LJA Engineering, Inc.

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JEFFERSON COUNTY
PLEASURE ISLAND SHORE PROTECTION
REVISED BREAKWATER-MARSH RESTORATION PROJECT

Addendum No. 2
Questions and Answers
March 15, 2013

This addendum addresses the questions asked during the mandatory pre-bid conference held on Tuesday, March 12, 2013 at 10:00 AM CST in the Engineering Department conference room at the Jefferson County Courthouse.

Item 1—Corrections:

Sheet As discussed at the meeting, the correct dimension for the width of the toe of the transition section (Sheet C-1010, Detail 2) is actually 5.48 ft **not the** 10.95 ft that is dimensioned on the drawing. This is simply a typographical issue and does not affect the quantities in the Bid Schedule.

Additionally, for clarification purposes, the breakwater sections shown in Detail 2 on Sheet C-1005 and the Type B circulation channel shown on Sheets C-1008 and C-1009 are included only for flexibility during construction, but **are not** used as a construction section or any other component of this project without Engineer approval.

Item 2:

The following are responses to questions posed prior to or during the Pre-Bid meeting:

1. **Question**: Is there a deadline for questions?

   Response: Answer given at the Pre-Bid meeting was close of business on **Thursday, March 14, 2013**. Questions received after this time cannot be assured of a response.

2. **Question**: Is there a required gradation for Core stone?

   Response: The design intent is that the Core material will occupy the volume between existing grade and Bedding Stone without consolidation, i.e., granular material. Bedding Stone meets this intent and may be used to form the Core, but Engineer will allow other materials that meet the design intent upon Contractor submittal.

3. **Question**: Is there a Buy American clause for this contract?

   Response: Yes. Federal funds are the primary funding source for the project. The Davis-Bacon Act regarding wage rates also applies.

4. **Question**: Is there Geotechnical information available? Will the Geotechnical Investigation report and Permit be made available?

   Response: Boring logs and geotechnical reports for several adjacent locations will be posted. The applicable USACE permit is attached.

5. **Question**: Is there a description for Control Monuments 1B and 2A?

   Response: The referenced control monuments are Concrete Monuments with 3” Brass Disks.

6. **Question**: Does the Warranty cover subsidence?

   Response: The warranty relates to defects in materials and workmanship. Contractor responsibility for vertical movement of materials after acceptance is limited to that caused by such defects. Care

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should be taken to limit disturbance of existing foundation soils that could result in excessive movement.

7. **Question**: Are there restrictions on the methods for dredging?

   Response: Mechanical excavation is expected for the structure toe. USACE permit and associated TCEQ water quality certification also apply. Prop washing of float channel is not likely to comply with TCEQ provisions and in any event must not degrade the 50 ft zone seaward of the structure toe.

8. **Question**: Can a contractor submit an alternate bond form?

   Response: Yes. A form is provided in the bid package for convenience only.

9. **Question**: Is there an anticipated date for Notice to Proceed?

   Response: NTP is typically issued at the conclusion of the pre-construction conference. Contract award is anticipated at the Commissioner's Court Meeting on the Monday following bid opening (March 25, 2013 based on March 19, 2013 bid opening). After approval by Commissioner's court, the Contractor has 10 days to finalize the contract. When the final contract is completed and approved, the pre-construction conference will be scheduled as quickly as is convenient for all stake holders.

10. **Question**: Is there a form to fill out the requested Subcontractor and Rock Supplier information?

    Response: A form for "Potential Rock Source and Potential Subcontractors'" is included in "**Exhibit C**" in this Addendum.

11. **Question**: Are rail weights acceptable?

    Response: Yes.

12. **Question**: Is there a flexibility in the +0.5' over, 0.0 under tolerances given the rock size?

    Response: Flexibility is provided in that the tolerances are averaged over a 100 sq ft area. Design intent is that the lines and grades be met or exceeded while limiting payment for overfill.

13. **Question**: Can Digtest/811 be used for utilities instead of One Call?

    Response: Yes.

14. **Question**: When was the last verification of depth?

    Response: The last survey of depths along the alignment of the breakwater was conducted in November, 2012.

15. **Question**: Is there a more specific criteria to determine satisfactory compaction of the embankment?

    Response: None other than that described in Section 31 23 00 of the Specifications.

16. **Question**: Can a hydraulic excavator be used to place stone?

    Response: Yes.

17. **Question**: Impacts of settlement on stone quantities?

    Response: Total project length may be adjusted to account for actual quantities. Funding constraints make it unlikely that additional materials will be required beyond the initially contracted amounts.

Item 3:

The following are responses to questions received after the Pre-Bid meeting:

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18. **Question**: At what point(s) in time will the warranty requirements be assessed? Once the project has achieved final acceptance upon completion of initial construction, at what interval(s) of time will the elevations or other criteria be measured to determine if additional construction will be required to comply with the warranty requirements? On previous breakwater construction projects we have completed, the settlement/movement of the breakwater was taken into account in the design and field adjustments made as necessary to achieve the intended product. It would be much more cost effective for this project to allow for all anticipated settlement in the initial construction work and achieve final and complete acceptance once construction was completed such that the bidder does not have to include additional costs for the potential to remobilize to re-construct portions of the work.

    Response: See response to Item 2.6 above.

19. **Question**: Do all warranty requirements end at the termination of one year from the date of initial acceptance or, does the warranty period extend to work conducted to comply with the initial warranty? In other words, is there a warranty period for the work conducted under warranty? At what point is the contractor relieved of all warranty obligations?

    Response: The warranty period would be extended only for the portion of the work redone.

20. **Question**: What is the criteria for "sound intrusion"? At what level of noise during what time of day will noise attenuation, if any, be required?

    Response: Engineer is not aware of any noise abatement requirements (such as City of Port Arthur requirements) between 7am and 10pm.

21. **Question**: Please provide all geotechnical data associated with the construction area including a map or coordinates of the boring locations.

    Response: See "Exhibit A".

22. **Question**: The contractor is required to maintain the constructed breakwater until acceptance. At what frequency will the completed construction work be accepted, daily, weekly?

    Response: Generally, monthly in association with payment applications detailed in Section 01 20 00.

23. **Question**: With regard to all surveying and other quality control requirements, at what frequency will inspection of delivered materials, staking, control point confirmation, inspection of areas to receive stone, and all other on site quality control requirements be conducted and approved?

    Response: Owner and Engineer will coordinate oversight at key times to keep pace with Contractor needs, recognizing that open excavations are subject to effects of ship wakes.

24. **Question**: The work area is known to be a very dynamic environment due to substantial and frequent induced tidal surge events caused by the passing of vessels. For what period of time will the contractor be obligated to maintain the structure prior to acceptance?

    Response: Generally, on a month to month basis associated with the payment application cycle.

25. **Question**: How much settlement is expected once the breakwater is installed?

    Response: The long term settlement anticipated per geotechnical information is on the order of 6 inches.

26. **Question: With regard to Alternates 1 and 2, will there be a lay down area available for these work sites and other land-based access points?**

    Response: Yes. Lay down areas will be coordinated among Contractor, Engineer, and Owner.

27. **Question**: In regard to potential settlement of the breakwater, how much settlement was assumed during the design phase in order to calculate the volume and overall tonnage for the project for the base bid and alternates? Can we assume that if additional settlement occurs prior to acceptance or

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prior to completion of the project, additional rock may be added as necessary and the contractor will be compensated for the additional tonnage?

Response: Quantities were not adjusted to account for settlement. See also response to Item 2.17 above.

28. **Question**: How is the excavation volume to be measured?

    Response: Pre- and post-excavation survey data.

29. **Question**: Is there bathymetry available for the Alternate work sites and a design illustrating existing conditions. Might the Type 2 cross section be applicable in the alternate construction areas due to deeper water?

    Response: Use of Type 2 is not intended and unlikely based on inspection of the site.

30. **Question**: Is the material dredged from the floatation channel to be placed on the landward side of the breakwater? If so, what confinement or other flow control measures are required?

    Response: The float channel material may be replaced in float channel.

31. **Question**: Is a Registered Professional Land Surveyor required to conduct all surveying for construction or will LJA Engineering conduct quality control of the contractor's survey technicians for construction and final acceptance criteria?

    Response: Not necessarily, but survey methods are subject to Engineer acceptance.

32. **Question**: The general notes on the Page entitled Breakwater Construction Notes refers to the float channel dredging. What are the required dimensions for the float channel?

    Response: The depth of the float channel is regulated by the USACE permit to a maximum of 8 ft. No width constraint is indicated. Engineer desires minimum disturbance to existing grade seaward of breakwater footprint consistent with Contractor's efficient execution of the work. Note the minimum clear-distance of 50 ft between the float channel and the toe of the breakwater that must be maintained for stability.

33. What material may be placed landward side of the breakwater, between the breakwater and the shoreline?

    Response: Generally, soil and concrete encountered during excavation may remain on site, subject to Engineer approval.

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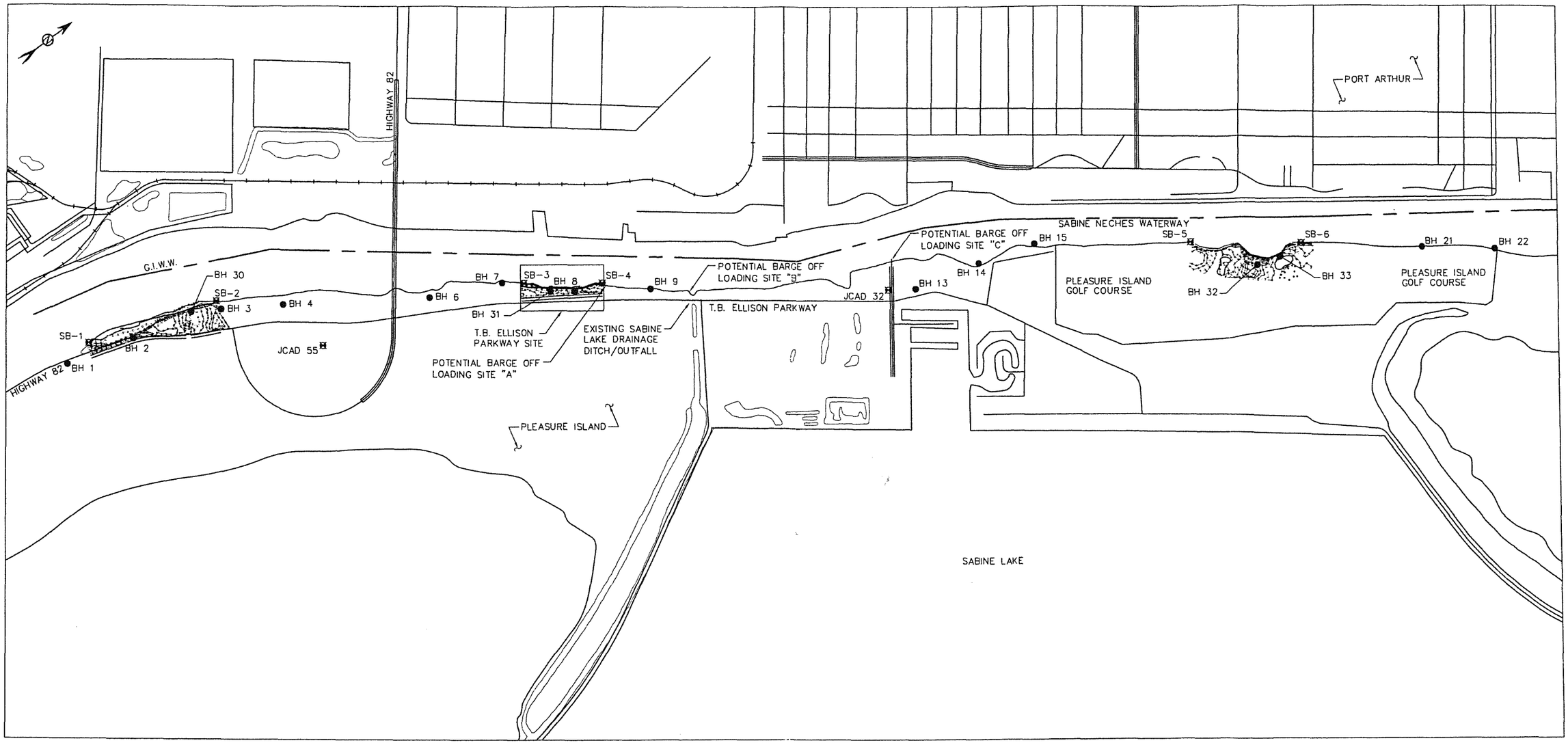
Addendum No. 2
Questions and Answers

Exhibit A

Geotechnical Information



NOTES:

1. SURVEY DATA
   HORIZONTAL DATUM: NAD83 (us feet)
   VERTICAL DATUM: NGVD29 (us feet)
2. SURVEY CONTROL POINTS ESTABLISHED BY SOUTEX SURVEYORS INC., PORT ARTHUR ON APRIL 23 to APRIL 27, 2001.
3. BATHYMETRIC SURVEY POINTS ESTABLISHED BY PS&J INC. ON FEBUARY 2001.
4. BOREHOLES BH-1 to BH-22 PER HVA ASSOCIATES PRELIMINARY GEOTECHNICAL ENGINEERING REPORT, MARCH 2001.
   BOREHOLES BH-30 to BH-34 PER FUGRO SOUTH GEOTECHNICAL ENGINEERING REPDRT, JUNE 2001.

TIDAL WATER LEVELS (NGVD29)

MEAN HIGHER HIGH WATER	+0.43'
MEAN SEA LEVEL	0.0'
MEAN LOWER LOW WATER	-0.62'

AREA MAP

SURVEY CONTROL BENCHMARK (SB)

POINT	NORTHING	EASTING
SB-1	13888036.5857	3568870.6499
SB-2	13889902.0520	3569483.9062
SB-3	13893701.0456	3571952.0969
SB-4	13894616.6423	3572630.4832
SB-5	13901907.4925	3577310.7639
SB-6	13903210.1336	3578305.3826
JCAD 32	13897944.3040	3575218.2111
JCAD 55	13890785.5850	3570932.4810

NOTE:
- JCAD 32 (TEXAS SOUTH CENTRAL ZONE) ELEV. 7.449 (NGVD 1929) THIS MONUMENT WAS USED FOR VERTICAL CONTROL
- JCAD 55 (TEXAS SOUTH CENTRAL ZONE) (NAD 83)

LEGEND:

C.S. = CHANNEL STATION
T.O. = TOP OF
B.O. = BOTTOM OF
= BOREHOLE
= BENCH MARK

STATE OF TEXAS
VLADIMIR J. SHEPSIS
87258
REGISTERED PROFESSIONAL ENGINEER

0 750 1,500
SCALE IN FEET

					DRAWING SCALE HALF SIZE
DESIGNED BY	K.G.				
ENTERED BY	K.G.				
CHECKED BY	S.P.				JOB NUMBER 0887
PROJ. ENGR.	H.B.				
		6/19/01	FOR BID	S.P.	CONTRACT NO.
		DATE	REVISION	BY	

JEFFERSON COUNTY ENGINEERING DEPT.
Jefferson County Courthouse
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PLEASURE ISLAND EMERGENCY STABILIZATION PROJECT T.B. ELLISON PARKWAY SITE

AREA MAP

REFERENCE SHEET NUMBER

SHEET 2 OF 4 SHEETS

FUGRO SOUTH, INC.

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Fax: (409) 840-5553

Report No. 0405-1191-1
June 22, 2001

Pacific International Engineering
310 Waterfront Park Building
144 Railroad Avenue
Edmonds, Washington 98020

Attention: Mr. Shane Phillips, P.E.

Geotechnical Study
Shoreline Stabilization Project
Pleasure Island
Jefferson County, Texas

Introduction

Fugro South, Inc. is pleased to submit this report of our geotechnical study for the above-referenced project. We performed the work for this study under Pacific International Engineering Subconsultant Agreement (Reference Number 0887-210) dated effective May 14, 2001. We performed this study in general accordance with our Proposal No. 0405-7000-603 dated May 15, 2001.

This report contains records of the field and laboratory work performed for this study. A subsequent report (Report No. 0405-1191-2) will provide discussions on our engineering analyses and our recommendations to guide the geotechnical aspects for the *Shoreline Stabilization Project* at Pleasure Island in Jefferson County, Texas.

Project Description. We understand that Pacific International Engineering is participating in the design of shoreline protection for segments of the western side of Pleasure Island, which is located in Port Arthur, Texas. The shoreline protection will be constructed along the Sabine-Neches Canal at three segments deemed critical. The locations are adjacent to the planned golf course, the T. B. Ellison Parkway, and Cajun Cabins. The approximate site locations are shown on the vicinity map presented on Plate 1.

A bulkhead may be constructed at the golf course site. Rock revetments will be constructed at the T. B. Ellison Parkway and Cajun Cabins sites. The revetments will be placed on the existing shoreline slope or on one of two proposed alternative shoreline slopes.

HVJ Associates, Inc. of Houston, Texas previously conducted a geotechnical study near the three critical project sites. We understand that twenty-two borings were conducted at approximately 1,000 ft intervals along the entire project length. The borings for this study were drilled at locations between the previous study boring locations considered by Pacific International Engineering most

critical. The results of the HVJ Associates, Inc. study were presented in HVJ Report No. 00-253G-00.

Purposes and Scope of Work. The purposes of our study were to explore subsurface soil and groundwater conditions at the project sites and to provide information to aid others in the design and shoreline stabilization at each project site. The results of the field and laboratory exploration are presented in this report. The results of our analyses and recommendations for design and construction will be presented in the subsequent report. The following was conducted in preparation of this report:

- drilling and sampling four borings at specified sites to explore subsurface soil and groundwater conditions and obtain soil samples for laboratory testing;
- performing laboratory tests on recovered soil samples to assess pertinent geotechnical engineering properties; and
- preparing this engineering report summarizing our findings and recommendations.

Environmental assessment, compliance with State and Federal Regulatory requirements, assessment of potential migration, and/or environmental analyses were beyond the scope of this study. A geological fault study was also beyond the scope of this study.

Applicability of Report. The explorations and analyses for this study, as well as the conclusions and recommendations in this report, were selected or developed based on our understanding of the project as described above. If pertinent details of the project differ from the descriptions provided in this report, we should be authorized to review the discrepancies and, if necessary, to modify our conclusions and recommendations.

We have prepared this report exclusively for Pacific International Engineering and Jefferson County to guide others in the design and construction of bulkheads and rock revetments for the *Shoreline Stabilization Project at Pleasure Island*. We have conducted this study using the standard level of care and diligence normally practiced by recognized engineering firms now performing similar services under similar circumstances. We intend for this report, including all illustrations, to be used in its entirety. The observations, conclusions, and recommendations provided in this report might not be applicable at locations not explored by borings or in areas outside the project boundaries. This report should be made available to prospective contractors for information only and not as a warranty of the subsurface conditions.

Field Exploration

Our field activities are discussed in this section. We have included discussions on drilling and sampling methods, depth-to-water observations, and borehole completion.

General. Fugro South, Inc. explored subsurface soil and groundwater conditions at the project site on May 18, 2001 and May 22, 2001 by drilling four borings. At the Cajun Cabins site, Boring B-1 was drilled to a depth of 40 ft below the ground surface; Boring B-2 at the T.B. Ellison Parkway site was drilled to a depth of 30 ft below the ground surface; and Borings B-3 and B-4 at the Golf Course site were drilled to a depth of 40 ft and 20 ft below the ground surface respectively. Representatives of Pacific International Engineering selected the boring depths and locations. Fugro representatives located the borings in the field based on surveying stakes placed by Pacific International Engineering representatives. The approximate locations of the borings, labeled Borings B-1 through B-4, are shown on Plates 2a through 2c. The approximate station numbers and surface elevations for the borings based drawings provided by Pacific are presented on the boring logs provided on Plates 3 through 6.

Drilling and Sampling Methods. The borings for this study were each drilled using dry-auger and wet-rotary drilling techniques. In the upper 10 ft, we sampled the soil at about 2-ft intervals. Below 10 ft, we obtained samples at about 5-ft intervals to the completion depth of the borings. Detailed descriptions of the soils encountered in the borings are presented on the boring logs provided on Plates 3 through 6. A key identifying the terms and symbols used on the boring log is presented on Plates 7a and 7b.

Cohesive soil samples were obtained by hydraulically pushing a 3-inch diameter, thin-walled tube sampler a distance of about 24 inches. Our field procedure for cohesive soil sampling was conducted in general accordance with the *Standard Practice for Thin-Walled Tube Sampling of Soils* (ASTM D 1587). The samples were extruded in the field and visually classified by our geotechnical technician. We obtained field estimates of the undrained shear strength of the recovered samples using either a hand-held penetrometer or Torvane. The penetrometer estimates of strength were modified for stiff to very stiff, overconsolidated, natural, cohesive soils, as described on Plate 7b. Portions of each recovered soil sample were placed into plastic bags or tubes for transportation to our laboratory.

Cohesionless samples were obtained using the Standard Penetration Test (SPT) as described on Plate 7b. This field procedure for soil sampling was in general accordance with the *Standard Method for Penetration Test and Split-Barrel Sampling of Soils* (ASTM D1586). Our geotechnical technician recorded the hammer blows for each sampling interval. The N-value, as described on Plate 7b, is recorded on the boring logs. Soil samples obtained from the split-barrel sampler were visually classified and placed in plastic bags for transportation to our laboratory.

Depth-to-Water Observations. Each boring was initially drilled using dry-auger techniques in an effort to identify the depth-to-water. When water was first encountered in Borings B-2, B-3, and B-4, drilling was halted and depth-to-water measurements were obtained. Depth-to-water observations were also made in Borings B-3 and B-4 after a period of about 15 minutes and in Borings B-1 and B-2 approximately 4 days after the borings were completed, when the crew

returned to the site to complete borings B-3 and B-4. A discussion on the interpreted groundwater conditions based on our depth-to-water observations is presented in the *General Site Conditions* section of this report.

Borehole Completion. The borings drilled for this study were each backfilled upon completion of drilling. Soil cuttings were used to backfill the sample borings.

Laboratory Testing

The laboratory testing program for this study was directed primarily toward evaluating the classification properties and undrained shear strength of the cohesive soils encountered in our borings. All of our laboratory tests were performed in general accordance with the appropriate standards as tabulated at the end of this section.

Classification Tests. The classification tests included tests for natural moisture content, liquid and plastic limits (collectively termed Atterberg Limits), and material finer than the No. 200 sieve. These tests aid in classifying the soils, and are used to correlate the results of other tests performed on samples taken from different depths and/or borings. The results of the classification tests are presented on the boring logs provided on Plates 3 through 6.

Undrained Shear Strength Tests. We measured the undrained shear strength of selected undisturbed-samples of cohesive soils by performing unconfined compression tests, and unconsolidated-undrained triaxial compression tests. Natural moisture contents and dry unit weights were determined as routine portions of the compression tests. The results of the undrained shear strength tests are presented on the boring logs provided on Plates 3 through 6.

Summary of Test Methods. The laboratory testing program conducted for this study is summarized in the table below.

TYPE OF TEST	NUMBER OF TESTS	TEST DESIGNATION
MOISTURE CONTENT	21	ASTM D 2216
MATERIAL FINER THAN THE NO. 200 SIEVE	7	ASTM D 1140
ATTERBERG LIMITS	9	ASTM D 4318
UNCONFINED COMPRESSION	3	ASTM D 2166
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION	9	ASTM D 2850

General Site Conditions

The interpreted site and subsurface soil conditions are discussed in this section. We interpreted the general site and subsurface conditions based on the results of our field exploration, laboratory testing, and our experience. This section also includes a discussion on the interpreted groundwater conditions.

Site Location and Description. The three project sites are located on the west shore of Pleasure Island in Jefferson County, Texas. The approximate locations of the sites are shown on Plate 1 (*Vicinity Map*). The approximate locations of the borings are shown on Plate 2 (*Plan of Borings*). The sites are generally covered with grass.

Subsurface Conditions. We encountered surficial, cohesive fill materials over natural, cohesive soils in our borings. The fill material was likely placed during construction of the island in 1910. The transition between the fill materials and natural materials is not readily apparent. Our interpretation of the transition between the fill and the natural soils was based on differences in undrained shear strength and on elevations provided to us.

The cohesive fill and natural soils consist of clay, sandy clay, and silty clay. Estimated and measured shear strengths range from about 0.5 ksf (soft) to about 2.7 ksf (very stiff) in the fill material and from about 0.3 ksf (very soft) to 1.7 ksf in the natural soils. Overall for the fill and natural soils, liquid limits range from about 26 to 62, plastic limits range from about 16 to 20, and the plasticity index ranges from about 6 to 46. In-situ moisture contents range from about 14 to 37 percent.

Additional subsurface information is provided on the boring logs presented on Plates 3 through 6. The results of field and laboratory testing are also presented on the boring logs.

Interpreted Groundwater Conditions. The water level was initially encountered in Borings B-2, B-3, and B-4 at a depth of about 12.5 to 18 ft below the ground surface. After about 15 minutes, the water levels in Borings B-3 and B-4 rose to depths of about 10 and 13.5 ft, respectively, below the ground surface. In Borings B-1 and B-2 observations after about 4 days indicated water levels at depths of about 8 to 14 ft below the ground surface.

Short-term water levels recorded in open boreholes may not represent a long-term condition. More accurate determinations of groundwater levels are usually made from long-term standpipe piezometer readings. Groundwater levels will fluctuate with seasonal variations in rainfall and surface runoff, especially during extended periods of heavy rainfall. It is possible that the groundwater level could rise to the natural ground surface during extended periods of heavy rainfall. The water in the adjacent waterway may also influence the water levels.

Variations in Subsurface Conditions. Our interpretations of the subsurface soil and groundwater conditions, as described in this report, are based on data obtained from our visual

observations, the sample borings, laboratory tests, and our experience. Although we have allowed for minor variations, our recommendations may not be appropriate for subsurface conditions other than those reported herein. It is likely that some undisclosed variations in soil or groundwater conditions may occur away from the boring locations. Should variations in our interpretations of subsurface soil and groundwater conditions be found, we recommend that we be notified and authorized to evaluate what, if any, revisions should be made to our recommendations.

* * *

The following illustrations are attached and complete this report:

	Plate
Vicinity Map	1
Plan of Borings	2
Log of Borings	3 through 6
Terms and Symbols Used on Boring Logs	7a and 7b

Closing

We appreciate the opportunity to be of continued service to Pacific International Engineering and Jefferson County, Texas. Please contact us if you have any questions concerning this report or when we may be of further service.

Sincerely,

FUGRO SOUTH, INC.

Jeffrey W. Williams, P.E.
Project Engineer

STATE OF TEXAS
JEFFREY WAYNE WILLIAMS
82122
REGISTERED
PROFESSIONAL ENGINEER
6-25-01

Copies Submitted: (3)

JWW/

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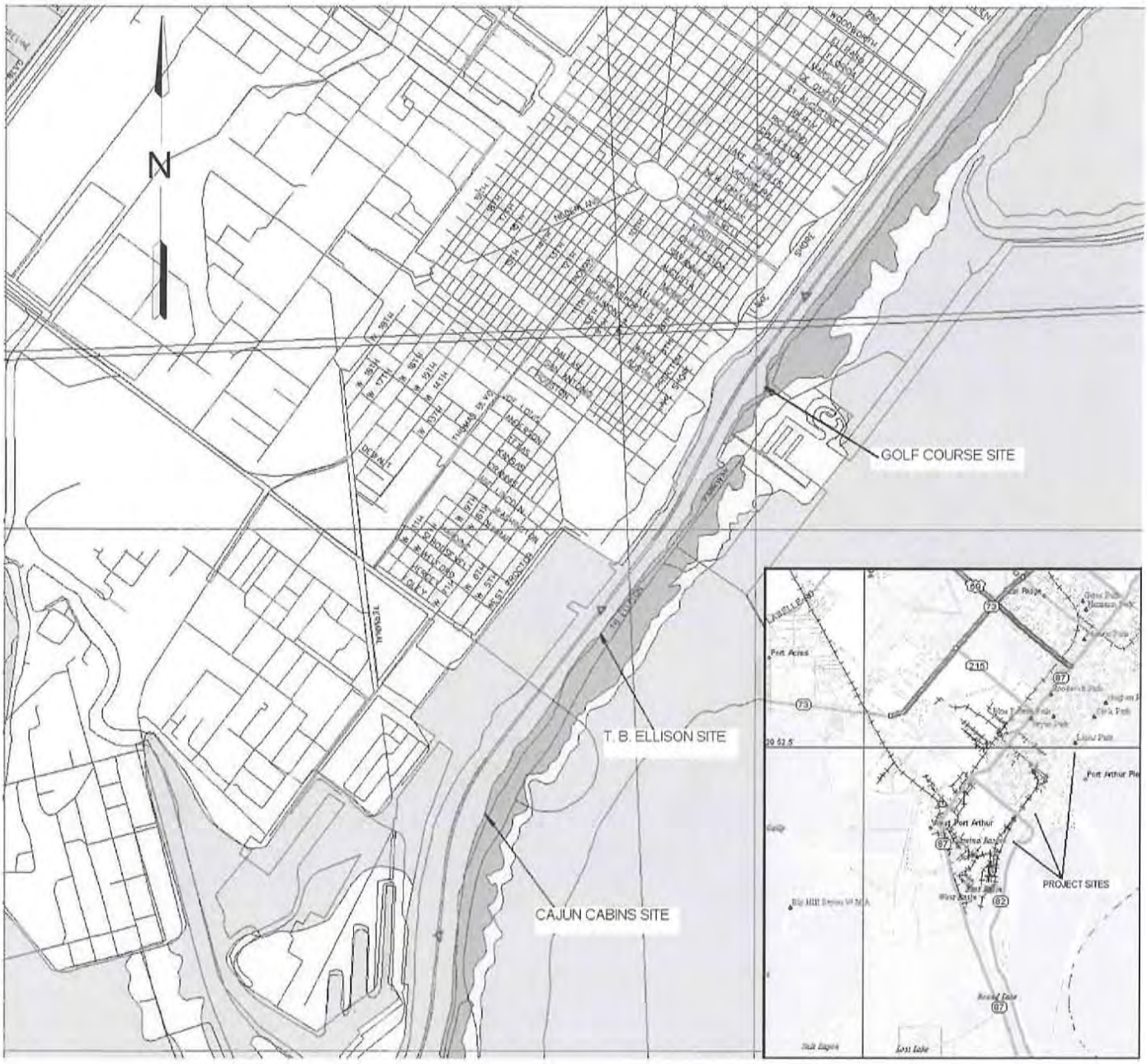
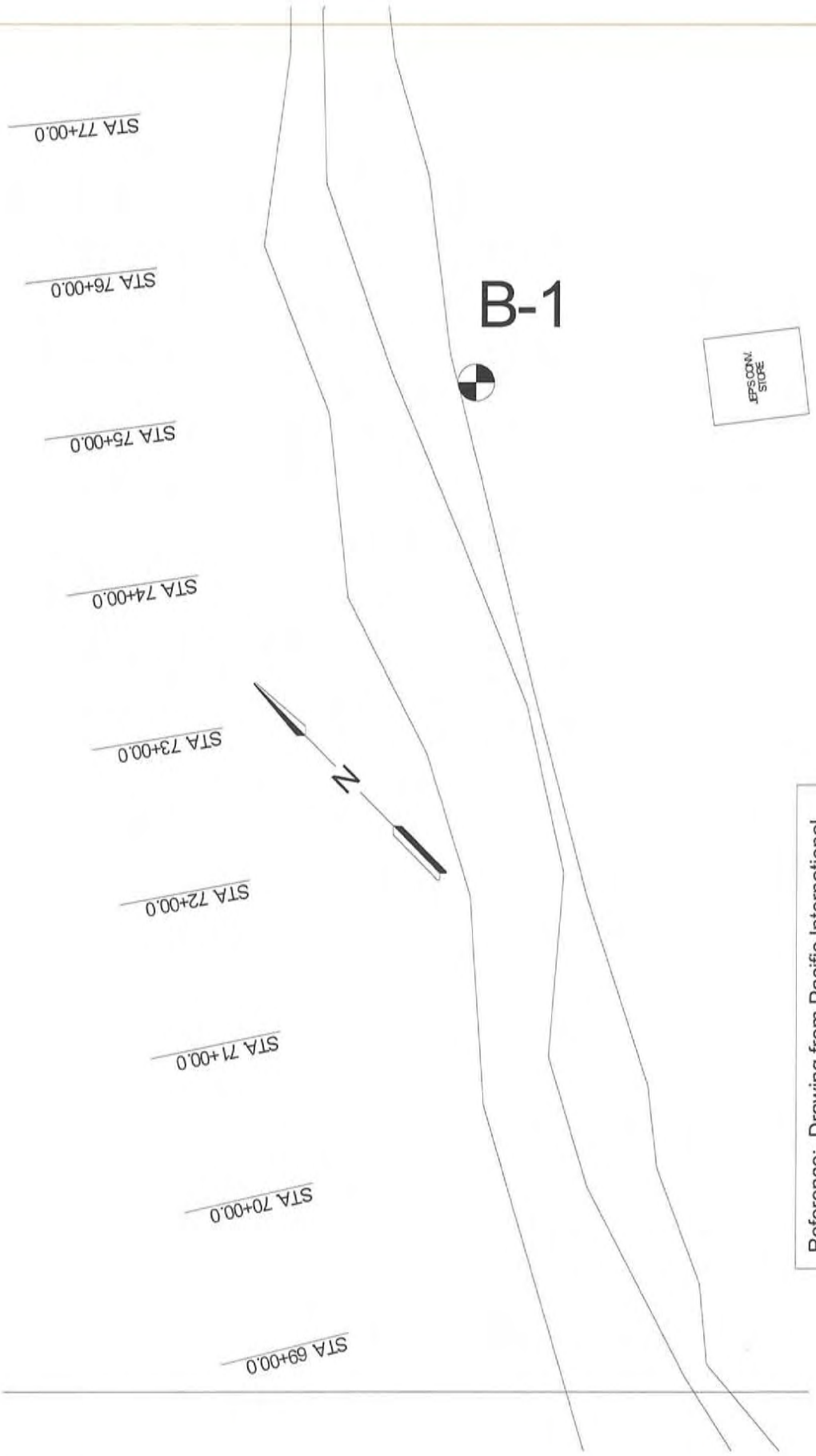


Reference: Drawing downloaded from http:/co.jefferson.tx.us/eng
June, 2001. Inset drawing from DeLorme Street Atlas USA
Version 5.0.

VICINITY MAP

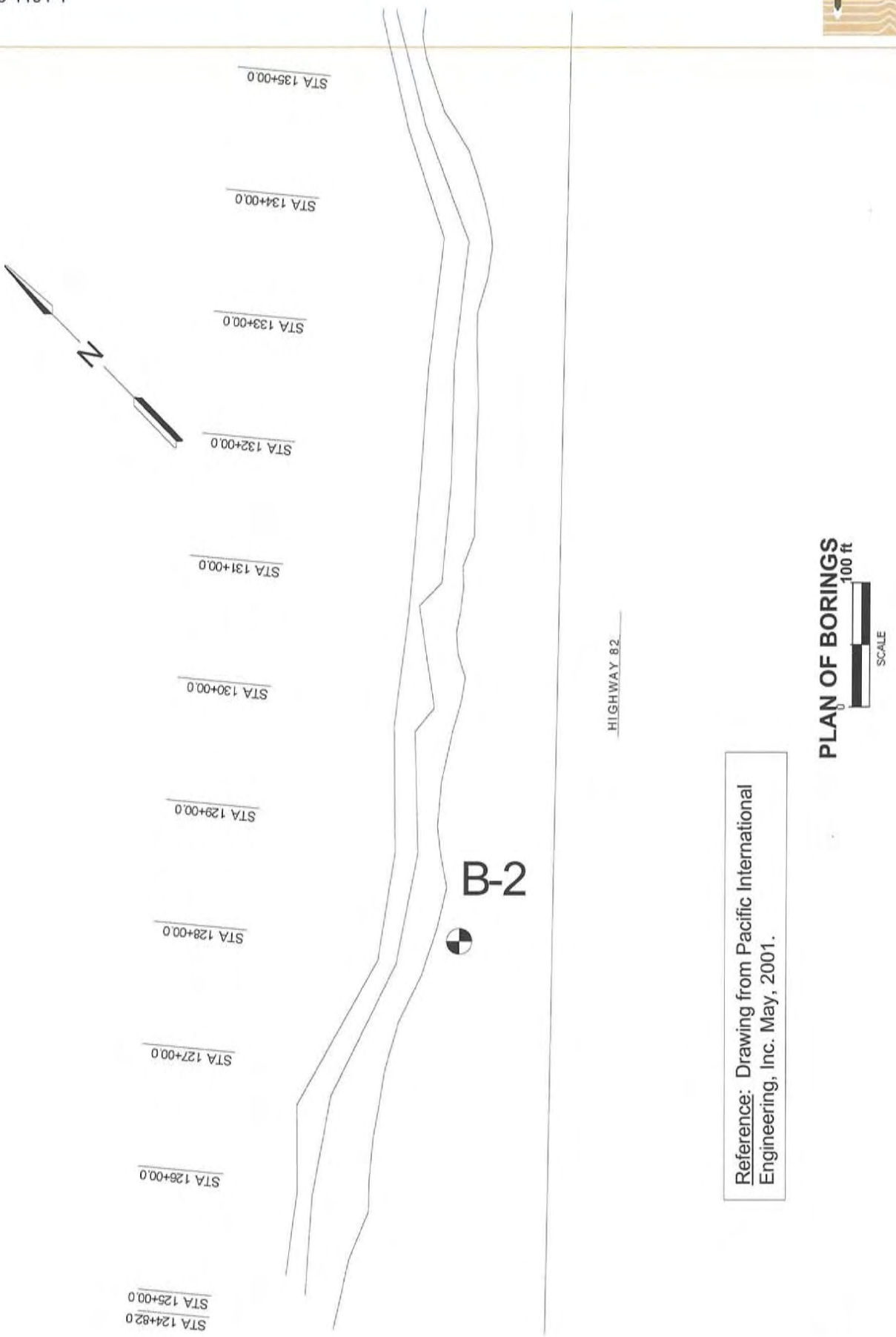
PLATE 1



PLAN OF BORINGS
0 100 ft
SCALE

Reference: Drawing from Pacific International Engineering, Inc. May, 2001.

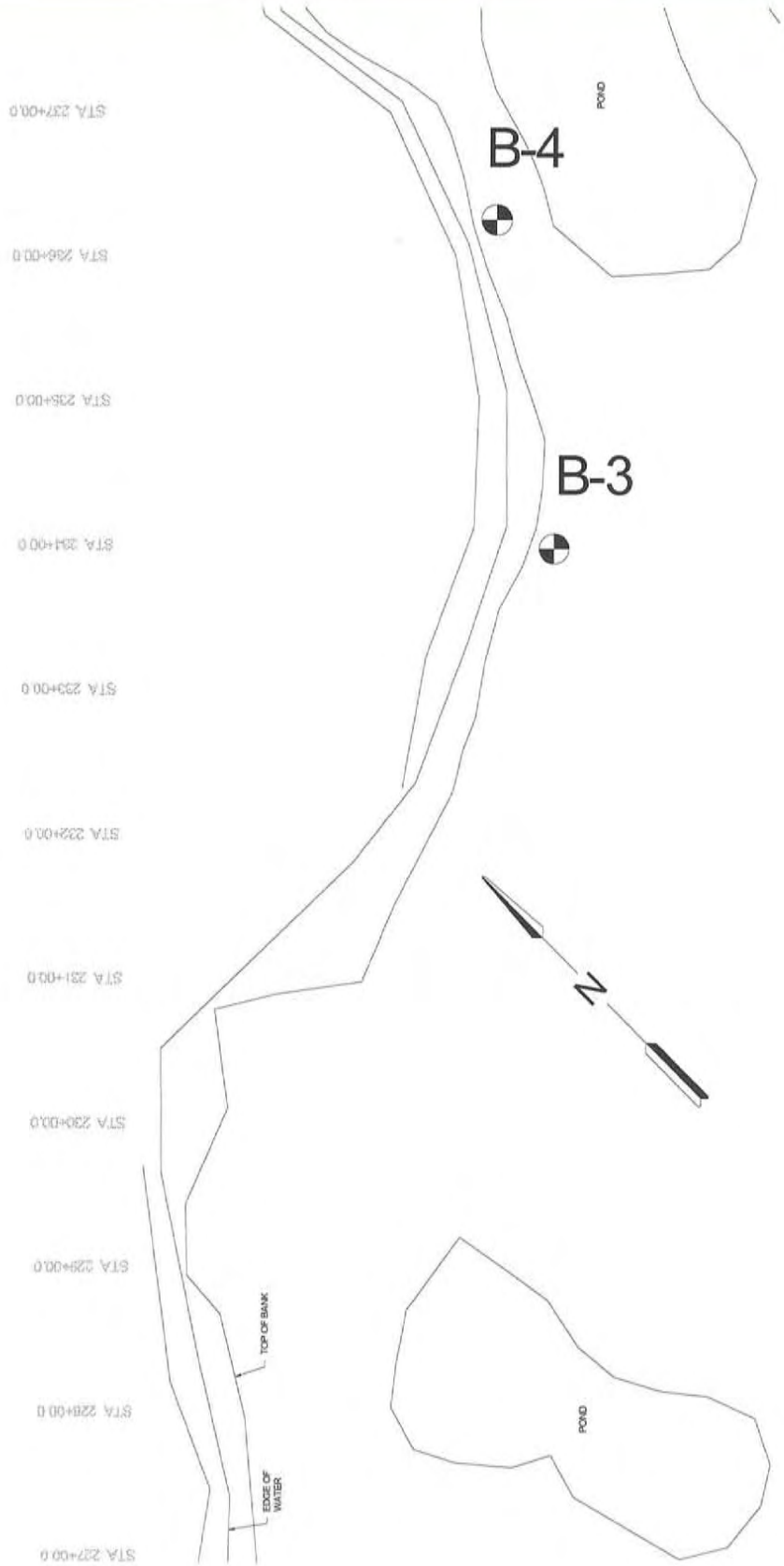
PLATE 2a



PLAN OF BORINGS
0 100 ft
SCALE

Reference: Drawing from Pacific International Engineering, Inc. May, 2001.

PLATE 2b



PLAN OF BORINGS
0 100 ft
SCALE

Reference: Drawing from Pacific International Engineering, Inc. May, 2001.

PLATE 2c

LOCATION: See Plates 1 and 2
COORDINATES: Sta. 75+00

SURFACE EL.: 19'

DEPTH, FT	STRATUM DESCRIPTION	STRATUM DEPTH, FT	UNIT DRY WT, PCF	PASSING NO. 200 SIEVE, %	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX (PI)
0	FILL: CLAY, very stiff, brown, with rootlets and calcareous nodules							
	- soft to stiff, light brown and light gray, 3 to 5'		85		25 30	60	18	42
5	- brown and light brown, slightly sandy, 5 to 7'							
	- firm below 6'							
	- gray below 7'							
	SANDY CLAY, soft to firm, gray	8.0	87		32			
10								
	- firm to stiff below 13'							
15								
	- brown, with light gray clay pockets below 18'		99		28 34	52	16	36
20								
	- gray below 23'			85				
25								
	CLAY, firm, light gray and light brown	29.0						
30								
	- stiff, brownish-red with calcareous nodules and sand pockets below 33'							
35								
	SANDY CLAY, firm to stiff, brownish-red	38.0						
40		40.0	92		28			

SHEAR STRENGTH
□ Penetrometer ▼ Unconfined
◇ Torvane ● Triaxial
△ Field Vane ▲ Miniature Vane
KIPS PER SQ FT
0.5 1.0 1.5 2.0 2.5

NOTES:
1. ▼: Depth To Water after 4 days.
1. Groundwater not encountered during dry auger drilling.
2. Terms and symbols defined on Plates 7a and 7b.

DATE: May 18, 2001
TOTAL DEPTH: 40.0'
CAVED DEPTH: 21.5'
DRY AUGER: 0 to 20'
WET ROTARY: 20 to 40'
BACKFILL: Soil Cuttings
LOGGER: R. Deitzel

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LOG OF BORING NO. B-1
SHORELINE PROTECTION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 3

LOCATION: See Plates 1 and 2
COORDINATES: Sta. 128+00

SURFACE EL.: 15'

DEPTH, FT	WATER LEVEL	SYMBOL	SAMPLES	BLOWS PER FOOT	STRATUM DESCRIPTION	STRATUM DEPTH, FT	UNIT DRY WT, PCF	PASSING NO. 200 SIEVE, %	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX (PI)
					FILL: SANDY CLAY, very stiff, dark brown, with calcareous nodules		116		12			
					FILL: CLAY, stiff to very stiff, dark brown with sand pockets	2.0						
5									21	45	17	28
							100		24			
10												
				WOH	- very soft, with sand seams, 13 to 15'			47				
15					SANDY CLAY, very soft, brown	15.0						
				1				67		26	20	6
20												
				2	CLAY, very soft, light gray and dark gray, with sand pockets	23.0				59	18	41
25												
					- firm to stiff, brownish-red, slightly sandy		101		29			
30						30.0						
35												
40												

CLASSIFICATION

SHEAR STRENGTH

□ Penetrometer ◇ Torvane △ Field Vane
Unconfined▼ Triaxial● Miniature Vane▲
KIPS PER SQ FT
0.5 1.0 1.5 2.0 2.5

NOTES:
1. ▽: Water First Noticed. ▼: Depth To Water after 4 days.
2. Terms and symbols defined on Plates 7a and 7b.

DATE: May 18, 2001
TOTAL DEPTH: 30.0'
CAVED DEPTH: 13.3'
DRY AUGER: 0 to 20'
WET ROTARY: 20 to 30'
BACKFILL: Soil Cuttings
LOGGER: R. Deitzel

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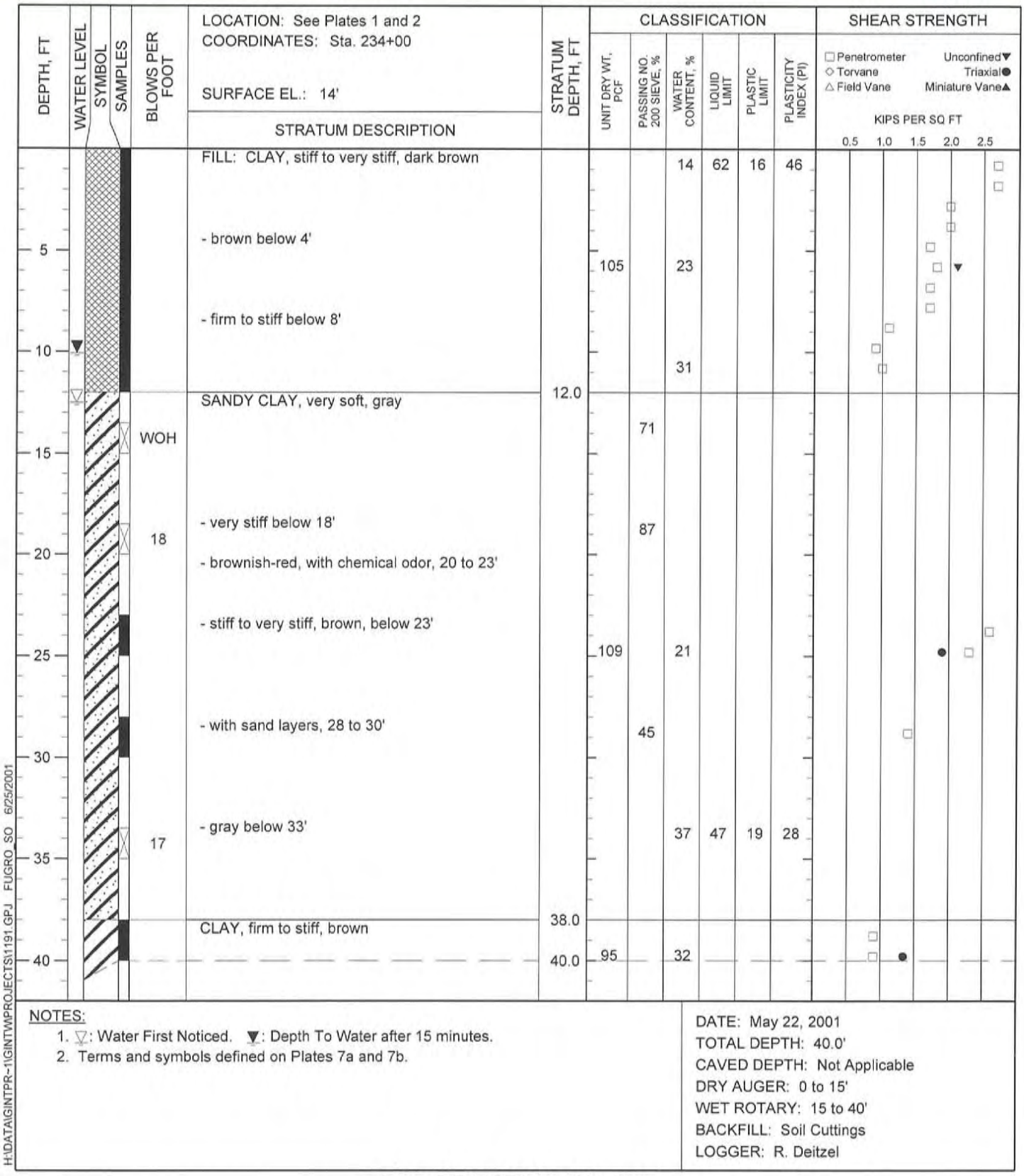
LOG OF BORING NO. B-2
SHORELINE PROTECTION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 4



NOTES:

1. ▽: Water First Noticed. ▼: Depth To Water after 15 minutes.
2. Terms and symbols defined on Plates 7a and 7b.

DATE: May 22, 2001
TOTAL DEPTH: 40.0'
CAVED DEPTH: Not Applicable
DRY AUGER: 0 to 15'
WET ROTARY: 15 to 40'
BACKFILL: Soil Cuttings
LOGGER: R. Deitzel

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LOG OF BORING NO. B-3
SHORELINE PROTECTION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 5

LOCATION: See Plates 1 and 2
COORDINATES: Sta. 236+00

SURFACE EL.: 7'

DEPTH, FT	STRATUM DESCRIPTION	STRATUM DEPTH, FT	UNIT DRY WT, PCF	PASSING NO. 200 SIEVE, %	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX (PI)
0	FILL: CLAY, stiff to very stiff, brown				17	51	18	33
	- with calcareous nodules to 4'							
	- with rootlets to 2'		94		26			
10	SILTY CLAY, soft to firm, brown	10.0	88		28			
	- with calcareous nodules, 13 to 15'				24	44	26	18
15	- gray below 15'							
	- firm to stiff below 18'			94				
20		20.0	96		28			

SHEAR STRENGTH
□ Penetrometer ▼ Unconfined
◇ Torvane ● Triaxial
△ Field Vane ▲ Miniature Vane
KIPS PER SQ FT
0.5 1.0 1.5 2.0 2.5

NOTES:
1. ▽: Water First Noticed. ▼: Depth To Water after 15 minutes.
2. Terms and symbols defined on Plates 7a and 7b.
3. * Sample failed at low strain.

DATE: May 22, 2001
TOTAL DEPTH: 20.0'
CAVED DEPTH: Not Applicable
DRY AUGER: 0 to 20'
WET ROTARY: Not Applicable
BACKFILL: Soil Cuttings
LOGGER: R. Deitzel

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LOG OF BORING NO. B-4
SHORELINE PROTECTION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 6

SOIL TYPES

Sand
Silt
Clay
Gravel
Silty Sand
Sandy Silt
Sandy Clay
Peat or Highly Organic
Clayey Sand
Clayey Silt
Silty Clay
Debris or Mixed Fill
Asphalt
Concrete

SAMPLER TYPES

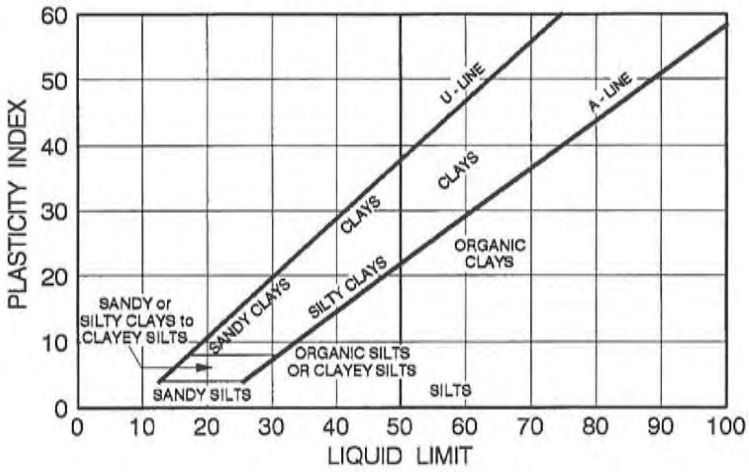
Thin-walled Tube
Partial Recovery w/ Tube
Auger
Split-barrel
No Recovery
Pitcher
Piston
Geoprobe
Rock Core

SOIL GRAIN SIZE

U.S. Standard Sieve

6"	3"	3/4"	4	10	40	200		
Boulders	Cobbles	Gravel		Sand			Silt	Clay
		Coarse	Fine	Coarse	Medium	Fine		
152	76.2	19.1	4.76	2.00	0.420	0.074	0.002	(mm)

PLASTICITY CHART



SOIL STRUCTURE

Slickensided	Having planes of weakness that appear slick and glossy.
Fissured	Containing shrinkage or relief cracks, often filled with fine sand or silt; usually more or less vertical.
Pocket	Inclusion of material of different texture that is smaller than the diameter of the sample.
Parting	Inclusion less than 1/8 inch thick extending through the sample.
Seam	Inclusion 1/8 inch to 3 inches thick extending through the sample.
Layer	Inclusion greater than 3 inches thick extending through the sample.
Laminated	Soil sample composed of alternating partings or seams of different soil type.
Interlayered	Soil sample composed of alternating layers of different soil type.
Intermixed	Soil sample composed of pockets of different soil type and layered or laminated structure is not evident.
Calcareous	Having appreciable quantities of carbonate.
Carbonate	Having more than 50% carbonate content.

TERMS AND SYMBOLS USED ON BORING LOGS

SOIL CLASSIFICATION (1 of 2)

PLATE 7a

FUGRO SOUTH, INC.

1850 IH-10 South
Beaumont, TX 77707

Tel : (409) 840-5551
Fax: (409) 840-5553

Report No. 0405-1191-2
September 4, 2001

Pacific International Engineering
310 Waterfront Park Building
144 Railroad Avenue
Edmonds, Washington 98020

Attention: Mr. Shane Phillips, P.E.

Geotechnical Study
Shoreline Stabilization Project
Pleasure Island
Jefferson County, Texas

Introduction

Fugro South, Inc. is pleased to submit this report of our geotechnical study for the above-referenced project. We performed the work for this study under Pacific International Engineering Subconsultant Agreement (Reference Number 0887-210) dated May 14, 2001. We performed this study in general accordance with our Proposal No. 0405-7000-603 dated May 15, 2001. This report provides our recommendations to guide the geotechnical aspects for the design of the *Shoreline Stabilization Project* at Pleasure Island in Jefferson County, Texas. Preliminary results of our analyses were submitted to Mr. Phillips during the course of this study. Comments received from Mr. Shane Phillips, P.E. were incorporated into our analyses and report.

The first phase of this project included the field exploration and laboratory testing programs. Results of the first phase of our work were presented in Fugro Report No. 0405-1191-1, dated June 25, 2001.

Project Description. Pacific International Engineering is participating in the design of shoreline protection for segments of the western side of Pleasure Island, which is located in Port Arthur, Texas. The shoreline protection will be constructed along three segments of the Sabine-Neches Canal. Segments are located adjacent to Cajun Cabins, T. B. Ellison Parkway, and the planned Golf Course. The Cajun Cabins and T. B. Ellison Parkway sites are located south of the Golf Course site. The site and boring locations are presented in Fugro Report No. 0405-1191-1 on Plates 1 and 2, respectively.

Rock revetments will be constructed at the Cajun Cabins and T. B. Ellison Parkway sites. The revetments will be placed on the existing shoreline slope or an alternative shoreline slope. We were asked to evaluate one alternative for the Cajun Cabins site that generally consists of a slope varying from about 2-horizontal to 1-vertical to 1.5-horizontal to 1-vertical and a rock revetment

placed at the toe. A bulkhead is planned for the Golf Course site. We understand that the maximum anticipated Sabine-Neches Canal water level for the 20 to 25 year project design life is about 5 ft above the existing slope toe elevation. Pacific International Engineering requested the following assumptions be made for our analyses.

- A 3 ft head differential for the drawdown condition where the tide and channel water level drops but the groundwater level remains the same;
- At the Cajun Cabins and T. B. Ellison sites, automobile parking will be no closer than about 5 ft from the upper edge of the slope and can be approximated by a 15-ft-wide, 200 psf surcharge pressure;
- Automobiles will not park adjacent to the slopes during storm events; and
- Automobiles will not park adjacent to the shore at the Golf Course site.

We were requested to provide geotechnical engineering recommendations for the design and construction of rock revetment structures at the Cajun Cabins and T. B. Ellison sites. The scope of our work is limited to providing geotechnical soil parameters and lateral earth pressure diagrams to be used by others in bulkhead design and evaluation of existing slopes against a global-type stability failure.

Purposes and Scope of Work. The purposes of this phase of our study were to: 1) provide information on soil properties and lateral earth pressures to aid others in the design of the Golf Course bulkhead, 2) to provide information to aid others in the design and construction of rock revetments at the Cajun Cabins and T. B. Ellison Parkway sites, and 3) evaluate stability of existing slopes against a global type failure. This study included the following:

- reviewing subsurface information contained in Fugro Report No. 0405-1191-1;
- analyzing the field and laboratory data from the previous study to develop geotechnical engineering recommendations to guide others in the design and construction of the bulkhead and rock revetments;
- performing engineering analysis to compute the factors of safety against soil failure for the existing slopes and for the planned Golf Course site slope; and
- preparing this engineering report summarizing our findings and recommendations.

Environmental assessment, compliance with State and Federal Regulatory requirements, assessment of potential migration, and/or environmental analyses were beyond the scope of this study. A geological fault study was also beyond the scope of this study. Design of planned bulkheads was also beyond the scope of this study.

Applicability of Report. The analyses for this study, as well as the conclusions and recommendations in this report, were selected or developed based on our understanding of the project as described above. If pertinent details of the project differ from the descriptions provided in this report, we should be authorized to review the discrepancies and, if necessary, to modify our conclusions and recommendations.

We have prepared this report exclusively for Pacific International Engineering and Jefferson County to guide others in the design and construction of bulkheads and rock revetments for the *Shoreline Stabilization Project at* Pleasure Island. We have conducted this study using the standard level of care and diligence normally practiced by recognized engineering firms now performing similar services under similar circumstances. We intend for this report, including all illustrations, to be used in its entirety. The observations, conclusions, and recommendations provided in this report might not be applicable at locations not explored by borings or in areas outside the project boundaries. This report should be made available to prospective contractors for information only and not as a warranty of the subsurface conditions.

Geotechnical Soil Parameters

We utilized the geotechnical soil parameters provided in this section in our slope stability analyses. The geotechnical soil parameters provided herein may also be used by others in designing sheet pile bulkheads. We estimated drained shear strength and angle of internal friction values based on our field observations, the results of laboratory testing (especially undrained shear strength testing), and our experience with similar soil and groundwater conditions. No advanced strength tests were conducted for this study. Estimates of total unit weight values are also provided herein. These total unit weight estimates are based on the results of laboratory testing and our experience. Estimates of shear strengths (undrained and drained), angles of internal friction, and total unit weight for onsite soils are tabulated on the following page.

Site	Material Description	Approx. Depth (ft)	Elev.	Saturated Unit Weight (pcf)	Short-Term (Undrained)		Long-Term (Drained)	
					Cohesion (psf)	Friction Angle (degrees)	Cohesion (psf)	Friction Angle (degrees)
Cajun Cabins	Clay Fill and Sandy Clay	0 to 15 ft		110	600	0	130	18
	Sandy Clay	15 to 30 ft		120	800	0	170	20
	Sandy Clay and Clay	30 to 40 ft		120	1,000	0	250	20
TB Ellison	Clay and Silty Clay	0 to 15 ft		110	1,500	0	300	20
	Silty Clay	15 to 25 ft		105	100	0	25	15
	Clay	25 to 30 ft		120	700	0	150	20
Golf Course	Clay	0 to 12 ft		120	1,500	0	300	20
	Sandy Clay and Silty Clay	12 to 20 ft		105	300	0	70	16
	Clay and Sandy Clay	20 to 40 ft		125	1,400	0	280	20

Lateral Earth Pressures

We were requested by Pacific International Engineering to provide a **net** lateral earth pressure diagram for an anchored sheet pile wall installed at the Golf Course site. We assumed the ground surface behind the bulkhead at EL+17, a 21 ft channel depth, and an anchor elevation of EL+14. We assumed a 3-ft water level differential between the channel water and the groundwater. The profile used in our analyses is presented on Plate 1.

We analyzed pressures assuming short-term (undrained) and long-term (drained) soil parameters. Our analyses with undrained soil parameters indicated larger lateral earth pressures as compared to the analyses with drained parameters. However, our analyses also indicated that drained parameters may govern the required sheet pile penetration. We have provided diagrams of active and passive lateral earth pressures based on undrained conditions and drained conditions on Plates 2a and 2b, respectively. We assumed factors of safety of 1.0 to compute active and passive earth pressures. Appropriate factors of safety should be applied.

The pressures presented on the lateral earth pressure diagrams were generated using CWALSHT, an Army Corps of Engineers program. Pressures were computed using the Free Earth Design method. The diagrams do not include pressures associated with surcharges. If surcharges are likely within about 40 ft of the wall, please contact us to conduct additional analyses. Appropriate factors of safety should be applied to the earth pressures during the design phase.

Recommendations for the design of the sheet pile wall were beyond the scope of this study. We did not perform any stability analyses for the bulkhead itself.

Stability Analyses

We evaluated the slope stability at each of the three designated segments based on our interpretation of the subsurface soil conditions encountered in the soil borings sampled for the first phase of this study (Fugro Report No. 0405-1191-1) and our experience with similar projects and soil conditions. We also evaluated the planned Cajun Cabins cross-section. We performed our analyses using the computer program PCSTABL and assumed a circular failure using Janbu's and modified Bishop's methods. The following loading conditions were analyzed in our global stability analyses:

- **Short-Term (Undrained) --** The short-term, or undrained, condition is applicable to situations before pore water pressures have dissipated, such as during and shortly following construction, as well as shortly following any significant loading. Analyses for this condition involves the use of undrained shear strength parameters as tabulated in the preceding section.
- **Long-Term (Drained) --** The long-term, or drained, case models the condition in which the pore pressures generated during construction and operation have dissipated. Analyses for this condition involves the use of drained shear strength parameters.
- **Earthquake --** Considering the location of this project (in an area of very low accelerations from very infrequent, distant earthquakes) we do not believe analysis for earthquake loading is warranted.

The slope geometry used in our analyses was based on the shoreline profile information provided to us by Pacific International Engineering. The cross-sections used in our analyses are presented on Plates 3, 4, and 5 for the existing conditions at the Cajun Cabins, T. B. Ellison, and Golf Course sites, respectively. The evaluation of the cross-section planned for the Cajun Cabins site is presented on Plate 6. Based on the soil conditions evaluated for this project, we consider a factor of safety of at least 1.25 to be suitable for permanent or sustained loading conditions.

Our analyses indicate that drained (long-term) conditions are critical for each site. We analyzed each shoreline segment assuming the groundwater was about 1 ft to 3 ft higher than the channel water level. As requested, we assumed the following in our analyses:

- A 3 ft head differential for the drawdown condition where the tide and channel water level drops but the groundwater level remains the same;

- At the Cajun Cabins and T. B. Ellison sites, automobile parking will be no closer than about 5 ft from the upper edge of the slope and can be approximated by a 15-ft-wide, 200 psf surcharge pressure and no automobiles will park adjacent to the slopes during storm events (thus no surcharge is to be considered); and
- Automobiles will not park adjacent to the Golf Course site.

Our analyses in these three segments indicate the existing slopes at the Cajun Cabins and T. B. Ellison sites are unstable against global failure. The existing Golf Course and planned Cajun Cabins sections are generally stable against global failure. The critical failure surfaces for the existing and planned cross-sections evaluated are presented on Plates 3 through 6. Critical factors of safety are tabulated below.

Site	Channel Water Elevation	Factor of Safety with No Surcharge	Factor of Safety with 200 psf Surcharge
Cajun Cabins Existing Conditions	0 ft	Less than 1	N/A
T. B. Ellison	0 ft	About 1	Less than 1
Golf Course	0 ft	1.4	1.2
Planned Cajun Cabins Section	0 ft	1.4	Not evaluated

Revetment Recommendations

This section provides our recommendations for the proposed rock revetment structures. Stability of the planned slopes should also be addressed.

Foundation Protection. In order to prevent removal of soils from below the revetments, protective measures should be incorporated into the design. The zone of scour and the location of the stability failure areas should be clearly identified to aid in determining the extent of protection.

We recommend overlaying a high strength geotextile fabric (such as Mirafi 700x or equivalent) on the underlying soils prior to placing the rock for the revetment. The geotextile fabric should act as a separator and filter between the revetment and the underlying soils. A fabric separator reduces the amount of fine-grained subgrade soils migrating from the support zone. As an option for

additional reinforcement, a geogrid may be incorporated into the design of the revetment structure. A geogrid will provide more stability and uniformity along the length of the structure. The geogrid should be placed directly above a geotextile fabric.

We also recommend that toe protection be provided as supplemental protection to the revetment structures. Toe stability is essential because failure of the toe will generally lead to failure throughout the entire structure. Ultimately, toe protection will help reduce the potential for waves and currents to scour and undercut the revetment.

In addition, revetment structures should be designed to provide flank protection. The edges of the system are typically the most vulnerable to scour and undermining. Flank protection is needed to limit vulnerability of the structure from the tendency of erosion to continue around the ends. The outer edges of the completed revetment system should be anchored to provide additional protection against damage. To protect the exposed edges, we recommend anchoring the ends in trenches excavated below grade along the edges, toe, and side edges of the completed system. The edges of the revetment should terminate in the perimeter trenches and backfill material should be placed to hold the edges in place to resist undermining. Soil anchors can be used in conjunction with the edge trenches to provide additional resistance to unraveling of the system. Extension of revetments past the point of active erosion should be considered. A second approach to provide additional resistance along the edges is to increase the size and weight at the perimeters. A thickened end section, similar to toe protection, can be used when the erosion rate is mild.

Construction Considerations. This section provides our recommendations for construction of the proposed revetment. "Long-reach" construction equipment should be used during revetment construction to minimize risk of damaging shoreline slopes and harm to equipment or personnel.

Site Preparation. The existing surface beneath the proposed revetment should be prepared properly prior to construction. Preparation should include removing the surficial vegetation, organic materials, debris, and other deleterious materials within the "footprint" of the proposed revetment. Removal should extend at least 2 ft beyond the "footprint" of the proposed revetment.

After stripping, the exposed surface should be observed by a geotechnical engineer. Areas that are observed to be soft, wet, weak, or contain deleterious materials should be overexcavated. The exposed surface should be protected from becoming dry and/or wet. If wet weather or extended dry periods deteriorate the surface whereby a good bond cannot be formed between the natural surface and any backfill, the earthwork Contractor should prepare the surface as necessary.

Toe Excavations. Details for open-cut slopes and excavation shoring based on soil type and groundwater conditions are provided in the latest amended OSHA federal regulations. We would be pleased to review the proposed excavation design systems before construction.

Excavations 4 ft deep or less are generally not required to be sloped back or braced, according to federal Occupational Safety and Health Administration (OSHA) requirements for excavations. We classified the near surface soils in accordance with our interpretation of the OSHA regulations and the subsurface conditions encountered in the borings performed for this study. Based on our borings, we classify the surficial fill materials and underlying natural cohesive soils likely to be encountered during revetment construction as Type C. Excavations deeper than about 4 ft should be either braced or sloped back no steeper than 1.5-horizontal to 1-vertical in Type C soils.

We recommend that a geotechnical engineer, or qualified representative, observe excavations. The engineer should compare the soils exposed with those encountered in the soil test borings and document the results. Any significant differences should be brought to the attention of the Owner's representative.

The bottoms of excavations should be as "dry" as possible and free of loose soil, ponded water, and debris prior to continuing construction. The excavations should expose competent soils. During construction, good surface drainage should be established to prevent surface water runoff from flooding the excavations. If the subgrade is softened by surface water intrusion, exposure to weather, or disturbance by construction activities, the softened material should be removed from the excavation bottom. Overexcavated materials should be replaced with lean concrete or the toe depth should be extended. Exposure to the environment can deteriorate the surface if the toe excavation remains open for extended periods.

Construction Monitoring

We recommend that a Geotechnical Engineer, or qualified representative, be present on-site during site preparation and revetment installation to evaluate the suitability of subgrade soils. On-site observations may also aid in recognizing and reconciling other unanticipated soil or groundwater conditions and ensure that design recommendations are appropriate and properly implemented during construction. We recommend that we be retained during the construction phases to provide materials testing and construction surveillance to: (1) observe compliance with the design concepts, specifications, and recommendations; (2) observe subsurface conditions during construction; and (3) perform quality control tests.

* * *

The following illustrations are attached and complete this report:

	Plate
Bulkhead Cross-Section for Golf Course Site	1
Net Lateral Earth Pressures for Golf Course Site Bulkhead	2a and 2b
Slope Stability Cross-Sections	
Cajun Cabins Site	3
T.B. Ellison Site	4
Golf Course Site	5
Planned Cajun Cabins Section	6

Closing

We appreciate the opportunity to be of continued service to Pacific International Engineering and Jefferson County. Please contact us if you have any questions concerning this report or when we may be of further service.

Sincerely,

FUGRO SOUTH, INC.

Jeffrey W. Williams, P.E.
Project Engineer

Kenneth W. Hill
Branch Manager

Copies Submitted: (3)
JWW/MH

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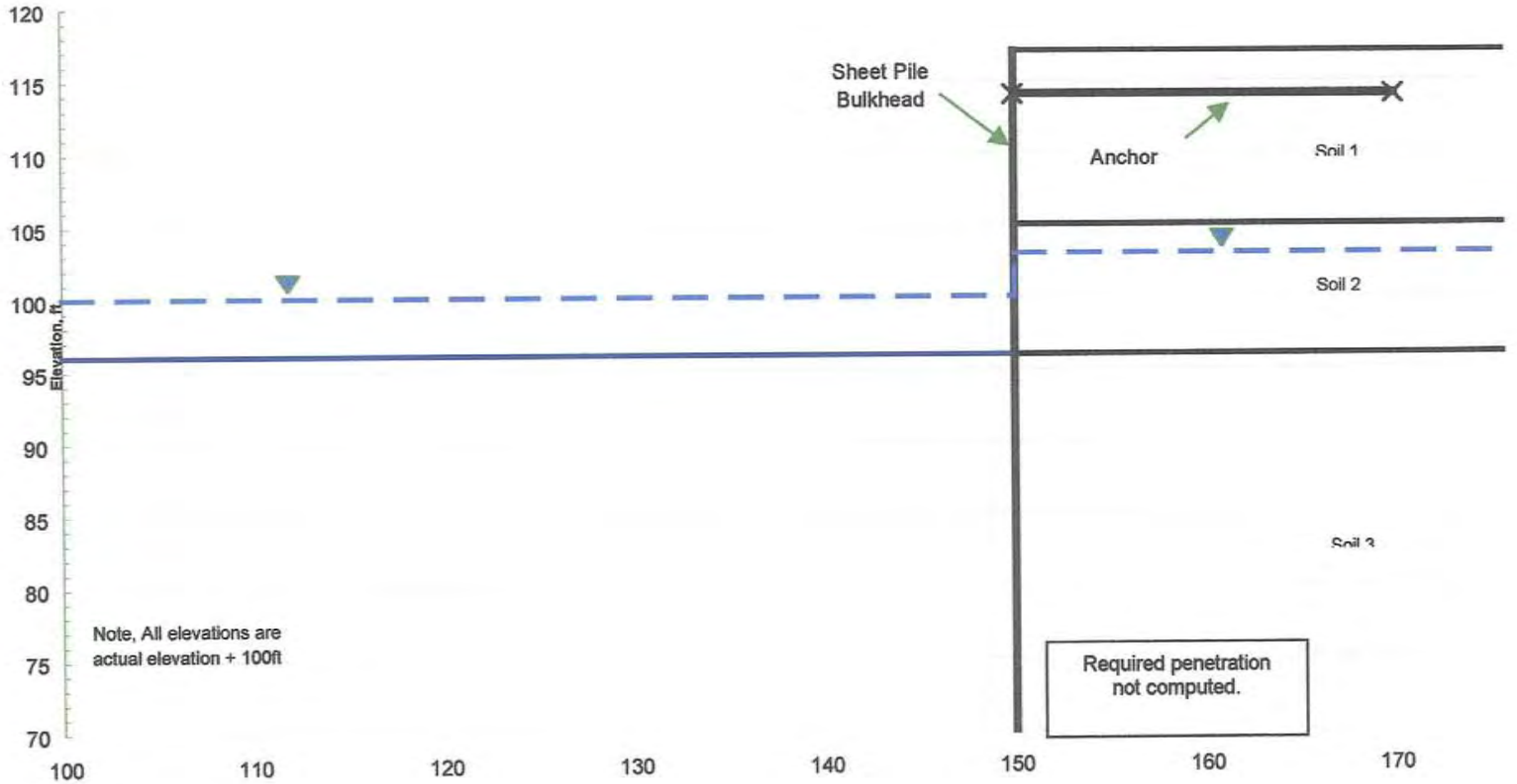
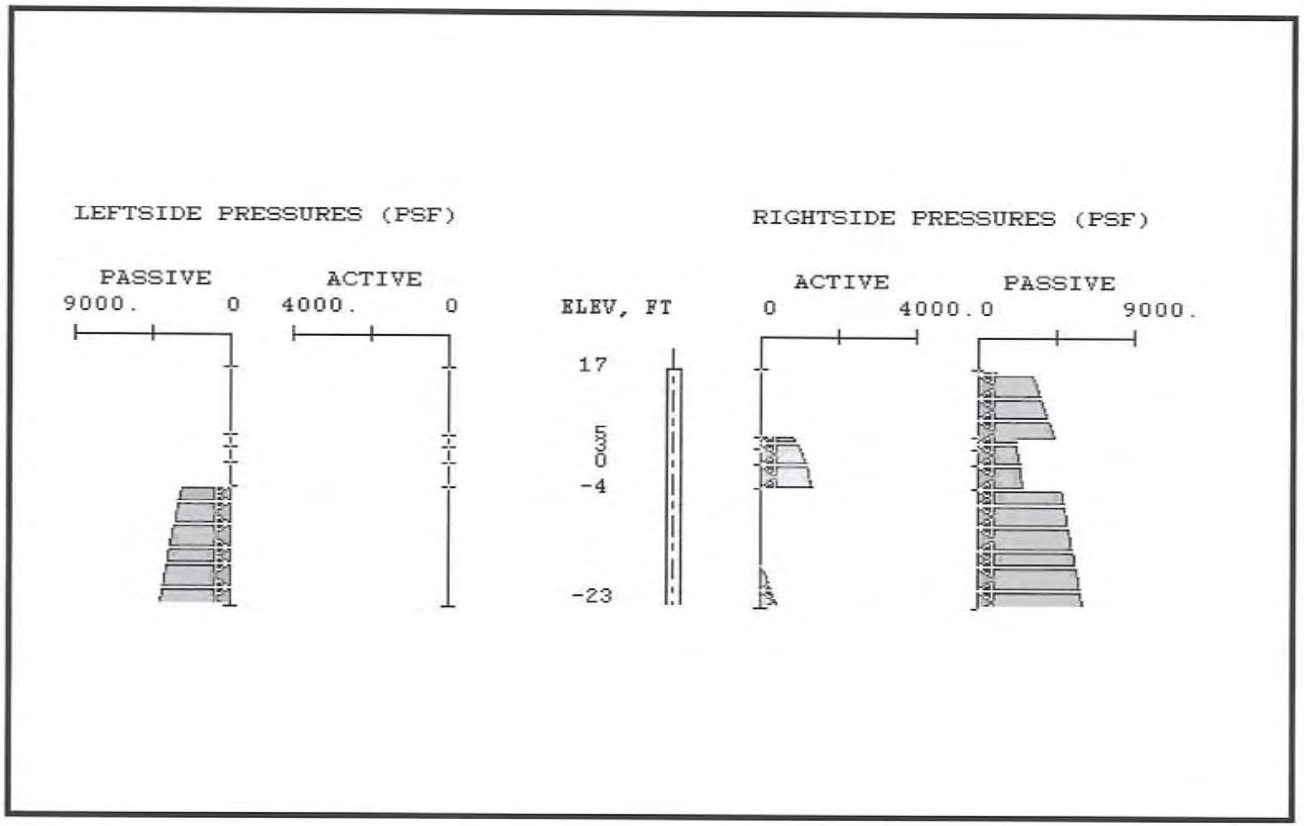


Notes:

1. Cross-section assumed for soil profile in lateral earth pressure computations.
2. Ground surface corresponds to EL+17 for our analyses.
3. Assumed 21 ft channel depth does not include a scour zone.
4. Pressures computed using CWALSHT design mode where sheet pile penetration depth is selected by the program.

BULKHEAD CROSS-SECTION FOR GOLF COURSE SITE
SHORELINE STABILIZATION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS



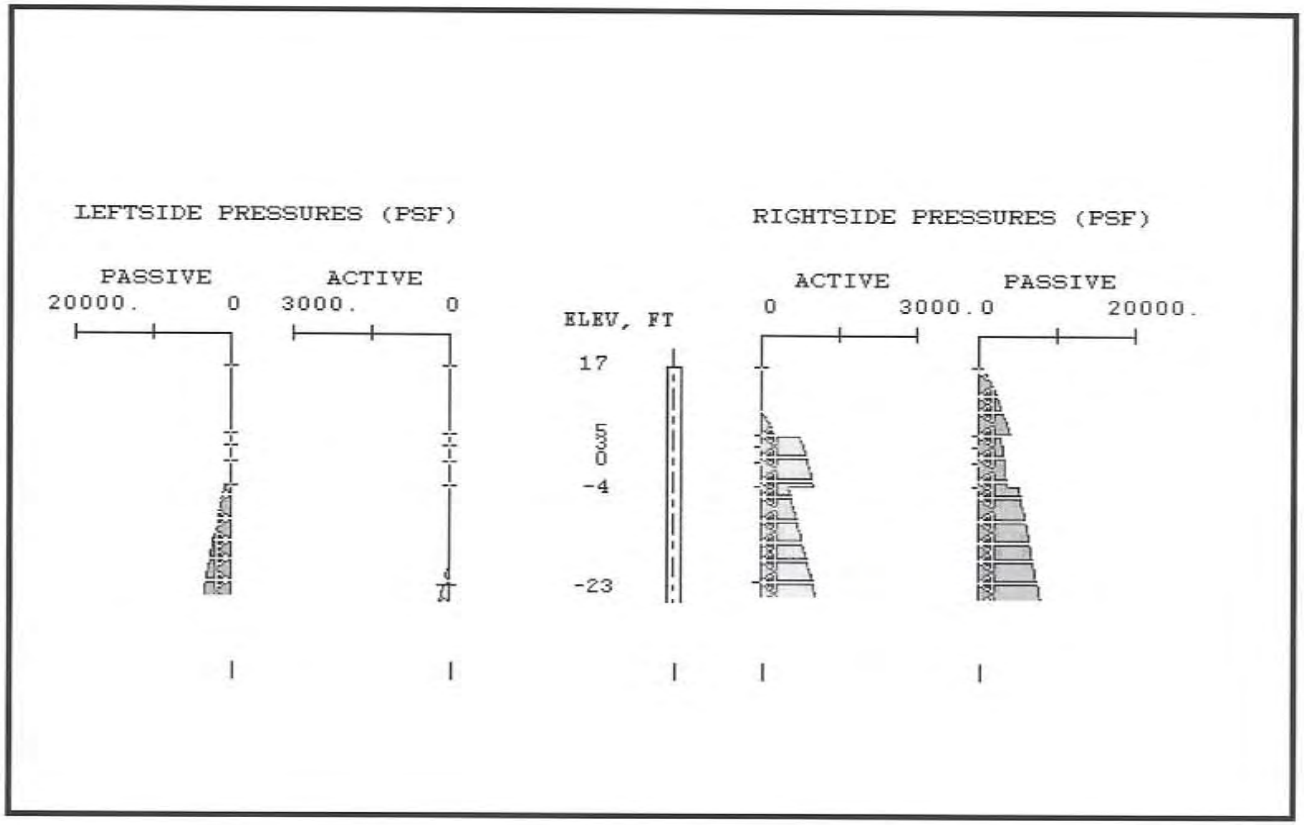
Notes:

1. EL+17 corresponds to ground surface behind bulkhead.
2. Computations assume 21 ft channel depth.
3. Assumes anchor at EL +14 ft.
4. Pressures are based on short-term (undrained) soil parameters.
5. Pressures do not include surcharge loading.
6. A factor of safety of 1.0 was used for active and passive conditions.
7. No internal stability analyses were performed for a bulkhead.

ACTIVE AND PASSIVE LATERAL EARTH PRESSURES (UNDRAINED CONDITIONS)

GOLF COURSE SITE
SHORELINE STABILIZATION PROJECT
PLEASURE ISLAND

PLATE 2a

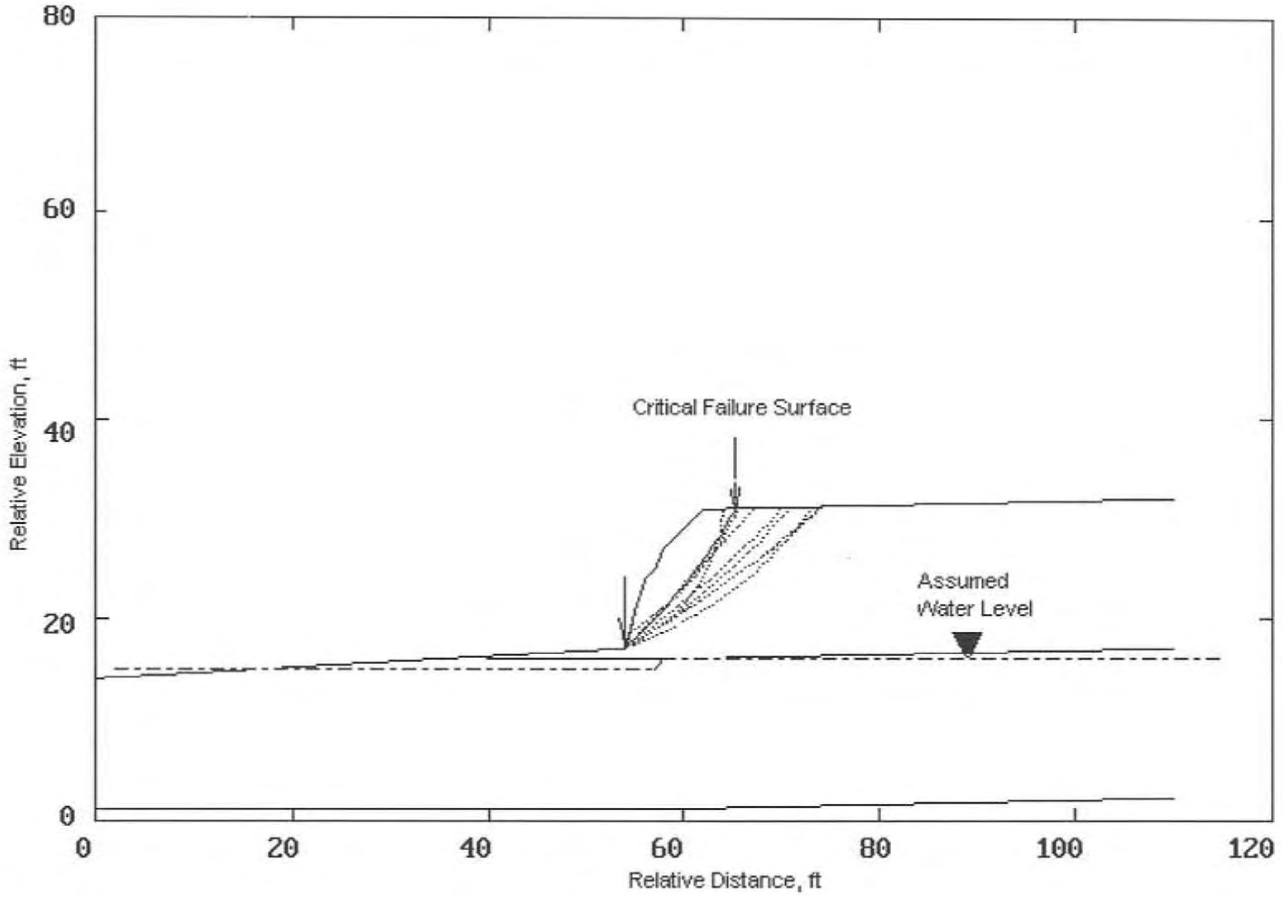


Notes:

1. EL+17 corresponds to ground surface behind bulkhead.
2. Computations assume 21 ft channel depth.
3. Assumes anchor at EL +14 ft.
4. Pressures are based on long-term (drained) soil parameters.
5. Pressures do not include surcharge loading.
6. A factor of safety of 1.0 was used for active and passive conditions.
7. No internal stability analyses were performed for a bulkhead.

ACTIVE AND PASSIVE LATERAL EARTH PRESSURES (DRAINED CONDITIONS)

GOLF COURSE SITE
SHORELINE STABILIZATION PROJECT
PLEASURE ISLAND

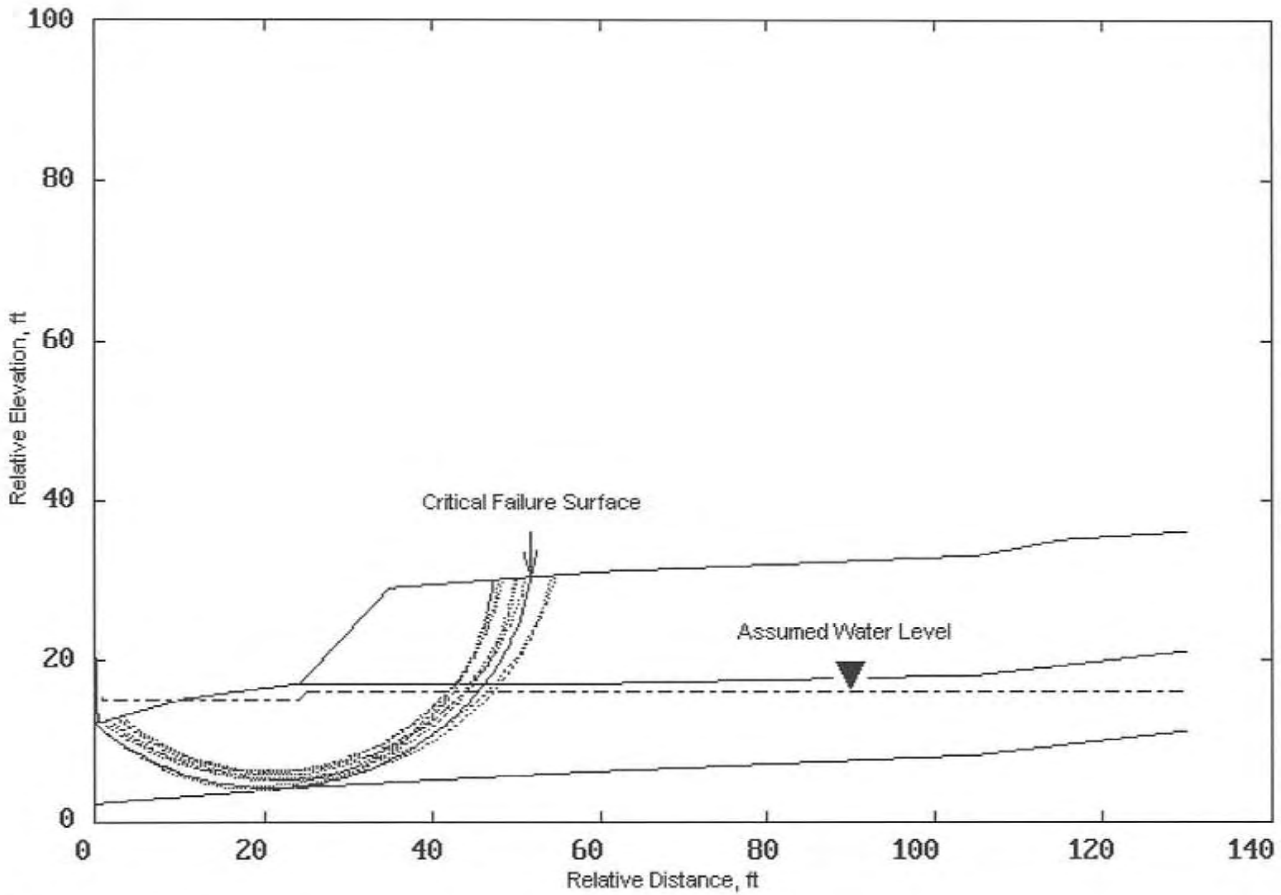


Reference: Generated by PCSTABL based on profile provided by Pacific International Engineering dated May 2001.

Note: Relative elevation are actual elevations plus 15 ft.

SLOPE STABILITY CROSS-SECTION – CAJUN CABINS SITE
SHORELINE STABILIZATION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

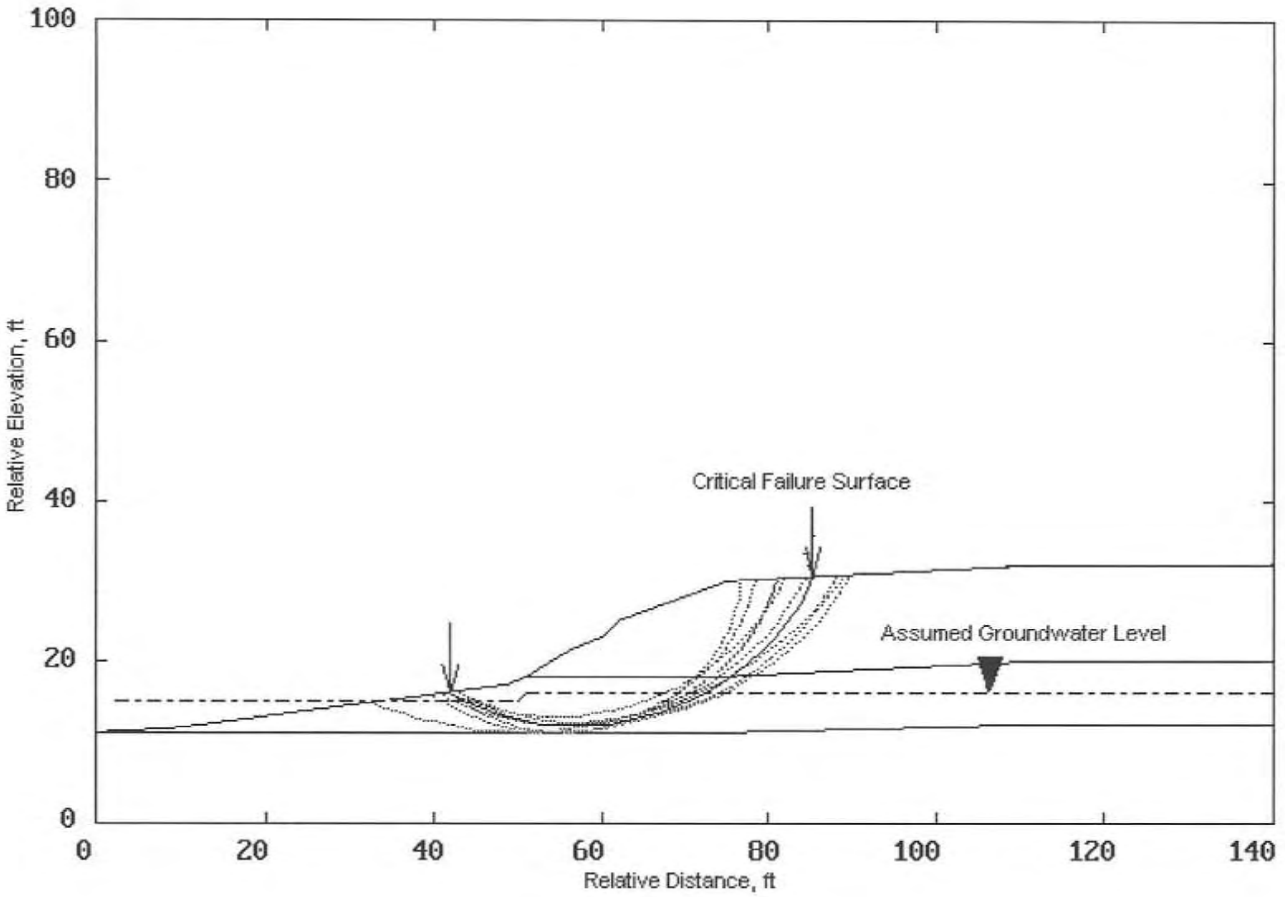
PLATE 3



Reference: Generated by PCSTABL based on profile provided by Pacific International Engineering dated May 2001.

Note: Relative elevation actual elevations plus 15 ft.

SLOPE STABILITY CROSS-SECTION - T. B. ELLISON SITE
SHORELINE STABILIZATION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

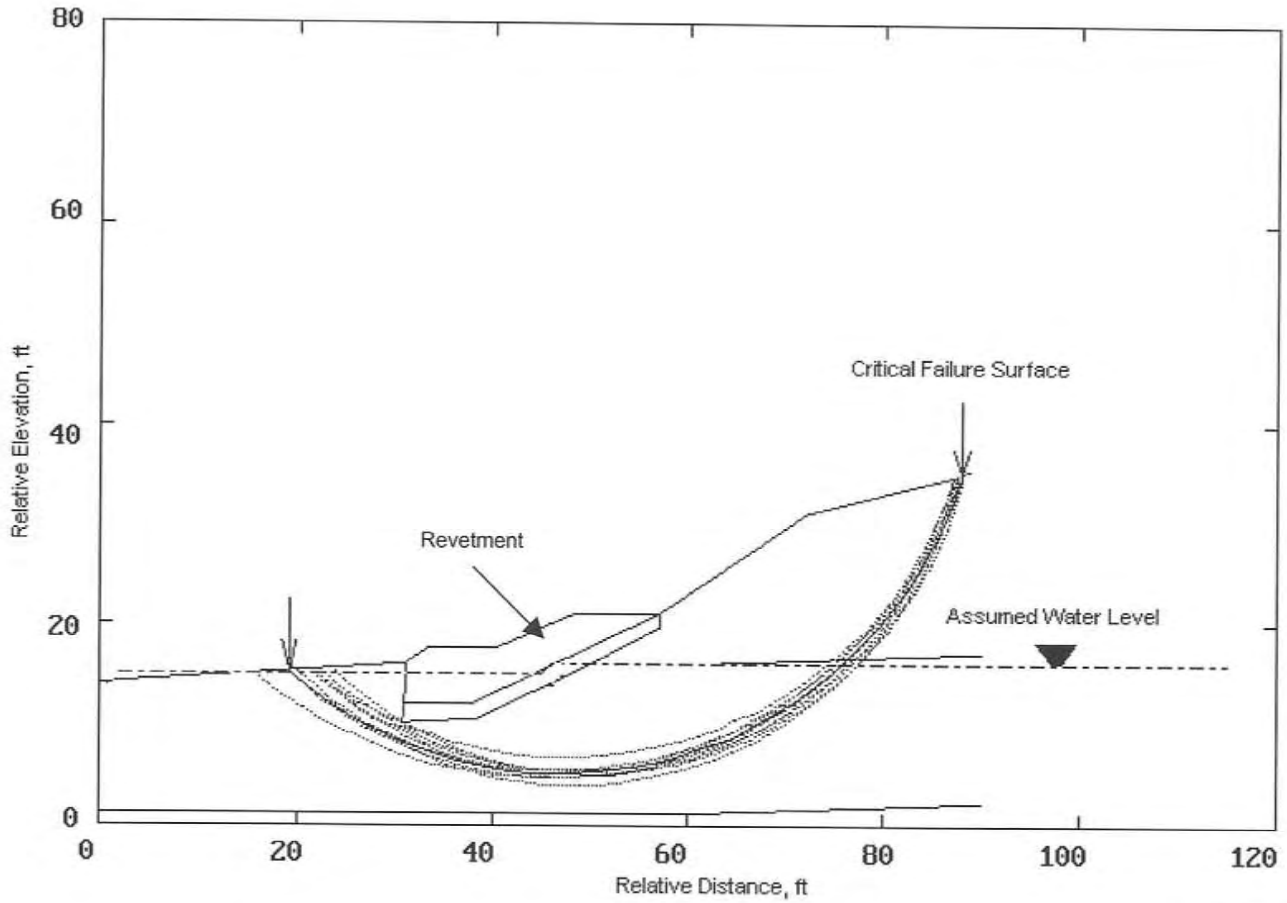


Reference: Generated by PCSTABL based on profile provided by Pacific International Engineering dated May 2001.

Note: Relative elevation are actual elevations plus 15 ft.

SLOPE STABILITY CROSS-SECTION – GOLF COURSE SITE
SHORELINE STABILIZATION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 5



Note: Relative elevation are actual elevations plus 15 ft.

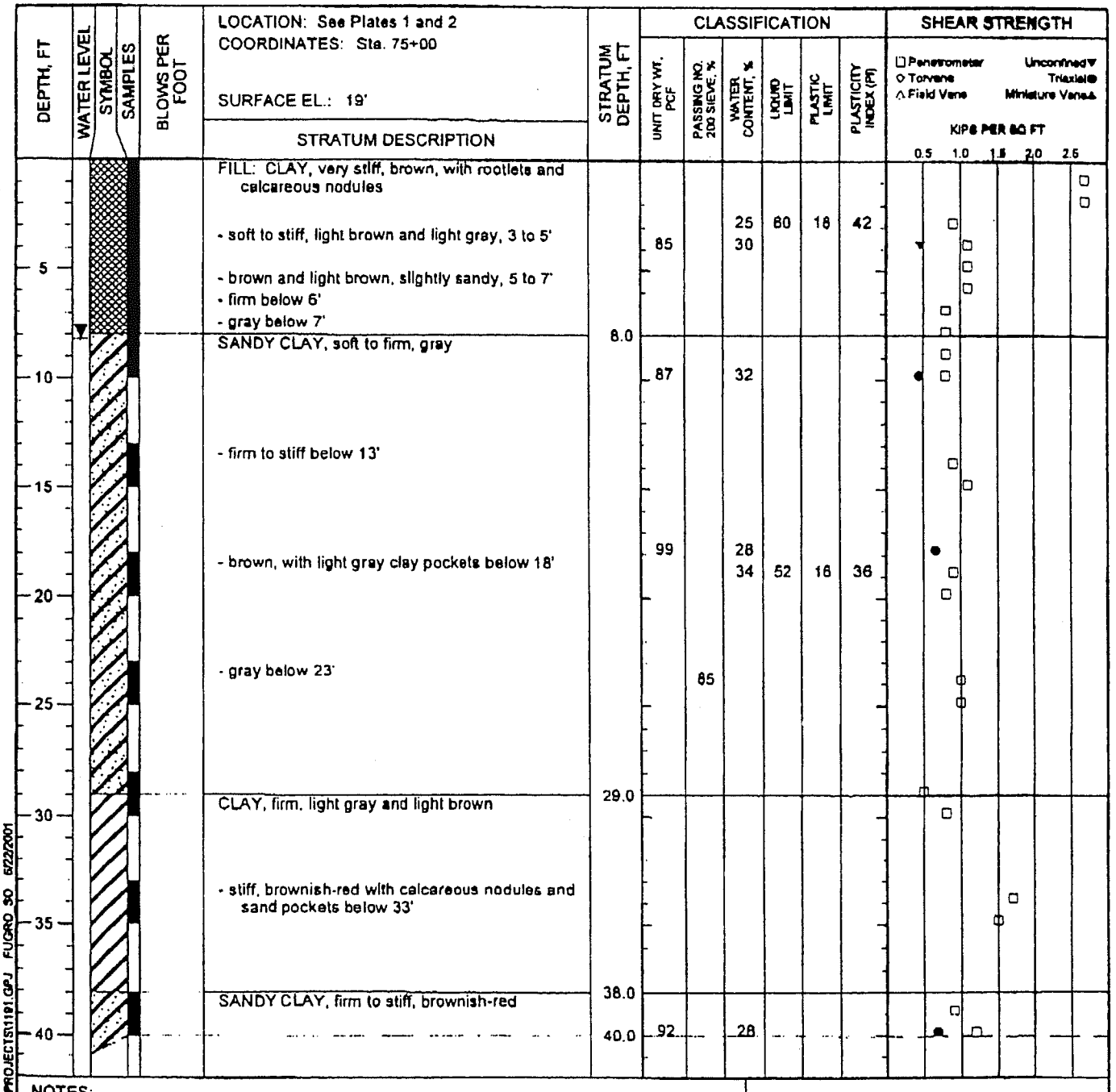
Reference: Generated by PCSTABL based on profile provided by Pacific International Engineering dated May 2001.

SLOPE STABILITY CROSS-SECTION – PLANNED CAJUN CABINS SECTION

SHORELINE STABILIZATION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 6

Report No. 0405-1191



NOTES:

1. ▼: Depth To Water after 4 days.
1. Groundwater not encountered during dry auger drilling.
2. Terms and symbols defined on Plates 7a and 7b.

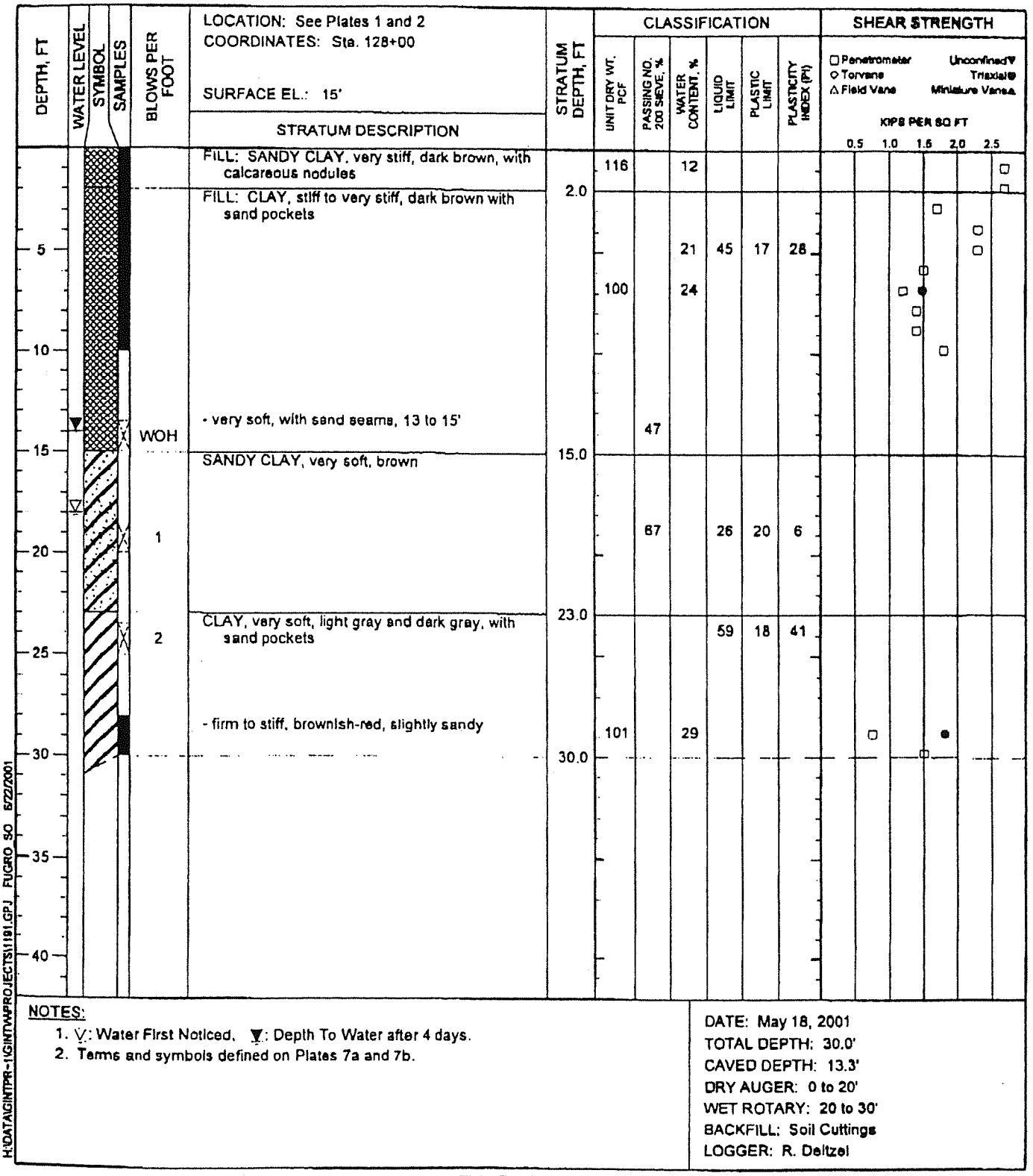
DATE: May 18, 2001
TOTAL DEPTH: 40.0'
CAVED DEPTH: 21.5'
DRY AUGER: 0 to 20'
WET ROTARY: 20 to 40'
BACKFILL: Soil Cuttings
LOGGER: R. Deitzel

H:\DATA\GINTPR~1\GINTWP\PROJECTS\1191.GPJ FUGRO_SO 6/22/2001

LOG OF BORING NO. 30
SHORELINE PROTECTION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 3

Report No. 0405-1191



NOTES:

1. V: Water First Noticed, ▼: Depth To Water after 4 days.
2. Terms and symbols defined on Plates 7a and 7b.

DATE: May 18, 2001
TOTAL DEPTH: 30.0'
CAVED DEPTH: 13.3'
DRY AUGER: 0 to 20'
WET ROTARY: 20 to 30'
BACKFILL: Soil Cuttings
LOGGER: R. Deitzel

H:\DATA\GINTPR~1\GINT\WPROJECTS\1191.GPJ FUGRO_SO 6/22/2001

LOG OF BORING NO. 31

SHORELINE PROTECTION PROJECT
PLEASURE ISLAND
JEFFERSON COUNTY, TEXAS

PLATE 4

LJA Engineering, Inc.

5316 Highway 290 West
Suite 150
Austin, Texas 78735

Phone 512.439.4700
Fax 512.439.4716
www.ljaengineering.com

JEFFERSON COUNTY
PLEASURE ISLAND SHORE PROTECTION
REVISED BREAKWATER-MARSH RESTORATION PROJECT

Addendum No. 2
Questions and Answers

Exhibit B

USACE Permit

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON TX 77553-1229

December 13, 2010

REPLY TO
ATTENTION OF:

Evaluation Section

SUBJECT: Permit No. SWG-2001-00135; Amendment

Donald Rao
Jefferson County Engineering Department
1149 Pearl Street, 5th Floor
Beaumont, Texas 77701-3633

Dear Mr. Rao:

Your request, dated March 24, 2010, to amend Department of the Army (DA) Permit SWG-2001-00135 to discharge dredged or fill material for the construction a rock breakwater and emergent marsh for bank stabilization, is approved pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. DA Permit SWG-2001-00135 (previously Permit 22285) was issued on December 6, 2001, and authorized the construction of bulkheads, riprap, and revetment structures along a 4-mile portion of the Sabine Neches Waterway. An amendment was issued on January 4, 2007, and authorized an extension of time to complete the previously authorized work and fill. The permit site is located on the left descending bank of the Sabine Neches Waterway, south of Port Arthur, in Jefferson County, Texas.

Work for the approximate 2,800-foot portion of the project south of the Martin Luther King (MLK) Bridge is to be performed in accordance with the enclosed amended plans in 6 sheets and the original permit conditions, which remain in full force and effect, except for the permit expiration date. This authorization expires on December 31, 2016. The remaining portions of the project north of the MLK Bridge are to be constructed in accordance with the original permit plans. In addition to the original permit conditions, the following special conditions are added to your authorization:

3. The permittee understands and agrees that if future operations by the United States require the removal, relocation or other alteration of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate or alter the structural work or obstructions caused thereby without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

4. The permittee is required to obtain a Corps of Engineers (CE), Galveston District Real Estate Outgrant prior to utilizing the CE dredged material placement areas (DMPAs).

5. The permittee must coordinate the use of DMPAs 8, 9, and/or 11 with the CE Galveston District's Port Arthur Area Office, and the Operation Division's Navigation Branch at least 60 days prior to conducting any and all work in or affecting the DMPA(s) to assure that the work will not conflict with U.S. Government dredging or DMPA management activities.

6. The permittee shall not initiate activities in the permit area associated with this permit which have not previously been evaluated by the CE as part of the permit review for this project until such work has been submitted to and approved by the CE. Such activities include, but are not limited to, haul roads, equipment staging areas, and borrow and disposal sites. The permit area includes all waters of the United States affected by activities associated with the project, as well as any additional area(s) of non-waters of the United States in the immediate vicinity of, directly associated with, and/or affected by, activities in waters of the United States. Special restrictions may be required for such work. The permittee shall develop procedures to ensure that contractors are aware of this condition and encourage contractors to coordinate their selection of these sites with the permittee as soon as possible to avoid construction delays. The permittee, or its designated agent/contractor, may coordinate with the CE on compliance with this special condition.

7. The permittee shall conduct a meeting with the construction contractor or contractors detailing the terms and conditions of this permit prior to commencing construction activities of the project. The permittee shall notify the Galveston District of the pre-construction meeting at least two weeks in advance of the scheduled meeting. Within two weeks following the meeting, the permittee will also provide written confirmation to the CE that the meeting was held.

8. The permittee shall provide as-built drawings of the breakwater and marsh creation area to the CE, Galveston District, Chief of Compliance, in addition to post-settlement elevation data for the marsh areas. Representative cross sections and ground level photographs should also be included for the post-settlement project. Reporting should take place not more than 12 months following completion of construction demobilization.

9. The permittee shall notify the CE, Galveston District, Chief of Compliance, in writing, upon completion of vegetative plantings on the site. Such notification should be within 30 days of completion of the plantings.

This letter also contains an approved jurisdictional determination for your subject site. If you object to this determination, or the amendment conditions, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a combined Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form. If you request to appeal this determination and or the amendment, you must submit a completed RFA form to us at the letterhead address. In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, meets the criteria for appeal under 33 C.F.R. Part 331.5, and that it has been received by us within 60 days of the date of the NAP. It is not necessary to submit an RFA form to us if you do not object to the determination or the amendment in this letter.

Corps determinations are conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular sites. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

Please notify the District Commander, in writing, upon completion of the authorized work. A pre-addressed postcard has been enclosed for your convenience.

FOR THE DISTRICT COMMANDER:

Kim McLaughlin
Leader, North Evaluation Unit

Enclosures

Copies Furnished:

Eighth Coast Guard District, New Orleans, LA

NOAA/NOS, Coast & Geodetic Survey, Silver Spring, MD

U.S. Fish and Wildlife Service, Houston, TX

Texas General Land Office, Austin, TX

Texas General Land Office, La Porte, TX

Port Arthur Area Office, Port Arthur, TX

Jean Adler, Leap Engineering, 323 Tremont St., Galveston, TX 77550-1509

MAY 19 2010

JEFFERSON COUNTY, TEXAS

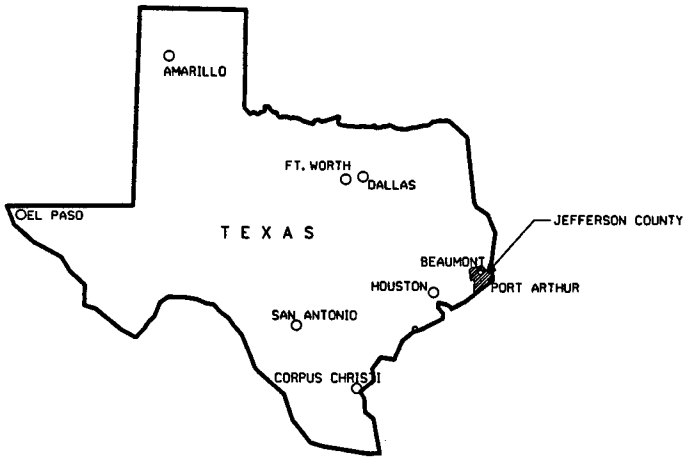
PLEASURE ISLAND
SHIP CHANNEL EROSION PROJECT
CAJUN CABINS TO MLK BRIDGE

PORT ARTHUR, TEXAS

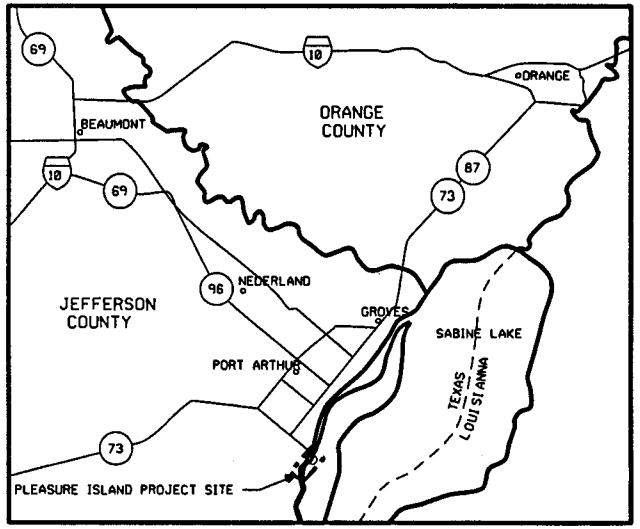
USACE PERMIT SWG-2001-00135
PERMIT AMENDMENT DRAWINGS
CAJUN CABINS TO MLK BRIDGE

DRAWING INDEX	TITLES
079A-1001E-P-1001	LOCATION & VICINITY MAP
079A-1001E-P-1002	AREA MAP
079A-1001E-P-1003	EXISTING SITE PLAN
079A-1001E-P-1004	PROPOSED SITE PLAN
079A-1001E-P-1005	BREAKWATER TYPICAL SECTIONS
079A-1001E-P-1006	MARSH PLAN & SECTION

PERMITTED PLANS



VICINITY MAP
SCALE: NTS



LOCATION MAP
SCALE: NTS

FOR PERMITTING ONLY
WILLIAM L. WORSHAM P.E. 83153
NOT TO BE USED FOR
CONSTRUCTION PURPOSES

LEAP ENGINEERING
550 Fannin St, Suite 510
Beaumont, Texas 77701
Tel: (409) 813-1982
Fax: (409) 813-1819
Texas Registered Engineering Firm F-2001

TEXAS GENERAL LAND OFFICE

JEFFERSON COUNTY ENGINEERING DEPT.

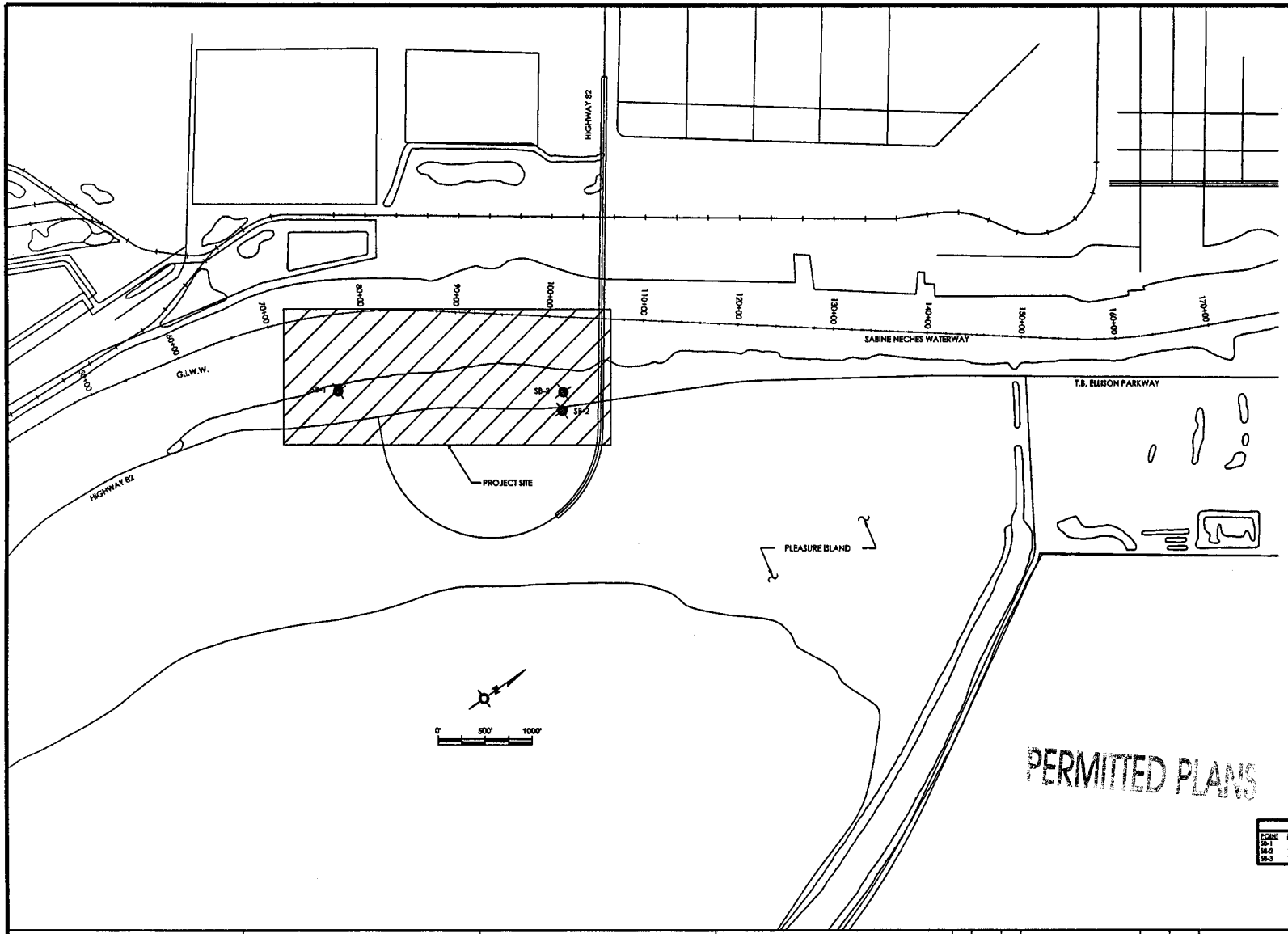
REV	DATE	BY	DESCRIPTION	CHKD	APPD
0	5/17/10	MDR	USACE Permit Amendment Submittal	CKW	WLW

PLEASURE ISLAND
SHIP CHANNEL EROSION PROJECT
CAJUN CABINS TO MLK BRIDGE
TITLES, LOCATIONS & VICINITY MAPS

PROJECT #: 079A-1001E
SCALE: NTS
DGN NAME 079A-1001E-EX-1001
SHEET 1 OF 6

MAY 19 2010

USACE PERMIT SWG-2001-00135
PERMIT AMENDMENT DRAWINGS
CAJUN CABINS TO MLK BRIDGE



PERMITTED PLANS

LEGEND
SURVEY CONTROL BENCHMARK (SB)
CHANNEL STATIONING

SURVEY CONTROL BENCHMARK (SB)

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
SB-1	13889731.54	3569521.41	16.02	
SB-2	13891567.43	3571065.08	20.93	
SB-3	13891683.66	3570901.37	16.65	

FOR PERMITTING ONLY
WILLIAM L. WORSHAM P.E. 83153
NOT TO BE USED FOR
CONSTRUCTION PURPOSES

LEAP ENGINEERING
550 Fannin St, Suite 510
Beaumont, Texas 77701
Tel: (409) 813-1882
Fax: (409) 813-1916
Texas Registered Engineering Firm F-2001

TEXAS GENERAL LAND OFFICE

JEFFERSON COUNTY ENGINEERING DEPT.

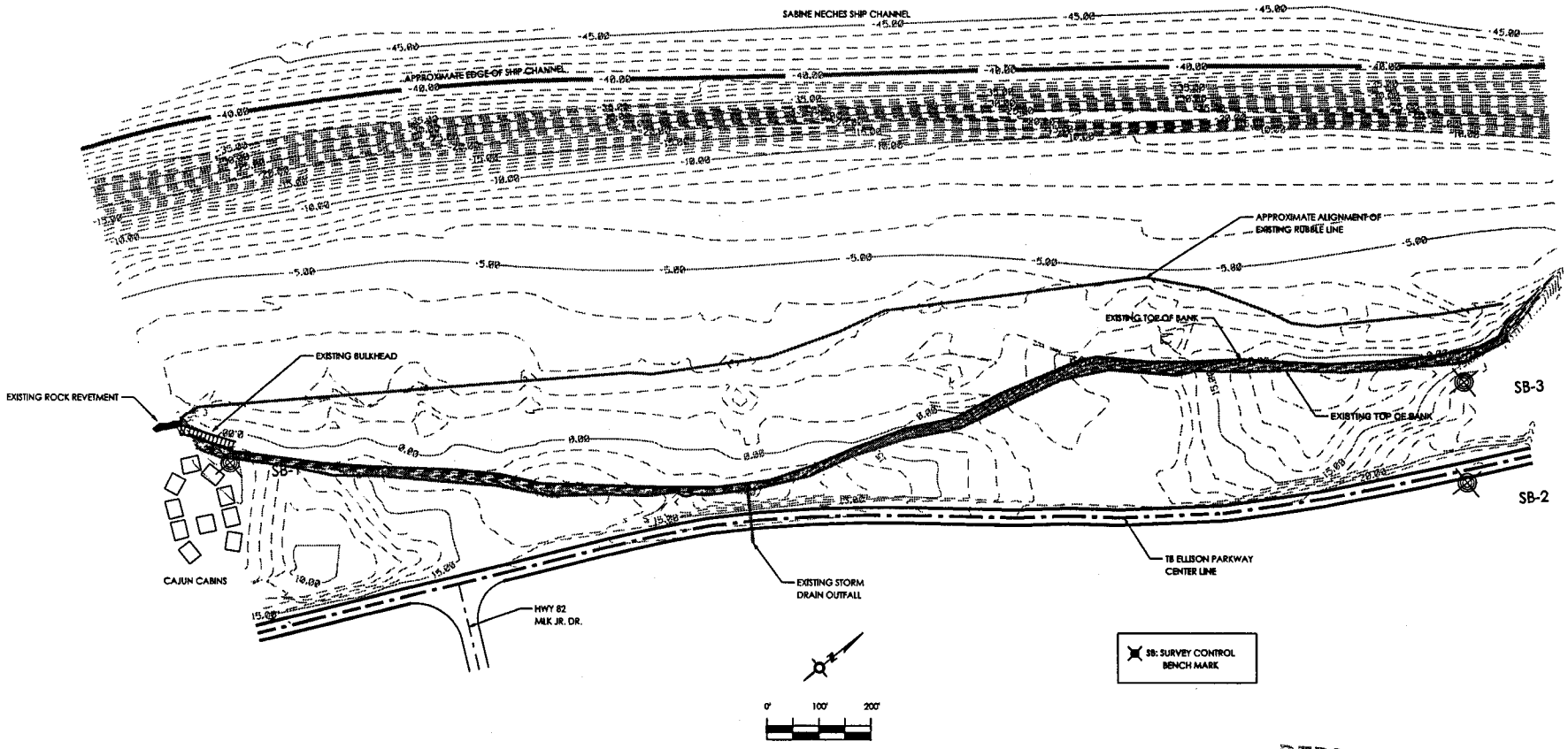
REV	DATE	BY	DESCRIPTION	CHK'D	APP'D
0	5/18/10	MDR	USACE Permit Amendment Submittal	CKW	WLW

PLEASURE ISLAND
SHIP CHANNEL EROSION PROJECT
CAJUN CABINS TO MLK BRIDGE
AREA MAP & CHANNEL STATIONING

PROJECT #: 079A-1001E
SCALE: AS NOTED
DGN NAME: 079A-1001E-EX-1002
SHEET 2 OF 6

MAY 19 2010

USACE PERMIT SWG-2001-00135
PERMIT AMENDMENT DRAWINGS
CAJUN CABINS TO MLK BRIDGE



PERMITTED PLANS

FOR PERMITTING ONLY
WILLIAM L. WORSHAM P.E. 83153
NOT TO BE USED FOR CONSTRUCTION PURPOSES

LEAP ENGINEERING
550 Fannin St, Suite 510
Beaumont, Texas 77701
Tel: (409) 813-1062
Fax: (409) 813-1916
Texas Registered Engineering Firm F-3691

TEXAS GENERAL LAND OFFICE

JEFFERSON COUNTY ENGINEERING DEPT.

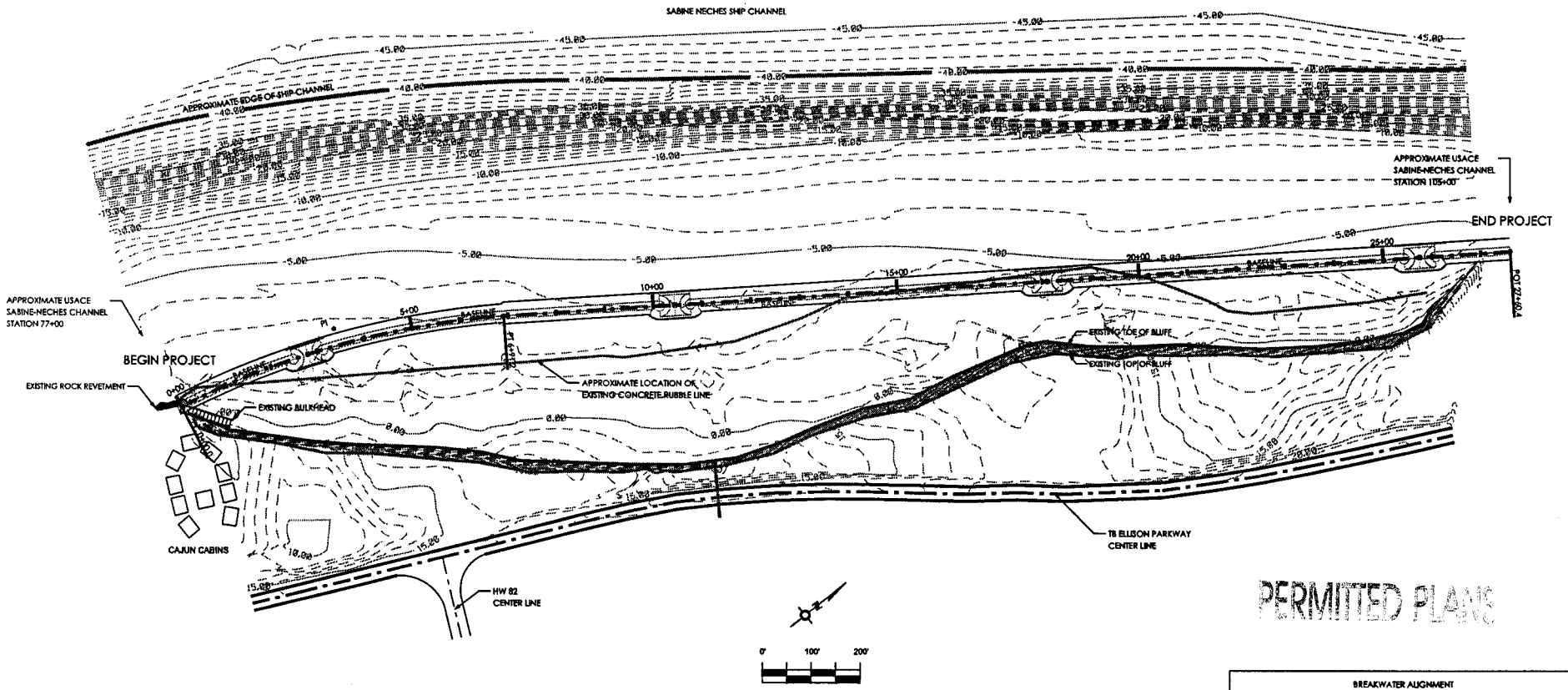
REV	DATE	BY	DESCRIPTION	CHKD	APPD
0	5/18/10	MDR	USACE Permit Amendment Submittal	CKW	WLW

PLEASURE ISLAND
SHIP CHANNEL EROSION PROJECT
CAJUN CABINS TO MLK BRIDGE
EXISTING SITE PLAN

PROJECT #:	079A-1001E
SCALE:	AS NOTED
DGN NAME	079A-1001E-EX-1005
SHEET	3 OF 6

MAY 19 2010

USACE PERMIT SWG-2001-00135
PERMIT AMENDMENT DRAWINGS
CAJUN CABINS TO MLK BRIDGE



PERMITTED PLANS

BREAKWATER ALIGNMENT

STATION	NORTHING	EASTING	DESCRIPTION
0+00	13889701.15	3569412.42	BEGIN PROJECT, POINT OF CURVE
2+80.2	13889970.40	3569488.34	CHANNEL CUT CENTER LINE, TYPE A
6+91.2	13890333.19	3569679.27	POINT OF TANGENT, BEGIN TRANSITION
7+06.2	13890345.45	3569687.95	END OF TRANSITION
10+44.5	13890621.56	3569883.44	CHANNEL CUT CENTER LINE, TYPE B
18+09.5	13891245.91	3570325.49	CHANNEL CUT CENTER LINE, TYPE B
25+74.5	13891870.26	3570767.54	CHANNEL CUT CENTER LINE, TYPE B
27+60.4	13892021.96	3570874.95	END PROJECT

FOR PERMITTING ONLY
WILLIAM L. WORSHAM P.E. 83153
NOT TO BE USED FOR CONSTRUCTION PURPOSES

LEAP ENGINEERING
550 Fannin St, Suite 510
Beaumont, Texas 77701
Tel: (409) 813-1882
Fax: (409) 813-1919
Texas Registered Engineering Firm F-2601

TEXAS GENERAL LAND OFFICE

JEFFERSON COUNTY ENGINEERING DEPT.

REV.	DATE	BY	DESCRIPTION	CHKD	APPD
0	5/19/10	MDR	USACE Permit Submittals	CKW	WLW

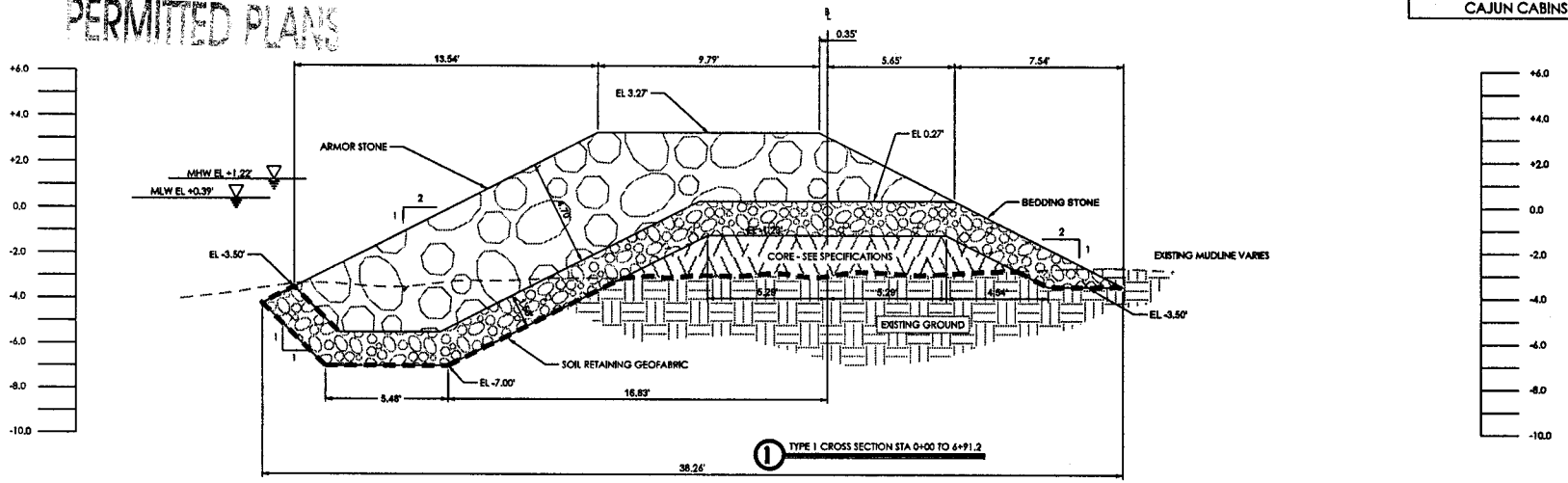
PLEASURE ISLAND
SHIP CHANNEL EROSION PROJECT
CAJUN CABINS TO MLK BRIDGE
PROPOSED SITE PLAN

PROJECT #: 079A-1001E
SCALE: AS NOTED
DGN NAME 079A-1001E-EXI-1004
SHEET 4 OF 6

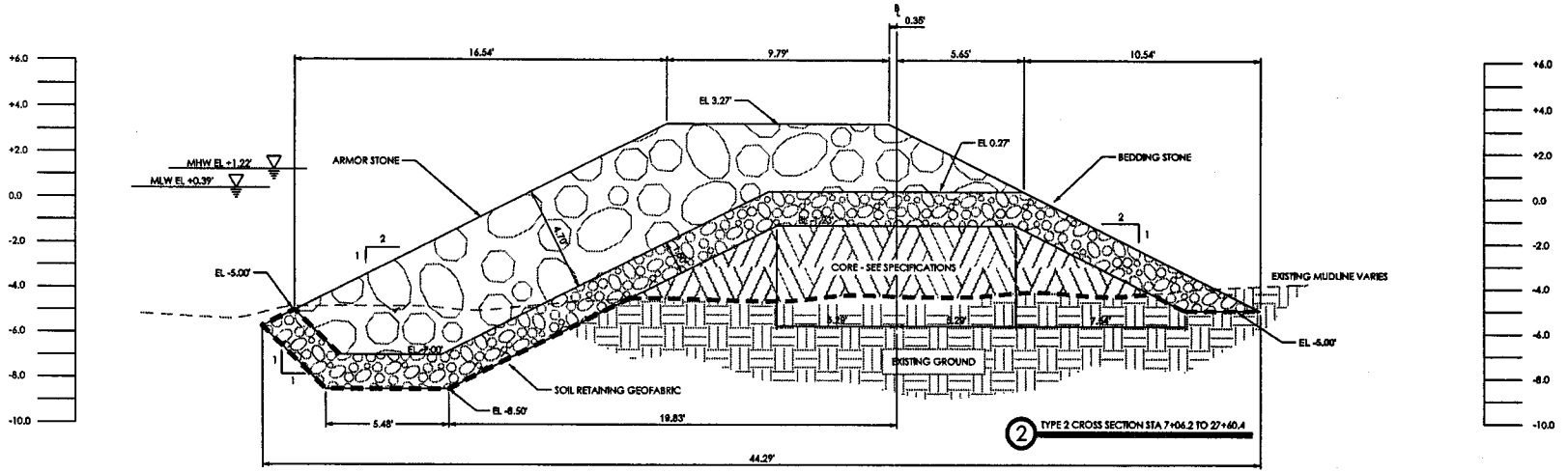
MAY 19 2010

PERMITTED PLANS

USACE PERMIT SWG 2001-00135
PERMIT AMENDMENT DRAWINGS
CAJUN CABINS TO MLK BRIDGE



① TYPE 1 CROSS SECTION STA 0+00 TO 6+91.2



② TYPE 2 CROSS SECTION STA 7+06.2 TO 27+60.4

FOR PERMITTING ONLY
WILLIAM L. WORSHAM P.E. 83153
NOT TO BE USED FOR
CONSTRUCTION PURPOSES

LEAP ENGINEERING
550 Fannin St, Suite 510
Beaumont, Texas 77701
Tel: (409) 813-1662
Fax: (409) 813-1918
Texas Registered Engineering Firm F-2601

TEXAS GENERAL LAND OFFICE

JEFFERSON COUNTY ENGINEERING DEPT.

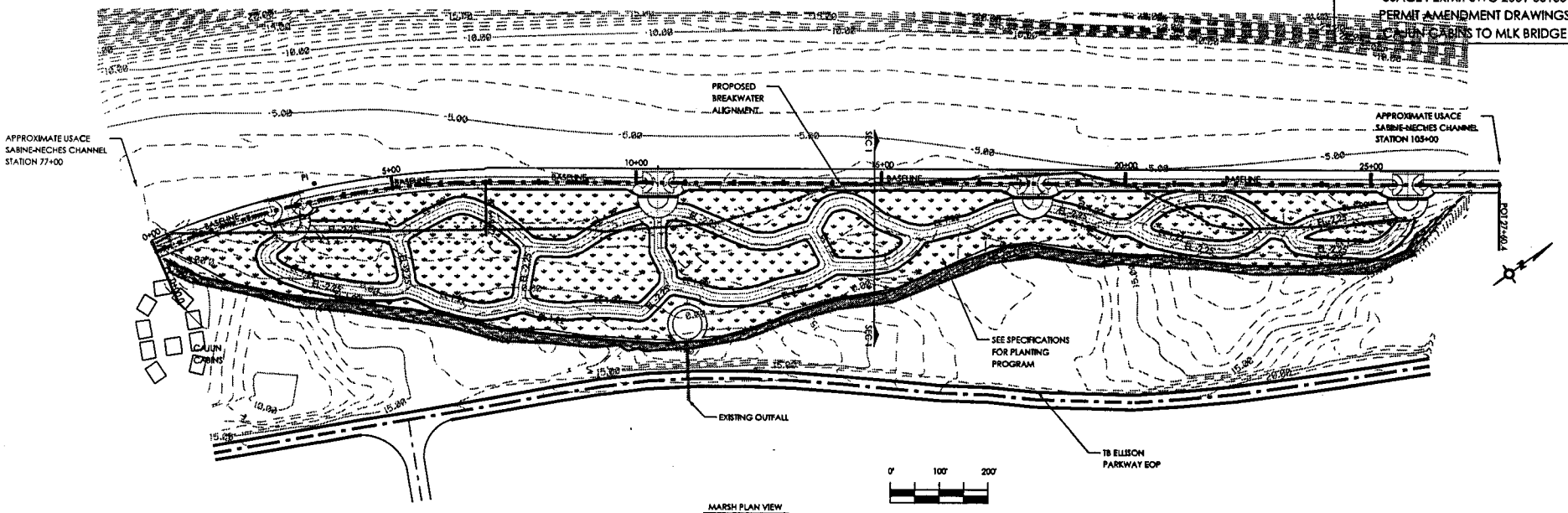
REV	DATE	BY	DESCRIPTION	CHKD	APPD
0	5/18/10	MDR	USACE Permit Amendment Submittal	CKW	WLW

PLEASURE ISLAND
SHIP CHANNEL EROSION PROJECT
CAJUN CABINS TO MLK BRIDGE
BREAKWATER TYPICAL SECTION

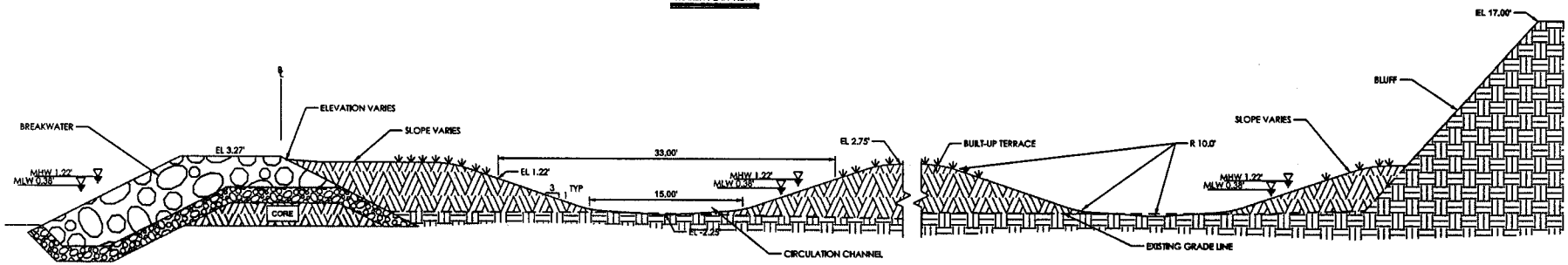
PROJECT #:	079A-1001E
SCALE:	AS NOTED
DGN NAME	079A-1001E-EX-1005
SHEET	5 OF 6

MAY 19 2010

USACE PERMIT SWG 2001-00135
PERMIT AMENDMENT DRAWINGS
CAJUN CABINS TO MLK BRIDGE



MARSH PLAN VIEW



1 MARSH TYPICAL SECTION

PERMITTED PLANS

FOR PERMITTING ONLY
WILLIAM L. WORSHAM P.E. 83153
NOT TO BE USED FOR CONSTRUCTION PURPOSES

LEAP ENGINEERING
550 Fannin St, Suite 510
Beaumont, Texas 77701
Tel: (409) 813-1062
Fax: (409) 813-1919
Texas Registered Engineering Firm F-3661

TEXAS GENERAL LAND OFFICE

JEFFERSON COUNTY ENGINEERING DEPT.

REV	DATE	BY	DESCRIPTION	CHKD	APPD
0	5/18/2010	MDR	USACE Permit Amendment Submittal	CXW	WLW

PLEASURE ISLAND
SHIP CHANNEL EROSION PROJECT
CAJUN CABINS TO MLK BRIDGE
MARSH LAYOUT PLAN & PROFILE

PROJECT #:	079A-10016
SCALE:	AS NOTED
DGN NAME	079A-10016-EX-1006
SHEET	6 OF 6

Pleasure Island

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT. CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON. TEXAS 77553-1229

REPLY TO ATTENTION OF

December 6, 2001

Evaluation Section

SUBJECT: Permit Application - 22285

Jefferson County
1149 Pearl Street, 5th floor
Beaumont, Texas 77701

Gentlemen:

The above numbered permit has been approved and a signed copy is enclosed for your retention.

Also enclosed is ENG Form 4336 and a copy of "Notice to Permittee" which provides important information for permit administration. You should notify the District Engineer, in writing, upon completion of the authorized work.

Sincerely,

Bruce H. Bennett

Bruce Bennett
Unit Leader
North Evaluation Unit

Enclosures

Copies Furnished:

Commander (oan), Eighth Coast Guard District, Hale Boggs Federal Building, 501 Magazine Street, New Orleans, Louisiana 70130-3396 w/encl

Director, National Ocean Service, Coast & Geo. Sur., Mapping & Charting Branch, Source Data Unit, Attn: N/CG2211, Station 7317, SSMC3, 1315 East-West Highway, Silver Spring, Maryland 20910-3233

NOTICE TO PERMITTEES

Department of the Army Permits for Work in Navigable Waters require attention to administration and policies which are often misunderstood or disregarded. To avoid possible misinterpretations and to expedite procedures, permit post-authorization requirements and pertinent information are outlined as follows:

1. Permits remain in effect until revoked, relinquished, or the structures are removed. An extension of time for completion of structures or work may be granted provided that a public notice is issued and that evidence is furnished of the bona fide intention of the permittee to complete the work within a reasonable time. If work or structures are not completed within the time provided in the permit, it is the permittee's responsibility to request an extension of time at least 4 months before the expiration date.

2. Maintenance of authorized completed structures may be done at any time without extending the completion period. It is, however, required that the District Engineer be notified prior to commencement of maintenance.

3. SPECIAL REGULATIONS GOVERN MAINTENANCE WORK INVOLVING DREDGING OR FILL. This maintenance is not authorized by the original permit and specific prior approval is required before such work is commenced in navigable waters. Your request for authorization should be submitted in time for public notice requirements and coordination with other agencies.

4. If ownership of structures or work covered by a permit is transferred, the District Engineer must be notified immediately. The notification will provide information so that permit responsibilities can be changed to the new owner or assignee.

5. Permittees are reminded that the Area Engineer must be notified as soon as possible of the time for commencement of construction or work, and immediately upon completion. If pipelines across Federal project channels are covered by the permit, the Area Engineer should be informed of the date the pipelines are to be placed in time for him to arrange for an inspector to be present.

6. All material changes in location or plans must be submitted promptly to the District Engineer for approval before construction is begun.

7. Permits should not be considered as an approval of design features of any structure authorized or an implication that such structure is adequate for the purpose intended.

DISTRICT ENGINEER
GALVESTON DISTRICT
CORPS OF ENGINEERS

SWG FL 279
24 April 85

DEPARTMENT OF THE ARMY PERMIT

Permittee Jefferson County

Permit No. 22285

Issuing Office Galveston 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: To install bulkheading, riprap, and revetment structures, along a 4-mile stretch of shoreline to provide erosion protection. The project will be conducted in accordance with the attached plans, in 9 sheets.

Project Location: An approximate 4-mile stretch of shoreline, on the Sabine-Neches Waterway, on Pleasure Island, south of Port Arthur, in Jefferson County, Texas.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on 31 December 2006. 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 one 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:

1. The area subject to this permit is being studied by the United States for possible improvements or modifications. The permittee is hereby notified that if these or future operations occur and require any facility, pipeline, or other structure to be moved to accommodate a Federal navigation or flood control improvement in navigable waters, the owners of said facility, pipeline, or other structure will be required to remove or relocate the facility, pipeline or other structure at the owner's expense.

2. The applicant shall obtain a Private Aides to Navigation permit from the United States Coast Guard (USCG) and shall mark the structure as per USCG guidelines.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

(X) 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.

Jon A. Patton — 30 NOV 01

(PERMITTEE) *(DATE)*

JEFFERSON COUNTY

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

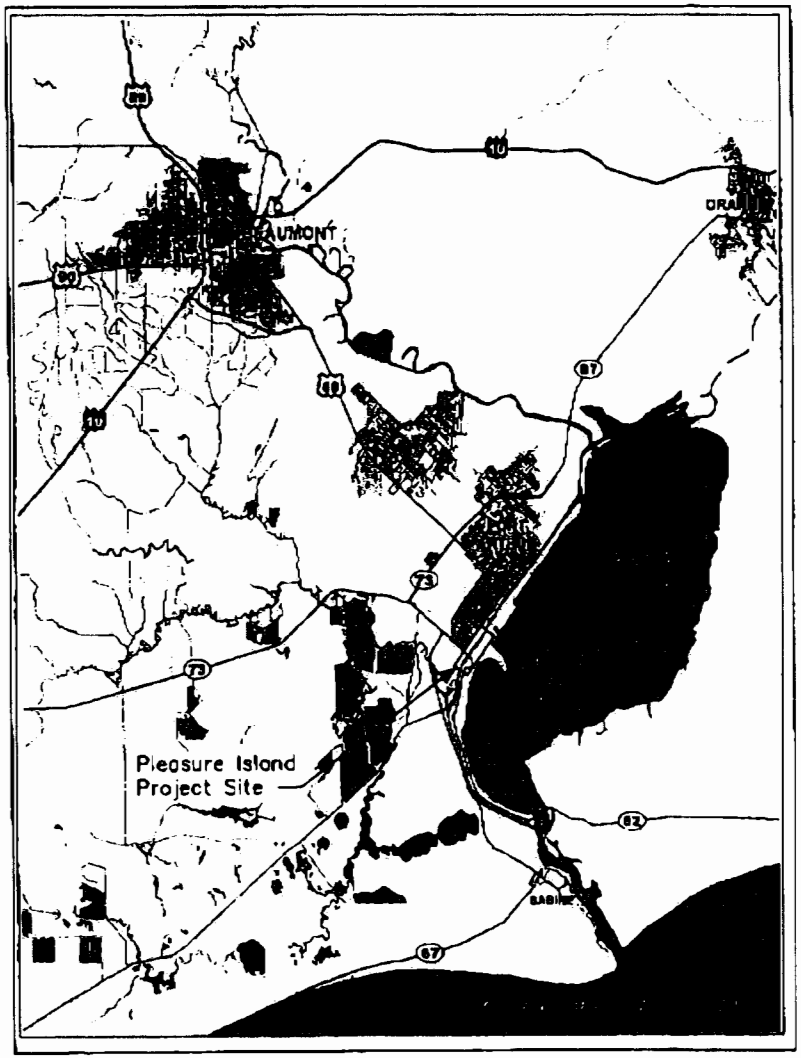
Bruce H. Bennett — 6 Dec 01

(DISTRICT ENGINEER) *(DATE)*

BRUCE H. BENNETT, LEADER
NORTH EVALUATION UNIT
FOR COLONEL LEONARD D. WATERWORTH

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)*



VICINITY MAP

PERMITTED PLANS

22285
Jefferson County
29 August 2001
Page 1 of 9

PACIFIC INTERNATIONAL ENGINEERING PLLC

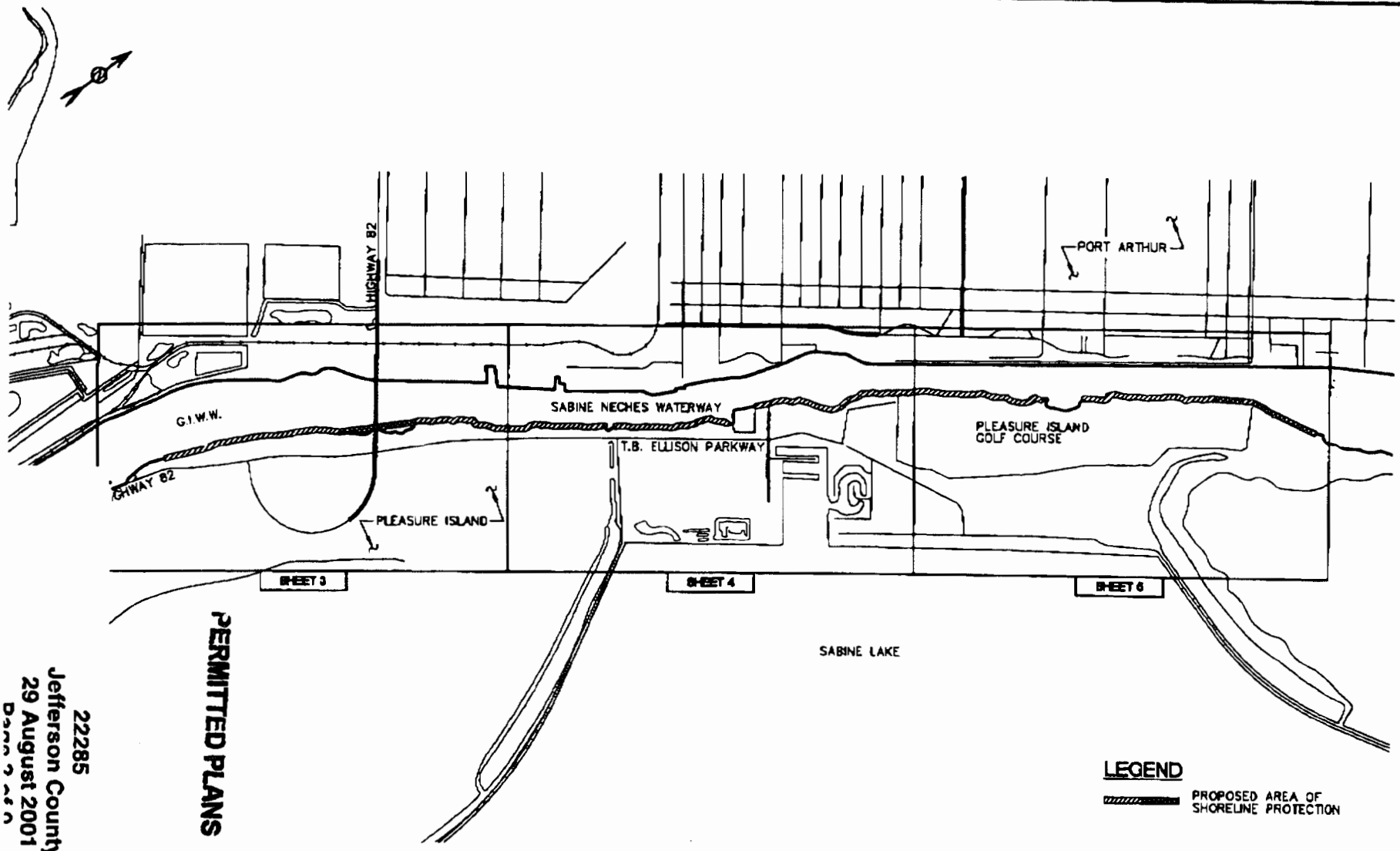
TEXAS
3415 Greystone Drive
Suite 100
Austin, TX 78731
Phone (512) 420-0604
Fax (512) 420-0609

WASHINGTON
310 Waterfront Park Bldg.
144 Railroad Avenue
Edmonds, WA 98020
Phone (425) 744-7700
Fax (425) 744-1400

PROJECT DESCRIPTION:
TO CONDUCT SHORELINE STABILIZATION ACTIVITIES ALONG ERODING SHORELINE ON PLEASURE ISLAND.

JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUGUST 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 1 OF 9



PERMITTED PLANS

22285
Jefferson County
29 August 2001

OVERALL PROJECT SITE PLAN

IFIC INTERNATIONAL
GINEERING PLLC
TEXAS
Greystone Drive
100
TX 78731
(512) 420-0804
512) 420-0809
WASHINGTON
310 Waterfront Park Bldg.
144 Railroad Avenue
Edmonds, WA 98020
Phone (425) 744-7700
Fax (425) 744-1400

PROJECT DESCRIPTION:
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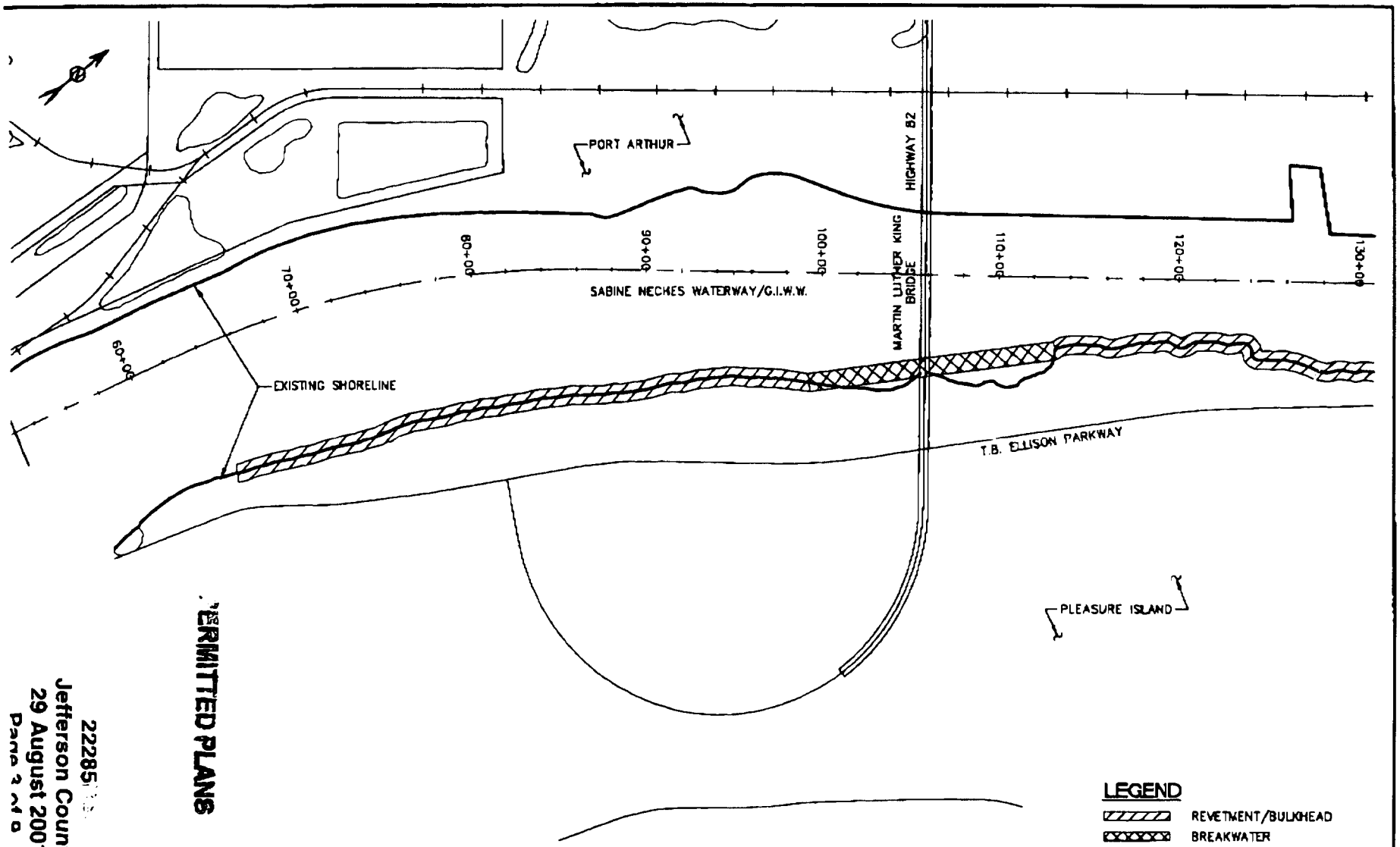
JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUGUST 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 2 OF 9



SITE PLAN

PERMITTED PLANS

22285
Jefferson County
29 August 2001

FIC INTERNATIONAL
INEERING PLLC

60
TX 78731
(512) 420-0814
12) 420-0809

310 Waterfront Park Bldg.
144 Railroad Avenue
Edmonds, WA 98020
Phone (425) 744-7700
Fax (425) 744-1400

PROJECT DESCRIPTION:
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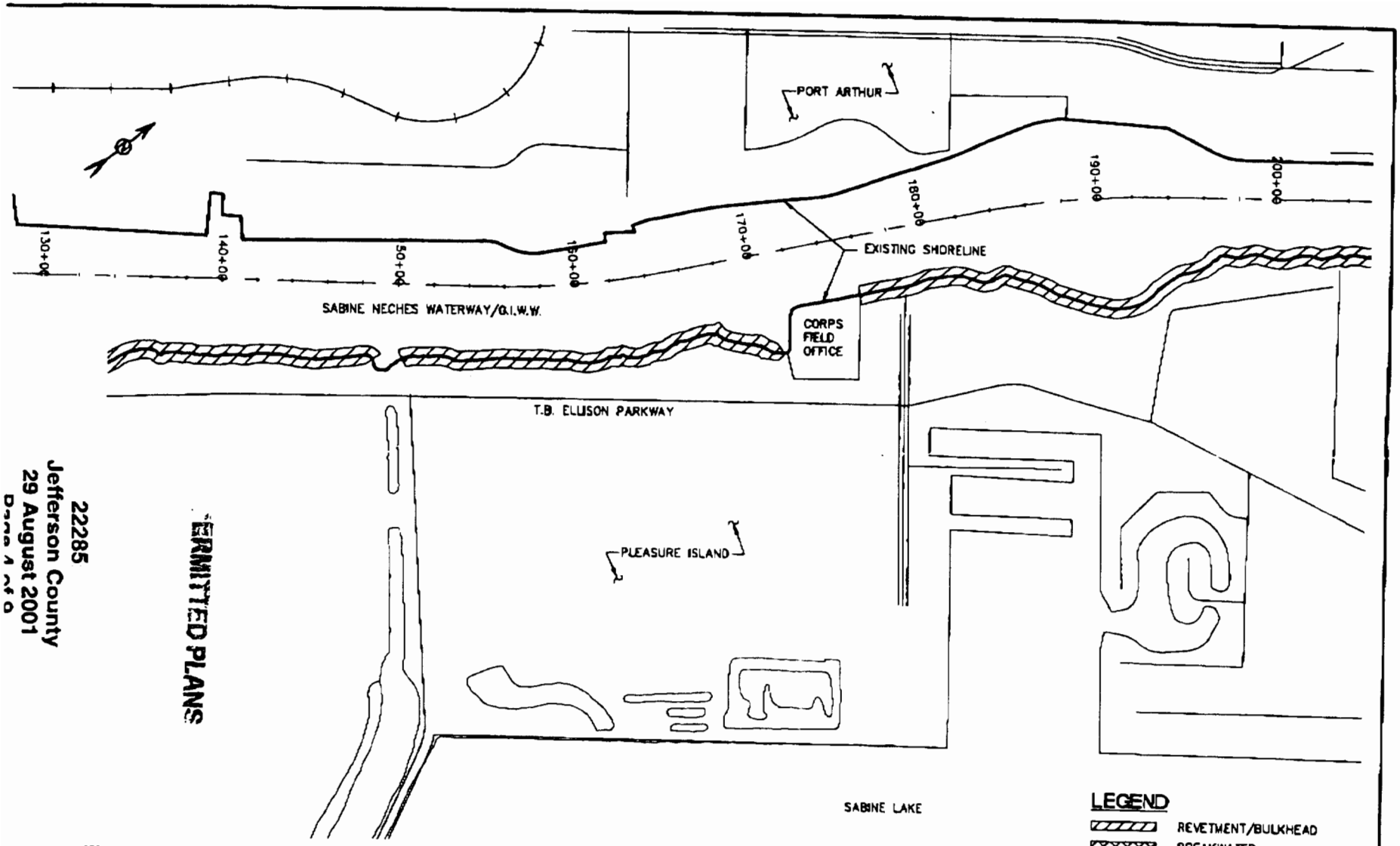
JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUGUST 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 3 OF 9



SITE PLAN

22285
Jefferson County
29 August 2001

PERMITTED PLANS

PACIFIC INTERNATIONAL ENGINEERING PLLC

TEXAS
3418 Greystone Drive
Suite 100
Austin, TX 78731
Phone (512) 420-0804
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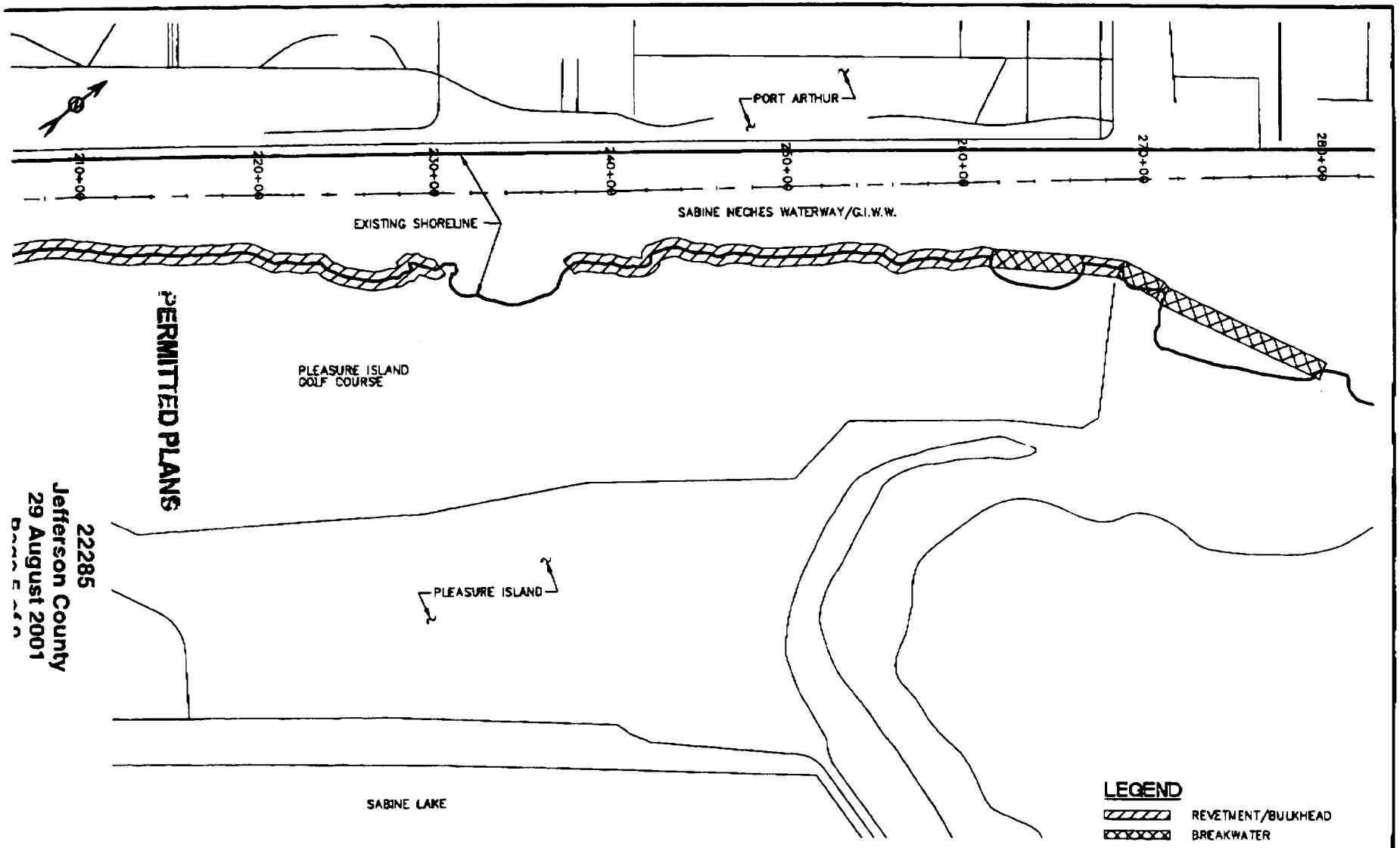
JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUGUST 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 4 OF 9



SITE PLAN

PACIFIC INTERNATIONAL ENGINEERING PLLC

TEXAS
3415 Greystone Drive
Suite 100
Austin, TX 78731
Phone (512) 420-0804
Fax (512) 420-0809

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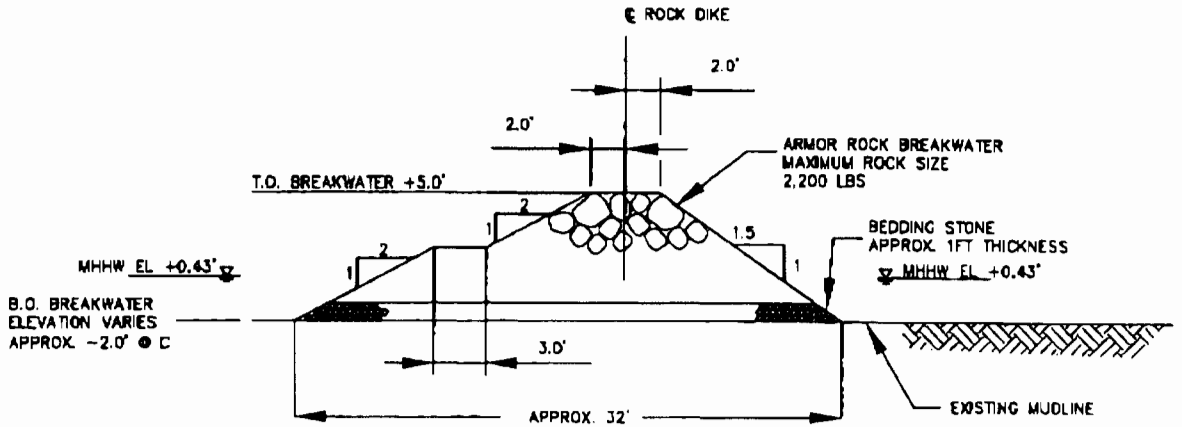
JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUGUST28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 5 OF 9

22285
Jefferson County
29 August 2001
PERMITTED PLANS



TYPICAL BREAKWATER SECTION

0 5 10
SCALE IN FEET

CONSTRUCTION QUANTITIES		
ROCK VOLUME	-	14,500 CY
DISTURBED AREA	-	2.3 ACRES

TIDAL WATER LEVELS (NGVD29)	
MEAN HIGHER HIGH WATER	+0.43'
MEAN SEA LEVEL	0.0'
MEAN LOWER LOW WATER	-0.82'

PACIFIC INTERNATIONAL ENGINEERING PLLC
TEXAS
3418 Greystone Drive
Suite 100
Austin, TX 78731
Phone (512) 420-0804
Fax (512) 420-0808
WASHINGTON
310 Waterfront Park Bldg.
144 Railroad Avenue
Edmonds, WA 98020
Phone (425) 744-7700
Fax (425) 744-1400

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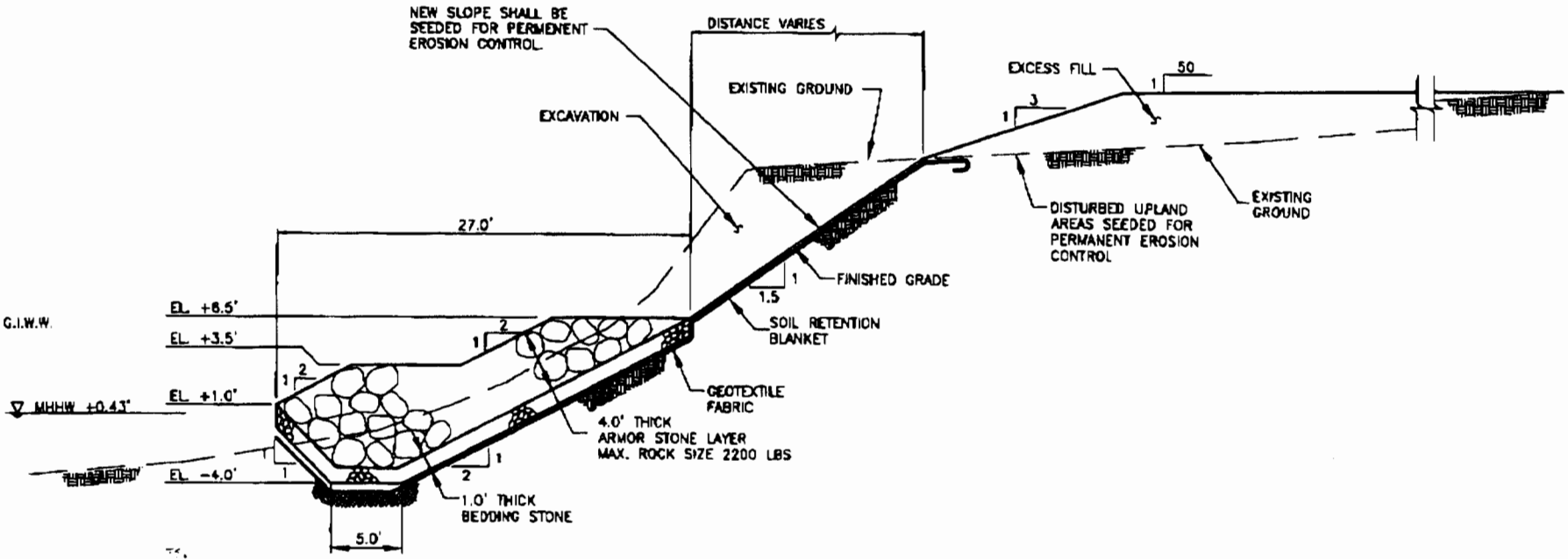
JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUG 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 6 OF 9



TYPICAL REVETMENT SECTION

0 5 10
SCALE IN FEET

PERMITTED PLANS

22285
Jefferson County
29 August 2001

NSTRUCTION QUANTITIES	
–	86,000 CY
–	10.4 ACRES

TIDAL WATER LEVELS (NGVD29)	
MEAN HIGHER HIGH WATER	+0.43'
MEAN SEA LEVEL	0.0'
MEAN LOWER LOW WATER	-0.82'

IFIC INTERNATIONAL
GINEERING PLLC
AS
Greystone Drive
100
, TX 78731
(512) 420-0804
512) 420-0699
WASHINGTON
310 Waterfront Park Bldg.
144 Railroad Avenue
Edmonds, WA 98020
Phone (425) 744-7700
Fax (425) 744-1400

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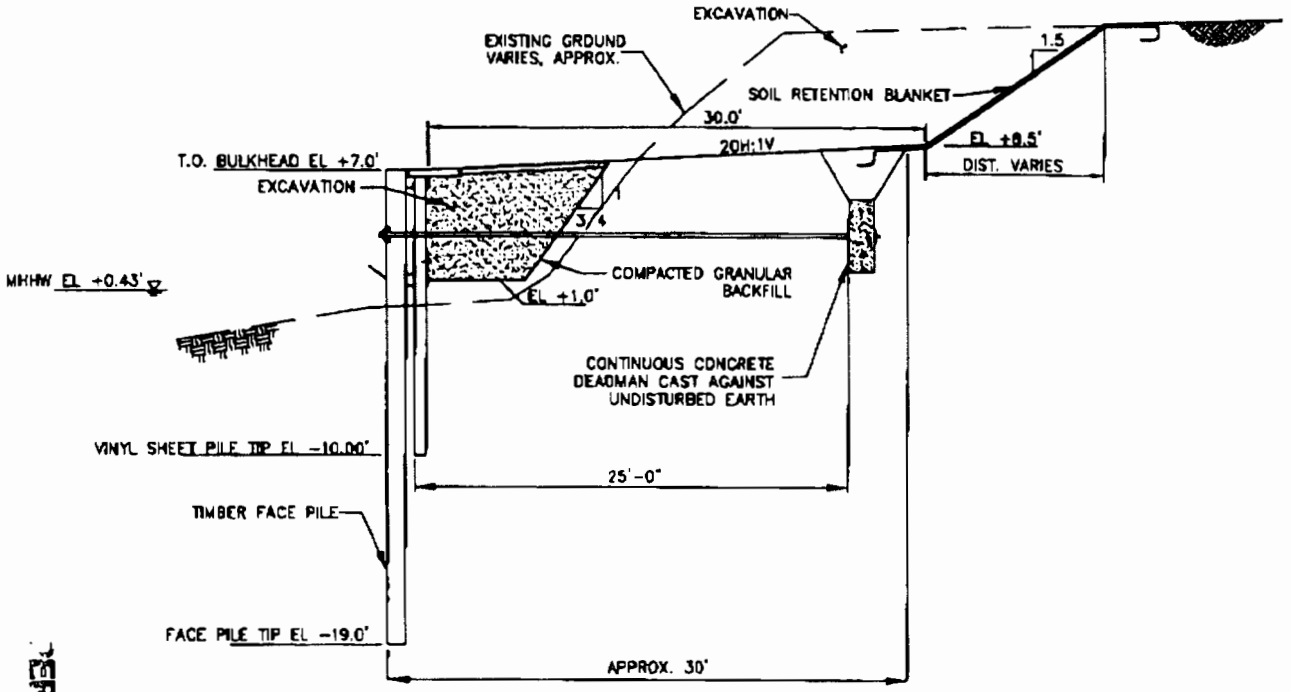
JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUG 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 7 OF 9



TYPICAL BULKHEAD SECTION

0 5 10
SCALE IN FEET

22285
Jefferson County
29 August 2001

PERMITTED PLANS

TIDAL WATER LEVELS (NGVD29)	
MEAN HIGHER HIGH WATER	+0.43'
MEAN SEA LEVEL	0.0'
MEAN LOWER LOW WATER	-0.82'

CONSTRUCTION QUANTITIES	
-	37,300 CY
-	5.8 ACRES

PACIFIC INTERNATIONAL ENGINEERING PLLC

TEXAS
[illegible] Greystone Drive
[illegible] 100
Austin, TX 78731
Phone (512) 420-0804
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WASHINGTON
310 Waterfront Park Bldg.
144 Railroad Avenue
Edmonds, WA 98020
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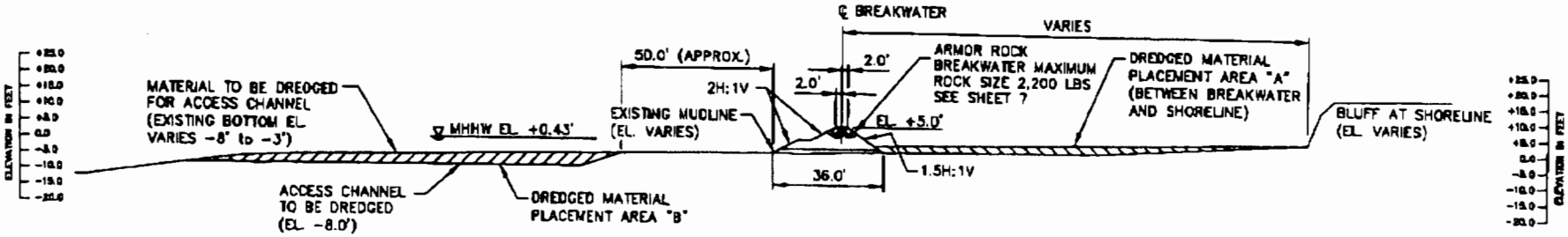
JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUG 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 8 OF 9

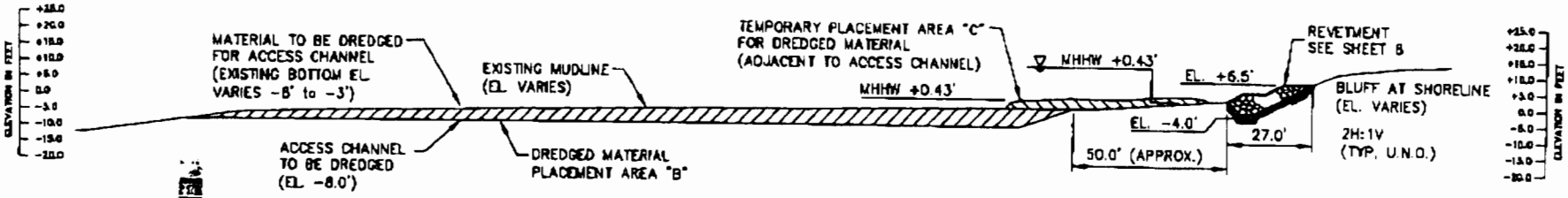


OFFSHORE BREAKWATER TYPICAL SECTION

(AT LOCATION REQUIRING DREDGING)

0 25 50

SCALE IN FEET



REVETMENT TYPICAL SECTION

(AT LOCATION REQUIRING DREDGING)

0 25 50

SCALE IN FEET

NOTE - AREA "C" IS FOR TEMPORARY PLACEMENT OF DREDGED MATERIAL. ACCESS CHANNEL CUT WILL BE FILLED WITH DREDGED MATERIAL UPON COMPLETION OF REVETMENT/BREAKWATER CONSTRUCTION.

PERMITTED PLANS

22285
Jefferson County
29 August 2001
Page 9 of 9

ANNEL DREDGING QUANTITIES	
-	13,700 CY
-	2.5 ACRES

TIDAL WATER LEVELS (NGVD29)	
MEAN HIGHER HIGH WATER	+0.43'
MEAN SEA LEVEL	0.0'
MEAN LOWER LOW WATER	-0.62'

PACIFIC INTERNATIONAL ENGINEERING PLLC

TEXAS
3615 Greystone Drive
Suite 100
Austin, TX 78731
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JEFFERSON COUNTY, TEXAS
PLEASURE ISLAND
SHORELINE PROTECTION PROJECT

DATE: AUGUST 28, 2001 | PROJECT NO. 0887 | DATUM: NGVD29 | SHEET 9 OF 9

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1229
GALVESTON TX 77553-1229

cc: HALLMARK FILE

January 4, 2007

REPLY TO
ATTENTION OF:
Evaluation Section

SUBJECT: Permit No. 22285(01); Extension of Time

Donald Rao
Jefferson County Engineering Department
1149 Pearl Street, 5th Floor
Beaumont, Texas 77701-3638

Dear Mr. Rao:

Your request, dated November 22, 2006, to amend Permit No. 22285 for an extension of time is approved pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Permit No. 22285 was issued on December 6, 2001, and authorized stabilization activities along a 4-mile-long stretch of eroded shoreline on Pleasure Island. These activities include: 1) installation of bulkheads; 2) the placement of riprap into the Sabine-Neches Waterway; 3) and the construction of offshore breakwaters. The project site is located along a 4-mile stretch of eroded shoreline on the western side of Pleasure Island, along the Sabine-Neches Waterway, south of Port Arthur, in Jefferson County, Texas.

All work is to be performed in accordance with the enclosed plans in 9 sheets and the original permit conditions, which remain in full force and effect, with the exception of the time limit for completion. This authorization expires on December 31, 2012. Please note the enclosed Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form regarding this permit.

This letter also contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a combined NAP and RFA form. If you request to appeal this determination you must submit a completed RFA form to the Southwestern Division Office at the following address:

James E. Gilmore, Appeal Review Officer
Southwestern Division, CESWD-CMO-E
1100 Commerce Street, Room 8E9
Dallas, Texas 75242-0216
Telephone: 469-487-7061; FAX: 469-487-7190

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by March 7, 2007. It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this letter.

The Supreme Court handed down a decision on June 19, 2006, which addresses the scope of Clean Water Act (CWA) jurisdiction over certain waters of the United States, including wetlands. In the near future, the U.S. Environmental Protection Agency and Corps intend to issue joint guidance clarifying CWA jurisdiction in light of the decision. Your permit may be affected by this guidance. However, we are issuing you this permit, with its existing terms and conditions, and the amount of required compensatory mitigation can be re-evaluated based on that new guidance when it is issued.

Please notify the District Commander, in writing, upon completion of the authorized work. A pre-addressed postcard has been enclosed for your convenience.

FOR THE DISTRICT COMMANDER:

Bruce H. Bennett
Leader, North Evaluation Unit

Enclosures

Copies Furnished:

Eighth Coast Guard District, New Orleans, LA

NOAA/NOS, Coast & Geodetic Survey, Silver Spring, MD

U.S. Fish and Wildlife Service, Houston, TX

Texas General Land Office, Austin, TX

Texas General Land Office, La Porte, TX

Northern Area Office, Galveston, TX

Port Arthur Project Office, Port Arthur, TX

LJA Engineering, Inc.

5316 Highway 290 West
Suite 150
Austin, Texas 78735

Phone 512.439.4700
Fax 512.439.4716
www.ljaengineering.com

JEFFERSON COUNTY
PLEASURE ISLAND SHORE PROTECTION
REVISED BREAKWATER-MARSH RESTORATION PROJECT

Addendum No. 2
Questions and Answers

Exhibit C

Potential Rock Sources and Potential Subcontractors

JEFFERSON COUNTY
PLEASURE ISLAND SHORE PROTECTION
REVISED BREAKWATER-MARSH RESTORATION PROJECT

STONE SOURCE AND SUBCONTRACTORS

SOURCE—ARMOR AND BEDDING STONE

Company Name: _____
Point of Contact: _____
Email Address: _____
Phone Number: _____

Company Name: _____
Point of Contact: _____
Email Address: _____
Phone Number: _____

SUBCONTRACTORS
(Complete additional pages as necessary)

Company Name: _____
Point of Contact: _____
Email Address: _____
Phone Number: _____
Subcontracting Opportunity, Scope of Work:
_____
_____
_____
_____
_____
_____
_____

Company Name: _____
Point of Contact: _____
Email Address: _____
Phone Number: _____
Subcontracting Opportunity, Scope of Work:
_____
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