CORPS OF ENGINEERS, U. S. ARMY

MISSISSIPPI RIVER COMMISSION

COMBINED CONTROL STRUCTURE AND HIGH-LEVEL CROSSING — MORGANZA FLOODWAY

MODEL INVESTIGATION

TECHNICAL MEMORANDUM NO. 2-275

WATERWAYS EXPERIMENT STATION

VICKSBURG, MISSISSIPPI

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PREFACE

The model investigation reported herein was authorized by the President, Mississippi River Commission, CE, in a letter dated 20 October 1947, subject, "Request for Model Studies - Morganza Floodway." The study was conducted in the Hydraulics Division of the Waterways Experiment Station during the period November 1947 to January 1948 under the supervision of Mr. E. B. Lipscomb, assisted by Mr. J. W. McGee. Active in liaison and advisory capacities as representatives of the President, Mississippi River Commission, were Messrs. E. J. Williams, F. B. Toffaleti, and E. A. Graves, engineers.

The data presented in this report supersede all preliminary results previously reported.

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COMBINED CONTROL STRUCTURE AND HIGH-LEVEL CROSSING -- MORGANZA FLOODWAY

Model Investigation

PART I: INTRODUCTION

Description of the Floodway

1. The existing plan for flood control below the latitude of Old River contemplates that waters reaching the Red River backwater area from the Mississippi, Ouachita, and Red Rivers shall be carried to the Gulf through the leveed channel of the Mississippi to its safe capacity, and through the Atchafalaya River and Floodway system. In its upper reaches this system includes the Atchafalaya River proper and the West Atchafalaya and Morganza Floodways.

2. The Morganza Floodway is located on the west bank of the Mississippi River, 280 miles above Head of Passes and 21 miles below Old River (plate 1). It extends southwesterly from the Mississippi River near Morganza, Louisiana, to the Atchafalaya River, thence southward, paralleling the Atchafalaya River to the vicinity of Krotz Springs, Louisiana, where it empties into the Atchafalaya Basin. The floodway proper embraces a tract of land four to six miles wide and approximately 30 miles long, bounded by the Atchafalaya River east levee on the west and the Atchafalaya Basin east protection levee on the east, with the main-line Mississippi River levee at its head. Operation of the floodway will divert a part of the Mississippi River flood water into the lower Atchafalaya Basin, where it will merge with flows of the Atchafalaya

River and the West Atchafalaya Floodway. This combined flow will be carried by the lower Atchafalaya River and Wax Lake Outlet into the Gulf of Mexico.

3. It is planned to control flow into the Morganza Floodway by means of a Bonnet-Carre-type needle structure located within the proposed high-level crossing of a railroad and highway (Texas and Pacific Railroad branch line and State Highway No. 30) which traverse the floodway in a northwesterly direction from Morganza, La. (plate 2). This control structure will have a sill elevation of 37.5 ft mGl and will be located at a point within the high-level crossing about mid-distance between the Morganza Floodway guide levees. The plan also provides for degrading the main-line Mississippi River levee at the head of the floodway. Although this levee is to be degraded to ground level (about 40 ft mGl), operation of the control structure will not begin until the stage of the Mississippi River at Angola, La., reaches 51.3 ft mGl.

Need for Model Analysis

4. The design of the various elements of the flood-control plan mentioned in paragraph 1 poses a complex problem, partly because of the lack of control of Old River, which functions as a connecting link between the Mississippi River and the Red-Atchafalaya Rivers system and permits free interchange between the two, and partly because the carrying capacities of the various channels and floodways below the latitude of Old River are interrelated in such a manner that operation of one affects the operation of each of the others. In consideration of the obvious difficulties confronting any attempt to resolve these design problems

by analytical means alone, the desirability of a model study is at once apparent.

Purpose of Model Study

5. The general purpose of the model study was to determine the effects on flood stages and flow distribution of installing and operating the Morganza Floodway control structure within the proposed railroad and highway high-level crossing near the upper end of the floodway. Of particular interest was the determination of the effectiveness of the control structure at this location in diverting flow from the Mississippi River into the Morganza Floodway.*

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* Another series of tests conducted with the control structure located within the Mississippi River levee was reported in Technical Memorandum No. 2-258, "Width of Openings, Morganza Floodway Control Structure, Mississippi River."

PART II: THE MODEL

Description

6. The Morganza Floodway combined structure study was conducted on a portion of the existing Mississippi River Flood-Control Model (plate 3). Included in the pertinent portion of this model are the leveed flood plain of the Mississippi River between Vicksburg, Miss., and Donaldsonville, La.; the backwater areas of the Red and Ouachita Rivers; the Atchafalaya River; the Morganza and West Atchafalaya Floodways; the Atchafalaya Basin; and a portion of the Gulf of Mexico. The model is of the fixed-bed type with scale ratios, model to prototype, as follows:

Horizontal dimensions	1:2000
Vertical dimensions	1:100
Discharge	1:1,500,000
Velocity	1:7.5
Time	1:267

For convenience, the part of the Mississippi River Flood-Control Model used in this study will be referred to hereinafter simply as "the model."

7. The main-line Mississippi River levee at the head of the Morganza Floodway was degraded in the model to ground level from 1,500 ft below the upper Morganza levee to about 3,000 ft below levee station 1300 (plate 2). All other levees on the model were constructed to confining grade with the following exceptions: the west-bank Mississippi River levee below Shaw, La., (levee stations 7490+00 to 8222+00) was constructed to the 1914 grade, and Bayou Des Glaise loop levee was built to conform to the 1932 grade (plate 1).

8. The control structure was simulated in the model by installing metal slides of required widths in the proposed high-level crossing

at the desired locations (photograph 1). The actual operation of the control structure was then accomplished by the withdrawal of these slides in accordance with schedules furnished by representatives of the Mississippi River Commission. Similar provisions were made for reproduction of the levee crevasse in the Atchafalaya River levee at the head of the West Atchafalaya Floodway.

9. Flow into the model was controlled and measured by means of right-angle V-notched weirs and Van Leer weirs. By means of adjustable tailgates the tailwater at the lower end of the model was regulated through the desired range of elevations on the basis of furnished rating curves for each outflow gaging station. Water-surface elevations were measured at appropriate points throughout the model area by means of standard hook gages located in gage pits to which the water level was transmitted by underground pipes.

Model Adjustment

10. Prior to installation and testing of the various plans, the model, with the exception of the floodways and the Mississippi River from Vicksburg to Natchez, was adjusted to reproduce the 1945 flood. The floodways were adjusted to computed flow lines furnished by representatives of the Mississippi River Commission; therefore, the accuracy of discharge and flow-line data obtained from the model tests is dependent upon the accuracy of these computed data. The Vicksburg-Natchez reach previously had been adjusted to reproduce the 1937 flood. Readjustment of this reach to reproduce the 1945 flood was considered impracticable because extensive model revision, entailing considerable

delay, would have been required and would not have significantly affected the results of the tests.

PART III: NARRATIVE OF TESTS

Testing Procedure

11. The various plans for the operation of the control structure were subjected to study under the conditions of the project flood, the 1927 flood, and the 1945 flood. In each test, varying-discharge hydrographs for the Mississippi River and tributary streams were reproduced at the following gaging stations (plate 3): Vicksburg, Miss., on the Mississippi River; just above Harrisonburg, La., on the Ouachita River; just above Barbin Landing, La., on the Red River; and at the mouth of the Big Black River. For the 1927 flood, rainfall was simulated by the introduction of flows at Winnsboro, La., and at Bayou Glade in the Red-Ouachita backwater area. For the 1945 flood, rainfall was simulated only at Bayou Glade. Inflow hydrographs for the three test floods are shown on plates 4-9. In each test the outflow from the model was measured at the following locations (plate 1): Donaldsonville, La., on the Mississippi River; Ravenswood, La., in the Morganza Floodway; W.A.F. Gage No. 2 (latitude Odenburg, La.) in the West Atchafalaya Floodway (project flood only); and at Melville, La., on the Atchafalaya River. Stages at the various points of discharge measurement were regulated to conform to their respective stage-discharge rating curves shown on plates 10-13.

12. Stage hydrographs were obtained at all regular and high-water gages for each test. The locations of these gages are shown on plate 1.

13. During tests of the project flood, the West Atchafalaya Floodway was operated by means of a levee crevasse which was initiated when the water level at Simmesport, La., reached an elevation of 59.1 ft mGl.

The width of this crevasse was gradually increased during a scheduled 15-day period until the breach was 3,300 ft in length and was then operated throughout the remainder of the test as a bank-level inlet 3,300 ft wide. The West Atchafalaya Floodway was not operated for tests of the 1927 and 1945 floods since the peak stage at Simmesport did not reach an elevation of 59.1 ft mGl for either of these tests.

14. In order to improve flow conditions into the West Atchafalaya Floodway, the Bayou Des Glaise loop levee, which is located just above the inlet into the floodway and offers considerable obstruction to flow into the floodway, was crevassed at two locations (plate 1). These crevasses consisted of two 10,000-ft breaches, one in the upper arc of the loop between levee stations 40+00 and 140+00 and the other in the lower arc between levee stations 560+00 and 660+00. These crevasses were made over a three-day period, beginning when the loop levee was overtopped.

15. Operation of the Morganza Floodway was different for each test, and this phase of the testing procedure is presented in the descriptions of the various tests.

16. In view of the desire of the Mississippi River Commission to obtain results of these tests as expeditiously as possible, it was agreed to forego the usual procedure of repeating each test to check results. For this reason, a few minor discrepancies may be found in the model test data.

Tests of Project Flood

Tests 1-4

17. For tests 1-4 all model operating procedures and test conditions were the same except for the width of opening in the Morganza

Floodway control structure. The width of opening for tests 1, 2, 3, and 4 was 3500 ft, 4000 ft, 4500 ft, and 5000 ft, respectively. Floodway operation was governed by the stage of the Mississippi River at Angola, La., operation for each test being initiated when this stage reached 51.3 ft mGl. The corresponding flow of the Mississippi River below Old River for the 51.3-ft Angola stage is about 1,250,000 cfs. The actual operation of the control structure was based on a definite schedule which called for 1000-ft daily increases (500 ft for final day when required) in the width of opening until the desired width was reached. The specific purpose of these four tests was to determine the Morganza Floodway discharge for the various widths of structure opening mentioned above and the resulting distribution of flow among the other outlets under project-flood conditions.

18. Stage hydrographs observed at regular gaging stations for each of the four tests are shown on plates 14-23. Discharge hydrographs observed at the four points of outflow measurement for each test are shown on plates 24-27. Crest stages and peak discharges are presented in tables 1 and 2, respectively. For convenience, a summary of the results is tabulated below:

Location	Project Flood			
	Test 1 (3500-ft opening)	Test 2 (4000-ft opening)	Test 3 (4500-ft opening)	Test 4 (5000-ft opening)
	Crest stages in ft mGl			
Angola, La.	62.7	62.4	62.2	62.1
Red-Ouachita Backwater	62.2	62.0	61.9	61.8

Location	Project Flood Test 1 (3500-ft opening)	Test 2 (4000-ft opening)	Test 3 (4500-ft opening)	Test 4 (5000-ft opening)
	Peak discharge in 1,000 cfs			
Mississippi River at Donaldsonville, La.	1,566	1,560	1,556	1,560
Atchafalaya River at Krotz Springs, La.	699	693	686	680
Morganza Floodway	523	540	556	573
West Atchafalaya Floodway	291	280	274	276

19. A comparison of the results of the four tests shows that the peak flow in the Morganza Floodway was increased from 523,000 cfs for the 3500-ft-wide opening to 573,000 cfs for the 5000-ft opening. This increase of 50,000 cfs was accomplished in practically equal increments by increasing the total width of opening by 500 ft for each successive test. It is to be noted that, of the 50,000 cfs increase in the peak flow of the Morganza Floodway resulting from increasing the width of structure opening from 3500 ft to 5000 ft, 6000 cfs was extracted from the Mississippi River flow, 15,000 cfs from the West Atchafalaya Floodway, 19,000 cfs from the Atchafalaya River, and the remaining 10,000 cfs from Red-Ouachita backwater storage.

20. A comparison of the results of tests 1, 2, 3 and 4 reveals also that crest stages at Angola were reduced 0.6 ft by the increase in structure opening from 3500 to 5000 ft while stages in the Red-Ouachita backwater area were reduced about 0.4 ft.

Tests 5 and 6

21. Upon completion of the first four tests of this study,

representatives of the Mississippi River Commission requested that an attempt be made to simulate the operation of the floodway with a cleared or improved entrance condition. Therefore, tests 5 and 6 were conducted with the wire roughness removed from the floodway area above the Texas and Pacific Railroad branch-line crossing. Except for the cleared entrance, tests 5 and 6 were identical to tests 3 and 4, respectively. The specific purpose of these two tests was to determine the effectiveness of the control structure with the improved entrance condition. (It is pointed out that the roughness removed from the upper end of the floodway for this test had been placed in adjusting the model to the furnished computed flow lines, and that the model was not adjusted to conditions with this roughness removed; therefore, the results of tests 5 and 6 with the roughness removed can not be expected to give accurate indications of the effects of clearing this portion of the prototype floodway.)

22. To facilitate analysis, a summary of results of tests 5 and 6 is shown below in comparison with the results of tests 3 and 4. Stage and discharge hydrographs for these four tests are shown on plates 28-41. Complete tabulations of crest stages and peak discharges are presented in tables 1 and 2, respectively.

	Project Flood			
	4500-ft opening		5000-ft opening	
Location	Test 3	Test 5 (cleared entrance)	Test 4	Test 6 (cleared entrance)
	Crest stages in ft mGl			
Angola, La.	62.2	61.8	62.1	61.8
Red-Ouachita Backwater	61.9	61.7	61.8	61.6

Location	Project Flood: 4500-ft opening, Test 3	Project Flood: 4500-ft opening, Test 5 (cleared entrance)	Project Flood: 5000-ft opening, Test 4	Project Flood: 5000-ft opening, Test 6 (cleared entrance)
	Peak discharge in 1,000 cfs			
Mississippi River at Donaldsonville, La.	1,556	1,550	1,560	1,539
Atchafalaya River at Krotz Springs, La.	686	685	680	672
Morganza Floodway	556	570	573	598
West Atchafalaya Floodway	274	273	276	267

23. An examination of the above table discloses that, with an opening of 4500 ft in the control structure, the cleared entrance to the Morganza Floodway increased the peak discharge of the floodway from 556,000 cfs (test 3) to 570,000 cfs (test 5). A comparison of tests 4 and 6 shows that the peak flow of the floodway was increased from 573,000 cfs to 598,000 cfs for a 5000-ft opening in the control structure by the improved entrance condition. A further comparison of tests 3 and 4 with tests 5 and 6 indicates that the increase in peak flow of the Morganza Floodway effected a reduction in crest stages of the Mississippi River at Angola, La., of about 0.4 ft, and in the Red-Ouachita backwater area of about 0.2 ft, and effected reductions in peak discharges as follows: Mississippi River, 13,000 cfs; Atchafalaya River, 5,000 cfs; and West Atchafalaya Floodway, 5,000 cfs.

Tests of 1927 and 1945 Floods

Test 7

24. Only one test of the 1927 flood was conducted. The general

purpose of this test was to determine the crest stages and flow distribution of the 1927 flood resulting from the operation of the Morganza Floodway with a total opening of 3000 ft in the control structure. The specific purpose of test 7 was to determine if a 3000-ft structure opening would extract sufficient flow from the Mississippi River to prevent the desired maximum discharge of 1,500,000 cfs from being exceeded. Operation of the Morganza Floodway was initiated when the Mississippi River stage at Angola, La., reached 51.3 ft mGl, with an initial opening in the control structure of 1000 ft and with daily increases in openings of 1000 ft until a total width of 3000 ft was reached. For test 7 the model roughness in the floodway area above the Texas and Pacific Railroad branch-line crossing, which had been removed for tests 5 and 6, was replaced in the same pattern as existed for tests 1-4 inclusive.

25. A complete tabulation of the crest stages and peak discharges of test 7 is shown in tables 1 and 2, respectively. Examination of the results of test 7 reveals that the 3000-ft structure opening would be sufficient to prevent the Mississippi River discharge from exceeding 1,500,000 cfs, the peak discharge of the outlets being 1,431,000 cfs for the Mississippi River, 594,000 cfs for the Atchafalaya River, and 372,000 cfs for the Morganza Floodway.

Test 8

26. The purpose of test 8 was to observe the crest stages and flow distribution of the 1945 flood resulting from the operation of the Morganza Floodway with a total opening of 3000 ft in the control structure, and to determine whether this width of opening would be sufficient to

prevent the peak Mississippi River discharge from exceeding 1,500,000 cfs. Plans for operating the floodway were the same for test 8 as for the test of the 1927 flood described above.

27. The crest stages and peak discharges of test 8 are shown in tables 1 and 2, respectively. Reference to table 2 shows that the peak flows for this test were 1,355,000 cfs for the Mississippi River, 567,000 cfs for the Atchafalaya River, and 331,500 cfs for the Morganza Floodway. Thus, it is evident that for floods of the 1945 magnitude a 3000-ft structure opening would maintain the Mississippi River discharge below 1,500,000 cfs.

PART IV: SUMMARY OF TEST RESULTS

28. Tests of the Morganza Floodway control structure under project-flood conditions revealed that for each successive 500-ft increase in opening width between 3500 ft and 5000 ft (tests 1-4), the peak Morganza Floodway discharge would be increased as follows: 17,000 cfs, 16,000 cfs, and 17,000 cfs. These increases in Morganza Floodway discharge would have little effect on the peak discharge of the Mississippi River. Of the 50,000-cfs increase in Morganza discharge caused by increasing the width of structure opening from 3500 to 5000 ft, only 6,000 cfs was extracted from the Mississippi River. The results of these tests also indicated that for each 500-ft increase in structure opening above 3500 ft, the crest stage of the project flood at Angola, La., and in the Red-Ouachita backwater area would be lowered 0.2 and 0.1 ft, respectively.

29. Clearing the floodway area above the Texas and Pacific Railroad branch line was found to increase the effectiveness of the control structure. A comparison of the results of tests 3 and 4 with those of tests 5 and 6 indicated that the cleared entrance would increase the peak Morganza Floodway discharge about 20,000 cfs. Results of these tests also revealed that the cleared floodway entrance would result in reducing crest stages at Angola and in the Red-Ouachita backwater area by 0.4 ft and 0.2 ft, respectively.

30. Tests of the 1927 and 1945 floods revealed that a total opening of 3000 ft in the Morganza Floodway control structure would be sufficient to reduce the peak Mississippi River discharge below the desired maximum of 1,500,000 cfs.

Table 1

CREST WATER-SURFACE ELEVATIONS IN FEET MGL

Location	Project Flood						1927 Flood	1945 Flood
	Test 1 (3500-ft Opening)	Test 2 (4000-ft Opening)	Test 3 (4500-ft Opening)	Test 4 (5000-ft Opening)	Test 5 (4500-ft Opening Cleared Entrance)	Test 6 (5000-ft Opening Cleared Entrance)	Test 7 (3000-ft Opening)	Test 8 (3000-ft Opening)
Mississippi River								
Natchez	82.8	82.6	82.7	82.8	82.6	82.7	77.3	73.9
H. W. 59	80.0	79.8	79.9	80.1	80.0	80.0	74.6	71.4
H. W. 58	79.0	78.9	78.6	78.9	78.7	78.5	73.6	70.6
H. W. 57	78.7	78.5	78.3	78.7	78.3	78.2	73.3	70.2
H. W. 56	77.1	76.9	76.6	77.0	76.7	76.5	71.7	68.3
H. W. 55	75.4	75.2	75.2	75.2	75.1	75.1	70.2	67.5
H. W. 54	73.5	73.4	73.3	73.4	73.3	73.2		66.2
H. W. 53	72.4	72.3	72.1	72.2	72.1	72.0	67.8	65.3
H. W. 52	71.0	70.7	70.4	70.6	70.6	70.2	66.4	63.7
H. W. 51	69.5	69.5	69.1	69.3	69.2	69.0	65.2	62.4
H. W. 50	66.3	66.2	66.1	66.2	66.1	66.0	62.5	60.1
H. W. 49	62.8	62.6	62.7	62.5	62.4	62.4	59.4	57.9
P - 10	63.2	63.0	62.8	62.8	62.5	62.5	59.3	57.7
Angola	62.7	62.4	62.2	62.1	61.8	61.8	58.7	57.1
O. R.-1	59.2	59.0	58.7	58.8	58.7	58.7	55.4	53.9
O. R.-2	59.1	58.9	58.9	58.8	58.7	58.7	55.9	54.3
H. W. 44	57.9	57.8	57.7	57.5	57.5	57.5	54.8	53.2
H. W. 43	57.2	57.1	57.1	57.0	56.8	56.9	54.0	52.4
H. W. 42	56.2	56.2	56.2	56.1	56.0	56.0	53.2	51.7
Bayou Sara	55.2	55.0	55.1	54.9	54.8	54.9	52.1	50.9
Baton Rouge	47.3	47.3	47.2	47.1	47.0	47.1	44.7	43.8
Donaldsonville	34.4	34.3	34.3	34.3	34.3	34.3	32.6	31.9
Morganza Floodway								
M-1	57.8	57.9	57.7	57.5	57.3	57.4	54.7	43.4
M-2	52.1	52.6	53.5	53.5	53.5	54.0	48.3	47.5
Ravenswood	47.2	47.6	48.0	48.1	48.4	48.5	43.9	43.0
Red-Ouachita Area								
Bougere	62.1	61.8	61.8	61.9	61.8	61.6	58.0	57.1
Acme	62.2	62.0	61.9	61.6	61.5	61.6	58.0	57.1
Shaw	62.3	62.0	61.9	62.0	61.8	61.6	58.1	56.9
Mean	62.2	62.0	61.9	61.8	61.7	61.6	58.0	57.0
Atchafalaya River								
Barbre Landing	61.4	61.3	61.2	61.0	61.0	60.9		
Simmesport	59.1	59.2	59.1	59.4	59.1	59.1	55.8	54.7
Melville	47.5	47.4	47.0	47.3	46.9	47.0	44.4	53.3
West Atchafalaya Floodway								
W.A.F. 1	52.5	52.6	52.9	52.7	52.8	52.5		
W.A.F. 2	48.6	48.4	48.1	48.2	48.1	47.9		

Note: For location of gages see plate 1.

Table 2

CREST DISCHARGES IN 1000 CUBIC FEET PER SEC

Location	Project Flood						1927 Flood	1945 Flood
	Test 1 (3500-ft Opening)	Test 2 (4000-ft Opening)	Test 3 (4500-ft Opening)	Test 4 (5000-ft Opening)	Test 5 (4500-ft Opening Cleared Entrance)	Test 6 (5000-ft Opening Cleared Entrance)	Test 7 (3000-ft Opening)	Test 8 (3000-ft Opening)
Mississippi River at Donaldsonville, La.	1,566	1,560	1,556	1,560	1,550	1,539	1,431	1,355
Morganza Floodway	523	540	556	573	570	598	372	331
Atchafalaya River at Krotz Springs, La.	699	693	686	680	685	672	594	567
West Atchafalaya Floodway	291	280	274	276	273	267		

PHOTOGRAPH 1

View of Morganza Floodway showing combined structure

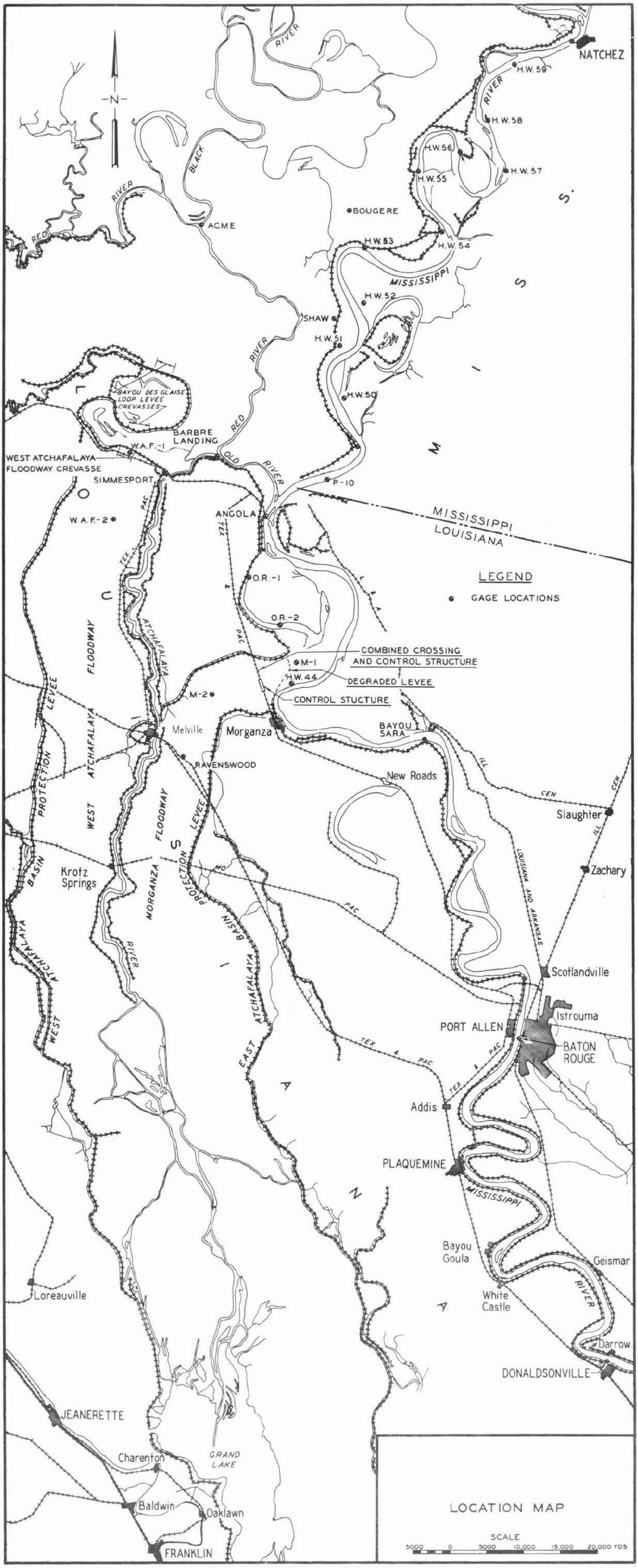

NATCHEZ
RIVER
H.W. 59
H.W. 58
H.W. 56
H.W. 57
H.W. 55
BLACK
RIVER
RED
ACME
BOUGERE
H.W. 53
H.W. 54
MISSISSIPPI
H.W. 52
SHAW
H.W. 51
RIVER
BAYOU DES GLAISE LOOP LEVEE CREVASSES
H.W. 50
BARBRE LANDING
RED
W.A.F.-1
WEST ATCHAFALAYA FLOODWAY CREVASSE
OLD
RIVER
SIMMESPORT
P-10
MISSISSIPPI
LOUISIANA
W.A.F.-2
ANGOLA
O.R.-1
O.R.-2
LEGEND
GAGE LOCATIONS
COMBINED CROSSING AND CONTROL STRUCTURE
DEGRADED LEVEE
CONTROL STUCTURE
M-1
H.W. 44
M-2
Melville
Morganza
BAYOU SARA
RAVENSWOOD
New Roads
Slaughter
Zachary
Krotz Springs
Scotlandville
Istrouma
PORT ALLEN
BATON ROUGE
Addis
PLAQUEMINE
Bayou Goula
Geismar
White Castle
Darrow
DONALDSONVILLE
Loreauville
JEANERETTE
Charenton
GRAND LAKE
Baldwin
Oaklawn
FRANKLIN
LOCATION MAP
SCALE
5000 0 5000 10,000 15,000 20,000 YDS

PLATE 1

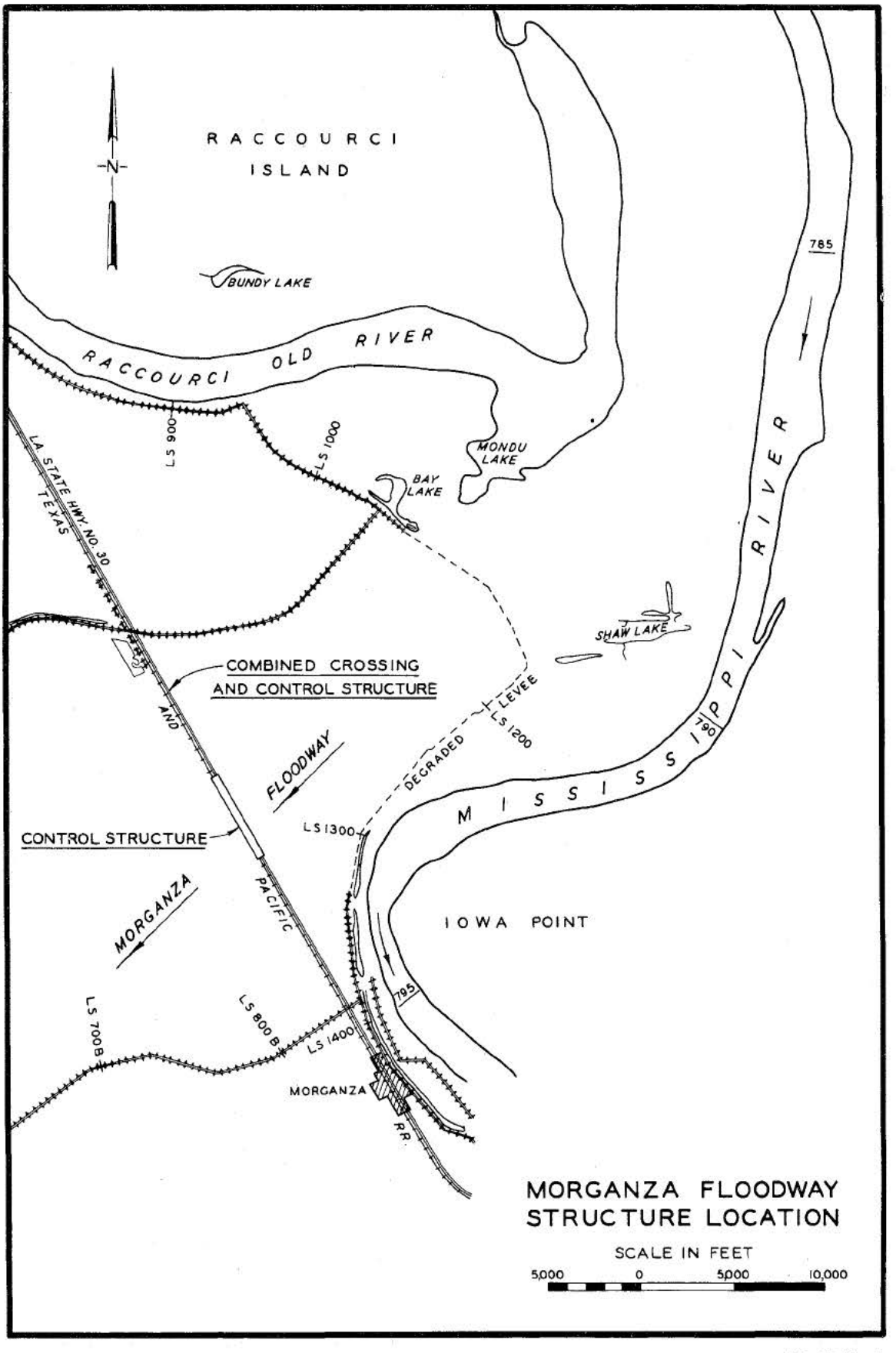
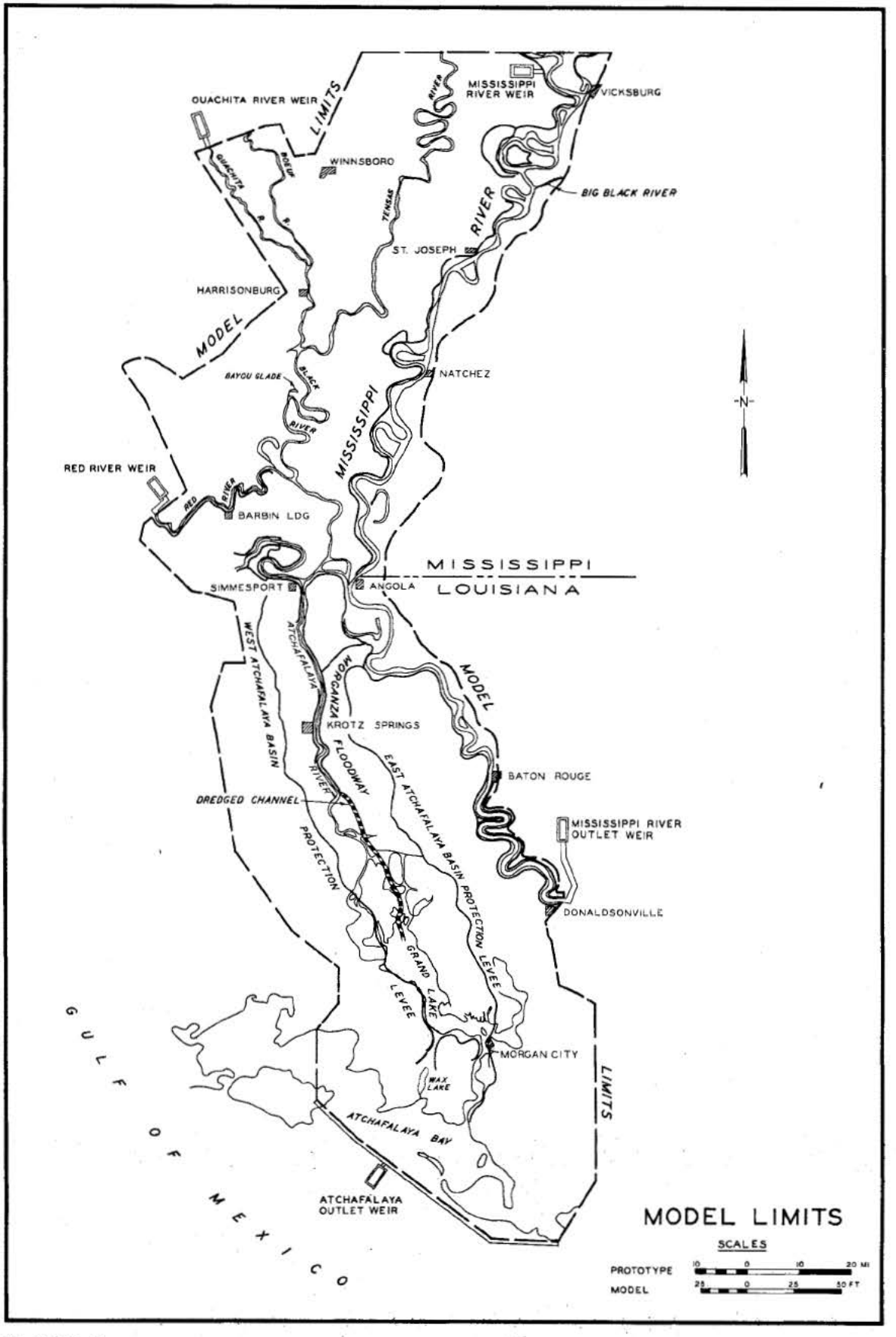

RACCOURCI ISLAND
N
BUNDY LAKE
RACCOURCI OLD RIVER
LS 900
LS 1000
MONDU LAKE
BAY LAKE
LA STATE HWY. NO. 30
TEXAS
SHAW LAKE
785
MISSISSIPPI RIVER
COMBINED CROSSING AND CONTROL STRUCTURE
AND
LEVEE
LS 1200
DEGRADED
FLOODWAY
LS 1300
CONTROL STRUCTURE
MORGANZA
PACIFIC
IOWA POINT
795
LS 700B
LS 800 B
LS 1400
MORGANZA
RR
MORGANZA FLOODWAY
STRUCTURE LOCATION
SCALE IN FEET
5,000 0 5,000 10,000

PLATE 2


OUACHITA RIVER WEIR
LIMITS
MISSISSIPPI RIVER WEIR
VICKSBURG
WINNSBORO
BIG BLACK RIVER
ST. JOSEPH
HARRISONBURG
MODEL
BAYOU GLADE
NATCHEZ
MISSISSIPPI
RED RIVER WEIR
BARBIN LDG
MISSISSIPPI
LOUISIANA
SIMMESPORT
ANGOLA
WEST ATCHAFALAYA BASIN
ATCHAFALAYA
MORGANZA
KROTZ SPRINGS
MODEL
BATON ROUGE
DREDGED CHANNEL
FLOODWAY
EAST ATCHAFALAYA BASIN PROTECTION LEVEE
MISSISSIPPI RIVER OUTLET WEIR
PROTECTION
DONALDSONVILLE
GRAND LAKE
LEVEE
MORGAN CITY
WAX LAKE
LIMITS
ATCHAFALAYA BAY
GULF OF MEXICO
ATCHAFALAYA OUTLET WEIR
N
MODEL LIMITS
SCALES
PROTOTYPE
MODEL
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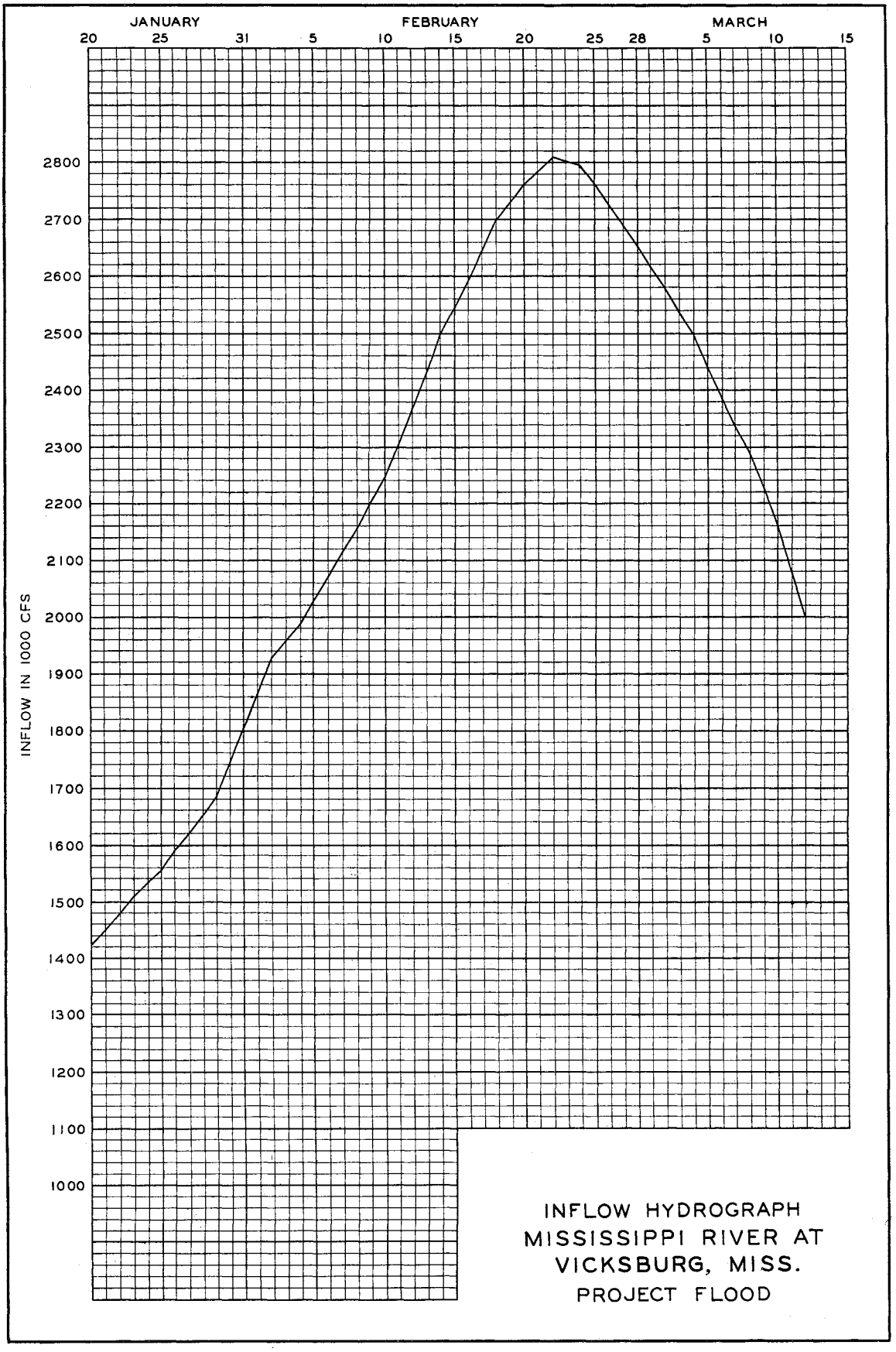
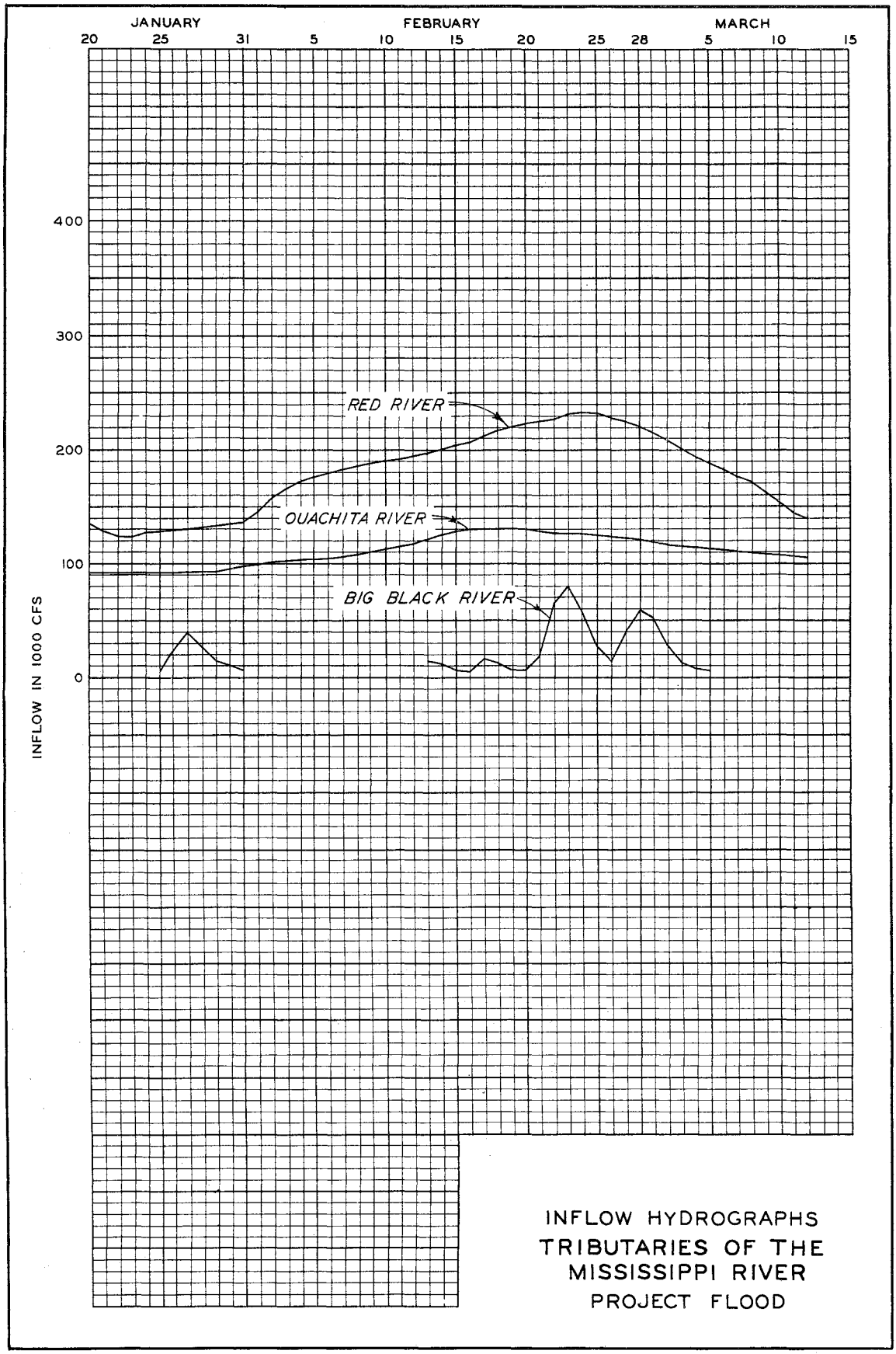
25 0 25 50 FT

PLATE 3



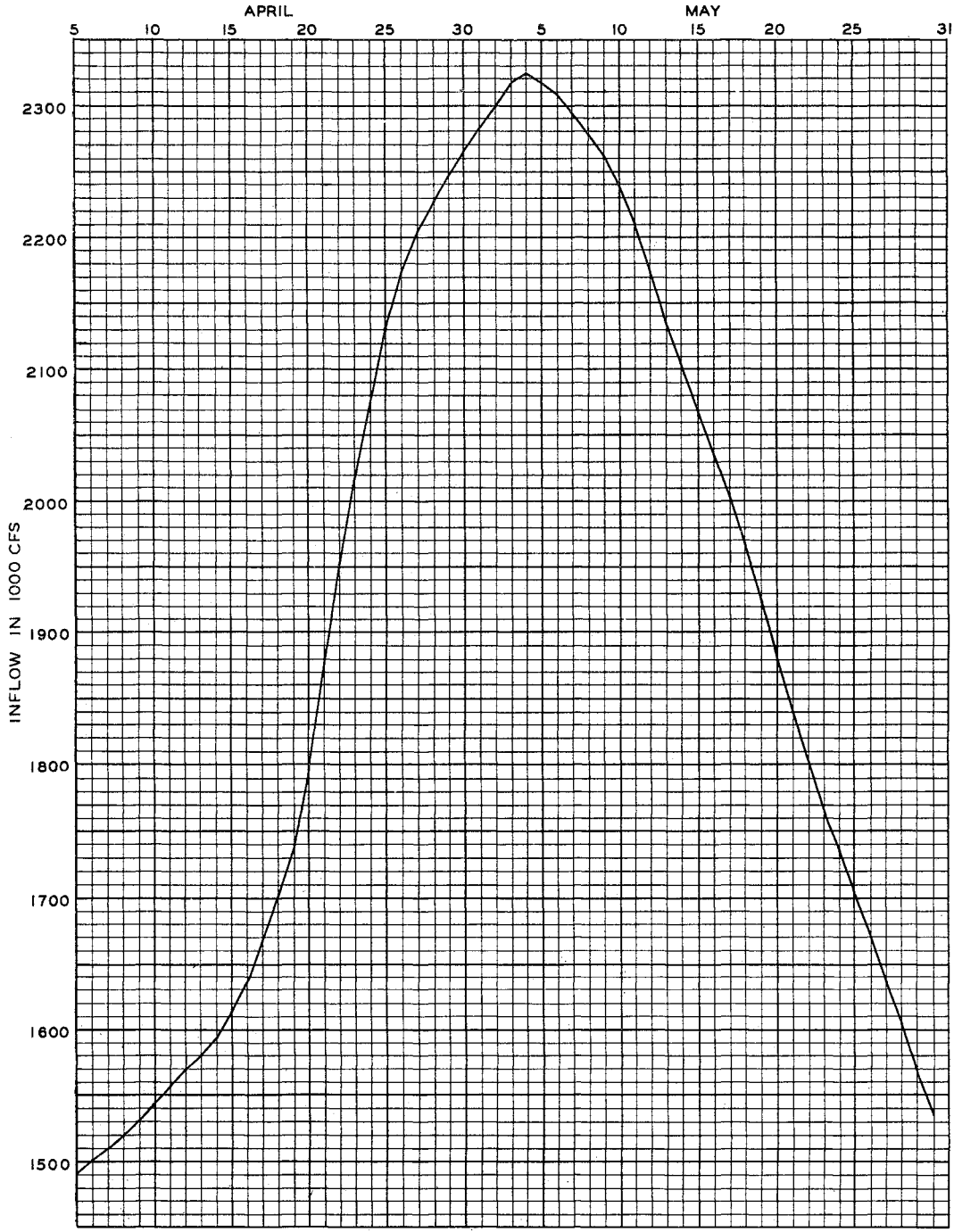
INFLOW HYDROGRAPH
MISSISSIPPI RIVER AT
VICKSBURG, MISS.
PROJECT FLOOD

PLATE 4



INFLOW HYDROGRAPHS
TRIBUTARIES OF THE
MISSISSIPPI RIVER
PROJECT FLOOD

PLATE 5

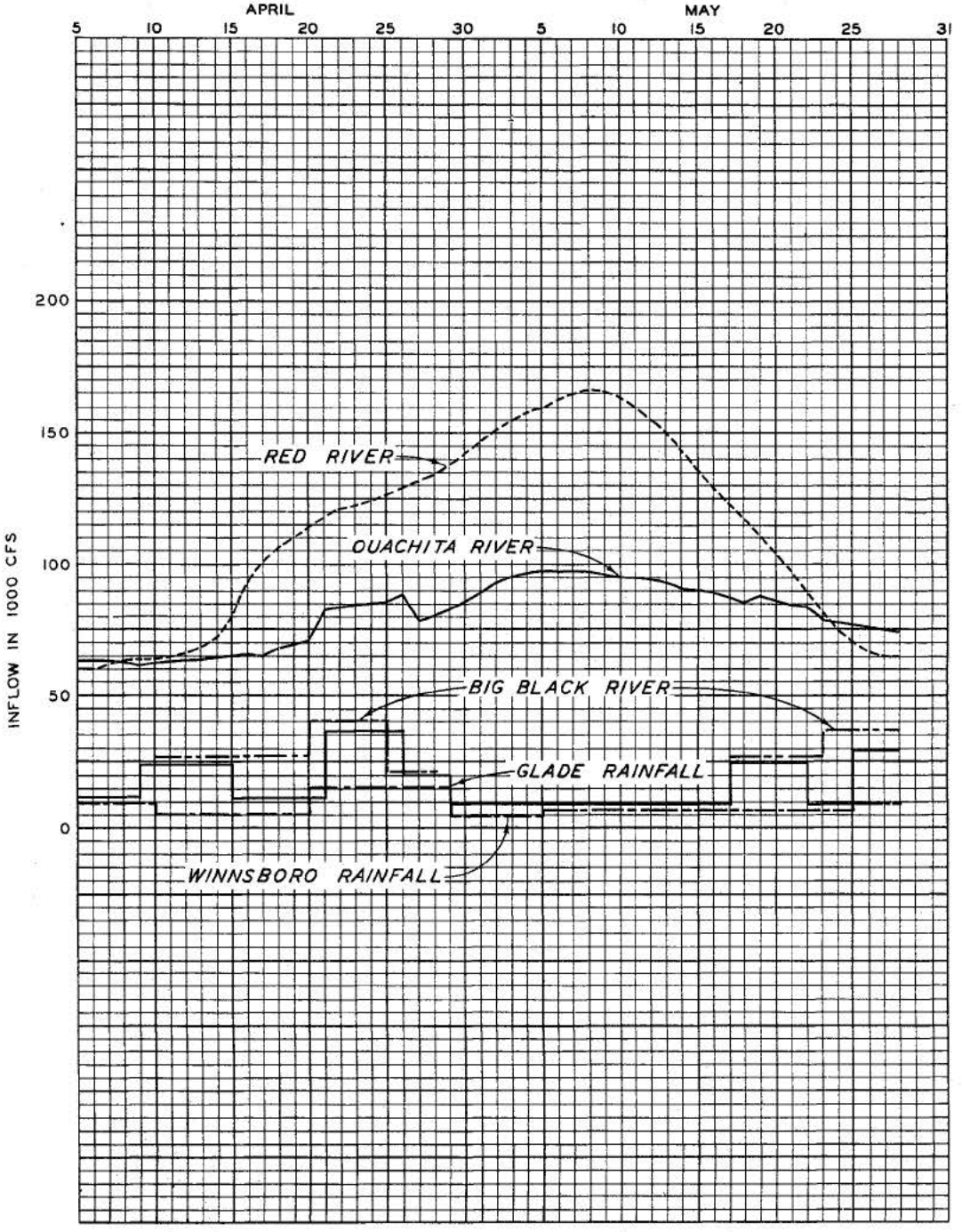


INFLOW HYDROGRAPH

MISSISSIPPI RIVER AT VICKSBURG, MISS.

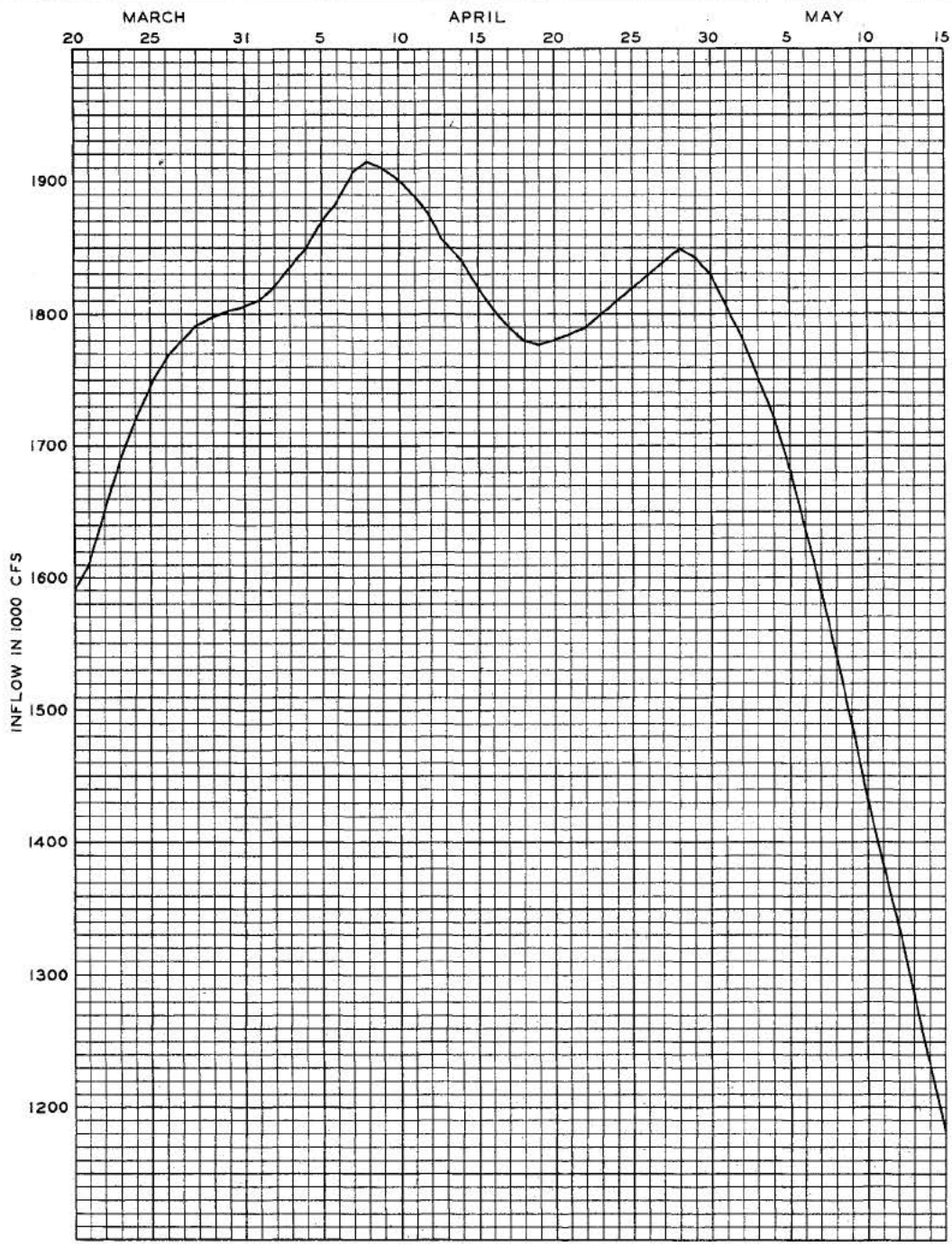
1927 FLOOD

PLATE 6



INFLOW HYDROGRAPHS
TRIBUTARIES OF THE
MISSISSIPPI RIVER
1927 FLOOD

PLATE 7

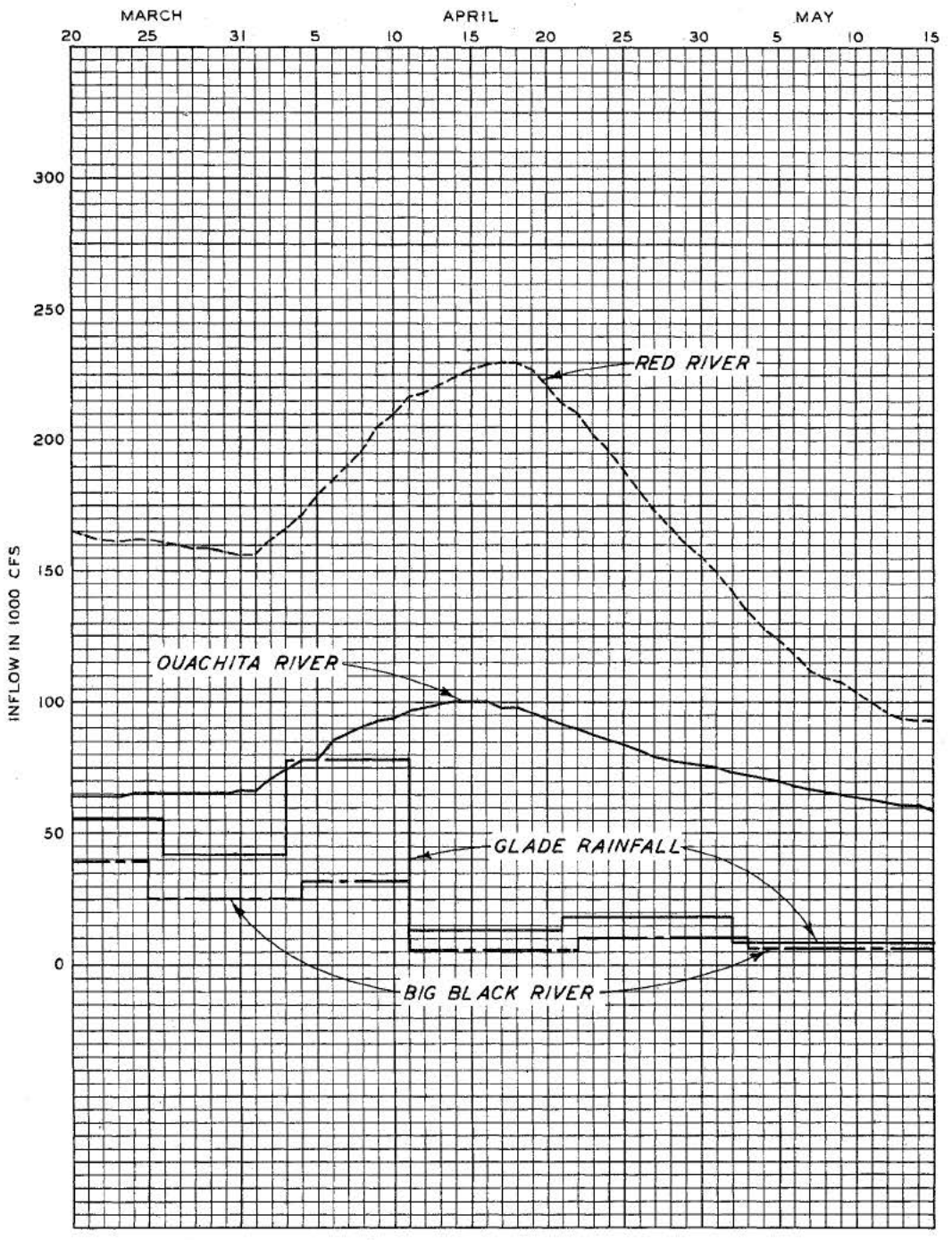


INFLOW HYDROGRAPH

MISSISSIPPI RIVER AT VICKSBURG, MISS.

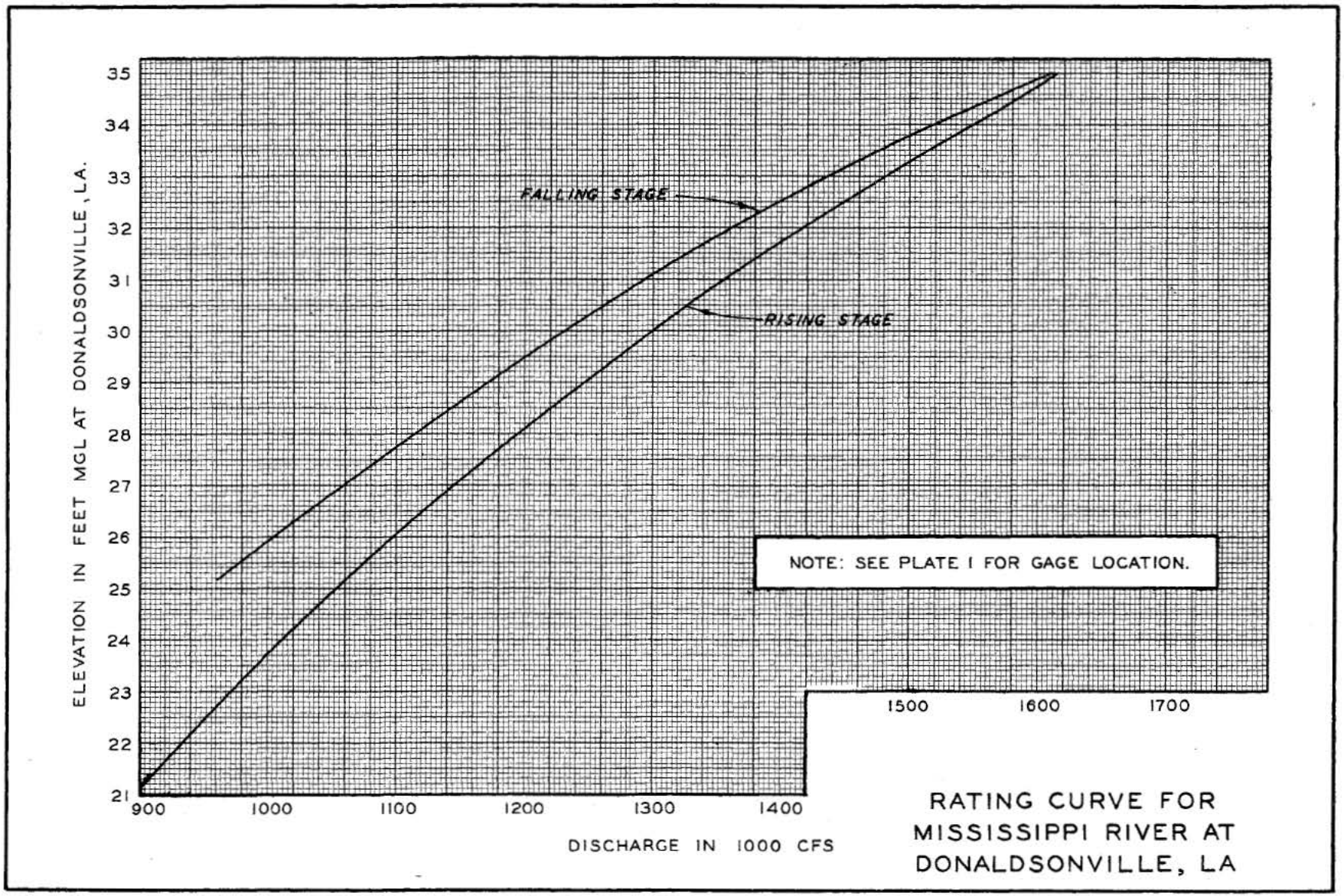
1945 FLOOD

PLATE 8



INFLOW HYDROGRAPHS
TRIBUTARIES OF THE
MISSISSIPPI RIVER
1945 FLOOD

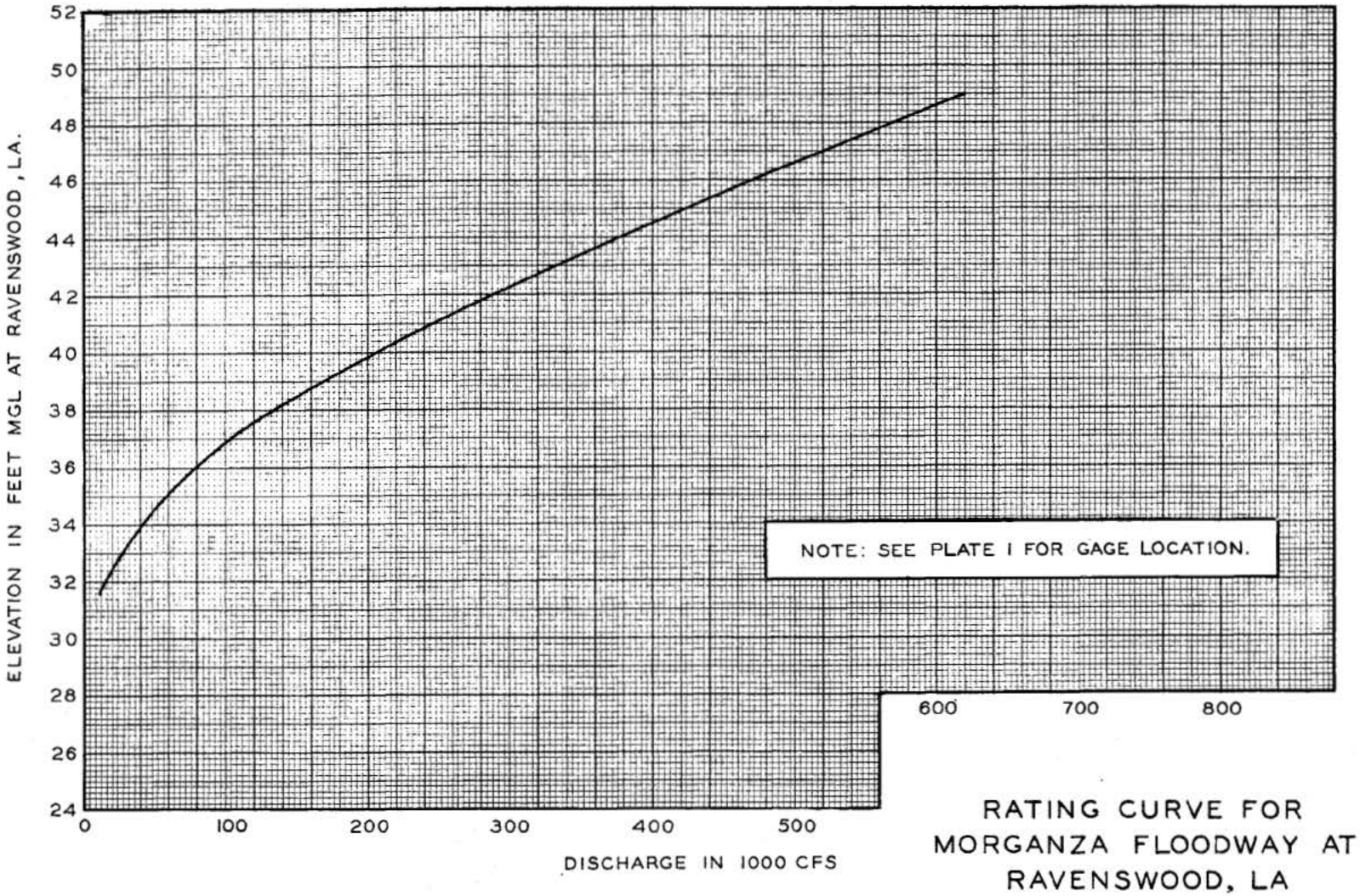
PLATE 9



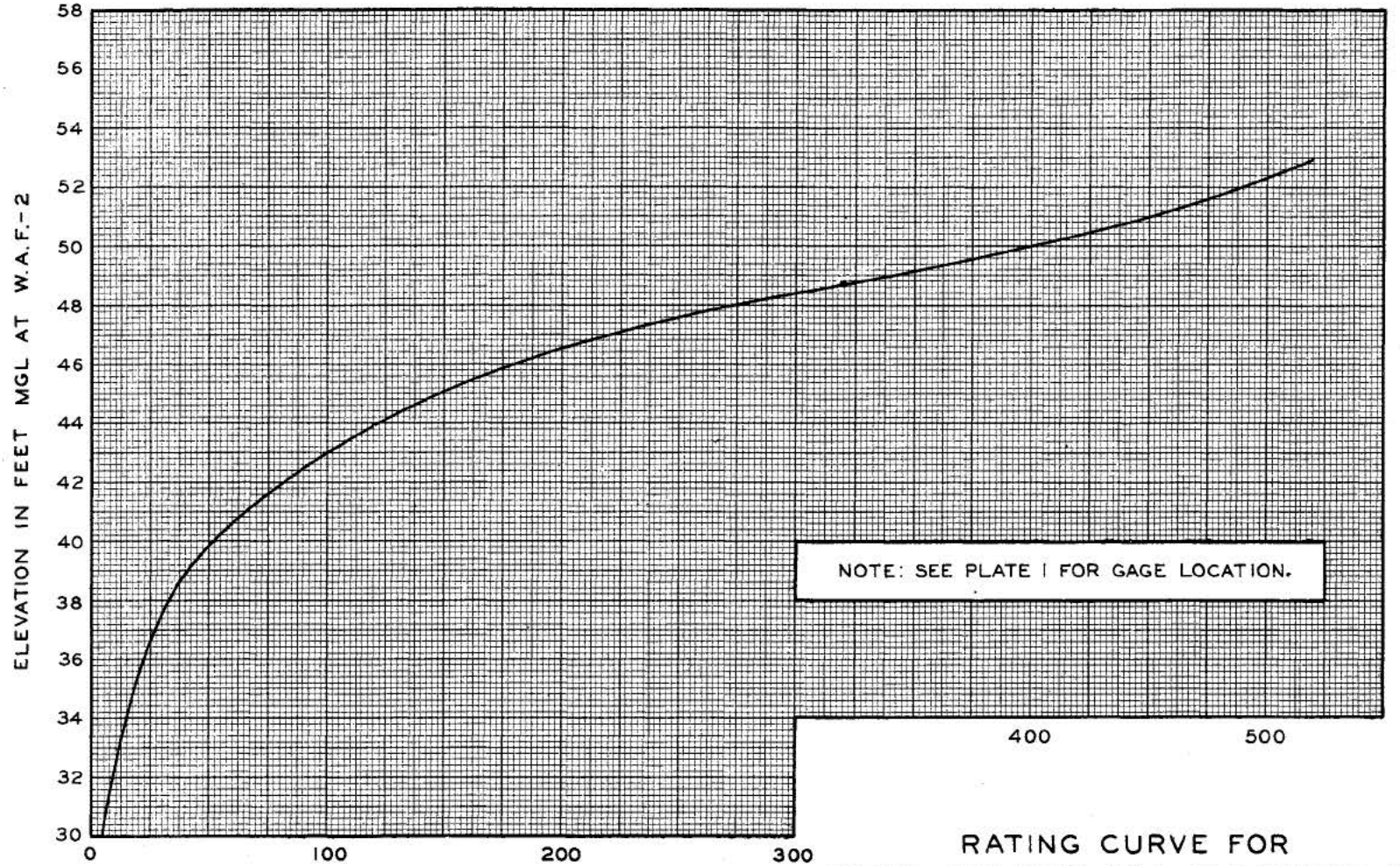
RATING CURVE FOR
MISSISSIPPI RIVER AT
DONALDSONVILLE, LA

PLATE 10

PLATE 11



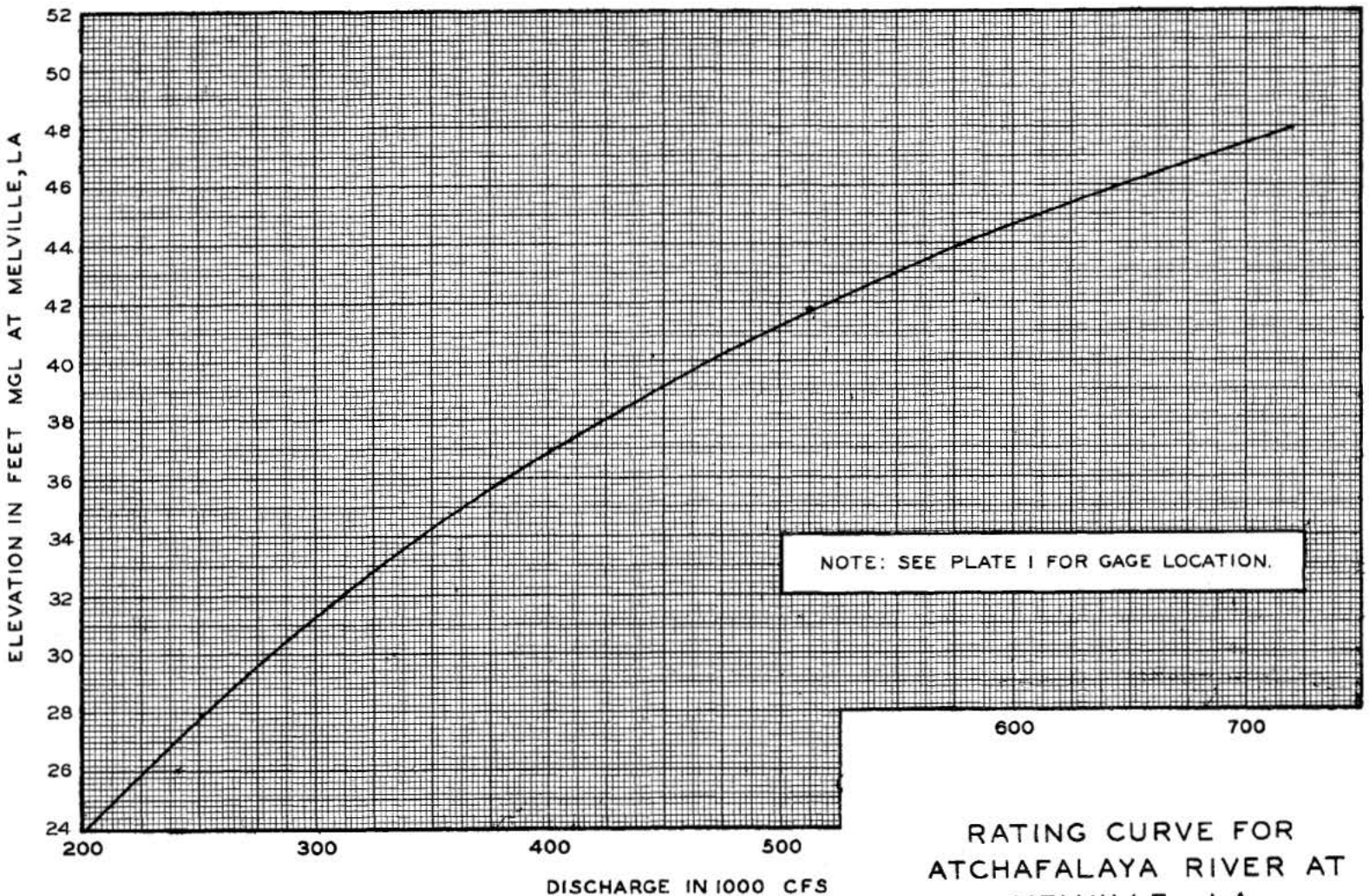
RATING CURVE FOR MORGANZA FLOODWAY AT RAVENSWOOD, LA



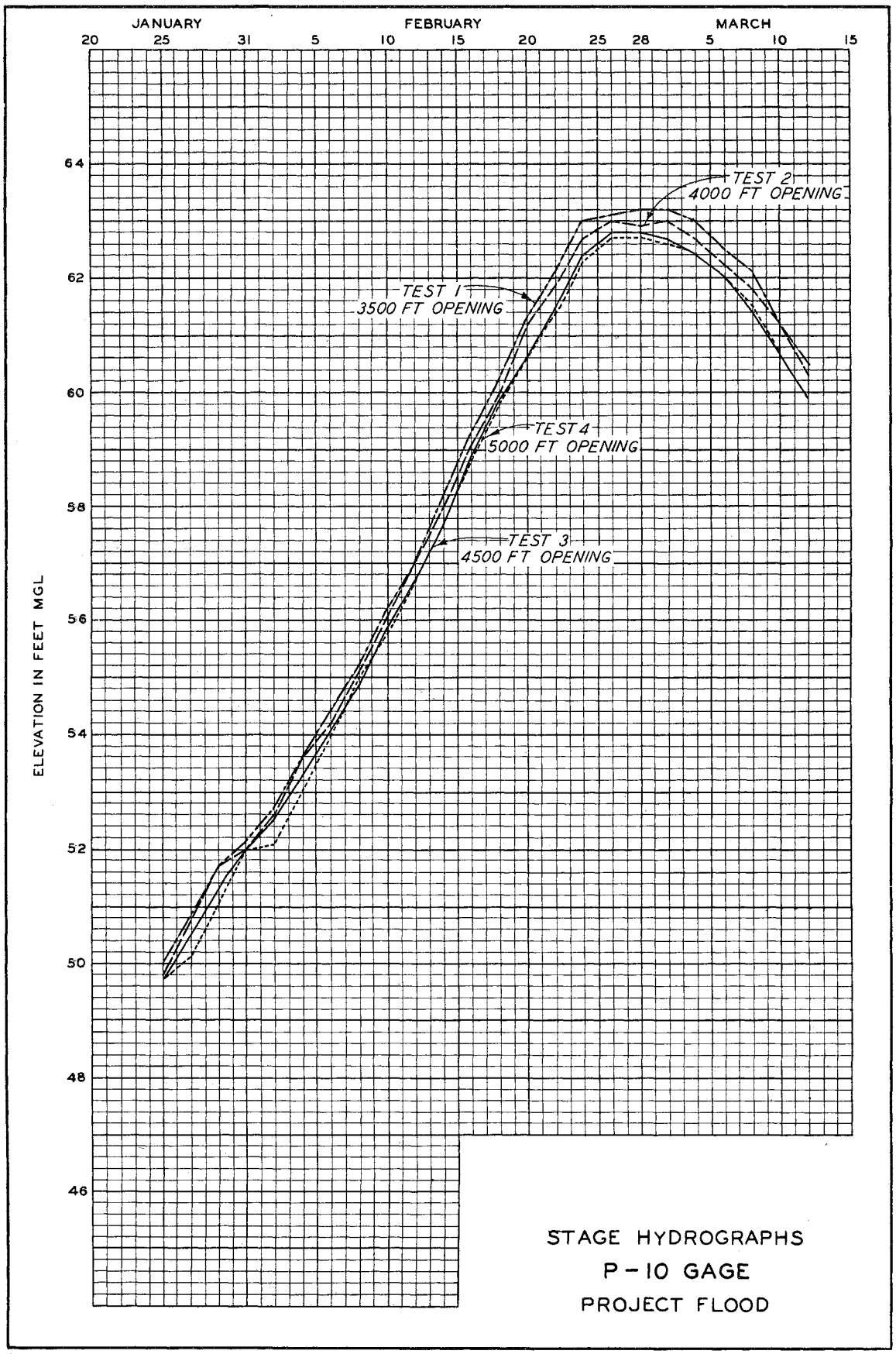
RATING CURVE FOR
WEST ATCHAFALAYA FLOODWAY AT
W.A.F. – 2

PLATE 12

PLATE 13



RATING CURVE FOR ATCHAFALAYA RIVER AT MELVILLE, LA

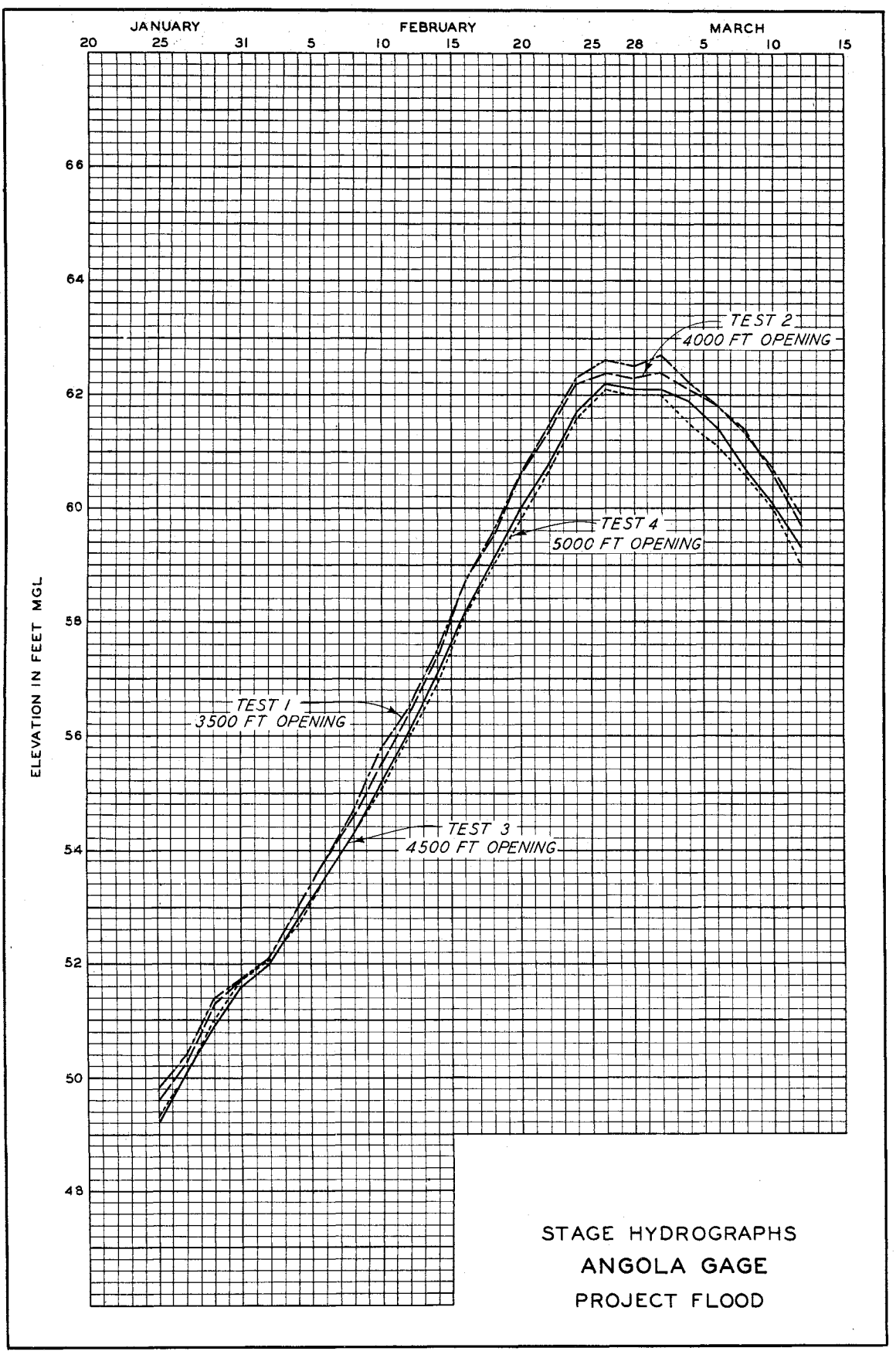


STAGE HYDROGRAPHS

P-10 GAGE

PROJECT FLOOD

PLATE 14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ELEVATION IN FEET MGL
TEST 2
4000 FT OPENING
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TEST 1
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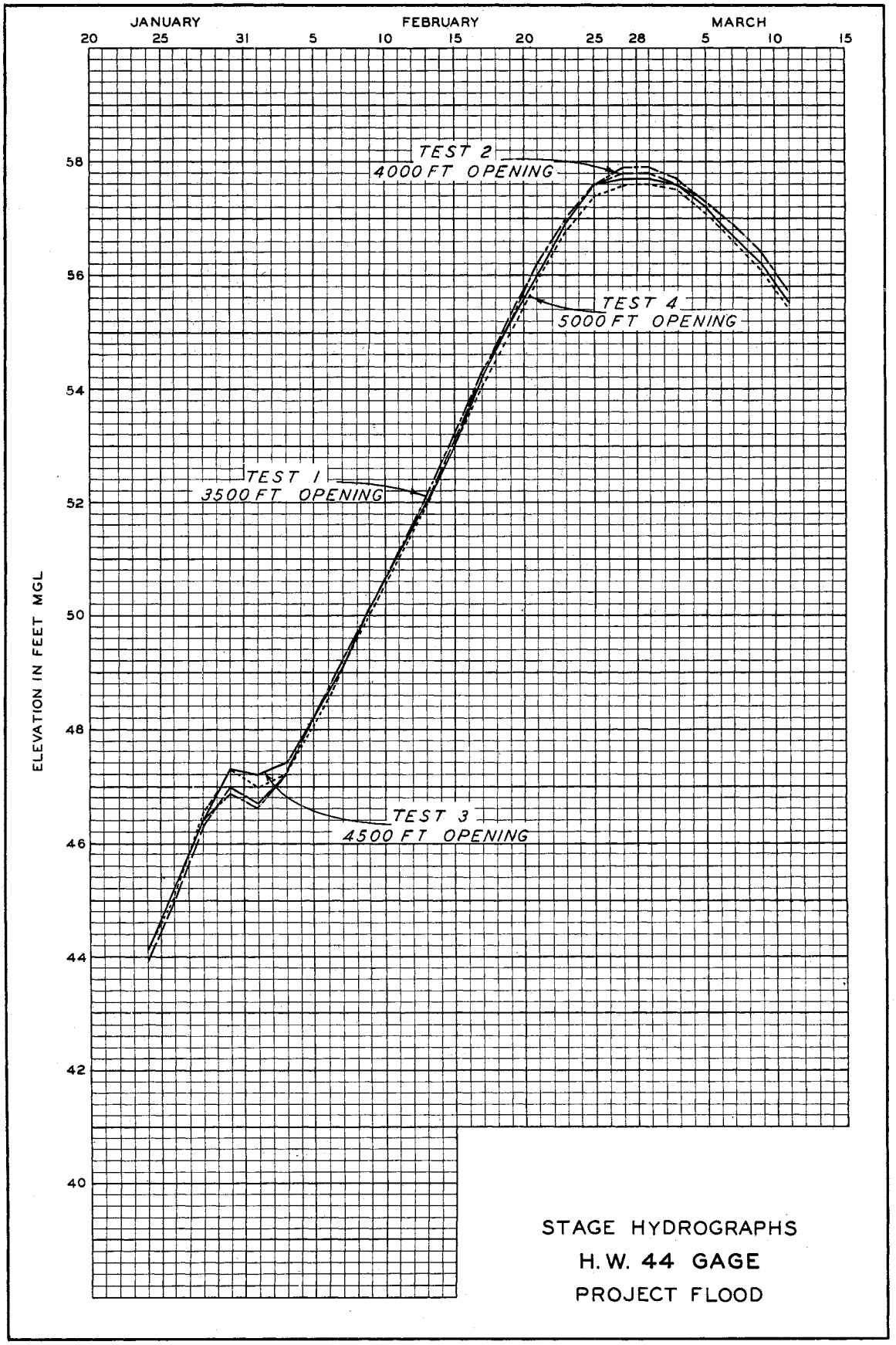
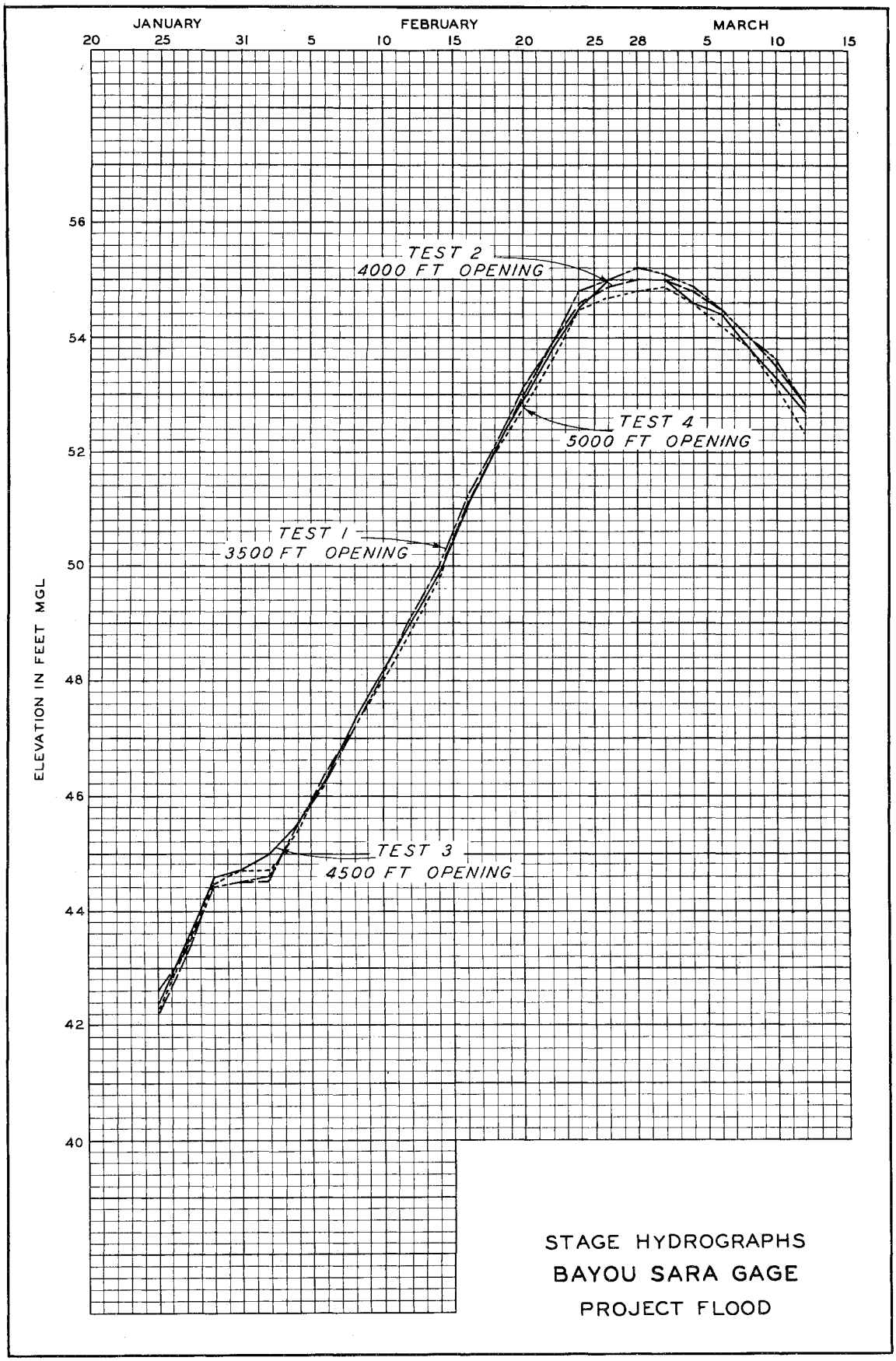
TEST 3
4500 FT OPENING
STAGE HYDROGRAPHS
ANGOLA GAGE
PROJECT FLOOD

PLATE 15



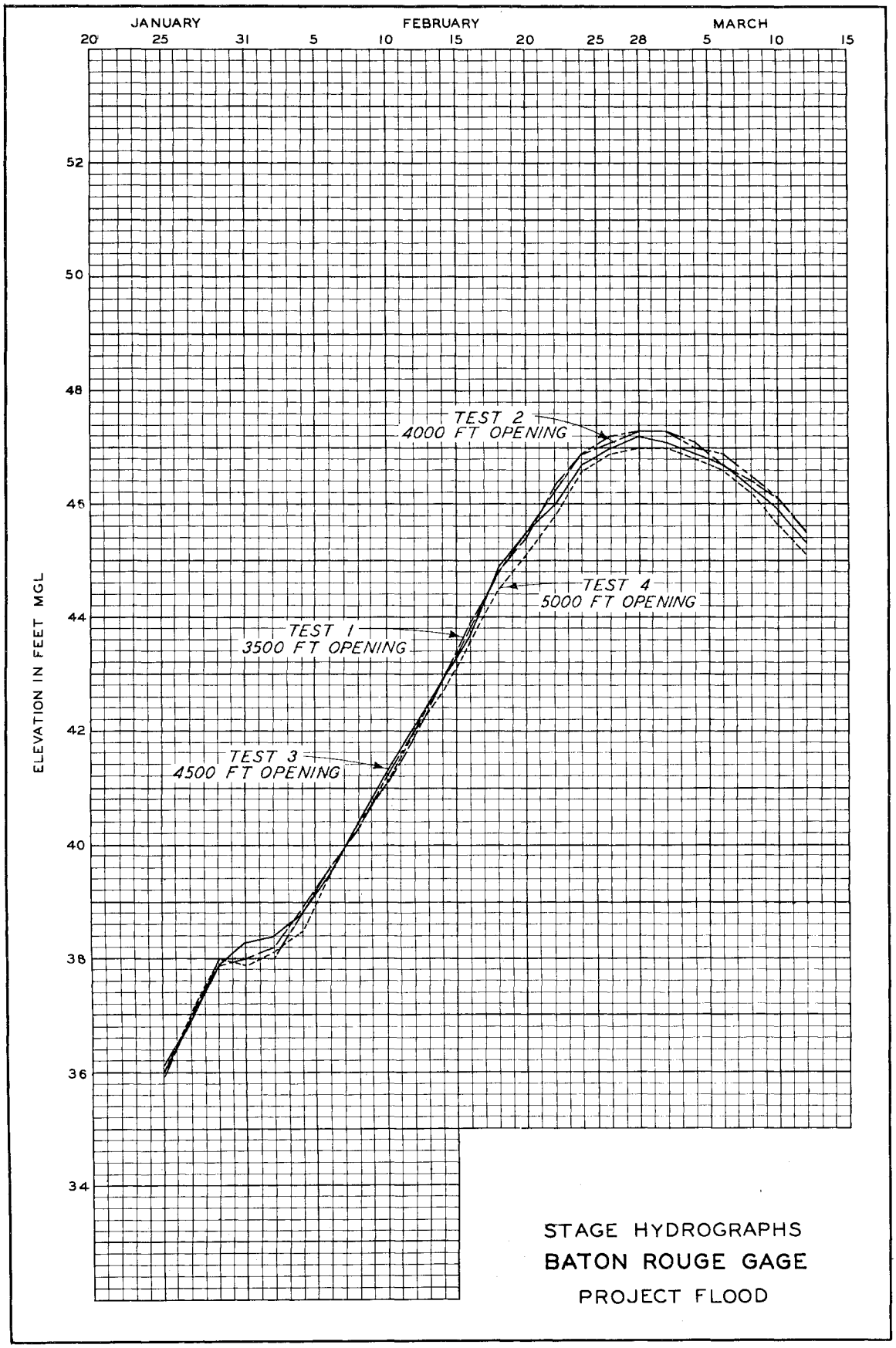
STAGE HYDROGRAPHS
H.W. 44 GAGE
PROJECT FLOOD

PLATE 16



STAGE HYDROGRAPHS
BAYOU SARA GAGE
PROJECT FLOOD

PLATE 17

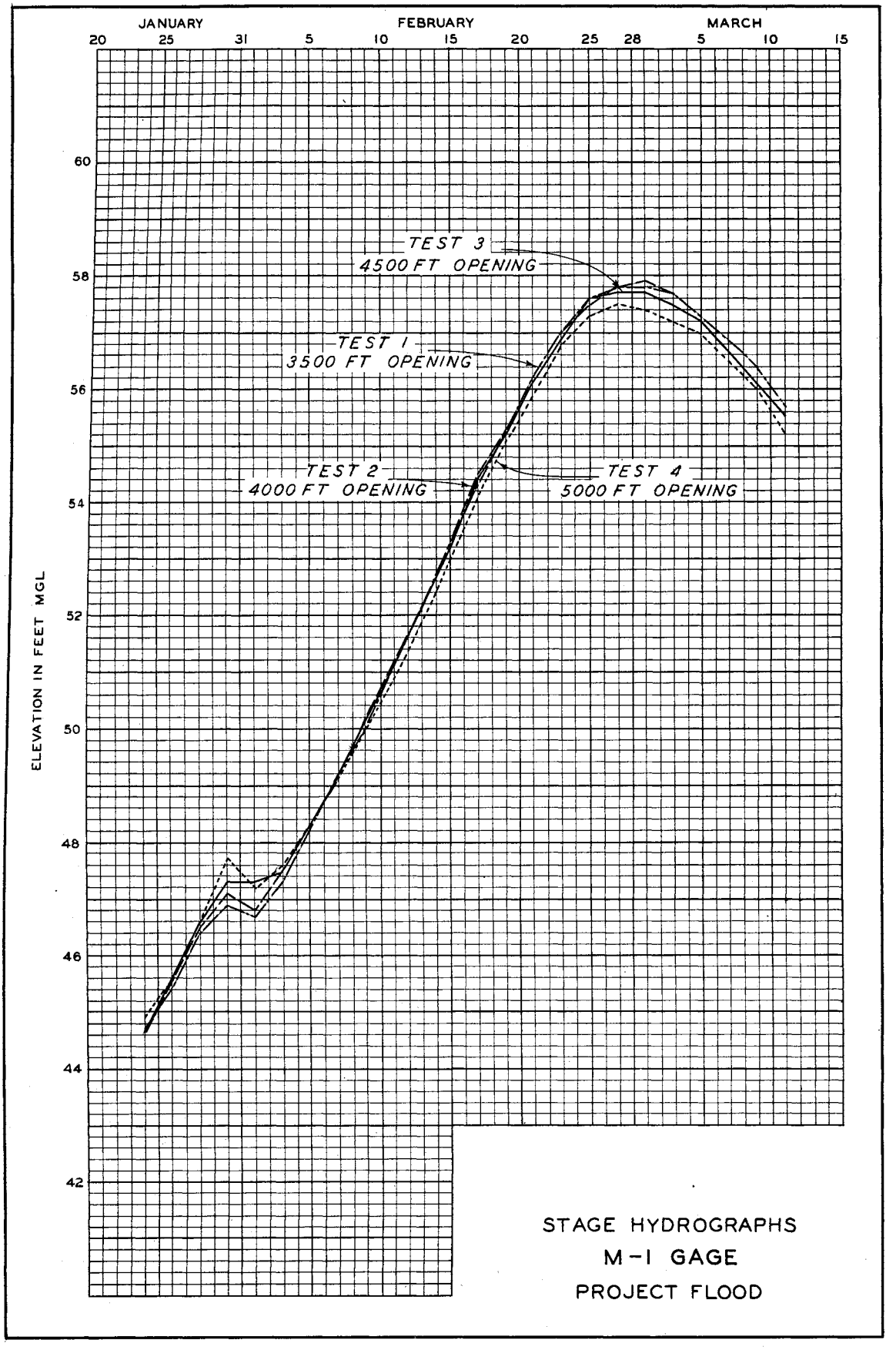


STAGE HYDROGRAPHS

BATON ROUGE GAGE

PROJECT FLOOD

PLATE 18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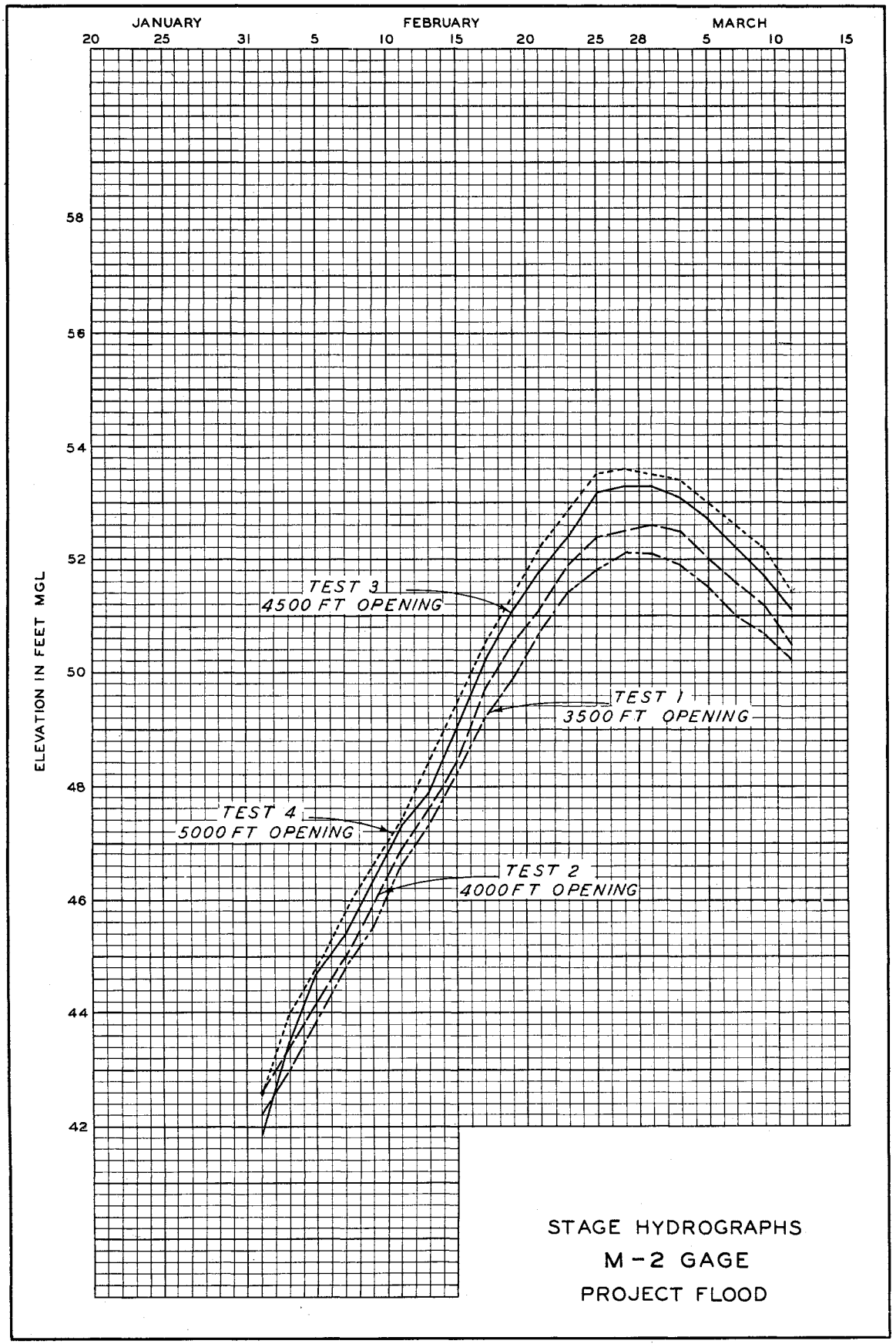
ELEVATION IN FEET MGL
TEST 3
4500 FT OPENING
TEST 1
3500 FT OPENING
TEST 2
4000 FT OPENING
TEST 4
5000 FT OPENING
STAGE HYDROGRAPHS
M-1 GAGE
PROJECT FLOOD

PLATE 19

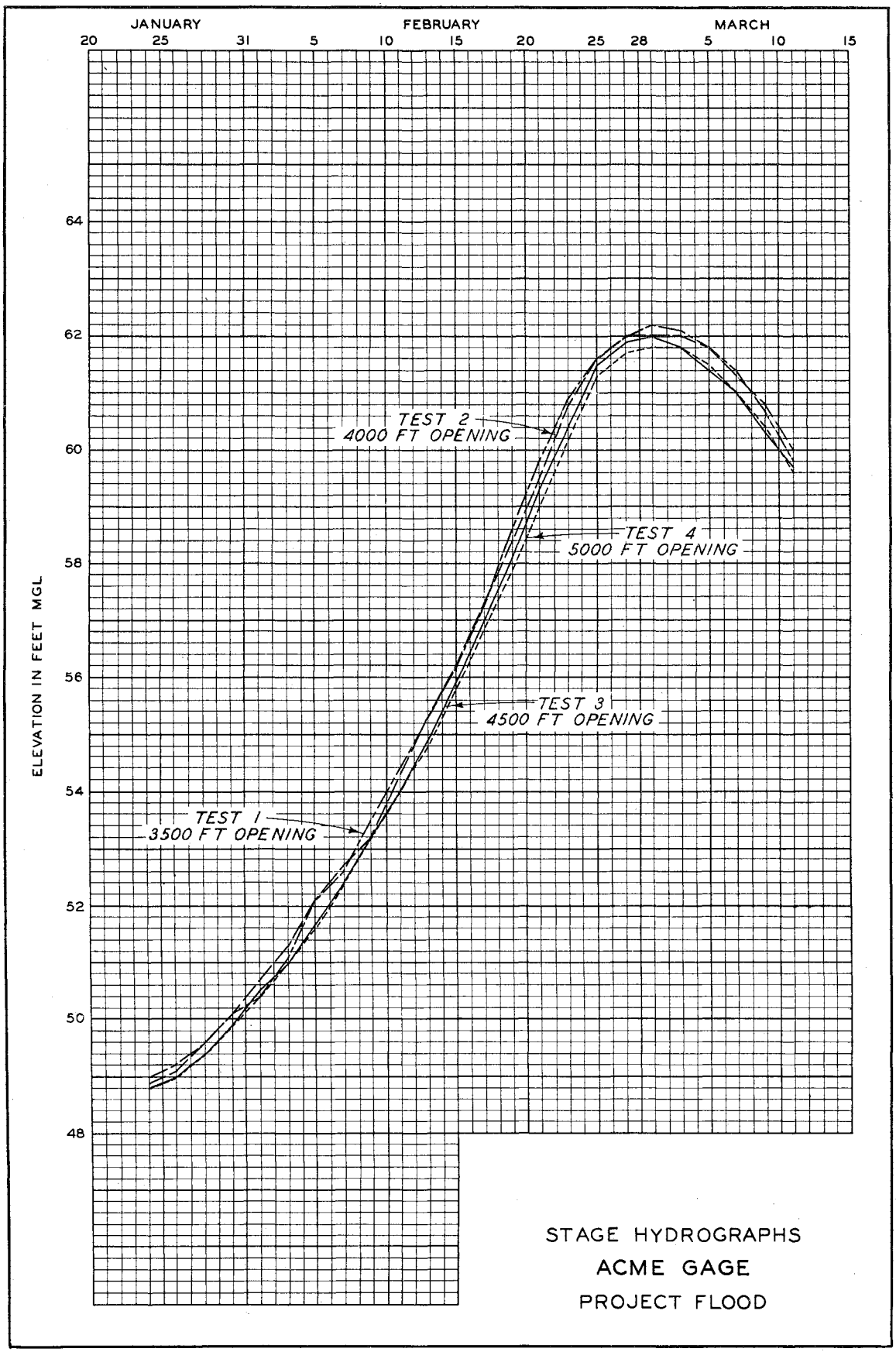


STAGE HYDROGRAPHS

M-2 GAGE

PROJECT FLOOD

PLATE 20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ELEVATION IN FEET MGL
TEST 2
4000 FT OPENING
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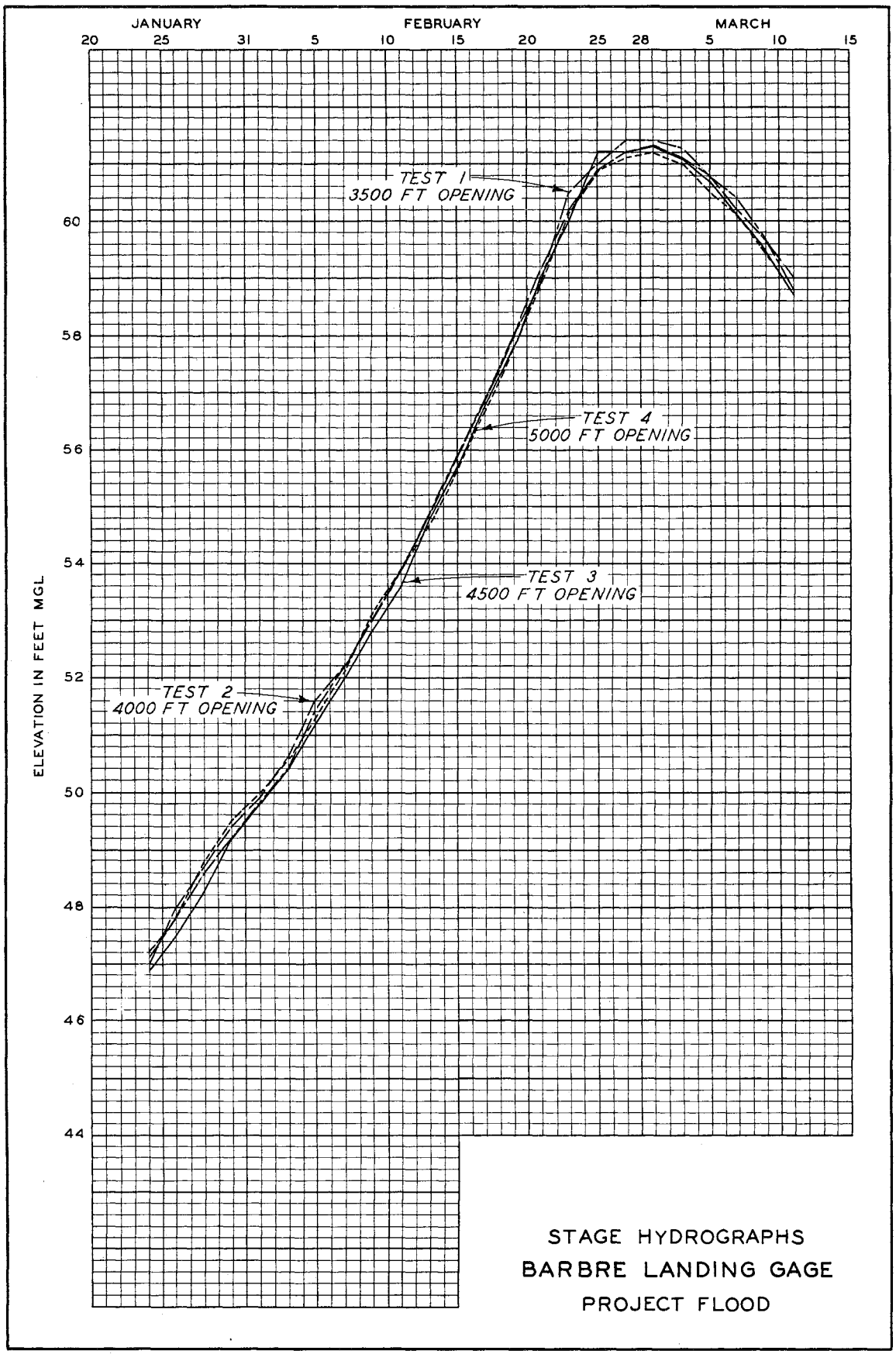
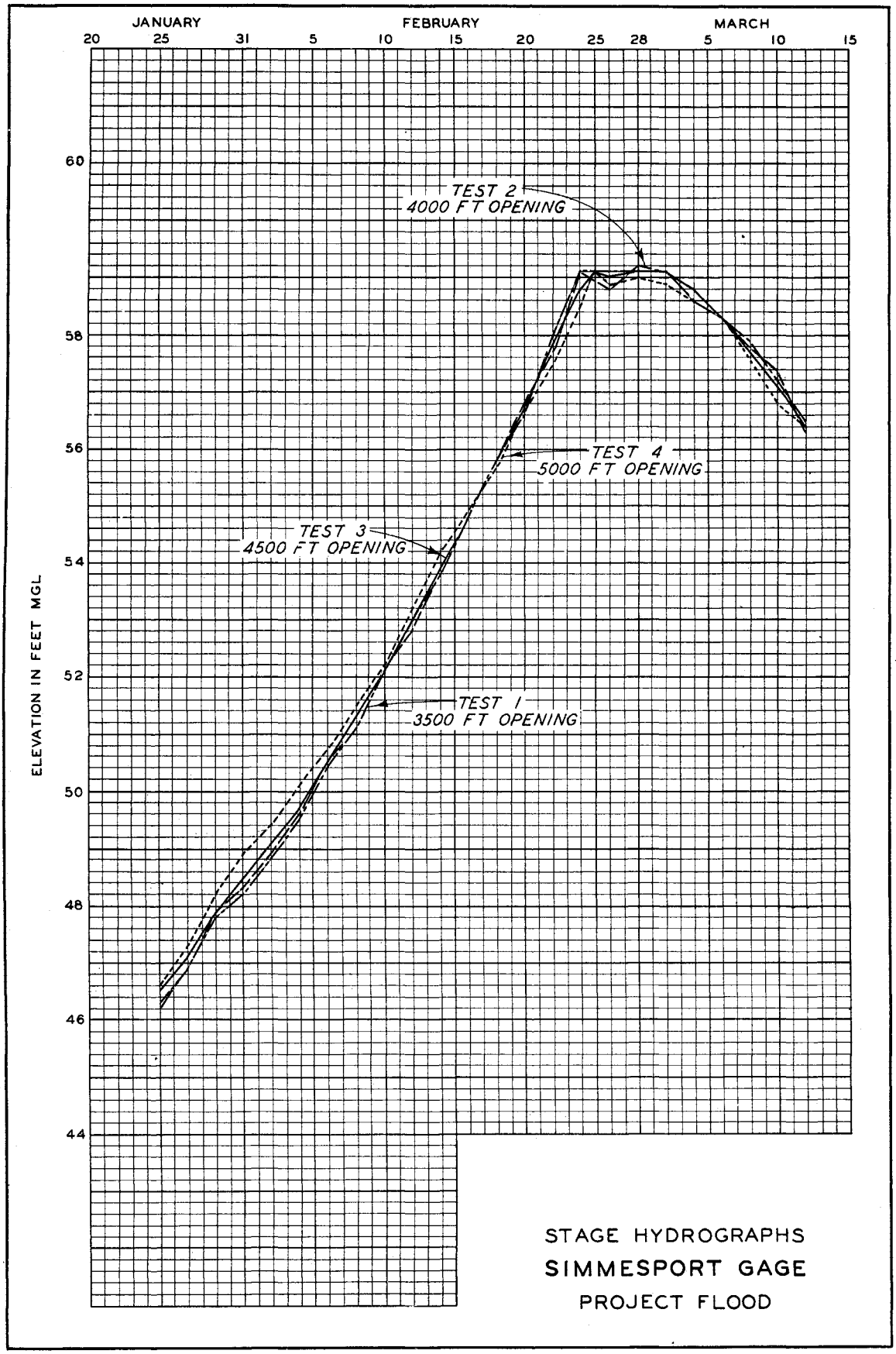
5000 FT OPENING
TEST 3
4500 FT OPENING
TEST 1
3500 FT OPENING
STAGE HYDROGRAPHS
ACME GAGE
PROJECT FLOOD

PLATE 21



STAGE HYDROGRAPHS
BARBRE LANDING GAGE
PROJECT FLOOD

PLATE 22

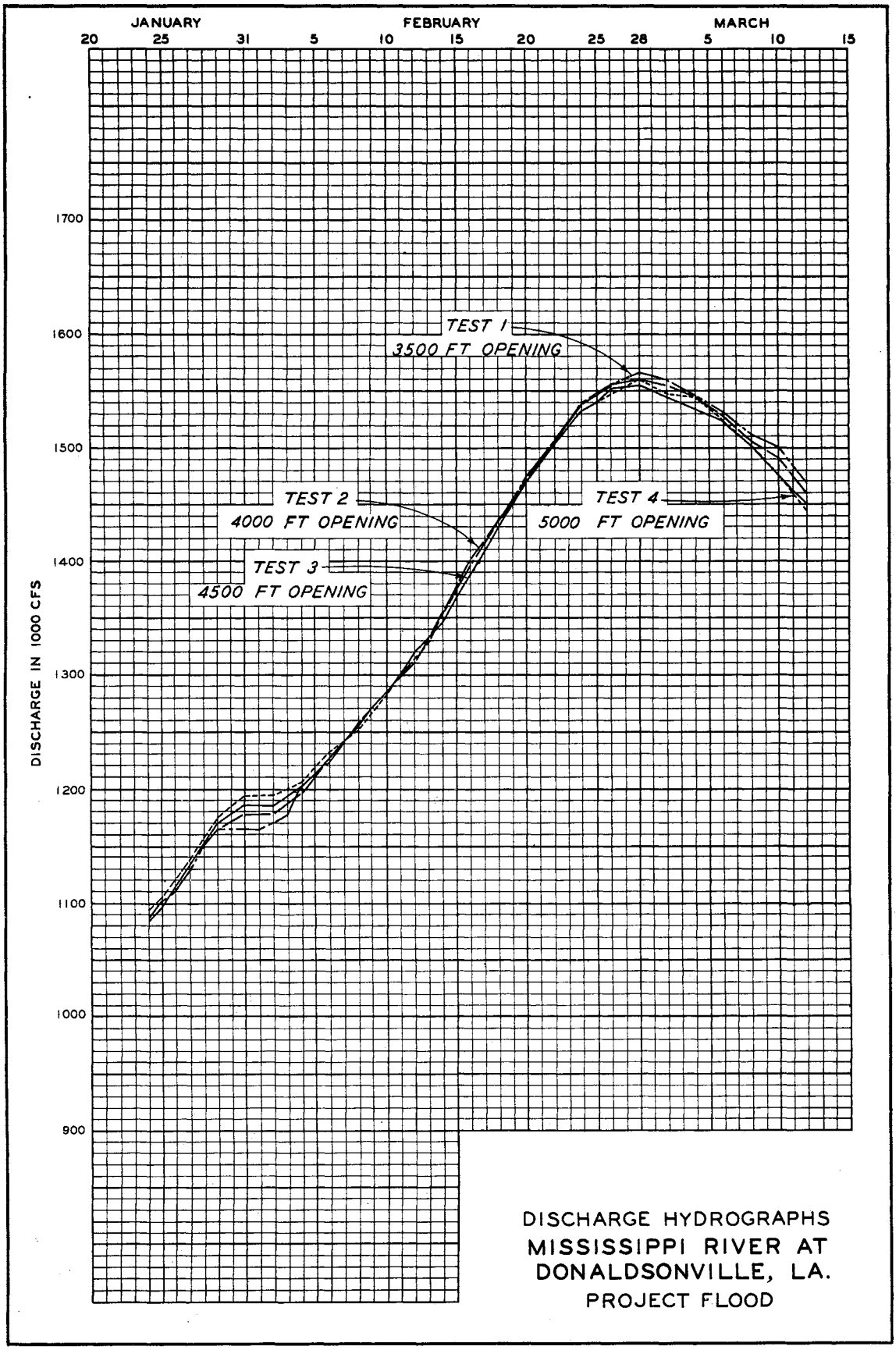


STAGE HYDROGRAPHS

SIMMESPORT GAGE

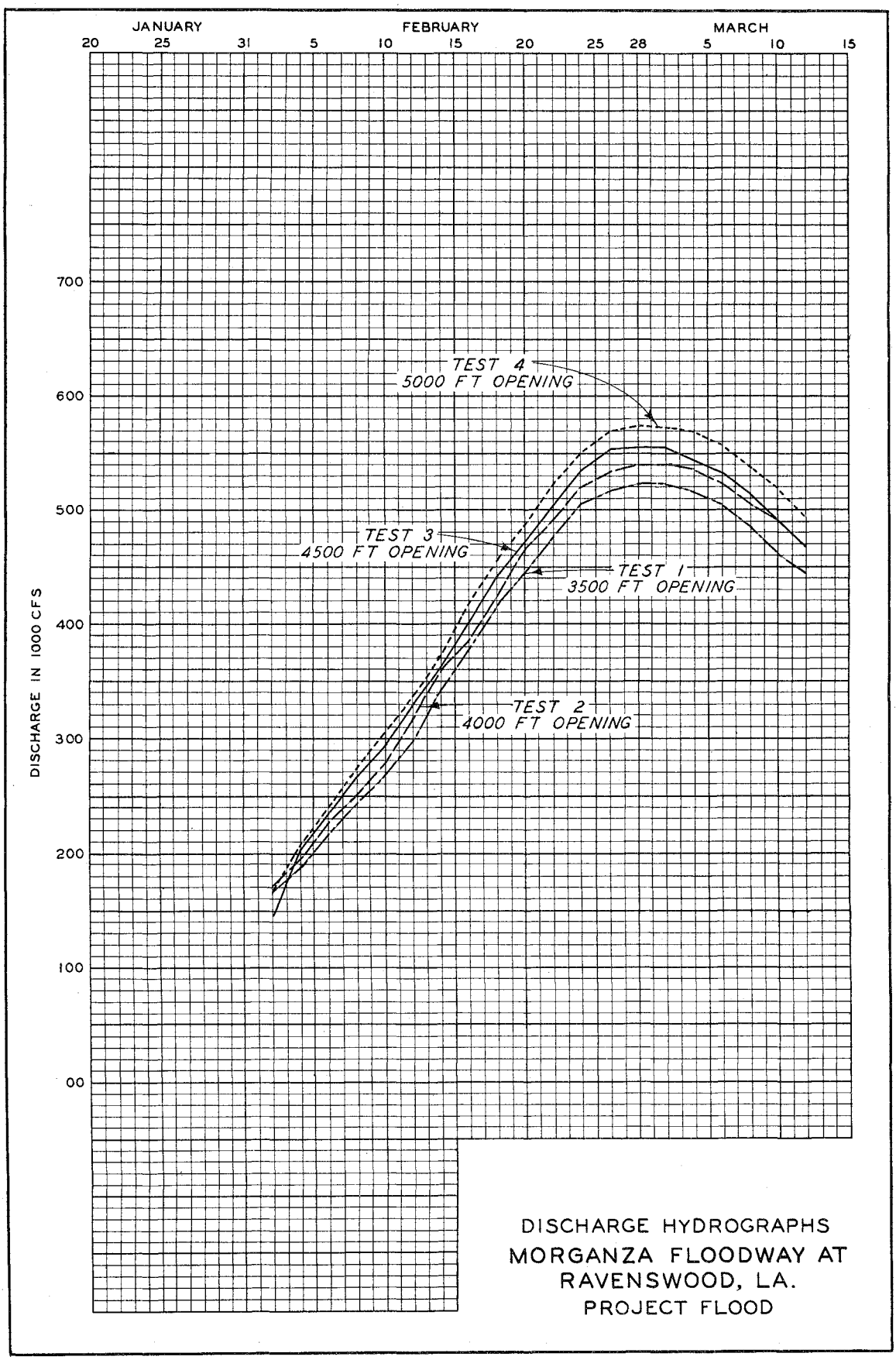
PROJECT FLOOD

PLATE 23



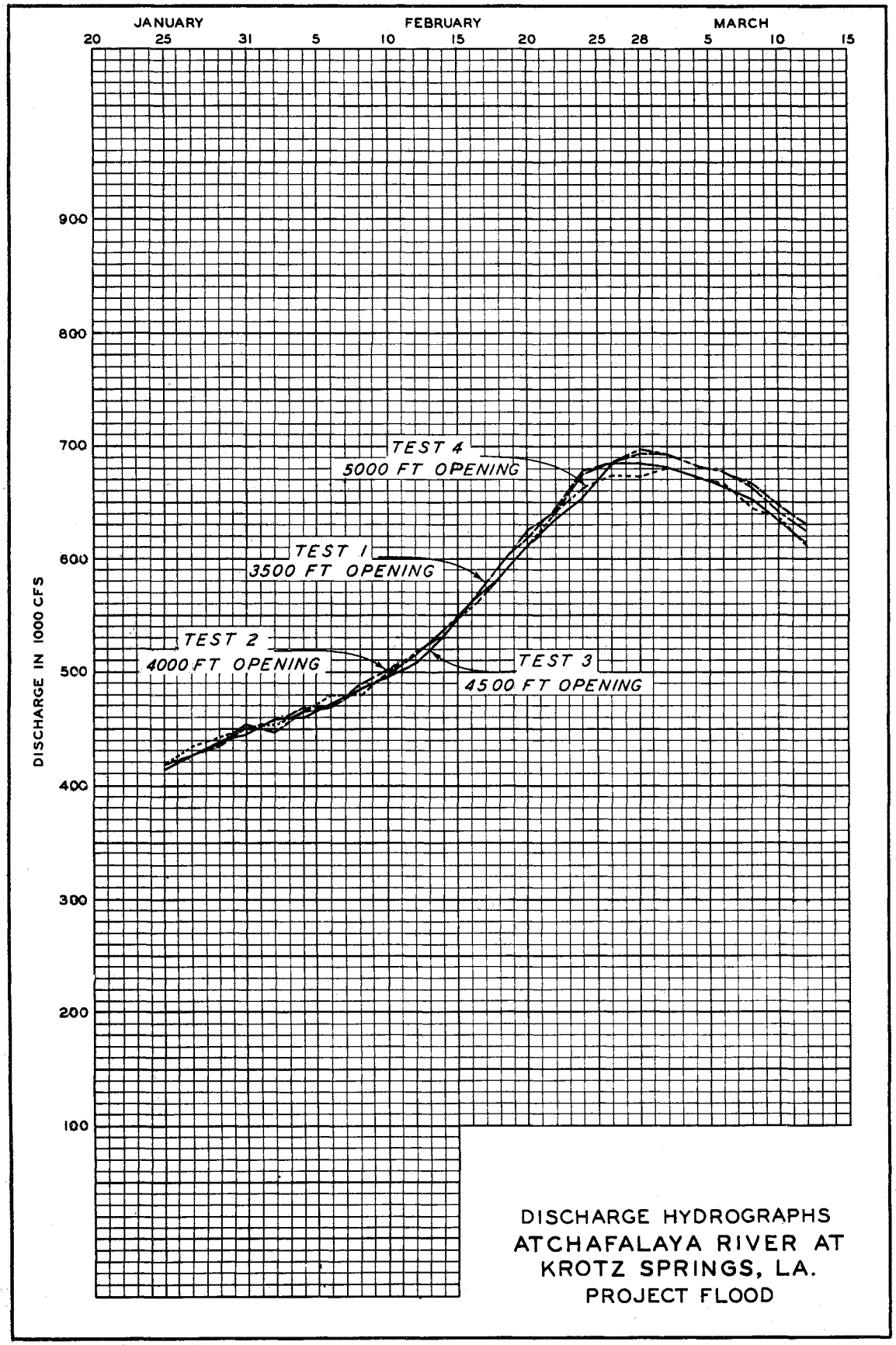
DISCHARGE HYDROGRAPHS
MISSISSIPPI RIVER AT
DONALDSONVILLE, LA.
PROJECT FLOOD

PLATE 24



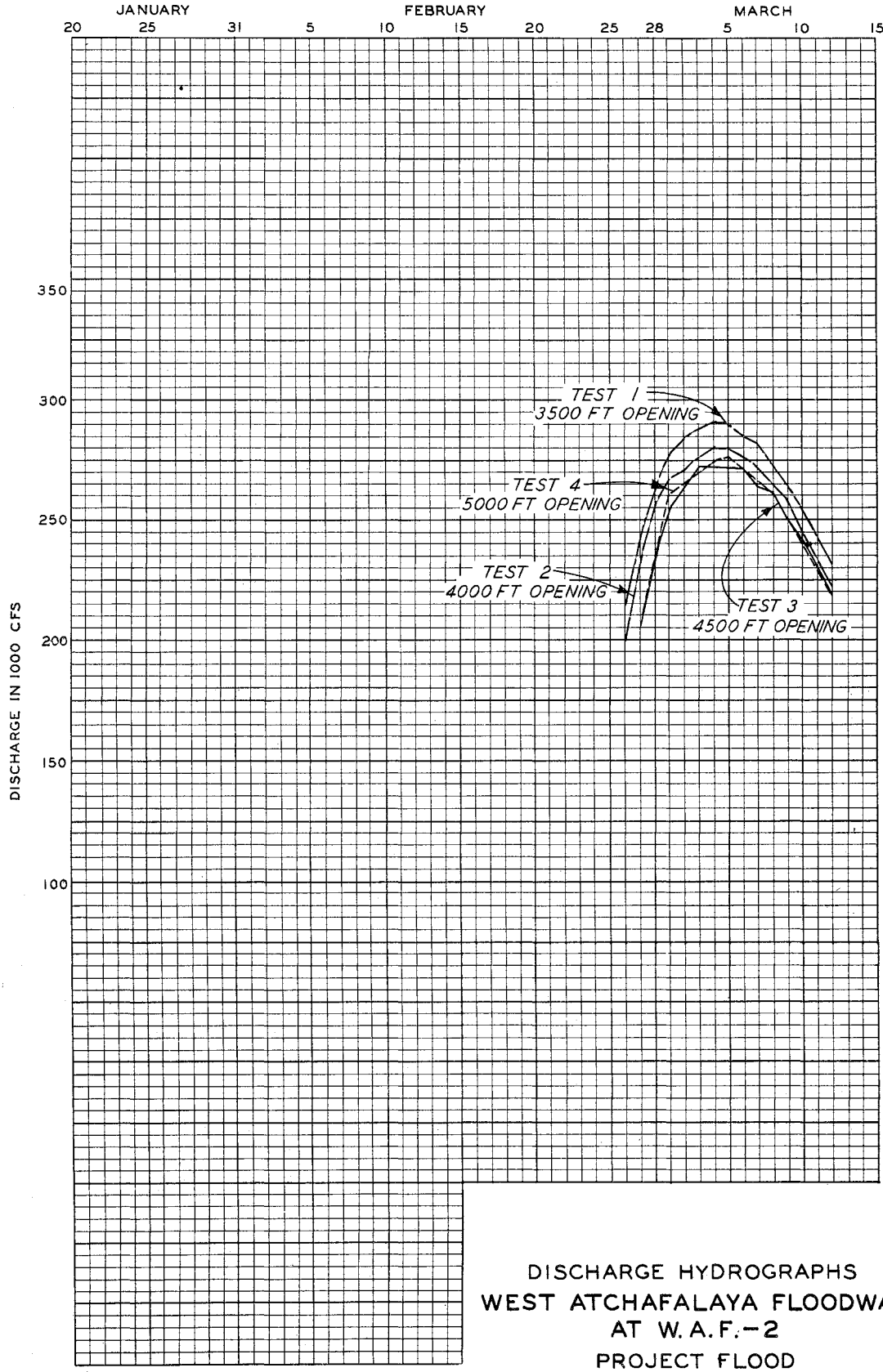
DISCHARGE HYDROGRAPHS
MORGANZA FLOODWAY AT
RAVENSWOOD, LA.
PROJECT FLOOD

PLATE 25



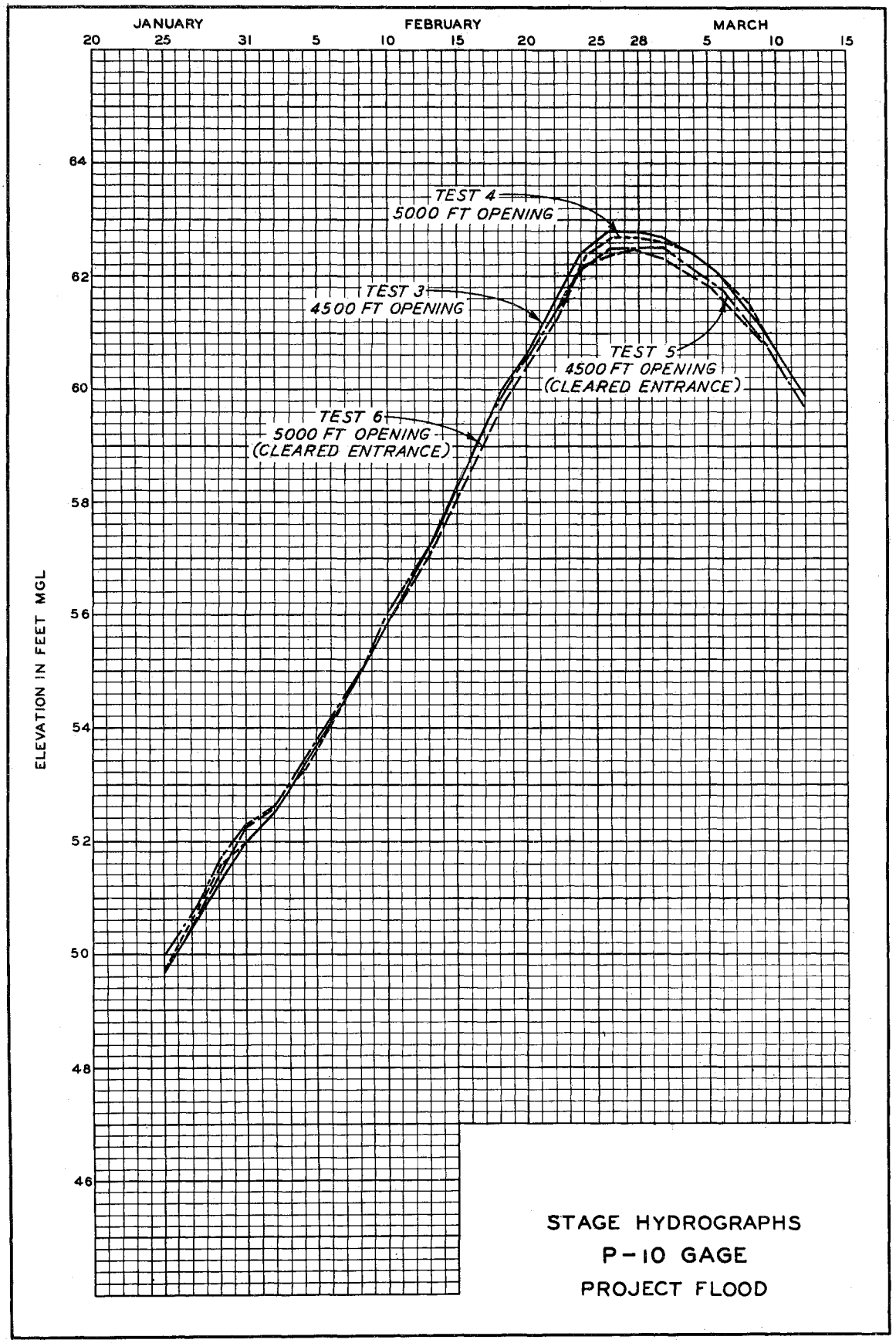
DISCHARGE HYDROGRAPHS
ATCHAFALAYA RIVER AT
KROTZ SPRINGS, LA.
PROJECT FLOOD

PLATE 26



DISCHARGE HYDROGRAPHS
WEST ATCHAFALAYA FLOODWAY
AT W.A.F.-2
PROJECT FLOOD

PLATE 27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ELEVATION IN FEET MGL
TEST 4
5000 FT OPENING
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4500 FT OPENING
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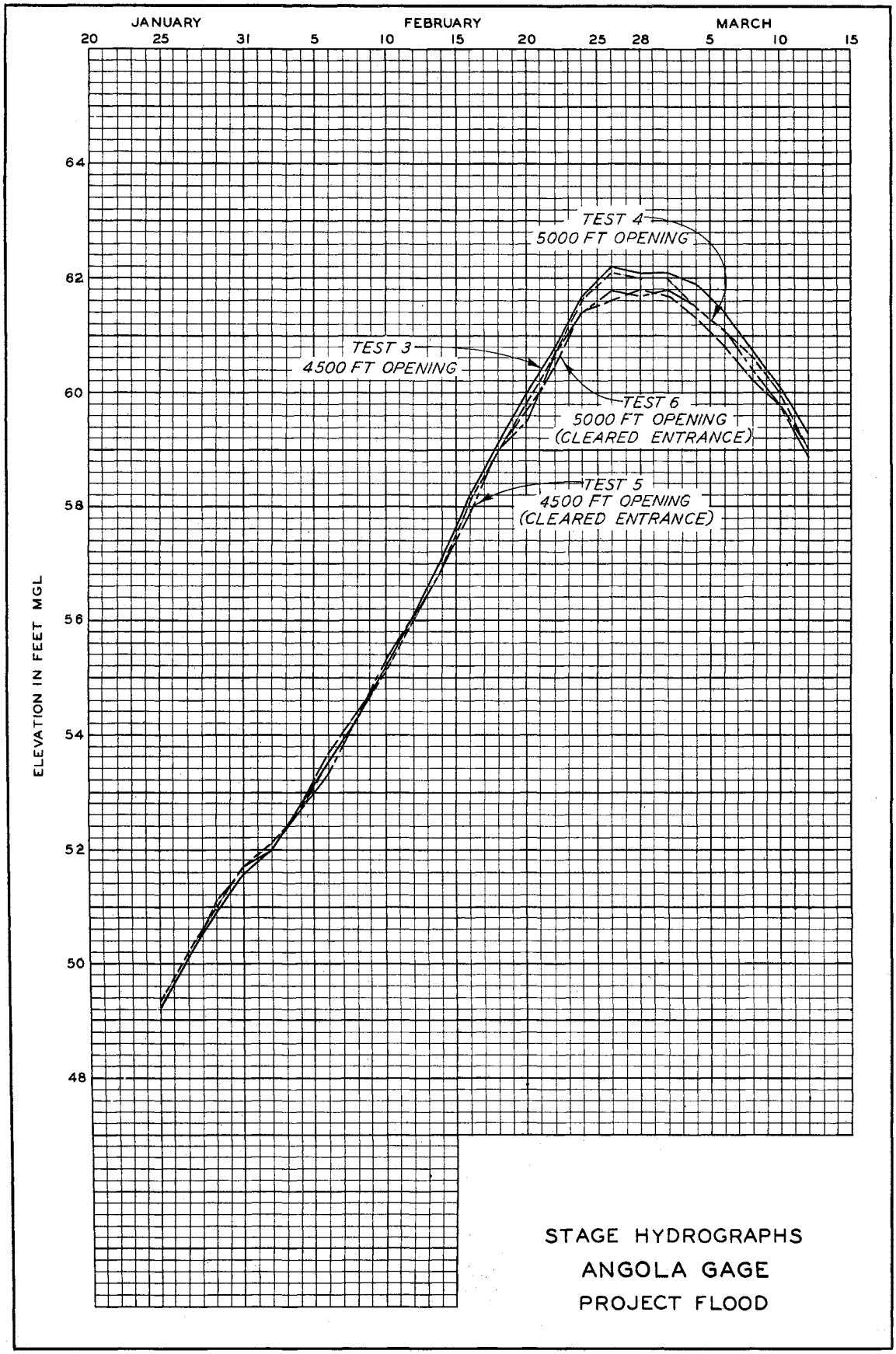
4500 FT OPENING
(CLEARED ENTRANCE)
TEST 6
5000 FT OPENING
(CLEARED ENTRANCE)
STAGE HYDROGRAPHS
P-10 GAGE
PROJECT FLOOD

PLATE 28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ELEVATION IN FEET MGL
TEST 4
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TEST 6
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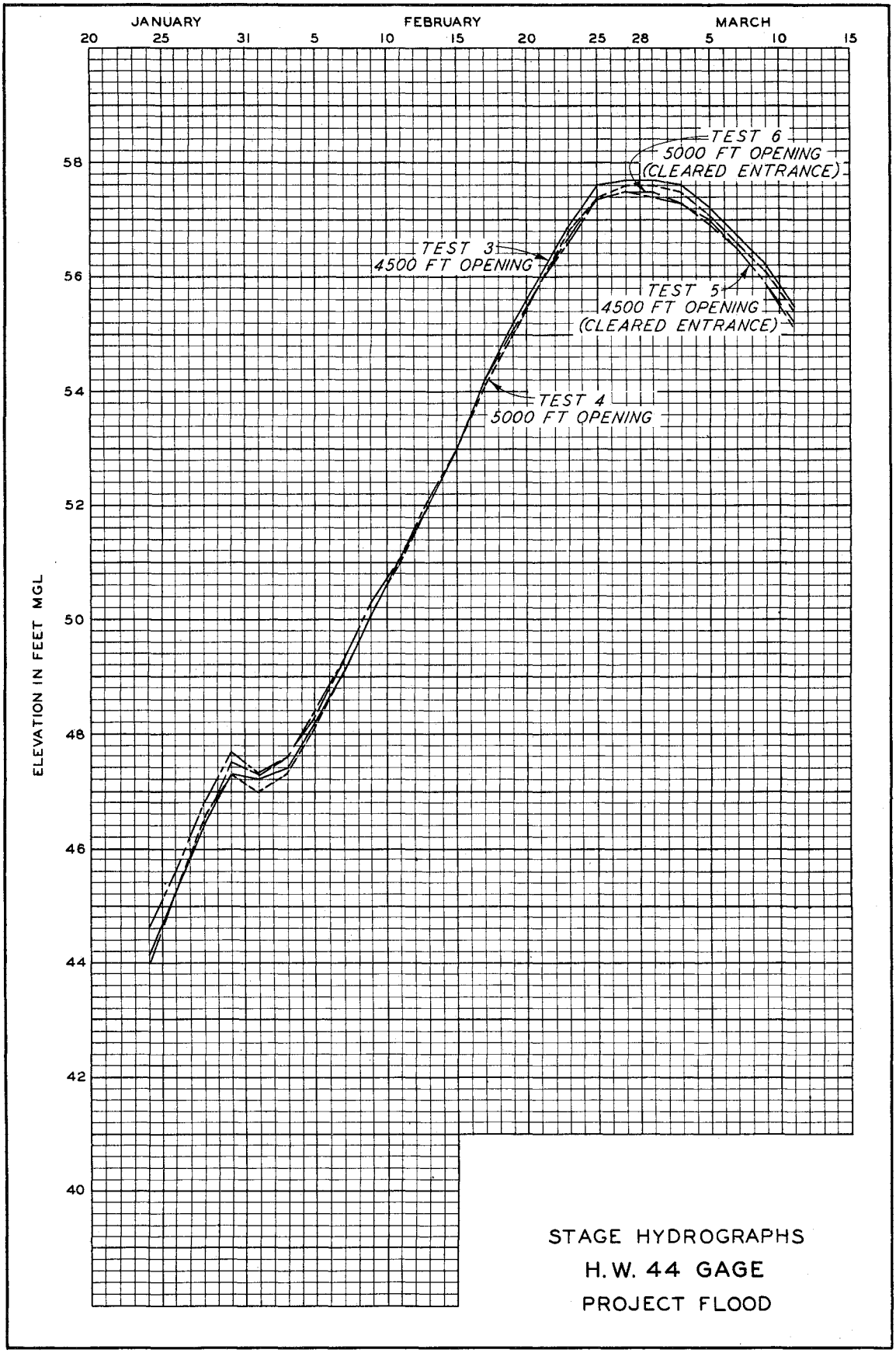
(CLEARED ENTRANCE)
TEST 5
4500 FT OPENING
(CLEARED ENTRANCE)
STAGE HYDROGRAPHS
ANGOLA GAGE
PROJECT FLOOD

PLATE 29

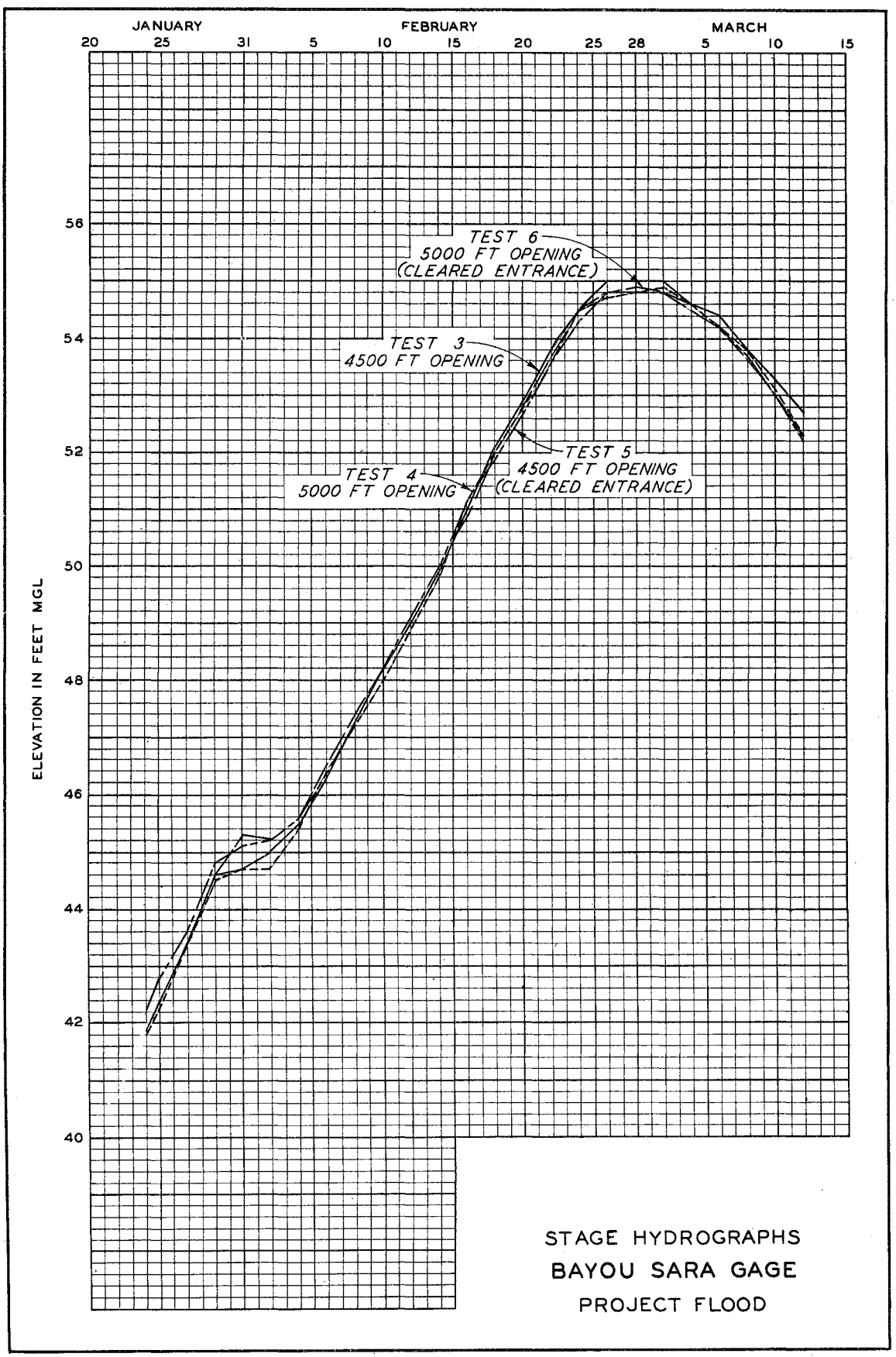


STAGE HYDROGRAPHS

H. W. 44 GAGE

PROJECT FLOOD

PLATE 30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ELEVATION IN FEET MGL
TEST 6
5000 FT OPENING
(CLEARED ENTRANCE)
TEST 3
4500 FT OPENING
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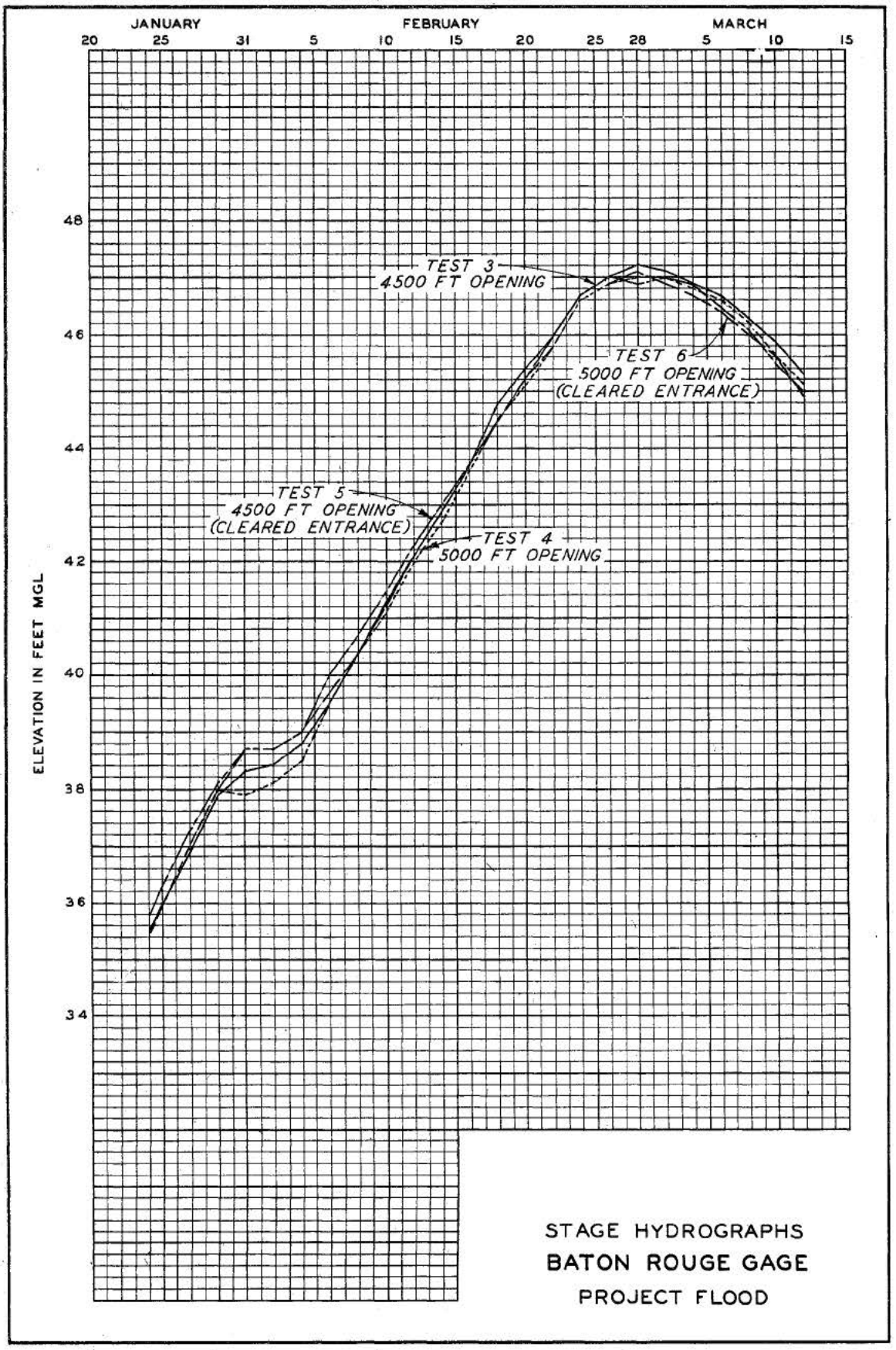
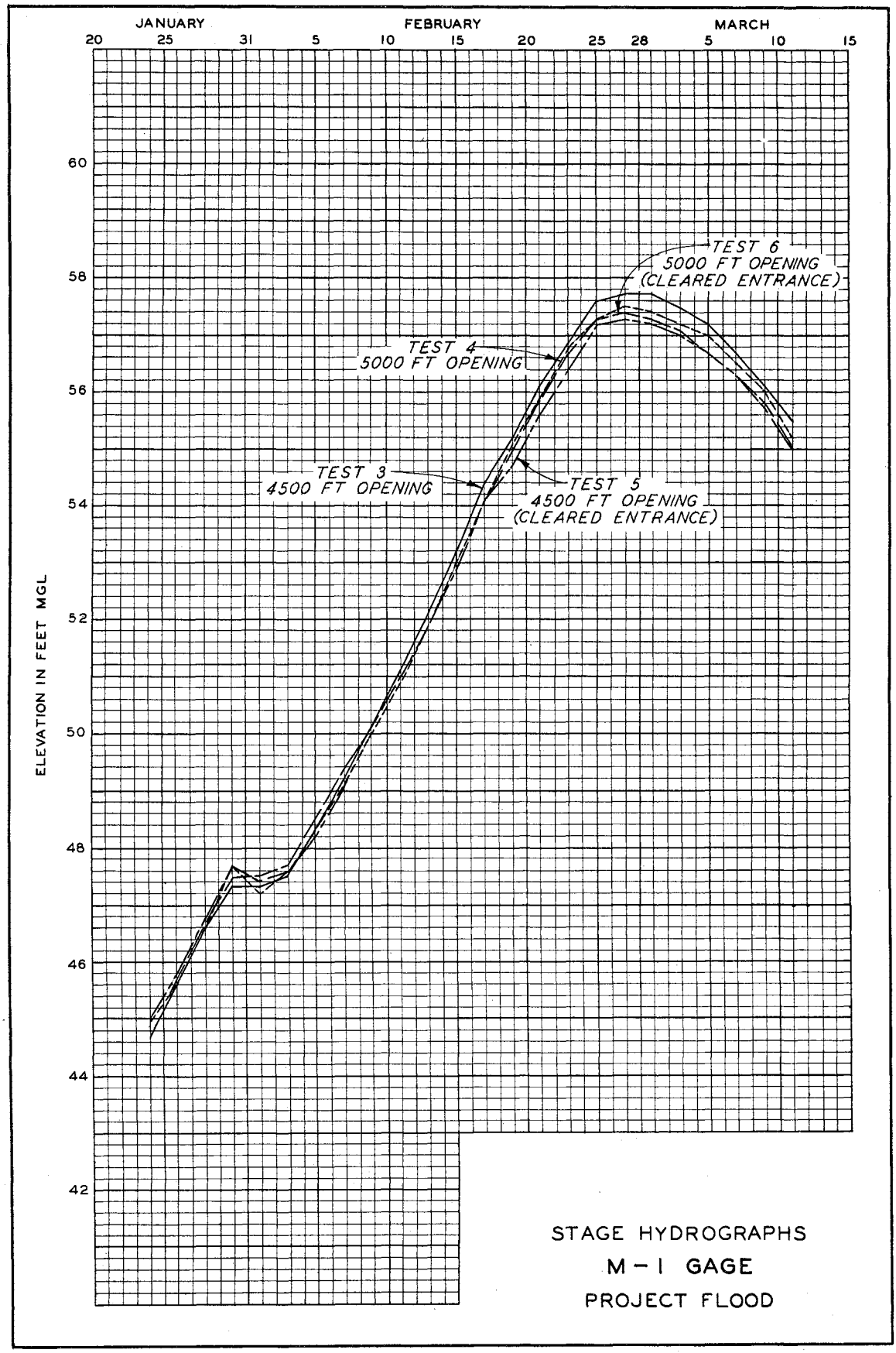
4500 FT OPENING
(CLEARED ENTRANCE)
TEST 4
5000 FT OPENING
STAGE HYDROGRAPHS
BAYOU SARA GAGE
PROJECT FLOOD

PLATE 31



STAGE HYDROGRAPHS
BATON ROUGE GAGE
PROJECT FLOOD

PLATE 32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ELEVATION IN FEET MGL
TEST 6
5000 FT OPENING
(CLEARED ENTRANCE)
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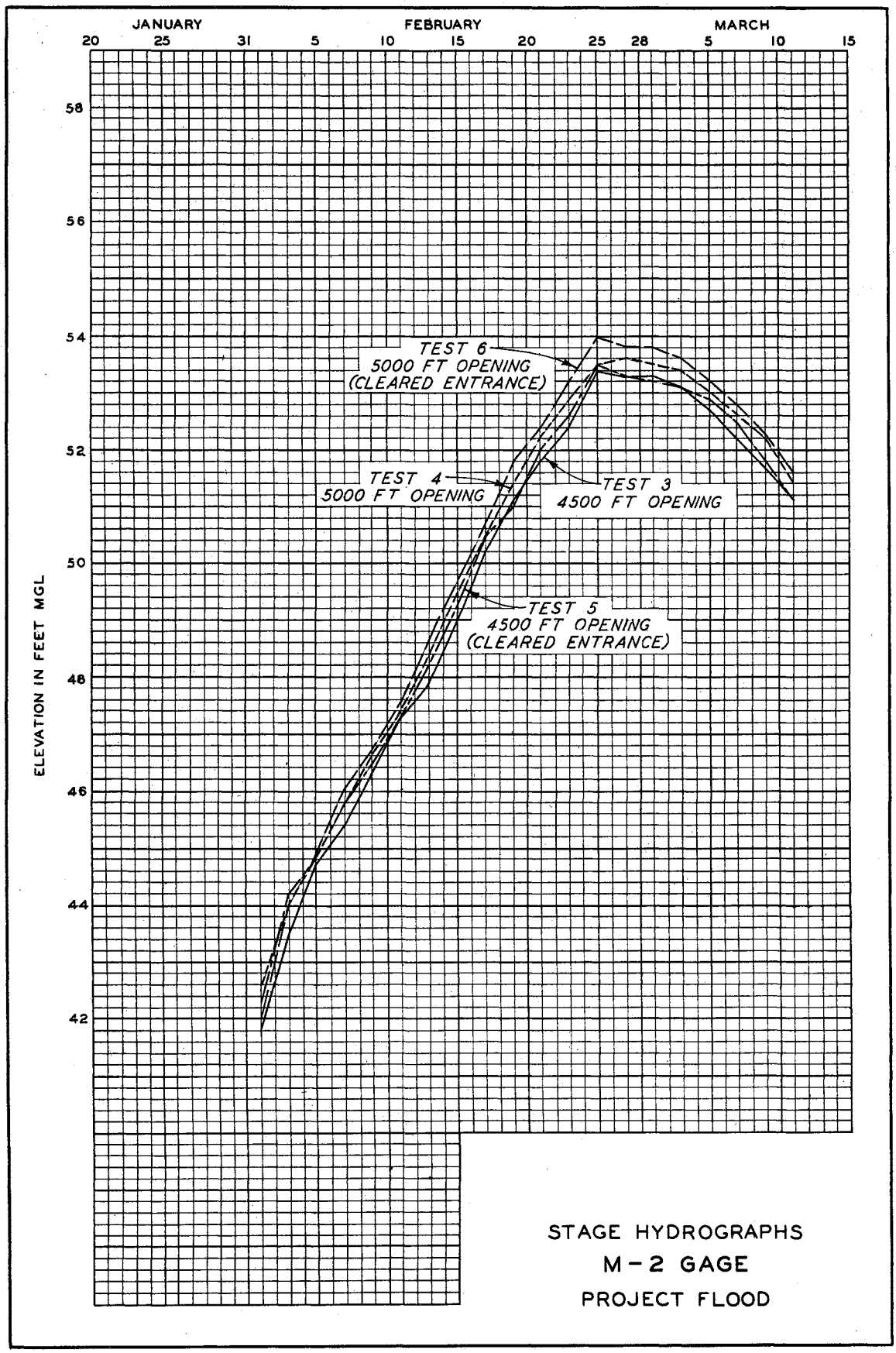
TEST 3
4500 FT OPENING
TEST 5
4500 FT OPENING
(CLEARED ENTRANCE)
STAGE HYDROGRAPHS
M – I GAGE
PROJECT FLOOD

PLATE 33

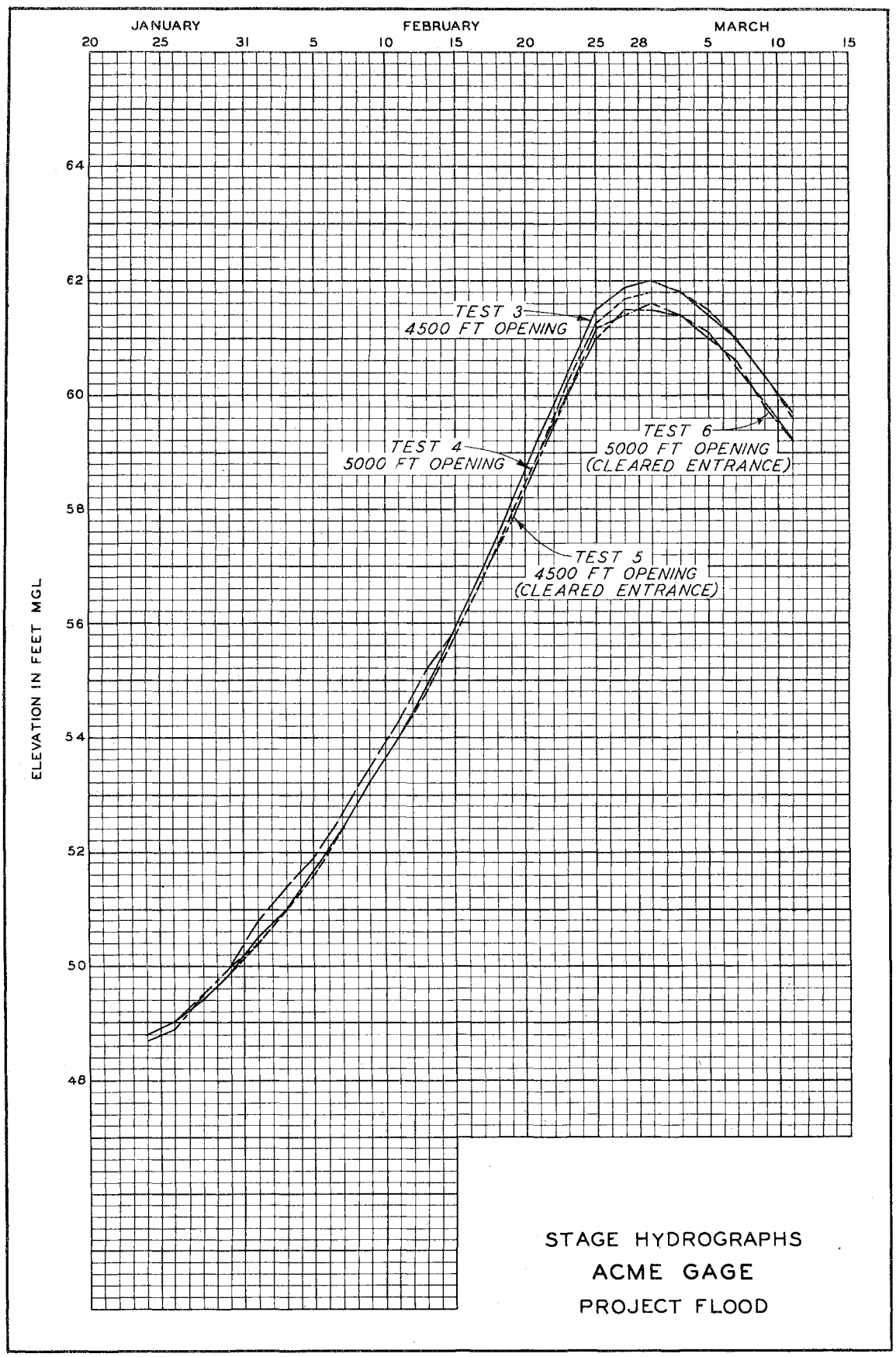


STAGE HYDROGRAPHS

M-2 GAGE

PROJECT FLOOD

PLATE 34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ELEVATION IN FEET MGL
TEST 3
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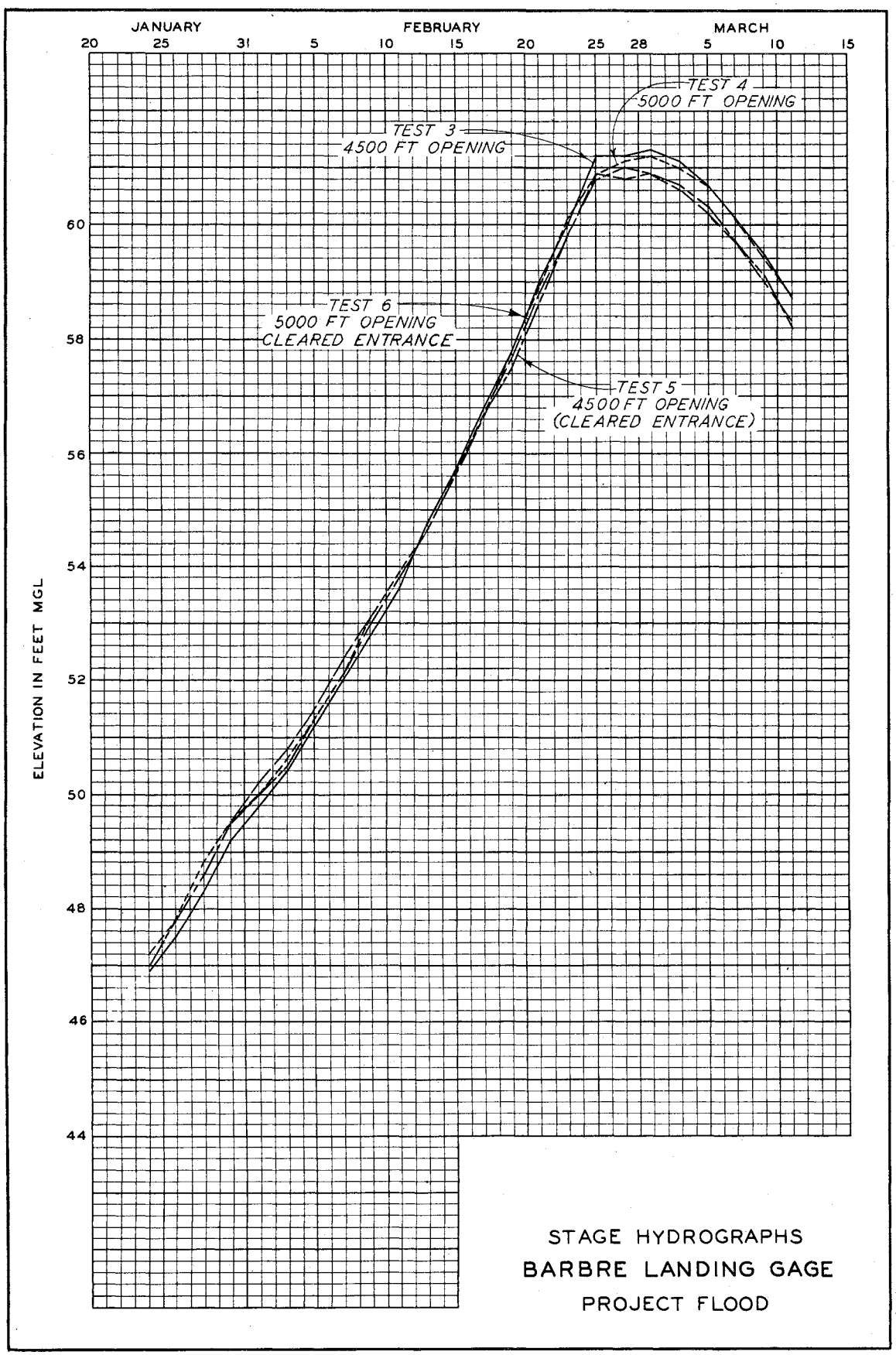
TEST 6
5000 FT OPENING
(CLEARED ENTRANCE)
TEST 5
4500 FT OPENING
(CLEARED ENTRANCE)
STAGE HYDROGRAPHS
ACME GAGE
PROJECT FLOOD

PLATE 35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TEST 4
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CLEARED ENTRANCE
TEST 5
4500 FT OPENING
(CLEARED ENTRANCE)
ELEVATION IN FEET MGL
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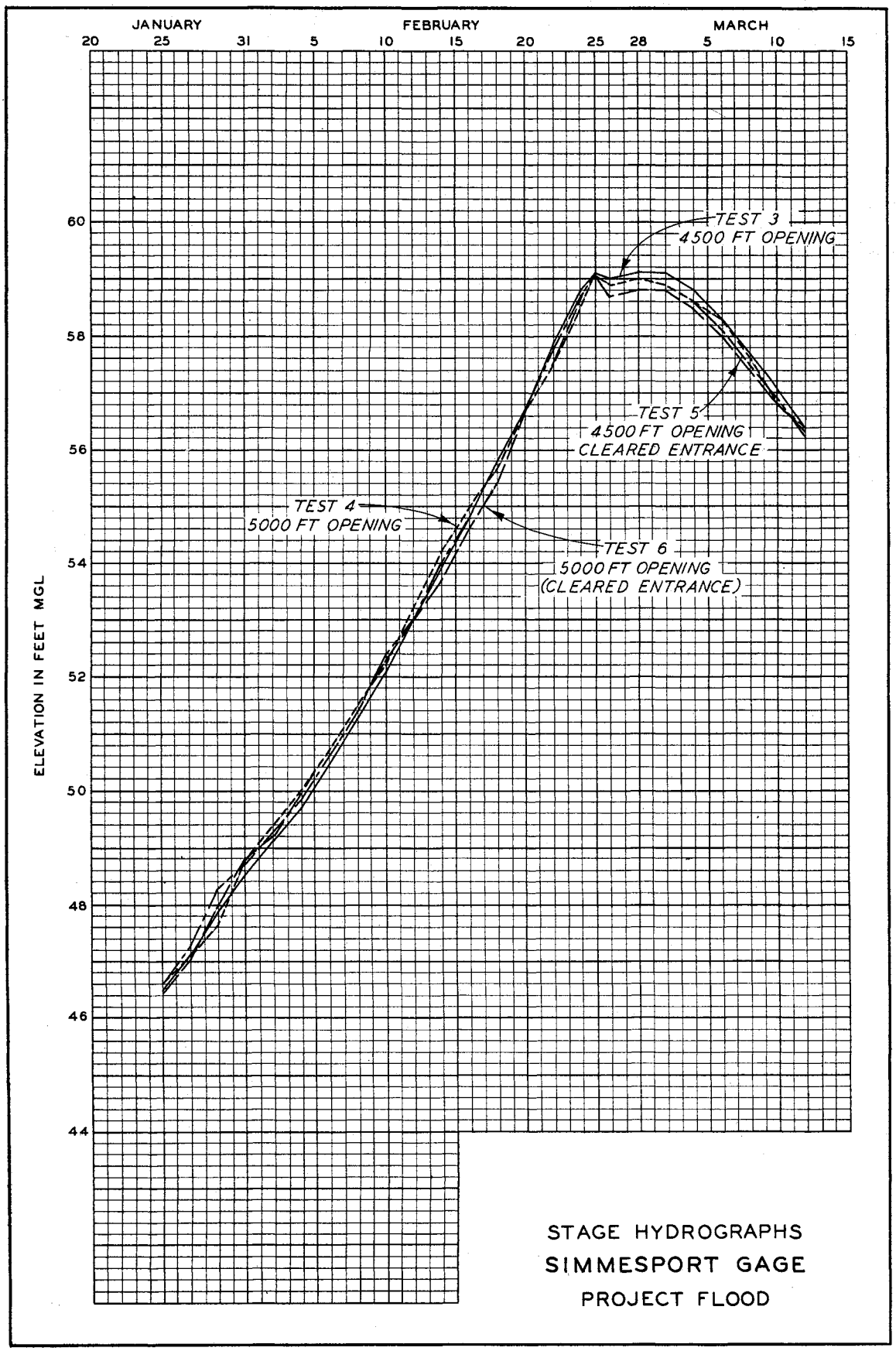
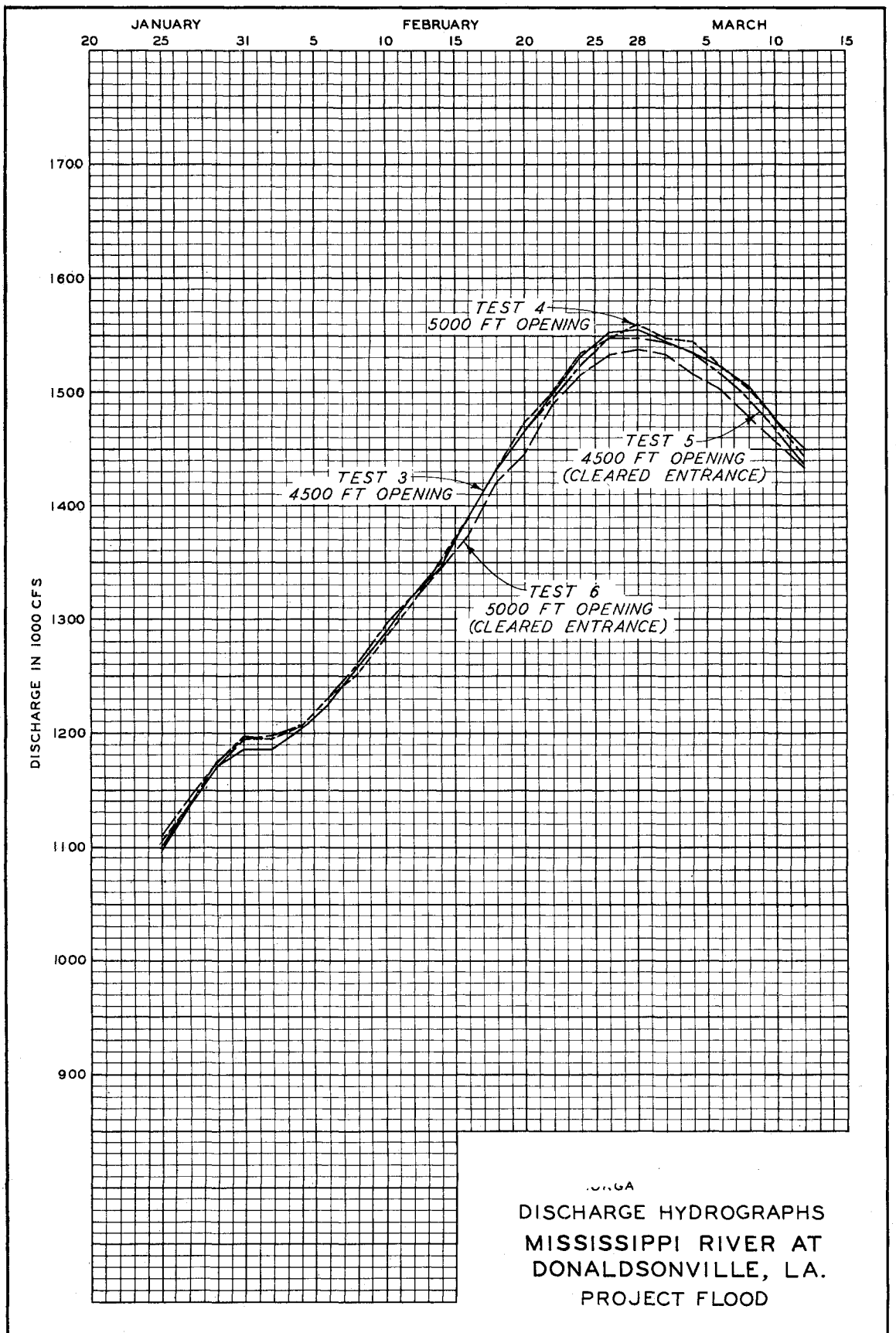
STAGE HYDROGRAPHS
BARBRE LANDING GAGE
PROJECT FLOOD

PLATE 36



STAGE HYDROGRAPHS
SIMMESPORT GAGE
PROJECT FLOOD

PLATE 37

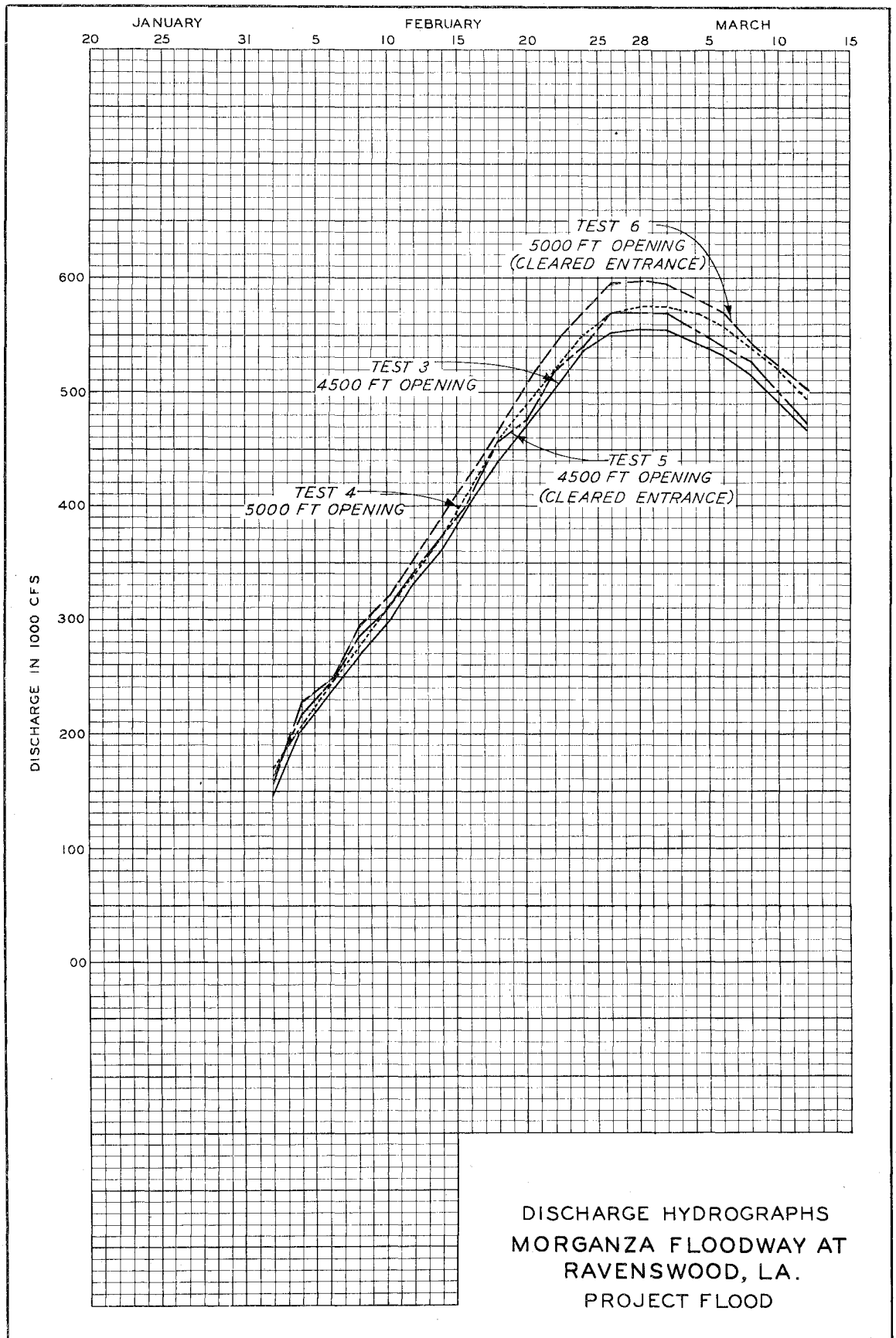


DISCHARGE HYDROGRAPHS

MISSISSIPPI RIVER AT
DONALDSONVILLE, LA.

PROJECT FLOOD

PLATE 38

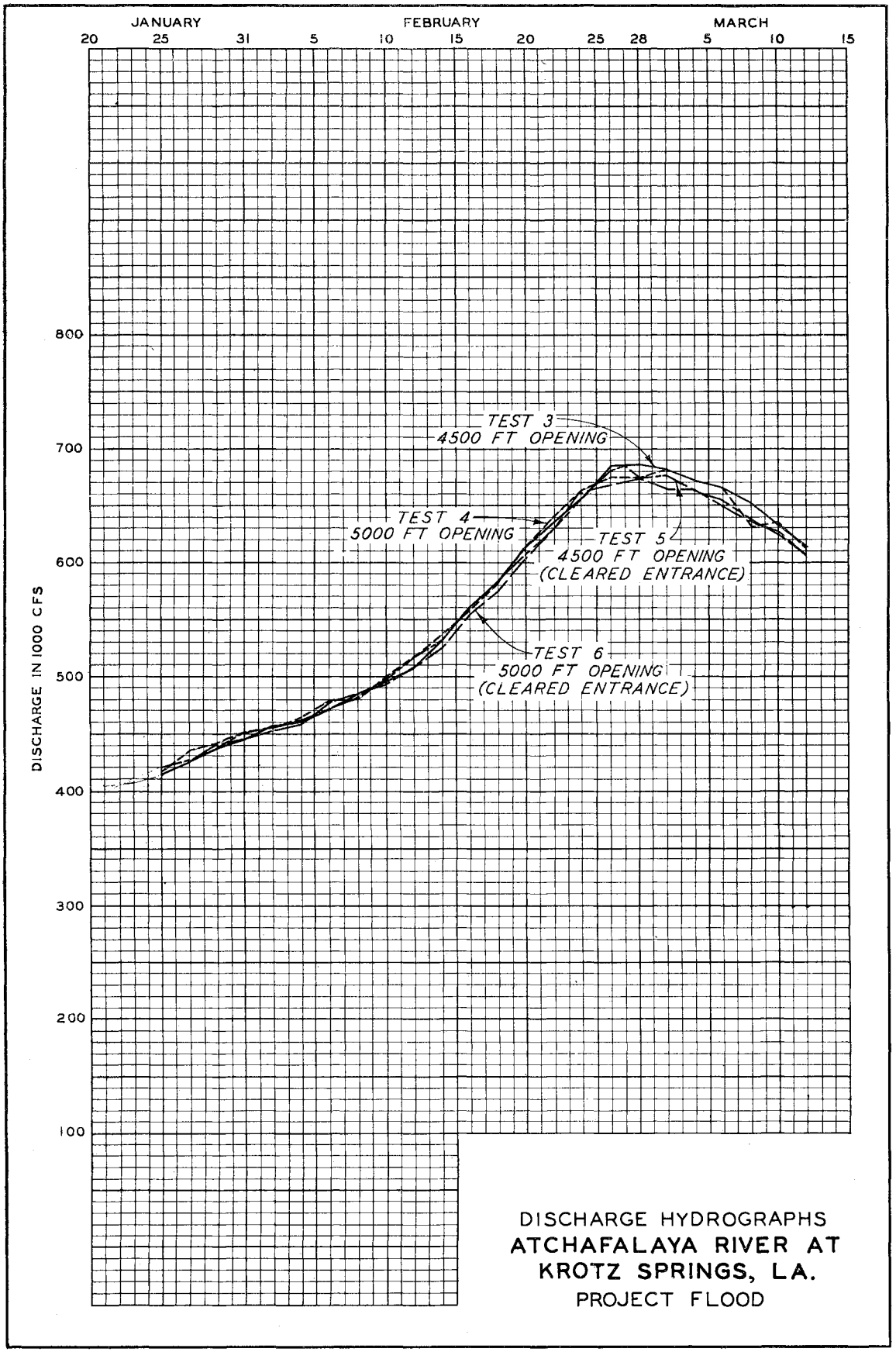


DISCHARGE HYDROGRAPHS

MORGANZA FLOODWAY AT RAVENSWOOD, LA.

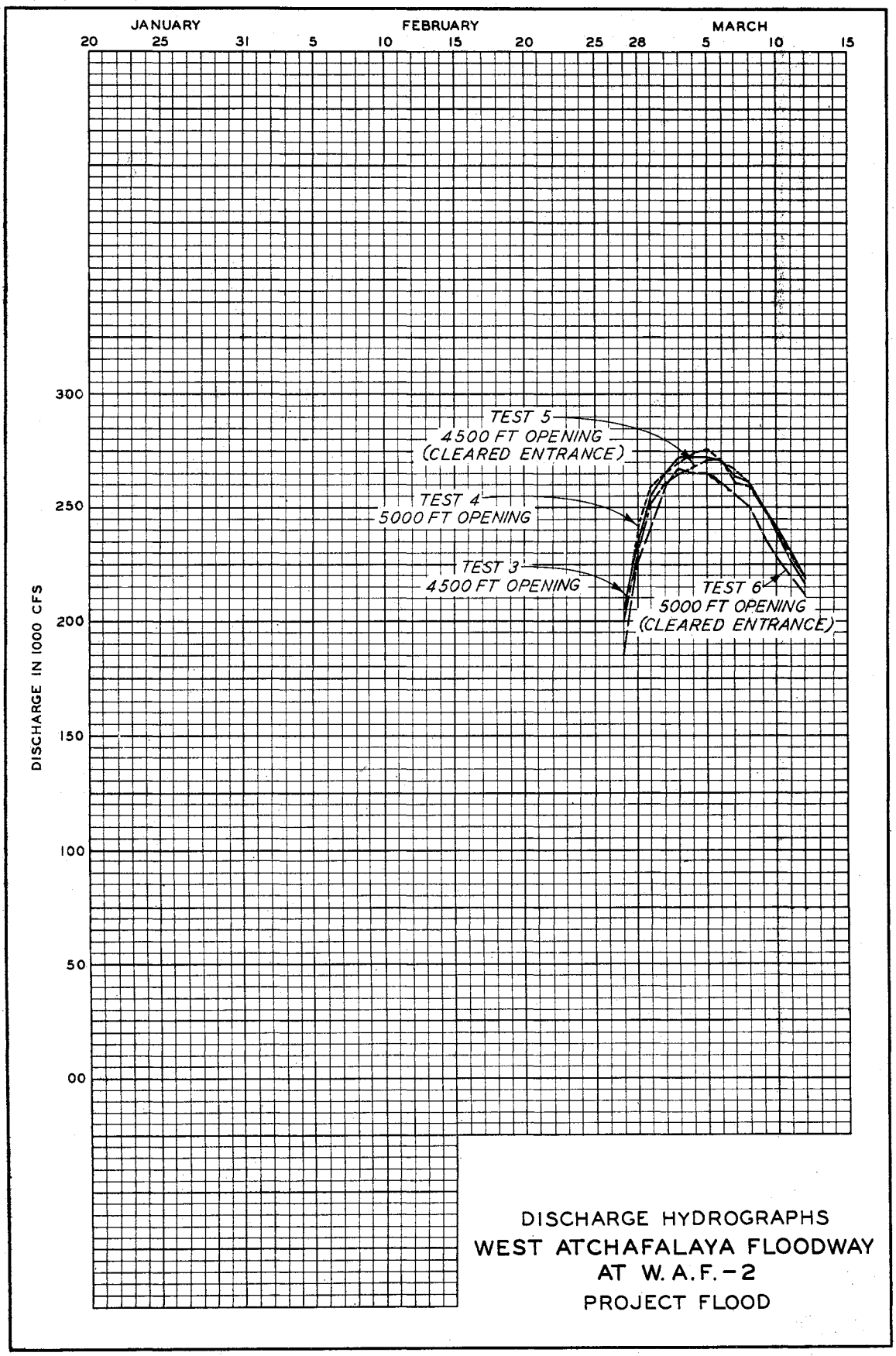
PROJECT FLOOD

PLATE 39



DISCHARGE HYDROGRAPHS
ATCHAFALAYA RIVER AT KROTZ SPRINGS, LA.
PROJECT FLOOD

PLATE 40



DISCHARGE HYDROGRAPHS
WEST ATCHAFALAYA FLOODWAY
AT W.A.F.-2
PROJECT FLOOD

PLATE 41