A0001762

1110-Gen COE Engr & Des Corres Files- '85
Subject: Lake Pontchatrain LA & Vic. High Level Plan,
Hurricane Protection Pontchatrain Beach Floodwall

A0001762

ENGINEERING DIVISION
Permit Review
Sheet

MAILTRAX # 00- 1105

SUSPENSE:*

ED-S
ED-SP
ED-SR

SUSPENSE:*

ED-H
ED-HD
ED-HC
ED-HH
ED-HM

SUSPENSE:* 09/08/00

1 ED-F
ED-FG
ED-FD
✓ ED-FS

SUSPENSE:*

2 ED-L
ED-LW
ED-LC
ED-LL
3 ED-T
ED-G

*If a suspense cannot be met, notify secy, ext. 2240, of new suspense date.

SUBJECT: Req by the University of New Orleans to Construct and Overflow Parking Lot & Install Conduits Across the Levee Vic. W/L Sta/ 37+63, in Orleans Parish

ED-FS 4 Sept 2000

No comments.

FJV JR

FIL

CEMVN-OD-T (11-2-240a) 31 August 2000

MEMORANDUM FOR C/ENGR DIV

SUBJECT: Req by the University of New Orleans to Construct an Overflow Parking Lot on the Floodside of the N.O. Lakefront Hurricane Protection Levee/Floodwall and to Install Conduits Across the Levee/Floodwall, Vic. W/L Sta. 37+63, in Orleans Parish, LA.

1. Forwarded for review, comment, and return. It is requested that **only Geotechnical Br**, **Structures Br** and **Civil Br** review this request in order to expedite a response.

2. Labor charges for this permit review may be charged to L20075 **is requested that each reviewer use their own organization code and log in their review time on the attached form. Please return this form along with the review comments so that this office can monitor and control project expenditures.**

3. If further assistance is needed, please contact Amy E. Powell, ext 2241.

00-197

Amy E. Powell

Encl

for R. H. Schroeder, Jr.
Chief, Operations Division

ltr dtd 25 July 00
w/dwgs

APPLICANT: University of New Orleans

PERMIT NO.: 00-197

O&M, GENERAL CHARGE ACCOUNT NO.: L20075

REVIEWER	OFFICE SYMBOL	REVIEW TIME (HOURS)	ORGANIZATION CODE
F. VOJKOVICH	ED-FS	2	KX

Facility Planning & Construction

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5553 / Fax: (504) 280-5555

University of
New Orleans

25 July 2000

Mr. Stevan G. Spencer, P.E.
Chief Engineer
Orleans Levee District
6001 Stars & Stripes Blvd.
Suite 202 Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

RE: Orleans Levee District Permit
UNO Information Technology Center Parking Garage – Overflow Lot

Mr. Spencer,

This letter serves as a request to obtain a permit from the Orleans Levee District for the construction of an overflow parking lot associated with the Parking Garage in the University of New Orleans' Research and Technology Park. The lot will be located on the unprotected side of the levee system, and consist of approximately 100 surface parking spots. There is no street addressed assigned to this area, but the overflow lot will serve three existing buildings at 2233, 2251, and 2285 Lakeshore Drive, and is within 250' of a hurricane levee system.

The construction includes refurbishment of an existing section of concrete roadway and the addition of new asphalt paving. The project also includes the construction of a turning lane off of Lakeshore Drive to accommodate access to this area. Electrical service will be provided from the existing Navy Buildings over the levee wall.

The area will be fenced and gated, as it is now, and access to the levee gate will be maintained for the Levee Board at all times. As part of this permit, we request that the levee gates remain normally open, though we understand that they must be closed in the event of a hurricane or other substantial weather event.

Per the requirements, attached please find a full set of plans (including the site plan and details), and the related specifications. Also attached is a Design Engineering Inc. traffic study related to the new turning lane. A check in the amount of $100.00 for the processing fee is included as well.

Please review the information for and issue a permit if it meets your requirements. Feel free to call with any questions or if you need any additional information. Thank you for your time.

Sincerely,

Gus Cantrell, P.E.
Director
Facility Planning & Construction

Cc: Ms. Geneva Grille, LADOTD
Mr. Brian Keller, CEMVN-OD-R, U.S. Army Corps of Engineers
File

Enc.

Facility Planning & Construction

University of
New Orleans

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5551 / Fax: (504) 280-5555

FAX

To: Mr. Brian Keller w/ Hard Copy
USACE

Fax: 862-2317

From: Paul Varisco PV ✓

Pages, inc. cover 2

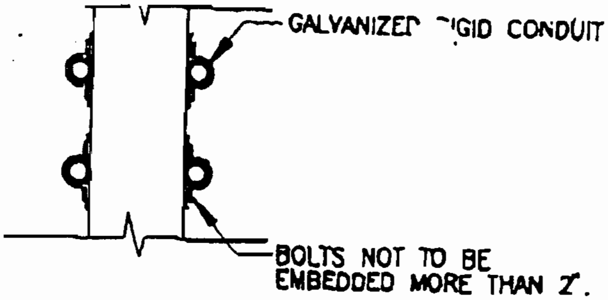
Date: 29 August 2000

Re: Revised Conduit Detail
UNO Parking Garage – Overflow Lot

Message:

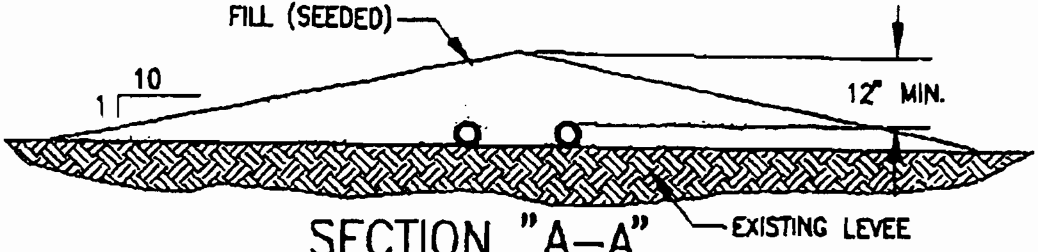
Mr. Keller, attached please find the proposed detail for conduit over the levee wall, revised per your comments. Please let us know if you require any additional information.

cc: Mr. Stevan Spencer – Chief Engineer, Orleans Levee District
Mr. Gus Cantrell – Director, UNO Facility Planning & Construciton



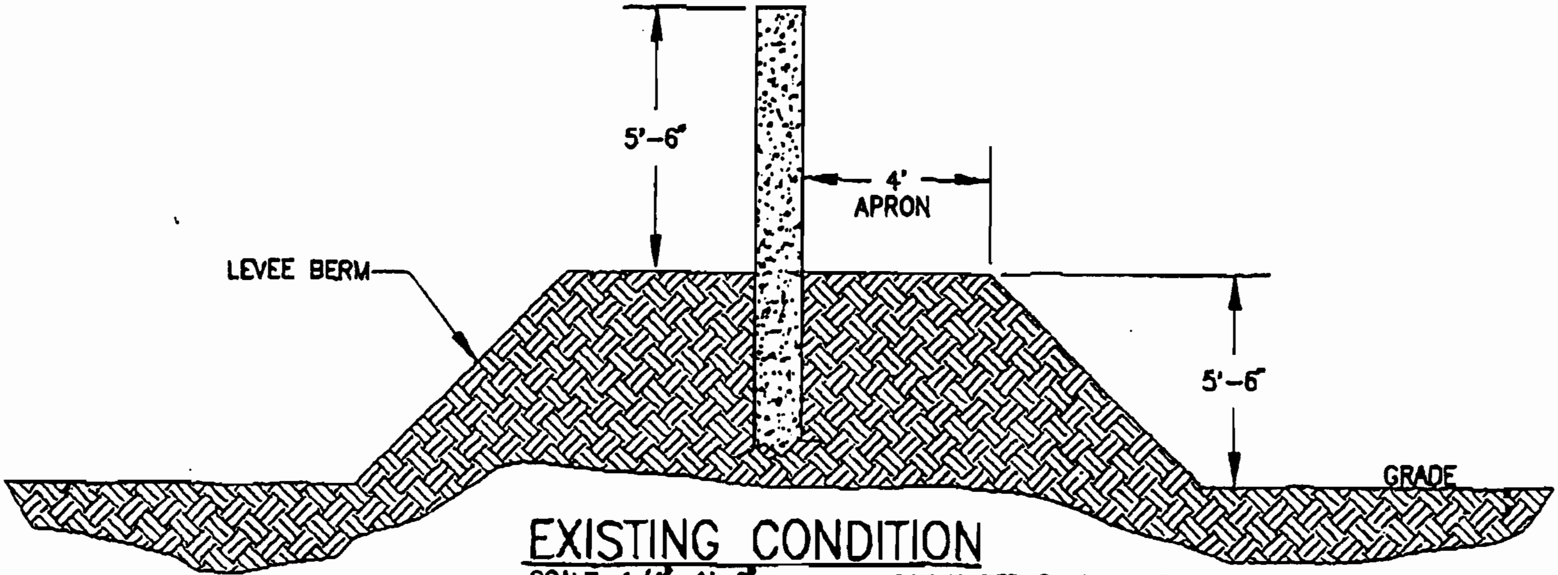
PLAN AT FLOOD WALL

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



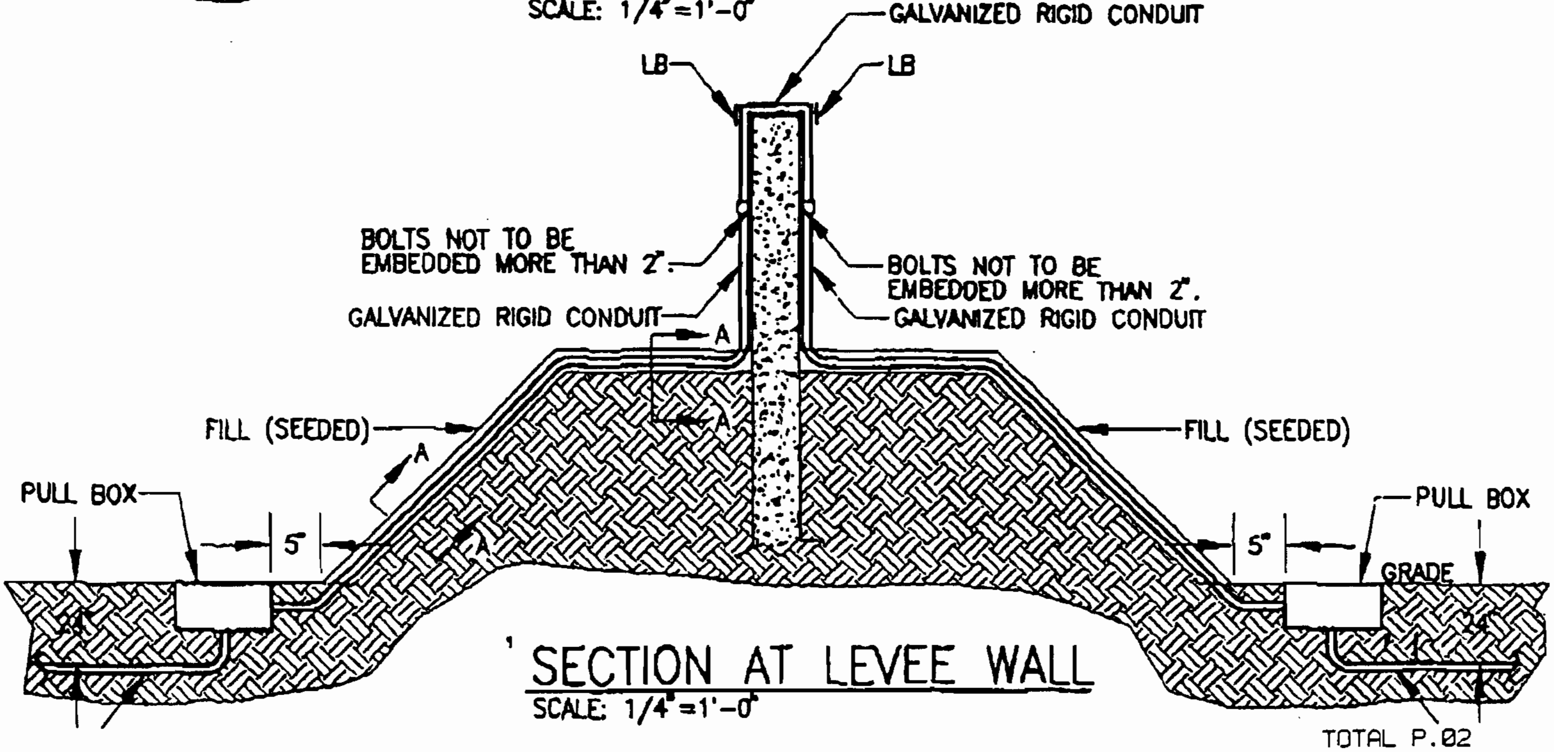
SECTION "A–A"

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



EXISTING CONDITION

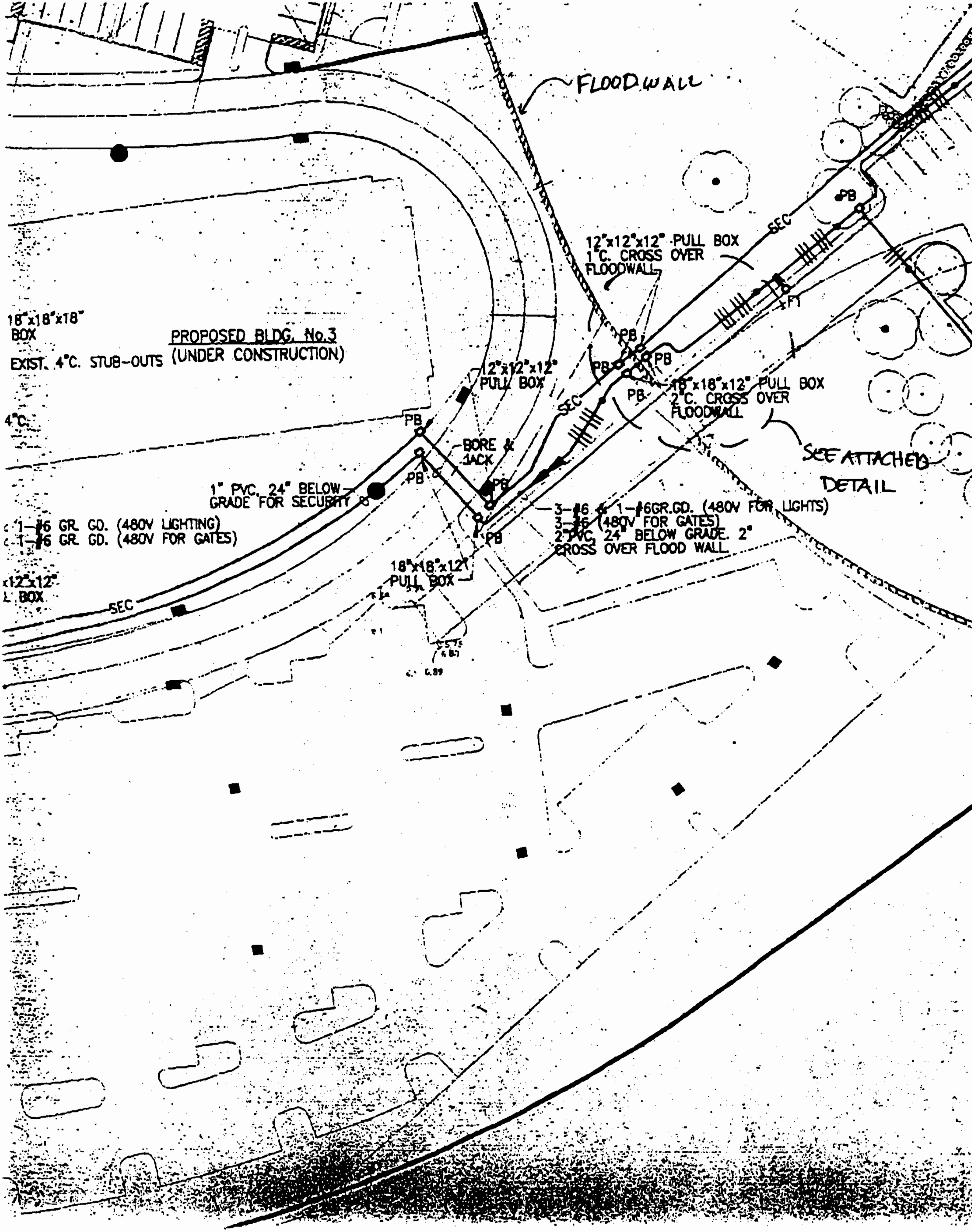
SCALE: 1/4"=1'-0"



SECTION AT LEVEE WALL

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

TOTAL P.02


FLOODWALL
12"x12"x12" PULL BOX
1"C. CROSS OVER
FLOODWALL
SEC
PB
FT
18"x18"x18"
BOX
PROPOSED BLDG. No.3
(UNDER CONSTRUCTION)
EXIST. 4"C. STUB-OUTS
4"C.
12"x12"x12"
PULL BOX
18"x18"x12" PULL BOX
2"C. CROSS OVER
FLOODWALL
SEE ATTACHED
DETAIL
BORE &
JACK
1" PVC, 24" BELOW
GRADE FOR SECURITY
3-#6 & 1-#6GR.GD. (480V FOR LIGHTS)
3-#6 (480V FOR GATES)
2"PVC, 24" BELOW GRADE. 2"
CROSS OVER FLOOD WALL.
1-#6 GR. GD. (480V LIGHTING)
1-#6 GR. GD. (480V FOR GATES)
x12"x12"
BOX
SEC
18"x18"x12"
PULL BOX

CEMVN-ED-LS (OD-T/22 Dec 99) (11-2-240a) 1st End Kearns/2718

SUBJECT: Req for an after the fact permit by the UNO to Drive Piles for a Bldg on the P.S. of the N.O. Lakefront Levee, Vic B/L Sta. 110+00 in Orleans Parish, LA.

CEMVN-ED 04 Jan 00

FOR Chief, Operations Division

We have no adverse comments regarding the subject after the fact permit request to drive piles for a future UNO building.

Encl GERARD S. SATTERLEE, JR.
nc Chief, Engineering Division

cf w/o encl:
✓CEMVN-ED-FS (J. Richardson)
CEMVN-ED-T (F. Young)

CEMVN-ED-LS (OD-T/5 Jan 00) (11-2-240a) 1st End Kearns/2718

SUBJECT: Req by the UNO to Drive Piles for New Housing Units on the P.S. of the N.O. Lakefront Levee, Vic B/L Sta. 147+50 & Adj to London Ave Outfall Canal East Levee, Vic of B/L Sta. 150+66, in Orleans Parish, LA.

CEMVN-ED 20 Jan 00

FOR Chief, Operations Division

We have no adverse comments regarding the subject permit request to drive piles for future UNO housing units.

Encl
nc

GERARD S. SATTERLEE, JR.
Chief, Engineering Division

cf w/o encl:
✓ CEMVN-ED-FS (F. Vojkovich)

ENGINEERING DIVISION
Permit Review Sheet

Mailtrac# 00.189

SUSPENSE:*

ED-S
ED-SP
ED-SR

SUSPENSE:*

ED-H
ED-HD
ED-HC
ED-HH
ED-HM

SUSPENSE:* 12 Jan 00

ED-F
ED-FG
ED-FD
✓ ED-FS

SUSPENSE:*

ED-L
ED-LW
ED-LC
ED-LL
ED-T
ED-G

*If a suspense cannot be met, notify secy, ext. 2240, of new suspense date.

SUBJECT: Req by the UNO to drive piles for new housing units on the protected side of the N.O. Lakefront Levee, Vic. Of B/L Sta. 147+50

ED-FS 12 Jan 00

No objection

FJV JP

FILE

CEMVN-OD-T(11-2-240a) 5 January 2000

MEMORANDUM FOR C/ENGR DIV

SUBJECT: Req by the University of New Orleans to Drive Piles for New Housing Units on the Protected Side of the New Orleans Lakefront Levee, Vic. of B/L Sta. 147+50, and Adjacent to the London Avenue Outfall Canal Levee, in Orleans Parish, LA.

1. Forwarded for review, comment, and return. It is requested that only Geotechnical Br and Civil Br review this request in order to expedite a response.

2. Labor charges for this permit review may be charged to L20075. **It is requested that each reviewer use their own organization code and log in their review time on the attached form. Please return this form along with the review comments so that this office can monitor and control project expenditures.**

3. If further assistance is needed, please contact Amy E. Powell, ext. 2241.

00-2

Encl

for Amy E. Powell
R. H. Schroeder, Jr.
Chief, Operations Division

ltr dtd 29 Dec 99
w/dwgs

APPLICANT: University of New Orleans

PERMIT NO.: 00-2

O&M, GENERAL CHARGE ACCOUNT NO.: L20075

REVIEWER	OFFICE SYMBOL	REVIEW TIME (HOURS)	ORGANIZATION CODE
FRANK VOJKOVICH	ED-FS	2	KX

Facility Planning and Construction
University of
New Orleans

Lakefront Campus, New Orleans, LA 70148
Phone (504) 280-5553 / FAX (504) 280-5555

29 December 1999

Mr. Stevan G. Spencer, P.E., Chief Engineer
Orleans Levee District
6001 Stars & Stripes Boulevard
New Orleans, LA 70126

Re: Privateer Place Two Permit
UNO Main Campus

Dear Mr. Spencer:

We seek a permit from the Orleans Levee District for the construction of additional housing units on the north and west edges of the University Main Campus. As shown in the enclosed site drawings, two building sites are proposed: one on the west property line and one on the north.

The west site will contain one building, positioned well away from the levee heel.

The north site contains five buildings, each positioned to maintain a 20'-0" easement with the north property line of the Main Campus. Per the survey of the site, the University north property line is approximately 20'-0" (+/-) from the heel of the levee.

Each building is a three-story structure on a pile-supported foundation. The proposed piling are Class B treated timber 44'-0" long. The piles will be driven without pre-drilling. Because the site contained previous construction, pre-punching to a depth of about 20'-0" may be used to identify existing underground obstructions.

Per permit submittal requirements, enclosed please find one (1) copy each of the following:

1. Topographic survey, one (1) sheet, of both building sites, prepared by Gandolfo, Kuhn & Associates, dated June 1999.
2. Site Plan (preliminary), one (1) sheet, prepared by Wallace/Garcia + Architects, Inc. dated 22 December 1999, showing the buildings in their approximate locations. Final site drawings showing paving and parking are in development and will be based on the building locations shown.

3. Foundation Plans, three (3) sheets: S1.1, S1.2, and S2.0, describing the foundation design for each of the proposed buildings.

4. A check in the amount of $100 payable to the Orleans Levee District covering fees for the requested permit.

5. Geotechnical Investigation Report of the Site, one (1) copy, prepared by Eustis Engineering Company, Inc., dated 18 June 1999.

Upon review of the enclosed information, should questions arise, please call. We seek issuance of a permit to begin immediate construction of this project. Your prompt attention to this matter is appreciated. Thank you.

Sincerely,

Gus Cantrell, P.E., Director
Facility Planning and Construction

enclosures

cc: Ms. Geneva Grille, LADOTD (w/ enclosures)
7252 Lakeshore Drive
New Orleans, LA 70124

Mr. Brian Keller, CEMVN-OD-R (w/enclosures)
U.S. Army Corps of Engineers
P.O. Box 60127
New Orleans, LA 70160-0267

Mr. Terry Maxwell, P.E. (letter only)
Century Development

Ms. Norma Grace, Vice Chancellor (letter only)
Property and Facilities Development

GSC/gsc99736

File: Privateer Place Two… Follow up

~~[illegible]~~

ENGINEERING DIVISION
Permit Review
Sheet

MAILTRAX #01-1659

SUSPENSE: * 05/21/2001

5-22
1 ED-S (Flock)
1A ED-SP EEB
1B ED-SR 5/22

SUSPENSE: * 05/23/2001

2 ED-H (Thibodeaux)
✓ ED-HD
✓ ED-HC
____ED-HH
____ED-HM

SUSPENSE: * 6-11-01

3 ED-F (Caver)
____ED-FG
____ED-FD
✓ ED-FS

SUSPENSE: *

4 ED-L (Baumy)
____ED-LW
____ED-LC
____ED-LL

SUSPENSE: *

____ED-T(Schilling)

SUSPENSE: *

____ED-G (Matsuyama)

***If a suspense cannot be met, notify secy, ext. 2240, of new suspense date.**

SUBJECT: Revised Req by Univ. of New Orleans to Construct an Overflow Parking Lot on the Floodside of the N.O. Lakefront Hurricane Protection Levee/Floodwall and to Install Conduits across the Levee/Floodwall, Vic. W/L Sta. 37+63, in Orleans Parish, LA.

ED-SR No comment. Hawkins x-2623

ED-HC No objection 6 JUN 01
Jim Hote

ED-FS 7 June 01
No objection.

Frank Vojkovich

FILE

CEMVN-OD-T (OD-T/31 Aug 00) 2nd End aep Powell/2241

SUBJECT: REVISED REQUEST BY UNIVERSITY OF NEW ORLEANS TO CONSTRUCT AN OVERFLOW PARKING LOT ON THE FLOODSIDE OF THE N.O. LAKEFRONT HURRICANT PROTECTION LEVEE/FLOODWALL AND TO INSTALL CONDUITS ACROSS THE LEVEE/FLOODWALL, VIC. W/L STA. 37+63, IN ORLEANS PARISH, LA.

CEMVN-OD 17 May 2001

FOR C/Engr Div

1. Forwarded for review, comment, and return are letter and revised drawings dated 1 May 2001 from University of New Orleans, in response to your 1st Endorsement.

2. Labor charges for this permit review may be charged to L20075.

4. If further assistance is needed, please contact Amy E. Powell, ext 2241.

for Amy E. Powell
R.H. Schroeder, Jr.
Chief, Operations Division

2 ENCL
wd Dwgs in Encl 1
Added 1 encl
2. Ltr dtd 1 May 01
Rev. dwgs

Paul
280-5551

CEMVN-ED-LS (CEMVN-OD-T/ 31 Aug 00) 1st End 21 Sep 00

SUBJECT: Request by the University of New Orleans to construct an Overflow Parking Lot on the Floodside of the N.O. Lakefront HP Levee/Floodwall and to install conduits across the Levee/Floodwall, Vic. W/L Sta.37+63, in Orleans Parish, LA. (Permit 00-197)

CEMVN-ED

MEMORANDUM FOR C/Operations Division

1. Please have the applicant resubmit the permit request for further review once the following comments have been resolved.

a. The applicant's Project Limit needs to be moved to the levee right-of-way, a distance of 30-feet from the wall face.

b. Ramp construction shall use "90% Compaction Maximum Dry Density". Side slopes shall be 1V on 3H. The new asphalt ramp alignment will require backfill of low-grade areas.

c. Applicant needs to submit for our review a detail for proposed concrete walkway as it crosses the gate monolith.

d. Corps right-of-way drawings for the HP levee indicate that the previously constructed roadway and parking lot configuration are within the levee right-of-way. Orleans Levee District needs to be advised by copy of your letter to applicant. For instance; the ramp ROW is 60-feet either side, from centerline of ramp.

e. Demolition note on L2 indicates "8-inches below existing grade". This is not consistent with "Asphalt Paving Detail" as shown on L6.

* f. Pull boxes adjacent to wall shall be located 5-feet from existing levee toe with a minimum of 20-feet from floodwall. Depict dimension on drawing.

2. POC is T. Wade Wright, X2721.

Robert J Fairless

Encl
nc

for ~~GE~~RARD S. SATTERLEE
Chief, Engineering Division

Copy Furnished:
CEMVN-ED-T
(A.DeSota)

CEMVN-OD-T (11-2-240a) 31 August 2000

MEMORANDUM FOR C/ENGR DIV

SUBJECT: Req by the University of New Orleans to Construct an Overflow Parking Lot on the Floodside of the N.O. Lakefront Hurricane Protection Levee/Floodwall and to Install Conduits Across the Levee/Floodwall, Vic. W/L Sta. 37+63, in Orleans Parish, LA.

1. Forwarded for review, comment, and return. It is requested that only Geotechnical Br, Structures Br and Civil Br review this request in order to expedite a response.

2. Labor charges for this permit review may be charged to L20075 **is requested that each reviewer use their own organization code and log in their review time on the attached form. Please return this form along with the review comments so that this office can monitor and control project expenditures.**

3. If further assistance is needed, please contact Amy E. Powell, ext 2241.

00-197

Encl

ltr dtd 25 July 00
w/dwgs

Amy E. Powell
for R. H. Schroeder, Jr.
Chief, Operations Division

APPLICANT: University of New Orleans

PERMIT NO.: 00-197

O&M, GENERAL CHARGE ACCOUNT NO.: L20075

REVIEWER	OFFICE SYMBOL	REVIEW TIME (HOURS)	ORGANIZATION CODE
F. VOJKOVICH	ED-FS	2	KX
WRIGHT	ED-L	5	B2L0400
Duncan	ED-TF	4	B2L0920
HOTE	ED-HC	3	B2L0220
F. VOJKOVICH	ED-FS	2	KX

FACILITY PLANNING & CONSTRUCTION

UNIVERSITY OF NEW ORLEANS

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5553 / Fax: (504) 280-5555

May 1, 2001

Mr. Steven G. Spencer, P.E. Engineer
Orleans Levee District
6001 Stars & Stripes Blvd.
Suite 202 Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

RE: Orleans Levee District Permit
UNO Information Technology Center Parking Garage-Overflow Lot
Re-Submittal

Mr. Spencer:

We herein re-submit our request to obtain a permit from the Orleans Levee District for the construction of an overflow parking lot associated with the Parking Garage in the University of New Orleans' Research and Technology Park. Included in this re-submittal is an attached set of plans that have been updated to reflect the notations by the Corps of Engineers on our initial submittal. Also included, is the initial letter (dated, July 25th, 2000) requesting a permit and providing the project description.

Please review the information, and issue a permit if it meets your requirements. Please call with questions or should you need any additional information. Thank you for your time.

Sincerely,

Gus Cantrell, P.E.

Director

Facility Planning & Construction

CC: Ms. Geneva Grille, LADOTD w/attachment
Mr. Brian Keller, CEMVN-OD-R, U.S. Army Corps of Engineers w/attachment
File

Facility Planning & Construction

University of
New Orleans

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5553 / Fax: (504) 280-5555

25 July 2000

Mr. Stevan G. Spencer, P.E.
Chief Engineer
Orleans Levee District
6001 Stars & Stripes Blvd.
Suite 202 Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

RE: Orleans Levee District Permit
UNO Information Technology Center Parking Garage – Overflow Lot

Mr. Spencer,

This letter serves as a request to obtain a permit from the Orleans Levee District for the construction of an overflow parking lot associated with the Parking Garage in the University of New Orleans' Research and Technology Park. The lot will be located on the unprotected side of the levee system, and consist of approximately 100 surface parking spots. There is no street addressed assigned to this area, but the overflow lot will serve three existing buildings at 2233, 2251, and 2285 Lakeshore Drive, and is within 250' of a hurricane levee system.

The construction includes refurbishment of an existing section of concrete roadway and the addition of new asphalt paving. The project also includes the construction of a turning lane off of Lakeshore Drive to accommodate access to this area. Electrical service will be provided from the existing Navy Buildings over the levee wall.

The area will be fenced and gated, as it is now, and access to the levee gate will be maintained for the Levee Board at all times. As part of this permit, we request that the levee gates remain normally open, though we understand that they must be closed in the event of a hurricane or other substantial weather event.

Per the requirements, attached please find a full set of plans (including the site plan and details), and the related specifications. Also attached is a Design Engineering Inc. traffic study related to the new turning lane. A check in the amount of $100.00 for the processing fee is included as well.

Please review the information for and issue a permit if it meets your requirements. Feel free to call with any questions or if you need any additional information. Thank you for your time.

Sincerely,

Gus Cantrell, P.E.
Director
Facility Planning & Construction

Cc: Ms. Geneva Grille, LADOTD
Mr. Brian Keller, CEMVN-OD-R, U.S. Army Corps of Engineers
File

Enc.

CEMVN-ED-LS(CEMVN-OD-T /22 Mar 01) 1st End 17 Apr 01
SUBJECT: Request by Meyer Engineers, LTD, on Behalf of the University of New Orleans, to Install a 12" Waterline Through the New Orleans Lakefront Hurricane Protection Floodwall, Vic. W/L Sta. 37+63, in Orleans Parish, LA.

CEMVN-ED

MEMORANDUM FOR C/Operations Division
Attn: Amy E. Powell

1. We have no adverse comments regarding the subject permit request provided the following changes and/or additions are made an integral part of your letter of no objection. Written verification of these provisions shall be requested and the agreements made part of your files. Accomplishment of the above negates the necessity of further review of the permit request by us.

a. The applicant shall submit an **Excavation Plan,** as shown on the enclosure for our **approval** prior to excavation of the existing levee for installation of the waterline. To expedite the review, the applicant can fax a detail sketch to Regulatory Br. for our review.

b. We require a COE stationing be added to the markers indicating a tie-in with the existing hurricane protection levee and floodwall for COE future survey work in the area. This can be provided by Orleans Levee District.

c. Applicant will be required to notify us for COE field **inspection and approval** of installation, prior to backfill operations. The following branch representatives shall be contacted for field verification. T. Wade Wright (862-2721), Civil, Frank Vojkovich (862-1034), Geotex and Robert Grubb (862-2678) Structures. Kindly provide COE address if applicant prefers notification by mail. Engineering Division, Corps of Engineers Building, P.O. Box 60267, New Orleans, and LA. 70160-0267.

2. Point of contact for permit review coordination is T.Wade Wright of Civil Br. ext.2721.

Gerard S. Satterlee
Chief, Engineering Division

CF:wo/Encls
ED-FS (Vojkovich)
ED-T (R. Grubb)

ENGINEERING DIVISION
Permit Review
Sheet

MAILTRAX #01-1520

SUSPENSE: *

________ED-S (Flock)
________ED-SP
________ED-SR

SUSPENSE: *

______ED-H (Thibodeaux)
________ED-HD
________ED-HC
________ED-HH
________ED-HM

SUSPENSE: * 03/27/2001

____1 ED-F (Caver)
________ED-FG
________ED-FD
___✓__ED-FS

SUSPENSE: *

____3 ED-L (Baumy)
________ED-LW
________ED-LC
________ED-LL
____2 ED-T (Schilling)
________ED-G

***If a suspense cannot be met, notify secy, ext. 2240, of new suspense date.**

SUBJECT: Req by Meyer Engineers, LTD on Behalf of the University of New Orleans to Install a 12" Waterline through the New Orleans Lakefront Hurricane Protection Floodwall Vic. W/L Sta 37+63, in Orleans Parish, LA.

ED-FS 3/28/01

The waterline should pass over the Floodwall unless the applicant can show that there is a safety concern or financial hardship.

FJV

FILE

CEMVN-OD-T (11-2-240a) 22 March 2001

MEMORANDUM FOR C/ENGR DIV

SUBJECT: Req by Meyer Engineers, LTD, on Behalf of the University of New Orleans, to Install a 12″ Waterline Through the New Orleans Lakefront Hurricane Protection Floodwall, Vic. W/L Sta 37+63, in Orleans Parish, LA.

1. Forwarded for review, comment, and return. It is requested that only Geotechnical Br, Structures Br and Civil Br review this request in order to expedite a response.

2. Labor charges for this permit review may be charged to L20075 **is requested that each reviewer use their own organization code and log in their review time on the attached form. Please return this form along with the review comments so that this office can monitor and control project expenditures.**

3. If further assistance is needed, please contact Amy E. Powell, ext 2241.

01-65

Encl

for Amy E. Powell
R. H. Schroeder, Jr.
Chief, Operations Division

Ltr dtd 9 Mar 01
w/dwgs

APPLICANT: Meyer Engineers, LTD, on Behalf of the University of New Orleans

PERMIT NO.: 01-65

O&M, GENERAL CHARGE ACCOUNT NO.: L20075

REVIEWER	OFFICE SYMBOL	REVIEW TIME (HOURS)	ORGANIZATION CODE
VOJKOVICH	ED-FS	1	KX

MEYER ENGINEERS, LTD
Engineer & Architect
P.O. Box 763
Metairie, LA 70004

(504)885-9892
FAX (504)887-5056
EMAIL: meyer@meyer-e-l.com

Letter of Transmittal

Date	03-16-01	**Job No.**	20-0050
Job Name	UNO Research Park Waterline		
Attention	Mr. Brian Keller		
Reference:			

TO: **U.S. Army Corps of Engineers**
CEMVN-OD-R

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via pick-up the following items:
☐ Shop drawings ☐ Prints ☒ Plans ☐ Samples ☒ Specifications ☐ Copy of letter
☐ Change order ☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	03-09-01		Transmittal letter from the Univeristy of New Orleans
1	03-15-01	9	Advanced Check Prints
1			Technical Specifications

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐
☐ FOR BIDS DUE _____ 19 ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS:

COPY TO:

SIGNED: Buster Lyons

Facility Planning & Construction

University of New Orleans

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5551 / Fax: (504) 280-5555

MAR 14 2001

MEMO

To: Buster Lyons
Meyer Engineers

From: Paul Varisco PV

Date: March 12 2001

Re: Water Main
UNO Research and Technology Center

Buster attached is the original permit application letter to the Orleans Levee District for the above referenced project. As we discussed, Meyer will be responsible for submitting the construction documents for approval. The original letter should be hand delivered to Mr. Stevan Spencer, along with a copy for his distribution to Ms. Geneva Grille with the LADOTD. A second copy should be hand delivered to Mr. Brian Keller with the USACE.

Please contact Mr. Gus Cantrell when the deliveries have been made, and coordinate any further reviews with him as well. Also, we feel that it would be appropriate at this time to submit a copy of the documents to the Sewerage and Water Board for their review. We will be happy to meet with the S&WB if necessary.

Feel free to call with any questions or comments.

Cc: Gus Cantrell

Facility Planning & Construction

University of New Orleans

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5551 / Fax: (504) 280-5555

9 March 2001

Mr. Stevan G. Spencer, P.E.
Chief Engineer
Orleans Levee District
6001 Stars & Stripes Blvd.
Suite 202 Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

RE: Orleans Levee District Permit
Water Main Installation
UNO Information Technology Center

Mr. Spencer,

This letter serves as a request to obtain a permit from the Orleans Levee District for the construction of a 12" water main to serve the University of New Orleans Research and Technology Park (the Research Park). The proposed water line will be fed from an existing Sewerage and Water Board main at the corner of Franklin Avenue and Lakeshore Drive and will run west along Lakeshore Drive, where it will tie into the existing Research Park infrastructure. The proposed construction of the new main is within 250' of the levee system, and the installation will require a penetration through a levee wall at the east end of the Research Park.

The installation of a feed to provide additional water to the Research Park is critical not only to the daily operation of the Buildings in the Park, but also to the safety of the tenants who work in these Buildings. As is documented in the attached letter from the State Fire Marshal, the existing water supply the Park is not sufficient to supply the sprinkler system in one of our tenant buildings. Moreover, each of the three (3) Park buildings currently on-line experience low water pressure on a regular basis, which causes building A/C and toilet facilities to drop out. The situation will only deteriorate when the Advanced Technology Center (March 2001), the CERM Laboratory (January 2002), the 4th Information Technology Center Building (February 2002) and the Hilton Hotel (March 2002) come on line.

The problem we have encountered is one of low volume and low pressure through our current 12" feed from Elysian Fields Avenue. The Sewerage and Water Board admits that there is a problem, but even after repairing leaks and replacing faulty valves, they have been unable to resolve the issue. Instead, they have worked with us to locate a second main to give us the water supply at the pressures our Park Buildings require.

As stated above, this permit application includes a request to penetrate the levee wall with the new water main. This request is key to the design, and is being made for the following reasons:

- Flow tests have been performed on the Franklin Avenue line to ensure that the volume of water at the end of the line will provide enough water not only to rectify the existing problem, but also accommodate the future growth already in progress. The calculations suggest that this proposed solution will suffice, but the conclusions are based on a straight connection to our existing system. If we are forced to run the line overhead, we are afraid that head losses and frictional losses in the line that would reduce the effectiveness of the solution.

- There is also concern that an exposed line would be susceptible to the elements, particularly to the high winds and water we experience at the lake. A blow from one of the several large oak trees in the immediate area could damage the line and cause serious problems for the people in the Park as well as for the Levee District.

- The Orleans Levee District has expressed concern for running the line overhead, as referenced in their letter of January 19, 2001 (attached). In addition to the obvious aesthetic consequences, an overhead line would inhibit grass cutting and future maintenance of the levee. Furthermore, when the Lake is reopened to swimmers, it is anticipated that the area surrounding the Park will once again become a public attraction. As such, the safety of the public becomes a concern. Children are prone to use such exposed lines for climbing and other activities.

The design of the proposed main incorporates US Army Corps of Engineers (USACE) standard penetration details through the levee wall. Moreover, the University intends, with the help of the Engineer and Contractor, to work with both the Levee Board and the USACE to insure that the proper inspections of work are performed.

Per the requirements, attached please find a full set of plans (including elevations and sectional details), and the related piping specifications. A check in the amount of $100.00 for the processing fee is included as well.

Please review the information for and issue a permit if it meets your requirements. Feel free to call with any questions or if you need any additional information. Thank you for your time.

Sincerely,

Gus Cantrell, P.E.
Director
Facility Planning & Construction

Cc: Ms. Geneva Grille, LADOTD
Mr. Brian Keller, CEMVN-OD-R, U.S. Army Corps of Engineers
File

DEPARTMENT OF PUBLIC SAFETY AND CORRECTIONS

Public Safety Services

M. J. "MIKE" FOSTER, JR.
GOVERNOR

V. J. BELLA
STATE FIRE MARSHAL

November 1, 2000

Mr. Robert W. Farnsworth
Executive Vice President
Columbus General Properties, L.L.C.
UNO Box 991
New Orleans, Louisiana 70148

Re: UNO/Navy Information Technology Center
Building 3
New Orleans, Louisiana

Dear Mr. Farnsworth:

This office is in receipt of your October 27, 2000, letter concerning temporary occupancy of the above-referenced facility and after review, offers the following comments and determination.

Issues 1 and 2 of your October 27, 2000, letter require no response at this time. Item 1 will be resolved by an appeal of the required 40-inch height above the finished floor for the restroom mirrors. Item 2 concerning handicap parking will be resolved by the completion of the parking garage located at the rear of the facility on or about November 10, 2000.

Item 3 concerns the testing of the installed automatic sprinkler system. You state that the sprinkler system has not been tested due to a lack of water pressure available from the City of New Orleans' water main. The UNO Research and Technology Park, Inc., is currently taking steps to upgrade the water pressure and volume available to the facility. You also state that the facility is equipped with a fully functioning fire alarm system

Until the sprinkler system can be tested, you offer to provide the following as an equivalency:

1. Double the number of fire extinguishers normally required; and,
2. A fire watch in accordance with the requirements of NFPA 601

Based on the submitted documentation, this office hereby grants the request for temporary occupancy until May 31, 2001.

Mr. Robert W. Famsworth
November 1, 2000
page 2

If you have any questions, please do not hesitate to call.

Sincerely,

Mark F. Gates
Deputy Assistant Secretary/Chief Architect

cc: New Orleans District Office
City of New Orleans, Department of Safety and Permits

The Board of Commissioners
OF THE
Orleans Levee District
SUITE 202 - ADMINISTRATION BUILDING
6001 STARS AND STRIPES BLVD.
New Orleans, La.
70126-8006

TEL. 504-243-4000

PROTECTING YOU
AND YOUR FAMILY

January 19, 2001

Mr. Gus Cantrelle
University of New Orleans
Lakefront
New Orleans, Louisiana 70124

RE: Lake Pontchartrain & Vicinity Hurricane Protection Levee
Floodgate L9C
12" Diameter Fire Water Line Penetration

Dear Mr. Cantrelle:

We have reviewed your preliminary request for the placement of a new 12" diameter underground fire water line from Franklin Avenue to the UNO Technology Park and see no problems with your proposal. Your proposed underground penetration of the floodwall adjacent to Floodgate L9C is to be done in accordance with the sleeve detail the USACE has provided you.

The underground penetration provides two benefits; one it reduces maintenance problems from our standpoint in regards to our cutting grass near an elevated structure adjacent to the floodwall and two, should the area be opened to the general public in the future an underground crossing is much safer than an elevated crossing with its associated structure.

The OLD would therefore support your request to provide an underground crossing/penetration for your 12" line versus an overhead crossing adjacent to the floodgate.

If you have any questions, please call me at 243-4045.

Sincerely,

Stevan G. Spencer, P. E.
Chief Engineer

SGS:dba

xc: Max Hearn, Executive Director
Gary Benoit, Senior Counsel
Brian Keller, USACE
Geneva Grille, LADOTD

ENGINEERING DIVISION
Permit Review
Sheet

MAILTRAX # 00-1292

SUBJECT: Req by the Univ of New Orleans to Install Palm trees on the Protected Side of the N. O. Lakefront Levee, between Approx B/L Sta 50+50 and 58+00 in, Orleans Parish, LA.

ED-FS 21 Nov 00

No comment.

FJV

SUSPENSE:*

________ ED-S (Flock)
________ ED-SP
________ ED-SR

SUSPENSE:*

________ ED-H (Laurent)
________ ED-HD
________ ED-HC
________ ED-HH
________ ED-HM

SUSPENSE:* 11/24/2000

____1____ ED-F (Caver)
________ ED-FG
________ ED-FD
____✓____ ED-FS

SUSPENSE:*

____2____ ED-L (Baumy)
________ ED-LW
________ ED-LC
________ ED-LL
________ ED-T
________ ED-G

***If a suspense cannot be met, notify secy, ext. 2240, of new suspense date.**

FILE

CEMVN-OD-T (11-2-240a) 20 November 2000

MEMORANDUM FOR C/ENGR DIV

SUBJECT: Req by the University of New Orleans to Install Palm Trees on the Protected Side of the N.O. Lakefront Levee, Between Approx. B/L Sta. 50+50 and 58+00, in Orleans Parish, LA.

1. Forwarded for review, comment, and return. It is requested that **only Geotechnical Br** and **Civil Br** review this request in order to expedite a response.

2. Labor charges for this permit review may be charged to L20075 **is requested that each reviewer use their own organization code and log in their review time on the attached form. Please return this form along with the review comments so that this office can monitor and control project expenditures.**

3. If further assistance is needed, please contact Amy E. Powell, ext 2241.

00-265

Encl

for Amy E. Powell
R. H. Schroeder, Jr.
Chief, Operations Division

ltr dtd 26 Oct 00
w/dwgs

APPLICANT: University of New Orleans

PERMIT NO.: 00-265

O&M, GENERAL CHARGE ACCOUNT NO.: L20075

REVIEWER	OFFICE SYMBOL	REVIEW TIME (HOURS)	ORGANIZATION CODE
VOJKOVICH	ED-FS	1	KX

00-265

Facility Planning & Construction

University of New Orleans

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5553 / Fax: (504) 280-5555

26 October 2000

Mr. Stevan G. Spencer, P.E.
Chief Engineer, Orleans Levee District
6001 Stars & Stripes Blvd.
Suite 202 Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

RE: Orleans Levee District Permit
UNO Information Technology Center Parking Garage – Landscaping Package

Mr. Spencer,

The University has previously applied for, and been granted, a permit for the construction of a Parking Facility at the UNO Research and Technology Park. This letter serves as a request to obtain a permit from the Orleans Levee District for landscaping at the Garage, particularly for the installation of palm trees on the north side of the structure. We propose to install these trees 6' from the north face of the Garage, and at a depth of no more than 3'-0". There will be no irrigation in this area. Though there is no street address assigned, the Parking Garage will serve three existing buildings at 2233, 2251, and 2285 Lakeshore Drive, and is within 250' of a hurricane levee system.

Per the requirements, attached please find a layout of the proposed landscaping in relation to the Parking Garage, to the UNO property line, and to the toe of the levee. A check in the amount of $100.00 for the processing fee is included as well.

Please review the information for and issue a permit if it meets your requirements. Feel free to call with any questions or if you need any additional information. Thank you for your time.

Sincerely,

Gus Cantrell, P.E.
Director
Facility Planning & Construction

Cc: Ms. Geneva Grille, LADOTD
Mr. Brian Keller, CEMVN-OD-R, U.S. Army Corps of Engineers

CEMVN-ED-TF (OD-T/30 JUN 00) 1st End Mr. Desai/2657
SUBJECT: Request by the University of New Orleans to Construct a Parking Garage on the Protected Side of the New Orleans Lakefront Levee, between approx. B/L Sta. 50+50 and 58+00, in Orleans Parish, LA

CEMVN-ED 12 JUN 00

FOR C/O & R Div.

The Engineering Division has no adverse comments regarding the subject permit request provided the applicant/owner shall comply with the following restrictions.

1. All excavation performed shall immediately be back filled if the region is under warning/watch of an approaching hurricane threat.

2. The soil borings indicate substantial sand deposits at or near the ground surface. We recommend that applicant's Geotechnical Engineer determine the potential for seepage and excess hydrostatic pressures at the drop inlet drains and the limestone bedding under the drainage pipes. The limestone bedding will collect any seepage from the drop inlet drains at the levee toe and allow the seepage to flow under the parking garage.

3. Any damage to the levee or berm resulting from the applicant's activities shall be repaired by the applicant to the pre-construction condition.

Encl
nc

GERARD S. SATTERLEE, P.E.
Chief, Engineering Division

CF:
✓CEMVN-ED-F

ENGINEERING DIVISION
Permit Review
Sheet

MAILTRAX # 00-902

SUSPENSE:*

ED-S
ED-SP
ED-SR

SUSPENSE:*

ED-H
ED-HD
ED-HC
[illegible]
ED-HH

SUSPENSE:* 7-11-00

1 ED-F
ED-FG
ED-FD
ED-FS

SUSPENSE:*

2 ED-L
ED-LW
ED-LC
ED-LL
3 ED-T
ED-G

*If a suspense cannot be met, notify secy, ext. 2240, of new suspense date.

SUBJECT:

Req by UNO to construct a parking garage on the protected side of the N.O. Lakefront Levee, between approx B/L sta 50+50 and 58+00 in Orleans Parish.

ED-FS 7 July 2000

See attached sheet.

FJV

FILE

ED-FS 7 July 2000

The soil borings indicate substantial sand deposits at or near the ground surface. We recommend that your Geotechnical Engineer determine the potential for seepage and excess hydrostatic pressures at the drop inlet drains and the limestone bedding under the drainage pipes. The limestone bedding will collect any seepage from the drop inlet drains at the levee toe and allow the seepage to flow under the parking garage.

All excavation shall be immediately backfilled if the region is under warning/watch of an approaching hurricane threat.

FJV

CEMVN-OD-T(11-2-240a)

30 June 2000

MEMORANDUM FOR C/ENGR DIV

SUBJECT: Req by the University of New Orleans to Construct a Parking Garage on the Protected Side of the New Orleans Lakefront Levee, Between Approx. B/L Sta. 50+50 and 58+00, in Orleans Parish, LA.

1. Forwarded for review, comment, and return. It is requested that only Geotechnical Br, Structures Br and Civil Br review this request in order to expedite a response.

2. Labor charges for this permit review may be charged to L20075. **It is requested that each reviewer use their own organization code and log in their review time on the attached form. Please return this form along with the review comments so that this office can monitor and control project expenditures.**

3. If further assistance is needed, please contact Amy E. Powell, ext. 2241.

00-148

Encl

ltr dtd 29 June 00
hand carried dwgs

Amy E. Powell
for R. H. Schroeder, Jr.
Chief, Operations Division

APPLICANT: University of New Orleans

PERMIT NO.: 00-148

O&M, GENERAL CHARGE ACCOUNT NO.: L20075

REVIEWER	OFFICE SYMBOL	REVIEW TIME (HOURS)	ORGANIZATION CODE
F. VOJKOVICH	ED-FS	4	KX

Facility Planning & Construction

University of
New Orleans

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5551 / Fax: (504) 280-5555

29 June 2000

Mr. Stevan G. Spencer, P.E.
Chief Engineer
Orleans Levee District
6001 Stars & Stripes Blvd.
Suite 202 Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

RE: Orleans Levee District Permit
UNO Information Technology Center Parking Garage

Mr. Spencer,

This letter serves as a request to obtain a permit from the Orleans Levee District for the construction of a Parking Garage in the University of New Orleans' Research and Technology Park. The Parking Garage is a two-story structure, approximately 760' long by 150' wide, and will supported by 65' composite piles (predrilled to a maximum 55') as well as 70' steel piles (12" diameter, predrilled to a maximum 55'). Though there is no street addressed assigned, the Parking Garage will serve three existing buildings at 2233, 2251, and 2285 Lakeshore Drive, and is within 250' of a hurricane levee system.

Per the requirements, attached please find a full set of plans (including the site plan, and the foundation plan and details), and the related piling specifications. Also attached is Specification 02005, Eustis Engineering Co.'s subsoil investigation for the property. A check in the amount of $100.00 for the processing fee is included as well.

Please review the information for and issue a permit if it meets your requirements. Feel free to call with any questions or if you need any additional information. Thank you for your time.

Sincerely,

Gus Cantrell, P.E.
Director
Facility Planning & Construction

Cc: Ms. Geneva Grille, LADOTD; Mr. Brian Keller, CEMVN-OD-R, U.S. Army Corps of Engineers; File

SECTION 02005 - SOIL BORINGS

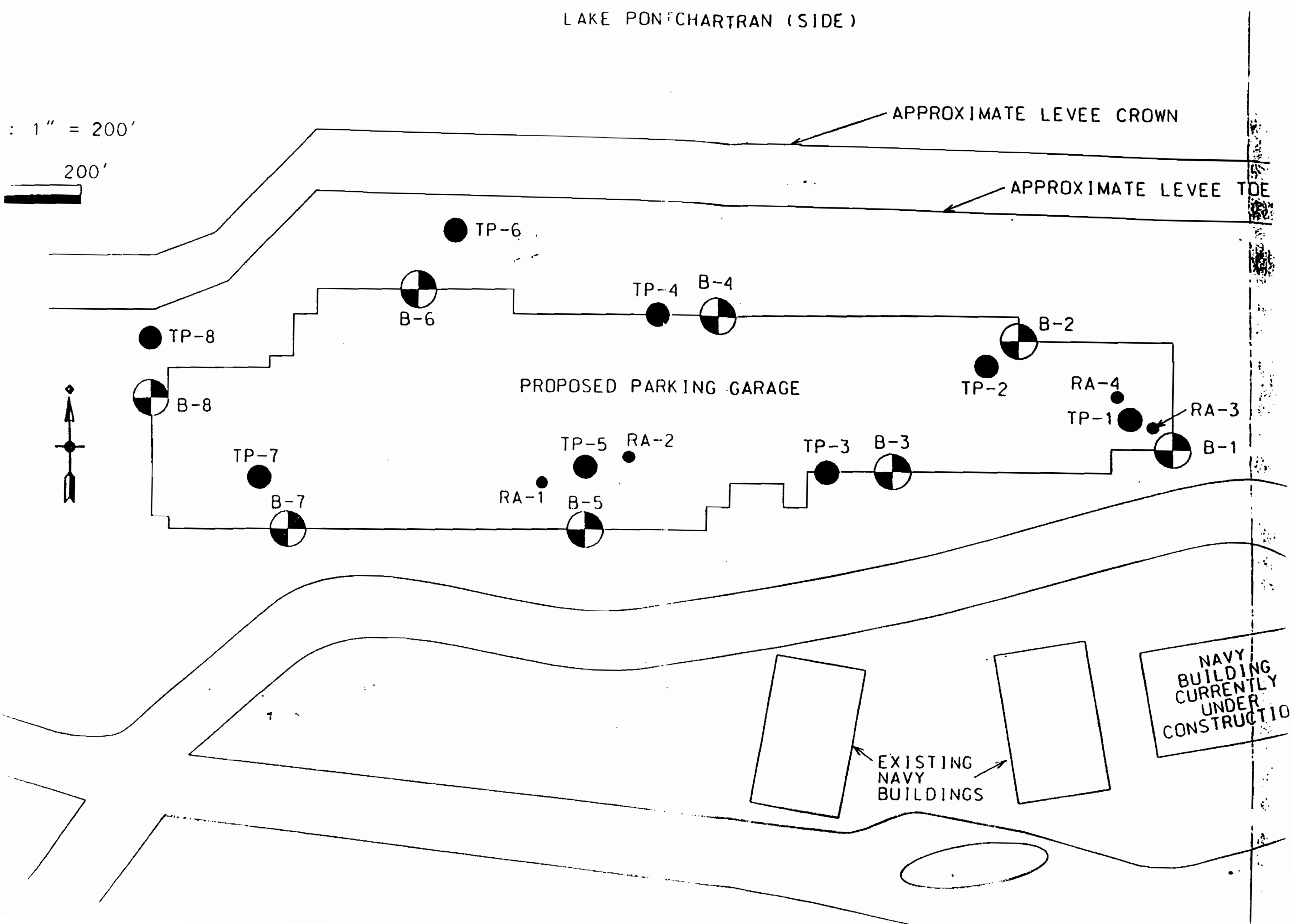
PART 1 - GENERAL

1.1 SUBSOIL INVESTIGATIONS

A. Subsoil investigations were made at the project site by Eustis Engineering Company, Inc. of Metairie, Louisiana, a recognized independent soils consultant. Copies of the soils report dated December 14,1999 may be examined at the offices of the Architect. Neither the Owner nor the Architect guarantee the accuracy of soil information.

B. As a convenience and for information purposes only there is included in this Section a reduced size reproduction of Fig. 1 - Boring Locations and Subsoil Profile, from the subsoil investigation report.

- END OF TEXT - ATTACHMENT FOLLOWS


LAKE PONTCHARTRAN (SIDE)
1" = 200'
200'
APPROXIMATE LEVEE CROWN
APPROXIMATE LEVEE TOE
TP-6
TP-4
B-4
B-6
B-2
TP-8
TP-2
PROPOSED PARKING GARAGE
RA-4
B-8
TP-1
RA-3
TP-5
RA-2
TP-3
B-3
B-1
TP-7
RA-1
B-7
B-5
NAVY BUILDING CURRENTLY UNDER CONSTRUCTIO
EXISTING NAVY BUILDINGS

LEGEND AND NOTES FOR LOG OF BORING AND TEST RESULTS

PP	Pocket penetrometer resistance in tons per square foot	
TV	Torvane shear strength in tons per square foot	
SPT	Standard Penetration Test. Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in O.D., 1.4-in. I.D. sampler a distance of one foot into the soil, after first seating it 6 inches	
SPLR	Type of Sampling	■ Shelby ☒ SPT ⧄ Auger ☐ No Sample
SYMBOL	Clay ▨ Silt ▥ Sand ⚄ Humus ≋	Predominant type shown heavy; Modifying type shown light
DENSITY	Unit weight in pounds per cubic foot	
USC	Unified Soil Classification	
TYPE	UC	Unconfined compression shear
	OB	Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
	UU	Unconsolidated undrained triaxial compression shear
	CU	Consolidated undrained triaxial compression shear
	DS	Direct shear
	CON	Consolidation
	PD	Particle size distribution
	k	Coefficient of permeability in centimeters per second
	SP	Swelling pressure in pounds per square foot
ϕ	Angle of internal friction in degrees	
c	Cohesion in pounds per square foot	

Other laboratory test results reported on separate figure

Ground Water Measurements ▼ Initial ▽ Final

GENERAL NOTES

(1) At the time the borings were made, ground water levels were measured below existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction, immediately prior to beginning work.

(2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: Datum: Gr. Water Depth: See Text Job No.: 16222 Date Drilled: 11/24/99 Boring: 1 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Loose tan silty sand w/organic matter	SM	1	0-1											
	1.75				Stiff & tan gray clay w/wood & sand layers	CH	2	2-3	17	109	128								
		9			Loose tan fine sand w/shell fragments	SP	3	4-5											
		4			Very loose gray fine sand w/shell fragments	SP	4	7-8											
10		12			Medium dense gray fine sand w/shell fragments	SP	5	10-11											
							6	14-15	29										
					Loose gray clayey sand w/shell fragments	SC	7	18-19											
20																			
					Very soft gray sandy clay w/shell fragments	CL	8	23-24											
		2					9	27-28	31										
30		2					10	30-31											
	0.10				Soft gray clay w/sand lenses & shell fragments	CH	11	34-35	59	62	99	UC	--	305					
					Very loose gray clayey sand w/shell fragments	SC	12	38-39										15.2	
40																			
		18			Medium dense gray silty sand w/clay pockets & shell fragments	SM	13	42-43											
		13					14	45-46											
50							15	49-50	29	93	120	OB	--	545					

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: **Gr. Water Depth:** See Text **Job No.:** 16222 **Date Drilled:** 11/24/99 **Boring:** 1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50				▥	Medium dense gray silty sand w/clay pockets & shell fragments	SM													
		11	☒	▨	Stiff gray & tan sandy clay	CL	16	54-55	25										
		14	☒	▥	Medium dense gray silty sand	SM	17	57-58											
60		19	☒	▥			18	60-61											
		21	☒	▥															
				░	Medium dense tan fine sand w/silt	SP-SM	19	63-64											
		20	☒	░			20	66-67										10.7	
70		22	☒	░			21	69-70											
		30	☒	░			22	74-75											
80																			
90																			
100																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/22/99 Boring: 2

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		8	☒	▨	Loose brown clayey sand w/shell fragments	SC	1 2	0-0.5 0.5-2											
		4	☒		w/concrete fragments		3	3.5-5										16.8	
10		11	☒	░	Medium dense gray fine sand w/shells	SP	4	8.5-10											
		30	☒				5	13.5-15											
20		18	☒				6	18.5-20											
		5	☒	▨	Soft gray sandy clay w/sand layers & shell fragments	CL	7	23.5-25	28										
30		3	☒				8	28.5-30	29										
			■	▨	Soft gray clay w/sand pockets & shell fragments	CH	9	33-34	40	78	108	UC	–	280					
			■	▨	Very soft gray sandy clay	CL	10	38-39											
40		25	☒	░	Medium dense gray silty sand	SM	11	40.5-42											
		7	☒	░	Loose gray silty sand	SM	12	43.5-45											
50	0.50		■	▨	Soft gray clay w/shell fragments & sand pockets	CH	13	48-49	49										

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/22/99 Boring: 2 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Medium stiff gray clay w/sand pockets	CH													
	3.00						14	53-54	36	81	110	UC	--	435					
					Loose to medium dense gray & tan silty sand	SM													
							15	58-59	23										
60																			
					w/clay lenses		16	63-64	22										
		18	☒		Medium dense gray silty sand	SM	17	64.5-66											
		30	☒		Dense gray silty sand w/clay pockets	SM	18	67.5-69										20.7	
70																			
		38	☒		Dense tan silty sand	SM	19	70.5-72											
		40	☒				20	73.5-75											
80																			
90																			
100																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/22/99 Boring: 3 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		18	☒		Loose tan fine sand w/gravel	SP	1	0-0.5											
					Medium dense brown fine sand w/clay layers & gravel	SP	2	0.5-2											
		7	☒		Loose gray silty sand	SM	3	3.5-5										13.6	
		7	☒				4	5.5-7											
10		3	☒		Very soft gray sandy clay w/clay layers	CL	5	8.5-10	37										
		8	☒		Loose gray silty sand w/clay pockets & lenses, & shell fragments	SM	6	13.5-15											
20		4	☒		Soft gray sandy clay w/shell fragments & sand pockets	CL	7	18.5-20	40										
			■		Loose gray clayay silt w/shell fragments	ML	8	23-24											
			■		Soft gray silty clay w/sand lenses	CL	9	28-29	39	79	110	UC	--	480					
30		42	■		Soft gray sandy clay w/shell fragments	CL	10	33-34											
			■		Very soft gray sandy clay	CL	11	38-39	33	86	115	UC	--	200					
40		30	☒		Dense gray silty sand	SM	12	42.5-44											
		29	☒				13	45.5-47											
50		9	☒		Loose gray silty sand w/clay layers	SM	14	48.5-50											

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/22/99 Boring: 3 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50				▨	Medium stiff gray clay w/sand pockets & shell fragments	CH													
			■	▨			15	53-54	36	83	112	UC	--	700					
				▨	Medium stiff tan & gray sandy clay	CL													
	3.00		■	▨			16	58-59	23										
60				▨	Very loose tan clayey sand	SC													
			■	▨			17	63-64	23										
		30	☒	▨	Dense tan silty sand w/clay layers	SM	18	65.5-67											
70		31	☒	▨			19	68.5-70										18.4	
		50=6"	☒	▨	Very dense tan silty sand	SM	20	73.5-75											
80																			
90																			
100																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/19/99 Boring: 4 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		13	☒		Loose brown silty sand w/shells & roots	SM	1	0-0.5											
					Medium dense brown silty sand w/clay layers	SM	2	0.5-2											
		6	☒		Loose tan silty sand w/clay pockets & shell fragments	SM	3	2.5-4											
		4	☒		Loose gray & tan silty sand w/clay pockets & shell fragments	SM	4	5.5-7											
		28	☒				5	8.5-10											
10					Medium dense gray & tan silty sand w/clay pockets & lenses & shell fragments	SM													
		21	☒				6	13.5-15											
		4	☒		Very loose gray clayey silt w/shell fragments	ML	7	18.5-20	39										
20																			
			■		Very loose gray sandy silt w/clay pockets	ML	8	23 24	44	76	109	OB	--	110					
			■		Soft gray sandy clay w/shells	CL	9	28-29											
30																			
			■				10	33-34											
			■		Very soft to soft gray clay w/sand lenses & shell fragments	CH	11	38-39	61	62	99	OB	--	415					
40																			
			■		Medium dense gray silty sand w/shell fragments	SM	12	41.5-42.5											
		38	☒				13	43.5-45											
		24	☒				14	45.5-47											
50		7	☒		S gr clay w/sand pckts. & shell frgs.	CH													

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/19/99 Boring: 4 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Soft gray clay w/sand pockets & shell fragments	CH	15	49.5-51	44										
							16	53-54	37										
					Soft gray & tan sandy clay	CL	17	58-59	22										
60																			
							18	63-64											
		WOR	☒		Very loose to loose gray silty sand w/clay pockets	SM													
		6	☒				19	68.5-70										24.5	
70																			
		50	☒		Very dense brown silty sand	SM	20	71.5-73											
		50	☒				21	73.5-75											
80																			
90																			
100																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/23/99 Boring: 5 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		36	☒		Loose brown clayey sand	SC	1	0-0.5	11										
					Dense brown clayey sand w/sandy clay layers	SC	2	0.5-2											
		50 = 12"	☒			SM	3	2.5-4	8										
		18	☒		Very dense brown silty sand w/concrete fragments & clay pockets	SM	4	4.5-6	12										
		10	☒		Medium dense brown silty sand w/clay layers & shell fragments														
10					Medium dense gray fine sand w/silt	SP-SM	5	8.5-9										10.9	
		7	☒		Soft to medium stiff gray sandy clay w/shell fragments	CL	6	13.5-15	31										
			■		Very soft gray sandy clay w/shell fragments	CL	7	18-19	34										
20			■		Very soft gray clay w/silt lenses & pockets	CH	8	23-24	50	70	105	UC	--	230					
			■		Soft gray sandy clay w/shell fragments	CL	9	28-29	28	93	119	OB	--	315					
30			■		Medium stiff gray clay w/sand lenses & pockets & shell fragments	CH	10	33-34	57	65	101	UC	--	505					
			■		Very loose gray silty sand w/shell fragments	SM	11	38-39	26										
40		18	☒		Medium dense gray silty sand w/shell fragments	SM	12	40.5-42											
		28	☒				13	43.5-45											
		29	☒				14	46.5-48											
50		3	☒		Loose gray silty sand w/shell fragments	SM	15	48.5-50	30										

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/23/99 Boring: 5 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50			■	▨	Medium stiff gray clay w/sand lenses & pockets	CH													
							17	53-54	44	75	107	UC	--	690					
			■	▨	Stiff tan & gray sandy clay	CL													
	1.50						18	58-59	22	98	120	UC	--	1395					
60			■	▨	Soft tan sandy clay w/silty sand layers	CL													
	0.50		■				19	63-64	26										
			■				20	68-69	26										
70		48	☒	░	Dense tan silty sand	SM	21	70.5-72											
		50 = 6"	☒	░	Very dense tan silty sand	SM	22	73.5-75											
80																			
90																			
100																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/19/99 **Boring: 6** **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		13	☒		Loose brown silty sand w/clay layers & shells	SM	1	0-0.5											
						CH	2	0.5-2											
		10	☒		Stiff tan & gray clay w/sand layers	SC	3	2.5-4											
					Loose brown clayey sand w/shells														
		14	☒		Medium dense gray silty sand w/clay pockets & shell fragments	SM	4	5.5-7											
10		15	☒				5	8.5-10										17.6	
		21	☒		Medium dense gray clayey sand w/shell fragments	SC	6	13.5-15											
20		7	☒		Medium stiff brown sandy clay	CL	7	18.5-20										81.6	
		2	☒		Very soft gray sandy clay w/shell fragments	CL	8	23.5-25											
30			■				9	28-29	30	92	120	UC	--	185					
			■		Very soft gray clay w/sand lenses	CH	10	33-34	58										
			■		Loose gray silty sand w/shell fragments	SM	11	38-39											
40		50	☒		Medium dense gray clayey sand	SC	12	39.5-40.5											
		35	☒		Dense gray clayey sand	SC	13	43.5-44.5											
		15	☒		Medium dense gray clayey sand w/clay pockets & shell fragments	SC	14	45.5-46.5										35.2	
50		13	☒				15	48.5-49.5											

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/19/99 Boring: 6 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50				▨	Very soft gray sandy clay	CL													
	0.50		■	▨			16	53-54	38										
	3.00		■	▨	Very stiff gray & tan sandy clay	CL	17	58-59	21	102	124	UC	--	3390					
60				▨															
			■	▨	Soft gray & tan sandy clay	CL	18	63-64	28	92	118	UC	--	490					
			■	▒	Loose to medium dense light gray clayey sand	SC	19	68-69										42.0	
70		50	☒	▒	Very dense tan & gray silty sand	SM	20	70.5-72											
		50	☒	▒			21	73.5-75											
80																			
90																			
100																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/23-24/99 Boring: 7 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		14	☒		Loose brown silty sand w/shells	SM	1	0-0.5											
					Medium dense brown silty sand w/gravel w/clay pockets	SM	2	0.5-2											
		12	☒				3	3.5-5	14										
		14	☒				4	6.5-7											
10		6	☒		Loose gray silty sand w/shells	SM	5	9.5-11											
		6	☒				6	13.5-15											
20		2	☒		Very soft gray silty clay	CL	7	18.5-20	49										
			■		Loose to medium dense dark gray silty sand w/wood	SM	8	23-24	42	77	110	OB	--	500					
			■		Soft gray sandy clay w/shell fragments	CL	9	28-29											
30			■		Medium stiff gray clay w/sand pockets	CH	10	33-34	44	74	108	UC	--	590					
			■		Very loose gray fine sand	SP	11	38-39	25										
40		20	☒		Medium dense gray fine sand w/shells	SP	12	40.5-42											
		28	☒				13	42.5-44											
		28	☒				14	46.5-48											
50		30	☒		Dense gray fine sand	SP	15	48.5-50											

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: **Datum:** **Gr. Water Depth:** **Job No.:** 16222 **Date Drilled:** 11/24/99 **Boring:** 8 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		12	☒	⁙	Loose brown silty sand	SM	1	0-0.5											
				⁙	Medium dense brown silty sand w/gravel	SM	2	0.5-2											
		28	☒	⁙			3	3.5-5											
		4	☒	⁙	Loose gray silty sand w/shells & clay pockets	SM	4	6.5-8	29										
10		16	☒	▨	Soft to medium stiff gray sandy clay w/shell fragments	CL	5	9.5-11	37										
		8	☒	⁙	Loose gray silty sand w/clay layers & wood fragments	SM	6	13.5-15	38										
		10	☒	▨	Medium stiff gray sandy clay w/wood	CL	7	15.5-17	174										
20		2	☒	▨	Medium stiff gray & brown sandy clay w/wood fragments & shells	CL	8	18.5-20	42										
			■	▨	Very soft gray sandy clay w/shell fragments	CL	9	23-25	37										
			■	▨	Soft gray sandy clay	CL	10	28-29											
30			■	▨			11	33-34	29	91	118	UC	--	310					
			■	▨			12	38-39											
40		19	☒	⁘	Medium dense gray fine sand w/silt	SP-SM	13	40.5-42										6.7	
		41	☒	⁘	Dense gray fine sand	SP	14	43.5-45											
		40	☒	⁘			15	46.5-48											
50		37	☒	⁘			16	48.5-50											

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/24/99 Boring: 8 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50				⁘	Dense gray fine sand	SP													
		8	☒	▨	Stiff gray & tan clay w/sand pockets	CH	17	53.5-55											
60		11	☒	▨			18	58.5-60	44										
	2.00		■	▨			19	63-64	26	95	120	UC	--	1200					
			■	▦	Medium dense gray silty sand w/clay layers	SM	20	68-69	25	96	120	OB	--	2740					
70		50	☒	▦	Dense gray silty sand	SM	21	70.5-72											
		50	☒	▦			22	73.5-75											
80																			
90																			
100																			

Comments:

SECTION 02315 - STEEL PIPE PILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to work of this Section.

1.2 SUMMARY

A. Description:

1. The extent of the work is shown on the Drawings including number and location of the piling.
2. The work includes furnishing and driving required piling. The layout work shall be by the General Contractor.

B. Pile Type: This Section includes the following type of piling:

1. Steel Piling

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Field Engineering: Section 01050.

B. Shop Drawings and Submittals: Section 01300.

C. Materials and Equipment: Section 01600.

D. Testing Laboratory Services: Section 01410.

E. Temporary Facilities: Section 01500.

F. Soil Borings: Section 02005.

G. Clearing and Preparing Site: Section 02100.

H. Excavating, Filling and Grading for Building Foundation: Section 02201.

I. Driven Piles: Section 02455.

J. Cast-In-Place Concrete: Section 03300.

1.4 DAMAGE TO EXISTING PROPERTY

A. Investigation: Contractor shall investigate the existing adjacent buildings, sewers, and utilities and shall take proper and necessary precautions to protect same from damage due to the execution of the piling work. Should damage occur due to Contractor's negligence, the cost and responsibility for repairing or replacing the work in its original condition shall be borne by the Contractor at no cost to the Owner.

B. Documentation: If conditions should warrant, the Contractor shall have photographs taken of walls and interior of adjacent building, showing in full any damages that now exist.

1.5 NOTIFICATION

A. Requirements: Contractor shall notify Architect forty-eight (48) hours prior to driving the initial pile. Pile driving must not commence without the Architect's representative and the testing laboratory being present.

1.6 SUBSOIL INVESTIGATION REPORT

A. Geotechnical Investigation: Refer to Section 02005 - SOIL BORINGS for soil investigation information.

B. Purpose: The data indicated in Subsoil Investigation are not intended as representations or warranties of continuity of such conditions. It is expressly understood that the Contractor is responsible for his interpretations or conclusions drawn therefrom. Data are made available for convenience of Contractor only.

C. Additional Investigations: Additional test borings and other exploratory operations may be made by Contractor at no additional cost to Owner, provided such operations are acceptable to Architect.

1.7 QUALITY ASSURANCE

A. Welders Qualifications: Qualify all welders, welding processes and procedures in accordance with AWS "Code for Welding in Building Construction."

1.8 TESTING AND INSPECTING - GENERAL

A. Test Agency: Testing and inspecting shall be performed by the Independent Testing Laboratory specified in Section 01410 - TESTING LABORATORY SERVICES.

B. Services: Testing Laboratory Services will include:

1. Inspections to certify materials' conformity to detail and material requirements.
2. Witnessing and logging all pile driving operations.
3. Other tests, inspections and certifications required by Specifications, or as necessary to ensure conformity to the Documents.

C. Steel Piles: All steel piles shall be inspected prior to driving by the Testing Laboratory. No piles shall be driven until inspected and approved. All piles are subject to reinspection at any time, and any piles which fail to conform to Specifications or which have been injured in handling shall be rejected.

D. Driving Records: Submit two (2) copies of driving record of each pile to Architect not later than two (2) days after driving. Include Project name, name of Contractor, pile location and number, type and size of hammer used, type of pile driving cushion used, rate of operation of pile driving equipment, pile dimensions, elevation of tip, continuous record of number of blows for each foot of penetration, pile deviation and any unusual occurrences during pile driving.

1.9 SUBMITTALS

A. General: Submit the following in accordance with the submittal requirements specified in Section 01300 - SUBMITTALS.

B. Mill Certificates: Submit two (2) copies of Mill Certificates for pile type purchased.

1.10 DELIVERING, STORING AND HANDLING

A. General: Comply with Section 01600 - MATERIALS AND EQUIPMENT.

B. Delivery Schedule:

1. Deliver materials to Project site in quantities and at times to assure continuity of pile driving operations to Project Schedule.

C. Storage: Store piles in orderly groups above ground and block during storage to minimize possible distortion of members. Piles exhibiting variations beyond mill tolerance limits will be considered distorted and shall not be used, unless otherwise permitted by Architect.

1.11 MEASUREMENT AND PAYMENT

A. Basis for Bids: Bids shall be based on number, dimensions, and pile length indicated, from designated tip to indicated butt elevations.

B. Basis for Payment:

1. Contract price includes all labor, materials, tools, equipment, and incidentals, and performance of all work for furnishing, driving, cutting off filling and related work for piles in place.
2. No payment will be made for rejected piles, including piles driven out of place and out of plumb, imperfect piles, or piles damaged in driving or handling.
3. Driving records of the Test Piles will establish the criteria for acceptance or rejection of the job piles.

PART 2 - PRODUCTS

2.1 STEEL PIPE

A. Description: Heavy gauge closed-end steel pipe, to be filled with 3000 psi concrete at 28 days following driving. Spiral welded pipe shall not be used.

B. Size: Sizes shown on Drawings are exact and supersede minimum wall thickness on Inspection tables indicated in ASTM A-252.

C. Steel: Weldable conforming to ASTM A-252, Grade 1, yield-strength: 30,000 psi.

D. Splicing: Splices are not permitted.

E. Reinforcing Steel: Provide 1 #6 16'-0" long in top section of each pile. Bars shall extend 1'-0" above pile into foundation.

2.2 DRIVING EQUIPMENT

A. Provide pile driving equipment with fixed leads of type designed and used in this locale for pile driving operations. Equipment shall be first-class operating condition, and shall have capacity to operate hammer regularly, rapidly and continuously, in accordance with manufacturer's rating. Equipment shall develop rated energy specified below. Before driving begins, secure approval of all driving equipment from Architect.

B. Hammer:

1. Single acting air hammer with a manufacturer's rated energy 15,000 ft./lbs. per blow.
2. Rated Driving Energy:
    a) Not less than 15,000 ft./lbs per blow.

C. Driving Caps: Equip hammer with cast steel or structural steel driving cap with grooved base conforming to pile shape. Keep bearing surfaces of grooves true and smooth.

D. Leads: Use fixed or rigid type pile driver leads that will hold pile firmly in position and alignment, and in axial alignment with hammer. Free-swinging leads will not be permitted.

2.3 PROTECTIVE COATING

A. Provide protective coating on a minimum of the top ten feet (10'-0") of all steel pipe piles or greater as indicated in the drawings.

B. Material: Hot-applied, coal tar enamel system complying with SSPC Paint 16-68T.

C. Surface Preparation: Blast all surfaces to be coated to minimum SSPC SP-6 (commercial blast finish) standard. Remove all mill scale. De-grease all areas of surfaces to be blasted, prior to blast cleaning, to remove of oil and grease.

D. Application: Apply in accordance with coating manufacturer's recommendations. Application shall consist of hot-applied primer plus two (2) coats of enamel, for a total average thickness of 3/32" (plus or minus 1/32").

E. Corrections: Finish coating shall be well-adhered and generally smooth and free from projections which can be removed by abrasion. Remove sharp edges and repair coating in accordance with coating manufacturer's directions.

PART 3 - EXECUTION

3.1 PRE-DRIVING WORK

A. Examination: Examine areas and conditions under which steel piles are to be installed. Notify Architect in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Site Conditions:

1. Do not drive piles within 30 feet of any concrete or masonry structure which is less than forty-eight (48) hours old.

C. Pile Length Markings: Mark leads and piling by painting a horizontal line at 1'-0" intervals and number of feet at 5'-0" intervals.

D. Welding:

1. Perform all manual arc-welding using either shielded metal arc or submerged arc method, complying with AWS standards. Use oxygen-gas or oxygen arc methods for field cutting of steel, complying with AWS recommendations.

3.2 DRIVING

A. General Requirements:

1. Continuously drive each pile at locations indicated, to required tip elevation specified.
2. Carefully maintain center of gravity for each group or cluster of piles to conform to locations shown on Drawings.
3. Carefully plumb leads and pile before driving. Take care during driving to maintain alignment between spliced sections.
4. When handling and driving long piles, take special precautions to ensure against over stress and leading away from a true position when driving. When high-resistant strata lying near surface must be penetrated, spud piles may be used, when authorized during early stages of driving operations with no additional payment to the Contractor.

B. Tolerances: Drive piles within the following maximum tolerances:

1. Location: 3" from location indicated for center of gravity of each single pile or pile groups.
2. Variation From Batter Specified: 1-1/2% maximum.
3. Butt Elevation: Not more than 1 inch above or below designated elevation.

C. Damaged or Misdriven Piles:

1. Damaged piles, and piles driven outside required driving tolerances, will not be accepted.
2. Rejected piles shall be cut off 12 inches below bottom of pile cap.
3. Drive additional pile or piles where centerline deviation exceeds 3" and a redesign indicates a load on any pile exceeding 110% of the design load.
4. Piles rejected after driving shall be abandoned, filled and cut off. Additional piles shall be driven to replace rejected units at newly designated locations. Fill spaces that are left by withdrawn piles, using cohesionless soil material such as gravel, sand, broken stone, and gravel-sand mixtures. Place and compact throughout the length of the space.
5. Additional quantities of piling, concrete, reinforcing steel, labor and all other materials and incidentals required for properly constructing redesigned pile caps due to damaged and misdriven piles shall be at the expense of the Contractor. No extensions of time and no delay-related cost claims will be entertained for rejected piles or reconfigured pile caps.

D. Cutting-Off: Cut-off tops of driven piles to receive cap plates, square with pile axis and at elevations indicated. Grind flame-cut surface, level to 1/16" tolerance, using a power-hand grinder. Dispose of excess material off site.

E. Following:

1. The Contractor may follow or pre-excavate to bottom of footing at his option. Provide adequate coating to provide 10'-0" of coating below pile cap.
2. Followers (if used) shall be approved by Architect and constructed with a steel pipe section which ensures complete positive coverage of pile butt and proper transfer axially of blow to pile.

F. Filling: After steel pipe piles are driven in place, place reinforcing steel in pipe and fill pipes with 3000 psi concrete, meeting Specifications in Section 03300.

1. Tension Connectors: Provide tension connectors as indicated on the drawings.

- END -

SECTION 02455 - DRIVEN PILES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Composite piles, consisting of untreated timber lower section and cast-in-place upper section for all building piles unless noted otherwise.

B. Related Sections:

1. Section 01410 - Testing Laboratory Services.
2. Section 02201 – Excavation, Filling and Grading for Building Foundation.
3. Section 03300 - Cast-In-Place Concrete.

1.2 TESTING LABORATORY SERVICES

A. Permanent Piles: The independent Testing Laboratory specified in Section 01410 will perform the following services.

1. Inspection: Perform inspections at source and at project site. Mark conforming piles for identification.
2. Logging: Log the driving of all piling and record the following:
    a. Date driven, type of hammer, pile description including tip, length and butt dimensions measured just prior to driving.
    b. Location of pile.
    c. Number of blows per foot for full length of pile.
    d. Tip and butt elevation.
    e. Vibration Measurements.
    f. Record control elevations provided by Contractor.
    g. Heaved piles.
3. Reporting: Submit driving records daily.

1.3 CONTRACTOR DUTIES

A. Protection of Property: The Contractor shall document the conditions of existing paving, structures, sewers, utilities, and other property on and adjacent to the work site and shall take suitable precautions to protect such property from damage which could result from the piling work. Should damage occur due to Contractor's operations, the Contractor shall repair or replace the damaged work to restore it to its original condition, without additional cost to the Owner.

1. Documentation: Photograph existing conditions of structures, finishes, equipment, and adjacent improvements that might be construed as damage resulting from pile driving operations. File photos with Architect before starting pile driving.

B. Notification: The Contractor shall notify the Architect and the Testing Laboratory 48 hours prior to driving initial pile. Pile driving must not commence without representatives of the Architect and the Testing Laboratory being present.

C. Regulatory Agency: In accordance with the applicable Building Code, the Contractor shall notify the Director of the responsible regulatory agency at least 24 hours in advance of pile driving.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Section 01300.

B. Splice Data: Descriptive data for pile splice connector, including evidence of approval by the responsible regulatory agency.

1.5 QUALITY ASSURANCE

A. Vibration Monitoring: The Owner shall employ and pay an independent agency to monitor the vibrations during the pile driving. Modify operations with the Architect's concurrence as necessary to assure that vibrations are such that adjacent property is not damaged or impaired structurally.

B. Building Code: Comply with applicable provisions of the governing Building Codes.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to Project site in such quantities and at such times to ensure continuity of pile driving operations and adherence to project schedule.

B. Storage: Store piles in orderly groups above ground and blocked to prevent distortion of piles.

C. Handling: Handle piles carefully without dropping, breaking, or abrading the surface. Repair damage or replace with new material.

1.7 PROJECT CONDITIONS

A. Basis for Cost: Pile material cost shall be based on indicated number of piles and dimensions from point to cut-off, plus not less than 1 ft. of extra length for cutting piles at required cut-off elevations.

B. Cost Adjustment: In order to fix the cost to the Owner on longer or shorter piles, if conditions should require change in pile lengths, the Contractor shall submit in his proposal the following unit cost:

1. Composite Piles.
    a. Cost per pile for base piles added or deleted.
    b. Cost per foot in 1'-0" increments for increase or decrease in pile length up to 5'-0".

C. No payment will be made for rejected piles including piles driven out of place, imperfect piles, or piles damaged in driving or handling.

D. Site Information: Data for subsurface conditions is available through the Owner and is not intended as a representation or warranty of continuity of conditions. It is expressly understood that the Owner, the Architect, and the Architect's consultants will not be responsible for interpretations or conclusions drawn by Contractor from the data which is made available for the information and convenience of Contractor.

E. Protection: Protect structures, utilities, and other improvements and construction from damage caused by pile driving operations.

F. Control: Establish surveyed elevation bench marks on structures where directed by Architect before commencing work when structures are within 10 feet of pile driving operations. Record and report elevation of each bench mark at least twice a day while pile driving is in progress and at completion of driving. If bench mark readings indicate displacement, halt driving operations until corrective action has been provided and is acceptable to Architect.

PART 2 - PRODUCTS

2.1 COMPOSITE PILES

A. General: Composite piles shall consist of a timber lower section and a concrete upper section.

1. The Contract pile tips and butts shall be driven to the indicated depths below existing grade.

B. Timber Section: Untreated smooth peeled Southern Pine timber section, complying with ASTM D 25, with dimensions as follows:

1. Minimum tip diameter 7 inches.
2. Minimum butt diameter 12 inches measured 3'-0" from the end.
3. Minimum length: Tip elevation 65'-0" below existing grade. Top of wood pile elevation 12'- 0" below existing grade.

C. Shell for Concrete Section: Shall consist of a corrugated steel shell (Armco Hel-Cor or approved equal) of at least 18 gauge or sufficient strength to prevent distortion during driving of the pile or adjacent piles. The steel shall be a minimum of 11 (I.D.) and sufficiently water tight to exclude water and foreign matter during the placing of concrete. The connector section shall consist of a 12 gauge ring 10 3/4" diameter by 4 inches long with 1 inch wide flange formed on one end and two 1/4 inch thick by 3 inches deep wedged double fillet welded to the inside of the ring and notched so as to cross near the center of the ring. The splice shall withstand a minimum moment capacity of 4 foot kips with no applied axial load. The splice shall withstand a minimum tensile force of 10 tons. The connector shall have a #6 reinforcing bar x 30 inches long welded to it and a #6 reinforcing bar spliced with it and run through the concrete of the piles and 8 inches into the concrete pile cap or beam, or slab.

D. Concrete Materials: See applicable Sections of Division 3. Compressive strength 3,000 psi minimum at 28 days, unless otherwise shown on drawings.

E. Pile Splice Connector: The splice connection between composite pile upper and lower sections shall comply with the Building Code, including the requirement for approval by the Director of the regulatory agency having jurisdiction, and the following requirements:

1. Moment capacity - 4 foot kips minimum, with no applied axial load.
2. Tensile force resistance - 10 tons minimum.
3. Construction - Structural grade steel, 12 ga. or thicker, firmly attached to steel shell and capable of penetrating at least 4 inches into the timber section.

2.2 DRIVING EQUIPMENT

A. General: Provide pile driving equipment of type generally used in standard pile driving practice, operated at manufacturer's specified rate, to develop required rated energy per blow.

B. Hammer: Employ pile driving hammers of sufficient capacity, size, and type to be able to deliver consistently effective dynamic energy, suitable to piles to be driven and to subgrade material into which they are to be driven, when operating at not more than 75 percent efficiency of rated driving energy.

1. Provide Vulcan 06 (19,500 ft. lbs.) or equivalent.

C. Driving Caps: Equip hammer with cast steel or structural steel driving cap conforming to pile shape, to prevent damage to pile during driving.

D. Leads: Use fixed or rigid-type pile driver leads that will hold pile firmly in position and alignment, and in axial alignment with hammer. Extend leads to within 2 ft. of elevation at which the pile enters ground.

E. Accessory Equipment: Provide necessary mandrels, drills and other acceptable equipment, suitable for the pile types and driving conditions involved.

PART 3 - EXECUTION

3.1 PRELIMINARY WORK

A. Investigation of Utilities: Investigate locations of underground utilities to identify possible interferences, before starting pile driving. Notify Architect of any interferences discovered before or during driving and obtain instructions before proceeding.

B. Pile Length Markings: Mark each pile with horizontal lines at 1'-0" intervals, and the number of feet from pile point at 5'-0" intervals.

3.2 DRIVING PILES

A. General: Continuously drive piles at locations indicated.

1. Steel upper-section shall be placed and driven immediately after each lower section has been installed.
2. Maintain center of gravity for each group or cluster of piles to conform to locations shown on drawings.
3. Plumb leads and pile before driving. Take care during driving to prevent, and to correct, any tendency of piles to twist or rotate.
4. The butt of each timber pile shall be cut at right angles to the longitudinal axis of the pile, and shall be taper trimmed.
5. When handling and driving long piles, take special precautions to ensure against over stress or leading away from a true position when driving. When high-resistant strata lying near the surface must be penetrated, spud piles may be used, to minimize hard driving of long piles during early stages of driving operations.
6. Jetting will not be permitted.
7. Predrill using a wet rotary type drilling method with a 6" max. bit and 55' maximum below existing grade.
8. Terminate pile driving operations and immediately notify Architect if 20 blows/ft. (in any one foot) is achieved utilizing the required (19,500 ft. lbs. of energy) previously noted.

B. Driving Tolerances: Drive piles within following maximum variance:

1. 3 inches from location indicated in not more than 10% of the total number of piles in a cluster.
2. Maintain 1 inch in 10 feet from vertical (or from required alignment if batter piles are required), or a maximum of 4 inches.

C. Corrections for Misdriven Piles: If variations exceed the tolerances specified above, unless limiting and controlling conditions as determined by the Architect make it impossible to maintain positions more accurately, the Contractor shall furnish and drive additional piles and/or modify pile caps, as instructed by the Architect, without additional cost to the Owner.

1. The Contractor shall plot the pile locations in each cluster and submit data to the Architect, who will then issue instructions for corrective action.
2. Additional piles and/or alterations to pile caps to compensate for or rectify failures to achieve proper locations will be the Contractor's responsibility, whether defects are discovered before or after cutting off.

D. Heaved Piles: Provide recorded instrument observations made during pile driving to determine whether driven pile has lifted from its original seat during driving of adjacent piles. If uplift occurs, re-drive affected piles to point elevation at least as deep as original point elevation with a driving resistance at least as great as original driving resistance.

E. Damaged Piles: Damaged piles will not be accepted. Any pile which is damaged, broken or deflected, or which cannot be driven to required penetration because of underground obstructions, shall be rejected.

1. Withdraw piles rejected after driving and replace with new piles at the location directed by the Architect.
2. Piles rejected after driving which cannot be withdrawn shall be abandoned and cut-off and additional piles driven to replace rejected units at designated locations.
3. Solidly fill spaces left by withdrawn piles that will not be filled by new piles using cohesion less soil material such as gravel, broken stone, and gravel-sand mixtures. Place and compact throughout length of space in lifts not exceeding 6 feet.

F. Over-Driven Piles: Any piles driven too low to permit proper cut-off shall be corrected without additional cost to the Owner, as instructed by the Architect.

G. Cast-In-Place Concrete:

1. Shell shall be dry and clean of all earth and other foreign material at time concrete is placed.
2. Testing laboratory representative will inspect shells immediately before concrete is placed.
3. Concrete shall be placed in shells within 24 hours after they are driven.
4. Maintain minimum 40-feet distance between freshly placed concrete and driving operations, until concrete sets.

H. Cutting-Off: Cut-off tops of driven piles on a horizontal plane and at elevations indicated. Dispose of excess materials off site.

- END -

9600551

ENGINEERING DIVISION
Permit Review
Sheet

SUBJECT: SE(Lake Pontchartrain)154

Appl - Orleans Levee Dist, Board of Commissioners

SA- No objection. GAGLIANO, 2-8-96

HC- No Objection Combe 2480

ED-FS. No objections.
ESTRADA ; 13 FEB. 96

SUSPENSE:* 2/8

1 ED-S 2-8-96
ED-SP
ED-SR

SUSPENSE* 2/12

2 ED-H 2/9/96
ED-HD
a ED-HC
ED-HH
ED-HM

SUSPENSE* 2/14

3 ED-F
ED-FG
ED-FD
3a ED-FS

SUSPENSE*

4 ED-L
ED-LW
ED-LC
ED-LL
ED-T
ED-G

*If suspense cannot be met, notify Secy, ext. 2240, of new suspense date.

FILE

5/cc
JF
2/13

CELMN-OD-SE

6 February 1996

MEMORANDUM TO: Engineering Division, Chief

SUBJECT: SE(Lake Pontchartrain)154, Orleans Levee District, BOC

1. Applicant requests review of project to upgrade existing facilities at the Seabrook boat launch, on the south shore of Lake Pontchartrain, at the outlet of the Inner Harbor Navigation Canal, in New Orleans, Louisiana, in Orleans Parish.

2. Please review the attached application and drawings, and comment.

3. POC is Annette Chioma, extension 2283.

Attachments

for A. Chio

Ronald J. Ventola, Chief
Regulatory Functions Branch
Operations Division

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

(33 CFR 325)

OMB APPROVAL NO. 0702-0036
Expires 30 June 1992

Public reporting burden for this collection of information is estimated to average 5 hours per response for the majority of cases, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Applications for larger or more complex projects, or those in ecologically sensitive areas, will take longer. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine, Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application *(see sample drawings and instructions)* and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. APPLICATION NUMBER *(To be assigned by Corps)*

2. NAME AND ADDRESS OF APPLICANT

ROBERT G. HARVEY, PRESIDENT
BOARD OF COMMISSIONERS OF THE ORLEANS LEVEE DISTRICT
6001 STARS & STRIPES BOULEVARD
SUITE 202 ADMINISTRATION BUILDING
NEW ORLEANS, LA 70126

Telephone no. during business hours

A/C ( ) ________ (Residence)
A/C ( ) ________ (Office)

3. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT

BURK-KLEINPETER, INC.
4176 CANAL STREET
NEW ORLEANS, LA 70119
ATTN.: LESTER GUARINO

Telephone no. during business hours

A/C ( ) ________ (Residence)
A/C (504) 486-5901 (Office)

Statement of Authorization: I hereby designate and authorize BURK-KLEINPETER, INC. to act in my behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.

SIGNATURE OF APPLICANT
ROBERT G. HARVEY, PRESIDENT

DATE 12/7/95

4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY

4a ACTIVITY

THE ACTIVITY IS TO DEMOLISH THREE EXISTING WOOD PIERS AND CONCRETE BOAT LAUNCH RAMPS AS DESCRIBED ON THE ATTACHED DRAWINGS. DREDGE DESCRIBED PORTION OF LAKE PONTCHARTRAIN TO ELEVATION - 5.00 NGVD. CONSTRUCT NEW WOOD PIERS AND NEW CONCRETE BOAT LAUNCH RAMPS. PLACE STEEL SHEET PILES AND WOOD PILING FOR NAVIGATION AIDS AND SAID WOOD PIERS. PLACE CONCRETE RIP-RAP AND CLAY FILL IN LOCATIONS SHOWN ON THE ATTACHED DRAWINGS.

THIS PROJECT WILL NOT HAVE ON-SITE RESTROOM FACILITIES THAT WILL GENERATE THE NEED FOR SANITARY WASTE DISPOSAL OR TREATMENT.

4b PURPOSE

TO RESTORE AND REPAIR AN EXISTING BOAT LAUNCH AND TO PROVIDE A SAFE AREA OF NAVIGATION IN AND AROUND THE LAUNCH.

4c. DISCHARGE OF DREDGED OR FILL MATERIAL

DREDGED MATERIAL (+5,000 CY) WILL BE REMOVED FROM LAKE PONTCHARTRAIN AND HAULED TO THE UPLAND NORTHEAST CORNER OF THE LAKEFRONT AIRPORT SHOWN ON THE PROJECT LOCATION MAP AS "PROPOSED DREDGED MATERIAL DISCHARGE SITE".

To the best of my knowledge the proposed activity described in my permit application complies with and will be conducted in a manner that is consistent with the Louisiana Coastal Management Program.

5. NAMES AND ADDRESSES OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ALSO ADJOINS THE WATERWAY

PROJECT SITE IS ENTIRELY WITHIN THE JURISDICTIONAL BOUNDARIES OF THE ORLEANS LEVEE DISTRICT.

6. WATERBODY AND LOCATION ON WATERBODY WHERE ACTIVITY EXISTS OR IS PROPOSED

LAKE PONTCHARTRAIN, SECTION 37, TWNSHP 12 S, RANGE 12 E
LATITUDE: 30° 1'52"
LONGITUDE: 90° 2'13"

7. LOCATION ON LAND WHERE ACTIVITY EXISTS OR IS PROPOSED

ADDRESS: NORTH OF LEON C. SIMON BLVD. AT SEABROOK BRIDGE IN SECTION 37, TWNSHP 12 S, RANGE 12 E, ORLEANS PARISH

INTERSECTION OF LAKESHORE DR. AND LEON C. SIMON BLVD. OPPOSITE THE U.S. NAVAL RESERVE TRAINING CENTER
STREET, ROAD, ROUTE OR OTHER DESCRIPTIVE LOCATION

ORLEANS PARISH	LA	
COUNTY	**STATE**	**ZIP CODE**

BOARD OF COMMISSIONERS, ORLEANS LEVEE DISTRICT
LOCAL GOVERNING BODY WITH JURISDICTION OVERSITE

8. Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO
If answer is "yes" give reasons, month and year the activity was completed. Indicate the existing work on the drawings.

9. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharges or other activities described in this application.

ISSUING AGENCY	TYPE APPROVAL	IDENTIFICATION NO.	DATE OF APPLICATION	DATE OF APPROVAL	DATE OF DENIAL
NONE RECIEVED					

10. Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

	12/7/95		
SIGNATURE OF APPLICANT	**DATE**	**SIGNATURE OF AGENT**	**DATE**

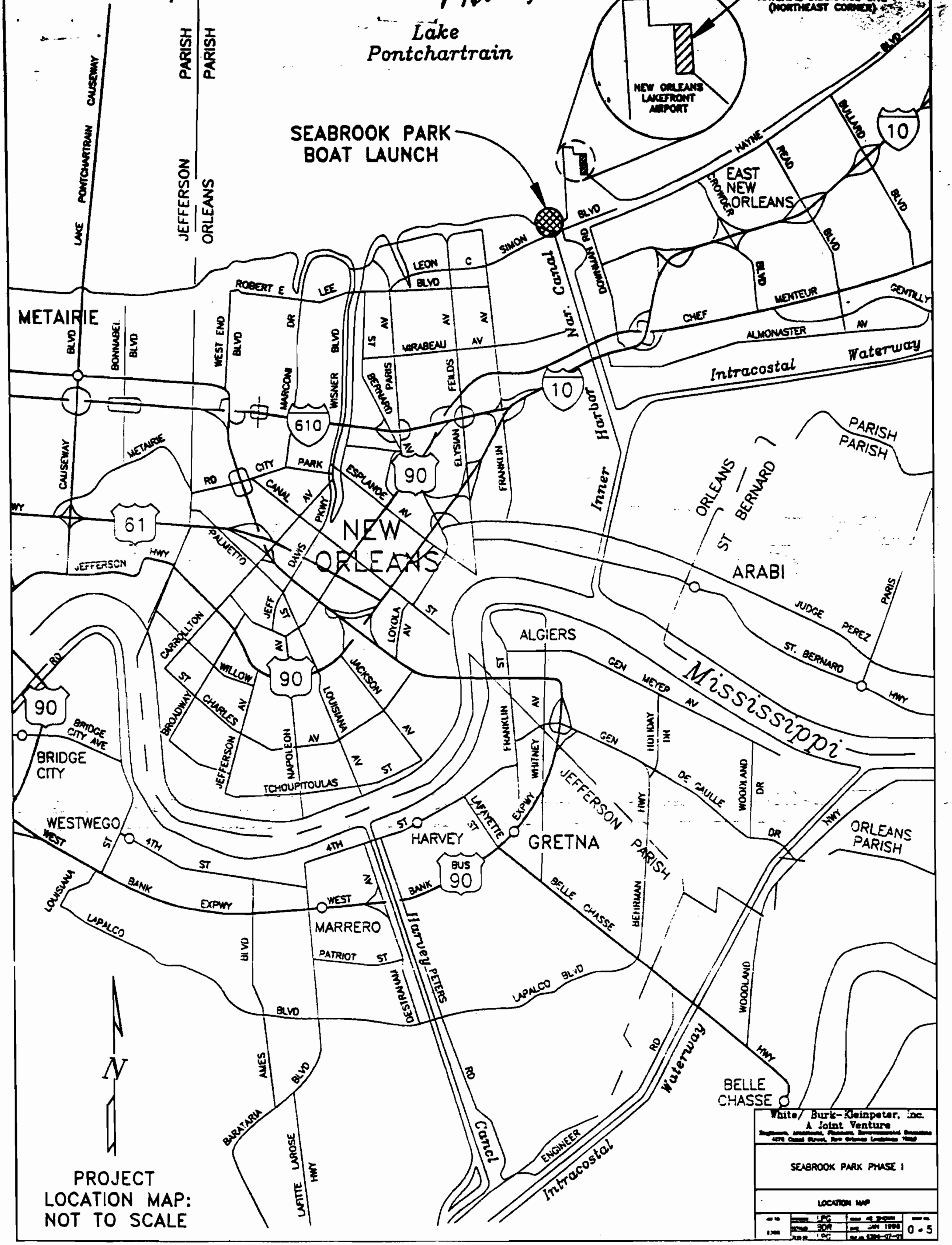
ROBERT G. HARVEY, PRESIDENT

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 3 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both.

(Reverse of ENG FORM 4345)

U S GOVERNMENT PRINTING OFFICE 1989 0—941 358



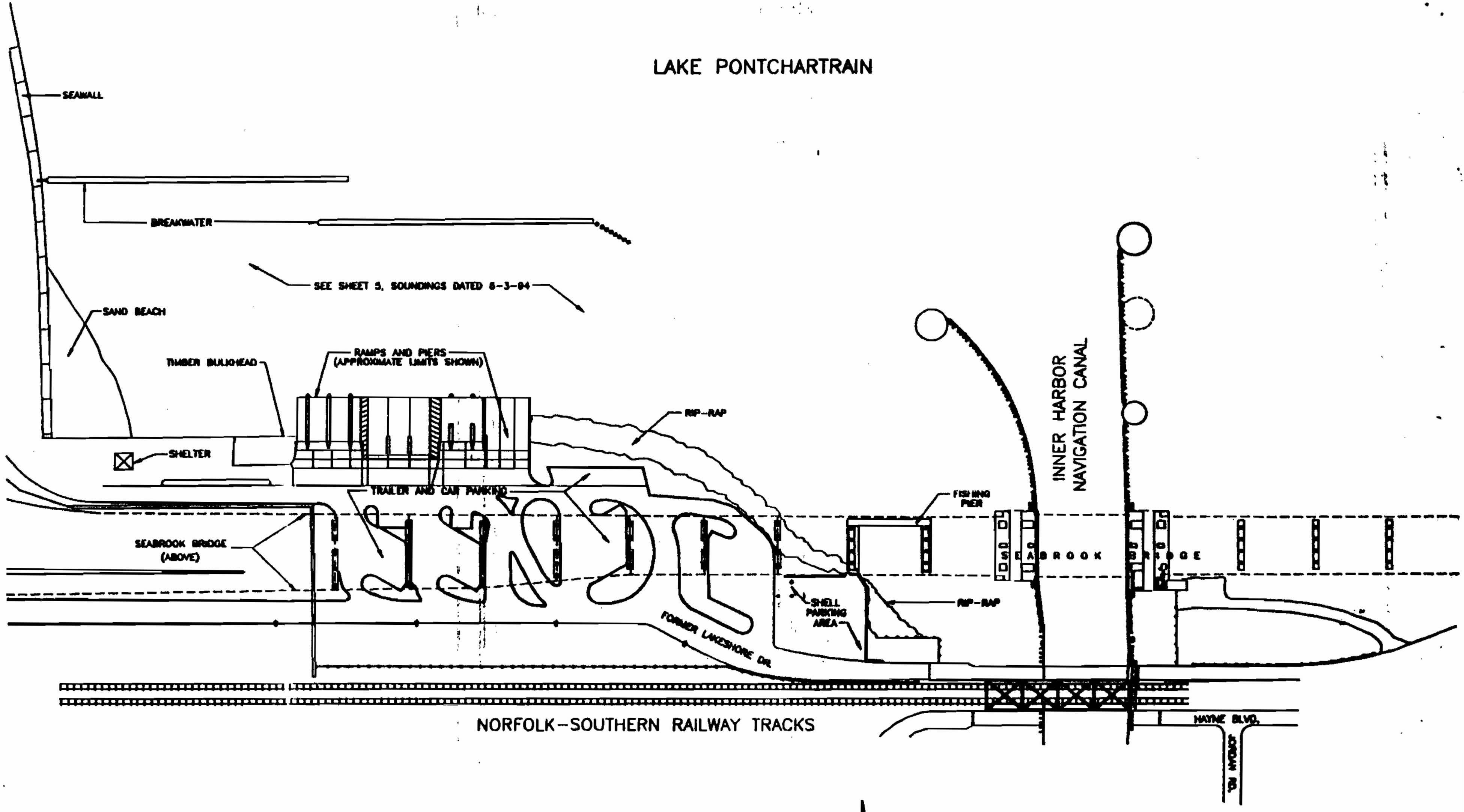
PROJECT
LOCATION MAP:
NOT TO SCALE

White/ Burk-Kleinpeter, Inc.
A Joint Venture
Engineers, Architects, Planners, Environmental Scientists
[illegible] Canal Street, New Orleans Louisiana [illegible]

SEABROOK PARK PHASE I

LOCATION MAP

[illegible]	LPG	AS SHOWN	0 - 5
[illegible]	3DR	JAN 1998	
	LPG	[illegible]	



1/1 Existing Conditions

100' 50' 0 50' 100'
SCALE IN FEET

Waite/ Burk-Kleinpeter,
A Joint Venture
[illegible]

SEABROOK PARK PHASE

EXISTING CONDITIONS

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

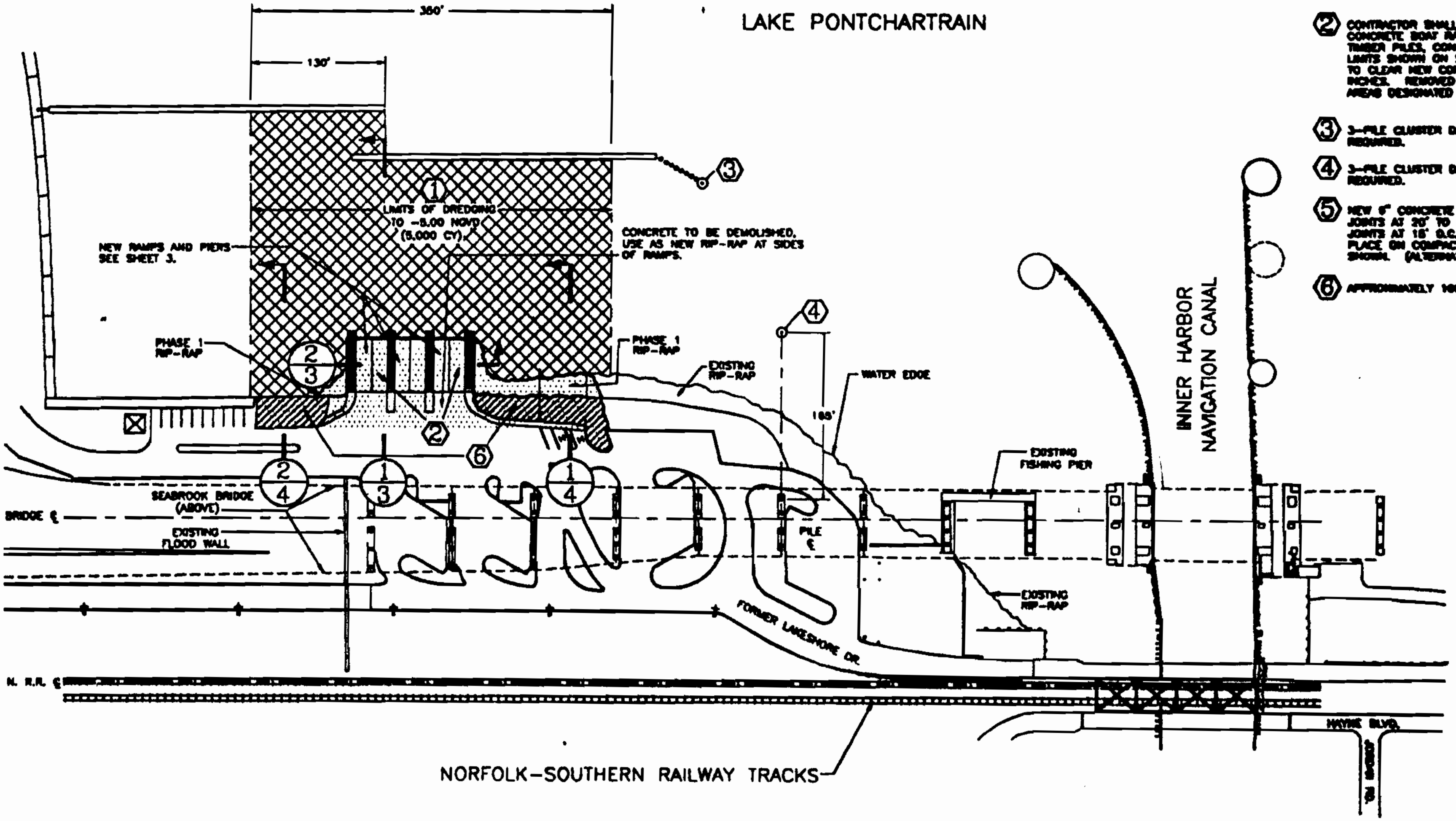
UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
PROPOSED PARKING GARAGE
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: Datum: Gr. Water Depth: Job No.: 16222 Date Drilled: 11/23-24/99 Boring: 7 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits			Percent Passing #200 Sieve	Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50				▨	Medium stiff gray clay w/sand pockets	CH													
		8	☒	▨			16	53.5-55	40										
	0.50		■	▨	w/sand lenses & pockets, & shell fragments		17	58-59	30	89	115	UC	--	690					
60				▨	Soft gray sandy clay	CL													
			■	▨			18	63-64											
				▨			19	68-69	30	94	121	UC	--	295					
70		50	☒	▒	Very dense tan silty sand	SM	20	70.5-72											
		50	☒	▒			21	73.5-75											
80																			
90																			
100																			

Comments:



1/2 Site Plan

NOTES

① CONTRACTOR SHALL REMOVE EXISTING LAKE BOTTOM MATERIAL TO A DEPTH OF -5.00 NGVD WITHIN THE LIMITS OF DREDGING. ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE AND PLACED AT UPLAND DISPOSAL SITE.

② CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING CONCRETE BOAT RAMPS, PAVING, CURBS, WOOD PIERS, TIMBER PILES, CONCRETE PILES, ETC. WITHIN THE LIMITS SHOWN ON SHT. 3 TO A DEPTH SUFFICIENT TO CLEAR NEW CONSTRUCTION BY A MINIMUM OF 6 INCHES. REMOVED CONCRETE SHALL BE PLACED IN AREAS DESIGNATED AS PHASE 1 RIP-RAP.

③ 3-PILE CLUSTER DAYMARKER, RED NAVIGATION MARKERS REQUIRED.

④ 3-PILE CLUSTER DAYMARKER. REQUIRED.

⑤ NEW 6" CONCRETE PAVING. PLACE LONGITUDINAL JOINTS AT 20' TO 23' APART. PLACE TRANSVERSE JOINTS AT 15' O.C. OR TO MATCH EXISTING. PLACE ON COMPACTED SAND FILL TO FINISH GRADES SHOWN. (ALTERNATE A)

⑥ APPROXIMATELY 1000 CY CLAY FILL TO BE HAULED IN.

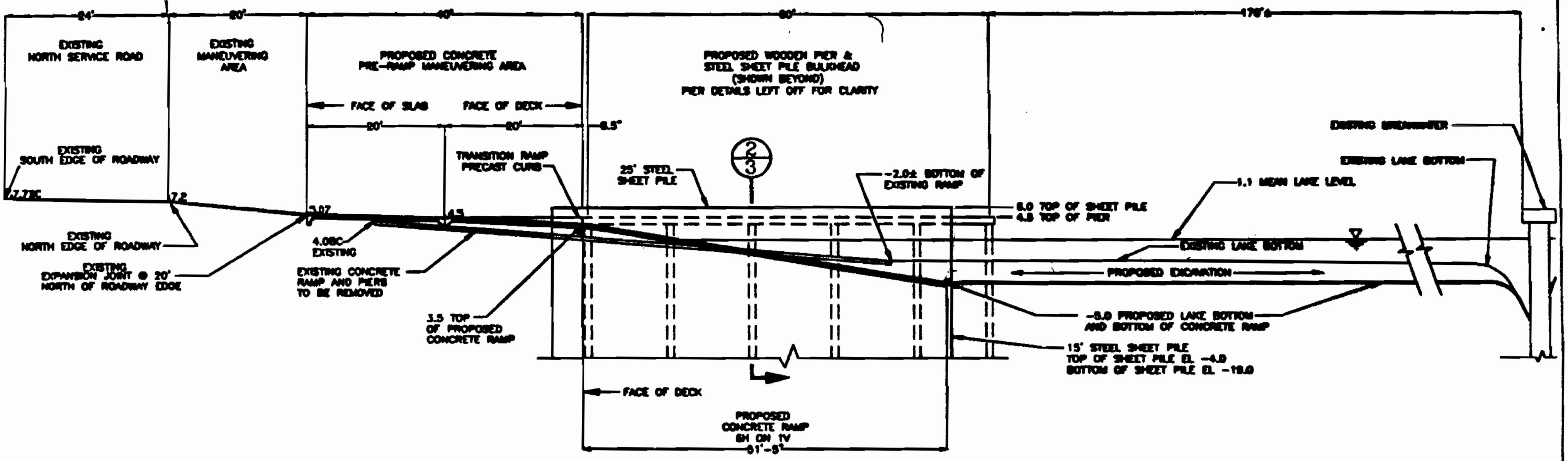
SITE PLAN LEGEND

░	AREA OF NEW CONSTRUCTION
☒	LIMITS OF DREDGING
☐	RIP-RAP PLACEMENT
▨	CLAY FILL AND SODDING
7.70	EXISTING SPOT ELEVATION
17.70	PROPOSED SPOT ELEVATION
⊙	NAVIGATION MARKER
†	EXISTING LIGHT

White/ Burk-Kleinpeter, Inc.
A Joint Venture
[illegible]

SEABROOK PARK PHASE I

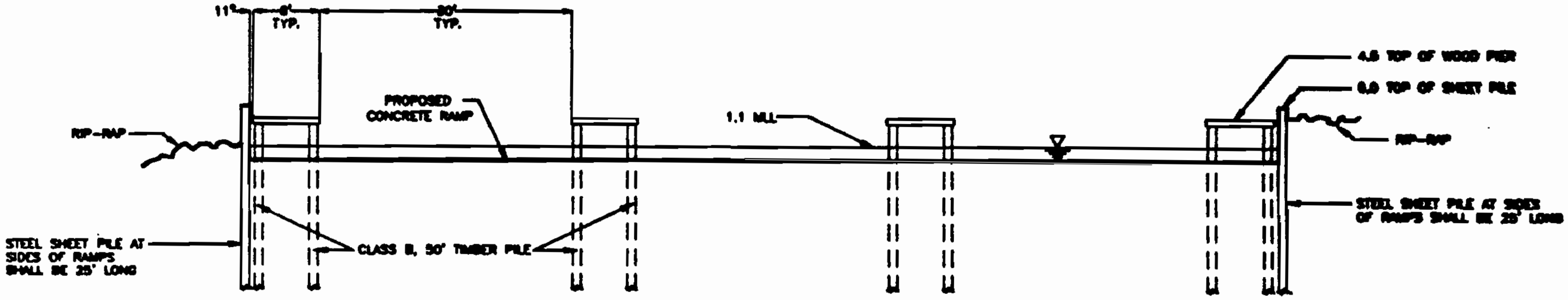
PROPOSED SITE PLAN



1/3 Section

0 10 20 40

SCALE IN FEET



2/3 Section

0 10 20 40

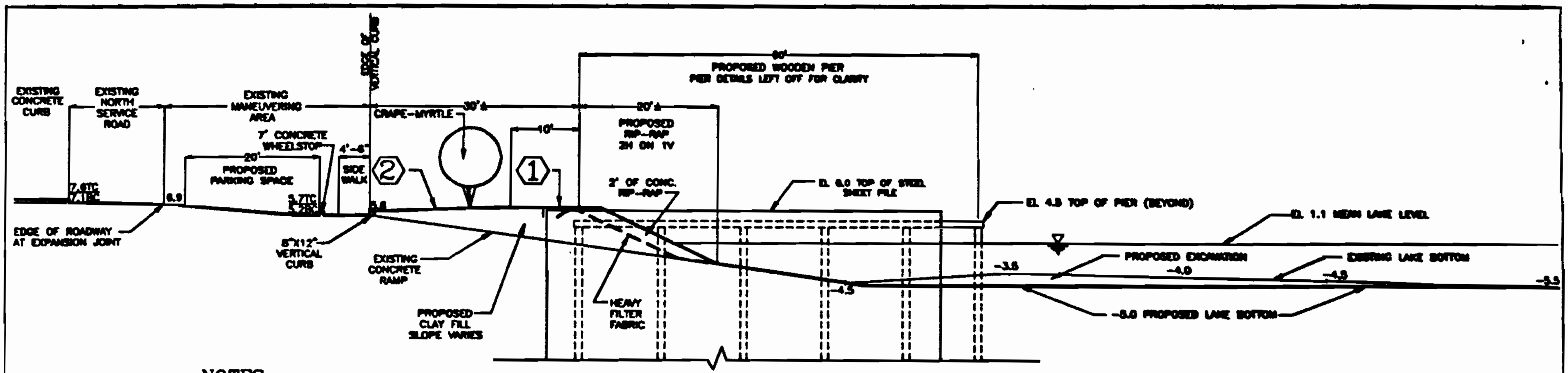
SCALE IN FEET

[illegible]/ Burk-Kleinpeter, Inc.
A Joint Venture
[illegible]

SEABROOK PARK PHASE 1

SECTIONS

3-5



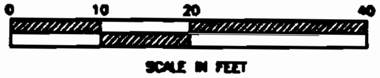
NOTES

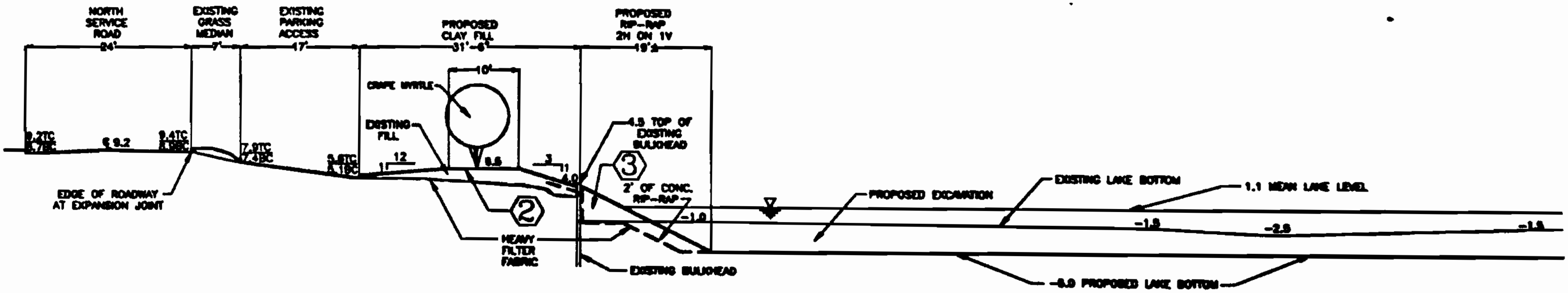
① MAINTAIN TOP ELEVATION OF CLAY FILL AT 6.5, TAPER TOP ELEVATION DOWN AT 5H ON 1V AT ENDS TO MEET NEW SIDEWALK AT RAMPS AND EXISTING GRADES.

② ALL CLAY FILL AREAS SHALL BE SODDED.

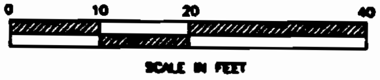
③ PLACE RIP-RAP IN AREA SHOWN ON BOAT LAUNCH PLAN, AT CORNER OF BULKHEAD AND SHEET PILE.

$\frac{1}{4}$ Section





$\frac{2}{4}$ Section



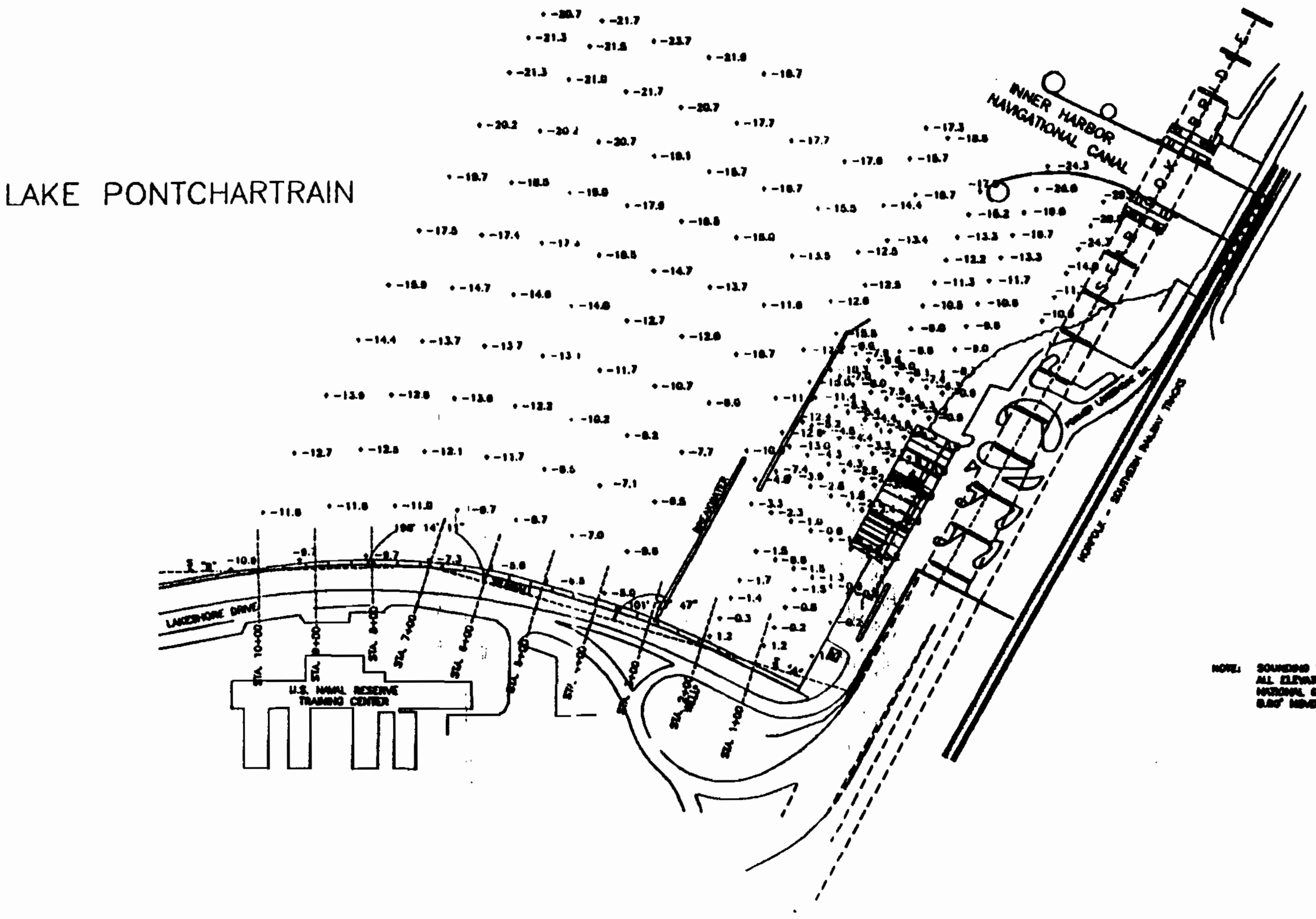
[illegible]/ Burk-Kleinpeter, Inc.
A Joint Venture
[illegible]

SEABROOK PARK PHASE I

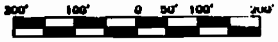
SECTIONS

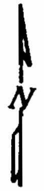
JAN 1998

4 • 5



1/6 Soundings





NOTE: SOUNDINGS TAKEN ON 6-3-94 AND 11-16-94.
ALL ELEVATIONS REFER TO
NATIONAL GEODETIC VERTICAL DATUM (NGVD)
0.00' NGVD = 20.43' CD

White/ Burk-Kleinpeter, I
A Joint Venture

SEABROOK PARK PHASE I

SOUNDINGS

5

ENGINEERING DIVISION
Permit Review
Sheet

Mail&Fax #00·185

SUSPENSE:*

______ED-S ______
______ED-SP______
______ED-SR______

SUSPENSE:*

______ED-H ______
______ED-HD______
______ED-HC______
______ED-HH______
______ED-HM______

SUSPENSE:* 11 Jan 00

______ED-F ______
______ED-FG______
______ED-FD______
✓ ED-FS______

SUSPENSE:*

L ______ED-L ______
______ED-LW______
______ED-LC______
______ED-LL______
S ______ED-T ______
______ED-G ______

*If a suspense cannot be met, notify secy, ext. 2240, of new suspense date.

SUBJECT: Req by the UNO to drive piles for a transformer pad and the Advance Technology Center Bldg in the UNO Reasearch and Technology Park

ED-FS 11 Jan 2000

No objection but a drawing should be submitted showing the toe of the levee, the levee board right of way and the distance from the right of way to the construction (parking lot, transformer pad and building), to Engr Div. for our information.

FJV.

FILE

CEMVN-OD-T(11-2-240a) 5 January 2000

MEMORANDUM FOR C/ENGR DIV

SUBJECT: Req by the University of New Orleans to drive piles for a transformer pad and the Advance Technology Center Building in the University of New Orleans' Research and Technology Park located on the protected side of the New Orleans Lakefront levee, vicinity of baseline station 110+00, in Orleans Parish, LA.

1. Forwarded for review, comment, and return. It is requested that only Geotechnical Br, Structures Br and **Civil Br** review this request in order to expedite a response.

2. Labor charges for this permit review may be charged to L20075. **It is requested that each reviewer use their own organization code and log in their review time on the attached form. Please return this form along with the review comments so that this office can monitor and control project expenditures.**

3. If further assistance is needed, please contact Amy E. Powell, ext. 2241.

00-1

Amy E. Powell

Encl

for R. H. Schroeder, Jr.
Chief, Operations Division

ltr dtd 18 Nov 99
w/dwgs

APPLICANT: University of New Orleans

PERMIT NO.: 00-1

O&M, GENERAL CHARGE ACCOUNT NO.: L20075

REVIEWER	OFFICE SYMBOL	REVIEW TIME (HOURS)	ORGANIZATION CODE
FRANK VOJKOVICH	ED-FS	2	KX

00-1

Facility Planning & Construction

University of
New Orleans

Lakefront Main Campus, New Orleans, Louisiana 70148
Tel: (504) 280-5551 / Fax: (504) 280-5555

18 November 99

Mr. Stevan G. Spencer, P.E.
Chief Engineer
Orleans Levee District
6001 Stars & Stripes Blvd.
Suite 202 Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

RE: Orleans Levee District Permit
UNO Advance Technology Center

Mr. Spencer,

This letter serves as a request to obtain a permit from the Orleans Levee District (OLD) for the construction of the Advance Technology Center in the University of New Orleans' Research and Technology Park. The Center is a five story, 80k square foot, tenant building supported by 70' composite piles (predrilled to 50'). It is located at 2021 Lakeshore Drive, within 250' of a hurricane levee system.

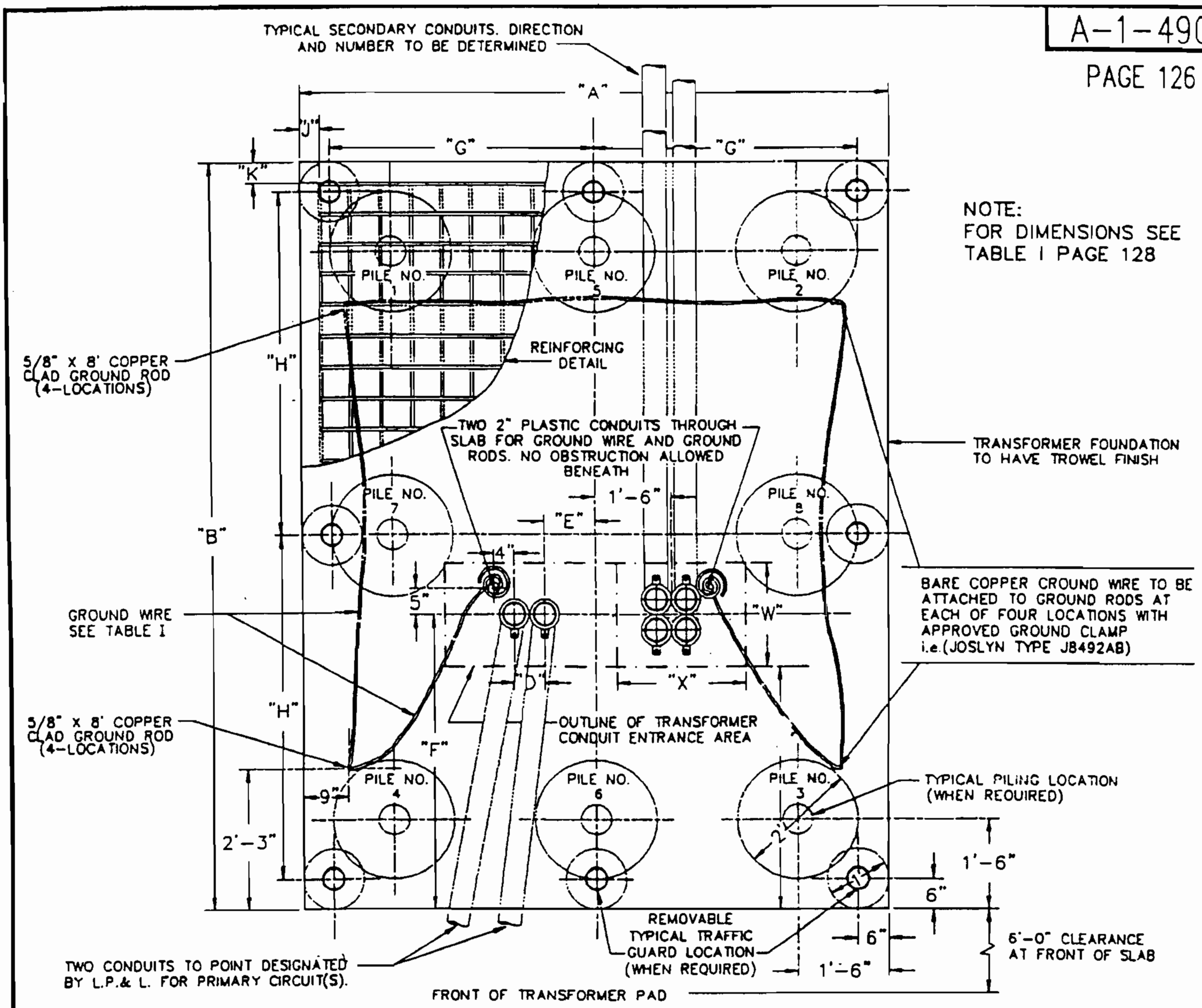
Per the requirements, attached please find a site plan (A-1), a parcel plan, the OLD right-of-way plan, the foundation plan and details (S-1 & S-5), and the related specifications. Also attached are the foundation details for the transformer pad, which is located on the western edge of the property. Per our discussions with Mr. Brian Keller with the USACE, the transformer pad will be located outside of the Levee Board Right of Way, and will be supported by ten (10) 40' Class B treated piles (no predrilling). Included in the package you will also find Eustis Engineering Co.'s geotechnical report for the property. A check in the amount of $100.00 for the processing fee is included as well.

Please review the information for and issue a permit if it meets your requirements. Feel free to call with any questions or if you need any additional information. Thank you for your time.

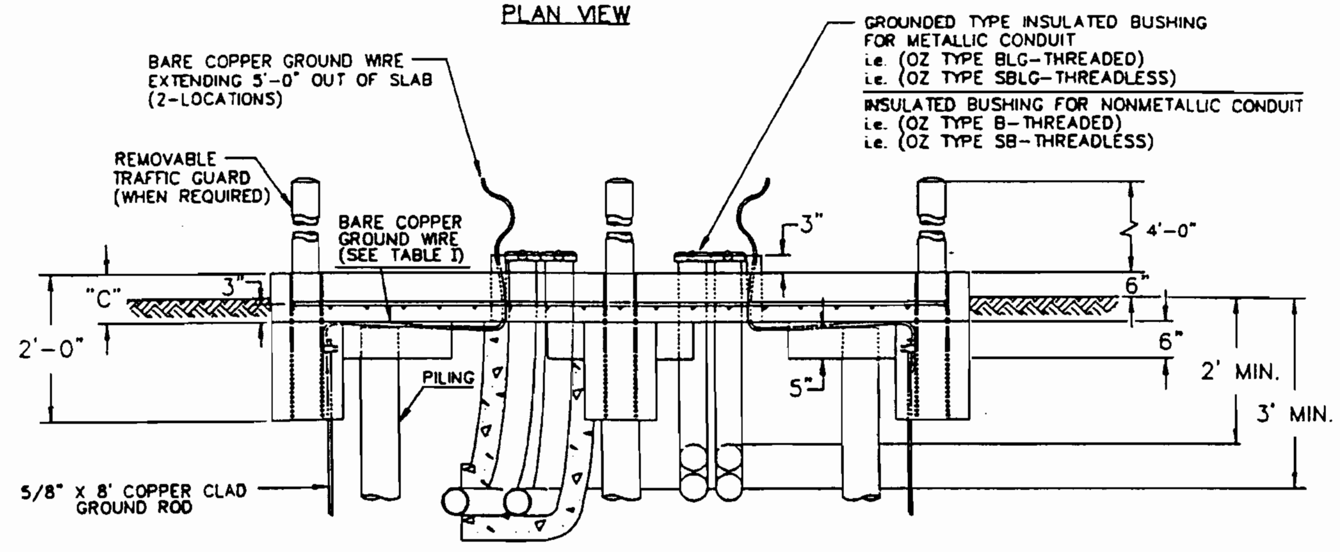
Sincerely,

Gus Cantrell, P.E.
Director
Facility Planning & Construction

Cc: Ms. Geneva Grille, LADOTD; Mr. Brian Keller, CEMVN-OD-R, U.S. Army Corps of Engineers; File



PLAN VIEW



FRONT ELEVATION

THREE PHASE PAD TYPE TRANSFORMER SLAB

SCALE: NONE	DRAWN BY: JH	DATE: 12-01-90	CHK. BY: AWP	APP. BY: CAM

LOUISIANA POWER & LIGHT COMPANY

1 OF 4

GENERAL NOTES

PILING SHALL BE TIMBER-CONCRETE COMPOSITE PILES CONSISTING OF A 55 FOOT UNTREATED TIMBER BOTTOM SECTION OF SOUTHERN PINE OR DOUGLAS FIR CONFORMING TO A.S.T.M. D-25 WITH A MINIMUM TIP DIAMETER OF 7 INCHES AND A MINIMUM DIAMETER AT THE BUTT OF 12 INCHES AND A CAST-IN-PLACE CONCRETE UPPER SECTION TO CUT-OFF. THE CAST-IN-PLACE SECTION SHALL CONSIST OF A NOMINAL 11 INCH DIAMETER CORRUGATED STEEL CASING OF SUFFICIENT STRENGTH TO RESIST DRIVING AND FILLED WITH 3000 PSI CONCRETE. CONNECTOR SHALL BE MINIMUM 12 GAUGE STEEL WELDED TO CASING AND SUFFICIENT LENGTH TO PENETRATE 4 INCHES INTO TOP OF TIMBER SECTION. PILE SHALL BE DRIVEN TO REFUSAL IN SAND STRATUM AT APPROXIMATELY 70 FEET BELOW EXISTING GRADE. DESIGN LOAD IS 25 TONS PER PILE.

2. ALL FILL MATERIAL USED AS BACKFILLING UNDER SLABS, PAVING, ETC., SHALL BE MISSISSIPPI RIVER "SUGAR" SAND FREE FROM ORGANIC OR OTHER DELETERIOUS MATERIALS. AREAS UNDER FILL SHALL BE STRIPPED OF ALL VEGETATION, DEBRIS, AND UNSATISFACTORY SOIL MATERIALS BEFORE PLACING FILL. FILL UNDER PILE SUPPORTED SLABS SHALL BE COMPACTED SUFFICIENTLY TO SUPPORT THE WEIGHT OF CONCRETE AND CONSTRUCTION LOADS UNTIL CONCRETE REACHES DESIGN STRENGTH.

3. PLACE ONE LAYER OF 6 MIL POLYETHYLENE VAPOR BARRIER BENEATH ALL SLABS AND BEAMS ON GRADE.

4. CONCRETE WORK SHALL BE IN ACCORDANCE WITH A.C.I. 301 LATEST REVISION. ALL CONCRETE SHALL BE STANDARD WEIGHT WITH A COMPRESSIVE STRENGTH OF 4000 PSI @ 28 DAYS AND A MAXIMUM SLUMP OF 4 INCHES. CONCRETE MIX SHALL CONTAIN A WATER REDUCING ADMIXTURE CONFORMING TO A.S.T.M. C-494, TYPE A OR D. ARCHITECT SHALL BE GIVEN 24 HOURS NOTICE BEFORE ANY CONCRETE POURS.

5. ALL REINFORCING STEEL SHALL BE IN ACCORDANCE WITH A.S.T.M. A-615, GRADE 60, AND SHALL BE DETAILED, FABRICATED, INSTALLED AND ACCESSORIES PROVIDED IN ACCORDANCE WITH LATEST A.C.I. AND C.R.S.I. SPECIFICATIONS. LAP ALL CONTINUOUS BARS A MINIMUM OF 30 BAR DIAMETERS, TOP BARS AT MID-SPAN AND BOTTOM BARS AT SUPPORTS. AT DISCONTINUOUS ENDS PROVIDE STANDARD 90 DEGREE HOOKS AT ALL TOP BARS. AT CORNERS PROVIDE CORNER BARS, SAME SIZE AND NUMBER AS OUTSIDE BEAM BARS AND TO LAP 30 BAR DIAMETERS EACH WAY.

GEOTECHNICAL INVESTIGATION

UNIVERSITY OF NEW ORLEANS

RESEARCH AND TECHNOLOGY PARK

OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES

STATE PROJECT NO. 09-326-93B-2, PART 1

NEW ORLEANS, LOUISIANA

FOR
STATE OF LOUISIANA
DIVISION OF ADMINISTRATION
FACILITY PLANNING AND CONTROL
BATON ROUGE, LOUISIANA

29 FEBRUARY 1996

RECEIVED
SEP 16 1997

EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERS
CONSTRUCTION QUALITY CONTROL & MATERIALS TESTING
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157 / FAX 504-834-0354

EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERS
CONSTRUCTION QUALITY CONTROL & MATERIALS TESTING
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157 / Fax 504-834-0354 / E-mail EustisEngr@aol.com

29 February 1996

State of Louisiana
Division of Administration
Facility Planning and Control
Post Office Box 94095
Baton Rouge, Louisiana 70804-9095

Attention Ms. Myrna L. Edwards
Administrative Director

Ladies and Gentlemen:

Geotechnical Investigation
University of New Orleans
Research and Technology Park
Office of Public Health Laboratory Facilities
State Project No. 09-326-93B-2, Part 1
New Orleans, Louisiana

Transmitted is one copy of our engineering report covering a geotechnical investigation for the subject project. Two copies are being sent to Crump, Wilson and Assoicates of Baton Rouge, Louisiana to the attention of Mr. Michael Wilson.

Thank you for asking us to perform these services.

Yours very truly,

EUSTIS ENGINEERING COMPANY, INC.

LLOYD A. HELD, JR., P.E.

LLOYD A. HELD, JR.
REG. NO. 11402

Gwen P. Sanders:ejg

EE 13903

GEOTECHNICAL INVESTIGATION

UNIVERSITY OF NEW ORLEANS

RESEARCH AND TECHNOLOGY PARK

OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES

STATE PROJECT NO. 09-326-93B-2, PART 1

NEW ORLEANS, LOUISIANA

FOR
STATE OF LOUISIANA
DIVISION OF ADMINISTRATION
FACILITY PLANNING AND CONTROL
BATON ROUGE, LOUISIANA

By
Eustis Engineering Company, Inc.
Metairie, Louisiana

29 FEBRUARY 1996

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION
UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
STATE PROJECT NO. 09-326-93B-2, PART 1
NEW ORLEANS, LOUISIANA

INTRODUCTION

1. This report contains the results of a geotechnical investigation performed for the proposed Office of Public Health laboratory facilities (State Project No. 09-326-93B-2, Part 1) for the University of New Orleans Research and Technology Park in New Orleans, Louisiana. The investigation was performed in accordance with Eustis Engineering Company, Inc.'s (Eustis Engineering) proposal dated 12 December 1995. Authorization for the investigation was received in a contract dated 23 January 1996 from Myrna L. Edwards, Administrative Director, State of Louisiana, Facility Planning and Control. Crump, Wilson and Associates are the project architects. Meyer Engineers, Ltd., are the engineers for the project.

2. This report has been prepared in accordance with generally accepted geotechnical engineering practice for the exclusive use of the State of Louisiana and their consultants for specific application to the subject site. In the event any changes in the nature, design or location of the proposed building are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing. Should these data be used by anyone other than the State of Louisiana and their consultants, they should contact Eustis Engineering for

interpretation of data and to secure other information which may be pertinent to the project.

3. The analyses and recommendations contained in this report are based, in part, on data from the soil borings. The nature and extent of variations in subsoil conditions between and away from the boring locations may not become evident until construction. If variations then appear, it will be necessary to reevaluate the recommendations contained in this report.

4. Recommendations and conclusions contained in this report are to some degree subjective. This report, in its entirety, should not be included in the contract plans and specifications. However, the results of the soil borings and laboratory tests contained in the Appendix of this report may be included in the plans and specifications.

SCOPE

5. The investigation included the drilling of undisturbed soil test borings to determine subsoil conditions and stratification, and to obtain samples of the subsoils. In situ Standard Penetration Tests and soil mechanics laboratory tests performed on samples obtained from the borings were used to evaluate the physical properties of the subsoils. Engineering analyses, based on the borings and laboratory tests, were made to determine estimates of the allowable pile load capacities, estimates of settlement, pavement component thicknesses for flexible and rigid pavements, general site preparation, and recommended types of fill and compaction criteria.

SOIL BORINGS

6. Three undisturbed sample type soil test borings, each 100 feet in depth, were drilled for the investigation of the proposed building. Four auger type soil test borings, each 6 feet in depth, were made for the investigation of the proposed parking lot. The borings were drilled at the approximate locations shown on Figure 1 during the period 9 through 12 February 1996. The borings were located in the field by a representative of Eustis Engineering using site plans furnished by Crump, Wilson and Associates and Meyer Engineers, Ltd. Detailed descriptive logs of the borings are shown in both tabular and graphical form in the Appendix.

7. The undisturbed borings were made using a truck mounted rotary type drill rig. Upon completion of drilling operations, these borings were backfilled with cement-bentonite grout in accordance with current regulatory requirements. Undisturbed samples of cohesive or semi-cohesive subsoils were obtained at close intervals or changes in stratum using a 3-in. diameter thinwall Shelby tube sampling barrel. The samples were immediately extruded from the sampling barrel, inspected and visually classified by Eustis Engineering's soil technician. Pocket penetrometer tests were performed on the soil samples to give a general indication of their shear strength or consistency. The results of these tests are shown on the boring logs under the column headed "PP." Representative samples were placed in moisture proof containers and sealed for preservation.

8. Samples of cohesionless soils were obtained during the performance of in situ Standard Penetration Tests. This test consists of driving a 2-in. diameter sampler 1 foot into the soil after it is first seated 6 inches. A 140-lb weight dropped 30 inches is used to advance the sampler. The number of blows required to drive

the sampler 1 foot is recorded and indicative of the relative density or approximate consistency of the subsoils tested. The results of the Standard Penetration Tests are shown on the boring logs under the column headed "SPT."

9. The auger borings were made with an auger on our truck mounted drill rig. Upon completion of the drilling operations, these borings were backfilled with natural subsoils. Representative samples obtained from the auger borings were visually classified and placed in glass jars for preservation.

LABORATORY TESTS

10. Soil mechanics laboratory tests consisting of natural water content, unit weight, and unconsolidated undrained triaxial compression shear (OB) were performed on samples obtained from the undisturbed borings. In addition, Atterberg liquid limit tests were performed on selected representative samples to aid in classification of the cohesive subsoils and to give an indication of their relative compressibility. Grain size analyses were performed on representative cohesionless samples to further classify these soils. Natural water content determinations and visual classification were also made on representative samples obtained from the auger borings. The results of the laboratory tests are tabulated on the boring logs in the Appendix. The results of the grain size are given on separate sheets following the boring logs.

DESCRIPTION OF SUBSOIL CONDITIONS

Geology

11. The project site is a reclaimed lake bottom area. Hydraulic fill was placed in the area as part of a 1930's Works Progress Administration reclamation project. This hydraulic fill is placed on Recent Holocene soils that overlie geologically older Pleistocene deposits. The Holocene unit is comprised of lake beach and beach ridge deposits and deposits of deltaic origin. Nearshore Gulf deposits contact the Pleistocene formation.

Stratigraphy

12. Undisturbed Borings. Surficial deposits are hydraulically placed fill materials that have been dredged from nearby Lake Pontchartrain. Their interface with undisturbed in situ lake beach deposits is not readily discernible. Fill materials and lake beach deposits are interbeded strata of medium stiff to stiff gray and tan silty clay, very soft to soft gray clay and sandy clay, loose to medium dense tan and gray fine sand, silty sand or clayey sand, and very loose to medium compact sandy silt and clayey silt. These materials extend to depths varying from 21.5 to 26.5 feet below the existing ground surface.

13. Underlying the fill materials and lake beach deposits are the deltaic plain deposits. These deposits consist of soft gray clay, sandy clay and silty clay with sandy silt lenses, pockets and layers, sand pockets and lenses, and shell fragments which extend to the 36.5-ft depth.

14. Beach ridge deposits are encountered beneath the deltaic plain deposits and continue to depths varying from 47.5 to 53.5 feet. These deposits consist of loose to medium dense gray clayey sand and fine sand with clay pockets and shell fragments. Nearshore Gulf deposits underlie the beach ridge deposits to the top of the Pleistocene horizon at the 56.5-ft depth. These deposits consist of soft to stiff gray clay with sand layers and pockets and shells. The nearshore Gulf deposits are the oldest Holocene unit.

15. Beneath the Holocene deposits are Pleistocene deposits consisting of medium stiff to very stiff gray and tan or greenish-gray sandy clay to the 61.5 to 63.5-ft depths. These deposits are underlain to the termination of the borings at the 100-ft depth by strata of loose to very dense light gray, gray and tan clayey sand, silty sand and fine sand with some silt.

16. Auger Borings. Borings A-1, A-2 and A-3 encountered existing pavement at the project site. Approximately 1 inch of asphalt is encountered at these boring locations. Beneath the pavement and from the existing ground surface at Boring A-4, strata of loose to medium dense tan and gray fine sand with shell fragments and clay layers are encountered to the termination of the borings at the 6-ft depth. These deposits appear to be fill.

Ground Water

17. In order to determine ground water conditions at the time of our field investigation, ground water observations were made at Boring A-4. This boring was made without the addition of water to a depth of 6 feet. Ground water was initially encountered at the 3-ft depth. Further observations after a period of 15

minutes indicated the ground water at the 2.5-ft depth. The depth to ground water will vary with climatic conditions, drainage improvements, water levels within Lake Pontchartrain and other factors. The depth to ground water should be determined by those persons responsible for construction immediately prior to beginning work.

FOUNDATION ANALYSIS

Furnished Information

18. The proposed laboratory facility will be 25,000 square feet in plan dimension. The 60' x 250' main block of the building will be a four-story structure. The remainder of the building will be comprised of one and two-story structures. Pile foundations have been proposed for support of the building. Vehicular traffic will be light in parking areas with occasional 18 wheelers in the service drive and main roadway. It is our understanding that less than 1 foot of additional fill will be required to achieve design grades for the proposed structures. Should this amount of fill differ by an appreciable amount, Eustis Engineering should be notified.

Foundation Recommendations

19. We recommend all building loads, including columns and first floor slab loads, be supported on driven pile foundations. The floor slab should be poured monolithically with grade beams and pile caps to provide rigidity and minimize the potential for differential settlement. To minimize the potential for differential settlement, we recommend all piles be tipped at the same elevation

unless excessive driving resistances are encountered. Details for pile foundations and settlement follow in this report.

Site Preparation

20. Drainage. The initial step to prepare the site for construction should be to establish adequate temporary and permanent drainage to prevent ponding of water and to ensure immediate runoff of all rainfall. This will prevent the near surface silty and sandy soils from experiencing a reduction in shear strength and increase in settlement when subjected to an increase in moisture content. Surface drainage may be accomplished with drainage ditches and by setting grades to ensure positive drainage of water away from the foundations and pavement areas.

21. Clearing. The existing ground surface beneath the proposed structure should be stripped of vegetation, loose topsoil, debris, organic matter, and any other deleterious materials. Stripping should be to a minimum depth necessary (approximately 4 to 6 inches) to remove all vegetation and roots. Additionally, all existing pavements within the footprint of the proposed construction should be removed. Existing utilities may also require removal or relocation outside the proposed construction area. Provisions should be made to locate any abandoned underground utilities and foundations which could impact new construction. Existing piles ***should not*** be pulled from the foundation. Instead, any existing piles should be cut off 3 feet below grade. Existing footings and old pipes should be excavated and removed from the site. Depressions resulting from clearing operations should be thoroughly cleaned out to the surface of firm undisturbed soil and backfilled with a select fill material placed and compacted under controlled conditions.

22. Demolition. Special care should be taken to remove any existing structures, old pavements, and abandoned underground utilities from the footprint of the proposed building and parking area. These structures should be demolished and all material should be removed from the site. Any weak zones identified within the site should be thoroughly cleaned out to firm subgrade and backfilled as necessary with select structural fill material.

23. Demolition operations will cause vibrations that may affect nearby structures, pavements and underground utilities. Please refer to the section of this report entitled "Vibrations" for recommendations on this matter.

24. Select Fill. All depressions should be backfilled and the site should be graded to provide drainage away from pavements and the foundation of the proposed structure. A select granular fill material should be used as backfill and/or fill required to reach the final design grade. The select granular fill material may be locally available, hydraulically pumped sand. Fill should be a non-plastic material free of all roots, wood, clay lumps and other deleterious materials, and should have no more than 10% by weight of material passing a U.S. Standard No. 200 mesh sieve.

25. Compaction. Select fill should be spread in loose lifts of 6 to 8 inches and should be compacted to at least 95% of its maximum dry density near optimum water content in accordance with ASTM D 698. All clearing, filling, and compaction operations should be accomplished during periods of dry weather only.

Pile Foundations

26. Allowable Pile Load Capacities. Analyses have been made to determine the estimated allowable compressive single pile load capacities for various sizes and embedments of treated ASTM D 25 quality treated timber or timber composite piles. The results of the analyses are tabulated on Figure 2. Analyses also have been made to determine the estimated allowable single pile load capacities in compression for various sizes and embedments of square precast concrete piles and open end steel pipe piles. The results of the analyses are tabulated on Figure 3. Our analyses provide for a nominal 2-ft cutoff for the pile cap and contain an estimated factor of safety of 2 against failure of a single pile through the soil.

27. Composite Piles. Timber composite piles should consist of an untreated ASTM D 25 quality timber lower section and a 12-in. diameter concrete filled metal can upper section. The metal can should extend at least 12 feet below the existing ground surface. Composite piles should not be used to resist tensile or lateral loads.

28. Structural Capacity. The estimated pile load capacities are based on a soil-pile relationship only. The structural capability of the individual pile to transmit these loads and any connections between the piles and the structure should be determined by a structural engineer.

29. Pile Group Capacity and Spacing. Timber and timber composite piles firmly seated in the sand strata will derive their supporting capacity primarily through end bearing and it will not be necessary to consider the effect of group

action. Concrete or steel piles driven to tip embedments between 45 and 65 feet below the existing ground surface will derive their supporting capacity primarily through skin friction, and it will be necessary to consider the effect of group action for piles driven in groups. In this regard, the supporting value of the friction piles driven in groups should be investigated on the basis of group perimeter shear by the formula shown on Figure 4. The minimum center to center pile spacing within a pile group or row of piles should be determined in accordance with the pile spacing formula also shown on Figure 4.

30. Pile Driving. A daily driving record should be kept for all piles. The driving record should include the type, size, length and embedment of piles, the number of blows per foot of penetration and the equipment used to drive the piles. An accurate driving record is especially important to verify the piles are driven to the required tip embedment and to give an indication of any unusual driving characteristics which may signify pile breakage.

31. Pile driving will cause vibrations which may affect nearby structures, pavements and utilities. Please refer to the section entitled "Vibrations" for recommendations in this matter.

32. Treated ASTM D 25 quality timber piles with minimum tip diameters of 7 inches or more may be driven using a single acting air hammer with a manufacturer's rated energy of 15,000 ft-lbs per blow. When using this hammer, penetration resistance should not exceed 25 blows per foot or damage may occur to timber piles. An air hammer delivering 19,000 ft-lbs of energy per blow may be used to install concrete or steel piles recommended in this report. We also

recommend the single acting air hammers used to install concrete piles have a ram stroke limited to 3 feet.

33. Prepunching or Predrilling. Timber piles will probably require a prepunched or predrilled pilot hole in order to facilitate penetration of the surficial fill materials. If vibrations are a concern, timber piles may be predrilled in lieu of prepunching. Predrilling may also be required for concrete, steel or timber composite piles to facilitate penetration of the sand strata between the 36.5 and 47.5 to 53.5-ft depths and to minimize vibrations.

34. Predrilling should be accomplished with a fishtail bit using wet rotary drilling methods. The diameter of the prepunched or predrilled hole should not exceed 6 inches for the timber piles or 75% of the side dimension or diameter of concrete or steel piles, respectively.

35. We recommend the depth of the prepunch or predrill not exceed 14 feet below the existing ground surface for timber piles with tip embedments of 40 to 45 feet. For concrete, steel or timber composite piles with tip embedments in the Pleistocene deposits, we recommend the depth of the predrill not exceed 55 feet below the existing ground surface.

36. Dynamic Analyses. The concrete and steel piles should have cross sections which are structurally sufficient to facilitate driving of the piles without damage. Dynamic analysis (WEAP) can be performed to evaluate driving stresses and driveability once the hammer and appurtenant equipment have been selected. Structural requirements can then be verified by a structural engineer and installation criteria can be established.

37. Test Piles and Load Tests. We recommend a minimum of six test piles be driven in the proposed foundation area to provide more definitive information regarding the anticipated driving resistance, requirements for predrilling or prepunching, and vibrations from pile driving. The test piles should be the same type that will be used for construction and should be driven with the same equipment and techniques that will be used to drive the job piles. The test piles should be allowed to "set" for at least 14 days after driving and then should be load tested to failure in accordance with ASTM D 1143.

38. Dynamic Pile Test. Dynamic analyses may be supplemented by a dynamic pile test (DPT) using a pile driving analyzer (PDA) to monitor the concrete or steel test piles and selected job piles during installation. The performance of a DPT may be used to evaluate actual driving stresses, penetration resistance, and the integrity and capacity of the job piles. The PDA can also monitor energy transferred to the pile from the hammer and evaluate installation efficiency. The results of static and dynamic tests should be evaluated by Eustis Engineering to verify the estimated pile load capacities presented in this report.

39. Estimated Settlement. We estimate settlement of ½ to ¾ of an inch for pile embedments bearing from 40 to 65 feet below the existing ground surface. This does not include the elastic deformation of the piles. Elastic deformation of concrete or steel piles may be estimated at 75% of the static column strain of a pile acting as a column.

40. Our estimates of settlement are based on the assumption that piles will be driven in small groups or widely spaced rows. We have assumed the largest group dimension will be no greater than 20% of the pile length and the center to

center spacing between groups will be no closer than twice the largest group dimension. We have assumed the center to center spacing between rows of single piles will be no closer than 8 feet. All piles should be driven to the same tip embedments in order to minimize differential foundation settlement. In the event any of our assumptions are not met, Eustis Engineering should be contacted to evaluate the potential settlement of pile foundations.

Vibrations

41. Demolition of existing pavements and pile driving operations will cause vibrations that may affect nearby structures, pavements and underground utilities. We recommend peak particle velocities be monitored at critical structures or pavements with a seismograph during demolition or pile driving operations. The record of peak particle velocities will provide information in assessing potential damage and the need for changes in demolition or driving operations.

42. Peak particle velocities of 0.25 in./sec as measured by the seismograph is generally regarded as a vibration level uncomfortable to human perception. Peak particle velocities in excess of 0.5 in./sec (measured at a structure) may induce damage to the structure. In addition, peak particle velocities in excess of 0.25 in./sec may densify loose cohesionless deposits resulting in settlements of structures founded in these deposits. Therefore, for sustained peak particle velocities in excess of 0.25 in./sec at a pavement or structure of concern, Eustis Engineering should be notified, demolition or driving operations should be terminated, and consideration should be given to altering demolition or pile installation procedures.

Pavement Recommendations

43. Subgrade Preparation. Analyses to determine the recommended pavement components and thicknesses for flexible and rigid pavements assume the subgrade will be prepared and drained as described in "Site Preparation." Poor drainage will cause a reduction in the service life of the pavement. Therefore, it is strongly recommended that drainage measures be maintained throughout the entire construction schedule until paving has been completed and permanent drainage facilities are in place.

44. Demolition and Recompaction. The existing asphalt pavements beneath the proposed pavement areas should be demolished and all material should be removed from the site. The surface of the proposed pavement beneath the demolished pavement or stripped areas should be scarified to a depth of 8 inches and recompacted. If used as a subbase, it should be compacted to a minimum density corresponding to 98% of its maximum dry density near optimum water content in accordance with ASTM D 1557. Otherwise, the subgrade may be compacted to a minimum density corresponding to 95% of its maximum dry density near optimum water content in accordance with ASTM D 698.

45. Design Assumptions. Furnished information indicates the anticipated traffic intensities will be "light" in the parking area with occasional 18 wheelers in the service drive and main roadway. The parking area will accommodate 162 vehicles. Analyses for pavement components assumed light vehicular traffic consisting of 324 passenger vehicles per day (at least one turnover) in the parking area. Occasional 18 wheelers (two per day) for the service drive and main roadway

were also assumed. These assumptions should be verified before implementation of the pavement analyses in design.

46. Forty percent of the passenger vehicles were assumed as pickup trucks having front and rear axial loads of 2 kips and 5 kips, respectively. The remaining 194 vehicles were assumed as cars having front and rear axial loads of 2 kips each. A front single axial load of 8 kips and a tandem axial load of 32 kips for the middle and rear axles (HS20 loading) were assumed for the 18-wheeler loading.

47. Based on these traffic assumptions, the equivalent 18-kip single axial load repetitions (E_{18}) for the rigid and flexible pavement design is approximately 6,000 for the parking area. The E_{18} for the rigid and flexible pavement designs are approximately 50,000 and 31,000, respectively for the service drive and main roadway. The design life of the pavement was assumed to be 20 years.

48. <u>Rigid Pavement.</u> For the design E_{18}, Portland Cement Concrete pavement should be 6 inches thick for the proposed parking area. The service drive and main roadway should be provided with an 8-in. thick Portland Cement Concrete pavement. Type B Portland Cement Concrete meeting the strength and material requirements included in Section 901 of the *Louisiana Standard Specifications for Roads and Bridges*, 1992 edition, (LSSRB) should be used. Grades should provide adequate drainage to prevent saturation of compacted structural fill beneath the rigid pavement and all joints should be sealed to prevent infiltration of water. All pavement details such as wire mesh, reinforcement, dowels, joints, curbs, etc., should be designed by a pavement design engineer.

49. The concrete pavement should be underlain by at least 6 inches of select structural fill. Structural fill used as the subbase should conform to the requirements previously given in this report for "Select Fill." Existing fill materials may be used if they are tested to ensure conformance with the recommendations given. Structural fill for the subbase should be compacted to 98% of the maximum dry density near optimum water content in accordance with ASTM D 1557.

50. Flexible Pavement. Eustis Engineering recommends pavement for parking areas be 3 inches of hot mix asphaltic surface course, consisting of at least 1.5 inches of wearing course and 1.5 inches of binder course. At least 6 inches of crushed stone base course should be used beneath the asphalt surface. An additional 8 inches of structural fill material should be used to construct the subbase. Beneath the service drive and main roadway, we recommend the asphaltic concrete be a 1.5-in. wearing course and a 2.5-in. binder course. The base course should be 8 inches and the subbase course should be increased to 12 inches.

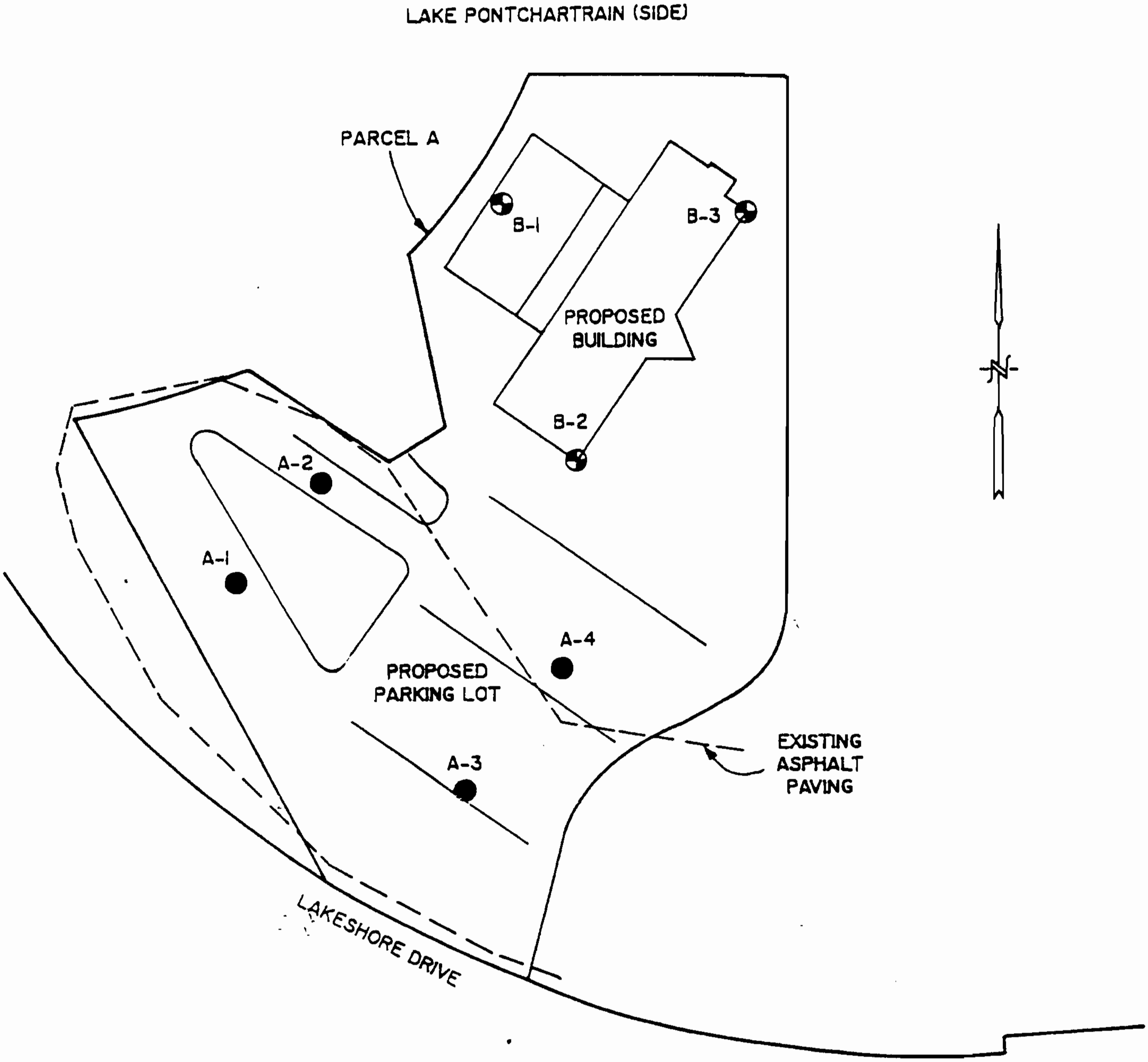
51. The asphaltic concrete should conform to all requirements for Type 3 wearing and binder courses of Section 501 of the LSSRB. The material for the crushed stone base course should conform to all requirements of Section 1003.03(d) of the LSSRB. Placement and compaction of the base course should follow Section 302 of the LSSRB for a Class II crushed stone base course. Structural fill used as the subbase for flexible pavement should conform to the requirements previously given in this report for "Select Fill." Existing fill materials may be used if they are tested to ensure conformance with the recommendations given. Structural fill for the subbase should be compacted to 98% of the maximum dry density near optimum water content in accordance with ASTM D 1557.

GEOTECHNICAL SERVICES DURING CONSTRUCTION

52. To provide continuity between the investigation, design and construction phases, Eustis Engineering should be retained to provide additional services which may include compaction and density testing of structural fill, inspection of piles and pile caps, monitoring and evaluation of vibrations, logging the driving of test piles and job piles, performance of pile load tests, asphalt and concrete testing and inspection, and any other soil and material testing services which will provide quality control during construction and conformance to design specifications.

53. Once the pile driving equipment is established, Eustis Engineering can perform dynamic analyses to evaluate driveability of the pile and driving stresses in the pile cross-section. Eustis Engineering can also preform DPT during installation and evaluate PDA data with respect to driving stresses, load capacity and pile integrity.

54. If any construction problems arise, Eustis Engineering should be notified immediately so appropriate action can be taken. Such notification will permit the geotechnical engineer to be available quickly, evaluate unanticipated conditions, conduct additional tests, if required, and recommend alternative solutions to problems when necessary.



APPROXIMATE SCALE : 1" = 100'
BORINGS DRILLED 9 - 12 FEBRUARY 1996

LOCATION OF BORINGS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING COMPANY, INC.

FIGURE 1

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

ESTIMATED ALLOWABLE PILE LOAD CAPACITY ASTM D 25 QUALITY TIMBER AND TIMBER COMPOSITE PILES

PILE TYPE AND SIZE	PILE TIP EMBEDMENT BELOW EXISTING GROUND SURFACE IN FEET	ESTIMATED ALLOWABLE COMPRESSIVE PILE LOAD CAPACITY IN TONS FACTOR OF SAFETY = 2
ASTM D 25 Quality Treated Timber 7-In. Tip, 12-In. Butt	40 - 45*	15
ASTM D 25 Quality Treated Timber 7-In. Tip, 13-In. Butt Or Timber Composite	68-73*	25

* Assumes piles are firmly seated in sand strata as indicated by an increase in driving resistance.

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

ALLOWABLE PILE LOAD CAPACITIES SQUARE PRECAST CONCRETE PILES AND OPEN END STEEL PIPE PILES

PILE TYPE AND SIZE	PILE TIP EMBEDMENT BELOW EXISTING GROUND SURFACE IN FEET	ESTIMATED ALLOWABLE SINGLE PILE LOAD COMPRESSIVE CAPACITY IN TONS FACTOR OF SAFETY = 2
12-In. x 12-In. Square Precast Concrete Piles	65	24
	70	26
	75	37
	80	50
14-In. x 14-In. Square Precast Concrete Piles	65	28
	70	31
	75	44
	80	61
12-In. Diameter Open End Steel Pipe Piles	65	31
	70	34
	75	47
	80	65
14-In. Diameter Open End Steel Pipe Piles	65	36
	70	40
	75	57
	80	78

CAPACITY OF PILE GROUPS

The maximum allowable load carrying capacity of a pile group is no greater than the sum of the single pile load capacities, but may be limited to a lower value if so indicated by the result of the following formula.

$$Q_a = \frac{P \times L \times c}{(FSF)} + \frac{2.6\, q_u \left(1 + 0.2\, \frac{w}{b}\right) A}{(FSB)}$$

In Which:

Q_a = Allowable load carrying capacity of pile group, lb

P = Perimeter distance of pile group, ft

L = Length of pile, ft

c = Average (weighted) cohesion or shear strength of material between surface and depth of pile tip, psf

q_u = Average unconfined compressive strength of material in the zone immediately below pile tips, psf
(unconfined compressive strength = cohesion x 2)

w = Width of base of pile group, ft

b = Length of base of pile group, ft

A = Base area of pile group, sq ft

(FSF) = Factor of safety for the friction area = 2

(FSB) = Factor of safety for the base area = 3

The values of c and q_u used in this formula should be based on applicable soil data shown on the Log of Boring and Test Results for this report. In the application of this formula, the weight of the piles, pile caps and mats, considering the effect of buoyancy, should be included.

SPACING WITHIN PILE GROUPS

SPAC = $0.05 (L_1) + 0.025 (L_2) + 0.0125 (L_3)$

In Which:

SPAC = Center to center of piles, feet
L_1 = Pile penetration up to 100 feet
L_2 = Pile penetration from 101 to 200 feet
L_3 = Pile penetration beyond 200 feet

NOTE: Minimum pile spacing = 3 feet or 3 pile diameters, whichever is greater

APPENDIX

LEGEND AND NOTES FOR LOG OF BORING AND TEST RESULTS

PP	Pocket penetrometer resistance in tons per square foot	
TV	Torvane shear strength in tons per square foot	
SPT	Standard Penetration Test. Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in O.D., 1.4-in. I.D. sampler a distance of one foot into the soil, after first seating it 6 inches	
SPLR	Type of Sampling ▮ Shelby ☒ SPT ⧄ Auger ☐ No Sample	
SYMBOL	Clay ▨ Silt ▥ Sand ⁙ Humus ≋	Predominant type shown heavy; Modifying type shown light
DENSITY	Unit weight in pounds per cubic foot	
USC	Unified Soil Classification	
TYPE	UC	Unconfined compression shear
	OB	Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
	UU	Unconsolidated undrained triaxial compression shear
	CU	Consolidated undrained triaxial compression shear
	DS	Direct shear
	CON	Consolidation
	PD	Particle size distribution
	k	Coefficient of permeability in centimeters per second
	SP	Swelling pressure in pounds per square foot
ϕ	Angle of internal friction in degrees	
c	Cohesion in pounds per square foot	

Other laboratory test results reported on separate figure

Ground Water Measurements ▼ Initial ▽ Final

GENERAL NOTES

(1) At the time the borings were made, ground water levels were measured below existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction, immediately prior to beginning work.

(2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/09/96 **Boring:** 1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Loose tan clayey silt w/silty clay pockets	ML	1	0-0.5											
	0.75				Medium stiff to stiff gray & tan silty clay w/clayey silt layers & roots	CL	2	2-3	14										
						ML	3	3-4											
		10			Medium compact gray & tan clayey silt w/silty clay & sand layers	SP	4	5-6											
		6			Loose tan fine sand		5	8-9											
10		17			Medium dense gray clayay sand w/sandy clay layers	SM	6	11-12											
		2			Very soft gray sandy clay	CL	7	14-15											
	0.30				Loose gray sandy silt	ML	8	18-19	34	87	116								
20	0.25				Soft gray silty clay w/clayey silt layers & shells	CL	9	23-24	36						39		39		
	0.40				Soft gray clay w/sandy silt pockets & lenses & shells	CH	10	28-29	41	78	110	OB	--	445					
30	0.50				w/sandy silt lenses & layers & trace of shells		11	33-34	47										
					Loose gray clayey sand	SC	12	38-39											
40					w/sandy clay layers & sand layers		13	42-43											
		26			Medium dense gray fine sand w/shells	SP	14	44-45											
50		19					15	49-50											

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/09/96 **Boring:** 1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50				⁙	Medium dense gray fine sand w/shells	SP													
		9	☒	▨	Stiff gray clay	CH	16	54-55											
	1.75		■	▨	Stiff gray & tan sandy clay w/clayey sand layers	CL	17	58-59	18										
60				▨															
	1.00		■	▨			18	62-63											
		31	☒	▨	Dense gray & tan clayey sand	SC	19	64-65											
		41	☒	▨			20	69-70											PD
70				▨															
		42	☒	▨			21	74-75											
		43	☒	⁙	Dense tan fine sand	SP	22	79-80											
80				⁙															
		38	☒	⁙			23	84-85											
		47	☒	⁙			24	89-90											
90				⁙															
		48	☒	⁙			25	94-95											
		50=9"	☒	⁙	Very dense tan fine sand	SP	26	99-100											
100																			
110																			

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/12/96 **Boring:** 2 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0		19	☒		Loose tan silty sand w/shells & roots	SM	1	0-0.5											
					Medium dense tan fine sand w/shells, gravel & sandy clay pockets	SP	2	1-2											
		14	☒		Medium dense gray fine sand		3	4-5											
		7	☒		Soft gray clay w/shells & sand layers	CH	4	7-8	44										
10																			
					Loose gray fine sand w/clay layers & shells	SP	5	11-12											
					Loose gray sandy silt	ML	6	14-15											
							7	18-19	36										
20																			
	0.25				Soft gray sandy clay w/shells	CL	8	23-24	32										
	0.30						9	28-29											
30																			
	0.50				Soft gray clay w/silty sand lenses	CH	10	33-34	47	72	106	OB	--	425					
					Loose gray clayey sand w/sand layers & shells	SC	11	38-39											
40		30	☒		Dense gray fine sand w/shells	SP	12	40-41											
		17	☒		Medium dense gray fine sand	SP	13	44-45											
50		3	☒		Soft gray clay w/sand layers & shells	CH	14	49-50											

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/12/96 **Boring:** 2 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	ϕ	C	LL	PL	PI		
50				▨	Soft gray clay w/sand layers & shells	CH													
	0.80		■	▨	Medium stiff gray clay w/shell fragments & sand pockets	CH	15	53-54	40										
			■	▨	Very stiff greenish-gray sandy clay	CL	16	58-59	22	102	124	OB	--	2960					
60																			
	0.60		■	▨	Medium stiff gray & tan sandy clay w/silty sand layers	CL	17	62-63											
		32	☒	░	Dense tan silty sand	SM	18	64-65											
		30	☒	░			19	69-70	26										
70																			
		44	☒	░	Dense tan fine sand	SP	20	74-75											
		50=9"	☒	░	Very dense tan fine sand w/silt	SP-SM	21	79-80											
80																			
		50=9"	☒	░			22	84-85											
		50=7"	☒	░			23	89-90											
90																			PD
		50=6"	☒	░			24	94-95											
		50 Seat	☒	░			25	99-100											
100																			
110																			

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 1 of 2)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/09 & 12/96 **Boring:** 3 **Refer to "Legends & Notes"**

Scale in Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					Medium compact tan clayey silt	ML	1	0-0.5											
	0.80				Medium stiff gray & tan silty clay w/clayey sand layers	CL	2	2-3											
		15			Medium dense gray & tan silty sand w/clayey silt & silty clay pockets	SM	3	4-5											
		6			Loose gray clayey sand w/sandy clay layers & shells	SC	4	7-8											
10		3			Loose gray fine sand w/clay layers & shells	SP	5	9-10											
	0.20				Very soft gray clay w/sand layers & shells	CH	6	12-13											
	0.20				Very soft gray sandy clay w/sand layers	CL	7	14-15	29	94	122	OB	--	135					
					Loose gray sandy silt w/clay layers	ML	8	18-19	33										
20																			
	0.40				Very loose gray clayey silt w/sand pockets & trace of shells	ML	9	23-24	39	82	114	OB	--	230					
	0.50				Soft gray clay w/clayey sand lenses & layers & shells	CH	10	28-29	46						62		62		
30																			
	0.40				Soft gray silty clay w/shells & sand pockets	CL	11	33-34											
	0.40				Loose gray clayay sand w/clay pockets	SC	12	38-39	27	96	122	OB	--	370					
40																			
		24			Medium dense gray fine sand w/shells	SP	13	43-44											PD
		26					14	46-47											
50		4			Soft gray sandy clay w/sand lay & shells	CL	15	49-50											

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 2 of 2)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/09 & 12/96 **Boring:** 3 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
50					Soft gray sandy clay w/sand layers & shells	CL													
	0.80				Medium stiff gray clay w/sand pockets	CH	16	53-54	50	71	107	OB	--	580					
	2.00				Very stiff gray & tan sandy clay w/vertical clayey sand lenses	CL	17	58-59	24						43		43		
60																			
	0.50				Loose light gray & tan clayey sand	SC	16	63-64	34	88	117	OB	--	365					
					Loose gray silty sand	SM	19	68-69	26										
70																			
		30	☒		Dense gray & tan silty sand	SM	20	71-72											
		31	☒				21	73-74											
		50=9"	☒		Very dense tan fine sand	SP	22	79-80											
80																			
					Dense tan fine sand	SP													
		48	☒				23	84-85											
		48	☒				24	89-90											
90																			
		50=9"	☒		Very dense gray & tan fine sand	SP	25	94-95											
		50=9"	☒				26	99-100											
100																			
110																			

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 1 of 1)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/09/96 **Boring:** A-1 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0				■	1" Asphalt	Pave													
				░	Loose tan fine sand w/clay layers	SP	1	1-2											
							2	3-4	32										
				░	Loose gray fine sand w/clay layers & shell fragments	SP	3	5-6											
10																			
20																			
30																			
40																			
50																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 1 of 1)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/09/96 **Boring:** A-2 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0					1" Asphalt	Pave													
					Loose tan fine sand w/clay layers	SP	1	1-2	37										
					Loose gray fine sand w/clay layers & shell fragments	SP	2	3-4											
							3	5-6											
10																			
20																			
30																			
40																			
50																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

(Sheet 1 of 1)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/09/96 **Boring:** A-3 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0				■	1" Asphalt	Pave													
				▨	Loose tan fine sand w/shells	SP	1	1-2											
				▨			2	3-4											
				▨	Loose gray fine sand w/clay layers & shell fragments	SP	3	5-6	27										
10																			
20																			
30																			
40																			
50																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

UNIVERSITY OF NEW ORLEANS
RESEARCH AND TECHNOLOGY PARK
OFFICE OF PUBLIC HEALTH LABORATORY FACILITIES
NEW ORLEANS, LOUISIANA

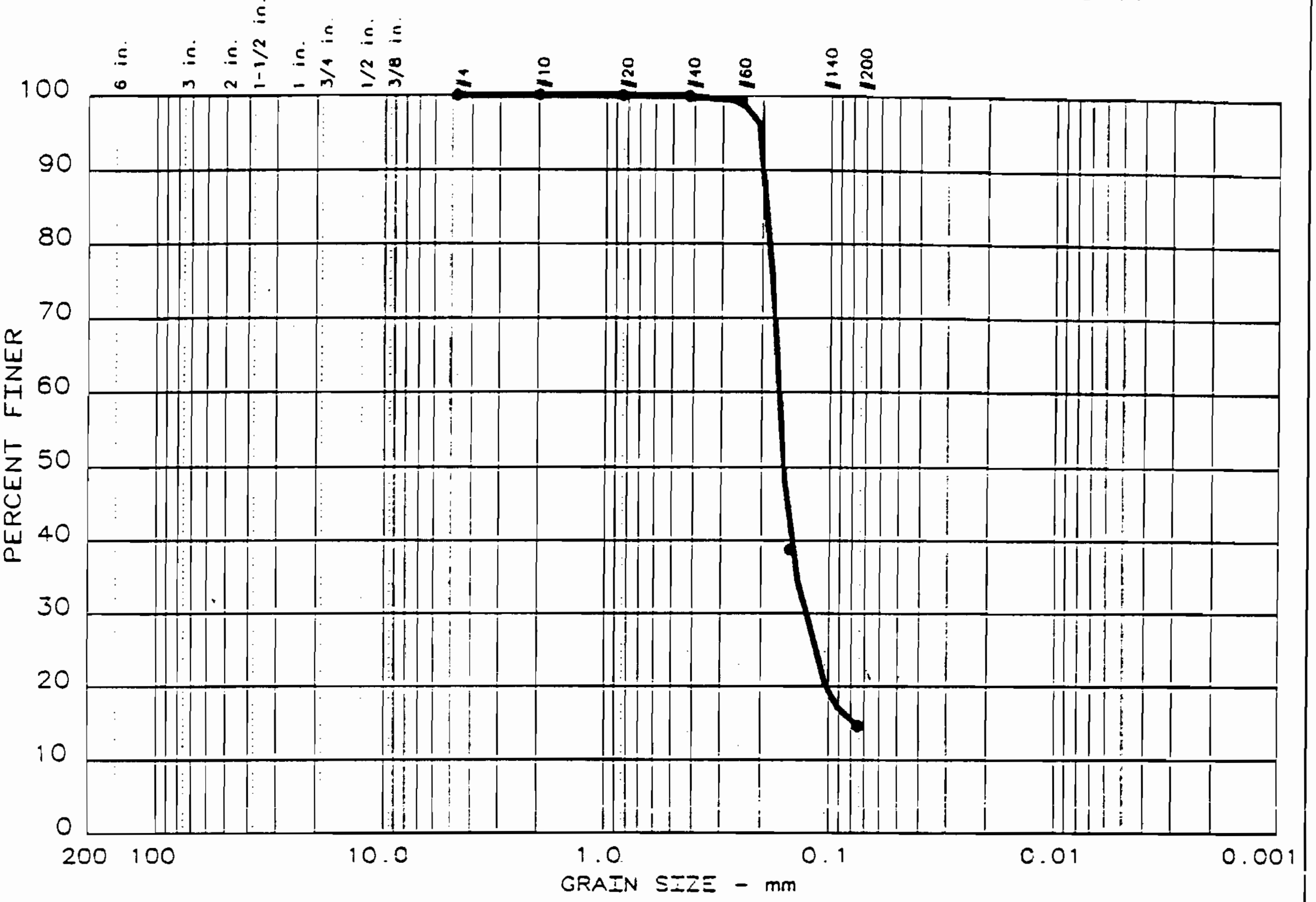
(Sheet 1 of 1)

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 13903 **Date Drilled:** 2/12/96 **Boring:** A-4 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	φ	C	LL	PL	PI		
0				▒	Loose to medium dense tan fine sand w/shells	SP	1 2 3	0-1 1-2 3-4	16										
				▒	Loose gray fine sand w/sandy clay layers	SP	4	5-6	32										
10																			
20																			
30																			
40																			
50																			

Comments:

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	0.0	0.0	85.4	14.6		SC		

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.17		
D_{30}	0.13		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
4	100.0		
10	100.0		
20	100.0		
40	99.9		
60	99.3		
100	38.8		
200	14.6		

Sample information:

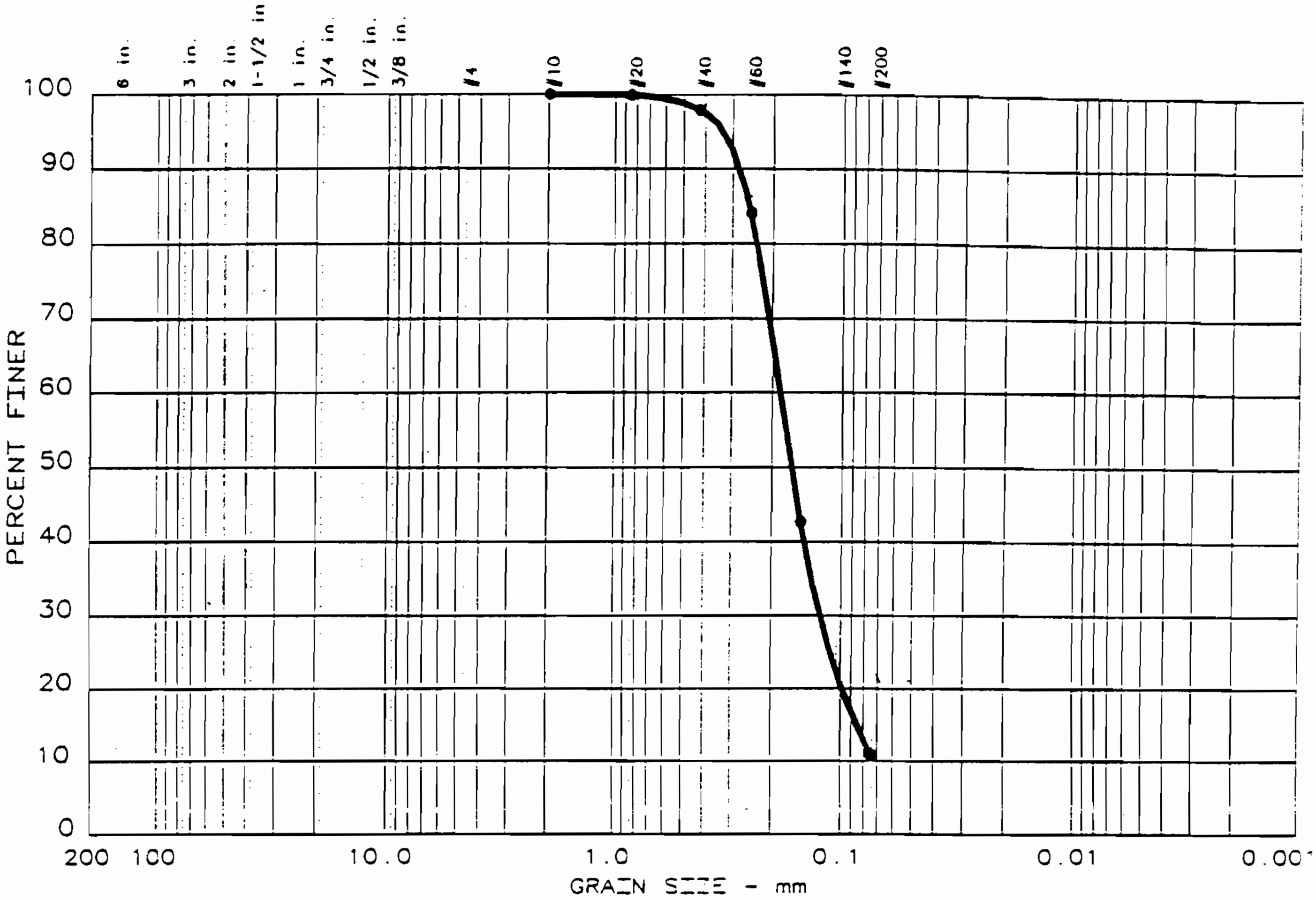
● Boring 1, Sample 20
Dense gray & tan CLAYEY SAND

Remarks:
Sample depth 69'-70'

Eustis Engineering Company, Inc.

Project No.: 13903
Project: U.N.O. - Research and Technology Park
Date: 2-16-96
Data Sheet No. ____

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	0.0	0.0	89.1	10.9		SP-SM		

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.18		
D_{30}	0.12		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
10	100.0		
20	99.9		
40	97.9		
60	84.1		
100	42.6		
200	10.9		

Sample information:

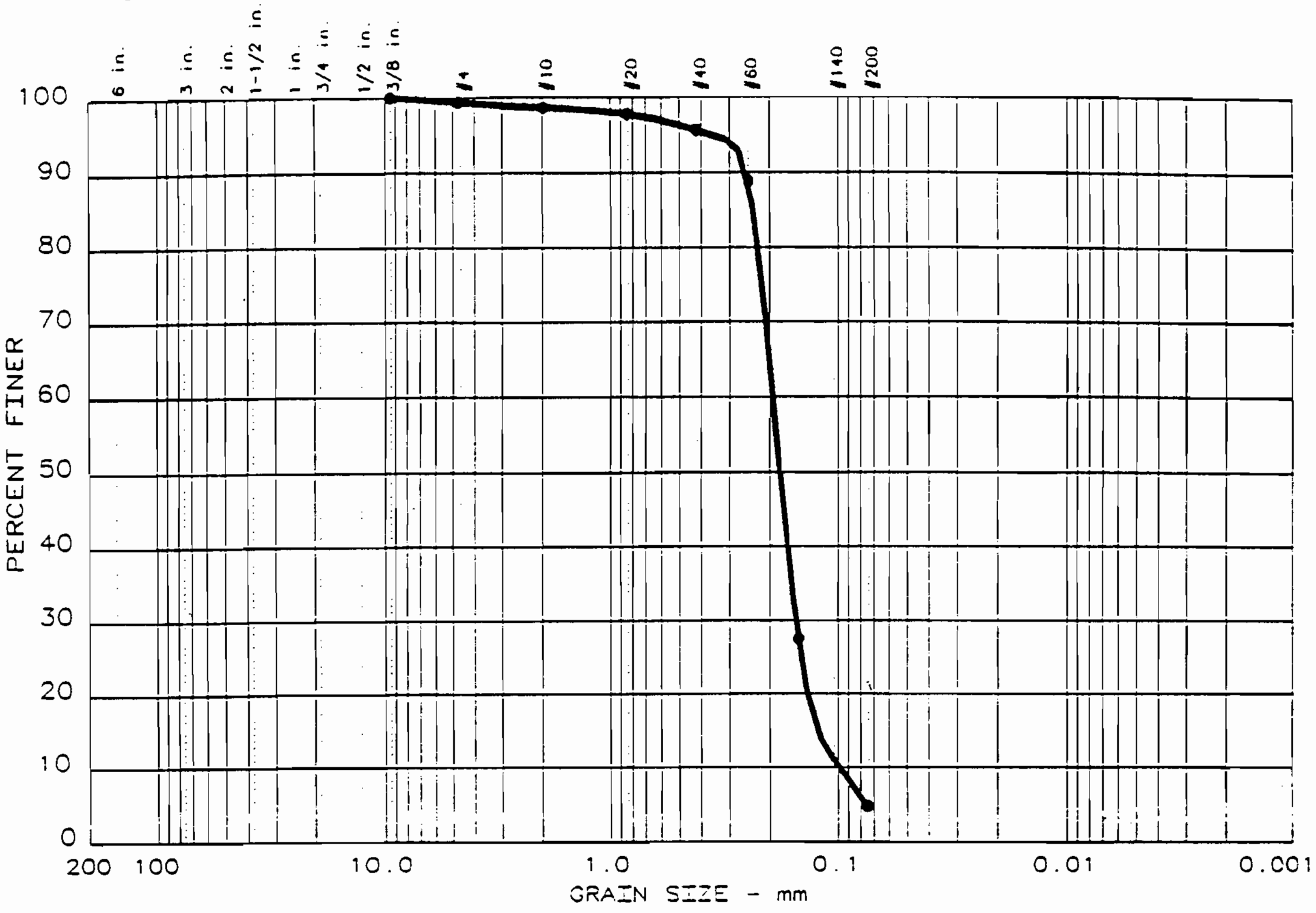
● Boring 2, Sample 23
Very Dense tan FINE
SAND w/ silt

Remarks:
Sample depth 89'-90'

**Eustis
Engineering
Company, Inc.**

Project No.: 13903
Project: U.N.O. - Research and Technology Park
Date: 2-16-96 Data Sheet No. ____

PARTICLE SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	0.0	0.7	94.6	4.7		SP		

SIEVE inches size	PERCENT FINER		
	●		
0.375	100.0		
	GRAIN SIZE		
D_{60}	0.19		
D_{30}	0.15		
D_{10}	0.09		
	COEFFICIENTS		
C_c	1.24		
C_u	2.0		

SIEVE number size	PERCENT FINER		
	●		
4	99.3		
10	98.6		
20	97.7		
40	95.6		
60	88.9		
100	27.5		
200	4.7		

Sample information:
● Boring 3, Sample 13
Medium Dense gray FINE
SAND w/ shell

Remarks:
Sample depth 43'-44'

Eustis Engineering Company, Inc.

Project No.: 13903
Project: U.N.O. - Research and Technology Park
Date: 2-16-96
Data Sheet No. ____

RE
Mr. Estrada/1035

CELMN-ED-FS 26 JUN 96

MEMORANDUM FOR Chief, Civil Branch
Attn: Mr. Kearns

SUBJECT: Review of Plans and Specifications for Lake Pontchartrain, La. and Vicinity, Orleans Parish Lakefront Levee/Floodwall, Pontchartrain Beach Wave Berm, Sta. 10+03.45 W/L to Sta. 39+78.39 W/L, Orleans Parish, La. (ED97-027)

1. Reference your multiple CELMN-ED-LH memo dated 21 May 96, SAB.

2. We have reviewed the enclosed Plans and Specs. and have the following comments:

a. <u>Plans</u>

(1). Dwg. 5.<u>Typical Design Section 1</u>. The distance from the c/l of the floodwall to: the flood side edge of the levee should be two (2) feet; to the protected side edge of the levee should be eight (8) feet.

(2). Dwg. 5.<u>Typical Design Section 2</u>. The distance from the c/l of the floodwall to the flood side edge of the levee should be two (2) feet.

(3). Dwg. 5.<u>Typical Design Section 3</u>. Give the Contractor the distance from El. 8.0 to the c/l of the floodwall. Replace " El. 10.0" for "El. varies."

(4). Dwg. 6. <u>Tree Section, Plan View</u>. Change the 5 feet minimum distance to 5 feet.

(5). Dwg. 6.<u>Tree Section, Section A</u>. Show El. 8.0 at the end of the 1V on 18H slope. Delete the word minimum.

(6). Dwg. 7. On "DETAIL A" show the stockpile area.

(7). Dwg. 7. Change the ground elevation of each boring to " Natural Ground". Change the vertical scale to read: " DEPTH IN FEET FROM NATURAL GROUND ". Position the ground surface elevation of each boring with the vertical scale at natural ground depth of 0.

(8). Dwg. 8. Borings 3-ULO and 6-PBU were taking prior to levee construction. They do not represent the actual field condition. Add an explanatory note.

b. <u>Specs</u>

(1). Pg. 02220-3; par. 3.2.2.4, pg. 02220-4; pars. 3.2.2.5 and 3.2.2.6.2. Reference is made to a provided stockpile area . The stockpile area is not showing on the drawings. This should be corrected.

(2). Pg. 02220-4; par. 3.2.2.6.1. On the fourth line change " 02225-11" to " paragraph 02225-6 ".

(3). Pg. 02225-6. paragraph 6.1.2. Add the following sentences prior to the last sentence: " The Contractor shall perform a minimum of one moisture content test per work shift in which semicompacted fill has been placed within the design section. The Contractor shall perform additional moisture content tests during any work shift in which semicompacted fill placement exceeds 3000 cubic yards. Additional tests shall be performed to ensure a minimum test frecuency of one moisture content test per 3000 cubic yards of semicompacted fill placed during that work shift. "

3. P.O.C. is Mr. Roberto Estrada, ext. 1035.

RODNEY P. PICCIOLA
Chief, Geotechnical Branch

GRIESHABER
Acting
CELMN-ED-FS
PICCIOLA
CELMN-ED-F

CELMN-ED-LH 21 May 1996

MEMORANDUM FOR ✓CELMN-ED-F
CELMN-ED-H
CELMN-ED-C
CELMN-ED-T

SUBJECT: Review of Plans and Specifications for Lake Pontchartrain, La. and Vicinity, Orleans Parish Lakefront Levee/Floodwall, Pontchartrain Beach Wave Berm, Sta. 10+03.45 W/L to Sta. 39+78.39 W/L, Orleans Parish, La. (ED97-027)

1. Please review the enclosed plans and specification in sufficient detail to detect and correct errors or conflicts and return them at the earliest practicable date, but not later than 20 Jun 96, along with any comments and recommendations you consider necessary or desirable. All major comments on the drawings must be addressed in the responding memorandum. Only minor comments should be marked on the drawings.

2. The estimated cost is approximately $200,000, beginning in fiscal year 97.

3. Charge all review work to cost account no. BE C21 30DAL1 0PBB.

4. In addition to the above, Cost Engineering Branch will include a statement indicating the use of the Clause in DFARS 252.236-7004 (if the contract duration is greater than 90 days; or less than 90 days if there are special circumstances (i.e. complexity) which require the use of this clause) and provide a cost estimate based on the enclosed plans and specifications.

5. Point of contact is Sam Kearns at x-2718.
SK

Encls
as

for GERARD J. BRANTLEY
Chief, Civil Branch

/

CELMN-ED-LH (CELMN-OD-SE/06 Feb 96) 1st End 28 Feb 96
SUBJECT: SE(Lake Pontchartrain)154 Orleans Levee District, BOC (ED #9600551)

CELMN-ED

MEMORANDUM FOR C/Operations Division

1. We have no adverse comments regarding the subject permit request.

2. POC is Sam Kearns, X2718.

Attachments
nc

W. EUGENE TICKNER
Chief, Engineering Division

CF w/o Attachs:
CELMN-ED-LW (Broussard)
✓CELMN-ED-FS (Estrada)
CELMN-ED-TF (Romero)

ENGINEERING DIVISION

Permit Review
Sheet

SUBJECT: (Bayou St. John 1)
ppl Levee Board (OLD) to dredge and install culverts, roadway embankments, levee, seawall and fill in New Orleans

LMN
1 ED-A 1/12/79
ED-Z

2 ED-S 1/15/79

SUSPENSE:* ~~16 Jan~~
3 ED-M
① ED-MP
② ED-MR 1/21
ED-MW

See attached DF LMNED-MP
Subject as above.

SUSPENSE:* ~~31 Jan~~
4 ED-H 1/29
ED-HD
✓ ED-HC
ED-HH
ED-HR
ED-HG

1/26

SUSPENSE:* 5 Feb
5 ED-F
ED-FG
ED-FD
✓ ED-FS JR

LMNED-FS 1 Feb 79
No objections subject to the comments contained in the LMNED-MP DF attached which is in accordance with our previous review. JR

SUSPENSE:*
6 ED-D
ED-DL
ED-DW
ED-DR
ED-DD
ED-DG

*If suspense date cannot be met, furnish Secretary, Chief of Eng Div, the date it can be met.

Continue comments on separate sheet if necessary

LMN Form 744 1 Dec 74 (Previous Edition Obsolete)

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL LMNOD-SP (Bayou St. John)1

SUBJECT Appl by Board of Levee Commissioners Orleans Levee District, to dredge in an area and install and maintain culverts, roadway embankments, levee, seawall and fill, in New Orleans, La., in Orleans Parish.

TO C/Eng Div

FROM C/Reg Func Br
Ops Div

DATE 16 Jan 79
Mr. Arroyo/ms/541

CMT 1

Forwarded for comment and return. Complete set of full scale drawings are available for review in the Regulatory Functions Branch, (52 sheets).

DECKER

1 Incl
Dwg (6 sheets)

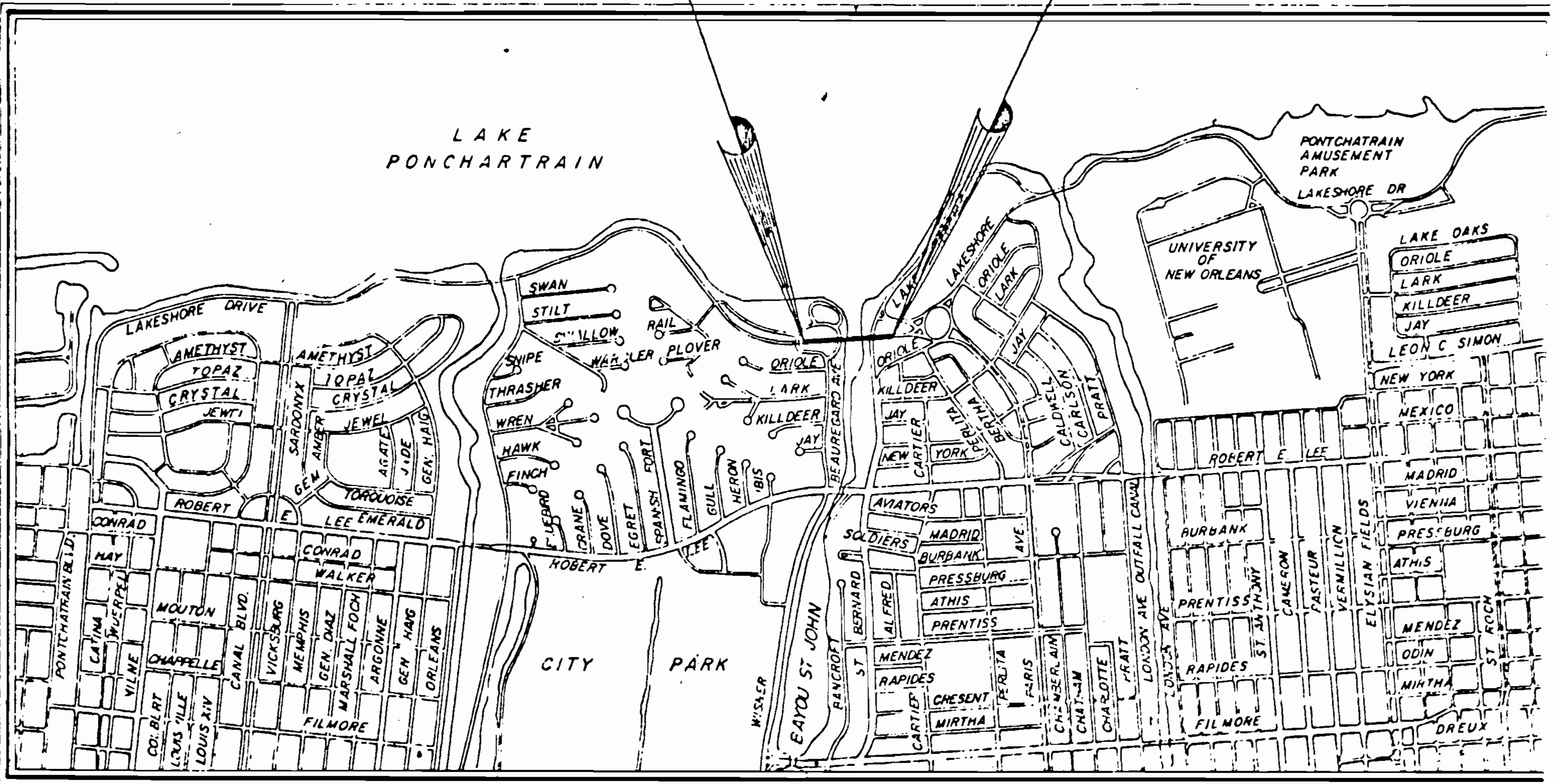
LMN FL 1096
1 Aug 76

DA FORM 1 FEB 62 2496 REPLACES DD FORM 96, WHICH IS OBSOLETE.

✿ U.S. G.P.O. 1976-665697/1018

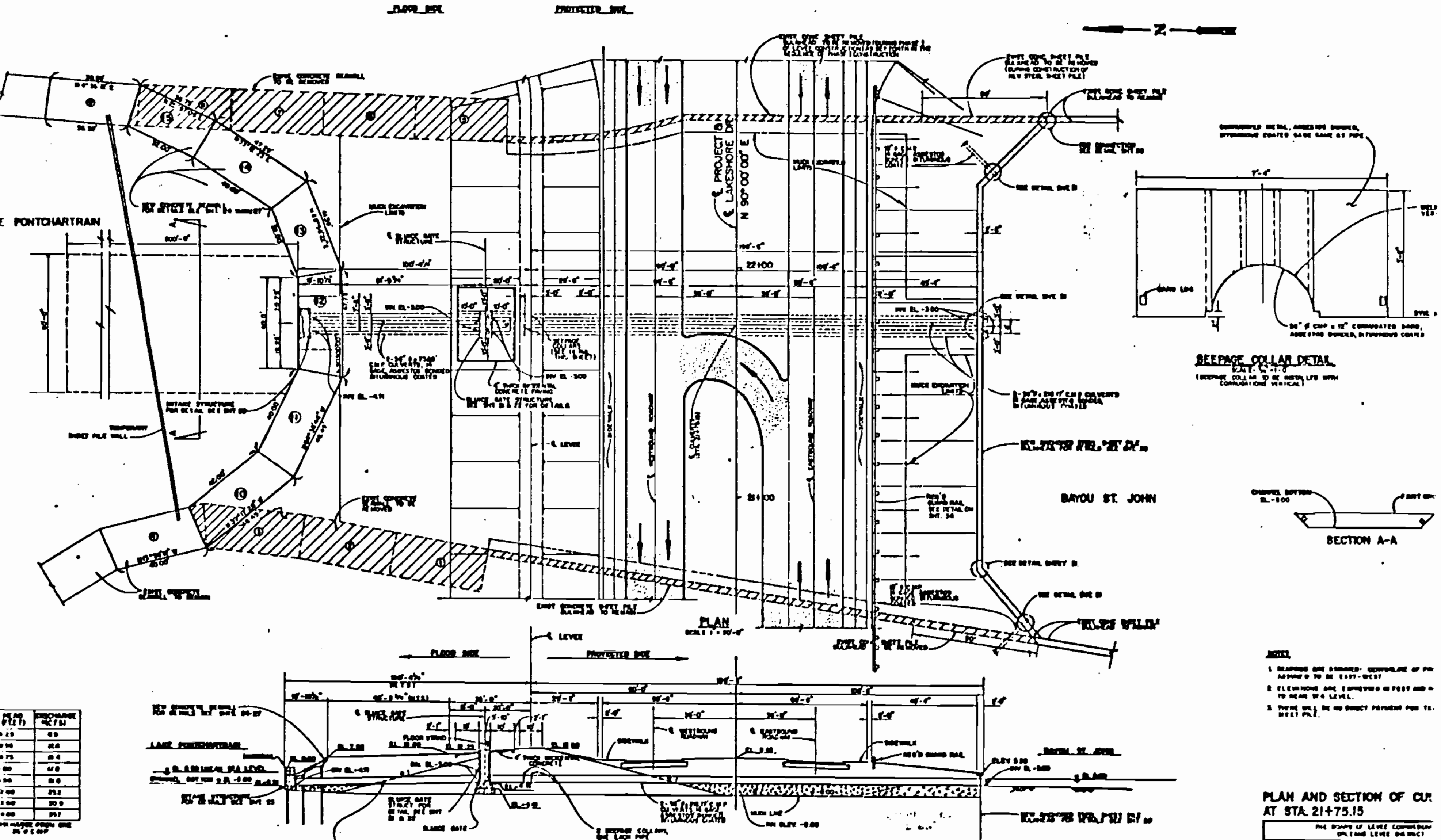
BEGIN PROJECT
STATION 12+06.48

END PROJECT
STATION 28+48.96



LOCATION MAP

ORLEANS LEVEE BOARD PROJ. NO.767-7M



CK EXCAVATION : 15,200 CU. YDS.
VEE DEGRADING : 16,700 CU. YDS.
LECT FILL : 20,900 CU. YDS.
ANULAR MATERIAL : 23,400 CU. YDS.

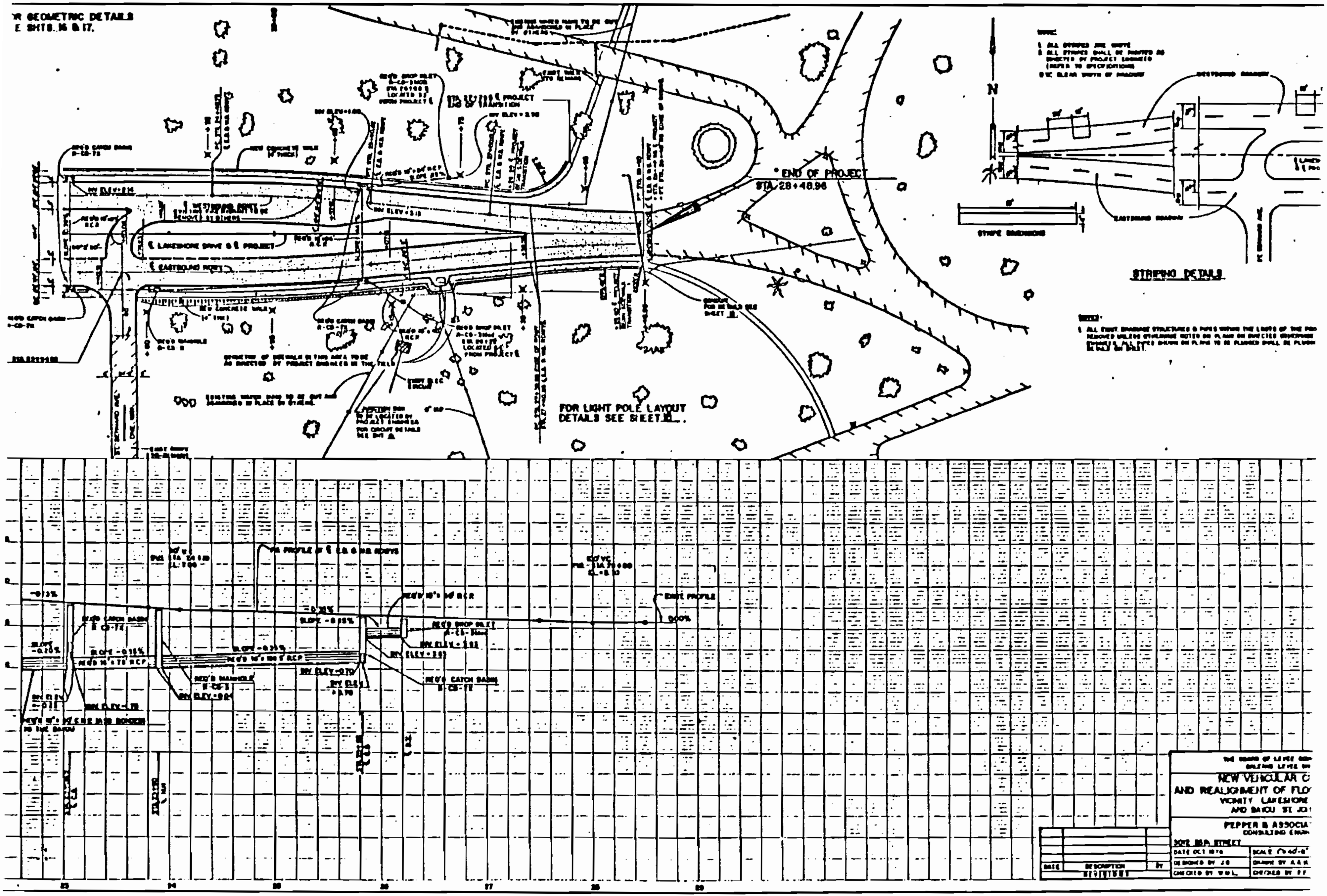
PLAN AND SECTION OF CU
AT STA. 21+75.15

NEW VEHICULAR CROS
AND REALIGNMENT OF FLOOD
VICINITY LAKESHORE DR
AND BAYOU ST. JOHN

PEPPER & ASSOCIATES,
CONSULTING ENGINEERS

DATE OCT 1978

SHEET 2 OF 6



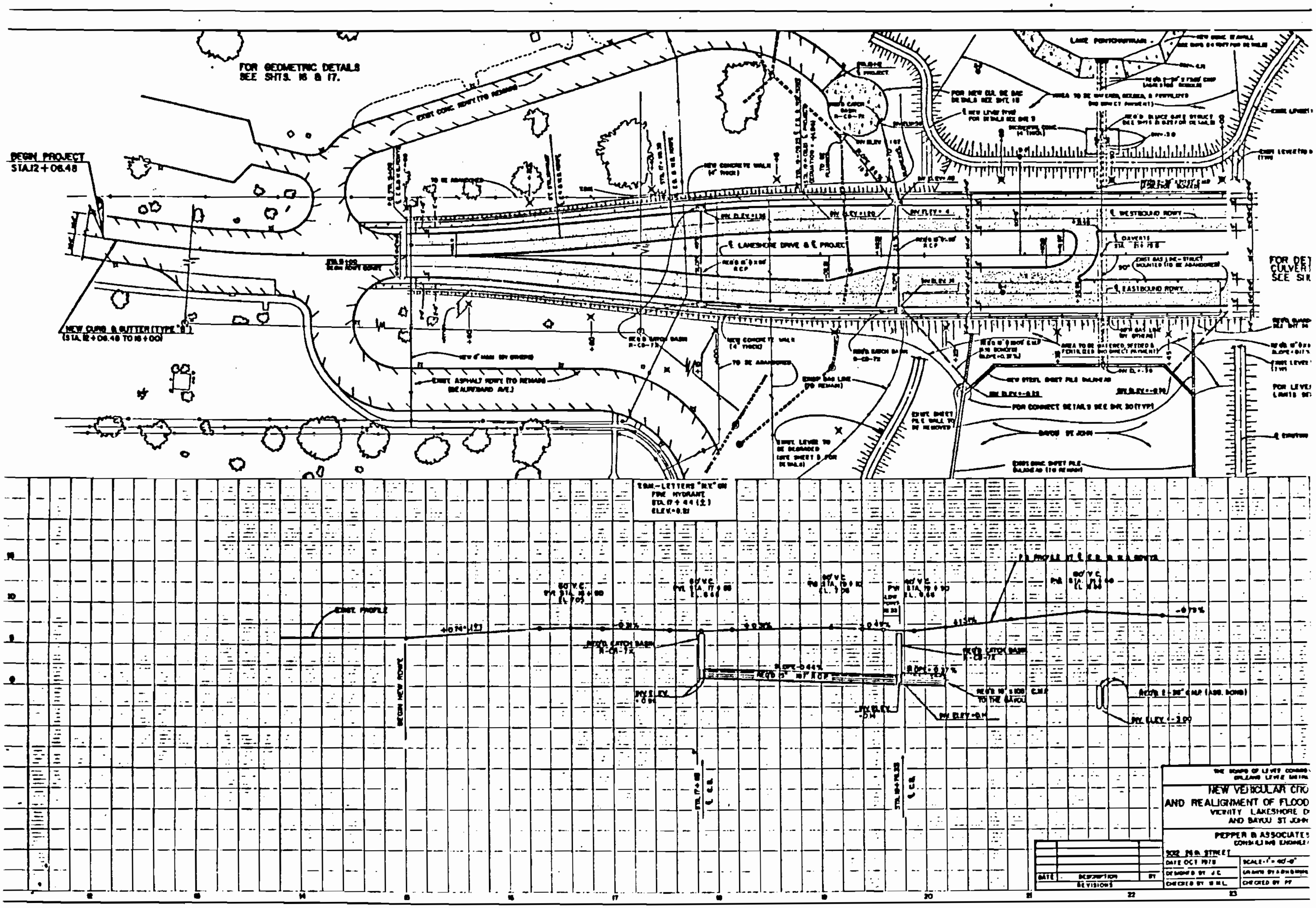
NEW VEHICULAR C
AND REALIGNMENT OF FLO
VICINITY LAKESHORE
AND BAYOU ST. JO

PEPPER & ASSOCIA
CONSULTING ENG

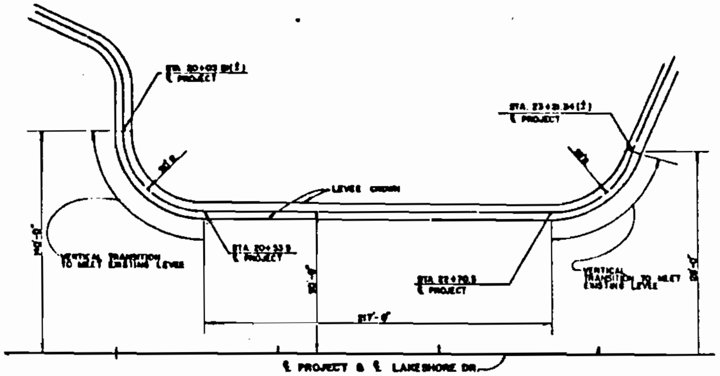
DATE OCT 1976

DATE	DESCRIPTION	BY
	REVISIONS	

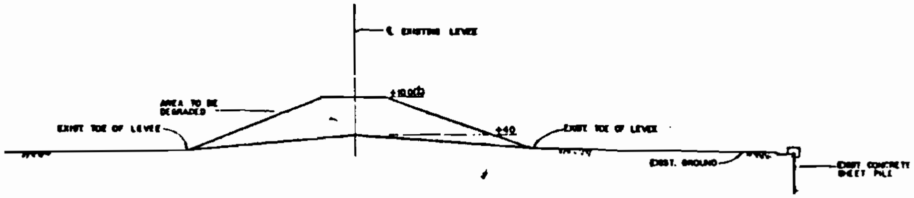
SHEET 3 OF 6


FOR GEOMETRIC DETAILS SEE SHTS. 16 & 17.
BEGIN PROJECT STA.12+06.48
NEW CURB & GUTTER (TYPE "B") (STA. 12+06.48 TO 16+00)
EXIST. CONC. RDWY (TO REMAIN)
LAKE PONTCHARTRAIN
NEW CONCRETE WALK (4" THICK)
TO BE ABANDONED
℄ LAKESHORE DRIVE & ℄ PROJECT
℄ WESTBOUND RDWY
℄ EASTBOUND RDWY
EXIST. ASPHALT RDWY (TO REMAIN) (BEAUREGARD AVE.)
NEW STEEL SHEET PILE BULKHEAD
FOR CONNECT DETAILS SEE SH. 20 (TYP)
BAYOU ST. JOHN
FOR DET CULVERT SEE SH
T.B.M.–LETTERS "N.E" ON FIRE HYDRANT STA. 17+44 (±) ELEV.+0.81
EXIST. PROFILE
BEGIN NEW RDWY
SLOPE-0.44%
-0.79%
THE BOARD OF LEVEE COMMIS ORLEANS LEVEE DISTR
NEW VEHICULAR CRO
AND REALIGNMENT OF FLOOD
VICINITY LAKESHORE D
AND BAYOU ST JOHN
PEPPER & ASSOCIATES
CONSULTING ENGINEERS
DATE OCT 1978
DESIGNED BY J.C.
CHECKED BY
SCALE 1" = 40'-0"
CHECKED BY
DATE
DESCRIPTION
BY
REVISIONS
12
13
14
15
16
17
18
19
20
21
22
23

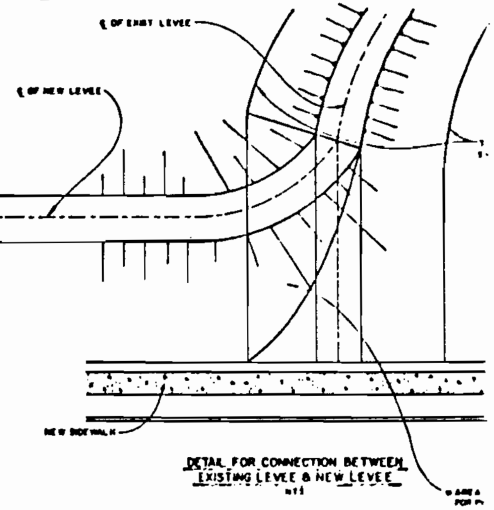
SHEET 4 OF 6



ALINEMENT DETAIL FOR NEW LEVEE
NTS

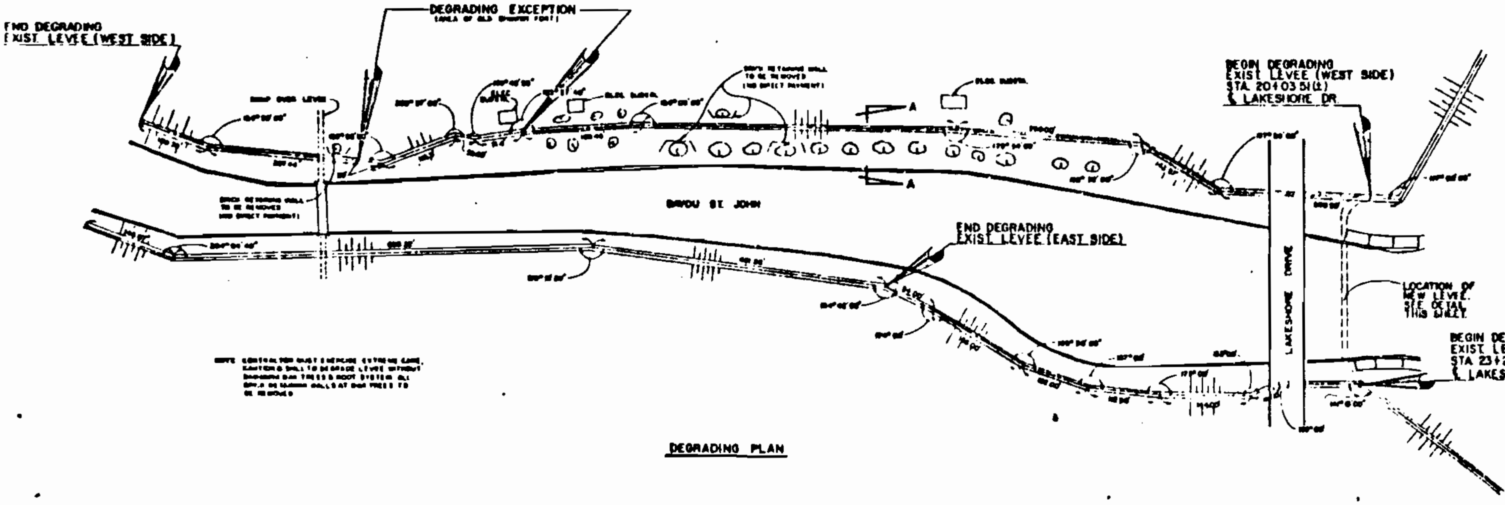


SECTION A-A (TYPICAL)
NTS



DETAIL FOR CONNECTION BETWEEN EXISTING LEVEE & NEW LEVEE
NTS

* CONTRACTOR SHALL NOT LEAVE ANY GRASS BETWEEN THE NEW FILL & EXISTING LEVEE



NOTE: CONTRACTOR MUST EXERCISE EXTREME CARE, CAUTION & SKILL TO DEGRADE LEVEE WITHOUT DAMAGING OAK TREES & ROOT SYSTEM. ALL [illegible] RETAINING WALLS AT OAK TREES TO BE REMOVED.

DEGRADING PLAN

LEVEE RELOCATION & DEGRADING PLAN

THE BOARD OF LEVEE COMMISSI
ORLEANS LEVEE DISTRICT

NEW VEHICULAR CROS
AND REALIGNMENT OF FLOOD
VICINITY LAKESHORE DR
AND BAYOU ST JOHN

PEPPER & ASSOCIATES,
CONSULTING ENGINEERS
3012 26th STREET

DATE	DESCRIPTION	BY
REVISIONS		

DATE OCT 1970	SCALE AS SHOWN
DESIGNED BY R F	DRAWN BY J H
CHECKED BY RML	CHECKED BY JCM

SHEET 5 of 6

Dredging (muck excavation) will be accomplished by either a land operated bucket or a barge mounted bucket. Depending on the nature of the material it will either be reused at the site or hauled away from the site by truck. It is estimated that there will be 15,200 cubic yards of this material.

The existing levee along the Westbank of Bayou St. John from Lakeshore Drive to Robert E. Lee will be degraded and used for fill in the new closure levee construction, except for the section at Spanish Fort ruins which will not be disturbed. Only a portion of the existing levee along the Eastbank of Bayou St. John will be degraded. The amount of fill obtained in this manner is estimated to be 20,900 cubic yards.

Granular material for the roadway sub-base will be truck hauled to the site from commercial borrow pits. The volume of this material is estimated to be 16,700 cubic yards.

Select fill for the levee berm and roadway slopes will also be obtained from commercial sources and it is estimated to be 23,400 cubic yards. If any of the dredged material meets the requirements of select fill it will be reused in the project.

Circulation of fresh lake water through Bayou St. John will be accomplished by the installation of metal culvert pipes connecting the lake to the Bayou. Each pipe will be equipped with a vertical lift gate to control the volume of flow to control the level of Bayou St. John.

The new roadway construction will be landscaped and is so designed to provide essentially the same traffic movements that existed with the bridge.

A new section of seawall will be constructed, connecting to the existing seawall so that it will provide continuous protection. On the protected side, the new section of retaining wall will be constructed to match the existing wall.

In conclusion, we feel that the project will remove a bridge that is in need of major repairs to restore it to a satisfactory condition and replace it with an attractive "at grade" crossing. In addition construction of the closure levee will permit abandonment of the interior levees which are causing problems with existing oak trees along the Bayou andenhance the recreational value of the park on each side of the Bayou.

CELMN-ED-FS 28 Fef 96

MEMORANDUM FOR Chief, Civil Branch

SUBJECT: Request for review of proposed wave berms for the existing Lake Pontchartrain, LA & Vic HLP,HPP, Pontchartrain Beach Floodwall Orleans Parish, LA.

1. Reference is made to CELMN-ED-TF memo dated 2 Mar 95 (Encl.1) and to CELMN-ED-HC's 1st End dated 15 Mar 95 (Encl.2) hand carried by Sam Kearns of your office.

2. We have reviewed the no overtopping and 50% reduced overtopping wave berms sections, as verbally requested by Mr. Kearns, and have no stability problems.

3. Furnished as Encls. 3,4,5 and 6 are the revised sections taking into consideration expected long term settlements and additional fill material required.

RE

4. P.O.C. is Roberto Estrada, ext. 1035.

6 Encls.
as

Rodney P. Picciola
Chief, Geotechnical Branch

JR

RE 2/28

FILE

ROUTING AND TRANSMITTAL SLIP

Date 2-9-96

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. JIM RICHARDSON ED-F		
2.		
3.		
4.		
5.		

☐	Action	☐	File	☐	Note and Return
☐	Approval	☐	For Clearance	☐	Per Conversation
☐	As Requested	☐	For Correction	☐	Prepare Reply
☐	Circulate	☒	For Your Information	☐	See Me
☒	Comment	☐	Investigate	☐	Signature
☐	Coordination	☐	Justify	☐	

REMARKS

RE: PONT BEACH WAVE BERM

FURNISHED: 1) H&H wave berm sections

2) Cross sections taken by Orleans Levee Dist.

Please review sections & advise if there is a stability problem. Response needed by 23 Feb 96.

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)
Sam Kearns
ED-LH

Room No.—Bldg. 319

Phone No. 2718

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

☆ U.S.G.P.O. 1992 312-070/60006

BEC 21 30 DAL 10 PBB

COMPUTATION SHEET

PROJECT

SUBJECT

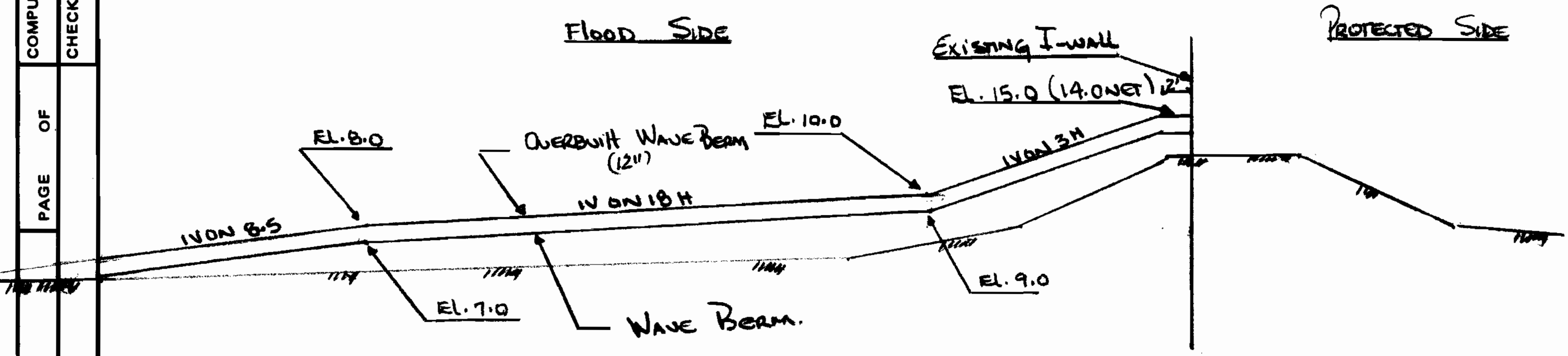
COMPUTED BY

DATE

CHECKED BY

DATE

PAGE OF



No Overtopping Section

Not To Scale

WIL. STA. 11+97.67 TO WIL. STA. 13+91.89

WIL. STA. 13+91.89 TO WIL. STA. 18+78.56
WIL. STA. 20+95.75 TO WIL. STA. 26+85.54
WIL. STA. 33+98.52 TO WIL. STA. 35+20.97
WIL. STA. 35+20.97 TO WIL. STA. 37+82.60

Lake Pont. & Vic. Hurricane Protection
Existing Pont. Beach Floodwall
Wave Berm Feb 96

(FOR USE WITH 10 x 10 GRID)

PREVIOUS EDITIONS MAY BE USED

LMV FORM MAR 82 107e

Encl 3

COMPUTATION SHEET

PROJECT

SUBJECT

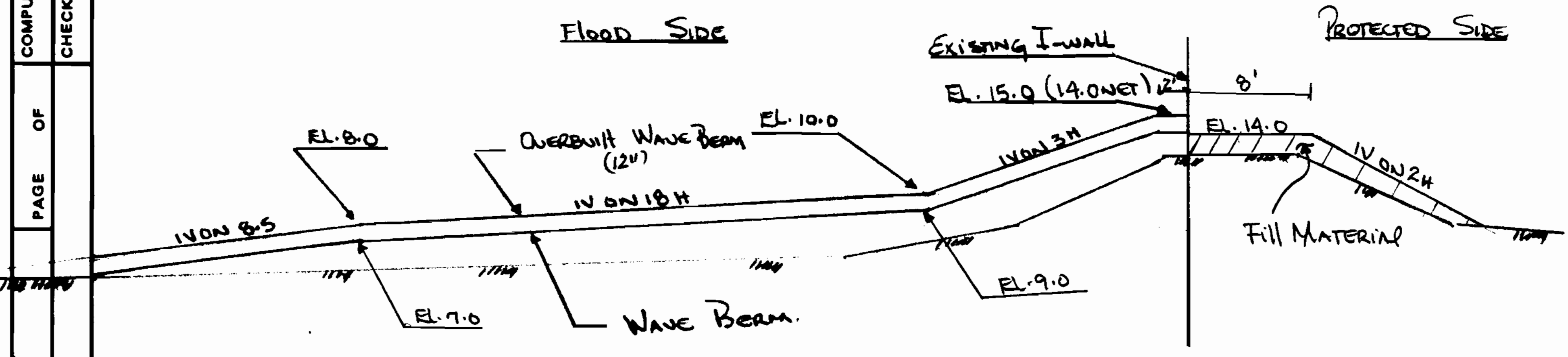
COMPUTED BY

DATE

CHECKED BY

DATE

PAGE OF



NO OVERTOPPING SECTION

NOT TO SCALE

w/l STA. 10+3.45 to w/l STA. 11+97.67
w/l STA. 37+82.60 to w/l STA. 39+78.39

LAKE PONT. & VIC. HURRICANE PROTECTION
EXISTING PONT. BEACH FLOODWALL
WAVE BERM

FEB 96

Encl. 4

(FOR USE WITH 10 x 10 GRID)

PREVIOUS EDITIONS MAY BE USED

LMV FORM 107-

COMPUTATION SHEET

PROJECT

SUBJECT

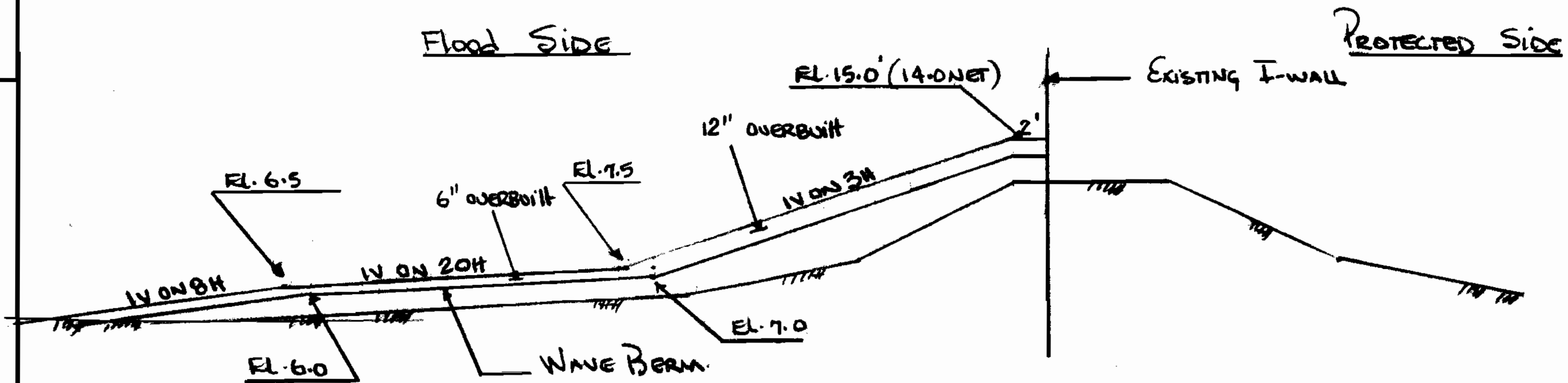
PAGE OF

COMPUTED BY

DATE

CHECKED BY

DATE



Not to Scale

50% Reduced Overtopping

W/L Sta. 11+97.67 To W/L Sta. 13+91.89

W/L Sta. 13+91.89 To W/L Sta. 18+73.56

W/L Sta. 20+95.75 To W/L Sta. 26+85.54

W/L Sta. 33+98.52 To W/L Sta. 35+20.97

W/L Sta. 35+20.97 To W/L Sta. 37+82.60

Lake Pont. & Vic. Hurricane Protection
Existing Pont. Beach Floodwall
Wave Berm

FEB 96

(FOR USE WITH 10 x 10 GRID)

PREVIOUS EDITIONS MAY BE USED

LMV FORM MAR 82 107e

Encl. 5

COMPUTATION SHEET

PROJECT

SUBJECT

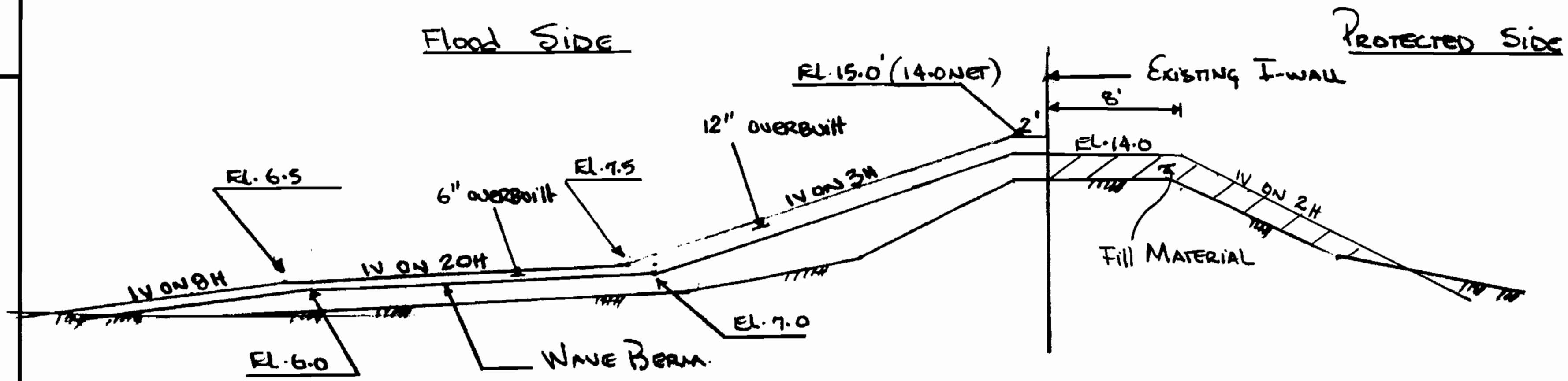
COMPUTED BY

DATE

CHECKED BY

DATE

PAGE OF



Not to Scale

50% Reduced Overtopping

W/L. Sta. 10+3.45 to W/L. Sta. 11+97.67

W/L. Sta. 37+82.60 To W/L. Sta. 39+78.39

Lake Pont. & Vic. Hurricane Protection
Existing Pont. Beach Floodwall
Wave Berm

Feb 96

(FOR USE WITH 10 x 10 GRID)

PREVIOUS EDITIONS MAY BE USED

LMV FORM MAR 82 107e

Encl. 6

CELMN-ED-TF 2 Mar 95

MEMORANDUM FOR C/H&H BR

SUBJECT: Request for hydraulic design computations for the existing Lake Pontchartrain, LA & Vic HLP, HPP, Pontchartrain Beach Floodwall Orleans Parish, LA.

1. During the 24 Feb 95 Engr Div Steering Committee meeting with the Orleans Levee Board (OLB), Mr. Stevan Spencer, Chief Engineer for the OLB, requested we provide him with the following design/analyses of the subject floodwalls:

   a. Design cross-section of the levee/floodwall with no overtopping allowed.

   b. Design cross-section of the levee/floodwall with a significant reduction of the allowed overtopping.

2. The above is required to help the OLB in planning the proposed development at the Pontchartrain Beach site by U.N.O. In the approved DM for the Orleans Parish Lakefront (DM No. 22), para. 14.d., page 19, you stated that approximately 50 acre feet of water will splash over the floodwall. The OLB would like to eliminate or minimize this overtopping.

2. Please provide us with the design computations requested by Mr. Spencer NLT 10 Mar 95. We will forward the computations to him.

3. Our POC for this work is Mr. Jorge Romero, x2645.

ROBERT J. GUIZERIX
Chief, Structures Branch

Encl.1

CELMN-ED-HC (CELMN-ED-TF/2 Mar 94) 1st End HOTE/2489
SUBJECT: Request for hydraulic design computations for the existing Lake Pontchartrain, LA & Vic HLP, HPP, Pontchartrain Beach Floodwall, Orleans Parish, LA.

CELMN-ED-H 15 Mar 95

FOR Chief, Structures Branch

Enclosed are two cross sections which may be constructed in lieu of the current design section. These cross sections are modifications of the current cross section using the existing 20-foot floodwall. One cross section allows no overtopping, the other reduces existing overtopping rates by approximately 50%.

9501086

HOTE
CELMN-ED-HC

COMBE
CELMN-ED-HC

Encl
as

ARTHUR C. LAURENT, JR
Chief, Hydraulics & Hydrologic Branch

LAURENT
CELMN-ED-H

Encl. 2

COMPUTATION SHEET

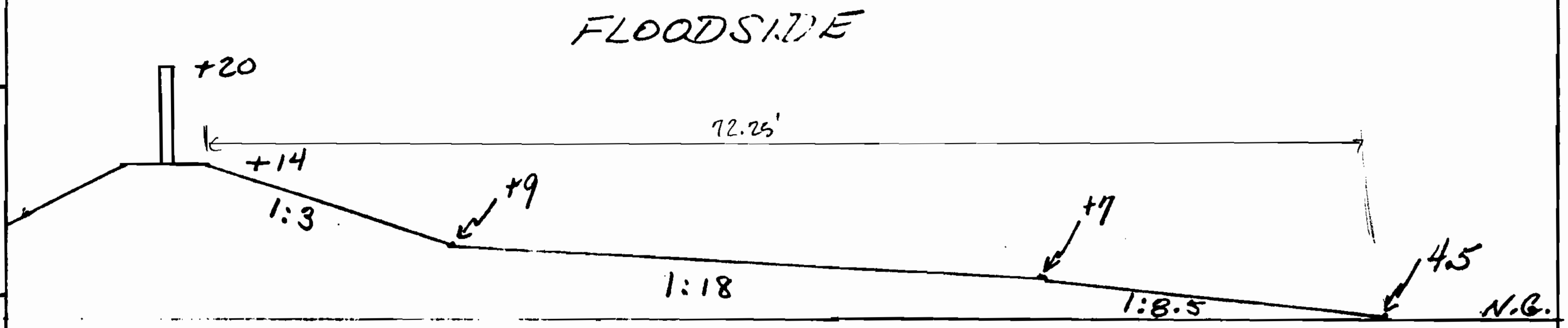
LAKE PONTCHARTRAIN & VIC HURR PROT

PONTCHARTRAIN BEACH FLOODWALL

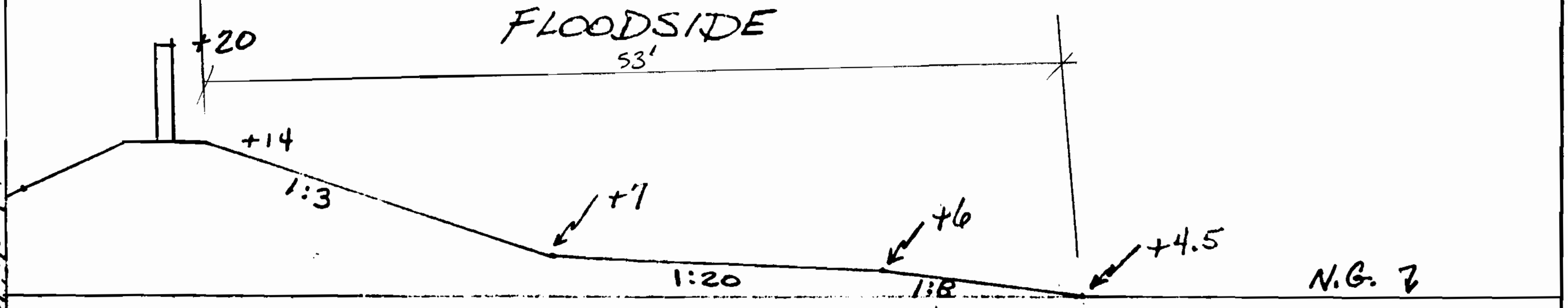
COMPUTED BY JH

CHECKED BY

DATE 15 A



0 OVERTOPPING SECTION



50% REDUCED OVERTOPPING

(FOR USE WITH 10 x 10 GRID)

PREVIOUS EDITIONS MAY BE USED

LMV Form 107e OCT 85

```
"PONTCHARTRAIN BEACH, Wave Berm ,PS TO FS"
"EARTHEN SECTION - EL 14. GROSS File=RE0222"
10.0 10.0 0.5 110 1 1
8 1 2 1
100
0 110 400 400
0 110 500 500
28 120 0 0
15 117 200 200
0 104 250 250
0 104 550 550
30 120 0 0
0 110 1000 1000
0 4.2 27 4.2 44 4.6 75 6 81.5 7.25 95 14
103 14 103.01 14 103.02 15 103.03 15 105 15 129.5 6.83
146 6 158 4.5 173 4.3 181.5 4 250 4 9999.9 0
0 4.2 27 4.2 44 4.6 75 6 125 6 134 5.5
158 4.5 173 4.3 181.5 4 250 4 9999.9 0
0 0 250 0 9999.9 0
0 -10 250 -10 9999.9 0
0 -20 250 -20 9999.9 0
0 -26 250 -26 9999.9 0
0 -34 250 -34 9999.9 0
0 -46 250 -46 9999.9 0
0 -56 250 -56 9999.9 0
0 0 250 0 9999.9 0
1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1
1 90110 6 124 6 1
123
2 105 0 150 0 1
155
3 105 -10 150 -10 1
145
4 105 -20 160 -20 1
145
5 105 -26 155 -26 1
145
6 105 -34 155 -34 1
160
7 105 -46 160 -46 1
165
```

PS TO FS

50% REDUCED OVERTOPPING

```
                    **** STABILITY WITH UPLIFT ****


          "PONTCHARTRAIN BEACH, Wave Berm ,PS TO FS"
          "EARTHEN SECTION - EL 14. GROSS File=RE0222"
                      9 PROFILES
                      1VERTICALS
          UPLIFT WITH 1 PIEZOMETRIC GRADE LINES


 * * STRATUM  1 ACT. WEDGE LOC. 90110.0 EL.    6.0 PASS.WEDGE LOC.   124.0 EL.


          ASSUMED FAILURE SURFACE DATA

    DIST.    ELEV.        WT.   UPLIFT    STR 1    STR 2   STR USED

       .0      6.0     -198.        0.     400.  999999.      400.
     27.0      6.0     -198.        0.     400.  999999.      400.
     44.0      6.0     -154.        0.     400.  999999.      400.
     75.0      6.0        0.        0.     400.     500.      400.
 STRATUM  1 STARTS FAILURE POSSIBLE FROM DIST.    75.0
     81.5      6.0      138.        0.     400.     500.      400.
     95.0      6.0      880.        0.     400.     500.      400.
    100.0      6.0      880.        0.     400.     500.      400.
    103.0      6.0      880.        0.     400.     500.      400.
    103.0      6.0      981.        0.     400.     500.      400.
    103.0      6.0      990.        0.     400.     500.      400.
    103.0      6.0      990.        0.     400.     500.      400.
    105.0      6.0      990.        0.     400.     500.      400.
    125.0      6.0      256.        0.     400.     500.      400.
    129.5      6.0       91.        0.     400.  999999.      400.
    134.0      6.0       66.        0.     400.  999999.      400.
    146.0      6.0        0.        0.     400.  999999.      400.
    158.0      6.0     -165.        0.     400.  999999.      400.
    173.0      6.0     -187.        0.     400.  999999.      400.
    181.5      6.0     -220.        0.     400.  999999.      400.
    250.0      6.0     -220.        0.     400.  999999.      400.


    ASSUMED CRIT. PASSIVE LOC.  124.0  EL.   6.0  DP      292.  RP    1597.


               ACTIVE WEDGE DATA


    DIST.    ELEV.       DA        RA        DB         RB         FS

    110.0      6.0     3829.     6400.        0.     5600.       3.84


      CRIT. ACTIVE LOC     110.0  EL   6.0  DA     3829.  RA    6400.


    DIS.     EL.        DP        RP        DB         RB         FS
```

```
    123.0       6.0       370.     1797.         0.      5200.      3.87
    113.4       6.0      1587.     3721.         0.      1352.      5.12
    115.1       6.0      1311.     3383.         0.      2028.      4.69
    116.8       6.0      1062.     3045.         0.      2704.      4.39
    118.5       6.0       840.     2707.         0.      3380.      4.18
    120.1       6.0       643.     2369.         0.      4056.      4.03
    121.8       6.0       472.     2030.         0.      4732.      3.92
    123.5       6.0       328.     1692.         0.      5408.      3.86
    125.2       6.0       210.     1355.         0.      6085.      3.82
    126.9       6.0       118.     1017.         0.      6761.      3.82
    128.6       6.0        53.      679.         0.      7437.      3.84


   * * STRATUM  2 ACT. WEDGE LOC.   105.0 EL.     .0 PASS.WEDGE LOC.   150.0 EL.


          ASSUMED FAILURE SURFACE DATA

     DIST.   ELEV.       WT.   UPLIFT    STR 1    STR 2  STR USED

       .0       .0      462.       0.     500.     246.     246.
     27.0       .0      462.       0.     500.     246.     246.
     44.0       .0      506.       0.     500.     269.     269.
     75.0       .0      660.       0.     500.     351.     351.
     81.5       .0      798.       0.     500.     424.     424.
 SHEAR STRENGTHS ARE EQUAL   500.0 AT DIST.   84.1
     95.0       .0     1540.       0.     500.     819.     500.
    100.0       .0     1540.       0.     500.     819.     500.
    103.0       .0     1540.       0.     500.     819.     500.
    103.0       .0     1641.       0.     500.     872.     500.
    103.0       .0     1650.       0.     500.     877.     500.
    103.0       .0     1650.       0.     500.     877.     500.
    105.0       .0     1650.       0.     500.     877.     500.
 SHEAR STRENGTHS ARE EQUAL   500.0 AT DIST.  124.3
    125.0       .0      916.       0.     500.     487.     487.
    129.5       .0      751.       0.     500.     399.     399.
    134.0       .0      726.       0.     500.     386.     386.
    146.0       .0      660.       0.     500.     351.     351.
    158.0       .0      495.       0.     500.     263.     263.
    173.0       .0      473.       0.     500.     251.     251.
    181.5       .0      440.       0.     500.     234.     234.
    250.0       .0      440.       0.     500.     234.     234.


    ASSUMED CRIT. PASSIVE LOC.  150.0  EL.    .0  DP    1479.  RP    4839.


               ACTIVE WEDGE DATA


     DIST.    ELEV.        DA         RA          DB         RB          FS

    105.0       .0    10706.     11334.         0.     19526.      3.87
    110.0       .0    11088.     12400.         0.     17026.      3.57
    115.0       .0    10261.     12400.         0.     14526.      3.62
    120.0       .0     8243.     13196.         0.     12026.      4.44
    125.0       .0     5722.     11195.         0.      9530.      6.02
    130.0       .0     3665.      9194.         0.      7336.      9.77
```

```
 135.0        .0      2530.      7147.          0.      5383.      16.52

   CRIT. ACTIVE LOC     110.0   EL     .0   DA    11088.   RA    12400.

  DIS.      EL.         DP          RP          DB          RB          FS

 155.0        .0      1174.      4480.          0.     18542.       3.57
 111.3        .0      6871.      8943.          0.       634.       5.21
 113.0        .0      6284.      8605.          0.      1479.       4.68
 114.6        .0      5723.      8267.          0.      2324.       4.29
 116.3        .0      5189.      7929.          0.      3169.       3.98
 118.0        .0      4680.      7591.          0.      4014.       3.75
 119.7        .0      4198.      7246.          0.      4859.       3.56
 121.4        .0      3743.      6890.          0.      5704.       3.40
 123.1        .0      3315.      6604.          0.      6549.       3.29
 124.8        .0      2960.      6522.          0.      7392.       3.24
 126.5        .0      2694.      6439.          0.      8195.       3.22
 128.2        .0      2518.      6356.          0.      8941.       3.23
 129.9        .0      2430.      6277.          0.      9634.       3.27
 131.5        .0      2369.      6199.          0.     10303.       3.31
 133.2        .0      2310.      6121.          0.     10964.       3.36
 134.9        .0      2251.      6042.          0.     11616.       3.40
 136.6        .0      2193.      5964.          0.     12260.       3.44
 138.3        .0      2135.      5885.          0.     12895.       3.48
 140.0        .0      2079.      5807.          0.     13522.       3.52
 141.7        .0      2013.      5643.          0.     14141.       3.55
 143.4        .0      1928.      5480.          0.     14751.       3.56
 145.1        .0      1825.      5316.          0.     15353.       3.57
 146.8        .0      1704.      5153.          0.     15945.       3.57
 148.5        .0      1584.      4989.          0.     16518.       3.57
 150.1        .0      1469.      4825.          0.     17071.       3.57
 151.8        .0      1358.      4661.          0.     17602.       3.56


* * STRATUM  3 ACT. WEDGE LOC.   105.0 EL.  -10.0 PASS.WEDGE LOC.   150.0 EL.

       ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.        WT.   UPLIFT    STR 1     STR 2   STR USED

    .0   -10.0     1662.     625.      551.      478.      478.
  27.0   -10.0     1662.     625.      551.      478.      478.
  44.0   -10.0     1706.     625.      575.      490.      490.
  75.0   -10.0     1860.     625.      657.      531.      531.
  81.5   -10.0     1998.     625.      730.      568.      568.
  95.0   -10.0     2740.     625.     1125.      767.      767.
 100.0   -10.0     2740.     625.     1125.      767.      767.
 103.0   -10.0     2740.     625.     1125.      767.      767.
 103.0   -10.0     2841.     625.     1178.      794.      794.
 103.0   -10.0     2850.     625.     1183.      796.      796.
 103.0   -10.0     2850.     625.     1183.      796.      796.
 105.0   -10.0     2850.     625.     1183.      796.      796.
 125.0   -10.0     2116.     625.      793.      600.      600.
 129.5   -10.0     1951.     625.      705.      555.      555.
 134.0   -10.0     1926.     625.      692.      549.      549.
```

```
146.0   -10.0     1860.     625.      657.      531.      531.
158.0   -10.0     1695.     625.      569.      487.      487.
173.0   -10.0     1673.     625.      557.      481.      481.
181.5   -10.0     1640.     625.      540.      472.      472.
250.0   -10.0     1640.     625.      540.      472.      472.

ASSUMED CRIT. PASSIVE LOC.  150.0  EL. -10.0  DP   12224.  RP   18584.

            ACTIVE WEDGE DATA

 DIST.    ELEV.       DA         RA         DB          RB         FS

105.0     -10.0     30708.     21642.         0.     27610.       3.67
110.0     -10.0     32161.     22955.         0.     23753.       3.27
115.0     -10.0     31074.     23136.         0.     20141.       3.28
120.0     -10.0     28598.     21966.         0.     16775.       3.50
125.0     -10.0     25041.     21593.         0.     13654.       4.20
130.0     -10.0     20629.     18826.         0.     10778.       5.73
135.0     -10.0     17421.     16151.         0.      8024.       8.23

  CRIT. ACTIVE LOC     110.0  EL -10.0  DA   32161.  RA   22955.

 DIS.     EL.       DP         RP         DB          RB         FS

145.0     -10.0     12714.     19460.         0.     21127.       3.27
113.8     -10.0     18632.     29432.         0.      2769.       4.08
115.5     -10.0     18009.     28357.         0.      3955.       3.91
117.2     -10.0     17440.     27377.         0.      5112.       3.77
118.9     -10.0     16926.     26492.         0.      6241.       3.66
120.6     -10.0     16465.     25701.         0.      7342.       3.57
122.3     -10.0     16059.     25004.         0.      8415.       3.50
123.9     -10.0     15706.     24373.         0.      9460.       3.45
125.6     -10.0     15391.     23780.         0.     10477.       3.41
127.3     -10.0     15111.     23282.         0.     11465.       3.38
129.0     -10.0     14865.     22879.         0.     12426.       3.37
130.7     -10.0     14642.     22538.         0.     13365.       3.36
132.4     -10.0     14412.     22176.         0.     14298.       3.35
134.1     -10.0     14173.     21789.         0.     15228.       3.33
135.8     -10.0     13923.     21378.         0.     16153.       3.32
137.5     -10.0     13666.     20992.         0.     17073.       3.30
139.2     -10.0     13423.     20672.         0.     17990.       3.29
140.8     -10.0     13202.     20327.         0.     18902.       3.28
142.5     -10.0     12998.     19967.         0.     19810.       3.27
144.2     -10.0     12802.     19617.         0.     20714.       3.27
145.9     -10.0     12613.     19279.         0.     21614.       3.27
147.6     -10.0     12437.     18965.         0.     22506.       3.27
149.3     -10.0     12282.     18688.         0.     23388.       3.27
151.0     -10.0     12149.     18449.         0.     24260.       3.28
152.7     -10.0     12036.     18234.         0.     25121.       3.29
154.4     -10.0     11939.     18033.         0.     25971.       3.31
156.1     -10.0     11857.     17870.         0.     26811.       3.33
```

```
* * STRATUM  4 ACT. WEDGE LOC.   105.0 EL.  -20.0 PASS.WEDGE LOC.   160.0 EL.

       ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.       WT.   UPLIFT    STR 1    STR 2  STR USED

     .0   -20.0    2832.    1250.     624.     250.     250.
   27.0   -20.0    2832.    1250.     624.     250.     250.
   44.0   -20.0    2876.    1250.     636.     250.     250.
   75.0   -20.0    3030.    1250.     677.     250.     250.
   81.5   -20.0    3168.    1250.     714.     250.     250.
   95.0   -20.0    3910.    1250.     913.     250.     250.
  100.0   -20.0    3910.    1250.     913.     250.     250.
  103.0   -20.0    3910.    1250.     913.     250.     250.
  103.0   -20.0    4011.    1250.     940.     250.     250.
  103.0   -20.0    4020.    1250.     942.     250.     250.
  103.0   -20.0    4020.    1250.     942.     250.     250.
  105.0   -20.0    4020.    1250.     942.     250.     250.
  125.0   -20.0    3286.    1250.     746.     250.     250.
  129.5   -20.0    3121.    1250.     701.     250.     250.
  134.0   -20.0    3096.    1250.     695.     250.     250.
  146.0   -20.0    3030.    1250.     677.     250.     250.
  158.0   -20.0    2865.    1250.     633.     250.     250.
  173.0   -20.0    2843.    1250.     627.     250.     250.
  181.5   -20.0    2810.    1250.     618.     250.     250.
  250.0   -20.0    2810.    1250.     618.     250.     250.

 ASSUMED CRIT. PASSIVE LOC.  160.0  EL. -20.0  DP   34038.  RP   31523.

            ACTIVE WEDGE DATA

  DIST.    ELEV.       DA         RA          DB         RB         FS

  105.0    -20.0    59737.    31971.          0.     13750.       3.01
  110.0    -20.0    62884.    33748.          0.     12500.       2.70
  115.0    -20.0    63807.    34836.          0.     11250.       2.61
  120.0    -20.0    62141.    34703.          0.     10000.       2.71
  125.0    -20.0    58453.    33492.          0.      8750.       3.02
  130.0    -20.0    53721.    31568.          0.      7500.       3.59
  135.0    -20.0    48308.    30162.          0.      6250.       4.76
  140.0    -20.0    43911.    26969.          0.      5000.       6.43

   CRIT. ACTIVE LOC    115.0  EL -20.0  DA    63807.  RA   34836.

  DIS.     EL.       DP         RP          DB         RB         FS

  145.0    -20.0    35467.    32931.          0.      7500.       2.66
  120.1    -20.0    40868.    39219.          0.      1285.       3.28
  121.8    -20.0    40186.    38515.          0.      1708.       3.18
  123.5    -20.0    39563.    37835.          0.      2130.       3.09
  125.2    -20.0    39010.    37293.          0.      2553.       3.01
  126.9    -20.0    38544.    36799.          0.      2975.       2.95
  128.6    -20.0    38168.    36329.          0.      3398.       2.91
```

```
     130.3    -20.0    37865.    35900.         0.     3820.      2.87
     132.0    -20.0    37578.    35490.         0.     4243.      2.84
     133.7    -20.0    37298.    35094.         0.     4665.      2.81
     135.4    -20.0    37022.    34720.         0.     5088.      2.79
     137.0    -20.0    36749.    34371.         0.     5511.      2.76
     138.7    -20.0    36480.    34047.         0.     5933.      2.74
     140.4    -20.0    36211.    33718.         0.     6356.      2.71
     142.1    -20.0    35939.    33408.         0.     6778.      2.69
     143.8    -20.0    35663.    33122.         0.     7201.      2.67
     145.5    -20.0    35387.    32855.         0.     7623.      2.65
     147.2    -20.0    35118.    32594.         0.     8046.      2.63
     148.9    -20.0    34874.    32379.         0.     8468.      2.62
     150.6    -20.0    34664.    32199.         0.     8891.      2.61
     152.3    -20.0    34486.    32029.         0.     9313.      2.60
     153.9    -20.0    34340.    31880.         0.     9736.      2.59
     155.6    -20.0    34223.    31754.         0.    10158.      2.59
     157.3    -20.0    34135.    31652.         0.    10581.      2.60
     159.0    -20.0    34072.    31569.         0.    11004.      2.60
     160.7    -20.0    34013.    31492.         0.    11426.      2.61
     162.4    -20.0    33956.    31423.         0.    11849.      2.62


    * * STRATUM  5 ACT. WEDGE LOC.   105.0 EL.  -26.0 PASS.WEDGE LOC.   155.0 EL.


             ASSUMED FAILURE SURFACE DATA

      DIST.   ELEV.       WT.   UPLIFT    STR 1    STR 2  STR USED

        .0   -26.0   3456.    1625.     250.     550.     250.
      27.0   -26.0   3456.    1625.     250.     550.     250.
      44.0   -26.0   3500.    1625.     250.     550.     250.
      75.0   -26.0   3654.    1625.     250.     550.     250.
      81.5   -26.0   3792.    1625.     250.     550.     250.
      95.0   -26.0   4534.    1625.     250.     550.     250.
     100.0   -26.0   4534.    1625.     250.     550.     250.
     103.0   -26.0   4534.    1625.     250.     550.     250.
     103.0   -26.0   4635.    1625.     250.     550.     250.
     103.0   -26.0   4644.    1625.     250.     550.     250.
     103.0   -26.0   4644.    1625.     250.     550.     250.
     105.0   -26.0   4644.    1625.     250.     550.     250.
     125.0   -26.0   3910.    1625.     250.     550.     250.
     129.5   -26.0   3745.    1625.     250.     550.     250.
     134.0   -26.0   3720.    1625.     250.     550.     250.
     146.0   -26.0   3654.    1625.     250.     550.     250.
     158.0   -26.0   3489.    1625.     250.     550.     250.
     173.0   -26.0   3467.    1625.     250.     550.     250.
     181.5   -26.0   3434.    1625.     250.     550.     250.
     250.0   -26.0   3434.    1625.     250.     550.     250.

     ASSUMED CRIT. PASSIVE LOC.  155.0  EL. -26.0  DP   53120.  RP   34479.


                  ACTIVE WEDGE DATA


      DIST.    ELEV.      DA        RA        DB         RB        FS
```

```
 105.0    -26.0    79236.    31579.        0.    12500.      3.01
 110.0    -26.0    84306.    34402.        0.    11250.      2.57
 115.0    -26.0    86922.    36512.        0.    10000.      2.40
 120.0    -26.0    87151.    37674.        0.     8750.      2.38
 125.0    -26.0    84927.    37822.        0.     7500.      2.51
 130.0    -26.0    80442.    36877.        0.     6250.      2.84
 135.0    -26.0    75257.    34951.        0.     5000.      3.36
 140.0    -26.0    69723.    33863.        0.     3750.      4.34
 145.0    -26.0    64839.    30549.        0.     2500.      5.76


   CRIT. ACTIVE LOC     120.0  EL -26.0  DA    87151.  RA    37674.


  DIS.      EL.        DP        RP         DB        RB         FS

 145.0    -26.0    54496.    35154.        0.     6250.      2.42
 124.4    -26.0    58930.    38879.        0.     1092.      2.75
 126.1    -26.0    58362.    38470.        0.     1514.      2.70
 127.7    -26.0    57890.    38074.        0.     1937.      2.65
 129.4    -26.0    57510.    37702.        0.     2359.      2.62
 131.1    -26.0    57181.    37354.        0.     2782.      2.60
 132.8    -26.0    56856.    37031.        0.     3204.      2.57
 134.5    -26.0    56530.    36702.        0.     3627.      2.55
 136.2    -26.0    56202.    36393.        0.     4049.      2.52
 137.9    -26.0    55870.    36108.        0.     4472.      2.50
 139.6    -26.0    55538.    35842.        0.     4894.      2.48
 141.3    -26.0    55207.    35581.        0.     5317.      2.46
 143.0    -26.0    54880.    35370.        0.     5739.      2.44
 144.6    -26.0    54561.    35190.        0.     6162.      2.42
 146.3    -26.0    54254.    35021.        0.     6585.      2.41
 148.0    -26.0    53969.    34873.        0.     7007.      2.40
 149.7    -26.0    53715.    34749.        0.     7430.      2.39
 151.4    -26.0    53489.    34647.        0.     7852.      2.38
 153.1    -26.0    53294.    34565.        0.     8275.      2.38
 154.8    -26.0    53137.    34488.        0.     8697.      2.38
 156.5    -26.0    53016.    34420.        0.     9120.      2.38
 158.2    -26.0    52931.    34359.        0.     9542.      2.38
 159.9    -26.0    52862.    34307.        0.     9965.      2.39
 161.5    -26.0    52795.    34263.        0.    10387.      2.40
 163.2    -26.0    52728.    34226.        0.    10810.      2.40
 164.9    -26.0    52665.    34192.        0.    11232.      2.41
 166.6    -26.0    52605.    34160.        0.    11655.      2.42
 168.3    -26.0    52548.    34132.        0.    12077.      2.42
 170.0    -26.0    52492.    34110.        0.    12500.      2.43
 171.7    -26.0    52438.    34093.        0.    12923.      2.44
 173.4    -26.0    52386.    34083.        0.    13345.      2.45
 175.1    -26.0    52340.    34078.        0.    13768.      2.46
 176.8    -26.0    52304.    34078.        0.    14190.      2.47
 178.5    -26.0    52278.    34078.        0.    14613.      2.48
 180.1    -26.0    52263.    34078.        0.    15035.      2.49
 181.8    -26.0    52260.    34078.        0.    15458.      2.50
 183.5    -26.0    52260.    34078.        0.    15880.      2.51


* * STRATUM  6 ACT. WEDGE LOC.   105.0 EL.  -34.0 PASS.WEDGE LOC.   155.0 EL.
```

```
      ASSUMED FAILURE SURFACE DATA

 DIST.   ELEV.       WT.   UPLIFT    STR 1    STR 2  STR USED

    .0   -34.0    4288.    2125.     550.    1249.     550.
  27.0   -34.0    4288.    2125.     550.    1249.     550.
  44.0   -34.0    4332.    2125.     550.    1274.     550.
  75.0   -34.0    4486.    2125.     550.    1363.     550.
  81.5   -34.0    4624.    2125.     550.    1443.     550.
  95.0   -34.0    5366.    2125.     550.    1871.     550.
 100.0   -34.0    5366.    2125.     550.    1871.     550.
 103.0   -34.0    5366.    2125.     550.    1871.     550.
 103.0   -34.0    5467.    2125.     550.    1929.     550.
 103.0   -34.0    5476.    2125.     550.    1935.     550.
 103.0   -34.0    5476.    2125.     550.    1935.     550.
 105.0   -34.0    5476.    2125.     550.    1935.     550.
 125.0   -34.0    4742.    2125.     550.    1511.     550.
 129.5   -34.0    4577.    2125.     550.    1416.     550.
 134.0   -34.0    4552.    2125.     550.    1401.     550.
 146.0   -34.0    4486.    2125.     550.    1363.     550.
 158.0   -34.0    4321.    2125.     550.    1268.     550.
 173.0   -34.0    4299.    2125.     550.    1255.     550.
 181.5   -34.0    4266.    2125.     550.    1236.     550.
 250.0   -34.0    4266.    2125.     550.    1236.     550.

ASSUMED CRIT. PASSIVE LOC.  155.0  EL. -34.0  DP   84020.  RP   43031.

           ACTIVE WEDGE DATA

 DIST.    ELEV.      DA         RA         DB        RB         FS

105.0    -34.0   109482.    35594.        0.     27500.       4.17
110.0    -34.0   115519.    38481.        0.     24750.       3.37
115.0    -34.0   120196.    41498.        0.     22000.       2.94
120.0    -34.0   122960.    44273.        0.     19250.       2.74
125.0    -34.0   123013.    45784.        0.     16500.       2.70
130.0    -34.0   120939.    46758.        0.     13750.       2.80
135.0    -34.0   116658.    46384.        0.     11000.       3.08
140.0    -34.0   111386.    44906.        0.      8250.       3.51
145.0    -34.0   105928.    43252.        0.      5500.       4.19
150.0    -34.0   100077.    41277.        0.      2750.       5.42

  CRIT. ACTIVE LOC    125.0  EL -34.0  DA  123013.  RA   45784.

 DIS.     EL.        DP         RP        DB        RB         FS

160.0    -34.0    83727.    42937.        0.     19250.       2.75
130.7    -34.0    88768.    44778.        0.      3137.       2.74
132.4    -34.0    88362.    44514.        0.      4067.       2.72
134.1    -34.0    87957.    44268.        0.      4996.       2.71
135.8    -34.0    87558.    44082.        0.      5926.       2.70
137.5    -34.0    87170.    43907.        0.      6856.       2.69
139.2    -34.0    86792.    43747.        0.      7785.       2.69
140.8    -34.0    86419.    43610.        0.      8715.       2.68
```

```
 142.5    -34.0    86052.    43496.          0.     9644.       2.68
 144.2    -34.0    85691.    43406.          0.    10574.       2.67
 145.9    -34.0    85342.    43327.          0.    11504.       2.67
 147.6    -34.0    85016.    43254.          0.    12433.       2.67
 149.3    -34.0    84727.    43189.          0.    13363.       2.67
 151.0    -34.0    84474.    43133.          0.    14292.       2.68
 152.7    -34.0    84258.    43084.          0.    15222.       2.69
 154.4    -34.0    84078.    43044.          0.    16151.       2.70
 156.1    -34.0    83936.    43009.          0.    17081.       2.71
 157.7    -34.0    83831.    42976.          0.    18011.       2.72
 159.4    -34.0    83752.    42946.          0.    18940.       2.74
 161.1    -34.0    83676.    42921.          0.    19870.       2.76
 162.8    -34.0    83601.    42901.          0.    20799.       2.78
 164.5    -34.0    83528.    42888.          0.    21729.       2.80
 166.2    -34.0    83457.    42880.          0.    22658.       2.81
 167.9    -34.0    83387.    42878.          0.    23588.       2.83
 169.6    -34.0    83321.    42878.          0.    24518.       2.85
 171.3    -34.0    83258.    42878.          0.    25447.       2.87
 173.0    -34.0    83200.    42878.          0.    26377.       2.89
 174.6    -34.0    83150.    42878.          0.    27306.       2.91
 176.3    -34.0    83111.    42878.          0.    28236.       2.93
 178.0    -34.0    83082.    42878.          0.    29165.       2.95
 179.7    -34.0    83065.    42878.          0.    30095.       2.97
 181.4    -34.0    83059.    42878.          0.    31025.       3.00
 183.1    -34.0    83059.    42878.          0.    31954.       3.02
 184.8    -34.0    83059.    42877.          0.    32884.       3.04
 186.5    -34.0    83059.    42878.          0.    33813.       3.07
 188.2    -34.0    83058.    42878.          0.    34743.       3.09


* * STRATUM  7 ACT. WEDGE LOC.   105.0 EL.  -46.0 PASS.WEDGE LOC.   160.0 EL.


       ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.        WT.   UPLIFT    STR 1    STR 2   STR USED

     .0   -46.0    5728.    2875.    1647.    1000.    1000.
   27.0   -46.0    5728.    2875.    1647.    1000.    1000.
   44.0   -46.0    5772.    2875.    1673.    1000.    1000.
   75.0   -46.0    5926.    2875.    1762.    1000.    1000.
   81.5   -46.0    6064.    2875.    1841.    1000.    1000.
   95.0   -46.0    6806.    2875.    2270.    1000.    1000.
  100.0   -46.0    6806.    2875.    2270.    1000.    1000.
  103.0   -46.0    6806.    2875.    2270.    1000.    1000.
  103.0   -46.0    6907.    2875.    2328.    1000.    1000.
  103.0   -46.0    6916.    2875.    2333.    1000.    1000.
  103.0   -46.0    6916.    2875.    2333.    1000.    1000.
  105.0   -46.0    6916.    2875.    2333.    1000.    1000.
  125.0   -46.0    6182.    2875.    1909.    1000.    1000.
  129.5   -46.0    6017.    2875.    1814.    1000.    1000.
  134.0   -46.0    5992.    2875.    1800.    1000.    1000.
  146.0   -46.0    5926.    2875.    1761.    1000.    1000.
  158.0   -46.0    5761.    2875.    1666.    1000.    1000.
  173.0   -46.0    5739.    2875.    1654.    1000.    1000.
  181.5   -46.0    5706.    2875.    1634.    1000.    1000.
  250.0   -46.0    5706.    2875.    1634.    1000.    1000.
```

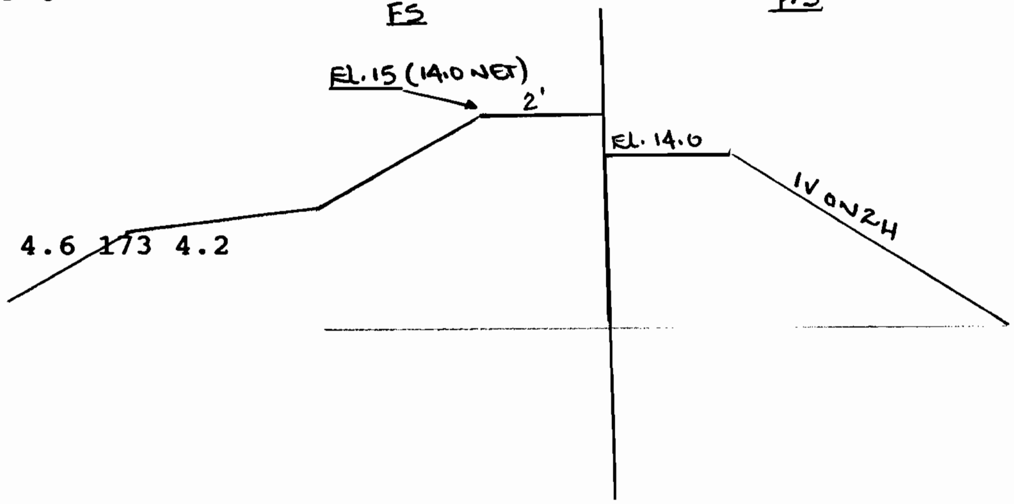
```
ASSUMED CRIT. PASSIVE LOC.  160.0  EL. -46.0  DP  143290.  RP  103336.

               ACTIVE WEDGE DATA

 DIST.     ELEV.        DA         RA          DB         RB         FS

105.0     -46.0     175079.    62088.         0.      55000.       6.93
110.0     -46.0     180636.    63788.         0.      50000.       5.81
115.0     -46.0     184733.    64854.         0.      45000.       5.14
120.0     -46.0     187872.    66600.         0.      40000.       4.71
125.0     -46.0     189246.    67956.         0.      35000.       4.49
130.0     -46.0     188160.    68579.         0.      30000.       4.50
135.0     -46.0     185504.    68811.         0.      25000.       4.67
140.0     -46.0     181585.    68678.         0.      20000.       5.01
145.0     -46.0     176221.    67492.         0.      15000.       5.64
150.0     -46.0     170366.    65270.         0.      10000.       6.60

  CRIT. ACTIVE LOC     125.0   EL -46.0   DA  189246.  RA    67956.

 DIS.      EL.        DP         RP          DB         RB         FS

165.0     -46.0     143149.   103058.         0.      40000.       4.58
134.5     -46.0     146333.   107699.         0.       9507.       4.31
136.2     -46.0     146018.   107278.         0.      11197.       4.31
137.9     -46.0     145726.   106836.         0.      12887.       4.31
139.6     -46.0     145447.   106403.         0.      14577.       4.31
141.3     -46.0     145176.   105990.         0.      16268.       4.32
143.0     -46.0     144913.   105595.         0.      17958.       4.32
144.6     -46.0     144659.   105221.         0.      19648.       4.32
146.3     -46.0     144413.   104866.         0.      21338.       4.33
148.0     -46.0     144185.   104547.         0.      23028.       4.34
149.7     -46.0     143982.   104269.         0.      24718.       4.35
151.4     -46.0     143803.   104032.         0.      26408.       4.37
153.1     -46.0     143649.   103833.         0.      28099.       4.38
154.8     -46.0     143523.   103668.         0.      29789.       4.41
156.5     -46.0     143423.   103536.         0.      31479.       4.43
158.2     -46.0     143351.   103436.         0.      33169.       4.46
159.9     -46.0     143294.   103344.         0.      34859.       4.49
161.5     -46.0     143244.   103246.         0.      36549.       4.52
163.2     -46.0     143196.   103151.         0.      38239.       4.55
164.9     -46.0     143151.   103061.         0.      39930.       4.58
166.6     -46.0     143108.   102977.         0.      41620.       4.61
168.3     -46.0     143068.   102896.         0.      43310.       4.64
170.0     -46.0     143030.   102820.         0.      45000.       4.67
171.7     -46.0     142995.   102750.         0.      46690.       4.70
173.4     -46.0     142963.   102685.         0.      48380.       4.73
175.1     -46.0     142935.   102629.         0.      50070.       4.76
176.8     -46.0     142913.   102587.         0.      51761.       4.80
```

FS to PS

Directory: Lakepoint

No Overtopping Section

```
"PONTCHARTRAIN BEACH, Wave Berm ,FS TO PS"
"EARTHEN SECTION - EL 15. GROSS File=re0215"
10.0 10.0 0.5 110 1 0
9 1 2 1
100
0 62.5 0 0
0 110 400 400
0 110 500 500
28 120 0 0
15 117 200 200
0 104 250 250
0 104 550 550
30 120 0 0
0 110 1000 1000
0 11.5 84.5 11.5 95 15 97 15 97.01 15
97.02 14 97.03 14 105 14 118.5 7.25 125 6 156 4.6
173 4.2 250 4.2 9999.9 0
0 4 18.5 4 44 7 76.5 8.83 84.5 11.5 95 15
250 90 9999.9 0
0 4 18.5 4 27 4.3 44 4.6 66 5.5 75 6
125 6 156 4.6 250 90 9999.9 0
0 0 250 0 9999.9 0
0 -10 250 -10 9999.9 0
0 -20 250 -20 9999.9 0
0 -26 250 -26 9999.9 0
0 -34 250 -34 9999.9 0
0 -46 250 -46 9999.9 0
0 -56 250 -56 9999.9 0
0 11.5 84.5 11.5 125 6 156 4.6 173 4.2
250 4.2 9999.9 0
1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1
2 95 6 124 6 1
123
3 95 0 150 0 1
145
4 95 -10 150 -10 1
140
5 95 -20 160 -20 1
145
6 95 -26 155 -26 1
145
7 95 -34 155 -34 1
160
8 95 -46 160 -46 1
165
```



Note:

1) Material (Wave Berm) was put on the F.S. It is overbuilt 12" inches.

2) Material was required on the P.S. to be sure the tip penetration of the section is above the existing one.

```
                  **** STABILITY WITH UPLIFT ****


        "PONTCHARTRAIN BEACH, Wave Berm ,FS TO PS"
        "EARTHEN SECTION - EL 15. GROSS File=re0215"
                   10 PROFILES
                    1VERTICALS
        UPLIFT WITH 1 PIEZOMETRIC GRADE LINES


* * STRATUM  2 ACT. WEDGE LOC.    95.0 EL.    6.0 PASS.WEDGE LOC.   124.0 EL.


        ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.       WT.   UPLIFT    STR 1    STR 2  STR USED

    .0     6.0     344.     344.     400.  999999.     400.
  18.5     6.0     344.     344.     400.  999999.     400.
  27.0     6.0     344.     344.     400.  999999.     400.
  44.0     6.0     391.     344.     400.  999999.     400.
  66.0     6.0     450.     344.     400.  999999.     400.
  75.0     6.0     474.     344.     400.     500.     400.
  76.5     6.0     478.     344.     400.     500.     400.
  84.5     6.0     605.     344.     400.     500.     400.
  95.0     6.0     990.     255.     400.     500.     400.
  97.0     6.0     990.     238.     400.     500.     400.
  97.0     6.0     889.     238.     400.     500.     400.
  97.0     6.0     880.     237.     400.     500.     400.
  97.0     6.0     880.     237.     400.     500.     400.
 100.0     6.0     880.     212.     400.     500.     400.
 105.0     6.0     879.     170.     400.     500.     400.
 118.5     6.0     137.      55.     400.     500.     400.
 125.0     6.0       0.       0.     400.     500.     400.
 156.0     6.0     -88.       0.     400.  999999.     400.
 173.0     6.0    -113.       0.     400.  999999.     400.
 250.0     6.0    -113.       0.     400.  999999.     400.

 ASSUMED CRIT. PASSIVE LOC.  124.0  EL.   6.0  DP       2.  RP     129.


             ACTIVE WEDGE DATA

  DIST.    ELEV.       DA        RA        DB         RB        FS

  95.0      6.0     3342.     5401.        0.    11600.      5.13
 100.0      6.0     3906.     6401.        0.     9600.      4.13
 105.0      6.0     3574.     7200.        0.     7600.      4.18
 110.0      6.0     2829.     6399.        0.     5600.      4.29
 115.0      6.0      988.     4794.        0.     3600.      8.64
 120.0      6.0       63.      951.        0.     1600.     43.89
 125.0      6.0        0.        0.        0.     -400.    160.01
```

```
    CRIT. ACTIVE LOC     100.0   EL    6.0   DA     3906.   RA     6401.

   DIS.       EL.        DP         RP         DB         RB         FS

  123.0       6.0         7.        258.         0.       9200.      4.07
  104.1       6.0      2597.       4509.         0.       1634.      9.59
  105.8       6.0      2123.       4058.         0.       2310.      7.16
  107.5       6.0      1678.       3608.         0.       2986.      5.83
  109.2       6.0      1285.       3157.         0.       3662.      5.04
  110.8       6.0       944.       2707.         0.       4338.      4.54
  112.5       6.0       656.       2256.         0.       5014.      4.21
  114.2       6.0       420.       1805.         0.       5690.      3.99


 * * STRATUM  3 ACT. WEDGE LOC.    95.0 EL.     .0 PASS.WEDGE LOC.    150.0 EL.

          ASSUMED FAILURE SURFACE DATA

   DIST.    ELEV.        WT.    UPLIFT    STR 1     STR 2   STR USED

      .0       .0      909.     719.      500.      101.      101.
    18.5       .0      909.     719.      500.      101.      101.
    27.0       .0      956.     719.      500.      126.      126.
    44.0       .0     1051.     719.      500.      177.      177.
    66.0       .0     1110.     719.      500.      208.      208.
    75.0       .0     1134.     719.      500.      221.      221.
    76.5       .0     1138.     719.      500.      223.      223.
    84.5       .0     1265.     719.      500.      291.      291.
SHEAR STRENGTHS ARE EQUAL   500.0 AT DIST.   93.2
    95.0       .0     1650.     630.      500.      543.      500.
    97.0       .0     1650.     613.      500.      552.      500.
SHEAR STRENGTHS ARE EQUAL   500.0 AT DIST.   97.0
    97.0       .0     1549.     613.      500.      498.      498.
    97.0       .0     1540.     612.      500.      493.      493.
    97.0       .0     1540.     612.      500.      493.      493.
SHEAR STRENGTHS ARE EQUAL   500.0 AT DIST.   98.5
   100.0       .0     1540.     587.      500.      507.      500.
   105.0       .0     1539.     545.      500.      529.      500.
SHEAR STRENGTHS ARE EQUAL   500.0 AT DIST.  106.2
   118.5       .0      797.     430.      500.      195.      195.
   125.0       .0      660.     375.      500.      152.      152.
   156.0       .0      506.     287.      500.      116.      116.
   173.0       .0      462.     263.      500.      106.      106.
   250.0       .0      462.     262.      500.      106.      106.


   ASSUMED CRIT. PASSIVE LOC.  150.0   EL.     .0   DP     1248.   RP     4660.


               ACTIVE WEDGE DATA


   DIST.     ELEV.        DA         RA         DB          RB         FS

    95.0       .0      9291.     10202.        0.      14425.      3.64
   100.0       .0     10672.     11201.        0.      11930.      2.95
```

```
 105.0        .0    11151.    12201.         0.      9430.      2.65
 110.0        .0    10254.    13200.         0.      7111.      2.77
 115.0        .0     8025.    12399.         0.      5393.      3.31
 120.0        .0     4681.    11593.         0.      4273.      5.98
 125.0        .0     2474.     7596.         0.      3432.     12.80
 130.0        .0     1931.     6190.         0.      2688.     19.84


   CRIT. ACTIVE LOC     105.0   EL    .0  DA   11151.  RA   12201.


  DIS.      EL.        DP        RP        DB         RB         FS

 145.0        .0     1367.     4876.         0.      8800.      2.64
 108.7        .0     5396.     7670.         0.      1785.      3.76
 110.4        .0     4670.     7220.         0.      2488.      3.38
 112.1        .0     4004.     6888.         0.      3120.      3.11
 113.8        .0     3438.     6670.         0.      3681.      2.92
 115.5        .0     2979.     6452.         0.      4172.      2.79
 117.2        .0     2625.     6234.         0.      4593.      2.70
 118.9        .0     2376.     6016.         0.      4944.      2.64
 120.6        .0     2182.     5932.         0.      5260.      2.61
 122.3        .0     2034.     5859.         0.      5557.      2.59
 123.9        .0     1933.     5786.         0.      5834.      2.58
 125.6        .0     1876.     5713.         0.      6094.      2.59
 127.3        .0     1828.     5640.         0.      6347.      2.59
 129.0        .0     1781.     5567.         0.      6597.      2.60
 130.7        .0     1735.     5494.         0.      6844.      2.61
 132.4        .0     1689.     5421.         0.      7087.      2.61
 134.1        .0     1644.     5348.         0.      7328.      2.62
 135.8        .0     1599.     5275.         0.      7564.      2.62
 137.5        .0     1555.     5202.         0.      7798.      2.63


* * STRATUM  4 ACT. WEDGE LOC.    95.0 EL.  -10.0 PASS.WEDGE LOC.   150.0 EL.


       ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.        WT.   UPLIFT    STR 1    STR 2  STR USED

    .0   -10.0    2109.    1344.    407.     405.     405.
  18.5   -10.0    2109.    1344.    407.     405.     405.
  27.0   -10.0    2156.    1344.    432.     418.     418.
  44.0   -10.0    2251.    1344.    483.     443.     443.
  66.0   -10.0    2310.    1344.    514.     459.     459.
  75.0   -10.0    2334.    1344.    527.     465.     465.
  76.5   -10.0    2338.    1344.    529.     466.     466.
  84.5   -10.0    2465.    1344.    596.     501.     501.
  95.0   -10.0    2850.    1255.    848.     627.     627.
  97.0   -10.0    2850.    1238.    857.     632.     632.
  97.0   -10.0    2749.    1238.    804.     605.     605.
  97.0   -10.0    2740.    1237.    799.     603.     603.
  97.0   -10.0    2740.    1237.    799.     603.     603.
 100.0   -10.0    2740.    1212.    812.     609.     609.
 105.0   -10.0    2739.    1170.    835.     621.     621.
 118.5   -10.0    1997.    1055.    501.     452.     452.
 125.0   -10.0    1860.    1000.    457.     430.     430.
```

```
156.0   -10.0    1706.     912.     422.     413.     413.
173.0   -10.0    1662.     888.     412.     408.     408.
250.0   -10.0    1662.     887.     412.     408.     408.


ASSUMED CRIT. PASSIVE LOC.  150.0  EL. -10.0  DP   12042.  RP   13132.


            ACTIVE WEDGE DATA


 DIST.    ELEV.        DA        RA         DB        RB         FS

  95.0    -10.0    28753.    16490.         0.    26846.       3.38
 100.0    -10.0    30824.    18095.         0.    23769.       2.93
 105.0    -10.0    31889.    19032.         0.    20694.       2.66
 110.0    -10.0    31360.    19570.         0.    17746.       2.61
 115.0    -10.0    28149.    19114.         0.    15110.       2.94
 120.0    -10.0    23414.    17070.         0.    12776.       3.78
 125.0    -10.0    18629.    16297.         0.    10581.       6.07
 130.0    -10.0    15254.    12024.         0.     8436.      10.46
 135.0    -10.0    14245.     9944.         0.     6306.      13.34


  CRIT. ACTIVE LOC    110.0  EL -10.0  DA   31360.  RA   19570.


 DIS.     EL.        DP        RP        DB        RB        FS

 140.0    -10.0    12571.    13718.         0.    13557.       2.49
 111.3    -10.0    16128.    17825.         0.      698.       2.50
 113.0    -10.0    15566.    17010.         0.     1597.       2.42
 114.6    -10.0    15091.    16347.         0.     2461.       2.36
 116.3    -10.0    14702.    15835.         0.     3289.       2.32
 118.0    -10.0    14399.    15475.         0.     4081.       2.31
 119.7    -10.0    14168.    15241.         0.     4845.       2.31
 121.4    -10.0    13967.    15060.         0.     5597.       2.31
 123.1    -10.0    13795.    14928.         0.     6341.       2.32
 124.8    -10.0    13651.    14844.         0.     7074.       2.34
 126.5    -10.0    13525.    14717.         0.     7801.       2.36
 128.2    -10.0    13400.    14580.         0.     8526.       2.38
 129.9    -10.0    13275.    14443.         0.     9250.       2.39
 131.5    -10.0    13151.    14305.         0.     9972.       2.41
 133.2    -10.0    13028.    14168.         0.    10692.       2.42
 134.9    -10.0    12905.    14034.         0.    11411.       2.44
 136.6    -10.0    12787.    13931.         0.    12128.       2.46
 138.3    -10.0    12675.    13828.         0.    12843.       2.47
 140.0    -10.0    12571.    13718.         0.    13557.       2.49
 141.7    -10.0    12471.    13601.         0.    14269.       2.51
 143.4    -10.0    12375.    13492.         0.    14979.       2.53
 145.1    -10.0    12284.    13389.         0.    15688.       2.55
 146.8    -10.0    12197.    13294.         0.    16395.       2.57
 148.5    -10.0    12114.    13206.         0.    17101.       2.59
 150.1    -10.0    12035.    13126.         0.    17805.       2.61
 151.8    -10.0    11961.    13052.         0.    18507.       2.64


* * STRATUM  5 ACT. WEDGE LOC.    95.0 EL.  -20.0 PASS.WEDGE LOC.   160.0 EL.
```

```
         ASSUMED FAILURE SURFACE DATA

 DIST.    ELEV.        WT.    UPLIFT     STR 1     STR 2   STR USED

    .0   -20.0     3279.     1969.     551.      250.      250.
  18.5   -20.0     3279.     1969.     551.      250.      250.
  27.0   -20.0     3326.     1969.     564.      250.      250.
  44.0   -20.0     3421.     1969.     589.      250.      250.
  66.0   -20.0     3480.     1969.     605.      250.      250.
  75.0   -20.0     3504.     1969.     611.      250.      250.
  76.5   -20.0     3508.     1969.     613.      250.      250.
  84.5   -20.0     3635.     1969.     647.      250.      250.
  95.0   -20.0     4020.     1880.     774.      250.      250.
  97.0   -20.0     4020.     1863.     778.      250.      250.
  97.0   -20.0     3919.     1863.     751.      250.      250.
  97.0   -20.0     3910.     1862.     749.      250.      250.
  97.0   -20.0     3910.     1862.     749.      250.      250.
 100.0   -20.0     3910.     1837.     755.      250.      250.
 105.0   -20.0     3909.     1795.     767.      250.      250.
 118.5   -20.0     3167.     1680.     598.      250.      250.
 125.0   -20.0     3030.     1625.     576.      250.      250.
 156.0   -20.0     2876.     1537.     559.      250.      250.
 173.0   -20.0     2832.     1513.     554.      250.      250.
 250.0   -20.0     2832.     1512.     554.      250.      250.


ASSUMED CRIT. PASSIVE LOC.  160.0  EL. -20.0  DP   34227.  RP   25393.


              ACTIVE WEDGE DATA


 DIST.     ELEV.       DA         RA          DB         RB          FS

  95.0     -20.0     57855.     23608.        0.     16250.        2.76
 100.0     -20.0     60948.     25728.        0.     15000.        2.47
 105.0     -20.0     63274.     27996.        0.     13750.        2.31
 110.0     -20.0     63676.     28751.        0.     12500.        2.26
 115.0     -20.0     61868.     28930.        0.     11250.        2.37
 120.0     -20.0     57289.     27904.        0.     10000.        2.74
 125.0     -20.0     51258.     26562.        0.      8750.        3.56
 130.0     -20.0     45650.     24316.        0.      7500.        5.01
 135.0     -20.0     40842.     21928.        0.      6250.        8.10


   CRIT. ACTIVE LOC     110.0  EL -20.0  DA    63676.  RA    28751.


 DIS.      EL.        DP         RP          DB         RB          FS

 145.0     -20.0     34900.     25650.        0.      8750.        2.19
 113.8     -20.0     39244.     28401.        0.       951.        2.38
 115.5     -20.0     38649.     28003.        0.      1373.        2.32
 117.2     -20.0     38164.     27681.        0.      1796.        2.28
 118.9     -20.0     37788.     27434.        0.      2218.        2.26
 120.6     -20.0     37470.     27227.        0.      2641.        2.24
 122.3     -20.0     37188.     27056.        0.      3063.        2.22
 123.9     -20.0     36947.     26934.        0.      3486.        2.21
 125.6     -20.0     36747.     26821.        0.      3908.        2.21
```

```
 127.3    -20.0    36559.    26682.         0.     4331.      2.20
 129.0    -20.0    36376.    26542.         0.     4754.      2.20
 130.7    -20.0    36198.    26408.         0.     5176.      2.20
 132.4    -20.0    36023.    26282.         0.     5599.      2.19
 134.1    -20.0    35853.    26163.         0.     6021.      2.19
 135.8    -20.0    35687.    26051.         0.     6444.      2.19
 137.5    -20.0    35525.    25947.         0.     6866.      2.19
 139.2    -20.0    35368.    25850.         0.     7289.      2.19
 140.8    -20.0    35219.    25799.         0.     7711.      2.19
 142.5    -20.0    35081.    25755.         0.     8134.      2.19
 144.2    -20.0    34954.    25686.         0.     8556.      2.19
 145.9    -20.0    34838.    25610.         0.     8979.      2.20
 147.6    -20.0    34731.    25545.         0.     9401.      2.20
 149.3    -20.0    34634.    25492.         0.     9824.      2.21
 151.0    -20.0    34546.    25450.         0.    10246.      2.21
 152.7    -20.0    34468.    25420.         0.    10669.      2.22
 154.4    -20.0    34400.    25402.         0.    11092.      2.23
 156.1    -20.0    34341.    25395.         0.    11514.      2.24


* * STRATUM  6 ACT. WEDGE LOC.    95.0 EL.  -26.0 PASS.WEDGE LOC.   155.0 EL.

       ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.        WT.   UPLIFT    STR 1    STR 2  STR USED

     .0   -26.0    3903.    2344.    250.     550.     250.
   18.5   -26.0    3903.    2344.    250.     550.     250.
   27.0   -26.0    3950.    2344.    250.     550.     250.
   44.0   -26.0    4045.    2344.    250.     550.     250.
   66.0   -26.0    4104.    2344.    250.     550.     250.
   75.0   -26.0    4128.    2344.    250.     550.     250.
   76.5   -26.0    4132.    2344.    250.     550.     250.
   84.5   -26.0    4259.    2344.    250.     550.     250.
   95.0   -26.0    4644.    2255.    250.     550.     250.
   97.0   -26.0    4644.    2238.    250.     550.     250.
   97.0   -26.0    4543.    2238.    250.     550.     250.
   97.0   -26.0    4534.    2237.    250.     550.     250.
   97.0   -26.0    4534.    2237.    250.     550.     250.
  100.0   -26.0    4534.    2212.    250.     550.     250.
  105.0   -26.0    4533.    2170.    250.     550.     250.
  118.5   -26.0    3791.    2055.    250.     550.     250.
  125.0   -26.0    3654.    2000.    250.     550.     250.
  156.0   -26.0    3500.    1912.    250.     550.     250.
  173.0   -26.0    3456.    1888.    250.     550.     250.
  250.0   -26.0    3456.    1887.    250.     550.     250.

 ASSUMED CRIT. PASSIVE LOC.  155.0  EL. -26.0  DP   53300.  RP   28381.

            ACTIVE WEDGE DATA

  DIST.    ELEV.        DA        RA        DB        RB        FS

  95.0    -26.0    79761.    24526.         0.    15000.      2.57
```

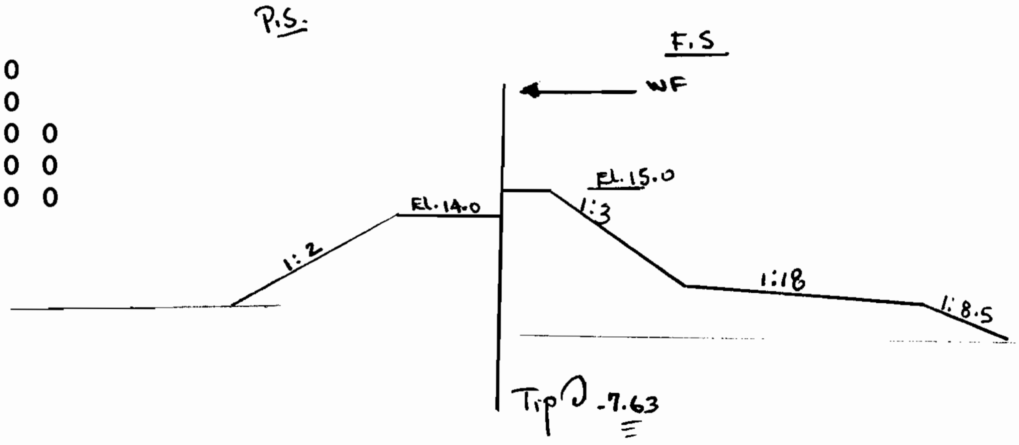
```
 100.0    -26.0    82814.    26193.        0.    13750.        2.31
 105.0    -26.0    85735.    28203.        0.    12500.        2.13
 110.0    -26.0    87523.    30621.        0.    11250.        2.05
 115.0    -26.0    86816.    31712.        0.    10000.        2.09
 120.0    -26.0    83852.    31975.        0.     8750.        2.26
 125.0    -26.0    78817.    31175.        0.     7500.        2.63
 130.0    -26.0    72522.    29941.        0.     6250.        3.36
 135.0    -26.0    66567.    27519.        0.     5000.        4.59


   CRIT. ACTIVE LOC     110.0  EL -26.0  DA   87523.  RA   30621.


  DIS.     EL.       DP        RP        DB        RB         FS

 145.0    -26.0    53911.    28450.        0.     8750.        2.02
 117.2    -26.0    57742.    29986.        0.     1796.        2.10
 118.9    -26.0    57281.    29877.        0.     2218.        2.07
 120.6    -26.0    56896.    29748.        0.     2641.        2.06
 122.3    -26.0    56563.    29604.        0.     3063.        2.04
 123.9    -26.0    56280.    29467.        0.     3486.        2.03
 125.6    -26.0    56044.    29338.        0.     3908.        2.03
 127.3    -26.0    55822.    29216.        0.     4331.        2.02
 129.0    -26.0    55604.    29101.        0.     4754.        2.02
 130.7    -26.0    55390.    28993.        0.     5176.        2.02
 132.4    -26.0    55180.    28892.        0.     5599.        2.01
 134.1    -26.0    54976.    28821.        0.     6021.        2.01
 135.8    -26.0    54782.    28774.        0.     6444.        2.01
 137.5    -26.0    54600.    28724.        0.     6866.        2.01
 139.2    -26.0    54429.    28642.        0.     7289.        2.01
 140.8    -26.0    54267.    28573.        0.     7711.        2.01
 142.5    -26.0    54115.    28515.        0.     8134.        2.01
 144.2    -26.0    53973.    28468.        0.     8556.        2.02
 145.9    -26.0    53840.    28433.        0.     8979.        2.02
 147.6    -26.0    53717.    28409.        0.     9401.        2.02
 149.3    -26.0    53604.    28397.        0.     9824.        2.03
 151.0    -26.0    53500.    28391.        0.    10246.        2.04
 152.7    -26.0    53408.    28389.        0.    10669.        2.04
 154.4    -26.0    53327.    28389.        0.    11092.        2.05
 156.1    -26.0    53258.    28370.        0.    11514.        2.06
 157.7    -26.0    53198.    28355.        0.    11937.        2.07
 159.4    -26.0    53143.    28344.        0.    12359.        2.07
 161.1    -26.0    53094.    28336.        0.    12782.        2.08
 162.8    -26.0    53051.    28333.        0.    13204.        2.09
 164.5    -26.0    53014.    28334.        0.    13627.        2.10
 166.2    -26.0    52982.    28339.        0.    14049.        2.11



* * STRATUM  7 ACT. WEDGE LOC.    95.0 EL.  -34.0 PASS.WEDGE LOC.   155.0 EL.


       ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.       WT.   UPLIFT    STR 1    STR 2   STR USED

    .0   -34.0    4735.    2844.    550.    1092.     550.
  18.5   -34.0    4735.    2844.    550.    1092.     550.
  27.0   -34.0    4782.    2844.    550.    1119.     550.
```

```
  44.0   -34.0    4877.    2844.     550.    1174.     550.
  66.0   -34.0    4936.    2844.     550.    1208.     550.
  75.0   -34.0    4960.    2844.     550.    1222.     550.
  76.5   -34.0    4964.    2844.     550.    1224.     550.
  84.5   -34.0    5091.    2844.     550.    1298.     550.
  95.0   -34.0    5476.    2755.     550.    1571.     550.
  97.0   -34.0    5476.    2738.     550.    1581.     550.
  97.0   -34.0    5375.    2738.     550.    1523.     550.
  97.0   -34.0    5366.    2737.     550.    1518.     550.
  97.0   -34.0    5366.    2737.     550.    1518.     550.
 100.0   -34.0    5366.    2712.     550.    1532.     550.
 105.0   -34.0    5365.    2670.     550.    1556.     550.
 118.5   -34.0    4623.    2555.     550.    1194.     550.
 125.0   -34.0    4486.    2500.     550.    1147.     550.
 156.0   -34.0    4332.    2412.     550.    1108.     550.
 173.0   -34.0    4288.    2388.     550.    1097.     550.
 250.0   -34.0    4288.    2387.     550.    1097.     550.

 ASSUMED CRIT. PASSIVE LOC.  155.0  EL. -34.0  DP   84313.  RP   37133.

             ACTIVE WEDGE DATA

  DIST.    ELEV.       DA        RA        DB        RB        FS

  95.0     -34.0   115334.   31933.        0.    33000.      3.29
 100.0     -34.0   118001.   32627.        0.    30250.      2.97
 105.0     -34.0   120693.   33914.        0.    27500.      2.71
 110.0     -34.0   122916.   35828.        0.    24750.      2.53
 115.0     -34.0   123644.   38035.        0.    22000.      2.47
 120.0     -34.0   122370.   40077.        0.    19250.      2.53
 125.0     -34.0   119116.   40598.        0.    16500.      2.71
 130.0     -34.0   114683.   40628.        0.    13750.      3.01
 135.0     -34.0   108685.   39453.        0.    11000.      3.59
 140.0     -34.0   102135.   37193.        0.     8250.      4.63

   CRIT. ACTIVE LOC     115.0  EL -34.0  DA  123644.  RA   38035.

  DIS.     EL.       DP        RP       DB        RB        FS

 160.0     -34.0    84116.   37143.        0.    24750.      2.53
 122.3     -34.0    88016.   37821.        0.     3989.      2.24
 123.9     -34.0    87687.   37719.        0.     4919.      2.24
 125.6     -34.0    87404.   37635.        0.     5849.      2.25
 127.3     -34.0    87141.   37586.        0.     6778.      2.26
 129.0     -34.0    86888.   37543.        0.     7708.      2.27
 130.7     -34.0    86647.   37463.        0.     8637.      2.27
 132.4     -34.0    86416.   37390.        0.     9567.      2.28
 134.1     -34.0    86193.   37329.        0.    10496.      2.29
 135.8     -34.0    85982.   37279.        0.    11426.      2.30
 137.5     -34.0    85779.   37241.        0.    12356.      2.31
 139.2     -34.0    85586.   37214.        0.    13285.      2.33
 140.8     -34.0    85403.   37199.        0.    14215.      2.34
 142.5     -34.0    85230.   37192.        0.    15144.      2.35
 144.2     -34.0    85067.   37189.        0.    16074.      2.37
```

```
   145.9     -34.0     84916.     37193.            0.     17004.         2.38
   147.6     -34.0     84777.     37174.            0.     17933.         2.40
   149.3     -34.0     84650.     37158.            0.     18863.         2.41
   151.0     -34.0     84535.     37146.            0.     19792.         2.43
   152.7     -34.0     84433.     37138.            0.     20722.         2.45
   154.4     -34.0     84343.     37134.            0.     21651.         2.46


 * * STRATUM  8 ACT. WEDGE LOC.    95.0 EL.  -46.0 PASS.WEDGE LOC.   160.0 EL.


        ASSUMED FAILURE SURFACE DATA

    DIST.   ELEV.        WT.   UPLIFT    STR 1    STR 2   STR USED

       .0   -46.0    6175.    3594.    1490.    1000.    1000.
     18.5   -46.0    6175.    3594.    1490.    1000.    1000.
     27.0   -46.0    6222.    3594.    1518.    1000.    1000.
     44.0   -46.0    6317.    3594.    1572.    1000.    1000.
     66.0   -46.0    6376.    3594.    1606.    1000.    1000.
     75.0   -46.0    6400.    3594.    1620.    1000.    1000.
     76.5   -46.0    6404.    3594.    1623.    1000.    1000.
     84.5   -46.0    6531.    3594.    1696.    1000.    1000.
     95.0   -46.0    6916.    3505.    1970.    1000.    1000.
     97.0   -46.0    6916.    3488.    1979.    1000.    1000.
     97.0   -46.0    6815.    3488.    1921.    1000.    1000.
     97.0   -46.0    6806.    3487.    1916.    1000.    1000.
     97.0   -46.0    6806.    3487.    1916.    1000.    1000.
    100.0   -46.0    6806.    3462.    1931.    1000.    1000.
    105.0   -46.0    6805.    3420.    1955.    1000.    1000.
    118.5   -46.0    6063.    3305.    1592.    1000.    1000.
    125.0   -46.0    5926.    3250.    1545.    1000.    1000.
    156.0   -46.0    5772.    3162.    1507.    1000.    1000.
    173.0   -46.0    5728.    3138.    1496.    1000.    1000.
    250.0   -46.0    5728.    3137.    1496.    1000.    1000.


   ASSUMED CRIT. PASSIVE LOC.  160.0  EL. -46.0  DP  144117.  RP   91053.


             ACTIVE WEDGE DATA


    DIST.    ELEV.        DA         RA          DB          RB          FS

     95.0    -46.0    184960.    54596.         0.      65000.        5.16
    100.0    -46.0    187925.    55908.         0.      60000.        4.72
    105.0    -46.0    190072.    56398.         0.      55000.        4.41
    110.0    -46.0    191454.    56982.         0.      50000.        4.18
    115.0    -46.0    190905.    56916.         0.      45000.        4.12
    120.0    -46.0    189057.    57119.         0.      40000.        4.19
    125.0    -46.0    186492.    58452.         0.      35000.        4.35
    130.0    -46.0    182976.    59127.         0.      30000.        4.64
    135.0    -46.0    178668.    59308.         0.      25000.        5.08
    140.0    -46.0    172909.    58403.         0.      20000.        5.89


     CRIT. ACTIVE LOC    115.0  EL -46.0  DA  190905.  RA   56916.
```

```
   DIS.      EL.        DP          RP          DB          RB          FS

  165.0     -46.0    144038.     90984.         0.       50000.        4.22
  125.2     -46.0    146747.     92587.         0.       10211.        3.62
  126.9     -46.0    146508.     92481.         0.       11901.        3.63
  128.6     -46.0    146280.     92378.         0.       13592.        3.65
  130.3     -46.0    146066.     92279.         0.       15282.        3.67
  132.0     -46.0    145863.     92184.         0.       16972.        3.69
  133.7     -46.0    145673.     92093.         0.       18662.        3.71
  135.4     -46.0    145496.     92003.         0.       20352.        3.73
  137.0     -46.0    145330.     91897.         0.       22042.        3.75
  138.7     -46.0    145173.     91800.         0.       23732.        3.77
  140.4     -46.0    145027.     91706.         0.       25423.        3.79
  142.1     -46.0    144892.     91620.         0.       27113.        3.82
  143.8     -46.0    144769.     91541.         0.       28803.        3.84
  145.5     -46.0    144657.     91471.         0.       30493.        3.87
  147.2     -46.0    144556.     91408.         0.       32183.        3.89
  148.9     -46.0    144467.     91353.         0.       33873.        3.92
  150.6     -46.0    144389.     91306.         0.       35563.        3.95
  152.3     -46.0    144322.     91265.         0.       37254.        3.98
  153.9     -46.0    144265.     91209.         0.       38944.        4.01
  155.6     -46.0    144217.     91169.         0.       40634.        4.04
  157.3     -46.0    144174.     91120.         0.       42324.        4.07
```

```
1000 'Pont. Beach, Wave Berm, RE0228
1100 'I-wall, S-case Wave Load FS=1.25
1120 C C D 1.25 1.25
1130 WAL 20
1140 SU R 5
1150 0 15 2 15 20.5 8.83 53 7 78.5 4
1160 SU L 6
1170 0 14 8 14 21.5 7.25 28 6
1175 59 4.6 76 4.2
1180 SO B S 6
1190 110 110 23 0 0 0 6 0 0 0
1200 110 110 23 0 0 0 0 0 0 0
1210 120 120 30 0 0 0 -10 0 0 0
1220 117 117 30 0 0 0 -20 0 0 0
1230 104 104 23 0 0 0 -26 0 0 0
1240 104 104 23 0 0 0 0 0 0
1250 WAT E 62.5 11.5 0
1260 H L 1 16.2 5362
1270 F
```



Note: This section shows that we have to add mat. on the P.S to bring the tip pen. up.

This Section applies to:

w/L. Sta. 10+3.45 to w/L 11+97.67
w/L. Sta. 37+82.60 to w/L. Sta. 39+78.39

In this area we need to put material on the protected side

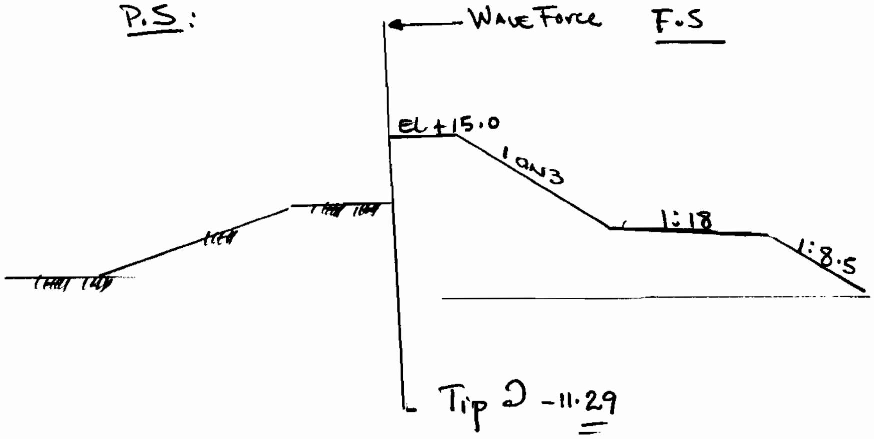
```
PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
                          BY CLASSICAL METHODS
DATE: 96/02/26                                             TIME: 10.51.44

                        *****************************
                        *  SUMMARY OF RESULTS FOR   *
                        *  CANTILEVER WALL DESIGN   *
                        *****************************

I.--HEADING

  'Pont. Beach, Wave Berm, RE0228
  'I-wall, S-case Wave Load FS=1.25

II.--SUMMARY


     RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

      LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

WALL BOTTOM ELEV. (FT)     :         -7.63
      PENETRATION (FT)     :         21.63

MAX. BEND. MOMENT (LB-FT) :        44703.
      AT ELEVATION (FT)    :          5.00

MAX. SCALED DEFL. (LB-IN3):     1.5949E+10
      AT ELEVATION (FT)    :         20.00

     (NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
     ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
     IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)
```

```
PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
                          BY CLASSICAL METHODS
DATE: 96/02/26                                             TIME: 10.51.44

                        *****************************
                        *   COMPLETE RESULTS FOR    *
                        *  CANTILEVER WALL DESIGN   *
                        *****************************

I.--HEADING
```

```
  'Pont. Beach, Wave Berm, RE0228
  'I-wall, S-case Wave Load FS=1.25

III.--RESULTS

                BENDING                           SCALED            NET
 ELEVATION      MOMENT           SHEAR          DEFLECTION        PRESSURE
   (FT)         (LB-FT)           (LB)           (LB-IN3)          (PSF)
   20.00             0.              0.         1.5949E+10            .00
   19.00             0.              0.         1.4889E+10            .00
   18.00             0.              0.         1.3830E+10            .00
   17.00             0.              0.         1.2770E+10            .00
   16.20             0.              0.         1.1923E+10            .00
   16.20             0.           5362.         1.1923E+10            .00
   16.00          1072.           5362.         1.1711E+10            .00
   15.00          6434.           5362.         1.0654E+10            .00
   14.00         11806.           5390.         9.6082E+09          56.53
   13.64         13737.           5400.         9.2386E+09            .00
   13.00         17198.           5368.         8.5829E+09        -101.47
   12.00         22488.           5186.         7.5873E+09        -262.52
   11.50         25045.           5033.         7.1034E+09        -349.78
   11.00         27515.           4842.         6.6304E+09        -414.95
   10.00         32125.           4357.         5.7211E+09        -553.91
    9.00         36183.           3736.         4.8672E+09        -688.41
    8.00         39557.           2995.         4.0758E+09        -793.41
    7.00         42145.           2169.         3.3525E+09        -857.72
    6.00         43878.           1287.         2.7020E+09        -906.58
    5.00         44703.            356.         2.1272E+09        -956.71
    4.00         44572.           -626.         1.6295E+09       -1006.92
    3.00         43434.          -1658.         1.2086E+09       -1057.12
    2.00         41241.          -2735.         8.6266E+08       -1095.84
    1.00         37936.          -3897.         5.8783E+08       -1228.75
     .97         37816.          -3935.         5.8043E+08       -1239.04
     .00         33480.          -4950.         3.7837E+08        -856.47
   -1.00         28167.          -5610.         2.2664E+08        -461.75
   -2.00         22392.          -5874.         1.2352E+08         -67.02
   -3.00         16551.          -5744.         5.9088E+07         327.70
   -4.00         11037.          -5219.         2.3299E+07         722.43
   -5.00          6245.          -4299.         6.6852E+06        1117.16
   -6.00          2571.          -2984.         1.0243E+06        1511.88
   -7.00           408.          -1275.         2.3539E+04        1906.61
   -7.63             0.              0.         0.0000E+00        2154.46

        (NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
        ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
        IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)


IV.--SOIL PRESSURES
 ELEVATION     < LEFTSIDE PRESSURE (PSF)>     <RIGHTSIDE PRESSURE (PSF)>
   (FT)         PASSIVE          ACTIVE          ACTIVE          PASSIVE
   20.00             0.              0.              0.               0.
   19.00             0.              0.              0.               0.
   18.00             0.              0.              0.               0.
   17.00             0.              0.              0.               0.
   16.20             0.              0.              0.               0.
   16.00             0.              0.              0.               0.
   15.00             0.              0.              0.               0.
   14.00             0.              0.             57.             208.
```

13.64	77.	20.	77.	272.
13.00	214.	56.	113.	386.
12.00	429.	113.	166.	536.
11.50	536.	141.	186.	593.
11.00	643.	169.	197.	621.
10.00	858.	226.	210.	646.
9.00	1068.	282.	224.	670.
8.00	1249.	339.	237.	695.
7.00	1390.	395.	251.	719.
6.00	1514.	452.	264.	744.
5.00	1641.	508.	278.	768.
4.00	1767.	565.	291.	792.
3.00	1893.	618.	305.	821.
2.00	2009.	668.	319.	860.
1.00	2209.	692.	324.	960.
.97	2220.	691.	323.	966.
.00	2585.	663.	304.	1181.
-1.00	2915.	619.	285.	1420.
-2.00	3019.	613.	291.	1554.
-3.00	3039.	627.	307.	1637.
-4.00	3069.	639.	323.	1726.
-5.00	3094.	651.	339.	1819.
-6.00	3108.	662.	355.	1926.
-7.00	3124.	674.	373.	2042.
-7.63	3164.	686.	393.	2161.
-9.00	3223.	697.	414.	2285.

```
1000 'Pont. Beach, Wave Berm, RE0226
1100 'I-wall, S-case Wave Load FS=1.25
1120 C C D 1.25 1.25
1130 WAL 20
1140 SU R 5
1150 0 15 2 15 20.5 8.83 53 7 78.5 4
1160 SU L 6
1170 0 12.5 7 12.5 17 8 28 6 59 4.6 76 4.2
1180 SO B S 6
1190 110 110 23 0 0 0 6 0 0 0
1200 110 110 23 0 0 0 0 0 0 0
1210 120 120 30 0 0 0 -10 0 0 0
1220 117 117 30 0 0 0 -20 0 0 0
1230 104 104 23 0 0 0 -26 0 0 0
1240 104 104 23 0 0 0 0 0
1250 WAT E 62.5 11.5 0
1260 H L 1 16.2 5362
1270 F
```



Note: We do not have to add material on the P.S; from:

w/L. Sta. 11+97.67 to 13+91.89

w/L. Sta. 13+91.89 to 18+73.56

w/L. Sta. 20+95.75 to 26+85.54

w/L. Sta. 33+98.52 to 35+20.97

w/L. Sta. 35+20.97 to 37+82.60

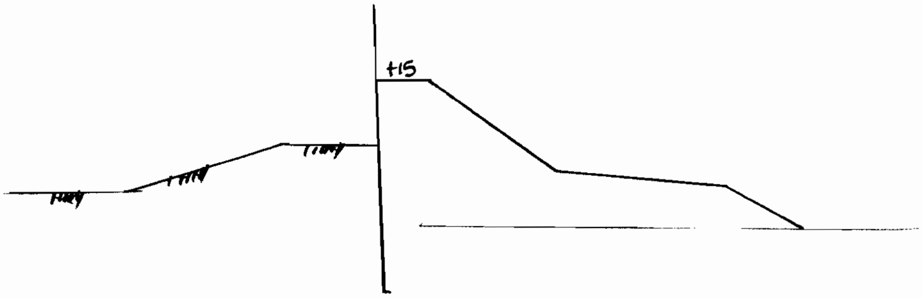
```
PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
                           BY CLASSICAL METHODS
DATE: 96/02/26                                                TIME:  9.31.53

                       ****************************
                       *  SUMMARY OF RESULTS FOR  *
                       *  CANTILEVER WALL DESIGN  *
                       ****************************

I.--HEADING

  'Pont. Beach, Wave Berm, RE0226
  'I-wall, S-case Wave Load FS=1.25

II.--SUMMARY


     RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

      LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

WALL BOTTOM ELEV. (FT)     :        -11.29
      PENETRATION (FT)     :         23.79

MAX. BEND. MOMENT (LB-FT)  :        60254.
      AT ELEVATION (FT)    :          2.00

MAX. SCALED DEFL. (LB-IN3):     2.8405E+10
      AT ELEVATION (FT)    :         20.00

     (NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
     ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
     IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)
```

```
PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
                           BY CLASSICAL METHODS
DATE: 96/02/26                                                TIME:  9.31.53

                       ****************************
                       *   COMPLETE RESULTS FOR   *
                       *  CANTILEVER WALL DESIGN  *
                       ****************************

I.--HEADING
```

```
   'Pont. Beach, Wave Berm, RE0226
   'I-wall, S-case Wave Load FS=1.25

III.--RESULTS

                BENDING                                 SCALED         NET
 ELEVATION      MOMENT            SHEAR               DEFLECTION     PRESSURE
    (FT)        (LB-FT)            (LB)                (LB-IN3)       (PSF)
   20.00             0.                 0.            2.8405E+10         .00
   19.00             0.                 0.            2.6763E+10         .00
   18.00             0.                 0.            2.5120E+10         .00
   17.00             0.                 0.            2.3478E+10         .00
   16.20             0.                 0.            2.2164E+10         .00
   16.20             0.              5362.            2.2164E+10         .00
   16.00          1072.              5362.            2.1835E+10         .00
   15.00          6434.              5362.            2.0195E+10         .00
   14.00         11806.              5390.            1.8566E+10       56.47
   13.00         17234.              5475.            1.6958E+10      113.04
   12.50         19986.              5538.            1.6165E+10      140.91
   12.00         22770.              5589.            1.5380E+10       59.49
   11.66         24663.              5599.            1.4854E+10         .00
   11.50         25568.              5596.            1.4604E+10      -28.41
   11.00         28360.              5566.            1.3840E+10      -93.59
   10.00         33856.              5403.            1.2350E+10     -231.69
    9.00         39120.              5102.            1.0918E+10     -371.27
    8.00         44014.              4665.            9.5542E+09     -502.11
    7.00         48412.              4114.            8.2660E+09     -599.77
    6.00         52216.              3482.            7.0613E+09     -663.46
    5.00         55357.              2792.            5.9468E+09     -717.75
    4.00         57781.              2046.            4.9279E+09     -773.37
    3.00         59431.              1245.            4.0086E+09     -828.98
    2.00         60254.               394.            3.1920E+09     -874.18
    1.00         60189.              -546.            2.4793E+09    -1004.99
     .00         59089.             -1707.            1.8705E+09    -1316.50
   -1.00         56669.             -3187.            1.3637E+09    -1643.95
   -1.68         54102.             -4333.            1.0738E+09    -1710.57
   -2.00         52647.             -4852.            9.5447E+08    -1568.20
   -3.00         47085.             -6196.            6.3603E+08    -1118.43
   -4.00         40406.             -7089.            3.9880E+08     -668.66
   -5.00         33057.             -7533.            2.3129E+08     -218.88
   -6.00         25490.             -7527.            1.2086E+08      230.89
   -7.00         18153.             -7071.            5.4523E+07      680.66
   -8.00         11497.             -6166.            1.9648E+07     1130.43
   -9.00          5972.             -4810.            4.8029E+06     1580.21
  -10.00          2027.             -3005.            5.0491E+05     2029.98
  -11.00           112.              -750.            1.4041E+03     2479.75
  -11.29             0.                 0.            0.0000E+00     2612.30

     (NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
     ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
     IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)


IV.--SOIL PRESSURES
 ELEVATION    < LEFTSIDE PRESSURE (PSF)>    <RIGHTSIDE PRESSURE (PSF)>
    (FT)        PASSIVE        ACTIVE         ACTIVE         PASSIVE
   20.00             0.            0.             0.              0.
   19.00             0.            0.             0.              0.
   18.00             0.            0.             0.              0.
```

17.00	0.	0.	0.	0.
16.20	0.	0.	0.	0.
16.00	0.	0.	0.	0.
15.00	0.	0.	0.	0.
14.00	0.	0.	56.	208.
13.00	0.	0.	113.	388.
12.50	0.	0.	141.	464.
12.00	107.	28.	167.	536.
11.66	180.	47.	180.	575.
11.50	214.	56.	186.	593.
11.00	321.	85.	197.	621.
10.00	536.	141.	210.	646.
9.00	751.	198.	224.	670.
8.00	958.	254.	237.	695.
7.00	1132.	311.	251.	719.
6.00	1271.	367.	264.	744.
5.00	1402.	424.	278.	768.
4.00	1533.	480.	291.	792.
3.00	1665.	535.	305.	821.
2.00	1787.	585.	319.	860.
1.00	1985.	613.	324.	960.
.00	2339.	591.	304.	1181.
-1.00	2648.	555.	285.	1420.
-1.68	2718.	553.	289.	1511.
-2.00	2751.	552.	291.	1554.
-3.00	2780.	567.	307.	1637.
-4.00	2834.	579.	323.	1726.
-5.00	2902.	592.	339.	1819.
-6.00	2970.	604.	355.	1926.
-7.00	3035.	617.	373.	2042.
-8.00	3101.	629.	393.	2161.
-9.00	3167.	642.	414.	2285.
-10.00	3231.	654.	435.	2409.
-11.00	3295.	666.	455.	2529.
-11.29	3366.	679.	475.	2647.
-13.00	3455.	692.	494.	2766.

```
1000 'Pont. Beach, Wave Berm, RE0301
1100 'I-wall, S-case Bulkhead  FS=1.50
1120 C C D 1.50 1.50
1130 WAL 20
1140 SU R 5
1150 0 15 2 15 20.5 8.83 53 7 78.5 4
1160 SU L 6
1170 0 12.5 7 12.5 17 8 28 6
1175 59 4.6 76 4.2
1180 SO B S 6
1190 110 110 23 0 0 0 6 0 0 0
1200 110 110 23 0 0 0 0 0 0 0
1210 120 120 30 0 0 0 -10 0 0 0
1220 117 117 30 0 0 0 -20 0 0 0
1230 104 104 23 0 0 0 -26 0 0 0
1240 104 104 23 0 0 0 0 0
1250 WAT E 62.5 11.5 0
1270 F
```



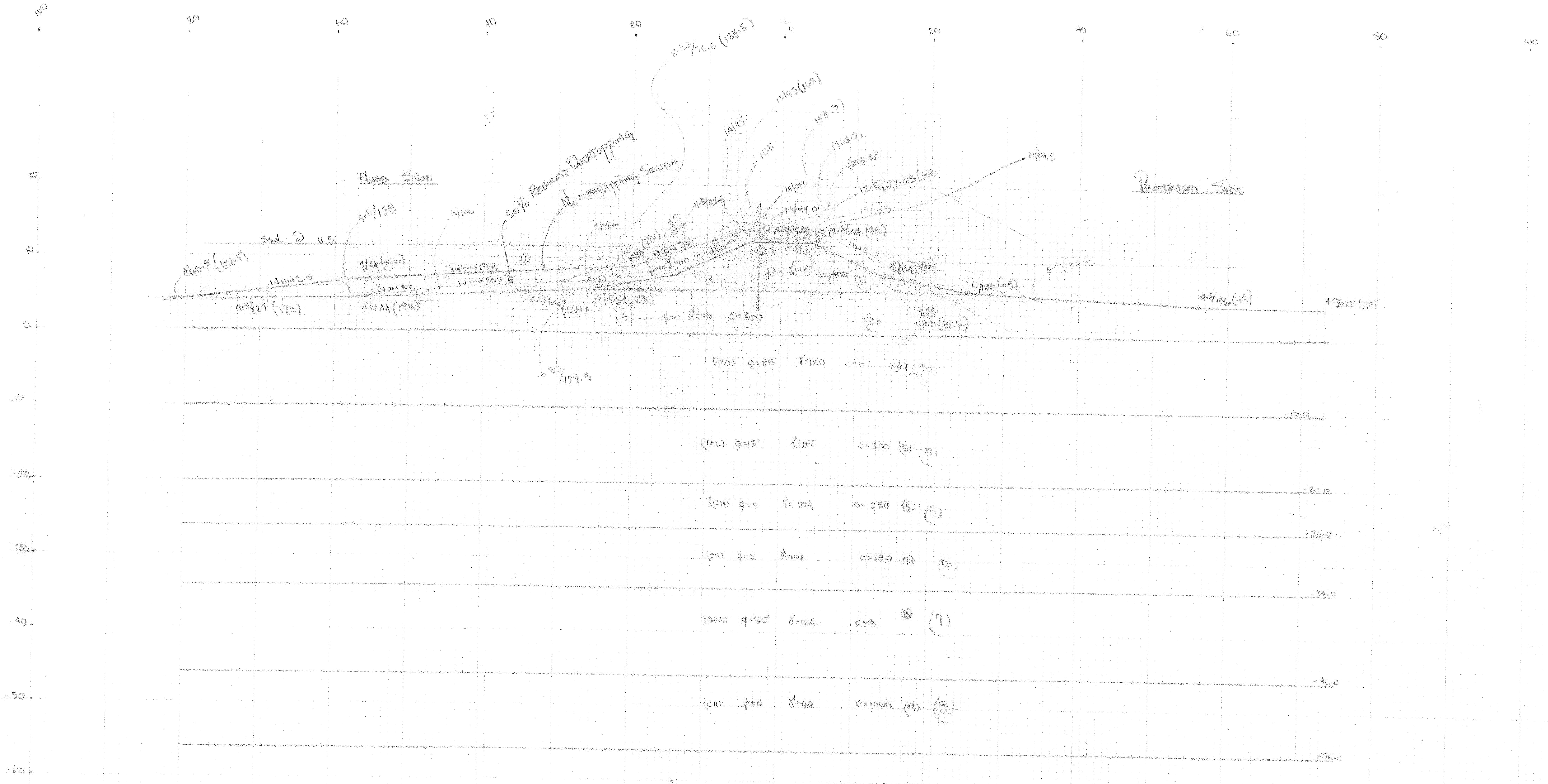
```
PROGRAM CWALSHT-DESIGN/ANALYSIS OF ANCHORED OR CANTILEVER SHEET PILE WALLS
                          BY CLASSICAL METHODS
DATE: 96/02/26                                              TIME: 16.01.40

                          *****************************
                          *  SUMMARY OF RESULTS FOR   *
                          *  CANTILEVER WALL DESIGN   *
                          *****************************

I.--HEADING

  'Pont. Beach, Wave Berm, RE0301
  'I-wall, S-case Bulkhead  FS=1.50

II.--SUMMARY


     RIGHTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

      LEFTSIDE SOIL PRESSURES DETERMINED BY FIXED SURFACE WEDGE METHOD.

WALL BOTTOM ELEV. (FT)     :          5.95
      PENETRATION (FT)     :          6.55

MAX. BEND. MOMENT (LB-FT) :           872.
      AT ELEVATION (FT)    :          9.00

MAX. SCALED DEFL. (LB-IN3):    6.3961E+07
      AT ELEVATION (FT)    :         20.00

     (NOTE: DIVIDE SCALED DEFLECTION BY MODULUS OF
     ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA
     IN IN**4 TO OBTAIN DEFLECTION IN INCHES.)
```

TABLE 2

FLOODWALL DESIGN SECTIONS

Steel Sheet Pile Penetration

REACH	STATION ALONG W/L	EXISTING TIP ELEVATION	DESIGN TIP ELEVATION
Orleans Marina	0+31.60 to 4+14.31	-37.0	-37.0
Orleans Marina	5+06.47 to 7+22.73	-37.0	-37.0
Orleans Marina	8+14.89 to 10+67.00	-37.0	-37.0
Orleans Marina	4+26.39 to 4+51.39	-30.0	-25.0
Orleans Marina	4+84.39 to 4+94.39	-30.0	-25.0
Orleans Marina	7+34.81 to 7+59.81	-30.0	-25.0
Orleans Marina	7+92.81 to 8+02.81	-30.0	-25.0
Orleans Marina	11+78.02 to 12+06.10	-24.0	-9.2
Orleans Marina	12+66.10 to 12+95.29	-13.0	-5.0
Orleans Marina	12+95.29 to 13+77.00	--	-5.0
Orleans Marina	13+77.00 to 14+37.00	--	-9.2
Orleans Marina	14+37.00 to 14+96.30	--	-25.0
Orleans Marina	15+67.80 to 16+28.00	--	-25.0
Orleans Marina	16+28.00 to 17+72.80	--	-9.2
Bayou St. John	2+02 to 5+25 East	-14.5	-8.4
Bayou St. John	6+43 to 8+61 East	-14.5	-5.3
Bayou St. John	8+61 to 9+63 East	-4.0	-3.8
Bayou St. John	12+50 to 13+11 East	-4.0	-2.0
Bayou St. John	1+31 to 2+61 West	-14.5	-10.8
Bayou St. John	3+80 to 5+08 West	-14.5	-4.7
Bayou St. John	5+08 to 5+73 West	-4.0	-3.4
Bayou St. John	7+90 to 9+18 West	-4.0	-3.7
Pontchartrain Beach	10+3.45 to 11+97.67	-10.0	-10.4
Pontchartrain Beach	11+97.67 to 13+91.89	-12.0	-10.4
Pontchartrain Beach	13+91.89 to 18+73.56	-14.0	-10.4
Pontchartrain Beach	20+95.75 to 26+85.54	-14.0	-10.4
Pontchartrain Beach	33+98.52 to 35+20.97	-14.0	-10.4
Pontchartrain Beach	35+20.97 to 37+82.60	-12.0	-10.4
Pontchartrain Beach	37+82.60 to 39+78.39	-10.0	-10.4
N.O. Lakefront Airport	10+13.20 to 17+53.20	-17.0	-11.3
N.O. Lakefront Airport	17+53.20 to 18+43.20	-12.5	-6.0
N.O. Lakefront Airport	18+43.10 to 22+09.5	-12.0	-4.3
N.O. Lakefront Airport	22+09 to 23+89	-12.5	-6.0
N.O. Lakefront Airport	23+89 to 26+03	-13.0	-6.4
N.O. Lakefront Airport	26+03 to 26+88	-13.5	-9.5
N.O. Lakefront Airport	26+88 to 28+95.27	-17.5	-11.3
N.O. Lakefront Airport	29+26.27 to 31+06.27	-17.5	-11.3
N.O. Lakefront Airport	31+06 to 31+42	-14.0	-11.3
N.O Lakefront Airport	32+58 to 32+80	-14.0	-11.3
Lincoln Beach	100+00.50 to 101+50	-10.0	-0.8
Lincoln Beach	101+50 to 106+92.91	-13.0	-11.3
Lincoln Beach	109+18.91 to 114+00	-13.0	-11.3
Lincoln Beach	114+23.81 to 115+43.81	-10.0	-0.8



No Overtopping Section

Directory : Lakepoint

File: RE0215

Respond 11 July 96

CELMN-CD-QM 20 Jun 96
BCOE Review of P & S for Lake Pontchartrain, LA. and Vicinity, Orleans Parish Lakefront Levee/Floodwall, Pontchartrain Beach Wave Berm (ED-97-027)

23. Page 4, Para 3.2.2.5, STRIPPING AND STOCKPILING OPERATIONS IN BONNET CARRE' FLOODWAY BORROW AREAS. Show permissible stockpile areas on the drawings as indicated in the second sentence of this paragraph.(NO)

SECTION 02225 - EMBANKMENT

24. Page 1, Para 2.1(9), MOISTURE CONTROL. Specify that determination of moisture content shall be performed in accordance with ASTM D2216 and soil classification shall be determined in accordance with the Unified Soil Classification System.(NO) — Agreed

25. Pages 2 and 6, Paras 3 and 6.1.3, EQUIPMENT. Recommend specifying the use of hand tampers or other approved methods for compacting fill adjacent (within 2 feet) to the existing floodwall where vehicular equipment cannot be used without damaging the floodwall. These hand tampers should be power driven hand operated type.(NO) - Agreed

26. Page 6, Para 6.1.2, MOISTURE CONTROL. Insert the following before the last sentence in this paragraph.(NO)

" The Contractor shall perform Atterberg limit tests on three separate soil samples taken from each borrow area at locations determined by the Contracting Officer. The Contractor shall perform a minimum of one moisture content test per work shift." Agreed

D-F

27. Page 8, Para 8.3.1. Delete the reference about resurfacing the crown since this existing hurricane protection levee crown has no surfacing. Also add the following to the end of the paragraph, "The restoration shall be made with suitable levee embankment material. placed and compacted as provided in paragraph 6.1.1. No section of the levee shall be degraded or weakened to provide runways. There will be no separate measurement or payment for temporary runway construction."(NO) Agreed

28. Page 8, Para 9, GRADE TOLERANCES. In the last sentence of this paragraph, substitute the following after the word **section**, "shall be spread by the end of the day and compacted prior to placing the next lift."(NO) - Do not Agreed. The CONTRACTOR CAN STOCK ALL the MATERIAL he wants, above the DESIGN Grade creating Stability Problems.

29. Page 9, Para 10.1. Add the following to the end of the paragraph, " If a rotary drill is used in locating the settlement gages, it shall be advanced no closer than two feet of the anticipated settlement gage elevation. The elevation of the settlement gage shall then be determined with a sounding rod."(NO)

-Agreed.

46. PLAN. Investigate with OLD and UNO officials and specify the size and thickness of the concrete slabs to be removed. OLD officials stated during the site visit that the small slab was an abandoned portion of the seawall and the large slab was an abandoned portion of Lakeshore Drive. Recommend that the seawall be sawcut or hydraulically cut at the C/E and the step portion and supporting piles be demolished and grubbed a minimum of three feet below grade. Recommend the roadway be sawcut or hydraulically cut at the C/E and all pavement, catch basins and underground piping be demolished and grubbed a minimum of three feet below grade to the C/E. Backfill material for the grubbed areas shall be included in the lump sum price for Clearing and Grubbing per 02210-7. Provide typical cross sections of the existing seawall and Lakeshore Drive pavement on the drawings for bidability and constructibility purposes.(NO,QM)

47. PLAN. Denote an existing oak tree located between the two concrete slabs which is to remain and two existing catch basins located in the large slab to be removed by the contractor.(NO)

DRAWING 4

48. PROFILE. Show the location and depths of the existing buried utilities that are not to be disturbed by the contractor.(NO)

DRAWING 5

Use 1on3. I was trying to put the minimum amount of dirt. The only reason was for tip pile penetration.

ED-F • 49. TYPICAL DESIGN SECTION 1. The proposed L/S slope for the embankment (1Von2H) may be too steep for OLD mowers. Verify the slope.(NO)

50. TYPICAL DESIGN SECTION 2. One of the limits of work for this section is specified at W/L Sta 26+00 whereas the PROFILE on DWG 4 specifies Sta W/L 26+60. Clarify this discrepancy.(NO)

51. TYPICAL DESIGN SECTIONS 1, 2 and 3. Denote on all three sections an allowable haul road corridor between the existing levee toe and the proposed vegetative windrow. Specify that all Contractor longitudinal access and haul operations shall be contained within this corridor with the exception of the P/S embankment work near floodgates 1 and 3. Consider adding an order of work clause to require construction of the new wave berm from the eastern limit of work progressing westward. No additional measurement will be made for material hauled/placed to repair ruts and restore the access corridor to original conditions. The cost for the Contractor's maintenance and restoration of the haul

road corridor to original conditions shall be included in the contract unit price per cubic yard for Semicompacted fill.(QM)

DRAWING 6

Agreed

52. TYPICAL DETAIL, FILL PLACEMENT NEAR GATE OPENINGS. Clarify the elevation (El 8.5) of the break in slopes on the typical tie in detail at the gate openings. The typical sections show this elevation at El 8.0.(NO)

Agreed only if the embankment toe goes that far.

53. PLAN, EMBANKMENT FILL ADJACENT TO TREES. Denote that the embankment material be wrapped around the trees with a minimum distance of five feet (all directions) from the tree to the levee toe.(NO)

D-F

54. PLAN, EMBANKMENT FILL ADJACENT TO TREES and SECTION A. Revise the PLAN and SECTION A as shown on Encl 3 for the warped embankment around trees.(QM)

Only if the embankment toe pass the tree.

DRAWING 7

55. PLAN. Provide an offset angle from the baseline for layout of the borrow area.(NO)

56. PLAN. Show available haul/access routes to borrow site.(NO)

57. GENERAL. The borrow pit limits and ground elevations will be verified by Const Div's A/E survey crew when the pit becomes accessible after the river stages recede.(NO)

58. Agreed BORROW BORING LOGS and DETAIL A. Delete borrow borings 1-EG, 2-EG and 3-EG from PLAN, LOGS and DETAIL A. These borings are not located within the boundaries of the proposed borrow area and may not accurately represent the borrow material available for use on this contract.(QM)

D-F

59. Agreed BORING LOGS 4-EG and 5-EG. Delete the elevation scale and ground elevations 6.4 and 5.7 from the logs and substitute the note "DEPTH BELOW GROUND" therefor. NOD has recently received several differing site conditions borrow area claims on the basis that the actual ground elevations at the time of award differed from that shown on the drawings.(QM)

* * *

Designation: D 2216 – 92

Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock[1]

This standard is issued under the fixed designation D 2216; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the laboratory determination of the water (moisture) content of soil, rock, and similar materials by mass. For simplicity, the word "material" ereinafter also refers to either soil or rock, whichever is most applicable.

1.2 The water content of a material is defined by this tandard as the ratio, expressed as a percentage, of the mass f "pore" or "free" water in a given mass of material to the mass of the solid material.

1.3 The term "solid particles" as used in geotechnical ngineering is typically assumed to mean naturally occurring ineral particles of soil and rock that are not readily soluble n water. Therefore, the water content of materials conaining extraneous matter (such as cement, and the like) may equire special treatment or a qualified definition of water ontent. In addition, some organic materials may be decomosed by oven drying at the standard drying temperature for is method (110°C). Materials containing gypsum (calcium lfate dihydrate or other compounds having significant mounts of hydrated water) may present a special problem as is material slowly dehydrates at the standard drying mperature (110°C) and at very low relative humidities, rming a compound (calcium sulfate hemihydrate) which is ot normally present in natural materials except in some esert soils. In order to reduce the degree of dehydration of ypsum in those materials containing gypsum, or to reduce ecomposition in highly organic soils, it may be desirable to y these materials at 60°C or in a desiccator at room mperature. Thus, when a drying temperature is used which different from the standard drying temperature as defined this test method, the resulting water content may be fferent from standard water content determined at the ndard drying temperature.

NOTE 1—Test Methods D 2974 provides an alternate procedure for ermining water content of peat materials.

1.4 Materials containing water with substantial amounts soluble solids (such as salt in the case of marine sediments) en tested by this method will give a mass of solids which cludes the previously soluble solids. These materials reire special treatment to remove or account for the esence of precipitated solids in the dry mass of the specimen, or a qualified definition of water content must be used.

1.5 This test method requires several hours for proper drying of the water content specimen. Test Method D 4643 provides for drying of the test specimen in a microwave oven which is a shorter process.

1.6 This standard requires the drying of material in an oven at high temperatures. If the material being dried is contaminated with certain chemicals, health and safety hazards can exist. Therefore, this standard should not be used in determining the water content of contaminated soils unless adequate health and safety precautions are taken.

1.7 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 653 Terminology Relating to Soil, Rock, and Contained Fluids[2]

D 2974 Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils[2]

D 4220 Practice for Preserving and Transporting Soil Samples[2]

D 4318 Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils[2]

D 4643 Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method[2]

D 4753 Specification for Evaluating, Selecting, and Specifying Balances and Scales for Use in Soil and Rock Testing[2]

E 145 Specification for Gravity-Convection And Forced-Ventilation Ovens[3]

3. Terminology

3.1 Refer to Terminology D 653 for standard definitions of terms.

3.2 *Description of Term Specific to This Standard:*

3.2.1 *water content* (of a material)—the ratio of the mass of water contained in the pore spaces of soil or rock material, to the solid mass of particles in that material, expressed as a percentage.

This method is under the jurisdiction of ASTM Committee D-18 on Soil and k and is the direct responsibility of Subcommittee D18.03 on Texture, sticity and Density Characteristics of Soils.

Current edition approved June 15, 1992. Published August 1992. Originally lished as D 2216 – 63 T. Last previous edition D 2216 – $90^{\epsilon 1}$.

[2] *Annual Book of ASTM Standards*, Vol 04.08.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

4. Summary of Test Method

4.1 A test specimen is dried in an oven to a constant mass. The loss of mass due to drying is considered to be water. The water content is calculated using the mass of water and the mass of the dry specimen.

5. Significance and Use

5.1 For many materials, the water content is one of the most significant index properties used in establishing a correlation between soil behavior and its properties.

5.2 The water content of a material is used in expressing the phase relationships of air, water, and solids in a given volume of material.

5.3 In fine-grained (cohesive) soils, the consistency of a given soil type depends on its water content. The water content of a soil, along with its liquid and plastic limits as determined by Test Method D 4318, is used to express its relative consistency or liquidity index.

6. Apparatus

6.1 *Drying Oven*, thermostatically-controlled, preferably of the forced-draft type, meeting the requirements of Specification E 145 and capable of maintaining a uniform temperature of 110 ± 5°C throughout the drying chamber.

6.2 *Balances*—All balances must meet the requirements of Specification D 4753 and this Section. A Class GP1 balance of 0.01g readability is required for specimens having a mass of up to 200 g (excluding mass of specimen container) and a Class GP2 balance of 0.1g readability is required for specimens having a mass over 200 g.

6.3 *Specimen Containers*—Suitable containers made of material resistant to corrosion and change in mass upon repeated heating, cooling, exposure to materials of varying pH, and cleaning. Containers with close-fitting lids shall be used for testing specimens having a mass of less than about 200 g; while for specimens having a mass greater than about 200 g, containers without lids may be used. One container is needed for each water content determination.

NOTE 2—The purpose of close-fitting lids is to prevent loss of moisture from specimens before initial mass determination and to prevent absorption of moisture from the atmosphere following drying and before final mass determination.

6.4 *Desiccator*—A desiccator cabinet or large desiccator jar of suitable size containing silica gel or anhydrous calcium phosphate. It is preferable to use a desiccant which changes color to indicate it needs reconstitution. See Section 10.5.

NOTE 3—Anhydrous calcium sulfate is sold under the trade name Drierite.

6.5 *Container Handling Apparatus*, gloves, tongs, or suitable holder for moving and handling hot containers after drying.

6.6 *Miscellaneous*, knives, spatulas, scoops, quartering cloth, sample splitters, etc, as required.

7. Samples

7.1 Samples shall be preserved and transported in accordance with Practice 4220 Groups B, C, or D soils. Keep the samples that are stored prior to testing in noncorrodible airtight containers at a temperature between approximately 3 and 30°C and in an area that prevents direct contact with sunlight. Disturbed samples in jars or other containers shall be stored in such a way as to prevent or minimize moisture condensation on the insides of the containers.

7.2 The water content determination should be done as soon as practicable after sampling, especially if potentially corrodible containers (such as thin-walled steel tubes, paint cans, etc.) or plastic sample bags are used.

8. Test Specimen

8.1 For water contents being determined in conjunction with another ASTM method, the specimen mass requirement stated in that method shall be used if one is provided. If no minimum specimen mass is provided in that method then the values given before shall apply.

8.2 The minimum mass of moist material selected to be representative of the total sample, if the total sample is not tested by this method, shall be in accordance with the following:

Maximum particle size (100 % passing)	Standard Sieve Size	Recommended minimum mass of moist test specimen for water content reported to ±0.1 %	Recommended minimum mass of moist test specimen for water content reported to ±1 %
2 mm or less	No. 10	20 g	20 g*
4.75 mm	No. 4	100 g	20 g*
9.5 mm	⅜-in.	500 g	50 g
19.0 mm	¾-in.	2.5 kg	250 g
37.5 mm	1½ in.	10 kg	1 kg
75.0 mm	3-in.	50 kg	5 kg

NOTE—*To be representative not less than 20 g shall be used.

8.2.1 If the total sample is used it does not have to meet the minimum mass requirements provided in the table above. The report shall indicate that the entire sample was used.

8.3 Using a test specimen smaller than the minimum indicated in 8.2 requires discretion, though it may be adequate for the purposes of the test. Any specimen used not meeting these requirements shall be noted in the report of results.

8.4 When working with a small (less than 200g) specimen containing a relatively large gravel particle, it is appropriate not to include this particle in the test specimen. However, any discarded material shall be described and noted in the report of the results.

8.5 For those samples consisting entirely of intact rock, the minimum specimen mass shall be 500 g. Representative portions of the sample may be broken into smaller particles, depending on the sample's size, the container and balance being used and to facilitate drying to constant mass, see Section 10.4.

9. Test Specimen Selection

9.1 When the test specimen is a portion of a larger amount of material, the specimen must be selected to be representative of the water condition of the entire amount of material. The manner in which the test specimen is selected depends on the purpose and application of the test, type of material being tested, the water condition, and the type of sample (from another test, bag, block, and the likes.)

9.2 For disturbed samples such as trimmings, bag samples, and the like, obtain the test specimen by one of the following methods (listed in order of preference):

9.2.1 If the material is such that it can be manipulated and handled without significant moisture loss, the material should be mixed and then reduced to the required size by quartering or splitting.

9.2.2 If the material is such that it cannot be thoroughly mixed and/or split, form a stockpile of the material, mixing as much as possible. Take at least five portions of material at random locations using a sampling tube, shovel, scoop, trowel, or similar device appropriate to the maximum particle size present in the material. Combine all the portions for the test specimen.

9.2.3 If the material or conditions are such that a stockpile cannot be formed, take as many portions of the material as possible at random locations that will best represent the moisture condition. Combine all the portions for the test specimen.

9.3 Intact samples such as block, tube, split barrel, and the ke, obtain the test specimen by one of the following methods depending on the purpose and potential use of the ample.

9.3.1 Carefully trim at least 3 mm of material from the uter surface of the sample to see if material is layered and to emove material that is drier or wetter than the main portion f the sample. Then carefully trim at least 5 mm, or a hickness equal to the maximum particle size present, from he entire exposed surface or from the interval being tested.

9.3.2 Slice the sample in half. If material is layered see ection 9.3.3. Then carefully trim at least 5 mm, or a ickness equal to the maximum particle size present, from e exposed surface of one half, or from the interval being sted. Avoid any material on the edges that may be wetter or ier than the main portion of the sample.

NOTE 4—Migration of moisture in some cohesionless soils may uire that the full section be sampled.

9.3.3 If a layered material (or more than one material type encountered), select an average specimen, or individual ecimens, or both. Specimens must be properly identified as location, or what they represent, and appropriate remarks tered on data sheets.

Procedure

10.1 Determine and record the mass of the clean and dry cimen container (and its lid, if used).

10.2 Select representative test specimens in accordance h Section 9.

10.3 Place the moist test specimen in the container and, if d, set the lid securely in position. Determine the mass of container and moist material using a balance (See 6.2) cted on the basis of the specimen mass. Record this ue.

OTE 5—To prevent mixing of specimens and yielding of incorrect ts, all containers, and lids if used, should be numbered and the ainer numbers shall be recorded on the laboratory data sheets. The umbers should match the container numbers to eliminate confu-

OTE 6—To assist in the oven-drying of large test specimens, they d be placed in containers having a large surface area (such as pans) he material broken up into smaller aggregations.

.4 Remove the lid (if used) and place the container with t material in the drying oven. Dry the material to a constant mass. Maintain the drying oven at 110 ± 5°C unless otherwise specified (see 1.3). The time required to obtain constant mass will vary depending on the type of material, size of specimen, oven type and capacity, and other factors. The influence of these factors generally can be established by good judgment, and experience with the materials being tested and the apparatus being used.

NOTE 7—In most cases, drying a test specimen overnight (about 12 to 16 h) is sufficient. In cases where there is doubt concerning the adequacy of drying, drying should be continued until the change in mass after two successive periods (greater than 1 h) of drying is an insignificant amount (less than about 0.1 %). Specimens of sand may often be dried to constant mass in a period of about 4 h, when a forced-draft oven is used.

NOTE 8—Since some dry materials may absorb moisture from moist specimens, dried specimens should be removed before placing moist specimens in the same oven. However, this would not be applicable if the previously dried specimens will remain in the drying oven for an additional time period of about 16 h.

10.5 After the material has dried to constant mass remove the container from the oven (and replace the lid if used). Allow the material and container to cool to room temperature or until the container can be handled comfortably with bare hands and the operation of the balance will not be affected by convection currents and/or its being heated. Determine the mass of the container and oven-dried material using the same balance as used in 10.3. Record this value. Tight fitting lids shall be used if it appears that the specimen is absorbing moisture from the air prior to determination of its dry mass.

NOTE 9—Cooling in a desiccator is acceptable in place of tight fitting lids since it greatly reduces absorption of moisture from the atmosphere during cooling especially for containers without tight fitting lids.

11. Calculation

11.1 Calculate the water content of the material as follows:

$$w = [(M_{cws} - M_{cs})/(M_{cs} - M_c)] \times 100 = \frac{M_w}{M_s} \times 100$$

where:

w = water content, %,

M_{cws} = mass of container and wet specimen, g,

M_{cs} = mass of container and oven dry specimen, g,

M_c = mass of container, g,

M_w = mass of water ($M_w = M_{cws} - M_{cds}$), g, and

M_s = mass of solid particles ($M_s = M_{cds} - M_c$), g.

12. Report

12.1 The report (data sheet) shall include the following:

12.1.1 Identification of the sample (material) being tested, such as boring number, sample number, test number, container number etc.

12.1.2 Water content of the specimen to the nearest 1 % or 0.1 %, as appropriate based on the minimum sample used. If this method is used in concert with another method, the water content of the specimen should be reported to the value required by the test method for which the water content is being determined.

12.1.3 Indicate if test specimen had a mass less than the minimum indicated in 8.2.

12.1.4 Indicate if test specimen contained more than one material type (layered, etc.).

12.1.5 Indicate the method of drying if different from oven-drying at 110 ± 5°C.

12.1.6 Indicate if any material (size and amount) was excluded from the test specimen.

13. Precision and Bias

13.1 *Statement on Bias*—There is no accepted reference value for this test method; therefore, bias cannot be determined.

13.2 *Statements on Precision:*

13.2.1 *Single-Operator Precision*—The single-operator coefficient of variation has been found to be 2.7 percent. Therefore, results of two properly conducted tests by the same operator with the same equipment should not be considered suspect unless they differ by more than 7.8 percent of their mean.

13.2.2 *Multilaboratory Precision*—The multilaboratory coefficient of variation has been found to be 5.0 percent. Therefore, results of two properly conducted tests by different operators using different equipment should not be considered suspect unless they differ by more than 14.0 percent of their mean.

14. Keywords

14.1 consistency; index property; laboratory; moisture analysis; moisture content; soil aggregate; water content

Mr. James Richardson/cl/1031
JR

CELMN-ED-FS 20 Jan 95

MEMORANDUM FOR Chief, Structures Branch

SUBJECT: Pontchartrain Beach Levee Hurricane Flood Protection

1. Reference your CELMN-ED-TF memo dated 14 Dec 94, SAB.

2. We have reviewed the furnished surveys on the subject levee and have the following comments:

   a. The surveys show that the levee is deficient in both elevation and side slopes.

   b. The original design done by the Orleans Levee District estimated the full earthen levee would settle 11 to 13 inches with a 1 foot overbuild. The levee was built to elevation 21 approximately 8 years ago. ~~Therefore,~~ As much as 1.5 to 2 feet of settlement has occurred since the levee was constructed.

   c. We recommend that the levee be rebuilt back to the original constructed section (crown elevation of 21.0, 1v on 4.75H floodside slope and 1v on 3H protected side slope).

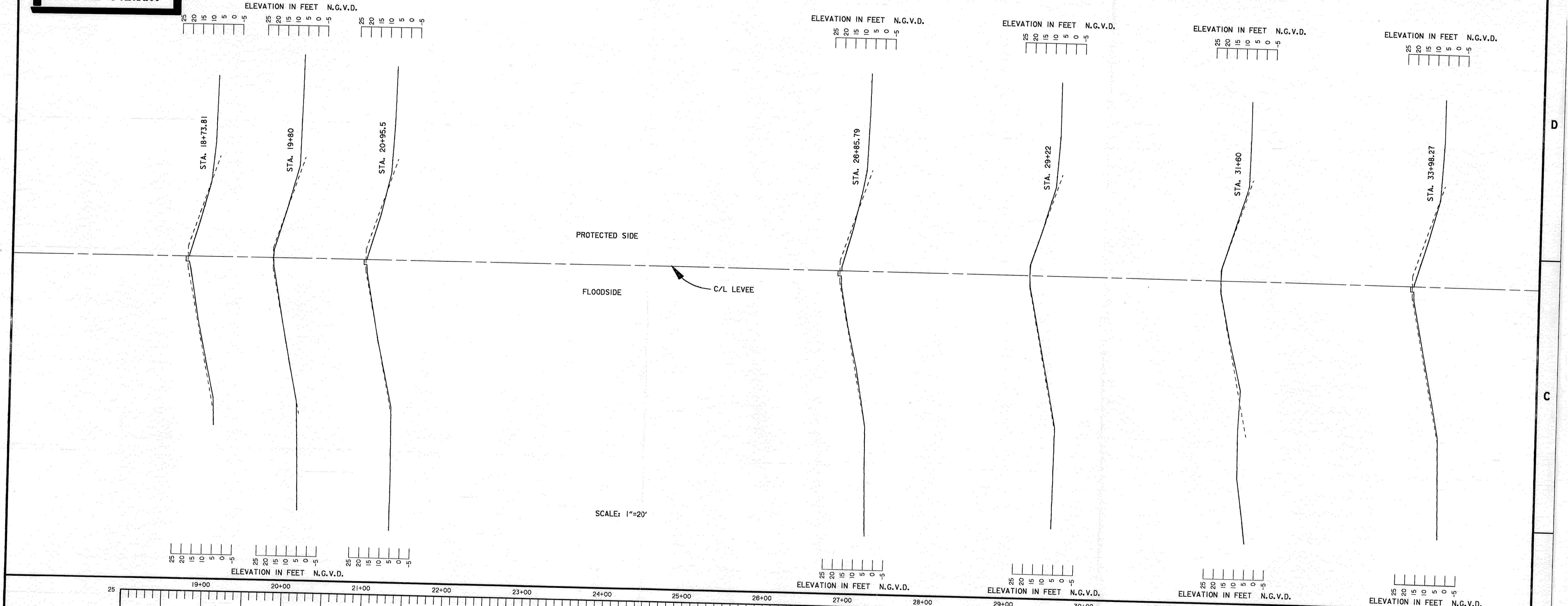
3. POC is Jim Richardson, ext. 1031.

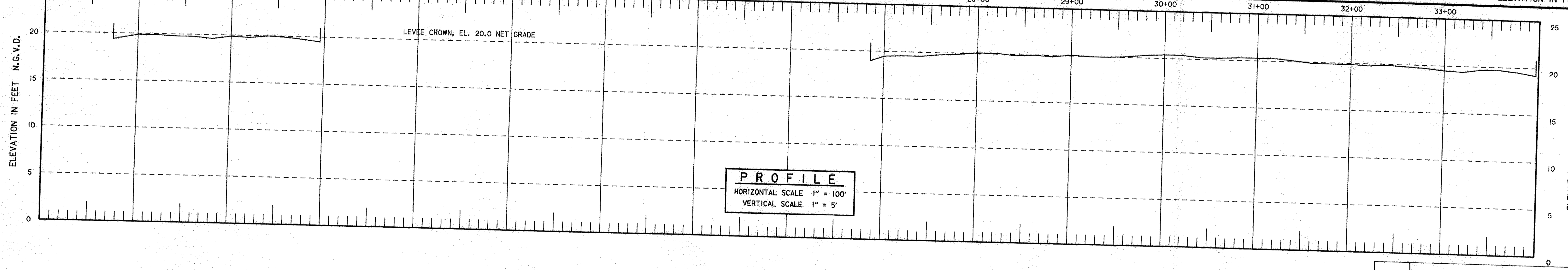
RODNEY P. PICCIOLA
Chief, Geotechnical Branch

NAPOLITANO
CELMN-ED-FS

PICCIOLA
CELMN-ED-F

Safety is a Part of Your Contract





PROFILE
HORIZONTAL SCALE 1" = 100'
VERTICAL SCALE 1" = 5'

SYMBOL	DESCRIPTION	DATE	APPROVED

REVISIONS

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

LAKE PONTCHARTRAIN, LA. AND VICINITY
HIGH LEVEL PLAN

ORLEANS PARISH LAKEFRONT

PROFILE & CROSS SECTIONS
VICINITY PONTCHARTRAIN BEACH

DESIGNED BY: RICHARDSON DRAWN BY: WOODS CHECKED BY: RICHARDSON	DATE: X	PLOT SCALE: 200:1	PLOT DATE: 19 JAN 95
SUBMITTED BY: DESIGN ENGINEER	CADD FILE: PLAN1.DGN SOLICITATION NO. DACW29-X		FILE NO. X DWG. X OF X

VALUE INCENTIVE CLAUSES ENGINEERING YOUR KEY TO HIGHER PROFITS

C•A•D

CELMN-ED-TF 14 Dec 94

MEMORANDUM FOR

C/H&H Br
C/Geotech Br

SUBJECT: Pontchartrain Beach Levee Hurricane Flood Protection

1. The levee at Pontchartrain Beach was recently surveyed to assess whether the levee is adequate for the subject purpose.

2. Please review the enclosed surveys concerning the above subject and send your comments to us by 13 Jan 1995.

3. POC is Robert J. Grubb ext. 2678 or Jorge Romero ext. 2645.

Encl
as

ROBERT J. GUIZERIX
Chief, Structures Branch

The Board of Commissioners
OF THE
Orleans Levee District
SUITE 202 — ADMINISTRATION BUILDING
NEW ORLEANS LAKEFRONT AIRPORT
New Orleans, La.
70126

TEL: 504-243-4000

PROTECTING YOU
AND YOUR FAMILY

November 30, 1994

Mr. Richard Grubb
U. S. Army Corps of Engineers
New Orleans District
Post Office Box 60267
New Orleans, Louisiana 70160-0267

RE: PONTCHARTRAIN BEACH LEVEE PROTECTION

Dear Mr. Grubb:

As per our meeting of November 29, 1994, please find attached log book sheets for seven levee cross-sections that were taken at the referenced site. Also attached is the center line profile for this same area. The attached URS Dwg. (2 of 24) shows the general area where the cross-section were taken.

If you have any questions about the survey, please call Mr. Steve King (OLD Survey Chief) at 243-4045.

Sincerely,

Stevan Spencer

Stevan G. Spencer, P. E.
Chief Engineer

SGS:dab
Attachment

xc: Mr. Steve King, Survey Chief

X-SECT & PROFILE LAKEFRONT
LEVEE @ PONT. BEACH. STATIONS
TAKEN FROM CONST. PLANS.

	4.50	25.36		20.86	END F/W @ 26+85.79
	15.4 ~~10.4~~	19.0	19.2	20.86	20.86
26+85.79	10.0	6.4	6.2	–	–
END	27	7.3	2.5	2.5	0
F/W			GND	TOP F/W	TOP F/W

FLOODSIDE

	10.4	5.6	5.2	4.5
	15.0	19.8	20.2	20.9
	49	77	103	131

F-4 11.30.94

TBM SET FROM B.M. ISOTTA
ELEV. 6.96 1991 DATUM.

19.0	19.0	14.0	9.9	7.7	6.7
6.4	6.4	11.4	15.5	17.7	18.7
0	2	20	38	50	78
GND					

PROT. SIDE

					6.4
			–	–	19.0
					98

		25.36								
27+00			5.9	19.5						
+20			5.8	19.6						
+40			5.8	19 6						
+60			5.6	19 8						
+80			5.5	19.9						
28+00			5.3	20.1						
+20			5.3	20.1						
+40			5.5	19.9						
+60			5.4	20.0						
+80			5.5	19.9						
29+00			5.3	20.1						
+										
	5.7	9.8	15.3	19.7	20.0	19.7	14.3	8.0	6.9	6.3
29+22	19.7	15.6	10.1	5.7	5.4	5.7	11.1	17.4	19.1	19.1
	75	54	27	5.5	0	5.5	22	44	69.5	96
					℄				EDGE	CONC.
									CONC	
(	6.7									
	19.1									
	125									

		25.36								
29+40			5.4	20.0						
+60			5.3	20.1						
+80			5.1	20.3						
30+00			5.0	20.4						
+20			5.0	20.4						
+40			5.2	20.2						
+60			5.2	20.2						
+80			5.1	20.3						
31+00			5.1	20.3						
+20			5.1	20.3						
+40			5.3	20.1						
	9.7	8.8	14.9	19.7	19.9	19.4	13.3	6.9	6.4	6.4
31+60	15.7	16.6	10.5	5.7	5.5	5.8	12.1	18.5	19.0	19.0
	74	54	29	6	0	6	26	47	72	89
										EDGE
										CONC.
	9.5	6.9	5.1							
	15.9	18.5	20.3							
	98	116	130							

		25.36			
31+80			5.5	19.9	
32+00			5.5	19.9	
+20			5.6	19.8	
+40			5.5	19.9	
+60			5.6	19.8	
+80			5.7	19.7	
33+00			5.9	19.5	
+20			6.0	19.4	
+40			5.7	19.7	
+60			5.7	19.7	
+80			5.9	19.5	
	13.8	19.0	19.2	20.84	20.84
33+98.27	11.6	6.4	6.2	4.52	4.52
END F/W	33	7	2.5	2.5	0
				\TOP/ F/W	
(	8.6	5.6	4.5		
	16.8	19.8	20.9		
	59	75	125		

19.2	18.7	12.4	7.1	5.6	5.6
6.2	6.7	13.0	18.3	19.8	19.8
0	2	23	43	72	93

				Flood	Side
	4.20	25.16		20.96	
	14.4	18.5	19.4	20.96	20.96
18+73.81	10.8	6.7	5.8	4.20	4.20
END F/W	31	6	2.5	2.5	0
				TOP F/W	
	9.0	5.9	5.4		
	16.2	19.3	19.8		
	56	70	83.5		
			FENCE		
19+00			5.3	19.9	
+20			5.3	19.9	
+40			5.4	19.8	
+60			5.4	19.8	

Protected Side

END FLOODWALL @ 18+73.81.

19.4	19.2	14.5	9.2	7.3	6.5
5.8	6.0	10.7	16.0	17.9	18.7
0	1	17	37	57	90

		25.16									
	6.8	9.9	14.4	19.6	19.8	19.6	13.6	7.7	6.8	6.4	
19+80	18.4	15.3	10.8	5.6	5.4	5.6	11.6	17.5	18.4	18.8	
	71	56	33	4	0	4	24	46	81	101	
					℄				EDGE CONC	CONC.	
(	5.9	5.2									
	19.3	20.0									
	96	125									
20+00			5.3	19.9							
+20			5.4	19.8							
+40			5.2	20.0							
+60			5.3	19.9							
+80			5.5	19.7							
	13.3	19.1	19.5	20.97	20.97	19.6	19.0	13.1	8.3	6.9	6.2
20+95.5	18.9	6.1	5.7	4.19	4.19	5.7	6.2	12.1	16.9	18.3	19.0
END F/W	39	7	2.5	2.5	0	0	2	22	43	68	96
(	5.8	5.3	5.4	TOP F/W							
	19.4	19.9	19.8								
	73	107	134								

GENERAL PLAN

SCALE: 1"= 100'-0"

NOTE: 1. THIS SHT. DENOTES GENERAL LAYOUT OF MAINLINE LEVEE SYSTEM. IMPROVEMENTS SHOWN ON PLAN AND PROFILE SHTS. 4-7.

2. FOR LEGEND SEE SHEET 4.

GENERAL NOTES

1.) CONTRACTOR TO PERFORM ALL LAYOUT SURVEY, VERIFY LAYOUT AND IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.

2.) ALL ELEVATIONS SHOWN ON PLANS REFER TO MEAN SEA LEVEL (M.S.L. = N.G.V.D.).

3.) ALL EXIST. UTILITIES AND FACILITIES TO BE VERIFIED IN FIELD BY CONTRACTOR.

4.) CONTRACTOR TO VERIFY EXACT LOCATION OF THE EXIST. WALL SLEEVE FOR THE WATER LINE CROSSING AND COORDINATE THE EXACT LOCATION OF THE PROPOSED WATER LINE CONNECTION WITH THE OWNER AND UTILITY COMPANY.

5.) CONTRACTOR'S STAGING AREA TO BE LOCATED AT EAST END OF PROJECT SITE, SOUTH OF TENNIS COURTS, AS DIRECTED BY OWNER.

6.) TREES TO BE RELOCATED ADJACENT TO PROJECT SITE AS DIRECTED BY OWNER.

7.) EXIST. LIGHT BASE AND FENCE TO BE REMOVED SHALL BE STORED AT LOCATION DESIGNATED BY OWNER AND PAID FOR UNDER "REMOVAL OF STRUCTURES AND OBSTRUCTIONS". ANY WOOD FENCE REMOVED SHALL BE USED FOR WOOD FENCING TO BE INSTALLED UNDER THIS CONTRACT. WOOD FENCE PRESENTLY STORED AT SITE SHALL ALSO BE INSTALLED AS REQUIRED. ONLY UPON EXHAUSTING SUPPLY OF EXIST. WOOD FENCE EITHER STORED AT THE SITE OR REMOVED UNDER THIS CONTRACT SHALL NEW WOOD FENCE BE INSTALLED.

8.) A GENERAL LOCATION OF THE ACCESS ROAD IS SHOWN ON THIS SHEET. CONTRACTOR SHALL USE UNIMPROVED ACCESS ROAD UNLESS CONTRACTOR ELECTS TO IMPROVE THE ACCESS FOR HIS CONVENIENCE. CONTRACTOR SHALL CONSTRUCT SHELL SURFACE ALONG ACCESS ROAD UPON ENGINEER'S APPROVAL OF CONTRACTOR'S REQUEST. IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. CONSTRUCTION AND MAINTENANCE OF SHELL ACCESS ROAD WILL BE AT NO DIRECT PAY.

9.) IN THE EVENT THAT AN IMPROVED ACCESS ROAD IS ALLOWED BY THE ENGINEER, THE IMPROVED SHELL ACCESS ROAD SHALL BE REMOVED AT END OF CONTRACT AND REPLACED WITH WHITE BEACH SAND. NO DIRECT PAY.

10.) A GENERAL LOCATION OF THE EXIST. SHELL ACCESS ROAD IS SHOWN ON THIS SHEET. SHELL ROAD SHALL BE MAINTAINED UNDER THIS CONTRACT AT NO ADDITIONAL PAY.

11.) ACCESS TO ALL PARKING AREAS WILL BE ALLOWED FROM LAKESHORE DRIVE.

12.) CONTRACTOR SHALL RECONSTRUCT JOB SITE TO ORIGINAL CONDITION PRIOR TO COMPLETION OF CONTRACT INCLUDING CLEANING SAND BEACH AREA AND REPLACING WHITE BEACH SAND AS DIRECTED BY OWNER. NO DIRECT PAY.

13.) FOR DESCRIPTION OF USE OF ACCESS GATES SEE SC-29 IN THE SPECIFICATIONS.

14.) SOIL BORINGS SHOWN WERE MADE PRIOR TO LEVEE CONSTRUCTION. SEE SPECIFICATIONS FOR FURTHER COMMENTS.

NO	DATE	REVISION	BY

DESIGNED BY: C.A.T.
DRAWN BY: J.O.B.
CHECKED BY: B.H.A.
REVIEWED BY: G.M.K.
DATE DECEMBER 31, 1986

BRUCE H. ADAMS
REG. No. 18752

URS New Orleans

PONTCHARTRAIN BEACH
FLOOD PROTECTION IMPROVEMENT PROJECT
ORLEANS PARISH PHASE II LOUISIANA

GENERAL PLAN

SHEET NO. 2
OF 24 SHEETS
FILE NO. 46021.00
565-04-73

ROUTING OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE FOR APPROVAL

(Used to route ENG Form 4025 with items attached. Not to become a part of the Contractor's record.)

1

TO: CHIEF, CONSTRUCTION DIVISION
ATTN: AL SCHICK
CD-CS RM 371

FROM: AREA ENGINEER
NEW ORLEANS AREA OFFICE

DATE 9 OCT 97

The attached items listed on ENG Form 4025 are forwarded for approval action.

CONTRACT NUMBER DACW29-97-C-0066

CONTRACTOR RIVER/ROAD CONSTRUCTION

TRANSMITTAL NUMBERS 1a

PROJECT TITLE AND LOCATION PONTCHARTRAIN BEACH WAVE BERM, W/L STA. 10+03 TO 39+78.39, ORLEANS PARISH, LA

COMMENTS (Attach additional sheet, if necessary.)
PLEASE REVIEW THE ENCLOSED SUBMITTAL REQUESTING USE OF AN ALTERNATE BORROW PIT, FORWARD IT TO ENGINEERING DIVISION AND PLANNING DIVISION FOR THEIR REVIEW AND COMMENTS, AND RETURN COMMENTS TO THE NEW ORLEANS AREA OFFICE, ATTN: TONY LAUTO, BY 24 OCT 97.

NO. OF INCL. 1 PACKAGE 35 PAGES

TYPED NAME AND TITLE CHESTER ASHLEY, AREA ENGINEER

SIGNATURE

2

TO: Chief, Engineering Div
ATTN: Jim Richardson
ED-FS, Rm 116

FROM: Chief, Construction Div
POC: Al Schick

DATE 10/10/97

COMMENTS (Attach additional sheet, if necessary.)
Your review & comments are requested NLT 24 Oct 97. Following your review Const Div will set up a meeting to discuss this submittal.

NO. OF INCL.

TYPED NAME AND TITLE TIM ROTH C/STRUCTURES SEC

SIGNATURE Tim Roth 10/15/97

3

TO: Chief, Construction Division
ATTN: AL Schick

FROM: Chief, Engineering Division

DATE 10/23/97

COMMENTS (Attach additional sheet, if necessary.)
No objection to the alternate borrow pit provided borrow material is obtained within 250 ft of the boring locations. If borrow is proposed greater than 250 ft from borings then additional borings will be required. (Added encl 2)

NO. OF INCL. 2

TYPED NAME AND TITLE W. Eugene Tickner, C/Engineering Div

SIGNATURE

4

TO:

FROM:

DATE

The following action codes are given to items listed on ENG Form 4025:

ACTION CODES

A - APPROVED AS SUBMITTED.

B - APPROVED, EXCEPT AS NOTED ON DRAWINGS. RESUBMISSION NOT REQUIRED.

C - APPROVED, EXCEPT AS NOTED ON DRAWINGS. REFER TO ATTACHED SHEET. RESUBMISSION REQUIRED.

D - WILL BE RETURNED BY SEPARATE CORRESPONDENCE.

E - DISAPPROVED (SEE ATTACHED)

F - RECEIPT ACKNOWLEDGED

G - OTHER *(specify)*

ACTION CODES TO BE INSERTED IN COLUMN G, SECTION I, ENG FORM 4025 *(Attach sheets, when required.)*

ITEM NO. *(Taken from ENG Form 4025)*	ALT. BORROW PIT							
CODE GIVEN								

REMARKS

FILE

NO. OF INCL.

TYPED NAME AND TITLE

SIGNATURE

ENG FORM 1 NOV 74 4026 EDITION OF NOV 66 MAY BE USED.

☆U.S. G.P.O. 1980-521-248/53

OCT 9 1997

PROPERTY RIGHTS DOCUMENTATION

HIGHWAY 11 EXIT, INC.
6305 ELYSIAN FIELDS AVE., SUITE 303
NEW ORLEANS, LOUISIANA, 70122

MEETING OF SHAREHOLDERS AND BOARD OF DIRECTORS

A meeting of shareholders and board of directors of Highway 11 Exit, Inc., occurred on April 3, 1996, at 5:00 p.m.

Angelo Paternostro presided as president and Henry Silvia presided as Secretary for the meeting.

After discussion, on motioned by Henry Silvia and seconded by Mary Lou Applewhite the following resolution was unanimously adopted:

> Resolved, to empower Angelo Paternostro to sell all of the existing property located on Highway 11 to the city of Slidell at a sale price of $583,000.00 less one-half of the mitigation fees associated with the 404 permit obtained from the Corps Of Engineers, as well as absorb the appropriate prorated share of real estate taxes through the date of such sale. Further, it was agreed to pay a 6% negotiators fee relating to such sale net of the mitigation fee.

There being no further business to come before such meeting, such meeting was adjourned.

Angelo A. Paternostro Pres.

Angelo Paternostro, President

The above represents a true and correct copy of the shareholders and board of directors meeting which occurred on April 3,1996 at 5:00 p.m.

Henry Silvia, Secretary

PARISH OF ST. TAMMANY	********	CASH SALE
STATE OF LOUISIANA	* DEED *	OF
UNITED STATES OF AMERICA	********	IMMOVABLE PROPERTY

****

On this 25th day of September, 1996, before me, the undersigned Notary Public, duly commissioned for life and qualified, in and for this Parish and State, and in the presence of the undersigned witnesses, personally came and appeared SELLER:

> **HIGHWAY 11 EXIT, INC.**, a corporation organized and existing under the laws of the State of Louisiana, with its registered office at 6305 Elysian Fields Avenue, Suite 202, New Orleans, Louisiana 70122, herein represented by Angelo A. Paternostro, its President, duly authorized by resolution of the Board of Directors of that corporation, a copy of which is attached hereto and made a part hereof,

who declared that they do hereby grant, bargain, sell, convey, transfer, assign, set-over, abandon and deliver with all legal warranties and with full substitution and subrogation in and to all rights and actions of warranty which they have or may have against all preceding owners and vendors, to BUYER:

> **THE CITY OF SLIDELL** (hereinafter **CITY**), a municipal corporation of the State of Louisiana, represented herein by its Mayor, Salvatore A. Caruso, duly authorized by ordinance of the Slidell City Council, the governing authority thereof, Ordinance Number 2664 dated April 9, 1996, amended by Ordinance Number 2703 dated September 24, 1996, which entity has a permanent mailing address of P. O. Box 828, 2055 Second Street, Slidell, Louisiana 70459,

here present, accepting and purchasing for purchaser, its heirs and assigns, who acknowledge due delivery and possession thereof, the following described immovable property, together with all the buildings and improvements thereon, and all the rights, ways, privileges, servitudes, appurtenances and advantages thereunto belonging or in anywise appertaining:

> All that certain parcel of land being situated in Section 34, Township 8 South, Range 14 East and Section 3, Township 9 South, Range 14 East, St. Tammany Parish, Louisiana, being more fully described as follows:
>
> Commencing at the Quarter corner common to Section 34, Township 8 South, Range 14 East and Section 3, Township 9 South, Range 14 East; thence South 89 degrees, 45 minutes East 634.0 feet to the Point of Beginning; thence North 208.56 feet to a point; thence North 89 degrees, 46 minutes, 19 seconds East 878.26 feet to a point on the Westerly Right-of-Way of U.S. Highway 11; thence South 19 degrees, 00 minutes, 00 seconds West 853.20 feet along said Right-of-Way to a point; thence West 600.66 feet to a point; thence North 594.66 feet to the Point of Beginning.
>
> Containing 13.66 acres of land, more or less.

BUYER'S MAILING ADDRESS: P. O. Box 828
Slidell, LA 70459

PURCHASE PRICE: FIVE HUNDRED SIXTY-SEVEN THOUSAND EIGHT HUNDRED EIGHTY-SEVEN AND 50/100 ($567,887.50) DOLLARS,

all cash, which has been paid by BUYER and SELLERS acknowledge full receipt of this amount.

DT. REG # 692,641
Inst # 1019916
FILED ST. TAMMANY PAR
10/15/1996 [illegible]

TAXES: SELLERS warrant that all State, Parish and City taxes have been paid for the last three years or will be paid from deductions from the sales price.

MORTGAGE AND CONVEYANCE CERTIFICATE: Waived by all parties.

SELLERS' WARRANTY: SELLERS warrant that no mortgages or encumbrances exist on this property.

THUS DONE AND PASSED in my office in Slidell, St. Tammany Parish, Louisiana, on the day, month and year herein first above written, in the presence of the undersigned witnesses, who signed their names with the appearers and me, Notary Public, after a reading of the whole.

HIGHWAY 11 EXIT, INC.

Louis Vivien
WITNESS

BY: Angelo A. Paternostro Pres.
ANGELO A. PATERNOSTRO, President

Judith U. Voelker
WITNESS

CITY OF SLIDELL

BY:
SALVATORE A. CARUSO, Mayor

TIM MATHISON, Notary Public
2065 Second Street
P. O. Box 828
Slidell, Louisiana 70459
(504) 646-4396

ZONING CLASSIFICATION

cc - 5c

DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA

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

REPLY TO
ATTENTION OF:

SEP 23 1996

September 17, 1996

Operations Division
Eastern Evaluation Section

SUBJECT: SE(St. Tammany Parish Wetlands)267

City of Slidell
Post Office Box 828
Slidell, Louisiana 70459

Gentlemen:

Enclosed is a permit dated this date, subject as above, authorizing work under the Department of the Army permit program.

You are again reminded that any work not in accordance with the approved plans is subject to removal regardless of the expense and the inconvenience that such removal may involve and regardless of the date when the discrepancy is discovered.

Your attention is directed to all the terms and conditions of the approval. In order to have the work approved in accordance with the issued permit, all terms and conditions of the permit and plans shown on the drawings attached thereto must be rigidly adhered to.

It is necessary that you notify the District Engineer, Attention: Surveillance and Enforcement Section, in writing, prior to commencement of work and also upon its completion. The notification must include the permittee's name, as shown permit, and the permit number. Please note the expiration date on the permit. Should the project not be completed by that date, you may request a permit time extension. Such requests must be received before, but no sooner than six months before, the permit expiration date and must show the work completed and the reason the project was not finished within the time period granted by the permit.

The enclosed Notice of Authorization, ENG Form 4336, is to be conspicuously displayed at the site of work.

Sincerely,

Ronald J. Ventola

Ronald J. Ventola
Chief, Regulatory Functions Branch

Enclosure

LMN FL 215
August 1995

DEPARTMENT OF THE ARMY PERMIT

Permittee: City of Slidell

Permit No.: SE(St. Tammany Parish Wetlands)267

Issuing Office: New Orleans District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: Clear and excavate to construct a storm water detention pond, in accordance with drawings attached in 3 sheets, sheet 1 undated and sheets 2 and 3 dated April 22, 1996.

Project Location: Adjacent to U.S. Highway 11, near Slidell, Louisiana, in St. Tammany Parish.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on September 30, 1999. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least 1 month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions: **See Page 4.**

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Stanley P. Palmer
(PERMITTEE)

9-16-96
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Ronald J. Ventola

Ronald J. Ventola, Chief, Regulatory Functions Branch
for William L. Conner, District Engineer

17 Sep 96
(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

SPECIAL CONDITIONS:
SE(St. Tammany Parish Wetlands)267

7. The permittee has agreed to provide compensation for unavoidable losses to wetland functions and values through the following mitigation plan:

a. The permittee shall donate $30, 225.00 (13 acres at $2325.00 per acre) to a mitigation fund dedicated to acquisition, enhancement, management, and administration of a pine flatwood wetland site in St. Tammany Parish to be owned and operated by the Louisiana field office of The Nature Conservancy.

b. The donation shall be made payable to "The Louisiana Nature Conservancy (LNC)" and sent in care of Mr. Richard Martin, Post Office Box 4125, Baton Rouge, Louisiana 70821.

c. Payment shall be made prior to commencement of the proposed project. The LNC will provide to the Corps of Engineers (Corps), <u>verification of receipt of payment and the Corps will then contact the permittee informing him that the permitted work may proceed.</u>

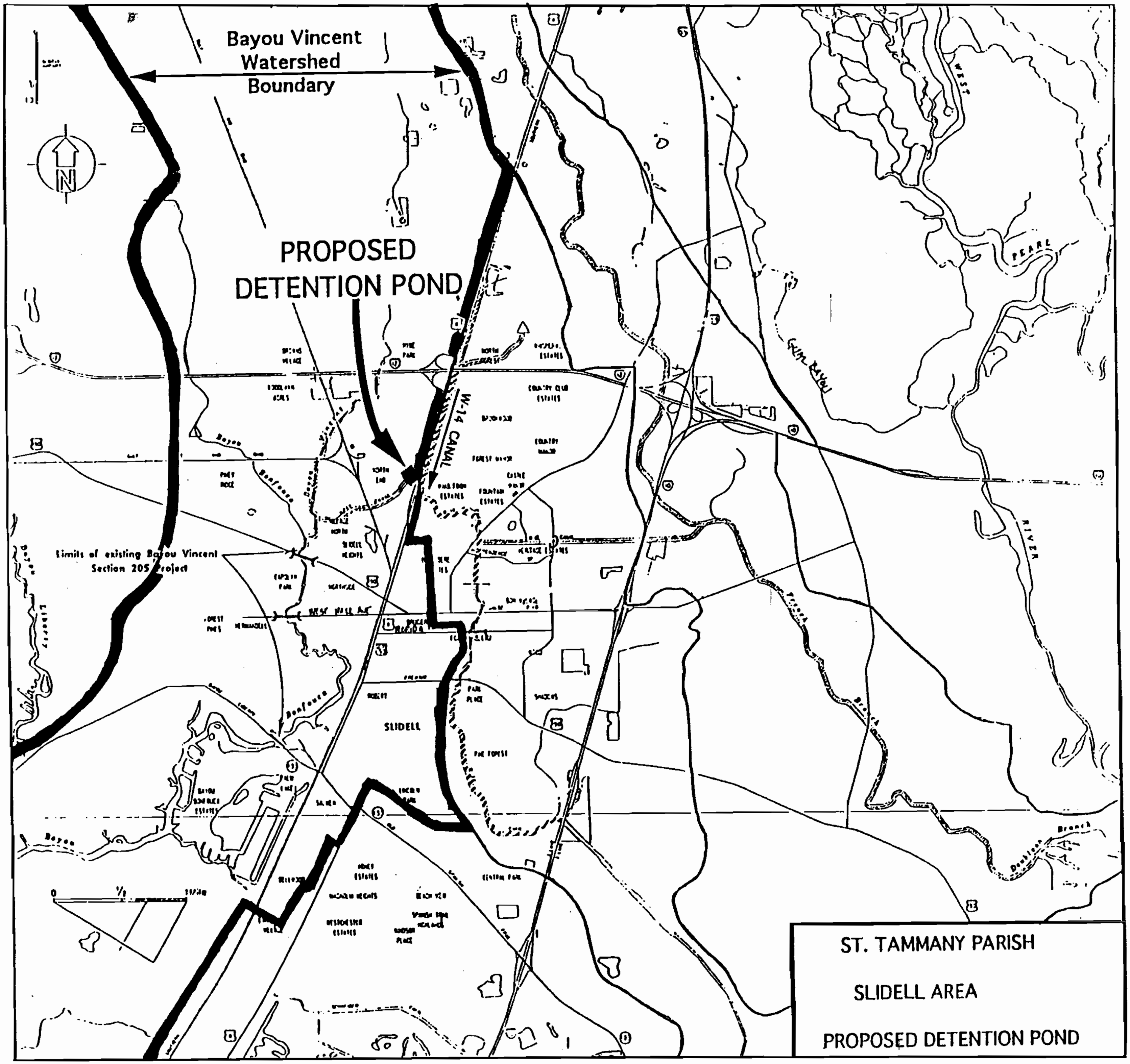
8. If drainage from the detention pond adversely impacts the wetlands on the south and west sides of the project, additional compensatory mitigation will be required to offset this loss.

9. The compensatory mitigation identified above has been determined to be a necessary and critical part of this permit approval. Failure by the permittee to perform the mitigation, in accordance with the permit conditions, is considered grounds for permit suspension and revocation, and restoration of the permit site.

10. Work in wetlands must not excessively impede or increase natural drainage resulting in unnatural ponding on adjoining properties. Remedial measures may be required of the permittee which could include installing culverts and/or swale ditches.

11. If the permitted project requires additional work not expressly permitted herein, or impacts any wetlands other than the area indicated on the attached drawings, the permittee must obtain an amendment to this authorization, or an individual permit, prior to the commencement of work.

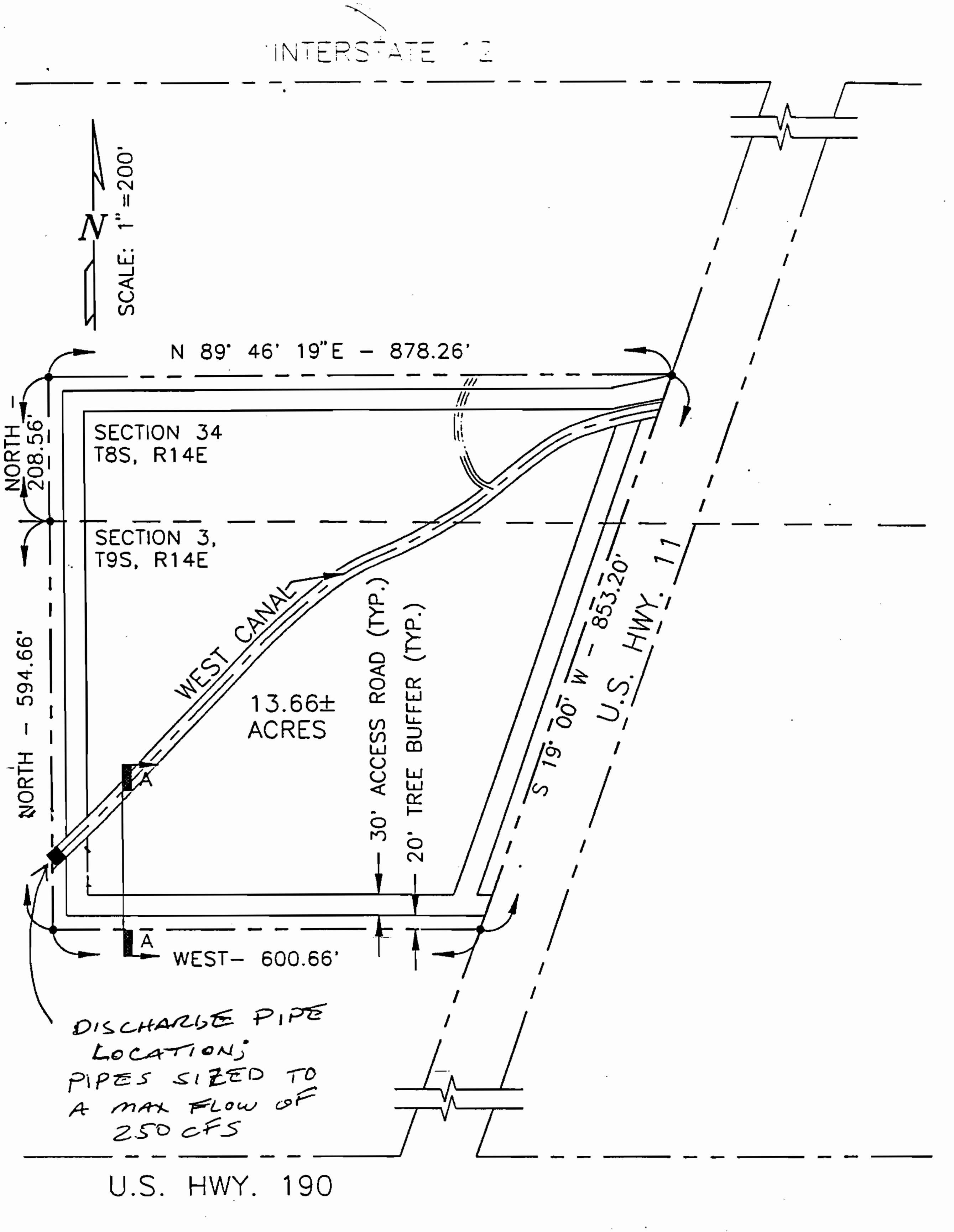
12. All dredged material associated with excavation and maintenance of the detention pond will be deposited in nonwetland areas as approved by the New Orleans District, Corps of Engineers. Maintenance dredging of the detention pond may continue for the life of the project.



ST. TAMMANY PARISH

SLIDELL AREA

PROPOSED DETENTION POND

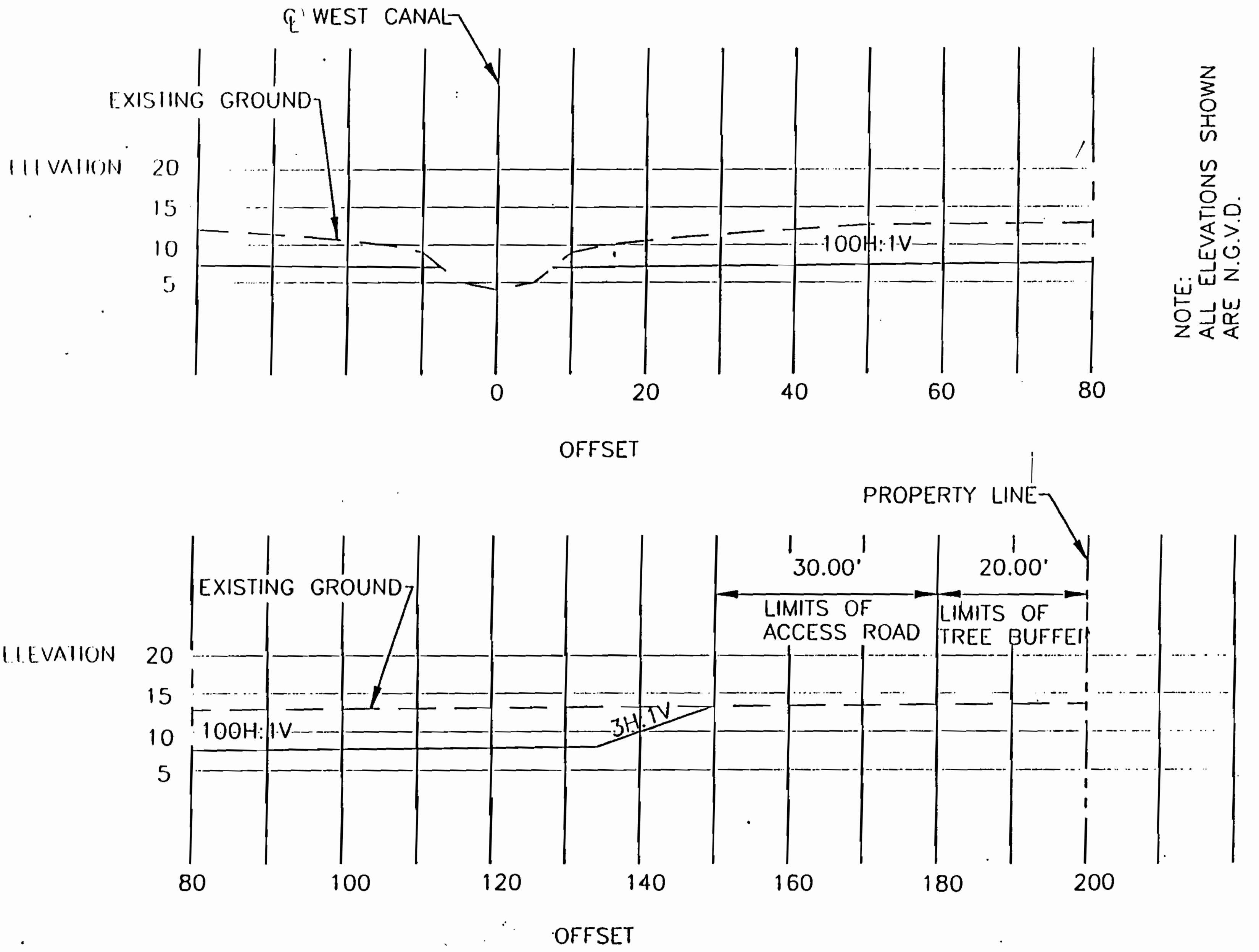


DISCHARGE PIPE LOCATION; PIPES SIZED TO A MAX FLOW OF 250 CFS

U.S. HIGHWAY 11 DETENTION POND PROJECT

0 100 200 300 400

CITY OF SLIDELL
P.O. BOX 828
SLIDELL, LA 70459
SHEET 1 of 2 4/22/96



SECTION A–A

NOTE:
ALL ELEVATIONS SHOWN
ARE N.G.V.D.

CITY OF SLIDELL
P.O. BOX 828
SLIDELL, LA 70459
SHEET 2 of 2
4/22/96

U.S. HIGHWAY 11 DETENTION POND PROJECT

This notice of authorization must be conspicuously displayed at the site of work.

United States Army Corps of Engineers

September 17, 19 96

A permit to clear and excavate to construct a storm water detention pond, adjacent to U.S. Highway 11, near Slidell, Louisiana, in ~~at~~ St. Tammany Parish,

has been issued to City of Slidell on Sep. 17, 19 96

Address of Permittee Post Office Box 828
Slidell, Louisiana 70459

Permit Number

SE(St. Tammany Parish
Wetlands)267

Ronald J. Ventola

For the Ronald J. Ventola
District Commander

ENG FORM 4336, Jul 81 (33 CFR 320-330) EDITION OF JUL 70 MAY BE USED (Proponent CECW-O

State of Louisiana

"MIKE" FOSTER, JR.
GOVERNOR

JACK C. CALDWELL
SECRETARY

DEPARTMENT OF NATURAL RESOURCES

Date May 7, 1996

CUP# P960683

Dear Applicant,

After careful review of the referenced coastal use permit application, it has been determined that the use is of local concern. This means that the permit application will be processed by the local St. Tammany Parish Coastal Management Program, not by the state's coastal management program. Therefore, we have refunded any fees paid and forwarded your application to the appropriate local program authority.

If you have any questions, please telephone Mr. Brian Fortson of St. Tammany Parish at (504)898-2529, or write to him at the address below.

Sincerely,

Marilyn Forbes

Marilyn Forbes
JPN Coordinator

c: Mr. Brian Fortson
Department of Development
St. Tammany Parish
Post Office Box 628
Covington, LA 70434

COASTAL MANAGEMENT DIVISION P.O. BOX 44487 BATON ROUGE, LOUISIANA 70804-4487
TELEPHONE (504) 342-7591 FAX (504) 342-9439
AN EQUAL OPPORTUNITY EMPLOYER

STATE OF LOUISIANA
DEPARTMENT OF HEALTH AND HOSPITALS

M. J. "Mike" Foster, Jr.
GOVERNOR

LOUISIANA
Department of
HEALTH and
HOSPITALS

Bobby P. Jindal
SECRETARY

00-3

Hwy
11
SITB

RECEIVED
JUL 15 1996

(504) 568-5102
July 3, 1996

Regulatory Functions Branch
Operations and Readiness Division
Department of the Army
New Orleans District
Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Mr. Gary R. Aydell, Acting Administrator
Water Pollution Control Division
Office of Water Resources
Department of Environmental Quality
P. O. Box 82215
Baton Rouge, Louisiana 70884-2215

Re: SE (St. Tammany Parish Wetlands) 267 - Corps of Engineers Permit Application
WQC 960507-10 - DEQ Water Quality Certification Application
CITY OF SLIDELL
Clear and excavate to construct a storm water detention pond. The proposed work will affect approximately 13.66 acres of wooded wetlands and will include the excavation of approximately 108,000 cubic yards of material. The excavated material will be used for fill in non-wetland areas.
Adjacent to U.S. Highway 11, at Slidell, LA
St. Tammany Parish, LA

Gentlemen:

Receipt is acknowledged of the subject Joint Public Notice recently prepared by the Corps of Engineers and Department of Environmental Quality.

Please be advised that, upon review of the subject transmittal, this office has determined that no apparent, substantial violations of those applicable provisions of the State Sanitary Code may be anticipated as a result of the proposed activity. Accordingly, this office will offer "no objection" to the project, as described.

By copy of this letter we are apprising the applicant of our disposition in this regard.

Should you need additional information or clarification, please advise.

Very truly yours,

George E. Robichaux

George E. Robichaux
Administrator
Sewerage Unit

GER:lm

xc: ✓City of Slidell
St. Tammany Parish Health Unit
Slidell Branch
2151 Second Street
P. O. Drawer 850
Slidell, LA 70459
(504) 646-6448
Sanitarian Regional Manager - Region 9
Attention: Mr. William Hathaway
Mr. Nolan Johnson, OPH-Region 2

LAYOUT MAP

100-5C

State of Louisiana

Department of Environmental Quality

M.J. "MIKE" FOSTER, JR.
GOVERNOR

J. DALE GIVENS
SECRETARY

RECEIVED
JUL 19 1996

JUL 16 1996

WQC 960507-10

City of Slidell
P. O. Box 828
Slidell, LA 70459

Attention: Mr. Stan Polivick

Gentlemen:

RE: Proposal to clear and excavate to construct a storm water detention pond, adjacent to LA Highway 11, in Slidell, St. Tammany Parish.

This is to acknowledge that you have completed the requirements for Water Quality Certification for the above referenced proposal.

It is our opinion that your proposed project will not violate water quality standards of the State of Louisiana, therefore, we offer no objection to this project provided: 1) that the cleared areas and spoil banks are seeded and revegetated in order to prevent erosion; 2) that drainage ditches are constructed with a slope no greater than 3:1 (horizontal:vertical) and allowed to revegetate; and 3) that all practicable means are utilized to minimize any discharge of water pollutants that can result from the proposed project.

In accordance with statutory authority contained in the Louisiana Revised Statutes of 1950, Title 30, Chapter 11, Part IV, Section 2074 A(3) and provisions of Section 401 of the Clean Water Act (P.L. 95-217), the Office of Water Resources certifies that it is reasonable to expect that water quality standards of Louisiana provided for under Section 303 of P.L. 95-217 will not be violated.

Sincerely,

Linda Korn Levy

Linda Korn Levy, Assistant Secretary
Office of Water Resources

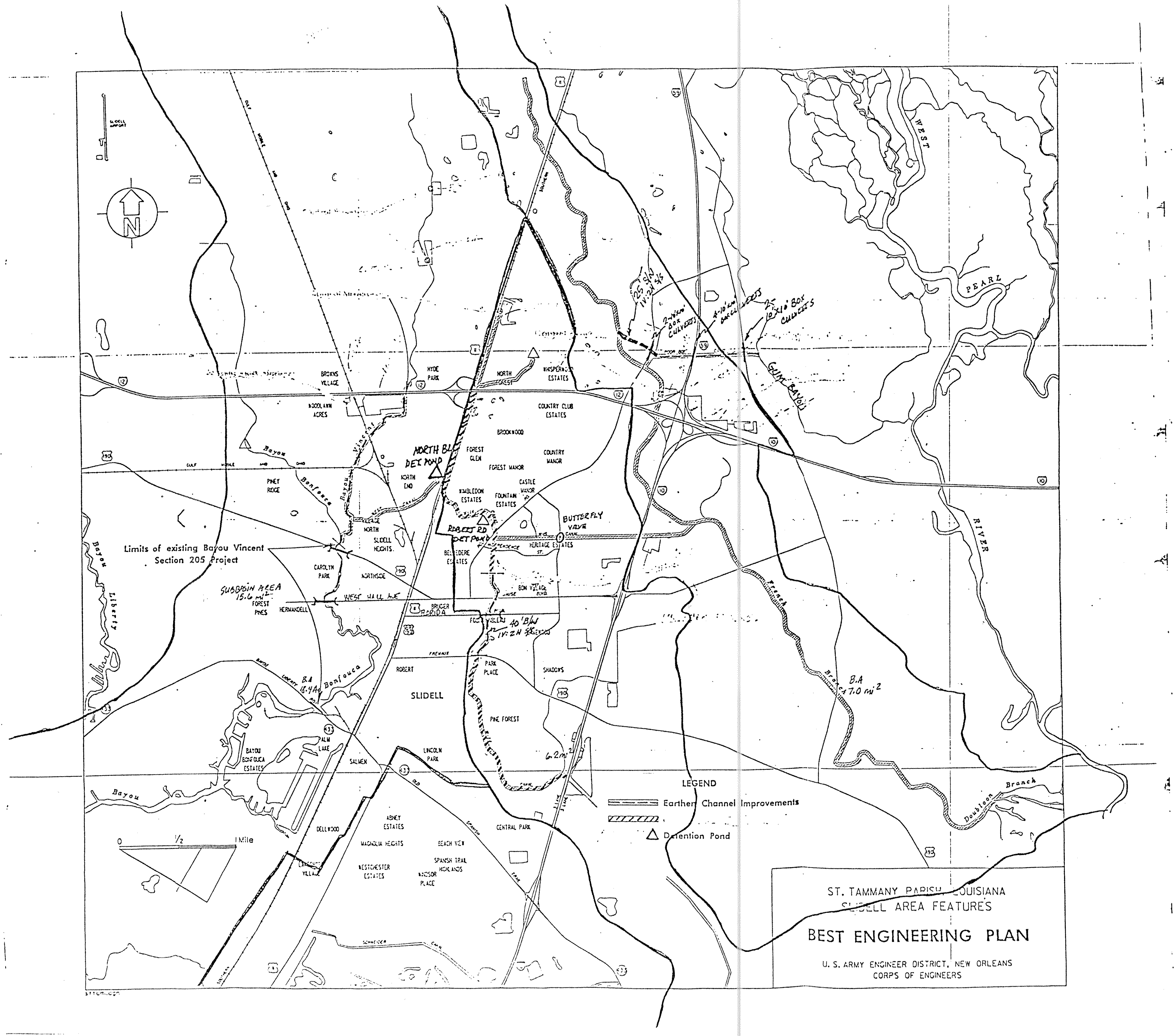
LKL:JWL
c: Corps of Engineers, New Orleans - SE(St. Tammany Ph. W/L)267 - Chris Trepagnier
Coastal Management Division

ATTACHMENT "A"

29.3589 acres situated in Section 2 Township 9 South Range 14 East, in the City of Slidell, St. Tammany Parish, Louisiana, acquired by the City of Slidell in COB ____ Page ____ of the official records of St. Tammany Parish, La., and shown on plat of J. V. Burkes & Associates dated October 24, 1995, #951660, less & except a 320 foot buffer strip from Robert Road on the southeast side, a 50 foot buffer strip on the east and north side, and a 20 foot buffer strip on the west and south side of the above described property.

vendor.

100-50

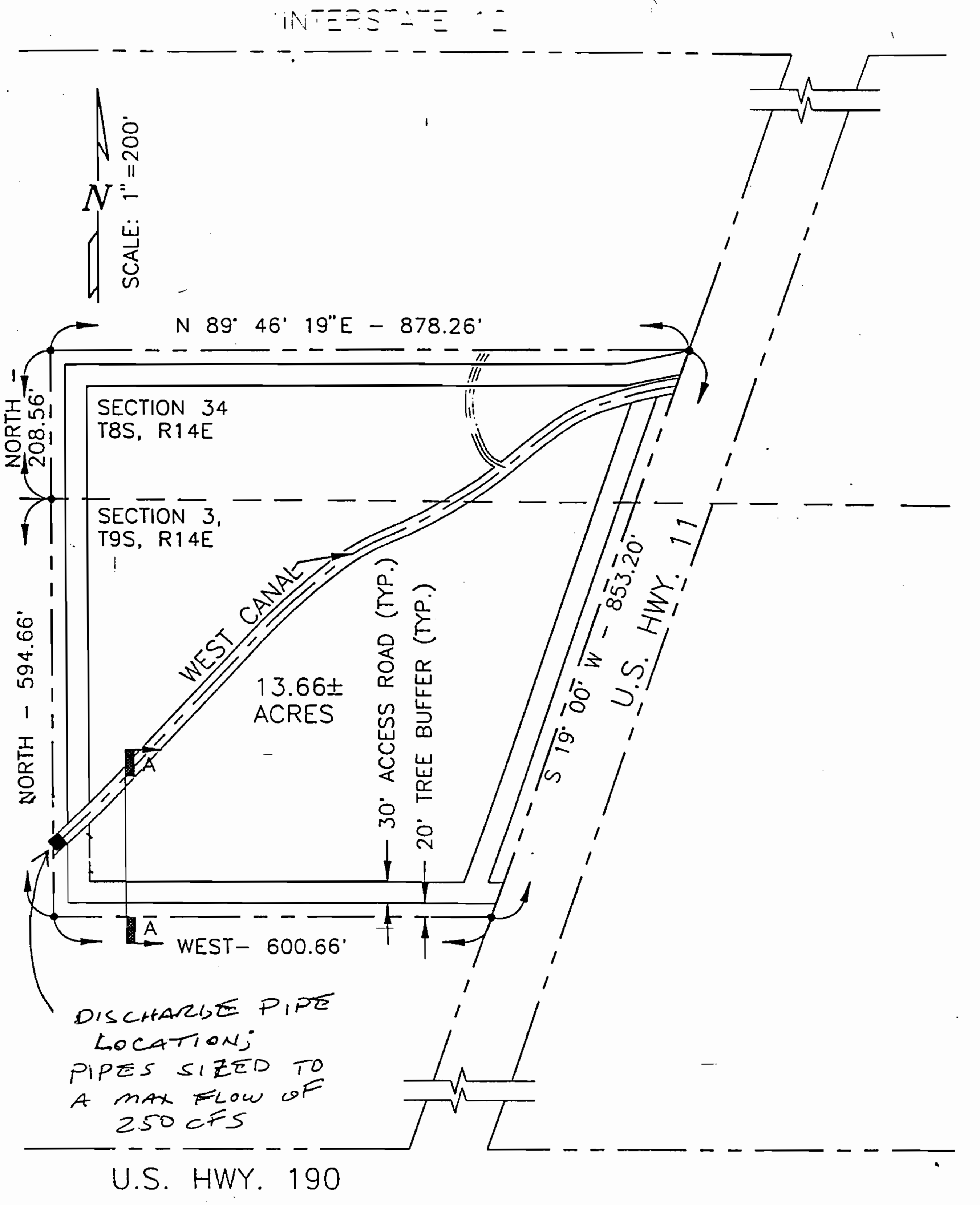


ST. TAMMANY PARISH, LOUISIANA
SLIDELL AREA FEATURES

BEST ENGINEERING PLAN

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

PIT CROSS SECTIONS & VOLUME REMAINING

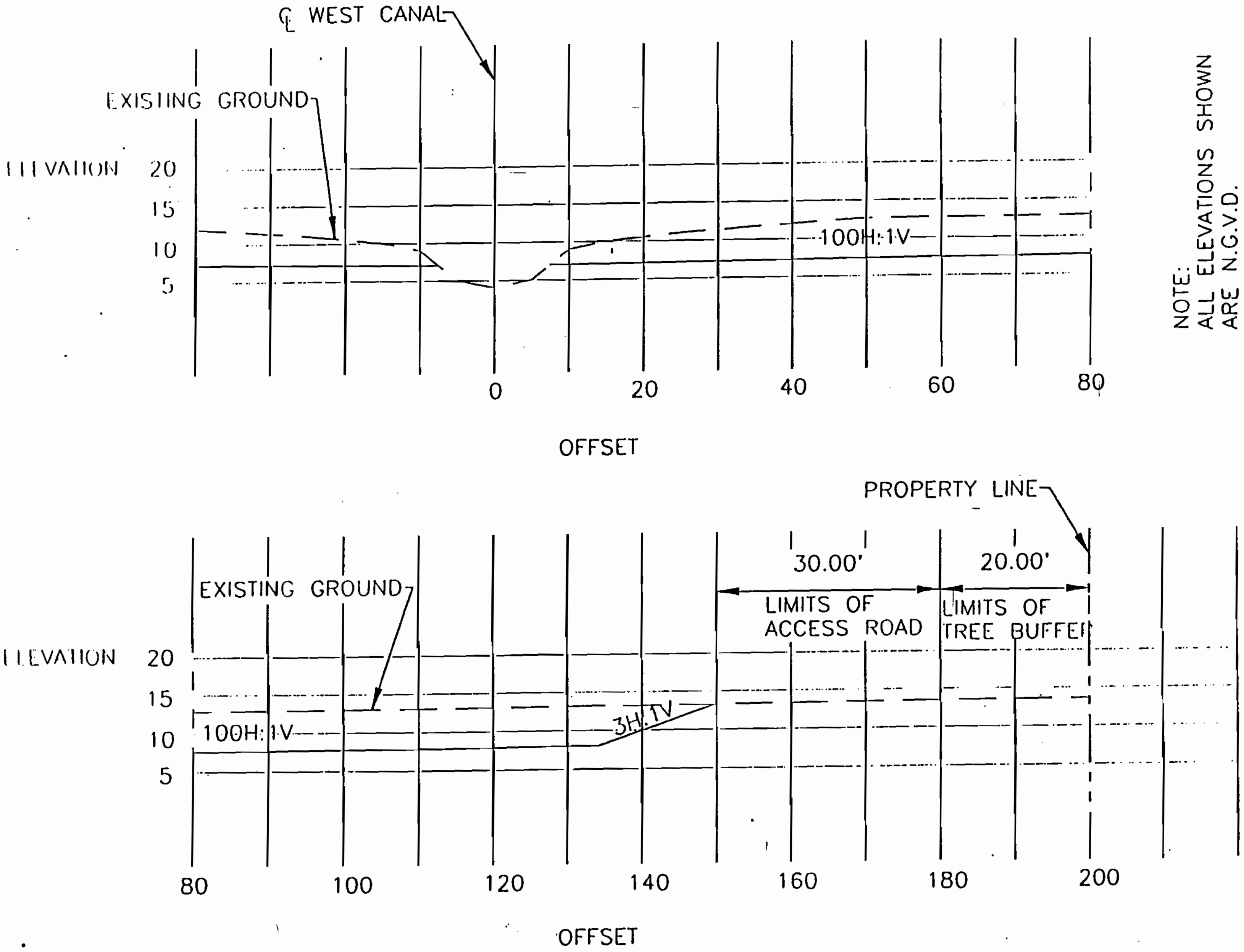


DISCHARGE PIPE
LOCATION;
PIPES SIZED TO
A MAX FLOW OF
250 CFS

U.S. HIGHWAY 11 DETENTION POND PROJECT

0 100 200 300 400

CITY OF SLIDELL
P.O. BOX 828
SLIDELL, LA 70459
SHEET 1 of 2 4/22/96



SECTION A–A

NOTE:
ALL ELEVATIONS SHOWN
ARE N.G.V.D.

CITY OF SLIDELL
P.O. BOX 828
SLIDELL, LA 70459
SHEET 2 of 2
4/22/96

U.S. HIGHWAY 11 DETENTION POND PROJECT

0 10 20 30 40

100-50

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

(33 CFR 325)

OMB APPROVAL NO. 0710-00
Expires 30 September 1992

Public reporting burden for this collection of information is estimated to average 5 hours per response for the majority of cases, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Applications for larger or more complex projects, or those in ecologically sensitive areas, could take up to 500 hours. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferso Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington, DC 20503. Please NOT RETURN your completed form to either of these addresses. Send your completed form to: Department of Defense, U.S. Army Corps of Engineers, Attn: CECW-OR, 20 Mass. Ave., N.W. Washington, DC 20314-1000.

The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine, Protection, Research and Sanctuaries Act. These laws require permits authorizing activities in or affecting navigable waters of th United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping into ocean waters. Information provided on this form will be used in evaluating the application for a permit. Information in this application is made a matter o public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order t communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed r can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application *(see sample drawings and instructions)* and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An applica that is not completed in full will be returned.

1. APPLICATION NUMBER *(To be assigned by Corps)*

2. NAME AND ADDRESS OF APPLICANT

City of Slidell, Louisiana
P.O. Box 828
Slidell, Louisiana 70459
Attn: Stanley P.Polivick, P.E. City Engineer

Telephone no. during business hours

A/C ( ) ______ (Residence)
A/C (504) 646-4270 (Office)

3. NAME, ADDRESS, AND TITLE OF AUTHORIZED AGENT

STAN POLIVICK
CITY OF SLIDELL
PO BOX 828 SLIDELL, LA 7045

Telephone no. during business hours

A/C ( ) ______ (Residence)
A/C (504) 646 4270 (Office)

Statement of Authorization: I hereby designate and authorize ______ to act in behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of the application.

SIGNATURE OF APPLICANT: Stanley P. Pol

DATE: 4-25-

4. DETAILED DESCRIPTION OF PROPOSED ACTIVITY

4a. ACTIVITY

To excavate property to develop a storm water detention pond. Property will be excavated approximately 5.5 feet below existing grade. The natural channel will not be modified by any construction activities. After construction of the pond, the area will be seeded. The City of Slidell will periodically mow and maintain the pond as required.

4b. PURPOSE

To develop a storm water detention pond to act as a storage area during rainfall events. The pond will be designed to have a "dry" bottom during non-rainfall periods. The pond is needed to relieve residential flooding during heavier rainfall events. The purpose of the pond is to provide additional storage area in the W-14 Canal and Bayou Vincent watersheds and reduce the amount and epth of out-of-bank flooding in the area.

4c. DISCHARGE OF DREDGED OR FILL MATERIAL

Approximately 108,000 cubic yards of material will be excavated and disposed by the City of Slidell in non-wetland areas. Specific spoil areas will be determined by the Contractor at the time of construction and approved by the U.S.C.O.E. prior placement. To the best of my knowledge the proposed activity described in my permit application complies with and will be conducted in a manner that is consistent with the Louisiana Coastal Management Program.

ENG FORM 4345, Jan 91 EDITION OF APR 88 IS OBSOLETE. (Proponent: CECW-

SOIL BORING LOGS AND REPORTS

JUL 28 1995

100-50

EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERS
CONSTRUCTION QUALITY CONTROL & MATERIALS TESTING
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157 / Fax 504-834-0354

27 September 1995

City of Slidell
2055 Second Street
Post Office Box 828
Slidell, Louisiana 70459

Attention Mr. Stanley P. Polivick
City Engineer
Fax Number 641-9528

Gentlemen:

Geotechnical Investigation
City of Slidell
Proposed Retention Pond
Highway 11, South of North Boulevard
Slidell, Louisiana

This letter contains the results of a geotechnical investigation performed for the proposed retention pond to be located off Highway 11 in Slidell, Louisiana. The investigation was performed in accordance with Eustis Engineering Company, Inc.'s (Eustis Engineering) proposal dated 6 September 1995, which was accepted on 8 September 1995 by Mr. Stanley P. Polivick, City Engineer, City of Slidell, Louisiana.

Field Exploration

Two undisturbed sample type soil test borings, each 20 feet in depth, were made on 14 September 1995 at the locations shown on Enclosure 1. The borings were located at the site by a representative of the City of Slidell. Detailed descriptive logs of the borings are enclosed.

The borings were made with a truck mounted rotary type drill rig. Samples of cohesive or semi-cohesive subsoils were obtained at close intervals or changes in stratum using a 3-in. diameter Shelby tube sampling barrel. The samples were immediately extruded from the sampling barrel, inspected and visually classified by Eustis Engineering's soil technician. Pocket penetrometer tests were performed on the soil samples to give a general indication of the soil shear strength or consistency, and the results of these tests are shown on the boring logs under the column headed "PP." Representative portions were placed in moisture proof containers and sealed for preservation.

Laboratory Tests

Soil mechanics laboratory tests consisting of visual classification, natural water content, and Atterberg liquid and plastic limits were performed on selected samples obtained from the borings. These tests were used to estimate the permeability of the subsoils and suitability for construction. The results of the laboratory tests are tabulated on the boring logs.

Retention Pond Construction

Furnished information indicates the pond may be 5 to 6 feet deep with earthen side slopes. Storm water will be drained by gravity flow into an adjacent ditch. Based on the boring logs, the upper 5 feet of soil is semi-permeable and erodable. The surficial soils consist of medium compact gray and tan sandy silt and clayey silt (ML) from the ground surface to a depth of 0.5 of a foot. This is underlain by soft tan and gray silty clay (CL) and medium compact tan and gray clayey silt (ML) to the 5-ft depth. From 5 to 20 feet, precompressed soils occur. These soils are relatively impervious and consist of stiff to very stiff tan and gray or greenish-gray and tan clay (CH) and silty clay (CL).

Side slopes of the pond should not be cut steeper than 1 vertical on 3 horizontal or sloughing of the side slopes may occur. The upper slope of the bank within the top 5 feet of soil should be protected from erosion until vegetation or sodding has been established. Maintenance equipment for mowing the side slopes can usually operate on 1 vertical on 3 horizontal side slopes or flatter. Steeper slopes are not recommended.

After the sides of the pond have been excavated, measures should be taken to protect the upper 5 feet of soil from erosion by rainfall and runoff. Consideration should be given to providing temporary erosion control along the upper slope of the pond. Recommendations for temporary erosion control can be found in Section 204 of the *Louisiana Standard Specifications for Roads and Bridges*, 1992 edition. Also, observations should be made during construction to determine if other erodable areas are present.

Thank you for asking us to provide these services. If you have any questions regarding this letter, please contact us.

Yours very truly,

EUSTIS ENGINEERING COMPANY, INC.

John R. Eustis

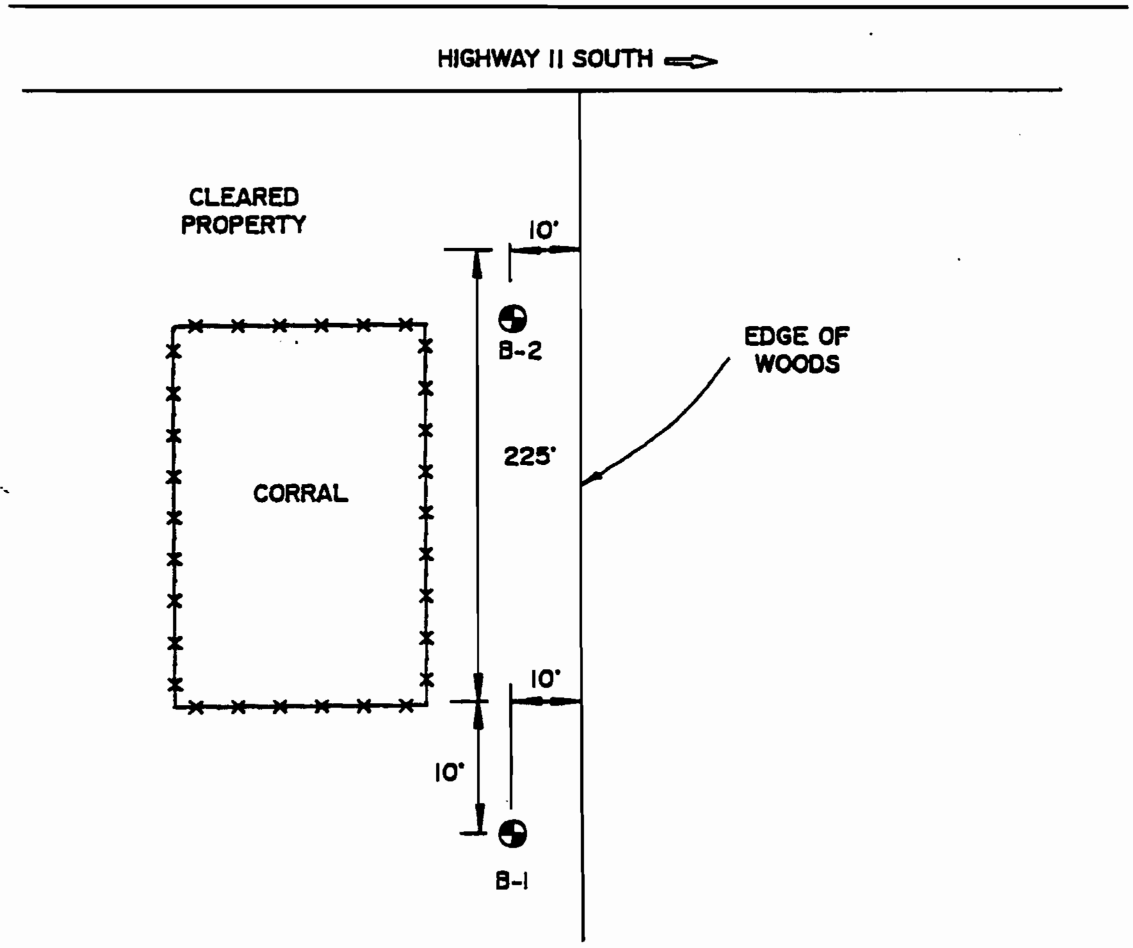
JOHN R. EUSTIS, P.E.

STATE OF LOUISIANA
JOHN R. EUSTIS
REG. NO. 22807
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

JRE:ln

Enclosures

EE 13677



NOT TO SCALE
BORINGS DRILLED 14 SEPTEMBER 1995

LOCATION OF BORINGS

PROPOSED RETENTION POND
CITY OF SLIDELL
SLIDELL, LOUISIANA

EUSTIS ENGINEERING COMPANY, INC.

ENCLOSURE 1

LEGEND AND NOTES FOR LOG OF BORING AND TEST RESULTS

PP	Pocket penetrometer resistance in tons per square foot	
TV	Torvane shear strength in tons per square foot	
SPT	Standard Penetration Test. Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in O.D., 1.4-in. I.D. sampler a distance of one foot into the soil, after first seating it 6 inches	
SPLR	Type of Sampling	■ Shelby ☒ SPT ▱ Auger ☐ No Sample
SYMBOL	Clay ▨ Silt ▥ Sand ⁙ Humus ≋	Predominant type shown heavy; Modifying type shown light
DENSITY	Unit weight in pounds per cubic foot	
USC	Unified Soil Classification	
TYPE	UC	Unconfined compression shear
	OB	Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
	UU	Unconsolidated undrained triaxial compression shear
	CU	Consolidated undrained triaxial compression shear
	DS	Direct shear
	CON	Consolidation
	PD	Particle size distribution
	k	Coefficient of permeability in centimeters per second
	SP	Swelling pressure in pounds per square foot
ϕ	Angle of internal friction in degrees	
c	Cohesion in pounds per square foot	

Other laboratory test results reported on separate figure

Ground Water Measurements ▼ Initial ▽ Final

GENERAL NOTES

(1) At the time the borings were made, ground water levels were measured below existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction, immediately prior to beginning work.

(2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

PROPOSED RETENTION POND, HIGHWAY 11, SOUTH OF NORTH BOULEVARD
SLIDELL, LOUISIANA

(SHEET 1 Of 1)

Ground Elev.: **Datum:** **Gr. Water Depth: See Text** **Job No.: 13677** **Date Drilled: 9/14/95** **Boring: 1** **Refer To "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	Ø	C	LL	PL	PI		
				▨	Medium compact tan & gray sandy silt w/organic matter		1	0-0.5											
	0.90		■	▨	Soft tan & gray silty clay w/clay layers & concretions	CL	2	2-3	21						43	16	27		
5	1.20		■	▨	Stiff tan & gray silty clay	CL	3	5-6	25						46	19	27		
10	2.20		■	▨	Very stiff tan & gray clay w/clayey sand lenses	CH	4	8-9	26						51	22	29		
			■	▨	Very stiff tan & gray silty clay w/clayey silt layers	CL	5	11-12	26										
15	3.00		■	▨	Very stiff gray & tan clay w/clayey silt lenses	CH	6	14-15	31										
20	2.25		■	▨	Very stiff greenish-gray & tan clay	CH	7	18-19											
25																			
30																			
35																			
40																			
45																			
50																			

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

PROPOSED RETENTION POND, HIGHWAY 11, SOUTH OF NORTH BOULEVARD
SLIDELL, LOUISIANA

(SHEET 1 Of 1)

Ground Elev.: **Datum:** **Gr. Water Depth: See Text** **Job No.: 13677** **Date Drilled: 9/14/95** **Boring: 2** **Refer To "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density		Shear Tests			Atterberg Limits				Other Tests
										Dry	Wet	Type	Ø	C	LL	PL	PI		
					Medium compact gray & tan clayey silt w/organic matter	ML	1	0-0.5											
					Medium compact tan & gray clayey silt		2	2-3	20										
5																			
					Very stiff tan & gray silty clay w/clayey silt lenses	CL	3	5-6	21						47	18	29		
					Very stiff tan & gray clay w/silt pockets & lenses	CH	4	8-9	21						53	19	34		
10																			
					Very stiff tan & gray silty clay	CL	5	11-12	24						47	18	29		
					Very stiff tan & gray clay w/silt lenses	CH	6	14-15	23										
15																			
					w/fine sand lenses		7	18-19											
20																			
25																			
30																			
35																			
40																			
45																			
50																			

JENS LORENZ
PRESIDENT
GERARD M. WHITTLE
VICE PRESIDENT

RIVER/ROAD
CONSTRUCTION, INC.
P.O. BOX 1406 MANDEVILLE, LA 70470-1406

FAX COVER SHEET

TO: Tony Lanto

COMPANY: COE

FAX NO.: 862-1226

DATE: 10/23/97

FROM: Derek Commander

COMPANY: RIVER/ROAD CONSTRUCTION, INC.

RETURN FAX NO.: (504) 624-9758

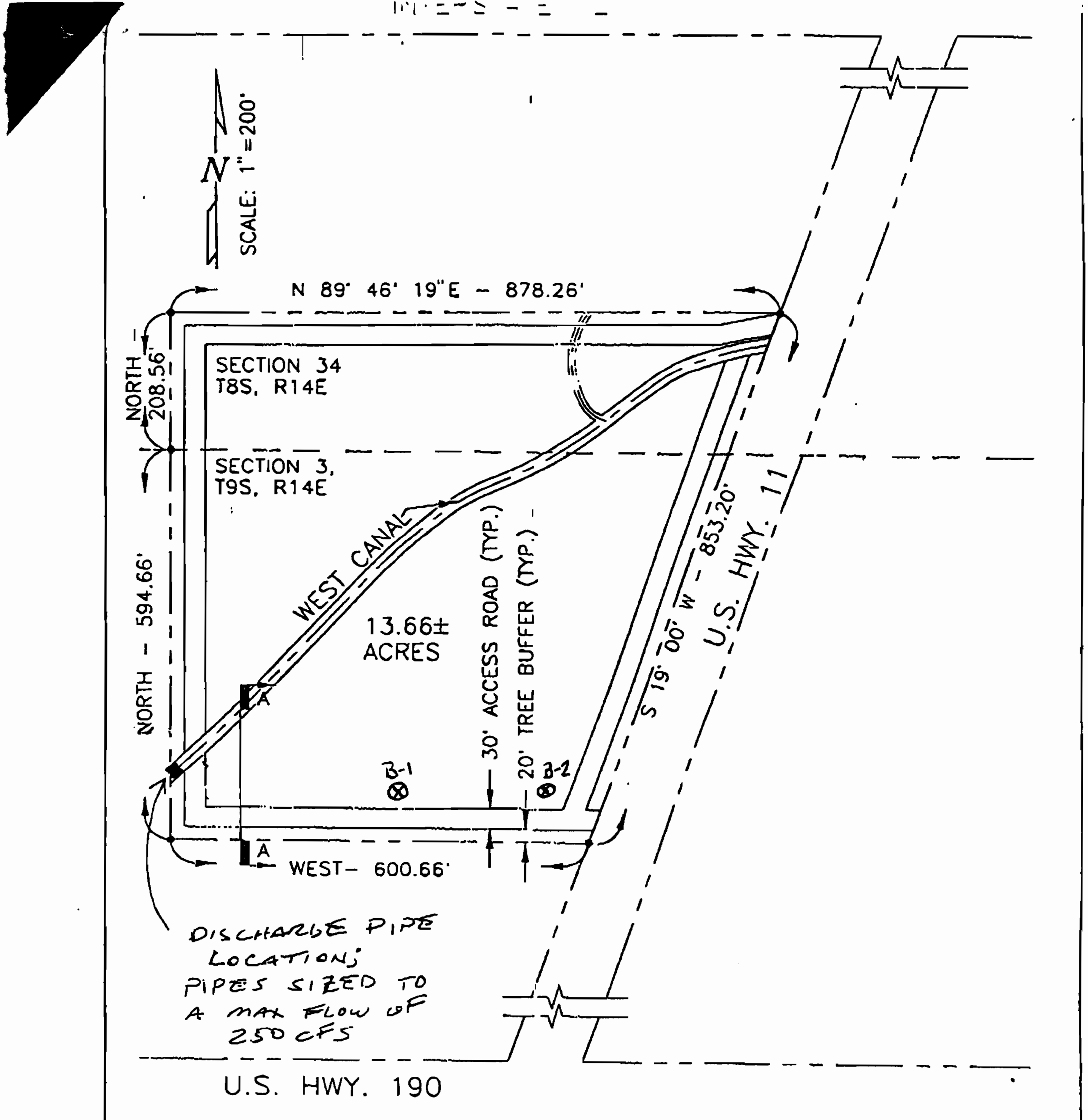
RETURN PHONE NO.: (504) 626-4530

COMMENTS: Boring Locations on Plot Plan
For Alternate Borrow Pit

NO OF PAGES ________(INCLUDING THE COVER SHEET)

TEL. 504-626-4530 N.O. 831-6958 FAX. 504-624-9758

Encl 2



DISCHARGE PIPE LOCATION; PIPES SIZED TO A MAX FLOW OF 250 CFS

U.S. HIGHWAY 11 DETENTION POND PROJECT

0 100 200 300 400

CITY OF SLIDELL
P.O. BOX 828
SLIDELL, LA 70459
SHEET 1 of 2 4/22/96

LMNED-DD

SUBJ: Review of Geotechnical Report and preliminary plans for:
Pont. Beach Flood Protection, Lake Pont. Hurricane Prot.
Proj.,Orleans Parish, LA.

TO: C/Des Svcs Br FROM: C/Des Br 24 Jan 86 CMT 1
Mr. Romero/lr/2645

1. We have completed our review of the subject report and preliminary plans for the realinement of the flood protection, as proposed by the Orleans Levee Board (OLB). Our comments and/or recommendations are as follows:

a. The plans submitted for our review are highly preliminary and are incomplete. The plans do not correspond to the recommended designs of the geotechnical report. The revised drawings, specifications and all design computations should be submitted for our review.

b. Our analyses of the steel sheet piling section (PZ-27) proposed for the I-walls indicate that the stresses in the piling for the reaches of wall with top elevation of 17.5 are above the allowable. In addition, the deflections at the top of all I-walls are excessive. The I-wall design should be re-evaluated using a heavier sheet pile section.

c. The sheet pile layouts under the gate monoliths should be shown on the drawings. The sheet piling should be centered on the concrete base to allow the placement of the prestressed concrete piles. Also, a slip joint is required between the gate monoliths and the adjacent I-wall. These details were previously provided to U.R.S.

d. The details of the prestressed concrete piles shown on the drawings note that 6 ea. 1/2 inch diameter prestressing strands are required, however, 8 strands are shown. The size of the spiral reinforcement is not indicated. The size should be No. 4W, square spiral. The size and number of all reinforcement should be indicated in these sections.

e. We have been working with U.R.S. Engineers, OLB's consultant for this work, and provided them with our recommendation for reducing the length of the gate monoliths, and for improving the pile foundation for these gates. When these revisions are finalized by U. R. S., the redesign should be submitted for our review.

f. The required height of protection for the reaches of floodwall on levee along the lakefront was computed by H&H Br with a 100 feet long wave berm, however, the design was prepared using a retaining wall reducing this berm to 10 feet in length. The height of protection required with the retaining wall concept should be checked by H&H Br.

g. The preliminary plans and the geotechnical report show the I-wall centered on the levee crown. The I-wall layout should be revised locating the wall line 4 ft. from the levee centerline, on the flood side. This configuration provides more soil mass to help resist the water loads on the wall.

h. On drawing No. 20, the typical I-wall section shows a stabilization slab under the concrete wall. If the stabilization slab is required, it should extend at least 6 inches on both sides of the wall to help support the formwork for the wall. The spacing of the vertical reinforcement should be revised to pass the rebars through the "flats" of the steel sheet piling. A No. 6 rebar should be welded to the tops of all sheet piling and a flexible wire jumper should be provided at the monolith joints to provide a cathodic protection system. These details were previously furnished to U.S.R.

i. A bush-hammer finish and a fractured fin finish, as well as wall graphics are shown on drawing No. 20, however, it is not indicated where these finishes will be used.

j. The New Orleans Lakefront Levee, I.H.N.C. West to London Ave. Canal, Levee Enlargement contract will be under construction concurrently with the subject project. The Corps contract is presently scheduled for award in March, with the work completed in September 1986. It is requested that the OLB's contractor coordinate his work with our contractor to avoid any delays or interferences in the work areas commond to both contracts.

k. The levee work to be constructed under our contract will have the following design:

West end. Gross grade, El. 19.0, side slopes 1V on 2.75H
East end. Gross grade, El. 18.0, side slopes 1V on 2.75H

l. The surface materials for the access ramps over the levee should be placed above the gross design grade for the ramp, and not within the levee design section.

m. The valve manholes for the drain lines, shown on drawings 3 and 6, should be located on the flood side of the levee section to reduce the chance of a blowout under the levee during flood conditions.

n. The drop inlet and drain line under the ramp, shown on drawing 4, may be plugged rather than removed to save on relocation cost.

o. The sewer cleanouts, shown on drawing 5, are noted to be plugged, however, the sewer line is not shown. The sewer line and the cleanouts should be removed if this line is to be abandoned since the line is under the levee design section.

p. The existing manhole, shown on drawing 6, located under the levee section next to the ramp should be removed. All pipes connecting to the manhole should be removed within the limits of the levee section. The ends of the pipes should be plugged with concrete.

q. On drawing No. 6 a valve is shown for a waterline crossing the flood protection. Since the water line is a "closed" system a valve is not required for flood protection.

r. The existing electric system, shown on drawing 12, should be relocated outside of the levee design sections.

s. The relocation plan for the 12 inch water line (see enclosed drawing, provided by the NOS&WB) along the west roadway ramp should include a connection to the existing 8 inch water main to U.N.O.

t. The 6 inch water main, shown on drawing 14, is to be abandoned. This should be verified with the NOS&WB. This line and the 6 inch H.P. gas line should be relocated outside the levee design section.

u. All utility relocations and utility crossings the flood protection should be constructed in accordance with COE criteria.

v. The design report for this work should explain alternative alinements and why this particular alinement was selected over the others.

2. Design Branch coordinator for this work is Mr. J. Romero, ext. 2645. Please contact Mr. Romero if there are any questions on our review.

Enclosure
CF:w/o encl
LMNED-DL
✓ LMNED-FS

WALTER D. JUDLIN,III
Chief, Design Branch

January 31, 1986

Engineering Division
Projects Engineering Section

Mr. John Holtgreve
Design Engineering, Inc.
3330 West Esplanade, Suite 205
Metairie, Louisiana 70002

Dear Mr. Holtgreve:

Reference is made to your December 18, 1985, letter concerning the Ponchartrain Beach Floodwall project.

As requested, we have reviewed the plans furnished in the above referenced letter and have the following comments to offer:

1. The plans submitted for our review are highly preliminary and are incomplete. The plans do not correspond to the recommended designs of the geotechnical report. The revised drawings, specifications and all design computations should be submitted for our review.

2. Our analyses of the steel sheet piling section (PZ-27) proposed for the I-walls indicate that the stresses in the piling for the reaches of wall with top elevation of 17.5 are above the allowable. In addition, the deflections at the top of all I-walls are excessive. The I-wall design should be re-evaluated using a heavier sheet pile section.

3. The sheet pile layouts under the gate monoliths should be shown on the drawings. The sheet piling should be centered on the concrete base to allow the placement of the prestressed concrete piles. Also, a slip joint is required between the gate monoliths and the adjacent I-wall. These details were previously provided to U.R.S.

4. The details of the prestressed concrete piles shown on the drawings note that 6 each 1/2 inch diameter prestressing strands are required, however, 8 strands are shown. The size of the spiral reinforcement is not indicated. The size should be No. 4W, square spiral. The size and number of all reinforcement should be indicated in these sections.

5. We have been working with U.R.S. Engineers and provided them with our recommendation for reducing the length of the gate monoliths, and for improving the pile foundation for these gates. When these revisions are finalized by U.R.S., the redesign should be submitted for our review.

6. The preliminary plans and the geotechnical report show the I-wall centered on the levee crown. The I-wall layout should be revised locating the wall line 4 feet from the levee centerline, on the flood side. This configuration provides more soil mass to help resist the water loads on the wall.

7. On drawing No. 20, the typical I-wall section shows a stabilization slab under the concrete wall. If the stabilization slab is required, it should extend at least 6 inches on both sides of the wall to help support the form work for the wall. The spacing of the vertical reinforcement should be revised to pass the rebars through the "flats" of the steel sheet piling. A No. 6 rebar should be welded to the tops of all sheet piling and a flexible wire jumper should be provided at the monolith joints to provide a cathodic protection system. These details were previously furnished to U.R.S.

8. A bush-hammer finish and a fractured fin finish, as well as wall graphics, are shown on drawing No. 20, however, it is not indicated where these finishes will be used.

9. The New Orleans Lakefront Levee, I.H.N.C. West to London Avenue Canal, Levee Enlargement contract will be under construction concurrently with the subject project. The Corps contract is presently scheduled for award in March, with the work completed in September 1986. It is requested that the OLB's contractor coordinate his work with our contractor to avoid any delays or interferences in the work areas common to both contracts. The levee work to be constructed under our contract will have the following design:

West end. Gross grade, El. 19.0, side slopes 1V on 2.75H
East end. Gross grade, El. 18.0, side slopes 1V on 2.75H

10. The surface materials for the access ramps over the levee should be placed above the gross design grade for the ramp, and not within the levee design section.

11. The valve manholes for the drain lines, shown on drawings 3 and 6, should be located on the flood side of the levee section to reduce the chance of a blowout under the levee during flood conditions.

12. The drop inlet and drain line under the ramp, shown on drawing 4, may be plugged rather than removed to save on relocation cost.

13. The sewer cleanouts, shown on drawing 5, are noted to be plugged, however, the sewer line is not shown. The sewer line and the cleanouts should be removed if this line is to be abandoned since the line is under the levee design section.

14. The existing manhole, shown on drawing 6, located under the levee section next to the ramp should be removed. All pipes connecting to the manhole should be removed within the limits of the levee section. The ends of the pipes should be plugged with concrete.

15. On drawing No. 6, a valve is shown for a waterline crossing the flood protection. Since the water line is a "closed" system, a valve is not required for flood protection.

16. The existing electric system, shown on drawing 12, should be relocated outside of the levee design sections.

17. The relocation plan for the 12-inch water line (see enclosure 1, provided by the NOS&WB) along the west roadway ramp should include a connection to the existing 8-inch water main to U.N.O.

18. The 6-inch water main, shown on drawing 14, is to be abandoned. This should be verified with the NOS&WB. This line and the 6-inch H.P. gas line should be relocated outside the levee design section.

19. All utility relocations and utilities crossing the flood protection should be constructed in accordance with COE criteria.

20. The design report for this work should explain alternative alinements and why this particular alinement was selected over the others.

ok 21. The levee and I-wall alinements should be located such that the existing seawall is outside of the extended main levee slope. In addition, appropriate geotechnical analyses (seepage, exit gradients, etc.) should be presented indicating that the location of the existing seawall does not adversely affect the integrity of the levee.

ok 22. The earthen levee section should be designed for IV on 3H side slopes and stability berms, if required, in lieu of the IV on 5H side slopes presented.

ok 23. The design of the spread footing for the retaining wall, including bearing capacity computations and settlement analysis, should be furnished for review.

ok 24. Pile tests, if performed, should be in accordance with COE procedures. The test results should be furnished for review. Example compression test and tension test schedules are shown in enclosure 2.

ok 25. The I-wall section located behind the seawall should be presented on the drawings.

ok 26. All utility lines should be relocated over the levee and designed for a FS = 1.5 according to established COE procedures. Also, any abandoned utility line should be removed from under the levee section.

ok ✓ 27. Settlement analysis for the levee section, I-wall, piles and ramps should be presented. These computations should include an allowance for shrinkage of the fill material.

Lateral spread = 25% of Total sett.
SHRINKAGE = 10% of Fill

ok 28. The stratification, wet densities, and the shear strength trend developed for each reach should be presented. The shear strength trend should be selected in accordance with EM 1110-2-1902 such that two-thirds of the test values exceed the values for each embankment zone and foundation layer.

29. Computations for seepage analyses beneath the proposed levee, I-wall sections, gate structures and ramps should be presented.

30. For the driving of concrete piles, it is required that the weight of the moving parts of the hammer shall be at least two-thirds of the weight of the pile to be driven.

31. If predrilling is necessary, the drilling should be no closer than 5 feet above the required pile tip elevation.

32. The computations for the Coefficient of Horizontal Subgrade Reaction for gates 1, 2, and 3 should be presented.

33. The maximum moisture content for a compacted CH material should be changed from 50% to 45%.

34. The stability analysis of the earthen levee should include the gross section.

35. The stratification and strength from Figure 29 is different from El.0.0 to El. -10.0 than the one presented on Figure 28 of the report.

36. The stratification and strength from Figure 30 is different from El. -6.0 down than the one presented on Figure 28 of the report. ✓

37. The shear strengths and wet density values used for the pile capacities and subgrade modulus for gates 1, 2, and 3 should be shown.

38. On drawing No. 6, the part of the seawall to be removed should be shown.

39. On drawing No. 10, the gross elevations of the earthen levee and I-wall levee combination should be shown.

40. On drawings No. 11 and No. 12, the type of material used to build the ramps should be shown.

41. Previous correspondence indicates that the swimming pool is a pile-founded structure. Based on this information, the swimming pool should be removed. This change should be presented on the corresponding drawings. ✓

Piles will stay

N.

I trust that the foregoing is responsive to your needs. If we can be of further assistance in this matter, please let me know.

Sincerely,

Frederic M. Chatry
Chief, Engineering Division

Enclosure

ELMER
LMNED-SP
BARTON
LMNED-SP
HARRINGTON
LMNED-S
JUDLIN
LMNED-D

PICCIOLA
LMNED-F

CHATRY
LMNED

PARTNERS
J. BRES EUSTIS
REG. C. E.
CHARLES A. BRAGG (1918-1979)
REG. C. E.
JOHN W. ROACH, JR.
REG. C. E.
GERALD A. BRAGG
REG. C. E.
LLOYD A. HELD, JR.
REG. C. E.

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
BORINGS • TESTS • ANALYSES
3011 28TH STREET
METAIRIE, LOUISIANA 70002
P. O. BOX 8708
METAIRIE, LOUISIANA 70011
PHONE (504) 834-0157

OFFICERS
EUSTIS ENGINEERING CO., INC.
ASSOCIATED WITH
EUSTIS ENGINEERING CO.
CHAIRMAN OF THE BOARD
J. BRES EUSTIS
PRESIDENT
JOHN W. ROACH, JR.
CORP. VICE-PRESIDENT AND
CHIEF ADMINISTRATIVE OFFICER
GERALD A. BRAGG
VICE PRESIDENT AND
CHIEF ENGINEER
LLOYD A. HELD, JR.

10 February 1986

URS Company
3500 N. Causeway Boulevard
Metairie, Louisiana 70002

Attention Mr. Bruce Adams

Gentlemen:

Corps of Engineers Comments
Geotechnical Investigation
Orleans Levee District
Pontchartrain Beach Floodwalls and Levees
New Orleans, Louisiana

Enclosed are our answers to the comments from the Corps of Engineers relative to our report.

If you require additional information or clarification, please do not hesitate to contact us.

Yours very truly,

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.
Lloyd A. Held, Jr.

W. W. Gwyn:kdl

Enclosures

Hand Carried by Ronald Elmer
14 FEB. 86
RE.

Corps of Engineers Comments
Geotechnical Investigation
Orleans Levee District
Pontchartrain Beach Floodwalls and Levees
New Orleans, Louisiana

✓Comment 21:	See Comment 29.
✓Comment 22:	This section will be provided in lieu of the all earthen section shown on Figure 28. The results of the revised stability analysis in the form of computer input and output are shown in Enclosure 2.
✓Comment 23:	These are provided in Enclosure 3.
✓Comment 26:	We agree that all abandoned lines should be removed. We understand relocated utility lines are anticipated to be placed at locations outside of the project limits and no analyses are required for the report.
✓Comment 27:	Settlement computations in the form of computer input and output are provided in Enclosure 4. Note that consolidation settlement is conservatively estimated in order to compensate for shrinkage. Shrinkage varies greatly with the type of material used as fill, the depth the fill is placed, and the moisture content at which the fill is compacted. We recommend any loss of section due to shrinkage in excess of the estimates in our report be replaced by subsequent maintenance. Ysai
✓Comment 28:	The stratification and design parameters are indicated in the stability analyses. An overlay of the laboratory shear strength values is shown as Enclosure 5. The same general stratification and design parameters were used for the stability and settlement analyses varying only with the extent of the near surface clay strata.
✓Comment 29:	See Enclosure 6.
✓Comment 32:	The results of these computations and the formulas are shown on Enclosure 7. "Worst case" overlay of these were assumed for the project site and presented in our report. Design parameters and the results of the calculations are shown on Enclosure 8.

Comment 34: The analyses presented is for the gross section. However, this section has been modified as per Comment 22.

Comment 35: See Comment 28. Stratification for this analysis reflects the near surface soil conditions as indicated by Borings 1 and 10.

Comment 36: Long term "S" case parameters (ϕ = 25°, γ = 117) were conservatively assumed for the loose sand stratum shown between -6.0 and -10.0 on Figure 30.

Comment 37: These are shown on Enclosure 8.

```
FILE NAME =  STABOUT
                      9:05 AM  MON., 10  FEB., 1986




                        * STABILITY WITH UPLIFT *


PONTCHARTRAIN BEACH
EARTHEN SECTION


  9 STRATA
 10 PROFILES
  1 VERTICALS
UPLIFT WITH 1 PIEZOMETRIC GRADE LINES



* * STRATUM  3, TEST PLANE  510. FT., EL.    3.0 FT. TO  900. FT.
                EL.    3.0 FT.

                P.H.L.  1 USED STRA.  3 AND  1 USED STRA.  4



ASSUMED FAILURE SURFACE DATA
   DIST.    ELEV.      WT.    UPLIFT     STR 1     STR 2  STR USED
    (FT)     (FT)     (LBF)    (LBF)     (LBF)     (LBF)     (LBF)

      0.0      3.0      674.      531.      600.       76.       76.
    430.0      3.0      674.      531.      600.       76.       76.
    455.0      3.0      935.      531.      600.      215.      215.
SHEAR STRENGTHS ARE EQUAL   600.0 LBF AT DIST.  481.7 FT.
    500.0      3.0     1980.      353.      600.      865.      600.
    510.0      3.0     1980.      314.      600.      886.      600.
SHEAR STRENGTHS ARE EQUAL   600.0 LBF AT DIST.  524.8 FT.
    552.0      3.0      330.      188.      600.       76.       76.
   1000.0      3.0      330.      188.      600.       76.       76.


ASSUMED CRIT. PASSIVE LOC.  900.0 FT., EL.   3.0 FT., DP      495. LBF.
RP     3599. LBF.


ACTIVE WEDGE DATA

   DIST.     ELEV.       DA         RA         DB         RB          FS
    (FT)      (FT)     (LBF)      (LBF)      (LBF)      (LBF)

   510.0      3.0     17203.     14485.        0.      44434.       3.74
   515.0      3.0     17239.     15182.        0.      41434.       3.60
   520.0      3.0     15849.     15598.        0.      38434.       3.75
   525.0      3.0     13395.     15596.        0.      35435.       4.23
   530.0      3.0     10080.     14707.        0.      32693.       5.32
   535.0      3.0      7037.     12486.        0.      30434.       7.11
   540.0      3.0      4540.     10264.        0.      28657.      10.51


CRIT. ACTIVE LOC    515.0 FT., EL   3.0 FT., DA   17239. LBF.,
RA   15182. LBF.

```

Enc. 2
(Sheet 1)

```
         DIS.        EL.        DP          RP          DB         RB           FS
         (FT)        (FT)      (LBF)       (LBF)       (LBF)      (LBF)

        542.0        3.0       1750.       5074.         0.      13353.        2.17
        530.0        3.0       4776.       7600.         0.       8741.        2.53
        520.0        3.0       8435.       9704.         0.       3000.        3.17



* * STRATUM   4, TEST PLANE   510. FT., EL.    -6.0 FT. TO   900. FT.
                        EL.    -6.0 FT.

                        P.H.L.   1 USED STRA.   4 AND   1 USED STRA.   5



ASSUMED FAILURE SURFACE DATA
       DIST.     ELEV.        WT.     UPLIFT      STR 1      STR 2   STR USED
        (FT)      (FT)      (LBF)     (LBF)      (LBF)      (LBF)     (LBF)

         0.0      -6.0      1754.     1094.       351.       351.       351.
       430.0      -6.0      1754.     1094.       351.       351.       351.
       455.0      -6.0      2015.     1094.       490.       490.       490.
       500.0      -6.0      3060.      916.      1140.      1140.      1140.
       510.0      -6.0      3060.      876.      1161.      1161.      1161.
       552.0      -6.0      1410.      750.       351.       351.       351.
      1000.0      -6.0      1410.      750.       351.       351.       351.


ASSUMED CRIT. PASSIVE LOC.   900.0 FT., EL.   -6.0 FT., DP     8324. LBF.
RP     9990. LBF.


ACTIVE WEDGE DATA

       DIST.       ELEV.       DA          RA          DB          RB           FS
        (FT)        (FT)      (LBF)       (LBF)       (LBF)       (LBF)

       510.0       -6.0      38770.      24735.         0.     153862.        6.19
       515.0       -6.0      38998.      25025.         0.     148298.        5.98
       520.0       -6.0      37388.      24710.         0.     143217.        6.12
       525.0       -6.0      34336.      24166.         0.     138619.        6.64
       530.0       -6.0      30194.      23150.         0.     134502.        7.67
       535.0       -6.0      25148.      21426.         0.     130867.        9.65
       540.0       -6.0      20293.      18189.         0.     127714.       13.02


CRIT. ACTIVE LOC     515.0 FT., EL   -6.0 FT., DA    38998. LBF.,
RA    25025. LBF.
                                          Rp=0 DUE TO DIFF. SETTL. AT EXISTING
                                                                 SEAWALL.

         DIS.        EL.        DP          RP          DB         RB           FS
         (FT)        (FT)      (LBF)       (LBF)       (LBF)      (LBF)

        542.0       -6.0       9505.     12080. 0        0.      21710.     ~~1.99~~ 1.58
        530.0       -6.0      14189.     19938. 0        0.      13797.     ~~2.35~~ 1.56
        520.0       -6.0      19834.     27364. 0        0.       5081.     ~~3.00~~ 1.57



* * STRATUM   5, TEST PLANE   510. FT., EL.   -10.0 FT. TO   900. FT.
                        EL.   -10.0 FT.

                        P.H.L.   1 USED STRA.   5 AND   1 USED STRA.   6
```

```
0126
0127
0128 ASSUMED FAILURE SURFACE DATA
0129     DIST.    ELEV.       WT.    UPLIFT     STR 1     STR 2  STR USED
0130      (FT)     (FT)     (LBF)     (LBF)     (LBF)     (LBF)     (LBF)
0131
0132       0.0    -10.0     2234.     1344.      473.      438.      438.
0133     430.0    -10.0     2234.     1344.      473.      439.      439.
0134     455.0    -10.0     2495.     1344.      612.      509.      509.
0135     500.0    -10.0     3540.     1166.     1262.      836.      836.
0136     510.0    -10.0     3540.     1126.     1283.      847.      847.
0137     552.0    -10.0     1890.     1000.      473.      438.      438.
0138    1000.0    -10.0     1890.     1000.      473.      438.      438.
0139
0140
0141 ASSUMED CRIT. PASSIVE LOC.   900.0 FT., EL. -10.0 FT., DP   14923. LBF.
0142 RP    15475. LBF.
0143
0144
0145 ACTIVE WEDGE DATA
0146
0147     DIST.     ELEV.         DA         RA         DB         RB          FS
0148      (FT)      (FT)      (LBF)      (LBF)      (LBF)      (LBF)
0149
0150     510.0     -10.0     51297.     30207.         0.    179572.        6.19
0151     515.0     -10.0     51754.     30547.         0.    175460.        6.01
0152     520.0     -10.0     50163.     29943.         0.    171592.        6.16
0153     525.0     -10.0     47003.     29172.         0.    167966.        6.63
0154     530.0     -10.0     42552.     27815.         0.    164583.        7.52
0155     535.0     -10.0     37113.     26346.         0.    161443.        9.16
0156     540.0     -10.0     31231.     23018.         0.    158546.       12.08
0157
0158
0159 CRIT. ACTIVE LOC     515.0 FT., EL -10.0 FT., DA   51754. LBF.,
0160 RA   30547. LBF.
0161
0162
0163      DIS.       EL.         DP         RP         DB         RB         FS
0164      (FT)      (FT)      (LBF)      (LBF)      (LBF)      (LBF)
0165
0166     542.0     -10.0     16105.     17566.         0.     18005.       1.85
0167     530.0     -10.0     20637.     25172.         0.     10877.       2.14
0168     520.0     -10.0     27065.     35153.         0.      3869.       2.82
0169
0170
0171
0172 * * STRATUM  6, TEST PLANE  510. FT., EL.  -20.0 FT. TO  900. FT.
0173                     EL.  -20.0 FT.
0174
0175                     P.H.L.  1 USED STRA.  6 AND  1 USED STRA.  7
0176
0177
0178
0179 ASSUMED FAILURE SURFACE DATA
0180     DIST.    ELEV.       WT.    UPLIFT     STR 1     STR 2  STR USED
0181      (FT)     (FT)     (LBF)     (LBF)     (LBF)     (LBF)     (LBF)
0182
0183       0.0    -20.0     3404.     1969.      585.      400.      400.
0184     430.0    -20.0     3404.     1969.      585.      400.      400.
0185     455.0    -20.0     3665.     1969.      655.      400.      400.
0186     500.0    -20.0     4710.     1791.      982.      400.      400.
0187     510.0    -20.0     4710.     1751.      993.      400.      400.
0188     552.0    -20.0     3060.     1625.      585.      400.      400.
0189    1000.0    -20.0     3060.     1625.      584.      400.      400.
0190
0191
```

Enc. 2
(Sheet 3)

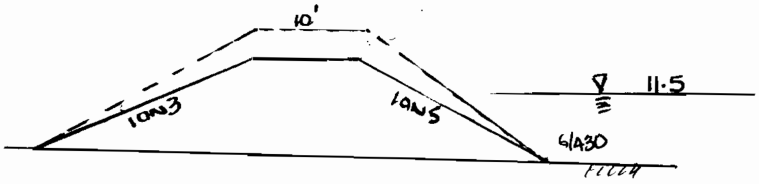
```
RP    28806. LBF.


ACTIVE WEDGE DATA

      DIST.     ELEV.        DA        RA       DB        RB        FS
      (FT)      (FT)       (LBF)     (LBF)    (LBF)     (LBF)

      510.0     -20.0     89425.    42568.      0.    156000.      4.57
      515.0     -20.0     91025.    43614.      0.    154000.      4.41
      520.0     -20.0     90596.    43712.      0.    152000.      4.41
      525.0     -20.0     88109.    42841.      0.    150000.      4.58
      530.0     -20.0     83772.    41349.      0.    148000.      4.95
      535.0     -20.0     77992.    39639.      0.    146000.      5.60
      540.0     -20.0     71113.    37444.      0.    144000.      6.69
      545.0     -20.0     63328.    34553.      0.    142000.      8.68


CRIT. ACTIVE LOC     520.0 FT., EL -20.0 FT., DA    90596. LBF.,
RA    43712. LBF.


       DIS.       EL.        DP        RP       DB        RB       FS
       (FT)      (FT)      (LBF)     (LBF)    (LBF)     (LBF)

      542.0     -20.0     41181.    29861.      0.      8800.      1.67
      530.0     -20.0     46705.    34570.      0.      4000.      1.87
      520.0     -20.0     53929.    42655.      0.         0.      2.36



* * STRATUM  7, TEST PLANE  510. FT., EL.  -26.0 FT. TO  900. FT.
                          EL.  -26.0 FT.

                          P.H.L.  1 USED STRA.  7 AND  1 USED STRA.  8



ASSUMED FAILURE SURFACE DATA
      DIST.    ELEV.       WT.    UPLIFT    STR 1     STR 2   STR USED
      (FT)     (FT)      (LBF)    (LBF)     (LBF)     (LBF)    (LBF)

        0.0    -26.0     4028.    2344.     400.      550.      400.
      430.0    -26.0     4028.    2344.     400.      550.      400.
      455.0    -26.0     4289.    2344.     400.      550.      400.
      500.0    -26.0     5334.    2166.     400.      550.      400.
      510.0    -26.0     5334.    2126.     400.      550.      400.
      552.0    -26.0     3684.    2000.     400.      550.      400.
     1000.0    -26.0     3684.    2000.     400.      550.      400.


ASSUMED CRIT. PASSIVE LOC.  900.0 FT., EL. -26.0 FT., DP   59902. LBF.
RP    33606. LBF.


ACTIVE WEDGE DATA

      DIST.     ELEV.        DA        RA       DB        RB        FS
      (FT)      (FT)       (LBF)     (LBF)    (LBF)     (LBF)

      510.0     -26.0    115781.    45064.      0.    156000.      4.20
      515.0     -26.0    118510.    47032.      0.    154000.      4.00
      520.0     -26.0    119355.    48296.      0.    152000.      3.93
      525.0     -26.0    118142.    48562.      0.    150000.      3.99
      530.0     -26.0    114897.    47898.      0.    148000.      4.17
```

Enc. 2
(Sheet 4)

```
0258     535.0    -26.0    109701.     46448.          0.    146000.        4.54
0259     540.0    -26.0     03014.     44878.          0.    144000.        5.16
0260     545.0    -26.0     95154.     42683.          0.    142000.        6.19
0261
0262
0263 CRIT. ACTIVE LOC     520.0 FT., EL -26.0 FT., DA  119355. LBF.,
0264 RA    48296. LBF.
0265
0266
0267       DIS.       EL.        DP         RP         DB         RB          FS
0268       (FT)      (FT)      (LBF)      (LBF)      (LBF)      (LBF)
0269
0270     542.0    -26.0     61797.     33777.          0.      8800.        1.58
0271     530.0    -26.0     68213.     36311.          0.      4000.        1.73
0272     520.0    -26.0     76377.     42162.          0.         0.        2.10
0273
0274
0275
0276 * * STRATUM  8, TEST PLANE  510. FT., EL.  -34.0 FT. TO  900. FT.
0277                     EL.  -34.0 FT.
0278
0279                     P.H.L.  1 USED STRA.  8 AND  1 USED STRA.  9
0280
0281
0282
0283 ASSUMED FAILURE SURFACE DATA
0284      DIST.    ELEV.       WT.    UPLIFT     STR 1     STR 2   STR USED
0285       (FT)     (FT)     (LBF)     (LBF)     (LBF)     (LBF)     (LBF)
0286
0287        0.0    -34.0     4868.     2844.      550.     1169.      550.
0288      430.0    -34.0     4868.     2844.      550.     1169.      550.
0289      455.0    -34.0     5129.     2844.      550.     1320.      550.
0290      500.0    -34.0     6174.     2666.      550.     2025.      550.
0291      510.0    -34.0     6174.     2626.      550.     2048.      550.
0292      552.0    -34.0     4524.     2500.      550.     1169.      550.
0293     1000.0    -34.0     4524.     2500.      550.     1168.      550.
0294
0295
0296 ASSUMED CRIT. PASSIVE LOC.  900.0 FT., EL. -34.0 FT., DP   92734. LBF.
0297 RP    42407. LBF.
0298
0299
0300 ACTIVE WEDGE DATA
0301
0302      DIST.     ELEV.        DA         RA         DB         RB          FS
0303       (FT)      (FT)      (LBF)      (LBF)      (LBF)      (LBF)
0304
0305      510.0    -34.0    155338.     50151.          0.    214500.        4.90
0306      515.0    -34.0    159068.     52527.          0.    211750.        4.62
0307      520.0    -34.0    161217.     54694.          0.    209000.        4.47
0308      525.0    -34.0    161673.     56468.          0.    206250.        4.43
0309      530.0    -34.0    160094.     57287.          0.    203500.        4.50
0310      535.0    -34.0    156525.     57221.          0.    200750.        4.71
0311      540.0    -34.0    150865.     56145.          0.    198000.        5.10
0312      545.0    -34.0    143487.     54650.          0.    195250.        5.76
0313      550.0    -34.0    134703.     52800.          0.    192500.        6.86
0314
0315
0316 CRIT. ACTIVE LOC     525.0 FT., EL -34.0 FT., DA  161673. LBF.,
0317 RA    56468. LBF.
0318
0319
0320       DIS.       EL.        DP         RP         DB         RB          FS
0321       (FT)      (FT)      (LBF)      (LBF)      (LBF)      (LBF)
0322
0323     542.0    -34.0     94702.     42408.          0.      9350.        1.62
```

```
0325
0326
0327
0328 * * END * *
0329
0330
```

```
FILE NAME =  EARTH
                          9:08 AM  MON., 10  FEB., 1986


0001 0010 PONTCHARTRAIN BEACH
0002 0010 EARTHEN SECTION
0003 0010 9 1 2 1
0004 0010 500
0005 0010 0 62.5 0 0
0006 0010 0 110 400 400
0007 0010 0 110 600 600
0008 0010 28 120 0 0
0009 0010 28 120 0 0
0010 0010 15 117 200 200
0011 0010 0 104 400 400
0012 0010 0 105 550 550
0013 0010 30 120 0 0
0014 0010 0 11.5 455 11.5 500 21 510 21
0015 0010 552 6 1000 6 9999.9 0
0016 0010 0 6 430 6 455 11.5 500 21
0017 0010 510 21 552 6 1000 6 9999.9 0
0018 0010 0 6 1000 6 9999.9 0
0019 0010 0 3 1000 3 9999.9 0
0020 0010 0 -6 1000 -6 9999.9 0
0021 0010 0 -10 1000 -10 9999.9 0
0022 0010 0 -20 1000 -20 9999.9 0
0023 0010 0 -26 1000 -26 9999.9 0
0024 0010 0 -34 1000 -34 9999.9 0
0025 0010 0 -46 1000 -46 9999.9 0
0026 0010 0 11.5 455 11.5 542 6 1000 6
0027 0010 9999.9 0
0028 0010 1 1 1 1 1 1 1 1 1 1 1 1
0029 0010 1 1 1 1 1 1
0030 0010 3 510 3 900 3 3
0031 0010 542 530 520
0032 0010 4 510 -6 900 -6 3
0033 0010 542 530 520
0034 0010 5 510 -10 900 -10 3
0035 0010 542 530 520
0036 0010 6 510 -20 900 -20 3
0037 0010 542 530 520
0038 0010 7 510 -26 900 -26 3
0039 0010 542 530 520
0040 0010 8 510 -34 900 -34 2
0041 0010 542 530
```



EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Page

Date

Project Pontchartrain Beach

Job 9271

Subject Retaining Wall

By WG

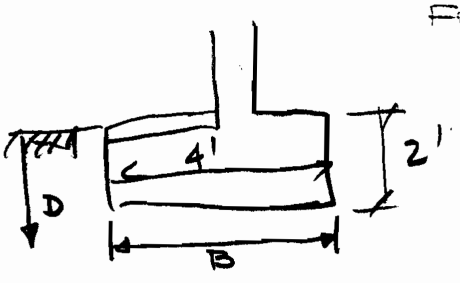
$$q_{ult} = cN_c + \gamma D N_q + 0.5\,\gamma B N_\gamma$$

WIDTH OF WALL ≅ 4'-0" @ 2'-0"

$\phi = 0$
$N_c = 5.7$
$N_q = 1.0$
$N_\gamma = 0$

FOR C=400 D=0

$\phi = 0$



$q_u = (5.14)(400)$ ✓

$= 2056$

$q_A = 822$ PSF F.S. = 2.5 OK ✓

ASSUME $\phi = 25°$

$N_q = 12$

$N_\gamma = 5$

$2 \quad 58 \times 4 \times 5 \times 0.5$

$q_u = \cancel{(58)(4)5} + (58)(2)(12)$ ✓

$= \cancel{2552}\ 1972$

$q_A = \cancel{1020}\ \overset{788}{}$ PSF F.S. = 2.5

USE ~~800~~ 788 PSF FS. = 2.5

Note:

$q_{ult} = 8400$

$q_{all} = \frac{8400}{3} = 2800$ #/ft² (see my computation) OK ✓

∴ OK

Enc. 3
(Sheet 1

```
PONTCHARTRAIN BEACH

RETAINING WALL SECTION


 CO-ORDINATES                     DIRECTIONAL STRESSES        EXCESS PORE EPSILON
   X         Y         Z        X\R         Y\T          Z         PRESSURE      Z

 575.0      0.0      3.0   563.8486   663.6476   763.4464   663.6476        .0015
 575.0      0.0      9.0   307.3224   500.6911   694.0597   500.6911        .0029
 575.0      0.0     14.0   201.5708   410.8721   620.1735   410.8721        .0031
 575.0      0.0     24.0   103.5167   300.0347   496.5527   300.0347        .0029
 575.0      0.0     36.0    55.0453   225.3497   395.6542   225.3497        .0026
 575.0      0.0     46.0    34.9159   185.9337   336.9514   185.9336        .0023
 575.0      0.0     57.0    22.2795   155.4575   288.6354   155.4575        .0020
 HORIZONTAL DISP.   =       0.00000   VERTICAL DISP.   =       0.00000


 613.0      0.0      3.0   207.5011   398.1704   588.8396   398.1703        .0029
 613.0      0.0      9.0   153.4659   243.4536   333.4412   243.4536        .0013
 613.0      0.0     14.0   150.2975   210.7395   271.1814   210.7395        .0009
 613.0      0.0     24.0   132.5990   182.5009   232.4028   182.5009        .0007
 613.0      0.0     36.0    99.1885   160.3487   221.5089   160.3487        .0009
 613.0      0.0     46.0    74.3055   144.2500   214.1945   144.2500        .0010
 613.0      0.0     57.0    53.5570   128.6400   203.7230   128.6400        .0011
 HORIZONTAL DISP.   =       0.00000   VERTICAL DISP.   =       0.00000
```

Enc. 3
(Sheet 2)

```
STRATUM     Z      SUB. WT   DRY  WT.       Eo      % SAT.      WC%      SPEC.GRAV
   1      3.00    47.5000    88.0000     .9176    73.56    25.0000     2.7000
   2      9.00    41.5000    67.5325   1.4988    97.28    54.0000     2.7000
   3     14.00    57.5000   100.0000     .6875    78.55    30.0000     2.7000
   4     24.00    54.5000    90.0000     .8750    92.57    30.0000     2.7000
   5     36.00    41.5000    72.7273   1.3203    87.93    43.0000     2.7000
   6     46.00    57.5000   100.0000     .6875    78.55    20.0000     2.7000
   7     57.00    47.5000    76.9231   1.1937    97.26    43.0000     2.7000


           WATER          TOTAL  STRESSES            EFFECTIVE  STRESSES
   Z      PRESSURE     VERTICAL     HORIZONTAL     VERTICAL     HORIZONTAL
  3.00      0.0000     330.0000     330.0000     330.0000     330.0000
  9.00    187.5000     972.0000     972.0000     784.5000     784.5000
 14.00    500.0000    1524.0000    1524.0000    1024.0000    1024.0000
 24.00   1125.0000    2700.0000    2700.0000    1575.0000    1575.0000
 36.00   1875.0000    4052.0000    4052.0000    2177.0000    2177.0000
 46.00   2500.0000    5188.0000    5188.0000    2688.0000    2688.0000
 57.00   3187.5000    6458.0000    6458.0000    3270.5000    3270.5000
```

ΔP/Po

✓ ✓ ✓ ✓

< 0.1
DISREGARD

```
   X              Y                      CONSOLIDATION SETTLEMENT
 575.00         0.00          3.00         .06243
 575.00         0.00          9.00         .26354
 575.00         0.00         14.00        0.00000
 575.00         0.00         24.00        0.00000
 575.00         0.00         36.00         .11604
 575.00         0.00         46.00        0.00000
 575.00         0.00         57.00         .01837

 575.00         0.00         TOTAL         .46038


 613.00         0.00          3.00         .05337
 613.00         0.00          9.00         .03870
 613.00         0.00         14.00        0.00000
 613.00         0.00         24.00        0.00000
 613.00         0.00         36.00         .06733
 613.00         0.00         46.00        0.00000
 613.00         0.00         57.00         .01312

 613.00         0.00         TOTAL         .22252


ELAPSED CPU TIME     33.3 SECONDS  $   6.67   FOR USER CWYN
```

ΔH = 0.14 1.68

SAY 1.5 TO 1.75

```
FILE NAME :   SETTB
                                    3:32 PM  WED.,   4  DEC., 1985

0001 PONTCHARTRAIN BEACH
0002 RETAINING WALL SECTION
0003 1 1 2 7
0004 575 0 613 0
0005 3 9 14 24 36 46 57
0006 100000 0.5 5
0007 2
0008 549 21
0009 770
0010 1
0011 570 10
0012 770
0013 3
0014 580 21
0015 770
0016 1
0017 601 10
0018 330
0019 1
0020 611 4
0021 800
0022 62.5 6
0023 6 110 2.7 0.5 100000 25
0024 6 104 2.7 0.5 100000 54
0025 4 120 2.7 0.5 100000 20
0026 16 117 2.7 0.5 100000 30
0027 8 104 2.7 0.5 100000 43
0028 12 120 2.7 0.5 100000 20
0029 10 110 2.7 0.5 100000 43
0030 2
0031 2
0032 0.02 0.11 3200
0033 2
0034 0.03 0.24 1000
0035 3
0036 0
0037 3
0038 0
0039 2
0040 0.04 0.2 2177
0041 3
0042 0
0043 2
0044 0.05 0.31 4400
```

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Page ______

Date 11/26/85

Project PONTCHARTRAIN BEACH FLOODWALL

Job 9271

Subject SETTLEMENT ANALYSES SUMMARY

By WWG

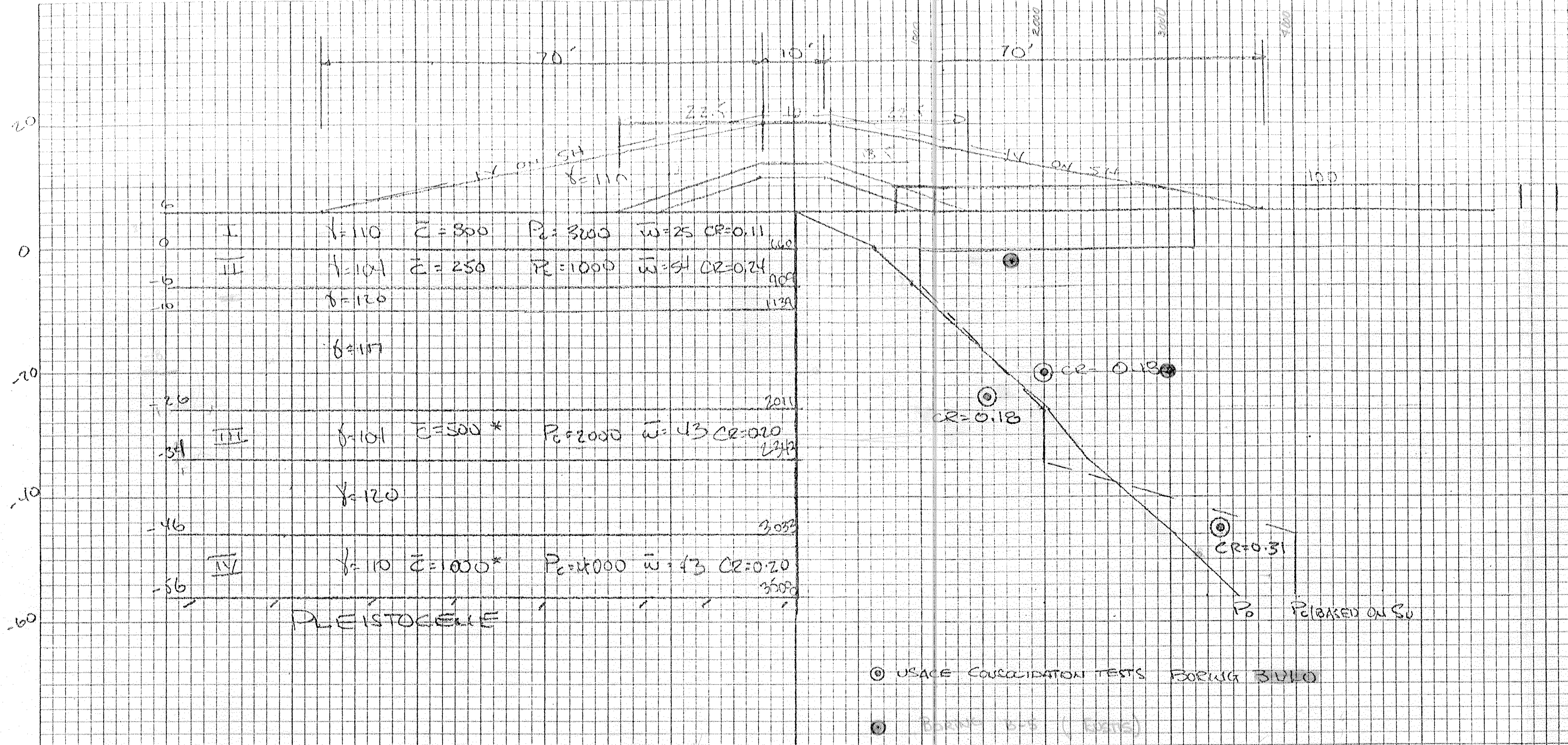
	ΔH (INCHES)	
FEATURE	℄	TOE (L.S.)
EARTHEN LEVEE (1) SECTION	10 TO 12	1 TO 2
I-WALL/LEVEE (2) EL 13.0 W/100' BERM	5 TO 7	0.75 TO 1.5
I-WALL/LEVEE (2) EL 13.0 W/10' BERM	5 TO 7	0.75 TO 1.5
I-WALL/LEVEE (3) EL 10.5 W/100' BERM	3 TO 5	0.75 TO 1.5
		—
		—

(1) ASSUMES 12" OVERBUILD TO EL 21.0

(2) ASSUMES 6" OVERBUILD TO EL 13.5

(3) ASSUMES 6" OVERBUILD TO EL 11.0

Enc. 4
(Sheet 1)



* TO ESTIMATE Pc

```
PONTCHARTRAIN BEACH


FULL LEVEE SECTION



 CO-ORDINATES                   DIRECTIONAL STRESSES     EXCESS PORE EPSILON
   X        Y        Z      X\R        Y\T        Z       PRESSURE      Z

 500.0     0.0      3.0  136.0548   79.2714   22.4879   79.2714      -.0009
 500.0     0.0      9.0  260.8073  163.8820   66.9567  163.8820      -.0015
 500.0     0.0     14.0  315.3595  209.1422  102.9249  209.1422      -.0016
 500.0     0.0     24.0  359.9648  264.9130  169.8612  264.9130      -.0014
 500.0     0.0     36.0  355.9155  297.0582  238.2009  297.0582      -.0009
 500.0     0.0     46.0  331.0406  307.3614  283.6821  307.3614      -.0004
 500.0     0.0     57.0  295.2963  308.5527  321.8091  308.5527       .0002
 HORIZONTAL DISP.  =      0.00000   VERTICAL DISP.  =      0.00000


 575.0     0.0      3.0 1415.5017 1530.5278 1645.5537 1530.5278       .0017
 575.0     0.0      9.0 1057.0940 1326.2461 1595.3984 1326.2463       .0040
 575.0     0.0     14.0  847.2257 1190.8259 1534.4258 1190.8257       .0052
 575.0     0.0     24.0  563.3584  983.6243 1403.8901  983.6243       .0063
 575.0     0.0     36.0  359.1476  806.4939 1253.8403  806.4940       .0067
 575.0     0.0     46.0  253.3630  696.9554 1140.5479  696.9554       .0067
 575.0     0.0     57.0  177.0189  603.4564 1029.8938  603.4563       .0064
 HORIZONTAL DISP.  =      0.00000   VERTICAL DISP.  =      0.00000
```

```
STRATUM    Z     SUB. WT.  DRY  WT.     Eo     % SAT.    WC%     SPEC.GRAV
   1      3.00   47.5000   88.0000    .9176   73.56   25.0000    2.7000
   2      9.00   41.5000   67.5325   1.4988   97.28   54.0000    2.7000
   3     14.00   57.5000  100.0000    .6875   78.55   20.0000    2.7000
   4     24.00   54.5000   90.0000    .8750   92.57   30.0000    2.7000
   5     36.00   41.5000   72.7273   1.3203   87.93   43.0000    2.7000
   6     46.00   57.5000  100.0000    .6875   78.55   20.0000    2.7000
   7     57.00   47.5000   76.9231   1.1937   97.26   43.0000    2.7000


           WATER        TOTAL  STRESSES          EFFECTIVE  STRESSES
   Z      PRESSURE    VERTICAL    HORIZONTAL    VERTICAL    HORIZONTAL
  3.00       0.0000    330.0000    330.0000     330.0000    330.0000
  9.00     187.5000    972.0000    972.0000     784.5000    784.5000
 14.00     500.0000   1524.0000   1524.0000    1024.0000   1024.0000
 24.00    1125.0000   2700.0000   2700.0000    1575.0000   1575.0000
 36.00    1875.0000   4052.0000   4052.0000    2177.0000   2177.0000
 46.00    2500.0000   5188.0000   5188.0000    2688.0000   2688.0000
 57.00    3187.5000   6458.0000   6458.0000    3270.5000   3270.5000
```

```
    X              Y              Z     CONSOLIDATION SETTLEMENT
 500.00          0.00          3.00         .00344
 500.00          0.00          9.00         .00640
 500.00          0.00         14.00        0.00000
 500.00          0.00         24.00        0.00000
 500.00          0.00         36.00         .07215
 500.00          0.00         46.00        0.00000
 500.00          0.00         57.00         .02038

 500.00          0.00         TOTAL         .10237


 575.00          0.00          3.00         .09326
 575.00          0.00          9.00         ~~.56122~~
 575.00          0.00         14.00        0.00000
 575.00          0.00         24.00        0.00000
 575.00          0.00         36.00         .31607
 575.00          0.00         46.00        0.00000
 575.00          0.00         57.00         .05945

 575.00          0.00         TOTAL        1.02999        '0.47        5.6 in


ELAPSED CPU TIME    40.9 SECONDS  $   8.17   FOR USER GWYN
```

```
   FILE NAME =  SETTA
                                  1:55 PM  TUE., 26  NOV., 1985


0001 PONTCHARTRAIN BEACH
0002 FULL LEVEE SECTION
0003 1 1 2 7
0004 500 0 575 0
0005 3 9 14 24 36 46 57
0006 100000 0.5 3
0007 2
0008 500 70
0009 1650
0010 1
0011 570 10
0012 1650
0013 3
0014 580 70
0015 1650
0016 62.5 6
0017 6 110 2.7 0.5 100000 25
0018 6 104 2.7 0.5 100000 54
0019 4 120 2.7 0.5 100000 20
0020 16 117 2.7 0.5 100000 30
0021 8 104 2.7 0.5 100000 43
0022 12 120 2.7 0.5 100000 20
0023 10 110 2.7 0.5 100000 43
0024 2
0025 2
0026 0.02 0.11 3200
0027 2
0028 0.03 0.24 1000
0029 3
0030 0
0031 3
0032 0
0033 2
0034 0.04 0.2 2177
0035 3
0036 0
0037 2
0038 0.05 0.31 4400
```

```
PONTCHARTRAIN BEACH

SHEET PILE SECTION 100' BERM 10.5 SECTION


 CO-ORDINATES                    DIRECTIONAL STRESSES        EXCESS PORE EPSILON
   X        Y        Z        X\R         Y\T           Z       PRESSURE       Z

 547.5     0.0      3.0     56.1039    28.7842      1.4646     28.7842     -.0004
 547.5     0.0      9.0    124.3412    73.3273     22.3135     73.3273     -.0008
 547.5     0.0     14.0    142.4077    95.4914     48.5751     95.4914     -.0007
 547.5     0.0     24.0    138.4749   115.1690     91.8631    115.1690     -.0003
 547.5     0.0     36.0    119.8415   119.8697    119.8980    119.8697      .0000
 547.5     0.0     46.0    105.4318   118.2604    131.0889    118.2603      .0002
 547.5     0.0     57.0     91.8132   114.4365    137.0599    114.4365      .0003
 HORIZONTAL DISP.  =        0.00000  VERTICAL DISP.  =        0.00000


 575.0     0.0      3.0    393.7842   468.7732    543.7621    468.7732      .0011
 575.0     0.0      9.0    223.9937   352.5999    481.2061    352.5999      .0019
 575.0     0.0     14.0    170.1216   295.7383    421.3550    295.7383      .0019
 575.0     0.0     24.0    129.6688   233.4762    337.2836    233.4762      .0016
 575.0     0.0     36.0    106.8080   194.7944    282.7807    194.7944      .0013
 575.0     0.0     46.0     92.1763   174.0350    255.8937    174.0350      .0012
 575.0     0.0     57.0     78.3026   156.8661    235.4297    156.8661      .0012
 HORIZONTAL DISP.  =        0.00000  VERTICAL DISP.  =        0.00000
```

```
STRATUM     Z      SUB. WT.    DRY  WT.      Eo      % SAT.      WC%       SPEC.GRAV
   1       3.00    47.5000    88.0000      .9176    73.56     25.0000      2.7000
   2       9.00    41.5000    67.5325    1.4988    97.28     54.0000      2.7000
   3      14.00    57.5000   100.0000      .6875    78.55     20.0000      2.7000
   4      24.00    54.5000    90.0000      .8750    92.57     30.0000      2.7000
   5      36.00    41.5000    72.7273    1.3203    87.93     43.0000      2.7000
   6      46.00    57.5000   100.0000      .6875    78.55     20.0000      2.7000
   7      57.00    47.5000    76.9231    1.1937    97.26     43.0000      2.7000


            WATER           TOTAL  STRESSES          EFFECTIVE  STRESSES
   Z       PRESSURE      VERTICAL    HORIZONTAL     VERTICAL     HORIZONTAL
  3.00       0.0000      330.0000     330.0000      330.0000      330.0000
  9.00     187.5000      972.0000     972.0000      784.5000      784.5000
 14.00     500.0000     1524.0000    1524.0000     1024.0000     1024.0000
 24.00    1125.0000     2700.0000    2700.0000     1575.0000     1575.0000
 36.00    1875.0000     4052.0000    4052.0000     2177.0000     2177.0000
 46.00    2500.0000     5188.0000    5188.0000     2688.0000     2688.0000
 57.00    3187.5000     6458.0000    6458.0000     3270.5000     3270.5000
```

```
      X            Y            Z    CONSOLIDATION SETTLEMENT
   547.50        0.00         3.00       .00023
   547.50        0.00         9.00       .00219
   547.50        0.00        14.00      0.00000
   547.50        0.00        24.00      0.00000
   547.50        0.00        36.00       .03725
   547.50        0.00        46.00      0.00000
   547.50        0.00        57.00       .00891

   547.50        0.00        TOTAL       .04859


   575.00        0.00         3.00       .05075
   575.00        0.00         9.00       .16633
   575.00        0.00        14.00      0.00000
   575.00        0.00        24.00      0.00000
   575.00        0.00        36.00       .08486
   575.00        0.00        46.00      0.00000
   575.00        0.00        57.00       .01509

   575.00        0.00        TOTAL       .31703


ELAPSED CPU TIME     35.1 SECONDS  $  7.02   FOR USER GWYN
```

```
FILE NAME =  SETTB
                              3:08 PM   TUE., 26  NOV., 1985


0001 PONTCHARTRAIN BEACH
0002 SHEET PILE SECTION 100' BERM 10.5 SECTION'
0003 1 1 2 7
0004 547.5 0 575 0
0005 3 9 14 24 36 46 57
0006 100000  0.5 4
0007 2
0008 555 15
0009 550
0010 1
0011 570 10
0012 550
0013 3
0014 580 15
0015 550
0016 1
0017 596 100
0018 330
0019 62.5 6
0020 6 110 2.7 0.5 100000 25
0021 6 104 2.7 0.5 100000 54
0022 4 120 2.7 0.5 100000 20
0023 16 117 2.7 0.5 100000 30
0024 8 104 2.7 0.5 100000 43
0025 12 120 2.7 0.5 100000 20
0026 10 110 2.7 0.5 100000 43
0027 2
0028 2
0029 0.02 0.11 3200
0030 2
0031 0.03 0.24 1000
0032 3
0033 0
0034 3
0035 0
0036 2
0037 0.04 0.2 2177
0038 3
0039 0
0040 2
0041 0.05 0.31 4400
```

```
PONTCHARTRAIN BEACH


SHEET PILE SECTION 10'BERM FULL SECTION



 CO-ORDINATES                  DIRECTIONAL STRESSES      EXCESS PORE EPSILON
   X        Y        Z       X\R         Y\T          Z        PRESSURE      Z

 547.5     0.0      3.0   142.0200    88.3858    34.7516    88.3858     -.0008
 547.5     0.0      9.0   207.1238   152.7918    98.4597   152.7918     -.0008
 547.5     0.0     14.0   203.6641   172.3741   141.0842   172.3741     -.0005
 547.5     0.0     24.0   159.1375   176.7561   194.3748   176.7561      .0003
 547.5     0.0     36.0   106.6064   161.6999   216.7932   161.6998      .0008
 547.5     0.0     46.0    75.5281   146.1430   216.7579   146.1430      .0011
 547.5     0.0     57.0    52.3712   130.1259   207.8806   130.1259      .0012
 HORIZONTAL DISP.   =       0.00000   VERTICAL DISP.   =       0.00000


 575.0     0.0      3.0   609.6715   714.0649   818.4583   714.0649      .0016
 575.0     0.0      9.0   334.6954   541.8776   749.0596   541.8774      .0031
 575.0     0.0     14.0   214.9623   444.5548   674.1472   444.5547      .0034
 575.0     0.0     24.0    99.2967   321.0652   542.8337   321.0652      .0033
 575.0     0.0     36.0    45.4153   236.7414   428.0674   236.7414      .0029
 575.0     0.0     46.0    26.0559   192.8013   359.5467   192.8013      .0025
 575.0     0.0     57.0    15.3464   159.4732   303.6000   159.4732      .0022
 HORIZONTAL DISP.   =       0.00000   VERTICAL DISP.   =       0.00000
```

```
STRATUM     Z      SUB. WT.    DRY  WT.      Eo     % SAT.      WC%       SPEC.GRAV
   1       3.00    47.5000     88.0000     .9176    73.56     25.0000      2.7000
   2       9.00    41.5000     67.5325    1.4988    97.28     54.0000      2.7000
   3      14.00    57.5000    100.0000     .6875    78.55     20.0000      2.7000
   4      24.00    54.5000     90.0000     .8750    92.57     30.0000      2.7000
   5      36.00    41.5000     72.7273    1.3203    87.93     43.0000      2.7000
   6      46.00    57.5000    100.0000     .6875    78.55     20.0000      2.7000
   7      57.00    47.5000     76.9231    1.1937    97.26     43.0000      2.7000


           WATER         TOTAL  STRESSES          EFFECTIVE  STRESSES
  Z       PRESSURE     VERTICAL    HORIZONTAL     VERTICAL     HORIZONTAL
 3.00       0.0000     330.0000     330.0000      330.0000      330.0000
 9.00     187.5000     972.0000     972.0000      784.5000      784.5000
14.00     500.0000    1524.0000    1524.0000     1024.0000     1024.0000
24.00    1125.0000    2700.0000    2700.0000     1575.0000     1575.0000
36.00    1875.0000    4052.0000    4052.0000     2177.0000     2177.0000
46.00    2500.0000    5188.0000    5188.0000     2688.0000     2688.0000
57.00    3187.5000    6458.0000    6458.0000     3270.5000     3270.5000
```

```
      X            Y            Z    CONSOLIDATION SETTLEMENT
   547.50        0.00         3.00        .00522
   547.50        0.00         9.00        .00924
   547.50        0.00        14.00       0.00000
   547.50        0.00        24.00       0.00000
   547.50        0.00        36.00        .06597
   547.50        0.00        46.00       0.00000
   547.50        0.00        57.00        .01338

   547.50        0.00        TOTAL        .09381


   575.00        0.00         3.00        .06499
   575.00        0.00         9.00        .28638
   575.00        0.00        14.00       0.00000
   575.00        0.00        24.00       0.00000
   575.00        0.00        36.00        .12474
   575.00        0.00        46.00       0.00000
   575.00        0.00        57.00        .01928

   575.00        0.00        TOTAL        .49539


ELAPSED CPU TIME     33.1 SECONDS   $   6.62    FOR USER GWYN
```

```
FILE NAME =  SETTB
                          2:59 PM  TUE., 26  NOV., 1985


0001 PONTCHARTRAIN BEACH
0002 SHEET PILE SECTION 10'BERM FULL SECTION
0003 1 1 2 7
0004 547.5 0 575 0
0005 3 9 14 24 36 46 57
0006 100000 0.5 4
0007 2
0008 547.5 22.5
0009 825
0010 1
0011 570 10
0012 825
0013 3
0014 580 22.5
0015 825
0016 1
0017 596 10
0018 330
0019 62.5 6
0020 6 110 2.7 0.5 100000 25
0021 6 104 2.7 0.5 100000 54
0022 4 120 2.7 0.5 100000 20
0023 16 117 2.7 0.5 100000 30
0024 8 104 2.7 0.5 100000 43
0025 12 120 2.7 0.5 100000 20
0026 10 110 2.7 0.5 100000 43
0027 2
0028 2
0029 0.02 0.11 3200
0030 2
0031 0.03 0.24 1000
0032 3
0033 0
0034 3
0035 0
0036 2
0037 0.04 0.2 2177
0038 3
0039 0
0040 2
0041 0.05 0.31 4400
```

PONTCHARTRAIN BEACH

SHEET PILE SECTION   100' BERM   - FULL SECTION

```
 CO-ORDINATES                  DIRECTIONAL STRESSES       EXCESS PORE EPSILON
   X         Y         Z        X\R          Y\T          Z          PRESSURE       Z

 547.5      0.0      3.0    148.5317     91.6461     34.7605     91.6461      -.0009
 547.5      0.0      9.0    226.2441    162.4680     98.6918    162.4680      -.0010
 547.5      0.0     14.0    232.4259    187.1746    141.9232    187.1746      -.0007
 547.5      0.0     24.0    203.5427    200.8198    198.0969    200.8198      -.0000
 547.5      0.0     36.0    162.4052    194.6641    226.9230    194.6641       .0005
 547.5      0.0     46.0    135.3188    184.5839    233.8489    184.5839       .0007
 547.5      0.0     57.0    112.3712    172.7642    233.1572    172.7642       .0009
 HORIZONTAL DISP.   =        0.00000   VERTICAL DISP.   =        0.00000


 575.0      0.0      3.0    624.6702    721.5948    818.5197    721.5950       .0015
 575.0      0.0      9.0    376.9325    563.7590    750.5854    563.7590       .0028
 575.0      0.0     14.0    274.8300    477.0134    679.1967    477.0133       .0030
 575.0      0.0     24.0    178.7319    369.6998    560.6677    369.6998       .0029
 575.0      0.0     36.0    128.5923    296.6897    464.7870    296.6897       .0025
 575.0      0.0     46.0    104.3944    257.3500    410.3056    257.3500       .0023
 575.0      0.0     57.0     85.3708    225.9061    366.4413    225.9061       .0021
 HORIZONTAL DISP.   =        0.00000   VERTICAL DISP.   =        0.00000
```

```
STRATUM      Z      SUB. WT.   DRY  WT.       Eo     % SAT.      WC%       SPEC.GRAV
   1       3.00    47.5000    88.0000      .9176    73.56    25.0000       2.7000
   2       9.00    41.5000    67.5325    1.4988    97.28    54.0000       2.7000
   3      14.00    57.5000   100.0000      .6875    78.55    20.0000       2.7000
   4      24.00    54.5000    90.0000      .8750    92.57    30.0000       2.7000
   5      36.00    41.5000    72.7273    1.3203    87.93    43.0000       2.7000
   6      46.00    57.5000   100.0000      .6875    78.55    20.0000       2.7000
   7      57.00    47.5000    76.9231    1.1937    97.26    43.0000       2.7000


             WATER          TOTAL  STRESSES            EFFECTIVE  STRESSES
   Z        PRESSURE     VERTICAL    HORIZONTAL     VERTICAL      HORIZONTAL
  3.00        0.0000      330.0000     330.0000      330.0000      330.0000
  9.00      187.5000      972.0000     972.0000      784.5000      784.5000
 14.00      500.0000     1524.0000    1524.0000     1024.0000     1024.0000
 24.00     1125.0000     2700.0000    2700.0000     1575.0000     1575.0000
 36.00     1875.0000     4052.0000    4052.0000     2177.0000     2177.0000
 46.00     2500.0000     5188.0000    5188.0000     2688.0000     2688.0000
 57.00     3187.5000     6458.0000    6458.0000     3270.5000     3270.5000
```

```
     X            Y            Z    CONSOLIDATION SETTLEMENT
  547.50        0.00         3.00       .00522
  547.50        0.00         9.00       .00926
  547.50        0.00        14.00      0.00000
  547.50        0.00        24.00      0.00000
  547.50        0.00        36.00       .06890
  547.50        0.00        46.00      0.00000
  547.50        0.00        57.00       .01495

  547.50        0.00        TOTAL       .09834


  575.00        0.00         3.00       .06499
  575.00        0.00         9.00       .28700
  575.00        0.00        14.00      0.00000
  575.00        0.00        24.00      0.00000
  575.00        0.00        36.00       .13446
  575.00        0.00        46.00      0.00000
  575.00        0.00        57.00       .02306

  575.00        0.00        TOTAL       .50952


ELAPSED CPU TIME     37.2 SECONDS  $   7.44   FOR USER GWYN
```

```
FILE NAME =  SETTB
                                  2:17 PM  TUE., 26  NOV., 1985

0001 PONTCHARTRAIN BEACH
0002 SHEET PILE SECTION  100'  BERM  FULL  SECTION
0003 1 1 2 7
0004 547.5 0 575 0
0005 3 9 14 24 36 46 57
0006 100000 0.5 4
0007 2
0008 547.5 22.5
0009 825
0010 1
0011 570 10
0012 825
0013 3
0014 580 22.5
0015 825
0016 1
0017 596 100
0018 330
0019 62.5 6
0020 6 110 2.7 0.5 100000 25
0021 6 104 2.7 0.5 100000 54
0022 4 120 2.7 0.5 100000 20
0023 16 117 2.7 0.5 100000 30
0024 8 104 2.7 0.5 100000 43
0025 12 120 2.7 0.5 100000 20
0026 10 110 2.7 0.5 100000 43
0027 2
0028 2
0029 0.02 0.11 3200
0030 2
0031 0.03 0.24 1000
0032 3
0033 0
0034 3
0035 0
0036 2
0037 0.04 0.2 2177
0038 3
0039 0
0040 2
0041 0.05 0.31 4400
```

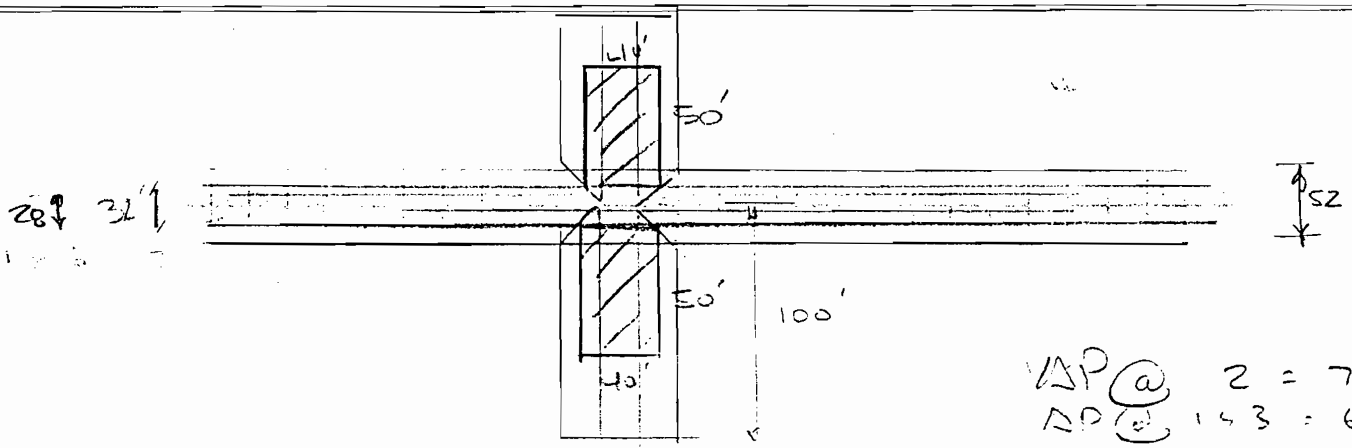
Date 12/4/85

Project Pontchartrain Beach Floodwall

Job 9271

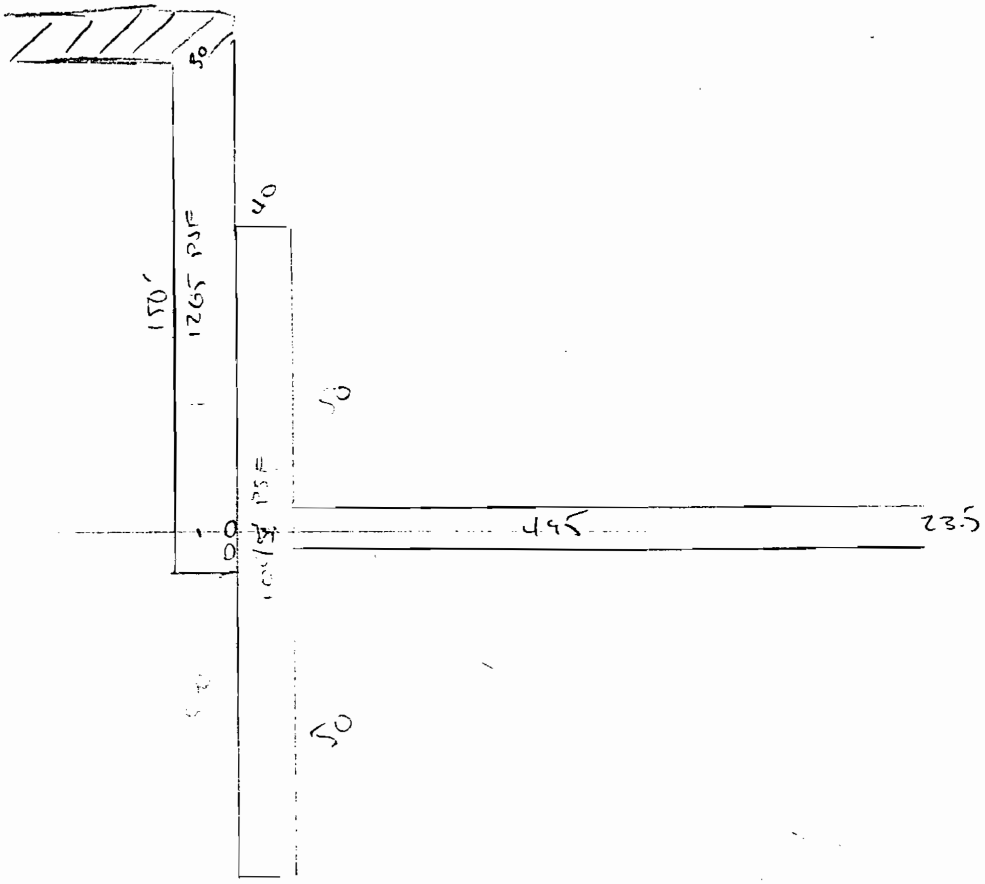
Subject Settlement at Ramps

By



ΔP @ 2 = 770
ΔP @ 153 = 632

Access Ramps



Lakeshore Drive

```
PONTCHARTRAIN BEACH


RAMP2


 CO-ORDINATES                  DIRECTIONAL STRESSES      EXCESS PORE EPSILON
   X       Y       Z       X\R        Y\T         Z         PRESSURE      Z

 500.0   500.0    3.0 1782.4351 1555.8281 2257.8779 2020.1565       .0059
 500.0   500.0    9.0 1080.1167  854.0653 1924.0386 1502.0776       .0096
 500.0   500.0   14.0  745.5094  572.9360 1665.2905 1205.3999       .0101
 500.0   500.0   24.0  409.4177  284.2502 1245.2373  827.3275       .0090
 500.0   500.0   36.0  248.1694  135.9208  899.5786  573.8740       .0071
 500.0   500.0   46.0  184.1125   78.0088  706.9193  445.5159       .0058
 500.0   500.0   57.0  142.8571   44.6881  558.6515  350.7543       .0046
 VERTICAL DISPLACEMENT  =      1.08812
```

```
STRATUM      Z      SUB. WT.      RY   WT.       Eo       % SAT.       WC%       SPEC.GRAV
   1        3.00    47.5000      88.0000       .9176     73.56     25.0000      2.7000
   2        9.00    41.5000      67.5325     1.4988      97.28     54.0000      2.7000
   3       14.00    57.5000     100.0000       .6875     78.55     20.0000      2.7000
   4       24.00    54.5000      90.0000       .8750     92.57     30.0000      2.7000
   5       36.00    41.5000      72.7273     1.3203      87.93     43.0000      2.7000
   6       46.00    57.5000     100.0000       .6875     78.55     20.0000      2.7000
   7       57.00    47.5000      76.9231     1.1937      97.26     43.0000      2.7000


              WATER            TOTAL  STRESSES              EFFECTIVE  STRESSES
   Z        PRESSURE       VERTICAL     HORIZONTAL       VERTICAL      HORIZONTAL
  3.00         0.0000      330.0000      330.0000        330.0000       330.0000
  9.00       187.5000      972.0000      972.0000        784.5000       784.5000
 14.00       500.0000     1524.0000     1524.0000       1024.0000      1024.0000
 24.00      1125.0000     2700.0000     2700.0000       1575.0000      1575.0000
 36.00      1875.0000     4052.0000     4052.0000       2177.0000      2177.0000
 46.00      2500.0000     5188.0000     5188.0000       2688.0000      2688.0000
 57.00      3187.5000     6458.0000     6458.0000       3270.5000      3270.5000
```

```
      X              Y              Z    CONSOLIDATION SETTLEMENT
  500.00         500.00          3.00          .10733
  500.00         500.00          9.00          .64211
  500.00         500.00         14.00         0.00000
  500.00         500.00         24.00         0.00000
  500.00         500.00         36.00          .24034
  500.00         500.00         46.00         0.00000
  500.00         500.00         57.00          .03424

  500.00         500.00         TOTAL         1.02402

ELAPSED CPU TIME     42.4 SECONDS   $   8.48    FOR USER GWYN
```

Cy 10 to Ri

```
PONTCHARTRAIN BEACH

RAMPS 1 & 3


 CO-ORDINATES                 DIRECTIONAL STRESSES      EXCESS PORE EPSILON
   X       Y        Z       X\R        Y\T         Z       PRESSURE      Z

 500.0   500.0     3.0 1452.6416 1257.0789 1852.4153 1652.5286       .0050
 500.0   500.0     9.0  862.8635  666.1876 1566.5879 1214.7258       .0080
 500.0   500.0    14.0  585.1827  441.6906 1341.8328  963.5078       .0083
 500.0   500.0    24.0  312.0453  219.7788  987.3696  649.7075       .0072
 500.0   500.0    36.0  184.8207  105.9280  705.9006  445.3607       .0056
 500.0   500.0    46.0  135.5247   60.9880  551.6448  343.5847       .0045
 500.0   500.0    57.0  104.3226   34.9680  433.8365  269.0806       .0036
 VERTICAL DISPLACEMENT  =        .84240
```

```
STRATUM     Z     SUB. WT.   DRY  WT.      Eo     % SAT.      WC%      SPEC.GRAV
   1      3.00    47.5000    88.0000     .9176    73.56    25.0000     2.7000
   2      9.00    41.5000    67.5325   1.4988     97.28    54.0000     2.7000
   3     14.00    57.5000   100.0000     .6875    78.55    20.0000     2.7000
   4     24.00    54.5000    90.0000     .8750    92.57    30.0000     2.7000
   5     36.00    41.5000    72.7273   1.3203     87.93    43.0000     2.7000
   6     46.00    57.5000   100.0000     .6875    78.55    20.0000     2.7000
   7     57.00    47.5000    76.9231   1.1937     97.26    43.0000     2.7000


            WATER          TOTAL  STRESSES           EFFECTIVE  STRESSES
  Z       PRESSURE     VERTICAL     HORIZONTAL     VERTICAL     HORIZONTAL
 3.00       0.0000     330.0000      330.0000      330.0000      330.0000
 9.00     187.5000     972.0000      972.0000      784.5000      784.5000
14.00     500.0000    1524.0000     1524.0000     1024.0000     1024.0000
24.00    1125.0000    2700.0000     2700.0000     1575.0000     1575.0000
36.00    1875.0000    4052.0000     4052.0000     2177.0000     2177.0000
46.00    2500.0000    5188.0000     5188.0000     2688.0000     2688.0000
57.00    3187.5000    6458.0000     6458.0000     3270.5000     3270.5000
```

```
     X          Y          Z    CONSOLIDATION SETTLEMENT
  500.00     500.00       3.00       .09845
  500.00     500.00       9.00       ~~.55360~~
  500.00     500.00      14.00      0.00000
  500.00     500.00      24.00      0.00000
  500.00     500.00      36.00       .19515
  500.00     500.00      46.00      0.00000
  500.00     500.00      57.00       .02705

  500.00     500.00      TOTAL       .87425


ELAPSED CPU TIME     38.3 SECONDS  $  7.66   FOR USER GWYN
```

0.33

Say 4 TO 6"

Enc. 4
(Sheet 25)

```
    FILE NAME =  SETTR
                                          4:35 PM  WED.,  4  DEC., 1985

0001 PONTCHARTRAIN BEACH
0002 RAMPS 1 & 3
0003 1 2 1 7
0004 500 500
0005 3 9 14 24 36 46 57
0006 100000 0.5 3
0007 1000 28 632 500 500
0008 40 50 632 500 480
0009 40 50 632 500 520
0010 62.5 6
0011 6 110 2.7 0.5 100000 25
0012 6 104 2.7 0.5 100000 54
0013 4 120 2.7 0.5 100000 20
0014 16 117 2.7 0.5 100000 30
0015 8 104 2.7 0.5 100000 43
0016 12 120 2.7 0.5 100000 20
0017 10 110 2.7 0.5 100000 43
0018 2
0019 2
0020 0.02 0.11 3200
0021 2
0022 0.03 0.24 1000
0023 3
0024 0
0025 3
0026 0
0027 2
0028 0.04 0.2 2177
0029 3
0030 0
0031 2
0032 0.05 0.31 4400
```

```
PONTCHARTRAIN BEACH

LAKESHORE DRIVE RAMP


 CO-ORDINATES                      DIRECTIONAL STRESSES        EXCESS PORE EPSILON
   X        Y         Z        X\R          Y\T          Z         PRESSURE      Z

 465.0    575.0      3.0 1063.9407 1135.6565 1264.4299 1164.1853        .0016
 465.0    575.0      9.0  700.2693  895.0066 1237.8479  969.0586        .0044
 465.0    575.0     14.0  489.2332  731.0264 1168.1252  828.6792        .0056
 465.0    575.0     24.0  270.6331  503.4791  980.8114  625.7223        .0059
 465.0    575.0     36.0  159.1024  340.5228  791.5288  475.3156        .0054
 465.0    575.0     46.0  110.6863  253.8596  673.0612  391.8737        .0049
 465.0    575.0     57.0   78.3030  188.3519  571.5353  324.9191        .0044
 VERTICAL DISPLACEMENT   =        .99107
```

```
  1     3.00   47.5000   88.0000    .9176   73.56    5.0000    2.7000
  2     9.00   41.5000   67.5325   1.4988   97.28   54.0000    2.7000
  3    14.00   57.5000  100.0000    .6875   78.55   20.0000    2.7000
  4    24.00   54.5000   90.0000    .8750   92.57   30.0000    2.7000
  5    36.00   41.5000   72.7273   1.3203   87.93   43.0000    2.7000
  6    46.00   57.5000  100.0000    .6875   78.55   20.0000    2.7000
  7    57.00   47.5000   76.9231   1.1937   97.26   43.0000    2.7000


          WATER          TOTAL STRESSES           EFFECTIVE STRESSES
  Z      PRESSURE     VERTICAL    HORIZONTAL     VERTICAL    HORIZONTAL
 3.00      0.0000     330.0000     330.0000      330.0000     330.0000
 9.00    187.5000     972.0000     972.0000      784.5000     784.5000
14.00    500.0000    1524.0000    1524.0000     1024.0000    1024.0000
24.00   1125.0000    2700.0000    2700.0000     1575.0000    1575.0000
36.00   1875.0000    4052.0000    4052.0000     2177.0000    2177.0000
46.00   2500.0000    5188.0000    5188.0000     2688.0000    2688.0000
57.00   3187.5000    6458.0000    6458.0000     3270.5000    3270.5000
```

```
  465.00     575.00      3.            .08209
  465.00     575.00      9.00         ~~.45944~~
  465.00     575.00     14.00         0.00000
  465.00     575.00     24.00         0.00000
  465.00     575.00     36.00          .21549
  465.00     575.00     46.00         0.00000
  465.00     575.00     57.00          .03497

  465.00     575.00     TOTAL          .79196


ELAPSED CPU TIME      0.0 SECONDS  $   0.00   FOR USER GWYN
```

0.33, 4.0 SAY

4 TO 6 (CONSERVATIVE

1[illegible] 6 AM THU., 5 DEC., 198[illegible]

```
0001 PONTCHARTRAIN BEACH
0002 LAKESHORE DRIVE RAMP  ← ADJACENT LEVEES
0003 1 2 1 7
0004 465 575
0005 3 9 14 24 36 46 57
0006 100000 0.5 3
0007 30 150 1265 465 575
0008 48 170 1045 500 500
0009 1000 23.5 495 1020 500
0010 62.5 6
0011 6 110 2.7 0.5 100000 25
0012 6 104 2.7 0.5 100000 54
0013 4 120 2.7 0.5 100000 20
0014 16 117 2.7 0.5 100000 30
0015 8 104 2.7 0.5 100000 43
0016 12 120 2.7 0.5 100000 20
0017 10 110 2.7 0.5 100000 43
0018 2
0019 2
0020 0.02 0.11 3200
0021 2
0022 0..03 0.24 1000
0023 3
0024 0
0025 3
0026 0
0027 2
0028 0.04 0.2 2177
0029 3
0030 0
0031 2
0032 0.05 0.31 4400
```

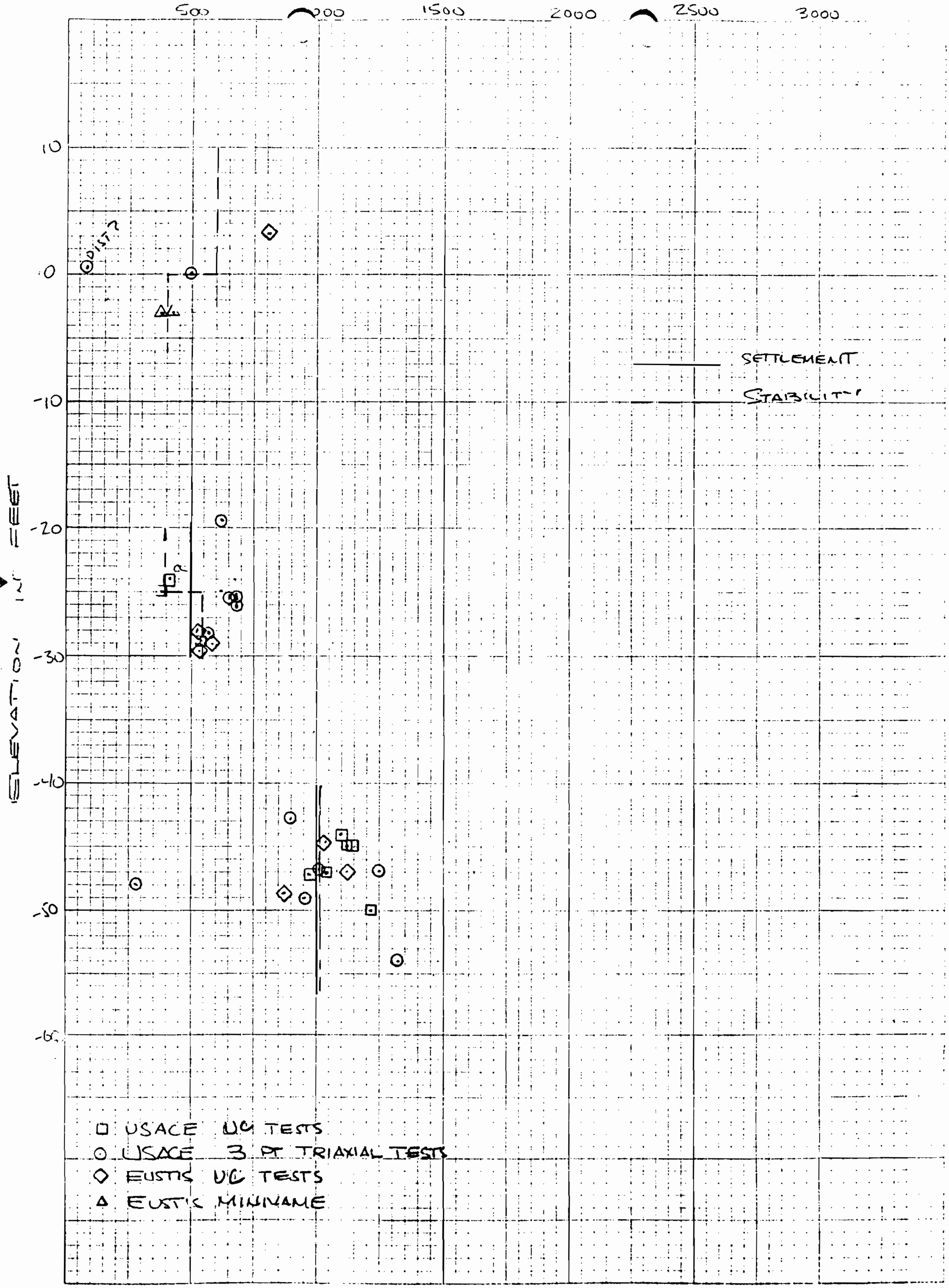
```
PONTCHARTRAIN BEACH

LAKESHORE DRIVE RAMP


 CO-ORDINATES              DIRECTIONAL STRESSES       EXCESS PORE EPSILON
   X        Y        Z      X\R        Y\T          Z     PRESSURE     Z

 500.0   500.0     3.0  933.5826  970.2961 1044.7478  989.1653     .0009
 500.0   500.0     9.0  721.4497  825.7656 1037.9509  879.7003     .0026
 500.0   500.0    14.0  568.4427  715.2748 1019.1517  793.7972     .0038
 500.0   500.0    24.0  349.5003  531.6565  942.5839  646.0421     .0050
 500.0   500.0    36.0  205.3191  373.4869  820.8593  513.0891     .0053
 500.0   500.0    46.0  139.5235  280.7141  722.4598  430.9917     .0051
 500.0   500.0    57.0   96.3019  207.2668  626.8094  361.5557     .0048
 VERTICAL DISPLACEMENT  =      1.01724
```

```
STRATUM     Z      SUB. WT.    RY  WT.       Eo      % SAT.      WC%       SPEC.GRAV
   1       3.00    47.5000    88.0000     .9176     73.56     25.0000      2.7000
   2       9.00    41.5000    67.5325   1.4988     97.28     54.0000      2.7000
   3      14.00    57.5000   100.0000     .6875     78.55     20.0000      2.7000
   4      24.00    54.5000    90.0000     .8750     92.57     30.0000      2.7000
   5      36.00    41.5000    72.7273   1.3203     87.93     43.0000      2.7000
   6      46.00    57.5000   100.0000     .6875     78.55     20.0000      2.7000
   7      57.00    47.5000    76.9231   1.1937     97.26     43.0000      2.7000


             WATER          TOTAL  STRESSES            EFFECTIVE  STRESSES
  Z        PRESSURE     VERTICAL    HORIZONTAL      VERTICAL     HORIZONTAL
 3.00         0.0000      330.0000      330.0000      330.0000      330.0000
 9.00       187.5000      972.0000      972.0000      784.5000      784.5000
14.00       500.0000     1524.0000     1524.0000     1024.0000     1024.0000
24.00      1125.0000     2700.0000     2700.0000     1575.0000     1575.0000
36.00      1875.0000     4052.0000     4052.0000     2177.0000     2177.0000
46.00      2500.0000     5188.0000     5188.0000     2688.0000     2688.0000
57.00      3187.5000     6458.0000     6458.0000     3270.5000     3270.5000
```

```
     X            Y              Z    CONSOLIDATION SETTLEMENT
 500.00       500.00          3.00        .07437
 500.00       500.00          9.00        ~~.39432~~
 500.00       500.00         14.00       0.00000
 500.00       500.00         24.00       0.00000
 500.00       500.00         36.00        .22232
 500.00       500.00         46.00       0.00000
 500.00       500.00         57.00        .03808

 500.00       500.00         TOTAL        .72908
```

0.33 Say 4 TO 6 in

```
    FILE NAME =  SETTR
                           5:12 PM  WED.,  4  DEC., 1985


0001 PONTCHARTRAIN BEACH
0002 LAKESHORE DRIVE RAMP
0003 1 2 1 7
0004 500 500
0005 3 9 14 24 36 46 57
0006 100000 0.5 3
0007 30 150 1265 465 575
0008 48 170 1045 500 500
0009 1000 23.5 495 1020 500
0010 62.5 6
0011 6 110 2.7 0.5 100000 25
0012 6 104 2.7 0.5 100000 54
0013 4 120 2.7 0.5 100000 20
0014 16 117 2.7 0.5 100000 30
0015 8 104 2.7 0.5 100000 43
0016 12 120 2.7 0.5 100000 20
0017 10 110 2.7 0.5 100000 43
0018 2
0019 2
0020 0.02 0.11 3200
0021 2
0022 0.03 0.24 1000
0023 3
0024 0
0025 3
0026 0
0027 2
0028 0.04 0.2 2177
0029 3
0030 0
0031 2
0032 0.05 0.31 4400
```


500
1000
1500
2000
2500
3000
10
0
-10
-20
-30
-40
-50
-60
ELEVATION IN FEET
OOIST?
SETTLEMENT
STABILITY
□ USACE UC TESTS
○ USACE 3 PT TRIAXIAL TESTS
◇ EUSTIS UC TESTS
△ EUSTIS MINIVANE

Enc. 5

Page 1

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Date 11/29/85

Project PONTCHARTRAIN BEACH

Job 9271

Subject LANE ANALYSIS AT FLOODWALLS

By WG

ASSUME CRITERIA FOR VERY FINE SAND OR SILTY FINE SAND OR $LWCR \geqq 8.5$

$\Delta H = 11.5 - 6.0 = 5.5$

$(70+42+10)/3 = 41$

?

OK a) EARTHEN LEVEE:

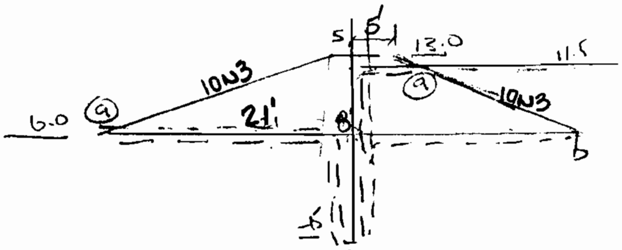
WEIGHTED CREEP DISTANCE $= [(70 \times 2) + 10]/3$
$= 50$ FT

$41/5.5 = 7.4 < 8.5$

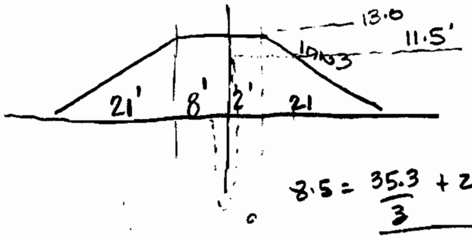
$LWCR = 50/5.5 = 9.1 > 8.5$ O.K.

b) EL 13.0 LEVEE / I-WALL

WEIGHTED CREEP DISTANCE



=



$8.5 = \dfrac{\frac{35.3}{3} + 26 + 5.5}{5.5}$

- ALONG WALL TO EL 6.0 - PATH ⓐ

$b = 14.7$

$El. = 6 - 14.7$
$= -8.7$

They put it lower in the P/S.

$WCD = (2)(21) + 5.5 + 26/3$
$= 56.1$

$LWCR = 56.1/5.5 = 10.2 > 8.5$ O.K.

- ALONG BASE OF LEVEE

$WCD = (2)(21) + (2)(26)/3$
$= 59.3$

$LWCR = 59.3/5.5 = 10.8 > 8.5$ O.K.

Enc. 6
(Sheet 1)

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Date 11/29/85

Project Pontchartrain Beach

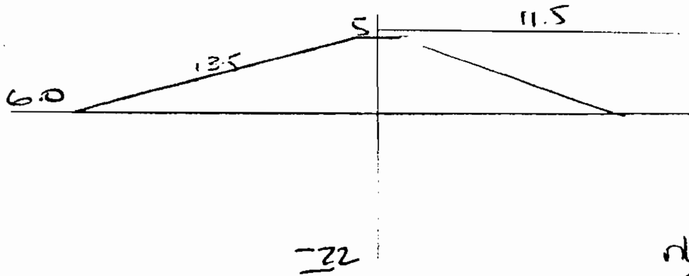
Job 9271

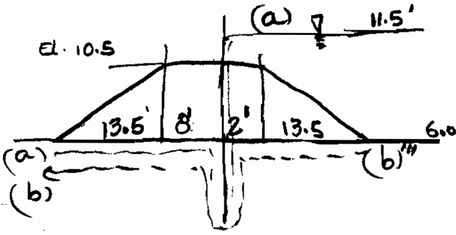
Subject Lane's Analysis at Floodwalls

By WWG

---

c) EL 10.5 LEVEE / I-WALL





(a) $8.5 = \frac{5.5 + 2b + \frac{21.5}{3}}{5.5}$

=> EL. -11.0

(b) $8.5 = \frac{\frac{47}{3} + 2b}{5.5}$ ✓

b = 15.64

EL = 6 - 15.54
= -9.5
Say -10

ok ✓ Path ⓐ WCD = (2)(28) + 5.5 + 18.5/3 ok ✓
= 67.6

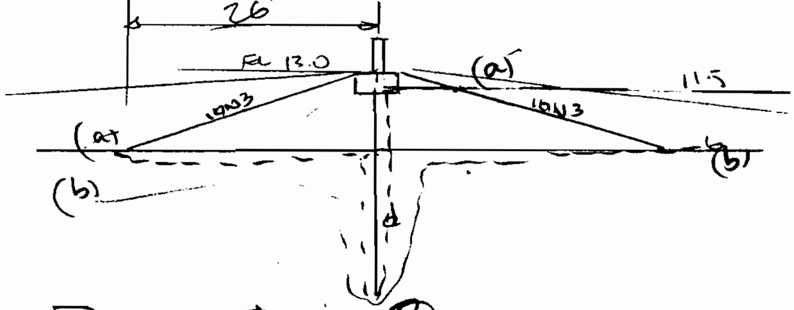
LWCR = 67.6 / 5.5 = 12.3 > 8.5

Path ⓑ WCD = (2)(28) + 2 (18.5/3)
= 68.3

LWCR = 68.3 / 5.5 = 12.4 > 8.5 ✓

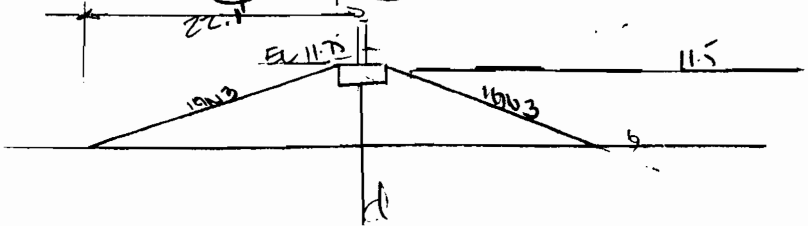
At Gates — Assume 1V to 3H configuration of adjacent levee, determine penetration required for LWCR = 8.5

Ramp ⑧



✓ $8.5 = \left(5.5 + 2d + \overset{30.5}{26}/3\right)/5.5$
d = 16.2 SAY 17.0
ok EL -11.0

Ramps ⑦ & ⑧



ok $8.5 = \left(5.5 + 2d + 22.1/3\right)/5.5$
✓ d = 16.9 SAY 17.0
EL -11.0

Enc. 6
(Sheet 2)

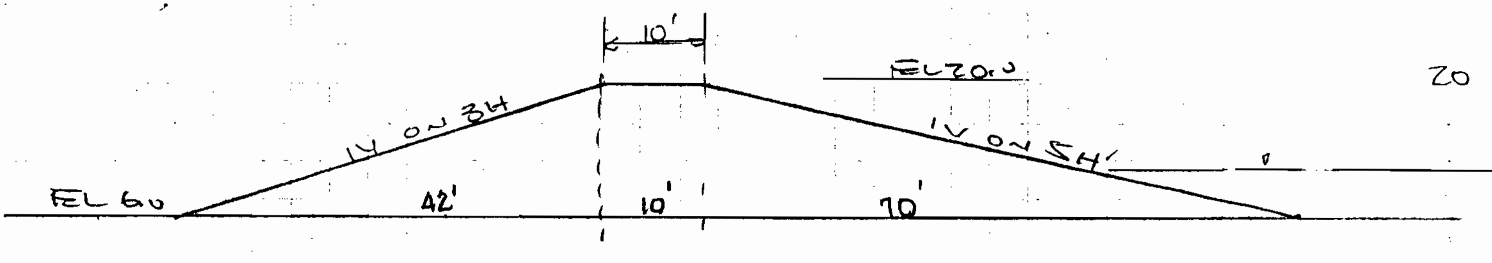
Date 2/10/80

Project Pontchartrain Beach Floodwalls

Job 9271

Subject Bligh's Analysis @ Levee

By WWG

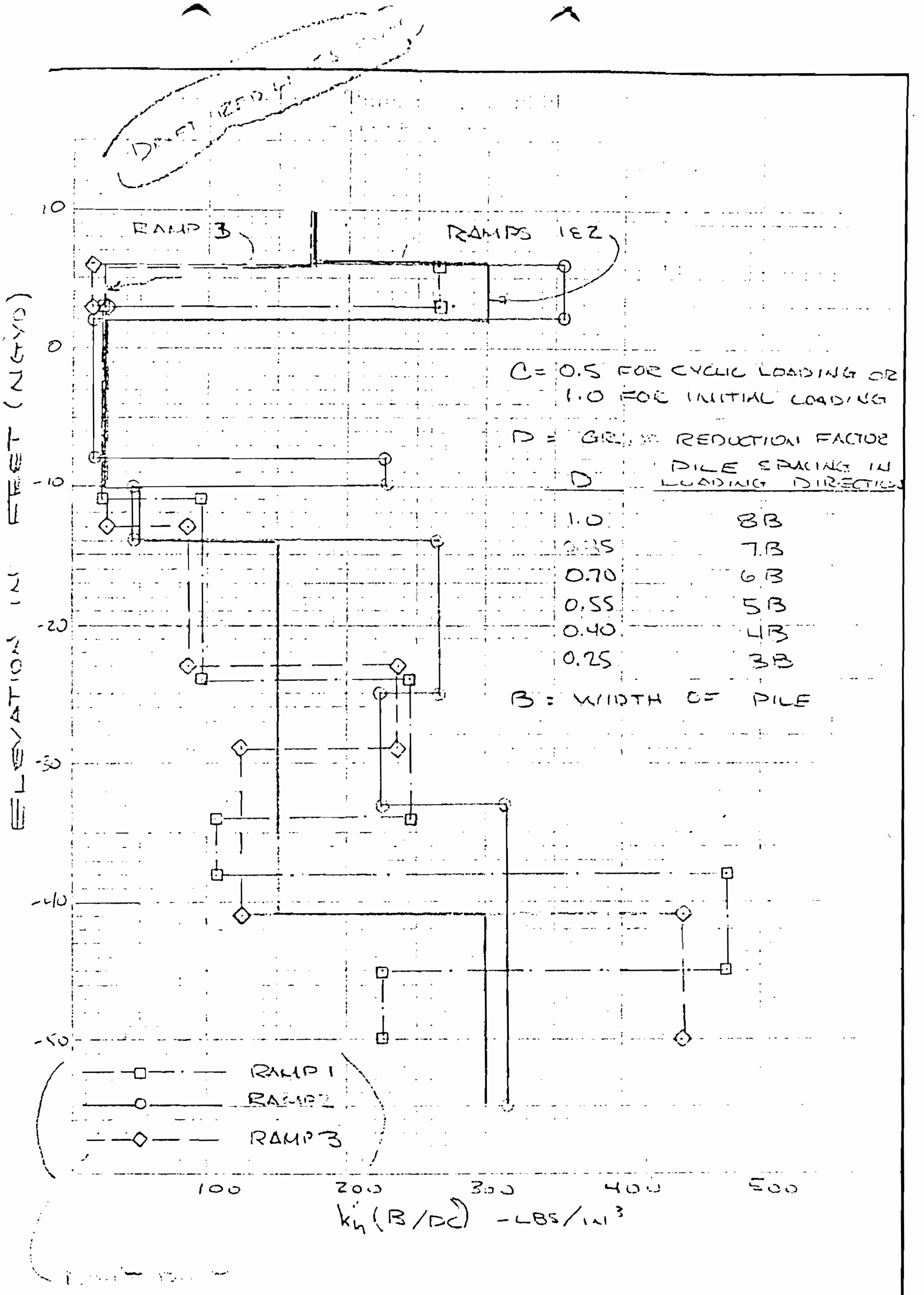


ΔH = 11.5 − 6.0 = 5.5

C.D. = (5)(14) + (3)(14) + 10
= 122.0.

Bligh's Ratio = 122.0 / 5.5
= 22.2 OK ✓

Enc. 6
(Sheet 3)



C = 0.5 FOR CYCLIC LOADING OR 1.0 FOR INITIAL LOADING

D = GROUP REDUCTION FACTOR

D	PILE SPACING IN LOADING DIRECTION
1.0	8B
0.85	7B
0.70	6B
0.55	5B
0.40	4B
0.25	3B

B = WIDTH OF PILE

Enc. 7
(Sheet 1)

EQUATIONS:

FOR COHESIVE SOILS:

$$k_h = \frac{\alpha K_1}{B}$$ [from Broms (1964)] (EQ.1)

where:

$K_1 = k_1 B_1 = 80$ qu [K_1 & qu in units of force per length^2, B_1 in units of length]

$\alpha \cong 0.4$ (varies from 0.32 to 0.52)

$\alpha\ K_1 = 0.4(80 \text{ qu}) = 32 \text{ qu}$ ✓

Since qu is normally reported in PSF and K_1 in PSI, a conversion is required as follows:

$$\alpha K_1\left(\frac{\#}{IN^2}\right) = 32\ qu\left(\frac{\#}{\cancel{FT}^2}\right) X \left(\frac{1\ \cancel{FT}^2}{144\ IN^2}\right) = \frac{32\ qu}{144}\left(\frac{\#}{IN^2}\right) = 0.222\ qu$$

Then with qu entered in PSF, $\alpha\, K_1$ is calculated in PSI, substituting into equation 1

$$k_h = \frac{0.2222\ qu}{B}$$ (With B entered in inches the proper units for k_h(PCI) are maintained.)

to which reduction factors are applied as follows:

$$k_h = \frac{(0.2222\ qu)}{B}(C)(D)$$

where: C = 0.5 for cyclic loading and 1.0 for initial loading

D = Group effect reduction factor;

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

Incl 3

FOR COHESIONLESS SOILS:

When n_h is assumed constant with depth:

$$k_h = n_h \frac{Z}{B}$$ from Broms (1964) and Terzaghi (1955)

to which the reduction factors for cyclic loading and group effects are applied as follow:

$$k_h = n_h \frac{Z}{B} \quad (C)(D)$$

Where: C = 0.5 for cyclic loading and 1.0 for initial loading

D = group effect reduction factor (see table above)

REFERENCES:

1. Broms, B.B., "Lateral Resistance of Piles in Cohesive Soils," Journal of Soil Mechanics and Foundations Division, ADCE, Vol. 90, No. SM2, Mar. 1964.

2. Broms, B.B., "Lateral Resistance of Piles in Cohesionless Soils," Journal of Soil Mechanics and Foundations Division, ASCE, Vol. 90, SM3, Pt. 1, May 1964.

3. Terzaghi, Karl, "Evaluation of Coefficient of Subgrade Reaction," Geotechnique, Vol. 5, 1955.

4. Davisson, M.T., "Lateral Load Capacity of Piles", Highway Research Record, No. 333, 1970.

5. Teng, Wayne C., "Foundation Design", Prentice-Hall, 1962.

6. Bowles, Joseph E., "Analytical and Computer Methods in Foundation Engineering", McGraw-Hill, 1974.

EUSTIS ENGINEERING COMPANY
PILE LOAD CAPACITY

PONTCHARTRAIN BEACH

JOB :9271 BORING: 2 RAMP 1 10:57 AM FRI., 29. NOV., 1985

Straight Sided Concrete Piles

ELEV/DEP	H	C	CAM'	SPT	Po	Phi	Del	Nq-1	K	F ~~(PSF)~~ PSI	
9.0 ℓ											
	3.0	400	0	0	0	0.0	0.0	0.0	1.0	420.0	177
6.0											
	3.0	600	110	0	165	0.0	0.0	0.0	1.0	600.0	266
3.0											
8	14.0	0	58	4(2.5)	736	12.0	12.0	1.5	1.0	156.3	21
-11.0											
	9.0	212	53	0	1380	0.0	0.0	0.0	1.0	212.0	
-20.0											
	4.0	218	60	0	1739	0.0	0.0	0.0	1.0	218.0	96
-24.0											
	10.0	551	45	0	2084	0.0	0.0	0.0	1.0	551.0	244
-34.0											
U2	4.0	0	53	3(2.5)	2415	8.6	8.6	.8	1.0	365.2	105
-38.0											
17.5	7.0	0	48	12(10)	2689	13.7	13.7	2.3	1.0	657.6	475
-45.0											
	5.0	500	48	0	2977	0.0	0.0	0.0	1.0	500.3	
-50.0											
	3.0	1000	58	0	3184	0.0	0.0	0.0	1.0	1000.	
-53.0											
	22.0	0	58	15	3909	14.0	14.0	2.4	1.0	973.9	
-75.0											

EUSTIS ENGINEERING COMPANY
PILE LOAD CAPACITY

PONTCHARTRAIN BEACH'

JOB :9271 BORING: 5-7 Ramp 2 11:09 AM FRI., 29 NOV., 1985

Straight Sided Concrete Piles

ELEV/DEP	H	C	GAM'	SPT nh	Po	Phi	Del	Nq-1	K	F psf (~~PSF~~)	
10.0 z											
	4.0	400	0	0	0	0.0	0.0	0.0	1.0	420.0	177
6.0											
	4.0	800	108	0	216	0.0	0.0	0.0	1.0	150.0	356
2.0											
	9 10.0	0	53	3 2.5	697	10.8	10.8	1.1	1.0	133.2	15
-8.0											
	15 2.0	0	55	17 15	1017	22.5	22.5	7.1	1.0	420.8	225
-10.0											
	18.5 5.0	0	53	4 2.5	1204	10.6	10.6	1.0	1.0	226.3	46
-15.0											
	5.0	238	46	0	1452	0.0	0.0	0.0	1.0	238.0	
-20.0											265
	5.0	360	55	0	1704	0.0	0.0	0.0	1.0	360.0	
-25.0											
	8.0	500	43	0	2014	0.0	0.0	0.0	1.0	500.3	222
-33.0											
	3.0	0	58	5	2273	10.2	10.2'	.9	1.0	408.6	
-36.0 uk				7.0							315
	9.0	0	58	13	2621	14.5	14.5	2.6	1.0	676.0	
-45.0											
	14.0	1000	50	0	3232	0.0	0.0	0.0	1.0	1000.	
-59.0											
	7.0	0	55	7	3774	9.6	9.6	.9	1.0	639.1	
-66.0											
	9.0	0	55	21	4214	16.9	16.9	4.0	1.0	1283.	
-75.0											

EUSTIS ENGINEERING COMPANY
PILE LOAD CAPACITY

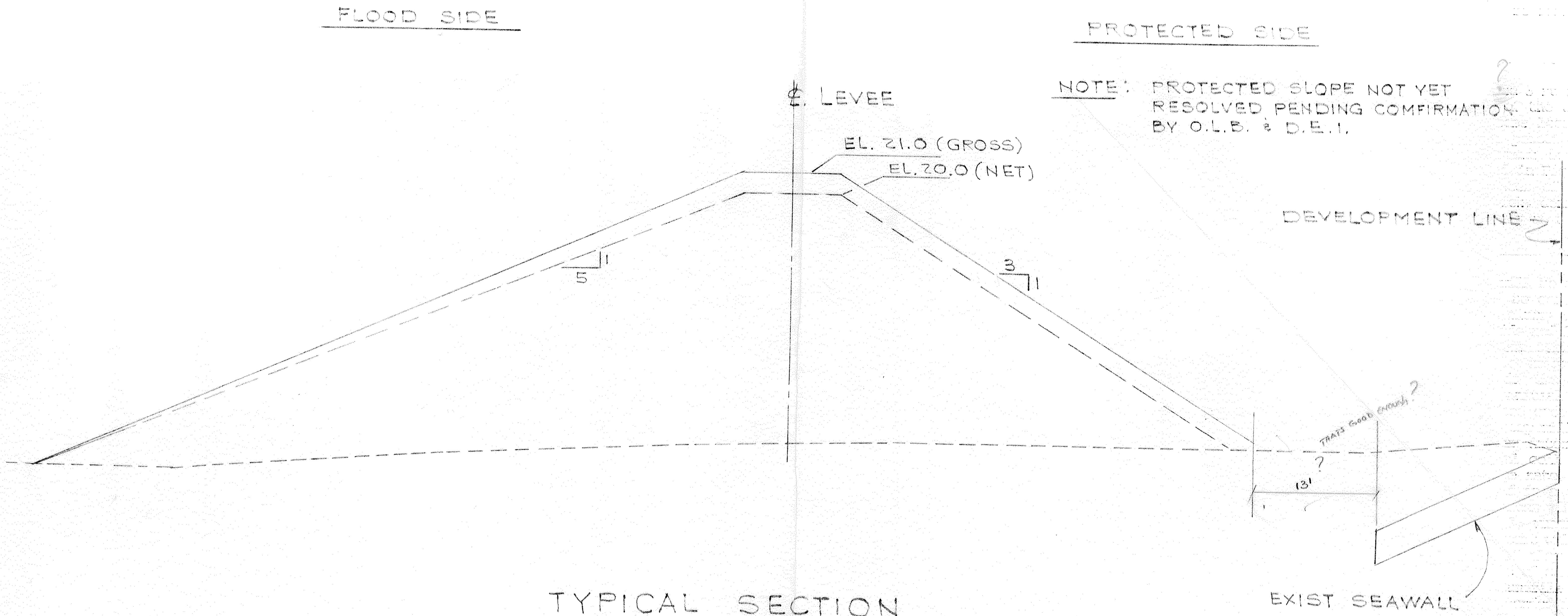
PONTCHARTRAIN BEACH

JOB :9271 BORING: 9 Ramp 3 11:34 AM FRI., 29 NOV., 1985

Straight Sided Concrete Piles

ELEV/DEP	H	C	GAM'	SPT	nh	Po	Phi	Del	Nq-1	K	F(~~PSF~~) PSI	Kh P/DC
9.0												
	3.0	400	0	0		0	0.0	0.0	0.0	1.0	420.0	177
6.0												
	3.0	0	55	14	(11)	82	25.3	25.3	9.5	1.0	39.05	16.5
3.0												
	3.0	0	55	5	(2.5)	247	14.5	14.5	2.6	1.0	64.08	27.5
0.0												
	13.0	0	55	2		687	9.4	9.4	.8	1.0	113.5	
-13.0												
	6.0	160	55	0		1210	0.0	0.0	0.0	1.0	160.0	87
-19.0												
	4.0	231	50	0		1475	0.0	0.0	0.0	1.0	231.0	
-23.0												
	6.0	535	43	0		1704	0.0	0.0	0.0	1.0	535.0	237
-29.0												
	12.0	0	55	4	(3)	2163	9.5	9.5	.8	1.0	361.0	123
-41.0												
	7.0	1000	48	0		2661	0.0	0.0	0.0	1.0	1000.	444
-48.0												
	4.0	1000	50	0		2929	0.0	0.0	0.0	1.0	1000.	
-52.0												
	6.0	0	55	6	(5)	3194	9.7	9.7	.9	1.0	546.0	DON'T PRESC
-58.0												
	17.0	0	55	20	(16)	3826	16.8	16.8	3.8	1.0	1152.	
-75.0												

Enc. 8
(Sheet 3)



TYPICAL SECTION

SCALE: H: 1" = 10'-0"
V: 1" = 5'-0"

INTRA- ARMY ORDER FOR REIMBURSABLE SERVICES

For use of this form, see AR 37-108 and AR 37-110: the proponent agency is USAFAC.

1. RECEIVING OFFICE CONTROL NUMBER

☐ FUNDED ☐ AUTOMATIC

2. ORDER

a NUMBER CELMN-ED-FT-87-22

b DATE 21 Sep.'87

3. CHANGE ORDER

a NUMBER

b DATE

4. TO BE PERFORMED BY *(Command, Installation or Activity)*, ADDRESS *(Include ZIP Code)*, AND AUTOVON NUMBER

DIRECTOR: WATERWAYS EXPERIMENT STATION
ATTN: WESGE-3

5. ORDERED BY *(Command, Installation or Activity)*, ADDRESS *(Include ZIP Code)*, AND AUTOVON NUMBER

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
FOOT OF PRYTANIA STREET, ATTN: BUDGET BR.
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

6. DESCRIPTION OF SERVICES TO BE PERFORMED

LK. PONT. LA. & VIC. HIGH LEVEL PLAN HURR. PROT. PONT. BEACH FLOODWALL (ADDITIONAL OBLIGATIONS) (CROSSED REFERENCE TO LMNED-FT-86-008)

Soil samples were tested by W.E.S. according to form 880 which was attached.

THIS INTRA-ARMY ORDER IS RECOGNIZED AS A FORMAL OBLIGATION. WHEN BILLING FOR THIS SERVICE, GIVE REFERENCING "ORDERING OFFICER SYMBOL CELMN-ED-FT-87-22".

Date samples sent to W.E.S. 16 December 1985.

It is requested that all communications regarding this matter be sent to U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS.

cc: LMVD. ATTN: LMVED-G
Prog. Dev.
F&A Br.
F&M Br. Mr. Estrada x-1035

7a NAME AND TITLE OF ORDERING OFFICER

ANNA JACKSON
ADMINISTRATIVE OFFICER

b. SIGNATURE

c DATE

ORIGINATING FINANCE AND ACCOUNTING OFFICE APPROVAL

8a. ACCOUNTING CLASSIFICATION 96x3112 - BEC 21 305L 30 ACOO

b. AMOUNT $3,454.77

c. CHANGE

INCREASE AMOUNT ________ DECREASE AMOUNT ________ REVISED AMOUNT ________

9. Services to be performed pursuant to this order are properly chargeable to the appropriations or other accounts indicated above until ________ *(Day - Month - Year)* the expiration date of this order.

10 a. TYPED NAME AND TITLE OF APPROVING OFFICER

JUDY M. DEBOSE
F&A OFFICER

b. SIGNATURE

c. DATE

ACCEPTING OFFICER

11. THE ABOVE TERMS AND CONDITIONS ARE SATISFACTORY AND ARE ACCEPTED.

a. TYPED NAME AND TITLE OF ACCEPTING OFFICER

b. SIGNATURE

c DATE ACCEPTED

DA FORM 1 JUN 77 2544

EDITION OF 1 DEC 75 WILL BE USED UNTIL EXHAUSTED

☆ U.S.GPO: 1983-415-654

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

December 19, 1986

REPLY TO
ATTENTION OF:
Engineering Division
Projects Engineering Section

Mr. Bruce Adams
URS Engineer
3500 North Causeway Boulevard
Metairie, Louisiana 70002

Dear Mr. Adams:

Reference is made to your November 14, 1986 letter to Mr. C.E. Bailey concerning the Pontchartrain Beach Food Protection OLB Construction Project No. 2040-0375 DEI Project No. 1008 URS Project No. 46021.00 a copy of which was furnished to this office. Reference is also made to the December 1, 1986 meeting between you and Mr. Vann Stutts of this office during which he furnished you an advanced set of marked up plans and specifications. As a result of the December 1, 1986 meeting you provided a revised set of plans and specifications on December 5, 1986.

We have reviewed the revised Plans and Specifications transmitted on December 5, 1986 and suggest you consider including the following comments.

a. Page 6D-11, para 6D-2.B.2.C. Part of the last sentence is missing. After "aggregate" add "(NMSA) and the maximum size aggregate".

b. Provisions for environmental protection are not detailed in the plans.

c. Page 11A-2, para 11A-3.A.1. and page 12-4, para 12-2. B.1. Reference is made to the "Soil Boring Legend", but only a very limited legend is given at the bottom of the boring logs in Section N of the specifications. Since a broader range of material is discussed in the above referenced paragraph, suggest that you include the enclosed legend (encl 1).

d. Page 11A-2, para 11A-3.A.2 In the third sentence, it should stipulate that only "power hand tampers" should be allowed for compacting backfill within 2-feet of the feature stipulated.

e. Drafting type comments are noted in red directly on the plan drawings. See sheet numbers 11, 12, 14, 15, 17, and 23.

If you have any questions concerning the above comments, please contact Mr. Vann Stutts phone 862-2614.

Sincerely,

Frederic M. Chatry
Chief, Engineering Division

Enclosure
(Picked up by URS)

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL LMNED-FM, FS	SUBJECT Review of P & S for Lake Pontchartrain, LA & Vicinity High Level Plan Hurricane Protection Plan Pontchartrain Beach Flood Protection Phase II

TO C/Des Svcs Br.
ATTN: Mr. Stutts

FROM C/F&M Br.

DATE 10 Dec 1986

CMT 1

Messrs. Rome,Estrada/1194,1035
JR

1. Reference LMNED-F DF dated 26 Nov 86, containing our original review comments for the subject job.

2. We have reviewed a "corrected" copy of the subject Plans and Specifications (enclosures 1 and 2) hand carried by Mr. Stutts and have the following comments:

a. Materials Comments.

(1) It is not obvious if any provisions for environmental protection have been added.

(2) Pg 6D-11, para 6D-2.B.2.c. Part of the last sentence is missing. After "aggregate" add "(NMSA) and the maximum size aggregate".

b. Foundations Comments.

(1) Pg 11A-2, para 11A-3.A.1. and Pg 12-4, para 12-2.B.1. Reference is made to the "Soil Boring Legend", but is not presented in the specifications or on the drawings. This should be corrected. ~~It is also suggested that the Soil Boring Logs be included in the drawings.~~

(2) Pg 11A-2, para 11A-3.A.2. For the third sentence, only power hand tampers should be allowed for compacting backfill within 2-feet of the features stipulated.

BECKER
LMNED-FM

NAPOLITANO
LMNED-FS

2 encl

RODNEY P. PICCIOLA
Chief, Foundations and Materials Branch

12/11

FILE
ED-FS

DA FORM 2496

PREVIOUS EDITIONS WILL BE USED

U.S. G.P.O. 1980-665141/288

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL
LMNED-FM, FS

SUBJECT Review of P & S for Lake Pontchartrain, LA & Vicinity High Level Plan Hurricane Protection Plan Pontchartrain Beach Flood Protection Phase II

TO C/Des Svcs Br.
ATTN: Mr. Stutts

FROM C/F&M Br.

DATE 26 Nov 1986

CMT 1

Messrs. Rome,Estrada/1194,1035

1. Reference LMNED-SP DF dated 17 Nov 86, requesting review of the subject job (enclosure 1).

2. Materials Comments. The following comments, most of which are shown in red on the specifications (encl 2) and plans (encl 3), are offered:

a. General Comments

(1) In the future, be sure to give third parties the most current and comprehensive examples that NOD has for concrete related work. We will be glad to assist.

(2) Preparing good specifications involves checking standards and references mentioned to see that they are current. If an update is needed, the intent of the designer must be taken into account and updated versions have to be read to insure that no loose ends are allowed or conflicts created. By making blanket reference to standards and references, etc, design control is lost, reviews and evaluations can be lengthy and difficult, and potentially costly situations can occur. To avoid this all standards and references should be dated. This includes those found in paragraphs 6A-1.B.1, 6B-1.C, 6C-1.C, 6D-1.B and sections 5, 7A, 7C and 16. Particular items to be dated are emphasized herein.

(3) There does not appear to be any provisions for environmental protection.

b. DWG 11, Concrete Notes.

(1) Change note 8 by updating the standard title and referencing the appropriate year (see comment 2e. Leaving the phrase "in effect ...." gives up design control.

(2) Modify note 9. What is now current and approved by the designer may not be when the job is built. Specify a date to avoid loss of design control and a potentially costly situation.

c. Pg L-8, para 1A-22. In the fourth paragraph, change "ASTM C 33" to "ASTM C 33-85".

d. Pg 6A-2, para 6A-2.B.1.a. In the last sentence, delete "of the Plyform".

e. Pg 6B-1, para 6B-1.C.1. Part 3 of the 1986 edition of the ACI Manual of Concrete Practice (Note on page 315-1) indicates that the Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315-74) has been superceded by Details and Detailing of Concrete Reinforcement (ACI 315-80) and Manual of Engineering and Placing Drawings for Detailing Reinforced Concrete Structures (ACI 315R-80). Modify reference to ACI 315 in paragraphs 6B-2.A.2.a and 6B-3.A to either ACI 315 or ACI 315R, or since ACI publication SP-66 contains ACI 315-80 and ACI 315R-80; change references in 6B-2.A.2.a and 6B-3.A from "ACI 315" to "SP-66".

f. Pg 6B-4, para 6B-3.A.2.b.

(1) In the second sentence, insert "tolerances" after "concrete".

(2) Values given in the "Variations" column are "maximum cover" values and should be labeled as such.

g. Pg 6C-1, para 6C-1.D.1.a. Costs of retesting waterstops and splices are questionable. Joe Tom (WES) has indicated that current rates are $650 per material sample and $100 per splice sample.

h. Pg 6D-1, para 6D-1.B.1. Delete ACI 214 and ACI 309.

i. Pg 6D-1, para 6D-1.B.2.

(1) Add ASTM C 29-78 (CRD-C 106) entitled "Unit Weight and Voids in Aggregate". This item is contingent upon using the wording described in comment 2x.

(2) Add ASTM C 127-84 (CRD-C 107) and ASTM C 128-84 (CRD-C 108) entitled "Specific Gravity and Absorption of Coarse Aggregate" and "Specific Gravity and Absorption of Fine Aggregate", respectively. This item is contingent upon using the wording described in comment 2o.

(3) Add ASTM C 171-69 (CRD-C 310) entitled "Sheet Materials for Curing Concrete". This item is contingent upon using the wording described in comment 2v.

j. Pg 6D-2, para 6D-1.B.3. Add "(Revised 1 Dec 77)" for the reasons given in comment 2a(2).

k. Pg 6D-2, para 6D-1.B.4. Add "(4th Edition, 1971, with Repacement Sheets)" for the reasons given in comment 2a(2).

l. Pg 6D-2, para 6D-1.B.5.

(1) Delete CRD-C 55.

(2) Add CRD-C 300-77 entitled "Membrane-Forming Compounds for Curing Concrete".

m. Pg 6D-3. Add the following paragraphs:

6D-1.B.7. Federal Specifications.

A-A-1555	Paint, Powder (Cementitious, White and Colors)

6D-1.C.1.c. Air-entraining admixture or other chemical admixtures which have been in storage at the project site for longer than 6 months or which have been subjected to freezing will be retested at the expense of the Contractor and the results reported to the Engineer at least one week before use. The admixture shall be rejected if test results indicate noncompliance with 6D-2.A.3.

6D-1.C.1.d. Water reducing and retarding admixtures will be accepted based on compliance with applicable specification requirements, except that 6-month and 1-year compressive strength requirements are waived.

n. Pg 6D-4, para 6D-1.C.2. It is suggested that the following be added at the end of the paragraph:

> Samples for strength tests of each class of concrete placed each day will be taken not less than once each day, nor less than once for each 150 cubic yards of concrete placed. Three specimens will be made from each sample; two will be tested at 28 days (90 days for concrete with pozzolan) for acceptance and one will be tested at 7 days for information. Acceptance will be based on the average of the compressive strengths of the specimens tested at 28 days (90 days for concrete with pozzolan).

o. Pg 6D-6 para 6D-1.E.1.a.

(1) After the third sentence, add "Admixture quantities per cubic yard shall also be reported."

(2) After the fourth sentence, add "Concrete compression strength results submitted shall include specific gravity and absorption of fine and coarse aggregates determined by ASTM C 128 and ASTM C 127, respectively; slump; air content and concrete temperature."

p. Pg 6D-6, para 6D-1.E.1.b. In the second sentence, change "identify" to "be from current production and shall be representative of".

q. <u>Pg 6D-7.</u> Add the following paragraphs:

6D-1.E.1.d. <u>Aggregates.</u> Test reports of aggregates shall be submitted from a laboratory complying with ASTM E 329. Tests to be conducted shall be those required to demonstrate that the aggregate conforms to the requirements of 6D-2.A.2. Gradation tests submitted for fine aggregate shall include the No. 8 and No. 30 sieve sizes. No aggregate shall be used until notice of acceptance has been given by the Engineer.

6D-1.E.1.e. <u>Non-shrink Grout.</u>

<u>General.</u> Descriptive literature of the grout proposed for use shall be furnished together with a certificate from the manufacturer stating that it is suitable for the application or exposure for which it is being considered. In addition, a detailed plan shall be submitted for approval, showing equipment and procedures proposed for use in mixing and placing the grout.

<u>Prepackaged material</u> requiring only the addition of water will be accepted on the basis of certified laboratory test results showing that the material meets the requirements of CRD-C 621. When fine aggregate is to be added, the Contractor shall also furnish for approval the design mix proportions together with certified copies of laboratory test results indicating that the mix is in conformance with the requirements of CRD-C 621.

<u>Mixture proportions</u> using a volume-change controlling ingredient shall be submitted for approval. The submittal shall include the design mix proportions of all ingredients and certified copies of laboratory test results indicating that the materials and the mix is in conformance with the requirements of CRD-C 621.

r. <u>Pg 6D-7, para 6D-1.E.2.</u> Add the following paragraphs:

e. <u>Retarding admixture</u> shall be certified for compliance with all specification requirements.

f. <u>High-range water-reducing admixture</u> shall be certified for compliance with all specification requirements.

s. <u>Pg 6D-7, para 6D-1.E.3.f.</u> After "medium" add ",equipment".

t. Pg 6D-8, para 6D-2.A.1.c. Change "C 150 or" to "C 150 for".

u. Pg 6D-9, para 6D-2.A.2.

(1) In the table, option 3, change "54" to "57".

(2) Delete the fifth sentence.

v. Pg 6D-9, para 6D-2.A.4. Replace this paragraph with:

4. Curing Materials

a. Impervious Sheet Materials. ASTM C 171, type optional except polyethelene film, if used, shall be white opaque.

b. Membrane-forming Curing Compound. CRD-C 300, pigmented, non-pigmented. Nom-pigmented compound shall contain a fugitive dye.

w. Pg 6D-9. Add the following paragraph:

7. Non-Shrink Grout shall comform to CRD-C 621. The type shall be expansive-cement.

x. Pg 6D-9, para 6D-2.B. It is suggested that the following paragraphs be used. They have been rewritten for easier reading and should enhance the quality of work. Note that design parameters for the stabilization slab have been added.

B. MIXTURE PROPORTIONING

1. General. For each portion of the structure, concrete mixture proportions shall be determined by the Contractor so that the following requirements contained herein are met. Where a concrete production facility has compressive test records, a standard deviation shall be established. Documentation that proposed concrete proportions produce the required average compressive strength, f_{cr}, determined in 6D-2.B.4 shall be based on previous field experience (6D-2.B.5.a) or laboratory trial batches (6D-2.B.5.b).

2. Concrete Properties.

a. Specified Compressive Strength, f_c, shall be as follows:

Compressive Strength at 28* days, psi	Structure or Portion of Structure
2500	4" stabilization slab
3000	All other structures

*90 days if fly ash is used

b. Maximum Water-Cementitious Ratio shall be as follows:

Water-Cementitious Ratio, by wt.	Structure of Portion of Structure
0.64	4" stabilization slab
0.58	All other structures

c. Nominal Maximum size coarse aggregate shall be 1 or 1-1/2 inches except 3/4-inch nominal maximum size coarse aggregate shall be used when any of the following conditions exist: the narrowest dimension between sides of forms is less than 7-1/2 inches; the depth of the slab is less than 4-1/2 inches or when the minimum clear spacing between reinforcing or between reinforcing steel and sheet piling is less than 2 inches. The nominal maximum size aggregate (NMSA) and the maximum size aggregate (MSA) shall be as defined in ACI 116R.

d. Air Content as determined by ASTM C 231 shall be between 4 and 7 percent except that when the nominal maximum size coarse aggregate is 3/4-inch it shall be between 5 and 7 percent.

e. Slump. The slump shall be determined in accordance with ASTM C-143 and shall be within the range of 1 to 4 inches. Where placement by pump is approved, the slump before pumping shall not exceed 6 inches and shall remain within a 3-inch band. Where the use of chemical admixtures conforming to ASTM C 494, Type F is approved, the slump shall not exceed 8 inches after the admixture is added.

f. Pozzolan Content. If pozzolan is to be used, it will be limited to a maximum of 25 percent by absolute volume of the total cementitious materials.

3. Determining Standard Deviation. Test records from which a standard deviation is calculated shall:

- represent materials, quality control procedures, and conditions similar to those expected at the proposed work;

- not be from a project where the allowable changes in materials and/or proportions were more restricted than for the proposed work;

- represent concrete produced to meet a specified strength or strengths, f'c, within 1000 psi of that specified for the proposed work;

- consist of at least 30 concecutive tests or two groups of consecutive tests totaling at least 30 tests;

- be from different batches;

- be the average of strengths from two cylinders made from the same sample of concrete and tested at the age indicated in 6D-2.B.2.a; and

- be from concrete that was produced within one year of the time when concrete placement is expected to begin for the proposed work.

a. For 30 Test Records. Use an unmodified standard deviation and calculate f_{cr} as per 6D-2.B.4.a.

b. For 15 to 29 Test Records. Where a concrete production facility does not have 30 test records, but does have a record based on 15 to 29 consecutive tests, a modified standard deviation may be established as the product of the standard deviation based on 15 to 29 tests and a modification factor from the following table. Calculate f_{cr} as per 6D-2.B.4.a.

Number of Records*	Modification Factor for Standard Deviation
15	1.16
20	1.08
25	1.03
30 or more	1.00

*Interpolate for intermediate numbers of records.

c. For Less Than 15 Test Records. No standard deviation is needed. Calculation of f_{cr} shall be as per 6D-2.B.4.b.

4. Required Average Compressive Strength, f_{cr}. In meeting the strength requirements specified in 6D-2.b.2.a, the selected mixture proportions shall produce an f_{cr} exceeding f'_c as indicated below.

a. For 15 to 30 Records. If a standard deviation is calculated as per 6D-2.B.3 or 6D-2.B.3.a, f_{cr} shall be determined based on the value of f'_c and the standard deviation, s, as follows:

Standard Deviation	Required Average Strength, f_{cr} (psi)
$\leq$ 505	$f'_c + 1.34\ S$
> 505	$f'_c + 2.33\ S-500$

b. For Less Than 15 Records. When a concrete production facility does not have field strength test records for calculation of standard deviation, f_{cr} shall be determined based on the value of f'_c as follows:

Specified Strength, f'_c (psi)	Required Average Strength, f'_{cr} (psi)
< 3000	f'_c + 1000
3000-5000	f'_c + 1200
> 5000	f'_c + 1400

5. Documenting Average Strength.

a. Field Experience. Required average strength, f_{cr}, can be documented by field experience if compressive strength test records consisting of not less than 10 consecutive tests and encompassing a period of not less than 60 days are used. Test records shall represent similar materials to those proposed and similar conditions to those expected. Changes in materials, conditions and proportions within the test record shall not have been more closely restricted that those for the proposed work.

b. Laboratory Trial Batches. Samples of approved aggregates shall be obtained in accordance with the requirements of ASTM D 75. Samples of materials other than aggregate shall be representative of those proposed for the project and shall be accompanied by manufacturer's test reports indicating compliance with applicable specified requirements. Trial mixtures having proportions, consistencies and an air content suitable for the work shall be made based on ACI 211.1 (CRD-C 99), using at least three different water-cement ratios which will produce a range of strength encompassing those required for the work. The target water-cement ratios required in 6D-2.B.2.b will be converted to a weight equivalency as described in ACI 211.1. Trial mixtures shall be designed in accordance with the procedure in ACI 211.1, Chapter 5, using the absolute volume basis for determining the required amount of fine aggregate. Format for submittal of proportioning shall be in accordance with ACI 211.1, paragraph 6.3.7.2. The Contractor shall provide a copy of this section of the contract specifications entitled STRUCTURAL SITECAST CONCRETE to the laboratory that performs the concrete proportioning at least 60 days (120 days when pozzolan is used) prior to the date when the first concrete will be placed for this project. Representative samples for all concrete materials proposed for this project shall also be delivered to the laboratory that performs the concrete proportioning at least 60 days (120 days when pozzolan is used) in advance of the time when concrete placement is expected to begin for the project. When all of these materials have been delivered, the name, address, and phone number of this laboratory and a list of the sources and types of all concrete materials shall be submitted to the Engineer. Trial mixtures shall be designed for maximum permitted slump and air content. The dry rodded weight per cubic foot of the coarse aggregate determined according to ASTM C 29 using the rodding procedure (para. 8), the fineness modulus of the fine aggregate determined according to CRD-C 104, the yield, and test results of concrete properties in 6D-2.B.2 shall be reported. For each water-cement ratio, at least three test cylinders for each test age shall be made and cured in accordance with ASTM C 192. They shall be tested at 7 and 28 days (7, 28, and 90 days if pozzolan is used) in accordance with ASTM C 39. From these test results a curve shall be plotted and submitted showing the relationship between water-cement ratio and design age strength.

y. Pg 6D-13, para 6D-3.A.2.a.

(1) In the thirteenth sentence, replace "prior to the" with "prior to their introduction into water or sand. The plant shall be arranged so as to".

z. Pg 6D-16, para 6D-3.B.7. In the last sentence, delete "the latest edition of".

aa. Pg 6D-19, para 6D-3.D.2. At the end of the last sentence, add "from agitating equipment".

ab. Pg 6D-19, para 6D-3.D.4. In the fourth sentence, add "of the concrete" after "temperature".

ac. Pg 6D-21, para 6D-3.E.1.c. In the second sentence, before "cement" add "water,".

ad. Pg 6D-23, para 6D-3.F.3. Add "any surface to receive a waterproof finish," after "applied".

ae. Pg 6D-23, para 6D-3.F.3.b. After the third sentence, add "The second coat shall be applied in a direction perpendicular to that of the first coat.

af. Pg 6D-24, para 6D-3.F.4. It is suggested that the first sentence be replaced with the following:

> When the daily outdoor ambient low temperature is less than 32° F, the temperature of the concrete shall be maintained above 40° F for at least the first three days and above 32° F for the remainder of the required curing period.

ag. Pg 6D-24, para 6D-3.F. Add the following paragraph:

5. Impervious-Sheet Curing. Concrete that may be cured using impervious sheets should be horizontal or near horizontal surfaces. All surfaces shall be thoroughly wetted and be completely covered with waterproof paper, polyethylene film or polyethylene-coated burlap having the burlap thoroughly water-saturated before placing. The covering shall be laid with the light colored side up. The covering shall be lapped not less than 12 inches and securely weighed down or shall be lapped not less than 4 inches and taped to form a continuous cover with completely closed joints. The sheets shall be weighted to prevent displacement so that they remain in contact with the concrete during the specified curing period. Coverings shall be folded down over exposed edges of slabs and secured by approved means. Sheets shall be immediately repaired or replaced if tears or holes appear during the curing period.

ah. Pg 6D-24. Add the paragraphs shown in enclosure 4:

ai. Pg 6D-26, para 6D-3.G.2.d (second paragraph). It is suggested that:

(1) After both occurances of "batching", add "and recording".

(2) In the first sentence, after "required weight," add "recorded weight".

aj. Pg 6D-26, para 6D-3.G.2.f. It is suggested that at the end of the first sentence of the first paragraph, "or at least once a day when concrete is placed" be added.

ak. Pg 6D-27, para 6D-3.G.2.j. Insert the following paragraph:

Impervious Sheet Curing. At least once each shift, but not less than once per day including weekends and holidays, an inspection shall be made of all areas being cured using impervious sheets. The condition of the covering and the tightness of the laps and tapes shall be noted and recorded.

al. Pg 6D-30, para 6D-3.G.3.g. Add the following paragraphs:

Curing Compound. When the coverage rate of curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

Impervious Sheet Curing. When a daily inspection lists any tears, holes or laps of joints that are not completely closed, the tears and holes shall be promptly repaired or the sheets replaced, the joints closed and the required curing period for those areas shall be extended by one day.

am. Pg. 13-1, para. 13-1.A. If the last sentence implies that all provisions of these manuals apply, then this is poor because it relies on these manuals and the quality, understanding and integrity of the Contractor to accomplish the intended work. These manuals will probably have several choices causing the designer to loose control.

an. Minor changes marked in green can be found on pages 6C-1, 6D-1, 6D-18, 6D-19, 6D-24 and 6D-29.

3. Structure Foundations Comments. The following comments, most of which are shown in red on the plans and specifications, are offered:

a. Pg. 5-6, para. 5-3.B. The eleventh sentence should be changed to read: "Predrilling shall not extend closer than 5 feet above the required tip elevation." The Engineer should be advised that if predrilling is to be used then prior approval from the Corps will be necessary.

b. Pg. 5-6, para. 5-3.C. The first sentence should be shortened to read: "Any pile ... shall be removed and replaced."

c. Pg. 5-7, para. 5-4.B.3.a. It is suggested that the first sentence be rearranged to read: "Each concrete pile ... driving the pile in its original driven position, plus 50 percent of the contract unit price for furnishing, driving and pulling."

d. Pg. 5-7, para. 5-4.B.3.a. The beginnings of the third sentence should be rearranged to read: "Undamaged pulled piles when redriven ...."

e. Pg. 5-8, para. 5-4.B.3.b. In the first sentence the words "due to Contractor negligence" should be inserted between the words "damaged" and "no."

f. Pg. 11A-1, para. 11A-1.B.4. The phrase "classification of borrow material" should be incorporated between the words "drainage" and "moisture."

g. Pg. 11A-2, para. 11A-3.A.1. and Pg. 12-3, para. 12-2.B.1. In these paragraphs reference is made to the "Soil Boring Legend," but is not presented in the specs. or on the drawings. This should be corrected.

h. Pg. 11A-2, para. 11A-3.A.2. Structural excavation lines are not shown on the drawings. Structural backfill should be compacted in accordance with paragraph 12-3.B.2. and only power tampers used within 2 feet of any structure.

i. Pg. 12-1, para. 12-1.B.2. The word "construction" should be inserted between the words "embankment" and "and."

j. Pg. 12-6, para. 12-3.d. The following sentence should be incorporated between the first and second sentence: "In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed at no additional cost to the Engineer."

k. Pg. 12-6, para. 12-4.B. The phrase "and moisture control" should be incorporated at the end of the first sentence."

l. Dwg. 1 of 24. Additional sheets should be added on the index for: Boring Logs, and Soil Borings Legend.

m. Dwg. 4, 7, and 24 of 24. The concrete cap of the I-Wall at the tie-ins with the Lakeshore Drive ramps should follow the same slope of the existing levee crown as shown on plates 5, 6, 7 and 24.

n. Dwg. 4 of 24. Any station where the bottom elevation of the existing steel sheet piling changes (Sta. 11 + 78.01 W/L and Sta. 13 + 69.01 W/L) should be identified on the profile view.

o. Dwg. 7 of 24. Sta. 35 + 32.17 (where the bottom ele. of the existing steel sheet piling changes) should be identified on the profile view.

4 encls

RODNEY P. PICCIOLA
Chief, Foundations & Materials Branch

If needed.

~~compounds shall not be used on concrete surfaces which are maintained at curing temperature by use of free steam.~~

*14. SETTING OF BASE PLATES AND BEARING PLATES.

14.1 General. After being plumbed and properly positioned, column base plates, bearing plates for beams and similar structural members, and machinery and equipment base plates shall be provided with full bearing with damp-pack bedding mortar except where non-shrink grout is approved or required. The space between the top of concrete or masonry bearing surface and the bottom of the plate shall be approximately 1/24 of the width of the plate, but not less than 1/2 inch for plates less than 12 inches wide. Concrete surfaces shall be rough, clean, free of oil, grease, and laitance, and shall be damp. Metal surfaces shall be clean and free of oil, grease, and rust.

14.2 Damp-pack bedding mortar shall consist of 1 part type I portland cement and 2-1/2 parts of fine aggregate conforming to ASTM C 33, proportioned by weight, and not more than 4-1/2 gallons of water per bag of cement. The space between the top of the concrete or masonry bearing surface and the bottom of the plate shall be packed with the bedding mortar by tamping or ramming with a bar or rod until the voids are completely filled.

14.3 Non-shrink grout shall conform to the requirements of paragraphs 5.2.6 and 6.6. For clearance of two inches or more, the mix shall include by weight 1-1/2 parts of sound, clean uncrushed gravel conforming to size No. 8 Table 2 ASTM C-33 in combination with fine aggregate conforming to ASTM C-33, to one part portland cement unless otherwise recommended by the material manufacturer. Water content shall be the minimum that will provide a flowable mixture and completely fill the space to be grouted without segregation, bleeding, or reduction of strength.

2nd 4

14.3.1 Mixing and placing shall be in conformance with the material manufacurer's instructions and as specified therein. Ingredients shall be thoroughly dry-mixed before adding water. After adding water, the batch shall be mixed for 3 minutes. Batches shall be of size to allow continuous placement of freshly mixed grout. Grout not used within 30 minutes after mixing shall be discarded. The space between the top of the concrete or masonry bearing surface and the plate shall be filled solid with the grout. Forms shall be of wood or other equally suitable material for retaining the grout and shall be removed after the grout has set. The placed grout shall be worked to eliminate voids; however, overworking and breakdown of the initial set shall be avoided. Grout shall not be retempered or subjected to vibration from any source. Where clearances are unusually small, placement shall be under pressure with a grout pump. Temperature of the grout, and of surfaces receiving the grout, shall be maintained at 65^{o} to 85^{o} F. until after setting.

14.3.2 Treatment of Exposed Surfaces. Those types containing metallic aggregate shall have, after the grout has set, the exposed surfaces cut back one-inch and immediately covered with a parge coat of mortar proportioned by weight of one part portland cement, two parts sand, and sufficient water to make the mixture placeable. The parge coat shall have a smooth, dense finish. The exposed surface of other types of non-shrink grout shall have a smooth, dense finish.

14.3.3 Curing. Grout and parge coats shall be cured in conformance with paragraph 13~~)~~.

~~15. CONTRACTOR QUALITY CONTROL.~~

F&M BRANCH F-6

11/18 F (PICCIOLA)
FG (SMITH)
FM (BECKER)
FD (SATTERLEE)
✓ FS (NAPOLITANO)
FT (LEUFROY)
F (SECRETARY)

ACTION/SUSPENSE 11/26
COORDINATION
INFORMATION
FILE
RETURN

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL
LMNED-SP

SUBJECT
Lake Pontchartrain, La. & Vicinity High Level Plan Hurricane Protection Project - Pontchartrain Beach Flood Protection Phase II

TO
C/Des Br
C/F&M Br 11/18
C/H&H Br

FROM C/Des Svcs Br

DATE 17 Nov ~~85~~ 86
Mr. Stutts/pas/2614

CMT 1

1. Enclosed, please find copies of the subject plans & Specification. It is requested that your review this material to insure compliance with project objectives and Corps criteria.

2. Your comments are requested as soon as possible but should be provided by COB 26 Nov 86.

Thomas E Harrington
THOMAS E. HARRINGTON, JR.
Chief, Design Services Branch

Encl

1 copy Design Br (hand carried)
1 copy F&M Br (hand carried) 11/18
1 copy H&H Br (hand carried)

DA FORM AUG 80 2496

PREVIOUS EDITIONS WILL BE USED

★ USGPO 1986-490-003/43241

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL LMNED-FS

SUBJECT Lake Pontchartrain LA & Vicinity, Hurricane Protection Project HLP, Pontchartrain Beach Flood Protection Project

TO C/Des Svcs Br

FROM C/F&M Br

DATE 24 Nov 86

Mr. Estrada/cl/1035

CMT 1

1. Reference is made to the 20 November letter from URS Engineers, subject as above, which was hand carried by Ron Elmer of your office.

2. The letter was in response to a stability analysis requested from our office on a 12 Nov DF.

3. We have reviewed the stability analysis and concluded that it meets our minimum stability requirements.

RODNEY P. PICCIOLA
Chief, Foundations and Materials Branch

11/25

FILE

DA FORM AUG 80 2496

PREVIOUS EDITIONS WILL BE USED

★ U.S.G.P.O. 1986-490-003/43241

URS

AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

URS COMPANY

3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL: (504) 837-6326

Dallas
Denver
Kansas City
New York
San Francisco
Seattle
Anchorage
Austin
Berkeley

Boston
Buffalo
Houston
Las Vegas
Montvale
New Orleans
Philadelphia
Washington, D.C.
Puerto Rico
Jeddah

November 20, 1986

Mr. Ron Elmer, LMNED-SP
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project - Phase II
OLB Construction Project No. 2040-0375
DEI Project No. 1008
URS Project No. 46021.00

In response to your recent request of URS, Eustis Engineering Company performed a new stability analysis for the non-symmetrical ramp alignment at gate No. 2 of the above proposed project. The results of their analysis are attached and indicate that there are "...no unbalanced forces to be carried by sheet piles beneath the proposed floodgate structure."

Please advise as to when the results the Corps review is complete. In the meantime, however, should any questions develop, please advise us of them so we can, if possible, address them in advance of the final comments to avoid any delays to the project.

Sincerely,

URS COMPANY

Charles A. Thompson

for Bruce H. Adams, P.E.

BHA/kam

Enclosures

cc: Mr. C.E. Bailey, OLB (w/enclosure)
DEI (w/enclosures)
Eustis Engineering Co.

Hand Carried by Ron Elmer
on 21 Nov. 86

21 November 1986

URS Company
Consulting Engineers
3500 North Causeway Boulevard
Metairie, Louisiana 70002

Attention Mr. Bruce Adams

Gentlemen:

Supplemental Information
Geotechnical Investigation
Orleans Levee District
Pontchartrain Beach Flood Walls and Levees
New Orleans, Louisiana

At your request, we have performed a stability analysis for the proposed ramp configuration at Gate 2. We understand this analysis has been requested by the U.S. Army Corps of Engineers as part of their review of the Phase II Plans and Specifications.

Results of a deep-seated stability analysis for the gate structure at Ramp 2 are shown on Enclosure 1. This analysis is a modification of the deep-seated analysis for Ramp 2 shown on Figure 31 of our original report. The results of the analysis shown on Enclosure 1 indicate that there are no unbalanced forces to be carried by sheetpiles beneath the proposed floodgate structure.

If we can be of further assistance or you require further information, please do not hesitate to contact us.

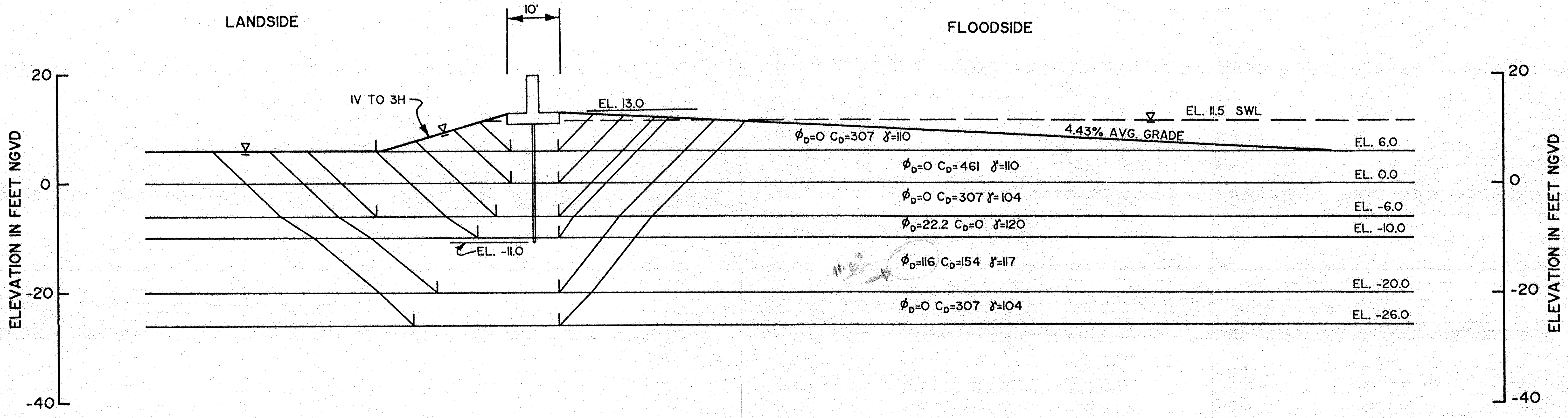
Yours very truly,

EUSTIS ENGINEERING

Lloyd A. Held, Jr.

Lloyd A. Held, Jr.

W. W. Gwyn:bh



FAILURE SURFACE ELEVATION	DISTANCE TO FACE OF PASSIVE WEDGE (FT)	D_A	$D_P + \Sigma R$	ΔE_C
6	10	2582	12429	-9847
0	10	8905	27367	-18462
-6	12.5	18915	40577	-21662
-10	15	27828	52197	-24369
-20	22	57961	89153	-31192
-26	26	81055	116518	-35463
6	31	2582	13635	-11053
-6	31	18915	39061	-20146

NOTE: ANALYSES BASED ON LMVD METHOD OF PLANES. RESISTING FORCES ARE COMPUTED ASSUMING SHEAR STRENGTH PARAMETERS ARE REDUCED BY A FACTOR OF 1.30. SUBSCRIPT "D" INDICATES FACTORED PARAMETERS.

$$\Delta E_C = D_A - (D_P + \Sigma R)$$

DEEP SEATED STABILITY ANALYSIS
RAMP 2

PONTCHARTRAIN BEACH FLOODWALLS AND LEVEES
OLB PROJECT NO. 2040-0204
NEW ORLEANS, LOUISIANA

EUSTIS ENGINEERING

ENCLOSURE I

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNED-FS	Lake Pontchartrain La & Vicinity, Hurricane Protection Project HLP; Pontchartrain Beach Flood Protection Project

TO	FROM	DATE	CMT 1
C/Des Svcs Br	C/F&M Br	12 Nov 86 Mr. Richardson/gl/1031	

1. Reference is made to the 29 October 86 letter from URS Engineers on the subject project addressed to Mr. Ron Elmer of your Branch with copy furnished to Mr. Jim Richardson of my Branch (copy attached).

2. We have reviewed the enclosed plans and have no objection to the proposed work provided that the non-symmetrical ramp sections do not lower the levee stability below the minimum required factor-of-safety. Stability analysis should be provided for our review.

1 Encl

RODNEY P. PICCIOLA
Chief, Foundations & Material Branch

11/13

FILE COPY

URS
AN INTERNATIONAL PROFESSIONAL SERVICE ORGANIZATI

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE LOUISIANA 70002
TEL (504) 837-6326

[illegible]

October 29, 1986

Mr. Ron Elmer, LMNED-SP
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, La 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project - Phase II
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

Subsequent to our recent conversation with Mr. Jim Richardson of the Corps, URS has enclosed a plan and cross-section of the proposed ramp crossing no. 2 at the above project. We have explained to Mr. Richardson that with this proposed crossing, an asphalt pavement would be placed upon the protected-side crown of the levee against the I-wall with a top of pavement elevation of 13.0' NGVD. This is the same elevation as the required net earthen portion of the combination earthen levee/I-wall section. Mr. Richardson stated that he did not think there would be a problem with this proposal, but also requested that we submit these preliminary drawings for his review. By copy of this letter, we are submitting these to Mr. Richardson.

Please confirm the Corps' opinion of this as soon as possible as our design deadline is imminent. Should you have any questions, call at your convenience.

Sincerely,

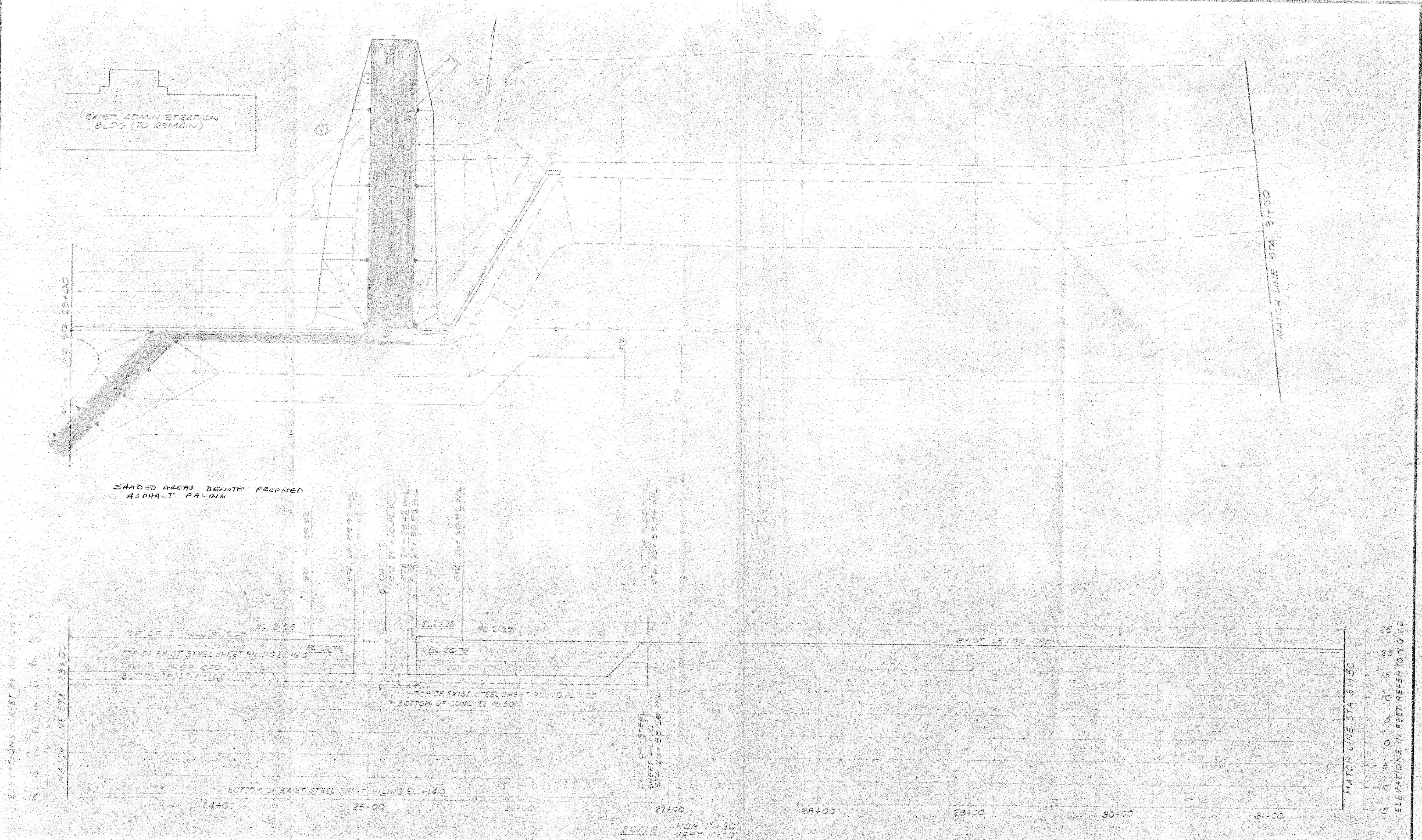
URS ENGINEERS

Bruce H Adams

Bruce H. Adams, P.E.

Enclosures (w/Mr. Richardson's cc)

cc: Mr. Jim Richardson, U.S. Army Corps of Engineers, LMNED-FS
Mr. C.E. Bailey, OLB
DEI



OCT 29 1986

REVISION BY

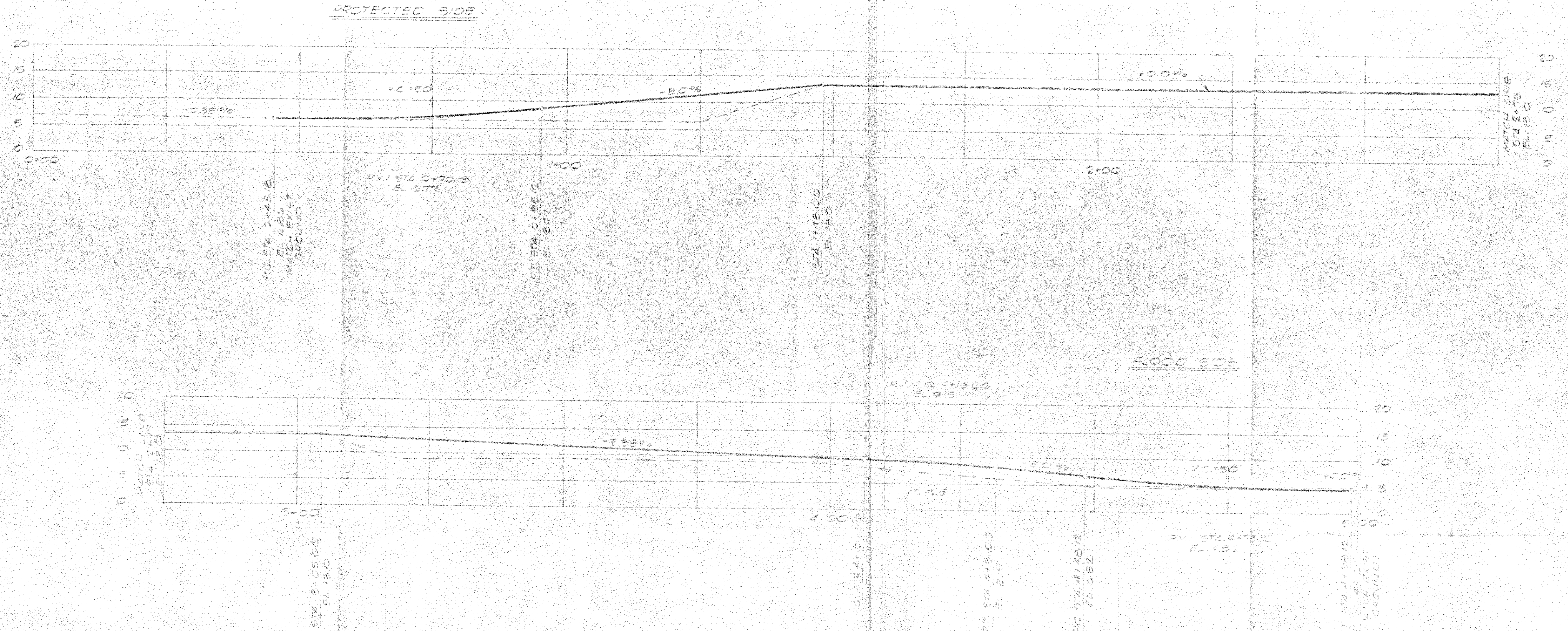
DESIGNED BY:
DRAWN BY: J.D.B.
CHECKED BY:
REVIEWED BY:
DATE:

URS
Dallas
Austin
Houston
New Orleans

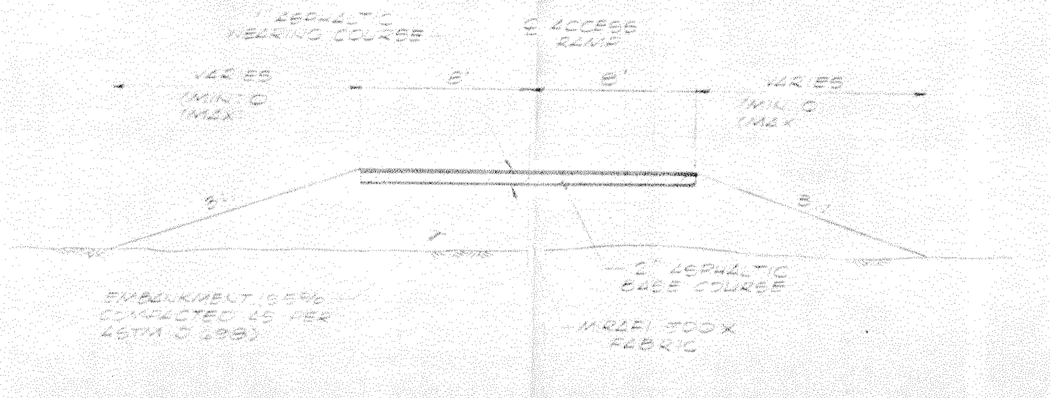
PONTCHARTRAIN BEACH
FLOOD PROTECTION IMPROVEMENT PROJECT
ORLEANS PARISH PHASE II LOUISIANA

PLAN AND PROFILE

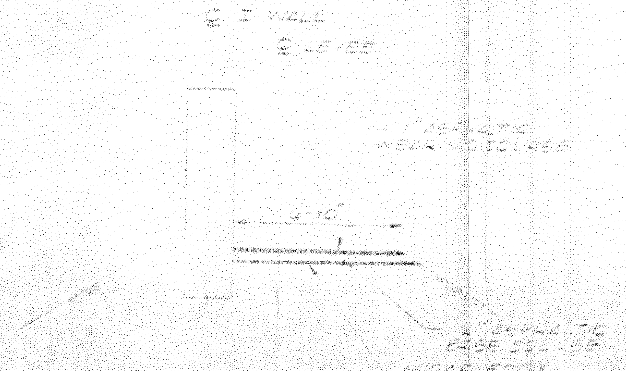
SHEET NO. 6
OF SHEETS
FILE NO. 46021.00
565-04-73



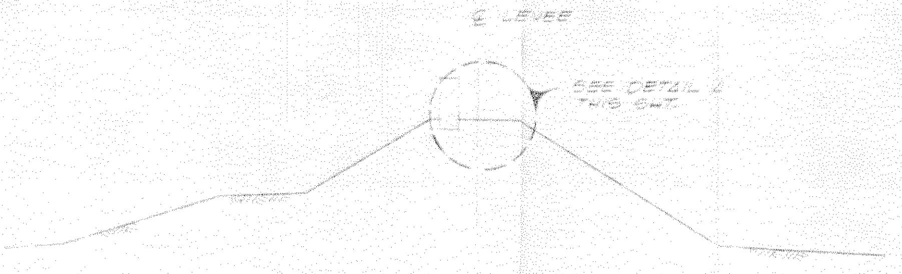
FINISHED GRADE PROFILE
ACCESS RAMP 2 STA.
SCALE 1"=10' HORIZ.
1"=10' VERT.



TYPICAL SECTION
ACCESS RAMP 2 STA. 0+45.18 TO STA. 1+48.00
N.T.S.



DETAIL A
N.T.S.



TYPICAL SECTION
ACCESS RAMP 2 STA. 1+48.00 TO STA. 2+95.00
N.T.S.

OCT 29 1986

NO.	DATE	REVISION	BY

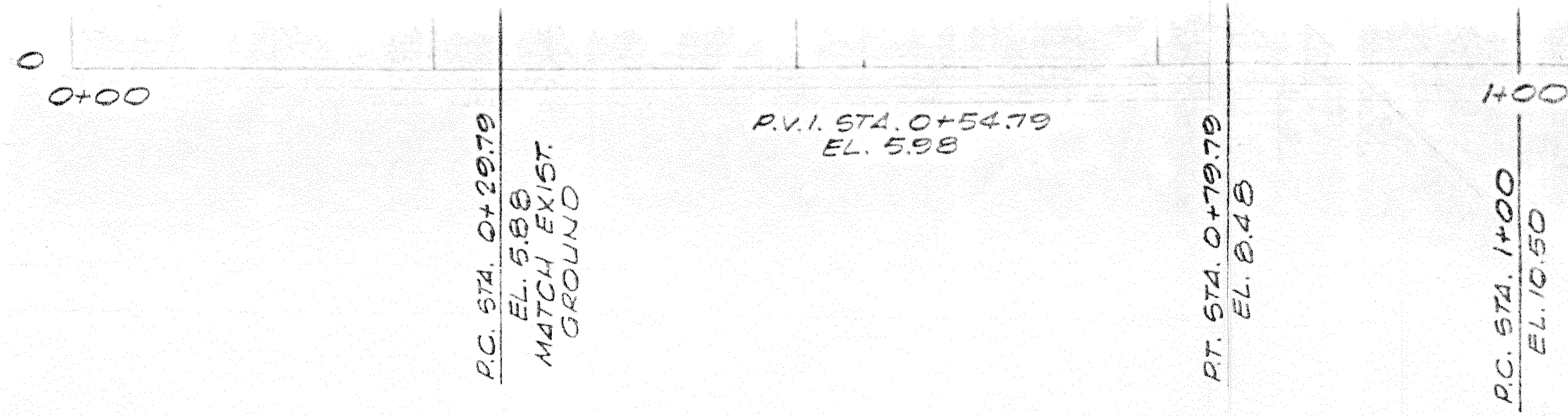
DESIGNED BY: C.A.T.
DRAWN BY: J.D.B.
CHECKED BY: C.A.T.
REVIEWED BY:
DATE

URS
Dallas
Austin
Houston
New Orleans

PONTCHARTRAIN BEACH
FLOOD PROTECTION IMPROVEMENT PROJECT
ORLEANS PARISH PHASE II LOUISIANA

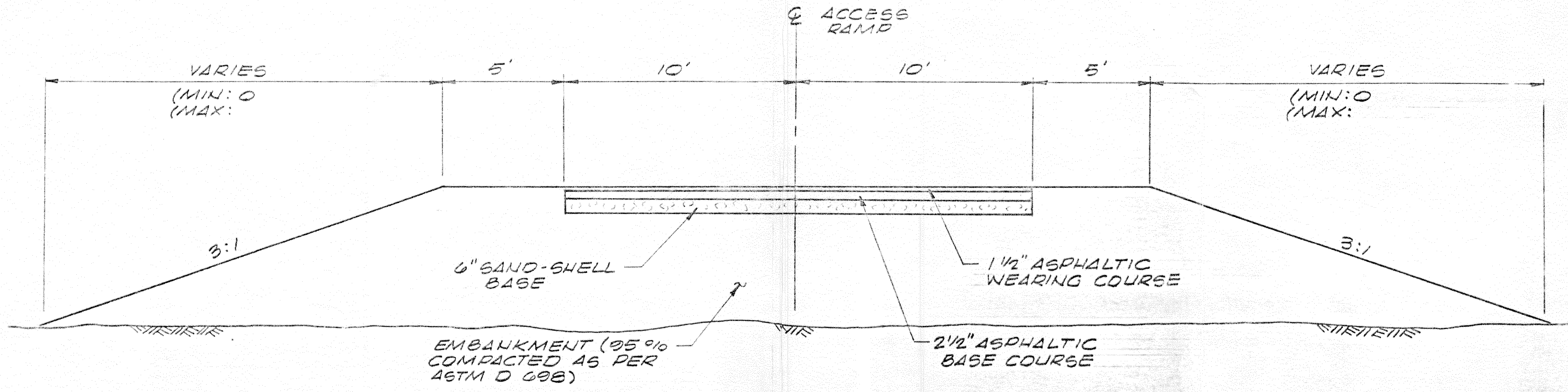
ACCESS RAMP PROFILES AND SECTIONS

SHEET NO.
OF SHEETS
FILE NO. 46021.00
565-04-73



FINISHED GRADE PROFILE
ACCESS RAMP 3 STA.

SCALE: 1" = 10' HORIZ.
1" = 10' VERT.



TYPICAL SECTION
ACCESS RAMPS 1 AND 3
ACCESS RAMP 2, STA. 3+05 TO STA. 4+98.12

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

OCT 29 1986

DESIGNED BY: C.A.T.

DRAWN BY: J.D.B.

CHECKED BY: C.A.T.

URS
Dallas
Austin
Houston
New Orleans

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

REPLY TO
ATTENTION OF:

August 6, 1986

Engineering Division
Projects Engineering Section

Mr. Bruce Adams
URS Engineers
3500 North Causeway Boulevard
Metairie, Louisiana 70002

Dear Mr. Adams:

At your request, we have reviewed the test results and Eustis Engineering recommendations contained in your letter of July 30, 1986. Based on the data furnished, we feel that the levee portion of the Lakeshore Drive ramp crossings meets our previously stated parameters for classification, seepage control and compaction required for semicompacted levee fill. Adequacy of the embankment for other than levee purposes was not evaluated.

This was rewritten stating just tha our criteria had been met.
JR

I trust that the foregoing satisfies your needs. If you have any questions, please contact Mr. D. Vann Stutts (Phone Number 862-2614).

Sincerely,

Frederic M. Chatry
Chief, Engineering Division

URS

URS ENGINEERS

3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL: (504) 837-6326

July 30, 1986

Mr. Ron Elmer, LMNED-SP
U.S. Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

HAND DELIVERY

On June 16, 1986, representatives of the Corps, OLB, Eustis Engineers, Johnny F. Smith (JFS), Design Engineering (DEI), E. Berkley Traughber (EBT), and URS met to discuss, among other topics, the feasibility of allowing JFS to stabilize the levee embankment at the Lakeshore Drive crossings so as to enhance their chances of achieving the specified 100% roadway compaction. At that meeting it was agreed that JFS would contract Delta Testing to develop a new standard proctor for a clay soil mixed with what was then thought to be fly-ash. (See the attached June 16, 1986 memorandum.) JFS supplied samples of cement tailings rather than fly-ash, and Delta developed a proctor weight based upon an agreed mix of cement dust and clay soil. Subsequently, examination of Delta's moisture density curves for this mix caused some concern in light of their apparently low dry density (approximately 85 pcf) for this mix, as re-moulded samples of this material tested by Eustis revealed a dry density of 98 pcf. It was agreed during a July 17, 1986 meeting at OLB that JFS may not have achieved the 100% compaction previously thought to have been developed. (See the attached July 18, 1986 correspondence.)

On Friday, July 18, both Delta Testing and Eustis secured samples in the field of the top two lifts of one of the levee sections in question for parallel testing in accordance with ASTM D-698. During a meeting held on July 24, 1986, Eustis and Delta presented their results again, showing some variances as Eustis had determined a maximum dry density of 89.8 and Delta determined 94.9 pcf.

During the July 18 meeting it was generally agreed that the 100% compactions apparently did not exist. Eustis had already checked the permeabilities and determined that Corps standards had been met. While it was recognized that the specified 100% compactions were not existent, it was also recognized that adequate compactions probably do exist for the roadway, however JFS did not meet the specified 100% compaction. At that point discussions turned to some sort of improved roadway section at JFS' expense and/or a warranty bond by JFS protecting OLB's interests as to the possibility of damage to the roadway crossings resulting from possible settlement. (See the attached memorandum of the July 24, 1986 meeting.)

On the following day, OLB confirmed in writing that they preferred the Corps to be consulted immediately to secure the Corps' opinion as to the levees' integrity as a stable flood control structure. In light of that request, Eustis has prepared their analysis and the results are hereby officially transmitted to the Corps, as requested during URS' 7:00 a.m. meeting at the Corps today with Messrs. Jim Richardson and Phil Napolitano.

URS is requesting the Corps to provide URS with their opinion of this situation as soon as possible. JFS' progress on the road work is delayed and UNO will soon be opening. Please contact us when your results are available; URS would prefer to collect this information for immediate delivery to the interested parties.

Sincerely,

URS ENGINEERS

Bruce H Adams

Bruce H. Adams, P.E.

attachments

cc: Mr. Jim Richardson, COE (w/enclosures)
Mr. Phil Napolitano, COE (w/enclosures)
Mr. H. B. Lansden, OLB
Mr. C. E. Bailey, OLB (w/Eustis' letter)
Mr. Alan Francinques, OLB (w/Eustis' letter)
Mr. Willis Palmer, JFS (w/Eustis' letter)
DEI (w/Eustis' letter)
E. Berkley Traughber and Assoc. (w/Eustis' letter)
Eustis Engineering
Delta Testing (w/Eustis' letter)

EUSTIS ENGINEERING
GEOTECHNICAL ENGINEERS
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157

29 July 1986

URS Company
Consulting Engineers
3500 North Causeway Boulevard
Metairie, Louisiana 70002

Attention Mr. Bruce Adams

Gentlemen:

Pontchartrain Beach Flood Protection Improvement Plan
Construction of Lakeshore Drive Ramps
OLD Project No. 2040-0204
New Orleans, Louisiana

Reference is made to the memorandum furnished our office on the meeting of 24 July 1986 concerning, in part, the construction of the Lakeshore Drive Ramps. At this meeting, it was generally concluded that the specified compaction (100 percent of maximum dry density at optimum water content in accordance with ASTM D 698) has not been achieved by the contractor. This conclusion is primarily based on the results of the compaction tests performed on samples of fill materials obtained within the ramp. Results of these compaction tests performed by Eustis Engineering are appended to this letter as Enclosures 1 and 2.

Representatives of Delta Testing and Inspection, Inc., E. Berkeley Traughber and Associates, Inc. and Eustis Engineering concur that the possibility exists for roadway deterioration due to inadequate compaction of the subgrade materials. We understand that a warranty bond will be required from the contractor for a total period of two and one-half years following construction of the roadway.

Concern was expressed by the Orleans Levee Board representative relative to the integrity of the levee section as flood protection. Additionally, the representatives of the U.S. Army Corps of Engineers had previously expressed concern over the use of cement-modified soil altering the permeability characteristics of the fill materials.

It is Eustis Engineering's opinion that the compactive effort used for ramp fill materials has resulted in in-place stability parameters equal to or better than those assumed for design, i.e. semi-compacted fill parameters. A permeability test performed on a sample of ramp fill material compacted to the density achieved in the field indicates a permeability on the order of 6.6 x 10^{-9} cm/sec. This is consistent with permeabilities assumed for design. Results of the permeability test are enclosed with this letter. We should note that this test was performed on material obtained from the east ramp. A test is being conducted on material obtained from the west ramp and will be forwarded when available. Eustis Engineering does not anticipate a substantial difference between the permeabilities of materials within the two ramps.

Based on data accumulated to date, it is Eustis Engineering's opinion that the warranty bond described above is in the best interests of the Orleans Levee Board in order to circumvent possible maintenance costs to the Board of the ramp roadways after they are put into service. We feel that the fill materials, as compacted, will provide a stable and impermeable levee.

If we can be of further assistance or you require further clarification of this letter, please do not hesitate to contact us.

Yours very truly,

EUSTIS ENGINEERING

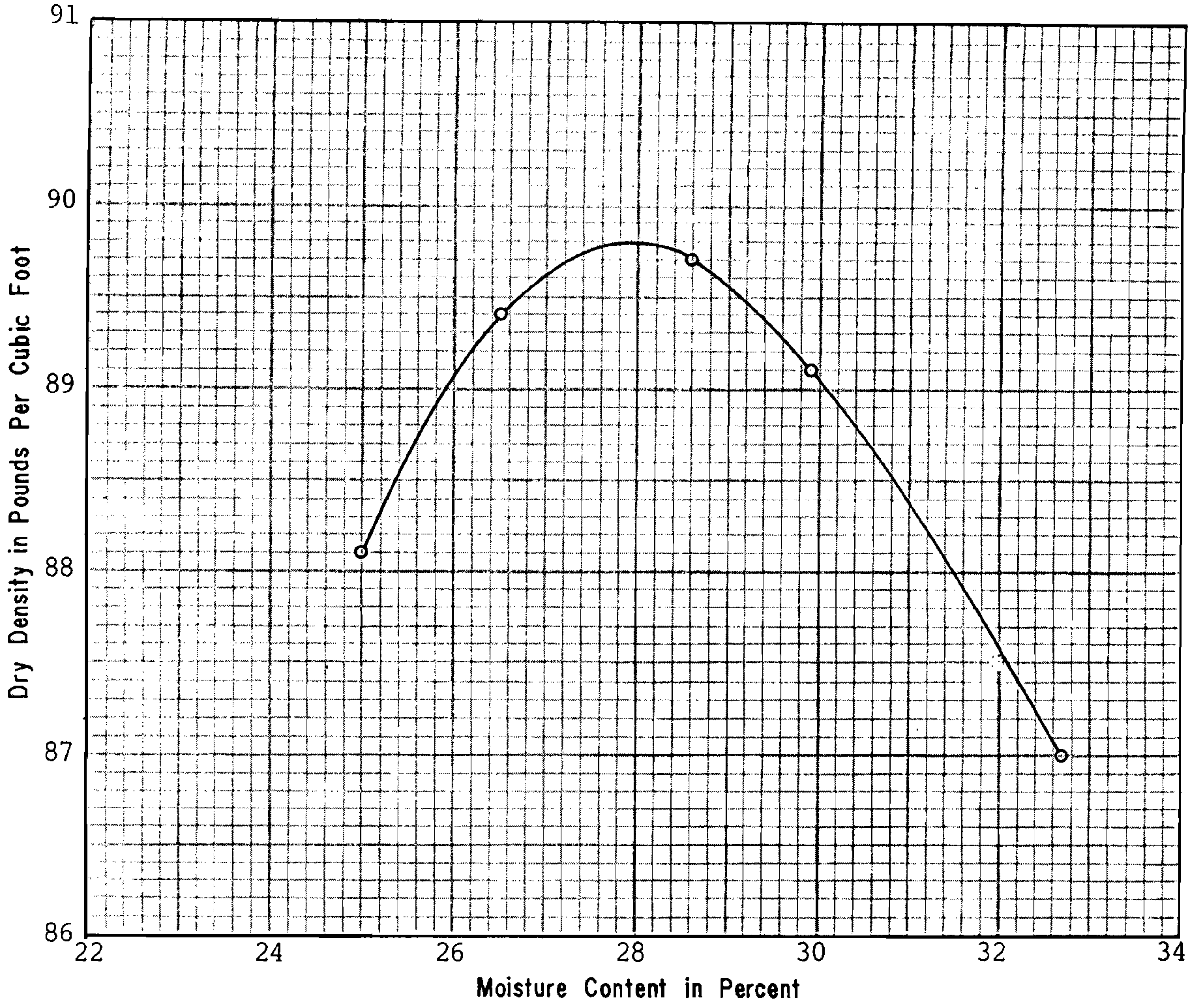
Lloyd A. Held, Jr.

Lloyd A. Held, Jr.

W. W. Gwyn:bh

Enclosures

<table>
<tr><th rowspan="2">Curve No.</th><th rowspan="2">Boring No.</th><th rowspan="2">Sample No.</th><th rowspan="2">Depth In Feet</th><th rowspan="2">Classification</th><th colspan="3">Atterberg Limits</th></tr>
<tr><th>LL</th><th>PL</th><th>PI</th></tr>
<tr><td></td><td></td><td>2</td><td></td><td>Tan & gray clay treated w/cement tailings</td><td>74</td><td>20</td><td>54</td></tr>
</table>



LABORATORY COMPACTION CURVES

ASTM D 698

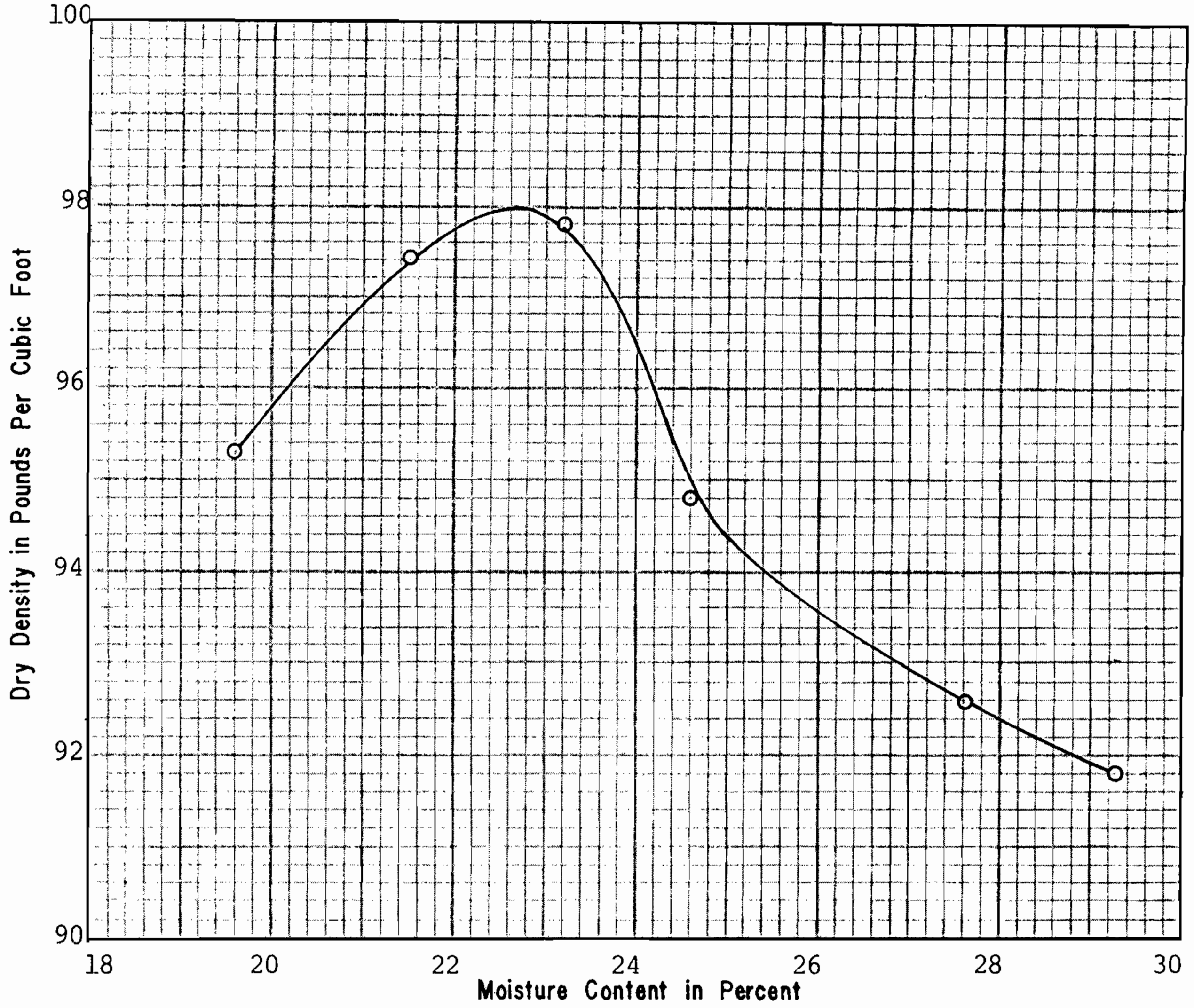
Field Services
Orleans Levee District
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

For: The Board of Levee Commissioners of the Orleans Levee District
New Orleans, Louisiana

URS Company, Consulting Engineers, Metairie, Louisiana

Enc. 1

Curve No.	Boring No.	Sample No.	Depth In Feet	Classification	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI
		1		Tan & gray clay treated w/cement tailings			



LABORATORY COMPACTION CURVES

ASTM D 698

Field Services
Orleans Levee District
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

For: The Board of Levee Commissioners of the Orleans Levee District
New Orleans, Louisiana

URS Company, Consulting Engineers, Metairie, Louisiana

Enc. 2

Field Services
Orleans Levee District
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

For: The Board of Levee Commissioners of the Orleans Levee District
New Orleans, Louisiana

URS Company, Consulting Engineers, Metairie, Louisiana

SUMMARY OF LABORATORY PERMEABILITY TESTS

Sample Number	Classification	Water Content Percent		Density PCF		Coefficient of Permeability cm/sec
		Initial	Final	Dry	Wet	
1	Tan & gray clay w/cement tailings	34.3	34.7	84.8	113.9	6.6×10^{-9} (V)

Specimen was compacted at maximum dry density from ASTM D 698 compaction test and on the wet side of optimum.

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL (504) 837-6326

Dallas
Denver
[illegible]
New York
San Francisco
Seattle
Anchorage
Austin
Berkeley
[illegible]
Buffalo
Houston
Las Vegas
McLean
New Orleans
Philadelphia
Washington DC
Puerto Rico
Jeddah

MEETING MEMORANDUM

PROJECT: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

DATE & LOCATION: Thursday, July 24, 1986 @ 9:00 a.m.
URS Conference Room

ATTENDANCE:

Frank Vicidomina	OLB
John Holtgreve	DEI
Berkley Traughber	E. Berkley Traughber, Inc. (EBT)
Willis Palmer	JFS
Don Meyer	Delta Testing
Chip Indest	Delta Testing
Curtis Lundstrom	Eustis Engineering
Charlene Thompson	URS
Joe Cervini	URS
Bruce Adams	URS

Topics of Discussion:

1. The apparent problems with the compactions of the clay soil-cement trailings mixture of the east and west roadway ramps initiated the meeting. Delta and Eustis presented the results of their parallel re-testing of the last two levee lifts on the east levee crossing. (Copies are attached.) Eustis commented that the variance in the dry densities determined by Eustis and Delta were slightly beyond the tolerance range allowed by ASTM D-698 for such parallel testing.

   Delta mentioned that this could probably due to varying amounts of the cement tailings being present in each of their samples even in light of the efforts made to mix the samples prior to separation. Delta went on to state that they felt that this could be the case throughout all the lifts where this soil-cement mixture was installed and that probably less was used in the upper lifts than the lower lifts as JFS' moisture problems relented.

   EBT agreed that the difference in Delta's and Eustis' plasticity indices liquid limits and densities for each sample indicated that the separated samples probably did not contain the same amount of cement tailings.

The locations of the three samples taken for the permeability analyses were identified as the fourth lift on the east end, one west end lift which was subsequently removed and a second west end sample (location not known.)

The compaction results of the recent re-testing are as follows:

	Lift	
	1	2
Eustis	101.0	97.0
Delta	95.6	91.8
Average	98.2	94.3

Delta, EBT and Eustis concur that the possibility exists of settlement being a problem, but that the compaction which does exist would probably be sufficient for the integrity of the roadway. EBT did remind those in attendance of the fact that the specified 100% compaction does not appear to have been achieved and that is not in compliance with JFS' contract. It was also stated that the State and City of New Orleans only require 95% compaction.

URS stated that some sort of protection of OLB's interests might be required of JFS, possible in the form of a warranty bond on the effected work for some specific scope and period beyond the 1 year presently in the contract (possibly 2 1/2 years, total). JFS stated that they would have to consider it further, but it might be agreeable to them.

OLB stated that as long as the levee was sound as flood protection, met COE standards, and no problems were really expected with the roadway, the bond might be acceptable to the Board, but this would have to be confirmed. URS will prepare a recommendation as to the scope of such warranty bond and submit it to OLB for consideration. (At this time, Delta and Eustis departed.)

OLB further stated that some assurance from Eustis would be necessary as to the integrity of this levee section in light of the field densities being lower than those used in the design. EBT elaborated stating that Eustis should confirm that the LL's, PI's, PL's and densities were acceptable for levee integrity and met the COE`s stability and permeability requirements. (i.e., Eustis's design was based upon densities higher than Delta's 85.4 dry density of the east end 4th lift, but is it a problem either with or without the adjacent and above roadway embankments and pavement sections?) This will be done and COE's comments will also be solicited.

2. Concerning utility improvements at the site, JFS confirmed that NOPSI will begin their gas line installations on Monday (7/28/86) and that JFS will follow with their water installations. JFS was reminded of URS' need for submittal data on the wall sleeve end seals for 1-1/2" conduits.

3. URS presented the proposed additional drainage improvements for the area of the Sail Club and stated that the information would be distributed no later than Friday (7/25/86).

4. Street paving was discussed with JFS stating that work had begun on the sub-base, and curb and gutter work would begin on 7/28. JFS was reminded that the west end paving was a top priority as UNO would soon begin classes.

5. Pending and possible change orders were reviewed as follows:

   A) East end catch basin modifications ($150) - the paper work is being processed and work is done.

   B) UNO barrier - the paperwork is being processed and JFS is ordering the material.

   C) Sail Club drainage - See no. 3, above.

   D) Re-paving of Lakeshore Drive between the JFS and COE contract areas. URS will prepare a scope of work based upon unit prices and solicite JFS for a cost estimate. Additional pay items required of JFS will be mill removal of the old pavement in 3 inch lifts and paving fabric.

6. JFS submitted revised schedules depicting a final date of August 27. (Copies enclosed). Preliminary discussions concerning contract extensions were made with particular attention to requests based upon tree relocation delays and weather JFS will review their request for weather delays and resubmit it with further substantiation than previously submitted.

The meeting adjourned at approximately 12:00 p.m.

Prepared by: Bruce H Adams
Bruce H. Adams

cc: Mr. C. E. Bailey, OLB
Meeting Attendees

1855 MASON AVE., BATON ROUGE, LA 70806

PROPOSAL NO. 2040-0204

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70119 • PHONE (504) 486-5595

DTI 25

SPECIAL 2 FIELD DENSITY TEST OF FILL MATERIAL

PROJECT: Pontchartrain Beach Flood Protection Improvement, Phase I

DATE: 7-23-86

ORDER NO: DNO-7981

REPORTED TO: Orleans Levee District

ENGINEER: URS Engineers

CONTRACTOR: Johnny Smith Trucking

PROCTER TEST METHOD: ☒ Standard ☐ Modified

THEORETICAL DRY DENSITY: Lbs./Cu. Ft. --

OPTIMUM MOISTURE: -- %

DATE	TEST NO.	FIELD MOISTURE %	FIELD DRY DENSITY LBS./CU. FT.	COMPACTION PERCENT	DEPTH OF FILL INCHES	TEST LOCATION
		TESTS TAKEN ON FINAL LIFT OF LEVEE, WEST END, AFTER EXPOSURE				
		BY BULL DOZER, CENTERLINE SOUTH BOUND ROADWAY.				
7-23-86	1	22.4	91.4	--	8" Test	Sta. 20+00
	2	25.7	91.9	--	8" Test	Sta. 19+93
MATERIAL: BROWN CLAY WITH CEMENT TAILINGS.						
ABOVE TESTS WITNESSED BY MR. GENE BREAZEALE.						

TIME, HOURS:

MILES:

INSPECTOR: D. Prudhomme

REMARKS: DFM/mb 7-24-86

2-Orleans Levee Dist. c/o URS Engineers
1-Orleans Levee District
1-Johnny Smith Trucking

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyn

Donald F. Meyn

MASON AVE., BATON ROUGE, LA 70806

PROPOSAL NO. 2040-0204

DELTA TESTING AND INSPECTION, INC.

725 S. GENOIS STREET • NEW ORLEANS, LA. 70119 • PHONE (504) 486-5595

DTI 23

SPECIAL 1 FIELD DENSITY TEST OF FILL MATERIAL

PROJECT: Pontchartrain Beach Flood Protection Improvement, Phase I

DATE: 7-18-86

ORDER NO: DNO-7981

REPORTED TO: Orleans Levee District

ENGINEER: URS Engineers

CONTRACTOR: Johnny Smith Trucking

PROCTER TEST METHOD: ☒ Standard ☐ Modified

THEORETICAL DRY DENSITY: Lbs./Cu. Ft. --

OPTIMUM MOISTURE: -- %

DATE	TEST NO	FIELD MOISTURE %	FIELD DRY DENSITY LBS/CU FT	COMPACTION PERCENT	DEPTH OF FILL INCHES	TEST LOCATION
7-18-86	TESTS CONDUCTED ON FINAL LIFT, EAST END, STA. 90+50					
	PURPOSE: COMPARISON OF FIELD DENSITY GAGES WITH EUSTIS ENGINEERING.					
	1E	27.6	90.8	90.75 vs mean -- 90.	8" Test	98.2% on top
	1D	31.2	90.7	--	8" Test	
	2E	31.6	86.9	87.5 --	8" Test	94.3%
	2D	32.1	87.4	--	8" Test	
	NOTE: TESTS CONDUCTED IN THE SAME PROBE HOLE AT EACH LOCATION					
	E - INDICATES TEST BY EUSTIS TECHNICIAN WITH EUSTIS MACHINE.					
	D - INDICATES TEST BY DELTA TECHNICIAN WITH DELTA MACHINE.					
	MATERIAL: BROWN CLAY					

TIME HOURS:

MILES:

INSPECTOR: D. Prudhomme

REMARKS: DFM/mb 7-24-86

2-Orleans Levee Dist. c/o URS Engineers
1-Orleans Levee District
1-Johnny Smith Trucking

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyn

Donald F. Meyn

PROPOSAL NO. 2040-0204

DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

DTI 19

SPECIAL REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

FOR
Orleans Levee District
c/o URS Engineers
3500 N. Causeway Blvd.
Metairie, LA 70002 Attn: Mr. Bruce Adams

DATE 7-24-86

ORDER NO DNO-7981

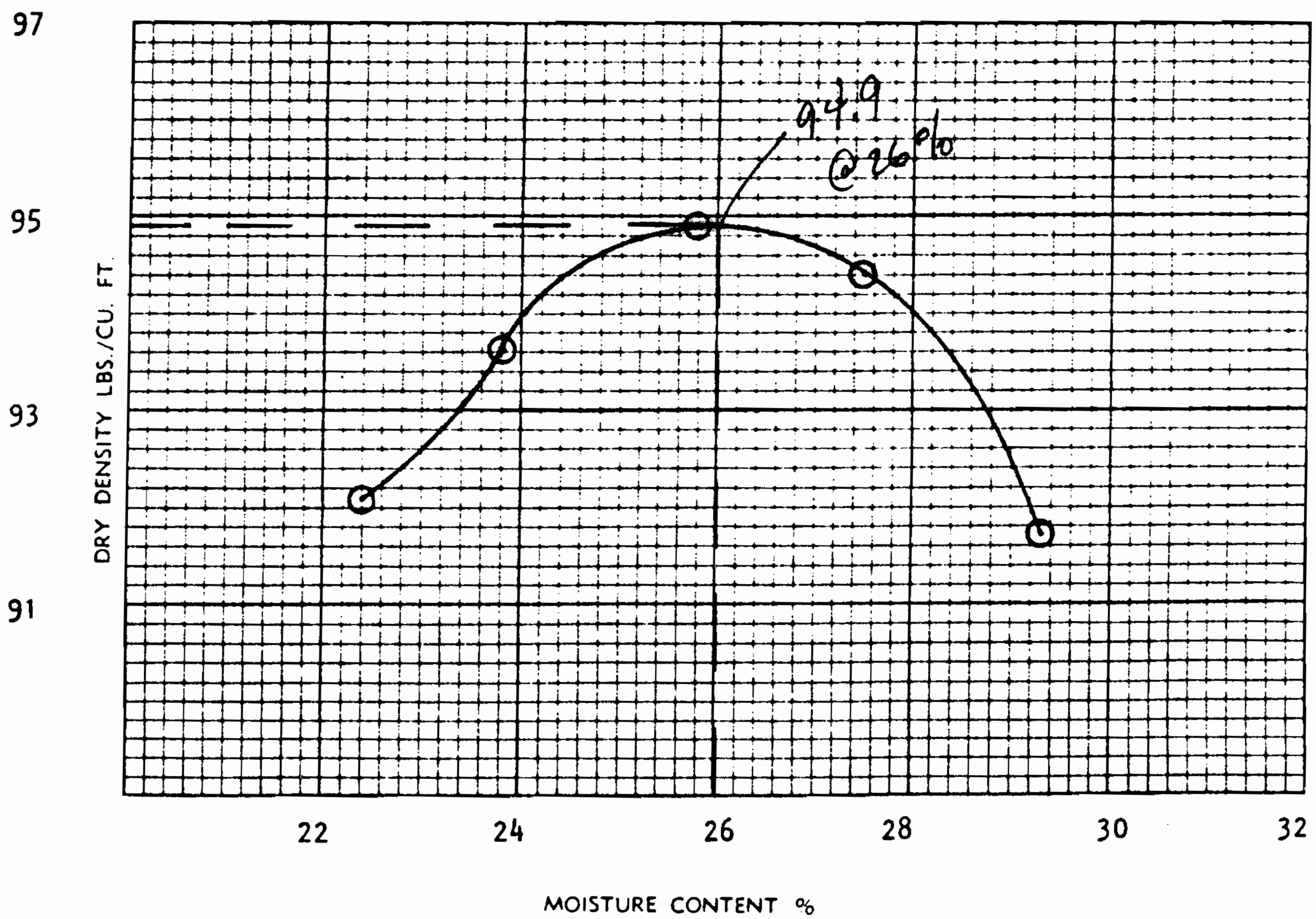
PROJECT
Pontchartrain Beach, Flood Protection Improvement Project, Phase I

SOURCE OF MATERIAL AND LOCATION
Sampled at job site, East end, Final Lift, Sta. 90+50, Sample split with Eustis Engineering

SAMPLE OF
Brown Clay with Cement Tailings

METHOD OF TEST
ASTM D-698, Method "A", Mechanical Rammer, Dry Preparation Method

MOISTURE-DENSITY RELATIONSHIP CURVE



OPTIMUM MOISTURE 26.0 %

MAXIMUM DRY DENSITY 94.9 Lbs./Cu. Ft.

Atterburg Limits: Liquid Limit = 67.4%
Plasticity Index = 39.6%

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyn

Donald F. Meyn

DFM/mb 7-24-86
2-Orleans Levee Dist. c/o URS Engineers
1-Orleans Levee District 1-Johnny Smith Trucking

Pontchartrain Beach Flood Protection
Improvement Project Phase I
Proposal No 2040-0204

Re: Completion Schedule

Drainage

(1) All R.C.P. & Catch Basin will be completed on Lake shore Drive by July 30th

(2) water line, Meter Boxes will be Completed by Aug 20th. meter Box will start July 23rd

(3) Sewer line & lift station will be completed by July 30th (lift station & Force main

Electric:

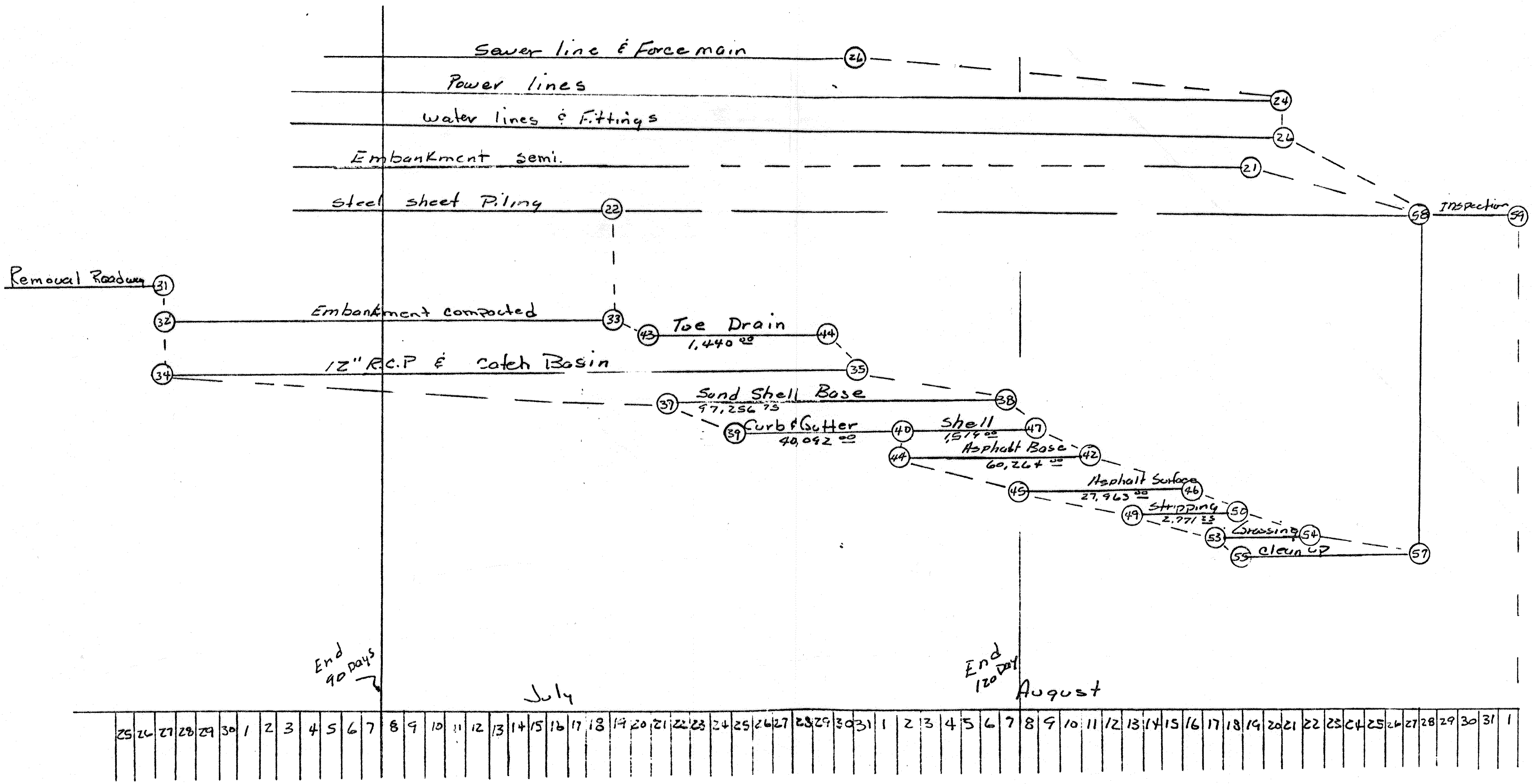
(1) Power line Relocation will be Completed by Aug 20th

Paving Lake shore Drive & U.N.O. Ent.:

(1) Sand & shell East End started July 23rd
(2) Sand & shell for UNO Ent. start " 24th
(3) Asp. for U.N.O. Ent start Aug 4th
(4) Curb & Gutter East End Start July 28th
(5) Asp. Base East End start Aug 4th
(6) Asp Surface East End start Aug 8th
(7) Stripping Aug 8th

West end ?

Pontchartrain Beach Flood Protection
Improvement Project Phase I
Proposal No 2040-0204
Date July 23 1986



URS

URS ENGINEERS

3500 NORTH CAUSEWAY BOULEVARD
METAIRIE LOUISIANA 70002
TEL (504) 837 6326

July ~~18~~, 1986
17

Mr. Willis Palmer
Johnny F. Smith Enterprises
P. O. Box 1115
Slidell, LA 70459

Letter was dated 7/18, but meeting was on 7/17

Dear Mr. Palmer:

Subject: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

Today URS met with OLB, DEI, Eustis Engineering Company and E. Berkley Traughber at the OLB offices to discuss an apparent problem at the above project. Present were the following:

C.E. Bailey, OLB
John Holtgreve, DEI
Berkley Traughber, E. Berkley Traughber, Inc.
William Gwyn, Eustis Engineers
Bruce Adams, URS

Examination of Delta Testing's moisture density relationship curves for the brown clay mixed with cement tailings has resulted in our questioning of the feasibility of this mixture to have such a low dry density (in the order of 85 pcf) while further analyses of the same soil mixture by Eustis have resulted in densities in the order of 98 pcf. In general, the question arises in how these cement tailings, when properly mixed with the fat clays, would not result in a more dense (higher dry density) than the clays alone. If the the lab tests which Delta performed for JFS to determine the density of this mixture were inaccurate, the compaction readings previously thought to meet the specified 100% in the east and, probably, the west levee sections across and parallel to the roadway crossings would also be inaccurate.

Subsequent to the above meeting, Delta has contested this opinion and both Delta and Eustis will simultaneously sample and perform new tests upon the in-place soils. Our understanding from Delta is that JFS will uncover the sampling locations for these additional analyses. As a result of this and if Delta cannot substantiate their densities, we expect differential settlements of this mixture would result in problems with roadway maintenance. In this case, to minimize this possibility and to protect OLB's interests, we would request that the roadway section in the area of the levee crossing be changed from that shown on the plans to a thicker asphalt section all at JFS' expense. Exact location and length will be determined, if necessary, after new tests are performed and results have been reviewed. In addition, we are requesting that JFS provide a warranty bond or some similar instrument to protect OLB from deficiencies in this work for a period of 2-1/2 years after the acceptance of the contract. (This would extend OLB's warranty on this work for 1-1/2 years beyond that presently in the contract). Some amount representing what we feel to be a representative value for the work effected by any substandard compactions of the clay - cement soil mixture would have to be agreed to.

Please be prepared to discuss this further during our meeting of July 23. In the meantime, we understand that Delta, Eustis and JFS will arrange the additional testing.

Sincerely,

URS ENGINEERS

Bruce H. Adams KC

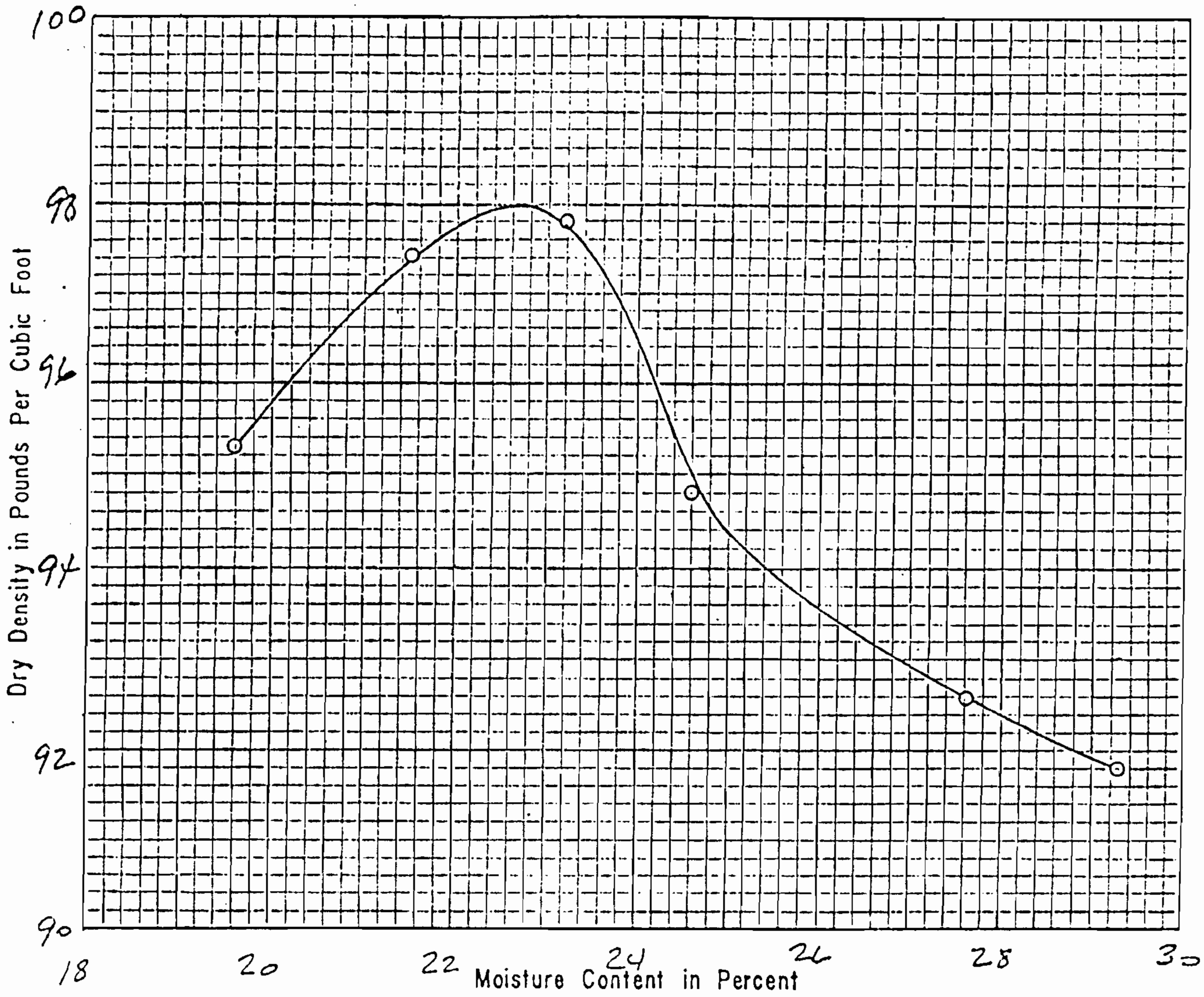
Bruce H. Adams, P.E.

BHA/kam

Enclosure

cc: Mr. C.E. Bailey, OLB
Mr. John Holtgreve, DEI
Mr. E. Berkley Traughber, E. Berkley Traughber, Inc.
Mr. William Gwyn, Eustis Engineering Co.
Mr. Curtis Lumstrom, Eustis Engineering Co.
Mr. Chip Indest, Delta Testing
URS Field Personnel

Curve No.	Boring No.	Sample No.	Depth In Feet	Classification	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI



LABORATORY COMPACTION CURVES

ASTM D-698

ORLEANS LEVEE BOARD

Job 9428

DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

1st REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

Johnny Smith Trucking Co.
P.O. Box 1115
Slidell, La. 70459, Attn: Mr. Willie Palmer

DATE 6-23-86

ORDER NO. DNO-8072

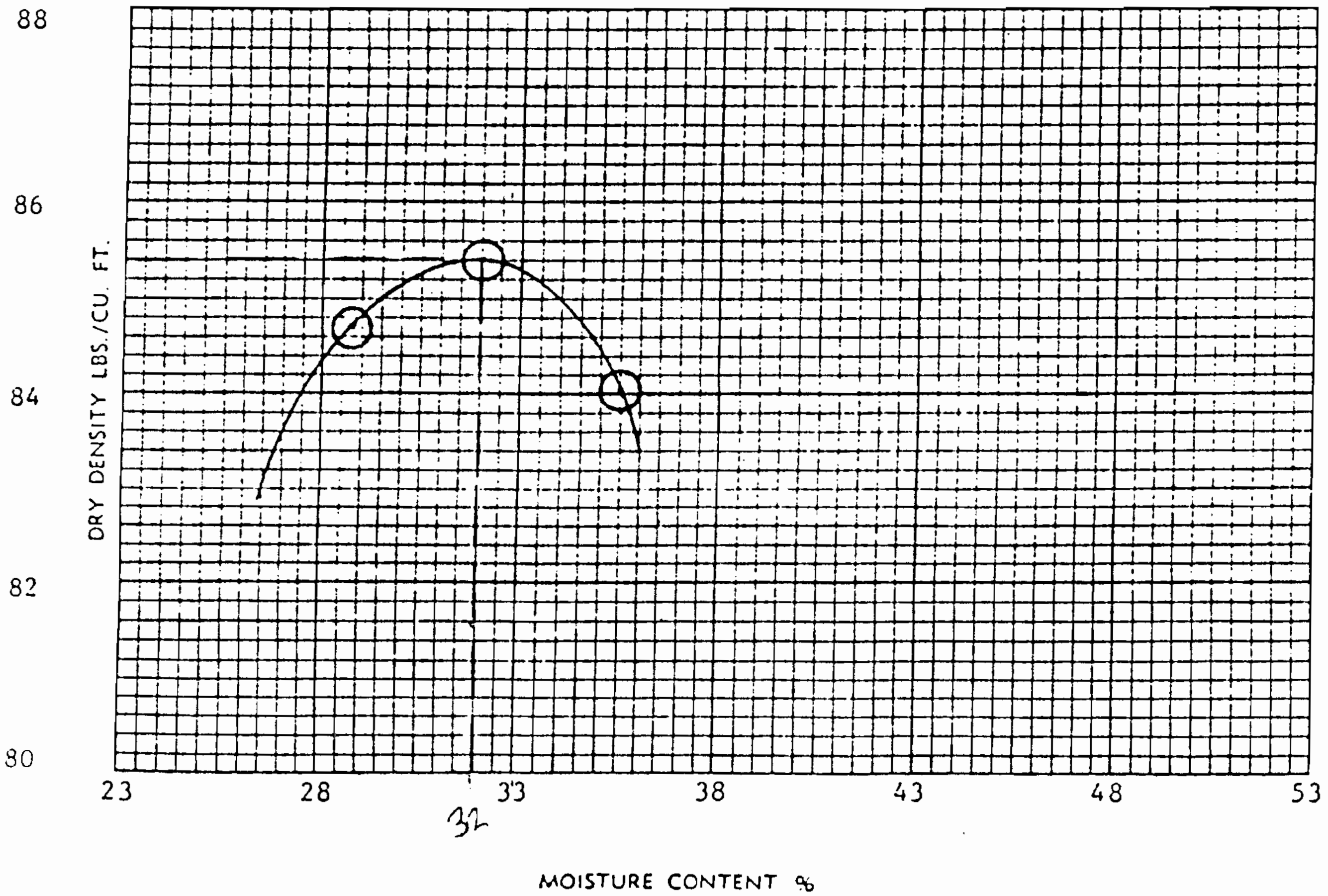
ECT
tchartrain Beach Flood Protection Improvement, Phase I

RCE OF MATERIAL AND LOCATION
pied from Jobsite (East Side Roadway) off of Lake Shore Dr.

PLE OF
wn Clay, Mixed with cement tailings

HOD OF TEST
D698 Method "C"

MOISTURE-DENSITY RELATIONSHIP CURVE



M MOISTURE 32 %

MAXIMUM DRY DENSITY 85.4 Lbs./Cu. Ft.

I/gd, 6-26-86
ny Smith Trucking Co.
.S. Engineers
eans Levee District

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyn

DONALD F. MEYN

DELTA TESTING AND INSPECTION, INC.

P. O. BOX 19172 • NEW ORLEANS, LA. 70179 • PHONE 486-5595

2nd REPORT OF MOISTURE DENSITY RELATIONSHIP OF SOIL

Johnny Smith Trucking Co.
P.O. Box 1115
Slidell, La. 70459, Attn: Mr. Willie Palmer

DATE 6/24/86

ORDER NO DNO-8072

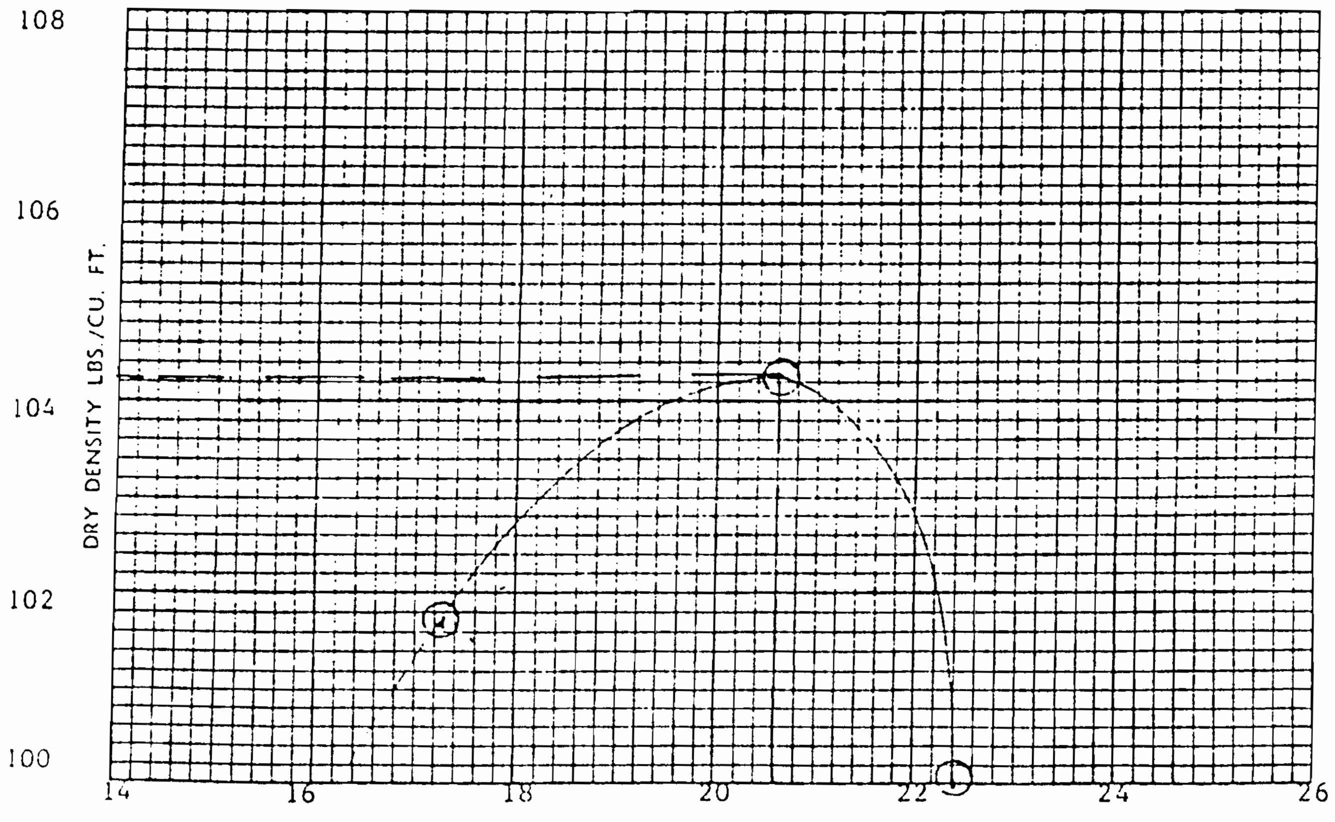
.ECT
Pontchartrain Beach Flood Protection Improvements - Phase I

•CE OF MATERIAL AND LOCATION
Sample from Jobsite (West Side Roadway) off of Lake Shore Dr.

•.E OF
Clay with cement tailing mixed

•OD OF TEST
ASTM D698 Method "C"

MOISTURE-DENSITY RELATIONSHIP CURVE



MOISTURE CONTENT %

• MOISTURE 20.6 %

MAXIMUM DRY DENSITY 104.3 Lbs./Cu. Ft.

1/gd, 6-26-86
nny Smith Trucking Co.
.S. Engineers
ans Levee District

DELTA TESTING AND INSPECTION, INC.

Donald F. Meyer

MEETING MEMORANDUM

DATE: June 16, 1986

PROJECT: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

LOCATION: URS Company Offices, 1:30 pm

ATTENDANCE:

Jim Richardson	COE
Roberto Estrada	COE
Willis Palmer	JFS
Bill Gwyn	Eustis
John Holtgreve	DEI
Berkley Traughber	EBT
Frank Vicidomina	OLB
Charlene Thompson	URS
Bruce Adams	URS

Topics of Discussion

1. West Roadway Compaction

In considering methods to expedite the progress of this work due to problems with rainfall, the following procedure was agreed to:

a. JFS will construct a continuous ditch ringing the area around the proposed embankment and begin pumping from the ditch (for 24 hrs/day, if necessary) into adjacent gravity storm sewers. Upon successful compaction of the embankment construction, the ditch will be backfilled with "hydraulically pumped" sand except along and beneath the adjacent levees where semi-compacted clay will be placed.

b. Embankment along the roadway section which is not within the levee section (see attached sketches) can be "pumped" sand with minimal strategically - located pockets of shell compacted to 100% of ASTM D698. Exposed faces of such granular embankment shall be capped with clay as per the attached sketch.

c. Embankment within the roadway section which is also within the levee sections, shall be compacted to 100% of ASTM D698, but, if necessary, minimal amounts of fly-ash can be added to stabilize it. JFS will have to obtain new moisture-density relationship curves determined by Delta at JFS' expense and also have new permeability analyses made at JFS' expense for any proposed fly-ash mixture. Also, should any clay material which is dissimilar to that placed already, new moisture-density relationships will have to be determined.

d. Prior to proceeding with any such construction, JFS will provide URS with the sample and test results.

2. Concerning the electrical power pole embedded in the levee, Jim Richardson (COE) will check as to the COE's position on simply cutting the pole several feet below the levee slope and then repairing the levee. It was agreed that the remaining conduit shall be grouted and the flood side toe of the levee shall be excavated, the conduit removed in the area of the excavation and the exposed ends capped.

3. Frank Vicidomina (OLB) will check the ownership of the fire hydrant at station 92 + 20 (approx.) along the east roadway raising of Lakeshore Drive as this hydrant will be removed and turned over to the proper owner. (OLB and S&WB have since confirmed that the hydrant is not theirs; it has been stored on site with the other hydrants.)

4. Concerning site drainage, URS will check on the feasibility of repairing the existing east side drainage system to facilitate drainage along the midway. Also, the feasibility of grading the levee toe toward a new central catch basin into the drainage system will be considered.

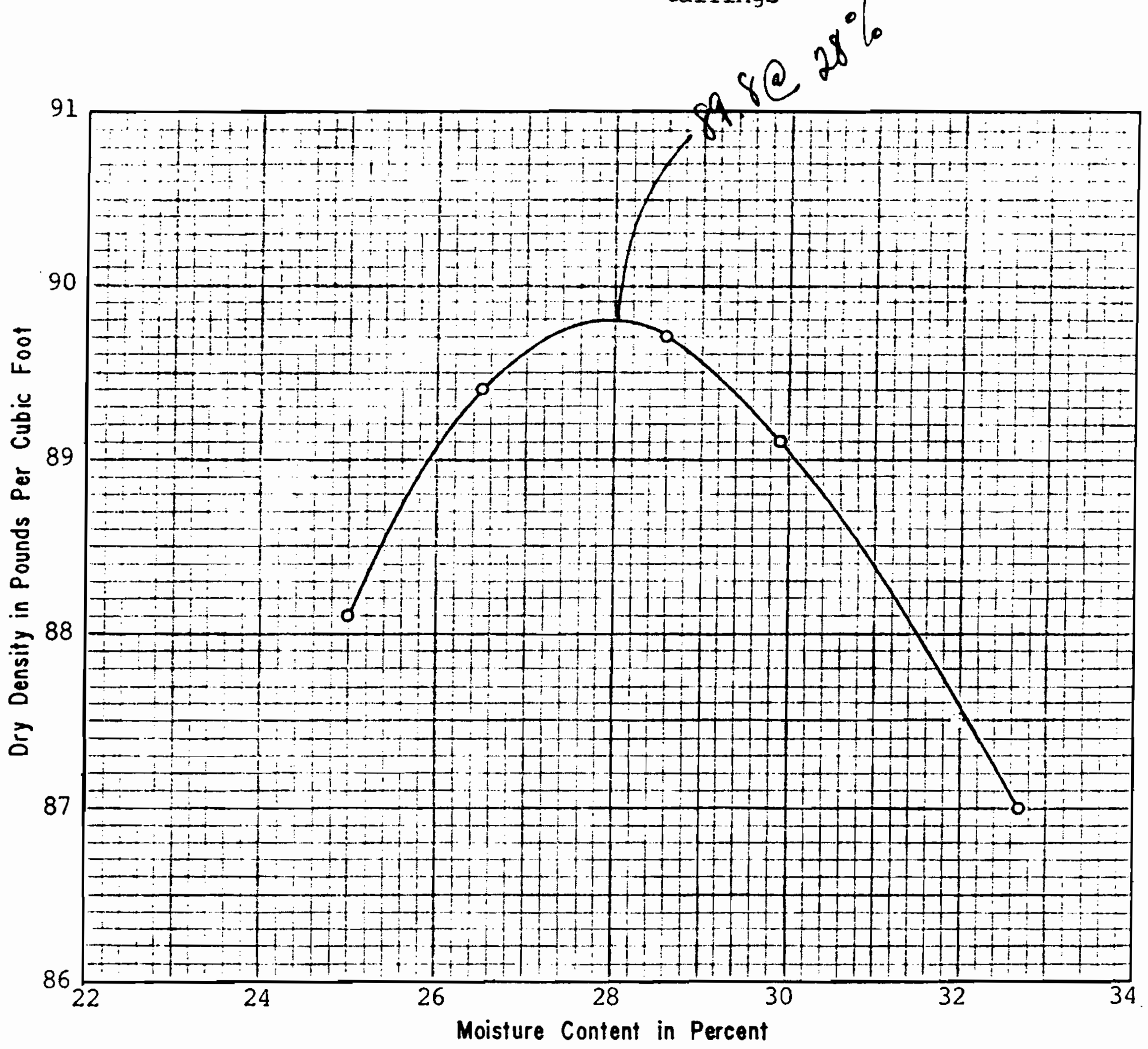
5. JFS will begin seeding the levees on or about July 1 and will immediately proceed with final levee grading and repairing the voids along the sheeting in accordance with previous correspondence, except where such voids are minor and will contain water. Those latter locations shall be repaired with semi-compacted clay.

6. JFS will provide survey information on settlement plates.

Prepared by: Bruce H Adams
Bruce H. Adams, P.E.
URS Company

Distribution: Meeting Attendees
URS Field Personnel

Curve No.	Boring No.	Sample No.	Depth In Feet	Classification	Atterberg Limits		
					LL	PL	PI
		2		Tan & gray clay treated w/cement tailings	74	20	54



89.8@ 28%

LABORATORY COMPACTION CURVES

ASTM D 698

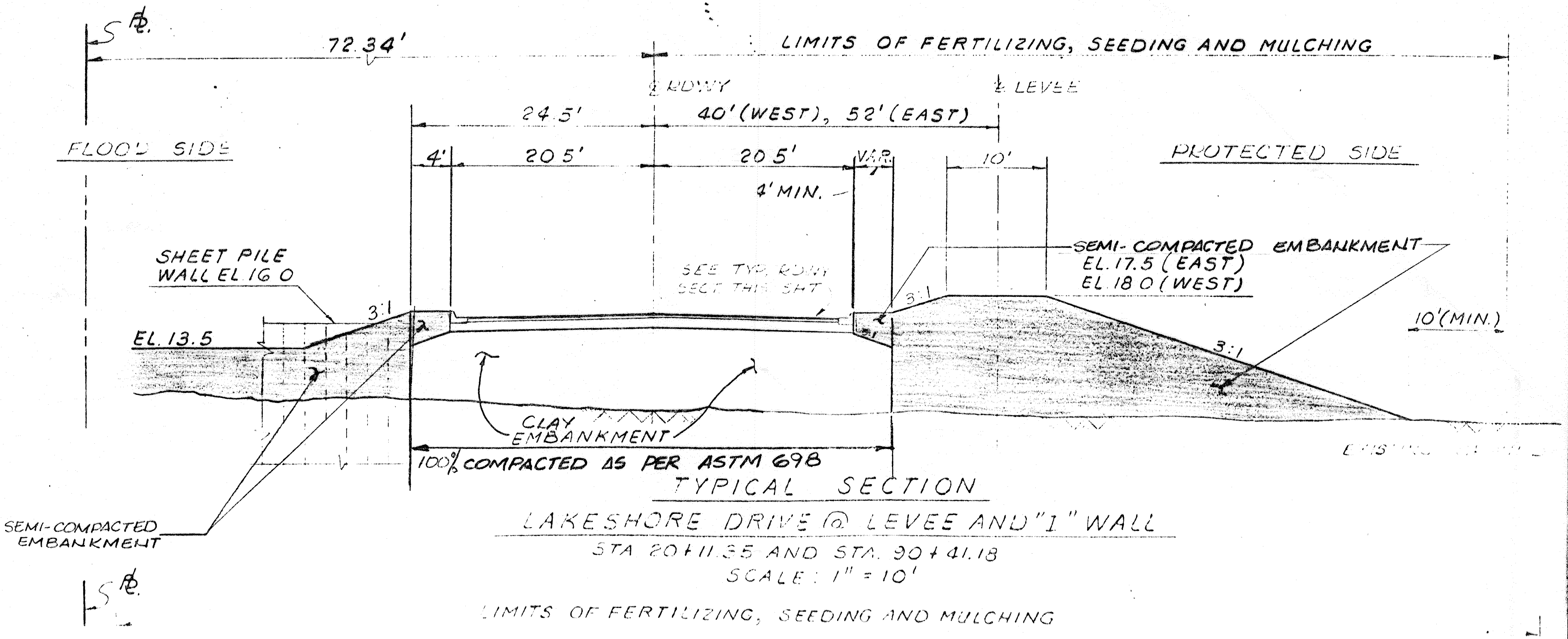
Field Services
Orleans Levee District
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

For: The Board of Levee Commissioners of the Orleans Levee District
New Orleans, Louisiana

URS Company, Consulting Engineers, Metairie, Louisiana

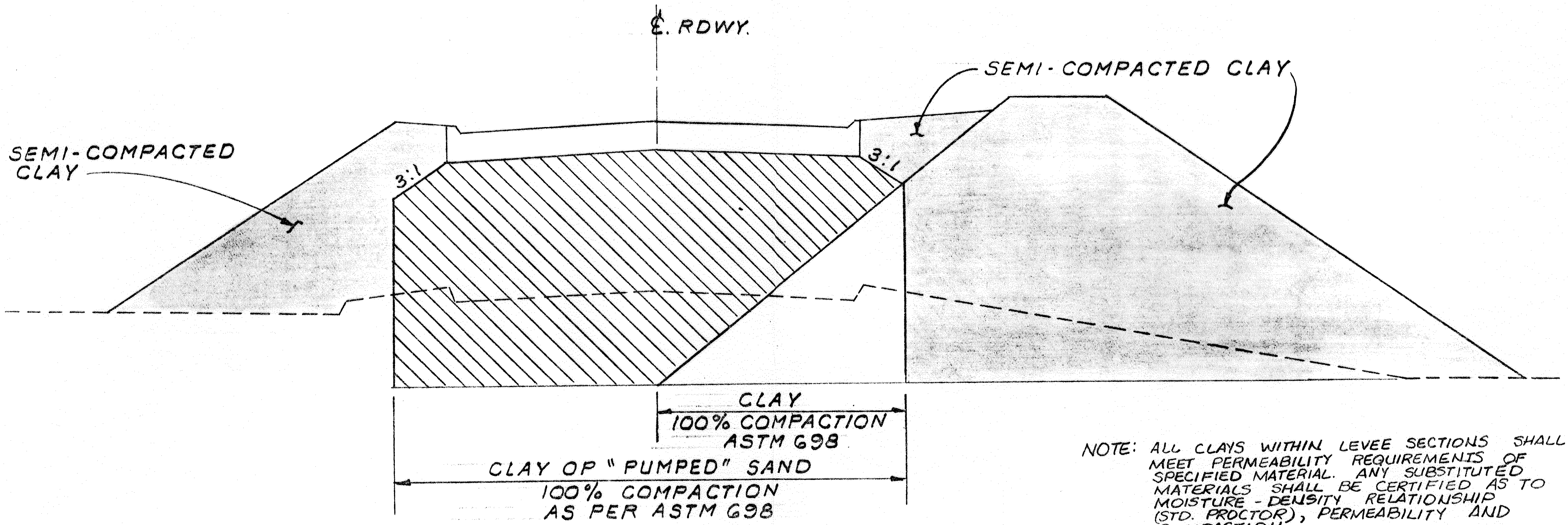
LEGEND:
- ░ SEMI-COMPACTED CLAY
- ☐ COMPACTED CLAY (100% - ASTM 698)
- ▨ COMPACTED CLAY OR "PUMPED" SAND (100% - ASTM 698)

PONTCHARTRAIN BEACH
PHASE I



TYPICAL SECTION

LAKESHORE DRIVE @ LEVEE AND "I" WALL
STA. 20+11.35 AND STA. 90+41.18
SCALE: 1" = 10'

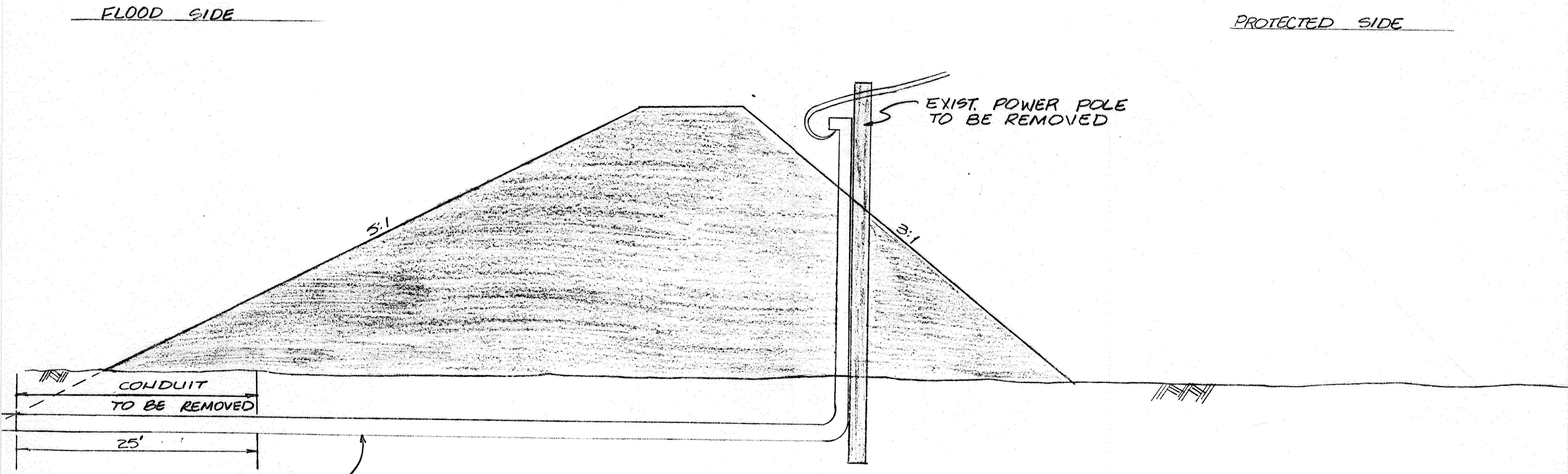


NOTE: ALL CLAYS WITHIN LEVEE SECTIONS SHALL MEET PERMEABILITY REQUIREMENTS OF SPECIFIED MATERIAL. ANY SUBSTITUTED MATERIALS SHALL BE CERTIFIED AS TO MOISTURE - DENSITY RELATIONSHIP (STD. PROCTOR), PERMEABILITY AND COMPACTION.

TYPICAL SECTION
(LAKESHORE DR.)

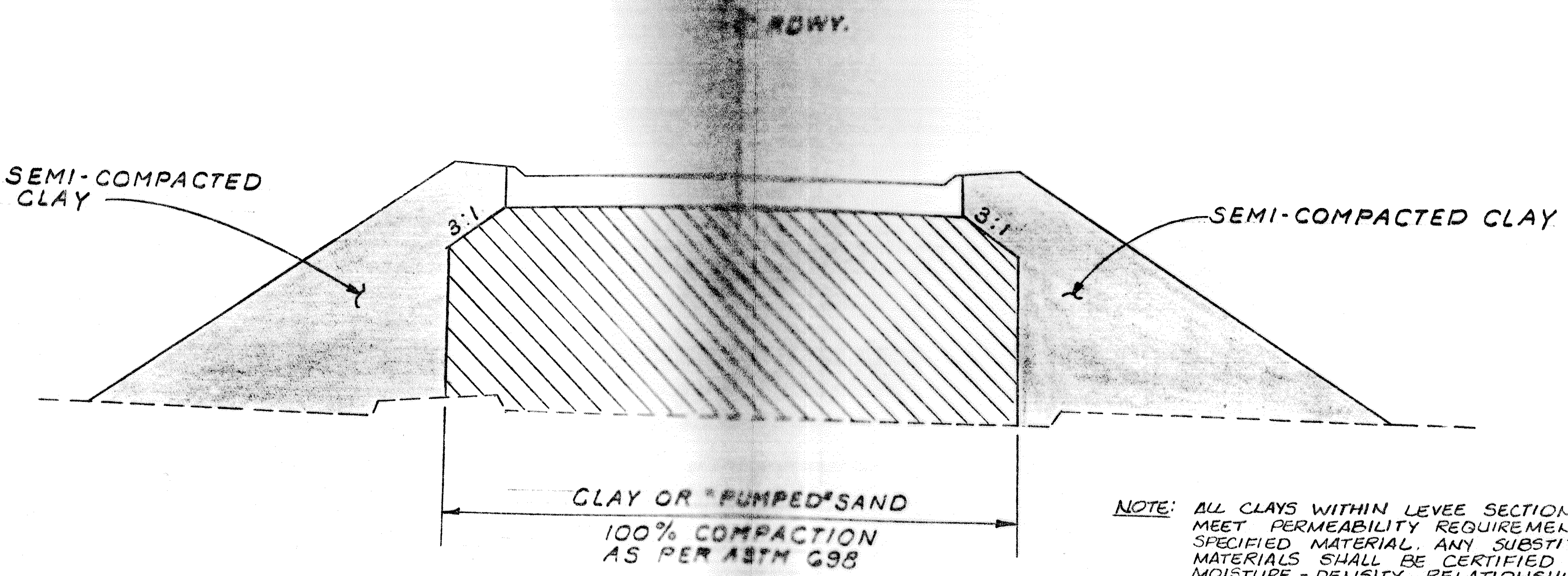
PONTCHARTRAIN BEACH
PHASE I

PONTCHARTRAIN BEACH
PHASE 1



EXIST. POWER POLE
TO BE REMOVED

EXIST. ELEC. CONDUIT
REMOVE CONDUCTORS & GROUT
FROM EACH END (NO ADDITIONAL PAY)



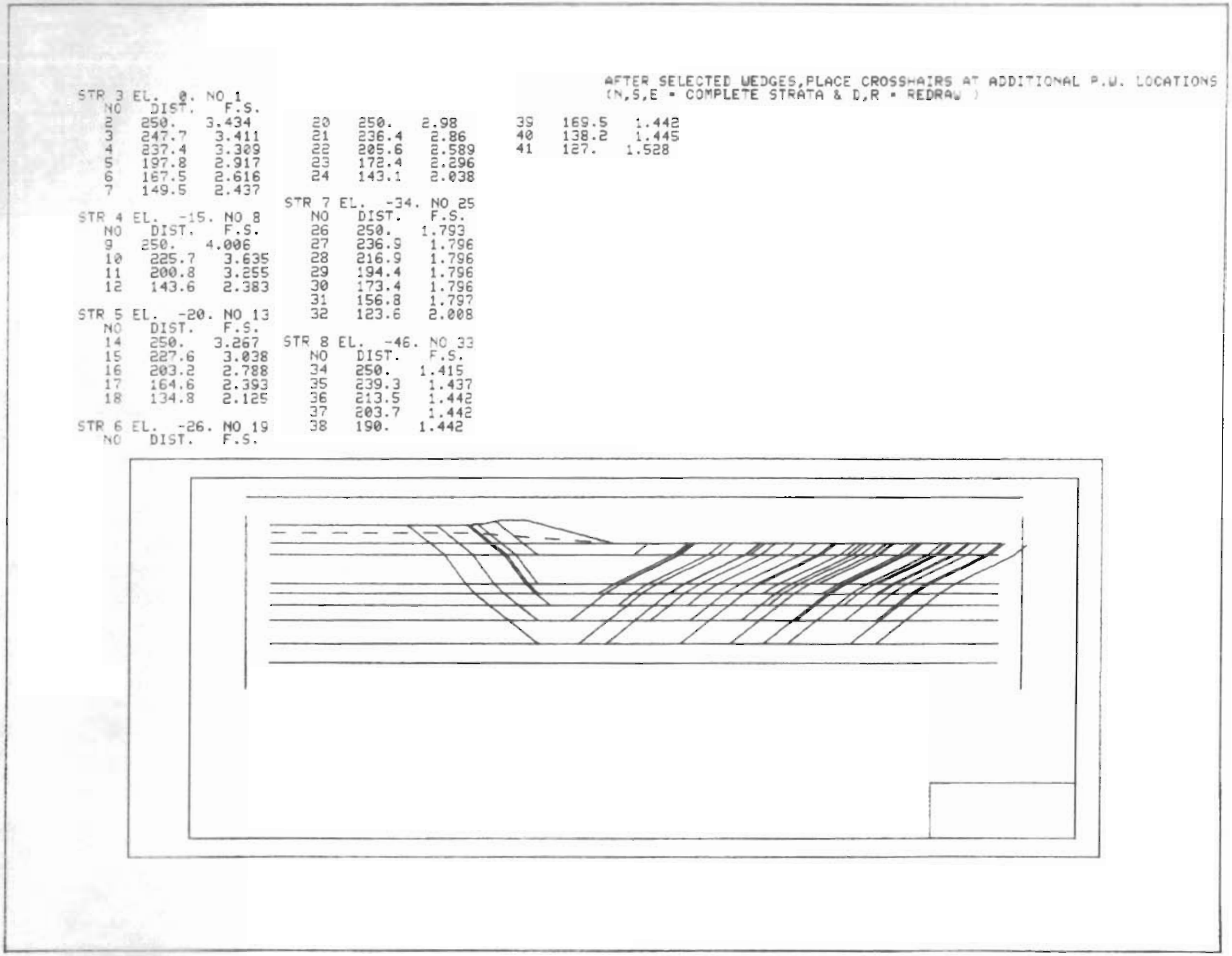
<u>NOTE:</u> ALL CLAYS WITHIN LEVEE SECTIONS SHALL MEET PERMEABILITY REQUIREMENTS OF SPECIFIED MATERIAL. ANY SUBSTITUTED MATERIALS SHALL BE CERTIFIED AS TO MOISTURE - DENSITY RELATIONSHIP (STD. PROCTOR), PERMEABILITY AND COMPACTION.

TYPICAL SECTION
(LAKESHORE DR.)

PONTCHARTRAIN BEACH
PHASE I

Ramp Analysis

```
LI RAMPS 1-60
1 'RAMPS AT LAKESIDE DRIVE"
2 'F.S.=1.30'
3 10.0 10.0 0.5 100 1 0
4 9 1 2 1
5 100
6 0 62.5 0 0
7 0 110 400 400
8 0 110 600 600
9 28 120 0 0
10 15 117 200 200
11 0 104 400 400
12 0 104 500 500
13 0 120 0 0
14 0 110 1000 1000
15 0 15.5 83 15.5 83.5 16 87.5 16 95 18
16 105 18 141 6 300 6 9999.9 0
17 0 15.5 83 15.5 300 90. 9999.9 0
18 0 6 300 6 9999.9 0
19 0 0 300 0 9999.9 0
20 0 -15 300 -15 9999.9 0
21 0 -20 300 -20 9999.9 0
22 0 -26 300 -26 9999.9 0
23 0 -34 300 -34 9999.9 0
24 0 -46 300 -46 9999.9 0
25 0 -56 300 -56 9999.9 0
26 0 11.5 83 11.5 141 6 300 6 9999.9 0
27 1 1 1 1 1 1 1 1 1 1 1 1
28 1 1 1 1 1 1
29 3 90 0 250 0 1
30 250
31 4 90 -15 250 -15 1
32 250
33 5 90 -20 250 -20 1
34 250
35 6 90 -26 250 -26 1
36 250
37 7 90 -34 250 -34 1
38 250
39 8 90 -46 250 -46 1
40 250
41 9 90 -56 250 -56 1
42 250
EOT..
```



```
STR 3 EL.  0. NO 1
  NO    DIST.    F.S.
  2    250.    3.434
  3    247.7    3.411
  4    237.4    3.309
  5    197.8    2.917
  6    167.5    2.616
  7    149.5    2.437

STR 4 EL.  -15. NO 8
  NO    DIST.    F.S.
  9    250.    4.006
  10    225.7    3.635
  11    200.8    3.255
  12    143.6    2.383

STR 5 EL.  -20. NO 13
  NO    DIST.    F.S.
  14    250.    3.267
  15    227.6    3.038
  16    203.2    2.788
  17    164.6    2.393
  18    134.8    2.125

STR 6 EL.  -26. NO 19
  NO    DIST.    F.S.
  20    250.    2.98
  21    236.4    2.86
  22    205.6    2.589
  23    172.4    2.296
  24    143.1    2.038

STR 7 EL.  -34. NO 25
  NO    DIST.    F.S.
  26    250.    1.793
  27    236.9    1.796
  28    216.9    1.796
  29    194.4    1.796
  30    173.4    1.796
  31    156.8    1.797
  32    123.6    2.008

STR 8 EL.  -46. NO 33
  NO    DIST.    F.S.
  34    250.    1.415
  35    239.3    1.437
  36    213.5    1.442
  37    203.7    1.442
  38    190.    1.442
39    169.5    1.442
40    138.2    1.445
41    127.    1.528
```

```
AFTER SELECTED WEDGES,PLACE CROSSHAIRS AT ADDITIONAL P.W. LOCATIONS
(N,S,E = COMPLETE STRATA & D,R = REDRAW )
```

```
LI W1

                    **** STABILITY WITH UPLIFT ****




          RAMPS AT LAKESIDE DRIVE
          F.S.=1.30
                     10 PROFILES
                       1VERTICALS
           UPLIFT WITH 1 PIEZOMETRIC GRADE LINES



  * * STRATUM  3 ACT. WEDGE LOC.    90.0 EL.    0.0 PASS.WEDGE LOC.   250.0 EL.   0.0


           ASSUMED FAILURE SURFACE DATA

     DIST.   ELEV.        WT.   UPLIFT    STR 1    STR 2  STR USED

      0.0     0.0    1705.     719.     600.     524.     524.
     83.0     0.0    1706.     719.     600.     525.     525.

     83.5     0.0    1745.     716.     600.     547.     547.
     87.5     0.0    1760.     692.     600.     568.     568.
SHEAR STRENGTHS ARE EQUAL   600.0  AT DIST.   89.2
     95.0     0.0    1980.     648.     600.     708.     600.
    100.0     0.0    1980.     618.     600.     724.     620.
    105.0     0.0    1980.     588.     600.     740.     600.
SHEAR STRENGTHS ARE EQUAL   600.0  AT DIST.  113.6
    141.0     0.0     660.     375.     600.     152.     152.
    300.0     0.0     660.     375.     600.     151.     151.


    ASSUMED CRIT. PASSIVE LOC.  250.0  EL.   0.0  DP    1980.  RP    7199.



               ACTIVE WEDGE DATA


     DIST.    ELEV.       DA        RA        DB        RB       FS

     90.0      0.0    13649.    14802.        0.    40962.     5.40
     95.0      0.0    14654.    14802.        0.    37962.     4.73
    100.0      0.0    15984.    14990.        0.    34962.     4.08
    105.0      0.0    17078.    15454.        0.    31962.     3.62
```

```
  110.0       0.0     17255.     16295.          0.     28962.      3.43
  115.0       0.0     15982.     16800.          0.     25979.      3.57
  120.0       0.0     13690.     16799.          0.     23301.      4.04
  125.0       0.0     10592.     15996.          0.     21032.      5.14
  130.0       0.0      7706.     13997.          0.     19172.      7.05
  135.0       0.0      5278.     11558.          0.     17719.     11.19


    CRIT. ACTIVE LOC     110.0  EL    0.0  DA   17255.  RA   16295.


   DIS.       EL.        DP         RP          DB         RB         FS

  250.0       0.0      1980.      7199.         0.      28962.      3.43
  247.7       0.0      1980.      7199.         0.      28607.      3.41
  237.4       0.0      1980.      7199.         0.      27052.      3.31
  197.8       0.0      1980.      7202.         0.      21057.      2.92
  167.5       0.0      1980.      7200.         0.      16467.      2.62
  149.5       0.0      1980.      7200.         0.      13728.      2.44



* * STRATUM  4 ACT. WEDGE LOC.     90.0 EL.  -15.0 PASS.WEDGE LOC.   250.0 EL. -15.0



        ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.        WT.   UPLIFT    STR 1     STR 2  STR USED

    0.0   -15.0    3505.    1656.     983.     695.     695.
   83.0   -15.0    3506.    1656.     983.     696.     696.
   83.5   -15.0    3545.    1653.    1006.     707.     707.
   87.5   -15.0    3560.    1630.    1027.     717.     717.
   95.0   -15.0    3780.    1585.    1167.     788.     788.
  100.0   -15.0    3780.    1555.    1183.     796.     796.
  105.0   -15.0    3780.    1526.    1198.     804.     804.
  141.0   -15.0    2460.    1312.     610.     507.     507.
  300.0   -15.0    2460.    1313.     610.     507.     507.


 ASSUMED CRIT. PASSIVE LOC.  250.0  EL. -15.0  DP   25378.  RP   26211.


              ACTIVE WEDGE DATA
```

```
                                                 RB          FS

   90.0     -15.0      53014.      29044.          0.     90701.        5.28
   95.0     -15.0      54629.      30215.          0.     86879.        4.90
  100.0     -15.0      56595.      31483.          0.     82918.        4.50
  105.0     -15.0      58122.      32017.          0.     78918.        4.19
  110.0     -15.0      58644.      32059.          0.     75002.        4.01
   115.0     -15.0      57405.      31470.          0.     71291.        4.03
   120.0     -15.0      54537.      30839.          0.     67786.        4.28
   125.0     -15.0      50277.      29705.          0.     64487.        4.84
   130.0     -15.0      45054.      28230.          0.     61394.        5.89
   135.0     -15.0      39162.      25561.          0.     58507.        8.00


      CRIT. ACTIVE LOC     110.0  EL -15.0  DA   58644.  RA   32059.


   DIS.       EL.        DP          RP          DB          RB          FS

   250.0     -15.0      25378.      26211.          0.     75002.        4.01
   225.7     -15.0      25378.      26211.          0.     62656.        3.64
   200.8     -15.0      25378.      26212.          0.     50012.        3.26
   143.6     -15.0      25379.      26213.          0.     21007.        2.38



 * * STRATUM  5 ACT. WEDGE LOC.    90.0 EL.  -20.0 PASS.WEDGE LOC.   250.0 EL. -20.0


          ASSUMED FAILURE SURFACE DATA

   DIST.    ELEV.        WT.   UPLIFT    STR 1     STR 2  STR USED

    0.0    -20.0     4090.    1969.     768.      400.      400.
   83.0    -20.0     4091.    1969.     769.      400.      400.
   83.5    -20.0     4130.    1966.     780.      400.      400.
   87.5    -20.0     4145.    1942.     790.      400.      400.
   95.0    -20.0     4365.    1898.     861.      400.      400.
  100.0    -20.0     4365.    1868.     869.      400.      400.
  105.0    -20.0     4365.    1838.     877.      400.      400.
  141.0    -20.0     3045.    1625.     580.      400.      400.
  300.0    -20.0     3045.    1625.     580.      400.      400.


  ASSUMED CRIT. PASSIVE LOC.  250.0  EL. -20.0  DP   39139.  RP   33300.
```

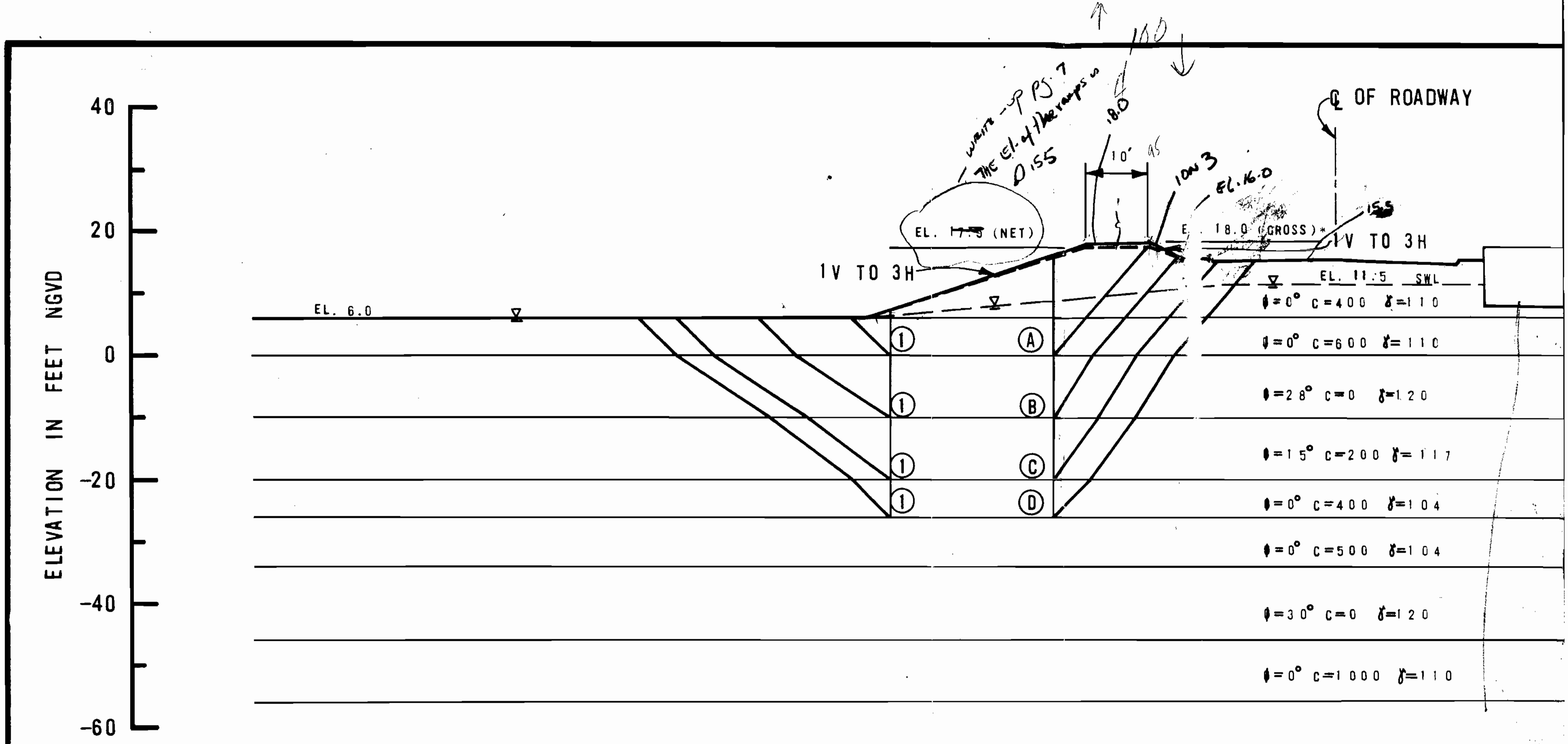
```

               ACTIVE WEDGE DATA


 DIST.    ELEV.       DA        RA         DB        RB        FS

  90.0    -20.0    71897.    34458.        0.     64000.      4.02
  95.0    -20.0    73376.    35445.        0.     62000.      3.82
 100.0    -20.0    75463.    36922.        0.     60000.      3.59
 105.0    -20.0    77353.    38098.        0.     58000.      3.39
 110.0    -20.0    78195.    38310.        0.     56000.      3.27
 115.0    -20.0    77390.    37880.        0.     54000.      3.27
 120.0    -20.0    74834.    36945.        0.     52000.      3.42
 125.0    -20.0    70701.    35998.        0.     50000.      3.78
 130.0    -20.0    65273.    34352.        0.     48000.      4.43
 135.0    -20.0    58921.    32562.        0.     46000.      5.65


  CRIT. ACTIVE LOC     110.0  EL -20.0  DA   78195.  RA   38310.


 DIS.     EL.       DP        RP        DB        RB        FS


 250.0    -20.0    39139.    33300.       0.     56000.      3.27
 227.6    -20.0    39140.    33300.       0.     47050.      3.04
 203.2    -20.0    39140.    33301.       0.     37279.      2.79
 164.6    -20.0    39141.    33301.       0.     21842.      2.39
 134.8    -20.0    39681.    33615.       0.      9922.      2.13



* * STRATUM  6 ACT. WEDGE LOC.    90.0 EL.  -26.0 PASS.WEDGE LOC.   250.0 EL. -26.0


           ASSUMED FAILURE SURFACE DATA

 DIST.    ELEV.        WT.    UPLIFT    STR 1     STR 2  STR USED

   0.0   -26.0    4714.    2344.     400.      500.      400.
  83.0   -26.0    4715.    2344.     400.      500.      400.
  83.5   -26.0    4754.    2341.     400.      500.      400.
  87.5   -26.0    4769.    2317.     400.      500.      400.
  95.0   -26.0    4989.    2273.     400.      500.      400.
 100.0   -26.0    4989.    2243.     400.      500.      400.
 105.0   -26.0    4989.    2213.     400.      500.      400.
 141.0   -26.0    3669.    2000.     400.      500.      400.
```

```
   300.0    -26.0     3669.     2000.       400.       500.       400.


   ASSUMED CRIT. PASSIVE LOC.  250.0  EL. -26.0  DP   59280.  RP   38120.


                  ACTIVE WEDGE DATA


    DIST.     ELEV.         DA          RA          DB          RB         FS

    90.0     -26.0      98145.     38832.          0.      64000.       3.63
    95.0     -26.0      99266.     39131.          0.      62000.       3.48
   100.0     -26.0     101031.     39988.          0.      60000.       3.31
   105.0     -26.0     103101.     41416.          0.      58000.       3.14
   110.0     -26.0     104615.     42725.          0.      56000.       3.02
   115.0     -26.0     104665.     43142.          0.      54000.       2.98
   120.0     -26.0     103113.     42847.          0.      52000.       3.03
   125.0     -26.0      99801.     41935.          0.      50000.       3.21
   130.0     -26.0      94868.     40987.          0.      48000.       3.57
   135.0     -26.0      88555.     39510.          0.      46000.       4.22
   140.0     -26.0      81286.     37720.          0.      44000.       5.44


     CRIT. ACTIVE LOC     115.0  EL -26.0  DA  104665.  RA   43142.


    DIS.      EL.         DP          RP          DB          RB         FS

   250.0     -26.0     59280.      38100.         0.      54000.       2.98
   236.4     -26.0     59281.      38100.         0.      48567.       2.86
   205.6     -26.0     59281.      38101.         0.      36256.       2.59
   172.4     -26.0     59282.      38101.         0.      22969.       2.30
   143.1     -26.0     59282.      38102.         0.      11244.       2.04



  * * STRATUM  7 ACT. WEDGE LOC.    90.0 EL.  -34.0 PASS.WEDGE LOC.   250.0 EL. -34.0


           ASSUMED FAILURE SURFACE DATA

    DIST.    ELEV.        WT.    UPLIFT     STR 1     STR 2  STR USED

     0.0    -34.0     5546.     2844.      500.        0.        0.
    83.0    -34.0     5547.     2844.      500.        0.        0.
```

```
  83.5    -34.0     5586.     2841.      500.       0.        0.
  87.5    -34.0     5601.     2817.      500.       0.        0.
  95.0    -34.0     5821.     2773.      500.       0.        0.
 100.0    -34.0     5821.     2743.      500.       0.        0.
 105.0    -34.0     5821.     2713.      500.       0.        0.
 141.0    -34.0     4501.     2500.      500.       0.        0.
 300.0    -34.0     4501.     2500.      500.       0.        0.


 ASSUMED CRIT. PASSIVE LOC.  250.0  EL. -34.0  DP   91949.  RP   45948.


               ACTIVE WEDGE DATA


  DIST.     ELEV.       DA         RA         DB        RB        FS

   90.0     -34.0   139178.    46809.        0.        0.      1.96
   95.0     -34.0   140185.    46810.        0.        0.      1.92
  100.0     -34.0   141594.    46893.        0.        0.      1.87
  105.0     -34.0   143166.    47402.        0.        0.      1.82
  110.0     -34.0   144636.    48530.        0.        0.      1.79
  115.0     -34.0   145343.    50019.        0.        0.      1.80

  120.0     -34.0   144839.    51031.        0.        0.      1.83
  125.0     -34.0   142808.    51038.        0.        0.      1.91
  130.0     -34.0   139081.    50474.        0.        0.      2.05
  135.0     -34.0   133618.    49556.        0.        0.      2.29


   CRIT. ACTIVE LOC    110.0  EL -34.0  DA  144636.  RA   48530.


  DIS.      EL.        DP        RP        DB        RB        FS

 250.0     -34.0    91949.    45948.       0.        0.      1.79
 236.9     -34.0    91959.    46100.       0.        0.      1.80
 216.9     -34.0    91960.    46100.       0.        0.      1.80
 194.4     -34.0    91960.    46101.       0.        0.      1.80
 173.4     -34.0    91961.    46101.       0.        0.      1.80
 156.8     -34.0    91961.    46101.       0.        0.      1.80
 123.6     -34.0    97480.    46182.       0.        0.      2.01



* * STRATUM  8 ACT. WEDGE LOC.    90.0 EL.  -46.0 PASS.WEDGE LOC.   250.0 EL. -46.0

```

```
          ASSUMED FAILURE SURFACE DATA

 DIST.    ELEV.        WT.   UPLIFT     STR 1     STR 2  STR USED

   0.0   -46.0    6986.    3594.        0.     1000.       0.
  83.0   -46.0    6987.    3594.        0.     1000.       0.
  83.5   -46.0    7026.    3591.        0.     1000.       0.
  87.5   -46.0    7041.    3567.        0.     1000.       0.
  95.0   -46.0    7261.    3523.        0.     1000.       0.
 100.0   -46.0    7261.    3493.        0.     1000.       0.
 105.0   -46.0    7261.    3463.        0.     1000.       0.
 141.0   -46.0    5941.    3250.        0.     1000.       0.
 300.0   -46.0    5941.    3250.        0.     1000.       0.


ASSUMED CRIT. PASSIVE LOC.  250.0  EL. -46.0  DP  153877.  RP   45392.


               ACTIVE WEDGE DATA


 DIST.     ELEV.        DA          RA          DB         RB        FS

  90.0     -46.0   214372.     46808.          0.         0.       1.52
  95.0     -46.0   215380.     46808.          0.         0.       1.50
 100.0     -46.0   216753.     46809.          0.         0.       1.47
 105.0     -46.0   218125.     46810.          0.         0.       1.44
 110.0     -46.0   219048.     46832.          0.         0.       1.42
 115.0     -46.0   219158.     47131.          0.         0.       1.42
 120.0     -46.0   218630.     47988.          0.         0.       1.44
 125.0     -46.0   217492.     49416.          0.         0.       1.49
 130.0     -46.0   215340.     50725.          0.         0.       1.56
 135.0     -46.0   211724.     51142.          0.         0.       1.67


   CRIT. ACTIVE LOC     110.0  EL -46.0  DA  219048.  RA   46832.

 DIS.      EL.          DP          RP          DB         RB        FS

 250.0     -46.0   153877.     45392.          0.         0.       1.42
 239.3     -46.0   154571.     45811.          0.         0.       1.44
 213.5     -46.0   154609.     46101.          0.         0.       1.44
 203.7     -46.0   154610.     46101.          0.         0.       1.44
 190.0     -46.0   154610.     46101.          0.         0.       1.44
```

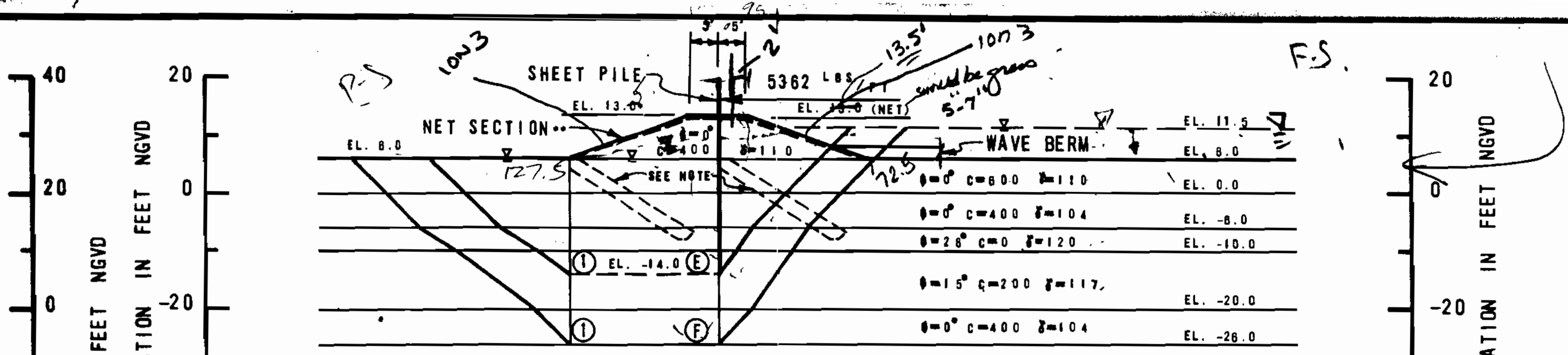
```
  169.5     -46.0   154611.     46101.         0.         0.       1.44
  138.2     -46.0   154753.     46102.         0.         0.       1.45
  127.0     -46.0   158210.     46102.         0.         0.       1.53



* * STRATUM  9 ACT. WEDGE LOC.    90.0 EL.  -56.0 PASS.WEDGE LOC.   250.0 EL. -56.0


        ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.       WT.   UPLIFT    STR 1    STR 2  STR USED

EOT..
```



RAMPS AT LAKESHORE DRIVE

* GROSS SECTION ANALYZED.

SLIP SURFACE			DRIVING FORCE			RESISTING FORCE					FACTOR OF SAFETY
NUMBER		ELEV.	$+D_A$	$-D_P$	ΣD	$+R_A$	$+R_B$		$+R_P$	ΣR	$\Sigma R/\Sigma D$
Ⓐ	①	0	17191	2252	14939	16319	7200		391	32910	2.20
[illegible]	①	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]



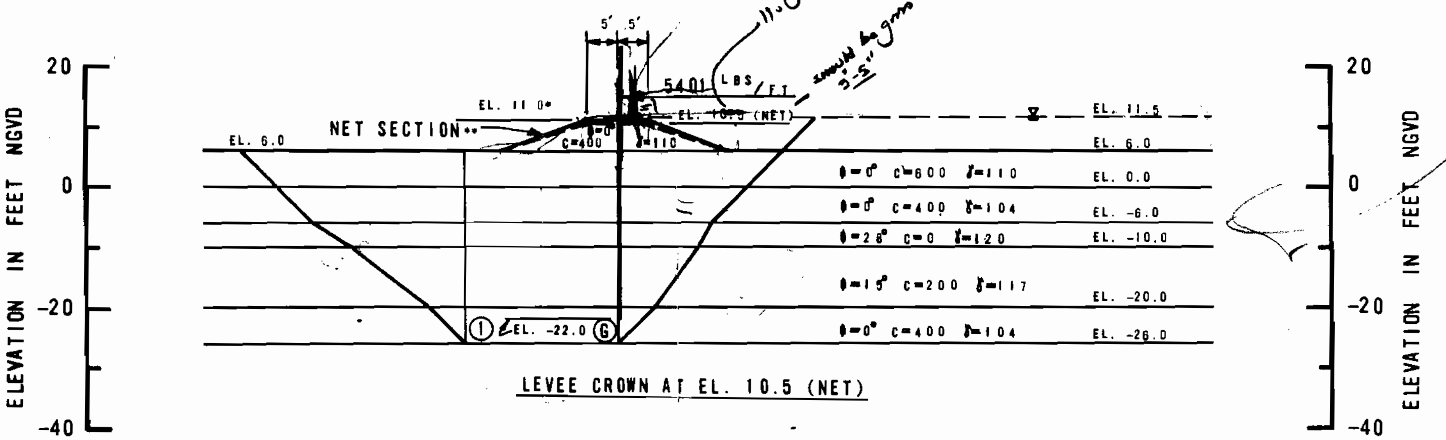
LEVEE CROWN AT EL. 13.0 (NET)

NOTE: LOCATION VARIES-TO BE REMOVED.

100 11.5

100.1 11.5

100



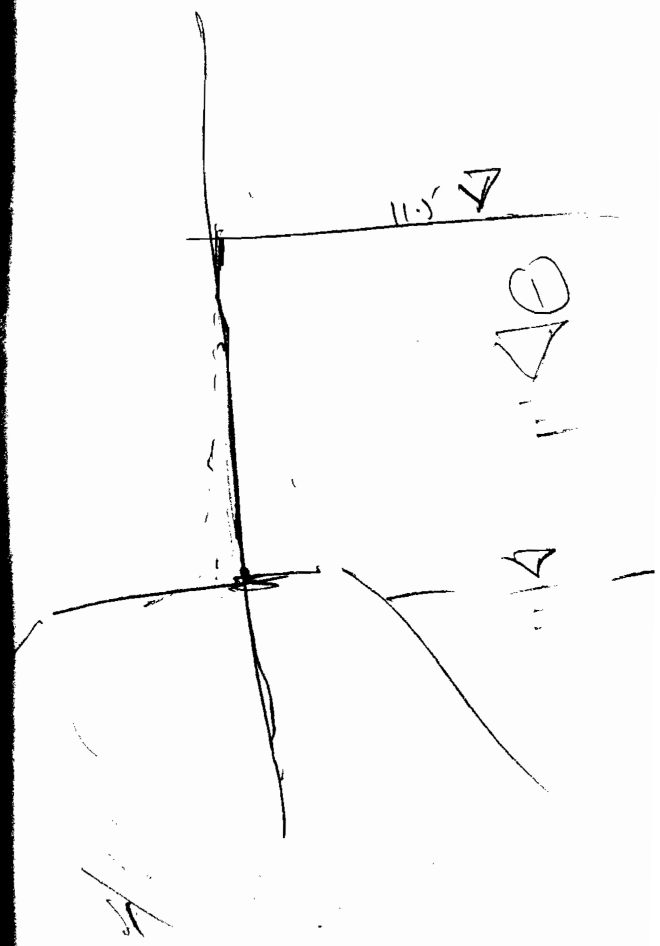
LEVEE CROWN AT EL. 10.5 (NET)

* GROSS ELEVATION ANALYZED.

** NET SECTION ASSUMED TO BE 1V TO 3H SIDE SLOPES AND A 10 FT. CROWN AT NET GRADE.

LEVEE / I WALL COMBINATION

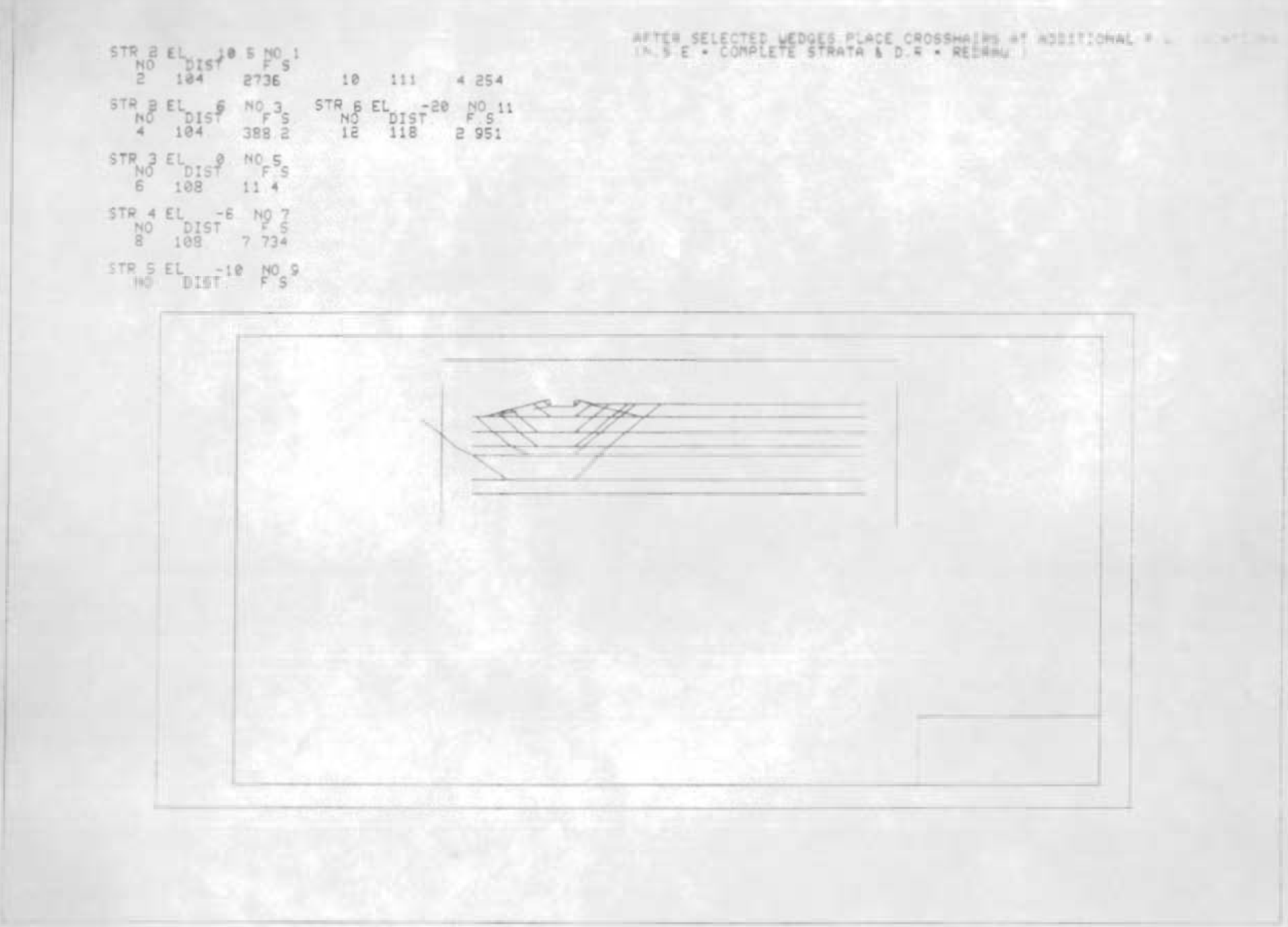
7.5



() CHECK-UNC

DEEP SEATED ANALYSIS

LEVEED EL. 13.0



```
STR 2 EL   10 5 NO 1
   NO   DIST     F S
   2   104    2736        10   111     4 254

STR 2 EL    6  NO 3     STR 6 EL    -20  NO 11
   NO   DIST     F S        NO   DIST     F S
   4   104    388 2         12   118    2 951

STR 3 EL    0  NO 5
   NO   DIST     F S
   6   108    11 4

STR 4 EL    -6  NO 7
   NO   DIST     F S
   8   108    7 734

STR 5 EL   -10  NO 9
   NO   DIST     F S
```

```
AFTER SELECTED WEDGES PLACE CROSSHAIRS AT ADDITIONAL F.L. LOCATIONS
(M.S E • COMPLETE STRATA & D.R • REDRAW )
```

```
LI W1

                    **** STABILITY WITH UPLIFT ****




          DEEP SEATED ANALYSIS
          LEVEE AT 13.0'
                       8 PROFILES
                        1VERTICALS
           UPLIFT WITH 1 PIEZOMETRIC GRADE LINES



  * * STRATUM  2 ACT. WEDGE LOC. 90096.0 EL.   10.5 PASS.WEDGE LOC.   104.0 EL.  10.5


           ASSUMED FAILURE SURFACE DATA

    DIST.    ELEV.       WT.   UPLIFT    STR 1    STR 2  STR USED

      0.0    10.5       63.      63.     307.  999999.     307.
     74.0    10.5       63.      63.     307.  999999.     307.

     90.0    10.5      102.      63.     307.  999999.     307.
     95.0    10.5      275.      63.     307.  999999.     307.
     96.0    10.5      250.      63.     307.  999999.     307.
     96.1    10.5        0.       0.     307.     461.     307.
    100.0    10.5        0.       0.     307.     461.     307.
STRATUM  2 STARTS FAILURE POSSIBLE FROM DIST.  100.0
    104.0    10.5       25.       0.     307.  999999.     307.
    104.1    10.5      275.       0.     307.  999999.     307.
    105.0    10.5      275.       0.     307.  999999.     307.
    126.0    10.5     -281.       0.     307.  999999.     307.
    130.0    10.5     -281.       0.     307.  999999.     307.


   ASSUMED CRIT. PASSIVE LOC.  104.0  EL.  10.5  DP     300.  RP    1303.


                ACTIVE WEDGE DATA


    DIST.     ELEV.        DA         RA         DB         RB        FS

    96.0      10.5       302.      1305.         0.      2456.   2736.48

```

```

  CRIT. ACTIVE LOC     96.0  EL  10.5  DA     302.  RA    1305.


 DIS.      EL.        DP        RP        DB        RB        FS

104.0      10.5      300.     1303.        0.     2456.  2736.48



* * STRATUM  2 ACT. WEDGE LOC. 90096.0 EL.     6.0 PASS.WEDGE LOC.   104.0 EL.   6.0


        ASSUMED FAILURE SURFACE DATA

 DIST.    ELEV.        WT.   UPLIFT    STR 1    STR 2  STR USED

   0.0     6.0     344.     344.     307.     461.     307.
  74.0     6.0     344.     344.     307.     461.     307.
  90.0     6.0     597.     344.     307.     461.     307.
  95.0     6.0     770.     344.     307.     461.     307.
  96.0     6.0     745.     344.     307.     461.     307.
  96.1     6.0     495.     281.     307.     461.     307.
 100.0     6.0     495.     281.     307.     461.     307.
 104.0     6.0     520.     281.     307.     461.     307.
 104.1     6.0     770.     280.     307.     461.     307.
 105.0     6.0     770.     268.     307.     461.     307.
 126.0     6.0       0.       0.     307.     461.     307.
 130.0     6.0      -0.       0.     307.     461.     307.


ASSUMED CRIT. PASSIVE LOC.  104.0  EL.   6.0  DP   2186.  RP    3376.


             ACTIVE WEDGE DATA


 DIST.     ELEV.       DA        RA        DB        RB        FS

 96.0       6.0     2210.     3378.        0.     2456.    388.17


  CRIT. ACTIVE LOC     96.0  EL   6.0  DA    2210.  RA    3378.


 DIS.      EL.        DP        RP        DB        RB        FS
```

```

  104.0       6.0     2186.     3376.         0.     2456.    388.17



* * STRATUM  3 ACT. WEDGE LOC. 90096.0 EL.    0.0 PASS.WEDGE LOC.   108.0 EL.   0.0


          ASSUMED FAILURE SURFACE DATA

    DIST.    ELEV.        WT.   UPLIFT     STR 1     STR 2  STR USED

     0.0      0.0     1004.     719.      461.      307.      307.
    74.0      0.0     1004.     719.      461.      307.      307.
    90.0      0.0     1257.     719.      461.      307.      307.
    95.0      0.0     1430.     719.      461.      307.      307.
    96.0      0.0     1405.     719.      461.      307.      307.
    96.1      0.0     1155.     656.      461.      307.      307.
   100.0      0.0     1155.     656.      461.      307.      307.
   104.0      0.0     1180.     656.      461.      307.      307.
   104.1      0.0     1430.     655.      461.      307.      307.
   105.0      0.0     1430.     643.      461.      307.      307.
   126.0      0.0      660.     375.      461.      307.      307.

   130.0      0.0      660.     375.      461.      307.      307.


   ASSUMED CRIT. PASSIVE LOC.  108.0  EL.   0.0  DP     5938.  RP     7373.


               ACTIVE WEDGE DATA


    DIST.     ELEV.       DA          RA         DB         RB        FS

    96.0       0.0     7609.      7989.          0.      3684.     11.40


     CRIT. ACTIVE LOC      96.0  EL   0.0  DA    7609.  RA    7989.


    DIS.      EL.       DP          RP         DB         RB        FS

   108.0       0.0     5938.      7373.          0.      3684.     11.40



```

```
 * * STRATUM  4 ACT. WEDGE LOC. 90096.0 EL.   -6.0 PASS.WEDGE LOC.   108.0 EL.  -6.0


         ASSUMED FAILURE SURFACE DATA

   DIST.   ELEV.      WT.   UPLIFT    STR 1    STR 2  STR USED

    0.0    -6.0    1628.    1094.     307.     218.     218.
   74.0    -6.0    1628.    1094.     307.     218.     218.
SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.   87.8
   90.0    -6.0    1881.    1094.     307.     321.     307.
   95.0    -6.0    2054.    1094.     307.     392.     307.
   96.0    -6.0    2029.    1094.     307.     382.     307.
SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.   96.1
   96.1    -6.0    1779.    1031.     307.     305.     305.
  100.0    -6.0    1779.    1031.     307.     305.     305.
SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.  100.7
  104.0    -6.0    1804.    1031.     307.     315.     307.
  104.1    -6.0    2054.    1030.     307.     418.     307.
  105.0    -6.0    2054.    1018.     307.     422.     307.
SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.  116.9
  126.0    -6.0    1284.     750.     307.     218.     218.
  130.0    -6.0    1284.     750.     307.     218.     218.


   ASSUMED CRIT. PASSIVE LOC.  108.0  EL.  -6.0  DP   13254.  RP   10137.



              ACTIVE WEDGE DATA


   DIST.     ELEV.       DA        RA         DB         RB        FS

   96.0      -6.0    16431.    10752.         0.      3677.      7.73


    CRIT. ACTIVE LOC      96.0  EL  -6.0  DA   16431.  RA   10752.


   DIS.      EL.        DP        RP         DB         RB        FS

  108.0      -6.0    13254.    10137.         0.      3677.      7.73



 * * STRATUM  5 ACT. WEDGE LOC. 90096.0 EL.  -10.0 PASS.WEDGE LOC.   111.0 EL. -10.0
```

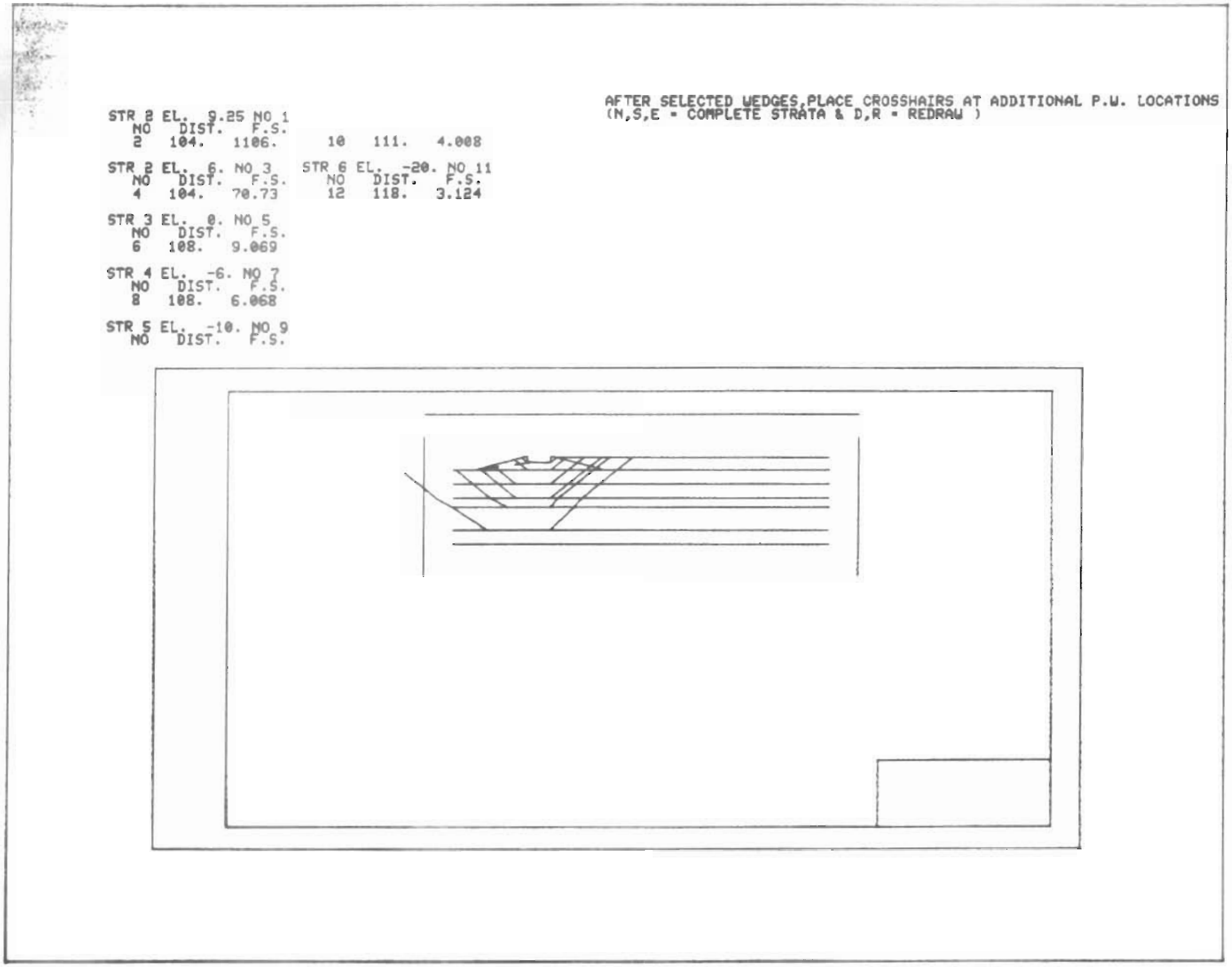
```


        ASSUMED FAILURE SURFACE DATA

   DIST.    ELEV.        WT.    UPLIFT     STR 1     STR 2  STR USED

    0.0    -10.0    2108.    1344.      312.      311.      311.
   74.0    -10.0    2108.    1344.      312.      311.      311.
   90.0    -10.0    2361.    1344.      415.      363.      363.
   95.0    -10.0    2534.    1344.      486.      398.      398.
   96.0    -10.0    2509.    1344.      475.      393.      393.
   96.1    -10.0    2259.    1281.      399.      355.      355.
  100.0    -10.0    2259.    1281.      399.      355.      355.
  104.0    -10.0    2284.    1281.      409.      360.      360.
  104.1    -10.0    2534.    1280.      512.      411.      411.
  105.0    -10.0    2534.    1268.      516.      414.      414.
  126.0    -10.0    1764.    1000.      312.      311.      311.
  130.0    -10.0    1764.    1000.      312.      311.      311.


  ASSUMED CRIT. PASSIVE LOC.  111.0  EL. -10.0  DP   17170.  RP   13763.



              ACTIVE WEDGE DATA


   DIST.    ELEV.       DA        RA        DB        RB        FS

   96.0    -10.0    24707.    12648.        0.     5654.      4.25


    CRIT. ACTIVE LOC     96.0  EL -10.0  DA   24707.  RA   12648.


   DIS.     EL.        DP        RP        DB        RB        FS

  111.0    -10.0    17170.    13763.        0.     5654.      4.25



 * * STRATUM  6 ACT. WEDGE LOC. 90096.0 EL.  -20.0 PASS.WEDGE LOC.   118.0 EL. -20.0


        ASSUMED FAILURE SURFACE DATA

   DIST.    ELEV.        WT.    UPLIFT     STR 1     STR 2  STR USED
```

```
     0.0    -20.0     3278.     1969.      423.      307.      307.
    74.0    -20.0     3278.     1969.      423.      307.      307.
    90.0    -20.0     3531.     1969.      475.      307.      307.
    95.0    -20.0     3704.     1969.      510.      307.      307.
    96.0    -20.0     3679.     1969.      505.      307.      307.
    96.1    -20.0     3429.     1906.      467.      307.      307.
   100.0    -20.0     3429.     1906.      467.      307.      307.
   104.0    -20.0     3454.     1906.      472.      307.      307.
   104.1    -20.0     3704.     1905.      523.      307.      307.
   105.0    -20.0     3704.     1893.      526.      307.      307.
   126.0    -20.0     2934.     1625.      423.      307.      307.
   130.0    -20.0     2934.     1625.      423.      307.      307.


 ASSUMED CRIT. PASSIVE LOC.  118.0  EL. -20.0  DP   36924.  RP   20418.



                  ACTIVE WEDGE DATA



  DIST.    ELEV.       DA        RA        DB        RB        FS


  96.0     -20.0    52277.    18136.        0.     6754.      2.95


   CRIT. ACTIVE LOC     96.0  EL -20.0  DA   52277.  RA   18136.


  DIS.     EL.        DP        RP        DB        RB        FS

 118.0     -20.0    36924.    20418.        0.     6754.      2.95
EOT..
```

DEEP SEATED ANALYSIS

LEVEE @ EL.

```
LI DSA11 1-60
1 "DEEP SEATED ANALYSIS"
2 "LEVEE AT 11.75'"
3 10.0 10.0 0.5 110.0 1 1
4 7 1 2 1
5 100
6 0 62.5 0 0
7 0 110 307 307
8 0 110 461 461
9 0 104 307 307
10 22.2 120 0 0
11 11.6 117 154 154
12 0 104 307 307
13 0 11.5 94 11.5 95 11.75 96 11.75 96.1 9.25
14 104 9.25 104.1 11.75 105 11.75 122.25 6
15 130 6 9999.9 0
16 0 6 77.75 6 95 11.75 130 90. 9999.9 0
17 0 6 130 6 9999.9 0
18 0 0 130 0 9999.9 0
19 0 -6 130 -6 9999.9 0
20 0 -10 130 -10 9999.9 0
21 0 -20 130 -20 9999.9 0
22 0 -26 130 -26 9999.9 0
23 0 11.5 94 11.5 96 11.75 96.1 9.25 104 9.25
24 122.25 6 130 6 9999.9 0
25 1 1 1 1 1 1 1 1 1 1 1 1
26 1 1
27 2 90096 9.25 104 9.25 1
28 104
29 2 90096 6 104 6 1
30 104
31 3 90096 0 108 0 1
32 108
33 4 90096 -6 108 -6 1
34 108
35 5 90096 -10 111 -10 1
36 111
37 6 90096 -20 118 -20 1
38 118
EOT..
```



```
STR 2 EL.  9.25 NO 1                                    AFTER SELECTED WEDGES,PLACE CROSSHAIRS AT ADDITIONAL P.W. LOCATIONS
  NO   DIST.   F.S.                                     (N,S,E = COMPLETE STRATA & D,R = REDRAW )
  2   104.   1106.      10    111.    4.008

STR 2 EL.  6. NO 3    STR 6 EL.  -20. NO 11
  NO   DIST.   F.S.     NO    DIST.   F.S.
  4   104.   70.73      12    118.    3.124

STR 3 EL.  0. NO 5
  NO   DIST.   F.S.
  6   108.   9.069

STR 4 EL.  -6. NO 7
  NO   DIST.   F.S.
  8   108.   6.068

STR 5 EL.  -10. NO 9
  NO   DIST.   F.S.
```

```
                  **** STABILITY WITH UPLIFT ****




          DEEP SEATED ANALYSIS
          LEVEE AT 11.75'
                       8 PROFILES
                        1VERTICALS
           UPLIFT WITH 1 PIEZOMETRIC GRADE LINES



   * * STRATUM  2 ACT. WEDGE LOC. 90096.0 EL.    9.3 PASS.WEDGE LOC.   104.0 EL.   9.3


           ASSUMED FAILURE SURFACE DATA

     DIST.   ELEV.        WT.    UPLIFT    STR 1    STR 2  STR USED

      0.0     9.3      141.     141.     307.  999999.     307.
     77.7     9.3      141.     141.     307.  999999.     307.

     94.0     9.3      244.     141.     307.  999999.     307.
     95.0     9.3      275.     148.     307.  999999.     307.
     96.0     9.3      250.     156.     307.  999999.     307.
     96.1     9.3        0.       0.     307.     461.     307.
    100.0     9.3        0.       0.     307.     461.     307.
 STRATUM  2 STARTS FAILURE POSSIBLE FROM DIST.  100.0
    104.0     9.3       25.       0.     307.  999999.     307.
    104.1     9.3      275.       0.     307.  999999.     307.
    105.0     9.3      275.       0.     307.  999999.     307.
    122.3     9.3     -203.       0.     307.  999999.     307.
    130.0     9.3     -203.       0.     307.  999999.     307.


    ASSUMED CRIT. PASSIVE LOC.  104.0  EL.   9.3  DP     300.  RP    1303.


                ACTIVE WEDGE DATA


    DIST.    ELEV.       DA        RA        DB        RB        FS

    96.0      9.3       304.     1306.       0.     2456.   1106.31
```

```
  CRIT. ACTIVE LOC      96.0  EL    9.3  DA     304.  RA     1306.

 DIS.       EL.          DP          RP          DB          RB         FS

104.0        9.3        300.       1303.          0.       2456.    1106.31


* * STRATUM  2 ACT. WEDGE LOC. 90096.0 EL.    6.0 PASS.WEDGE LOC.   104.0 EL.   6.0

        ASSUMED FAILURE SURFACE DATA

 DIST.    ELEV.        WT.    UPLIFT     STR 1     STR 2  STR USED

   0.0      6.0     344.     344.      307.      461.      307.
  77.7      6.0     344.     344.      307.      461.      307.
  94.0      6.0     601.     344.      307.      461.      307.
  95.0      6.0     633.     352.      307.      461.      307.
  96.0      6.0     607.     359.      307.      461.      307.
  96.1      6.0     358.     201.      307.      461.      307.

 100.0      6.0     358.     203.      307.      461.      307.
 104.0      6.0     383.     203.      307.      461.      307.
 104.1      6.0     633.     202.      307.      461.      307.
 105.0      6.0     632.     192.      307.      461.      307.
 122.3      6.0       0.       0.      307.      461.      307.
 130.0      6.0      -0.       0.      307.      461.      307.

ASSUMED CRIT. PASSIVE LOC.  104.0  EL.   6.0  DP    1494.  RP    2800.

            ACTIVE WEDGE DATA

 DIST.     ELEV.       DA          RA          DB          RB         FS

 96.0       6.0      1608.       2803.          0.      2456.      70.73

 CRIT. ACTIVE LOC      96.0  EL    6.0  DA     1608.  RA     2803.

 DIS.      EL.         DP          RP          DB          RB         FS
```

```
 104.0      6.0     1494.     2800.          0.     2456.     70.73


* * STRATUM  3 ACT. WEDGE LOC. 90096.0 EL.    0.0 PASS.WEDGE LOC.   108.0 EL.   0.0

           ASSUMED FAILURE SURFACE DATA

     DIST.    ELEV.        WT.   UPLIFT    STR 1     STR 2  STR USED

      0.0     0.0    1004.     719.     461.      307.      307.
     77.7     0.0    1004.     719.     461.      307.      307.
     94.0     0.0    1261.     719.     461.      307.      307.
     95.0     0.0    1293.     727.     461.      307.      307.
     96.0     0.0    1267.     734.     461.      307.      307.
     96.1     0.0    1018.     576.     461.      307.      307.
    100.0     0.0    1018.     578.     461.      307.      307.
    104.0     0.0    1043.     578.     461.      307.      307.
    104.1     0.0    1293.     577.     461.      307.      307.
    105.0     0.0    1292.     567.     461.      307.      307.
    122.3     0.0     660.     375.     461.      307.      307.

    130.0     0.0     660.     375.     461.      307.      307.


    ASSUMED CRIT. PASSIVE LOC.  108.0  EL.   0.0  DP    4765.  RP    6798.


                ACTIVE WEDGE DATA


     DIST.    ELEV.       DA        RA          DB         RB        FS

     96.0      0.0    6739.     7414.          0.     3684.      9.07


      CRIT. ACTIVE LOC      96.0  EL   0.0  DA    6739.  RA    7414.


     DIS.     EL.       DP        RP          DB         RB        FS

    108.0      0.0    4765.     6798.          0.     3684.      9.07
```

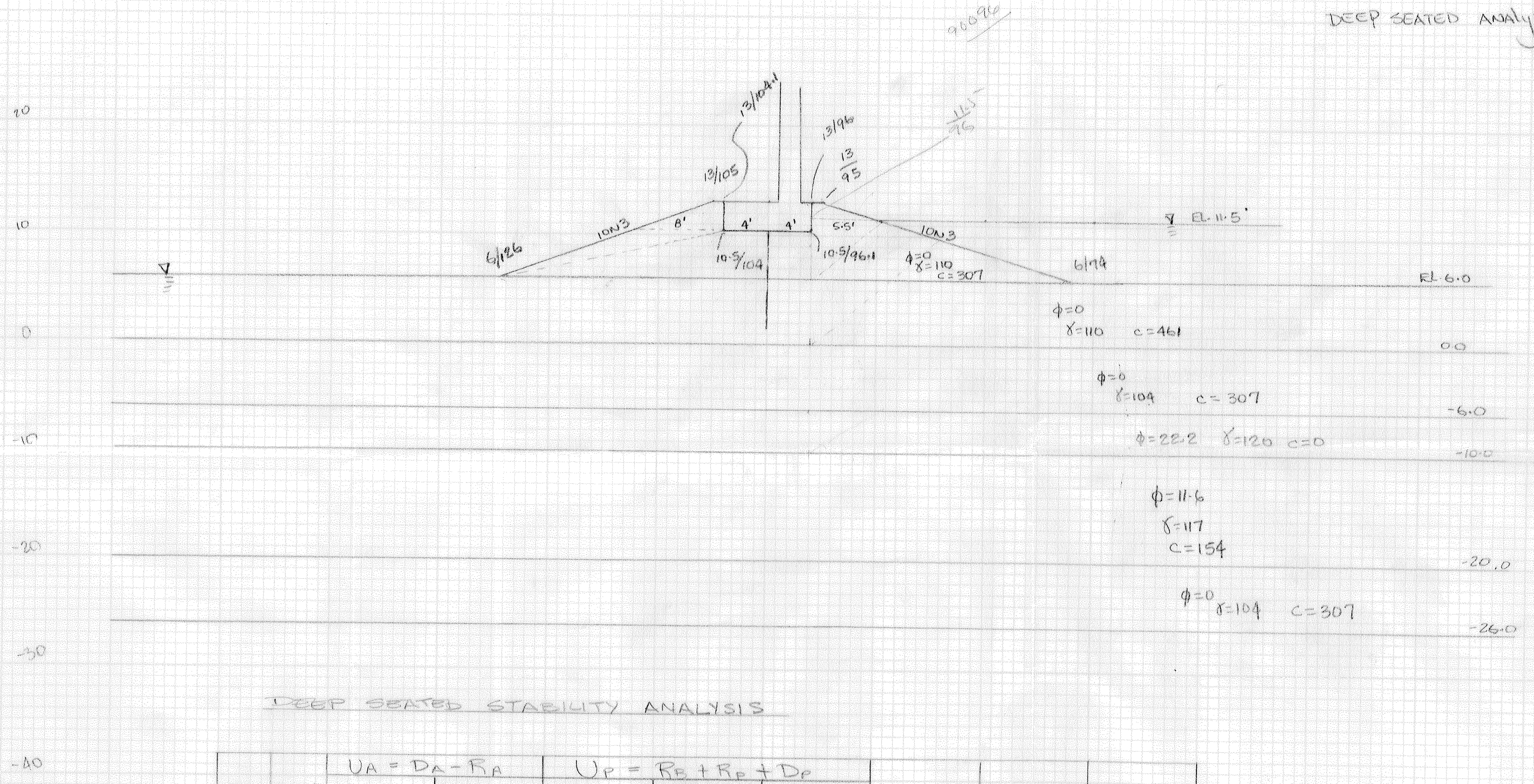
```
  * * STRATUM  4 ACT. UEDGE LOC. 90096.0 EL.   -6.0 PASS.UEDGE LOC.   108.0 EL.  -6.0


          ASSUMED FAILURE SURFACE DATA

      DIST.    ELEU.       UT.   UPLIFT    STR 1    STR 2  STR USED

        0.0     -6.0    1628.     1094.     307.     218.     218.
       77.7     -6.0    1628.     1094.     307.     218.     218.
 SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.   91.5
       94.0     -6.0    1885.     1094.     307.     323.     307.
       95.0     -6.0    1917.     1102.     307.     333.     307.
       96.0     -6.0    1891.     1109.     307.     319.     307.
 SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.   96.0
       96.1     -6.0    1642.      951.     307.     282.     282.
      100.0     -6.0    1642.      953.     307.     281.     281.
      104.0     -6.0    1667.      953.     307.     291.     291.
 SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.  104.0
      104.1     -6.0    1917.      952.     307.     394.     307.
      105.0     -6.0    1916.      942.     307.     398.     307.
 SHEAR STRENGTHS ARE EQUAL   307.0  AT DIST.  113.7
      122.3     -6.0    1284.      750.     307.     218.     218.
      130.0     -6.0    1284.      750.     307.     218.     218.



    ASSUMED CRIT. PASSIUE LOC.  108.0  EL.  -6.0  DP    11463.  RP     9561.



               ACTIUE UEDGE DATA



     DIST.    ELEU.       DA        RA         DB         RB        FS

     96.0     -6.0    15293.    10177.         0.       3499.      6.07


      CRIT. ACTIUE LOC      96.0  EL  -6.0  DA    15293.  RA   10177.


     DIS.      EL.       DP        RP         DB         RB        FS

    108.0     -6.0    11463.     9561.         0.       3499.      6.07



  * * STRATUM  5 ACT. UEDGE LOC. 90096.0 EL.  -10.0 PASS.UEDGE LOC.   111.0 EL. -10.0
```

```
        ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.        WT.   UPLIFT    STR 1    STR 2  STR USED

    0.0   -10.0     2108.    1344.     312.     311.     311.
   77.7   -10.0     2108.    1344.     312.     311.     311.
   94.0   -10.0     2365.    1344.     417.     364.     364.
   95.0   -10.0     2397.    1352.     426.     368.     368.
   96.0   -10.0     2371.    1359.     413.     362.     362.
   96.1   -10.0     2122.    1201.     375.     343.     343.
  100.0   -10.0     2122.    1203.     375.     343.     343.
  104.0   -10.0     2147.    1203.     385.     348.     348.
  104.1   -10.0     2397.    1202.     487.     399.     399.
  105.0   -10.0     2396.    1192.     491.     401.     401.
  122.3   -10.0     1764.    1000.     312.     311.     311.
  130.0   -10.0     1764.    1000.     312.     311.     311.


 ASSUMED CRIT. PASSIVE LOC.  111.0  EL. -10.0  DP   15634.  RP   13394.


              ACTIVE WEDGE DATA

  DIST.    ELEV.      DA        RA        DB        RB        FS

  96.0    -10.0    23273.    11761.        0.      5462.      4.01

   CRIT. ACTIVE LOC      96.0  EL -10.0  DA    23273.  RA    11761.

  DIS.     EL.        DP        RP        DB        RB        FS

 111.0    -10.0    15634.    13394.        0.      5462.      4.01


* * STRATUM  6 ACT. WEDGE LOC. 90096.0 EL.  -20.0 PASS.WEDGE LOC.   118.0 EL. -20.0

        ASSUMED FAILURE SURFACE DATA

  DIST.   ELEV.        WT.   UPLIFT    STR 1    STR 2  STR USED
```

```
  0.0     -20.0     3278.     1969.      423.      307.      307.
 77.7     -20.0     3278.     1969.      423.      307.      307.
 94.0     -20.0     3535.     1969.      476.      307.      307.
 95.0     -20.0     3567.     1977.      480.      307.      307.
 96.0     -20.0     3541.     1984.      474.      307.      307.
 96.1     -20.0     3292.     1826.      455.      307.      307.
100.0     -20.0     3292.     1828.      454.      307.      307.
104.0     -20.0     3317.     1828.      460.      307.      307.
104.1     -20.0     3567.     1827.      511.      307.      307.
105.0     -20.0     3566.     1817.      513.      307.      307.
122.3     -20.0     2934.     1625.      423.      307.      307.
130.0     -20.0     2934.     1625.      423.      307.      307.


ASSUMED CRIT. PASSIVE LOC.  118.0  EL. -20.0  DP   36237.  RP   20211.


            ACTIVE WEDGE DATA


 DIST.    ELEV.       DA         RA        DB         RB        FS


 96.0    -20.0    50521.    17655.        0.      6754.      3.12


  CRIT. ACTIVE LOC      96.0  EL -20.0  DA   50521.  RA   17655.


 DIS.     EL.       DP         RP        DB         RB        FS

118.0    -20.0    36237.    20211.        0.      6754.      3.12
EOT..
```

273DΦSW
KXRE9A
JIFLUD

DEEP SEATED ANALYSIS.



DEEP SEATED STABILITY ANALYSIS

NO.	ELEV.	UA = DA − RA RA	DA	UP = RB + RP + DP RB	RP	DP	UA	UP	UA−UP
A-1	+10.5	1305	302	0	1303	300	-1003	1603	-2606
B-1	+6.0	3378	2210	2456	3376	2186	-1168	8018	-9186
C-1	0.0	7989	7609	3684	7373	5938	-380	16995	-17,375
D-1	-6.0	10752	16431	3677	10137	13254	+5,679	27068	-21,389
E-1	-10.0	12648	24707	5654	13763	17170	+12,059	36,587	-24,528
F-1	-20.0	18136	52277	6754	20418	36924	+34,141	64,096	-29,955

SEEPAGE Analysis.

WORST CONDITION #1 $8.5 = \dfrac{21.5/3 + 2b + 1}{5.5} \Rightarrow b = 19.29$

FINE SAND

PUT Tip @ EL. -9.0.

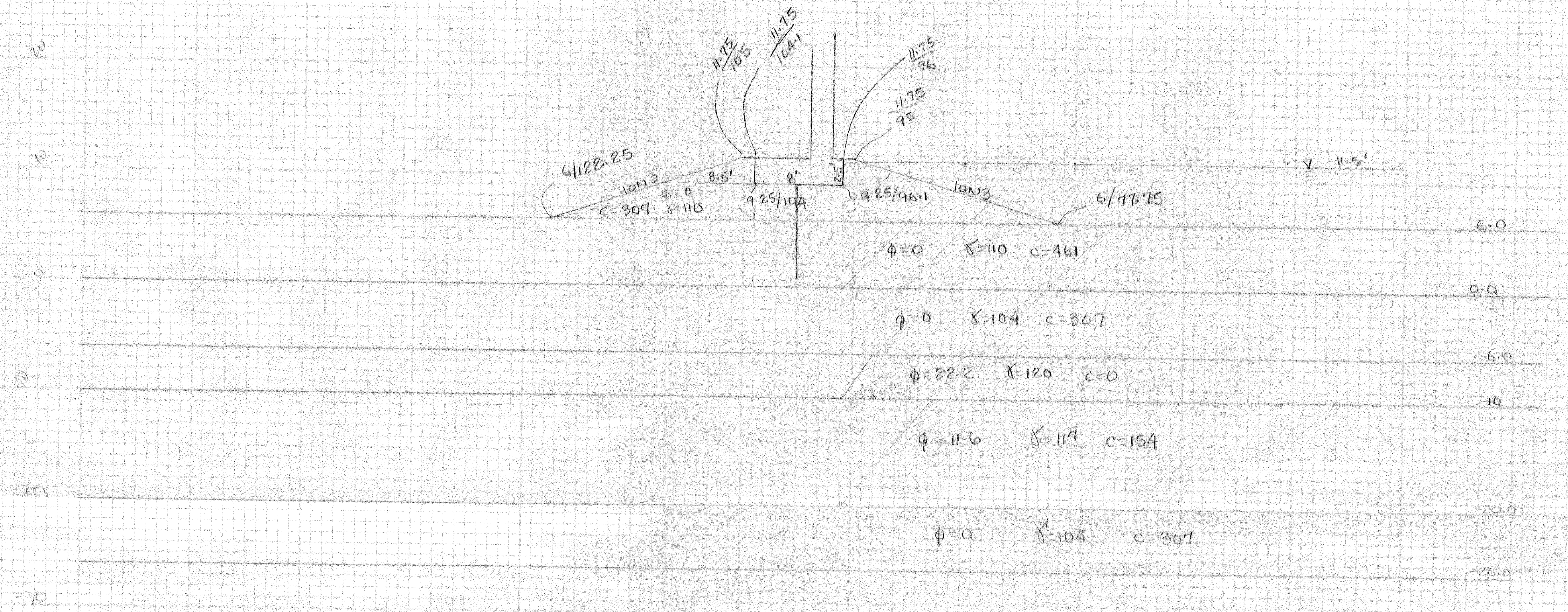
ASSUMING CLAY

13.75

$2.5 = \dfrac{21.5/3 + 2b + 1}{5.5} \Rightarrow b = 2.80$

Tip @ EL. 7.70

LAKE PONTC. BEACH
GATE MONOLITH 2 RAMP 2.
PROGRAM DS11



DEEP SEATED STABILITY ANALYSIS

NO.	ELEV.	$U_A = D_A - R_A$		$U_P = R_B + R_P + D_P$					
		R_A	D_A	R_B	R_P	D_P	U_A	U_P	$U_A - U_P$
A-1	+9.25	1306	304	0	1303	300	-1002	1602	-600
B-1	+6.0	2803	1608	2456	2800	1494	-1195	6,750	-7945
C-1	0.0	7414	6739	3684	6798	4765	-675	15247	-15922
D-1	-6.0	10177	15293	3499	9561	11463	5116	24523	-19407
E-1	-10.0	11761	23273	5462	13394	15634	11512	34490	-22969
F-1	-20.0	17655	50521	6754	20211	36237	32866	96068	-63202

* Seepage Analysis.

Assuming Sand

$$8.5 = \frac{(18.5/3) + 2.5 + 2b}{5.5} \Rightarrow b = 19.04$$

EL = 9.25 - 19.04 = -10.0

Put EL. -10.0

* Worst Condition.

Assume Clay

$$2.5 = \frac{(18.5/3) + 2.5 + 2b}{5.5} \Rightarrow b = 2.54$$

EL = 9.25 - 2.54 = 6.7.

Gate Monoliths at Ramps 1 & 3.
Deep Seated Analysis.

EUSTIS ENGINEERING
GEOTECHNICAL ENGINEERS
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157

29 July 1986

URS Company
Consulting Engineers
3500 North Causeway Boulevard
Metairie, Louisiana 70002

Attention Mr. Bruce Adams

Gentlemen:

Pontchartrain Beach Flood Protection Improvement Plan
Construction of Lakeshore Drive Ramps
OLD Project No. 2040-0204
New Orleans, Louisiana

Reference is made to the memorandum furnished our office on the meeting of 24 July 1986 concerning, in part, the construction of the Lakeshore Drive Ramps. At this meeting, it was generally concluded that the specified compaction (100 percent of maximum dry density at optimum water content in accordance with ASTM D 698) has not been achieved by the contractor. This conclusion is primarily based on the results of the compaction tests performed on samples of fill materials obtained within the ramp. Results of these compaction tests performed by Eustis Engineering are appended to this letter as Enclosures 1 and 2.

Representatives of Delta Testing and Inspection, Inc., E. Berkeley Traughber and Associates, Inc. and Eustis Engineering concur that the possibility exists for roadway deterioration due to inadequate compaction of the subgrade materials. We understand that a warranty bond will be required from the contractor for a total period of two and one-half years following construction of the roadway.

Concern was expressed by the Orleans Levee Board representative relative to the integrity of the levee section as flood protection. Additionally, the representatives of the U.S. Army Corps of Engineers had previously expressed concern over the use of cement-modified soil altering the permeability characteristics of the fill materials.

It is Eustis Engineering's opinion that the compactive effort used for ramp fill materials has resulted in in-place stability parameters equal to or better than those assumed for design, i.e. semi-compacted fill parameters. A permeability test performed on a sample of ramp fill material compacted to the density achieved in the field indicates a permeability on the order of 6.6×10^{-9} cm/sec. This is consistent with permeabilities assumed for design. Results of the permeability test are enclosed with this letter. We should note that this test was performed on material obtained from the east ramp. A test is being conducted on material obtained from the west ramp and will be forwarded when available. Eustis Engineering does not anticipate a substantial difference between the permeabilities of materials within the two ramps.

Based on data accumulated to date, it is Eustis Engineering's opinion that the warranty bond described above is in the best interests of the Orleans Levee Board in order to circumvent possible maintenance costs to the Board of the ramp roadways after they are put into service. We feel that the fill materials, as compacted, will provide a stable and impermeable levee.

If we can be of further assistance or you require further clarification of this letter, please do not hesitate to contact us.

Yours very truly,

EUSTIS ENGINEERING

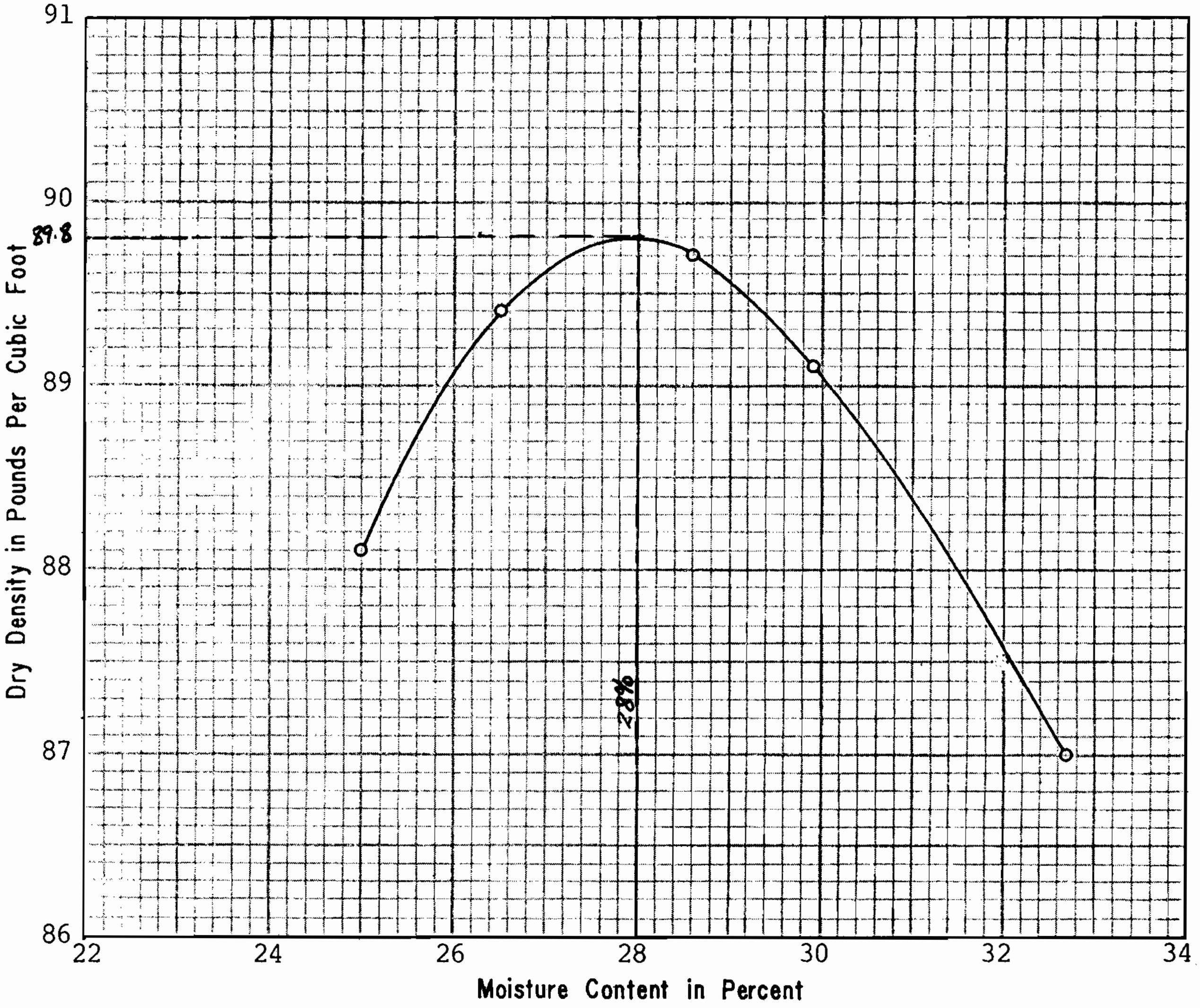
Lloyd A. Held Jr.

Lloyd A. Held, Jr.

W. W. Gwyn:bh

Enclosures

Curve No.	Boring No.	Sample No.	Depth In Feet	Classification	Atterberg Limits LL	 PL	 PI
		2		Tan & gray clay treated w/cement tailings	74	20	54



LABORATORY COMPACTION CURVES

ASTM D 698

Field Services
Orleans Levee District
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

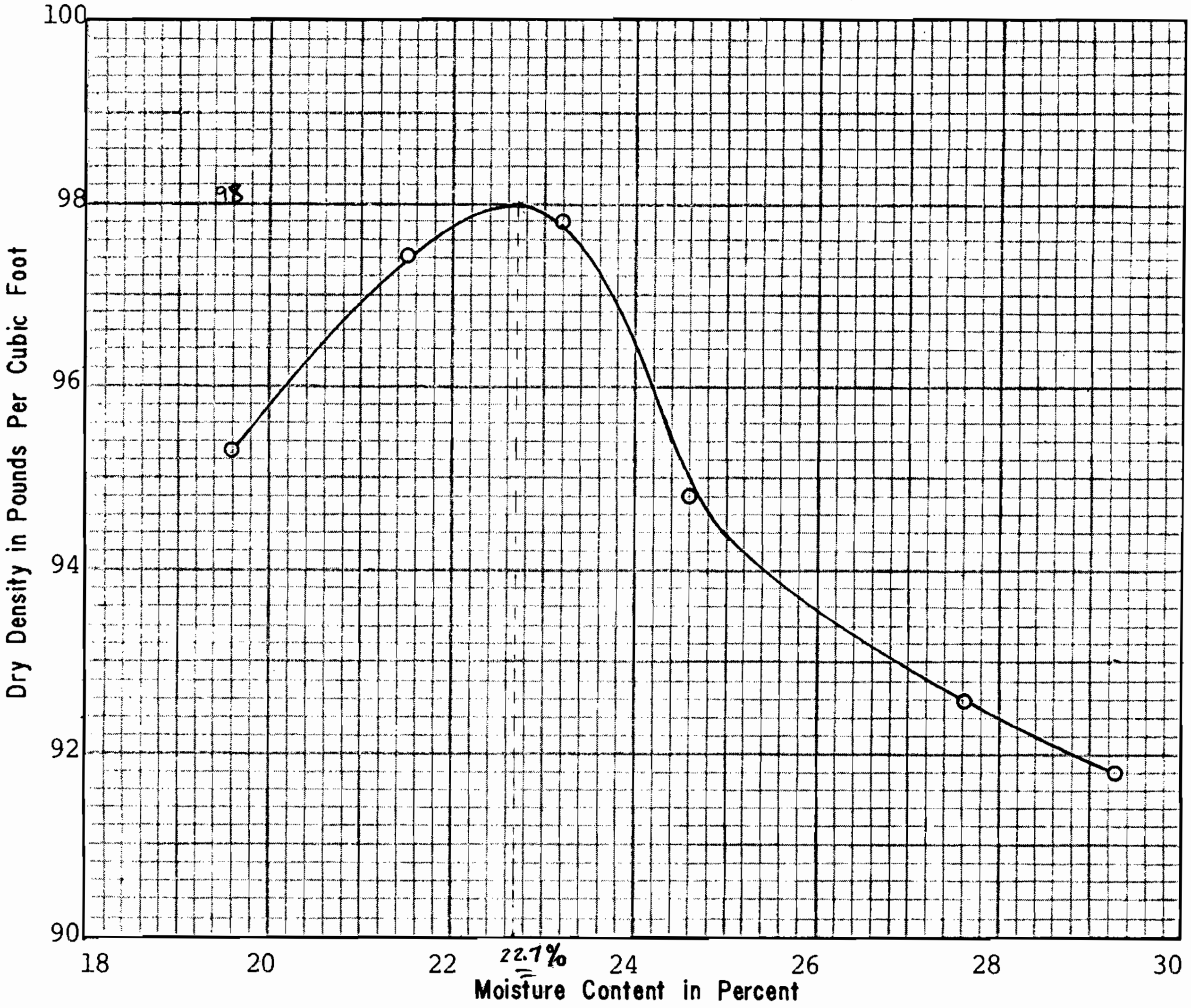
For: The Board of Levee Commissioners of the Orleans Levee District
New Orleans, Louisiana

URS Company, Consulting Engineers, Metairie, Louisiana

Enc. 1

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

					Atterberg Limits		
Curve No.	Boring No.	Sample No.	Depth In Feet	Classification	LL	PL	PI
		1		Tan & gray clay treated w/cement tailings			



LABORATORY COMPACTION CURVES

ASTM D 698

Field Services
Orleans Levee District
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

For: The Board of Levee Commissioners of the Orleans Levee District
New Orleans, Louisiana

URS Company, Consulting Engineers, Metairie, Louisiana

Enc. 2

Field Services
Orleans Levee District
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

For: The Board of Levee Commissioners of the Orleans Levee District
New Orleans, Louisiana

URS Company, Consulting Engineers, Metairie, Louisiana

SUMMARY OF LABORATORY PERMEABILITY TESTS

Sample Number	Classification	Water Content Percent		Density PCF		Coefficient of Permeability cm/sec
		Initial	Final	Dry	Wet	
1	Tan & gray clay w/cement tailings	34.3	34.7	84.8	113.9	6.6×10^{-9} (V)

Specimen was compacted at maximum dry density from ASTM D 698 compaction test and on the wet side of optimum.

MEETING MEMORANDUM

DATE: June 16, 1986

PROJECT: Pontchartrain Beach Flood Protection Proj
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

LOCATION: URS Company Offices, 1:30 pm

ATTENDANCE:		
	Jim Richardson JR 23 Jun 86	COE
	Roberto Estrada	COE
	Willis Palmer	JFS
	Bill Gwyn	Eustis
	John Holtgreve	DEI
	Berkley Traughber	EBT
	Frank Vicidomina	OLB
	Charlene Thompson	URS
	Bruce Adams	URS

Scotch® 7664 "Post-it" Routing-Request Pad

ROUTING - REQUEST

To ~~B. RICCIOLA~~ RR 7/3
~~P. NAPOLITANO~~
~~J. RICHARDSON~~ JR

Please
☑ READ
☐ HANDLE
☐ APPROVE
and
☐ FORWARD
☐ RETURN
☐ KEEP OR DISCARD
☐ REVIEW WITH ME

Date 25 JUNE

From RD

Topics of Discussion

1. West Roadway Compaction

In considering methods to expedite the progress of this work due to problems with rainfall, the following procedure was agreed to:

a. JFS will construct a continuous ditch ringing the area around the proposed embankment and begin pumping from the ditch (for 24 hrs/day, if necessary) into adjacent gravity storm sewers. Upon successful compaction of the embankment construction, the ditch will be backfilled with "hydraulically pumped" sand except along and beneath the adjacent levees where semi-compacted clay will be placed.

b. Embankment along the roadway section which is not within the levee section (see attached sketches) can be "pumped" sand with minimal strategically - located pockets of shell compacted to 100% of ASTM D698. Exposed faces of such granular embankment shall be capped with clay as per the attached sketch.

c. Embankment within the roadway section which is also within the levee sections, shall be compacted to 100% of ASTM D698, but, if necessary, minimal amounts of fly-ash can be added to stabilize it. JFS will have to obtain new moisture-density relationship curves determined by Delta at JFS' expense and also have new permeability analyses made at JFS' expense for any proposed fly-ash mixture. Also, should any clay material which is dissimilar to that placed already, new moisture-density relationships will have to be determined.

d. Prior to proceeding with any such construction, JFS will provide URS with the sample and test results.

2. Concerning the electrical power pole embedded in the levee, Jim Richardson (COE) will check as to the COE's position on simply cutting the pole several feet below the levee slope and then repairing the levee. It was agreed that the remaining conduit shall be grouted and the flood side toe of the levee shall be excavated, the conduit removed in the area of the excavation and the exposed ends capped.

3. Frank Vicidomina (OLB) will check the ownership of the fire hydrant at station 92 + 20 (approx.) along the east roadway raising of Lakeshore Drive as this hydrant will be removed and turned over to the proper owner. (OLB and S&WB have since confirmed that the hydrant is not theirs; it has been stored on site with the other hydrants.)

4. Concerning site drainage, URS will check on the feasibility of repairing the existing east side drainage system to facilitate drainage along the midway. Also, the feasibility of grading the levee toe toward a new central catch basin into the drainage system will be considered.

5. JFS will begin seeding the levees on or about July 1 and will immediately proceed with final levee grading and repairing the voids along the sheeting in accordance with previous correspondence, except where such voids are minor and will contain water. Those latter locations shall be repaired with semi-compacted clay.

6. JFS will provide survey information on settlement plates.

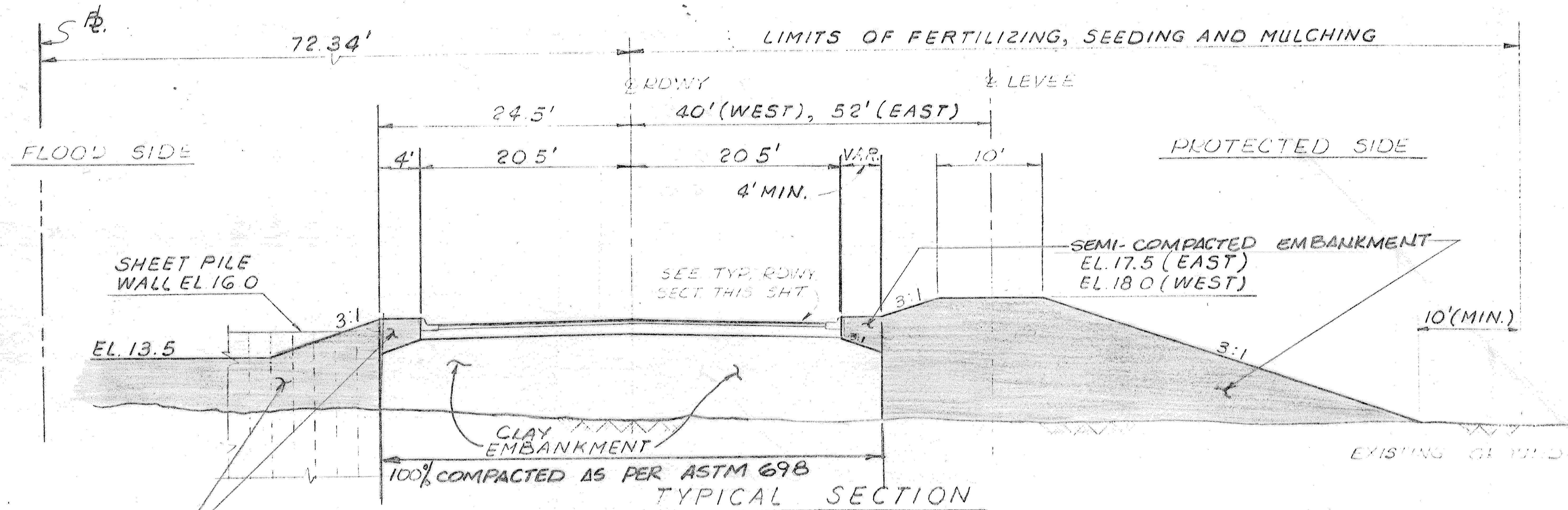
Prepared by: Bruce H Adams

Bruce H. Adams, P.E.
URS Company

Distribution: Meeting Attendees
URS Field Personnel

LEGEND:
▒ SEMI-COMPACTED CLAY
☐ COMPACTED CLAY (100% - ASTM 698)
▨ COMPACTED CLAY OR "PUMPED" SAND (100% - ASTM 698)

PONTCHARTRAIN BEACH
PHASE I



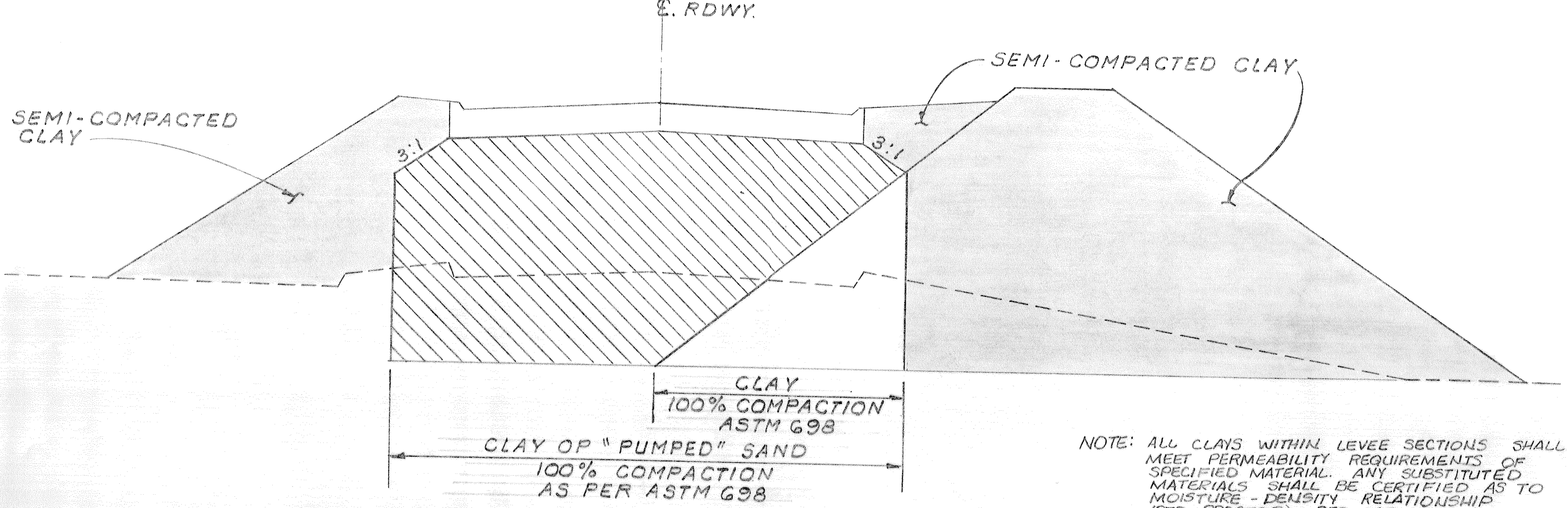
TYPICAL SECTION

LAKESHORE DRIVE @ LEVEE AND "I" WALL
STA. 20+11.35 AND STA. 90+41.18
SCALE: 1" = 10'

SEMI-COMPACTED
EMBANKMENT

S ℙ

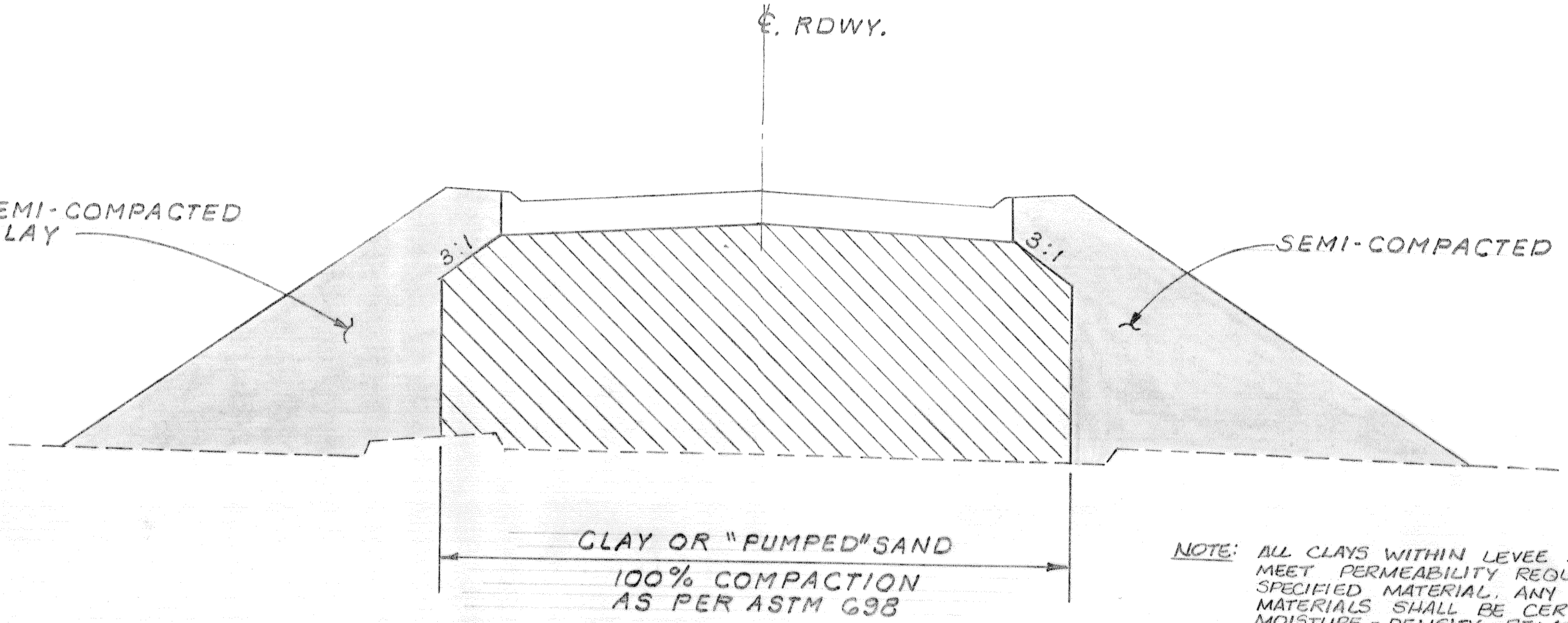
LIMITS OF FERTILIZING, SEEDING AND MULCHING



NOTE: ALL CLAYS WITHIN LEVEE SECTIONS SHALL MEET PERMEABILITY REQUIREMENTS OF SPECIFIED MATERIAL. ANY SUBSTITUTED MATERIALS SHALL BE CERTIFIED AS TO MOISTURE - DENSITY RELATIONSHIP (STD. PROCTOR), PERMEABILITY AND COMPACTION.

TYPICAL SECTION
(LAKESHORE DR.)

PONTCHARTRAIN BEACH
PHASE I

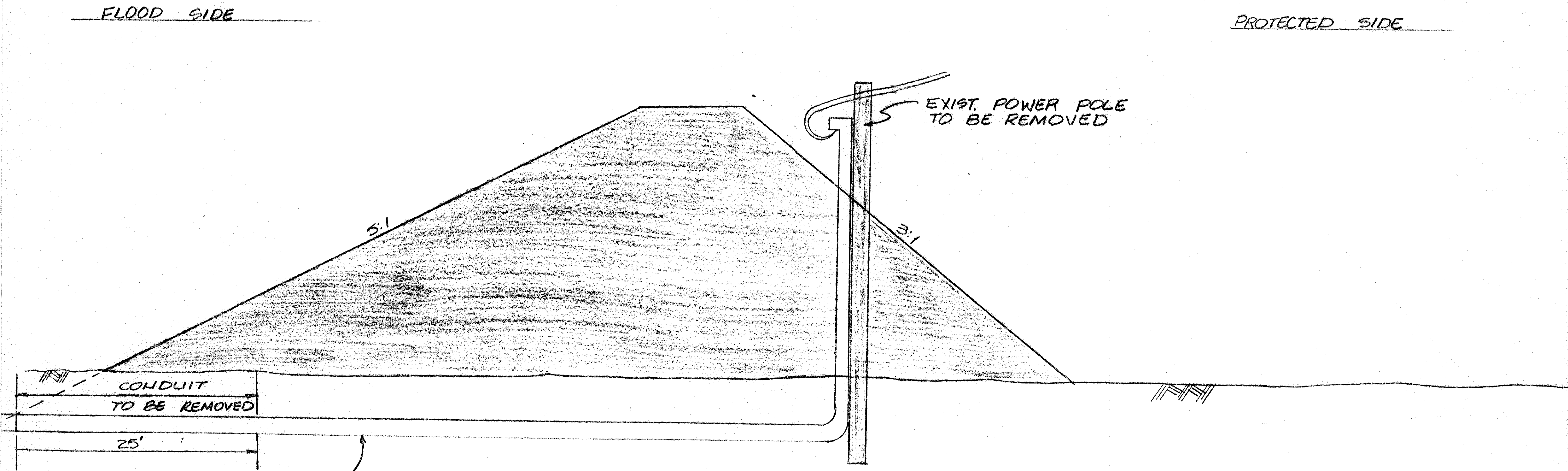


NOTE: ALL CLAYS WITHIN LEVEE SECTIONS SHALL MEET PERMEABILITY REQUIREMENTS OF SPECIFIED MATERIAL. ANY SUBSTITUTED MATERIALS SHALL BE CERTIFIED AS TO MOISTURE-DENSITY RELATIONSHIP (STD. PROCTOR), PERMEABILITY AND COMPACTION.

TYPICAL SECTION
(LAKESHORE DR.)

PONTCHARTRAIN BEACH
PHASE I

PONTCHARTRAIN BEACH
PHASE 1



EXIST. POWER POLE
TO BE REMOVED

EXIST. ELEC. CONDUIT
REMOVE CONDUCTORS & GROUT
FROM EACH END (NO ADDITIONAL PAY)

ROUTING AND TRANSMITTAL

Date 9 JUN 86

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. ~~Mr. Phil Napolitano~~	PN	9 JUN
2. ~~R. RICCIOLA~~	RR	10 June
3. J. RICHARDSON	JR	June
4. Fedrana		
5.		

☐	Action	☐	File	☐	Note and Return
☐	Approval	☑	For Clearance	☐	Per Conversation
☐	As Requested	☐	For Correction	☐	Prepare Reply
☐	Circulate	☑	For Your Information	☐	See Me
☐	Comment	☐	Investigate	☐	Signature
☐	Coordination	☐	Justify	☐	

REMARKS

Phil if you have any problems with what is in this letter from ORS let me know

Ronnie

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
R Elmer LMNOD-SP	227
	Phone No. 2618

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

☆ U.S. GOVERNMENT PRINTING OFFICE : 1982 O - 361-529 (215)

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATIO

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL: (504) 837-6326

Dallas
Denver
Kansas City
New York
San Francisco
Seattle
Anchorage
Austin
Berkeley
Boston
Buffalo
Houston
Las Vegas
Montvale
New Orleans
Philadelphia
Washington, D C
Puerto Rico
Jeddah

June 3, 1986

Mr. Ron Elmer, LMNED-SP
U.S. Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project - Phase II
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

Today, Messrs. Phil Napolitano (COE), Bill Gwyn (Eustis Engineering Company) and myself met to discuss the above project. In particular, the existing sand-shell bed associated with the second roadway found to be buried beneath the known upper roadway section will be removed to the point where it is in no direction closer than 10' from the face of the theoretical levee section inside of the theoretical levee section. A second item discussed concerned filling of the holes which developed between the web of the steel sheeting in several locations as it was driven and/or soon thereafter. It was agreed that since the design of the sheeting was based upon its embedment in sand, the holes would be backfilled with sand and compacted by hand-tamping in 6" lifts. Also, the sand material shall be a hydraulically-pumped sand similar to that used at the site to date as backfill.

Sincerely,

URS ENGINEERS

Bruce H Adams

Bruce H. Adams, P.E.

cc: Mr. C. E. Bailey, OLB
DEI
E. B. Traughber
Eustis Engineering Co.
URS Field Office Personnel

URS
AN INTERNATIONAL PROFESSIONAL SERVICE ORGANIZATION

URS ENGINEERS

3500 NORTH CAUSEWAY BOULEVARD
METAIRIE LOUISIANA 70002
TEL (504) 837-6326

New Orleans
Philadelphia
Washington, D.C.
Puerto Rico
Jeddah

May 23, 1986

Mr. Ron Elmer LMNED-SP
Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Phase I
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

Confirming our conversation with Phil Napolitano of the Corps on May 22, 1986 concerning the above project, please be advised that a second roadway section was discovered buried beneath the existing west "levee" crossing of Lakeshore Drive. It is expected that a similar situation will be discovered at the existing east "levee" crossing also. It is URS' understanding that all sand-shell base and roadway is to be removed within the limits of the levee and its theoretical projection until natural ground. This includes the levees crossing and parallel to Lakeshore Drive. However, any buried roadway and base material adjacent to, but out of, new levee sections will remain.

Sincerely,

URS ENGINEERS

Bruce H Adams

Bruce H. Adams, P.E.

cc: Mr. C.E. Bailey, OLB
DEI
E.B. Traughber
JFS
Eustis
URS Field Personnel

JIM,
Please Review
let me know if
Not correct THANKS
Ronnie
2618

URS

URS ENGINEERS

3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL. (504) [illegible]

May 14, 1986

Mr. Ron Elmer, LMNED-SP
Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

Confirming our conversation with Mr. Jim Richardson of the Corps' Foundations Section, URS will inform the Contractor for the above project of the agreed method for backfilling the cofferdam excavation where the seawall sheet piling has already and will be in the future removed. In particular to the existing excavation, the Contractor will immediately flood the excavation to prevent any of the adjacent foundation material from entering the excavation and improve his well point system and cofferdam. The next step for the existing excavation and in general for the upcoming excavations will be to attempt to remove the water from the excavation with the well point system and then mechanically compact the specified pumped sand backfill in lifts to the elevation of the bottom of the clay cap. Should the well point system not succeed in removing the water from the excavation, the well point system will be operated so that the water level in the ground adjacent to the cofferdam is lower than that in the cofferdam and the sand backfill will be placed in lifts through the water as the water flows downward toward the well point system. Additional well points located inside the perimeter of the cofferdam will be allowed but they must be properly installed below the bottom of the excavation so as to draw water downward through the cofferdam and the sand backfill as it is placed. However, as sand is placed by this method, the water elevation inside the excavation must be maintained above that in the ground outside of the cofferdam.

Thank you for the Corps' attention to this matter. Please contact us should this not be as per the Corps' understanding.

Sincerely,

URS ENGINEERS

Bruce H Adams

Bruce H. Adams, P.E.

BHA/kam

cc: Mr. C.E. Bailey, OLB
DEI
JFS
E.B. Traughber
Eustis Engineering Company
URS Field Personnel

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL LMNED-FS

SUBJECT Pontchartrain Beach Floodwall - Lake Pontchartrain, LA & Vicinity (High Level Plan)

TO C/Des Svcs Br **FROM** C/F&M Br **DATE** 17 Mar 86 **CMT 1**

Mr. Estrada/mlm/1035

1. Reference is made to your LMNED-SP DFs dated 14 Feb and 18 Feb subject as above, requesting our review and comments on the Eustis Engineering Company responses to COE comments and on two letters from URS Engineers.

2. All our responses to these DFs have been discussed and furnished over the phone and in meetings held at the district and at the URS office between Corps personnel and URS Engineers personnel on the following dates: 4 Feb, 7 Feb, and 24 Feb.

3. All our recommendations have been incorporated into the P&S, which have been reviewed and approved by our office.

RODNEY P. PICCIOLA
Chief, Foundations & Materials Branch

RP
3/18

FILE

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

☆ U.S. Government Printing Office: 1983—406-86

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNED-FS	Pontchartrain Beach Floodwall - Lake Pontchartrain LA & Vicinity (High Level Plan)

TO	FROM	DATE	CMT 1
C/Des Svcs Br	C/F&M Br	11 Mar 86	

Mr. Richardson/mlm/1031

1. On 5 March 1986, a copy of the Phase I construction documents for the above project was hand-carried to this office by Mr. Elmer of your office. Mr. Elmer verbally requested our review and comment.

2. We have reviewed the documents and offer the following comments:

a. Project Requirements, Para. 1B-1.04, Page M-5. The specifications indicate that the sequence of construction requires that the sheetpiles are to be driven before the embankment is placed. This creates a problem in that to semi-compact the materials, as required by the specifications, adjacent to the sheetpile would require special procedures and equipment. It is recommended that the embankment material first be placed and compacted before driving the sheetpiles. Any voids around the driven sheetpiles should be filled and hand tamped. In a telephone conversation, Mr. Bruce Adams of URS indicated that they would comply with this recommendation.

b. Technical Specifications, Para. 3-10, Page 3-7. Change the second sentence to read "caused through no fault of the contractor".

c. Drawing 19 of 39. At the time of capping the sheetpile with concrete, all utility wall penetrations should be raised in their sleeves to give maximum allowance for any additional settlement due to future maintenance lifts.

RODNEY P. PICCIOLA
Chief, Foundations & Materials Branch

RP 3/12

FILE

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

URS

[illegible]

URS ENGINEERS

3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 700[illegible]
TEL (504) 837 6326

[illegible]
Buffalo
[illegible]
[illegible]
[illegible]
New Orleans
[illegible]
Washington D.C.
Puerto Rico
Jeddah

March 3, 1986

Hand Carried
by Ron Elmer
5 March 86

Mr. C. E. Bailey, Chief Engineer
Orleans Levee District
Board of Commissioners
Suite 202, Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

Dear Mr. Bailey:

Subject: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 46021.00

By copy of this letter, URS is delivering to the Orleans Levee District 3 copies of the Phase I construction documents for final approval of the above project. As you review these documents please note that adjacent to the west roadway ramp of Lakeshore Drive, the proposed improvements will require that OLB obtain the rights to or ownership of additional land from UNO. As per our meeting of February 7, 1986 at COE, Mr. John Holtgreve of DEI had informed us that OLB would have to obtain what land was necessary from UNO. We are mentioning this now so such acquisition can be initiated.

In light of the impending advertisement date, please provide URS with your review comments by the end of business on March 5, if at all possible. We await your response.

Sincerely,

URS ENGINEERS

Bruce H Adams

Bruce H. Adams, P.E.

BHA/bpe

Enclosures

cc: DEI (w/enclosures) ✓
COE (w/enclosures) ✓

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNED-FS	Pontchartrain Beach Flood Protection, Lake Pontchartrain Hurricane Protection Project, Orleans Parish, LA

TO C/Des Svcs Br

FROM C/F&M Br

DATE 20 Feb 86

CMT 1

Mr. Estrada/mlm/1035

1. Reference is made to your LMNED-SP DF dated 14 Feb 86, subject as above, requesting our review and comments on the minutes of the meeting held on 7 Feb 86.

2. We have reviewed the minutes and have the following comment:

The sheet pile wall design requested on Item 1 was furnished by phone to Bruce H. Adams of URS Engineers on 7 Feb by our Jim Richardson.

3. The Eustis Engineering Company responses will be reviewed and our comments furnished at a later date.

RODNEY P. PICCIOLA
Chief, Foundations & Materials Branch

file

DA FORM AUG 80 2496

PREVIOUS EDITIONS WILL BE USED

☆ U.S. Government Printing Office: 1983—406-082

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL
LMNED-SP

SUBJECT
Pontchartrain Beach Floodwall - Lake Pontchartrain, La. & Vicinity (High Level Plan)

TO C/Des Br
✓C/F&M Br 2/19
C/H&H Br

FROM C/Des Svcs Br

DATE 14 Feb 86
Mr. Elmer/dn/2618

CMT 1

1. Reference the meeting held on 7 Feb 86 with represenatives of Design Engineers Inc, URS Engineers, New Orleans Public Service, Orleans Levee Board, and COE personnel (a list of attendees is included in the enclosure). The purpose of the meeting was to address COE comments on the alternative alinement study for the subject project and to resolve other issues pertaining to the designs being developed for the OLB.

2. Enclosed, please find minutes of the meeting and for F&M Br the responses to the F&M related comments prepared by Eustis Engineering Company on the Pontchartrain Beach Floodwall plans.

3. You are requested to review the minutes of the meeting and provide comments by 21 Feb 86. F&M Br is additionally requested to review the Eustis Engineering Company responses to the COE comments on the subject project.

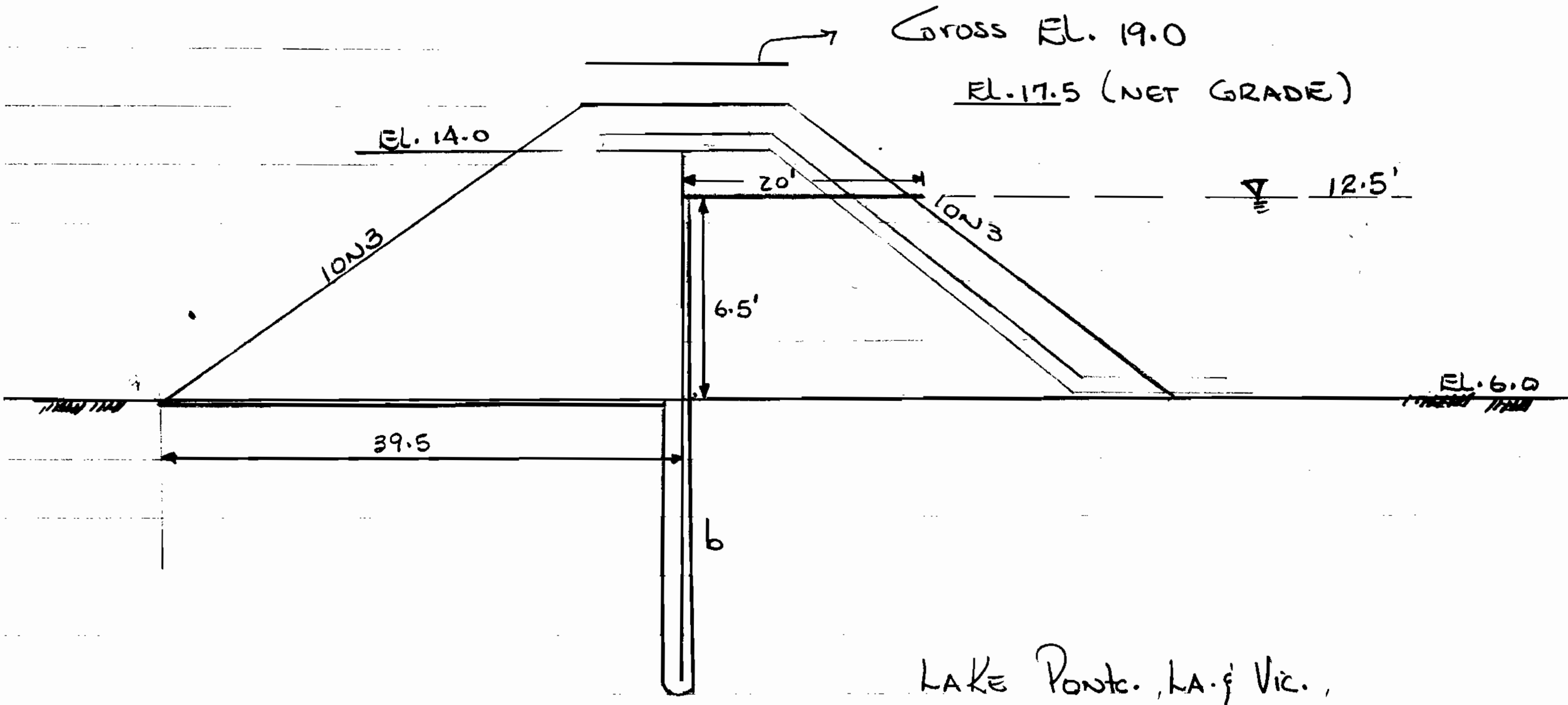
4. If there are any questions, please contact Mr. Elmer, Ext. 2618.

Encl (hand-carried)

Thomas E. Harrington
THOMAS E. HARRINGTON, JR.
Chief, Design Services Branch

7 FEB. 86

TWO utility Lines



ASSUME FINE SAND.

LAKE Pontc., LA. & Vic.,
Pont. BEACH Floodwall
Utility Line Crossing # 1
Appox. STA. 136±
7 FEB. 86

$$8.5 = \frac{1/3(39.5+20) + 6.5 + 2b}{6.5}$$

b = 14.5 say 15'

EL. = 6 - 15 = -9.0

Say Put Tip @ EL. -11.0

NOTES:

1) The TOP OF THE SHEET Pile will be @ EL. 14.0' (12.5 (S.W.L) + 1.5' (SETTL.)

2) The utility lines will be ~~at~~ placed over the top of the SHEET Pile.

3) The SHEET pile will EXTEND 15 FT, (on both sides) from the ℄ of the utility lines.

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL: LMNED-SP

SUBJECT: Pontchartrain Beach Floodwall - Lake Pontchartrain, La. & vicinity (High Level Plan)

TO C/F&M Br 2/20

FROM C/Des Svcs Br

DATE 18 Feb 86
Mr. Elmer/dn/2618

CMT 1

1. On 14 Feb 86, copies of the enclosed letters with enclosures from URS Engineers were hand carried to Mr. Richardson of your office by Mr. Stutts of my office.

2. You are requested to review this material and provide comments NLT 21 Feb 86. If you have any questions, please contact Mr. Elmer, Ext. 2618.

Encls

Thomas E Harrington
THOMAS E. HARRINGTON, JR.
Chief, Design Services Branch

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED ☆ U.S. Government Printing Office: 1983—406-882

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL LMNED-SP

SUBJECT Pontchartrain Beach Floodwall - Lake Pontchartrain, La. & vicinity (High Level Plan)

TO C/F&M Br 2/20

FROM C/Des Svcs Br

DATE 18 Feb 86
Mr. Elmer/dn/2618

CMT 1

1. On 14 Feb 86, copies of the enclosed letters with enclosures from URS Engineers were hand carried to Mr. Richardson of your office by Mr. Stutts of my office.

2. You are requested to review this material and provide comments NLT 21 Feb 86. If you have any questions, please contact Mr. Elmer, Ext. 2618.

Encls

THOMAS E. HARRINGTON, JR.
Chief, Design Services Branch

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

☆ U.S. Government Printing Office: 1983—406-862

LMNED-SP

Pontchartrain Beach Floodwall - Lake Pontchartrain, La. & vicinity (High Level Plan)

C/F&M Br

C/Des Svcs Br

18 Feb 86
Mr. Elmer/dn/2618

1. On 14 Feb 86, copies of the enclosed letters with enclosures from URS Engineers were hand carried to Mr. Richardson of your office by Mr. Stutts of my office.

2. You are requested to review this material and provide comments NLT 21 Feb 86. If you have any questions, please contact Mr. Elmer, Ext. 2618.

Encls

THOMAS E. HARRINGTON, JR.
Chief, Design Services Branch

URS

AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZ

URS ENGINEERS

3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL. (504) 837-6326

[illegible]

Boston
Buffalo
Houston
Las Vegas
Montvale
New Orleans
Philadelphia
Washington DC
Puerto Rico
Jeddah

February 14, 1986

Mr. Ron Elmer, Project Coordinator
LMNED-SP
U.S Army Corps of Engineers, NOD
P. O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 565-04-73

Enclosed are copies of URS' recommended sheet pile installations and design calculations for both of the east and west end reaches of the above project. You will note that as per our meeting of February 7, 1986, the transitions of both bottom pile elevations and type of section have been minimized. However, our cost analysis (enclosed) reveals that the most economical installation would be a combination of PZ-40, -35 and -27 steel pile sections. Please review this information and comment as soon as possible.

Sincerely,

Bruce H. Adams

Bruce H. Adams, P.E.
URS Engineers

BHA/kam

Enclosures

cc: Mr. C.E. Bailey, OLB
Mr. Walter Baudier, DEI
Mr. John Holtgreve, DEI

PONTCHARTRAIN BEACH
SHEET PILE SECTIONS

2/13/86
CT

LENGTHS

NORTH	5669.61'	+378.52'
WEST	485.54'	
EAST	572.47'	

CONTRACTORS CONTACTED:
LANDIS
BOH
PITTMAN

WEST END		TIP EL.	*EAST END:	
3/5 PZ-40 :	291.32	-14	(+) 3/5 PZ-40 :	376.13
2/5 PZ-27 :	194.22	-10	(-) 2/5 PZ-27 :	196.34
1/5 PZ-40 :	97.11	-14	1/5 PZ-40 :	114.49
4/5 PZ-35 :	388.43	-12	4/5 PZ-35 :	457.98
1/5 PZ-40 :	97.11	-14	1/5 PZ-40 :	114.49
2/5 PZ-35 :	194.22	-12	(+) 2/5 PZ-35 :	261.64
2/5 PZ-27 :	194.22	-10	(-) 2/5 PZ-27 :	196.34

Using

*SAME TYPE SHEET PILING USED ON BOTH SIDES OF GATE MONOLITH

PER SQ. FT.

CASE 1	LIN. FT.	SQ. FT.	LBS.	UNIT PRICE	COST
PZ-40	1,615.58	48,467.40	1,938,696	$17.00	823,946
PZ-27	390.56	10,154.56	274,173	14.00	142,164
TOTAL			2,212,869		$ 966,110
CASE 2					
PZ-40	1159.73	34,791.90	1,391,676	17.00	591,462
PZ-35	846.41	23,699.48	829,482	16.00	379,192
TOTAL			2,221,158		$ 970,654
CASE 3					
PZ-40	1159.73	34,791.90	1,391,676	17.00	591,462
PZ-35	455.86	12,764.08	446,743	16.00	204,225
PZ-27	390.56	10,154.56	274,173	14.00	142,164
TOTAL			2,112,592		$ 937,851

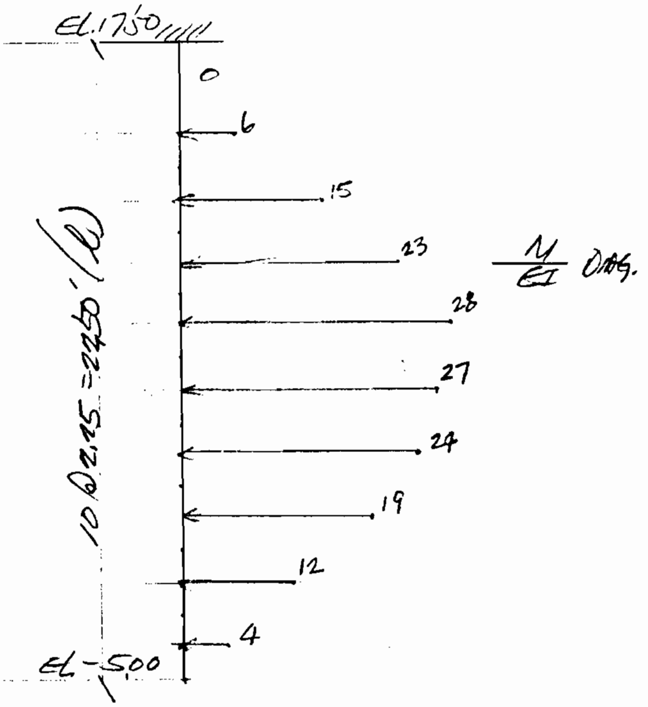
∴ CASE 3 IS MOST ECONOMICAL

@ I-wall & Lakeshore Dr

Pontchartrain Levee Floodwall #565-04-73
Sheet Piling TTC 2/3/8?

Deflection & Bending Stress @ Levee Crown El. 13.00
Ref: Gustas Report 7/3/85 - Bending Moment Diag.
Max = 24.50'k/', @ el. 6.00.
Assume Fixed at Zero Moment i.e. El. -5.00

For Deflection, by using Conjugate Beam Method.
Fixed at Top & Free at Bot. As sketch
$E = 30 \times 10^6$ psi $= 4320 \times 10^3$ ksf
A328 Steel $F_y = 39$ ksi



Deflection at top of Sheet Pile (EL. 17.50).

$$\Delta = \frac{\quad}{EI}\left[(6)(3.38) + (15)(5.63) + (23)(7.88) + (28)(10.13) + (27)(12.38)\right.$$
$$\left.(24)(14.63) + (19)(16.88) + (12)(19.13) + (4)(21.38)\right]$$
$$= \frac{1}{4320 \times 10^3 I}(20.28 + 84.45 + 181.24 + 283.64 + 334.26 + 351.12$$
$$+ 320.72 + 229.56 + 85.52)$$
$$= \frac{1890.79}{(4320 \times 10^3) I} = \frac{.0004}{I}$$

(1) For PZ 22 $I = 154.7$ in⁴/pile $= (154.7)\left(\frac{12}{22}\right) = 84.4$ in⁴/' $S_x = 18.1$ in³/'

$f_b = \frac{(24.50)(12)}{18.1} = 16.24$ ksi

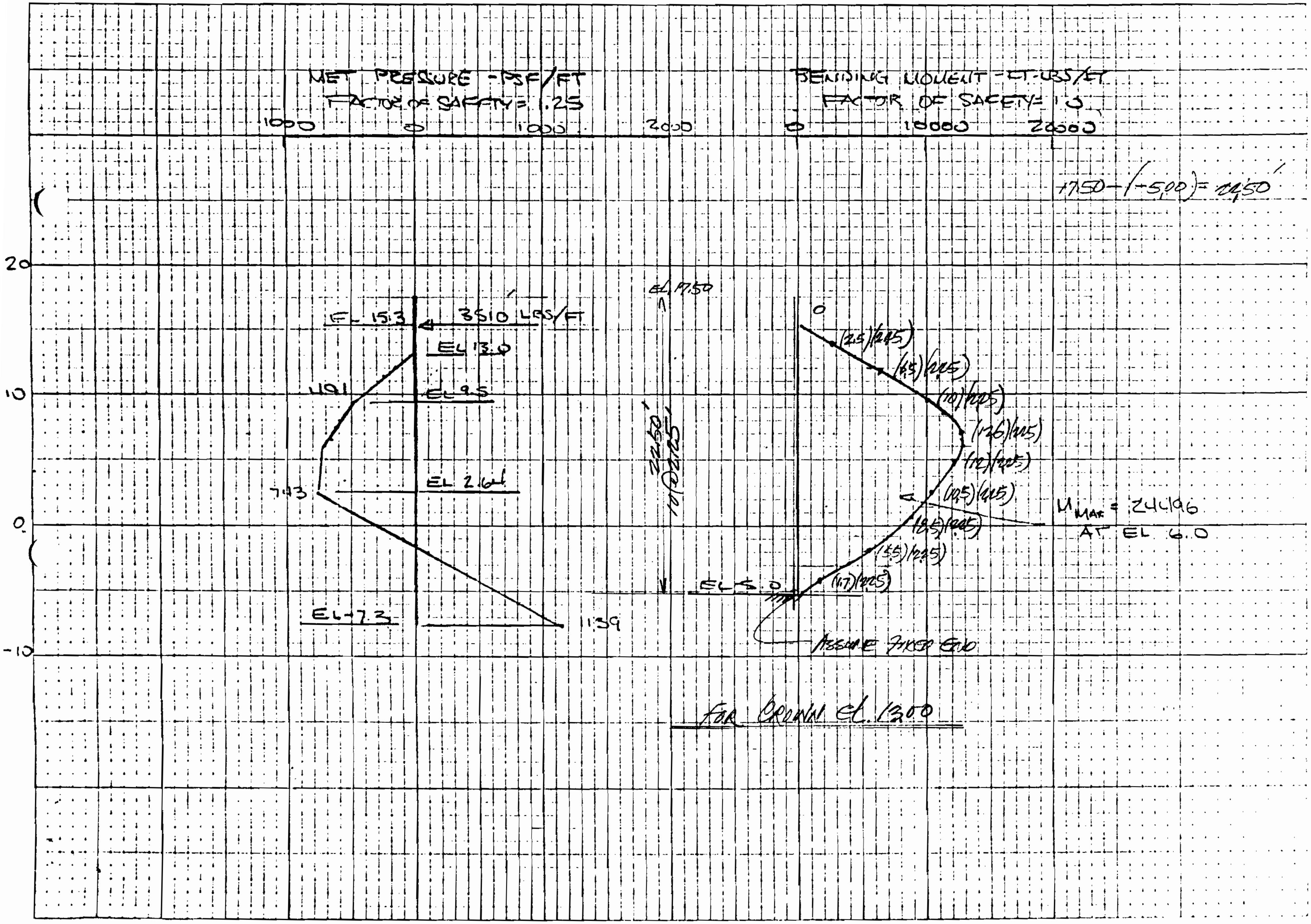
$\Delta_{max} = \frac{(.0004)(12^4)}{84.4} = .098' = 1.18$ in

(2) For PZ 27 $I = 184.2$ in⁴/' $S_x = 30.2$ in³/'

$f_b = \frac{(24.50)(12)}{30.2} = 9.74$ ksi

$\Delta_{max} = \frac{(.0004)(12^4)}{184.2} = .045' = .54$ in

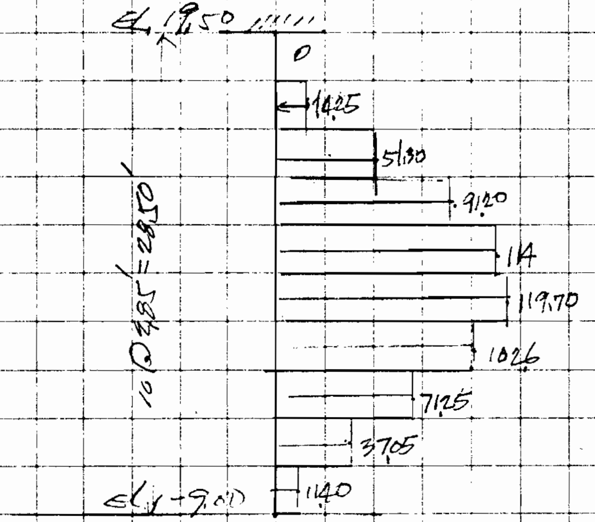
FEB 3, '86
WES. #565-0L-73
SHEET PILING. ANALYSIS TTC.



Pontchartrain [illegible] Hospital #5K5-04-23
Sheetpiling TTC 2/3/86

[illegible] @ 5 ft. [illegible] top 19.50)

Ref: [illegible] Analysis 2/6/86
$M_{max} = 42.50^{k'/'}$ @ el. 5.00



$\frac{M}{EI}$ DIAGRAM

$E = 30 \times 10^6$ psi $= 4320 \times 10^3$ ksf

A328 STEEL $f_y = 39$ ksi

CONJUGATE BEAM

DEFLECTION AT TOP OF SHEET PILE (EL. 19.50)

$$\Delta = \frac{1}{EI}\{0 + (14.25)(4.27) + (51.30)(7.12) + (91.20)(9.97) + (114)(12.82) + (119.7)(15.67) + (102.6)(18.52) + (71.25)(21.37) + (37.05)(24.22) + (11.40)(27.07)\}$$

$$= \frac{1}{4320 \times 10^3 I}(0 + 60 + 365 + 909 + 1461 + 1875 + 1900 + 1522 + 897 + 308)$$

$$= \frac{9297}{4320 \times 10^3 I}$$

$$= \frac{.0022}{I}$$

(1) TRY PZ-27 $I = 184.2^{in^4/'}$ $S_x = 30.2^{in^3/'}$

$$f_b = \frac{(42.50)(12)}{30.2} = 16.89^{ksi} \text{ OK.}$$

$$\Delta_{max} = \frac{(.0022)(12)^4}{184.2} = .2477' = 2.97''$$

(2) PZ-35 $I = 361.22^{in^4/'}$ $S_x = 48.5^{in^3/'}$

$$f_b = \frac{(42.50)(12)}{48.5} = 10.52^{ksi}$$

$$\Delta_{max} = \frac{(.0022)(12)^4}{361.22} = .1263' - 1.52^{in}$$

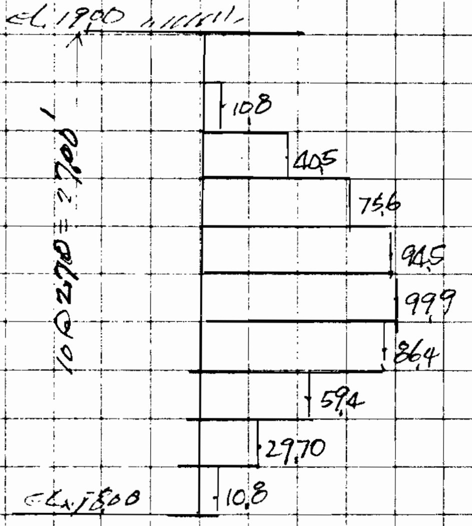
#565-01-B

TTC 2/9/96

BENDING STRESS & DEFLECTION @ 25 POINT (CROWN 13.00 / TOP 19.00)

ELASTIC ANALYSIS 2/6/96

$M_{max} = 37.494^{'k/'}$ @ EL. 15.00



$\frac{M}{EI}$ DIAGRAM.

$E = 30 \times 10^6$ psi $= 4320 \times 10^3$ ksf

A328 STEEL. $F_y = 39$ ksi

CONJUGATE BEAM

DEFLECTION @ TOP OF SHEET PILE (EL. 19.00)

$$\Delta = \frac{1}{EI}\{0 + (10.8)(4.05) + (40.5)(6.75) + (75.6)(9.45) + (94.5)(12.15) + (99.9)(14.85)$$

$$(86.4)(17.55) + (59.4)(20.25) + (27.90)(22.95) + (10.8)(25.65)\}$$

$$= \frac{1}{4320 \times 10^3 I}\{0 + 44 + 273 + 714 + 1148 + 1483 + 1516 + 1202 + 640 + 277\}$$

$$= \frac{7297}{4320 \times 10^3 I}$$

$$= \frac{0.0017}{I}$$

(1) PZ-27 $I = 184.2^{in^4/'}$ $S_x = 30.2^{in^3/'}$

$$f_b = \frac{(37.49)(12)}{30.2} = 14.90^{ksi}$$

$$\Delta_{max} = \frac{(0.0017)(12)^4}{184.2} = .1914' = 2.29^{in}$$

(2) PZ-35 $I = 361.22^{in^4/'}$ $S_x = 48.5^{in^3/'}$

$$f_b = \frac{(37.49)(12)}{48.5} = 9.27^{ksi}$$

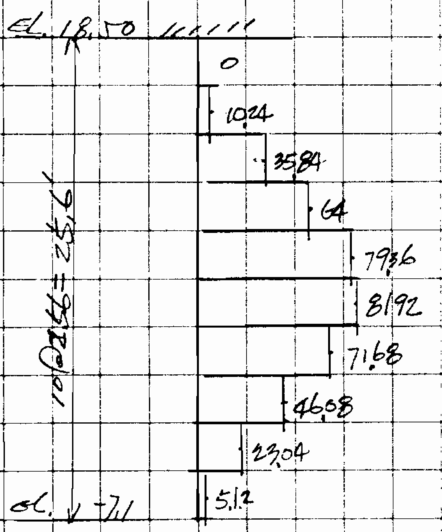
$$\Delta_{max} = \frac{(0.0017)(12)^4}{361.22} = .0976 = 1.17^{in}$$

#565-04-73
TTC 7/8/86.

BENDING STRESS & DEFLECTION @ $\frac{3}{4}$ POINT (CRANE LOAD/TOP LSS)

STATIC ANALYSIS 7/6/86.

$M_{max} = 33.073^{k'/'}$ @ EL. 5.00



$\frac{M}{EI}$ DIAGRAM

$E = 30 \times 10^6$ psi $= 4320 \times 10^3$ ksf

A 328 STEEL $F_y = 39$ ksi

CONJUGATE BEAM

DEFLECTION AT TOP OF SHEET PILE (EL. 18.50).

$$\Delta = \frac{1}{EI}\{0 + (10.24)(3.84) + (35.84)(6.40) + (64)(8.96) + (79.36)(11.52) + (81.92)(14.08) + (71.68)(16.64) + (46.08)(19.20) + (23.04)(21.76) + (5.12)(24.32)\}$$

$$= \frac{1}{EI}(0 + 39 + 229 + 573 + 914 + 1153 + 1192 + 884 + 501 + 124)$$

$$= \frac{5609}{4320 \times 10^3 I}$$

$$= \frac{0.0013}{I}$$

(1) PZ-27 $I = 184.2$ in^4/', $S_x = 30.2$ in^3/'

$$f_b = \frac{(33.07)(12)}{30.2} = 13.14 \text{ ksi}$$

$$\Delta_{max} = \frac{(0.0013)(12)^4}{184.2} = .1463' = 1.75 \text{ in}$$

(2) PZ-35 $I = 361.22$ in^4/' $S_x = 48.5$ in^3/'

$$f_b = \frac{(33.07)(12)}{48.5} = 8.18 \text{ ksi}$$

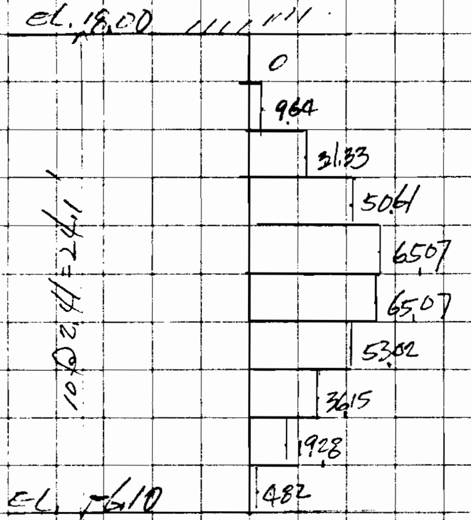
$$\Delta_{max} = \frac{(.0013)(12)^4}{361.22} = .0746' = .89 \text{ in}$$

PONTCHARTRAIN BEACH FLOODWALL #1163 [illegible]
SHEETPILING TTC 2/9/86

BEND. STRESS & DEFLECTION @ 45 FT. ([illegible])

EUSTIS ANALYSIS 2/6/86

$M_{MAX} = 28{,}613\ ^{\#'}/_{'}$ @ EL. 6.00



$\frac{M}{EI}$ DIAGRAM.

$E = 30 \times 10^6$ PSI $= 4320 \times 10^3$ KSF

A 328 STEEL $F_y = 39$ KSI

CONJUGATE BEAM.

DEFLECTION AT TOP OF SHEET PILE (EL. 18.00)

$$\Delta = \frac{1}{EI}\left[0 + (9.64)(3.60) + (31.33)(6.00) + (50.61)(8.40) + (65.07)(10.80) + (65.07)(13.20) \right.$$
$$\left. (53.02)(15.60) + (36.15)(18.00) + (19.28)(20.40) + (4.82)(22.80)\right]$$
$$= \frac{1}{EI}\left[0 + 34 + 187 + 425 + 702 + 858 + 827 + 650 + 393 + 109\right]$$
$$= \frac{4185}{4320 \times 10^3 I}$$
$$= \frac{.0010}{I}$$

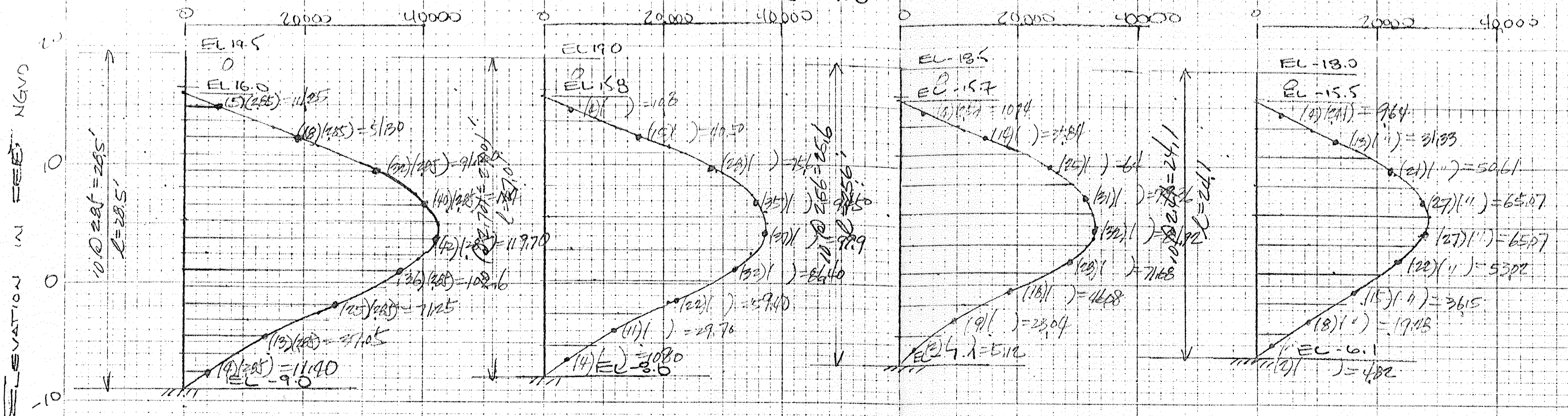
PZ-27 $I = 184.2\ ^{IN^4}/_{'}$ $S_x = 30.2\ ^{IN^3}/_{'}$

$$f_b = \frac{(28.613)(12)}{30.2} = 11.36\ KSI$$
$$\Delta_{max} = \frac{(.0010)(12)^4}{184.2} = .1126' = 1.35\ IN$$

PZ-22 $I = 84.4\ ^{IN^4}/_{'}$ $S_x = 18.1\ ^{IN^3}/_{'}$

$$f_b = \frac{(28.613)(12)}{18.1} = 18.96\ KSI$$
$$\Delta_{max} = \frac{(.0010)(12^4)}{84.4} = .2457' = 2.94\ IN$$

BENDING MOMENT
FT-LBS / FT
F.C. = 1.0



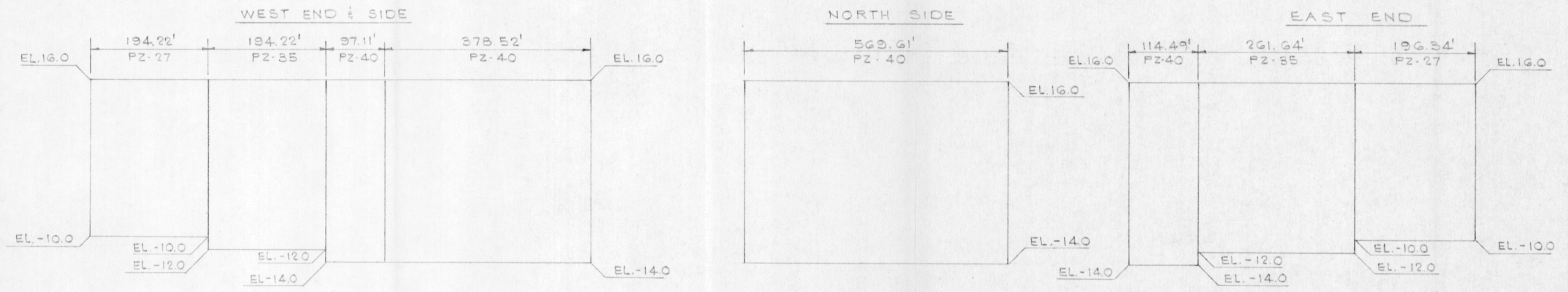
1/5 PT
MMAX = 42500
@ EL 5.0

2/5 PT
MMAX = 37494
@ EL 5.0

3/5 PT
MMAX = 33073
@ EL 5.0

4/5 PT
MMAX = 28613
@ EL 6.0

LOCATION	PENETRATION REQ'D F.S. = 1.25
1/5 PT	-12
2/5 PT	-11
3/5. PT	-9.7
4/5 PT	-8.5



FROM POINT	TO POINT	BEARING	DISTANCE(FT.)
1	2	S 81°28'15"E	56.76
2	3	S 83°55'47"E	30.00
3	4	N 87°36'41"E	30.00
4	5	N 82°09'09"E	30.00
5	6	N 76°41'37"E	30.00
6	7	N 71°14'05"E	30.00
7	8	N 65°46'33"E,	30.00
8	9	N 56°34'32"E	71.00
9	10	N 47°22'31"E	30.00
10	11	N 41°54'59"E	30.00
11	12	N 36°27'27"E	30.00
12	13	N 30°59'55"E	30.00
13	14	N 25°32'23"E	30.00
14	15	N 20°04'51"E	27.78
15	16	N 89°31'10"E	256.64
16	17	N 28°07'48"E	121.88
17	18	N 89°31'10"E	242.86
18	19	S 27°10'42"E	114.33
19	20	N 84°09'53"E	330.00
20	21	N 25°30'28"E	125.28
21	22	N 84°09'53"E	368.48
22	23	N 77°59'20"E	364.10
23	24	S 46°50'59"E	243.82
24	25	S 49°34'45"E	30.00
25	26	S 55°02'17"E	30.00
26	27	S 64°14'18"E	71.00
27	28	S 73°26'19"E	30.00
28	29	S 78°53'51"E	30.00
29	30	S 84°21'23"E	30.00
30	31	S 89°48'55"E	30.00
31	32	N 84°43'33"E	30.00
32	33	N 79°16'01"E	47.65

FEB 14 1986

NO	DATE	REVISION	BY

DESIGNED BY R.J.T.
DRAWN BY T.R.E.
CHECKED BY R.J.T.
REVIEWED BY B.H.A.
DATE

URS
Dallas
Austin
Houston
New Orleans

FOR REVIEW

PONTCHARTRAIN BEACH
FLOOD PROTECTION IMPROVEMENT PROJECT
ORLEANS PARISH LOUISIANA

GEOMETRIC LAYOUT

SHEET NO
OF SHEETS
FILE NO 565-04-73

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
METAIRIE, LA.

Page

URS PROJECT #565-04-73

Date 2/6/86

Project Pontchartrain Beach Floodwall

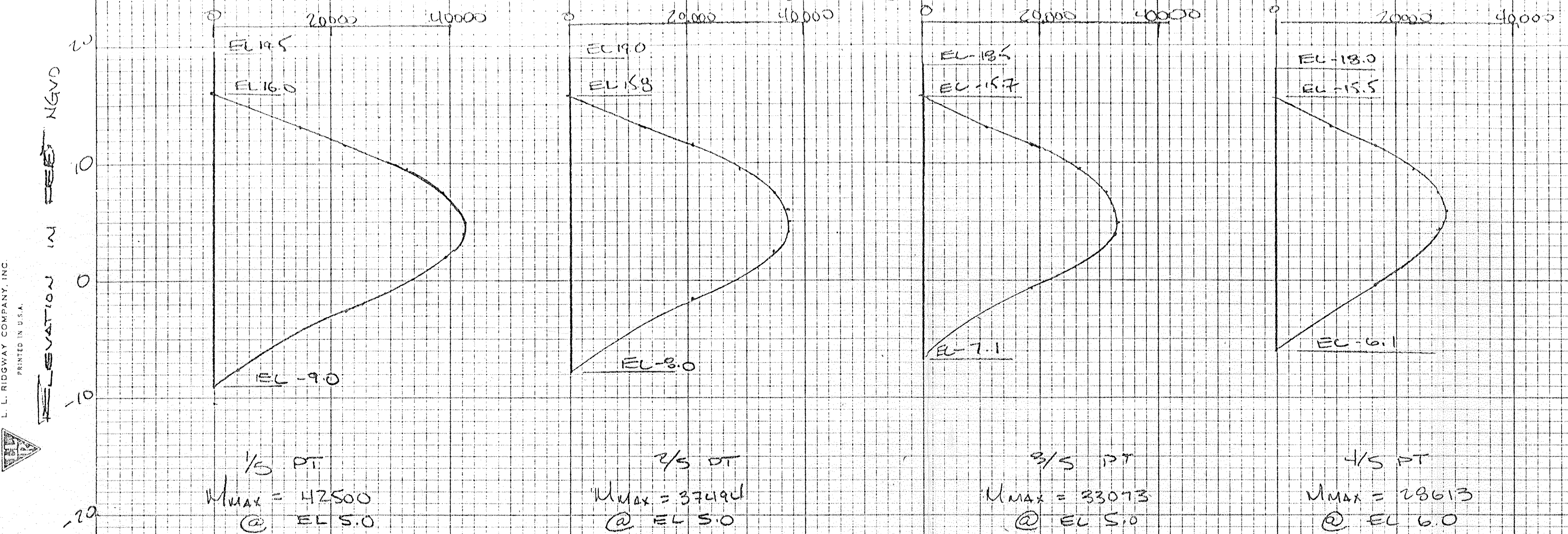
Job 9271

Subject Wave Load Transition

By WG

Location	EL	Total Wave Wave Load	
→ North Beach	16.2	5362	→ **Done**
1/5 PT	16.0	4992	
→ 2/5 PT	15.8	4621 ✓	
3/5 PT	15.7	4251 ✓	
→ 4/5 PT	15.5	**3880** 1.25	
~~Ka[illegible] Drive~~	~~15.3~~	~~3510~~ ~~1.25~~	

BENDING MOMENT
FT-LBS / FT
FS = 1.0



1/5 PT
Mmax = 42500
@ EL 5.0

2/5 PT
Mmax = 37494
@ EL 5.0

3/5 PT
Mmax = 33073
@ EL 5.0

4/5 PT
Mmax = 28613
@ EL 6.0

LOCATION	PENETRATION REQ'D FS. = 1.25
1/5 PT	-12
2/5 PT	-11
3/5 PT	-9.7
4/5 PT	-8.5

PONTCHARTRAIN BEACH FLOOD PROTECTION PROJECT
U.R.S. PROJECT NO. 565-04-73
FEB 6, '86
SHEET PILE BENDING MOMENT AT 5TH POINT.

URS

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL (504) 837-6326

February 14, 1986

Mr. Ron Elmer, Project Coordinator
LMNED-SP
U.S. Army Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 565-04-73

Enclosed is a sketch of the full earthen levee with the revised proposed 1:3 protected side back slope at the above project as per Eustis' recent re-analysis. Please note that Eustis has proposed no berm on the protected side. Also, please note the relative position of the levee to the seawall.

Sincerely,

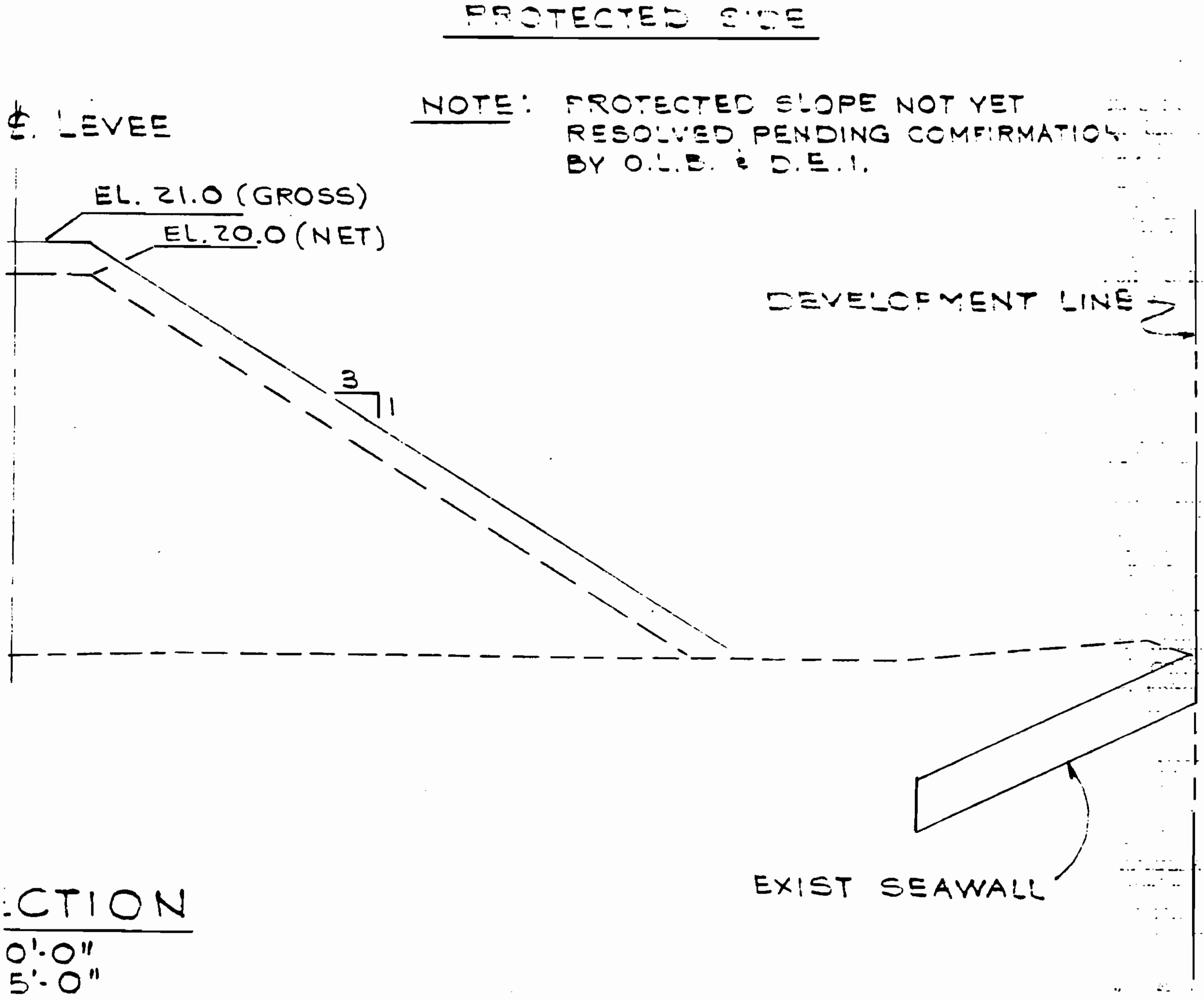
Bruce H. Adams

Bruce H. Adams, P.E.

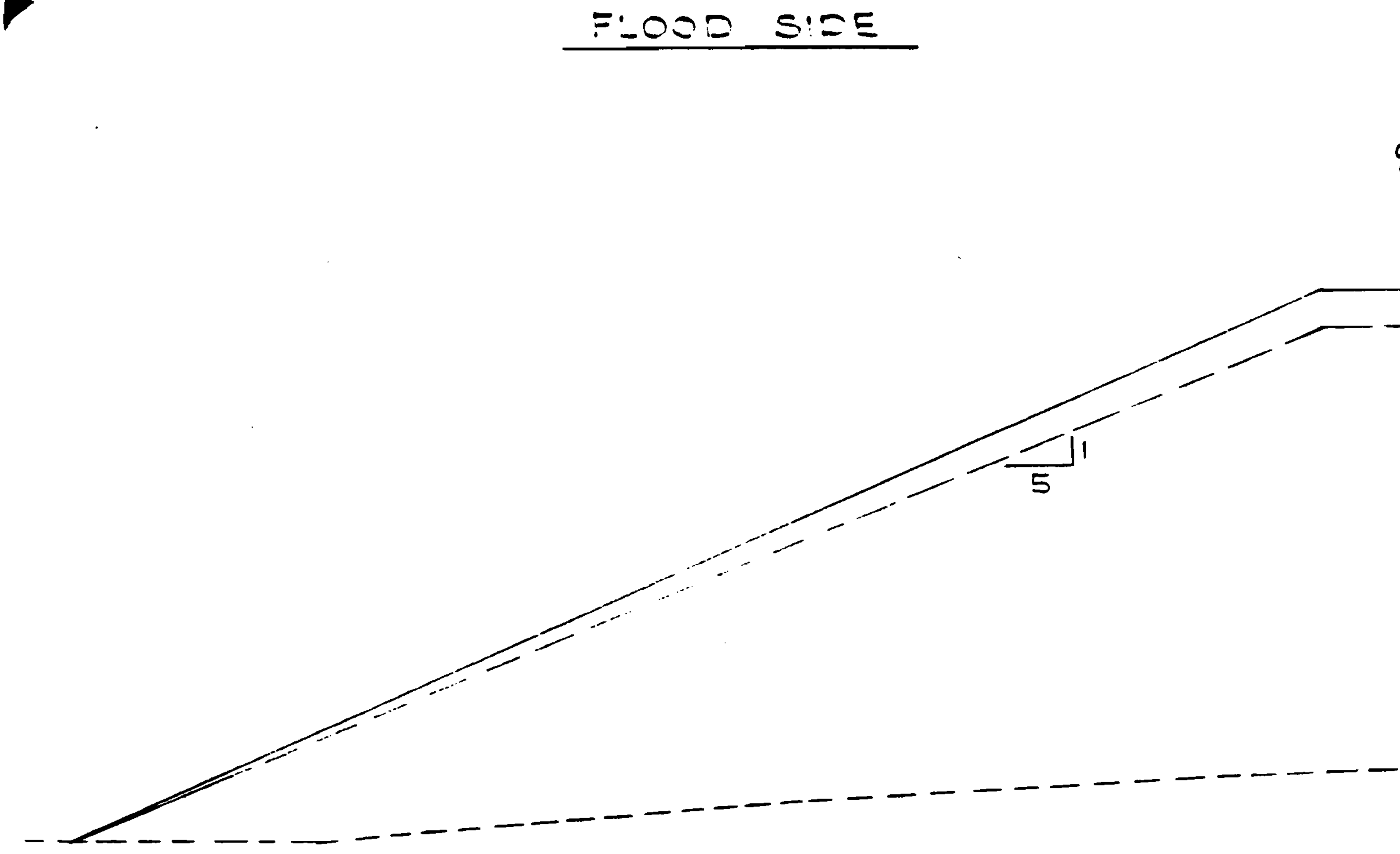
URS ENGINEERS

BHA/kam

cc: Mr. C.E. Bailey, OLB (w/enclosures)
Mr. Walter Boudier, DEI (w/enclosures)
Mr. John Boltgreve, DEI (w/enclosures)



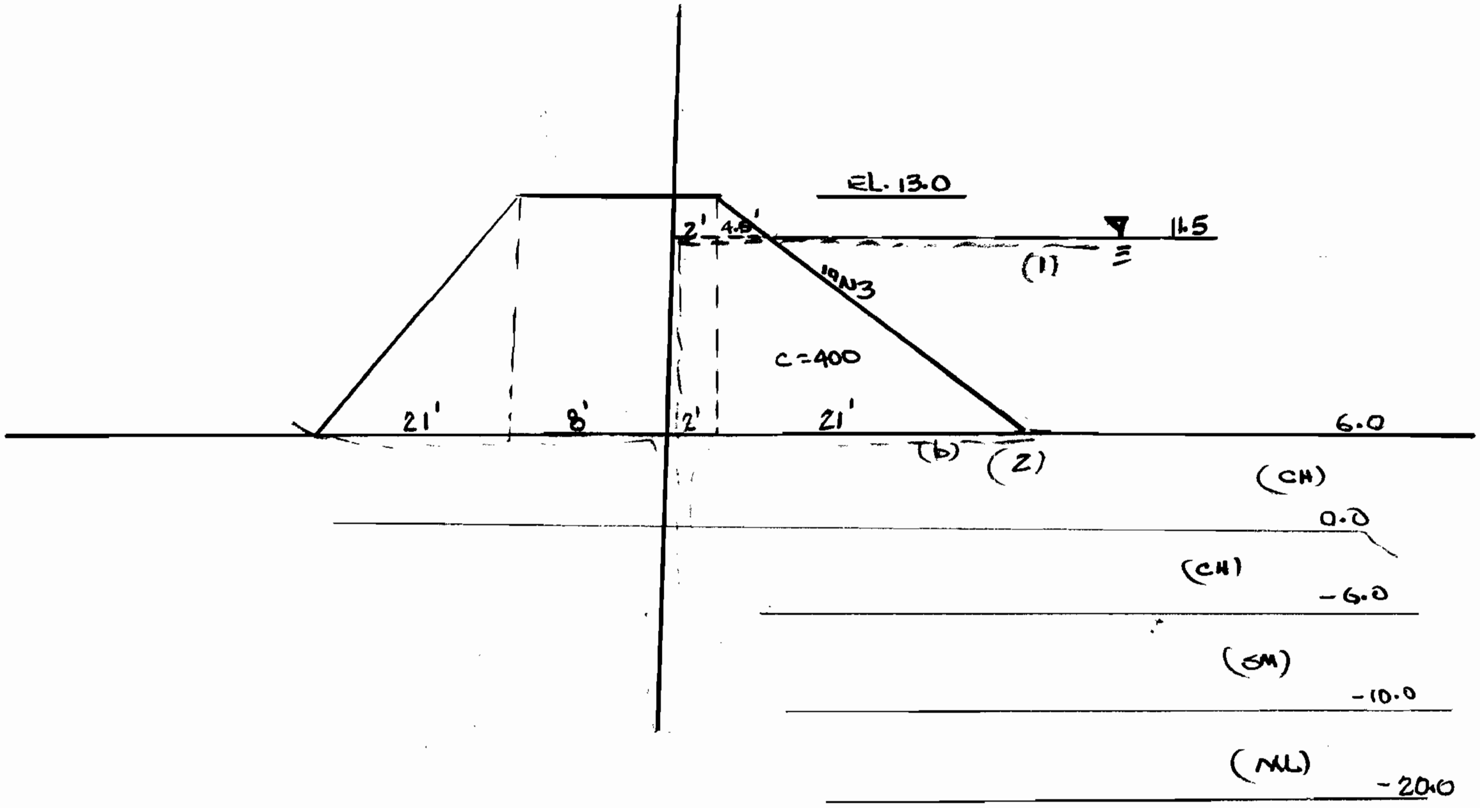
NOTE: PROTECTED SLOPE NOT YET RESOLVED PENDING COMFIRMATION BY O.L.B. & D.E.I.



TYPICAL SE

SCALE: H: 1" =
V: 1" =

SEEPAGE Analysis:



(2) worst condition Fine Sand

$$8.5 = \frac{52/3 + 2b}{5.5}$$

OR

(1)

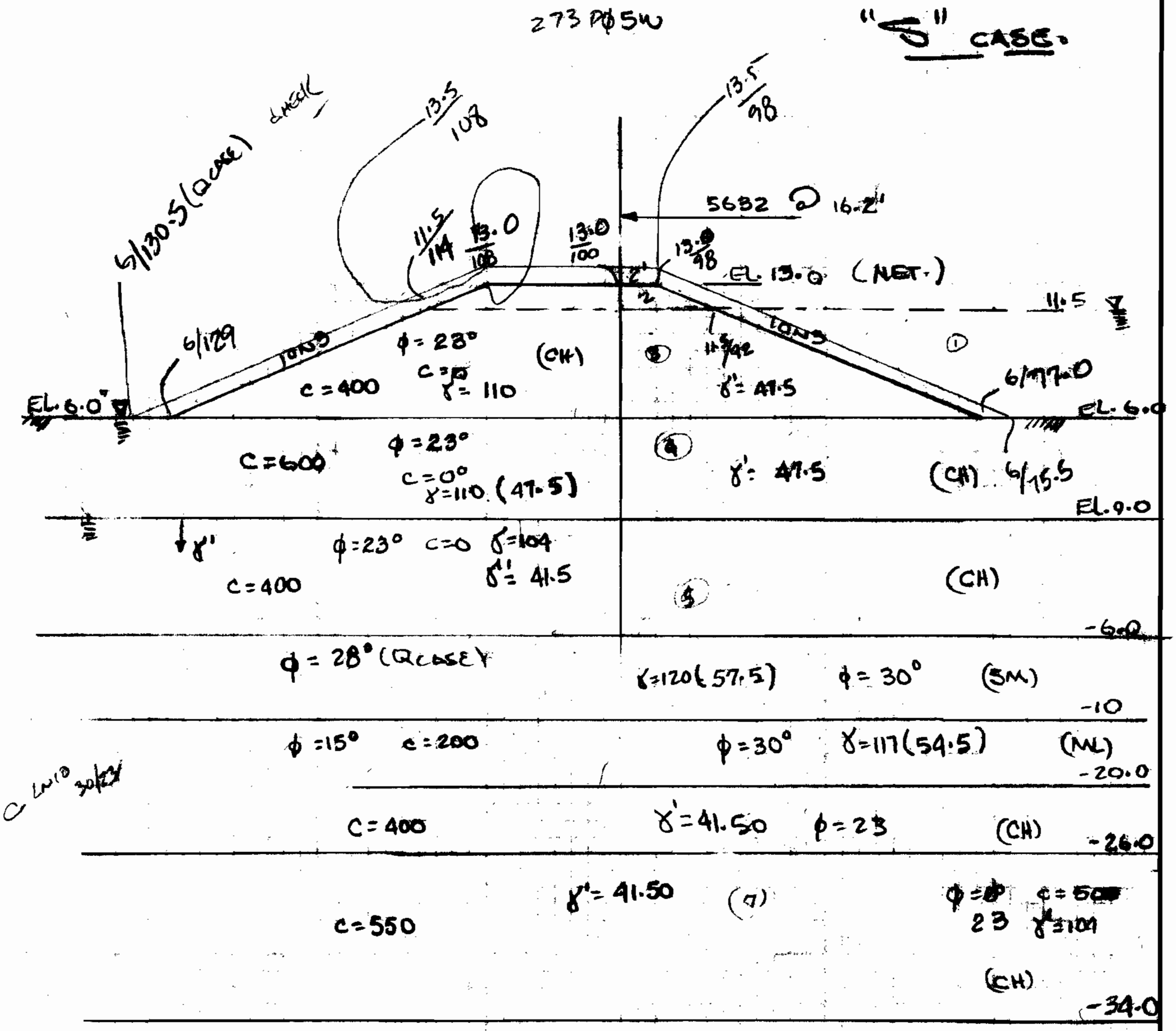
$$8.5 = \frac{\frac{6.5+29}{3} + 2b + 5.5}{5.5} \Rightarrow EL. = -8.7$$

b ⇒ EL - 9.0 ∴ Stability Governs.

Put tip @ EL. -11.74 or -12.0

COMPUTATION SHEET

PROJECT Lake Pontc. Beach	PAGE OF	COMPUTED BY	DATE
SUBJECT Levee w/I-wall, crown = EL. 13.0		CHECKED BY	DATE



NOTE: Levee @ 13.5 FOR "Q" CASE Problems.

Levee @ 13.0 FOR "S" CASE

I CAN'T NUT

RUN Q CASE

```
LI RE0121 1-50
1 100 "LAKE PONT. BEACH, I-WALL"
2 110 "LEVEE=13.5. WF=5632 ,FS=1.25'
3 120 100 "Q" 13.5
4 130 1 13.6 6 -8 -10 13.6 1.25 8 -34
5 140 5632 16.2
6 160 0 0 0 0 0 0 0 0 13.6
7 170 0 47.5 400 400 0 110 400 400 13.5
8 180 0 47.5 600 600 0 47.5 600 600 6.0
9 190 0 41.5 400 400 0 41.5 400 400 0.0
10 200 28 57.5 0 0 28 57.5 0 0 -6.0
11 210 15 54.5 200 200 15 54.5 200 200 -10
12 220 0 41.5 400 400 0 41.5 400 400 -20
13 210 0 41.5 550 550 0 41.5 550 550 -26
14 220 0 13.6 100 13.6 200 13.6 9999.9 0
15 0 6 75.5 6 98 13.5 100 13.5 108 13.5 130.5 6
16 230 200 6 9999.9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 0 100 0 200 0 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999.9 0
23 330 0 -34 100 -34 200 -34 9999.9 0
EOT..
6013VW*PLOTWALL

     * * CANPLOT (K571067) VER. 85/11/12 * *

ENTER INPUT DATA FILE
RE0121
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND, 30, 120 OR 960
960
```

```
                    * MASTER STABILITY PROGRAM *


          14 STR. READ

          15 PRO. READ

  * * STR.  5  ELEV. -13.00  NO PW.  1


  * * * * * * MINIMUM  SECTION  DESIGN * * * * * *



  * * STR.  5  ELEV.  -13.00



  * * STR.  6  ELEV.  -30.00

  FEL   870.000PXXX    301.60    870.00
  C.A.W. LOC.  173.00 FT.  DA =   54642.7   RA =   35346.3  RB =    45010.0
  C.P.W. LOC.  301.60 FT.  DP =       0.0   RP =       0.0  FS =     1.4706
  P.W. = 0.0 AT274.97 FT.  RB CUT =   0.0
```

```
         CANTILEVER RETAINING WALL STABILITY (VER. 85/11/12)

                   RUN TIME = 21 JAN 86  11:12:06
                         DATA FILE = RE0121

LAKE PONT. BEACH, I-WALL
LEVEE=13.5. WF=5632 ,FS=1.25
FS/LS WATER ** PS  WATER **UPPER **LOWER **  FS WATER ** FS ** NO.
     ELEV    **   ELEV    **RANGE **RANGE**GROUND EL  **    **STR
   13.60           6.00    -8.00  -10.00      13.60    1.25     8

                          FLOODWALL ANALYSIS
       DYNAMIC WAVE
       LOAD     ELEV
       (LBS)    (FT)
     5632.00    16.20

* SLOPE OF LINE AT Y1=      -10.00 CHANGED SLIGHTLY!


* SLOPE OF LINE AT Y1=      -10.00 CHANGED SLIGHTLY!



TRIAL ELEV NO.    3 EQUALS -36.73
THIS ELEV IS BELOW THE LAST COMPUTED NET PRESSURE ELEV OF -34.00

 ERROR RETURN FROM SUBROUTINE 'SUMFAM', PROGRAM ABORTED.
STOP
```

```
LI RE0121 1-50
1 100 'LAKE PONT. BEACH, I-WALL'
2 110 'LEVEE=13.5, WF=5632 ,FS=1.25'
3 120 100 'Q' 13.5
4 130 -11 13.6 6 -8 -10 13.6 1.25 8 -34
5 140 5632 16 2
6 160 0 0 0 0 0 0 0 0 13.6
7 170 0 47.5 400 400 0 110 400 400 13.5
8 180 0 47.5 600 600 0 47.5 600 600 6.0
9 190 0 41.5 400.400 0 41.5 400 400 0.0
10 200 28 57 5 0 0 28 57.5 0 0 -6.0
11 210 15.54.5 200 200 15 54.5 200 200 -10
12 220 0 41 5 400 400 0 41 5 400 400 -20
13 210 0 41.5 550 550 0 41 5 550 550 -26
14 220 0 13.6 100 13 6 200 13.6 9999 9 0
15 0 6 75.5 6 98 13.5 100 13.5 108 13.5 130.5 6
16 230 200 6 9999 9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 0 100 0 200 0 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999 9 0
23 330 0 -34 100 -34 200 -34 9999 9 0
EOT
6013VW*PLOTWALL

     * * CANPLOT (K571067) VER  85/11/12 * *

ENTER INPUT DATA FILE
RE0121
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND. 30. 120 OR 960
```

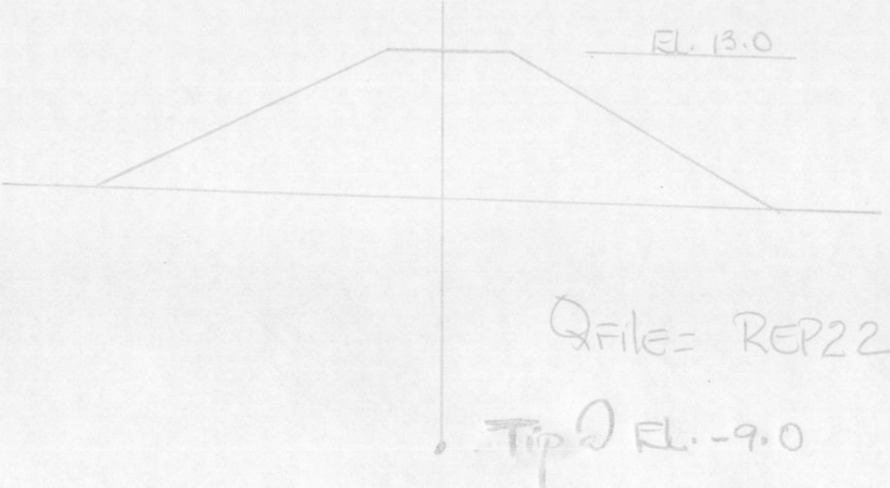
```
LI RE0121 1-50
1 100 "LAKE PONT. BEACH, I-WALL"
2 110 "LEVEE=13 5, WF=5632 ,FS=1 25"
3 120 100 "Q" 13.5
4 130 1 13.6 6 -8 -10 13 6 1 25 8 -34
5 140 5632 16 2
6 160 0 0 0 0 0 0 0 0 13 6
7 170 0 47.5 400 400 0 110 400 400 13.5
8 180 0 47.5 600 600 0 47.5 600 600 6.0
9 190 0 41.5 400 400 0 41 5 400 400 0.0
10 200 28 57 5 0 0 28 57 5 0 0 -6 0
11 210 15 54 5 200 200 15 54 5 200 200 -10
12 220 0 41 5 400 400 0 41.5 400 400 -20
13 210 0 41 5 550 550 0 41 5 550 550 -26
14 220 0 13 6 100 13.6 200 13 6 9999 9 0
15 0 6 75 5 6 98 13 5 100 13 5 108 13 5 130 5 6
16 230 200 6 9999 9 0
17 270 0 6 100 6 200 6 9999 9 0
18 280 0 0 100 0 200 0 9999 9 0
19 290 0 -6 100 -6 200 -6 9999 9 0
20 300 0 -10 100 -10 200 -10 9999 9 0
21 310 0 -20 100 -20 200 -20 9999 9 0
22 320 0 -26 100 -26 200 -26 9999 9 0
23 330 0 -34 100 -34 200 -34 9999 9 0
EOT
6013VW*PLOTWALL

     * * CANPLOT (K571067) VER  85/11/12 * *

ENTER INPUT DATA FILE
RE0121
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND. 30, 120 OR 960
```

$\sigma_v \tan\phi$

$S = c + \sigma_v \tan\phi =$

W.F. = 3880 FS=1.25

```
LI RE0221 1-50
1 100 'LAKE PONT. BEACH, I-WALL'
2 110 'LEVEE=13.0,WF=3880 ,FS=1.25'
3 120 100 'S' 13.0
4 130 1 13.1 6 -5 -6.5 13.1 1.25 8 -34
5 140 3880 15.5
6 160 0 0 0 0 0 0 0 0 13.1
7 170 23 47.5 0 0 23 110 0 0 13.0
8 180 23 47.5 0 0 23 47.5 0 0 6
9 190 23 41.5 0 0 23 41.5 0 0 0
10 200 30 57.5 0 0 30 57.5 0 0 -6
11 210 30 54.5 0 0 30 54.5 0 0 -10
12 220 23 41.5 0 0 23 41.5 0 0 -20
13 210 23 41.5 0 0 23 41.5 0 0 -26
14 220 0 13.1 100 13.1 200 13.1 9999.9 0
15 220 0 6 77 6 98 13 100 13 108 13 129 6
16 230 200 6 9999.9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 0 100 0 200 0 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999.9 0
23 330 0 -34 100 -34 200 -34 9999.9 0
EOT..
6013VW*PLOTWALL

     * * CANPLOT (K571067) VER. 85/11/12 * *

ENTER INPUT DATA FILE
RE0221
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND, 30, 120 OR 960
```



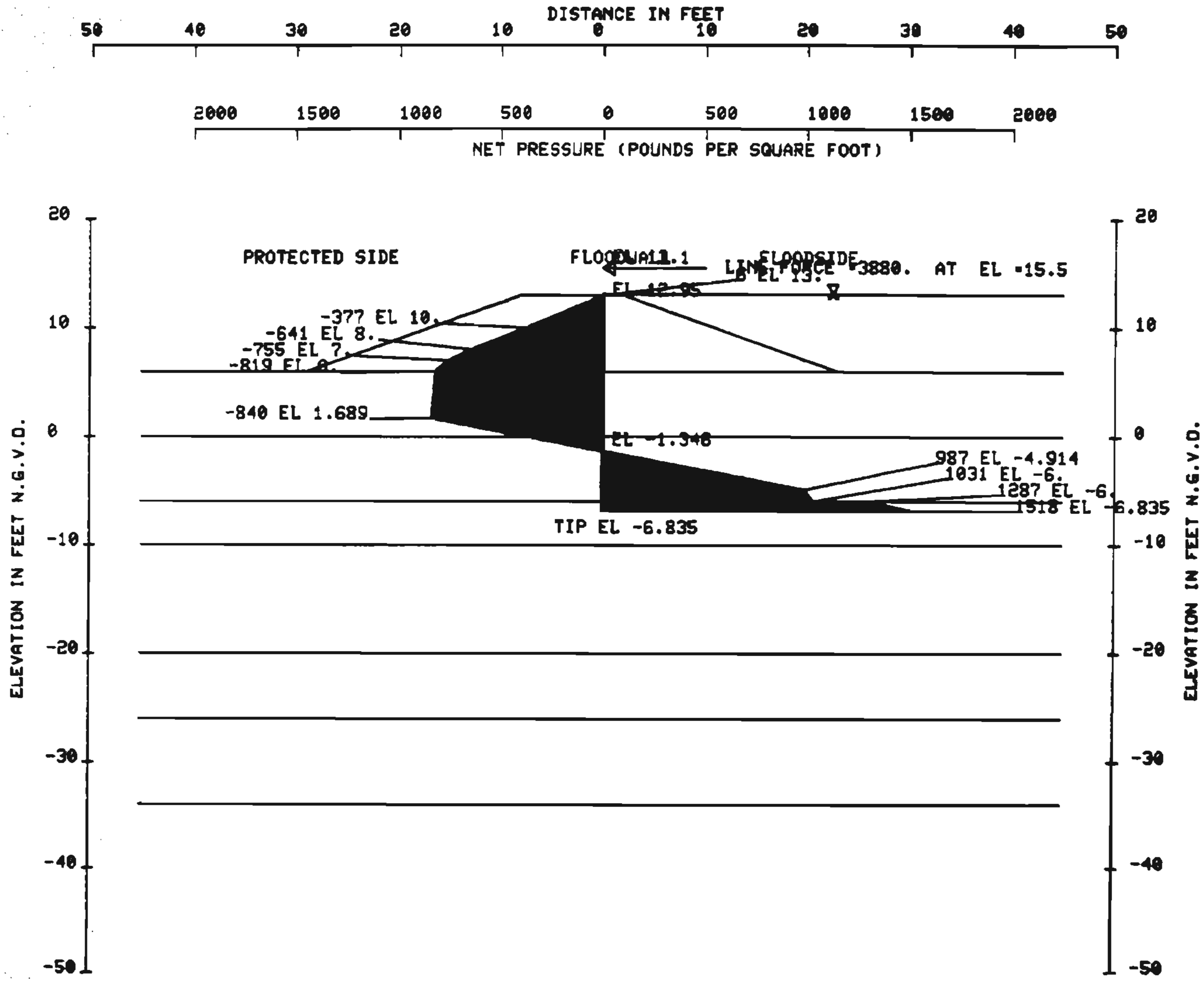
QFile= REP22

Stability Analysis = -7.0

Seep. Analysis = -9.0

```
         CANTILEVER RETAINING WALL STABILITY (VER. 85/11/12)

                   RUN TIME = 20 FEB 86  15:16:19
                         DATA FILE = RE0221

LAKE PONT. BEACH, I-WALL
LEVEE=13.0,WF=3880 ,FS=1.25
FS/LS WATER ** PS  WATER **UPPER **LOWER **  FS WATER ** FS ** NO.
     ELEV    **   ELEV    **RANGE **RANGE**GROUND EL  **    **STR
   13.10          6.00    -5.00   -6.50     13.10    1.25     8

                        FLOODWALL ANALYSIS
       DYNAMIC WAVE
       LOAD     ELEV
       (LBS)    (FT)
     3880.00    15.50

AREA    SUM FORCE   MOM ARM      MOMENT

X(1)         0.47     19.85        9.25
X(2)      7907.33     11.90    94126.46
X(3)      4027.51      1.85     7456.38
*         3880.00     22.33    86659.56 WAVE FORCE AT ELEV   15.50
TRIAL ELEV  =  -5.00 SUM OF FORCES=      0.00 SUM OF MOM=  13865.80
TRIAL ELEV  =  -6.50 SUM OF FORCES=      0.37 SUM OF MOM=   2426.45
TRIAL ELEV  =  -6.82 SUM OF FORCES=      0.63 SUM OF MOM=    119.49
TRIAL ELEV  =  -7.82 SUM OF FORCES=      1.76 SUM OF MOM=  -7006.98
DESIGN EL   =  -6.83 SUM OF FORCES=      0.65 SUM OF MOM=     -1.28

   ELEVATION      NET DIAGRAM
     (FT)         (LBS/SQ FT)
     13.10            0.00
     13.00            6.25
     13.00            6.25
     12.95            0.00
     12.00         -121.13
     11.00         -248.51
     10.00         -376.87
      9.00         -508.96
      8.00         -641.04
      7.00         -754.89
      6.00         -818.94
      6.00         -818.94
      5.00         -823.75
      4.00         -828.56
      3.00         -833.37
      2.00         -838.18
      1.69         -839.67
     -1.35            0.00
     -4.91          986.78
     -5.00          990.33
     -6.00         1031.37
     -6.00         1287.29
     -6.83         1518.25
     -6.83            0.00
 COPY SCREEN, THEN STRIKE RETURN TO PLOT
```

```
DO YOU WANT A CALCOMP PLOT (Y/N)?
```



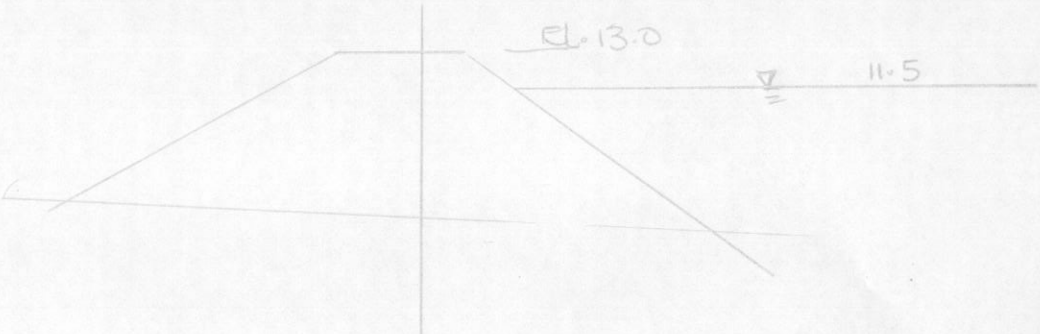
NET DIAGRAM

(B) CASE F.S.=1.30

```
 CONTINUE WITH DEFLECTION/BENDING MOMENT DIAGRAM (Y/N)?
N


RUN COMPLETED.  WORK FILES ARE IN W2, W3, AND W4
STOP
CO W3 REP22

JOBCNTRL ER   512 : WARNING: FILE GENERATED.
RT REP22 PW PR OD
```

WF. = 3880 FS=1.0

```
LI RE0221 1-50
1 100 'LAKE PONT. BEACH, I-WALL'
2 110 'LEVEE=13.0,WF=3880 ,FS=1.0'
3 120 100 'S' 13.0
4 130 1 13.1 6 -5 -6 13.1 1.0 8 -34
5 140 3880 15.5
6 160 0 0 0 0 0 0 0 0 13.1
7 170 23 47.5 0 0 23 110 0 0 13.0
8 180 23 47.5 0 0 23 47.5 0 0 6
9 190 23 41.5 0 0 23 41.5 0 0 0
10 200 30 57.5 0 0 30 57.5 0 0 -6
11 210 30 54.5 0 0 30 54.5 0 0 -10
12 220 23 41.5 0 0 23 41.5 0 0 -20
13 210 23 41.5 0 0 23 41.5 0 0 -26
14 220 0 13.1 100 13.1 200 13.1 9999.9 0
15 220 0 6 77 6 98 13 100 13 108 13 129 6
16 230 200 6 9999.9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 0 100 0 200 0 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999.9 0
23 330 0 -34 100 -34 200 -34 9999.9 0
EOT..
6013VW*PLOTWALL

     * * CANPLOT (K571067) VER. 85/11/12 * *

ENTER INPUT DATA FILE
RE0221
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND, 30, 120 OR 960
```

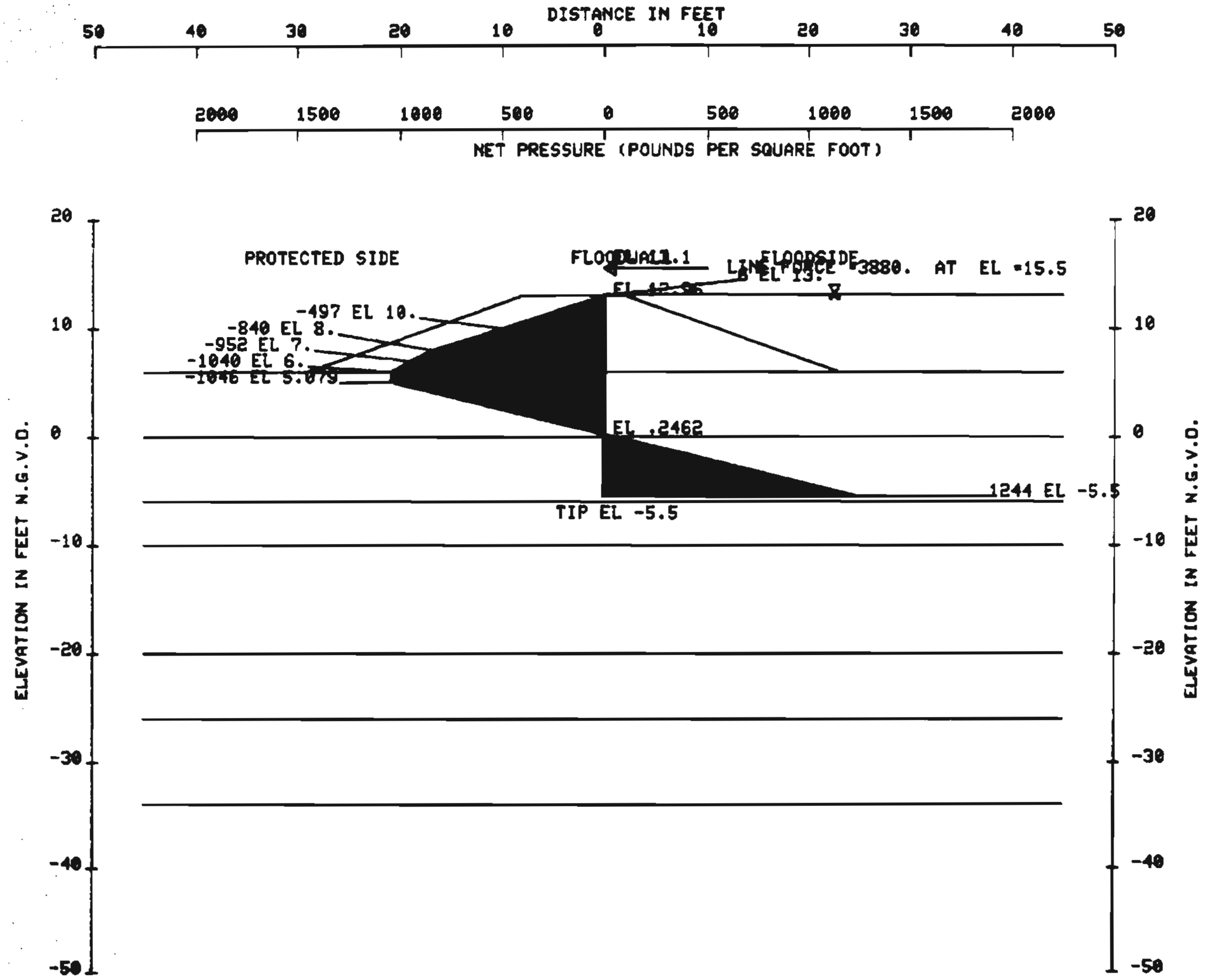


Q File = REP23

Stability Analysis = EL. -

```
          CANTILEVER RETAINING WALL STABILITY (VER. 85/11/12)

                    RUN TIME = 20 FEB 86  15:23:50
                          DATA FILE = RE0221

LAKE PONT. BEACH, I-WALL
LEVEE=13.0,WF=3880 ,FS=1.0
FS/LS WATER ** PS  WATER **UPPER **LOWER **  FS WATER ** FS ** NO.
     ELEV    **   ELEV    **RANGE **RANGE**GROUND EL  **    **STR
   13.10           6.00    -5.00   -6.00     13.10    1.00     8

                          FLOODWALL ANALYSIS
       DYNAMIC WAVE
       LOAD     ELEV
       (LBS)    (FT)
     3880.00    15.50

AREA    SUM FORCE   MOM ARM      MOMENT

X(1)         0.43     18.52        7.94
X(2)      7455.10     11.84     88283.62
X(3)      3574.67      1.92      6846.86
*         3880.00     21.00     81479.75 WAVE FORCE AT ELEV   15.50
TRIAL ELEV  =  -5.00 SUM OF FORCES=      0.00 SUM OF MOM=   2789.67
TRIAL ELEV  =  -6.00 SUM OF FORCES=      0.00 SUM OF MOM=  -2860.49
TRIAL ELEV  =  -5.49 SUM OF FORCES=      0.00 SUM OF MOM=     85.96
TRIAL ELEV  =  -6.49 SUM OF FORCES=      0.53 SUM OF MOM= -13774.40
DESIGN EL   =  -5.50 SUM OF FORCES=      0.00 SUM OF MOM=     50.94

   ELEVATION      NET DIAGRAM
     (FT)         (LBS/SQ FT)
     13.10           0.00
     13.00           6.25
     13.00           6.25
     12.96           0.00
     12.00        -161.53
     11.00        -329.31
     10.00        -497.09
      9.00        -668.55
      8.00        -840.09
      7.00        -952.35
      6.00       -1039.79
      6.00       -1039.79
      5.08       -1046.49
      0.25           0.00
     -5.50        1244.20
     -5.50           0.00
 COPY SCREEN, THEN STRIKE RETURN TO PLOT
```

```
DO YOU WANT A CALCOMP PLOT (Y/N)?
```



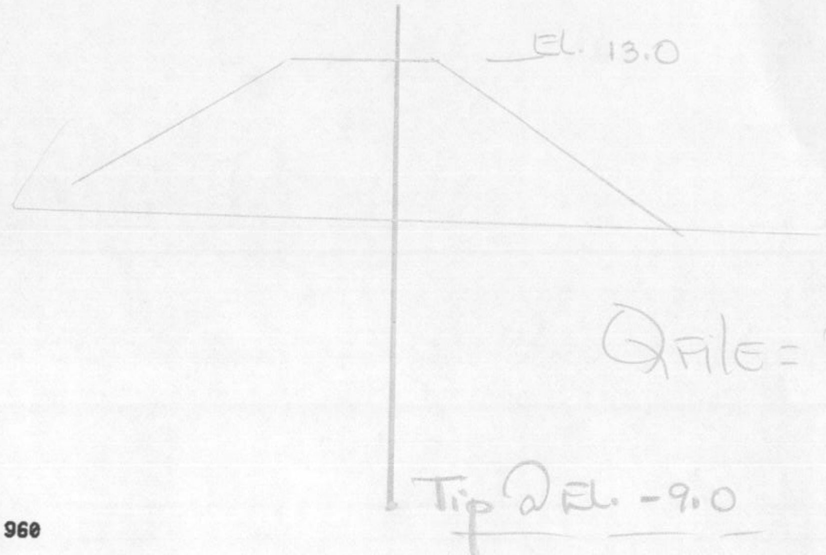
NET DIAGRAM

(B) CASE F.S.=1.

```
 CONTINUE WITH DEFLECTION/BENDING MOMENT DIAGRAM (Y/N)?
N


RUN COMPLETED.  WORK FILES ARE IN W2, W3, AND W4
STOP
CO W3 REP23

JOBCNTRL ER   512 : WARNING: FILE GENERATED.
RT REP23 PW PR OD
```

WF= 4621   FS=1.25.

```
LI RE0220 1-50
 1 100 'LAKE PONT. BEACH, I-WALL'
 2 110 'LEVEE=13.0,WF=4621 ,FS=1.25'
 3 120 100 'S' 13.0
 4 130 1 13.1 6 -8 -9 13.1 1.25 8 -34
 5 140 4621 15.8
 6 160 0 0 0 0 0 0 0 0 13.1
 7 170 23 47.5 0 0 23 110 0 0 13.0
 8 180 23 47.5 0 0 23 47.5 0 0 6
 9 190 23 41.5 0 0 23 41.5 0 0 0
10 200 30 57.5 0 0 30 57.5 0 0 -6
11 210 30 54.5 0 0 30 54.5 0 0 -10
12 220 23 41.5 0 0 23 41.5 0 0 -20
13 210 23 41.5 0 0 23 41.5 0 0 -26
14 220 0 13.1 100 13.1 200 13.1 9999.9 0
15 220 0 6 77 6 98 13 100 13 108 13 129 6
16 230 200 6 9999.9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 0 100 0 200 0 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999.9 0
23 330 0 -34 100 -34 200 -34 9999.9 0
EOT..
6013VW*PLOTWALL

     * * CANPLOT (K571067) VER. 85/11/12 * *

ENTER INPUT DATA FILE
RE0220
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND, 30, 120 OR 960
```



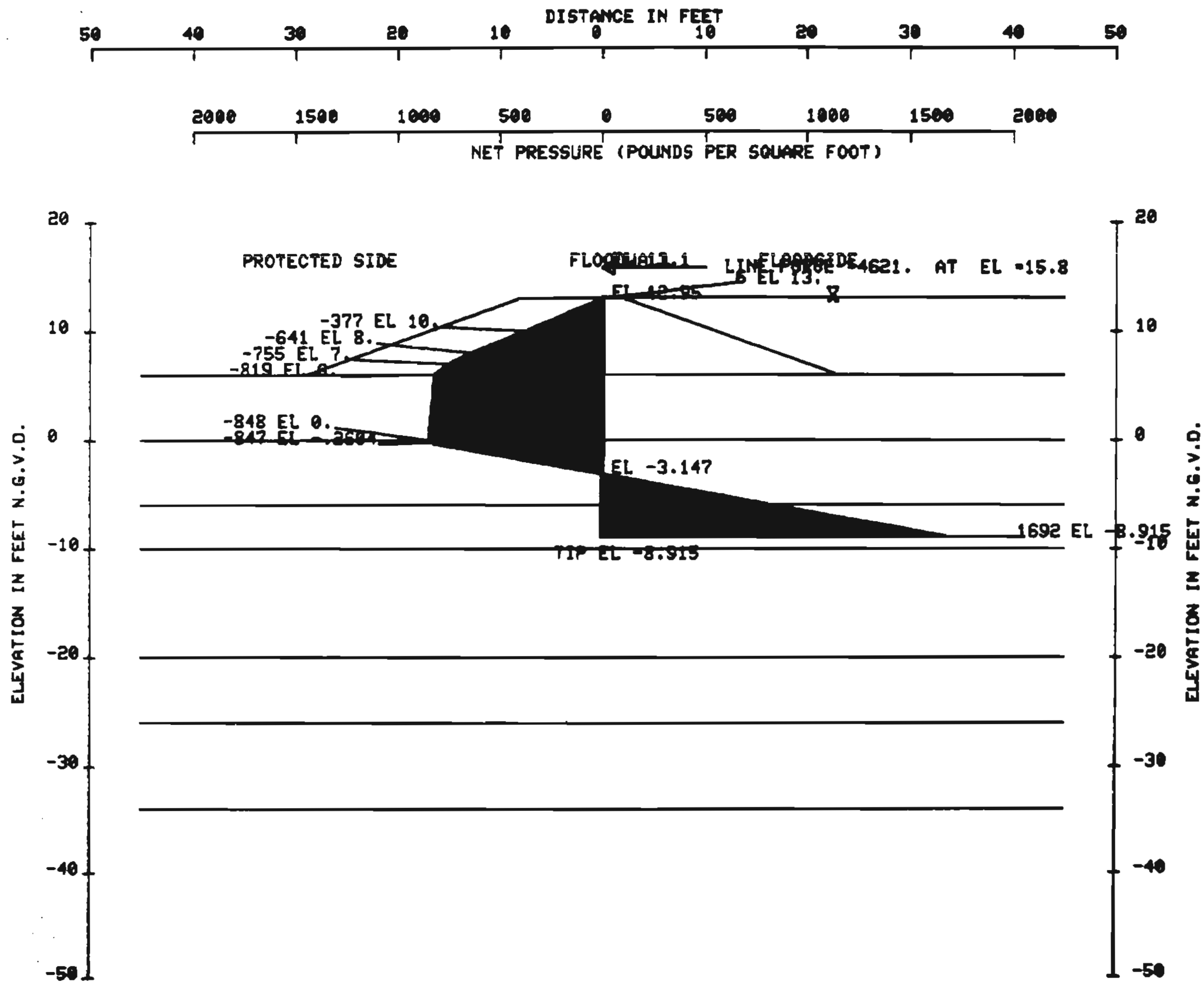
Qfile = REP20

Stability Analysis = -9.0

Seep. Analysis = -9.0

```
          CANTILEVER RETAINING WALL STABILITY (VER. 85/11/12)

                    RUN TIME = 20 FEB 86  14:56:50
                          DATA FILE = RE0220

LAKE PONT. BEACH, I-WALL
LEVEE=13.0,WF=4621 ,FS=1.25
FS/LS WATER ** PS  WATER **UPPER **LOWER **  FS WATER ** FS ** NO.
    ELEV    **   ELEV    **RANGE **RANGE**GROUND EL  **    **STR
  13.10          6.00    -8.00   -9.00     13.10    1.25     8

                        FLOODWALL ANALYSIS
       DYNAMIC WAVE
       LOAD     ELEV
       (LBS)    (FT)
     4621.00    15.80

AREA    SUM FORCE   MOM ARM      MOMENT

X(1)         0.47     21.93        10.22
X(2)      9501.02     13.01    123596.47
X(3)      4879.06      1.92      9380.30
*         4621.00     24.71    114207.56 WAVE FORCE AT ELEV   15.80
TRIAL ELEV  =  -8.00 SUM OF FORCES=     -3.33 SUM OF MOM=   6219.85
TRIAL ELEV  =  -9.00 SUM OF FORCES=      0.00 SUM OF MOM=   -605.89
TRIAL ELEV  =  -8.91 SUM OF FORCES=     -0.55 SUM OF MOM=     27.50
TRIAL ELEV  =  -9.91 SUM OF FORCES=      0.00 SUM OF MOM=  -7470.20
DESIGN EL   =  -8.91 SUM OF FORCES=     -0.50 SUM OF MOM=      1.60

   ELEVATION     NET DIAGRAM
     (FT)        (LBS/SQ FT)
     13.10           0.00
     13.00           6.25
     13.00           6.25
     12.95           0.00
     12.00        -121.13
     11.00        -248.51
     10.00        -376.87
      9.00        -508.96
      8.00        -641.04
      7.00        -754.89
      6.00        -818.94
      6.00        -818.94
      5.00        -823.75
      4.00        -828.56
      3.00        -833.37
      2.00        -838.18
      1.00        -842.98
      0.00        -847.79
      0.00        -847.79
     -0.26        -846.80
     -3.15           0.00
     -8.91        1691.86
     -8.91           0.00
 COPY SCREEN, THEN STRIKE RETURN TO PLOT
```

```
DO YOU WANT A CALCOMP PLOT (Y/N)?
```



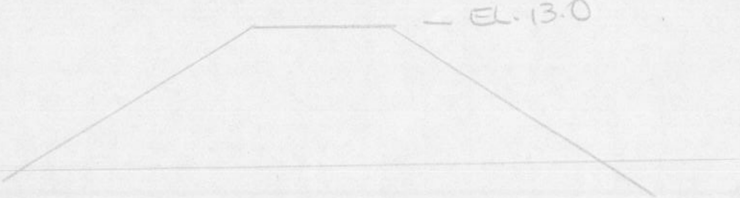
NET DIAGRAM

(S) CASE F.S.=1.25

```
 CONTINUE WITH DEFLECTION/BENDING MOMENT DIAGRAM (Y/N)?
N


RUN COMPLETED.  WORK FILES ARE IN W2, W3, AND W4
STOP
CO W3 REP20

JOBCNTRL ER   512 : WARNING: FILE GENERATED.
RT REP20 PW PR OD
```

```
LI RE0220 1-50
1 100 'LAKE PONT. BEACH, I-WALL'
2 110 'LEVEE=13.0,WF=4621 ,FS=1.0'
3 120 100 'S' 13.0
4 130 1 13.1 6 -5 -6.5 13.1 1.0 8 -34
5 140 4621 15.8
6 160 0 0 0 0 0 0 0 0 13.1
7 170 23 47.5 0 0 23 110 0 0 13.0
8 180 23 47.5 0 0 23 47.5 0 0 6
9 190 23 41.5 0 0 23 41.5 0 0 0
10 200 30 57.5 0 0 30 57.5 0 0 -6
11 210 30 54.5 0 0 30 54.5 0 0 -10
12 220 23 41.5 0 0 23 41.5 0 0 -20
13 210 23 41.5 0 0 23 41.5 0 0 -26
14 220 0 13.1 100 13.1 200 13.1 9999.9 0
15 220 0 6 77 6 98 13 100 13 108 13 129 6
16 230 200 6 9999.9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 0 100 0 200 0 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999.9 0
23 330 0 -34 100 -34 200 -34 9999.9 0
EOT..
6013VW*PLOTWALL

     * * CANPLOT (K571067) VER. 85/11/12 * *

ENTER INPUT DATA FILE
RE0220
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND, 30, 120 OR 960
```

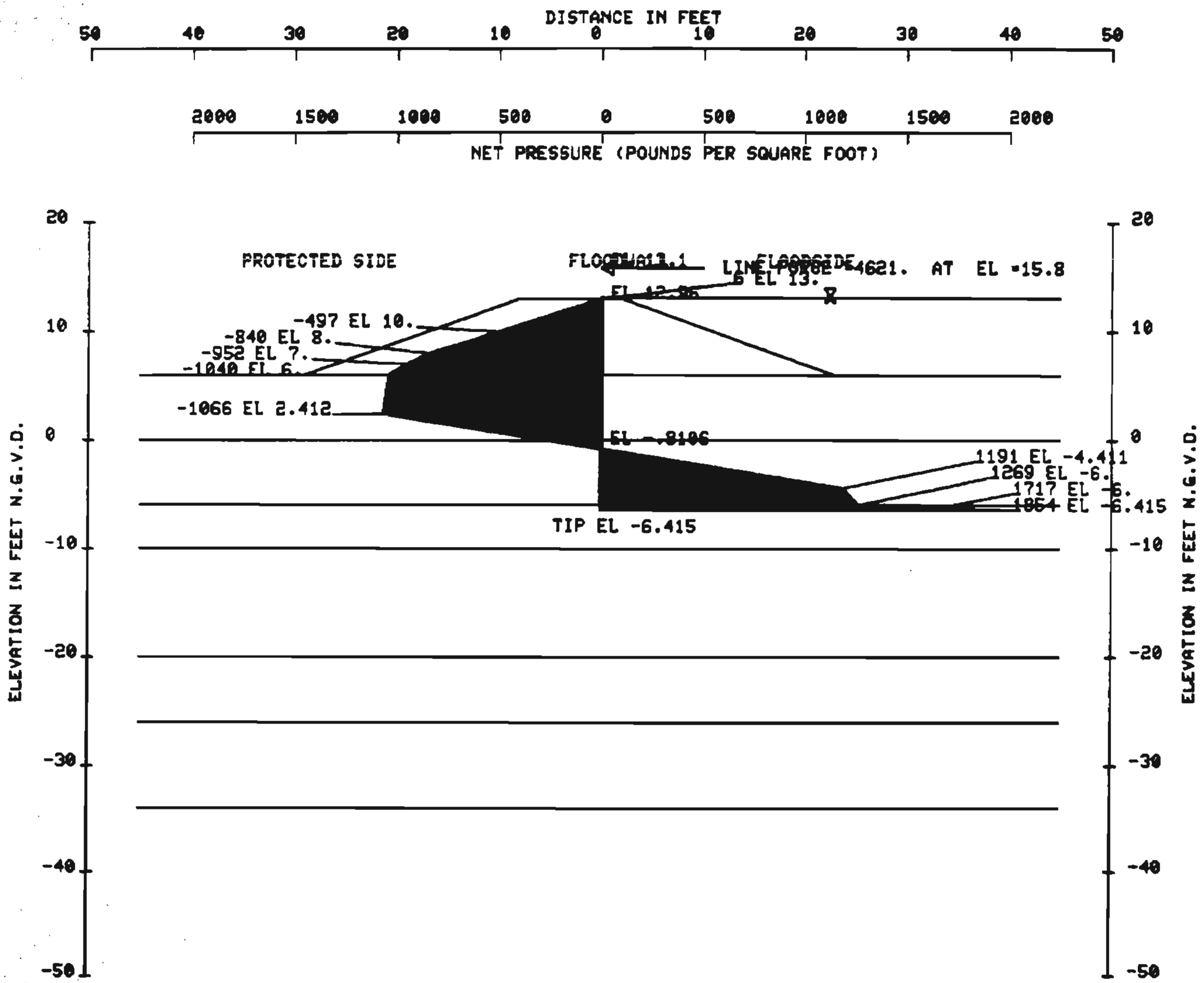
WF = 4621 FS = 1.0



Q File = REP21

```
              CANTILEVER RETAINING WALL STABILITY (VER. 85/11/12)

                         RUN TIME = 20 FEB 86  15:09:34
                                DATA FILE = RE0220

LAKE PONT. BEACH, I-WALL
LEVEE=13.0,WF=4621 ,FS=1.0
FS/LS WATER ** PS  WATER **UPPER **LOWER **  FS WATER ** FS ** NO.
    ELEV    **   ELEV    **RANGE **RANGE**GROUND EL  **    **STR
  13.10           6.00    -5.00   -6.50     13.10    1.00     8

                              FLOODWALL ANALYSIS
      DYNAMIC WAVE
      LOAD     ELEV
      (LBS)    (FT)
    4621.00    15.80

AREA     SUM FORCE   MOM ARM      MOMENT

X(1)          0.43     19.44        8.34
X(2)       9461.12     11.84   112045.82
X(3)       4839.94      1.94     9371.00
*          4621.00     22.22   102657.44 WAVE FORCE AT ELEV   15.80
TRIAL ELEV  =  -5.00 SUM OF FORCES=      0.00 SUM OF MOM=  14470.83
TRIAL ELEV  =  -6.50 SUM OF FORCES=      0.23 SUM OF MOM=   -828.42
TRIAL ELEV  =  -6.42 SUM OF FORCES=      0.25 SUM OF MOM=    -41.65
TRIAL ELEV  =  -5.42 SUM OF FORCES=      0.00 SUM OF MOM=  12351.05
DESIGN EL   =  -6.42 SUM OF FORCES=      0.25 SUM OF MOM=     -9.04

   ELEVATION      NET DIAGRAM
     (FT)        (LBS/SQ FT)
    13.10            0.00
    13.00            6.25
    13.00            6.25
    12.96            0.00
    12.00         -161.53
    11.00         -329.31
    10.00         -497.09
     9.00         -668.55
     8.00         -840.09
     7.00         -952.35
     6.00        -1039.79
     6.00        -1039.79
     5.00        -1047.07
     4.00        -1054.34
     3.00        -1061.62
     2.41        -1065.90
    -0.81            0.00
    -4.41         1190.88
    -5.00         1219.73
    -6.00         1268.67
    -6.00         1716.69
    -6.42         1854.12
    -6.42            0.00
 COPY SCREEN, THEN STRIKE RETURN TO PLOT
```

DO YOU WANT A CALCOMP PLOT (Y/N)?



NET DIAGRAM

(B) CASE F.S.-1.

```
 CONTINUE WITH DEFLECTION/BENDING MOMENT DIAGRAM (Y/N)?
N


RUN COMPLETED.  WORK FILES ARE IN W2, W3, AND W4
STOP
CO W3 REP21

JOBCNTRL ER   512 : WARNING: FILE GENERATED.
RT REP21 PW PR OD
```

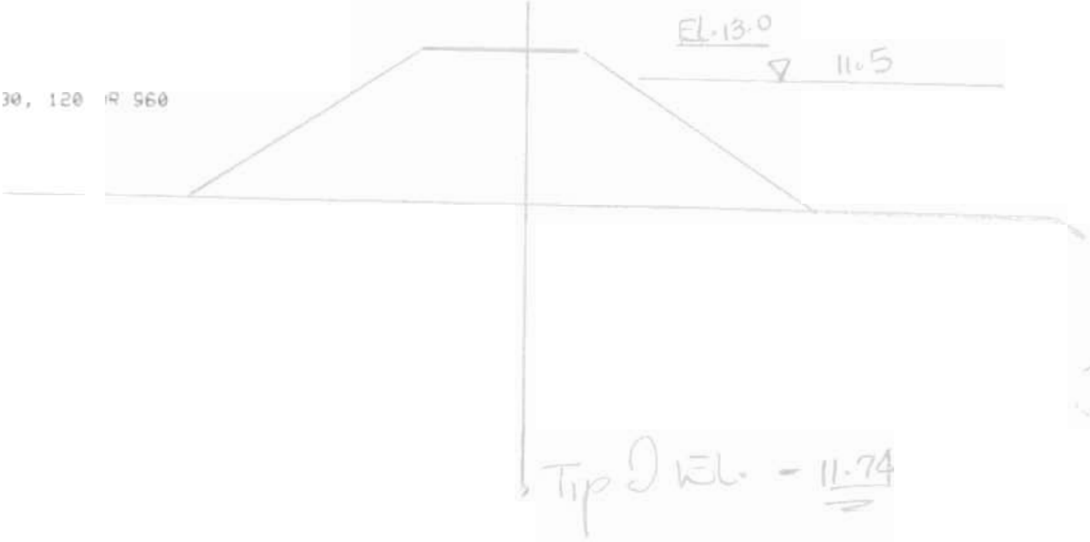
```
LI RE0119 1-50
1 100 'LAKE PONT. BEACH, I-WALL'
2 110 'LEVEE=13.0,WF=5362 ,FS=1.25'
3 120 100 'S' 13.0
4 130 1 13.1 6 -8 -10 13.1 1.25 8 -34
5 140 5362 16.2
6 160 0 0 0 0 0 0 0 0 13.1
7 170 23 47.5 0 0 23 110 0 0 13.0
8 180 23 47.5 0 0 23 47.5 0 0 6
9 190 23 41.5 0 0 23 41.5 0 0 0
10 200 30 57.5 0 0 30 57.5 0 0 -6
11 210 30 54.5 0 0 30 54.5 0 0 -10
12 220 23 41.5 0 0 23 41.5 0 0 -20
13 230 23 41.5 0 0 23 41.5 0 0 -26
14 240 0 13.1 100 13.1 200 13.1 9999.9 0
15 250 0 6 77 6 98 13 100 13 108 13 129 6
16 260 200 6 9999.9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 2 100 2 200 2 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999.9 0
23 330 0 -34 100 -34 200 -34 9999.9 0
EDT..
6213UW#PLOTWALL

     * * CANPLOT (K571067) VER. 85/11/12 * *

ENTER INPUT DATA FILE
RE0119
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND, 30, 120 OR 960
```

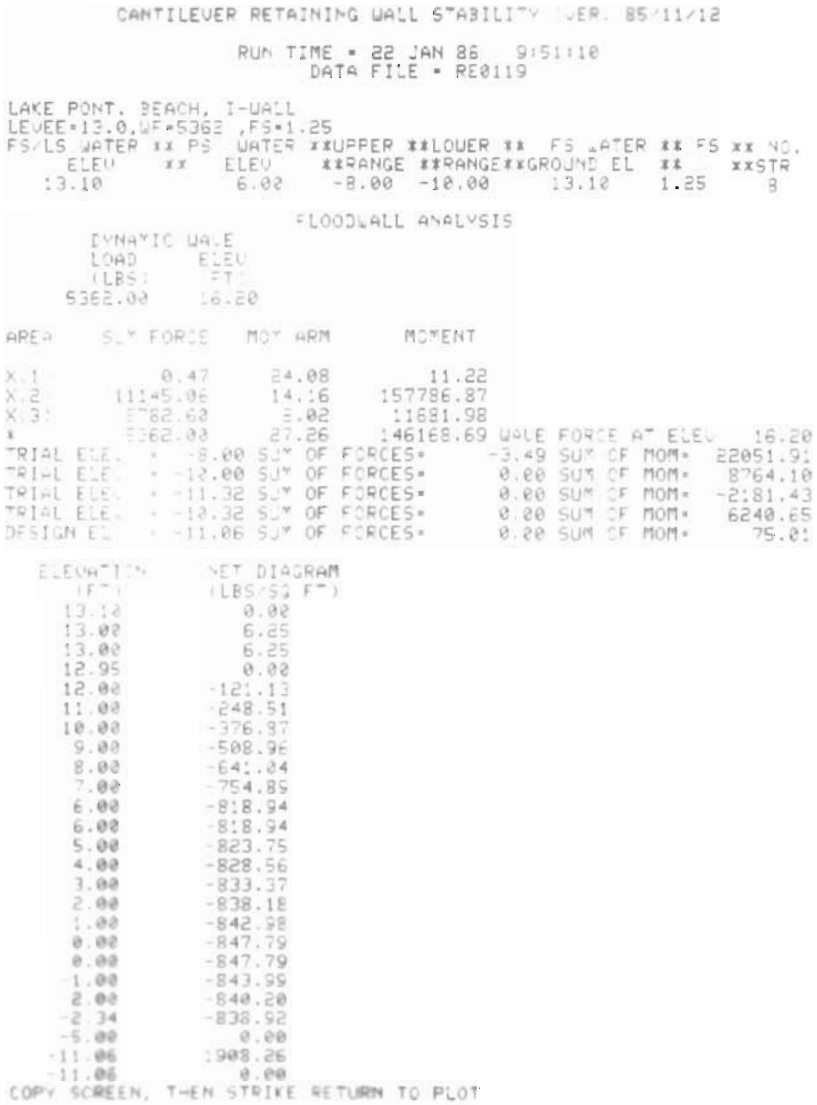
FS=1.25 REP5 (Q file)

Note: In this program the WATER EL. was put @ EL. 13.1

S CASE

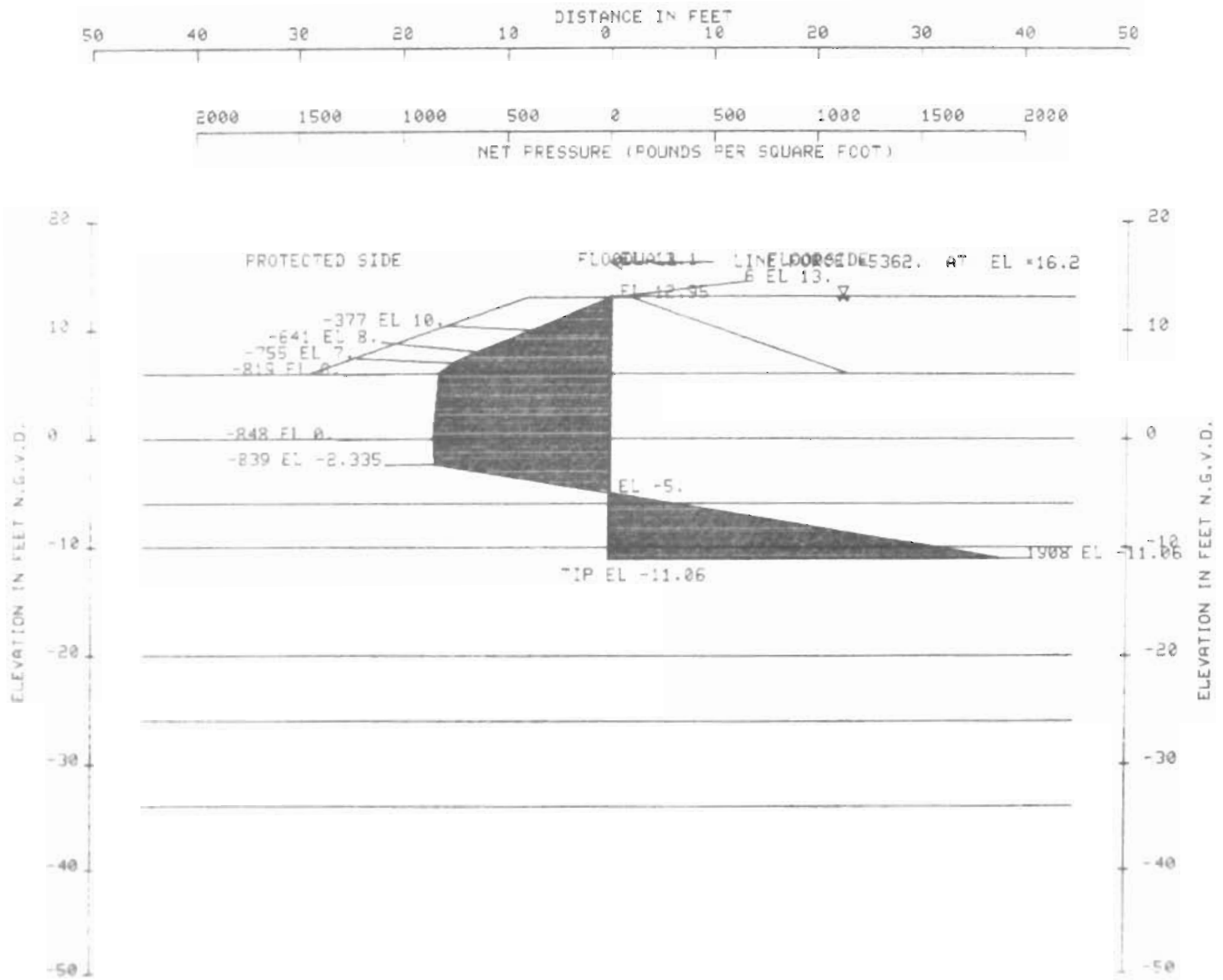
Tip EL. = -11.74.





```
            CANTILEVER RETAINING WALL STABILITY (VER. 85/11/12

                           RUN TIME = 22 JAN 86   9:51:10
                               DATA FILE = RE0119

LAKE PONT. BEACH, I-WALL
LEVEE=13.0,WF=5362 ,FS=1.25
FS/LS WATER ** PS  WATER **UPPER **LOWER **  FS WATER ** FS ** NO.
     ELEV     **   ELEV    **RANGE **RANGE**GROUND EL  **    **STR
   13.10            6.02    -8.00  -10.00      13.10    1.25     8

                              FLOODWALL ANALYSIS
       DYNAMIC WAVE
       LOAD     ELEV
       (LBS)    (FT)
    5362.00    16.20

AREA     SUM FORCE   MOM ARM       MOMENT

X(1)          0.47     24.08        11.22
X(2)      11145.06     14.16    157786.87
X(3)       5762.60      2.02     11681.98
*          5362.00     27.26    146168.69 WAVE FORCE AT ELEV   16.20
TRIAL ELEV  =  -8.00 SUM OF FORCES=      -3.49 SUM OF MOM=  22051.91
TRIAL ELEV  = -10.00 SUM OF FORCES=       0.00 SUM OF MOM=   8764.10
TRIAL ELEV  = -11.32 SUM OF FORCES=       0.00 SUM OF MOM=  -2181.43
TRIAL ELEV  = -10.32 SUM OF FORCES=       0.00 SUM OF MOM=   6240.65
DESIGN EL   = -11.06 SUM OF FORCES=       0.00 SUM OF MOM=     75.01

   ELEVATION      NET DIAGRAM
     (FT)         (LBS/SQ FT)
     13.10            0.00
     13.00            6.25
     13.00            6.25
     12.95            0.00
     12.00         -121.13
     11.00         -248.51
     10.00         -376.97
      9.00         -508.96
      8.00         -641.04
      7.00         -754.89
      6.00         -818.94
      6.00         -818.94
      5.00         -823.75
      4.00         -828.56
      3.00         -833.37
      2.00         -838.18
      1.00         -842.98
      0.00         -847.79
      0.00         -847.79
     -1.00         -843.99
     -2.00         -840.20
     -2.34         -838.92
     -5.00            0.00
    -11.06         1908.26
    -11.06            0.00
COPY SCREEN, THEN STRIKE RETURN TO PLOT
```

```
DO YOU WANT A CALCOMP PLOT (Y/N)?
```



NET DIAGRAM

(B) CASE F.S.=1.25

```
 CONTINUE WITH DEFLECTION/BENDING MOMENT DIAGRAM (Y/N)?
N


RUN COMPLETED.  WORK FILES ARE IN W2, W3, AND W4
STOP
CO W3 REPS
RT REPS P1 PR CI
```

FS=1.0 REP4 (Q File)

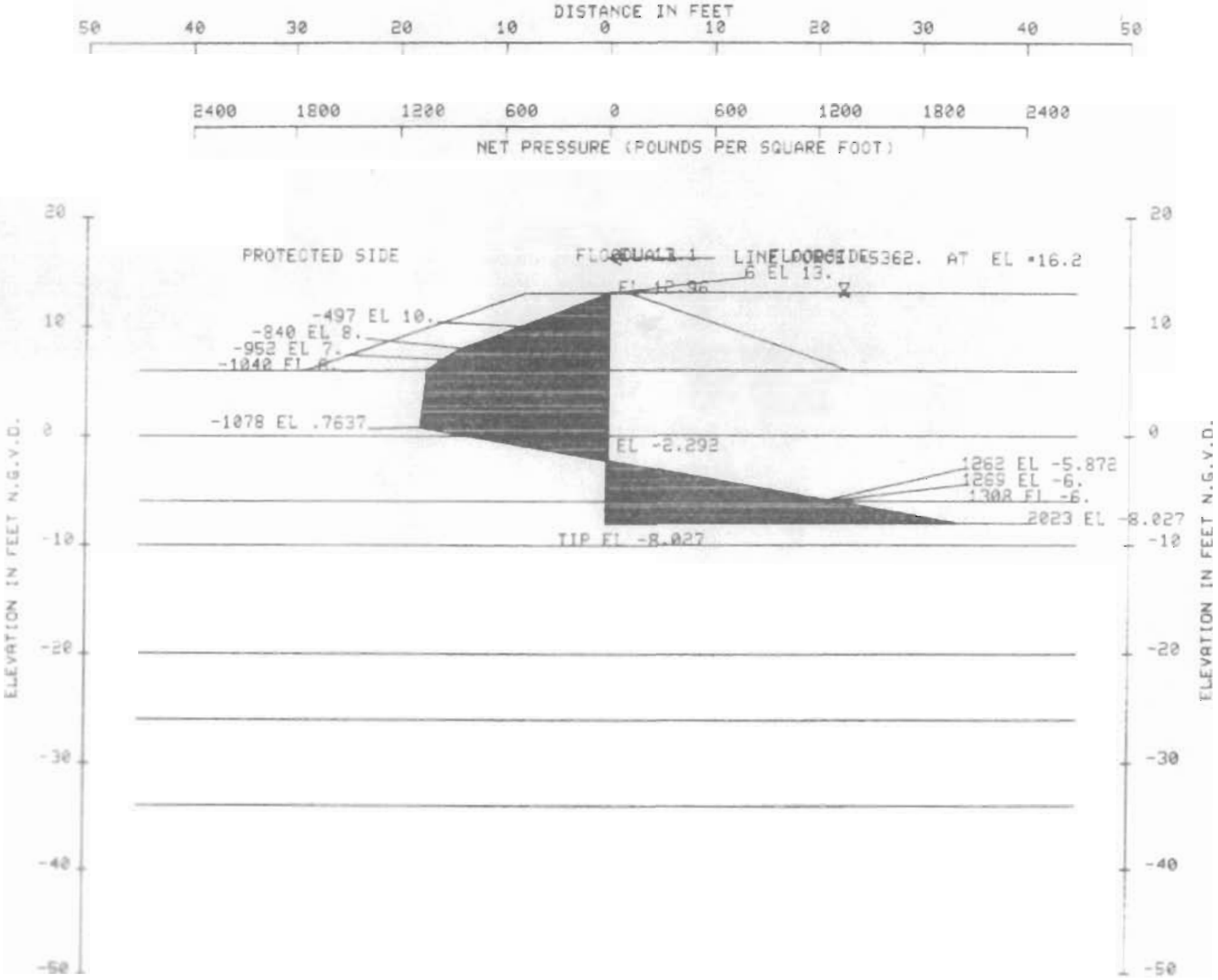
S CASE

5362

```
LI RE0119 1-50
1 100 "LAKE PONT. BEACH, I-WALL"
2 110 "LEVEE=13.0,WF=~~5632~~ ,FS=1.0"
3 120 100 "S" 13.0
4 130 1 13.1 6 -8 -10 13.1 1.0 8 -34
5 140 5362 16.2
6 160 0 0 0 0 0 0 0 0 13.1
7 170 23 47.5 0 0 23 110 0 0 13.0
8 180 23 47.5 0 0 23 47.5 0 0 6
9 190 23 41.5 0 0 23 41.5 0 0 0
10 200 30 57.5 0 0 30 57.5 0 0 -6
11 210 30 54.5 0 0 30 54.5 0 0 -10
12 220 23 41.5 0 0 23 41.5 0 0 -20
13 210 23 41.5 0 0 23 41.5 0 0 -26
14 220 0 13.1 100 13.1 200 13.1 9999.9 0
15 220 0 6 77 6 98 13 100 13 108 13 129 6
16 230 200 6 9999.9 0
17 270 0 6 100 6 200 6 9999.9 0
18 280 0 0 100 0 200 0 9999.9 0
19 290 0 -6 100 -6 200 -6 9999.9 0
20 300 0 -10 100 -10 200 -10 9999.9 0
21 310 0 -20 100 -20 200 -20 9999.9 0
22 320 0 -26 100 -26 200 -26 9999.9 0
23 330 0 -34 100 -34 200 -34 9999.9 0
EOT..
6013JU*PLOTWALL

     * * CANPLOT (KS71067) VER. 85/11/12 * *

ENTER INPUT DATA FILE
RE0119
ENTER COMMUNICATION RATE IN CHARACTERS PER SECOND, 30, 120 OR 960
```

```
         CANTILEVER RETAINING WALL STABILITY (VER. 85/11/12)

                      RUN TIME = 22 JAN 86   9:45:28
                             DATA FILE = RE0119

LAKE PONT. BEACH, I-WALL
LEVEE=13.0,WF=5632 ,FS=1.0
FS/LS WATER ** PS  WATER **UPPER **LOWER **  FS WATER ** FS ** NO.
    ELEV    **   ELEV    **RANGE **RANGE**GROUND EL  **    **STR
  13.10            6.00    -8.00  -10.00      13.10    1.00     8

                         FLOODWALL ANALYSIS
      DYNAMIC WAVE
      LOAD     ELEV
      (LBS)    (FT)
   5362.00    16.20

AREA    SUM FORCE   MOM ARM       MOMENT

X(1)         0.43     21.05         9.03
X(2)     11157.32     12.64    140995.46
X(3)      5797.23      1.91     11081.48
X         5362.00     24.23    129906.19 WAVE FORCE AT ELEV   16.20
TRIAL ELEV  =  -8.00 SUM OF FORCES=        2.30 SUM OF MOM=    242.99
TRIAL ELEV  = -10.00 SUM OF FORCES=        0.00 SUM OF MOM= -19866.71
TRIAL ELEV  =  -8.02 SUM OF FORCES=        2.33 SUM OF MOM=     28.14
TRIAL ELEV  =  -9.02 SUM OF FORCES=       -1.29 SUM OF MOM=  -9275.73
DESIGN EL   =  -8.03 SUM OF FORCES=        2.33 SUM OF MOM=      1.24

   ELEVATION      NET DIAGRAM
     (FT)        (LBS/SQ FT)
     13.10           0.00
     13.00           6.25
     13.00           6.25
     12.96           0.00
     12.00        -161.53
     11.00        -329.31
     10.00        -497.09
      9.00        -668.55
      8.00        -840.09
      7.00        -952.35
      6.00       -1039.79
      6.00       -1039.79
      5.00       -1047.07
      4.00       -1054.34
      3.00       -1061.62
      2.00       -1068.90
      1.00       -1076.18
      0.76       -1077.90
     -2.29           0.00
     -5.87        1262.39
     -6.00        1268.67
     -6.00        1307.67
     -8.03        2022.66
     -8.03           0.00
COPY SCREEN, THEN STRIKE RETURN TO PLOT
```

```
DO YOU WANT A CALCOMP PLOT (Y/N)?
```



NET DIAGRAM

(B) CASE F.B.-1.

```
 CONTINUE WITH DEFLECTION/BENDING MOMENT DIAGRAM (Y/N)?
N


RUN COMPLETED.  WORK FILES ARE IN W2, W3, AND W4
STOP
CO W3 REP*
RT REP4 P, PR 30.
```

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNED-SP	Pontchartrain Beach Floodwall - Lake Pontchartrain, La. & Vicinity (High Level Plan)

TO C/Des Br
✓C/F&M Br 2/19
C/H&H Br

FROM C/Des Svcs Br

DATE 14 Feb 86

Mr. Elmer/dn/2618

CMT 1

1. Reference the meeting held on 7 Feb 86 with represenatives of Design Engineers Inc, URS Engineers, New Orleans Public Service, Orleans Levee Board, and COE personnel (a list of attendees is included in the enclosure). The purpose of the meeting was to address COE comments on the alternative alinement study for the subject project and to resolve other issues pertaining to the designs being developed for the OLB.

2. Enclosed, please find minutes of the meeting and for F&M Br the responses to the F&M related comments prepared by Eustis Engineering Company on the Pontchartrain Beach Floodwall plans.

3. You are requested to review the minutes of the meeting and provide comments by 21 Feb 86. F&M Br is additionally requested to review the Eustis Engineering Company responses to the COE comments on the subject project.

4. If there are any questions, please contact Mr. Elmer, Ext. 2618.

Encl (hand-carried)

Thomas E. Harrington
THOMAS E. HARRINGTON, JR.
Chief, Design Services Branch

DA FORM AUG 80 2496 PREVIOUS EDITIONS WILL BE USED

☆U.S. Government Printing Office: 1983—408-862

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL (504) 837 6326

February 12, 1986

Mr. Ron Elmer, Project Coordinator
LMNED-SP
U.S. Army Corps of Engineers, NOD
P. O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 565-04-73

By copy of this letter URS is transmitting the minutes of our meeting of February 7, 1986, concerning the above project. Accompanying these minutes are Eustis Engineering Company's responses to the Corps' February 4, 1986, letter. Please respond to the information they have provided as soon as possible with particular attention given to their settlement analyses and the new earthen levee section analysis so as to enable us to complete the work on these portions of the project. In regard to the settlement analysis, the interface of URS' and the Corps' projects are yet unresolved and, in a related item, we are now unsure as to the Corps' opinion of the settlement analyses for other areas of the project. Although Eustis feels certain about their recommendations, we would like to be assured that the Corps agrees to them in light of the potential of redesign should the Corps not agree.

We await your reply.

Sincerely,

Bruce H. Adams

Bruce H. Adams, P.E.
URS Engineers

BHA/kam

Enclosures

cc: Mr. C.E. Bailey, OLB
Meeting Attendees

MEETING MEMORANDUM

Project: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
URS Project No. 565-04-73

Location: U.S. Army Corps of Engineers - NOD
Date & Time: Friday, February 7, 1986 at 9:00 a.m.

Attendance:

Alan Francingues	OLB
Jorge Romero	COE
Ronald Elmer	COE
Roberto Estrada	COE
Jim Richardson	COE
Philip Napolitano	COE
Janice Hote	COE
Thomas Graff	COE
David Cook	NOPSI-Electrical
Bob Bulot	NOPSI-Gas
John Holtgreve	DEI
Walter Baudier	DEI
Charlene Thompson	URS
Tai Chen	URS
Bruce Adams	URS

Scope of Meeting

A meeting agenda was presented by URS to those in attendance outlining the topics which URS wished to discuss at the meeting. A copy of this agenda is attached.

Item 1

The methods of relocating the utilities along Lakeshore Drive (water, gas and electrical) were discussed as well as the sequence of doing so. Bob Bulot of NOPSI stated that the gas line was on a loop and the section in question could possibly be taken out of service for some period of time, but that he would confirm this. NOS&WB's water line (and UNO's water service) was discussed as it parallels the gas service in the project area. Along the west end of the project it was agreed by those at the meeting to relocate the gas and water service around the southern toe of the proposed levee paralleling Lakeshore Drive and over the top of the existing levee which is proposed for improvement also. The UNO water service will be re-fed by tapping into the relocated water line south of the proposed levee along Lakeshore Drive. The water line will be 12" up to the UNO service and then 6" over the levee to connect to the existing 6" water line along Lakeshore Drive. COE agreed to provide the design of a sheet pile wall in the levee which would provide adequate stability for installing the water and gas lines. These lines would be buried below the gross levee section with minimum cover but above the steel sheet pile wall. URS will provide drawings to NOPSI and NOS&WB with the proposed work superimposed thereon for their review, design purposes and cost estimating. URS will also adjust the project limit on the west end to include the levee work in the immediate area. Tom Graff with COE will coordinate appropriate match lines for the COE's project to interface with URS' project.

The electrical feeder at the west end of the project was discussed with NOPSI considering eliminating the feeder and replacing it with a direct-bury cable for street lighting. (Subsequently, NOPSI informed URS that the feeder has to remain and a wall penetration provided where it penetrates the I-wall north of Lakeshore Drive.) It will be relocated around the north side of the Lakeshore Drive improvements with construction of the relocation by the project's general contractor. NOPSI may pull the cable, but this will be confirmed later.

Along the east end of the project, the gas line will be relocated adjacent to the toe of the proposed levee along the southside of Lakeshore Drive with a levee crossing over the COE's theoretical section buried below minimum cover. No increased levee section is required at this end. URS will again adjust the project limits in coordination with Tom Graff.

Street lighting was discussed with NOPSI subsequently informing URS that the light standards are concrete with integral bases which can be relocated by the project's general contractor. NOPSI will provide their specifications for such work to URS (as they have confirmed that they are within NOPSI's maintenance responsibilities). Further, concerning the west end relocations, DEI stated that if additional land from UNO is required that OLB will obtain it.

Item 2

URS' analysis of the I-wall levee section at four additional points was discussed and it was agreed that the total of six analysis points evenly spaced along the east and west reaches of the I-wall were adequate. URS will provide the calculations for wall stress and deflection as soon as possible for COE review and verification. Both the number of section types and variances in penetration will be minimized. The top of the sheet pile wall will be at 16.0 as per the original preliminary design report, but the top of the concrete I-wall will slope gradually from the north reach (at elev. 20.00) to Lakeshore Drive (at elev. 17.50). Top of the gated structure will be level.

Item 3

The net elevations for the tie-in levees along Lakeshore Drive were confirmed by COE to be 17.0 on the east end and 17.5 on the west end. The top of the I-walls across Lakeshore Drive were confirmed to be 17.5 on both ends. The gate and levee heights listed in the agenda were confirmed, but if it is determined by URS to be cost effective to increase the gate height slightly to avoid the use of a "guyed" swing gate, this can be done.

Item 4

COE confirmed the number of analysis points along the east and west I-wall reaches as discussed above in item 2. COE confirmed the linear interpolation of the wave and hydraulic loadings from the load cases presented by the COE in their October 9, 1985 letter for levee crown elevations of 20.0 along the north reach and 17.5 on the I-wall adjacent to the north edge of Lakeshore Drive. Jorge Romero suggested that FZ steel sheet piling be considered as an alternate which could be allowed to the project contractor should they elect to propose such a modified design. (Subsequently, URS' investigation of this revealed that no FZ section is available which is similar to PZ-40. Therefore it will not be included in the project.)

Item 5

The 1.5" deflection criteria was confirmed by Jorge Romero to be relative deflection, not absolute.

Item 6

The net elevations of the COE's adjacent levee improvements were discussed in item 3, above. The amount of overbuild necessary along each of URS' tie-in levees along the south side of Lakeshore Drive will be confirmed by the COE's review of Eustis' settlement analyses.

Item 7

Eustis is analyzing the COE's proposed modification of the protected side levee slopes along the main earthen levees from 1:5 to 1:3 with the goal of keeping the seawall from under the new levee.

Items 8 & 9

Structural design criteria were confirmed by Jorge Romero to include the following:

a) EM 1110-1-2101 for structural steel gates and steel sheet piling (but not reinforced concrete).

b) Use 100% wave load and Fb=0.55 Fy (recommended), i.e., Fb=20KSI for A36 steel, or 75% wave load and Fb=0.45 FY (possible) for steel swing gate design.

c) Use 100% wave load and Fb=20KSI (recommended) or 75% wave load and Fb=0.45 Fy for A328 steel sheet piling.

d) Miminum skin plate thickness for the gate is 5/16".

e) Use 3000 psi for concrete design

f) Use 40 KSI reinforcing steel for design (GR40) but allow the contractor to substitute GR60 if GR40 is not available on a bar for bar basis at no additional cost to OLB (or if design includes 60 KSI, use Fy=48 KSI but splices should be based upon 60 KSI).

g) Prestressed precast concrete piling shall be of 5000 psi concrete.

Item 10

Because of maintenance, OLB prefers to use 1:3 side slopes for the gross sections along the combination I-wall sections. Jorge Romero questioned this in light of the short duration of the gross section when in place. DEI and OLB will verify this matter.

Item 11

The COE's slip joint detail for I-wall - gate monolith interface was briefly discussed and clarified by COE.

Item 12

Utilities along the north reach of the project were discussed and it was agreed that gas pipes could be provided now with the ends capped beyond the levee toes. All utilities except the gravity sewer will be installed with minimum cover parallel to the earthen slopes of the I-wall sections, but below the base of the proposed concrete I-wall cap.

Item 13

The use of COE's computer pile analysis was briefly discussed and confirmed.

Item 14

Responses to COE's February 4, 1986 letter comments concerning the project follow. Refer to the Eustis Engineering responses (enclosed) as applicable.

1. The preliminary design was submitted prior to receipt of the completed geotechnical report. Upon receipt of the report the preliminary design was amended by letter. The final design will properly address the results of the geotechnical report and COE's and OLB's comments.

2. This was addressed partially during a meeting among Jorge Romero and Jim Richardson of COE, DEI and URS on February 4, 1986. It has been agreed that the north reach of I-wall would include a PZ-40 steel sheet pile section and the end reaches would transition from PZ-40 along the north reach toward PZ-22 at Lakeshore Drive. See Item 2, above, of the meeting minutes.

3. This will be done on final plans.

4. This will be done on final plans.

5. This will be done on final plans.

6. This will be done on final plans.

7. This detail will be included in the final plans.

8. URS is preparing a detail of the "arch" type of relief similar to that in the French Quarter as preferred by OLB and will submit this to DEI.

9. See Items 3 and 6, above,of the meeting minutes. COE will review the Eustis geotechnical analyses and comment upon their settlement analyses. The overbuild included in the gross sections of URS project will then be resolved.

10. The Lakeshore Drive roadway improvements will be revised to reflect this in the final design. The pedestrian ramps will include the surfacing materials within the final net section adjacent to the gate monoliths.

11. There will not be any drainage wall penetrations.

12. Agreed.

13. This will be addressed in the final plans.

14. This will be addressed in the final plans.

15. Agreed.

16. See Item 1, above, of the meeting minutes.

17. Agreed, also see Item 1, above, of the meeting minutes.

18. Agreed, also see Item 1, above, of the meeting minutes.

19. Agreed.

20. This will be addressed in DEI's revised D.M. for the project.

21. See Eustis' response (attached) and item 22, below.

22. See Eustis' response. According to their analysis, the IV to 3H slopes can be incorporated along the protected side of the full earthen section without a berm being necessary. This will also move the levee section from above the seawall as per COE's comment 21.

23. See Eustis' response.

24. Pile tests are not in the project as cost analyses have determined it more feasible to design the project with a f.s.=3 and delete the pile testing.

25. This will be reflected in the final plans as soon as they are available.

26. This was addressed in Item 1, above, of the meeting minutes.

27. See Eustis' response.

28. See Eustis' response.

29. See Eustis' response.

30. This will be addressed in the specifications.

31. This will be addressed in the specifications.

32. See Eustis' response.

33. This will be addressed in the specifications.

34. See Eustis' response.

35. See Eustis' response.

36. See Eustis' response.

37. See Eustis' response.

38. This will be addressed in the final plans.

39. This will be addressed in the final plans.

40. This will be addressed in the final plans.

41. The pool has been confirmed to be pile supported. The pool surfaces will be removed from beneath the proposed levee improvements, but piling will remain.

Being there is further discussion, the meeting adjoured at approximately 11:30 a.m.

Prepared by: ______________________

Bruce H. Adams, P.E.
URS Company

Enclosures

Distribution: Mr. C.E. Bailey, OLB (w/enclosures)
Messrs. Holtgreve & Baudier, DEI (w/enclosures)
Mr. Ron Elmer, COE (w/enclosures)
Other meeting attendees (w/o enclosures)

MEETING AGENDA

PONTCHARTRAIN BEACH FLOOD PROTECTION PROJECT
OLB PROJECT NO. 2040-0204
URS PROJECT NO. 565-04-73
February 6, 1986

Proposed Topics of Discussion

1. Relocation of NOPSI's & NOS&WB utilities along Lakeshore Drive with respect to URS & COE projects.

2. Transition between PZ-40 and PZ-22 sheet pile section along east and west ends of project (COE item #2) including COE deflection checks of URS analysis. Hydrolic and wave loading as interpolated by Eustis (2/6/86) at 1/5 PTS between north reach and Lakeshore Drive will be utilized for I-wall and sheet pile analysis (Eustis loading attached). Transition will involve varying sizes of steel sheet pile.

3. Gate elevations and type of swing gate.
   Gate 1: Levee Crown = 13.0 (net), Top Gate = 18.75, Gate Height = 5.75'
   Gate 2: Levee Crown = 13.0 (net), Top Gate = 20.00, Gate Height = 7.00'
   Gate 3: Levee Crown = 13.0 (net), Top Gate = 18.75, Gate Height = 5.75'
   (Probably do not need "guyed" swing gate at gates 1 and 3.)

4. Gate design criteria will include hydrolic and wave load at 2/5 Pt as interpolated by Eustis (total load of 4621 pounds/ft. at el. 15.8 and Fb = 0.___ Fy.)

5. Sheet pile deflection criteria of 1.5" max is relative or absolute deflection?

6. Elevations of COE's adjacent levee improvements (COE item #9).

7. Main earthen levee side slopes (COE items 21 & 22).

8. Concrete design criteria (fc' = 3000 psi and reinforcing fy = 40,000 psi, grade 40).

9. I-wall sheet pile design criteria (Fb = 0.___ Fy).

10. Overbuilt section side slopes.

11. COE's slip joint detail.

12. Utilities to flood side buildings - casings, walls, levees, etc. for water, sewer, etc.

13. COE computer pile analysis after URS' load diagrams.

14. Address COE's letter comments not addressed above.

OD increases 3"

Bruce Adams 837-6326

MEETING AGENDA

PONTCHARTRAIN BEACH FLOOD PROTECTION PROJECT
OLB PROJECT NO. 2040-0204
URS PROJECT NO. 565-04-73
February 6, 1986

Proposed Topics of Discussion

1. Relocation of NOPSI's & NOS&WB utilities along Lakeshore Drive with respect to URS & COE projects.

2. Transition between PZ-40 and PZ-22 sheet pile section along east and west ends of project (COE item #2) including COE deflection checks of URS analysis. Hydrolic and wave loading as interpolated by Eustis (2/6/86) at 1/5 PTS between north reach and Lakeshore Drive will be utilized for I-wall and sheet pile analysis (Eustis loading attached). Transition will involve varying sizes of steel sheet pile.

3. Gate elevations and type of swing gate.
   Gate 1: Levee Crown = 13.0 (net), Top Gate = 18.75, Gate Height = 5.75'
   Gate 2: Levee Crown = 13.0 (net), Top Gate = 20.00, Gate Height = 7.00'
   Gate 3: Levee Crown = 13.0 (net), Top Gate = 18.75, Gate Height = 5.75'
   (Probably do not need "guyed" swing gate at gates 1 and 3.)

4. Gate design criteria will include hydrolic and wave load at 2/5 Pt as interpolated by Eustis (total load of 4621 pounds/ft. at el. 15.8 and Fb = 0.___ Fy.)

5. Sheet pile deflection criteria of 1.5" max is relative or absolute deflection?

6. Elevations of COE's adjacent levee improvements (COE item #9).

7. Main earthen levee side slopes (COE items 21 & 22).

8. Concrete design criteria (fc' = 3000 psi and reinforcing fy = 40,000 psi, grade 40).

9. I-wall sheet pile design criteria (Fb = 0.___ Fy).

10. Overbuilt section side slopes.

11. COE's slip joint detail.

12. Utilities to flood side buildings - casings, walls, levees, etc. for water, sewer, etc.

13. COE computer pile analysis after URS' load diagrams.

14. Address COE's letter comments not addressed above.

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL: (504) 837-6326

Dallas
Denver
Kansas City
New York
San Francisco
Seattle
Anchorage
Austin
Berkeley
Boston
Buffalo
Houston
Las Vegas
Montvale
New Orleans
Philadelphia
Washington, D.C.
Puerto Rico
Jeddah

February 7, 1986

Mr. Ron Elmer, Project Coordinator
LMNED-SP
U.S. Army Corps of Engineers, NOD
P.O. Box 60267
New Orleans, LA 70160

Dear Mr. Elmer:

Subject: Pontchartrain Beach Flood Protection Project
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 565-04-73

During our meeting of today we discussed the Corp's objection to inclusion of the roadway paving sections within the gross design section of the roadway ramp crossings over the levee along Lakeshore Drive at the above project. (See item 10 of the Corps' February 4, 1986 letter to Mr. John Holtgrave of DEI commenting upon the plans submitted to the Corps by DEI.) Our present design of these ramps is within the gross section (gross elev. = 15.0 NGVD, net elev. = 14.5 NGVD) of these levee crossings. In light of this fact and in consideration of the roadway surfacing and subbase materials being above the floodline and in the freeboard of this reach of the project, URS is hereby requesting that the Corps waive this requirement and allow the materials to be included within the gross design section.

Please consider this request and comment as soon as possible. We have enclosed the pertinent project drawings for aid in the Corps review of this matter.

Sincerely,

URS ENGINEERS

Bruce H Adams

Bruce H. Adams, P.E.

BHA/mn

Enclosures

cc: Mr. Ed Bailey, OLB
Mr. Walter Baudier, DEI
Mr. John Holtgrave, DEI

NOTE: F&M HAVE NO INPUT.

RE/10 Feb 86

Meeting w/C.O.E. 9:00 AM 2-7-86.
Attending:

Alan Francingues	OLB	246-4000
JORGE A. ROMERO	COE	862-2645
CHARLENE THOMPSON	URS	837 6326
BRUCE ADAMS	URS	" "
TAI CHEN	URS	" "
RONALD R ELMER	COE	862-2618
John Holtgreve	DEI	836-2155
DAVID COOK	NOPSI	595-2323
BOB BULOT	NOPSI - GAS ENGR.	595-2289
ROBERTO ESTRADA	COE	862-1035
Jim Richardson	COE	862-1031
Thomas Graff	COE	862-2772
PHILIP NAPOLITANO	COE	862-2977

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNED-FS	Review of Geotechnical Report and Preliminary Plans for Pontchartrain Beach Flood Protection, Lake Pontchartrain Hurricane Protection Project, Orleans Parish, LA

TO	FROM	DATE	CMT 1
C/Des Svcs Br	C/F&M Br	29 Jan 86	
		Mr. Estrada/mlm/1035	
		RE, JR	

1. Reference is made to your LMNED-SP DF dated 3 Jan 86, subject as above, requesting our review and comments on the subject report.

2. The draft geotechnical report and the preliminary plans have been reviewed and the following comments are offered:

a. The design of the spread footing for the retaining wall, including bearing capacity computations and settlement analysis, should be furnished for review.

b. Pile tests, ~~should be~~ if performed, should be in accordance with COE procedures. The test results should be furnished for review. Example compression test and tension test schedules are shown in enclosure 1.

c. The I-wall section located behind the seawall should be presented on the drawings.

d. ~~If any~~ All utility lines should be relocated over the levee and ~~cross the levee it should be~~ designed for a FS = 1.5 according to established COE procedures. Also any abandoned utility line should be removed from under the levee section.

e. Settlement analyses for the levee section, I-wall, piles and ramps should be presented. These computations should include an allowance for shrinkage of the fill material.

f. The stratification, wet densities, and the shear strength trend developed for each reach should be presented. The shear strength trend should be selected in accordance with EM 1110-2-1902 such that two-thirds of the test values exceed the values for each embankment zone and foundation layer.

g. Computations for seepage analyses beneath the proposed levee, I-wall sections, gate structures and ramps should be presented.

h. For the driving of concrete piles it is required that the weight of the moving parts of the hammer shall be at least two-thirds of the weight of the pile to be driven.

i. If predrilling is necessary the drilling should be no closer than 5 feet ~~of~~ above the required pile tip elevation.

j. The computations for the Coefficient of Horizontal Subgrade Reaction for gates 1, 2, and 3 should be presented.

~~k. The computations for the bearing capacities for the retaining wall should be shown. A factor of safety of 3.0 against failure of the underlying soil should be used instead of a factor of safety of 2.5.~~

k. The levee and I-wall ~~aliment~~ alinements should be located such that the existing seawall is outside of the extended main levee slope, In addition, appropriate geotechnical analyses (seepage, exit gradients, etc.) should be presented indicating that the location of the existing seawall does not adversely affect the integrity of the levee.

FILE

LMNED-FS CMT 1

SUBJECT: Review of Geotechnical Report and Preliminary Plans for Pontchartrain Beach Flood Protection, Lake Pontchartrain Hurricane Protection Project, Orleans Parish, LA

l. The earthen levee section should be designed for 1V on 3H [redacted] side slopes and
~~1. The computations of the settlement analysis for the retaining wall should be shown.~~
stability berms if required in lieu of the 1V on 5H side slopes presented.

m. The maximum moisture content for a compacted CH material should be changed from 50% to 45%.

n. The stability analysis of the earthen levee should include the gross section.

o. The stratification and strength from fig. 29 is different from El. 0.0 to El. -10.0 than the one presented on fig. 28 of the report.

p. The stratification and strength from fig. 30 is different from El. -6.0 down than the one presented on fig. 28 of the report.

q. The shear strengths and wet density values used for the pile capacities and subgrade modulus for gates 1, 2 and 3 should be shown.

r. On drawing No. 6 the part of the seawall to be removed should be shown.

s. On drawing No. 10 the gross elevations of the earthen levee and I-wall levee combination should be shown.

t. On drawing No. 11 and No. 12 the type of material used to build the ramps should be shown.

u. Subsequent correspondence shows that the swimming pool is a pile-founded structure. Based on this information, the swimming pool should be removed. This change should be presented on the corresponding drawings.

Rodney P. Picciola

Enclosure

RODNEY P. PICCIOLA
Chief, Foundations & Materials Branch

LMNED-FS

Preliminary Design - Pontchartrain Beach Floodwall - Lake Pontchartrain, LA & Vicinity (High Level Plan)

C/Des Svcs Br

C/F&M Br

9 Jan 86
Mr. Estrada/mlm/1035

1. Reference is made to your LMNED-SP DF dated 3 Jan 86, subject as above, requesting our confirmation on the review and comments of the report submitted by Design Engineering Inc. by the 24th of this month.

2. Through this DF F&M Branch confirms that the work will be furnished by the requested date.

RODNEY P. PICCIOLA
Chief, Foundations & Materials Branch

RP 1/10
file

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL	SUBJECT
LMNED-SP	Preliminary Design - Pontchartrain Beach Floodwall - Lake Pontchartrain, La. & Vicinity (High Level Plan)

TO C/Des Br
√C/F&M Br WP 1/6/86

FROM C/Des Svcs Br

DATE 3 Jan 86

CMT 1

W.T. ~~Mr.~~ Teckemeyer/dn/2611

1. Reference is made to a letter dated 18 Dec 85 from Mr. John Holtgreve of Design Engineering Inc., subject as stated above.

2. Enclosed with the letter referenced in para 1 above were four sets of each of the following:

a. Blueline prints of the preliminary plan

b. Preliminary Design Report

c. Geotechnical Report

3. The materials referenced in para 2 above were hand-delivered by Mr. Ron Elmer of our office to Mr. Jim Richardson of F&M Br and Mr. Jorge Romero of Des Br during the week of 16 Dec 85. When these materials were delivered, it was agreed that review and comments concerning these materials would be furnished to our office by F&M Br NLT 24 Jan 86 and by Des Br NLT 31 Jan 86. Please confirm this agreement.

4. The confirmation requested in para 3 above is needed ASAP but should be provided NLT 10 Jan 86. If you have any questions, please contact Mr. Walter Teckemeyer on Ext. 2611.

Thomas E Harrington
THOMAS E. HARRINGTON, JR.
Chief, Design Services Branch

ROUTING AND TRANSMITTAL SLIP

Date 3 JAN 85

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. J. RICHARDSON LMNED-FS		
2.		
3.		
4.		
5.		

☐	Action	☐	File	☐	Note and Return
☐	Approval	☐	For Clearance	☐	Per Conversation
☐	As Requested	☐	For Correction	☐	Prepare Reply
☐	Circulate	☑	For Your Information	☐	See Me
☐	Comment	☐	Investigate	☐	Signature
☐	Coordination	☐	Justify	☐	

REMARKS

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
R. Elmer LMNED-SP	Phone No. 2618

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

✩ U.S. G.P.O. 1980-311-156/27

December 27, 1985

Mr. Ron Elmer
Corps of Engineers
P. O. Box 60267
New Orleans, Louisiana 70160-0267

Re: Pontchartrain Beach Flood
Protection Project
OLB Contract No. 2040-0204
DEI Project No. 1005-1

Dear Mr. Elmer:

At the time of completion of the preliminary design report by URS Engineers, the foundation for the swimming pool was unknown. Since completing the report, URS Engineers has determined that the swimming pool is a pile-founded structure.

Please make note of this change in your copy of the preliminary design report.

With best regards, I remain

Sincerely,

DESIGN ENGINEERING, INC.

John Holtgreve

JH/mnh

cc: Mr. C. E. Bailey
Dr. E. Berkley Traughber
URS Engineers

Design Engineering Inc.
3330 West Esplanade, Suite 205, Metairie, Louisiana 70002, (504) 836-2155

12 Dec 85

Told Ron Elmer that we could
finish our review by 24 Jan 86
JR

December 18, 1985

BY HAND

Mr. Ron Elmer
Project Coordination
U. S. Army Corps of Engineers
New Orleans, Louisiana

Re: Pontchartrain Beach Floodwall
DEI Project Nos. 1005-1 and 1008

Dear Ron:

Attached herewith are four (4) sets of blueline prints of the preliminary plan for the above referenced project for your review and comment. Also included for your review are four (4) copies of the preliminary design report and four (4) copies of the geotechnical report.

This project is on a very tight time schedule with final plan completion scheduled for March 1, 1986. The purpose of this accelerated schedule is to provide increased flood protection prior to the 1986 Hurricane season. Your assistance in reviewing these plans and reports as expeditiously as possible will be appreciated.

Should you need additional information, please do not hesitate to call.

With best regards, I am

Sincerely,

John Holtgreve

Hand carried by Ron Elmer
18 Dec 85
RE.

JH:ab

Enclosures

cc: Mr. C. E. Bailey
Mr. Bruce Adams (URS Engineers)

Design Engineering Inc.
3330 West Esplanade, Suite 205, Metairie, Louisiana 70002, (504) 836-2155

URS

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL (504) 837-6326

December 10, 1985

Mr. C. E. Bailey, Chief Engineer
Board of Commissioners
Orleans Levee District
Suite 202 - Administration Building
New Orleans Lakefront Airport
New Orleans, LA 70126

Dear Mr. Bailey:

Subject: Pontchartrain Beach Flood Protection Project
Lakefront Capital Improvement Program
OLB Project No. 2040-0204
DEI Project No. 1008
URS Project No. 565-04-73

URS is in receipt of Eustis Engineering Company's draft report of the geotechnical investigation performed by them for the above project. Enclosed is a copy for your review. In your review of the report, you will note that several of the URS' preliminary design recommendations are affected by the results of Eustis' report as discussed in the following paragraphs.

Roadway Ramps

The URS preliminary design included an allowance of 1.0' overbuild for these roadway ramps above the Corps' required net elevation of 14.5 ft NGVD. Eustis' settlement. analyses indicate that the ramps will only require an overbuild of 6 inches, thereby reducing the overall height and length of the roadway ramps which will have to be provided in the final design. Also, the seepage analyses do not require that seepage cut-off walls be constructed beneath the roadway raisings.

Combination Earthen Levee/Concrete I-Walls

The preliminary plans indicated a sheet pile tip penetration to elevation -15.0 ft throughout the project. This was based upon preliminary results of the geotechnical analyses which suggested an I-wall total length-to-height above crown ratio of approximately 4.0. Eustis' draft report now indicates a sheet pile tip elevation of -22.0 where the earthen crown elevation is 10.5 ft and a sheet pile tip elevation of -14.0 where the crown elevation is 13.0 ft. As the crown (and top of wall) elevations transition, so will the tip elevations of the sheet pile wall.

OK ✓

Retaining Walls

The retaining walls proposed in lieu of the run-up berm included a 15 ft seepage cut-off wall in the preliminary design report. However, the geotechnical analyses now indicate that a 10 ft seepage cut-off wall will be sufficient.

OK

Earthen Levee Toe Drains

Preliminary indications of the geotechnical analyses included the necessity of a toe-drain system beneath the protected side of the full earthen levee section. The geotechnical analyses now indicate that the toe drain will not be required. OK

Gated Structures

The geotechnical analyses now indicate that seepage cutoff be provided beneath the gated structures to a tip elevation of -11.0 ft. However, this is precluded with the interim phase construction program recommended in the preliminary design wherein all the steel sheet pile wall and earthen levee embankments are to be constructed to the recommended tip elevations prior to next year's hurricane season without the concrete I-wall cap and gate structures. (It should be noted though, that the tip elevations shown in the preliminary design will be modified to concur with the revised sheet pile wall tip elevations discussed above.) This also works within the geotechnical investigation's recommendation to overbuild the site to allow for settlement prior to completing the I-wall concrete cap and the gated structures. The recommended preconsolidation period is 9 months. OK

show computation

Swimming Pool

URS is now researching the existing pool's foundation to determine whether it is pile supported or not. If it is pile supported, the geotechnical analyses indicate that the pool structure should be removed beneath the levee.

OK It is pile supported.

Utilities

Due to the settlement estimated by the geotechnical analyses, URS is now considering certain changes to the utility modifications proposed for the project. These include the following:

1) Water:

  A) Along the old midway at the east end of the project, a 12" water line exists and will conflict with the combination I-wall. Because of the expected 6" settlement at this location, URS is considering recommending that the water line be removed and capped where the new combination I-wall crosses it. The water line would be replaced later after the settlement has occurred and the concrete I-wall caps and gates are constructed.

  B) Along the west roadway ramp exists a 6" water line (not the 12" shown on the preliminary plans). URS recommends relocating this line immediately adjacent to, but beyond, the protected-side toe of the new levee paralleling Lakeshore Drive to avoid the problems of settlement around this pipe.

  C) At the east roadway ramp, an existing 6" line crosses beneath the roadway. This line once served a now abandoned meter into the Beach site. URS proposes to cap this line adjacent to and east of the ramp and abandon the line beneath the roadway raising.

The Sewerage and Water Board is being consulted concerning all of the above.

II) Gas Service

The existing 6" gas line which parallels each of the roadway raisings is recommended to be relocated immediately adjacent, but beyond the protected-side levee toe of the levees parallel to the two roadway ramps. The gas lines would be reinstalled with a crossing over the existing levees adjacent to Lakeshore Drive. NOPSI is being consulted concerning this.

III) Drainage

A) Along the west end of the midway where the combination I-wall will cross the existing drain lines, this line (according to the survey) is out of service. URS now recommends to simply plug this line on each side of the wall and abandon the section below the combination I-wall.

B) Along the east end of the midway where the combination I-wall will cross the existing drain line, URS proposes to abandon the line beneath the wall as the survey shows that only one set of catch basins exists which will be cut off from draining to the flood side of the wall. The drainage for these catch basins will be re-directed westward.

C) Along each of the roadway raisings, it was proposed that some of the existing drainage system could be salvaged and the new catch basins and a few new lines simply connected to this existing system. However, while some of the main drain lines paralleling these roadway raisings may be able to be maintained beyond the new embankments, should these embankments and their expected settlement be a problem, the affected drain lines will be replaced.

D) The existing drain line which passes beneath the proposed pedestrian ramp No. 3 will be abandoned and plugged. The existing drainage pattern on Lakeshore Drive (which flows to this line) will be re-directed toward the system along Lakeshore Drive.

As soon as the effected utility companies can confirm these recommendations, and with concurrence of the OLB, URS will incorporate them into the final design of the project.

WAIT for these
RESULTS;
see how
Affect us!

Please now consider this new information as you complete your review of the project's preliminary phase recommendations and contact URS with your comments as soon as possible. We are awaiting the Orleans Levee District's approval prior to issuing review documents to the Corps and other effected agencies.

Sincerely,

URS COMPANY

Bruce H. Adams

Bruce H. Adams, P.E.

Enclosures

cc: DEI (w/enclosures)

INTRA- ARMY ORDER FOR REIMBURSABLE SERVICES

For use of this form, see AR 37-108 and AR 37-110: the proponent agency is USAFAC.

1. RECEIVING OFFICE CONTROL NUMBER

☐ FUNDED ☐ AUTOMATIC

2. ORDER

a NUMBER LMNED-FT-86-008

b DATE 12 Dec.'85

3. CHANGE ORDER

a NUMBER

b DATE

ORDERED BY *(Command, Installation or Activity)*, ADDRESS *(Include zip code)*, AND AUTOVON NUMBER

U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
P.O.BOX 60267
NEW ORLEANS, LA. 70160

TO BE PERFORMED BY *(Command, Installation or Activity)*, ADDRESS *(Include zip code)*, AND AUTOVON NUMBER

DIRECTOR: WATERWAYS EXPERIMENTAL STATION
ATTN: WESGE-3

6. DESCRIPTION OF SERVICES TO BE PERFORMED

LK. PONT. LA. & VIC. HIGH LEVEL PLAN HURR. PROT. PONT. BEACH FLOODWALL
BORING: 6-PBU

Soil samples to be tested as per W.E.S. form 880 attached.

Please forward your acceptence of this order within 10 days. When billing for this service please indicate "ORDERING SYMBOL LMNED-FT".

NOTE: Please send the results via teletype upon completion.

Date samples shipped 16 December 1985.

It is requested that the results be forwarded by 16 March 1986 to U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS.

cc: LMVD. ATTN: LMVED-G
Prog. Dev.
F&A Br.
F&M Br. Mr. Estrada x-1035

7a NAME AND TITLE OF ORDERING OFFICER

DENISE GIEGER
BUDGET ASSISTANT

b. SIGNATURE

c DATE

ORIGINATING FINANCE AND ACCOUNTING OFFICE APPROVAL

8a. ACCOUNTING CLASSIFICATION BEC 21 305L 30 ACOO

b. AMOUNT $4,170.00

c. CHANGE

INCREASE AMOUNT________ DECREASE AMOUNT________ REVISED AMOUNT________

9. Services to be performed pursuant to this order are properly chargeable to the appropriations or other accounts indicated above until ________ *(Day - Month - Year)* the expiration date of this order.

10 a. TYPED NAME AND TITLE OF APPROVING OFFICER

JUDY DEBOSE
F&A OFFICER

b. SIGNATURE

c. DATE

ACCEPTING OFFICER

11. THE ABOVE TERMS AND CONDITIONS ARE SATISFACTORY AND ARE ACCEPTED.

a. TYPED NAME AND TITLE OF ACCEPTING OFFICER

b. SIGNATURE

c. DATE ACCEPTED

DA FORM 1 JUN 77 2544

EDITION OF 1 DEC 75 WILL BE USED UNTIL EXHAUSTED.

REQUEST FOR WES SOILS LABORATORY TESTS

TEST FOR: NEW ORLEANS DISTRICT

DATE OF REQUEST:

PROJECT: LAKE PONT. LA. & VIC. HIGH LEVEL PLAN
HURR. PROT. PONT. BEACH FLOODWALL

TEST PRIORITY:

DATE REQUIRED:

DATE DESIGN MEMO DUE:

DATE PLANS & SPECS DUE:

SPACE FOR WES USE

DATE REQUEST RECEIVED:

DATE SAMPLES RECEIVED:

DATE TEST COMPLETED:

JOB NO.:

COST CODE NO.:

WORK ORDER NO.:

(USE BLACK INK, PENCIL OR CARBON ONLY)

BORING	SAMPLE	DEPTH	LOCATION	DENSITY	SIEVE	HYDROMETER	SP GRAVITY	WATER CONTENT	UC UNCON-FINED COMP	UU (Q) TRIAXIAL	CU (R) TRIAXIAL	CD (S) SHEAR	ATTERBERG LIMITS	CONSOLIDATION	PERMEABILITY	COMPACTION				REMARKS
6-PBU	7-B	19.7						X			R									
	8-B	24.0										S								
	9-B	27.3						X		Q			X							
	9-C	28.1						X					X	C						
	10-B	31.7						X		Q			X							
	10-C	32.6						X					X	C						
	18-C	52.5						X		Q			X							
	19-B	55.7						X		Q			X							
	20-B	59.8						X			R									
	21-B	63.7										S								
																				NOTE: Sta. 117+93*
																				EL. ≈ 7.0*
																				* Approx. Sta. & Elev.
																				RE,

WES FORM NO. 880
REV APR. 65

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL: LMNED-FS

SUBJECT: LAKE PONTCHARTRAIN, LA. & VICINITY, HIGH LEVEL PLAN, HURRICANE PROTECTION, PONTCHARTRAIN BEACH FLOODWALL

TO: C/Geol Sec
C/Soils & Mats Test Sec (w/incl)

FROM: C/F&M Br

DATE: Nov 85

CMT 1

1. It is requested that the borings listed below be classified. Mr. ESTRADA/1035

Boring No.	Station	Long.	Lat.	Location	Depth	Grnd Elev	Water Table
6-PBU					100'	*	*

Lake Pont. Hurricane Protection
Pontchartrain Beach
Boring ~~B-10~~
6-PBU

NOTE: MAKE A remark ABOUT the Lat & Long - will be furnished at a later date.

"U" denotes 5" undisturbed boring

* Obtain elevation

2.

3. Charge all costs to the following charge numbers, not to exceed listed amounts:

Field Investigation		
NOD Testing	BEC 21304 L10 AC00	$3500
Geology		
Computer		
WES Testing	BEC 21305 L30 AC00	$8420

RODNEY P. PICCIOLA
Chief, Foundations and Materials Branch

LAKE PONTCHARTRAIN, LA. & VICINITY,
HIGH LEVEL PLAN, HURRICANE PROTECTION,
PONTCHARTRAIN BEACH FLOODWALL

NOVEMBER 13, 1985

COST ESTIMATE

A. WES (1 BORING 100 FEET / DEEP)

TESTS

Q's - EVERY 10 FT = 10 Q's @ $385 = $3850

S - 3 S / BORING @ $450 = $1350

C - 7 C's / BORING @ $460 = $3220

WES TESTING = $8420

B. NEW ORLEANS DISTRICT

1) VISUAL CLASSIFICATION - 100 FT @ $30.00 / FT = $3000

2) HANDLING CHARGE - 20 samples @ $25/SAMPLE = $500

NEW ORLEANS DISTRICT = $3500

~~Richardson~~ JR
Estrada

October 24, 1985

MEETING MEMORANDUM

Project: Pontchartrain Beach Flood Protection
Orleans Levee Board Project No. 2040-0204
DEI Project No. 1008
URS Project No. 565-04-73

Location: Corps of Engineers - New Orleans Dist.

Meeting Date: October 22, 1985

Time: 2:00 p.m.

Attendees:	Ron Elmer	C.O.E.
	Van Stutts	C.O.E.
	Jorge Romero	C.O.E.
	Jim Richardson	C.O.E.
	Janice Hote	C.O.E.
	John Holtgreve	DEI
	Tai Chen	URS
	Bruce Adams	URS

Topics of Discussion:

1) Net design elevations for the east and west ends of the project at the connections to the existing levees were verified to be 17.5 NGVD at each location.
2) By copy of this memorandum, URS is transmitting three (3) copies of DEI's conceptual design to the Corps.
3) Should the project geotechnical investigations determine that settlement along the project will approach 6 inches or greater, consideration should be given to installing the concrete caps after the over-built earthen sections have had time to settle through a phased construction schedule.
4) Where piling will be used in the project the Corps' preference is for prestressed precast concrete square piles as per their standard detail.
5) Structural design will involve the use of the Corps modified strength design as per Corps ETL 1110-2-265, but utilizing a load factor of 1.9 for all loads.
6) The gates for this project should be designed for combined hydrostatic and wave loading. Wind loading shall be considered for dry conditions. Swing gates should be the most cost efficient and easiest to design for this application rather than the roller gate type. The swing gate should be supported from a cantelever I-wall similar to the Corps' gate 5 shown in DM No. 13.

7) In designing the pile foundations all lateral loading shall be from the gate to the bearing columns at each end of the gate. These gate monoliths will be designed as one section with vertical and batter piles beneath the wall-column sections and vertical piles only beneath the opening gated section. For pile load design, use service loads then apply load factors to develop design of the above structure. For pile design analysis, use Corps' Hrenicoff program. Corps will aid URS in use of program provided URS prepares correct input data.

8) Review of the geotechnical report by the Corps' should take approximately 2 weeks. In order to expedite such review, 3 copies of the report should be provided to the Corps.

Prepared by: Bruce H Adams
Bruce H. Adams, URS

Distribution: Attendees
Mr. Ed Bailey, OLB
Mr. Earl Magner, OLB
URS Company Files

URS

URS ENGINEERS
SUITE 900, EXECUTIVE TOWER
3500 N. CAUSEWAY BLVD.
METAIRIE, LOUISIANA 70002

Env. Div

NEW ORLEANS, LA 701
PM
25 OCT
1985

Jim Richardson
U. S. Army Corps of Engineers
New Orleans District
P. O. Box 60267
New Orleans, La. 70160

9/26/85

Walter Baudier	Design Engineering, Inc.
Earl Magner	Orleans Levee Board.
Ronald P. Lee	COE Levees
Bruce Adam	URS
JORGE ROMERO	COE, ENGR DIV
Ernest Barton	COE, Eng. Div
Van Stutts	COE, Eng. Div
RONALD R ELMER	COE ENGR DIV
JAY COMBE	COE, ENGR DIV
JANIS HOTE	COE, ENGR DIV
Jim Richardson	COE, Engr. Div
ROBERTO ESTRADA	COE, ENGR DIV
THOMAS GRAFF	COE, LEVEE SEC.
JOHN HOLTGREVE	DESIGN ENGINEERING, INC.
WALTER BAUDIER	DESIGN ENGINEERING, INC.
C.E. Bailey	Orleans Levee Bd.

URS
AN INTERNATIONAL PROFESSIONAL SERVICES ORGANIZATION

URS ENGINEERS
3500 NORTH CAUSEWAY BOULEVARD
METAIRIE, LOUISIANA 70002
TEL: (504) 837-6326

Dallas
Denver
Kansas City
New York
San Francisco
Seattle
Anchorage
Austin
Berkeley

Boston
Buffalo
Houston
Las Vegas
Montvale
New Orleans
Philadelphia
Washington, D.C.
Puerto Rico
Jeddah

September 12, 1985

MEETING MEMORANDUM

Project: Pontchartrain Beach Floodwall
Orleans Levee Board
URS Project No: 567-04-73

Meeting Date: September 25, 1985

Time: 1:30 p.m.

Attendees:	Jim Richardson	U.S.C.O.E. - N.O.D.
	Roberto Estrada	U.S.C.O.E. - N.O.D.
	Lloyd Held	Eustis Engineering Co.
	Bruce Adams	URS

The meeting was held among the above to discuss the proposed scope of geotechnical services for the above project. The Corps' existing borings taken around the site were reviewed and the following comments were offered by Jim Richardson:

1) The Corps would require one boring be taken by the Orleans Levee Board's geotechnical consultant at the site in their sampling tubes for their use.

2) The Corps suggested that a boring be made for each of the pile supported structures, in this case one at each gated ramp structure. These borings should be 100' deep.

3) Static water level loading will have to be evaluated I-wall with a factor of safety of 1.5 applied to the soil parameters. Dynamic wave action loading will have to be evaluated with a factor of safety of 1.25. The governing case of the above two would then be used in design.

4) A seepage barrier along the toe of the run-up berm would not be required for this project.

1) Seepage Analysis required

General discussions and discussions by others included the following:

A) Lloyd Held said that a separate cost item would be provided to accommodate the Corps' request for their one additional boring. Upon receipt of this separate proposal, URS will evaluate the relative costs of the proposals received to date.

B) Lloyd Held said that the 3 borings recommended at the three pile-supported gated structures would require borings deeper than that in the original Eustis proposal. However, this could be accomplished at minimal increase to the original proposal.

C) Due to the nature of the existing soils, the retaining walls proposed in lieu of the run-up berms might require a sheet pile cut-off wall on the "flood" side of the wall as well as possibly requiring foundation piling due to the soil pressure differential on the "dry" side of the retaining walls.

D) Settlement of the proposed earthen embankments and floodwall relative to the existing seawall may require a cut-off wall in front of the seawall due to seepage and possibly stability problems. Analyses of these potential problems might reveal that removal of the seawall would be required with the present floodwall alignment along the seawall.

It was agreed that the above comments would all be considered in developing any recommendations for design of the project.

The meeting adjourned at approximately 2:30 p.m.

Prepared by: Bruce H Adams
Bruce H. Adams, URS

Distribution:
Jim Richardson, U.S.C.O.E. - N.O.D.
Orleans Levee Board
Design Engineering, Inc.
Lloyd Held, Eustis Engineering Co.
URS Company Files

PARTNERS
J. BRES EUSTIS
REG. C. E.
CHARLES A. BRAGG (1918-1979)
REG. C. E.
JOHN W. ROACH, JR.
REG. C. E.
GERALD A. BRAGG
REG. C. E.
LLOYD A. HELD, JR.
REG. C. E.

EUSTIS ENGINEERING COMPANY
SOIL AND FOUNDATION CONSULTANTS
BORINGS • TESTS • ANALYSES
3011 28TH STREET
METAIRIE, LOUISIANA 70002
P. O. BOX 8708
METAIRIE, LOUISIANA 70011
PHONE (504) 834-0157

OFFICERS
EUSTIS ENGINEERING CO., INC.
ASSOCIATED WITH
EUSTIS ENGINEERING CO.
CHAIRMAN OF THE BOARD
J. BRES EUSTIS
PRESIDENT
JOHN W. ROACH, JR.
CORP. VICE-PRESIDENT AND
CHIEF ADMINISTRATIVE OFFICER
GERALD A. BRAGG
VICE PRESIDENT AND
CHIEF ENGINEER
LLOYD A. HELD, JR.

17 September 1985

URS Company
Consulting Engineers
3500 North Causeway Boulevard
Metairie, Louisiana 70002

Attention Mr. Bruce Adams

Gentlemen:

Estimated Cost for
Professional Soil Engineering Services
Geotechnical Investigation
Pontchartrain Beach Floodwall and Levees
New Orleans, Louisiana

In accordance with your request of 5 September 1985, we are submitting our proposal for the performance of a geotechnical investigation for the subject project.

It is recommended that a total of eight (8) undisturbed sample type soil test borings be drilled to a depth of 75 feet each below the existing ground surface. Four of the borings should be sampled with a 3-in. diameter sampling barrel, and four of the borings should be drilled with a 5-in. diameter sampling barrel. In addition, we will install four (4) piezometers and perform field permeability tests in the sand strata at the site.

We propose to drill the soil borings with one of our truck mounted rotary type drill rigs, and undisturbed samples of cohesive or semi-cohesive soils will be obtained at close intervals or change in stratum using a 3-in. diameter thinwall Shelby tube sampling barrel. Standard Penetration Tests will be performed in cohesionless subsoils, when encountered. All samples will be sealed in moisture proof containers for preservation prior to laboratory testing.

Soil mechanics laboratory tests consisting principally of natural water content, unit weight, grain size analyses, either unconfined compression, unconsolidated undrained triaxial compression or consolidated undrained triaxial shear, Atterberg liquid and plastic limits and consolidation will be performed on representative samples obtained from the borings. These laboratory tests are necessary for the determination of the shear strength, permeability and the relative compressibility of the subsoils encountered.

Based on the results of the soil borings and laboratory tests, we will prepare an engineering report of findings and recommendations which will include a boring location plan, individual boring logs, summary of laboratory test data, discussion of ground water conditions, allowable pile load capacities for various types and embedments of piles, slope stability analyses for new levees, roadways and ramps, sheetpile analyses to determine penetration and pressure diagrams, seepage analyses for levees and walls, design of seepage berms and settlement analyses.

We propose to charge for the geotechnical investigation on a unit price basis in accordance with the schedule of fees shown on Enclosure 1, Sheets 1 through 6. Based on our experience on jobs of a similar scope of work, it is estimated that the overall cost for the soil borings, laboratory tests and soil engineering analyses and report of findings and recommendations will be on the order of $17,600.00. This cost estimate assumes that the borings will be accessible to truck mounted equipment and that the borings will either be staked in the field by others or can be easily located based on existing topographic features.

Eustis Engineering Company maintains $1,000,000 of professional liability insurance.

Thank you for asking us to submit this proposal for performing a geotechnical investigation for the subject project. We look forward to working with you on this project. We can initiate the soil borings within one week from authorization to proceed and it is estimated that the engineering report can be completed within four weeks from initiation of drilling operations.

Yours very truly,

EUSTIS ENGINEERING COMPANY

By Lloyd A. Held, Jr.
Lloyd A. Held, Jr.

LAH:bh

Enclosure 1 (6 Sheets)

EUSTIS ENGINEERING COMPANY
Soil and Foundation Consultants

FEES FOR PROFESSIONAL ENGINEERING SERVICES GEOTECHNICAL INVESTIGATIONS

Fees for soil test borings, soil mechanics laboratory tests, consulting, engineering analyses and reports of recommendations are on a unit price basis. Charges for marine equipment, clearing, and/or matting to reach the boring locations, and any detailed survey work required for accurately locating the borings are either on a unit price or direct cost basis plus 10%. These various prices are as follows.

(1) MOBILIZATION

Mobilization and demobilization of our drilling equipment and crewmen from New Orleans area to the job site and return. Prices per mile round trip for mobilization depend on the number and type of equipment and crewmen assigned to the individual job.

Equipment or Crewman	Average Mobilization Charge Per Mile Round Trip
Drill Rig	$0.58
Water Truck	0.33
Personnel Carrier	0.25
Driller	0.61
Driller's Helper	0.40
Soil Technician	0.66

(2) SOIL BORINGS (four crewmen including a soil technician)

Undisturbed soil test borings with 3-in. thinwall sampling every 5 feet or change in cohesive materials, including Standard Penetration Test with a 2-in. splitspoon sampler in cohesionless materials.

	Price Per Linear Foot Measured From Surface Of		
Boring Depth In Feet	Land	Marsh or Swamp	Water (Excluding Offshore)
0 - 100	$ 9.50	$13.50	$15.70
100 - 150	10.50	14.60	17.10
150 - 200	11.80	16.10	18.90
200 - 250	13.40	18.10	21.00
250 - 300	15.60	20.30	23.30
300 - 350	18.30	23.30	26.20
350 - 400	22.00	27.10	30.10

5-in. diameter sampling or 3-in. diameter continuous sampling, add 35% to the linear foot price.

(3) OFFSHORE BORINGS

Undisturbed soil test borings drilled in offshore waters with rig mounted on fixed drilling platform, including intermittent sampling of the various strata - Prices furnished on request.

(4) SPECIAL DRILLING (four crewmen including soil technician)

- (a) Borings made according to specialized specifications or time consuming methods; Sealing borings (plus cost of cement and drilling mud); Installation of special in-situ measuring devices such as piezometers, inclinometers, pore pressure transducers and extensometers (plus cost of material plus 10%) - each item $135.50 per hour.
- (b) For 5-in. diameter sampling or 3-in. diameter continuous sampling, add 35% to the linear foot price.
- (c) Wash borings in conjunction with undisturbed borings - $6.15 per linear foot.
- (d) Shallow auger borings made by hand operations (three crewmen including a soil technician and personnel carrier) - $648.80 per day.

(5) TRAVEL TIME

From office, or place of lodging, to site and return

Equipment or Crewman	Hourly Rate
Driller	$25.80
Driller's Helper	16.60
Soil Technician	27.70
Personnel Carrier	11.00

Note: When drilling on a linear foot price basis, one hour of travel time daily is included in the boring unit price for each drill crew.

(6) CONSULTING, PLANNING AND ENGINEERING ANALYSES

Consulting, planning, site reconnaissance, soil engineering analyses and computations, preparation of soil engineering reports of findings and recommendations as per the following per diem sliding scale.

Principals			$560.00	per day
Principal Engineers	$430.00	to	530.00	per day
Senior Engineers	350.00	to	430.00	per day
Engineers	290.00	to	350.00	per day
Associate Engineers	250.00	to	290.00	per day
Draftsmen	150.00	to	220.00	per day
Secretaries	14.00	to	21.00	per hour
Special Field Reconnaissance or Field Supervision	270.00	to	400.00	per day
Computer Rental			0.20	per second

(7) AUTOMOBILE EXPENSES

$24.00 per day plus 30¢ per mile or direct rental cost plus 10%.

(8) CLEARING

Bulldozer, if necessary, plus timber and crop damage - Direct cost plus 10%.

(9) LAND SURVEYS

Land survey work required for detailed location of borings and ground surface elevations - Direct cost plus 10%.

(10) LIVING EXPENSES

For engineering personnel - Direct cost;
For drilling crewmen (per man) - $45.00 per day

(11) MARINE EQUIPMENT

Marine equipment varies with job sites. For tug and barge, the direct cost is on the order of $1200 to $1300 per day, and for marsh buggy and pontoons, the direct cost is at least $500 per day - Direct cost plus 10%.

(12) MATTING AND/OR MOVING

Matting and clearing to and from the boring locations or moving and traveling between boring locations - $135.50 per hour.

(13) RIGGING UP AND RIGGING DOWN

Rigging up and rigging down of marine equipment for water, marsh or swamp borings to include time assembling and loading equipment - $124.40 per hour.

(14) AVERAGE HOURLY UNIT RATES

Average drilling crew rate dependent on the number of personnel and equipment utilized

Equipment or Personnel	Regular Time	Overtime
Drill Rig	$24.20	$24.20
Water Truck	14.00	14.00
Personnel Carrier	10.60	10.60
Driller	25.80	38.80
Driller's Helper	16.60	24.90
Soil Technician	27.70	41.50
Marine Insurance	6.00	6.00

(15) SUPPLIES AND EQUIPMENT

Extra supplies and equipment beyond that normally used for drilling and sampling operations; grouting materials for sealing borings; special in-situ measuring devices and freight - Direct cost plus 10%.

(16) TRAVEL EXPENSES

Airplane, train, bus, etc. - Direct cost plus 10%.

(17) INSURANCE

Any insurance requirements over and above those normally maintained such as naming the client as additional insured or providing waiver of subrogation - Direct cost plus 10%.

SOIL MECHANICS LABORATORY TEST PRICES

Angle of Repose	$ 6.65
Atterberg Liquid and Plastic Limits (one point method)	28.45
Atterberg Liquid Limit (one point method)	16.25
Atterberg Limits for Lime Stabilization (per specimen)	36.95
California Bearing Ratio (per specimen)	88.75
Compaction (optimum moisture)	88.75
Consolidation, regular (2-in. diameter specimen)	178.30
Consolidation, hysteresis loop (2-in. diameter specimen)	232.40
Grain Size Analysis, sieve or hydrometer	20.40
Grain Size Analysis, combined sieve and hydrometer	40.80
Maximum and Minimum Density (2" x 4" mold)	38.70
Organic Content	24.85
Permeability (2-in. diameter specimen)	43.30
Shear:	
Consolidated Undrained One Point Triaxial Compression	56.65
Consolidated Undrained Multiple Stage Triaxial Compression	68.25
Consolidated Undrained Direct Shear (per specimen)	45.60
Consolidated Drained Direct Shear (per specimen)	95.65
Unconfined Compression	22.70
Unconsolidated Undrained One Point Triaxial Compression	26.95
Unconsolidated Undrained Multiple Stage Triaxial Compression	38.70
Unconsolidated Undrained Direct Shear (per specimen)	36.35
Shrinkage Limit	24.85
Specific Gravity (absolute)	39.00
Swelling Pressure	61.15
Swelling Pressure, Percent of Swell (per point)	11.55
Unit Weight Determination (includes Water Content)	13.05
Vane Shear (miniature)	9.50
Visual Classification and Water Content	4.10

SOIL MECHANICS FIELD TEST PRICES

In-place density, in-place CBR, miniature vane shear, plate bearing, permeability and unconfined compression (3-in. high by 1.4-in. diameter) - Prices furnished on request.

SPECIAL LABORATORY SAMPLE PREPARATION AND SERVICES

Curves:	
Time-Settlement (per curve)	$ 11.95
Stress-Strain (per curve)	11.95
Mohr's Diagram (per curve)	11.95
Extruding Tube Sample and Preserving for Test	15.00
Hand Remolding Specimen	8.10
Hand Trimming Test Specimen	11.00
Remolding and Compacting Specimen	13.90

NOTE: All shear tests include water content and unit weight determinations and specimens are 3" in height by 1.4" in diameter. Prices for specialized consolidation, permeability or shear tests involving back pressure procedure, pore pressure measurement, long duration test or different size specimens can be furnished on request.

EUSTIS ENGINEERING COMPANY

GENERAL CONDITIONS
FOR
PROFESSIONAL ENGINEERING SERVICES
GEOTECHNICAL INVESTIGATIONS

1. INSURANCE AND INDEMNITY. We will carry the following liability insurance: workmen's compensation and employer's liability, comprehensive general liability, and comprehensive automobile liability, and we will furnish certificates of insurance on request. Within the limits and exclusions of such insurance, we agree to indemnify and save client harmless from all losses, claims, demands, causes of action, and suits arising out of our negligent acts or those of our officers, agents, employees, in performing at the work site the services undertaken hereunder, in furnishing and using equipment and materials at the work site, or in traveling to and from the work site. If client's contract places greater responsibility upon us or requires further insurance coverage, we, if specifically directed by client, will take out additional insurance (if procurable) at client's expense (Item 17 of Fee Schedule). It is understood that we do not indemnify client for damage arising out of client's use of our data, advice, recommendations and reports under the above insurance. It is expressly understood that our indemnity commitments under this contract shall not exceed the amount and extent of coverage of our insurance.

2. PAYMENT. Invoices will be submitted once a month for services performed during the prior month. Payment will be due on receipt of invoice. Interest will accrue at the rate of 1 percent per month for accounts which are over 60 days old.

3. RECORDS. All pertinent records relating to services performed hereunder shall be retained for three years after completion of the work. The client shall have access to the records at all reasonable times during this period.

4. RIGHT-OF-ENTRY. Unless otherwise agreed, client will furnish right-of-entry on the land for us to make the planned borings and surveys. We will take reasonable precautions to minimize damage by our equipment to the land and crops, but we have not included in our fee the cost of restoration or crop damage which may result from our operations. If client desires us to restore the land to its former condition and pay for crop damage, we will accomplish this and add the cost to our fee.

5. SAMPLES. All samples of soil and rock will be discarded 60 days after submission of our report unless the client advises us otherwise. Upon request, we will ship the samples in accordance with client's instructions, at client's expense, or will store them for agreed upon charges.

6. WARRANTY. The only warranty or guarantee made by Eustis Engineering Company in connection with its services performed hereunder is that we will use that degree of care and skill ordinarily exercised

under similar conditions by reputable members of our profession practicing in the same or similar locality. No other warranty, expressed or implied, is made or intended by our proposal for consulting services or by our furnishing oral or written reports of the findings made.

7. UTILITIES. If there are buried utilities in the area of our proposed operations the client will provide a location plan showing the existing utilities on the site where the explorations are to be made. We will use reasonable care and diligence to avoid the utilities as shown; however, client must agree to hold Eustis Engineering Company and its agents, officer, employees harmless for any damage which my be the result of inaccuracies in the plans or lack of plans relating to the location of underground utilities.

8. DELIVERY. It is agreed that Eustis Engineering Company will furnish its findings within a reasonable period of time. It is further understood that neither Eustis Engineering Company nor the client shall hold thee other responsible for any delays which are caused by events which are beyond the control of the other, or of the other's employees or agents. Some of these considerations being, but not limited to, Acts of God (natural disasters), strikes, lockouts, accidents or other events of this nature.

9. DISAVOWAL. Eustis Engineering Company specifically disavows the responsibility for design or construction review services relating to the safety precautions of any contractors or subcontractors who my be working on the project. It is specifically understood between Eustis Engineering Company and the client that Eustis Engineering Company will not be the supervising engineer of the project unless hired for that purpose.

FOR GENERAL CONDITIONS ITEMS 1 THROUGH 9

ACCEPTED BY: ______________________________

TITLE: ______________________________

DATE: ______________________________