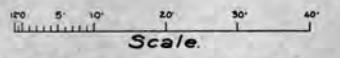


HALF UPSTREAM ELEVATIONS

Notes:  
 Sides of Piers to be gunited above low Water after removal of Caisson Skin Plates.  
 Caisson Steel which is left in place in Substructure not shown.



PRELIMINARY DESIGN

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 CONTROL WORKS-70'x80' GATE  
 PRELIMINARY ESTIMATE NO.11

APPROVED FOR ESTIMATING PURPOSES-  
*O. J. Dralter*  
 CHIEF ENGINEER

DRAWN: C.M.J. C.A.M. SUBMITTED: *W. P. Young*  
 CHECKED: N.B.H. RECOMMENDED: *R. Salage*  
 5V-113 Ellensburg Wash July 31, 1926 193-D-65  
 Sheet 2 of 3

Plate 4-43  
**CONTROL WORKS, 70' x 80' GATES**  
 Preliminary Estimate No. 11  
 Sheet 3 of 3

SALT WATER BARRIER AND CONTROL WORKS

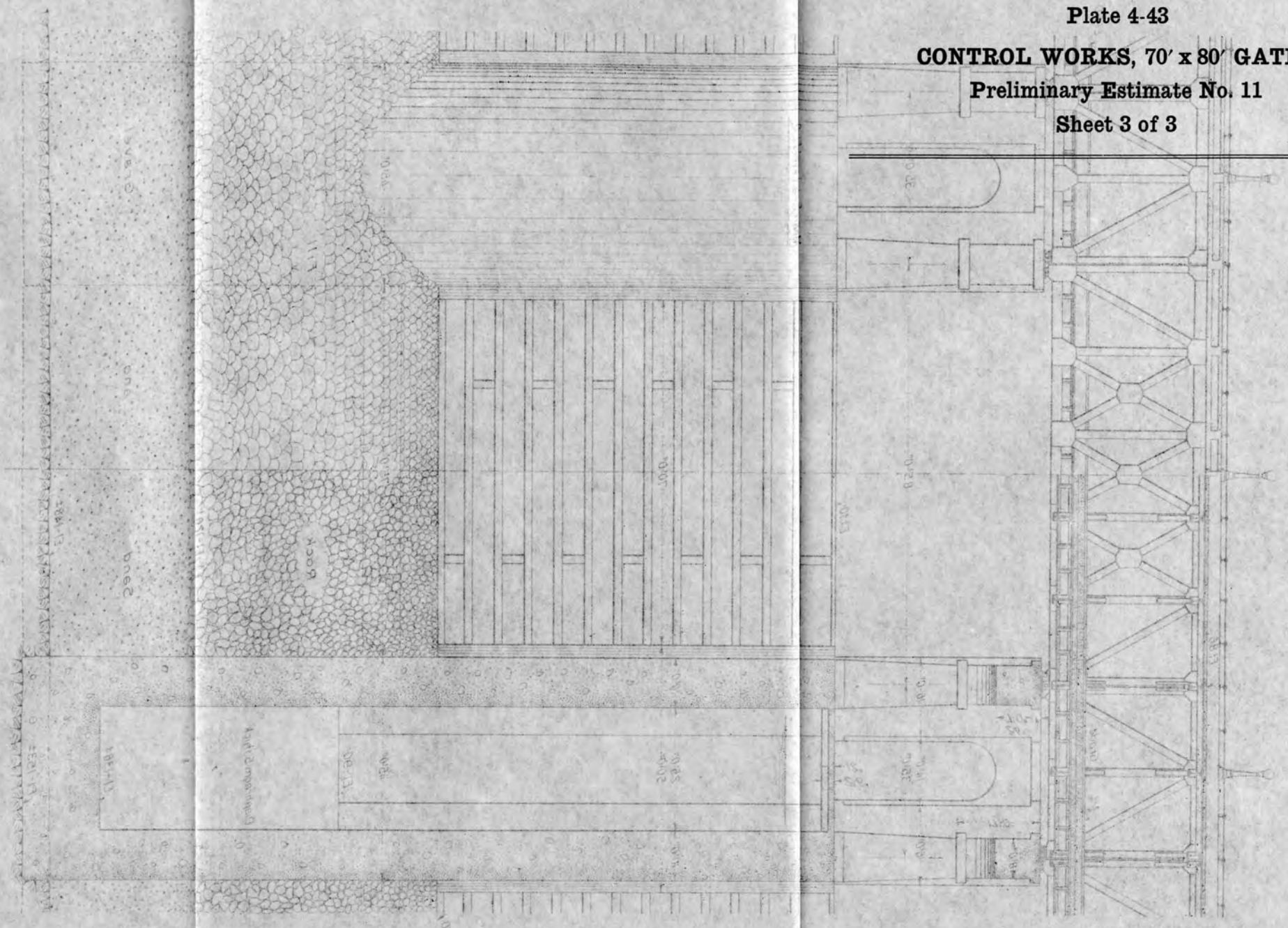
Notes:-  
 Maximum Elevation of Base of Rail and  
 Lowest Elevation of Top Face do not  
 actually occur in the same section  
 Sides of Piers to be finished above low  
 water after removal of Casson Ship  
 Plates  
 Casson Steel which is left in place in sub-  
 structure and Reinforcing Steel in  
 Bridge not shown

Scale  
 PRELIMINARY DESIGN

Department of the Interior  
 Bureau of Reclamation  
 SACRAMENTO WATER INVESTIGATIONS  
**SALT WATER BARRIER  
 CONTROL WORKS-70'x80' GATE**  
 PRELIMINARY ESTIMATE NO. 11

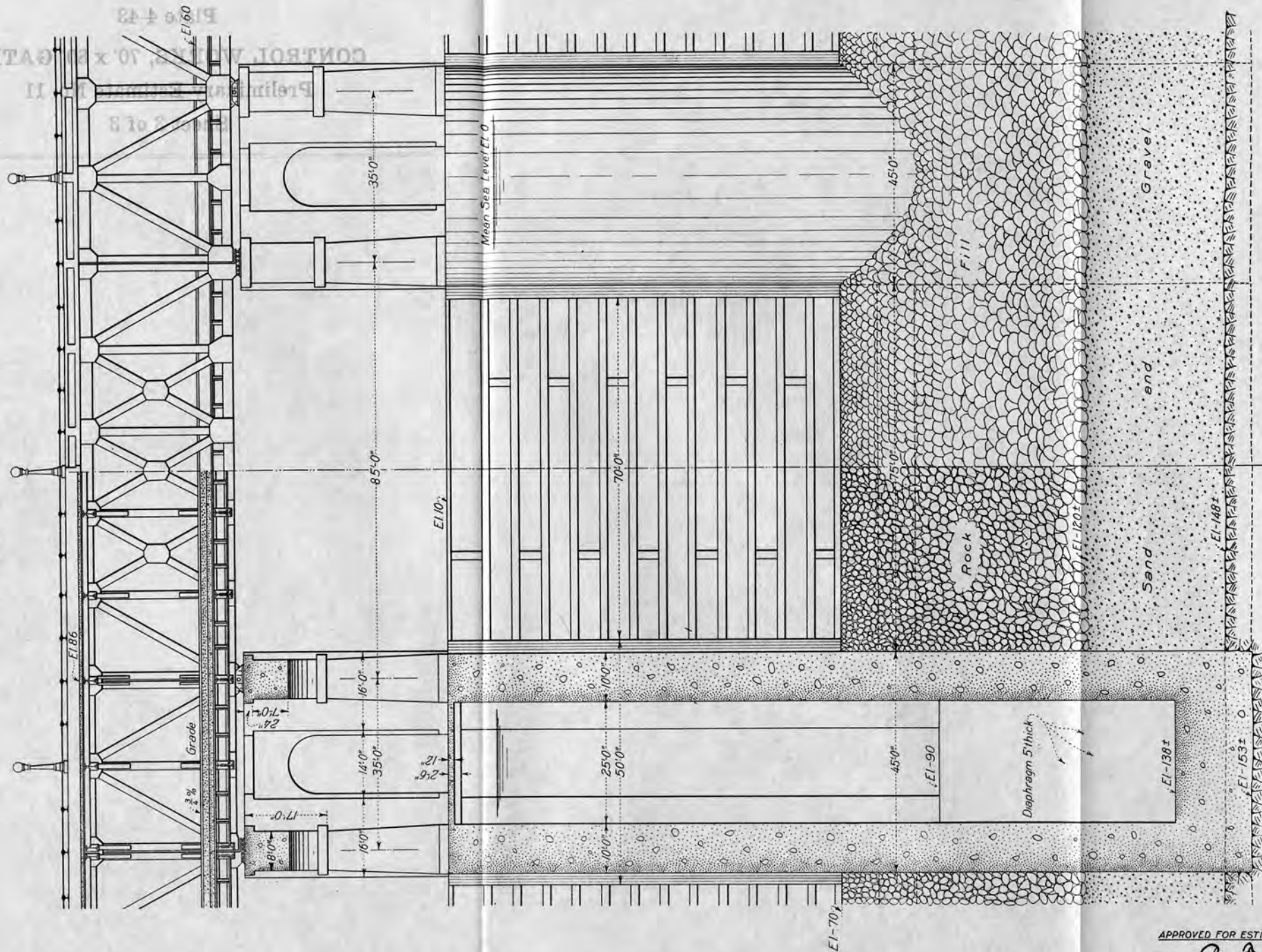
Checked by: *[Signature]*  
 Approved: *[Signature]*  
 Date: *[Date]*

27-114  
 1930-66



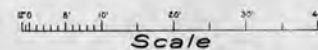
510 W

Note:- Gate Superstructure not shown.



HALF SECTIONAL AND DOWNSTREAM ELEVATIONS

Notes:-  
 Maximum Elevation of Base of Rail and lowest Elevation of Bed Rock do not actually occur in the same Section.  
 Sides of Piers to be gunited above low Water after removal of Caisson Skin Plates.  
 Caisson Steel which is left in place in Substructure and Reinforcing Steel in Bridge not shown.



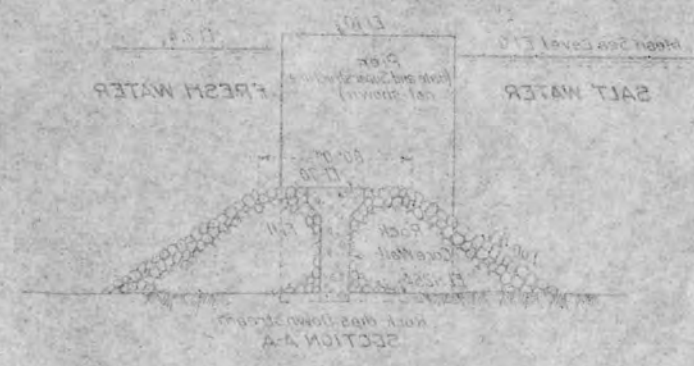
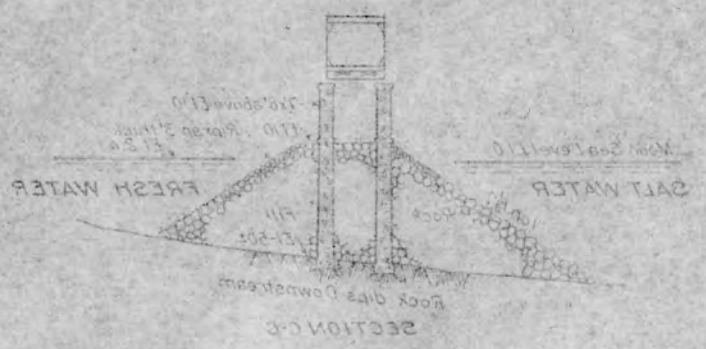
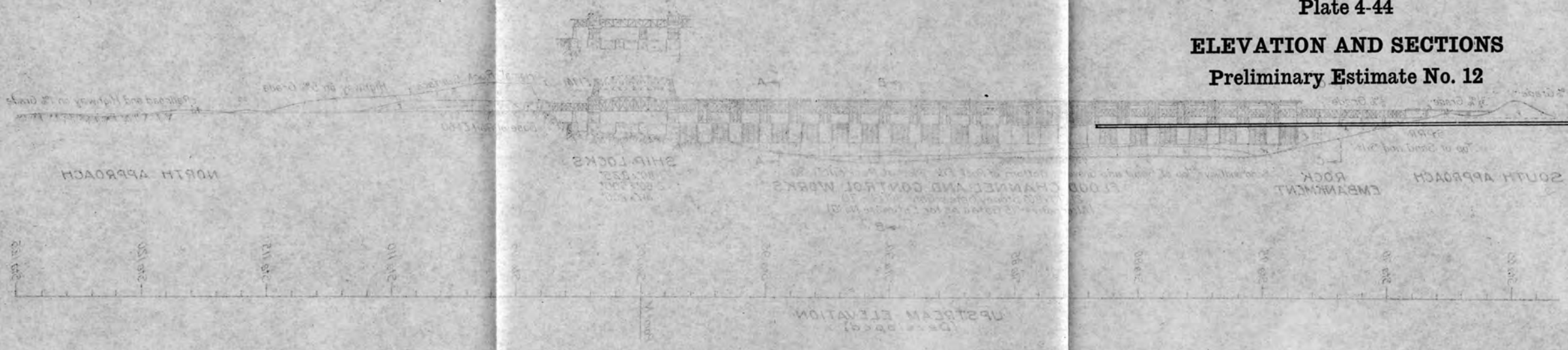
PRELIMINARY DESIGN

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 CONTROL WORKS- 70' x 80' GATE  
 PRELIMINARY ESTIMATE NO. 11

APPROVED FOR ESTIMATING PURPOSES-  
*O. J. Walter*  
 CHIEF ENGINEER

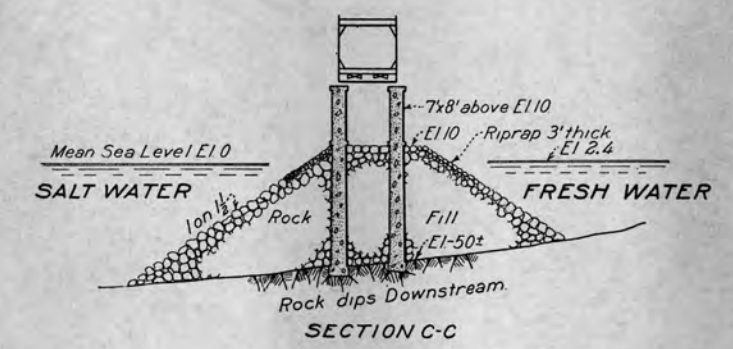
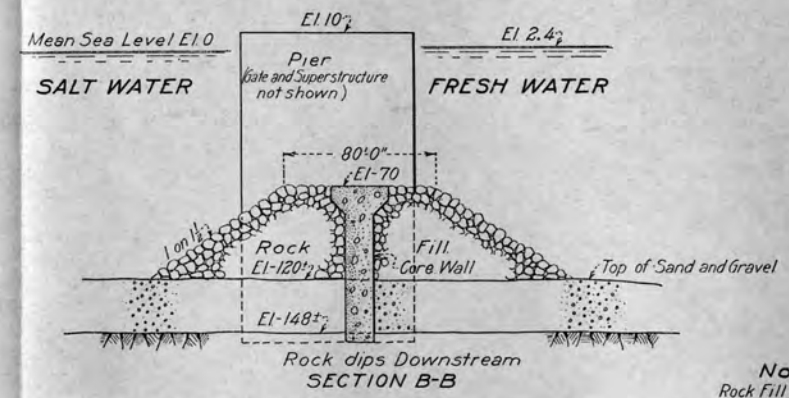
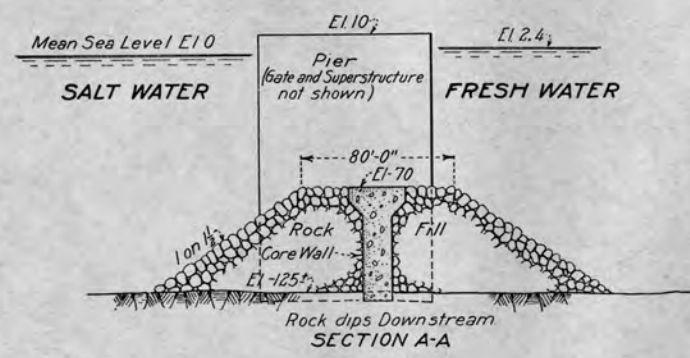
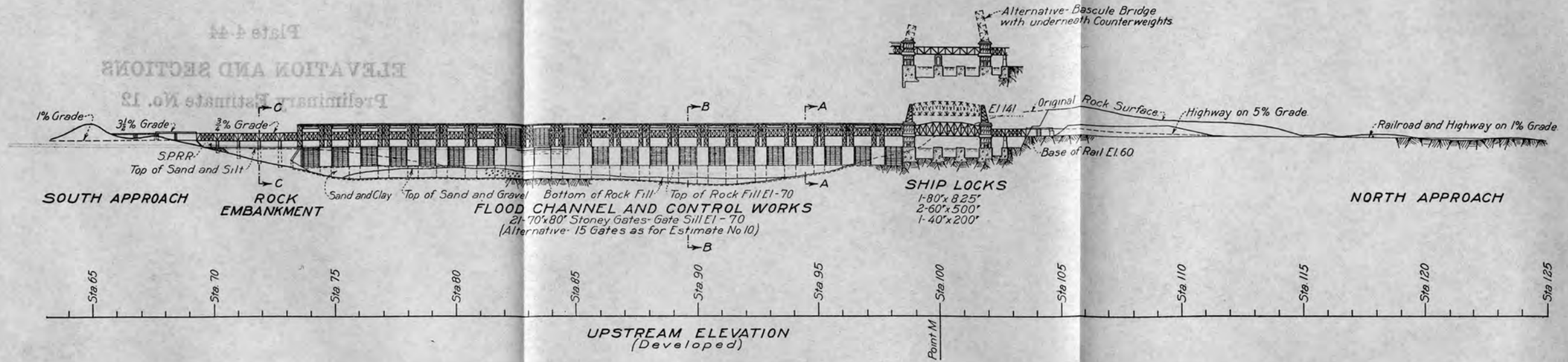
DRAWN: C.M.J. - C.A.M. SUBMITTED: *W. R. Young*  
 CHECKED: N.B.H. RECOMMENDED: *J. L. Savage*  
 SV-114 Ellensburg, Wash. July 31, 1926  
 Sheet 3 of 3 193-D-66

Plate 4-44  
**ELEVATION AND SECTIONS**  
**Preliminary Estimate No. 12**



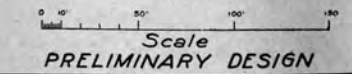
Notes:  
 1. The dam is designed for a maximum water level of 215.00 feet above mean sea level.  
 2. The dam is designed for a maximum water level of 215.00 feet above mean sea level.  
 3. The dam is designed for a maximum water level of 215.00 feet above mean sea level.  
 4. The dam is designed for a maximum water level of 215.00 feet above mean sea level.  
 5. The dam is designed for a maximum water level of 215.00 feet above mean sea level.

Scale  
**PRELIMINARY DESIGN**  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
**ELEVATION AND SECTIONS**  
 PRELIMINARY ESTIMATE NO. 12  
 25-115  
 Approved for Estimating Purposes  
 Chief Engineer  
 193-8-87



EMBANKMENT SECTIONS

**Notes:-**  
 Rock Fill to be placed by Bottom Dump Barges up to Maximum Elevation permitted by draft. Remainder to be placed by Derrick Barges and Skips  
 Sections A-A and B-B show Rock Fill deposited around Core Wall under Stony Gates where action of Current is negligible below E1-70  
 Section C-C shows Embankment placed inside South Cofferdam. Alternative Estimate No 12, gives cost with only 15 Flood Gates, located as for Estimate No 10



APPROVED FOR ESTIMATING PURPOSES  
**A. F. Dralter**  
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 ELEVATION AND SECTIONS  
 PRELIMINARY ESTIMATE NO. 12

DRAWN: C.M.J.L.T.F.-CAM SUBMITTED: *W. P. Young*  
 CHECKED: N.B.H. RECOMMENDED: *J. E. Savage*

SV-115 Ellensburg, Wash July 19, 1926. 193-D-67

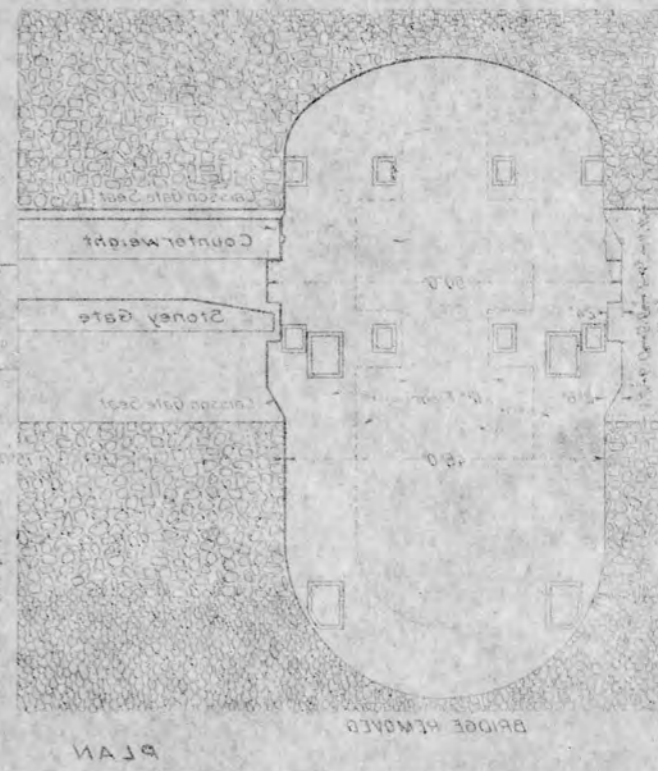
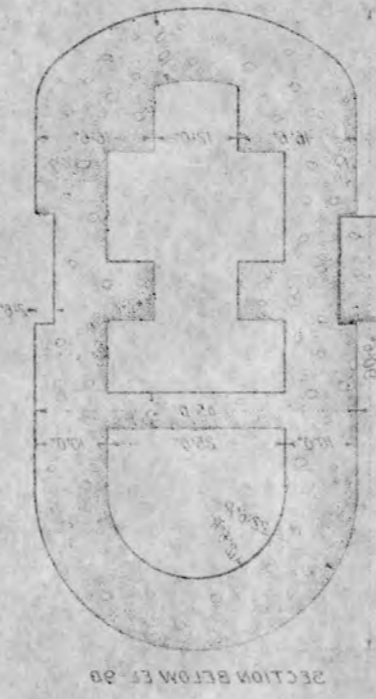
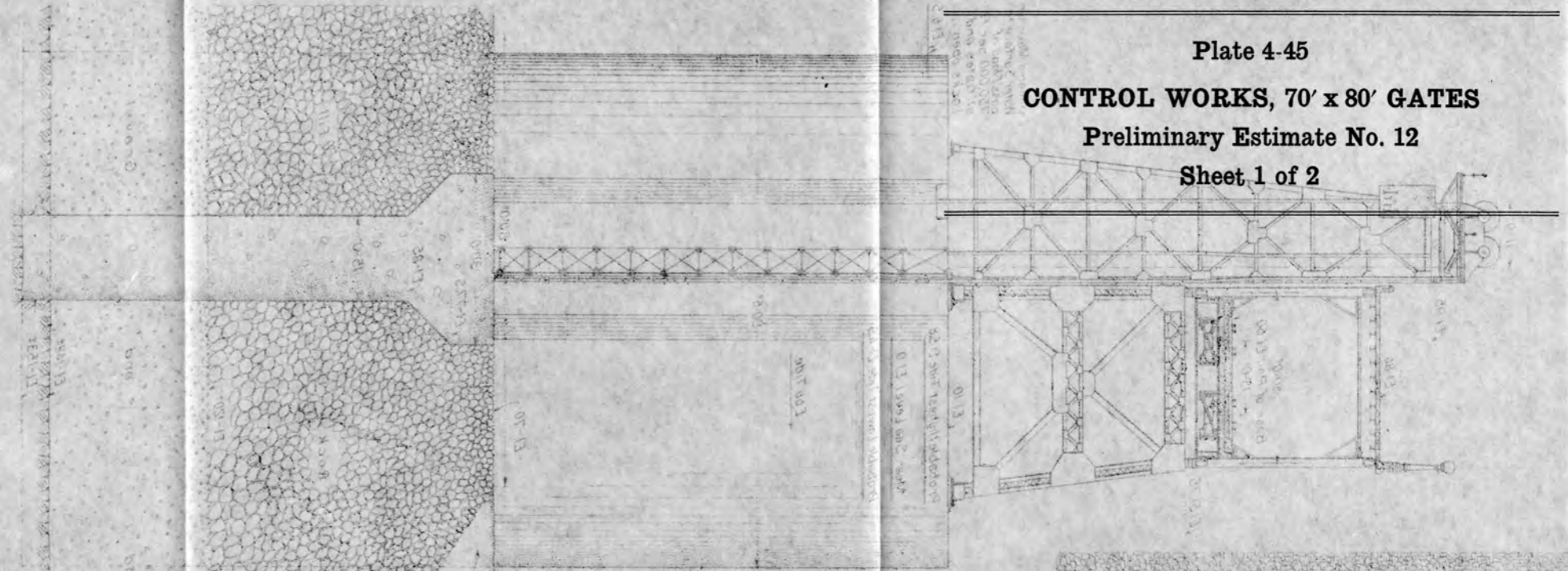
Plate 4-45  
**CONTROL WORKS, 70' x 80' GATES**  
 Preliminary Estimate No. 12  
 Sheet 1 of 2

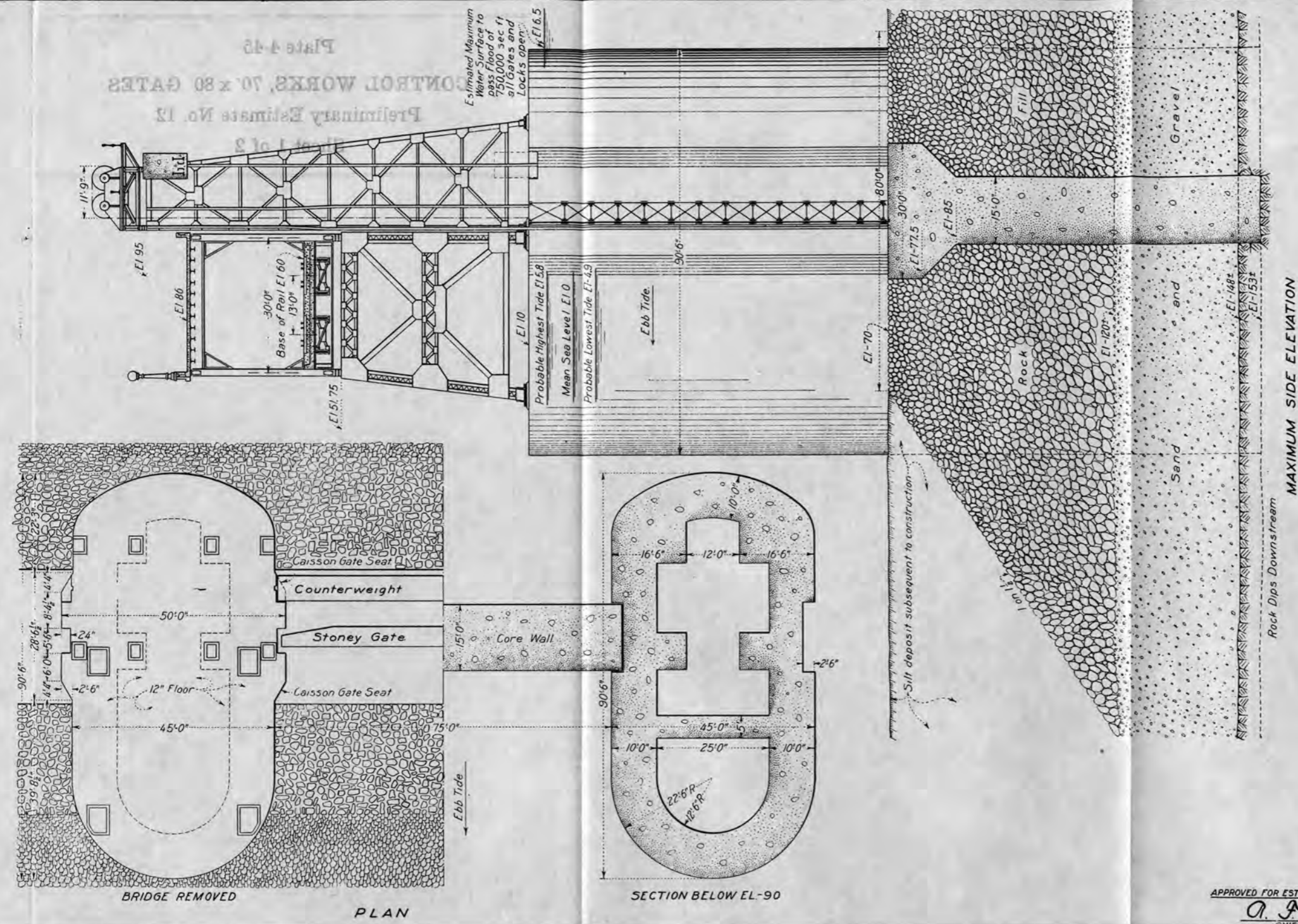
NOTATION TO BE MAINTAINED

**Notes-**  
 Control Works for Estimate No. 12 are shown on this drawing except for location of bridge and highway bridge. Maximum Elevation of Gate is 101.00 and lowest elevation of Bar is 100.00. Actual elevations in the same section will vary to be checked above low water after removal of Cañon State Filter.  
 Cañon State which is left in place. Structure and retaining structure bridge not shown.

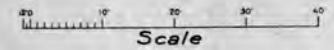
Scale  
 1" = 10'

PRELIMINARY DESIGN  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
**CONTROL WORKS-70'x80' GATE**  
 PRELIMINARY ESTIMATE NO. 12  
 DRAWN BY: C. H. ...  
 CHECKED BY: ...  
 APPROVED FOR ESTIMATING PURPOSES:  
 D. J. ...  
 24-116  
 193-D-68





**Notes:-**  
 Control Works for Estimate No 10 are as shown on this Drawing except for omission of Railroad and Highway Bridge  
 Maximum Elevation of Base of Rail and lowest Elevation of Bed Rock do not actually occur in the same Section  
 Sides of Piers to be gunited above low Water after removal of Caisson Skin Plates  
 Caisson Steel which is left in place in Sub-structure and Reinforcing Steel in Bridge not shown



**PRELIMINARY DESIGN**

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 CONTROL WORKS- 70' x 80' GATE  
 PRELIMINARY ESTIMATE NO. 12

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

DRAWN: CMJ-CAM SUBMITTED: *W. R. Young*  
 CHECKED: NBH RECOMMENDED: *J. L. Savage*

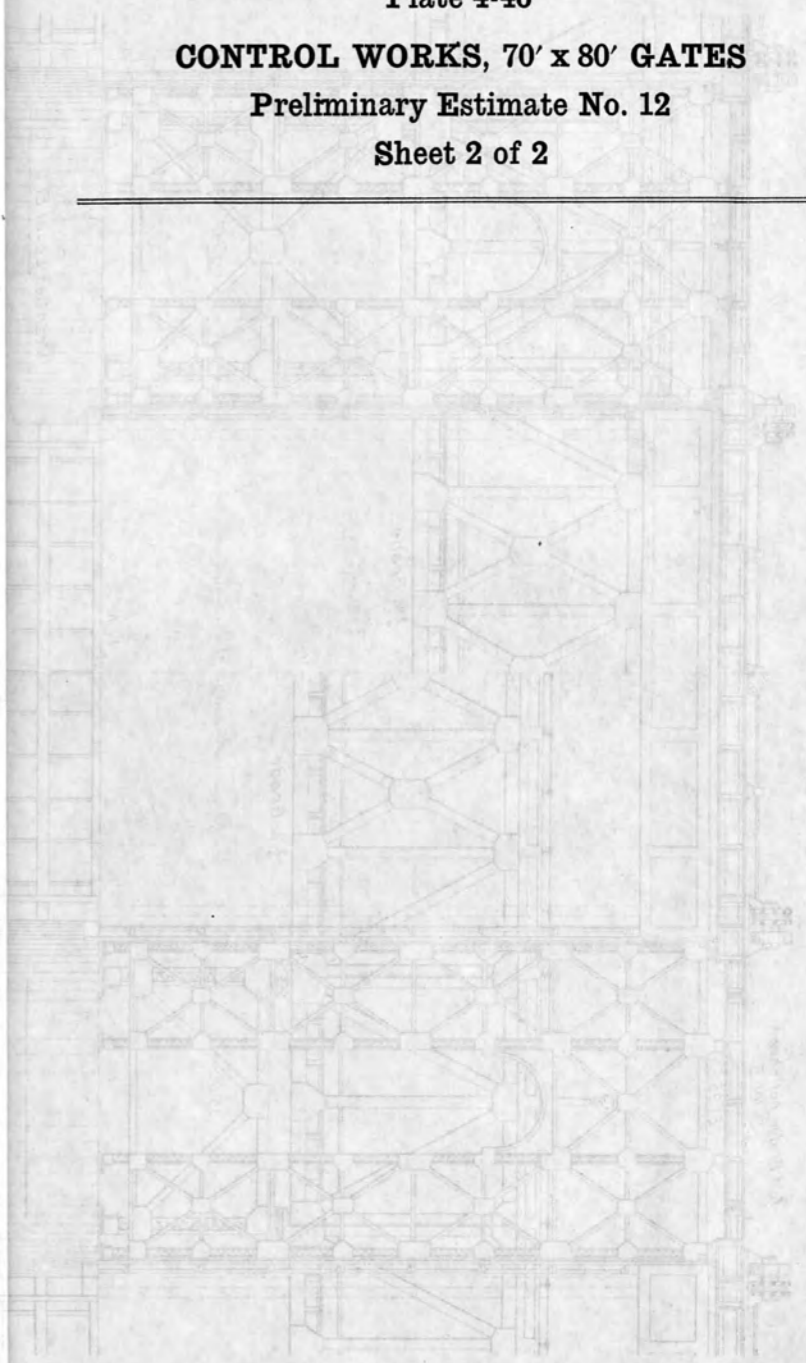
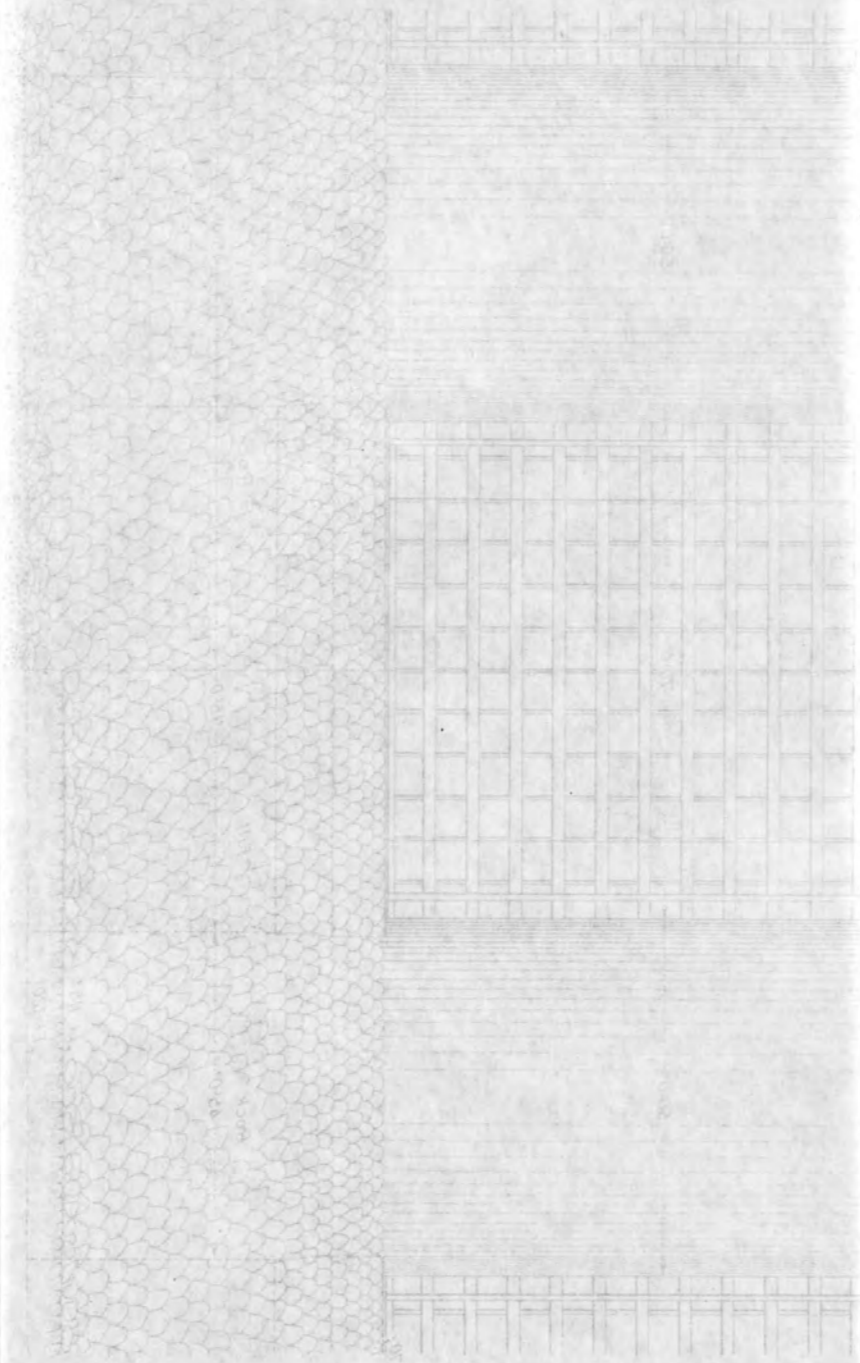
SV-116 Ellensburg Wash July 29, 1926 Sheet 1 of 2 193-D-68

Plate 4-46  
**CONTROL WORKS, 70' x 80' GATES**  
 Preliminary Estimate No. 12  
 Sheet 2 of 2

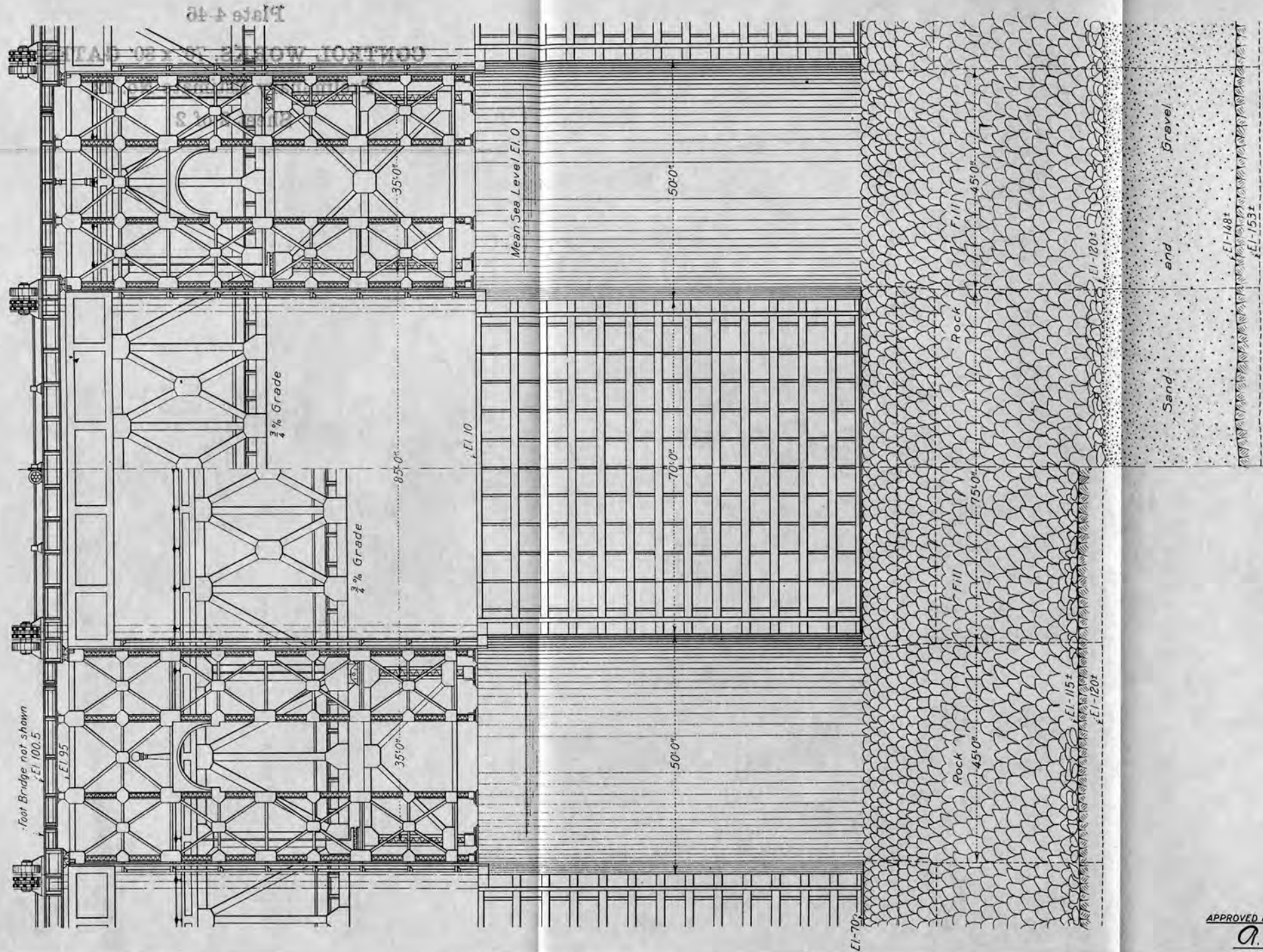
Notes:  
 1. Control Works are to be constructed in accordance with the specifications and drawings of the Department of the Interior, Bureau of Reclamation, Salt Water Barrier, Control Works, 70' x 80' Gate, Preliminary Estimate No. 12.  
 2. The Control Works are to be constructed in accordance with the specifications and drawings of the Department of the Interior, Bureau of Reclamation, Salt Water Barrier, Control Works, 70' x 80' Gate, Preliminary Estimate No. 12.  
 3. The Control Works are to be constructed in accordance with the specifications and drawings of the Department of the Interior, Bureau of Reclamation, Salt Water Barrier, Control Works, 70' x 80' Gate, Preliminary Estimate No. 12.

WATER CONTROL WORKS

Scale  
 PRELIMINARY DESIGN  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO RIVER INVESTIGATION  
 SALT WATER BARRIER  
 CONTROL WORKS-70' x 80' GATE  
 PRELIMINARY ESTIMATE NO. 12  
 APPROVED FOR ESTIMATING PURPOSES  
 SPECIAL AGENT IN CHARGE  
 APPROVED  
 DIVISION ENGINEER  
 2V-117  
 1937-58







HALF UPSTREAM ELEVATIONS

**Notes:-**  
 Control Works for Estimate No 10 are as shown on this Drawing except for omission of Railroad and Highway Bridge.  
 Sides of Piers to be gunited above low Water after removal of Caisson Skin Plates.  
 Caisson Steel which is left in place in Sub-structure not shown.

Scale  
 PRELIMINARY DESIGN

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 CONTROL WORKS - 70' x 80' GATE  
 PRELIMINARY ESTIMATE NO 12

APPROVED FOR ESTIMATING PURPOSES:  
*A. J. Fralter*  
 CHIEF ENGINEER

DRAWN: CMJ-CAM SUBMITTED: *W. P. Young*  
 CHECKED: N.B.H. RECOMMENDED: *J. L. Savage*  
 SV-117 Ellensburg Wash Aug 2, 1926 Sheet 2 of 2 193-D-69

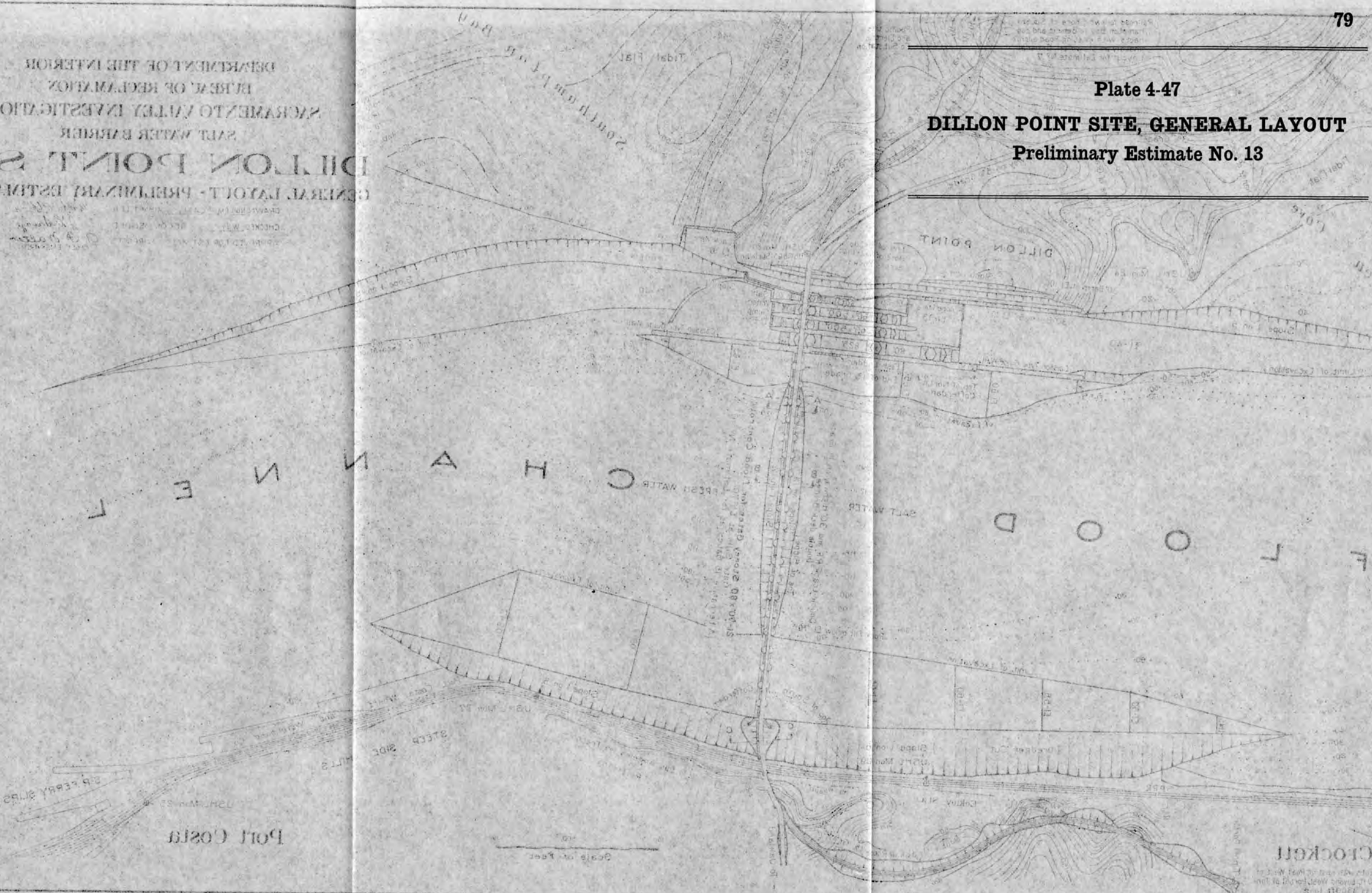
Plate 4-47  
**DILLON POINT SITE, GENERAL LAYOUT**  
 Preliminary Estimate No. 13

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
**DILLON POINT SITE**  
 GENERAL LAYOUT - PRELIMINARY ESTIMATE NO. 13

APPROVED FOR THE ESTIMATE  
 CHECKED BY  
 DRAWN BY  
 DATE

PONT COSTA  
 STEP SIDE  
 STEP SIDE

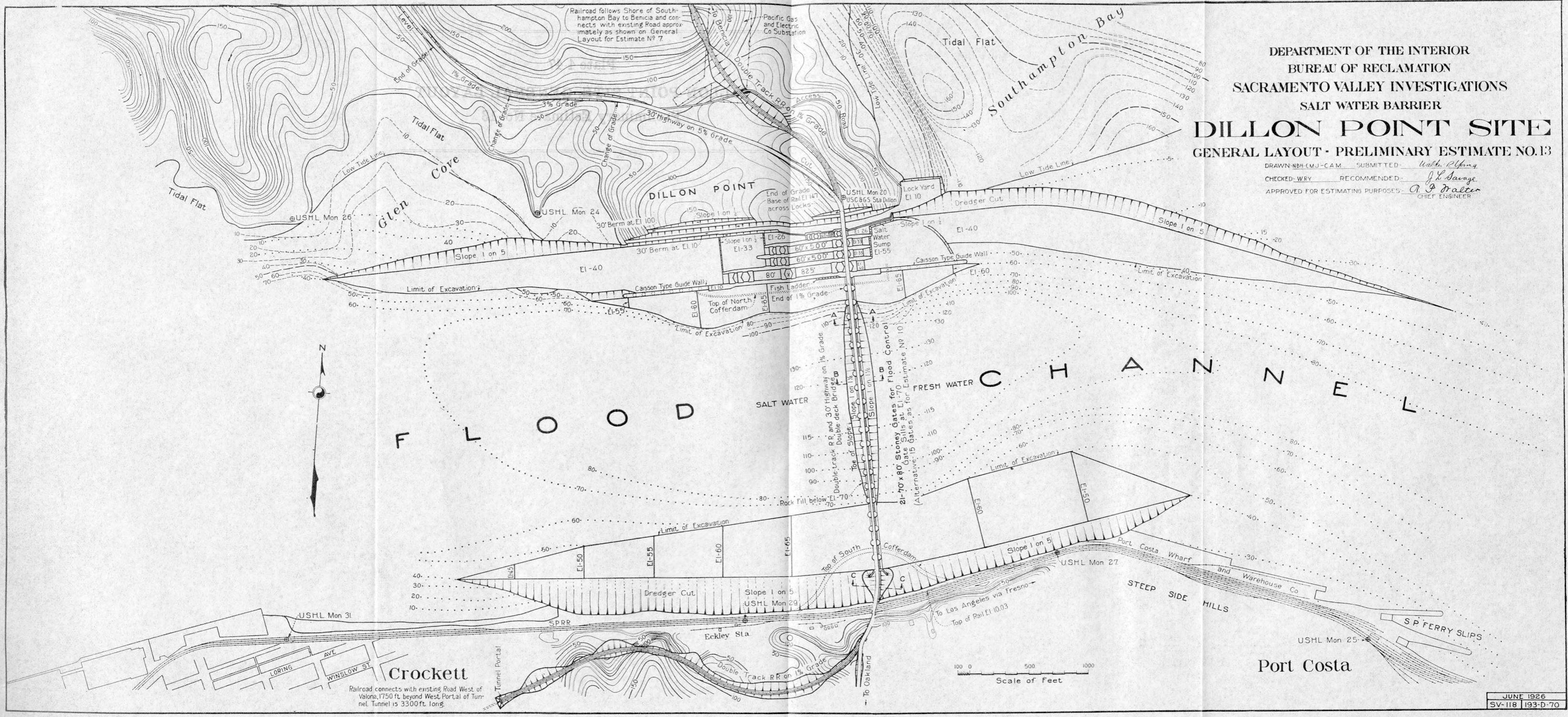
UNIVERSITY OF CALIFORNIA  
 DIVISION OF WATER RESOURCES  
 SACRAMENTO



Crockett  
 ENGINEERS  
 1015 B STREET, SACRAMENTO, CALIF.

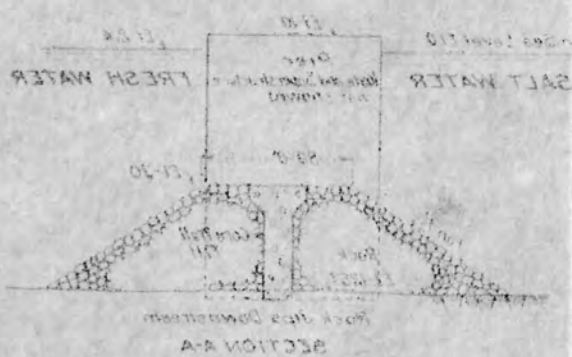
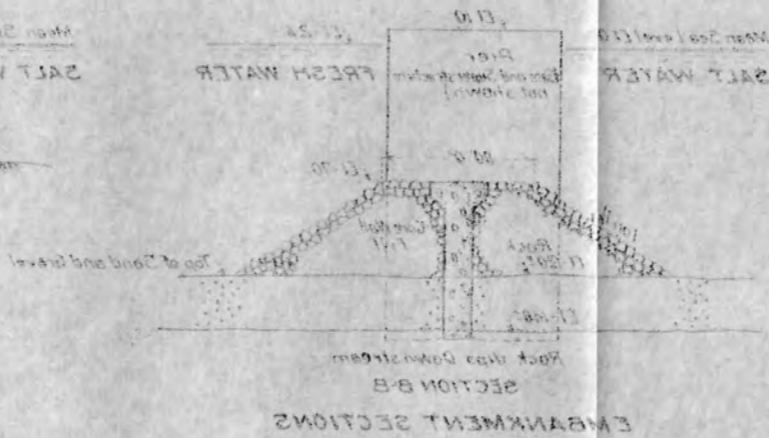
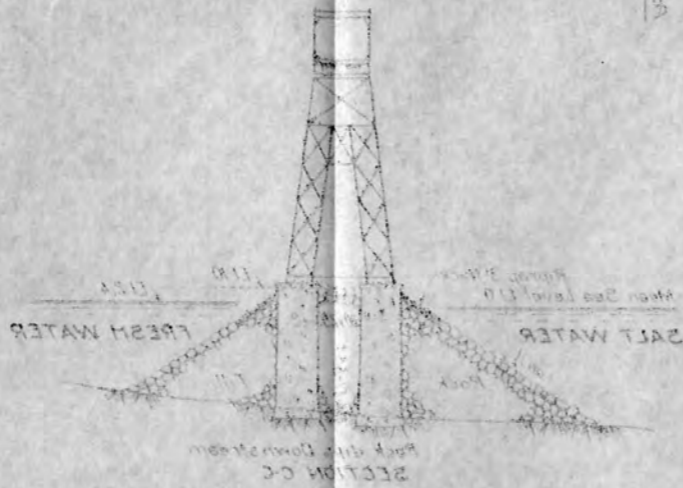
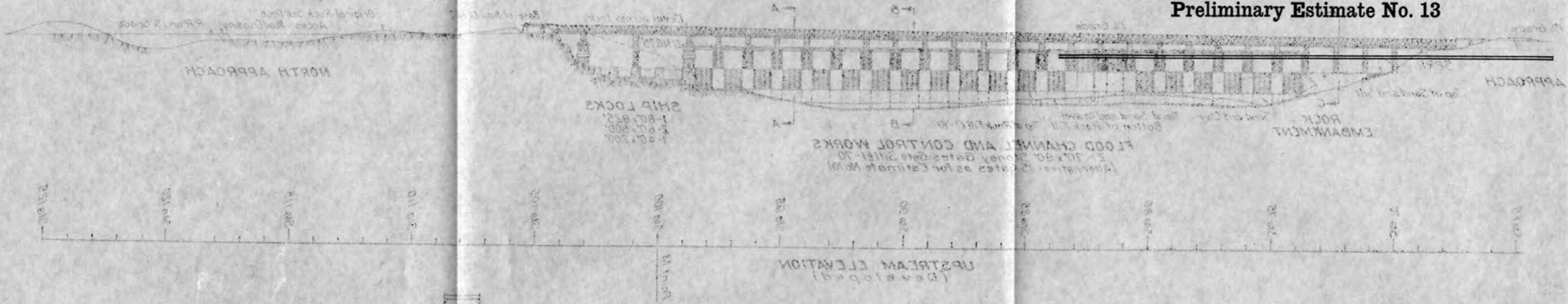
DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
**DILLON POINT SITE**  
 GENERAL LAYOUT - PRELIMINARY ESTIMATE NO.13

DRAWN: NBH-EMJ-CAM SUBMITTED: *Walter R. Perry*  
 CHECKED: WRY RECOMMENDED: *J. L. Savage*  
 APPROVED FOR ESTIMATING PURPOSES: *A. F. Walter*  
 CHIEF ENGINEER



Railroad connects with existing Road West of Valona, 1750 ft. beyond West Portal of Tunnel. Tunnel is 3300 ft. long.

Plate 4-48  
**ELEVATION AND SECTIONS**  
**Preliminary Estimate No. 13**

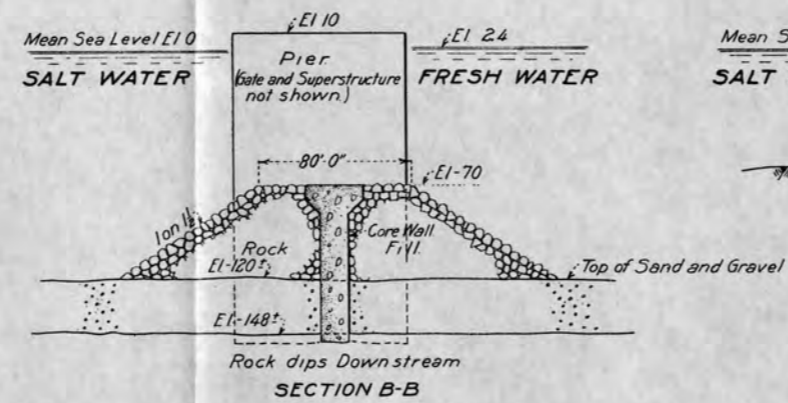
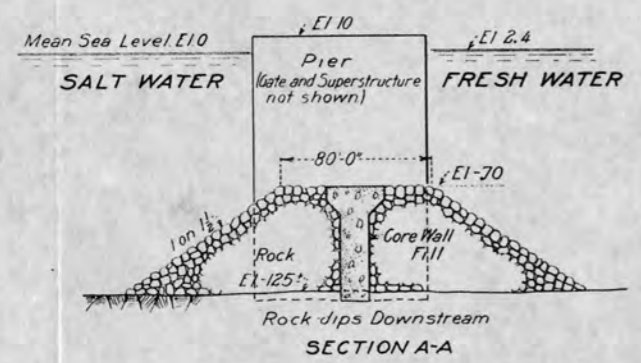
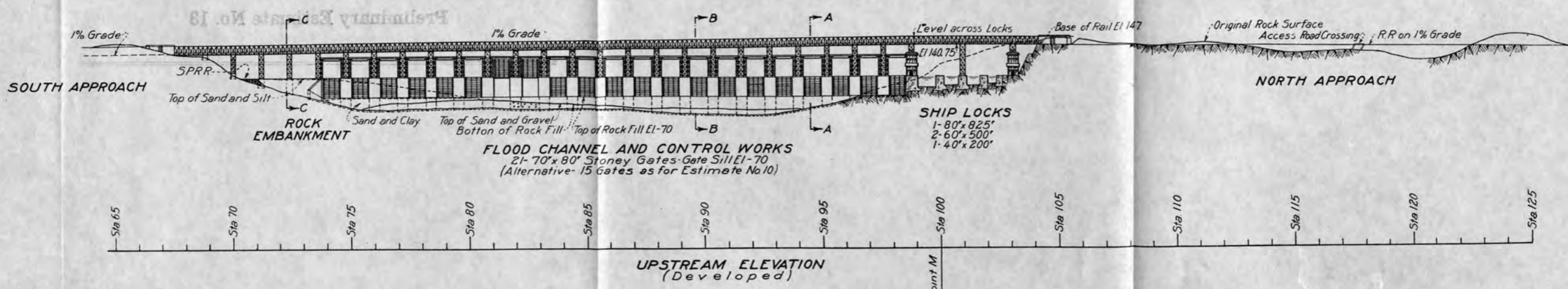


Notes -  
 Part 711 to be placed by Bottom Dump  
 Barges into Maximum Elevation per  
 lifted by Shell Hoist and to be placed  
 by Deck Gages and Skips  
 Section A-A and B-B show Rock Fill to be  
 deposited around Gate Wall under  
 stone piles when water is raised  
 to height above 11-70  
 Section C-C shows Embankment placed  
 west of South Gate dam  
 Alternative Estimate No. 13 gives Cut  
 with only 12' flood gates, created  
 water Estimate No. 10

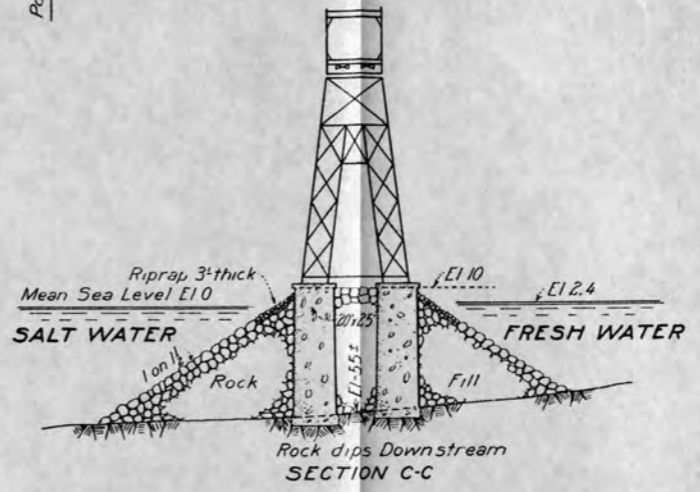
Scale  
 PRELIMINARY DESIGN

Department of the Interior Bureau of Reclamation SACRAMENTO SALTY WATERS DIVISION SALT WATER BARRIER ELEVATION AND SECTIONS PRELIMINARY ESTIMATE NO. 13
APPROVED FOR ESTIMATION PURPOSES D. S. Brewer CIVIL ENGINEER
25-119 (Revised) 1-25-35

Plate 4-48  
 ELEVATION AND SECTIONS  
 Preliminary Estimate No. 13



**EMBANKMENT SECTIONS**



**Notes:-**

- Rock Fill to be placed by Bottom Dump Barges up to Maximum Elevation permitted by draft Remainder to be placed by Derrick Barges and Skips
- Section A-A and B-B show Rock Fill to be deposited around Core Wall under Stony Gates where action of Current is negligible below El-70
- Section C-C shows Embankment placed inside of South Cofferdam.
- Alternative Estimate No.13 gives Cost with only 15 Flood Gates, located as for Estimate No.10.

Scale  
 PRELIMINARY DESIGN

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

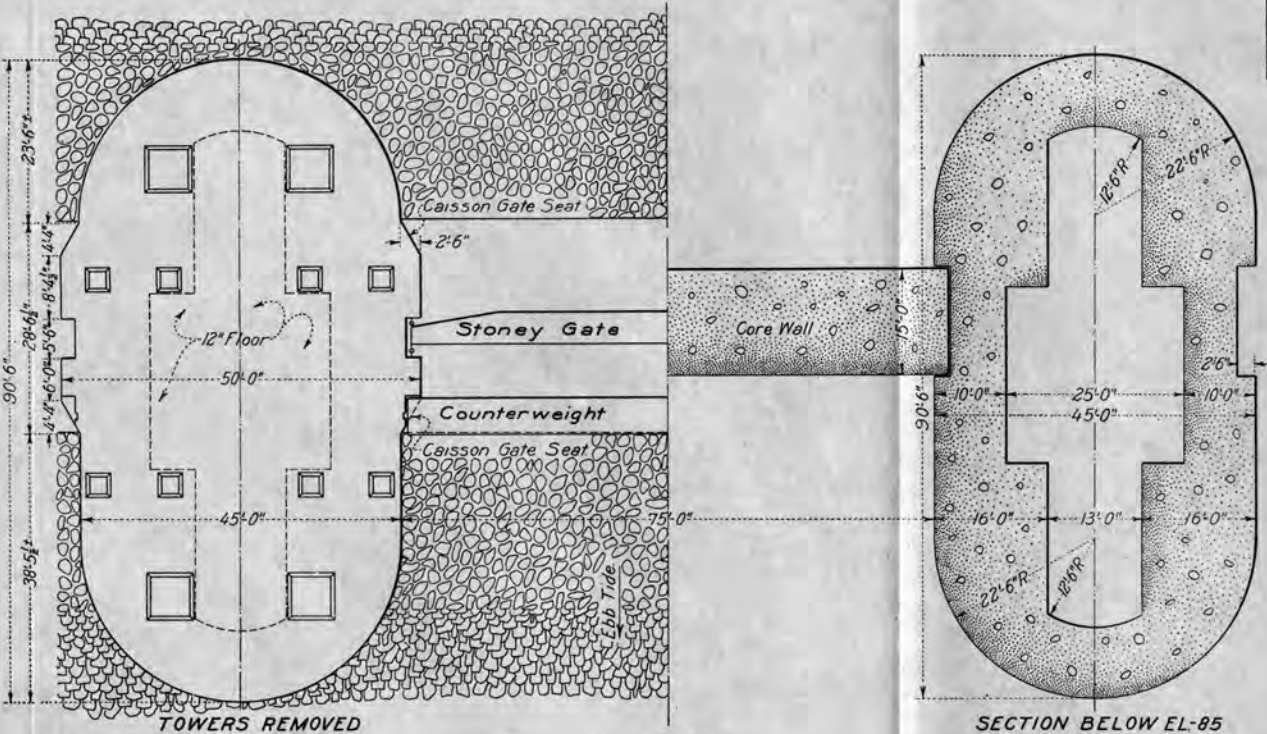
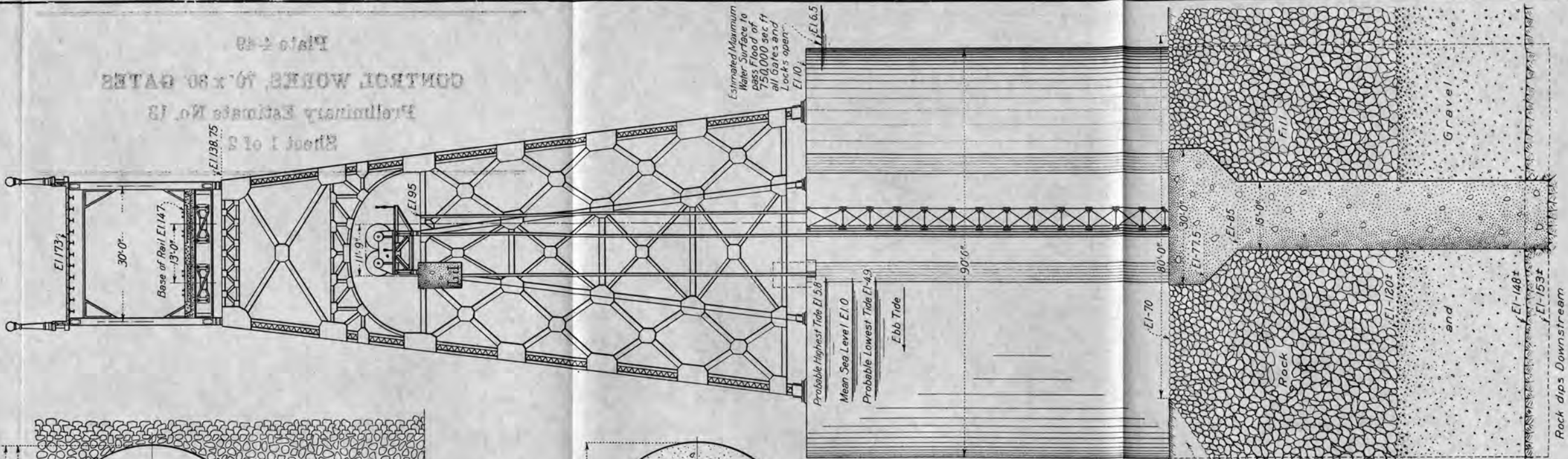
DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 ELEVATION AND SECTIONS  
 PRELIMINARY ESTIMATE NO. 13

DRAWN: C.M.J.L.F. CAM SUBMITTED: *W. R. Johnson*  
 CHECKED: N.B.H. RECOMMENDED: *J. H. Savage*

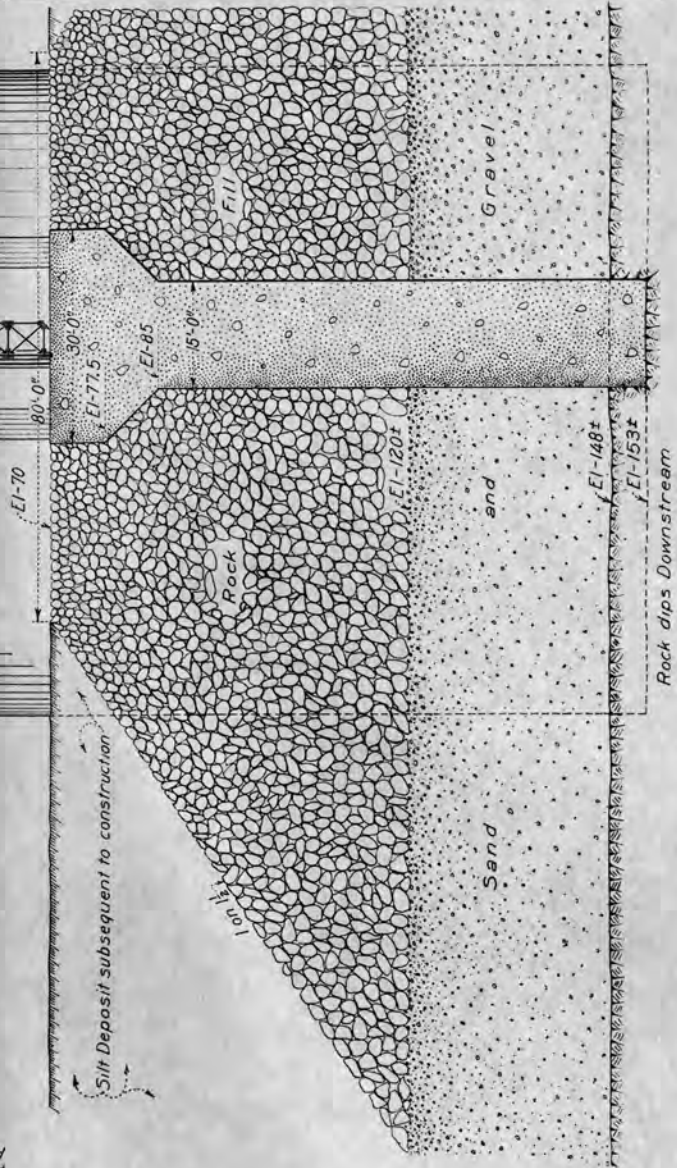
SV-119 Ellensburg, Wash July 23, 1926 193-D-71



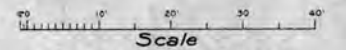
CONTROL WORKS 70' x 80' GATES  
Preliminary Estimate No. 13  
Sheet 1 of 2



**Notes-**  
 Maximum Elevation of Base of Rail and lowest Elevation of Bed Rock do not actually occur in the same Section  
 Sides of Piers to be gunited above low Water after removal of Caisson Skin Plates.  
 Caisson Steel which is left in place in Substructure and Reinforcing Steel in Bridge not shown.



MAXIMUM SIDE ELEVATION

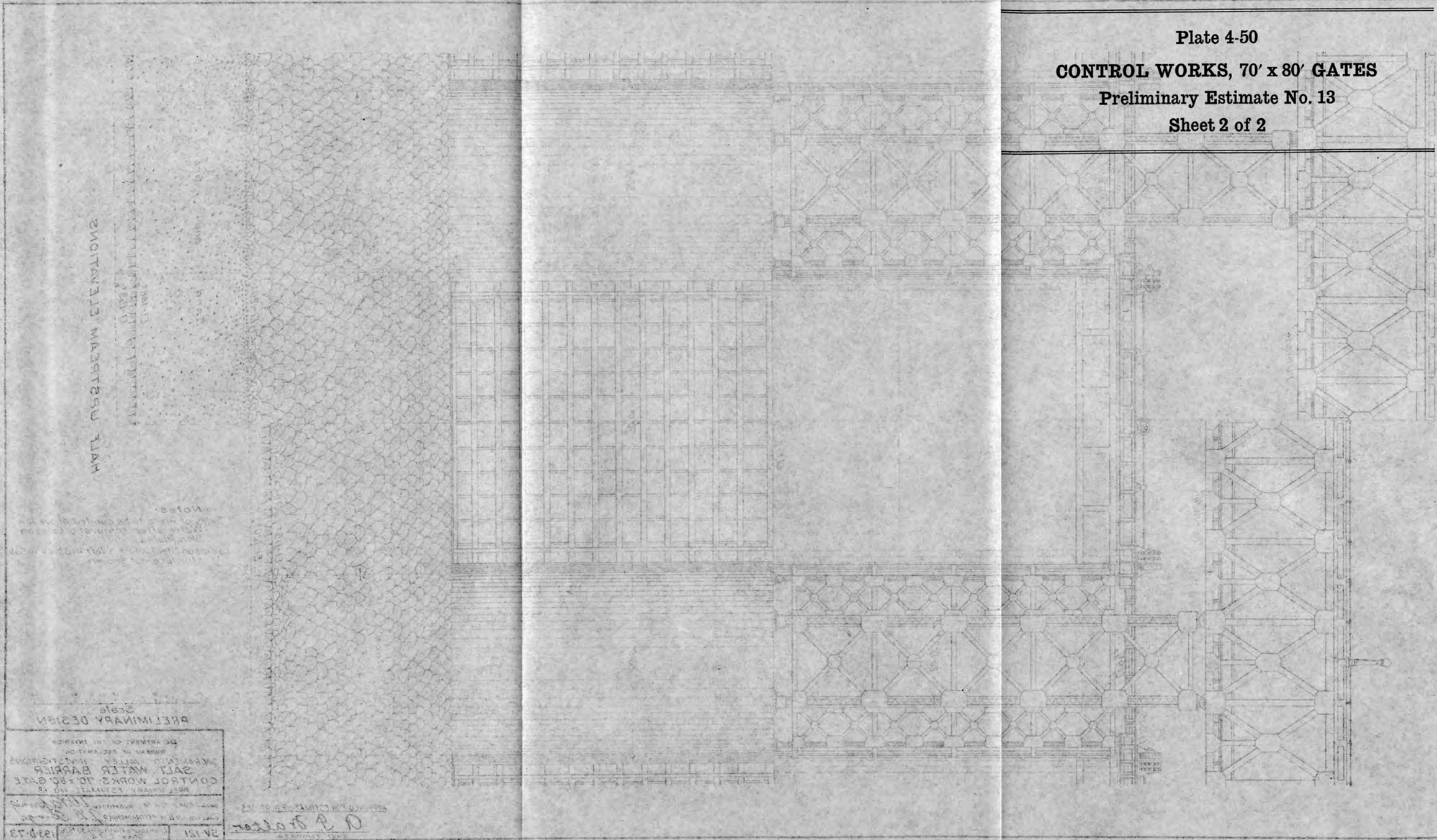


PRELIMINARY DESIGN  
 DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 CONTROL WORKS-70' x 80' GATE  
 PRELIMINARY ESTIMATE NO. 13

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

DRAWN: C.M.J.: C.A.M. SUBMITTED: *W. J. Young*  
 CHECKED: N.B.H. RECOMMENDED: *J. L. Savage*  
 SV-120 Ellensburg Wash July 29, 1926 Sheet 1 of 2 193-D-72

Plate 4-50  
**CONTROL WORKS, 70' x 80' GATES**  
 Preliminary Estimate No. 13  
 Sheet 2 of 2

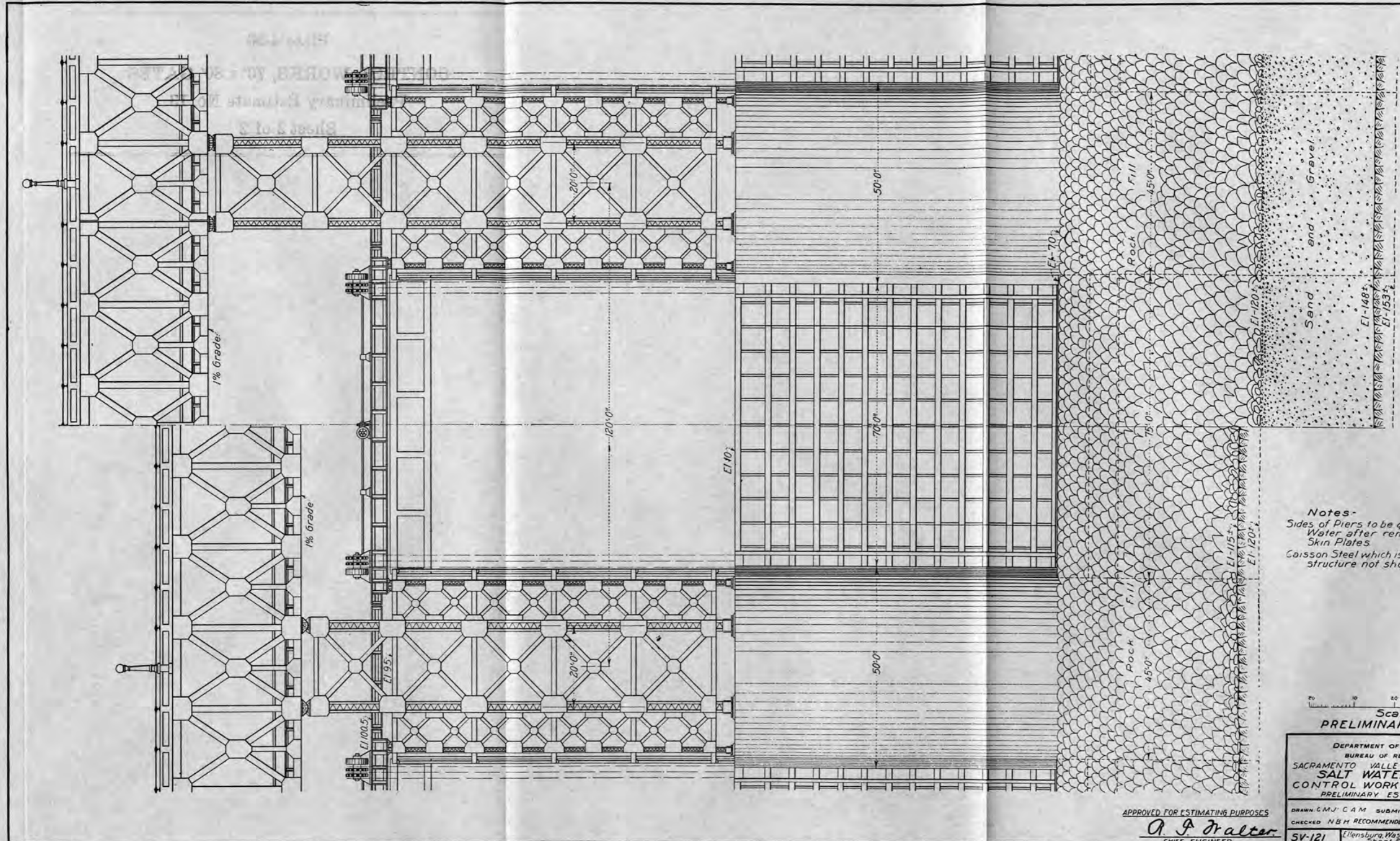


Notes:  
 1. All work to be completed by the end of the season.  
 2. The design is preliminary and subject to change.  
 3. The contractor shall be responsible for the construction of the gates and the control works.

Scale  
 PRELIMINARY DESIGN  
 CONTROL WORKS TO 80' GATE  
 PRELIMINARY ESTIMATE NO. 13  
 PREPARED BY THE ENGINEER  
 IN CHARGE OF THE DIVISION  
 OF CANALS AND IRRIGATION  
 U. S. DEPARTMENT OF AGRICULTURE  
 WASHINGTON, D. C.

APPROVED FOR ESTIMATION BY THE  
 ENGINEER IN CHARGE OF THE DIVISION  
 OF CANALS AND IRRIGATION  
 U. S. DEPARTMENT OF AGRICULTURE  
 WASHINGTON, D. C.





HALF UPSTREAM ELEVATIONS

Notes-  
 Sides of Piers to be quited above low Water after removal of Caisson Skin Plates  
 Caisson Steel which is left in place in Sub structure not shown.

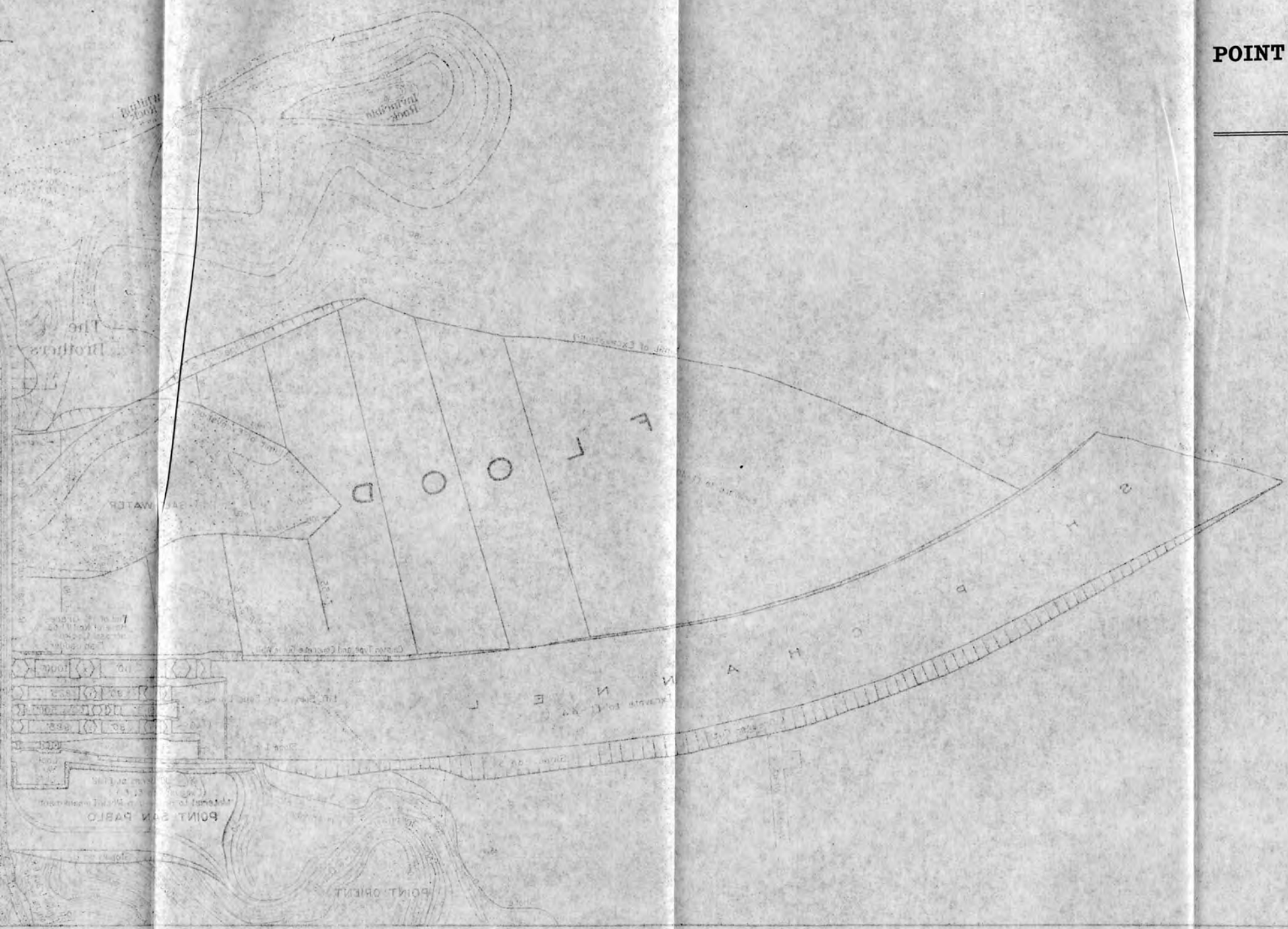
Scale  
 PRELIMINARY DESIGN

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 CONTROL WORKS- 70'x80' GATE  
 PRELIMINARY ESTIMATE NO. 13

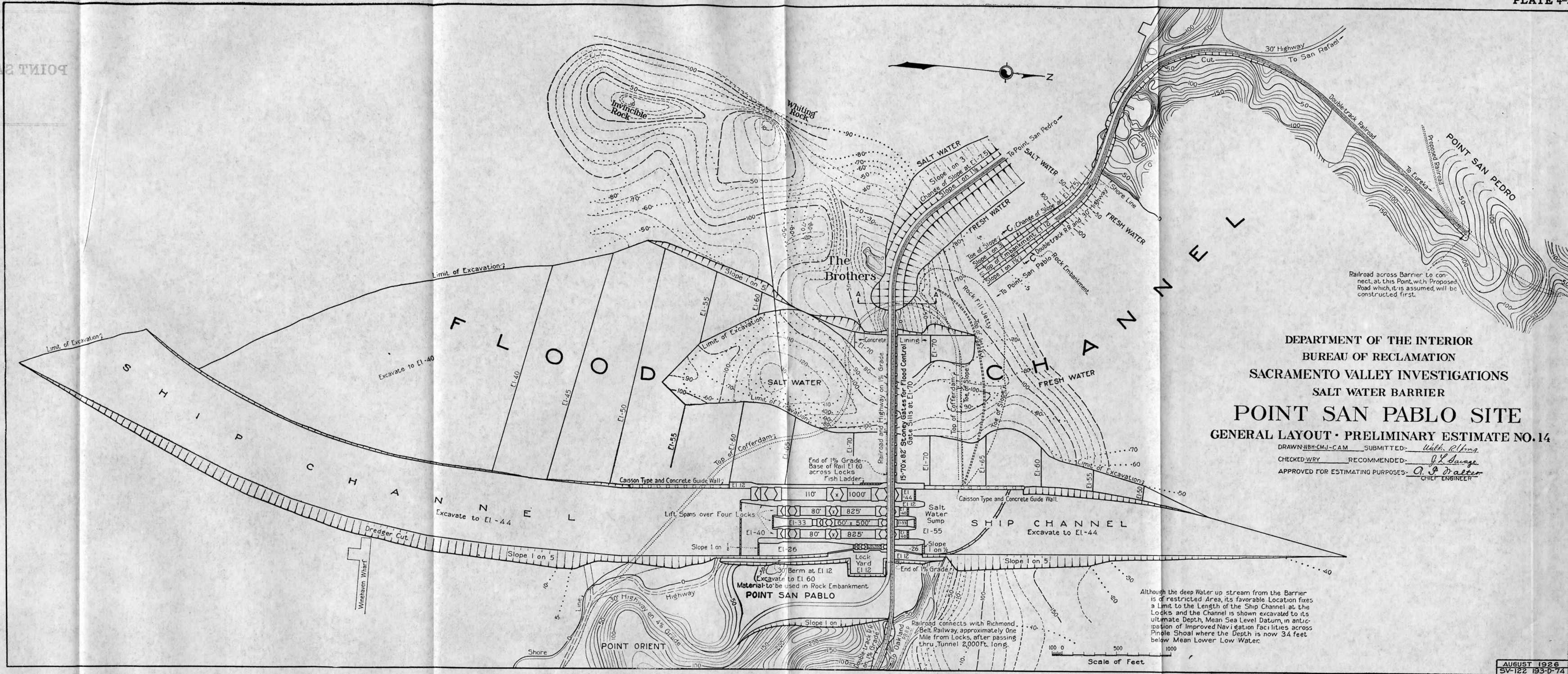
APPROVED FOR ESTIMATING PURPOSES  
*A. F. Dralter*  
 CHIEF ENGINEER

DRAWN C.M.J. C.A.M. SUBMITTED *W. R. Johnson*  
 CHECKED N.B.H. RECOMMENDED *J. B. Shrage*  
 SV-121 Ellensburg, Wash. July 30, 1926 Sheet 5 of 5 193-D-73

Plate 4-51  
**POINT SAN PABLO SITE, GENERAL LAYOUT**  
Preliminary Estimate No. 14



POINT SAN PABLO  
Preliminary



DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
**POINT SAN PABLO SITE**  
 GENERAL LAYOUT - PRELIMINARY ESTIMATE NO. 14

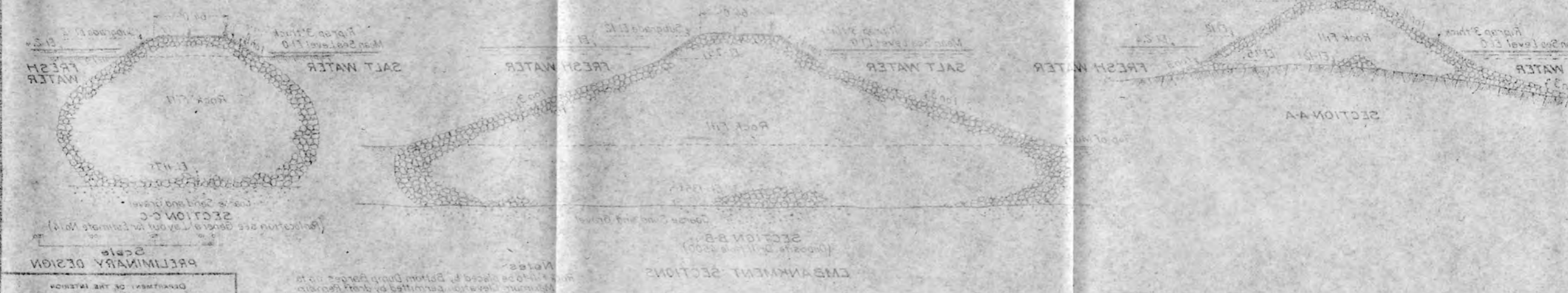
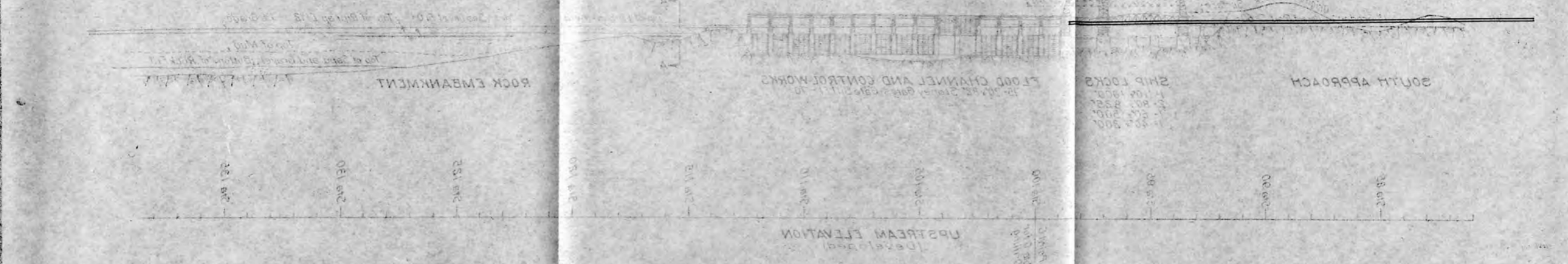
DRAWN NBH-CMJ-CAM SUBMITTED: *W. R. King*  
 CHECKED WRY RECOMMENDED: *J. L. Savage*  
 APPROVED FOR ESTIMATING PURPOSES: *A. P. Walter*  
 CHIEF ENGINEER

Although the deep water up stream from the Barrier is of restricted Area, its favorable Location fixes a Limit to the Length of the Ship Channel at the Locks and the Channel is shown excavated to its ultimate Depth, Mean Sea Level Datum, in anticipation of Improved Navigation Facilities across Pile Shoal where the Depth is now 34 feet below Mean Lower Low Water.

Scale of Feet  
 0 500 1000

Plate 4-52

ELEVATION AND SECTIONS  
Preliminary Estimate No. 14

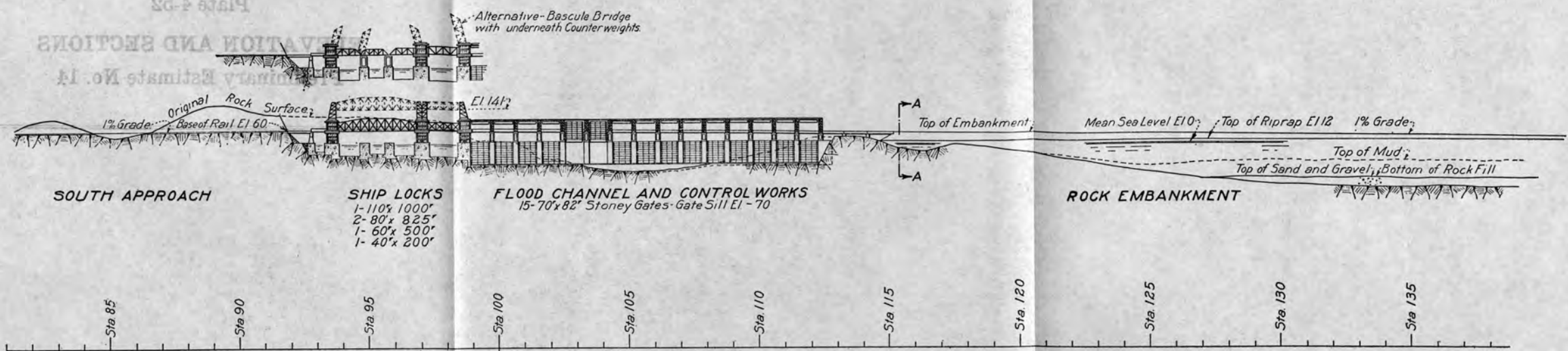


DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SALT WATER BARRIER  
ELEVATION AND SECTIONS  
PRELIMINARY ESTIMATE NO. 14  
Scale  
PRELIMINARY DESIGN

APPROVED FOR ESTIMATING PURPOSES  
CHIEF ENGINEER  
DATE: 4 10  
DRAWN BY: [Signature]

2V-123 / 193-0-73

Plate 4-52  
ELEVATION AND SECTIONS  
Preliminary Estimate No. 14



SOUTH APPROACH

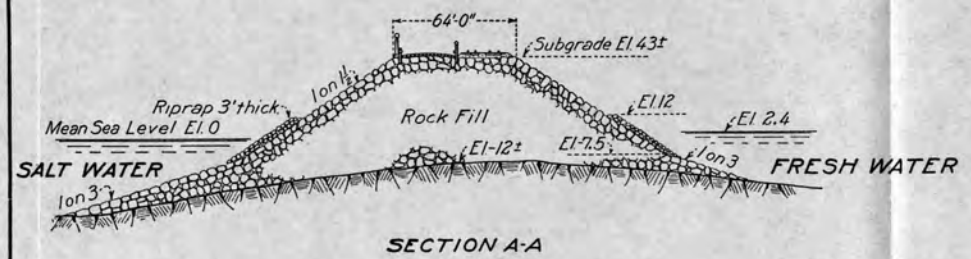
SHIP LOCKS  
1- 110'x 1000'  
2- 80'x 825'  
1- 60'x 500'  
1- 40'x 200'

FLOOD CHANNEL AND CONTROL WORKS  
15- 70'x 82' Stony Gates Gate Sill El - 70

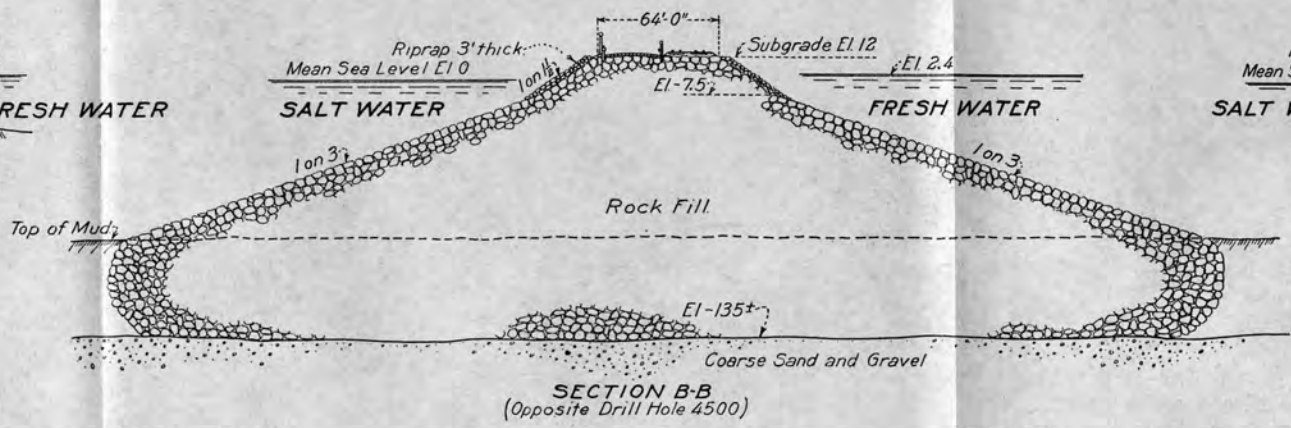
ROCK EMBANKMENT

UPSTREAM ELEVATION  
(Developed)

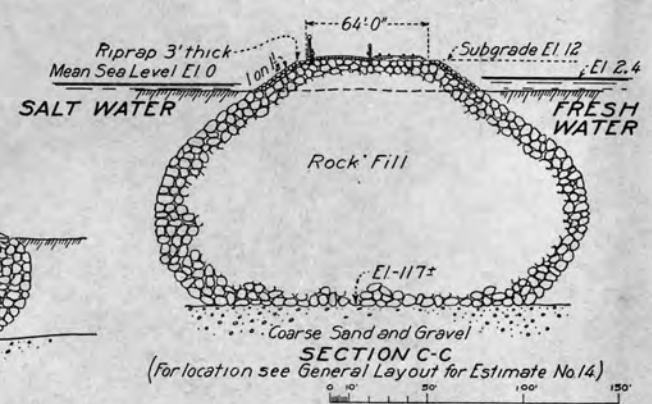
Point C  
Sta 0 for  
Drilling



SECTION A-A



SECTION B-B  
(Opposite Drill Hole 4500)  
EMBANKMENT SECTIONS



SECTION C-C  
(For location see General Layout for Estimate No 14)

Scale  
PRELIMINARY DESIGN

Notes:-  
Rock Fill to be placed by Bottom Dump Barges up to  
Maximum Elevation permitted by draft Remain-  
der to be placed by Derrick Barges and Skips

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

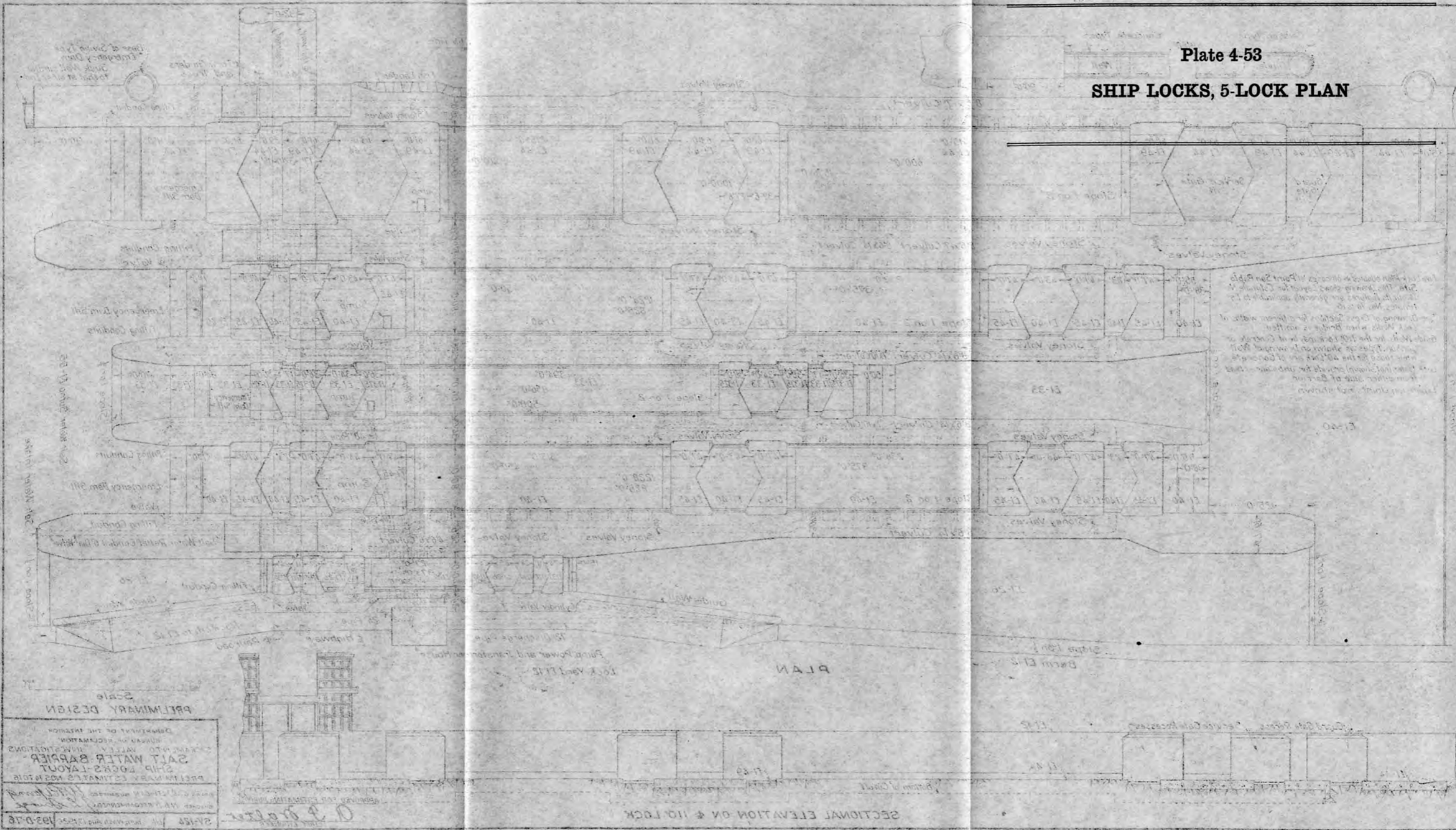
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER  
ELEVATION AND SECTIONS**  
PRELIMINARY ESTIMATE NO 14

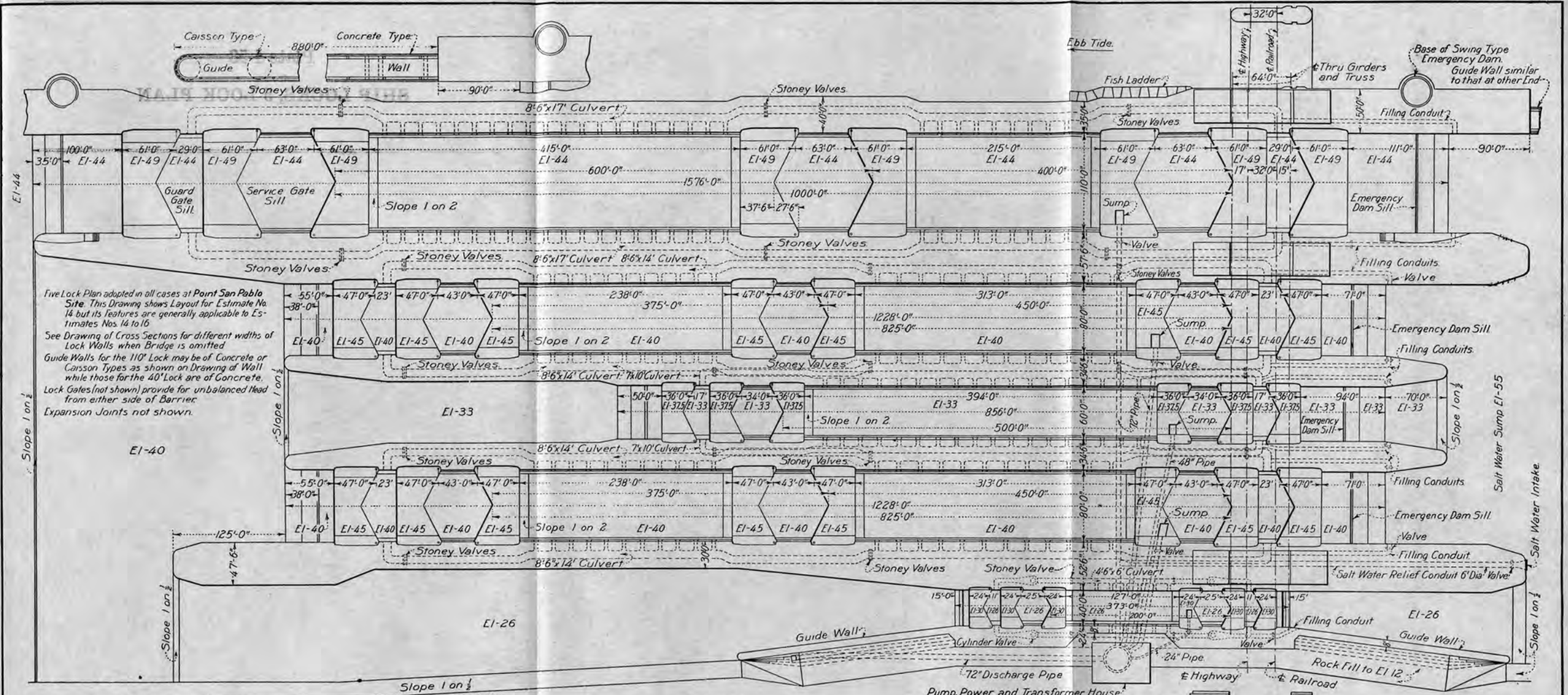
DRAWN: C.M.J.-L.T.F.-C.A.M. SUBMITTED: *W. H. Young*  
CHECKED: N.B.H. RECOMMENDED: *J. D. Savage*

SV-123 Ellensburg, Wash. Aug. 12, 1926. 193-D-75

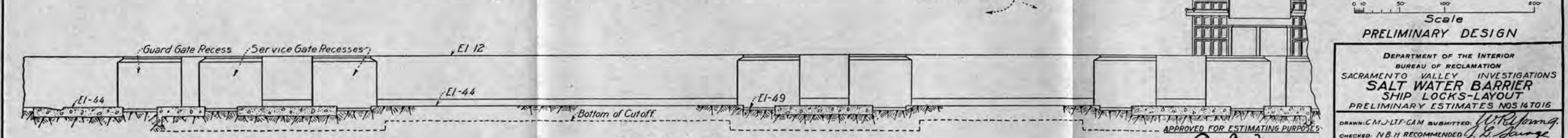
Plate 4-53

SHIP LOCKS, 5-LOCK PLAN





PLAN



Scale  
 PRELIMINARY DESIGN

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATION'S  
**SALT WATER BARRIER**  
 SHIP LOCKS-LAYOUT  
 PRELIMINARY ESTIMATES NOS. 14 TO 16  
 DRAWN: C.M. J. LIF-CAM SUBMITTED: *W. P. ...*  
 CHECKED: N.B.H. RECOMMENDED: *J. S. ...*  
 APPROVED FOR ESTIMATING PURPOSES:  
**A. P. Dralter**  
 CHIEF ENGINEER  
 SV-124 Ellensburg, Wash. Aug. 17, 1926 193-D-76

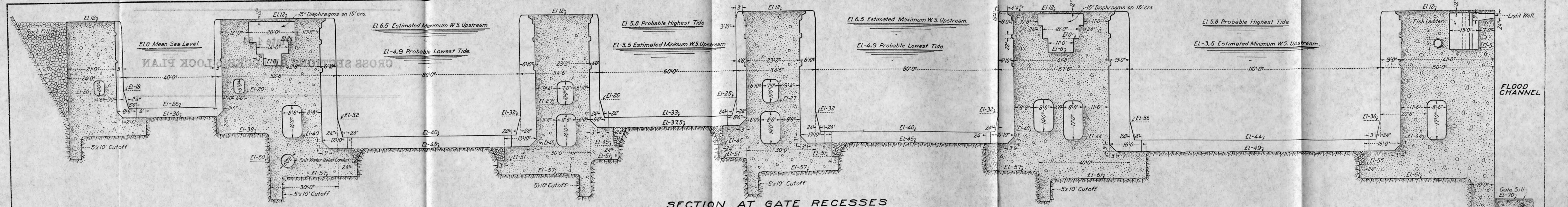
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Plate 4-54

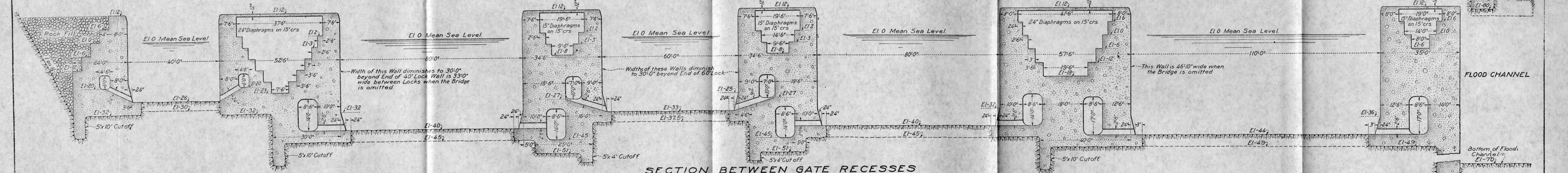
CROSS SECTIONS OF LOCKS, 5-LOCK PLAN

---



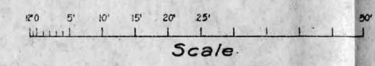


SECTION AT GATE RECESSES



SECTION BETWEEN GATE RECESSES

**Notes:-**  
 Five Lock Plan adopted for Point San Pablo Site. This Drawing shows Sections for Estimate No 14 but its Features are generally applicable to Estimates Nos 14 to 16  
 When Bridge is provided the 60' Lock and both 80' Locks are crossed by a Lift Span 31' long and the 110' Lock by a Lift Span 140' long. The arrangement of Ends of Lift Spans is similar to that for the Three Lock Plan. The clearance is the same  
 Reinforcing Steel not shown. In Salt Water same to be 12" from Face of Concrete  
 Lock Gates not shown.



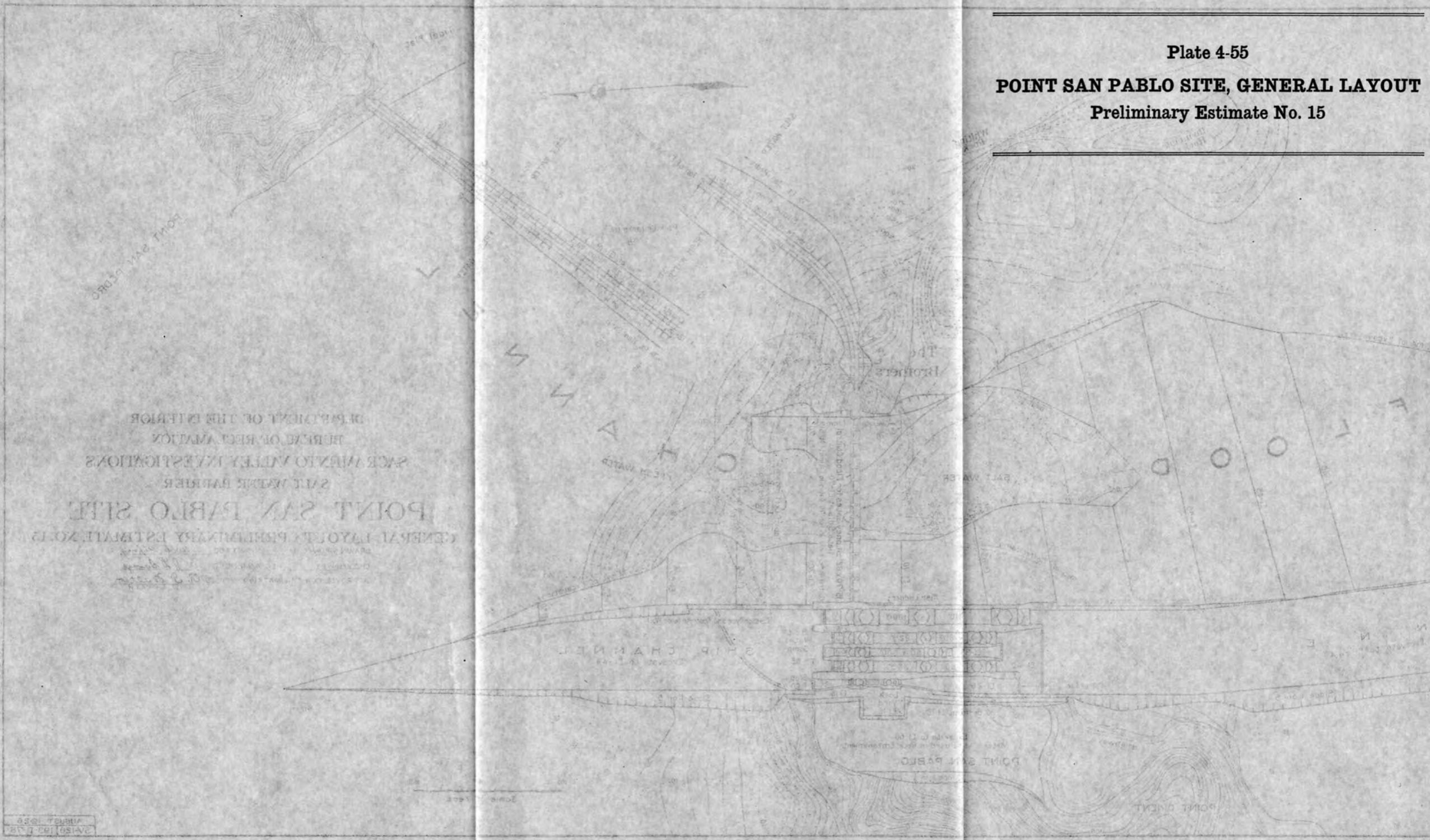
APPROVED FOR ESTIMATING PURPOSES:  
*A. J. Walter*  
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 SHIP LOCKS - CROSS SECTIONS  
 PRELIMINARY ESTIMATES NOS 14 TO 16  
 DRAWN: E.M.L.C.A.M. SUBMITTED: *A.P. Jones*  
 CHECKED: N.B.H. RECOMMENDED: *A. J. Walter*  
 SV-125 [Elkensburg Wash Aug 28 1933-D-77]

Plate 4-55

POINT SAN PABLO SITE, GENERAL LAYOUT

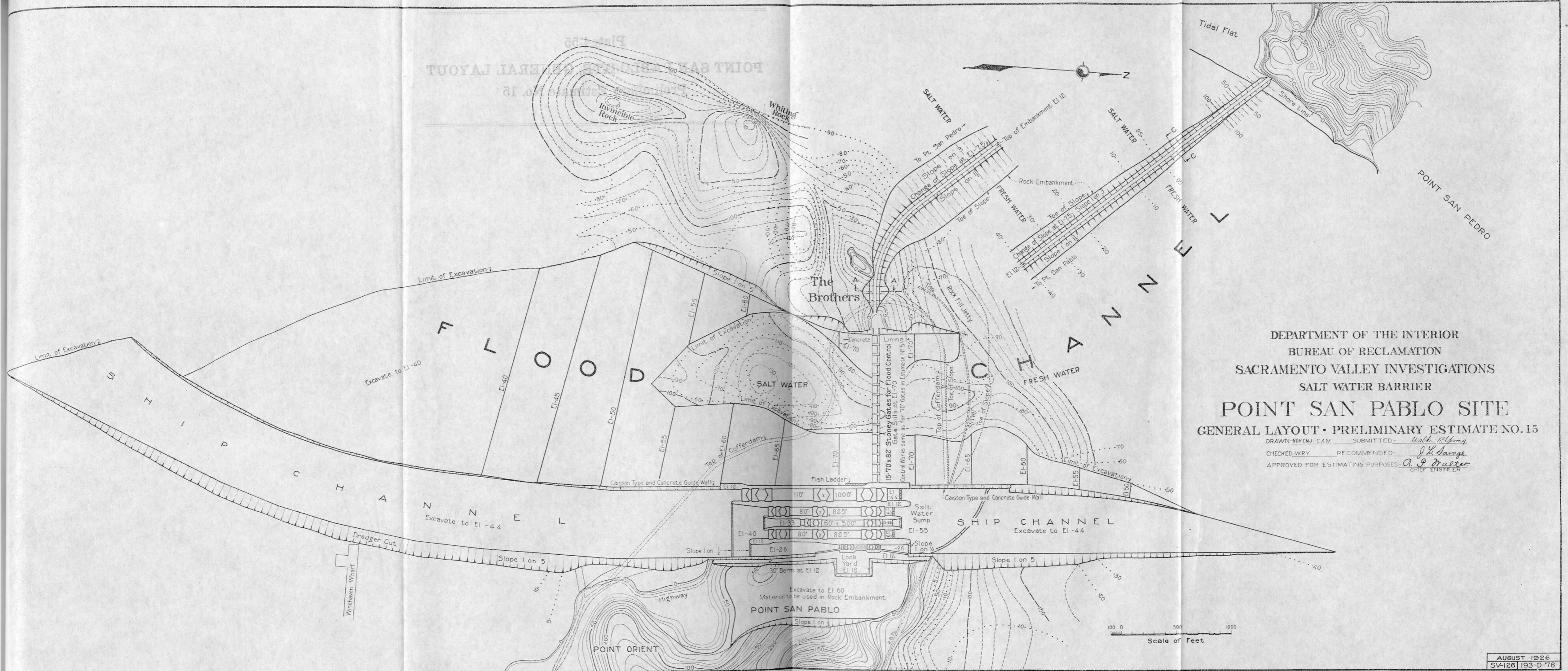
Preliminary Estimate No. 15



GENERAL LAYOUT, PRELIMINARY ESTIMATE NO. 15  
 POINT SAN PABLO SITE  
 SALT WATER BARRIER  
 SACRAMENTO VALLEY INVESTIGATIONS  
 BUREAU OF RECLAMATION  
 DEPARTMENT OF THE INTERIOR

APR 1936  
 3515 (100-7-38)

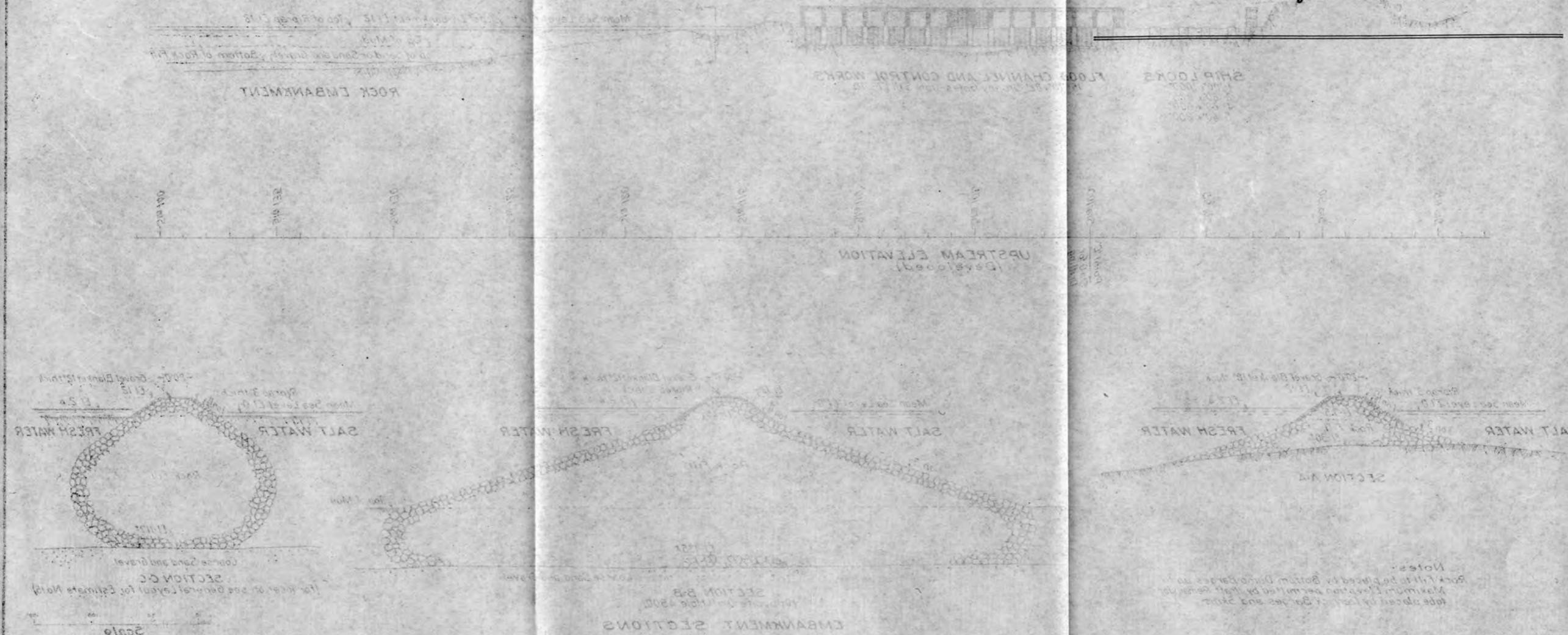
POINT SAN PABLO GENERAL LAYOUT



DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 POINT SAN PABLO SITE  
 GENERAL LAYOUT - PRELIMINARY ESTIMATE NO. 15

DRAWN-NBHCWJ-CAM SUBMITTED- *Walter P. Young*  
 CHECKED-WRY RECOMMENDED- *J. L. Savage*  
 APPROVED FOR ESTIMATING PURPOSES- *A. J. Walter* CHIEF ENGINEER

Plate 4-56  
**ELEVATION AND SECTIONS**  
 Preliminary Estimate No. 15



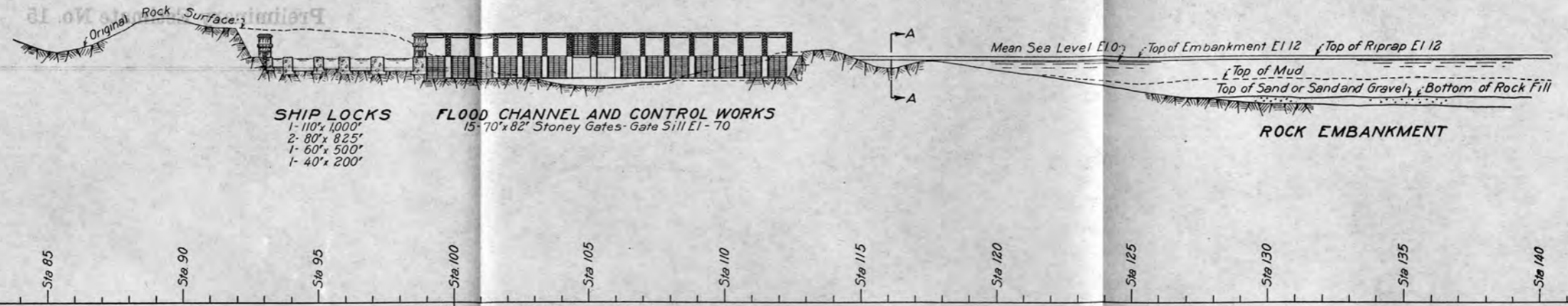
DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY DIVISION  
**SALT WATER BARRIER**  
 ELEVATION AND SECTIONS  
 PRELIMINARY ESTIMATE NO. 15

APPROVED FOR ESTIMATING PURPOSES  
*D. J. Miller*  
 CHIEF ENGINEER

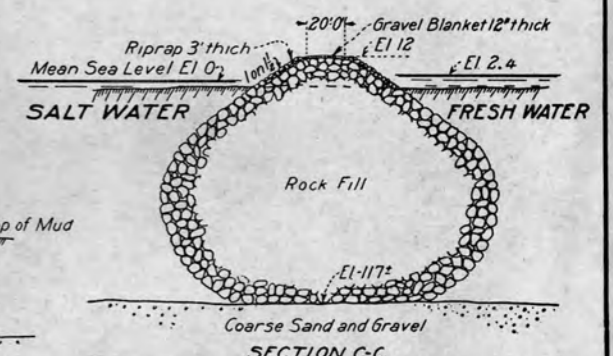
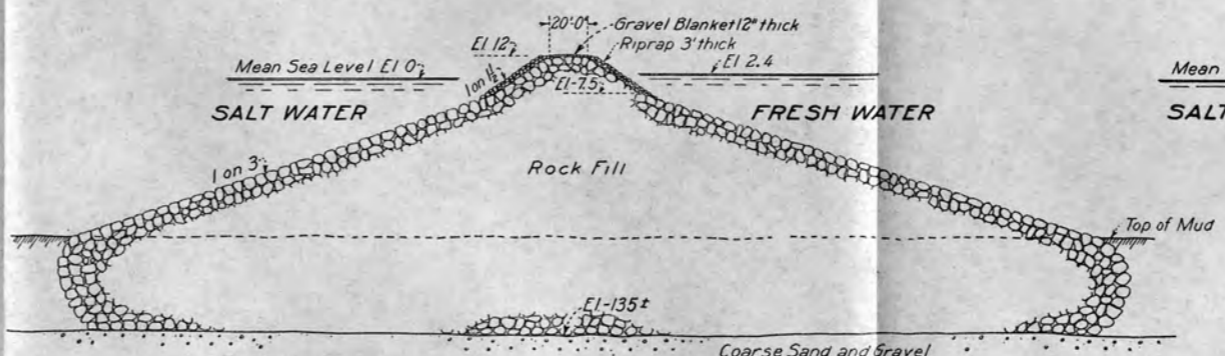
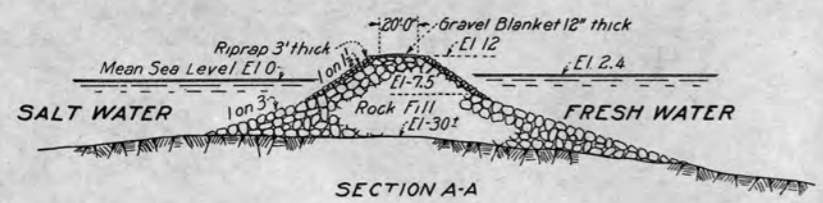
24-157 (Amended) Aug 14, 1935 103-B-75

Notes:  
 Rock fill to be placed in bottom barrier as shown.  
 Maximum elevation permitted on both sides to be about 1.5 feet and shown.

Plate 4-56  
ELEVATION AND SECTIONS  
Preliminary Estimate No. 15

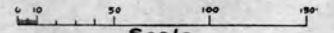


**UPSTREAM ELEVATION**  
(Developed)



**Notes:-**  
 Rock Fill to be placed by Bottom Dump Barges up to Maximum Elevation permitted by draft Remainder to be placed by Derrick Barges and Skips

**EMBANKMENT SECTIONS**



**PRELIMINARY DESIGN**

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 ELEVATION AND SECTIONS  
 PRELIMINARY ESTIMATE NO. 15

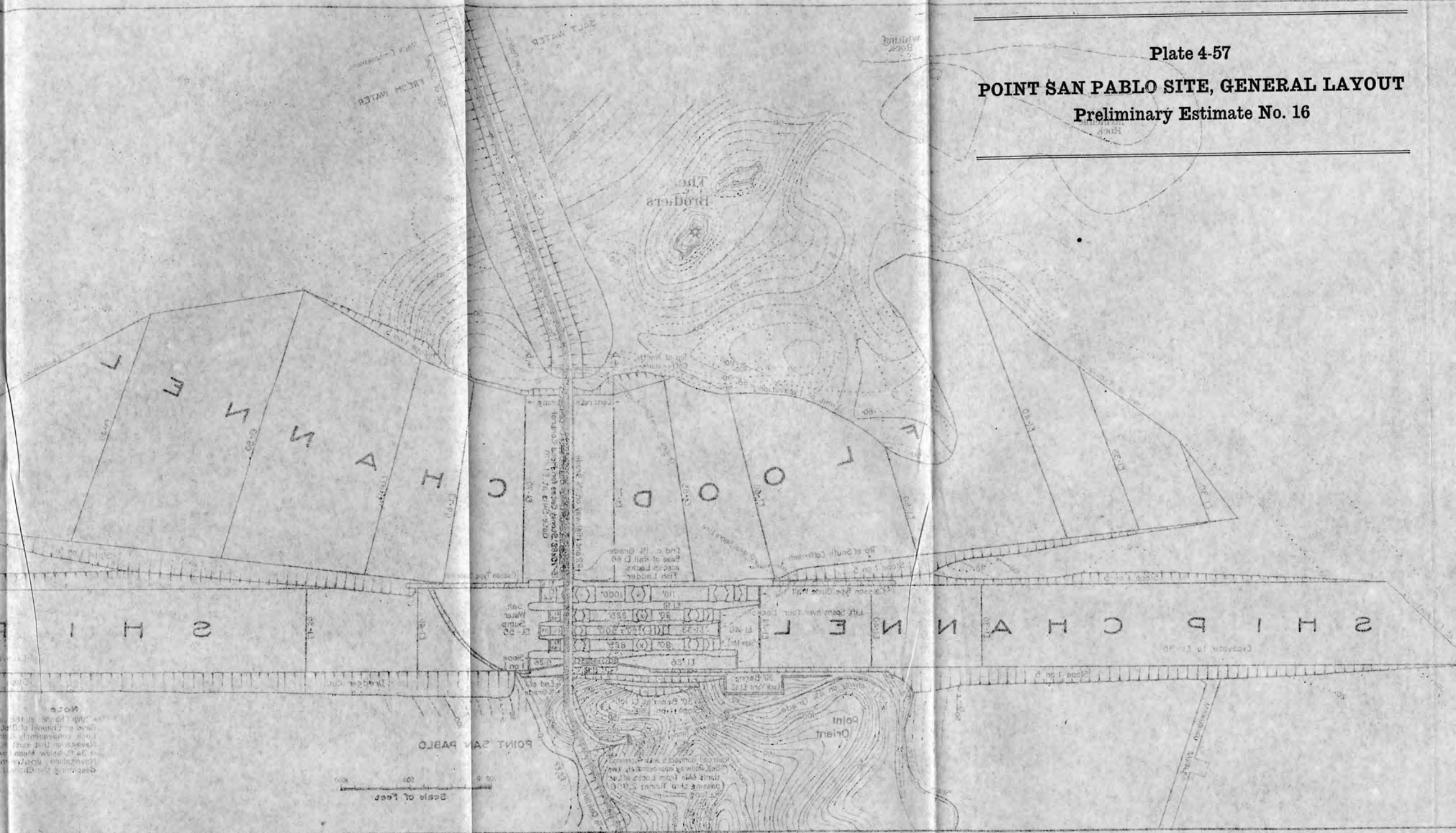
APPROVED FOR ESTIMATING PURPOSES:  
*A. F. Dralter*  
 CHIEF ENGINEER

DRAWN: C.M.J. L.T.F.-C.A.M. SUBMITTED: *W. H. Johnson*  
 CHECKED: N.B.H. RECOMMENDED: *J. H. Savage*  
 SV-127 Ellensburg, Wash Aug 14, 1926 193-D-79

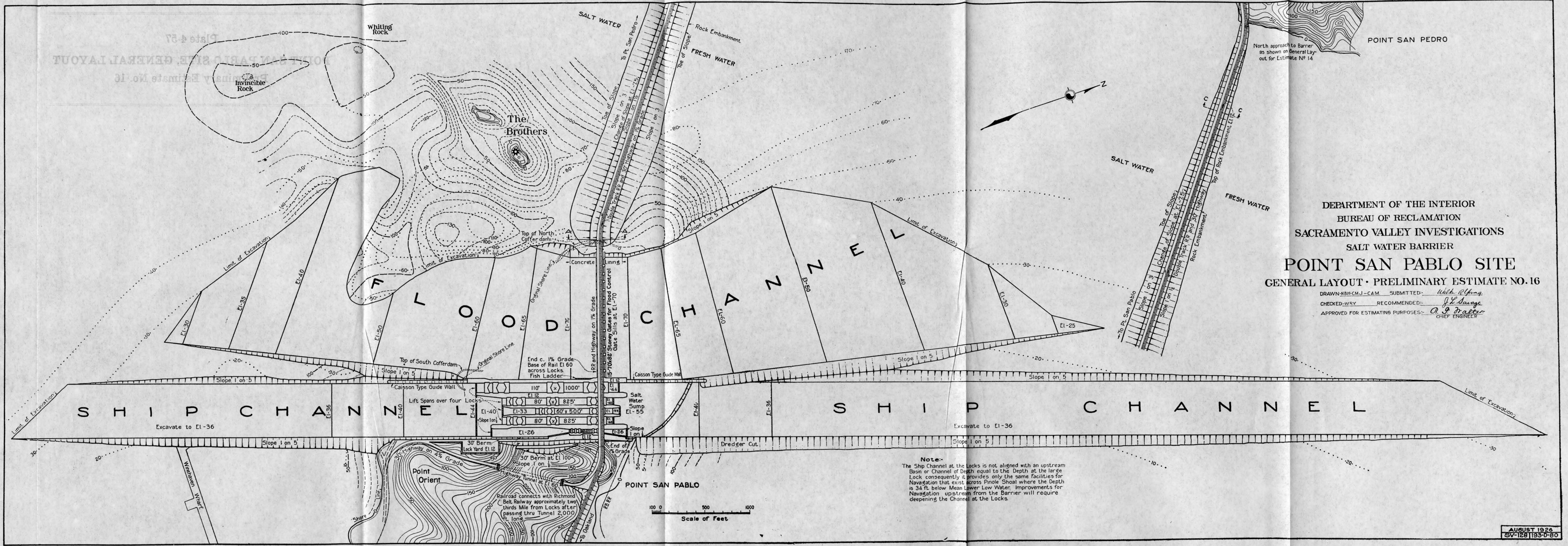
Plate 4-57

POINT SAN PABLO SITE, GENERAL LAYOUT

Preliminary Estimate No. 16



Note:  
 as shown in the  
 plan view of the  
 site, the channel  
 is to be 100 feet  
 wide at the  
 bottom and 200  
 feet wide at the  
 top. The channel  
 is to be 100 feet  
 deep at the  
 bottom and 200  
 feet deep at the  
 top. The channel  
 is to be 100 feet  
 wide at the  
 bottom and 200  
 feet wide at the  
 top. The channel  
 is to be 100 feet  
 deep at the  
 bottom and 200  
 feet deep at the  
 top.

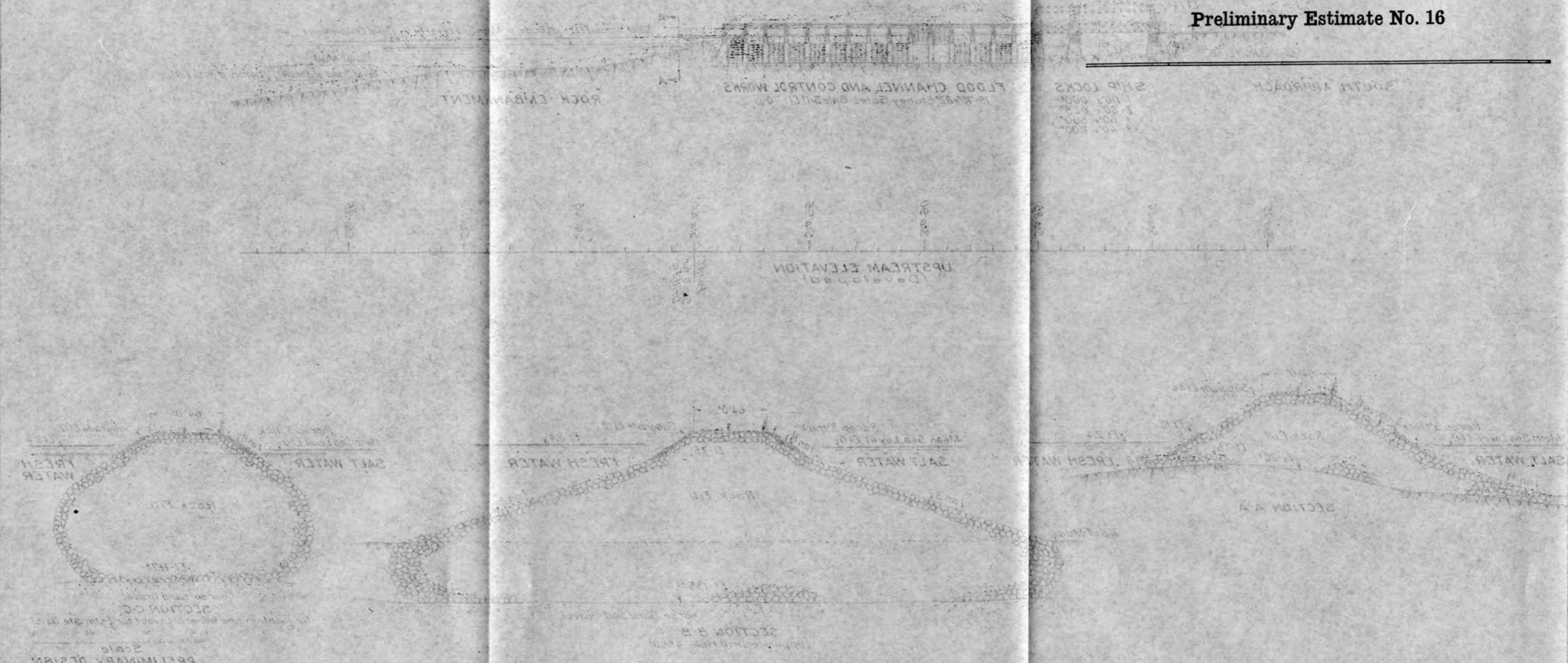


DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
**POINT SAN PABLO SITE**  
 GENERAL LAYOUT - PRELIMINARY ESTIMATE NO. 16

DRAWN-NBH-CMJ-CAM SUBMITTED: *W.H. Blom*  
 CHECKED-WRY RECOMMENDED: *J.L. Savage*  
 APPROVED FOR ESTIMATING PURPOSES: *A.J. Walter*  
 CHIEF ENGINEER

**Note:**  
 The Ship Channel at the Locks is not aligned with an upstream Basin or Channel of Depth equal to the Depth at the large Lock consequently it provides only the same facilities for Navigation that exist across Pinole Shoal where the Depth is 34 ft. below Mean Lower Low Water. Improvements for Navigation upstream from the Barrier will require deepening the Channel at the Locks.

Plate 4-58  
**ELEVATION AND SECTIONS**  
 Preliminary Estimate No. 16



DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SALT WATER BARRIER  
 ELEVATION AND SECTIONS  
 PRELIMINARY ESTIMATE NO. 16  
 DRAWN BY: [Signature]  
 CHECKED BY: [Signature]  
 DATE: 1933-08-11

APPROVED FOR ESTIMATING PURPOSES  
 [Signature]  
 Note: Rock fill to be placed in bottom of barrier as shown in section and estimated in this preliminary estimate. Location of barrier barrier and rock fill to be shown in plan view.

EMBANKMENT SECTIONS

SECTION B-B

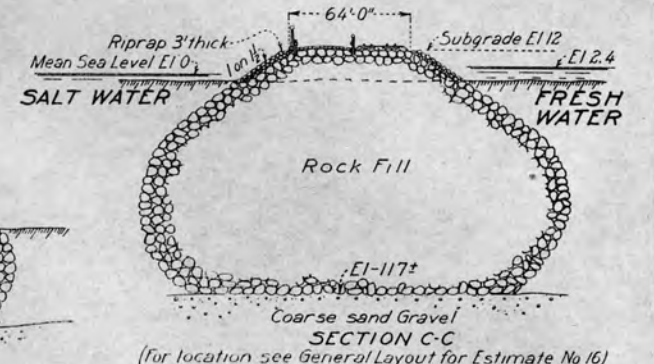
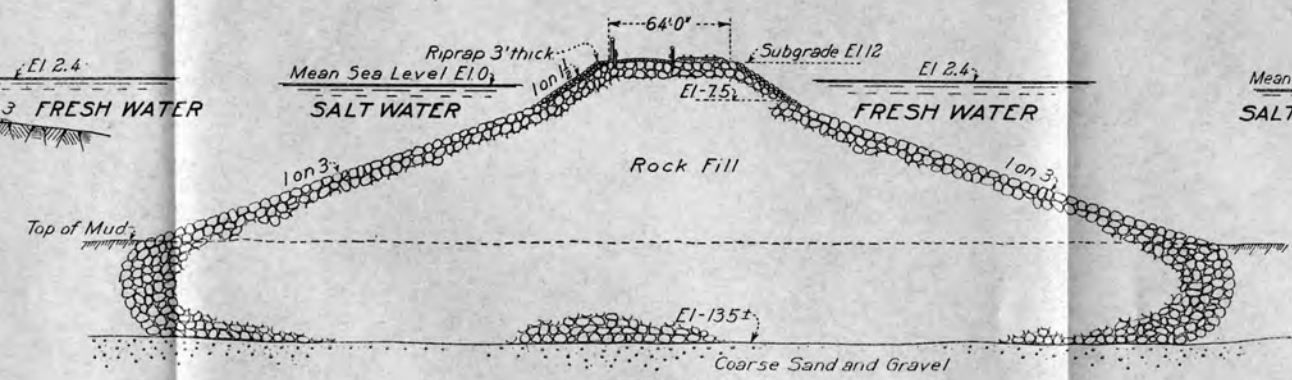
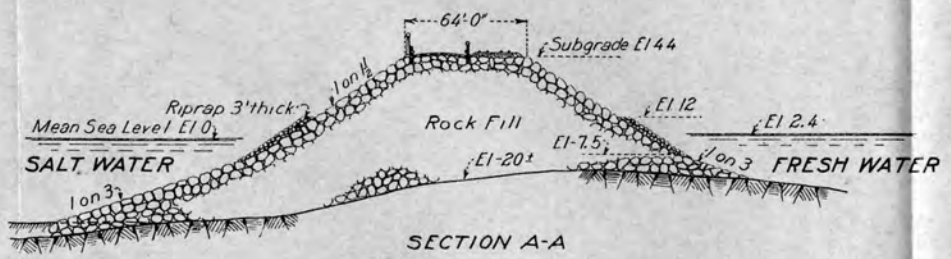
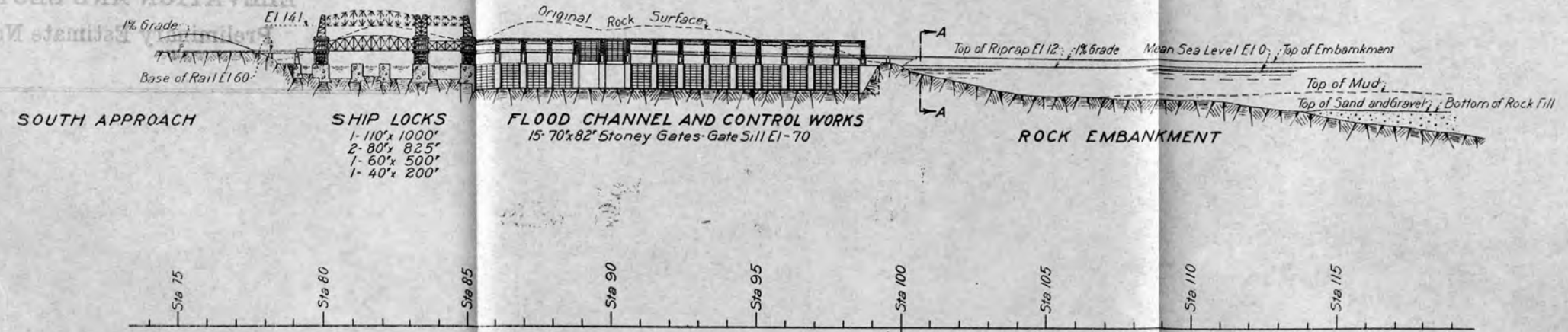
SECTION C-C

SECTION A-A



Plate 4-58  
ELEVATION AND SECTIONS  
Preliminary Estimate No. 16

Bascule Bridge shown on Upstream  
Elevation for Estimate No. 14 may  
be used as Alternative to Vertical  
Lift.



**EMBANKMENT SECTIONS**

Note:  
 Rock Fill to be placed by Bottom Dump Barges up to  
 Maximum Elevation permitted by Draft Remainder  
 to be placed by Derrick Barges and Skips

Scale  
**PRELIMINARY DESIGN**

APPROVED FOR ESTIMATING PURPOSES  
*R. A. Dralter*  
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 ELEVATION AND SECTIONS  
 PRELIMINARY ESTIMATE NO. 16

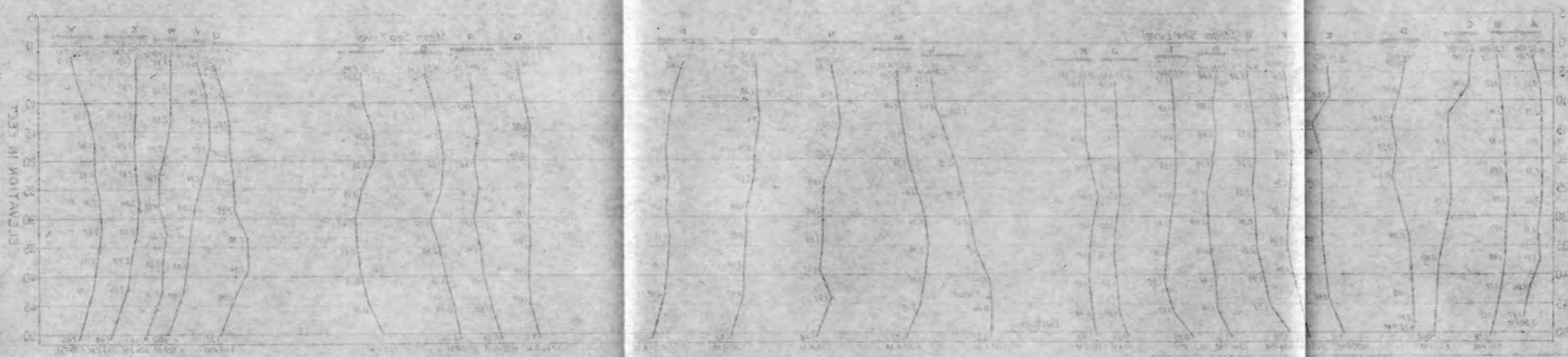
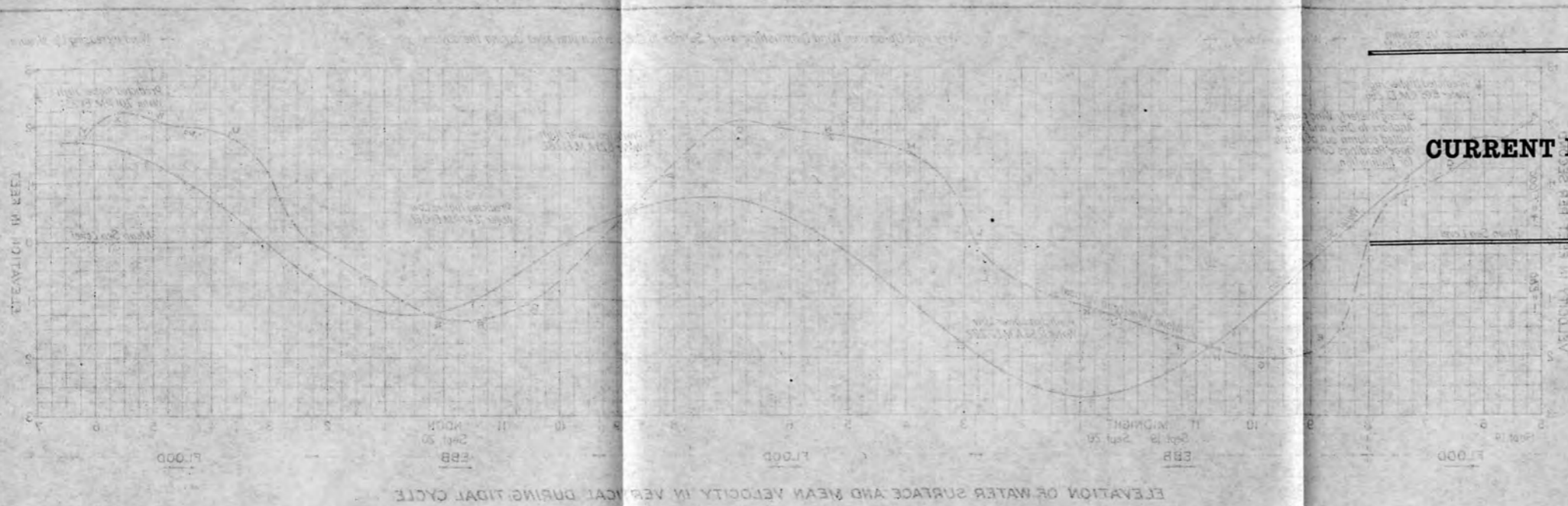
DRAWN: C.M.J. L.T.F.-C.A.M. SUBMITTED: *W. R. Johnson*  
 CHECKED: N.B.H. RECOMMENDED: *P. B. Savage*

SV-129 Ellensburg, Wash Aug 20, 1926 193-D-81

Plate 5-1

CURRENT METER MEASUREMENTS

Sheet 1 of 5

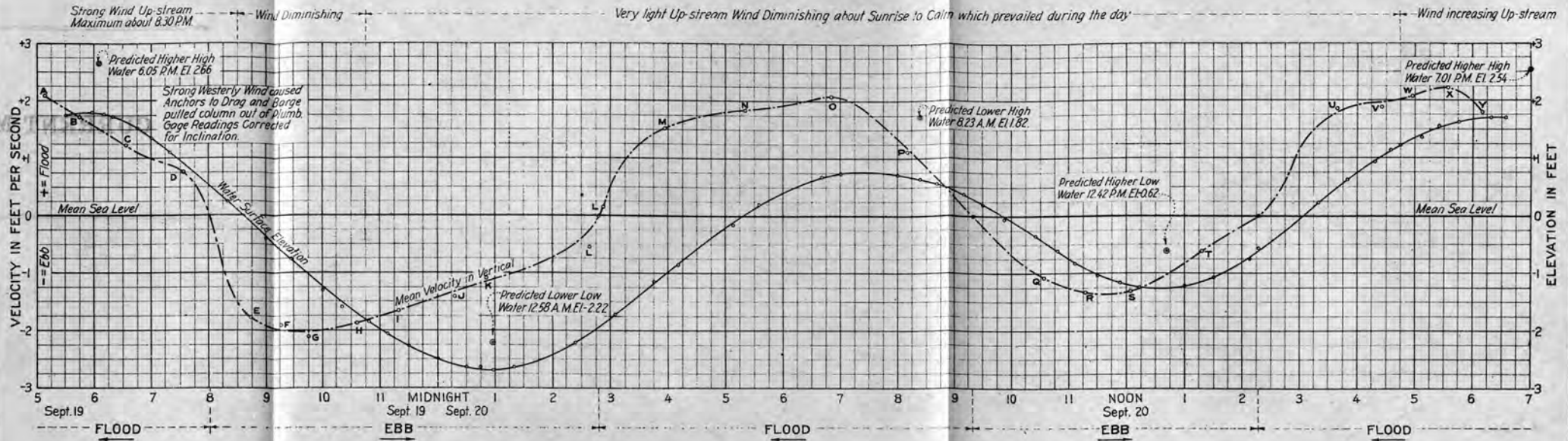


APPROVED FOR ESTIMATING PURPOSES

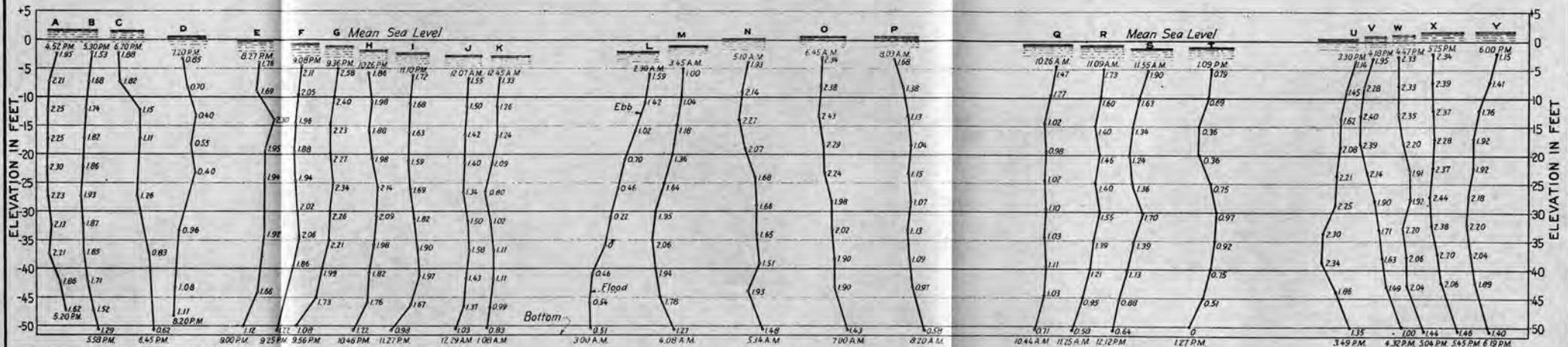
*D. J. Water*  
CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATION  
SALT WATER CHANNEL  
SALMON POINT SITE  
GAGE HEIGHTS AND VELOCITIES  
TIDAL CYCLE SEPT 19 AND 20, 1954

Observations were made from 0600 to 2000 hours on Sept 19, 20, and 21, 1954. The water surface elevation and mean velocity were measured at various points in the channel. The velocity profiles were measured at various depths and locations. The water surface elevation and mean velocity were measured at various points in the channel. The velocity profiles were measured at various depths and locations.



ELEVATION OF WATER SURFACE AND MEAN VELOCITY IN VERTICAL DURING TIDAL CYCLE



Observations made from Drill Barge at Hole 2500.  
Water Surface elevations determined from point of known elevation on drill column.  
The time and height of predicted tides at Benicia were determined by applying corrections to figures for Fort Point as described on pages 131, 339, 340 and 372 of Tide Tables for Pacific Coast for 1924, published by the United States Coast and Geodetic Survey.  
Owing to elapse of time between first and last measurements, curves do not represent simultaneous conditions throughout vertical.  
The direction of flow was toward and from the Martinez ferry slip except for a few minutes during each reversal of current when the direction was perpendicular to the prevailing direction

There was no evidence to indicate variance in direction of flow at different depths except in some cases at slack tide when all velocities were low. In many cases the direction of flow was indicated by the inclination of the meter cable. When velocities were too low to carry the cable out of plumb it is believed that with gradually changing velocities at different depths and a constant direction at the surface, a change in direction below the surface cannot be inferred unless the velocities diminished to zero, or nearly zero, at some point of depth. When however the velocities diminished to zero and then increased during successive measurements and a change in direction of surface flow took place during the vertical series, it was assumed that the point of zero flow marked the change in direction below the surface. See measurement L.

APPROVED FOR ESTIMATING PURPOSES-

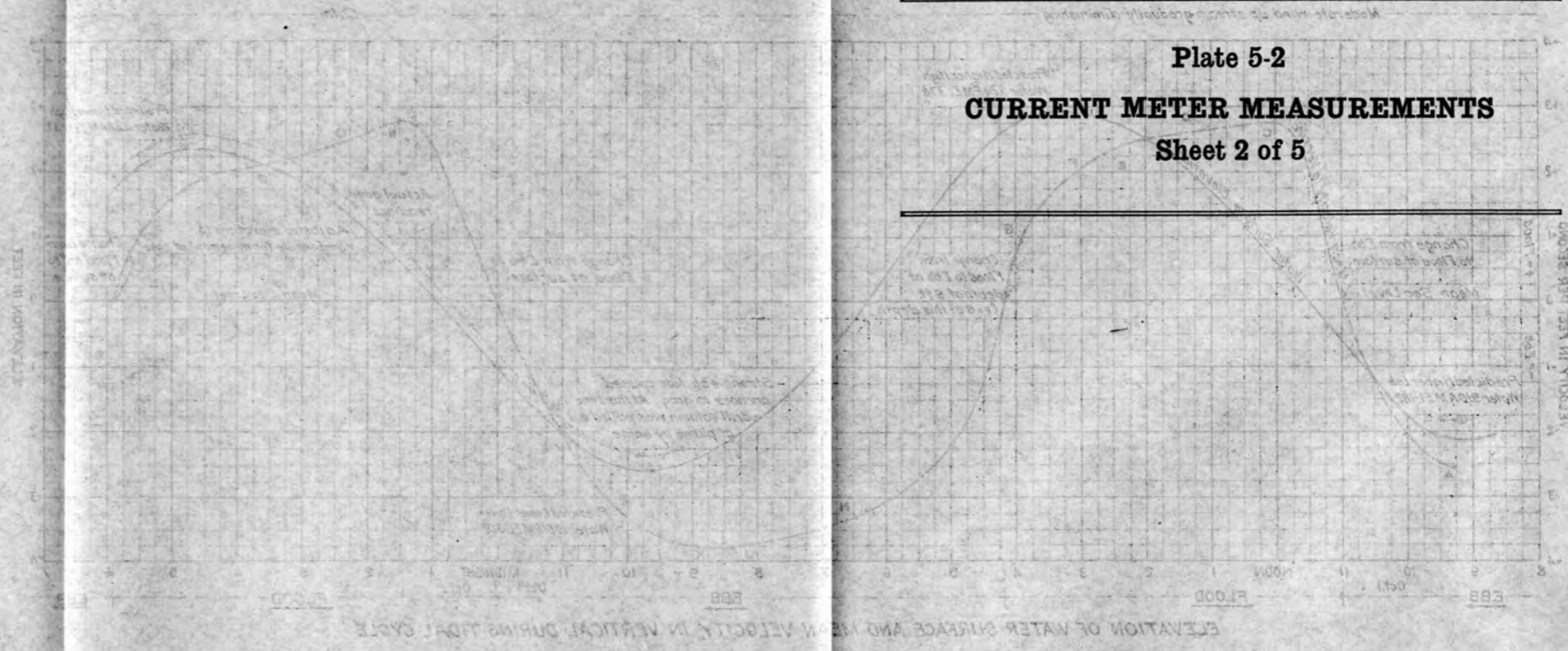
A. J. Dralter  
CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATIONS  
SALT WATER BARRIER  
ARMY POINT SITE  
GAGE HEIGHTS AND VELOCITIES  
TIDAL CYCLE SEPT. 19 AND 20, 1924

DRAWN: R.R.K.-C.B.G. SUBMITTED: W.P. Young  
CHECKED: F.V.S. APPROVED: J.P. Sledge  
SV-4 Berkeley, Calif. Oct 21, 1924 193-D-99

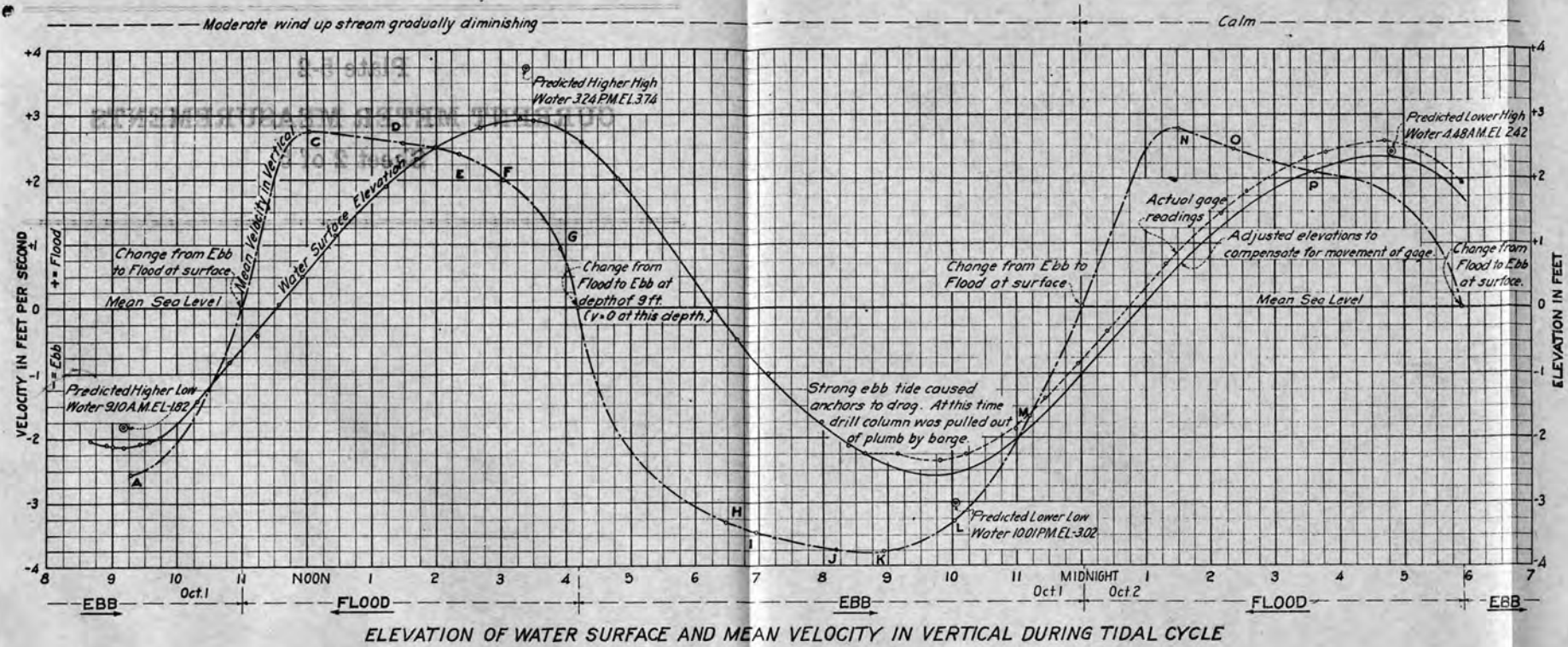
# Plate 5-2 CURRENT METER MEASUREMENTS Sheet 2 of 5

On the left side of the page, there is a vertical column of text, likely bleed-through from the reverse side of the document. The text is mostly illegible due to the image quality and orientation.



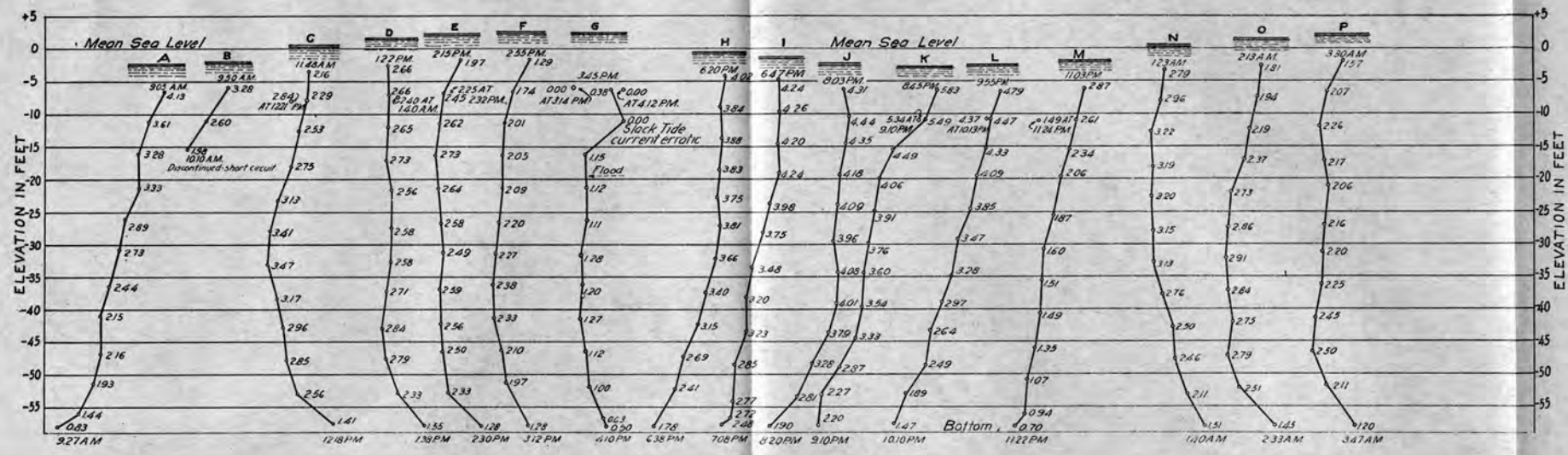
TIDE GAUGE AND VELOCITY  
 DATA FOR THE TIDAL CYCLE  
 AT THE WATER GAUGE  
 STATION NO. 1000  
 DATE: 10/10/50

D. J. [Signature]  
 [Title/Position]



Observations made from Drill Barge at Hole 3550.  
 Water Surface elevations determined from point of known elevation on drill column.  
 The time and height of predicted tides at Benicia were determined by applying corrections to figures for Fort Point as described on pages 132, 339, 340 and 372 of Tide Tables for Pacific Coast for 1924, published by the United States Coast and Geodetic Survey.  
 Owing to elapse of time between first and last measurements, curves do not represent simultaneous conditions throughout vertical.  
 The direction of flow was toward and from the Martinez ferry slip except for a few minutes during each reversal of current when the direction was perpendicular to the prevailing direction.  
 There was no evidence to indicate variance in direction of flow at different depths except in one case (measurement G) at slack tide when all velocities were low. Near the end of this measurement the surface current changed from a direction across the Channel toward Suisun Point to ebb flow although the upstream inclination of cable with meter at depths greater than 35 ft showed that the flood flow had not ceased below the surface. This feature is substantiated by later measurements at other sites and these measurements also indicate that flood flow begins near the bottom before the ebb has ceased at the surface.

ELEVATION OF WATER SURFACE AND MEAN VELOCITY IN VERTICAL DURING TIDAL CYCLE



VELOCITY CURVES  
 (Numbers show velocity in ft per sec)

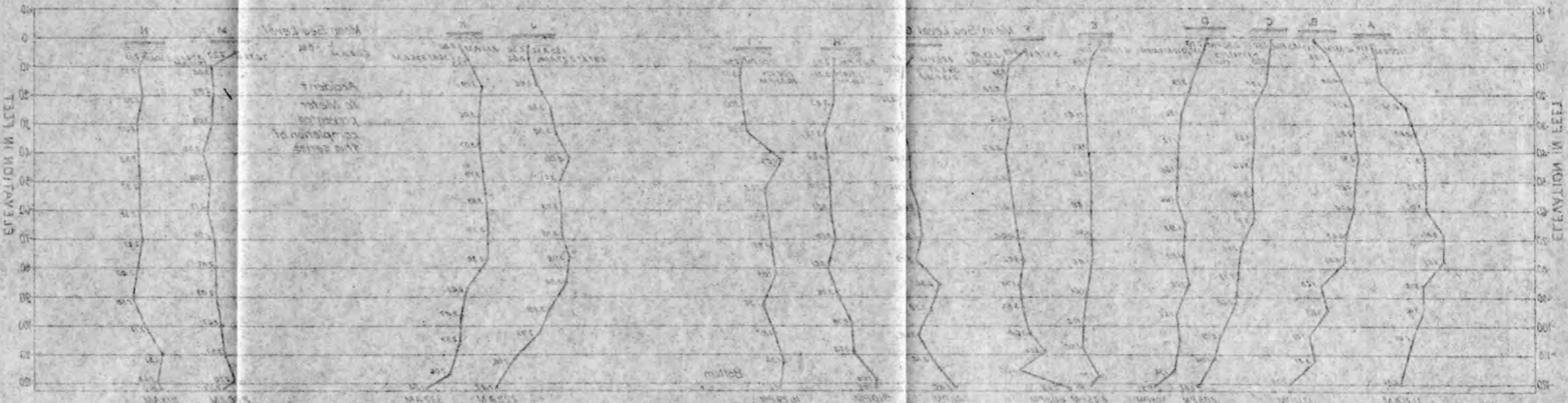
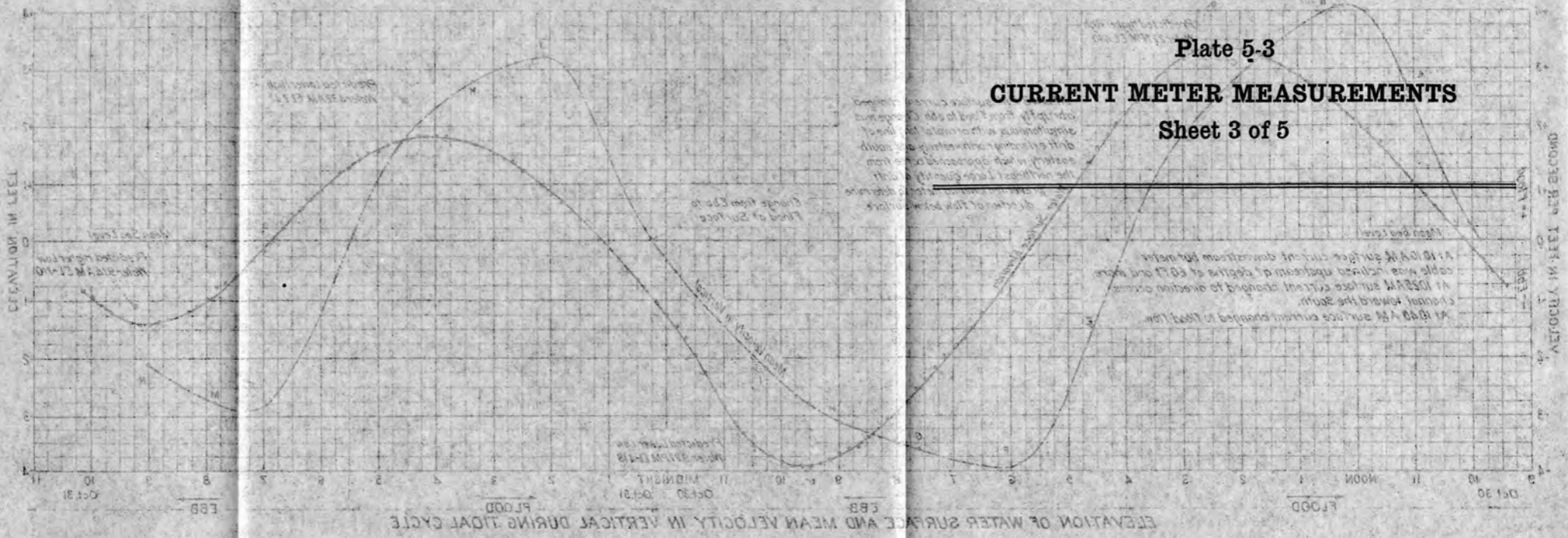


APPROVED FOR ESTIMATING PURPOSES -  
*A. J. Dralter*  
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 ARMY POINT SITE  
 GAGE HEIGHTS AND VELOCITIES  
 TIDAL CYCLE OCT. 1 AND 2, 1924

DRAWN: W.H.H. SUBMITTED: *W.H.H.*  
 CHECKED: T.H.K. APPROVED: *A.S. Sledge*  
 SV-5 Berkeley, Calif. Dec. 11, 1924 193-D-100

# Plate 5-3 CURRENT METER MEASUREMENTS Sheet 3 of 5

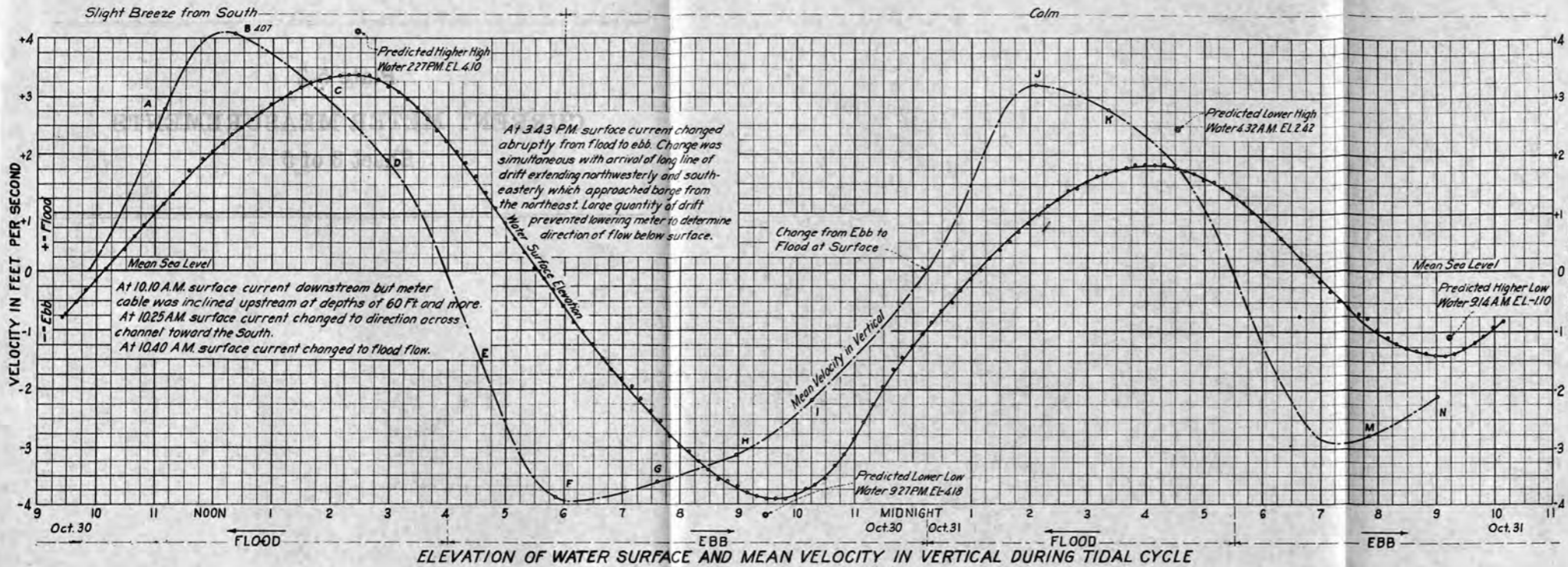


Observations made from 11:00 a.m. to 1:00 p.m. on Oct 30, 1954. The tide and height of water were determined by observations from the tide gauge located on the pier at the mouth of the strait. The tide gauge was installed by the United States Coast and Geodetic Survey. The tide gauge was installed on the pier at the mouth of the strait. The tide gauge was installed on the pier at the mouth of the strait. The tide gauge was installed on the pier at the mouth of the strait.

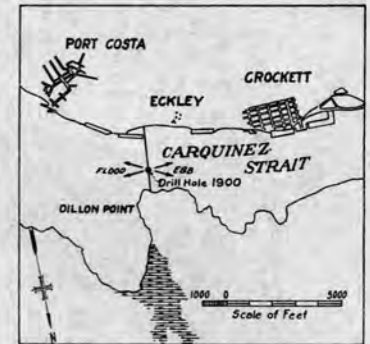
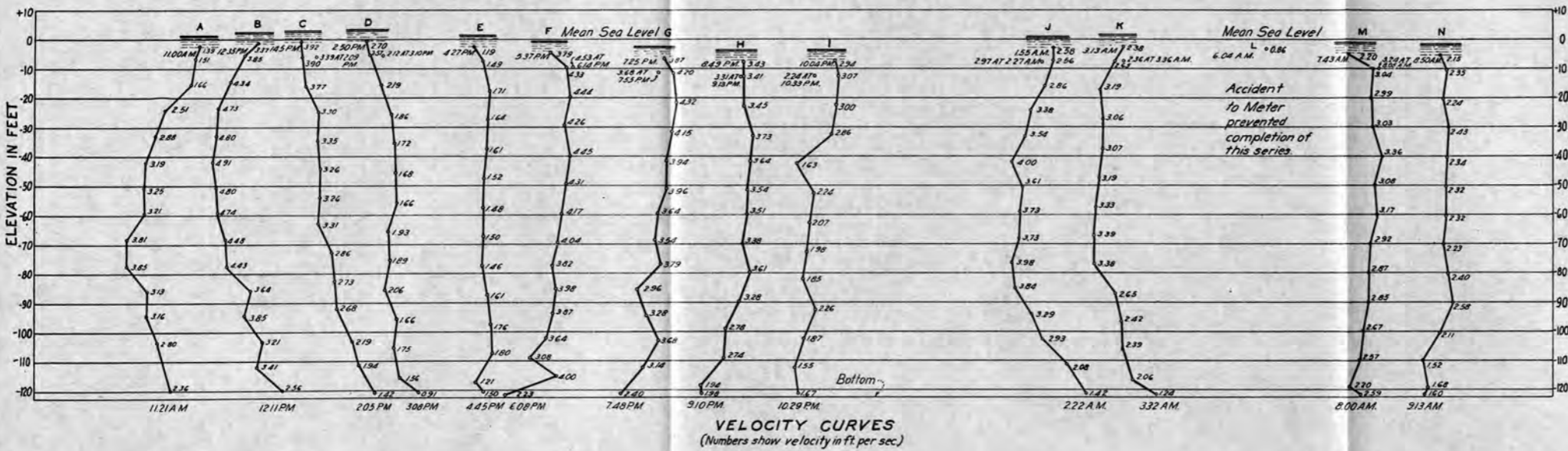


DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATION  
SALT WATER BARRIER  
BILTON POINT SITE  
TIDAL CYCLE OCT 30 AND 31, 1954  
SAGE HEIGHTS AND VELOCITIES

APPROVED FOR ESTIMATING PURPOSES  
D. J. HARRIS  
CHIEF ENGINEER



Observations made from Drill Barge at Hole 1900  
 Water surface elevations determined from gage on pier east of Eckley.  
 The time and height of predicted tides at Dillon Point were determined by applying corrections to figures for Fort Point as described on pages 132, 339, 340 and 372 of Tide Tables for Pacific Coast for 1924, published by the United States Coast and Geodetic Survey.  
 Owing to slope of time between first and last measurements, curves do not represent simultaneous conditions throughout vertical.  
 The direction of flow fluctuated through an angle of 30 degrees during each ebb and flood tide and was never constant for periods of any length.  
 The indications that flood flow begins near the bottom before the ebb has ceased at the surface has substantiated by later measurements at another site. Measurements at other sites prior and subsequent to those at Dillon Point indicate that flood flow is sustained near the bottom after ebb has begun at the surface.



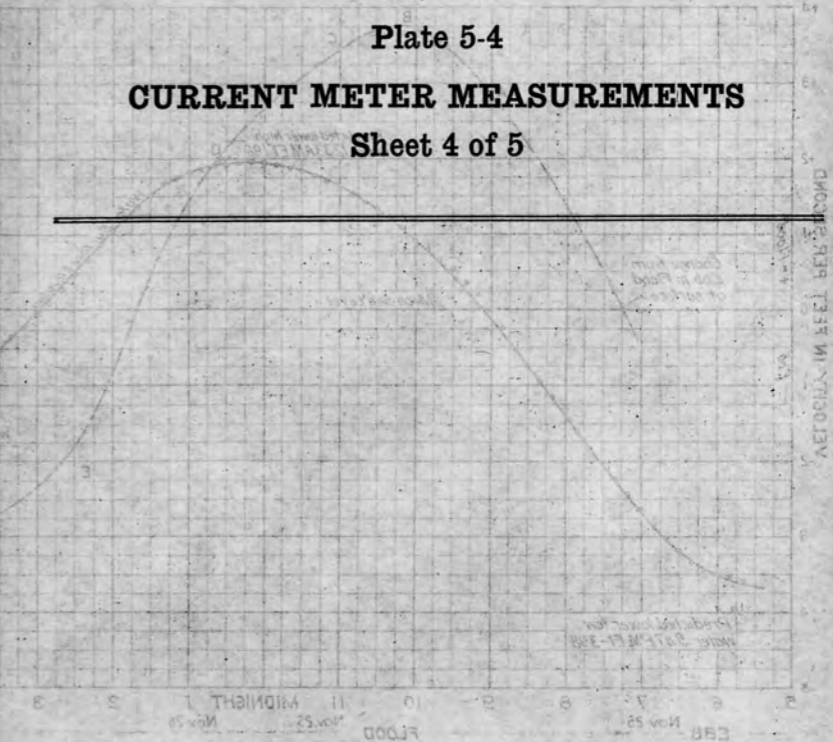
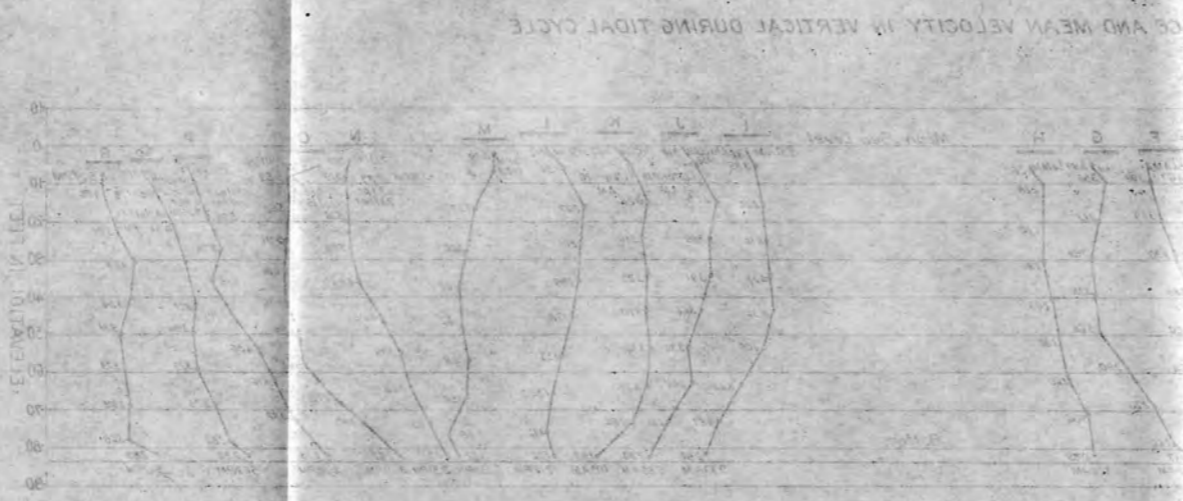
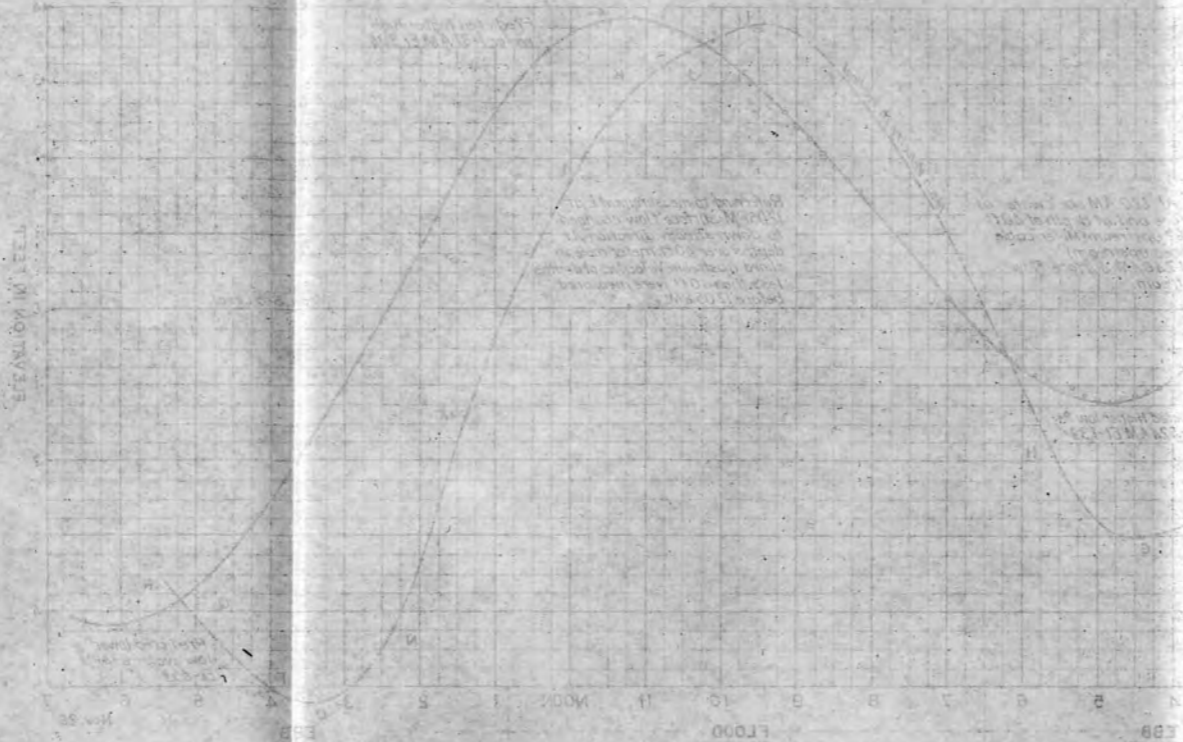
APPROVED FOR ESTIMATING PURPOSES:  
 R. J. Dralter  
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 DILLON POINT SITE  
 SAGE HEIGHTS AND VELOCITIES  
 TIDAL CYCLE OCT. 30 AND 31, 1924  
 DRAWN N.B.H.-H.W.K. SUBMITTED W.H. Young  
 CHECKED F.C. K.S. APPROVED J.H. Savage  
 SV-6 Berkeley, Calif. Dec. 12, 1924 193-D-101

# Plate 5-4 CURRENT METER MEASUREMENTS Sheet 4 of 5

Observations made at Point San Pablo during the tidal cycle of Nov. 25 and 26, 1928. The time and depth of high and low water were determined by observations on the tide gauge at Point San Pablo. The observations were made at the following depths: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000.

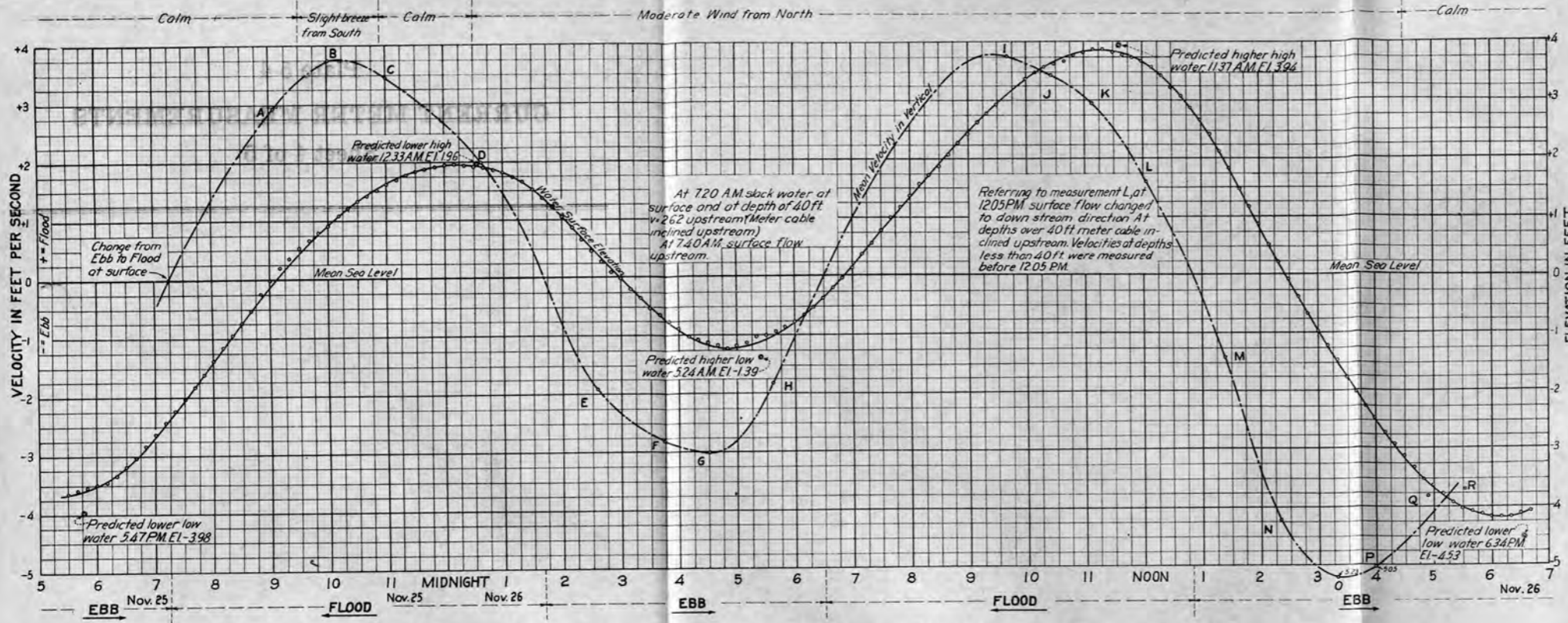
Currents were measured at the following depths: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550, 560, 570, 580, 590, 600, 610, 620, 630, 640, 650, 660, 670, 680, 690, 700, 710, 720, 730, 740, 750, 760, 770, 780, 790, 800, 810, 820, 830, 840, 850, 860, 870, 880, 890, 900, 910, 920, 930, 940, 950, 960, 970, 980, 990, 1000.



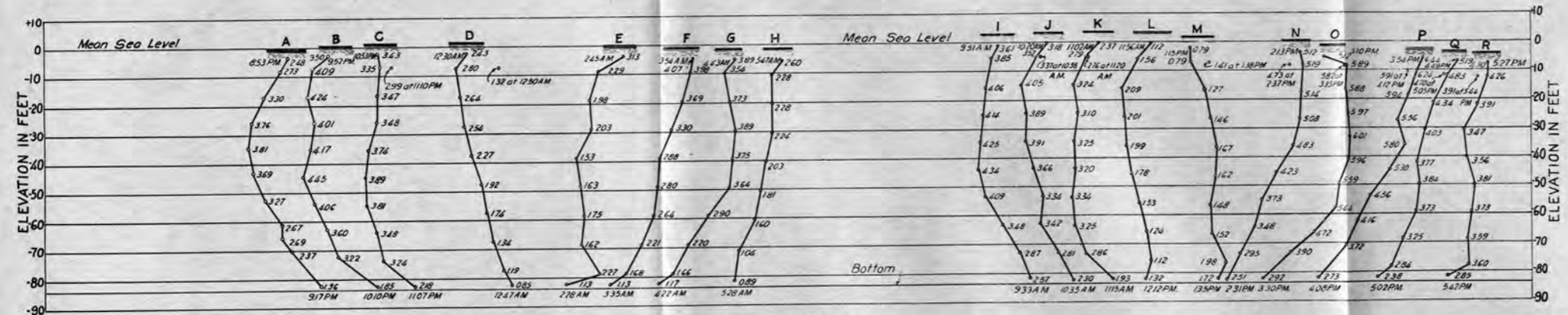
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATIONS  
SALT WATER BARRIER  
POINT SAN PABLO SITE  
GAUGE HEIGHTS AND VELOCITIES  
TIDAL CYCLE NOV. 25 AND 26, 1928

APPROVED FOR PUBLISHING PURPOSES  
D. J. Hester  
CHIEF ENGINEER



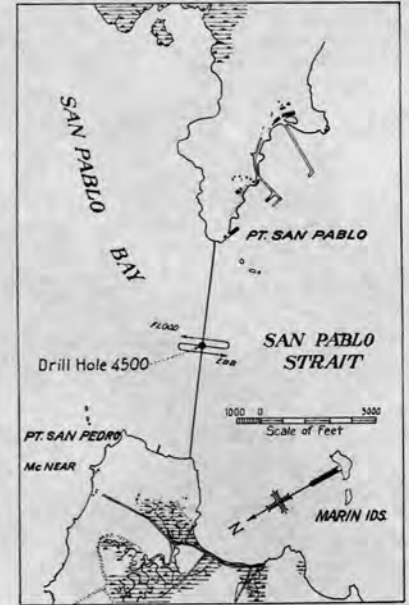


ELEVATION OF WATER SURFACE AND MEAN VELOCITY IN VERTICAL DURING TIDAL CYCLE



VELOCITY CURVES (Numbers show velocity in ft per sec.)

Observations made from Drill Barge at Hole 4500 Water surface elevations determined from gage on Pier at Point San Pablo. The time and height of predicted Tides at McNear Landing were determined by applying corrections to figures for Fort Point as described on pages 132, 339, 340 and 372 of Tide Tables for Pacific Coast for 1924, published by the United States Coast and Geodetic Survey. Owing to lapse of time between first and last measurements, curves do not represent simultaneous conditions throughout vertical. The direction of flow was generally perpendicular to the line of drilling. During the early part of the flood flow however the surface current approached the Barge from a point between San Quentin and the Marin Islands while the direction of current below the surface was perpendicular to the line of drilling as at other times. Observations indicate that flood flow begins near the bottom before the ebb has ceased at the surface and is sustained near the bottom after ebb has begun at the surface.

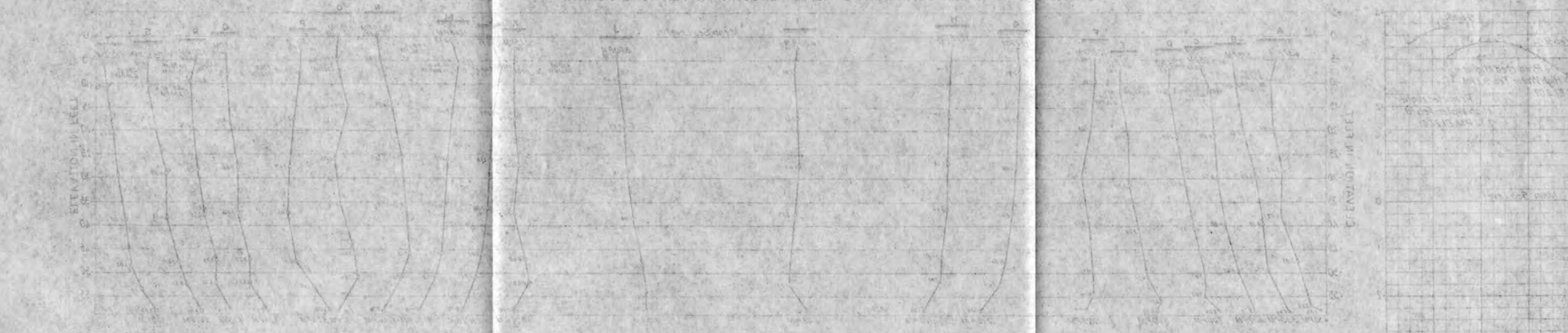
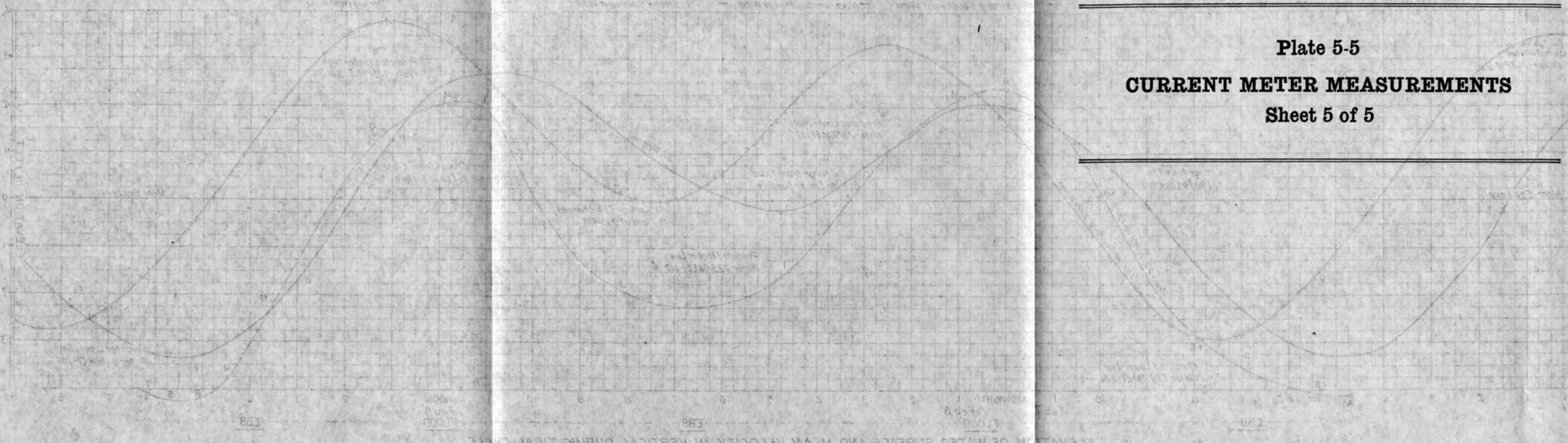


APPROVED FOR ESTIMATING PURPOSES:

A. F. Walter  
CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATIONS  
SALT WATER BARRIER  
POINT SAN PABLO SITE  
GAGE HEIGHTS AND VELOCITIES  
TIDAL CYCLE NOV. 25 AND 26, 1924  
DRAWN N.B.H. SUBMITTED W. J. Young  
CHECKED T.B.K. APPROVED J.B. Savage  
SV-7 Berkeley, Cal. Dec. 22, 1924 193-D-102

Plate 5-5  
**CURRENT METER MEASUREMENTS**  
 Sheet 5 of 5



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

TOOL CYCLE FEB AND 1952  
 TIDE HEIGHTS AND VELOCITIES  
 SALT WATER BRIDGE  
 BUREAU OF RECLAMATION  
 DEPARTMENT OF THE INTERIOR  
 WASHINGTON, D. C.

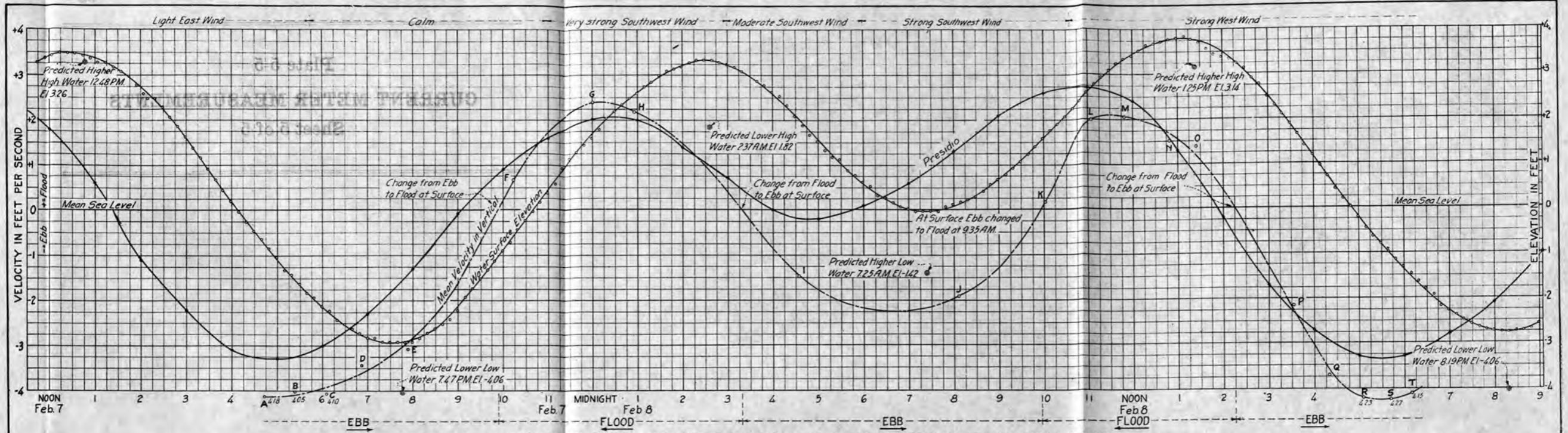
APPROVED FOR ESTIMATING PURPOSES  
 CHIEF ENGINEER  
 D. J. [Signature]

VELOCITY CURVES  
 [Faint text describing the velocity curves]

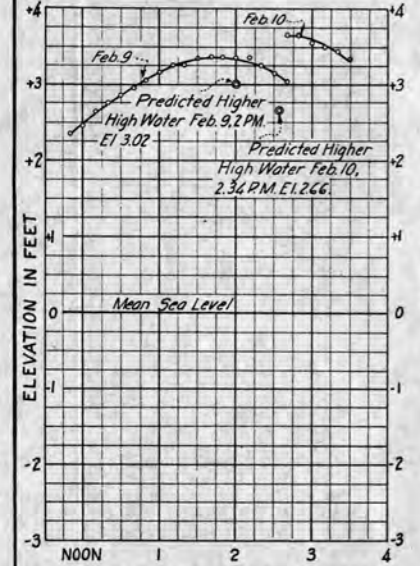
VELOCITY CURVES  
 [Faint text describing the velocity curves]

VELOCITY CURVES  
 [Faint text describing the velocity curves]

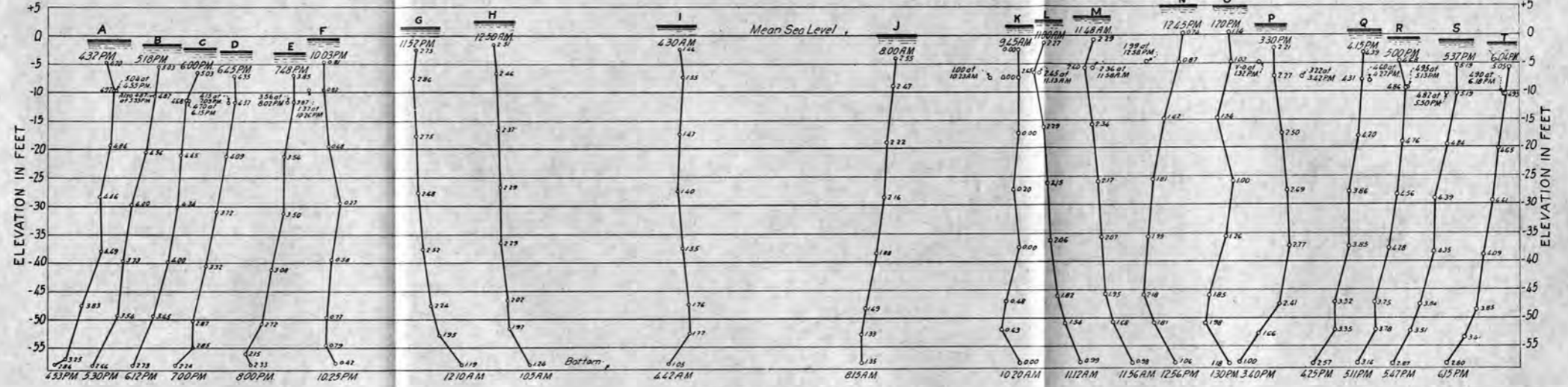
VELOCITY CURVES  
 [Faint text describing the velocity curves]



ELEVATION OF WATER SURFACE AND MEAN VELOCITY IN VERTICAL DURING TIDAL CYCLE



ELEVATION OF WATER SURFACE



VELOCITY CURVES  
(Numbers show velocity in ft per sec.)

Observations made from Drill Barge at Tole 3550 for locality Map see Dwg SV-5 prepared in connection with observations made Oct 1 and 2, 1924 at the same place. Water surface elevations determined from gage at Pier at Suisun Point. The time and height of predicted Tides at Benicia were determined by applying corrections to figures for Fort Point as described on pages 129, 339, 340 and 372 of Tide Tables for Pacific Coast for 1925, published by the United States Coast and Geodetic Survey.

Owing to a lapse of time between first and last measurements, curves do not represent simultaneous conditions throughout vertical. The direction of flow was towards and from Martinez ferry slip, except for a short period during each reversal of current, when the direction was perpendicular to the prevailing direction. During reversal of surface current there was at no time any inclination of cable to indicate direction of flow below surface.

APPROVED FOR ESTIMATING PURPOSES:  
**R. F. Dralter**  
CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATIONS  
SALT WATER BARRIER  
ARMY POINT SITE  
GAGE HEIGHTS AND VELOCITIES  
TIDAL CYCLE FEB. 7 AND 8, 1925

DRAWN: H.B.K. - H.W.V.      SUBMITTED: *[Signature]*  
CHECKED: A.B.K.      APPROVED: *[Signature]*  
SV-27 Berkeley Calif. Mar 7, 1925 193-D-103

JULY 7 1925  
U.S. NAVY

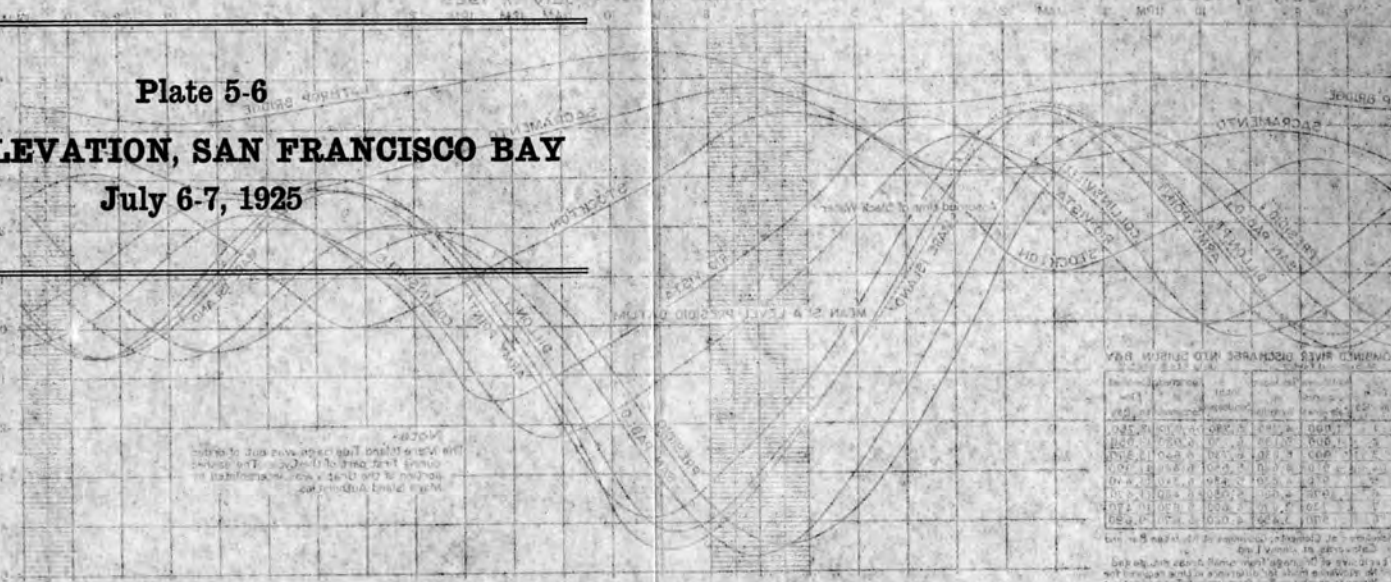
JULY 6 1925  
U.S. NAVY

Plate 5-6

TIDAL ELEVATION, SAN FRANCISCO BAY

July 6-7, 1925

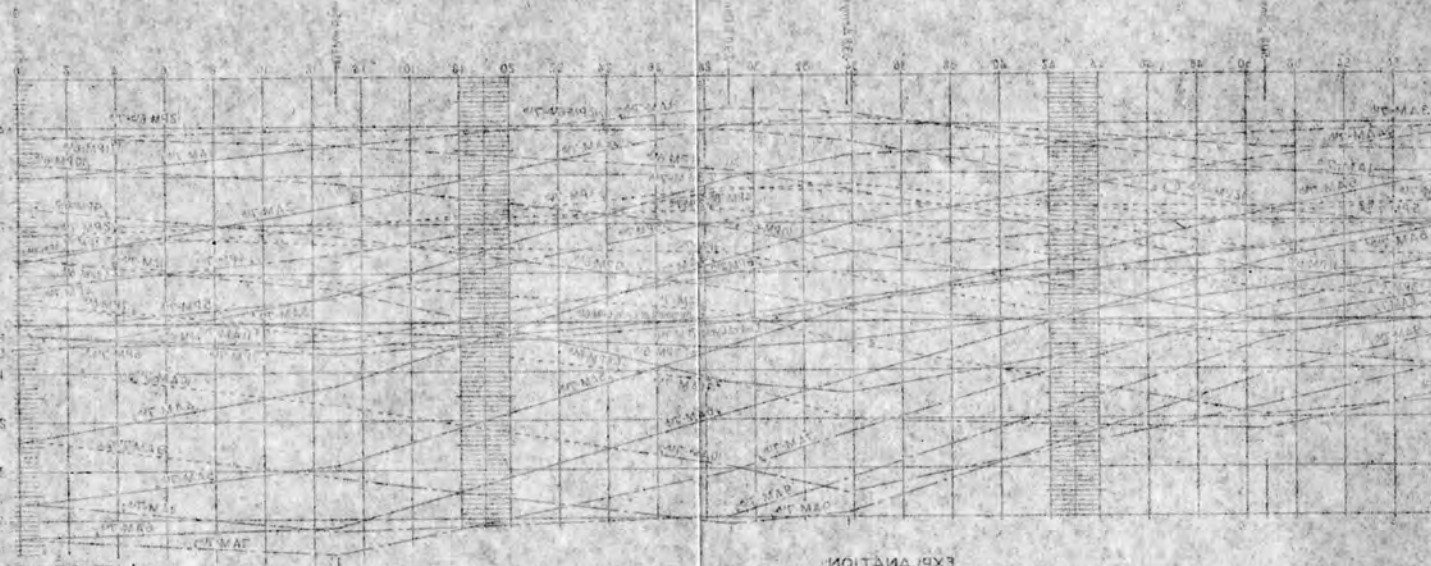
WATER SURFACE ELEVATION



Note: The water surface elevation was not observed at the station for part of the day. The curves shown are the result of a tidal prediction based on the observations at the other stations.

COMPARISON OF TIDE GAUGE RECORDS FOR JULY 6-7, 1925

Station	Time	Observed Elevation (ft)	Computed Elevation (ft)
Golden Gate	6:00 AM	1.2	1.2
	6:30 AM	1.5	1.5
Sausalito	6:00 AM	1.8	1.8
	6:30 AM	2.1	2.1
Point San Francisco	6:00 AM	2.4	2.4
	6:30 AM	2.7	2.7
Sausalito	7:00 AM	2.3	2.3
	7:30 AM	2.0	2.0
Point San Francisco	7:00 AM	2.8	2.8
	7:30 AM	2.5	2.5
Golden Gate	8:00 AM	1.8	1.8
	8:30 AM	1.5	1.5
Sausalito	8:00 AM	2.4	2.4
	8:30 AM	2.1	2.1
Point San Francisco	8:00 AM	2.7	2.7
	8:30 AM	2.4	2.4
Sausalito	9:00 AM	2.0	2.0
	9:30 AM	1.7	1.7
Point San Francisco	9:00 AM	2.5	2.5
	9:30 AM	2.2	2.2
Golden Gate	10:00 AM	1.5	1.5
	10:30 AM	1.2	1.2
Sausalito	10:00 AM	2.1	2.1
	10:30 AM	1.8	1.8
Point San Francisco	10:00 AM	2.4	2.4
	10:30 AM	2.1	2.1
Sausalito	11:00 AM	1.8	1.8
	11:30 AM	1.5	1.5
Point San Francisco	11:00 AM	2.3	2.3
	11:30 AM	2.0	2.0
Golden Gate	12:00 PM	1.2	1.2
	12:30 PM	0.9	0.9
Sausalito	12:00 PM	1.8	1.8
	12:30 PM	1.5	1.5
Point San Francisco	12:00 PM	2.1	2.1
	12:30 PM	1.8	1.8



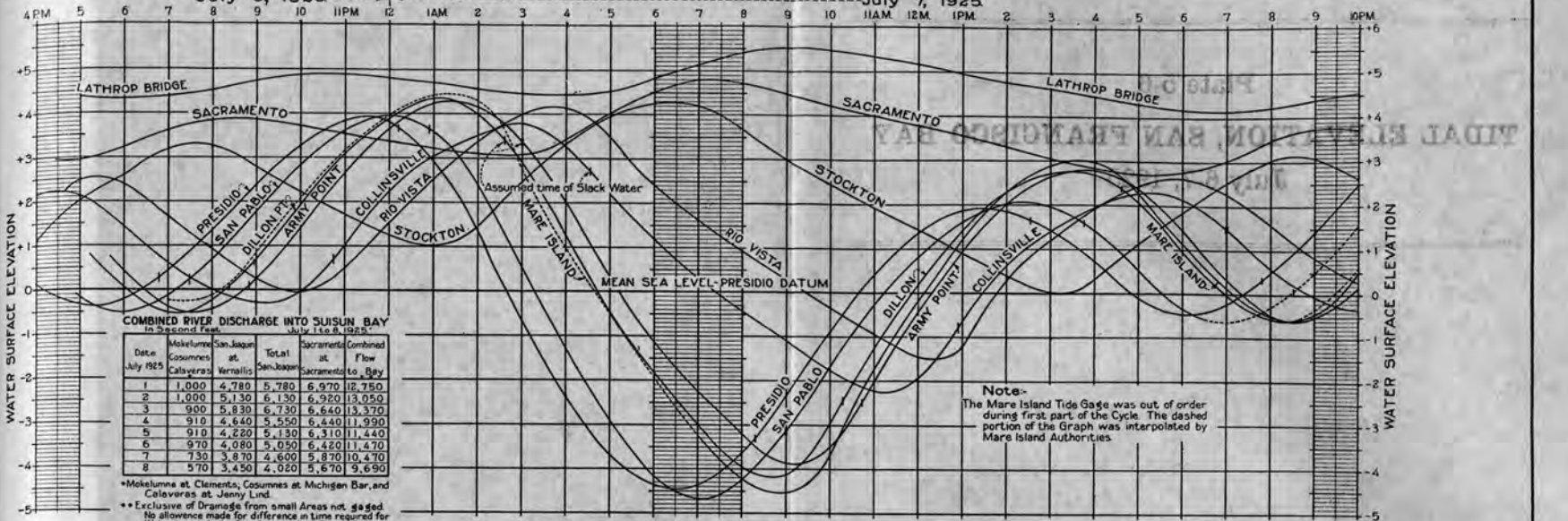
U.S. NAVY  
 TIDAL ELEVATION  
 SAN FRANCISCO BAY  
 JULY 6-7, 1925  
 SALT WATER BARRIER  
 GENERAL AND WATER BUREAU  
 OFFICE OF THE CHIEF OF ENGINEERS  
 U.S. NAVY

APPROVED FOR PUBLICATION  
 J. P. ...  
 CHIEF OF ENGINEERS

EXPLANATION  
 Solid line - Tide gauge record  
 Dashed line - Tide gauge record  
 Dotted line - Tide gauge record  
 Dash-dot line - Tide gauge record

July 6, 1925

July 7, 1925

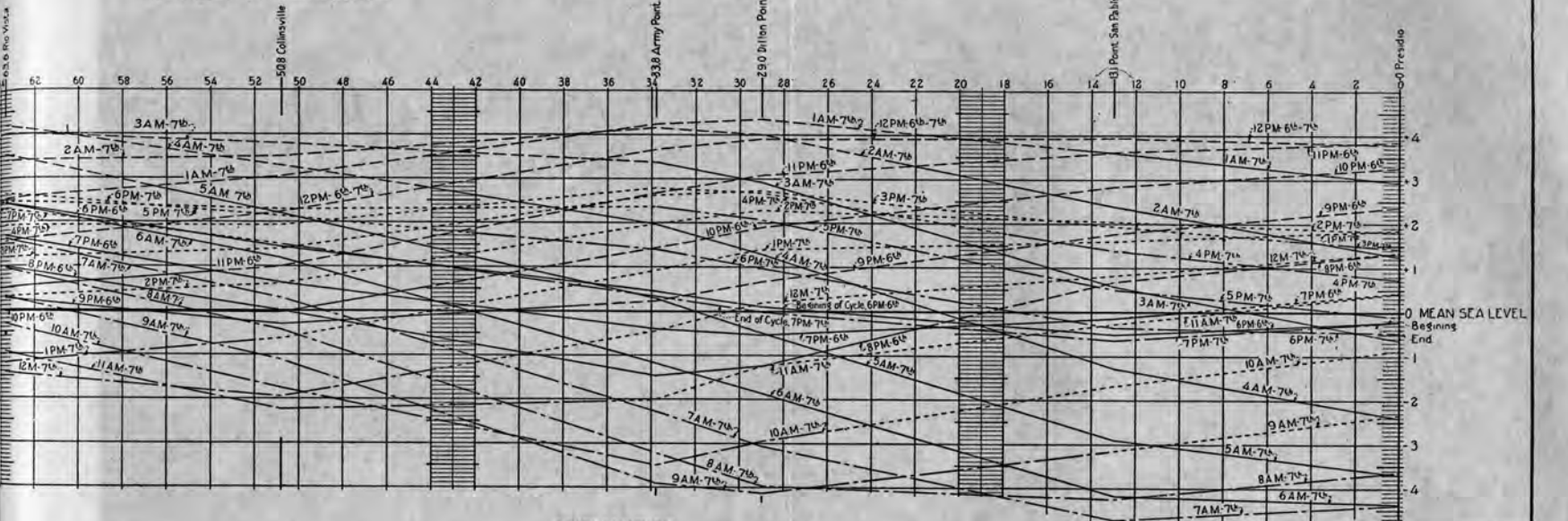


COMBINED RIVER DISCHARGE INTO SUISUN BAY  
In Second Feet July 1 to 8, 1925

Date July 1925	Mokelumne Cosumnes Calaveras	San Joaquin at Verastis	Total at San Joaquin	Sacramento at Sacramento	Combined Flow to Bay
1	1,000	4,780	5,780	6,970	12,750
2	1,000	5,130	6,130	6,920	13,050
3	900	5,830	6,730	6,640	13,370
4	910	4,840	5,750	6,440	11,990
5	910	4,220	5,130	6,310	11,440
6	970	4,080	5,050	6,420	11,470
7	730	3,870	4,600	5,870	10,470
8	570	3,450	4,020	5,670	9,690

\*Mokelumne at Clements, Cosumnes at Michigan Bar, and Calaveras at Jenny Lind.  
\*\* Exclusive of drainage from small areas not gaged. No allowance made for difference in time required for water to reach the Bay from various Gaging Stations.

Note-  
The Mare Island Tide Gage was out of order during first part of the Cycle. The dashed portion of the Graph was interpolated by Mare Island Authorities.



EXPLANATION:  
 — Ebb, 6PM July 6<sup>th</sup> to 6AM July 7<sup>th</sup>  
 - - - Flood  
 - - - Ebb, 7AM July 7<sup>th</sup> to 7PM July 7<sup>th</sup>  
 - - - Flood

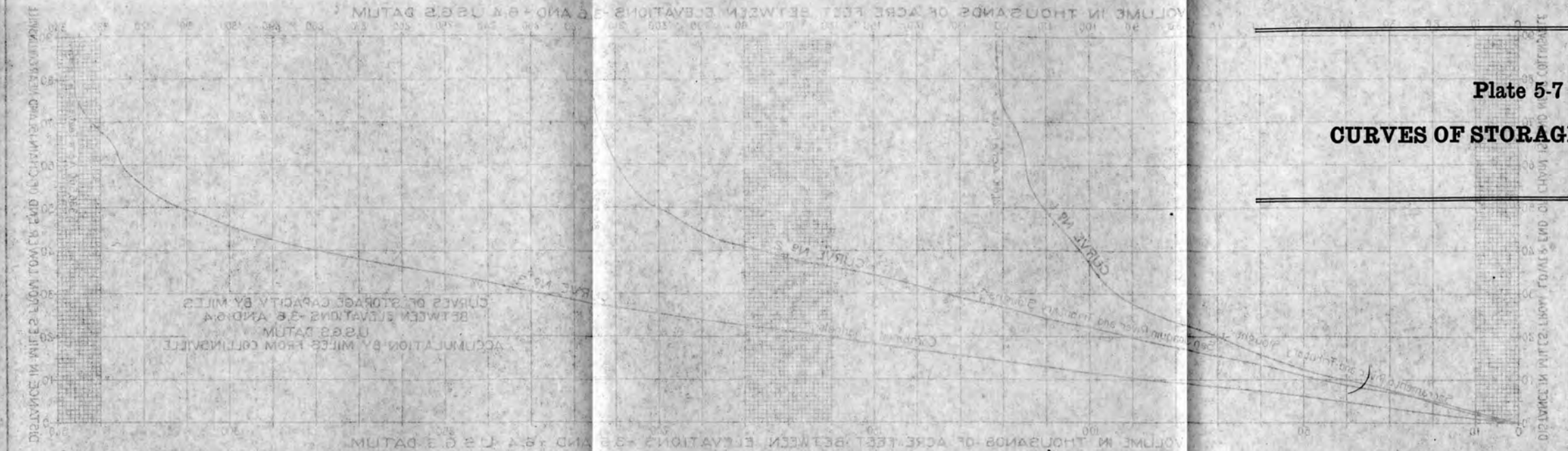
APPROVED FOR ESTIMATING PURPOSES  
*A. J. Haller*  
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 TIDAL ELEVATIONS  
 SAN FRANCISCO BAY  
 JULY 6 AND 7, 1925  
 Drawn: HAD:CAM. Checked: *[Signature]*  
 SV-65 Berkeley, California March 1925 193-D-82

Plate 5-7

CURVES OF STORAGE IN DELTA

PLATE 5-7



Notes:  
 1. The curves shown in this plate are based on the data furnished by the U.S. Army Corps of Engineers, Vicksburg, Mississippi.  
 2. The curves are based on the assumption that the water level in the Mississippi River is 1.0 foot above the mean sea level.  
 3. The curves are based on the assumption that the water level in the Mississippi River is 1.0 foot above the mean sea level.  
 4. The curves are based on the assumption that the water level in the Mississippi River is 1.0 foot above the mean sea level.

U.S. ARMY CORPS OF ENGINEERS  
 VICKSBURG DISTRICT  
 MISSISSIPPI RIVER DIVISION  
 VICKSBURG, MISSISSIPPI

PLATE 5-7  
 CURVES OF STORAGE IN DELTA FOR  
 SALT WATER BARRIER  
 TICAL STUDIES

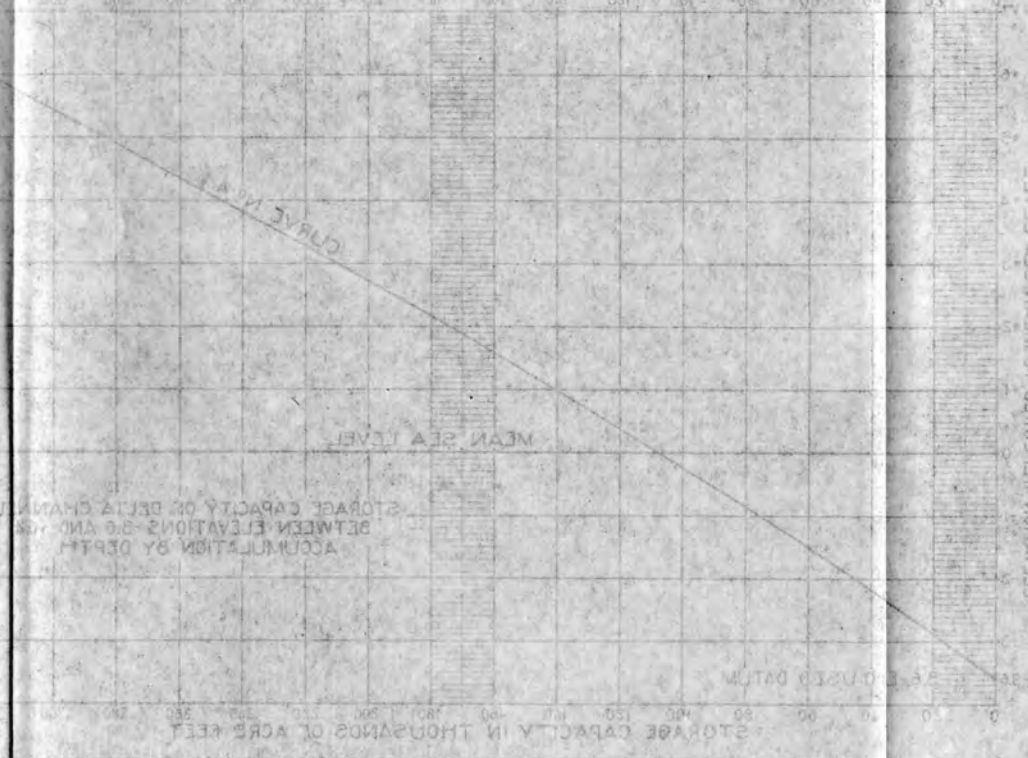


TABLE OF INCREMENTS FOR CURVES NOS 1 AND 2

RIVER MILES	ACRES IN 1000	ACRES IN 1000
0	0	0
10	10	10
20	20	20
30	30	30
40	40	40
50	50	50
60	60	60
70	70	70
80	80	80
90	90	90
100	100	100
110	110	110
120	120	120
130	130	130
140	140	140
150	150	150
160	160	160
170	170	170
180	180	180
190	190	190
200	200	200
210	210	210
220	220	220
230	230	230
240	240	240
250	250	250
260	260	260
270	270	270
280	280	280
290	290	290
300	300	300
310	310	310
320	320	320
330	330	330
340	340	340
350	350	350
360	360	360
370	370	370
380	380	380
390	390	390
400	400	400
410	410	410
420	420	420
430	430	430
440	440	440
450	450	450
460	460	460
470	470	470
480	480	480
490	490	490
500	500	500

U.S. ARMY CORPS OF ENGINEERS  
 VICKSBURG DISTRICT  
 MISSISSIPPI RIVER DIVISION  
 VICKSBURG, MISSISSIPPI

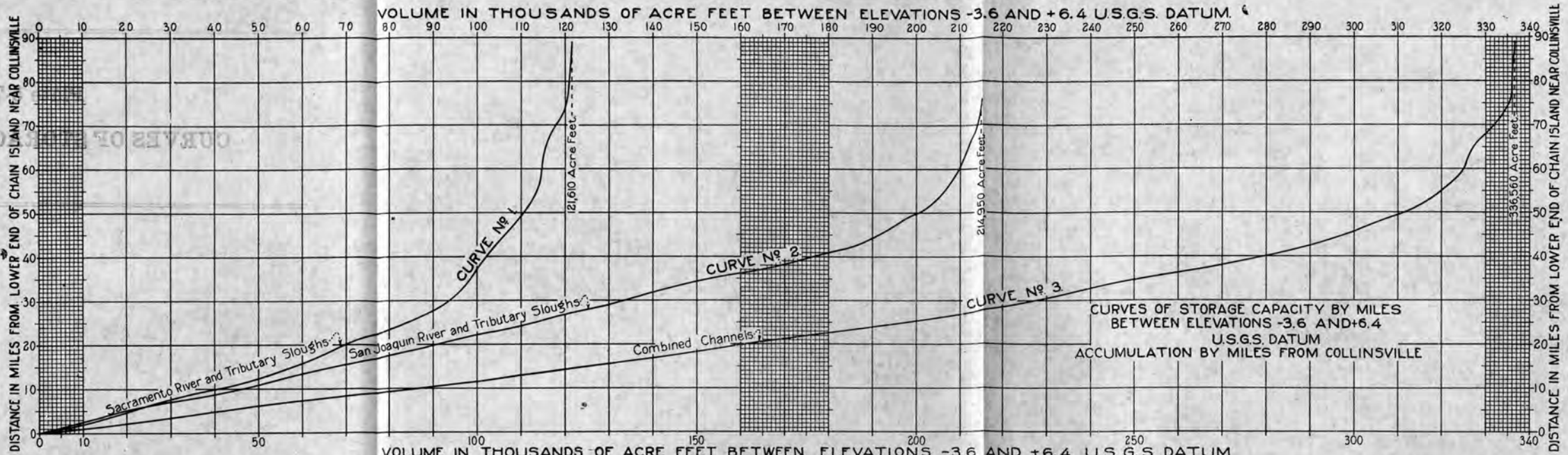
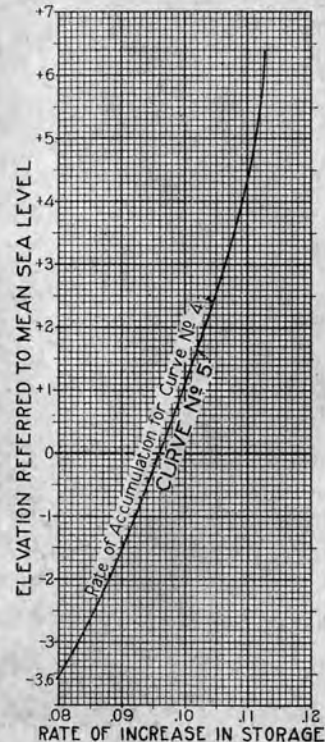
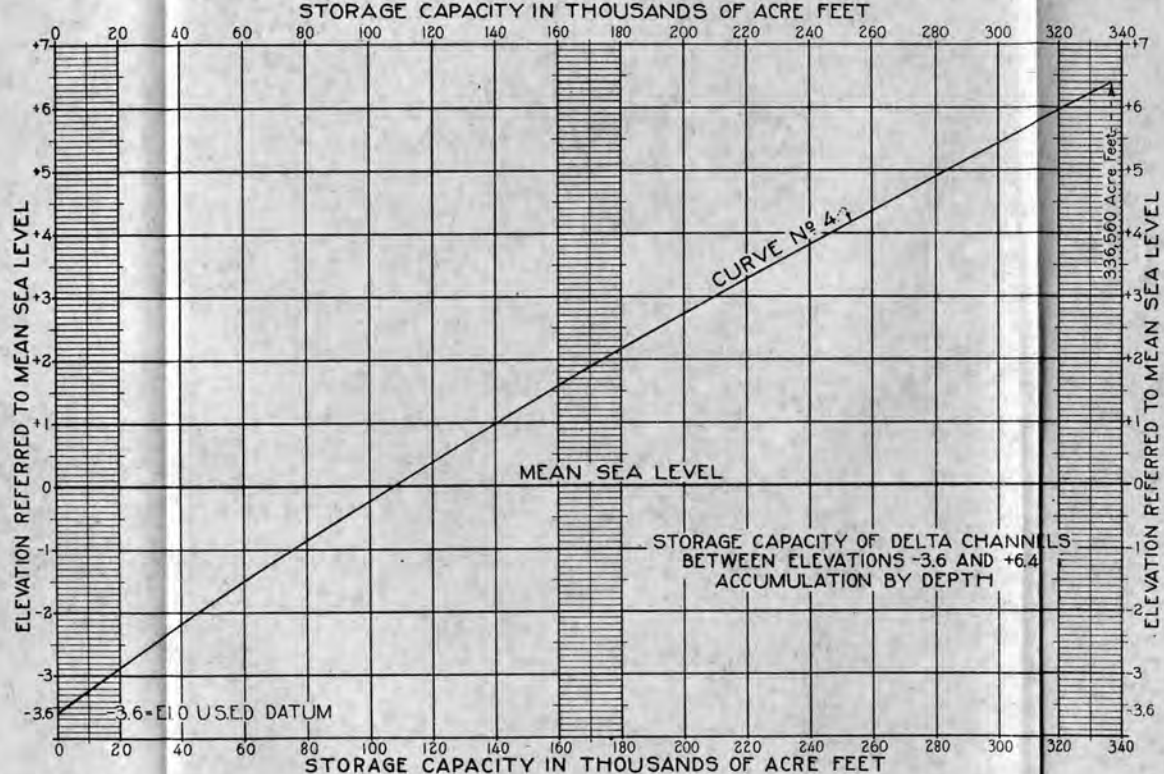


TABLE OF INCREMENTS FOR CURVES NOS 1, 2 AND 3

	SACRAMENTO RIVER	SAN JOAQUIN RIVER	COMBINED CHANNELS
0	10,200	8,000	18,200
2	7,500	7,800	15,300
4	6,300	8,200	14,500
6	7,000	11,500	18,500
8	9,500	10,500	20,000
10	8,600	8,100	16,700
12	5,800	8,470	14,270
14	5,500	9,770	15,270
16	5,000	10,250	15,250
18	4,630	260	12,890
20	5,720	880	14,300
22	6,060	990	15,750
24	5,080	7,700	12,780
26	3,780	19,180	12,960
28	3,120	17,560	10,680
30	2,340	9,940	9,280
32	1,470	9,940	9,510
34	510	10,010	11,520
36	710	10,540	12,250
38	670	7,530	9,200
40	1,660	2,140	2,800
42	2,970	2,310	3,800
44	760	2,100	2,860
46	1,760	2,890	4,650
48	1,640	2,360	4,000
50	1,800	500	1,700
52	1,430	370	1,620
54	850	540	2,390
56	600	580	2,180
58	300	930	1,330
60	100	300	1,090
62	300	790	1,090
64	550	860	1,410
66	950	950	1,900
68	1,100	860	1,960
70	1,300	410	1,710
72	800	390	1,190
74	600	100	700
76	250	100	250
78	100	100	100
80	100	100	150
82	250	250	250
84	150	150	150
86	30	30	30

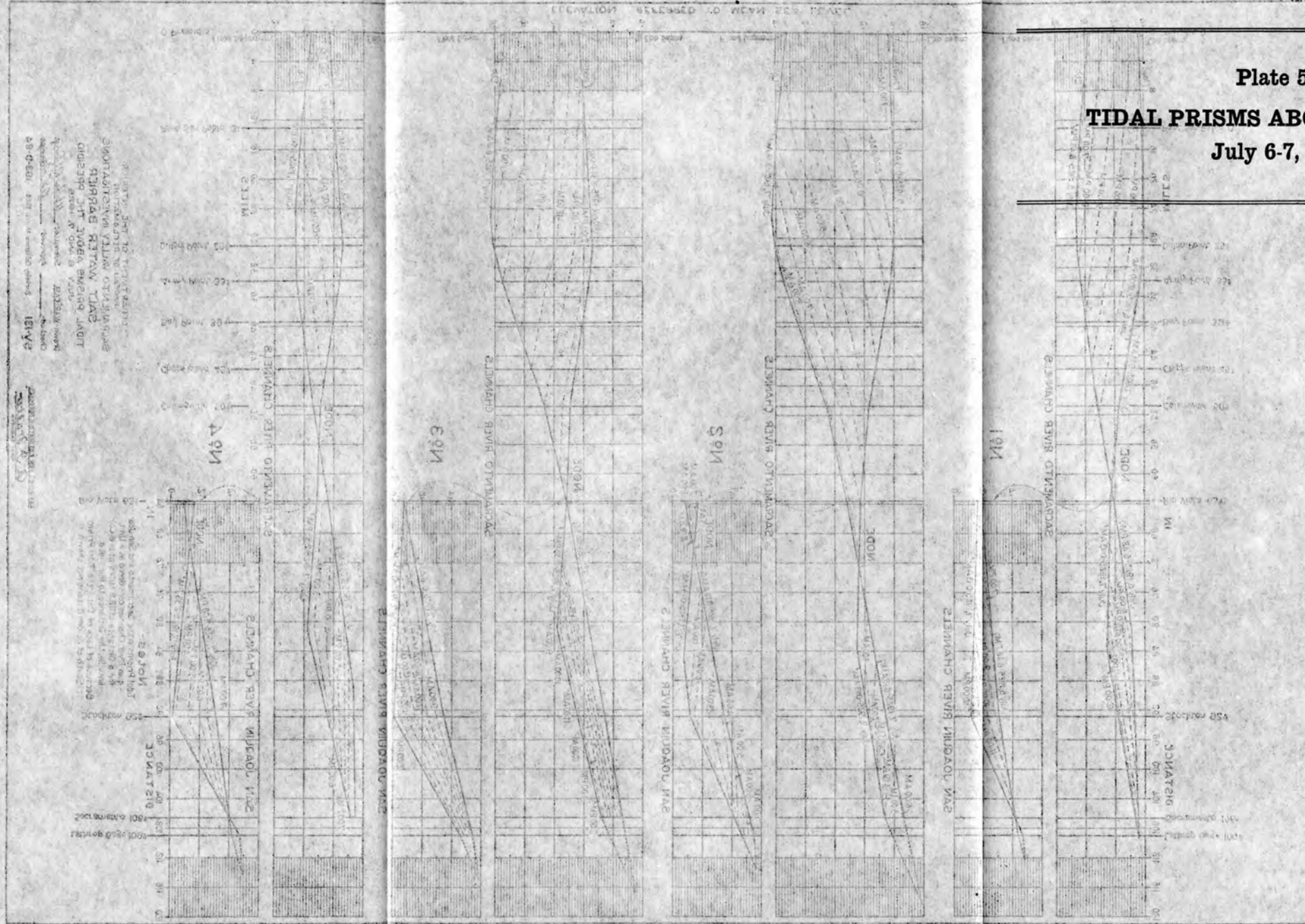


Notes:-  
 The Abscissas on Curve No 5 represent the fractional part of the total accumulation which would be included in a Section one foot deep at the various Elevations indicated by the Ordinates  
 It was assumed in the use of Curves No 4 and 5 that Curve No 4 represents the form of the Storage Curve for each two Mile Block as well as for the total Volume of Storage.  
 The Curves do not include 16,810 Acre Feet of Marsh Storage lying above El 2.9 Upstream from Cache Slough.

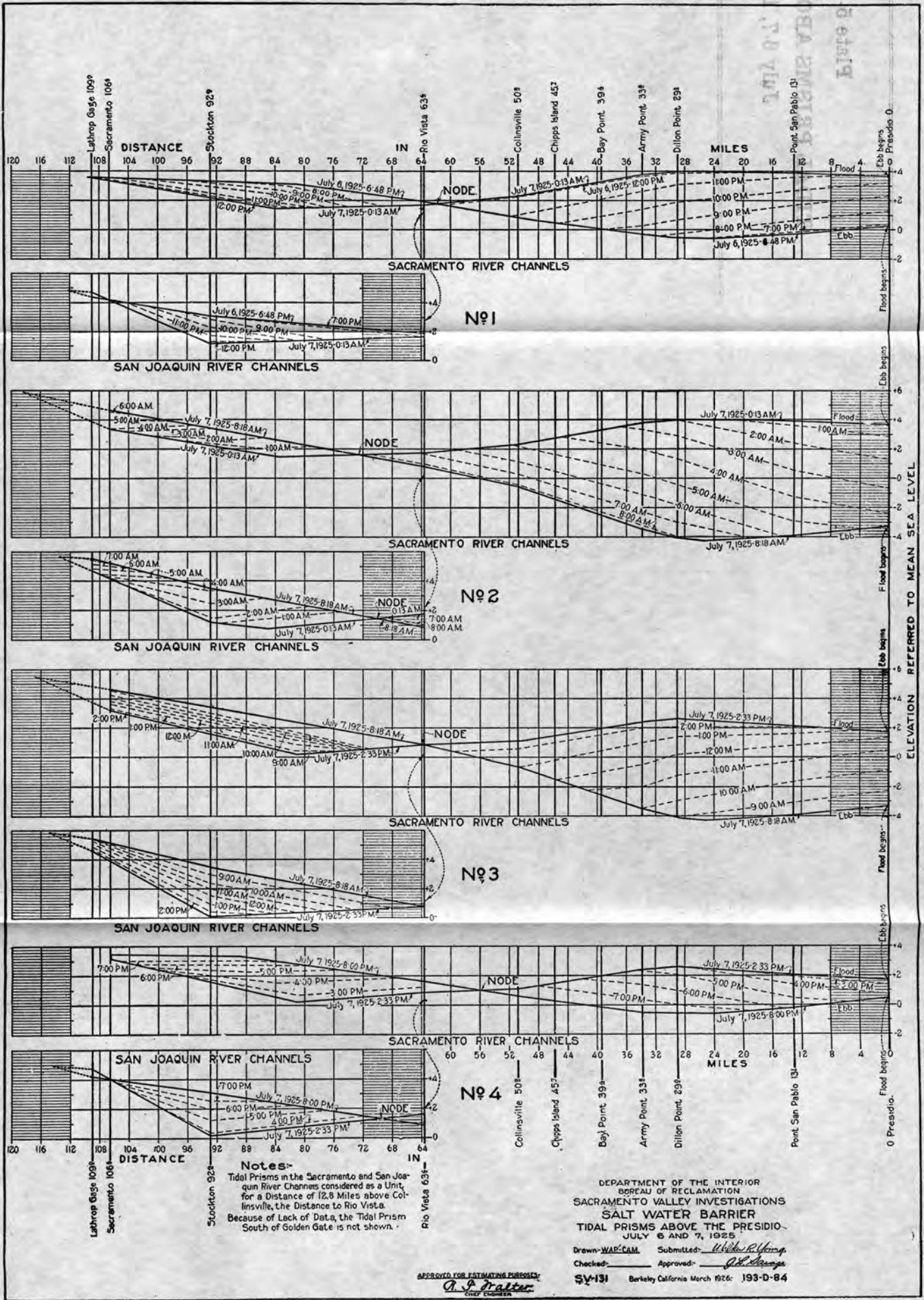
APPROVED FOR ESTIMATING PURPOSES:-  
*A. J. Dralter*  
 CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 CURVES OF STORAGE IN DELTA FOR  
 TIDAL STUDIES

Drawn W&P-CAM Submitted *W. J. ...*  
 Checked *J. ...* Approved *J. ...*  
 SV-130 Berkeley California, Mch. 1926 193-D-83







Lathrop Gage 109<sup>9</sup>  
 Sacramento 106<sup>8</sup>  
 Stockton 92<sup>9</sup>  
 Rio Vista 63<sup>4</sup>  
 Collinsville 50<sup>1</sup>  
 Chipps Island 45<sup>7</sup>  
 Bay Point 39<sup>4</sup>  
 Army Point 33<sup>8</sup>  
 Dillon Point 29<sup>8</sup>  
 Point San Pablo 0<sup>1</sup>  
 0 Presidio

**Notes-**  
 Tidal Prisms in the Sacramento and San Joaquin River Channels considered as a Unit, for a Distance of 12.5 Miles above Collinsville, the Distance to Rio Vista. Because of Lack of Data, the Tidal Prism South of Golden Gate is not shown.

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 TIDAL PRISMS ABOVE THE PRESIDIO  
 JULY 6 AND 7, 1925  
 Drawn-WAR:CAM Submitted-Willis R. Young  
 Checked- Approved- J. H. ...  
 SY-131 Berkeley California March 1926: 193-D-84

APPROVED FOR ESTIMATING PURPOSES  
 G. P. Prater  
 CHIEF ENGINEER

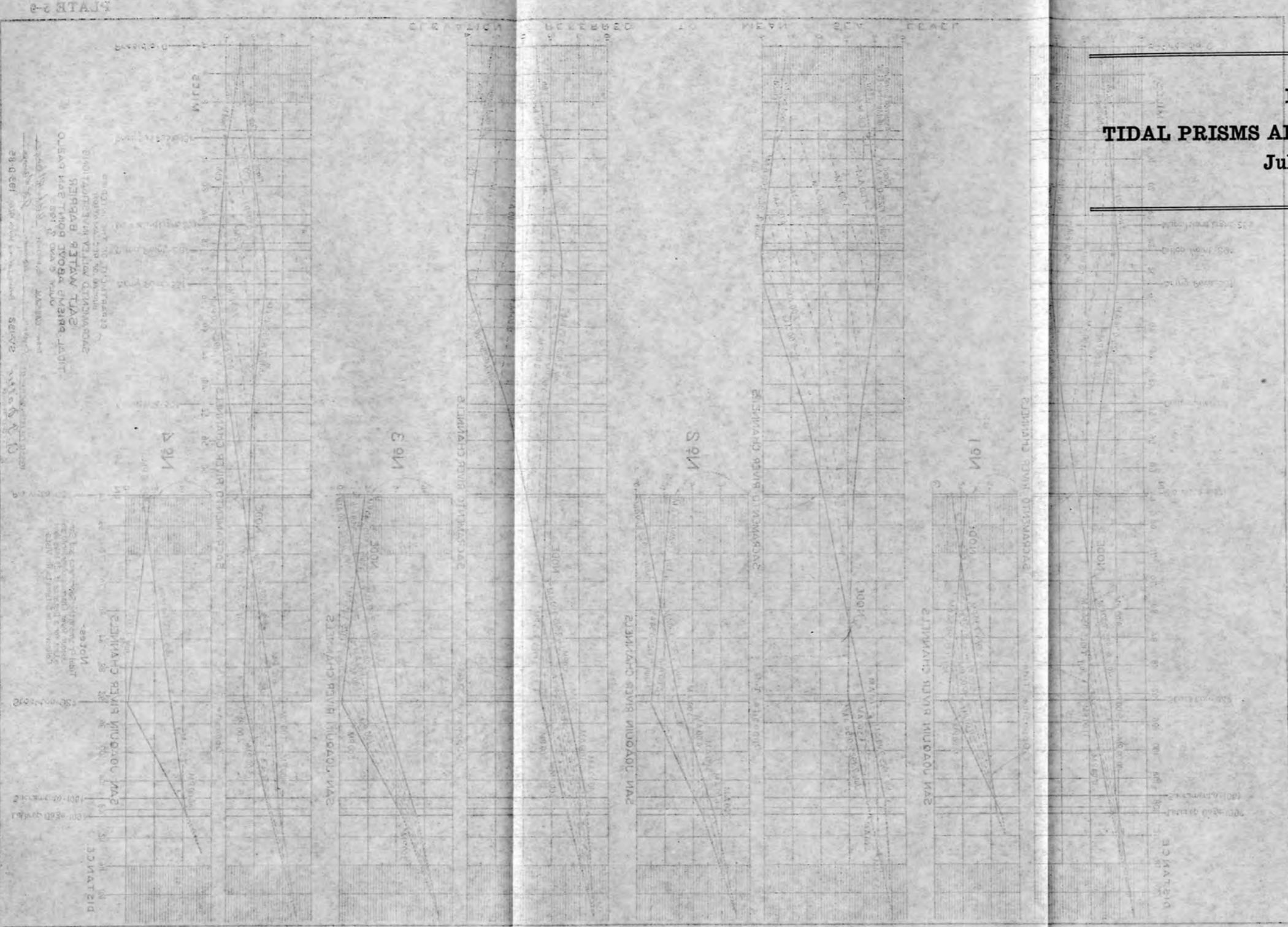
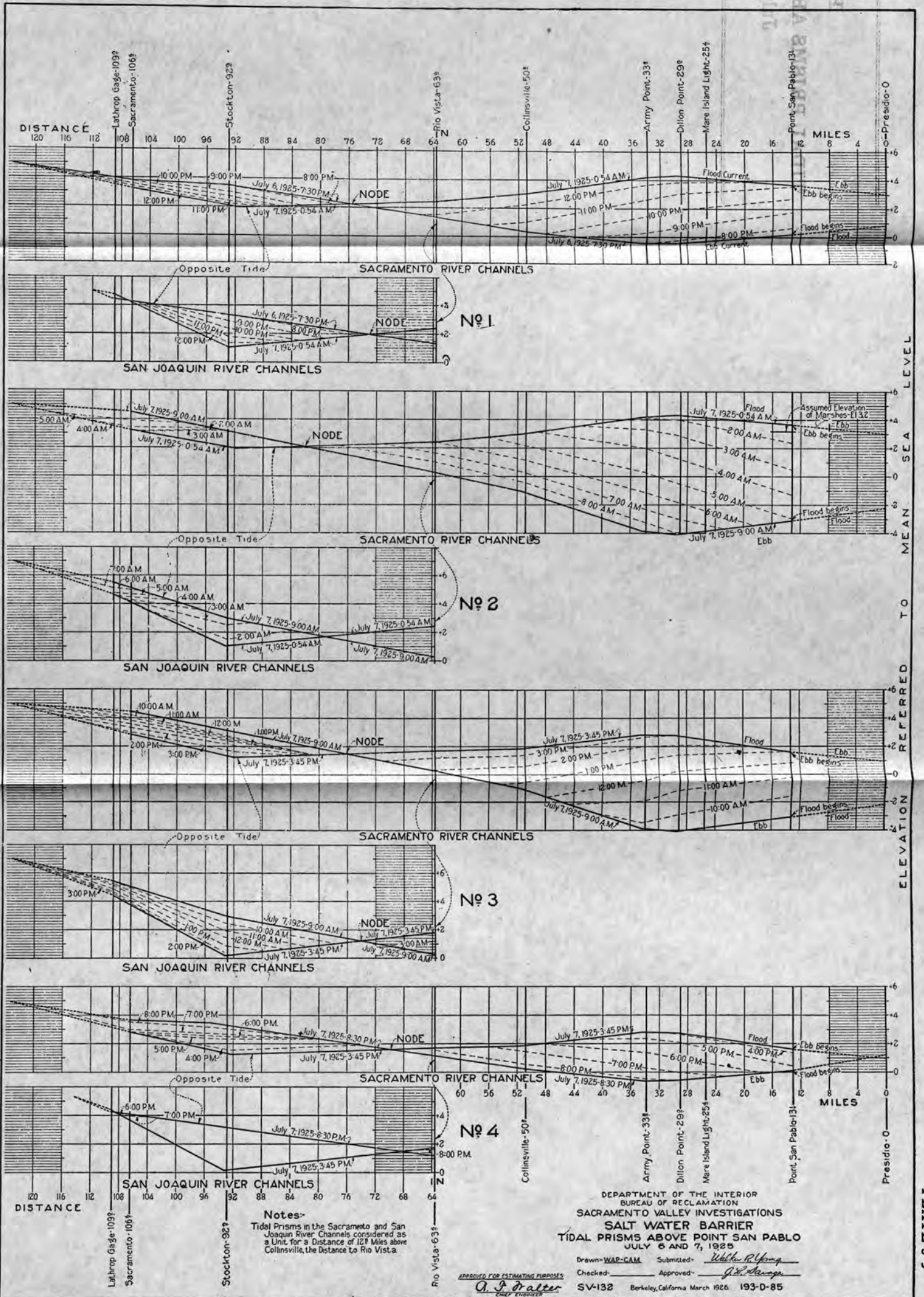


Plate 5-9  
**TIDAL PRISMS ABOVE POINT SAN PABLO**  
 July 6-7, 1925



DEVIATION BELIEVED TO BE

Plate 5-10

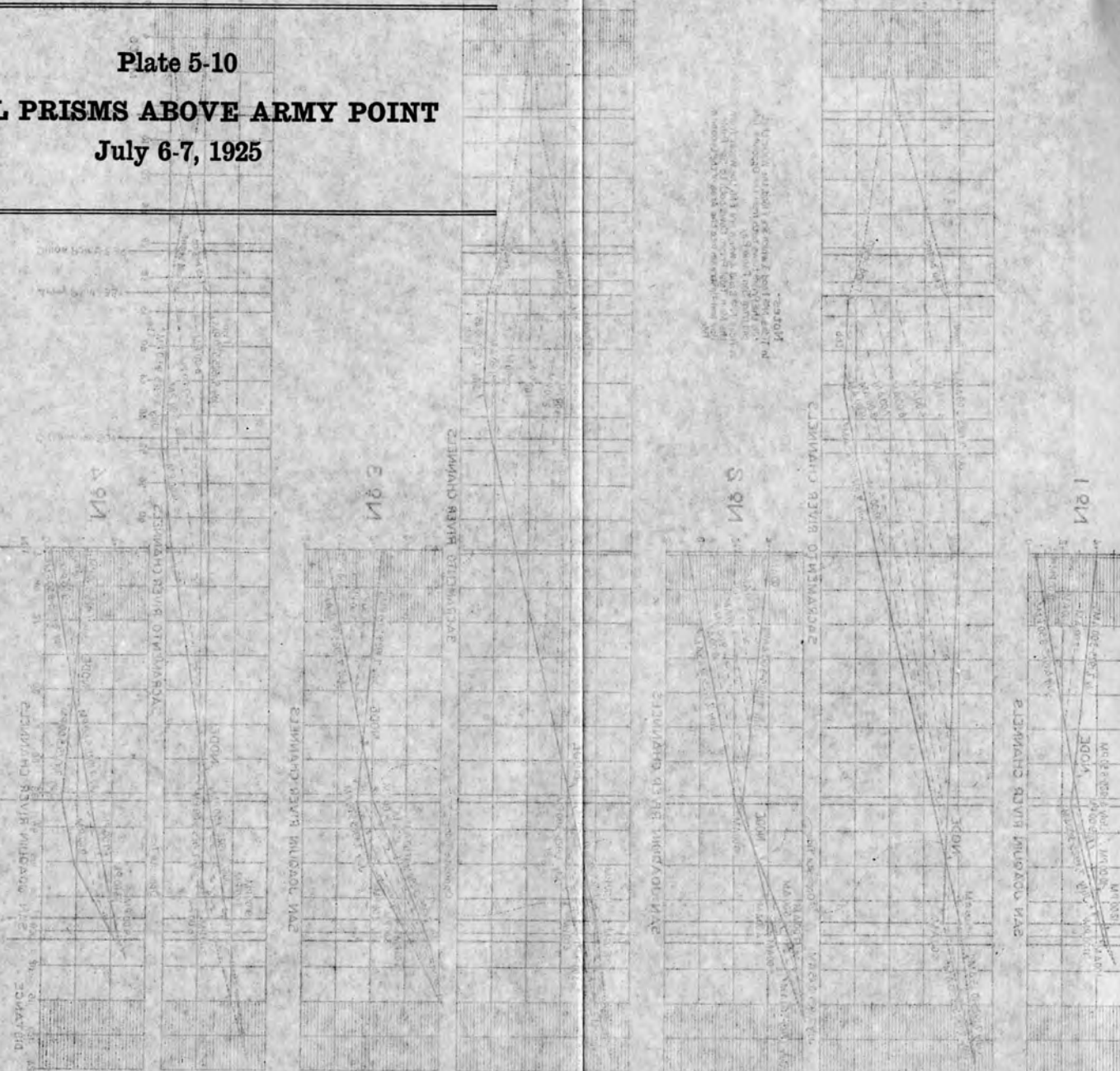
TIDAL PRISMS ABOVE ARMY POINT

July 6-7, 1925

U.S. GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION  
 WASHINGTON, D. C.  
 TIDAL PRISMS ABOVE ARMY POINT  
 JULY 6-7, 1925  
 BY  
 W. M. GIBSON  
 ASSISTANT CHIEF OF DIVISION

Scale  
 1 inch = 100 feet

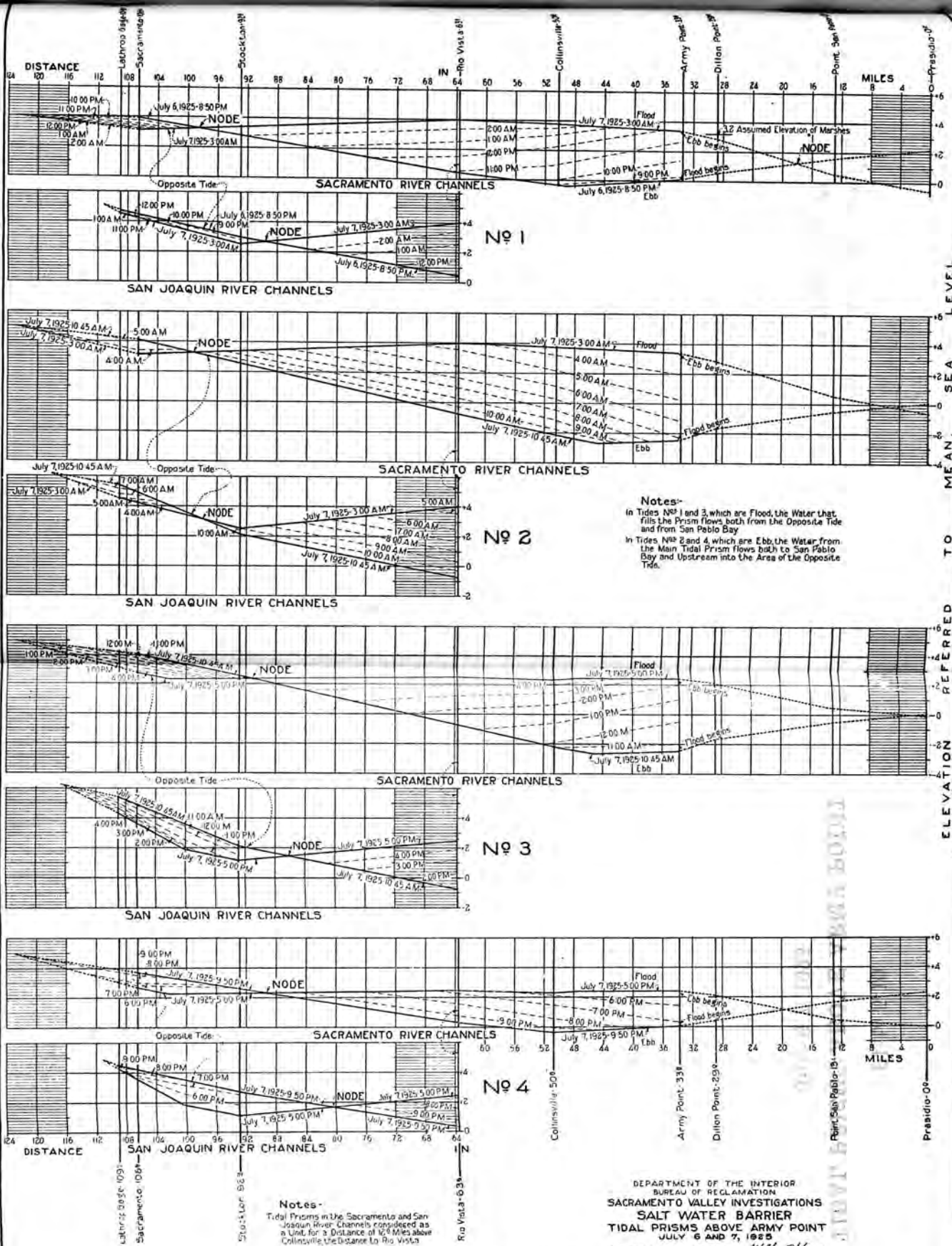
1. The tidal prism is the volume of water that flows in and out of a bay or estuary during one tidal cycle. It is measured in cubic feet or cubic meters. The tidal prism is a function of the tidal range and the area of the bay or estuary. The tidal prism is a function of the tidal range and the area of the bay or estuary. The tidal prism is a function of the tidal range and the area of the bay or estuary.



1. The tidal prism is the volume of water that flows in and out of a bay or estuary during one tidal cycle. It is measured in cubic feet or cubic meters. The tidal prism is a function of the tidal range and the area of the bay or estuary. The tidal prism is a function of the tidal range and the area of the bay or estuary. The tidal prism is a function of the tidal range and the area of the bay or estuary.

Scale  
 1 inch = 100 feet

U.S. GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION  
 WASHINGTON, D. C.



ELEVATION REFERRED TO MEAN SEA LEVEL

**Notes:-**  
 in Tides No 1 and 3, which are Flood, the Water that fills the Prism flows both from the Opposite Tide and from San Pablo Bay  
 in Tides No 2 and 4, which are Ebb, the Water from the Main Tidal Prism flows both to San Pablo Bay and Upstream into the Area of the Opposite Tide.

**Notes:-**  
 Tidal Prisms in the Sacramento and San Joaquin River Channels considered as a Unit for a Distance of 12.4 Miles above Collinsville the Distance to Rio Vista

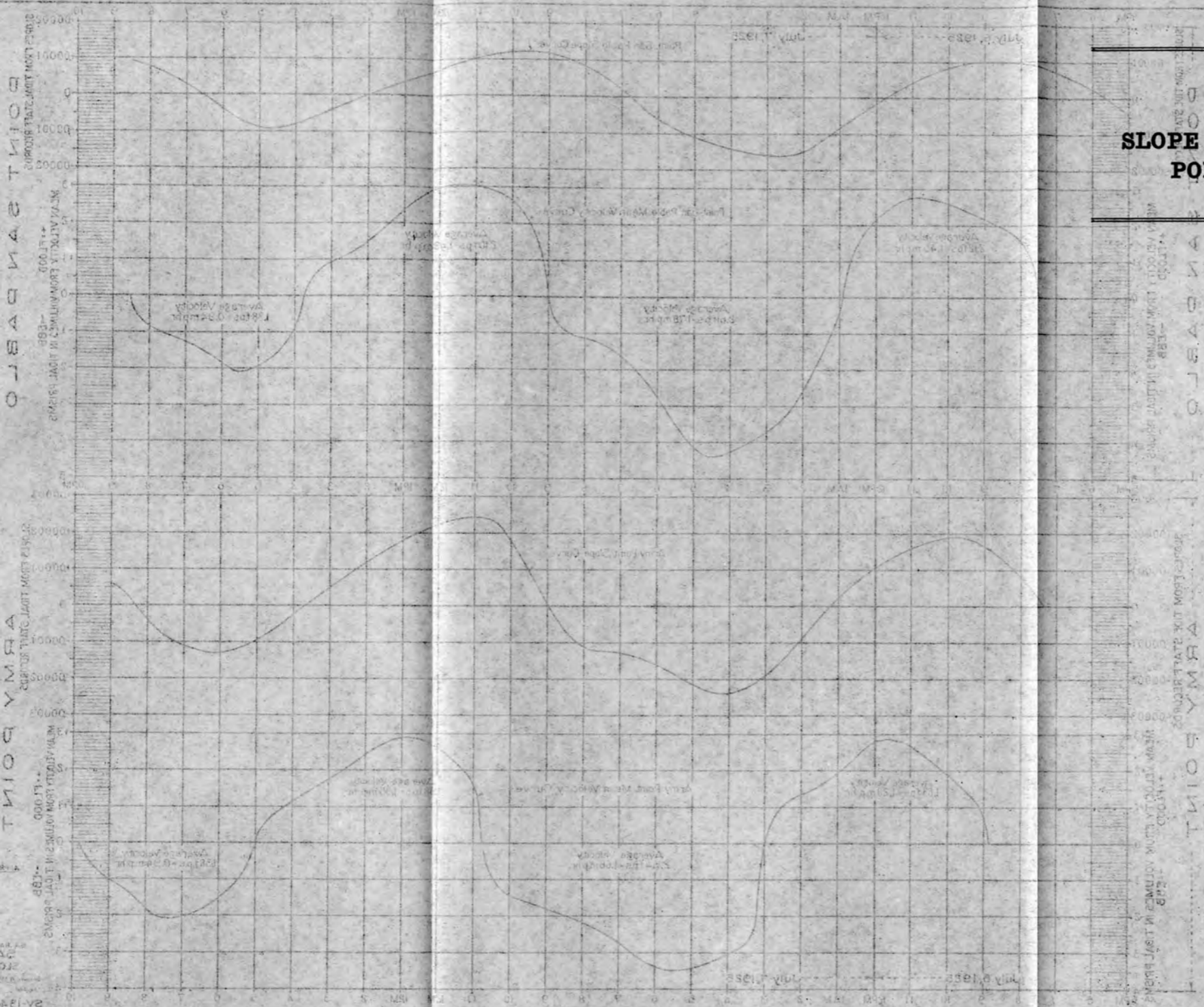
DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 TIDAL PRISMS ABOVE ARMY POINT  
 JULY 6 AND 7, 1925

Drawn-WAR:CAM. Submitted-*W.H. P. Young*  
 Checked- Approved-*P.H. Savage*  
 SV-133 Berkeley, California March 1926 193-D-86

DESIGNED BY THE NATIONAL BUREAU OF STANDARDS  
*A. J. Dralter*  
 CIVIL ENGINEER

Plate 5-11

SLOPE AND VELOCITY CURVES, ARMY POINT AND POINT SAN PABLO



Prepared by the  
 Hydrographic Division  
 U.S. Army Corps of Engineers  
 San Francisco District  
 San Francisco, California  
 July 1953

POINT SAN PABLO  
 ARMY POINT  
 FLOOD DISCHARGE  
 AVERAGE VELOCITY  
 WATER LEVEL

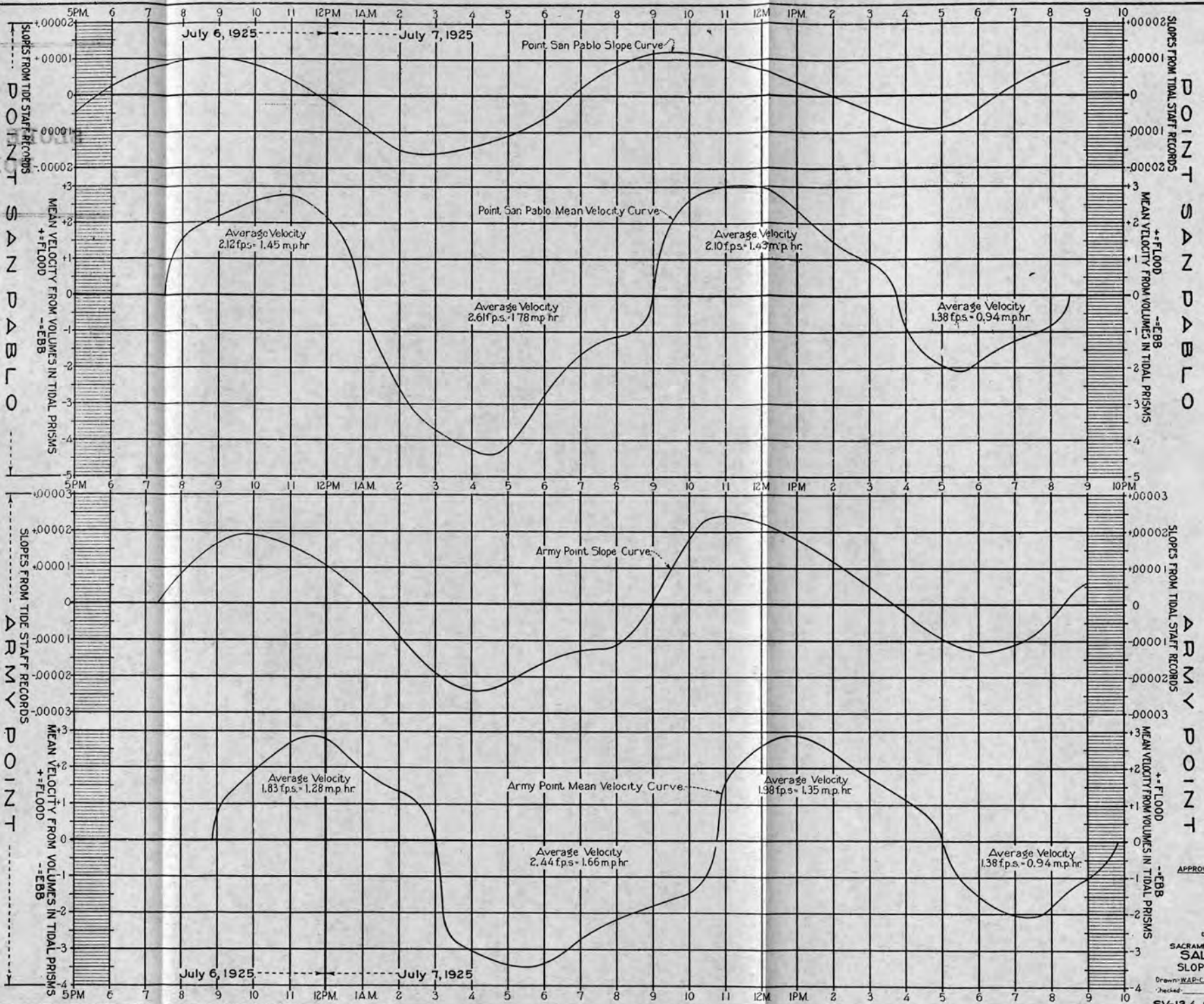


Plate 5-11  
 POINT AND VELOCITY OF  
 POINT SA

POINT SAN PABLO  
 ARMY POINT

POINT SAN PABLO  
 ARMY POINT

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

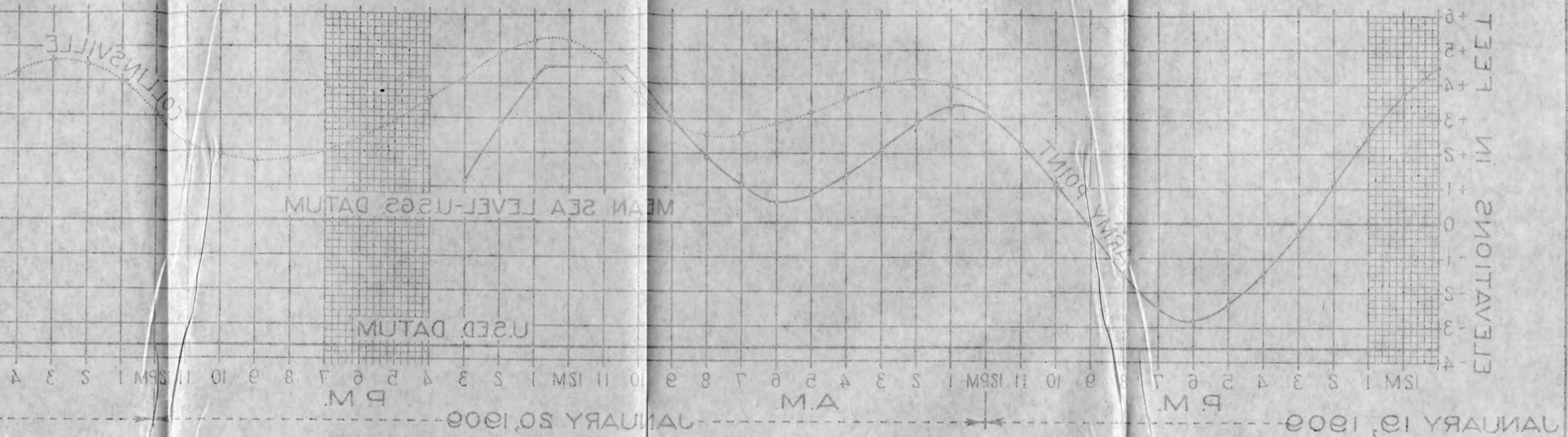
DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
 SALT WATER BARRIER  
 SLOPE AND VELOCITY CURVES

Drawn: W.A.P.-C.A.M. Submitted: *W.P. Jones*  
 Checked: *J.H. Savage*  
 Approved: *J.H. Savage*

Plate 5-12

**ARMY POINT AND COLLINSVILLE GAGE HEIGHTS**

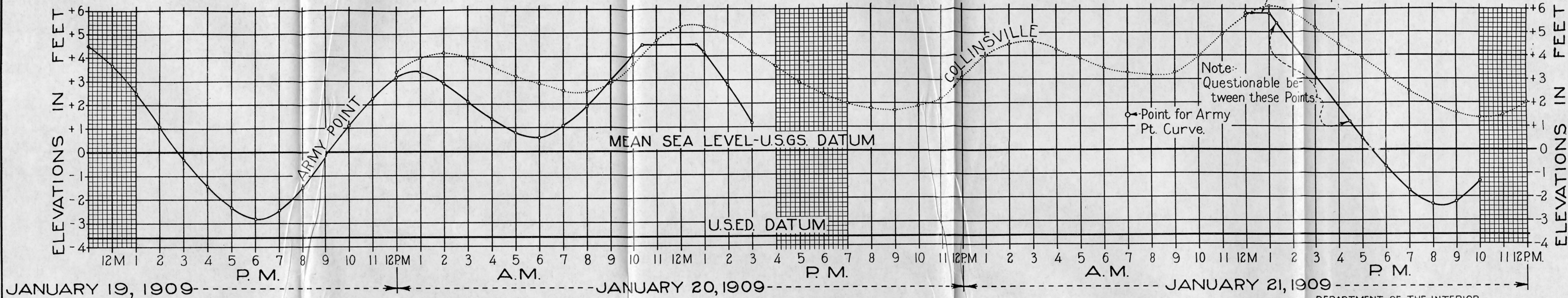
January, 1909, Flood



APPROVED FOR ESTIMATING  
*D. E. D.*  
 CHIEF ENGINEER



Plate 5-12  
ARMY POINT AND COLLINSVILLE GAGE  
HEIGHTS  
January, 1909, Flood



DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
ARMY POINT AND COLLINSVILLE GAGE HEIGHTS  
DURING JAN. 1909 FLOOD-FROM U.S. ENGINEER  
DEPARTMENT RECORDS - AUG. 25, 1924

APPROVED FOR ESTIMATING PURPOSES:-  
*R. F. Walter*  
CHIEF ENGINEER.

Drawn:- N.B.H.-CAM. Submitted:- *W. R. Young*  
Checked:- \_\_\_\_\_ Approved:- *J. D. Savage*  
SV-135 Berkeley, California. Mch. 1926. 193-D-88

APPROVED FOR ESTIMATING PURPOSES

Chief Engineer  
U.S. Coast and Geodetic Survey  
Letter of Dec 18, 1898 from Mr. H. L. Esler  
Reproduced from Survey accompanying  
Note-

Checked: [Signature] Approved: [Signature]  
SACRAMENTO RIVER DISCHARGE NEAR RED BLUFF  
AND IN  
VARIATION IN SEA LEVEL IN S.F. BAY  
SACRAMENTO WATER BARRIER  
SACRAMENTO WATER INVESTIGATIONS  
BUREAU OF COAST AND GEODETIC SURVEY  
DEPARTMENT OF THE INTERIOR

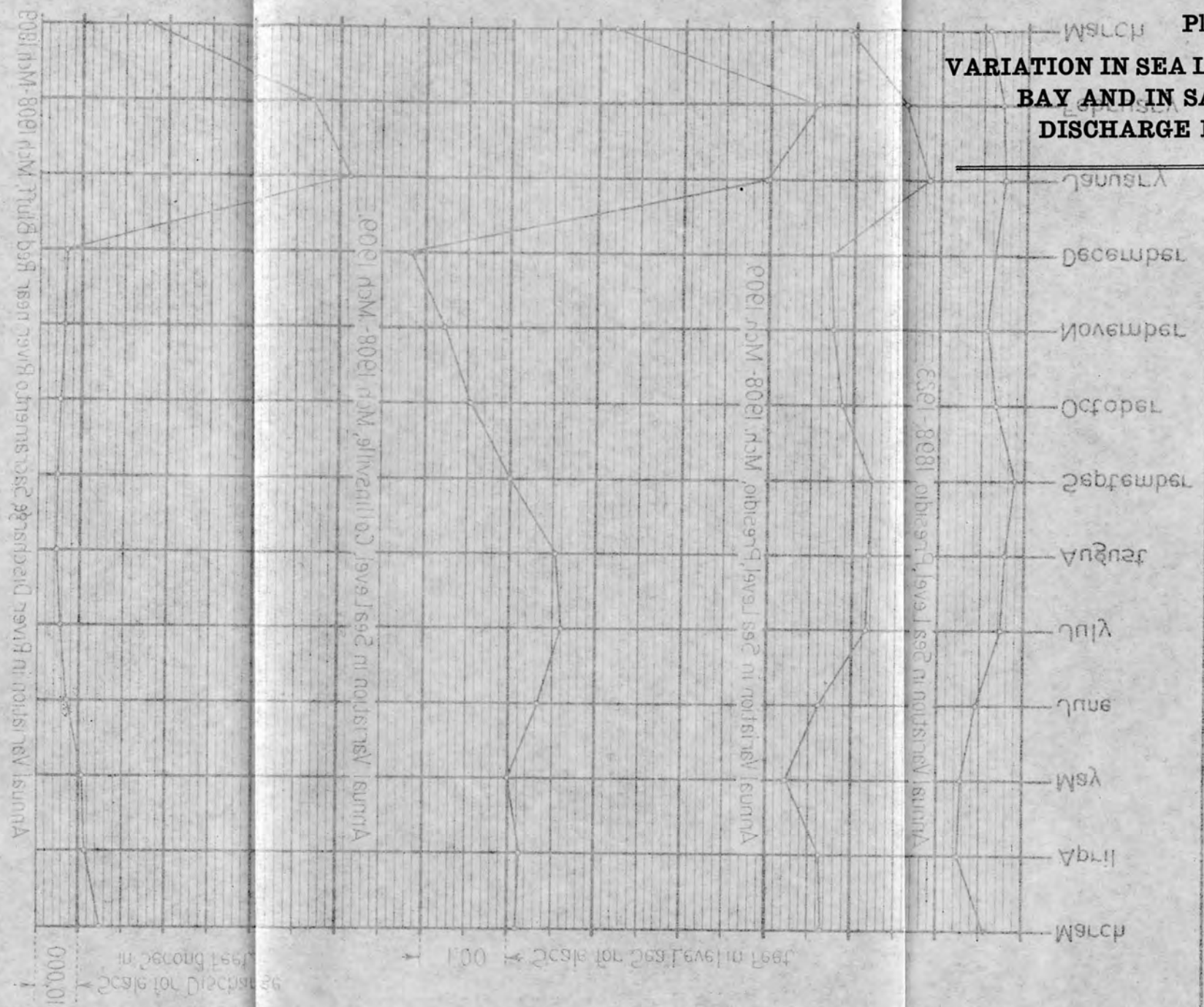
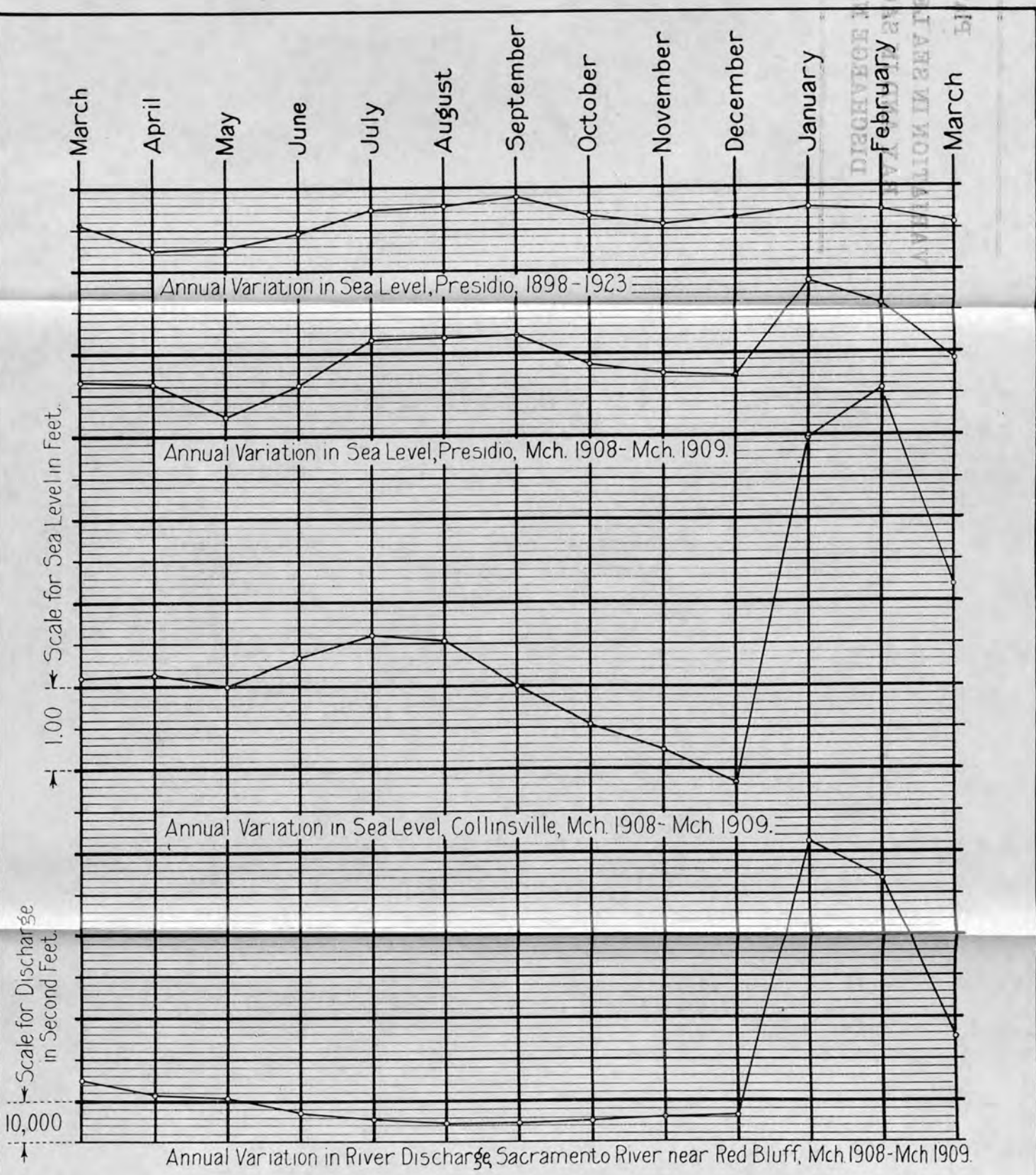


Plate 5-13  
VARIATION IN SEA LEVEL IN SAN FRANCISCO BAY AND IN SACRAMENTO RIVER DISCHARGE NEAR RED BLUFF

DISCHARGE NEAR RED BLUFF  
SACRAMENTO VALLEY INVESTIGATIONS  
VARIATION IN SEA LEVEL IN S.F. BAY



**Note:-**  
 Reproduced from Curves accompanying  
 Letter of Dec 18, 1925 from Mr. R.L. Faris,  
 Acting Director, U.S. Coast and Geodetic  
 Survey.

DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 VARIATION IN SEA LEVEL IN S.F. BAY  
 AND IN  
 SACRAMENTO RIVER DISCHARGE NEAR RED BLUFF

APPROVED FOR ESTIMATING PURPOSES:-  
*A. F. Dralter*  
 CHIEF ENGINEER.

Drawn: WRY-CAM. Submitted: *W.R. Young*  
 Checked: Approved: *J. N. Savage*

SV-136 Berkeley, California Mch. 1926. 193-D-89

25-1-11  
 U.S. GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION  
 SAN FRANCISCO DISTRICT  
 DURING FLOOD PERIODS IN BAY AND MARE ISLANDS  
 HIGH AND LOW WATER LEVELS  
 SULLY WATER BARRIER  
 SAN FRANCISCO BAY, CALIFORNIA

U.S. GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION  
 SAN FRANCISCO DISTRICT  
 DURING FLOOD PERIODS IN BAY AND MARE ISLANDS  
 HIGH AND LOW WATER LEVELS  
 SULLY WATER BARRIER  
 SAN FRANCISCO BAY, CALIFORNIA

U.S. GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION  
 SAN FRANCISCO DISTRICT  
 DURING FLOOD PERIODS IN BAY AND MARE ISLANDS  
 HIGH AND LOW WATER LEVELS  
 SULLY WATER BARRIER  
 SAN FRANCISCO BAY, CALIFORNIA

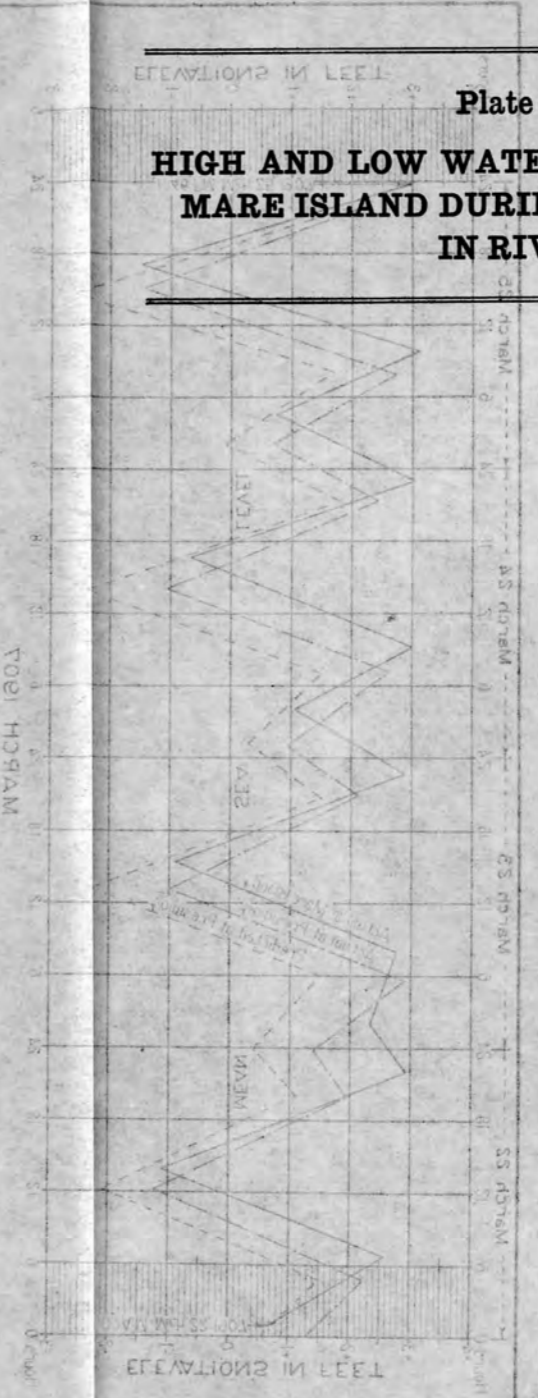
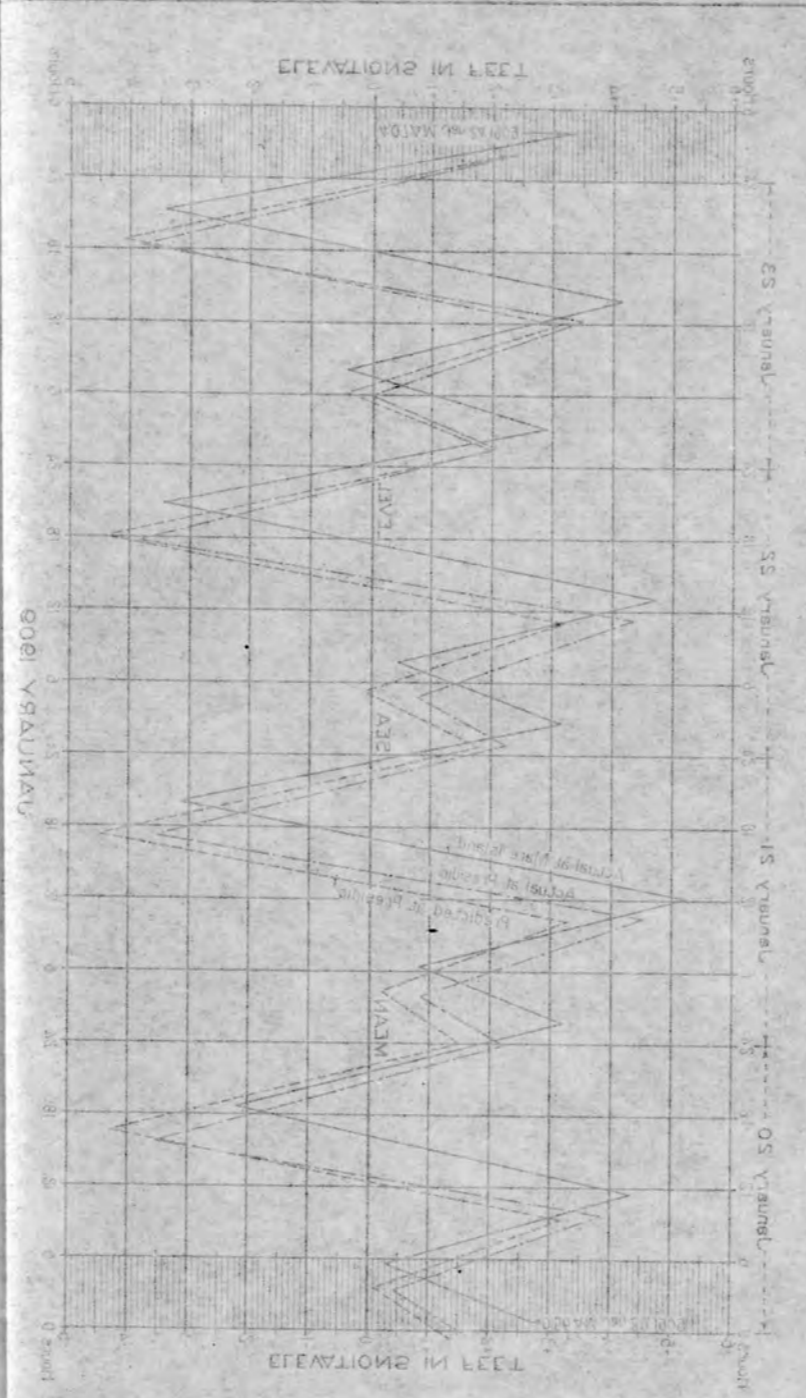
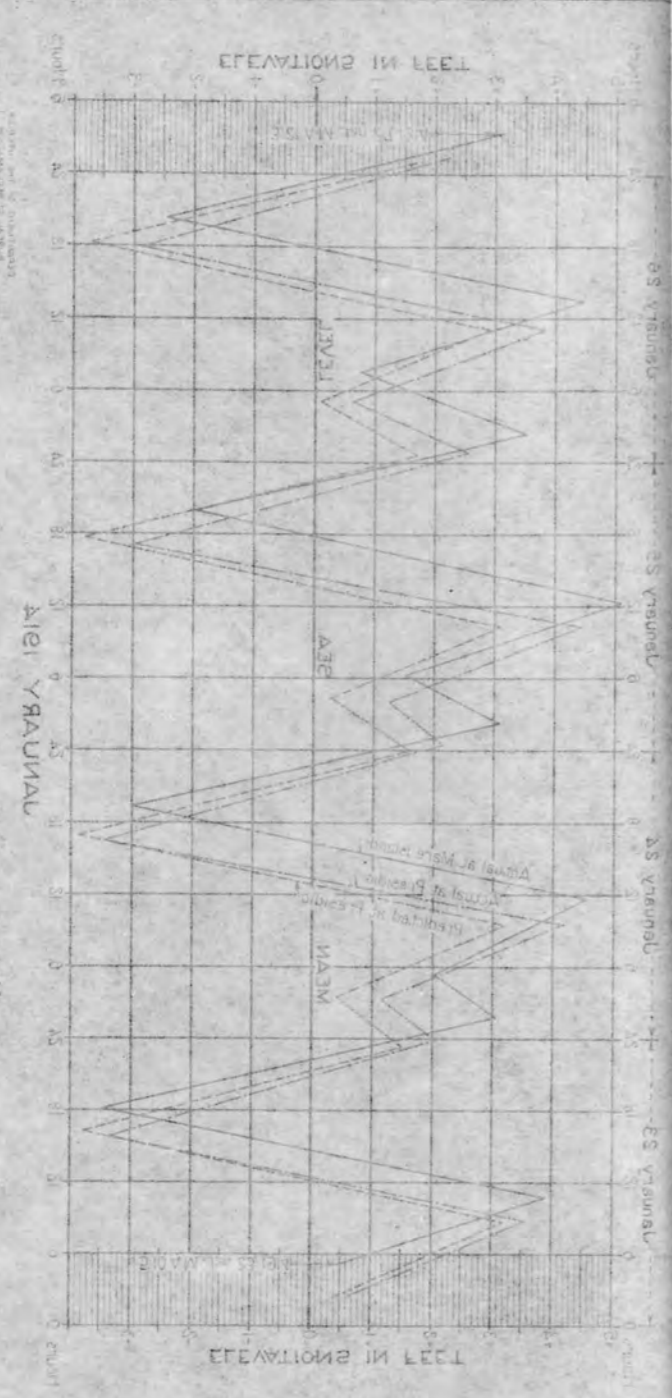
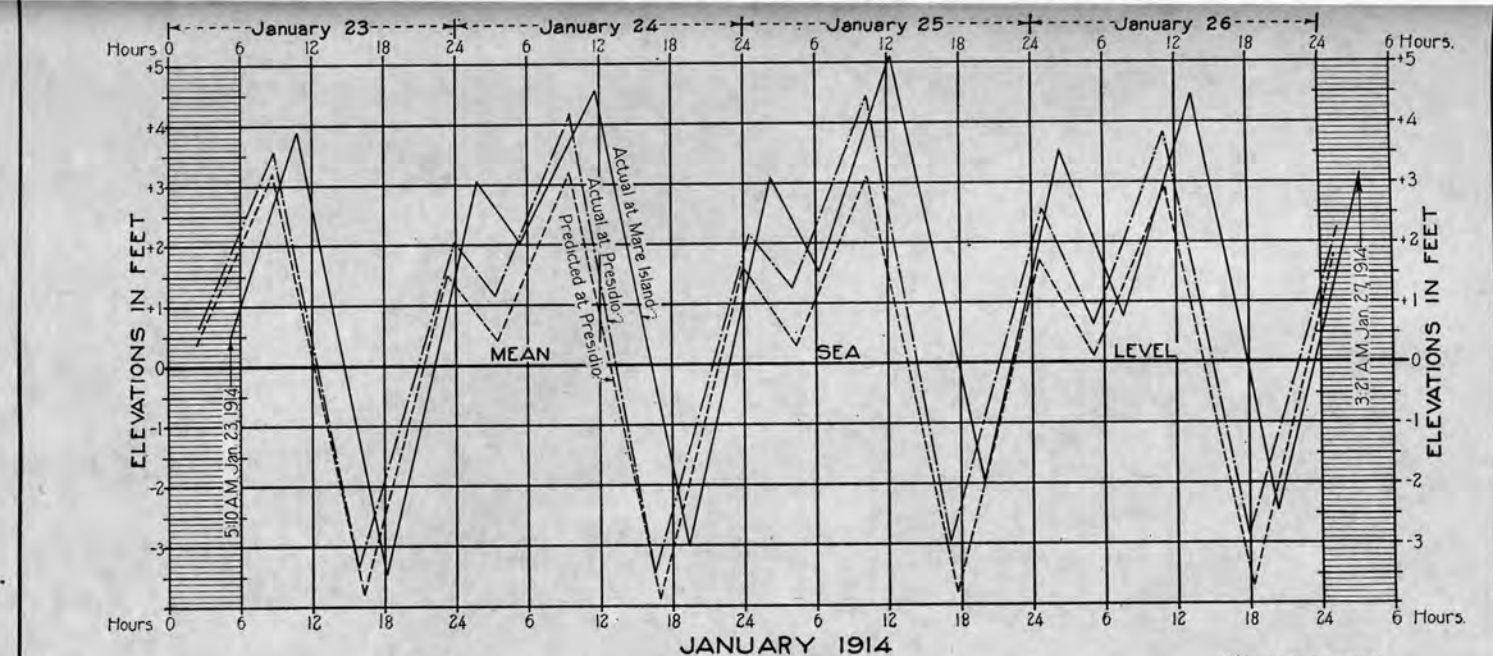
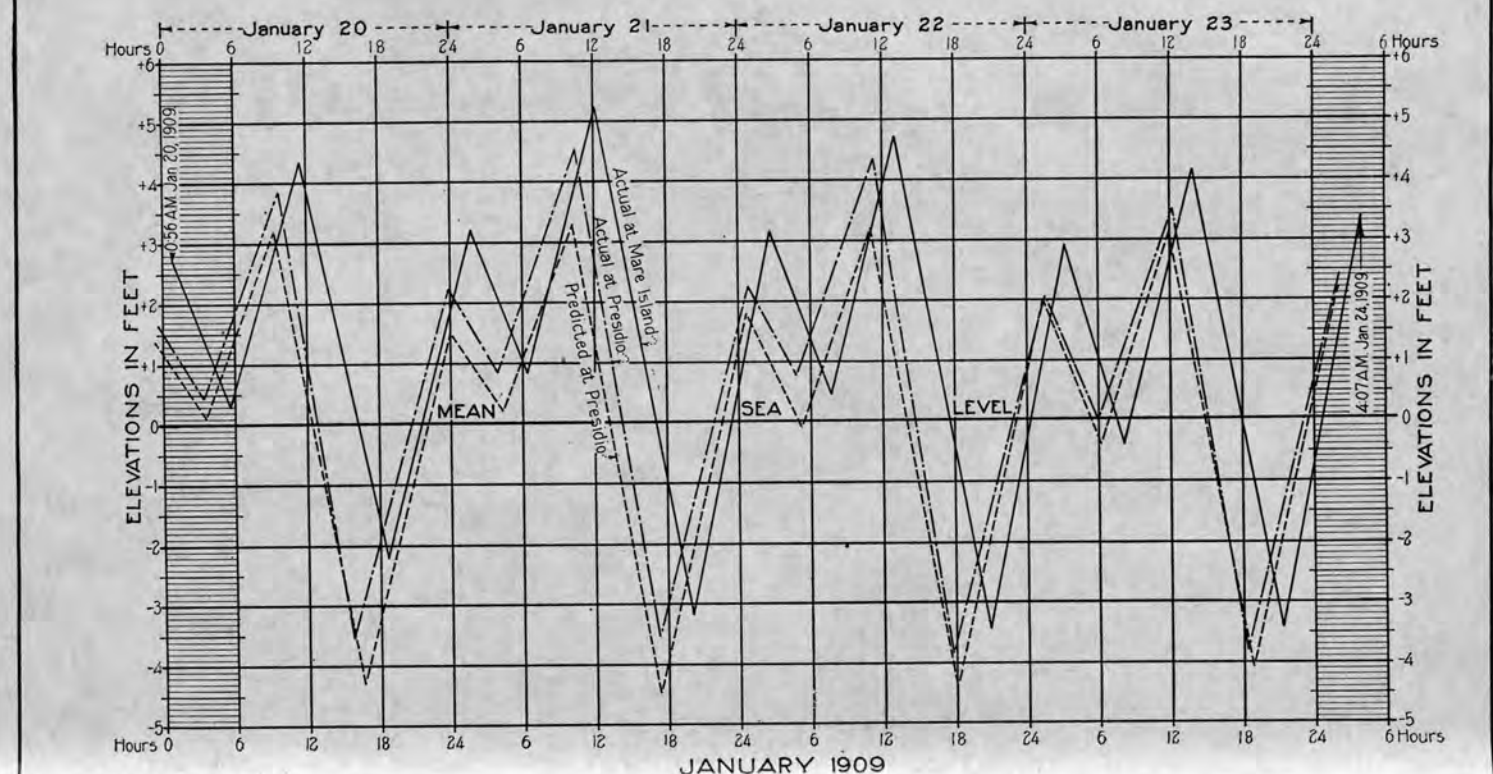
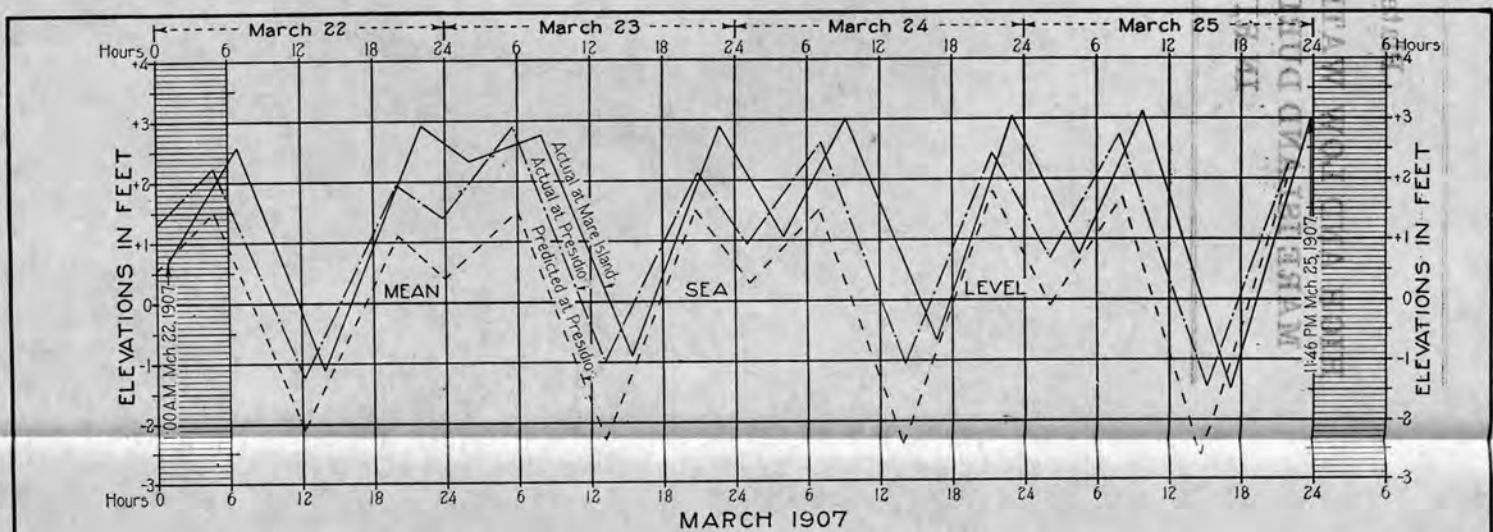


Plate 5-14  
 HIGH AND LOW WATER AT PRESIDIO AND  
 MARE ISLAND DURING FLOOD PERIODS  
 IN RIVERS



Note:-  
The Graphs are not true Graphs.  
Maximum and Minimum Elevations  
reached are, for convenience, joined  
by straight Lines.

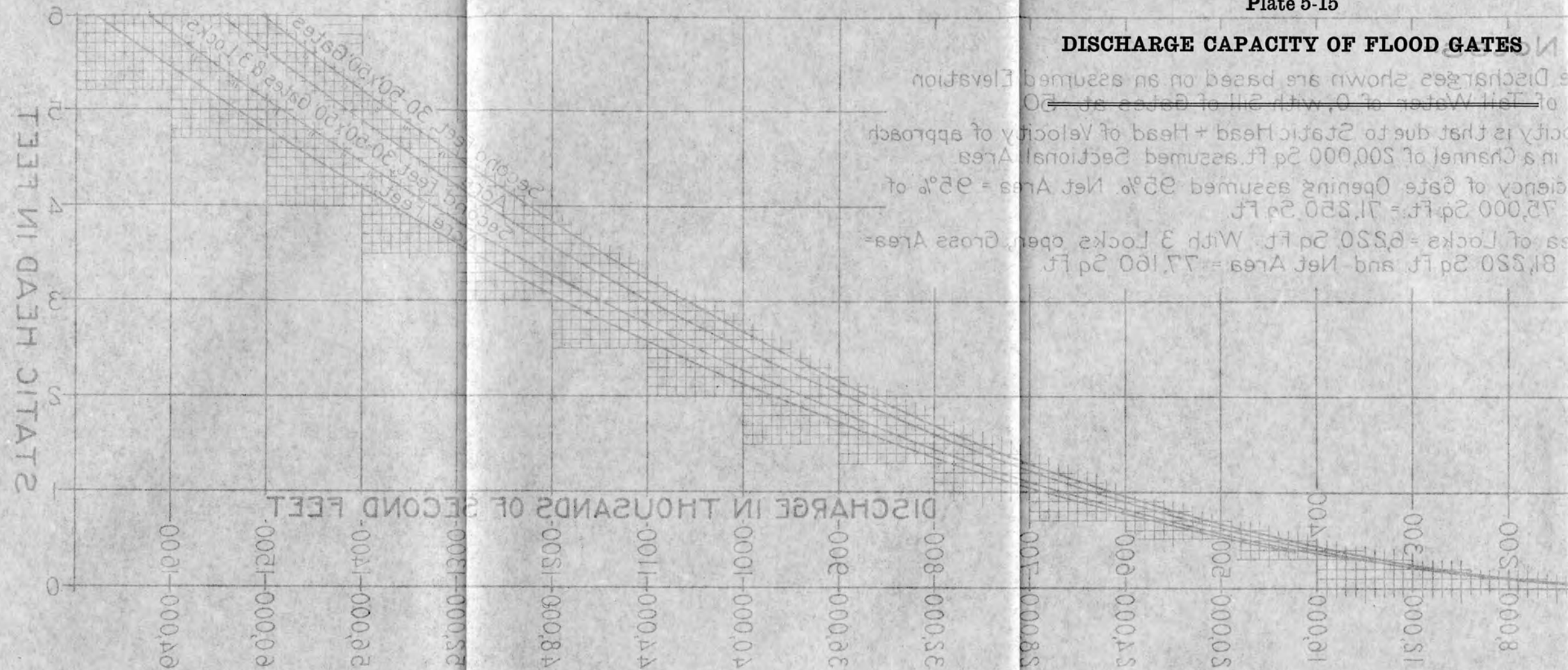
APPROVED FOR ESTIMATING PURPOSES-  
*A. J. Dralter*  
CHIEF ENGINEER

DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
HIGH AND LOW WATER AT PRESIDIO AND  
MARE ISLAND  
DURING FLOOD PERIODS IN RIVER 5  
Drawn-WAD:CAM Submitted-*W. R. Young*  
Checked- Approved-*J. H. Savage*  
SV-137 Berkeley, California Mch 1926. 193-D-90

Plate 5-15

DISCHARGE CAPACITY OF FLOOD GATES

Discharges shown are based on an assumed elevation of Tail Water of 0, with sill of gates at 50 ft. Discharge capacity is that due to Static Head + Head of Velocity of approach in a channel of 200,000 sq ft. assumed sectional area. Coefficient of gate opening assumed 95%. Net Area = 95% of 75,000 sq ft = 71,250 sq ft. Area of Locks = 6,220 sq ft. With 3 Locks open, Gross Area = 81,220 sq ft and Net Area = 77,160 sq ft.

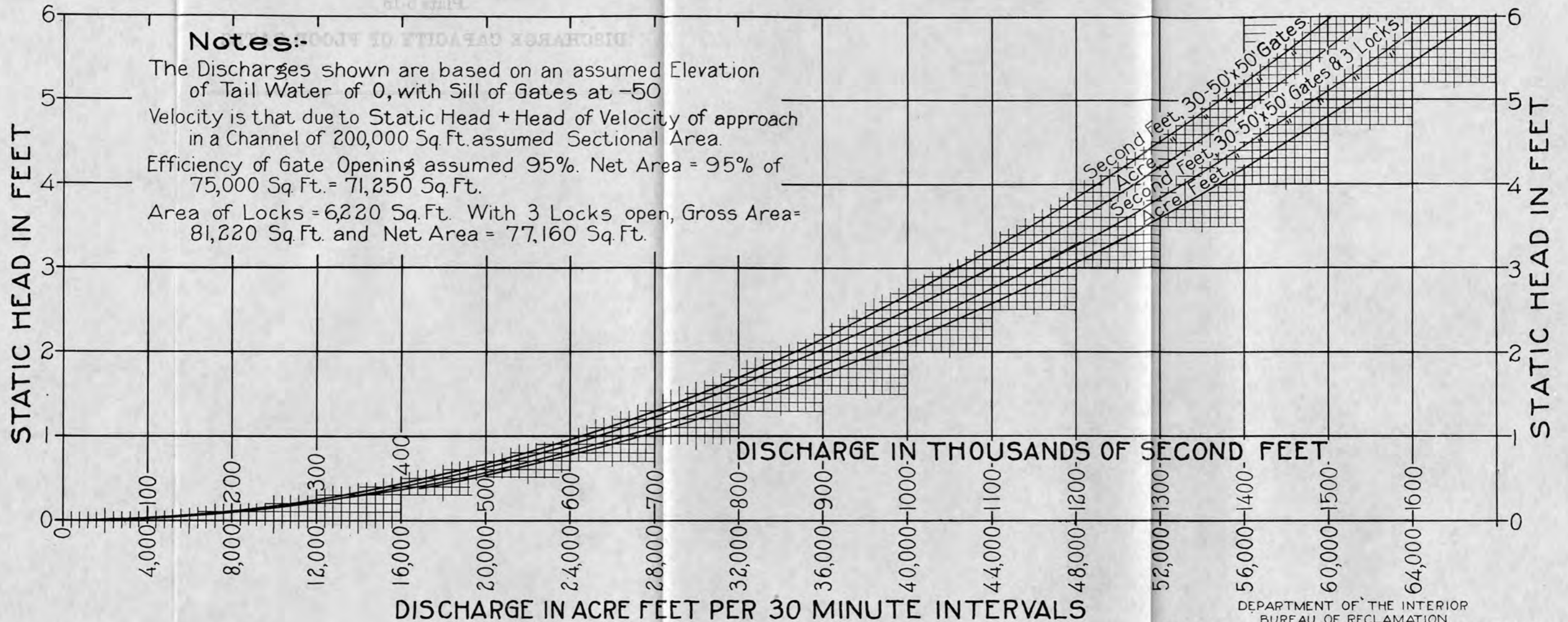


APPROVED FOR ESTIMATING PURPOSES:  
*O. J. Bratter*  
 CHIEF ENGINEER

Checked: \_\_\_\_\_ Approved: \_\_\_\_\_  
 Drawn: WAP-CAM Submitted: *W. J. ...*

DISCHARGE CAPACITY OF FLOOD GATES  
 SALT WATER BARRIER  
 SACRAMENTO VALLEY INVESTIGATIONS  
 BUREAU OF RECLAMATION  
 DEPARTMENT OF THE INTERIOR

2V-138 Berkeley California, Mar. 1936 133-d-21



APPROVED FOR ESTIMATING PURPOSES:-

*A. J. Walter*  
 CHIEF ENGINEER.

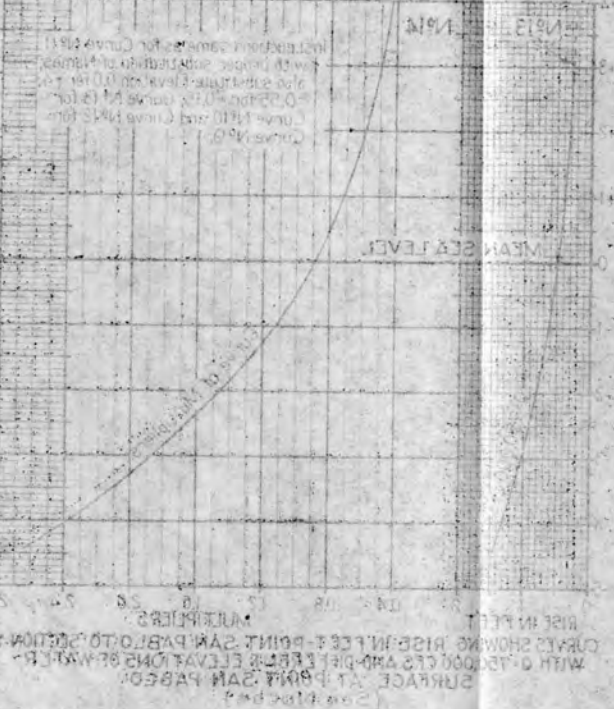
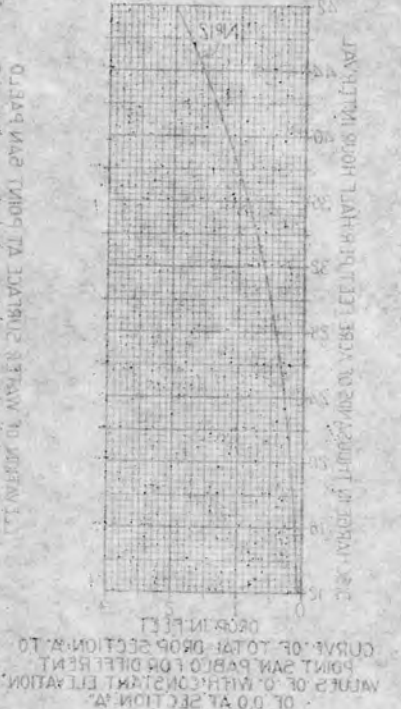
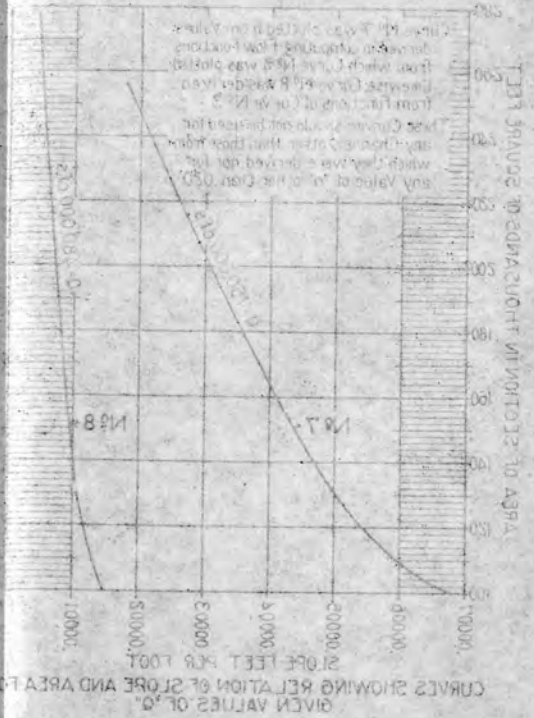
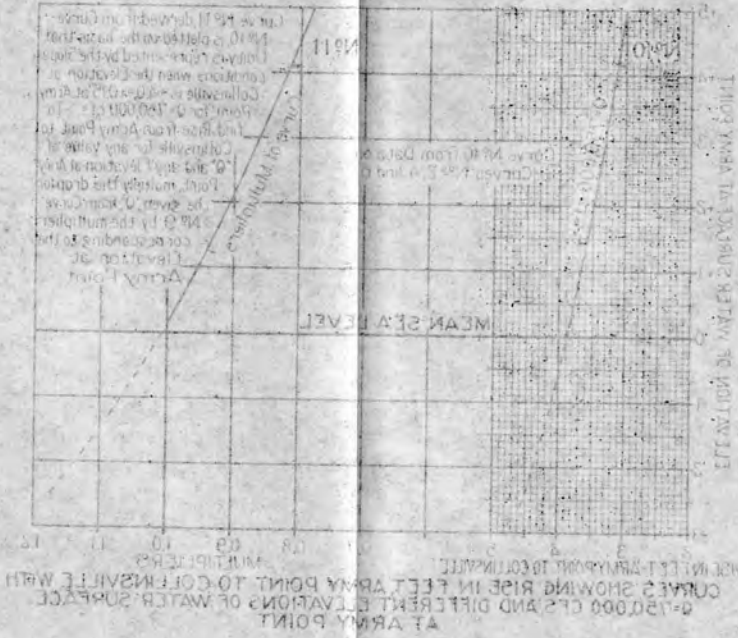
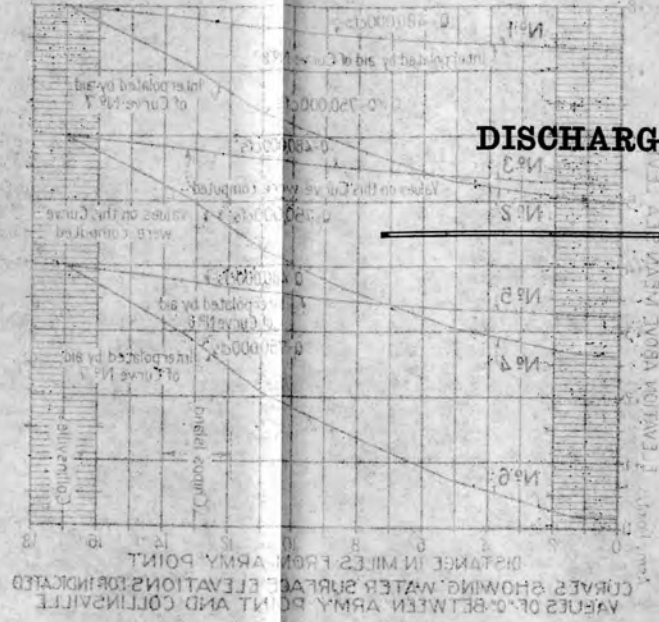
DEPARTMENT OF THE INTERIOR  
 BUREAU OF RECLAMATION  
 SACRAMENTO VALLEY INVESTIGATIONS  
**SALT WATER BARRIER**  
 DISCHARGE CAPACITY OF FLOOD GATES

Drawn: W.A.P.-C.A.M. Submitted: *W. P. Young*  
 Checked: \_\_\_\_\_ Approved: *J. L. Savage*

SV-138 Berkeley, California. Mch, 1926. 193-D-91

Plate 5-16

DISCHARGE AND SLOPE CURVES



Notes:  
 1. The curves are based on a constant elevation of 4.0 at Collinsville.  
 2. The curves are based on a constant elevation of 4.0 at Collinsville.  
 3. The curves are based on a constant elevation of 4.0 at Collinsville.  
 4. The curves are based on a constant elevation of 4.0 at Collinsville.  
 5. The curves are based on a constant elevation of 4.0 at Collinsville.  
 6. The curves are based on a constant elevation of 4.0 at Collinsville.