STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

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

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LIST OF PLATES

LIST OF PLATES—Continued

LIST OF PLATES—Continued

Plate 1-1

RELIEF MAP OF CALIFORNIA

PLATE 1-1

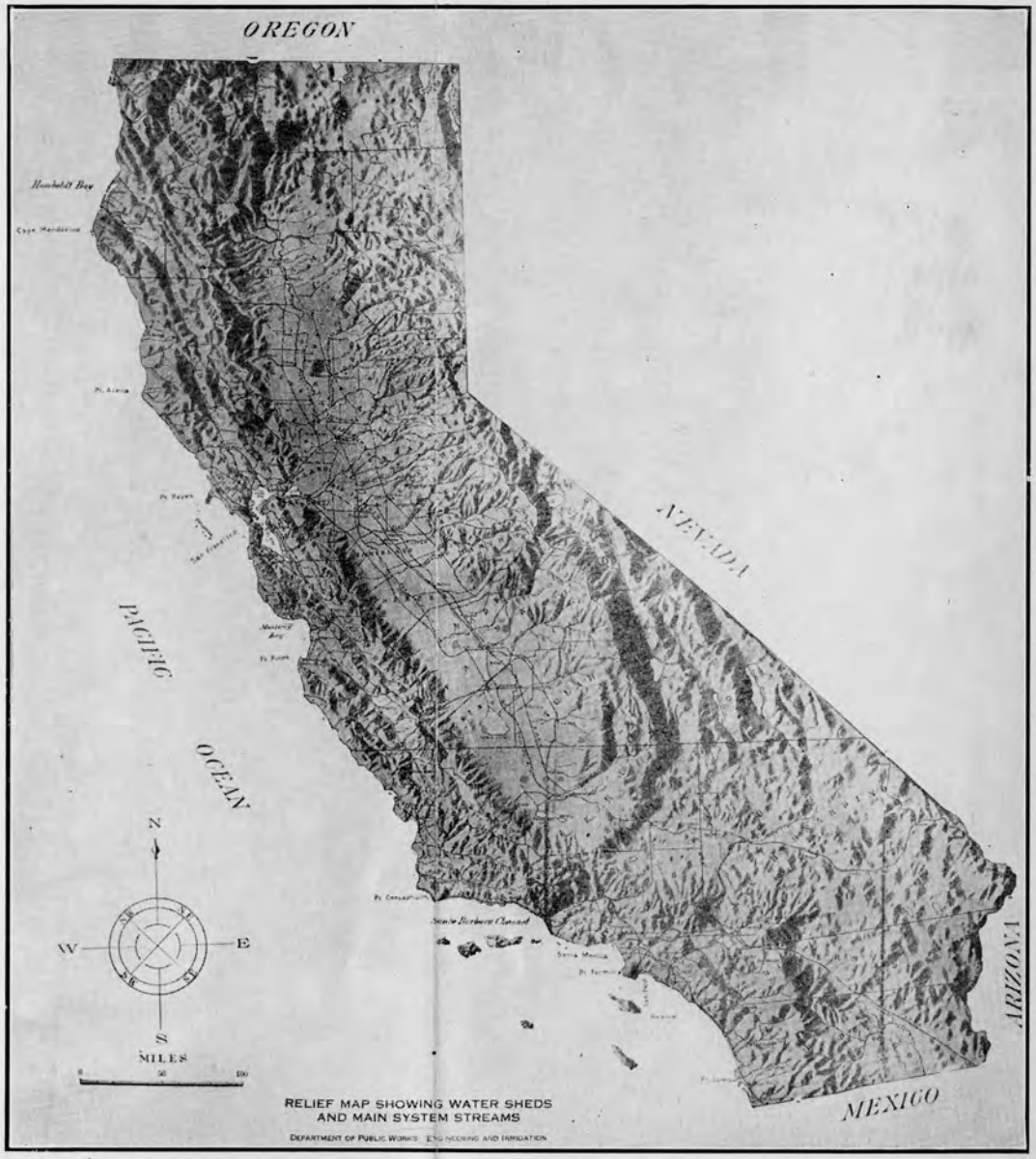
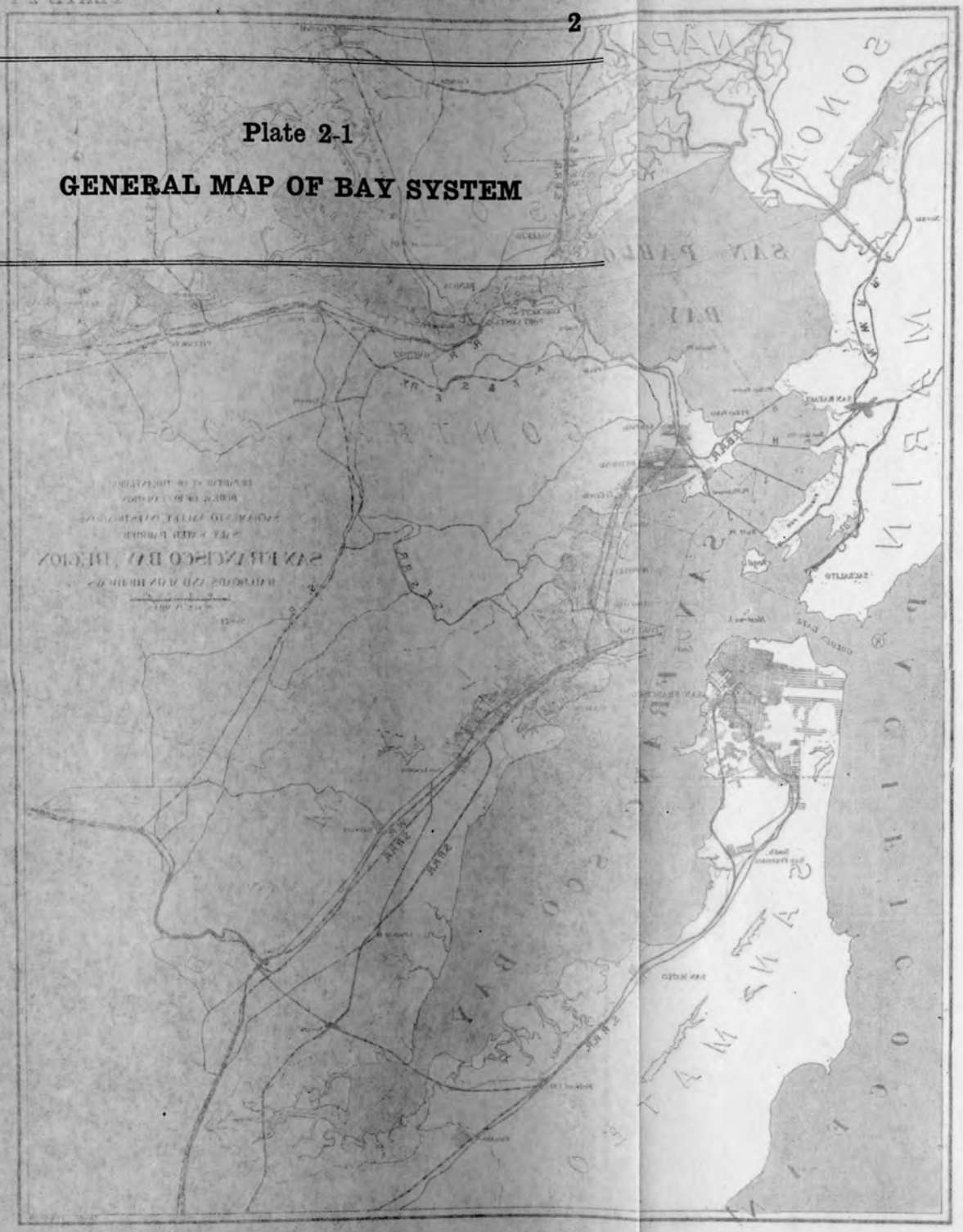

OREGON
NEVADA
ARIZONA
MEXICO
PACIFIC
OCEAN
Humboldt Bay
Cape Mendocino
Pt. Arena
Pt. Reyes
San Francisco
Monterey Bay
Pt. Pinos
Pt. Conception
Santa Barbara Channel
Santa Monica
Pt. Fermin
N
S
E
W
MILES
0
50
100
RELIEF MAP SHOWING WATER SHEDS
AND MAIN SYSTEM STREAMS
DEPARTMENT OF PUBLIC WORKS ENGINEERING AND IRRIGATION

Plate 2-1

GENERAL MAP OF BAY SYSTEM



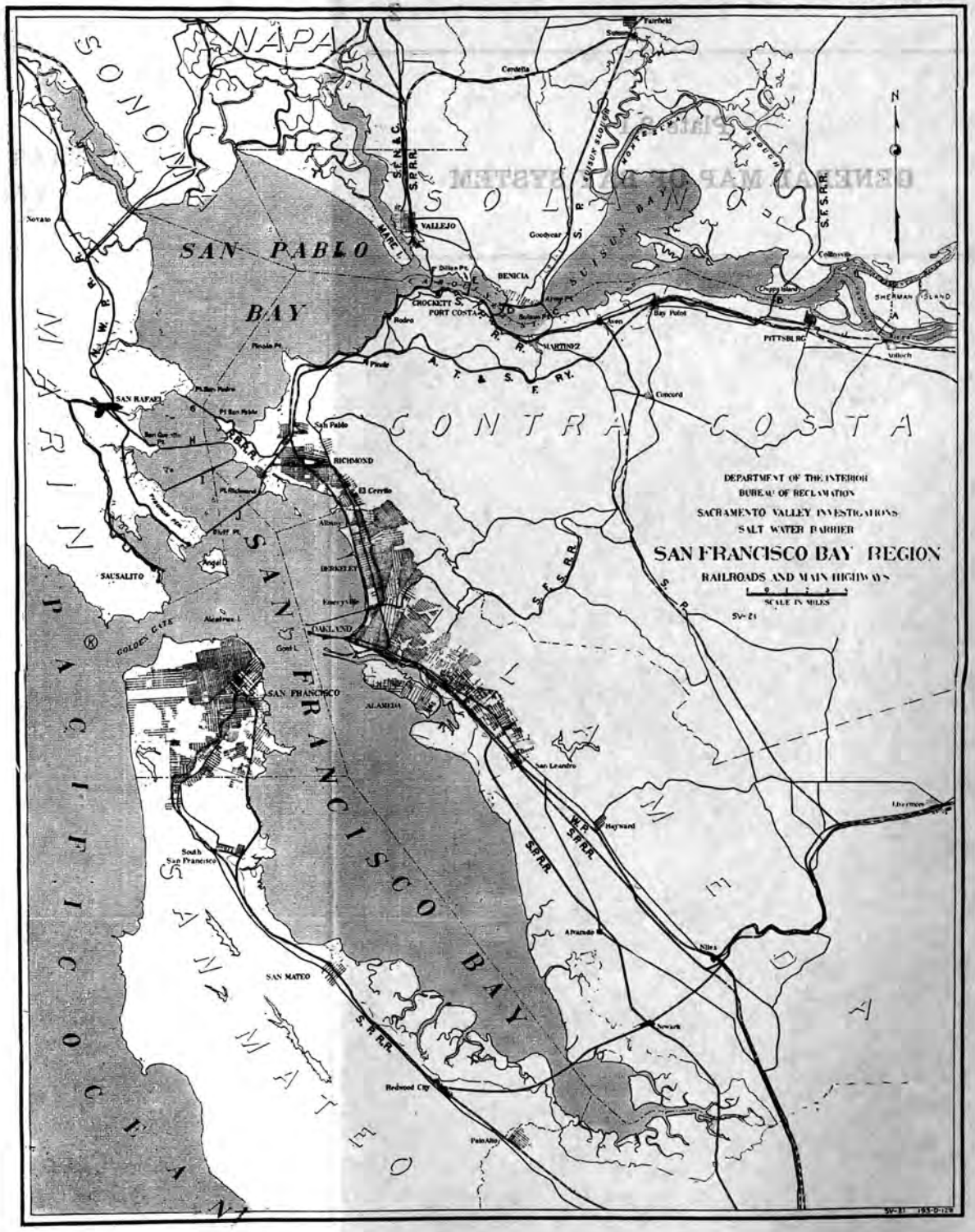

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
SAN FRANCISCO BAY REGION
RAILROADS AND MAIN HIGHWAYS
SCALE IN MILES
SAN PABLO BAY
SAN FRANCISCO BAY
SUISUN BAY
NAPA
SONOMA
SOLANO
CONTRA COSTA
MARIN
SAN MATEO
ALAMEDA
PACIFIC OCEAN
VALLEJO
BENICIA
CROCKETT
PORT COSTA
MARTINEZ
PITTSBURG
Bay Point
Concord
Antioch
SHERMAN ISLAND
Collinsville
Fairfield
Cordelia
Goodyear
Novato
Rodeo
Pinole
SAN RAFAEL
Pt San Pablo
Pt Richmond
RICHMOND
El Cerrito
Albany
BERKELEY
Emeryville
OAKLAND
SAUSALITO
Angel I.
Alcatraz I.
Goat I.
SAN FRANCISCO
ALAMEDA
San Leandro
Hayward
Livermore
South San Francisco
SAN MATEO
Alvarado
Niles
Newark
Redwood City
Palo Alto
GOLDEN GATE
Tiburon Pen.
Bluff Pt.
Pt Richmond
Pt San Pablo
Pt San Pedro
Pinole Pt.
Dillon Pt.
Army Pt.
Bulwer Pt.
Ryer Is.
Chipps Island
Ware I.
N.W.P.R.R.
S.F.N.&C.
S.P.R.R.
S.F.S.P.R.R.
A.T.&S.F.RY.
E.B.R.R.
S.F.R.R.
W.P.R.R.
S.P.R.R.
S.F.R.R.
S.P.R.R.
N
SV-21

Plate 2-2

CHART OF NORTHERN PART OF SAN FRANCISCO BAY


UNITED STATES - WEST COAST
SAN FRANCISCO ENTRANCE
CALIFORNIA
SV-145
193-D-130

Plate 2-3

CHART OF SAN PABLO BAY

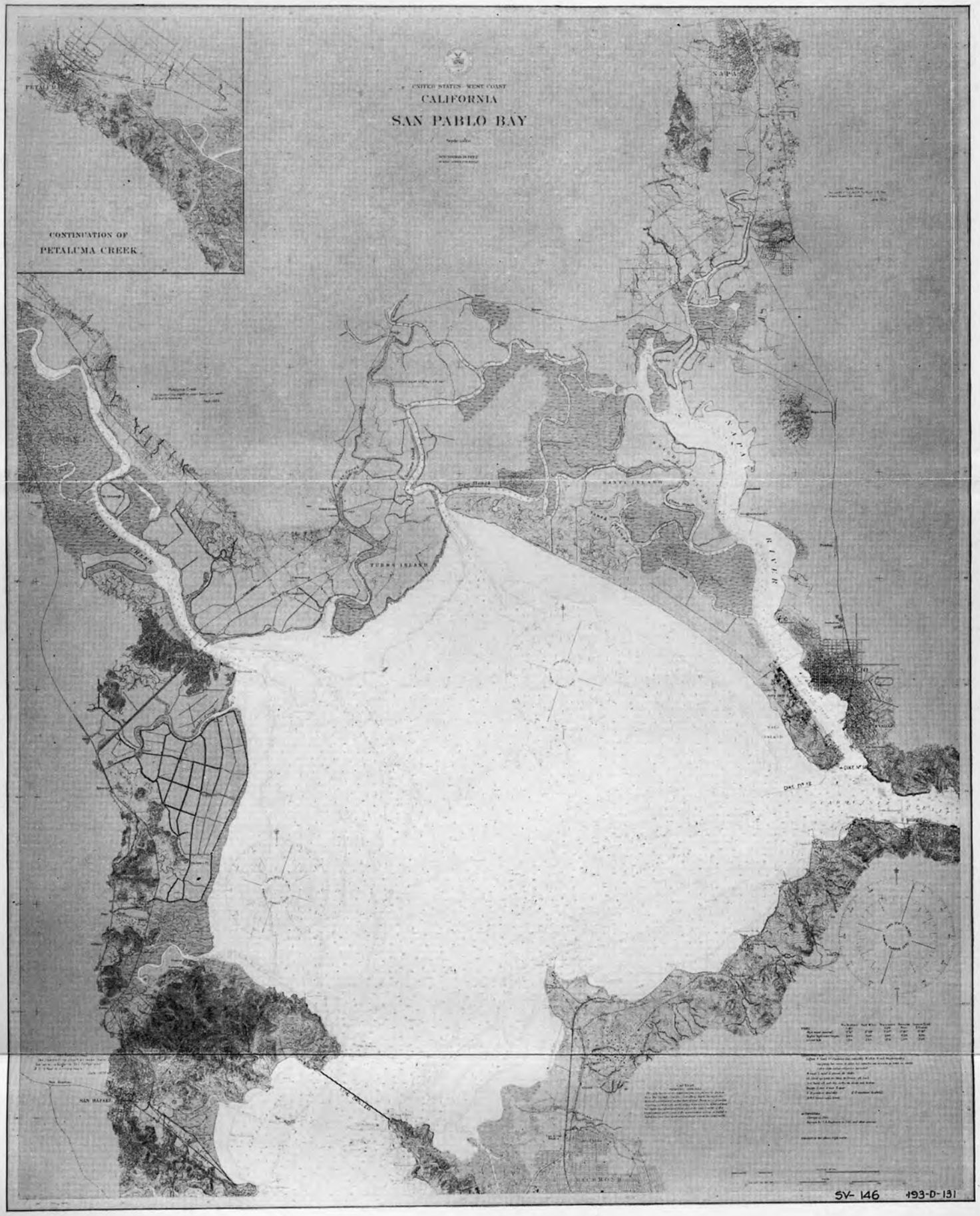

UNITED STATES WEST COAST
CALIFORNIA
SAN PABLO BAY
CONTINUATION OF
PETALUMA CREEK
NAPA
VALLEJO
SAN RAFAEL
RICHMOND
SV- 146
193-D-131

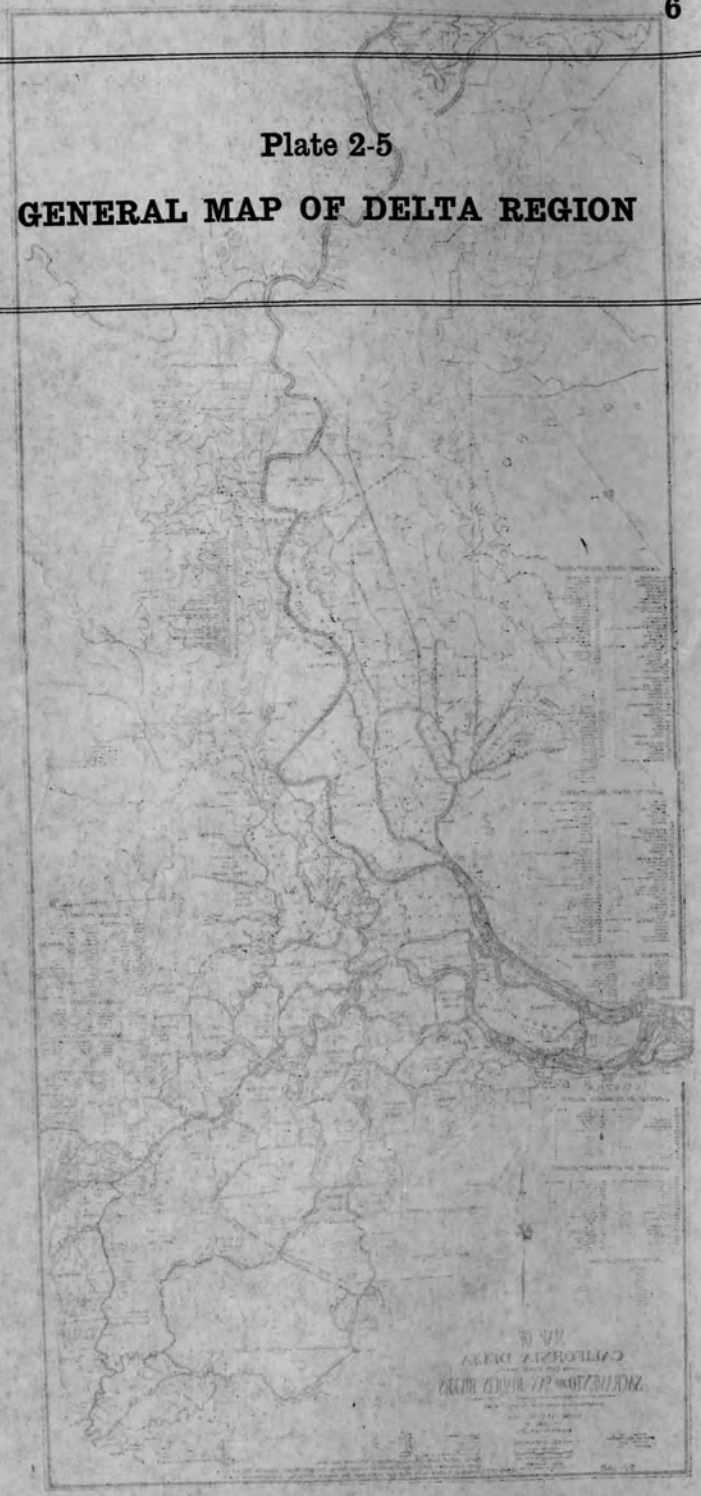
Plate 2-4

CHART OF SUISUN BAY


UNITED STATES - WEST COAST
SUISUN BAY
CALIFORNIA
GRIZZLY BAY
SIMMONS ISLAND
WHEELER ISLAND
(Exact location not determined)
SAN SIGNE ISLAND
SHERMAN I.
SAN JOAQUIN RIVER
SACRAMENTO RIVER
ANTIOCH
MARTINEZ
BENICIA
SUISUN
FAIRFIELD
SV-147
193-D-132

Plate 2-5

GENERAL MAP OF DELTA REGION



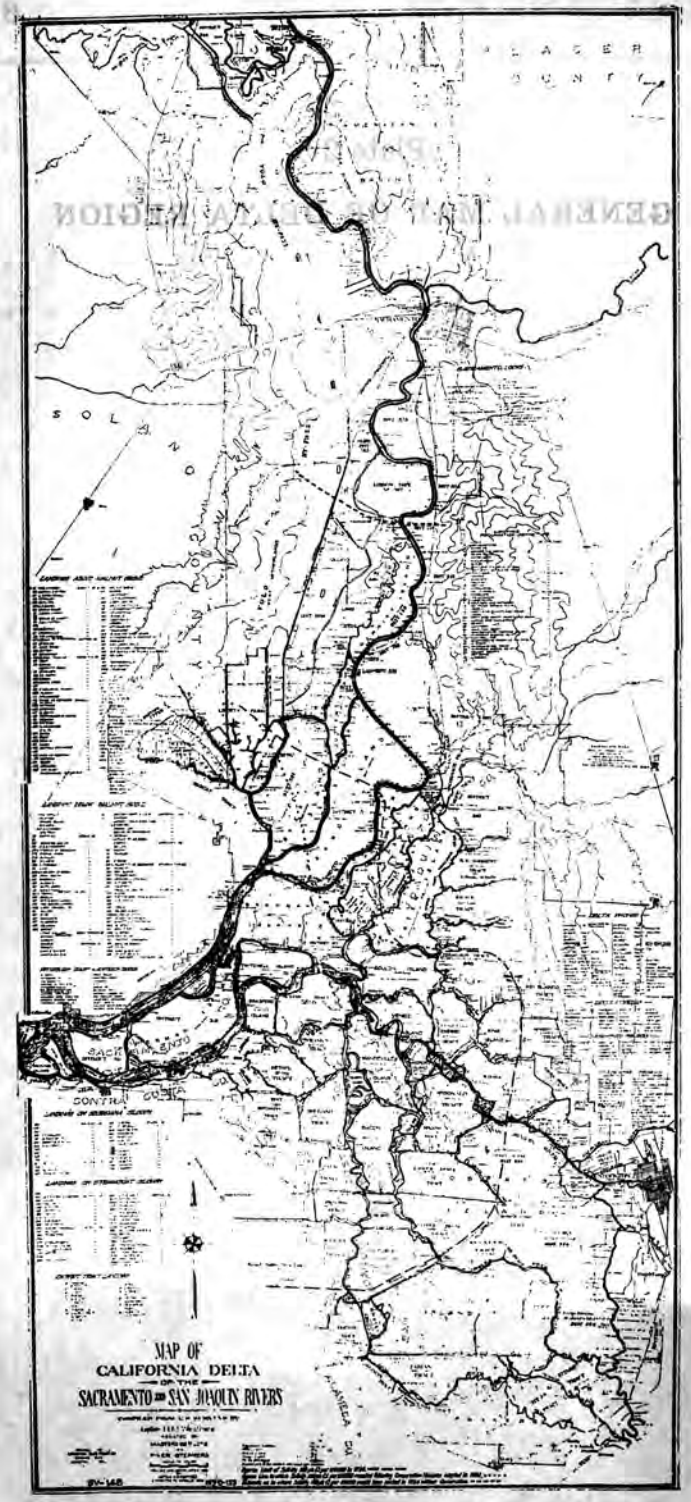

PLACER
COUNTY
SOLANO
SACRAMENTO
CONTRA COSTA
ALAMEDA
MAP OF
CALIFORNIA DELTA
OF THE
SACRAMENTO AND SAN JOAQUIN RIVERS

Plate 3-1

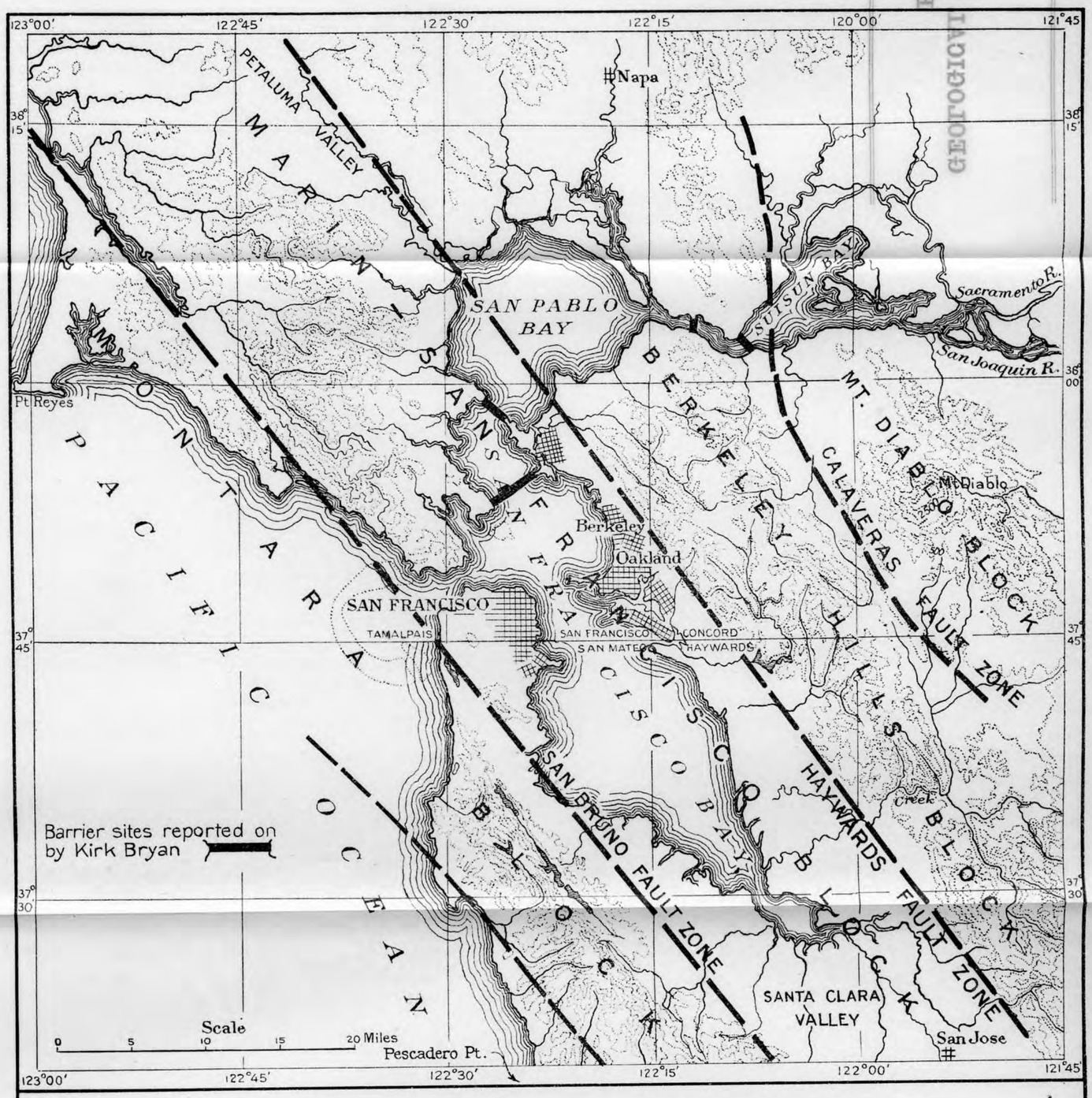
GEOLOGICAL MAP OF SAN FRANCISCO BAY REGION

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 overthrust 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 3-1



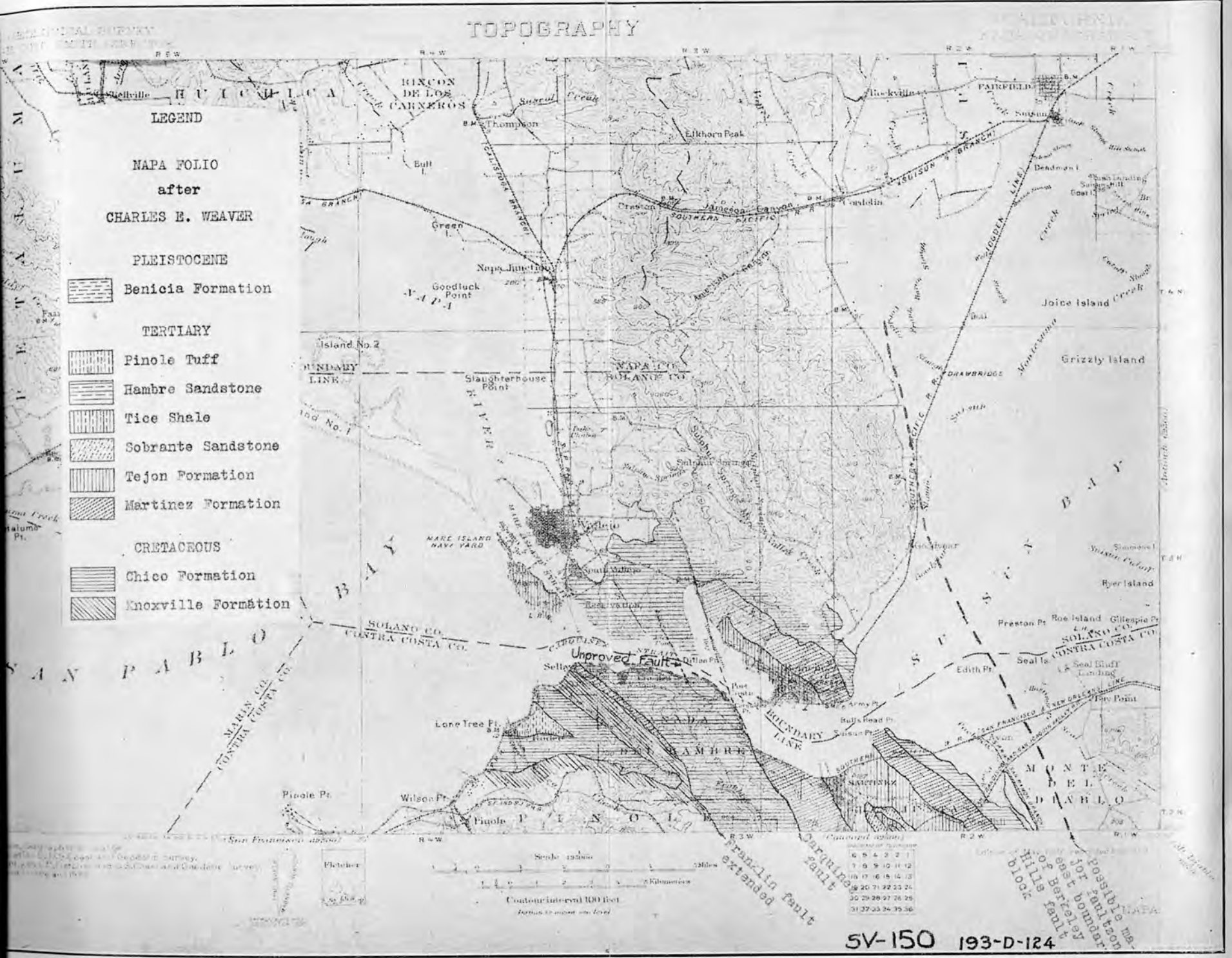
Map of vicinity of San Francisco Bay showing topographic features and the geomorphic divisions resulting from the adjustment by tilting of great fault blocks

The eastern boundary of the Berkeley Hills block is not sharply defined; it may be drawn along a general zone of overthrust 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
SAN PABLO BAY
SUISUN BAY
Unproved Fault
Franklin fault extended
Carquinez fault
Hills of Berkeley east boundary fault
Contour interval 100 feet
SV-150 193-D-124

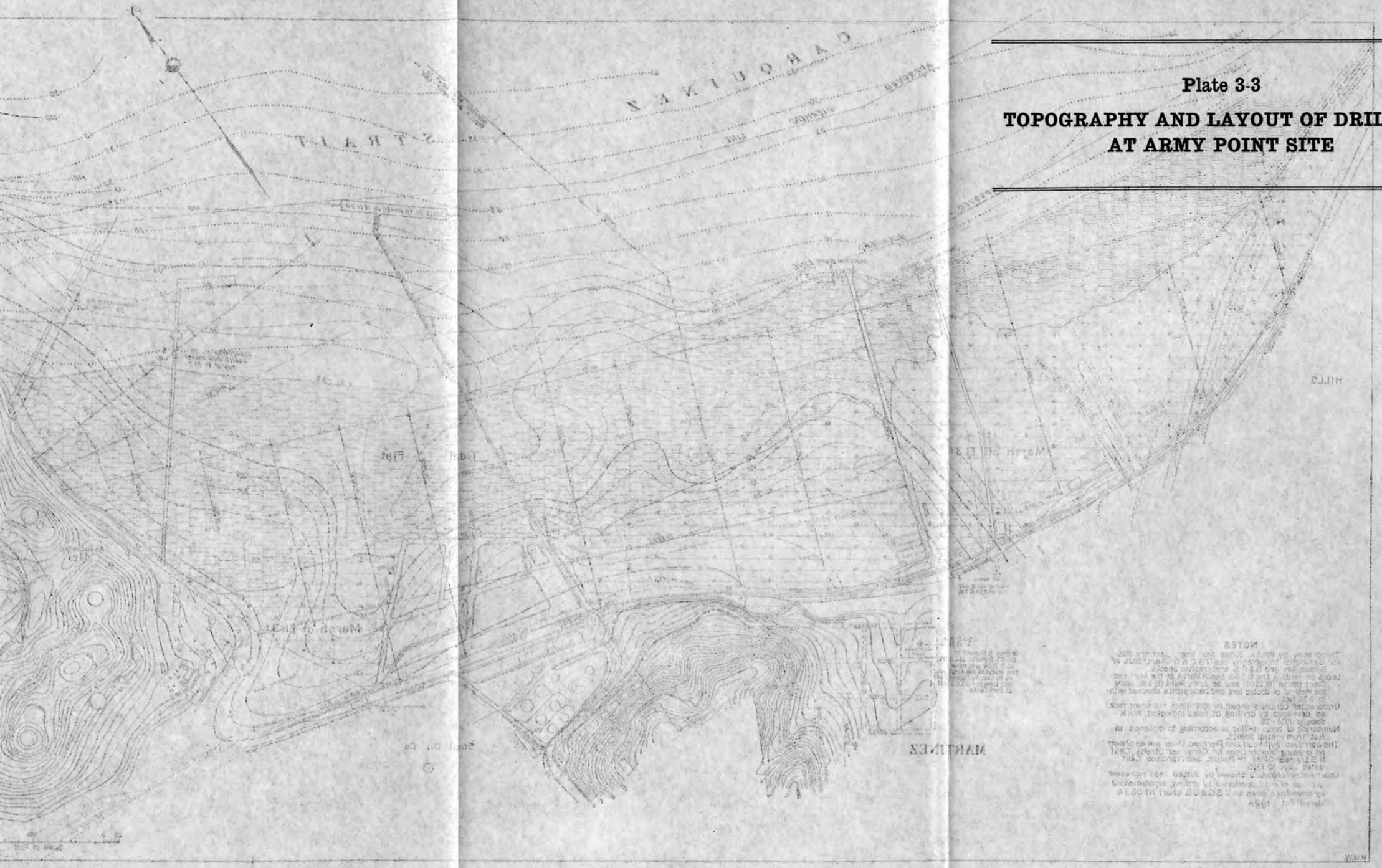
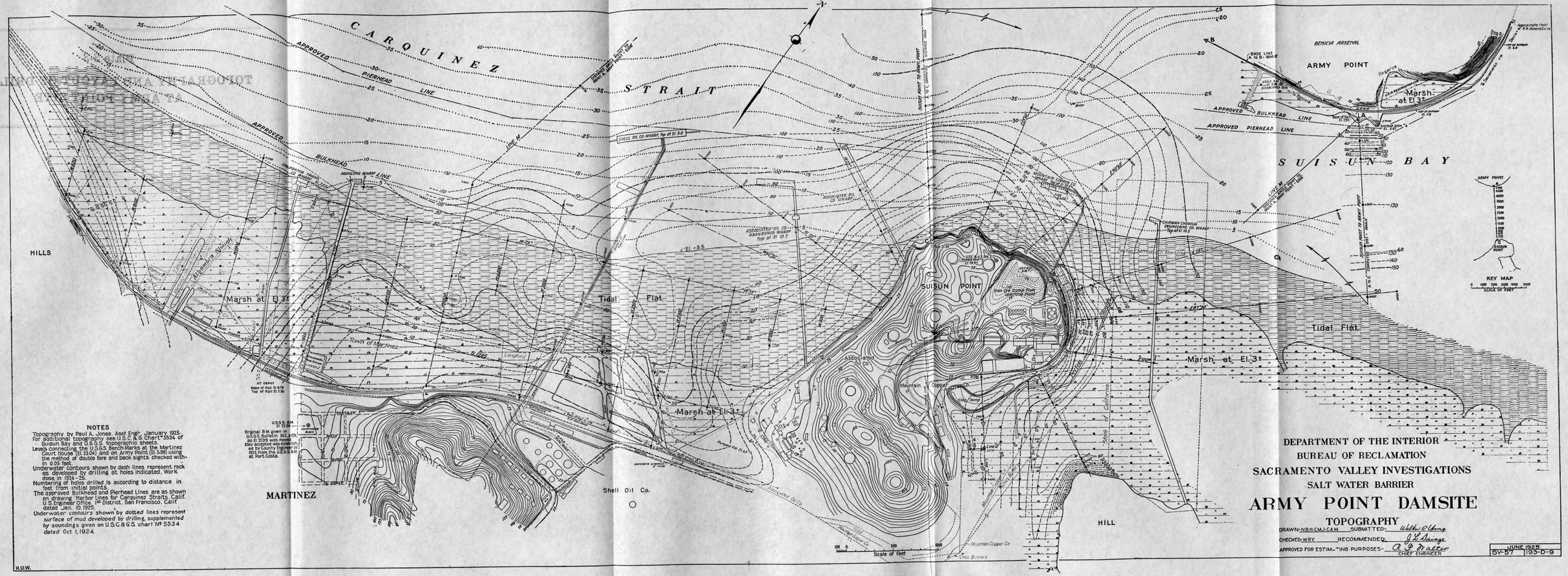


Plate 3-3

TOPOGRAPHY AND LAYOUT OF DRILLING AT ARMY POINT SITE



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

ARMY POINT DAMSITE

TOPOGRAPHY

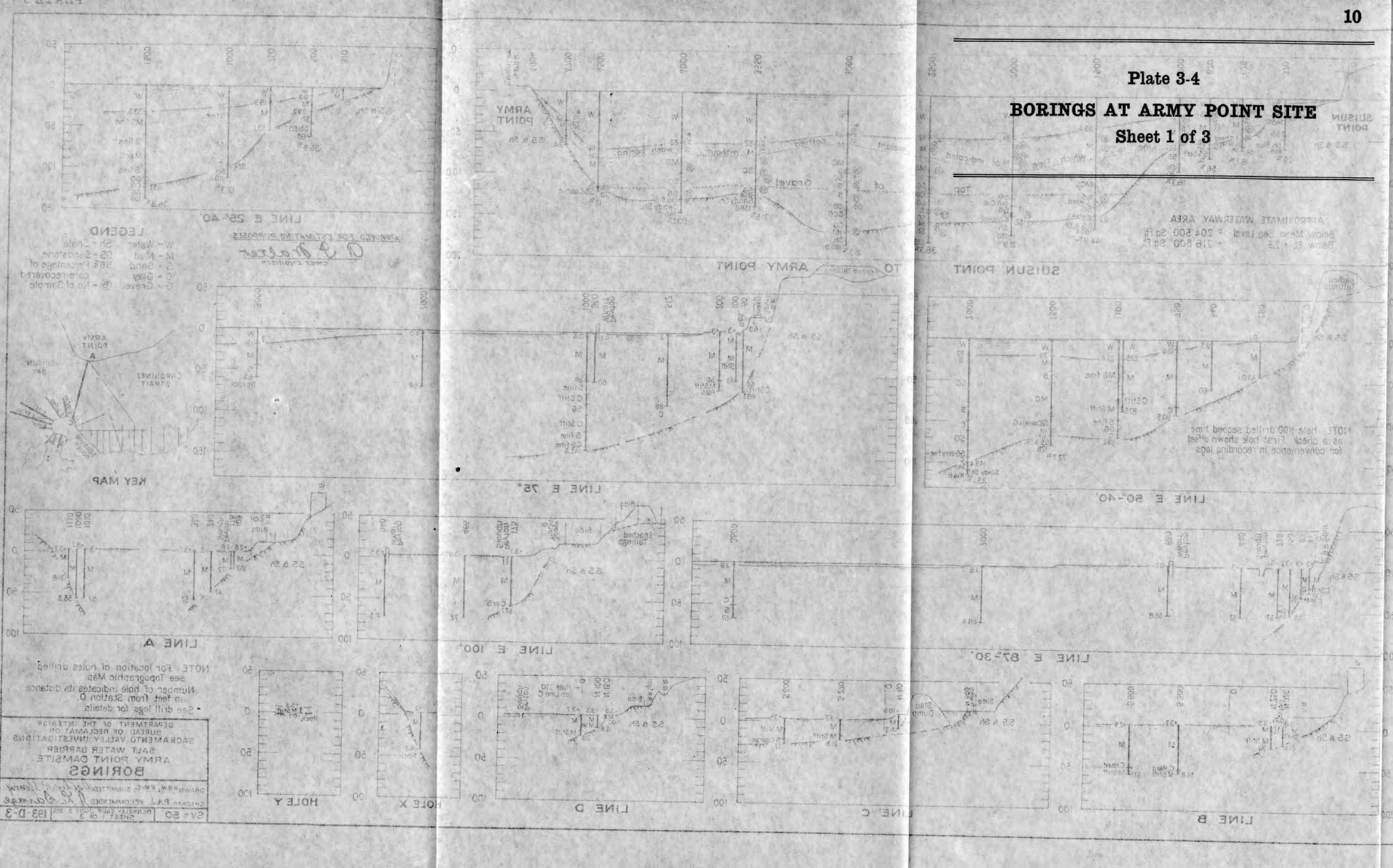
DRAWN-NBH.CM.J.CAM SUBMITTED- Walter R. Young
CHECKED-WRY RECOMMENDED- J. L. Savage
APPROVED FOR ESTIMATING PURPOSES- A. J. Parker, CHIEF ENGINEER

JUNE 1925
SV-57 193-D-9

Plate 3-4

BORINGS AT ARMY POINT SITE

Sheet 1 of 3



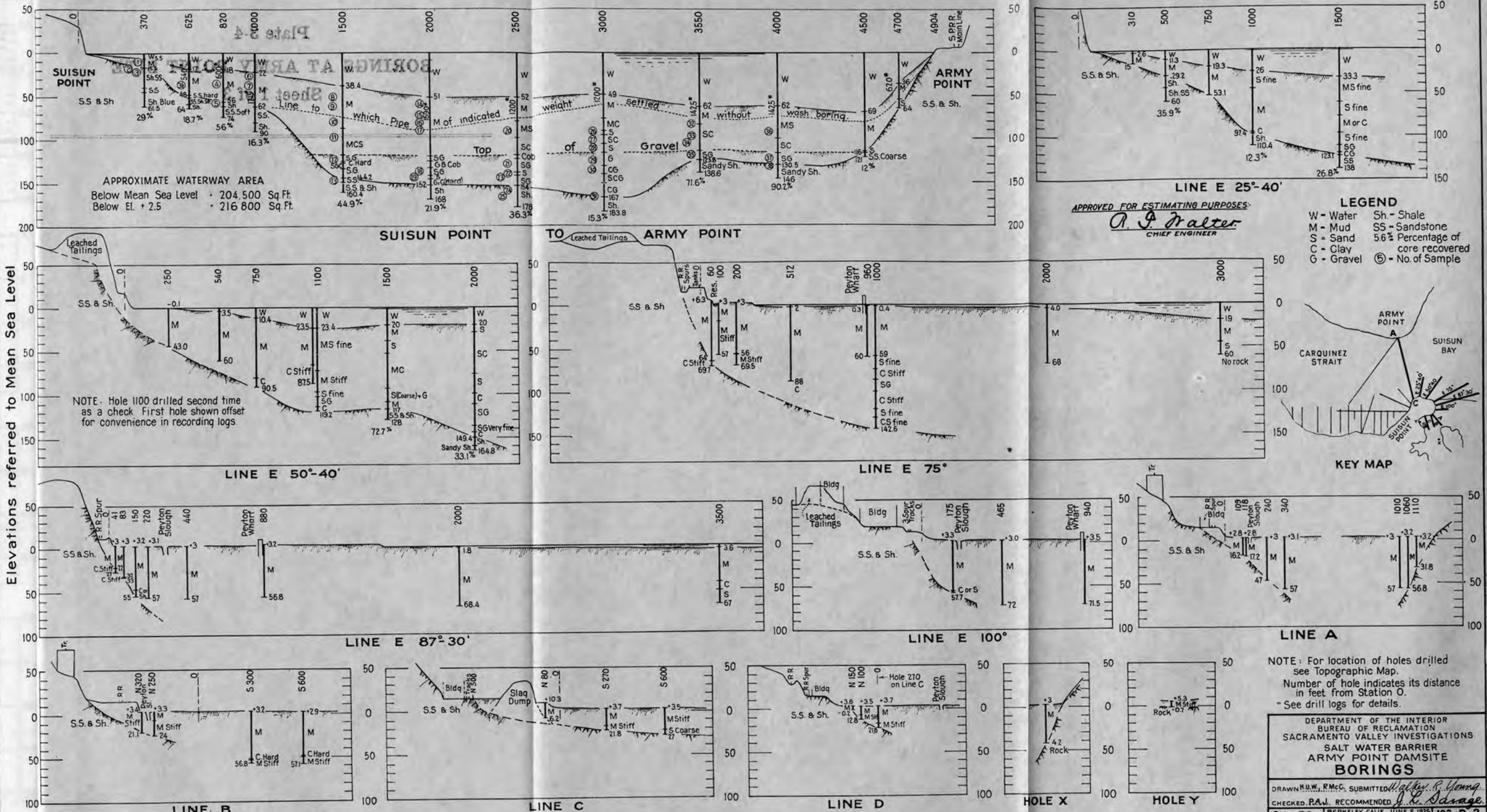
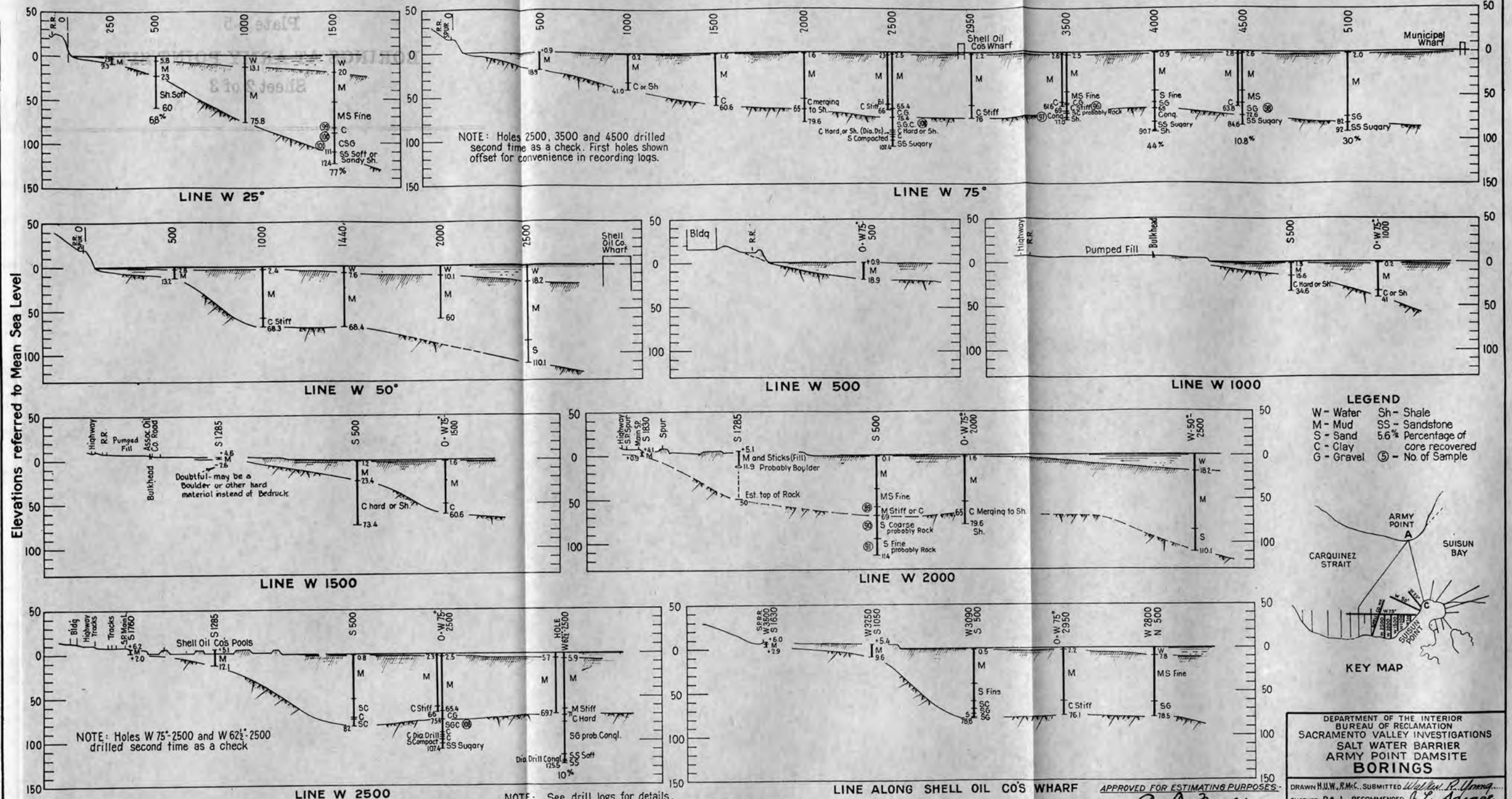

SUISUN POINT TO ARMY POINT
Elevations referred to Mean Sea Level
SUISUN POINT
ARMY POINT
APPROXIMATE WATERWAY AREA
Below Mean Sea Level · 204,500 Sq. Ft.
Below El. + 2.5 · 216 800 Sq. Ft.
Line to which Pipe weight of indicated settled without wash boring
Top of Gravel
Leached Tailings
NOTE: Hole 1100 drilled second time as a check. First hole shown offset for convenience in recording logs.
LINE E 25°-40'
LINE E 50°-40'
LINE E 75°
LINE E 87°-30'
LINE E 100°
LINE A
LINE B
LINE C
LINE D
HOLE X
HOLE Y
APPROVED FOR ESTIMATING PURPOSES:
A. J. Walter
CHIEF ENGINEER
LEGEND
W - Water
M - Mud
S - Sand
C - Clay
G - Gravel
Sh. - Shale
SS - Sandstone
5.6% Percentage of core recovered
⑤ - No. of Sample
KEY MAP
ARMY POINT
CARQUINEZ STRAIT
SUISUN BAY
SUISUN POINT
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.U.W., P.McC. SUBMITTED Walter R. Young
CHECKED P.A.W. RECOMMENDED J. L. 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



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. Walter
CHIEF ENGINEER

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

DRAWN H.U.W., R.McC. SUBMITTED Walter R. Young
CHECKED R.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

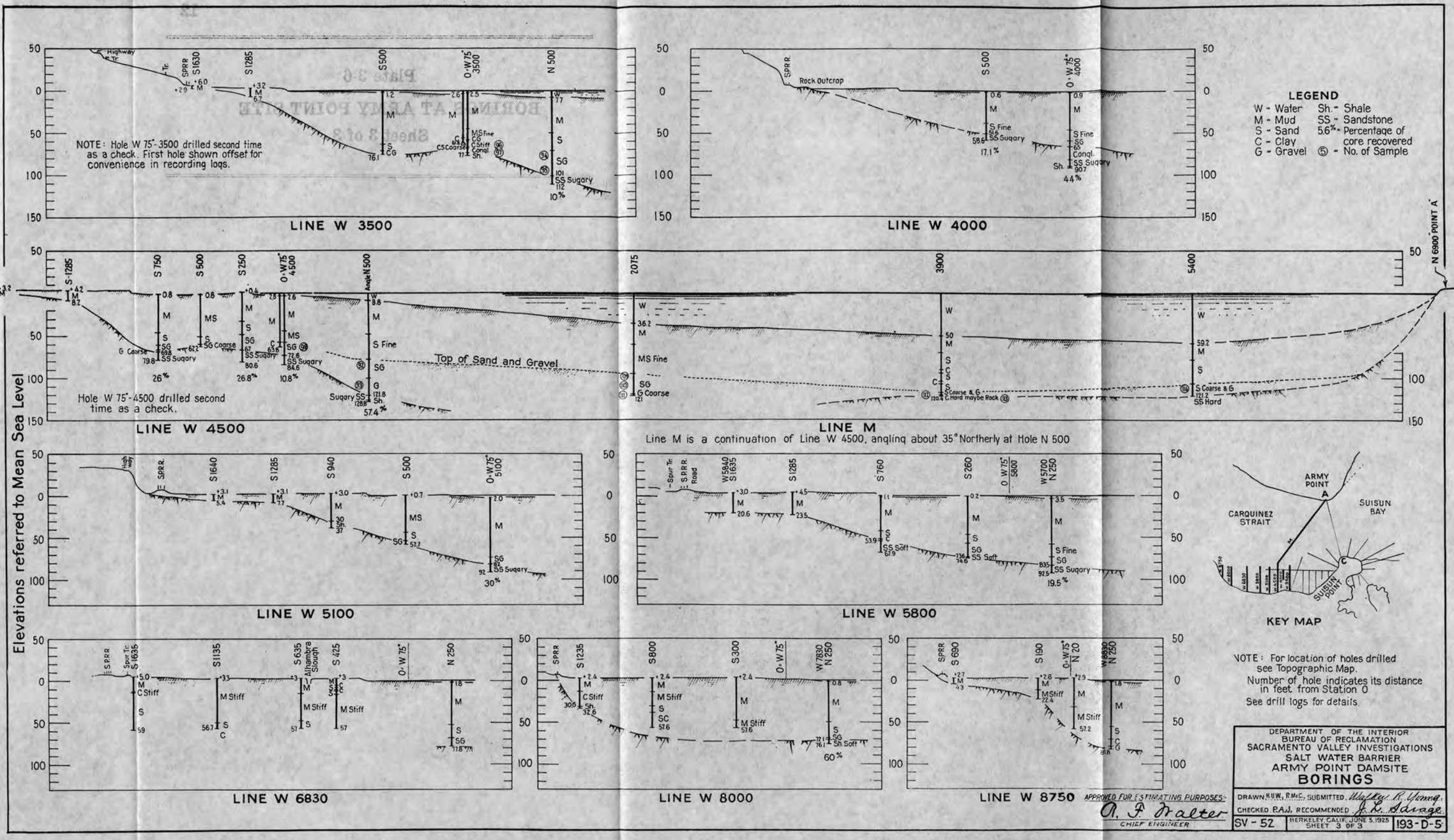

LINE W 3500
NOTE: Hole W 75'-3500 drilled second time as a check. First hole shown offset for convenience in recording logs.
LINE W 4000
LEGEND
W - Water
M - Mud
S - Sand
C - Clay
G - Gravel
Sh. - Shale
SS - Sandstone
5.6% - Percentage of core recovered
⑤ - No. of Sample
LINE W 4500
Hole W 75'-4500 drilled second time as a check.
Top of Sand and Gravel
LINE M
Line M is a continuation of Line W 4500, angling about 35° Northerly at Hole N 500
N 6900' POINT A
S.P.R.R. = MAIN LINE
Elevations referred to Mean Sea Level
LINE W 5100
LINE W 5800
KEY MAP
ARMY POINT
CARQUINEZ STRAIT
SUISUN BAY
SUISUN POINT
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
DRAWN N.W.W., R.M.C., SUBMITTED Wesley R. Young
CHECKED P.A.J. RECOMMENDED J. L. Savage
APPROVED FOR ESTIMATING PURPOSES
A. F. Walter
CHIEF ENGINEER
SV - 52
BERKELEY, CALIF. JUNE 5, 1925
SHEET 3 OF 3
193-D-5

Plate 3-7

TOPOGRAPHY AND LAYOUT OF DRILLING AT DILLON POINT SITE

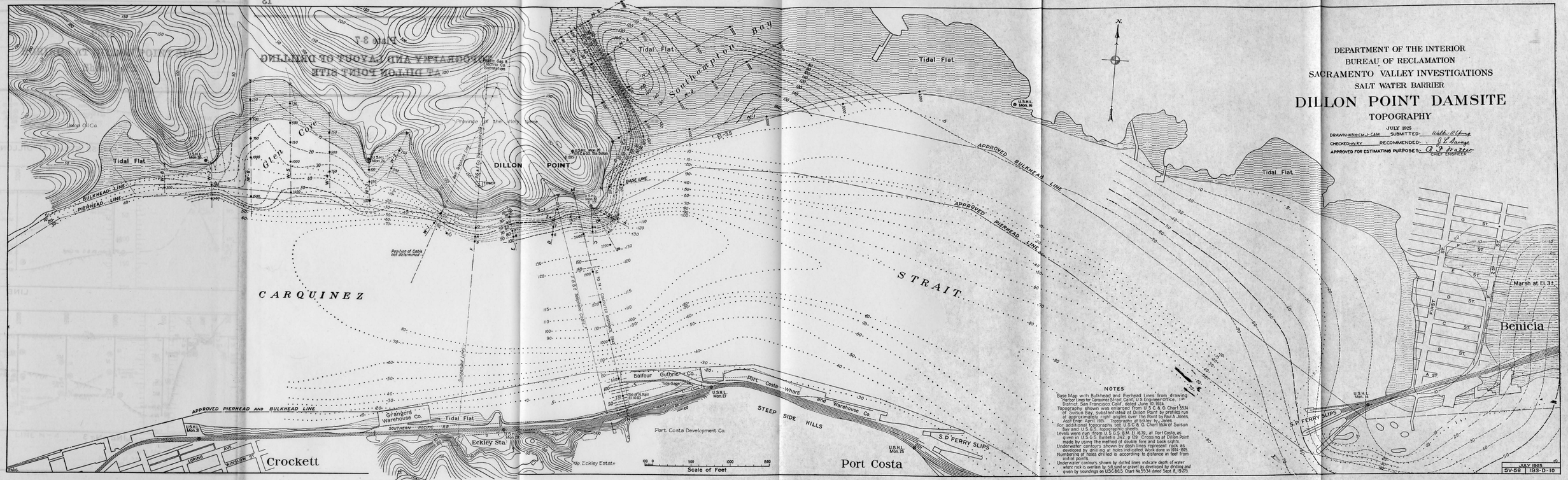
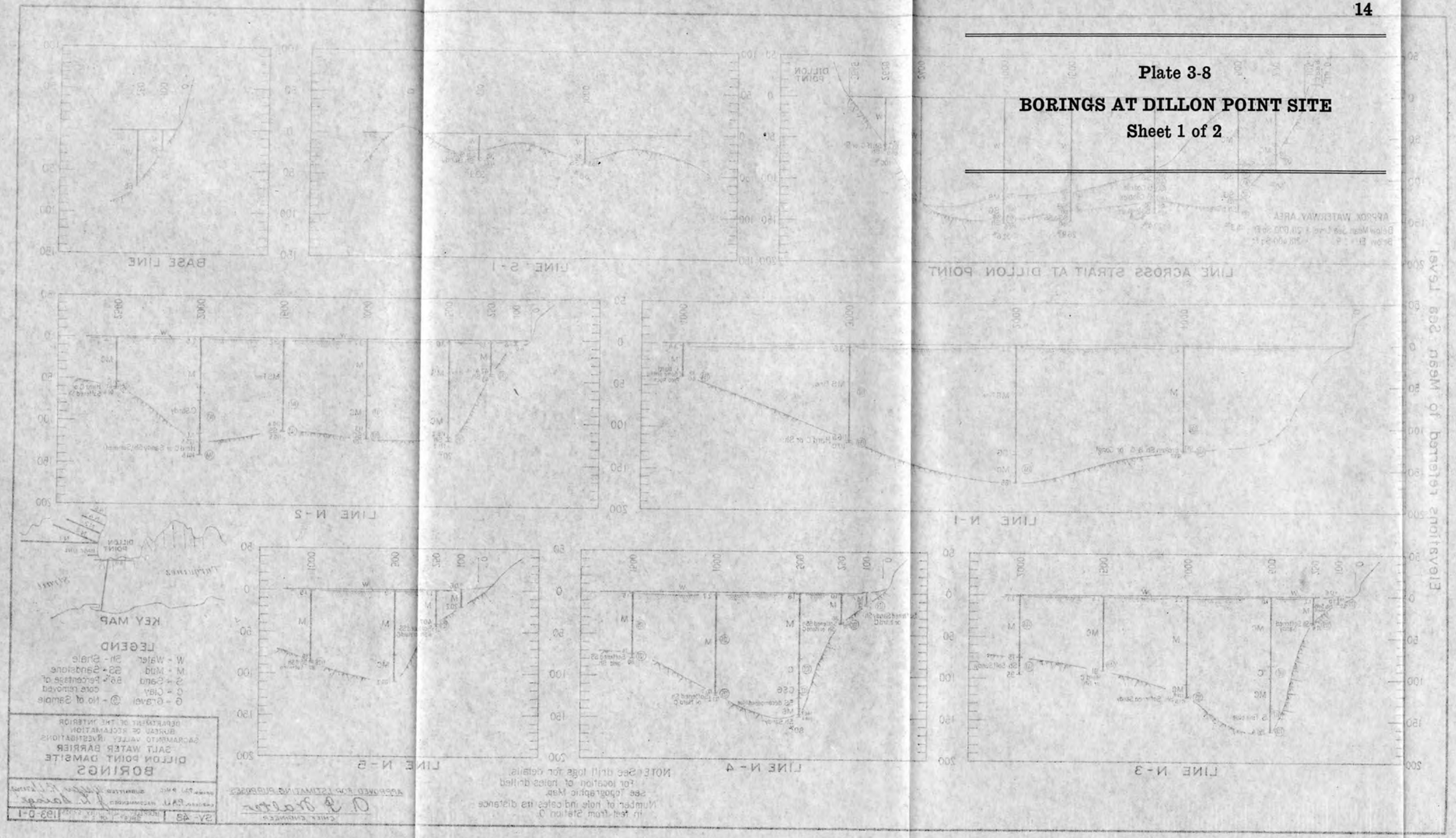

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
DILLON POINT DAMSITE
TOPOGRAPHY
JULY 1925
DRAWN-NBH-CMJ-CAM SUBMITTED-
CHECKED-WVRY RECOMMENDED-
APPROVED FOR ESTIMATING PURPOSES-
CHIEF ENGINEER
NOTES
Base Map with Bulkhead and Pierhead Lines from drawing "Harbor lines for Carquinez Strait Calif." U.S. Engineer Office, 1st Distrct, 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 J. Jones.
For additional topography see U.S.C.&G. Chart 5534 of Suisun Bay and U.S.G.S. Topographic Sheets.
Location of Cable from U.S.G.S. B.M. Tl. 8.79, at Port Costa as given in U.S.G.S. Bulletin 342, p 179. 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.S. Chart No. 5534 dated Sept. 8, 1925.
Tidal Flat
Southampton Bay
Glen Cove
DILLON POINT
BASE LINE
BULKHEAD LINE
PIERHEAD LINE
APPROVED BULKHEAD LINE
APPROVED PIERHEAD LINE
CARQUINEZ
STRAIT
Position of Cable not determined
Balfour Guthrie & Co.
Tide Gage
Port Costa Wharf and Warehouse Co.
STEEP SIDE HILLS
S.P. FERRY SLIPS
Grangers Warehouse Co.
SOUTHERN PACIFIC R.R.
Eckley Sta.
Eckley Estate
Port Costa Development Co
Scale of Feet
Crockett
Port Costa
Benicia
Marsh at El. 3.5
JULY 1925
SV-58 183-D-10

Plate 3-8

BORINGS AT DILLON POINT SITE

Sheet 1 of 2



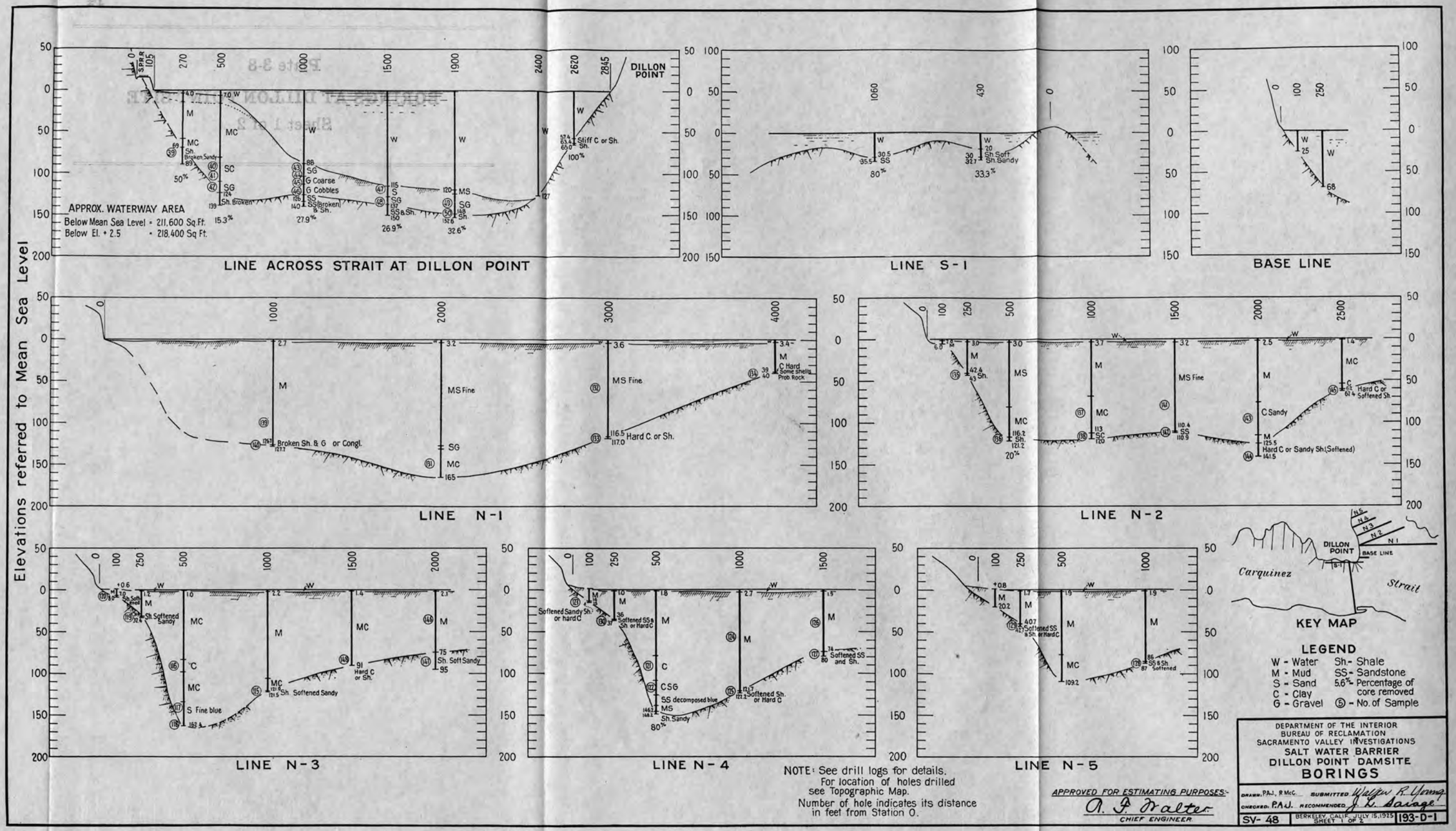
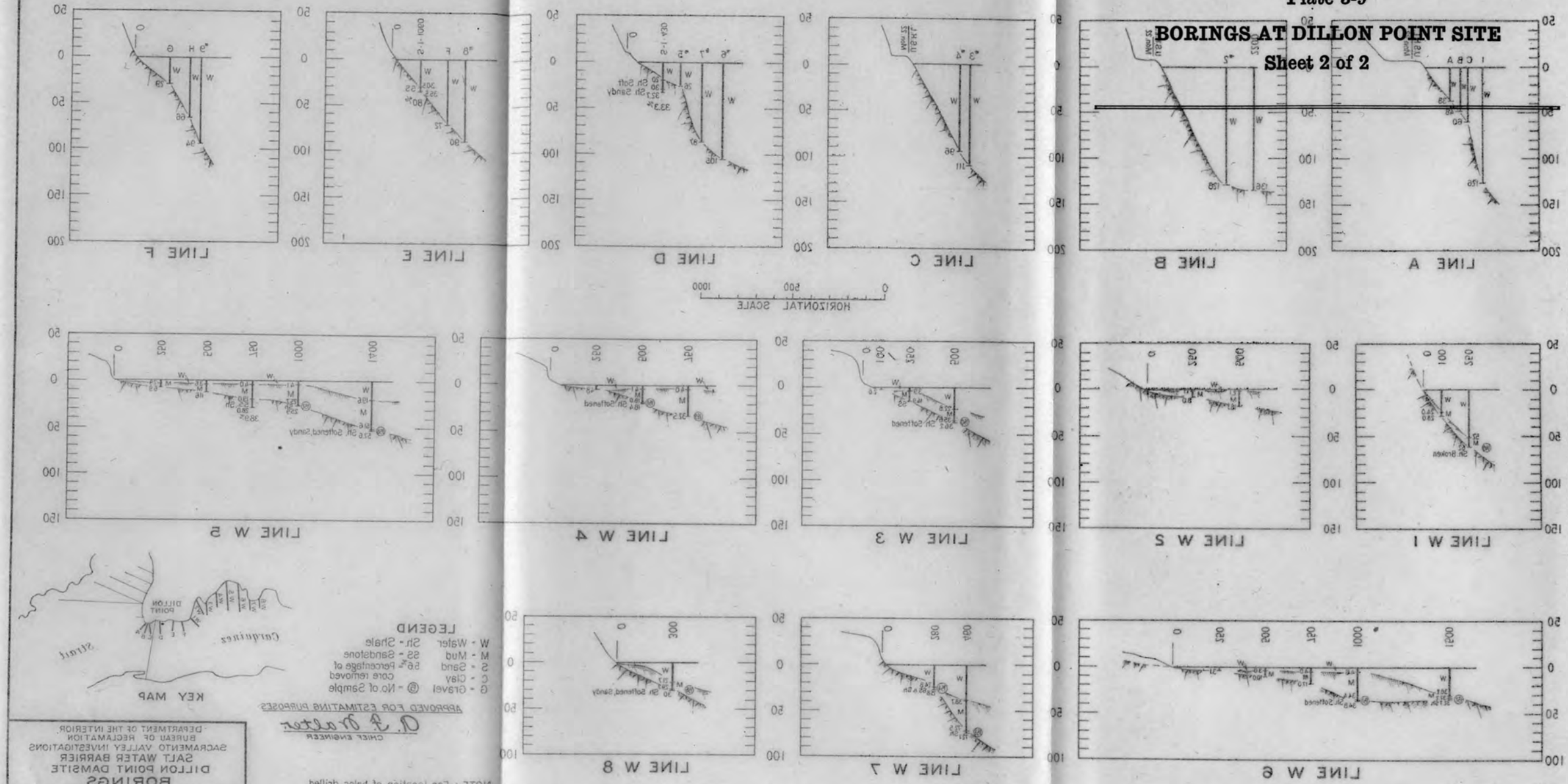
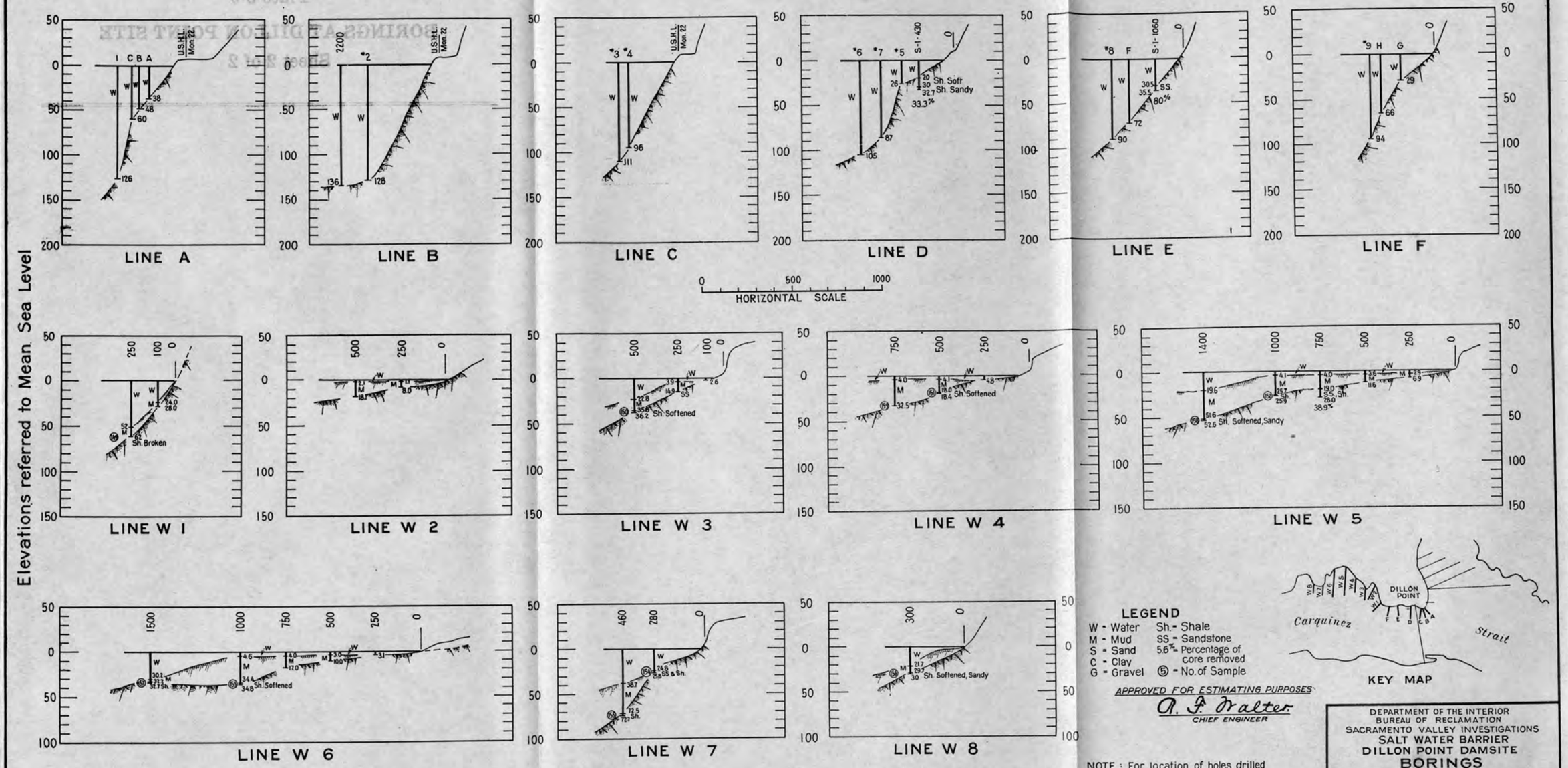

Elevations referred to Mean Sea Level
LINE ACROSS STRAIT AT DILLON POINT
DILLON POINT
APPROX. WATERWAY AREA
Below Mean Sea Level = 211,600 Sq.Ft.
Below El. + 2.5 = 218,400 Sq.Ft.
Broken Sandy
Sh. Broken
Broken Sh. & G or Congl.
Hard C or Sh.
Stiff C or Sh.
Sh.
G Coarse
G Cobbles
Sh. Softened Sandy
S Fine blue
Sh. Softened Sandy
Hard C or Sh.
Sh. Soft Sandy
Softened Sandy Sh. or hard C
Softened SS & Sh. or Hard C
SS decomposed blue
Sh. Sandy
Softened Sh. or Hard C
Softened SS and Sh.
Softened SS & Sh. or Hard C
SS & Sh. Softened
LINE S-1
Sh. Soft Sh. Sandy
BASE LINE
LINE N-1
MS Fine
Hard C. or Sh.
C Hard Some Shells Prob. Rock
LINE N-2
C Sandy
Hard C or Softened Sh.
Hard C or Sandy Sh. (Softened)
LINE N-3
LINE N-4
LINE N-5
Carquinez
Strait
DILLON POINT
BASE LINE
KEY MAP
LEGEND
W - Water
M - Mud
S - Sand
C - Clay
G - Gravel
Sh. - Shale
SS - Sandstone
5.6% - Percentage of core removed
(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. Walter
CHIEF ENGINEER
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
DILLON POINT DAMSITE
BORINGS
DRAWN: P.A.J., R McG.
SUBMITTED: Walter R. Young
CHECKED: P.A.J.
RECOMMENDED: J. R. Savage
SV-48
BERKELEY, CALIF., JULY 15, 1925
SHEET 1 OF 2
193-D-1

Plate 3-9

BORINGS AT DILLON POINT SITE

Sheet 2 of 2





KEY MAP

LEGEND

W - Water
M - Mud
S - Sand
C - Clay
G - Gravel

Sh. - Shale
SS - Sandstone
56% - Percentage of core removed
⑤ - No. of Sample

APPROVED FOR ESTIMATING PURPOSES

A. F. Walter
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.

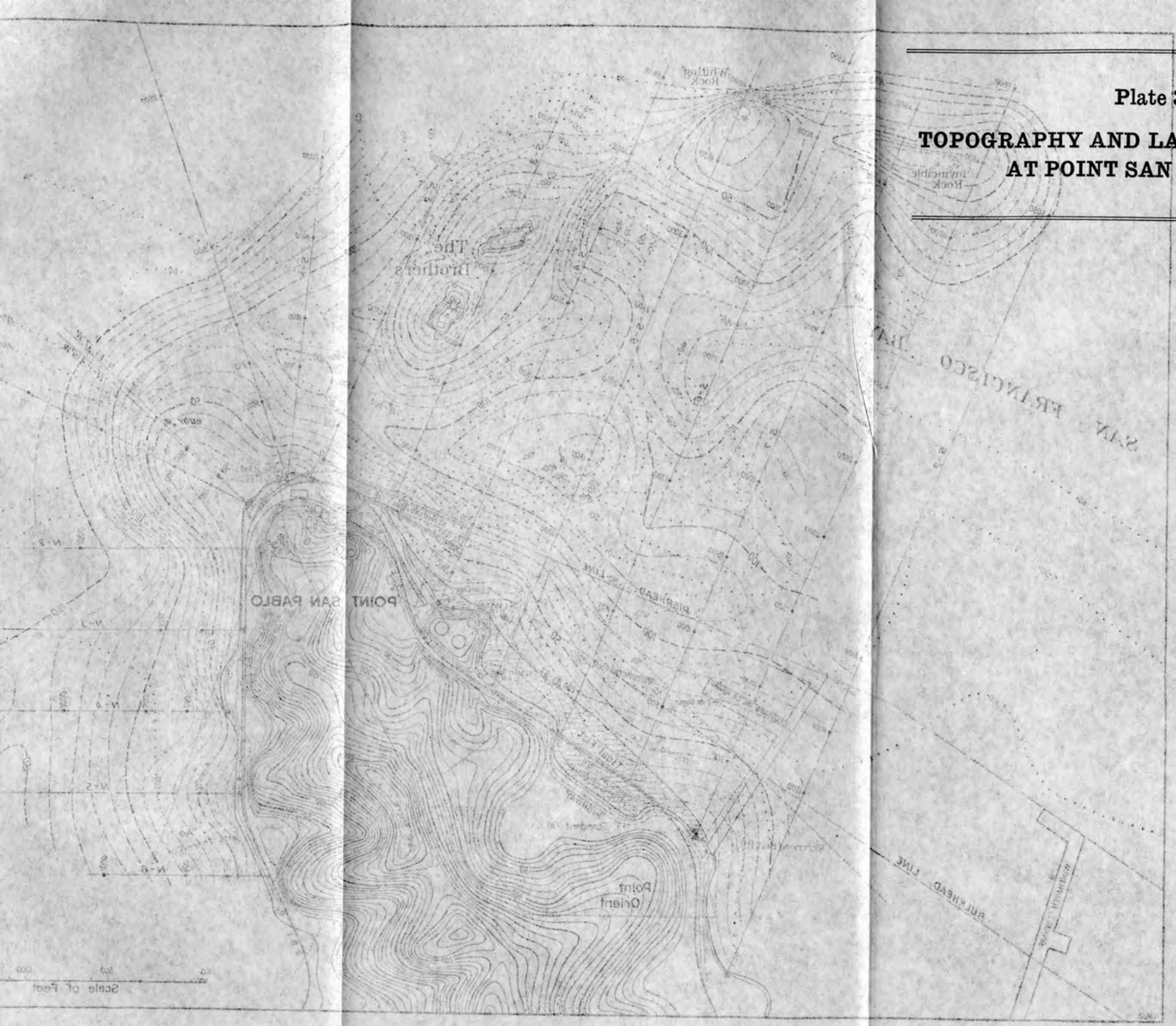
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
DILLON POINT DAMSITE
BORINGS

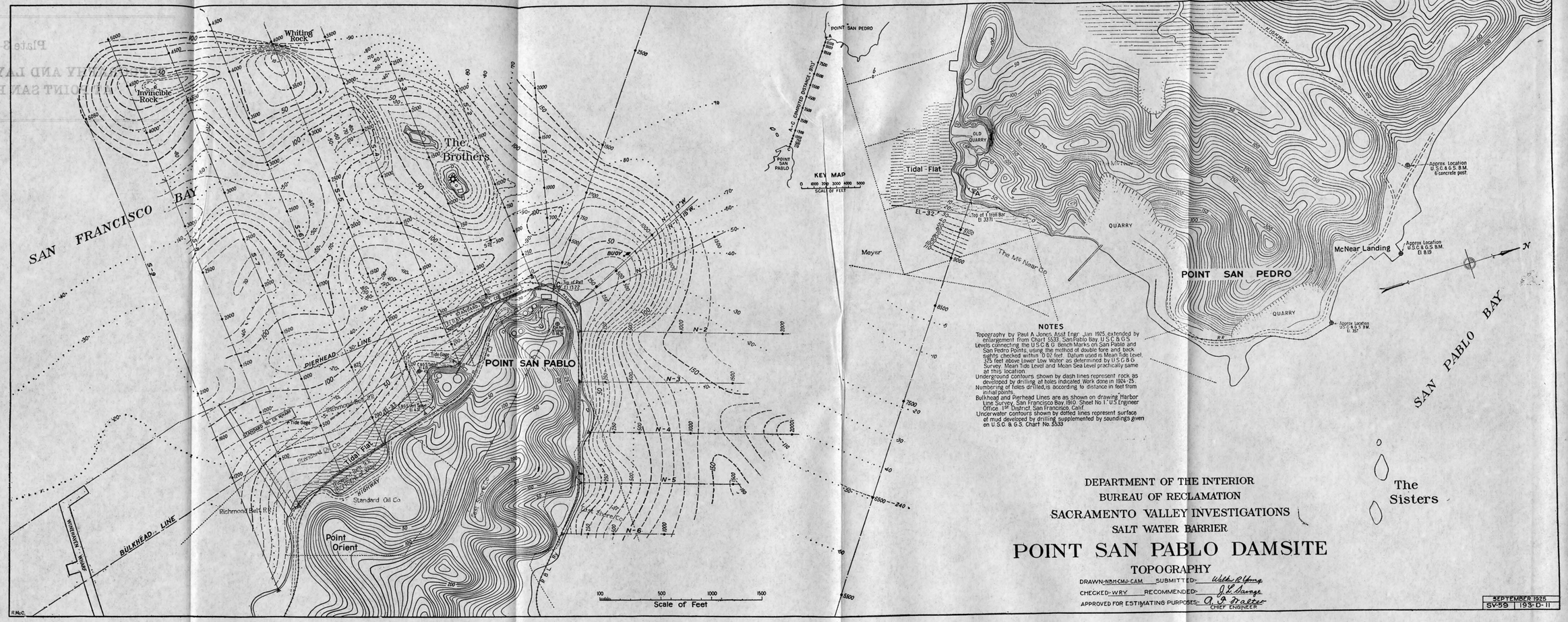
DRAWN: P.A.J., R.McC., SUBMITTED: Walter R. Young
CHECKED: P.A.J. RECOMMENDED: J. L. Savage

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, 3.75 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 1st 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

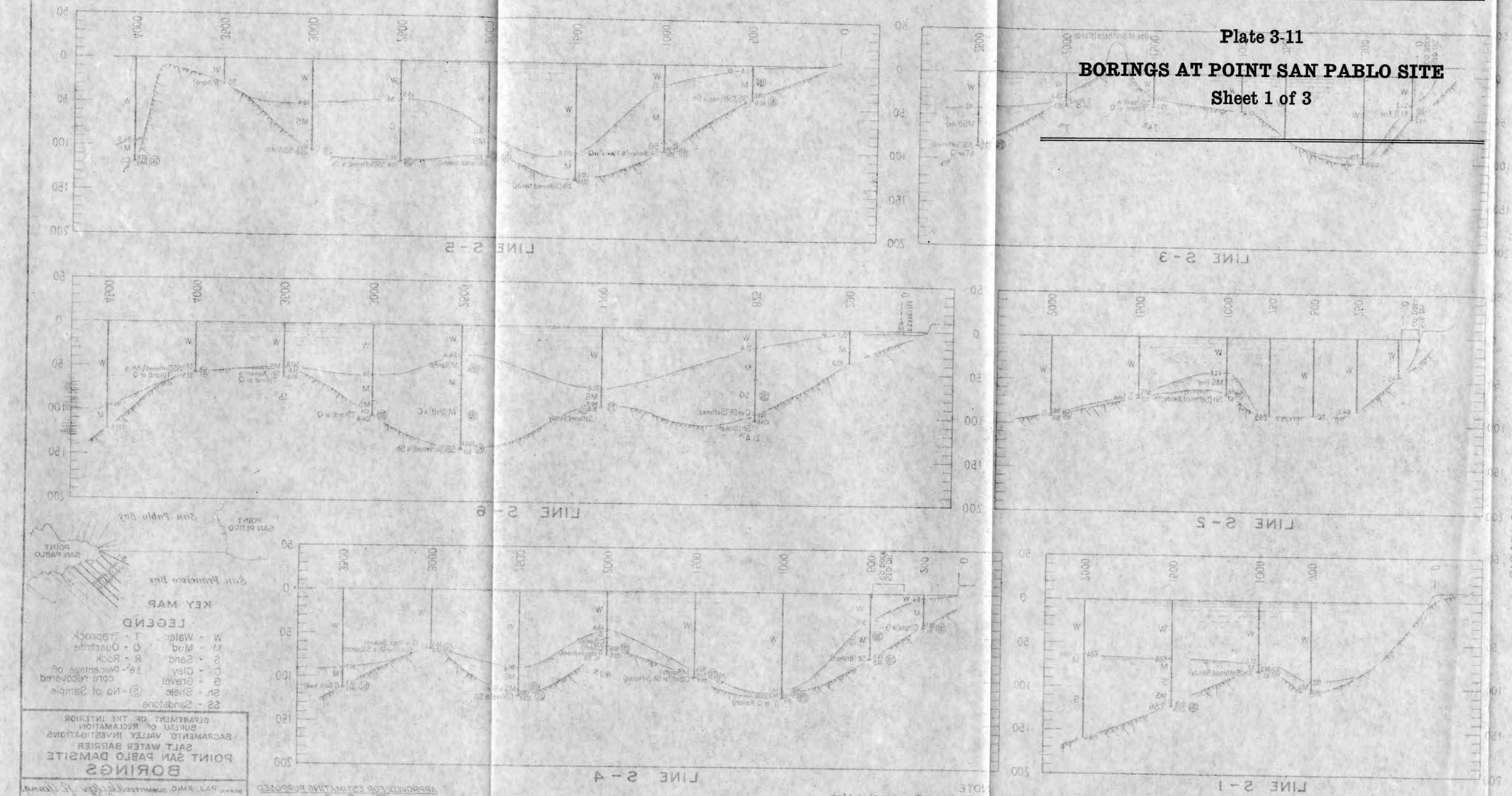
DRAWN-NBH-CMJ-CAM SUBMITTED- Walter R Young
CHECKED-WRY RECOMMENDED- J. L. Savage
APPROVED FOR ESTIMATING PURPOSES- A. J. Walter CHIEF ENGINEER

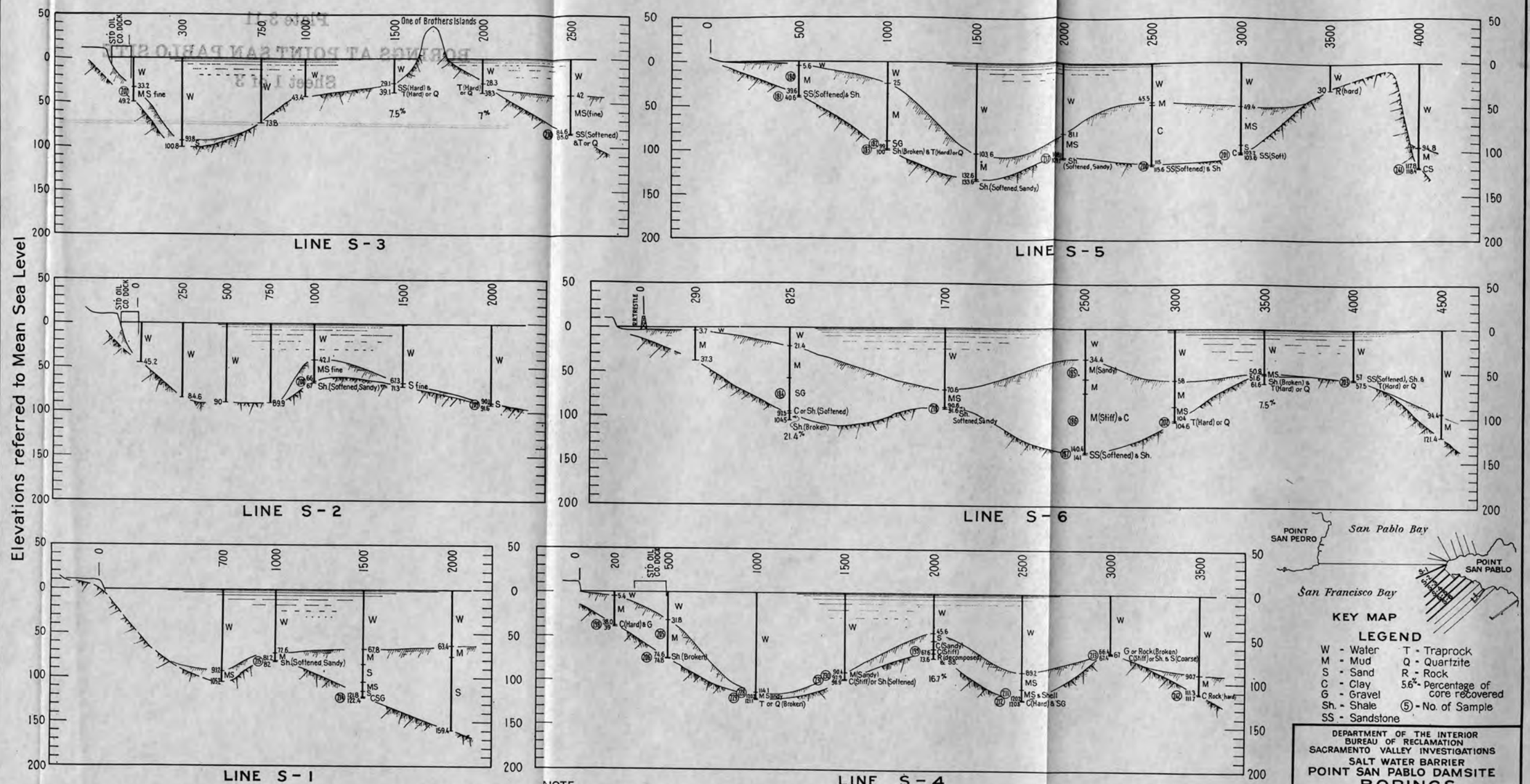
SEPTEMBER 1925
SV-59 | 193-D-11

Plate 3-11

BORINGS AT POINT SAN PABLO SITE

Sheet 1 of 3





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.

APPROVED FOR ESTIMATING PURPOSES
A. F. Walter
CHIEF ENGINEER

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

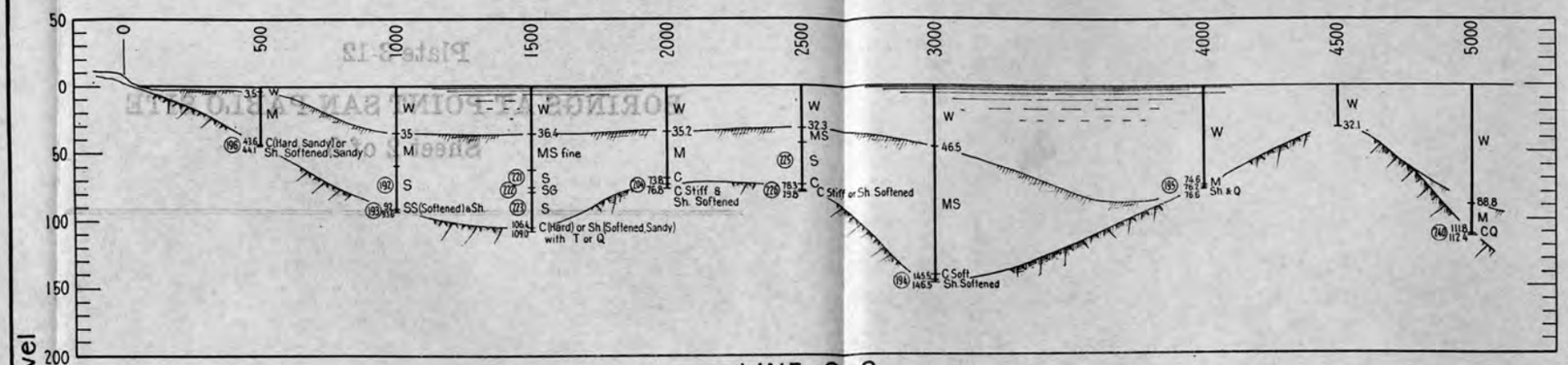
DRAWN: P.A.J., R.McC. SUBMITTED: Walter R. Young
CHECKED: P.A.J. RECOMMENDED: J. L. Savage

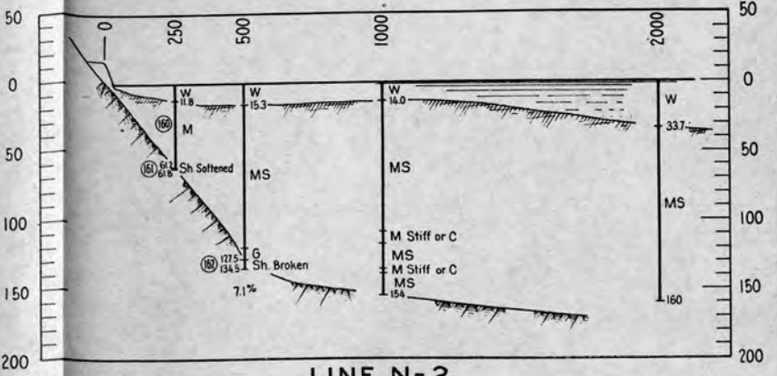
SV-53 | BERKELEY, CALIF. SEPT. 1, 1935 SHEET 1 OF 3 | 193-D-6

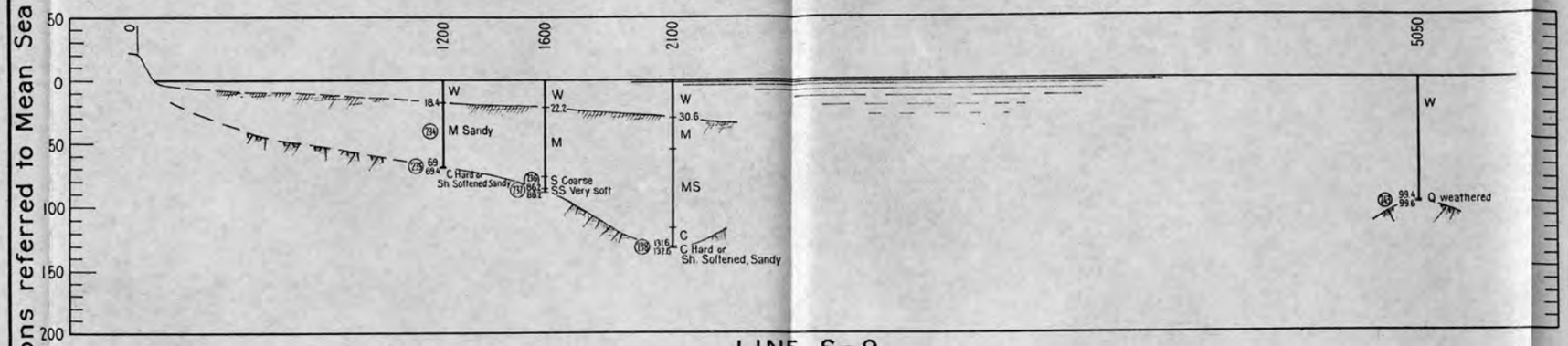
Plate 3-12

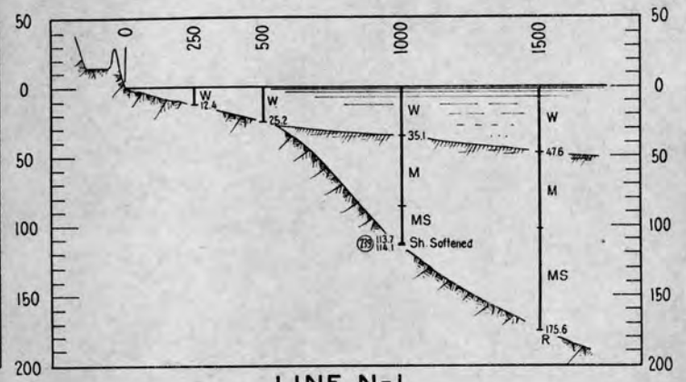
BORINGS AT POINT SAN PABLO SITE

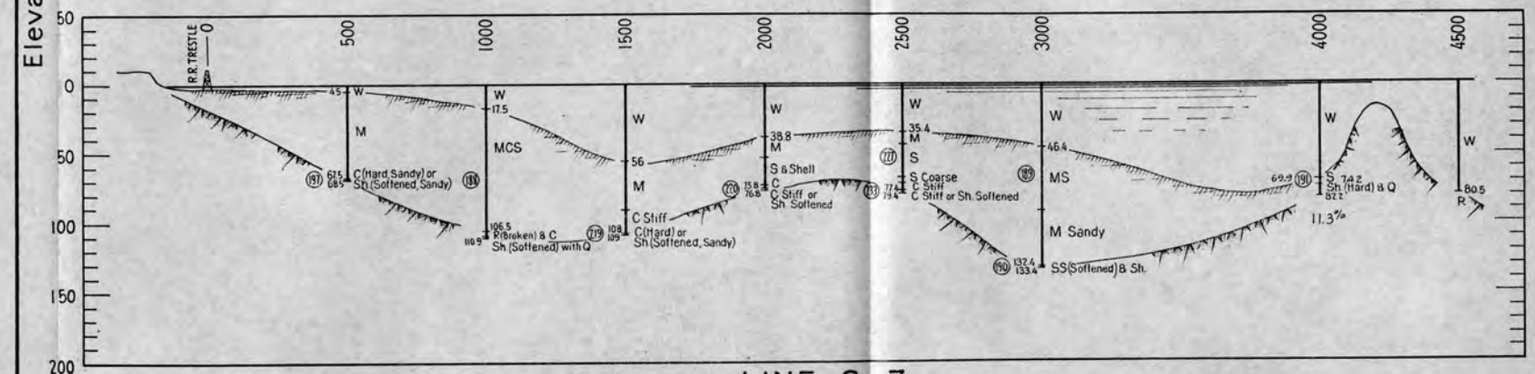
Sheet 2 of 3

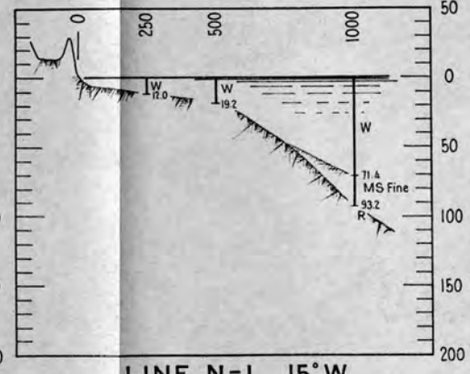












Hole 1000 is located on Line N-1 17° W

APPROVED FOR ESTIMATING PURPOSES

R. P. Walter
CHIEF ENGINEER

KEY MAP

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

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.McC. SUBMITTED: Walter R. Young
CHECKED: P.A.J. RECOMMENDED: J. D. Savage

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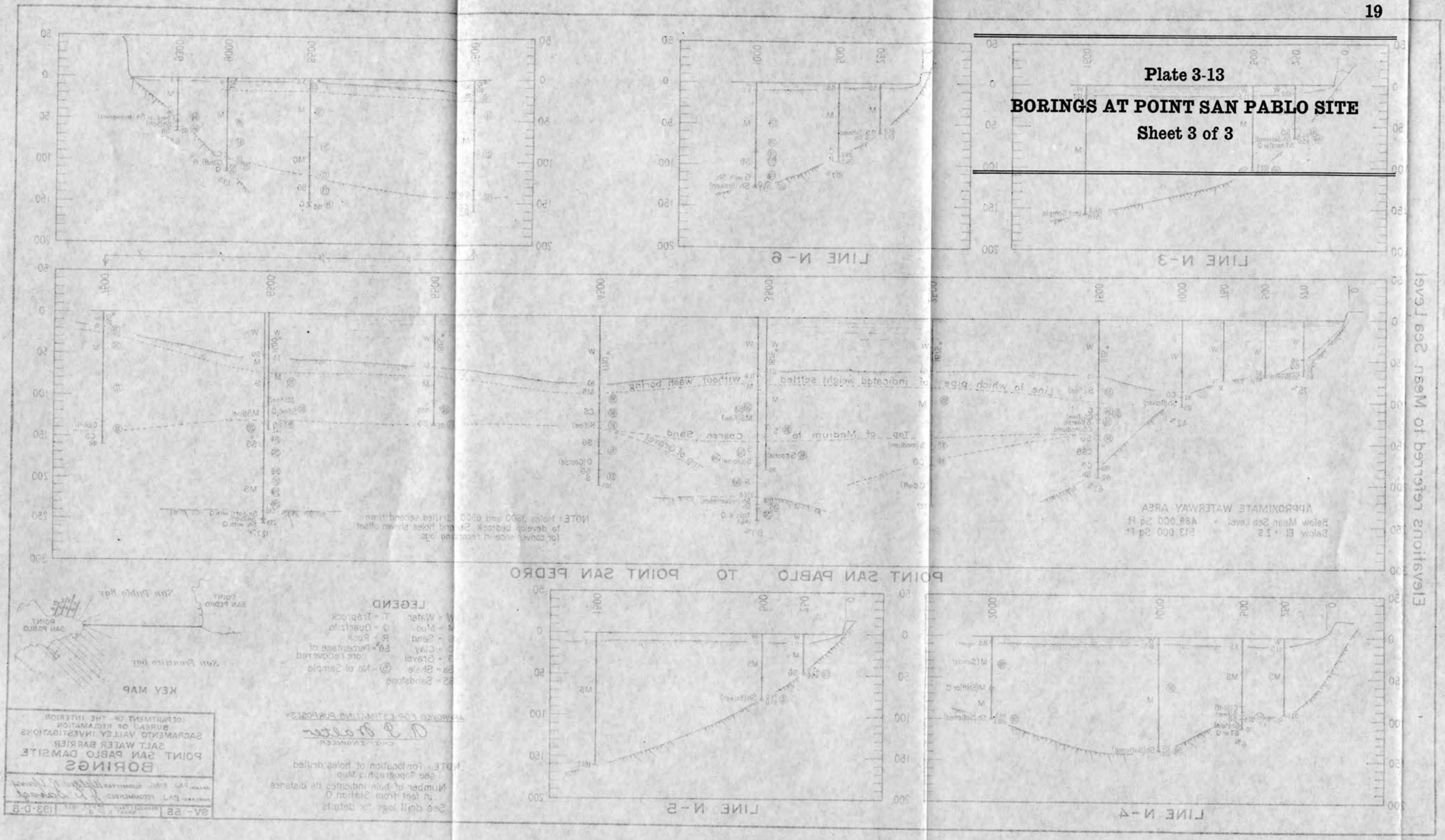
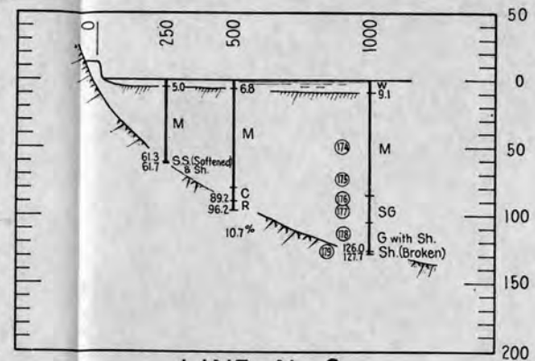


Plate 3-13

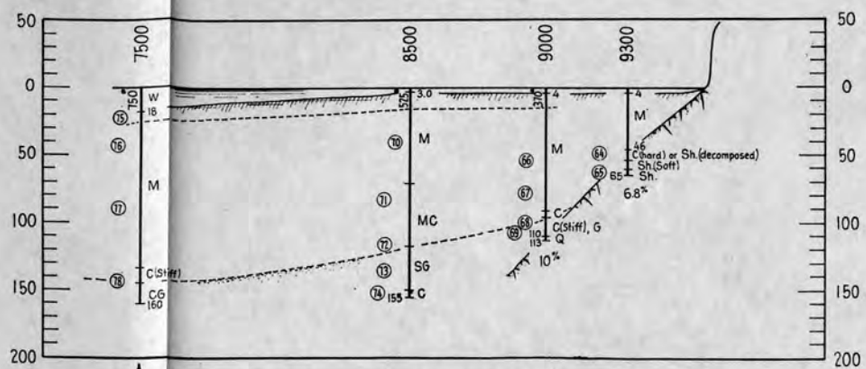
BORINGS AT POINT SAN PABLO SITE

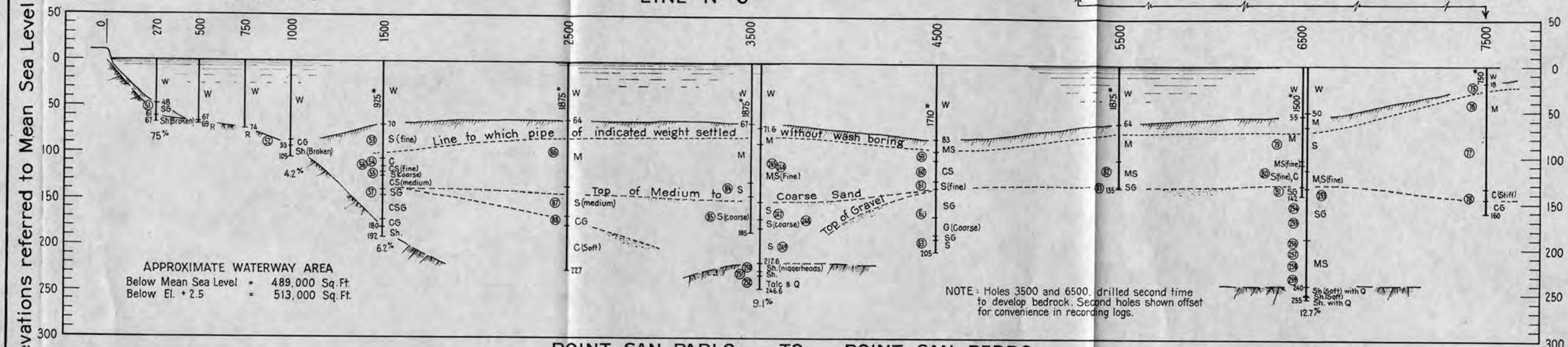
Sheet 3 of 3

LINE N-3

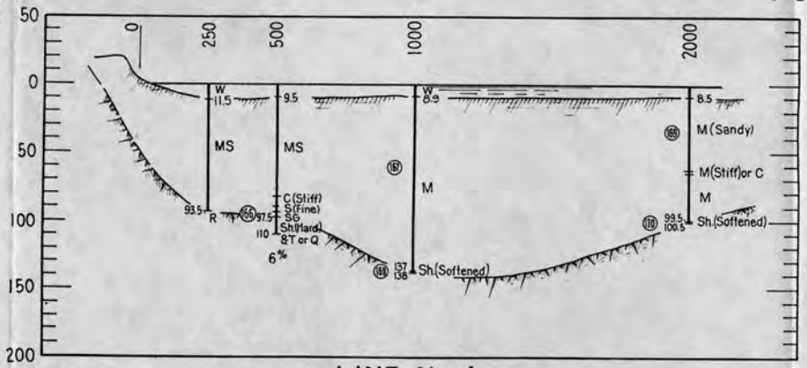


LINE N-6

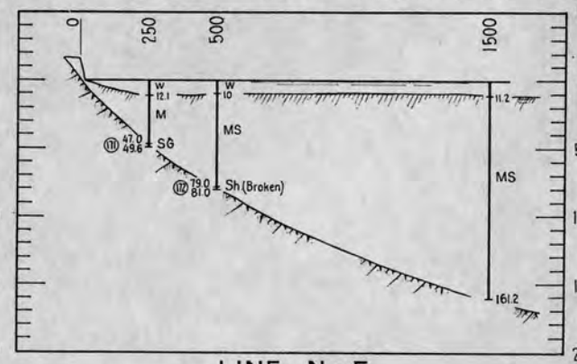




POINT SAN PABLO TO POINT SAN PEDRO



LINE N-4



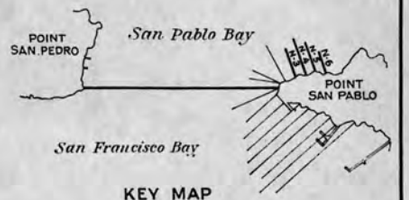
LINE N-5

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
(5) - No. of Sample

APPROVED FOR ESTIMATING PURPOSES:
A. F. Walter
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.



KEY MAP

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

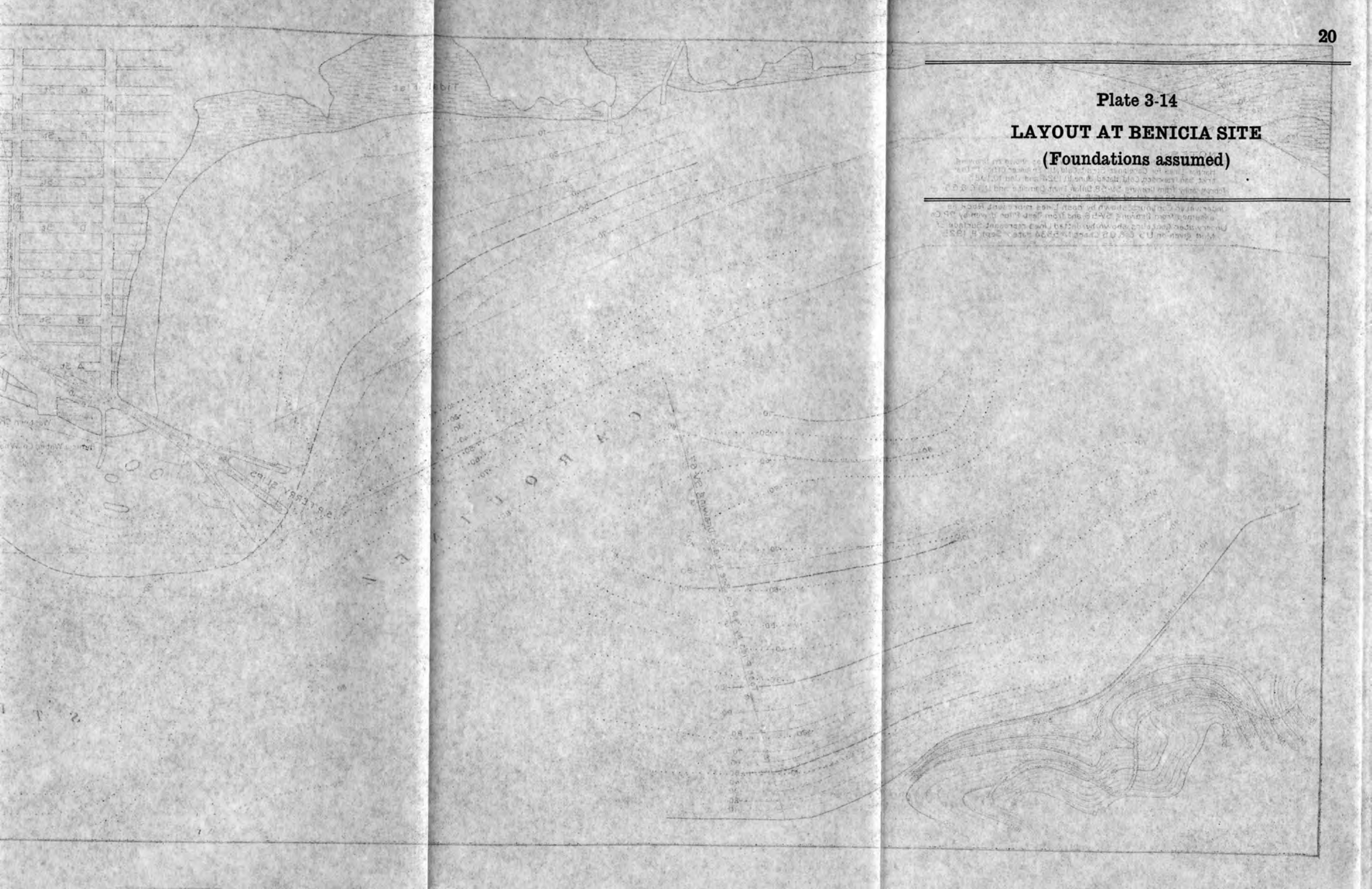
DRAWN: P.A.J., R.McC. SUBMITTED: Walter R. Young
CHECKED: P.A.J. RECOMMENDED: J. L. Savage

SV-55 | BERKELEY, CALIF. SEPT. 1, 1925 SHEET 3 OF 3 | 193-D-8

Plate 3-14

LAYOUT AT BENICIA SITE

(Foundations assumed)



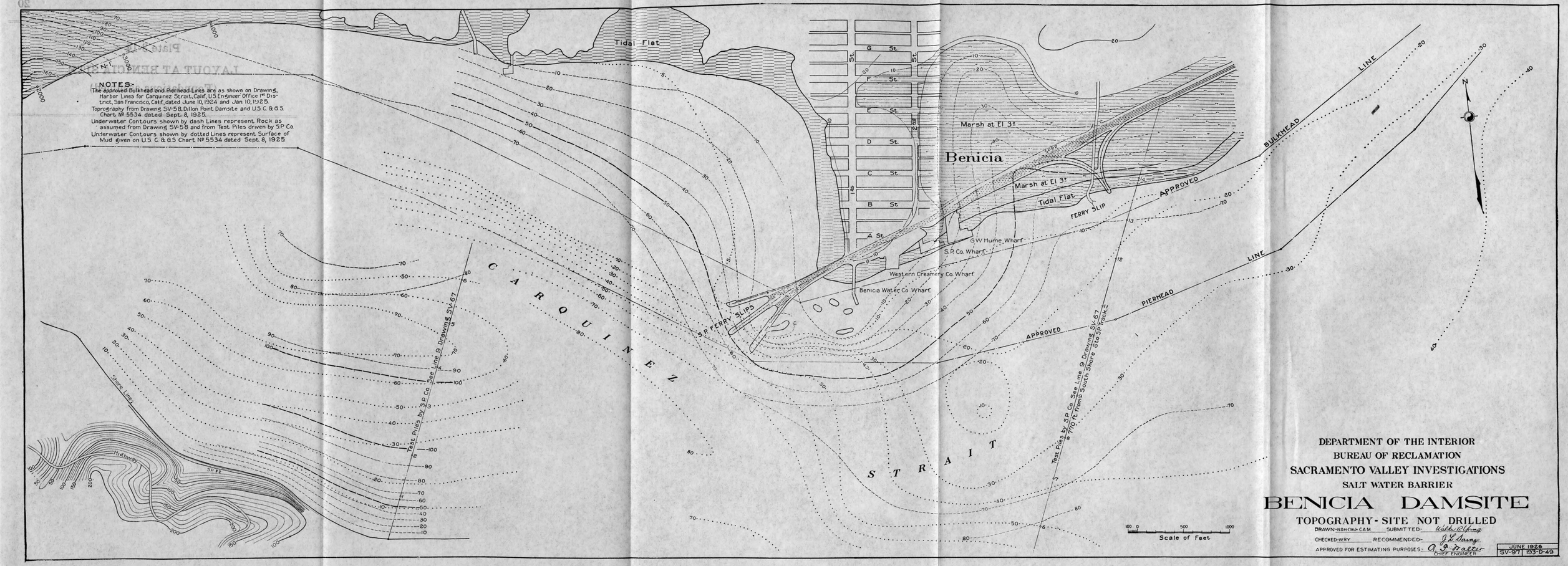
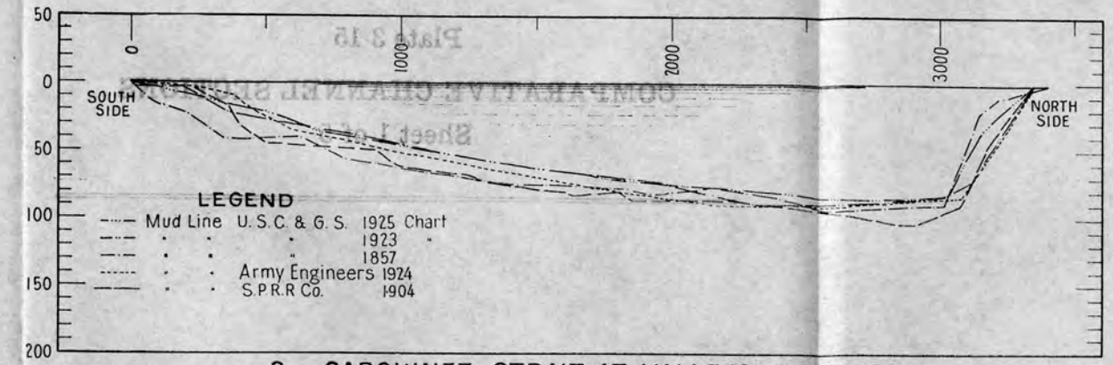

NOTES:-
The approved Bulkhead and Pierhead Lines are as shown on Drawing, Harbor Lines for Carquinez Strait, Calif, U.S. Engineer Office 1st District, San Francisco, Calif, dated June 10, 1924 and Jan 10, 1925.
Topography from Drawing SV-58, Dillon Point Damsite and U.S. C. & G.S. Chart No 5534 dated 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
Tidal Flat
Benicia
Marsh at El 3±
Tidal Flat
FERRY SLIP
G.W. Hume Wharf
S.P. Co. Wharf
Western Creamery Co. Wharf
Benicia Water Co. Wharf
S.P. FERRY SLIPS
APPROVED
BULKHEAD
LINE
PIERHEAD
LINE
APPROVED
C A R Q U I N E Z
S T R A I T
Test Piles by S.P. Co. See Line 9 Drawing SV-67
Test Piles by S.P. Co. See Line 9 Drawing SV-67 & 770 ft. from South Shore S.P. Track
Shore Line
Highway
Scale of Feet
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
BENICIA DAMSITE
TOPOGRAPHY - SITE NOT DRILLED
DRAWN-NBH CMJ-CAM
SUBMITTED-
CHECKED-WRY
RECOMMENDED-
APPROVED FOR ESTIMATING PURPOSES-
CHIEF ENGINEER
JUNE 1926
SV-97
93-D-49

Plate 3-15

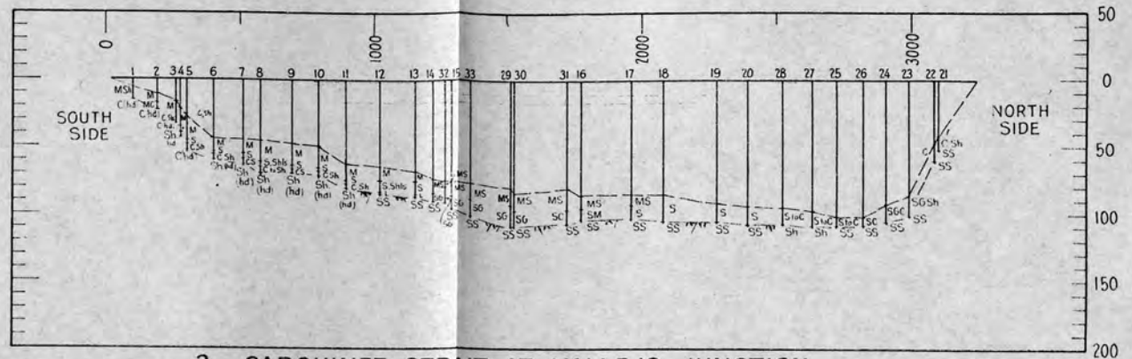
COMPARATIVE CHANNEL SECTIONS

Sheet 1 of 5

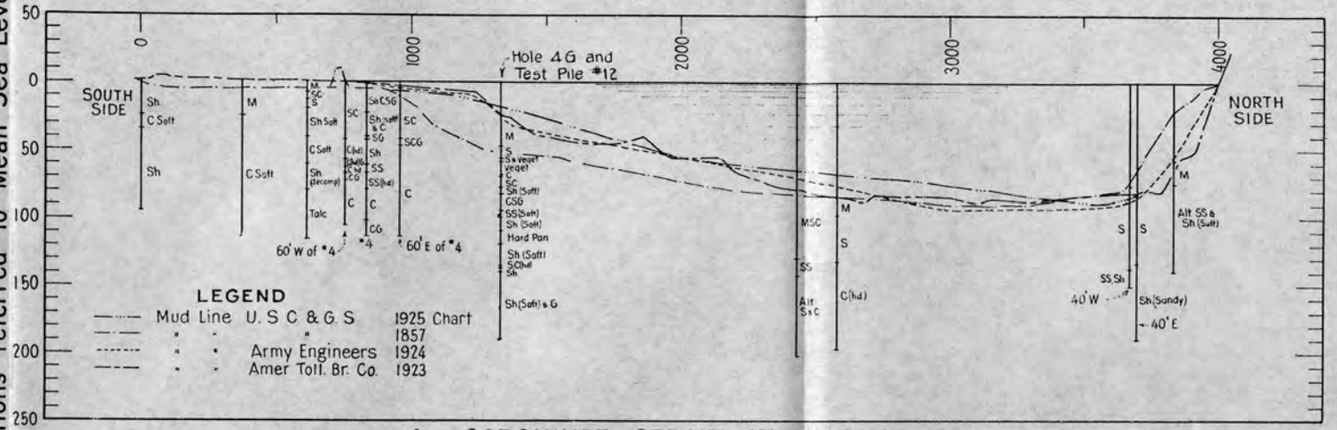
Elevations referred to Mean Sea Level



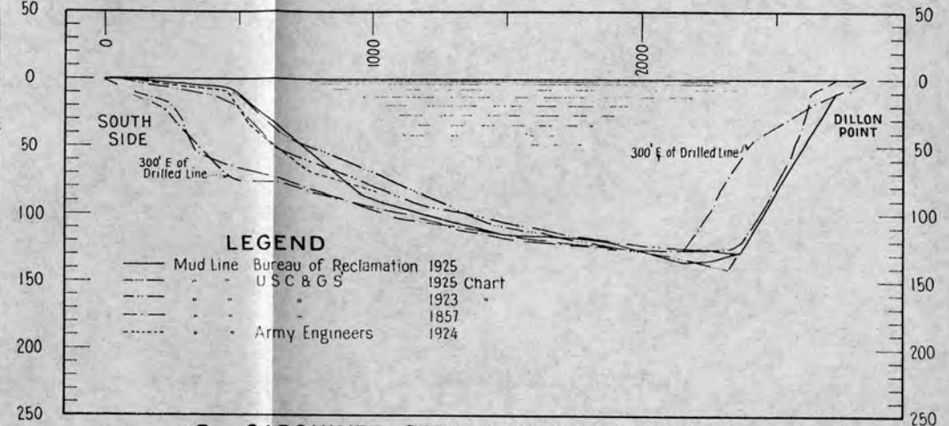
2 CARQUINEZ STRAIT AT VALLEJO JUNCTION



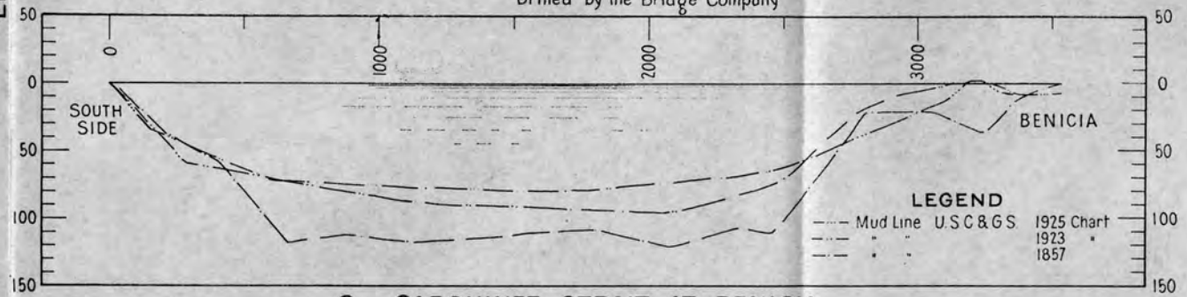
3 CARQUINEZ STRAIT AT VALLEJO JUNCTION
Drilled by Southern Pacific Company



4 CARQUINEZ STRAIT AT VALONA
American Toll Bridge Site
Drilled by the Bridge Company



5 CARQUINEZ STRAIT AT DILLON POINT
(See Drawings SV-48 and SV-58)



6 CARQUINEZ STRAIT AT BENICIA

LEGEND

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

APPROVED FOR ESTIMATING PURPOSES.
A. P. 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.McK., P.A.J., R.McC. SUBMITTED Walker R. Young
CHECKED P.A.J. RECOMMENDED J. L. Savage

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Plate 3-16

COMPARATIVE CHANNEL SECTIONS

Sheet 2 of 5

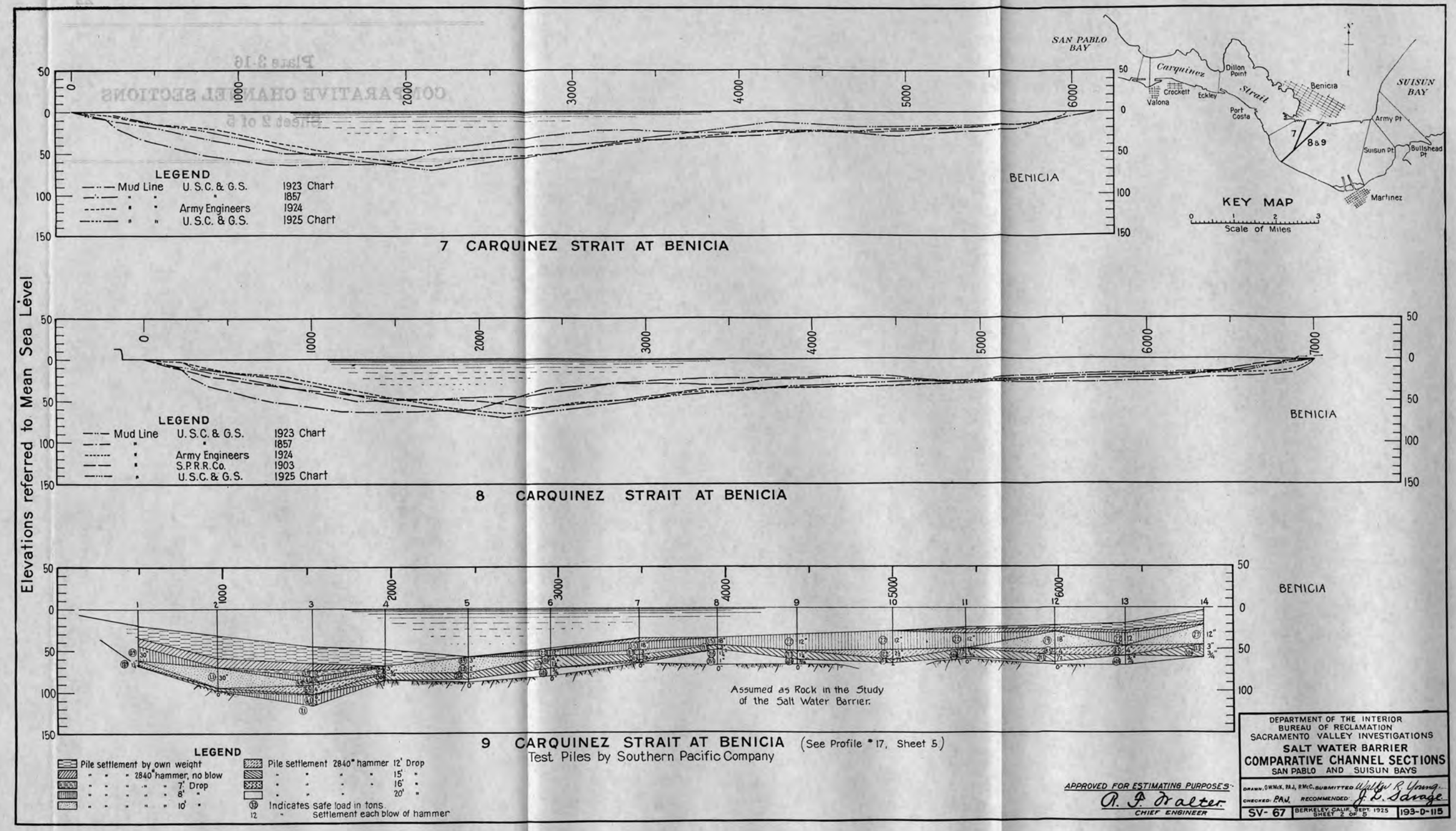
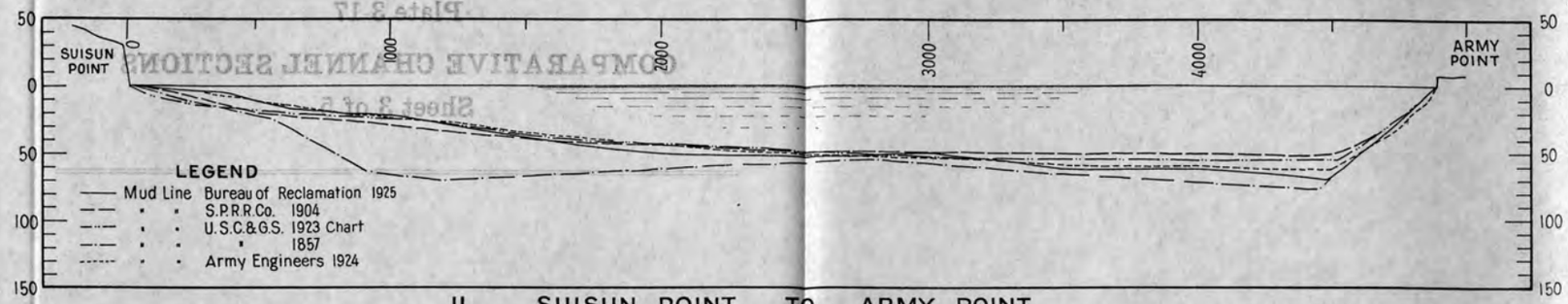

Elevations referred to Mean Sea Level
7 CARQUINEZ STRAIT AT BENICIA
LEGEND
Mud Line U.S.C. & G.S. 1923 Chart
" " 1857
" " Army Engineers 1924
" " U.S.C. & G.S. 1925 Chart
BENICIA
SAN PABLO BAY
Carquinez Strait
Crockett
Valona
Eckley
Dillon Point
Port Costa
Benicia
SUISUN BAY
Army Pt
Suisun Pt
Bullshead Pt
Martinez
7
8 & 9
KEY MAP
Scale of Miles
8 CARQUINEZ STRAIT AT BENICIA
LEGEND
Mud Line U.S.C. & G.S. 1923 Chart
" " 1857
" " Army Engineers 1924
" " S.P.R.R.Co. 1903
" " U.S.C. & G.S. 1925 Chart
BENICIA
9 CARQUINEZ STRAIT AT BENICIA (See Profile #17, Sheet 5.)
Test Piles by Southern Pacific Company
Assumed as Rock in the Study of the Salt Water Barrier.
LEGEND
Pile settlement by own weight
" " " 2840# hammer, no blow
" " " " " 7' Drop
" " " " " 8' "
" " " " " 10' "
Pile settlement 2840# hammer 12' Drop
" " " " 15' "
" " " " 16' "
" " " " 20' "
Indicates safe load in tons.
12 " settlement each blow of hammer
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. F. Walter
CHIEF ENGINEER
DRAWN: G.W.McK, P.A.J, R.McC. SUBMITTED: Walter R. Young
CHECKED: P.A.N. RECOMMENDED: J. L. Savage
SV-67
BERKELEY, CALIF. SEPT. 1925
SHEET 2 OF 5
193-D-115

Plate 3-17

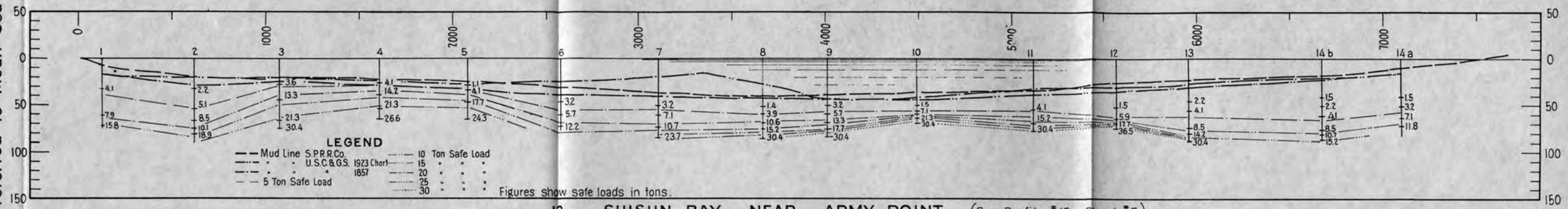
COMPARATIVE CHANNEL SECTIONS

Sheet 3 of 5

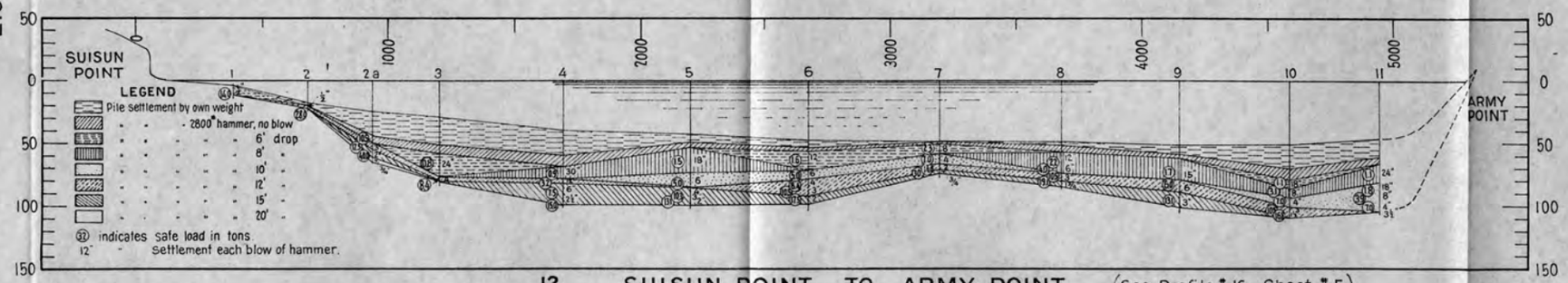


11 SUISUN POINT TO ARMY POINT
(See Drawings SV-50 and SV-57)

Elevations referred to Mean Sea Level



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



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

APPROVED FOR ESTIMATING PURPOSES:-
A. P. 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.McK., P.A.J., R.W.McC. SUBMITTED Walter R. Young
CHECKED P.A.J. RECOMMENDED J. L. Savage

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Plate 3-18

COMPARATIVE CHANNEL SECTIONS

Sheet 4 of 5

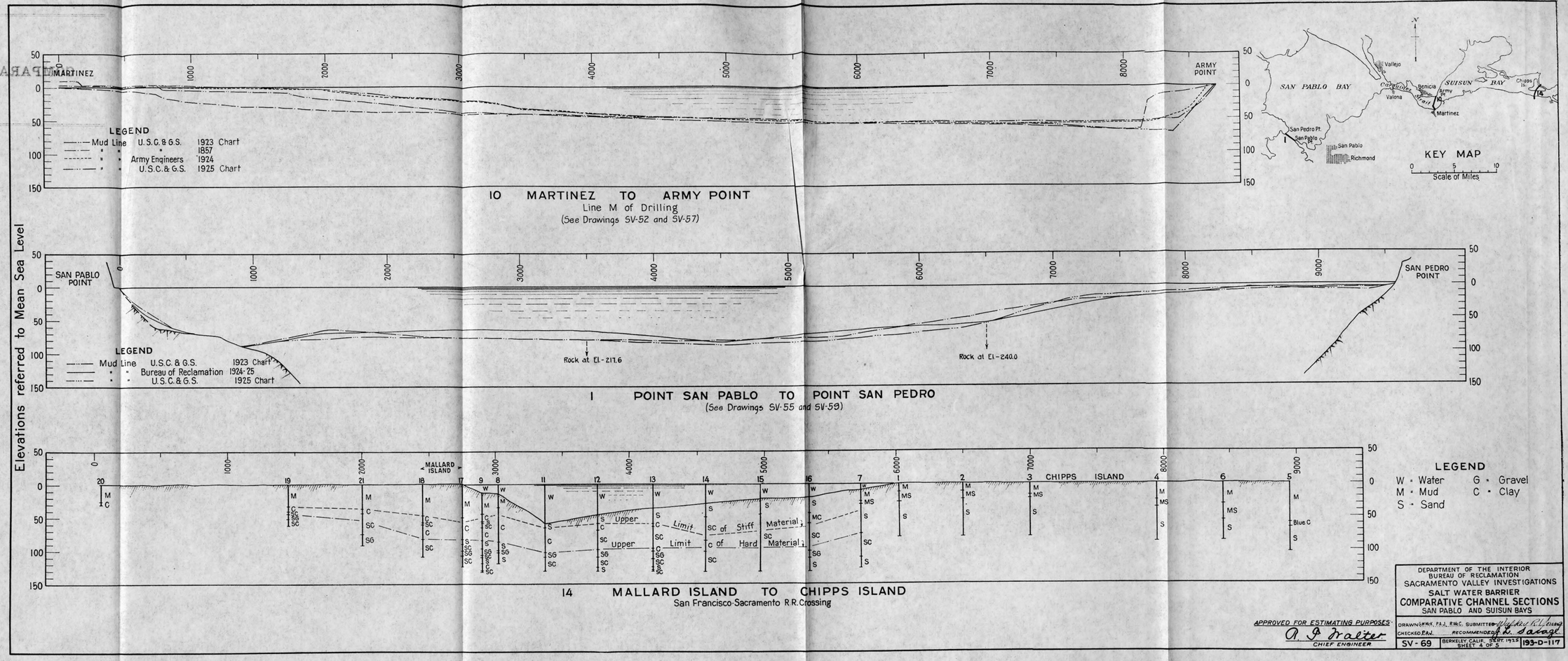
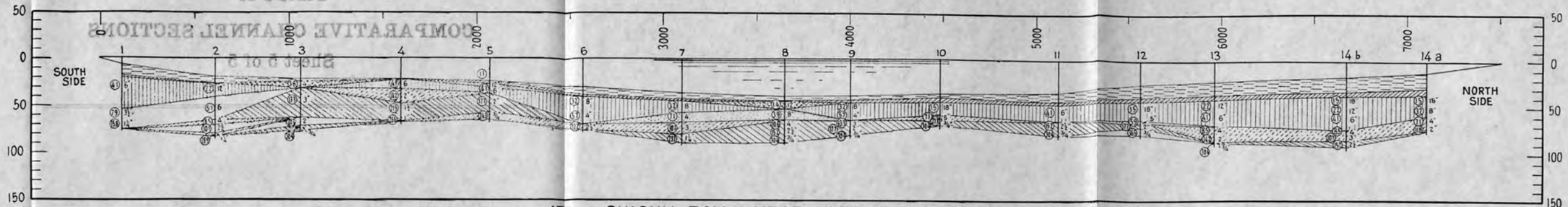

Elevations referred to Mean Sea Level
MARTINEZ
ARMY POINT
LEGEND
Mud Line U.S.C.&G.S. 1923 Chart
" " 1857
" " Army Engineers 1924
" " U.S.C.&G.S. 1925 Chart
10 MARTINEZ TO ARMY POINT
Line M of Drilling
(See Drawings SV-52 and SV-57)
SAN PABLO POINT
SAN PEDRO POINT
LEGEND
Mud Line U.S.C.&G.S. 1923 Chart
" " Bureau of Reclamation 1924-25
" " U.S.C.&G.S. 1925 Chart
Rock at El-217.6
Rock at El-240.0
1 POINT SAN PABLO TO POINT SAN PEDRO
(See Drawings SV-55 and SV-59)
MALLARD ISLAND
CHIPPS ISLAND
Upper Limit of Stiff Material
Upper Limit of Hard Material
14 MALLARD ISLAND TO CHIPPS ISLAND
San Francisco-Sacramento R.R. Crossing
KEY MAP
SAN PABLO BAY
SUISUN BAY
Vallejo
Benicia
Valona
Martinez
Chipps Is.
San Pedro Pt.
San Pablo
Richmond
Scale of Miles
LEGEND
W - Water
M - Mud
S - Sand
G - Gravel
C - Clay
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. Walter
CHIEF ENGINEER
SV-69
BERKELEY CALIF. SEPT. 1928
SHEET 4 OF 5
193-D-117

Plate 3-19

COMPARATIVE CHANNEL SECTIONS

Sheet 5 of 5

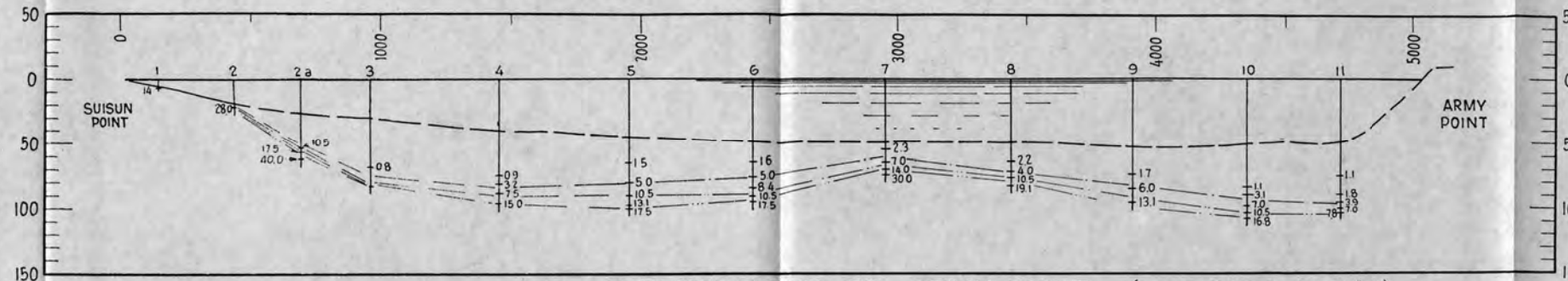
Elevations referred to Mean Sea Level



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

LEGEND

- Pile settlement by own weight
- " " " 2840" hammer no blow
- " " " " 4' Drop
- " " " " 5' "
- " " " " 8' "
- Pile settlement 2840" hammer 10' Drop
- " " " " 12' "
- " " " " 15' "
- " " " " 18' "
- (22) Indicates safe load in tons
- 12' " Settlement each blow of hammer

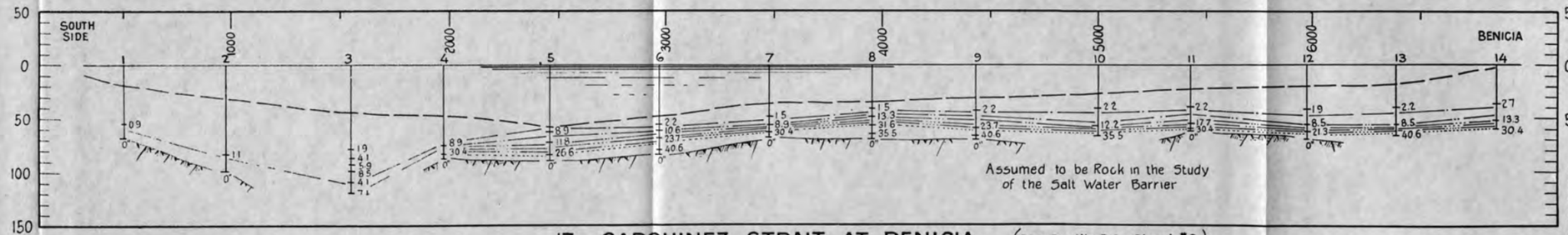


16 SUISUN POINT TO ARMY POINT (See Profile "12, Sheet "3)
Test Piles by Southern Pacific Co.

LEGEND

- Mud Line S.P.R.R. Co
- 5 Ton Safe Load
- 10 " " "
- 15 " " "
- 20 Ton Safe Load
- 25 " "
- 30 "

Figures show safe load in tons



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

APPROVED FOR ESTIMATING PURPOSES:
R. P. 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.McC. SUBMITTED Walter P. Young
CHECKED: P.A.J. RECOMMENDED J. R. Savage

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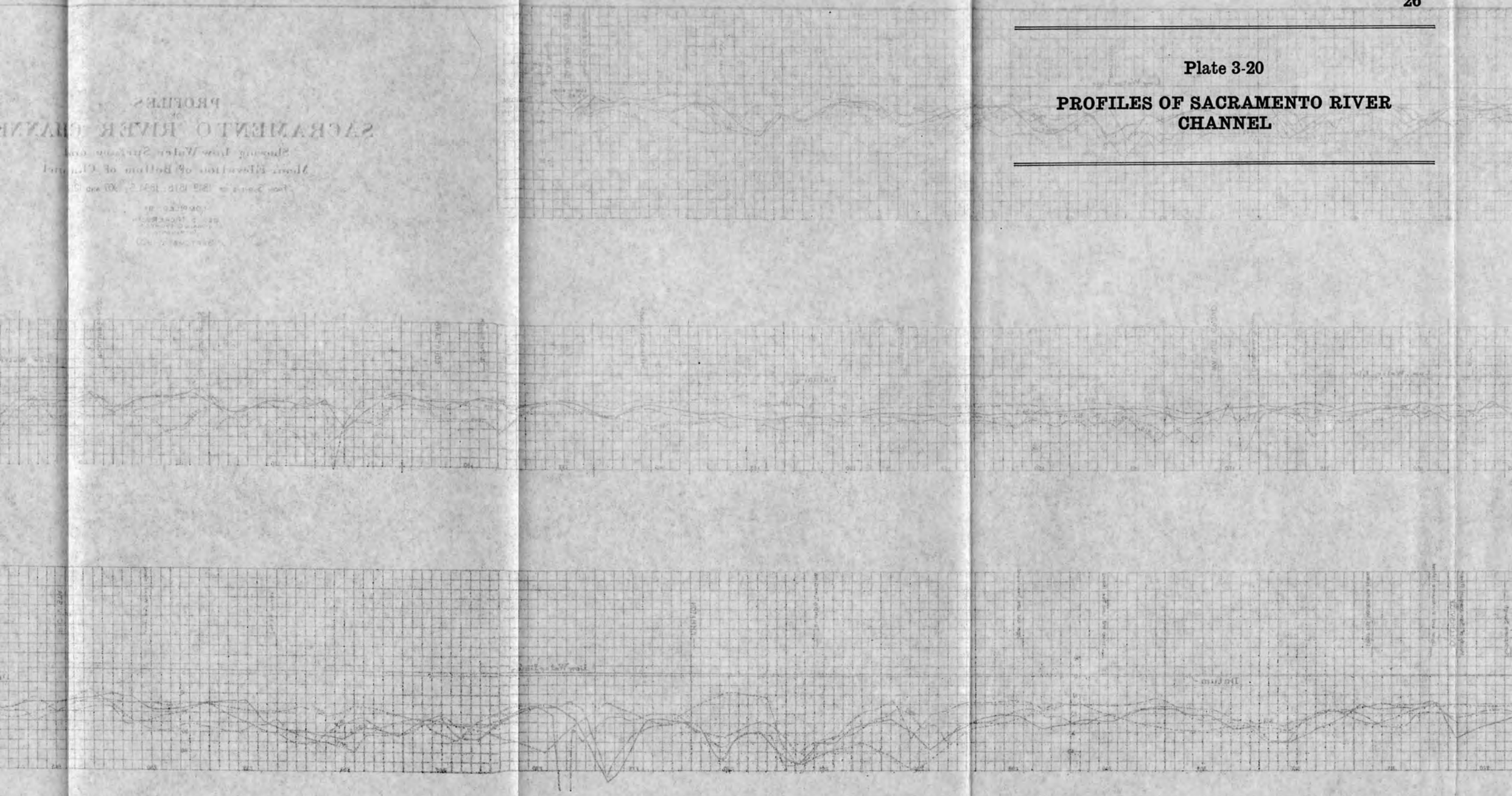
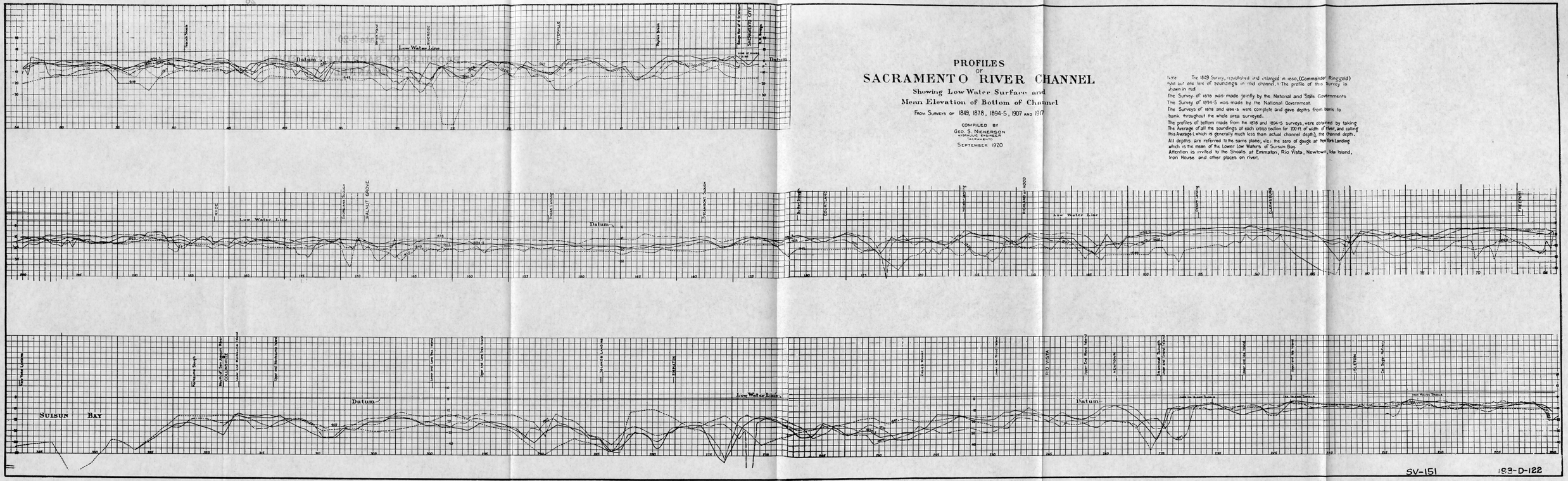
Plate 3-20

PROFILES OF SACRAMENTO RIVER CHANNEL





PROFILES OF SACRAMENTO RIVER CHANNEL

Showing Low Water Surface and Mean Elevation of Bottom of Channel

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

COMPILED BY
GEO. S. NICHERSON
HYDRAULIC ENGINEER

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.

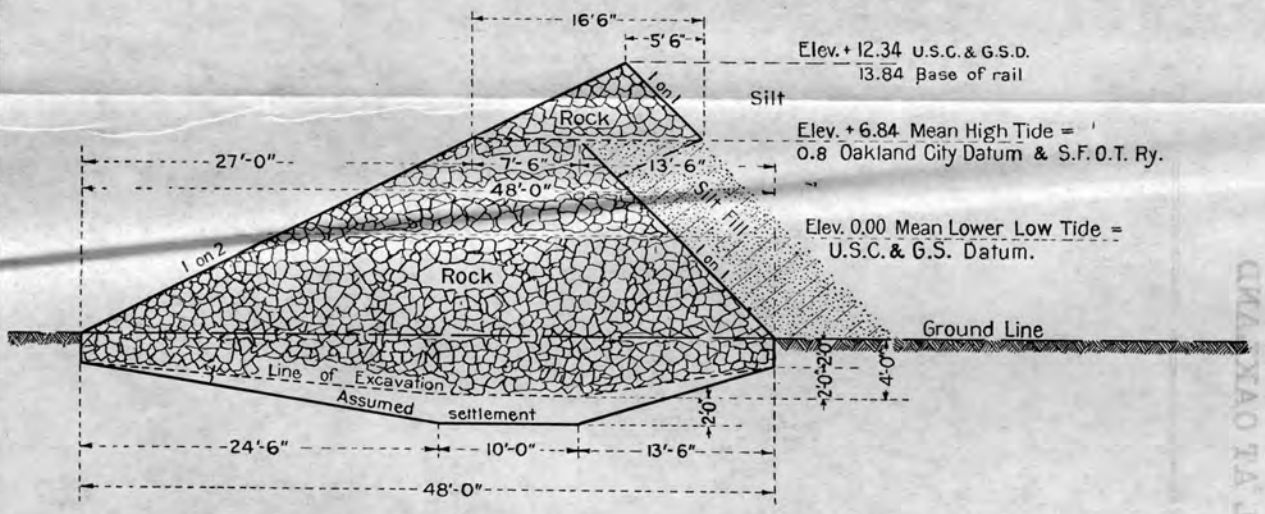
Attention is invited to the Shoals at Emmaton, Rio Vista, Newtown, Ida Island, Iron House and other places on river.

SV-151

183-D-122

Plate 3-21

THEORETICAL CROSS SECTION OF KEY SYSTEM PIER FILL AT OAKLAND



Note : Quantities for typical sections
23.4 cu. yds. rock
5.7 " " excavation.

S. F.-O. TERMINAL RYS. Maint. of Way & Bldgs. Dept.		
References	ALTERNATE PLAN FOR SEA WALL FOR PIER FILL Appgoved (sgd) Edward M. Boggs Asst to Gen. Mgr.	
Oakland, Cal. 2-26-13	Scale 1" = 10' J.T.M.	9444-D

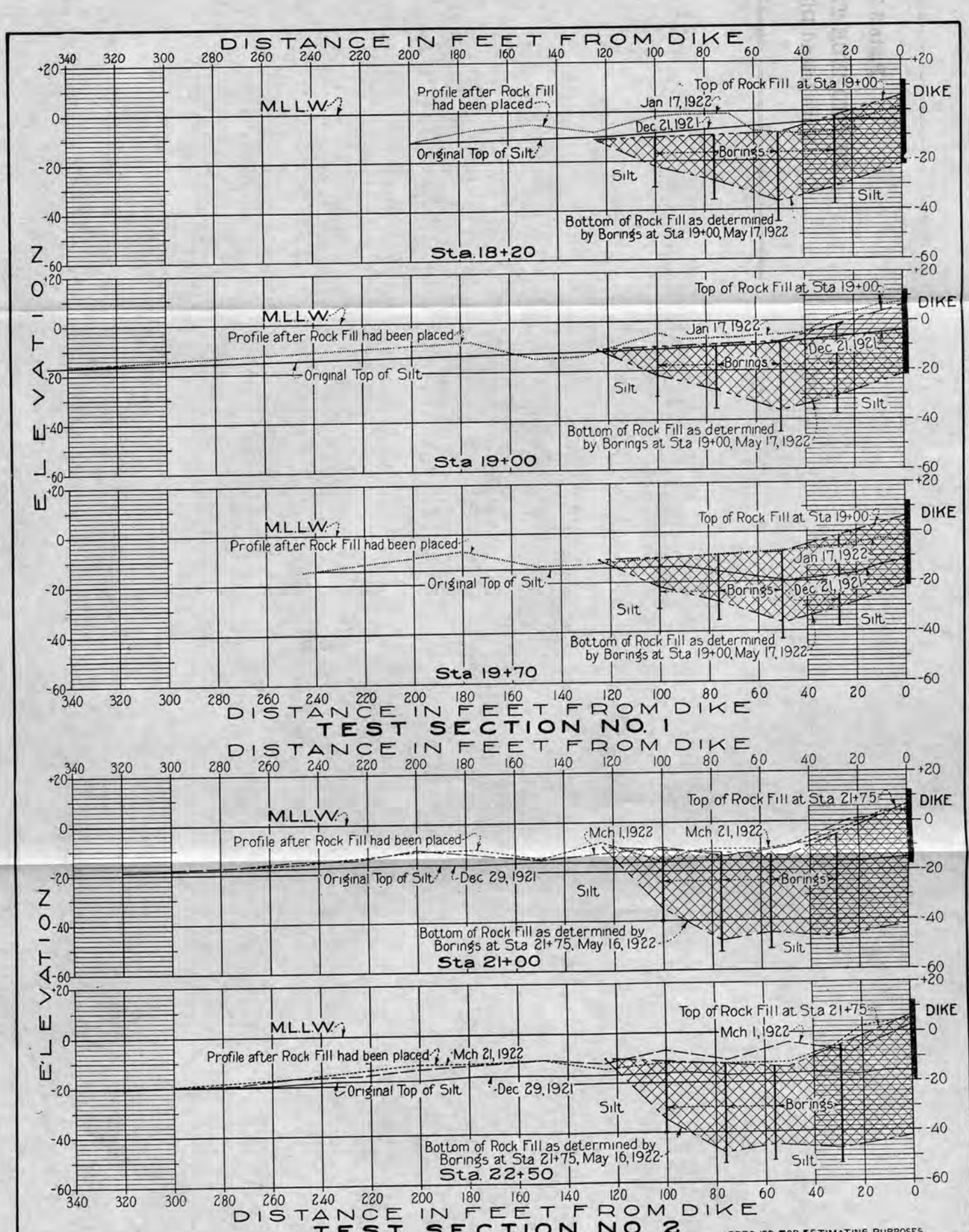
Theoretical cross-section of Key System pier fill at Oakland

PLATE 3-21

Plate 3-22

SUBSIDENCE TEST DATA

Mare Island Dike No. 12



APPROVED FOR ESTIMATING PURPOSES
R. P. 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-CAM Submitted W. R. Young
Checked Approved J. L. Savage

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

PLATE 3-22

Plate 3-23

TEST PILE DATA

American Toll Bridge Company

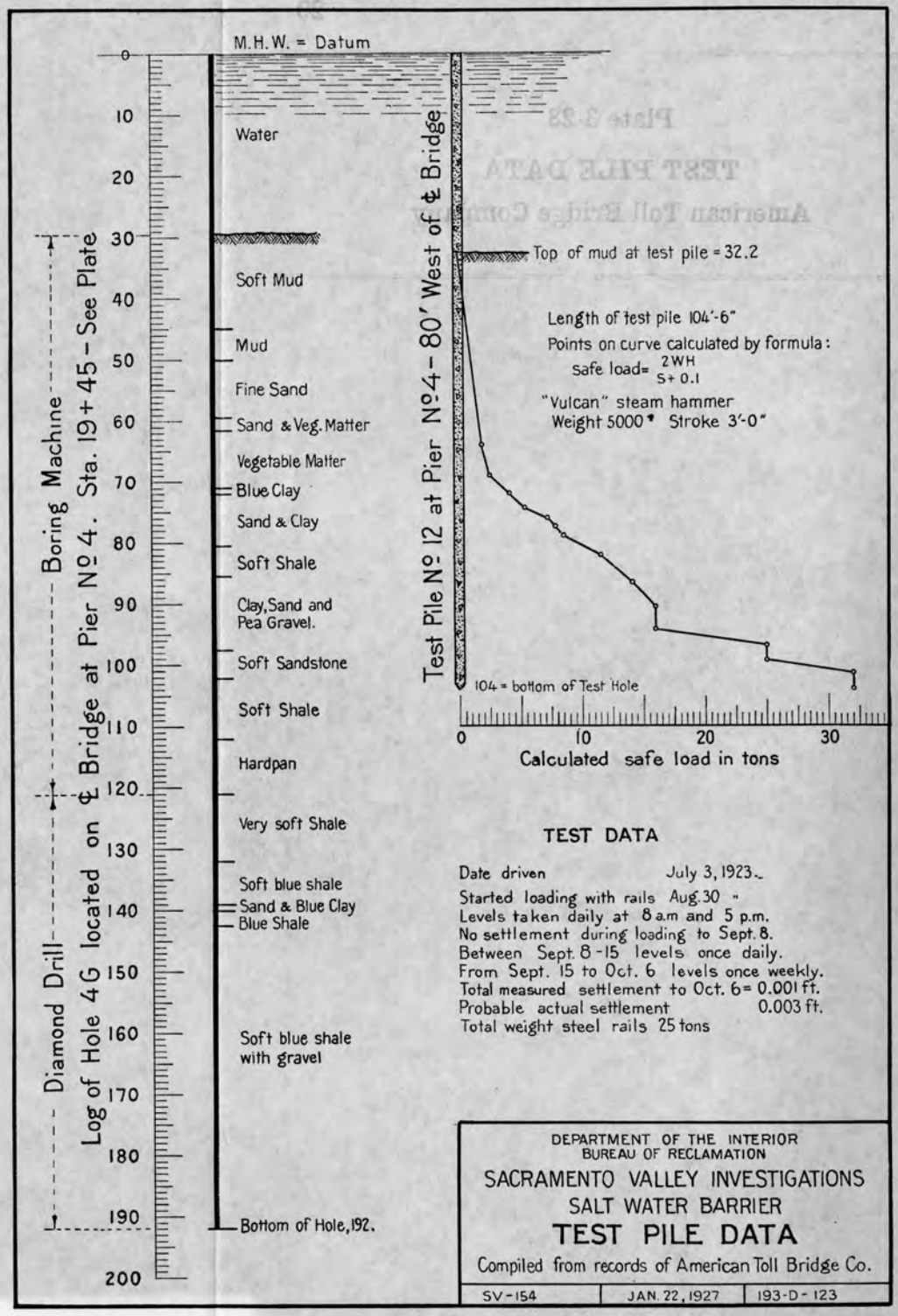

M.H.W. = Datum
Water
Soft Mud
Mud
Fine Sand
Sand & Veg. Matter
Vegetable Matter
Blue Clay
Sand & Clay
Soft Shale
Clay, Sand and Pea Gravel.
Soft Sandstone
Soft Shale
Hardpan
Very soft Shale
Soft blue shale
Sand & Blue Clay
Blue Shale
Soft blue shale with gravel
Bottom of Hole, 192.
Log of Hole 46 located on ℄ Bridge at Pier Nº 4. Sta. 19+45 - See Plate
Diamond Drill
Boring Machine
Test Pile Nº 12 at Pier Nº 4 - 80' West of ℄ Bridge
Top of mud at test pile = 32.2
Length of test pile 104'-6"
Points on curve calculated by formula:
Safe load = 2WH / S+0.1
"Vulcan" steam hammer
Weight 5000# Stroke 3'-0"
104 = bottom of Test Hole
0
10
20
30
Calculated safe load in tons
TEST DATA
Date driven July 3, 1923.
Started loading with rails Aug. 30 "
Levels taken daily at 8 a.m and 5 p.m.
No settlement during loading to Sept. 8.
Between Sept. 8-15 levels once daily.
From Sept. 15 to Oct. 6 levels once weekly.
Total measured settlement to Oct. 6 = 0.001 ft.
Probable actual settlement 0.003 ft.
Total weight steel rails 25 tons
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
SACRAMENTO VALLEY INVESTIGATIONS
SALT WATER BARRIER
TEST PILE DATA
Compiled from records of American Toll Bridge Co.
SV-154
JAN. 22, 1927
193-D-123

Plate 3-24

DRILL RIG ACCESSORIES