whenever the water surface in the Sacramento River reaches the gage readings indicated above. The Superintendent shall cause readings to be taken at intervals of two to four hours during the period when the water surface is above flood-flow stage and record the time of the observations. One copy of the readings shall be forwarded to the District Engineer immediately following the flood, and a second copy transmitted as an inclosure to the semi-annual report in compliance with paragraph 3-06 of the Standard Manual.

2-03. Levees.

a. Description. The bypass levees will not be described in this manual, except that portion of the north and south levees of the Sacramento Weir north and south abutments and which may be considered a part thereof.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements see the following:

(1) Maintenance - Paragraph 4-02 of the Standard Manual.

(2) Check Lists - Exhibit E of this Supplement Manual.

(3) Operation - Paragraph 4-04 of the Standard Manual.

(4) Special Instructions - Paragraph 4-05 of the Standard Manual.

2-04. Miscellaneous Facilities.

a. Description. Miscellaneous structures or facilities which were constructed as a part of, or in conjunction with, the protective works, and which might affect their functioning, include the following:

(1) Bridges.

(a) A reinforced concrete bridge over the Sacramento Weir 20 feet wide that carries traffic of State Highway No. 16 and No. 24.

(b) A steel plate girder single track, bridge of the Sacramento Northern Railroad.

(2) Utility Relocation.

(a) A power pole line anchored to four wing walls. This line crosses the Sacramento Bypass channel and is parallel to and about 400 feet downstream from the railroad trestle.

(3) Hydrographic Facilities. Water level gages to be maintained by the following Government agencies within this unit are listed as follows:

(a) U. S. Weather Bureau and State Division of Water Resources gage located on the Sacramento River at the foot of "I" Street, City of Sacramento.

(b) U. S. Corps of Engineers and State Division of Water Resources gage located on the right bank of the Sacramento River about 100 feet downstream from the Sacramento Weir.

b. For pertinent Requirements of the Code of Federal Regulations and other requirements see the following:

(1) Maintenance - Paragraph 7-02 of the Standard Manual.

(2) Check Lists - Paragraph 7-03 of the Standard Manual.

(3) Operation - Paragraph 7-04 of the Standard Manual.

SECTION III
REPAIR OF DAMAGE TO PROJECT WORKS AND METHODS OF COMBATING FLOOD CONDITIONS

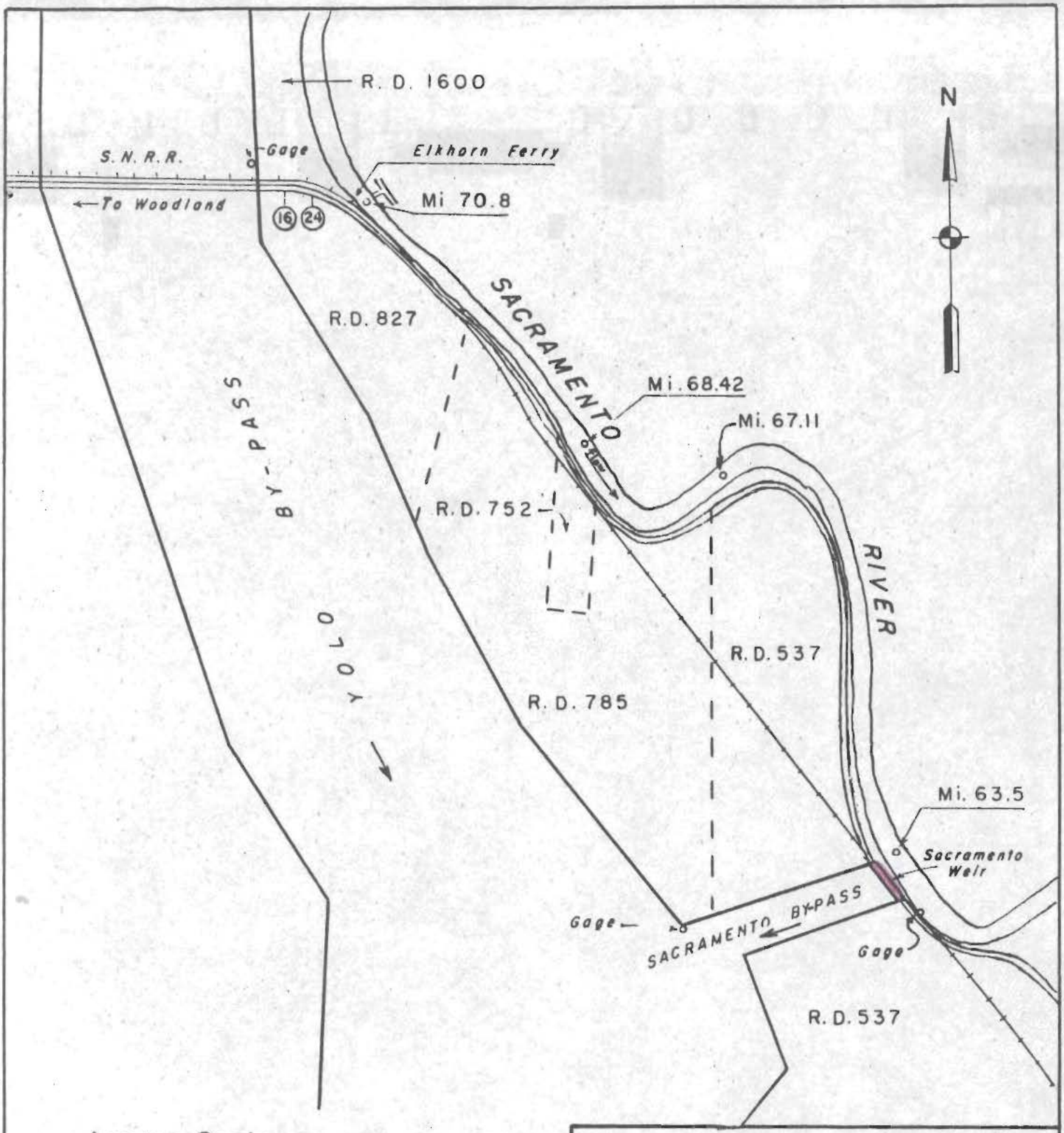
3-01. Repair of Damage. In the event of damage to the project works, whether due to flood conditions or other causes, and which may be beyond the capability of local interests to repair, the Superintendent will contact a representative of the Division of Water Resources, State of California, who coordinates maintenance of project works of the Sacramento River Flood Control Project. The State representative will give assistance or advice, or will determine appropriate action to be taken.

3-02. Applicable Methods of Combating Floods. For applicable methods of combating flood conditions reference is made to Section VIII of the Revised Standard Manual, where the subject is fully covered.

EXHIBIT A

FLOOD CONTROL REGULATIONS

(See Standard Manual)



Approx. Scale
One inch = One Mile

LEGEND

Area covered by this Manual.

LOCATION MAP

SACRAMENTO WEIR

SACRAMENTO RIVER, CALIFORNIA

UNIT NO. 158

EXHIBIT A-1

EXHIBIT B

"AS CONSTRUCTED"
DRAWINGS

See separate folder for the following drawings:

File No.	Title	
50-9-2985	General Location Plan - - - - -	1 sheet
50-9-2985	General Plan and Arrangement of Weirs and Levees - - - - - - -	Sheet No. 1c
50-9-2985	General Plan for Weir and Piers	Sheet C2
50-9-2985	Details of Abutments - - - - -	Sheet C3
50-9-2985	Details of Hinged Needle Connections - - - - - - - - - - -	Sheet C4
50-9-2985	General Details of Railway and Highway Bridges - - - - - -	Sheet C5
50-9-2985	Details of Float and Tripping Device - - - - - - - - - - -	Sheet C6
50-9-2985	Details of Highway Bridge Skew Spans - - - - - - - - - - - -	Sheet C7

EXHIBIT B
Unattached

EXHIBIT D

CHECK LIST NO. 1
LEVEE INSPECTION REPORT

(See Standard Manual)

EXHIBIT E

CHECK LISTS OF LEVEES, CHANNEL AND STRUCTURES

For definition of "flood" or "high water period" see paragraph 1-05 of this manual

CHECK LIST NO. 2

SACRAMENTO WEIR

Inspector's Report Sheet No. _____ Inspector _____

Date _____ Superintendent _____

Item	Remarks
(a) Location by Station	
(b) Settlement, sloughing, or loss of grade	
(c) Erosion of both slopes	
(d) Condition of roadways, including ramps	
(e) Evidence of seepage	
(f) Condition of gates and fencing	
(g) Maintenance measures taken since last inspection	
(h) Comments	

INSTRUCTIONS FOR COMPLETING SHEET 2, EXHIBIT E
(To be printed on back of sheet 2)

Item (a) Indicate levee station of observation, obtained by pacing from nearest reference point; indicate right or left Bank.

Item (b) If sufficient settlement of earthwork has taken place to be noticeable by visual observation, indicate amount of settlement in tenths of a foot. If sloughing has caused a change in slope of the embankment sections, determine the new slope. Note areas where erosion or gullying of the section has occurred.

Item (c) If sufficient erosion or gullying of back face of back toe of levee has taken place to be noticeable by visual inspection, indicate area affected and depth.

Item (d) Note any natural change in any section of roadway or ramps. Indicate any inadequacy in surface drainage system.

Item (e) Indicate any evidence of seepage through the embankment section.

Item (f) Indicate the serviceability of all farm gates across the embankments and roadway, and indicate if repainting is required.

Item (g) Indicate maintenance measures that have been performed since last inspection and their condition at the time of this inspection.

Item (h) Record opinion, if any, of contributory causes for conditions observed and also any observations not covered under other columns.

NOTE: One copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion, and one copy is to be attached to and submitted with the Superintendent's semi-annual report.

INSTRUCTION FOR COMPLETING SHEET 4, EXHIBIT E
(To be printed on back sheet 4)

Item (a) Indicate station of observation obtained by pacing from nearest reference point.

Item (b) Note nature, extent, and size of vegetal growth within the limits of flood flow channel.

Item (c) Note nature and extent of debris and refuse that might cause fouling of the bridges over the channel.

Item (d) Report any construction along or above the diversion channel that has come to the attention of the inspector and that might affect the functioning of the project.

Item (e) Indicate any change in grade or alignment of the channels, either by deposition of sediment or scour, that is noticeable by visual inspection. Estimate amount and extent.

Item (f) Indicate any change that has taken place in the riprap such as disintegration of the rock, erosion, or movement of the rock. Note the presence of vegetal growth through the riprap.

Item (g) Note any damage or settlement of the footings of the bridges. Indicate condition of wooden structures and if repainting is required. Indicate condition of bridge approaches, headwalls, other appurtenances.

Item (h) Indicate maintenance measures that have been performed since the last inspection and their condition at time of this inspection.

Item (i) Record opinion, if any, of contributory causes for conditions observed, also any observations not covered under other columns.

NOTE: One copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion and one copy is to be attached to and submitted with the Superintendent's semi-annual report.

CHECK LIST NO. 4

WEIR STRUCTURE

SACRAMENTO WEIR

Inspector's Report Sheet No. _____ Inspector _____

Date _____ Superintendent _____

Item	Remarks
(a) Condition of concrete weir section stilling basin and abutments	
(b) Condition of concrete highway bridge	
(c) Condition of railroad bridge	
(d) Condition of needles, beams and tripping devices	
(e) Condition of concrete revetment	
(f) Vegetal growth	
(g) Accumulation of trash and debris	
(h) Measures taken since last inspection	
(i) Comments	

INSTRUCTIONS FOR COMPLETING SHEET 6, EXHIBIT E
(To be printed on back of sheet 6)

Item (a) Inspect condition of concrete weir, stilling basin and abutments with respect to abraision, chipping or spalling and record observations.

Item (b) Note condition of highway bridge for abraision, chipping, road surfacing or damage due to traffic.

Item (c) Note condition of railroad tracks, ties and beams or structural members of bridge.

Item (d) Note conditions of needles and beams as to state of preservation of wood and mechanical tripping mechanism.

Item (e) Note condition of concrete revetment such as erosion, undue settlement or mis-alignment.

Item (f) Note nature, extent, and size of vegetal growth in and around the weir structure with particular emphasis on growth on the upstream side between the weir and the Sacramento River.

Item (g) Note nature and extent of debris that might cause scour around the weir section or abutments or tend to decrease the channel capacity.

Item (h) Indicate maintenance measures that have been performed since the last inspection and their condition at time of this inspection.

Item (i) Record opinion, if any, of contributory causes for conditions observed, also any observations not covered under other items. A copy of the Inspector's Report is to be mailed to the District Engineer immediately on completion.

EXHIBIT F

LETTER OF ACCEPTANCE
BY STATE RECLAMATION BOARD

THE RECLAMATION BOARD
OF THE
STATE OF CALIFORNIA

March 11, 1953

District Engineer
Sacramento District
Corps of Engineers, U.S. Army
P.O. Box 1739
Sacramento 8, California

Dear Sir:

Reference your letters file No. SPKKO-P 824.3 (Sac. R.F.C.P.) dated 1 December 1951, 3 December 1951, 4 December 1951, three letters dated 6 December 1951, 7 December 1951 and six letters dated 8 December 1951. Subject letters transferred to The Reclamation Board for operation and maintenance, various levee units of the Sacramento River Flood Control Project.

The Reclamation Board at its 18 December 1951 meeting, on behalf of the State of California, accepted certain of the transferred units together with their contiguous banks for operation and maintenance, and rejected others. A tabulation of the units so accepted or rejected is attached hereto.

Yours very truly,

THE RECLAMATION BOARD
A. M. BARTON
Chief Engineer and General Manager

Signed D. M. Carr
D. M. CARR

EXHIBIT F
Sheet 1 of 2

December 18, 1951

The Board accepted the transfer from the Corps of Engineer, in letters of dates listed below, the following reaches of levees and their contiguous waterway banks where applicable for flood control operation and maintenance, as complete and meeting the requirements of the Sacramento River Flood Control Project.

No.	Date of letter	Levee Location	Remarks
*	**********	**********	**********
11	8 Dec. 1951	Sacramento Weir	Maintained by State
*	**********	**********	**********

NOTE: Only item pertaining to Operation and Maintenance Manual No. 158 is included in the above copy.

EXHIBIT F
Sheet 2 of 2

EXHIBIT G

SUGGESTED SEMI-ANNUAL REPORT FORM

TO: The District Engineer
Sacramento District
Corps of Engineers
1209 - 8th Street
Sacramento, California

(1 May 19____)
(1 Nov 19____)

Dear Sir:

The semi-annual report for the period (1 May 19___ to 31 October 19___) (1 November 19___ to 30 April 19___) Sacramento River Flood Control Project, Sacramento Weir is as follows:

a. The physical condition of the protective works is indicated by the inspector's report, copies of which are inclosed, and may be summarized as follows:

(Superintendent's summary of conditions)

It is our intention to perform the following maintenance work in order to repair or correct the conditions indicated:

(Outline the anticipated maintenance operations for the following 6 months.)

b. During this report period, major high water stages (water level at 25.0 on the gage at foot of "I" Street or 29.0 on the gage 100 feet downstream from Sacramento Weir) occurred on the following dates:

Dates	Maximum Elevation
_____	_____
_____	_____
_____	_____

EXHIBIT G
Sheet 1 of 2

Comments on the behavior of the protective works during such high water periods are as follows:

(Superintendent's log of flood observations)

During the high water stages when the water level reached a height of _____, on the gage or excess thereof (dates)_____, it was necessary to organize and carry out flood operations as follows:

(See Maintenance Manual_____.)

c. The inspections have indicated (no) or (the following) encroachments or trespasses upon the project right-of-way.

d. (No) (_____) permits have been issued for (the following) improvements or construction within the project right-of-way.

Executed copies of the permit documents issued are transmitted for your files.

e. The status of maintenance measures, indicated in the previous semi-annual report as being required or as suggested by the representatives of the District Engineer, is as follows:

(Statement of maintenance operations, item by item with percent completion.)

f. The fiscal statement of the Superintendent's operations for the current report period is as follows:

	Labor	Material	Equipment	Overhead	Total
1. Inspection					
2. Maintenance					
3. Flood fighting operations					
TOTAL					

Respectfully submitted,

_____
Superintendent of Works

EXHIBIT G
Sheet 2 of 2

EXHIBIT H

SCHEDULE OF OPERATION, SACRAMENTO WEIR

(Letterhead) November 25, 1940

WAR DEPARTMENT
Calif. Debris Comm.
Sacramento, Calif.

File No. 662.8 (FC)1

Subject: Schedule of Operation, Sacramento Weir.

Mr. Edward Hyatt, State Engineer
Division of Water Resources
401 Public Works Building
Sacramento, Calif.

Dear Sir:

Reference is made to the proposed schedule for the operation of the movable top of the Sacramento Weir, ad outlined in our letter of November 4, 1940.

The California Debris Commission has formally adopted this schedule, which reads as follows:

"None of the weir gates shall be opened before a gage height of 27.5 feet is reached on the U. S. Weather Bureau gage at Sacramento, and the movable crest shall be operated in such a manner that the maximum flood height in the Sacramento River does not exceed 29.0 feet on this gage insofar as this is possible. In any event, on a rising stage only such gates shall be opened as required to hold the water surface in the river at Sacramento Weir at Elevation 31.0 U.S.E.D. Datum. The closing of the gates opened to effect the control outlined above shall be started as soon as the river stage at Sacramento Weir recedes to Elevation 28.5 U.S.E.D. Datum, and shall be prosecuted with faithfulness and energy, using adequate equipment, so that all gates are closed within as short a period as practicable."

In accordance with the terms and provisions of the existing law, it is requested that the State of California operate the Sacramento Weir in accordance with the above schedule.

FOR THE CALIFORNIA DEBRIS COMMISSION:

Yours very truly

R. C. Hunter
Lt. Col., Corps of Engineers
Member and Secretary

EXHIBIT H

Sheet 1 of 1

STANDARD OPERATION PROCEEDURES

FOR THE

SACRAMENTO WEIR

SACRAMENTO RIVER FLOOD CONTROL PROJECT

NOVEMBER 1965

MANUAL NO.158

FOLDER NO. 63

STANDARD OPERATION PROCEDURES FOR THE

SACRAMENTO WEIR,

SACRAMENTO RIVER FLOOD CONTROL PROJECT

STANDARD OPERATION PROCEDURES FOR THE
SACRAMENTO WEIR,
SACRAMENTO RIVER FLOOD CONTROL PROJECT

Purpose

The purpose of the Standard Operation Procedures for the Sacramento Weir is to set forth the operational criteria and procedures to be followed by the Department of Water Resources during high water periods.

Additional miscellaneous information concerning the Sacramento Weir, including a description of the facilities, maintenance and inspection requirements, and various check lists and reports is contained in the "Supplement to Standard Operation and Maintenance Manual, Sacramento River Flood Control Project, Unit No. 158, Sacramento Weir," a publication of the Corps of Engineers.

Authority

State legislation authorizing the Department to maintain and operate the Sacramento Weir with its adjoining channel is contained in Sections 8360 and 8361 under Division 5, Part 2, Chapter 3, Article 2 of the Water Code.

Schedule of Operation

The recommendation to the Chief of Flood Operations for the opening or closing of either all or part of the 48 flood gates comprising the Sacramento Weir shall be determined by the Forecasting Unit of the Flood Operations Center. This recommendation will be made using criteria as set forth in the letter from the Corps of Engineers on schedule of operation, Sacramento Weir, dated November 19, 1963, as follows:

"The objectives of the operation of Sacramento Weir are to limit flood stages in Sacramento River from Verona to Isleton to the project flood plane, insofar as possible, with maximum feasible utilization of the flood capacity of the Sacramento River channel below that weir. In order to accomplish these objectives, the following schedule of operation shall be used. None of the weir gates shall be opened before a gage height of 28.0 feet m.s.l. datum is reached on the I Street Gage at Sacramento. When this 28.0 foot stage at I Street Gage is exceeded with a further rise anticipated, the gates shall be opened progressively to maintain the I Street stage between 28.0 and 29.0 feet and to limit the maximum I Street stage to 29.0 feet, insofar as this is possible. The number of gates opened to accomplish these criteria shall be kept to a practical minimum. After the peak of the flood has passed and the river stage at Sacramento Weir has receded to 28.0 feet C of E datum, the closing of the gates shall be initiated and prosecuted with dispatch so that, insofar as practicable, all gates in excess of minimum anticipated requirements are closed before the arrival of the next flood wave that might require a new cycle of weir operation in accordance with the provisions of these regulations.

"This schedule of operation is subject to temporary modification by the District Engineer, Corps of Engineers, if found necessary."

Chain of Command

Upon the recommendation of the Forecasting Unit, the Chief of Flood Operations or his appointed assistant will make the decision for the opening or closing of the flood gates and transmit the command to the person in charge at the Sacramento Weir Maintenance Yard. The number of gates to be opened or closed and time of same will be given to the person in charge at the Maintenance Yard by the Chief of Flood Operations by radio or phone and confirmed in writing. The physical operation of the flood gates will be carried out by personnel from the Sacramento Weir Maintenance Yard.

Safety Requirements

Only those personnel trained in the proper operation of the weir and instructed in the proper safety measures to be employed may participate in operating the flood gates. Stringent safety measures will be adhered to

which will be the responsibility of the person in charge at the Sacramento Maintenance Yard. The person in charge of the physical opening and closing of the weir gates shall provide any necessary precautions with regard to traffic control.

Forms

Attached are samples of two forms which are for use in recording data pertinent to the operation of the weir. The first, DWR 1886, "Weir and Flood Data," shall be used to record date and time of opening or closing of individual weir gates, with the corresponding staff gage reading. On the second form, DWR 2127, "Flood Data - Gage Heights," a gage height reading of the Sacramento Weir staff gage shall be noted hourly during the entire period of flow over the weir.

After the flood gates of the weir are secured in a closed position, copies of both forms shall be transmitted in duplicate to the Flood Operations Center.

Responsibility of the Flood Operations Center

The Chief of Flood Operations shall be responsible for transmitting a report to the Corps of Engineers, Sacramento, after the operation of the flood gates. The report shall contain all pertinent data concerning the operation of the weir.

The Flood Operations Center shall be responsible for disseminating information and coordination of efforts regarding the operation of the weir.

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
FLOOD OPERATIONS CENTER

WEIR AND FLOOD DATA

Sacramento Weir
Sacramento River Flood Control Project

Date	Time	Gate No.* (opened or closed)	Sacto. Weir Staff Reading	Entered by	Remarks

*Gates numbered consecutively from north end

DWR 1886

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
FLOOD OPERATIONS CENTER

FLOOD DATA – GAGE HEIGHTS–

Sacramento Weir
Sacramento River Flood Control Project

Number of Gates Opened During Period_____

Number of Gates Closed During Period_____

Date_____, 19_____

GAGE HEIGHTS

Time	G.H.	Time	G.H.	Time	G.H.	Time	G.H.
0000		0600		1200		1800	
0030		0630		1230		1830	
0100		0700		1300		1900	
0130		0730		1330		1930	
0200		0800		1400		2000	
0230		0830		1430		2030	
0300		0900		1500		2100	
0330		0930		1530		2130	
0400		1000		1600		2200	
0430		1030		1630		2230	
0500		1100		1700		2300	
0530		1130		1730		2330	

STATE OF CALIFORNIA—RESOURCES AGENCY

EDMUND G. BROWN, Governor

DEPARTMENT OF WATER RESOURCES
P. O. BOX 388
SACRAMENTO

December 19, 1966

Mr. A. Gomez, Chief
Engineering Division
Sacramento District, Corps of Engineers
650 Capitol Mall
Sacramento, California 95814

Attention: Hydrology Section

Dear Mr. Gomez:

The purpose of this letter is to clarify operational procedures necessitated by the datum change at the Sacramento Weir staff gage.

As you are aware, Standard Operating Procedures for the Sacramento Weir were reviewed and minor revisions made in the fall of 1963. These revised operating procedures were documented in a letter from the Corps of Engineers dated November 19, 1963.

Subsequent to that date all staff gages in the Sacramento-San Joaquin tidal influence area set at, or near, U.S.E.D. datum were reset. These gages were reset so that zero on the gage equals -3.00 feet U.S.C. & G.S. datum.

The gage at the Sacramento Weir was one of those that was reset. The effect of this resetting is that a stage of 28.0 feet as previously set would now read 27.5 feet.

The Standard Operating Procedures for the Sacramento Weir (as referred to above) require that gate closing activities begin when the stage has receded to 28.0 feet at the weir. The equivalent stage of 27.5 feet will, therefore, be used henceforth as the stage to initiate gate closing activities.

In summary, it seems pertinent to note that this stage of 27.5 feet (with the changed datum) results in the same flow of water over the weir as resulted from the previous stage of 28.0 feet. As documented in previous operating procedures, it is this flow of water over the weir which has been established as being most effective and safe for gate closing operations.

Sincerely yours,

William L. Horn, Chief
Flood Operations
Statewide Operations Office

December 1966

UNIT NO. 158

SACRAMENTO WEIR

The Sacramento Weir will be operated by the Department of Water Resources of the State of California in accordance with the following schedule adopted in 1963:

SCHEDULE OF OPERATION - SACRAMENTO WEIR

The objectives of the operation of Sacramento Weir are to limit flood stages in Sacramento River from Verona to Isleton to the project flood plane, insofar as possible, with maximum feasible utilization of the flood capacity of the Sacramento River channel below that weir. In order to accomplish these objectives, the following schedule of operation shall be used. None of the weir gates shall be opened before a gage height of 28.0 feet m.s.l. datum is reached on the I Street Gage at Sacramento. When this 28.0 foot stage at I Street Gage is exceeded with a further rise anticipated, the gates shall be opened progressively to maintain the I Street stage between 28.0 and 29.0 feet and to limit the maximum I Street stage to 29.0 feet, insofar as this is possible. The number of gates opened to accomplish these criteria shall be kept to a practical minimum. After the peak of the flood has passed and the river stage at Sacramento Weir has receded to 27.5 feet C of E datum, the closing of the gates shall be initiated and prosecuted with dispatch so that, insofar as practicable, all gates in excess of minimum anticipated requirements are closed before the arrival of the next flood wave that might require a new cycle of weir operation in accordance with the provisions of these regulations.

This schedule of operation is subject to temporary modification by the District Engineer, Corps of Engineers, if found necessary.

EXHIBIT H
Sheet 1 of 1
(revised 1966)

EXHIBIT H

SCHEDULE OF OPERATION, SACRAMENTO WEIR

December 1966

UNIT NO. 158

SACRAMENTO WEIR

The Sacramento Weir will be operated by the Department of Water Resources of the State of California in accordance with the following schedule adopted in 1963:

SCHEDULE OF OPERATION - SACRAMENTO WEIR

The objectives of the operation of Sacramento Weir are to limit flood stages in Sacramento River from Verona to Isleton to the project flood plane, insofar as possible, with maximum feasible utilization of the flood capacity of the Sacramento River channel below that weir. In order to accomplish these objectives, the following schedule of operation shall be used. None of the weir gates shall be opened before a gage height of 28.0 feet m.s.l. datum is reached on the I Street Gage at Sacramento. When this 28.0 foot stage at I Street Gage is exceeded with a further rise anticipated, the gates shall be opened progressively to maintain the I Street stage between 28.0 and 29.0 feet and to limit the maximum I Street stage to 29.0 feet, insofar as this is possible. The number of gates opened to accomplish these criteria shall be kept to a practical minimum. After the peak of the flood has passed and the river stage at Sacramento Weir has receded to 27.5 feet C of E datum, the closing of the gates shall be initiated and prosecuted with dispatch so that, insofar as practicable, all gates in excess of minimum anticipated requirements are closed before the arrival of the next flood wave that might require a new cycle of weir operation in accordance with the provisions of these regulations.

This schedule of operation is subject to temporary modification by the District Engineer, Corps of Engineers, if found necessary.

EXHIBIT H
Sheet 1 of 1
(revised 1966)

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

IN REPLY REFER TO
SPKGD-L

4 January 1967

Department of Water Resources
State of California
ATTN: Mr. W. L. Horn
Sacramento, California

Gentlemen:

Reference is made to your letter of 19 December 1966 requesting a revision for Standard Operating Procedures for the Sacramento Weir.

In compliance with your request a revision has been made to our Standard Operating Procedures for the Sacramento Weir to conform to the new gage setting so that a stage of 28.0 feet as previously set would now read 27.5 feet. There are inclosed four copies of a revision for Unit No. 158 of the Supplement to the Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project, and eleven copies of a corresponding revision of page 20-a in the Master Manual of Reservoir Regulation for Sacramento River Basin, California.

Copies of the revision to Unit No. 158 are also being furnished the State Reclamation Board at this time.

Sincerely yours,

A. GOMEZ
Chief, Engineering Division

2 Incl
1. Revision to Unit No. 158 (4 cys)
2. Revision to R.R. Manual (11 cys)

C O P Y

STATE OF CALIFORNIA - RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

C O P Y

January 28, 1975

Mr. George C. Weddell
Chief of Engineering Division
Sacramento District, Corps of Engineers
Department of the Army
650 Capitol Mall
Sacramento, California 95814

Dear Mr. Weddell:

This letter is in regard to the proposal considered by our staffs to modify the operating criteria for the Sacramento Weir to reduce the effects on improvements within the channel in the vicinity of the Weir.

We have no objection to reverting back to the approved weir operating criteria that were used for operation of the Weir from 1940 to 1963, as set forth in the War Department's letter of November 25, 1940, subject to a one-half foot datum change that was made at the Weir in 1966.

We understand that you intend to document in a memorandum the reasons for reverting back to the earlier operating criteria, and that you will coordinate this with the Department of Water Resources and the State Reclamation Board.

We have appreciated your close coordination on this subject, and will work with you as necessary to complete action on it.

Sincerely yours,

/s/ Herbert W. Greydanus
HERBERT W. GREYDANUS
Division Engineer
Division of Resources
Development

DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF SPKED-T

28 January 1975

Mr. Stanley J. Gale
Gale & Goldstein, Inc.
1214 F Street
Sacramento, CA 95814

Dear Mr. Gale:

This is in further reply to your prior letters regarding operation of the Sacramento Weir.

We have completed an investigation of the operation of the Sacramento Weir. The study has included an evaluation of the existing operating criteria and of the effects that modifications of these criteria (including your proposal) would have on the flow regimen of the Sacramento River. The study was conducted with the objective of determining the operating schedule that would best serve the overall public interest. Our findings have been coordinated with the California Department of Water Resources and with the California State Reclamation Board.

In your initial letter you requested two specific modifications to the existing criteria:

a. Operating the Weir to maintain a maximum stage of 26 feet m.s.l. in the Sacramento River between the Sacramento Weir and I Street gage, insofar as possible.

b. Using an upstream gage (at either the Interstate 880 Bridge or the Elkhorn Bridge) as an index in addition to the I Street gage. Adoption of these suggestions would reduce river stages up to 3 feet in the vicinity of your property during moderate flood events. River stages would not be reduced during large floods (February 1963 and December 1964 events for example) nor during small floods where flows below Verona do not exceed 70,000 cfs (approximately 50% of the years). This plan of operation would have detrimental effects both to landowners along the Sacramento River and landowners in the Yolo Bypass. During those years in which a stage reduction would be effected, the velocities in the Sacramento River could be increased approximately 20 to 25% in the channel between Verona and the Sacramento Weir.

These increased velocities would accelerate bank and channel erosion. In addition, the peak and volume of flows to the bypass would be substantially increased during these same years, thereby increasing the frequency, depth and duration of flooding in the bypass, which affects landowners there. Primarily because of these hydraulic factors, together with legal and operational considerations, adoption of your proposed modifications is not considered to be in the overall public interest.

During investigation of your suggested proposal we studied several other possible modifications to the existing criteria, in addition to an intensive study of existing criteria. On the basis of these studies we have concluded that substantially following the operating criteria in effect prior to 1963 would best serve all interests. These criteria are as follows:

a. No gates shall be opened until the stage at the I Street gage exceeds 27.5 feet m.s.l.

b. Gates shall be opened so that the stage at I Street does not exceed 29 feet m.s.l., insofar as possible.

c. Subject to provisions a. and b. above, the stage at the Sacramento Weir shall be maintained during the gate-opening period at 30.5 feet CofE Datum (equivalent to 27.5 feet m.s.l.) insofar as possible.

d. Gates shall be closed as rapidly as practicable when the stage drops below 28.0 feet CofE Datum (25.0 m.s.l.) at the Sacramento Weir.

Reverting to the pre-1963 operating criteria will provide a river stage reduction in the vicinity of the Sacramento Weir of 1.5 feet (maximum). This is in addition to the stage reduction presently provided under existing criteria. The maximum reduction will only be achieved or approached during certain moderate floods. We plan to change the operation of the Sacramento Weir in the near future to the operation described in the preceding paragraph. The criteria may be modified in the future as additional data are obtained.

Again, I would like to stress that our primary objective in prescribing operating criteria for the Sacramento River Flood Control project is to serve the overall public interest, giving consideration to all concerns of interested groups and agencies.

SPKED-T
Mr. Stanley J. Gale

28 January 1975

Should you wish further discussions on the operation of the Sacramento Weir, I would be happy to meet with you.

Sincerely yours,

F. G. ROCKWELL, JR.
Colonel, CE
District Engineer

CF:
DWR
Rec Board

SUPPLEMENT TO STANDARD
OPERATION AND MAINTENANCE MANUAL
SACRAMENTO RIVER FLOOD CONTROL PROJECT

UNIT NO. 158

SACRAMENTO WEIR
SACRAMENTO RIVER, CALIFORNIA

REVISIONS OR ADDITIONS

REVISIONS	DATE
Delete Exhibit H dated December 1966	May 1975
*Add Exhibit H dated March 1975	May 1975
Add letter from State Department of Water Resources dated 28 January 1975	May 1975

* This revision for operation of the Sacramento Weir was made to conform with the revision (sheet 20a) dated March 1975, to the Master Manual of Reservoir Regulation, Sacramento River Basin, California.

UNIT NO. 158

SACRAMENTO WEIR

The Sacramento Weir will be operated by the Department of Water Resources of the State of California in accordance with the following schedule adopted in 1975:

SCHEDULE OF OPERATION - SACRAMENTO WEIR

The operational objectives of the Sacramento Weir are to limit flood stages in the Sacramento River to the project flood plane, insofar as possible, with maximum feasible utilization of the flood capacity of the Sacramento River Channel below the weir. In order to accomplish these objectives, the following schedule of operation shall be used.

1. Opening of the weir gates will not be initiated until a stage of 27.5 feet msl datum is exceeded at the I Street gage, Sacramento.

2. As many gates as necessary shall be opened so that the stage at I Street does not exceed 29.0 feet msl datum, insofar as possible.

3. Subject to provisions 1 and 2 above, the stage at the Sacramento Weir shall be maintained during the gate opening period at 27.5 feet msl datum, insofar as practicable.

4. Gates shall be closed at the stage drops below 25.0 feet msl datum at the Sacramento Weir. The gate closing shall be prosecuted with dispatch so that all gates are closed within as short a period as practicable.

This schedule of operation is subject to temporary modification by the District Engineer, Corps of Engineers, if found necessary.

EXHIBIT H
Sheet 1 of 1
(Revised May

Sacramento Weir		Flow in 1000 cfs																								
Flow per	Sac Weir	# of Gates opened																								
Gate	Stage	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	22.1	0.01	0.02	0.04	0.05	0.06	0.07	0.08	0.1	0.11	0.12	0.13	0.14	0.16	0.17	0.18	0.19	0.2	0.22	0.23	0.24	0.25	0.26	0.28	0.29
12	22.2	0.02	0.05	0.07	0.1	0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.31	0.34	0.36	0.38	0.41	0.43	0.46	0.48	0.5	0.53	0.55	0.58
18	22.3	0.04	0.07	0.11	0.14	0.18	0.22	0.25	0.29	0.32	0.36	0.4	0.43	0.47	0.5	0.54	0.58	0.61	0.65	0.68	0.72	0.76	0.79	0.83	0.86
24	22.4	0.05	0.1	0.14	0.19	0.24	0.29	0.34	0.38	0.43	0.48	0.53	0.58	0.62	0.67	0.72	0.77	0.82	0.86	0.91	0.96	1.01	1.06	1.1	1.15
30	22.5	0.06	0.12	0.18	0.24	0.3	0.36	0.42	0.48	0.54	0.6	0.66	0.72	0.78	0.84	0.9	0.96	1.02	1.08	1.14	1.2	1.26	1.32	1.38	1.44
40	22.6	0.08	0.16	0.24	0.32	0.4	0.48	0.56	0.64	0.72	0.8	0.88	0.96	1.04	1.12	1.2	1.28	1.36	1.44	1.52	1.6	1.68	1.76	1.84	1.92
50	22.7	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2	2.1	2.2	2.3	2.4
60	22.8	0.12	0.24	0.36	0.48	0.6	0.72	0.84	0.96	1.08	1.2	1.32	1.44	1.56	1.68	1.8	1.92	2.04	2.16	2.28	2.4	2.52	2.64	2.76	2.88
70	22.9	0.14	0.28	0.42	0.56	0.7	0.84	0.98	1.12	1.26	1.4	1.54	1.68	1.82	1.96	2.1	2.24	2.38	2.52	2.66	2.8	2.94	3.08	3.22	3.36
80	23	0.16	0.32	0.48	0.64	0.8	0.96	1.12	1.28	1.44	1.6	1.76	1.92	2.08	2.24	2.4	2.56	2.72	2.88	3.04	3.2	3.36	3.52	3.68	3.84
96	23.1	0.19	0.38	0.58	0.77	0.96	1.15	1.34	1.54	1.73	1.92	2.11	2.3	2.5	2.69	2.88	3.07	3.26	3.46	3.65	3.84	4.03	4.22	4.42	4.61
111	23.2	0.22	0.44	0.67	0.89	1.11	1.33	1.55	1.78	2	2.22	2.44	2.66	2.89	3.11	3.33	3.55	3.77	4	4.22	4.44	4.66	4.88	5.11	5.33
127	23.3	0.25	0.51	0.76	1.02	1.27	1.52	1.78	2.03	2.29	2.54	2.79	3.05	3.3	3.56	3.81	4.06	4.32	4.57	4.83	5.08	5.33	5.59	5.84	6.1
142	23.4	0.28	0.57	0.85	1.14	1.42	1.7	1.99	2.27	2.56	2.84	3.12	3.41	3.69	3.98	4.26	4.54	4.83	5.11	5.4	5.68	5.96	6.25	6.53	6.82
158	23.5	0.32	0.63	0.95	1.26	1.58	1.9	2.21	2.53	2.84	3.16	3.48	3.79	4.11	4.42	4.74	5.06	5.37	5.69	6	6.32	6.64	6.95	7.27	7.58
177	23.6	0.35	0.71	1.06	1.42	1.77	2.12	2.48	2.83	3.19	3.54	3.89	4.25	4.6	4.96	5.31	5.66	6.02	6.37	6.73	7.08	7.43	7.79	8.14	8.5
197	23.7	0.39	0.79	1.18	1.58	1.97	2.36	2.76	3.15	3.55	3.94	4.33	4.73	5.12	5.52	5.91	6.3	6.7	7.09	7.49	7.88	8.27	8.67	9.06	9.46
216	23.8	0.43	0.86	1.3	1.73	2.16	2.59	3.02	3.46	3.89	4.32	4.75	5.18	5.62	6.05	6.48	6.91	7.34	7.78	8.21	8.64	9.07	9.5	9.94	10.4
236	23.9	0.47	0.94	1.42	1.89	2.36	2.83	3.3	3.78	4.25	4.72	5.19	5.66	6.14	6.61	7.08	7.55	8.02	8.5	8.97	9.44	9.91	10.4	10.9	11.3
255	24	0.51	1.02	1.53	2.04	2.55	3.06	3.57	4.08	4.59	5.1	5.61	6.12	6.63	7.14	7.65	8.16	8.67	9.18	9.69	10.2	10.7	11.2	11.7	12.2
278	24.1	0.56	1.11	1.67	2.22	2.78	3.34	3.89	4.45	5	5.56	6.12	6.67	7.23	7.78	8.34	8.9	9.45	10	10.6	11.1	11.7	12.2	12.8	13.3
300	24.2	0.6	1.2	1.8	2.4	3	3.6	4.2	4.8	5.4	6	6.6	7.2	7.8	8.4	9	9.6	10.2	10.8	11.4	12	12.6	13.2	13.8	14.4
323	24.3	0.65	1.29	1.94	2.58	3.23	3.88	4.52	5.17	5.81	6.46	7.11	7.75	8.4	9.04	9.69	10.3	11	11.6	12.3	12.9	13.6	14.2	14.9	15.5
345	24.4	0.69	1.38	2.07	2.76	3.45	4.14	4.83	5.52	6.21	6.9	7.59	8.28	8.97	9.66	10.4	11	11.7	12.4	13.1	13.8	14.5	15.2	15.9	16.6
368	24.5	0.74	1.47	2.21	2.94	3.68	4.42	5.15	5.89	6.62	7.36	8.1	8.83	9.57	10.3	11	11.8	12.5	13.2	14	14.7	15.5	16.2	16.9	17.7
394	24.6	0.79	1.58	2.36	3.15	3.94	4.73	5.52	6.3	7.09	7.88	8.67	9.46	10.2	11	11.8	12.6	13.4	14.2	15	15.8	16.5	17.3	18.1	18.9
420	24.7	0.84	1.68	2.52	3.36	4.2	5.04	5.88	6.72	7.56	8.4	9.24	10.1	10.9	11.8	12.6	13.4	14.3	15.1	16	16.8	17.6	18.5	19.3	20.2
445	24.8	0.89	1.78	2.67	3.56	4.45	5.34	6.23	7.12	8.01	8.9	9.79	10.7	11.6	12.5	13.4	14.2	15.1	16	16.9	17.8	18.7	19.6	20.5	21.4
471	24.9	0.94	1.88	2.83	3.77	4.71	5.65	6.59	7.54	8.48	9.42	10.4	11.3	12.2	13.2	14.1	15.1	16	17	17.9	18.8	19.8	20.7	21.7	22.6
497	25	0.99	1.99	2.98	3.98	4.97	5.96	6.96	7.95	8.95	9.94	10.9	11.9	12.9	13.9	14.9	15.9	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.9

Flow per	Sac Weir	# of Gates opened																							
Gate	Stage	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
526	25.1	1.05	2.1	3.16	4.21	5.26	6.31	7.36	8.42	9.47	10.5	11.6	12.6	13.7	14.7	15.8	16.8	17.9	18.9	20	21	22.1	23.1	24.2	25.2
555	25.2	1.11	2.22	3.33	4.44	5.55	6.66	7.77	8.88	9.99	11.1	12.2	13.3	14.4	15.5	16.7	17.8	18.9	20	21.1	22.2	23.3	24.4	25.5	26.6
583	25.3	1.17	2.33	3.5	4.66	5.83	7	8.16	9.33	10.5	11.7	12.8	14	15.2	16.3	17.5	18.7	19.8	21	22.2	23.3	24.5	25.7	26.8	28
612	25.4	1.22	2.45	3.67	4.9	6.12	7.34	8.57	9.79	11	12.2	13.5	14.7	15.9	17.1	18.4	19.6	20.8	22	23.3	24.5	25.7	26.9	28.2	29.4
641	25.5	1.28	2.56	3.85	5.13	6.41	7.69	8.97	10.3	11.5	12.8	14.1	15.4	16.7	17.9	19.2	20.5	21.8	23.1	24.4	25.6	26.9	28.2	29.5	30.8
673	25.6	1.35	2.69	4.04	5.38	6.73	8.08	9.42	10.8	12.1	13.5	14.8	16.2	17.5	18.8	20.2	21.5	22.9	24.2	25.6	26.9	28.3	29.6	31	32.3
705	25.7	1.41	2.82	4.23	5.64	7.05	8.46	9.87	11.3	12.7	14.1	15.5	16.9	18.3	19.7	21.2	22.6	24	25.4	26.8	28.2	29.6	31	32.4	33.8
736	25.8	1.47	2.94	4.42	5.89	7.36	8.83	10.3	11.8	13.2	14.7	16.2	17.7	19.1	20.6	22.1	23.6	25	26.5	28	29.4	30.9	32.4	33.9	35.3
768	25.9	1.54	3.07	4.61	6.14	7.68	9.22	10.8	12.3	13.8	15.4	16.9	18.4	20	21.5	23	24.6	26.1	27.6	29.2	30.7	32.3	33.8	35.3	36.9
800	26	1.6	3.2	4.8	6.4	8	9.6	11.2	12.8	14.4	16	17.6	19.2	20.8	22.4	24	25.6	27.2	28.8	30.4	32	33.6	35.2	36.8	38.4
834	26.1	1.67	3.34	5	6.67	8.34	10	11.7	13.3	15	16.7	18.3	20	21.7	23.4	25	26.7	28.4	30	31.7	33.4	35	36.7	38.4	40
868	26.2	1.74	3.47	5.21	6.94	8.68	10.4	12.2	13.9	15.6	17.4	19.1	20.8	22.6	24.3	26	27.8	29.5	31.2	33	34.7	36.5	38.2	39.9	41.7
903	26.3	1.81	3.61	5.42	7.22	9.03	10.8	12.6	14.4	16.3	18.1	19.9	21.7	23.5	25.3	27.1	28.9	30.7	32.5	34.3	36.1	37.9	39.7	41.5	43.3
937	26.4	1.87	3.75	5.62	7.5	9.37	11.2	13.1	15	16.9	18.7	20.6	22.5	24.4	26.2	28.1	30	31.9	33.7	35.6	37.5	39.4	41.2	43.1	45
971	26.5	1.94	3.88	5.83	7.77	9.71	11.7	13.6	15.5	17.5	19.4	21.4	23.3	25.2	27.2	29.1	31.1	33	35	36.9	38.8	40.8	42.7	44.7	46.6
1009	26.6	2.02	4.04	6.05	8.07	10.1	12.1	14.1	16.1	18.2	20.2	22.2	24.2	26.2	28.3	30.3	32.3	34.3	36.3	38.3	40.4	42.4	44.4	46.4	48.4
1047	26.7	2.09	4.19	6.28	8.38	10.5	12.6	14.7	16.8	18.8	20.9	23	25.1	27.2	29.3	31.4	33.5	35.6	37.7	39.8	41.9	44	46.1	48.2	50.3
1084	26.8	2.17	4.34	6.5	8.67	10.8	13	15.2	17.3	19.5	21.7	23.8	26	28.2	30.4	32.5	34.7	36.9	39	41.2	43.4	45.5	47.7	49.9	52
1122	26.9	2.24	4.49	6.73	8.98	11.2	13.5	15.7	18	20.2	22.4	24.7	26.9	29.2	31.4	33.7	35.9	38.1	40.4	42.6	44.9	47.1	49.4	51.6	53.9
1160	27	2.32	4.64	6.96	9.28	11.6	13.9	16.2	18.6	20.9	23.2	25.5	27.8	30.2	32.5	34.8	37.1	39.4	41.8	44.1	46.4	48.7	51	53.4	55.7
1198	27.1	2.4	4.79	7.19	9.58	12	14.4	16.8	19.2	21.6	24	26.4	28.8	31.1	33.5	35.9	38.3	40.7	43.1	45.5	47.9	50.3	52.7	55.1	57.5
1236	27.2	2.47	4.94	7.42	9.89	12.4	14.8	17.3	19.8	22.2	24.7	27.2	29.7	32.1	34.6	37.1	39.6	42	44.5	47	49.4	51.9	54.4	56.9	59.3
1274	27.3	2.55	5.1	7.64	10.2	12.7	15.3	17.8	20.4	22.9	25.5	28	30.6	33.1	35.7	38.2	40.8	43.3	45.9	48.4	51	53.5	56.1	58.6	61.2
1312	27.4	2.62	5.25	7.87	10.5	13.1	15.7	18.4	21	23.6	26.2	28.9	31.5	34.1	36.7	39.4	42	44.6	47.2	49.9	52.5	55.1	57.7	60.4	63
1350	27.5	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3	27	29.7	32.4	35.1	37.8	40.5	43.2	45.9	48.6	51.3	54	56.7	59.4	62.1	64.8
1392	27.6	2.78	5.57	8.35	11.1	13.9	16.7	19.5	22.3	25.1	27.8	30.6	33.4	36.2	39	41.8	44.5	47.3	50.1	52.9	55.7	58.5	61.2	64	66.8
1434	27.7	2.87	5.74	8.6	11.5	14.3	17.2	20.1	22.9	25.8	28.7	31.5	34.4	37.3	40.2	43	45.9	48.8	51.6	54.5	57.4	60.2	63.1	66	68.8
1476	27.8	2.95	5.9	8.86	11.8	14.8	17.7	20.7	23.6	26.6	29.5	32.5	35.4	38.4	41.3	44.3	47.2	50.2	53.1	56.1	59	62	64.9	67.9	70.8
1518	27.9	3.04	6.07	9.11	12.1	15.2	18.2	21.3	24.3	27.3	30.4	33.4	36.4	39.5	42.5	45.5	48.6	51.6	54.6	57.7	60.7	63.8	66.8	69.8	72.9
1560	28	3.12	6.24	9.36	12.5	15.6	18.7	21.8	25	28.1	31.2	34.3	37.4	40.6	43.7	46.8	49.9	53	56.2	59.3	62.4	65.5	68.6	71.8	74.9
1604	28.1	3.21	6.42	9.62	12.8	16	19.2	22.5	25.7	28.9	32.1	35.3	38.5	41.7	44.9	48.1	51.3	54.5	57.7	61	64.2	67.4	70.6	73.8	77
1648	28.2	3.3	6.59	9.89	13.2	16.5	19.8	23.1	26.4	29.7	33	36.3	39.6	42.8	46.1	49.4	52.7	56	59.3	62.6	65.9	69.2	72.5	75.8	79.1
1692	28.3	3.38	6.77	10.2	13.5	16.9	20.3	23.7	27.1	30.5	33.8	37.2	40.6	44	47.4	50.8	54.1	57.5	60.9	64.3	67.7	71.1	74.4	77.8	81.2