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REPORTS OF THE
DIVISION OF WATER RESOURCES
EDWARD HYATT, State Engineer

BULLETIN No. 22

Volume II
of Two Volumes

DRAWINGS

ACCOMPANYING REPORT ON

SALT WATER BARRIER

Below Confluence of Sacramento and San Joaquin Rivers,
California

By WALKER R. YOUNG, Engineer,
U. S. Bureau of Reclamation

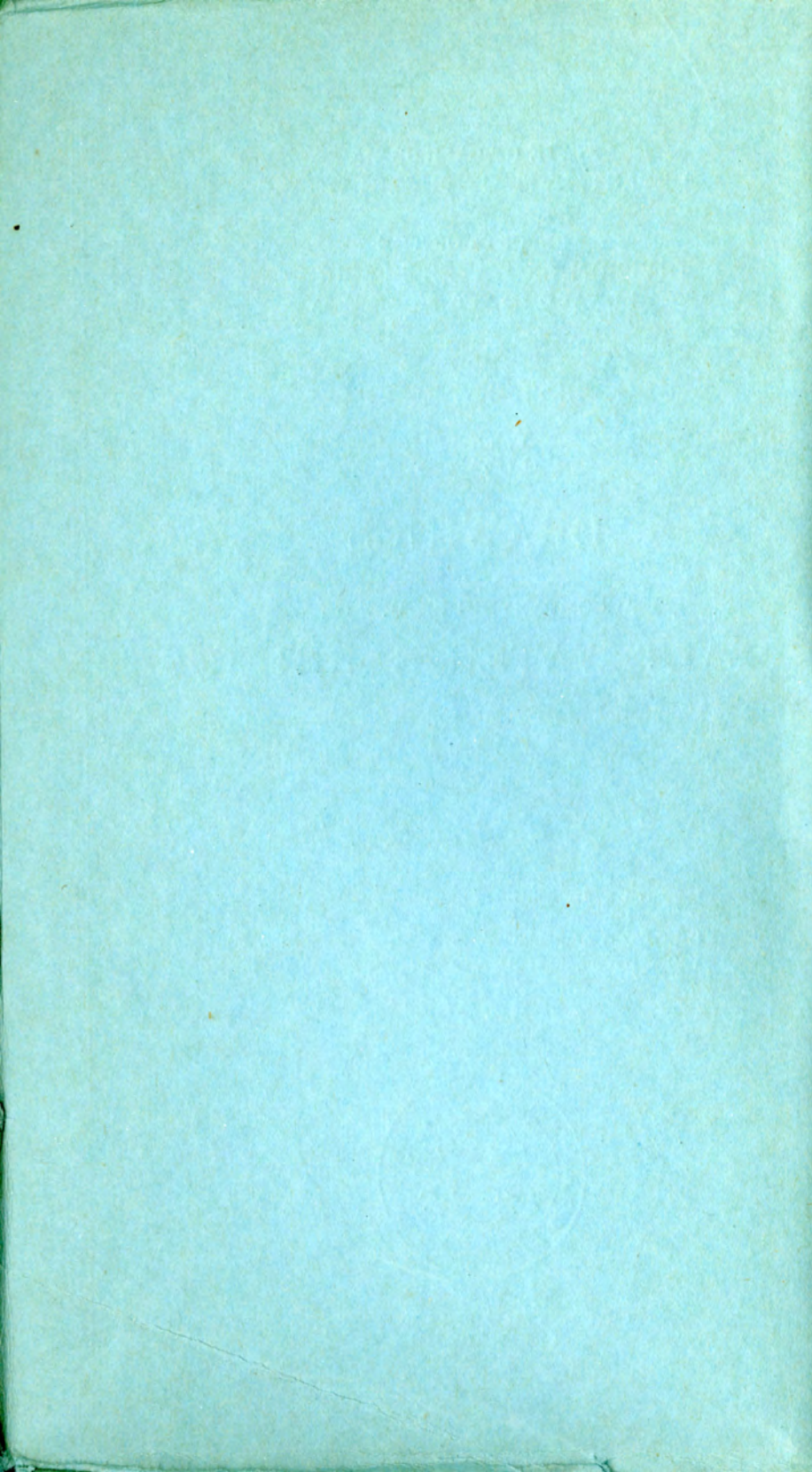
Prepared under contracts executed jointly by the
U. S. Bureau of Reclamation, the California
Department of Public Works, and the Sacramento
Valley Development Association

1929



CALIFORNIA STATE PRINTING OFFICE
SACRAMENTO, 1929

70686



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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

REPORT OF THE
DIVISION OF WATER RESOURCES
FOR THE YEAR 1924

PLATE NO. 12

Volume 11
of 12 Volumes

DRAWINGS

OF THE

SALT WATER BARRIER

between the Sacramento and San Joaquin Rivers
California

BY
J. M. HARRIS, Chief Engineer

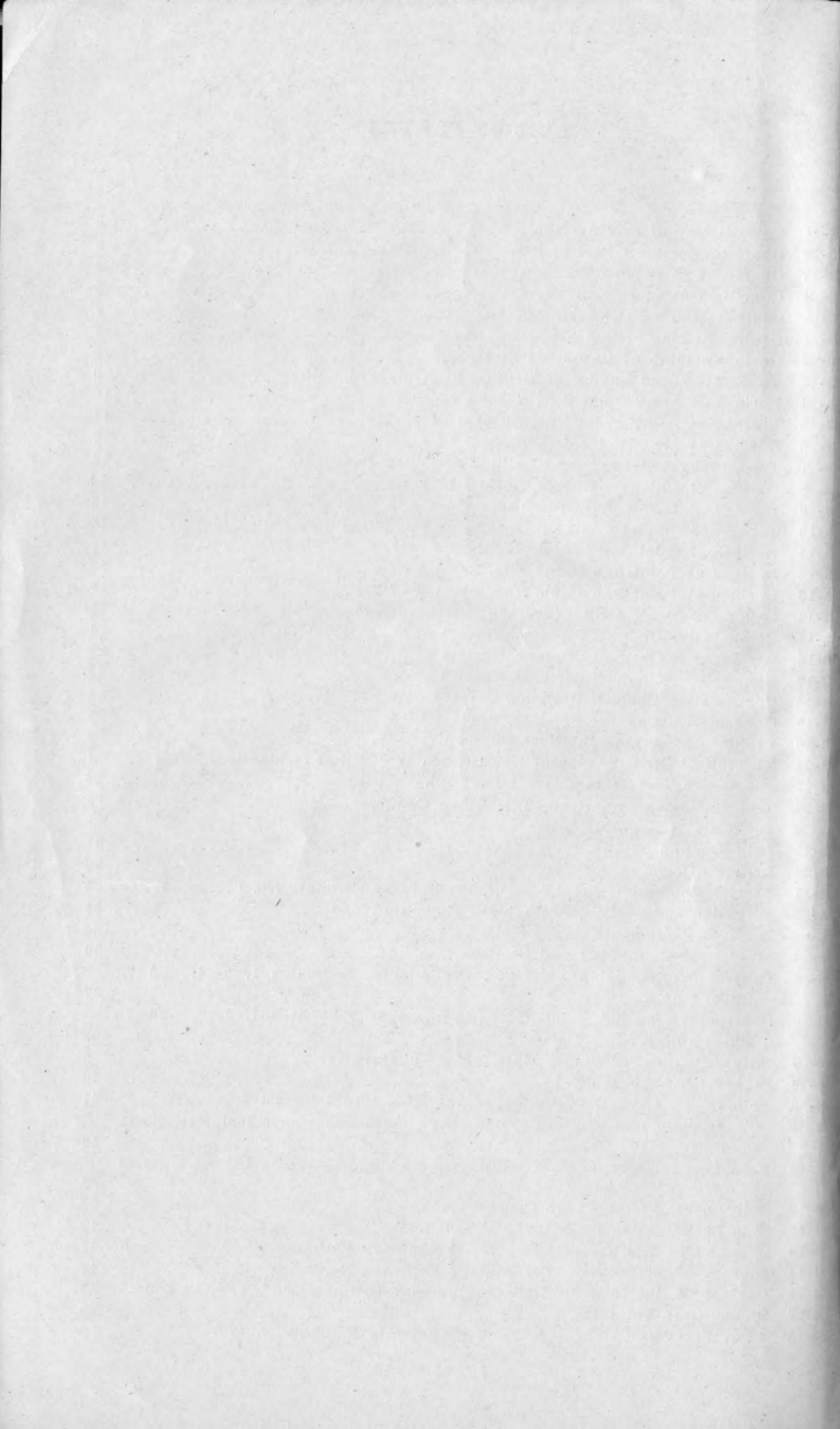
Prepared under contract and published by the
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Water Reclamation Association.

1924



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[The text in this section is extremely faint and illegible. It appears to be a multi-paragraph document, possibly a report or a letter, but the specific content cannot be discerned.]

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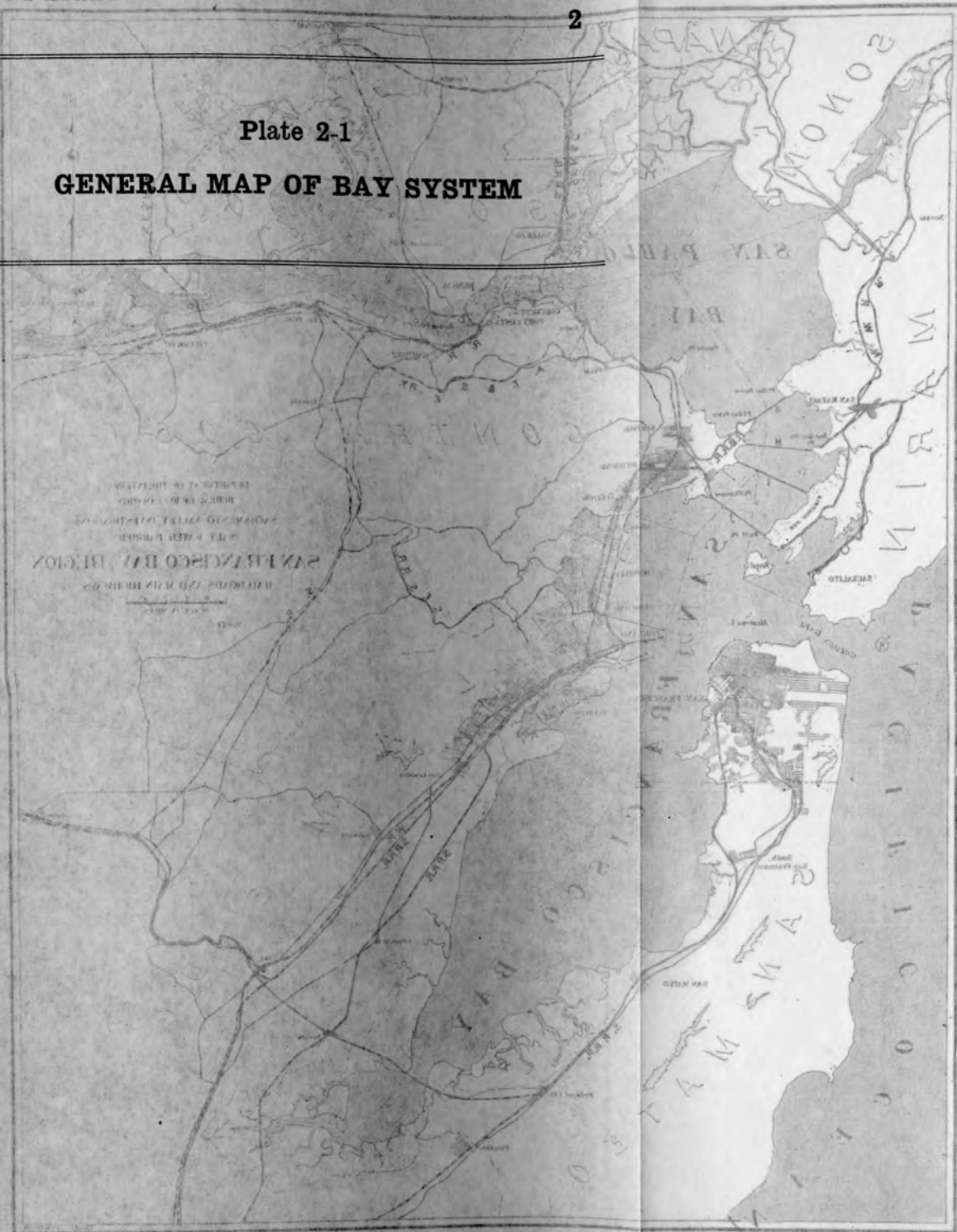
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Plate 1-1

RELIEF MAP OF CALIFORNIA



Plate 2-1
GENERAL MAP OF BAY SYSTEM



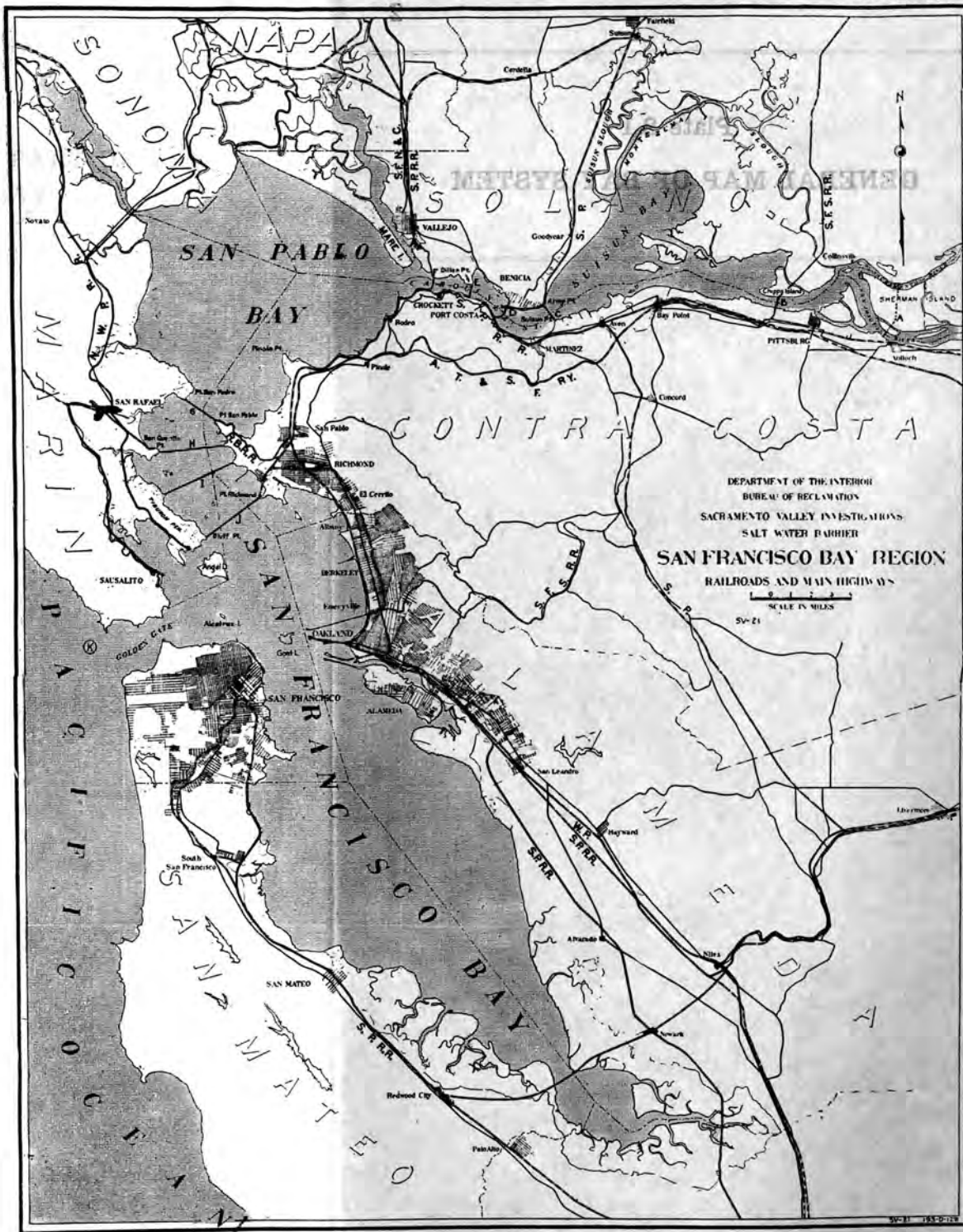


Plate 2-2

**CHART OF NORTHERN PART OF SAN
FRANCISCO BAY**



Plate 2-3

CHART OF SAN PABLO BAY

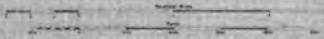


Plate 2-4

CHART OF SUISUN BAY

UNITED STATES - WEST COAST
SUISUN BAY
CALIFORNIA

Scale 1:50,000
Vertical Exaggeration 10x



Scale
Horizontal distance 1" = 1/2 mile
Vertical distance 1" = 50 feet

Vertical Exaggeration
The vertical scale is 10 times the horizontal scale.
The horizontal scale is 1 inch = 1/2 mile.
The vertical scale is 1 inch = 50 feet.

Vertical Exaggeration
The vertical scale is 10 times the horizontal scale.
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The vertical scale is 1 inch = 50 feet.

Vertical Exaggeration
The vertical scale is 10 times the horizontal scale.
The horizontal scale is 1 inch = 1/2 mile.
The vertical scale is 1 inch = 50 feet.

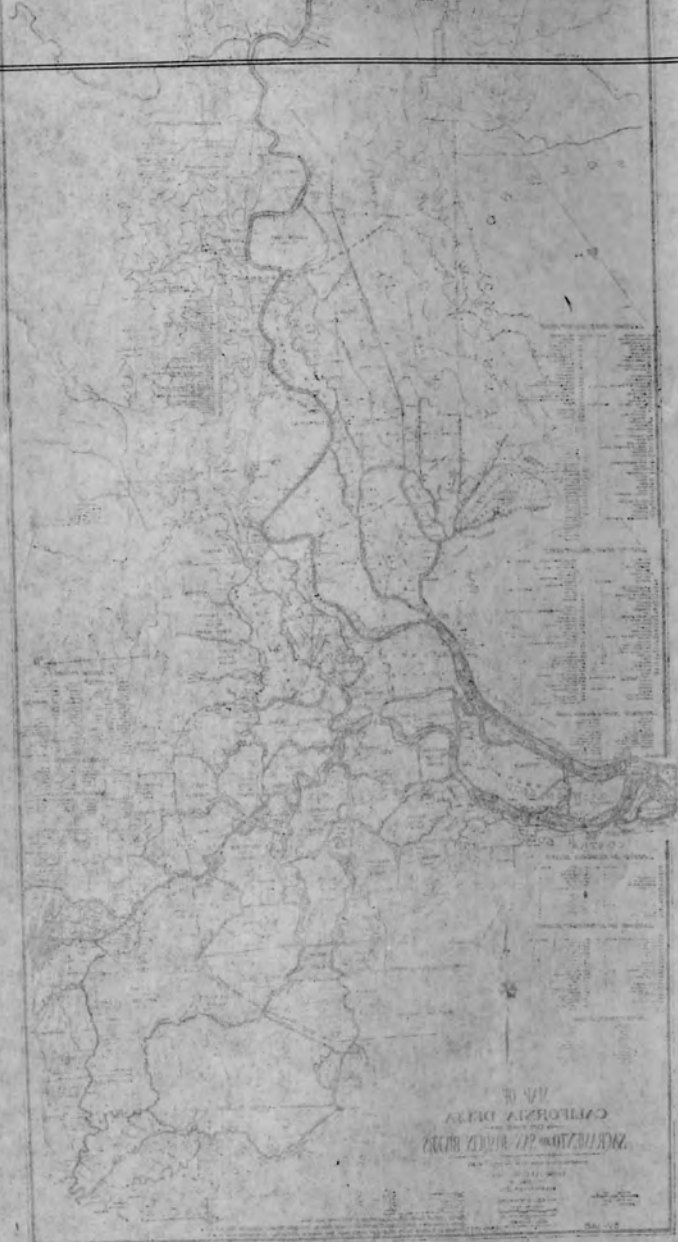


Location not determined
SAN NICOLE ISLAND

Vertical Exaggeration
The vertical scale is 10 times the horizontal scale.
The horizontal scale is 1 inch = 1/2 mile.
The vertical scale is 1 inch = 50 feet.

Plate 2-5

GENERAL MAP OF DELTA REGION



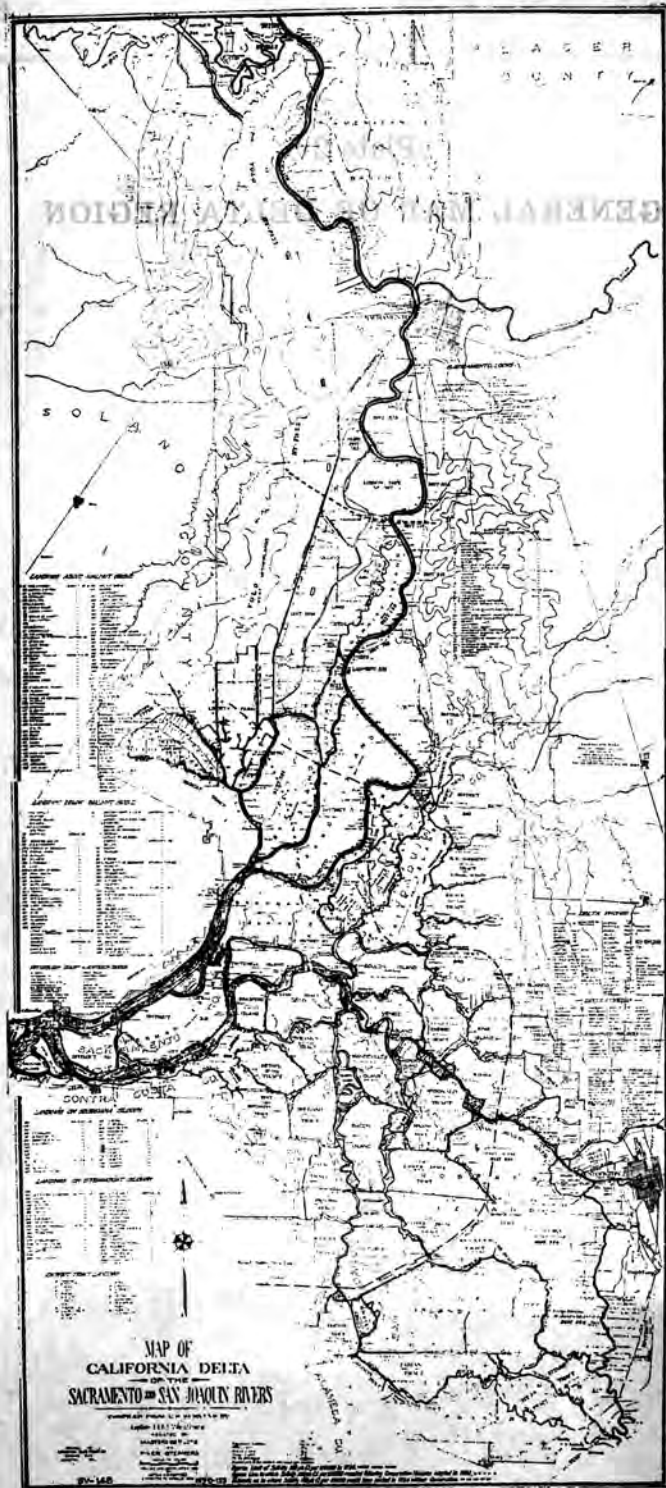


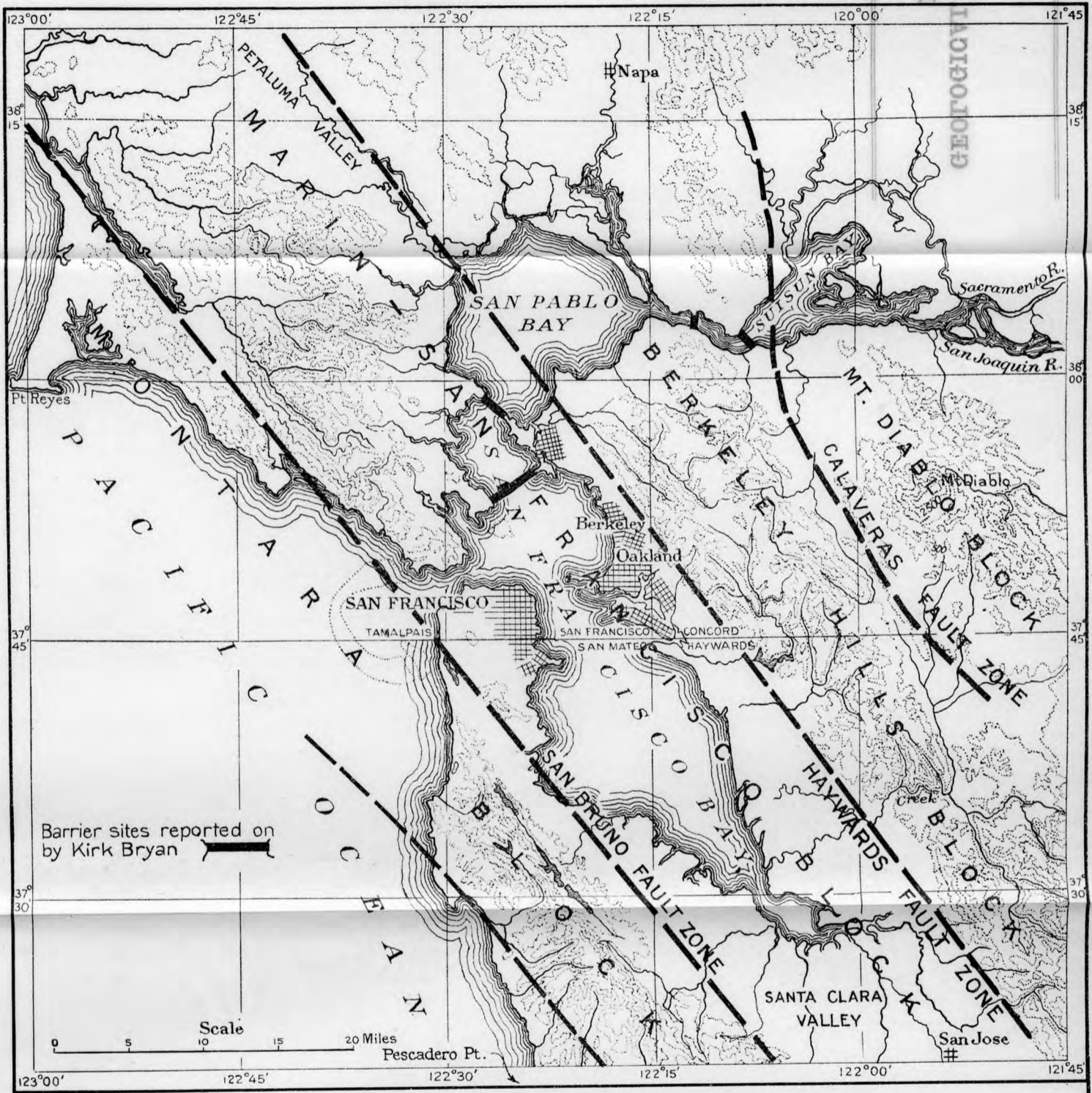
Plate 3-1
GEOLOGICAL MAP OF SAN FRANCISCO
BAY REGION



Map of vicinities to San Francisco
 showing
 principal faults and geological features

This map shows the principal faults and geological features of the San Francisco Bay region. The Hayward Fault Zone, San Bruno Fault Zone, San Geronimo Fault Zone, and the San Francisco Bay Fault Zone are clearly marked. The map also shows the major geographical features, including San Francisco Bay, the Golden Gate, and the Marin Peninsula. Topographic contours are shown throughout the map, and various cities and towns are labeled. A scale bar at the bottom left indicates distances in miles and kilometers. A coordinate grid is overlaid on the map, with latitude and longitude markings.

From Geological Survey of California, 1906. Reprinted by permission of the United States Geological Survey. (Plate 3-1)



Map of vicinity of San Francisco Bay
 showing
topographic features and the geomorphic divisions
resulting from the adjustment by tilting of great fault blocks

The eastern boundary of the Berkeley Hills block is not sharply defined; it may be drawn along a general zone of over-thrust folding and faulting just east of the Berkeley Hills, on which the Mt Diablo thrust block has ridden westward. This thrust movement antedated the tilting of blocks to the west. The submerged bar outside the Golden Gate originated as a delta deposit of the stream that flowed in the old valley of San Francisco Bay before the land was submerged.

From Geologic Atlas of the United States - San Francisco Folio - by Andrew C. Lawson - Published by U.S. Geological Survey, Folio No 193. (Supplementary data has been added for this report.)










Plate 3-2

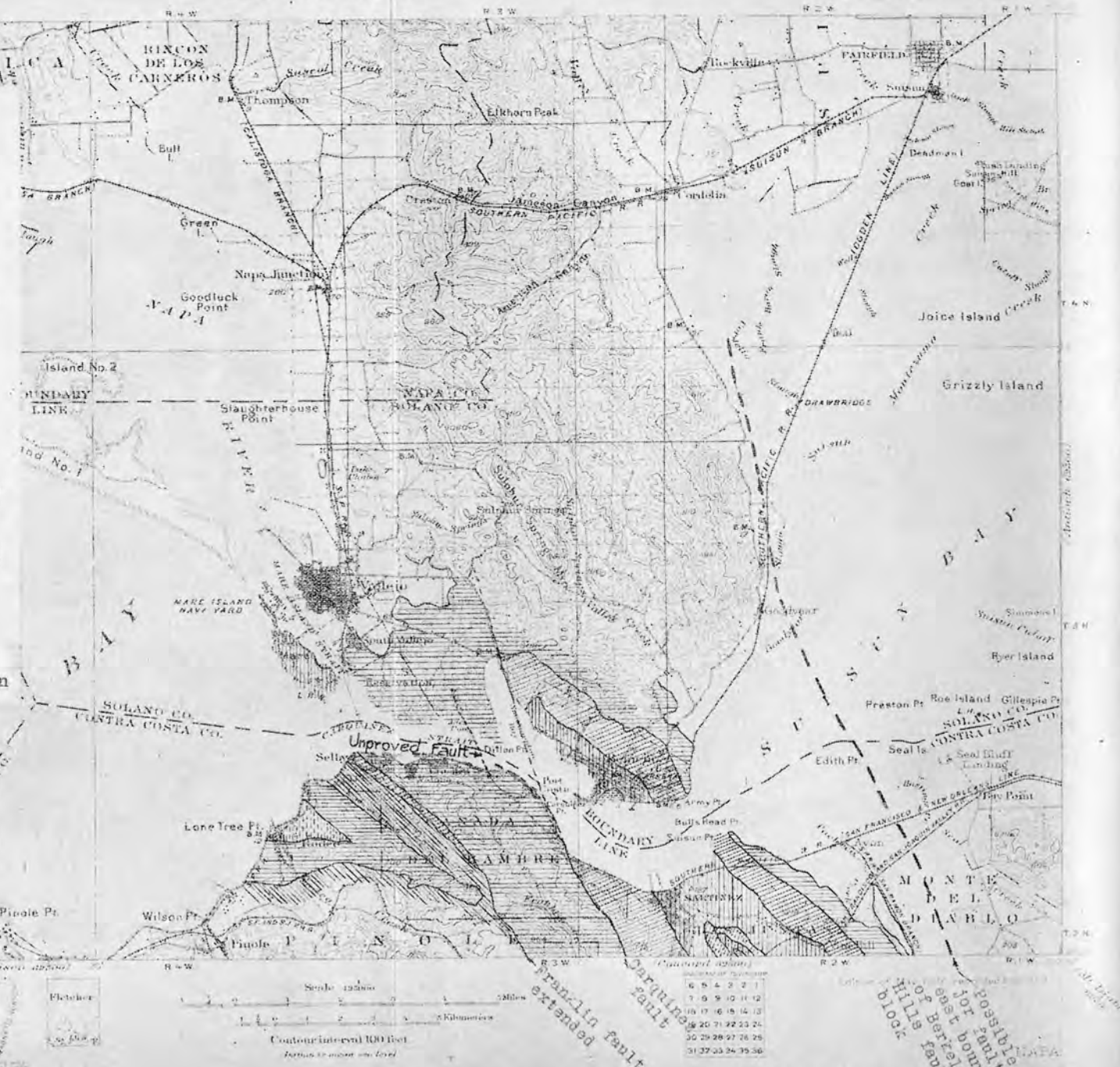
GEOLOGICAL MAP OF CARQUINEZ STRAIT

TOPOGRAPHY

LEGEND

NAPA FOLIO
after
CHARLES E. WEAVER

- PLEISTOCENE**
-  Benicia Formation
- TERTIARY**
-  Pinole Tuff
 -  Hambre Sandstone
 -  Tice Shale
 -  Sobrante Sandstone
 -  Tejon Formation
 -  Martinez Formation
- CRETACEOUS**
-  Chico Formation
 -  Knoxville Formation



6	5	4	3	2	1
7	6	5	4	3	2
8	7	6	5	4	3
9	8	7	6	5	4
10	9	8	7	6	5
11	10	9	8	7	6
12	11	10	9	8	7
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Possible boundary for San Leandro Hills fault, Berkeley Hills fault, and other geological features.

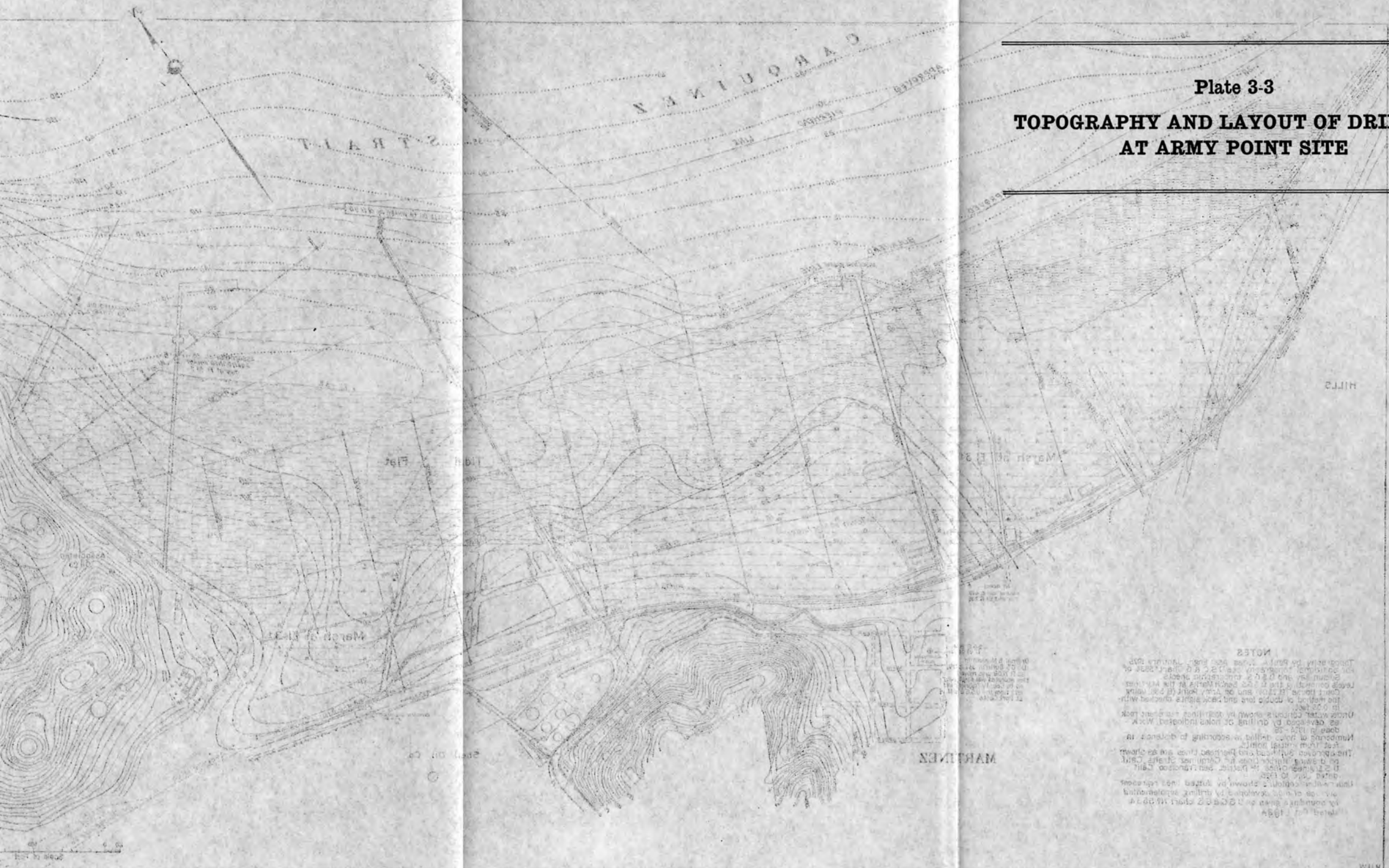


Plate 3-3
TOPOGRAPHY AND LAYOUT OF DRILLING
AT ARMY POINT SITE

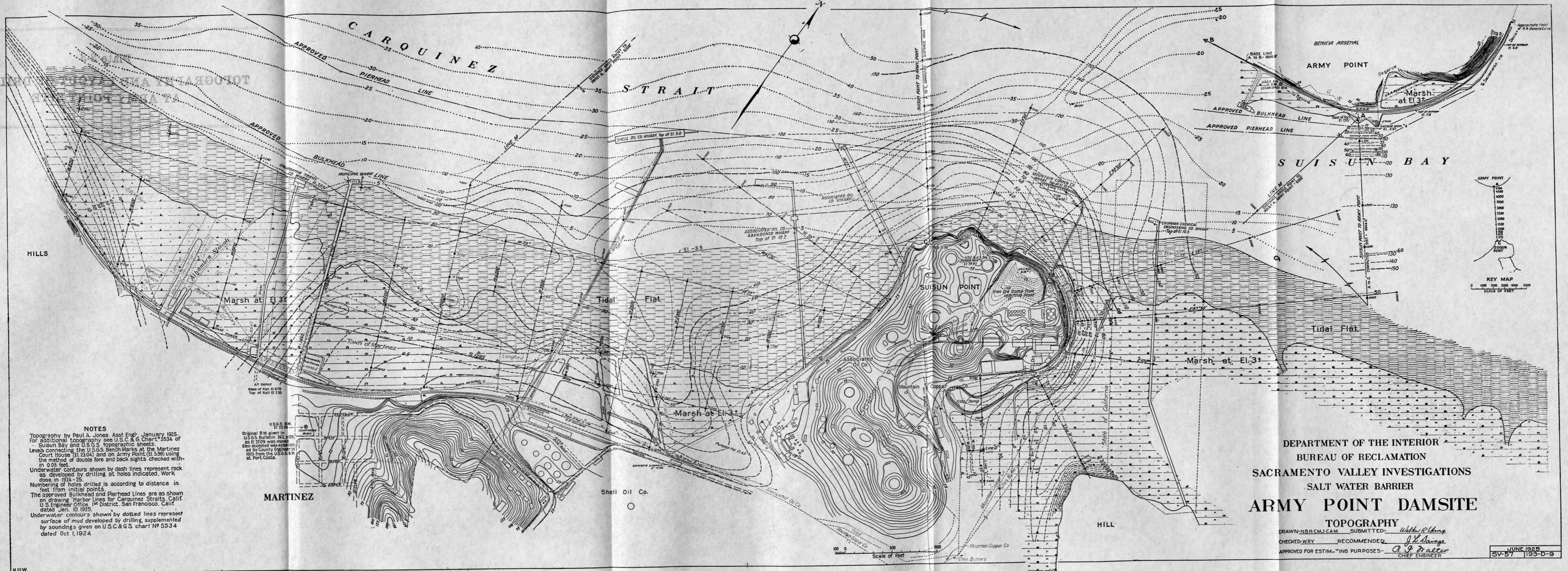
Notes
 This map is based on the topographic map of the Army Point site, which was prepared by the U.S. Army Corps of Engineers, and shows the topography and the layout of the drilling operations. The map is a plan view of the site, and the contour lines represent the elevation of the ground. The drilling layout is shown by the lines and points on the map. The map is a plan view of the site, and the contour lines represent the elevation of the ground. The drilling layout is shown by the lines and points on the map.

MARTINEX

HILLS

Scale of 1:50,000

N.W.



NOTES

Topography by Paul A. Jones, Asst Engr, January 1925.
 For additional topography see U.S.C. & G. Chart 5534 of Suisun Bay and U.S.G.S. topographic sheets.
 Levels connecting the U.S.G.S. Bench Marks at the Martinez Court House (El. 23.04) and on Army Point (El. 5.38) using the method of double fore and back sights checked within 0.05 feet.
 Underwater contours shown by dash lines represent rock as developed by drilling at holes indicated. Work done in 1924-25.
 Numbering of holes drilled is according to distance in feet from initial points.
 The approved Bulkhead and Pierhead Lines are as shown on drawing Harbor Lines for Carquinez Straits, Calif. U.S. Engineer Office, 1st District, San Francisco, Calif. dated Jan. 10, 1925.
 Underwater contours shown by dotted lines represent surface of mud developed by drilling, supplemented by soundings given on U.S.C. & G.S. chart No. 5534 dated Oct. 1, 1924.

U.S.G.S. B.M. El. 73.04
 Original B.M. given in U.S.G.S. Bulletin 342, p. 109, as El. 77.09 was moved. Elev. accepted was established by County Engineer in 1923 from the U.S.G.S. B.M. at Port Costa.

DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER

ARMY POINT DAMSITE

TOPOGRAPHY
 DRAWN-N.B.H.-C.M.-CAM. SUBMITTED-*Walker R. Long*
 CHECKED-W.R.Y. RECOMMENDED-*J. L. Sainge*
 APPROVED FOR ESTIMATING PURPOSES-*R. P. Walter*
 CHIEF ENGINEER

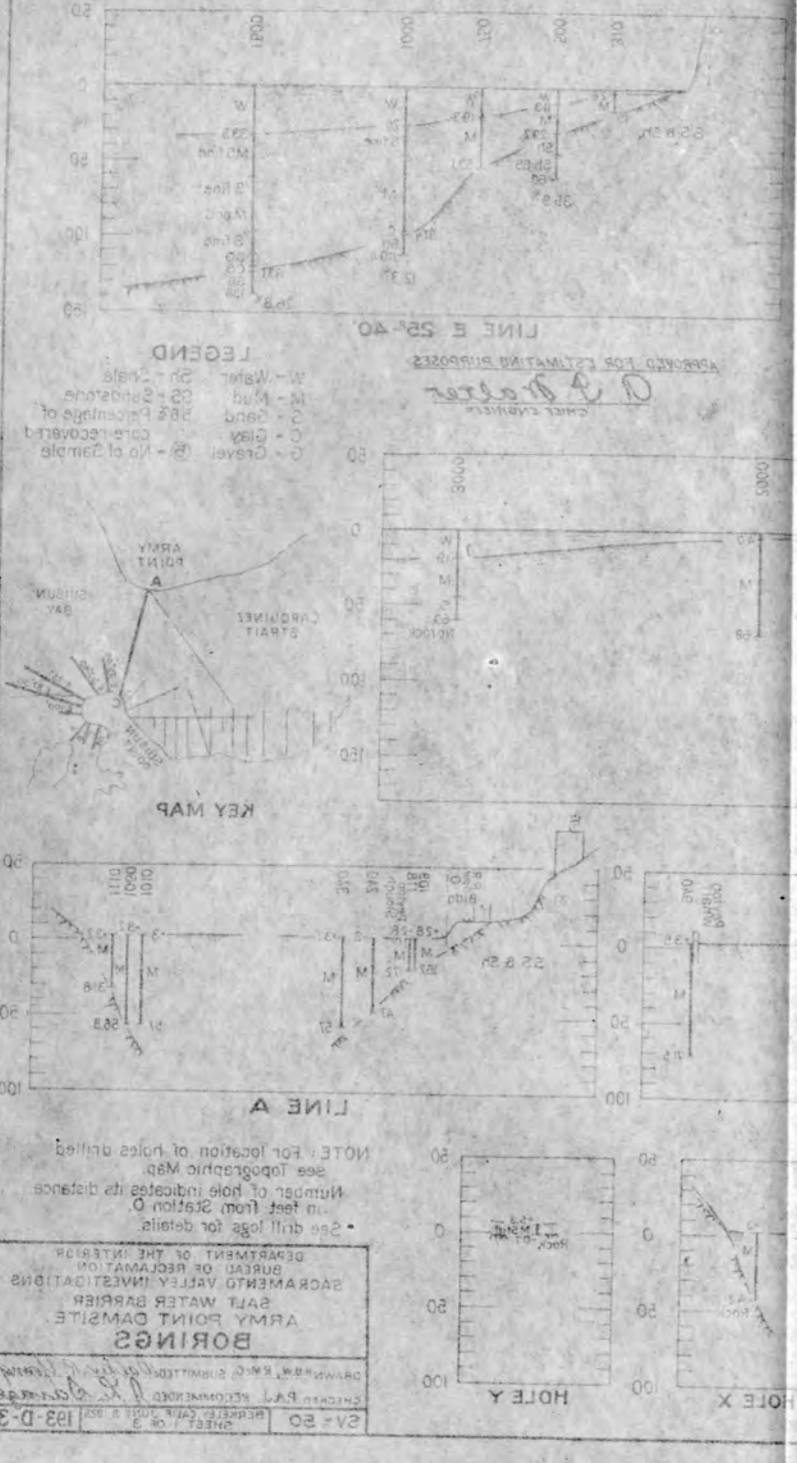
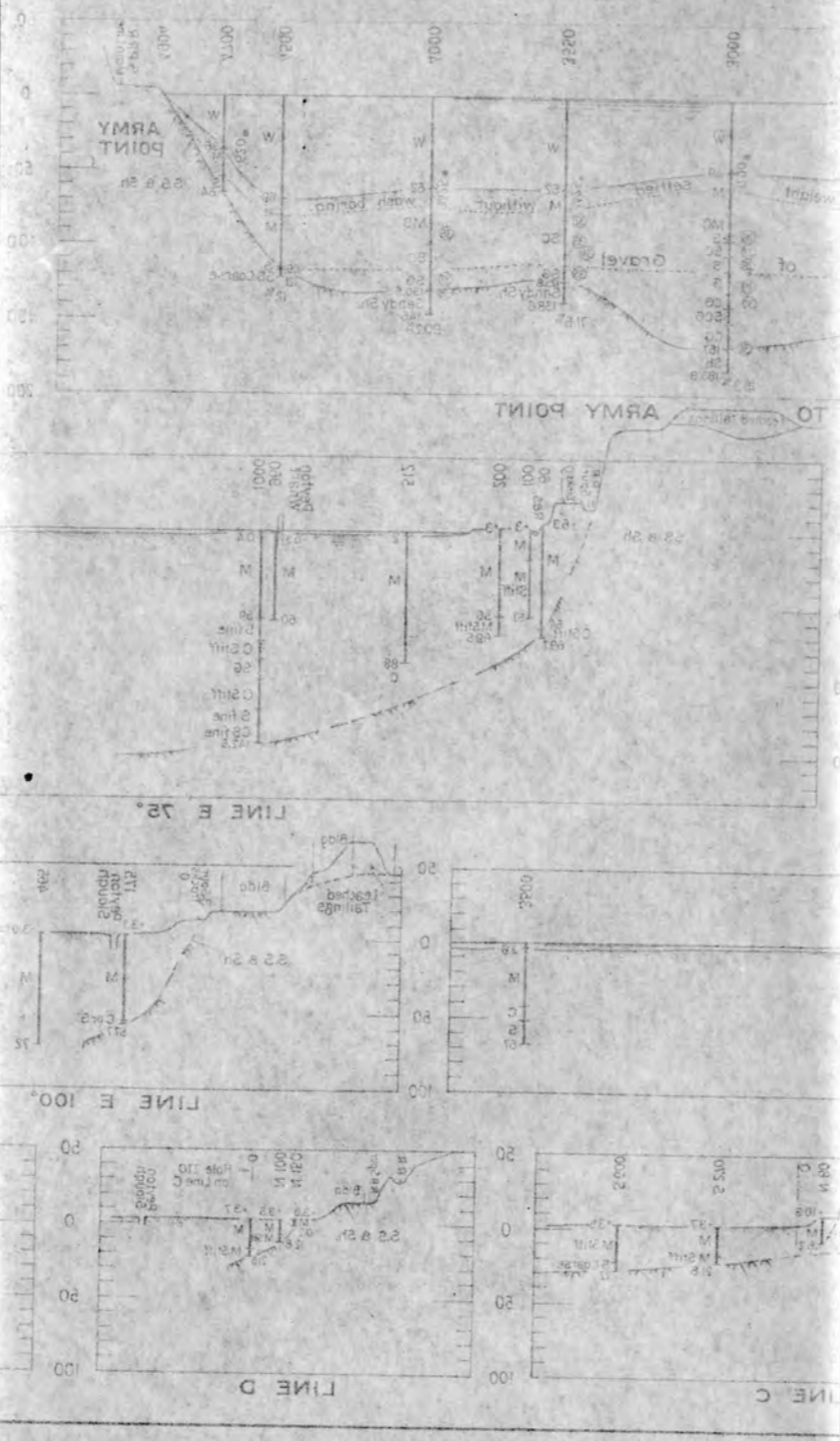
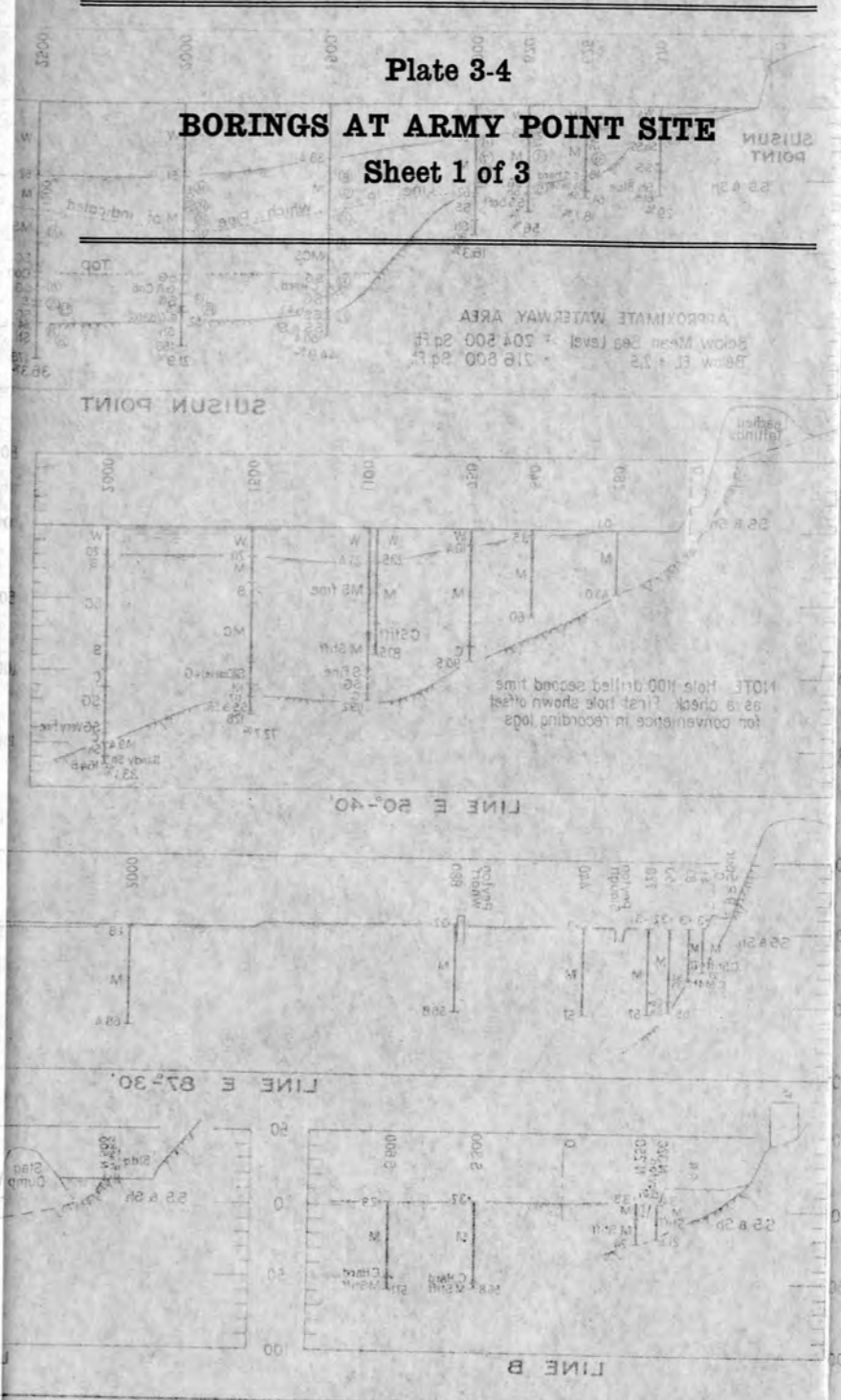
JUNE 1925
 SV-57 1193-D-9

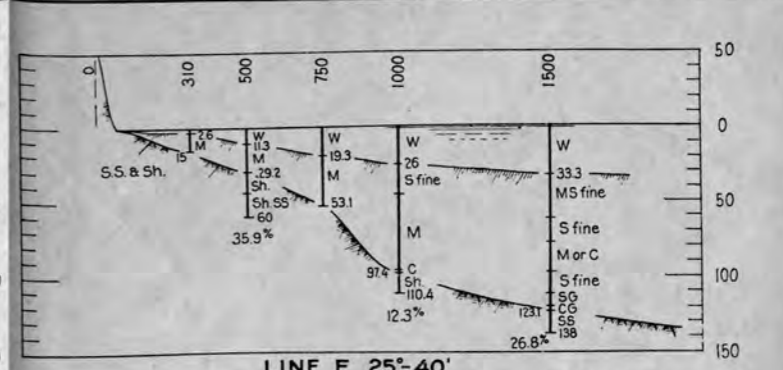
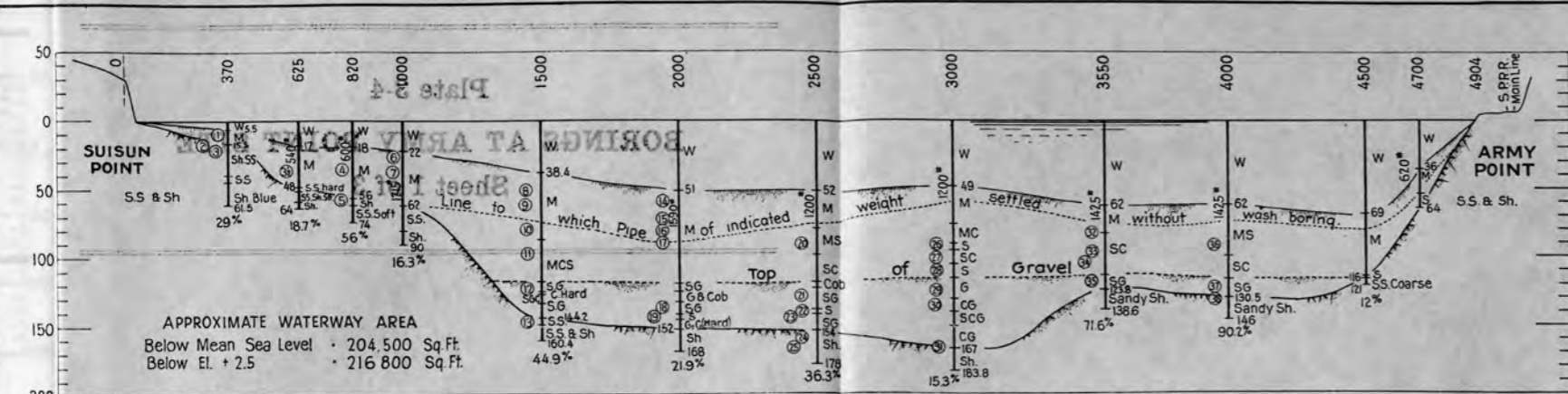
Plate 3-4

BORINGS AT ARMY POINT SITE

Sheet 1 of 3

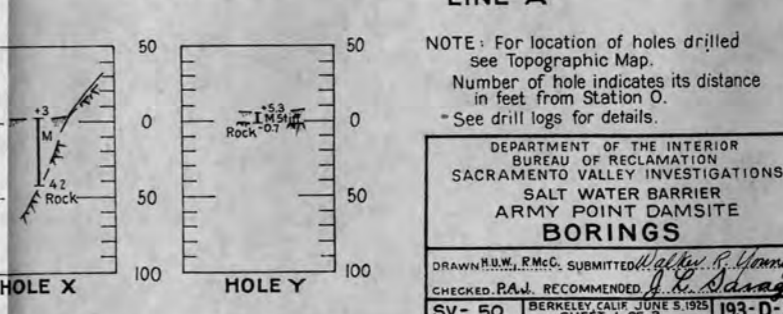
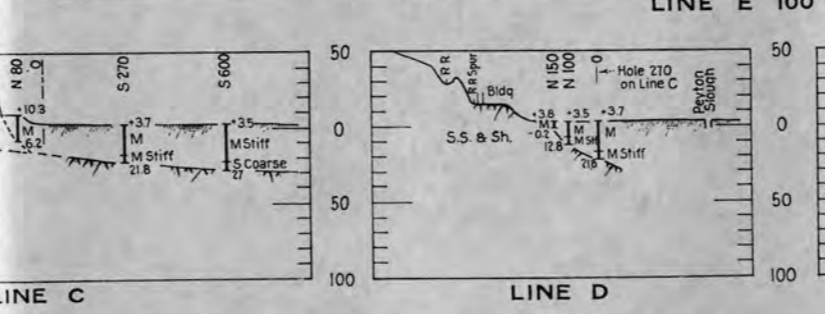
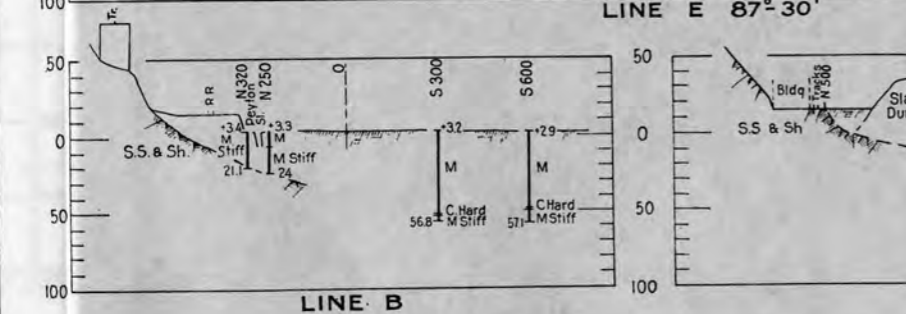
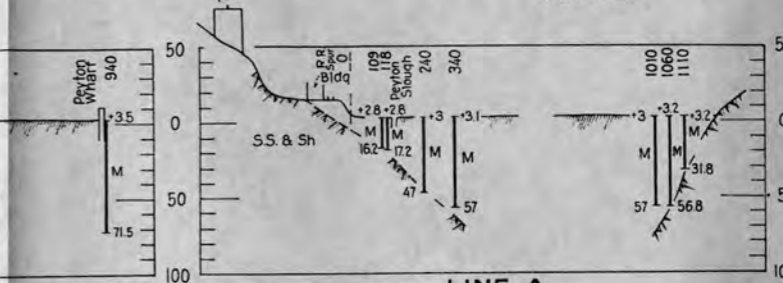
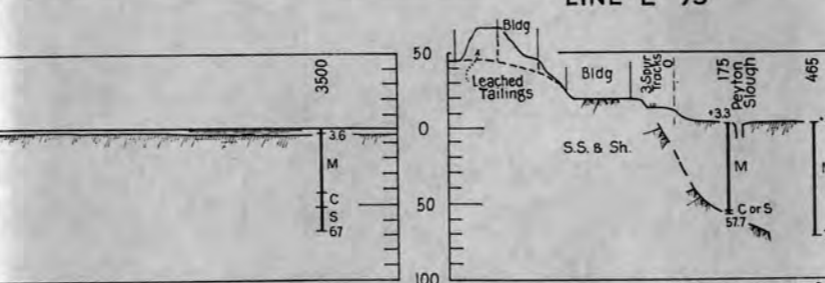
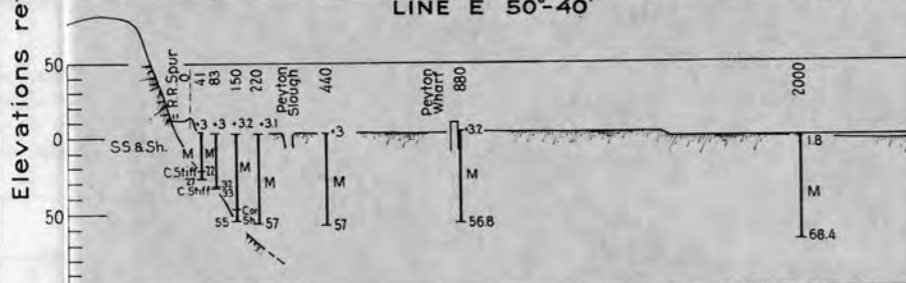
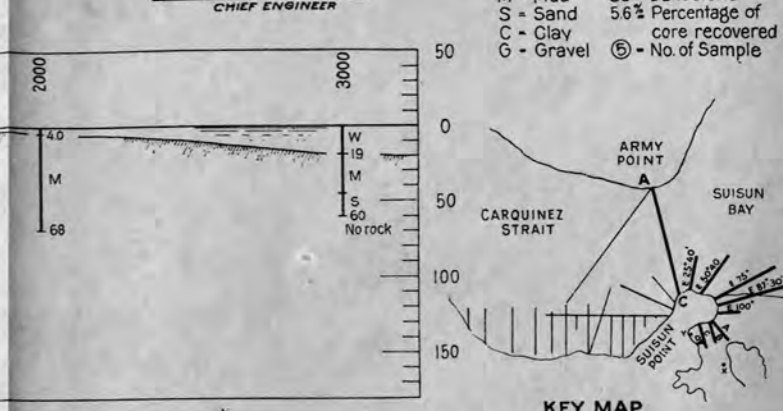
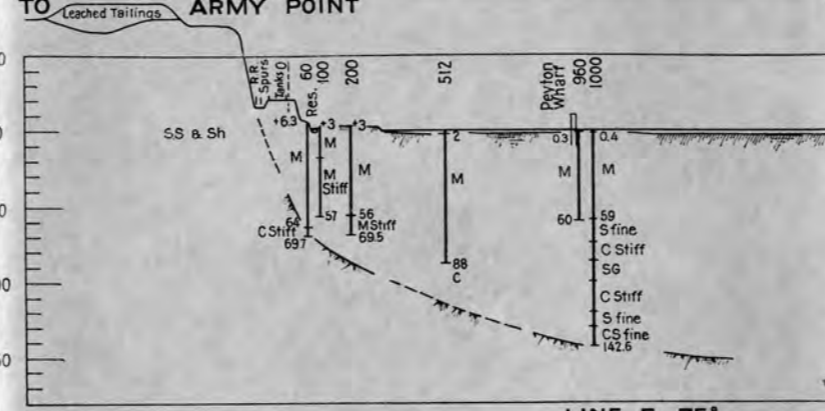
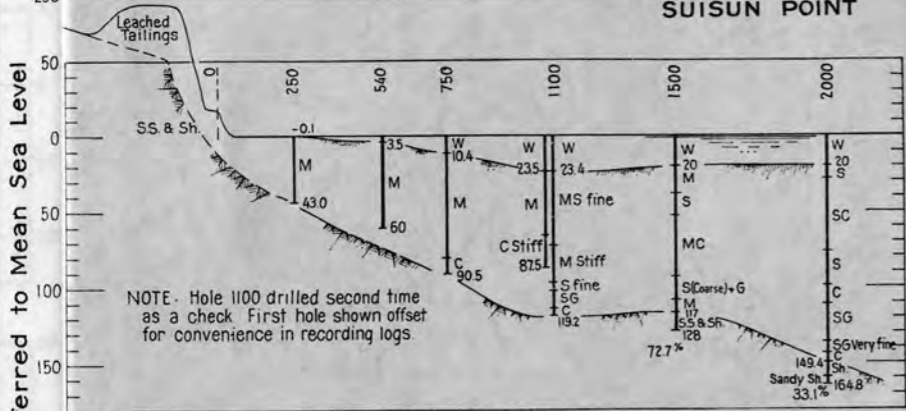
Elevation of water level





APPROVED FOR ESTIMATING PURPOSES:
A. J. Walter
 CHIEF ENGINEER

LEGEND
 W - Water Sh - Shale
 M - Mud SS - Sandstone
 S - Sand 56% Percentage of
 C - Clay core recovered
 G - Gravel ⑤ - No. of Sample

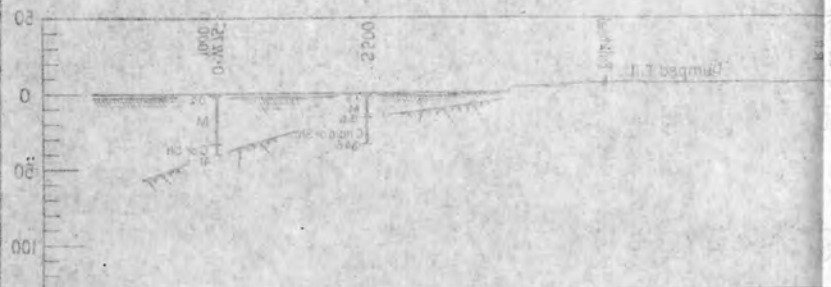
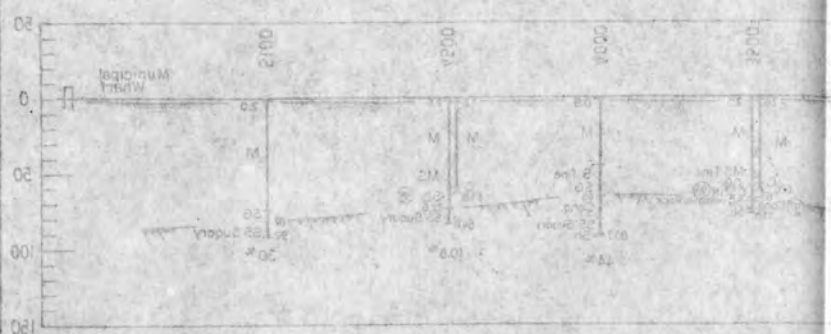
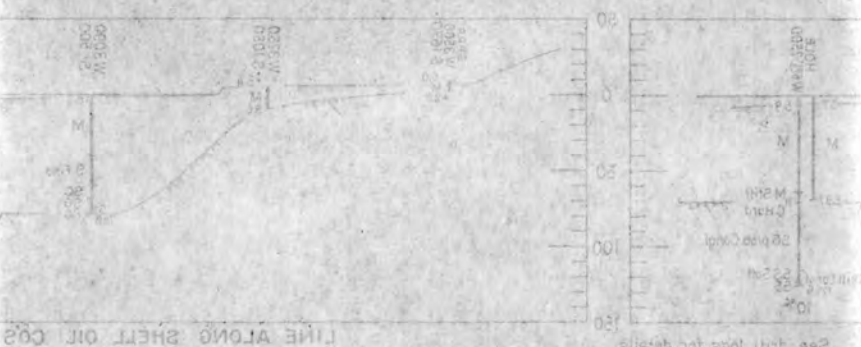
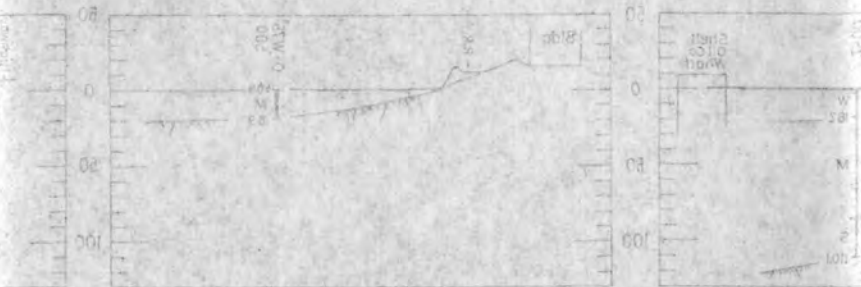
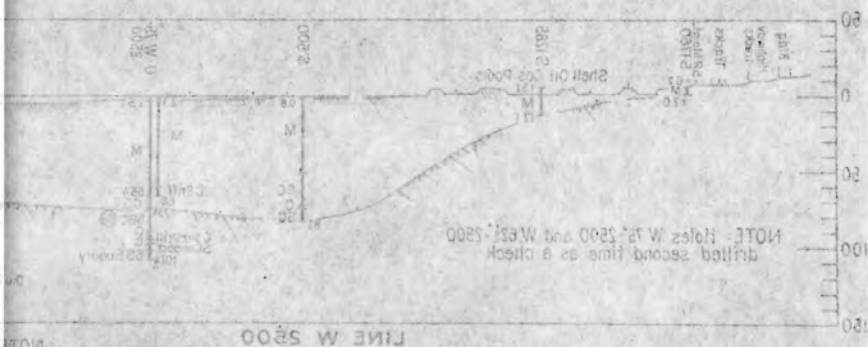
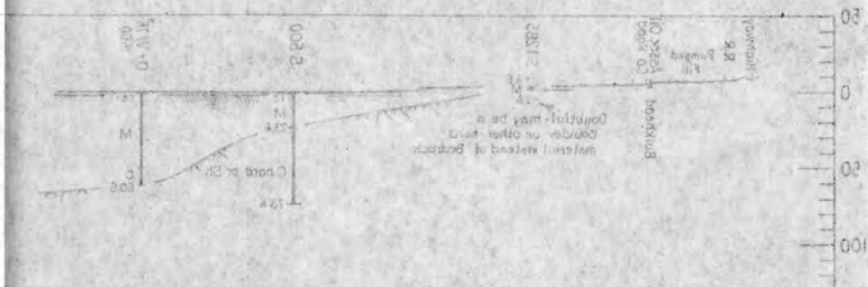
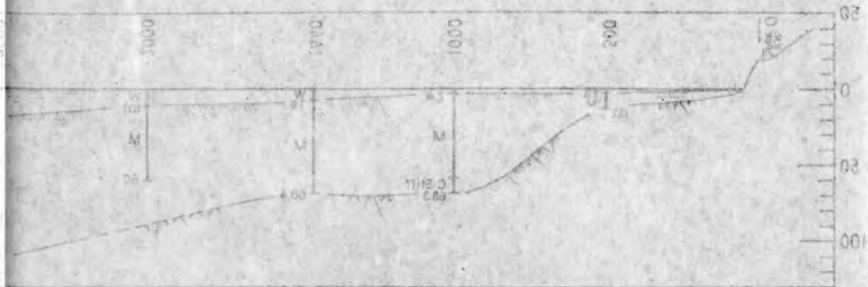
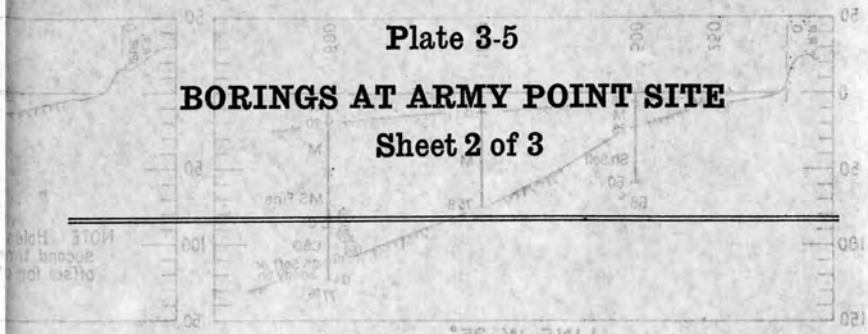


NOTE: For location of holes drilled see Topographic Map.
 Number of hole indicates its distance in feet from Station O.
 - See drill logs for details.

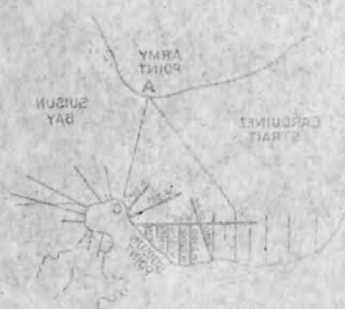
DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 ARMY POINT DAMSITE
BORINGS

DRAWN H.W. R.M.C. SUBMITTED *Walter R. Young*
 CHECKED *R.A.W.* RECOMMENDED *J. H. Savage*
 SV-50 BERKELEY CALIF. JUNE 5, 1925 SHEET 1 OF 3 **193-D-3**

Plate 3-5
BORINGS AT ARMY POINT SITE
Sheet 2 of 3



LEGEND
W - Water
M - Mud
S - Sand
C - Clay
G - Gravel
Sh - Shale
Ss - Sandstone
S - Sand
C - Clay
G - Gravel
No of Sample
No of Sample



BORINGS
ARMY POINT DAM SITE
SALT WATER BARRIER
SACRAMENTO VALLEY INVESTIGATIONS
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

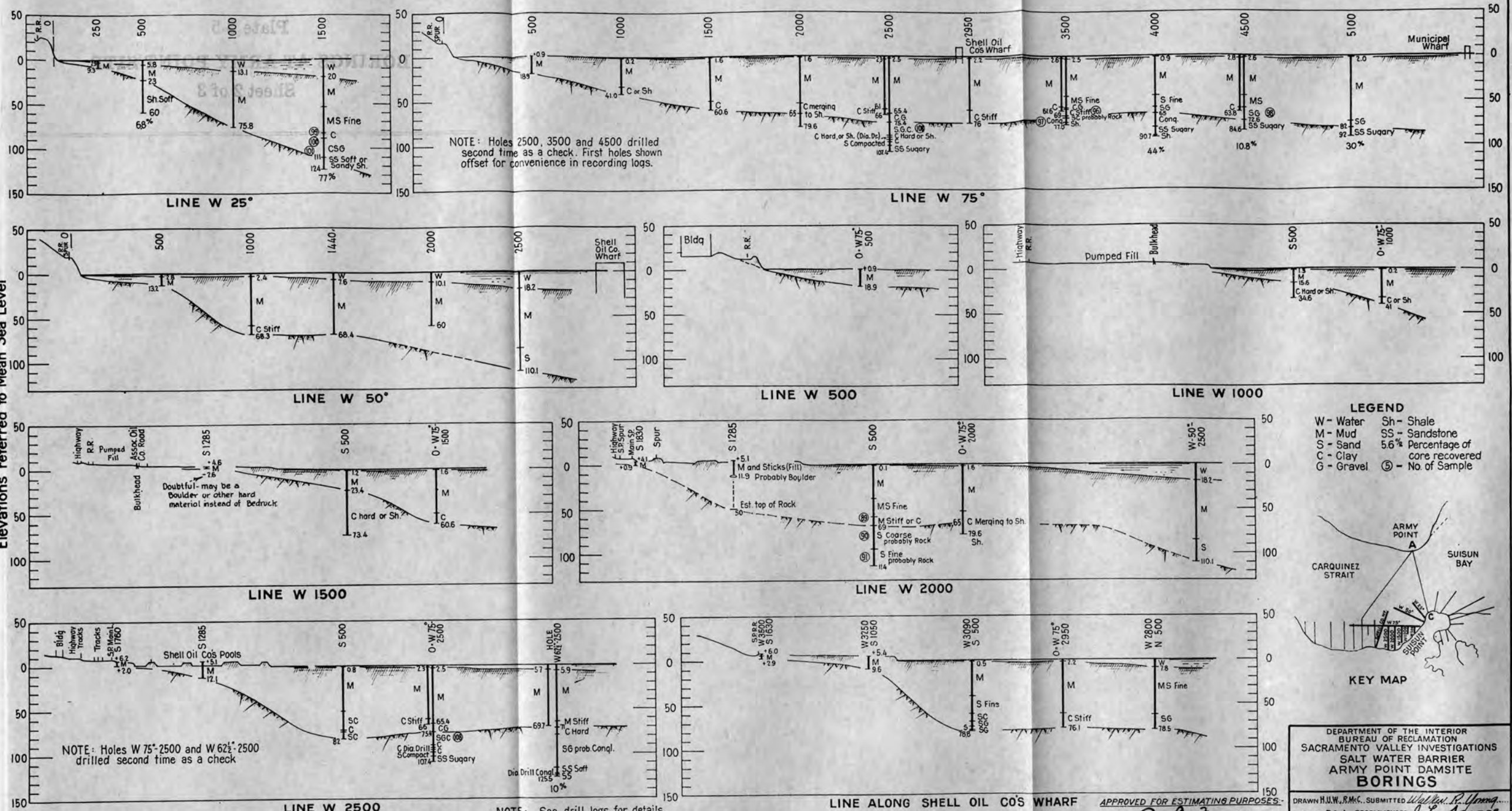
LINE ALONG SHELL OIL CO'S WHARF APPROVED FOR ESTIMATING PURPOSES

APPROVED FOR ESTIMATING PURPOSES
C. S. HARRIS
ENGINEER

NOTE: See this log for details.
For location of holes drilled see Topographic Map.
Number of logs indicates distance in feet from station 0.

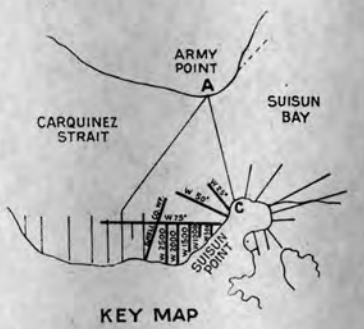
NOTE: Holes W 75 2500 and W 51 2500 drilled second time as a check.

NOTE: Holes 2500 2500 and 4200 drilled second time as a check. First holes drilled first time in location in location log.



NOTE: Holes 2500, 3500 and 4500 drilled second time as a check. First holes shown offset for convenience in recording logs.

LEGEND
 W - Water Sh - Shale
 M - Mud SS - Sandstone
 S - Sand 5.6% Percentage of
 C - Clay core recovered
 G - Gravel ⑤ - No. of Sample



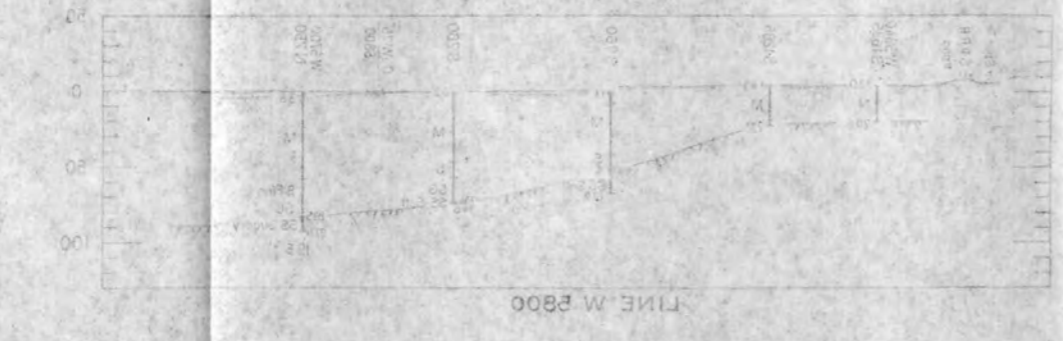
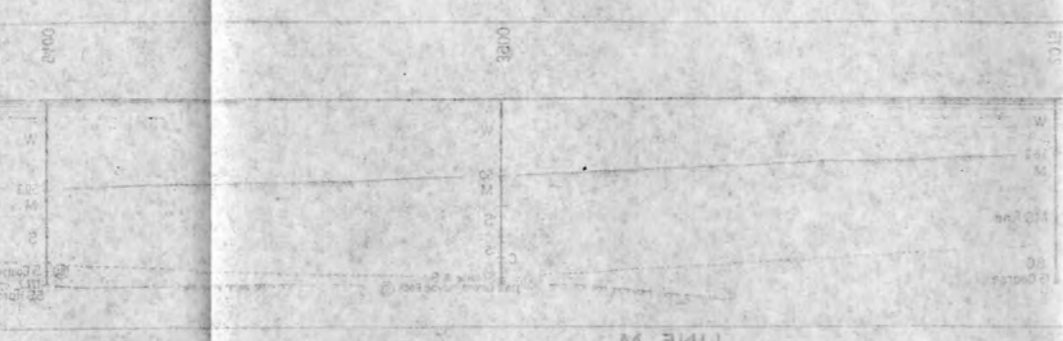
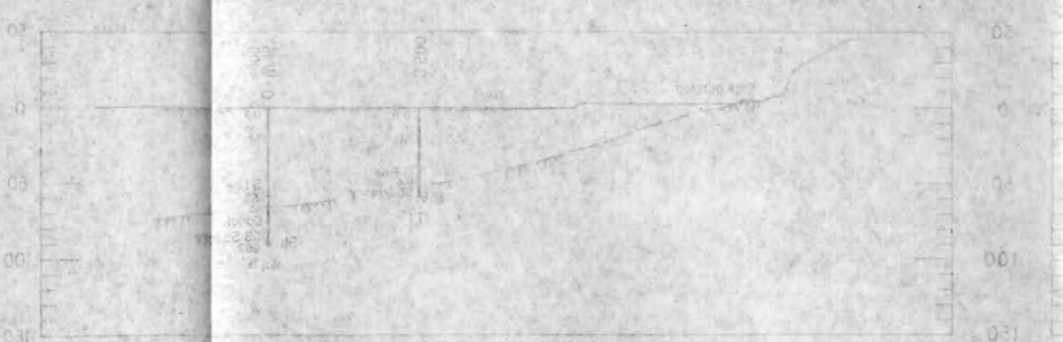
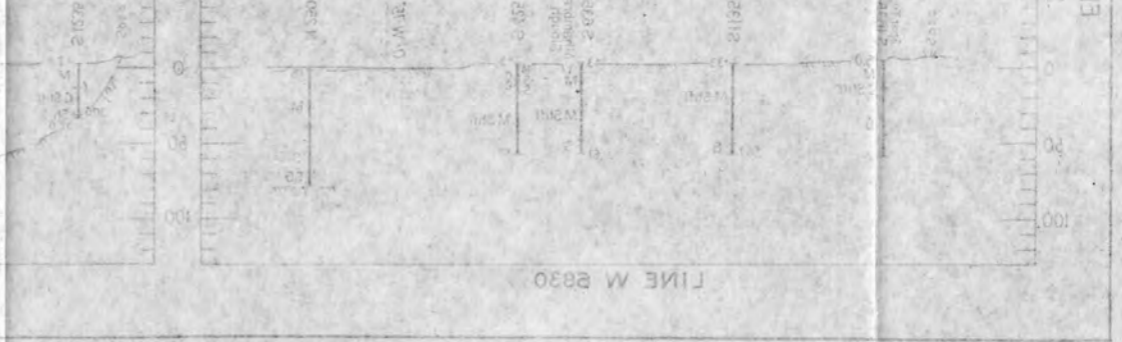
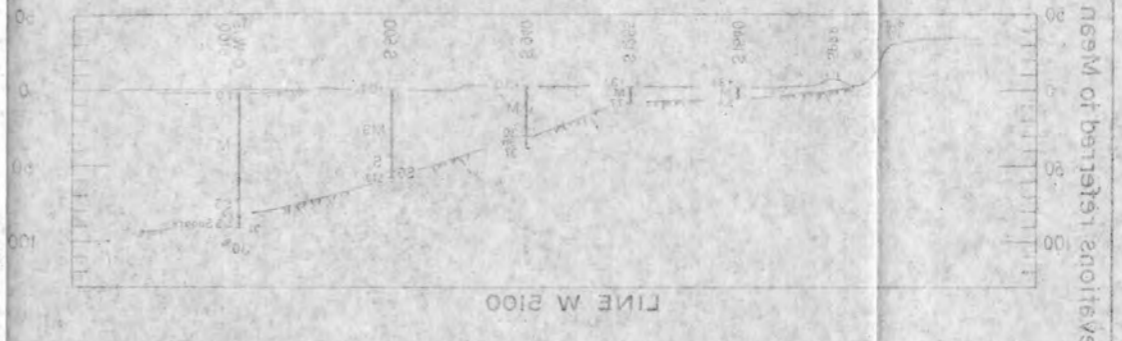
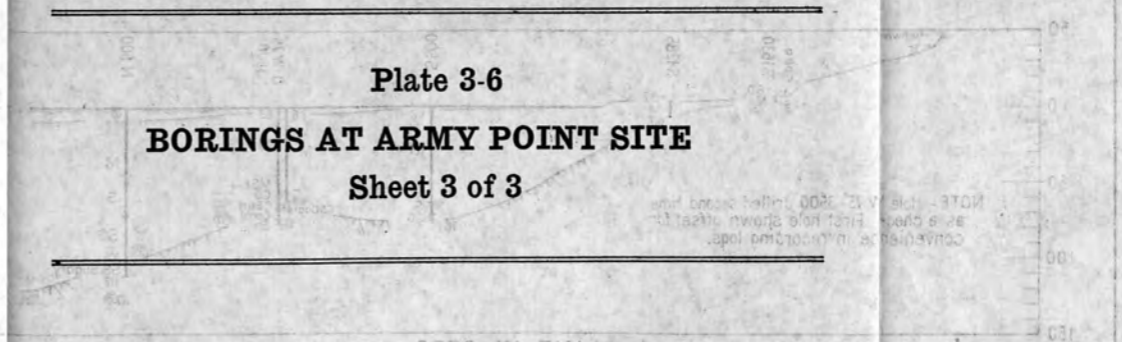
DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 ARMY POINT DAMSITE
BORINGS

NOTE: See drill logs for details.
 For location of holes drilled see Topographic Map.
 Number of hole indicates its distance in feet from Station 0.

APPROVED FOR ESTIMATING PURPOSES:
A. F. Tralter
 CHIEF ENGINEER

DRAWN H.W.W., R.M.C., SUBMITTED *Walker, R. Young*
 CHECKED *P.A.J.*, RECOMMENDED *J. L. Savage*
 SV-51 BERKELEY, CALIF., JUNE 5, 1925 SHEET 2 OF 3 193-D-4

Plate 3-6 BORINGS AT ARMY POINT SITE Sheet 3 of 3

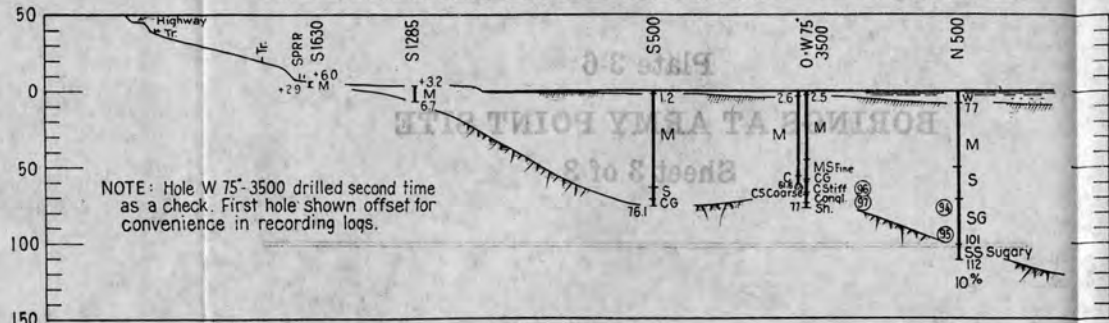


LEGEND
 W - Water
 M - Mud
 S - Sand
 C - Clay
 G - Gravel
 S1 - Silty
 S2 - Silty
 S3 - Silty
 S4 - Silty
 S5 - Silty
 S6 - Silty
 S7 - Silty
 S8 - Silty
 S9 - Silty
 S10 - Silty
 S11 - Silty
 S12 - Silty
 S13 - Silty
 S14 - Silty
 S15 - Silty
 S16 - Silty
 S17 - Silty
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 S19 - Silty
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 S25 - Silty
 S26 - Silty
 S27 - Silty
 S28 - Silty
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 S31 - Silty
 S32 - Silty
 S33 - Silty
 S34 - Silty
 S35 - Silty
 S36 - Silty
 S37 - Silty
 S38 - Silty
 S39 - Silty
 S40 - Silty
 S41 - Silty
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 S48 - Silty
 S49 - Silty
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 S68 - Silty
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 S74 - Silty
 S75 - Silty
 S76 - Silty
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 S79 - Silty
 S80 - Silty
 S81 - Silty
 S82 - Silty
 S83 - Silty
 S84 - Silty
 S85 - Silty
 S86 - Silty
 S87 - Silty
 S88 - Silty
 S89 - Silty
 S90 - Silty
 S91 - Silty
 S92 - Silty
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 S95 - Silty
 S96 - Silty
 S97 - Silty
 S98 - Silty
 S99 - Silty
 S100 - Silty

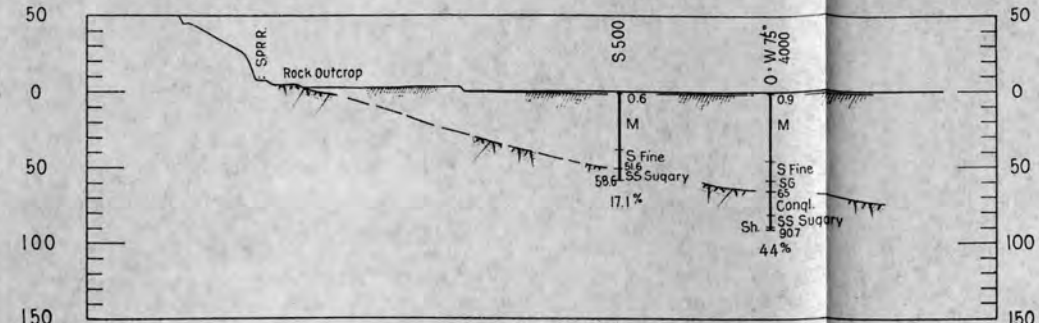


KEY MAP
 NOTE: For location, hole drilled
 in this map
 See 0-11 logs
 in Section 10
 of Volume 1
 of this report

BORINGS
 ARMY POINT DAM SITE
 SACRAMENTO VALLEY INVESTIGATIONS
 BUREAU OF RECONSTRUCTION
 DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY
 WASHINGTON, D. C.
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 2025

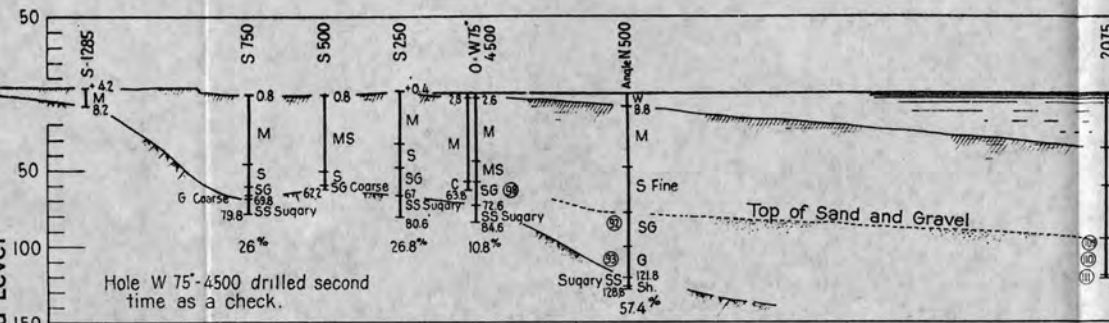


LINE W 3500

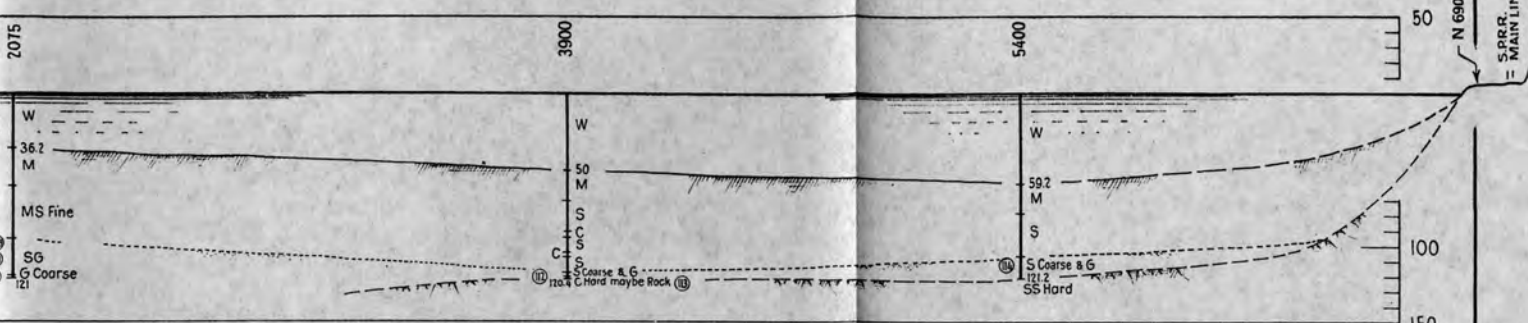


LINE W 4000

LEGEND
 W - Water Sh - Shale
 M - Mud SS - Sandstone
 S - Sand 56% - Percentage of
 C - Clay core recovered
 G - Gravel (5) - No. of Sample

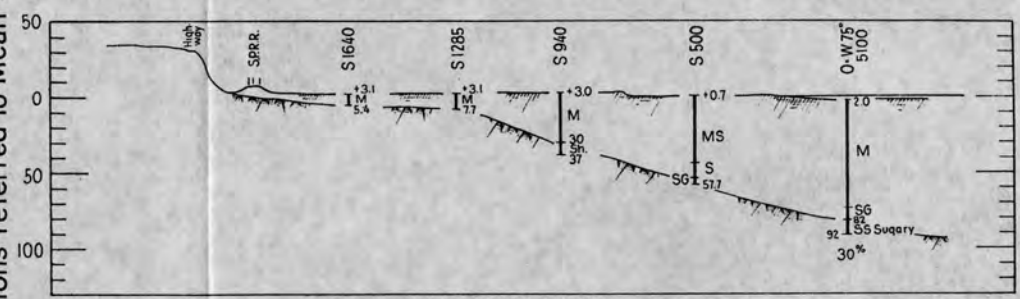


LINE W 4500

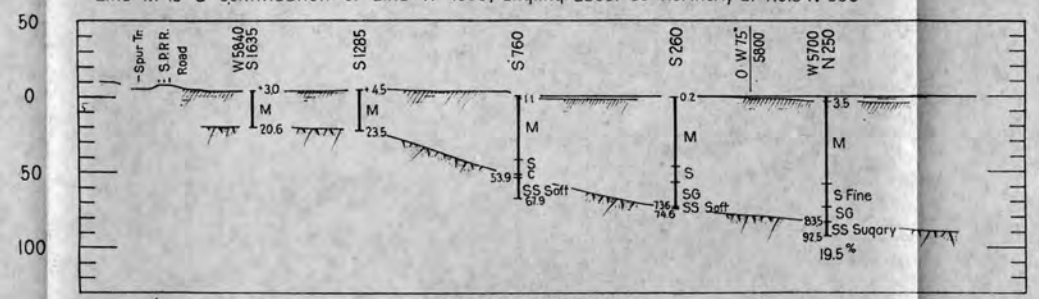


LINE M

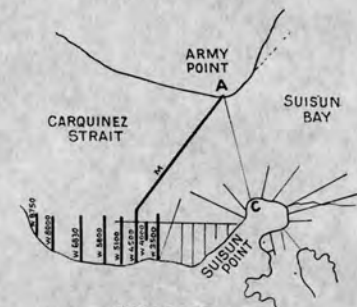
Line M is a continuation of Line W 4500, anqing about 35° Northerly at Hole N 500



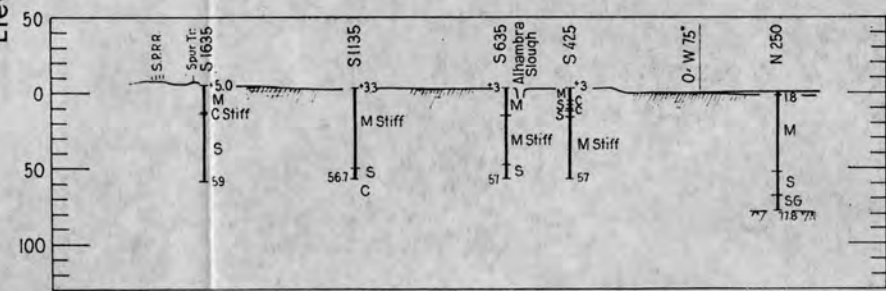
LINE W 5100



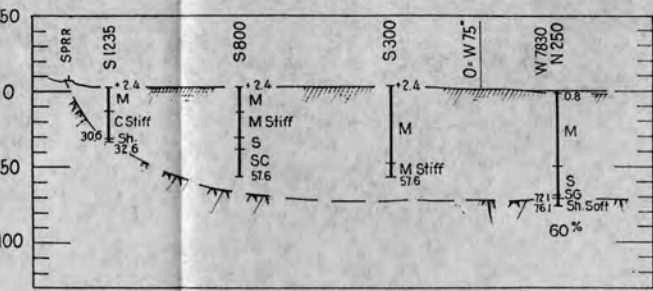
LINE W 5800



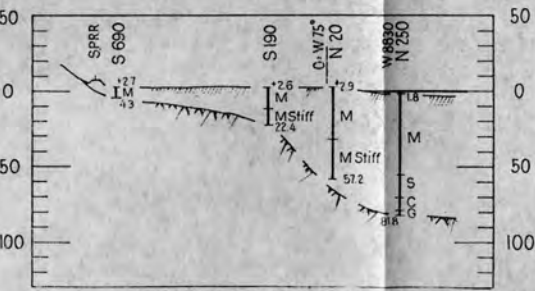
KEY MAP



LINE W 6830



LINE W 8000



LINE W 8750

NOTE: For location of holes drilled see Topographic Map.
 Number of hole indicates its distance in feet from Station 0
 See drill logs for details.

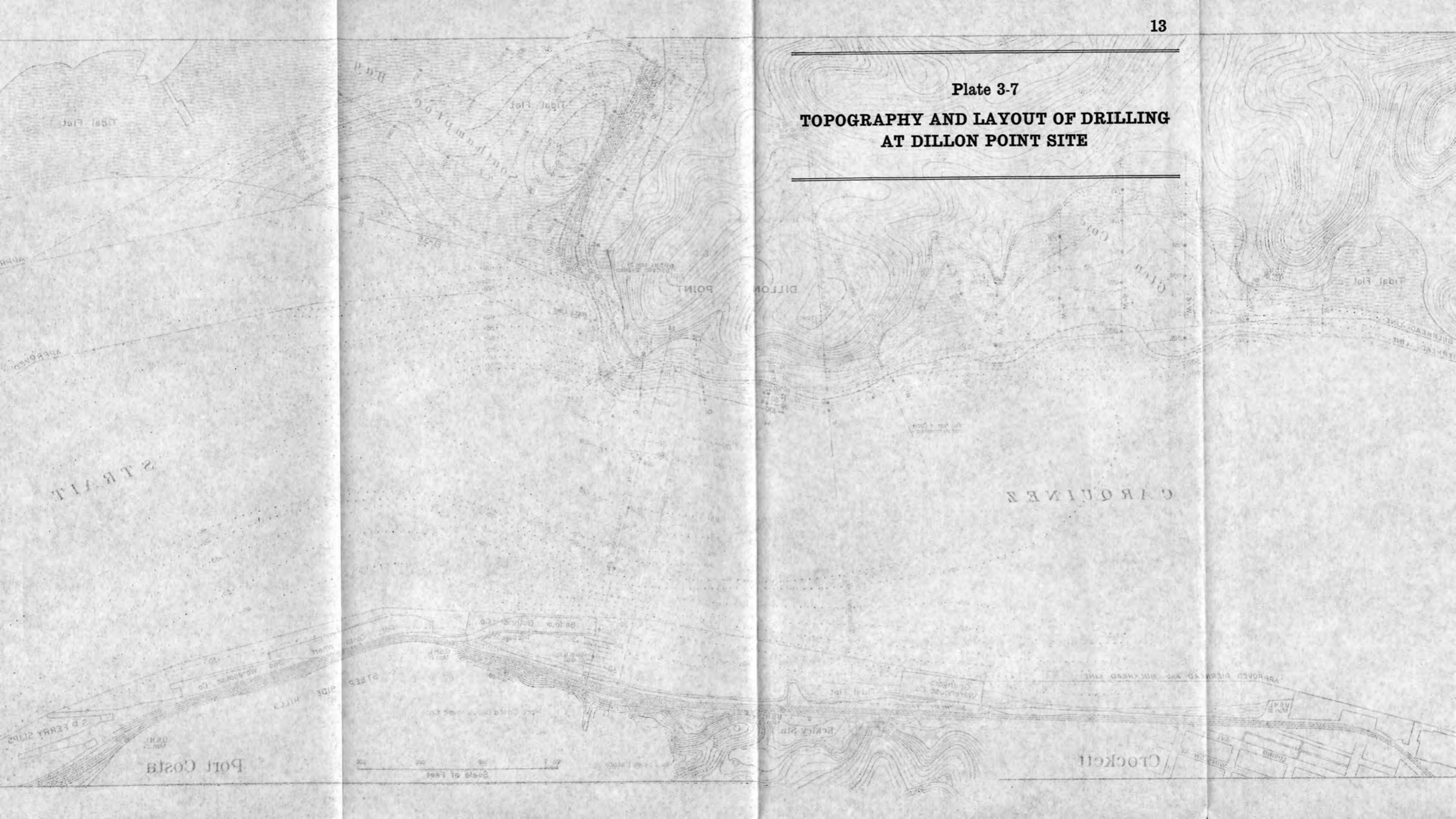
DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 ARMY POINT DAMSITE
BORINGS

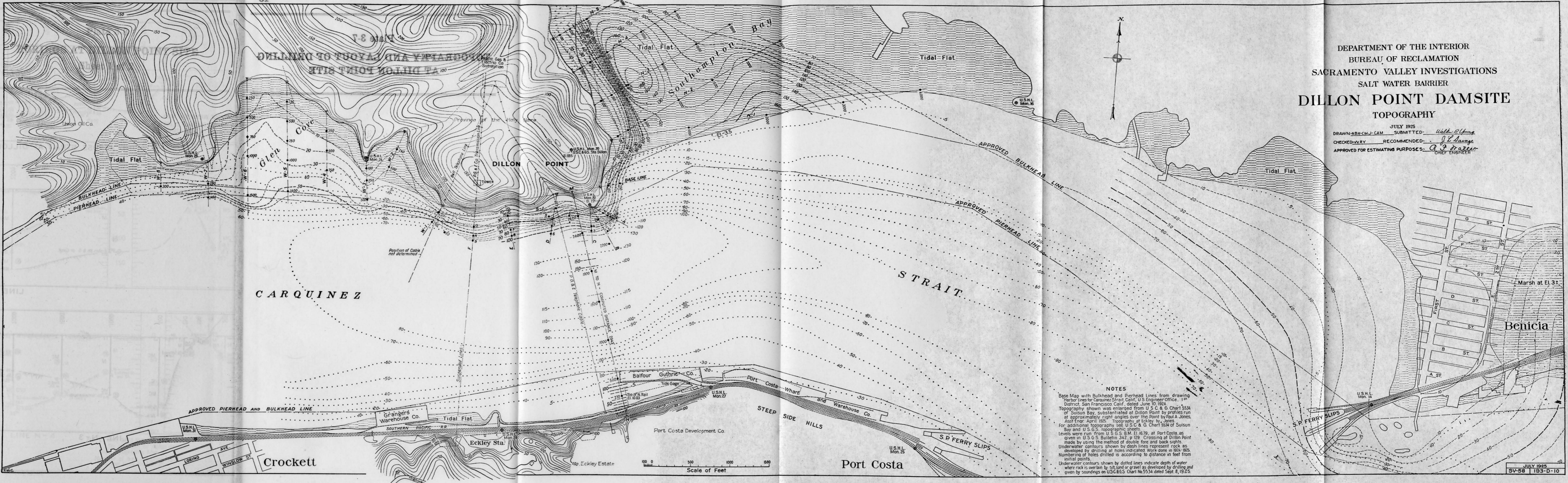
APPROVED FOR ESTIMATING PURPOSES:
O. F. Walter
 CHIEF ENGINEER

DRAWN W.W.R.M.C. SUBMITTED *Walter R. Young*
 CHECKED R.A.J. RECOMMENDED *A. R. Savage*
 SV - 52 BERKELEY, CALIF. JUNE 5, 1925 SHEET 3 OF 3 193-D-5

Elevations referred to Mean Sea Level

Plate 3-7
**TOPOGRAPHY AND LAYOUT OF DRILLING
 AT DILLON POINT SITE**





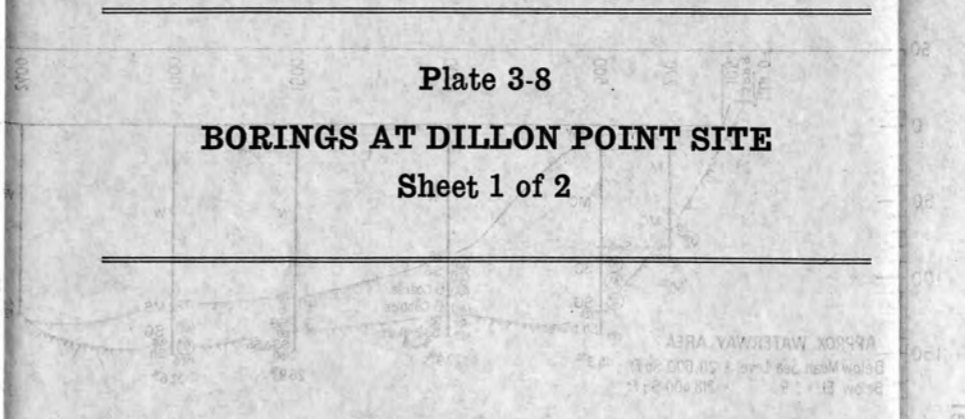
DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
DILLON POINT DAMSITE
 TOPOGRAPHY

JULY 1925
 DRAWN: NBH-CM-J-CAM SUBMITTED: *Walter R. Long*
 CHECKED: W.V.R.Y. RECOMMENDED: *J. L. Savage*
 APPROVED FOR ESTIMATING PURPOSES: *A. J. Draper*
 CHIEF ENGINEER

NOTES
 Base Map with Bulkhead and Pierhead Lines from drawing Harbor Lines for Carquinez Strait, Calif., U.S. Engineer Office, 1st District, San Francisco Calif., dated June 10, 1924.
 Topography shown was enlarged from U.S.C. & G. Chart 5534 of Suisun Bay, substantiated at Dillon Point by profiles run at approximately right angles over the Point by Paul A. Jones, Asst. Engr. April 1925. Topography at Eckley by Jones.
 For additional topography see U.S.C. & G. Chart 5534 of Suisun Bay and U.S.G.S. topographic sheets.
 Levels were run from U.S.G.S. B.M. El. 1679, at Port Costa, as given in U.S.G.S. Bulletin 342, p. 129. Crossing at Dillon Point made by using the method of double fore and back sights.
 Underwater contours shown by dash lines represent rock as developed by drilling at holes indicated. Work done in 1924-1925. Numbering of holes drilled is according to distance in feet from initial points.
 Underwater contours shown by dotted lines indicate depth of water where rock is overlain by silt, sand or gravel as developed by drilling and given by soundings on U.S.C. & G. Chart No. 5534 dated Sept. 8, 1925.

Plate 3-8
BORINGS AT DILLON POINT SITE
Sheet 1 of 2

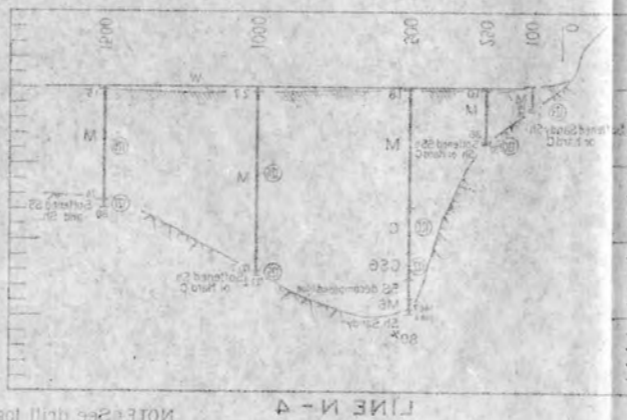
LINE ACROSS STRAIT AT DILLON POINT



LINE N-1

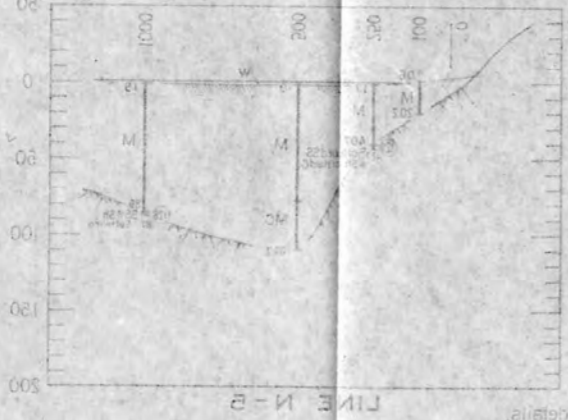


LINE N-4



NOTE: See drill logs for details.
For location of notes drilled
see topographic map.
Number of notes indicates its distance
in feet from Station 0.

LINE N-2

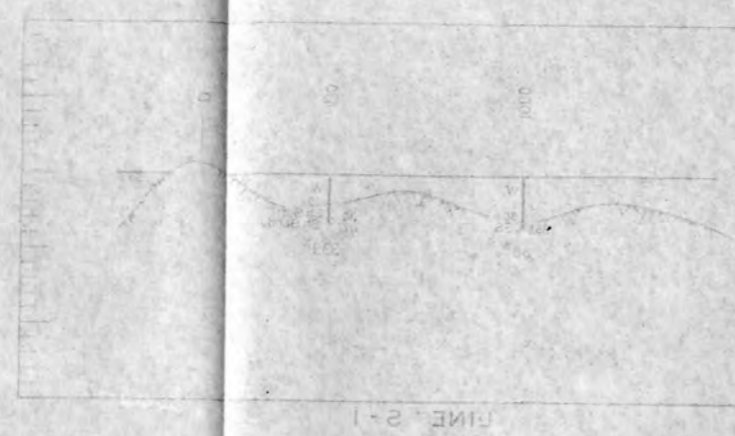
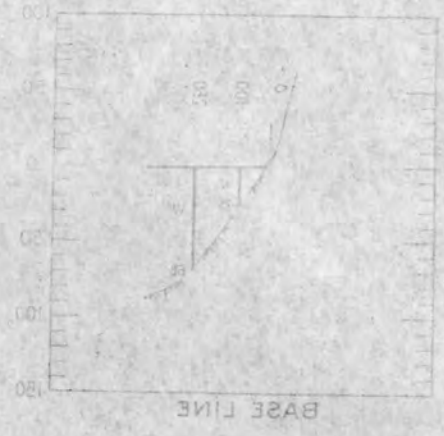


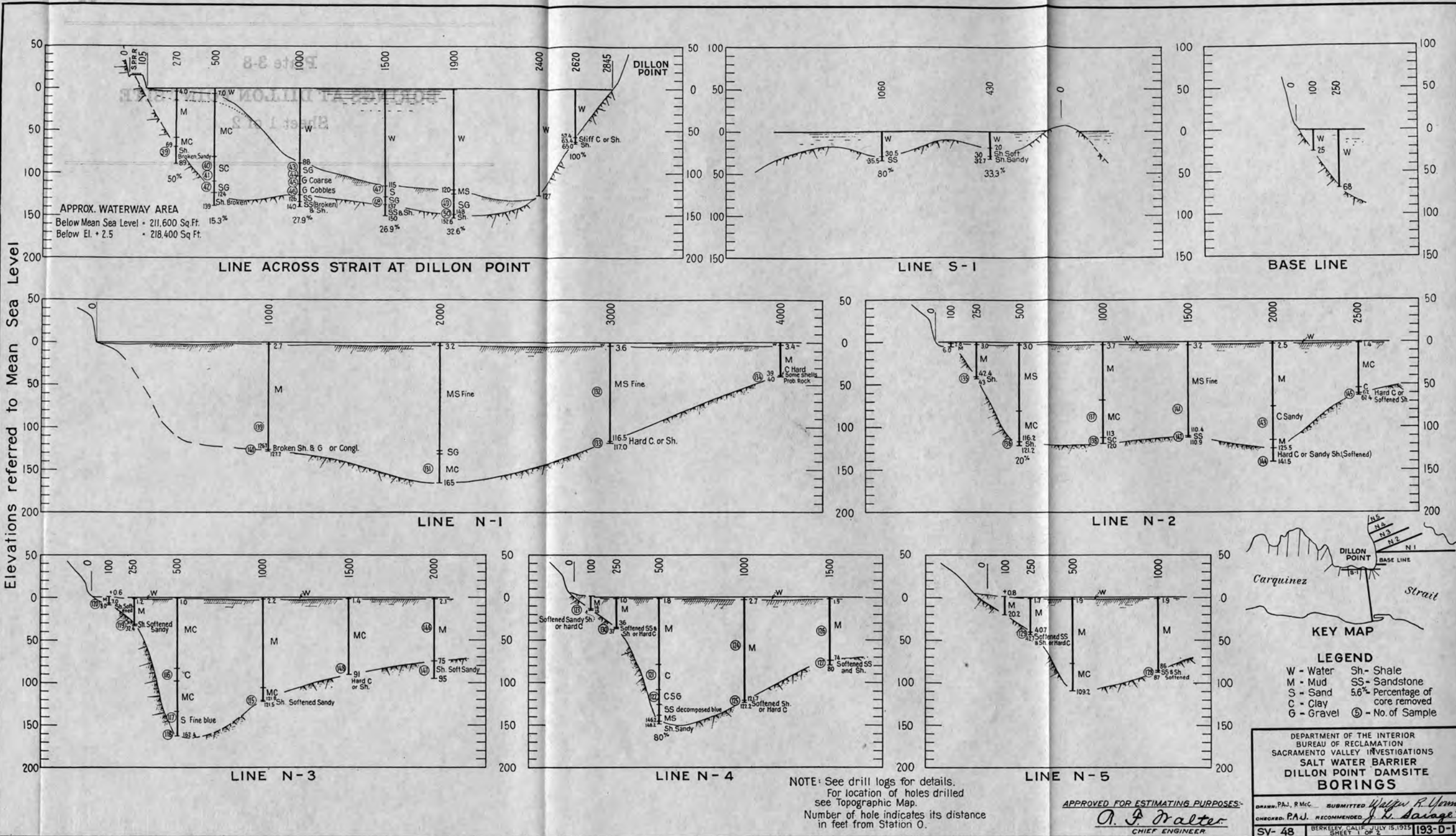
LINE N-5



LEGEND
W - Water
M - Mud
S - Sand
C - Clay
G - Gravel
MC - No. of Sample
MC - Core removed
MC - Percentage of
MC - Sandstone
MC - Slate

DILLON POINT DAM SITE
SALT WATER BARRIER
SACRAMENTO VALLEY INVESTIGATIONS
BUREAU OF RECLAMATION
DEPARTMENT OF THE INTERIOR
APPROVED FOR ESTIMATING PURPOSES
BY: *[Signature]*
DATE: 1933-0-1





APPROX. WATERWAY AREA
 Below Mean Sea Level - 211,600 Sq. Ft.
 Below El. + 2.5 - 218,400 Sq. Ft.

LINE ACROSS STRAIT AT DILLON POINT

LINE S-1

BASE LINE

LINE N-1

LINE N-2

LINE N-3

LINE N-4

LINE N-5

KEY MAP

LEGEND
 W - Water Sh - Shale
 M - Mud SS - Sandstone
 S - Sand 5.6% - Percentage of
 core removed
 C - Clay
 G - Gravel (5) - No. of Sample

NOTE: See drill logs for details.
 For location of holes drilled
 see Topographic Map.
 Number of hole indicates its distance
 in feet from Station 0.

APPROVED FOR ESTIMATING PURPOSES:-
A. F. Pralter
 CHIEF ENGINEER

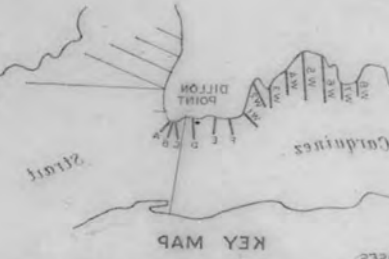
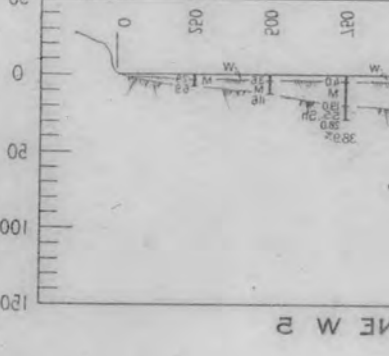
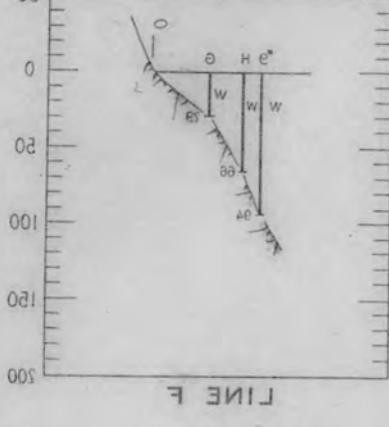
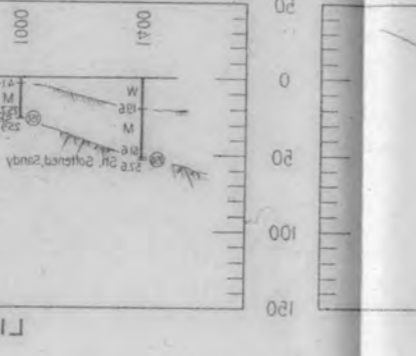
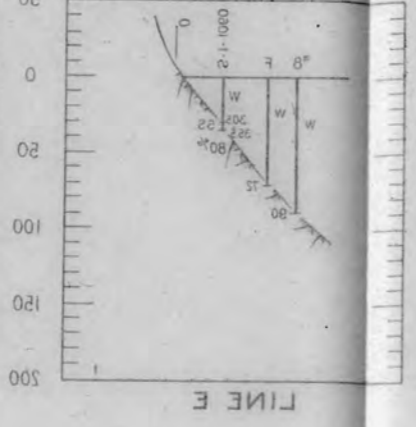
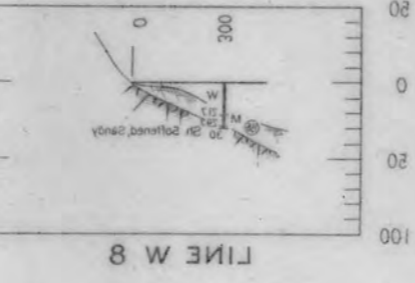
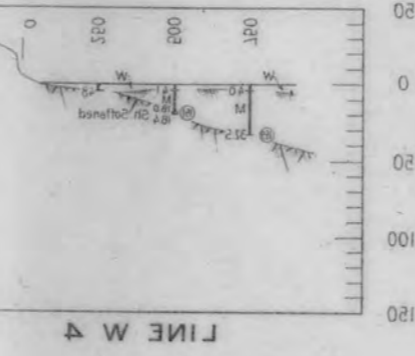
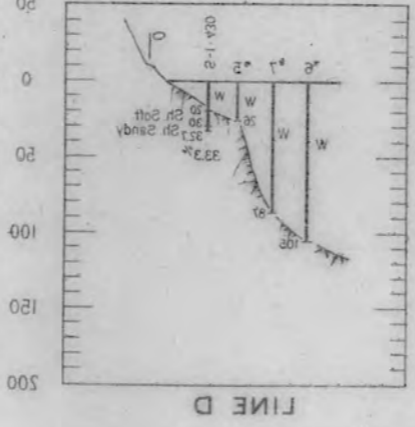
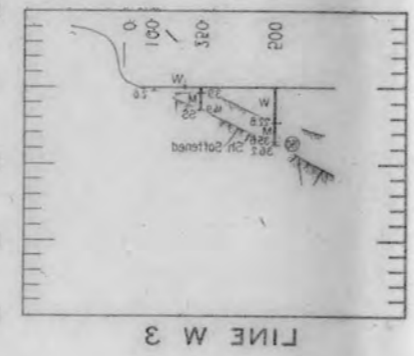
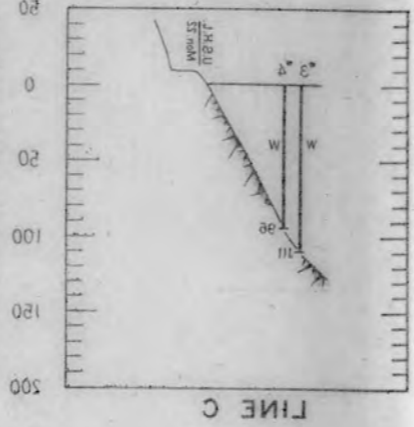
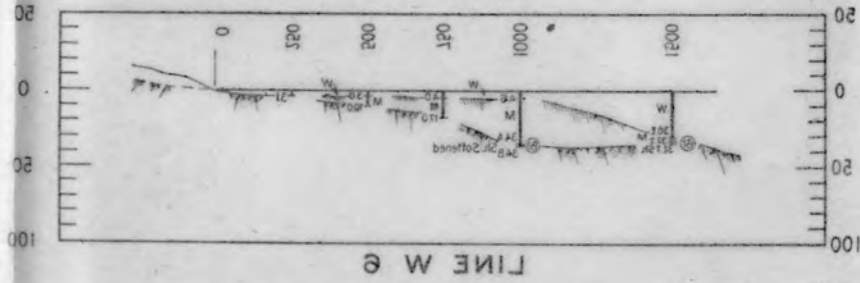
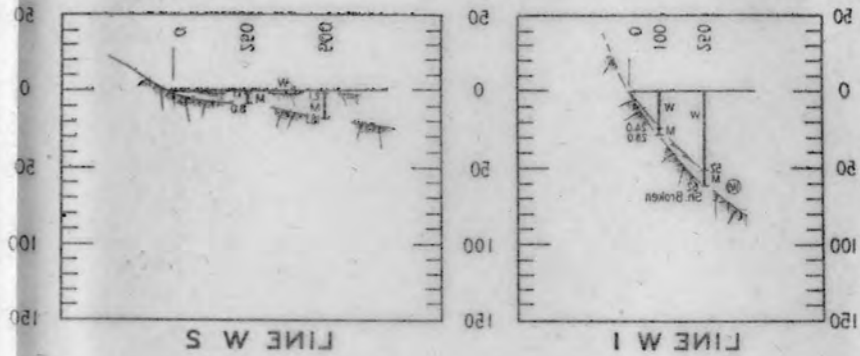
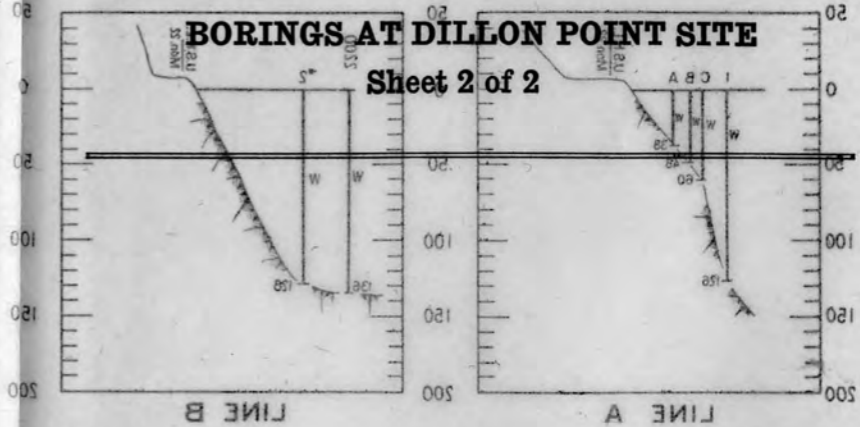
DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 DILLON POINT DAMSITE
 BORINGS

DRAWN: P.A.J. R.M.C. SUBMITTED: *W. R. Young*
 CHECKED: P.A.J. RECOMMENDED: *J. L. Savage*
 SV-48 BERKELEY, CALIF. JULY 15, 1915 SHEET 1 OF 2 193-D-1

Plate 3-9

BORINGS AT DILLON POINT SITE

Sheet 2 of 2



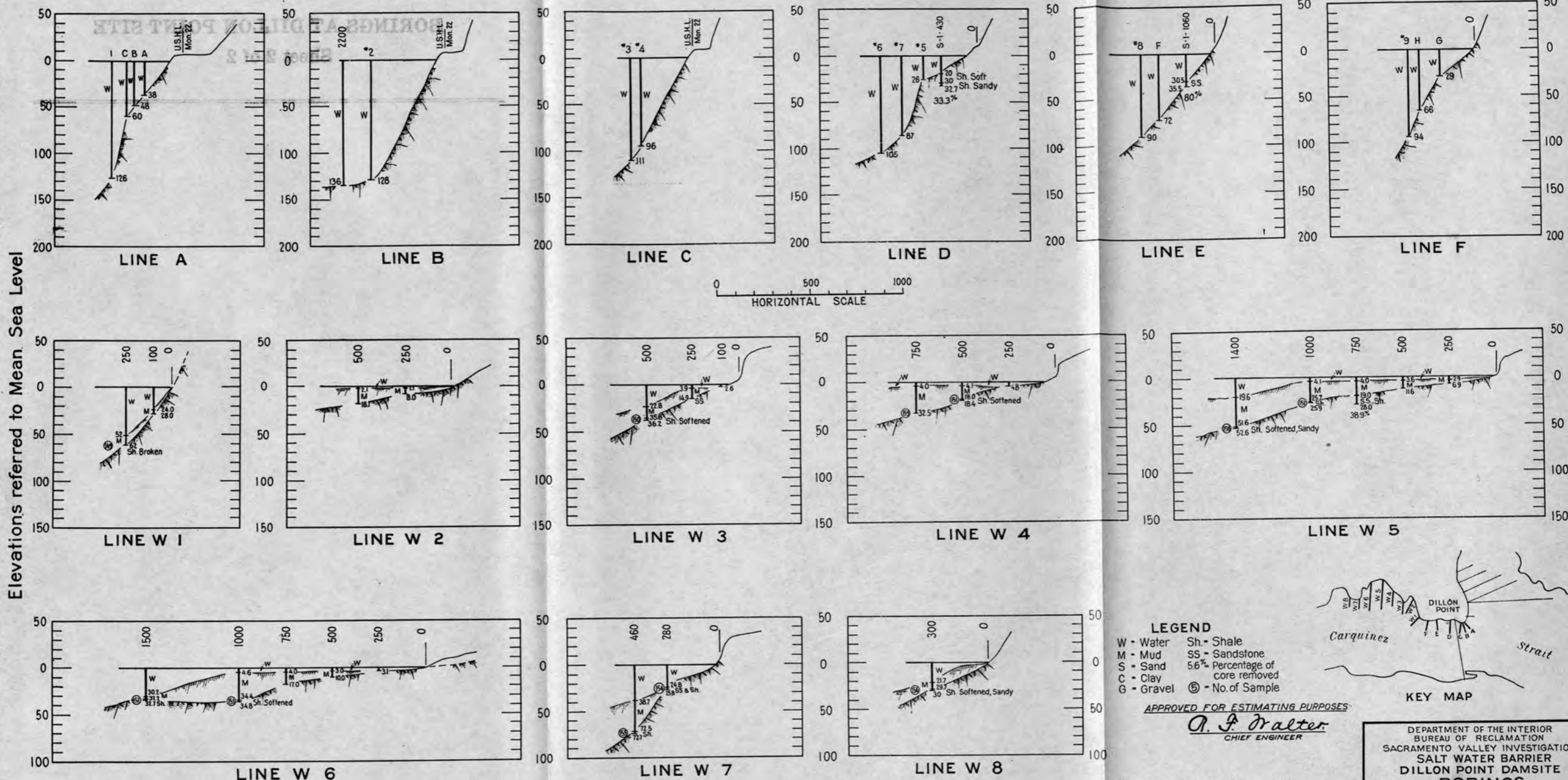
LEGEND
 W - Water
 M - Mud
 S - Sand
 C - Clay
 G - Gravel
 (Symbol) - No of Sample
 % - Percentage of core removed

APPROVED FOR ESTIMATING PURPOSES
D. J. Butler
 CHIEF ENGINEER

NOTE: For location of holes drilled see Topographic Map. Number of hole indicates its distance in feet from Station 0. See drill logs for details.

SV-43
 DRAWN BY J. R. McC... SUBMITTED BY R. N. ...
 CHECKED BY J. R. ...
 DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 DILLON POINT DAMSITE
BORINGS

Level 662 nasm of batterer anoitvel3



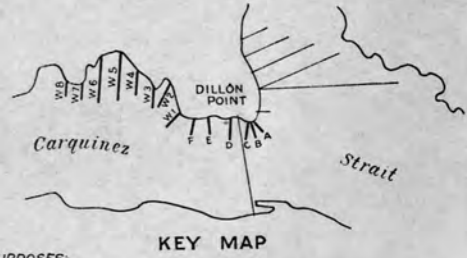
Elevations referred to Mean Sea Level

HORIZONTAL SCALE
0 500 1000

LEGEND
 W - Water Sh - Shale
 M - Mud SS - Sandstone
 S - Sand 5.6% - Percentage of
 core removed
 C - Clay
 G - Gravel (S) - No. of Sample

APPROVED FOR ESTIMATING PURPOSES:

O. F. Dralter
 CHIEF ENGINEER



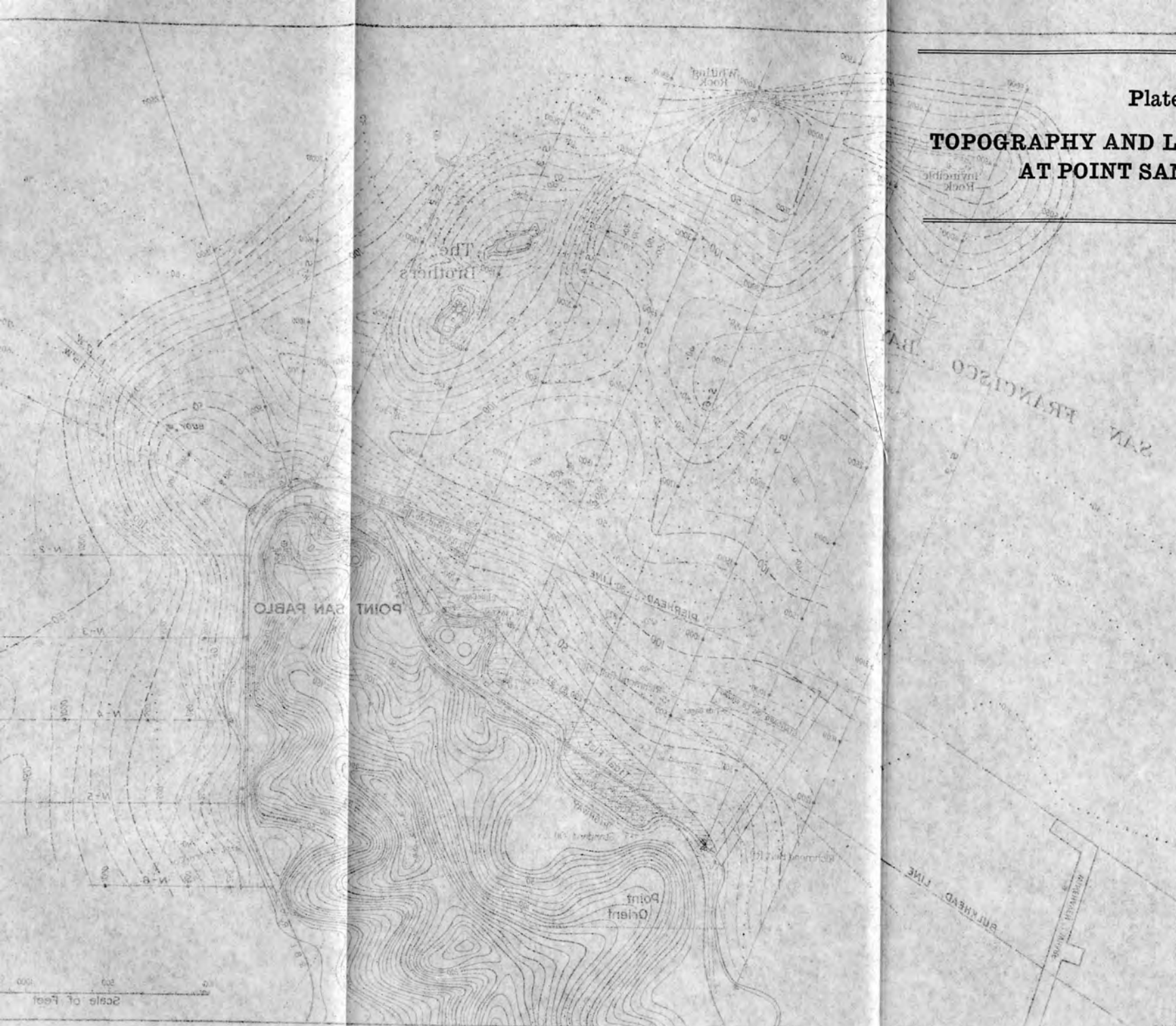
DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 DILLON POINT DAMSITE
BORINGS

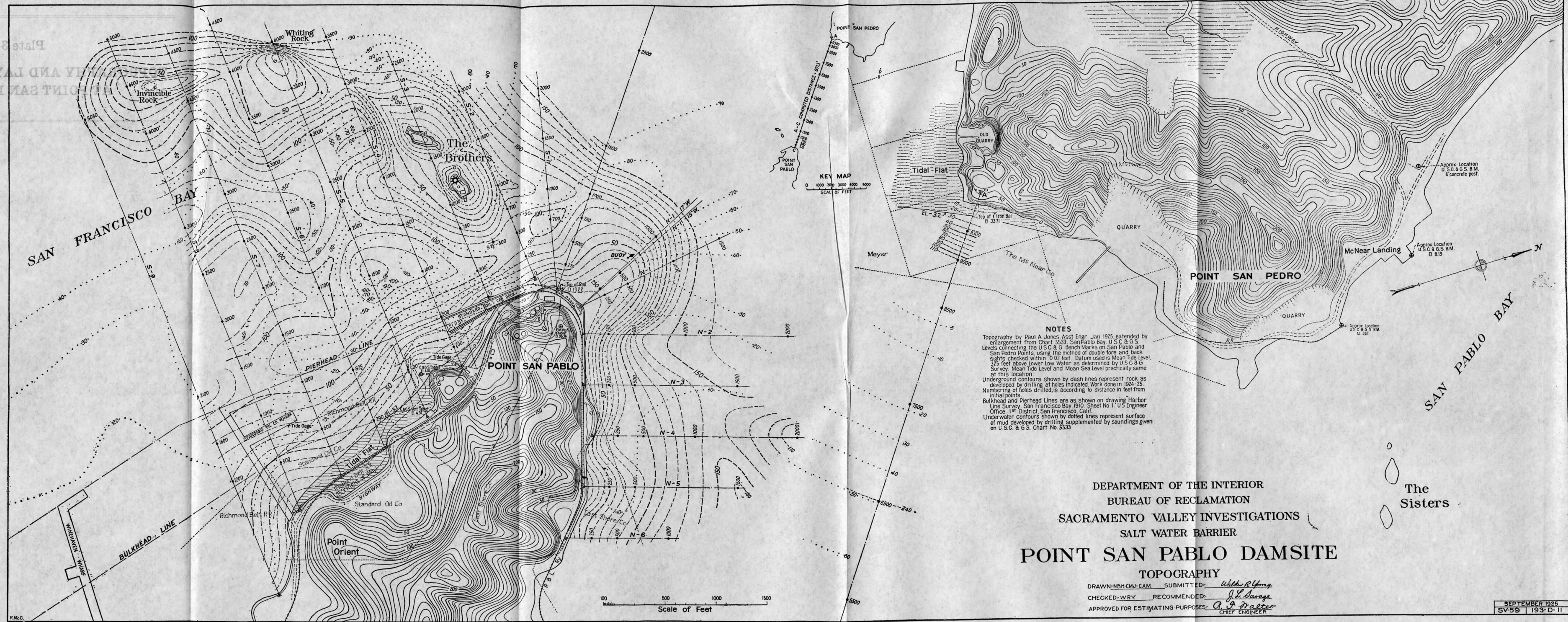
NOTE: For location of holes drilled see Topographic Map.
 Number of hole indicates its distance in feet from Station 0.
 See drill logs for details.

DRAWN: PA-J, R.M.C., SUBMITTED: *Malcolm R. Young*
 CHECKED: PAJ, RECOMMENDED: *J. K. Savage*
 SV-49 BERKELEY CALIF., JULY 15, 1925 SHEET 2 OF 2 193-D-2

Plate 3-10

**TOPOGRAPHY AND LAYOUT OF DRILLING
AT POINT SAN PABLO SITE**





NOTES
 Topography by Paul A Jones, Asst Engr, Jan 1925, extended by enlargement from Chart 5533, San Pablo Bay, U.S.C. & G.S. Levels connecting the U.S.C. & G.S. Bench Marks on San Pablo and San Pedro Points, using the method of double fore and back sights checked within 0.02 feet. Datum used is Mean Tide Level, 3.25 feet above Lower Low Water as determined by U.S.C. & G.S. Survey. Mean Tide Level and Mean Sea Level practically same at this location.
 Underground contours shown by dash lines represent rock as developed by drilling at holes indicated. Work done in 1924-25. Numbering of holes drilled, is according to distance in feet from initial points.
 Bulkhead and Pierhead Lines are as shown on drawing Harbor Line Survey, San Francisco Bay, 1910, Sheet No. 1, U.S. Engineer Office, 15th District, San Francisco, Calif.
 Underwater contours shown by dotted lines represent surface of mud developed by drilling supplemented by soundings given on U.S.C. & G.S. Chart No. 5533.

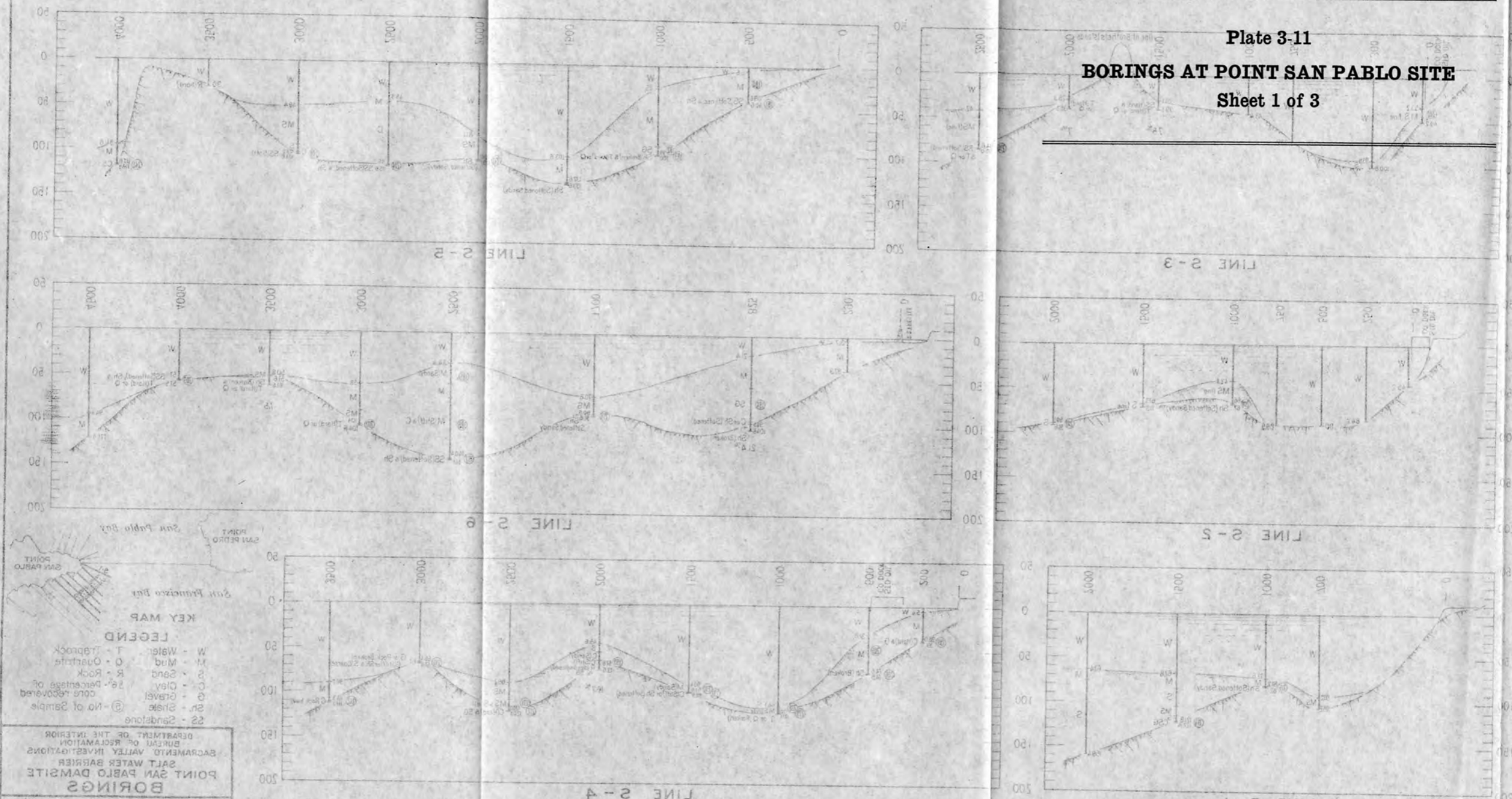
DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
POINT SAN PABLO DAMSITE
 TOPOGRAPHY

DRAWN: N.B.H.C.M.J.: C.A.M. SUBMITTED: *Walter R. Young*
 CHECKED: W.R.Y. RECOMMENDED: *J.L. Savage*
 APPROVED FOR ESTIMATING PURPOSES: *A.A. Walter*
 CHIEF ENGINEER

Plate 3-11

BORINGS AT POINT SAN PABLO SITE

Sheet 1 of 3

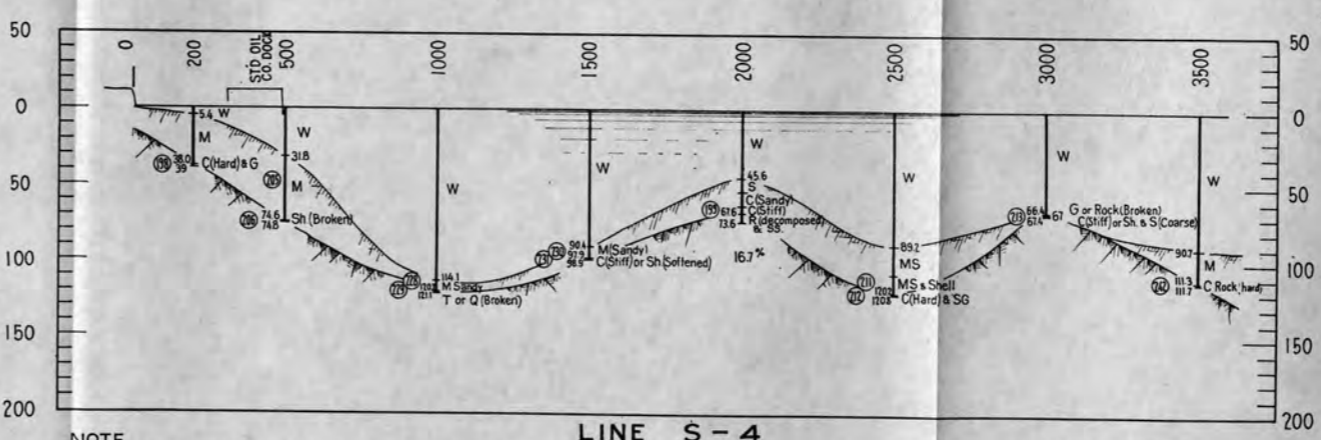
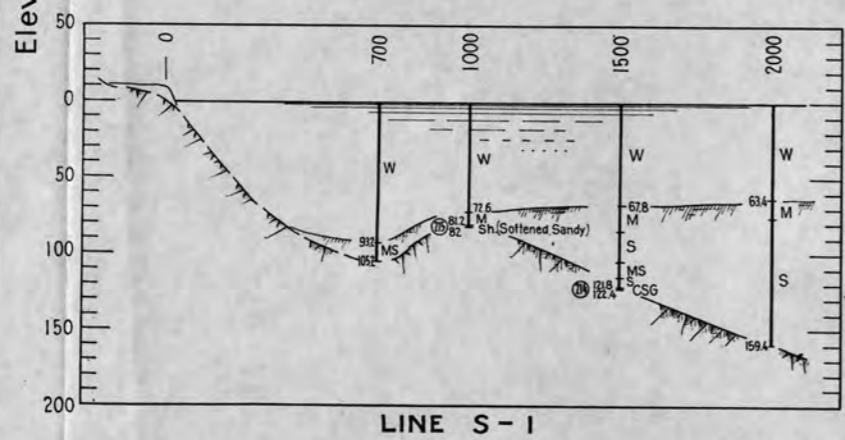
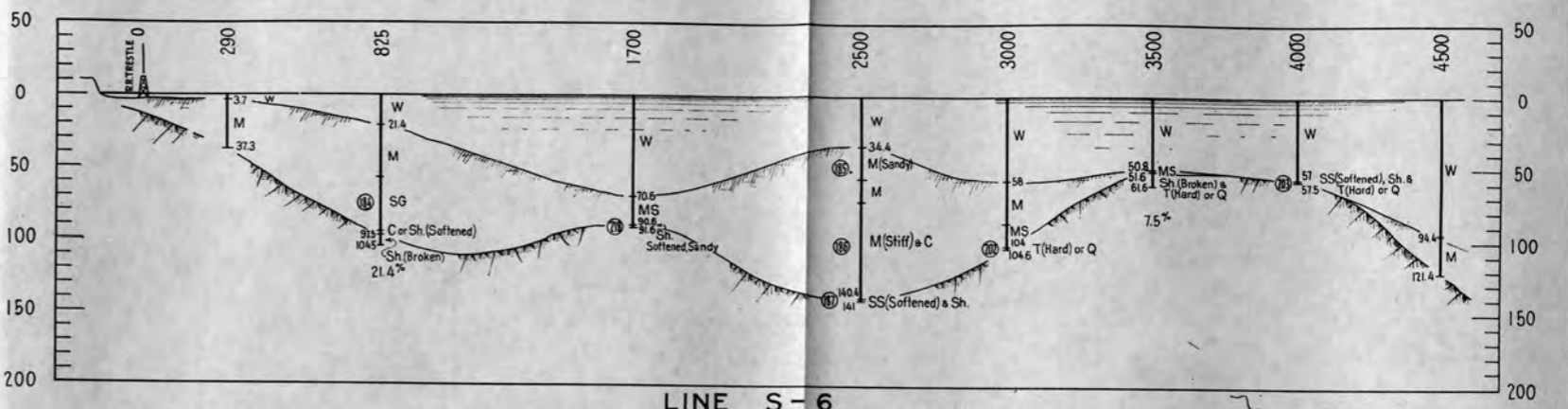
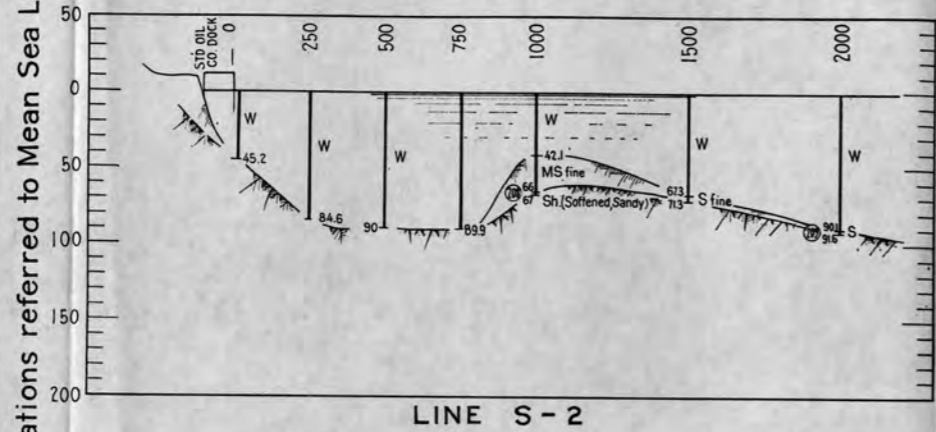
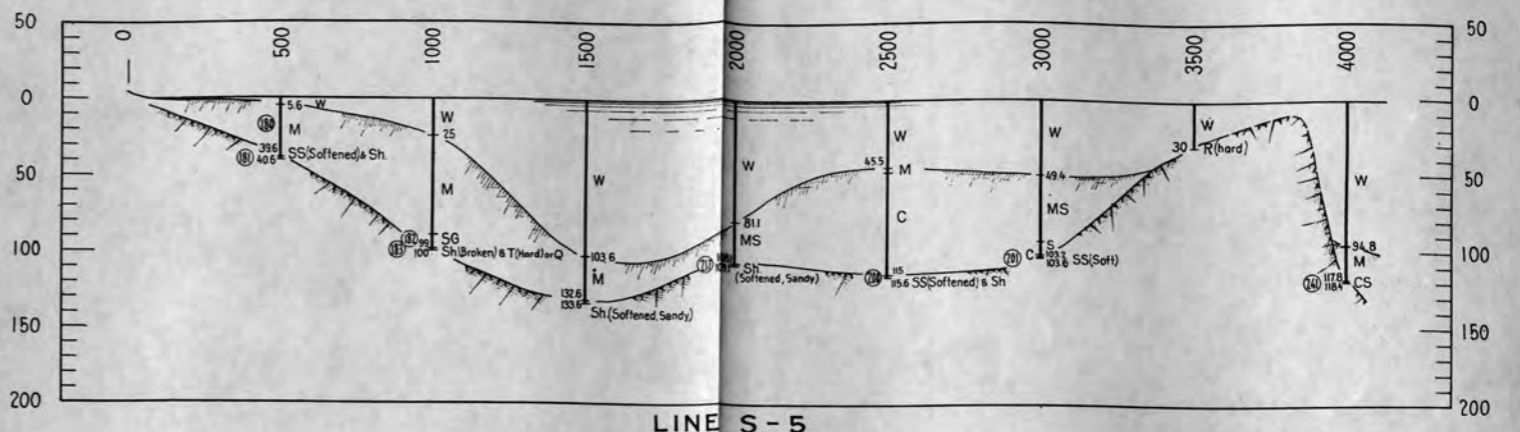
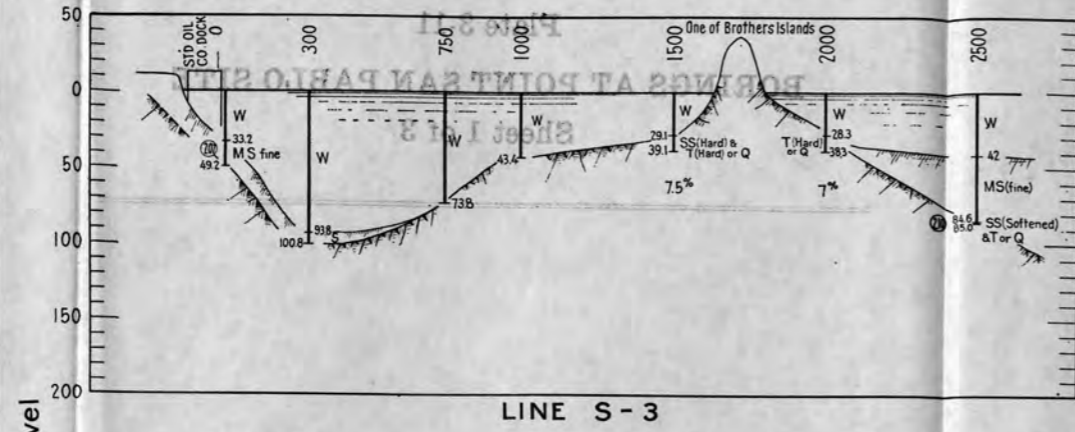


Elevations in feet M.S.M. of borings

NOTE
 For location of holes drilled see Geographic Map
 Number of hole indicates its distance in feet from Station 0.
 See drill logs for details.

APPROVED FOR ESTIMATING PURPOSES
 CHIEF ENGINEER
 CHECKED BY
 DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 POINT SAN PABLO DAMSITE
 BORINGS
 SHEET 1 OF 3
 103-D-3

KEY MAP
 San Francisco Bay
 San Pablo Bay
 POINT SAN PABLO
 LEGEND
 W - Water
 M - Mud
 S - Sand
 R - Rock
 C - Clay
 G - Gravel
 Sr - Strata
 SS - Sandstone
 T - Trench
 O - Outcrop
 R - Rock
 C - Clay
 G - Gravel
 Sr - Strata
 SS - Sandstone
 @ - No. of Sample
 % - Percentage of Core Recovered



Elevations referred to Mean Sea Level

NOTE
For location of holes drilled see Topographic Map.
Number of hole indicates its distance in feet from Station 0.
See drill logs for details.



- LEGEND
- W - Water
 - M - Mud
 - S - Sand
 - C - Clay
 - G - Gravel
 - Sh - Shale
 - SS - Sandstone
 - T - Traprock
 - Q - Quartzite
 - R - Rock
 - 56% - Percentage of core recovered
 - ⑤ - No. of Sample

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
POINT SAN PABLO DAMSITE
BORINGS

APPROVED FOR ESTIMATING PURPOSES
O. J. Walter
CHIEF ENGINEER

DRAWN: PAJ, R.M.C. SUBMITTED: *Walter R. Young*
CHECKED: PAJ. RECOMMENDED: *J. E. Savage*
SV - 53 BERKELEY CALIF. SEPT. 1, 1928 SHEET 1 OF 3 193-D-6

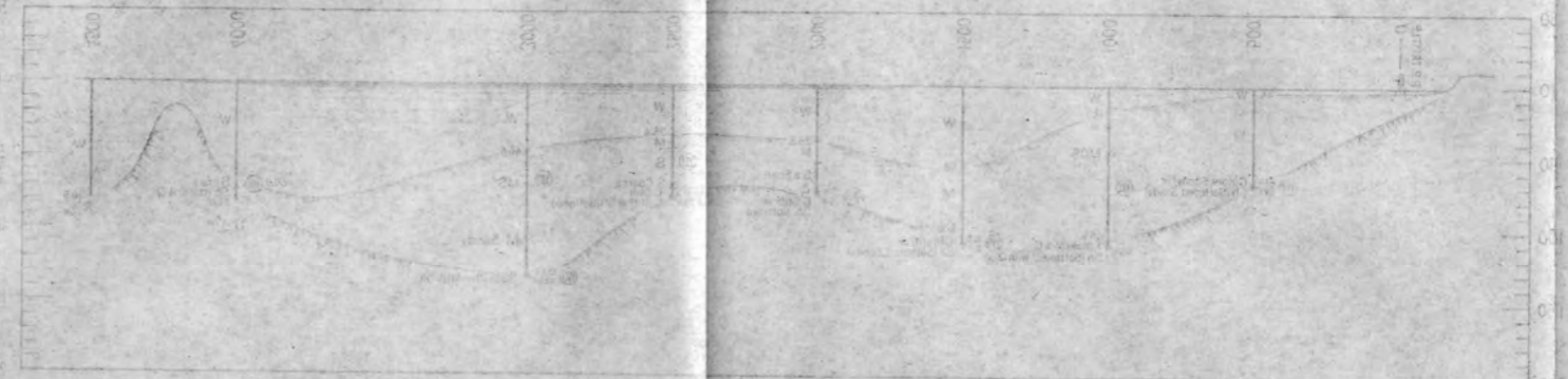
Plate 3-12

BORINGS AT POINT SAN PABLO SITE

Sheet 2 of 3

Vertical Scale of Depth in Feet

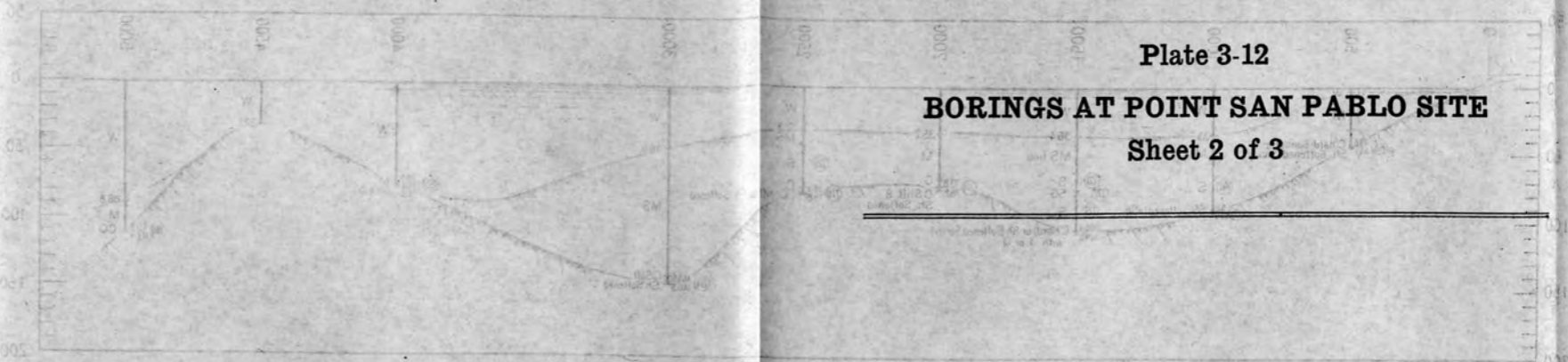
LINE S-7



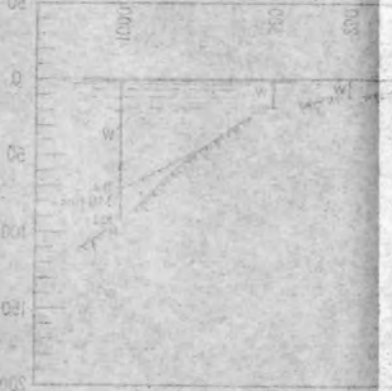
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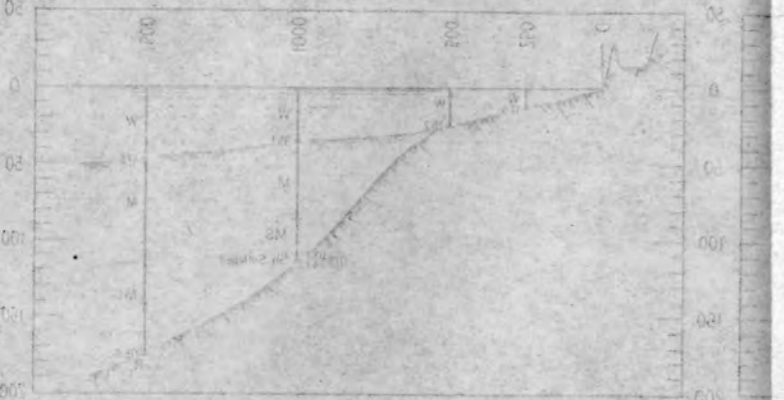
LINE S-8



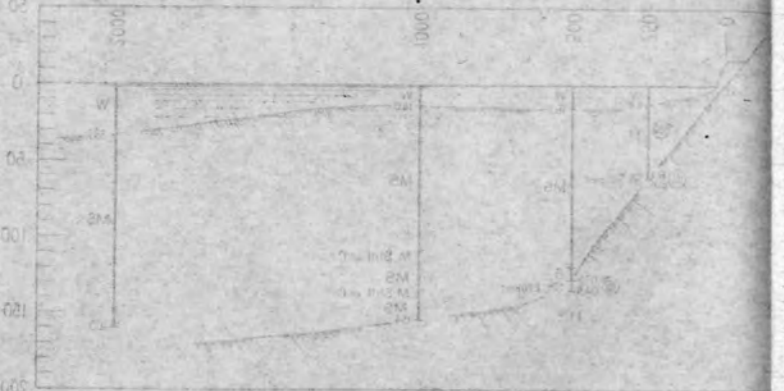
LINE N-1 15' W



LINE N-1



LINE N-5



U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
POINT SAN PABLO DAMSITE
BORINGS

KEY MAP

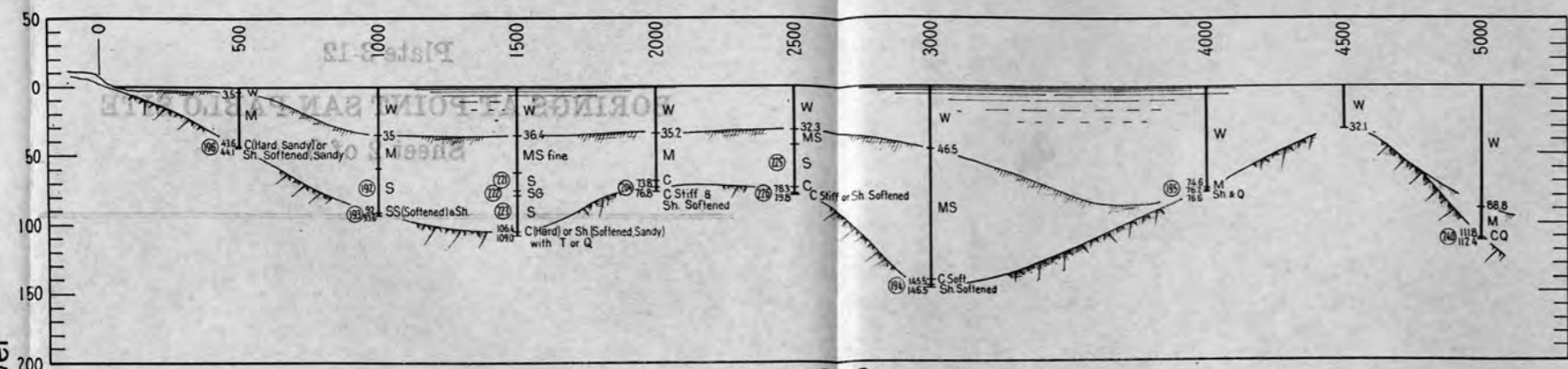
LEGEND

W - Water	T - Trench
M - Mud	O - Old
S - Sand	R - Rock
C - Clay	G - Gravel
G - Gravel	Sh - Shale

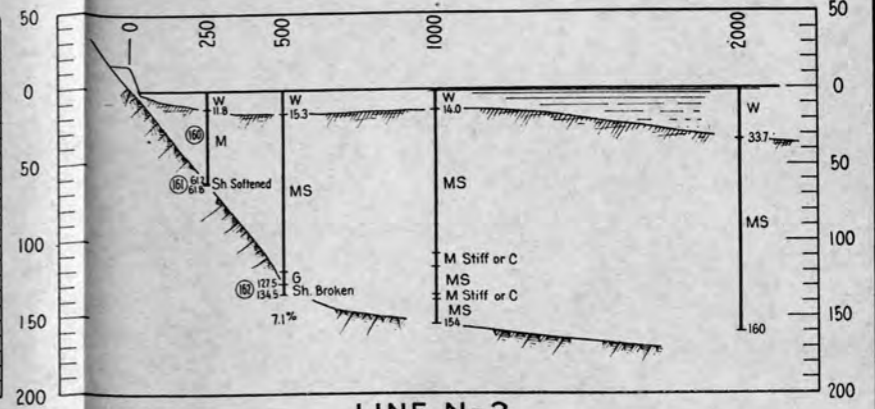
DATE: 1953-11-17
BY: J. H. ...

NOTE
For location of holes drilled see Topographic Map.
Number of hole indicates its distance in feet from station 0.
See drill logs for details.

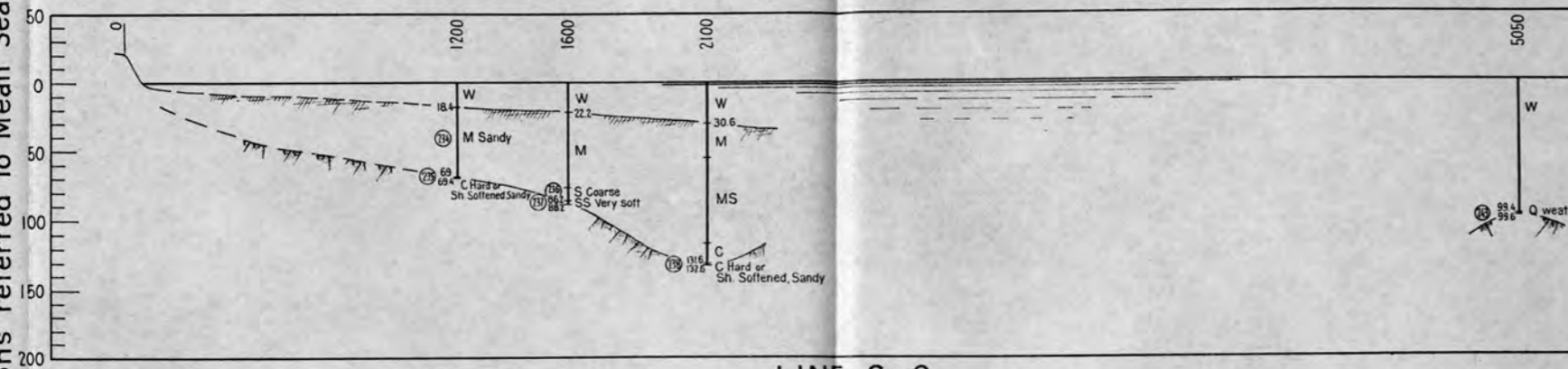
Elevations referred to Mean Sea Level



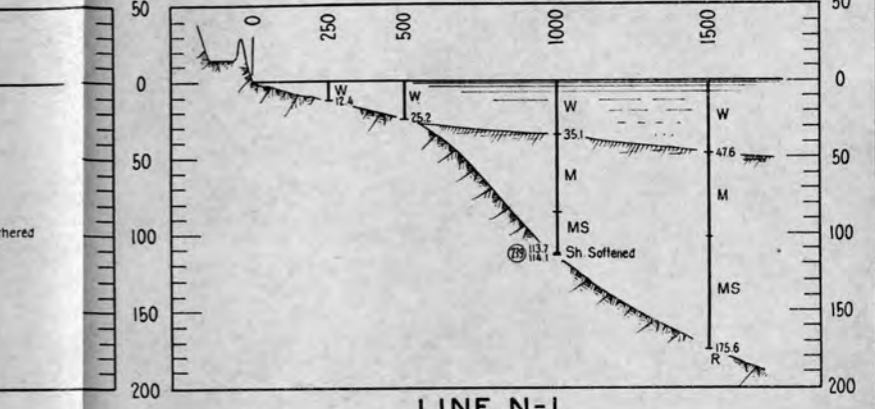
LINE S-8



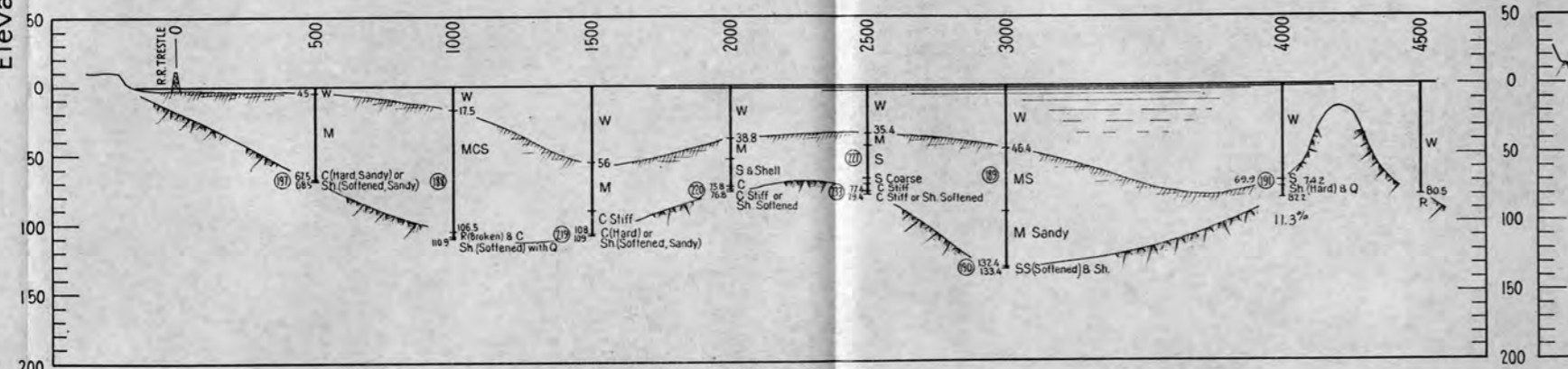
LINE N-2



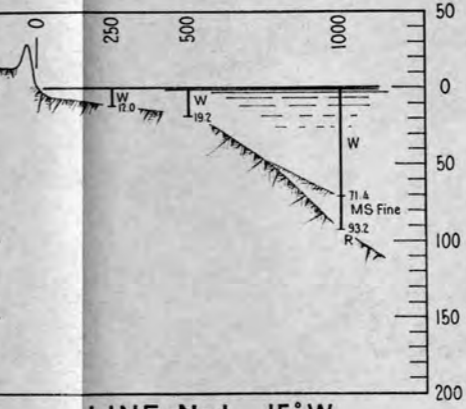
LINE S-9



LINE N-1



LINE S-7



LINE N-1 15° W

NOTE
For location of holes drilled see Topographic Map.
Number of hole indicates its distance in feet from Station 0.
See drill logs for details.



- LEGEND**
- W - Water
 - M - Mud
 - S - Sand
 - C - Clay
 - G - Gravel
 - Sh - Shale
 - SS - Sandstone
 - T - Traprock
 - Q - Quartzite
 - R - Rock
 - 5.6% - Percentage of core recovered
 - ⑤ - No. of Sample

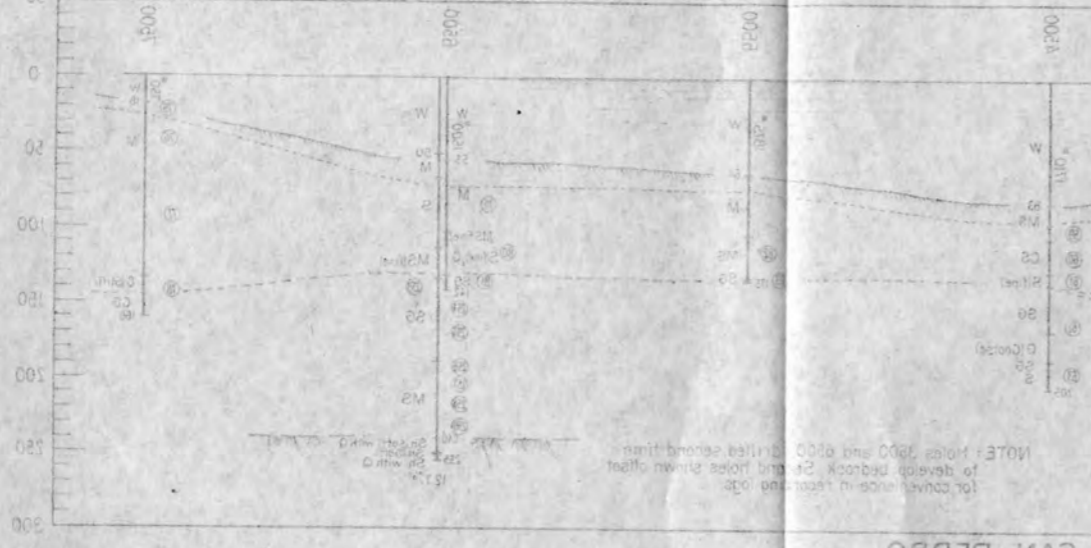
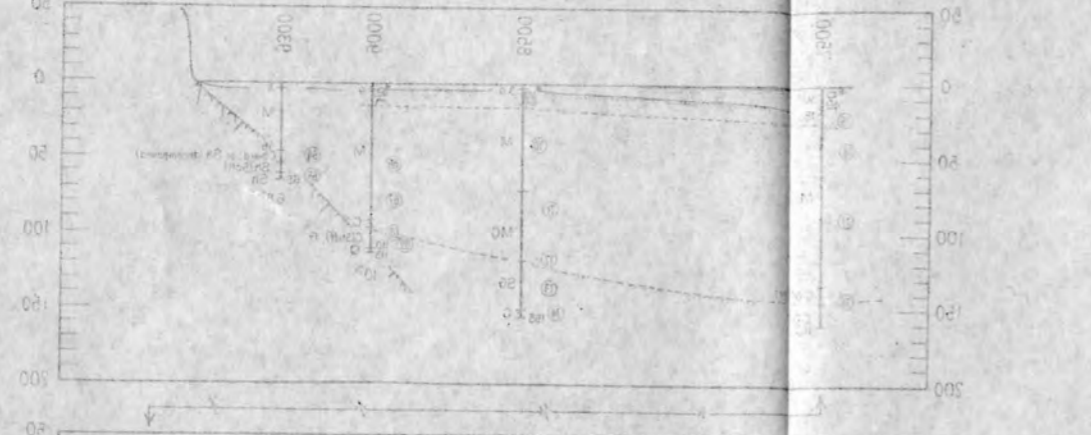
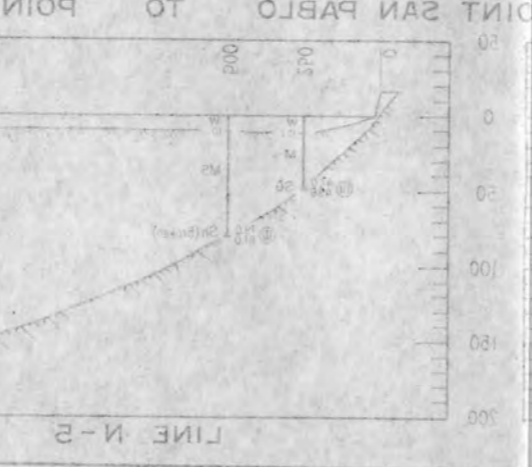
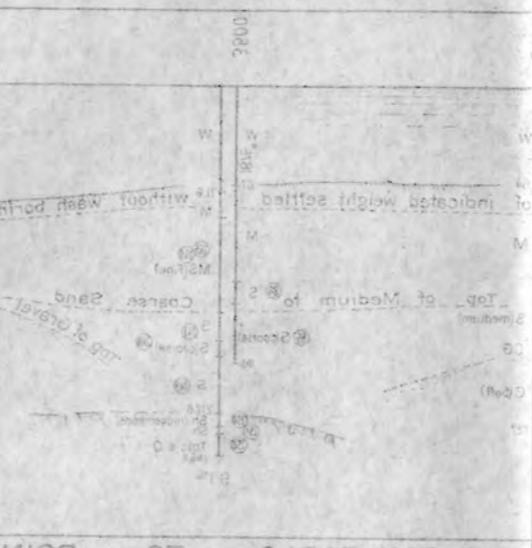
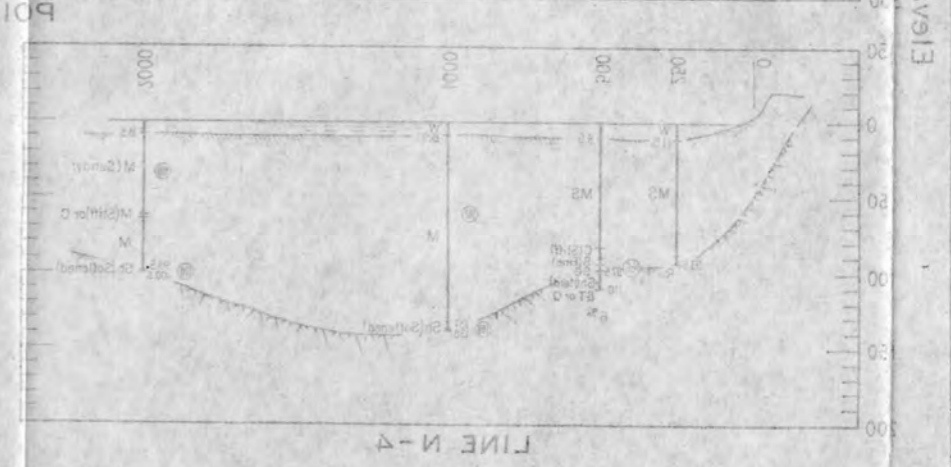
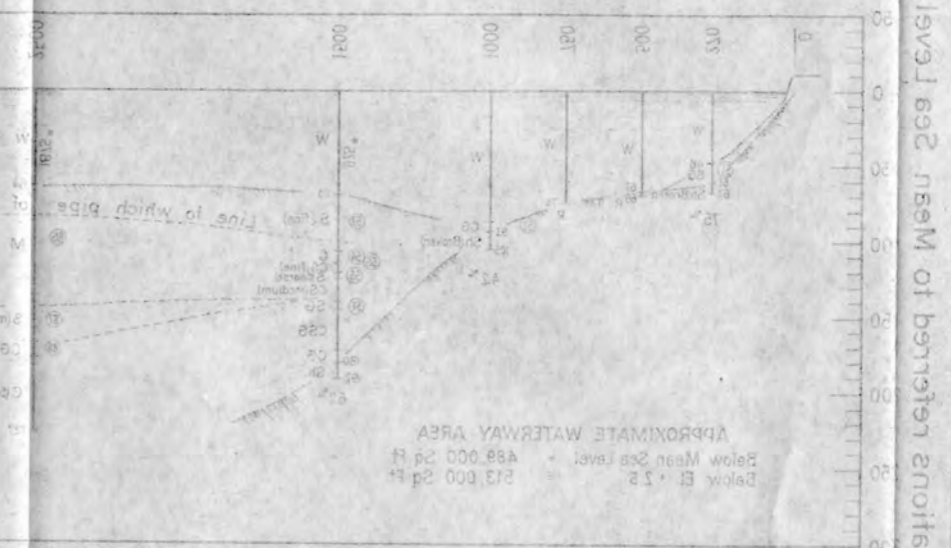
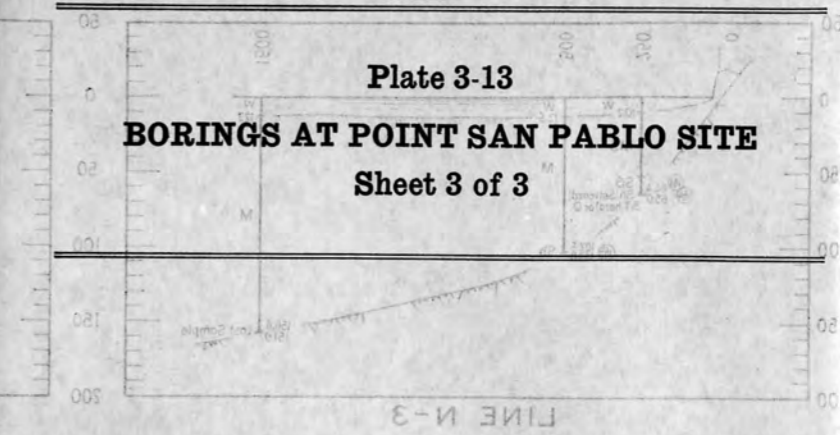
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
POINT SAN PABLO DAMSITE
BORINGS

DRAWN: P.A.J., R.M.C. SUBMITTED: *Walter R. Yarns*
CHECKED: P.A.J., RECOMMENDED: *J. V. Savage*
SV - 54 BERKELEY, CALIF., SEPT. 1, 1925 SHEET 2 OF 3 193-D-7

A. J. Walter
CHIEF ENGINEER

Hole 1000 is located on Line N-1, 17° W
APPROVED FOR ESTIMATING PURPOSES

Plate 3-13
BORINGS AT POINT SAN PABLO SITE
Sheet 3 of 3



APPROXIMATE WATERWAY AREA
 Below Mean Sea Level: 489,000 sq ft
 Below El. + 25: 213,000 sq ft

NOTE: Notes 1850 and 6500 drilled second time to develop bedrock. Station notes given offset for convenience in recording logs.

NOTE: For location of holes drilled see Geographic Map. Number of hole indicates the distance in feet from station 0 in test from station 0. See drill logs for details.

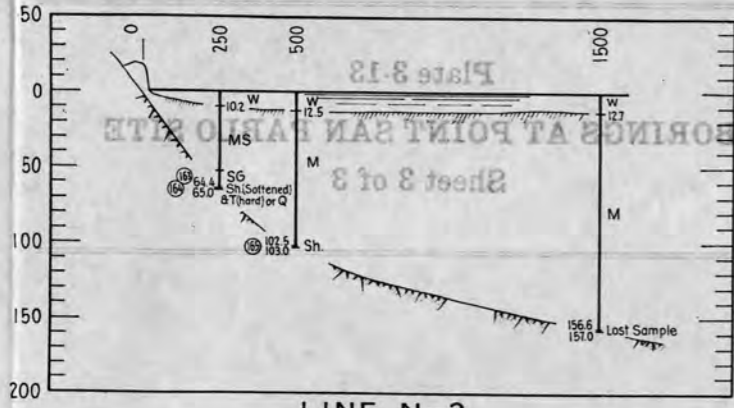
CHIEF ENGINEER
D. J. Foster
 APPROVED FOR ESTIMATING PURPOSES

LEGEND
 W - Water
 M - Mud
 Q - Quartzite
 R - Rock
 S - Sand
 C - Clay
 Ss - Fractured or loose sand
 G - Gravel
 Ss - No of Sample
 Ss - Sandstone

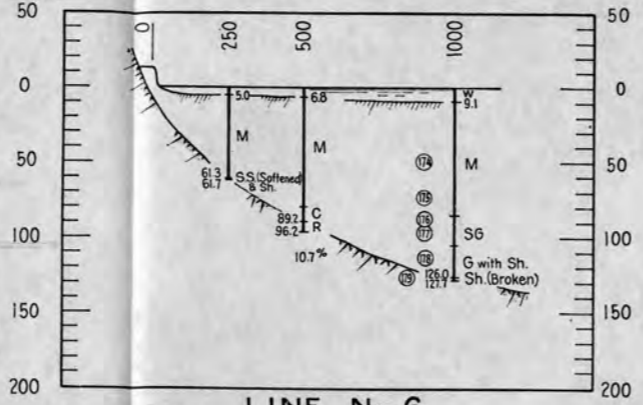


BORINGS
 POINT SAN PABLO DAM SITE
 SACRAMENTO VALLEY INVESTIGATIONS
 BUREAU OF RECLAMATION
 DEPARTMENT OF THE INTERIOR

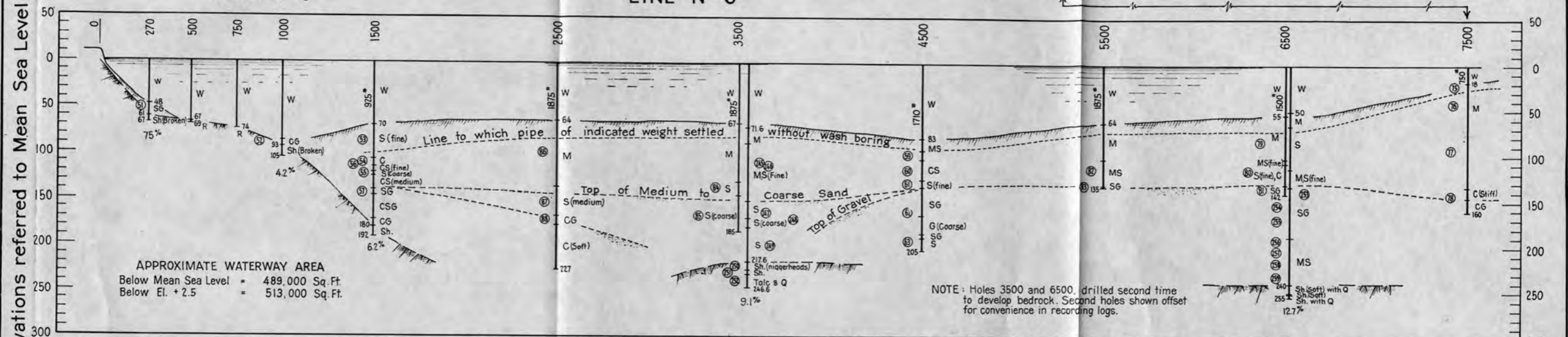
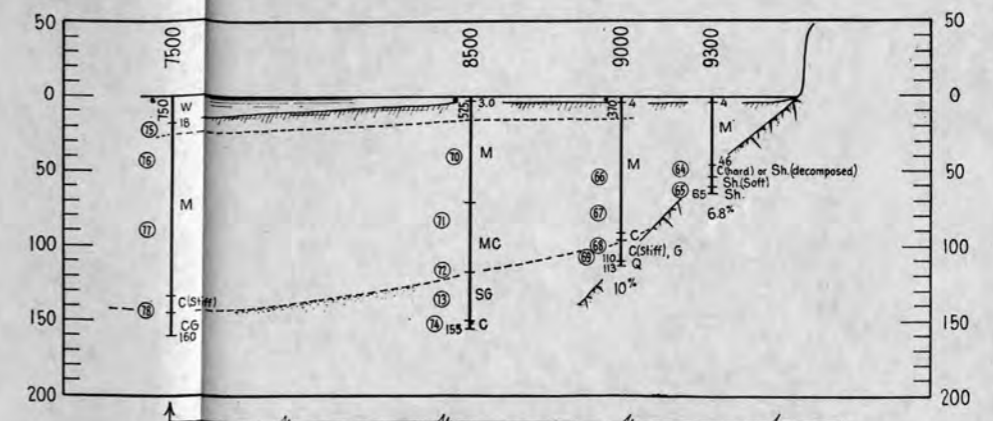
3V-58
 133-D-8



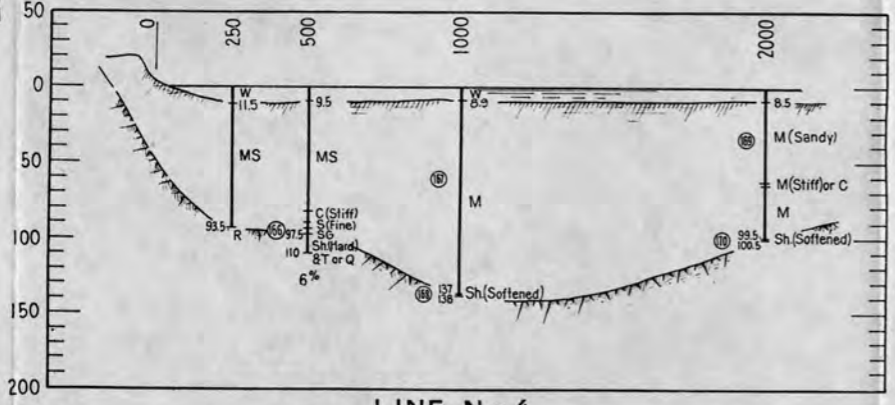
LINE N-3



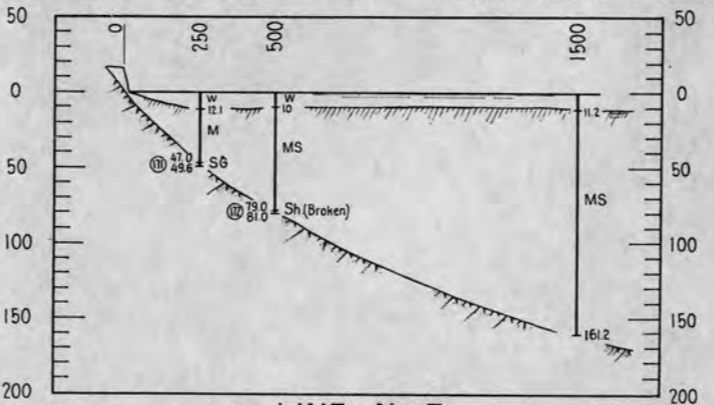
LINE N-6



POINT SAN PABLO TO POINT SAN PEDRO



LINE N-4

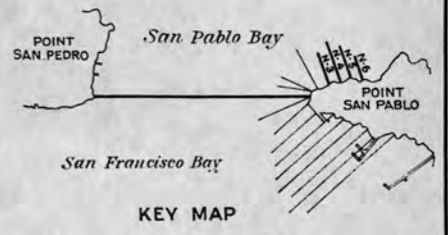


LINE N-5

- LEGEND**
- W - Water
 - M - Mud
 - S - Sand
 - C - Clay
 - G - Gravel
 - Sh - Shale
 - SS - Sandstone
 - T - Traprock
 - Q - Quartzite
 - R - Rock
 - 56 - Percentage of core recovered
 - Ⓢ - No. of Sample

APPROVED FOR ESTIMATING PURPOSES:-
A. J. Dralter
 CHIEF ENGINEER.

NOTE: For location of holes drilled see Topographic Map.
 Number of hole indicates its distance in feet from Station 0.
 See drill logs for details.



DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 POINT SAN PABLO DAMSITE
BORINGS

DRAWN: P.A.J., R.M.C. SUBMITTED: *Walter R. Young*
 CHECKED: P.A.J. RECOMMENDED: *J. K. Savage*

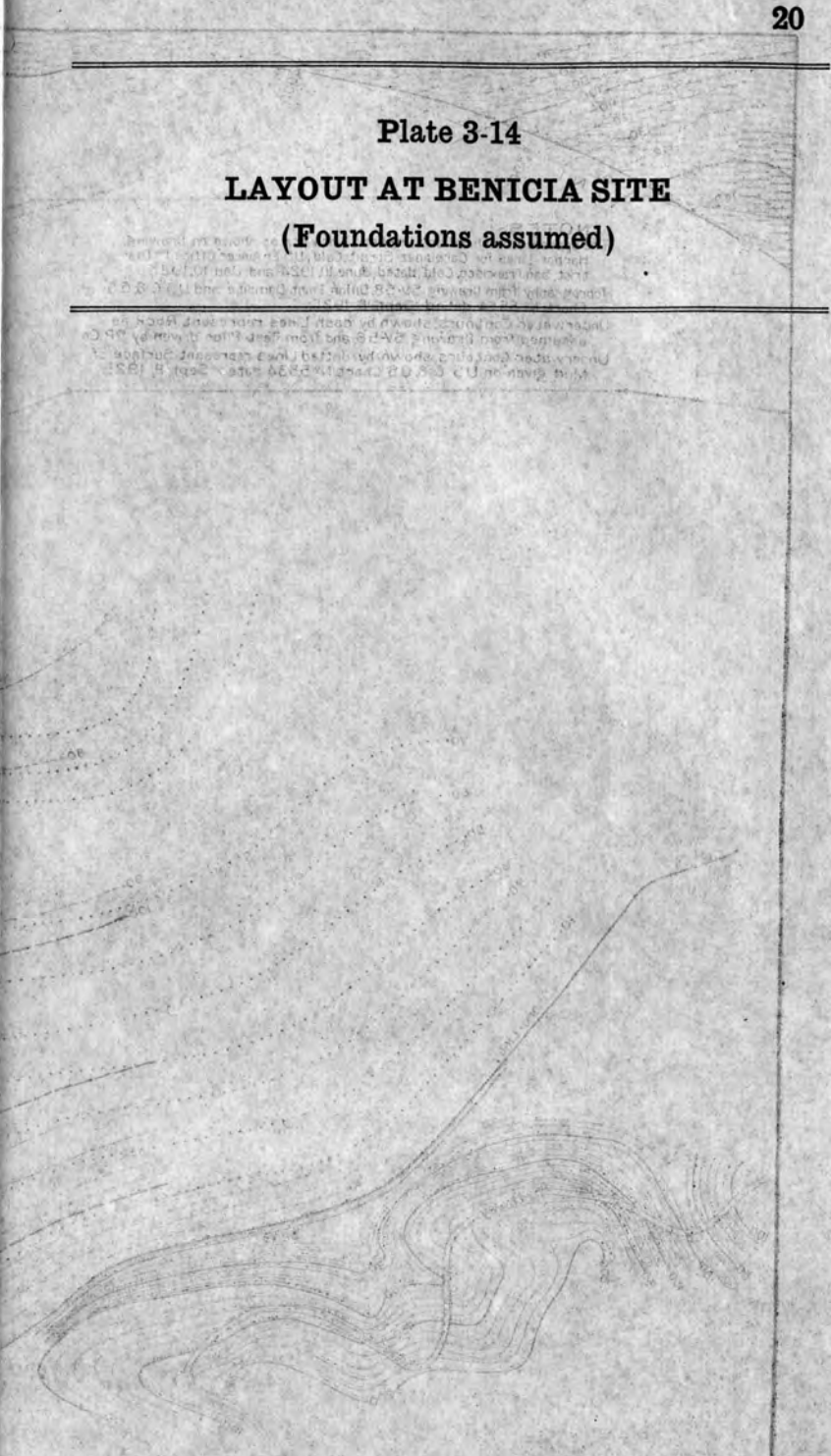
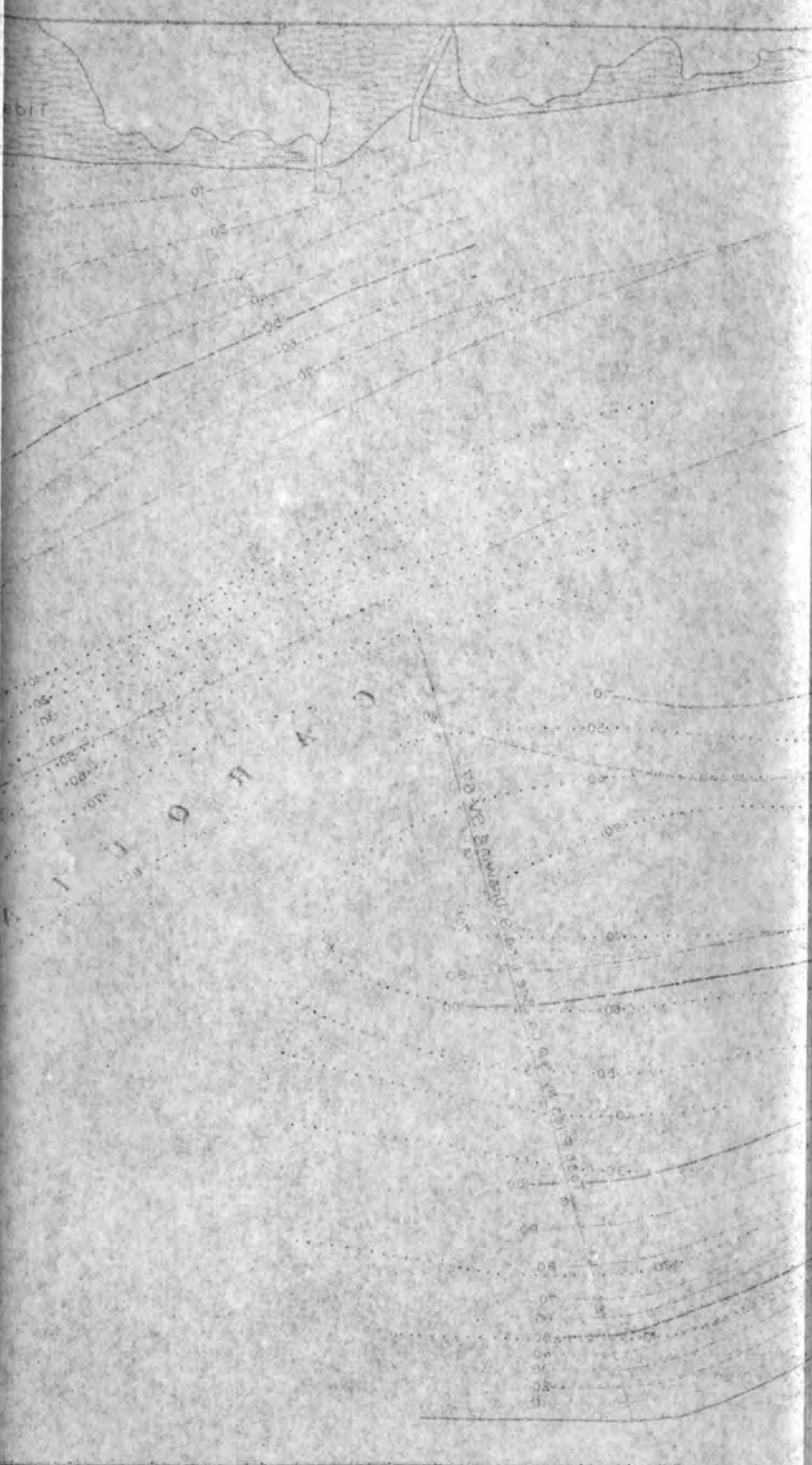
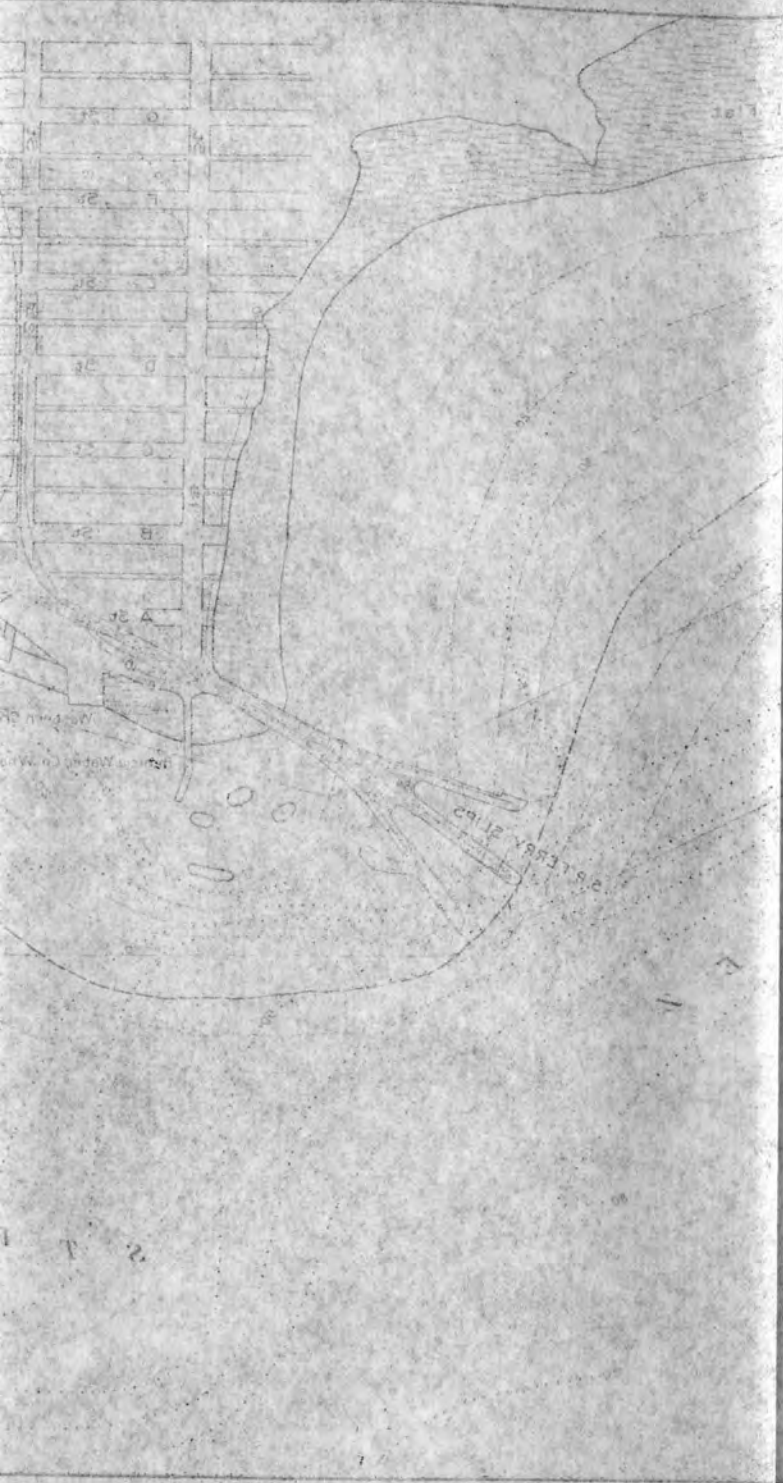
SV-55 BERKELEY, CALIF. SEPT. 1, 1928 SHEET 3 OF 3 193-D-8

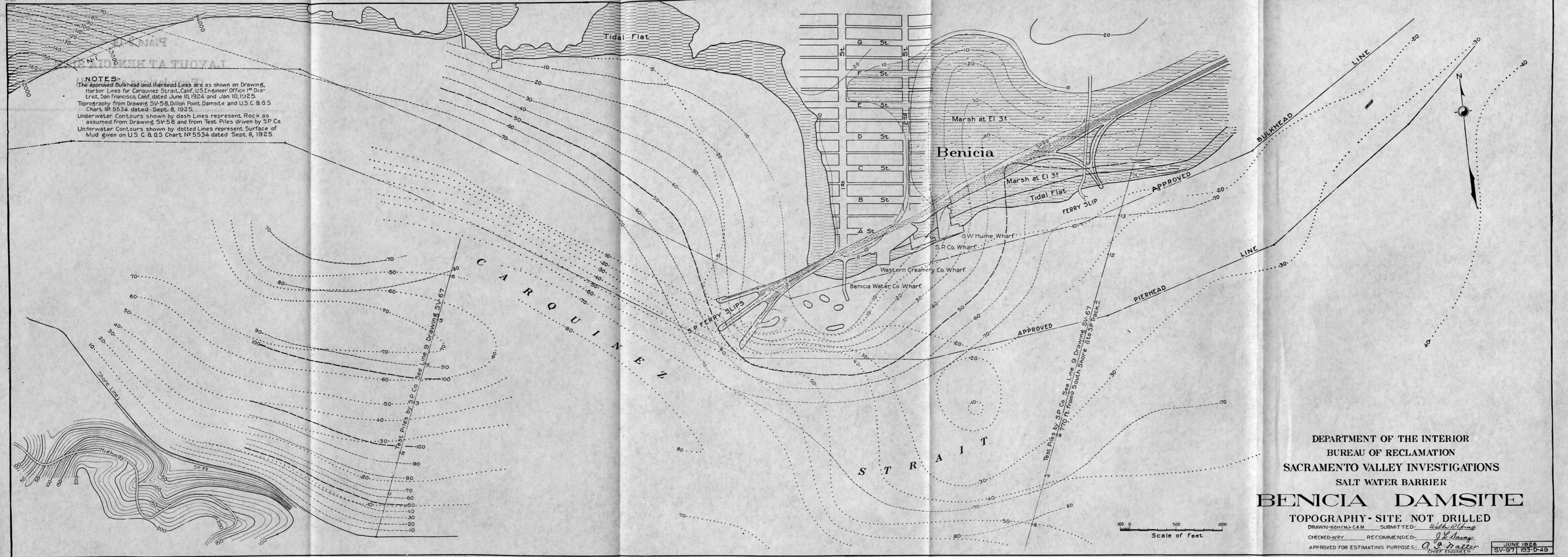
Plate 3-14

LAYOUT AT BENICIA SITE

(Foundations assumed)

This plan shows the layout of the Benicia site, including the assumed foundations for the various buildings. The layout is based on the topographic map of the site, which shows the terrain and the location of the buildings. The foundations are shown as dashed lines, and the buildings are shown as solid lines. The plan also shows the location of the Benicia River and the Benicia Canal.





NOTES:
 The approved Bulkhead and Pierhead Lines are as shown on Drawing 5, Harbor Lines for Carquinez Strait, Calif. U.S. Engineer Office 1st District, San Francisco, Calif. dated June 10, 1924 and Jan 10, 1925.
 Topography from Drawing SV-58, Dillon Point Dam site and U.S. C. & G. S. Chart No 5534 dated Sept. 8, 1925.
 Underwater Contours shown by dash Lines represent Rock as assumed from Drawing SV-58 and from Test Piles driven by S.P. Co.
 Underwater Contours shown by dotted Lines represent Surface of Mud given on U.S. C. & G. S. Chart No 5534 dated Sept. 8, 1925.

DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER

BENICIA DAMSITE

TOPOGRAPHY - SITE NOT DRILLED

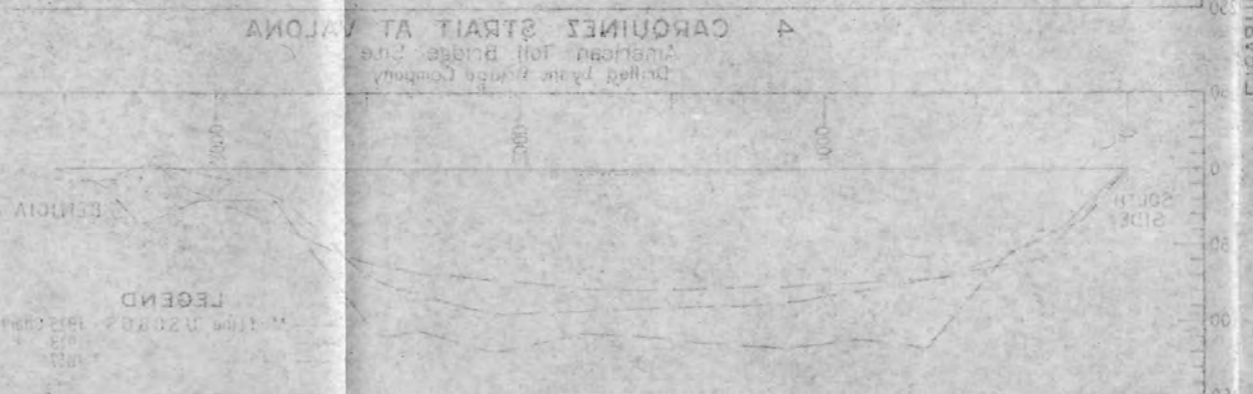
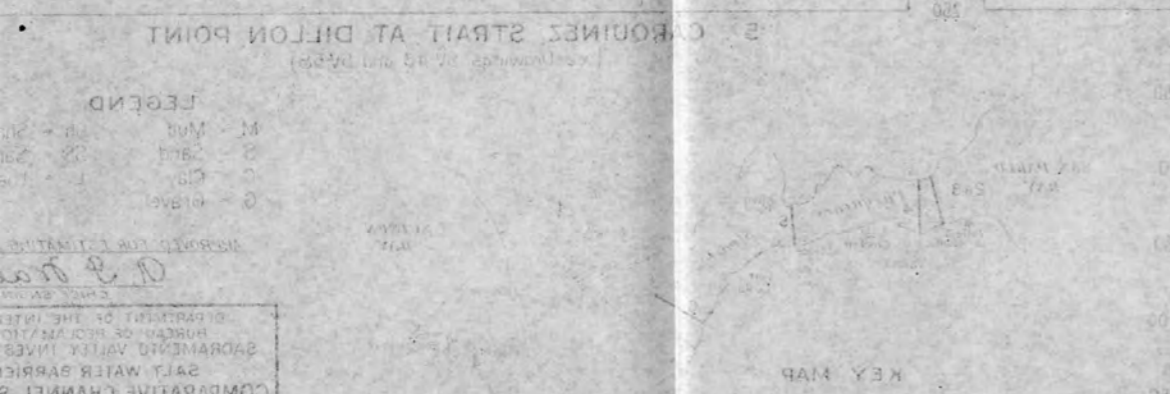
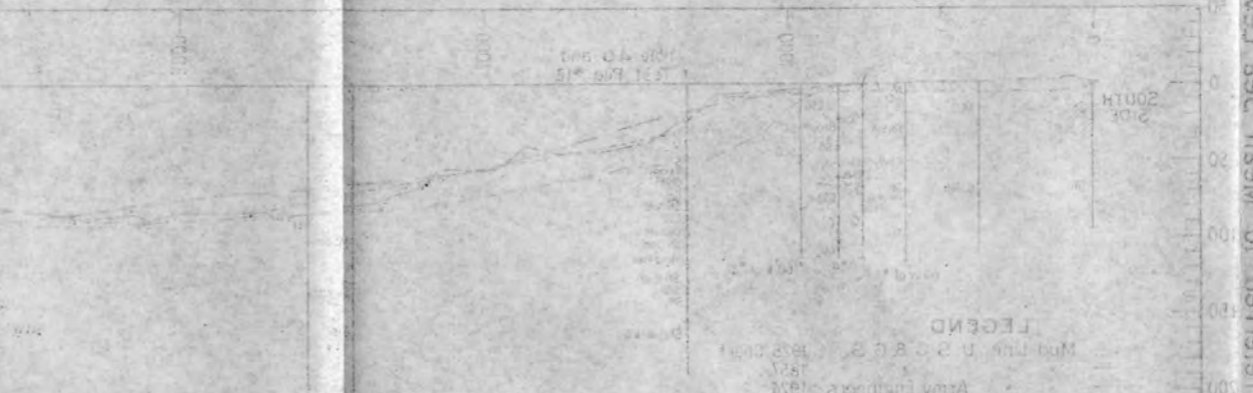
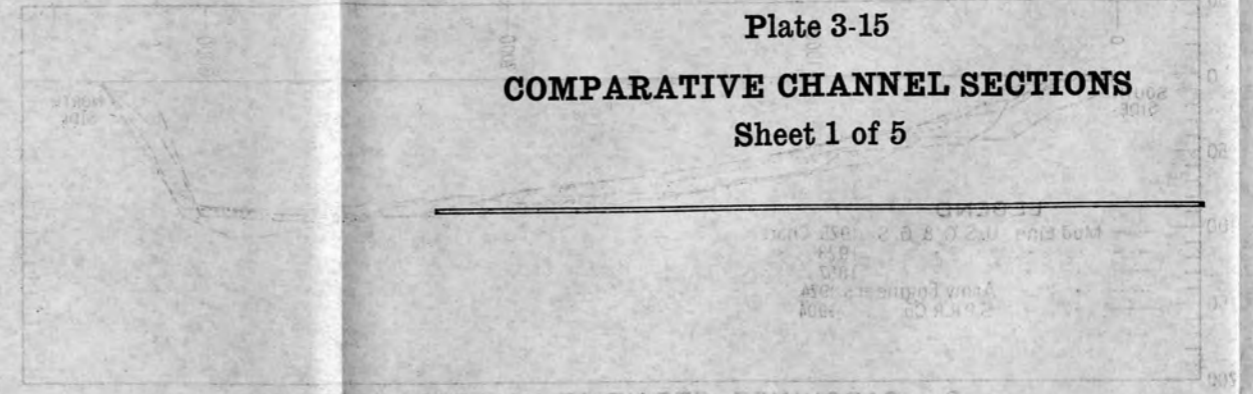
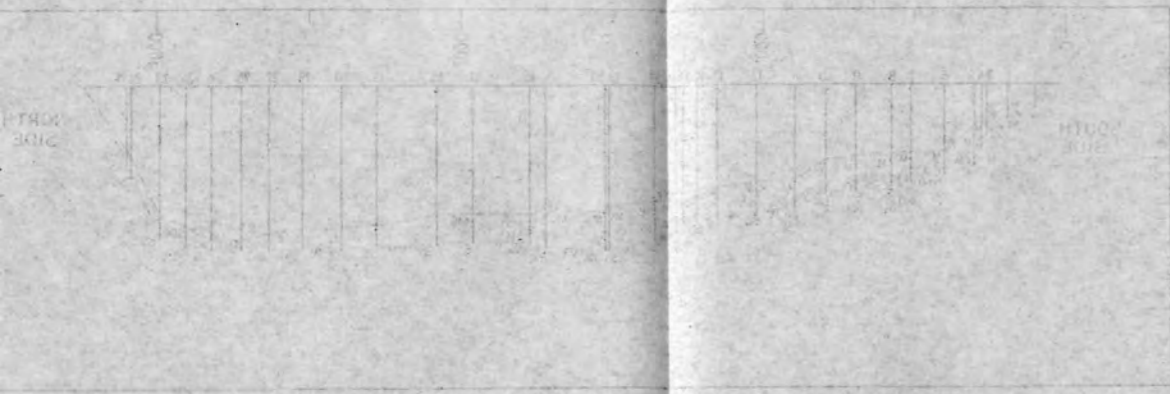
DRAWN-NBRCMJ-CAM SUBMITTED: *Walker R. Young*

CHECKED-WRY RECOMMENDED: *J. H. Savage*

APPROVED FOR ESTIMATING PURPOSES: *A. P. Waller*
 CHIEF ENGINEER

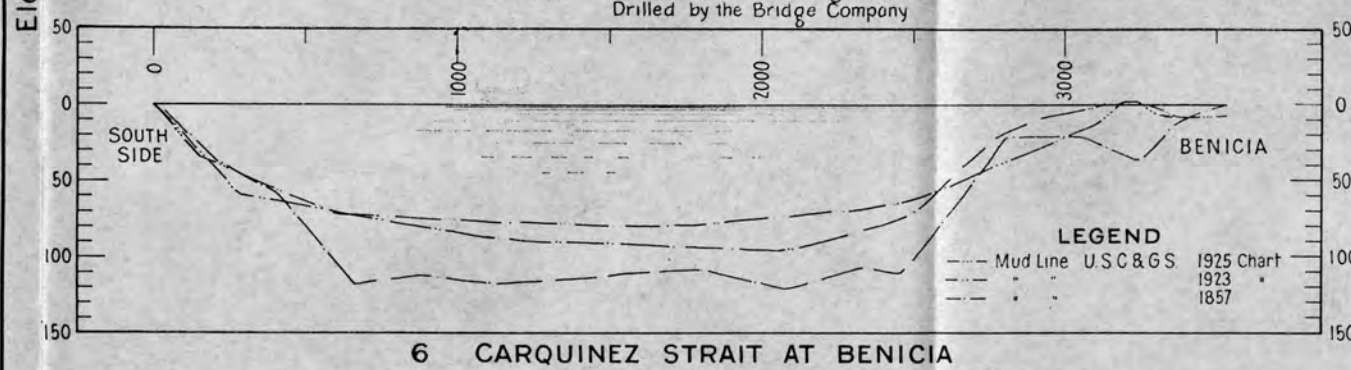
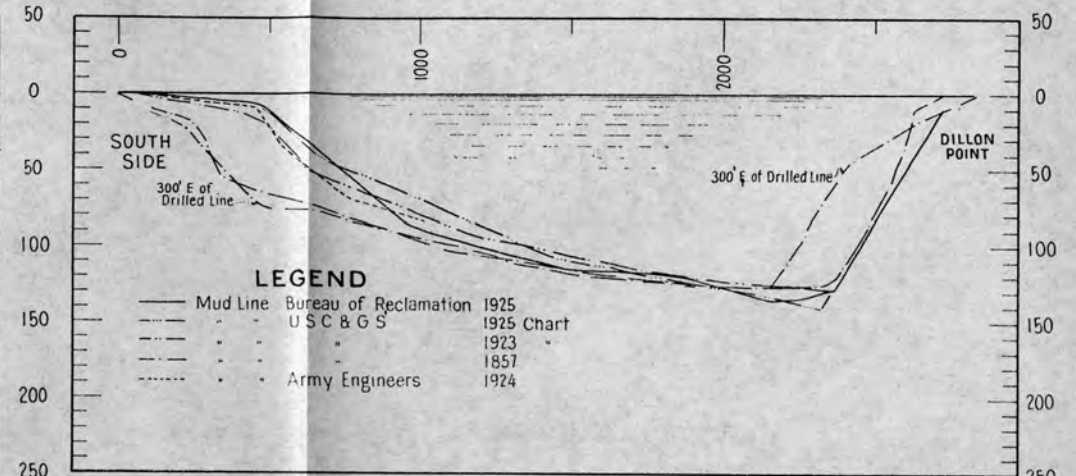
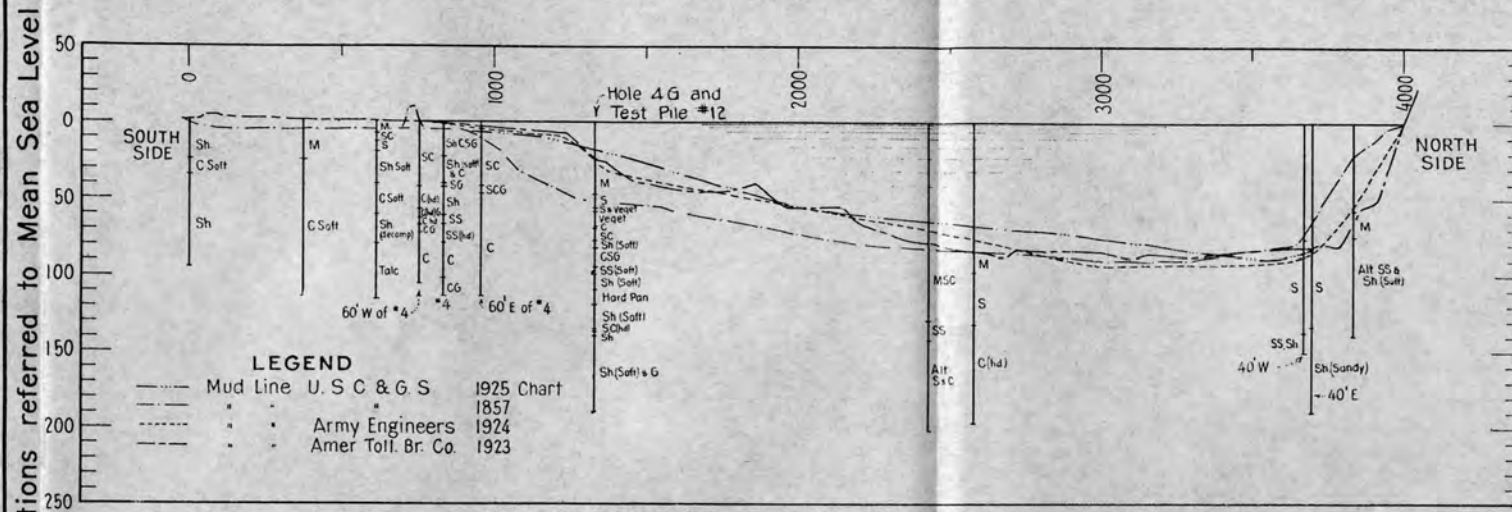
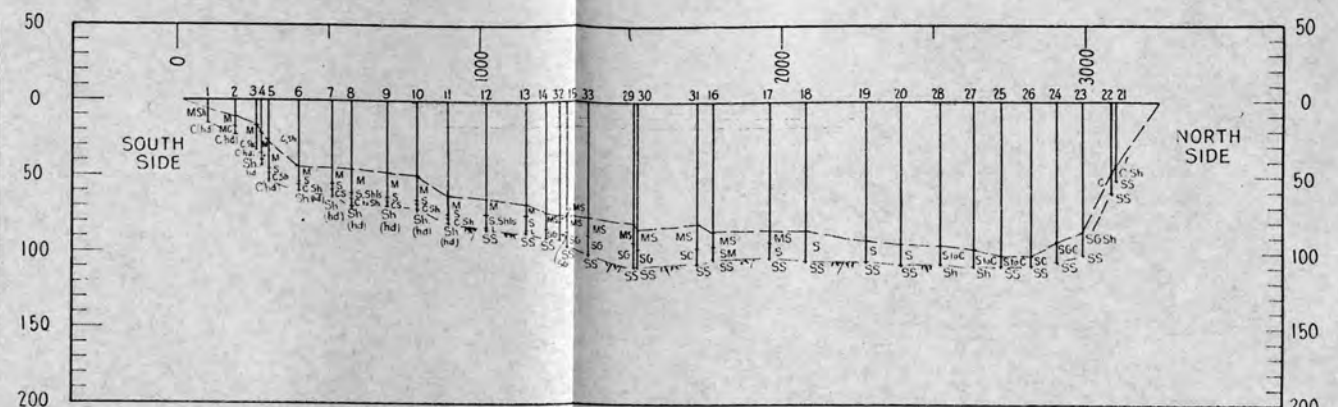
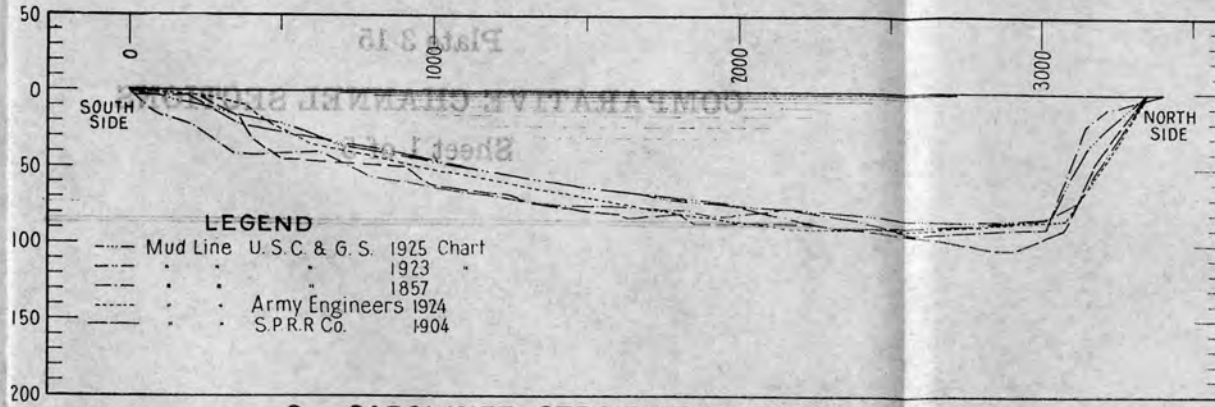
JUNE 1926
 SV-97 193-D-49

Plate 3-15
COMPARATIVE CHANNEL SECTIONS
Sheet 1 of 5



DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY IRRIGATION
SALT WATER BARRIER
COMPARATIVE CHANNEL SECTIONS
SAN JUAN RIVER AND CUISIN
PROJECT NO. 100-1000
DRAWN BY: [Signature]
CHECKED BY: [Signature]
DATE: [Date]

LEVEL IN FEET OF MEAN SEA LEVEL



LEGEND

- M = Mud
- S = Sand
- C = Clay
- G = Gravel
- Sh = Shale
- SS = Sandstone
- L = Loam

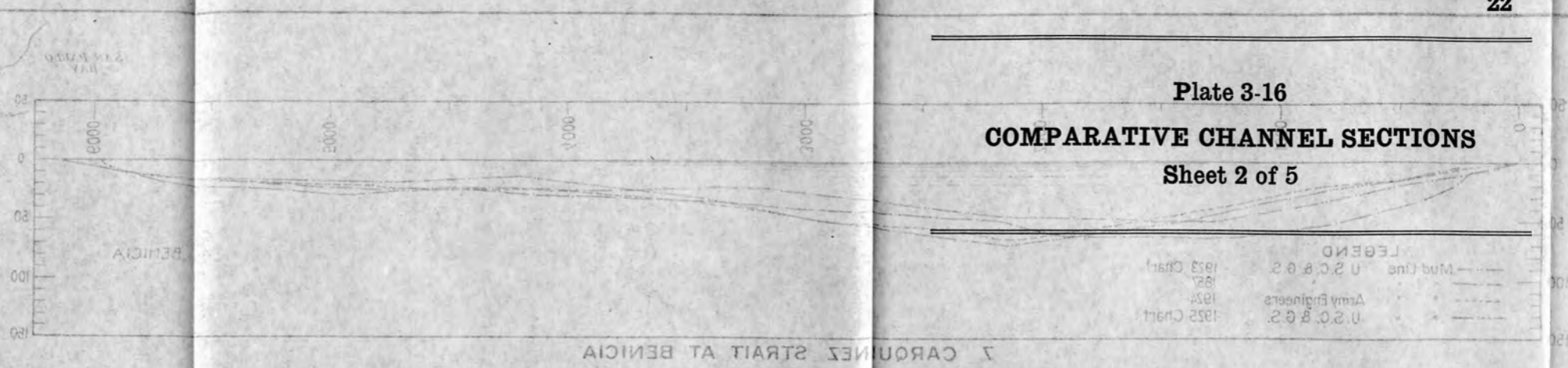
APPROVED FOR ESTIMATING PURPOSES

R. F. Walter
CHIEF ENGINEER

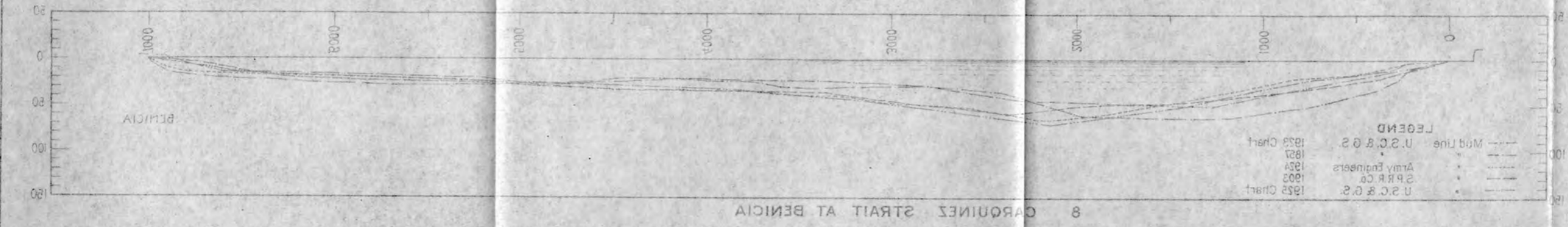
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
COMPARATIVE CHANNEL SECTIONS
SAN PABLO AND SUISUN BAYS

DRAWN: G.W.M.K., P.A.I., R.M.C. SUBMITTED: *William R. Young*
CHECKED: P.A.J. RECOMMENDED: *J. K. Salas*
SV-66 BERKELEY, CALIF. SEPT 1925 SHEET 1 OF 5 193-D-114

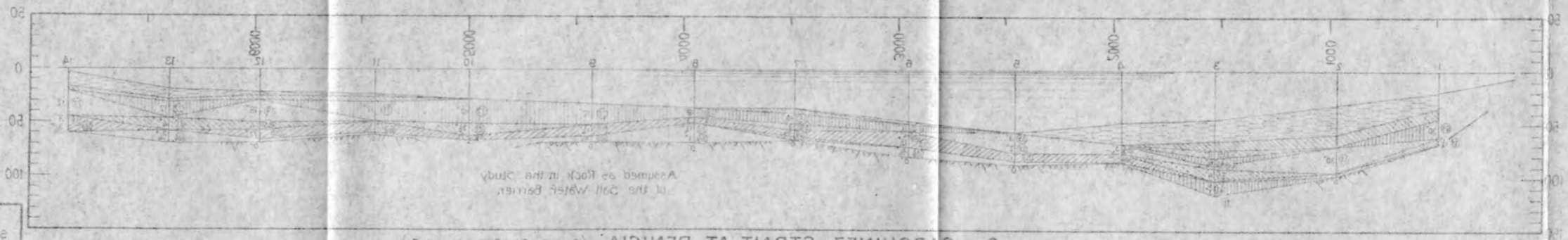
Plate 3-16
COMPARATIVE CHANNEL SECTIONS
Sheet 2 of 5



LEGEND
 Mud Line U.S.C. & G.S. 1923 Chart
 1827
 Army Engineers 1924
 U.S.C. & G.S. 1925 Chart



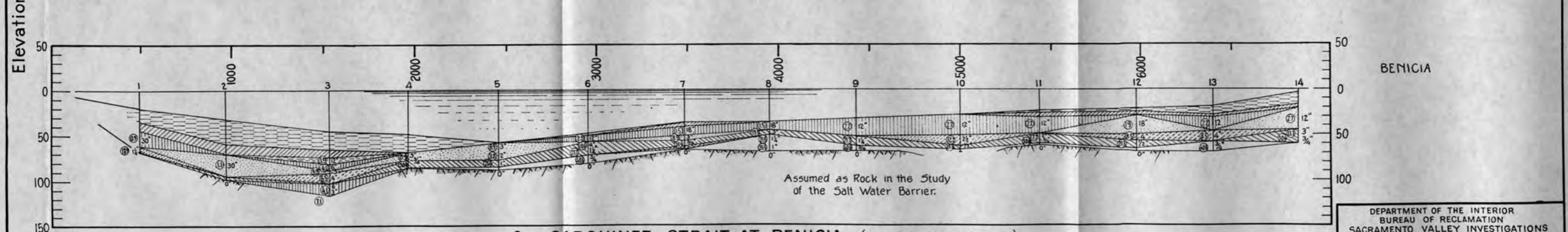
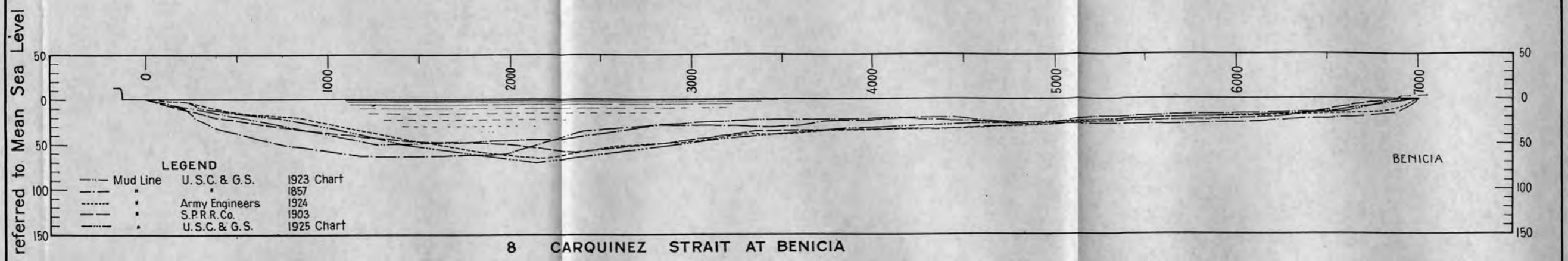
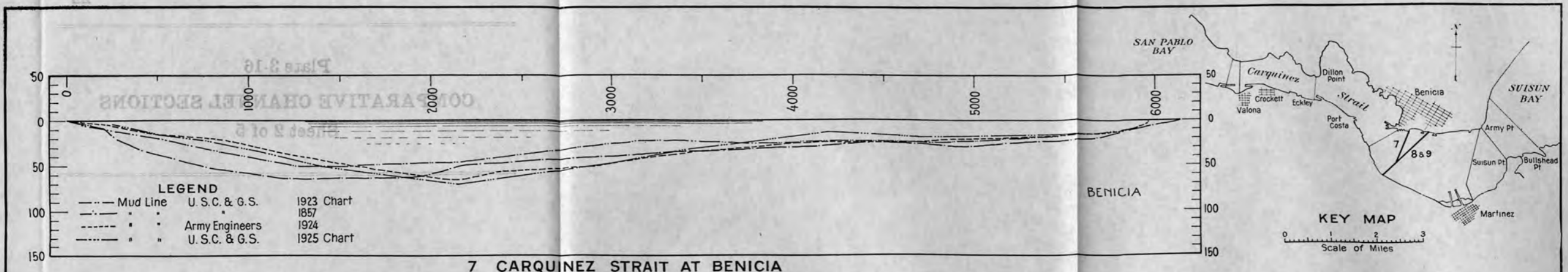
LEGEND
 Mud Line U.S.C. & G.S. 1923 Chart
 1827
 Army Engineers 1924
 S.P.R. Co. 1903
 U.S.C. & G.S. 1925 Chart



LEGEND
 Pile settlement by own weight
 1840 Hammer, no blow
 7 Drop
 to
 Indicated settlement in tons
 Settlement each pile of 100 tons

DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 COMPARATIVE CHANNEL SECTIONS
 SAN PABLO AND BUISIN BAYS
 2V-67
 193-D-118

APPROVED FOR ESTIMATING PURPOSES
 D. P. Walter
 CHIEF ENGINEER



LEGEND

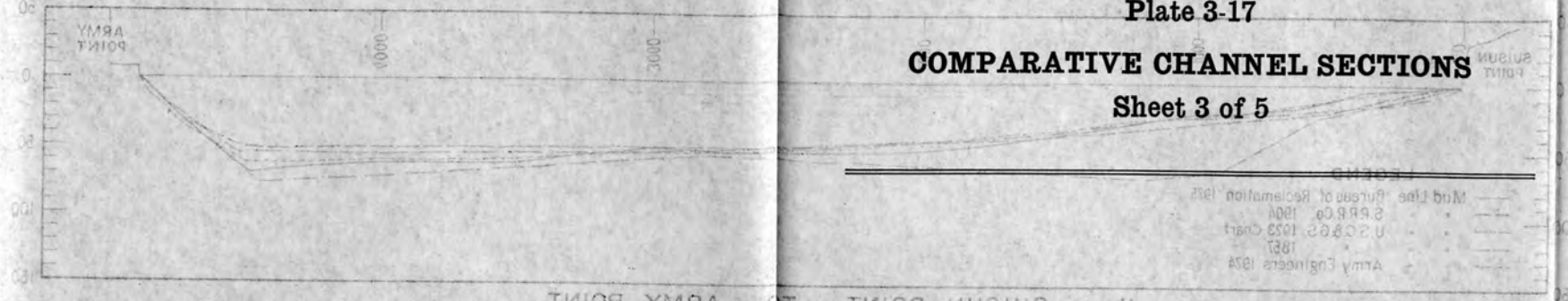
	Pile settlement by own weight		Pile settlement 2840' hammer 12' Drop
	" " " 2840' hammer, no blow		" " " " 15' "
	" " " " 7' Drop		" " " " 16' "
	" " " " 8' "		" " " " 20' "
	" " " " 10' "		Indicates safe load in tons.
			12 - settlement each blow of hammer

APPROVED FOR ESTIMATING PURPOSES:
A. J. Drafter
CHIEF ENGINEER

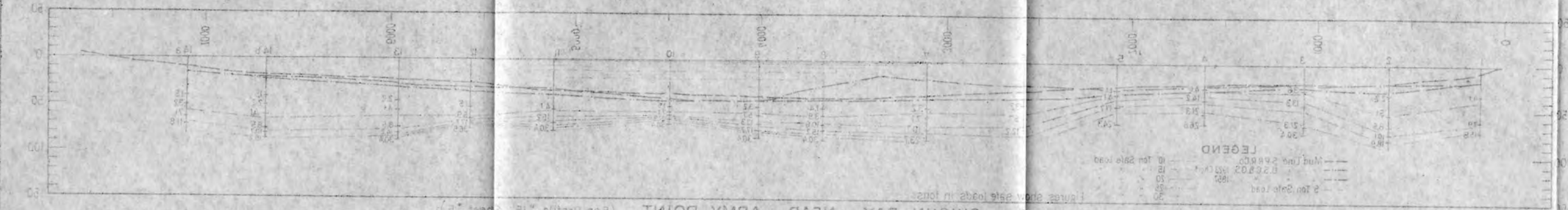
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
COMPARATIVE CHANNEL SECTIONS
SAN PABLO AND SUISUN BAYS

DRAWN, G.W.M.K. 22, R.M.C. SUBMITTED *Walter R. Young*
CHECKED: P.A.M. RECOMMENDED: *J. L. Savage*
SV-67 BERKELEY CALIF. SEPT. 1925 SHEET 2 OF 5 193-D-115

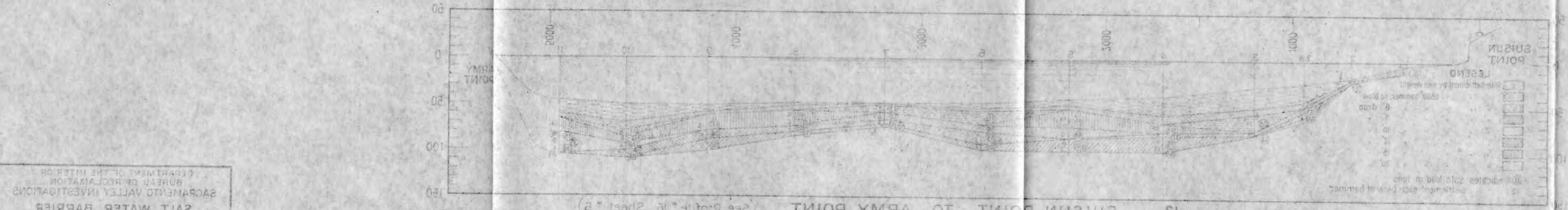
Plate 3-17
COMPARATIVE CHANNEL SECTIONS
Sheet 3 of 5



II SUISUN POINT TO ARMY POINT
(See Drawings SV-50 and SV-57)



15 SUISUN BAY NEAR ARMY POINT
(See Profile 18, Sheet 5)

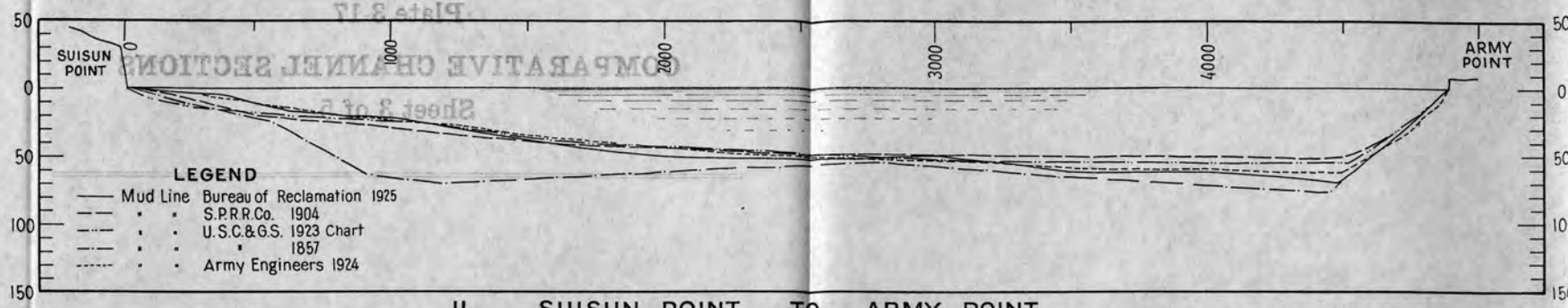


16 SUISUN POINT TO ARMY POINT
(See Profile 16, Sheet 5)

2V-68
APPROVED FOR ESTIMATING PURPOSES
SACRAMENTO VALLEY INVESTIGATIONS
BUREAU OF RECLAMATION
DEPARTMENT OF THE INTERIOR

CHIEF ENGINEER
D. J. [Signature]

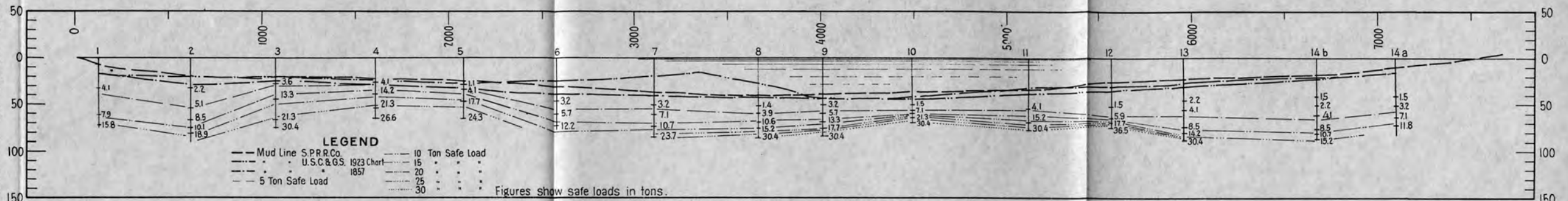
COMPARATIVE CHANNEL SECTIONS
SAN BAY AND SUISUN BAYS
SALT WATER BARRIER



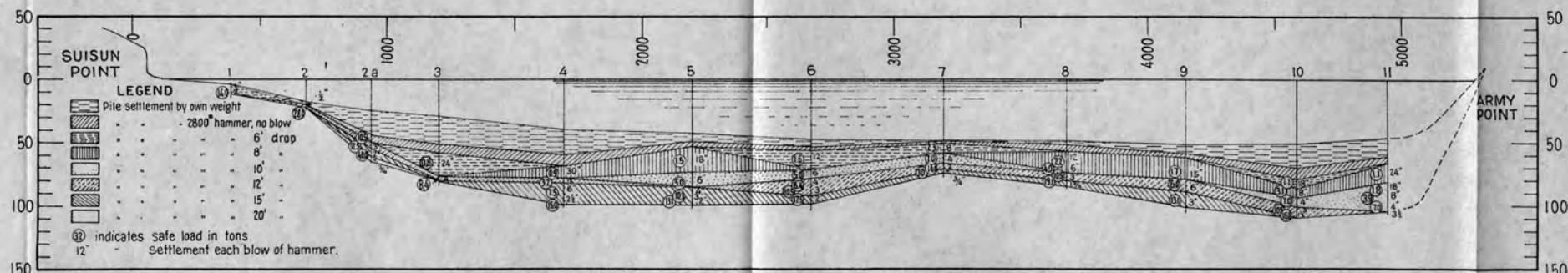
II SUISUN POINT TO ARMY POINT
(See Drawings 5V-50 and 5V-57)



Elevations referred to Mean Sea Level



III SUISUN BAY NEAR ARMY POINT (See Profile #15, Sheet #5)



IV SUISUN POINT TO ARMY POINT (See Profile #16, Sheet #5)
Test Piles by Southern Pacific Company

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
COMPARATIVE CHANNEL SECTIONS
SAN PABLO AND SUISUN BAYS

APPROVED FOR ESTIMATING PURPOSES:
A. P. Dralter
CHIEF ENGINEER.

DRAWN G.W.M.C., P.A.J., P.M.C. SUBMITTED *Walter B. Young*
CHECKED P.A.J. RECOMMENDED *J. K. Savage*
SV-68 BERKELEY CALIF., SEPT. 1925 SHEET 3 OF 5 193-D-116

Plate 3-18

COMPARATIVE CHANNEL SECTIONS

Sheet 4 of 5

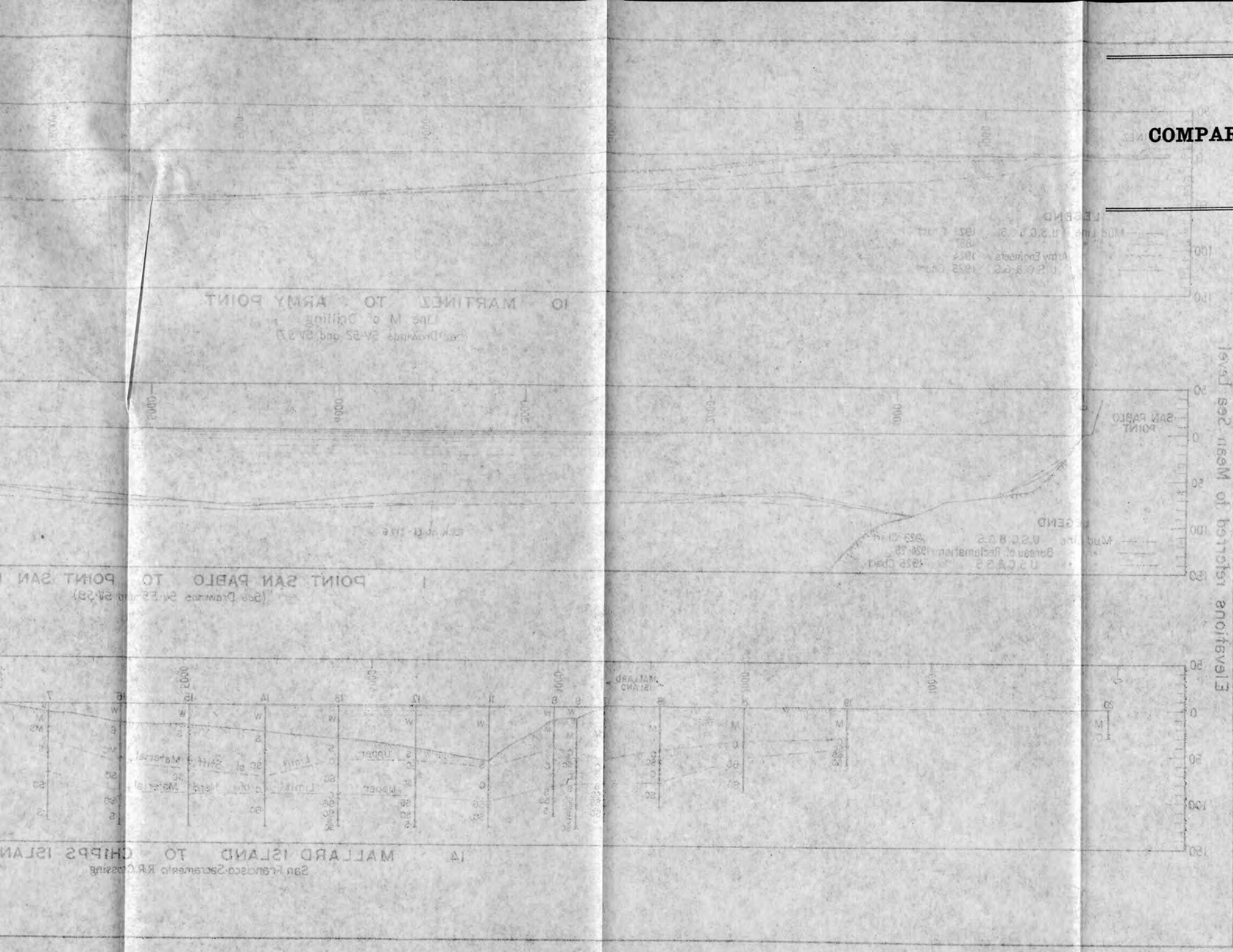
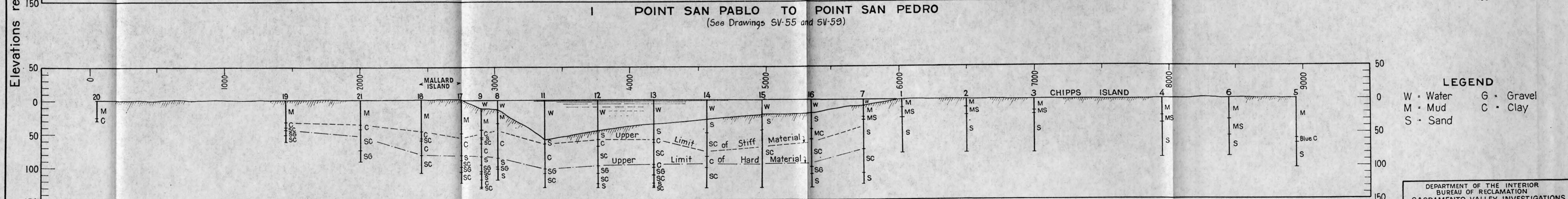
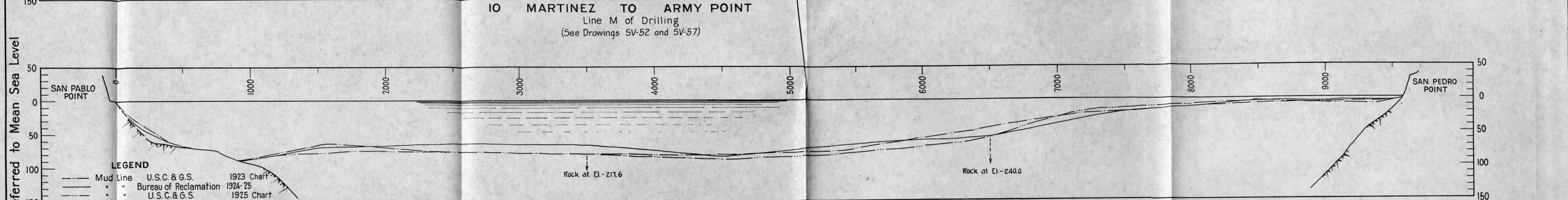
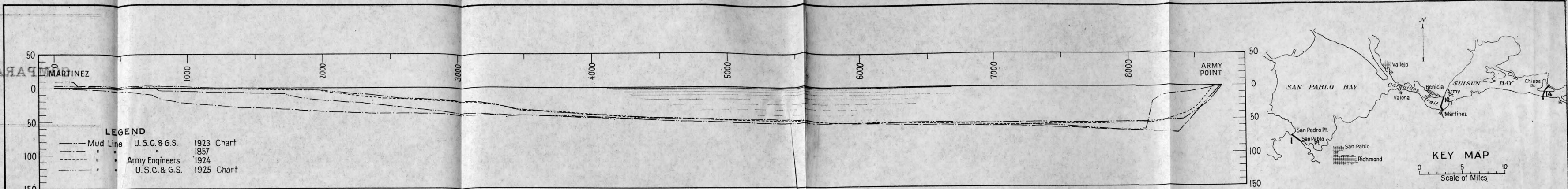


Plate 3-18
COMPARATIVE CHANNEL SECTIONS
Sheet 4 of 5

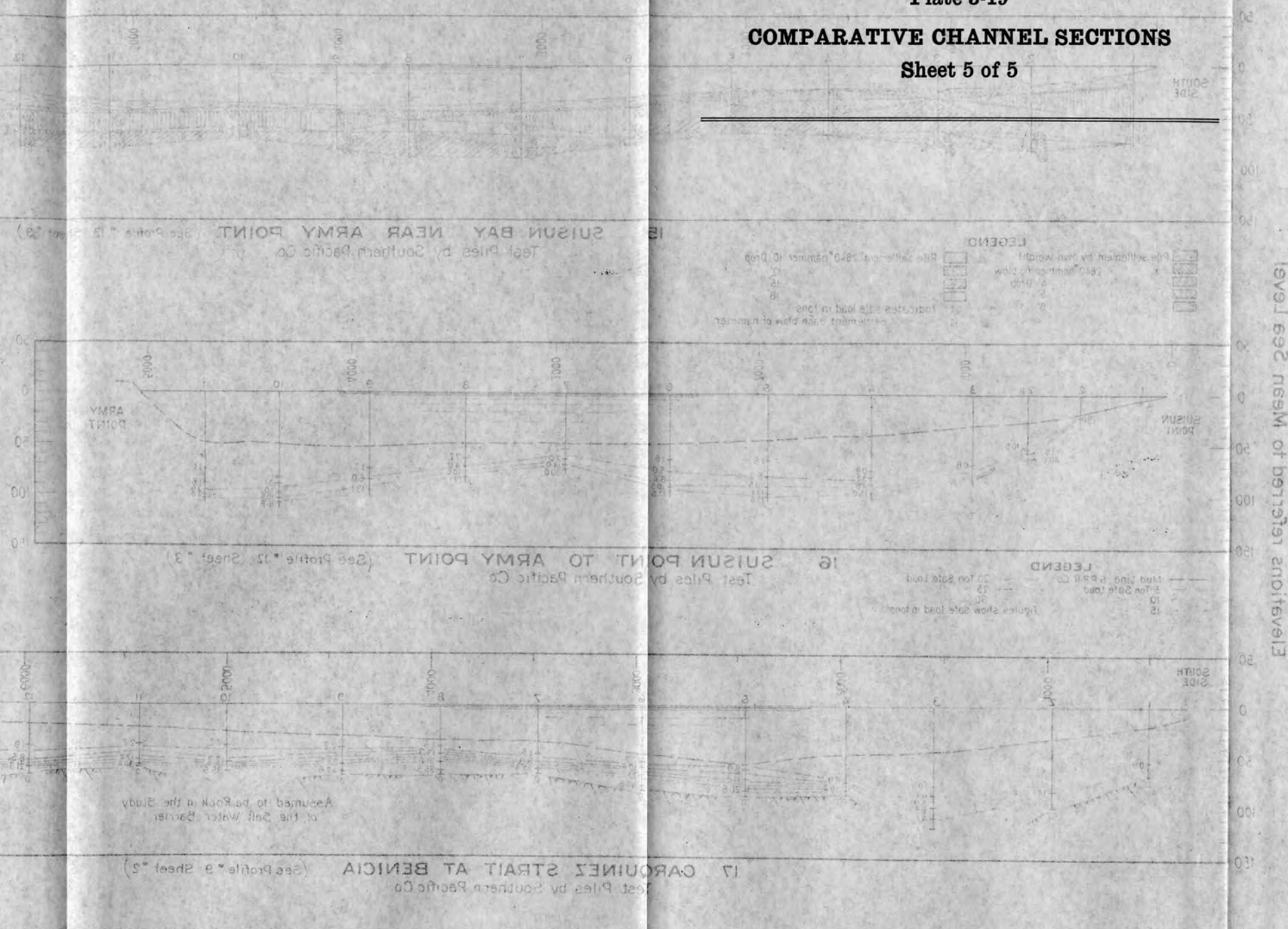


DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
COMPARATIVE CHANNEL SECTIONS
SAN PABLO AND SUISUN BAYS

APPROVED FOR ESTIMATING PURPOSES:
R. A. Walter
CHIEF ENGINEER

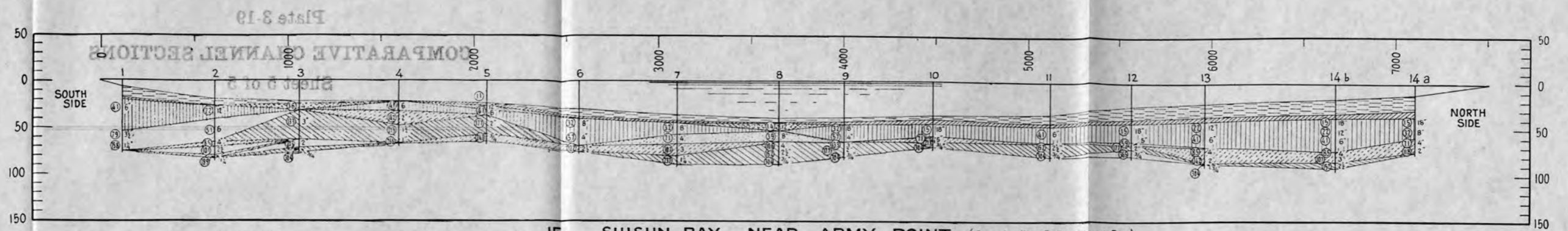
DRAWN BY M.K. P.A.J. R.M.C. SUBMITTED BY *W. H. R. King*
CHECKED BY *R.A.* RECOMMENDED BY *R. A. Walter*
SV-69 BERKELEY CALIF. SEPT. 1925 SHEET 4 OF 5 193-D-117

Plate 3-19
COMPARATIVE CHANNEL SECTIONS
Sheet 5 of 5

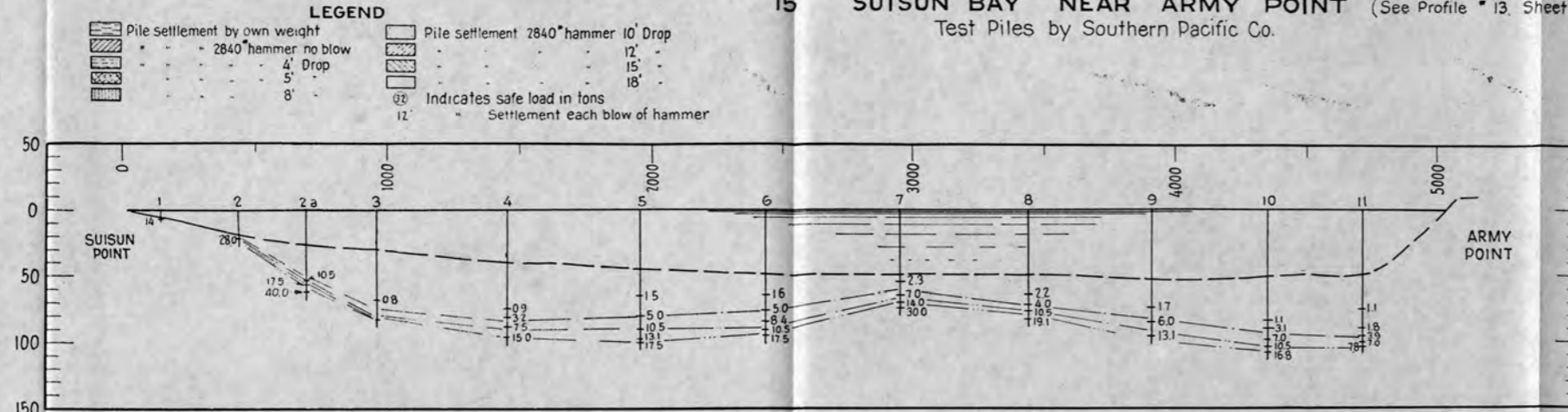


APPROVED FOR ESTIMATING P.W.
 Chief Engineer

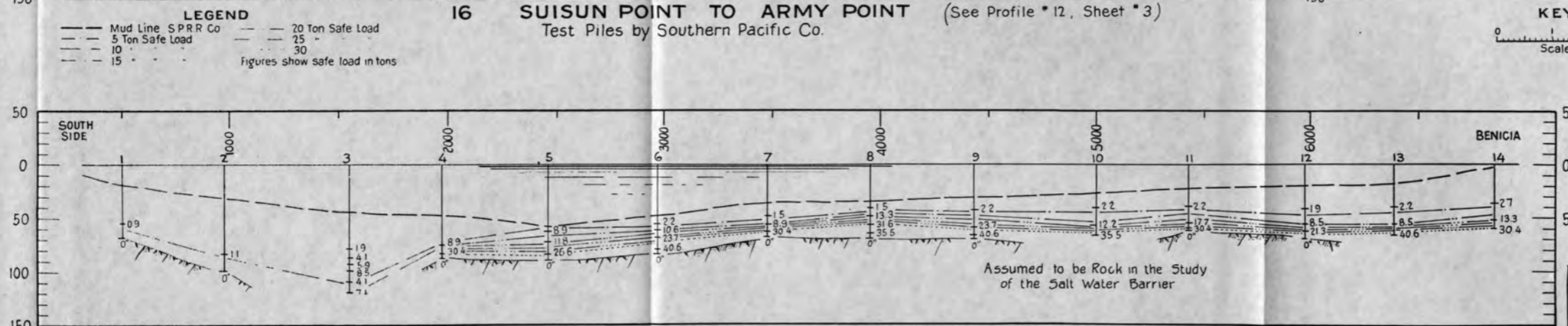
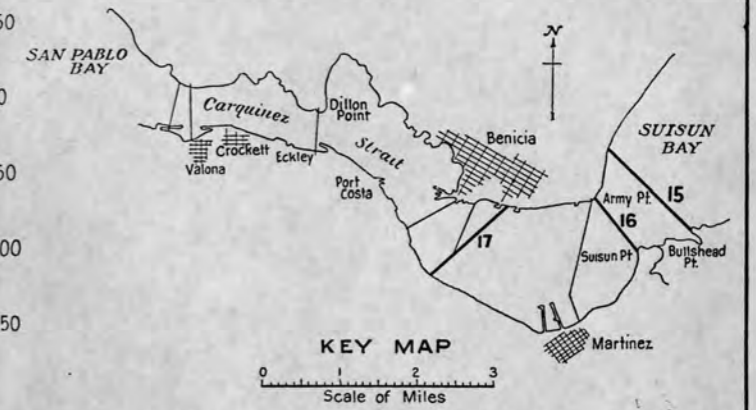
Assumed to be Rock in the Study
 of the Salt Water Barrier



15 SUISUN BAY NEAR ARMY POINT (See Profile * 13, Sheet * 3)
Test Piles by Southern Pacific Co.



16 SUISUN POINT TO ARMY POINT (See Profile * 12, Sheet * 3)
Test Piles by Southern Pacific Co.



17 CARQUINEZ STRAIT AT BENICIA (See Profile * 9 Sheet * 2)
Test Piles by Southern Pacific Co.

Elevations referred to Mean Sea Level

APPROVED FOR ESTIMATING PURPOSES:
A. J. Walter
CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
COMPARATIVE CHANNEL SECTIONS
SAN PABLO AND SUISUN BAYS

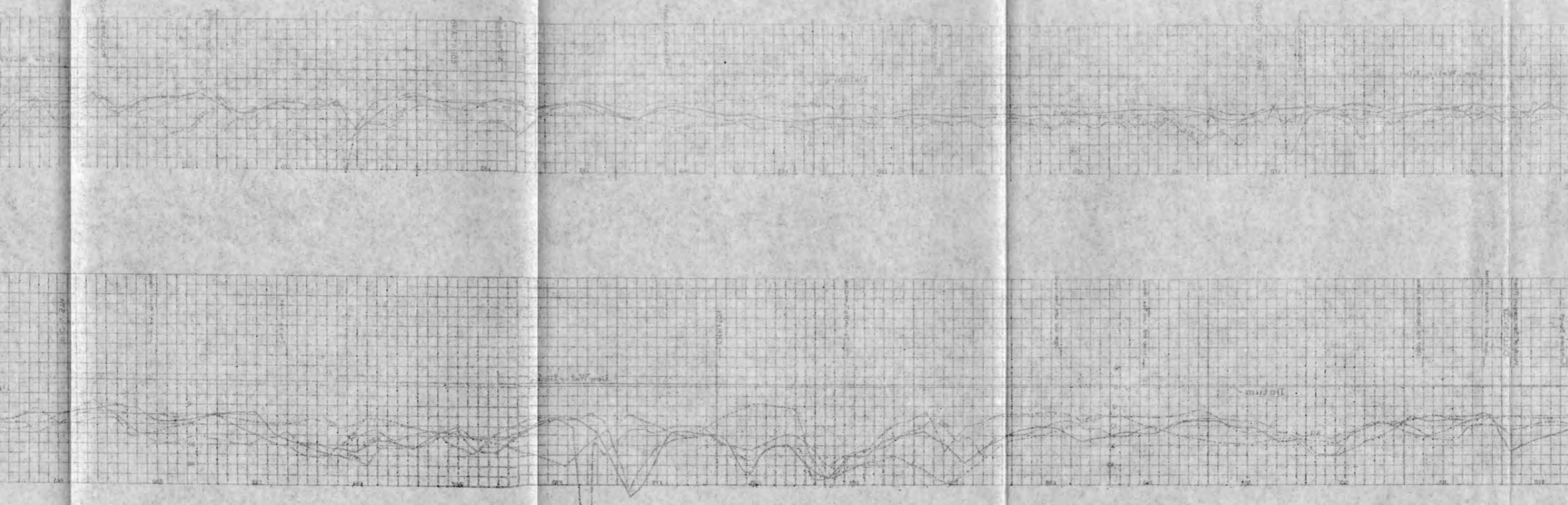
DRAWN: P.A.J., R.M.C. SUBMITTED: *Walter P. Young*
CHECKED: P.H.V. RECOMMENDED: *J. P. Savage*

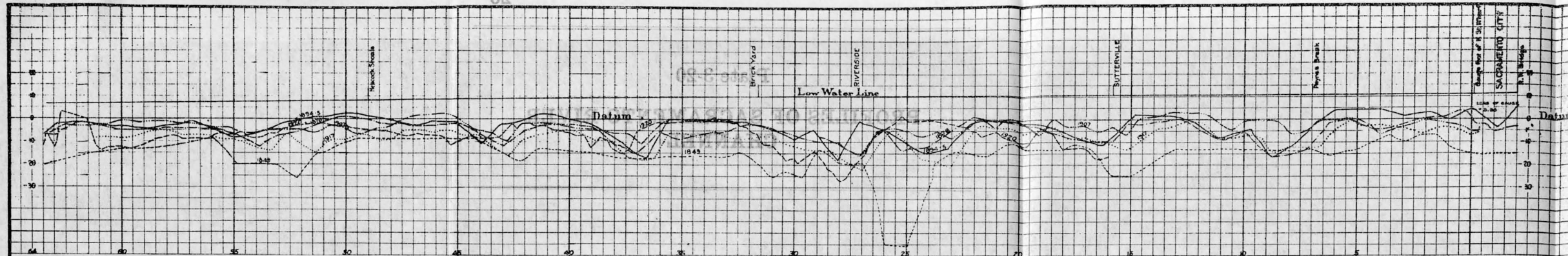
SV-70 BERKELEY, CALIF. SEPT. 1925 SHEET 5 OF 5 193-D-118

Plate 3-20

PROFILES OF SACRAMENTO RIVER CHANNEL

PROFILES
OF
SACRAMENTO RIVER CHANNEL
Showing Low Water Surface and
Mean Elevation of Bottom of Channel
from June 1872 to 1900 and 1901
by
W. H. JACKSON
U. S. GEOLOGICAL SURVEY
WASHINGTON, D. C.





**PROFILES
OF
SACRAMENTO RIVER CHANNEL**

Showing Low Water Surface and
Mean Elevation of Bottom of Channel

FROM SURVEYS OF 1849, 1878, 1894-5, 1907 AND 1917

COMPILED BY
GEO. S. NICKERSON
HYDRAULIC ENGINEER
SACRAMENTO
SEPTEMBER 1920

Note: The 1849 Survey, republished and enlarged in 1880, (Commander Ringgold) had but one line of soundings in mid channel. The profile of this Survey is shown in red.
The Survey of 1878 was made jointly by the National and State Governments.
The Survey of 1894-5 was made by the National Government.
The Surveys of 1878 and 1894-5 were complete and gave depths from bank to bank throughout the whole area surveyed.
The profiles of bottom made from the 1878 and 1894-5 surveys, were obtained by taking the Average of all the soundings at each cross section for 200 ft. of width of river, and calling this Average (which is generally much less than actual channel depth), the channel depth.
All depths are referred to the same plane, viz: the zero of gauge at New York Landing which is the mean of the Lower Low Waters of Suisun Bay.
Attention is invited to the Shoals at Emmaton, Rio Vista, Newtown, Ida Island, Iron House and other places on river.

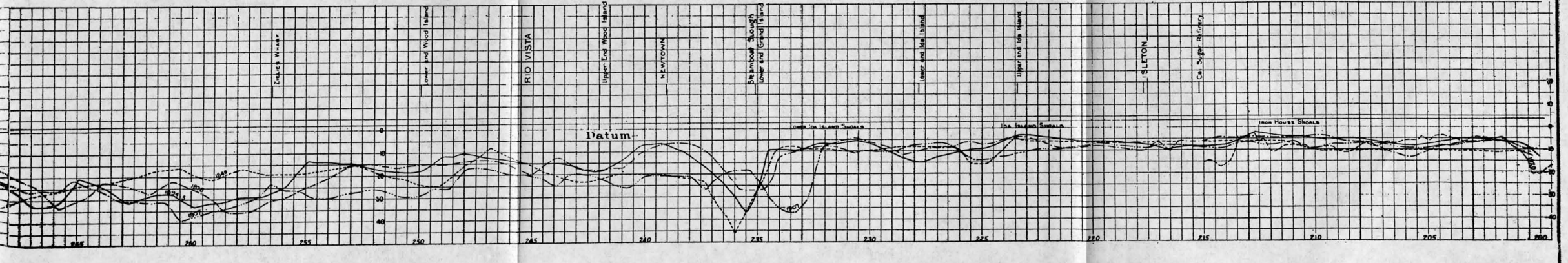
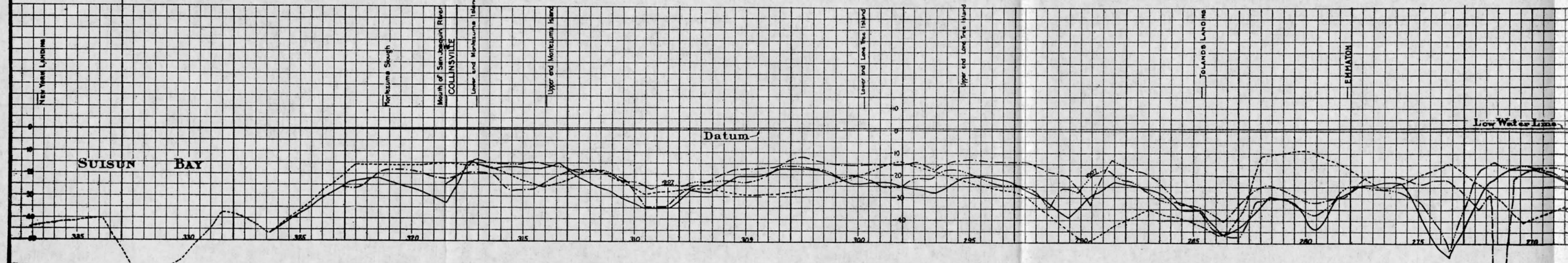
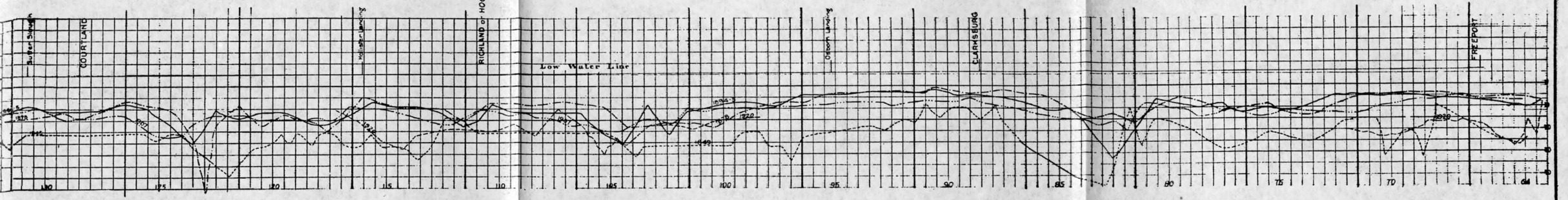
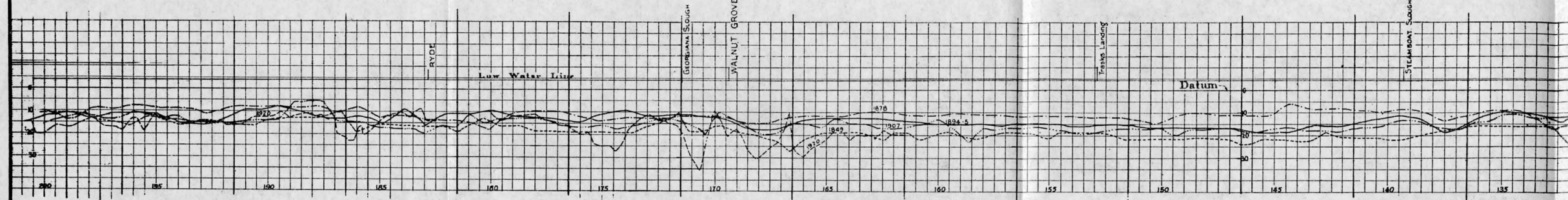
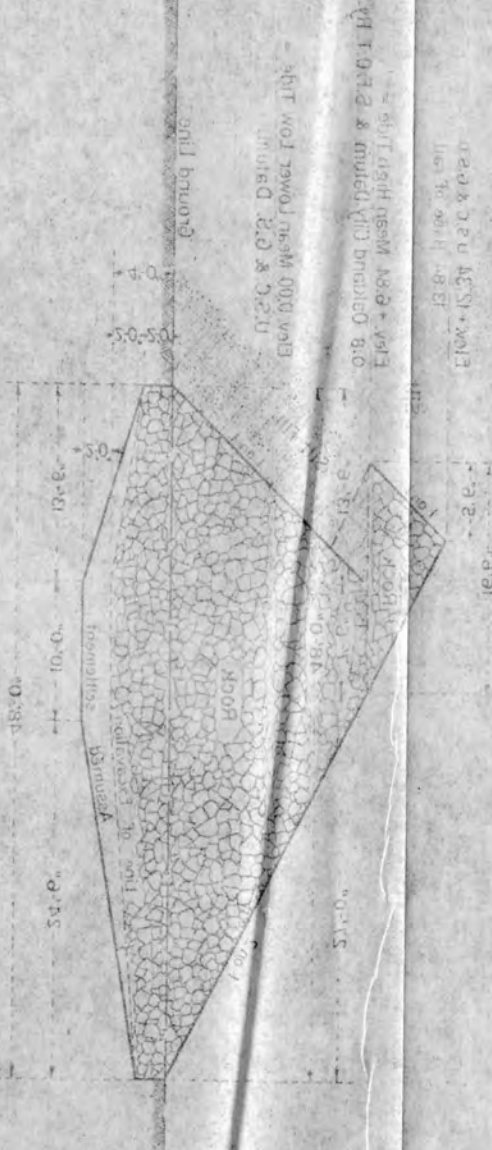


Plate 3-21

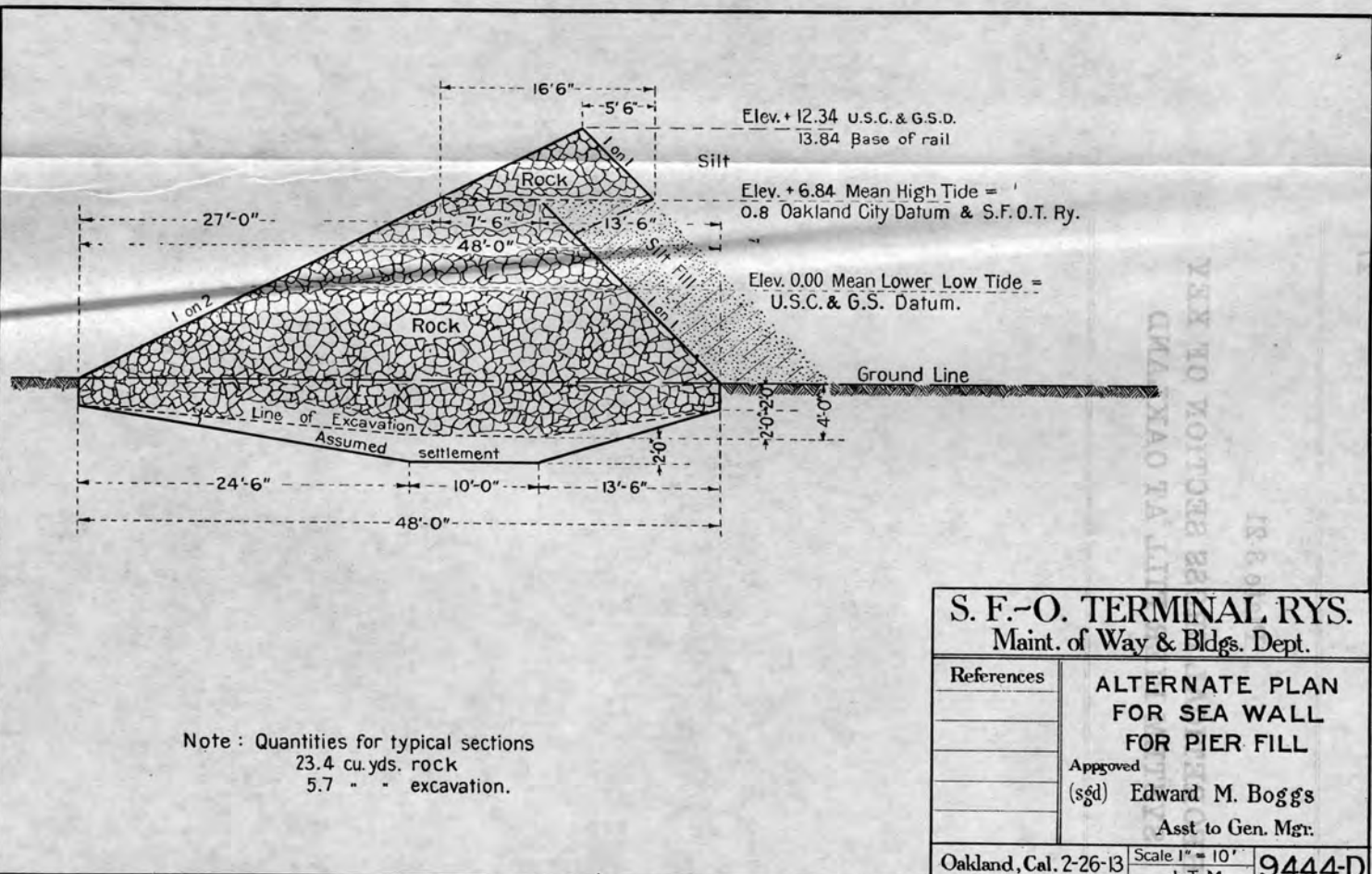
THEORETICAL CROSS SECTION OF KEY SYSTEM PIER FILL AT OAKLAND

Theoretical cross-section of Key System Pier III at Oakland

21' excavation;
53'4" of Key Lock
Note: Consult for typical sections



Original City of Oakland	10'	21'-0"
Excavation	53'-4"	53'-4"
Key Lock		
Foundation		
Ground Line		



S. F.-O. TERMINAL RYS.
 Maint. of Way & Bldgs. Dept.

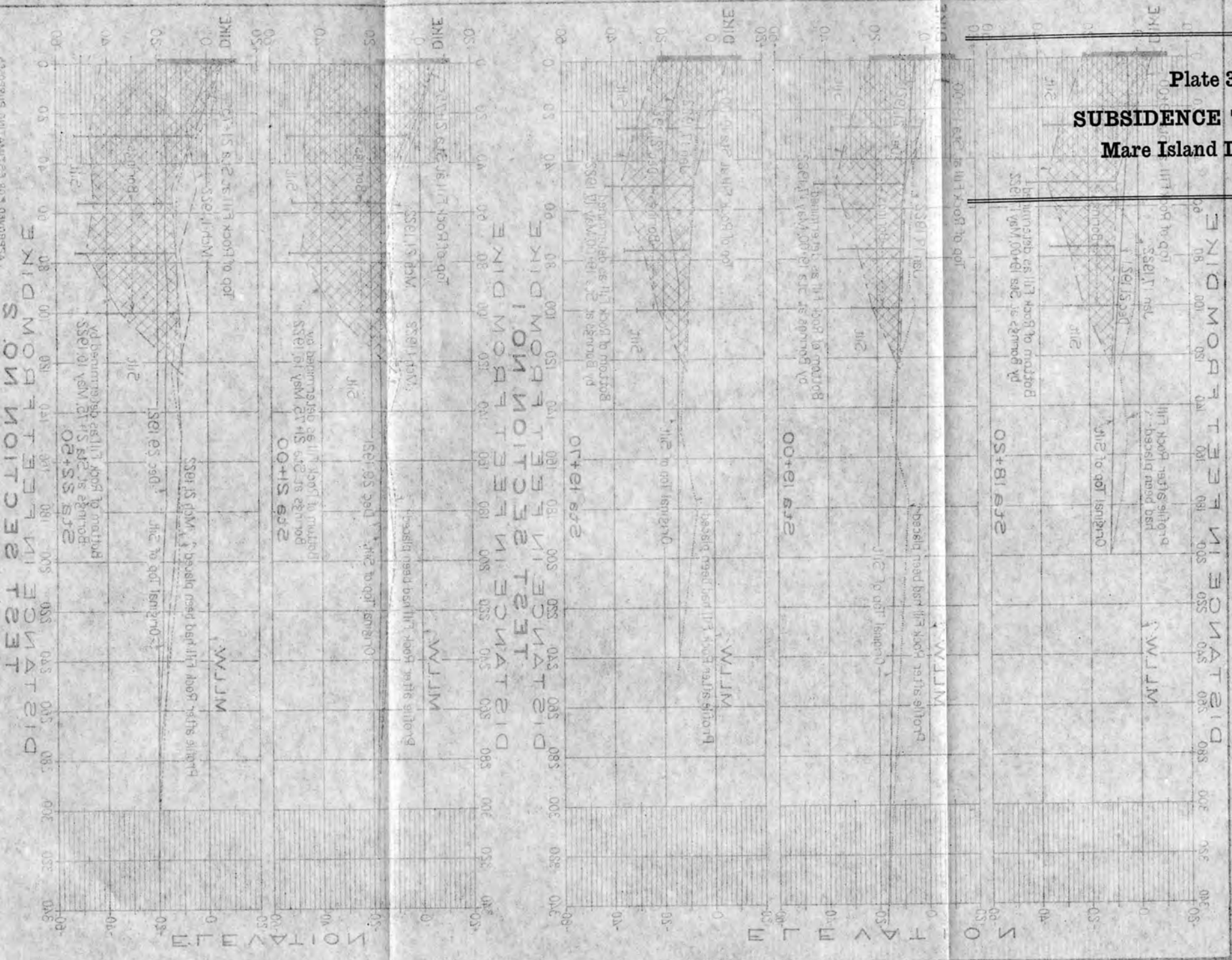
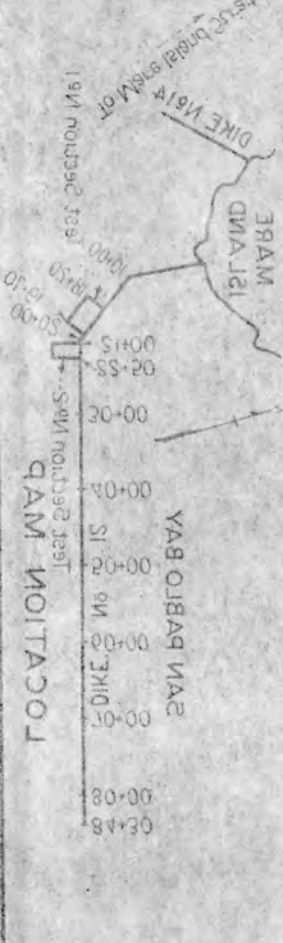
References	ALTERNATE PLAN FOR SEA WALL FOR PIER FILL Approved (sgd) Edward M. Boggs Asst to Gen. Mgr.
Oakland, Cal. 2-26-13	Scale 1" = 10' J. T. M. 9444-D

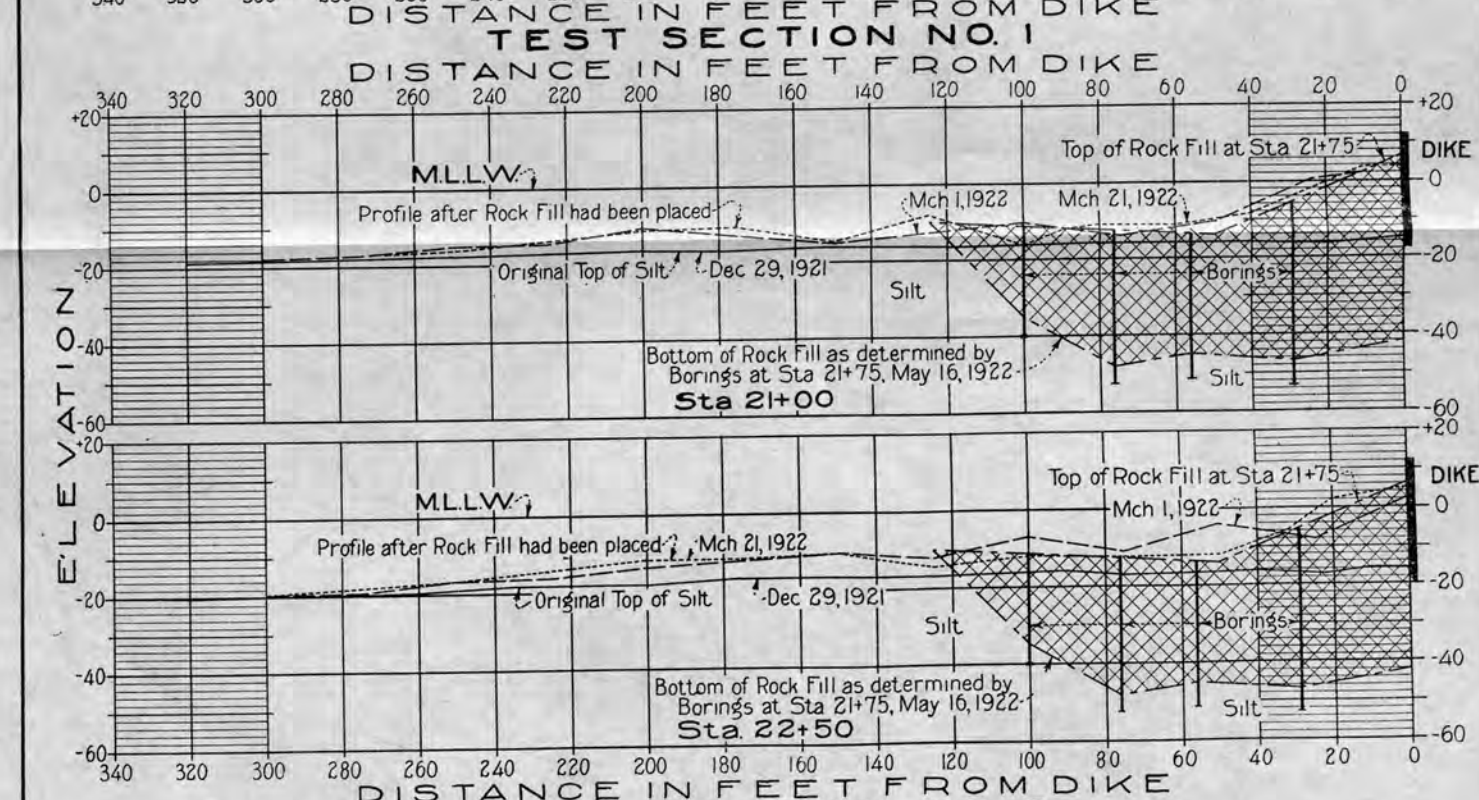
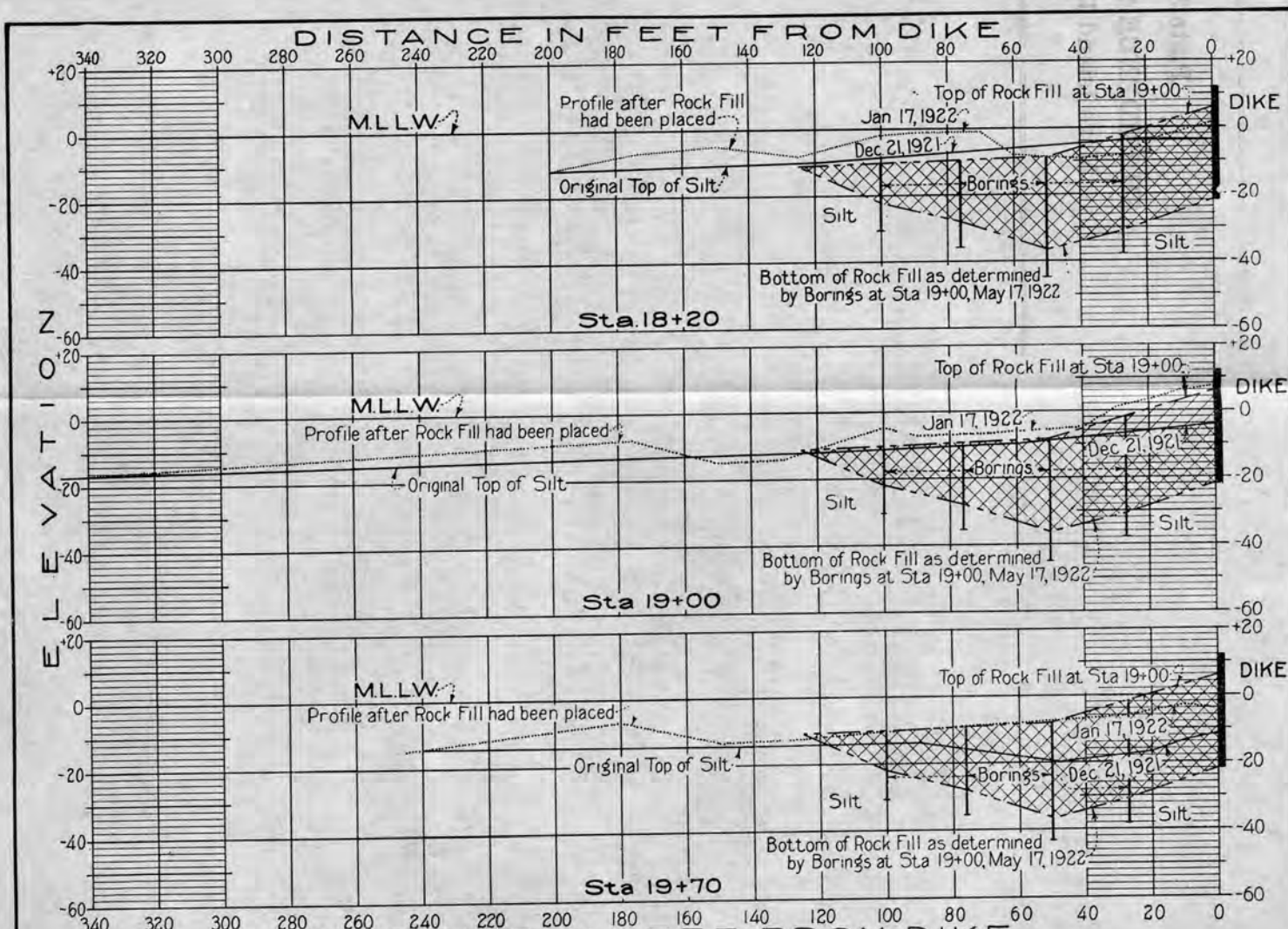
Theoretical cross-section of Key System pier fill at Oakland

PLATE 3-21

Plate 3-22
SUBSIDENCE TEST DATA
Mare Island Dike No. 12

2-123 - Elevation of top of dike at station 103-D-108
Date: 1/15/50
By: [Signature]
SUBSIDENCE TEST ON DIKE NO. 12
AT MAKE ISLAND MARINE BAR
AT WATER BARRIER
SACRAMENTO-SAN FRANCISCO
DISTRICT OFFICE
SAN FRANCISCO, CALIF.





APPROVED FOR ESTIMATING PURPOSES
A. J. Walter
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR
 BUREAU OF RECLAMATION
 SACRAMENTO VALLEY INVESTIGATIONS
 SALT WATER BARRIER
 SUBSIDENCE TEST DATA-DIKE No 12
 AT MARE ISLAND NAVY YARD

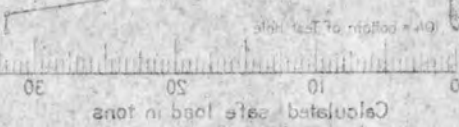
Drawn WRY:GAM Submitted *W. R. Gamm*
 Checked _____ Approved *J. S. Savage*

SV-153 Ellensburg, Wash June 1927 193-D-108

Plate 3-23
TEST PILE DATA
American Toll Bridge Company

Top of mud at test pile = 35.2

Weight 5000 * Stroke 2.0
 Vulcan steam hammer
 Safe loads
 Points on curve calculated by formula
 Length of test pile 80.6'



TEST DATA

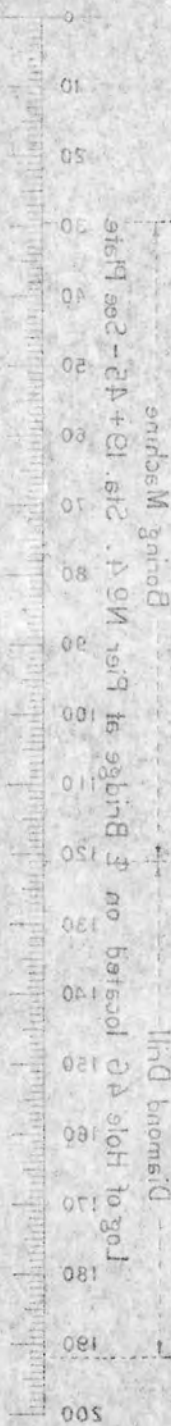
Date driven July 3, 1923
 Started loading with falls Aug 30
 Levels taken daily at 8 am and 2 pm.
 No settlement during loading to Sept 8.
 Between Sept 8-12 levels once daily.
 From Sept. 12 to Oct. 6 levels once weekly.
 Total measured settlement to Oct. 6 = 0.0017.
 Probable actual settlement 0.003 in.
 Total weight steel falls 25 tons

Compiled from records of American Toll Bridge Co.
TEST PILE DATA
 SALT WATER BARRIER
 SACRAMENTO VALLEY INVESTIGATIONS
 BUREAU OF RECLAMATION
 DEPARTMENT OF THE INTERIOR

JAN 22 1923 1923-153

Test pile No. 15 at Pier No. 1 - 80' Metal of Bridge

M.H.W. Datum
 Water
 Fine sand
 Sand & Wax matter
 Vegetation
 Blue Clay
 Sand & silt
 Soft shale
 Clay sand and
 fine gravel
 Soft sandstone
 Soft shale
 Hardpan
 Very soft shale
 Soft blue shale
 Sand & Blue clay
 Blue shale
 Soft blue shale
 with gravel



Log of hole located on Bridge at Pier No. 1 - 219.12 + 22 - See Plate

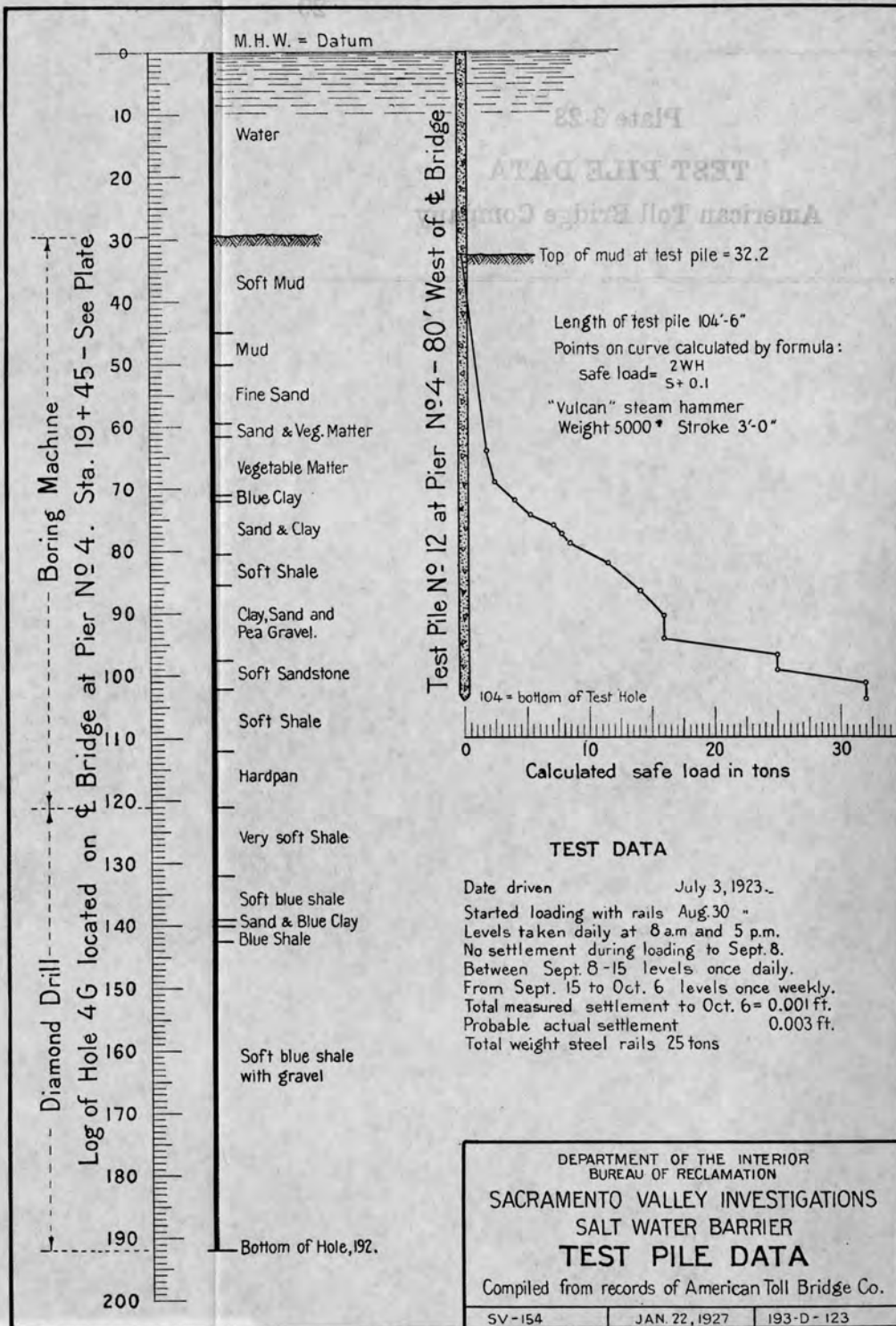
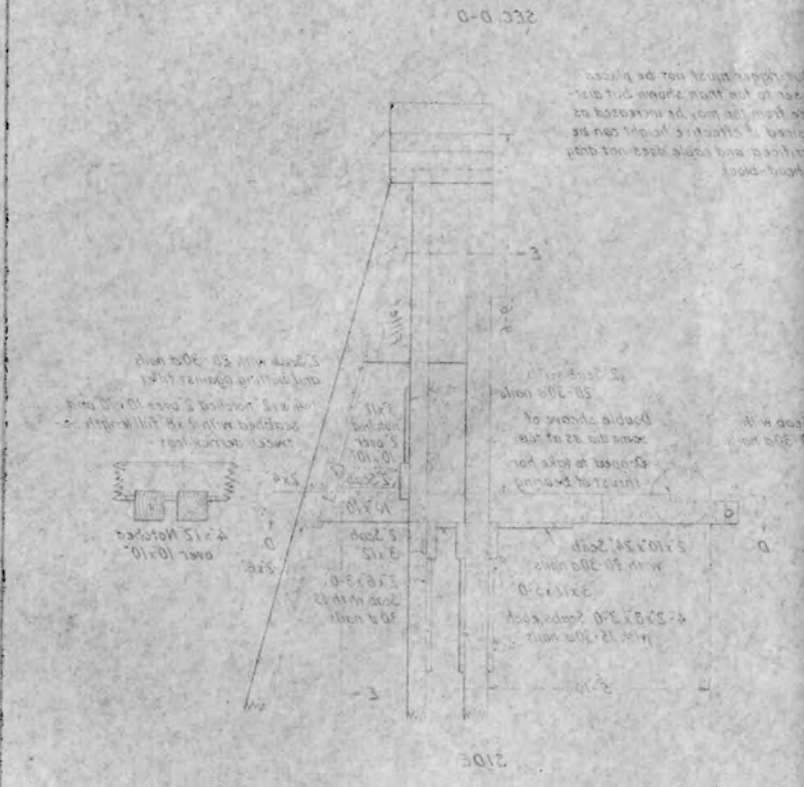
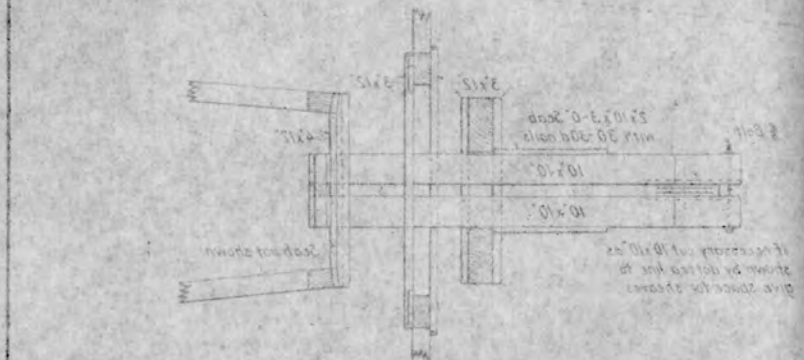


Plate 3-24

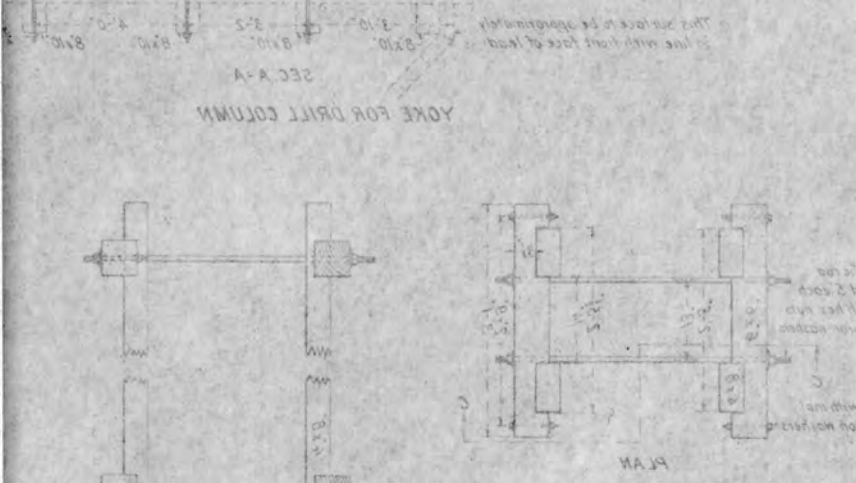
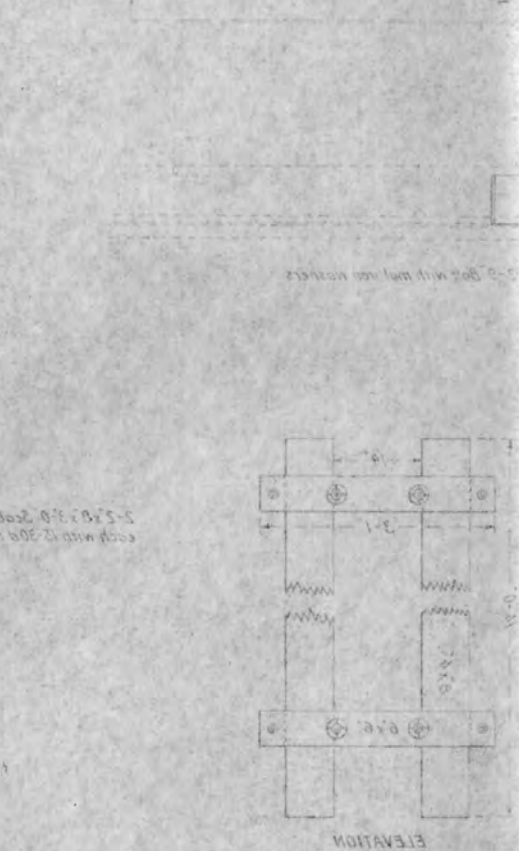
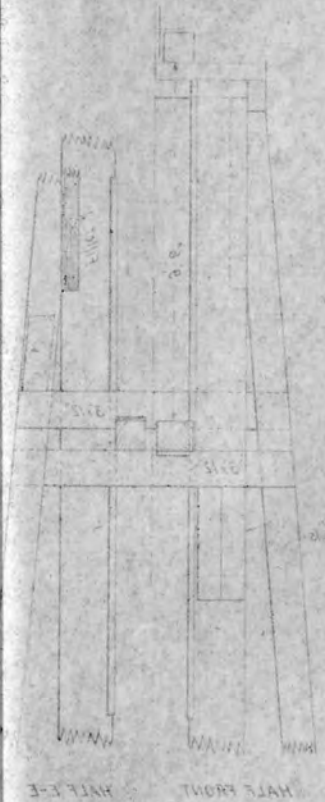
DRILL RIG ACCESSORIES



DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO WATER INVESTIGATION
SALT WATER BARRIER
DRILL RIG ACCESSORIES

APPROVED FOR ESTIMATING PURPOSES
O. J. [Signature]
CHIEF ENGINEER

21-37
193-D-121



Provide means for...
constant position of...
edge of...
paint

Provide bearing...
to...
allow clearance for...
setting from...
washers

This surface to be approximately...
to line with front face of...
2 1/2 x 3/8 steel with nut and washers

Technical drawing showing a cross-section of a structure with various dimensions and annotations.