mile north of the Southern Pacific Railroad station. The B. M. is about 3 meters from the southeast corner of the south side of the building and about 1 meter above the ground. Elevation: 29.7 feet above lower low water; 25.84 feet above mean sea level.

**Serial No. 296.** *San Mateo, San Mateo County.*—B. M. B<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the top of the concrete wall at the east entrance to the small park at the Southern Pacific Railroad passenger station, about 0.3 meter north of the north pillar. Elevation: 31.2 feet above lower low water; 27.39 feet above mean sea level.

**Serial No. 297.** *San Mateo, San Mateo County.*—B. M. 1 (or O) (C. & G. S.) is the top surface of the upper frame or table of the railroad switch at the northwest corner of the water tank at San Mateo. Elevation: 31.2 feet above lower low water; 27.37 feet above mean sea level.

**Serial No. 298.** *San Mateo, San Mateo County.*—B. M. 2 (or P) (C. & G. S.) is on pavement at outer edge of pillar under the northeast corner of the Union Hotel. The pavement is about 6 inches above the sidewalk. Elevation: 30.9 feet above lower low water; 27.02 feet above mean sea level.

**Serial No. 299.** *Beresford, San Mateo County.*—B. M. C<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the concrete foundation of signal tower 202, west of railroad track, and about 300 meters north of the Southern Pacific Railroad station. Elevation: 27.2 feet above lower low water; 22.92 feet above mean sea level.

**Serial No. 300.** *Belmont, San Mateo County.*—B. M. D<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the top of a stone or cement post about 4 feet long and projecting about 6 inches from the ground in the south end of the grass park, midway between the rail and the fence, and north of the Southern Pacific Railroad station. Elevation: 39.1 feet above lower low water; 34.81 feet above mean sea level.

**Serial No. 301.** *San Carlos, San Mateo County.*—B. M. E<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the east side of the eastern stone post that supports the roof over the passageway of the Southern Pacific Railroad station. The B. M. is about 0.23 meter above the pavement. Elevation: 30.0 feet above lower low water; 25.74 feet above mean sea level.

**Serial No. 302.** *Redwood, San Mateo County.*—B. M. F<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the top of a stone or cement post about 4 feet long and projecting about 6 inches from the ground in the north corner of the triangular grass park north of the Southern Pacific Railroad station. Elevation: 17.0 feet above lower low water; 12.71 feet above mean sea level.

**Serial No. 303.** *Redwood Creek, San Mateo County.*—B. M. 2 (C. & G. S.) is a cross on a heavy granite slab about 46 inches long, 14 inches wide, and 6 inches thick, located on the southwest shore of Redwood Creek about 575 meters east northeasterly of "China House." The slab is marked "B. M. No. 2+U. S. C. &

G. S. S. McArthur 1897," and rests on four 12-foot piles driven down into the marsh, crosspieces to form a bed being nailed across heads of piles and short piles and braces driven in about stone slab to steady it. Elevation: 8.2 feet above lower low water; 3.89 feet above mean tide level.

**Serial No. 304. Menlo Park, San Mateo County.**—B. M. G<sub>7</sub> is a Coast and Geodetic survey standard disk set in the top of a concrete sphere on a corner post, on the opposite side of the alley from the Oak Grove Villa Hotel, about 1.2 meters above the ground. Elevation: 75.1 feet above lower low water; 70.63 feet above mean sea level.

**Serial No. 305. San Mateo County, near Palo Alto, Santa Clara County.**—B. M. H<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the top surface of the stone abutment at the north end of the Southern Pacific Railroad bridge over San Francisco Creek, which forms the boundary between San Mateo and Santa Clara Counties. The B. M. is west of the track. Elevation: 78.0 feet above lower low water; 73.52 feet above mean sea level.

**Serial No. 306. Palo Alto, Santa Clara County.**—B. M. I<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the top of a stone or cement post about 4 feet long and projecting about 6 inches from the ground in the north end of the small grass park east of the Southern Pacific Railroad and south of University Avenue. Elevation: 66.6 feet above lower low water; 62.08 feet above mean sea level.

**Serial No. 307. Ravenswood, San Mateo County.**—B. M. 3 (C. & G. S.) is on a brick projecting  $\frac{1}{2}$  inch outside the wooden window sill in the first story of Mr. Cooley's brick house near landing at Ravenswood. The point used is on the second brick from the north side of the west window nearest the road. Elevation: 10.6 feet above lower low water; 6.06 feet above mean sea level.

**Serial No. 308. Mayfield, Santa Clara County.**—B. M. J<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the top of a stone or cement post about 4 feet long and projecting about 6 inches from the ground in the south end of the small grass park north of the Southern Pacific Railroad station and west of the track. Elevation: 37.3 feet above lower low water; 32.84 feet above mean sea level.

**Serial No. 309. Mountain View, Santa Clara County.**—B. M. K<sub>7</sub> is a Coast and Geodetic Survey standard disk set in the top of a stone or cement post about 4 feet long and projecting about 6 inches from the ground in the south end of the small grass park north of the Southern Pacific Railroad station, in the south side of the northern one of the two circular grass parks. Elevation: 82.1 feet above lower low water; 77.60 feet above mean sea level.

**Serial No. 310. Alviso, Santa Clara County.**—B. M. 1 (C. & G. S.) is the top of the lower hinge of the north door in the east end of Boot's brick warehouse in Alviso, on the right hand as one enters. Elevation: 12.4 feet above lower low water; 7.25 feet above mean sea level.

**Serial No. 311. Alviso, Santa Clara County.**—B. M. 2 (C. & G. S.) is the top of the lower hinge of the south door in the east end of Chase and Martin's brick warehouse in Alviso, on the left hand as one enters. Elevation: 12.2 feet above lower low water; 7.08 feet above mean sea level.

**Serial No. 312. Alviso, Santa Clara County.**—B. M. 3 (C. & G. S.) is the top of the lower hinge of the south door on the west side of Chase and Martin's brick warehouse in Alviso. It is marked by a cross cut on top of the hinge and the letters "B. M." scratched in the nearest brick. Elevation: 12.1 feet above lower low water; 6.93 feet above mean sea level.

**Serial No. 313. Warm Springs, Alameda County.**—B. M. T<sub>7</sub> is a Coast and Geodetic Survey standard disk set on the west head wall of culvert 36B under the crossing of the track and the highway, about 90 meters north of the Southern Pacific Railroad station. Elevation: 46.4 feet above lower low water; 42.06 feet above mean sea level.

**Serial No. 314. Near Warm Springs, Alameda County.**—B. M. U<sub>7</sub> is a Coast and Geodetic Survey standard disk set on the west head wall of culvert 34-E under the Southern Pacific Railroad track. Elevation: 36.5 feet above lower low water; 32.14 feet above mean sea level.

**Serial No. 315. Dumbarton Point, Alameda County.**—B. M. 1 (C. & G. S.) is a cross cut in the upper rim of the southern pipe of the Spring Valley Water Co. as it comes out of the gatehouse and descends into the bay. It is marked by the letters "U. S. C. S. B. M." cut in the pipe near the cross. Elevation: 14.8 feet above lower low water; 10.37 feet above mean tide level.

**Serial No. 316. Dumbarton Point, Alameda County.**—B. M. 2 (C. & G. S.) is a wire nail driven into the southern face of the foundation part of the watchman's

house, at the southwest corner. Elevation: 10.4 feet above lower low water; 5.92 feet above mean tide level.

**Serial No. 317. *Dumbarton Bridge.***—B. M. 1 (C. & G. S.) is the top of the southeast corner of bearing plate, which is the elevation, on the southeast corner of the east end of the draw or movable span of the bridge and is approximately 4 inches above the top of the concrete pier on which it rests. (Bottom of rod fitted on corner so that edges of plate were flush with sides of rod.) Elevation: 17.6 feet above lower low water; 13.19 feet above mean tide level.

**Serial No. 318. *Dumbarton Bridge.***—B. M. 2 (C. & G. S.) is a Southern Pacific Railroad Engineer B. M. (No. 115.99) on the top of the northwest pier of the west end of the easternmost span of the bridge, about 6 inches north of the identification plate. Elevation: 17.4 feet above lower low water; 12.95 feet above mean tide level.

**Serial No. 319. *Dumbarton Bridge.***—B. M. 3 (C. & G. S.) is the top of the southeast corner of bearing plate on the southeast corner of the first span at the eastern end of the bridge, same relative position as B. M. 1 (Serial No. 317) and approximately 11 inches above the top of the concrete pier. Elevation: 18.3 feet above lower low water; 13.84 feet above mean tide level.

**Serial No. 320. *Dumbarton Bridge.***—B. M. 4 is a Coast and Geodetic Survey standard disk set in the south concrete pier at the east end of the bridge. The top of the B. M. is flush with the top of the pier and south of bearing plate. Elevation: 17.5 feet above lower low water; 13.00 feet above mean tide level.

**Serial No. 321. *Dumbarton Bridge.***—B. M. 5 is a Coast and Geodetic Survey standard disk set in the concrete pier under the southeast corner of the movable span. The B. M. is flush with the top of the pier and south of bearing plate. Elevation: 17.3 feet above lower low water; 12.83 feet above mean tide level.

**Serial No. 322. *Dumbarton Bridge.***—B. M. 6 is a Coast and Geodetic Survey standard disk set in the concrete pier under the southwest corner of the west span of the bridge. The B. M. is flush with the top of the pier and south of the bearing plate. Elevation: 17.4 feet above lower low water; 12.92 feet above mean tide level.

**Serial No. 323. *Alameda.***—B. M. 1 (C. & G. S.) is on the northern end of the sill of the eastern door of the main building of the Encinal Boat Club, at the foot of Grand Avenue, and is marked by the letters "C. S." of copper tacks driven into the sill. Elevation: 10.7 feet above lower low water; 7.11 feet above mean tide level.

**Serial No. 324. *Alameda.***—B. M. 2 is a Coast and Geodetic Survey standard disk set in the concrete cover of the pipe on top of the Park Street pipe wharf and just north of the manhole near the end of the pipe. Elevation: 15.1 feet above lower low water; 11.53 feet above mean tide level.

**Serial No. 325. *Alameda.***—B. M. 3 is a Coast and Geodetic Survey standard disk set in the top of the concrete sea wall at the corner west of the wharf landing. B. M. bears N. 69° W. (mag). distant 55 meters from the landing, and S. 65° W. (mag.) distant 82 meters from the southwest corner of the municipal light plant. Elevation: 10.7 feet above lower low water; 7.15 feet above mean tide level.

**Serial No. 326. *Alameda.***—B. M. 5 is a Coast and Geodetic Survey standard disk set in the south side of the north concrete gatepost of the southernmost gateway at the Alameda Municipal Electric Light Co. plant at Park Street and Powell Boulevard. B. M. is about 2.35 feet above the concrete driveway. Elevation: 14.2 feet above lower low water; 10.64 feet above mean tide level.

**Serial No. 327. *Alameda.***—B. M. 6 is a Coast and Geodetic Survey standard disk set flush with the top of the concrete in the center of a concrete wing wall 1.2 feet in width, at northeast corner of Bay Farm Island bridge approach. Elevation: 11.4 feet above lower low water; 7.79 feet above mean tide level.

**Serial No. 328. *San Antonio Creek, San Leandro Bay.***—B. M. 1 (C. & G. S.) is the top surface of a nut on the southwest corner of the lumber wharf of the Mercantile Box Co., near the exit of San Antonio Creek (Tidal Canal) into San Leandro Bay. B. M. is surrounded by a triangle of nailheads. Elevation: 10.7 feet above lower low water; 7.34 feet above mean tide level.

**Serial No. 329. *San Antonio Creek, San Leandro Bay.***—B. M. 2 is a Coast and Geodetic Survey standard disk set into a cylindrical mass of concrete flush with the top surface of the ground, northeast of B. M. 1 (Serial No. 328) and across railroad spur tracks in the Enterprise Lumber Co. yard. Elevation: 10.8 feet above lower low water; 7.40 feet above mean tide level.

**Serial No. 330.** *San Antonio Creek, San Leandro Bay.*—B. M. 4 (C. & G. S.) is the highest point of the right-hand one of two railroad irons set diagonally in the ground at corner of building in the Enterprise Lumber Co. yard, and on the east side of railroad track. The tank is 27.8 meters westerly on the other side of the railroad track. Elevation: 12.5 feet above lower low water; 9.07 feet above mean tide level.

**Serial No. 331.** *San Antonio Creek, Oakland.*—B. M. 2 (C. & G. S.) is seven copper nails in the form of a cross driven into the floor of the wharf about 30 feet west of Hay & Wright's Shipbuilding Works. B. M. is 15½ feet from the northern end of the wharf and 2 feet 4 inches from the eastern edge. Elevation: 12.3 feet above lower low water; 9.07 feet above mean tide level.

**Serial No. 332.** *Oakland.*—B. M. 1 (S. P.) is the top of a 30-foot bar of railroad iron driven in solid ground by means of a pile driver. B. M. was afterwards covered by a wooden platform, with a hole bored through the planking so as to make it easy of access. B. M. is 30½ feet from machine shop and 19 feet from office building. Elevation: 11.5 feet above lower low water; 7.92 feet above mean tide level.

**Serial No. 333.** *Oakland.*—B. M. 2 (C. & G. S.) is a cross made of 9 copper tacks in the northern upright of the eastern end of the southern wing of the narrow-gauge depot, between the railroad going to Alameda and that to San Jose. The mark is 4.8 feet above the flooring of the station. Elevation: 17.4 feet above lower low water; 14.09 feet above mean tide level.

**Serial No. 334.** *Oakland.*—B. M. (U. S. G. S.), stamped "24," is a bronze tablet in foundation on north side of entrance, Broadway front of Hall of Records at Oakland. Elevation: 27.6 feet above lower low water; 24.34 feet above mean sea level.

**Serial No. 335.** *Oakland Mole.*—B. M. 3 is a Coast and Geodetic Survey standard disk set in the stone footing of the steel column at the northwest corner of the higher tank tower on the Southern Pacific lumber wharf. B. M. is 42 feet from the south side of the wharf landing. Elevation: 15.1 feet above lower low water; 11.84 feet above mean tide level.

**Serial No. 336.** *Oakland Mole.*—B. M. 4 is a Coast and Geodetic Survey standard disk set in the stone footing of the steel column at the northeast corner of the higher tank tower on the Southern Pacific lumber wharf. B. M. is about 32 feet from B. M. 3 (Serial No. 335). Elevation: 15.2 feet above lower low water; 11.87 feet above mean tide level.

**Serial No. 337.** *Oakland Mole.*—B. M. 5 is a Coast and Geodetic Survey standard disk set in the concrete footing of a column at the recess in the train shed of the Southern Pacific Railroad. B. M. bears S. 86° E. (mag.) distant 137 meters from B. M. 4 (Serial No. 336), and N. 85° E. (mag.) distant 120 meters from the southeast corner of the pump house. Elevation: 13.7 feet above lower low water; 10.38 feet above mean tide level.

**Serial No. 338.** *Goat Island.*—B. M. 2 (C. & G. S.) is the horizontal line of a half cross cut in sandstone rock about 415 feet northeast from the inner end of the military wharf on the south side of the northeastern point of the island. Elevation: 8.9 feet above lower low water; 5.54 feet above mean tide level.

**Serial No. 339.** *Goat Island.*—B. M. 3 (C. & G. S.) is a small hole surrounded by a circle cut into a horizontal projection of rock on the northern side of the northwest point of the island and has the letters "B. M." cut just below the vertical face of the rock. Elevation: 10.6 feet above lower low water; 7.26 feet above mean tide level.

**Serial No. 340.** *Goat Island.*—B. M. 4 is a Coast and Geodetic Survey standard disk cemented into a hole which was drilled in the concrete base containing a post used to hold a guy to a transformer pole, near shore on promontory about 150 feet south of the Army Wharf. Elevation: 13.5 feet above lower low water; 10.22 feet above mean tide level.

**Serial No. 341.** *Goat Island.*—B. M. 5 is a Coast and Geodetic Survey standard disk set in cement in a ledge of rock which projects out a little and bears about west from the south end of the Army Wharf which lies at the northeast extremity of Goat Island. Elevation: 7.8 feet above lower low water; 4.51 feet above mean tide level.

**Serial No. 342.** *Goat Island.*—B. M. 6 is a Coast and Geodetic Survey standard disk set in a hole drilled in a square concrete slab which lies at the junction of the south end of the Army Wharf and the shore. Elevation: 13.1 feet above lower low water; 9.79 feet above mean tide level.

**Serial No. 343.** *West Berkeley.*—B. M. 5 is a Coast and Geodetic Survey standard disk set in the top of the concrete sewer on the southeast side of the

University Avenue Wharf, just to the southwest of the outermost manhole and 414 meters from the wharf shed. Elevation: 9.2 feet above lower low water; 5.86 feet above mean tide level.

**Serial No. 344. West Berkeley.**—B. M. 6 is a Coast and Geodetic Survey standard disk set in the top of the concrete sewer just to the southwest of the inner manhole, 530 meters from the wharf shed. Elevation: 10.8 feet above lower low water; 7.50 feet above mean tide level.

**Serial No. 345. West Berkeley.**—B. M. 7 is a Coast and Geodetic Survey standard disk set in concrete inside of the fence and in the foundation of an oil tank of the Coconut Oil Products factory on the northeast corner of University Avenue and Second Street. B. M. is 19 feet from a telephone pole on which there is a fire-alarm box placed right at the northeast corner of the street intersection. Elevation: 12.7 feet above lower low water; 9.37 feet above mean tide level.

**Serial No. 346. Brooks Island.**—B. M. 1 (C. & G. S.) is a cross cut in the rock at the extreme northern end of a small rocky inlet just north of Brooks Island, about 1 foot above the high-water line. Elevation: 6.6 feet above lower low water; 3.38 feet above mean tide level.

**Serial No. 347. Ellis Landing, Richmond.**—B. M. 1 (C. & G. S.) is the base of a triangle formed by nails driven in the east side of an old stable near the dilapidated wharf at Ellis Landing. Elevation: 11.0 feet above lower low water; 7.73 feet above mean tide level.

**Serial No. 348. Ellis Landing, Richmond.**—B. M. 2 (C. & G. S.) is the base of a triangle formed by nails driven in the east side of the warehouse or barn on the dilapidated wharf at Ellis Landing. Elevation: 11.0 feet above lower low water; 7.73 feet above mean tide level.

**Serial No. 349. Point Richmond.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in the southwest corner of pump house on concrete foundation of settling basin of salt-water pumping plant on the east side of the Standard Oil Dock. Elevation: 13.1 feet above lower low water; 9.81 feet above mean tide level.

**Serial No. 350. Point Richmond.**—B. M. 2 is a Coast and Geodetic Survey standard disk set on the southwest corner of the concrete foundation of the brick stack at the old salt-water station on the west side of the Standard Oil Dock. B. M. is at the foot of a square brick chimney at the southwest corner of brick power house at west of wharf landing and bears west-northwest (true) 34 meters from B. M. 1 (Serial No. 349). Elevation: 13.0 feet above lower low water; 9.78 feet above mean tide level.

**Serial No. 351. Point San Pablo.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in a dark-colored outcrop of rock at about high-water line at the tip of the bluff, bearing S. 63° E. (mag.) distant 155 meters from the east corner of the end of the wharf. Elevation: 7.3 feet above lower low water; 4.10 feet above mean tide level.

**Serial No. 352. Point San Pablo.**—B. M. 2 is a Coast and Geodetic Survey standard disk set vertically in the concrete foundation of a red brick house in the bight of shore line beyond the above-mentioned bluff (see description for B. M. 1, Serial No. 351). B. M. 2 is about 2 feet from the south corner of the building and bears N. 75° E. (mag.) 97 meters from B. M. 1 (Serial No. 351). Elevation: 7.6 feet above lower low water; 4.37 feet above mean tide level.

**Serial No. 353. Pinole Point, San Pablo Bay.**—B. M. 1 (C. & G. S.) is a notched bolt in the large square chimney in the rear of the Pinole Powder Works Landing. The letters "U. S. C." are marked on the chimney alongside the bolt. Elevation: 36.8 feet above lower low water; 33.31 feet above mean tide level.

**Serial No. 354. Pinole, Contra Costa County.**—B. M. (C. & G. S.) is a cross cut in the head of a copper bolt let into the facade of the powder magazine at the California Powder Works. B. M. is 3 feet 1 inch above base and 7 inches from south corner of building. Elevation: 14.6 feet above lower low water; 11.07 feet above mean tide level.

**Serial No. 355. Refugio Landing, Contra Costa County.**—B. M. 1 is a Coast and Geodetic Survey standard disk set with cement in a drill hole on top of a concrete foundation pier, which is about 2½ feet square on top and about 3 feet high, in the grounds of the Hercules Powder Co. B. M. is located in the south foundation wall of a small building just east of narrow-gauge railroad track and north of the main line of the Southern Pacific Railroad. Elevation: 13.0 feet above lower low water; 9.53 feet above mean tide level.

**Serial No. 356. Refugio Landing, Contra Costa County.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in cement inside a 30-inch length of draintile in the grounds of the Hercules Powder Co. The top of the tile is about 6 inches above the surface of the ground. B. M. is about 7 feet from an iron fire hydrant, the fire hydrant being the first one on solid ground reached from the dock and located between two narrow-gauge railroad tracks. Elevation: 11.3 feet above lower low water; 7.80 feet above mean tide level.

**Serial No. 357. Refugio Landing, Contra Costa County.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in the top and on the northeast side of a concrete pile on the northeast side of the Hercules Powder Co.'s Dock No. 1 and about midway along the dock. The pile is the twenty-fifth from the inshore end of the dock, and the sixteenth which has a heavy concrete coating. Elevation: 7.0 feet above lower low water; 3.54 feet above mean tide level.

**Serial No. 358. Refugio Landing, Contra Costa County.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in the concrete foundation on the northwest corner of the power plant in the grounds of the Hercules Powder Co. This is the only large brick building north of the Southern Pacific Railroad tracks. B. M. is  $2\frac{1}{2}$  feet above the ground. Elevation: 14.7 feet above lower low water; 11.25 feet above mean tide level.

**Serial No. 359. Crockett, Carquinez Strait.**—B. M. 1 (C. & G. S.) is a cross on an iron bolt in north face of oil-storage house of C. & H. Sugar Refinery. Bolt is placed about 9 feet west of door and midway between the first and second windows on a level with the window ledges. Elevation: 14.8 feet above lower low water; 11.24 feet above mean tide level.

**Serial No. 360. Crockett, Carquinez Strait.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in the south face of the old shop building of the C. & H. Sugar Refinery. B. M. is placed 5 feet east of the entrance to passageway through building and  $1\frac{1}{2}$  feet above surface of the ground. Elevation: 13.9 feet above lower low water; 10.31 feet above mean tide level.

**Serial No. 361. Crockett, Carquinez Strait.**—B. M. 3 (C. & G. S.) is a nailhead in the top of a concrete post placed along the outside of the south wall of the C. & H. Sugar Refinery, 51 feet east of the gate and between the third and fourth posts in the wall. The post is about 5 inches in diameter and projects 2 or 3 inches above the ground. B. M. is 12 feet east of nearest west post in wall, 3 feet west of nearest east post in wall, and 7 feet north of Southern Pacific Railroad sidetrack. Elevation: 13.9 feet above lower low water; 10.36 feet above mean tide level.

**Serial No. 362. Martinez, Carquinez Strait.**—B. M. 2 (C. & G. S.) is a horizontal mark cut in the head of a 6-inch copper bolt set in bricks on west side of a pier built to mark the triangulation station Martinez East. It is upon the first hill overlooking the bay just east of the town of Martinez. The triangulation station is marked as follows: A large stone,  $3\frac{1}{2}$  feet below the surface of the ground, has a copper bolt with a cross marking its center. Over this stone a brick pier was built which rises 4 feet above the surface of the ground. A copper bolt was set in the center of the pier  $1\frac{1}{2}$  feet below the surface, and another bolt in top, each with a cross cut in top of bolt to mark station. B. M. 2 is about 10 inches above the ground. Elevation: 190.6 feet above lower low water; 187.19 feet above mean sea level.

**Serial No. 363. Martinez, Carquinez Strait.**—B. M. 3 (U. S. G. S.) is a cross in the center of a copper disk, 4 inches in diameter, set into the north side of the courthouse steps that face toward the west. B. M. is about  $2\frac{1}{2}$  feet in from the lower step and 1 foot above the ground, and the disk is inscribed "U. S. Geological Survey B. M., elevation 27.0 feet." As the mark was moved during the construction of the new building, prior to 1909, its elevation was probably changed. Elevation: 26.6 feet above lower low water; 23.20 feet above mean sea level.

**Serial No. 364. Suisun Point, Suisun Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in the top of a 6-inch pipe filled with concrete and set into the ground with 2 or 3 inches projecting above the surface of the ground. B. M. is 114 feet from the inner end of the dock, 27 feet east of projection of center line of straight approach to the dock, and about 7 feet from the center line of track running onto the dock. Elevation: 14.4 feet above lower low water; 11.06 feet above mean tide level.

**Serial No. 365. Suisun Point, Suisun Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in the northeast corner of the concrete foundation under steel column at the northeast corner of smelter building. Elevation: 19.1 feet above lower low water; 15.78 feet above mean tide level.

**Serial No. 366. Suisun Point, Suisun Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in top of vitrified pipe filled with concrete set flush in ground between warehouse No. 8 and railroad, being 2 feet from the warehouse and 5 feet from its northeast corner. Elevation: 17.3 feet above lower low water; 13.96 feet above mean tide level.

**Serial No. 367. Suisun Point, Suisun Bay.**—B. M. 4 is a Coast and Geodetic Survey standard disk set in top of retaining wall which runs north from the smelter building along the track. B. M. is about 6 feet from the building. Elevation: 24.2 feet above lower low water; 20.86 feet above mean tide level.

**Serial No. 368. Bay Point, Suisun Bay.**—B. M. 1 (C. & G. S.) is the head of a galvanized spike forming the center of a cross of iron tacks driven into the horizontal upper surface of one of the stringers supporting the plank roadway on which the lumber railroad tracks are laid at the Smith Lumber Co. dock. B. M. is on the west end of the stringer a short distance south of where the roadway branches and is 6.2 feet south from a pole supporting a fire-alarm box and 25.7 feet from the ladder leading to the tank. Elevation: 9.3 feet above lower low water; 5.87 feet above mean tide level.

**Serial No. 369. Bay Point, Suisun Bay.**—B. M. 2 (C. & G. S.) is the head of a galvanized spike forming the center of a cross of iron tacks driven horizontally into the 8 by 8 inch stringer which forms the north sill of a small stable and platform on the east side of the main wharf of the Smith Lumber Co. B. M. is 6.1 feet west of the northwest corner of the stable and 1.5 feet below the planking of the dock. Elevation: 9.8 feet above lower low water; 6.39 feet above mean tide level.

**Serial No. 370. Bay Point, Suisun Bay.**—B. M. 3 (C. & G. S.) is the head of a galvanized spike forming the center of a cross of iron tacks driven horizontally into the middle of the east end of the south big sill of the electric crane on the dock of the Smith Lumber Co. The sill is about 1½ feet square. Elevation: 12.1 feet above lower low water; 8.71 feet above mean tide level.

**Serial No. 371. Bay Point, Suisun Bay.**—B. M. 4 (C. & G. S.) is a small hole in the center of an iron cap set in a concrete post which projects about 9 inches out of the ground and is placed 42 feet west of the shore end of wharf, 25 feet south of edge of bank, 16 feet north of small one-story shack, and 50 feet south of high-water line (all distances approximate). The iron cap is marked "U. S. E. D., ELEV.—B. M. No. —." Elevation: 18.0 feet above lower low water; 14.64 feet above mean tide level.

**Serial No. 372. Bay Point, Suisun Bay.**—B. M. 5 is a Coast and Geodetic Survey standard disk set in concrete in 10-inch sewer pipe, set flush with the ground, 6 feet northwest of the northeast corner of the machine shop of the Pacific Shipbuilding Co. and about 15 feet from the southwest corner of the paint shop. Elevation: 15.1 feet above lower low water; 11.71 feet above mean tide level.

**Serial No. 373. Bay Point, Suisun Bay.**—B. M. 6 is a Coast and Geodetic Survey standard disk set into the vertical face of the vault of the office building of the Pacific Shipbuilding Co. It is in the northern face 3 feet from the north-east corner of the vault and 3 feet above the ground. Elevation: 17.1 feet above lower low water; 13.68 feet above mean tide level.

**Serial No. 374. Ryer (Kings) Island, Suisun Bay.**—B. M. 2 (C. & G. S.) is the middle one of five copper nails driven into the southeast corner of a large dwelling house on Ryer Island. It is about 927 feet from the center of the wharf or dock. Elevation: 9.4 feet above lower low water; 6.00 feet above mean tide level.

**Serial No. 375. Pittsburg, Suisun Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "#1-1923," set in the top of the west retaining wall back of the City Hall. The wall is of concrete, and the B. M. is located about 13½ feet from the building itself. Elevation: 29.8 feet above lower low water; 27.19 feet above mean tide level.

**Serial No. 376. Pittsburg, Suisun Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk, stamped "#2-1923," set in concrete in the top of a 10-inch vitrified pipe. The pipe is set in the ground with 3 or 4 inches projecting above the ground and is located in the northwest corner of the fence around a white house which is about 260 feet west of Booth's cannery and 160 feet south of the high-water line. Elevation: 13.1 feet above lower low water; 10.49 feet above mean tide level.

**Serial No. 377. Pittsburg, Suisun Bay.**—B. M. 3 (C. & G. S.) is the letter "W" on sewer inlet set in the corner of the curb near the First National Bank at

Railroad Avenue and East Fourth Street. Elevation: 20.3 feet above lower low water; 17.68 feet above mean tide level.

**Serial No. 378.** *Pittsburg, Suisun Bay.*—B. M. 21 (U. S. G. S.) is a United States Geological Survey bench mark, stamped “#21,” set in an iron pipe which stands about 2 feet above the ground. The pipe is located in the corner of the primary-school yard which is nearest to and back of the Contra Costa County Bank. Elevation: 22.7 feet above lower low water; 20.05 feet above mean tide level.

**Serial No. 379.** *Stockton, San Joaquin River.*—B. M. 1 (U. S. E.) is on iron post with brass cap, stamped “No. 201,” on south levee, San Joaquin River, opposite gauge and about 800 feet below Stockton Channel. Elevation: 12.1 feet above lower low water; 10.92 feet above mean tide level.

**Serial No. 380.** *Collinsville, Sacramento River.*—B. M. 3 (C. & G. S.) is a 2-inch copper nail driven into the south side of Upham's Hotel, 10 inches west of the southeast corner and 4.33 feet above the floor of the portico. Four iron nails form a 4-inch square about the B. M. Elevation: 14.3 feet above lower low water; 11.38 feet above mean tide level.

**Serial No. 381.** *Collinsville, Sacramento River.*—B. M. 4 (C. & G. S.) is a point marked by three iron tacks driven close up to the casing of the window, in the window sill at the left of the entrance to the general store. Elevation: 11.9 feet above lower low water; 8.99 feet above mean tide level.

**Serial No. 382.** *Collinsville, Sacramento River.*—B. M. 5 (C. & G. S.) is an iron tack surrounded by three other tacks driven into the flooring at the left of the entrance to the building formerly used as a saloon and located directly opposite the general store. Elevation: 10.1 feet above lower low water; 7.21 feet above mean tide level.

**Serial No. 383.** *Collinsville, Sacramento River.*—B. M. 6 (U. S. G. S.) is an iron post with a brass cap, stamped “5 B.” at the southwest corner of the school-house grounds at the crossroads  $\frac{1}{2}$  mile north of Collinsville. Elevation: 7.9 feet above lower low water; 4.97 feet above mean sea level.

**Serial No. 384.** *Rivista, Sacramento River.*—B. M. 1 (U. S. G. S.) is an aluminum tablet 2 feet above the sidewalk at the east corner of the Rivista Bank Building. Elevation: 23.3 feet above lower low water; 21.44 feet above mean tide level.

**Serial No. 385.** *Sacramento, Sacramento River.*—B. M. 1 (U. S. G. S.) is an aluminum tablet, stamped “31 B.” 5 feet from the ground in the north wall of the post office, 15 feet from the northwest corner. Elevation: 25.7 feet above lower low water; 25.16 feet above mean tide level.

**Serial No. 386.** *Montezuma Slough Entrance, Suisun Bay.*—B. M. 1 is a Coast and Geodetic Survey standard disk set in concrete in a 10-inch tile. A stake was driven 8 feet in the ground and the tile set over it. It is about 5 meters west of the levee and about 30 meters south of where the levee turns to the southwest. Elevation: 7.4 feet above lower low water; 4.29 feet above mean tide level.

**Serial No. 387.** *Montezuma Slough Entrance, Suisun Bay.*—B. M. 2 is a Coast and Geodetic Survey standard triangulation mark cemented in the top of a  $2\frac{1}{2}$ -inch galvanized-iron pipe 8 feet long driven into the marshy ground until 2 feet of it projects above the surface. An 8-inch tile was placed around the top of the pipe, with its top 6 inches above ground and 18 inches below the top of the pipe. The space between the pipe and the tile was filled with concrete. B. M. 2 (Serial No. 387) is triangulation station “Montezuma.” It is about 50 meters north of where the levee turns and about 5 meters from the shore. Elevation: 8.8 feet above lower low water; 5.63 feet above mean tide level.

**Serial No. 388.** *Montezuma Slough Entrance, Suisun Bay.*—B. M. 3 is a Coast and Geodetic Survey standard disk set in concrete in a 6-inch tile projecting 8 inches above the surface of the ground. B. M. 3 (Serial No. 388) is the reference mark for triangulation station “Montezuma.” It is located on the levee and directly inshore from the station. Elevation: 7.8 feet above lower low water; 4.69 feet above mean tide level.

**Serial No. 389.** *Benicia, Carquinez Strait.*—B. M. 1 (C. & G. S.) is the upper surface of a  $\frac{3}{4}$ -inch iron bolt driven in a hole horizontally into the southwest face of a large sandstone rock near the high-water mark, about 250 feet east of the land end of the Army wharf. The rock is apparently the outcropping of a ledge about 7 feet high, the B. M. being about 4 feet from the top. The face of the rock was smoothed 1 foot square about the B. M., and the letters “U. S. C. S. B. M.” were cut in the stone. These letters have since been entirely

obliterated. The bolt was reported missing in 1926, and B. M. used was the plane of the upper side of the horizontal drill hole. Elevation: 9.4 feet above lower low water; 5.97 feet above mean sea level.

**Serial No. 390. Benicia, Carquinez Strait.**—B. M. 3 (C. & G. S.) is about 1 foot above and to the left of B. M. 1 (Serial No. 389) and consists of a horizontal step in the ledge covered with what is apparently concrete, circular in shape, and about 4 inches in diameter. There is a small cross in the center of the B. M. In 1926 the cross had weathered away. The horizontal step was used as the B. M. Elevation: 10.3 feet above lower low water; 6.89 feet above mean sea level.

**Serial No. 391. Benicia, Carquinez Strait.**—B. M. 4 is a Coast and Geodetic Survey standard disk set flush with the top of the northeast concrete abutment of the shore end of the Army dock runway. The abutment is near the low-water line. Elevation: 10.4 feet above lower low water; 7.01 feet above mean sea level.

**Serial No. 392. Benicia, Carquinez Strait.**—B. M. 5 is a Coast and Geodetic Survey standard disk set in the east end of the top of the semaphore base at the southwest corner of the railroad and Army dock roadbed intersection. The semaphore is about 6 feet from the south track and about 15 feet from the center of the dock road. The railroad is the main line of the Southern Pacific. Elevation: 10.2 feet above lower low water; 6.80 feet above mean sea level.

**Serial No. 393. Benicia, Carquinez Strait.**—B. M. 6 is a Coast and Geodetic Survey standard disk set in the vertical face of the west side of the south doorway of the second Army storehouse directly north of the Southern Pacific Railroad and dock road crossing and about 50 meters away. B. M. is about 2½ feet above the ground. The doorway is a railroad entrance. Elevation: 16.6 feet above lower low water; 13.16 feet above mean sea level.

**Serial No. 394. Vallejo, Mare Island Strait.**—B. M. 1 (C. & G. S.) is the center of a cross cut on the end of a ½-inch copper bolt cemented horizontally into the southwest brick foundation wall of the southeast frame building of the Union Pressed Brick & Terra Cotta Works, on Fifth Street, about 300 yards northwest of the Southern Pacific Railroad. The bolt is halfway between the corners of the wall, 1 foot above the ground, and is marked "B. M. 1." Elevation: 15.3 feet above lower low water; 11.77 feet above mean sea level.

**Serial No. 395. Vallejo, Mare Island Strait.**—B. M. 2 (C. & G. S.) is the top surface of a copper bolt cemented vertically into a drill hole in an outcrop of rock on the beach, just below the bluff at the intersection of Fifth Street and Solano Avenue. The top of the bolt is marked "B. M. 2." Elevation: 5.1 feet above lower low water; 1.54 feet above mean sea level.

**Serial No. 396. Mare Island.**—B. M. 2 (C. & G. S.) is a cross within a circle cut into the upper surface of the Naval Ammunition Depot stone sea wall at Mare Island Magazine Wharf, and painted black. It is 4 feet 7 inches south of the southern side of the land end of the wharf and 55 feet 2 inches north of the southernmost angle in the wall. It is marked with the letters "U. S. C. S. B. M." Elevation: 11.6 feet above lower low water; 8.01 feet above mean tide level.

**Serial No. 397. Mare Island.**—B. M. (U. S. N. E.) is on edge of sea wall at the lighthouse reservation at the southern end of Mare Island. B. M. is located east from shore end of wharf. Elevation: 11.6 feet above lower low water; 7.98 feet above mean tide level.

**Serial No. 398. Mare Island.**—B. M. (U. S. N. E.) is the center of an arrow cut in concrete at the lower end of the northern dry dock, or Dry Dock No. 1, at Mare Island, on top of sea wall. This is the standard, or base, bench mark used by the Mare Island Navy Engineers. The Mare Island datum plane is tied onto this mark. Navy Engineer levels can be used to obtain the elevations of any number of other prominent points. The arrow mentioned above indicates the direction in which to turn the mechanism to open the caisson of the dry dock. It is 21 feet east and 12 feet south of the south end of the caisson and about 8 inches from the face of the wall. Elevation: 11.0 feet above lower low water; 7.42 feet above mean tide level.

**Serial No. 399. Mare Island.**—B. M. (U. S. N. E.) is on top of sea wall at its northern end in front of the steam engineering building at the navy yard. Elevation: 11.4 feet above lower low water; 7.79 feet above mean tide level.

**Serial No. 400. Napa Junction, Napa County.**—B. M. 1 (C. & G. S.) is the upper surface of the concrete base of a wooden signal post at the Southern Pacific Railroad station. B. M. is 11 feet 3 inches north and 5 feet 4 inches east of the northeast corner of the depot building and is marked by a 1½-inch

square cut with a chisel. Elevation: 77.9 feet above lower low water; 74.17 feet above mean sea level.

**Serial No. 401. Napa Junction, Napa County.**—B. M. 2 (U. S. G. S.) is the upper surface of a brass cap on a section of a 4-inch iron pipe showing 10 inches above the ground. The cap is lettered "U. S. Geological Survey B. M.; Elevation 70 feet," and has a cross in its center. B. M. is 172 feet west of the west side of the station and 45 feet south of its southern side, or about 178 feet from the southwest corner of the railway station. Elevation: 73.5 feet above lower low water; 69.81 feet above mean sea level.

**Serial No. 402. Napa River.**—B. M. 1 (C. & G. S.) is a cross cut in the head of an iron railroad spike driven into the upper surface of one of the main cross timbers, under the southeast end of trestle No. 65-A over Napa Creek. B. M. is about 2 feet below the track of the Southern Pacific Railroad and 2 feet 8 inches southwest of the southwest rail. It is about 50 yards northwest of bridge tender's house,  $3\frac{1}{2}$  miles northwest of Napa Junction railroad depot. Elevation: 10.4 feet above lower low water; 6.65 feet above mean sea level.

**Serial No. 403. Napa River.**—B. M. 2 (C. & G. S.) is similar to B. M. 1 (Serial No. 402) and is driven into the same timber about 3 feet northeast of the northeast rail. Elevation: 10.3 feet above lower low water; 6.62 feet above mean sea level.

**Serial No. 404. Brazos Drawbridge, Napa River.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in cement in a tile and embedded in the ground with the tile projecting about 3 inches above the ground. B. M. is about 12 yards south of the end of the viaduct approach to the drawbridge, on the levee due west of Brazos station. Elevation: 9.7 feet above lower low water; 5.91 feet above mean tide level.

**Serial No. 405. Brazos Drawbridge, Napa River.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in the abutment 1 foot from the north point of the west abutment of the Brazos Drawbridge. B. M. is practically under the end chord of the north side of the bridge about 300 yards west of Brazos station. Elevation: 10.0 feet above lower low water; 6.25 feet above mean tide level.

**Serial No. 406. Brazos Drawbridge, Napa River.**—B. M. 3 (C. & G. S.) is the top of the south rail opposite the operating house at the center of the draw. Elevation: 17.4 feet above lower low water; 13.68 feet above mean tide level.

**Serial No. 407. Napa, Napa River.**—B. M. 1 is a Coast and Geodetic Survey standard disk cemented into one of the stones forming part of the west abutment of the Third Street Bridge over the Napa River at Napa. B. M. is south of the roadway on Third Street and near the head of a stairway leading down to the boat landing just below the bridge. Elevation: 22.8 feet above lower low water; 18.99 feet above mean tide level.

**Serial No. 408. Napa, Napa River.**—B. M. 2 (U. S. G. S.) is a United States Geological Survey disk set in a wall at the northeast corner of the courthouse, facing Brown Street, 1 foot south of the corner stone and 3.7 feet above the walk. B. M. is stamped "20." Elevation: 24.2 feet above lower low water; 20.47 feet above mean sea level.

**Serial No. 409. Merazo, Sonoma County.**—B. M. 1 (or "yy") (C. & G. S.) is on a bolt in a wing timber at the southeast angle of culvert 69-D, about 300 meters east of Merazo station. The wood is cut away to permit the rod to stand on the bolt. Elevation: 17.3 feet above lower low water; 13.86 feet above mean sea level.

**Serial No. 410. Merazo, Sonoma County.**—B. M. 2 (or "yy2") (C. & G. S.) is 41 feet north of B. M. 1 (Serial No. 409) and is on the rounded head of a bolt through washer and through the easternmost tie of culvert 69-D, between the stringer and the south rail. Elevation: 17.8 feet above lower low water; 14.30 feet above mean sea level.

**Serial No. 411.—Sonoma Creek.**—B. M. (C. & G. S.) is a cross cut in the head of an iron railroad spike driven into the upper surface of the northernmost of the main cross timbers of the trestlework of the Northwestern Pacific Railroad over Sonoma Creek, about 1 mile north of McGill station. This timber is 1 foot square and runs east and west across the trestle about 2 feet below the railroad track. A square iron washer, 3 inches on a side, is between the spike head and the wood. B. M. is  $4\frac{1}{2}$  feet west of the west rail of the track and 5 inches from the west end of the timber. Elevation: 10.7 feet above lower low water; 7.26 feet above mean sea level.

**Serial No. 412. Tubbs Island Wharf, Sonoma Creek.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in concrete in 6-inch tile projecting 6 inches,

on inner slope of levee and 10 feet from the southeast corner of the most northerly large barn at the second turn from the entrance of Sonoma Creek. The barn is at the northern edge of the group of trees. Elevation: 8.3 feet above lower low water; 4.84 feet above mean tide level.

**Serial No. 413.** *Tubbs Island Wharf, Sonoma Creek.*—B. M. 2 is a Coast and Geodetic Survey standard disk set in concrete in a 6-inch tile, 18 inches outside of the east fence around ranch house and 6 feet from the southeast corner of the fence. Elevation: 5.3 feet above lower low water; 1.82 feet above mean tide level.

**Serial No. 414.** *Tubbs Island Wharf, Sonoma Creek.*—B. M. 3 is a Coast and Geodetic Survey standard disk set in the southeast foundation corner of the fourth electric-power transmission tower from the high tower on the west bank of Sonoma Creek entrance. Elevation: 6.2 feet above lower low water; 2.70 feet above mean tide level.

**Serial No. 415.** *Petaluma Creek Entrance.*—B. M. 3 (C. & G. S.) is a cross cut in the upper face of the southeast concrete pier which forms one of the supports of the Northwestern Pacific Railroad drawbridge over Petaluma Creek entrance. Elevation: 8.3 feet above lower low water; 4.93 feet above mean sea level.

**Serial No. 416.** *Petaluma Creek Entrance.*—B. M. 4 (C. & G. S.) is a cross cut with a cold chisel on the top of a piece of railroad iron about  $2\frac{1}{2}$  feet long, which was buried vertically in the hard clay with its top near the surface of the ground, at the west corner of the bridge tender's house on the southwest bank of Petaluma Creek. It is about  $29\frac{1}{2}$  feet southeasterly from the nearest rail of the track and 230 yards northeast of Black Point station on the Northwestern Pacific Railroad. Elevation: 15.2 feet above lower low water; 11.75 feet above mean sea level.

**Serial No. 417.** *Petaluma Creek Entrance.*—B. M. 7 (C. & G. S.) is the outer and upper part of a bolt on the northernmost center pile of the middle cluster on the southern extremity of the falsework on which the bridge swings. A triangle of nails surrounds it, and it is about the same elevation as the central stringer. Elevation: 10.1 feet above lower low water; 6.66 feet above mean tide level.

**Serial No. 418.** *Petaluma Creek Entrance.*—B. M. 8 is a Coast and Geodetic Survey standard disk set in the easternmost concrete pier on the south side of the Northwestern Pacific Railroad drawbridge. Elevation: 9.4 feet above lower low water; 5.98 feet above mean tide level.

**Serial No. 419.** *Petaluma Creek Entrance.*—B. M. 9 is a Coast and Geodetic Survey standard disk set in the westernmost concrete pier on the south side of the Northwestern Pacific Railroad drawbridge. Elevation: 9.6 feet above lower low water; 6.18 feet above mean tide level.

**Serial No. 420.** *Petaluma Creek Entrance.*—B. M. 10 (C. & G. S.) is the upper part of the end of a bolt projecting from the face of a wooden bulkhead at the end of a fill on the west side of the creek and on the north side of the track. A triangle of nails surrounds it. Elevation: 13.3 feet above lower low water; 9.84 feet above mean tide level.

**Serial No. 421.** *Lakeville, Petaluma Creek.*—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "No. 1," set in a 6-inch tile filled with concrete and standing 8 inches out of the ground, 35 meters east and 38 meters north of the east end of the dock, on north end of small knoll. Elevation: 22.1 feet above lower low water; 18.21 feet above mean tide level.

**Serial No. 422.** *Lakeville, Petaluma Creek.*—B. M. 2 is a Coast and Geodetic Survey standard disk, stamped "No. 2," set in a 6-inch tile filled with concrete and standing 3 inches out of the ground, 2 meters west of the northeast corner of a barn located southeast of the dock, and 1 foot north of the north side of this barn. Elevation: 15.5 feet above lower low water; 11.66 feet above mean tide level.

**Serial No. 423.** *Lakeville, Petaluma Creek.*—B. M. 3 is a Coast and Geodetic Survey standard disk, stamped "1922 No. 3," set in a 6-inch tile filled with concrete and placed in the southwest fence corner  $\frac{2}{3}$  meter from each fence line and 3 meters south of south gatepost of gate opening to the driveway leading to the residence of C. H. Bodwell. Elevation: 12.3 feet above lower low water; 8.47 feet above mean tide level.

**Serial No. 424.** *Upper, or Quarry, Drawbridge, Petaluma Creek.*—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "1922 No. 1," set in a 6-inch tile filled with concrete, 4 meters west of the west rail of the main track of the Northwestern Pacific Railroad, 33 meters north of the north end of crushed-

stone bins, 12 meters east of the eastern edge of the concrete highway, and 270 meters south of the drawbridge. Elevation: 14.2 feet above lower low water; 10.10 feet above mean tide level.

**Serial No. 425.** *Upper, or Quarry, Drawbridge, Petaluma Creek.*—B. M. 2 is a Coast and Geodetic Survey standard disk, stamped "1922 No. 2," set in a 6-inch tile filled with concrete placed along a fence, 5 meters from the edge of the concrete highway, 10 meters south of a telephone pole marked "36/18," and about 100 meters from the south end of the drawbridge on a line approximately at right angles with the bridge. Elevation: 21.4 feet above lower low water; 17.39 feet above mean tide level.

**Serial No. 426.** *Upper, or Quarry, Drawbridge, Petaluma Creek.*—B. M. 3 is a Coast and Geodetic Survey standard disk, stamped "1922 No. 3," set in a 6-inch tile filled with concrete, 70 meters south of the south end of the drawbridge, 5½ meters east of the east rail of the main line of the Northwestern Pacific Railroad, 3 meters north of the first switch point south of the drawbridge, and 1 meter west of the right-of-way fence. Elevation: 12.6 feet above lower low water; 8.60 feet above mean tide level.

**Serial No. 427.** *Upper, or Quarry, Drawbridge, Petaluma Creek.*—B. M. 4 (C. & G. S.) is a 6-inch-square concrete highway post with a cross cut on top, 4 meters west of the west edge of the concrete highway, 12 meters north of the telephone pole marked "36/25," and 20 meters west of B. M. 1 (Serial No. 424). Elevation: 24.0 feet above lower low water; 19.93 feet above mean tide level.

**Serial No. 427.** *Upper, or Quarry, Drawbridge, Petaluma Creek.*—B. M. 4 (C. & G. S.) is a 6-inch-square concrete highway post with square cut in its top. The post is set by the north gatepost of the gate between two barns at a distance of 5 meters west of the western edge of the concrete highway and 26 meters north of the telephone pole marked "36/23." Elevation: 19.8 feet above lower low water; 15.71 feet above mean tide level.

**Serial No. 429.** *McNears Landing, San Pablo Bay.*—B. M. 1 is a Coast and Geodetic Survey standard disk, stamped "No. 1," set in a large irregular concrete slab on top of the sea wall, and bears N. 27° W. (mag.) distant 30 meters from the north side of the wharf landing. Elevation: 12.5 feet above lower low water; 9.22 feet above mean tide level.

**Serial No. 430.** *McNears Landing, San Pablo Bay.*—B. M. 2 is a Coast and Geodetic Survey standard disk set in bedrock just above the high-water line and 4 meters southeast of B. M. 1. (Serial No. 429). Elevation: 6.8 feet above lower low water; 3.57 feet above mean tide level.

**Serial No. 431.** *McNears Landing, San Pablo Bay.*—B. M. 3 is a Coast and Geodetic Survey standard disk, stamped "No. 3," set in a concrete post in the southeast corner of the yard of the McNear residence, and bears N. 70° W. (mag.) distant 190 meters from the northwest corner of a large frame building south of the north landing to the wharf. Elevation: 11.4 feet above lower low water; 8.19 feet above mean tide level.

**Serial No. 432.** *McNears Landing, San Pablo Bay.*—B. M. 4 is a Coast and Geodetic Survey standard disk set in a horizontal drill hole in an outcropping rock on the face of a cliff on the left-hand side of a road which turns off to the left from the main road leading from McNears quarry. The station is about 10 meters from the fork of the road. Elevation: 19.5 feet above lower low water; 16.26 feet above mean tide level.

**Serial No. 433.** *McNears Landing San Pablo Bay.*—B. M. 5 is a Coast and Geodetic Survey standard disk set in a drill hole in the rocky shore north of McNears Landing. It is about 2 feet above high water and about 2 meters from B. M. 1 (Serial No. 429). Elevation: 6.8 feet above lower low water; 3.51 feet above mean tide level.

**Serial No. 434.** *San Rafael, Marin County.*—B. M. 2 (C. & G. S.) is the northeast corner of the iron cap over the brick pier supporting the northeast corner post of the depot of the Northwestern Pacific Railroad. Elevation: 12.5 feet above lower low water; 9.34 feet above mean sea level.

**Serial No. 435.** *Point San Quentin.*—B. M. 1 is a Coast and Geodetic Survey standard disk set in sandstone bedrock at the southeast side of the head of the wharf leading to the ferry slip. Elevation: 11.9 feet above lower low water; 8.69 feet above mean tide level.

**Serial No. 436.** *Point San Quentin.*—B. M. 2 is a Coast and Geodetic Survey standard disk set in a yellow sandstone outcrop just above the high-water line northwest of the head of the ferry wharf and bearing N. 80° W. (mag.) distant 30 meters from B. M. 1 (Serial No. 435). Elevation: 7.0 feet above lower low water; 3.71 feet above mean tide level.

**Serial No. 437. Point San Quentin.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in a black-stained, hard, gray sandstone outcrop at about the high-water line on the first point to the northwest of the causeway leading to the ferry wharf and just north of a ledge of yellow sandstone extending out to the low-water line. B. M. 3 bears N. 80° W. (mag.) distant 226 meters from B. M. 2 (Serial No. 436). Elevation: 5.2 feet above lower low water; 1.90 feet above mean tide level.

**Serial No. 438. El Campo, Marin County.**—B. M. 1 (C. & G. S.) is the head of a nail driven into the center of a lead plug in a hole in the center of a 7-inch circle cut in the top of the highest point of the rock ledge on the north side of the point of land about  $\frac{3}{4}$  mile southeast by south from California Point. Bearings and distances are as follows: Highest point Red Rock, NNE.  $\frac{3}{4}$  E., distant  $2\frac{3}{8}$  miles; California Point, NW by N., distant  $\frac{3}{4}$  mile. Elevation: 5.9 feet above lower low water; 2.74 feet above mean tide level.

**Serial No. 439. California City, Marin County.**—B. M. 1/17 (C. & G. S.) is the top of a ringbolt set in the sandstone bedrock at about the high-water line and bearing N. 37° W. (mag.) distant 133 feet from the northwest side of the abutment of the Government coal dock. The bolt is bent to the northeastward. Elevation: 6.1 feet above lower low water; 2.93 feet above mean tide level.

**Serial No. 440. California City, Marin County.**—B. M. 5 is a Coast and Geodetic Survey standard disk set in a slightly projecting sandstone bedrock ledge and bearing N. 52° W. (mag.) from B. M. 1 (Serial No. 439). Elevation: 10.4 feet above lower low water; 7.24 feet above mean tide level.

**Serial No. 441. California City, Marin County.**—B. M. 6 is a Coast and Geodetic Survey standard disk set in a sandstone bedrock point bearing N. 40° W. (mag.) distant about 230 feet from the abutment of the coal dock and N. 25° W. (mag.) distant 30 feet from B. M. 5 (Serial No. 440). Elevation: 10.0 feet above lower low water; 6.78 feet above mean tide level.

**Serial No. 442. Tiburon, Marin County.**—B. M. 1 (C. & G. S.) is the center one of five nails in the form of a cross driven between the letters "U. S." and "B. M." in the sill at the southeast corner of the Northwestern Pacific Railroad Co.'s tank house. Elevation: 11.3 feet above lower low water; 8.19 feet above mean tide level.

**Serial No. 443. Quarantine Station, Angel Island.**—B. M. 1 (C. & G. S.) is the top of a copper bolt set in a yellow block-shaped rock weighing about 300 pounds, which was moved into its position. The letters "B. M." are chiseled into the rock near the bolt. It is located at the high-water line on the beach, nearly north from the signal N. W. X. 2 on the western edge of the immigrant reservation. Elevation: 6.7 feet above lower low water; 3.59 feet above mean tide level.

**Serial No. 444. Quarantine Station, Angel Island.**—B. M. 2 (C. & G. S.) is a copper bolt set in the rocky bluff at the high-water mark on the shore. It is 55 feet west, in a horizontal line, from the signal N. E. X. 1 on the eastern boundary of the immigrant reservation. Elevation: 9.1 feet above lower low water; 5.96 feet above mean tide level.

**Serial No. 445. Quarantine Station, Angel Island.**—B. M. 3 (C. & G. S.) is the signal station N. W. X. 2 on the bluff at the north end of the western boundary of the immigrant reservation. Elevation: 53.1 feet above lower low water; 50.00 feet above mean tide level.

**Serial No. 446. Quarantine Station, Angel Island.**—B. M. 4 (C. & G. S.) is the signal station N. E. X. 1 on the bluff at the north end of the eastern boundary of the immigrant reservation. Elevation: 44.3 feet above lower low water; 41.20 feet above mean tide level.

**Serial No. 447. Quarry Point, Angel Island.**—B. M. 2 (C. & G. S.) is a horizontal line cut in the face of a sandstone ledge, about 40 feet to the southward and eastward from the inner end of wharf formerly located about halfway between Quarry Point and Blunt Point. Elevation: 8.9 feet above lower low water; 5.74 feet above mean tide level.

**Serial No. 448. Quarry Point, Angel Island.**—B. M. 3 (C. & G. S.) is a cross with the letters "U. S." cut below, on the south face of a large boulder in the small bight north of Quarry Point. The boulder is about 15 by 10 feet and is about 250 meters northwest from triangulation station "Quarry." The cross is about 2 feet below the top of the boulder. Elevation: 6.7 feet above lower low water; 3.60 feet above mean tide level.

**Serial No. 449. Sausalito, Marin County.**—B. M. 2 (C. & G. S.) is the round head of a copper bolt set firmly in a rock alongshore just above the high-water mark, about 100 feet south of the Government wharf at the United

States military reservation. Elevation: 7.4 feet above lower low water; 4.44 feet above mean sea level.

**Serial No. 450. Sausalito, Marin County.**—B. M. 5 (C. & G. S.) is the upper surface of the lowest of three hinge sockets on the east side of the door on the north side of the brick magazine on the Government reservation. Elevation: 34.1 feet above lower low water; 31.06 feet above mean sea level.

**Serial No. 451. Sausalito, Marin County.**—B. M. 6 (C. & G. S.) is similar to B. M. 5 (Serial No. 450), and is the upper surface of the lowest of three hinge sockets on the west side of the door on the north side of the brick magazine on the Government reservation. Elevation: 34.1 feet above lower low water; 31.06 feet above mean sea level.

**Serial No. 452. Sausalito, Marin County.**—B. M. 18 is a Coast and Geodetic Survey standard disk set in a concrete post projecting about 6 inches above the ground at the wharf and between the wharf and the Northwestern Pacific Railroad tracks. B. M. bears S. 5° W. (mag.) distant 67 meters from the southwest corner of the wharf house and is stamped "Sausalito No. 1, 1917." Elevation: 9.9 feet above lower low water; 6.92 feet above mean sea level.

**Serial No. 453. Sausalito, Marin County.**—B. M. 19 is a Coast and Geodetic Survey standard disk set in the side of a small brick store building at the northeast corner of the intersection of Pine and Caledonia Streets, about 1 foot above the cement sidewalk on Pine Street. B. M. bears S. 2° W. (mag.) distant 94 meters from B. M. 18 (Serial No. 452) and is stamped "Sausalito No. 2, 1917." Elevation: 16.4 feet above lower low water; 13.44 feet above mean sea level.

**Serial No. 454. Sausalito, Marin County.**—B. M. 20 is a Coast and Geodetic Survey standard disk set in the concrete foundation of a large frame building on the southwest corner of the intersection of Pine and Caledonia Streets, about 1 foot above the cement sidewalk on Pine Street. B. M. bears S. 50° W. (mag.) distant 27 meters from B. M. 19 (Serial No. 453). B. M. is stamped "Sausalito No. 3, 1917." Elevation: 17.8 feet above lower low water; 14.78 feet above mean sea level.

**Serial No. 455. Sausalito, Marin County.**—B. M. 23 is a Coast and Geodetic Survey standard disk set in the black rocks of the shore about 5 feet above high water and on the first rocky point north of the old Water Dock, about 150 feet. B. M. is about 6 feet out from the cliff. The Water Dock is about  $\frac{1}{4}$  mile from the Fort Baker-Sausalito Gate. Elevation: 10.3 feet above lower low water; 7.32 feet above mean sea level.

**Serial No. 456. Sausalito, Marin County.**—B. M. 24 is a Coast and Geodetic Survey standard disk set in a concrete block about 4 inches above the level of the ground, about 83 feet west up the path from the shore end of the old Water Dock, about 75 feet up a well-cut stream bed from the shore end of the old dock and about 35 feet northwest from that point. B. M. is about 7 feet southeast of a large three-forked scrub-oak tree and about 25 feet southwest from the edge of the bank leading to the bay. A  $\frac{5}{8}$ -inch iron rod is set in the base of the concrete block and extends about  $2\frac{1}{2}$  feet above the ground. Elevation: 47.2 feet above lower low water; 44.24 feet above mean sea level.

**Serial No. 457. Sausalito, Marin County.**—B. M. 25 is a Coast and Geodetic Survey standard disk set in a concrete block about 1,300 feet south of the Fort Baker-Sausalito Gate and about 18 feet northeast of the northeast side of the Fort Baker-Sausalito Road. B. M. is about 10 feet below the level of the road and about 6 inches above the ground. Elevation: 101.5 feet above lower low water; 98.45 feet above mean sea level.

**Serial No. 458. Sausalito, Marin County.**—B. M. 26 is a Coast and Geodetic Survey standard disk set in the center of the top of the west wall of a brick culvert, about 825 feet south of the Fort Baker-Sausalito Gate. B. M. is about 7 feet west of the west side of the road and about 2 feet below the level of the road. A stream runs to the old dock. Elevation: 106.6 feet above lower low water; 103.64 feet above mean sea level.

**Serial No. 459. Sausalito, Marin County.**—B. M. 27 is a Coast and Geodetic Survey standard disk set in a concrete block about 775 feet south of the Fort Baker-Sausalito Gate, about 8 feet west of the west side of the road, 1 foot inside the fence line, and 1 foot above the road level. B. M. is 4 inches above the ground and about 50 feet north of B. M. 26 (Serial No. 458). Elevation: 110.0 feet above lower low water; 107.04 feet above mean sea level.

**Serial No. 460. Sausalito, Marin County.**—B. M. 28 is a Coast and Geodetic Survey standard disk set in a concrete block about 475 feet south of the Fort

Baker-Sausalito Gate, about 14 feet east of the east side of the road, and about 4 feet below the level of the road. B. M. is 6 inches above the ground. Elevation: 106.8 feet above lower low water; 103.79 feet above mean sea level.

**Serial No. 461. Lime Point, Golden Gate.**—B. M. 11 (C. & G. S.) is a 2½-inch triangle cut at the western end of the granite step at the bottom of the wooden stairs on the south side of the guardhouse at Fort Baker and is partly covered by a post supporting a handrail. Elevation: 18.4 feet above lower low water; 15.39 feet above mean sea level.

**Serial No. 462. Lime Point, Golden Gate.**—B. M. 13 (C. & G. S.) is a cross on the southwest end of the granite sill of the northwest door of the old pumping station at Fort Baker, on the road leading to Lime Point from the barracks. Elevation: 12.5 feet above lower low water; 9.45 feet above mean sea level.

**Serial No. 463. Lime Point, Golden Gate.**—B. M. 14 (C. & G. S.) is a triangle inscribed in a 4-inch circle on the granite abutment on the inner end of the Government wharf, about 500 meters southwest of the barracks and 300 meters from B. M. 13 (Serial No. 462) in the direction of Lime Point Lighthouse. Elevation: 12.8 feet above lower low water; 9.83 feet above mean sea level.

**Serial No. 464. Lime Point, Golden Gate.**—B. M. 15 (C. & G. S.) is a cross cut 9 inches from the eastern end of the next to the bottom step of the cement steps leading from the path to the upper cement walk to the lighthouse. B. M. is possibly covered with whitewash. Elevation: 20.7 feet above lower low water; 17.65 feet above mean sea level.

**Serial No. 465. Lime Point, Golden Gate.**—B. M. 16 (C. & G. S.) is a 2½-inch triangle cut in the cement walk leading to the lighthouse close to the eastern edge near the railing and at the top of the steps. B. M. is possibly covered with whitewash. Elevation: 28.5 feet above lower low water; 25.50 feet above mean sea level.

**Serial No. 466. Lime Point, Golden Gate.**—B. M. 17 (C. & G. S.) is a ¾-inch brass bolt about 6 inches long set with cement in the extremely hard rock, with about ¼ inch protruding above the highest part. B. M. is just west of the cement walk and north of the tank which is west of the walk. Elevation: 31.6 feet above lower low water; 28.54 feet above mean sea level.

**Serial No. 467. Lime Point, Golden Gate.**—B. M. 21 is a Coast and Geodetic Survey standard disk set in the concrete top of the rubble sea wall just north of the wharf abutment. Elevation: 10.8 feet above lower low water; 7.80 feet above mean sea level.

**Serial No. 468. Lime Point, Golden Gate.**—B. M. 22 is a Coast and Geodetic Survey standard disk set in a concrete post projecting about 8 inches from the ground just north of the bottom of the stairs up the hill. B. M. bears N. 86° W. (mag.) distant 83 feet from B. M. 21 (Serial No. 467). Elevation: 16.0 feet above lower low water; 13.02 feet above mean sea level.

**Serial No. 469. Diablo Cove, Golden Gate.**—B. M. 1 (C. & G. S.) is a cross chipped in the vertical face of the rock wall on the south side of a small cleft in the shore, 200 meters northwest by north (mag.) from the eastern tip of Diablo Point. Elevation: 10.5 feet above lower low water; 7.43 feet above mean tide level.

**Serial No. 470. Bonita Cove, Golden Gate.**—B. M. 1 is a Coast and Geodetic Survey standard disk, marked "Bonita," set in the top of a flat rock directly under the wharf where it crosses the high-water mark on the beach and 3 feet southeast of a bend in the trestle. B. M. 1 is 1½ feet northerly from a 4-foot vertical drop in the rock. Elevation: 11.3 feet above lower low water; 8.17 feet above mean tide level.

**Serial No. 471. Bonita Cove, Golden Gate.**—B. M. 2a is a Coast and Geodetic Survey standard disk set in the top of a large red and green rock on the beach 10 feet from the base of the bluff and 42 paces west of B. M. 1 (Serial No. 470). Elevation: 15.8 feet above lower low water; 12.68 feet above mean tide level.

**Serial No. 472. Bonita Cove, Golden Gate.**—B. M. 3 is a Coast and Geodetic Survey standard disk, marked "Bonita," set in a rocky ledge extending out from shore, 31 paces north of the inshore end of the trestle, 10 paces north-easterly from the railway to the boathouse, and 16 paces east of the boathouse. B. M. 1 (Serial No. 470) bears 204° (mag.). Elevation: 9.7 feet above lower low water; 6.60 feet above mean tide level.

**Serial No. 473. Bonita Cove, Golden Gate.**—B. M. A 1 (C. & G. S.) is the top of the westernmost of two square boltheads set 18 inches apart near the north-east corner of the enlarged section of the wharf on top of cant topping wharf planking within 8 inches of the edge of the wharf. Elevation: 17.5 feet above lower low water; 14.41 feet above mean tide level.

**SECTION D.—ELEVATIONS OF BENCH MARKS, SERIAL NOS. 474 TO 513, GOLDEN GATE TO CRESCENT CITY, STATE OF CALIFORNIA**

Serial number	Locality	Elevation of bench marks above—							
		Highest tide	Higher high water	Mean high water	Mean tide level	Mean sea level	Mean low water	Lower low water	Lowest tide
474	Tomales Point, Tomales Bay.....	Feet -1.8	Feet 1.7	Feet 2.3	Feet 4.24	Feet	Feet 6.2	Feet 7.2	Feet 9.7
475	do.....	0.4	3.9	4.5	6.40		8.4	9.4	11.9
476	do.....	0.7	4.2	4.8	6.72		8.7	9.7	12.2
477	Hamlet Wharf, Tomales Bay.....	-0.6	2.9	3.5	5.42		7.4	8.4	10.9
478	do.....	-2.1	1.4	2.0	3.99		5.9	6.9	9.4
479	do.....	0.0	3.5	4.1	6.04		8.0	9.0	11.5
480	Greenwood Landing, Mendocino County.....	29.2	32.2	32.9	34.59		37.0	38.2	40.7
481	do.....	138.7	141.7	142.4	144.42		146.5	147.7	160.2
482	do.....	151.7	154.7	155.4	157.45		159.5	160.7	163.2
483	do.....	146.7	149.7	150.4	152.42		154.5	155.7	158.2
484	Russian Gulch, Mendocino County.....	3.1	6.2	6.9	8.88		10.9	12.1	14.6
485	do.....	0.6	3.7	4.4	6.40		8.4	9.6	12.1
486	do.....	2.8	5.9	6.6	8.55		10.6	11.8	14.3
487	Rockport, Mendocino County.....	4.0	6.8	7.5	9.68		11.8	13.0	15.5
488	do.....	7.5	10.3	11.0	13.18		15.3	16.5	19.0
489	do.....	56.3	59.1	59.8	61.93		64.1	65.3	67.8
490	Shelter Cove, Humboldt County.....	-1.5	1.4	2.1	4.23		6.3	7.5	10.0
491	do.....	-1.6	1.3	2.0	4.08		6.2	7.4	9.9
492	do.....	62.7	65.6	66.3	68.44		70.5	71.7	74.2
493	do.....	55.7	58.6	59.3	61.36		63.5	64.7	67.2
494	South Jetty, Humboldt Bay.....	-1.6	1.5	2.2	4.39		6.7	7.9	10.9
495	do.....	5.5	8.6	9.3	11.55		13.8	15.0	18.0
496	do.....	1.0	4.1	4.8	7.03		9.3	10.5	13.5
497	do.....	5.3	8.4	9.1	11.37		13.6	14.8	17.8
498	do.....	0.5	3.6	4.3	6.56		8.8	10.0	13.0
499	North Jetty, Humboldt Bay.....	3.6	6.1	6.8	9.11		11.4	12.6	15.6
500	do.....	5.6	8.1	8.8	11.13		13.4	14.6	17.6
501	do.....	2.3	4.8	5.5	7.84		10.1	11.3	14.3
502	do.....	-2.0	0.5	1.2	3.46		5.8	7.0	10.0
503	Fields Landing, Humboldt Bay.....	0.8	3.3	4.0	6.29		8.6	9.8	12.8
504	do.....	-1.4	1.1	1.8	4.15		6.4	7.6	10.6
505	do.....	5.2	7.7	8.4	10.71		13.0	14.2	17.2
506	Eureka, Humboldt Bay.....	1.9	4.2	4.9	7.30		9.7	10.9	13.9
507	do.....	24.6	26.9	27.6	30.01		32.4	33.6	36.6
508	do.....	10.2	12.5	13.2	15.61		18.0	19.2	22.2
509	do.....	38.7	41.0	41.7	44.07		46.5	47.7	50.7
510	do.....	6.1	8.4	9.1	11.53		13.9	15.1	18.1
511	do.....	37.7	40.0	40.7	43.14		45.5	46.7	49.7
512	Arcata, Humboldt Bay.....	20.8	23.1	23.8	26.18		28.6	29.8	32.8
513	Crescent City, Del Norte County.....	8.3	10.5	11.1	13.63		16.1	17.3	20.3

**SECTION D.—DESCRIPTIONS OF BENCH MARKS, SERIAL NOS. 474 TO 513, GOLDEN GATE TO CRESCENT CITY, STATE OF CALIFORNIA**

**Serial No. 474. Tomales Point, Tomales Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in cement on a large detached rock near the water's edge, about 90 yards northwest of a small stream bed on the western side of Tomales Bay just south of Sand Point. B. M. is located approximately at the high-water mark. Elevation: 7.2 feet above lower low water; 4.24 feet above mean tide level.

**Serial No. 475. Tomales Point, Tomales Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in cement on a large rocky ledge on the western side of the mouth of a small stream south of B. M. 1 (Serial No. 474). B. M. is located about 4 feet above high water. Elevation: 9.4 feet above lower low water; 6.40 feet above mean tide level.

**Serial No. 476. Tomales Point, Tomales Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in cement on the point of a rocky ledge projecting out from the cliff about 110 yards southwest of the mouth of the small stream

referred to in the above descriptions for B. M. 1 and 2 (Serial Nos. 474 and 475). B. M. is located about 4 feet above high water. Elevation: 9.7 feet above lower low water; 6.72 feet above mean tide level.

**Serial No. 477. Hamlet Wharf, Tomales Bay.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in cement on a large rock outcrop just south of the clubhouse porch at Hamlet. The cement is marked "No. 1, 1921." B. M. is located about 3 feet above high water. Elevation: 8.4 feet above lower low water; 5.42 feet above mean tide level.

**Serial No. 478. Hamlet Wharf, Tomales Bay.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in cement on a large rock near the water's edge about 105 yards south of the clubhouse at Hamlet. The cement is marked "B. M. No. 2." B. M. is located about 1 foot above high water. Elevation: 6.9 feet above lower low water; 3.99 feet above mean tide level.

**Serial No. 479. Hamlet Wharf, Tomales Bay.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in cement in a large rock near the water's edge about 250 yards north of the clubhouse at Hamlet. The cement is marked "B. M. No. 3." B. M. is located about 4 feet above high water. Elevation: 9.0 feet above lower low water; 6.04 feet above mean tide level.

**Serial No. 480. Greenwood Landing, Mendocino County.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in concrete in a crevice of the second rock northwest of and past the cliff line of the mainland. The rock is the first flat-topped rock and supports the railway used by the Goodyear Lumber Co. for loading ships. B. M. is 60 paces from the base of the incline of the railway, 55 paces from a shed on the south side of the railway used for storing the lumber company's Ford pusher, and 1 meter east of the sand box on the east side of the track. B. M. is about 4 meters east of the railway and about 1 foot lower. Elevation: 38.2 feet above lower low water; 34.99 feet above mean tide level.

**Serial No. 481. Greenwood Landing, Mendocino County.**—B. M. 2 is a Coast and Geodetic Survey standard triangulation station disk set in the center of a mass of concrete in a tile and protruding about 5 inches above the ground, marking triangulation station "Yard, 1926." B. M. is in the yard of the lumber company, near the edge of the cliff, and is 40 paces south of the loading platform at the yard end of the chute, 18 paces west of the most westerly railroad track in the yard of the lumber company, 9 paces from the edge of the cliff to the west, and 9 paces from the edge of the cliff to the south. Elevation: 147.7 feet above lower low water; 144.42 feet above mean tide level.

**Serial No. 482. Greenwood Landing, Mendocino County.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in a block of concrete in the yard of the Goodyear Redwood Lumber Co. It is about 2 meters west of the main road through town, about 2 meters south of a railroad track which is the only railroad track that crosses the street from the yard of the lumber company and runs along the south side of the tennis court of the Greenwood Inn. Elevation: 160.7 feet above lower low water; 157.45 feet above mean tide level.

**Serial No. 483. Greenwood Landing, Mendocino County.**—B. M. 4 (C. & G. S.) is the top of a brass screw in the southeast corner of the gasoline-tank base of the Goodyear Redwood Lumber Co.'s general store. The top of the screw is flush with the top of the base of the tank. Elevation: 155.7 feet above lower low water; 152.42 feet above mean tide level.

**Serial No. 484. Russian Gulch, Mendocino County.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in cement on top of a lone detached rock, the only detached rock south of the dock road, about 4 feet high, 2 meters back of the high-water line and 5 meters out from the cliff line, 6 meters south of the dock road and about 25 meters west of the point where the dock road and road to county road meet. Elevation: 12.1 feet above lower low water; 8.88 feet above mean tide level.

**Serial No. 485. Russian Gulch, Mendocino County.**—B. M. 2 is a Coast and Geodetic Survey standard disk set in cement in an outcrop of rock right at the southeast corner of the warehouse dock and easily visible from this corner of the dock, about 3½ feet above high water and 2 meters east of the southeast corner of the dock, and about 20 meters south of the point where the dock road runs onto the dock. Elevation: 9.6 feet above lower low water; 6.40 feet above mean tide level.

**Serial No. 486. Russian Gulch, Mendocino County.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in cement in a crevice of the cliff out 2 meters south of the dock. B. M. is about 2 meters west of the westerly one of two stringers supporting the east end of the warehouse and dock. These

stringers run to the cliff mentioned above. B. M. is due west of the end of the westerly stringer, about 6 feet above high water, and only the cement is visible from the southeast corner of the warehouse on the dock. Elevation: 11.8 feet above lower low water; 8.55 feet above mean tide level.

**Serial No. 487. Rockport, Mendocino County.**—B. M. 1 is a Coast and Geodetic Survey standard disk set in concrete in a drill hole in niche on the rock ledge about 2 feet above high water on the east and shore face of the largest rock in Rockport Harbor and about 30 feet from the south end of the rock. This rock supports the loading towers. B. M. is at the bottom of an old ladder that is bolted to the rock. Elevation: 13.0 feet above lower low water; 9.68 feet above mean tide level.

**Serial No. 488. Rockport, Mendocino County.**—B. M. 2 is a Coast and Geodetic Survey standard disk cemented into a drill hole in a shelf on the rocky point on the beach about 300 feet north of the end of the loading trestle. From B. M. 1 (Serial No. 487) the point mentioned is in range with the south end of the long, narrow, and low rock which lies about two-thirds of the distance to the shore from the rock supporting the loading towers. B. M. is about 5 feet above the high-water line. Elevation: 16.5 feet above lower low water; 13.18 feet above mean tide level.

**Serial No. 489. Rockport, Mendocino County.**—B. M. 3 is a Coast and Geodetic Survey standard disk set in a concrete pier on the slope of an alluvial fan at the mouth of the small gully about 500 feet east of the landward loading tower, 50 feet north of the railroad track and about 20 feet higher. There is a switch on the railroad about 100 feet west. Elevation: 65.3 feet above lower low water; 61.93 feet above mean tide level.

**Serial No. 490. Shelter Cove, Humboldt County.**—B. M. 1 (C. & G. S.) is a hole  $2\frac{1}{2}$  inches square and 1 inch deep in the top of a small boulder 2 feet high on the beach, 5 meters from the bulkhead which supports the road leading along the cliff from the wharf to the store. It is the first boulder on the beach toward the point from the pier and is distant 40.7 meters from the nearest pier pile. Elevation: 7.5 feet above lower low water; 4.23 feet above mean tide level.

**Serial No. 491. Shelter Cove, Humboldt County.**—B. M. 2 is a Coast and Geodetic Survey standard reference disk, with arrow pointing to B. M. 1 (Serial No. 490), set in a small recess in top of a greenish, irregularly shaped rock 3 feet high and 12 feet in diameter, on the beach between the pier and point  $2\frac{1}{2}$  meters from the bulkhead supporting the road along the cliff and 12.03 meters from B. M. 1 (Serial No. 490), which bears  $29^\circ$  (mag.). The highest rock in the cove is distant about 100 meters and bears  $128^\circ$  (mag.); left tangent of point is distant about 300 meters and bears  $173^\circ$  (mag.). Elevation: 7.4 feet above lower low water; 4.08 feet above mean tide level.

**Serial No. 492. Shelter Cove, Humboldt County.**—B. M. 3 is a Coast and Geodetic Survey standard reference disk set in a concrete mark 8 by 12 inches and 3 inches above the ground, which stands on the eastern side of the straight road,  $1\frac{1}{2}$  meters from the southwest corner of a blacksmith shop, 9 meters westward from the wagon scales, 24.6 meters southeast from the southwest corner of the store, and 24 meters from the bluff facing the cove. The arrow points to B. M. 4 (Serial No. 493), which is distant 70.4 meters. Elevation: 71.7 feet above lower low water; 68.44 feet above mean tide level.

**Serial No. 493. Shelter Cove, Humboldt County.**—B. M. 4 (C. & G. S.) is an outlined square in a flat rock 8 by 12 inches set in concrete and flush with the surface. The mark is on the eastern side of the straight road leading past Shelter Cove store. The following measurements were taken from the mark: Cliff, 73 meters; B. M. 3 (Serial No. 492) distant 70.4 meters, bearing  $123^\circ$  (mag.); northwest corner of store, 21.2 meters; eucalyptus tree in yard, 26.6 meters; pump, 25.6 meters. Elevation: 64.7 feet above lower low water; 61.36 feet above mean tide level.

**Serial No. 494. South Jetty, Humboldt Bay.**—B. M. A-3 (U. S. A. E.) is the top of a 2-inch galvanized-iron pipe 20 feet east of the main fuel-oil tank. Elevation: 7.9 feet above lower low water; 4.39 feet above mean tide level.

**Serial No. 495. South Jetty, Humboldt Bay.**—B. M. 5 (C. & G. S.) is the top of a rusty  $\frac{5}{8}$ -inch iron bolt embedded in the north side of an old engine-house concrete foundation, 15 feet southwest of the northeast corner. The engine house is on the north side of the railroad track extending to the jetty. It is referenced by a cross and triangle chiseled in the concrete a few inches from it. Elevation: 15.0 feet above lower low water; 11.55 feet above mean tide level.

**Serial No. 496. South Jetty, Humboldt Bay.**—B. M. 6 is a Coast and Geodetic Survey standard disk set in a concrete block 8 by 8 inches by 2 feet. This block projects a few inches above the sand and is located in the projected position of the northeast piling of the water tank. The water tank is the higher of the two tanks located on the north side of the railroad. Elevation: 10.5 feet above lower low water; 7.03 feet above mean tide level.

**Serial No. 497. South Jetty, Humboldt Bay.**—B. M. 7 (C. & G. S.) is located on the same concrete foundation as B. M. 5 (Serial No. 495). It is the center of a 6-inch triangle chiseled in the concrete (horizontal surface) 5 feet east of the west end and halfway between the railroad rails embedded in the concrete. Elevation: 14.8 feet above lower low water; 11.37 feet above mean tide level.

**Serial No. 498. South Jetty, Humboldt Bay.**—B. M. 8 (C. & G. S.) is the top of a 3-inch galvanized-iron pipe (capped) projecting about 15 inches above the sand, on the north side of the railroad track. B. M. is southeast of water tank. Elevation: 10.0 feet above lower low water; 6.56 feet above mean tide level.

**Serial No. 499. North Jetty, Humboldt Bay.**—B. M. 2 (C. & G. S.) is a 6-inch drain-tile, filled flush with concrete, located in the yard of the house occupied by the watchman at North Jetty. Elevation: 12.6 feet above lower low water; 9.11 feet above mean tide level.

**Serial No. 500. North Jetty, Humboldt Bay.**—B. M. 4 is a Coast and Geodetic Survey standard disk located near the railroad track about 100 meters west of the United States Engineers office at North Jetty. Elevation: 14.6 feet above lower low water; 11.13 feet above mean tide level.

**Serial No. 501. North Jetty, Humboldt Bay.**—B. M. 5 is a Coast and Geodetic Survey standard disk set in the concrete floor of the engine house near North Jetty. Elevation: 11.3 feet above lower low water; 7.84 feet above mean tide level.

**Serial No. 502. North Jetty, Humboldt Bay.**—B. M. 6 is a Coast and Geodetic Survey standard disk set in the top of a concrete pile north of the apron. It is the second pile east of the inshore end of piles extending along the south side of the dock. Elevation: 7.0 feet above lower low water; 3.46 feet above mean tide level.

**Serial No. 503. Fields Landing, Humboldt Bay.**—B. M. 1 (C. & G. S.) is a 1¼-inch iron pipe 2 feet long driven in the ground with the top projecting 2 inches above the surface of the ground. B. M. is 15 feet south of the center line of Railroad Street and 27 feet west of the west rail of the railroad. Elevation: 9.8 feet above lower low water; 6.29 feet above mean tide level.

**Serial No. 504. Fields Landing, Humboldt Bay.**—B. M. 2 (C. & G. S.) is the top of a concrete block supporting the southwest corner post of a picket fence on the Charlie Peterson place. The reading was taken on the shoulder of the block on the south side of the post. The Peterson place is the northeast corner lot at Railroad and Second Streets. Elevation: 7.6 feet above lower low water; 4.15 feet above mean tide level.

**Serial No. 505. Fields Landing, Humboldt Bay.**—B. M. 3 (C. & G. S.) is a ¾-inch galvanized-iron pipe 4 feet long, projecting 6 inches from the ground located on the east side of the county road on the projected center line of B Street at the foot of the south slope of a red clay bluff surmounted by the Field schoolhouse. Elevation: 14.2 feet above lower low water; 10.71 feet above mean tide level.

**Serial No. 506. Eureka, Humboldt Bay.**—B. M. A-3 (U. S. A. E.) is a nail in the floor of the northeast corner of the Pacific Coast Steamship Co.'s warehouse. Elevation: 10.9 feet above lower low water; 7.90 feet above mean tide level.

**Serial No. 507. Eureka, Humboldt Bay.**—B. M. 4 (U. S. G. S.) is a standard aluminum plate stamped "B B 1906 19 31," set in the granite coping on the north side of the steps of the City Hall. Elevation: 33.6 feet above lower low water; 30.01 feet above mean tide level.

**Serial No. 508. Eureka, Humboldt Bay.**—B. M. 7 is a Coast and Geodetic Survey standard disk, stamped "B. M. 1 1921," set horizontally in the concrete surface of the foundation of the Humboldt National Bank at the corner of E and Fourth Streets. Entering the bank on the E Street entrance, the B. M. is located to the right of a pillar and to the right of the steps. B. M. is set in the concrete base of the pillar. Elevation: 19.2 feet above lower low water; 15.61 feet above mean tide level.

**Serial No. 509. Eureka, Humboldt Bay.**—B. M. 8 is a Coast and Geodetic Survey standard disk, stamped "B. M. 2 1921," set in the concrete retaining wall in the back of the Eureka post office at the corner of Fifth and H Streets.

Elevation: 47.7 feet above lower low water; 44.07 feet above mean tide level.

**Serial No. 510.** *Eureka, Humboldt Bay.*—B. M. 9 (C. & G. S.) is the top of a copper nail driven in the concrete at the intersection of Third and E Streets. The nail is 1 foot below the street level and is protected by an iron cover which sets flush with the street level. This B. M. is one of several of the city of Eureka's bench marks and is known as B. M. 2 in the Eureka city engineer's office. Elevation: 15.1 feet above lower low water; 11.53 feet above mean tide level.

**Serial No. 511.** *Eureka, Humboldt Bay.*—B. M. (U. S. G. S.) is an aluminum tablet, stamped "B B 1906 20 44," set in a granite post on the west side of the steps to the north approach to the courthouse. Elevation: 46.7 feet above lower low water; 43.14 feet above mean tide level.

**Serial No. 512.** *Arcata, Humboldt Bay.*—B. M. (U. S. G. S.) is an aluminum tablet, stamped "BB 18 1906 27," located in the northwest corner of a brick building 25 by 100 feet at the southeast corner of Eighth and H Streets. Elevation: 29.8 feet above lower low water; 26.18 feet above mean tide level.

**Serial No. 513.** *Crescent City, Del Norte County.*—B. M. 1 (C. & G. S.) is the top of "Flat Rock" at end of wharf, near the foot of a pile on the rock. A circle with two diameters at right angles and the letters "U. S." near by it were cut in the rock with a chisel. B. M. is 3.33 feet below the top of the wharf. Elevation: 17.3 feet above lower low water; 13.63 feet above mean tide level.

# INDEX

	Page		Page
Accuracy of bench-mark elevations.....	5	Gato.....	10, 24
Alameda.....	37, 43	Gaviota.....	9, 10, 24
Alto, Palo.....	37, 42	Goat Island.....	37, 44
Alviso.....	37, 42	Golden Gate.....	39, 40, 55
American Park.....	7, 14	Golden Gate Park, San Francisco.....	29, 30
Anacapa.....	10, 25	Golets.....	9, 23
Angel Island.....	39, 53	Greenwood Landing.....	56, 67
Arcata, Humboldt Bay.....	56, 60	Half Moon Bay.....	11, 28
Arguello.....	10, 25	Hamlet Wharf, Tomales Bay.....	56, 67
Arlight.....	10, 25, 26	Heights of tide, extreme.....	3, 4
Arrangement of bench marks.....	5	Hermosa Beach, Santa Monica Bay.....	8, 18
Atwood.....	7, 14	High water, mean.....	2, 3, 4
Avalon, Santa Catalina Island.....	7, 15, 16	Higher high water, mean.....	2, 3, 4
Balboa, Newport Bay.....	7, 15	Highest tide.....	2, 3, 4
Balboa Park, San Francisco.....	30, 36	Holly Park, San Francisco.....	30, 36
Bay Point, Suisun Bay.....	38, 47	Holy Cross.....	37, 40
Belmont.....	37, 41	Honda.....	10, 26
Bench-mark elevations, accuracy.....	5	Hope Ranch.....	9, 23
Bench mark, standard.....	6	Hueneme.....	8, 20
Bench marks, arrangement.....	5	Humboldt Bay.....	3, 56, 58, 59, 60
changes in elevations.....	6	Hunters Point, San Francisco.....	30, 36
descriptions.....	5	Hydrographic datum.....	4
elevations.....	5	Inequality, diurnal.....	4
numbering.....	5	Jalama.....	10, 25
Benham.....	9, 21	Kings Island, Suisun Bay.....	38, 47
Benicia, Carquinez Strait.....	38, 48, 49	La Fayette Square, San Francisco.....	29, 33
Beresford.....	37, 41	La Jolla.....	7, 14, 15
Berkeley, West.....	37, 38, 44, 45	La Paterra.....	9, 23
Bonita Cove, Golden Gate.....	40, 55	Ladrillo.....	7, 14
Brazos Drawbridge, Napa River.....	39, 50	Lakeville, Petaluma Creek.....	39, 51
Brooks Island.....	38, 45	Landing, Ellis.....	38, 45
Burlingame.....	37, 41	Fields.....	56, 59
California City.....	39, 52	Greenwood.....	56, 57
Capitan.....	9, 23	Lompoc.....	10, 26
Carpinteria.....	9, 21	McNears.....	39, 52
Carquinez Strait.....	38, 46, 48, 49	Refugio.....	38, 45, 46
Catalina Harbor, Santa Catalina Island.....	7, 8, 16	Level, mean sea.....	2, 3, 4
Cayucos, Estero Bay.....	10, 27	mean tide.....	2, 3, 4
Central Basin, San Francisco.....	29, 30, 35, 36	Lime Point, Golden Gate.....	39, 40, 56
Changes in elevation of bench marks.....	6	Lompoc Junction.....	10, 26
City Hall, San Francisco.....	29, 34	Lompoc Landing.....	10, 26
Collinsville, Sacramento River.....	38, 48	Long Beach.....	8, 16
Conception.....	10, 25	Los Angeles Harbor, San Pedro.....	3, 8, 16, 17
Coromar.....	9, 23	Lower low water, mean.....	2, 3, 4
Crescent City.....	56, 60	Lowest tide.....	2, 3, 4
Crockett, Carquinez Strait.....	38, 46	Manhattan Beach, Santa Monica Bay.....	8, 18
Datum, hydrographic.....	4	Mare Island.....	3, 38, 49
Datum planes, tidal.....	2, 3, 4	Mare Island Strait.....	38, 49
Datum, standard.....	2	Martinez, Carquinez Strait.....	38, 46
Descriptions of bench marks.....	5	Mayfield.....	37, 42
Diablo Cove, Golden Gate.....	40, 55	McNears Landing, San Pablo Bay.....	39, 52
Diurnal inequality.....	4	Mean higher high water.....	2, 3, 4
Dolores.....	8, 17	Mean high water.....	2, 3, 4
Drake.....	10, 24	Mean low water.....	2, 3, 4
Dulah.....	9, 20	Mean lower low water.....	2, 3, 4
Dumbarton Bridge.....	37, 43	Mean range of tide.....	4
Dumbarton Point.....	37, 42	Mean sea level.....	2, 3
El Campo.....	39, 53	Mean tide level.....	37, 42
El Segundo, Santa Monica Bay.....	3, 18	Menlo Park.....	39, 50
Elevations of bench marks.....	5	Merazo.....	37, 41
changes.....	6	Milbrae.....	9, 22
Ellis Landing, Richmond.....	38, 45	Miramar.....	9, 22
Elwood.....	9, 23	Montecito.....	10, 11, 28
Estero Bay.....	10, 27	Monterey.....	10, 11, 28
Eureka, Humboldt Bay.....	56, 59, 60	Montezuma Slough Entrance.....	38, 48
Explanation of tables.....	5	Morro Bay.....	10, 27
Extreme heights of tide.....	3, 4	Morro, Morro Bay.....	10, 27
Fields Landing, Humboldt Bay.....	56, 59	Mountain View.....	37, 42
Fort Mason, San Francisco.....	29, 33	Municipal Pier, San Diego.....	7, 13
Fort Miley Reservation, San Francisco.....	29, 31		

	Page		Page
Napa Junction.....	38, 49, 50	San Mateo.....	37, 41, 42
Napa, Napa River.....	39, 50	San Pablo Bay.....	38, 39, 45, 46, 52
Napa River.....	38, 39, 50	San Pedro.....	3, 8, 16, 17
Brazos Drawbridge.....	39, 50	San Quentin, Point.....	39, 52, 53
Railroad trestle.....	38, 50	San Rafael.....	39, 52
Naples.....	9, 23	San Simeon.....	10, 28
Newport Bay.....	7, 15	Santa Barbara.....	9, 22
Newport Bay Entrance.....	7, 15	Santa Catalina Island.....	7, 8, 15, 16
North Jetty, Humboldt Bay.....	56, 59	Santa Cruz, Monterey Bay.....	11, 28
North Lagoon, Newport Bay.....	7, 15	Santa Monica.....	8, 19, 20
Numbering of bench marks.....	5	Santa Monica Bay.....	8, 17, 18, 19, 20
Oakland.....	37, 44	Sausalito.....	3, 39, 53, 54
Oakland Mole.....	37, 44	Scripps Institution, La Jolla.....	7, 14, 15
Ocean Beach, San Francisco.....	29, 30, 31	Sea level, mean.....	2, 3
Ocean Park, Santa Monica Bay.....	8, 19	Seacliff.....	9, 21
Old Town, San Diego.....	7, 13	Setwyn.....	7, 15
Oliva.....	9, 22	Shelter Cove.....	56, 58
Oretia.....	9, 24	Sonoma Creek.....	39, 50, 51
Palo Alto.....	37, 42	Railroad trestle.....	39, 50
Pecks Beach, Santa Monica Bay.....	8, 18	Tubbs Island Wharf.....	39, 50, 51
Petaluma Creek.....	39, 51, 52	South Jetty, Humboldt Bay.....	56, 58, 59
Petaluma Creek Entrance.....	39, 51	South San Francisco Canal.....	37, 40
Pinole.....	38, 45	Standard bench mark.....	6
Pinole Point.....	38, 45	Standard datum.....	2
Pittsburg, Suisun Bay.....	38, 47, 48	Stockton, San Joaquin River.....	38, 48
Playa del Rey, Santa Monica Bay.....	8, 18, 19	Strand, The, Morro Bay.....	10, 27
Point Richmond.....	38, 45	Sudden.....	10, 25
Point San Bruno.....	37, 40	Suisun Bay.....	33, 46, 47, 48
Point San Pablo.....	38, 45	Suisun Point, Suisun Bay.....	38, 46, 47
Point San Quentin.....	39, 52, 53	Summerland.....	9, 21, 22
Port San Luis.....	10, 26, 27	Sutro Heights, San Francisco.....	29, 31
Presidio of San Francisco.....	4, 29, 31, 32	Surf.....	10, 26
Punta Gorda.....	9, 21	Tables, explanation.....	5
Quarantine Station, Angel Island.....	39, 53	Tajiquas.....	9, 24
San Diego.....	3, 7, 11, 12, 13	Thenard Junction.....	8, 17
Quarry Point, Angel Island.....	39, 53	The Presidio, San Francisco.....	4, 29, 31, 32
Railroad Trestle, Napa River.....	38, 50	The Strand, Morro Bay.....	10, 27
Sonoma Creek.....	39, 50	Tiburon.....	39, 53
Range of tide, mean.....	4	Tidal datums.....	2, 3, 4
Ravenswood.....	37, 42	Tide, highest.....	2, 3, 4
Redondo Beach, Santa Monica Bay.....	8, 17, 18	Tide level, mean.....	2, 3, 4
Redwood.....	37, 41	Tide, lowest.....	2, 3, 4
Redwood Creek.....	37, 41	mean range.....	4
Refugio Landing.....	38, 45, 46	Tides, extreme heights.....	3, 4
Richmond.....	38, 45	Tomales Bay.....	56, 57
Richmond, Point.....	3, 4, 5	Tomales Point, Tomales Bay.....	56, 56
Rincon Point, San Francisco.....	29, 33, 34, 35	Tubbs Island Wharf, Sonoma Creek.....	39, 50, 51
Rio Vista, Sacramento River.....	38, 48	Union Iron Works, San Francisco.....	29, 35
Rockport.....	56, 58	Upper drawbridge, Petaluma Creek.....	39, 51, 52
Russian Gulch.....	56, 57	Vallejo, Mare Island Strait.....	38, 49
Ryer Island, Suisun Bay.....	38, 47	Venice, Santa Monica Bay.....	8, 19
Sacate.....	10, 24	Ventura.....	8, 9, 20, 21
Sacramento River.....	38, 48	Ventura Junction.....	8, 20
Sacramento, Sacramento River.....	38, 48	Water, mean high.....	4, 3, 4
San Antonio Creek.....	37, 43, 44	mean higher high.....	2, 3, 4
San Bruno.....	37, 41	mean low.....	2, 3, 4
San Carlos.....	37, 41	mean lower low.....	2, 3, 4
San Diego.....	7, 13, 14	Warm Springs.....	37, 42
San Diego Bay.....	3, 7, 11, 12, 13, 14	West Berkeley.....	37, 38, 44, 45
San Francisco.....	4, 29-36	Wilmington.....	8, 17
San Joaquin River.....	38, 48	Zuniga Jetty, San Diego.....	7, 1
San Luis, Port.....	10, 26, 27		