CONTRACT ADMINISTRATION OFFICE RECORD	CONTRACT N A0008290	
CONTRACTOR	SCHEDULED DELIVERY DATE	TELEPHONE NO.
CONTRACTING OFFICER'S REPRESENTATIVE		

DATE	NATURE OF ACTION.	Page No.
2/27/89	Letter from Mr. Picciola in regard to wall alignment (4 Encls.)	1
3/1/89	Note from Frank V. of F & M (Need info. on Project	2
3/2/89	Letter from Mr. Picciola requesting info. on Valve structure	3
—	Drawings on 17th Street CANAL	4-7
No date	Letter to CELMN-ED-S from Mr. Marsalone in regard to joint details	8
—	Sealing of Flo Bridges over the 17th street CANAL	9-11
6/27/	Letter from LA. D.O.T. to Mr Chatry reg: Elev. of bridges on 17th	12-13
7/15/89	Letter from Mr. Guggenheimer on Concrete Specs.	14
—	Drawing for 12" Concrete - Pile Capacity	15
—	Info. on utility Crossing	16
—	Schedule - Lake Pontchartrain Hurr. Prot. Project	17
8/2-3	Letter from C.E. Bailey N.O. Levee Dist. - Review Comments	18-19

25 Jun 91

17th St. Outfall Const. West Bank

A000 8290

Name	Representing	Phone No.
W.D. Judlin	COE Proj. Manager	862-2626
Felton Sutton	Modjeski + Masters	524-4344
William Conway		
Martha Sternitzke		
Vance Stiles	COE	862-2614
Bob Fairless	COE	862-1930
Jorge Romero	COE	862-2645
Phil Nakamitano	COE	862-2977
FRANK VOJKOVICH	COE	862-1034
Jim Richardson	COE	862-1031
C. J. NETTLES	EJLD	733-0087
MARTHA STERNITZKE	MODJESKI & MASTERS	524-4344
William B Conway	Modjeski & Masters	524-4344

The Board of Levee Commissioners
OF THE
East Jefferson Levee District

PROTECTION YOU
AND YOUR FAMILY

(504) 733-0087

COMMISSIONERS

GREGORY F. GAMBEL, PRESIDENT
RICHARD RICHTER, VICE-PRESIDENT
FRANK CHAMBERLAIN
GEORGE MAHL III

203 PLAUCHE COURT
Harahan, La.
70123

C.J. NETTLES
CHIEF ADMINISTRATIVE OFFICER

BRUCE REED
T. ROBERT LACOUR
SPECIAL COUNSEL

April 26, 1991

Col. Richard V. Gorski
District Engineer
New Orleans District
U. S. Army Corps of Engineers
P. O. Box 60267
New Orleans, La. 70160

Dear Col. Gorski:

The purpose of this letter is to formally notify New Orleans District that East Jefferson Levee District intends to let a construction contract to build most of the High Level Plan Hurricane Protection floodwall on the west bank of the 17th St. Canal.

We are in the process of finalizing a joint venture agreement with the New Orleans Sewerage and Water Board to dredge the remaining 40% of the 17th St. Canal and construct the sheet pile and concrete floodwall. Both agencies have entered into contracts with Modjeski and Masters to design the work and prepare plans and specifications. When a firm construction cost estimate is available so that a division of costs can be made, we will sign a formal Agreement with the Sewerage and Water Board and award a construction management contract to Modjeski and Masters.

The floodwall work that we propose to do will consist of tie-in to the Lakefront Levee and construction of the floodwall, including the concrete cap, from the Lakefront to the existing floodwall and gate at the Southern Railroad. No work areas will be designated at the gate structure for Old Hammond Highway/Orpheum Ave.; Veterans Blvd. bridges; and the I-10/610 bridges. We desire that N.O.D. design and construct or coordinate the design and construction of the structural work in these areas.

The present schedule projects us to seek bids around the end of the year with an 18 to 24 month construction period.

Two reasons drive the decision to let the contract ourselves. Foremost is the fact that we can joint venture with Sewerage and Water Board and their dredging can be carried out coincident with construction of the floodwall. This will allow the Canal to be dredged to match the upgraded capacity of Pumping Station No. 6, considerably earlier than if they had to wait until the floodwall was constructed by the Corps. Secondly, if we let the contract, we will have substantially upgraded protection some 2.5 years earlier than the current Corps schedule.

Our contractor will be designing the floodwall in accordance with the approved GDM for the project, and will be coordinating and submitting his plans for New Orleans District review and approval. We would appreciate expeditious review in order to keep the project on schedule. We will keep careful cost records for project credit purposes.

Sincerely yours,

CJN:mln

Gregory F. Gambel
President

cf - Modjeski & Masters
Ken Brown, Jefferson Parish
Geneva Grille, LDOTD
Larry Bodet, N.O.S&WB

_____ MARSALONE

_____ GUIZERIX

_____ CINDY

_____✓_____ DD

_____ Specs Unit

_____ DG

_____ DL

_____ DR

_____ DW

D-1709

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_____

_____

_____ SUSPENSE

_____ DISTRIBUTE

_____ RELEASE

_____ FILE

_____ DESTROY

_____ ROUTE

_____ 90-DAY HOLD

CELMN-ED-SP(1110-2-1150a)

25 May 1990
Mr. Stutts/2614

MEMORANDUM FOR: See Distribution

SUBJECT: Lake Pontchartrain, La. & Vicinity Hurricane Protection Project DM No. 20, 17th St. Outfall Canal

We are enclosing copies of the subject report for your use and retention.

Calvin W. Shelton

Encl
As

CALVIN W. SHELTON
Chief, Design Services Br.

DISTRIBUTION:
C/ Design Br. (1 copy)
C/ F & M Br. (2 copies)
C/ Hyd & Hydro Br. (2 copies)
C/ Cost Engr Br. (1 copy)
C/ Engr Controls Br. (1 copy)

CELMN-ED-SP(1110-2-1150a)

21 August 1990
Mr. Stutts/2614

MEMORANDUM FOR: C/Design Branch ✓
C/ F&M Branch
C/Hyd & Hydro Branch

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project, High Level Plan, Design Memorandum No. 20 - General Design, 17th Street Outfall Canal - 1st End Comments

1. Enclosed, ~~please find~~ it, a copy of the 1st Endorsement comments. Vann Stutts hand carried copies of the enclosure to your study principals on 15 August 1990.

2. Please, ~~respond~~ give us responses to those comments directed at your respective areas of expertise. ~~We need your responses~~ by COB 17 Sep 1990.

Calvin W. Shelton

CALVIN W. SHELTON
Chief Design Services Br.

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

REPLY TO
ATTENTION OF:
CELMN-ED-SP (1110-2-1150a) 15 May 90

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

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity, High Level Plan, Design Memorandum No. 20 - General Design, 17th Street Outfall Canal

1. The subject design memorandum is submitted for review and approval, and has been prepared generally in accordance with the provisions of ER 1110-2-1150, dated November 1984.

2. A summary of the current status of the Clean Water Act, endangered species, Environmental Impact Statement (EIS), and cultural resources investigations is as follows:

a. Since the tentatively selected plan will not require the deposition of dredged and fill materials into the waters of the U.S., a Section 404(b)(1) Evaluation is not necessary.

b. Based on studies and investigations at this stage of designs, the proposed action is not likely to jeopardize the continued existence of any endangered species or result in the destruction or adverse modification of the critical habitats of such species.

c. A final EIS for the barrier plan for the subject project was filed with Council on Environmental Quality (CEQ) on 17 January 1975. A final supplement to this EIS was filed with the Environmental Protection Agency (EPA) on 7 December 1984. An environmental Assessment addressing the recommended plan (parallel protection) was mailed to the public on 27 March 1990.

d. The project area consists of an existing levee corridor on Post-1930 reclaimed land, and the artificial channel of the 17th Street Outfall canal. No cultural resources are recorded in the vicinity of the proposed work and no cultural resource surveys are warranted.

3. In accordance with LMNED-TS memorandum dated 5 February 1981, this report has been reviewed by the District Security Officer. There were no comments to be incorporated in the report.

CELMN-ED-SP (1110-2-1150a)
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity, High Level Plan, Design Memorandum No. 20 - General Design, 17th Street Outfall Canal

4. Reference CECW-EP, multiple memorandum dated 16 February 1990: GDM Review Process. No adverse issues were raised in the Administration's clearing process or no known policy changes have occurred which would concern OMB relative to the planning and designs presented in this DM. The status of the LCA's for the project feature addressed in this DM is discussed in paragraph 8, Volume I. Cost sharing for the project remains as originally authorized i.e., 70% Federal and 30% non-Federal. Preparation of this DM is in compliance with the most recent guidelines and policies covering plan formulation and engineering design. House Document No. 231, 89th Congress served as the basis for the feasibility report on the Lake Pontchartrain project and the subsequent project authorization, Public Law 298, 89th Congress, 1st Session. Higher authority approval of the July 1984 reevaluation report entitled, "Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project", is the vehicle which authorized the current "High Level Plan". That document now serves as the feasibility report for the Lake Pontchartrain project.

5. This report was scheduled to be submitted to LMVD by 31 March 1990. This delay will not cause a delay in the start of construction.

6. Approval of this Design Memorandum as a basis for preparation of plans and specifications is recommended.

FOR THE COMMANDER:

W. EUGENE TICKNER
Chief, Engineering Division

Encl
(30 cys fwd sep)

Mr. Barton —
Comments on 2nd End

HQN should respond this?

- Para b - It's not responsive to LMV comment. It doesn't say whether there is the cited type of horizontal load on the bridge. ✓
- Para c - The LMV comment says penetration to head ratio, while the 2nd End says head to penetration ratio. I suppose the 2nd End is wrong. In one sentence the 2nd End says tip to penetration ratio.
  Have LMNED personnel discussed this difference of opinion with LMVED personnel?
- Para d - Says head to penetration. I can't see a reason for nonconcurrence in para d.
  If we to not concur, what's the purpose of the last sentence?
- Para e - "Comment noted" is superfluous.
- Para g - I think it's not responsive. It doesn't tell the cost engineers "means of establishing unit prices, quantities, etc" and does not give "area of uncertainties etc." It does nothing that LMV asked for in para g (2).
- Para h (2) It says that OLB "see no reason the cap the floodwall at this time." What's wrong with the corps floodwall at this time? What's wrong with the LMV's capping it? our response does not mention LMV's concern about leaving the floodwall uncapped.
- Para J - It ignores LMV's comment to consider NES advice.

CELMV-ED-PG (CELMN-ED-SP/15 May 90) (1105-2-10c) 1st End Bardwell/ts/5925
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity, High Level Plan, Design Memorandum No. 20 - General Design, 17th Street Outfall Canal

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

08 AUG '90
FOR Commander, New Orleans District, ATTN: CELMN-ED-SP

The subject DM is approved subject to the satisfactory resolution of the following comments.

a. Para 7k. The interest rate shown as 3.225 percent per annum should be 3.125 percent per annum.

b. Para 14 and Appendix DD, page DD-9. It is not clear from this paragraph and the design computations in Appendix DD whether a horizontal load condition will exist at the Veterans Highway Bridge similar to that described in the Lake Pontchartrain, Louisiana and Vicinity, High Level Plan, Design Memorandum No. 19 - General Design, Orleans Outfall Canal, 11 Aug 1988, for the Robert E. Lee Bridge modification. If such a loading condition does in fact exist, it should be addressed and the design computations should be furnished for review. In addition, the guidance contained in paragraph c of the 3rd endorsement to DM No. 19, dated 10 Mar 89, should be evaluated for possible applicability in determining pile fixity for the Veterans Highway Bridge if a similar horizontal loading exists.

c. Para 29b. Due to the critical nature of this project and the close proximity of the adjacent canal, a minimum penetration to head ratio of 3 to 1 should be used for sheet pile design for this project. We note that the 3 to 1 minimum ratio has been used on less critical projects in the New Orleans area. In addition, the sheet piles shown on I-wall penetration analysis Plates 101 to 105 and 110 to 113 will serve as permanent bulkheads retaining as much as 4 ft of soil. To ensure adequate bulkhead stability toward the floodside, these sheet pile bulkheads should be analyzed using the "S" case soil strengths, a factor of safety of 1.5, and a canal level of el 0.0. Based on the above, the sheet pile penetration in this DM should be increased as necessary. If there is a potential for erosion at the floodside toe of the bulkheads, stone protection should be considered.

d. Para 29c. Also refer to the tied back and braced wall analyses on Plates 121-124. These analyses are based on the "Q" case soil strengths, a canal level at el -5.0, and a factor of safety of 1.5. Since these sheet pile bulkheads permanently retain soil, they should also be analyzed using "S" soil strengths, a factor of safety of 1.5, and at the normal canal level of el 0.0.

e. Para 39. CECW-ED Circular No. 1110-2-267, subject: Strength Design for Reinforced Concrete Hydraulic Structures, 31 Jan 90, has superseded ETL 1110-2-312 referenced in this paragraph. For work not previously completed, the guidance in the circular should be followed.

1530 AUG 13
CELMN
USACE

f. Para 41b. Provide the rationale for not considering the Q-case with F.S. = 1.25, as shown in paragraph 29b. If this case is applicable, wave loads should be incorporated into the loadings for the floodgates and gate monoliths.

g. Para 68.

(1) The text does not contain a narrative description and explanation of the cost estimate. This description should immediately precede the cost estimate and should contain the cost engineers methods of cost estimate preparation; i.e., means of establishing unit prices, quantities, etc.; the rationale for establishing contingencies; areas of uncertainties in the estimate, etc.

(2) The chosen plan has a net project contingency of less than 10 percent on the east and west side levees and floodwalls and no contingencies identified for Accounts 30 and 31 and the work for Pumping Station No 6. A project contingency level of 10 percent is normally acceptable only when the estimate was based on completed plans and specifications. You should identify contingencies on Accounts 30 and 31 and the work at Pumping Station No. 6 and review the contingencies set on the remaining project. A total contingency of less than 15 percent for this project should not be used unless plans and specifications are completed. The setting of contingencies should be fully explained in the cost estimate write-up discussed in comment g(1) above.

h. Para 69.

(1) This schedule indicates that the construction contract for the east side floodwall will be awarded in Oct 95. However, we understand that the Orleans Levee Board has already awarded a contract to drive sheet pile for the east bank floodwall and also to perform some dredging work, and the work under this contract was to commence in early Jul 90. These sheet piles are to be driven full length and not capped with concrete until the scheduled contract award in Oct 95. We understand the plans and specifications for the current sheet pile contract were reviewed and approved by you and the sheet pile lengths specified are the same as shown in this DM.

(2) Compliance with comment c above will result in additional sheet pile penetrations in some reaches over that shown in this DM. The fact that a construction contract was awarded for the east side sheet pile work prior to our review of this DM results in an undesirable situation for this office and the Corps. The current Orleans Levee Board contract should either be modified to provide the additional lengths or the sheet piles should be driven as shown in the DM and later driven to the revised penetration just prior to capping. The Orleans Levee Board should be advised that there is some risk involved with waiting 5 years to achieve the revised sheet pile penetrations. The sheet pile lengths for the west side floodwall should be revised prior to preparation of plans and specifications.

(3) It is not clear why the sheet piles are being driven full length and not capped under the current Orleans Levee Board floodwall contract. Since the existing levee is either being degraded or left intact, no settlement should occur after driving the sheet pile. Therefore, the considerable additional expense incurred by driving the sheet piles full length at this time would not appear justified. If you conclude that it is not possible to cap the floodwall under the current Orleans Levee Board floodwall contract, action should be taken to cap the floodwall as soon as possible in order to reduce the period in which the floodwall will be exposed to the risk mentioned in the paragraph above.

i. Table 1. The water surface elevations and head losses are shown for the various bridge conditions under existing and future pump discharge capacities; however, the design flowline and freeboard are not indicated. These should be presented when the final bridge conditions are known.

j. Plate 15. If not previously accomplished suggest you check to ensure by analysis that cracking in the lower portion of the concrete I-wall section shown in the center of the plate will not occur. Our concern with cracking stems from the restraint that will be encountered in the lower section, the abrupt change in width of the concrete between the lower section and upper section, and our unfamiliarity and inexperience with this particular wall design configuration. In addition consider seeking the advice of the concrete experts at WES for their opinions pertaining to this potential cracking and possible remedies that could economically be incorporated in the design to alleviate this concern.

k. Plates 60, 82, 84, 92, and 97. Some of the active and passive wedges shown on these plates are too close together to represent any possible failure planes which might develop. In future reports, the active and passive wedges should be separated at least by a distance equal to the height of the active wedge.

l. Plates 94, 95, 117, 118 and 122. The soil strengths and stratification used on these plates appear to be based on that shown on Plate 56 for the reach "Pumping Station to Sta 670+00." However, the W/L stationing on these plates seem to represent areas lakeside of Hammond Highway. We understand that the W/L stationing on these plates is in error and will be revised as necessary.

m. Plates 121 through 124. The walls shown on these plates should be evaluated for the anchor forces and resulting stresses on the anchors and the sheet piling should be checked using the conditions shown except change the water level on the canal side to el 0.0 NGVD and use soil properties for the 'S' case and a F.S. = 1.5.

CELMV-ED-PG 08 AUG '90
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity, High Level Plan, Design Memorandum No. 20 - General Design, 17th Street Outfall Canal

n. Appendix D. The construction cost contingency is shown as 27 percent with no contingency shown on Accounts 30 and 31. This cost estimate should have some explanation of the assumptions made, use of contingencies, etc.

FOR THE COMMANDER:

Encl wd

for William R. Bailey
FRED H. BAYLEY III
Chief, Engineering Division

CF (w/10 cys encl 1):
CECW-EP

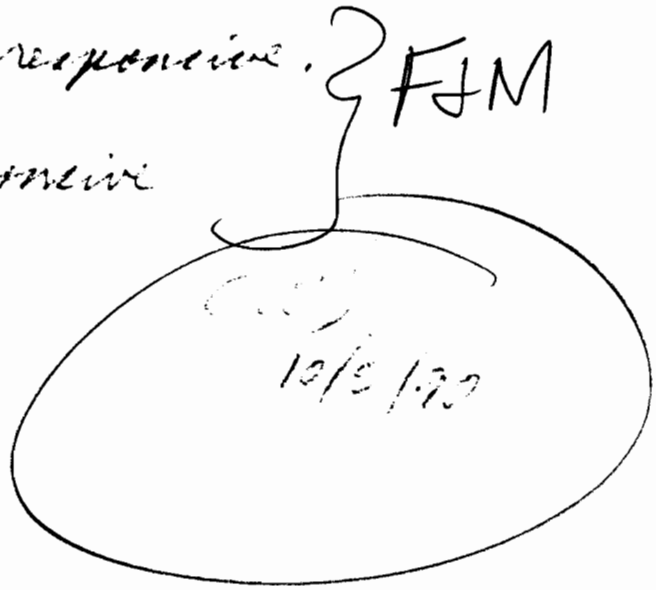
Mr. Barton
comments on 2nd End

- Para b - It's not responsive to LMV comment. It doesn't say whether there is the cited type of horizontal load on the bridge.
- [illegible] LMV comment says penetration to head ratio, while the 2nd End says load to penetration ratio. I suppose the 2nd End is wrong, but one cannot tell. 2nd End says tip to penetration ratio.
  Have LMVED personnel discussed this difference of opinion with LMVED personnel?
- Para d - says head to penetration. I can't see a reason for nonconcurrence in para d.
  If we do not concur, what's the purpose of the last sentence?

FOUO

- Para e - "Comment noted" is superfluous.
- Para g - I think it's not responsive. It doesn't tell the cost engineers "means of establishing unit prices quantities, etc" and does not give "area of uncertainties, etc." It does nothing that LMV asked for in para g(2).
- Para h(3) It says that OLB "see no reason the cap the floodwall at this time." What's wrong with the Corps capping it? our response does not mention LMV's concern about leaving the floodwall uncapped.
- Para j - It ignores LMV's comment to consider WES' advice.

- Para 2 - M is not responsive.
- Para 1 - Semi-responsive



CELMN-ED-SP (CELMN-ED-SP/15 May 90) (1110-2-1150a) 2d End
Mr. Stutts/mn/2614
SUBJECT: Lake Pontchartrain, Louisiana and Vicinity, High Level Plan, Design Memorandum No. 20 - General Design, 17th Street Outfall Canal

DA, New Orleans District, Corps of Engineers, P. O. Box 60267, New Orleans, LA 70160-0267 10 Oct 90

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

The following are our responses to comments contained in the 1st Endorsement.

a. Comment a. Para. 7k. Concur. The per annum interest rate is 3.125 percent.

b. Comment b. Para. 14 and Appendix DD, page DD-9. The design computations for the Veterans Highway Bridge are adequate to develop the GDM scope cost estimate. During preparation of plans and specifications we will prepare a more punctilious design that addresses all conventional loading including hydraulic loads (horizontal and uplift) as recommended by American Association of State Highway and Transportation Officials (AASHTO). In addition, CELMV's recommendation on establishing pile fixity is noted and we will comply in the detailed design phase.

c. Comment c. Para. 29b. Do not concur. Reference CEMRC-ED-GS memorandum dated 24 July 89, para. 3. A head to penetration ratio of 2.5 to 3:1 is recommended in the referenced memorandum. For certain projects a head to tip penetration ratio of less than 2.5 was authorized. The factors stated in the memorandum which cause the tip to be arbitrarily increased by a head to penetration ratio are unknown variations in ground surface elevations and soil conditions. The 2.5:1 head to penetration ratio was used because of the following:

(1) The ground surface elevations are based on surveys at 100 ft. intervals.

(2) Two surveys along the canal were done in the last 10 years.

(3) The velocities in the canal are too low to cause scour.

(4) Borings were taken at 350 ft. intervals by the A/E on both sides of the canal and were supplemented by USACE check borings.

(5) The existing levee is over 30 years old.

All hurricane protection in urban areas is critical in nature; however, no other hurricane protection project has had the level of borings or surveys as the 17th St. Canal project. The 3 to 1 minimum ratio was used on other New Orleans projects because of the CEMRC-ED-GS memorandum dated 23 Dec 87 which required the 3 to 1 ratio. No GDM has been submitted for a 3 to 1 ratio in an existing levee since the July 89 criteria.

The sheetpile sections on plates 101-103 have tip to penetration ratios of 2.8 to 1 and an S-CASE F.S. of 1.2 for canal water level of 0.0. Sections on plates 104-105 have tip elevations deeper than required for an S-CASE F.S. = 1.5 or 3:1 ratio for the bulkhead case (see Encl 2). Additionally, the existing sheetpile wall has served as a permanent bulkhead retaining as much as 4 ft. of soil for at least 19 years (Orleans Levee Board 1971 Surveys). We will monitor the sheetpile wall being constructed by the local interests on the Orleans side of the canal. We will consider driving the sheetpile deeper instead of cutting the sheetpile in 1994 during capping.

d. Comment d. Para. 29c. Do not concur. The analyses presented were for the Q-CASE soil strengths, a canal level at EL. -5.0 and a factor of safety of 1.5. For plates 121, 122, and 124 the actual design (completed before Dec 87) was controlled by the S-CASE, F.S. = 1.5, and canal level at EL -5.0. The design on plate 123 (completed after Dec 87) was based on the S-CASE F.S. = 1.2 with canal level at EL -5.0; S-CASE F.S. = 1.5 with canal level at EL 0.0; or the 3:1 penetration to head ratio. All the braced walls and tieback walls have been constructed. The tip penetrations shown on plates 122-124 are deeper than the minimum required tip penetration (Encl 3). Intermediate tip penetrations were used to reduce the anchor forces. Please provide guidance in your correspondence on sheetpile wall design criteria on which case and F.S. is to be used for the moments and shear forces, deflections and anchor forces computed for the design for the sheetpile wall sections and anchorages.

e. Comment e. Para. 39. Concur. Comment noted.

f. Comment f. Para. 41b. Reference Para. 3 of CEMRC-ED-GS dated 24 July 89. The Q-CASE F.S. = 1.25 applies only for waveloads on hurricane protection levees. No waveloads occur in the canal.

g. Comment g. Para. 68.

(1) Concur. The narrative description and explanation of the cost estimates is added as follows:

The unit prices and estimated costs were obtained with the use of a personal computer software system developed within NOD. This is the same computer software system utilized in preparing Government estimates for advertised construction projects.

The contingency percentage for each item was established by evaluating the uncertainty of both the quantity and costs for each item with the appropriate design engineer and cost engineer. Such evaluation was further assisted by the historical data on many cost items as this project incorporates a majority of items commonly found on hurricane protection projects within NOD.

Since the project is located in the metropolitan New Orleans area, accessibility presents no problem. Similarly, the materials for this project (including the steel and concrete products) are readily available. And as mentioned previously, the construction work is conventional and similar to such work throughout NOD which results in no unusual pricing.

(2) We incorporated the project contingencies in the cost estimate for account 30 and 31 and the work for Pumping Station No. 6. The net project contingency for the east and west floodwall work is approximately 13 percent. The total project contingency is 15 percent.

h. Comment h. Para. 69.

(1) Concur. The east-side work is currently under construction. The Orleans Levee Board's contractor is driving

the piling to the depths specified in the DM. Approximately 6 to 7 feet of sheetpile stick-up above the levee crown is incorporated in the design to provide interim protection.

(2) See response c. above.

(3) The levee board elected to take the lead and commit these expenditures at this time to achieve savings because the New Orleans Sewerage and Water Board (NOSWB) planned to deepen and widen the canal to meet their drainage needs. The work proposed by NOSWB required modification to the existing levees and floodwalls. Under their permit, NOSWB is required to maintain the status quo for the existing levees including overall stability and level of protection. Since this involved pulling and driving new sheetpiling, it is obviously more cost effective to combine the two projects and replace the sheetpiling to the High Level Plan criteria. OLB elected to expend these funds even though they currently have credits in excess of those required. However, they see no reason to cap the sheetpiling at this time since it would only increase their share of the project cost. With the remaining work in the Orleans unit, it appears likely that OLB will have contributed in excess of their 30 percent share.

i. Comment i. Table 1. Concur. We will furnish the final design watersurface profile when the bridge designs conditions are known. In developing the designs for the bridges, we will insure that bridge losses are not excessive so as to cause the flowline to encroach into the floodwall freeboard.

j. Comment j. Plate 15. The stress levels in this portion of the concrete cap are below 8 ksi. We designed the lower section of the concrete cap with sufficient reinforcement to prevent cracking.

k. Comment k. Plates 60, 82, 84, 92 and 97. The minimum spacing between active and passive failure wedges is based on engineering judgment. We generally use a distance equal to about 0.7 and 1.0 of the height of the wedge.

l. Comment l. Plates 94, 95, 117, 118 and 122. Concur. The W/L stationing on these plates applies to the area between B/L Station 670+00 and the pumping station. We will revise the

stationing in the plans and specifications to eliminate possible confusion.

m. Comment m. Plates 121 through 124. Concur. Revised plates 121 through 124 are enclosed as Encl 3.

n. Comment n. Appendix D. The 27 percent contingency is listed as a project contingency. This contingency rate represents a weighted average of all the contingencies in the estimate. The 30 and 31 accounts have their respective contingencies built in to the summarized figures given in the table. We do not think that a more detailed presentation is necessary since the table is for an alternative plan which is not recommended. The rather high overall project rate is supportable owing to the more complex phased construction necessary to build the butterfly valve structure in the canal and at the same time not interrupt pumping operations.

FOR THE COMMANDER:

3 Encls
Added 2 encls
2-3. as

W. EUGENE TICKNER
Chief, Engineering Division

CELMN-ED-DD

5 Sep 90
Mr. Desai/sl/2657

SUBJECT: Lake Pont. LA and Vic. Hurricane Protection Project, HLP, Design Memorandum No. 20, General Design, 17th Street Outfall Canal 1st End Comments

MEMORANDUM FOR CELMN-ED-SP

1. This is in response to your multiple memorandum dated 21 Aug 1990, subject as above.

2. Our proposed disposition of comments pertaining to Design Branch is as follows:

Comment b. The design computations for the Veterans Highway Bridge are preliminary and adequate to develop the GDM scope cost estimate. During preparation of plans and specifications, the detailed design will address all conventional loading including hydraulic loads (horizontal and uplift) as recommended by American Association of State Highway and Transportation Officials (AASHTO). In addition, CELMV's recommendation on establishing pile fixity is noted and will be used during the detailed design phase.

Comment e. Noted.

Comment g(2). The project contingencies for accounts 30 & 31 and the work for pumping station No. 6 have been incorporated into the estimates. The net project contingency for the east and west floodwall work is approximately 13%. The total project contingency is 15%.

Comment j. The stress levels in this portion of the concrete cap are below 8 ksi. The lower section of the concrete cap has been designed with sufficient reinforcement to prevent cracking.

DANIEL A./ MARSALONE
Chief, Design Branch

FILE COPY

CELMN-ED-DD 2 May 90

MEMORANDUM FOR C/Des Svcs Br

SUBJECT: Lake Pont., LA & Vic. HPP - Design Memorandum No. 20 - 17th St. Outfall Canal - Review of Draft Report

1. Reference your multiple memorandum dated 5 Apr 90, subject as above.

2. Our comments on the subject draft report were handcarried to Mr. Van Stutts on 2 May 90.

DANIEL A. MARSALONE
Chief, Design Branch

CELMN-ED-SP 5 April 1990/Stutts/2614

MEMORANDUM FOR: C/ Design Branch
C/ F & M Branch
C/ Hyd & Hydro Branch

SUBJECT: Lake Pontchartrain Louisiana & Vicinity Hurricane Protection Project - Design Memorandum No. 20 - 17th Street Outfall Canal - REVIEW OF DRAFT REPORT

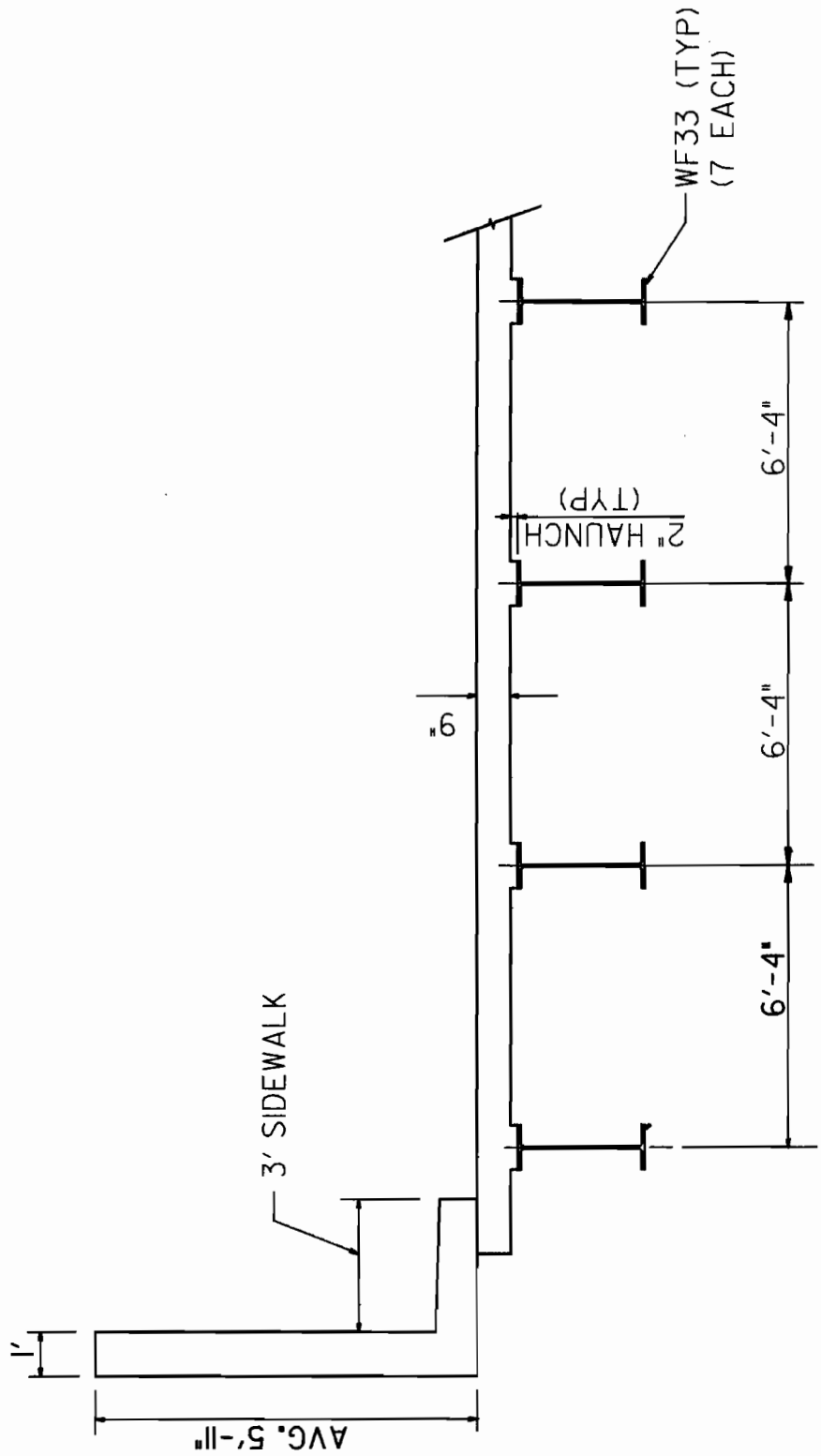
1. Enclosed are copies of the Draft subject DM.

2. Please review the report and comment by COB 19 April 90.

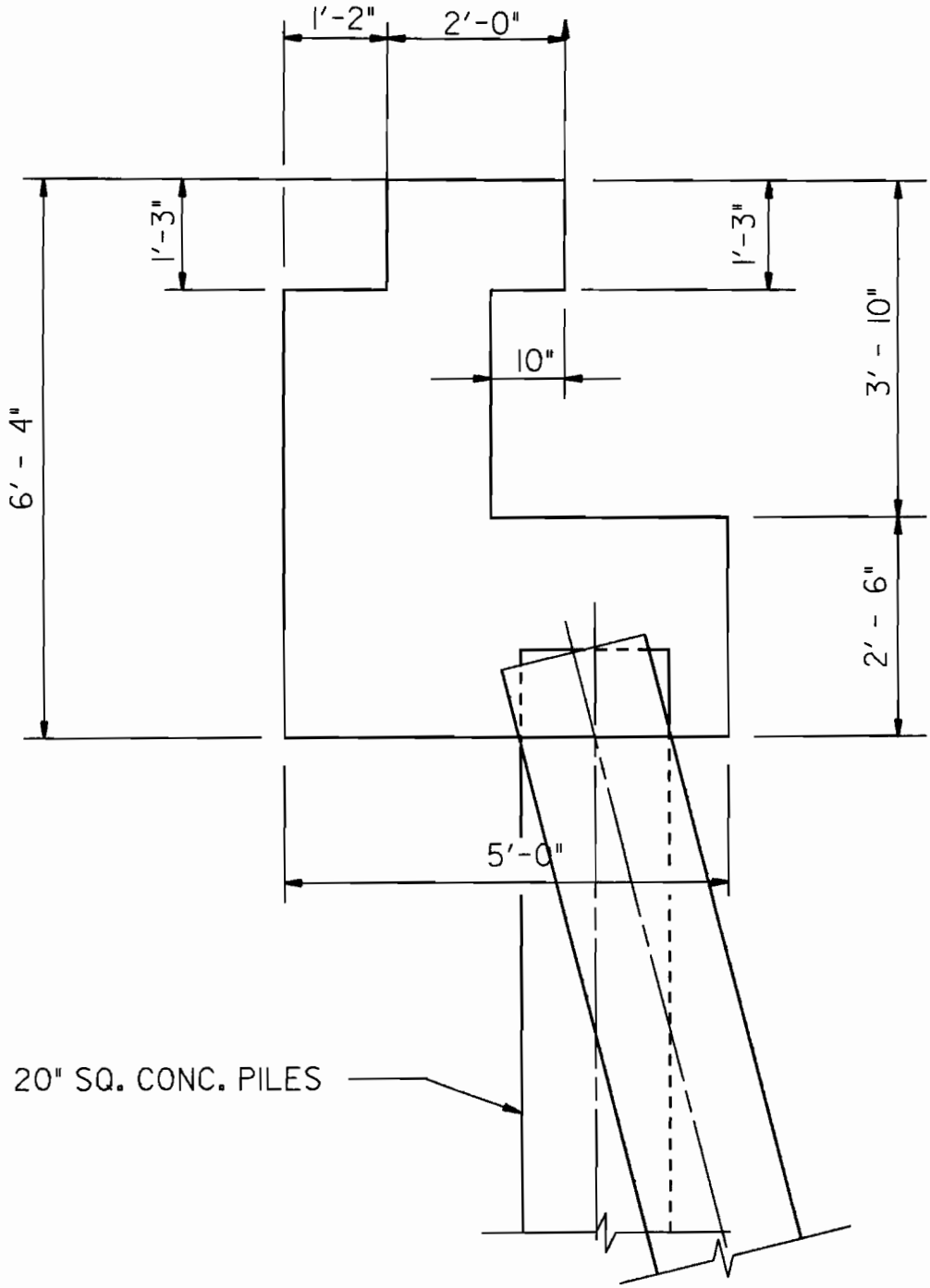
Calvin W. Shelton
Calvin W. Shelton
Chief Design Services Br.

Encl
(Design Br. 3 copies)
(F & M Br. 2 copies)
(Hyd & Hydro Br. 1 copy)

17TH STREET CANAL GDM	PAGE 1/9	DESIGN:MSD	1/15/90
VETERANS BRIDGE		CHECKED:CAL	4/15/90



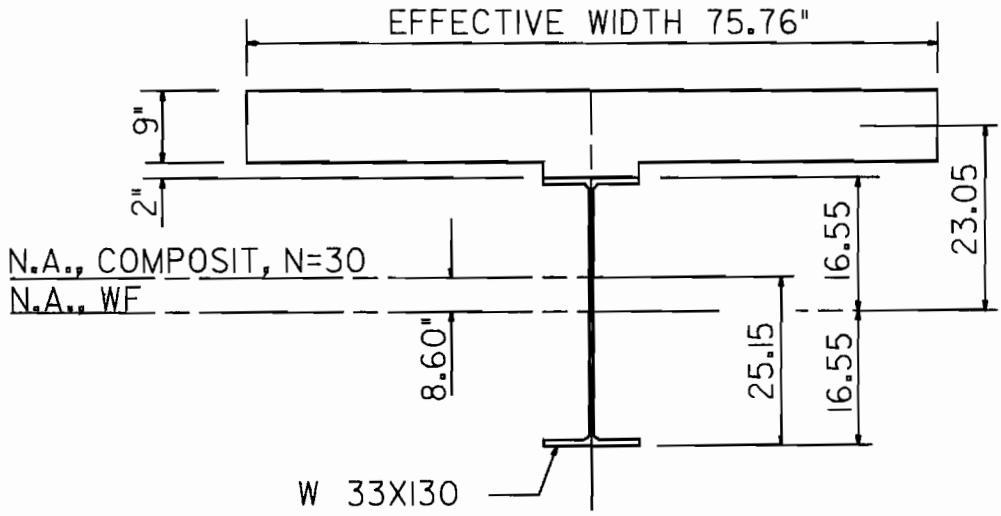
17TH STREET CANAL GDM	PAGE 2/9	DESIGN:MSD	1/15/90
VETERANS BRIDGE		CHECKED:CAL	1/15/90



DD-2

17TH STREET CANAL GDM	PAGE 3/9	DESIGN:MSD	1/15/90
VETERANS BRIDGE		CHECKED:CAL	4/15/90

SECTION PROPERTY, COMPOSIT SECTION, N=30 :



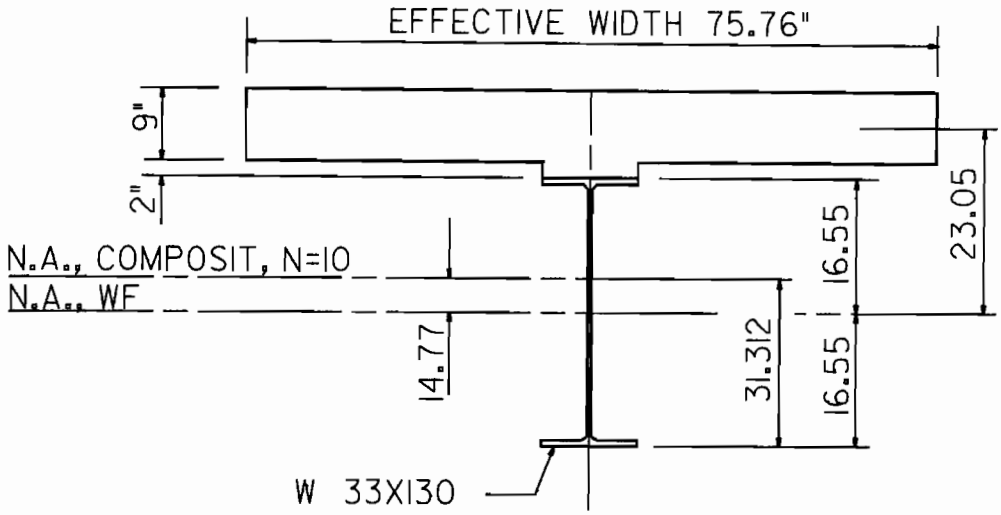
	A	d	Ad	Ad^2	I_0	$Ad^2 + I_0$
W 33X130	38.3	-	-	-	6710	6710
CONC 75.96X9/30	22.80	23.05	525.5	12113	154	12267
	61.1	(8.60)	525.5	12113	6864	18977
				LESS 525.5X8.6=		-4520
						I = 14,457

$S_{TOP/STEEL}$ = 14,457/7.945 =1820 IN^3

$S_{BOTT/STEEL}$ = 14,457/25.15 =575 IN^3

$S_{TOP/CONC}$ = 14457/18.95 =763 IN^3

SECTION PROPERTY, COMPOSIT SECTION, N=10:



	A	d	Ad	Ad^2	I_0	$Ad^2 + I_0$
W 33X130	38.3	-	-	-	6710	6710
CONC 75.96X9/10	68.36	23.05	15765	36327	461	36788
	106.66	(14.77)	15765	36327	7171	43478
				LESS 1576X14.77 =		-23278
					I =	20,220

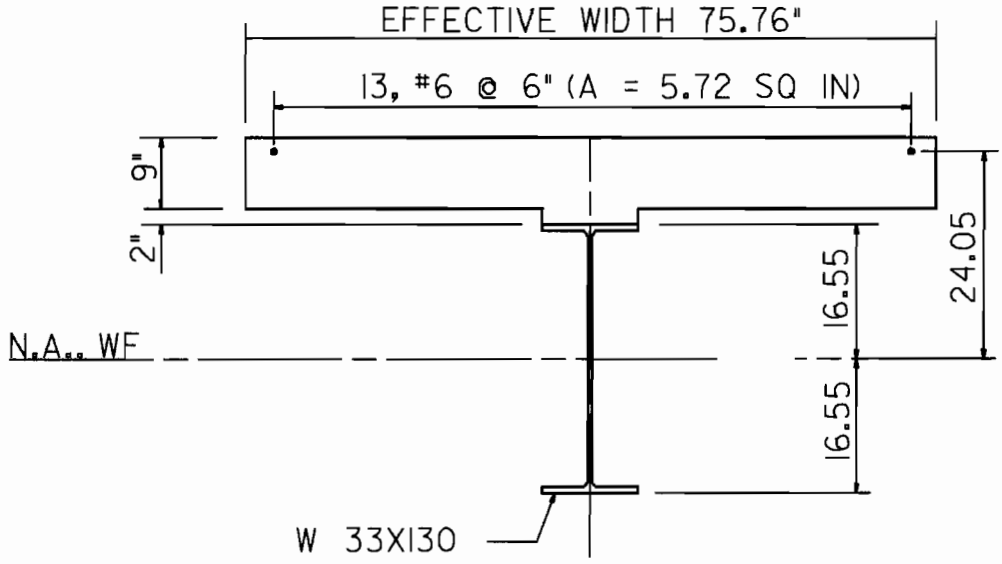
$S_{TOP/STEEL} = 20,220/1.775 = 11,392\ IN^3$

$S_{BOTT/STEEL} = 20,220/31.312 = 646\ IN^3$

$S_{TOP/CONC} = 20,220/12.78 = 1582\ IN^3$

17TH STREET CANAL GDM	PAGE 5/9	DESIGN:MSD	1/15/90
VETERANS BRIDGE		CHECKED:CAL	4/15/90

COMPOSITE SECTION FOR -M, NEGLECT CONC. USE #6 @ 6



	A	d	Ad	Ad^2	I_0	$Ad^2 + I_0$
W 33X130	38.3	-	-	-	6710	6710
REINF BARS 13,#6 BARS	5.72	24.05	137.5	3308	-	3308
	44.02	(3.12)	137.5	3308	6710	10018
				LESS 137.5X3.12		= -429
						9,588

$S_{TOP/STEEL} = 9588/13.43 = 714 \ IN^3$

$S_{BOTT/STEEL} = 9588/19.67 = 488 \ IN^3$

$S_{REINF.\ BAR} = 9588/20.93 = 458 \ IN^3$

DEAD LOAD (DL)

END SPAN , L = 40'

SLAB	(9/12)X6.33X0.15	= 0.712	k/ft
HAUNCH	(2/12)X1.50X0.15	= 0.038	k/ft
WF SECTION		= 0.130	k/ft
MISC. (20% WF WT.)		= 0.026	k/ft
	TOTAL	= 0.906	

$M_{DL} = 181.20^{ft-k}$

$V_{DL} = 18.12^{k}$

SUPERIMPOSED DL (SDL)

PARAPET	= (1/7)X5.08X1X2X0.15	= 0.218	k/ft
SIDEWALK	= (1/7)X3X(10/12)X2X0.15	= 0.107	k/ft
WEARING SURFACE	= 0.02X6.33	= 0.127	k/ft
	TOTAL	= 0.452	

$M_{SDL} = 90.40^{ft-k}$

$V_{SDL} = 9.04^{k}$

LIVE LOAD (LL)

a. HS-20 44 TRUCK LOAD

$M_{LL} = 449.80^{ft-k}$

$V_{LL} = 55.2$

LL DISTR. FACTOR = 6.33/11 = 0.576

IMPACT = 50/(40+125) = 0.303 USE MAX. 30%

$M_{LL+I} = 337^{ft-k}$

$V_{LL+I} = 41.3^{k}$

LIVE LOAD (CONT)

b. HYDRAULIC LOAD

WATER TO EL. 14.5

UPLIFT HEAD = AVG. HT/PARAPET + SIDEWALK + SLAB

UPLIFT LOAD = 6.66X0.064X6.33 = =2.70

$-M_{LL} = 540^{ft-k}$

$-V_{LL} = 54^{k}$

STRESS IN WF-SECTION

		AT TOP/SECTION		AT BOTTOM/SECTION	
CASE I:					
DL	181.2X12/406	= 5.36		181.2X12/406	= 5.36
SDL	90.4X12/1820	= 0.60		90.4X12/575	= 1.89
LL + I (TRUCK)	337X12/11392	= 0.36		337X12/646	= 6.26
		6.32 COMP	< 20		13.51 TEN
CASE II:					
DL	181.2X12/406	= 5.36		181.2X12/406	= 5.36
SDL	90.4X12/1820	= 0.60		90.4X12/575	= 1.89
HYDR	-540X12/7142	= -9.08		-540X12/488	=-13.28
	Σ	3.12 TEN	< 20		6.03 COMP

STRESS IN CONC

CASE I:

SDL	90X12/(763X30)	= 0.047
LL + I (TRUCK)	337X12/(1582X10)	= 0.256
	Σ	0.303 < 1.2

STRESS IN CONC (CONT)

CASE II:

SDL	90X12/458	= 2.36
LL + I	-540X12/458	= -14.15

11,79 TEN < 20

WEB SHEAR

CASE I:

V_{DL} = 18.12
V_{SDL} = 9.04
V_{LL+I} = 41.30

$\sum$ 68.46 v =68.46/(33.09X0.58) =3.57 < 12

ANCHOR (WF TO PIER CAP)

CASE II:

V_{DL} = 18.12
V_{SDL} = 9.04
V_{HYD} = -54.0

$\sum$ -26.84^{K} UPLIFT

REQUIRED A = 26.84/18 = 1.47 SQ. IN

PROVIDE 2-1"Φ ANCHORS AT EACH GIRDER

PILE BENT AT ABUTMENT
(CHECK FOR UPLIFT)

DL REACTIONS

a. SUPER STRUCTURE

DECK	42.14X.75X.15X20	= 94.82
HAUNCH	7X1.5X0.167X.15X20	= 5.32
GIRDER	7X0.130X20	= 18.20
SDL	0.452X7X20	= 63.28

b. ABUTMENT

2.5X5X49.33X0.15	= 92.49
3.83X0.83X40X0.15	= 19.07
1.17X2.83X40X0.15	= 19.87
1.17X1.83X40X0.15	= 12.85
5.17X4.67X3.17X0.15	= 11.48
4.17X4.67X3.17X0.15	= 9.26
$\sum$ DL	= 346.64 k

LIVE LOAD (HYDR. LOAD)

CASE I: HWL = 12.5

ON SUPER STRUCTURE

UPLIFT HEAD = 3.08 + 0.83 + 0.75 = 4.66

UPLIFT LOAD = 4.66X0.064X47.33X20 = -282.3 k

ON SUB STRUCTURE

UPLIFT HEAD = 3.08 + 0.83 + 3.83 +2.5 =10.24

UPLIFT LOAD = 10.24X0.64X49.33X5 = -161.6 k

$\sum$ CASE I: = 346.64 -282.3 -161.6 = -97.26

CASE II: HWL = 12.5 + 2 =14.5

ON SUPER STRUCTURE

UPLIFT LOAD = 6.66X0.064X47.33X20 = -403.5 k

ON SUB STRUCTURE

UPLIFT LOAD = 12.24X0.64X49.33X5 = -193.2 k

$\sum$ CASE II: = 346.64 -403.5 -193.2 = -250.06

CONTROLS

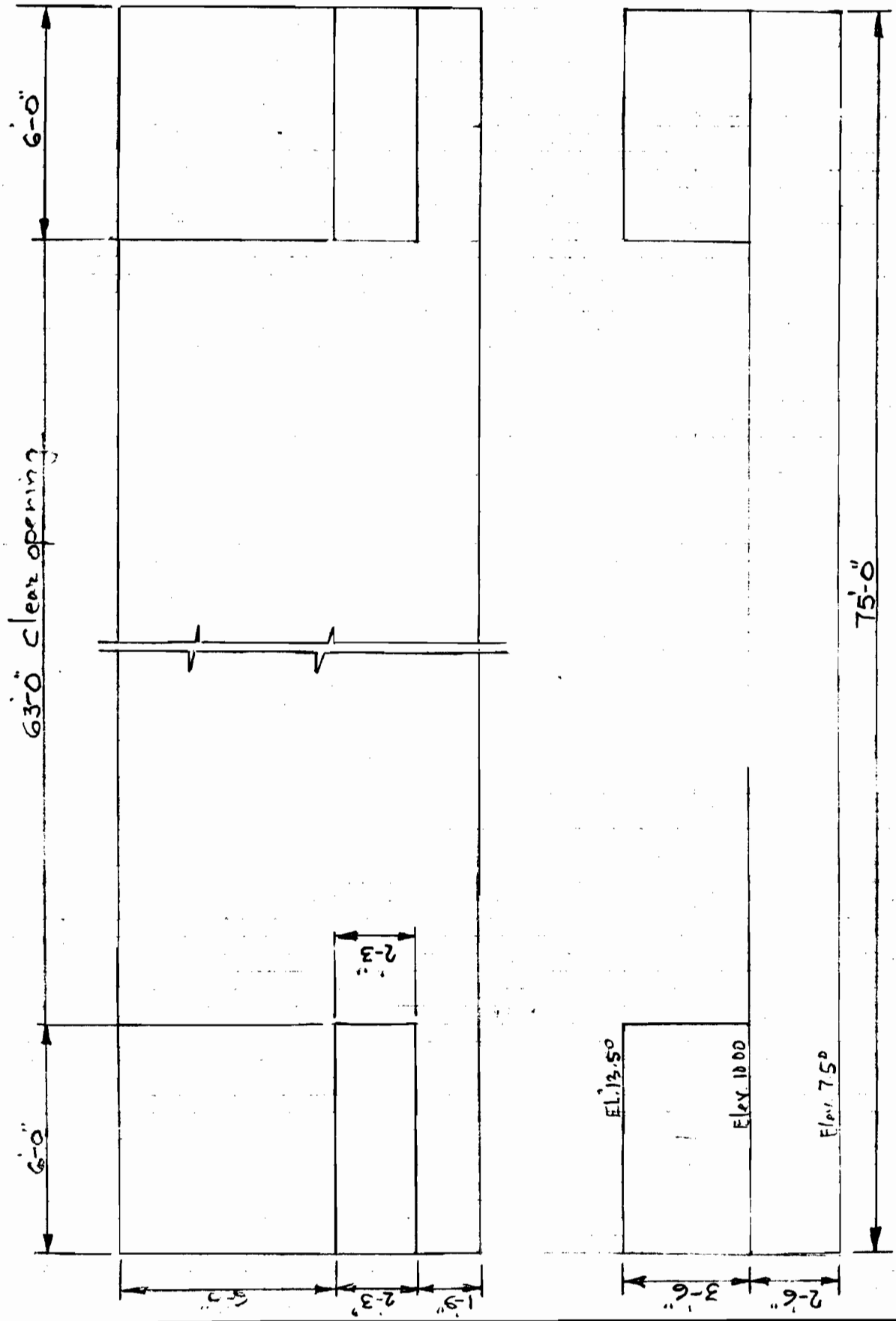
CAPACITY OF EXIST PILES = 5X47.8 + 2X47.8X4/4.12

= 331.82 k > 250.06 k

NO EXTRA PILES NEEDED, HOWEVER PROVIDE 2-12" SQ CONCRETE PILES

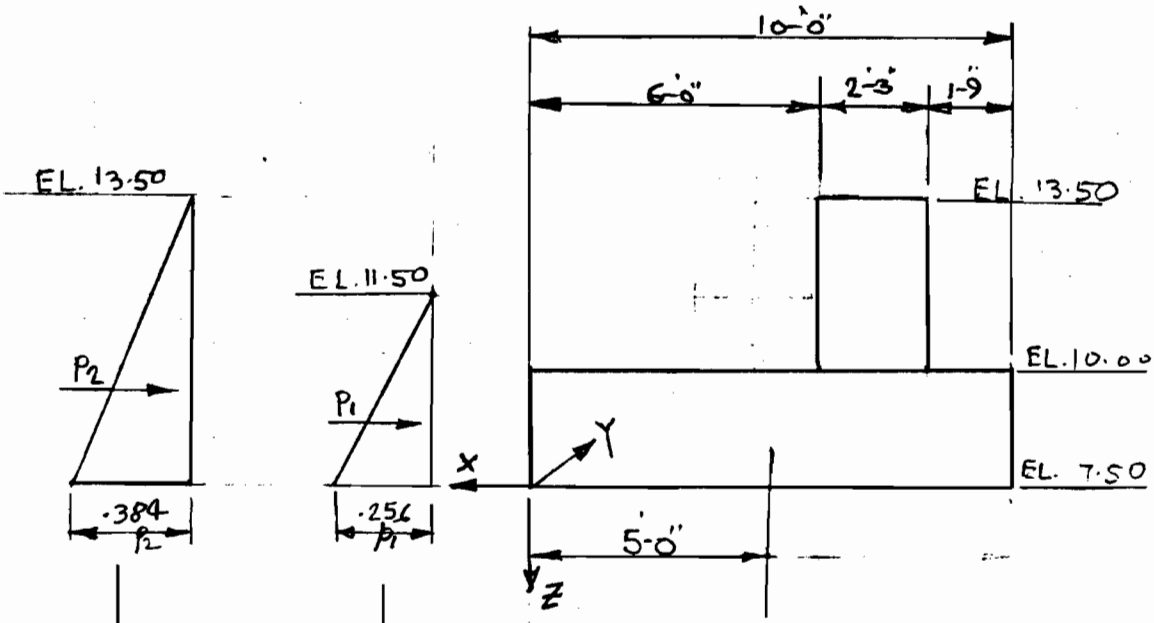
COMPUTATION SHEET

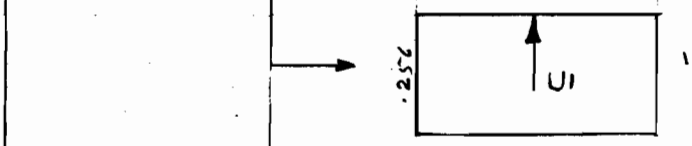
PROJECT 17th Street CANAL G.D.M.	PAGE 1 OF 18	COMPUTED BY S.A.	DATE 10/31/89
SUBJECT Roller Gate Monolith		CHECKED BY MSD	DATE 3/90



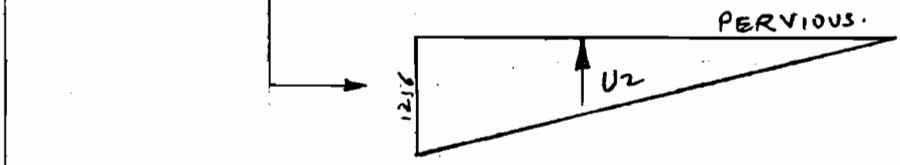
LMV FORM MAR 92 107a PREVIOUS EDITIONS MAY BE USED (FOR USE WITH 8 x 8 GRID)

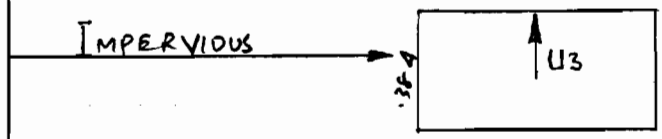
PROJECT 17th Street CANAL G.D.#	PAGE 2 OF 16	COMPUTED BY S.A.	DATE 10/27
SUBJECT Roller gate Monolith		CHECKED BY MSD	DATE 3/90



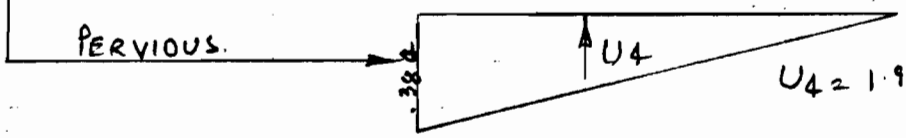


$p_1 = .256$
Impervious $P_1 = .512$
$.256 \times 5$ $U_1 = 1.280$





$p_2 = .384$
$P_2 = 1.152$
$U_3 = 1.920$



$U_4 = 1.920$

PROJECT 17th Street CANAL G.D.M.	PAGE 3 OF 18	COMPUTED BY J.A.	DATE 4/25
SUBJECT Roller GATE MONOLITH		CHECKED BY MSD	DATE 3/90

DEAD LOADS

	Fx	FZ	L.A.	My-Y
Base slab = 1x75x10x2.50x.150	—	281.25	5.00	1406.25
Columns = 2x6.50x2.25x3.50x.150	—	15.36	7.125	109.44
GATE CLOSED Position	—	12.50	7.125	89.06
Σ D.L.		309.11		1604.75

HYDRAULIC LOADS

a. Water to (S.W.L.) Elev. 11.50

Down water = 6x1.50x75x.064		43.20	3.00	129.60
uplift Imp. = 4x.064x5x75.0		−96.00	2.50	−240.00
Pervious = $4 \times .064 \times \frac{10}{2} \times 75.0$		−96.00	3.33	−320.00
HORIZ. = $(4 \times .064) \times 4/2 \times 75.0$	−38.40		1.33	51.10

b. Water to (SWL+2) Elev. 13.50

Down Water = 6x3.50x75x.064		100.80	3.00	302.40
uplift Imp. = 6x.064x5x75.0		−144.00	2.50	−360.00
uplift Perv. = $6 \times .064 \times \frac{10}{2} \times 75.0$		−144.00	3.33	−480.00
HORIZ. = $(6 \times .064) \times 6/2 \times 75.0$	−86.4		2.00	172.80

WIND LOADS

From Flood-side = 3.50x.05x75	−13.13		4.25	55.80
From Prot. side = 3.50x.05x75	13.13		4.25	−55.80

TRUCK-LOADING-HS 20-44	FZ	$\bar{x}$	$\bar{Y}$	Mx-x	My-Y
4 trucks on F.S. Edge	128	10	1.2	160	1280.00

PROJECT 17th Street CANAL GDM	PAGE 4 OF 18	COMPUTED BY S.A.	DATE 10/27
SUBJECT Roller Gate Monolith		CHECKED BY MSD	DATE 3/90

SUMMARY OF LOAD CASES

CASE No. 1. WATER TO EL. 11.50, IMPERVIOUS Seepage AND No Dynamic Wave Force (100 %)

DESCRIPTION	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. Conc.	—	—	309.11	—	1604.75	—
WATER Down	—	—	43.20	—	129.60	—
UPLIFT (Imp)	—	—	-96.00	—	-240.00	—
Horiz.	-38.40	—	—	—	51.10	—
TOTAL	-38.40	—	256.31	—	1545.55	

CASE-No.2 WATER To Elev. 11.50, Pervious seepage and no dynamic WAVE FORCE (100 %)

Description	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. Conc.	—	—	309.11	—	1604.75	—
WATER Down	—	—	43.20	—	129.60	—
UPLIFT (Perv.)	—	—	-96.00	—	-320.00	—
Horiz.	-38.40	—	—	—	51.10	—
TOTAL	-38.40	—	256.31	—	1465.45	—

CASE-No.3 : WATER TO Elev. 13.50, NO WIND, Impervious seepage & No DYNAMIC WAVE FORCE (75 %)

Description	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. Conc.	—	—	309.11	—	1604.75	—
WATER Down	—	—	100.80	—	302.40	—
Imp. uplift	—	—	-144.00	—	-360.00	—
Horiz.	-86.4	—	—	—	172.80	—
100 %	-86.4	—	265.91	—	1719.95	—
75 %	-65.0		200.00		1290.00	

PROJECT 17TH Street CANAL G-D.M	PAGE 5 OF 18	COMPUTED BY S.A.	DATE 10/27
SUBJECT Roller GATE MONOLITH		CHECKED BY MSD	DATE 3/90

CASE 4: WATER TO Elev. 13.50, NO WIND, Pervious Seepage And no Dynamic WIND FORCE (75%)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
CONC. DL.	—	—	309.11	—	1604.75	—
WATER DOWN	—	—	100.80	—	302.40	—
UPLIF (PERV.)	—	—	-144.00	—	-480.00	—
HORIZ.	-86.4	—	—	—	172.80	—
100% TOTAL	-86.4	—	265.91	—	1599.95	—
75% TOTAL	-65.0	—	200.00	—	1200.00	—

CASE NO. 5: NO WATER, NO WIND (100 %)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
DL. CONC.	—	—	309.11	—	1604.75	—
100% TOTAL	—	—	309.11	—	1604.75	—

CASE No. 6: NO WATER, WIND FROM PROT. SIDE (75%)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
D.L. CONC.	—	—	309.11	—	1604.75	—
P.S. wind Force	—	—	13.13	—	-55.80	—
100% TOTAL	—	—	322.24	—	1548.95	—
75% TOTAL	—	—	241.68	—	1161.71	—

CASE No. 7: NO WATER, WIND FROM FLOOD-SIDE (75%)

DESCRIPTIONS	Fx	FY	FZ	Mx-x	My-y	Mz-z
DL. CONC.	—	—	309.11	—	1604.75	—
F.S. WIND FORCE	—	—	-13.13	—	55.80	—
100% TOTAL	—	—	295.98	—	1660.55	—
75% TOTAL	—	—	221.99	—	1245.41	—

PROJECT 17th Street CANAL	PAGE 6 OF 18	COMPUTED BY S.A.	DATE 10/30
SUBJECT Roller Gate Monolith		CHECKED BY MSD	DATE 3/96

LOAD CASE 8: D.L. & HS20-44 TRUCK LOADING
Flood side.

Description	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. Conc	—	—	309.11	—	1604.75	—
TRUCK-LOAD	—	—	128	160.0	—	—
TOTAL	—	—	437.11	160	1604.75	—

LOAD CASE 9: D.L. & HS-20-44 TRUCK LOAD, PROT. SIDE

Description	Fx	Fy	Fz	Mx-x	My-y	Mz-z
D.L. Conc	—	—	309.11	—	1604.75	—
TRUCK LOAD	—	—	128	160	1280	—
TOTAL	—	—	437.11	160	2884.75	—

LOAD SUMMARY

DESCRIPTIONS	Fx	Fy	Fz	Mx-x	My-y	Mz-
LOAD CASE 1	-38.40	—	256.31	—	1545.55	—
LOAD CASE 2	-38.40	—	256.31	—	1465.45	—
LOAD CASE 3	-65.00	—	200.00	—	1290.00	—
LOAD CASE 4	-65.00	—	200.00	—	1200.00	—
LOAD CASE 5	—	—	309.11	—	1604.75	—
LOAD CASE 6	—	—	241.68	—	1161.71	—
LOAD CASE 7	—	—	221.99	—	1245.41	—
LOAD CASE 8	—	—	437.11	160.0	1604.75	—
LOAD CASE 9	—	—	437.11	160.0	2884.75	—

17TH STREET CANAL G.D.M. | 10/31/89
ROLLER GATE MONOLITH DESIGN | CAL

STIFFNESS MATRIX FOR CPGA (3D PILE)

* KhB = .15 ksi Ec = 4074 ksi

I1 = 1728 cu in I2 = 1728 cu in

A = 144 sq in L = 50 ft

R1 = 82.8 in R2 = 82.8 in

STIFFNESS COEFFICIENT	FIXITY CONSTANT Co	RESULT
B11 =	1	8.782
B22 =	1	8.782

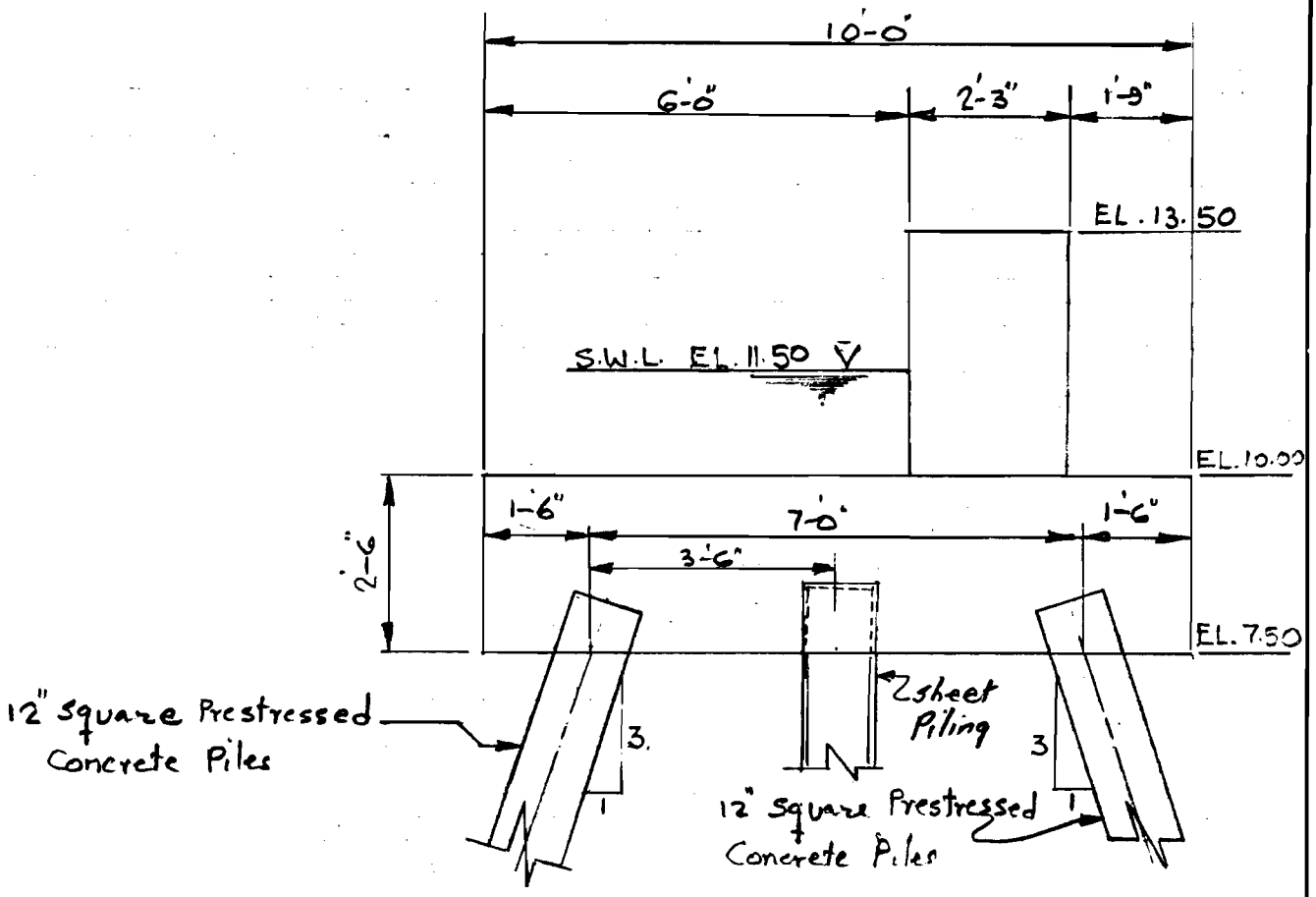
B33 = 1955.5

KMP1 = 37.7
KMP2 = 37.7

* -- LOW Kh VALUE TO ACCOUNT FOR GROUP AFFECTS OF TIMBER PILES 1,2,4,5.

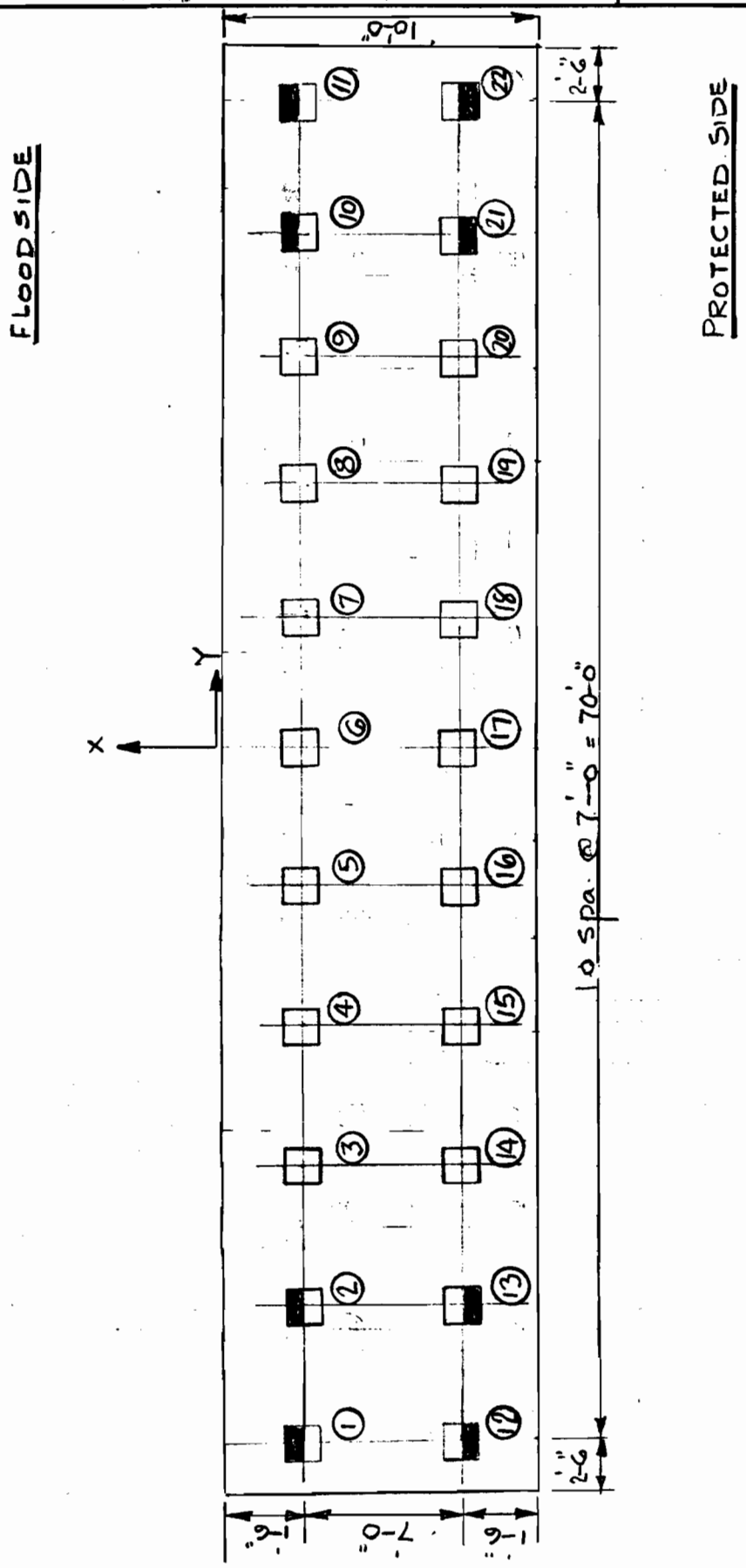
NOTE : ABOVE COMPUTATIONS ARE FOR FLOODWALLS WITH CONSTANT SUBGRADE MODULUS, FULLY EMBEDDED PILES AND FOLLOW THE CALCULATIONS PRESENTED ON PAGE B35 OF THE CPGA MANUAL.

PROJECT 17TH street CANAL G.D.M	PAGE 8 OF 18	COMPUTED BY S.A.	DATE 11/1/89
SUBJECT Roller GATE MONOLITH		CHECKED BY MSD	DATE 3/90

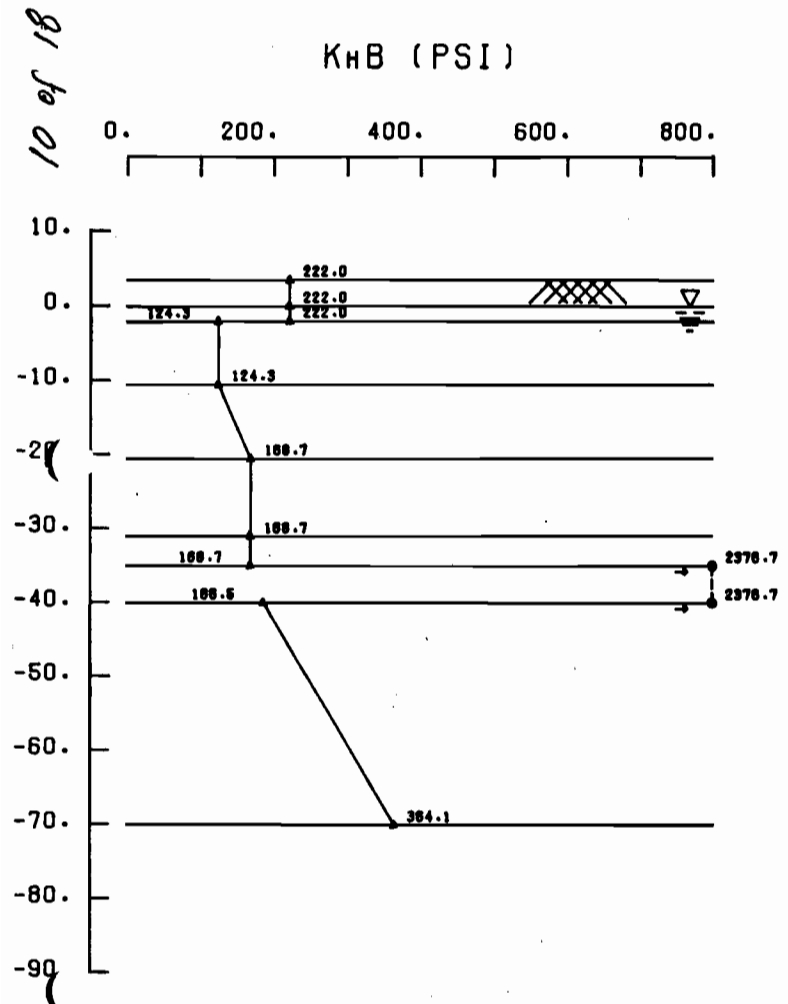


COMPUTATION SHEET

PROJECT 17TH STREET CANAL G.D.11	PAGE 9 OF 18	COMPUTED BY S.A.	DATE 11/1/89
SUBJECT DESIGN OF GATE MONOLITH		CHECKED BY MSD	DATE 3/90



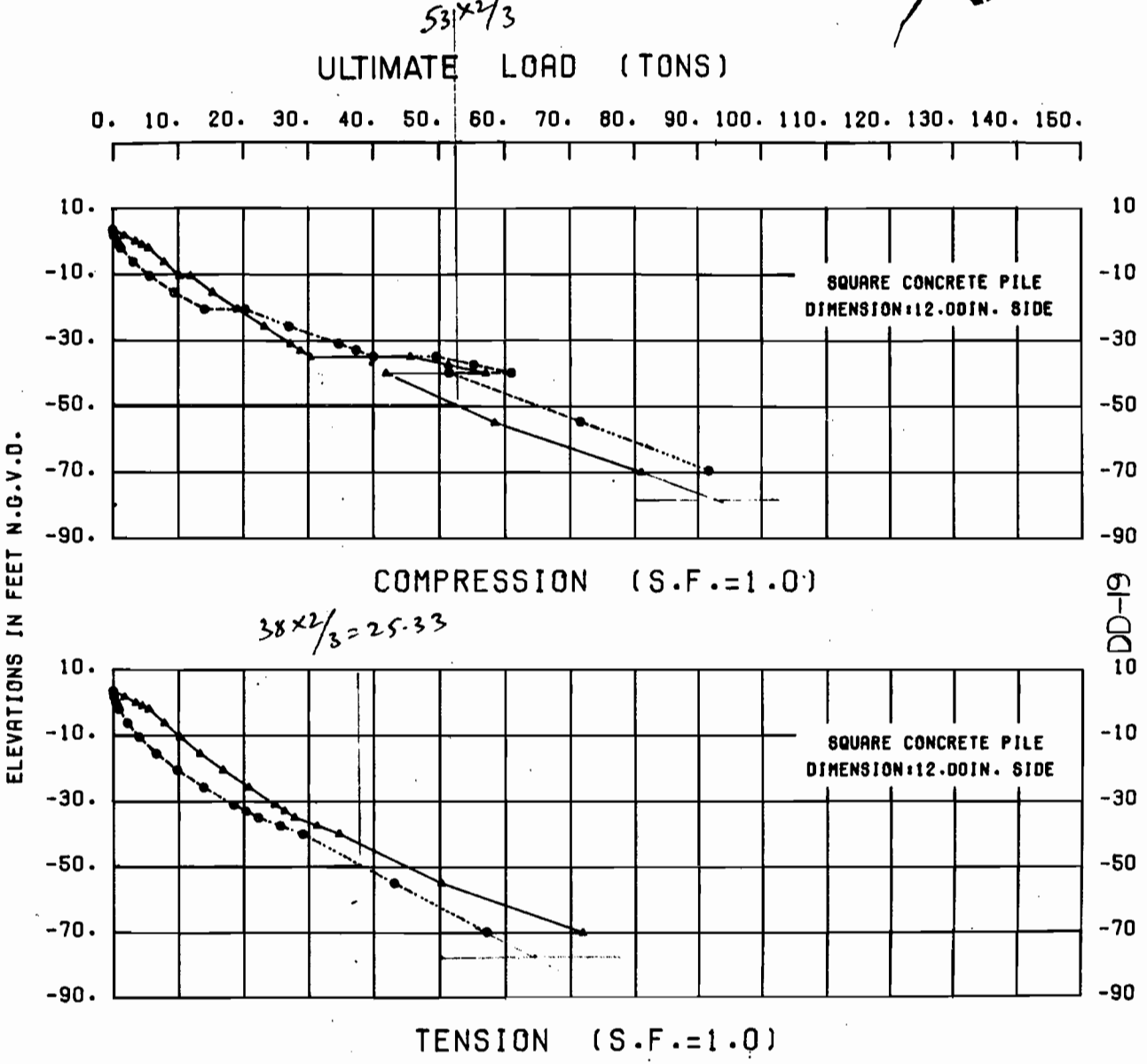
10 of 18



NOTES: $K_H = \alpha K_1/B = (0.2222\,q_u/B)(C)(D)$ COHESIVE

- α = 0.4 = Factor of material properties of soil and pile
- k_1 = Modulus of subgrade reaction for test plate (pci)
- B_1 = Width or diameter of test plate (in)
- $K_1 = k_1 B_1$ = 80 qu (psf) = 0.5556 qu (psi)
- $q_u = 2 \cdot c$ = Unconfined compressive strength (psf)
- C = Reduction for cyclic loading-not applicable
- D = Group effect reduction factor
- B = Width of pile measured at right angles to the direction of displacement (in)
- $K_H = (nh)(Z/B)(C)(D)$ COHESIONLESS
- nh = Coefficient of horizontal subgrade reaction (pci)
- Z = Depth below equivalent ground surface (in)

$53 \times 2/3 = 35.33$



DD-19

THE FACTOR SHOWN, (MODULUS OF HORIZONTAL SUBGRADE K_h, TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX: $K_h = \frac{0.2222\,q_u\,(C)(D)}{(B)}$

----- S-CASE

——— Q-CASE

NOTE: ALLOWABLE CAPACITIES SHOULD BE DETERMINED INCORPORATING F.S.=2.0 WITH PILE TEST OR F.S.=3.0 WITHOUT PILE TEST.

17TH ST OUTFALL CANAL ODM
HAMMOND HIGHWAY FLOODGATE
12" SQUARE PRESTRESSED CONCRETE PILE
PILE CAPACITY CURVE

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS

NEW ORLEANS
JUNE 1987

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3$ 10 17TH STREET CANAL G.D.M.-
 20 ROLLER GATE MONOLITH DESIGN (A:ROLLER)
 30 BIJ 8.782 8.782 1955.5 0 0 0 0 0 ALL
 40 TENSION 0.8 ALL
 50 DLS S 35.33 25.33 539.4 182.0 73.7 939.0 775.0 H 12 ALL
 60 ASC S 144 288 0.84 .9975 1.75 0 ALL
 70 PMAXMOM 37.7 37.7 ALL
 80 BATTER 3 1 2 9 TO 13 21 22
 90 ANGLE 00 1 TO 11
100 ANGLE 180 12 TO 22
110 PILE 1 -1.5 -35 0 2 -1.5 -28 0 3 -1.5 -21 0 4 -1.5 -14 0
120 PILE 5 -1.5 -7 0 6 -1.5 0 0 7 -1.5 7 0 8 -1.5 14 0
130 PILE 9 -1.5 21 0 10 -1.5 28 0 11 -1.5 35 0 12 -8.5 -35 0
140 PILE 13 -8.5 -28 0 14 -8.5 -21 0 15 -8.5 -14 0 16 -8.5 -7 0
150 PILE 17 -8.5 0 0 18 -8.5 7 0 19 -8.5 14 0 20 -8.5 21 0
160 PILE 21 -8.5 28 0 22 -8.5 35 0
170 LOAD 1 -38 0 256 0 1546 0
180 LOAD 2 -38 0 256 0 1465 0
190 LOAD 3 -65 0 200 0 1290 0
200 LOAD 4 -65 0 200 0 1200 0
210 LOAD 5 0 0 309 0 1605 0
220 LOAD 6 0 0 242 0 1162 0
230 LOAD 7 0 0 222 0 1245 0
240 LOAD 8 0 0 437 160 1605 0
250 LOAD 9 0 0 437 160 2885 0
260 FOUT 1 2 3 4 5  A:ROLOUT
270 PSO 1
280 PFO ALL
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  **********************************
* CORPS PROGRAM  #  X0080      *  CPGA - CASE PILE GROUP ANALYSIS PROGRAM
* VERSION NUMBER # 88/11/02    *  RUN DATE 90/04/26  RUN TIME  8.06.00
**********************************


17TH STREET CANAL G.D.M.
ROLLER GATE MONOLITH DESIGN (A:ROLLER)


THERE ARE  22 PILES AND
            9 LOAD CASES IN THIS RUN.

ALL PILE COORDINATES ARE CONTAINED WITHIN A BOX
                                          X          Y          Z
                                       -------    -------    -------
WITH DIAGONAL COORDINATES = (          -8.50 ,    -35.00 ,      .00 )
                            (          -1.50 ,     35.00 ,      .00 )


*******************************************************************************

         PILE STIFFNESSES AS INPUT


  .87820E+01    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00
  .00000E+00    .87820E+01    .00000E+00    .00000E+00    .00000E+00    .00000E+00
  .00000E+00    .00000E+00    .19555E+04    .00000E+00    .00000E+00    .00000E+00
  .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00
  .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00
  .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00    .00000E+00


THIS MATRIX APPLIES TO THE FOLLOWING PILES -

   1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16
    ALL


*******************************************************************************

         PILE GEOMETRY AS INPUT AND/OR GENERATED

NUM        X          Y          Z       BATTER    ANGLE    LENGTH  FIXITY
          FT         FT         FT                            FT

  1     -1.50     -35.00        .00       3.00       .00              P
  2     -1.50     -28.00        .00       3.00       .00              P
  3     -1.50     -21.00        .00          V       .00              P
  4     -1.50     -14.00        .00          V       .00              P
  5     -1.50      -7.00        .00          V       .00              P
  6     -1.50        .00        .00          V       .00              P
  7     -1.50       7.00        .00          V       .00              P
  8     -1.50      14.00        .00          V       .00              P
  9     -1.50      21.00        .00       3.00       .00              P
 10     -1.50      28.00        .00       3.00       .00              P
 11     -1.50      35.00        .00       3.00       .00              P
 12     -8.50     -35.00        .00       3.00    180.00              P
 13     -8.50     -28.00        .00       3.00    180.00              P
 14     -8.50     -21.00        .00          V    180.00              P
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15	-8.50	-14.00	.00	V	180.00	P
16	-8.50	-7.00	.00	V	180.00	P
17	-8.50	.00	.00	V	180.00	P
18	-8.50	7.00	.00	V	180.00	P
19	-8.50	14.00	.00	V	180.00	P
20	-8.50	21.00	.00	V	180.00	P
21	-8.50	28.00	.00	3.00	180.00	P
22	-8.50	35.00	.00	3.00	180.00	P

****

APPLIED LOADS

LOAD CASE	PX K	PY K	PZ K	MX FT-K	MY FT-K	MZ FT-K
1	-38.0	.0	256.0	.0	1546.0	.0
2	-38.0	.0	256.0	.0	1465.0	.0
3	-65.0	.0	200.0	.0	1290.0	.0
4	-65.0	.0	200.0	.0	1200.0	.0
5	.0	.0	309.0	.0	1605.0	.0
6	.0	.0	242.0	.0	1162.0	.0
7	.0	.0	222.0	.0	1245.0	.0
8	.0	.0	437.0	160.0	1605.0	.0
9	.0	.0	437.0	160.0	2885.0	.0

****

ORIGINAL PILE GROUP STIFFNESS MATRIX

.19453E+04	.68075E-04	.58402E+03	.14717E+06	-.18572E+06	-.49057E+05
.68075E-04	.19320E+03	-.20422E-03	.00000E+00	-.20831E-01	-.11592E+05
.58402E+03	-.20422E-03	.41269E+05	-.49057E+05	.24843E+07	-.14717E+06
.14717E+06	.00000E+00	-.49057E+05	.27979E+10	-.88303E+06	-.37087E+08
-.18572E+06	-.20831E-01	.24843E+07	-.88303E+06	.22235E+09	-.26491E+07
-.49057E+05	-.11592E+05	-.14717E+06	-.37087E+08	-.26491E+07	.25230E+09

LOAD CASE 1. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 3.

LOAD CASE 2. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 2.

LOAD CASE 3. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 4. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 5.

LOAD CASE 5. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 6. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 7. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 8. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

LOAD CASE 9. NUMBER OF FAILURES = 0. NUMBER OF PILES IN TENSION = 0.

****

PILE CAP DISPLACEMENTS

LOAD CASE	DX IN	DY IN	DZ IN	RX RAD	RY RAD	RZ RAD
1	-.2551E-01	-.4136E-05	.8630E-02	.1482E-05	-.3430E-04	-.6918E-07
2	-.2786E-01	.1193E-05	.9897E-02	.1622E-05	-.5477E-04	.1965E-07
3	-.4568E-01	-.1846E-03	.1097E-01	.2526E-05	-.9114E-04	-.3076E-05
4	-.4828E-01	-.1786E-03	.1238E-01	.2681E-05	-.1139E-03	-.2977E-05
5	-.1819E-02	.2407E-03	.7336E-02	.2785E-06	.3181E-05	.4011E-05
6	-.4172E-02	.1947E-03	.7230E-02	.3825E-06	-.2152E-04	.3246E-05
7	.1351E-02	.1669E-03	.3834E-02	.4106E-07	.2551E-04	.2781E-05
8	-.2189E-01	.3898E-03	.2079E-01	.2236E-05	-.1638E-03	.6496E-05
9	.1514E-01	.3056E-03	.7793E-03	.2143E-07	.1597E-03	.5092E-05

****

PILE FORCES IN LOCAL GEOMETRY

M1 & M2 NOT AT PILE HEAD FOR PINNED PILES
* INDICATES PILE FAILURE
# INDICATES CBF BASED ON MOMENTS DUE TO (F3*EMIN) FOR CONCRETE PILES
B INDICATES BUCKLING CONTROLS

LOAD CASE - 1

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.2	.0	-2.1	.0	8.8	.0	.08	.06	1.01	.79	
2	-.2	.0	-1.8	.0	8.8	.0	.07	.06	1.02	.80	
3	-.2	.0	14.9	.0	8.5	.0	.42	.13	1.13	.91	#
4	-.2	.0	15.2	.0	8.5	.0	.43	.13	1.13	.92	#
5	-.2	.0	15.4	.0	8.4	.0	.44	.13	1.13	.92	#
6	-.2	.0	15.7	.0	8.4	.0	.44	.13	1.14	.92	#
7	-.2	.0	15.9	.0	8.4	.0	.45	.13	1.14	.92	#
8	-.2	.0	16.2	.0	8.4	.0	.46	.13	1.14	.92	#
9	-.2	.0	-.2	.0	8.9	.0	.01	.03	1.03	.81	
10	-.2	.0	.0	.0	8.9	.0	.00	.20	1.03	.81	
11	-.2	.0	.3	.0	8.9	.0	.01	.20	1.03	.81	
12	.2	.0	24.2	.0	-7.6	.0	.68	.10	1.19	.98	#
13	.2	.0	24.4	.0	-7.5	.0	.69	.10	1.19	.98	#
14	.2	.0	9.3	.0	-8.5	.0	.26	.15	1.09	.88	#
15	.2	.0	9.5	.0	-8.5	.0	.27	.15	1.09	.88	#
16	.2	.0	9.8	.0	-8.4	.0	.28	.15	1.09	.88	#
17	.2	.0	10.0	.0	-8.4	.0	.28	.15	1.10	.88	#
18	.2	.0	10.3	.0	-8.4	.0	.29	.14	1.10	.88	#
19	.2	.0	10.5	.0	-8.4	.0	.30	.14	1.10	.88	#
20	.2	.0	10.8	.0	-8.4	.0	.30	.14	1.10	.89	#
21	.2	.0	26.2	.0	-7.4	.0	.74	.10	1.21	1.00	#
22	.2	.0	26.4	.0	-7.4	.0	.75	.10	1.21	1.00	#

LOAD CASE - 2

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.3	.0	-2.0	.0	9.6	.0	.08	.06	1.02	.79	
2	-.3	.0	-1.7	.0	9.6	.0	.07	.06	1.02	.79	
3	-.2	.0	16.6	.0	9.2	.0	.47	.13	1.14	.92	#
4	-.2	.0	16.9	.0	9.2	.0	.48	.12	1.15	.93	#
5	-.2	.0	17.2	.0	9.2	.0	.49	.12	1.15	.93	#
6	-.2	.0	17.4	.0	9.2	.0	.49	.12	1.15	.93	#
7	-.2	.0	17.7	.0	9.2	.0	.50	.12	1.15	.93	#
8	-.2	.0	18.0	.0	9.2	.0	.51	.12	1.15	.93	#
9	-.3	.0	.1	.0	9.7	.0	.00	.20	1.03	.81	
10	-.3	.0	.3	.0	9.7	.0	.01	.20	1.03	.81	
11	-.3	.0	.6	.0	9.8	.0	.02	.20	1.04	.81	
12	.2	.0	24.0	.0	-8.4	.0	.68	.10	1.19	.98	#
13	.2	.0	24.2	.0	-8.4	.0	.69	.10	1.19	.98	#
14	.2	.0	7.6	.0	-9.2	.0	.22	.15	1.08	.86	
15	.2	.0	7.9	.0	-9.2	.0	.22	.15	1.08	.86	#
16	.2	.0	8.2	.0	-9.2	.0	.23	.15	1.09	.86	#
17	.2	.0	8.4	.0	-9.2	.0	.24	.15	1.09	.87	#
18	.2	.0	8.7	.0	-9.2	.0	.25	.15	1.09	.87	#
19	.2	.0	9.0	.0	-9.2	.0	.25	.15	1.09	.87	#
20	.2	.0	9.2	.0	-9.2	.0	.26	.15	1.09	.87	#
21	.2	.0	26.2	.0	-8.2	.0	.74	.10	1.21	.99	#
22	.2	.0	26.5	.0	-8.2	.0	.75	.10	1.21	1.00	#

LOAD CASE - 3

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.4	.0	-13.7	-.0	15.6	.0	.54	.26	.96	.69	
2	-.4	.0	-13.2	-.0	15.6	.0	.52	.25	.96	.69	
3	-.4	.0	17.0	-.0	15.4	.0	.48	.12	1.17	.90	#
4	-.4	.0	17.4	-.0	15.3	.0	.49	.12	1.17	.91	#
5	-.4	.0	17.8	-.0	15.2	.0	.50	.12	1.17	.91	#
6	-.4	.0	18.2	-.0	15.1	.0	.52	.12	1.18	.91	#
7	-.4	.0	18.7	-.0	15.0	.0	.53	.12	1.18	.92	#
8	-.4	.0	19.1	-.0	15.0	.0	.54	.12	1.18	.92	#
9	-.4	.0	-9.3	-.0	15.1	.0	.37	.19	.99	.72	
10	-.4	.0	-8.7	-.0	15.1	.0	.34	.18	.99	.73	
11	-.4	.0	-8.2	-.0	15.0	.0	.32	.17	.99	.73	
12	.4	.0	30.2	-.0	-14.7	.0	.85	.12	1.26	1.00	#
13	.4	.0	30.4	-.0	-14.6	.0	.86	.12	1.26	1.00	#
14	.4	.0	2.0	-.0	-15.4	.0	.06	.21	1.07	.80	
15	.4	.0	2.4	-.0	-15.3	.0	.07	.20	1.07	.80	
16	.4	.0	2.9	-.0	-15.2	.0	.08	.20	1.07	.81	
17	.4	.0	3.3	-.0	-15.1	.0	.09	.20	1.07	.81	
18	.4	.0	3.7	-.0	-15.0	.0	.10	.19	1.08	.81	
19	.4	.0	4.1	-.0	-15.0	.0	.12	.19	1.08	.82	
20	.4	.0	4.5	-.0	-14.9	.0	.13	.19	1.08	.82	
21	.4	.0	32.3	-.0	-13.8	.0	.91	.14	1.27	1.02	#
22	.4	.0	32.5	-.0	-13.7	.0	.92	.14	1.27	1.02	#

LOAD CASE - 4

PILE	F1	F2	F3	M1	M2	M3	ALF	CBF	ASC	AST

	K	K	K	IN-K	IN-K	IN-K			KSI	KSI	
1	-.4	.0	-13.6	-.0	16.5	.0	.54	.26	.96	.69	
2	-.4	.0	-13.0	-.0	16.5	.0	.51	.25	.96	.69	
3	-.4	.0	18.9	-.0	16.2	.0	.53	.12	1.19	.91	#
4	-.4	.0	19.3	-.0	16.2	.0	.55	.12	1.19	.92	#
5	-.4	.0	19.8	-.0	16.1	.0	.56	.12	1.19	.92	#
6	-.4	.0	20.2	-.0	16.0	.0	.57	.12	1.19	.92	#
7	-.4	.0	20.6	-.0	15.9	.0	.58	.11	1.20	.93	#
8	-.4	.0	21.1	-.0	15.8	.0	.60	.11	1.20	.93	#
9	-.4	.0	-9.0	-.0	16.1	.0	.35	.19	.99	.72	
10	-.4	.0	-8.4	-.0	16.0	.0	.33	.18	.99	.73	
11	-.4	.0	-7.8	-.0	16.0	.0	.31	.17	1.00	.73	
12	.4	.0	30.0	-.0	-15.6	.0	.85	.12	1.26	.99	#
13	.4	.0	30.2	-.0	-15.5	.0	.86	.12	1.26	1.00	#
14	.4	.0	.2	-.0	-16.2	.0	.00	.22	1.06	.78	
15	.4	.0	.6	-.0	-16.2	.0	.02	.22	1.06	.79	
16	.4	.0	1.0	-.0	-16.1	.0	.03	.21	1.06	.79	
17	.4	.0	1.5	-.0	-16.0	.0	.04	.21	1.06	.79	
18	.4	.0	1.9	-.0	-15.9	.0	.05	.21	1.07	.80	
19	.4	.0	2.4	-.0	-15.8	.0	.07	.21	1.07	.80	
20	.4	.0	2.8	-.0	-15.7	.0	.08	.20	1.07	.80	
21	.4	.0	32.3	-.0	-14.7	.0	.91	.14	1.27	1.01	#
22	.4	.0	32.6	-.0	-14.6	.0	.92	.14	1.27	1.02	#

LOAD CASE - 5

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	-.0	.0	13.4	.1	.8	.0	.38	.14	1.09	.93	#
2	-.0	.0	13.3	.1	.9	.0	.38	.14	1.09	.93	#
3	.0	.0	14.3	.1	.3	.0	.41	.13	1.10	.94	#
4	-.0	.0	14.4	.1	.4	.0	.41	.13	1.10	.94	#
5	-.0	.0	14.4	.1	.5	.0	.41	.13	1.10	.94	#
6	-.0	.0	14.5	.1	.6	.0	.41	.13	1.10	.94	#
7	-.0	.0	14.5	.1	.7	.0	.41	.13	1.10	.94	#
8	-.0	.0	14.5	.1	.8	.0	.41	.13	1.10	.94	#
9	-.0	.0	12.1	.1	1.7	.0	.34	.14	1.09	.92	#
10	-.0	.0	11.9	.1	1.8	.0	.34	.14	1.09	.92	#
11	-.1	.0	11.8	.1	1.9	.0	.33	.14	1.09	.91	#
12	-.0	.0	14.1	.1	.7	.0	.40	.13	1.10	.93	#
13	-.0	.0	14.3	.1	.6	.0	.41	.13	1.10	.94	#
14	.0	.0	14.8	.1	-.3	.0	.42	.13	1.10	.94	#
15	.0	.0	14.9	.1	-.4	.0	.42	.13	1.10	.94	#
16	.0	.0	14.9	.1	-.5	.0	.42	.13	1.10	.94	#
17	.0	.0	15.0	.1	-.6	.0	.42	.13	1.10	.94	#
18	.0	.0	15.0	.1	-.7	.0	.43	.13	1.10	.94	#
19	.0	.0	15.1	.1	-.8	.0	.43	.13	1.11	.94	#
20	.0	.0	15.1	.1	-.9	.0	.43	.13	1.11	.94	#
21	.0	.0	16.3	.1	-.2	.0	.46	.13	1.11	.95	#
22	.0	.0	16.6	.1	-.3	.0	.47	.13	1.11	.95	#

LOAD CASE - 6

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI

1	-.Ø	.Ø	10.7	.Ø	1.6	.Ø	.30	.14	1.08	.91 #
2	-.Ø	.Ø	10.6	.Ø	1.7	.Ø	.30	.14	1.08	.91 #
3	-.Ø	.Ø	13.2	.Ø	1.1	.Ø	.37	.14	1.09	.93 #
4	-.Ø	.Ø	13.3	.Ø	1.2	.Ø	.38	.14	1.09	.93 #
5	-.Ø	.Ø	13.3	.Ø	1.3	.Ø	.38	.14	1.09	.93 #
6	-.Ø	.Ø	13.4	.Ø	1.4	.Ø	.38	.14	1.10	.93 #
7	-.Ø	.Ø	13.4	.Ø	1.5	.Ø	.38	.14	1.10	.93 #
8	-.Ø	.Ø	13.5	.Ø	1.6	.Ø	.38	.14	1.10	.93 #
9	-.1	.Ø	9.8	.Ø	2.3	.Ø	.28	.15	1.07	.90 #
10	-.1	.Ø	9.7	.Ø	2.4	.Ø	.27	.15	1.07	.90 #
11	-.1	.Ø	9.6	.Ø	2.5	.Ø	.27	.15	1.07	.90 #
12	.Ø	.Ø	10.8	.Ø	-.4	.Ø	.31	.14	1.07	.91 #
13	.Ø	.Ø	11.Ø	.Ø	-.5	.Ø	.31	.14	1.08	.91 #
14	.Ø	.Ø	9.7	.Ø	-1.1	.Ø	.27	.15	1.07	.90 #
15	.Ø	.Ø	9.7	.Ø	-1.2	.Ø	.28	.15	1.07	.90 #
16	.Ø	.Ø	9.8	.Ø	-1.3	.Ø	.28	.15	1.07	.90 #
17	.Ø	.Ø	9.8	.Ø	-1.4	.Ø	.28	.15	1.07	.90 #
18	.Ø	.Ø	9.9	.Ø	-1.5	.Ø	.28	.15	1.07	.90 #
19	.Ø	.Ø	10.Ø	.Ø	-1.6	.Ø	.28	.15	1.07	.90 #
20	.Ø	.Ø	10.Ø	.Ø	-1.7	.Ø	.28	.15	1.07	.90 #
21	.Ø	.Ø	12.8	.Ø	-1.1	.Ø	.36	.14	1.09	.93 #
22	.Ø	.Ø	13.1	.Ø	-1.2	.Ø	.37	.14	1.09	.93 #

LOAD CASE - 7

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	.Ø	.Ø	9.5	.Ø	-.3	.Ø	.27	.15	1.06	.90 #
2	.Ø	.Ø	9.4	.Ø	-.3	.Ø	.26	.15	1.06	.90 #
3	.Ø	.Ø	8.4	.Ø	-.7	.Ø	.24	.15	1.06	.90 #
4	.Ø	.Ø	8.4	.Ø	-.6	.Ø	.24	.15	1.06	.90 #
5	.Ø	.Ø	8.4	.Ø	-.5	.Ø	.24	.15	1.06	.90 #
6	.Ø	.Ø	8.4	.Ø	-.4	.Ø	.24	.15	1.06	.90 #
7	.Ø	.Ø	8.4	.Ø	-.4	.Ø	.24	.15	1.06	.90 #
8	.Ø	.Ø	8.4	.Ø	-.3	.Ø	.24	.15	1.06	.90 #
9	.Ø	.Ø	8.4	.Ø	.2	.Ø	.24	.15	1.06	.90 #
10	.Ø	.Ø	8.2	.Ø	.3	.Ø	.23	.15	1.06	.90 #
11	-.Ø	.Ø	8.1	.Ø	.4	.Ø	.23	.15	1.06	.89 #
12	-.Ø	.Ø	10.4	.Ø	1.5	.Ø	.29	.14	1.07	.91 #
13	-.Ø	.Ø	10.5	.Ø	1.4	.Ø	.30	.14	1.08	.91 #
14	-.Ø	.Ø	12.6	.Ø	.7	.Ø	.36	.14	1.09	.92 #
15	-.Ø	.Ø	12.6	.Ø	.6	.Ø	.36	.14	1.09	.93 #
16	-.Ø	.Ø	12.6	.Ø	.5	.Ø	.36	.14	1.09	.93 #
17	-.Ø	.Ø	12.6	.Ø	.4	.Ø	.36	.14	1.09	.93 #
18	.Ø	.Ø	12.6	.Ø	.4	.Ø	.36	.14	1.09	.93 #
19	.Ø	.Ø	12.6	.Ø	.3	.Ø	.36	.14	1.09	.93 #
20	.Ø	.Ø	12.6	.Ø	.2	.Ø	.36	.14	1.09	.93 #
21	-.Ø	.Ø	11.7	.Ø	.8	.Ø	.33	.14	1.08	.92 #
22	-.Ø	.Ø	11.9	.Ø	.7	.Ø	.34	.14	1.08	.92 #

LOAD CASE - 8

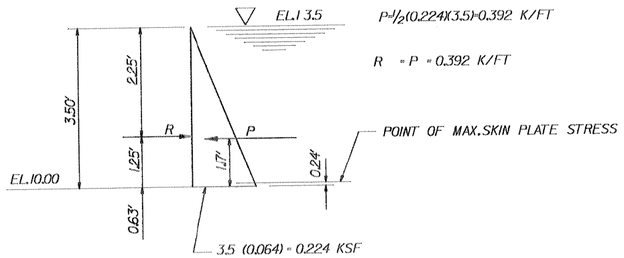
PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI
1	-.2	.Ø	19.5	.1	7.8	.Ø	.55	.12	1.16	.95 #
2	-.2	.Ø	19.5	.1	8.Ø	.Ø	.55	.12	1.16	.95 #

3	-.2	.Ø	33.8	.1	6.7	.Ø	.96	.15	1.26	1.Ø5	#
4	-.2	.Ø	34.1	.1	6.9	.Ø	.97	.16	1.26	1.Ø5	#
5	-.2	.Ø	34.5	.1	7.1	.Ø	.98	.16	1.26	1.Ø5	#
6	-.2	.Ø	34.9	.1	7.2	.Ø	.99	.16	1.27	1.Ø6	#
7	-.2	.Ø	35.2	.1	7.4	.Ø	1.ØØ	.17	1.27	1.Ø6	#
8	-.2	.Ø	35.6	.1	7.6	.Ø	1.Ø1	.17	1.27	1.Ø6	#
9	-.2	.Ø	19.6	.1	9.3	.Ø	.55	.12	1.17	.94	#
1Ø	-.3	.Ø	19.6	.1	9.5	.Ø	.55	.12	1.17	.94	#
11	-.3	.Ø	19.6	.1	9.7	.Ø	.56	.12	1.17	.94	#
12	.2	.Ø	17.7	.1	-5.7	.Ø	.5Ø	.12	1.14	.94	#
13	.2	.Ø	18.4	.1	-5.8	.Ø	.52	.12	1.15	.95	#
14	.2	.Ø	6.9	.1	-6.7	.Ø	.19	.15	1.Ø7	.86	#
15	.2	.Ø	7.2	.1	-6.9	.Ø	.2Ø	.15	1.Ø7	.87	#
16	.2	.Ø	7.6	.1	-7.1	.Ø	.22	.15	1.Ø8	.87	#
17	.2	.Ø	8.Ø	.1	-7.2	.Ø	.23	.15	1.Ø8	.87	#
18	.2	.Ø	8.3	.1	-7.4	.Ø	.24	.15	1.Ø8	.87	#
19	.2	.Ø	8.7	.1	-7.6	.Ø	.25	.15	1.Ø8	.87	#
2Ø	.2	.Ø	9.1	.1	-7.8	.Ø	.26	.15	1.Ø9	.88	#
21	.2	.Ø	23.8	.1	-7.1	.Ø	.67	.1Ø	1.19	.98	#
22	.2	.Ø	24.5	.1	-7.2	.Ø	.69	.1Ø	1.19	.98	#

LOAD CASE - 9

PILE	F1 K	F2 K	F3 K	M1 IN-K	M2 IN-K	M3 IN-K	ALF	CBF	ASC KSI	AST KSI	
1	.1	.Ø	17.4	.1	-5.Ø	.Ø	.49	.12	1.14	.94	#
2	.1	.Ø	17.2	.1	-4.9	.Ø	.49	.12	1.13	.94	#
3	.1	.Ø	7.1	.1	-5.4	.Ø	.2Ø	.15	1.Ø7	.87	#
4	.1	.Ø	7.1	.1	-5.3	.Ø	.2Ø	.15	1.Ø7	.87	#
5	.1	.Ø	7.1	.1	-5.2	.Ø	.2Ø	.15	1.Ø7	.87	#
6	.1	.Ø	7.1	.1	-5.Ø	.Ø	.2Ø	.15	1.Ø6	.87	#
7	.1	.Ø	7.1	.1	-4.9	.Ø	.2Ø	.15	1.Ø6	.87	#
8	.1	.Ø	7.2	.1	-4.7	.Ø	.2Ø	.15	1.Ø6	.87	#
9	.1	.Ø	15.4	.1	-4.Ø	.Ø	.43	.13	1.12	.93	#
1Ø	.1	.Ø	15.1	.1	-3.8	.Ø	.43	.13	1.12	.93	#
11	.1	.Ø	14.8	.1	-3.7	.Ø	.42	.13	1.11	.93	#
12	-.2	.Ø	21.Ø	.1	7.2	.Ø	.59	.11	1.17	.96	#
13	-.2	.Ø	21.2	.1	7.1	.Ø	.6Ø	.11	1.17	.96	#
14	-.1	.Ø	33.4	.1	5.4	.Ø	.94	.15	1.25	1.Ø5	#
15	-.1	.Ø	33.4	.1	5.3	.Ø	.94	.15	1.25	1.Ø5	#
16	-.1	.Ø	33.4	.1	5.2	.Ø	.94	.15	1.25	1.Ø5	#
17	-.1	.Ø	33.4	.1	5.Ø	.Ø	.94	.15	1.25	1.Ø5	#
18	-.1	.Ø	33.4	.1	4.9	.Ø	.94	.15	1.25	1.Ø5	#
19	-.1	.Ø	33.4	.1	4.7	.Ø	.94	.15	1.25	1.Ø6	#
2Ø	-.1	.Ø	33.4	.1	4.6	.Ø	.95	.15	1.25	1.Ø6	#
21	-.2	.Ø	23.4	.1	6.Ø	.Ø	.66	.11	1.18	.98	#
22	-.2	.Ø	23.6	.1	5.9	.Ø	.67	.11	1.18	.98	#

LOADING



SKIN PLATE

LOAD, w = 0.064 (3.5-0.24) = 0.209 K/FT

USE 5/16" MINIMUM THICKNESS OF SKIN PLATE

$S = \frac{bt^2}{6} = 0.1953$ IN ^{3}/FT

MAXIMUM ALLOWABLE MOMENT = SF_b =

0.1953 (20.0) = 3.91 IN-K/FT = 0.3255 FT-K/FT

INTERIOR SPAN, $M = \frac{1}{12} w\ell^2$

$\frac{1}{12} w\ell^2 = 0.3255$

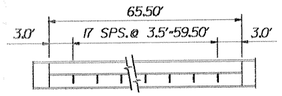
$\frac{1}{12}(0.209)\ell^2 = 0.3255$

$\ell = 4.32$ FT (ALLOW. SPAN), USE 3.50 FT

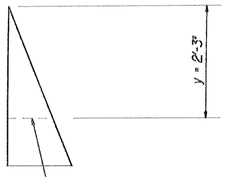
EXTERIOR SPAN, $M = \frac{1}{10} w\ell^2$

$\frac{1}{10} w\ell^2 = 0.3255$

$\ell = 4.08$ FT (ALLOW. SPAN), USE 3.00 FT

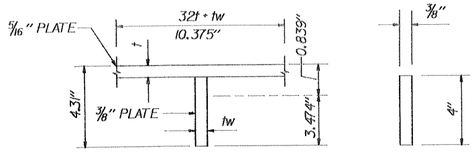


VERTICAL STIFFENERS



MOMENT = 0.064 X 2.25^3 X 1/6

= 0.12 K/FT



EFFECTIVE FLANGE WIDTH

AISC 1.9.1.2

$\frac{95^k}{\sqrt{36{,}000}} = 16$

32 x 0.3125" + 0.375 = 10.375"

ITEM	AREA	y	Ay	Ay^2	Io
PLATE 10.375" x 5/16"	3.242	0.156	0.506	0.079	—
PLATE 4" x 3/8"	1.50	2.313	3.470	8.026	2
	4.742	(0.838)	3.976	8.105	2

$y = \frac{\Sigma Ay}{\Sigma A} = \frac{3.976}{4.742} = 0.839$

$I = I + \Sigma Ay^2 - (Ay \times y)$

$2 + 8.105 - (3.976 \times 0.839)$

$= 6.769$ In ^{4}

$S_{TOP} = \frac{I}{C_{TOP}} = \frac{6.769}{0.839} = 8.068^3$

$S_{BOT} = \frac{I}{C_{BOT}} = \frac{6.769}{3.474} = 1.949^3$

$f_s = \frac{M}{S_{BOT}} = \frac{(0.12)(3.125)(12)}{1.949} = 2.309$ ksi $<<$ allow = 20 ksi

GIRDERS

Span = Opening + Column Face to c/l Seal + Column Face to c/l Seal

Span = 62.0 + 1.75 + 2.75 = 66.50'

Try W30 x 99

Load, w = 0.39 k/ft

$M = \frac{1}{8} w\ell^2 = \frac{1}{8}(0.39)(66.50) = 215.6$ ft-k

per AISC 1.5.1.4.1 and EM 1110-1-2101

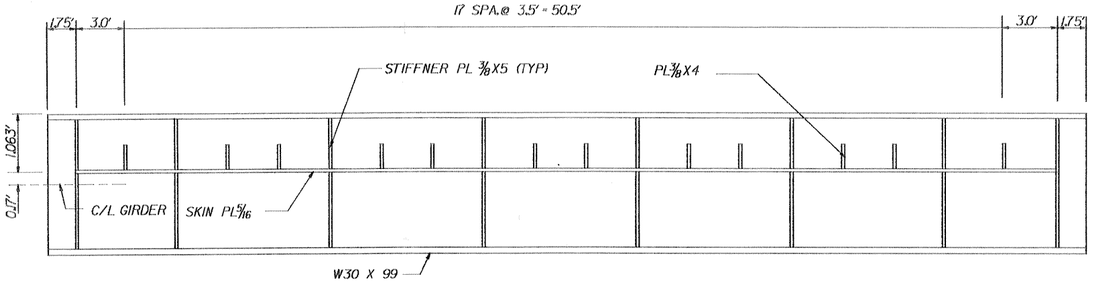
$f_b = \frac{M}{S} = \frac{215.8(12)}{269} = 9.62$ ksi < 20.0 ksi, ok use W30 x 99

DEFLECTION :

$\Delta_{max} = \frac{5w\ell^4}{384EI}$

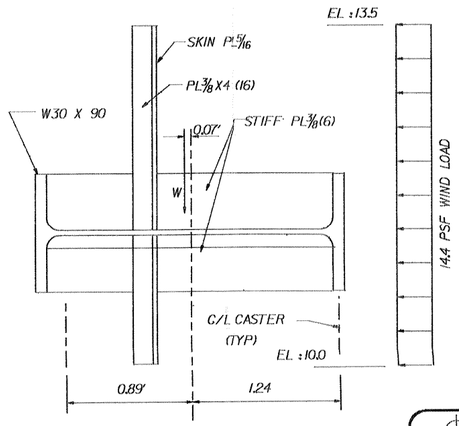
$= \frac{5(0.39)(66.50)(66.50x12)^3}{384(29x10^3)(3990)} = 0.12"$

$\Delta_{allow} = \frac{\ell}{360} = 2.21" < 0.33"$ OK USE WF30X99



ITEM	COMPUTATION	WEIGHT (LB)	x (FT) TO C/L GIRDER	wx (FT – LB)
5/16 PL	3.42x65.50x12.8	2867	0.17	487
W30x99	69X99	6831	0.0	0.0
PL 3/8x4X2.25 (12)	12X2.25X5.1	138	0.33	45
PL 3/8x4X1.25 (12)	12X1.25X5.1	77	0.33	25
PL 3/8x4X0.83 (6)	6x0.83X5.1	25	0.33	8
PL 3/8x4X1.83 (6)	6x1.83x5.1	56	0.33	18
PL 3/8x5 (16)	16X2.36X6.38	241	0.0	0
L 5x3 1/2 X 1/2	65.5X13.6	891	0.1	9
L 6x4X1/2	2x3.50x16.2	113	1.11	125
WELD 4 1/4	0.21x(2x65.5+40x3.50)	57	0.17	10
1 1/2 In^2 Bar	2x3.5x7.66	54	1.30	70
		11,350	(0.070')	797

GATE DEAD WEIGHT



CHECK GATE STABILITY

GATE WEIGHT 'W' = 11,350

RESISTING MOMENT 'M_R' = 11,350 (0.89 - .07)

= 9,799 FT-LBS

FOR 75 MPH WIND, WIND PRESSURE = $0.00256X75^2$

= 14.40 PSF

OVER TURNING MOMENT 'M_O' = $\frac{1}{2}$X14.4X3.5 ^{2}X65.5

= 5,777 FT-LBS

$M_R > M_O$ GATE IS STABLE

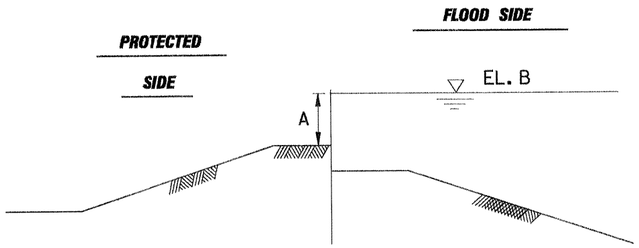
C·A·D

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20 GENERAL DESIGN
ORLEANS PARISH – JEFFERSON PARISH
17TH. STREET OUTFALL CANAL
(METAIRIE RELIEF)

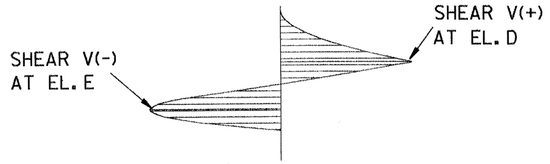
ROLLER GATE DESIGN

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: MARCH 1990 FILE NO. H-2-30300

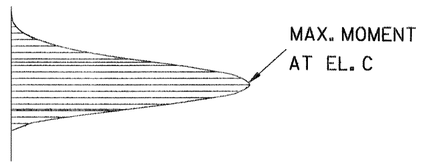
PLATE DD 2



I-WALL / LEVEE SECTION



SHEAR DIAGRAM



BENDING MOMENT DIAGRAM

JEFFERSON PARISH SIDE (WEST BANK)

STATION TO STATION LIMITS	SHEET PILE TYPE	NET SHEET PILE STICKUP (A)	PLATE NO. FOR PRESS. DIAGRAM	FACTOR OF SAFETY	GOVERNING LOAD CASE (Q OR S)	SWL (NGVD) FOR GOVERNING LOAD CASE (B)	MAX. BENDING STRESS f_b (ksi)	LOCATION OF MAX. BENDING STRESS EL. (NGVD) (C)	MAX. SHEAR STRESS f_v (ksi)	LOCATION OF MAX. SHEAR STRESS EL. (NGVD) (D OR E)	MAX. DEFLECTION (IN.)
STA 549+22 TO 552+70 B/L	PZ-22	4.0	109	1.0	Q	13.5	0.6	8.63	-0.4	7.35	0.01
STA 549+22 TO 552+70 B/L *	PZ-27	*	121	1.5	Q	-5.0	2.3	-9.19	0.3	-2.00	-0.10
STA 554+00 TO 589+00 B/L	PZ-22	7.6	110	1.0	Q	13.6	4.9	3.04	-1.1	-0.33	0.37
STA 589+00 TO 614+00 B/L	PZ-22	6.6	111	1.0	Q	13.6	3.0	4.90	-0.9	2.30	0.14
STA 614+00 TO 625+25 B/L	PZ-22	6.1	112	1.0	Q	13.6	2.3	5.76	-0.8	3.52	0.08
STA 625+25 TO 635+00 B/L	PZ-22	6.1	113	1.0	Q	14.1	2.3	6.27	-0.8	4.00	0.08
STA 635+00 TO 641+50 B/L	PZ-22	2.6	114	1.0	Q	14.1	0.1	11.18	-0.2	10.57	0.00
STA 641+50 TO 663+00 B/L	PZ-22	2.6	115	1.0	Q	14.6	0.1	11.74	-0.2	11.33	0.00
STA 663+00 TO 670+00 B/L	PZ-22	4.1	116	1.0	Q	14.6	0.6	10.00	-0.8	8.94	0.00

* TIEBACK SHEET PILE WALL TO SUPPORT I-WALL SECTION IN THIS REACH

NOTE:
THE SHEARS, DEFLECTIONS, AND BENDING MOMENTS WERE OBTAINED BY THE USE OF THE BEAMS PROGRAM (X0015) OF THE WES LIBRARY.

ORLEANS PARISH SIDE (EAST BANK)

STATION TO STATION LIMITS	SHEET PILE TYPE	NET SHEET PILE STICKUP (A)	PLATE NO. FOR PRESS. DIAGRAM	FACTOR OF SAFETY	GOVERNING LOAD CASE (Q OR S)	SWL (NGVD) FOR GOVERNING LOAD CASE (B)	MAX. BENDING STRESS f_b (ksi)	LOCATION OF MAX. BENDING STRESS EL. (NGVD) (C)	MAX. SHEAR STRESS f_v (ksi)	LOCATION OF MAX. SHEAR STRESS EL. (NGVD) (D OR E)	MAX. DEFLECTION (IN.)
STA 545+80 TO 552+70 B/L	ARBED BZ12.IL	5.0	100	1.5	Q	-5.0	0.2	5.05	-0.2	4.26	0.00
STA 554+00 TO 568+00 B/L	PZ-22	8.1	101	1.0	Q	13.6	6.2	2.00	1.1	5.50	0.59
STA 568+00 TO 589+00 B/L	PZ-22	8.1	102	1.0	Q	13.6	6.2	2.00	1.1	5.50	0.59
STA 589+00 TO 614+00 B/L	PZ-22	8.1	103	1.0	Q	13.6	6.2	2.00	1.1	5.50	0.59
STA 614+00 TO 625+00 B/L	PZ-22	7.1	104	1.0	Q	13.6	3.8	4.00	-0.9	1.02	0.23
STA 625+00 TO 635+00 B/L	PZ-22	6.6	105	1.0	Q	14.1	3.0	5.41	-0.9	2.81	0.14
STA 635+00 TO 642+00 B/L	PZ-22	4.6	106	1.0	Q	14.1	0.8	8.78	-0.5	7.58	0.01
STA 642+00 TO 663+00 B/L	PZ-22	2.6	107	1.0	Q	14.6	0.1	11.74	-0.2	11.40	0.00
STA 663+00 TO 670+63 B/L	PZ-22	3.6	108	1.0	Q	14.6	0.4	10.57	-0.3	9.79	0.00

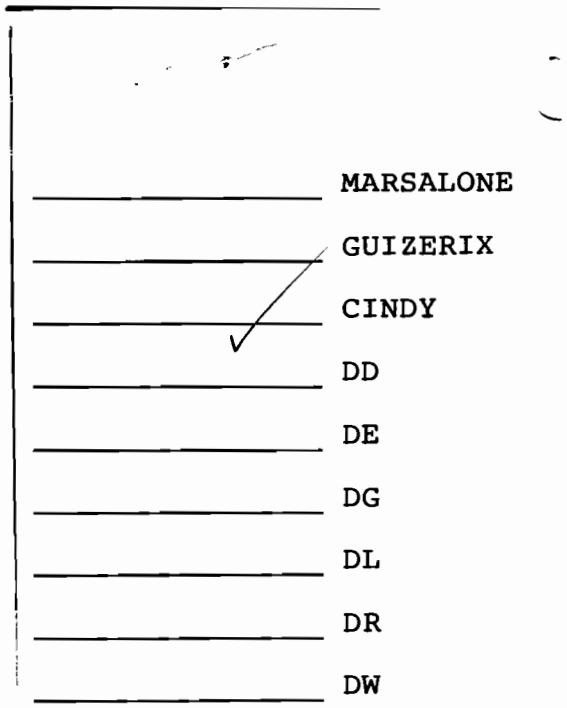
COMPUTER AIDED DESIGN DRAFTING

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN
DESIGN MEMORANDUM NO. 20 GENERAL DESIGN
ORLEANS PARISH – JEFFERSON PARISH
17TH STREET OUTFALL CANAL
(METAIRIE REFIEF)

STRUCTURAL ANALYSIS OF I-WALLS

U. S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
DATE: MARCH 1990 FILE NO. **H-2-30300**

PLATE DD3



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CELMN-ED-DD 2 May 90

MEMORANDUM FOR C/Des Svcs Br

SUBJECT: Lake Pont., LA & Vic. HPP - Design Memorandum No. 20 - 17th St. Outfall Canal - Internal Review Comments Construction Division

1. Reference your multiple memorandum dated 26 Apr 90, subject as above.

2. Our response to the subject comments were coordinated with Mr. Van Stutts of your office on 1 May 90. A copy of Engineering Division response to Construction Division is attached for your response.

Atch

DANIEL A. MARSALONE
Chief, Design Branch

CELMN-ED-SP(CELMN-CD-QR/20 Apr. 90) 1st End 1 May 1990
Messrs. Romero/Stutts/2645/2614

MEMORANDUM FOR: C/Construction Div, ATTN: CELMN-CD-QR

SUBJECT: Review of Draft Report for Lake Pontchartrain, Louisiana & Vicinity, Hurricane Protection Project, 17th Street Outfall Canal, Design Memorandum No. 20

1. Our responses to comments contained in the basic memorandum are as follows:

a. Comment 2.(1) Both the Orleans Levee Board and the East Jefferson Levee District share responsibility for assuring the work described in the DM. In general, the levee work on the east bank of the canal is the responsibility of the Orleans Levee Board and the west bank of the canal is the responsibility the East Jefferson Levee District. Responsibility for construction costs at the bridges will most likely be equally split between the two levee districts.

PLATE 2

b. Comment 2.(2) Concur. The Orleans Levee Board at this time plans to construct the first phase of the east bank flood wall themselves. The Corps will award the contract to place the concrete cap on the wall. The levee Board has the responsibility to insure a clear rights-of-way is available to construct, operate, and maintain the project.

PLATE 3

c. Comment 2.(3) The pipe outfall in question is a temporary outfall. We expect it to be removed prior to initiation of construction.

d. Comment 2.(4) Concur. We will incorporate, in the plans and specifications, special provisions to construct the flood wall under the high tension aerial power line. The added cost to construct the short segment of wall is covered by the contingencies in the DM cost estimate.

e. Comment 2.(5) Concur. We will address these small details in the plans and specifications. Removal of the steps is the responsibility of the levee board. Replacement is at their option and cost.

f. Comment 2.(6) The DM does contain a cost estimate to remove and replace the asphalt bike path. We will include details on the removal and replacement of the bike path in the construction drawings.

g. Comment 2.(7) Concur. Prior to construction, we will re-survey the entire job site and establish in the field the R/W and B/L. Pertinent survey information will be made available to the contractor.

h. Comment 2.(8) Concur. During construction, we will require the contractor to use erosion control measures such as those identified in your comment. Once a segment of the levee is completed by the contractor, we will require him to mulch and seed the levee.

i. Comment 2.(9) We concur in your assessment of the congestive nature of the work area. The list of access roads shown on page 30 of the DM is only intended to illustrate that there are numerous points of access potentially available to construct this job. The list is not intended to be all inclusive and the absence from the list of a particular access route does not preclude it from being added prior to advertising the work. We will make a formal request for specific access routes after having met with levee board and parish officials to discuss pros and cons of the various access points. We agree that use of the vacant lots which you identified in your comment would be most helpful in the conduct of the contracts. However, we did not at this time identify them in the DM to avoid land speculation which would drive up costs. We will however, at the appropriate time request the use of the properties in question.

j. Comment 2.(10) We concur with your assessment of conditions along the canal banks. At this time, we expect that most of the boats, boat docks, etc. will have been removed by the New Orleans Sewerage and Water Board in preparation for their drainage improvement project. If however objects remain in the canal and adjacent banks, we will request the levee board have them cleared prior to any construction. Access to construct the levee from canal based equipment will be an option available to the contractor.

PLATE 4

k. Comment 2.(11) See our response e. above.

l. Comment 2.(12) See our response f. above.

m. Comment 2.(13) See our response g. above.

PLATE 5

n. Comment 2.(14) See our response e. above.

o. Comment 2.(15) The U.S. Sprint line located at B/L Sta. 645+00 was put in under a recent permit. The applicant was required to install the line so that it could readily be relocated and incorporated into the project design. The specifics of the relocation will be addressed in the plans and specifications.

p. Comment 2.(16) See our response e. above.

PLATES 7 and 9

q. Comment 2.(17) The Louisiana Department of Transportation and Development has indicated that they will schedule the work at the bridges in their 5- yr. capitol outlay program. We will coordinate the floodwall design and construction with the bridge work so that the two items of work will be compatible. The Plates in the DM represent the final configuration of the floodwall and are not intended to be used as the construction drawings. The contract drawings will indicate no work areas at the time that they are prepared, if appropriate.

PLATE 10

r. Comment 2.(18) The existing treated timber mooring piles, sheetpile bulkhead tie rods, concrete pavement at elevation 3.5 and concrete tie-back anchor system are to remain. This will be clarified on the construction drawings.

s. Comment 2.(19) The elevation of the ground surface on the floodside of the floodwall is dictated by stability requirements. The extended face section is needed to protect the steel sheetpile.

t. Comment 2.(20) The riprap shown on the Plate 10 will be of minimum thickness (18"). We will specify gradation requirements in the Plans and Specifications.

PLATE 11

u. Comment 2.(21) The Orleans Levee Board will be constructing the first phase of the east bank floodwall work. The sequence of construction that you suggest in your comment is a good approach to building the job. It is similar to the sequence used for the Jefferson/St. Charles return levee except that, there, the new work was on the flood side of the existing sheetpile wall.

PLATES 10 through 14

v. Comment 2.(22) Concur. See our response i. above.

w. Comment 2.(23) The 17th Street outfall canal is to be dredged by the New Orleans Sewerage and Water Board. This work is currently scheduled prior to construction of the hurricane protection work.

PLATE 16

x. Comment 2.(24) The level of detail shown on the plate is more than what is considered necessary for DM scope. We will add any additional details that are needed during preparation of Plans and Specifications.

PLATES 17 and 18

y. Comment 2.(25) We will have the contractor remove the superstructures of the existing bridges and drive additional pilings. The new floodproofed superstructure is designed to protect against a project storm and allow for uninterrupted traffic flow. Work will proceed on one bridge at a time and the bridge not under construction will be used for both east and west bound traffic. The scope of coverage for the Veteran's bridge flood proofing is sufficient to develop DM scope cost estimates. The detail of coverage requested in your comment is considered to be of Plans and Specification scope. We will provide answers to these questions in the Plans and Specifications for the Bridge work.

z. Comment 2.(26) See our response y. above.

PLATE 19

aa. Comment 2.(27) The two pours for the gate monolith base are needed to facilitate the leveling of the sill plate.

bb. Comment 2.(28) Concur. The view as sectioned would technically not show the batter piles. We elected to show them in order to eliminate showing another detail on the DM

drawing.

cc. Comment 2.(29) We will dimension the pile spacing on the construction drawings. The plate as presented is sufficient for DM scope coverage.

W. EUGENE TICKNER
Acting Chief,
Engineering Division

CELMN-ED-SP(1110-2-1050a) 26 April 1990

Mr. Sparks/2614

MEMORANDUM FOR: C/ Design Br
C/ F & M Br
C/ Hyd & Hydro Br

SUBJECT: Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project, DM No. 20, 17th St Outfall Canal Internal Review Cmts Construction Division

Enclosed is a copy of the subject comments generated by Construction Division's review. Please provide responses to these comments and/or make corrections to the DM plates as you deem necessary. Provide your response by COB 1 May 1990.

Calvin W. Shelton

Enclosure

CALVIN W. SHELTON
Chief Design Services Br

CELMN-CD-QR (1180-1-1q) 20 April 1990

MEMORANDUM FOR C/Engr Div, ATTN: CELMN-ED-SP

SUBJECT: Review of Draft Report for Lake Pontchartrain, Louisiana & Vicinity, Hurricane Protection Project, 17th Street Outfall Canal, Design Memorandum No. 20

1. Reference CELMN-ED-SP memo dated 5 Apr 90.

2. The subject DM has been reviewed by Construction Division and the following comments are offered:

(1) To what extent are the Orleans Levee District and East Jefferson Levee District involved in the project as cost sharing partners or local assuring agencies? This question is asked since the majority of the project exists within the boundaries of Jefferson Parish?(CP)

PLATE 2

(2) The east bank R/W on this drawing was observed to be very narrow on a 19 April site visit with possible encroachments by private homeowners. Most of the rear fences in this reach are located half-way up the levee slope. The local assuring agency may have to resurvey and clear the R/W prior to the east bank construction contract.

PLATE 3

(3) An existing pipe outfall over the levee and sheetpile wall was observed at the intersection of West Esplanade and the levee on the west bank. It includes asphalt pavement on the F/S bank. Investigate this utility and address its relocation over or through the new floodwall.

(4) A high tension aerial powerline crossing exists over the levees and canal from the foot of West Esplanade(WB) to 36th Street(EB). Show this utility on the plate and address crossing under this utility with the new floodwalls. Its presence may impact the constructability of the floodwalls, especially the pile driving operations.

(5) Three existing concrete steps exist along this reach as shown on enclosure 2. Incorporate the removal/replacement of these items into the floodwall design.

(6) A 6' - 8' wide asphalt bike/jogging path exists on the levee crown from Magnolia Street to Veterans Blvd. Address its removal/replacement in the design.

PLATES 2 thru 5

(7) Provide tabular listings of B/L to R/W offset distances and azimuths.

(8) An extensive erosion control system(ie. haybales, silt fences) should be incorporated into the design to protect adjacent private/public property from the construction runoff.

(9) A 19 Apr 90 site visit revealed that the entire project area is extremely congested with limited R/W, access routes, etc.. for the safe movement/delivery of equipment, supplies, formwork, dump trucks, concrete trucks, etc...With reference to page 30 of the design report, are all the listed access roads available for use for the movement of heavy equipment and hauling operations? Many of the local streets listed probably have load limits and restrictions placed upon them. It is imperative that the local assuring agencies procure additional public/private easements/rights of way such that at least one-way access routes can be provided to the Government contractor for each reach on both sides of the canal. We recommend the following locations be considered for access in addition to the present ones of Old Hammond Highway and Orpheum Avenue:(CM,QR)

EAST BANK

(a) Vacant property at the intersection of Old Hammond highway and Bellaire Drive.

(b) Vacant lot on Bellaire Drive between 32nd and 33rd Streets(1/2 ton traffic only).

(c) Two vacant lots at the intersection of West Harrison and Bellaire Drive.

(d) Veterans Memorial Blvd and the levee(both sides).

(e) West Kenilworth at the intersection of the levee and I-10 WEST.

(f) Academy Drive at the intersection of the levee and I-10 EAST.

WEST BANK

(a) Intersection of West Esplanade and Orpheum Avenue.

(b) Several dead-end streets(ie. Lilac to Raspberry) along Lake Avenue which end at the levee.

(c) Veterans Memorial Blvd. and the levee(both sides).

(d) Intersection of North Frontage Road and the levee.

(e) Intersection of Holleygrove and the levee.

(f) Intersection of Canal Street and the levee.

(10) Numerous pleasure/fishing boats and their wooden docks are prevalent along the canal which may have to be removed prior to construction for clearing and grubbing operations along the banks as well as for marine access for equipment such as a pile driving rig and spud barge. Due to the narrow, congested levee R/W, the only viable alternative for pile driving equipment and storage area for formwork/supplies/etc.. may be from flexi-float barges placed within the 17th street canal. Address whether the canal will be available for access/use during construction.

PLATE 4

(11) A set of existing concrete steps are located at the foot of Raspberry Street on the west bank. Address its removal/replacement.

(12) An asphalt bike/jogging path exists from Veterans Blvd. to the North Frontage Road at the P/S levee toe. Address its removal/replacement.

(13) At the intersection of Paris Avenue(WB) and the levee a high tension powerline and powerpoles exist at the water's edge of the canal running south parallel to the levee. Show this utility on the plates and investigate whether it affects the floodwall or bank grading designs.

PLATE 5

(14) Three concrete steps exist on the west bank levee as shown on enclosure 2. Address their removal/replacement.

(15) A U.S. Sprint utility crossing exists near B/L Sta 645+00 as shown on enclosure 2. Address the relocation of this utility through the proposed new floodwalls.

(16) On the east bank levee from I-10 to the railroad, a series of small metal utility boxes(3' x 3' x 2'tall) exist 10' -15' within the R/W behind the residences. Investigate the nature of these items and address their relocation outside the construction R/W.

PLATES 7 and 9

(17) When is the raising of the interstate bridges to be accomplished by the state? Additional plates will be required illustrating the configuration of the proposed floodwalls with respect to the new raised bridges. If a delay is anticipated on the interstate raising then NO WORK AREAS in the floodwall may be necessary.(CP)

PLATE 10

(18) Provide sufficient notes stating whether the existing treated timber mooring piles, sheetpile bulkhead tie rods, concrete pavement at elev. 3.5 and concrete tie-back anchor system are to remain as is, removed or modified.(CM, CP)

(19) Reference TYPICAL SECTIONS on PLATE 15. On the West Bank, the new I-Wall has an extended floodside face whereas the east bank I-Wall does not have this design. All efforts should be made to use the same I-wall section in the design of the project. The standard I-wall section on the east bank is preferable to the extended face section due to the fact that it is easier to construct the formwork and place the concrete without the additional F/S studded anchors. The standardization of the TYPICAL I-WALL SECTIONS (tapered or rectangular) will result in substantial cost savings to the project. Therefore, if stability analysis allows, eliminate the extended face floodwall sections and raise the bankline to tie-in higher with the standard floodwall section.(CP,QR)

(20) West Bank. Provide the thickness and gradation of the proposed F/S riprap pavement.(CP)

PLATE 11

(21) East Bank. Consider allowing the option of removal of the existing concrete cap and PMA-22 sheetpile (20' long) after the new I-wall is constructed adjacent to it. This offers two advantages to the new construction. It enables the structural excavation trench of the new I-wall to remain dry until placement of the new wall and it provides interim hurricane protection until the new adjacent wall is complete.

PLATES 10 thru 14

(22) A nearby offsite storage area should be provided for the storage of pulled and new sheetpile due to the lack of available storage space along the construction area. The vacant land adjacent to Old Hammond Highway and Bellaire Drive would be an ideal location.(CM)

(23) Is the 17th Street Canal "to be dredged by others" prior to, concurrent with, or after construction of the two new floodwalls?

PLATE 16

(24) Provide additional details/information on the bolt type and spacings for the proposed "SPECIAL PSA-23 TEE" in SECTION A.(CM)

PLATES 17 and 18

(25) It is unclear as to what extent the existing structure of the Veterans Memorial bridges are to removed, replaced or modified. Are the existing bridges to be removed in their entirety and replaced with new piling, bents, beams, decks, approach abutments and parapet guardrails?

(26) If the two Veterans bridges are to be closed to traffic during floodproofing and other construction, the design should include closing only one span(ie. west or east) at a time with sufficient detour roads and traffic control signage to ensure the public's access and safety.

PLATE 19

(27) Is the two pour placement for the gate monolith mandatory or optional? Clarify.(CP)

(28) TYPICAL SECTION A should show ONLY battered piles due to the location of the section taken from the FLOOD SIDE ELEVATION.(CP)

(29) In PLAN, delineate the proposed concrete pile spacing.(CP)

3. POC is Lee Guillory, x2934.

DONALD F. HULL
Chief, Construction Division

2 Encls.

1. CELMN-ED-SP Memo
2. Red-lined DM Plates

APR 6 1990

5: 20 APR 90

CELMN-ED-SP (1110-2-1150a) 5 April 1990

Mr. Stutts/2614

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Lake Pontchartrain Louisiana & Vicinity Hurricane Protection Project - Design Memorandum No. 20 - 17th Street Outfall Canal - REVIEW OF DRAFT REPORT

1. Enclosed are copies of the subject DM.

2. Please review the report and comment by COB 20 April 90.

Encl

W. Eugene Tickner
Acting Chief
Engineering Division

DISTRIBUTION:

C/Ops & Redy Div
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CD-220/

The Board of Commissioners

OF THE

Orleans Levee District

SUITE 202 — ADMINISTRATION BUILDING
NEW ORLEANS LAKEFRONT AIRPORT

New Orleans, La.

70126

August 23, 1989

Mr. Neil L. Wagoner
Secretary
Department of Transportation
and Development
P. O. Box 94245
Baton Rouge, LA 70804-9245

RE: State Project No. 700-19-06
F.A.P. No. IR-10-5(260)231
I-10/I-610 Widening
17th Street Canal Bridges
Route I-10
Orleans Parish

Dear Mr. Wagoner:

I am writing in response to your letter dated June 27, 1989, concerning the referenced project.

The accompanying plans and data have been reviewed, and I have the following comments.

The design water surface elevation should be verified by the United States Army Corps of Engineers. Other water surface elevations (i.e., including freeboard) may have to be considered for the design. Since no bench mark is shown on the plans submitted, you should also confirm that the datum for the design is the same one that is used for calculating the design high water elevation.

The seal system used between the slab and the abutment must be approved by the USACE. All details relative to the seal system should be submitted in advance to the USACE and this Board for approval.

The USACE will consider the bridge as a hydraulic structure and pertinent design criteria required by them will have to be incorporated into the design.

It is also noted that you show a stub wall to tie into the future floodwall. The floodwall plans are now complete and we expect to have the flood protection project under construction in the latter part of this year and completed long before the bridges are built. In order to accommodate the proposed bridge construction, it will be necessary to leave out approximately four hundred feet of

the floodwall at this time. We will be glad to meet with you and your staff and/or consultants in the near future to discuss methods of providing interim flood protection during the period prior to completion of the bridges and also requirements for tying the bridge construction to the completed floodwall.

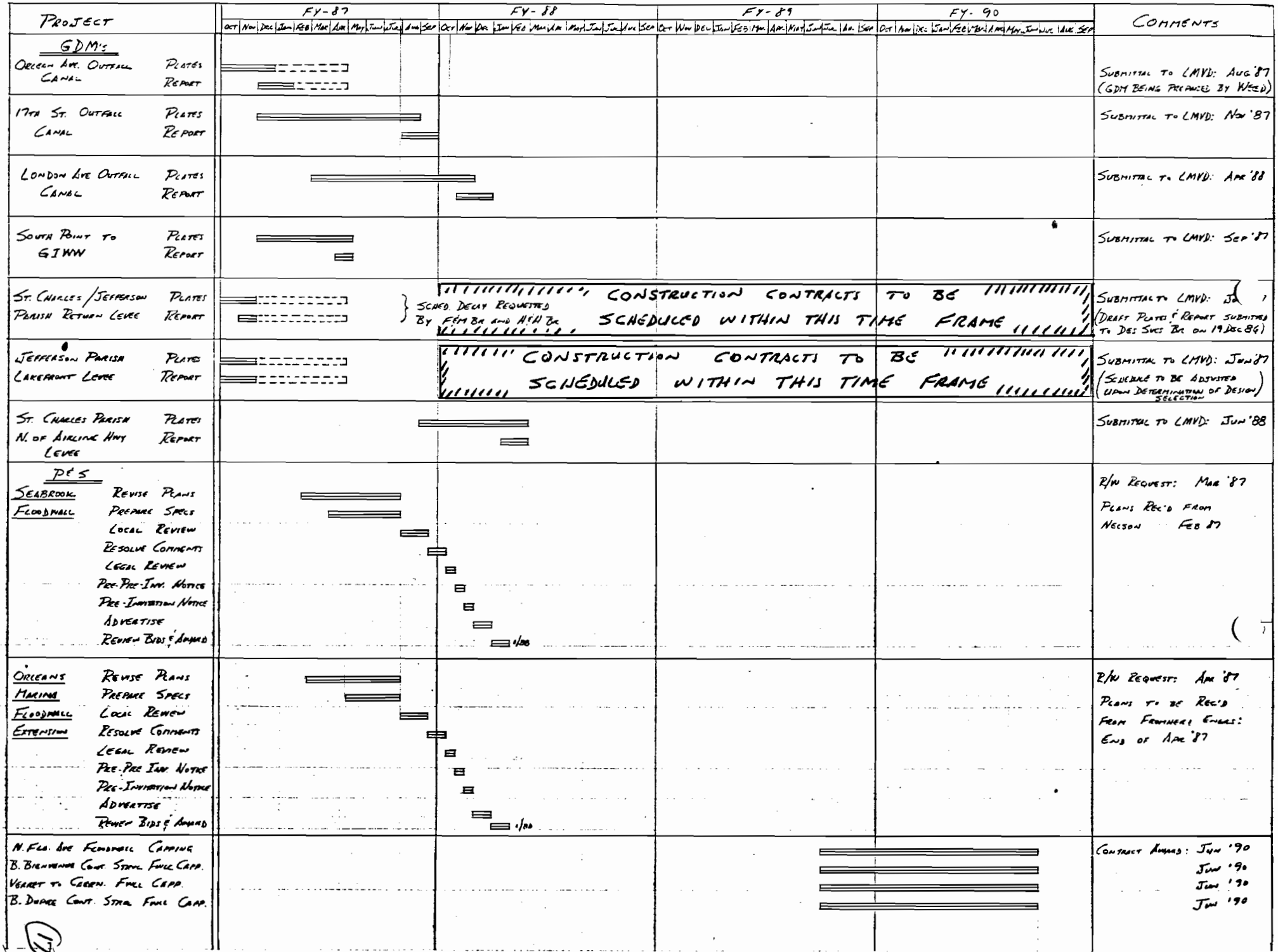
Sincerely,

C. E. Bailey
Chief Engineer

CEB:lah

xc: Mr. H. B. Lansden
Mr. Alan Francingues
Mr. Walter Baudier, Design Engineering, Inc.
Mr. Barney Martin, Modjeski & Masters
Mr. G. Joseph Sullivan, Sewerage & Water Board
Mr. Frederic Chatry, U. S. Corps of Engineers
Ms. Geneva Grille, Dept. of Transportation
Mr. Om P. Dixit, Burk & Associates

Schedule - Lake Pontchartrain Hurricane Protection Project

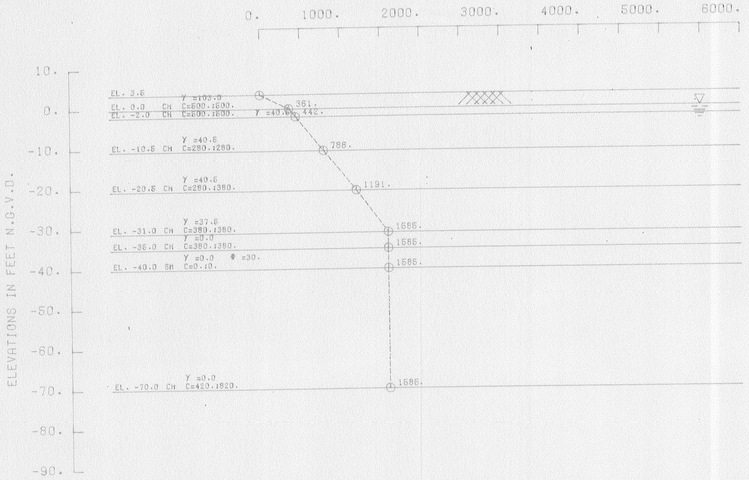


Utilities Crossing

(A)
① E-T
② 2" HPG
③ 12" CIW
> Vicinity sta. 550+00 B/E

(B) overhead Power line — Vicinity of sta 581+00

C. Overhead Power Line 631 ~ 679



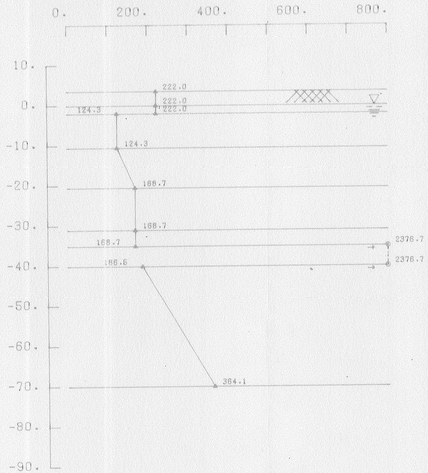
S-CASE
CH,CL- Φ=23°
ML- Φ=30°
SM,SP- Φ=30°,33°

TYPICAL SOIL PROFILE

SOIL STRATIFICATION IS BASED ON GEOLOGIC PROFILE
SHEAR STRENGTH AND WET DENSITIES SEE PLATE

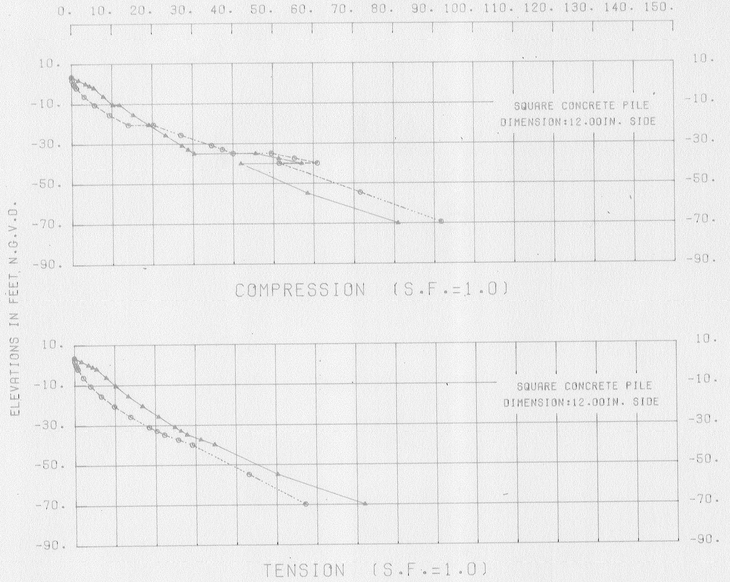
D	PILE SPACING IN DIRECTION OF LOADING
1.00	8B
0.85	7B
0.70	6B
0.55	5B
0.40	4B
0.25	3B

C	LOADING CONDITION
1.00	INITIAL LOADING
0.30	CYCLIC LOADING



NOTES: $K_H = \alpha K_1/B = (0.2222\,q_u/B)(C)(D)$ COHESIVE

- α = 0.4 = Factor of material properties of soil and pile
- k_1 = Modulus of subgrade reaction for test plate (pci)
- B_1 = Width or diameter of test plate (in)
- $K_1 = k_1 B_1 = 80\,q_u$(psf) = 0.5556 q_u(psi)
- q_u = 2·c = Unconfined compressive strength (psf)
- C = Reduction for cyclic loading-not applicable
- D = Group effect reduction factor
- B = Width of pile measured at right angles to the direction of displacement (in)
- $K_H = (nh)(Z/B)(C)(D)$ COHESIONLESS
- nh = Coefficient of horizontal subgrade reaction (pci)
- Z = Depth below equivalent ground surface (in)



THE FACTOR SHOWN, (MODULUS OF HORIZONTAL SUBGRADE K_H, TIMES THE PILE WIDTH IN INCHES (B), MEASURED AT RIGHT ANGLES TO THE DIRECTION OF DISPLACEMENT) MUST BE MODIFIED BY A REDUCTION FACTOR FOR THE EFFECT OF GROUP ACTION (D) AND A REDUCTION FACTOR FOR CYCLIC LOADING (C) EX: $K_H = \frac{0.2222\,q_u\,(C)(D)}{(B)}$

------ S-CASE
——— Q-CASE

NOTE: ALLOWABLE CAPACITIES SHOULD BE DETERMINED INCORPORATING F.S.=2.0 WITH PILE TEST OR F.S.=3.0 WITHOUT PILE TEST.

17TH ST OUTFALL CANAL ODM
HAMMOND HIGHWAY FLOODGATE
12" SQUARE PRESTRESSED CONCRETE PILES

PILE CAPACITY CURVES

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
NEW ORLEANS
JUNE 1987

CONCRETE SPECIFICATIONS July 15, 1988

For all future contracts containing concrete, a DF should be sent to F&M Branch (Materials Section) early in the design process submitting guide specs or relevant contract specification sections for review and updating. In addition to concrete, specifications for concrete piling, sheet piling, roadways and any other pertinent sections should also be reviewed. The updated specifications will be used in preparing the contract specifications to be sent out for local review. If necessary, a meeting may be arranged with F&M to discuss the revisions. Hopefully this procedure will reduce the number of comments we receive during local review.

Carl R. Guggenheimer

CARL R. GUGGENHEIMER

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245, Baton Rouge, Louisiana 70804-9245

NEIL L. WAGONER, P.E.
SECRETARY

June 27, 1989
(504) 379-1200

BUDDY ROEMER
GOVERNOR

STATE PROJECT NO. 700-19-06
F.A.P. NO. IR-10-5(260)231
I-10/I-610 WIDENING
(17TH STREET CANAL BRIDGES)
ROUTE I-10
ORLEANS PARISH

MR. FREDRIC CHATRY
CHIEF, ENGINEERING DIVISION
DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LA 70160-0267

Dear Sir:

As you are aware, the Department has been planning the replacement of the three I-10 and I-610 bridges over the 17th Street Canal in conjunction with the I-10 widening project which will eventually extend from Williams Boulevard to Metairie Road. Contrary to our previous plans to rebuild these bridges at a higher elevation, this was too costly and was rejected by the Federal Highway Administration. Therefore, the only viable option that would satisfy the proposed High Level Flood Protection Plan and provide uninterupted traffic flow for a hurricane event would be the sealing option. For this option, the abutments will be designed in a manner that will facilitate future connection to the proposed levee floodwalls. The bridge will consist of three 70' continuous spans with joints only at the abutments. These joints will be sealed to prevent water intrusion in the event of a flood.

The low concrete elevation will be 7.57 on the west end and 9.5 on the east end of the bridge, which will satisfy the New Orleans Sewerage and Water Board criteria. The sealed joints will be tested periodically to insure their adequacy for a hurricane event. The top of bridge rail elevation will be 14.5 to coincide with top of floodwall elevation.

Transmitted, herewith, for your review and comment are two blueline drawings showing a general plan of the bridge and cross sections of the abutment and sealing system. Also included is a brief writeup including a design summary.

(13)

3 JUL 89 CF: GUIZERIX
SOILEAU

Your expeditious review and favorable consideration of this concept would be greatly appreciated, as this is a much needed project due to the tremendous traffic problems on I-10 and poor condition of the lightweight bridge deck. It is requested that your conceptual approval or comments be received by July 21, 1989.

Sincerely,

NEIL L. WAGONER
DOTD SECRETARY

NLW:rdc
Attachment
cc: Mr. Dempsey White
Mr. Charles Higgins
Mr. Al Dunn
Mr. John Evanco
Mr. Kent Israel

State Project No. 700-19-06
F.A.P. No. IR-10-5(260)231
I-10/I-610 Widening
(17th Street Canal Bridges)
Route I-10
Orleans Parish

SEALING OF I-10 BRIDGES OVER THE 17TH. ST. CANAL

The I-10 bridges over the 17th St. Canal will be replaced with new bridges which will have the same profile as the existing bridges. The I-10 EB. and I-610 EB. will be combined over the canal and will be separated after crossing the canal. The existing I-10 EB. will be demolished after new bridges are built and open for traffic.

The new bridges over the canal will be built with three continuous spans of 3' thick voided slab and 4'-3" high concrete railing. It is recommended to provide 3' thick voided slab instead of precast concrete girders or cast-in-place rectangular concrete girders in order to have sufficient weight to overcome the uplift force from the canal water. The top of concrete railing will be at same elevation as the floodwall elevation which is 14.50. The high water elevation is at 12.50 which is 2'-0" above the bridge deck at west abutment. In order to keep water from coming in on the bridge deck, joint at both ends of 210' span over the canal must be sealed.

Several possible seal configurations that would be suitable for the I-10 bridges over the canal were studied. Following is the summary of the design features suggested for sealing the 17th St. Canal bridges.

(11)

DESIGN SUMMARY :

1. Sufficient bridge weight to completely overcome buoyant force to assure no net uplift, and eliminate need for hold down devices at expansion end of spans. In computing the buoyant force, it is assumed that the water level is at the elevation of 12.50, which is Corps of Engineers proposed highwater elevation for a 300 year storm. The top of floodwall is at elevation 14.50 due to 2 feet for waves and freeboard. It is felt that it is not necessary to take this additional 2 feet in computing uplift forces which are balanced by the weight of the structure. Additional anchorage of superstructure at the bents will be provided to take care of this 2 feet of additional uplift forces (see item 2).

2. The voided slab will be rigidly connected to the bents, and the piles will be solidly anchored into the caps, as the secondary measure to prevent uplift, which is caused by the high water elevation between 12.50 and 14.50.

3. At the west abutment of the bridge, a seal system with multiple backups, including a reservoir, will be employed beneath the bridge to prevent water intrusion from the canal. The reservoir will provide a holding area to test for leaks in the seals. It would only be necessary to pump water into the reservoir, and monitor the water level over a period of time. Portable pumps will be required for this procedure. A periodic testing and maintenance program by LDOTD will be required to assure proper working of seals.

4. The east abutment of the bridge is approximately 2' higher than the west abutment. The minimum deck slab elevation at the east abutment is approximately 12.50 which is same as high water elevation. Therefore, we have not recommended an extensive seal system in the reservoir at the east abutment. Instead, a continuous J type waterstop at top anb bottom of reservoir and a strip seal at joint opening are recommended as means of sealing system.

5. The existing floodwalls will be raised (by others) to an elevation 14.50 and an expansion joint with a waterstop will be provided between raised floodwall and new abutment wall. Therefore, the abutment wall will be constructed with a 9" three-bulb waterstop for a future connection of raised floodwalls.

(10)

Attached are two drawings:

Drawing No. 1: General Plan and Elevation of I-10 bridges over the 17th St. Canal, typical section of voided slab, and a typical anchorage details of voided slab and a bent cap.

Drawing No. 2: An enlarged partial plan view of west abutment, an elevation section of the end of the span, also showing a cross section view, which shows the configuration the reservoir holding area, and the location of the seals. A section view of the seal configuration , showing primary seal, expandable rubber backup seal, and narrow opening which would limit water intrusion , in the event of the seal failure.

An enlarged partial plan view of east abutment, an elevation section of the end of the span, also showing a cross section view, which shows the location of the strip seal and a J type continuous waterstop at top and bottom of the reservoir.

(9)

CELMN-ED-DD (CELMN-ED-SP(1110-2-115a)/6 JULY 89) 1st End DESAI/2657
SUBJECT: Lake Pontchartrain, Louisiana & Vic High Level Plan-17th Street Outfall Canal I-610/I-10 Replacement Bridge over the Canal.

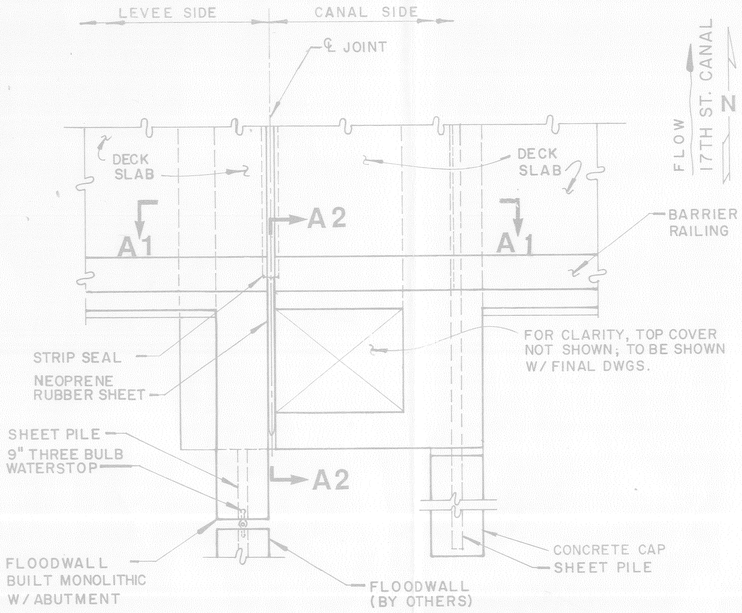
CELMN-ED-D

FOR CELMN-ED-S

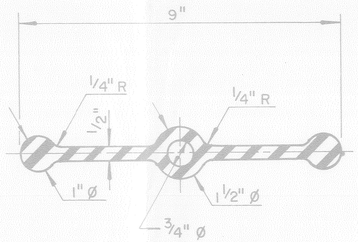
1. The concept of the Joint Sealing shown on the subject preliminary plans is acceptable.

2. The final submittal should include joint details with critical dimensions affecting the joint sealing material. Design computations, showing the stability of the structure under normal loading conditions as well as flood condition, must also be submitted for our review.

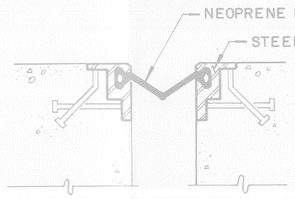
Daniel A. Marsalone
Chief, Design Branch



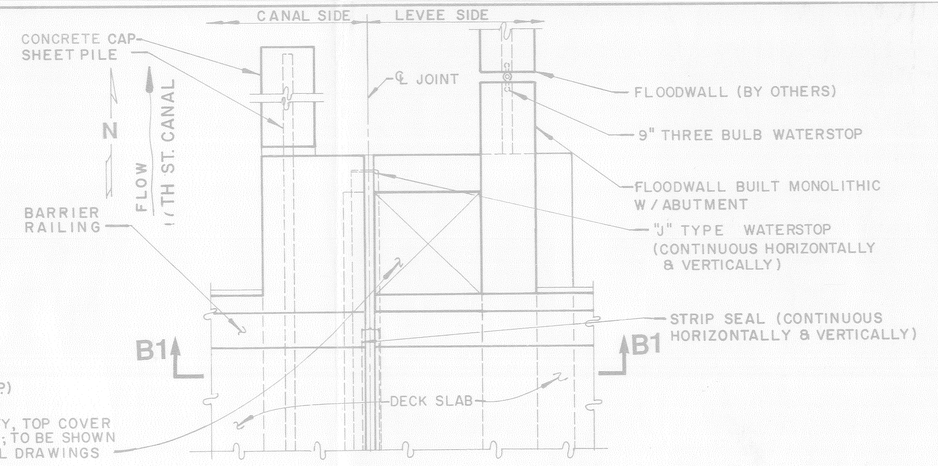
PLAN "A"
SCALE: 1/2"= 1'-0"
(SHOWING PARTIAL WEST ABUTMENT)



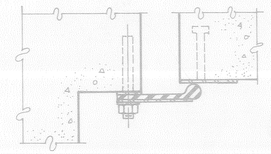
THREE BULB WATERSTOP (P.V.C)
N.T.S.



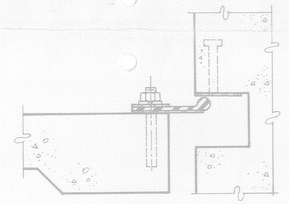
STRIP SEAL DETAIL
N.T.S.



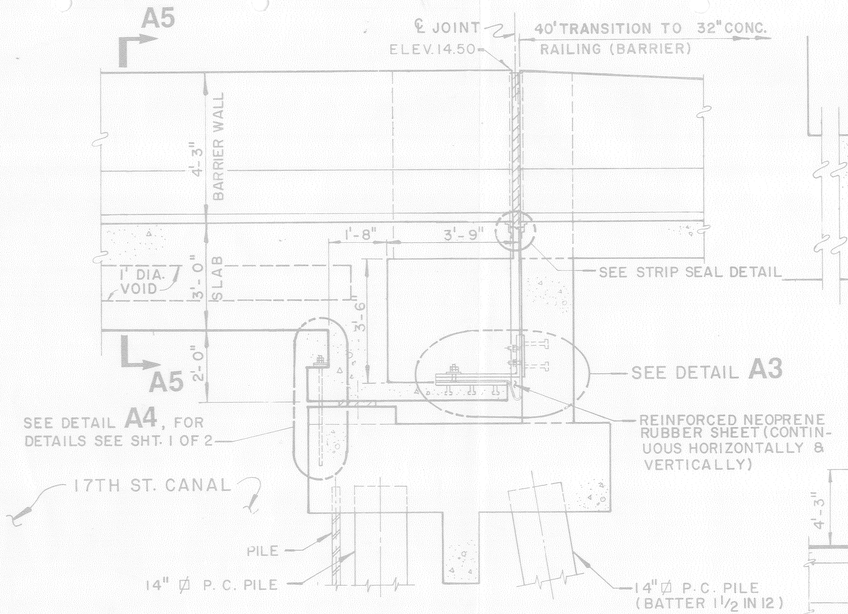
PLAN "B"
SCALE: 1/2" = 1'-0"



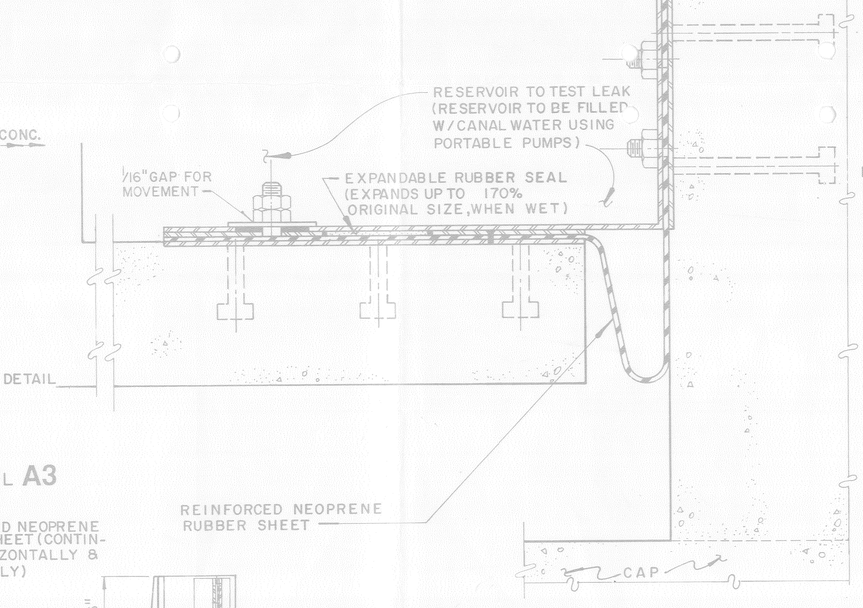
DETAIL B2
"J" WATERSTOP (P.V.C.)
SCALE: 1/2" = 1'-0"



DETAIL B3
"J" WATERSTOP (P.V.C.)
SCALE: 1/2" = 1'-0"



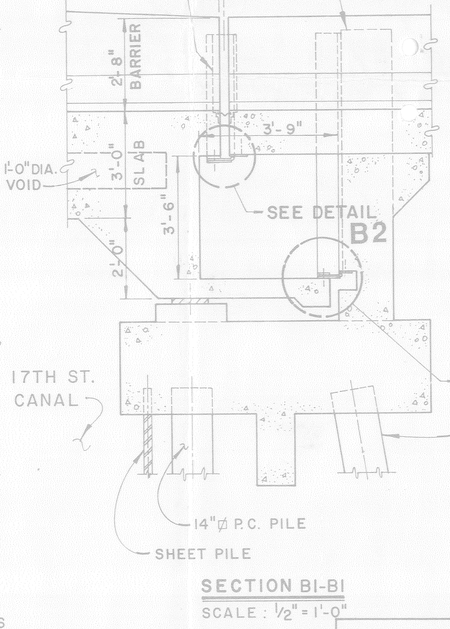
SECTION A1-A1
SCALE: 1/2"= 1'-0"



SECTION A2-A2
SCALE: 1/4"= 1'-0"

DETAIL A3
SCALE: 3" = 1'-0"

NOTE: ALL PLATES, ANGLES AND FASTENERS IN DETAILS 1, 2, 3 & 4 WILL BE STAINLESS STEEL.



SECTION B1-B1
SCALE: 1/2" = 1'-0"

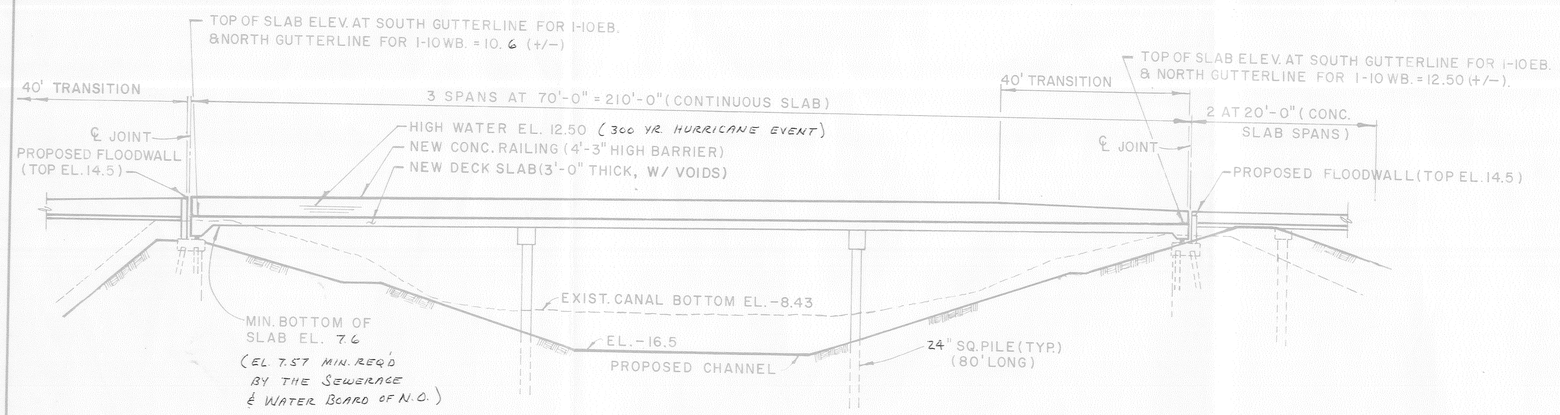
FIGURE 45

17th St. Canal Bridges
Joint Sealing Detail

I-10 EA

PLAN

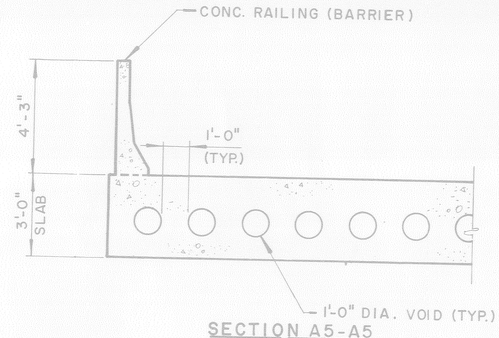
SCALE: 1" = 50'-0"



ELEVATION

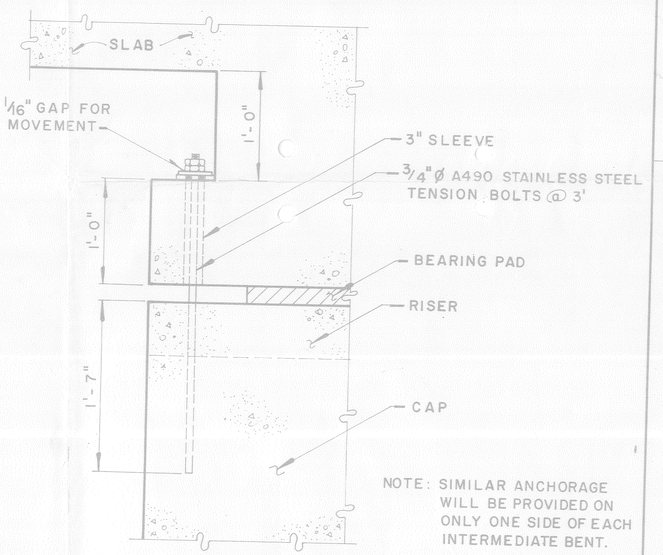
(I-10 / 610 BRIDGES)

SCALE: 1" = 15'-0" HORIZ.
1" = 15'-0" VERT.



SECTION A5-A5

SCALE: 3/8" = 1'-0"



DETAIL A4

SCALE: 1 1/2" = 1'-0"

FIGURE 44

Detail of 17th St. Canal Bridges Plan & Profile

I-10 EA

CELMN-ED-FS 22 March 89

MEMORANDUM FOR C/Des Svcs Br

SUBJECT: GDM Design, 17th Street Outfall Canal Lake Pontchartrain, LA & Vicinity Hurricane Protection Project

1. We need the following information to complete F&M Branch input for the valve structure plan of the 17th St Outfall Canal GDM.

a. Type and size of piles for valve structure, wing wall and apron foundations.

b. Layout of channel transition from valve structure to normal channel width with slope tie-ins.

c. Ground elevation required for vehicular access. Will vehicular access be required for the Orleans and Jefferson sides?

d. The total loads and pile tip elevations for the valve structure and apron, for pile load settlement calculations.

e. Will riprap be required and if so the location of the riprap?

f. Type of breakwater to be used for the valve structure plan.

2. The information is needed ASAP if the current schedule is to be maintained.

3. P.O.C. is Frank Vojkovich ext. 1034.

RODNEY P. PICCIOLA
Chief, Foundations and Materials Branch

(3)

1 March 89

Mo Desai

I need information on the following:

(1) Type of piles used @ Veterans Blvd 20 □" piles

(2) Type of piles used @ Valve Structure

(3) W/L Stations for work around Pump Sta No 6.

(4) The breakwater system that will be used for the valve structure.

I Know some of the above information you will not be able to get to me for weeks.

Frank V. 1034

CELMN-ED-FS 27 Feb 89

MEMORANDUM FOR C/Des Br

SUBJECT: GDM Design, 17th Street, Outfall Canal Lake Pontchartrain, LA & Vicinity Hurricane Protection Project
HLP

1. We have compared the wall alinement for the Jefferson Parish side of the 17th St Canal which was furnished by Mr. Desai of Design Br with the existing 17th St Canal cross sections, and with the latest N.O.S.&W.B. alinement.

2. We recommend the wall alinement be changed between B/L Sta. 627+28 to Sta. 669+00 Jefferson Parish side. The change is necessary to maintain the wall line in the crown of the levee. The B/L and W/L offsets are shown in Encl. 1.

3. At B/L Sta 568+00 (end of reach) Orleans Parish side the W/L offset should be changed from 205.6' to 206.3'. From B/L Sta. 614+00 to B/L Sta. 627+28 Orleans Parish side the wall alinement must be changed as shown in Encl. 2. The changes are necessary because of a change in channel alinement by the N.O.S.&W.B. from their original plans.

4. Enclosure 3 is a table of minor changes made on the levee sections furnished to your office by CELMN-ED-FS's DF dated 10 May 88 subject as above.

5. Encl. 4 is a landside enlargement for Sta. 663+00 to 670+00 Orleans Parish side. The new section has been furnished to you because Modjeski & Masters, consulting engineers for the OLB, have requested that the highest possible levee crown elevation be maintained. P.O.C. is Frank Vojkovich ext. 1034.

RXB

4 Encls
as

RODNEY P. PICCIOLA
Chief, Foundations and Materials Branch

0

CELMN-ED-FS 27 Feb 89

MEMORANDUM FOR C/Des Br

SUBJECT: GDM Design, 17th Street, Outfall Canal Lake Pontchartrain, LA & Vicinity Hurricane Protection Project
HLP

1. We have compared the wall alinement for the Jefferson Parish side of the 17th St Canal which was furnished by Mr. Desai of Design Br with the existing 17th St Canal cross sections, and with the latest N.O.S.&W.B. alinement.

2. We recommend the wall alinement be changed between B/L Sta. 627+28 to Sta. 669+00 Jefferson Parish side. The change is necessary to maintain the wall line in the crown of the levee. The B/L and W/L offsets are shown in Encl. 1.

3. At B/L Sta 568+00 (end of reach) Orleans Parish side the W/L offset should be changed from 205.6' to 206.3'. From B/L Sta. 614+00 to B/L Sta. 627+28 Orleans Parish side the wall alinement must be changed as shown in Encl. 2. The changes are necessary because of a change in channel alinement by the N.O.S.&W.B. from their original plans.

4. Enclosure 3 is a table of minor changes made on the levee sections furnished to your office by CELMN-ED-FS's DF dated 10 May 88 subject as above.

5. Encl. 4 is a landside enlargement for Sta. 663+00 to 670+00 Orleans Parish side. The new section has been furnished to you because Modjeski & Masters, consulting engineers for the OLB, have requested that the highest possible levee crown elevation be maintained. P.O.C. is Frank Vojkovich ext. 1034.

4 Encls
as

RODNEY P. PICCIOLA
Chief, Foundations and Materials Branch

JEFFERSON PARISH SIDE
STA 627+28 TO STA 669+00

B/L STATION	F.S. Levee Toe (Channel Bottom)	GDM WALL ℄ (B/L OFFSET)	W/L (• B/L offset)
627+28	86'	4.5	5.5
628+00	86	4.5	5.5
630+00	86	4.5	5.5
632+00	88	4.5	5.5
634+00	88	4.5	5.5
636+00	90	-0.5	+0.5
638+31	90	-0.5	+0.5
642+08	90	2.5	3.5
643+00	90	2.5	3.5
644+00	90	2.5	3.5
645+00	90	2.5	3.5
646+00	90	2.5	3.5
647+00	90	2.5	3.5
648+00	90	2.5	3.5
649+00	91	2.5	3.5
650+00	92	2.5	3.5
651+00	93	2.5	3.5
652+00	94	2.5	3.5
653+00	94	2.5	3.5
654+00	94	2.5	3.5
655+00	94	2.5	3.5
656+00	94	2.5	3.5
657+00	94	2.5	3.5
658+00	94	2.5	3.5
659+00	93	2.5	3.5
660+00	92	2.5	3.5

ENCL 1

JEFFERSON PARISH SIDE

STA 627+28 TO STA 669+00

B/L STA	F.S. Levee Toe (Channel Bottom)	(B/L OFFSET) GDM WALL ℄	W/L (B/L OFFSET)
661+00	91	2.5	3.5
662+00	90	2.5	3.5
663+00	90	-4.5	-3.5
664+00	90	-4.5	-3.5
665+00	90	-4.5	-3.5
666+00	90	-4.5	-3.5
667+00	90	-4.5	-3.5
668+00	90	-4.5	-3.5
669+00	90	-4.5	-3.5

Encl 1

ORLEANS PARISH SIDE

B/L STATION	F.S. Levee Toe (Channel Bottom)	(B/L OFFSET) GDM Wall ℄	W/L (B/L OFFSET)
616+00	145.8	227.1	226.1
618+00	145.3	226.6	225.6
620+00	144.9	226.2	225.2
622+00	144.4	225.7	224.7
624+00	144.0	225.3	224.3
624+27	143.9	225.2	224.2
627+28	143.3	223.8	222.8

Encl 2

ORLEANS PARISH SIDE

STATION	CHANGES
STA 545+80 TO STA 552+70	NONE
554+00 TO 568+00	Change Tip EL -13.2 to EL -12.8
568+00 TO 589+00	Change 11' F.S. bench to 8.5' F.S. bench
589+00 TO 614+00	Change 15.5' F.S. bench at EL 3.5 to 19.7' F.S. bench sloping from EL 2.1 to EL 3.0. Change tip EL-7.5 to EL -7.8.
614+00 TO 625+00	Change 16.5' F.S. bench at EL 4.5 to 15' F.S. bench at EL 3.6. Change 11' P.S. crown width to 8' P.S. crown width. Change tip from EL-5.3 to EL -6.8.
625+25 TO 635+00	Change 9.5' P.S. crown width to 8' P.S. crown width. Change tip EL -4.6 to EL -4.9
635+00 TO 642+00	Change 8.5' P.S crown width to 8' P.S. crown width
642+00 TO 663+00	Change crown EL 12.0 to EL 12.1
663+00 TO 670+63	Change Crown EL to 12.5 (Landside Levee Enlargement)
[redacted]	
549+22 TO 552+76	Change gross levee from EL 10.0 to EL 13.5, change gross sheetpile EL 14.0 to EL 14.7. These changes apply from Sta 551+00 to Sta 552+25 (Wall alinement changes)
554+00 TO 589+00	change 18' F.S. bench to 17'. & Change 10.5 P.S. crown width to 11.5'. Change tip EL-10.1 to EL-10.0
589+00 TO 614+00	change 19' F.S. bench to 18'. change 11' P.S. crown width to 11.5'
614+00 TO 625+25	Change Crown EL from 8.0 to 7.5 on P.S. Change EL 5.5 at F.S. sheetpile to EL 5.0. Change slope from IVON14H to IVON21H on F.S. bench. Change 8' P.S. crown width to 9' P.S. crown width. Change tip EL-1.3 to EL-3.3.
625+25 TO 635+00	Change EL 5.5 F.S. bench to EL 5.0 F.S. bench change 12' F.S. bench width to 14'. Change tip EL-2.9 to EL-2.6
635+00 TO 641+50	NONE
641+50 TO 663+00	"
663+00 TO 670+00	"

ENCL [redacted]3

COMPUTATION SHEET

PROJECT 17th St Outfall Canal	PAGE OF	COMPUTED BY FJV	DATE 2/89
SUBJECT ORLEANS PARISH SIDE STA 663+00 TO STA 670+00		CHECKED BY	DATE