US Army Corps
of Engineers
New Orleans District

# LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY

## CHALMETTE AREA PLAN

# BAYOU DUPRE CONTROL STRUCTURE PERIODIC INSPECTION REPORT NO. 6

**25 APRIL 1990**

CELMV-ED-GS (CELMN-ED-DG/15 Aug 90) (1105-2-10c) 3d End
Mr. Cave/jl/601-634-5897
SUBJECT: 1990 Periodic Inspection Report No. 6 for Bayou Dupre Control Structure

CDR, Lower Mississippi Valley Division, Vicksburg, MS 39181-0080

04 NOV '91
FOR Commander, New Orleans District, ATTN: CELMN-ED-DG

Actions taken in the preceding 2d End are satisfactory. No further action is required on this correspondence chain.

FOR THE COMMANDER:

2 Encls
wd 1 cy encl 2

for William R. Bailey
FRED H. BAYLEY III
Director of Engineering

CELMN-ED-DG (ED-DG/15 Aug 90) 2d End Mr. Mayeux/cm/2714
SUBJECT: 1990 Periodic Inspection Report No. 6 for Bayou Dupre Control Structure

DA, New Orleans District, Corps of Engineers, P. O. Box 60267, New Orleans, LA 70160-0267 21 Mar 91

FOR Commander, Lower Mississippi Valley Division, ATTN: CELMV-ED-G

Disposition of the comments made on the 1st End follows. The paragraph numbers refer to like numbered paragraphs.

a. Para. 6-02a.(3) and Photo No. 3. Concur. Para. 6-02a.(3) has been revised. Three copies of revised page VI-1 are submitted for your files (see encl 2).

b. Photo No. 11. Concur. Para. 6-02a(6) has been added to include this comment. Three copies of revised page VI-1 are submitted for your files (see encl 2).

W. EUGENE TICKNER
Chief, Engineering Division

2 Encls
wd encl 1
Added 1 encl (3 cys)
2. as

## SECTION VI - CONCLUSIONS AND PROPOSED REMEDIAL ACTIONS

6-01 Conclusions. It is concluded from Periodic Inspection No. 6 of the Bayou Dupre Control Strcuture, that the structure is structurally soumd and stable, and that operational capability meets the requirements established in the original design criteria.

6-02 Proposed Remedial Actions. To ensure continuation of safety, stability, and operational capability of the structure, the following remedial actions will be performed by the LBBLD.

a. Concrete.

(1) The expansion joints, minor spalls and shrinkage cracks will continue to be monitored by LBBLD.

(2) The thin sheet of concrete which has separated further off the wall near the east gate hinge, will continue to be monitored by LBBLD.

*(3) The rusted portion of the metal hatch on top of the east gate monolith (shown in Photo No. 3) will be cleaned and painted and the concrete repaired by LBBLD.*

(4) The differential settlement between the "T"-wall monoliths, "T"-wall and concrete sheet pile wall, and "T"-wall and structure monolith, causing differential movement at the expansion joint, will continue to be monitored by LBBLD.

(5) The LBBLD will install wood blocking to hold the expansion joint material in place at the gap on top of the "T"-type floodwall and structure monolith on the east and west sides.

*(6) The spalled area at the joint of the concrete sheet pile shown on Photo No. 11, will be repaired by LBBLD.*



Encl 2

*Revised March 1991

S: 29 Mar 91

CELMV-ED-GS (CELMN-ED-DG/15 Aug 90) (1105-2-10c) 1st End
Mr. Cave/jl/601-634-5897
SUBJECT: 1990 Periodic Inspection Report No. 6 for Bayou Dupre Control Structure

CDR, Lower Mississippi Valley Division, Vicksburg, MS 39181-0080

28 FEB '91

FOR Commander, New Orleans District, ATTN: CELMN-ED-DG

1. The enclosed periodic inspection report is approved subject to the following comments:

a. Para 6-02a.(3) and Photo No. 3. The rusted portion of the metal hatch should be cleaned and painted and the concrete repaired as required. Continuing to "monitor" the problem will only result in a worse condition in another year or so.

b. Photo No. 11. The spalled area at the joint of the concrete sheet pile should be repaired.

2. The report should be revised in accordance with the comments in para 1 above and revised pages should be submitted to this office by 29 Mar 91.

FOR THE INTERIM DIVISION ENGINEER:

James R. Hill

Encl (6 cys)
wd 3 cys

for WILLIAM R. HILL
Chief, Engineering Division

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

CELMN-ED-DG

15 August 1990

MEMORANDUM FOR Commander, Lower Mississippi Valley Division,
ATTN: CELMV-ED-G

SUBJECT: 1990 Periodic Inspection Report No. 6 for Bayou Dupre Control Structure

Subject report is submitted for your approval.

1 Encl (6 cys)
as

for W. EUGENE TICKNER
Chief, Engineering Division

# LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY

## CHALMETTE AREA PLAN

## BAYOU DUPRE CONTROL STRUCTURE

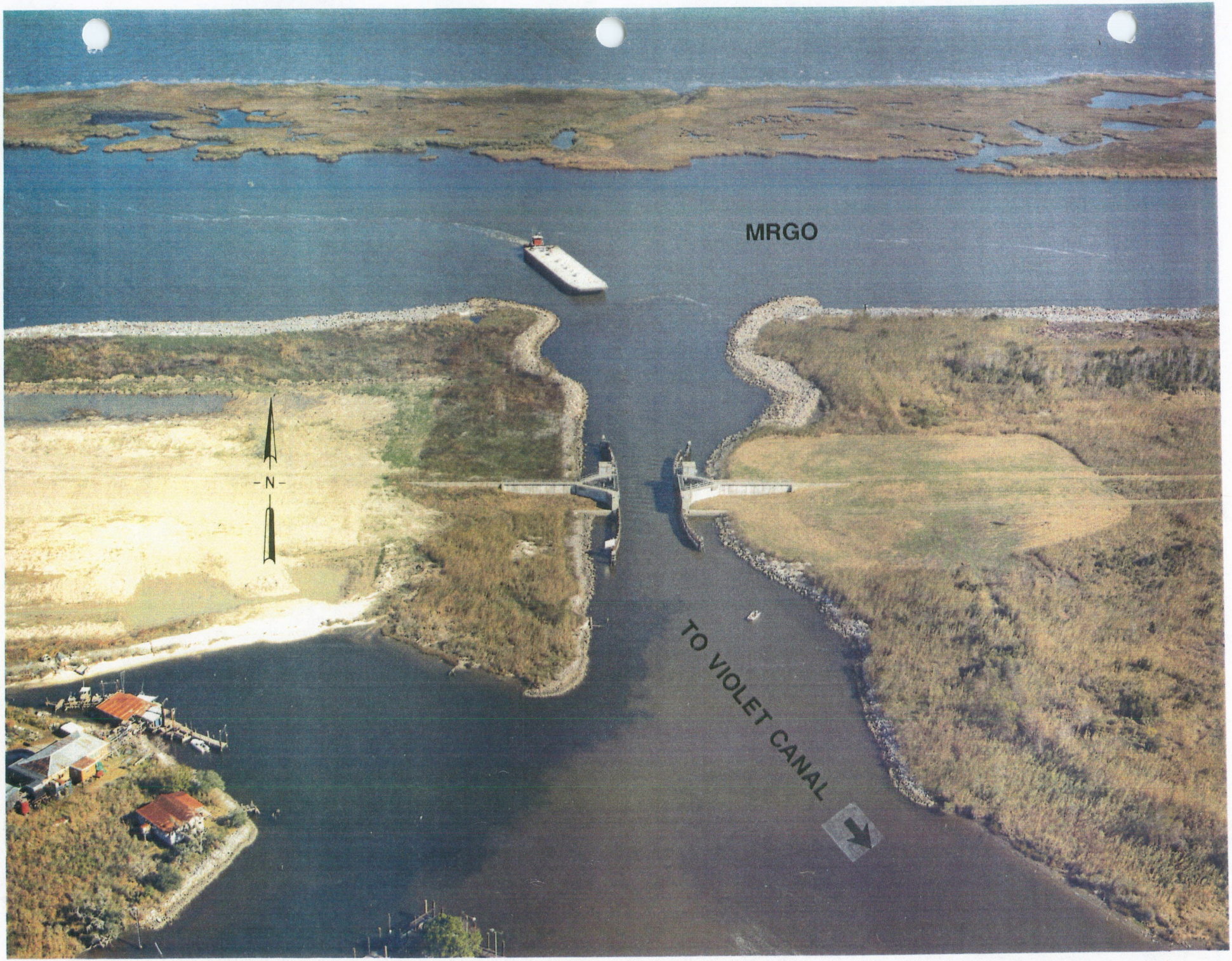
## PERIODIC INSPECTION REPORT NO. 6

25 April 1990

U. S. ARMY ENGINEER DISTRICT

CORPS OF ENGINEERS

NEW ORLEANS, LOUISIANA




BAYOU DUPRE CONTROL STRUCTURE

PHOTO TAKEN IN DECEMBER 1987

## SUMMARY

Periodic Inspection No. 6 of the Bayou Dupre Control Structure was conducted by representatives from New Orleans District (NOD), and the Lake Borgne Basin Levee District (LBBLD) on 25 April 1990. Observations made during this inspection indicate that the Bayou Dupre Control Structure is structurally sound and that the operational capability of the structure meets the criteria established in the original design memorandum.

Some remedial actions are required. The deficiencies noted are minor and will be corrected as discussed in Section VI.

## PREVIOUS PERIODIC INSPECTION REPORTS

| Report No. | Date of Inspection | Date of Report Submittal | Date of Report Approval |
|---|---|---|---|
| 1 | 22 Feb 74 | 24 May 74 | 25 Jun 74 |
| 2 | 12 Mar 80 | 1 Aug 80 | 10 Nov 80 |
| 3 | 1 Dec 83 | 2 Feb 84 | 6 Apr 84 |
| 4 | 25 Jun 86 | 1 Dec 86 | 19 Mar 87 |
| 5 | 8 Apr 87 | 10 Sep 87 | 16 Oct 87 |

## LIST OF ABBREVIATIONS

The following list of abbreviations are used in this report:

| | |
|---|---|
| NOD | New Orleans District |
| LMVD | Lower Mississippi Valley Division |
| LBBLD | Lake Borgne Basin Levee District |
| Engr Div | Engineering Division |
| Gen Engr Sec | General Engineering Section |
| Gen Engr Sec (Mech) | General Engineering Section, Mechanical |
| Gen Engr Sec (Elec) | General Engineering Section, Electrical |
| Struc Des Sec | Structural Design Section |
| F&M Br | Foundations and Materials Branch |
| H&H Br | Hydraulics and Hydrologic Branch |
| O&R Div | Operations and Readiness Division |
| Tech Engr Br | Technical Engineering Branch of LMVD |
| LDOTD | Louisiana Department of Transportation and Development |

~~LAROSE FLOODGATE~~

# PERIODIC INSPECTION REPORT NO. 6

## TABLE OF CONTENTS

## SECTION 1 - INTRODUCTION

1-01 Authority. Authority is provided by ER 1110-2-100, subject, Periodic Inspection and Continuing Evaluation of Completed Civil Works Structures," dated 8 Apr 88.

1-02 Purpose and Scope. The results and conclusions of the inspection and evaluation for assuring the structural integrity and operation adequacy of the structure are presented herein.

1-03 Datum. All elevations, except where otherwise indicated, are in feet and refer to the National Geodetic Vertical Datum of 1929 (NGVD), formerly mean sea level (msl).

## SECTION II - PROJECT DESCRIPTION AND BACKGROUND

2-01 General. Bayou Dupre Control Structure is a feature of the Chalmette Area Plan of the Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project authorized by Public Law 298, 89th Congress, 1st Session, approved 27 October 1965. On 29 November 1969, it was recommended that the approved plan of hurricane protection for the Chalmette area contained in Design Memorandum No. 3, General Design for Lake Pontchartrain, Louisiana and Vicinity, Chalmette Area Plan, be modified under the discretionary authority of the Chief of Engineers to provide for enlargement of the protected area. This would be done by the construction of a levee from the Mississippi River levee near Caernarvon, Louisiana, thence to and along the Mississippi River Gulf Outlet (MRGO) spoil bank to a junction with the approved plan levee at Bayou Lawler and the elimination of the levee in the approved plan from Bayou Lawler to Violet. This recommendation was approved by OCE on 31 January 1967. As part of the modification to the plan, navigable control structures would be built for Bayous Dupre and Bienvenue at their junctions with the MRGO. The Bayou Dupre Control Structure was constructed under Contract No. DACW29-72-C-0159, which was awarded to Williams-McWilliams Co. It was completed in July 1974 and turned over to Lake Borgne Basin Levee District (LBBLD) for maintenance and operation in accordance with the conditions of local cooperation, as specified by the authorizing law.

The control structure is located in St. Bernard Parish, Louisiana, near the intersection of Bayou Dupre and the MRGO. The structure is located at station 707+57.90 on the MRGO baseline, approximately 1,700 feet southeast

of the original intersection of Bayou Dupre and the MRGO. The site is accessible by boat via the MRGO from the intersection of Parish Road and the MRGO, and via Bayou Dupre from Violet, Louisiana. During the dry season the structure is accessible by vehicle driving on the crown of the MRGO levee.

A description of the structure and historical and other general information are included in Report No. 1, which also contains selected construction drawings illustrating typical sections and details. This report and others issued subsequently to Report No. 1 are considered supplementary to that report.

## SECTION III - OPERATION AND MAINTENANCE DATA

3-01 Operation and Maintenance.

a. General. Operation and maintenance of the Bayou Dupre Control Structure is the responsibility of the Lake Borgne Basin Levee District (LBBLD). The floodgate has operated successfully several times since the last inspection due to highwater conditions.

b. Operation and Maintenance Problems. Semi-annual reports submitted by LBBLD indicate no operation and maintenance problems at Bayou Dupre Control Structure since the last inspection.

3-02 Status of Remedial Actions Recommended in the Previous Inspection Report.

a. The following remedial actions listed in the last periodic inspection report were accomplished while the structure was dewatered:

1. Blasting and painting of sector gates. Repair of ladders and other metal items damaged by corrosion.

2. A new cathodic protection system was installed on the sector gates.

3. Replacement of the timber fender systems on both gates.

4. Repairs to the dolphins on the east side of the structure. Repair to navigable lights on these dolphins.

5. Repair of the tidal current warning system.

6. Replacement of staff gages.

## SECTION IV - REVIEW DESIGN AND ANALYSIS OF INSTRUMENTATION

4-01 Review of Design. The original design of the Bayou Dupre Control Structure was made in accordance with standard engineering practice and with criteria as set forth in engineering manuals for civil works construction published by the Office of the Chief of Engineers. The original design criteria was given in Periodic Inspection Report No. 1; therefore, a detailed review of the design is not included herein, and can be obtained by referring to the above report.

4-02 Analysis of Instrumentation. The latest surveys of the Bayou Dupre Control Structure were completed in December 1989. Findings are as follows:

a. Settlement Reference Marks. The settlement reference marks for the floodwall and concrete sheet pile wall on the east and west sides of the control structure show continued settlement as expected due to additional fill placements in these areas accomplished in 1978 and 1983 (east side), and 1981 and 1987 (west side). Because the settlement is occurring at a relatively rapid rate, the east and west floodwalls and sheet pile walls should be monitored closely to detect any possible future settlement that could endanger the safety of the structure.

b. Scour Survey.

(1) Scour of about 4 feet in depth was noted at Stations 8+50 and 10+00; and shoal of about 10 feet at Station 5+00 in the north approach channel. There is no significant threat to the integrity of the riprap apron, at this time.

(2) Based on the comparison of the 13 Dec 89 and the 12 Dec 88 surveys for the south approach channel, it was determined that the scour hole at Station 17+00 has deepened an average of 6 feet. Comparison of the 13 Dec 89 with the June 1982 surveys indicated that the scour hole has deepened from -10 feet in 1982 to -36 feet in 1989. The scour hole appears to be migrating toward the east bank. Since the hole is in the deeper portion of the channel, no threats exist to the structure. At the present, no visible signs of erosion are indicated. However, monitoring of this situation is recommended for the private property in the vicinity of Station 17+00.

## SECTION V - INSPECTION

5-01 Inspection Team.

a. NOD. The following personnel from NOD participated in Periodic Inspection No. 6 of Bayou Dupre Control Structure:

| | |
|---|---|
| Paul Mayeux | Gen Engr Sec (Inspection Coordinator) |
| Paul Salassi | Gen Engr Sec (Struc Insp Unit) |
| Aiden Andry | Gen Engr Sec (Struc Insp Unit) |
| Emanuel Harris | Gen Engr Sec (Struc Insp Unit) |
| Dennis Strecker | Gen Engr Sec (Mech) |
| Dan Bradley | Gen Engr Sec (Elec) |
| Charles Laborde | Struc Des Sec |
| Jose Lizarribar | F&M Br (Mat'l Sec) |
| Roberto Estrada | F&M Br (Found Sec) |
| Angel Mislan | H&H Br |
| Deborah Garrett | H&H Br |
| Bob Kahl | O&R Div (Lock Sec) |

b. Local Interests. The Lake Borgne Basin Levee District was represented at this inspection by Dan Caluda, Bob Brocomedes, Mr. Collins and Mr. Gilmore. The Louisiana Department of Transportation and Development was represented by A.V. Flotte and Connie Standige.

5-02 Orientation. A preinspection briefing was conducted for NOD personnel participating in this inspection on 18 Apr 90 to familiarize NOD personnel with the general features, technical data and plan of inspection of the floodgate structure. A second briefing was conducted at the project site prior to the inspection to familiarize the LBBLD representative with the structure.

5-03 Observations. The following observations were made by team members during Periodic Inspection No. 6 of the Bayou Dupre Control Structure.

a. Concrete. The concrete structure including T-walls was generally found to be in good condition and appears to be sound and stable.

(1) Structure. The following minor items were noted for future monitoring:

(a) A shrinkage crack with effloresence was noted at the lower corner of the west gate hinge recess. See Photo No. 2.

(b) A thin sheet of concrete has separated further off the wall near the east gate hinge. The area was painted black with the same paint used for the gates during the 1987 repairs. The separation has resulted in loss of concrete cover thickness and could eventually lead to corrosion on the reinforcing steel. See Photo No. 4.

(c) The vertical crack with minor efflorescence was again observed at the cable assembly of the east gate. This shrinkage crack formed soon after the initial concrete placement. The crack appears not to have widened or extended. See Photo No. 5.

(d) The exposed reinforcing steel near the "A-NE" mark on the east gate monolith, noted during the last periodic inspection, has not worsened or caused any deterioration to the surrounding concrete. See Photo No. 8.

(e) Some tie rod patches on walls appeared to have been repaired; however, others do not show any further deterioration. See Photo No. 9.

(f) White substance on walls, apparently curing compound, was noted. No change could be visually determined from previous inspections. This condition is only of aesthetic impact and should not worsen.

(g) The metal hatch on top of the east gate monolith shows corrosion around its perimeter, causing minor concrete spalling. See Photo No. 3.

(2) Spalls. No major spalls were observed during the inspection. Minor spalls were noted on the top corners of the concrete sheetpiles due to differential settlement. See Photo No. 11.

(3) Joints.

(a) A gap of 1/2" was found at the top between the two west side "T"-type floodwall monoliths. This gap tapered to 0"± at the groud level. A similar gap of 1" was found between the two east side "T"-type floodwall monoliths. However, in each case the waterstops and expansion joint material were found to be intact.

(b) The same conditions noted in Periodic Inspection No. 4 remain at the expansion joints between T-wall monoliths and T-walls and gate monoliths. In the top, the sealant is desiccated and has shrunk and some of it is missing. On the sides, it is also desiccated and shrunken but most of it is still in place. Due to the inaccessibility of the structure and since the joints are free from foreign material, no remedial action is recommended at this time. See Photo No's. 6 and 7.

(c) A gap of 1" on the east side and 1 1/2" on the west side were found between the top of the "T"-type floodwall and the structure monolith. The 3-bulb waterstop was intact but the expansion joint material was coming out. The LBBLD stated they will install wood blocking to hold the expansion joint material in place.

(d) A gap of 1" to 1 1/2" was observed between each of the 4 wingwalls and the structure monolith. The water stop was intact. No evidence of additional soil loss was noticed through the joint between the N-E wingwall and the structure (documented in report

no. 4). See Photo No. 10. These locations should be monitored for loss or subsidence of soil behind the wing walls.

(e) The expansion joint between the "T"-wall and concrete sheet pile wall on the west side of the structure has separated considerably. The sealant is missing and the gap left between T-wall and the I-wall is approximately 6 inches. It is recommended that this gap be covered from the top to prevent the intrusion of debris, animals or injury to humans. See Photo No. 1.

b. Gates. The sector gates were in excellent to good condition with no observable corrosion or structural damage. The seals were in good condition.

c. Mechanical. The gate machinery operated satisfactorily using both commercial and diesel generator power. The engine generator has an exhaust leak at the connection of the flexible exhaust to the engine exhaust manifold. The flexible connection should be repaired or replaced. The gate machinery was well maintained.

d. Electrical. The electrical system was in good operating condition, with no apparent problems.

e. Sheetpiling. The east and west concrete sheet pile walls continue to settlement due to the embankment fill material put adjacent to these structures. Based on this, it is recommended that the capping of these walls be postponed until the rate of settlement has decrased to a minimum. Several of the sheetpiles on both the east and west sides are pulling apart at their interlocks (1/2" to 1 1/2"). In all cases the interlocks were intact.

f. Embankments. The repair work on the east and west banks of the north approach channel were in satisfacory condition.

g. Gages. The staff gages on the end of the timber guidewalls were in good condition.

Two additional staff gages were observed on the structure; one on the inside of the northeast timber fender and the other on the inside of the southeast fender. According to the levee district representative, these gages are not read to record data. The gages should be removed in order to avoid confusion in data collection.

h. Timber Guidewalls.

(1) The timber guidewalls are the originals installed in 1972 and are still in good condition. The vertical walers are not capped, but they are in good condition after 18 years in service. The metal caps on the piles are rusted, but appear to still be providing adequate weatherproofing. See Photo No. 12.

(2) The fender system was replaced during the 1987 repairs. The field cuts appear to have been field treated with creosote as requested following Periodic Insepction No. 5. Some members show minor nicks, apparently caused by marine traffic.

(3) The two timber pile dophins on the south side of the structure were found to be damaged. The LBBLD stated that they will replace them in the near future.

i. Cathodic Protection System. The LBBLD secured the services of a corrosion-cathodic protection engineering firm, who conducted tests on the day of Periodic Inspection No. 6, 25 Apr 90. The report containing the results of those tests, indicates that the current system is adequately protecting the structure.

PHOTO 1: JOINT BETWEEN T-WALL AND CONCRETE SHEET PILE WALL ON WEST SIDE. THE SHEET PILE WALL HAS SEPARATED APPROX 6" TO THE WEST. THE TOP SEALANT IS MISSING LEAVING A VERY DEEP AND WIDE OPENING.

PHOTO 2: VERTICAL SHRINKAGE CRACK OFF THE WEST GATE HINGE RECESS. NOTE EFFLORESCENCE.

PHOTO 3: CORROSION OF METAL HATCH ON TOP OF THE SOUTH END OF THE EAST GATE MONOLITH. NOTE CONCRETE SPALLS DUE TO EXPANSION OF THE METAL.

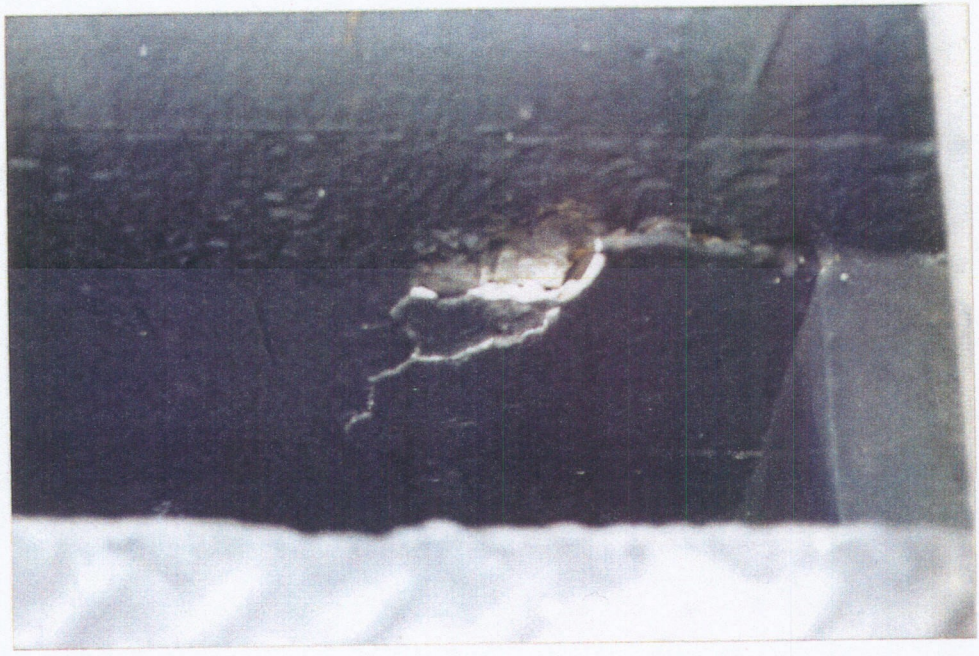


PHOTO 4: DELAMINATED CONCRETE NEAR THE EAST GATE HINGE RECESS. THE SHEET OF CONCRETE HAS SEPARATED SINCE INSPECTION NO. 4. NO CORRSION IS EVIDENT.

PHOTO 5: VERTICAL SHRINKAGE CRACK OFF THE EAST GATE HINGE RECESS. NOTE EFFLORESCENCE. NO APPARENT CHANGE SINCE INSPECTION NO. 4.

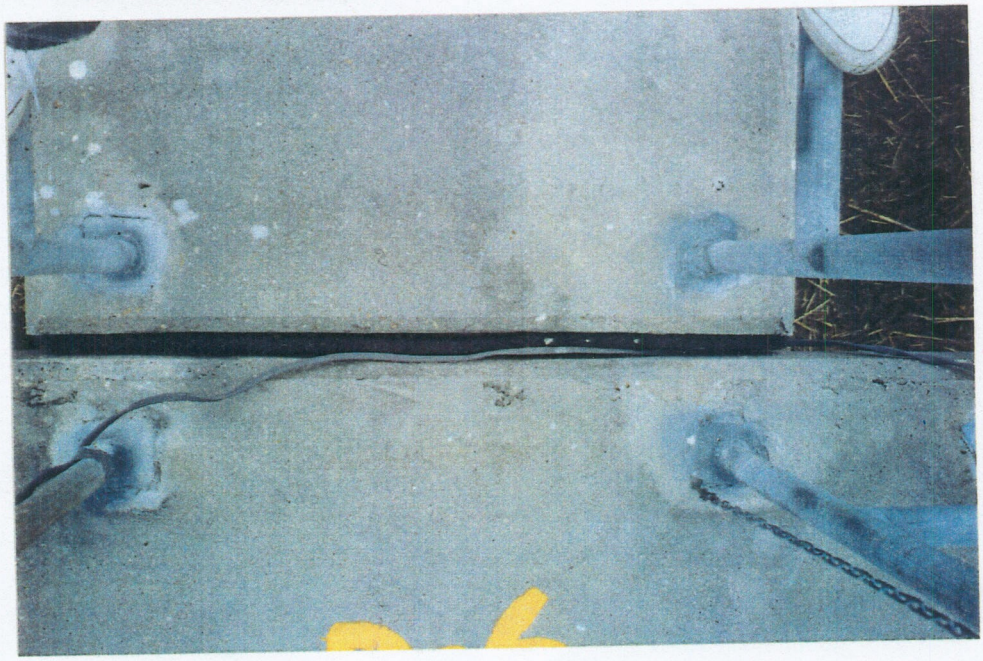


PHOTO 6: TYPICAL CONDITION OF EXPANSION JOINT BETWEEN THE GATE MONOLITHS AND T-WALLS. FILLER MATERIAL IS DESICCATED AND SHRUNKEN. NO DEBRIS IN JOINTS.

PHOTO 7: TYPICAL CONDITION OF EXPANSION JOINT BETWEEN THE T-WALL MONOLITHS. FILLER MATERIAL IS DESICCATED AND SHRUNKEN, SOME IS MISSING. NO DEBRIS IN JOINTS.


PHOTO 8: EXPOSED PIECE OF METAL ON TOP SURFACE OF EAST GATE MONOLITH. NO CHANGE OR DETRIMENTAL ACTION TO THE CONCRETE SINCE INSPECTION NO. 4.

PHOTO 9: TIE ROD PATCH THAT WAS APPARENTLY REPAIRED. THE GENERAL CONDITION OF THE PATCHES IS GOOD.

PHOTO 10: L-SHAPE WATERSTOP AT THE GATE MONOLITH AND WINGWALL JOINTS. NO EVIDENCE OF MORE SOIL LOSS THRU JOINTS.

PHOTO 11: TYPICAL SPALL AT THE CORNER OF CONCRETE SHEET PILE WALL DUE TO DIFFERENTIAL VERTICAL AND HORIZONTAL MOVEMENT.

PHOTO 12: TIMBER GUIDEWALL WITH RUSTED PILE CAPS AND UNCAPPED WALERS. THE GUIDEWALL HAVE BEEN IN PLACE FOR 18 YEARS AND ARE IN GOOD CONDITION.

## SECTION VI - CONCLUSIONS AND PROPOSED REMEDIAL ACTIONS

6-01 Conclusions. It is concluded from Periodic Inspection No. 6 of the Bayou Dupre Control Structure, that the structure is structurally sound and stable, and that operational capability meets the requirements established in the original design criteria.

6-02 Proposed Remedial Actions. To insure continuation of safety, stability, and operational capability of the structure, the following remedial actions will be performed by the LBBLD.

a. Concrete.

(1) The expansion joints, minor spalls and shrinkage cracks will continue to be monitored by LBBLD.

(2) The thin sheet of concrete which has separated further off the wall near the east gate hinge will continue to be monitored by LBBLD.

REVISED
Sa Incl 2

(3) The metal hatch on top of the east gate monolith will continue to be monitored by LBBLD for further corrosion and concrete spalling adjacent to the hatch.

(4) The differential settlement between the "T"-wall monoliths, "T"-wall and concrete sheet pile wall, and "T"-wall and structure monolith, causing differential movement at the expansion joint, will continue to be monitored by LBBLD.

(5) The LBBLD will install wood blocking to hold the expansion joint material in place at the gap on top of the "T"-type floodwall and structure monolith on the east and west sides.

b. Mechanical. The flexible connection at the exhaust manifold of the emergency diesel generator will be replaced or repaired by LBBLD.

c. Sheetpiling. The LBBLD has been requested not to cap the sheetpiling until the rate of settlement has decreased to a minimum.

d. Gages. The LBBLD has agreed to remove the two additional staff gages, one on the inside of the northeast timber fender and the other on the inside of the southeast fender.

e. Timber Guidewalls. The two timber pile dophins on the south side of the structure which were damaged, will be replaced by LBBLD.

f. Cathodic Protection System.

(1) The LBBLD has been requested to secure the services of the same corrosion-cathodic protection engineering firm, if possible, for a system test to be conducted within one month of the next periodic inspection. A Corps representative should be invited to witness the tests.

(2) Prior to the time of testing, shunts for current measurements should be installed under the direction of the corrosion engineer to facilitate system testing.

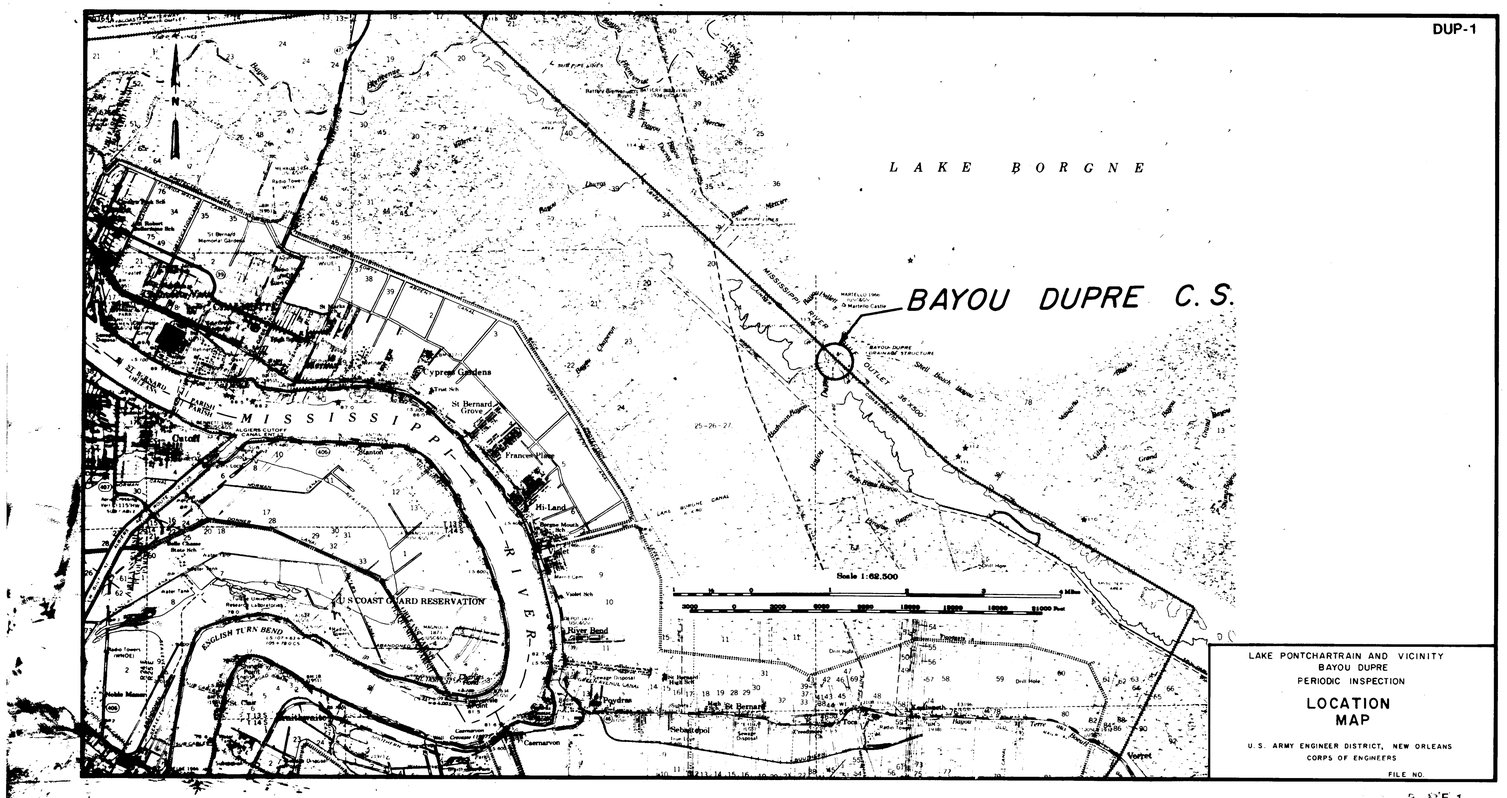
(3) If the test results indicate system degradation relative to the 25 Apr 90 test results, part of the perforated PVC pipe surrounding each anode should be removed. This would involve some underwater work for freeing and resecuring the pipe.

6-03 Next Inspection. The next periodic inspection will be in 3 years, Apr 93.

# BAYOU DUPRE CONTROL STRUCTURE

## INDEX OF INSTRUMENTATION PLATES

DUP-1



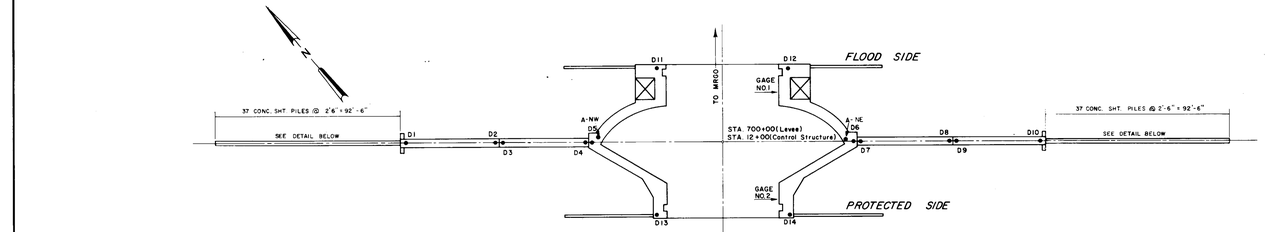

LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

# LOCATION MAP

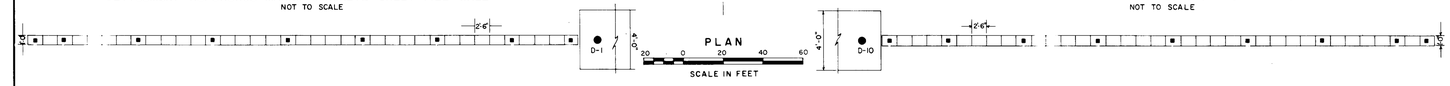
U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

FILE NO.

PLATE 1




SETTLEMENT REFERENCE MARKS-CONCRETE SHEET PILE WALL
NOT TO SCALE




SETTLEMENT REFERENCE MARKS - CONCRETE SHEET PILE WALL
NOT TO SCALE

DISTANCE TO REFERENCE MARKS

| NO. OF REFERENCE MARKS | | D2 - D3 | D4 - D5 | D5 - D6 | D6 - D7 | D8 - D9 | D11 - D12 | D13 - D14 |
|---|---|---|---|---|---|---|---|---|
| INITIAL DATE | | 6-7-74 | 6-7-74 | 6-7-74 | 6-7-74 | 6-7-74 | 6-7-74 | 6-7-74 |
| ORIGINAL READINGS (FT) | | 4.00 | 4.05 | 129.96 | 4.00 | 4.00 | 64.17 | 64.06 |
| DATE OF OBSERVATIONS | 2 APRIL 1984 | 4.04 | 4.08 | — | 4.04 | 4.04 | — | — |
| | 10 OCTOBER 1984 | 4.02 | 4.08 | — | 4.04 | 4.02 | — | — |
| | 28 JULY 1986 | 4.03 | 4.08 | — | 4.03 | 4.03 | — | — |
| | 18 FEBRUARY 1987 | 4.03 | 4.09 | — | 4.05 | 4.04 | — | — |
| | 02 MARCH 1988 | 4.02 | 4.09 | — | 4.05 | 4.02 | — | — |
| | 15 DECEMBER 1988 | 4.03 | 4.10 | — | 4.06 | 4.03 | — | — |
| | 15 DECEMBER 1989 | 4.03 | 4.07 | — | 4.05 | 4.03 | — | — |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

PBM TED Elevation N.G.V.D.
Galvanized pipe, 1¾ inches in diameter, was set in bore hole at a depth of 95 feet. The 1¾-inch diameter pipe was then driven an additional 10.5 feet into strata. PBM is on the east side of Bayou Dupre, south side of the structure, 105 feet from Bayou Dupre and 282 feet from the wall of the structure. The 1¾-inch pipe is protected by 3-inch diameter galvanized pipe with cap and three 1⅞-inch guard posts painted yellow.

PBM BD-2 Elevation N.G.V.D.
Galvanized pipe, 1¾ inches in diameter, was set in bore hole at 95 feet, then driven an additional 10.5 feet into strata. PBM is on the west side of Bayou Dupre and on the south side of the structure, 67 feet from Bayou Dupre and 291 feet from the wall of the structure. The 1½-inch pipe is protected by 3-inch diameter galvanized pipe with cap and three 1⅞-inch guard post painted yellow.

NOTE:
Bench marks set and vertical control established during the months of May and June 1974 by the Survey Branch. All elevations are expressed in feet and refer to N.G.V.D.

PBM BD-3 Elevation N.G.V.D.
Galvanized pipe, 1½ inches in diameter was set in bore hole at a depth 95 feet then driven an additional 10.5 feet into strata. PBM is on the west side of Bayou Dupre and 128 feet west of Bayou Dupre and 483 feet from the wall of the structure. The 1½-inch diameter pipe is protected by 3-inch diameter galvanized pipe with cap and three 1⅞-inch guard posts painted yellow.

*This gage may be in error as 3 new PBMs were set during May and June 1974. The present gage was set by general contractor earlier.

| REVISION | DATE | DESCRIPTION | BY |
|---|---|---|---|

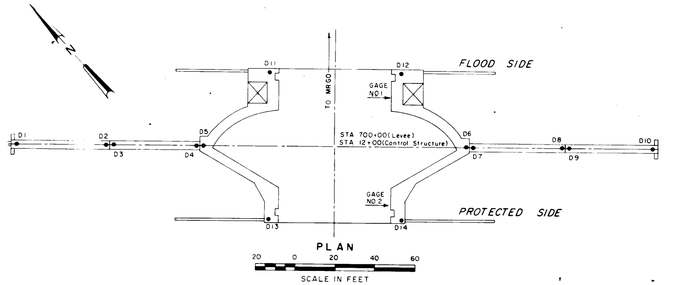
LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

# INSTRUMENTATION LOCATION

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

FILE NO.

PLATE 2



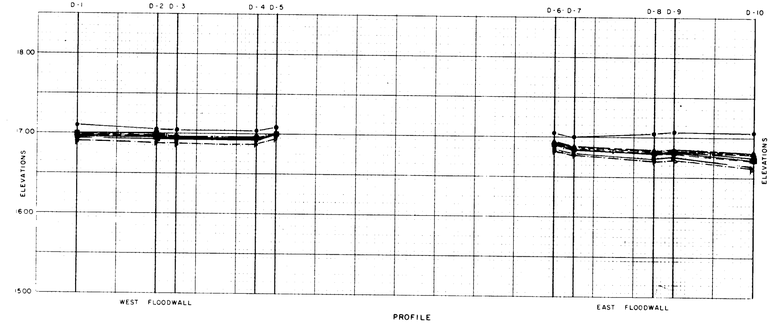

PLAN

20 0 20 40 60

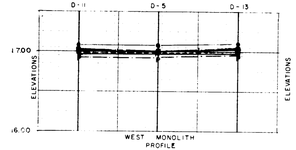
SCALE IN FEET

SETTLEMENT REFERENCE MARKS

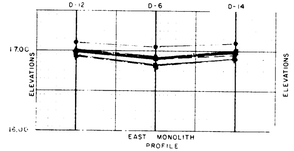
| NO OF REFERENCE MARKS | D-1 | D-2 | D-3 | D-4 | D-5 | D-6 | D-7 | D-8 | D-9 | D-10 | D-11 | D-12 | D-13 | D-14 | TEMP | GAGE 1 | GAGE 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INITIAL DATE | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 7-20-74 | 91° | 1.6 | 1.6 |
| ORIGINAL READINGS | 17.07 | 17.04 | 17.03 | 17.03 | 17.07 | 17.04 | 17.01 | 17.03 | 17.05 | 17.05 | 17.07 | 17.10 | 17.10 | 17.09 | | | |
| 17 JUNE 1982 | 16.99 | 16.98 | 16.96 | 16.95 | 17.00 | 16.92 | 16.88 | 16.86 | 16.87 | 16.81 | 17.01 | 17.01 | 17.03 | 17.00 | 85° | 0.7 | 0.6 |
| 17 DECEMBER 1982 | 16.97 | 16.96 | 16.95 | 16.94 | 16.99 | 16.90 | 16.85 | 16.83 | 16.84 | 16.79 | 17.03 | 17.01 | 16.99 | 16.98 | 53° | 1.2 | 1.4 |
| 2 APRIL 1984 | 16.99 | 16.98 | 16.96 | 16.96 | 17.01 | 16.91 | 16.87 | 16.84 | 16.85 | 16.78 | 17.01 | 17.00 | 17.04 | 16.99 | 60° | -0.4 | |
| 10 OCTOBER 1984 | 16.98 | 16.98 | 16.96 | 16.96 | 17.01 | 16.90 | 16.85 | 16.82 | 16.83 | 16.75 | 17.01 | 16.98 | 17.04 | 16.99 | 76° | 1.4 | 1.4 |
| 29 JULY 1986 | 16.96 | 16.96 | 16.94 | 16.94 | 16.99 | 16.89 | 16.84 | 16.80 | 16.81 | 16.72 | 17.00 | 16.99 | 17.02 | 16.98 | 87° | 1.1 | 1.1 |
| 18 FEBRUARY 1987 | 16.96 | 16.95 | 16.94 | 16.94 | 16.99 | 16.88 | 16.83 | 16.78 | 16.79 | 16.70 | 16.99 | 16.97 | 17.01 | 16.96 | 46° | 02 | 02 |
| 02 MARCH 1988 | 16.96 | 16.96 | 16.94 | 16.94 | 16.99 | 16.88 | 16.83 | 16.78 | 16.79 | 16.70 | 16.99 | 16.98 | 17.02 | 16.98 | 57° | 0.5 | 0.8 |
| 12 DECEMBER 1988 | 16.94 | 16.93 | 16.92 | 16.92 | 16.97 | 16.84 | 16.79 | 16.74 | 16.75 | 16.65 | 16.96 | 16.94 | 16.99 | 16.93 | 47° | 2.0 | 2.4 |
| 12 DECEMBER 1989 | 16.90 | 16.89 | 16.88 | 16.88 | 16.93 | 16.82 | 16.77 | 16.71 | 16.72 | 16.62 | 16.93 | 16.93 | 16.96 | 16.92 | 35° | -0.25 | -0.60 |




PROFILE




WEST MONOLITH PROFILE




EAST MONOLITH PROFILE

LEGEND

| | | | |
|---|---|---|---|
| ● | 20 | JUL | 1974 |
| ○ | 17 | JUN | 1982 |
| △ | 17 | DEC | 1982 |
| ▲ | 02 | APR | 1984 |
| ▫ | 10 | OCT | 1984 |
| ■ | 29 | JUL | 1986 |
| ◉ | 18 | FEB | 1987 |
| X | 02 | MAR | 1988 |
| N | 12 | DEC | 1988 |
| P | 12 | DEC | 1989 |

LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

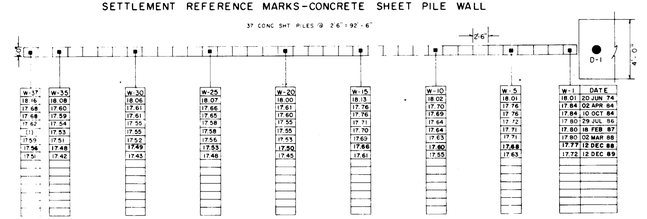
# SETTLEMENT REFERENCE MARKS PLAN AND PROFILE

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

FILE NO

PLATE 3

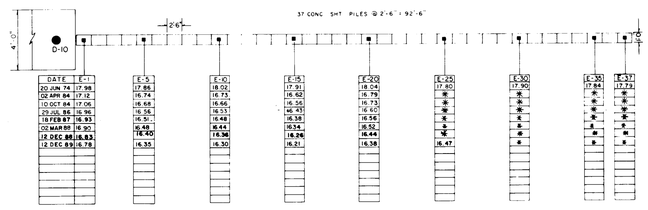
## SETTLEMENT REFERENCE MARKS-CONCRETE SHEET PILE WALL




## SETTLEMENT REFERENCE MARKS - CONCRETE SHEET PILE WALL

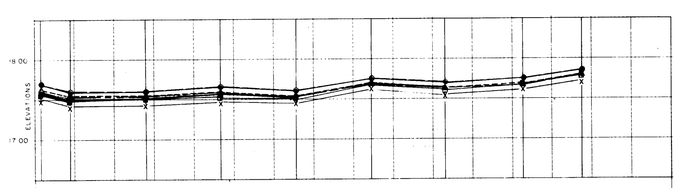
PLAN

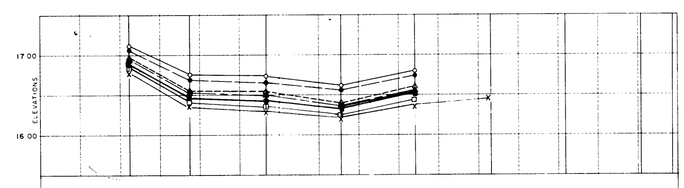
NOT TO SCALE




NOTE:

✱ Covered by Levee
(I) Not Surveyed




LEGEND

- ○ 02 APR 84
- ● 10 OCT 84
- △ 29 JUL 86
- ▲ 18 FEB 87
- ■ 02 MAR 88
- □ 12 DEC 88
- X 12 DEC 89

LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

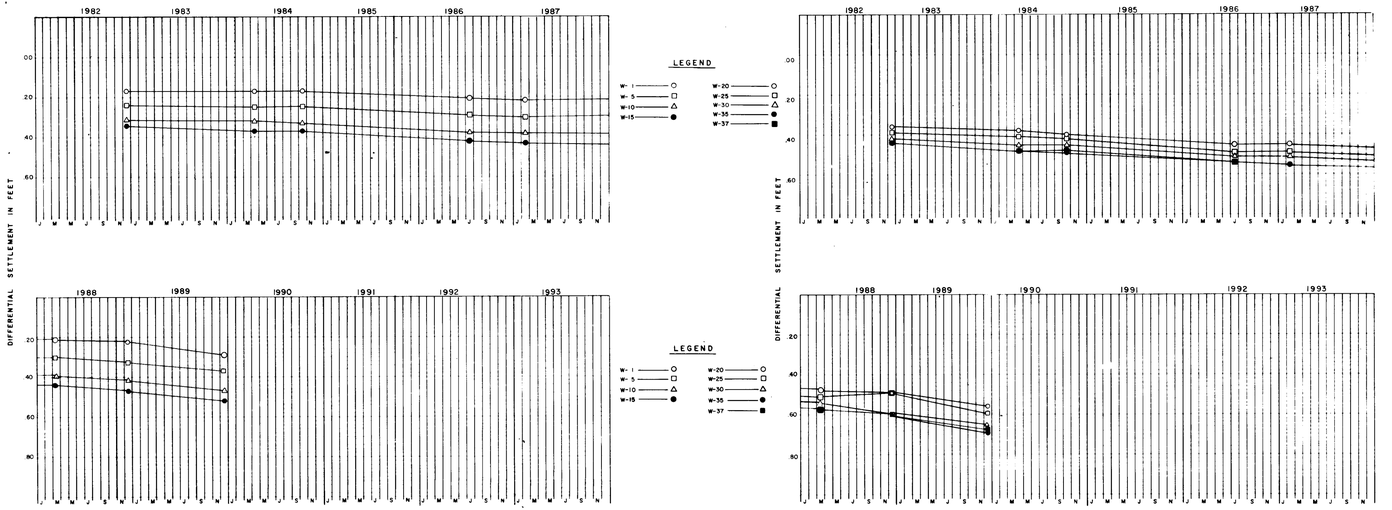
# SETTLEMENT REFERENCE MARKS PLAN AND PROFILE CONCRETE-SHEET PILE

U S ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

FILE NO. H-

**PLATE 4**

## WEST CONCRETE SHEET PILE WALL




FILL PLACEMENTS NEAR WEST SIDE OF STRUCTURE

| STATIONS | CONTRACT NO. | DATES OF WORK |
|---|---|---|
| 380+70 - 899+00 | 80-C-0343 | SEP 80 TO MAY 81 |

LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

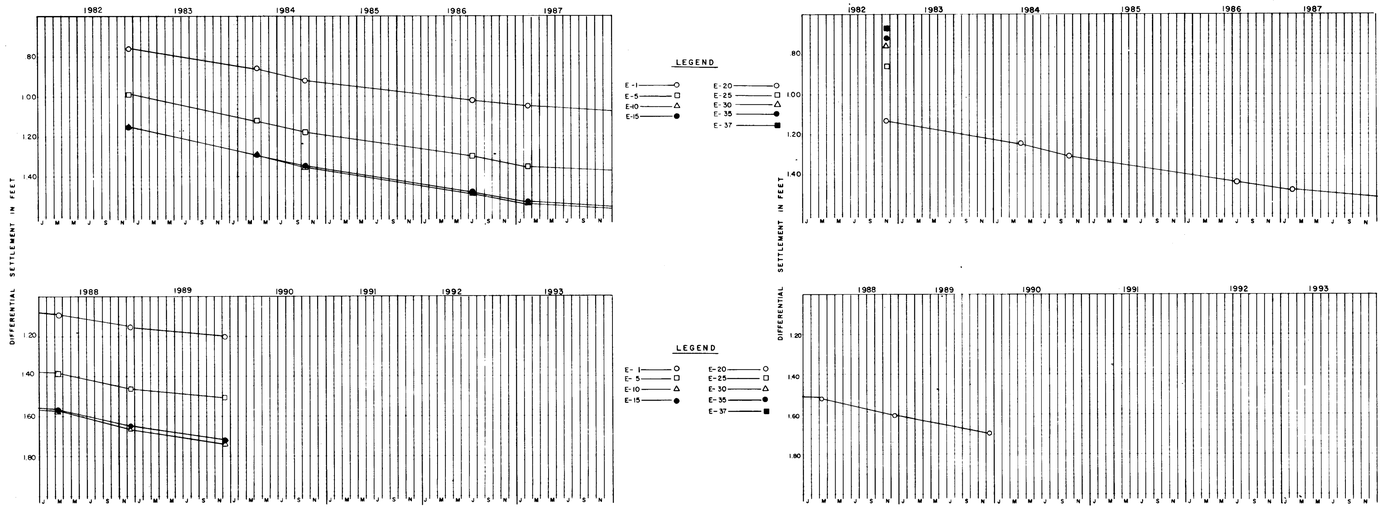
SETTLEMENT REFERENCE MARKS
DIFFERENTIAL SETTLEMENT CHART

U S ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

FILE NO. H-4-28857

PLATE 5

## EAST CONCRETE SHEET PILE WALL




FILL PLACEMENTS NEAR WEST SIDE OF STRUCTURE

| STATIONS | CONTRACT NO. | DATES OF WORK |
|---|---|---|
| 705+95 - 945+85 | 78-C-0274 | JUL 78 TO JUL 79 |
| 708+00 - 945+00 | 83-C-0175 | JUN 83 TO NOV 83 |

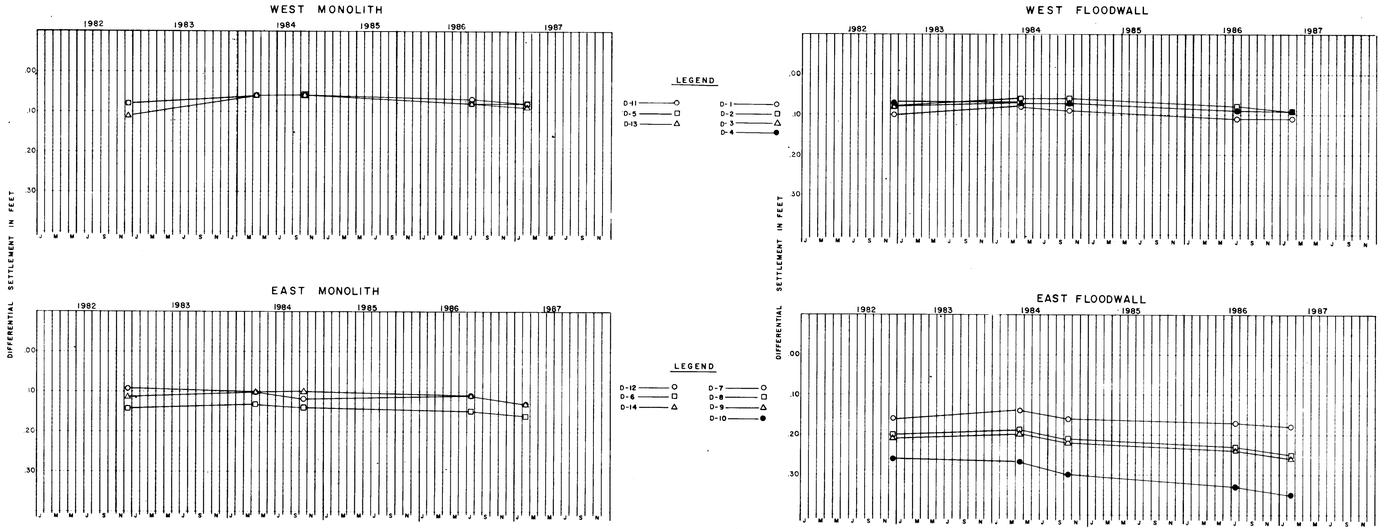
LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

SETTLEMENT REFERENCE MARKS
DIFFERENTIAL SETTLEMENT CHART

U S ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS

FILE NO. H-4-26857

PLATE 6



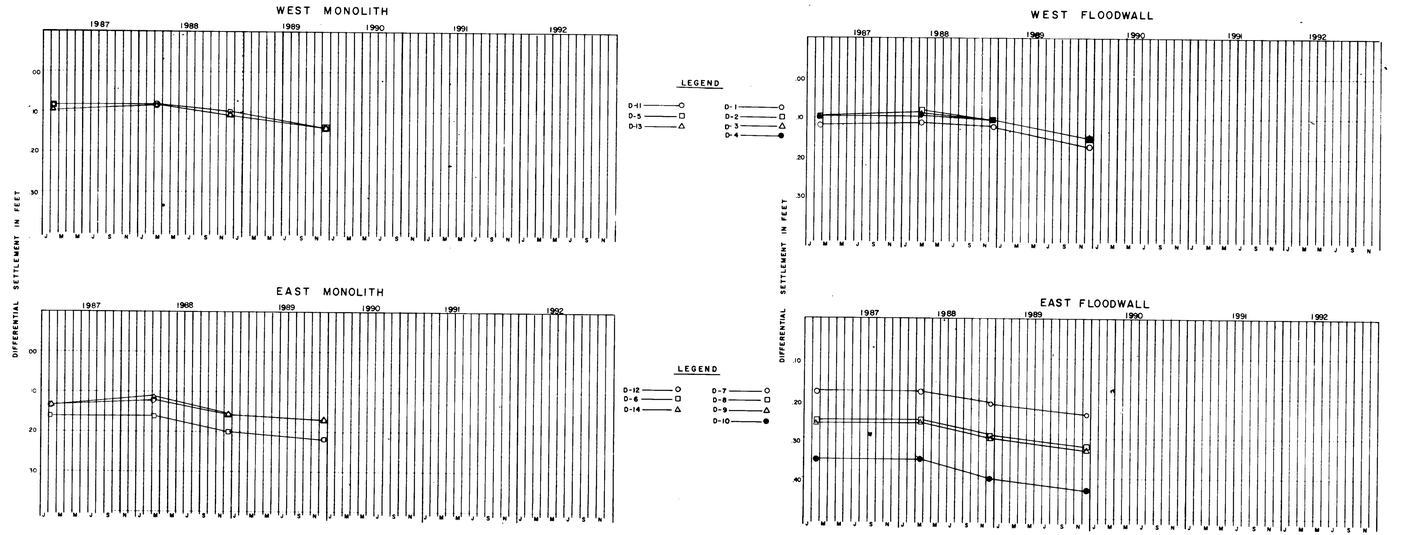

LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

SETTLEMENT REFERENCE MARKS
DIFFERENTIAL SETTLEMENT CHART

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

FILE NO. H-4-28857

PLATE 7




LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

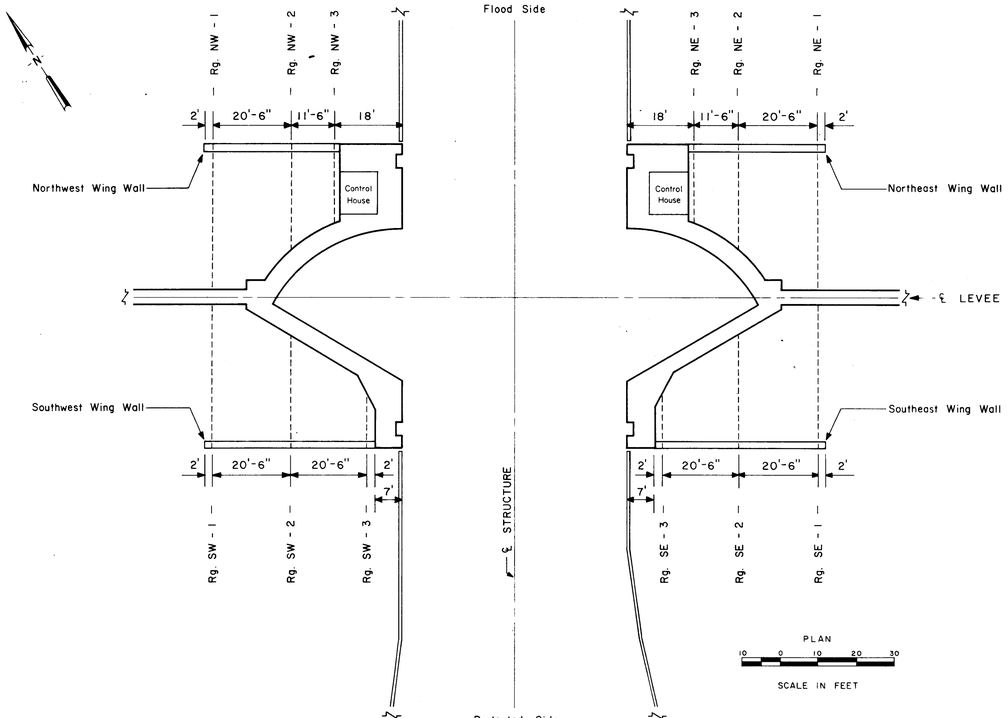
# SETTLEMENT REFERENCE MARKS
# DIFFERENTIAL SETTLEMENT CHART

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

FILE NO. H-4-26857

PLATE 8

DUP 4



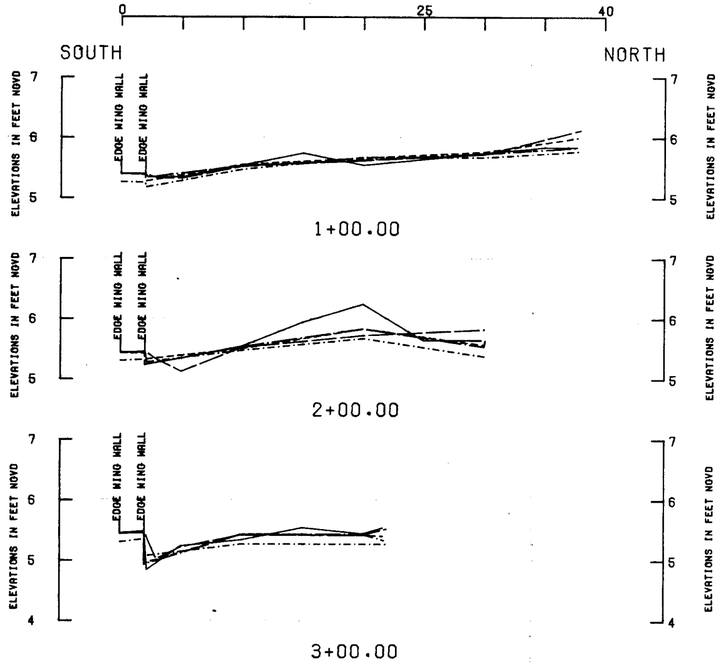

LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE
PERIODIC INSPECTION

# WING WALL RANGE LAYOUT

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

FILE NO.

PLATE 9




LEGEND

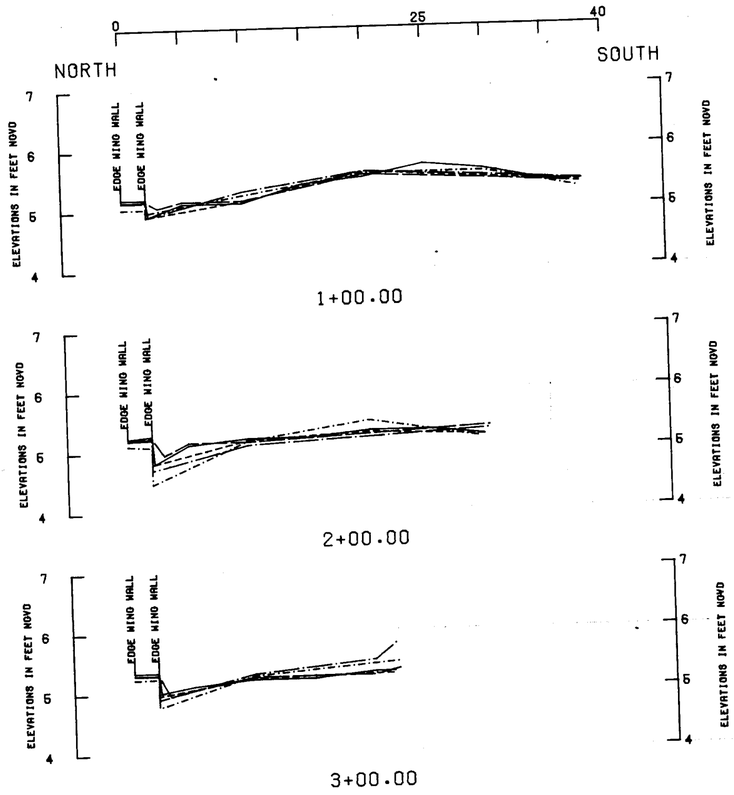
| | |
|---|---|
| ——— | 30 JUL 86 JOB NO. 86-107 |
| — — — | 18 FEB 87 JOB NO. 87-044 |
| - - - - - | 02 MAR 88 JOB NO. 88-060 |
| ——·—— | 12 DEC 88 JOB NO. 89-024 |
| ——··—— | 13 DEC 89 JOB NO. 90-010 |

NOTE
TOPOGRAPHY TAKEN FROM JUL 86 SURVEY

STATION
1+00.00
2+00.00
3+00.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
NORTHWEST WINGWALL (FY 90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1989

PLATE




LEGEND

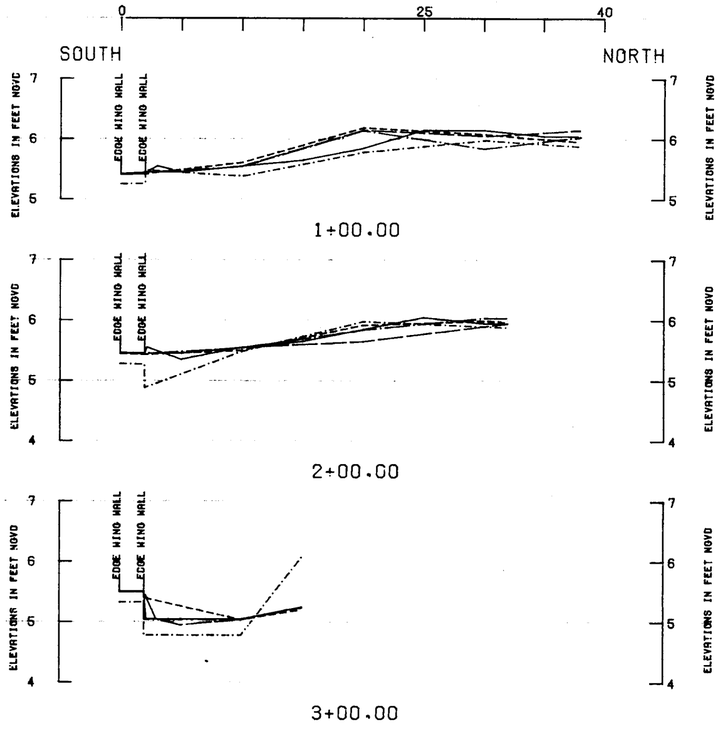
| | |
|---|---|
| 30 JUL 86 | JOB NO. 886-107 |
| 18 FEB 87 | JOB NO. 87-044 |
| 02 MAR 88 | JOB NO. 88-060 |
| 12 DEC 88 | JOB NO. 89-024 |
| 13 DEC 89 | JOB NO. 90-010 |

NOTE
TOPOGRAPHY TAKEN FROM JUL 86 SURVEY

STATION
1+00.00
2+00.00
3+00.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
NORTHEAST WINGWALL (FY 90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1989

PLATE 11




LEGEND

| | |
|---|---|
| 30 JUL 86 | JOB NO. 86-107 |
| 18 FEB 87 | JOB NO. 87-044 |
| 02 MAR 88 | JOB NO. 88-060 |
| 12 DEC 88 | JOB NO. 89-024 |
| 13 DEC 89 | JOB NO. 90-010 |

NOTE
TOPOGRAPHY TAKEN FROM JUL 86 SURVEY

STATION
1+00.00
2+00.00
3+00.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SOUTHWEST WINGWALL (FY 90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1990

PLATE 12

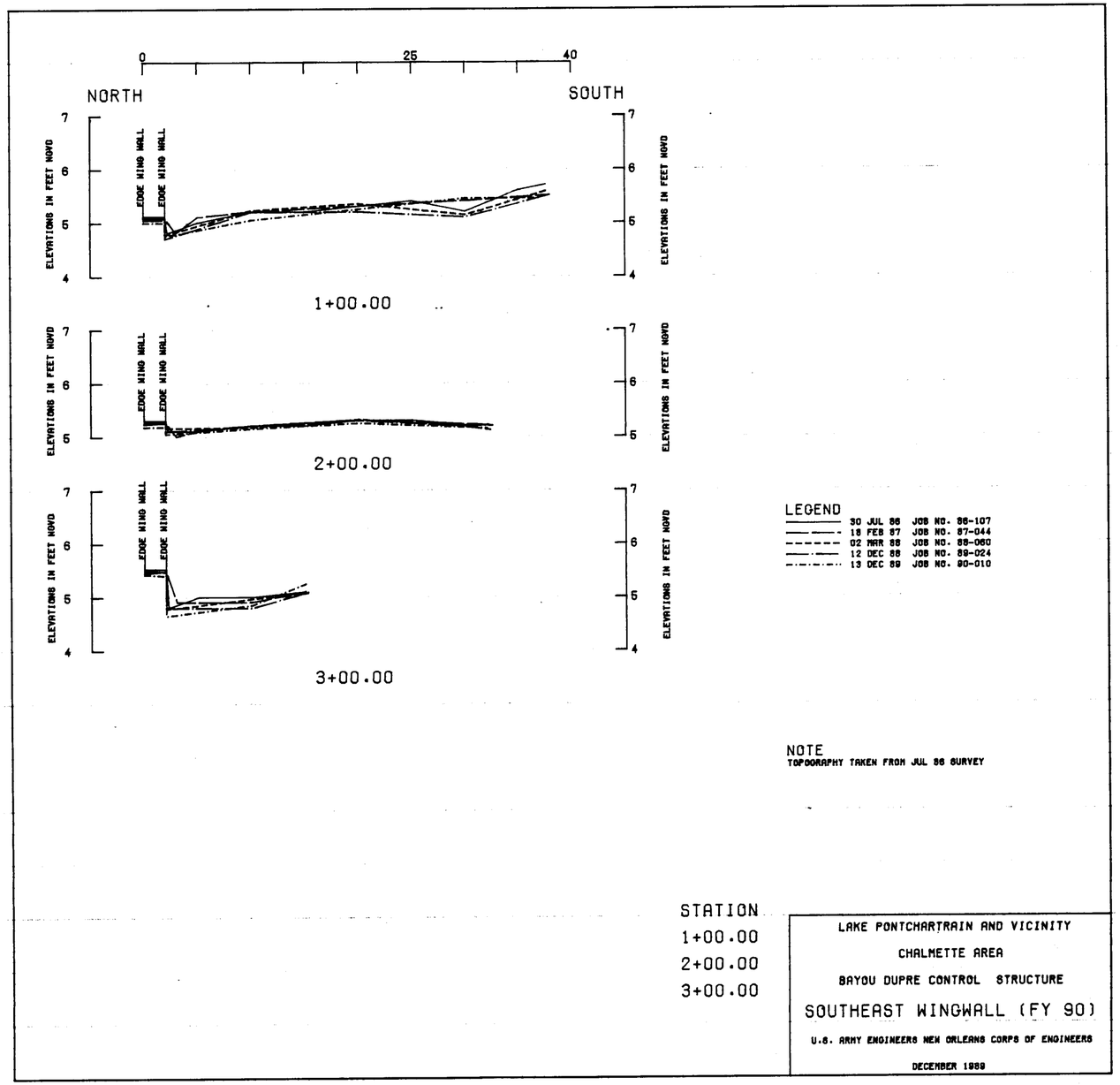

0
25
40
NORTH
SOUTH
ELEVATIONS IN FEET NGVD
7
6
5
4
EDGE WING WALL
EDGE WING WALL
1+00.00
2+00.00
3+00.00
LEGEND
30 JUL 86 JOB NO. 86-107
18 FEB 87 JOB NO. 87-044
02 MAR 88 JOB NO. 88-060
12 DEC 88 JOB NO. 89-024
13 DEC 89 JOB NO. 90-010
NOTE
TOPOGRAPHY TAKEN FROM JUL 86 SURVEY
STATION
1+00.00
2+00.00
3+00.00
LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SOUTHEAST WINGWALL (FY 90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1989

PLATE 13

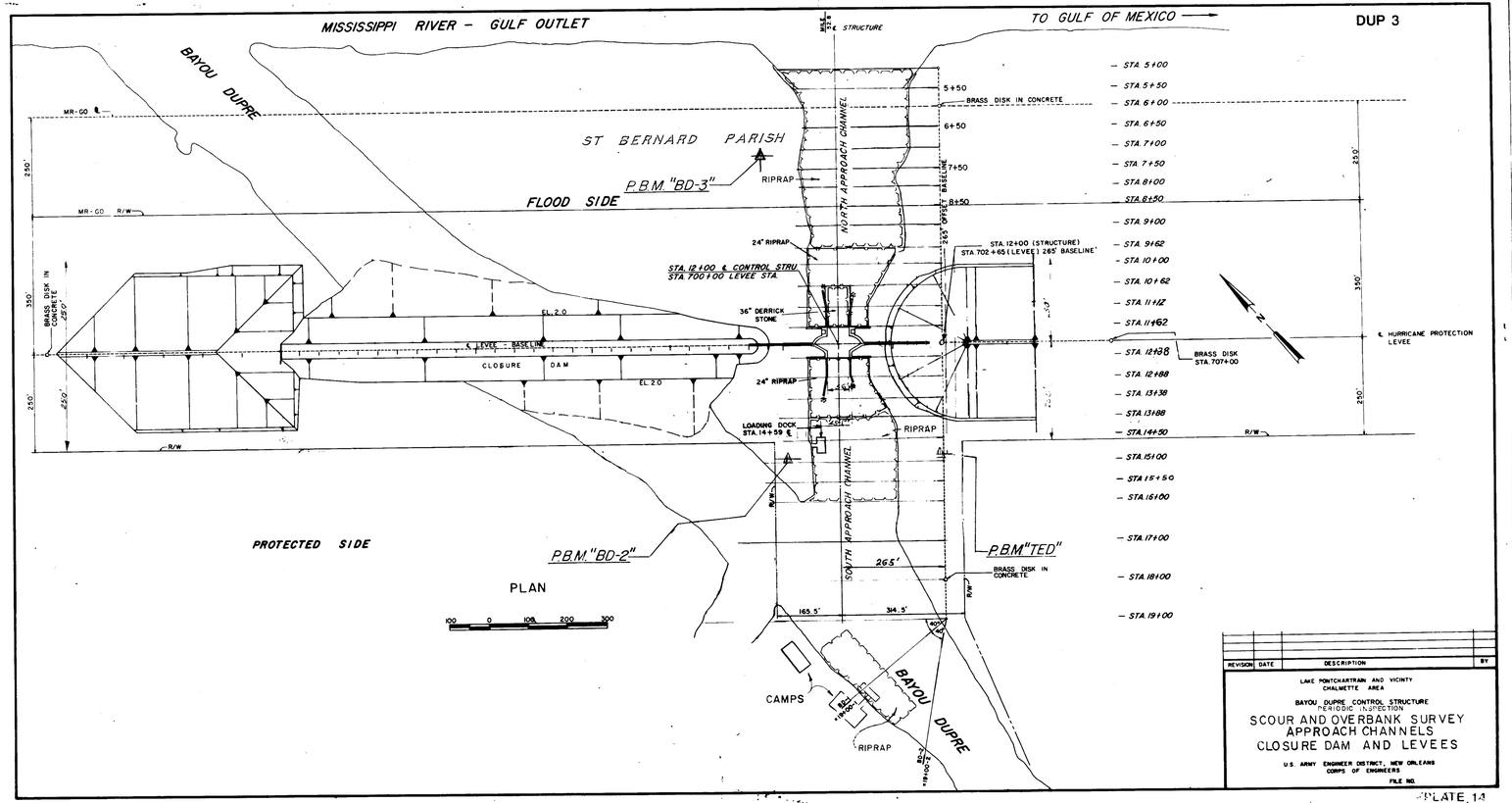
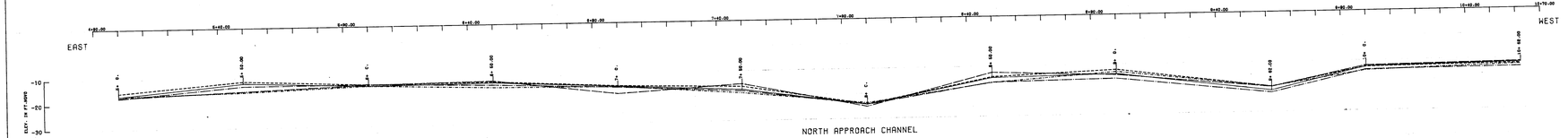
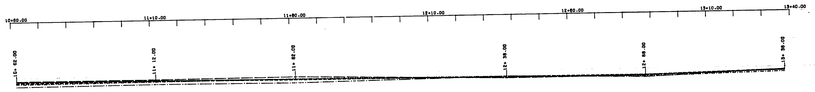
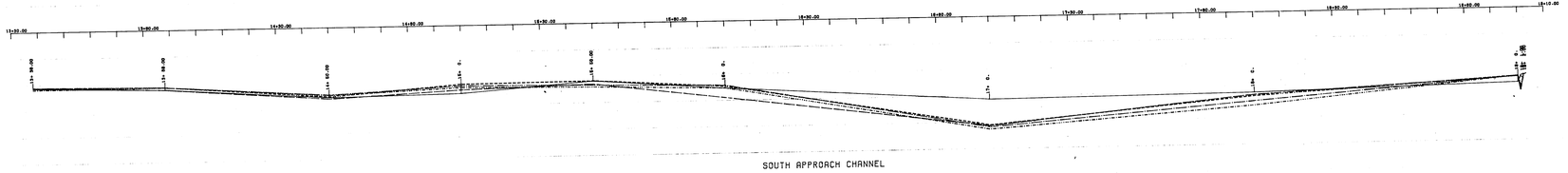

MISSISSIPPI RIVER – GULF OUTLET
TO GULF OF MEXICO
DUP 3
BAYOU DUPRE
MR-GO
MR-GO R/W
ST BERNARD PARISH
P.B.M. "BD-3"
RIPRAP
FLOOD SIDE
NORTH APPROACH CHANNEL
265' OFFSET BASELINE
24" RIPRAP
STA 12+00 & CONTROL STRU
STA 700+00 LEVEE STA
STA 12+00 (STRUCTURE)
STA 700+65 (LEVEE) 265' BASELINE
36" DERRICK STONE
EL 2.0
℄ LEVEE - BASELINE
CLOSURE DAM
EL 2.0
24" RIPRAP
LOADING DOCK
STA 14+59 ℄
RIPRAP
R/W
PROTECTED SIDE
P.B.M. "BD-2"
SOUTH APPROACH CHANNEL
P.B.M. "TED"
265'
BRASS DISK IN CONCRETE
165.5'
314.5'
PLAN
100 0 100 200 300
CAMPS
BAYOU DUPRE
RIPRAP
BRASS DISK IN CONCRETE
5+50
6+50
7+50
8+50
STA 5+00
STA 5+50
STA 6+00
STA 6+50
STA 7+00
STA 7+50
STA 8+00
STA 8+50
STA 9+00
STA 9+62
STA 10+00
STA 10+62
STA 11+12
STA 11+62
STA 12+38
STA 12+88
STA 13+38
STA 13+88
STA 14+50
STA 15+00
STA 15+50
STA 16+00
STA 17+00
STA 18+00
STA 19+00
BRASS DISK STA. 707+00
℄ HURRICANE PROTECTION LEVEE
350'
250'
BRASS DISK IN CONCRETE
REVISION DATE DESCRIPTION BY
LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
PERIODIC INSPECTION
SCOUR AND OVERBANK SURVEY
APPROACH CHANNELS
CLOSURE DAM AND LEVEES
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
FILE NO.

PLATE 14



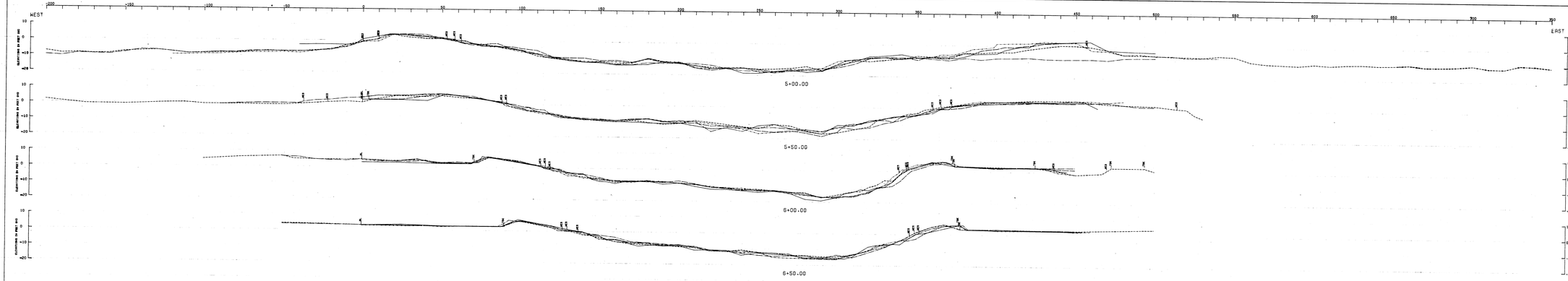

LEGEND

| | | |
|---|---|---|
| ——— | 15 JAN 1982 | JOB NO. 82-152 |
| ——— | 19 FEB 1987 | JOB NO. 87-044 |
| - - - - | 02 DEC 1988 | JOB NO. 89-004 |
| — · — · — | 13 DEC 1988 | JOB NO. 89-004 |
| — · · — · · — | 13 DEC 1989 | JOB NO. 89-010 |

NOTE

LAKE PONTCHARTRAIN AND VICINITY
BAYOU DUPRE CONTROL STRUCTURE
PERIODIC INSPECTION
COMPARATIVE PROFILE (FY 90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1989

PLATE 15




LEGEND

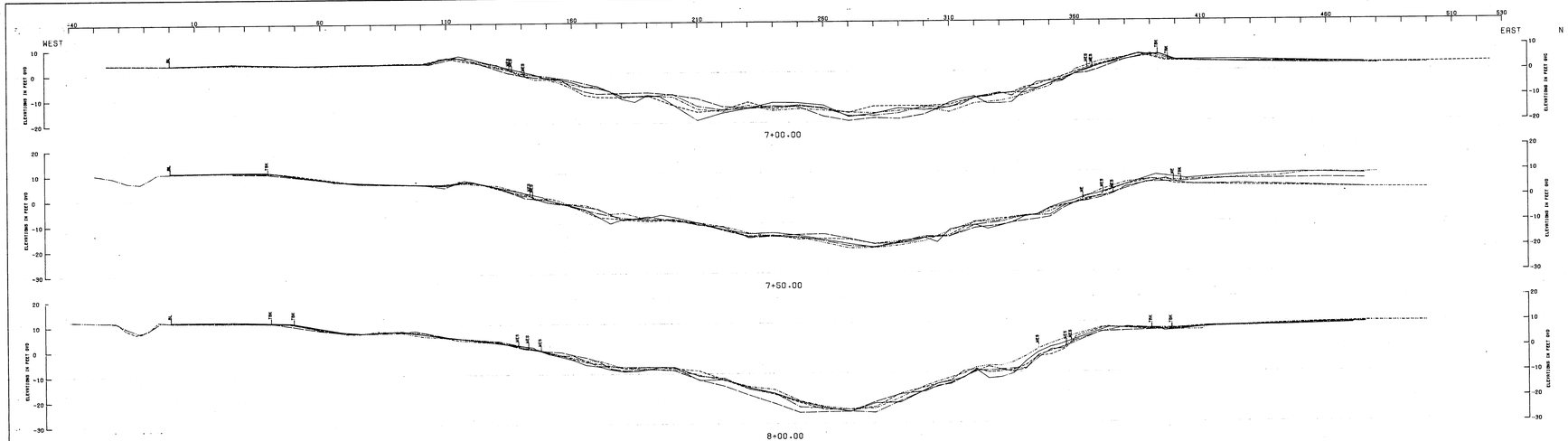
NOTE
SECTIONS PLOTTED LOOKING SOUTH

| STATION |
|---|
| 5+00.00 |
| 5+50.00 |
| 6+00.00 |
| 6+50.00 |

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

PLATE 16




LEGEND

| | |
|---|---|
| 16 JUN 82 | JOB NO: 82-160 |
| 15 FEB 87 | JOB NO: 87-44 |
| 02 FEB 88 | JOB NO: 88-02 |
| 12 DEC 89 | JOB NO: 89-24 |
| 13 DEC 89 | JOB NO: 89-13 |

NOTE
SECTIONS PLOTTED LOOKING SOUTH

STATION
7+00.00
7+50.00
8+00.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1990

PLATE 17

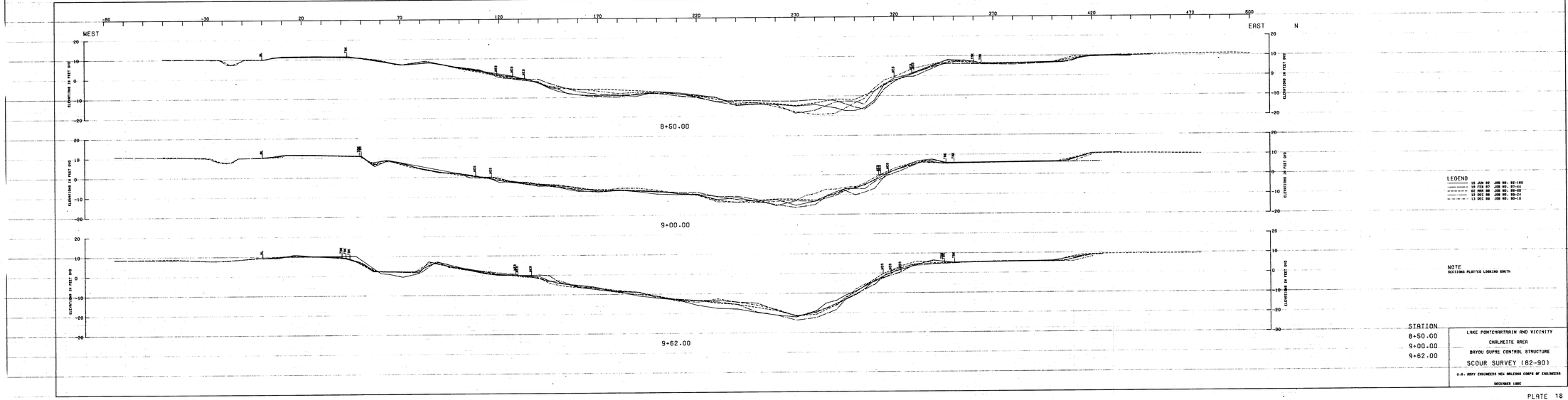
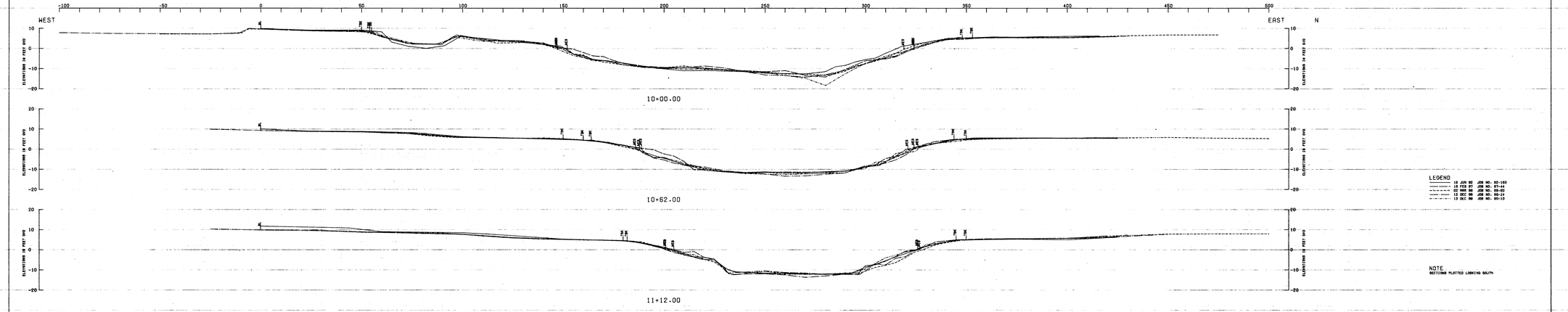
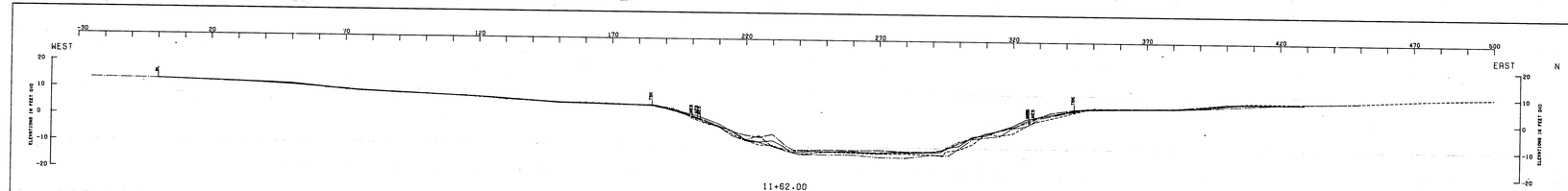

WEST
EAST
N
-80
-30
20
70
120
170
220
270
320
370
420
470
500
ELEVATIONS IN FEET (NVD)
8+50.00
9+00.00
9+62.00
LEGEND
16 JAN 91 JOB NO. 91-190
15 FEB 91 JOB NO. 91-14
02 NOV 89 JOB NO. 89-00
12 DEC 89 JOB NO. 89-14
13 DEC 89 JOB NO. 90-10
NOTE
SECTIONS PLOTTED LOOKING SOUTH
STATION
8+50.00
9+00.00
9+62.00
LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1990

PLATE 18




STATION
10+00.00
10+62.00
11+12.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1990




LEGEND

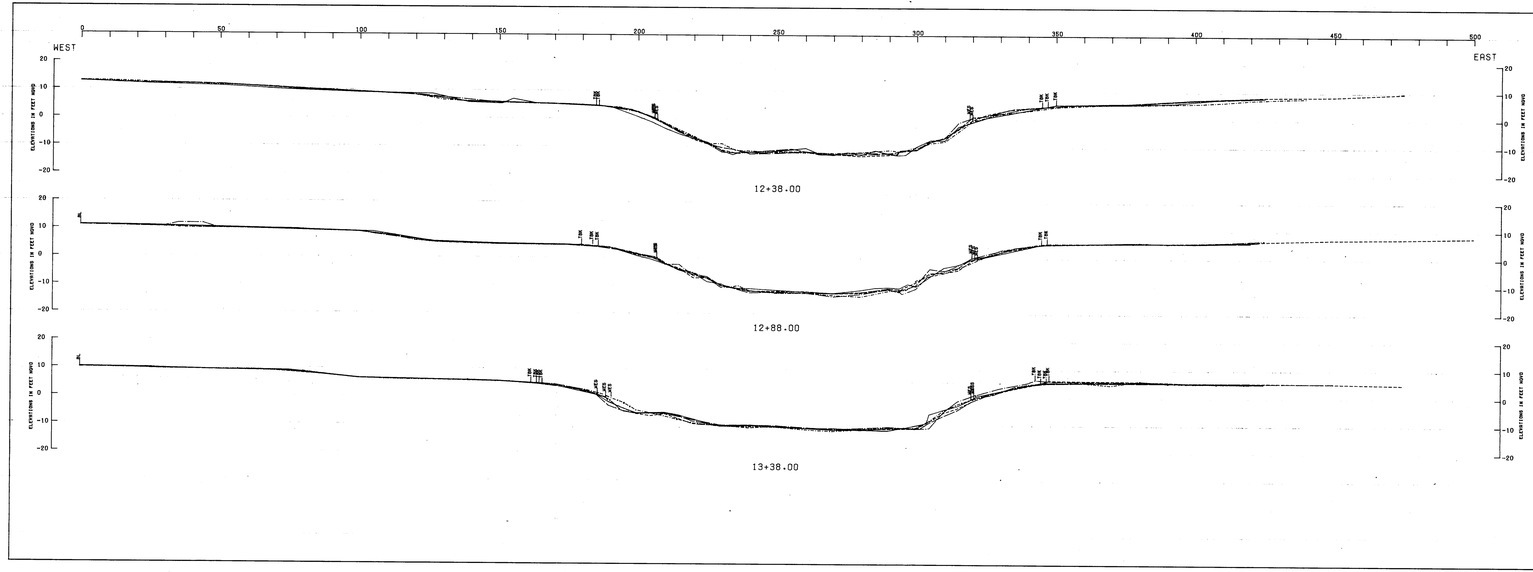
| | |
|---|---|
| ——— | 16 JUN 82 JOB NO. 82-160 |
| ——— | 18 FEB 87 JOB NO. 87-18 |
| - - - - - | 02 MAR 88 JOB NO. 88-02 |
| ——— | 12 DEC 88 JOB NO. 88-24 |
| - - - - - | 13 OCT 89 JOB NO. 90-10 |

NOTE
SECTIONS PLOTTED LOOKING SOUTH

STATION
11+62.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1990

PLATE



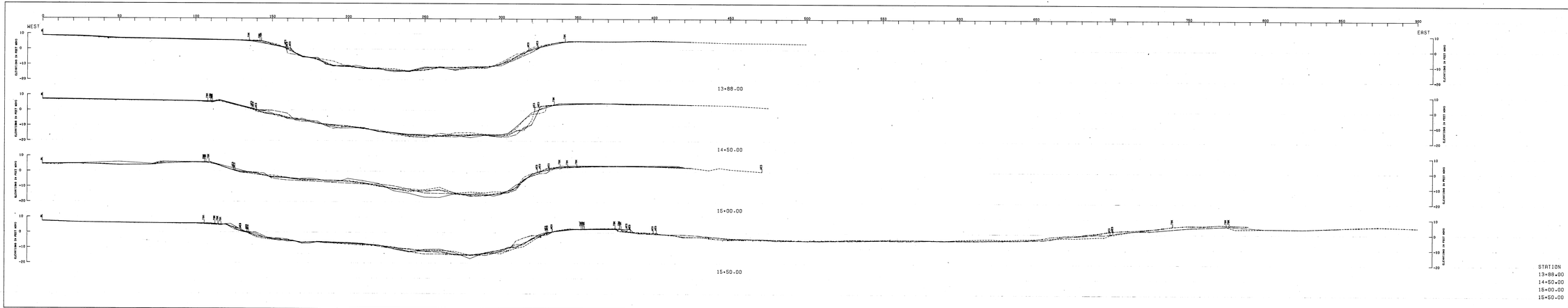

LEGEND

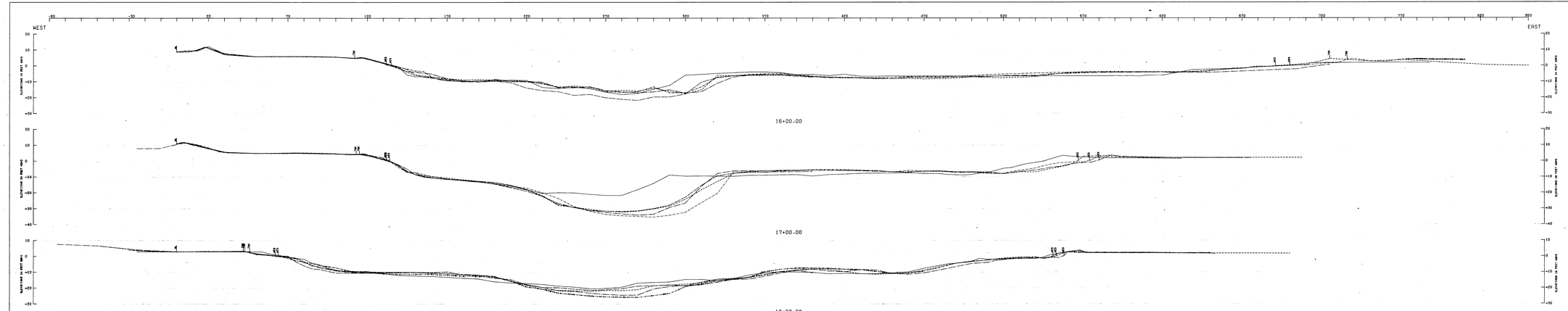
| | |
|---|---|
| ——— | 16 JUN 82 JOB NO. 82-180 |
| — — — | 18 FEB 87 JOB NO. 87-44 |
| - - - - - | 02 MAR 88 JOB NO. 88-60 |
| ——·—— | 12 DEC 89 JOB NO. 89-24 |
| ——··—— | 19 DEC 90 JOB NO. 90-10 |

NOTE
SECTIONS PLOTTED LOOKING SOUTH

STATION
12+38.00
12+88.00
13+38.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEERS NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1990

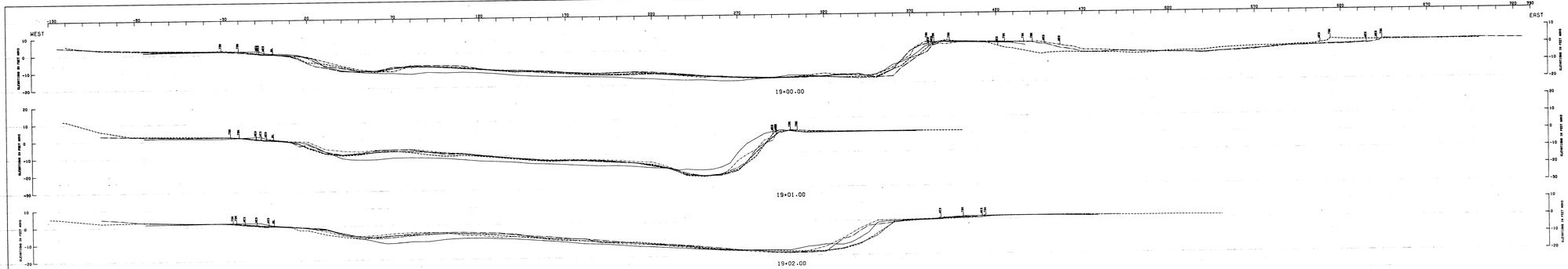

WEST
EAST
ELEVATIONS IN FEET (NGVD)
13+88.00
14+50.00
15+00.00
15+50.00
LEGEND
NOTE
MAXIMUM PLOTTED LOOKING SOUTH
STATION
13+88.00
14+50.00
15+00.00
15+50.00
LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEER NEW ORLEANS CORPS OF ENGINEERS
SEPTEMBER 1990




STATION
16+00.00
17+00.00
18+00.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEER NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1992

PLATE 23




LEGEND

| | |
|---|---|
| 15 JAN 80 | JAN 80 - 80-100 |
| 15 FEB 81 | JAN 80 - 81-82 |
| 09 SEP 82 | JAN 80 - 82-83 |
| 15 SEP 83 | JAN 80 - 83-84 |
| 15 DEC 90 | JAN 80 - 90-91 |

NOTE
SECTIONS PLOTTED LOOKING SOUTH

STATION
19+00.00
19+01.00
19+02.00

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU DUPRE CONTROL STRUCTURE
SCOUR SURVEY (82-90)
U.S. ARMY ENGINEER NEW ORLEANS CORPS OF ENGINEERS
DECEMBER 1990

PLATE 24