US Army Corps
of Engineers®
NEW ORLEANS DISTRICT

LAKE PONTCHARTRAIN, LOUISIANA & VICINITY
CHALMETTE AREA PLAN

BAYOU BIENVENUE CONTROL STRUCTURE

PERIODIC INSPECTION REPORT NO. 9

28 APRIL 2004

DEPARTMENT OF THE ARMY
MISSISSIPPI VALLEY DIVISION, CORPS OF ENGINEERS
P.O. BOX 80
VICKSBURG, MISSISSIPPI 39181-0080
http://www.mvd.usace.army.mil/

REPLY TO
ATTENTION OF:

CEMVD-PD-WW (1110-2-240a) 9 September 2004

MEMORANDUM FOR Commander, New Orleans District, ATTN: CEMVN-ED-G

SUBJECT: Lake Pontchartrain Louisiana & Vicinity Bayou Bienvenue Control Structure, Periodic Inspection Report No. 9, 28 April 2004

1. Reference memorandum, CEMVN-ED-G, 27 July 2004, subject as above (encl). This is the second document in the referenced chain of correspondence.

2. The subject Inspection Report has been reviewed and we offer the following comments:

a. EC 1110-2-6061 states we should be following the guidance set forth in draft ER 1110-2-1156. For future reports, an executive summary should be sent to HQUSACE Dam Safety Program Manager and the MSC Dam Safety Program Manager as required by paragraph 6.2.2.3 of the ER.

b. The HSS information presented in Appendix ~~H~~ E conforms to the requirements for reporting this information in Periodic Inspection Reports.

3. The Inspection Report is approved and no further action is needed on this chain of correspondence.

Encl

for DANIEL H. HITCHINGS, P.E.
Director of Regional Business

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

REPLY TO
ATTENTION OF

CEMVN-ED-G

JUL 2 7 2004

MEMORANDUM FOR Commander, Mississippi Valley Division,
ATTN: CEMVD-TD

SUBJECT: Lake Pontchartrain, Louisiana & Vicinity Bayou Bienvenue Control Structure, Periodic Inspection Report No. 9, 28 April 2004

1. Subject report is submitted for your information and concurrence (Enclosure 1).

2. The Technical Review was conducted as outlined in Enclosures 2 and 3.

FOR THE COMMANDER:

WALTER O. BAUMY, JR., P.E.
Chief, Engineering Division

4 Encls
1. Periodic Inspection
   Report No. 9 (2 cys)
2. Quality Control Plan
3. Design/Review Activities

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
QUALITY CONTROL PLAN – BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTION REPORT

Project Title: Lake Pontchartrain, Louisiana & Vicinity Bayou Bienvenue Control Structure, Periodic Inspection Report No. 9, 28 April 2004

Authority: Authority to inspect the subject structure is provided by ER 1110-2-100, subject "Periodic Inspection and Continuing Evaluation of Completed Civil Works Structures", dated 15 February 1995. The Periodic Inspection was performed in accordance with the subject regulation.

Quality Control Plan: The Quality Control is the function whereby policies, standards, procedures, and format are used to control the quality of the work produced.

Preinspection Brochure. A preinspection brochure was prepared in advance of the project inspection in order to familiarize inspection team members with the general features of the structure and project history. The brochure included a checklist that was used during the inspection to highlight areas of concern.

Periodic Inspection Report. The Periodic Inspection Report presents the results and conclusions of the engineering inspection and data evaluation to evaluate the structural integrity and operational adequacy of the lock structure. The report also presents recommended remedial actions to correct any noted deficiencies. The inspection and report were accomplished in accordance with the subject ER.

In-House Technical Review. The New Orleans District (NOD) performed an in-house review to achieve the desired quality control on various project tasks and to check for format, adequacy and accuracy of the report. A copy of the quality control plan is filed in General Engineering Branch. These reviews were conducted in-house because the necessary expertise was located within NOD. These reviews ensure the accuracy of the report and ensure the inspection and reporting was conducted in accordance with ER 1110-2-100. A copy of NOD's quality control plan with all endorsements to the report will be included with the file copy of the Periodic Inspection Report.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
QUALITY CONTROL PLAN – BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTION REPORT

Periodic Inspection Team

New Orleans District

Brian J. Gannon	Gen Engr Branch (Inspection Coordinator)
Daniel Haggerty	Geotechnical Branch
Jeff Richey	Structures Branch
Anthony Gallodoro	Gen Engr Branch (Materials)
Daniel Bradley	Gen Engr Branch (Mechanical & Electrical)
David Vossen	Hydraulics & Hydrologic Branch
Jerry Colletti	Operations Division
Jerry Beaugez	Orleans Levee District
Dom Elguezabal	Orleans Levee District
Louis Durr	Orleans Levee District
Mark Theard	Orleans Levee District
Guy Dietsch	Orleans Levee District
Justin Guibeau	LA DOTD
John R Monzon	LA DOTD

Technical Review Team

Name	Function	Office	Ext	Registered
Donald Jolissaint	FTL for PI Program	ED-G	2649	Yes/ Civil
Joseph Chryssoverges	TM/TL for PI Program	ED-G	1009	No/EI
Joesph Chow	Technical Review Manager	ED-E	2722	No/EI

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
QUALITY CONTROL PLAN – BERWICK LOCK
PERIODIC INSPECTION REPORT

DESIGN/REVIEW ACTIVITIES

TASK	DATE COMPLETED
Prepare preinspection brochure	7 April 04
Perform periodic inspection	28 April 04
Team review of draft report and additional Input	9 July 04
Operations Manager review of draft report	13 July 04
Perform ITR, and resolve Comments	19 July 04
Finalize Periodic Inspection Report	21 July 04
Submit report to MRC	22 July 04

Brian J. Gannon, Date
Inspection Coordinator

Joseph Chow, Date
Technical Review Manager

Walter O. Baumy, Jr., P.E. Date
Chief, Engineering Division

ENCL 3

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY

CHALMETTE AREA PLAN

BAYOU BIENVENUE CONTROL STRUCTURE

PERIODIC INSPECTION REPORT NO. 9

28 APRIL 2004

U. S. ARMY ENGINEER DISTRICT

CORPS OF ENGINEERS

NEW ORLEANS, LOUISIANA

SUMMARY

Periodic Inspection No. 9 of the Bayou Bienvenue Control Structure was conducted on 28 April 2004 by representatives from the New Orleans District (MVN), from the Louisiana Department of Transportation and Development (LADOTD), and from the Orleans Levee District (OLD). This inspection was conducted in accordance with the provisions of ER 1110-2-100 "Periodic Inspection and Continuing Evaluation of Completed Civil Works Structures" dated 15 February 1995. The structure was not dewatered and only that portion above the water surface was inspected. The inspection team concluded that the 30-year old control structure was found to be safe, structurally stable, well maintained and in satisfactory operating condition.

Several critical deficiencies were observed. These deficiencies as well as other minor deficiencies will be corrected as discussed in Section VI.

BAYOU BIENVENUE
CONTROL STRUCTURE
PHOTO TAKEN 11/1999

BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTION REPORT NO. 9

TABLE OF CONTENTS

BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTION REPORT NO. 9

TABLE OF CONTENTS (cont.)

SECTION I - INTRODUCTION

1-01. Authority. Authority for the inspection of this structure is provided by ER 1110-2-100, subject "Periodic Inspection and Continuing Evaluation of Completed Civil Works Structures", dated 15 February 1995.

1-02. Purpose and Scope. The results and conclusions of the inspection and evaluation for assuring the structural integrity and operational adequacy of the control structure are presented herein. All surfaces above the water line were inspected for deterioration, corrosion and damage. This report is supplementary to the previously numbered reports.

1-03. Safety. The inspection was performed in accordance with the pertinent provisions of the latest EM 385-1-1, "Safety and Health Requirements Manual," and other applicable recognized safety practices. Nothing in the inspection report shall be interpreted or constructed as altering the provisions of the "Safety and Health Requirements Manual."

1-04. Previous Inspections. Past inspection of the Bayou Bienvenue Control Structure are included in the following reports:

Report No.	Date of Inspection	Type
1	October 1973	Dewatered (Still Under Construction)
2	27 July 1979	Above Water Surface
3	31 March 1983	Above Water Surface
4	7 March 1985	Dewatered
5	29 March 1988	Above Water Surface
6	25 July 1991	Above Water Surface
7	30 March 1994	Above Water Surface
-	1 March 1997	Dewatered (Appendix in Report No. 8)
8	24 March 1999	Above Water Surface

1-05. Datum. All elevations, unless otherwise indicated, are in feet and refer to the National Geodetic Vertical Datum (N.G.V.D.), formerly Mean Sea Level (M.S.L.).

SECTION II - PROJECT DESCRIPTION AND BACKGROUND

2-01. Project Authorization. The Bayou Bienvenue 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. In November 1966, 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 by construction of a levee from the Mississippi River levee near Caernarvon, Louisiana to the vicinity of Verret, Louisiana, thence to and along the Mississippi River-Gulf Outlet (MR-GO) spoil bank to a junction with the approved plan levee at Bayou Lawler and elimination of the levee in the approved plan from Bayou Lawler to Violet. This recommendation was approved by OCE on 31 January 1967.

2-02. Purpose of Structure. In the context of the Chalmette Area Plan, the Bayou Bienvenue Control Structure serves as part of the hurricane protection for the general area and allows water traffic to proceed normally to and from the MR-GO via Bayou Bienvenue. In addition, this structure, together with the Bayou Dupre Control Structure, provides drainage for the area enclosed by the levees. In addition to handling runoff from within the area, the Bayou Bienvenue Control Structure passes drainage from the City of New Orleans.

2-03. Location. The structure is located at the eastern edge of Orleans Parish, Louisiana, near the intersection of Bayou Bienvenue and the MR-GO. The structure is located at station 367+60.25 on the MR-GO base line, approximately 400 feet west of the original intersection

of Bayou Bienvenue and the MR-GO. See Selected Construction Drawings Plate Nos. II-1 and II-2.

2-04. Construction History & Local Interest. The structure was constructed under contract No. DACW29-72-C-0064, which was awarded in January 1972 to T.L. James & Company. It was completed in September 1974 and turned over to local interests for maintenance and operation in accordance with the conditions of local cooperation agreement, as specified by the authorizing law.

2-05. Description.

a. General. The Bayou Bienvenue Control Structure consists of a reinforced concrete sector gate bay, welded steel sector gate, treated timber guidewalls, inverted "T" and "I" type floodwalls connecting the gate bay to the earthen levee on each side, and access channels. See Selected Construction Drawings Plate Nos. II-2 and II-3. The gate bay is 76 feet in length and has a channel width of 56 feet. The elevation of the top of the gates and floodwalls is 17.5 and the sill is at -10.78. The sector gate machinery is powered by electric motors with provisions for manual operation.

b. Piling. The gate bay structure is supported on untreated timber piling driven into the Pleistocene clays to a tip elevation of -67.0. The pilings were all driven on a batter of 4V on 1H to compensate for unbalanced lateral forces. See Selected Construction Drawings Plate No. II-7. Steel sheet pile cutoff walls are provided beneath the gate bay structure and beneath the inverted "T" floodwall as shown on Selected Construction Drawings Plate Nos. II-7 and II-21 to prevent piping beneath the structure.

c. Gate Bay. The gate bay was designed as a reinforced concrete "U" frame 76 feet in length with a channel clearance of 56 feet as shown on Selected Construction Drawings Plate Nos. II-8 through II-14. The top of the gates, the gate bay walls, and the inverted "T" floodwalls are at elevation 17.5 and the sill is at elevation -10.78 feet. The original "I" floodwalls were constructed after the final levee lift was placed and the levee settlement

had stabilized. Slots for the needle girders and needles have been provided so that the gate bay can be dewatered for repair or repainting of the gates. At the ends of the gate bay there are concrete sheet pile wing walls installed (with tie backs) to retain the adjacent backfill. See Selected Construction Drawings Plate No. II-21. Two small control houses constructed of reinforced concrete are located above the machinery recesses on each side of the gate bay. Both houses contain the machinery for manual operation and control panels to start the generator and to operate the gate leaves electrically from either side. Control House No. 1 also contains the engine driven generator and the electrical switchgear. Each gate leaf may be manually operated from its respective control house. See Selected Construction Drawings Plate Nos. II-15 and II-16.

d. Dewatering. Dewatering of the gate bay is accomplished by the use of needle dams consisting of vertical reinforced concrete needles supported at the bottom in a slot in the base slab and at the top by a single span steel girder. Two vertical supports are provided to minimize bending and deflection due to the weight of the girder. Only one set of dewatering components that consists of 2 girders and 22 needles have been fabricated for dewatering this structure and the Bayou Dupre Control Structure. These dewatering components are stored atop a reinforced concrete rack located on the floodside of the Bayou Bienvenue Control Structure. See Selected Construction Drawings Plate Nos. II-19 and II-20.

e. Sector Gate. The gate consists of the two identical gate leaves with a central angle of 60 degrees, with rubber seals at the bottom and both sides of the gate leaves. The gate leaves are steel sector type with welded connections. The radius to the inside of the skin plate is 34 feet 7-5/16 inches and the height of each gate leaf is 28 feet 2-3/8 inches. Each leaf has two vertical trusses that carry the load to the hinge and pintle. See Selected Construction Drawings Plate Nos. II-25 thru II-33. Vertical dead load reaction is carried by the pintle alone. The operation of the gate leaves is by means of pull cables storing on a cable drum, as shown on Selected Construction Drawings Plate No. II-34. The walkways mounted on top of the gate leaves provide access across the gate bay.

f. Gate Operating Machinery. The operating machinery for the sector gate leaves consists of winch drums and cable drives actuated either by electric motors or emergency hand cranks. Each gate leaf operating machinery unit is provided with an electric motor (2 HP, 460-volt, 3 phase, 60 Hz, 1,800 RPM); a solenoid brake; a concentric shaft speed reducer with a 7.59:1 ratio; a parallel shaft speed reducer with a 657:1 ratio; limit switches; a cable drum attached to the output shaft of the parallel shaft reducer; and wire rope and sheaves, as shown on Selected Construction Drawings Plate No. II-34. Gate control panels are located adjacent to each gate leaf allowing the gate leaves to be operated individually or simultaneously from either side of the structure. Gate operating time is approximately 15 minutes for normal operation. See Selected Construction Drawings Plate No. II-35 for the control room plan.

g. Power Generator. Electric power is furnished for gate operation and interior lighting by a diesel engine driven generator. The generator is rated at 15 KW (18.75 KVA at 0.8 pf, 480-volt, 3 phase, 60 HZ). The power plant is a 4-cylinder, 4-cycle, 120 cubic inch, radiator cooled diesel engine that is rated at 30.4 HP at 1,800 RPM.

h. Floodwalls. There are three types of existing floodwalls constructed between the gate bays and the adjacent levees: (1) inverted "T" floodwall, (2) steel sheetpile "I" floodwall and (3) concrete monolithic type "I" floodwall. The inverted "T" floodwall commences at the gate bay wall and extends approximately 95 feet toward the levee on each side of the structure. The inverted "T" floodwall consists of a pile-supported concrete base slab and stem up to elevation 17.5, with a sheet pile cutoff wall. The inverted "T" floodwall is supported against settlement and overturning by battered, prestressed concrete piles with tip elevations at about -65.0. A 4-foot wide concrete access walkway forms the top of the inverted "T" floodwalls. The original "I" floodwall design consisted of pre-stressed concrete sheet piles that were to be driven in place. At the time of Periodic Inspection No. 1, 31 October 1973, approximately 30 of the 37 concrete sheet piles (I-wall) were in place on the east wall. According to the order of work established in the specifications, the concrete sheet piles were to be driven after the levee fill. The order of work established a maximum amount of time to elapse between the placement of levee fill and the driving of the piles in order that a large portion of the

levee settlement would take place prior to installation of the wall. These 30 piles however, were driven prior to placement of the levee fill. Since the fill material was not in place, these piles were only embedded approximately 5 feet. This, together with the poor soil conditions at the site, resulted in the piles settling and rotating in the plane of driving. The Contractor was then ordered to pull the piles in order that the levee fill could be placed. In the pulling of the first pile, it was noted that the plastic interlock was torn the entire length of the pile. The contractor was then order to stop the pulling operation. A system of cables and come-alongs were then installed to hold the piles in a plumb position. At that time, it was the intention to try to hold the piles with the cable arrangement while backfilling operations proceeded. Subsequent to Periodic Inspection No. 1, with MVN concurrence, the driving of the concrete sheet piles was deleted from the contract and the driven concrete sheet piles were pulled (excluding the two that tied into the inverted "T" floodwall) and all the concrete sheet piles were stockpiled on both sides of the landside channel. The areas between the ends of the inverted "T" floodwalls and the levee embankments remained below hurricane protection levels until 1993, when PZ-22 steel sheet piles were driven to connect the inverted "T" floodwalls to the levee embankments. See Selected Construction Drawings Plate No. III-1. The steel sheet piles had a top elevation of 18.5 and were coated with coal tar epoxy. In 1997, the west side steel sheet piles were cut off at elevation 13.75 and a cast-in-place reinforced concrete monolithic type "I" floodwall having a top elevation of 18.5 was constructed thereon. See Selected Construction Drawings Plate Nos. III-2 thru III-4. In summary, on the east side of the structure, a steel sheetpile "I" floodwall ties the inverted "T" floodwall into the levee section. On the west side, a concrete monolithic type "I" floodwall atop a steel sheetpile wall ties the "T" floodwall into the levee section.

i. Concrete Sheet Pile Wing walls. Concrete sheet pile wing walls with tiebacks are provided on each end of the gate bay to retain the earth and shell backfill at the entrance and exit of the gate bay chamber.

j. Timber Guide Walls. A timber guide wall 96 feet long is provided at each end of the gate bay and a timber fender 72 feet long is provided opposite each guide wall. The walls consist of treated timber piles, vertical and battered, and treated timber wales. A

7-pile timber dolphin is located at the end of each guide wall and fender wall. See Selected Construction Drawings Plate Nos. II-5, II-6 and II-23. Prior to 1999, the navigation lights were relocated from the dolphins to the end of the fenders and guidewalls.

k. Dock and Loading Ramp. The unloading dock is constructed of treated timbers on treated timber piles as shown on Selected Construction Drawings Plate No. II-24. The ramp from the dock to the top of the levee is shell paved.

l. Approach Channels. Upon completion of all construction and placement of the shell blanket, riprap, derrick stone and shell backfill in the dry, the approach channels were dredged to project depth by a hydraulic dredge. See Selected Construction Drawings Plate Nos. II-2 and II-3.

2-06. Gate Operating Criteria. The control structure gate will be closed when rising tides, in advance of an approaching hurricane, exceed elevation 2.0 feet on the staff gage. The gate will be kept closed until such time as the tides in the MR-GO are equal to or lower than the water elevation on the landside, and are falling.

2-07. Subsurface Conditions. The subsurface soils in the vicinity of the Bayou Bienvenue Control Structure are indicated in the log of boring B-1U and shown on Selected Construction Drawings Plate No. II-4. The location of boring B-1U is shown on Selected Construction Drawings Plate No. II-2. From existing ground at elevation 5.5 to about elevation -8.0, the soil is very soft, dark gray and dark brown clay with peat, wood and fine rootlets, and has a water content which ranges up to 310 percent. From elevation -8.0 to elevation -28.0 the stratum consist of soft to very soft gray clay with silt pockets, sandy silt pockets and shell fragments having a water content between 50 and 80 percent. From elevation -28.0 to elevation -35.0, there is a stratum of gray sand ranging from loose to dense.

From elevation -35.0 to elevation -63.0 there is a soft to stiff gray clay with silt pockets and occasional small shell fragments. From elevation -63.0 (top of the Pleistocene) to elevation -78.0 (limit of the boring), the soil consists of soft to medium gray clays and green clays with silt and sand lenses. In general, the upper soils at the control structure location have low shear strength, high sensitivity, and are compressible, indicating the need for bearing piles under the gate structure.

2-08. Instrumentation. Instrumentation readings at the structure were taken annually until 1995. Instrumentation readings are now taken the year preceding the periodic inspection, which is now scheduled on a five-year frequency. The most recent readings were taken in May 2003. Instrumentation at the project consists of 26 reference marks, 4 wall joint measurements, 28 scour survey ranges in the approach channels, and 12 overbank survey ranges.

SECTION III - OPERATION AND MAINTENANCE DATA

3-01. Operation and Maintenance Problems. There have been no major operating problems since the previous periodic inspection of the structure.

3-02. Major Repairs and Accidents. There have been no major accidents at the structure since the last inspection. Repairs have been limited to deficiency repairs discussed in paragraph 3-03. There have been no major repairs or re-construction of any features since the last inspection.

3-03. Actions on Deficiencies From Last Inspection. The following is a status of the actions taken to correct the deficiencies noted in Periodic Inspection Report No. 8, dated 24 March 1999. The text in bold italics after each item represents the remedial actions that have been reported to Engineering Division and what was observed the day of the inspection.

a. During the 2007 dewatering, an evaluation of the upward seepage through the small crack/hole in the sill slab noted during the 1997 dewatering will be conducted. ***The seepage in 1997 was deemed minor and no corrective action was necessary.***

b. Fracture critical welds above water surface as well as below the water surface will be scheduled for nondestructive testing (NDT) during the next scheduled dewatering in March 2007. The nonredundant tension chords above the water surface shall be visually inspected at each periodic inspection. Nondestructive testing will be immediately required if defects are found during the visual inspection. Drawings indicating all FCM areas will be included in the next brochure. ***Log sheets and drawings are included in Appendix E.***

c. Corroded areas on embedded metals above the normal waterline shall be cleaned and painted by March 2000. ***The embedded metals have not been cleaned and repainted based on the results of the inspection (see photo no.4).***

d. OLD was notified that the wire ropes used to activate the sector gates should be tightened (such that they do not jump out of the sheaves) as soon as the work could be scheduled. ***The wire ropes were tightened in July 1999 by OLD.***

e. OLD was notified that the abrasive material needs to be removed from the operating equipment as soon as possible. ***Abrasive materials were removed from the operating room.***

f. The frequency meter on the generator set will be repaired or replaced by March 2000. ***The frequency meter has been repaired.***

g. OLD was notified that the defective (damaged insulation) load side conductors for the east sector gate should be replaced as soon as the work could be scheduled. ***The conductors were replaced in July 1999 by OLD.***

h. The east gate sector indicator light system will be checked out, and as appropriate the limit switch and/or indicator light repaired/replaced. This will be done by March 2000. ***The light has been repaired.***

i. The lights in the control room will be cleaned by March 2000. ***This deficiency is considered an on-going maintenance item and the lights are cleaned as necessary.***

j. When the fluorescent fixtures in the machinery recesses deteriorate such that they need replacing, high quality (more durable) gasketed fixtures will be installed. ***The fluorescent fixtures have been replaced.***

k. OLD was notified that the broken weather proof cover on the receptacle near the access stair should be replaced as soon as the work could be scheduled. ***The cover was replaced in July 1999 by OLD.***

l. All receptacles will be replaced with GFCI type receptacles by March 2000. ***The receptacles have been replaced with GFCI units.***

m. Appropriate "As-Built" drawings for the new floodwalls and a narrative completion report explaining the modifications to the floodwalls will be included in the pre-inspection brochure for Periodic Inspection No. 9. ***As-Built drawings have been added to the Selected Construction Drawings found in Appendix A. A detailed narrative which explains the history of the floodwall situation is contained in Section II of this inspection report.***

n. The guidewalls and dolphins shall be repaired as necessary to maintain structural integrity. Prior to the next dewatering, a detailed inspection shall be performed to determine if major repairs or replacement of the entire guidewalls is required. ***There have been no notable repairs to the guidewalls/dolphins since the last inspection report.***

o. An evaluation to remove the dock for public safety and liability concerns will be conducted by OLD. ***OLD has been determined that dock removal is required. However, the dock has not yet been removed.***

p. MVN will re-establish reliable benchmarks during FY 2000. Settlement readings will also be taken to establish base line readings and the identification numbers for the settlement markers shall be repainted. ***PBM B-1 was reset at elev. 2.56' on 7 December 1999 by in-house survey personnel and was latter used for the FY 2003 instrumentation work. The settlement marker identification numbers atop the gate bay structure and inverted "T" floodwalls have been repainted. However, the identification numbers atop the wing wall have not been re-painted.***

q. Monitoring of concrete spalling and hairline cracks, neoprene sheets between the wall monoliths, and embankment depressions are required on a continual basis. These deficiencies are all ***on-going and are repaired/addressed on an as needed basis***.

r. The scour noted between stations 16+50 and 18+00 will be monitored: OLD will visually inspect the area on a semiannual basis and report any problems to MVN. Surveys

will continue to be taken at five-year intervals. ***OLD has not seen any problems to report to MVN. The scour noted in the previous inspection was occurring below the water surface. See Section IV for additional information.***

SECTION IV - REVIEW OF DESIGN AND ANALYSIS OF INSTRUMENTATION

4-01. Geotechnical Design Criteria.

a. A descriptive review of the design was presented in Periodic Inspection Report No. 1, 31 October 1973, and revised in September 1974. The original design criterion, as presented in this review, was used in comparing the original geotechnical design criteria with current geotechnical design criteria.

b. Revised Design Criteria. The following geotechnical design criteria have been revised:

(1) EM 1110-2-2906, "Design of the Pile Foundations," dated 15 January 1991, updated the design requirements for pile foundations.

(2) EM 1110-2-2502, "Retaining and Flood Walls," dated 29 September 1989, updated the design requirements for retaining walls.

(3) Guidance has been provided by MVD regarding lateral earth pressures and drag forces on structures due to backfill settlements.

(4) ETL 1110-2-307, "Flotation Stability Criteria for Concrete Hydraulic Structures," dated 20 August 1987, updated the analysis requirement for flotation.

(5) The seismic risk zones have changed since the original design.

c. Impacts to Design Requirements. The impacts of these revisions to the design requirements are as follows:

(1) Pile Foundation. The pilings were designed using a factor of safety of 1.75 for compression and 2.0 for tension. Pile tests were performed during construction. Current criteria for a Q-Case analysis require a factor of safety of 2.0 for both tension and compression for normal loading conditions if pile load tests are performed, and a factor of safety of 3.0 for normal loading conditions if pile load tests are not performed. For an S-Case analysis a 1.5 factor of safety is required with or without a pile load test. Also the MVD guidance on drag loads may have yielded higher pile design loads. Based on the instrumentation data, the piling have performed satisfactorily for the loading conditions they have been subjected to.

(2) "I" Type Floodwalls and Wing walls. The analysis of criteria that was used in the early 1970's required a factor of safety of 1.50 in computing both active and passive pressures for the project flood loading condition for both the cantilever "I" walls and the tie-back anchored wing walls. Current criteria for cantilever "I" walls require a factor of safety of 1.5 for the "Q" case with water to the static water level and a factor of safety of 1.25 when the wave force is added. A factor of safety of 1.2 is required for the "S" Case with water to the static water level and the wave loading applied. If the floodwall has no significant wave loading, only the "Q" case criteria are applied. The factors of safety are applied to both the active and passive pressures. Current criteria for tie-back retaining walls has not really changed form the 1970's. The fact that the sheetpile wing walls were reported to be in good condition at the last inspection indicates that the original design was adequate for the load cases that have been experienced by the structure.

(3) Slope Stability. The MVD slope stability design criteria for channels and levees have not changed since the early 1970's. However, the available information does not indicate that the slopes were analyzed for the long-term case. Also, the analysis probably did not consider an earthquake loading since this did not normally influence the design. Earthquake loadings would be even less of a factor with current seismic risk zones.

(4) Pile Supported T-Walls. The loading cases used to develop the wall loads appear to be consistent with current requirements, except possibly for the effect of the MVD guidance regarding lateral earth pressures and drag loads. The pile design procedures using the developed loads meet current standards. Since the pile supported T-walls have performed satisfactorily, the original design is indicated to be adequate.

4-02. Structural Design Criteria.

a. The original structural design criteria were reviewed and compared with current design criteria. The allowable working stresses for concrete and reinforcing steel used in the original design were in accordance with Engineering Manual EM 1110-1-2101,

entitled "Working Stresses for Structural Design", dated 1 November 1963 and are as follows:

Concrete	Original Stress (psi)
Compressive Strengths (28 days)	3,000
Compression (flexure, with or without axial load)	1,050
Shear: Beams, without web reinforcement	60
Shear: Beams, with web reinforcement	275
Bond (deformed bars): Beams, slab, one-way footings (except top bars)	$\frac{4.8\sqrt{f'c}}{D}$ (500 max.)
Reinforcing Steel	
Tension	20,000
Modular Ratio	10

b. Revised Design Criteria. The following design criteria have been revised:

(1) Engineering Manual EM 1110-1-2101, "Working Stresses for Structural Design", was updated to require the "Strength" method of analysis, similar to the requirements of the American Concrete Institute, for all concrete structures. The latest concrete design criteria is contained in EM 1110-2-2104, "Strength Design for Reinforced Concrete Hydraulic Structures", dated 30 June 1992. The latest design criteria for steel structures is contained in EM 1110-2-2105, "Design of Hydraulic Steel Structures," dated 31 March 1993 and Change 1, dated 31 May 1994.

(2) New criteria for the design of sector gates is contained in EM 1110-2-2703, "Lock Gates and Operating Equipment," dated 30 June 1994.

(3) New criteria for the design of piles and pile foundations is contained in EM 1110-2-2906, "Design of Pile Foundations," dated 15 January 1991.

(4) Guidance has been received from MVD regarding lateral earth pressures and drag loading on structures.

(5) The seismic risk zones have changed since the original design.

c. Impacts to Design Requirements. The impacts of revisions to the design requirements are as follows:

(1) A comparison of the new concrete design criteria with that utilized in the original design indicates that the design is adequate in flexure. The new design requirements for shear are more stringent than those used for the original design. In addition, it is unlikely that the amount of temperature steel provided meets the current design standards, which have been increased significantly. The latest ACI criteria for development and splice lengths has also increased significantly. A comparison with the code requirements in effect during the design of this structure indicates that the bar development and splice requirements do not meet current standards.

(2) The pile foundation design meets current standards.

(3) The sector gate was designed for a boat impact load of 120 kips. The new design criteria of 125 kips boat impact specified by EM 1110-2-2103, "Lock Gates and Operating Machinery," dated 30 June 1994, is only slightly higher. Considering the fact that the gate is only closed in advance of rising tides caused by an approaching hurricane, and remains closed until the tides recede, it is highly doubtful the gate would ever experience a boat impact approaching the design impact load.

(4) A review of available information indicates that the structure was designed considering drag force caused by settlement of adjacent fills.

(5) The structure was not designed for seismic accelerations. The current earthquake design criteria is contained in ER 1110-2-1806 "Earthquake Design and Evaluation for Civil Works Projects," dated July 31, 1995. This document places this project in Earthquake Zone 0. Based on the ER, MVN Geotechnical Branch personnel consider the appropriate geotechnical design earthquake acceleration loading to be zero. Therefore the earthquake loading will not be critical.

d. Conclusion. While a review of current design standards indicates that the gate bay and inverted "T" floodwalls do not meet several current design requirements for concrete structures, these structures are deemed adequate based on their past performance as well as the performance of other similar structures designed by "working stress" methods. In accordance with ER 1110-2-8157, "Responsibility For Hydraulic Steel Structures," dated

31 January 1997, the sector gate have been evaluated by MVN Engineering Division to determine fracture critical members and required field inspection and testing of the fracture critical members. See Appendix E for additional information.

4-03. Analysis of Instrumentation Data.

a. General. The engineering data survey measurements at Bayou Bienvenue include scour surveys with cross-sections and profiles of the approach channels and overbank areas, and elevations taken on settlement reference marks on the gate structure, the east and west concrete T-walls and the concrete sheet pile wing walls at the four corners of the structure. Joint opening measurements are made between adjacent markers on the two concrete T-walls. Historical analyses of the engineering measurements are presented in the following subparagraphs.

b. Vertical Control. The last inspection report indicated a potential problem with the remaining PBM's at the project site: BB-2, and BB-3. PBM BB-1 could not be located and was noted as being destroyed in the May 1982 survey notes. The May 1982 survey notes also state the 3-inch guard pipe could not be located for PBM's BB-2 and BB-3. The November 1982 survey notes the pipe cap for BB-2 seems to have been unscrewed and then placed back on the pipe. The PBM level loops since 1982 have shown PBM BB-2 to have a higher reading that the initial 1974 value. The March 1998 data evaluation by the AE contractor indicated that the condition for the two PBM's were not in accordance with their documented description (However, the data sheets provided by contractor indicated PBM's were found as described). A MVN survey crew in December 1999 installed a replacement PBM named BB-1 (Reset) for the PBM that was destroyed in the early 1980's. All three existing PBM's then had their elevations re-established from PBM U-375 (nearby PBM).

The tabulated settlement data and level loop runs are shown on Instrumentation Plate No. 2A. The values for the data shown on this plate are based upon the PBM used to start the level loop run. Over the years, different PBM's were used at this structure to start the level loop. Also, the elevation values for the PBM's have different epoch values. The value in boldface indicates which PBM was used to start the level loop. Prior to

performing an evaluation, the settlement readings needed to be adjusted so that the values are based on the same common starting point. PBM BB-3 (1974 epoch) was chosen. Instrumentation Plate No. 2B show the adjusted values for the reference marks.

c. Settlement.

(1) Gate Bay and T-walls. Instrumentation Plate No. 2 shows the locations of the settlement reference marks on the gate bay and T-walls. Four markers are located on each of the east and west inverted "T" floodwalls, and three markers are located on each side of the gate structure. The tabulated **adjusted** settlement values are shown on Instrumentation Plate No. 2B and the corresponding plotted data are presented on Instrumentation Plate Nos. 2C, 2D, 3 and 3A. The original readings were taken in 1974, and the maximum settlement from all data points except one, B-1, is indicated to have occurred by 1998. The maximum settlement occurred on the ends of the inverted "T" floodwalls at the junctures with the I-walls. The profiles of the inverted "T" floodwalls presented on Instrumentation Plate No. 2C show this differential settlement. Total settlement of the west T-wall ranges from 0.16 feet at the gate structure to 0.79 feet at the west end. Total settlement of the east T-wall ranges from 0.07 feet at the gate structure to 0.44 feet at the east end. Thus, the differential settlement of the T-walls is not uniform with greater settlement occurring on the levee side ends. The gate bay structure shows an average total settlement of 0.08 feet for the western portion of the structure and an average total settlement of 0.01 feet for the eastern portion of the structure. The plotted profiles show little differential settlement for the gate bay structure, indicating a uniform settlement of the structure.

(2) Concrete Capped Sheet Pile Wing Walls. The locations of the reference markers for the tie back wing walls are presented on Instrumentation Plate No. 4. The tabulated adjusted settlement data is shown on Instrumentation Plate No. 2B and the plotted data is presented on Instrumentation Plate Nos. 5 and 5A. Three reference markers are located on each wing wall. All reference points on each wall have experienced a slow consistent settlement. The original readings were taken in 1978, and the maximum settlement from all data points is indicated to have occurred either in 1998 or 2003. The maximum settlement occurred on the landward ends of the wing

walls (four outer most corners). The west wing walls shows an average total settlement of 0.27 feet while the east wing walls shows an average total settlement of 0.25 feet. This is in contrast to the gate bay and inverted "T" floodwalls whereby the western portion of the project had a noticeable larger amount of settlement.

d. Joint Openings. The locations of the two monitored horizontal joint openings on each concrete T-wall are shown on Instrumentation Plate No. 2 and measurements of the joint openings are tabulated on Instrumentation Plate No. 2A. The total joint openings have increased from 0.08 inches to 0.11 inches, with the majority of the widening occurring between 1974 and 1987. The last five readings (1993, 1994, 1996, 1998, and 2003) show a maximum joint increase of 0.01 inches, which is generally insignificant.

e. Scour Survey

(1) Wing wall Ranges. The locations of the wing wall ranges for scour detection are shown on Instrumentation Plate No. BUN-6. The data plots are presented on Instrumentation Plate Nos. 7-10. These ranges record any scour or deposition on the banks adjacent to and behind the wing walls. The data recorded consist of the 1984 survey and the four most recent annual surveys. The northwest and northeast wing wall overbank areas have experienced minor scour since the 1998 survey as depicted by survey range 3.

(2) Channel Scour. The range layout for channel scour is presented on Instrumentation Plate No. BUN-11. The centerline profile survey is presented on Instrumentation Plate No. 12 and the cross-sections are presented on Instrumentation Plate Nos. 13 through 22. The data show that after the 1984 survey there was a period of scouring between approximate Stations 16+50 and 22+00. Since 1996, the channel has been more or less stable. The 2003 survey indicates approximately one foot of silt has accumulated within the limits of the structure since 1998. The 2003 centerline profile survey indicates that the majority of the channel has experienced bottom siltation or scour ranging plus or minus two feet when compared to the 1998 survey. Extreme siltation of approximately ten feet occurs at Station 16+50 and extreme scour

of approximately nine feet at Stations 6+00 and 17+50 (heights are relative to the 1998 survey). The 2003 cross section data indicates a wide variation of siltation and scour when compared to the 1998 survey. Ranges 6+00 and 6+50 have deepened up to nine feet while the channel side slopes have not steepened. Ranges 7+00 through 15+50 and 20+00 through 22+00 have insignificant deviations from the previous surveys. Ranges 6+00 and 6+50 have had up to ten feet of siltation. Ranges 17+00 through 19+00 have experienced significant recession that exceeds 20 feet at Range 18+00. The underwater slope on the west side of the channel is steeper than 1V on 1H and has a factor of safety of essentially 1.0 against failure (previously mentioned in the last inspection report). The recent erosion has not caused further steepening of the west underwater channel slope, but has resulted in increasing the cross sectional area of the channel. A bank failure in this location would not affect the integrity or operation of the control structure.

SECTION V – INSPECTION

5-01. Inspection Team. Periodic Inspection No. 9 of the Bayou Bienvenue Control Structure was conducted on 28 April 2004 by the following inspection team members and observers who are pictured below from left to right, starting with the back row then front row:

Mr. Justin Guilbeau	LADOTD	Transportation Specialist
Mr. Dom Elguezabal	OLB (Orleans Levee Board)	Civil Engineer
Mr. Jeff Richey	CEMVN-ED-T	Structures
Mr. Anthony Gallodoro	CEMVN-ED-GM	Materials
Mr. Dan Bradley	CEMVN-ED-G	Mechanical/Electrical
Mr. Rusty Barras	CEMVN-ED-G	Electrical Observer
Mr. David Vossen	CEMVN-ED-HD	Hydraulics
Mr. Jerry Bequgez	OLB	Emer. Oper. Coord.
Mr. Chris Dunn	CEMVN-ED-T	Structures Observer
Mr. Danny Haggerty	CEMVN-ED-FS	Geotechnical
Mr. Jerry Colletti	CEMVN-OD-T	Operations Manager
Mr. Louis Durr	OLB	Director of Ops & Maint.
Mr. John R. Monzon	LADOTD	District Hydraulics Engr.

Other personnel present and not pictured include:

Mr. Brian J. Gannon	CEMVN-ED-T	Inspection Coordinator
Mr. Mark Theard	OLB	Senior Electrician
Mr. Guy Dietsch	OLB	Electrical Specialist

5-02. Orientation. A pre-inspection briefing was held the morning of the Periodic Inspection in the parking area adjacent to the structure. Mr. Gannon noted the deficiencies observed in the previous report and instructed team members to verify the deficiency resolutions provided in inspection brochure. Mr. Dom Elguezabal, of the Orleans Levee Board, discussed the overall condition of the structure and work that had been performed since the last periodic inspection. The inspection team discussed the plan for accomplishing the inspection. A post inspection comment session was also conducted upon completion of the field observations to compare notes and achieve consensus on the deficiencies noted.

5-03. Observations & Photographs. The inspection team members noted the following observations:

a. General. The structure was not dewatered during the inspection and was fully operational. A detailed visual inspection was made of all structure features above the waterline. The structure is in a reasonably good condition with no major operating problems and is safe for continued operation. The project is well maintained and good house keeping is exhibited throughout. Both the floodside and protected side water elevations were at a constant elevation of 1.0 during the inspection. The staff gages are in excellent condition. (See photo no. 1).

b. Concrete Gate Bay Structure. The overall condition of the concrete gate bay structure was good. Due to the age and isolation of the structure, minor vessel damage and vandalism was noted. Both structure walls have surface abrasions and spalling around the corner armor and needle girder recesses. A structural concrete crack was noted at the eastern most portion of the east gate bay monolith on the protected side, just

adjacent to the seal that joins the inverted "T" floodwall to the gate bay structure. (See photo no. 2). On the protected side east face of the Gate Bay structure, a section of concrete is spalled due to a fire that burned wales in the timber guidewall. The fire occurred prior to the last periodic inspection. Minor delamination of the concrete beneath the west control house was also noted. The top of the each Gate Bay wall surrounding the sector gates has minor surface cracks and spalling. No change from the last inspection was noted on the spall located on the protected side vertical face of the east gate bay monolith.

c. Sector Gates & Miscellaneous Metals. The sector gates are in good condition. The gates were reportedly sandblasted and painted during the last dewatering event. Minor corrosions was noted around the waterline in some of the members. (See photo no. 3). The recess ladders, the needle recesses and corner protection on the gate bay walls have corrosion up to 6 feet from the waterline. (See photo no. 4). All handrails atop the sector gates and the inverted "T" floodwalls as well as the steel walkways atop the sector gates were in good condition and appeared to be recently painted. (See photo no. 5). Appendix E contains summary inspection log sheets.

d. Gate Operating Machinery. The sector gates are controlled from consoles located in each control houses located atop the gate bay structure on either side of the channel. Controls for the gate operating machinery are original equipment, but performed well. (See photo no. 6). The limit switches appear to be operating normally. Due to a buildup of debris in the gate recess, the limits switches have been adjusted to accommodate for the inability of the gates to fully open. (See photo no. 7). The debris buildup is minor and does not result in the gates protruding into the channel, when the limit switch is set within the limits of the mounting bracket. When debris buildup prevents the gates from opening within the limits of the limit switch mounted bracket, divers are used to cleanout each gate bay. The two 2-HP, 480Vgate motors, brakes, cable drives, and winch drums. (See photo nos. 8, 9, & 10) appear to function normally except during the initial operation of the west side gate. The west side motor brake appeared to set several times while the gate was in the closing motion. Later, in repeated attempts to recreate this malfunction, the brake operated normally.

e. Power Generator. Commercial power service was connected to the facility approximately three years prior to this inspection. The 15 kW 480 V generator set, which was the primary source of electrical power, is now auxiliary. (See photo no. 11). There is a manual switch that transfers commercial and auxiliary power. (See photo no. 12). During the two hours of the inspection, the generator set was used to operate the gates. The generator and transfer switch are well maintained and functioned properly.

f. Power Distribution. The structure power distribution is routed through an aging Motor Control Center. (See photo no. 13). The ground fault detector lights were illuminated indicating there was a ground fault problem somewhere in the system. The ground fault is most likely located somewhere in the conductors routed under the structure. The power conductors appear to be completely immersed in water and have likely existed in this condition for an extended period of time. The following paragraph provides a brief explanation of the basis for the conductors' ground fault issue.

> The power and control cables for the gate machinery pass under the structure in 2-inch conduits. The conductors enter the machinery rooms from below and into 18"W x 18"L x 15" deep junction box in the floor very similar to a sump. (See photo no 14). As a consequence, when rainwater enters the machinery rooms through the cable machinery opening, it collects in the junction boxes and fills the conduits. In addition, the conduits routed up to the control rooms have corroded to the point where rainwater can easily run into the junction boxes from those open conduits. (See photo no.15). The conduits and cables appear to stay wet for extended periods of time. Conductor insulation failure is imminent and the power and control circuits will eventually either fault to ground or another conductor. There is also an indication of a fault condition in the motor control center's ground fault detector.

All navigation lights were inspected and in excellent condition. (See photo no.16). The tide monitoring system (see photo no. 17) appeared to be in good operating condition and was sending information to the Orleans Levee Board's emergency operation center (EOC) reliably.

g. Dewatering Components. The overall condition of the concrete dewatering needles was good, however the seals are falling off. (See photo no. 18). Only minor corrosion was noted on the steel needle girders. Appendix E contains summary inspection log sheets.

h. Concrete Inverted "T" Floodwalls. The overall condition of the "T" Floodwall concrete was good. Mild surface cracks and delaminations were observed on the east and west floodwall walkways. Exposed rebar was also noted on the west walkway. (See photo 19). Spalling occurred due to corrosion of the reinforcement chairs and rebar underneath the walkway on the flood side of the monolith closest to the west "I" wall. (See photo no. 20). On the east floodwall, downstream side, gunfire damage was observed (see photo no. 21).

i. Concrete "I" Floodwall. The overall condition of the "I" Floodwall concrete (west side) was good. There were no notable deficiencies observed. This floodwall is approximately seven years old.

j. Concrete Capped Wing Walls. The overall condition of the concrete wing walls was good. The concrete cap on top of the wing walls have cracks spaced equal to the steel sheets below, thus indicating differential settlement. (See photo no 22).

k. Concrete Joints. Separation of the inverted "T" floodwall joints is causing rainwater to deteriorate the joint material. (See photo no. 23). On the west flood side floodwall, one of the monolith seals is torn. (See photo no. 24). One of the seals on the west "T" floodwall is missing a bolt. Generally, the neoprene seals throughout each "T" floodwall are showing signs of weathering. (See photo no. 25). The L-Type waterstop between the northwest wing wall and the gate bay structure has separated. (See photo no. 26)

l. Sheetpile Floodwall. The overall condition of the steel sheetpile floodwall was good. Some minor corrosion was noted. (See photo no. 27)

m. Timber Guidewalls & Dolphins. The guidewalls are in reasonably good condition. There is some deterioration on the lower horizontal members. The northeast guidewall is missing wales near the waterline. (See photo nos. 28 & 29). Subsequent to the team inspection of 28 April, the OLB conducted an independent inspection of each guidewall and found them to be heavily infested with termites. The two dolphins on the protected

side are in reasonably good condition. However, broken piles were noted on the northeast and northwest dolphins. (See photo nos. 30 and 31, respectively).

n. Channels. At approximate station 6+00, the riprap slope protection on the east channel slope on the flood side of the structure showed signs of wash out and appears to be slightly deficient as compared to the other channel slopes. (See photo no. 32). Otherwise the channel slopes and riprap protection were in good condition.

o. Embankments. The levee embankments in the vicinity of the structure were in good condition (see photo no. 33). The backfill behind the wing walls appeared to be in good condition. There is a history of erosion of the backfill behind the wing walls at this facility. Due to settlement of the northwest wing wall, the waterstop between the northwest wing wall and gatebay has separated. Minor loss of fill material was noted in this area. At the other three wing wall junctures with the structure, there were small depressions indicating minor loss of material through the "L" waterstops. Additional depressions and evidence of material loss were noted adjacent to each of the wing walls. (See photo no. 34).

p. Settlement Reference markers & Instrumentation. The settlement reference markers (SRM) on the gate bay structure and the inverted "T" Floodwalls have recently been repainted and are in good condition (see photo no. 35). However, the SRMs on the wing walls are faded and illegible. (See photo No. 22). The SRM SW-3 located on the southwest wing wall (adjacent to the gate bay structure) was found bent. (See photo no. 36). PBM BB-1 reset was located on the east protected side of the structure and was clearly marked and readily accessible. The other PBMs (BB-2 and BB-3) that are adjacent to the structure could not be located during the inspection. PBM U-375 (nearby PBM consisting of a metal disk in the base slab of a flood gate, (see photo no. 37) was located at the floodgate approximately 1 mile west of the structure.

SECTION VI – CONCLUSIONS & PROPOSED REMEDIAL ACTIONS

6-01. Conclusions. The inspection team concludes that the Bayou Bienvenue Control Structure is generally safe, structurally stable, well maintained and in satisfactory operating condition. Good housekeeping is demonstrated throughout the site.

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

a. Ranking System. Remedial actions for deficiencies noted and discussed during the inspection are ranked according to the following levels:

(1) **Emergency.** Serious deficiency exists that needs to be resolved immediately. Emergency needs should be elevated to the current year program for quick response.

(2) **Urgent and Compelling**. Deficiency work that has unsatisfactory risk associated with potential loss of life and property.

(3) **Critical.** Work critical in nature but can be deferred for a short period of time.

(4) **Major Deficiency**. Work that is generally covered under operating and routine maintenance that needs to be resolved within 1 to 2 years.

(5) **Medium Level Deficiency**. Work that needs to be resolved as soon as funding becomes available beyond the biennium.

(6) **Low Level Deficiency**. Work at the structure and periphery features that need to be resolved during the next 5 years.

(7) **Ultra Low Deficiency**. Work that is nice to have that can be deferred to the out years and will not get addressed unless the deficiency worsens and begins to affect the structure or operation more significantly.

(8) **Routine Maintenance**. Work that is of a routine nature that is not critical to the operation, safety or stability of the structure, but should be done on a reoccurring basis and would usually be funded annually.

b. Prioritized remedial actions/recommendations.

1. **Emergency** - None

2. **Urgent & Compelling** – None

3. **Critical** – One Item

i. Without resolution of the ground fault condition, a failure is imminent and will render the structure only operable by manual mode. New control and power cables shall be installed in the two spare 2" conduits in by April 2005. The existing conduits shall be extended above the machinery room floor into the control room by core drilling through the control room floor. This elevation will eliminate rainwater from entering the conduits. Additionally, interior conduits are less likely to corrode than exterior, where exposed to the elements.

4. **Major Deficiencies** – One Item

i. Replacement of the motor control center is recommended in the near future. The existing motor control center is aging and replacement parts are problematic per project personnel. It is cost effective to have this work done in conjunction with the installation of the new wiring.

5. **Medium Level Deficiencies** – Three items

i. The waterstops, located at the "T" floodwall joints, are damaged and weathered. The useful life of this material has been exceeded. The waterstops of each joint in the "T" floodwalls should be re-installed with new material. This work shall be accomplished by April 2005.

ii. Excessive separation of the L-type waterstop between the west flood side wing wall and the gate bay structure shall be repaired by April 2005.

iii. Each timber guidewall shall be replaced as soon as funding is available due to termite infestation.

6. **Low Level Deficiencies** – Two Items

i. Deteriorated/damaged guidewall and dolphin components as well as the missing wales near the waterline of the northeast guidewall should be repaired in 2005.

ii. The rip rap slope protection on the northeast channel should be replaced in 2005.

7. **Ultra Low Deficiency** – One Item

i. Corroded areas on embedded metals (such as corner protection, recesses and ladders) above the normal waterline should be cleaned and painted by December 2004.

8. **Routine Maintenance** – Six Items

i. The rubber pads on the concrete needles should be replaced. This work should be accomplished prior to the next dewatering.

ii. Erosion and backfill material loss, behind each wing wall, shall continue to be monitored. If erosion becomes excessive over a short period of time, replacement of the remaining three "L" waterstops between the wing walls and the structure shall be required. (Note repair/replacement of the west flood side wing wall waterstop is specified in 5iii).

iii. The identification name for the settlement reference markers on each of the wing walls shall be re-painted by OLD in 2004.

iv. The PBMs (BB-2, and BB-3) adjacent to the structure shall be located and clearly marked for easy future field reference. USACE – MVN in-house survey crew shall perform this action prior to the next instrumentation readings.

v. The scour noted between stations 16+50 and 18+00 will be monitored. OLD will visually inspect the area on a semiannual basis and report any problems to MVN. Surveys will continue to be taken at five-year intervals.

vi. Project personnel shall continually monitor structural concrete cracks and spalls within the gate bay structure and floodwalls/wing walls for stability and excessive re-bar corrosion.

6-03 Next Inspection. The next Periodic Inspection of the Bayou Bienvenue Control Structure is scheduled for March 2009. An inspection will be conducted during the next dewatering, which is tentatively scheduled for 2007, and those observations will be included in the 2009 report.

APPENDIX A

SELECTED CONSTRUCTION DRAWINGS

BAYOU BIENVENUE
INDEX
SELECTED CONSTRUCTION DRAWINGS

Plate No.	Title	File No.	Dwg. No.
II-1	*Location Map	H-2-26856	1
II-2	General Plan	H-4-24326	2
II-3	*Typical Sections	H-4-24326	4A
II-4	Log of Borings	H-4-24326	5
II-5	*Completed Plan	H-4-24326	6
II-6	Completed Sections	H-4-24326	8
II-7	*Gate Bay Piling Layout and Stabilization Slab	H-4-24326	13
II-8	*Gate Bay Base Slab – Masonry Plan	H-4-24326	14
II-9	*Gate Bay Base Slab – Sections	H-4-24326	17
II-10	*Gate Bay Wall Masonry and Reinforcing Plan at Elevation –10.45	H-4-24326	18
II-11	*Gate Bay Wall Masonry and Reinforcing Plan at Elevation 17.5	H-4-24326	19
II-12	*Gate Bay Wall – Elevations and Sections	H-4-24326	20
II-13	*Gate Bay Wall – Elevations and Sections	H-4-24326	21
II-14	*Gate Bay Wall – Elevations and Sections	H-4-24326	22
II-15	*Control House – Plan and Elevation	H-4-24326	23
II-16	*Control House – Sections and Details	H-4-24326	24
II-17	*Hinge Anchor – Assembly and Details	H-4-24326	26
II-18	*Pintle Support – Assembly and Details	H-4-24326	27
II-19	*Needle Girder – Plan and Details	H-4-24326	28
II-20	*Needle Details	H-4-24326	29
II-21	*Floodwall – Plan and Elevation	H-4-24326	34
II-22	*Floodwall – Sections and Details	H-4-24326	35
II-23	*Timber Guide Wall Fender and Dolphins	H-4-24326	36
II-24	*Loading Dock	H-4-24326	37
II-25	*Sector Gates – Upper Frame and Joints	H-4-24326	39
II-26	*Sector Gates – Center Frame and Joints	H-4-24326	40
II-27	*Sector Gates – Lower Frame and Joints	H-4-24326	41
II-28	*Sector Gates Channel Truss	H-4-24326	42
II-29	*Sector Gates – Recess Truss	H-4-24326	43
II-30	*Sector Gates – Skin Plate	H-4-24326	44
II-31	*Sector Gates – Hinge	H-4-24326	48
II-32	*Sector Gates – Pintle	H-4-24326	49
II-33	*Sector Gates – Rubber Seals	H-4-24326	50
II-34	*Operating Machinery – General Arrangement	H-4-24326	52
II-35	*Operating Machinery – Control Room – Plan and Details	H-4-24326	53
II-36	*Cathodic Protection, Navigation Aids and Details	H-4-24326	64

BAYOU BIENVENUE
INDEX
SELECTED CONSTRUCTION DRAWINGS

II-37	*Cathodic Protection, Mounting Details	H-4-24326	64A
III-1	Profile and Details – Vicinity of Bayou Bienvenue Structure	H-8-30920	7
III-2	Profile and Details – Vicinity of Bayou Bienvenue Structure	H-8-40689	6
III-3	Typical Wall Joint	H-8-40689	13
III-4	Typical Joint Reinforcement	H-8-40689	14

* Included in Periodic Inspection Report No. 1

Photo No. 1 – Staff gage (typical condition).

Photo No. 2 – Structural crack noted in the east gate bay monolith, just adjacent to the inverted "T" Floodwall.

Photo No. 3 – Sector gate members; corrosion at waterline noted.

Photo No. 4 – Corrosion of the ladder, corner protection and needle beam recess noted.

Photo No. 5 – Steel walkways and handrails noted in excellent condition

Photo No. 6 – Original controls for the gate operating machinery.

Photo No. 7 - Sector gate limit switch (typical condition).

Photo No. 8 – Gate cable drives

Photo No. 9 – Gate motors.

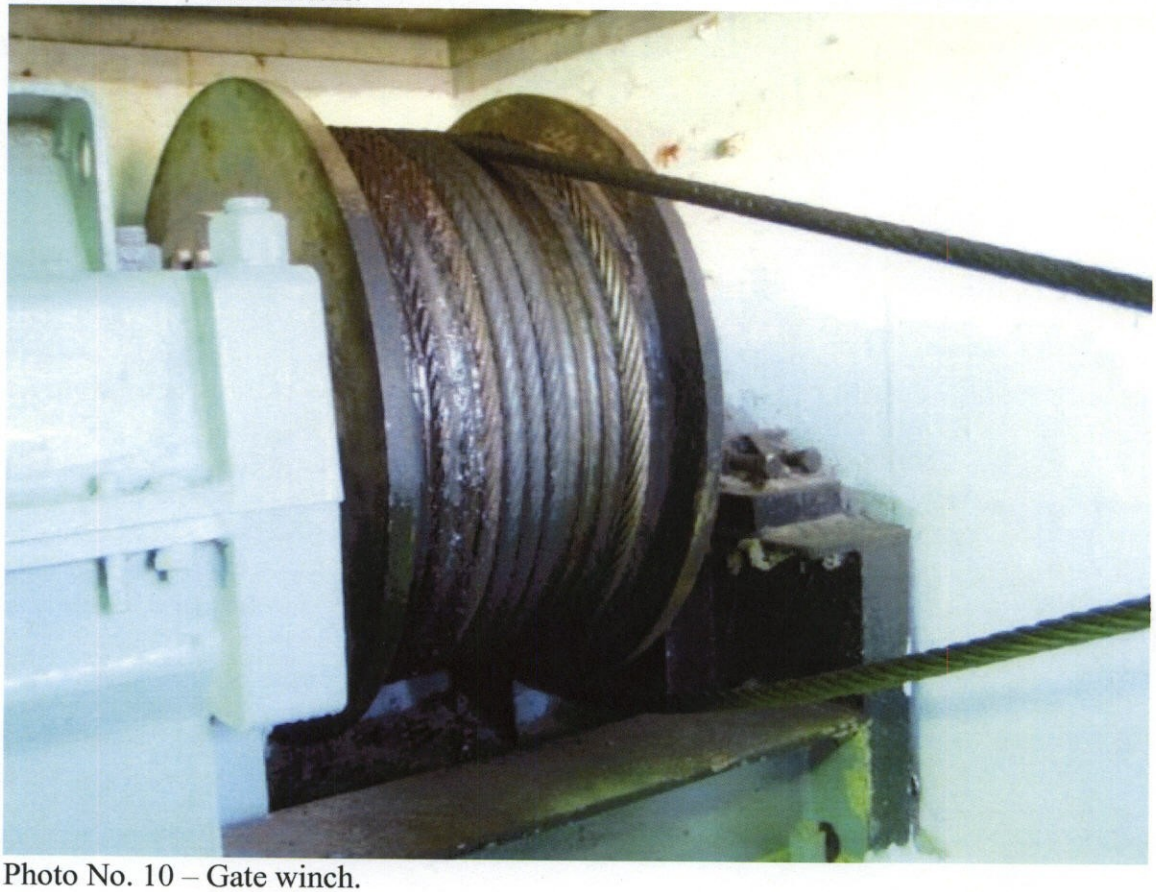


Photo No. 10 – Gate winch.

Photo No. 11 – Emergency generator set.

Photo No. 12 – Manual transfer switch for commercial to generator power.

Photo No. 13 – Motor control center.

Photo No. 14 – Conductor junction box.

Photo No. 15 – Conductor conduit.

Photo No. 16 – Typical navigation light.

Photo No. 17 – Tide monitoring and reporting equipment.


Photo No. 18 – Concrete needles with noted damage to the rubber seals.

Photo No. 19 - Exposed rebar on the walkway atop the inverted west "T" floodwall.

Photo No. 20 – Rebar chair corrosion noted on the inverted west "T" floodwall, flood side.

Photo No. 21 – Gunfire damage on the inverted east "T" floodwall, protected side.

Photo No. 22 – Cracks observed on a wing wall. (Typical).

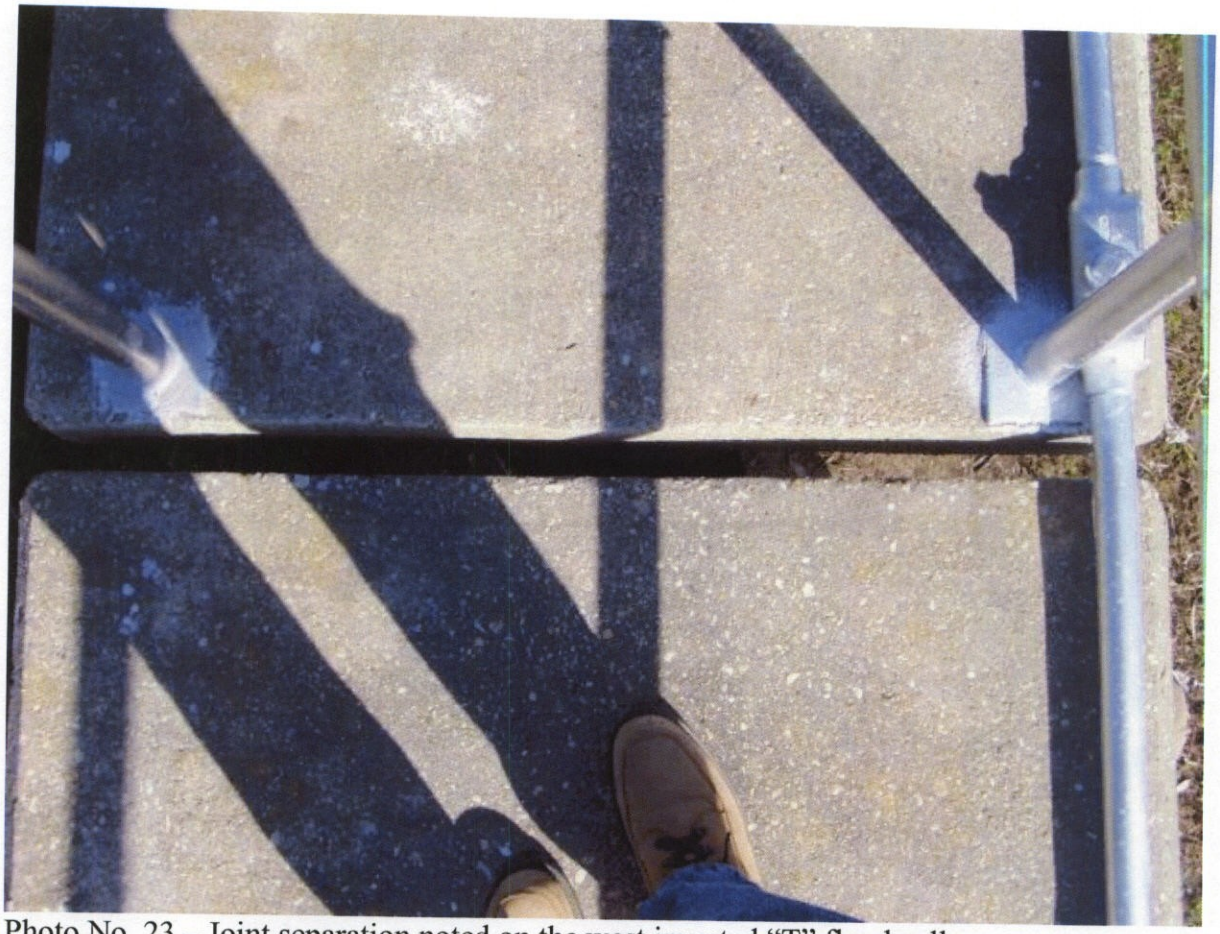


Photo No. 23 – Joint separation noted on the west inverted "T" floodwall.

Photo No. 24 – Torn Monolith joint seal.

Photo No. 25 – Weathering condition of a monolith joint seal. (Typical).

Photo No. 26 – Separation of the L-type waterstop between the west flood side wing wall and structure.

Photo No. 27 – East side steel sheetpile "I" floodwall.

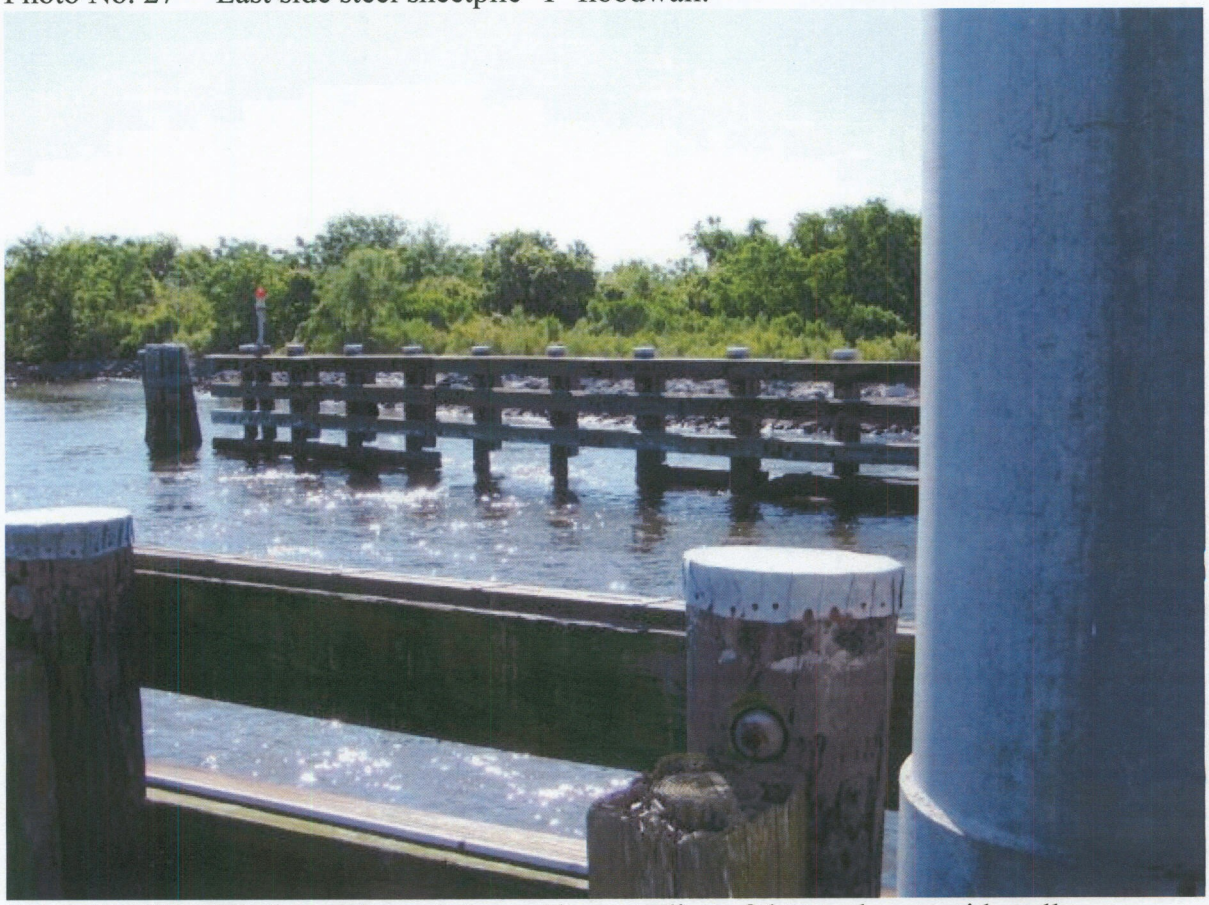


Photo No. 28 – Missing wales noted near the waterline of the northeast guidewall.

Photo No. 29 – Southwest guidewall noted in good condition.

Photo No. 30 – Broken pile noted in the northeast dolphin.

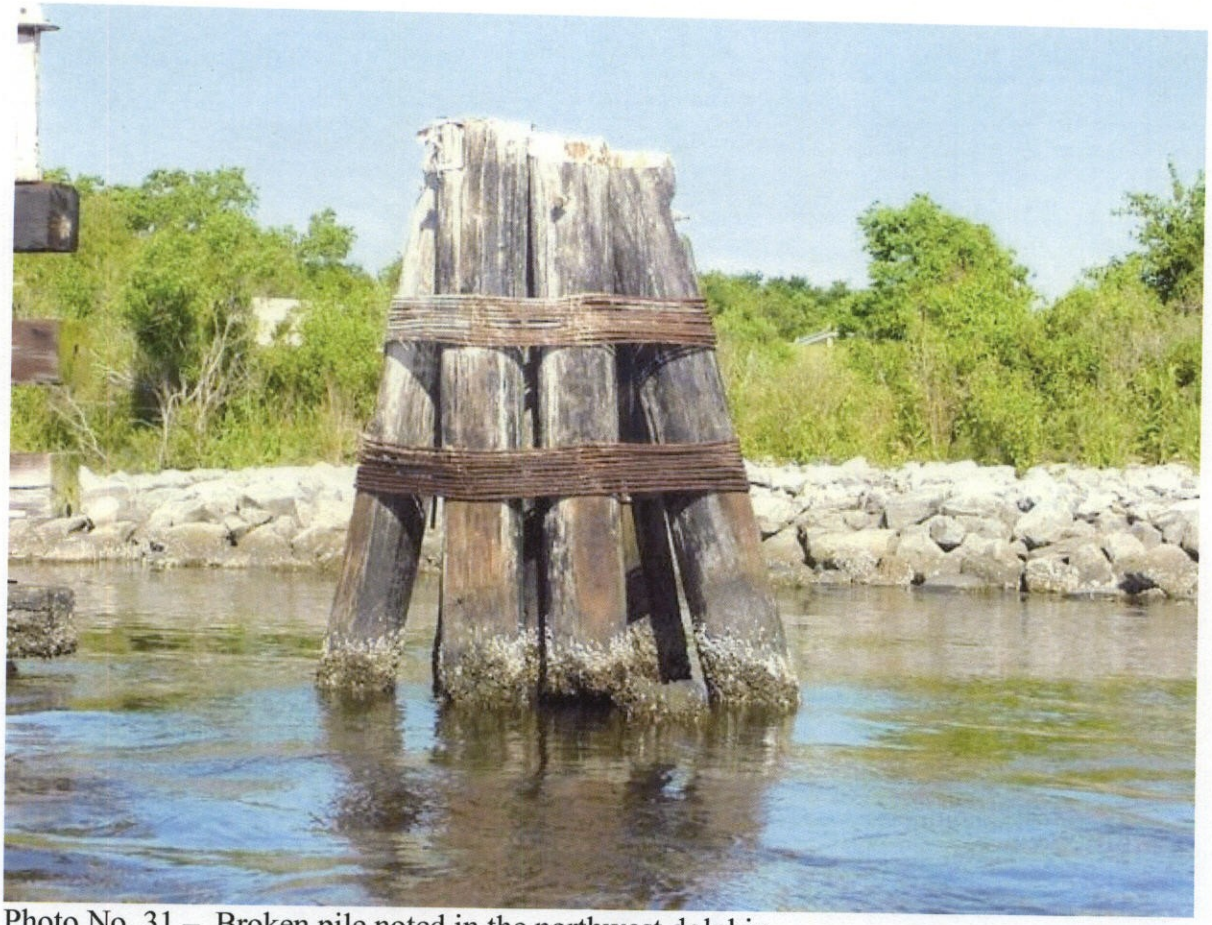


Photo No. 31 – Broken pile noted in the northwest dolphin.

Photo No. 32 – Deficient rip rap slope protection noted on the east channel slope, floodside side of structure.

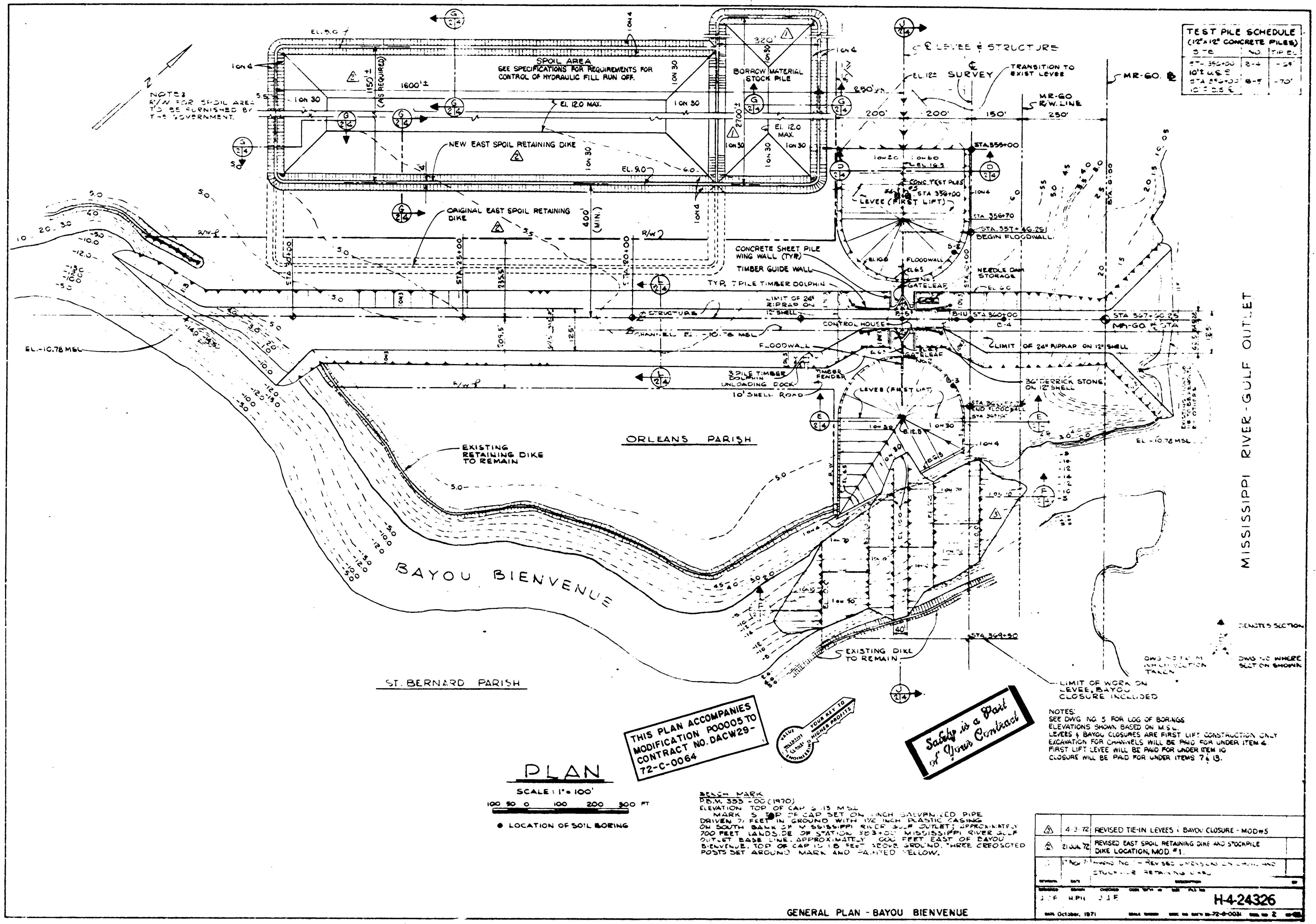
Photo No. 33 – Western adjacent levee alignment.

Photo No. 34 – Evidence of material loss noted adjacent to the wing walls.

Photo No. 35 – Settlement reference markers (SRM) noted atop the "T" Floodwall.

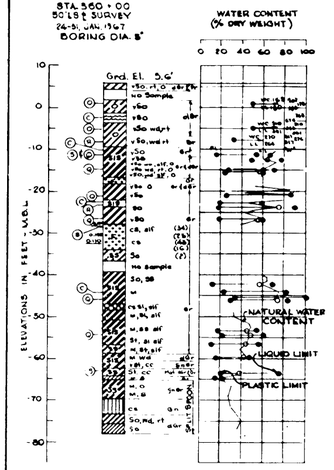

Photo No. 36 – Bent SRM noted on the southwest wing wall.

Photo No. 37 – PBM U-375 – located at the floodgate approximately 1 mile west of the structure along the levee alignment.

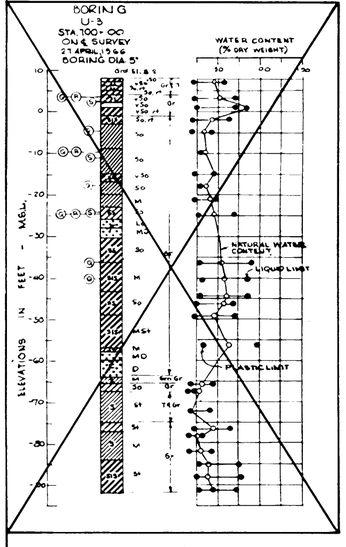


BAYOU BIENVENUE CONTROL STRUCTURE PLATE II-2

BORING
B-1U
STA. 360+00
50' L.S. ℄ SURVEY
24-31 JAN. 1967
BORING DIA. 8"



BORING
U-3
STA. 700+00
ON ℄ SURVEY
27 APRIL 1966
BORING DIA. 5"

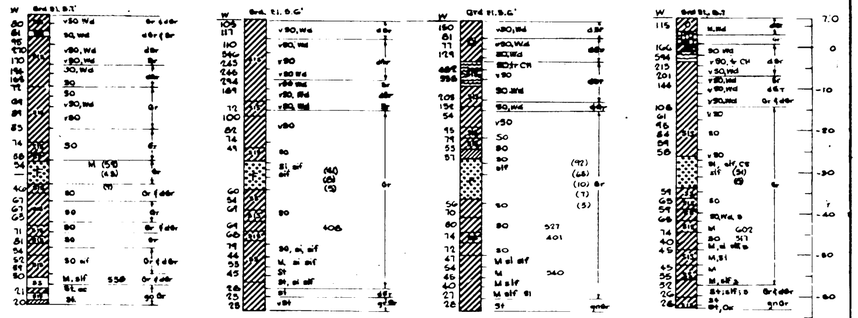


B-2
STA. 358+00
30' L.S. ℄ SURVEY
13-14 FEB. 1967

B-3
STA. 362+00
50' L.S. ℄ SURVEY
13-14 FEB. 1967

B-4
STA. 360+00
100' F.S. ℄ SURVEY
13-14 FEB. 1967

B-5
STA. 360+00
200' L.S. ℄ SURVEY
13-16 FEB. 1967



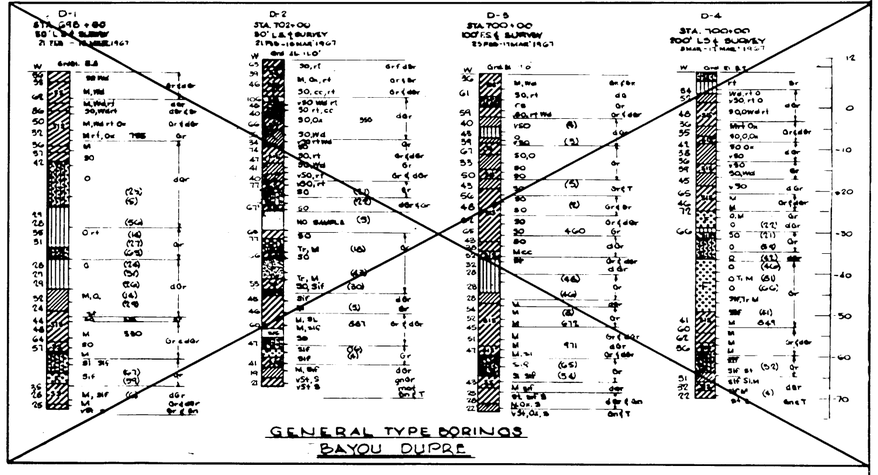
GENERAL TYPE BORINGS
BAYOU BIENVENUE

D-1
STA. 698+80
50' L.S. ℄ SURVEY
21 FEB-15 MAR. 1967

D-2
STA. 702+00
50' L.S. ℄ SURVEY
21 FEB-15 MAR. 1967

D-3
STA. 700+00
100' F.S. ℄ SURVEY
23 FEB-15 MAR. 1967

D-4
STA. 700+00
200' L.S. ℄ SURVEY
8 MAR.-17 MAR. 1967



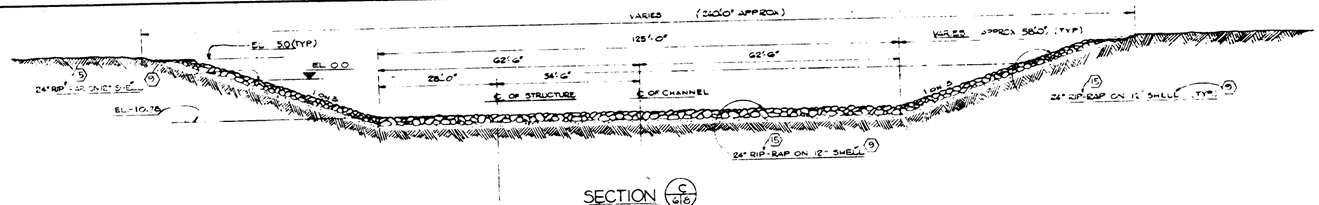
GENERAL TYPE BORINGS
BAYOU DUPRE

NOTES:
1-FOR LOCATION OF BORINGS SEE DWGS. NO. 2 (
2-FOR SOIL BORING LEGEND SEE DWG. FILE NO. H-2-21800.
3-GENERAL TYPE SOIL SAMPLES WERE TAKEN WITH A 3" I.D. CORE BARREL SAMPLER. CONESIONLESS SAMPLES WERE TAKEN WITH 2" O.D. SPLIT SPOON SAMPLER USING A 140 LB. HAMMER WITH A 30" DROP.
4-UNDISTURBED SOIL SAMPLES WERE TAKEN WITH A 3" I.D. STEEL TUBE PISTON-TYPE SAMPLER.
5-ELEVATIONS REFER TO M.S.L. DATUM.

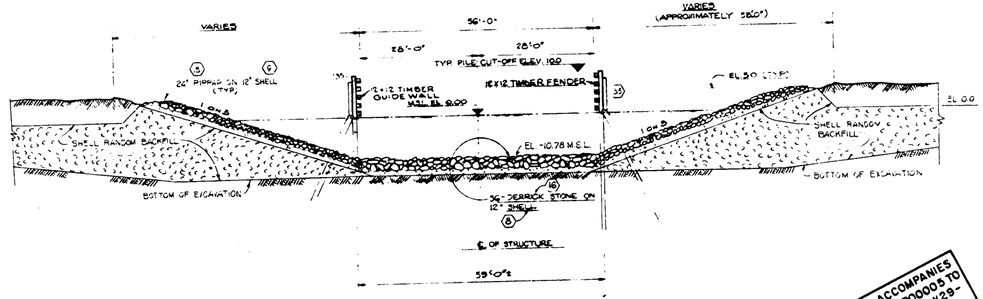
LOG OF BORINGS

DESIGNED	DRAWN	CHECKED	CODE IDENT. NO.	SIZE	FILE NO.
J.J.F	H.P.K.	J.J.F			H-4-24326
DATE: October, 1971		SCALE: SHOWN	TAPE NO. DWG'S D-72-8-003	SHT. NO. 5	OF 63

BAYOU BIENVENUE CONTROL STRUCTURE PLATE II-4



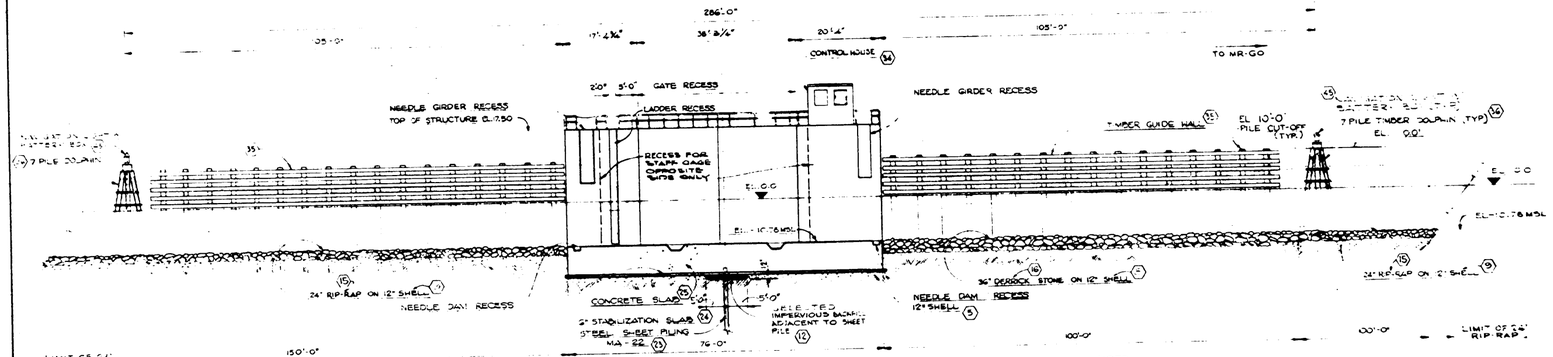
SECTION (C/G/O)
SCALE 1"=10'



SECTION (B/G/O) ⚠
SCALE 1"=10'

THIS PLAN ACCOMPANIES MODIFICATION P00005 TO CONTRACT NO. DACW29-72-C-0064

Safety is a Part of Your Contract



SECTION (D/G/O)
SCALE 1"=10'

NOTE
ELEV. REFER TO M.S.L. DATUM

⚠ 5-3-72 (RELOCATED SECTION E TO SHOW SHELL RANDOM BACKFILL MODIFIED WALL

NO.	DATE	DESCRIPTION	BY
DESIGNED	DRAWN	CHECKED	QUAN.	SUBMITTED	REC'D
J.J.R.	M.P.H.	J.J.R.			

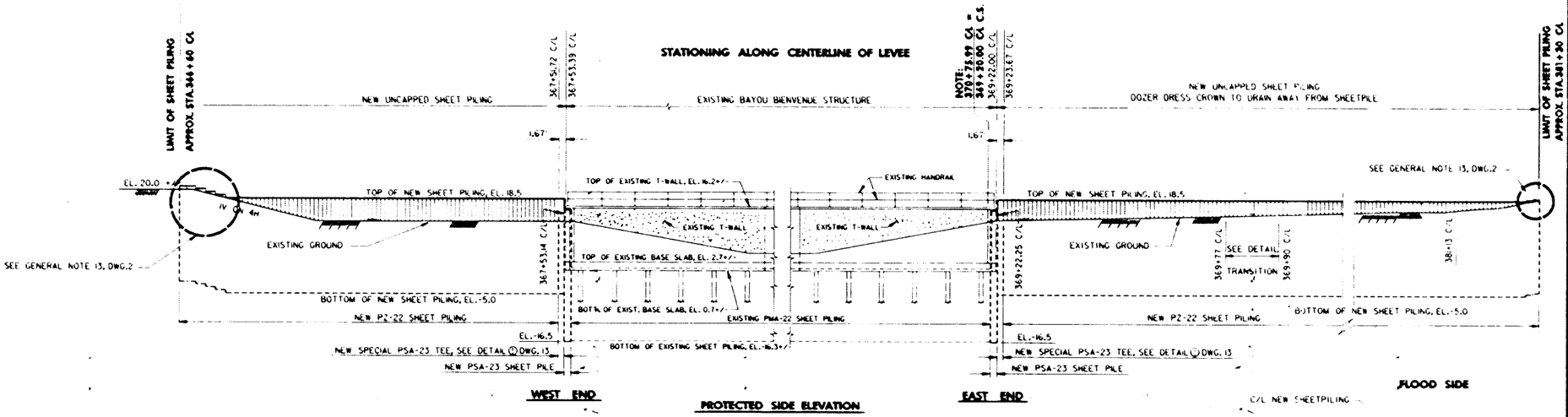
H-4-24326

DATE: October, 1971 SCALE: SHOWN SPEC. NO. DACW 29-72-B-0034 SHT. NO. 6 OF 65

COMPLETED SECTIONS

BAYOU BIENVENUE CONTROL STRUCTURE PLATE II-6

Safety is a Part of Your Contract



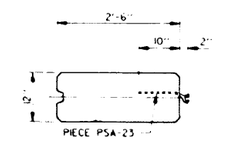
PROTECTED SIDE ELEVATION

PROFILE

SCALE: 1" = 10'

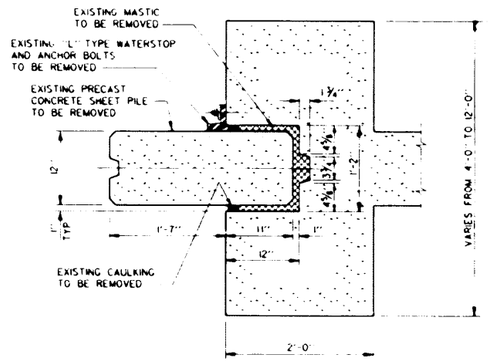
SHEETPILE LAYOUT TRANSITION

NTS



EXISTING PRECAST CONCRETE SHEET PILE DETAIL

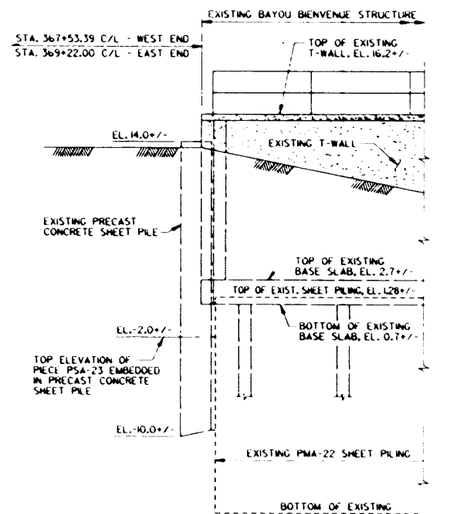
SCALE: 1" = 1'- 0"



PLAN SECTION

VICINITY STA. 367+53.39 C/L - SHOWN
VICINITY STA. 369+22.00 C/L - OPPOSITE HAND
EXISTING T-WALL END BULKHEAD DETAIL

SCALE: 1 ½" = 1'- 0"



VICINITY STA. 367+53.39 C/L - SHOWN
VICINITY STA. 369+22.00 C/L - OPPOSITE HAND
ELEVATION OF EXISTING T-WALL END BULKHEAD

SCALE: ¼" = 1'- 0"

SCALE: 1" = 10'

SCALE: ¼" = 1'- 0"

SCALE: 1" = 1'- 0"

SCALE: 1 ½" = 1'- 0"

DIVISION	DATE	DESCRIPTION	BY

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

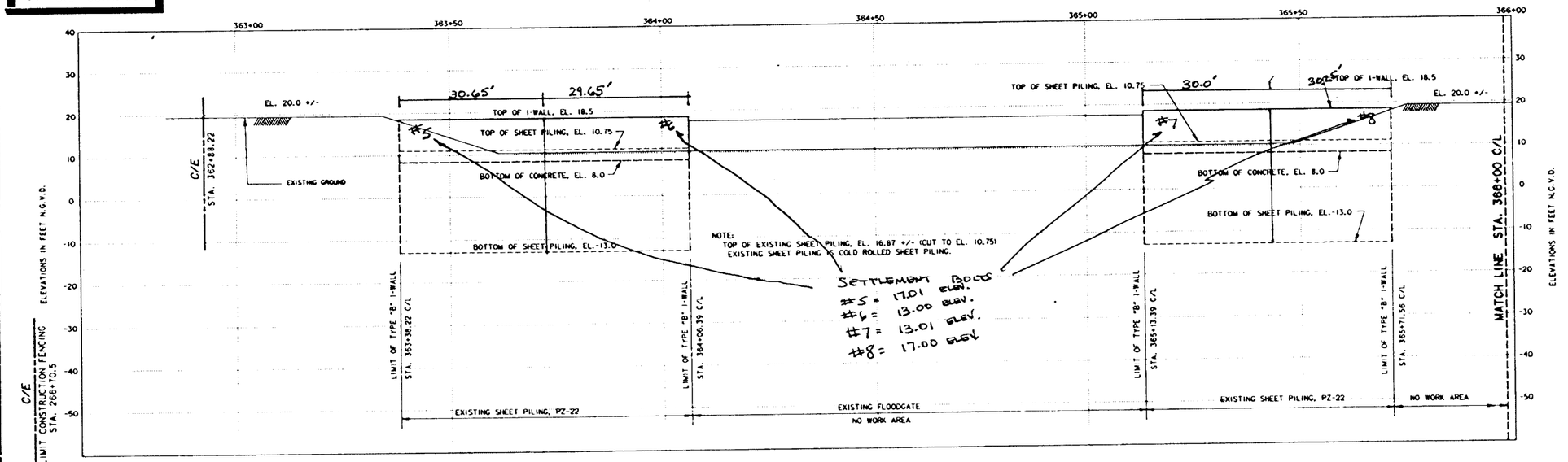
CHALMETTE AREA PLAN
HURRICANE PROTECTION LEVEE CLOSURES
(STA.305+00 OL TO STA.369+18 OL)
ORLEANS PARISH AND ST BERNARD PARISH, LA.

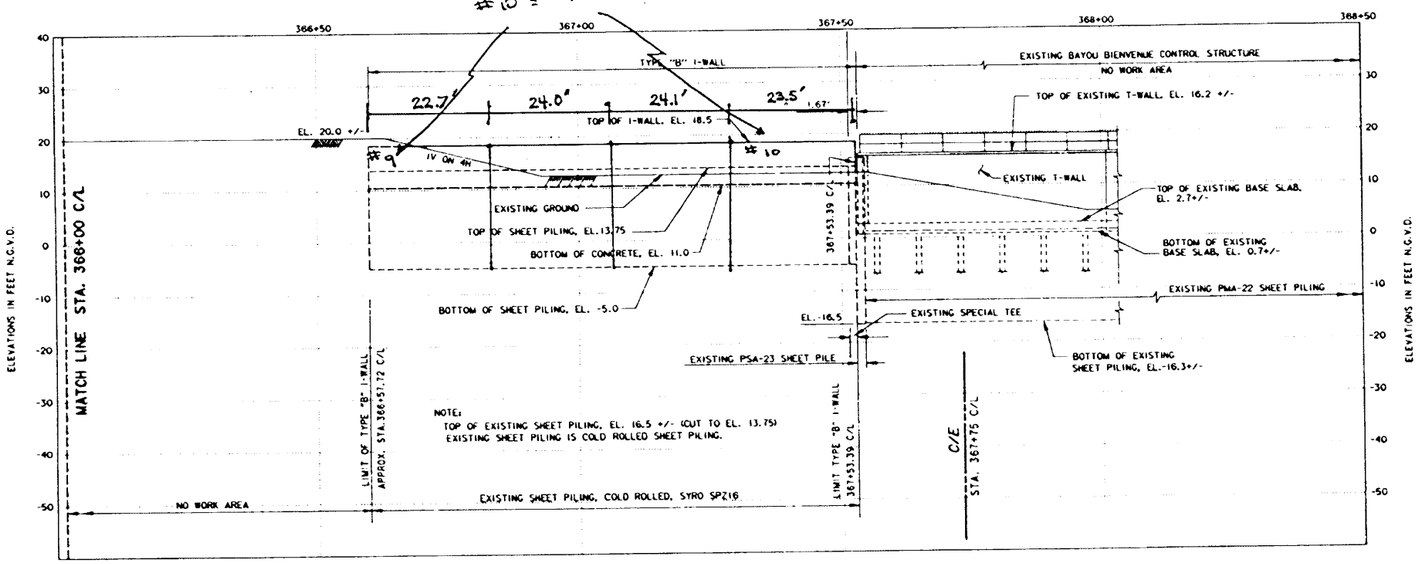
PROFILE AND DETAILS
VICINITY OF BAYOU BIENVENUE STRUCTURE

DESIGNED: WRIGHT	DATE: MAY '92	PLOT SCALE: 1to1	FILE NO. H-8-30920
DRAWN: HOBAT			
CHECKED: ROLINO	DESIGN FILE: 30920DETAIL.DGN		
SUBMITTED:	CONTR. NO. DACW29-92-B-0061	DWG. 7 OF 17	

Safety is a Part of Your Contract

STATIONING ALONG CENTERLINE OF LEVEE





PROTECTED SIDE ELEVATION

PROFILE

NOTE:
FOR LEVEE TRANSTION STATIONING, SEE PROFILE.

NOTES:
1. FOR GENERAL NOTES, SEE DWG. 2.
2. FOR TYPICAL SECTIONS, SEE DWGS. 7 AND 8.
3. FOR TYPICAL WALL JOINTS, SEE DWGS. 10 AND 11.
4. FOR MISCELLANEOUS DETAILS, SEE DWG. 15.

SCALE: 1" = 10'

10' 0 10' 20' 30' 40'

SYMBOL	DESCRIPTION	DATE	APPROVED

REVISIONS

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

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
CHALMETTE AREA PLAN

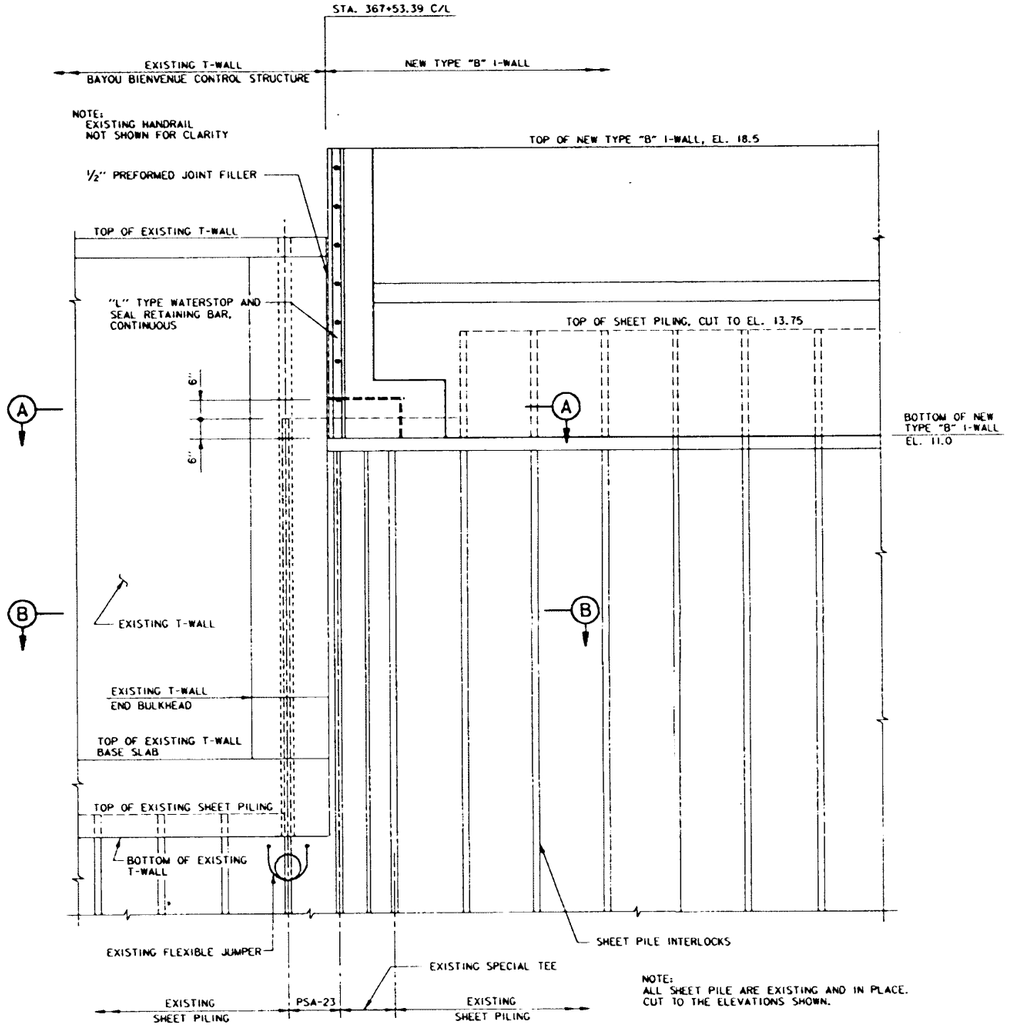
PARIS ROAD TO BAYOU BIENVENUE
MISCELLANEOUS FLOODWALL CAPPING
ORLEANS PARISH, LA.

PROFILE
VICINITY OF BAYOU BIENVENUE CONTROL STRUCTURE

DESIGNED BY: R.GRUBB	DATE: AUG 1995	PLOT SCALE: 120	PLOT DATE: JUL 95
DRAWN BY: L.MAGEE	CADD FILE: H08SP001.DGN		FILE NO. H-8-40689
CHECKED BY: R.GRUBB			
SUBMITTED BY: ROBERT A. GRUBB	SOLICITATION NO. DACW29-96-R-0017		DWG. 6 OF 16

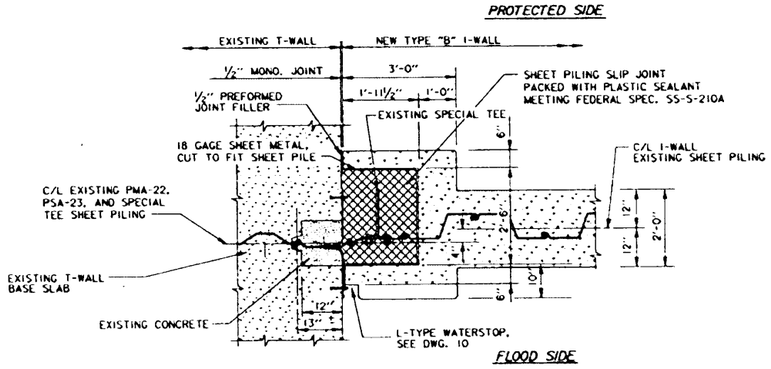
PLATE III-2

Safety is a Part of Your Contract

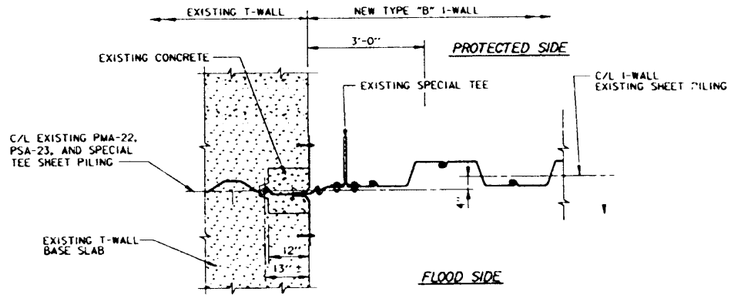


FLOOD SIDE ELEVATION

EXISTING T-WALL TO NEW TYPE "B" I-WALL



SECTION (A)



SECTION (B)

NOTES:
1. FOR GENERAL NOTES, SEE DWG. 2.
2. FOR TYPICAL SECTIONS, SEE DWGS. 7 AND 8.
3. FOR TYPICAL WALL JOINTS, SEE DWG. 11.
4. FOR MISCELLANEOUS DETAILS, SEE DWG. 15.
5. FOR PLAN AND PROFILES, SEE DWGS. 3 THRU 6.

SCALE: ¾" = 1'-0"

SYMBOL	DESCRIPTION	DATE	APPROVED
	REVISIONS		

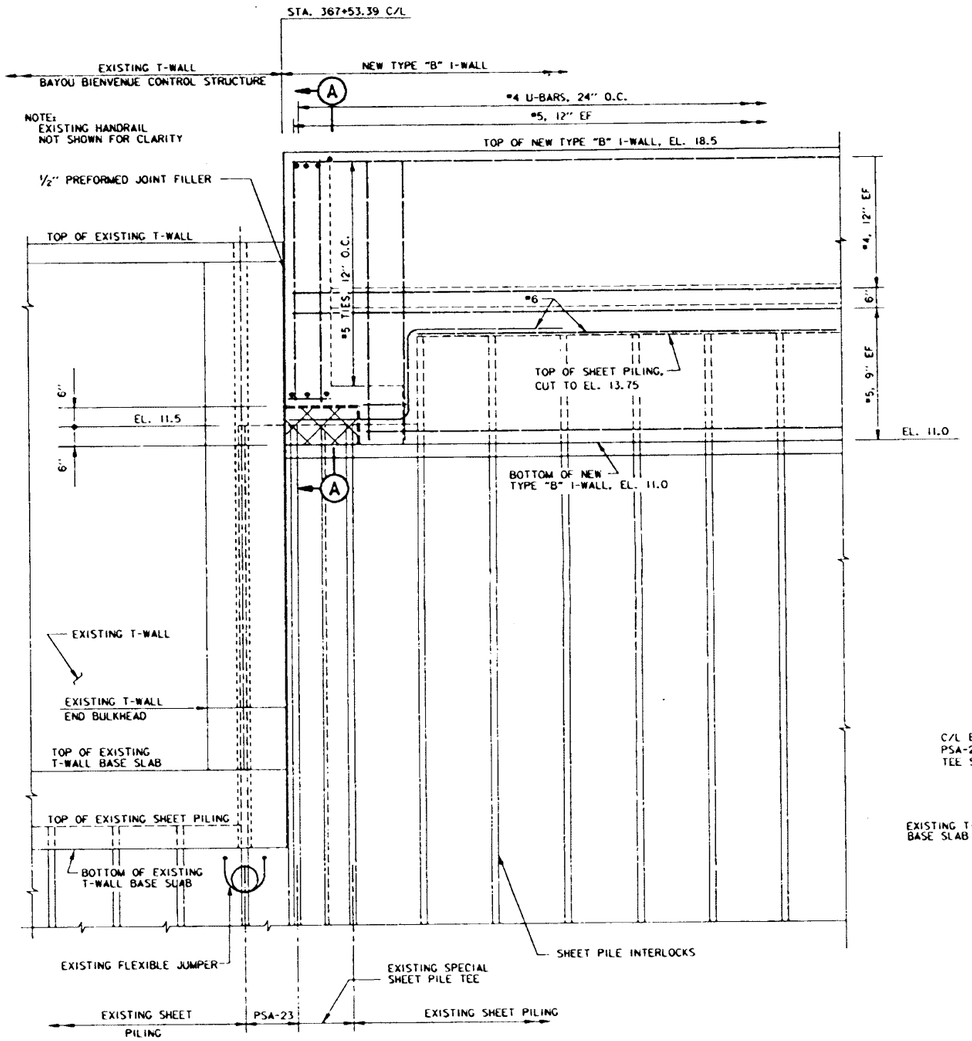
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
CHALMETTE AREA PLAN
PARIS ROAD TO BAYOU BIENVENUE
MISCELLANEOUS FLOODWALL CAPPING
ORLEANS PARISH, LA.

TYPICAL WALL JOINT TYPE "B" I-WALL TO EXISTING T-WALL

DESIGNED BY: R.GRUBB	DATE: AUG 1995	PLOT SCALE: 16	PLOT DATE: JUL 95
DRAWN BY: L.MAGEE			
CHECKED BY: R.GRUBB	CADD FILE: 400MP1L.DGN		FILE NO. H-8-40689
SUBMITTED BY: ROBERT A. GRUBB	SOLICITATION NO. DACW29-96-R-0017		DWG. 13 OF 16

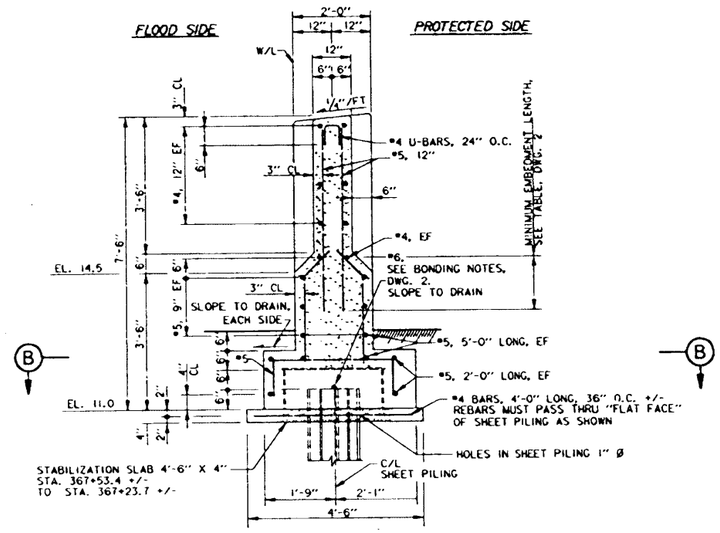
Safety is a Part of Your Contract



FLOOD SIDE ELEVATION

EXISTING T-WALL TO NEW TYPE "B" I-WALL

SCALE: ¾" = 1'- 0"



SECTION (A)

SECTION (B)

NOTES:
1. FOR GENERAL NOTES, SEE DWG. 2.
2. FOR TYPICAL SECTIONS, SEE DWGS. 7 AND 8.
3. FOR TYPICAL WALL JOINTS, SEE DWG. 11.
4. FOR MISCELLANEOUS DETAILS, SEE DWG. 15.
5. FOR PLAN AND PROFILES, SEE DWGS. 3 THRU 6.

SYMBOL	DESCRIPTION	DATE	APPROVED
	REVISIONS		

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

LAKE PONTCHARTRAIN, LOUISIANA AND VICINITY
CHALMETTE AREA PLAN
PARIS ROAD TO BAYOU BIENVENUE
MISCELLANEOUS FLOODWALL CAPPING
ORLEANS PARISH, LA.

TYPICAL JOINT REINFORCEMENT TYPE "B" I-WALL TO EXISTING T-WALL

DESIGNED BY: R.GRUBB	DATE: AUG 1995	PLOT SCALE: 18	PLOT DATE: JUL 95
DRAWN BY: L.MAGEE			
CHECKED BY: R.GRUBB	CADD FILE: 40B0P14.DGN		FILE NO. H-8-40689
SUBMITTED BY: ROBERT J. GRUBB	SOLICITATION NO. DACW29-94-B-0017		DWG. 14 OF 16

PLATE III-4

APPENDIX B

HISTORICAL

DEFICIENCIES

APPENDIX B
HISTORICAL DEFICIENCIES

DATE	DESCRIPTION
Oct 1974	During PI No. 1, the structure was still under construction. The concrete sheet pile I-wall was recommended for replacement by modification to the construction contract. This was the only deficiency documented report no. 1.
July 1979	Spot rusting of the Sector gate members and corroded surfaces of the sector gates and embedded steel members required cleaning and treatment with a corrosion preventative material. The electronic gate monitor was non-operational. Both sides of the approach channels were missing rip rap.
March 1983	Rip rap along the approach channels was missing again. Additional rip rap, 275 feet north and 200 feet south of the structure was recommended to be placed to assist in erosion control. A ¾ inch gap was noted between the gate seals. Corrosion in the areas of tidal fluctuation and separation of expansion joints on the wing walls was noted. Heavy vegetative growth was noted. The expansion joint between the west wing wall and the structure on the protected side needed repair and backfill.
March 1985	The floodwall and wing wall joints were not watertight. Vegetation was noted in one of the expansion joints in the northwest floodwall. Sinkholes and voids were noted behind the wing walls. Missing rip rap was noted again on both the north and south approach channels. Broken handrails and safety chains required repair. Staff gages required cleaning and repair.
March 1988	Missing rip rap in the approach channels continues to be a deficiency. Navigation lights are frequently broken due to vandalism. Rust and corrosion was noted on steel members, ladders and steel plates. Staff gages required cleaning and repair.
July 1991	Channels missing rip rap again. Metal pile caps were rusted and the timber guide wall was termite infested. Rust and corrosion was noted on steel members, ladders and steel plates.
March 1994	Deficient riprap, rusting steel members, and the termite infested guidewall/missing timbers noted in the last inspection still existing. Missing safety chains noted. A hazardous electrical conduit and

	loose cables/frozen sheave in the machinery room was noted. The staff gages were unreadable. Small concrete spalls were noted. A depression behind the wing wall in the north west corner was noted.
March 1999	Small spalls and hairline cracks noted in the concrete surfaces. Upward seepage through a small crack/hole in the sill slab was noted. Corroded areas on embedded metals was noted. Wire ropes used to activate the gate sectors were loose. Equipment and sheaves in the equipment recesses required cleaning. The frequency meter on the generator set was improperly operating. Defective load side conductors for the east gate sector required replacement. The east gate indicator light system required repair/replacement. The lights in the control room required cleaning. The fluorescent fixtures in the machinery recess required replacement. A broken weatherproof cover on the receptacle near the access stair required replacement. All the receptacles required replacement with GFCI units. Guidewalls noted in poor condition. An evaluation was recommended to determine if major repair and or replacement of the guidewalls is necessary. Settlement markers needed repainting. A reliable benchmark was required.

APPENDIX C

HISTORICAL REPAIRS/CONSTRUCTION WORK

APPENDIX C

HISTORICAL REPAIRS/CONSTRUCTION WORK

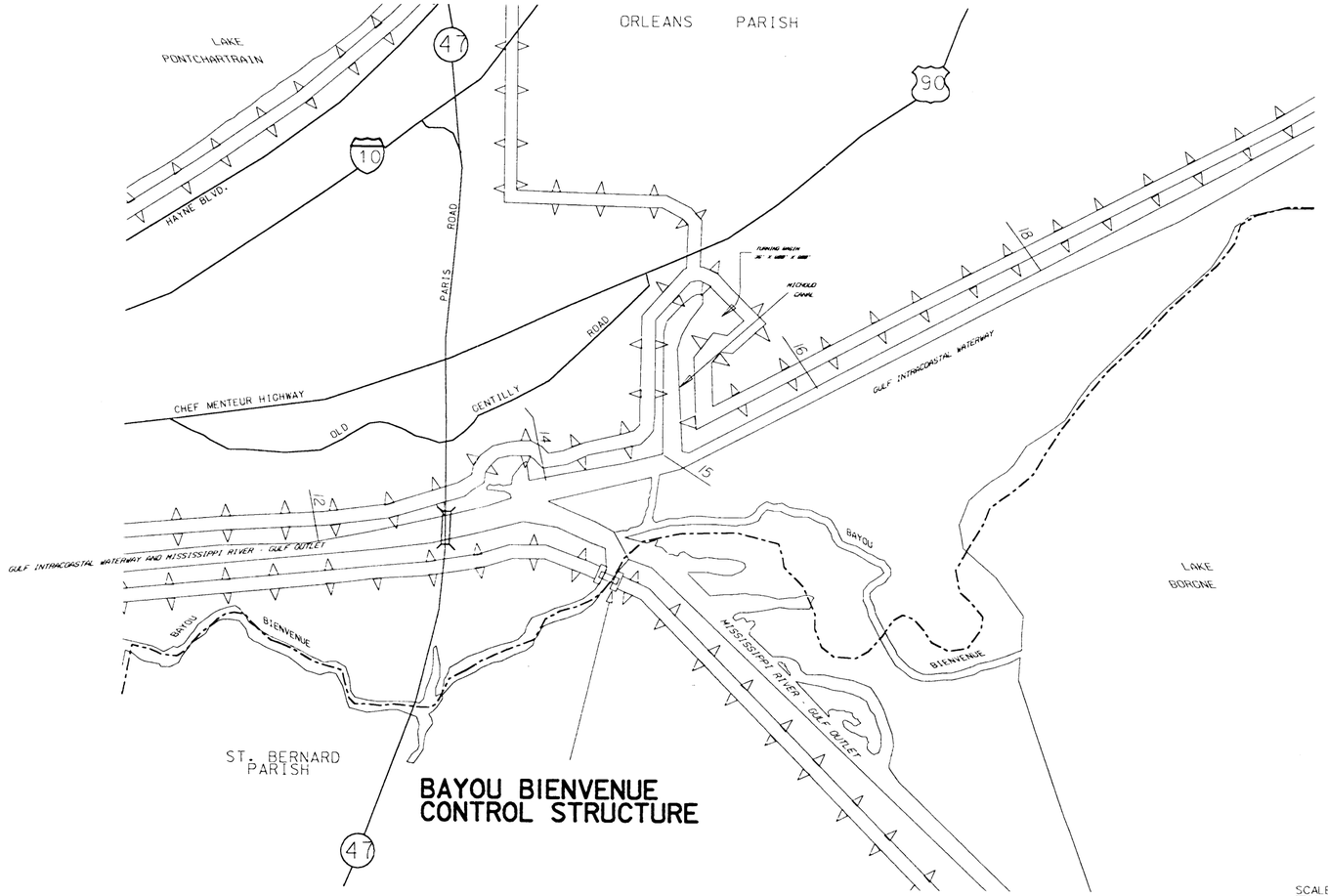
DATE	DESCRIPTION
July 1979	Vandalism was repaired as part of regular maintenance. Rip rap was placed along the landside channel banks to prevent erosion. Ladders were installed on the protected side of the structures to provide access from ground level to the top of the structure. The concrete sheet pile I-wall was pulled and stockpiled for future placement after the levee adjacent to the structure settles.
March 1985	The north and south channels received scour repair. The ¾ inch gap between the gate seals, the corrosion in the areas of tidal fluctuation, and the separation of expansion joints on wing walls were repaired during dewatering. The vegetative growth and debris was cleaned-up. Silting and accumulated oyster shells were removed from the gatebays. Corrosion in the area of tidal fluctuation was removed and the gates were sandblasted and re-painted. The cathodic protection anodes on the skin plate and structural members was replaced. The floodwall and wing wall joints were repaired and made water tight. Vegetation was removed from one of the expansion joints in the north west floodwall. Sinkholes and voids behind the wing walls were backfilled. Broken handrails and safety chains were replaced. Staff gages were cleaned and repaired. Reference marks were repaired and grouted.
July 1991	Minor deficiencies repaired as necessary under routine maintenance program including navigation light repairs, corrosion monitoring, cleaning, re-painting, and staff gage repair/cleaning.
FY 1993	Steel Sheetpile floodwalls were installed at the end of each "T" Floodwall to tie into the levee on either side of the structure. The Sheetpile tie-in brought the structure up to hurricane protection elevation. Section II for further discussion.

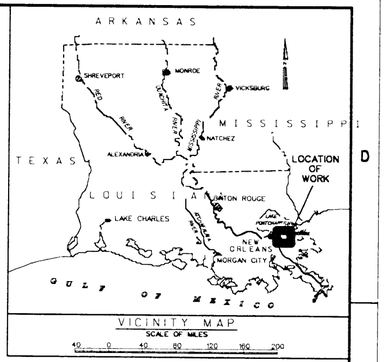
March 1994	Rusting metal pile caps and termite infested guidewall members were replaced as necessary.
March 1994-97	Deficient rip rap, rusting steel members, termite infested timbers and missing timbers were replaced. Missing safety chains, hazardous electrical conduits, loose cable/frozen sheave in machinery room and unreadable staff gages were repaired/replaced as necessary.
FY 1997	On the west side of the structure, the steel sheetpile floodwall levee tie-in (installed in 1993) was cutoff at ground level and a new concrete I-wall section was constructed to tie-into the levee. See Section II for further discussion.
July 1999	The wire ropes used to activate the gate sectors were tightened. The defective load side conductors for the east sector gate was replaced. The broken weather proof cover on the receptacle near the access stairs was replaced.

APPENDIX D

INSTRUMENTATION PLATES

BAYOU BIENVENUE CONTROL STRUCTURE
INDEX
INSTRUMENTATION PLATES





N

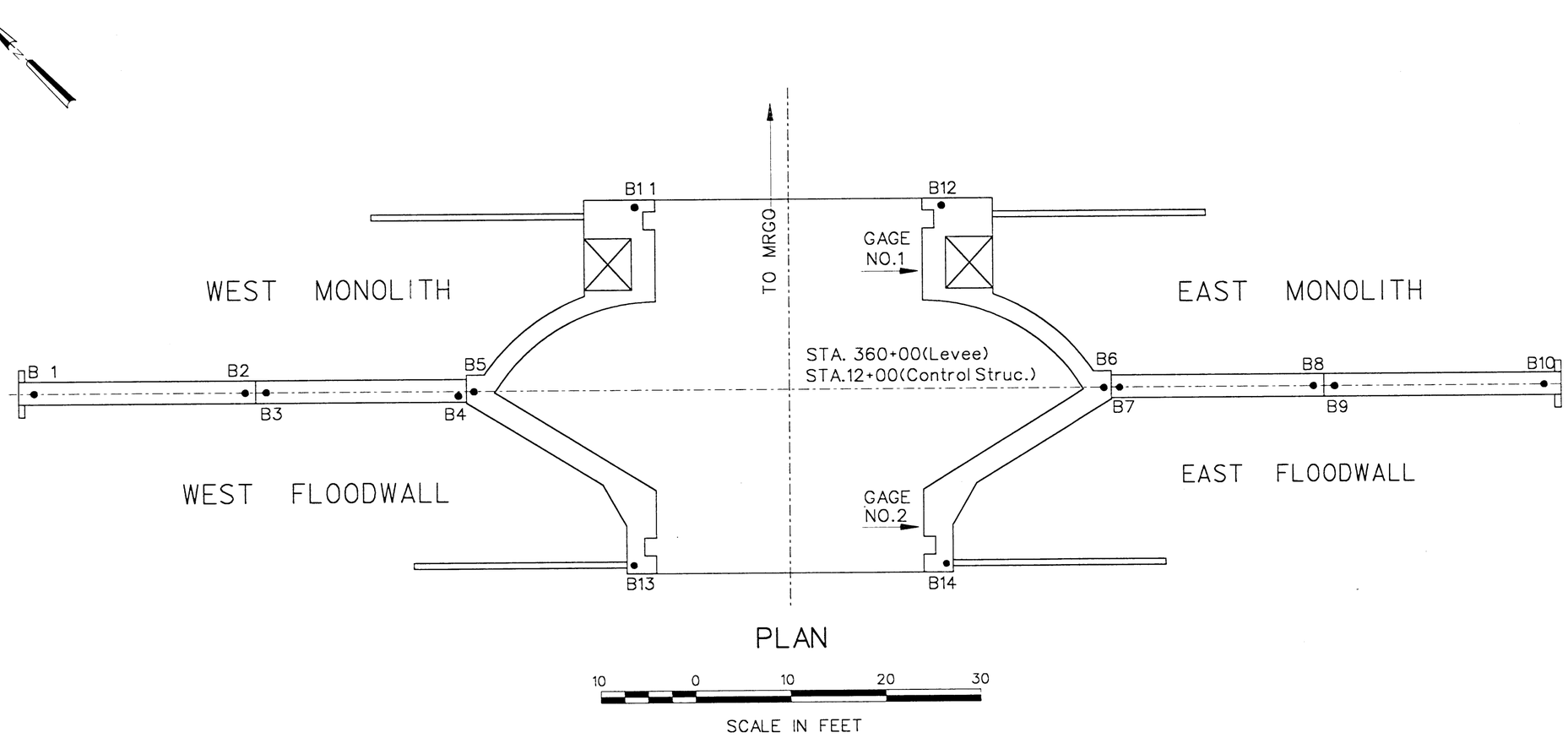
SCALES
MILES
1 0 1
KILOMETERS
1 0 1

LAKE PONTCHARTRAIN AND VICINITY
CHALMETTE AREA
BAYOU BIENVENUE
PERIODIC INSPECTION

LOCATION MAP

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

PLATE BNU-1



PLAN

LAKE PONTCHARTRAIN AND VICINITY
BAYOU BIENVENUE
PERIODIC INSPECTION

SETTLEMENT REFERENCE MARKS
PLAN AND PROFILE

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

PLATE 2

BAYOU BIENVENUE CONTROL STRUCTURE - RAW DATA READINGS

STRUCTURE SETTLEMENT REFERENCE MARKS - RAW DATA

																	PBM's			
REF. MARK NO.	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-12	B-13	B-14	TEMP	GAGES		BB-1	BB-2	BB-3	U-375
INSTALLED	25-Jun-74	25-Jun-74	26-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	26-Jun-74	26-Jun-74	25-Jun-74	26-Jun-74	26-Jun-74	26-Jun-74	26-Jun-74	(F)	1	2	(1974)	(1974)	(1974)	(1985)
ORIGINAL EL.	16.86	16.88	16.87	16.87	16.89	16.86	16.84	16.80	16.81	16.76	16.87	16.86	16.91	16.88	79°	1.9	1.9	5.768	6.279	6.210	4.92
27 Nov 1974	16.78	16.87	16.86	16.87	16.90	16.87	16.85	16.80	16.81	16.72	16.88	16.88	16.92	16.89	57°	0.9	0.9	------	6.28	6.21	-
27 Jun 1975	16.71	16.84	16.83	16.85	16.86	16.86	16.84	16.78	16.80	16.68	16.88	16.87	16.91	16.86	80°	1.5	1.5	5.760	6.28	-	-
18 Jun 1976	16.61	16.76	16.74	16.78	16.81	16.81	16.78	16.71	16.74	16.60	16.84	16.81	16.81	16.82	82°	1.3	1.3	5.758	6.279	6.198	-
18 Jul 1977	16.60	16.79	16.78	16.83	16.86	16.85	16.82	16.74	16.77	16.61	16.86	16.86	16.90	16.86	87°	1.45	1.45	5.786	6.279	6.205	-
13 Jul 1978	16.56	16.76	16.75	16.81	16.84	16.84	16.81	16.73	16.76	16.61	16.85	16.86	16.89	16.87	87°	1.00	0.95	5.784	6.283	6.210	-
29 Feb 1980	16.61	16.72	16.71	16.78	16.81	16.83	16.79	16.71	16.75	16.58	16.83	16.85	16.87	16.86	58°	-0.3	0.1	5.819	6.279	-	-
11 Nov 1980	16.51	16.73	16.72	16.80	16.84	16.86	16.82	16.72	16.76	16.59	16.86	16.88	16.89	16.89	69°	1.5	1.4	-	6.279	6.177	-
31 May 1982	16.46	16.68	16.67	16.76	16.80	16.82	16.78	16.68	16.71	16.48	16.82	16.84	16.86	16.85	85°	1.8	1.9	DESTROYED	6.279	6.166	-
29 Nov 1982	16.46	16.72	16.71	16.80	16.84	16.87	16.82	16.72	16.75	16.50	16.86	16.88	16.90	16.89	66°	1.2	1.6		6.336	6.210	-
13 Apr 1984	16.48	16.71	16.70	16.80	16.84	16.87	16.83	16.72	16.75	16.49	16.87	16.89	16.90	16.90	67°	-	1.0		6.342	6.210	-
22 Oct 1984	16.46	16.70	16.69	16.78	16.82	16.86	16.81	16.70	16.73	16.46	16.86	16.87	16.88	16.88	80°	2.5	2.5		6.336	6.210	-
11 Aug 1986	16.48	16.72	16.71	16.81	16.86	16.88	16.82	16.71	16.74	16.45	16.89	16.90	16.92	16.91	76°	1.1	1.0		6.351	6.210	-
03 Mar 1987	16.45	16.69	16.68	16.78	16.83	16.85	16.80	16.68	16.71	16.42	16.86	16.87	16.89	16.85	60°	1.9	1.7		6.334	6.210	-
25 Feb 1988	16.42	16.71	16.70	16.82	16.86	16.90	16.85	16.72	16.76	16.46	16.90	16.92	16.93	16.93	50°	-0.3	0.1		6.342	6.210	-
01 Dec 1988	16.37	16.68	16.67	16.79	16.83	16.89	16.84	16.71	16.74	16.45	16.86	16.90	16.90	16.91	52°	0.8	0.8		6.343	6.210	-
04 Dec 1989	16.31	16.64	16.63	16.76	16.81	16.86	16.81	16.68	16.71	16.41	16.85	16.87	16.88	16.89	52°	-	-		6.348	6.210	-
01 Nov 1990	16.30	16.65	16.65	16.78	16.83	16.87	16.82	16.69	16.72	16.41	16.87	16.90	16.90	16.90	80°	1.8	1.4		6.343	6.210	-
18 Nov 1991	16.28	16.64	16.64	16.78	16.82	16.87	16.81	16.68	16.72	16.41	16.87	16.89	16.90	16.90	86°	1.9	1.9		6.370	6.210	-
17 Dec 1992	16.23	16.59	16.59	16.74	16.79	16.84	16.78	16.66	16.68	16.37	16.83	16.86	16.86	16.87	63°	-	-		6.343	6.210	-
02 Nov 1993	16.24	16.62	16.62	16.76	16.81	16.86	16.82	16.69	16.72	16.40	16.88	16.89	16.89	16.91	72°	1.4	2.2		6.343	6.210	-
05 Apr 1995	16.20	16.60	16.60	16.75	16.81	16.86	16.81	16.67	16.70	16.38	16.86	16.88	16.89	16.89	70°	1.3	1.3			6.210	-
04 Mar 1996	16.19	16.60	16.60	16.77	16.82	16.88	16.82	16.69	16.72	16.39	16.87	16.90	16.90	16.91	59°	0.8	0.8	BB-1 (Reset)		6.210	-
12 Mar 1998	16.10	16.53	16.53	16.71	16.76	16.84	16.77	16.62	16.67	16.31	16.81	16.85	16.84	16.86	75°	3.5	1.7	(1998)	6.341	6.210	-
07 Dec 1999	15.81	16.26	16.26	16.45	16.50	16.57	16.50	16.36	16.40	16.06	16.55	16.59	16.58	16.59	-	-	-	2.560	6.055	5.930	4.820
05 May 2003	15.76	16.23	16.24	16.45	16.49	16.56	16.49	16.35	16.38	16.05	16.54	16.58	16.59	16.59	82°	1.4	1.6	2.660	-	5.915	-

WING - WALL SETTLEMENT REFERENCE MARKS - RAW DATA

REF. MARK NO.	NW-1	NW-2	NW-3	NE-1	NE-2	NE-3	SW-1	SW-2	SW-3	SE-1	SE-2	SE-3
INSTALLED	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78
ORIGINAL EL.	5.02	5.17	5.32	4.83	5.00	5.23	5.02	5.12	5.26	4.86	4.99	5.32
29 Feb 1980	4.87	5.04	5.18	4.68	4.86	5.11	4.89	5.02	5.16	4.71	4.85	5.21
11 Nov 1980	4.86	5.02	5.22	4.67	4.84	5.13	4.86	4.98	5.13	4.70	4.85	5.19
31 May 1982	4.81	4.99	5.16	4.62	4.80	5.07	4.81	4.84	5.08	4.66	4.80	5.17
29 Nov 1982	4.85	5-02	5.17	4.65	4.84	5.13	4.84	4.98	5.14	4.68	4.83	5.21
13 Apr 1984	4.84	5.02	5.21	4.65	4.84	5.12	4.84	4.98	5.15	4.68	4.83	5.22
22 Oct 1984	4.84	5.03	5.21	4.64	4.83	5.11	4.84	4.97	5.15	4.68	4.83	5.21
11 Aug 1986	4.81	5.03	5.20	4.62	4.83	5.07	4.82	4.97	5.15	4.65	4.75	5.19
03 Mar 1987	4.81	5.00	5.20	4.59	4.79	5.08	4.80	4.94	5.12	4.62	4.78	5.18
25 Feb 1988	4.82	5.00	5.21	4.64	4.85	5.14	4.80	4.96	5.13	4.64	4.82	5.22
01 Dec 1988	4.81	5.00	5.20	4.63	4.84	5.13	4.80	4.94	5.13	4.67	4.83	5.23
04 Dec 1989	4.79	4.99	5.18	4.60	4.80	5.09	4.78	4.93	5.13	4.63	4.79	5.19
01 Nov 1990	4.79	4.98	5.20	4.60	4.80	5.09	4.78	4.93	5.13	4.62	4.79	5.18
18 Nov 1991	4.80	4.99	5.20	4.62	4.83	5.13	4.79	4.94	5.14	4.63	4.80	5.23
17 Dec 1992	4.74	4.94	5.16	4.57	4.79	5.08	4.74	4.90	5.10	4.60	4.77	5.19
02 Nov 1993	4.80	5.00	5.19	4.58	4.79	5.09	4.70	4.90	-	4.61	4.78	5.20
05 Apr 1995	4.74	4.94	5.15	4.56	4.78	5.07	4.72	**	**	4.58	4.76	5.18
04 Mar 1996	4.76	4.96	5.19	4.58	4.80	5.11	4.74	4.90	5.12	4.60	4.77	5.20
12 Mar 1998	4.69	4.90	5.11	-	-	5.08	4.70	4.86	5.08	4.55	4.74	5.17
05 May 2003	4.40	4.61	4.86	4.22	4.46	4.79	4.37	4.54	4.77	4.22	4.41	4.86

DISTANCES BETWEEN REFERENCE MARKS (FEET)

REF. MARK NO.	B2 - B3	B4 - B5	B6 - B6	B11 - B12	B13 - B14	B6 - B7	B8 - B9
INSTALLED	11-Apr-74	11-Apr-74	11-Apr-74	11-Apr-74	11-Apr-74	11-Apr-74	11-Apr-74
READINGS (FT)	4.97	3.98	131.36	64.17	64.19	2.48	5.00
22 Jul 1974	5.00	3.99	131.35	---	---	2.49	---
27 Nov 1974	5.02	4.00	131.34	64.15	64.17	2.50	5.00
27 Jun 1975	5.02	3.99	131.36	64.18	64.19	-	5.04
28 Jun 1976	5.03	4.00	131.42	64.21	64.22	2.51	5.04
18 Jul 1977	5.04	4.00	131.36	64.20	64.21	2.51	5.04
14 Jul 1978	5.03	4.00	131.56	64.23	64.24	2.66	5.29
03 Mar 1980	5.04	4.02	-	-	-	2.52	5.02
18 Nov 1980	5.05	4.03	-	-	-	2.54	5.06
31 May 1982	5.05	4.01	-	-	-	2.53	5.06
29 Nov 1982	5.04	4.02	---	64.25	64.26	2.54	5.08
13 Apr 1984	5.02	4.02	---	---	---	2.54	5.08
22 Oct 1984	5.02	4.02	---	---	---	2.54	5.08
10 Aug 1986	5.02	4.02	---	---	---	2.56	5.08
03 Mar 1987	5.02	4.03	---	---	---	2.56	5.08
25 Feb 1988	5.04	4.03	---	---	---	2.56	5.08
01 Dec 1988	5.15#	4.04	---	---	---	2.57	5.09
04 Dec 1989	5.05	4.05	---	---	---	2.55	5.08
01 Nov 1990	5.07	4.04	---	---	---	3.57	5.09
18 Nov 1991	5.05	4.03	---	---	---	2.57	5.08
17 Dec 1992	5.05	4.03	---	---	---	2.57	5.09
02 Nov 1993	5.05	4.06	---	---	---	2.58	5.08
05 Apr 1995	5.06	4.04	---	---	---	2.58	5.09
04 Mar 1996	5.08	4.05	---	---	---	2.58	5.09
12 Mar 1998	5.06	4.06	---	---	---	2.56	5.09
05 May 2003	5.06	4.06	---	---	---	2.57	5.08

GENERAL NOTES

- Survey data not taken

* Top of brass bolt bent over.

** Pins missing - destroyed

Boldface PBM elevation indicates the start of the level run.

--- Measurements discontinued

Survey Error

PLATE 2A

BAYOU BIENVENUE CONTROL STRUCTURE - ADJUSTED VALUES

STRUCTURE SETTLEMENT REFERENCE MARKS

Adjusted values

adj. Value	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-12	B-13	B-14	REF. MARK NO.
	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	25-Jun-74	INSTALLED
	16.85	16.88	16.87	16.87	16.89	16.86	16.84	16.80	16.81	16.75	16.87	16.86	16.91	16.88	ORIGINAL EL.
0.000	16.78	16.87	16.86	16.87	16.90	16.87	16.85	16.80	16.81	16.72	16.88	16.88	16.92	16.89	27 Nov 1974
	Cannot be adjusted - Level loop not run through BB-3 in this year														27 Jun 1975
0.012	16.82	16.77	16.75	16.79	16.82	16.82	16.79	16.72	16.75	16.61	16.85	16.82	16.92	16.83	16 Jun 1976
0.005	16.61	16.80	16.79	16.84	16.87	16.86	16.83	16.75	16.78	16.62	16.87	16.87	16.91	16.89	18 Jul 1977
0.000	16.56	16.76	16.75	16.81	16.84	16.84	16.81	16.73	16.76	16.61	16.85	16.86	16.89	16.87	13 Jul 1978
	Cannot be adjusted - Level loop not run through BB-3 in this year														29 Feb 1980
0.033	16.54	16.76	16.75	16.83	16.87	16.89	16.85	16.75	16.79	16.62	16.89	16.91	16.92	16.92	11 Nov 1980
0.044	16.50	16.72	16.71	16.80	16.84	16.86	16.82	16.72	16.75	16.52	16.86	16.88	16.90	16.89	31 May 1982
0.000	16.49	16.72	16.71	16.80	16.84	16.87	16.82	16.72	16.75	16.50	16.86	16.88	16.90	16.89	29 Nov 1982
0.000	16.48	16.71	16.70	16.80	16.84	16.87	16.83	16.72	16.75	16.49	16.87	16.89	16.90	16.90	13 Apr 1984
0.000	16.46	16.70	16.69	16.78	16.82	16.86	16.81	16.70	16.73	16.46	16.86	16.87	16.88	16.88	22 Oct 1984
0.000	16.48	16.72	16.71	16.81	16.86	16.88	16.82	16.71	16.74	16.45	16.89	16.90	16.92	16.91	11 Aug 1986
0.000	16.45	16.69	16.68	16.78	16.83	16.85	16.80	16.68	16.71	16.42	16.86	16.87	16.89	16.85	03 Mar 1987
0.000	16.42	16.71	16.70	16.82	16.86	16.90	16.85	16.72	16.76	16.46	16.90	16.92	16.93	16.93	25 Feb 1988
0.000	16.37	16.68	16.67	16.79	16.83	16.89	16.84	16.71	16.74	16.45	16.86	16.90	16.90	16.91	01 Dec 1988
0.000	16.31	16.64	16.63	16.76	16.81	16.86	16.81	16.68	16.71	16.41	16.85	16.87	16.88	16.89	04 Dec 1989
0.000	16.30	16.65	16.65	16.78	16.83	16.87	16.82	16.69	16.72	16.41	16.87	16.90	16.90	16.90	01 Nov 1990
0.000	16.28	16.64	16.64	16.78	16.82	16.87	16.81	16.68	16.72	16.41	16.87	16.89	16.90	16.90	18 Nov 1991
0.000	16.23	16.59	16.59	16.74	16.79	16.84	16.78	16.65	16.68	16.37	16.83	16.86	16.86	16.87	17 Dec 1992
0.000	16.24	16.62	16.62	16.76	16.81	16.88	16.82	16.69	16.72	16.40	16.88	16.89	16.89	16.91	02 Nov 1993
0.000	16.20	16.60	16.60	16.75	16.81	16.86	16.81	16.67	16.70	16.38	16.86	16.89	16.86	16.89	05 Apr 1995
0.000	16.19	16.60	16.60	16.77	16.82	16.88	16.82	16.69	16.72	16.39	16.87	16.90	16.90	16.91	04 Mar 1996
0.000	16.10	16.53	16.53	16.71	16.76	16.84	16.77	16.62	16.67	16.31	16.81	16.85	16.84	16.86	12 Mar 1996
0.260	16.09	16.54	16.54	16.73	16.78	16.85	16.78	16.64	16.68	16.34	16.83	16.87	16.86	16.87	07 Dec 1996
0.295	16.06	16.53	16.54	16.73	16.79	16.88	16.79	16.65	16.68	16.35	16.84	16.88	16.88	16.89	06 May 2003

WING - WALL SETTLEMENT REFERENCE MARK - ADJUSTED VALUES

	NW-1	NW-2	NW-3	NE-1	NE-2	NE-3	SW-1	SW-2	SW-3	SE-1	SE-2	SE-3	REF. MARK NO
	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	29-Mar-78	INSTALLED
	5.02	5.17	5.32	4.83	5.00	5.23	5.02	5.12	5.26	4.86	4.99	5.32	ORIGINAL EL.
	Cannot be adjusted - Level loop not run through BB-3 in this year												29 Feb 1980
0.033	4.89	5.05	5.25	4.70	4.87	5.16	4.89	5.01	5.16	4.73	4.88	5.22	11 Nov 1980
0.044	4.85	5.03	5.20	4.66	4.84	5.11	4.85	4.98	5.13	4.70	4.84	5.21	31 May 1982
0.000	4.85	5.02	5.17	4.65	4.84	5.13	4.84	4.98	5.14	4.68	4.83	5.21	29 Nov 1982
0.000	4.84	5.02	5.21	4.65	4.84	5.12	4.84	4.98	5.15	4.68	4.83	5.22	13 Apr 1984
0.000	4.84	5.03	5.21	4.64	4.83	5.11	4.84	4.97	5.15	4.68	4.83	5.21	22 Oct 1985
0.000	4.81	5.03	5.20	4.62	4.83	5.07	4.82	4.97	5.15	4.65	4.75	5.19	11 Aug 1986
0.000	4.81	5.00	5.20	4.59	4.79	5.08	4.80	4.94	5.12	4.62	4.78	5.18	03 Mar 1987
0.000	4.82	5.00	5.21	4.64	4.85	5.14	4.80	4.95	5.13	4.64	4.82	5.22	25 Feb 1988
0.000	4.81	5.00	5.20	4.63	4.84	5.13	4.80	4.94	5.13	4.67	4.83	5.23	01 Dec 1988
0.000	4.79	4.99	5.18	4.60	4.80	5.09	4.78	4.93	5.13	4.63	4.79	5.19	04 Dec 1989
0.000	4.79	4.98	5.20	4.60	4.80	5.09	4.78	4.93	5.13	4.62	4.79	5.18	01 Nov 1990
0.000	4.80	4.99	5.20	4.62	4.83	5.13	4.79	4.94	5.14	4.63	4.80	5.23	18 Nov 1991
0.000	4.74	4.94	5.16	4.57	4.79	5.08	4.74	4.90	5.10	4.60	4.77	5.19	17 Dec 1992
0.000	4.80	5.00	5.19	4.58	4.79	5.09	4.76	4.90	*	4.61	4.78	5.20	02 Nov 1993
0.000	4.74	4.94	5.15	4.56	4.78	5.07	4.72	**	**	4.56	4.76	5.18	05 Apr 1995
0.000	4.76	4.96	5.19	4.58	4.80	5.11	4.74	4.90	5.12	4.60	4.77	5.20	04 Mar 1996
0.000	4.69	4.90	5.11	-	-	5.08	4.70	4.86	5.08	4.55	4.74	5.17	12 Mar 1996
0.295	4.70	4.91	5.16	4.52	4.76	5.09	4.67	4.84	5.07	4.52	4.71	5.16	06 May 2003

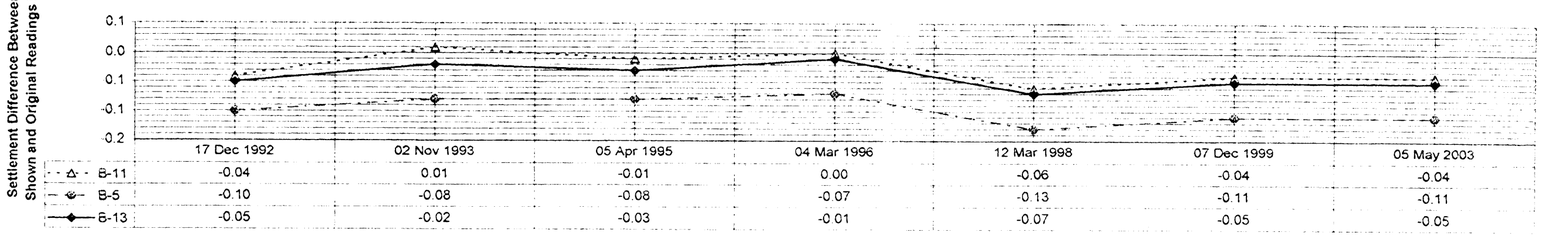
- Survey data not taken

* Top of brass bolt bent over

** Pins missing - destroyed

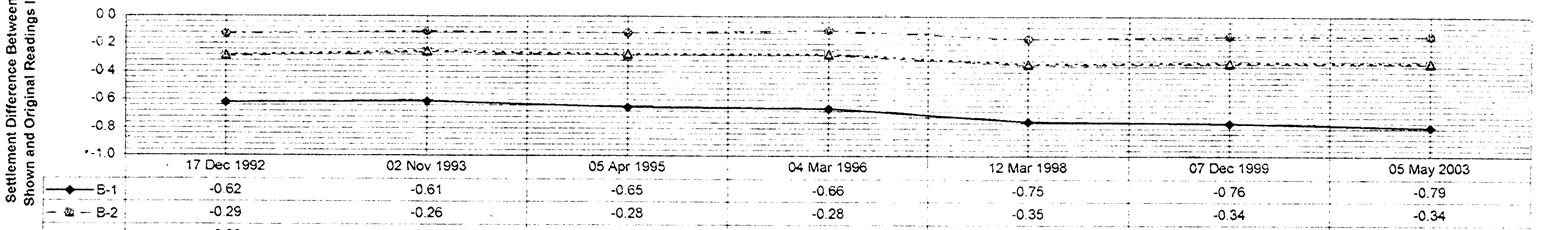
PLATE 2B

BAYOU BIENVENUE CONTROL STRUCTURE
WEST MONOLITH
DIFFERENTIAL SETTLEMENT CHART



	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	07 Dec 1999	05 May 2003
B-11	-0.04	0.01	-0.01	0.00	-0.06	-0.04	-0.04
B-5	-0.10	-0.08	-0.08	-0.07	-0.13	-0.11	-0.11
B-13	-0.05	-0.02	-0.03	-0.01	-0.07	-0.05	-0.05

BAYOU BIENVENUE CONTROL STRUCTURE
WEST FLOODWALL
DIFFERENTIAL SETTLEMENT CHART

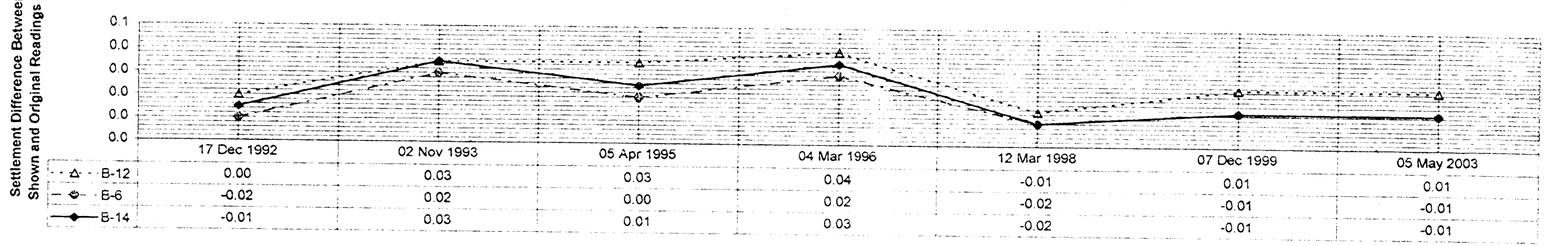


	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	07 Dec 1999	05 May 2003
B-1	-0.62	-0.61	-0.65	-0.66	-0.75	-0.76	-0.79
B-2	-0.29	-0.26	-0.28	-0.28	-0.35	-0.34	-0.34
B-3	-0.28	-0.25	-0.27	-0.27	-0.34	-0.33	-0.33
B-4	-0.13	-0.11	-0.12	-0.10	-0.16	-0.14	-0.14

Filename: BienPlot03

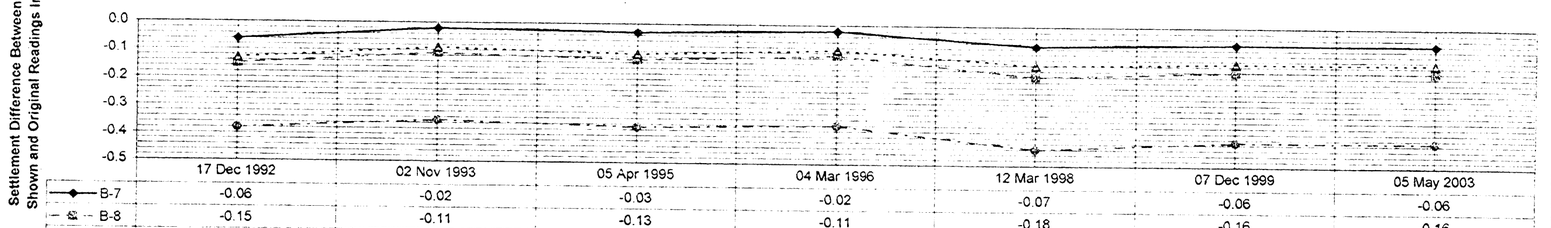
(Adjusted) Plate 3

BAYOU BIENVENUE CONTROL STRUCTURE
EAST MONOLITH
DIFFERENTIAL SETTLEMENT CHART



	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	07 Dec 1999	05 May 2003
B-12	0.00	0.03	0.03	0.04	-0.01	0.01	0.01
B-6	-0.02	0.02	0.00	0.02	-0.02	-0.01	-0.01
B-14	-0.01	0.03	0.01	0.03	-0.02	-0.01	-0.01

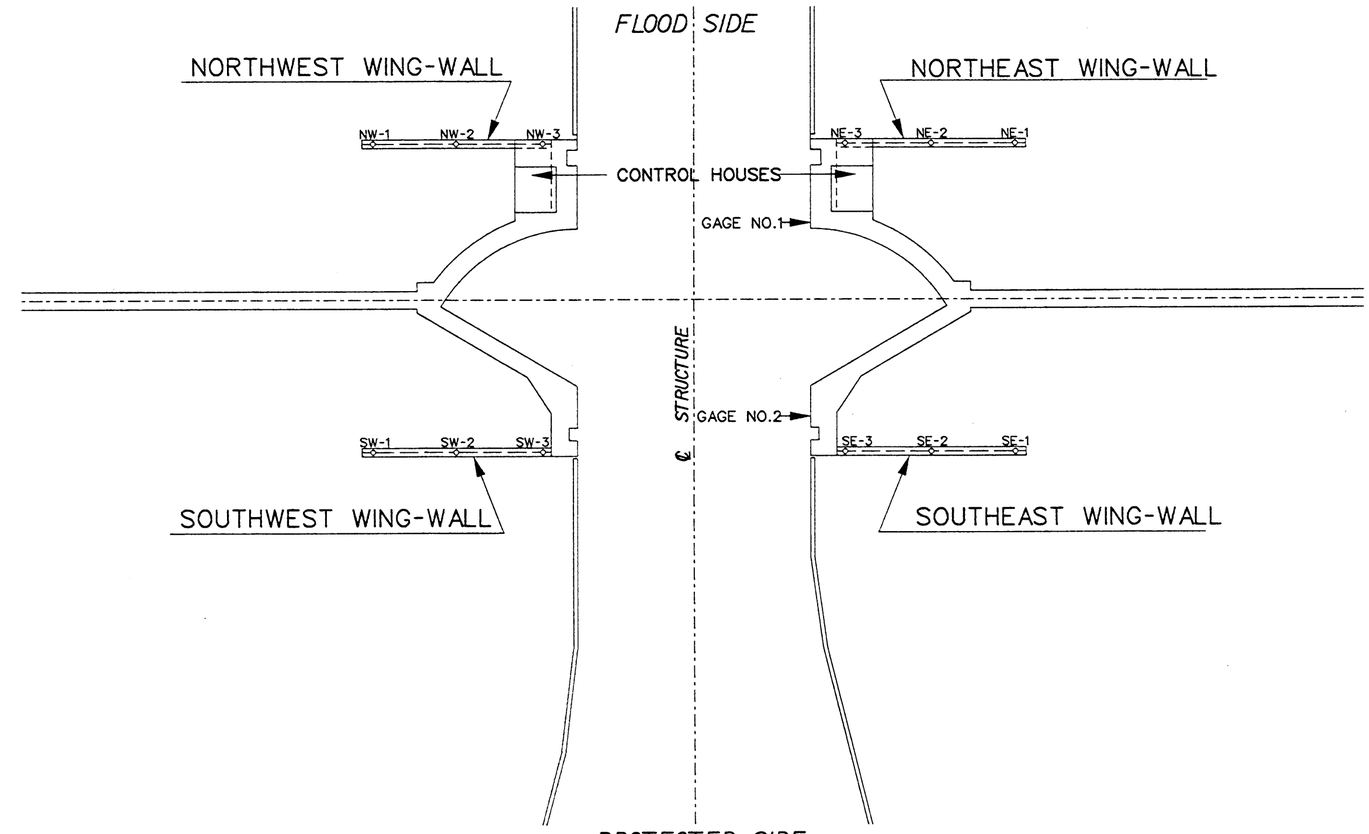
BAYOU BIENVENUE CONTROL STRUCTURE
EAST FLOODWALL
DIFFERENTIAL SETTLEMENT CHART



	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	07 Dec 1999	05 May 2003
B-7	-0.06	-0.02	-0.03	-0.02	-0.07	-0.06	-0.06
B-8	-0.15	-0.11	-0.13	-0.11	-0.18	-0.16	-0.16
B-9	-0.13	-0.09	-0.11	-0.09	-0.14	-0.13	-0.13
B-10	-0.38	-0.35	-0.37	-0.36	-0.44	-0.41	-0.41

Filename: BienPlot03

(Adjusted) Plate 3A



PLAN
SCALE: NTS

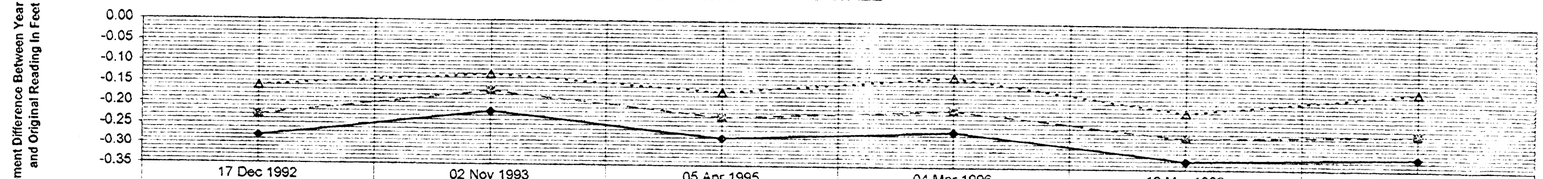
LAKE PONTCHARTRAIN AND VICINITY
BAYOU BIENVENUE
PERIODIC INSPECTION

WING-WALL
SETTLEMENT REFERENCE MARKS
PLAN AND TABULATION

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

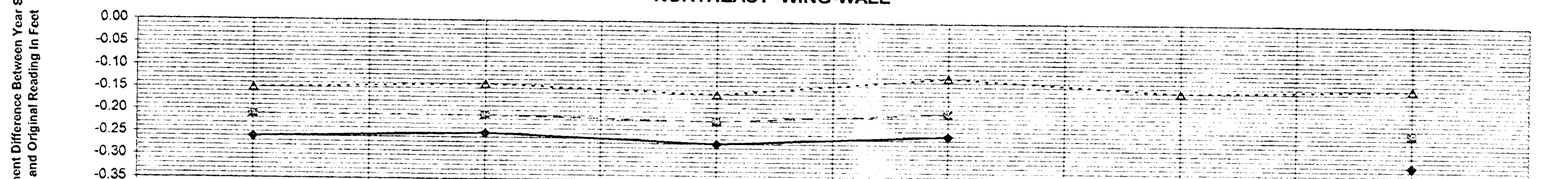
PLATE 4

BAYOU BIENVENUE CONTROL STRUCTURE
SETTLEMENT REFERENCE MARKS
DIFFERENTIAL SETTLEMENT CHART
NORTHWEST WING-WALL



	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	05 May 2003
NW-1	-0.28	-0.22	-0.28	-0.26	-0.33	-0.32
NW-2	-0.23	-0.17	-0.23	-0.21	-0.27	-0.26
NW-3	-0.16	-0.13	-0.17	-0.13	-0.21	-0.16

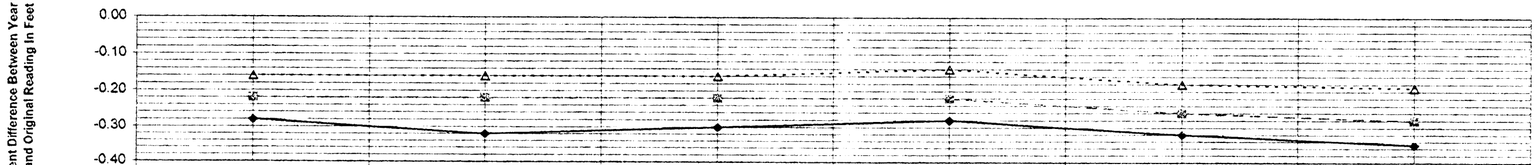
BAYOU BIENVENUE CONTROL STRUCTURE
SETTLEMENT REFERENCE MARKS
DIFFERENTIAL SETTLEMENT CHART
NORTHEAST WING-WALL



	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	05 May 2003
NE-1	-0.26	-0.25	-0.27	-0.25		-0.31
NE-2	-0.21	-0.21	-0.22	-0.20		-0.24
NE-3	-0.15	-0.14	-0.16	-0.12	-0.15	-0.14

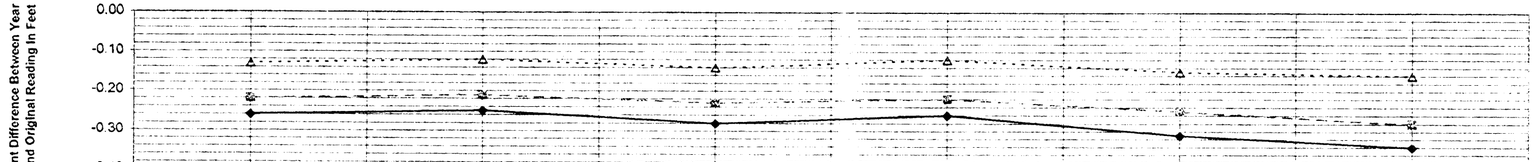
(Adjusted) Plate 5

BAYOU BIENVENUE CONTROL STRUCTURE
SETTLEMENT REFERENCE MARKS
DIFFERENTIAL SETTLEMENT CHART
SOUTHWEST WING-WALL



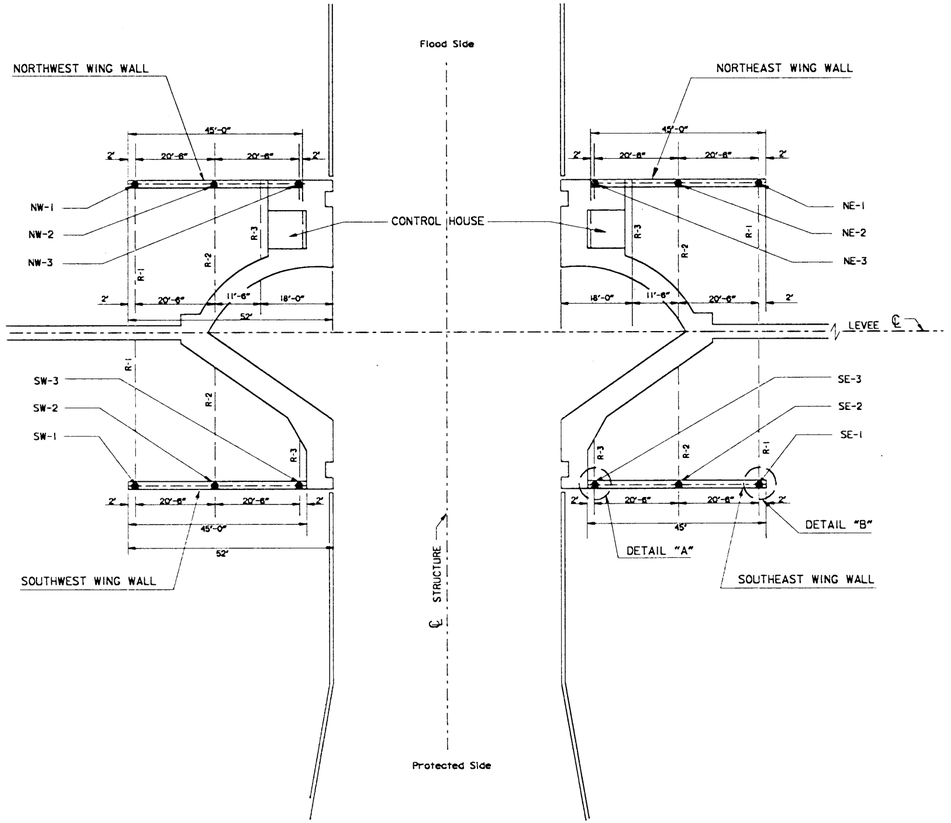
	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	05 May 2003
SW-1	-0.28	-0.32	-0.30	-0.28	-0.32	-0.35
SW-2	-0.22	-0.22	-0.22	-0.22	-0.26	-0.28
SW-3	-0.16	-0.16	-0.16	-0.14	-0.18	-0.19

BAYOU BIENVENUE CONTROL STRUCTURE
SETTLEMENT REFERENCE MARKS
DIFFERENTIAL SETTLEMENT CHART
SOUTHEAST WING-WALL



	17 Dec 1992	02 Nov 1993	05 Apr 1995	04 Mar 1996	12 Mar 1998	05 May 2003
SE-1	-0.26	-0.25	-0.28	-0.26	-0.31	-0.34
SE-2	-0.22	-0.21	-0.23	-0.22	-0.25	-0.28
SE-3	-0.13	-0.12	-0.14	-0.12	-0.15	-0.16

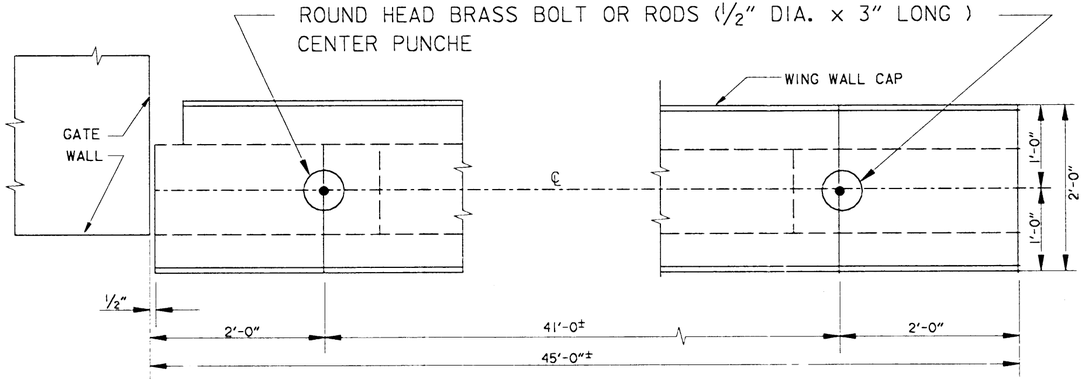
(Adjusted) Plate 5A



PLAN

20' 0 20' 40' 60' 80'

SCALE: 1" - 20'



DETAIL "A"

DETAIL "B"

SCALE: 3/4" - 1'- 0"

12" 0 1' 2' 3' 4' 5'

LAKE PONTCHARTRAIN AND VICINITY

BAYOU BIENVENUE
PERIODIC INSPECTION

SETTLEMENT REFERENCE MARKS OVERBANKS RANGES

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

PLATE BUN-6

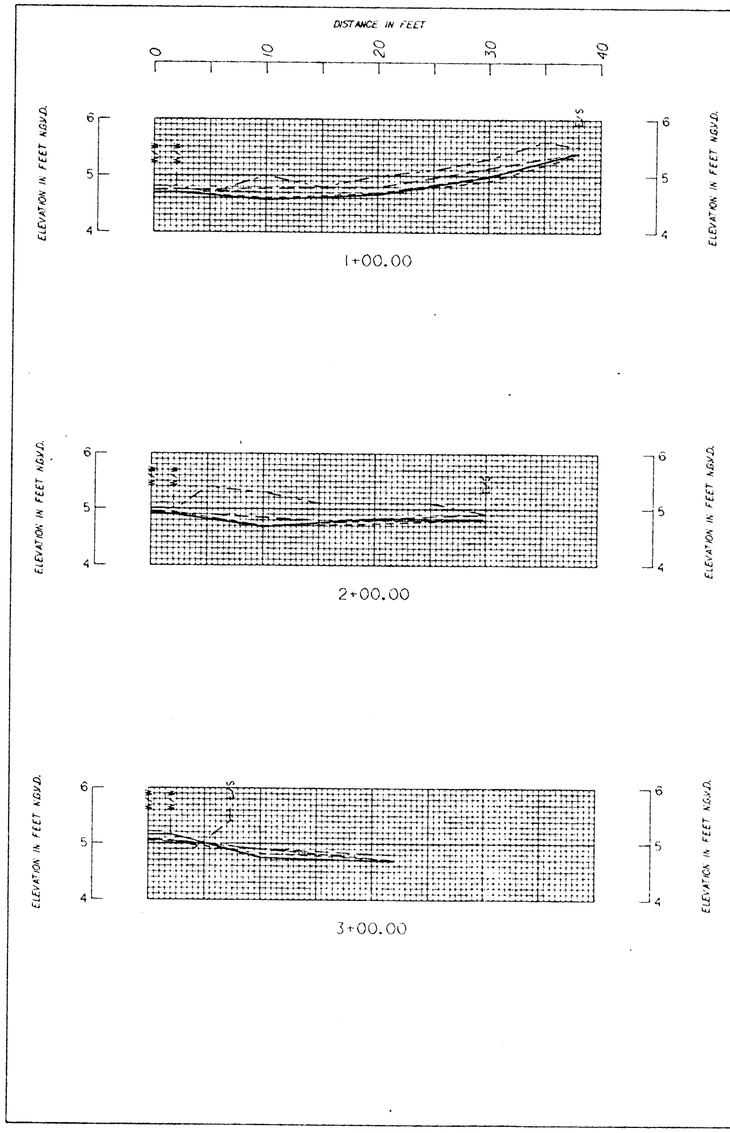
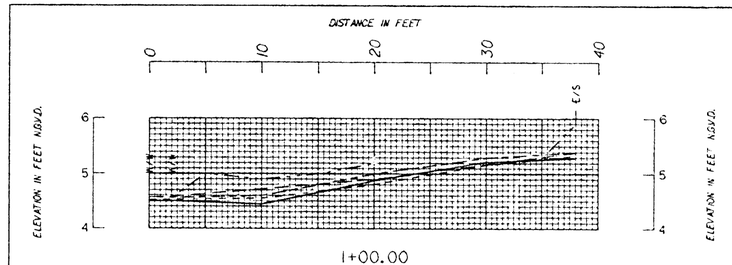
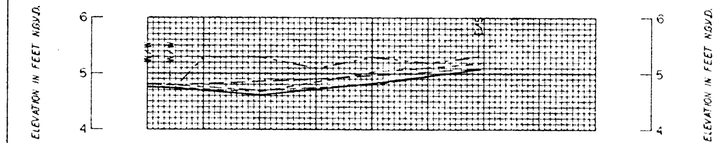

DISTANCE IN FEET
0
10
20
30
40
ELEVATION IN FEET NGVD.
6
5
4
1+00.00
2+00.00
3+00.00
LEGEND:
16-APR-1984
18-APR-1995
19-MAR-1996
17-MAR-1998
05-MAY-2003
NOTES:
STATION:
1+00.00
2+00.00
3+00.00
LAKE PONTCHARTRAIN, LA. AND VICINITY
BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTIONS
NORTHWEST WINGWALL (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS (CORPS OF ENGINEERS)

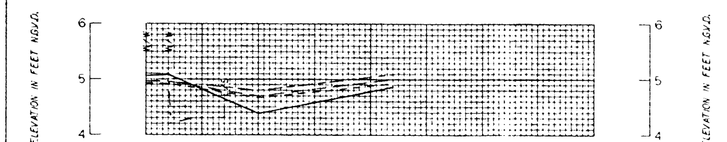
PLATE 7



1+00.00



2+00.00



3+00.00

LEGEND:

- 16-APR-1984
- 18-APR-1995
- 19-MAR-1996
- 17-MAR-1998
- 05-MAY-2003

NOTES:

STATION:

1+00.00
2+00.00
3+00.00

LAKE PONTCHARTRAIN, LA. AND VICINITY
BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTIONS
NORTHEAST WINGWALL (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS DISTRICT CORPS OF ENGINEERS

PLATE 8

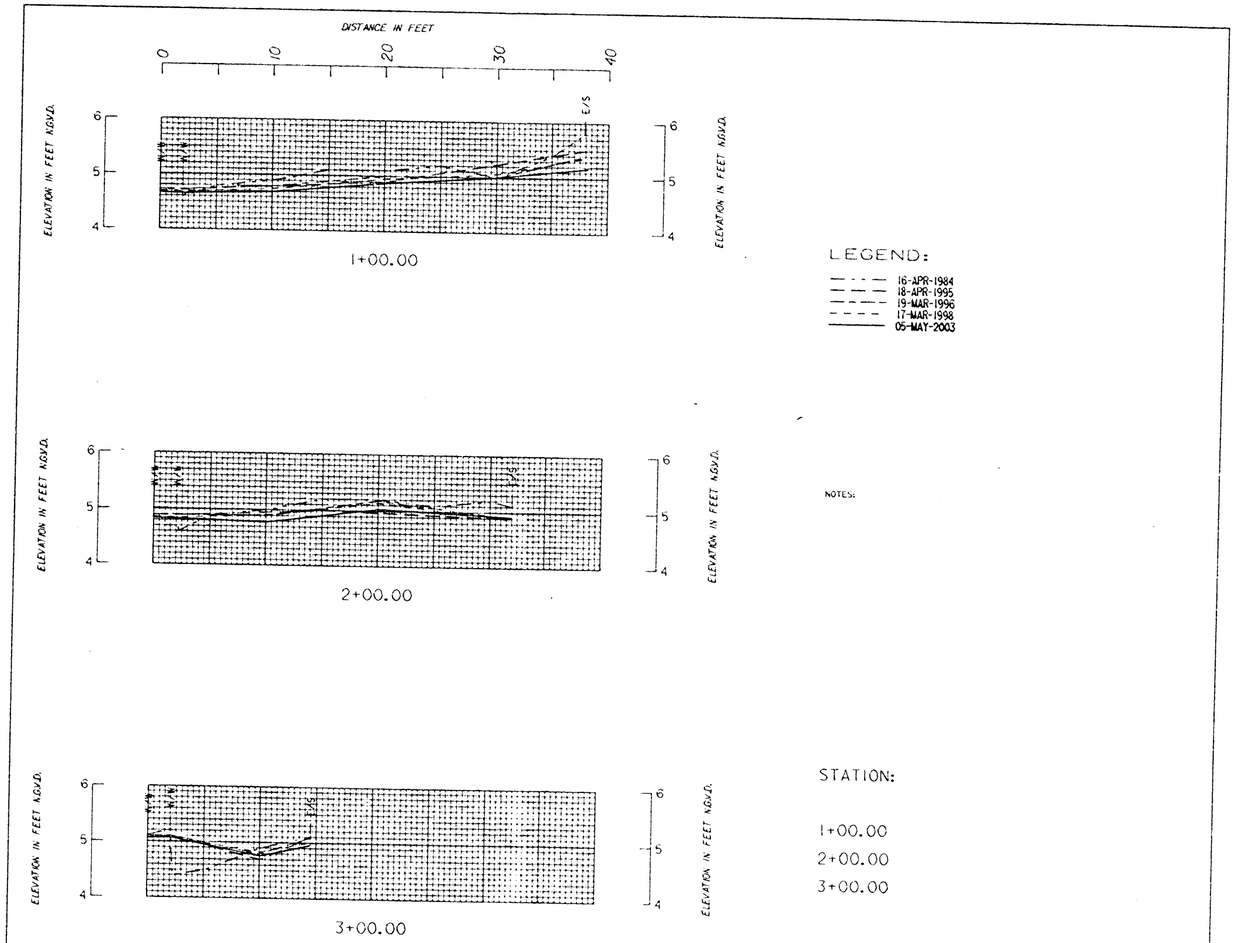
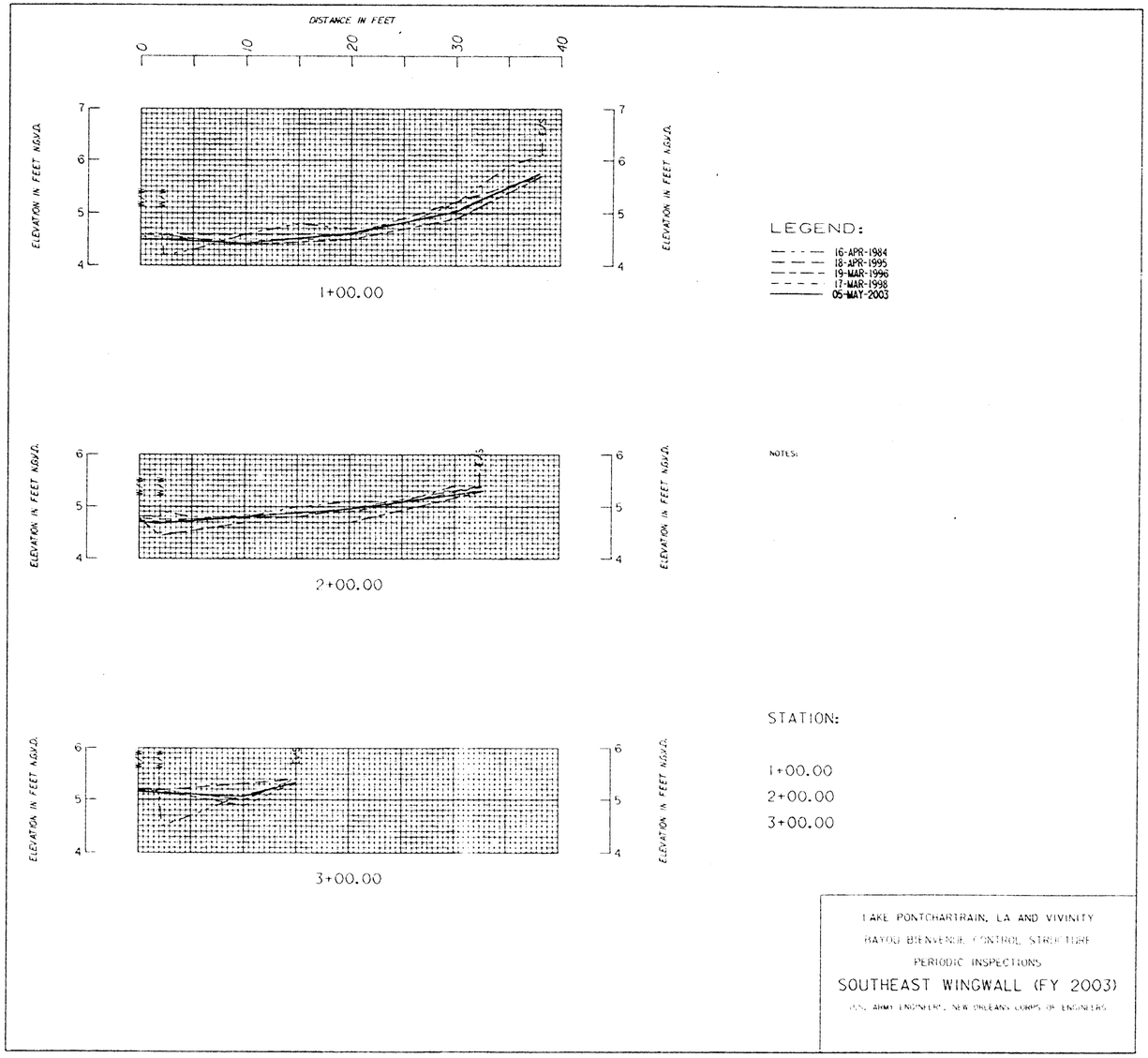
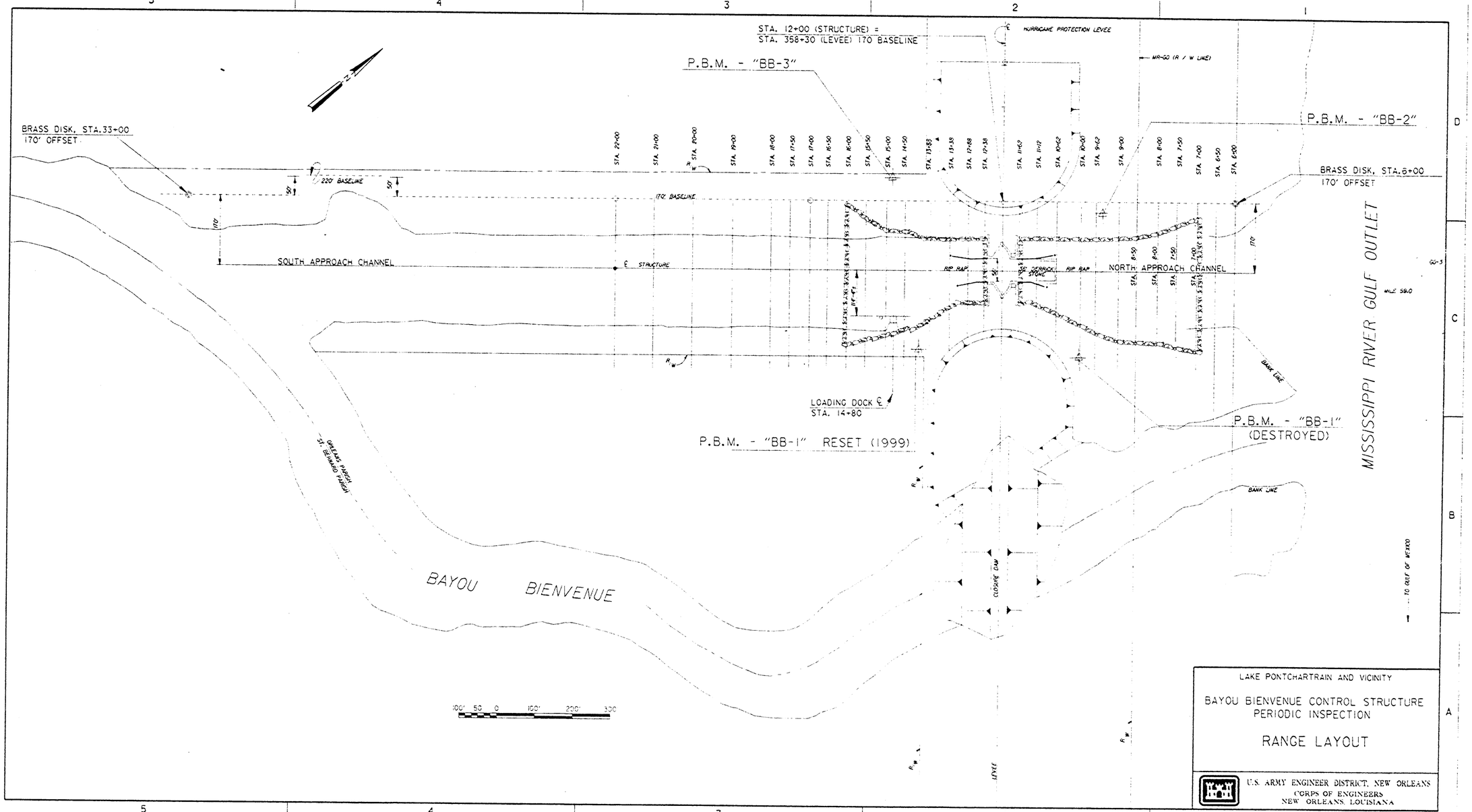

DISTANCE IN FEET
0
10
20
30
40
E/S
ELEVATION IN FEET NGVD.
6
5
4
1+00.00
2+00.00
3+00.00
LEGEND:
16-APR-1984
18-APR-1995
19-MAR-1996
17-MAR-1998
05-MAY-2003
NOTES:
STATION:
1+00.00
2+00.00
3+00.00
LAKE PONTCHARTRAIN, LA. AND VICINITY
BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTIONS
SOUTHWEST WINGWALL (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS CORPS OF ENGINEERS

PLATE 9


DISTANCE IN FEET
0
10
20
30
40
ELEVATION IN FEET NGVD.
7
6
5
4
1+00.00
2+00.00
3+00.00
LEGEND:
16-APR-1984
18-APR-1995
19-MAR-1996
17-MAR-1998
05-MAY-2003
NOTES:
STATION:
1+00.00
2+00.00
3+00.00
LAKE PONTCHARTRAIN, LA AND VIVINITY
BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTIONS
SOUTHEAST WINGWALL (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS CORPS OF ENGINEERS



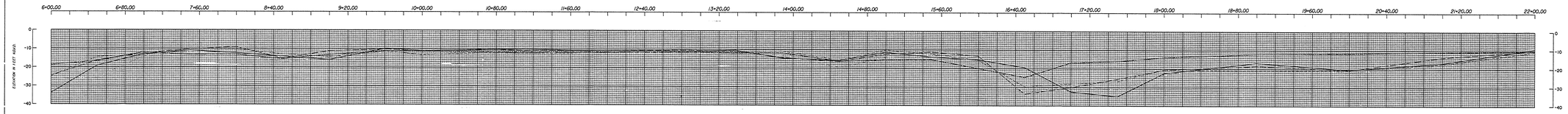
LAKE PONTCHARTRAIN AND VICINITY

BAYOU BIENVENUE CONTROL STRUCTURE
PERIODIC INSPECTION

RANGE LAYOUT

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

PLATE BUN-11



NOTES:

C/L PROFILE OFFSET 110'

LAKE PONTCHARTRAIN, LA. AND VICINITY

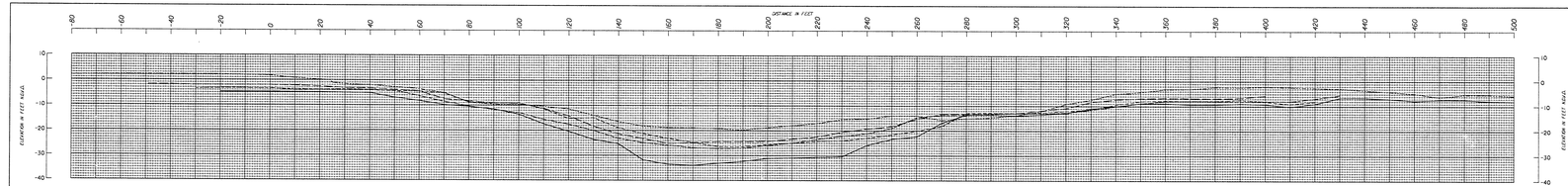
CHALMETTE AREA

BAYOU BIENVENUE CONTROL STRUCTURE

PROFILE SURVEY (FY 2003)

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

PLATE 12



LEGEND:

- 17-APR-1984
- 25-APR-1995
- 22-MAR-1998
- 15-MAR-2003

NOTES:

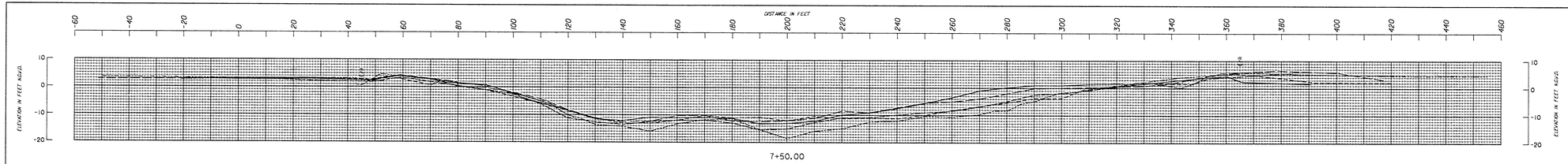
STATION:

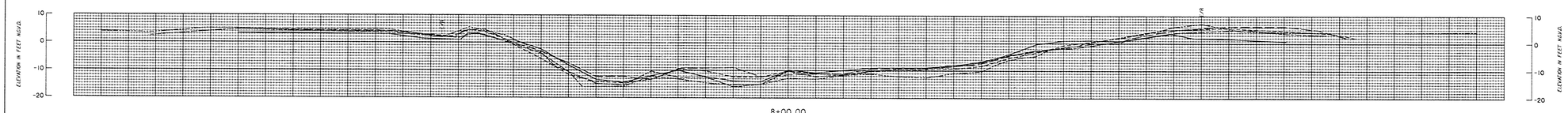
6+00.00
6+50.00
7+00.00

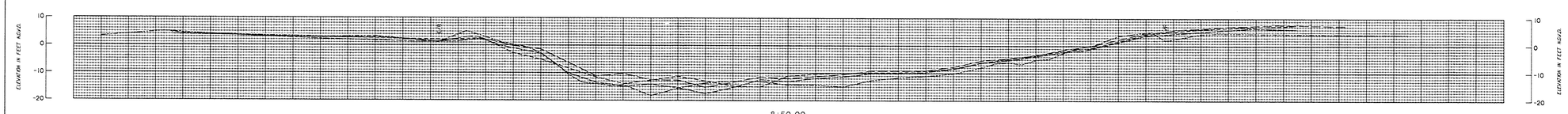
LAKE PONTCHARTRAIN, LA. AND VICINITY
CHALMETTE AREA
BAYOU BIENVENUE CONTROL STRUCTURE

SCOUR SURVEY (FY 2003)

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







LEGEND:

- 17-APR-1984
- 18-APR-1995
- 21-MAR-1996
- 30-MAR-1998
- 15-MAY-2003

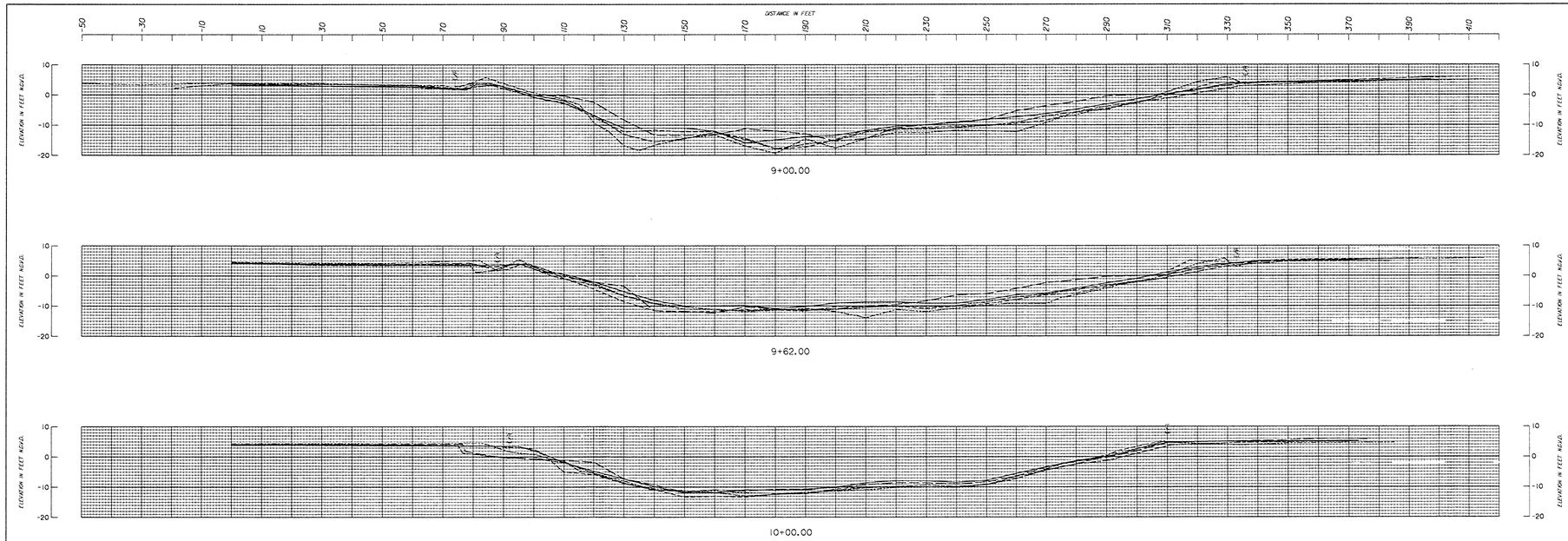
NOTES:

STATION:

7+50.00
8+00.00
8+50.00

LAKE PONTCHARTRAIN, LA. AND VICINITY
CHALMETTE AREA
BAYOU BIENVENUE CONTROL STRUCTURE
SCOUR SURVEY (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS CORPS OF ENGINEERS

PLATE 14



LEGEND:

- 17-APR-1984
- 18-APR-1995
- 21-MAR-1996
- 30-MAR-1998
- 15-MAY-2002

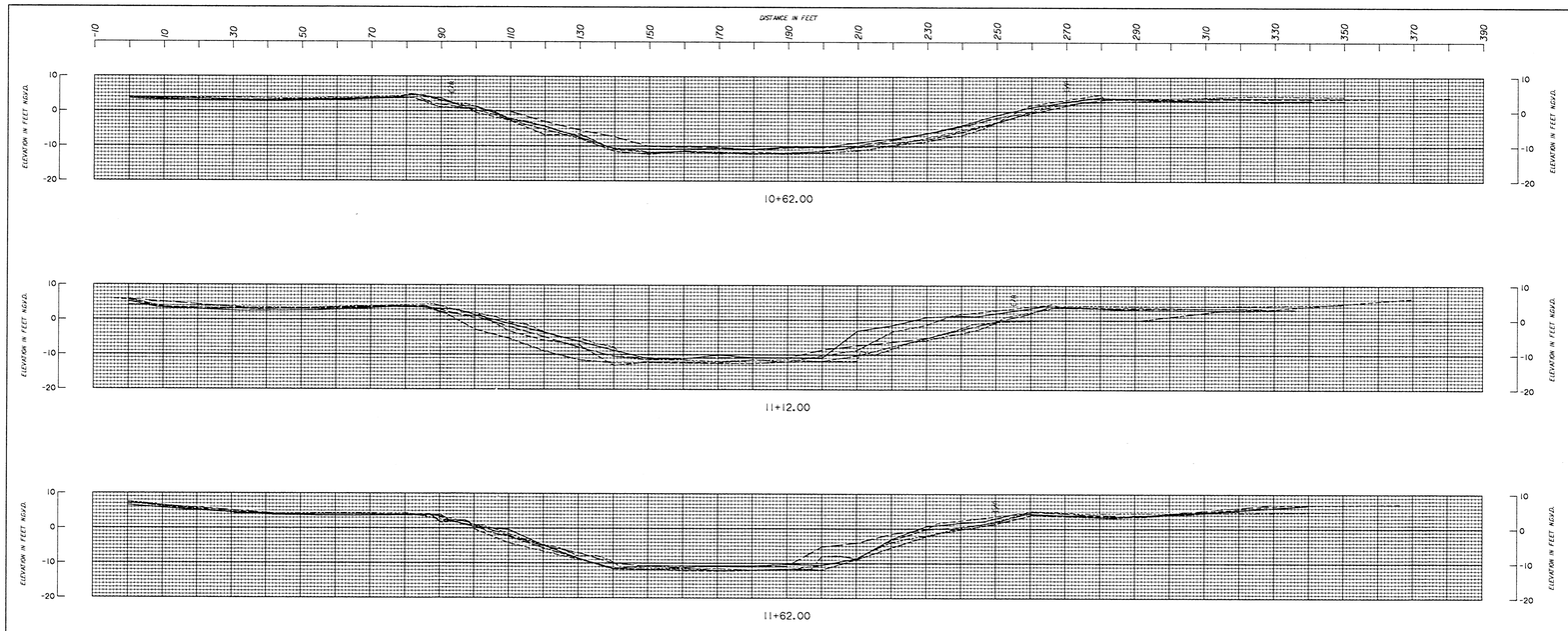
NOTES:

STATION:

9+00.00
9+62.00
10+00.00

LAKE PONTCHARTRAIN, LA. AND VICINITY
CHALMETTE AREA
BAYOU BIENVENUE CONTROL STRUCTURE
SCOUR SURVEY (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS CORPS OF ENGINEERS

PLATE 15



LAKE PONTCHARTRAIN, LA. AND VICINITY

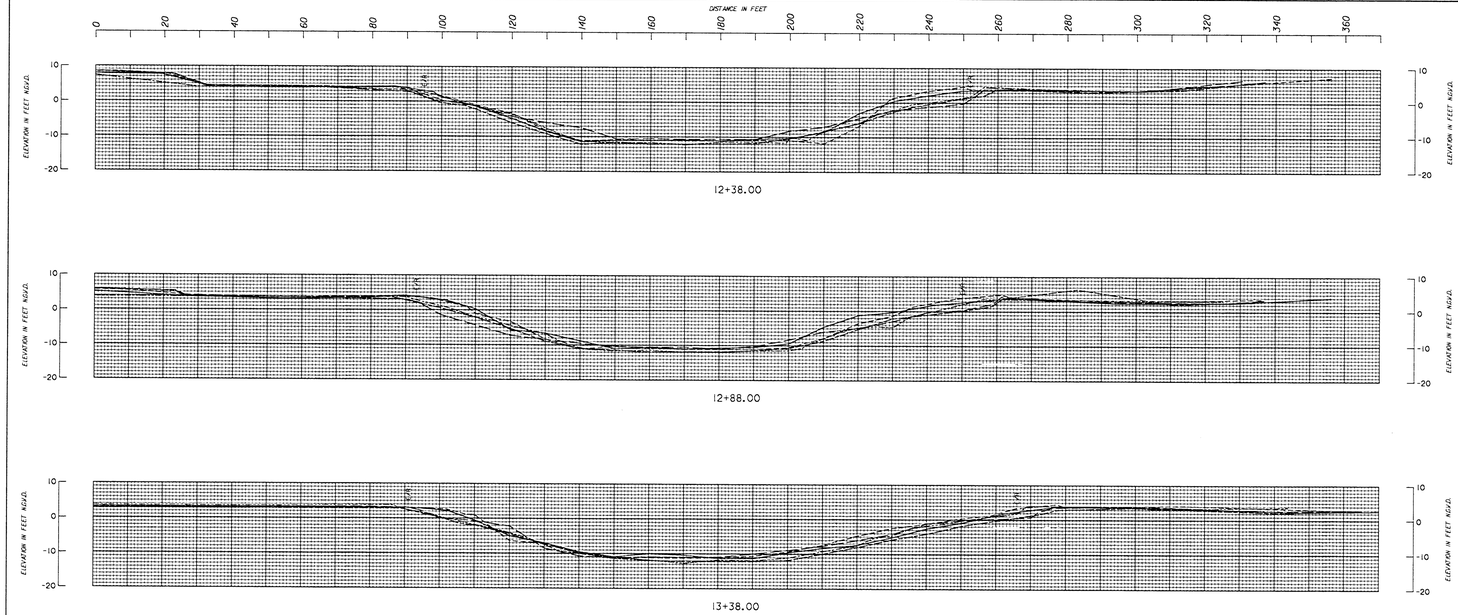
CHALMETTE AREA

BAYOU BIENVENUE CONTROL STRUCTURE

SCOUR SURVEY (FY 2003)

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

PLATE 16



LAKE PONTCHARTRAIN, LA. AND VICINITY

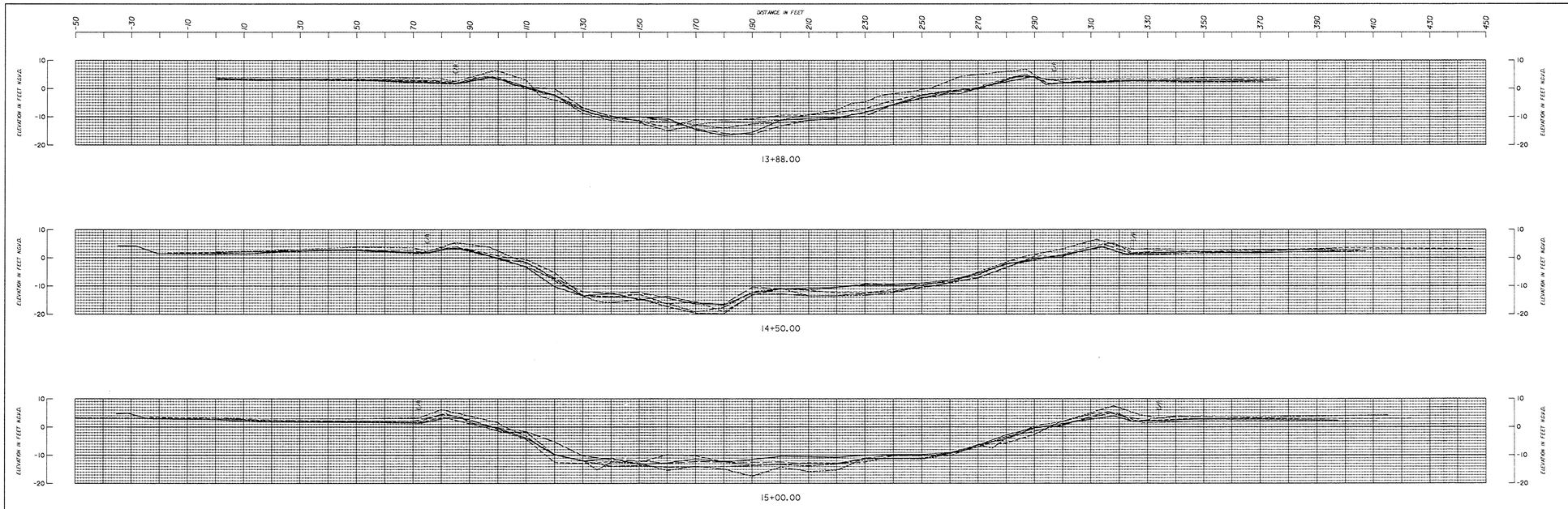
CHALMETTE AREA

BAYOU BIENVENUE CONTROL STRUCTURE

SCOUR SURVEY (FY 2003)

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

PLATE 17



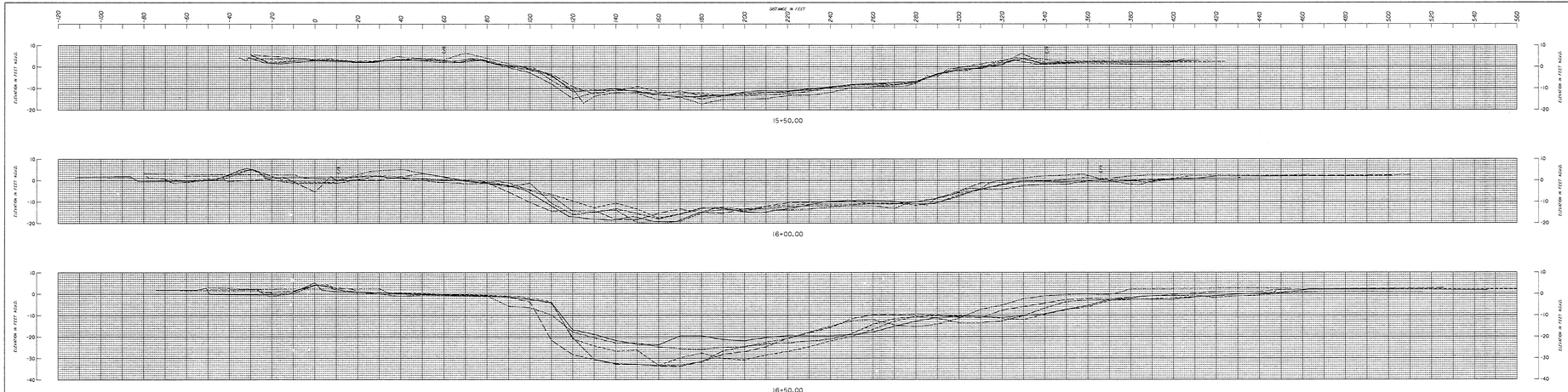
LAKE PONTCHARTRAIN, LA. AND VICINITY

CHALMETTE AREA

BAYOU BIENVENUE CONTROL STRUCTURE

SCOUR SURVEY (FY 2003)

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



LEGEND:

- (1) 6/79 - 1984
- (2) 8/87 - 1995
- (3) 5/97 - 1998
- (4) 9/97 - 2000
- (5) 8/97 - 2002

NOTES:

STATION:

15+50.00
16+00.00
16+50.00

LAKE PONTCHARTRAIN, LA. AND VICINITY
CHALMETTE AREA
BAYOU BIENVENUE CONTROL STRUCTURE
SCOUR SURVEY (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS CORPS OF ENGINEERS

PLATE 19

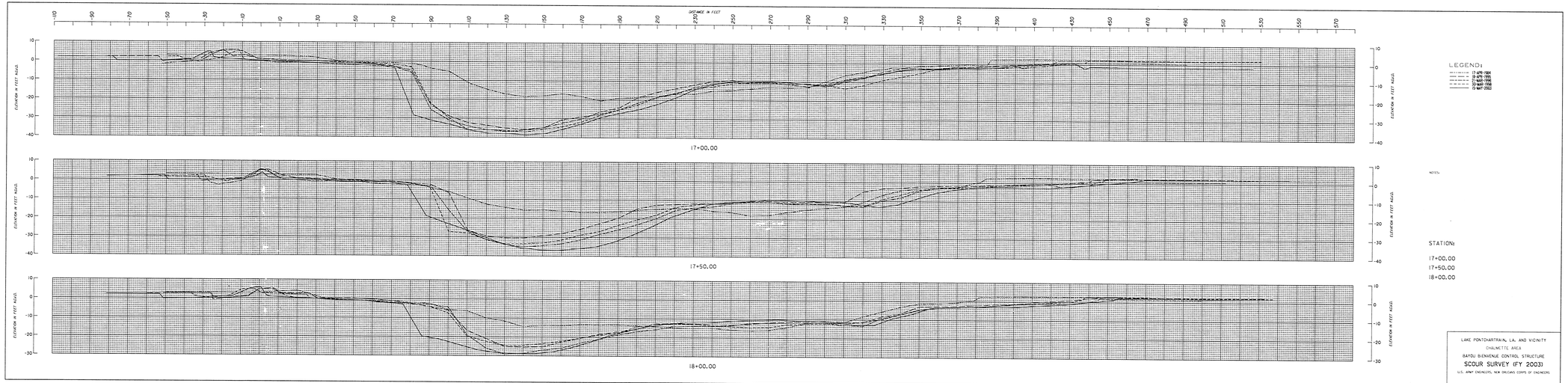
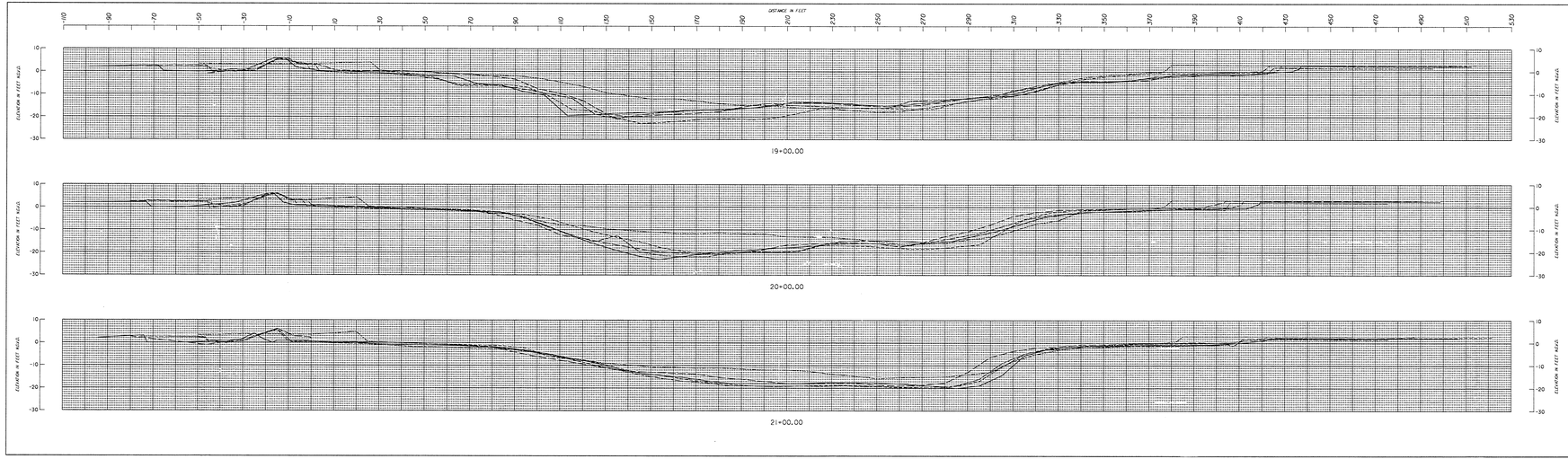

DISTANCE IN FEET
-110 -90 -70 -50 -30 -10 10 30 50 70 90 110 130 150 170 190 210 230 250 270 290 310 330 350 370 390 410 430 450 470 490 510 530 550 570
ELEVATION IN FEET NGVD
10 0 -10 -20 -30 -40
17+00.00
17+50.00
18+00.00
LEGEND:
17-APR-1984
15-APR-1995
11-MAR-1998
15-MAR-2002
NOTES:
STATION:
17+00.00
17+50.00
18+00.00
LAKE PONTCHARTRAIN, LA. AND VICINITY
CHALMETTE AREA
BAYOU BIENVENUE CONTROL STRUCTURE
SCOUR SURVEY (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS CORPS OF ENGINEERS

PLATE 20

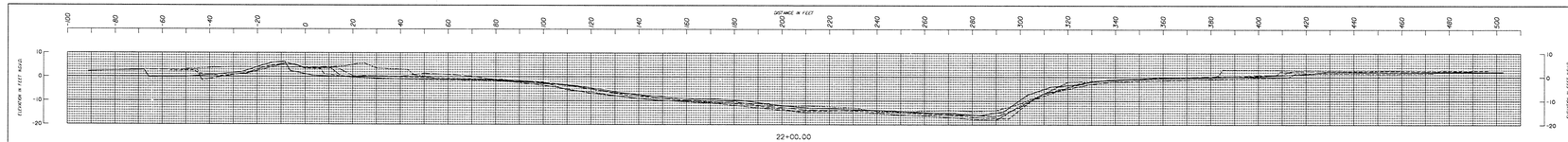


NOTES:

STATION:
19+00.00
20+00.00
21+00.00

LAKE PONTCHARTRAIN, LA. AND VICINITY
CHALMETTE AREA
BAYOU BIENVENUE CONTROL STRUCTURE
SCOUR SURVEY (FY 2003)
U.S. ARMY ENGINEERS, NEW ORLEANS CORPS OF ENGINEERS

PLATE 21



LEGEND:

- 19-APR-1984
- 18-APR-1995
- 17-MAR-1999
- 17-MAY-1999
- 19-MAY-2003

NOTES:

STATION:

22+00.00

LAKE PONTCHARTRAIN, LA. AND VICINITY

CHALMETTE AREA

BAYOU BIENVENUE CONTROL STRUCTURE

SCOUR SURVEY (FY 2003)

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

PLATE 22

APPENDIX E

HSS REPORT

APPENDIX E

HYDRAULIC STEEL STRUCTURE (HSS) INFORMATION BAYOU BIENVENUE CONTROL STRUCTURE

1. BACKGROUND. ER 1110-2-8157, "Responsibility for Hydraulic Steel Structures (HSS)," dated 31 January 1997, established the criteria and requirements for identifying and testing fracture critical members and connections.

2. GENERAL. The additional inspection required for critical members addressed herein does not preclude the need for a general inspection of the remaining components as required by the Periodic Inspection Program and the O&M manual. The general inspection shall address the effects of corrosion and damage. This project contains one type of Hydraulic Steel Structure: sector gates and needle girders. The needle girders stored at Bayou Bienvenue are also used at Bayou Dupre. The design calculations for these items can be found in "Lake Pontchartrain, LA. And Vicinity, Chalmette Area Plan, Design Memorandum No. 5: Detail Design Bayou Bienvenue and Bayou Dupre Control Structures", dated March 1968. Each HSS and its fractural critical components are described below and are labeled on the attached drawings.

3. PROJECT HSS LIST. There are: 2 sector gate leaves (one set of gates)
2 needle girders

4. DESCRIPTION OF HSS AND FCM COMPONENTS. The sector gates are constructed from A36 steel. The gates are composed of two vertical trusses that are connected by three horizontal frames. The primary load-carrying components in the trusses and frames are rolled, wide-flange sections and pipe. Steel bars, steel plate, and angles make up the skin plate assembly. All connections for all components of the gate (except the hinge plate) are welded connections. Construction of the gates was completed in 1974. This structure is used for hurricane flood protection. Using the design load cases from Periodic Inspection Report No. 1, "Bayou Bienvenue Control Structure", dated February 1974, page III-24, the gates were analyzed and were found to have low to moderate operating stresses. A check for load-path redundancy was performed and it was revealed that the removal of any one of several tension members

would result in unacceptable stress levels elsewhere in the structure, thus rendering them Fracture Critical. The Fracture Critical Members are Members 1-2, 1-6, 2-6, 8-14, 12-18, 8-12, 14-18, 2-16, and 6-16. The connections associated with these members that require testing are shown in the attached drawings. Also, any pad eyes present are considered Fracture Critical, as well. The needle girders are continuous W36 x 194 wide flange beams conforming to ASTM A-36.

5. LIST OF PROBABLE LOSS OF LIFE FCM COMPONENTS (PFCM). The 2 needle girders.

6. INSPECTION FREQUENCY. The following types of inspections will be performed on the sector gates:

7. Initial FCM Inspections. Initial NDT Testing will be performed on all FCM during the next dewatering. All members shall be cleansed and the connections shall be sandblasted to a commercial blast cleaning. All FCM will be inspected in accordance with AWS D1.5. All other members will be cleaned and visually inspected to address the effects of corrosion and damage. The members and connections requiring testing are listed in the tables included at the end of this appendix.

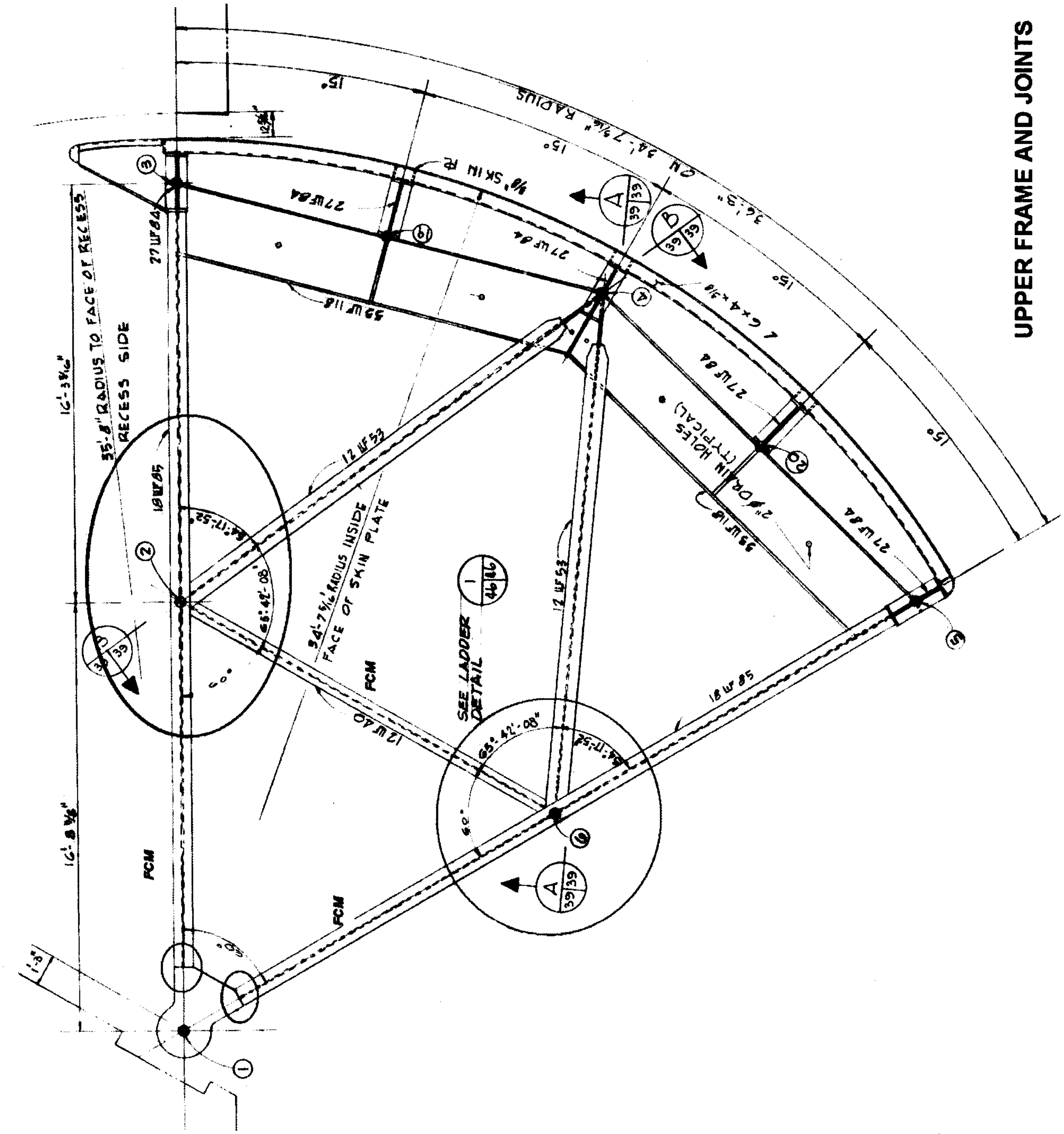
8. Routine Inspections. An experienced structural engineer shall visually inspect the top hinge, connections, and FCM members located above the water. The visual inspection shall coincide with the periodic inspection (5 year cycle). Any repairs to these locations shall be made and tested in accordance with AWS D1.5.

9. Operations Inspections. Project personnel shall frequently inspect all HSS and report any distress to Engineering Division.

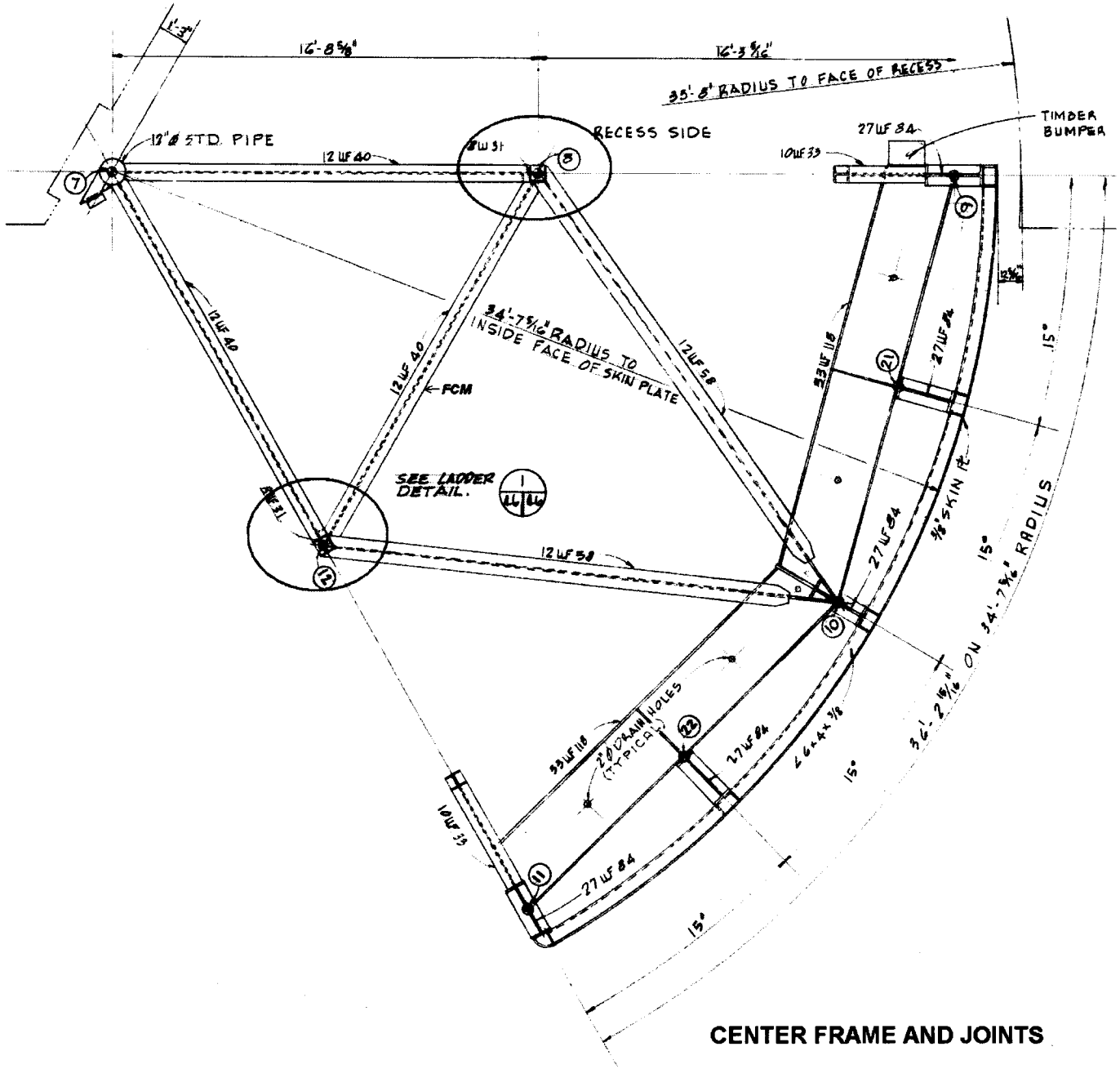
10. Detailed Inspection. Each HSS should be dewatered and visually inspected at a frequency no greater than 20 years. FCM members and connections shall be cleaned to a Commercial Blast Cleaning (SSPC No. 6) in advance of the inspection. NDT shall be utilized only as needed based on the visual inspection.

11. FUTURE NDT TESTING. When non-destructive testing is indicated as a result of distress or other reasons, the following general guidelines should be observed. All non-destructive testing shall be performed on a sand blasted clean surface. Fillet welds shall be tested by the magnetic particle (MT) method and groove welds (full penetration welds) shall be tested by the ultrasonic method (UT). Where backer bars are present, or excessive corrosion exists, the radiographic (RT) method may be required in lieu of the ultrasonic (UT) method. Tension splices of FCM shall be both ultrasonically (UT) and radiographically (RT) tested. Testing and repairs shall conform to the applicable provisions of AWS D1.5, Chapter 12; acceptance criteria are specified in Chapter 9. All repairs shall be NDT full length.

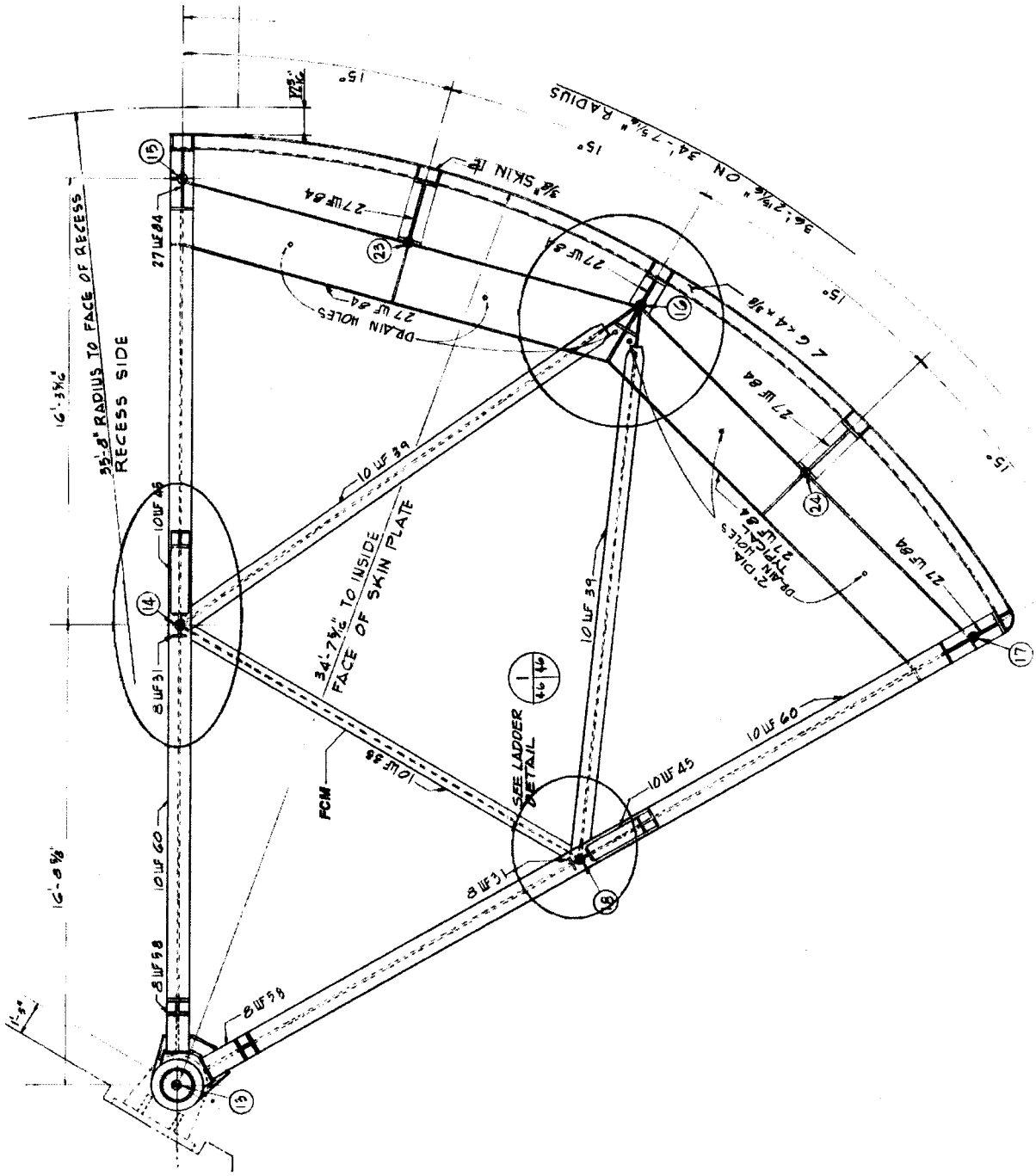
12. LOG OF INSPECTIONS. Tables for recording inspections for the HSS are located at the end of this appendix. Any defects shall be individually recorded and located on the drawings. Repairs shall be made prior to use. The responsible structural engineer will enter the appropriate data on the form for inclusion in the Periodic Inspection Report. FCM components, weld locations and other critical components are shown on the attached drawings. Major repairs shall be added to the drawings. The columns designated for summarizing the results of Periodic Inspections will be utilized during the next inspection.

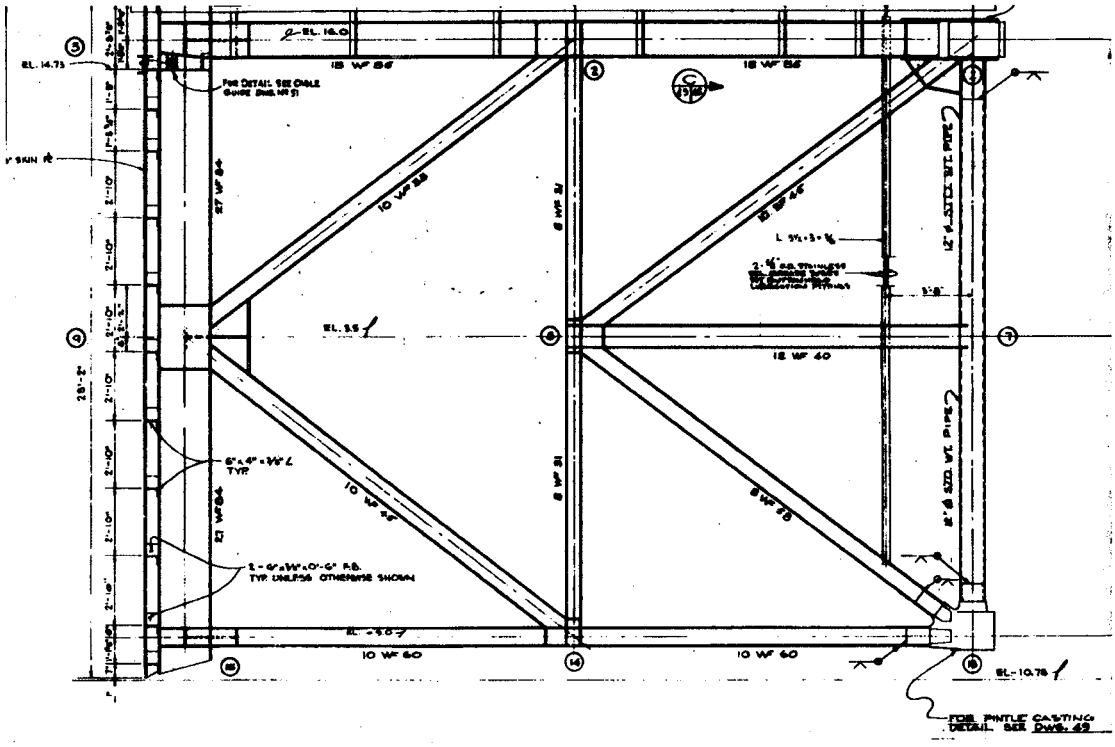


UPPER FRAME AND JOINTS



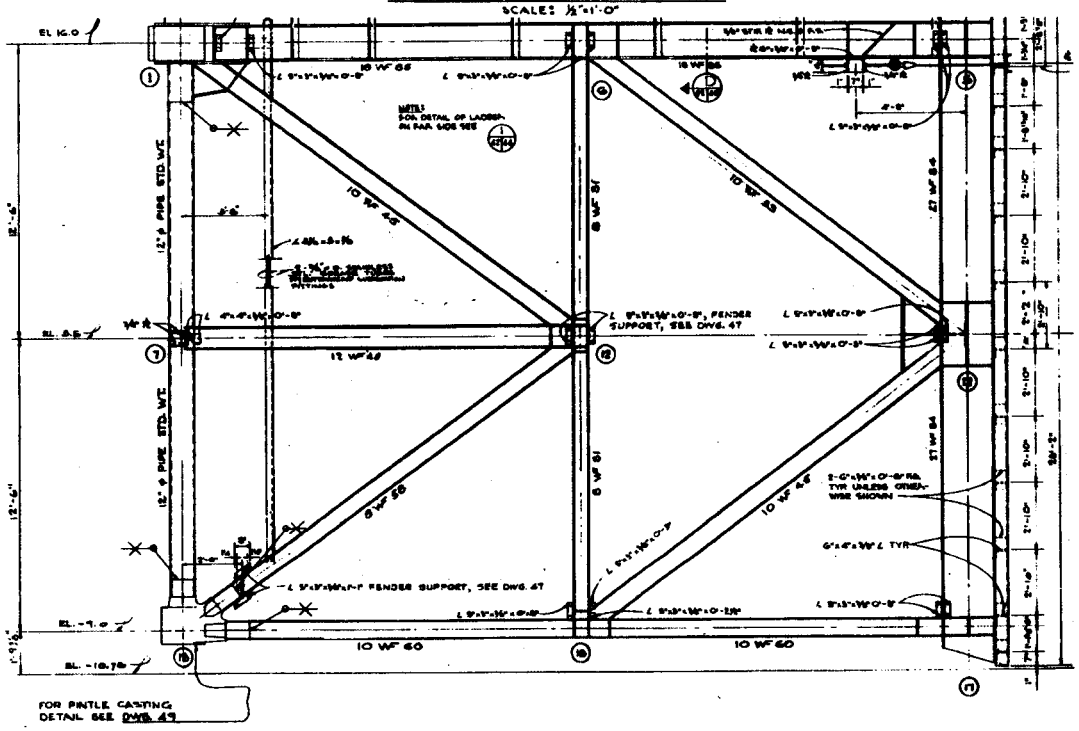
CENTER FRAME AND JOINTS


15°
15°
15°
15°
RADIUS
3/8" SKIN PL
27 LF 84
27 LF 84
27 LF 84
27 LF 84
27 LF 84
27 LF 84
DRAIN HOLES
2" DIA DRAIN HOLES TYP OF 4
RECESS SIDE
10 LF 39
10 LF 39
10 LF 45
10 LF 60
10 LF 60
10 LF 45
8 LF 31
8 LF 31
8 LF 58
8 LF 58
34'-7 1/16" TO INSIDE FACE OF SKIN PLATE
FCM
SEE LADDER DETAIL
1/46/46



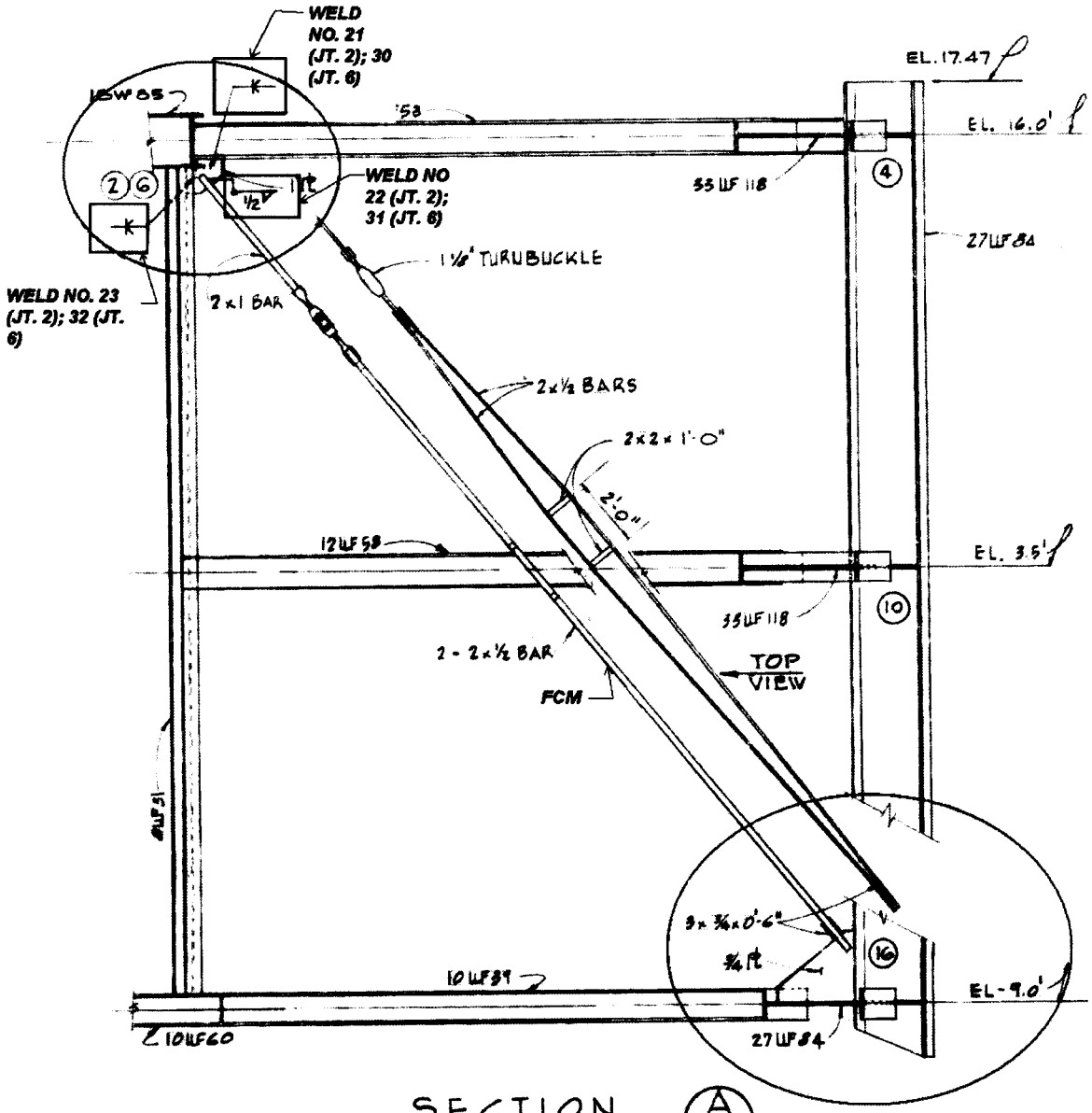
RECESS TRUSS ELEVATION

SCALE: ½"=1'-0"



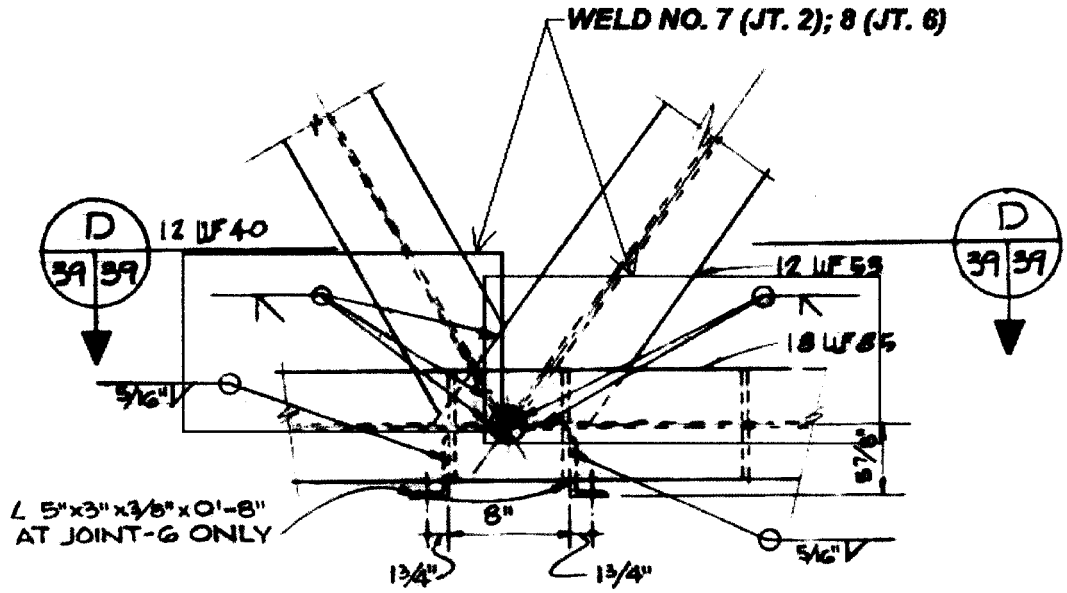
CHANNEL TRUSS ELEVATION

SCALE ½"=1'-0"

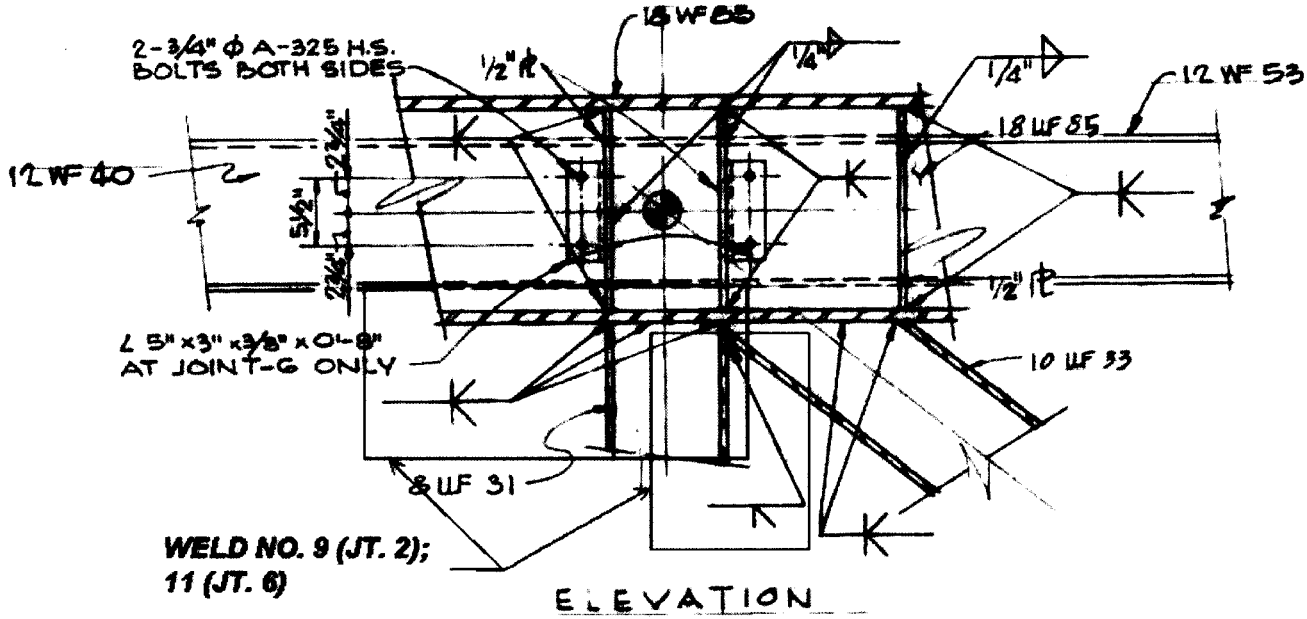


SECTION A (39/39)

SECTION B (39/39)
(SIMILAR - OPPOSITE HAND)



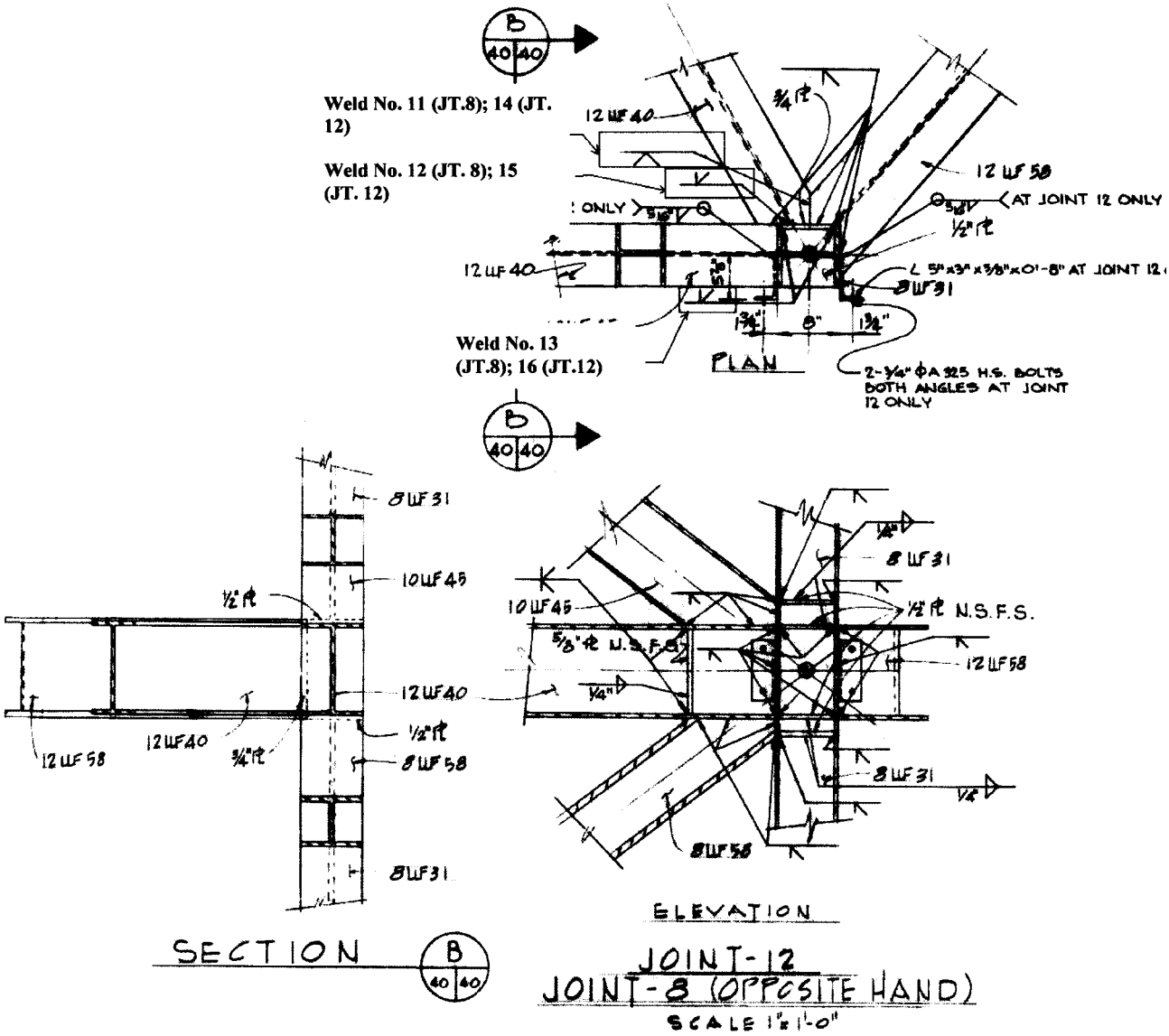
PLAN

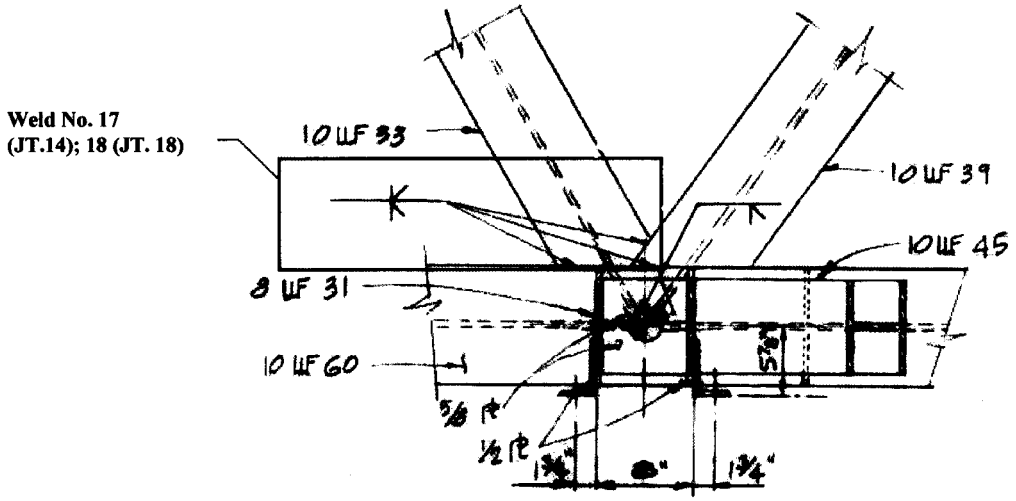


ELEVATION

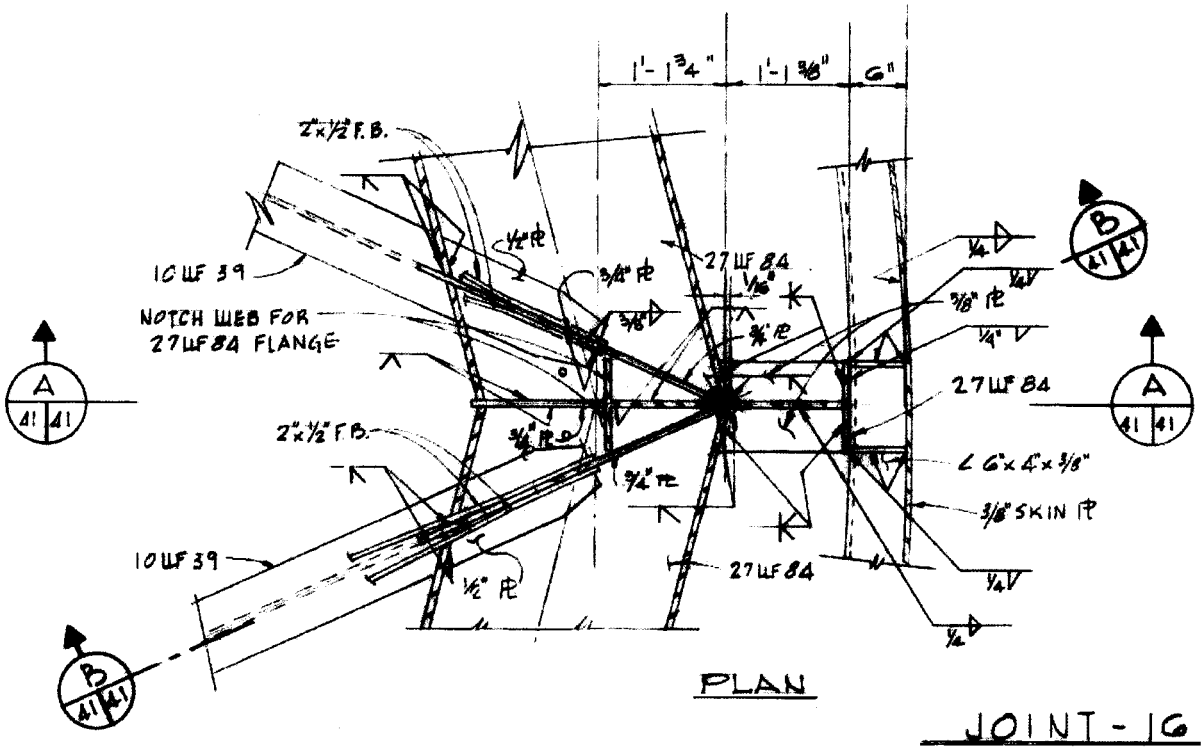
JOINT-G

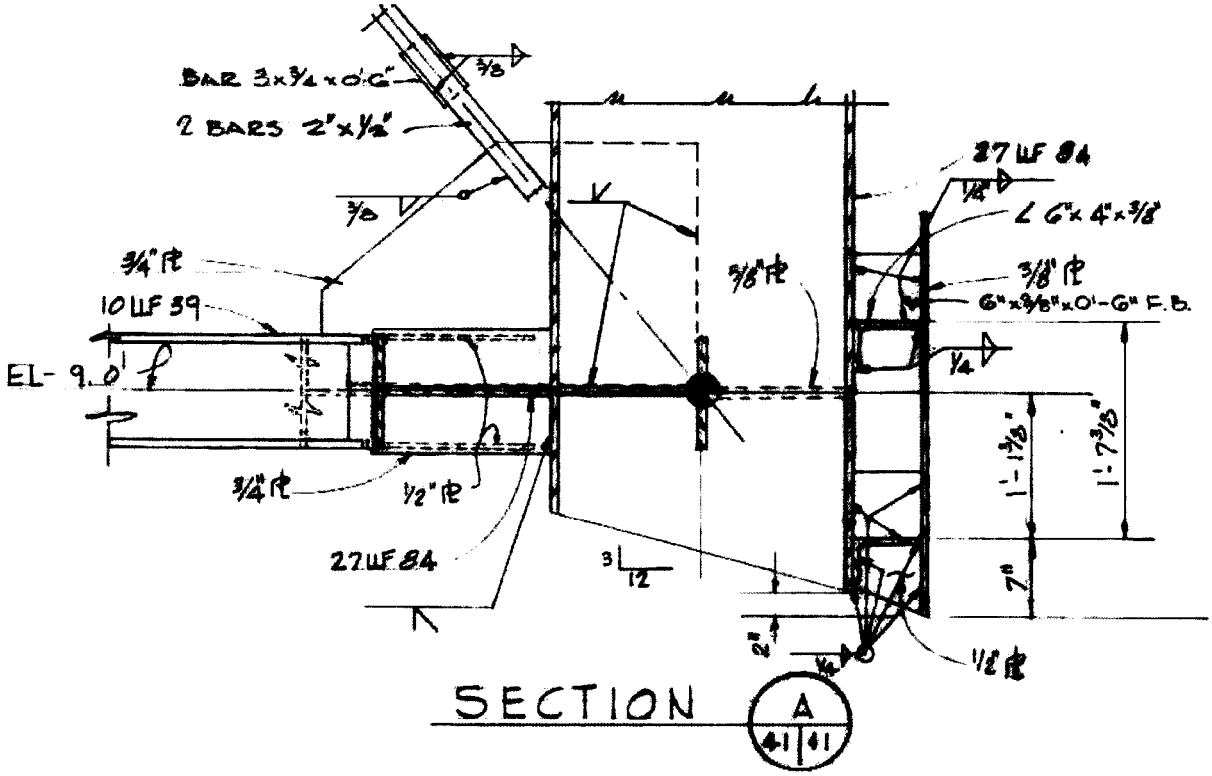
JOINT-2 (OPPOSITE HAND)


B
40 40
Weld No. 11 (JT.8); 14 (JT. 12)
Weld No. 12 (JT. 8); 15 (JT. 12)
12 WF 40
12 WF 58
AT JOINT 12 ONLY
L 5"x3"x3/8"x0'-8" AT JOINT 12
8 WF 31
Weld No. 13 (JT.8); 16 (JT.12)
PLAN
2-3/4" ϕA 325 H.S. BOLTS BOTH ANGLES AT JOINT 12 ONLY
8 WF 31
10 WF 45
12 WF 40
12 WF 58
8 WF 58
SECTION
N.S.F.S.
ELEVATION
JOINT-12
JOINT-8 (OPPOSITE HAND)
SCALE 1"=1'-0"



JOINT-18
JOINT-14 OPPOSITE HAND

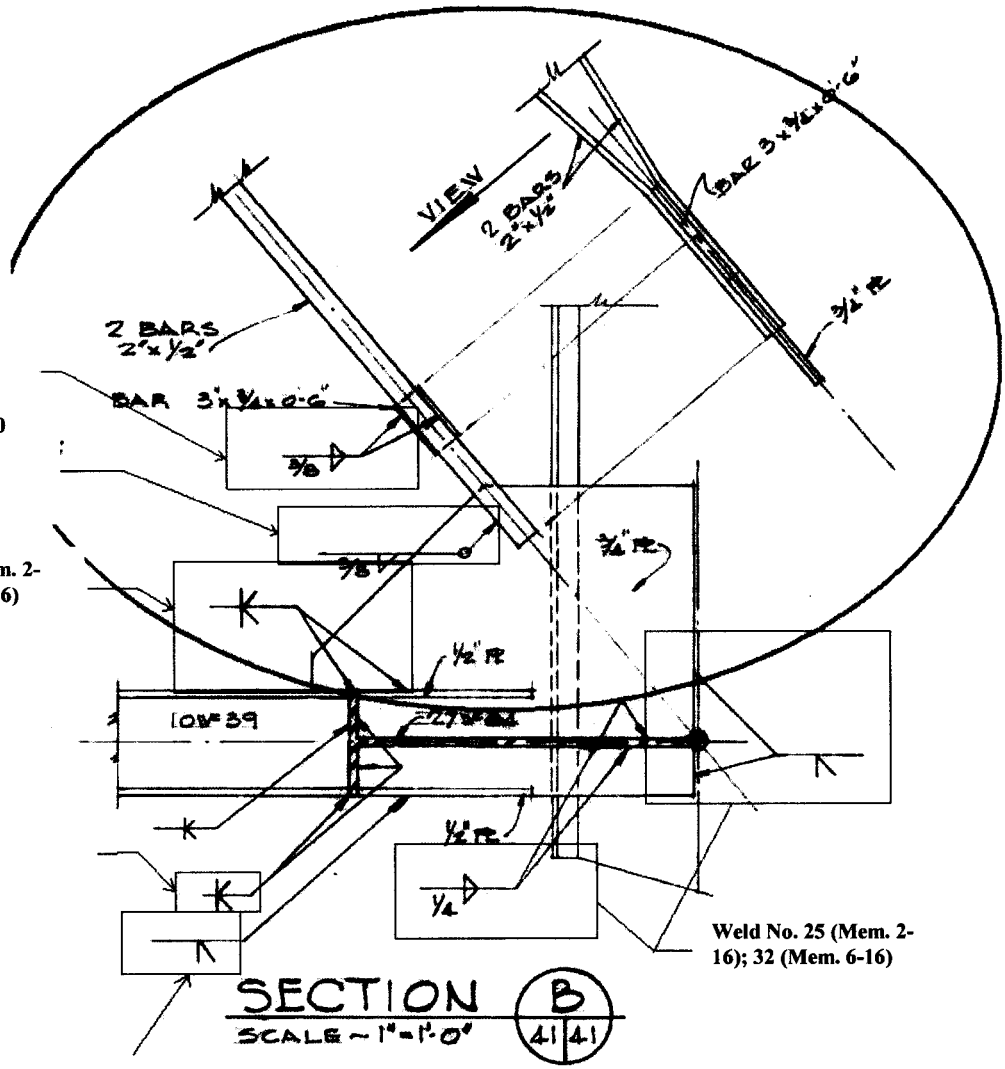

1'-1¾"
1'-1⅜"
6"
2"x½" F.B.
10 WF 39
NOTCH WEB FOR 27WF84 FLANGE
27 WF 84
L 6"x 4"x ⅜"
⅜" SKIN PL
2"x½" F.B.
10 WF 39
27 WF 84
PLAN
JOINT - 16


BAR 3x¾x0'-6"
2 BARS 2"x½"
27 WF 84
L 6"x 4"x ⅜"
6"x⅜"x0'-6" F.B.
10 WF 39
EL- 9.0'
1'-1⅜"
1'-7⅜"
7"
2"
3/12
SECTION

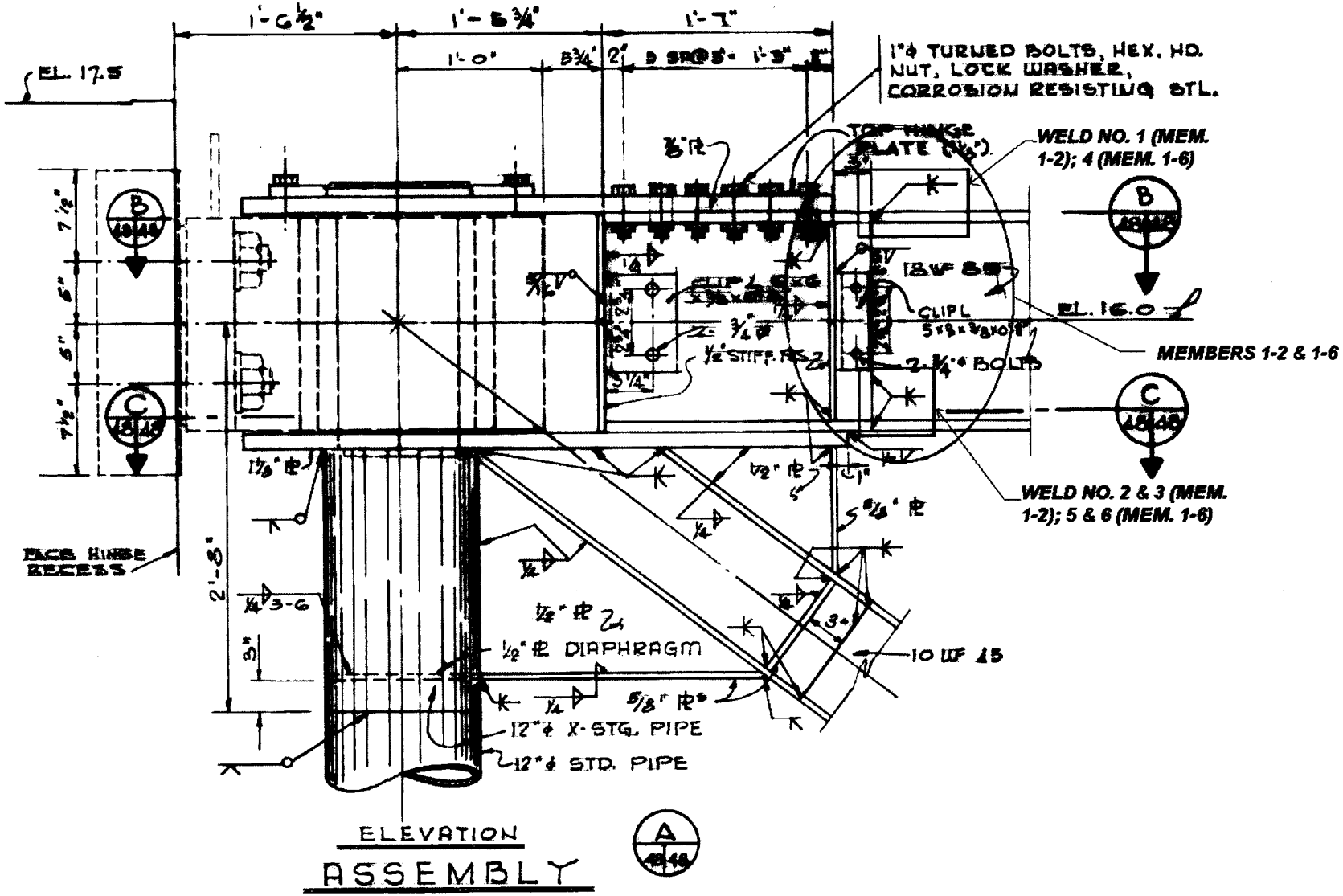
Weld No. 22 (Mem. 2-16); 29 (Mem. 6-16)

Weld No. 23 (Mem. 2-16); 30 (Mem. 6-16)

Weld No. 24 (Mem. 2-16); 31 (Mem. 6-16)



Weld No. 25 (Mem. 2-16); 32 (Mem. 6-16)


1'-6½"
1'-5¾"
1'-7"
1'-0"
5¾"
2"
3 SPACES @ 5" = 1'-3"
EL. 17.5
1"ϕ TURNED BOLTS, HEX. HD. NUT, LOCK WASHER, CORROSION RESISTING STL.
TOP HINGE PLATE (½")
WELD NO. 1 (MEM. 1-2); 4 (MEM. 1-6)
B 48/48
C 48/48
EL. 16.0
MEMBERS 1-2 & 1-6
WELD NO. 2 & 3 (MEM. 1-2); 5 & 6 (MEM. 1-6)
FACE HINGE RECESS
2'-8"
3-6
3"
½" ℄ DIAPHRAGM
10 WF 45
12"ϕ X-STG. PIPE
12"ϕ STD. PIPE
ELEVATION
ASSEMBLY
A 48/48

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 1 (WEST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Require-ment	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
1-2	1	D1.5	28 April 2004	Jeff Richie	OK					
1-2	2	D1.5	28 April 2004	Jeff Richie	OK					
1-2	3	D1.5	28 April 2004	Jeff Richie	OK					
1-6	4	D1.5	28 April 2004	Jeff Richie	OK					
1-6	5	D1.5	28 April 2004	Jeff Richie	OK					
1-6	6	D1.5	28 April 2004	Jeff Richie	OK					
2-6	7	D1.5	28 April 2004	Jeff Richie	OK					
2-6	8	D1.5	28 April 2004	Jeff Richie	OK					
8-14	9	D1.5	28 April 2004	Jeff Richie	OK					

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 1 (WEST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Requirement	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
12-18	10	D1.5	28 April 2004	Jeff Richie	OK					
8-12	11	D1.5	28 April 2004	Jeff Richie	OK					
8-12	12	D1.5	28 April 2004	Jeff Richie	OK					
8-12	13	D1.5	28 April 2004	Jeff Richie	OK					
8-12	14	D1.5	28 April 2004	Jeff Richie	OK					
8-12	15	D1.5	28 April 2004	Jeff Richie	OK					
8-12	16	D1.5	28 April 2004	Jeff Richie	OK					

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 1 (WEST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Requirement	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
14-18	17	D1.5	28 April 2004	Jeff Richie	OK					
14-18	18	D1.5	28 April 2004	Jeff Richie	OK					
2-16	19	D1.5	28 April 2004	Jeff Richie	OK					
2-16	20	D1.5	28 April 2004	Jeff Richie	OK					
2-16	21	D1.5	28 April 2004	Jeff Richie	OK					
2-16	22	D1.5	28 April 2004	Jeff Richie	OK					
2-16	23	D1.5	28 April 2004	Jeff Richie	OK					
2-16	24	D1.5	28 April 2004	Jeff Richie	OK					
2-16	25	D1.5	28 April 2004	Jeff Richie	OK					

)))

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 1 (WEST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Requirement	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
6-16	26	D1.5	28 April 2004	Jeff Richie	OK					
6-16	27	D1.5	28 April 2004	Jeff Richie	OK					
6-16	28	D1.5	28 April 2004	Jeff Richie	OK					
6-16	29	D1.5	28 April 2004	Jeff Richie	OK					
6-16	30	D1.5	28 April 2004	Jeff Richie	OK					
6-16	31	D1.5	28 April 2004	Jeff Richie	OK					
6-16	32	D1.5	28 April 2004	Jeff Richie	OK					

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 2 (EAST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Require-ment	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
1-2	1	D1.5	28 April 2004	Jeff Richie	OK					
1-2	2	D1.5	28 April 2004	Jeff Richie	OK					
1-2	3	D1.5	28 April 2004	Jeff Richie	OK					
1-6	4	D1.5	28 April 2004	Jeff Richie	OK					
1-6	5	D1.5	28 April 2004	Jeff Richie	OK					
1-6	6	D1.5	28 April 2004	Jeff Richie	OK					
2-6	7	D1.5	28 April 2004	Jeff Richie	OK					
2-6	8	D1.5	28 April 2004	Jeff Richie	OK					
8-14	9	D1.5	28 April 2004	Jeff Richie	OK					

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 2 (EAST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Requirement	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
12-18	10	D1.5	28 April 2004	Jeff Richie	OK					
8-12	11	D1.5	28 April 2004	Jeff Richie	OK					
8-12	12	D1.5	28 April 2004	Jeff Richie	OK					
8-12	13	D1.5	28 April 2004	Jeff Richie	OK					
8-12	14	D1.5	28 April 2004	Jeff Richie	OK					
8-12	15	D1.5	28 April 2004	Jeff Richie	OK					
8-12	16	D1.5	28 April 2004	Jeff Richie	OK					

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 2 (EAST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Requirement	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
14-18	17	D1.5	28 April 2004	Jeff Richie	OK					
14-18	18	D1.5	28 April 2004	Jeff Richie	OK					
2-16	19	D1.5	28 April 2004	Jeff Richie	OK					
2-16	20	D1.5	28 April 2004	Jeff Richie	OK					
2-16	21	D1.5	28 April 2004	Jeff Richie	OK					
2-16	22	D1.5	28 April 2004	Jeff Richie	OK					
2-16	23	D1.5	28 April 2004	Jeff Richie	OK					
2-16	24	D1.5	28 April 2004	Jeff Richie	OK					
2-16	25	D1.5	28 April 2004	Jeff Richie	OK					

LOG OF INSPECTIONS OF CRITICAL MEMBERS AND CONNECTIONS
BAYOU BIENVENUE CONTROL STRUCTURE
SECTOR GATE 2 (EAST SIDE)

Member Number	Weld Number	Criteria	Initial NDT Test (Visual Inspection)				Results of Periodic Inspections			
		AWS Requirement	Date of Inspection	Inspector	Results	Defect Repair Status	FY_____	FY_____	FY_____	FY_____
6-16	26	D1.5	28 April 2004	Jeff Richie	OK					
6-16	27	D1.5	28 April 2004	Jeff Richie	OK					
6-16	28	D1.5	28 April 2004	Jeff Richie	OK					
6-16	29	D1.5	28 April 2004	Jeff Richie	OK					
6-16	30	D1.5	28 April 2004	Jeff Richie	OK					
6-16	31	D1.5	28 April 2004	Jeff Richie	OK					
6-16	32	D1.5	28 April 2004	Jeff Richie	OK					

APPENDIX F

BAYOU BIENVENUE FLOODWALL

NARRATIVE COMPLETION REPORT

CELMN-CD-NO 15 Apr 97

MEMORANDUM THRU

Area Engineer, NOAO
C/Const Div ATTN: Contr Adm Br.

FOR C/Engr Div

SUBJECT: Narrative Completion Report for Contract No. DACW29-96-C-0077, Lake Pontchartrain, Louisiana and Vicinity, Chalmette Area Plan, Paris Road to Bayou Bievenue, Miscellaneous Floodwall Capping, Orleans Parish, Louisiana.

1. The subject contract, dated 23 Sep 96, was awarded to Hamp's Enterprises, Incorporated, 1319 Newton Street, New Orleans, Louisiana 70114. The Notice to Proceed was issued on 24 October 1996, with work scheduled to commence by 3 November 1996. The original completion date was 21 February 1997, with the estimated amount of the contract being $184,509.00. This contract was a Small Business set aside (8a) negotiated contract.

2. The preconstruction conference was held, in the New Orleans Area Office, on 24 October 1996. Detailed minutes of this meeting are located in the contract file. The Notice to Proceed was signed by the contractor on 24 October 1996 and the contractor began operations on 25 October 1996 by sampling waterstop material.

3. The contract provided for six (6) major phases of construction: (1) Structural Excavation, (2) Steel Sheetpile Cutting, (3) Concrete Floodwall Construction, (4) Structural Backfill, (5) Access Road Maintenance, and (6) Fertilizing and Seeding. These phases of construction were of a routine nature; however, existing field conditions dictated that a certain amount of skill was required to obtain required results.

4. The contractor began on-site operations by stripping grass and vegetation from areas required for structural excavation on 3 January 1997. A Komatsu 31P dozer was used to strip grasses and a JD 310 backhoe was used to excavate material. In lieu of shoring excavation areas, the contractor chose to slope back the excavation areas thereby providing a safe workplace. Material was stockpiled on site for use in backfilling after floodwall construction and curing. Excavation activities were substantially complete on 14 January 1997.

5. The cutting of steel sheetpile operations began on 8 January 1997. This phase was completed using burning torches, a Grove 20 ton cherry picker and appropriate safety equipment. Sheets were marked at the cutoff elevation using a surveyor's level and chalk. The torches were used to actually cut the sheets and the cherry picker was used to handle the sheets during and after cutting activities. A respirator mask was used for safety due to coal tar epoxy paint on sheetpiling. Drop-off pieces of sheetpiling were removed from the site by the contractor. Work crew included an operator, welder/cutter, and a laborer with approximately 85 linear feet being cut per day of operations. This phase of operations was substantially complete by 20 January 1997.

SUBJECT: Narrative Completion Report for Contract No. DACW29-96-C-0077, Lake Pontchartrain, Louisiana and Vicinity, Chalmette Area Plan, Paris Road to Bayou Bievenue, Miscellaneous Floodwall Capping, Orleans Parish, Louisiana.

6. Construction of reinforced concrete floodwall operations began on 10 January 1997 with the placement of stabilization slab concrete. This phase of construction was completed using the Grove cherry picker, steel formwork with required wood facing, and approved reinforcing steel and concrete. A concrete bucket, a chute and a vibrator were also used in placement. Each wall contained approximately 16 cubic yards of concrete. Crews usually consisted of a foreman, 2 carpenters, 3 rodbusters, 2 laborers, and 1 operator with a placement every 3-4 working days. This phase was complete by 10 February 1997.

7. Structural backfill operations began on 7 February 1997. Due to an excessive amount of rain, this operation was significantly delayed. The Komatsu 31P dozer and a Cat sheepsfoot roller were used to place and compact previously excavated material back into levee section. Material was being placed in approximately 4-6 inch lifts with each lift being compacted and tested for minimum compaction requirements. The material passed all contract test requirements, and this phase of operations was complete by 11 March 1997. A typical crew consisted of a foreman, an operator and a laborer.

8. The access road maintenance operations began on approximately 10 January 1997 by grading and redressing existing material in section that was disturbed by ongoing operations. The 31P dozer was used alone until approximately 28 January 1997 when the contractor chose to mobilize a motor grader to assist in maintenance and restoration. On 12 March 1997, the contractor began hauling crushed stone material for restoration of the road. This operation took two (2) 10 hour days with a crew consisting of 1 foreman, 1 operator and 1 laborer. A total of 798 cubic yards of material was placed on the access road and dressed to previous lines and grade. This operation was complete by 25 March 1997.

9. The final major phase of construction activities, fertilizing, seeding and mulching disturbed areas, began operations on 24 March 1997. A sub-contractor, Economy Grass of Ethel, Louisiana, mobilized a farm tractor, a broadcaster, a cultipacker, and a mulch applicator/sprayer. Operations consisted of broadcasting and incorporating fertilizer into existing material, spreading and incorporating seeds, and applying mulch on top of disturbed areas. Materials were applied at the application rates required by the specifications. A crew consisted of 1 foreman, 1 operator and 1 laborer. One and one third (1.3) acres were fertilized and seeded and took approximately 9 working hours. This operation was complete by 25 March 1997. At this time the contract was declared substantially complete.

10. There were two (2) modifications on this contract, both in order to extend the contract completion date due to unusually severe weather delays.

11. Following is a list of the sub-contractor's and major suppliers as well as their areas of responsibility:

SUBJECT: Narrative Completion Report for Contract No. DACW29-96-C-0077, Lake Pontchartrain, Louisiana and Vicinity, Chalmette Area Plan, Paris Road to Bayou Bievenue, Miscellaneous Floodwall Capping, Orleans Parish, Louisiana.

a. Circle Incorporated, Belle Chasse, Louisiana – Concrete, Excavation, Backfill, Cutting Sheetpiling, and Clearing and Grubbing.
b. Economy Grass Incorporated, Ethel, Louisiana – Fertilizer, Seed, and Mulching.
c. Lulich Steel, Slidell, Louisiana - Reinforcing steel.
d. LaFarge Concrete, New Orleans, Louisiana - Ready Mix Concrete.
e. Manufab, Kenner, Louisiana - Miscellaneous Metals and L-type waterstop.
f. Construction Materials, Jefferson, Louisiana - Three Bulb Waterstop.
g. Pontchartrain Materials Corporation, New Orleans, Louisiana - Crushed Stone.

12. The contractor submitted and enforced an adequate Accident Prevention Program. The contractor was very cooperative in the performance of the work and performed daily safety inspections, as well as, holding weekly "Toolbox" safety meetings with their entire crew. There were no lost time accidents throughout the duration of the contract.

13. The contractor was efficient, professional and cooperative in the performance of contract work. The equipment that the contractor had on site was in good working condition. Quality control activities were maintained throughout the life of the contract.

14. Following is a comparison of contract quantities and actual quantities:

Item No.	Description	Qty & Unit	Unit Price	Est. Amt.	Actual Amount	Earnings To Date
0001	Mobilization and Demobilization	Lump Sum	LS	$17,480.00	100%	$17,480.00
0002	Clearing and Grubbing	Lump Sum	LS	$2,700.00	100%	$2,700.00
0003	Structural Excav.	Lump Sum	LS	$13,463.00	100%	$13,463.00

SUBJECT: Narrative Completion Report for Contract No. DACW29-96-C-0077, Lake Pontchartrain, Louisiana and Vicinity, Chalmette Area Plan, Paris Road to Bayou Bievenue, Miscellaneous Floodwall Capping, Orleans Parish, Louisiana.

Item No.	Description	Qty & Unit	Unit Price	Est. Amt.	Actual Amount	Earnings To Date
0004	Fertilizing, Seed, and Mulching	Lump Sum	LS	$3,272.00	100%	$3,272.00
0005	Cutting Existing Piling	Lump Sum	LS	$2,292.00	100%	$2,292.00
0006	Reinforced Concrete Floodwall	Lump Sum	LS	$103,896.00	100%	$103,896.00
0007	Misc. Metals	Lump Sum	LS	$7,026.00	100%	$7026.00
0008	Erosion Control					
0008AA.	First 500 LF	500LF	$4.70	$2,350.00	400	$1880.00
0008BB.	All over 500 LF	100LF	$4.70	$470.00	0	$0.00
0009	Access Road Maint.					
0009AA.	First 200 CY	200CY	$39.45	$7,890.00	200	$7,890.00
0009BB.	All over 200 CY	600CY	$39.25	$23,760.00	598	$23,591.00

15. A copy of the As-built drawings is attached.

SUBJECT: Narrative Completion Report for Contract No. DACW29-96-C-0077, Lake Pontchartrain, Louisiana and Vicinity, Chalmette Area Plan, Paris Road to Bayou Bievenue, Miscellaneous Floodwall Capping, Orleans Parish, Louisiana.

16. The contract was completed under time limits and in accordance with the contract plans and specifications with final acceptance on 23 April 1997.

Steve Keen
Quality Assurance Representative

ENCL

CF:
Project Engr (Hebert)
Project Inspector (Keen)
Ofc Engr w/as-builts
CELMN-CD-Q
CELMN-CT
CELMN-ED-C
CELMN-CD-B
CELMN-CD-S
Project Mgr (CELMN-PM)