

U. S. ARMY CORPS OF ENGINEERS

MISSISSIPPI RIVER-GULF OUTLET, LOUISIANA

GENERAL DESIGN MEMORANDUM NO. 2
SUPPLEMENT NO. 4
FORESHORE PROTECTION

Prepared in the Office of the District Engineer
New Orleans District, Corps of Engineers

April 1968

7



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160

IN REPLY REFER TO
LMNED-DL

18 April 1978

SUBJECT: Mississippi River - Gulf Outlet, Louisiana, General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

Division Engineer, Lower Mississippi Valley
ATTN: LMVED-T

1. Purpose. The purpose of this letter report is to update the subject general design memorandum supplement. This report is limited to the Mississippi River - Gulf Outlet north bank foreshore protection. South bank foreshore protection will be addressed in a future report. Foreshore dike construction on the south bank is scheduled to begin in 1980.

2. Design changes.

a. Alinement.

(1) A change in the alinement of the foreshore dike was required due to the elimination of the borrow pit on the north bank of the Mississippi River - Gulf Outlet (MR-GO) for Citrus back levee construction. Therefore, instead of placing the foreshore dike on the bank of the LV on 2H borrow pit slope, the foreshore dike toe was placed at the -4.0-foot mean sea level (m.s.l.) contour line with the exception noted in paragraph 2.a.(2) below. Placement at the -4.0-foot m.s.l. contour line allowed for the placement of stone to a sufficient depth to minimize the likelihood of wave wash undermining at the dike toe without having to excavate for foundation preparation or flotation access. Approval was received by letter dated 7 June 1976 (LMVED-TL, NOD 11 May 1976, 1st Indorsement, MR-GO, Citrus Back Levee, Foreshore Protection, Station 196+00 to Station 531+00, Non-Continucous.)

(2) In areas where the Citrus back levee, second lift floodside stability berm extends past the bank line into the channel, it was necessary to incorporate the foreshore dike in the levee stability berm. Approval was received by the 7 June 1976 letter referred to in paragraph 2.a.(1) above.

LMVED-TD (NOD 18 Apr 78) 1st Ind
SUBJECT: Mississippi River - Gulf Outlet, Louisiana, General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg,
Miss. 39180

9 JUN 78

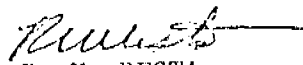
TO: District Engineer, New Orleans, ATTN: LMNED-DL

The letter report updating Supplement 4 to GDM No. 2 is approved subject
to the following:

The price level used in the letter report and the price level of the
PB-3 should be indicated.

FOR THE DIVISION ENGINEER:

wd all incl



R. H. RESTA
Chief, Engineering Division

CF:
DAEN-CWE-B
w 4 cy bas ltr and Incl 1-3
and 1 cy Incl 4

LMVED-DL (18 Apr 78) 2d Ind
SUBJECT: Mississippi River-Gulf Outlet, Louisiana, General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection


DA, New Orleans District, Corps of Engineers, P.O. Box 60267,
New Orleans, LA 70160 21 Jun 78

TO: Division Engineer, Lower Mississippi Valley, ATTN: LMVED-TL

Price levels have been added to inclosure 3. A revised inclosure 3 is
attached.

FOR THE DISTRICT ENGINEER:

1 Incl
As stated



FREDERIC M. CHATRY
Chief, Engineering Division

LMVED-TD (NOD 18 Apr 78) 3d Ind
SUBJECT: Mississippi River -- Gulf Outlet, Louisiana, General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

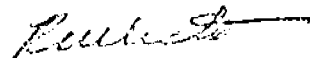
DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg,
Miss. 39180 27 JUN 78

✓ TO: District Engineer, New Orleans, ATTN: LMNED-DL

Satisfactory.

FOR THE DIVISION ENGINEER:

wa Incl


R. H. RESTA
Chief, Engineering Division

CF:
DAEN-CWE-R
w 4 cy 2d Ind and Incl 3

LMNED-DL

18 April 1978

SUBJECT: Mississippi River - Gulf Outlet, Louisiana, General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

b. Construction sequence. As a result of the observed settlement that occurred subsequent to the foreshore dike first lift construction, a new settlement and stability analyses were performed. Based on those analyses, it was determined that only one topping, as presented in the subject general design memorandum supplement, would not be sufficient. The recommended foreshore dike construction sequence consists of a first lift with two subsequent toppings. In order to minimize dike settlement, prior to the second topping it will be necessary to remove a portion of the stone that was placed during the first lift and first topping, and replace it with shell. The complete construction plan is presented as inclosure 1. Stability analyses are presented as inclosure 4.

3. Status of construction. Construction of the first lift (Citrus back levee base line station 196+00 - 429+00, non-continuous) began on 18 January 1977 and was completed on 28 March 1977. At present, the foreshore dike has settled an average of approximately one foot.

4. Cost estimate. The revised cost estimate for the MR-GO foreshore protection, north bank (Citrus back levee), is presented as inclosure 2. A comparison with the PB-3 estimate is presented as inclosure 3.

5. Status of cultural resource investigation. On 23 August 1973, an investigation was conducted in the project area. No damage or alteration to known sites of historical or archeological importance is expected to occur due to the MR-GO foreshore protection project.

6. Status of environmental impact statement. The MR-GO environmental impact statement (EIS) was placed on file with the President's Council on Environmental Quality (CEQ) on 21 May 1976. Additional information is available in the Lake Pontchartrain, Louisiana and Vicinity, Hurricane Protection project EIS which was placed on file with CEQ on 17 January 1975.

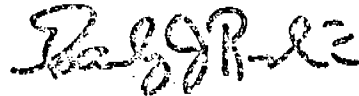
7. Section 404 evaluation. A public notice was issued on 15 July 1976 in compliance with Section 404 of the Federal Water Pollution Control Act of 1972, describing the MR-GO north bank foreshore protection project. A statement of findings was sent to the US Environmental Protection Agency (EPA) on 9 September 1976. EPA issued a letter of no objection on 16 September 1976.

IMNED-DL

18 April 1978

SUBJECT: Mississippi River - Gulf Outlet, Louisiana, General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

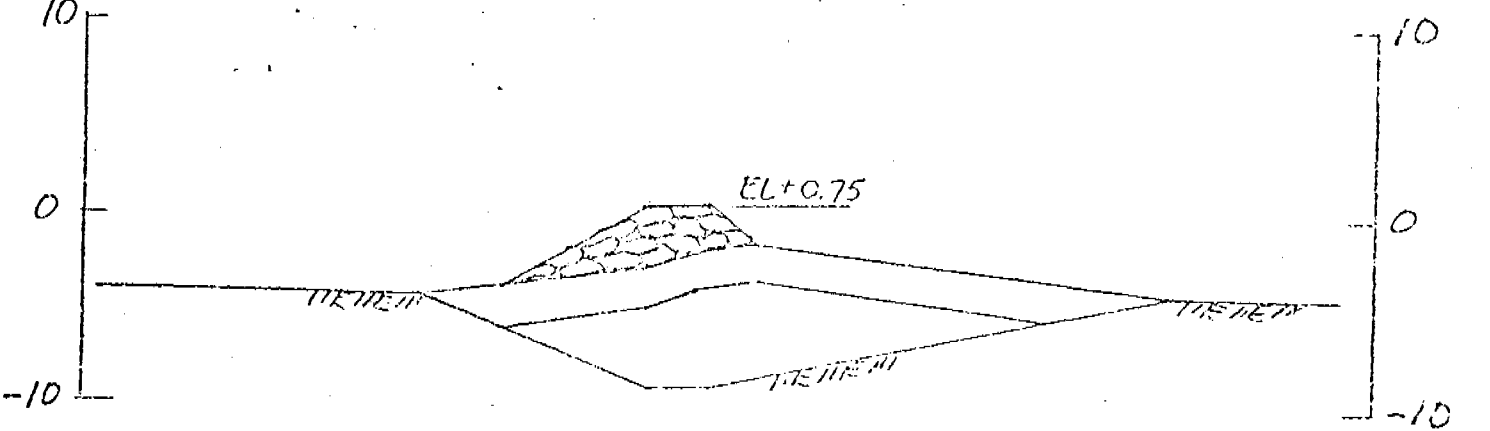
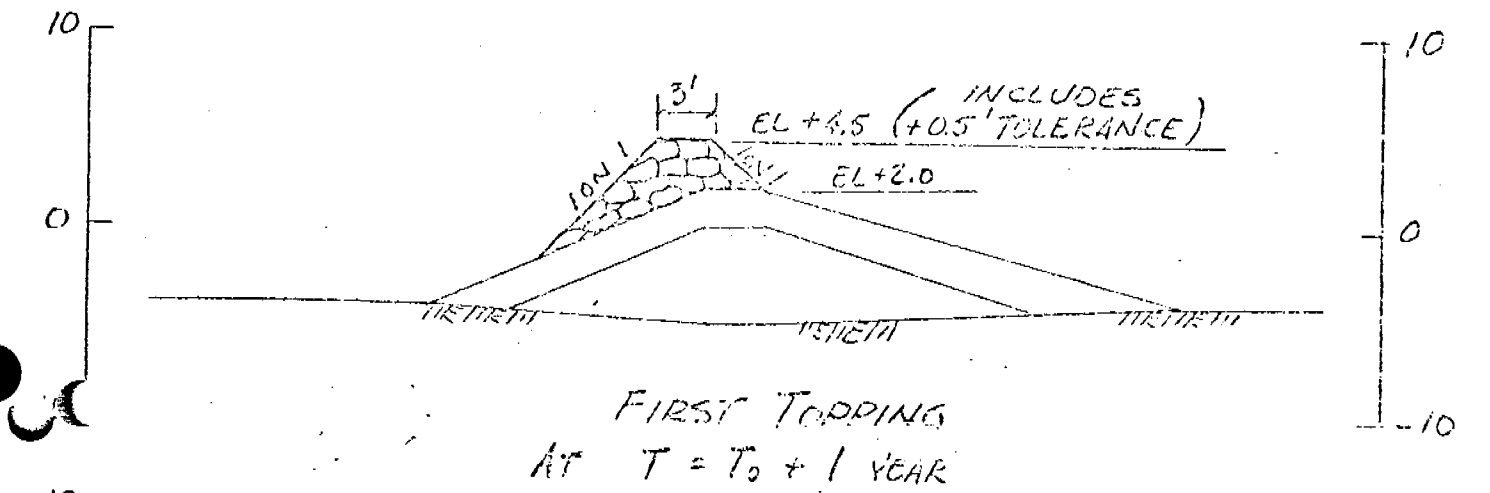
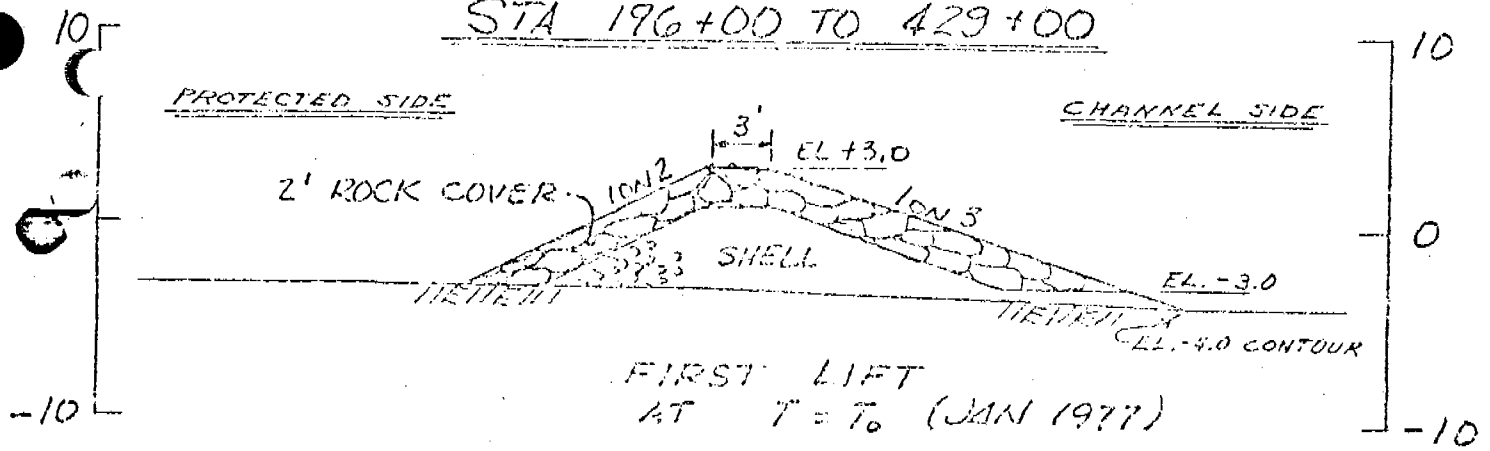
8. Recommendation. This letter report for the subject design memorandum supplement is recommended for approval.



EARLY J. RUSH III
Colonel, CE
District Engineer

- 4 Incl
1. Construction plan
 2. Cost estimate
 3. PB-3, letter report
cost comparison
 4. Stability analyses (trip)

STA 196+00 TO 429+00



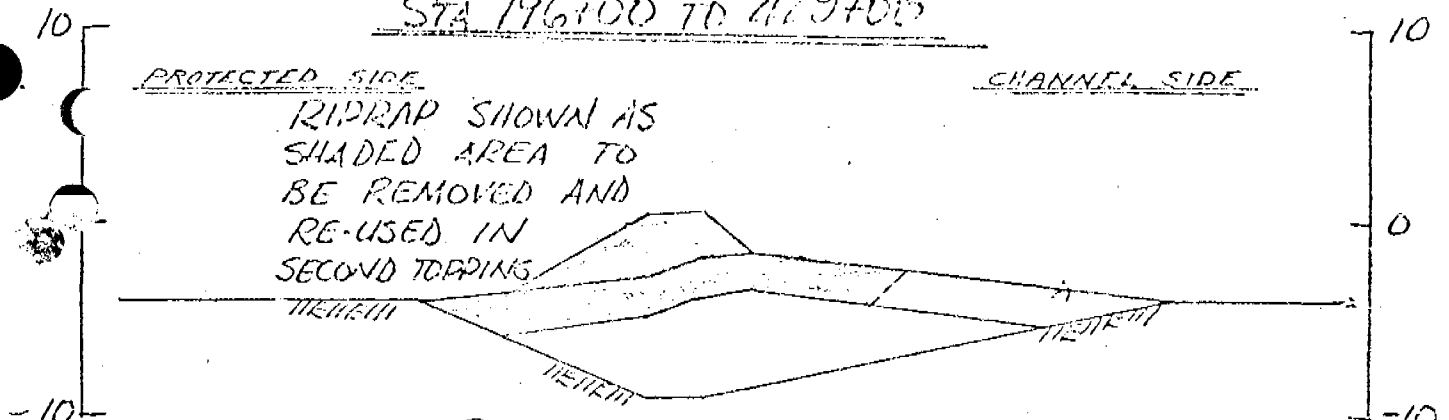
DIKE CONFIGURATION
AT $T = T_0 + 5$ YEARS

MISSISSIPPI RIVER - GULF OUTLET
NORTH BANK
(CITRUS BACK LEVEL)
FORESHORE DIKE
CONSTRUCTION PLAN

SHEET 1 OF 2

Incl 1.

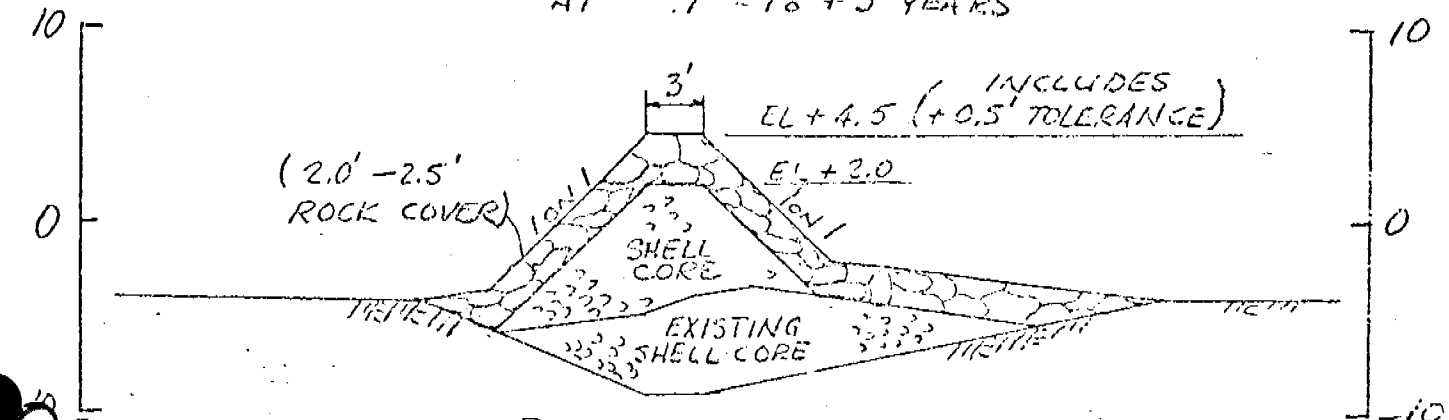
STA 196+00 TO 199+00



PROTECTED SIDE
 RIPRAP SHOWN AS
 SHADED AREA TO
 BE REMOVED AND
 RE-USED IN
 SECOND TOPPING

CHANNEL SIDE

REMOVAL OF ROCK COVER
 AT $T = T_0 + 5$ YEARS

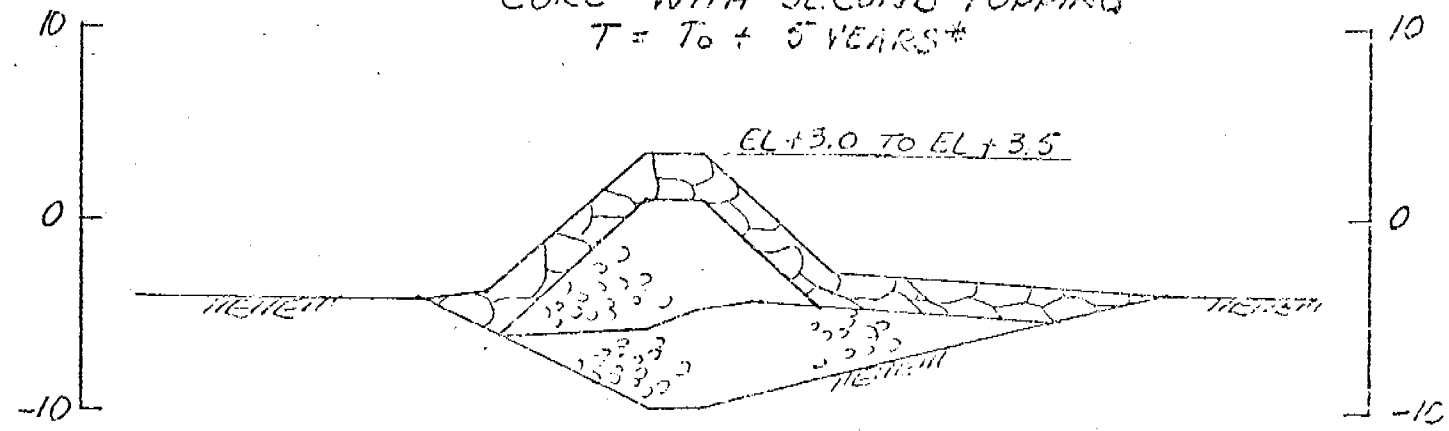


(2.0' - 2.5'
 ROCK COVER)

INCLUDES
 EL + 4.5 (+0.5' TOLERANCE)

EL + 2.0

RECONSTRUCTION OF SHELL
 CORE WITH SECOND TOPPING
 $T = T_0 + 5$ YEARS*



FINAL CONFIGURATION OF
 FORESHORE DIKE
 (ALL SETTLEMENT COMPLETE.)

* THIS WORK WILL BE COMPLETED PRIOR TO THE
 LAKE PONTCHARTRAIN, LA. AND VICINITY
 HURRICANE PROTECTION PROJECT CITRUS BACK
 LEVEL THIRD LIFT CONSTRUCTION.

REASONABLE CONTRACT ESTIMATE

SHEET 1 of 1

PROJECT					INVITATION NO.
MR-GO Foreshore Protection, North Bank (Citrus Back Levee)					
ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
FIRST LIFT					
	Mobilization & Demobilization	Lump Sum			12,000.00
	Shell	53,084.7	C.Y.	5.70	302,532.79
	Graded Stone B	64,200		7.36	472,512.00
	Environment Protection	Lump Sum			2,000.00
				SUB TOTAL	\$789,044.79
	Engineering and Design	3%+			21,565.21
	Supervision and Administration	4%+			29,400.00
	* Actual contract cost			TOTAL	\$840,000.00
FIRST TOPPING					
	Mobilization & Demobilization	Lump Sum			25,000.00
	Graded Stone B	29,000	Ton	12.00	336,000.00
	Environment Protection	Lump Sum			2,000.00
				SUB TOTAL	363,000.00
	Contingencies	20%+			77,600.00
				SUB TOTAL	440,600.00
	Engineering and Design	3%+			13,218.00
	Supervision and Administration	4%+			17,672.00
				TOTAL	\$470,000.00
FINAL TOPPING					
	Mobilization & Demobilization	Lump Sum			25,000.00
	Shell	62,000	C.Y.	6.00	372,000.00
	Existing Stone Removal and Replacement Over Shell Core	70,000	Ton	3.00	210,000.00
	Environment Protection	Lump Sum			4,000.00
				SUB TOTAL	\$735,000.00
	Contingencies	20%+			145,000.00
				SUB TOTAL	\$880,000.00
	Engineering and Design	3%+			25,500.00
	Supervision and Administration	4%+			35,000.00
				TOTAL	\$940,000.00
	TOTAL COST - MRGO Foreshore Protection, North Bank (Citrus Back Levee)				\$2,250,000.00

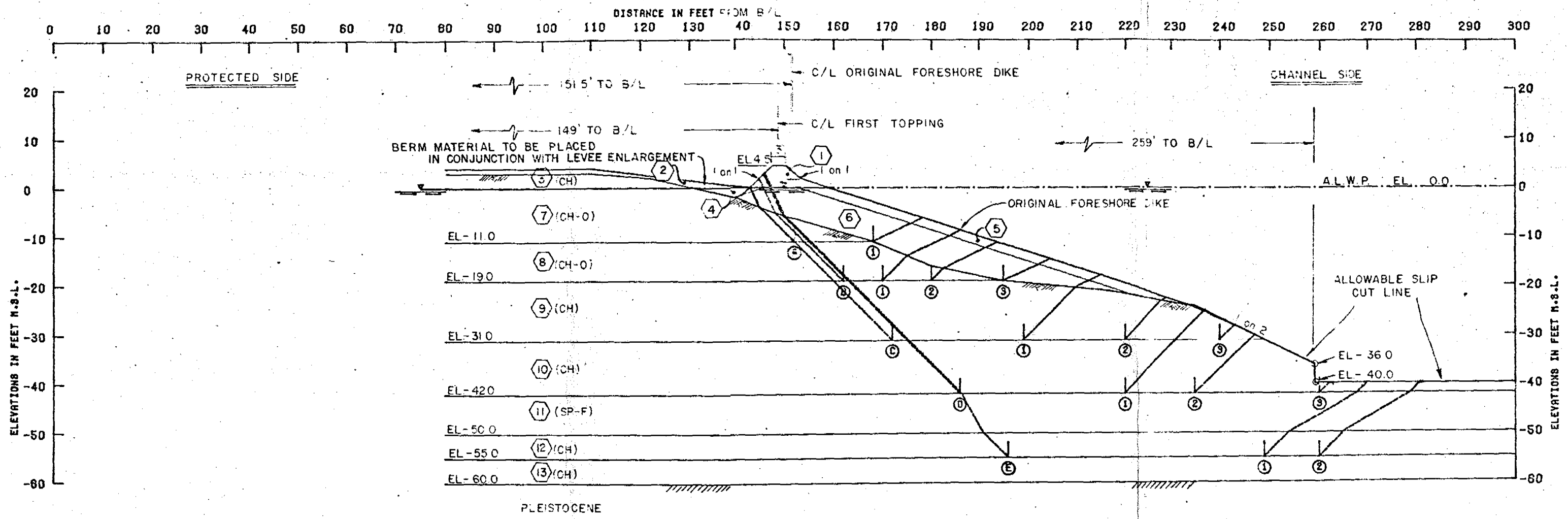
JACL 2

COMPARISON OF COST ESTIMATES
MR-60 FORESHORE PROTECTION

	<u>PB-3</u> (Oct 77 prices)	<u>Letter Report</u> (Oct 77 prices)	<u>*Increase</u>
11 Levees & Floodwalls Foreshore Protection (north bank)	1,078,000	2,109,000	+1,031,000
30 Engineering & Design	31,000	60,000	+29,000
31 Supervision & Administration	<u>41,000</u>	<u>81,000</u>	<u>+40,000</u>
	\$1,150,000	\$2,250,000	+\$1,100,000

* Increased costs are the result of redesign of the project due to settlement greater than anticipated in the GDM supplement.

*Revised
2/13/78*



GENERAL NOTES

CLASSIFICATION STRATIFICATION SHEAR STRENGTHS AND UNIT WEIGHTS OF THE SOIL WERE BASED ON THE RESULTS OF THE UNDISTURBED BORINGS. SEE BORING DATA PLATES.

SHEAR STRENGTHS BETWEEN VERTICALS 1 AND 2 WERE ASSUMED TO VARY LINEARLY BETWEEN THE VALUES INDICATED FOR THESE LOCATIONS.

STRENGTHS AND STRATIFICATION ARE THOSE OF SOILS REACH 1, STA. 176+50 TO STA. 271+00

NATURAL GROUND LINE REPRESENTS THE MINIMUM COMPOSITE CROSS SECTION BETWEEN STATIONS 176+50 AND 43+00

STRATUM NO.	SOIL TYPE	EFFECTIVE UNIT WT. P.C.F.		C - UNIT COHESION - P.S.F.				FRICTION ANGLE DEGREES
		VERT. 1	VERT. 2	CENTER OF STRATUM		BOTTOM OF STRATUM		
				VERT. 1	VERT. 2	VERT. 1	VERT. 2	
1	RR	130.0	130.0	0.0	0.0	0.0	0.0	40.0
2	CH	110.0	110.0	200.0	200.0	200.0	200.0	0.0
3	CH	110.0	110.0	250.0	250.0	250.0	250.0	0.0
4	CH	40.0	40.0	200.0	200.0	200.0	200.0	0.0
5	RR	88.0	88.0	0.0	0.0	0.0	0.0	40.0
6	SI	30.0	30.0	0.0	0.0	0.0	0.0	40.0
7	CH-O	22.0	22.0	125.0	125.0	125.0	125.0	0.0
8	CH-O	22.0	22.0	150.0	150.0	155.0	155.0	0.0
9	CH	33.0	33.0	200.0	200.0	235.0	235.0	0.0
10	CH	33.0	33.0	300.0	300.0	355.0	355.0	0.0
11	SP	60.0	60.0	0.0	0.0	0.0	0.0	30.0
12	CH	41.0	41.0	425.0	425.0	450.0	450.0	0.0
13	CH	43.0	43.0	825.0	825.0	800.0	800.0	0.0

ASSUMED FAILURE SURFACE NO.	ELEV.	RESISTING FORCES			DRIVING FORCES		SUMMATION OF FORCES		FACTOR OF SAFETY
		R _A	R _B	R _P	D _A	-D _P	RESISTING	DRIVING	
A 1	-11.00	2381	2000	3212	5777	893	7574	4884	1.551
B 1	-19.00	8501	1320	5200	11429	9085	13029	8844	1.550
B 2	-19.00	8501	2970	4555	11429	2009	14028	9426	1.488
B 3	-19.00	8501	5445	2780	11429	773	14774	10658	1.382
C 1	-31.00	9581	8345	5297	18750	4790	21117	13967	1.519
C 2	-31.00	9581	11280	3281	18750	2070	24111	13541	1.745
C 3	-31.00	9581	15380	1200	18750	289	28711	14449	1.987
D 1	-42.00	18822	12070	9000	30742	8804	39544	21900	1.805
D 2	-42.00	18822	17376	7000	30742	3750	45490	28647	1.620
D 3	-42.00	18822	23010	1189	30742	86	49713	30727	1.630
E 1	-55.00	30287	23850	11325	49702	7638	67414	41180	1.634
E 2	-55.00	30287	28600	10292	49702	5754	69181	43548	1.572

NOTES

- φ -- ANGLE OF INTERNAL FRICTION, DEGREES
- c -- UNIT COHESION, P.S.F.
- Σ -- STATIC WATER SURFACE
- D -- HORIZONTAL DRIVING FORCE IN POUNDS
- K -- HORIZONTAL RESISTING FORCE IN POUNDS
- A -- AS A SUBSCRIPT REFERS TO ACTIVE WEDGE
- B -- AS A SUBSCRIPT REFERS TO CENTRAL BLOCK
- P -- AS A SUBSCRIPT REFERS TO PASSIVE WEDGE

$$\text{FACTOR OF SAFETY} = \frac{R_A + R_B + R_P}{D_A - D_P}$$

MISSISSIPPI RIVER - GULF OULIET
 CIVIL ENGINEERING DEPARTMENT
 STR. 176+50 TO STA. 421+00
STABILITY ANALYSIS
 (FIRST TOPPING)
 CIVIL ENGINEER DISTRICT
 GROUP OF ENGINEERS
 FEBRUARY 1978

4

LMVED-TD (NOD 29 Apr 68) 7th Ind
SUBJECT: Mississippi River-Gulf Outlet, La., General Design Memorandum
No. 2, Supplement No. 4, Foreshore Protection

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg,
Miss. 39180 10 Mar 69

TO: District Engineer, New Orleans, ATTN: LMNED-PP

Actions taken with respect to comments in previous indorsement are
considered satisfactory.

FOR THE ACTING DIVISION ENGINEER:

wd all incl

A. J. Davis
A. J. DAVIS
Chief, Engineering Division

LMVED-TD (NOD 29 Apr 68) 1st Ind
SUBJECT: Mississippi River-Gulf Outlet, La., General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg,
Miss. 39180 29 May 68

TO: Chief of Engineers, ATTN: ENGCV-V/ENGCV-F

1. Supplement No. 4 to subject design memorandum is forwarded for review and approval pursuant to para 17, ER 1110-2-1150. Approval is recommended, subject to minor annotation marked in red on page 1 and the following comments.

2. Plate 2. a. The top of the foreshore protection on the south bank is indicated to be located 750 feet from the centerline of the MR-GO. This distance agrees with that shown in GDM No. 3, Chalmette Area Plan, and presumably was based on conditions with the present 500-foot bottom width channel. If the current study of channel size results in the Gulf Outlet channel being enlarged to 50' x 750' and the GIWW portion of the channel is widened entirely on the south side, the adjacent Chalmette Area levee in this reach will have to be moved at least 250 feet farther from the existing centerline of the channel. The subject supplement should indicate what revisions in location of the protection are anticipated if the channel is widened.

b. The supplement should include discussion on the basis for selecting el -3 as the bottom of the protection. Along this channel, the uppermost 10 to 20 feet of soil is soft organic material having a low unit weight and might erode easily. Thus, it may be necessary to extend the protection to greater depths.

3. The south bank protection should be placed as close to the channel as practical taking into account the future widening of the MR-GO channel and the location and stability of the levee.

FOR THE DIVISION ENGINEER:

1 Incl
wd 2 cy

A. J. DAVIS
Chief, Engineering Division

CF:
NOD-1MNE-PP
w/marked cy incl

ENGOW-EZ (LMNED-PP 29 Apr 68) 2nd Ind
SUBJECT: Mississippi River-Gulf Outlet, La., General Design Memorandum
No. 2, Supplement No. 4, Foreshore Protection

DA, Office of the Chief of Engineers, Washington, D. C. 20315 3 July 1968

TO: Division Engineer, Lower Mississippi Valley

Approved, subject to the comments of the Division Engineer in the 1st
Indorsement.

FOR THE CHIEF OF ENGINEERS:

wd Incl

WENDELL E. JOHNSON
Chief, Engineering Division
Civil Works

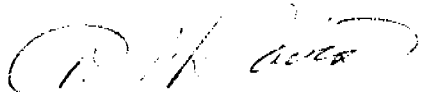
LMVED-TD (NOD 29 Apr 68) 3d Ind
SUBJECT: Mississippi River-Gulf Outlet, La., General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg,
Miss. 39180 8 Jul 68

TO: District Engineer, New Orleans, ATTN: LMNED-PP

Referred for necessary action to comply with comments of 1st Indorsement.

FOR THE DIVISION ENGINEER:



A. J. DAVIS
Chief, Engineering Division

LMNED-PP (NOD 29 Apr 68) 4th Ind
SUBJECT: Mississippi River-Gulf Outlet, La., General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

DA, New Orleans District, Corps of Engineers, PO Box 60267, New Orleans , La.
70160 27 Nov 68

TO: Division Engineer, Lower Mississippi Valley, ATTN: LMVED-TD

1. The proposed disposition of comments contained in the 1st Ind of this chain of correspondence is as follows:

a. Par. 2.a. Whether or not the current study of channel size results in the MR-GO being enlarged to 50 feet by 750 feet, the foreshore protection can be placed as recommended in paragraph 1.c. below. Construction of the foreshore protection will not commence until the study is completed.

b. Par. 2.b. In view of the thickness of the organic material along the MR-GO, it is impracticable to extend the foreshore protection to firm material. However, construction of the foreshore protection dike which will consist of 1.75 feet of riprap on 0.75 feet of shell placed on a 1 on 3 slope between elevations -3.0 and 3.0 is based on experience along the Mississippi River below New Orleans and recent observations along the magnitude of erosion along the MR-GO. Accordingly, a foreshore protection dike with a bottom elevation of -3.0 will adequately serve to prevent erosion of the foreshore area located between the levee and the alignment of the dike, and therefore, preserve the structural integrity of the levee.

c. Par. 3. A detailed study was made in order to determine the most practical and economical location for construction of the south bank foreshore protection. The study consisted of comparing the two following alignments:

(1) Alignment No. 1. Foreshore protection placed approximately 80 feet landside of the -5 foot m.s.l. contour. For this alignment, the riprap is placed on the bank directly from the supplier's barge.

(2) Alignment No. 2. Foreshore protection placed on the existing spoil retaining dike which is approximately located on the MR-GO right-of-way line. For this alignment, two methods of construction were considered. The first method is as described in the subject supplement No. 4 which states that the riprap will be loaded onto trucks, transported to the construction site, then placed on the bank. The second method is to excavate a flotation channel parallel and adjacent to the dike alignment; thus providing access in order to place the riprap on the bank directly from the supplier's barge.

LMNED-PP (NOD 29 Apr 68) 4th Ind 27 Nov 68

SUBJECT: Mississippi River-Gulf Outlet, La., General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

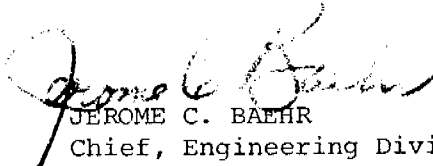
(3) The results of the above study indicate that the choice of alignment No. 1 will effect a savings of approximately \$373,000 when compared with the least costly of the two alternatives for alignment No. 2. Alignment No. 1 will also serve to protect a greater foreshore area. Accordingly, approval of alignment No. 1 is recommended.

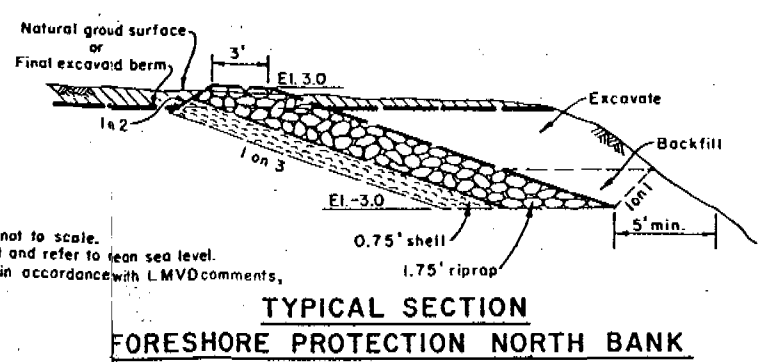
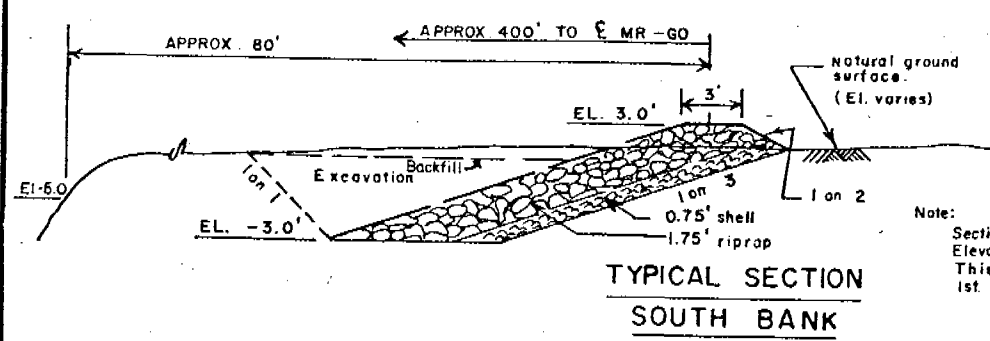
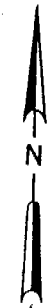
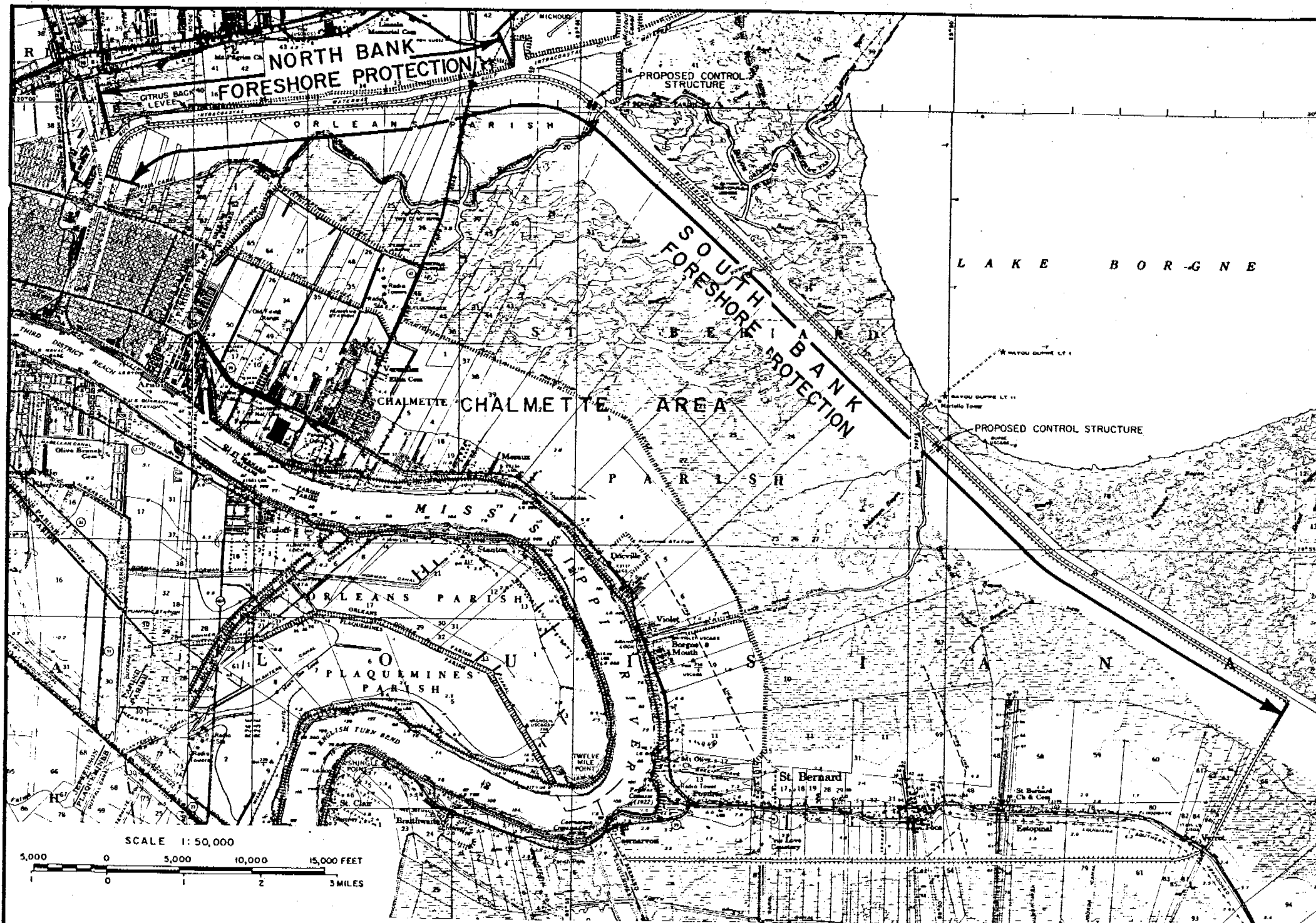
2. Plate 2 of the subject supplement No. 4 has been revised to show the new typical section for the foreshore protection along the south bank and is inclosed (incl 2) herewith for inclusion in the memorandum.

3. In addition to the above, pages 3, 4, 5, and 6 of the supplement have been revised to reflect the revised cost estimates and other attendant changes. Copies of these revisions are also inclosed (incl 3) for inclusion in the memorandum.

FOR THE DISTRICT ENGINEER:

2 Incl
Added 2 incl (16 cys)
2. Rev. plate 2
3. Rev. pp 3,4,5, & 6


JEROME C. BAEHR
Chief, Engineering Division



Note:
 Sections plotted are not to scale.
 Elevations are in feet and refer to mean sea level.
 This plate revised in accordance with LMVD comments,
 1st Ind., Par. 3.

MISSISSIPPI RIVER, BATON ROUGE TO GULF OF MEXICO
 MISSISSIPPI RIVER-GULF OUTLET
 GENERAL DESIGN MEMO. NO. 2
 SUPPLEMENT NO. 4

**FORESHORE PROTECTION
 NORTH AND SOUTH BANKS**

SCALES AS SHOWN
 U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
 CORPS OF ENGINEERS

APRIL 1968 FILE NO. H-2-24567

Area Plan Levee, shown on plate 2, is adjacent to the MR-GO from approximate mile 66 to approximate mile 47. The design for all foreshore protection required in connection with the modified Chalmette Area Plan was developed in Lake Pontchartrain, La. and Vicinity, Design Memorandum No. 3, General Design, approved 31 January 1967, and is being continued accordingly in Supplement No. 1 to General Design Memorandum No. 3, scheduled for submission in May 1968. Typical design sections are shown on plate 2.

6. Cost estimates. In accordance with Lake Pontchartrain, La. and Vicinity, General Design Memorandum No. 2, the estimated cost, based on July 1968 price levels, for foreshore protection to be provided along the north bank of the MR-GO is \$653,000. This estimate consists of \$566,000 for Levees and Floodwalls, \$48,000 for Engineering and Design, and \$39,000 for Supervision and Administration. The estimated cost, also based on July 1968 price levels, for foreshore protection to be provided along the south bank of the MR-GO is \$3,205,600, which consists of \$2,777,800 for Levees and Floodwalls, \$236,100 for Engineering and Design, and \$191,700 for Supervision and Administration.

7. The aggregate estimated cost for the foreshore protection along the MR-GO, as previously defined, based on July 1968 price levels, is \$3,858,600, which consists of \$3,343,800 for Levees and Floodwalls, \$284,100 for Engineering and Design, and \$230,700 for Supervision and Administration. The estimate of first cost is shown in table 1 and a recapitulation of the total Corps of Engineers cost for the MR-GO project is shown in table 2.

TABLE 1
ESTIMATE OF FIRST COST
(Foreshore Protection, MR-GO)
(July 1968 Price Levels)

Item No.	Estimated quantity	Unit	Unit price	Estimated amount	
<u>NORTH BANK (Citrus Back Levee)</u>					
11	<u>Levees and Floodwalls</u>				
	Excavation	42,000	c.y.	\$ 0.40	\$ 16,800
	Shell	18,500	c.y.	3.50	64,750
	Riprap	60,000	ton	6.50	390,000
	Subtotal				\$ 471,550
	Contingencies, 20%+				94,450
	Subtotal				\$ 566,000
30	Engineering and design, 8.5%+				48,000
31	Supervision and administration, 6.9%+				39,000
	Total Cost Levees and Floodwalls (Foreshore Protection North Bank)				\$ 653,000
<u>SOUTH BANK (Chalmette Area Plan including Chalmette Extension)</u>					
11	<u>Levees and Floodwalls</u>				
	Excavation	277,100	c.y.	\$ 0.40	\$ 110,840
	Shell	44,350	c.y.	3.50	155,225
	Riprap	315,200	ton	6.50	2,048,800
	Subtotal				\$2,314,865
	Contingencies, 20%+				462,935
	Subtotal				\$2,777,800
30	Engineering and design, 8.5%+				236,100
31	Supervision and administration, 6.9%+				191,700
	Total Cost Levees and Floodwalls (Foreshore Protection South Bank)				\$3,205,600

TABLE 2
 RECAPITULATION OF ESTIMATE FOR MR-GO PROJECT¹

02 Relocations	\$ 11,240,000
05 Locks	53,785,000
09 Channels & canals	40,180,000
10 Breakwaters & seawalls	44,860,100
11 Levees & floodwalls (foreshore protection)	4,823,000
19 Buildings, grounds, & utilities	140,000
20 Permanent operating equipment	6,900
30 Engineering and design	6,615,000
31 Supervision and administration	<u>9,350,000</u>
Total cost	\$171,000,000

¹Total Corps of Engineers cost as shown in PB-3 effective 1 July 1968. The foreshore protection costs which appear in table 1 herein reflect a lesser cost than the PB-3 due to present recommended location which was determined subsequent to preparation of the current PB-3.

8. Recommendations. Approval of the bases for inclusion of foreshore protection in the Mississippi River-Gulf Outlet project, the location of such protection, and the revised cost estimate for the overall project is recommended.

LMVED-TD (NOD 29 Apr 68) 5th Ind
SUBJECT: Mississippi River-Gulf Outlet, La., General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

DA, Lower Mississippi Valley Division, Corps of Engineers, Vicksburg,
Miss. 39180 20 Dec 68

TO: District Engineer, New Orleans, ATTN: LMNED-PP

1. Alignment No. 1 is approved and disposition of comments contained in 1st indorsement is considered satisfactory subject to the following comments.

2. For that portion of the south bank foreshore protection west of the intersection of the Intracoastal Waterway and the MP-GO channels, consideration should be given to any modification of the alignment which may be necessary if the Intracoastal Waterway is widened and/or for construction of waterside slips which are understood to be proposed along the south bank in this reach.

3. Erosion of the foreshore between the protection dike and the channel very probably could occur deeper than elevation -3.0, the proposed bottom of the stone dike. If significant erosion occurs below elevation -3.0, the stability and integrity of the stone dike could be endangered due to undermining and/or shear failure. However, we have no further objection to the proposed bottom elevation of -3.0, provided that periodic surveys are made after construction to determine the actual depth of scour development channelward of the protection to indicate if the bottom of the riprap should be lowered to prevent loss of the protection dike. Consideration should be given to construction of a test section about 3000 feet in length to provide information to determine whether the riprap should be extended below elevation -3.0.

4. Para 5, page 3 revised 11/25/68. Supplement No. 1 to GDM No. 3 was submitted 21 Oct 68 and forwarded to OCE by LMVED-TD 1st indorsement dated 13 Dec 68.

5. Table No. 1, page 4 revised 11/25/68. The riprap quantity of 315,200 tons for the south bank should be checked. A rough estimate with available information indicates about 225,000 tons would be adequate.

LMVED-TD (NOD 29 Apr 68) 5th Ind

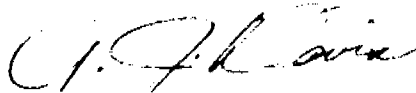
20 Dec 68

SUBJECT: Mississippi River-Gulf Outlet, La., General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

6. Plate 2. The shell blanket should be placed beneath the base of the protection dikes as indicated in red to provide a proper bedding for the stone.

FOR THE ACTING DIVISION ENGINEER:

2 Incl
wd 15 cy



A. J. DAVIS
Chief, Engineering Division

LMNED-PP (NOD 29 Apr 68) 6th Ind
SUBJECT: Mississippi River-Gulf Outlet, La., General Design Memorandum
No. 2, Supplement No. 4, Foreshore Protection

DA, New Orleans District, Corps of Engineers, PO Box 60267, New Orleans, La.
70160 13 Feb 69

TO: Division Engineer, Lower Mississippi Valley, ATTN: LMVED-TD

The proposed disposition of comments contained in the 5th Ind of this chain of correspondence is as follows:

a. Par. 2. Whether or not the current study of channel size results in the MR-GO being enlarged to 50 feet by 750 feet, the foreshore protection would be placed approximately 80 feet landside of the -5-foot m.s.l. contour since construction of the foreshore protection will not commence until the study is completed. In addition, the waterside slips which are proposed by local interests along the south bank of the MR-GO are presently scheduled for construction approximately 20 years hence. Therefore, these waterside slips were not further considered in determining the location of the foreshore protection along the south bank of the MR-GO.

b. Par. 3. Based on the inclosed stability and settlement analysis as shown on plate 3 (incl 4), an estimated settlement of 2 feet will occur. This will eventually lower the bottom elevation of the stone dike to -5.0 and therefore reduce the probability of undermining and/or shear failure. However, a test section of approximately 3000 feet in length will be constructed in order to substantiate the above analysis.

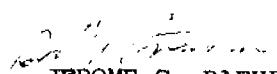
c. Par. 4. This comment is concurred in.

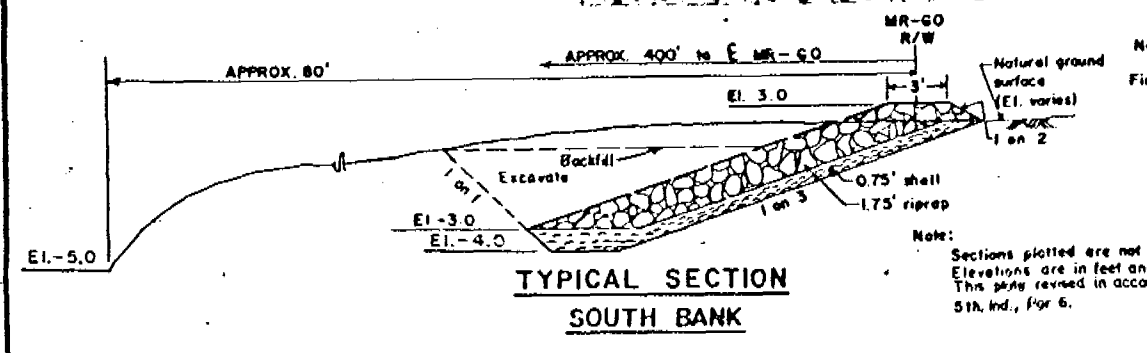
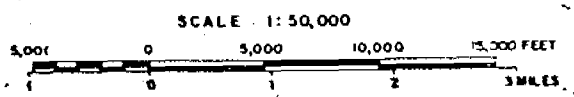
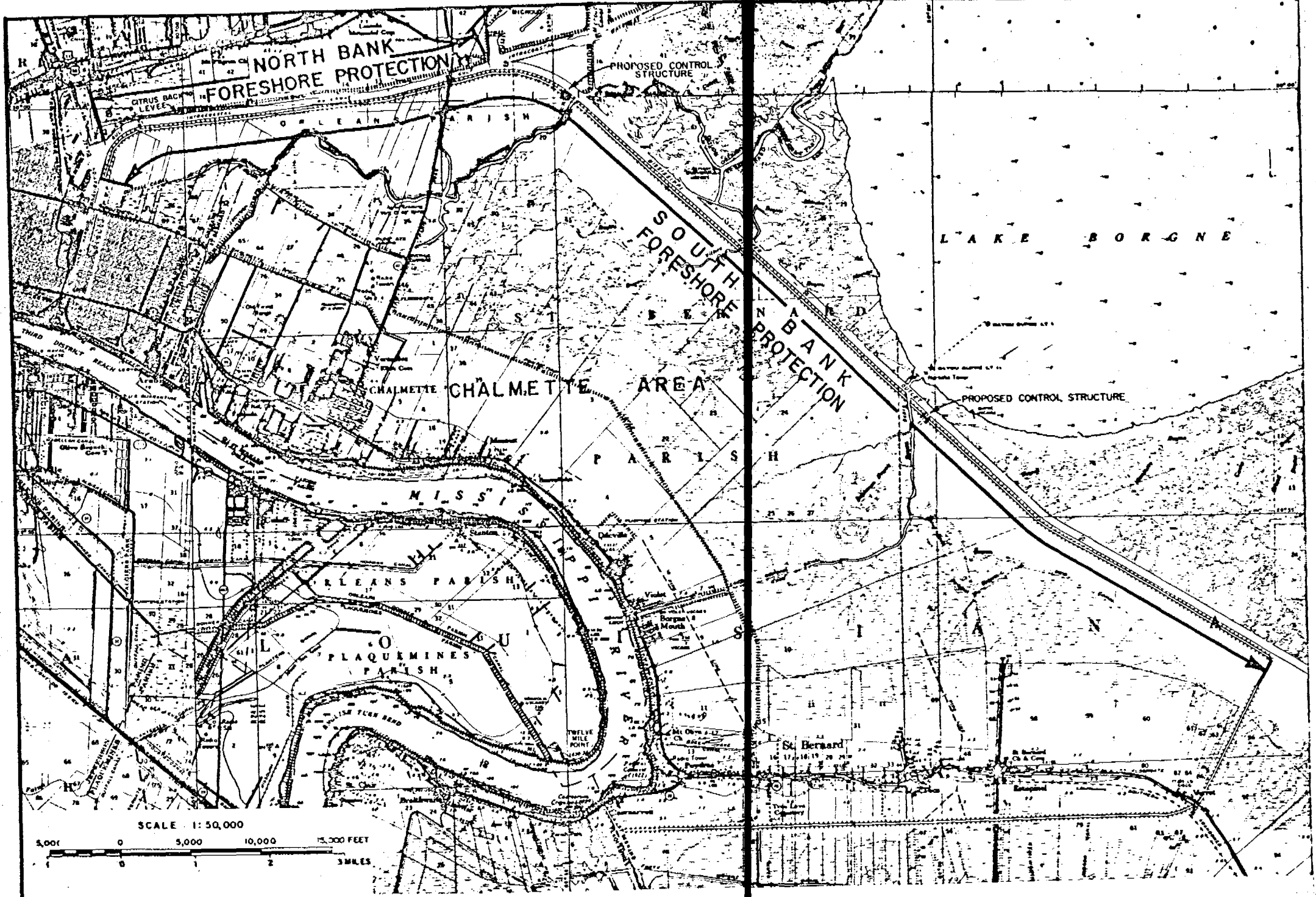
d. Par. 5. The riprap quantity of 315,200 tons for the south bank has been checked and found to be correct. Our estimate is taken from actual cross sections and includes the additional riprap needed due to the settlement discussed in paragraph b above.

e. Par. 6. The shell blanket will be placed as shown on inclosed revised plate 2 (incl 5) and will increase the quantity of shell required on the north and south shores by 6,000 and 21,450 cubic yards, respectively. Pages 3 and 4 of the subject supplement have been revised (incl 6) to reflect the additional cost.

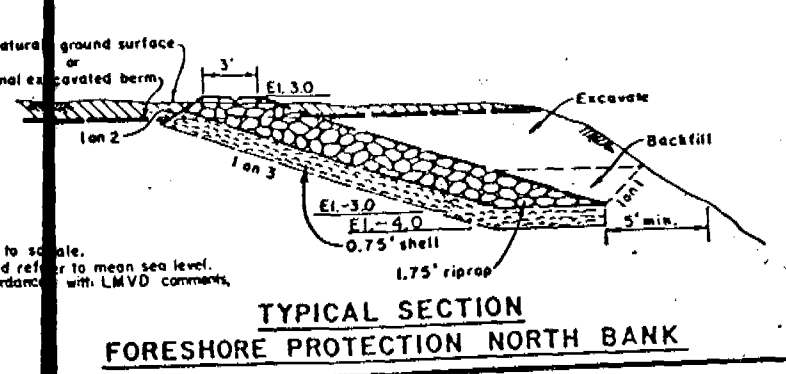
FOR THE DISTRICT ENGINEER:

3 Incl (16 cys each)
wd incl 2 & 3
Added 3 incl
4. Plate 3
5. Revised plate 2
6. Revised pages 3 and 4


JEROME C. BAEHR
Chief, Engineering Division



Note: Sections plotted are not to scale. Elevations are in feet and refer to mean sea level. This plate revised in accordance with LMVD comments, 51A, Ind., for 6.



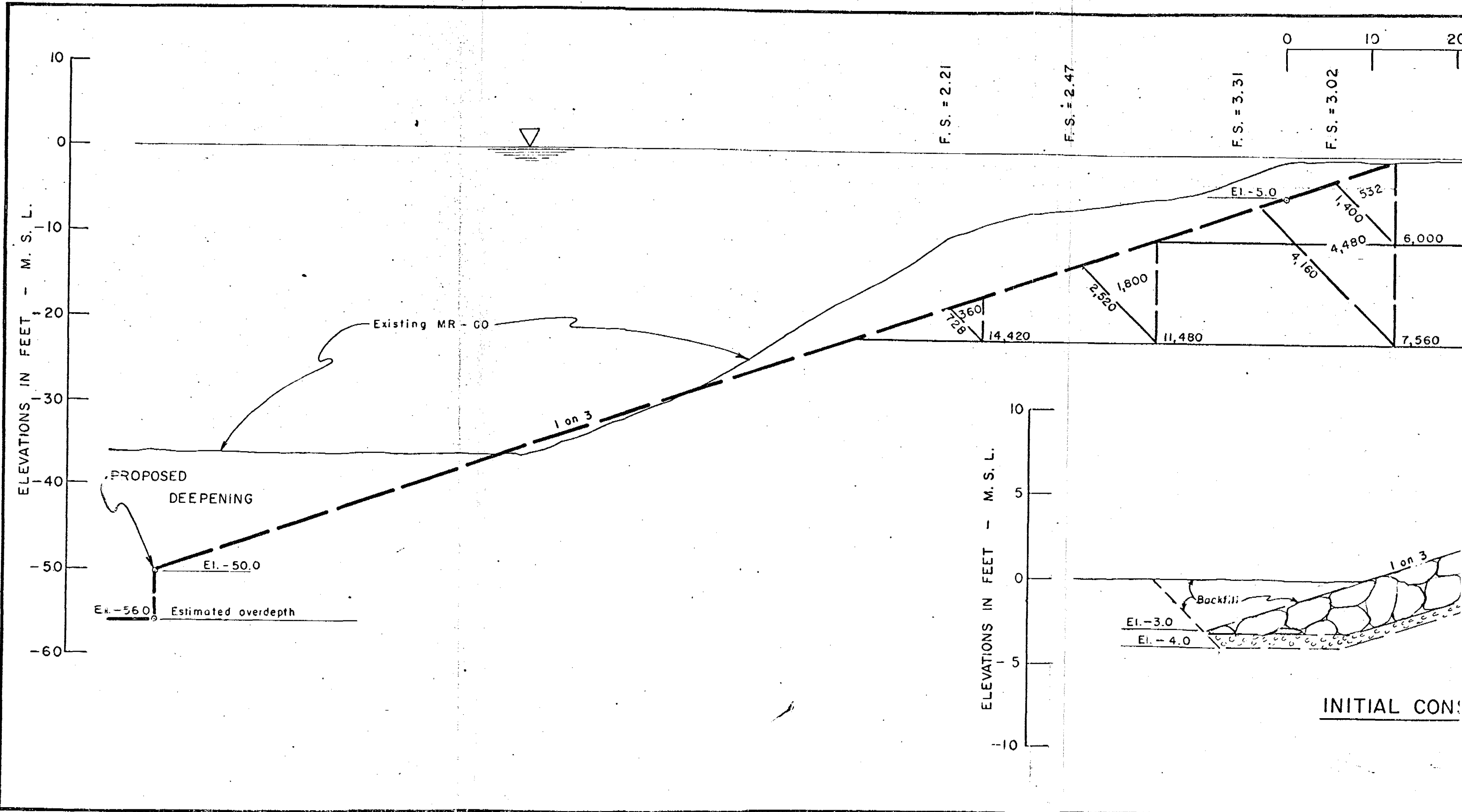
MISSISSIPPI RIVER, BATON ROUGE TO GULF OF MEXICO
 MISSISSIPPI RIVER-GULF OUTLET
 GENERAL DESIGN MEMO. NO. 2
 SUPPLEMENT NO. 4

**FORESHORE PROTECTION
 NORTH AND SOUTH BANK**

SCALES AS SHOWN
 U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
 CORPS OF ENGINEERS

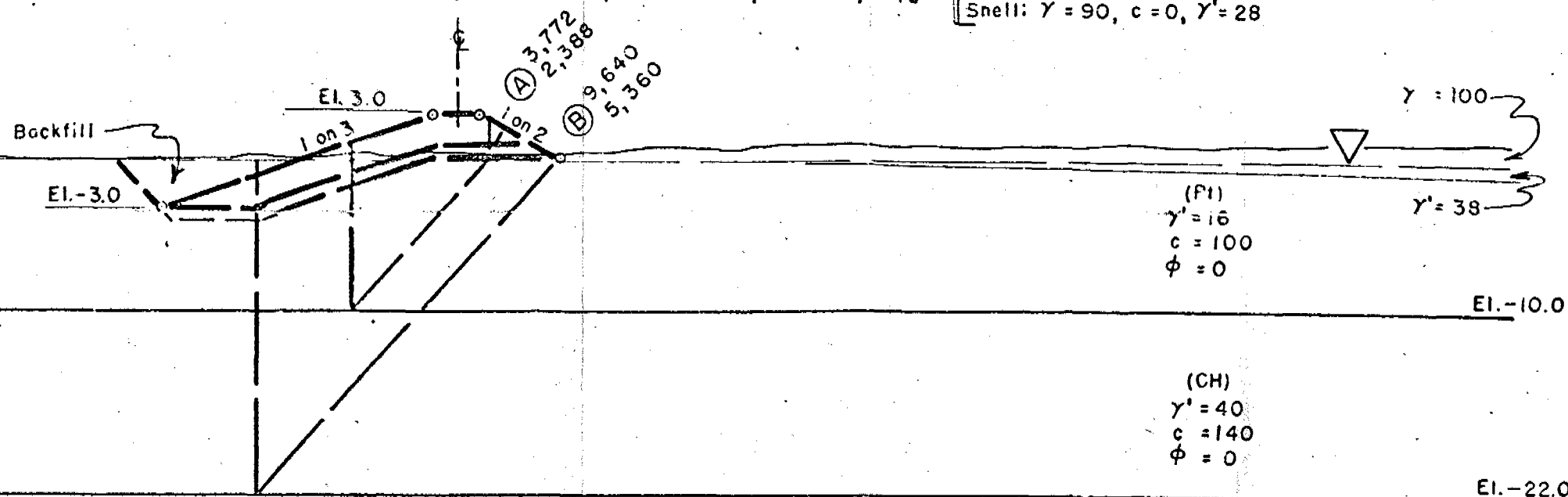
APRIL 1968
 REV. 15 NOV. 68
 24 JAN. 69

FILE NO. 11-2 24567

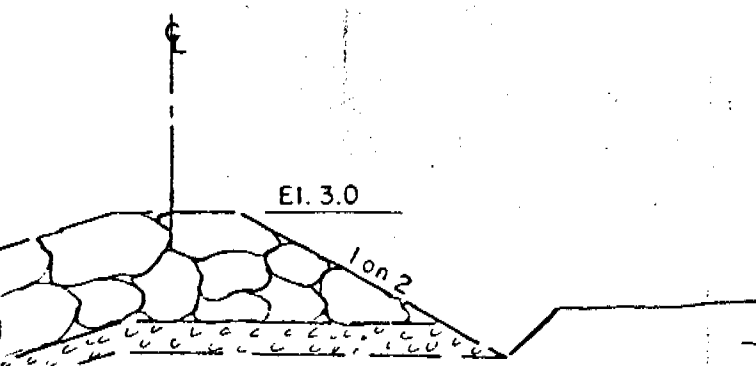


DISTANCE IN FEET
30 40 50 60 70 80 90 100

$\phi = 40'$ R:prap: $\gamma = 125, c = 0, \gamma' = 62$
Snell: $\gamma = 90, c = 0, \gamma' = 28$

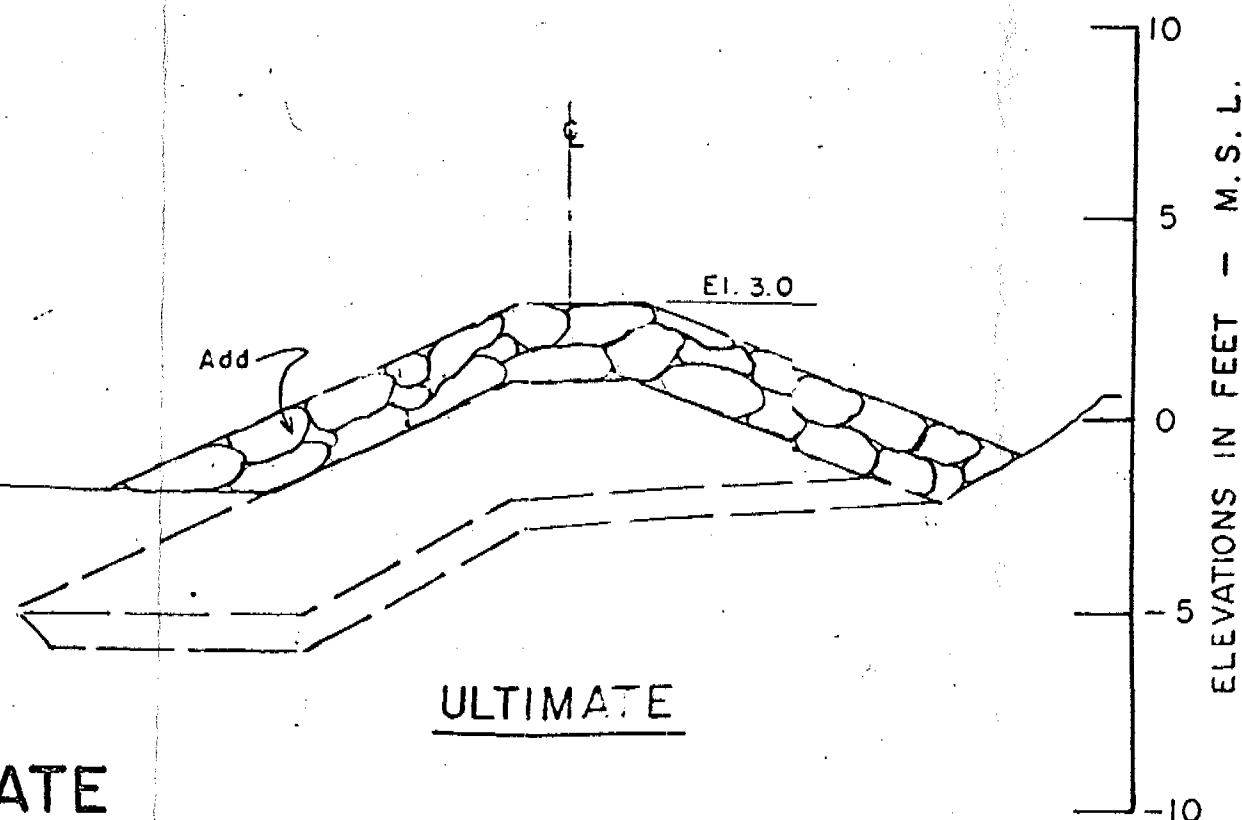


STABILITY



CONSTRUCTION

SETTLEMENT ESTIMATE



ULTIMATE

NOTE: This plate included as result of LMVD comments 5th Ind., Par. 3.

GENERAL NOTES

The ground elevation in the vicinity of the protection is $2' \pm$.

The foreshore protection location criteria applies, also, to future deepening and/or widening of the existing channel.

MISSISSIPPI RIVER - GULF OUTLET LOUISIANA
ALIGNMENT OF FORESHORE PROTECTION
(Q) STABILITY AND SETTLEMENT ESTIMATE
U.S. ARMY ENGINEER DISTRICT NEW ORLEANS
CORPS OF ENGINEERS
FILE NO. H-2-24507

Area Plan Levee, shown on plate 2, is adjacent to the MR-GO from approximate mile 66 to approximate mile 47. The design for all foreshore protection required in connection with the modified Chalmette Area Plan was developed in Lake Pontchartrain, La. and Vicinity, Design Memorandum No. 3, General Design, approved 31 January 1967, and is being continued accordingly in Supplement No. 1 to General Design Memorandum No. 3, submitted 21 October 1968. Typical design sections are shown on plate 2.

6. Cost estimates. The estimated cost, based on January 1969 price levels, for foreshore protection to be provided along the north bank of the MR-GO, is \$682,000. This estimate consists of \$591,000 for Levees and Floodwalls, \$50,200 for Engineering and Design, and \$40,800 for Supervision and administration. The estimated cost, also based on January 1969 price levels, for foreshore protection to be provided along the south bank of the MR-GO is \$3,309,600, which consists of \$2,867,900 for Levees and Floodwalls, \$243,800 for Engineering and Design, and \$197,900 for Supervision and Administration.

7. The aggregate estimated cost for the foreshore protection along the MR-GO, as previously defined, based on January 1969 price levels, is \$3,991,600, which consists of \$3,458,900 for Levees and Floodwalls, \$294,000 for Engineering and Design, and \$238,700 for Supervision and Administration. The estimate of first cost is shown in table 1 and a recapitulation of the total Corps of Engineers cost for the MR-GO project is shown in table 2.

TABLE 1

ESTIMATE OF FIRST COST
(Foreshore Protection, MR-GO)
(January 1969 Price Levels)

Item No.	Estimated quantity	Unit	Unit price	Estimated amount
<u>NORTH BANK (Citrus Back Levee)</u>				
11	<u>Levees and Floodwalls</u>			
	42,000	c.y.	\$ 0.40	\$ 16,800
	24,500	c.y.	3.50	85,750
	60,000	ton	6.50	390,000
				<u>\$ 492,500</u>
				Contingencies, 20%+
				<u>98,450</u>
				Subtotal
				<u>\$ 591,000</u>
30				Engineering and design, 8.5%+
				50,200
31				Supervision and administration, 6.9%+
				<u>40,800</u>
				Total Cost Levees and Floodwalls (Foreshore Protection North Bank)
				<u>\$ 682,000</u>
<u>SOUTH BANK (Chalmette Area Plan including Chalmette Extension)</u>				
11	<u>Levees and Floodwalls</u>			
	277,100	c.y.	\$ 0.40	\$ 110,840
	65,800	c.y.	3.50	230,300
	315,200	ton	6.50	2,048,800
				<u>\$2,389,940</u>
				Contingencies, 20%+
				<u>477,960</u>
				Subtotal
				<u>\$2,867,900</u>
30				Engineering and design, 8.5%+
				243,800
31				Supervision and administration, 6.9%+
				<u>197,900</u>
				Total Cost Levees and Floodwalls (Foreshore Protection South Bank)
				<u>\$3,309,600</u>



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160

IN REPLY REFER TO

LMNED-PP


29 April 1968

SUBJECT: Mississippi River-Gulf Outlet, La., General Design
Memorandum No. 2, Supplement No. 4, Foreshore Protection

Division Engineer, Lower Mississippi Valley
ATTN: LMVED-TD

1. The subject Supplement No. 4 is submitted herewith for review and approval in accordance with the provisions of ER 1110-2-1150 dated 1 July 1966.
2. Approval of Supplement No. 4 is recommended.

1 Incl (16 cys)
Supp. No. 4


THOMAS J. ROWEN
Colonel, CE
District Engineer

MISSISSIPPI RIVER-GULF OUTLET, LA.,
GENERAL DESIGN MEMORANDUM NO. 2
SUPPLEMENT NO. 4
FORESHORE PROTECTION

STATUS OF DESIGN MEMORANDA

Design Memo No.

1-A	Channels, mile 63.77-mile 68.85	Approved 11 Sep 57
1-B	Channels, mile 39.01-mile 63.77	Approved 27 Jan 59
1-C	Channels, mile 0-mile 36.43, mile 0-mile -9.75	Approved 2 Feb 60
1-C	Supplement No. 1, Stone Retention Dike Extension	Approved 31 Jan 66
2	Mississippi River-Gulf Outlet, La. GDM	Approved 16 Sep 59
2	Supplement No. 2, Relocation and Modification of Turning Basin	Approved 17 Mar 64
2	Supplement No. 3, Bayou La Loutre Reservation	Submitted 29 Feb 68
2	Supplement No. 4, Foreshore Protection	Submitted 29 Apr 68

MISSISSIPPI RIVER-GULF OUTLET, LOUISIANA
GENERAL DESIGN MEMORANDUM NO. 2
SUPPLEMENT NO. 4
FORESHORE PROTECTION

TABLE OF CONTENTS

<u>Paragraph</u>	<u>Title</u>	<u>Page</u>
1	Authority	1
2	Purpose	1
3	Plan	1
4	Location of foreshore protection	2
6	Cost estimates	3
9	Recommendations	6

TABLES

<u>No.</u>	<u>Title</u>	<u>Page</u>
1	Estimate of first cost	4
2	Recapitulation of estimate for MR-GO project	5

PLATES

Title

1	General map
2	Foreshore protection north and south banks

APPENDIXES

- APPENDIX A - Report on modification of the Chalmette Area Plan to include larger area
- APPENDIX B - Intraagency correspondence

MISSISSIPPI RIVER-GULF OUTLET
LOUISIANA
DESIGN MEMORANDUM NO. 2, GENERAL
SUPPLEMENT NO. 4
FORESHORE PROTECTION

1. Authority. The Mississippi River-Gulf Outlet, La., a navigation improvement, was authorized by the River and Harbor Act, approved 29 March 1956, Public Law 455, 84th Congress, 2d. Session. The act and description of the project, as recommended by the Chief of Engineers in House Document No. 245, 81st Congress, 1st Session, are given in detail in Mississippi River-Gulf Outlet, La., Design Memorandum No. 2, General Design, dated 30 June 1959 and approved 16 September 1959.
2. Purpose. This supplement was prepared in accordance with ENGCW-EZ 6th Indorsement dated 12 April 1967 to LMNED-PR letter dated 29 November 1966, subject "Lake Pontchartrain, Louisiana and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area." Its purposes are to present the bases for inclusion of foreshore protection in the Mississippi River-Gulf Outlet (MR-GO) project, the location of such protection, and a revised cost estimate for the overall MR-GO project. Copies of the above indorsement and all prior and subsequent elements of the chain of correspondence are included herein as appendix A. Location of the authorized MR-GO project and limits of the foreshore protection discussed herein are shown on plate 1.
3. Plan. In House Document No. 231, 89th Congress, the project document for the "Lake Pontchartrain, La. and Vicinity," hurricane protection project, the cost for levee foreshore protection along the MR-GO and the Gulf Intracoastal Waterway (GIWW) was included with the portion of the project costs to be distributed in accordance with the 70%-30% formula specified in the authorization. Local interests expressed concern that the project for the Chalmette area included charges to local interests for foreshore protection along the MR-GO required to protect the levee berm from wind-generated and vessel-generated waves during high tide periods. Since the existence of the MR-GO dictates the location of that part of the Chalmette levee paralleling the south bank of the MR-GO and adds to the exposure of the levee, local interests considered that the foreshore protection work was not a cost of the hurricane protection project, but a navigation cost to protect the levee against wavewash. In addition, at the time that the MR-GO was authorized, a levee of substantial dimensions existed within the City of New Orleans for a distance of about 6 miles along what was to become the north bank of the outlet. The MR-GO exposes the foreshore fronting this levee to direct attack by waves generated by oceangoing vessels. Therefore, providing the

Par 3

means for achieving the necessary erosion control for those areas, where such control is essential, is considered to be a function of the MR-GO project. By ENGCW-OM 1st Indorsement dated 15 April 1966 to LMVED-A letter dated 21 March 1966, subject "Hurricane Protection - Lake Pontchartrain, La. and Vicinity - Chalmette Area," the Chief of Engineers directed that the costs for foreshore protection contiguous to the levee plan for the Chalmette area along the MR-GO be charged to the navigation project. This directive was amplified and clarified by OCE in 1st Indorsement to LMVBC letter of 24 April 1967, subject "Hurricane Protection - Lake Pontchartrain and Vicinity." Specifically, OCE concluded that the levee foreshore protection along the MR-GO is properly a feature of the Mississippi River-Gulf Outlet project, and the costs for such protection are, in their entirety, chargeable to that project. OCE concluded further that the levee foreshore protection required along the GIWW is properly a feature of the Lake Pontchartrain, La. and Vicinity, project, and hence, is subject to the 70%-30% cost sharing. It should be noted that this decision was based on those facts pertaining to the specific projects involved and was not to be considered a precedent with the principles thereof applicable to other projects. The PB-3's for the two projects have been revised to reflect appropriate costs for foreshore protection, and by ENGCW-OM letter dated 27 November 1967, the Appropriations Committees of the Congress were notified of the most recent estimates of total project costs for the MR-GO and Lake Pontchartrain, La. and Vicinity projects. Copies of the above correspondence and indorsements thereto are included herein as appendix B.

4. Location of foreshore protection. Foreshore protection to be provided along the north bank of the MR-GO is contiguous to the Citrus Back Levee, a portion of the Lake Pontchartrain, La. and Vicinity project, which extends from a junction with flood protective works on the east bank of the Inner Harbor Navigation Canal to and through the site occupied by the Michoud Assembly Facility of the National Aeronautics and Space Administration. The Citrus Back Levee alignment, as shown on plate 2, is adjacent to and on the north bank of the MR-GO from approximate Mile 65 to approximate Mile 60. The design for all foreshore protection required in connection with the Citrus Back Levee was developed in Lake Pontchartrain, La. and Vicinity, Design Memorandum No. 2, General Design, approved 29 December 1967. A typical design section presented therein is shown on plate 2 of this memorandum.

5. The foreshore protection required along the south bank of the MR-GO is contiguous to a reach of the modified Chalmette Area Plan Levee, an independent element of the Lake Pontchartrain, La. and Vicinity project, which extends northward from a junction with flood protective works on the east bank of the Inner Harbor Navigation Canal, thence adjacent and parallel to the MR-GO to a point approximately 5.5 miles southeast of Bayou Dupre. This reach of the modified Chalmette

Area Plan Levee, shown on plate 2, is adjacent to the MR-GO from approximate Mile 66 to approximate Mile 47. The design for all foreshore protection required in connection with the modified Chalmette Area Plan was developed in Lake Pontchartrain, La. and Vicinity, Design Memorandum No. 3, General Design, approved 31 January 1967, and is being continued accordingly in Supplement No. 1 to General Design Memorandum No. 3, scheduled for submission in May 1968. Typical design sections are shown on plate 2.

6. Cost estimates. In accordance with Lake Pontchartrain, La. and Vicinity, General Design Memorandum No. 2, the estimated cost, based on July 1967 price levels, for foreshore protection to be provided along the north bank of the MR-GO is \$653,000. This estimate consists of \$566,000 for Levees and Floodwalls, \$48,000 for Engineering and Design and \$39,000 for Supervision and Administration. A cost estimate to design memorandum scope for foreshore protection to be provided along the south bank of the MR-GO is available only for that portion of the foreshore protection contiguous to the Chalmette Area Plan (Lake Pontchartrain, La. and Vicinity, Design Memorandum No. 3, General Design, approved 31 January 1967) prior to modification. The cost estimate for the remainder of the foreshore protection on the south bank of the MR-GO was presented in LMNED-PR letter dated 29 November 1966 subject, "Lake Pontchartrain, La. and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area" (appendix A). Therefore, the cost estimate for foreshore protection to be provided along the south bank of the MR-GO is comprised of the two aforementioned estimates updated to July 1967 price levels and consists of \$3,941,000 for Levees and Floodwalls, \$429,000 for Engineering and Design and \$315,000 for Supervision and Administration.

7. The aggregate estimated cost for the foreshore protection along the MR-GO, as previously defined, based on July 1967 price levels, is \$5,338,000 which consists of \$4,507,000 for Levees and Floodwalls, \$477,000 for Engineering and Design and \$354,000 for Supervision and Administration. The estimate of first cost is shown in table 1 and a recapitulation of the total Corps of Engineers cost for the MR-GO project is shown in table 2.

8. The percentages of the construction cost used herein to arrive at the Engineering and Design, and Supervision and Administration costs are the same percentages used in determining the E&D and S&A costs for the project features of the Lake Pontchartrain, La. and Vicinity project which contain the design of the foreshore protection. Further, the variation in riprap unit prices is due to the different degrees of accessibility to the construction sites. The lesser unit price is for riprap placed on the bank directly from the supplier's barge. The larger unit price is for riprap which must be loaded onto trucks, transported to the construction site, then placed on the bank.

TABLE 1
ESTIMATE OF FIRST COST
(Foreshore Protection, MR-GO)

Item No.		Estimated Quantity	Unit	Unit Price	Estimated Amount
<u>NORTH BANK (Citrus Back Levee)^{1/}</u>					
11	<u>Levees and Floodwalls</u>				
	Excavation	42,000	c.y.	\$0.40	\$ 16,800
	Shell	18,500	c.y.	3.50	64,750
	Riprap	60,000	ton	6.50	390,000
	Subtotal				\$471,550
	Contingencies, 20% +				94,450
	Subtotal				\$566,000
30	Engineering and Design, 8.5% +				48,000
31	Supervision & Administration, 6.9% +				39,000
	Total Cost Levees & Floodwalls (Foreshore Protection North Bank)				\$653,000
<u>SOUTH BANK (Chalmette Area Plan Excluding Chalmette Extension)^{2/}</u>					
11	<u>Levees and Floodwalls</u>				
	Excavation	201,400	c.y.	\$1.00	\$201,400
	Shell	57,500	c.y.	3.50	201,250
	Riprap	206,300	ton	10.00	2,063,000
	Subtotal				\$2,465,650
	Price level increase (Aug '66 to July '67)				91,229
	Subtotal				\$2,556,879
	Contingencies, 20%, +				511,121
	Subtotal				\$3,068,000
30	Engineering & Design, 10.9% +				334,000
31	Supervision & Administration, 8.0% +				245,000
	Subtotal				\$3,647,000
	(Chalmette Area Extension) ^{3/}				
11	<u>Levees and Floodwalls</u>				
	Excavation	121,000	c.y.	\$1.00	\$ 121,000
	Shell	12,000	c.y.	3.50	42,000
	Riprap	54,000	ton	10.00	540,000
	Subtotal				\$703,000
	Price level increase (Nov '66 to July '67)				24,603
	Subtotal				\$727,603
	Contingencies, 20% +				145,395
	Subtotal				\$873,000
30	Engineering & Design, 10.9% +				95,000
31	Supervision & Administration, 8.0% +				70,000
	Subtotal				\$1,038,000
	Total Cost Levees & Floodwalls (Foreshore Protection South Bank)				\$4,685,000

TABLE 1 (cont'd)

- 1/ Cost (July 1967 price levels) in "Lake Pontchartrain, La. & Vicinity, GDM No. 2, Citrus Back Levee."
- 2/ Cost (Aug 1966 price levels) in "Lake Pontchartrain, La. & Vicinity, GDM No. 3, Chalmette Area Plan" escalated to July 1967 price levels.
- 3/ Cost (Nov 1966 price levels) in LMNED-PR letter dated 29 November 1966, 1966, subject, "Lake Pontchartrain, La. and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area" escalated to July 1967 price levels.

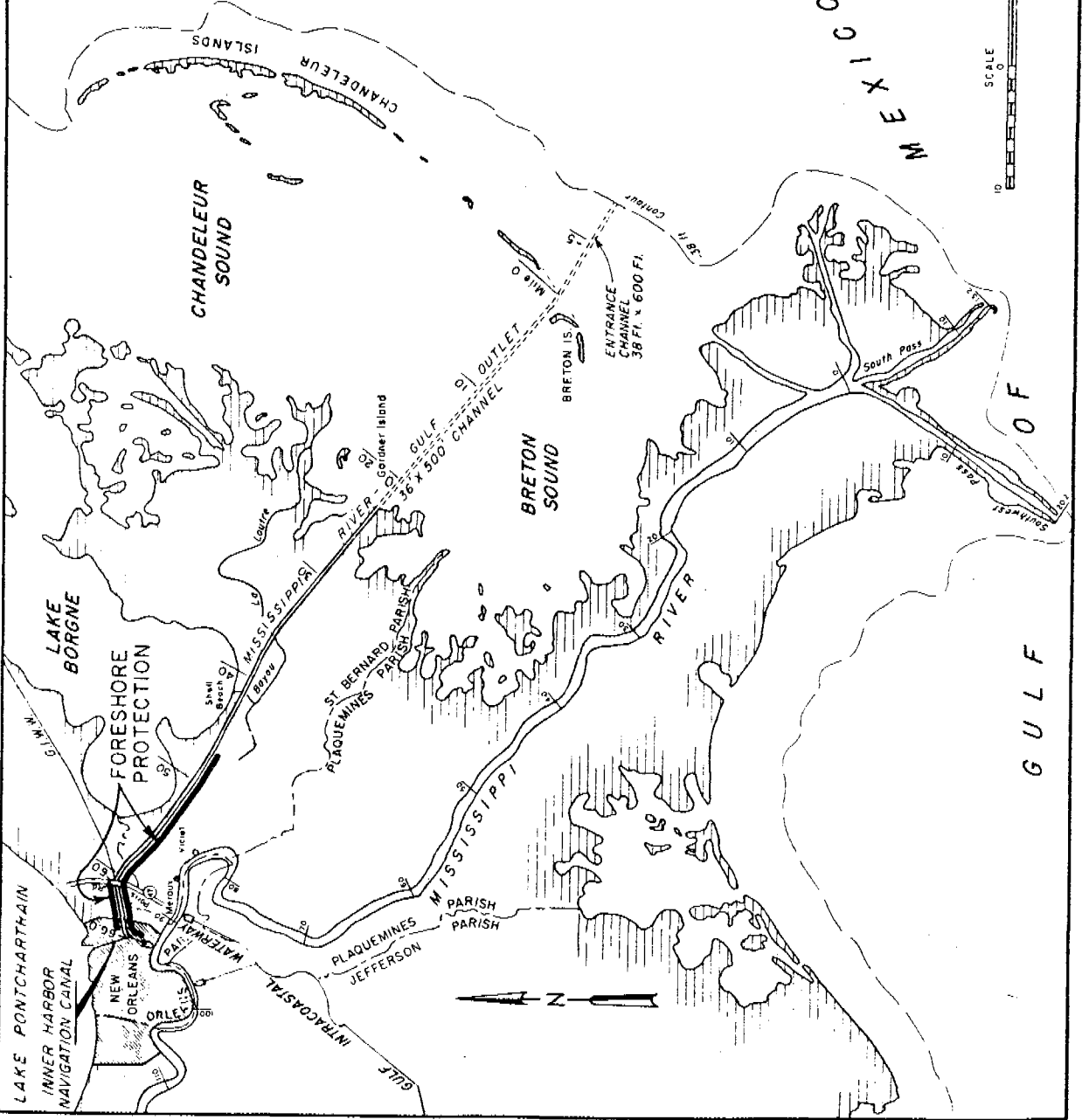
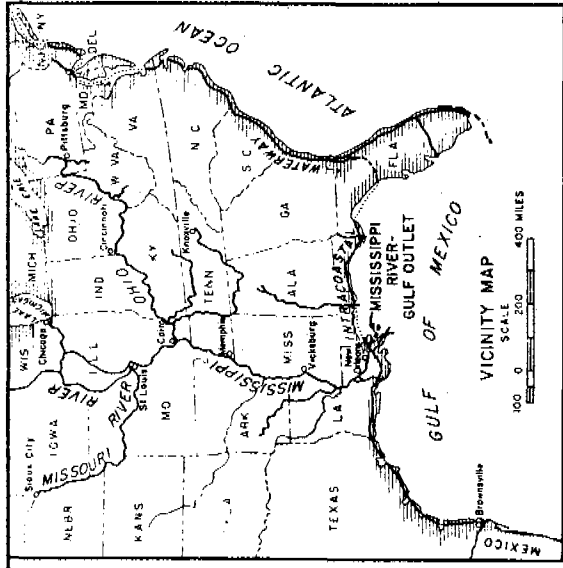
TABLE 2

RECAPITULATION OF ESTIMATE FOR MR-GO PROJECT ^{4/}

02	Relocations	\$11,290,900
05	Locks	50,000,000
09	Channels & Canals	40,160,000
10	Breakwaters & Seawalls	41,762,800
11	Levees & Floodwalls (foreshore protection)	4,507,300
20	Permanent Operating Equipment	6,900
30	Engineering and Design	6,204,600
31	Supervision and Administration	<u>9,067,500</u>
	TOTAL COST	\$163,000,000

- 4/ Total Corps of Engineers cost as shown in PB-3 effective 1 July 1967.

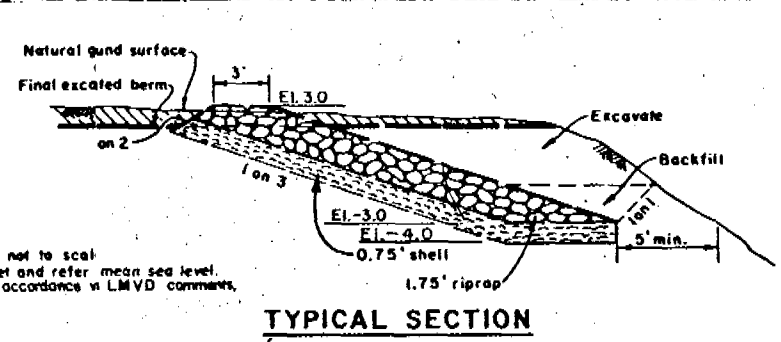
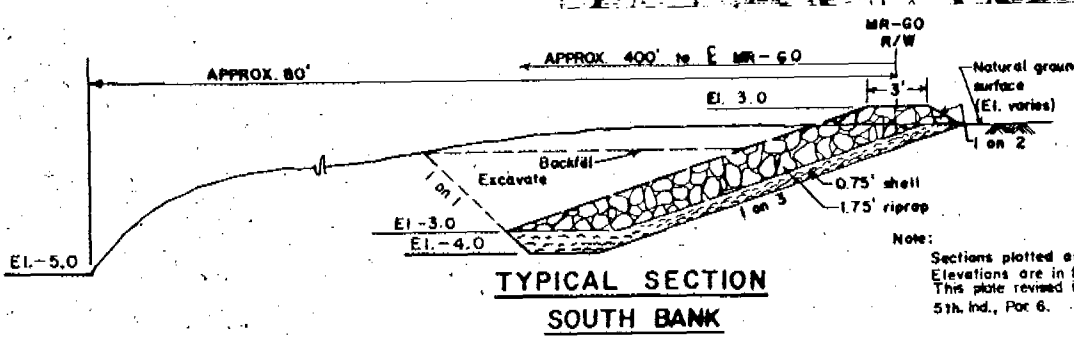
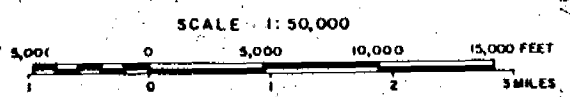
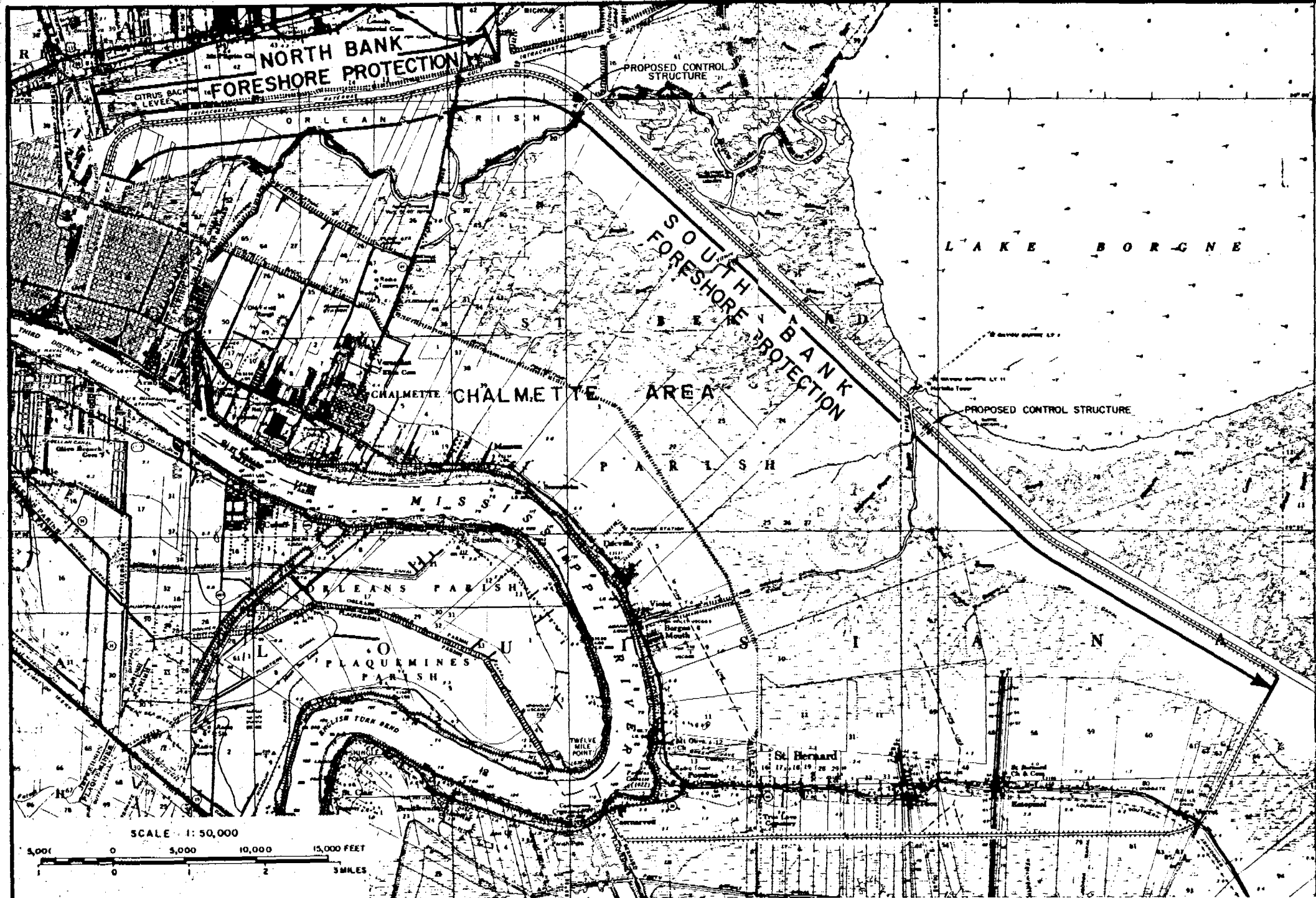
9. Recommendations. Approval of the bases for inclusion of foreshore protection in the Mississippi River-Gulf Outlet project, the location of such protection, and the revised cost estimate for the overall project is recommended.



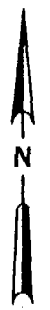
MISSISSIPPI RIVER-GULF OUTLET TO GULF OF MEXICO
 MISSISSIPPI RIVER-GULF OUTLET
 GENERAL DESIGN MEMO. NO. 2
 SUPPLEMENT NO. 4

GENERAL MAP

SKILLS AS SHOWN
 U.S. ARMY ENGINEER DISTRICT NEW ORLEANS
 CORPS OF ENGINEERS
 FILE NO. H-2-24567
 APRIL 1948



Note:
Sections plotted are not to scale.
Elevations are in feet and refer mean sea level.
This plate revised in accordance with LMVD comments,
5th. Ind., Par 6.



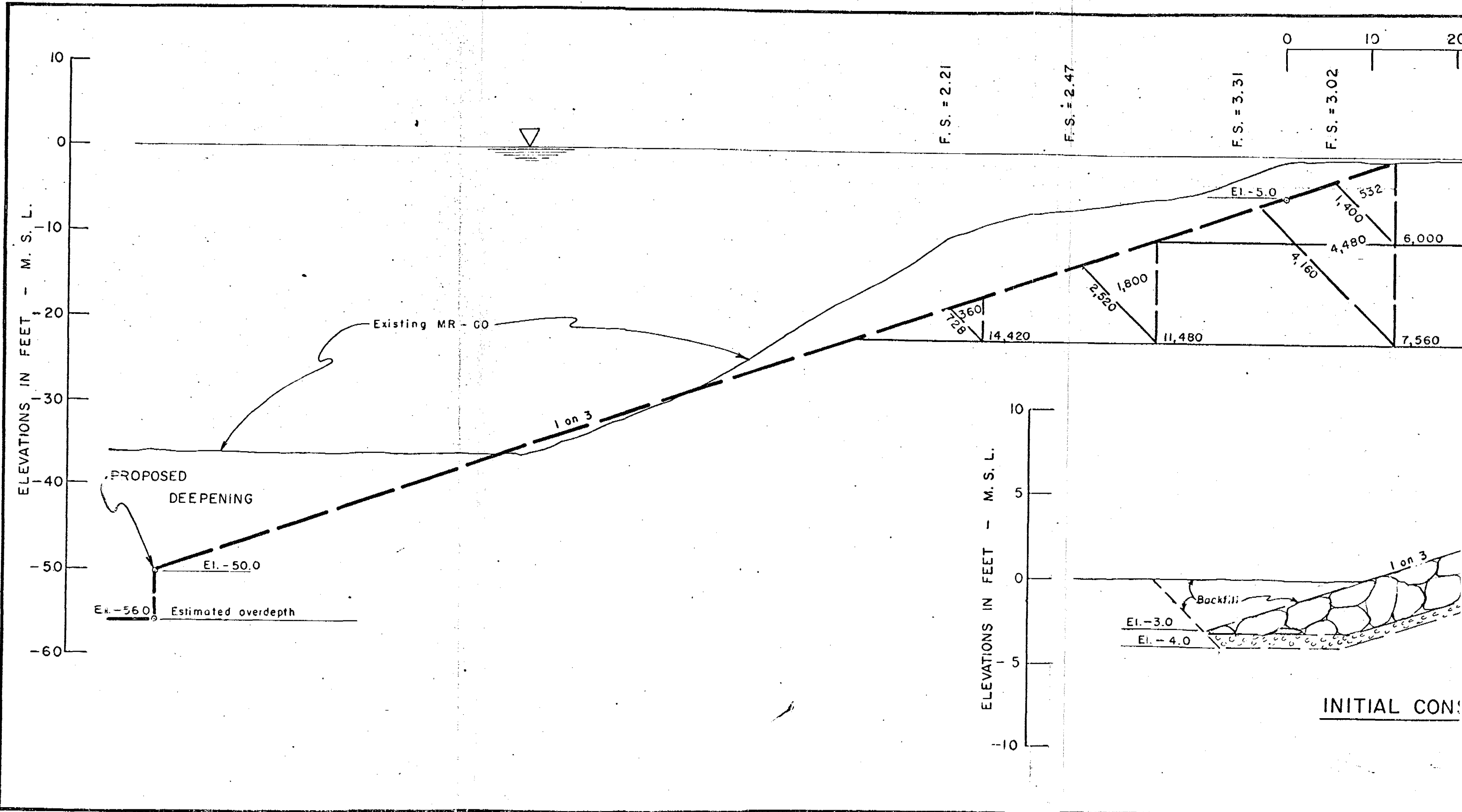
MISSISSIPPI RIVER, BATON ROUGE TO GULF OF MEXICO
MISSISSIPPI RIVER - GULF OUTLET
GENERAL DESIGN MEMO. NO. 2
SUPPLEMENT NO. 4

**FORESHORE PROTECTION
NORTH AND SOUTH BANKS**

SCALES AS SHOWN
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

APRIL 1968 FILE NO. H-2-24567

REV. 18 NOV. 68
24 JAN. 69



ELEVATIONS IN FEET - M. S. L.

10
0
-10
-20
-30
-40
-50
-60

PROPOSED DEEPENING
El. - 50.0
El. - 56.0 Estimated overdepth

Existing MR - GO

1 on 3

F. S. = 2.21

F. S. = 2.47

F. S. = 3.31

F. S. = 3.02

0 10 20

14,420

11,480

7,560

6,000

ELEVATIONS IN FEET - M. S. L.

10
5
0
-5
-10

El. - 3.0
El. - 4.0

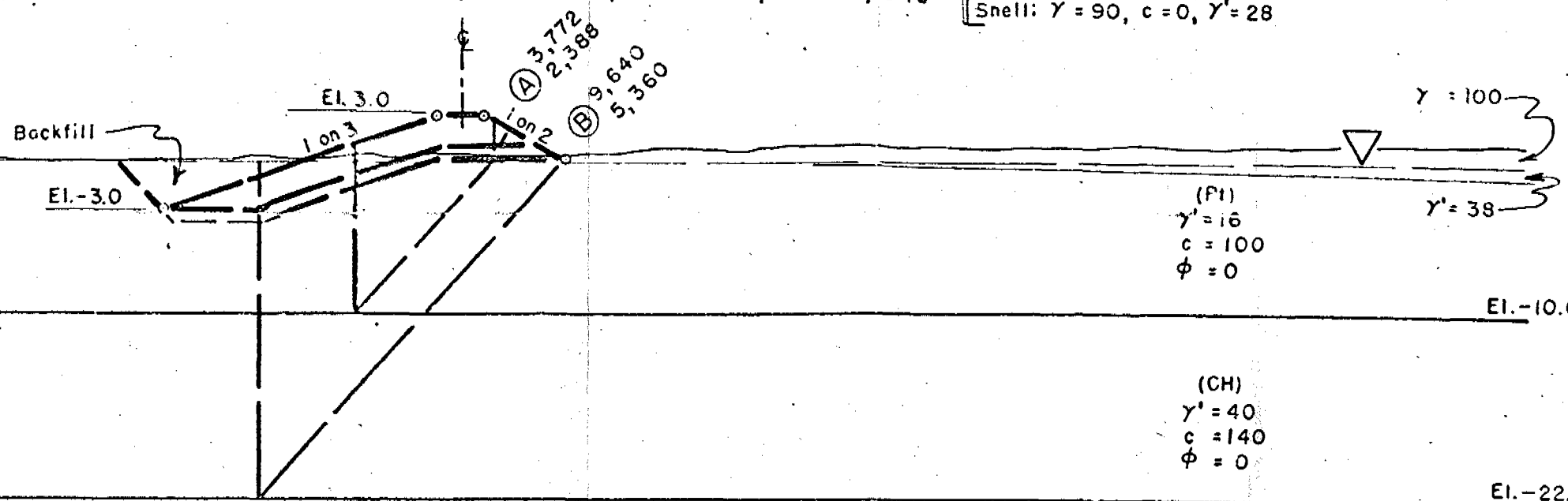
Backfill

1 on 3

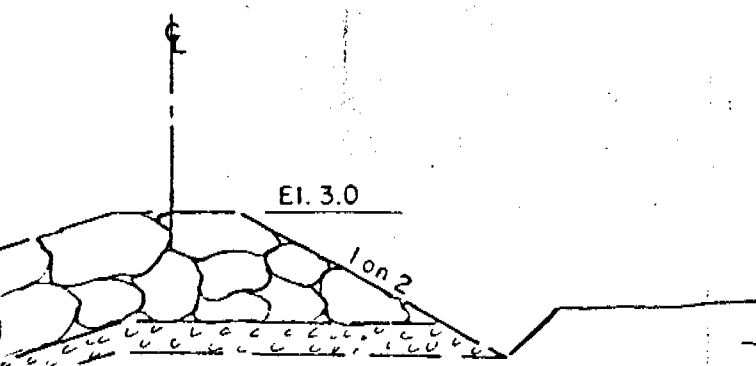
INITIAL CON...

DISTANCE IN FEET
30 40 50 60 70 80 90 100

$\phi = 40'$ R:prap: $\gamma = 125, c = 0, \gamma' = 62$
Snell: $\gamma = 90, c = 0, \gamma' = 28$

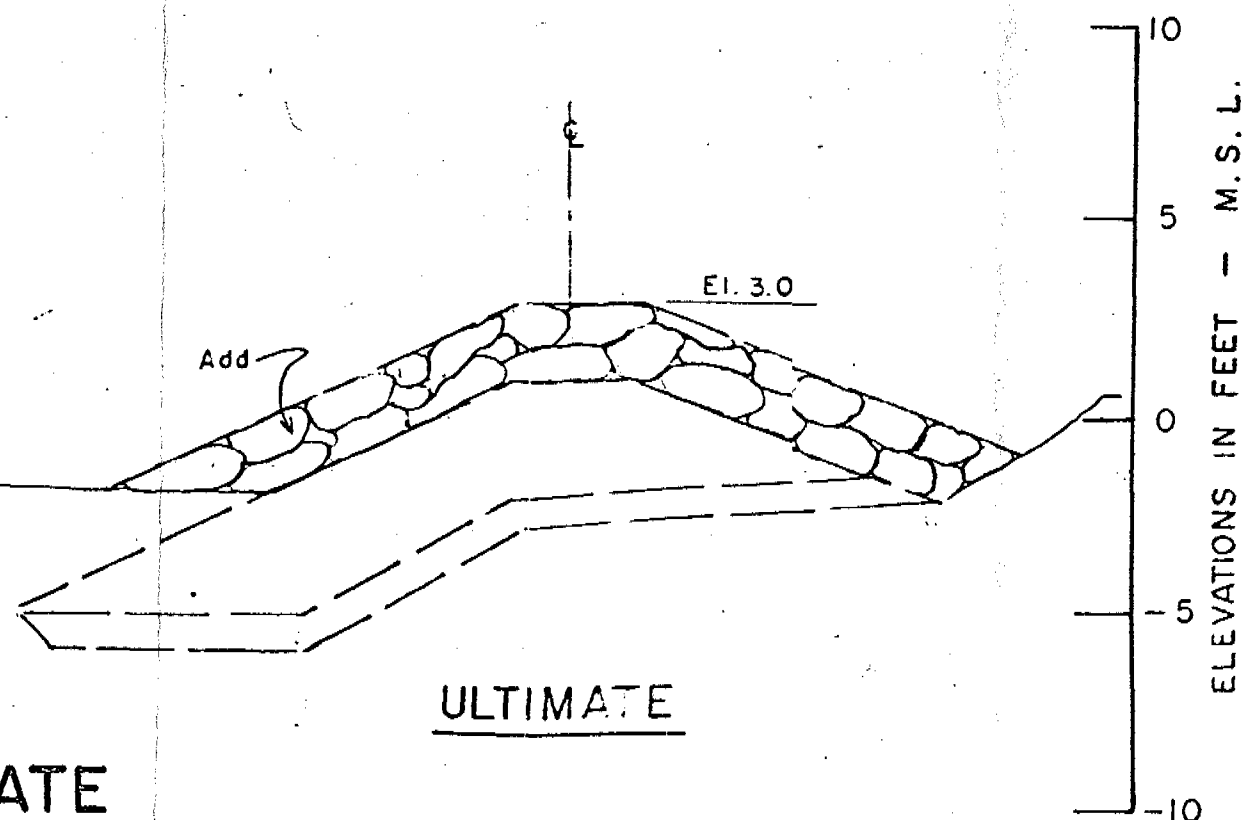


STABILITY



CONSTRUCTION

SETTLEMENT ESTIMATE



ULTIMATE

ELEVATIONS IN FEET - M. S. L.
10
0
-10
-20
-30
-40
-50
-60

GENERAL NOTES

The ground elevation in the vicinity of the protection is $2' \pm$.

The foreshore protection location criteria applies, also, to future deepening and/or widening of the existing channel.

NOTE: This plate included as result of LMVD comments 5th Ind., Par. 3.

MISSISSIPPI RIVER - GULF OUTLET LOUISIANA
ALIGNMENT OF FORESHORE PROTECTION
(Q) STABILITY AND SETTLEMENT ESTIMATE
U.S. ARMY ENGINEER DISTRICT NEW ORLEANS
CORPS OF ENGINEERS
FILE NO. H-2-24507

APPENDIX A

REPORT ON MODIFICATION OF THE
CHALMETTE AREA PLAN TO INCLUDE
LARGER AREA



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160

IN REPLY REFER TO
LMNED-PR

29 November 1966

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

TO: Acting Division Engineer, Lower Mississippi Valley
ATTN: LMVED-TD and LMVPD-F

1. Reference is made to the following:
 - a. Flood Control Act of 1965 authorizing subject project.
 - b. Project document for subject project (H.Doc. 231/89th Congress).
 - c. Design Memorandum No. 3, General Design for Lake Pontchartrain, La. and Vicinity, Chalmette Area Plan, submitted 1 November 1966.
 - d. Flood Control Act of 1962 authorizing hurricane protection for the Mississippi River Delta Area at and below New Orleans, Louisiana, and Reach E, Violet to Verret, in particular.
 - e. Project document for Mississippi River Delta at and below New Orleans, La. (New Orleans to Venice, La.) (H.Doc. 550/87th Congress).
 - f. Resolution adopted 8 May 1964 by the House Public Works Committee authorizing a restudy of hurricane protection in St. Bernard Parish.
 - g. Paragraph 2 of 1st Ind file LMVED-PR dated 25 February 1966 to NOD letter of 21 February 1966 subject "Review of St. Bernard Parish, Louisiana - Plan of Survey."
 - h. Paragraph 9.b. of ER 1110-2-1150 dated 1 July 1966.

2. Hurricane protection for the Chalmette area was authorized as an item of the "Lake Pontchartrain, Louisiana and Vicinity," project by the Flood Control Act of 1965 (page 5 of PL 89-298) "...substantially in accordance with the recommendations of the Chief of Engineers in House Document Numbered 231, Eighty-Ninth Congress, except that the recommendations of the Secretary of the Army in that document shall apply with respect to the Seabrook Lock feature of the project...."

LMNED-PR

29 November 1966

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area

3. The recommendations of the Board as stated in paragraph 4 of the report are as follows:

"Subject to re-examination of the levee alignment in the preconstruction stage with a view to protecting additional lands, and to certain requirements of local cooperation, the Board recommends authorization for construction of the improvements, essentially as planned by the reporting officers, provided...."

The Chief of Engineers concurred in the recommendations of the Board subject to certain modifications pertaining to the Rigolets lock as a result of a change in the interest rates.

4. The present plan of improvement for the Chalmette area is shown in Design Memorandum No. 3, General Design (reference l.c.). This plan, also shown on the attached map, provides for protection of the Chalmette area against a standard project hurricane (described in paragraph 14 of the DM) having an estimated frequency of about once in 200 years.

5. Protection for the Reach E area, Violet to Verret, against a hurricane having a frequency of about once in 100 years was authorized as a feature of the project "New Orleans to Venice, La.," by the Flood Control Act of 1962. The plan of improvement provided for raising existing back levees from the Mississippi River at Violet to the highway at Verret (see attached map).

6. St. Bernard Parish interests were dissatisfied with this plan and secured authorization for a restudy (reference l.f.) which was initiated in FY 1966 and is being continued in FY 1967. At the public hearing in Chalmette on 15 December 1965, the Parish Police Jury, State of Louisiana, Department of Public Works, and others requested hurricane protection for a much larger area in St. Bernard Parish including the settlements of Caernarvon, Reggio, Delacroix, Yscloskey, and Hopedale. The locations of the levees proposed by the sponsors at the public hearing are shown on the attached map.

7. After preliminary examination of the requested levee alignment, previous studies, and damages caused by hurricane "Betsy" (9 September 1965), it was deemed advisable to move the levee about halfway between the requested location and the highway from Poydras to Verret because of better levee construction conditions (Reach A-B on the inclosed map). The area thus deleted from the proposed protected area is entirely undeveloped marsh in which only minor enhancement benefits would be

LMNED-PR

29 November 1966

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area

obtained from hurricane protection. It was also deemed advisable to consider the initial plan as protection for the Poydras to Verret area which, if added to the Chalmette area, would eliminate the need for the return levee between the Mississippi River-Gulf Outlet spoil bank and the Mississippi River levee at Violet, a very expensive section of levee to construct and maintain (see reference l.c.). The remainder of the requested levees would be considered as increments thereto. The plan of survey recommending this approach was submitted 21 February 1966 and approved 25 February 1966 (see reference l.g.).

8. Initial studies of the additional protection requested for St. Bernard Parish have been essentially completed. Maximum utilization has been made of the data developed during preparation of the design memorandum for the Chalmette area. The levee sections and estimated construction requirements and unit prices for comparable areas in the Chalmette plan have been used for cost estimates. Hydraulic studies have been made to estimate levee grades. Field reconnaissance and hydraulic studies have been made for benefit estimates.

9. The net levee grade for the Chalmette area plan levee along the spoil banks of the Mississippi River-Gulf Outlet gulfward of Paris Road is 17.5 feet m.s.l. (plates 10 through 15 of design memorandum, reference l.c.). Hydraulic studies have been made and levee grades established for the additional area under study as follows: along the entire spoil bank, 17.5 feet m.s.l.; Caernarvon to the highway at Verret, 16.5 feet; Verret to spoil bank, 17.5 feet; and Verret to Reggio, and thence along Bayou LaLoutre to the Mississippi River-Gulf Outlet spoil bank, 17.0 feet. Levees to these grades would provide the same degree of protection for the entire area as that under the existing Chalmette area plan.

10. The estimated cost of modifying the Chalmette area plan to include the settlements of Caernarvon, Poydras, and Verret (by levees A, B, C, D) in the protected area is as shown below. A detailed estimate of the costs is inclosed.

LMNED-PR

29 November 1966

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area

<u>Item</u>	<u>Estimated cost</u>
Levee construction	\$ 9,548,500
Foreshore protection along MR-GO	703,000
Drainage structure	146,000
Relocations	
Highway crossings(2)	93,800
Pipelines(7)	295,000
Subtotal	<u>\$10,786,300</u>
Contingencies (20%+)	2,157,700
Subtotal	<u>\$12,944,000</u>
Engineering and design	776,000
Supervision and administration	<u>1,099,000</u>
 Total construction cost	 \$14,819,000
 Rights-of-way	 537,000
 Total estimated cost of additional levees	 \$15,356,000(1)
Less levee from Bayou Lawler (Point D) to Violet made unnecessary	 <u>7,212,000(2)</u>
 Total increased cost for additional protection	 \$ 8,144,000(1)

(1) Includes \$966,000 for foreshore protection along Mississippi River-Gulf Outlet, Reach C-D on the inclosed map.

(2) Section IV, pages 52-53 of D.M. reference l.c.

11. The estimated annual charges based on the increased costs in the preceding paragraph, a 100-year life, and an interest rate of 3-1/8% are:

<u>Item</u>	<u>Amount</u>
Interest	\$255,000
Amortization	12,000
Maintenance and operation	
16 miles levee @ \$5,000/mile	80,000
Less: maintenance levee--Bayou Lawler to Violet(par. 65 D.M. ref. 1)	 <u>42,000</u>
 Increased levee maintenance	 <u>38,000</u>
 Increased annual charges	 \$305,000

LMWED-PR

29 November 1966

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
The Chalmette Area Plan to Include Larger Area

12. The benefits from the additional protection are estimated at \$359,200 average annually, consisting of \$13,100 crop, \$178,600 non-crop, and \$167,500 land enhancement. A detailed computation of the benefits is inclosed.

13. Based on annual charges in paragraph 11 and annual benefits in paragraph 12, the benefit-cost ratio for the protection of the additional area is 1.2.

14. Consideration was given to extending the protection eastward and southward of Verret generally as requested by the local sponsors and shown on the attached map. However, these studies indicate protection for a larger area cannot be justified in the foreseeable future. The length of levee required would be relatively large in relation to the levee eliminated and the increased area protected. The area is sparsely inhabited and the improvements are of low value. Reconnaissance scope studies show that the estimated incremental first costs and annual charges for extending the hurricane protection from the Poydras-Verret area to include Yscloskey (excludes Hopedale and Delacroix), generally as shown on the inclosed map (levees B, E, F, I, C), are \$18,000,000 and \$670,000, respectively. The estimated incremental first costs and annual charges for extending the hurricane protection from Verret to Hopedale (levees F, G, H, I) are \$28,000,000 and \$1,000,000, respectively. The average annual benefits for extending the hurricane protection from Verret to Hopedale are only \$195,000 (exclusive of Delacroix) (\$5,000 crop, \$140,000 non-crop, and \$50,000 land enhancement). In view of the very small benefit-cost ratio for the area from Verret to Yscloskey (less than 0.2), no studies were made of the levees along Bayou Terre aux Boeufs to include Delacroix in the protected area.

15. A survey of the highway from Poydras to Verret shows the controlling elevation to be about 5 feet mean sea level. Over two miles of the highway have a controlling elevation of less than 6.0 feet m.s.l. Hurricane "Betsy" produced stillwater elevations in excess of 10.0 feet m.s.l. in the Poydras-Verret-Hopedale area. The protection to be provided under the authorized project "Reach E" is obviously inadequate for a residential area. In recognition of this, the State of Louisiana, Department of Public Works, at the request of the Board of Commissioners of the Lake Borgne Levee District, has recently (about 1 November 1966) initiated the construction of a small levee to elevation 10.0 feet m.s.l. (by dragline) from Caernarvon to Verret generally along the alignment proposed herein and shown on the attached map. The alignment and levee section have been examined in this office. The work being accomplished, unless enlarged and raised, will soon settle

LMNED-PR

29 November 1966


SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

until it would provide only a small amount of additional protection. However, it will be of substantial value in expediting the construction of the levee to the full grade and section recommended herein. Local interests should be given credit for the work accomplished on their Caernarvon to Verret levee.

16. It is recommended that the presently approved plan of hurricane protection for the Chalmette area contained in the general design memorandum (reference l.c.) be modified under the authority quoted in paragraphs 2 and 3 to provide for the construction of the levee from Caernarvon via Verret and the Mississippi River-Gulf Outlet spoil bank to the approved plan levee at Bayou Lawler (Point D) generally along the alignment shown on the attached map and for the elimination of the levee in the approved plan from Bayou Lawler to Violet (Section IV in reference l.c.). This modification will increase the total estimated cost of the Chalmette area plan from \$29,552,200 to \$37,697,000, which includes \$4,337,400 for foreshore protection along the Mississippi River-Gulf Outlet (an increase of \$966,000). The estimated Federal cost will be increased from \$21,697,952 to \$27,689,000 and the estimated non-Federal cost from \$7,854,236 to \$10,008,000.

17. It is further recommended that, when the modification in the authorized plan is approved, this District be authorized to proceed with work necessary to prepare a supplement to the general design memorandum for the Chalmette area (reference l.c.) on the modified plan.

- 4 Incl (quint)
 - 1. Map
 - 2. Cost est.
 - 3. Benefit est.
 - 4. Apportionment of costs


THOMAS J. BOWEN
Colonel, CE
District Engineer

LMVED-TD (NOD 29 Nov 66) 1st Ind
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 13 Dec 66

TO: Chief of Engineers, ATTN: ^{DDA/15} ENGCW-V/ENGCW-E

1. The recommendations of the District Engineer in paras 16 and 17 of basic communication are concurred in, subject to the comments below. General Design Memorandum No. 3 (reference 1c) was forwarded to OCF by our 1st Ind, LMVED-TD, dated 1 Dec 66, on NOD letter, dated 1 Nov 66, subject: Lake Pontchartrain, La. and Vicinity, General Design Memorandum No. 3, Chalmette Area Plan.

2. Para 1f, basic letter. In connection with studies being made in response to referenced resolution, present indications are that the part of the area below Verret will probably have a very low B/C ratio.

3. Para 16, basic letter. The estimate of \$29,552,200 is that shown in General Design Memorandum No. 3 and has not been approved in a Project Cost Estimate (PB-3). The estimate of \$37,697,000 should be designated as approximate in view of the comment in para 5 below.

4. Incl 1. a. Location of drainage structure should be shown.

b. Upon approval of enlarged Chalmette Area, consideration should be given to locating the east-west portion of levee A-B approximately 2,000 feet north of the recommended alignment in order to provide a slightly better foundation and to place the levee on somewhat higher ground.

5. Incl 2. It should be noted that levee fill volumes and costs are based on data furnished in General Design Memorandum No. 3. As pointed out in para 5 of our 1st Ind dated 1 Dec 66, cited in para 1 above, the data and analyses presented in the GDM are not completely adequate to permit the levee to be constructed in stages to final grade without additional studies. As a result, at this time we do not actually know the volume of levee fill required to construct the levee to an ultimate grade taking into account all future settlement and displacement. Thus, the cost estimate for the levee is based on the best information available at this time.

6. Incl 4. Upon approval of the modified plan, local interests should be apprised of the plan including the increase in required

LMVED-TD (NOD 29 Nov 66)

1st Ind

13 Dec 66

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

non-Federal contribution and their views discussed in the proposed
supplement to the general design memorandum.

FOR THE DIVISION ENGINEER:

4 Incl (quad)
wd 1 cy ea



A. J. DAVIS
Chief, Engineering Division

Copy furnished:
NOD, ATTN: LMNED-PR

ENGCW-EZ

2nd Ind

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

Da. CofEngrs, Washington, D.C. 20315, 31 January 1967

TO: Division Engineer, Lower Mississippi Valley Division

1. References:

a. 2nd Indorsement, ENGCW-EZ, 27 October 1966, on letter LMNED-PP, 18 August 1966, subject: "Lake Pontchartrain, Louisiana and Vicinity, Design Memorandum No. 1, Hydrology and Hydraulic Analysis, Part I - Chalmette."

b. 2nd Indorsement, ENGCW-EZ, 31 January 1967 on letter LMNED-PP, 1 November 1966, subject: "Lake Pontchartrain, Louisiana and Vicinity, General Design Memorandum No. 3, Chalmette Area Plan."

2. The modification recommended by the District Engineer in paragraph 1b of the basic letter is approved subject to the comments of the Division Engineer, the comments in OCE 2nd indorsement referenced in paragraph 1a above, and the following additional comment.

3. Since the modification involves a significant increase in the project cost, the Appropriations Committees of Congress will have to be notified by this office. For this purpose the views of local interests on the plan and the increase in the non-Federal contribution is necessary. It is requested that the modification be discussed with local interests and this office be advised of the results thereof.

4. Cost for Reach B, shown in orange on Inclosure No. 1, should be stated in the supplement mentioned below, since the levee ABCD will replace this authorized levee as well as that shown in green.

5. Preparation of the supplement recommended in paragraph 17 of the basic letter is approved.

FOR THE CHIEF OF ENGINEERS:

wd incl



DANIEL D. HALL

Major, Corps of Engineers
Assistant Director of Civil Works
for Mississippi Valley

LMVED-TD (NOD 29 Nov 66) 3d Ind
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification
of the Chalmette Area Plan to Include Larger Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 9 Feb 67

TO: District Engineer, New Orleans District, ATTN: LMNED-PR.

1. Referred to note approval, subject to comments of 1st and 2d Indorsements.

2. Early action should be taken in regard to para 3, 2d Ind so that OCE may be furnished required information prior to impending Appropriations Hearings. In addition to a statement setting forth the views of local interests on the proposed modification and the increase in local costs, the submittal should clearly show that the modification of the Chalmette Area levee plan will obviate the need for the "Reach E" feature of the New Orleans to Venice hurricane protection project at a saving of \$ _____ to that project. Furthermore, the modified levee plan will eliminate the Bayou Lawler to Violet segment of the Chalmette Area as now planned at a saving of \$ _____. This proposed addition to the Chalmette Area will provide protection to all areas in St. Bernard Parish that can be economically justified at this time.

FOR THE DIVISION ENGINEER:

George B. Davis
A. J. DAVIS
Chief, Engineering Division

LMVED-PP (NOD 29 Nov 66)

4th Ind

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification
of the Chalmette Area Plan to Include Larger Area

DA, New Orleans District, CE, New Orleans, La. 70160 23 Feb 67

TO: Division Engineer, Lower Miss. Valley, CE, AITN: LMVED-TD

1. In accordance with paragraph 3 of the 2d Indorsement, the State of Louisiana, Department of Public Works, which was designated by the Governor of Louisiana on 2 November 1965 as "...the agency to coordinate the efforts of local interests and to see that the local commitments are carried out promptly....," was requested to comment on the acceptability of the subject modification to local interests and their willingness to provide an additional local contribution therefor of approximately \$2,150,000, inclusive of the value of lands, damages, relocations, and a cash contribution (or equivalent work) amounting to \$1,080,000. A copy of our telegraphic request is inclosed.

2. By letter dated 13 February 1967, the Department of Public Works concurred in the modification and gave assurance that "...the requirements made of local interests will be carried out by the appropriate local governmental units." A copy of this response is inclosed.

3. The modified Chalmette Area Plan will extend hurricane protection to all areas in St. Bernard Parish for which such protection can be economically justified at this time. Since the entire Reach "E" feature of the "New Orleans to Venice, La.," project is located within the protected area of the modified Chalmette Area Plan, construction of this plan will, in addition to producing other benefits, generate all of the benefits realizable through construction of the Reach "E" feature, thus obviating the need for construction of the feature at a saving of \$1,316,000 (\$921,900 Federal, \$394,100 non-Federal, based on PB-3 approved 2 June 1966). In addition, the return levee along Bayou Dupre, a segment of the Chalmette Area Plan as originally authorized, is not required with the modified plan, and its elimination results in an additional saving of \$7,212,000 (\$5,048,400 Federal and \$2,163,600 non-Federal, based on DM No. 3, 1 November 1966).

2 Incl (dupe)

5. NOD telegram LMVED-PP-6,

7 Feb 67

6. DPW ltr dtd 13 Feb 67



THOMAS J. BOWEN

Colonel, CE

District Engineer

LMVED-TD (NOD 29 Nov 66) 5th Ind
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 27 Feb 67

TO: Chief of Engineers, ATTN: ENGCW-EZ

Information requested by OCE 2d Ind is forwarded for your information. To avoid misinterpretation of the last sentence of para 3, 4th Ind, and to correct minor discrepancies, a summary of costs rounded to nearest \$1,000 is furnished below.

Cost of Modifying Chalmette Area Plan

Total Const. Cost	\$14,819,000
Right of Way	<u>537,000</u>
Total Cost	\$15,356,000
Less Levee Violet to Point D	<u>7,212,000</u>
Total Cost of Modifying Plan	\$ 8,144,000

Cost of Chalmette Area Plan as Modified

Total Cost of Modified Plan	\$37,697,000
Previous Estimate	<u>29,553,000</u>
Increase	\$ 8,144,000

Federal Cost of Modified Plan	\$27,689,000
Previous Estimate	<u>21,698,000</u>
Increase	\$ 5,991,000

Non-Federal Cost of Modified Plan	\$10,008,000
Previous Estimate	<u>7,854,000</u>
Increase	\$ 2,154,000

Additional Saving

Elimination of Reach E of New Orleans to Venice
Hurricane Protection Project

Total Savings	\$ 1,316,000
Federal Cost	\$ 922,000
Non-Federal Cost	\$ 394,000

FOR THE DIVISION ENGINEER:

2 Incl
Dupe cy wd

George B. Davis

GEORGE B. DAVIS
Acting Chief, Engineering Division

Copy furnished:
NOD, ATTN: LMNED-PP

ENGW-EZ (LMNED-PR, 29 Nov 66) 6th Ind
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, CofEngrs, Washington, D.C. 20315, 12 April 1967

TO: Division Engineer, Lower Mississippi Valley Division

1. Reference is made to letter, LMVED-A, 21 March 1966, subject: "Hurricane Protection - Lake Ponchartrain and Vicinity - Chalmette Area" and 1st indorsement, ENGOW-OM, 15 April 1966 thereon.

2. The construction costs presented in the 4th and 5th indorsements and in the GDM (DM #3) include costs for riprap foreshore protection along the Mississippi River - Gulf Outlet reach of the project. 1st indorsement ENGOW-OM, 15 April 1966, referenced in paragraph 1 above, directed that these costs be charged to the navigation project (MR-GO) as a Federal cost for wave protection. These costs, including the modified plan, are in excess of \$4,000,000. The estimated costs should be adjusted by the District and revised estimates submitted to OCE, together with draft of letters to Congressional Committees. Since the riprap should be included in the Gulf Outlet (MR-GO) project, the necessary revisions to the design memorandum for the Gulf Outlet project should be made, or a supplement be prepared, and furnished OCE.

FOR THE CHIEF OF ENGINEERS:

wd incl

WENDELL E. JOHNSON
Chief, Engineering Division
Civil Works

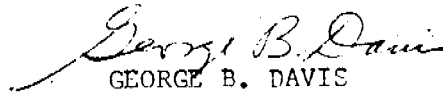
LMVED-TD (NOD 29 Nov 66) 7th Ind
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 2 May 67

TO: District Engineer, New Orleans, ATTN: LMNED-PR

1. Referred for necessary action.
2. The question of charging the cost of riprap protection along the GIWW has been submitted to OCE by letter, LMVBC, SUBJECT: Hurricane Protection, Lake Pontchartrain and Vicinity, 24 Apr 67 for guidance. You will be advised when a decision is reached.

FOR THE ACTING DIVISION ENGINEER:



GEORGE B. DAVIS
Acting Chief, Engineering Division

LMNED-PP (NOD 29 Nov 66)

8th Ind

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, New Orleans District, CE, New Orleans, La. 70160 14 Jul 67

TO: Division Engineer, Lower Miss. Valley, CE, ATTN: LMVED-TD & LMVBC

1. In addition to the prior elements of this chain, reference is made to LMVBC letter dated 24 April 1967, subject "Hurricane Protection - Lake Pontchartrain and Vicinity," and 1st through 3d Indorsements thereto.

2. Forwarded herewith are the following:

a. Draft of proposed letter from the Chief of Engineers to the Special Assistant to the Secretary of the Army for Civil Functions explaining the inclusion of foreshore protection costs in the "Mississippi River-Gulf Outlet, La.," project.

b. Draft of proposed letter from the Special Assistant to the Director, Bureau of the Budget, transmitting a draft of proposed letters to the Public Works and Appropriations Committees of the United States Congress notifying them of the increase in cost of the "Mississippi River-Gulf Outlet, La.," project as a result of including foreshore protection in the plan of improvement, and requesting information as to whether there is any objection by the Bureau to the submission of the proposed letters to the respective committees.

c. Draft of proposed letter to the Committees.

3. Design for a portion of the foreshore protection has been covered in the general design memorandum (No. 3) for the Chalmette Area Plan. Inasmuch as the foreshore protection is more or less integral to and must be coordinated with the levee construction, it is planned to cover the design of the remaining foreshore protection in the general design memorandum for the Lake Pontchartrain Barrier Plan (No. 2) and in Supplement No. 1 to the general design memorandum for the Chalmette Area Plan. In addition a very brief letter-type supplement to the general design memorandum for the Mississippi River-Gulf Outlet (MR-GO) will be prepared and submitted for approval. This supplement, which will present the bases for inclusion of foreshore protection in the MR-GO project, the location of such protection, and a revised cost estimate for the overall project, will be prepared and submitted for approval after the notification of the Congressional Committees has been effected.

LMNED-PP (NOD 29 Nov 66)

8th Ind (contd)

14 Jul 67

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

4. Approval of the course of action outlined in paragraph 3.
above is recommended.

3 Incl (dupe)

7, 8, & 9 as listed w/i

(copy to [unclear])
GEORGE H. HUDSON
Acting District Engineer

LMVED-TD (NOD 29 Nov 66)

9th Ind

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 14 Aug 67

TO: Chief of Engineers, ATTN: ENGCW-EZ

1. In our opinion the drafts of letters as prepared by the New Orleans District, mentioned in paragraph 2, 8th Ind, are not fully responsive to the request of the Chief of Engineers in his 2d and 6th Ind. Actually there are 3 projects being modified under the discretionary authority of the Chief of Engineers. Modification of the Chalmette Area affects both the Lake Pontchartrain and Vicinity project and the New Orleans to Venice project. Modification of the Mississippi River-Gulf Outlet project includes levee protection affecting the Lake Pontchartrain and Vicinity project. In addition the New Orleans to Venice project is being modified because of need to change net levee grade and construct levees on modified alignments. Thus, it is our opinion that each of these projects should be covered separately but concurrently. For this reason we are forwarding for each of the three projects the following:

a. Draft of proposed letter from the Chief of Engineers to the Special Assistant to the Secretary of the Army for Civil Functions.

b. Draft of proposed letter from the Special Assistant to the Director, Bureau of the Budget.

c. Draft of proposed letter to the Committees.

2. The course of action outlined in paragraph 3 of 8th Ind is concurred in except we recommend proceeding with preparation of the supplement to the general design memorandum for the Mississippi River-Gulf Outlet project without waiting for notification of the Congressional Committee.

ACTING
FOR THE/DIVISION ENGINEER:



A. S. DAVIS
Chief, Engineering Division

9 Incl (dupe)
wd Incl 7, 8, and 9
Added: 10 thru 18, as listed

Copy furnished:
NOD, ATTN: LMNED-PP

ENGW-EZ (LMNED-PR, 29 Nov 66) 10th Ind
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, CofEngrs, Washington, D. C., 20315, 16 November 1967

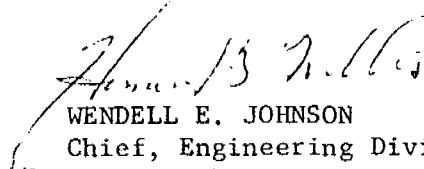
TO: Division Engineer, Lower Mississippi Valley Division

1. The action indicated in paragraph 2 of the 9th indorsement is satisfactory.

2. It is proposed to notify the Committees of Congress at an early date of the modifications of the projects, indicated in paragraph 1 of the 9th indorsement, which are considered to be within the discretionary authority of the Chief of Engineers.

FOR THE CHIEF OF ENGINEERS:

wd Incls


WENDELL E. JOHNSON
Chief, Engineering Division
Civil Works

LMVED-TD (NOD 29 Nov 66)

11th Ind

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity - Modification of
the Chalmette Area Plan to Include Larger Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 22 Nov 67

TO: District Engineer, New Orleans, ATTN: LMNED-PP

Referred to note approval of action indicated in 9th Indorsement.

FOR THE DIVISION ENGINEER:

George B. Davis
A. J. DAVIS

Chief, Engineering Division



APPENDIX B

INTRAGENCY CORRESPONDENCE



DEPARTMENT OF THE ARMY
LOWER MISSISSIPPI VALLEY DIVISION
CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI 39180

REPLY REFER TO: LMVED-A

21 March 1966

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity -
Chalmette Area

TO: Chief of Engineers
ATTN: ENGCW-V

1. In telephone conversation 3 March 1966, Colonel Kristoferson informed me that Judge Perez, in discussion with General Cassidy and him on 2 March, expressed concern that the project for the Chalmette area includes charges to local interests for bank protection work. Judge Perez felt that this was not a cost of hurricane protection, but a navigation cost to protect the levees against wave wash.

2. Although the protection is referred to as "bank protection" and "foreshore protection" in the authorizing document (HD/231/89/1), the work to which Judge Perez refers consists of riprap slope protection on the hurricane protection levee. The riprap protection will be placed on the channelside of a Mississippi River-Gulf Outlet retaining dike which will become the channelward edge of the stability berm of the hurricane levee.

3. The foreshore distance between the Gulf Outlet Channel and the retaining dike is some 500 feet, and the intervening area is covered with a thick growth of marsh grass. Therefore, no foreshore protection or slope paving is required or included in the Outlet project to prevent silting of the Outlet Channel due to wave action on the retaining dike.

4. The riprap paving is required to protect the levee berm from wind-generated and vessel-generated waves during high tide periods. Similar slope protection is provided for all other channel and lakeside levees in the hurricane protection project. The existence of the Mississippi River-Gulf Outlet dictates the location of that part of the Chalmette hurricane levee paralleling the Outlet and adds to the exposure of the levee. It is understandable that local interests would contend that the Outlet project should bear some part of the cost of the riprap protection. However, the benefits from the hurricane levee will include the prevention of flood damages and will allow considerable

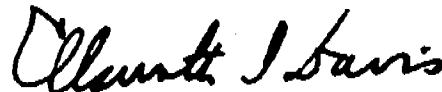
LMVED-A

21 March 1966

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity -
Chalmette Area

enhancement in the protected area. No benefits will accrue to the Gulf Outlet Channel because of the levee construction other than those that might stem from industrial development which could conceivably take place within the Chalmette area after it is afforded a higher degree of protection by the levee.

5. In light of the conditions discussed above, it is my belief that the levee slope protection along the Mississippi River-Gulf Outlet Channel is properly chargeable to the Lake Pontchartrain, La., and Vicinity hurricane protection project. However, in view of the divergent views expressed by local interests in direct contacts with your office, your ruling on this matter is requested.



ELLSWORTH I. DAVIS
Major General, USA
Division Engineer

Copy furnished:
New Orleans District

ENGCW-OM (21 Mar 66)

1st Ind

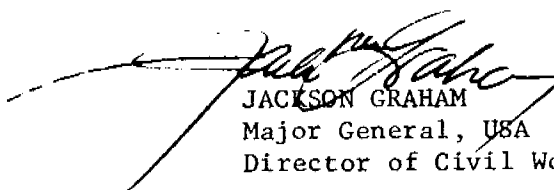
SUBJECT: Hurricane Protection - Lake Pontchartrain & Vicinity-Chalmette Area

DA, CofEngrs, Washington, D. C. 15 April 1966

TO: Division Engineer, Lower Mississippi Valley

As indicated in the authorizing document, riprap foreshore protection against erosion by wave wash from shipping was included as a part of the levee plan for the Chalmette Area. It is considered that the portion of the riprap costs that is required for such purposes should be charged to the navigation project as a Federal cost for wave protection.

FOR THE CHIEF OF ENGINEERS:



JACKSON GRAHAM
Major General, USA
Director of Civil Works

Copy furnished:
New Orleans District

S-27 May 66

LMVED-T (LMVD 21 Mar 66) 2d Ind
SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity -
Chalmette Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 25 Apr 66

TO: District Engineer, New Orleans District, ATTN: LMNED

1. Reference is made to letter, ENGCW-OM, OCE, 15 April 1966, to the Honorable Allen J. Ellender, United States Senate.

2. The Chief of Engineers has stated in the referenced letter and has ruled in the preceding 1st Ind that the portion of riprap costs required to protect against erosion by wave wash from shipping should be charged to the navigation project. You should prepare and submit for approval by 27 May 1966 a breakdown of the riprap foreshore and levee slope protection costs, proportioned between the hurricane-flood protection project and the navigation project.



ELLSWORTH I. DAVIS
Major General, USA
Division Engineer

LMNED-PP (LMVD 21 Mar 66) 3d Ind
SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity -
Chalmette Area

DA, New Orleans District, CE, New Orleans, La. 70160 26 May 66

TO: Division Engineer, Lower Miss. Valley Division, CE, ATTN: LMVED-T

1. Estimates requested in 2d Ind are forwarded herewith.
2. The decision of the Chief of Engineers in the 1st Ind is noted and understood. We note a number of implications of interest insofar as the decision is concerned and offer the following observations thereon.
3. The Mississippi River-Gulf Outlet was authorized long before the Chalmette levee was even planned; hence, it seems strange that the Outlet should be burdened with any construction which is subsequently planned. The levee could have been planned at a more remote location where no wavewash hazard would be involved; however, the optimum benefits and costs are derived from a location close to the outlet channel. At this location, the maximum protected area is made available and the considerable benefit of utilizing the spoil bank from the outlet channel is enjoyed, despite the possible hazard of wavewash.
4. The principle of having a project assume the financial burden of a subsequently authorized project may result in many of our marginal projects being forced into a category of less than unity benefit-cost ratio by virtue of factors that could not possibly have been evaluated when the project was presented to the Congress. The application of the principle is equivalent to making the Mississippi River navigation project bear the cost of levee slope paving in the MR&T project, or of the Gulf Intracoastal Waterway bearing the cost of the locks which were required in previously authorized waterways in order to permit the levees to be extended to protect additional land areas.
5. This principle is in no wise comparable to that of taking action to correct an unforeseen condition which has been brought on by the functioning of a project. In the subject instance, no action would be required until the Chalmette levee is constructed, hence the levee project should be complete within itself. The application of the cost shifting principle violates the cardinal principle of incremental justification and could be utilized to bring an unfavorable benefit-cost ratio to above unity by having a completed project bear a part of the cost; however, such action would bring up many awkward funding problems, particularly where fully completed projects are involved.

1 Incl
Table I (dupe)



THOMAS J. BOWEN
Colonel, CE
District Engineer

TABLE I

LAKE PONTCHARTRAIN, LA. & VICINITY
 COSTS FOR WAVEWASH AND FORESHORE PROTECTION

I. NAVIGATION PURPOSE

1.	Citrus back levee	
	Construction	\$1,555,365.00
	E&D	115,720.00
	S&A	99,100.00
		<u>\$1,770,185.00</u>
2.	New Orleans East Back Levee	
	Construction	\$ 783,130.00
	E&D	58,265.00
	S&A	49,885.00
		<u>\$ 891,280.00</u>
3.	Chalmette back levee	
	Construction	\$1,949,430.00
	E&D	212,490.00
	S&A	155,950.00
		<u>\$2,317,870.00</u>
	TOTAL, NAVIGATION PURPOSE	\$4,979,335.00

II. HURRICANE PROTECTION PURPOSE

1.	St. Charles Parish	
	Construction	\$2,184,130.00
	E&D	238,070.00
	S&A	174,730.00
		<u>\$2,596,930.00</u>
2.	Jefferson Parish	
	Construction	\$ 552,400.00
	E&D	57,400.00
	S&A	43,800.00
		<u>\$ 653,600.00</u>
3.	Citrus lakefront levee	
	Construction	\$1,409,800.00
	E&D	104,890.00
	S&A	89,800.00
		<u>\$1,604,490.00</u>

TABLE I (cont'd)

II. HURRICANE PROTECTION PURPOSE (cont'd)

4.	N.O. East lakefront levee	
	Construction	\$2,362,270.00
	E&D	176,200.00
	S&A	150,860.00
		<u>\$2,695,330.00</u>
5.	Rigolets levees & closure dam:	
	Construction	\$1,834,880.00
	E&D	165,140.00
	S&A	135,780.00
		<u>\$2,135,800.00</u>
6.	Chef Menteur levees & closure dam	
	Construction	\$ 428,340.00
	E&D	38,550.00
	S&A	31,700.00
		<u>\$ 498,590.00</u>
	TOTAL, HURRICANE PROTECTION PURPOSE	<u>\$10,184,740.00</u>
	TOTAL, WAVEWASH AND FORESHORE PROTECTION	\$15,164,075.00

LMVDE (LMVD 21 Mar 66)

4th Ind

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity -
Chalmette Area

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 15 Jun 66

TO: Chief of Engineers, ATTN: ENGCW

1. I concur in the concern of the District Engineer.
2. This item was discussed with Major General R. G. MacDonnell during the recent Command Inspection of LMVD.
3. No further action is contemplated by this office.



ELLSWORTH I. DAVIS
Major General, USA
Division Engineer

1 Incl
wd 1 cy

Copy furnished:
NOD, ATTN: LMNED-PP

1507-03 (Lake Pontchartrain) 18 Jul 66

ENGCW-OM (21 Mar 66) 5th Ind
SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity -
Chalmette Area

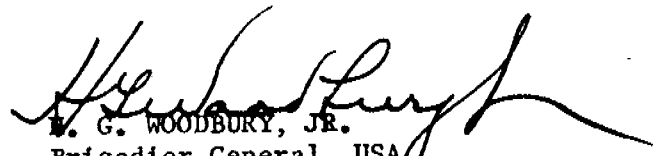
DA, CofEngrs, Washington, D. C. 20315, 6 July 1966

TO: Division Engineer, Lower Mississippi Valley Division

The concern of the Division and District Engineers that the decision made in this case may have serious implications if applied to other projects in the future, is appreciated. However, this particular decision was based on those facts pertaining to the specific projects involved and it was not intended that it be considered a precedent with the principles thereof applicable to other projects. If any similar cases develop they will be treated independently and without regard to this decision.

FOR THE CHIEF OF ENGINEERS:

1 Incl
w/d


W. G. WOODBURY, JR.
Brigadier General, USA
Acting Director of Civil Works

CC: NEW ORLEANS DISTRICT

LMVED (LMV 21 Mar 66)

6th Ind

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 18 July 66

TO: District Engineer, New Orleans District, ATTN: LMNED


A.S.D.



DEPARTMENT OF THE ARMY
LOWER MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
VICKSBURG, MISSISSIPPI 39180

IN REPLY REFER TO: LMVBC

24 April 1967

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity

TO: Chief of Engineers
ATTN: ENGCW-V & ENGCW-PR

1. Reference is made to the following:

a. Lower Mississippi Valley Division letter of 21 March 1966, subject: Hurricane Protection - Lake Pontchartrain and Vicinity - Chalmette Area.

b. New Orleans District letter of 29 November 1966, subject: Lake Pontchartrain, La., and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area.

c. House Document No. 231, 89th Congress, 1st Session, Lake Pontchartrain and Vicinity, La.

2. In first indorsement to Reference a. the Chief of Engineers considers that the portion of the cost that is required for riprap foreshore protection against erosion from wavewash from shipping should be charged to the navigation project as a Federal cost for wavewash protection. Obviously, the navigation project referred to is the Mississippi River-Gulf Outlet project.

3. In third indorsement to Reference a. the New Orleans District Engineer furnished an estimate of the costs for wavewash and foreshore protection chargeable to the navigation purpose. This estimate includes wavewash and foreshore protection for the Citrus back levee, the New Orleans East back levee, and the Chalmette back levee which are identified as the levees paralleling and adjacent to the Gulf Intracoastal Waterway and the Mississippi River-Gulf Outlet project as shown on Plate 3 of Reference c. In fifth indorsement to Reference a. the Chief of Engineers states that this particular decision (i.e., the decision in first indorsement) was based on those facts pertaining to the specific projects involved. Thus, the projects involved are the Lake Pontchartrain and Vicinity Hurricane Protection project, the Mississippi River-Gulf Outlet project, and the Gulf Intracoastal Waterway project.

LMVBC

24 April 1967

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity

4. Reference b. discusses enlargement of the Chalmette area and in paragraph 10 sets forth an additional cost of \$966,000 for foreshore protection along the Mississippi River-Gulf Outlet in Reach C-D. Paragraph 16 of Reference b. states that the modification of the Chalmette area will increase the total estimated cost of the Chalmette area plan from \$29,555,200 to \$37,697,000, which includes \$4,377,400 for foreshore protection along the Mississippi River-Gulf Outlet.

5. The sixth indorsement to Reference b. indicates that the costs for riprap foreshore protection along the Mississippi River-Gulf Outlet reach of the project are in excess of \$4 million.

6. It is our opinion, based on the above correspondence, that the costs of foreshore and wavewash protection to be provided along the north side of the Mississippi River-Gulf Outlet and the Gulf Intracoastal Waterway in the Citrus and New Orleans East areas and along the south side of the Mississippi River-Gulf Outlet in the Chalmette area are to be borne by the Federal government and are chargeable to the navigation projects.

7. There will be no difficulty in charging the cost of riprap protection to be placed adjacent to the Mississippi River-Gulf Outlet Navigation project to that project since it is still in a construction status. However, the remaining riprap in the Citrus area, and that in the New Orleans East area are adjacent to the Gulf Intracoastal Waterway which is a completed project and for which construction funds are not available. The cost of this protection cannot be charged to the Gulf Intracoastal Waterway without reopening the project, and since there are no other navigation projects in the area to bear the cost, your guidance is needed as to the funding of this portion of the riprap protection.

8. In summary, the cost of the riprap protection is approximately \$7 million at January 1966 price levels and ordinarily would be charged to the navigation projects as shown below:

	<u>Cost</u>	<u>Charge to</u>
Citrus Back Levee	\$1,770,185	Miss. R.-Gulf Outlet and G.I.W.W.
New Orleans East Back Levee	891,280	G.I.W.W.
Expanded Chalmette Area	<u>4,337,400</u>	Miss. R.-Gulf Outlet
Total	\$6,998,865	(Say \$7 million)

LMVBC


24 April 1967

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity

9. It is proposed to increase the cost of the Mississippi River-Gulf Outlet project by \$6 million (rounded) to provide for the riprap protection. Your concurrence in this action and in our opinion expressed in paragraph 6 above is requested, as well as guidance on the procedure to be followed in charging the costs of riprap protection for part of the Citrus area back levee and all of the New Orleans East back levee.

FOR THE DIVISION ENGINEER:

Copy furnished:
New Orleans Dist


MARSHALL E. BUSH
Chief, Program Development Office

ENCLOSURE (24 Apr 67)

1st Ind

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity

DA, OCE/Engrs, Washington, D. C. 20315, 26 May 1967

TO: Division Engineer
Lower Mississippi Valley Division

1. Based on discussions between the Division Engineer and members of the OCE staff, it has been determined that the costs of the riprap foreshore protection indicated below should be charged to the Mississippi River-Gulf Outlet project and included as part of the Federal cost of that project:

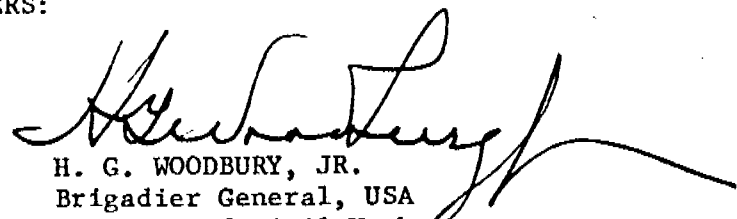
a. For the entire portion of the levee of the Chalmette Unit fronting the Mississippi River-Gulf Outlet project.

b. For the back levee of the Citrus Unit from the S.W. corner to Station 507+44.6.

2. The balance of the back levee of the Citrus Unit and the back levee of the New Orleans East Unit are not affected by wavewash from the Mississippi River-Gulf Outlet.

3. The above decision should be reflected in your reply to the 6th Indorsement of 12 April 1967, subject: "Lake Pontchartrain, Louisiana and Vicinity, Modification of the Chalmette Area Plan to Include Larger Area," which should be submitted promptly so that the appropriate Committees of Congress can be notified. In addition, the drafts of the letters to the Committees should give the amount of the increase in the Gulf Outlet project cost as a result of the above decision.

FOR THE CHIEF OF ENGINEERS:


H. G. WOODBURY, JR.
Brigadier General, USA
Director of Civil Works

LMVBC (24 Apr 67)

2nd Ind

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity

DA, Lower Miss. Valley Div, CE, Vicksburg, Miss. 39180 9 June 1967

TO: District Engineer, New Orleans

1. The determination made in paragraph 1 of the Chief of Engineers 1st Indorsement will require a revision in the PB-3 now being prepared for the Mississippi River-Gulf Outlet project. You should include the cost of riprap protection in accordance with that determination.

2. The statement in paragraph 2 of the preceding indorsement concerning the balance of the back levee of the Citrus unit and the back levee of the New Orleans East unit was further discussed with the Chief of Engineers on this date. It is the intent of the Chief of Engineers to require funding for this work within the Lake Pontchartrain project.

3. Based on the determinations made, and as further clarified by this indorsement, you should comply with the instructions issued in paragraph 3 of the Chief's indorsement.

FOR THE DIVISION ENGINEER:



for MARSHALL E. BUSH
Chief, Program Development Office

Copy furnished:
OCE, ATTN: ENGCW-B

1507-03 (Lake Pontchartrain)

LMVED-PP (24 Apr 67)

3d Ind

19 Jul 67
Chatry/kn/239

SUBJECT: Hurricane Protection - Lake Pontchartrain and Vicinity

DA, New Orleans District, CE, New Orleans, La. 70160 19 Jul 67

TO: Division Engineer, Lower Miss. Valley, CE, ATTN: LMVBC

Action directed in paragraph 3 of 1st Ind of this chain was taken in 8th Ind dated 14 Jul 67 to LMVED-PP ltr dtd 29 Nov 1966 subject "Lake Pontchartrain, La. and Vicinity - Modification of the Chalmette Area Plan to Include Larger Area."

FOR THE DISTRICT ENGINEER:

GEORGE H. HUDSON
Chief, Engineering Division

JH for
Mask

f. H. Hudson
Hudson

67-1132

ENGCW-OM

27 November 1967

Honorable Carl Hayden
Chairman, Committee on Appropriations
United States Senate
Washington, D. C. 20510

Dear Mr. Chairman:

This letter is to advise you of an increase in estimated Federal costs for three closely related projects in the New Orleans, Louisiana area, namely the Lake Pontchartrain and Vicinity Hurricane Protection project; the New Orleans to Venice Hurricane Protection project; and the Mississippi River-Gulf Outlet Navigation project. These increases result primarily from approval of project modifications by the Chief of Engineers.

The Lake Pontchartrain and Vicinity, Louisiana, Hurricane Protection project was authorized by the Flood Control Act of 1965 (H. Doc. 231, 89th Congress, 1st Session). This project, which will provide protection from hurricane generated floods, consists of two units, the Lake Pontchartrain barrier plan and the Chalmette area plan. The authorizing document provides for reexamination of the levee alignment during the preconstruction planning stage with a view to protecting additional lands. The preliminary results of the study for hurricane protection in St. Bernard Parish initiated under a resolution for the review of hurricane protection in that parish indicated conclusively that expansion of the Chalmette area plan to encompass additional areas including the area between Violet and Verret (Reach E of the New Orleans to Venice project) were fully justified and should be incorporated into the project plan for the Chalmette area. Conditions experienced during hurricane Betsy in 1965 resulted in the development of new hurricane parameters with the result that net levee grades have been increased. The increased levee height requirement has necessitated the realignment of levees and other structural modifications. The most recent estimate of the Federal cost of the modified project for Lake Pontchartrain and Vicinity Hurricane Protection is \$92,598,000, an increase of \$20,927,500 over the amount previously reported to Congress in connection with the Fiscal Year 1968 Budget. The B/C ratio is 13.5 to 1.

ENGCGW-OM
Honorable Carl Hayden

27 November 1967

The New Orleans to Venice, Louisiana, Hurricane Protection project was authorized by the Flood Control Act of 1962 (H. Doc. 550, 87th Congress, 2d Session). This project will provide for hurricane protection on four reaches of the Mississippi River below New Orleans by increasing the height and section of the existing back levees and other improvements. Conditions experienced during Hurricane Betsy in 1965 resulted in the development of new hurricane parameters with the result that the net levee grades have been increased from about 13.5 feet to 15.0 feet. In certain reaches, the increased levee height requirement made necessary the realignment of levees and other structural modifications. As indicated heretofore, Reach E was eliminated from this project and incorporated into the Lake Pontchartrain and Vicinity Project. As a result of the above changes, the estimate of the Federal cost of the modified project for New Orleans to Venice Hurricane project is \$24,064,000, an increase of \$15,014,000 over the amount previously reported to Congress in connection with the Fiscal Year 1968 Budget. The B/C ratio is 2.5 to 1.

The Mississippi River-Gulf Outlet project was authorized by Public Law 455, 84th Congress, approved 29 March 1956 (H. Doc. 245, 82d Congress, 1st Session). At the time this project was authorized there existed, within the city of New Orleans, levees of substantial dimensions extending along both banks of the project navigation canal. Construction of the navigation project exposed these levees and the foreshore between them and the channel to direct attack with resultant damage from waves generated by seagoing vessels utilizing the waterway. The navigation project should have included adequate provisions for protecting these levees and their foreshore from this damage. In addition, this protection will be necessary to protect the new levees which will be constructed for sections of the Lake Pontchartrain and Vicinity Hurricane Protection project located adjacent to this ship channel. In view of this, as a mitigating measure, the plan for Mississippi River-Gulf Outlet project has been modified to provide wave wash protection for approximately 6 miles of levees and foreshore on the north bank of the channel and about 18 miles of levees and foreshore along the south bank. The authorization provided that replacement of the existing Industrial Canal lock or an additional lock be constructed when economically justified by obsolescence of the existing lock or by increased traffic. Recent studies have shown that replacement of the lock will apparently be justified and therefore it is being included

ENCCW-OM

27 November 1967

Honorable Carl Hayden

in the project. The most recent estimate of the Federal cost of the modified project for Mississippi River-Gulf Outlet navigation is \$13,000,000 an increase of \$4,000,000 over the amount previously reported to Congress in connection with the Fiscal Year 1968 Budget. Included in this increase is \$3,370,000 for wave wash protection and \$600,000 for planning and construction of the additional lock. The B/C ratio is 1.5 to 1.

A similar letter is being sent to the Chairman of the House Committee on Appropriations.

Sincerely yours,

H. G. WOODBURY, JR.
Brigadier General, USA
Director of Civil Works

Copy furnished:
Lower Mississippi Valley Division
New Orleans District