

Preliminary (30%) Design Report

June 2012



Lost Lake Marsh Creation and Hydrologic Restoration Project

TE - 72

Terrebonne Parish, Louisiana



Louisiana Coastal Protection
and Restoration Authority



Lost Lake Marsh Creation and Hydrologic Restoration Project (TE-72)
Preliminary Design Report

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1.0 INTRODUCTION

The Lost Lake Marsh Creation and Hydrologic Restoration Project (herein referred to as TE-72) is located in the Terrebonne Basin near the vicinity of Lost Lake as shown in Figure 1. The Louisiana Coastal Wetlands Planning, Protection and Restoration Task Force designated TE-72 as part of the 19th Priority Project List (PPL). The United States Fish and Wildlife Service (USFWS) was designated as the federal sponsor with funding approved on January 20, 2010, through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) of 1990 by the United States Congress and the Wetlands Conservation Trust Fund by the State of Louisiana. The Louisiana Coastal Protection and Restoration Authority (CPRA) is serving as the local sponsor and will also be performing engineering and design.

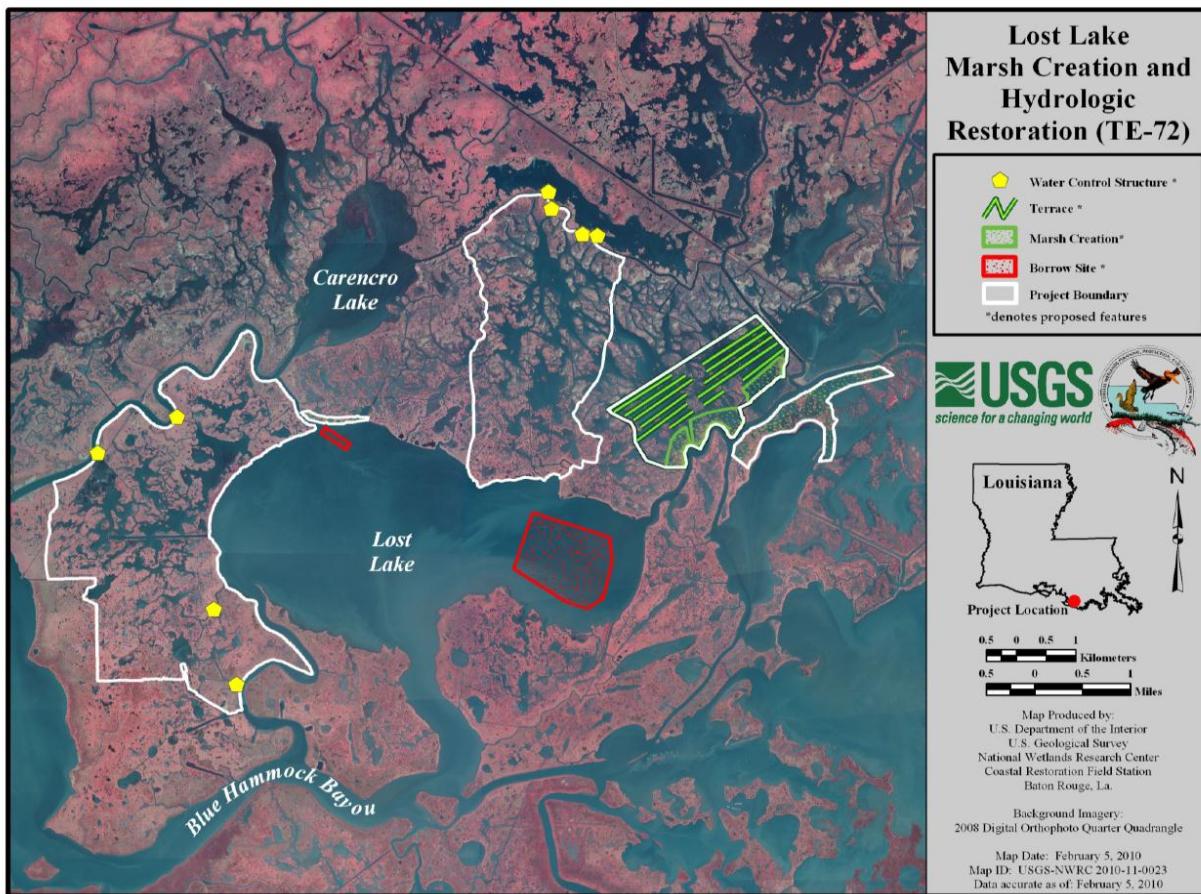


Figure 1: Phase 0 Project Features for TE-72

Restoration strategies developed during the Phase 0 stage for this project include the construction of marsh creation areas, terraces, and hydrologic restoration features as shown in Figure 1. The proposed marsh creation features will be achieved by dredging sediment from Lost Lake to fill open water and broken marsh areas along Bayou Decade and the Lake Pagie lake rim. An earthen terrace field will be constructed in open water north of Bayou Decade in order to minimize damage to the existing marsh caused by local wind-induced waves. Eight fixed-crest weirs to the north and west of Lost Lake are

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proposed to be removed and reconstructed in an effort to increase flow rates of freshwater into the existing marsh while allowing water levels to be maintained during the waterfowl season (i.e., November to January).

Engineering and design is being conducted by the CPRA Restoration Engineering Division. Data collection activities including topographic, bathymetric and magnetometer surveys, and a geotechnical subsurface investigation were completed. Additionally, water level data has also been collected by CPRA to inform decisions on the hydrologic restoration project features. The collected data and survey information have been used to design the proposed restoration project features and develop construction methodology criteria for each restoration feature to the 30% level of completion as required by the CWPPRA Standard Operating Procedures Manual.

2.0 HISTORICAL WATER LEVELS

Historical water level calculations were performed during the design of the TE-72 project. These calculated parameters were used during the development and design of the marsh creation fill areas and the hydrologic structures.

The United States Geological Survey (USGS) stage recorder #0738165067 (no longer in service) was selected to determine historical water levels due to its close proximity to the project area and database availability. Stage recorder #0738165067 was located in Bayou Raccourci at 29°20'18"N, 90°57'08"W to the south east of the TE-72 project area (Figure 2). Daily maximum and minimum water level data were recorded from August 27, 1999 to March 19, 2002. These data were used to determine mean high water (MHW) and mean low water (MLW) values for the project area.

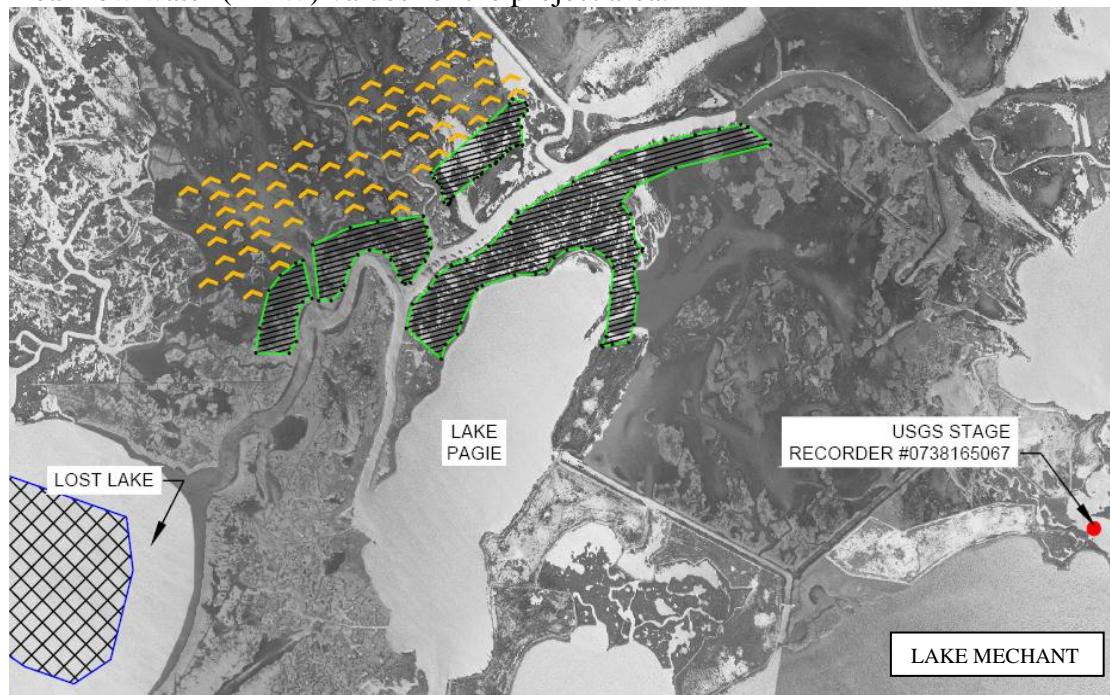


Figure 2: USGS Stage Recorder Location

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A normal tidal epoch lasts approximately 19 years. In order to accurately estimate MHW and MLW, a data set with less than 19 years of data should be correlated to a gauge which has a data set of at least 19 years. NOAA station #8761724 located at Grand Isle near Barataria Pass at $29^{\circ}15'48"N$, $89^{\circ}57'24"W$ (Figure 3) was used as a control station for making this correlation. The period of record used for the 19 year tidal epoch was from January 1, 1984 to December 31, 2002. The method used to make this correlation is summarized in Table 1.



Figure 3: NOAA Gage Station Location

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KNOWN VARIABLES	ELEV. FT NAVD88
MHW _C = 19 Year Mean High Water At Control Station	1.38
MTL _C = 19 Year Mean Tide Level At Control Station	0.83
MLW _C = 19 Year Mean Low Water At Control Station	0.29
MR _C = 19 Year Mean Tide Range At Control Station	1.09
TL _C = Mean Tide Level For The Observation Period At Control Station	0.88
R _C = Mean Tide Range For The Observation Period At Control Station	1.04
TL _S = Mean Tide Level For The Observation Period At Subordinate Station	0.90
R _S = Mean Tide Range For The Observation Period At Subordinate Station	1.12
CALCULATED VARIABLES	
MHW _S = 19 Year Mean High Water At Subordinate Station (MHW = MTL + MR/2)	1.44
MTL _S = 19 Year Mean Tide Level At Subordinate Station (MTL = TL+MTL-TL)	0.86
MLW _S =19 Year Mean Low Water At Subordinate Station (MLW=MTL-MR/2)	0.27
MR _S =19 Year Mean Tide Range At Subordinate Station (MR=(MR*R)/R)	1.17

Table 1: Summary of Tidal Datum Determination

3.0 SURVEYS

Topographic, bathymetric, and magnetometer surveys were conducted by Pyburn & Odom in May 2011. This survey effort was intended to facilitate the planning and design efforts regarding the various aspects of the project.

3.1 Horizontal and Vertical Control

The horizontal and vertical position of the existing permanent secondary monument, designated as TE-34-SM-04, was updated by the GPS Survey Team. Two 5-hour static sessions were observed and corrected using NOAA's Online Positioning User Service (OPUS). The observed positions were comparable to both the published position and the Gulfnet Virtual Real Time Network (VRS) position. The published position of the monument is listed below. The survey monument data sheet can be found in Appendix A.

Lat. = 29°21'45.4779"N NAD83
 Long. = 90°59'34.13005"W NAD83
 EL = 2.99 ft NAVD88

3.2 Marsh Creation Fill Areas and Earthen Terrace Field

Survey transects were established at 500 foot increments throughout the marsh creation fill areas and the earthen terrace field. Position, elevation and water depth were recorded every 25 feet along each transect and where there was an elevation change of greater than half a foot. Several transects extended across Bayou Decade to aid in determining the location for containment dikes along the bayou. This will enable the use of existing spoil banks to minimize the amount of material used in earthen containment dike construction. Additional transects were established outside of the limits of the fill sites to provide information in the event additional fill areas are needed. These transects are shown on Sheet 11 in Appendix B.

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3.3 Magnetometer

In order to locate pipelines and other potential obstructions which could interfere with construction activities, CPRA tasked Pyburn & Odom to perform a magnetometer survey in the project area. Data was collected using a G-881 Cesium marine magnetometer. Magnetometer lines were run within the borrow area, marsh creation fill areas, and earthen terrace field. The areas where anomalies were observed were compiled and compared to CPRA's GIS pipeline database.

3.4 Healthy Marsh Elevation Survey

A survey of the average marsh elevation in the project area was conducted near the proposed marsh creation fill areas. The survey consisted of at least 20 elevation shots taken in the different areas determined by CPRA biologists to be healthy marsh. The marsh elevation for each shot was defined as the point where the survey rod was resting among living vegetative stems and is supported by soil containing living vegetative roots. The average marsh elevation data along with the evaluation of healthy marsh in the area were used to assist in the determination of the target marsh elevation of +1.14 ft NAVD88.

4.0 GEOTECHNICAL INVESTIGATION

In order to determine the suitability of the soils in the TE-72 project area for the various proposed construction alternatives, a geotechnical subsurface investigation was performed by GeoEngineers and completed on August 26, 2011. GeoEngineers was tasked to collect geotechnical data and perform geotechnical engineering analyses to aid in the development of recommendations for marsh creation fill areas, earthen terracing and hydrologic restoration features.

4.1 Soils Investigation

A total of 20 subsurface soil borings were drilled in the project area at locations shown below in Figure 4. Four of the borings were taken in proposed dredge borrow sites, nine soil borings were taken in the proposed marsh creation fill areas and earthen terrace field, and seven soil borings were taken at locations for proposed weir removal and replacement.

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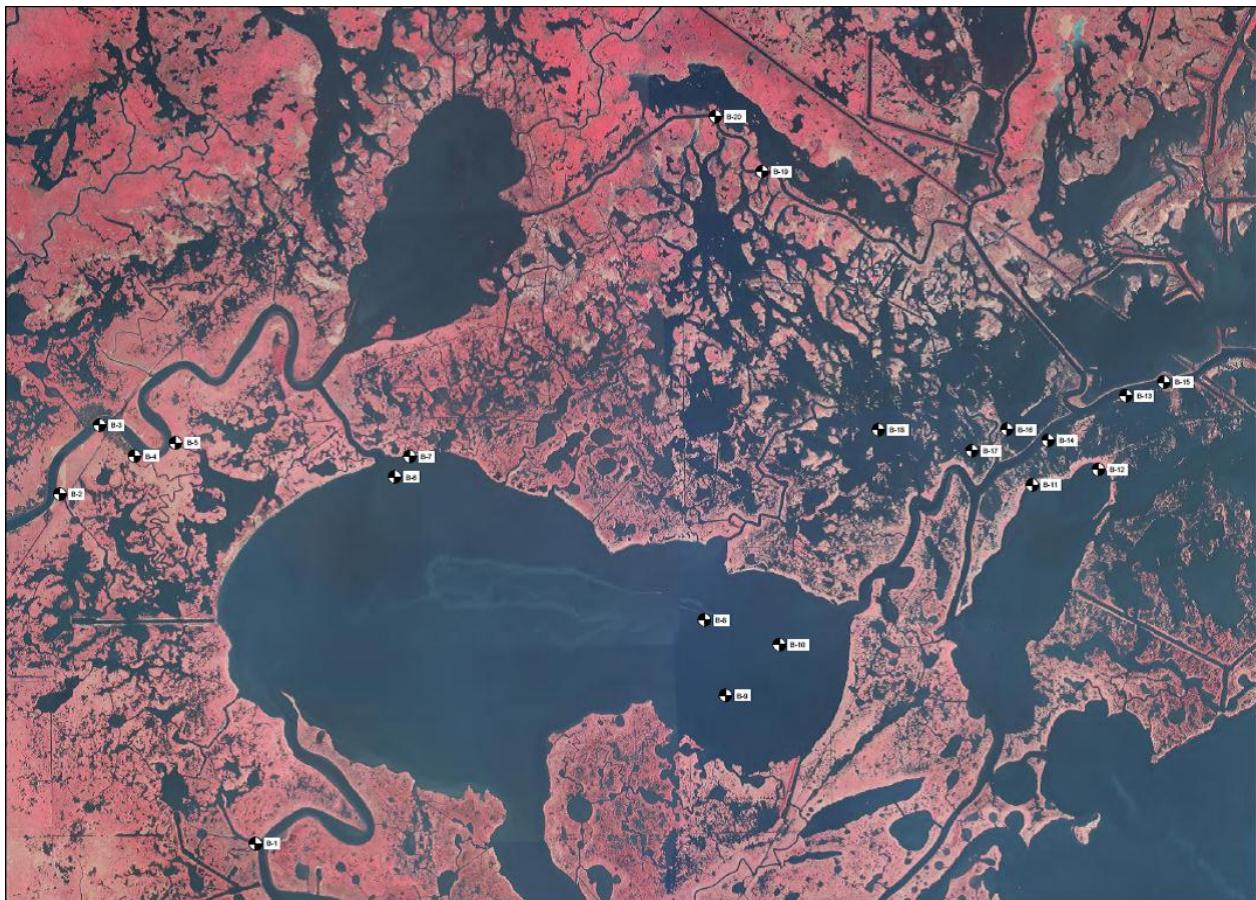


Figure 4: Soil Boring Locations

4.2 General Geologic Evaluation

The site is generally underlain by weak and highly compressible Delta Plain, Marsh deposits of Holocene Age (normally consolidated) to approximately Elev. -500 feet (+/-) NAVD88. More competent Pleistocene materials begin below that depth. The majority of the borings encountered very soft cohesive soil with varying amounts of organic matter. Layers of peat were encountered at a few of the borings at various depths. Several borings in the marsh creation fill areas encountered semi-cohesive and non-cohesive soils at intermittent depths. The detailed soil boring logs are presented in Appendix C.

4.3 Marsh Creation Settlement Analyses

The height of dredged material in a contained area is reduced by primary consolidation, secondary compression, and desiccation within the dredged fill, as well as settlement of soil beneath the fill. The consolidation settlement and time rate of settlement of the fill areas was determined using the Primary consolidation, Secondary consolidation, and Desiccation of Dredged Fill (PSDDF) program.

In addition to dredged material settlement, the soil beneath the marsh creation fill areas will consolidate from the additional weight added by the marsh fill material. This

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consolidation was calculated using load area dimensions and pressures consistent with the dredged fill. The sum of the dredged fill settlement and the underlying soil settlement was used to determine the total settlement of the marsh creation fill areas. This process of settlement is shown in Figure 5.

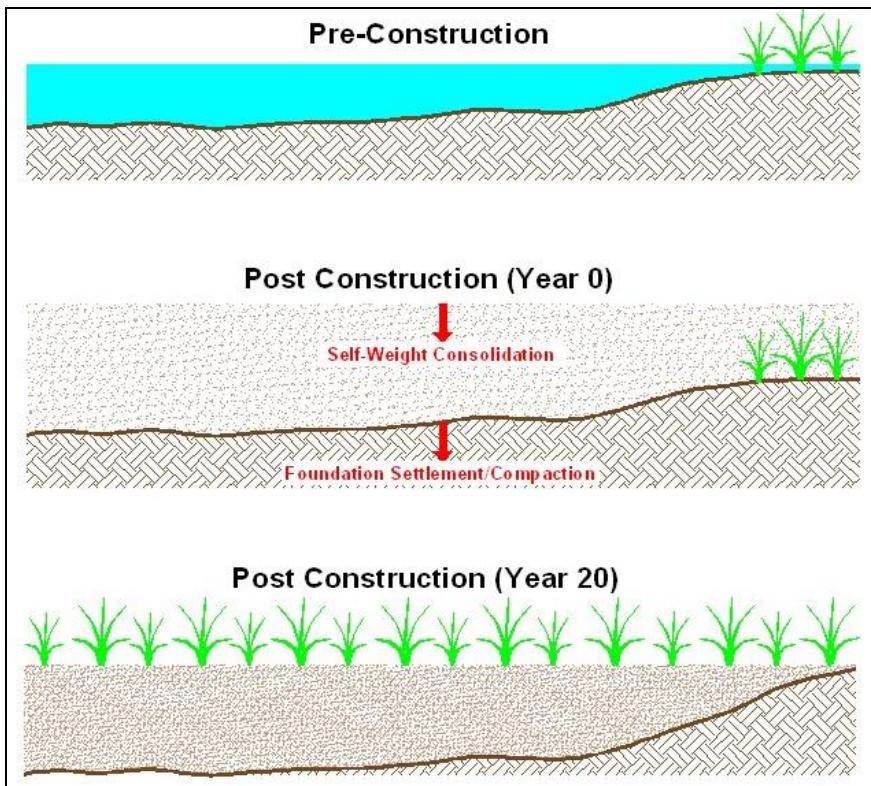


Figure 5: Marsh Fill Settlement

Marsh fill creation area settlement was evaluated for a one lift construction system with construction marsh fill elevations at +2.0 feet, +2.5 feet, and +3.0 feet NAVD88. The goal of the project is to have the elevation of the marsh fill be intertidal as soon as possible while remaining intertidal for the 20 year life of the project. This elevation should also remain near the average healthy marsh elevation (+1.14 feet NAVD88) for the longest duration possible. The settlement curve shown in Figure 6 represents the marsh fill elevation when constructed to +3.0 feet NAVD88 in Fill Area 1 using one initial lift. Also represented are the MHW, MLW, and healthy marsh elevations for the proposed marsh creation fill areas. This construction marsh fill elevation (CMFE) is the elevation of the top of the marsh fill upon construction acceptance of the marsh creation fill area. The construction acceptance period is typically 28-30 days following the completion of dredge material placement activities in the marsh creation fill area. This is also depicted as the marsh fill elevation at Target Year 0 (TY 0).

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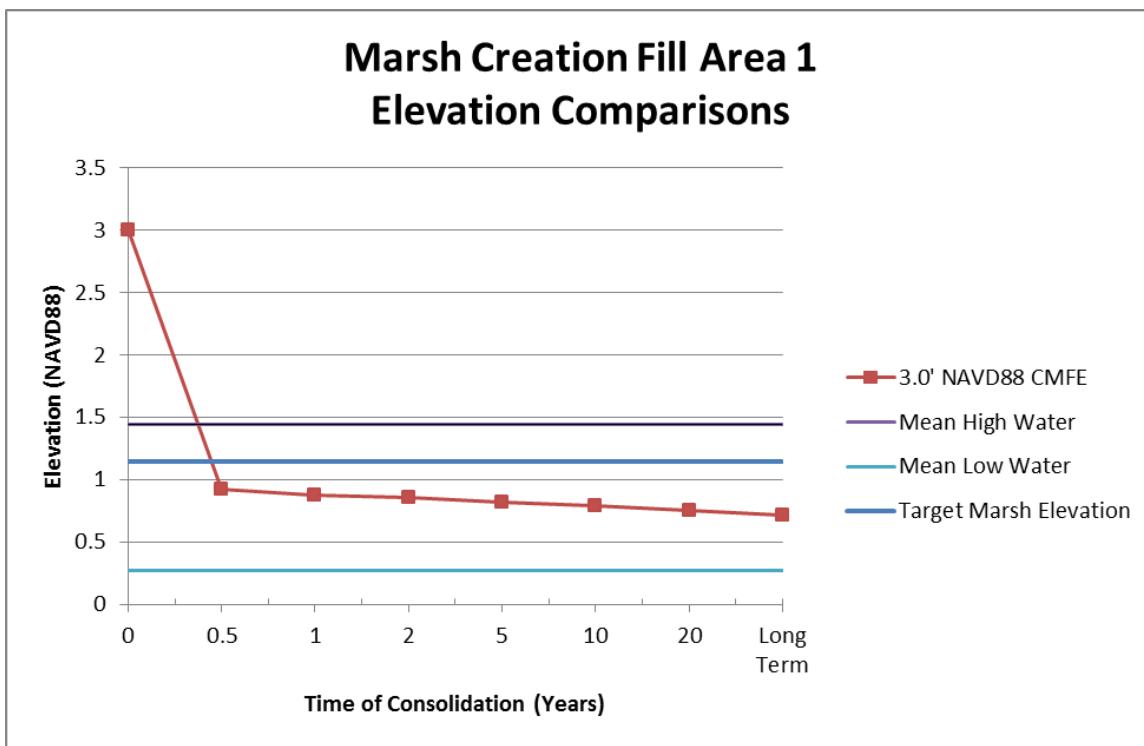


Figure 6: Settlement Curve – Marsh Creation Fill Area 1

For the evaluation shown in Figure 6, the elevation of the marsh creation fill area is predicted to be intertidal within the first 6 months post-construction and should remain intertidal for the 20 year life of the project. However, the marsh fill elevation is also predicted to be below the target marsh elevation for the entire project life which would not meet the goals established for the project. Therefore, additional geotechnical evaluations were performed to determine a marsh fill strategy that would achieve a desirable and sustainable marsh elevation.

It was determined that a two lift marsh fill construction system would be needed to achieve marsh fill elevations to meet the project goal. GeoEngineers performed this evaluation with an initial construction marsh fill elevation of +1.5 feet NAVD88, followed by a 30 day waiting period, to facilitate dewatering and initial consolidation. A second lift would be placed to a maximum construction marsh fill elevation of +3.5 feet NAVD88. The settlement curve shown in Figure 7 represents this evaluation for marsh creation Fill Area 1. The settlement curves for all other marsh creation fill areas can be found in Appendix D.

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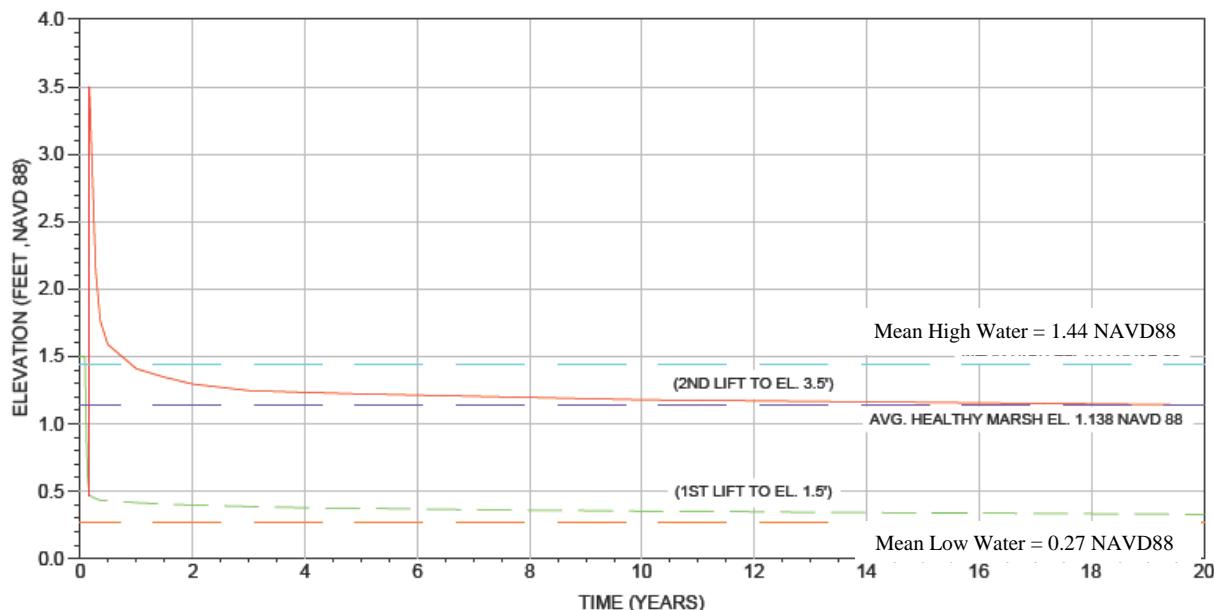


Figure 7: Two Lift Settlement Curve – Marsh Creation Fill Area 1

As shown on the two lift settlement curve, this construction method meets the goals of the project because the elevation of the marsh fill becomes intertidal within the first year post construction and remains intertidal for the 20 year project design life, while staying near the average healthy marsh elevation.

The Louisiana Applied Coastal Engineering and Science (LACES) Division of CPRA produced a relative sea-level rise prediction for the TE-72 project area of 0.3209 meters (1.053 feet) by year 2033. This sea-level rise was then applied to the current water levels and applied to the settlement curves (Figure 8). After accounting for RSLR, the proposed marsh creation fill area will remain intertidal for 17 years, which is 85% of the project's design life. It should be noted that RSLR does not account for accretion which will extend the intertidal lifespan beyond 17 years. An accretion rate has not been provided due to the lack of research near the project area.

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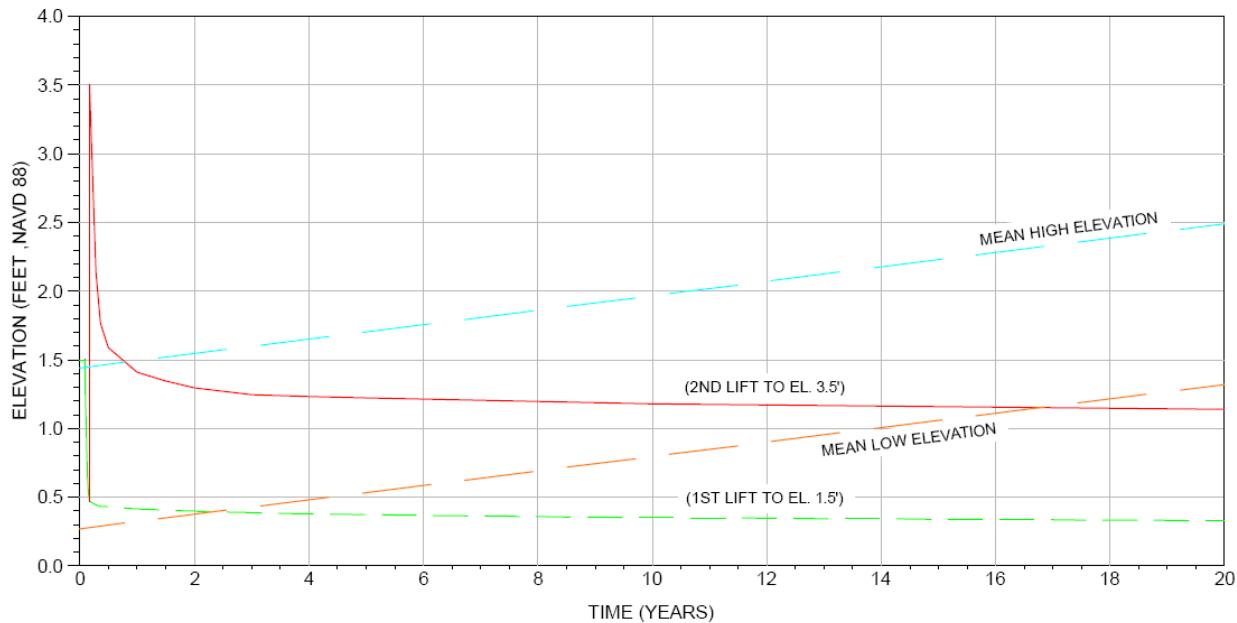


Figure 8: Two Lift Settlement Curve – Relative Sea Level Rise

5.0 MARSH CREATION DESIGN

This project proposes to create marsh by dredging and hydraulically pumping sediment from a borrow area in Lost Lake into the proposed marsh creation fill areas using hydraulic dredging techniques. The three components evaluated in this process are the borrow area, the marsh creation fill areas, and the earthen containment dikes.

5.1 Fill Area

The marsh fill portion of TE-72 has been delineated into four different marsh creation fill areas and one marsh nourishment area. These areas are located in open, shallow-water areas that border Bayou Decade to the northeast of Lost Lake (Figure 9) and on the northeastern lake rim of Lost Lake (Figure 10). The configuration of these marsh creation fill areas does not significantly vary from the original (Phase 0) layout.

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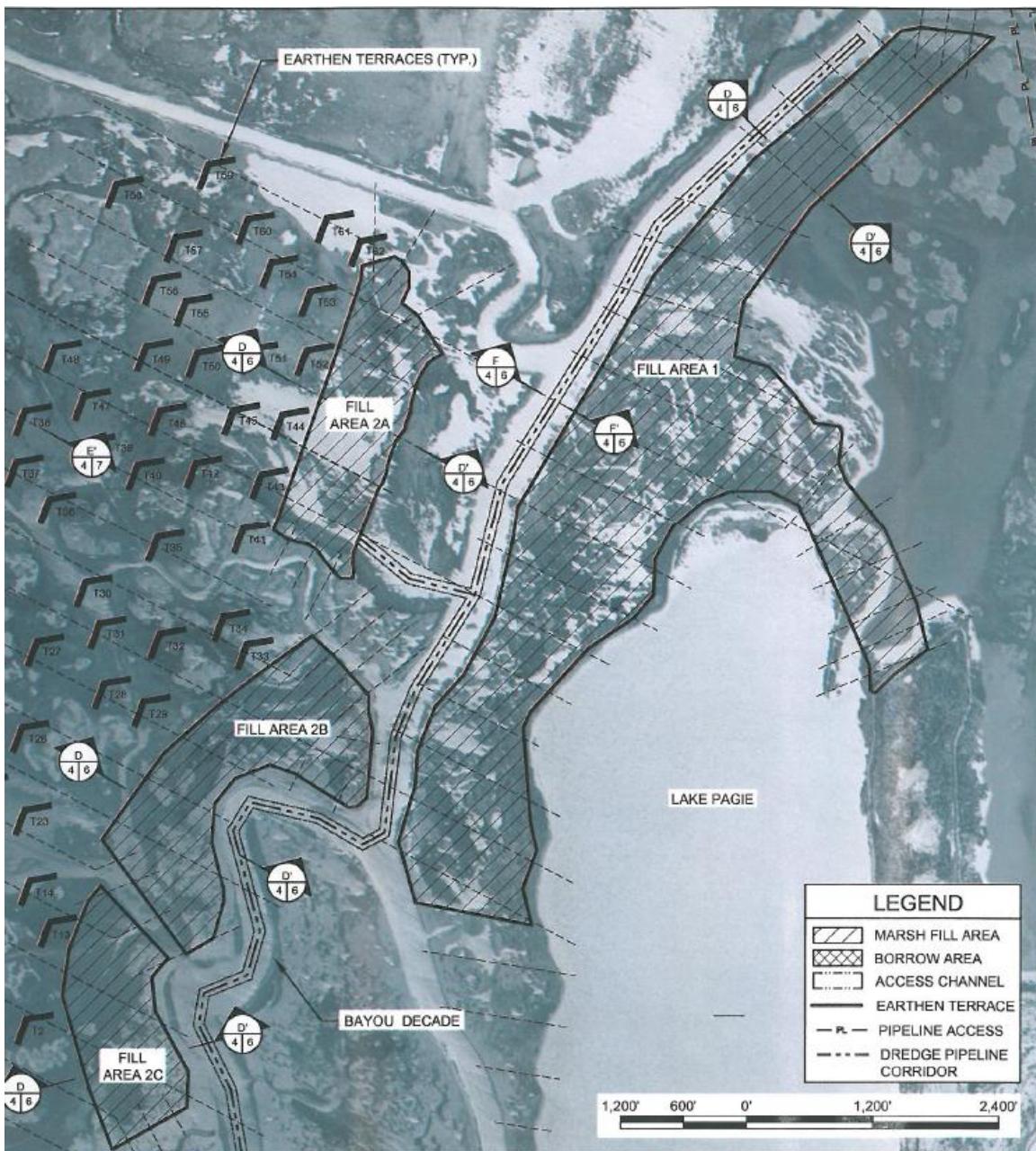


Figure 9: Marsh Creation Fill Area Layout – Fill Area 1, 2A, 2B, and 2C

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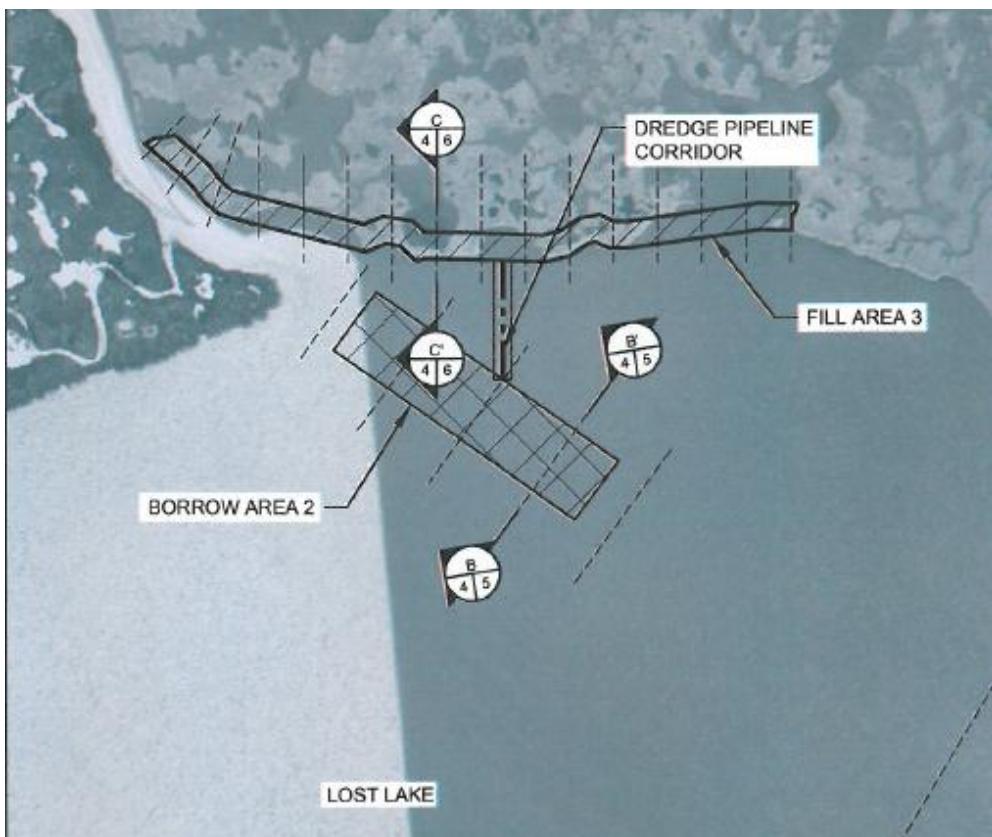


Figure 10: Marsh Creation Fill Area Layout – Fill Area 3

The key design component of the marsh creation fill areas is the estimated volume of material required to achieve the construction marsh fill elevation. This elevation was chosen based on the mean high water elevation, mean low water elevation, and target marsh elevation. This means that the marsh elevation should be below Mean High Water (+1.44 feet NAVD88) shortly after construction and above Mean Low Water (+.27 feet NAVD88) at Year 20, while staying as close to the target marsh elevation (+1.14 feet NAVD88) for the longest period of time. Several fill elevations and techniques were evaluated, as described in Section 3.3, in order to determine the final construction marsh fill elevation. Marsh Creation Fill Areas 1, 2A, 2B, and 2C will be constructed to +1.5 feet NAVD88, followed by a 30 day minimum waiting period, and then constructed to +3.5 feet NAVD88. Using this two-lift construction method, each of these fill areas are expected to settle to an approximate elevation between +0.8 and +1.3 feet NAVD88 by Year 20, which meets the goals of the project.

In order to optimize costs and improve constructability, Marsh Creation Fill Area 3 will be constructed without the use of containment dikes on the northern (landward) side of the fill area. This construction technique will eliminate the need of nearly 8,000 linear feet of earthen containment dikes. This unconfined flow will create approximately 13 acres of marsh at an elevation of approximately +2.0 feet NAVD88. This acreage will begin at the existing shoreline and extend approximately 150 feet northward. From this point, the marsh fill will begin a gradual slope, approximately 100H:1V until reaching the

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existing marsh elevation. The marsh fill material will be pumped from the nearby Borrow Area 2 (Figure 10) by the use of a small dredge.

After determining the construction marsh fill elevations, the volume of material required for each fill site was calculated. Cross sectional areas of each transect in the fill sites were computed using the data collected in the marsh creation fill area survey described in Section 2.2. The required in-place volume for each marsh creation fill area was then calculated using these areas. The estimated volumes needed for each fill area are shown below in Table 2.

Marsh Creation Fill Area	Area (Acres)	Volume of In-Place Marsh Fill (yds ³)
1	280	1,296,502
2A	50	289,282
2B	71	323,681
2C	41	214,897
3	13*	75,865
Total	442	2,200,227

* Not including marsh nourishment “runoff”

Table 2: Summary of Marsh Fill Acreage and In-Place Marsh Fill Volume

5.2 Borrow Area

The controlling factors in the design of a borrow area are the location, size, and depth. It is preferred that the borrow area be located in close proximity to the marsh creation fill areas in order to minimize the pumping distance of the material. It is also preferred that the borrow area be clear of any existing oyster leases and pipelines. The borrow area chosen, Borrow Area 1, during the Phase 0 stage of the project satisfies all of these criteria.

The size of the borrow area is determined by the total volume of marsh fill required for the project and provide sufficient latitude for the contractor to select the most effective area to dredge and move within. A cut to fill ratio should be applied when placing hydraulically dredged material. This is to account for any lost material during the dredging and dewatering processes of construction. Under normal circumstances, it takes approximately 1.3 to 1.5 cubic yards of hydraulically removed material to fill 1.0 cubic yards in the placement area. For TE-72, a conservative 1.5:1 cut to fill ratio was applied to determine the cut volume in the borrow area. A summary of in-place fill and cut volumes for each marsh creation fill area is found in Table 3.

Marsh Creation Fill Area	Volume of In-Place Marsh Fill (yds ³)	Volume of Cut (yds ³)
1	1,296,502	1,944,753
2A	289,282	433,923
2B	323,681	485,522
2C	214,897	322,346
3	75,865	113,798
Total	2,200,227	3,300,341

Table 3: Summary of Marsh Fill and Cut Volumes

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In order to limit the ecological impacts to the existing environment, the depth of cut used during inshore hydraulic dredging projects is typically limited to an elevation of -15 feet NAVD88. The borrow area chosen during the Phase 0 stage of the project has an area of 448 acres. Cross sectional areas of each transect in the borrow area were calculated using the data collected in the borrow area survey. The available volume of material within this borrow area was then calculated using these areas. The chosen borrow area has approximately 7.5 million cubic yards of mostly cohesive material (soft clay with varying amounts of organic matter) available. For additional information refer to the detailed boring logs for B-6, B-8, B-9, and B-10 in Appendix C.

5.3 Earthen Containment Dikes (ECD)

The primary design parameters for earthen containment dikes include crown elevation, crown width, and side slopes. In order to prevent overtopping during construction, engineering judgment and experience on similar projects indicates that 1.0 feet of freeboard should exist between the top of the earthen containment dike and the maximum construction marsh fill elevation. With a maximum construction fill elevation of +3.5 feet NAVD88, the crown elevation for containment dikes will be +4.5 feet NAVD88. Based on slope stability analyses, GeoEngineers recommended side slopes of 3H:1V with a 15 foot berm width from the ECD toe to the borrow channel bank. The borrow channel will be excavated to a maximum depth of -10 feet NAVD88 with a 3H:1V side slope. A crown width of 4 feet is recommended for all earthen containment dikes. A typical cross section for the marsh creation fill areas and earthen containment dikes is shown in Figure 11.

Settlement analyses for this typical section show that the elevation of the earthen containment dike will provide at least 1.0 feet of freeboard as the earthen containment dike and marsh fill settle concurrently. If unexpected earthen containment dike settlement occurs, CPRA's construction specifications require that an adequate elevation of the earthen containment dike be maintained throughout the duration of construction.

At Marsh Fill Area 3 a more robust earthen containment dike with a 10 foot crest width and 6H:1V side slopes will be constructed along the lake rim to an initial elevation of +5.0 feet NAVD88. This larger earthen containment dike is needed in order to preserve the existing shoreline and provide protection to the newly created marsh.

A mechanical dredging cut to fill ratio of 2.0:1 was applied to the calculated fill volumes. Table 4 provides the approximate lengths and volumes for earthen containment dikes.

Fill Area	Containment Length (ft)	In-Place Fill Volume (yds ³)	Cut Volume (yds ³)
1	27,962	125,087	250,174
2A	7,439	30,229	60,459
2B	9,278	30,341	60,682
2C	5,983	26,334	52,668
3	3,928	20,908	41,816
TOTAL	54,590	232,899	465,799

Table 4: Earthen Containment Dike Lengths and Volumes

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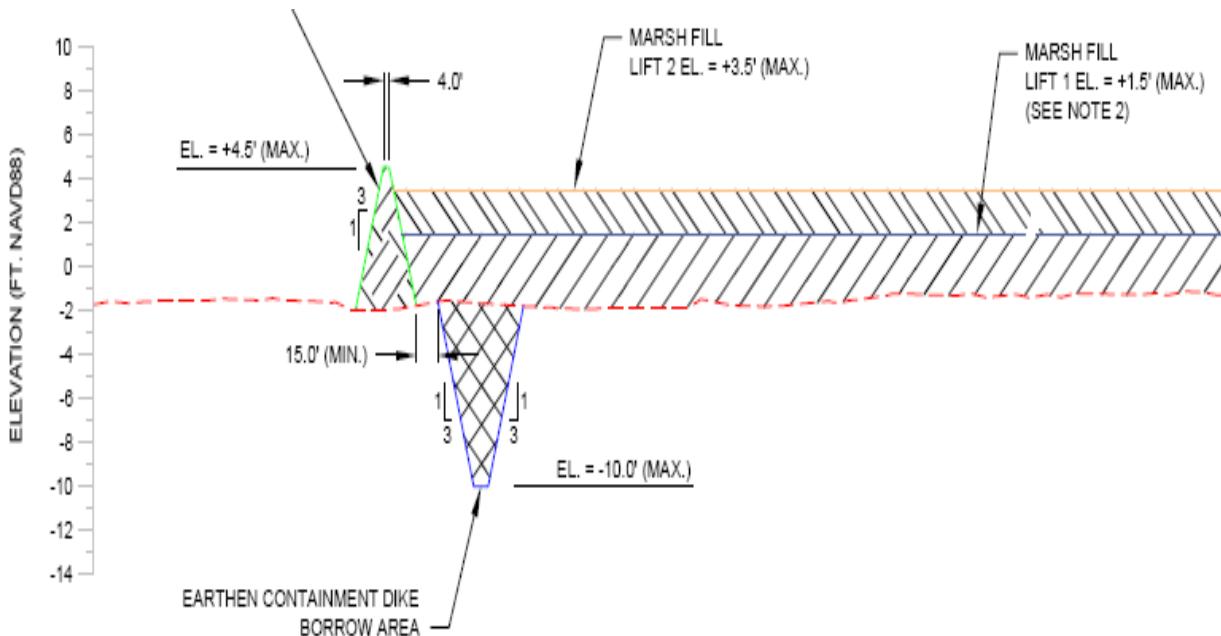


Figure 11: Typical Marsh Fill Area Cross Section

6.0 EARTHEN TERRACE DESIGN

Another proposed project feature is the construction of approximately 30,000 linear feet of earthen terraces. The terraces will play a major role in creating edge habitat and allowing submerged aquatic vegetation to grow, while limiting fetch distance in open water areas.

The main design component of the earthen terrace field involves the development of the earthen terrace template. CPRA tasked GeoEngineers to conduct slope stability, settlement and bearing capacity analyses for an earthen terrace with a 10 foot crown width, 3H:1V side slopes, and +3.0 foot NAVD88 crown elevation. Based on calculations provided by GeoEngineers, a 15 foot berm will be needed from the toe of the earthen terrace to the adjacent borrow area bank. These analyses show that this typical cross section will provide a minimum factor of safety of 1.51, which is greater than the recommended 1.2. The earthen terraces are expected to have a maximum settlement of 12 inches by year 20 of the project life. This means that the crown elevation of the terraces will be approximately 0.5 feet above MHW for the majority of the project life.

The terraces will be laid out so that the footprints of each terrace will not impact any existing vegetation. A “duck-wing” shape for each terrace was chosen to account for winds with varying directions. The layout of the terraces is shown in Figure 12.

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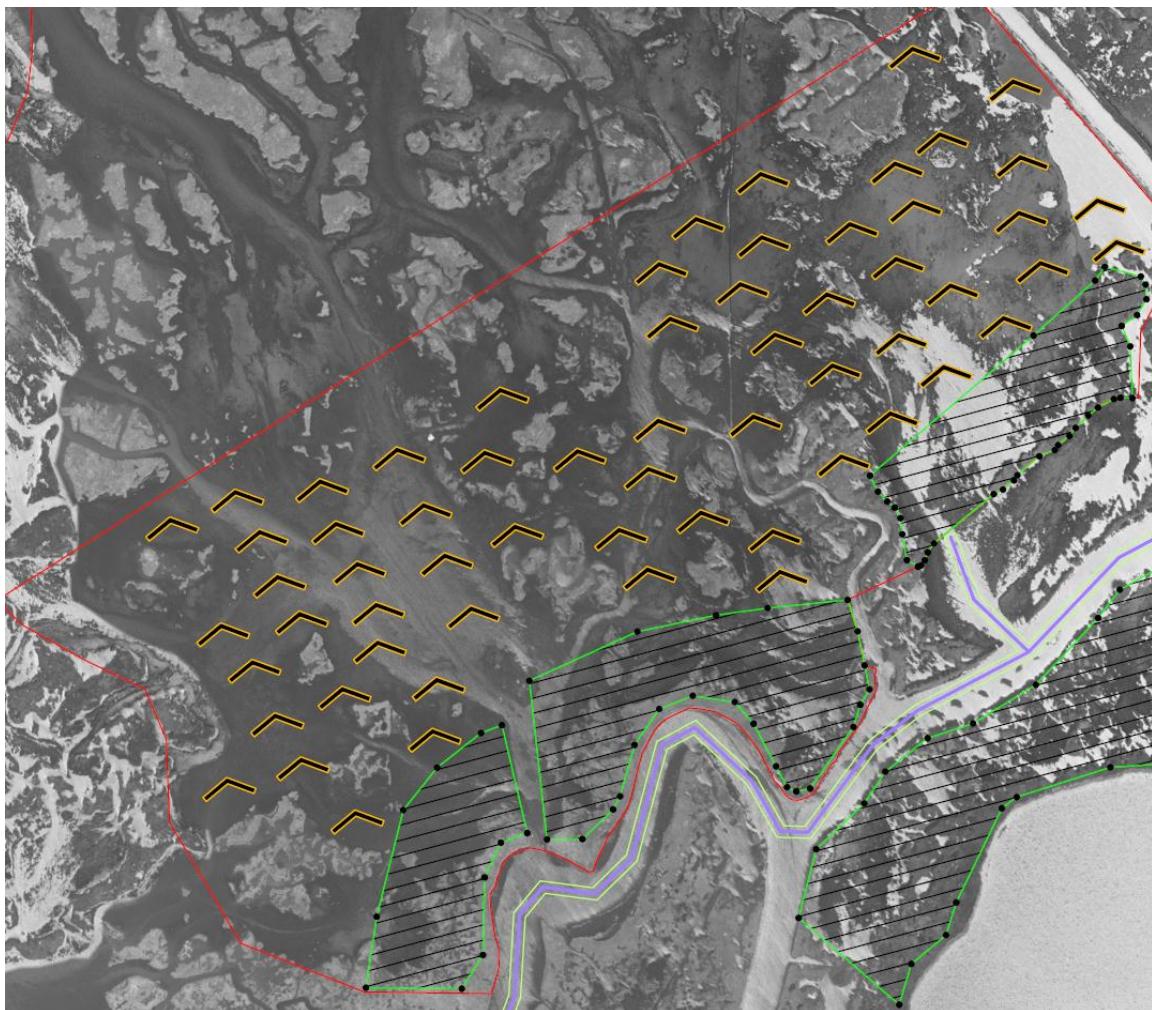


Figure 12: Earthen Terrace Layout

6.1 Vegetative Plantings

Each earthen terrace will be planted in order to promote growth and protect the newly created terrace. Two rows of smooth cordgrass will be planted on a 3-foot spacing in the intertidal region on each side of all terraces. Two rows of paspalum will be planted along the crest of each terrace with a five-foot spacing between each plant. Figure 13 shows the typical earthen terrace cross section with vegetative plantings.

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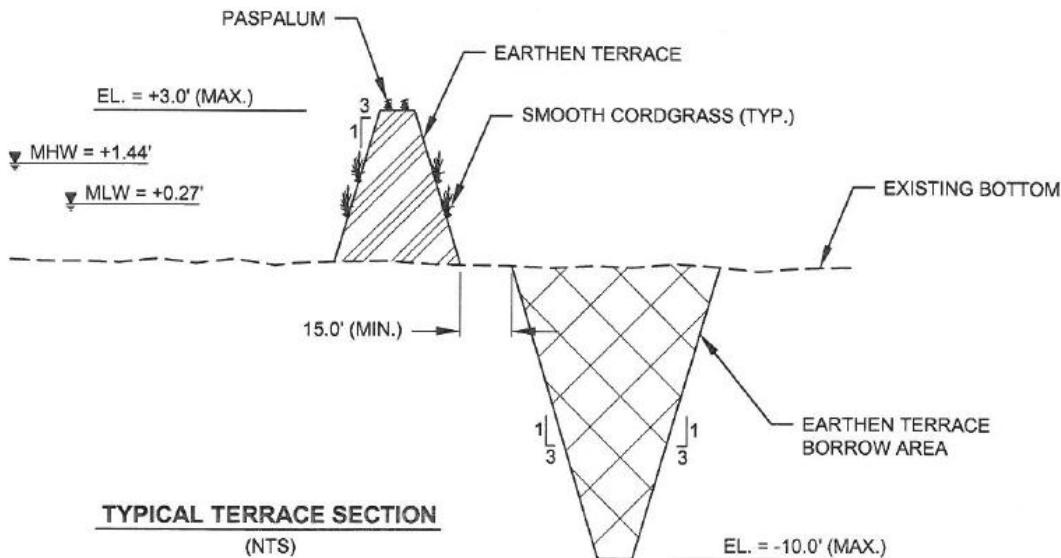


Figure 13: Typical Earthen Terrace with Plantings

7.0 HYDROLOGIC RESTORATION

The interior marsh areas to the west and the north of Lost Lake have been identified as areas that lack flow from the freshwater sources north of the project area. These areas contain numerous fixed crest weir structures that contribute to the declining health of the existing marsh. Eight of these weirs in the TE-72 project area were recommended for replacement during Phase 0 in order to increase the delivery of freshwater from the north into the degrading marshes near Lost Lake (Figure 1). Topographic survey data were collected for thirteen structures in the area so that all could be considered for replacement. The Phase 0 goal was to replace the existing structures with variable crest weirs in order to improve hydrologic connectivity while preserving the ability to control water levels during certain times of the year. An existing fixed crest structure in the project area is shown in Figure 14.



Figure 14: Existing Fixed Crest Weir (WC-3)

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7.1 Data Collection

In April 2011, four data collection stations were established in order to collect water level data for a period of twelve months. Two stations were installed in the area to the north of Lost Lake (Figure 15) and two stations were installed in the area to the west of Lost Lake (Figure 16). Water elevation data were collected at 15 minute intervals from April 5, 2011 to April 24, 2012 for both areas.

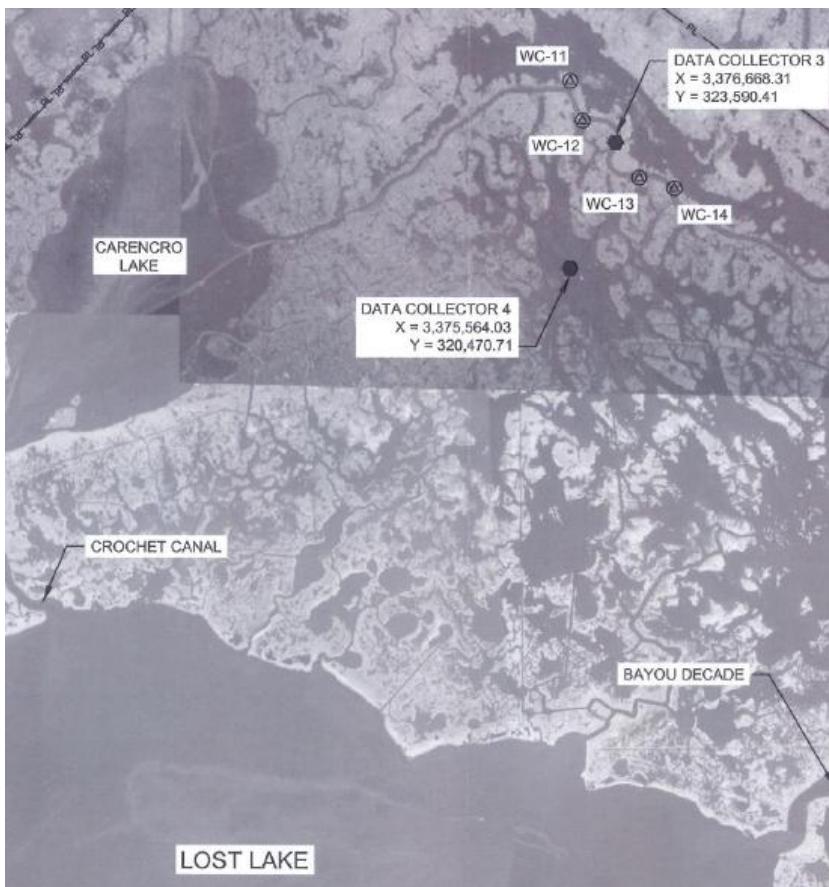


Figure 15: Data Collection Stations and Existing Structures North of Lost Lake

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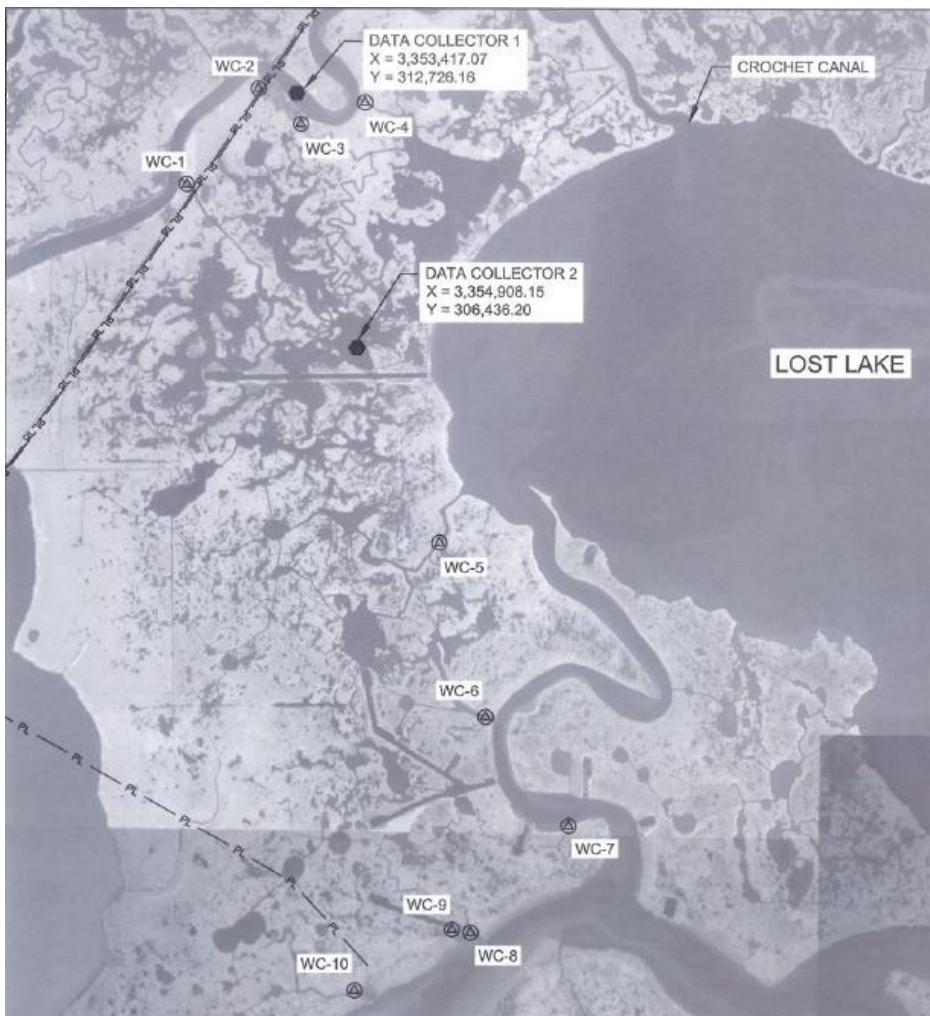


Figure 16: Data Collection Stations and Existing Structures West of Lost Lake

7.2 Flow Calculations

The water levels collected from the four stations were used to calculate the flow rates through the existing and proposed structures. A summary of these flow rates is shown in Tables 5 and 6. The flows are oriented so that positive flow rates are entering the interior marsh and negative flow rates are exiting the interior marsh. The proposed flow rates were calculated under the assumption that the head differential does not change as water enters or exits the system. Structures WC-11 and WC-14 (Figure 15) were not considered in these calculations because they are located north of Carencro Bayou and do not have any effect on the project area. Prior to calculating the proposed flow rates, structures WC-7, WC-8, and WC-9 (Figure 16) were eliminated from consideration because of the lack of area that would benefit from replacing these structures. Structure WC-10 was eliminated from consideration after reviewing the flow rates because of its isolation from the other project features. Structures WC-12 and WC-13 (Figure 15) do not have existing flow rates because they are earthen plugs that do not allow flow into the interior marsh. The proposed flow rate for these structures is determined using assumed channel dimensions with 3H:1V side slopes extending from the top bank of the existing channel down to -7.0 foot NAVD88.

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Existing Fixed Crest Weirs

	Average Flow (cfs)	Average Positive Flow (cfs)	Max Positive Flow (cfs)	Average Negative Flow (cfs)	Max Negative Flow (cfs)
WC-1	1	28	350	27	497
WC-2					
WC-3	(2)	5	163	7	232
WC-4	0	7	182	7	260
WC-5	229	610	1,981	380	1,675
WC-6	(2)	39	564	42	803
WC-7	4	23	195	19	278
WC-8	(1)	23	285	24	405
WC-9					
WC-10	6	50	416	44	591
WC-11					
WC-12					
WC-13					

Table 5: Existing Weir Flow Rates

Proposed Variable Crest Weirs

	Average Flow (cfs)	Average Positive Flow (cfs)	Max Positive Flow (cfs)	Average Negative Flow (cfs)	Max Negative Flow (cfs)
WC-1	79	240	842	160	905
WC-2					
WC-3	24	72	253	48	338
WC-4	32	96	337	64	415
WC-5	79	240	842	160	937
WC-6	111	336	1,179	224	1,215
WC-7					
WC-8					
WC-9					
WC-10	79	240	842	160	935
WC-11					
WC-12	(211)	36	438	246	887
WC-13	(94)	16	195	110	456

Table 6: Proposed Weir Flow Rates

Comparing the proposed weir flow rates (Table 6) with the existing weir flow rates (Table 5) shows a significant increase in flow rates both into and out of the interior marsh, with the exception of structure WC-5. These proposed flow rates will be used to determine the structures that will be replaced as design proceeds towards final design.

7.3 Proposed Variable Crest Weir Structure

The existing fixed crest weir structures will be replaced with variable crest structures. Each structure will be custom fit to the existing channels. The weirs will consist of bays with stoplog channels, 30 foot steel sheetpiles (or similar alternate), and 50 foot timber piles to support the bays. The bays are 5 foot wide and 5 foot deep. The invert elevation of each bay will be -2.5 ft NAVD88. The number of bays will vary for each structure. A 2.0 foot thick rip rap scour pad will be placed along the weir structure and will extend 15

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feet on the interior and exterior of the structure. A typical cross section of each structure is shown in Figure 17. Figure 18 shows a similar variable crest weir structure that was constructed at Rycade Canal (CS-02).



Figure 17: Variable Crest Weir - Typical Cross Section



Figure 18: Variable Crest Weir Water Control Structure

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8.0 COST ESTIMATE

A cost estimate for the TE-72 project was completed using the CWPPRA PPL 21 spreadsheet. Mobilization and demobilization costs include the use of a small dredge accessing Borrow Area 2 to construct Marsh Fill Area 3. Item No. 6 Water Control Structures includes the cost to remove the existing weir structure and install all proposed variable crest weir structures discussed in Section 7.2. Adjustments will be made prior to the completion of 95% design that will represent the most up to date cost estimate.

Project: TE-72		Project Name	Lost Lake MC and HR		Revised:	
Item No.	Work or Material		Quantity	Unit	Unit Cost	Amount
1	Mobilization/Demobilization		1	LS	\$2,770,800	\$2,770,800
2	Marsh Creation		3,186,543	CY	\$3.75	\$11,949,536
3	Marsh Nourishment		113,798	CY	\$3.75	\$426,743
4	Containment Dikes		465,798	CY	\$3.50	\$1,630,293
5	Terraces		126,376	CY	\$4.00	\$505,504
6	Water Control Structures (7)		1	LS	\$3,932,905	\$3,932,905
7	Vegetative Plantings -Smooth Cordgrass (Terraces)		40,748	EA	\$3.00	\$122,244
8	Vegetative Plantings-Paspalum(Terraces)		12,200	EA	\$5.00	\$61,000
9	Warning Signs		16	EA	\$2,000.00	\$32,000
10	Construction Surveys		1	LS	\$350,164.29	\$350,164
						\$21,781,189
						\$27,226,486

Table 7: Preliminary Construction Cost Estimate

Maintenance Items	Quantity	Unit	Unit Cost	Year 7	Year 10	Year 14
Contractor Mobilization/Demobilization	1	LS		\$250,000		\$250,000
Sign Replacement	16	EA	\$2,000.00		\$32,000	
Structure Maintenance	4	EA	\$30,000.00	\$120,000		\$120,000
			Subtotal	\$370,000	\$32,000	\$370,000
			Subtotal w/ 25% contingency	\$462,500	\$40,000	\$462,500

Table 8: Preliminary Maintenance Cost Estimate

Estimated maintenance costs shown above were developed during Phase 0 of the project. These costs will be revised prior to the completion of 95% Design in order to reflect the operation costs of the water control structures.

9.0 MODIFICATIONS FROM THE PHASE 0 PROJECT

All project features, which include marsh creation/nourishment, earthen terraces, and the four water control structures west of Lost Lake, remain essentially unchanged from the Phase 0 project. Slight changes were made to the boundaries of the marsh creation fill areas to adjust to current conditions and to improve the constructability of the marsh creation fill area. Only two water control structures will be installed to benefit the area north of Lost Lake as compared to the replacement of four structures as proposed in the Phase 0 project.

Lost Lake Marsh Creation and Hydrologic Restoration Project (TE-72)
Preliminary Design Report

10.0 REFERENCES

GeoEngineers, Inc. *Geotechnical Engineering Report for Lost Lake Marsh Creation and Hydrologic Restoration Project (TE-72)* Baton Rouge, LA. August 2011.

Pyburn and Odom, Inc. *Survey Report for Lost Lake Marsh Creation and Hydrologic Restoration Project (TE-72)*. Baton Rouge, LA. May 2011.

United States Army Corps of Engineers, EM 1110-2-5027. *Confined Disposal of Dredged Material*. Washington, D.C. 1987.

DeMarco, K. E., J. Mouton., J. W. Pahl. (January 2012 Version). Recommendations for Anticipating Sea-level Rise impacts on Louisiana Coastal Resources on Project Planning and Design: Technical Report {HYPERLINK “http://www.lacpra.org/assets/docs/LACES/LACEStech02_06_.pdf”}.

Appendix A

Survey Monument Data Sheet



VICINITY MAP Not to Scale

Reproduced from Louisiana 2005 DOQQ

Station Name: "TE34 SM 04"

Location: From the intersection of State Highway 3219 and State Highway 3127 south of Lagan, Louisiana, proceed westerly on State Highway 3127 for approximately 0.7 mile to the monument on the left, approximately 382 feet westerly of a gravel oilfield road leading south to Cut Grass Coulee Oilfield. The Monument is located 43.3 feet southerly from the centerline of the highway and 25.8 feet northerly from the north edge of a canal. Permission is required for Right of entry from Burlington Resources, POC: Jeff Deblieux at (985) 853-3009 or (985) 879-1517.

Monument Description: NGS Style floating sleeve monument; 9/16" stainless steel rods driven 60 feet to refusal, set in a sand filled 6" PVC pipe with access cover set flush with the ground.

Stamping: TE34-SM-04

Installation Date: May 2004 **Date of Survey:** June 2008

Monument Established By: JCLS

For: JCLS

Adjusted NAD83 Geodetic Position (NSRS2007)

Lat. 29°21'45.47779" N

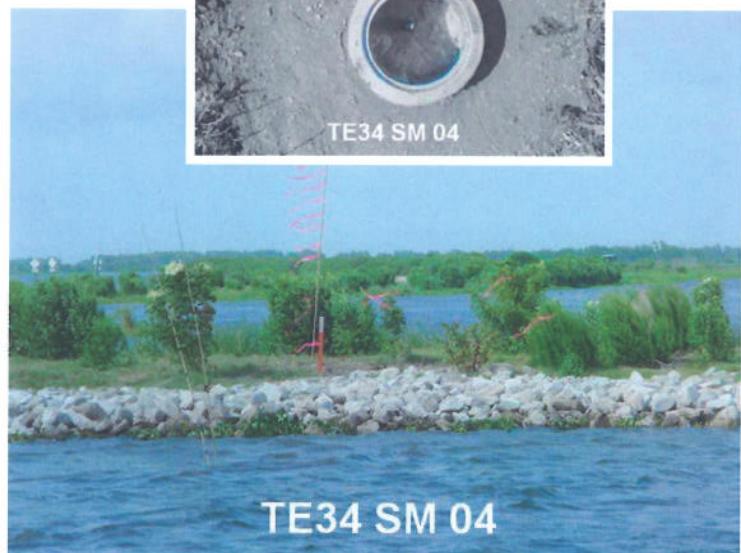
Long. 090°59'34.13005" W



Adjusted NAD83 Datum LSZ (1702) Ft (NSRS2007)

N= 313,874.11

E= 3,389,307.21



TE34 SM 04

Adjusted NAVD88 Height (2006.81)

Elevation = 2.99 feet (0.911 mtrs)

Ellipsoid Height = -23.939 mtrs.

Geoid03 Height = -24.850 mtrs. (2004.65)

FOR REFERENCE ONLY

LCZ Adjusted NAVD88 Height (Geoid99)

Elevation = 3.43 feet (1.045 mtrs)

Appendix B

Survey Plan

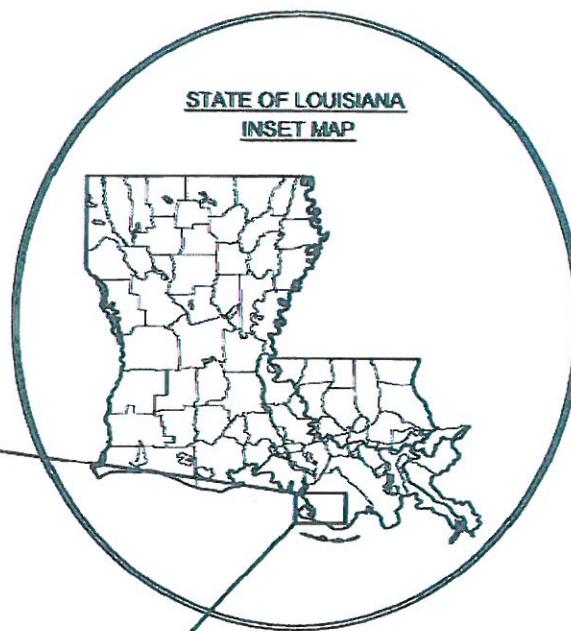
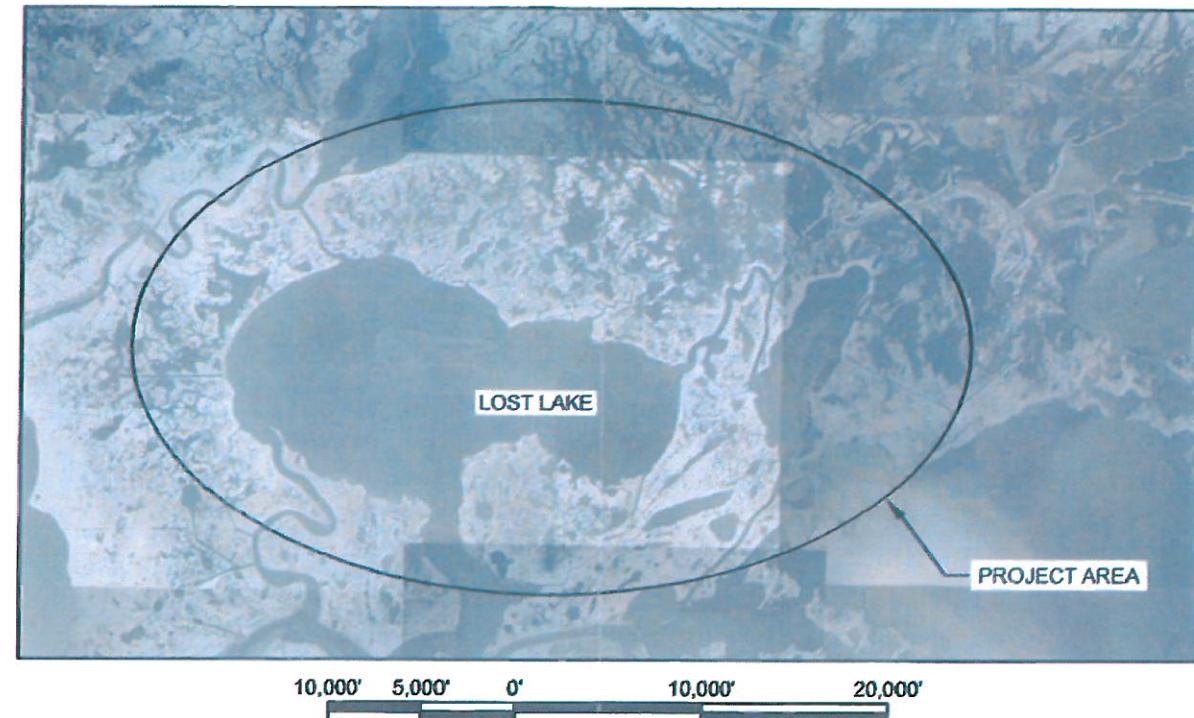
STATE OF LOUISIANA
OFFICE OF COASTAL PROTECTION & RESTORATION
RESTORATION DIVISION

INDEX TO SHEETS

SHEET NO. DESCRIPTION

- 1 TITLE SHEET
- 2 SURVEY LAYOUT
- 3 MAGNETOMETER LAYOUT
- 4-5 WATER CONTROL STRUCTURES
- 6 TRANSECT COORDINATES
- 7 MAGNETOMETER COORDINATES

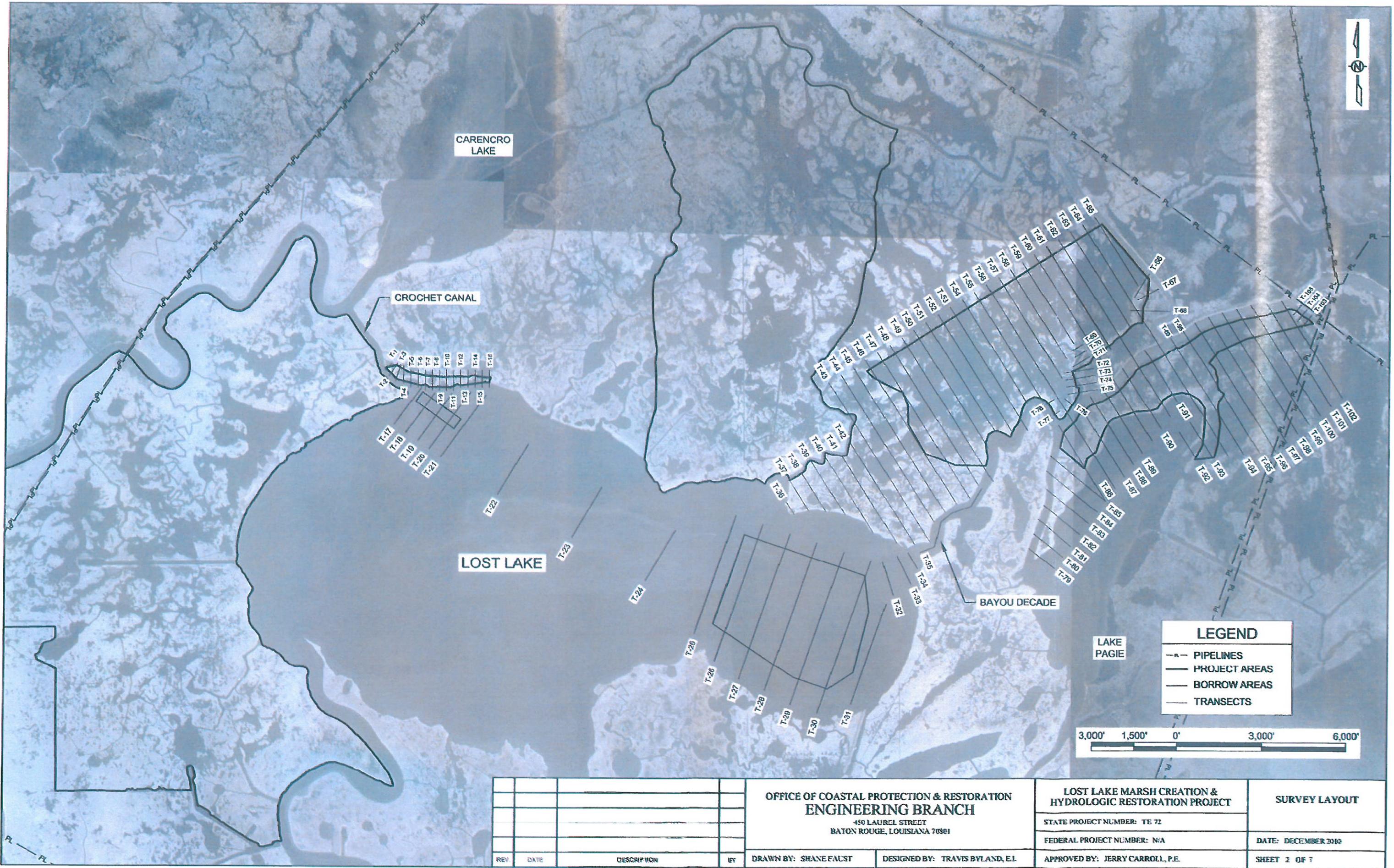
LOST LAKE MARSH CREATION
& HYDROLOGIC RESTORATION
TE-72
TERREBONNE PARISH, LOUISIANA

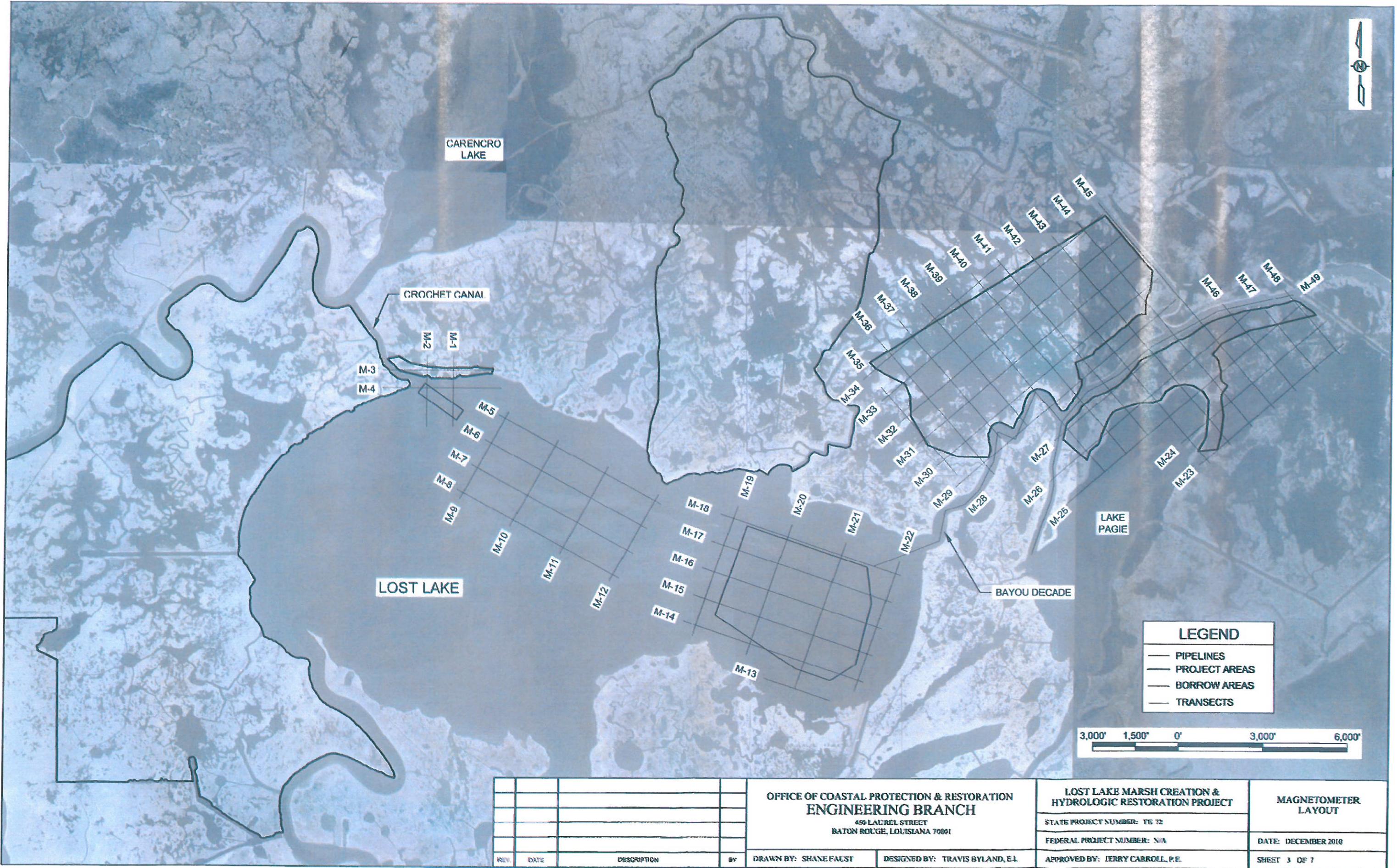


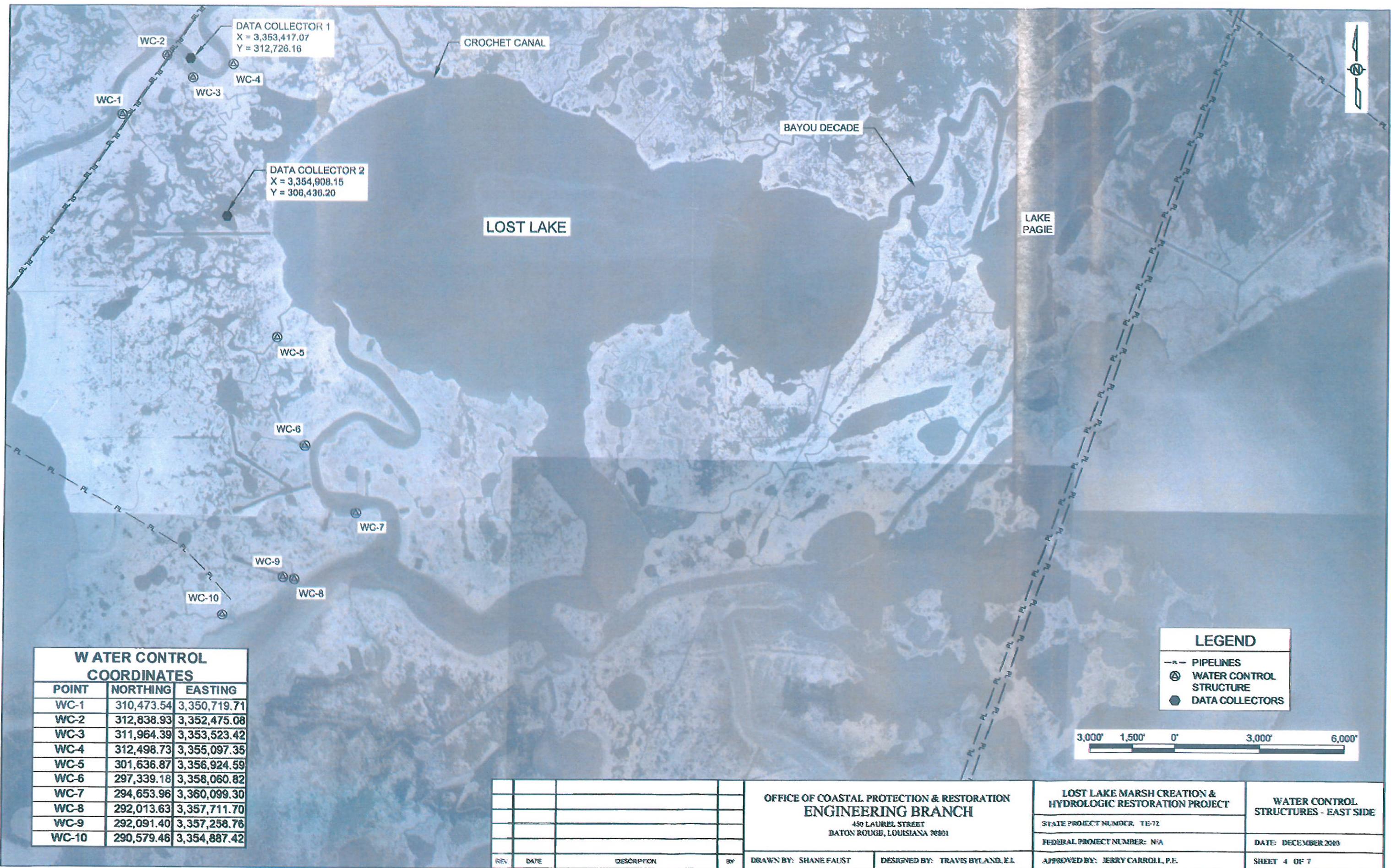
FEDERAL
PROJECT
SPONSOR



				OFFICE OF COASTAL PROTECTION & RESTORATION RESTORATION DIVISION 450 LAUREL STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION & HYDROLOGIC RESTORATION STATE PROJECT NUMBER: TE 72 FEDERAL PROJECT NUMBER: N/A APPROVED BY: JERRY CARROLL, P.E.	TITLE SHEET DATE: DECEMBER 2010 SHEET 1 OF 7
REV.	DATE	DESCRIPTION	BY			





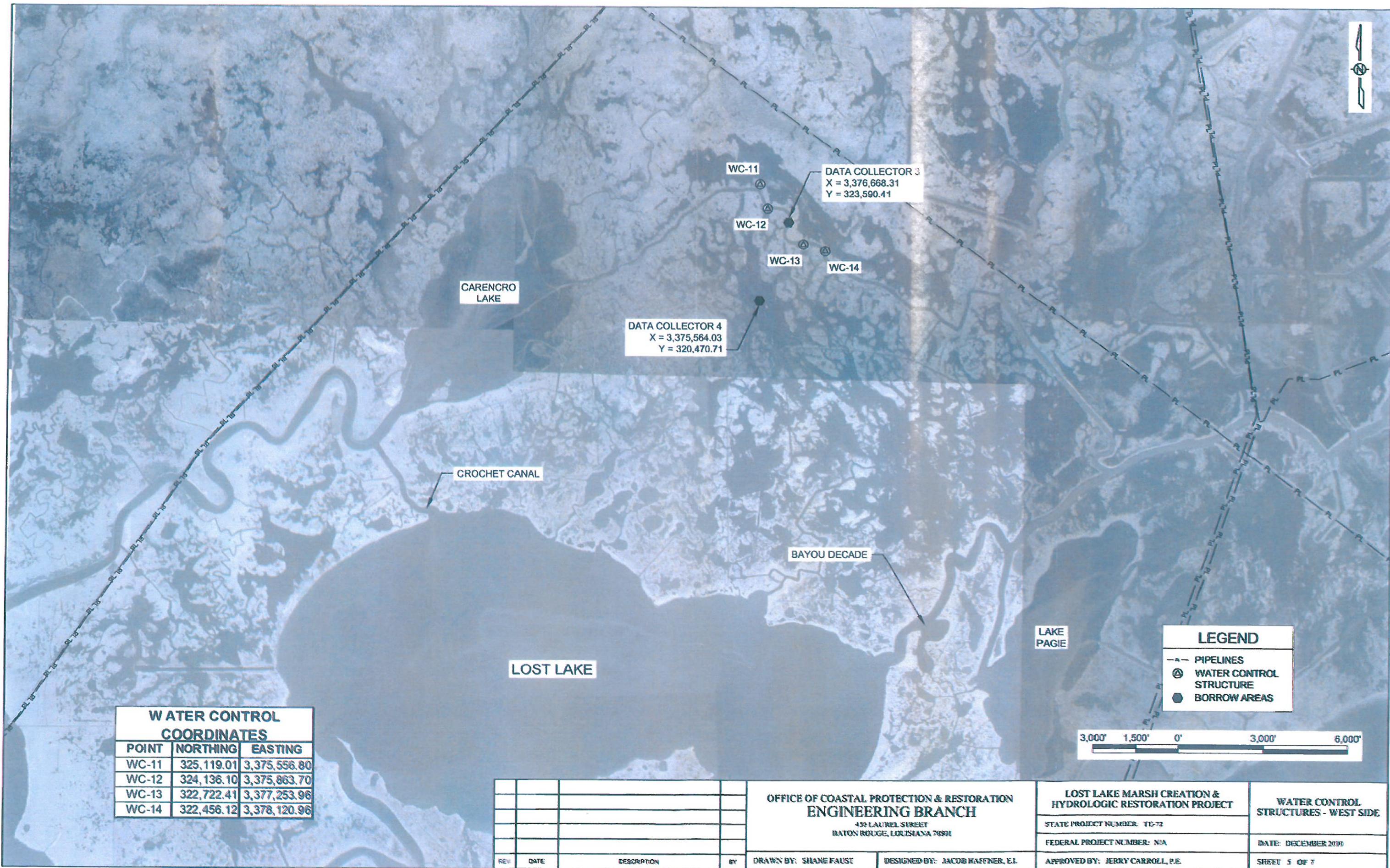


REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JERRY CARROLL, P.E.	WATER CONTROL STRUCTURES - EAST SIDE

OFFICE OF COASTAL PROTECTION & RESTORATION
ENGINEERING BRANCH
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

STATE PROJECT NUMBER: TB-72
FEDERAL PROJECT NUMBER: N/A

APPROVED BY: JERRY CARROLL, P.E.
SHEET 4 OF 7



TRANSECT COORDINATES					
TRANSECT	BEGINNING		ENDING		LENGTH
	NORTHING	EASTING	NORTHING	EASTING	
T-1	312,819.03	3,362,041.02	312,577.07	3,361,803.19	339.27
T-2	312,823.35	3,362,239.94	312,378.33	3,361,945.89	533.94
T-3	312,781.16	3,362,361.69	312,197.88	3,362,175.75	612.19
T-4	312,737.95	3,362,467.23	312,129.88	3,362,467.23	608.06
T-5	312,597.00	3,362,717.23	311,989.30	3,362,717.23	467.11
T-6	312,597.00	3,362,967.23	311,989.30	3,362,967.23	607.69
T-7	312,598.11	3,363,217.23	311,879.55	3,363,214.03	718.56
T-8	312,597.00	3,363,467.23	311,878.44	3,363,464.03	718.56
T-9	312,595.98	3,363,716.56	311,870.52	3,363,717.23	726.48
T-10	312,597.00	3,363,967.23	311,870.52	3,363,967.23	726.48
T-11	312,597.00	3,364,217.23	311,870.52	3,364,217.23	726.48
T-12	312,597.00	3,364,467.23	311,989.30	3,364,467.23	607.69
T-13	312,597.00	3,364,717.23	311,989.30	3,364,717.23	607.69
T-14	312,597.00	3,364,967.23	311,989.30	3,364,967.23	607.69
T-15	312,595.98	3,365,216.56	311,989.30	3,365,217.23	607.69
T-16	312,597.00	3,365,467.23	311,989.30	3,365,467.23	607.69
T-17	310,672.31	3,362,139.87	311,975.01	3,363,079.58	1,605.04
T-18	310,382.70	3,362,547.48	311,784.20	3,363,558.46	1,726.86
T-19	310,093.10	3,362,955.08	311,782.47	3,364,173.80	2,083.08
T-20	309,803.49	3,363,362.68	311,832.81	3,364,826.64	2,502.25
T-21	309,513.89	3,363,770.29	311,717.95	3,365,360.31	2,717.73
T-22	308,213.06	3,365,798.51	310,004.08	3,366,853.21	2,078.50
T-23	306,690.75	3,368,383.57	308,481.77	3,369,438.28	2,078.50
T-24	305,168.44	3,370,968.64	306,959.46	3,372,023.35	2,078.50
T-25	303,299.09	3,372,711.59	307,496.18	3,374,153.45	4,437.85
T-26	302,320.09	3,373,432.63	307,171.48	3,375,098.52	5,129.46
T-27	301,692.23	3,374,274.30	306,846.58	3,376,044.27	5,449.81
T-28	301,284.21	3,375,191.49	306,521.27	3,376,990.02	5,537.69
T-29	300,788.14	3,376,078.44	306,196.78	3,377,935.77	5,718.68
T-30	300,489.23	3,377,033.11	305,871.88	3,378,881.51	5,691.20
T-31	300,810.09	3,378,199.96	304,358.21	3,379,418.88	3,751.65
T-32	305,841.14	3,379,291.19	304,662.76	3,379,665.67	1,236.44
T-33	306,054.57	3,379,789.55	305,047.57	3,380,288.40	1,123.78
T-34	306,181.67	3,380,171.02	305,604.85	3,380,513.37	670.76
T-35	306,191.17	3,380,597.65	308,447.99	3,382,738.26	3,382.06
T-36	307,981.63	3,375,892.59	307,534.27	3,376,176.46	529.82
T-37	308,764.41	3,375,988.05	307,659.99	3,376,688.85	1,307.99
T-38	308,991.49	3,376,436.12	307,626.74	3,377,302.13	1,616.32
T-39	309,429.55	3,376,750.32	307,518.34	3,377,962.98	2,264.87
T-40	309,581.85	3,377,245.84	306,877.73	3,378,961.75	3,202.59
T-41	309,596.91	3,377,828.45	306,530.07	3,379,774.53	3,632.18
T-42	310,089.12	3,378,108.29	306,463.01	3,380,409.25	4,294.53
T-43	312,184.96	3,377,370.54	306,581.27	3,380,926.37	6,636.65
T-44	312,452.85	3,377,792.72	307,267.53	3,381,083.08	6,141.17

TRANSECT COORDINATES					
TRANSECT	BEGINNING		ENDING		LENGTH
	NORTHING	EASTING	NORTHING	EASTING	
T-45	312,720.74	3,378,214.89	307,607.26	3,381,459.67	6,056.09
T-46	312,988.64	3,378,637.07	307,906.40	3,381,862.01	6,019.08
T-47	313,256.53	3,379,059.25	308,093.18	3,382,335.66	6,116.37
T-48	313,524.42	3,379,481.42	308,569.60	3,382,625.52	5,888.18
T-49	313,792.32	3,379,903.60	308,708.68	3,383,129.44	6,020.74
T-50	314,060.21	3,380,325.78	309,884.49	3,382,970.86	4,942.98
T-51	314,328.10	3,380,747.95	310,490.81	3,383,182.92	4,544.65
T-52	314,596.00	3,381,170.13	310,449.33	3,383,801.41	4,912.27
T-53	314,863.89	3,381,592.31	310,514.80	3,384,352.04	5,150.79
T-54	315,131.78	3,382,014.48	311,460.36	3,384,342.07	4,561.99
T-55	315,399.66	3,382,436.66	311,546.22	3,384,878.52	4,561.99
T-56	315,667.57	3,382,858.84	308,451.73	3,387,437.66	8,545.98
T-57	315,935.46	3,383,281.01	312,358.55	3,385,550.76	4,236.27
T-58	316,203.36	3,383,703.19	313,041.01	3,385,709.87	3,745.29
T-59	313,583.26	3,385,957.95	316,471.25	3,384,125.37	3,420.35
T-60	316,739.14	3,384,547.54	310,155.82	3,388,725.00	7,796.87
T-61	317,007.04	3,384,969.72	313,414.11	3,387,249.62	4,255.23
T-62	317,274.93	3,385,391.90	311,007.86	3,389,368.67	7,422.31
T-63	317,542.82	3,385,814.07	314,127.55	3,387,974.11	4,041.02
T-64	317,810.72	3,386,236.25	309,617.27	3,391,435.42	9,703.80
T-65	318,078.61	3,386,658.43	315,641.20	3,388,220.78	2,895.15
T-66	316,053.13	3,388,593.91	315,236.57	3,388,093.74	957.56
T-67	315,545.17	3,388,947.22	315,137.70	3,388,200.30	850.83
T-68	314,725.59	3,389,343.20	314,765.02	3,387,956.72	1,387.03
T-69	313,565.98	3,386,279.33	313,301.97	3,385,848.59	505.21
T-70	313,352.83	3,386,409.97	313,088.82	3,385,979.24	505.21
T-71	313,139.68	3,386,540.62	312,767.68	3,385,933.69	711.86
T-72	312,708.24	3,386,674.88	312,546.27	3,385,629.06	1,058.28
T-73	312,461.19	3,386,713.14	312,299.22	3,385,667.32	1,058.28
T-74	312,214.13	3,386,751.40	312,052.16	3,385,705.58	1,058.28
T-75	311,967.08	3,386,789.66	311,805.11	3,385,743.84	1,058.28
T-76	311,386.72	3,385,949.35	311,648.05	3,385,634.02	409.54

MAGNETOMETER COORDINATES

TRANSECT	BEGINNING		ENDING		LENGTH
	NORTHING	EASTING	NORTHING	EASTING	
M-1	312,782.41	3,364,124.33	310,286.81	3,364,124.33	2,495.59
M-2	312,782.41	3,363,181.36	310,286.81	3,363,181.36	2,495.59
M-3	312,278.60	3,361,646.23	312,278.60	3,365,797.19	4,150.96
M-4	311,667.88	3,361,646.23	311,667.88	3,365,797.19	4,150.96
M-5	310,715.29	3,365,730.45	307,581.96	3,371,425.38	6,500.00
M-6	309,839.15	3,365,248.40	308,705.82	3,370,943.33	6,500.00
M-7	308,963.01	3,364,766.34	305,829.68	3,370,461.28	6,500.00
M-8	308,086.86	3,364,284.29	304,953.53	3,369,979.23	6,500.00
M-9	307,747.31	3,364,382.82	310,813.82	3,366,069.99	3,500.00
M-10	306,783.21	3,366,135.10	309,849.71	3,367,822.28	3,500.00
M-11	305,819.11	3,367,887.39	308,885.61	3,369,574.57	3,500.00
M-12	304,855.01	3,369,639.68	307,921.51	3,371,326.85	3,500.00
M-13	301,408.55	3,375,076.62	300,623.70	3,377,379.32	2,432.77
M-14	303,428.62	3,372,249.51	301,281.53	3,378,548.96	6,655.30
M-15	304,375.15	3,372,572.12	302,228.07	3,378,871.57	6,655.30
M-16	305,321.68	3,372,894.73	303,174.60	3,379,194.18	6,655.30
M-17	306,268.21	3,373,217.34	304,121.13	3,379,516.79	6,655.30
M-18	307,214.74	3,373,539.96	305,067.66	3,379,839.41	6,655.30
M-19	307,509.39	3,374,119.07	302,899.98	3,372,548.01	4,869.79
M-20	306,864.17	3,376,012.13	302,254.76	3,374,441.07	4,869.79
M-21	306,218.94	3,377,905.19	301,045.47	3,376,141.88	5,465.72
M-22	305,573.72	3,379,798.25	300,964.31	3,378,227.20	4,869.79
M-23	308,998.38	3,390,292.14	313,347.99	3,395,379.88	6,693.59
M-24	309,758.47	3,389,642.32	314,108.09	3,394,730.06	6,693.59
M-25	307,652.29	3,385,669.17	314,704.48	3,393,889.36	10,830.73
M-26	308,409.56	3,385,016.06	314,489.72	3,392,102.63	9,337.59
M-27	309,859.24	3,385,181.63	313,038.80	3,388,878.41	4,876.04
M-28	305,391.43	3,378,889.48	311,578.80	3,384,521.50	9,654.53
M-29	308,209.71	3,381,722.10	314,844.83	3,389,444.66	10,181.49
M-30	308,966.97	3,381,068.99	315,603.92	3,388,793.67	10,184.29
M-31	309,724.23	3,380,415.87	316,363.00	3,388,142.68	10,187.09
M-32	310,481.49	3,379,762.76	317,122.09	3,387,491.69	10,189.89
M-33	311,238.75	3,379,109.64	317,881.17	3,386,840.70	10,192.69
M-34	311,996.01	3,378,456.53	316,109.30	3,383,255.17	6,320.33
M-35	311,737.33	3,379,102.56	308,634.37	3,381,778.78	4,097.62
M-36	313,559.57	3,378,851.49	308,658.13	3,383,078.84	6,472.60
M-37	314,137.44	3,379,673.64	309,940.60	3,383,293.30	5,542.14
M-38	314,705.43	3,380,504.32	310,385.09	3,384,230.49	5,705.23
M-39	315,261.28	3,381,345.47	308,757.43	3,386,954.84	8,588.66
M-40	315,772.17	3,382,225.39	309,431.75	3,387,694.73	8,403.65
M-41	316,300.26	3,383,090.48	310,059.42	3,388,473.02	8,241.34
M-42	316,615.06	3,384,139.53	309,051.90	3,390,662.52	9,987.52
M-43	317,110.96	3,385,032.38	309,701.73	3,391,422.62	9,784.26
M-44	317,615.36	3,385,917.90	310,351.55	3,392,182.72	9,592.23
M-45	318,268.48	3,386,675.16	311,001.37	3,392,942.82	9,596.58
M-46	314,701.03	3,391,072.53	311,651.2	3,393,702.91	4,027.45
M-47	314,563.52	3,392,511.68	312,301.02	3,394,463.01	2,987.74
M-48	315,224.48	3,393,262.17	312,950.84	3,395,223.11	3,002.44
M-49	310,187.81	3,389,682.85	305,821.84	3,384,411.56	14,407.42

REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JERRY CARROLL, P.E.	SHEET 7 OF 7
OFFICE OF COASTAL PROTECTION & RESTORATION ENGINEERING BRANCH 430 LAUREL STREET BATON ROUGE, LOUISIANA 70801						LOST LAKE MARSH CREATION & HYDROLOGIC RESTORATION PROJECT	MAGNETOMETER COORDINATES
						STATE PROJECT NUMBER: TE-72	
						FEDERAL PROJECT NUMBER: N/A	DATE: DECEMBER 2010

Appendix C

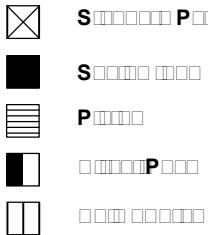
Geotechnical Boring Logs

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS	TYPE AND DESCRIPTIONS
	GRAPH	LETTER		
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GP	Poorly-graded gravels, gravel - sand mixtures
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	G	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
		CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS
	SILTS AND CLAYS MORE THAN 50% PASSING NO. 200 SIEVE	SP	Poorly-graded sands, gravelly sand	
		SM	SILTY SANDS, SAND - SILT MIXTURES	
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	S	CLAYEY SANDS, SAND - CLAY MIXTURES	
		M	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY	
		O	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		M	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	M	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS	
		O	INORGANIC CLAYS OF HIGH PLASTICITY	
		PT	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY	
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

S SYMBOLS



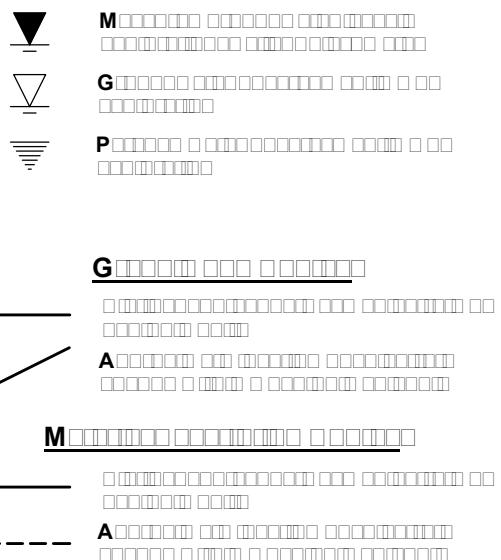
12 S

A P

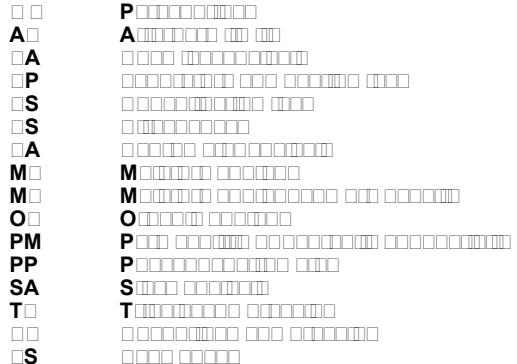
NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

ADDITIONAL MATERIAL SYMBOLS

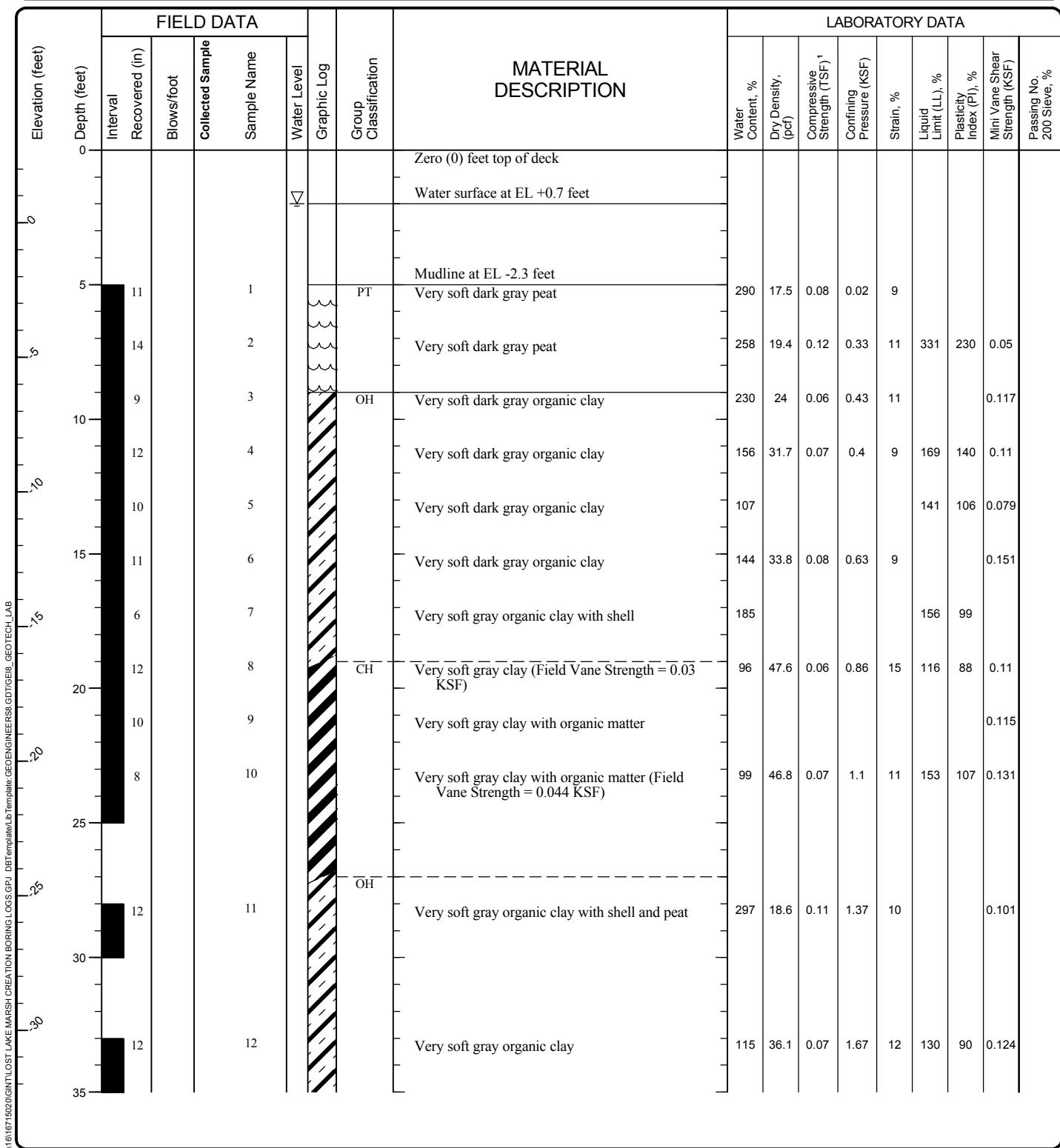
SYMBOLS	TYPE AND DESCRIPTIONS
GRAPH	LETTER
	Cement Concrete
	Asphalt Concrete
	Crushed Rock/ Quarry Spalls
	Topsoil/ Forest Duff/Sod



T SYMBOLS



Drilled	Start 5/18/2011	End 5/18/2011	Total Depth (ft) 55	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method Rotary Wash
Surface Elevation (ft) Vertical Datum		2.7		Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment Pontoon-Mounted Drill Rig
Latitude N29° 19' 02.0" Longitude W91° 05' 27.0"		System Datum		Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft) Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.						

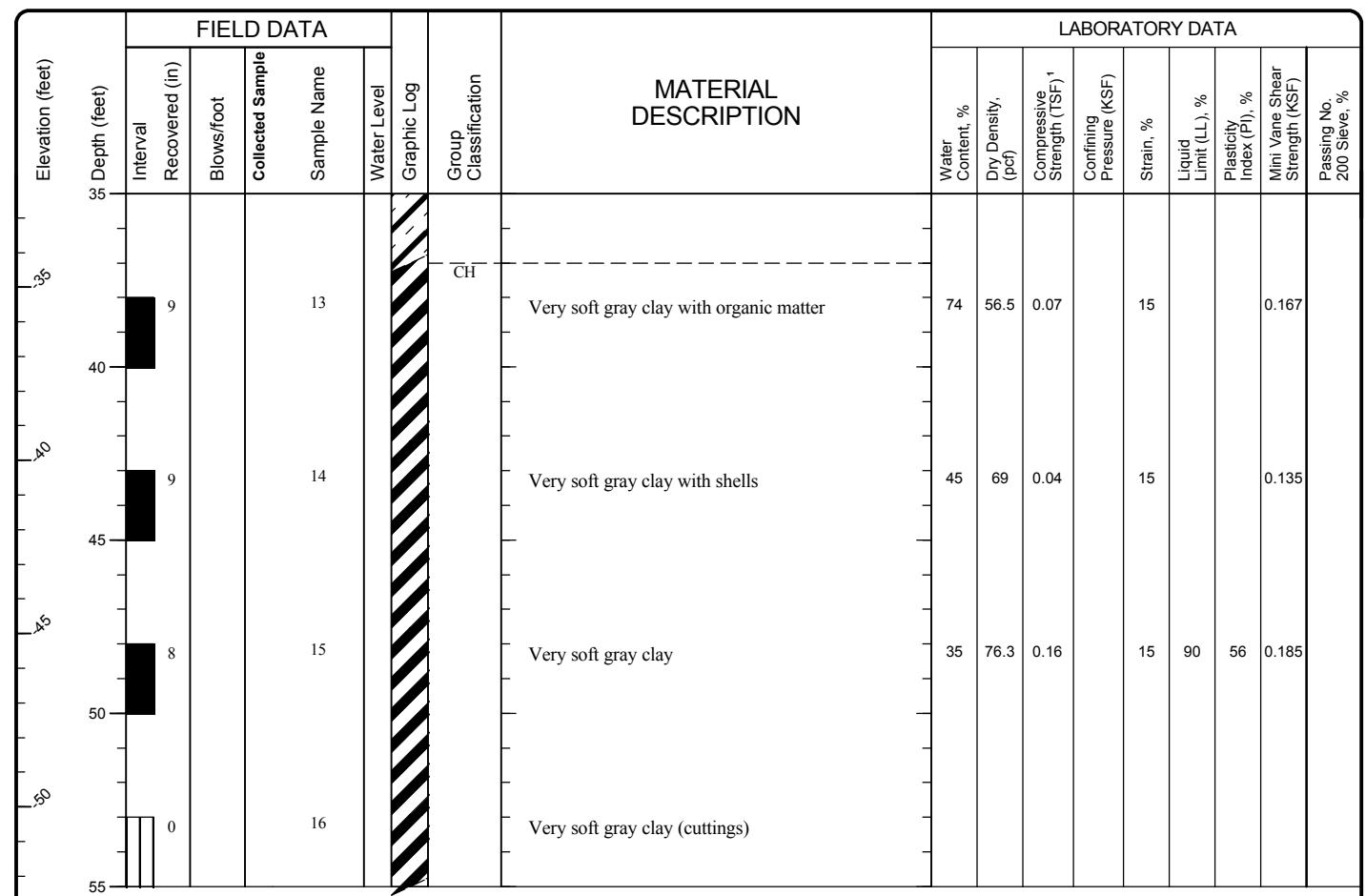


Baton Rouge: Date 8/21 Path:P:\16167150\20\GINT\LOST LAKE MARSH CREATION BORING LOGS.GPJ DBT template.lib\template.gdb\GEOTECH\LAB

Log of Boring B-1



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

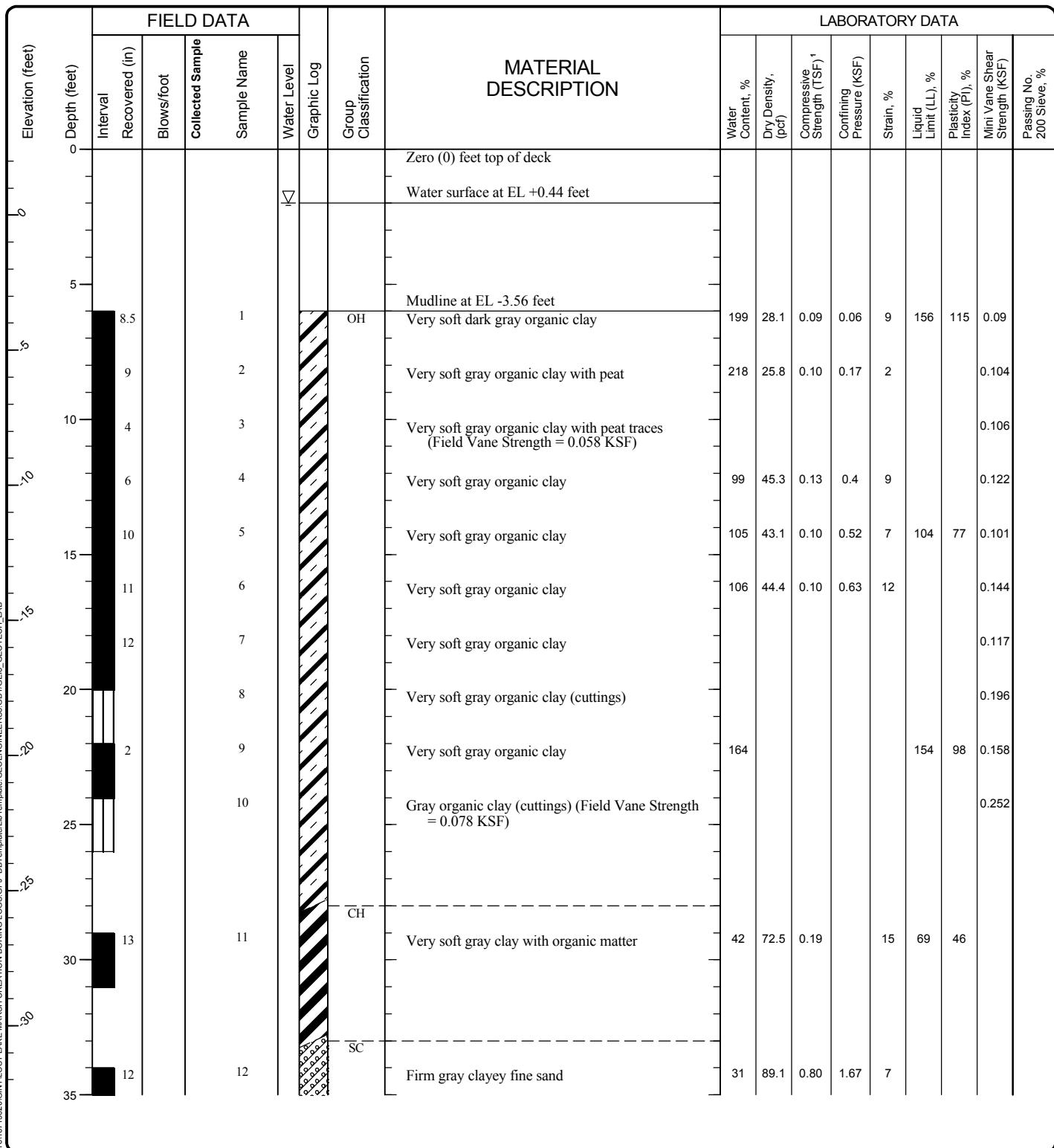


Log of Boring B-1 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/16/2011	End 5/16/2011	Total Depth (ft)	56	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum		2.4		Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop		Drilling Equipment	Pontoon-Mounted Drill Rig
Latitude Longitude		N29° 21' 13.5" W91° 06' 50.4"		System Datum	Geographic NAD83 (feet)		Groundwater Date Measured	Depth to Water (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-2

	Project:	Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)		
	Project Location:	Terrebonne Parish, Louisiana		
	Project Number:	16715-020-00		

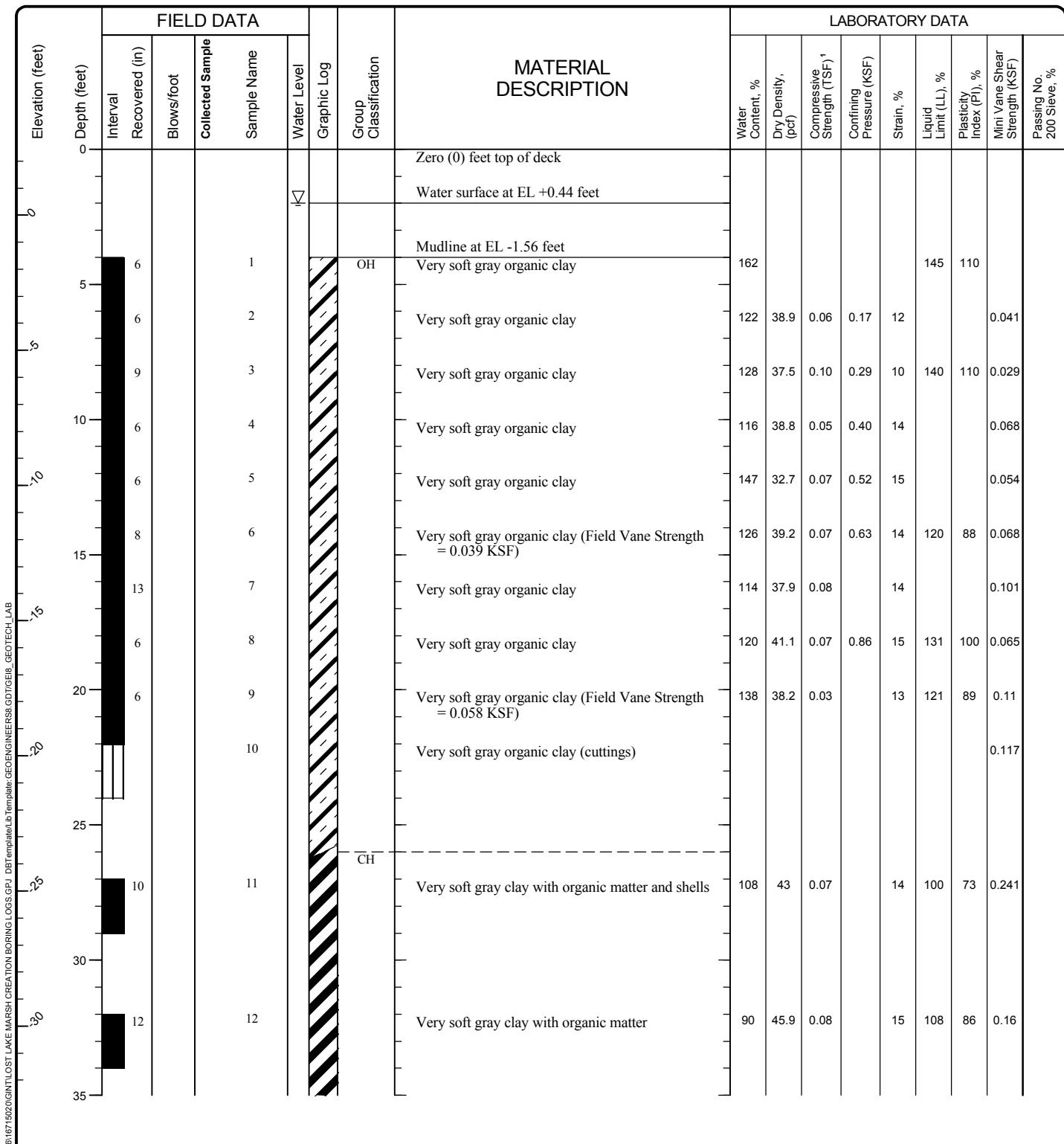
Elevation (feet)	Depth (feet)	FIELD DATA			MATERIAL DESCRIPTION			LABORATORY DATA							
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Compressive Strength (TSF) ¹	Confining Pressure (KSF)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Mini Vane Shear Strength (KSF)
35	34						CH								
40	41	10		13			Very soft gray clay with 3½" clayey silt layer	53	68.6	0.21	15	58	38		
45	46	13		14			Firm gray clayey silt with 4" clay layer	33	87.8	0.65	2.25	14			
50	51	12		15			Very soft gray clay with silt lenses, pockets and streaks	40	74.1	0.23	15	55	35		
55	56	11		16			Very soft gray clay with silt pockets	67	68.6	0.11	15	53	30		

Log of Boring B-2 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/17/2011	End 5/17/2011	Total Depth (ft)	54	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.4			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 21' 39.4" W91° 06' 33.3"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-3



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Elevation (feet)	Depth (feet)	FIELD DATA						MATERIAL DESCRIPTION						LABORATORY DATA					
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Compressive Strength (TSF) ¹	Confining Pressure (KSF)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Mini Vane Shear Strength (KSF)	Passing No. 200 Sieve, %		
35	36	10			13			Very soft gray clay with organic matter	88	47.2	0.05	13			0.086				
40	41	12			14			Very soft gray clay with organic matter	80	49.6	0.06	11	106	73	0.158				
45	46	8			15			Very soft gray clay with organic matter	104	44.2	0.13	9			0.221				
50	51	14			16			Very soft gray clay with organic matter and shells	99	45.4	0.09	10	117	83	0.243				

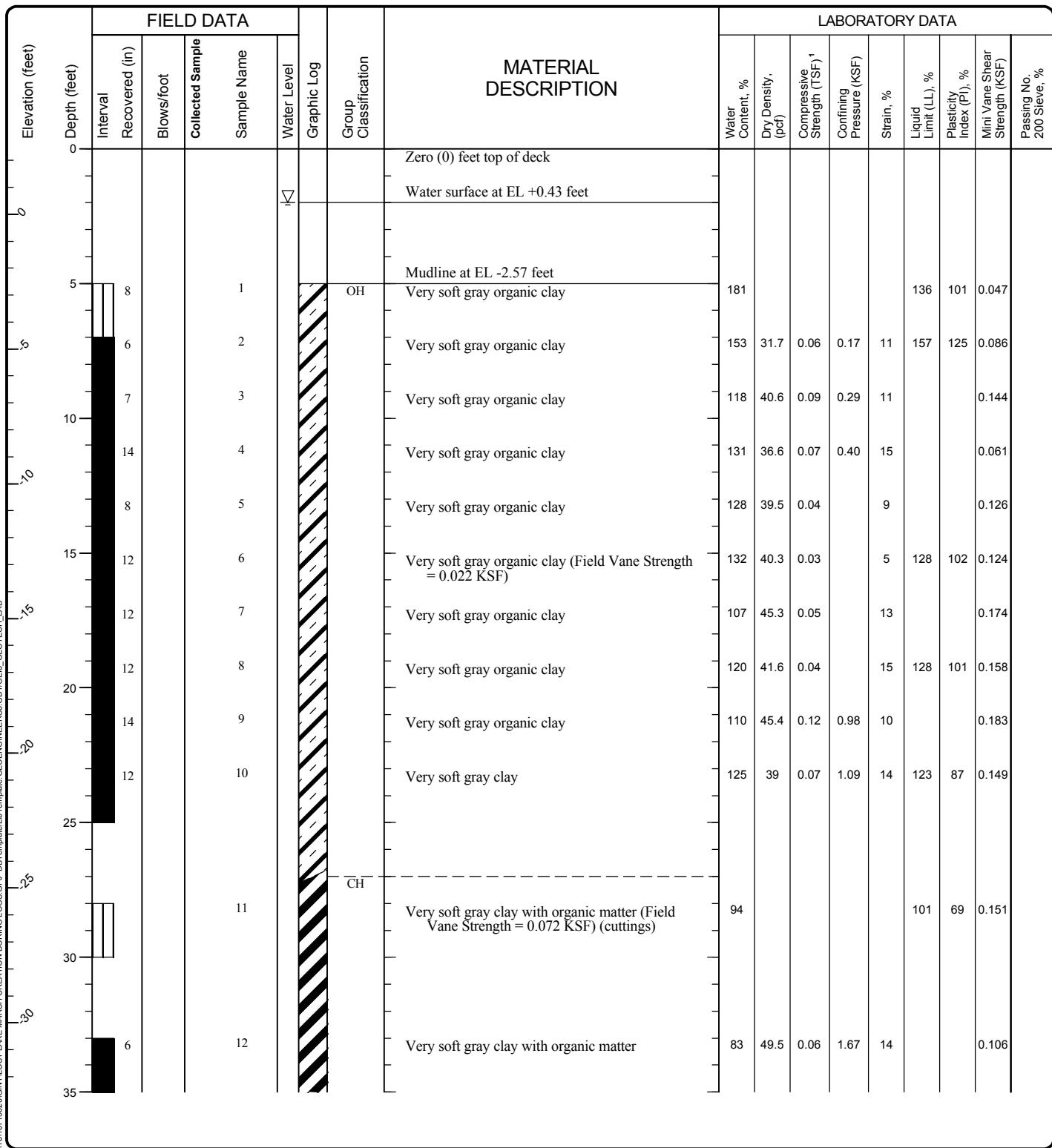
Log of Boring B-3 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
Project Location: Terrebonne Parish, Louisiana
Project Number: 16715-020-00

Figure I-B4
Sheet 2 of 2

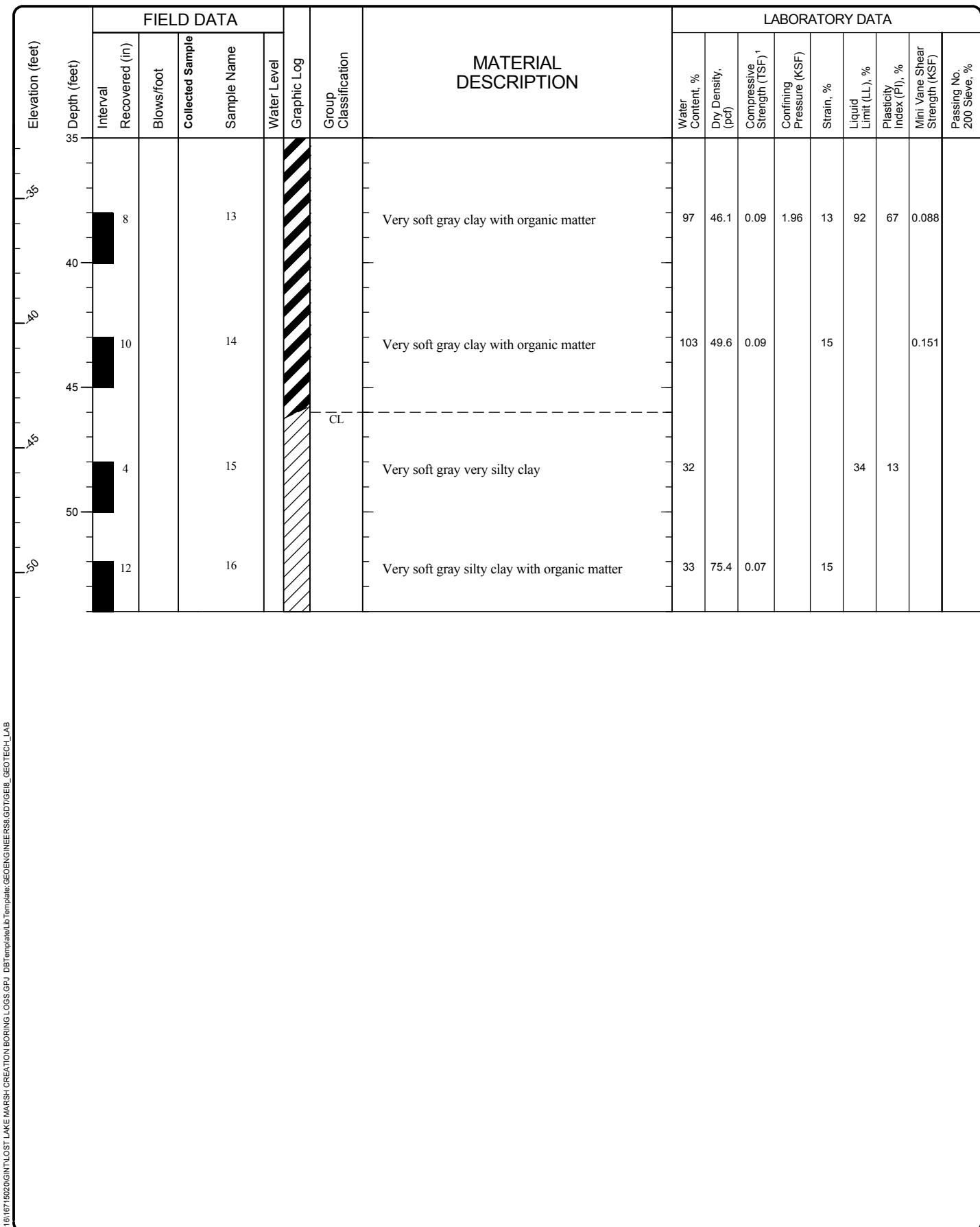
Drilled	Start 5/17/2011	End 5/17/2011	Total Depth (ft)	54	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.4			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 21' 27.5" W91° 06' 18.4"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-4



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00



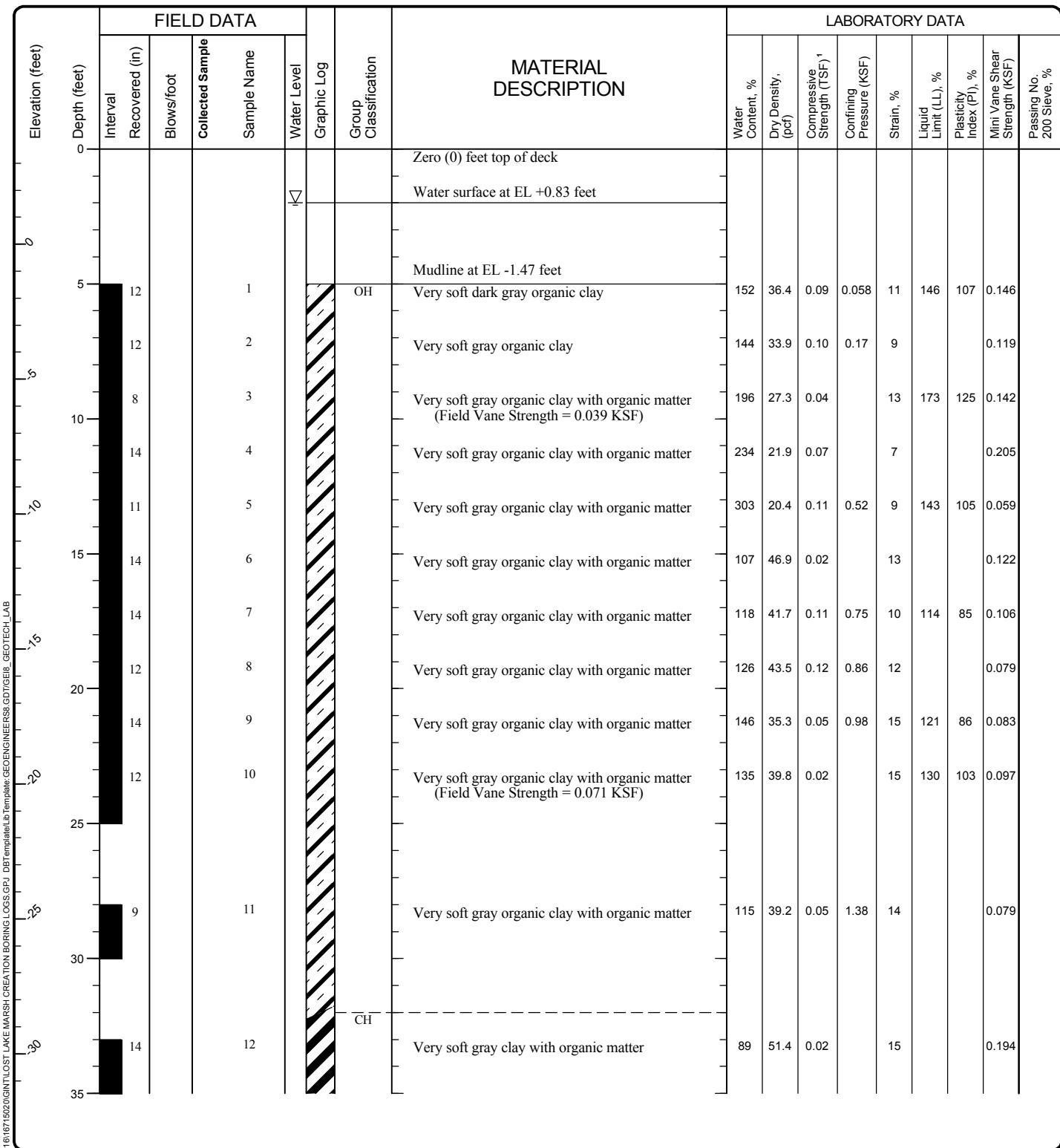
Log of Boring B-4 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Figure I-B5
 Sheet 2 of 2

Drilled	Start 5/18/2011	End 5/18/2011	Total Depth (ft)	54	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	3.5			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 21' 32.7" W91° 06' 00.8"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-5



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Elevation (feet)	Depth (feet)	FIELD DATA				MATERIAL DESCRIPTION				LABORATORY DATA						
		Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Compressive Strength (TSF) ¹	Confining Pressure (KSF)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Mini Vane Shear Strength (KSF)
35	38	14			13				Very soft gray clay with organic matter							
40	42	9			14					89	50.8	0.06	12	88	66	0.119
45	47	8			15					86	51.4	0.05	14			0.126
50	52	12			16					73	60.1	0.06	15	87	63	0.167
										71	53.5	0.04	15			0.248

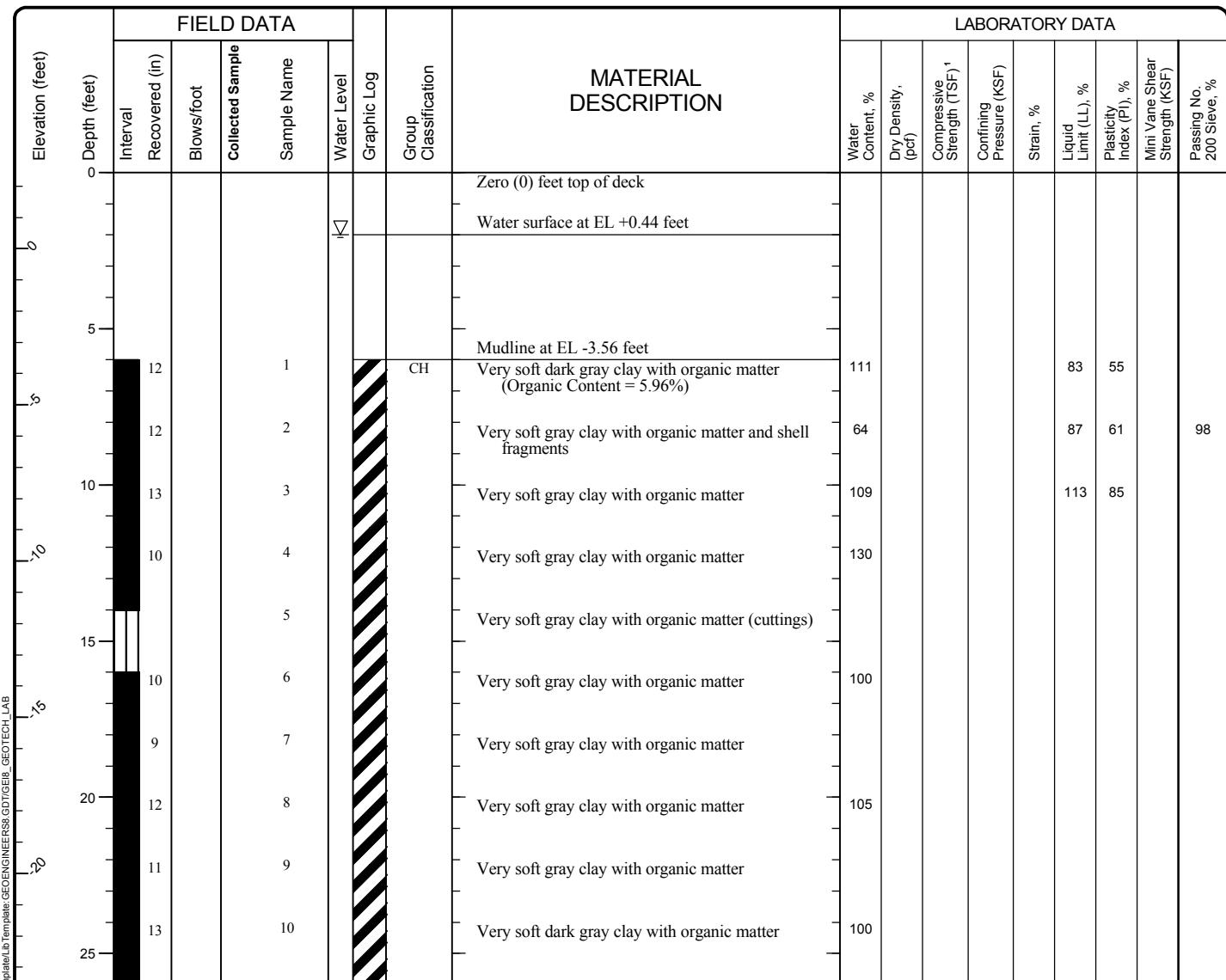
Log of Boring B-5 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Figure I-B6
 Sheet 2 of 2

Drilled	Start 5/15/2011	End 5/15/2011	Total Depth (ft)	26	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash	
Surface Elevation (ft) Vertical Datum		2.4		Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig		
Latitude Longitude		N29° 21' 19.6" W91° 04' 27.2"		System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)	
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill full depth.									



Baton Rouge: Date 8/21 Path:P:\16167150\20GIRNL\LOST LAKE MARSH CREATION BORING LOGS.GPJ DBT template.lib\template GEOENGINEERS8.GDT\GEIB_GEOTECH.LAB

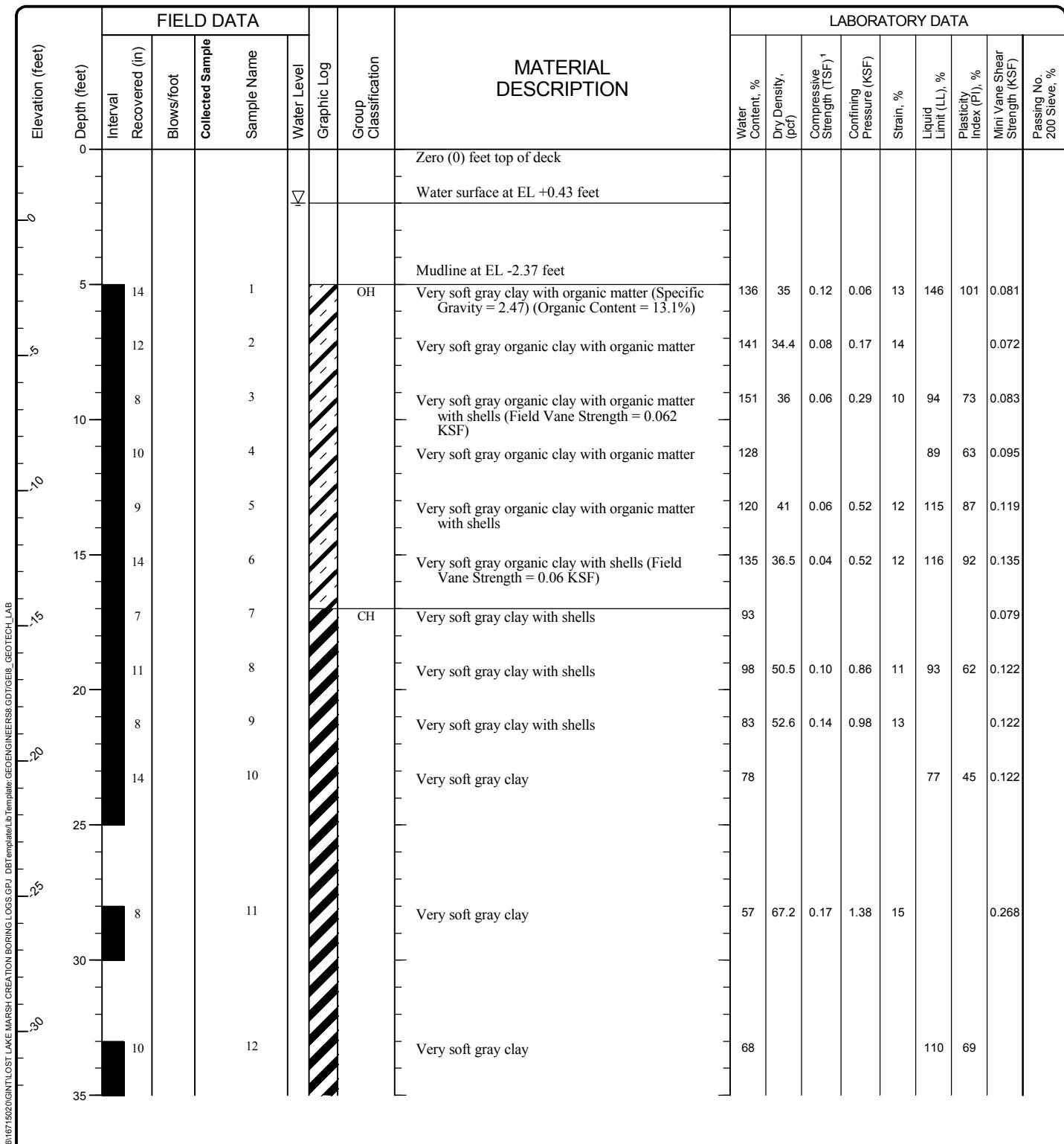
Log of Boring B-6



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

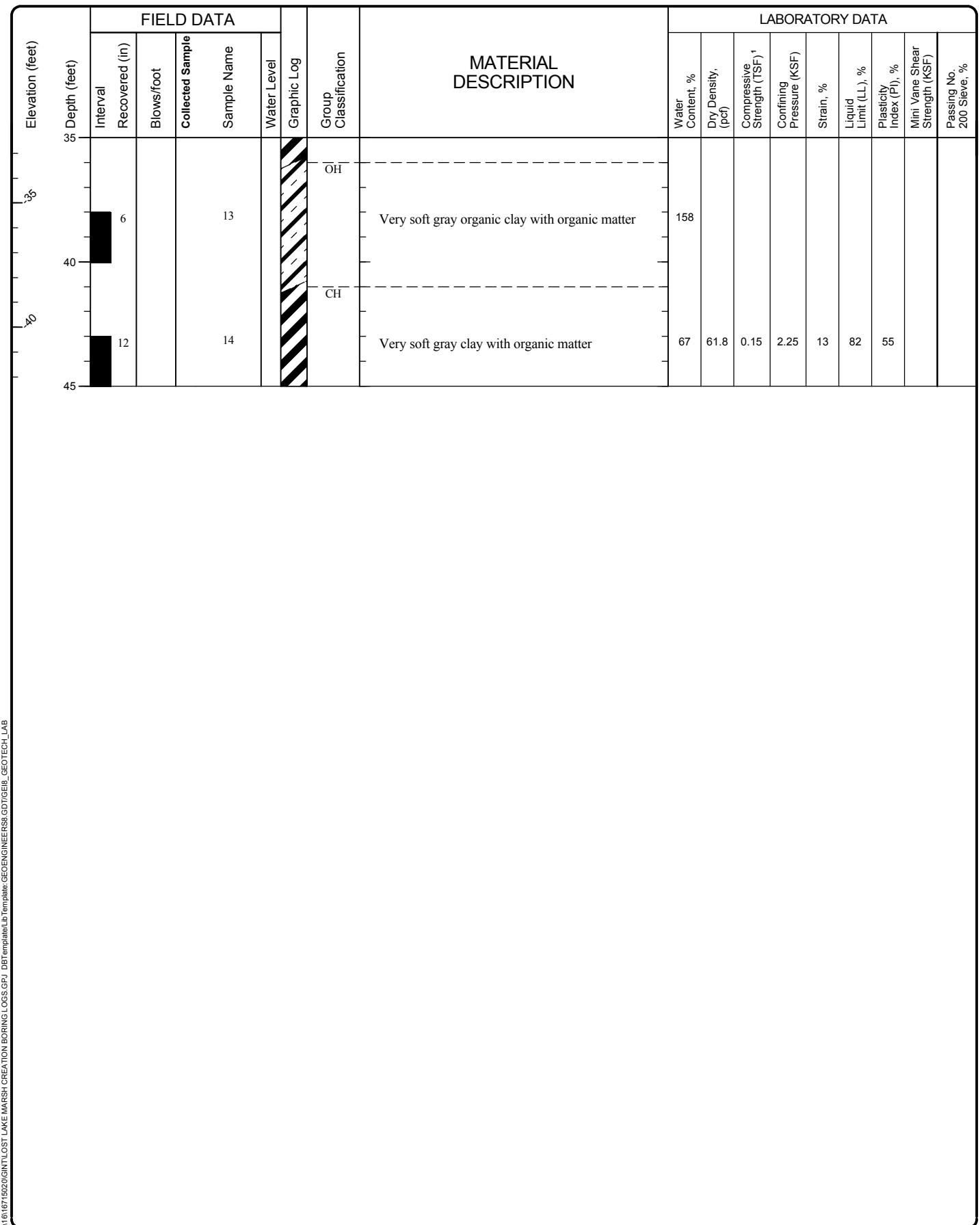
Figure I-B7
 Sheet 1 of 1

Drilled	Start 5/16/2011	End 5/16/2011	Total Depth (ft)	45	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum		2.6		Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop		Drilling Equipment	Pontoon-Mounted Drill Rig
Latitude Longitude		N29° 21' 27.5" W91° 04' 20.7"		System Datum	Geographic NAD83 (feet)		Groundwater Date Measured	Depth to Water (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								Elevation (ft)



Log of Boring B-7

	Project:	Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)		
	Project Location:	Terrebonne Parish, Louisiana		
	Project Number:	16715-020-00		
		Figure I-B8 Sheet 1 of 2		

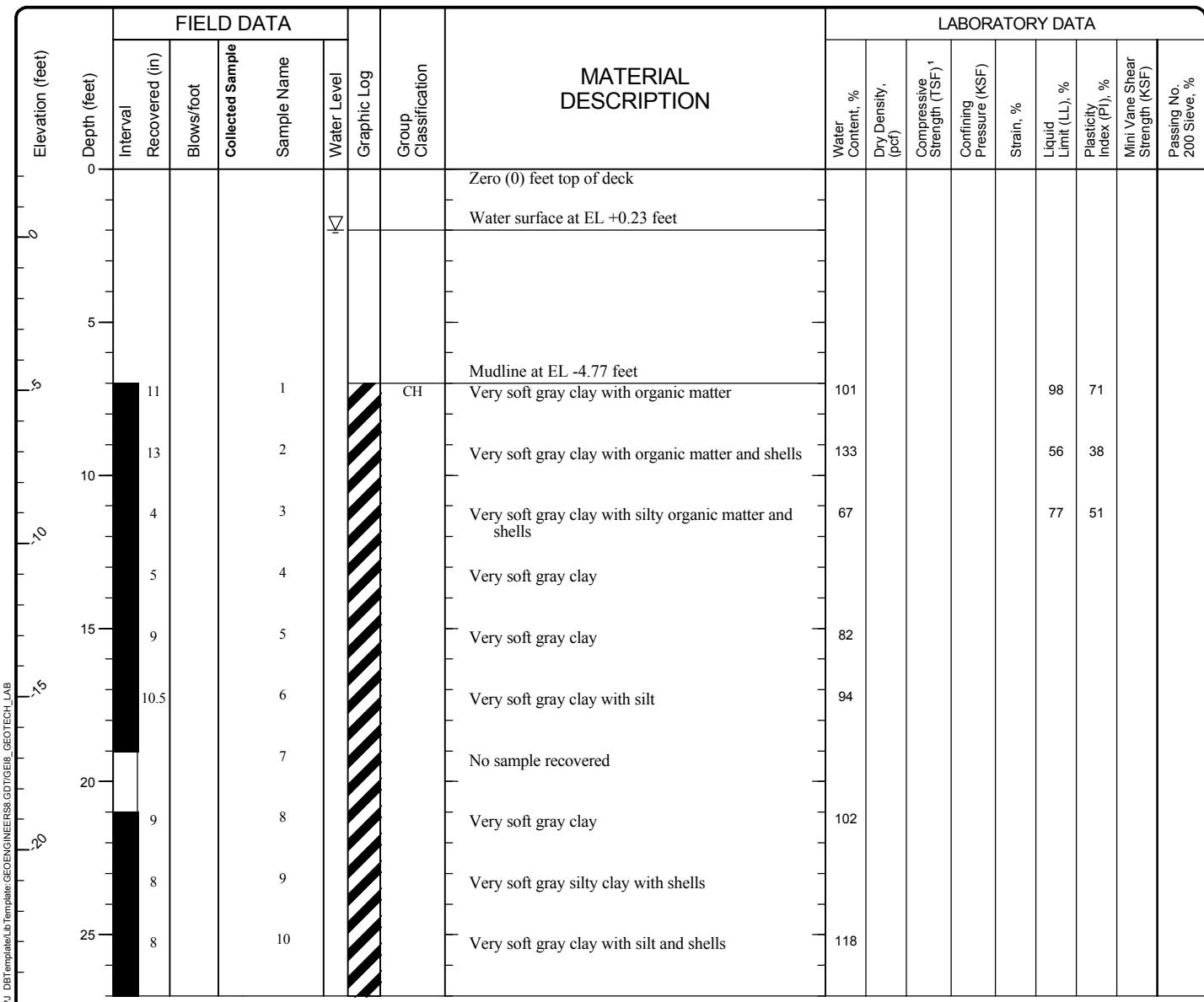


Log of Boring B-7 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/15/2011	End 5/15/2011	Total Depth (ft)	27	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.2			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 20' 25.7" W91° 02' 14.6"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill full depth.								

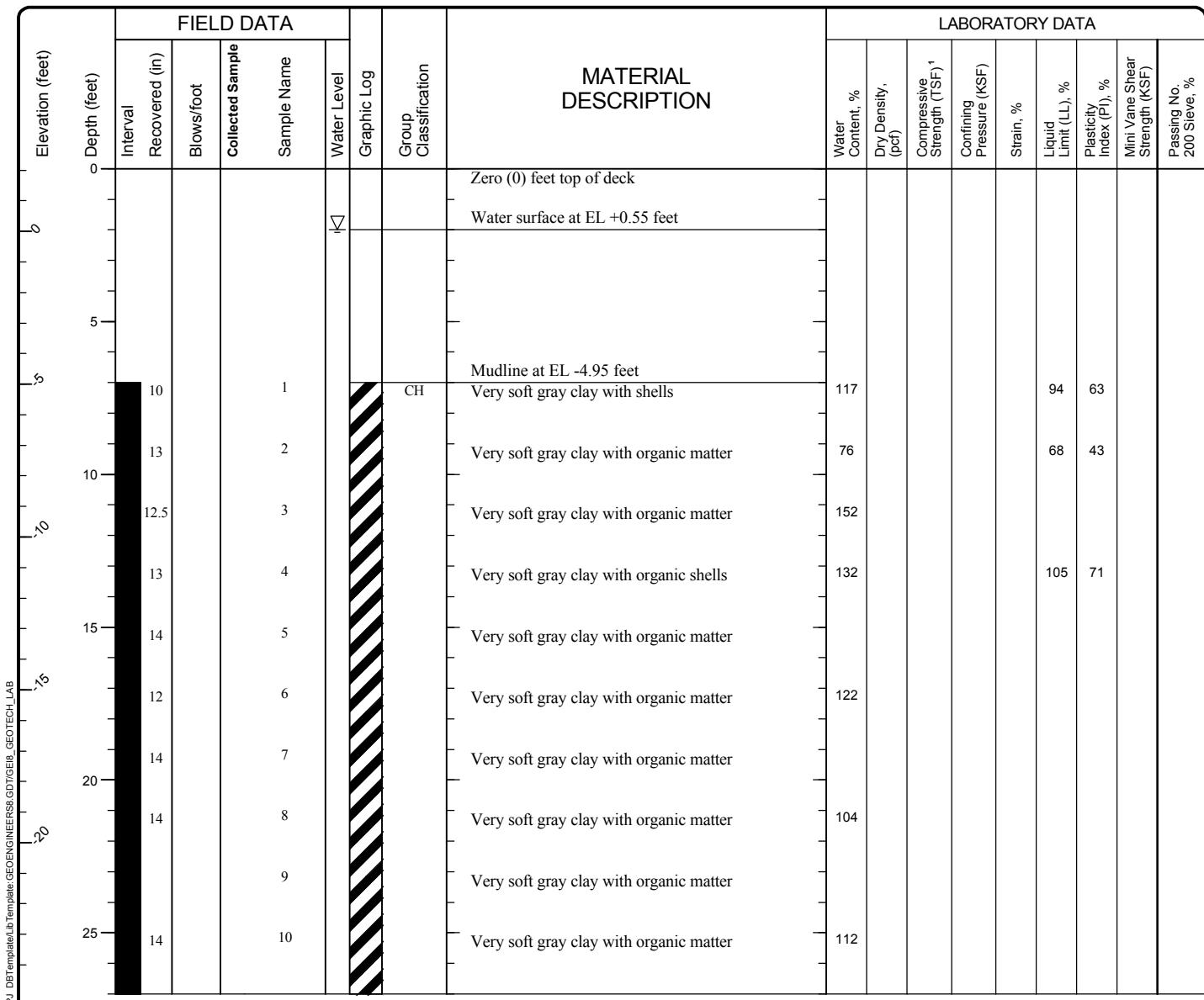


Log of Boring B-8



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/15/2011	End 5/15/2011	Total Depth (ft)	27	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.1			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 19' 57.4" W91° 02' 05.6"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill full depth.								

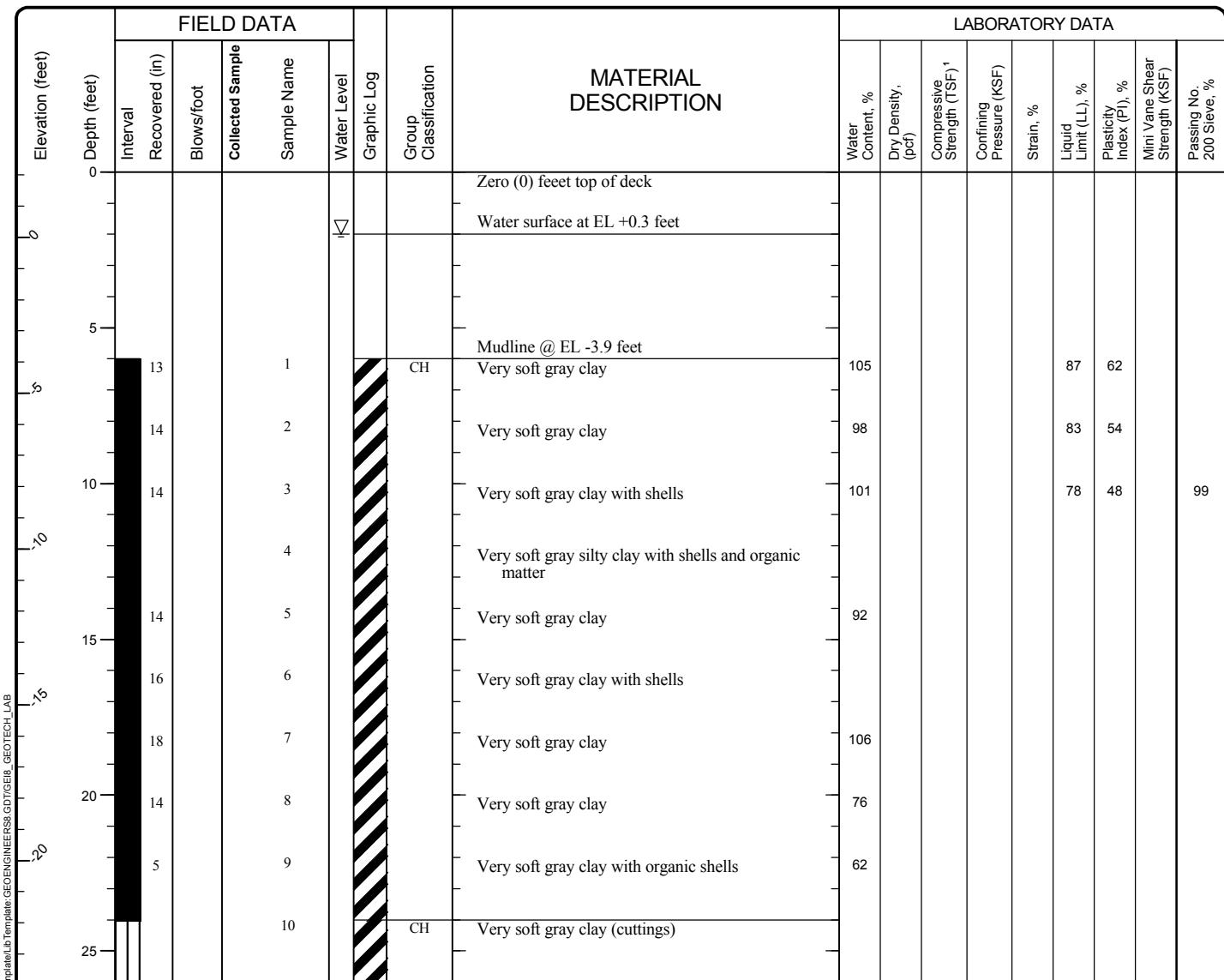


Log of Boring B-9



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/14/2011	End 5/14/2011	Total Depth (ft) 26	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method Rotary Wash
Surface Elevation (ft) Vertical Datum	2.1	Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 20' 16.2" W91° 01' 42.7"	System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill full depth.						

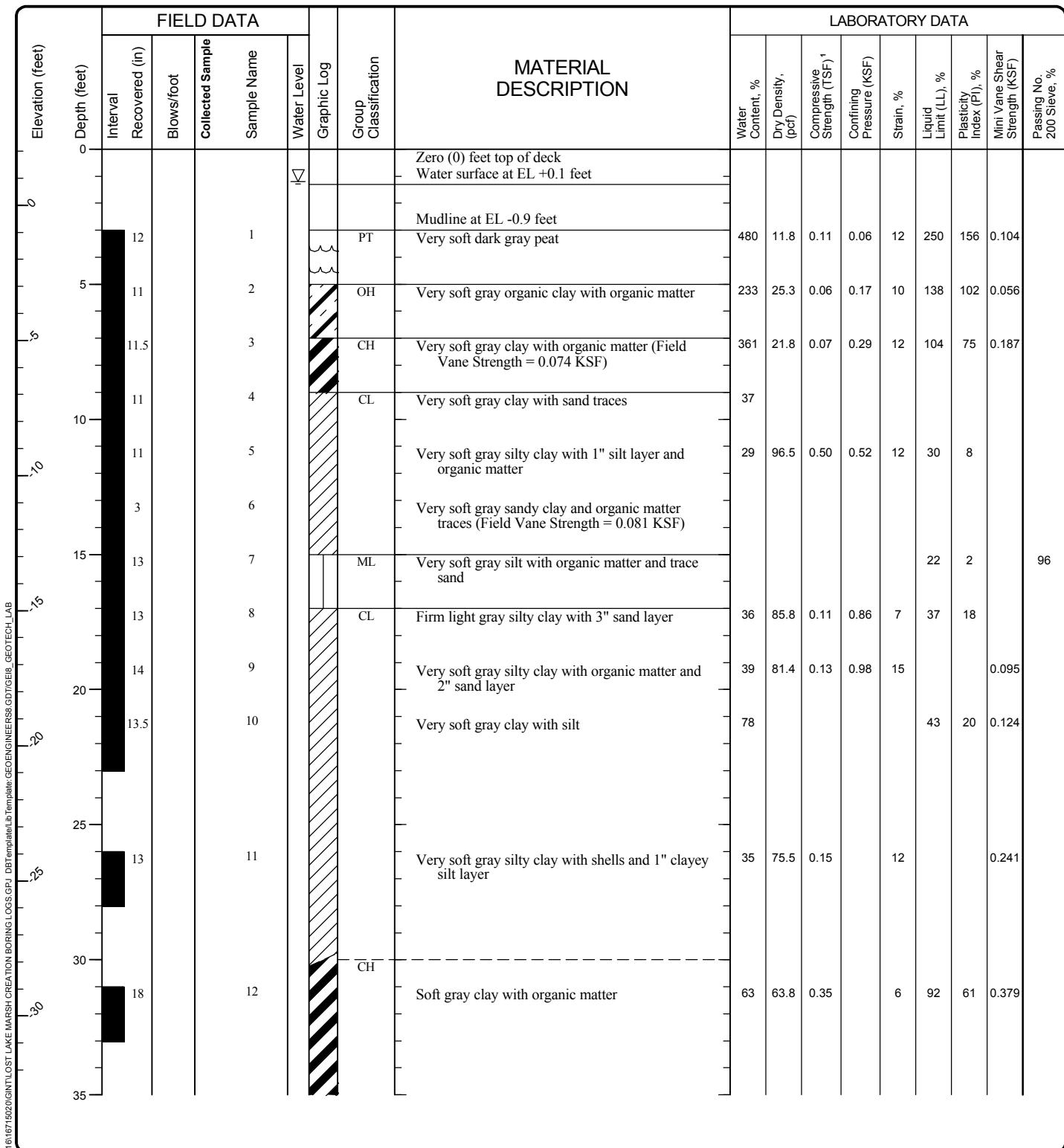


Log of Boring B-10



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/14/2011	End 5/14/2011	Total Depth (ft)	43	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.1			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 21' 16.1" W90° 59' 54.3"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-11



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

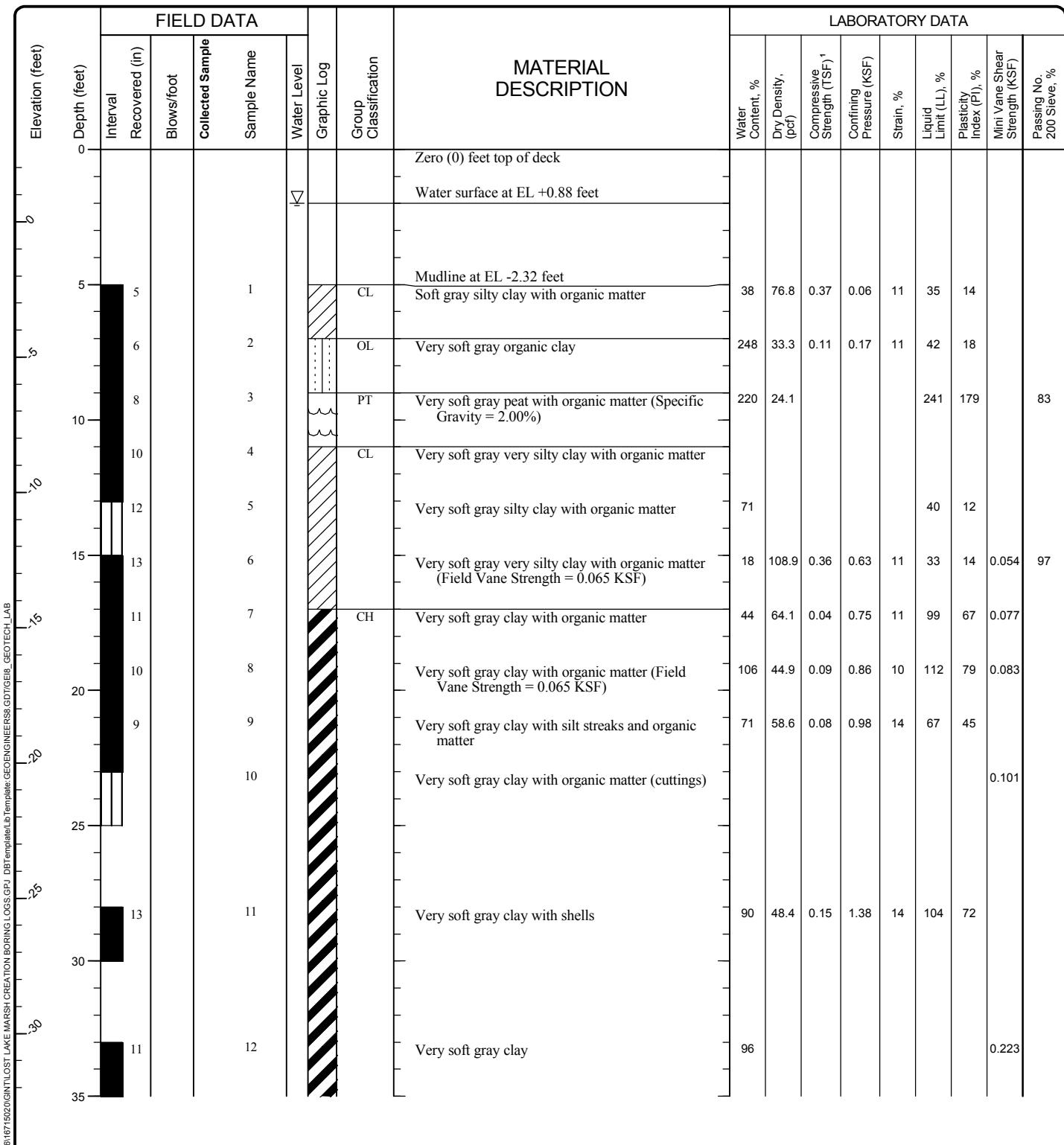
Elevation (feet)	FIELD DATA				MATERIAL DESCRIPTION		LABORATORY DATA									
	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	Water Content, %	Dry Density, (pcf)	Compressive Strength (TSF) ¹	Confining Pressure (KSF)	Strain, %	Liquid Limit (LL), %	Plasticity Index (PI), %	Mini Vane Shear Strength (KSF)	Passing No. 200 Sieve, %
33	12			13				64								
38	13.5			14				66	63.5	0.36		9	94	63	0.406	0.243
40																

Log of Boring B-11 (continued)



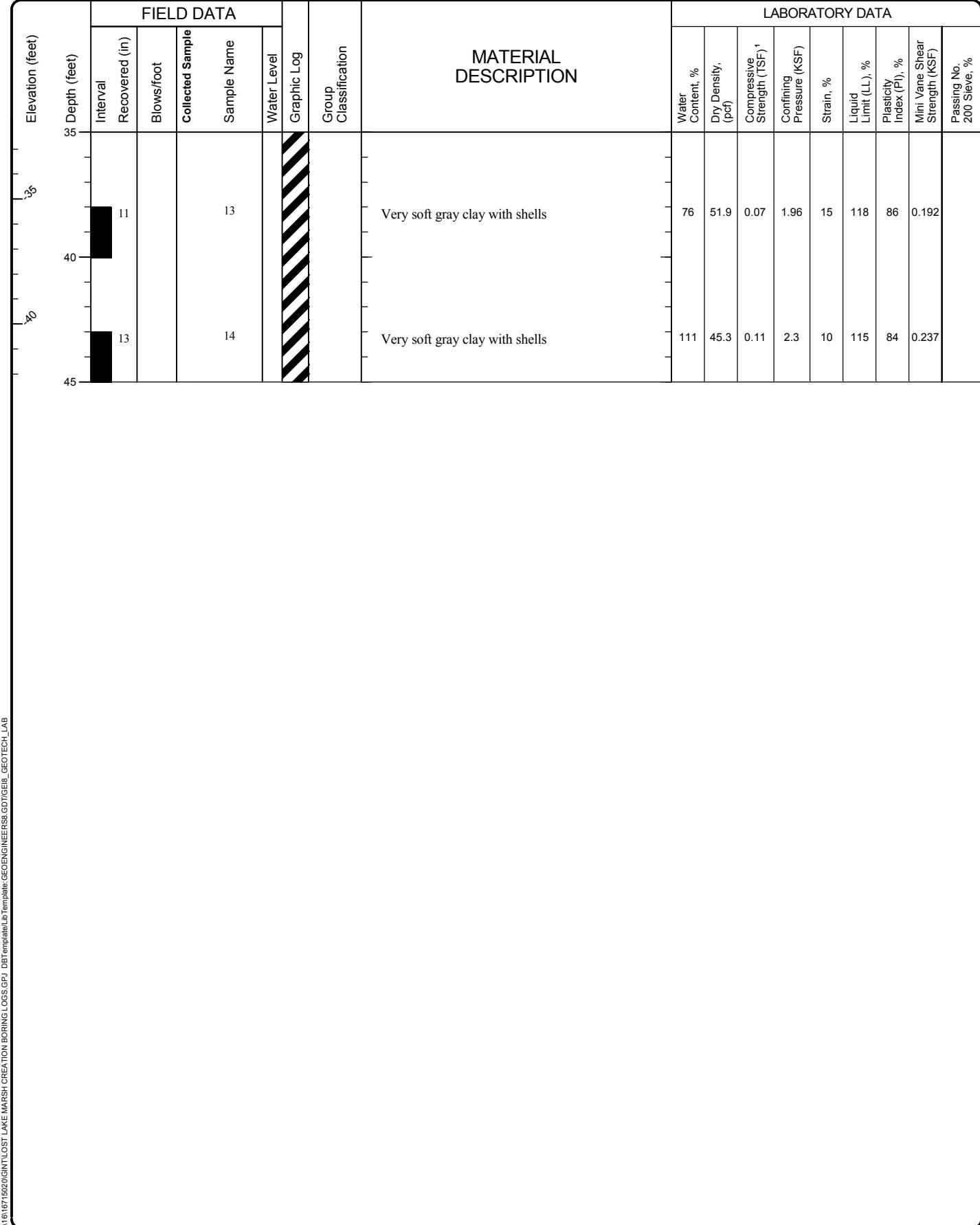
Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/14/2011	End 5/14/2011	Total Depth (ft)	45	Logged By Checked By	DAS VT	Driller	GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.7			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop			Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 21' 21.9" W90° 59' 25.9"			System Datum	Geographic NAD83 (feet)			Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.										



Log of Boring B-12

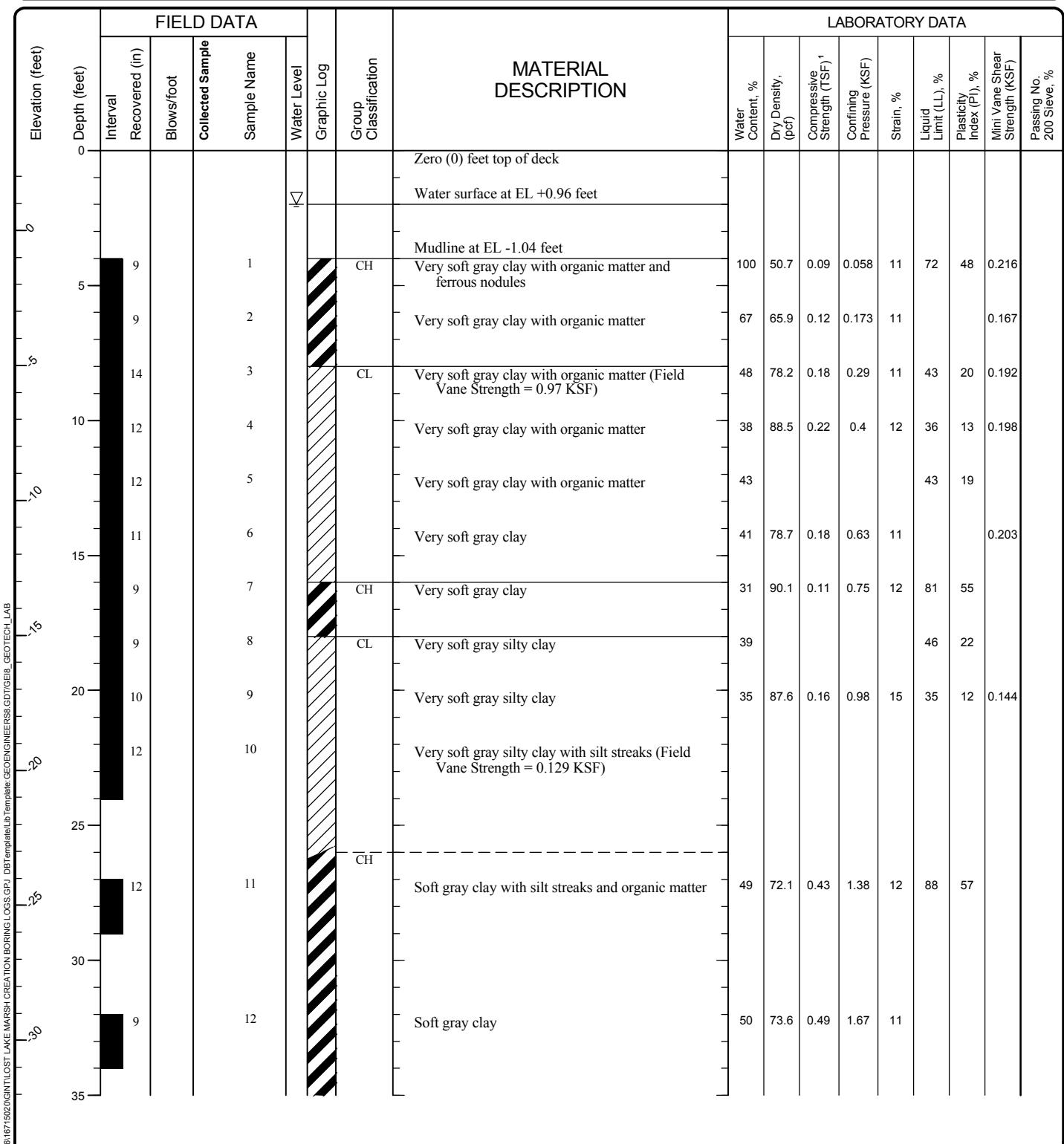
	Project:	Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)		
	Project Location:	Terrebonne Parish, Louisiana		
	Project Number:	16715-020-00		
		Figure I-B13 Sheet 1 of 2		



Log of Boring B-12 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

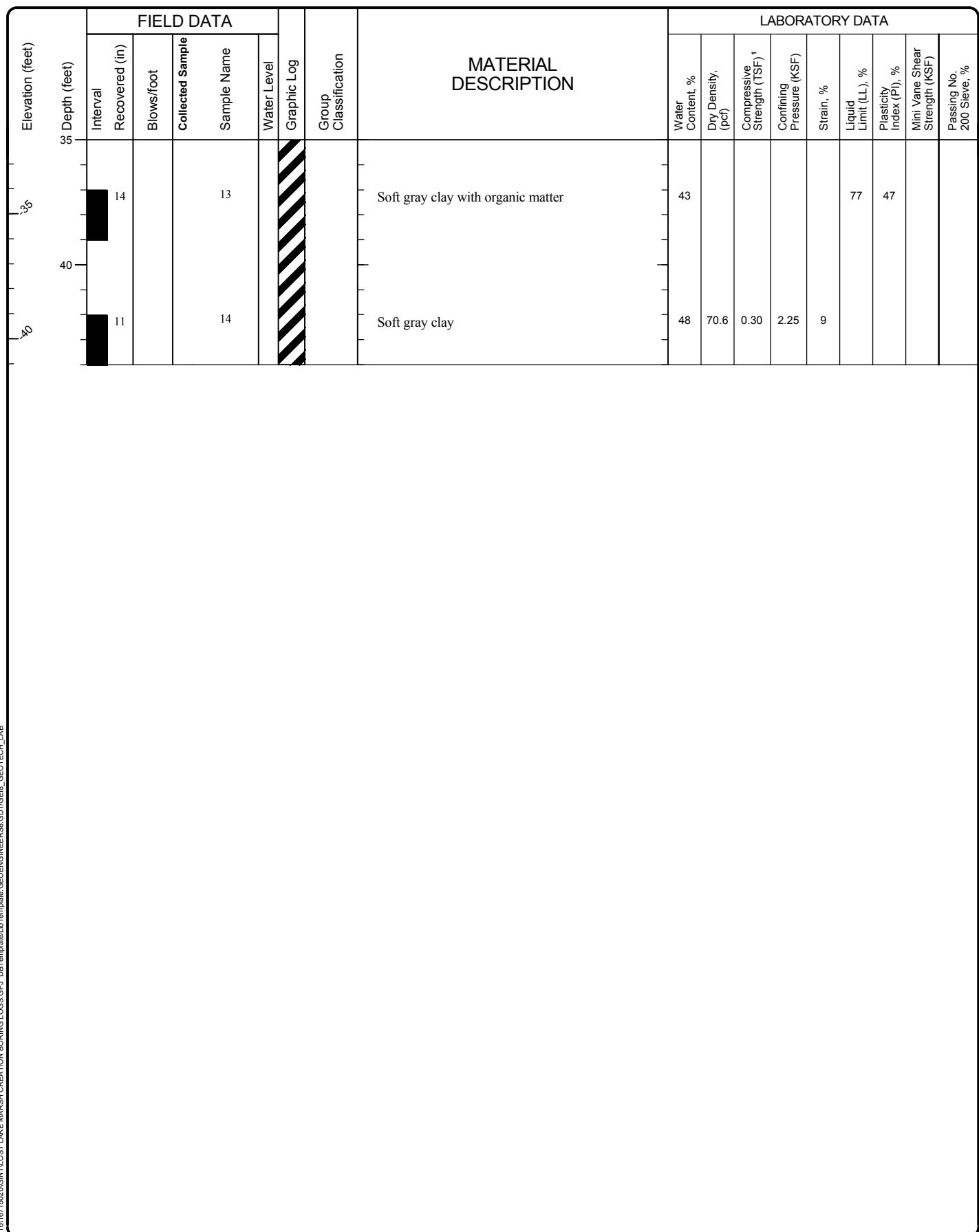


Log of Boring B-13



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
Project Location: Terrebonne Parish, Louisiana
Project Number: 16715-020-00

Figure I-B14
Sheet 1 of 2



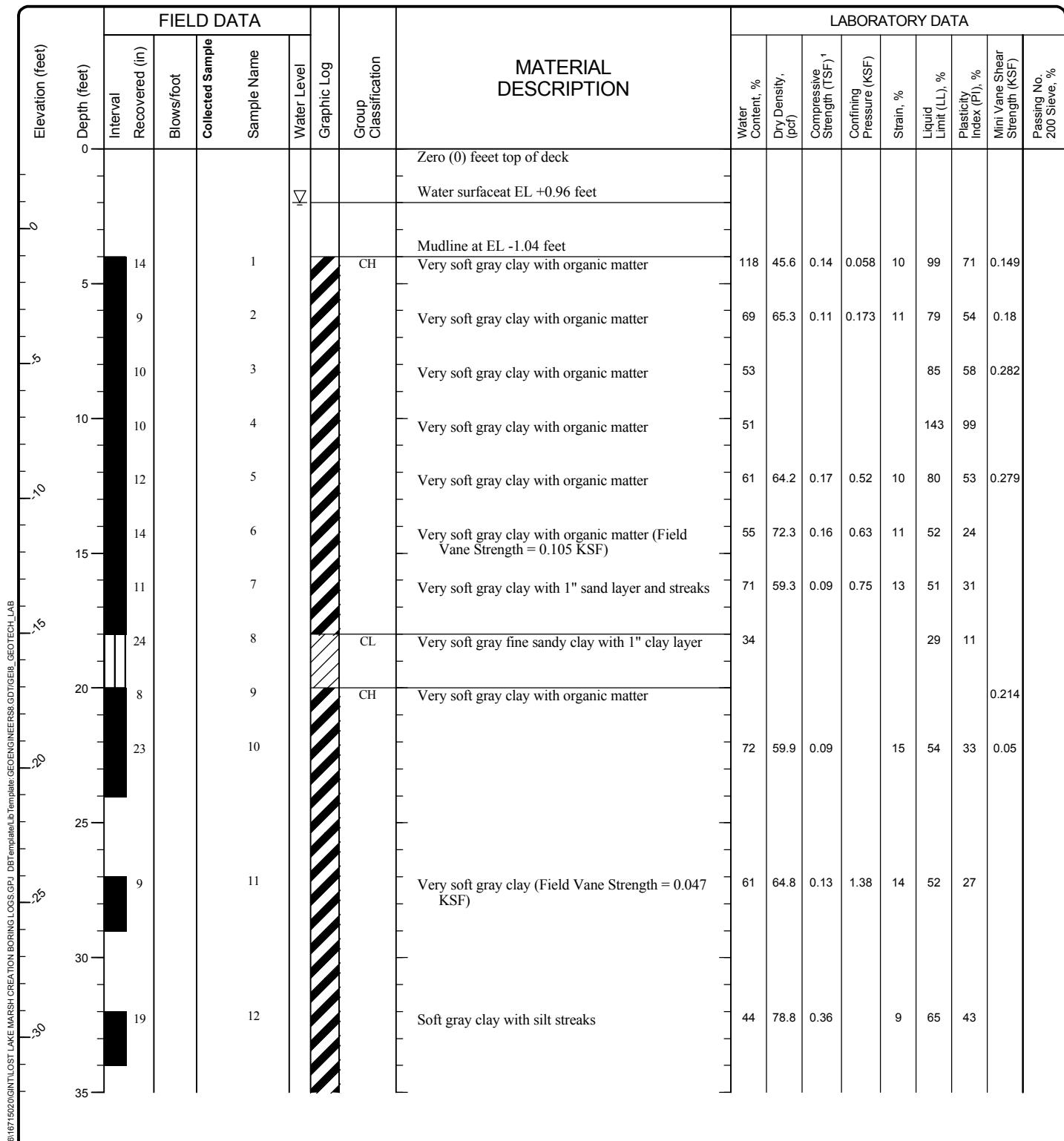
Log of Boring B-13 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
Project Location: Terrebonne Parish, Louisiana
Project Number: 16715-020-00

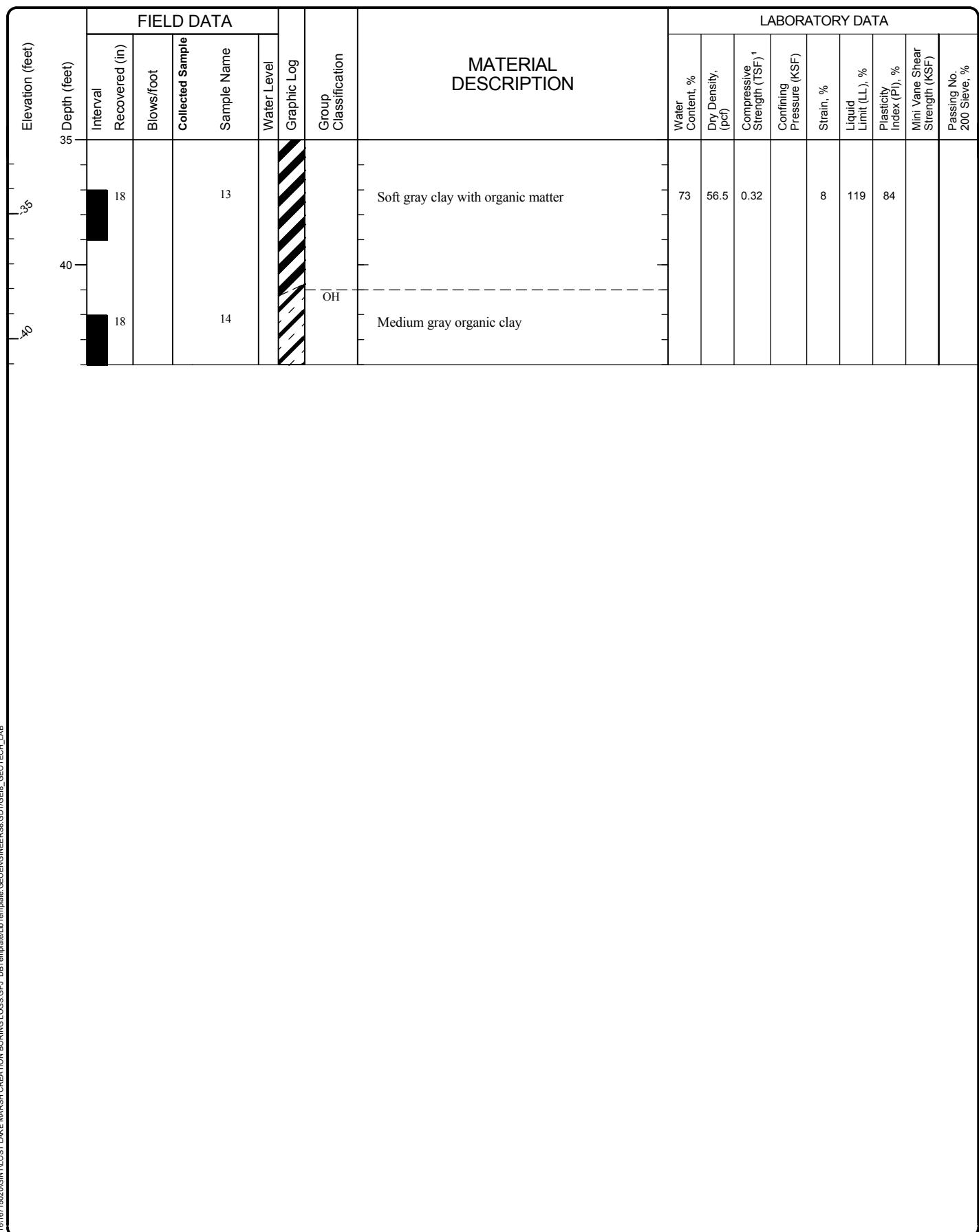
Figure I-B14
Sheet 2 of 2

Drilled	Start 5/13/2011	End 5/13/2011	Total Depth (ft)	44	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	3.0			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 21' 32.8" W90° 59' 47.4"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-14

	Project:	Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
	Project Location:	Terrebonne Parish, Louisiana
	Project Number:	16715-020-00



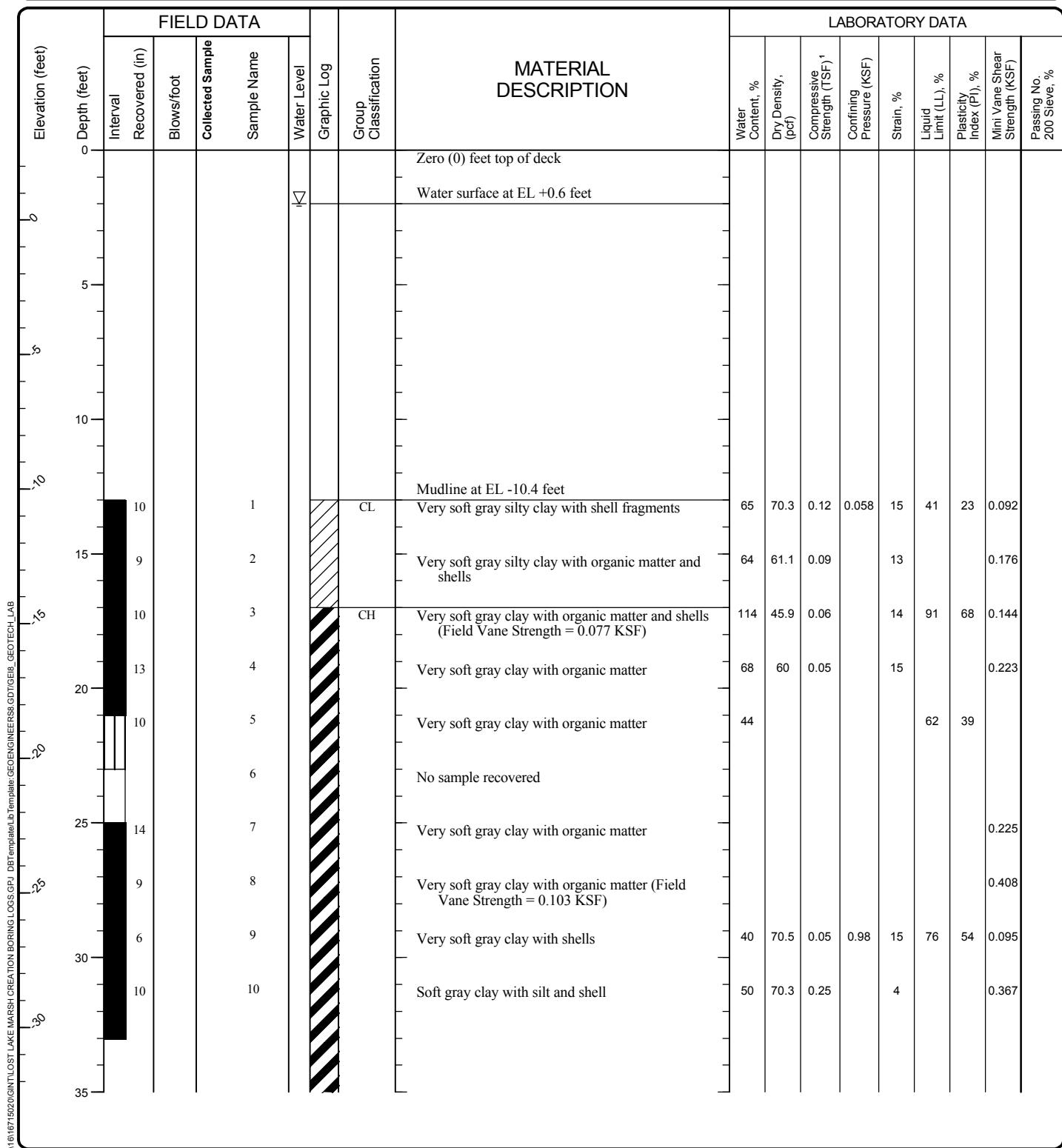
Log of Boring B-14 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
Project Location: Terrebonne Parish, Louisiana
Project Number: 16715-020-00

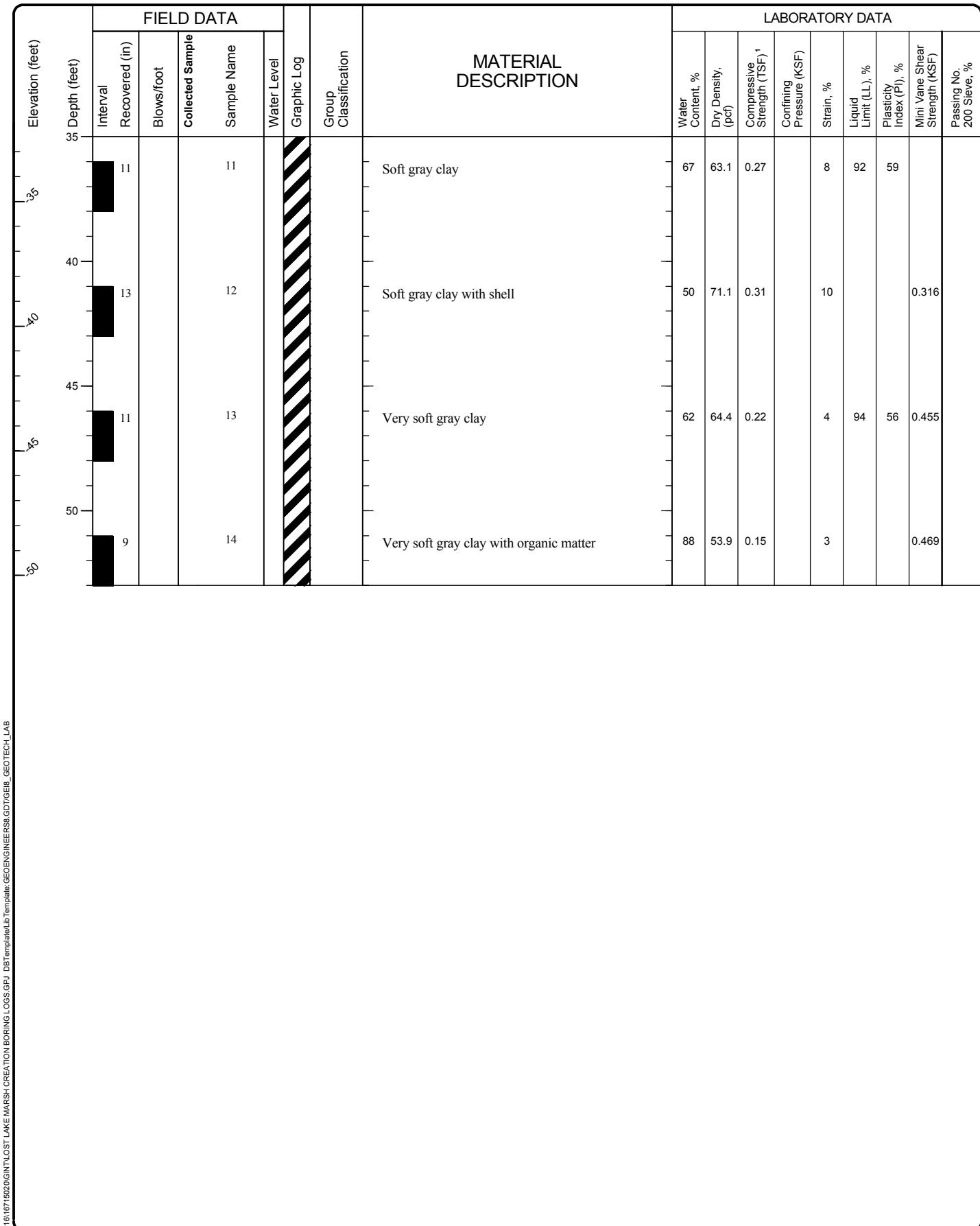
Figure I-B15
Sheet 2 of 2

Drilled	Start 5/19/2011	End 5/19/2011	Total Depth (ft)	53	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum		2.6		Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop		Drilling Equipment	Pontoon-Mounted Drill Rig
Latitude Longitude		N29° 21' 54.7" W90° 58' 58.0"		System Datum	Geographic NAD83 (feet)		Groundwater Date Measured	Depth to Water (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.						Elevation (ft)		



Log of Boring B-15

	Project:	Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)		
	Project Location:	Terrebonne Parish, Louisiana		
	Project Number:	16715-020-00		



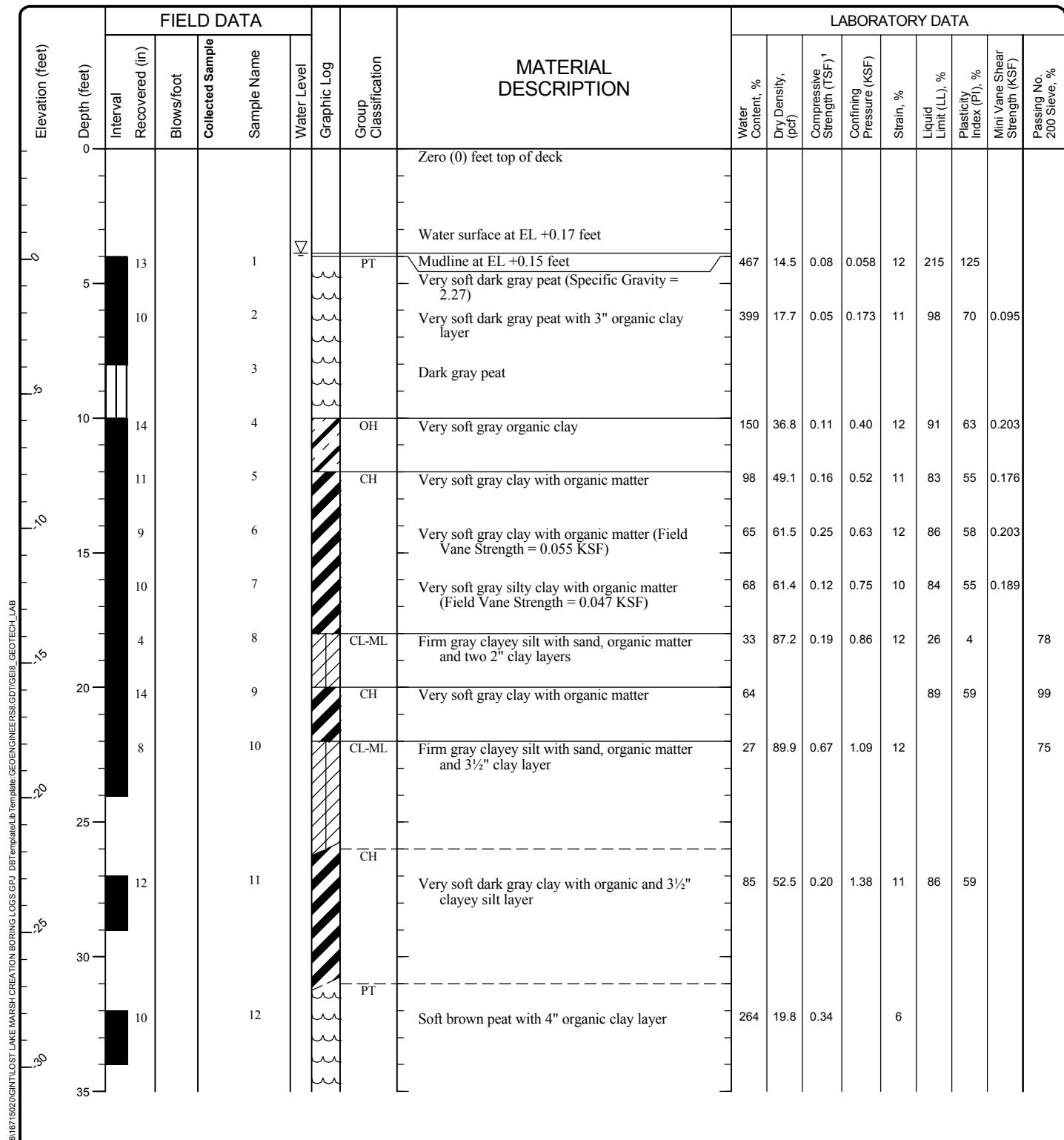
Log of Boring B-15 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

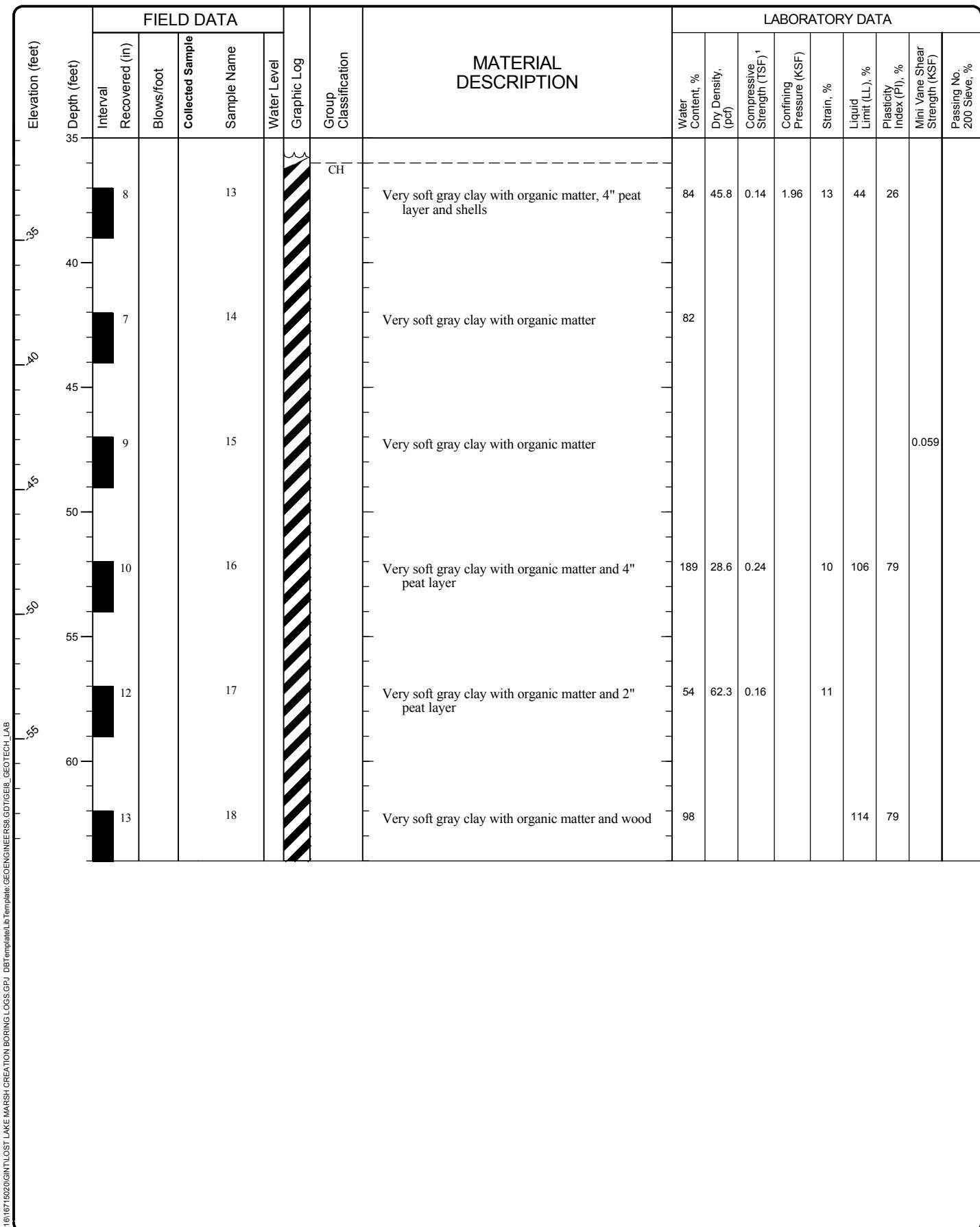
Figure I-B16
 Sheet 2 of 2

Drilled	Start 5/27/2011	End 5/27/2011	Total Depth (ft) 64	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method Rotary Wash
Surface Elevation (ft) Vertical Datum	4.1	Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Marsh Buggy-Mounted Drill Rig	
Latitude Longitude	N29° 21' 37.0" W91° 00' 05.0"	System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.						



Log of Boring B-16

	Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
	Project Location: Terrebonne Parish, Louisiana
	Project Number: 16715-020-00

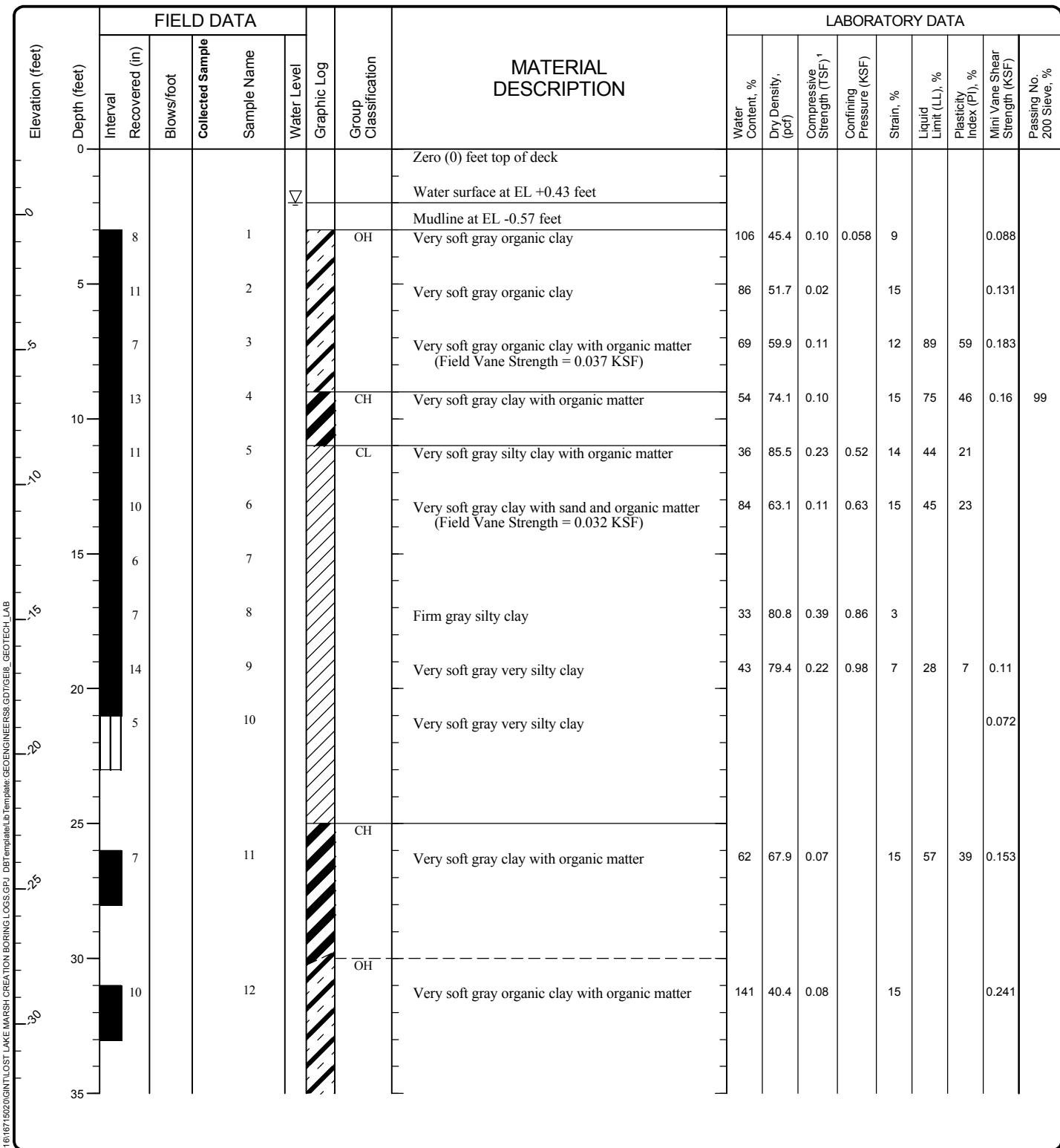


Log of Boring B-16 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

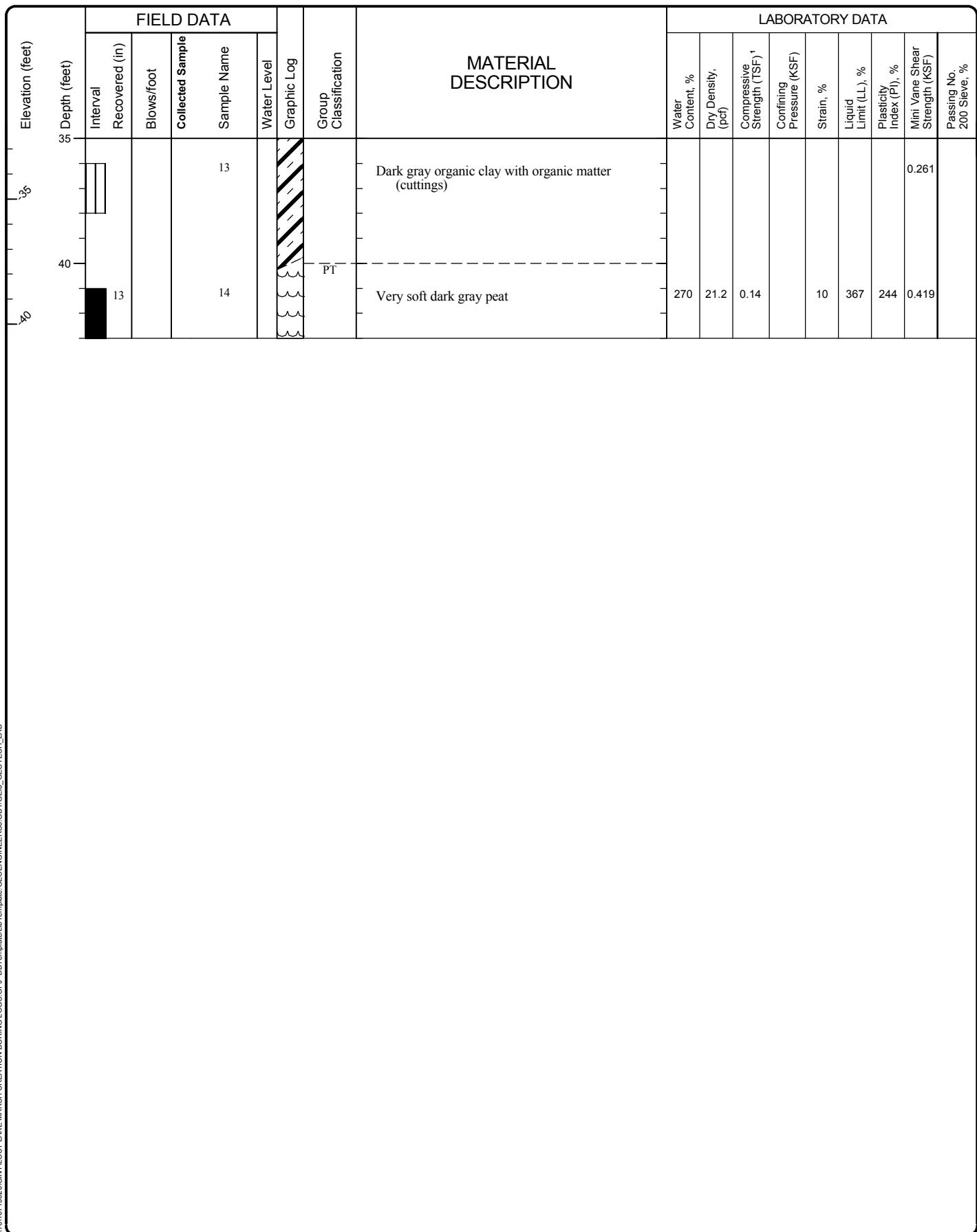
Drilled	Start 5/28/2011	End 5/28/2011	Total Depth (ft)	43	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.4			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Marsh Buggy-Mounted Drill Rig	
Latitude Longitude	N29° 21' 29.0" W91° 00' 20.0"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-17



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

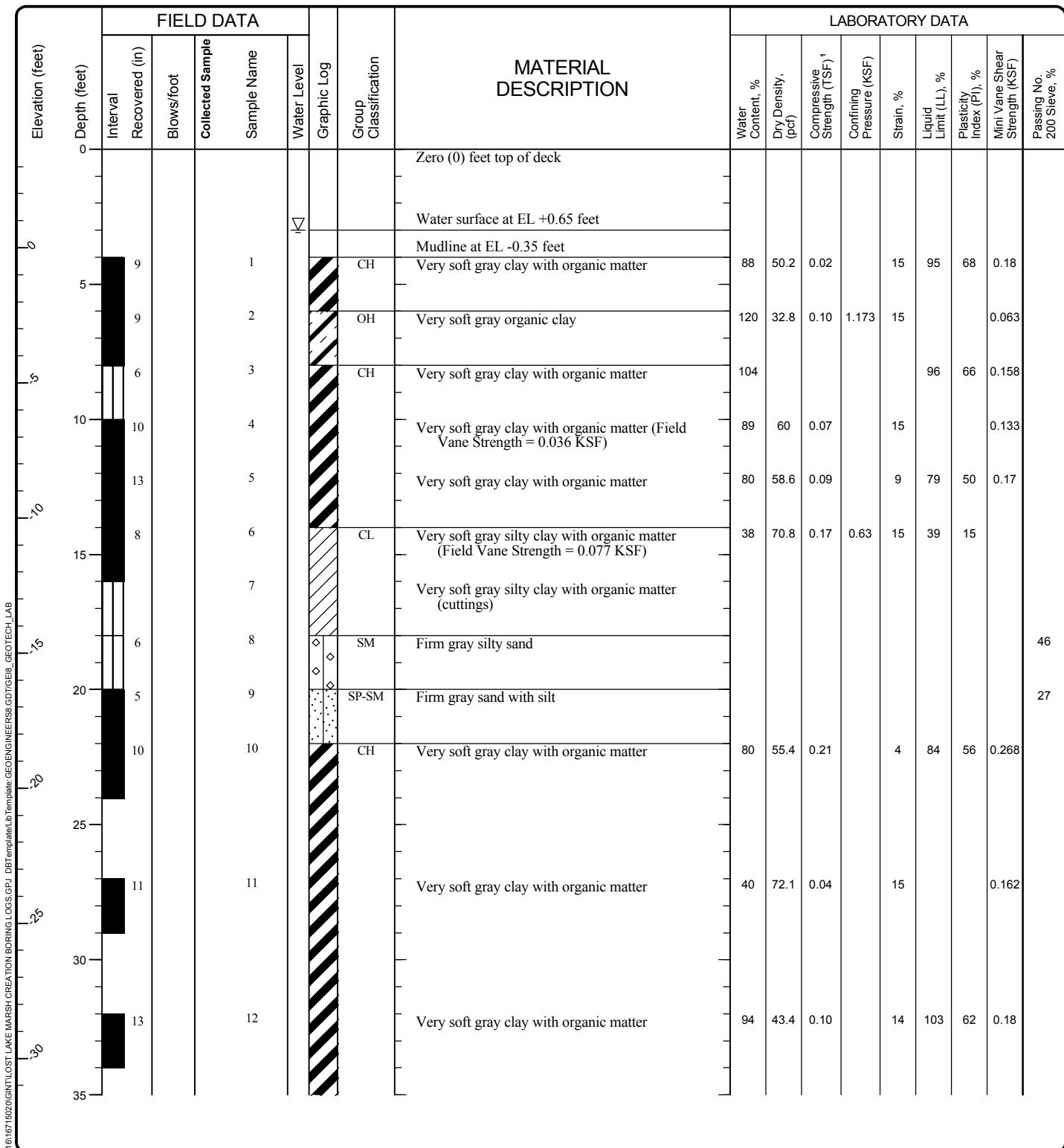


Log of Boring B-17 (continued)



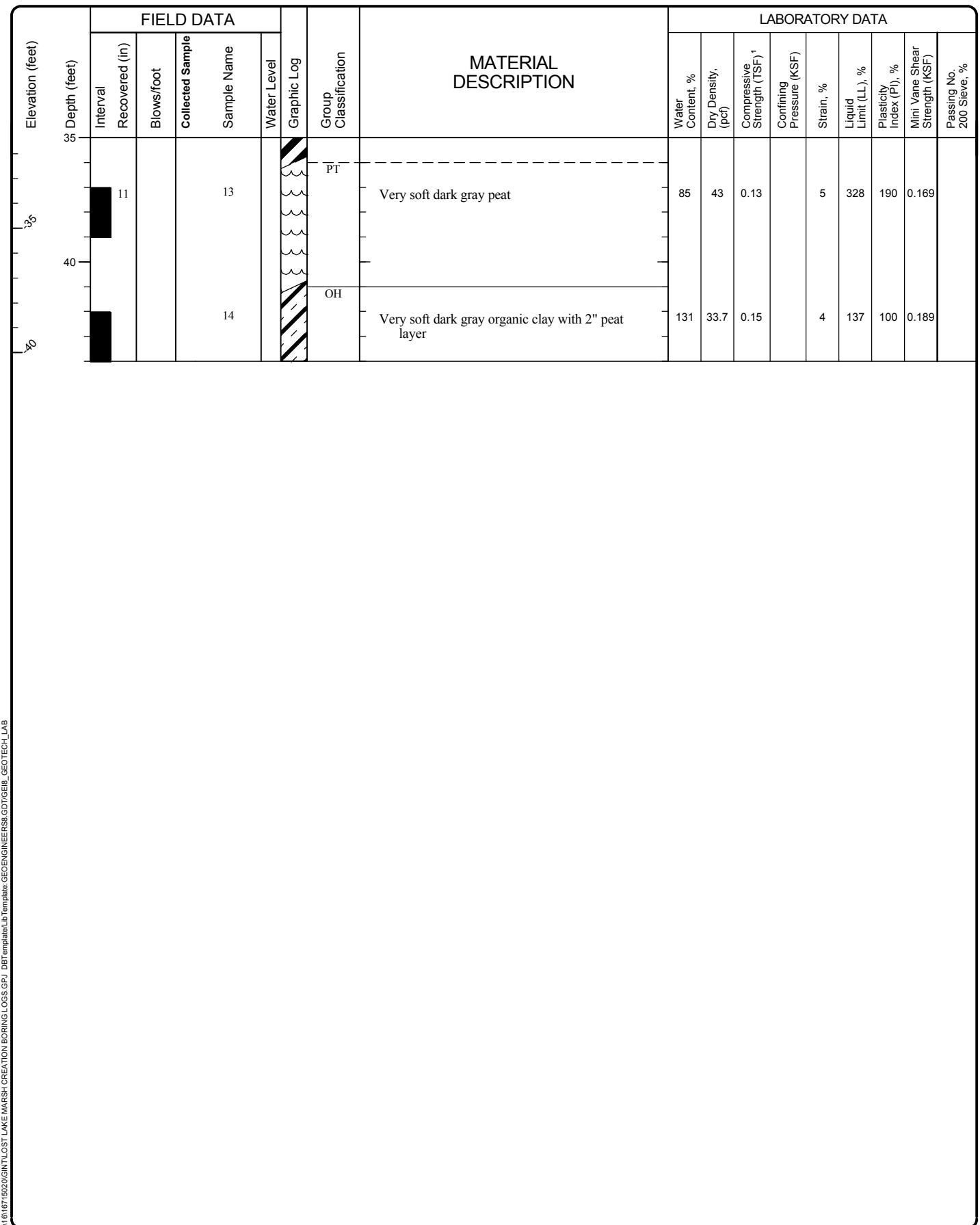
Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/28/2011	End 5/28/2011	Total Depth (ft)	44	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	3.7			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Marsh Buggy-Mounted Drill Rig	
Latitude Longitude	N29° 21' 37.0" W91° 01' 00.0"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-18

	Project:	Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)		
	Project Location:	Terrebonne Parish, Louisiana		
	Project Number:	16715-020-00		

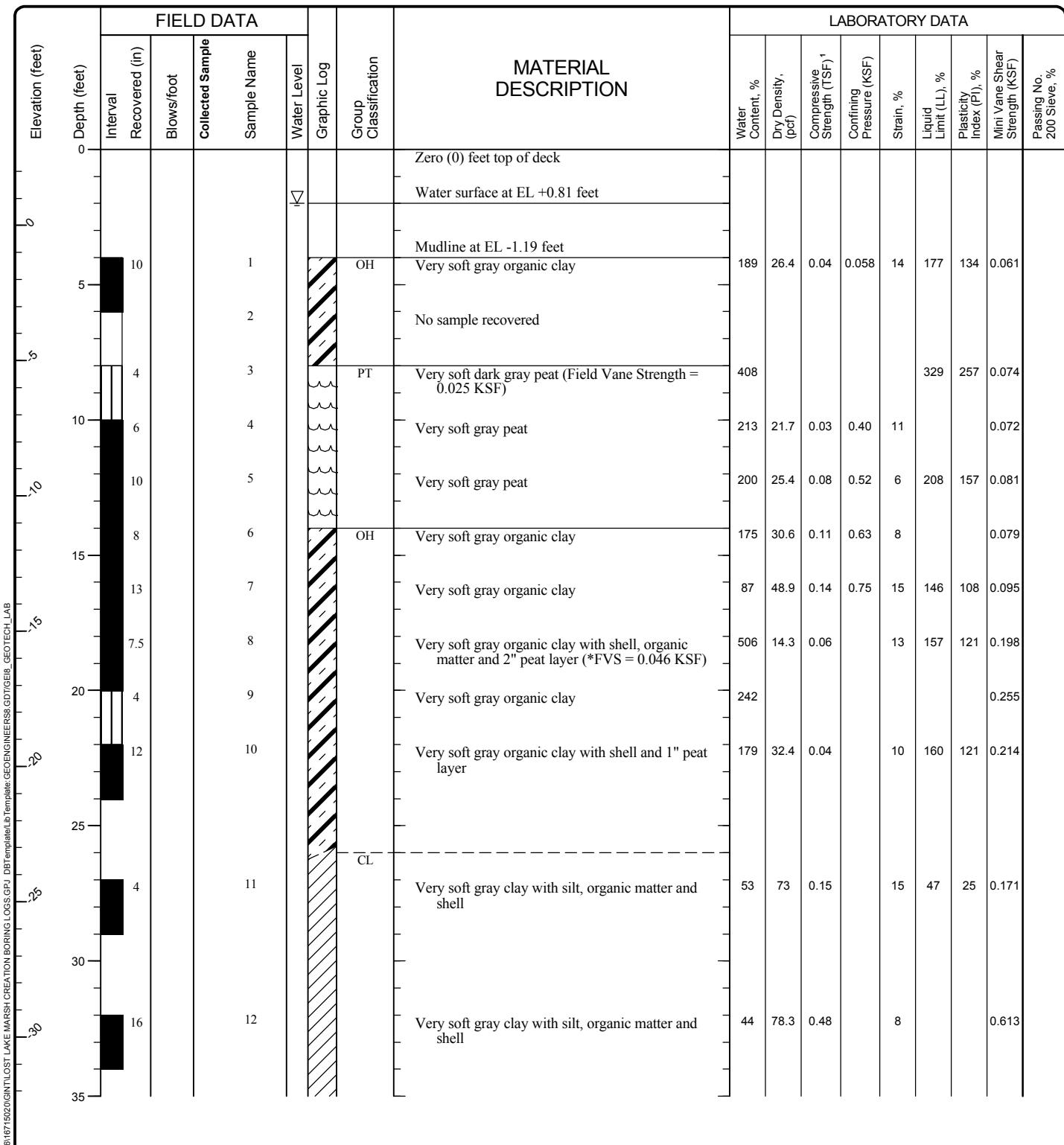


Log of Boring B-18 (continued)



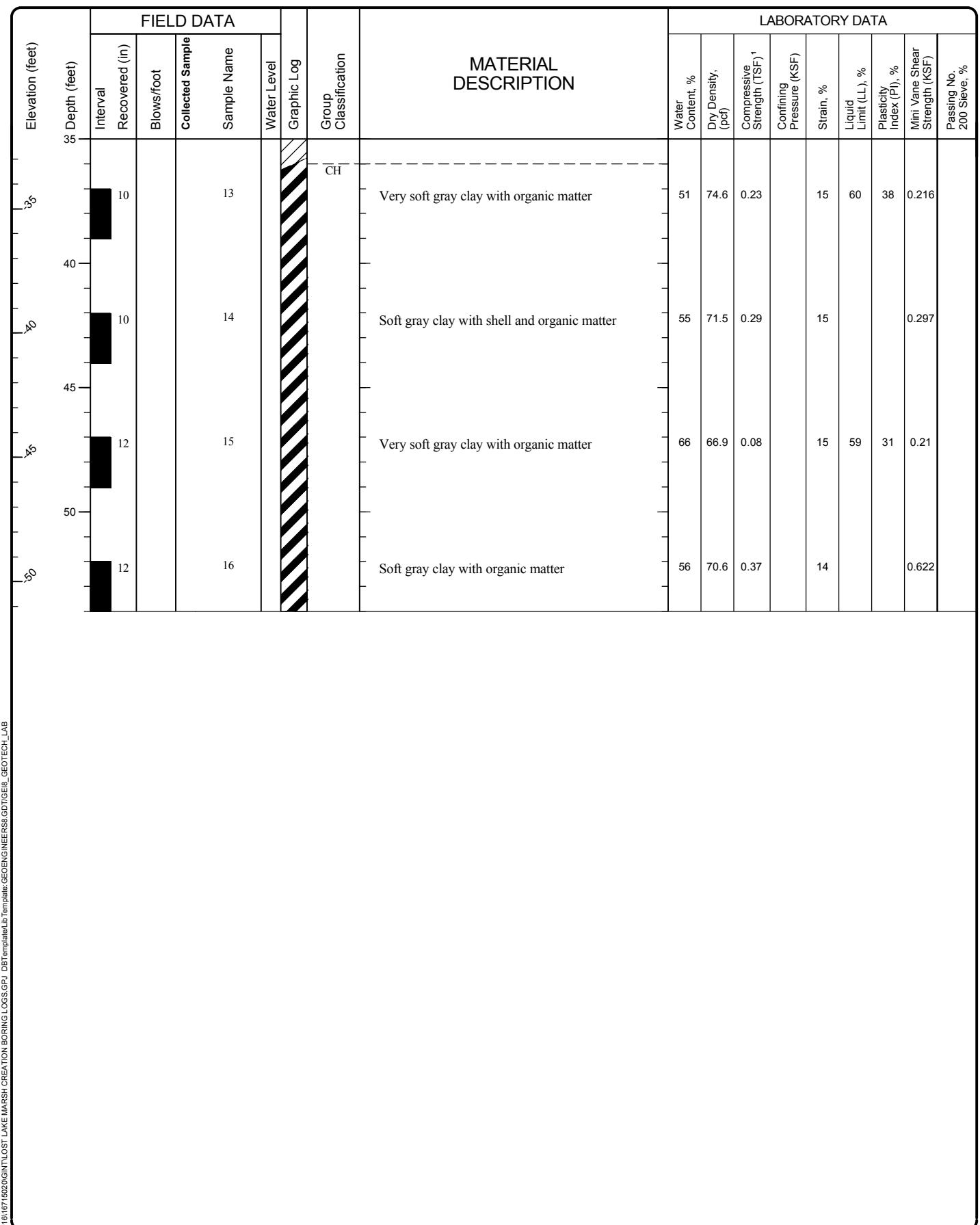
Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Drilled	Start 5/20/2011	End 5/20/2011	Total Depth (ft)	54	Logged By Checked By	DAS VT	Driller	GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.8			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop			Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 23' 14.1" W91° 01' 49.5"			System Datum	Geographic NAD83 (feet)			Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.										



Log of Boring B-19

	Project:	Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)				
	Project Location:	Terrebonne Parish, Louisiana				
	Project Number:	16715-020-00				

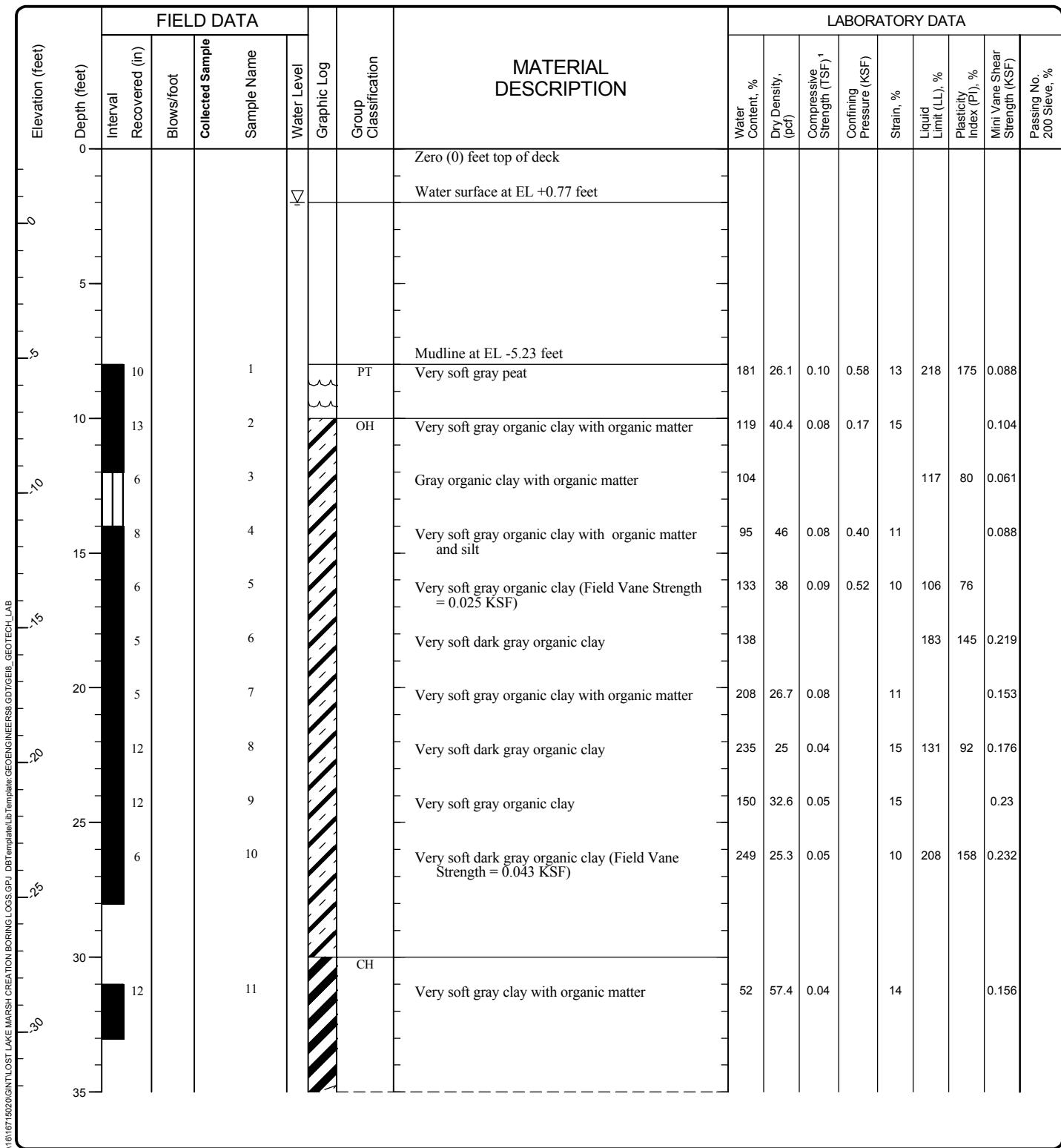


Log of Boring B-19 (continued)



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

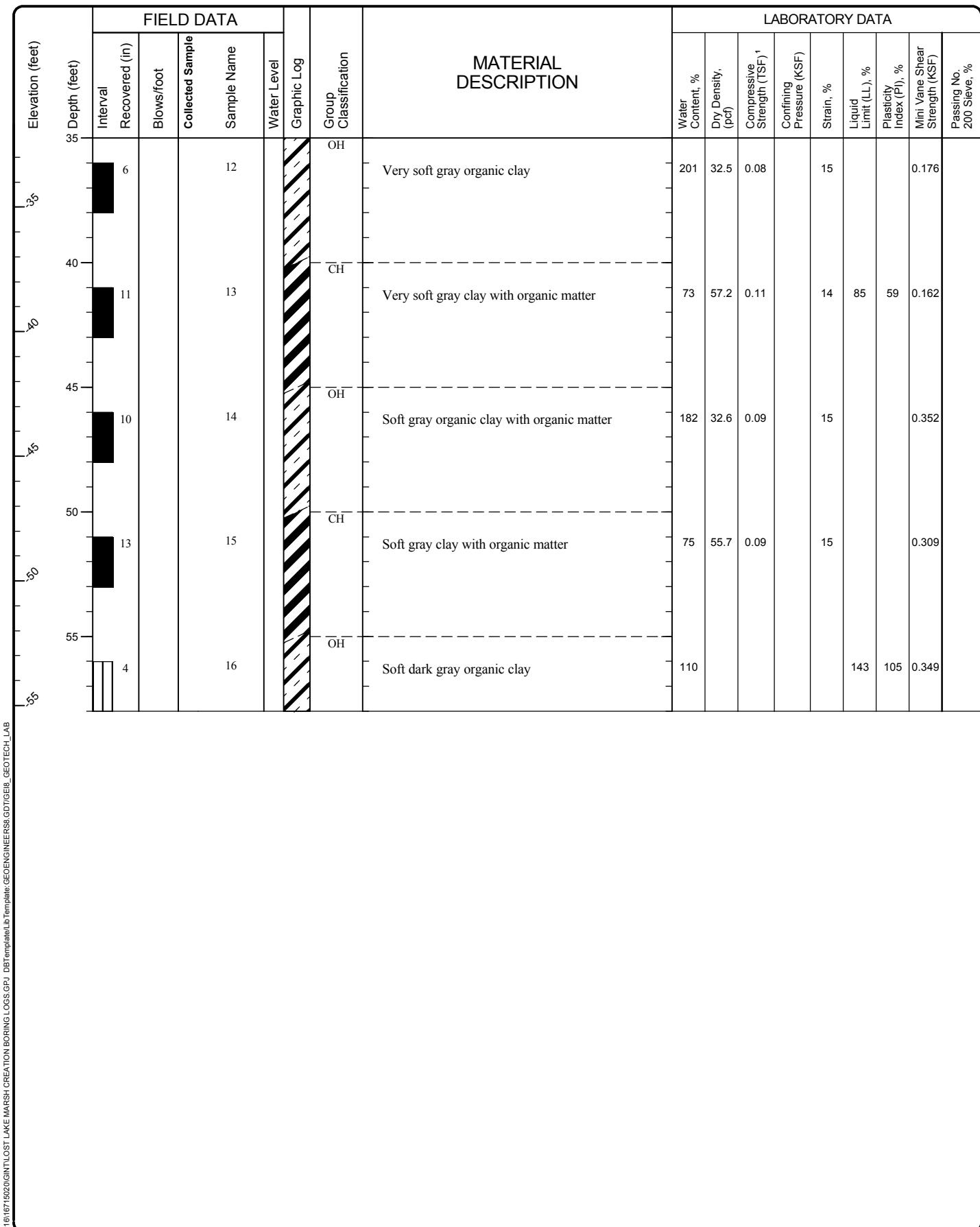
Drilled	Start 5/19/2011	End 5/19/2011	Total Depth (ft)	58	Logged By DAS Checked By VT	Driller GeoEngineers, Inc.	Drilling Method	Rotary Wash
Surface Elevation (ft) Vertical Datum	2.8			Hammer Data	Safety Hammer/Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Pontoon-Mounted Drill Rig	
Latitude Longitude	N29° 23' 37.2" W91° 02' 09.4"			System Datum	Geographic NAD83 (feet)	Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
Notes: See Figure A-1 for explanation of symbols. Cement-bentonite grout backfill top 25 feet.								



Log of Boring B-20



Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00



Log of Boring B-20 (continued)



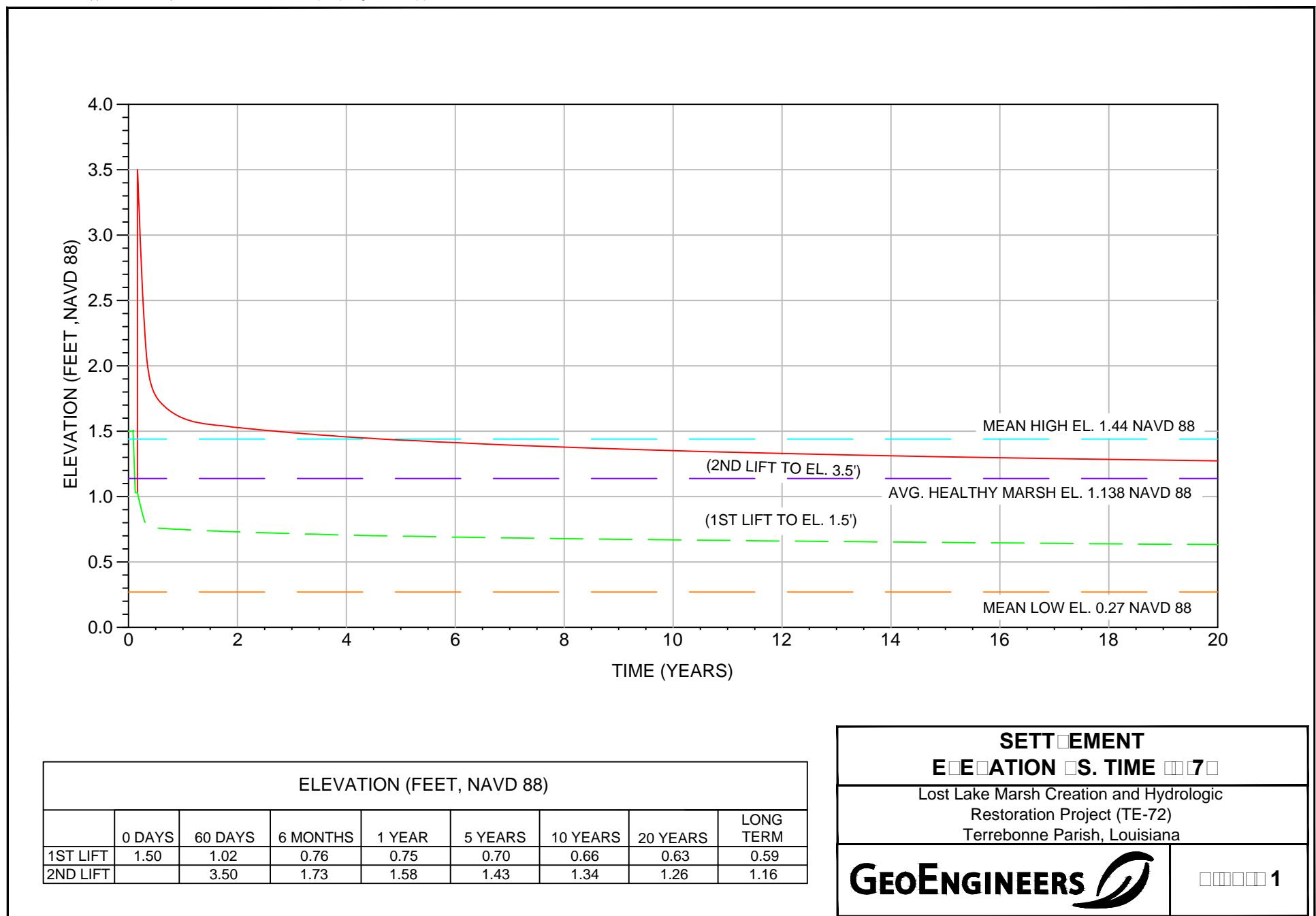
Project: Lost Lake Marsh Creation and Hydrologic Restoration (TE-72)
 Project Location: Terrebonne Parish, Louisiana
 Project Number: 16715-020-00

Figure I-B21
 Sheet 2 of 2

Appendix D

Marsh Fill Settlement Curves

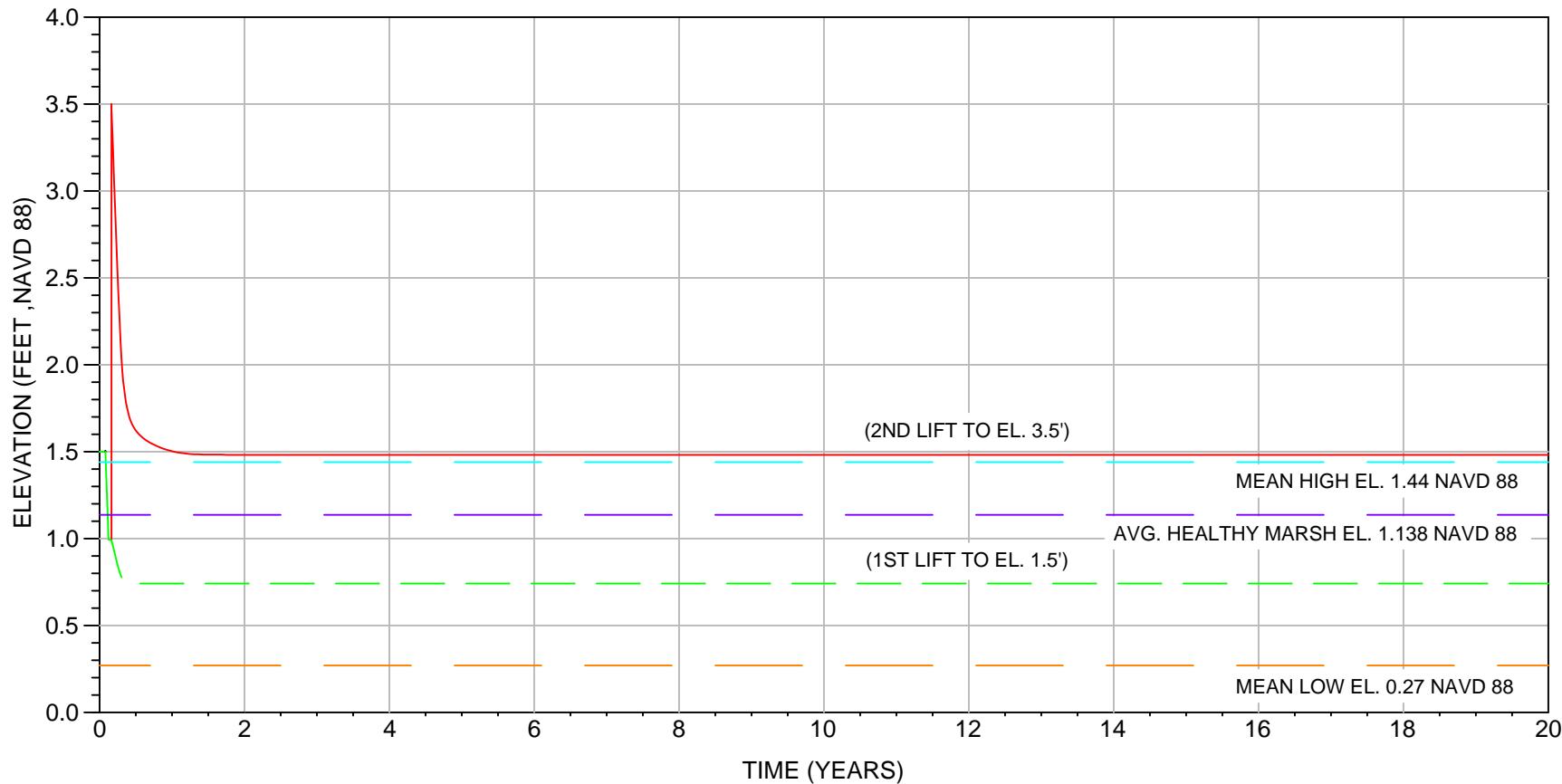
PRELIMINARY



PRELIMINARY

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VT : KMC



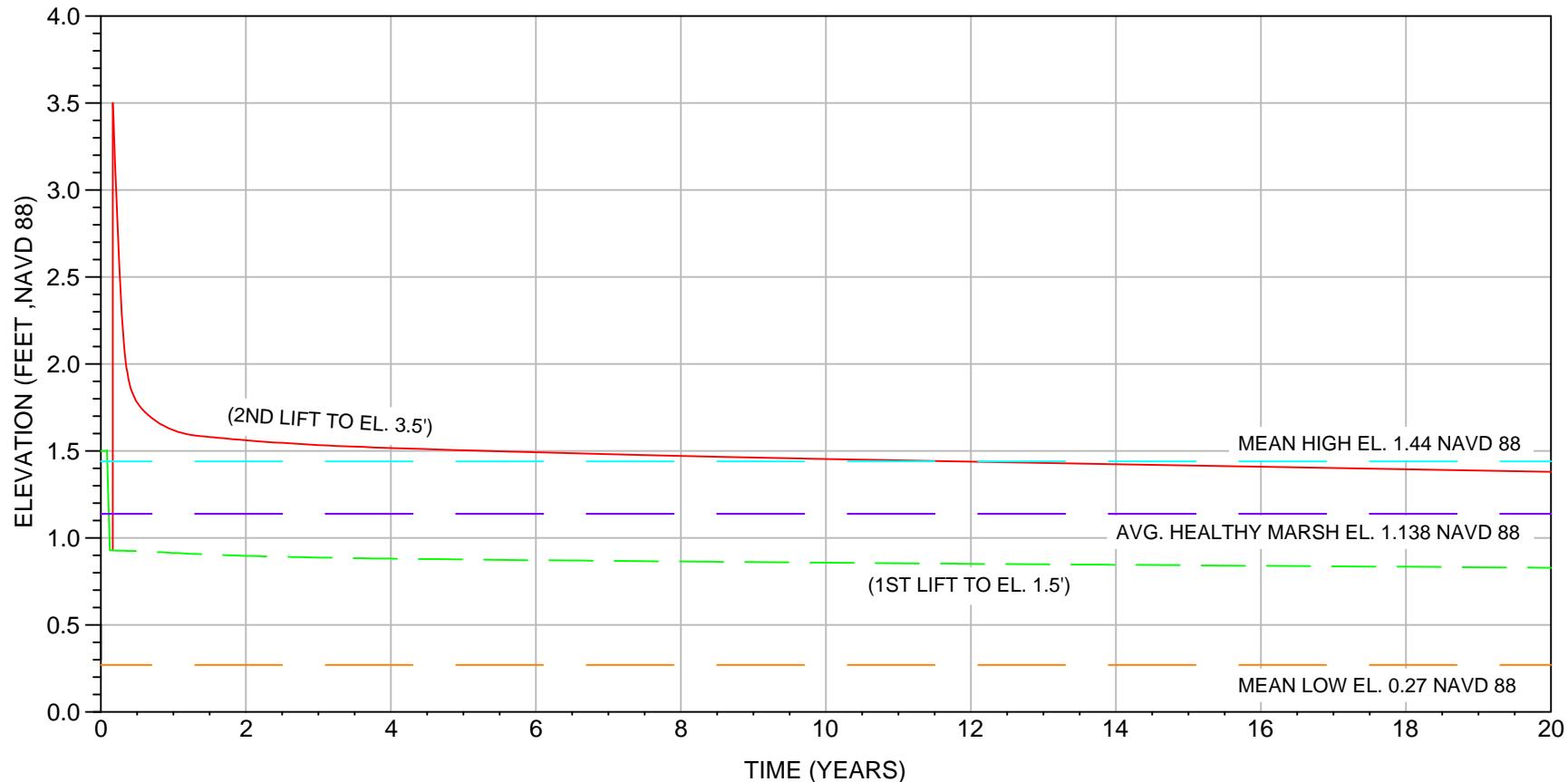
ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.99	0.74	0.74	0.74	0.74	0.74	0.73
2ND LIFT		3.50	1.59	1.49	1.48	1.48	1.48	1.44



PRELIMINARY

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VT : KMC



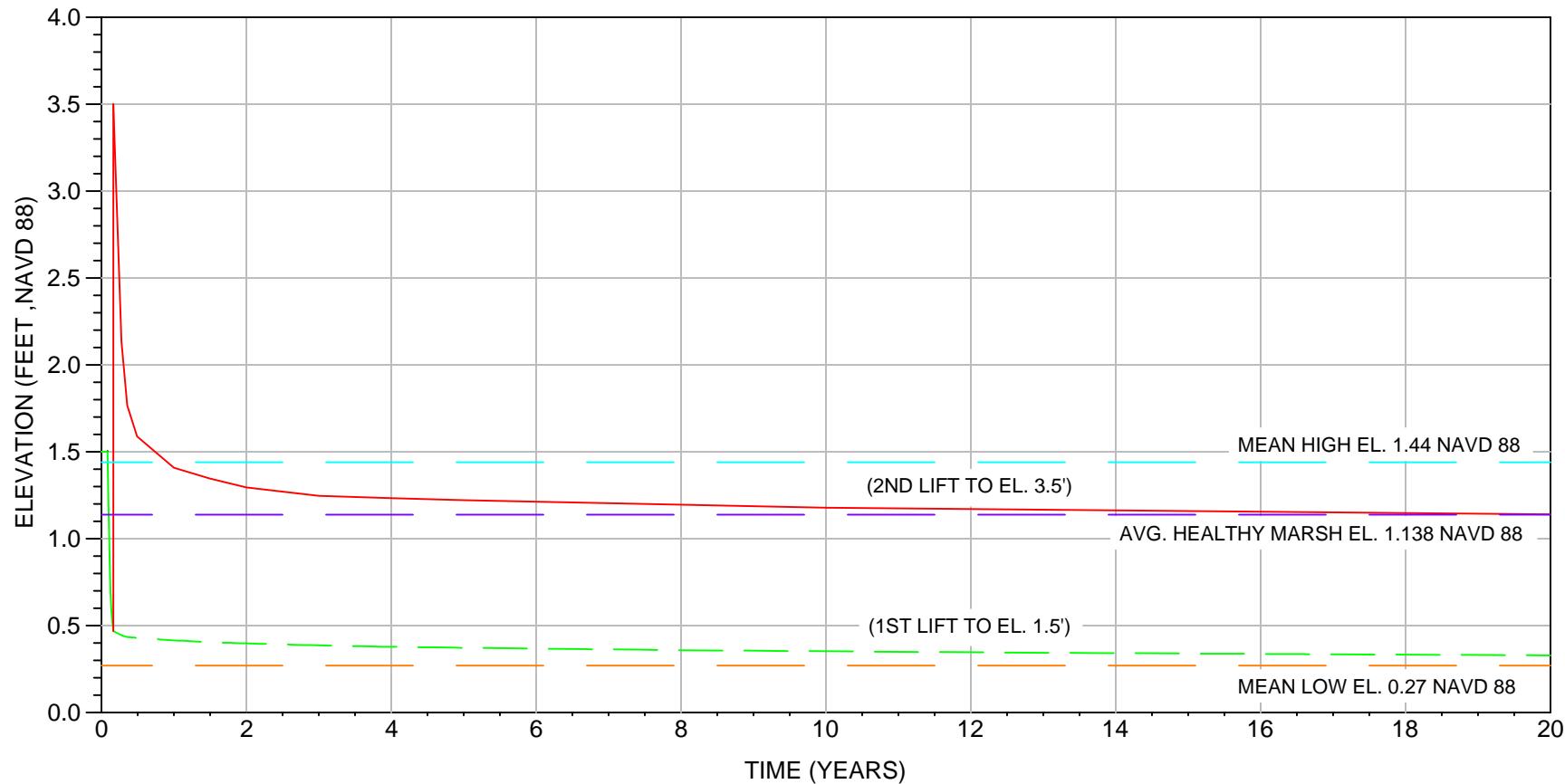
ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.93	0.93	0.91	0.88	0.86	0.83	0.78
2ND LIFT		3.50	1.74	1.60	1.50	1.45	1.38	1.26



PRELIMINARY

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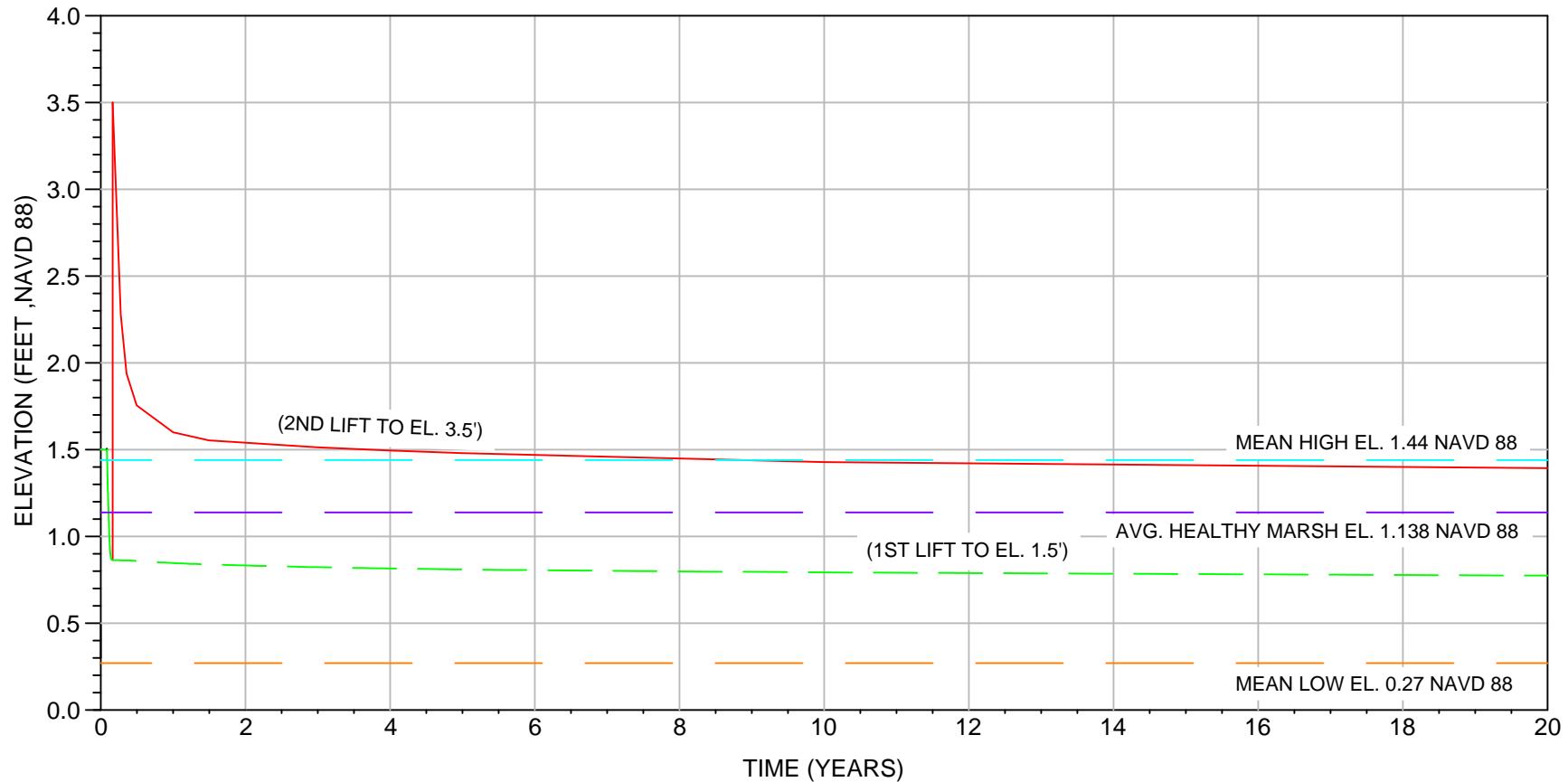
VT : KMC



ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.47	0.43	0.41	0.37	0.35	0.33	0.31
2ND LIFT		3.5	1.59	1.41	1.22	1.18	1.14	1.10



PRELIMINARY



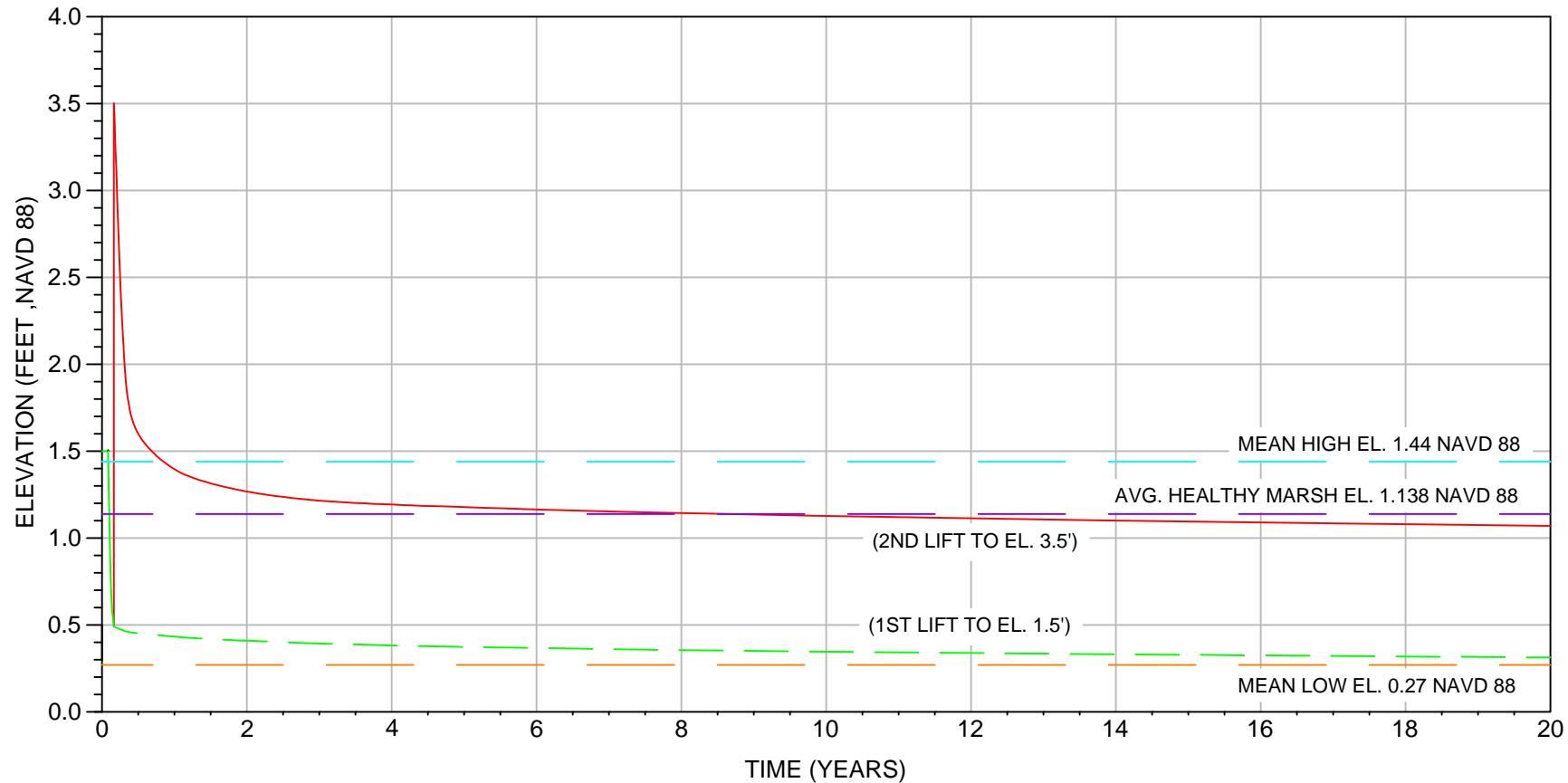
ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.86	0.86	0.85	0.81	0.79	0.78	0.76
2ND LIFT		3.5	1.76	1.60	1.48	1.43	1.39	1.35



PRELIMINARY

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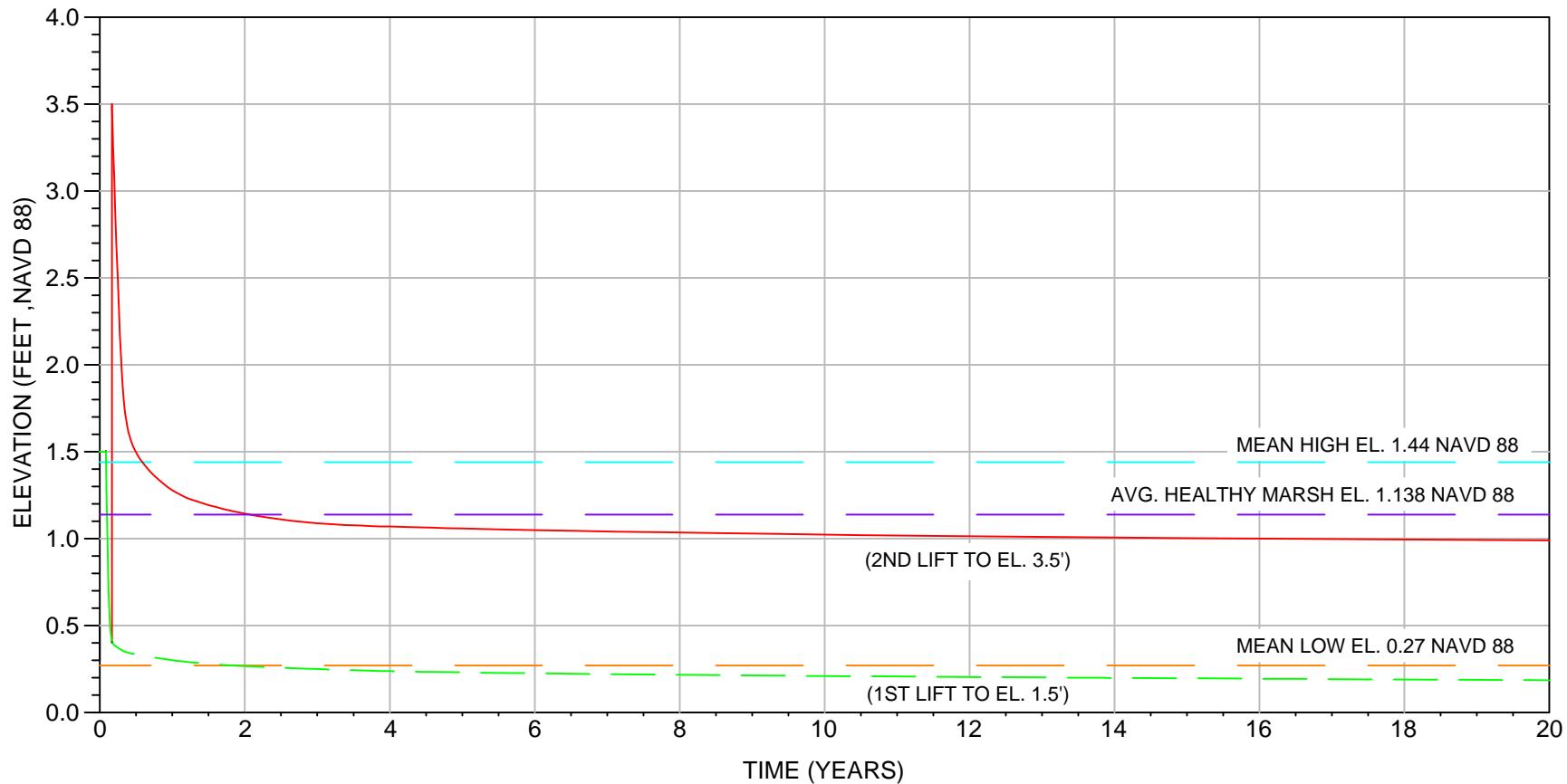
VT : KMC



ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.49	0.45	0.43	0.37	0.34	0.31	0.28
2ND LIFT		3.5	1.56	1.37	1.18	1.12	1.07	1.02



PRELIMINARY



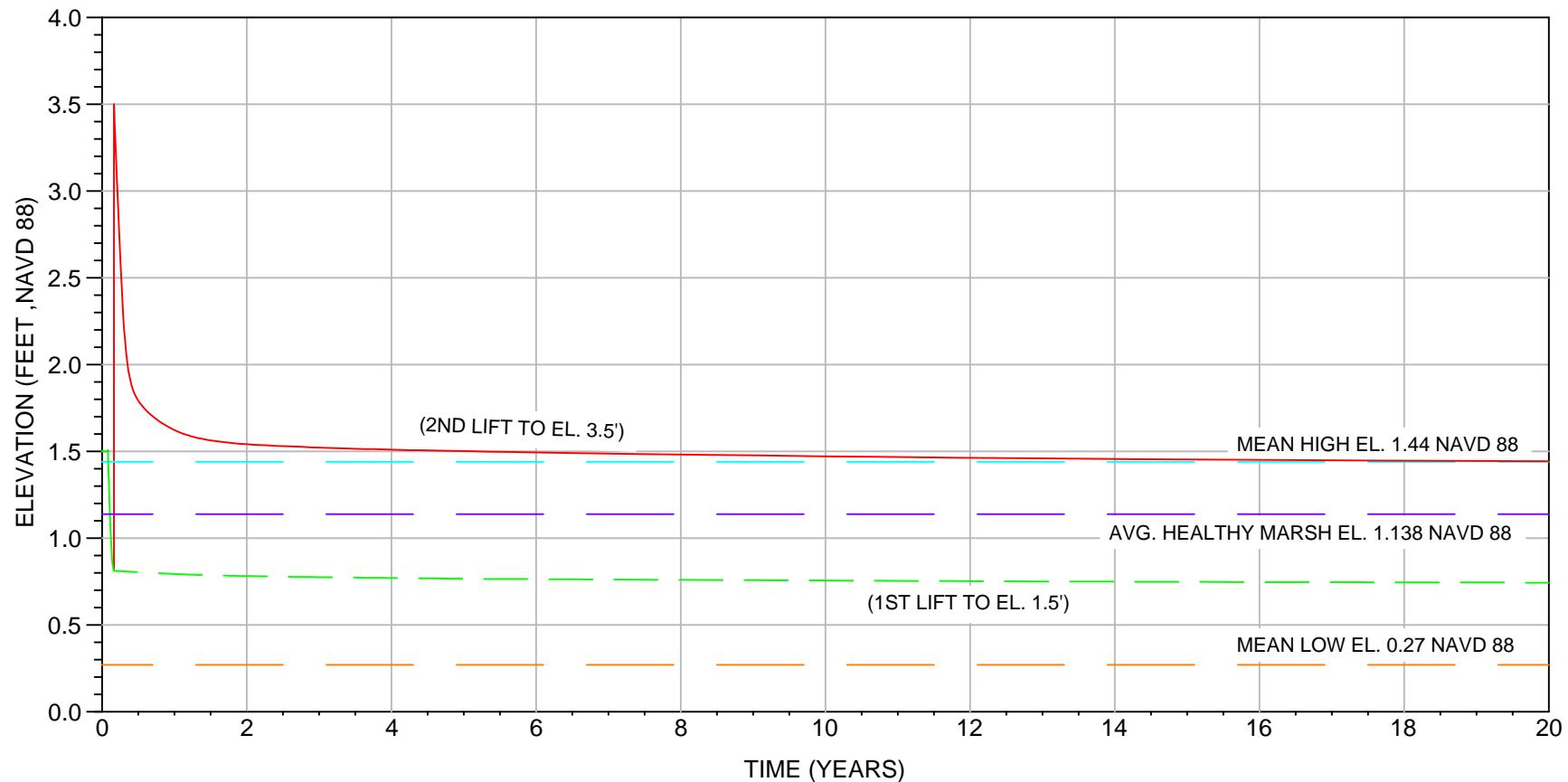
ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.40	0.33	0.30	0.23	0.21	0.19	0.15
2ND LIFT		3.50	1.46	1.25	1.06	1.01	0.98	0.93



PRELIMINARY

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VT : KMC



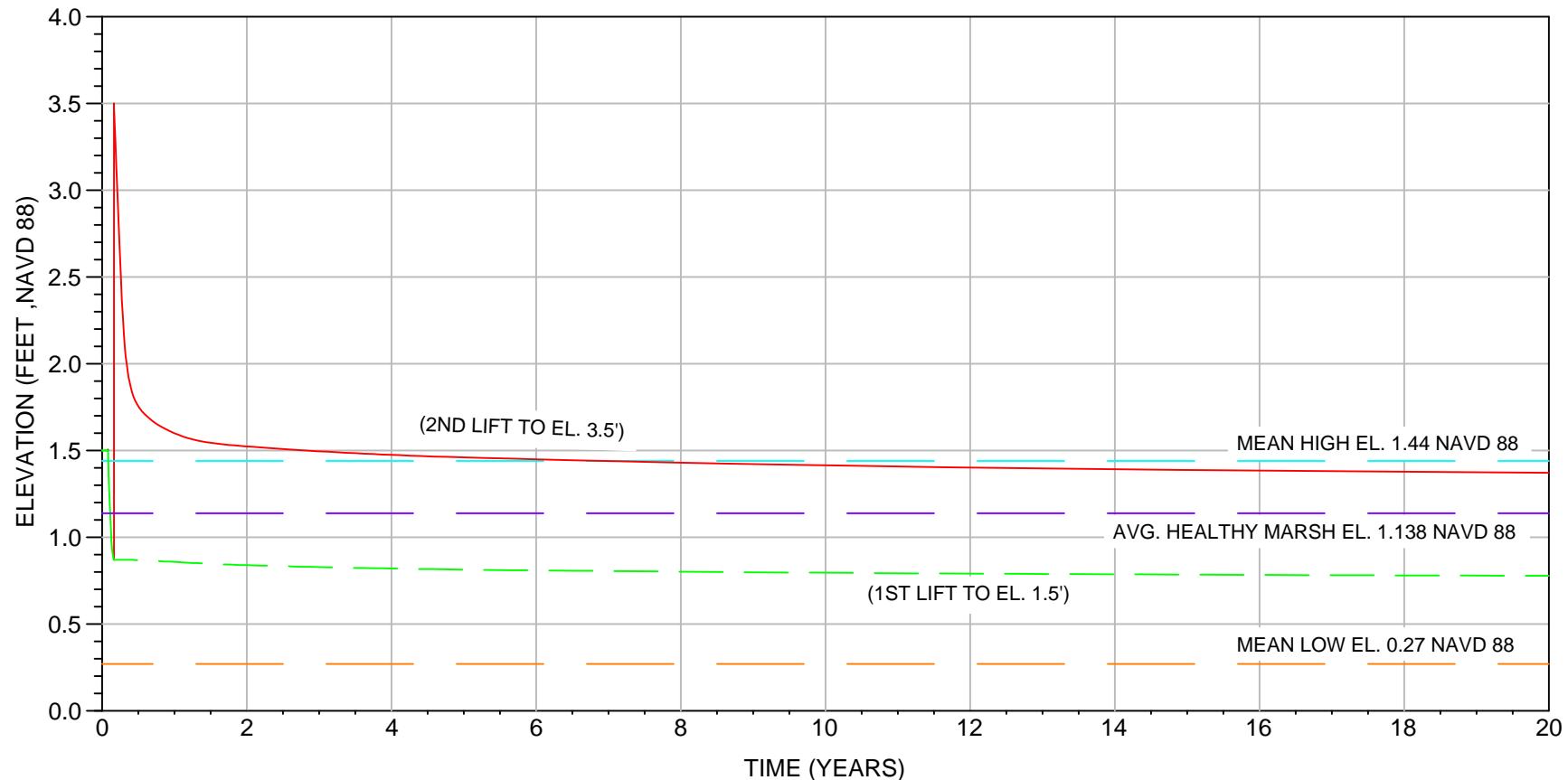
ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.81	0.80	0.79	0.77	0.75	0.74	0.73
2ND LIFT		3.50	1.76	1.61	1.50	1.47	1.44	1.41



PRELIMINARY

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VT : KMC



ELEVATION (FEET, NAVD 88)								
	0 DAYS	60 DAYS	6 MONTHS	1 YEAR	5 YEARS	10 YEARS	20 YEARS	LONG TERM
1ST LIFT	1.50	0.87	0.87	0.86	0.81	0.79	0.77	0.75
2ND LIFT		3.50	1.72	1.59	1.46	1.41	1.36	1.31



Appendix E

30% Design Plan Set

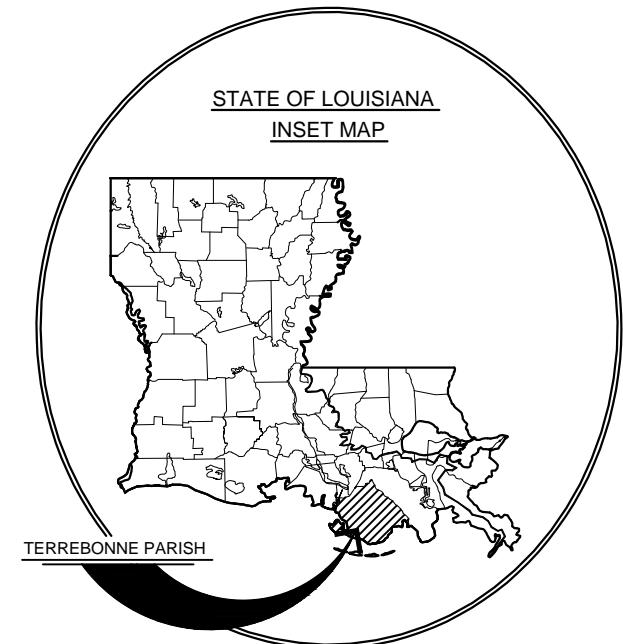
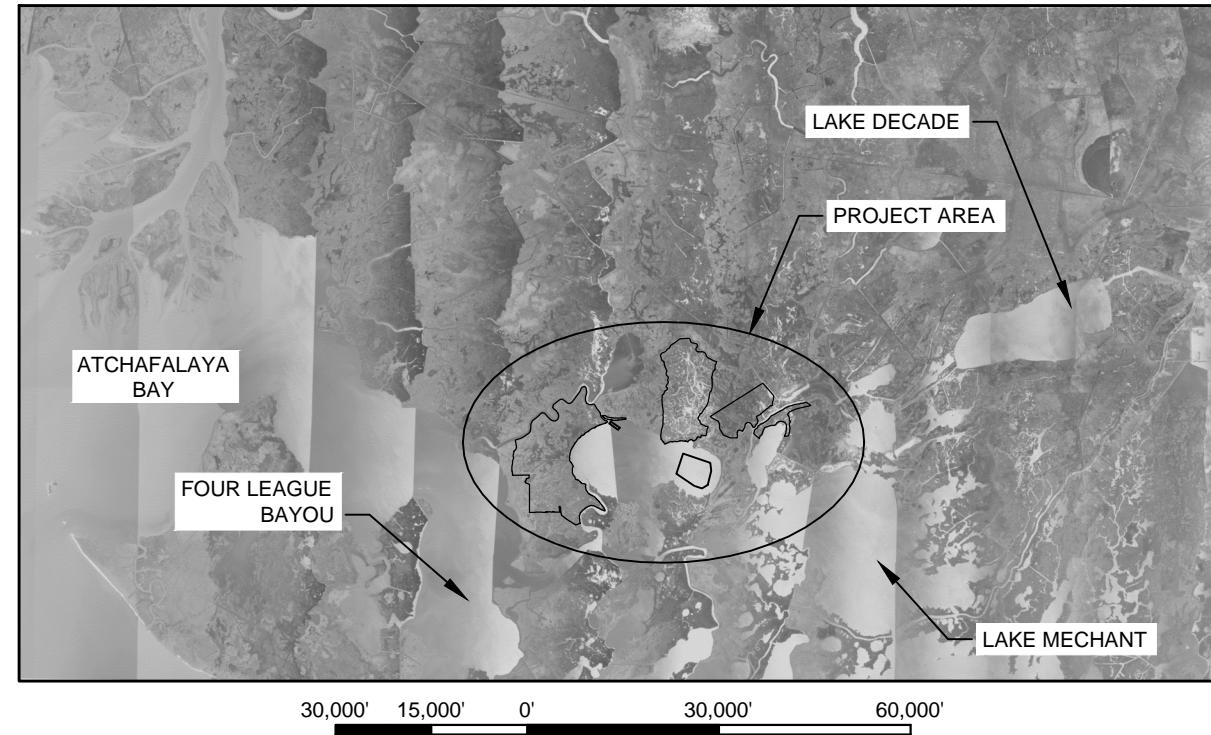
STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION AUTHORITY

INDEX TO SHEETS

SHEET NO. DESCRIPTION

- 1 TITLE SHEET
- 2 GENERAL NOTES
- 3 PROJECT LAYOUT
- 4 MARSH CREATION LAYOUT
- 5 MARSH CREATION COORDINATES
- 6 TYPICAL BORROW SECTIONS
- 7 TYPICAL FILL SECTIONS
- 8 TYPICAL EARTHEN TERRACE AND ACCESS CHANNEL
- 9 WEIR STRUCTURE
- 10 WARNING SIGN AND GRADE STAKE DETAILS
- 11 SURVEY LAYOUT
- 12 TRANSECT COORDINATES
- 13-49 CROSS SECTIONS
- 50-53 WIER SECTIONS

LOST LAKE MARSH CREATION
AND HYDROLOGIC RESTORATION
TE-72
TERREBONNE PARISH, LOUISIANA



PRE□IMINARY

□O□MENTS ARE NOT TO □E □SE□ □OR
□ONSTR□CTION□I□ING RE□OR□ATION□
□ON□EYAN□E SA□ES □OR AS T□E □ASIS
□OR T□E ISS□AN□E O□ A PERMIT.



Louisiana Coastal Protection
and Restoration Authority

CHIEF - RESTORATION ENGINEERING DIVISION

ENGINEER MANAGER

PROJECT ENGINEER

LICENSURE CLASSIFICATION REQUIREMENTS

MAJOR CATEGORY: HEAVY CONSTRUCTION
SUB CLASSIFICATION: DREDGING

REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYALND, E.I.	APPROVED BY: JASON LANCLOS, P.E.	TITLE SHEET
							LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION
							STATE PROJECT NUMBER: TE-72
							FEDERAL PROJECT NUMBER: TE-72

DATE: APRIL 2012

SHEET 1 OF 53

GENERAL NOTES

1. ALL ELEVATIONS ARE GIVEN IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) U.S. SURVEY FEET. ALL HORIZONTAL COORDINATES ARE GIVEN IN THE NORTH AMERICAN DATUM OF 1983 (NAD 83, LOUISIANA STATE PLANE SOUTH ZONE U.S. FEET). ALL MARSH CREATION AREA ELEVATIONS ARE BASED ON LOUISIANA DEPARTMENT OF NATURAL RESOURCES (LDNR) SECONDARY MONUMENT TE-34-SM-04. SEE APPENDIX F OF THE SPECIFICATIONS FOR SURVEY MONUMENT DATA SHEETS.

SECONDARY SURVEY MONUMENT	ELEVATION	NORTHING	EASTING
TE-34-SM-04	2.99'	313,874.12	3,389,307.21

2. FILL AREA ELEVATIONS SHOWN ON THE PLANS ARE BASED ON THE SURVEYS PERFORMED IN FEBRUARY 2010 BY PYBURN AND ODOM, INC. FOR THE CPRA. PIPELINE CORRIDOR ELEVATIONS SHOWN ON THE PLANS ARE BASED ON SURVEYS PERFORMED IN FEBRUARY 2010 BY PYBURN AND ODOM, INC.
3. THE CONTRACTOR SHALL FOLLOW THE SPECIFIED PIPELINE CORRIDOR AND SHALL NOT, AT ANY TIME, TREAD ON EXISTING MARSH OR VEGETATED WETLANDS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NAVIGATING WITHIN THE LIMITS OF THE PROJECT PLAN AREA AND SHALL NOTIFY LANDOWNERS ACCORDING TO THE LAND RIGHTS MEMORANDUM SHOWN IN APPENDIX C. THE ENGINEER OR HIS REPRESENTATIVE SHALL MONITOR THE LOCATION DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING PIPELINE AND UTILITY OPERATORS AT LEAST 72 HOURS IN ADVANCE OF THE WORK. PIPELINES IN OPEN WATER SHALL BE MARKED WITH BUOYS BY THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN BUOYS DURING CONSTRUCTION AND HAVE ADEQUATE NAVIGATIONAL EQUIPMENT ON THE DREDGE TO AVOID DREDGING IN RESTRICTED AREAS. THE CONTRACTOR SHALL NOT ANCHOR OR EXCAVATE WITHIN 500 FEET OF ANY PIPELINE IN THE MISSISSIPPI RIVER. THE FOLLOWING IS A LIST OF PIPELINE OPERATORS KNOWN TO HAVE PIPELINES IN THE VICINITY. CALL LOUISIANA ONE CALL AT 1-800-272-3020 5 DAYS PRIOR TO EXCAVATION TO LOCATE ANY OTHER PIPELINES OR UTILITIES.

TEXAS GAS TRANSMISSION LINE, LLC.
CONTACT: ????
PHONE: (985) 850-1253

TENNESSEE GAS PIPELINE
CONTACT: ?????
PHONE: (504) 392-4177

6. PLANS AND SPECIFICATIONS ARE COMPLEMENTARY; WHAT IS REQUIRED BY ONE IS BINDING AS IF REQUIRED BY ALL. CLARIFICATIONS AND INTERPRETATIONS OF, OR NOTIFICATIONS OF MINOR VARIATIONS AND DEVIATIONS IN THE CONTRACT DOCUMENTS, WILL BE ISSUED BY THE ENGINEER.
7. ANY DAMAGE TO EXISTING U.S. COAST GUARD NAVIGATION AIDS OR PRIVATE NAVIGATION AIDS SHALL BE REPAIRED BY THE CONTRACTOR TO U.S. COAST GUARD STANDARDS AT THE EXPENSE OF THE CONTRACTOR.
8. THE MARSH CREATION AREAS AND BORROW AREAS MAY BE REVISED BY THE ENGINEER AT THE TIME OF CONSTRUCTION TO REFLECT CHANGES IN FIELD CONDITIONS.
9. ESTIMATED MARSH CREATION QUANTITIES SHOWN ARE FOR BIDDING PURPOSES ONLY AND WERE CALCULATED ACCORDING TO CONDITIONS SURVEYED IN MAY 2011. QUANTITIES WERE CALCULATED USING THE AVERAGE END AREA METHOD OF SECTIONS. THE OWNER RESERVES THE RIGHT TO ADJUST QUANTITIES OF ANY BID ITEM HIGHER OR LOWER WITHOUT ADJUSTMENT OF THE UNIT PRICE.
10. DATA FROM USGS GAGE #0738165067 AND NOAA STATION #8761724 WAS USED TO CALCULATE THE MHW AND MLW. ELEVATIONS ARE REFERENCED TO NAVD 88, US FEET. MHW = +1.44' AND MLW = +0.27'.
11. THE CONTRACTOR SHALL PERFORM A MAGNETOMETER SURVEY OF THE BORROW AREA AND THE FILL AREAS AS WELL AS ANY OTHER EXCAVATION LOCATIONS PRIOR TO EXCAVATION. DRAWINGS SHOWING THE TRACK LINES, ANY MAGNETOMETER HITS, COORDINATES, AMPLITUDE, SIGNATURE TYPE, AND SIGNATURE WIDTH OF ALL MAGNETOMETER HITS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO EXCAVATION AS PER TS-2, CONSTRUCTION SURVEYS OF THE SPECIFICATIONS.

SUMMARY OF ESTIMATED QUANTITIES

BASE BID

ITEM No.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
1	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	1
2	CONSTRUCTION SURVEYS	LUMP SUM	1
3	EARTHEN CONTAINMENT DIKES	LINEAR FOOT	50,664
4	BANK STABILIZATION DIKE	LINEAR FOOT	3,929
5	EARTHEN TERRACES	LINEAR FOOT	30,500
6	HYDRAULIC DREDGING	CUBIC YARD	3,300,341
7	ACCESS CHANNEL	LUMP SUM	1
8	WARNING SIGNS	LUMP SUM	32
9	WATER CONTROL STRUCTURES	LUMP SUM	1

* THE LINEAR FOOTAGE FOR THE EARTHEN CONTAINMENT DIKES AND THE EARTHEN RIDGE WAS ESTIMATED USING AERIAL PHOTOGRAPHY, FIELD SURVEYS, AND AUTOCAD. THE OWNER RESERVES THE RIGHT TO REQUEST ADDITIONAL DIKES BE BUILT FOR CONSTRUCTION AT THE CONTRACTOR'S BID UNIT PRICE PER LINEAR FOOT.

* HYDRAULIC DREDGING QUANTITIES FOR MARSH CREATION ARE BASED ON CUT VOLUME.

COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

DRAWN BY: SHANE FAUST DESIGNED BY: TRAVIS BYLAND, E.I.

LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION

STATE PROJECT NUMBER: TE-72

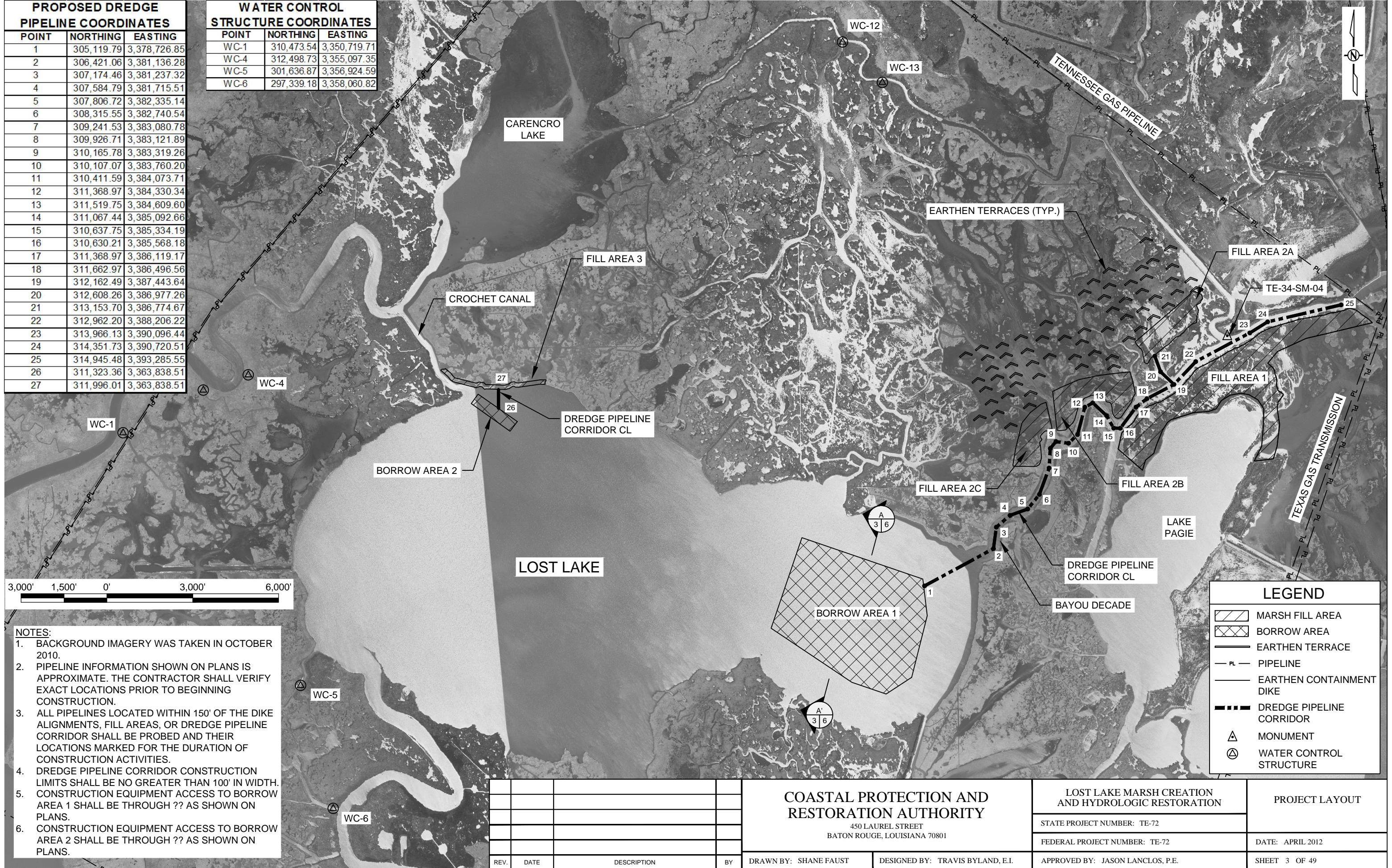
FEDERAL PROJECT NUMBER: TE-72

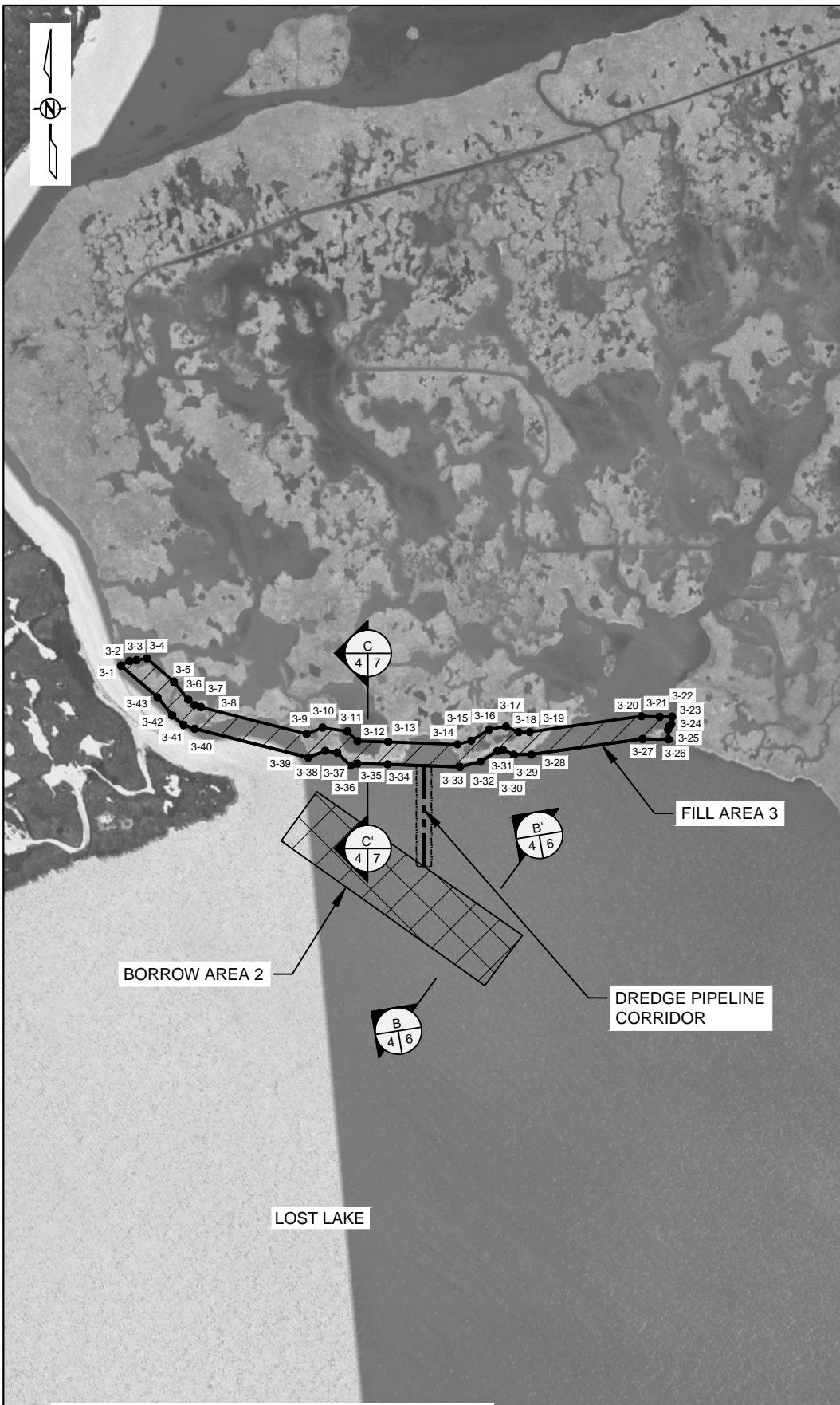
GENERAL NOTES

DATE: JANUARY 2012

APPROVED BY: JASON LANCLOS, P.E.

SHEET 2 OF 53





NOTE:
SEE SHEET 5 FOR MARSH CREATION COORDINATES.

1,000' 500' 0' 1,000' 2,000'



COASTAL PROTECTION AND RESTORATION AUTHORITY

450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

LOST LAKE MARSH CREATION
AND HYDROLOGIC RESTORATION

STATE PROJECT NUMBER: TE-72

FEDERAL PROJECT NUMBER: TE-72

MARSH CREATION
LAYOUT

DATE: APRIL 2012

REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.	SHEET 4 OF 53
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MARSH CREATION AREA 1 COORDINATES		
POINT	NORTHING	EASTING
1	309,166.79	3,386,344.21
2	309,903.67	3,385,490.59
3	310,486.64	3,385,639.50
4	310,874.95	3,386,047.81
5	311,145.60	3,386,226.90
6	311,429.58	3,386,585.07
7	311,554.56	3,386,970.68
8	311,883.78	3,387,504.89
9	312,450.09	3,388,032.04
10	312,691.01	3,388,215.96
11	313,441.42	3,389,560.05
12	313,969.52	3,390,462.59
13	314,444.10	3,391,815.66
14	314,567.98	3,392,544.13
15	314,691.94	3,393,128.23
16	314,819.12	3,393,647.41
17	314,755.82	3,393,825.33
18	314,453.08	3,394,237.70
19	314,325.28	3,394,377.40
20	313,773.77	3,392,063.59
21	313,314.17	3,391,062.01
22	312,908.31	3,390,724.56
23	312,657.87	3,390,960.06
24	312,325.21	3,391,034.33
25	311,977.48	3,391,070.19

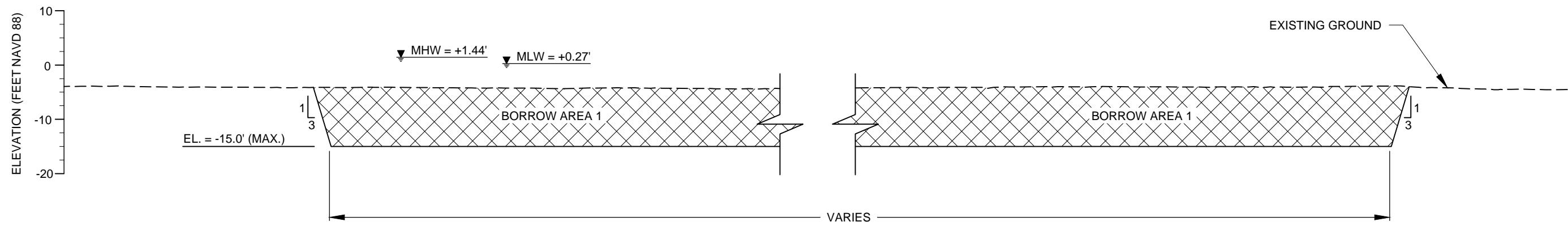
MARSH CREATION AREA 1 COORDINATES CONT'D.		
POINT	NORTHING	EASTING
26	311,830.72	3,391,257.34
27	311,757.91	3,391,249.36
28	311,532.92	3,391,077.76
29	311,344.05	3,391,052.51
30	310,754.42	3,391,136.20
31	309,997.56	3,391,046.48
32	309,559.97	3,390,917.30
33	309,515.70	3,390,517.07
34	309,451.24	3,390,283.35
35	309,490.04	3,390,251.83
36	309,707.34	3,390,361.39
37	310,758.79	3,390,481.92
38	311,370.12	3,390,544.15
39	311,622.31	3,390,377.40
40	311,807.29	3,390,060.72
41	311,850.89	3,389,769.83
42	311,788.80	3,389,407.96
43	311,598.82	3,389,099.83
44	311,309.90	3,388,915.25
45	311,216.48	3,388,650.15
46	311,182.14	3,388,135.99
47	310,929.66	3,387,341.07
48	310,834.27	3,387,214.77
49	310,034.54	3,386,828.57
50	309,758.12	3,386,741.34
51	309,512.42	3,386,446.31

MARSH CREATION AREA 2A COORDINATES		
POINT	NORTHING	EASTING
A1	312,941.33	3,386,408.94
A2	313,160.63	3,386,370.39
A3	313,298.00	3,386,354.98
A4	313,388.13	3,386,305.04
A5	313,440.23	3,386,242.41
A6	313,522.95	3,386,163.72
A7	313,659.33	3,386,096.22
A8	314,848.84	3,387,483.24
A9	315,315.53	3,388,007.11
A10	315,431.36	3,388,088.81
A11	315,349.80	3,388,394.72
A12	315,281.00	3,388,435.30
A13	315,157.14	3,388,442.66
A14	315,023.00	3,388,362.10
A15	314,930.47	3,388,231.80
A16	314,756.39	3,388,304.83
A17	314,317.98	3,388,323.42
A18	314,319.98	3,388,221.55
A19	314,310.03	3,388,166.35
A20	314,238.04	3,388,030.04
A21	314,169.99	3,387,947.27
A22	314,064.52	3,387,841.94
A23	313,996.06	3,387,789.06
A24	313,918.78	3,387,692.00
A25	3,138,764.66	3,387,664.66
A26	313,823.51	3,387,533.34
A27	313,664.13	3,387,347.02
A28	313,618.92	3,387,318.07
A29	313,540.86	3,387,224.77
A30	313,502.04	3,387,146.09
A31	313,083.90	3,386,638.40
A32	313,007.68	3,386,586.01
A33	312,940.91	3,386,559.98
A34	312,896.20	3,386,529.83
A35	312,886.16	3,386,503.64

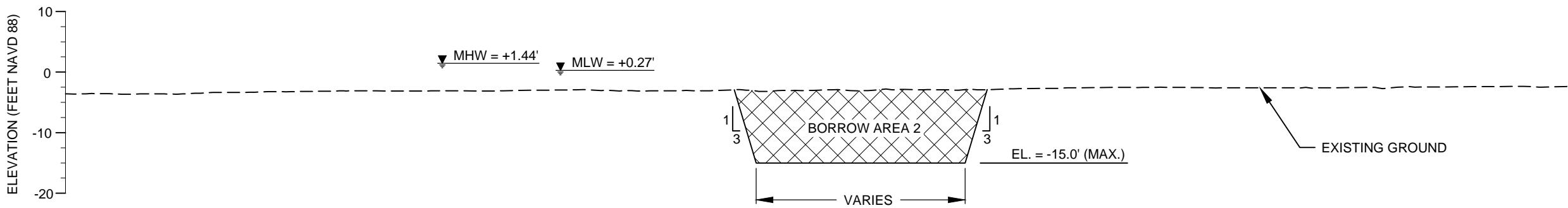
MARSH CREATION AREA 2B COORDINATES		
POINT	NORTHING	EASTING
B1	310,570.18	3,383,355.04
B2	311,917.05	3,383,205.14
B3	312,335.05	3,384,122.40
B4	312,473.35	3,384,789.39
B5	312,534.86	3,385,227.46
B6	312,603.42	3,385,906.57
B7	312,336.59	3,385,991.32
B8	312,047.56	3,386,049.72
B9	311,845.23	3,386,092.04
B10	311,712.99	3,386,013.71
B11	311,524.58	3,385,955.48
B12	311,002.00	3,385,588.67
B13	310,977.64	3,385,470.26
B14	311,013.46	3,385,392.64
B15	311,191.02	3,385,298.81
B16	311,552.23	3,385,108.63
B17	311,736.81	3,384,948.05
B18	311,789.67	3,384,592.11
B19	311,677.95	3,384,307.55
B20	311,372.24	3,384,097.41
B21	310,936.65	3,383,975.46
B22	310,824.37	3,383,915.96
B23	310,572.86	3,383,655.43

MARSH CREATION AREA 2C COORDINATES		
POINT	NORTHING	EASTING
C1	309,310.73	3,381,817.99
C2	309,913.98	3,381,909.50
C3	310,819.38	3,382,135.19
C4	311,179.55	3,382,422.72
C5	311,473.03	3,382,795.24
C6	311,540.10	3,382,972.18
C7	310,623.98	3,383,187.43
C8	310,542.75	3,382,964.01
C9	310,247.83	3,382,826.13
C10	309,588.29	3,382,811.55
C11	309,302.64	3,382,632.14

MARSH CREATION AREA 3 COORDINATES		
POINT	NORTHING	EASTING
1	3,361,817.42	312,663.13
2	3,361,873.99	312,694.78
3	3,361,922.15	312,699.22
4	3,361,990.40	312,711.86
5	3,362,170.80	312,555.91
6	3,362,267.26	312,435.78
7	3,362,309.98	312,400.18
8	3,362,351.93	312,386.20
9	3,363,057.01	312,207.56
10	3,363,162.70	312,249.87
11	3,363,329.28	312,223.91
12	3,363,396.09	312,159.98
13	3,363,601.15	312,154.81



TYPICAL BORROW SECTION
A-A'
TRANSECT T-28
6 | 3



TYPICAL BORROW SECTION
B-B'
TRANSECT T-20
6 | 4

HORIZONTAL GRAPHIC SCALE
200' 100' 0 200' 400'
20' 10' 0 20' 40'
VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY
		DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.
		APPROVED BY: JASON LANCLOS, P.E.	
			SHEET 6 OF 53

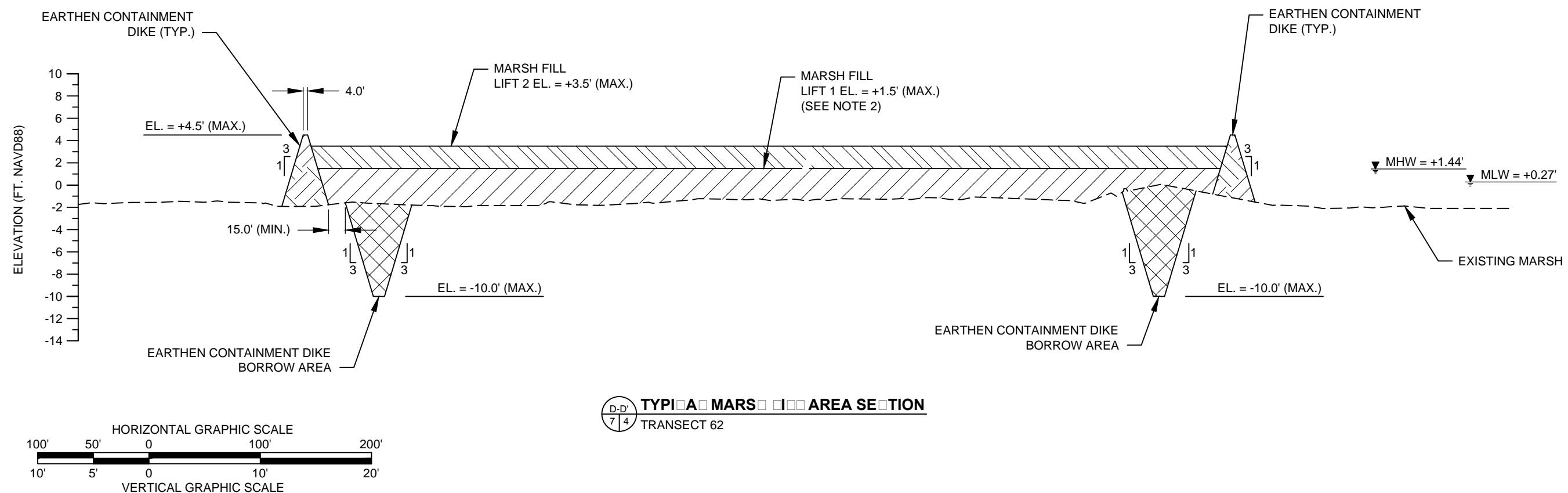
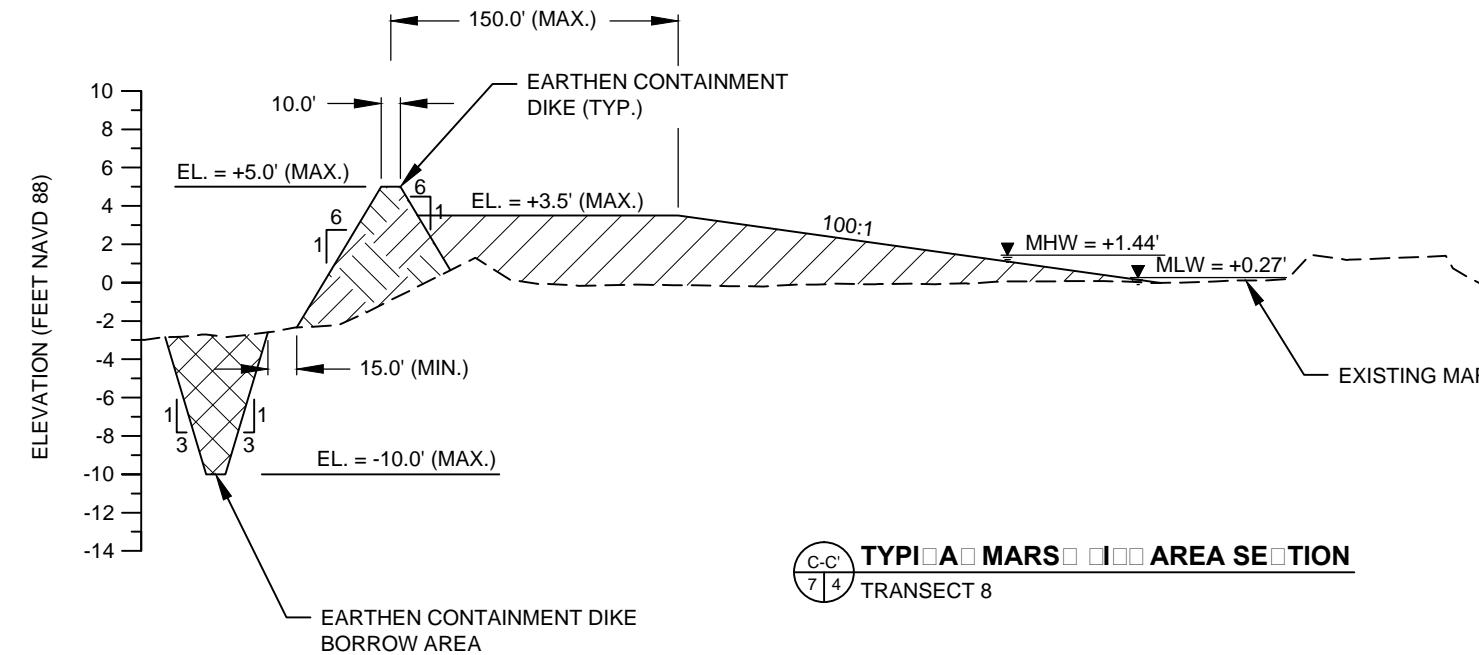
COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION
STATE PROJECT NUMBER: TE-72

TYPICAL BORROW SECTIONS

FEDERAL PROJECT NUMBER: TE-72

DATE: APRIL 2012



NOTES:

- A TWO LIFT SYSTEM IS REQUIRED TO MEET MARSH FILL DESIGN HEIGHT.
- THE ENGINEER HAS ESTIMATED THAT AN APPROXIMATE WAITING PERIOD OF 85 DAYS FROM THE COMPLETION OF MARSH FILL LIFT 1 SHOULD OCCUR BEFORE CONSTRUCTION OF MARSH FILL LIFT 2 CAN BEGIN.
- THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO BE INCLUDED IN THE WORK PLAN FOR APPROVAL.
- THE CONTRACTOR SHALL USE IN-SITU MATERIAL AS SHOWN ON THE PLANS TO CONSTRUCT THE EARTHEN CONTAINMENT DIKE FOR FILL AREAS.

REV.	DATE	DESCRIPTION	BY

COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

DRAWN BY: SHANE FAUST

DESIGNED BY: TRAVIS BYLAND, E.I.

LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION

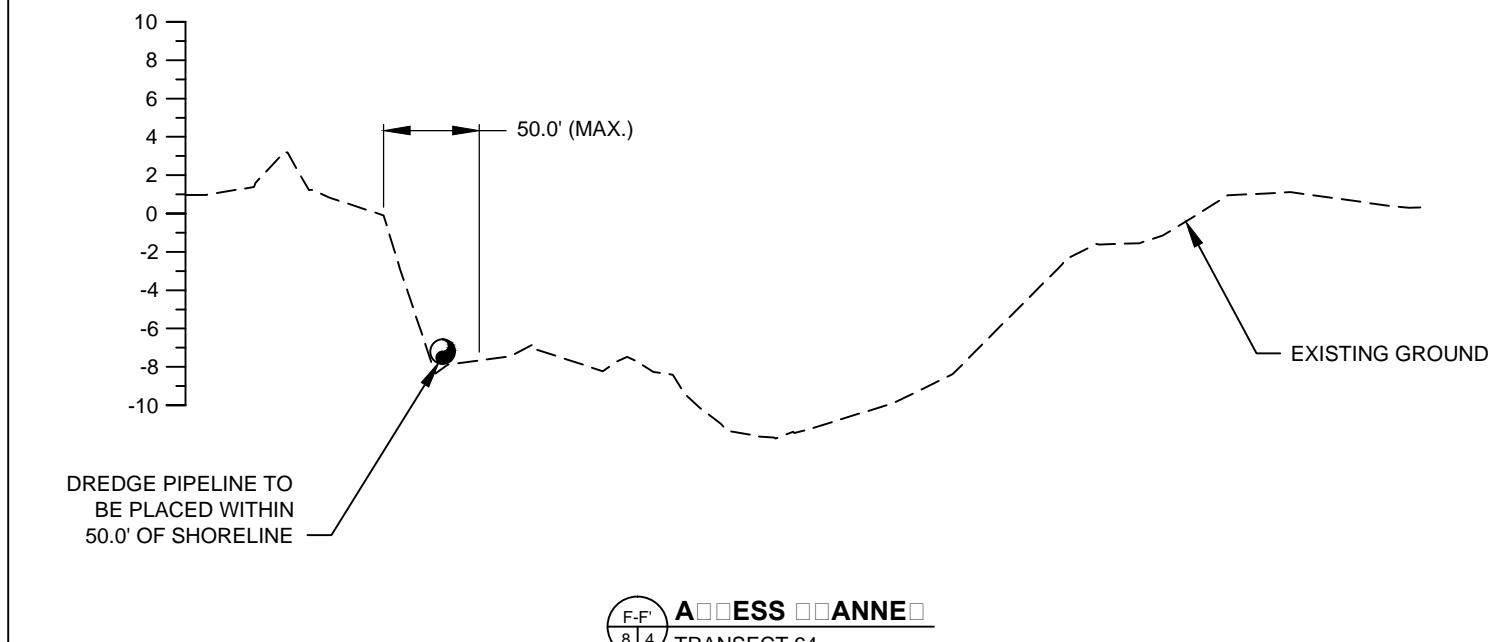
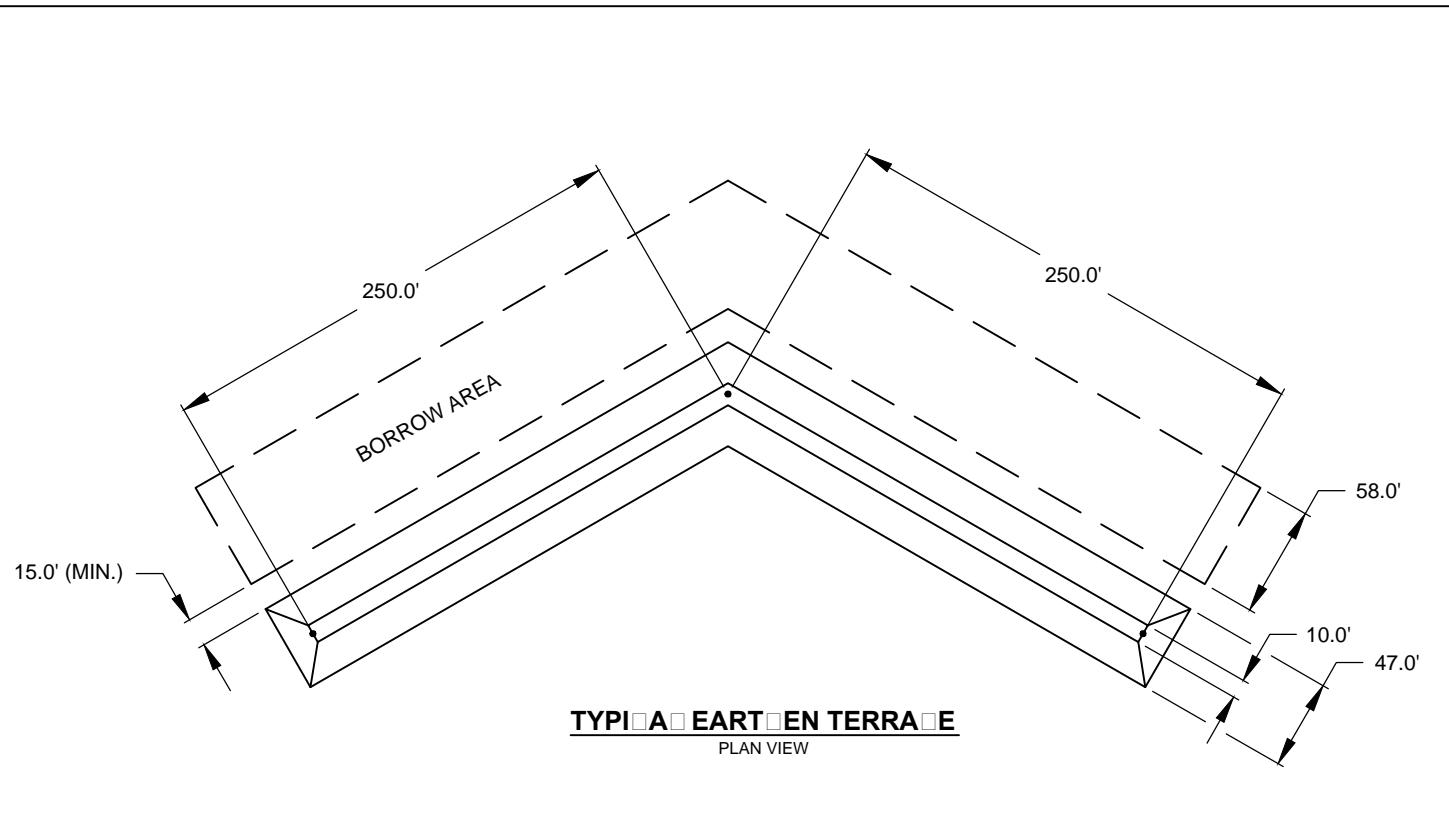
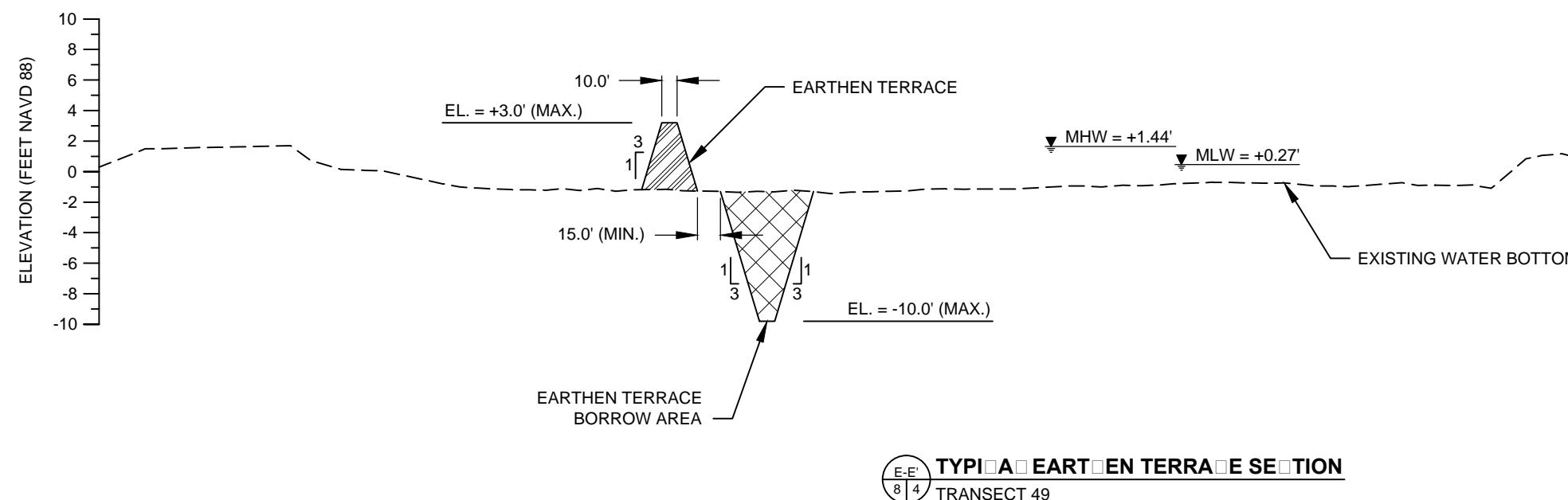
STATE PROJECT NUMBER: TE-72

FEDERAL PROJECT NUMBER: TE-72

TYPICAL FILL SECTIONS

DATE: APRIL 2012

SHEET 7 OF 53



HORIZONTAL GRAPHIC SCALE
100' 50' 0 100' 200'
10' 5' 0 10' 20'
VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY
		DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.

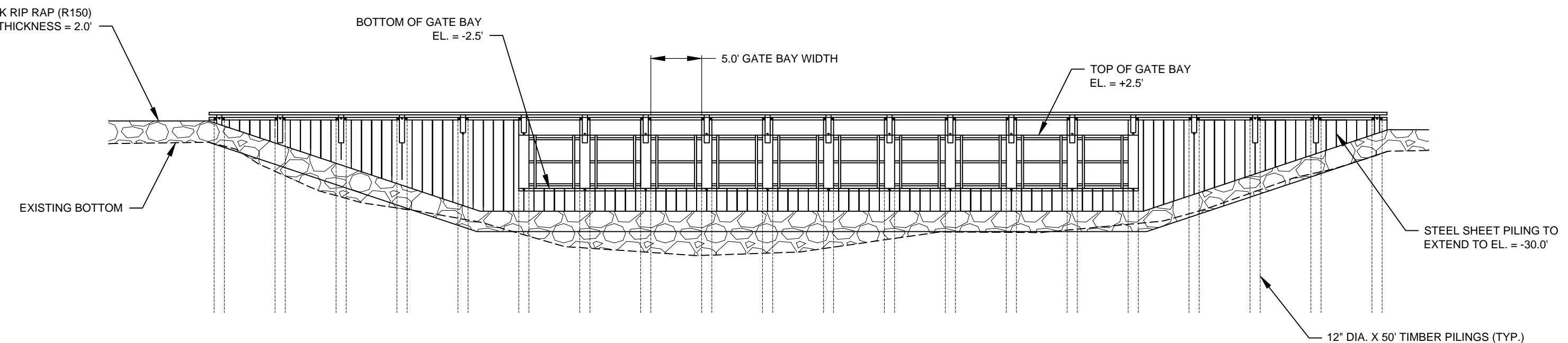
COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION
STATE PROJECT NUMBER: TE-72

FEDERAL PROJECT NUMBER: TE-72

TYPICAL EARTHEN TERRACE AND ACCESS CHANNEL
DATE: APRIL 2012

SHEET 8 OF 53

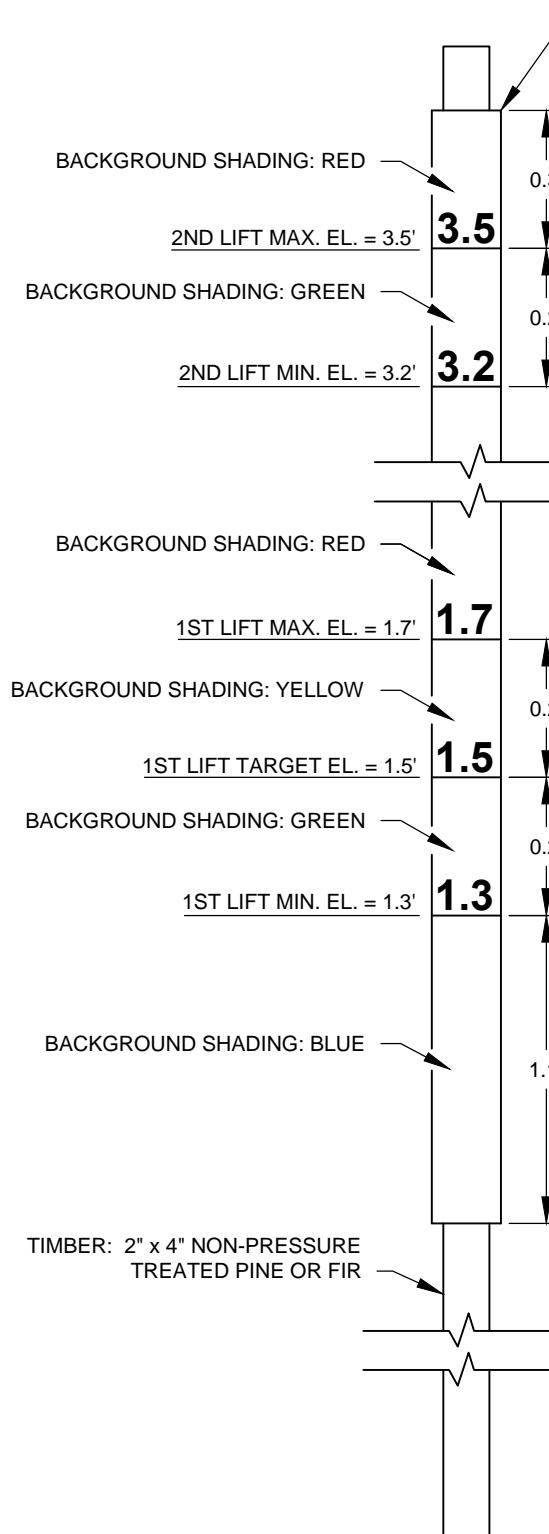


TYPE A WEIR STRUCTURE

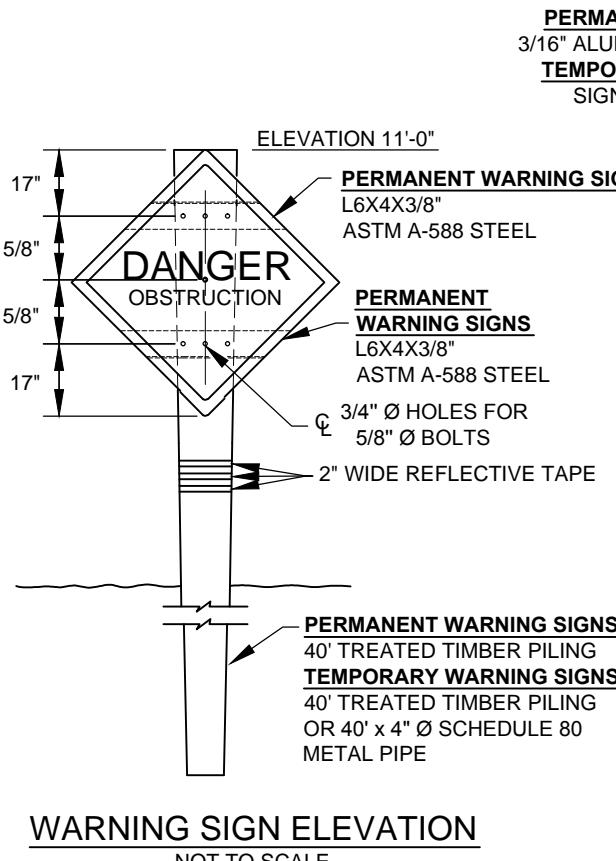
NTS

NOTE:
WEIR STRUCTURES WILL VARY AT EACH LOCATION. SEE SHEETS
50-53 FOR ACTUAL WEIR SECTIONS.

				COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION		WEIR STRUCTURE	
REV.	DATE	DESCRIPTION	BY		STATE PROJECT NUMBER: TE-72			
					FEDERAL PROJECT NUMBER: TE-72			
					APPROVED BY: JASON LANCLOS, P.E.			
					SHEET 9 OF 53			



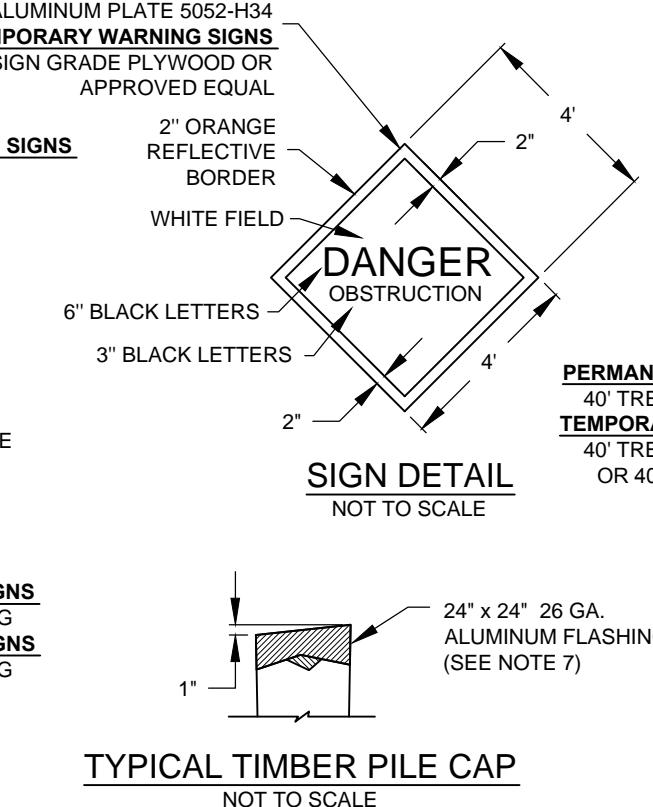
GRADE STAKE
NOT TO SCALE



WARNING SIGN ELEVATION

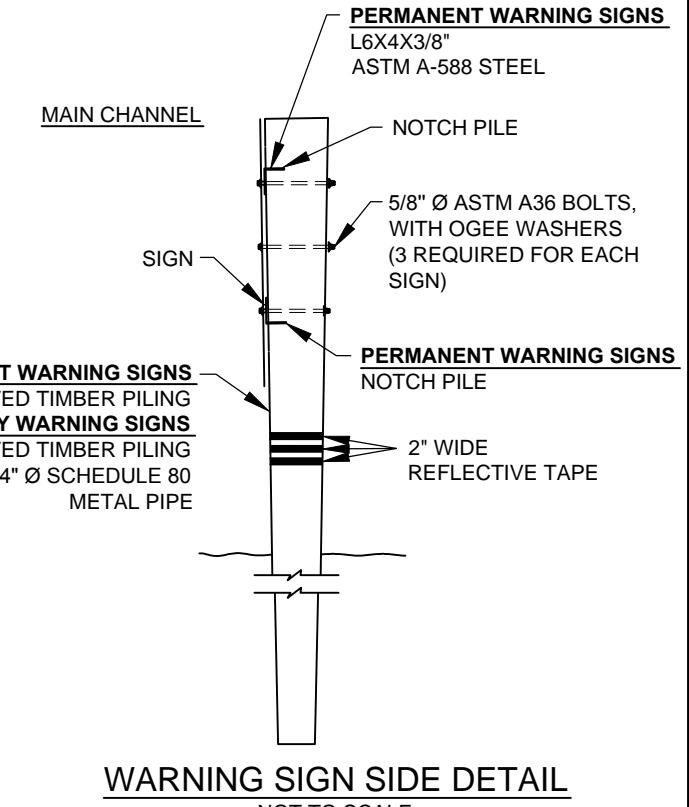
NOTES

1. THE 2" BORDER ON THE WARNING SIGN WILL BE A REFLECTIVE MATERIAL OF ORANGE COLOR. THE LETTERING FIELD WILL BE A REFLECTIVE MATERIAL OF WHITE COLOR. THE LETTERING FOR THE WARNING SIGNS WILL BE BLACK. ALL SIGNS MUST MEET U.S. COAST GUARD STANDARDS; IN ACCORDANCE WITH 33 CFR 330.4 (a) (1) WHICH CAN BE DOWNLOADED AT http://www.access.gpo.gov/nara/cfr/waisidx_02/33cfr330_02.html
 2. NEOPRENE WASHERS SHALL BE PLACED BETWEEN THE SIGN AND THE PILING AT ALL POINTS OF CONTACT.
 3. HARDWARE FOR TIMBER CONNECTIONS SHALL NOT BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH SECTION 811.5 OF THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AS PUBLISHED BY THE LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT, LATEST EDITION.
 4. TIMBER PILES SHALL CONFORM TO SECTIONS 804 AND 1014 OF THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AS PUBLISHED BY THE LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT, LATEST EDITION. PILES SHALL BE TREATED WITH A CREOSOTE SOLUTION CONFORMING TO AWPA P2 TO A MINIMUM RETENTION OF 20 PCF AND CAPPED ACCORDING TO LA DOTD SPECIFICATION 812.06.
 5. TIMBER PILINGS SHALL BE 40' IN LENGTH WITH A NORMAL 12" DIAMETER BUTT AND 7" MINIMUM DIAMETER AT THE TIP.
 6. THE TOP OF THE PILES SHALL BE COATED WITH COAL TAR EPOXY PAINT PRIOR TO PLACING CAP. THE PILE CAP SHALL BE ATTACHED USING ALUMINUM OR STAINLESS STEEL NAILS.
 7. SEE SPECIFICATION TS-4 "GRADE STAKES" FOR GRADE STAKE PLACEMENT.
 8. THE SIGNS SHALL HAVE THE DIMENSIONS, NUMBERING , AND SHADING AS SHOWN.
 9. THE GAUGE SIGN SHALL BE CONSTRUCTED OF 0.120" THICK FIBERGLASS REINFORCED PLASTIC (FRP) WHICH HAS BEEN UV STABILIZED FOR OUTDOOR WEATHER ABILITY. THE FRP MATERIAL SHALL BE WHITE OR GRAY IN COLOR AND BE TOTALLY DIELECTRIC AND NON-CONDUCTIVE.
 10. THE MARSH FILL GRADE STAKES SHALL HAVE ELEVATION DELINEATIONS FOR MINIMUM, TARGET, AND MAXIMUM ELEVATIONS AS STATED IN SECTION TS-4.2.
 11. THIS WORK CONSISTS OF FURNISHING, ASSEMBLING, INSTALLING, AND REMOVING THE REQUIRED MATERIAL FOR GRADE STAKES IN ACCORDANCE WITH SPECIFICATION TS-4 "GRADE STAKES". THE GRADE STAKES SHALL BE USED BY THE CONTRACTOR TO MONITOR ELEVATIONS OF THE MARSH FILL WITHIN THE FILL AREA. IF AREAS ARE DEEMED INACCESSIBLE BY THE ENGINEER FOR PAYMENT SURVEYS AFTER PLACEMENT OF THE FILL, THE CONTRACTOR SHALL USE THE GRADE STAKES TO DETERMINE PAYMENT ELEVATIONS AND VOLUMES. IN SUCH CASE THE CONTRACTOR SHALL DETERMINE MARSH ELEVATION FROM VISUAL INSPECTIONS OF THE GRADE STAKES UNDER DIRECT SUPERVISION OF THE INSPECTOR.



TYPICAL TIMBER PILE CAP

NOT TO SCALE



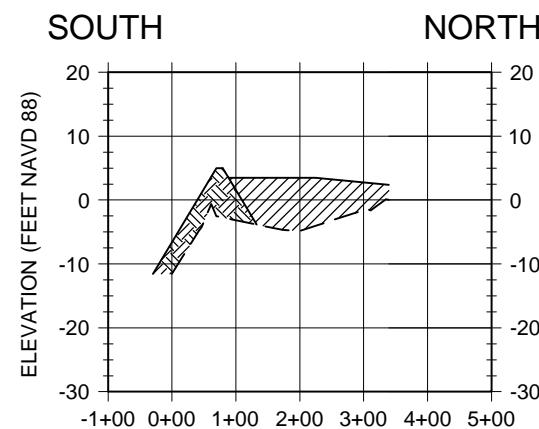
WARNING SIGN SIDE DETAIL

			COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION	WARNING SIGN AND GRADE STAKE DETAILS
				STATE PROJECT NUMBER: TE-72	
				FEDERAL PROJECT NUMBER: TE-72	DATE: APRIL 2012
DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.
					SHEET 10 OF 53

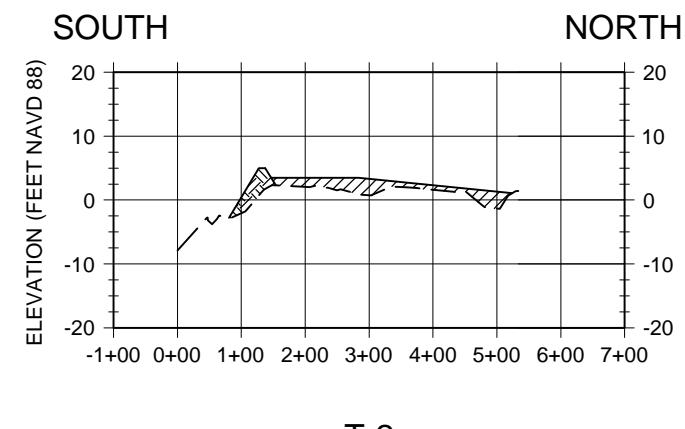


TRANSECT COORDINATES					
TRANSECT	BEGINNING		ENDING		LENGTH
	NORTHING	EASTING	NORTHING	EASTING	
T-1	312,819.03	3,362,041.02	312,577.07	3,361,803.19	339.27
T-2	312,823.35	3,362,239.94	312,378.33	3,361,945.89	533.94
T-3	312,781.16	3,362,361.69	312,197.88	3,362,175.75	612.19
T-4	312,737.95	3,362,467.23	312,129.88	3,362,467.23	608.06
T-5	312,597.00	3,362,717.23	311,989.30	3,362,717.23	467.11
T-6	312,597.00	3,362,967.23	311,989.30	3,362,967.23	607.69
T-7	312,598.11	3,363,217.23	311,879.55	3,363,214.03	718.56
T-8	312,597.00	3,363,467.23	311,878.44	3,363,464.03	718.56
T-9	312,595.98	3,363,716.56	311,870.52	3,363,717.23	726.48
T-10	312,597.00	3,363,967.23	311,870.52	3,363,967.23	726.48
T-11	312,597.00	3,364,217.23	311,870.52	3,364,217.23	726.48
T-12	312,597.00	3,364,467.23	311,989.30	3,364,467.23	607.69
T-13	312,597.00	3,364,717.23	311,989.30	3,364,717.23	607.69
T-14	312,597.00	3,364,967.23	311,989.30	3,364,967.23	607.69
T-15	312,595.98	3,365,216.56	311,989.30	3,365,217.23	607.69
T-16	312,597.00	3,365,467.23	311,989.30	3,365,467.23	607.69
T-17	310,672.31	3,362,139.87	311,975.01	3,363,079.58	1,605.04
T-18	310,382.70	3,362,547.48	311,784.20	3,363,558.46	1,726.86
T-19	310,093.10	3,362,955.08	311,782.47	3,364,173.80	2,083.08
T-20	309,803.49	3,363,362.68	311,832.81	3,364,826.64	2,502.25
T-21	309,513.89	3,363,770.29	311,717.95	3,365,360.31	2,717.73
T-22	308,213.06	3,365,798.51	310,004.08	3,366,853.21	2,078.50
T-23	306,690.75	3,368,383.57	308,481.77	3,369,438.28	2,078.50
T-24	305,168.44	3,370,968.64	306,959.46	3,372,023.35	2,078.50
T-25	303,299.09	3,372,711.59	307,496.18	3,374,153.45	4,437.85
T-26	302,320.09	3,373,432.63	307,171.48	3,375,098.52	5,129.46
T-27	301,692.23	3,374,274.30	306,846.58	3,376,044.27	5,449.81
T-28	301,284.21	3,375,191.49	306,521.27	3,376,990.02	5,537.69
T-29	300,788.14	3,376,078.44	306,196.78	3,377,935.77	5,718.68
T-30	300,489.23	3,377,033.11	305,871.88	3,378,881.51	5,691.20
T-31	300,810.09	3,378,199.96	304,358.21	3,379,418.88	3,751.65
T-32	305,841.14	3,379,291.19	304,662.76	3,379,665.67	1,236.44
T-33	306,054.57	3,379,789.55	305,047.57	3,380,288.40	1,123.78
T-34	306,181.67	3,380,171.02	305,604.85	3,380,513.37	670.76
T-35	306,191.17	3,380,597.65	308,447.99	3,382,738.26	3,382.06
T-36	307,981.63	3,375,892.59	307,534.27	3,376,176.46	529.82
T-37	308,764.41	3,375,988.05	307,659.99	3,376,688.85	1,307.99
T-38	308,991.49	3,376,436.12	307,626.74	3,377,302.13	1,616.32
T-39	309,429.55	3,376,750.32	307,518.34	3,377,962.98	2,264.87
T-40	309,581.85	3,377,245.84	306,877.73	3,378,961.75	3,202.59
T-41	309,596.91	3,377,828.45	306,530.07	3,379,774.53	3,632.18
T-42	310,089.12	3,378,108.29	306,463.01	3,380,409.25	4,294.53
T-43	312,184.96	3,377,370.54	306,581.27	3,380,926.37	6,636.65
T-44	312,452.85	3,377,792.72	307,267.53	3,381,083.08	6,141.17

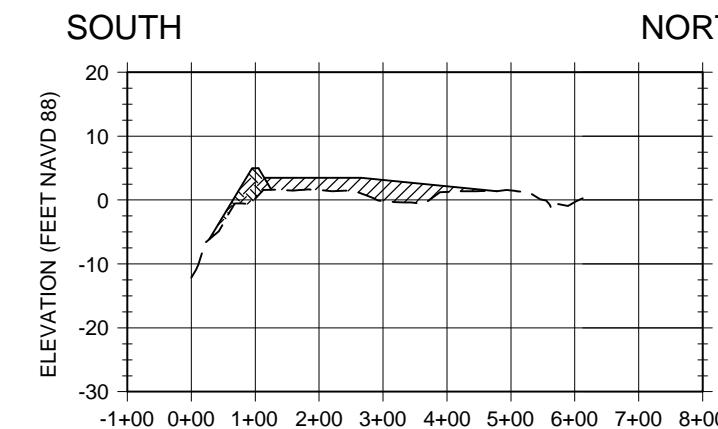
TRANSECT COORDINATES					
TRANSECT	BEGINNING		ENDING		LENGTH
	NORTHING	EASTING	NORTHING	EASTING	
T-45	312,720.74	3,378,214.89	307,607.26	3,381,459.67	6,056.09
T-46	312,988.64	3,378,637.07	307,906.40	3,381,862.01	6,019.08
T-47	313,256.53	3,379,059.25	308,093.18	3,382,335.66	6,116.37
T-48	313,524.42	3,379,481.42	308,569.60	3,382,625.52	5,868.18
T-49	313,792.32	3,379,903.60	308,708.68	3,383,129.44	6,020.74
T-50	314,060.21	3,380,325.78	309,884.49	3,382,970.86	4,942.98
T-51	314,328.10	3,380,747.95	310,490.81	3,383,182.92	4,544.65
T-52	314,596.00	3,381,170.13	310,449.33	3,383,801.41	4,912.27
T-53	314,863.89	3,381,592.31	310,514.80	3,384,352.04	5,150.79
T-54	315,131.78	3,382,014.48	311,460.36	3,384,342.07	4,561.99
T-55	315,399.68	3,382,436.66	311,546.22	3,384,878.52	4,561.99
T-56	315,667.57	3,382,858.84	308,451.73	3,387,437.66	8,545.98
T-57	315,935.46	3,383,281.01	312,358.55	3,385,550.76	4,236.27
T-58	316,203.36	3,383,703.19	313,041.01	3,385,709.87	3,745.29
T-59	313,583.26	3,385,957.95	316,471.25	3,384,125.37	3,420.35
T-60	316,739.14	3,384,547.54	310,155.82	3,388,725.00	7,796.87
T-61	317,007.04	3,384,969.72	313,414.11	3,387,249.62	4,255.23
T-62	317,274.93	3,385,391.90	311,007.86	3,389,368.67	7,422.31
T-63	317,542.82	3,385,814.07	314,127.55	3,387,974.11	4,041.02
T-64	317,810.72	3,386,236.25	309,617.27	3,391,435.42	9,703.80
T-65	318,078.61	3,386,658.43	315,641.20	3,388,220.78	2,895.15
T-66	316,053.13	3,388,593.91	315,236.57	3,388,093.74	957.56
T-67	315,545.17	3,388,947.22	315,137.70	3,388,200.30	850.83
T-68	314,725.59	3,389,343.20	314,765.02	3,387,956.72	1,387.03
T-69	313,565.98	3,386,279.33	313,301.97	3,385,848.59	505.21
T-70	313,352.83	3,386,409.97	313,088.82	3,385,979.24	505.21
T-71	313,139.68	3,386,540.62	312,767.68	3,385,933.69	711.86
T-72	312,708.24	3,386,674.88	312,546.27	3,385,629.06	1,058.28
T-73	312,461.19	3,386,713.14	312,299.22	3,385,667.32	1,058.28
T-74	312,214.13	3,386,751.40	312,052.16	3,385,705.58	1,058.28
T-75	311,967.08	3,386,789.66	311,805.11	3,385,743.84	1,058.28
T-76	311,386.72	3,385,949.35	311,648.05	3,385,634.02	409.54



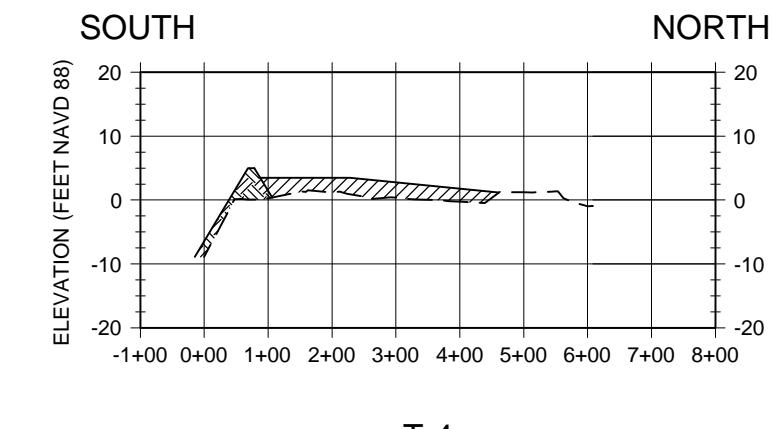
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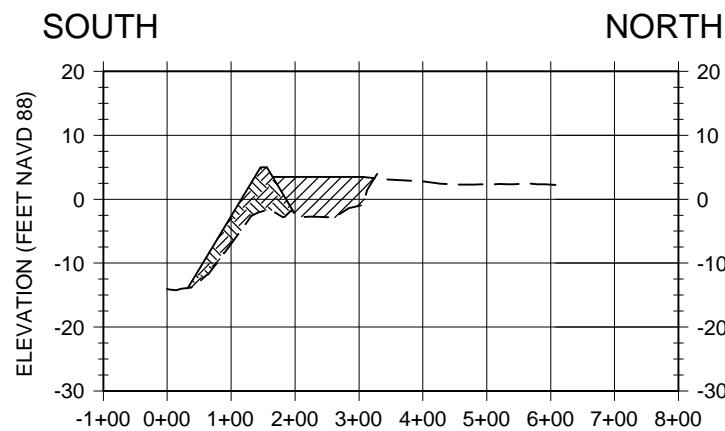
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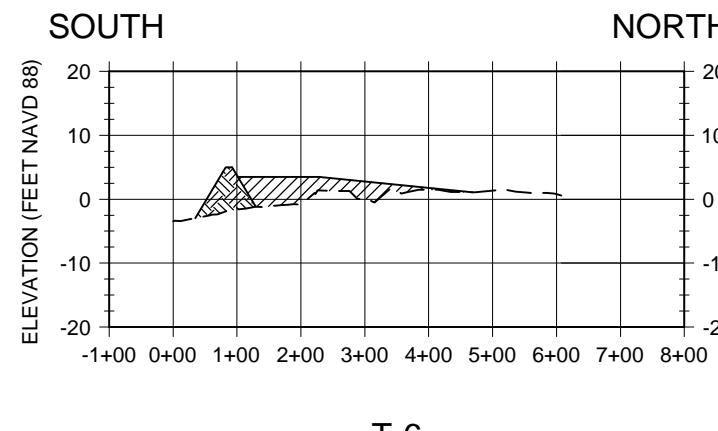
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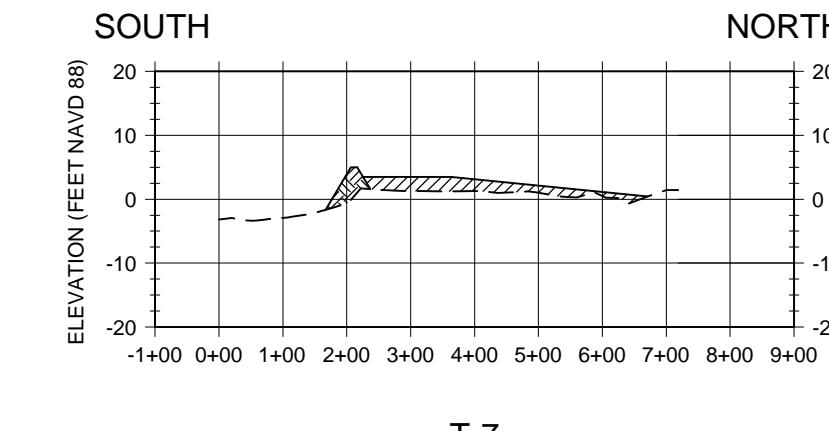
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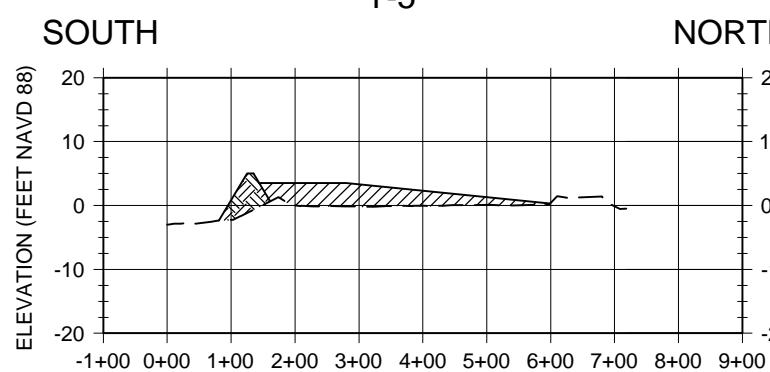
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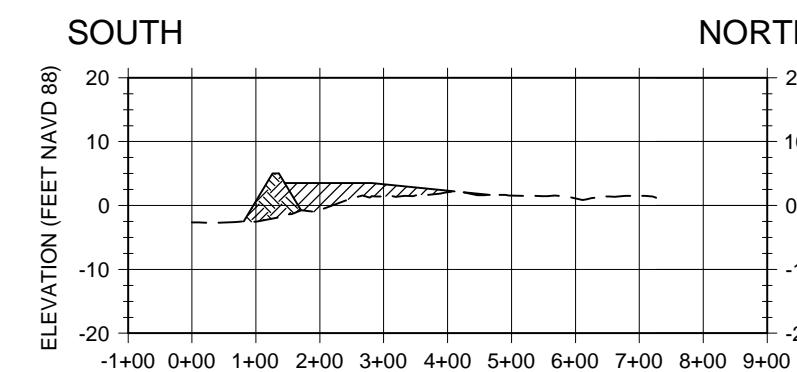
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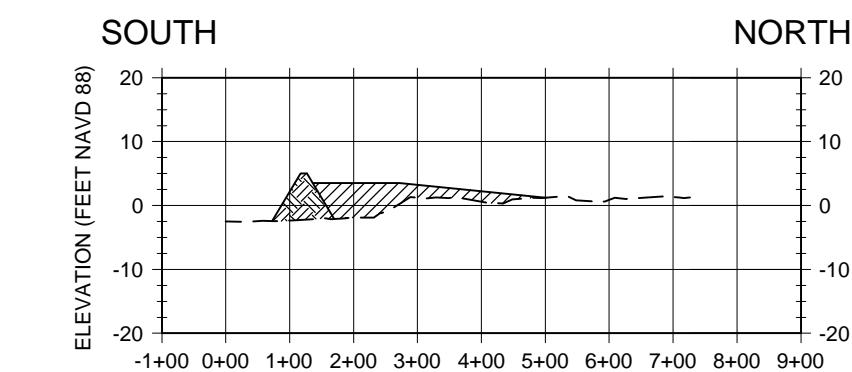
T-7



T-8



T-9



T-10

HORIZONTAL GRAPHIC SCALE
300' 150' 0 300' 600'
30' 15' 0 30' 60'

VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY

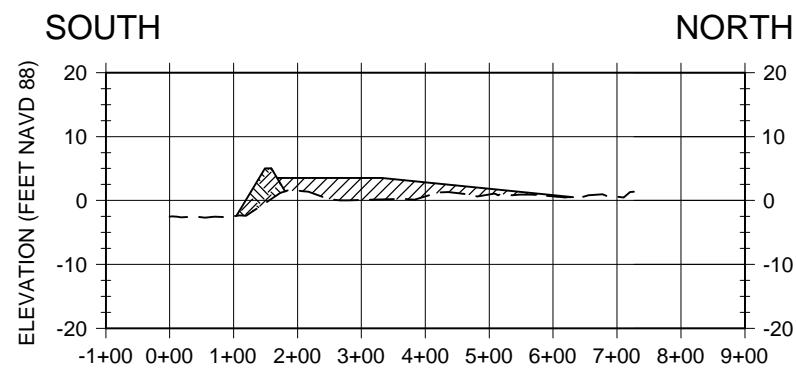
COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET STREET
BATON ROUGE, LOUISIANA 70801

LOST LAKE MARSH CREATION
AND HYDROLOGIC RESTORATION
STATE PROJECT NUMBER: TE-72

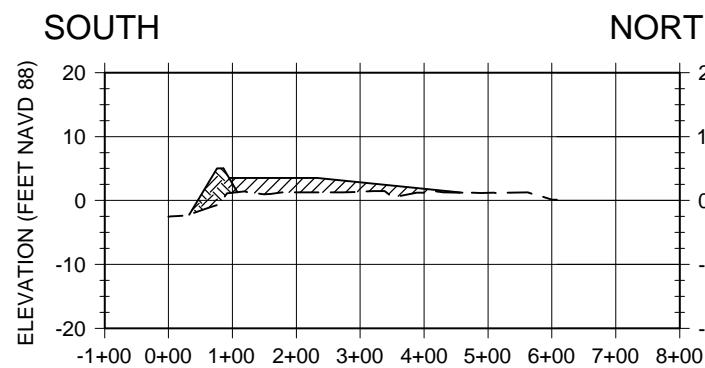
CROSS SECTIONS
FEDERAL PROJECT NUMBER: TE-72

APPROVED BY: JASON LANCLOS, P.E.

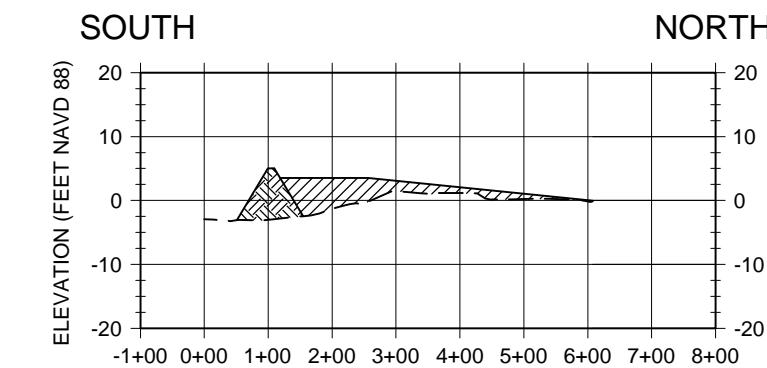
DATE: APRIL 2012
SHEET 13 OF 53



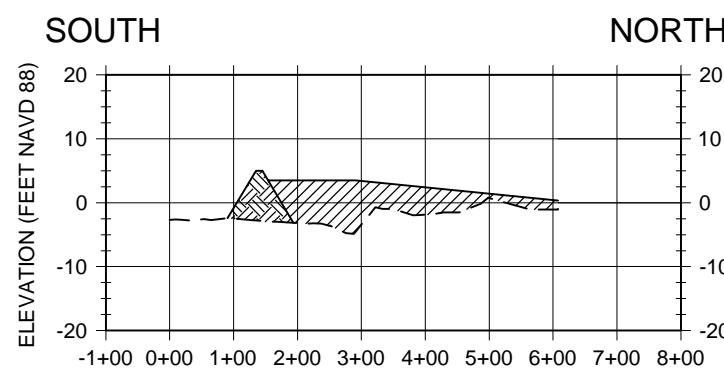
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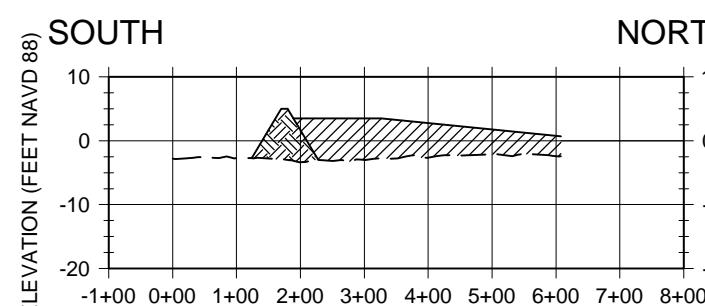
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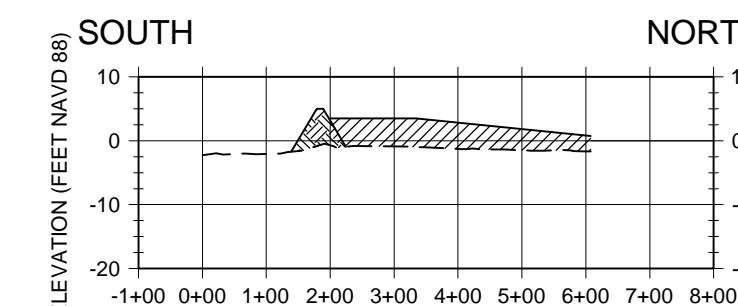
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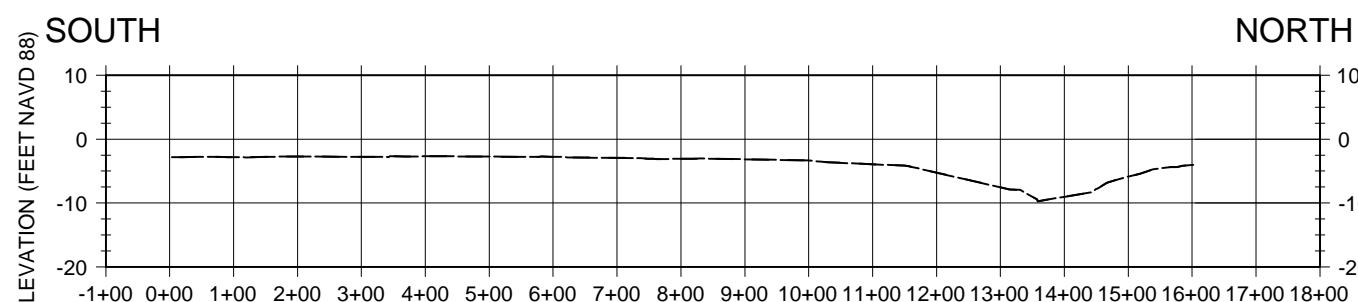
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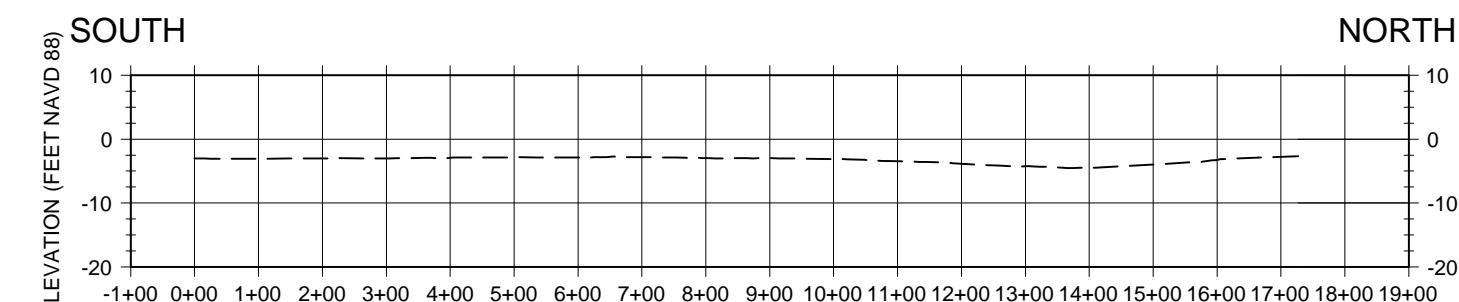
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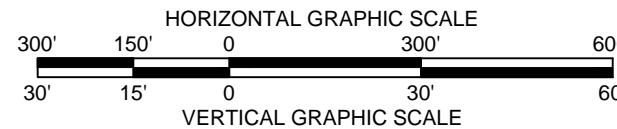
T-16



T-17



T-18



**COASTAL PROTECTION AND
RESTORATION AUTHORITY**

450 LAUREL STREET STREET
BATON ROUGE, LOUISIANA 70801

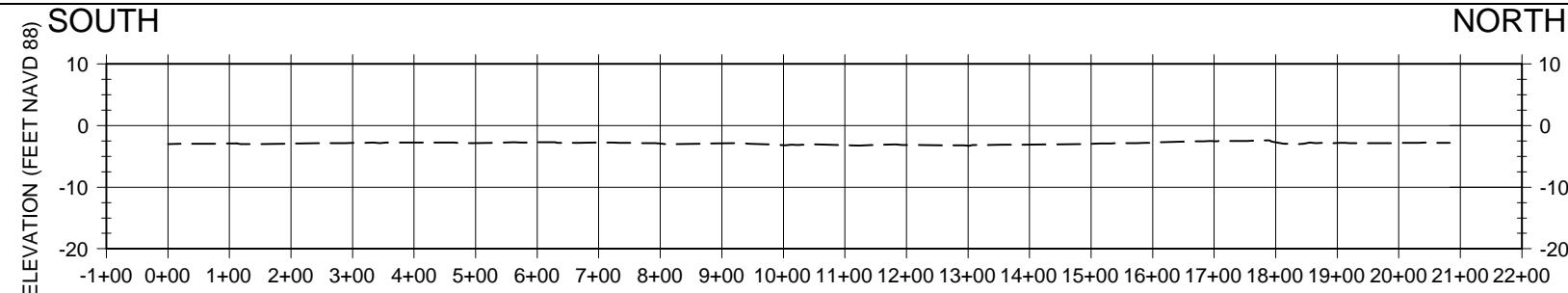
LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION

STATE PROJECT NUMBER: TE-72

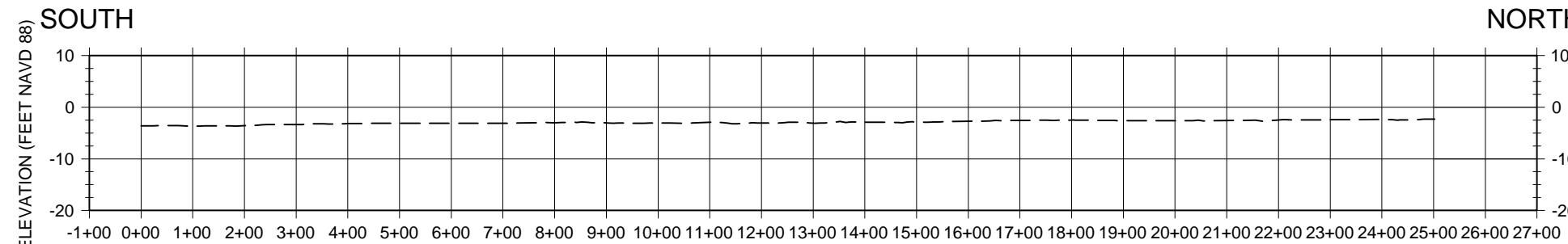
FEDERAL PROJECT NUMBER: TE-72

CROSS SECTIONS

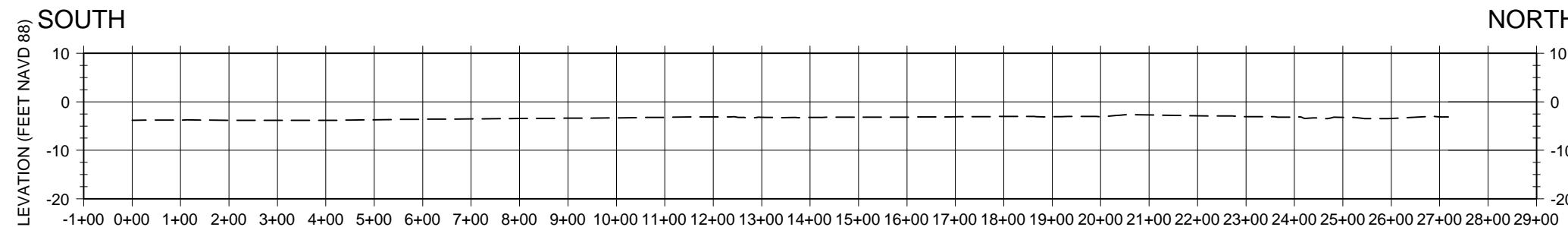
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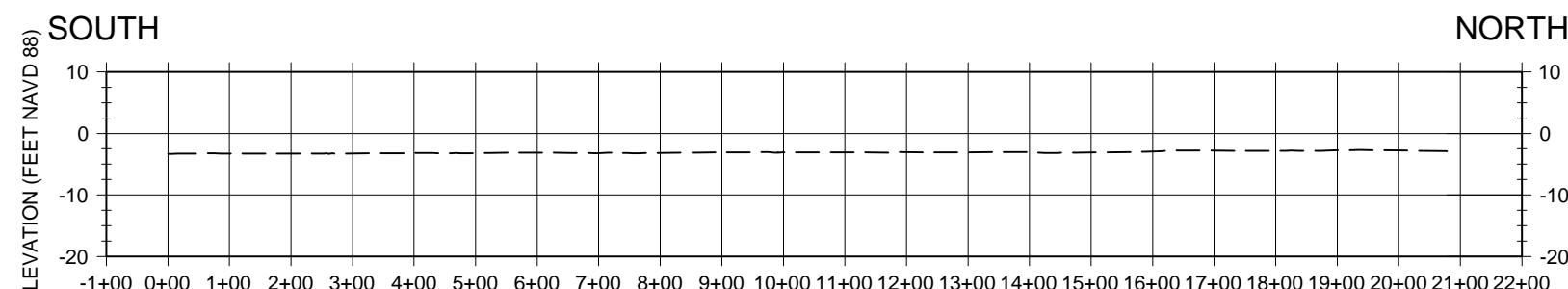
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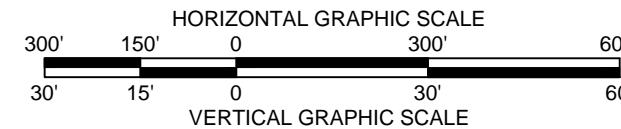
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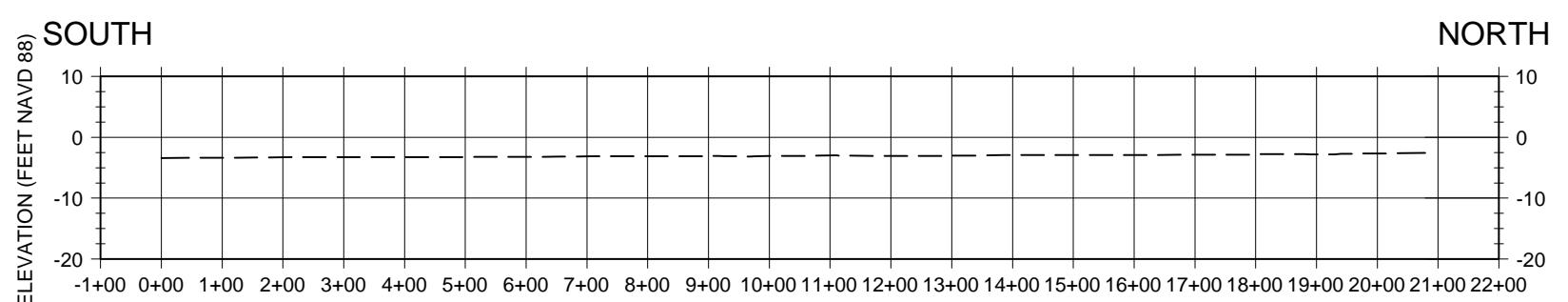
T-21



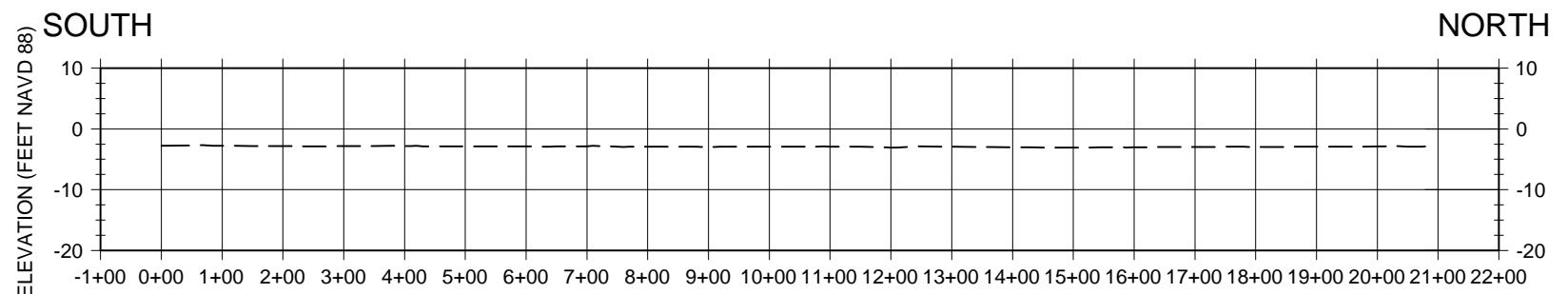
T-22



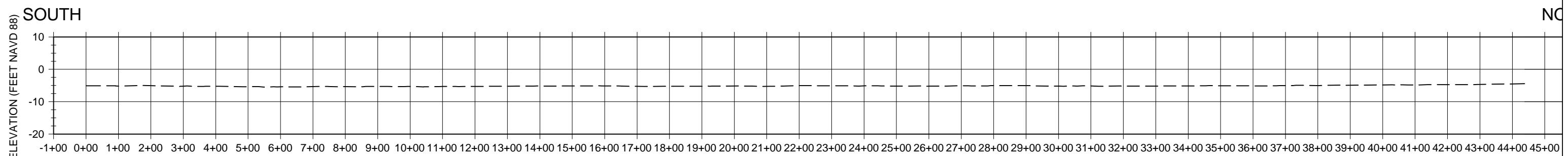
				COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION STATE PROJECT NUMBER: TE-72 FEDERAL PROJECT NUMBER: TE-72	CROSS SECTIONS DATE: APRIL 2012
REV.	DATE	DESCRIPTION	BY			
APPROVED BY:	JASON LANCLOS, P.E.					SHEET 15 OF 53



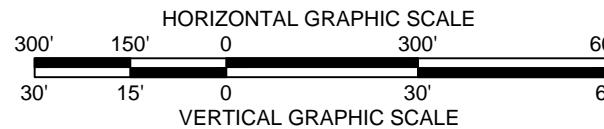
T-23



T-24



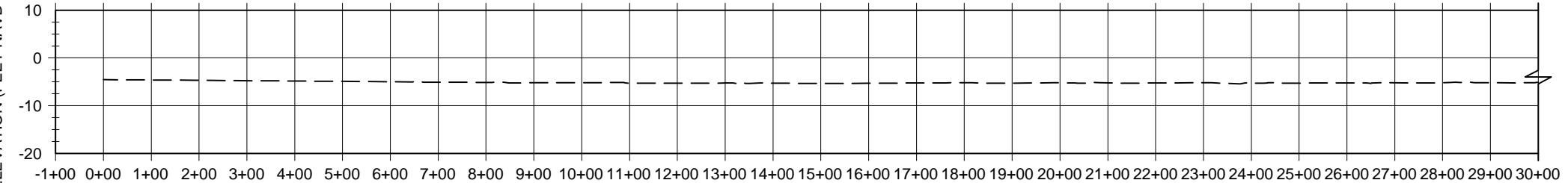
T-25



				COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION STATE PROJECT NUMBER: TE-72 FEDERAL PROJECT NUMBER: TE-72	CROSS SECTIONS DATE: APRIL 2012
REV.	DATE	DESCRIPTION	BY			

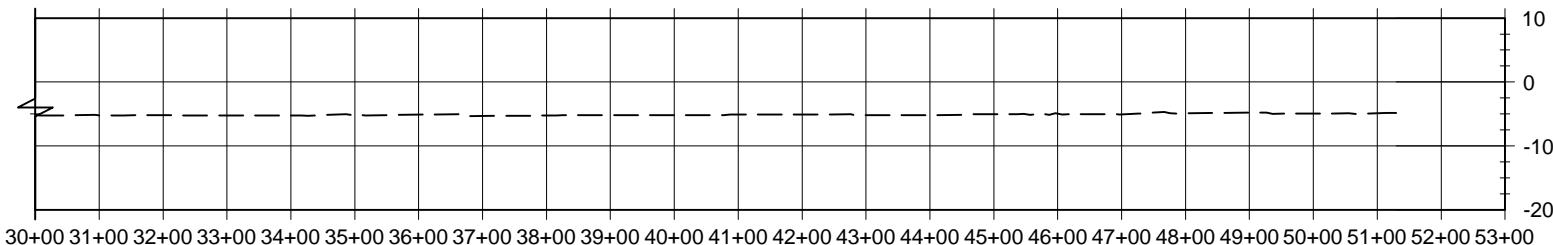
DRAWN BY: SHANE FAUST DESIGNED BY: TRAVIS BYLAND, E.I. APPROVED BY: JASON LANCLOS, P.E. SHEET 16 OF 53

SOUTH
ELEVATION (FEET NAVD 88)



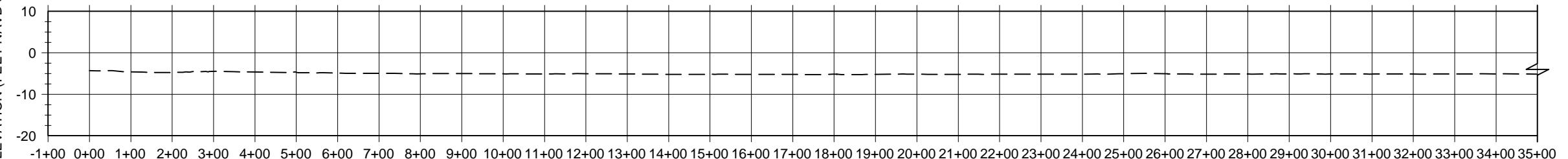
T-26

NORTH



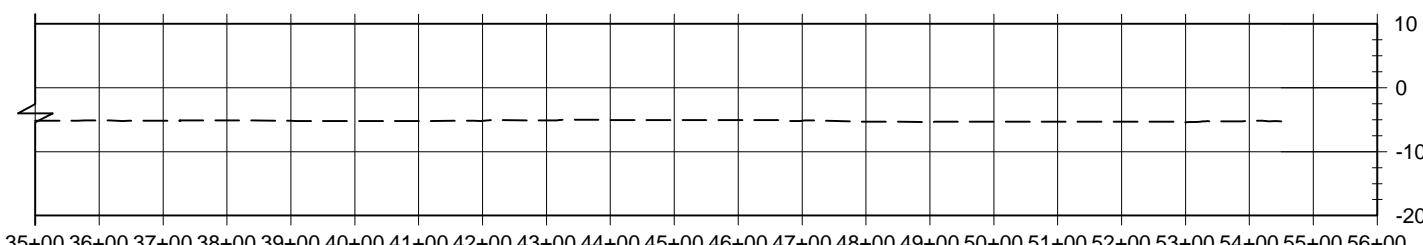
T-26 CONT'D.

SOUTH
ELEVATION (FEET NAVD 88)

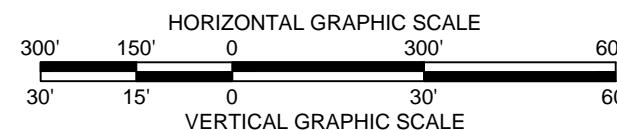


T-27

NORTH

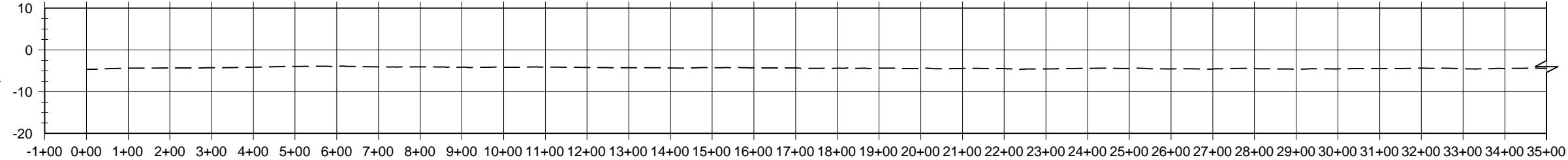


T-27 CONT'D.



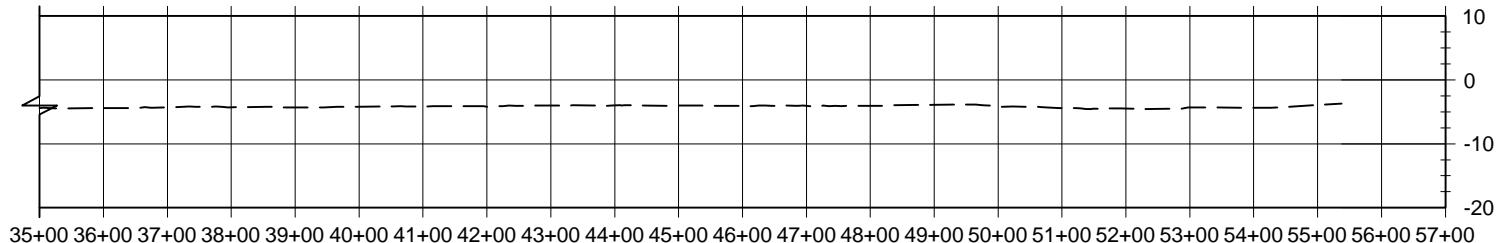
				COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION STATE PROJECT NUMBER: TE-72 FEDERAL PROJECT NUMBER: TE-72	CROSS SECTIONS DATE: APRIL 2012
REV.	DATE	DESCRIPTION	BY			

SOUTH
ELEVATION (FEET NAVD 88)



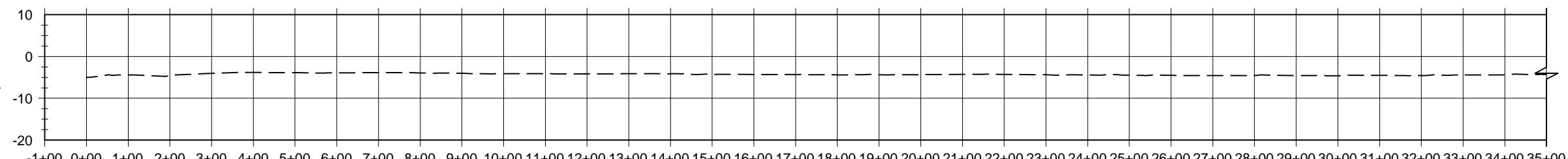
T-28

NORTH



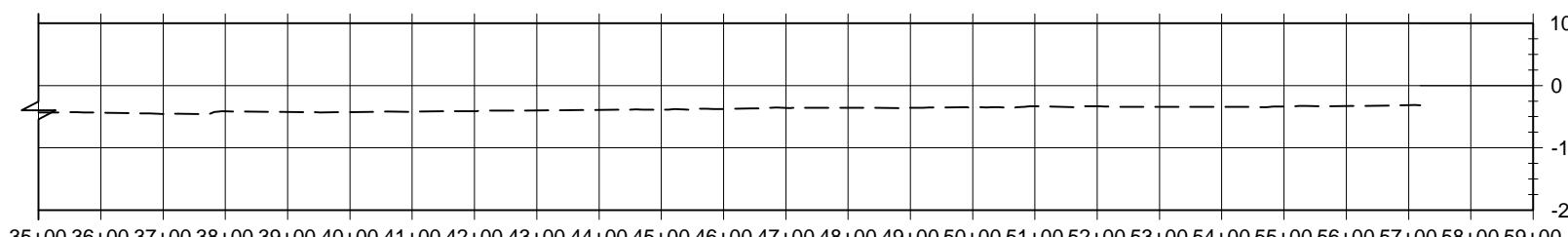
T-28 CONT'D.

SOUTH
ELEVATION (FEET NAVD 88)

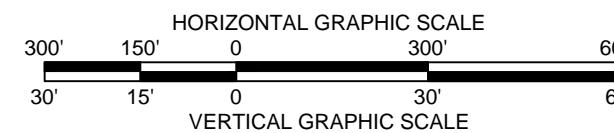


T-29

NORTH



T-29 CONT'D.

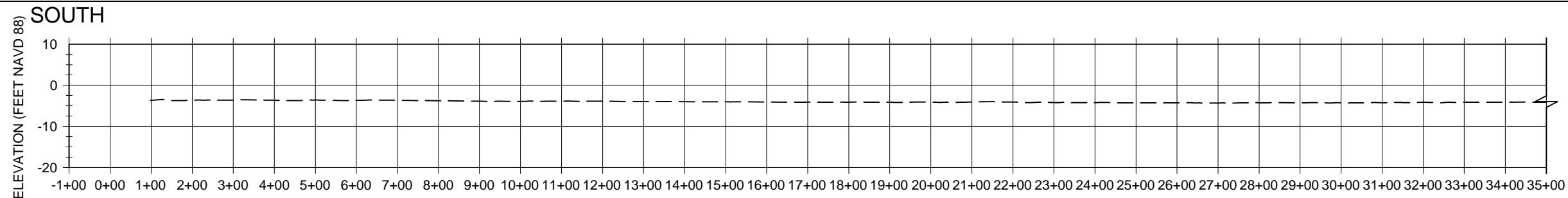


REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.	CROSS SECTIONS
							LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION
							STATE PROJECT NUMBER: TE-72

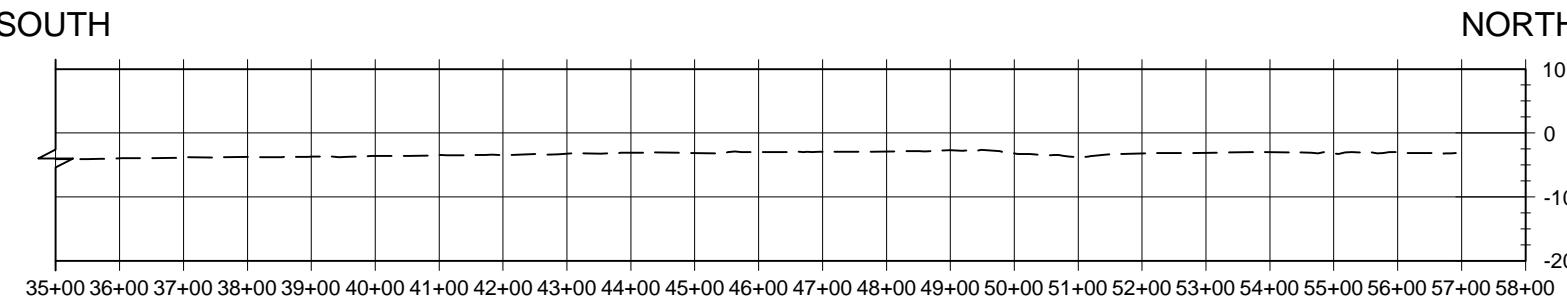
COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET STREET
BATON ROUGE, LOUISIANA 70801

FEDERAL PROJECT NUMBER: TE-72

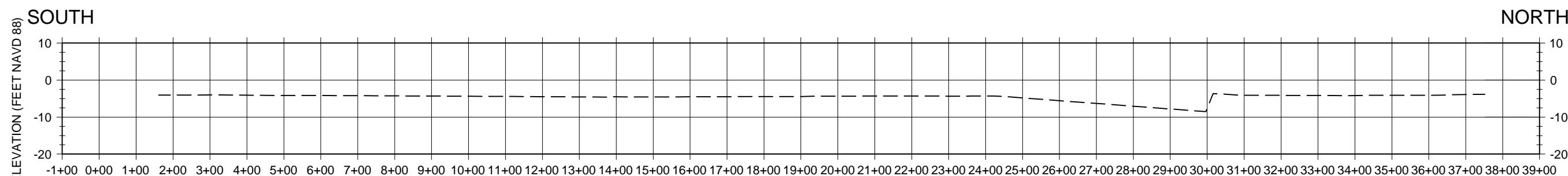
DATE: APRIL 2012
SHEET 18 OF 53



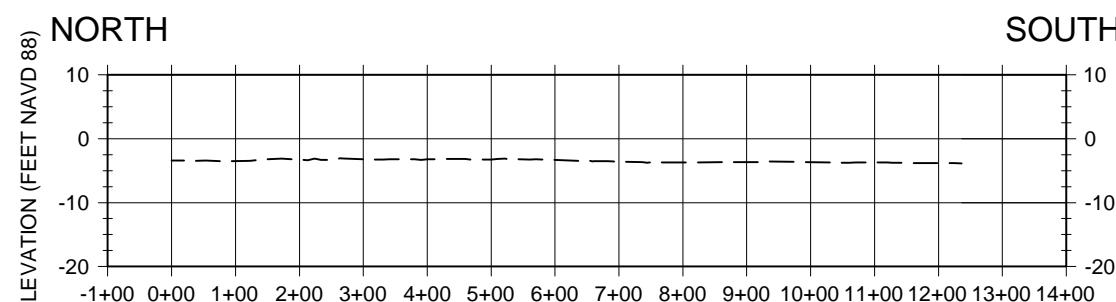
T-30



T-30 CONT'D.



T-31



T-32

HORIZONTAL GRAPHIC SCALE
300' 150' 0 300' 600'
30' 15' 0 30' 60'

VERTICAL GRAPHIC SCALE

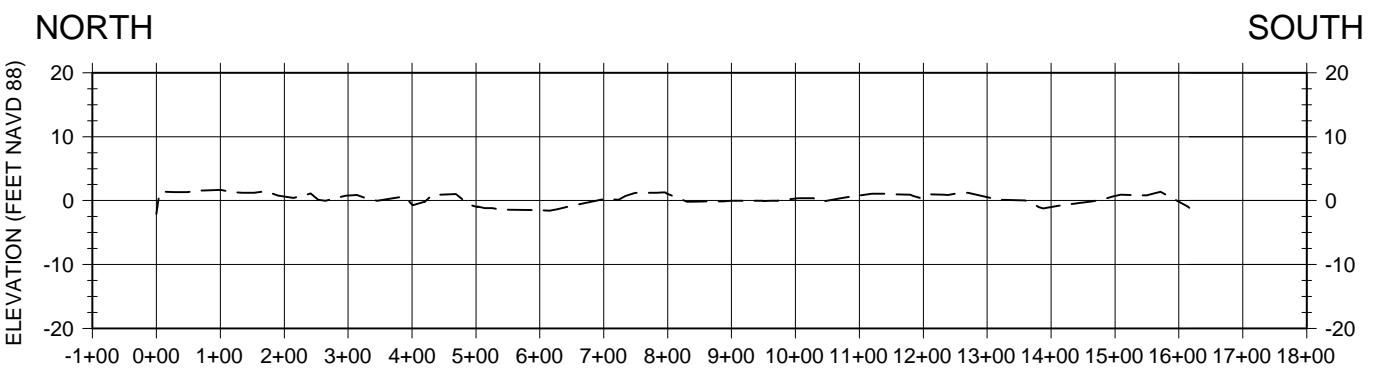
REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.	SHEET 19 OF 53
							CROSS SECTIONS

COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET STREET
BATON ROUGE, LOUISIANA 70801

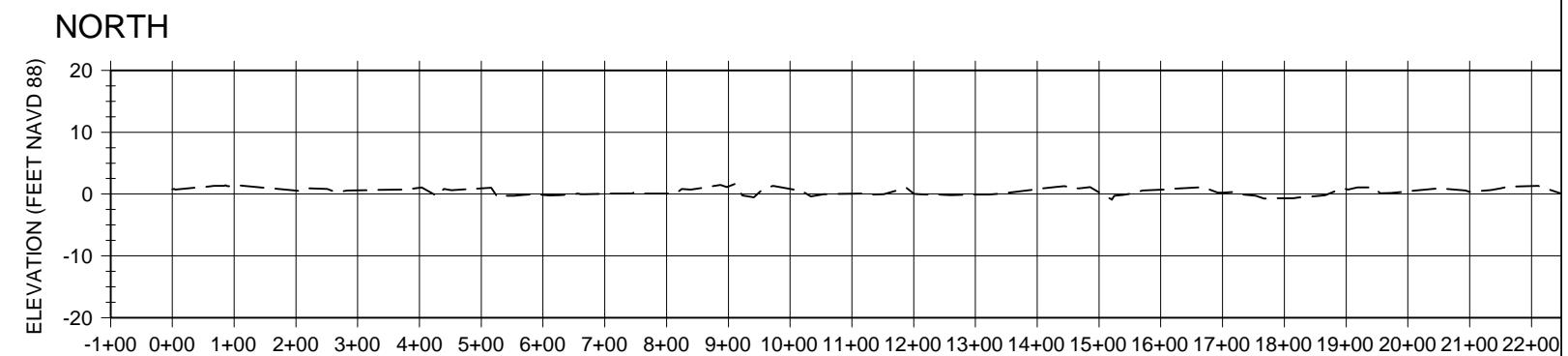
LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION
STATE PROJECT NUMBER: TE-72

FEDERAL PROJECT NUMBER: TE-72

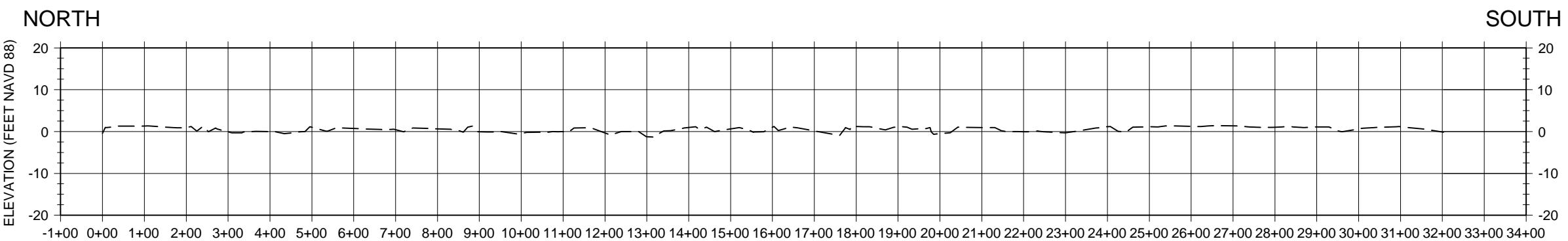
DATE: APRIL 2012
SHEET 19 OF 53



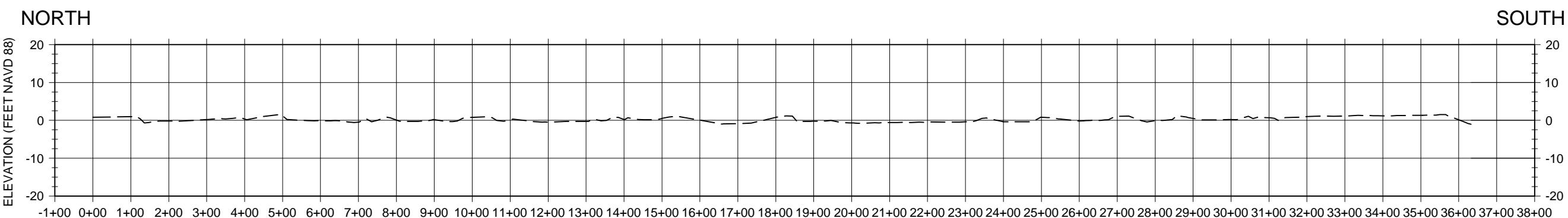
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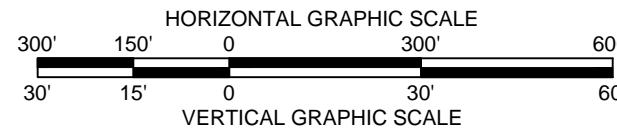
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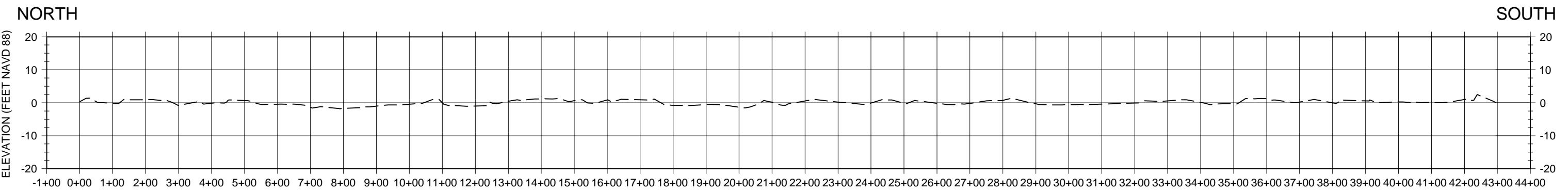
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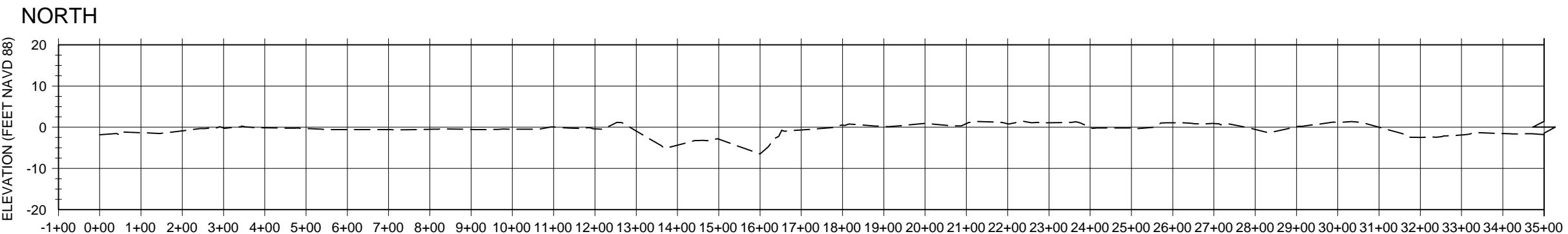
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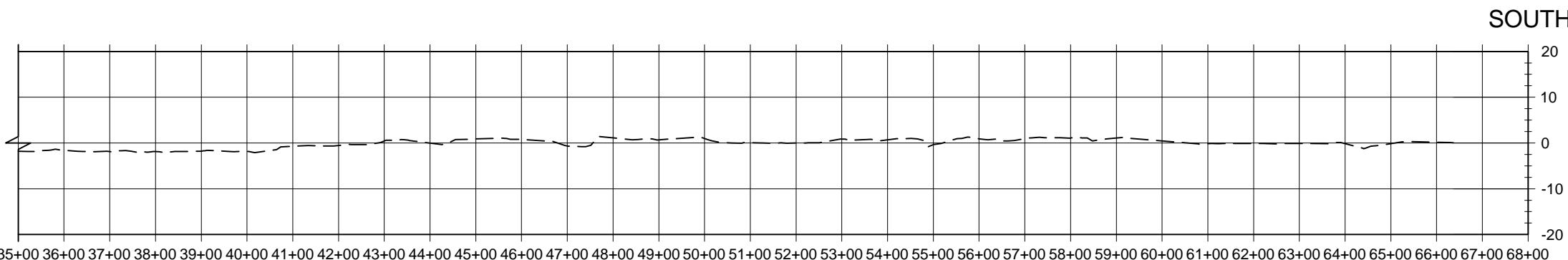
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REV.	DATE	DESCRIPTION	BY			
DRAWN BY:	SHANE FAUST	DESIGNED BY:	TRAVIS BYLAND, E.I.	APPROVED BY:	JASON LANCLOS, P.E.	SHEET 21 OF 53



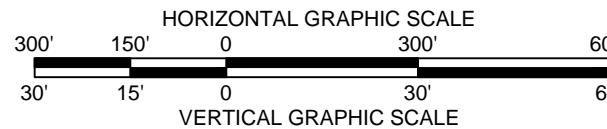
T-42



T-43



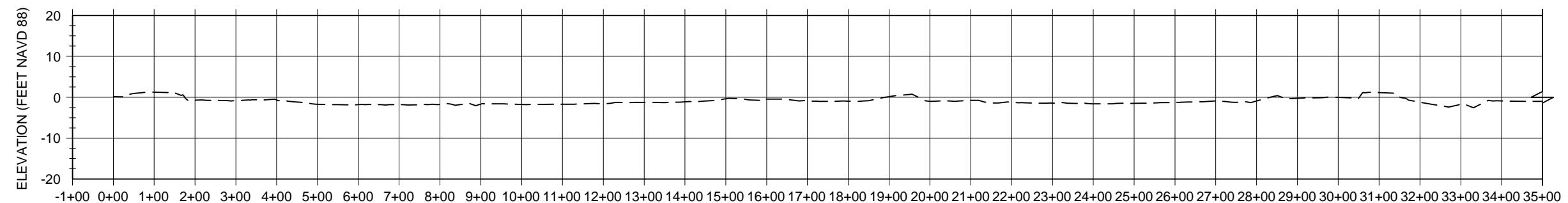
T-43 CONT'D.



REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.	CROSS SECTIONS
							LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION
							STATE PROJECT NUMBER: TE-72
							FEDERAL PROJECT NUMBER: TE-72
							DATE: APRIL 2012
							SHEET 22 OF 53

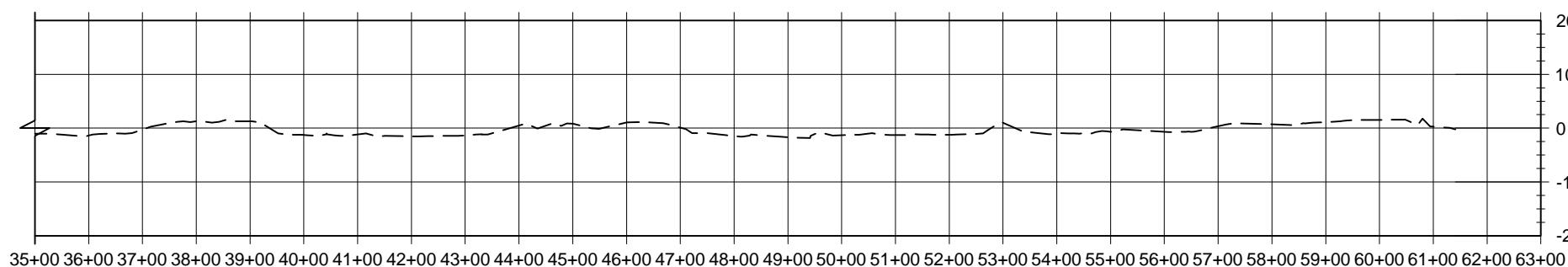
COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET STREET
BATON ROUGE, LOUISIANA 70801

NORTH

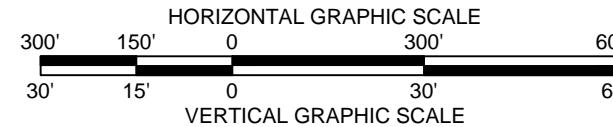


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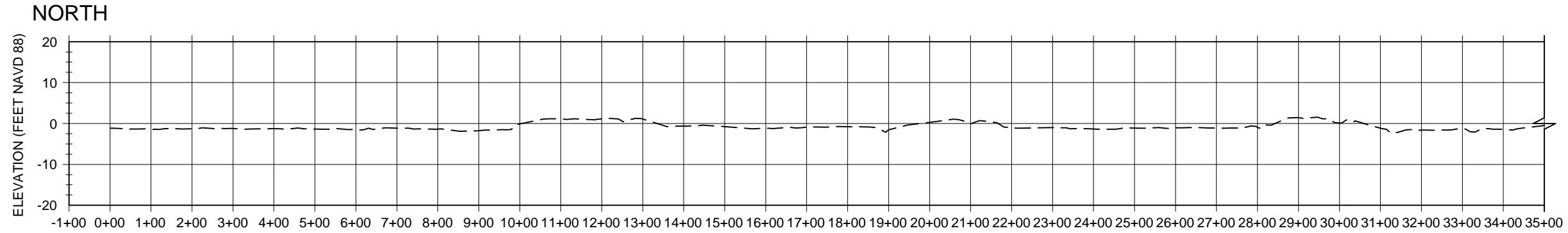
SOUTH



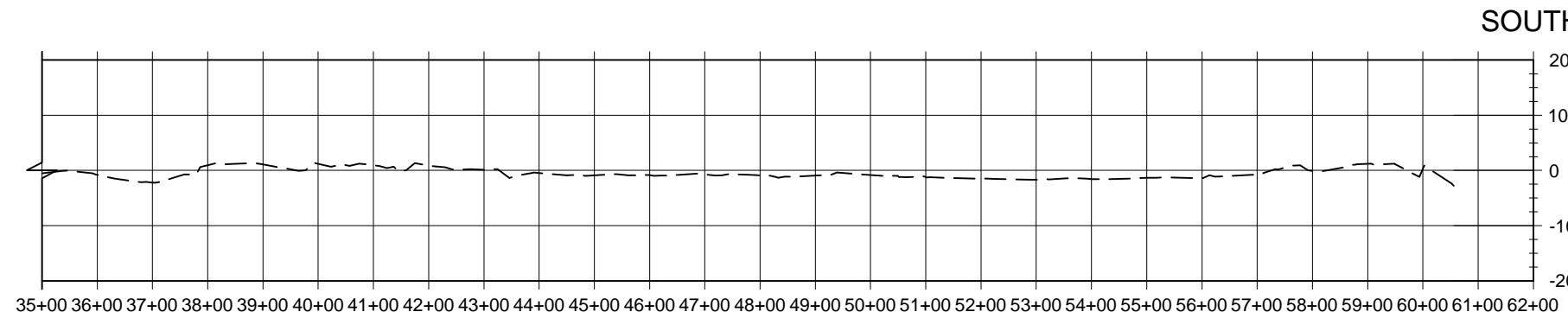
T-44 CONT'D.



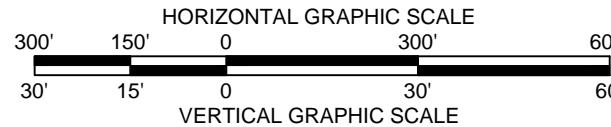
				COASTAL PROTECTION AND RESTORATION AUTHORITY		LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION		CROSS SECTIONS	
				450 LAUREL STREET STREET BATON ROUGE, LOUISIANA 70801		STATE PROJECT NUMBER: TE-72		DATE: APRIL 2012	
REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST		DESIGNED BY: TRAVIS BYLAND, E.I.			
								APPROVED BY: JASON LANCLOS, P.E.	SHEET 23 OF 53



T-45

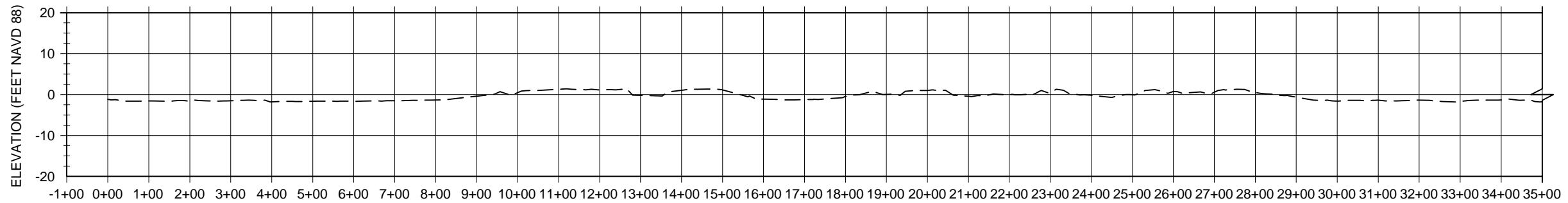


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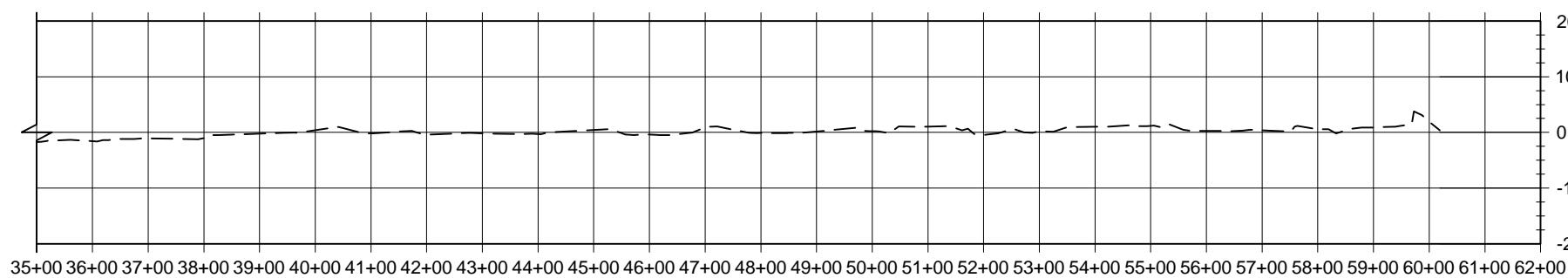
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REV.	DATE	DESCRIPTION	BY			
		DRAWN BY: SHANE FAUST				
		DESIGNED BY: TRAVIS BYLAND, E.I.				
		APPROVED BY: JASON LANCLOS, P.E.				

NORTH

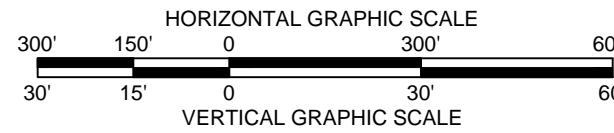


T-46

SOUTH

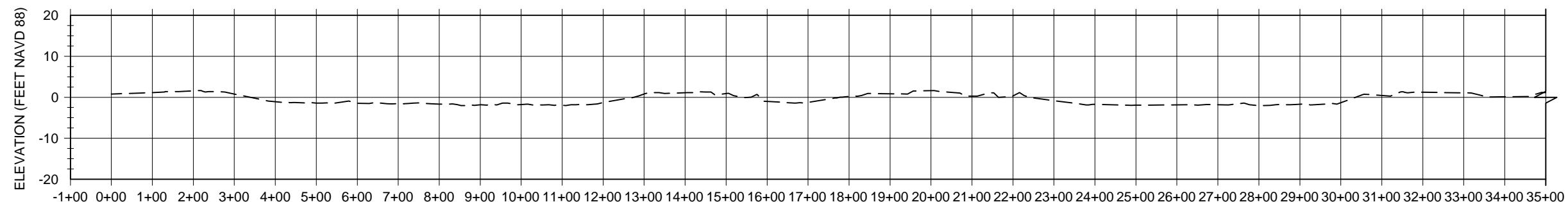


T-46 CONT'D.



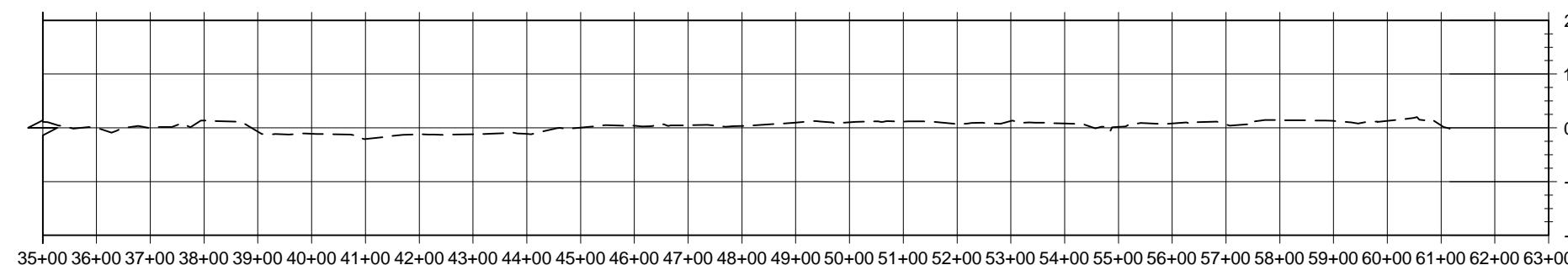
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REV.	DATE	DESCRIPTION	BY			

NORTH

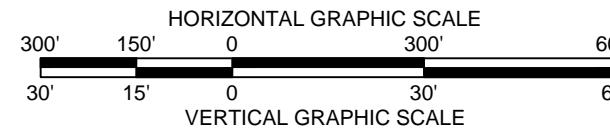


T-47

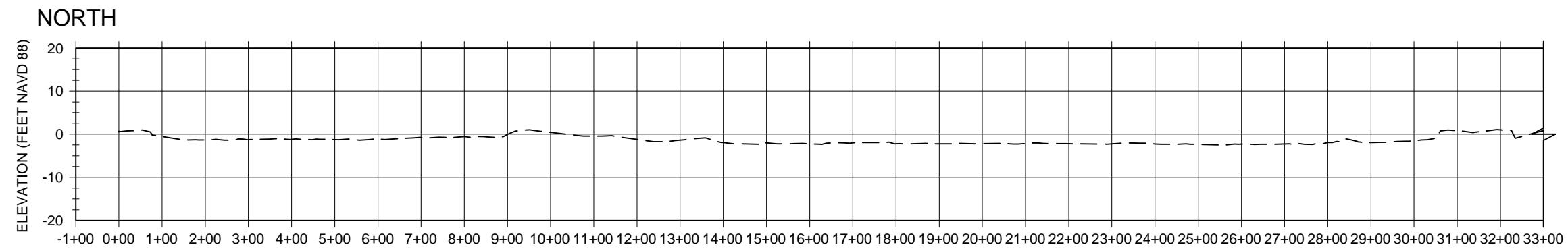
SOUTH



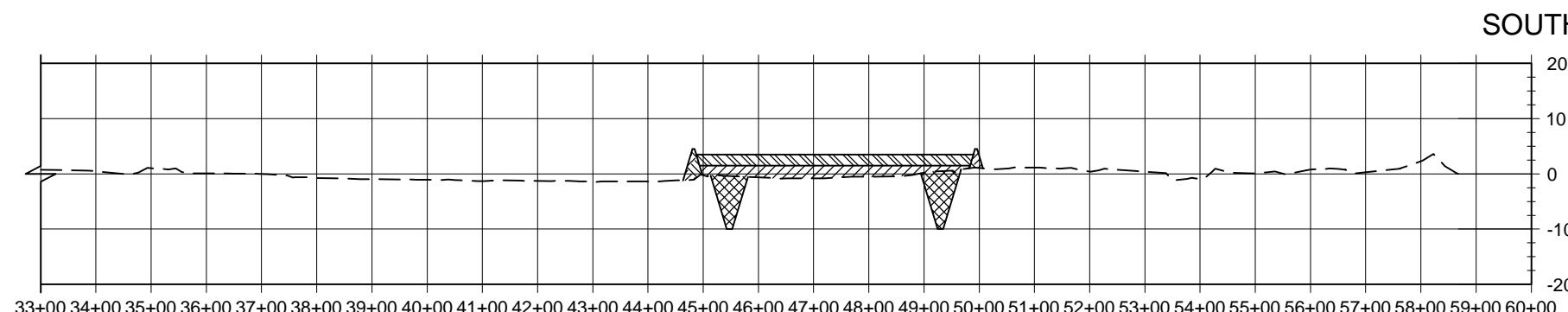
T-47 CONT'D.



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REV.	DATE	DESCRIPTION	BY			
		DRAWN BY: SHANE FAUST				
		DESIGNED BY: TRAVIS BYLAND, E.I.				
					APPROVED BY: JASON LANCLOS, P.E.	



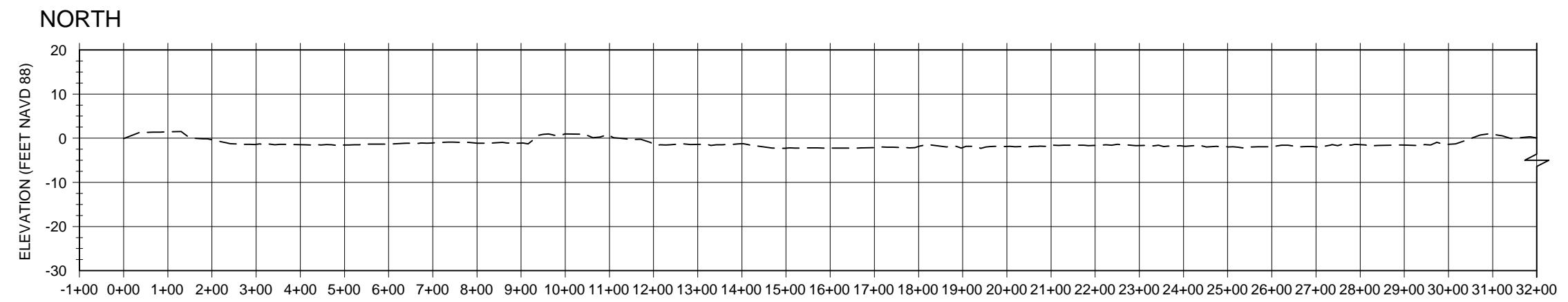
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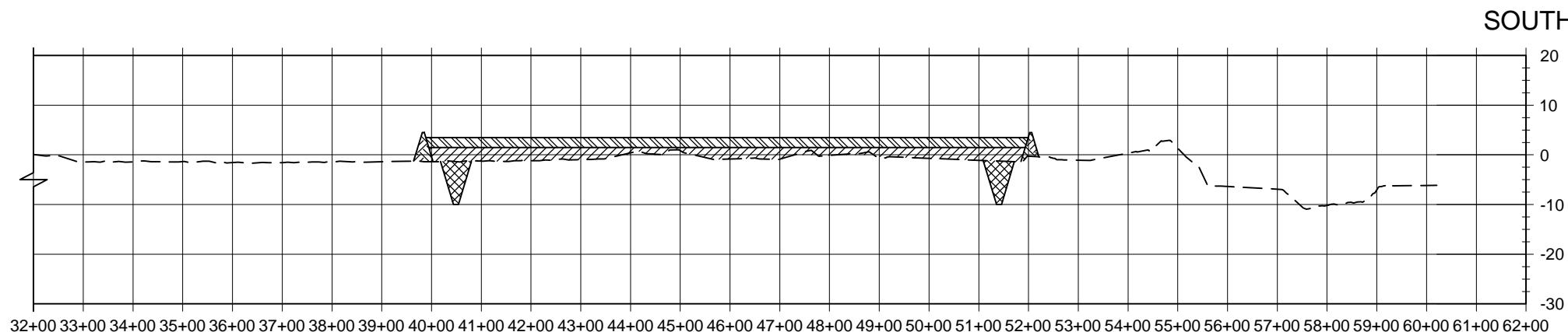
T-48 CONT'D.

The figure consists of two horizontal bars representing scales. The top bar is labeled "HORIZONTAL GRAPHIC SCALE" and has tick marks at 300', 150', 0, 300', and 600'. The bottom bar is labeled "VERTICAL GRAPHIC SCALE" and has tick marks at 30', 15', 0, 30', and 60'.

				COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION	CROSS SECTIONS
					STATE PROJECT NUMBER: TE-72	
					FEDERAL PROJECT NUMBER: TE-72	
REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.



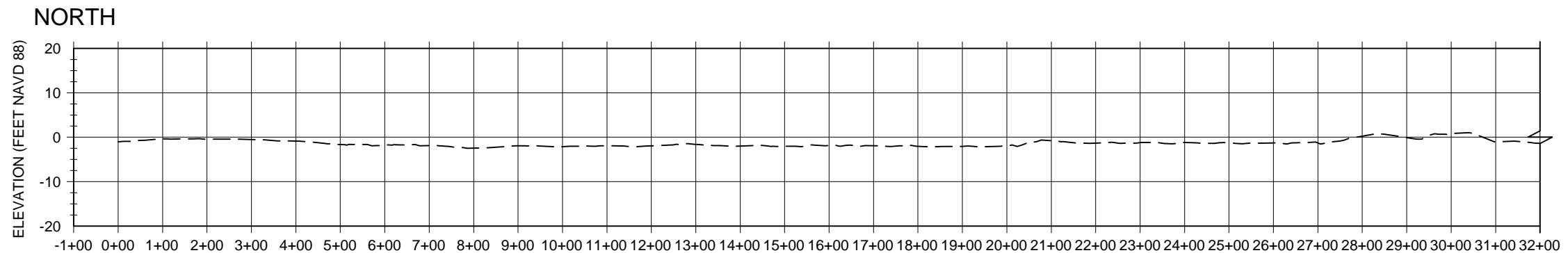
T-49



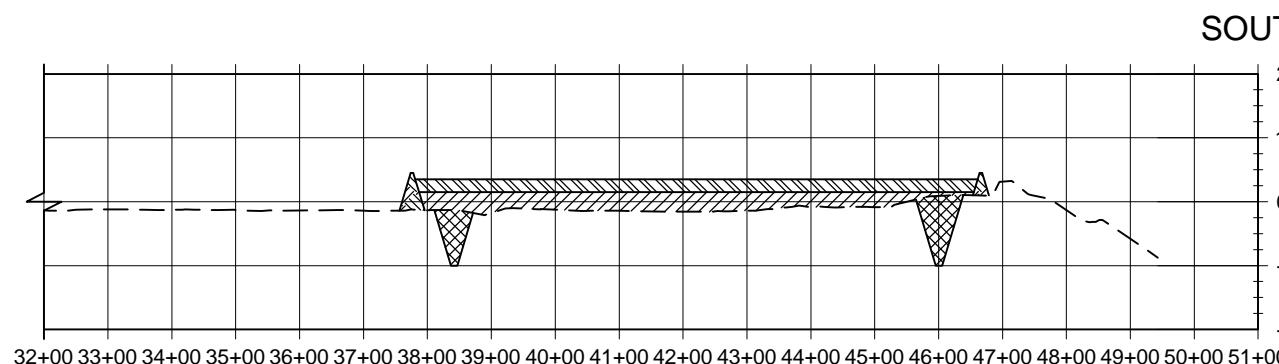
T-49 CONT'D.

HORIZONTAL GRAPHIC SCALE
300' 150' 0 300' 600'
30' 15' 0 30' 60'
VERTICAL GRAPHIC SCALE

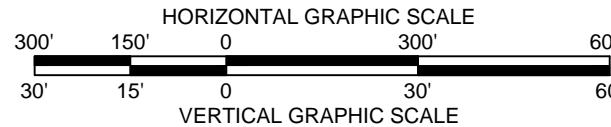
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REV.	DATE	DESCRIPTION	BY			
		DRAWN BY: SHANE FAUST				
		DESIGNED BY: TRAVIS BYLAND, E.I.				
		APPROVED BY: JASON LANCLOS, P.E.				



T-50

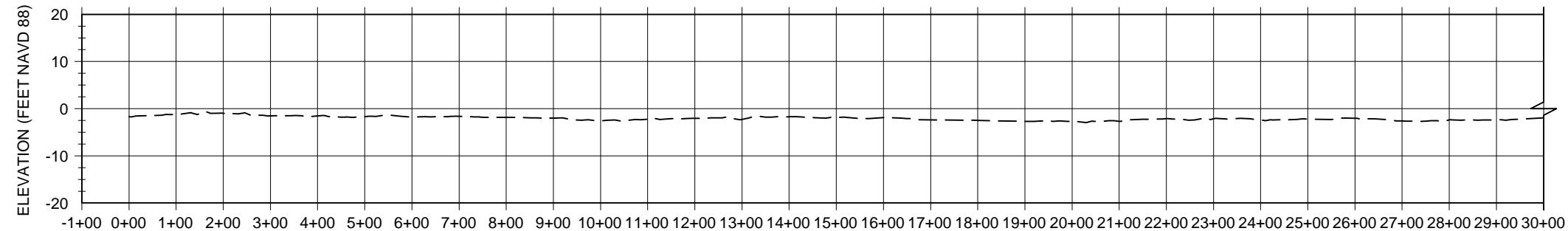


T-50 CONT'D.



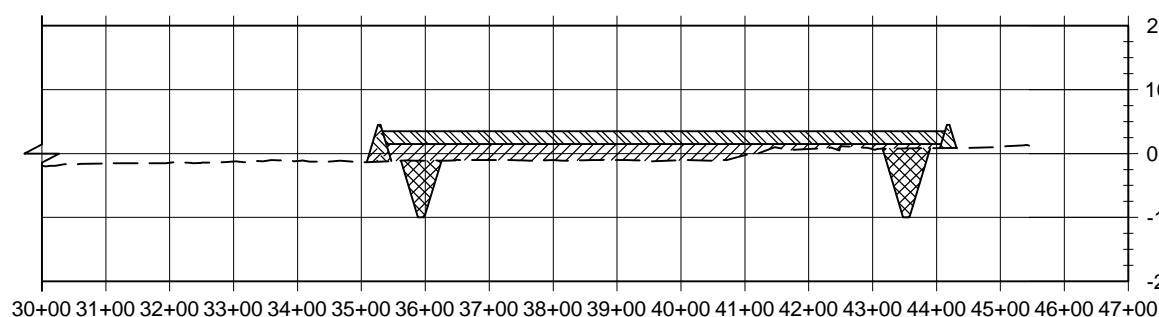
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					STATE PROJECT NUMBER: TE-72			
					FEDERAL PROJECT NUMBER: TE-72			
REV.	DATE	DESCRIPTION	BY		DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	DATE: APRIL 2012	
						APPROVED BY: JASON LANCLOS, P.E.		
							SHEET 29 OF 53	

NORTH

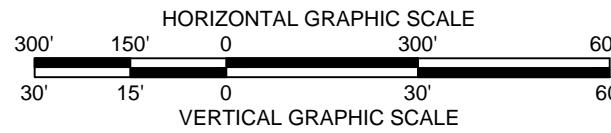


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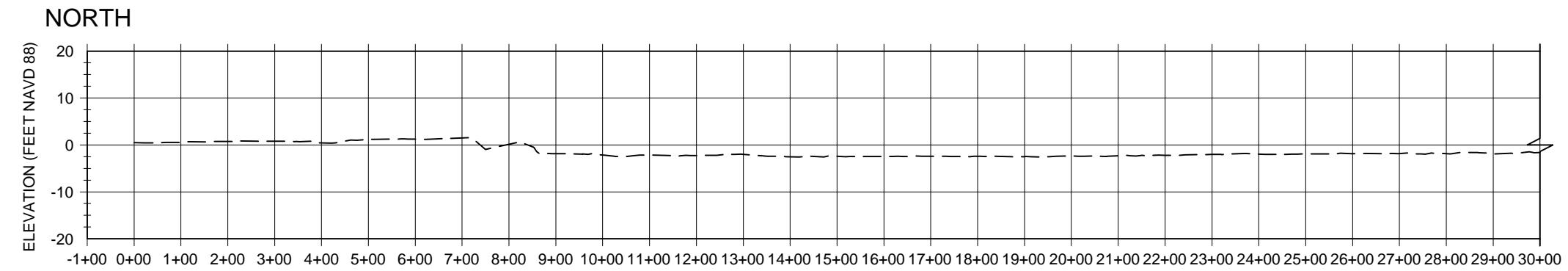
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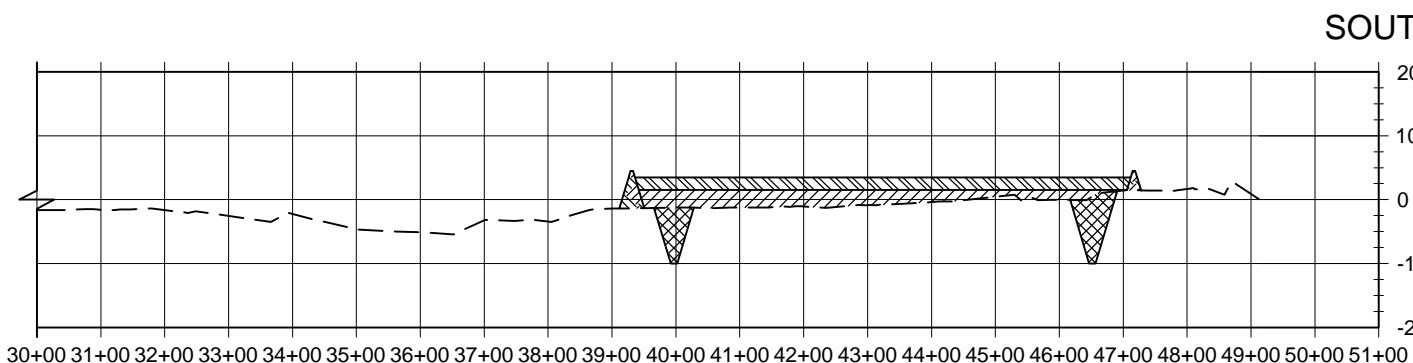
T-51 CONT'D.



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REV.	DATE	DESCRIPTION	BY			
		DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.		APPROVED BY: JASON LANCLOS, P.E.	SHEET 30 OF 53



T-52

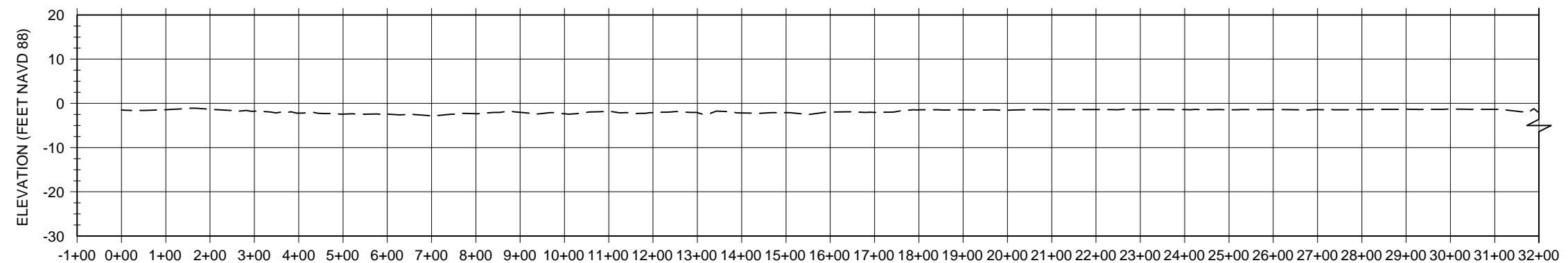


T-52 CONT'D

The figure consists of two horizontal bars representing scales. The top bar is labeled "HORIZONTAL GRAPHIC SCALE" and has tick marks at 300', 150', 0, 300', and 600'. The bottom bar is labeled "VERTICAL GRAPHIC SCALE" and has tick marks at 30', 15', 0, 30', and 60'.

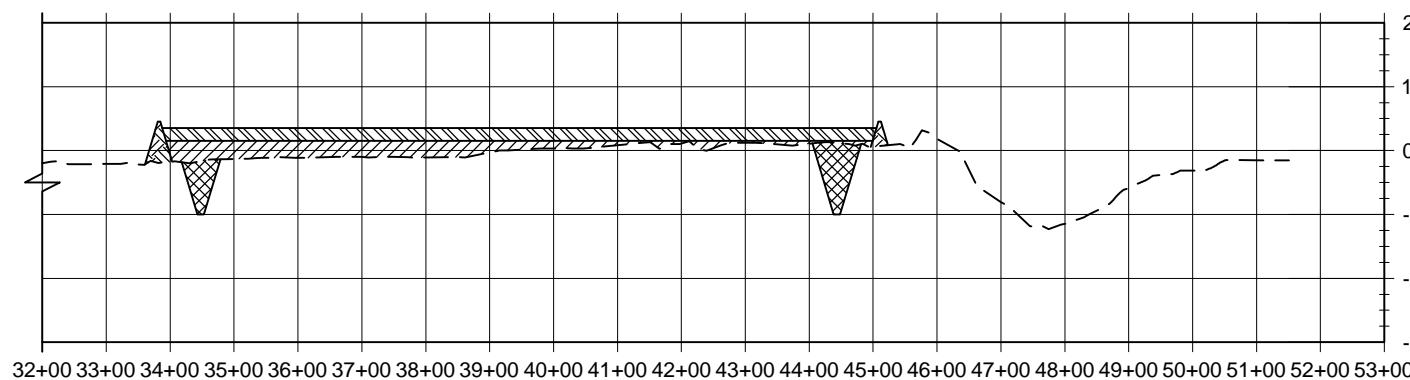
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					STATE PROJECT NUMBER: TE-72	
					FEDERAL PROJECT NUMBER: TE-72	
REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.

NORTH

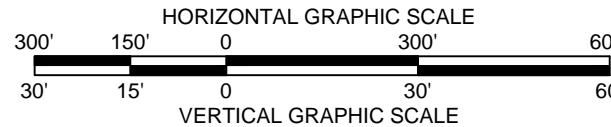


T-53

SOUTH

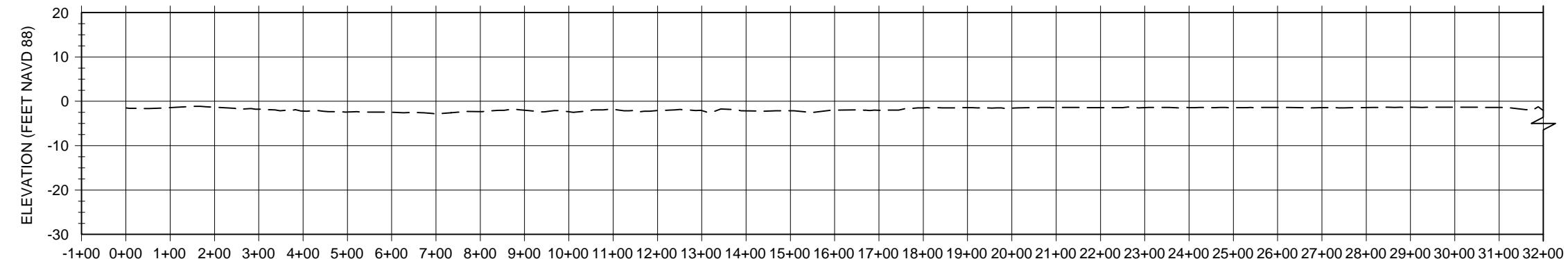


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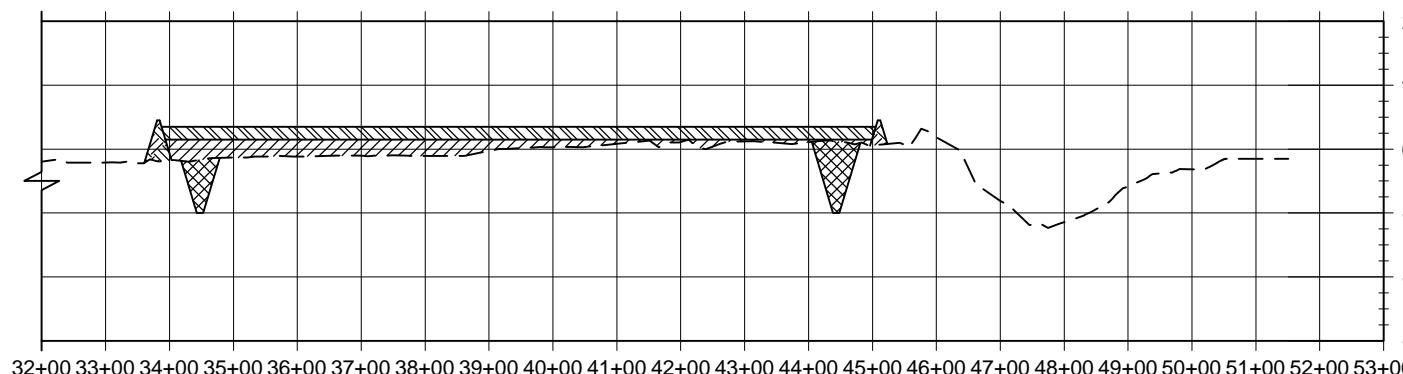
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REV.	DATE	DESCRIPTION	BY			
		DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.		APPROVED BY: JASON LANCLOS, P.E.	SHEET 32 OF 53

NORTH

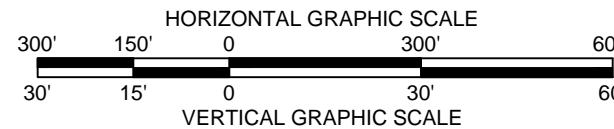


T-53

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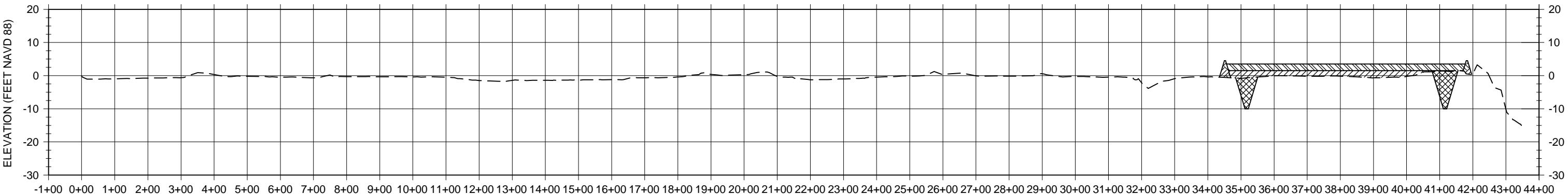


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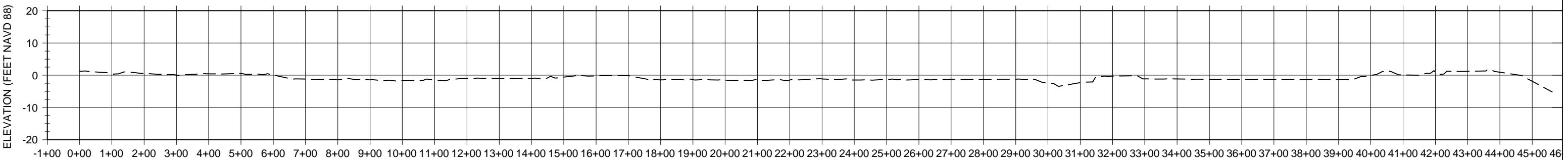
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				450 LAUREL STREET STREET BATON ROUGE, LOUISIANA 70801		STATE PROJECT NUMBER: TE-72		DATE: APRIL 2012	
REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST		DESIGNED BY: TRAVIS BYLAND, E.I.			
								APPROVED BY: JASON LANCLOS, P.E.	SHEET 33 OF 53

NORTH

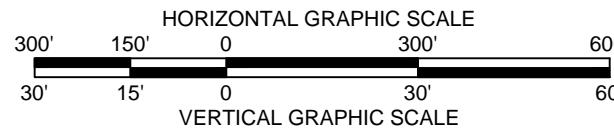


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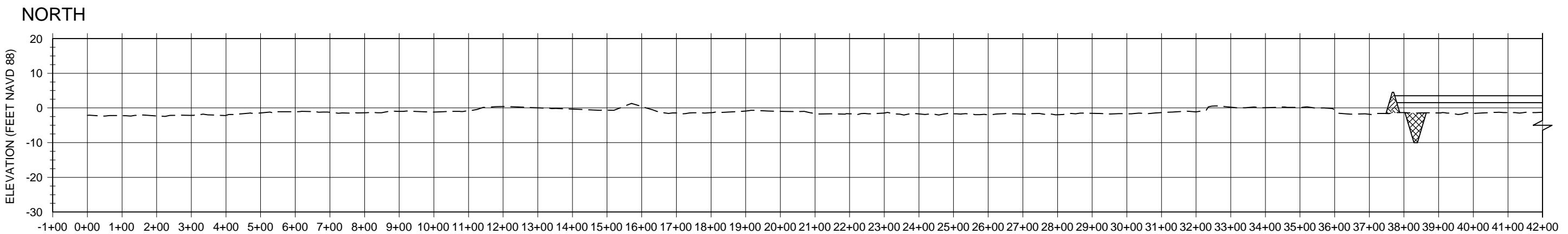
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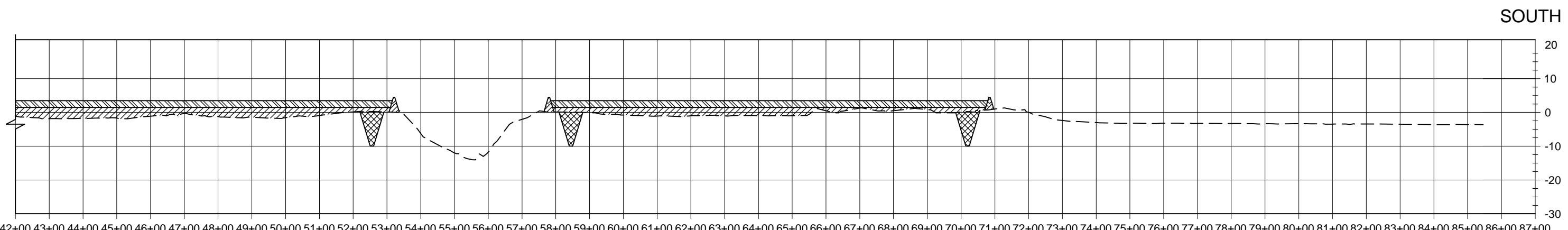
T-55



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REV.	DATE	DESCRIPTION	BY			
DRAWN BY:	SHANE FAUST	DESIGNED BY:	TRAVIS BYLAND, E.I.	APPROVED BY:	JASON LANCLOS, P.E.	SHEET 34 OF 53



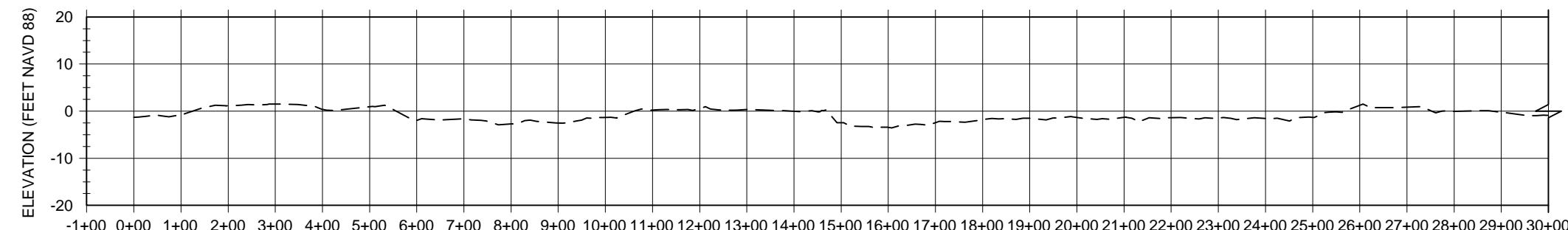
T-56



T-56 CONT'D.

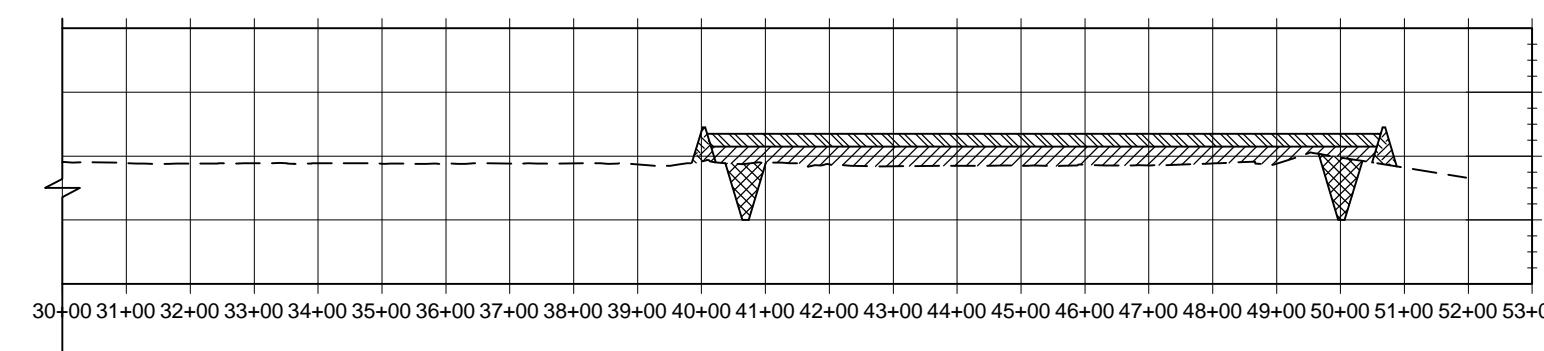
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					STATE PROJECT NUMBER: TE-72	
					FEDERAL PROJECT NUMBER: TE-72	
REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.

NORTH

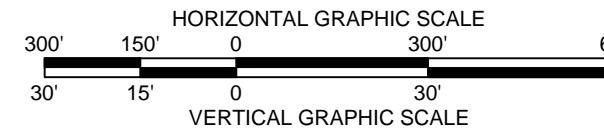


T-57

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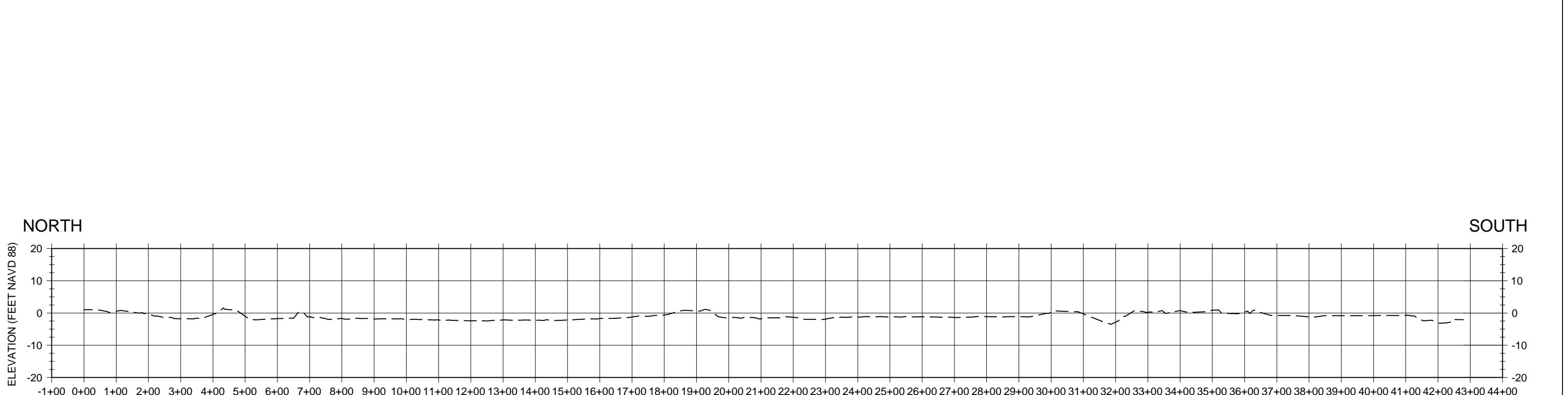


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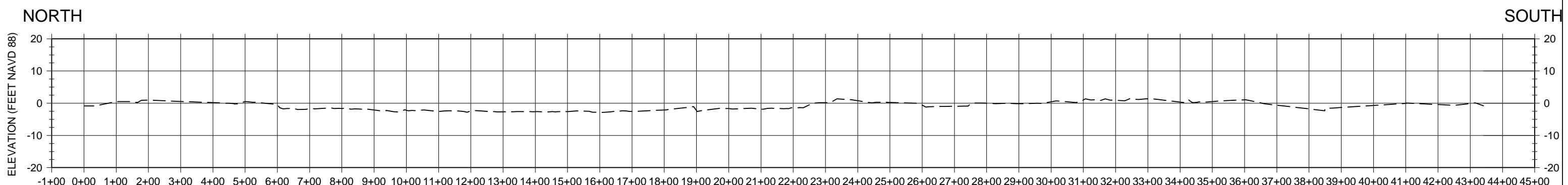


REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E.	CROSS SECTIONS
							LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION STATE PROJECT NUMBER: TE-72 FEDERAL PROJECT NUMBER: TE-72 DATE: APRIL 2012 SHEET 36 OF 53

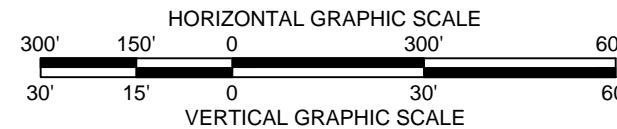
COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET STREET
BATON ROUGE, LOUISIANA 70801



T-58

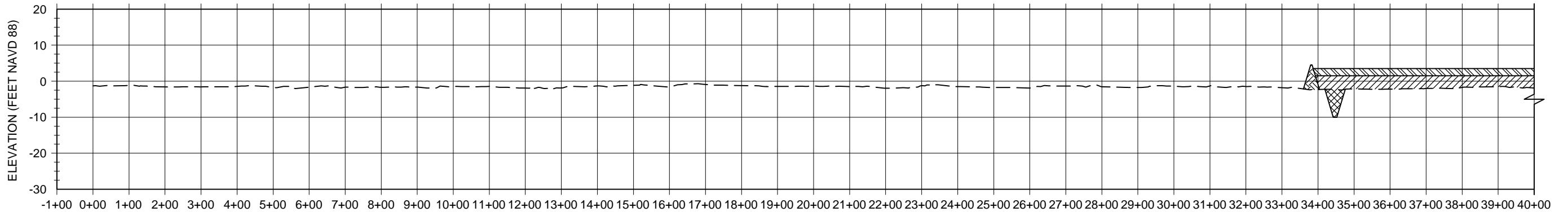


T-59



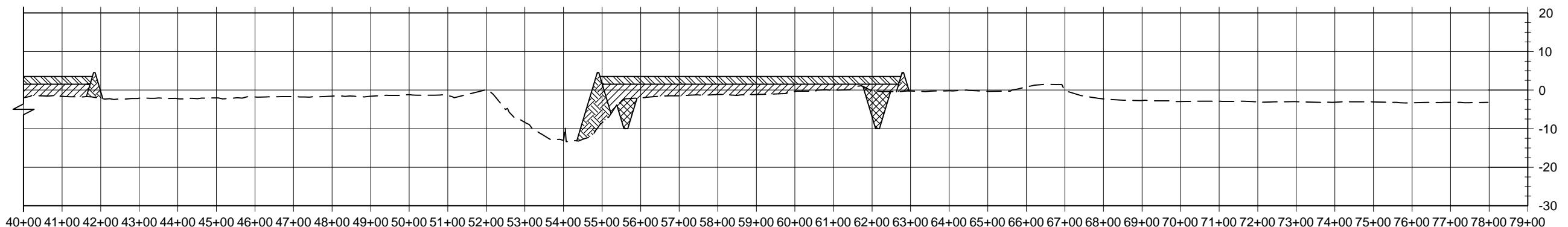
				COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION STATE PROJECT NUMBER: TE-72 FEDERAL PROJECT NUMBER: TE-72	CROSS SECTIONS DATE: APRIL 2012
REV.	DATE	DESCRIPTION	BY			
DRAWN BY:	SHANE FAUST	DESIGNED BY:	TRAVIS BYLAND, E.I.	APPROVED BY:	JASON LANCLOS, P.E.	SHEET 37 OF 53

NORTH

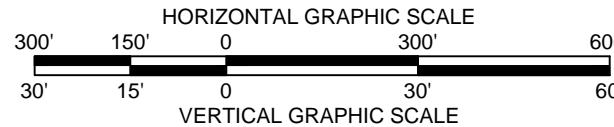


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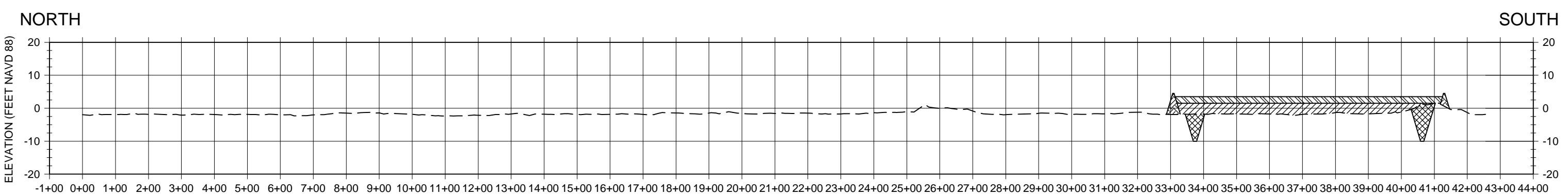
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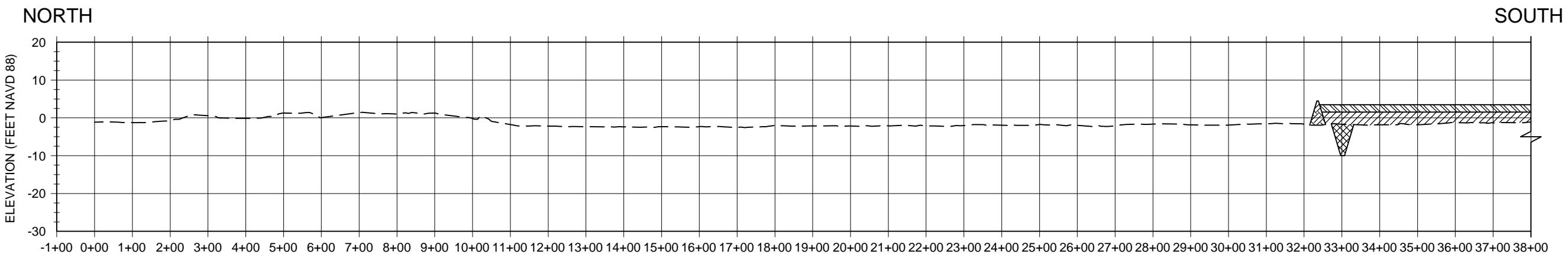
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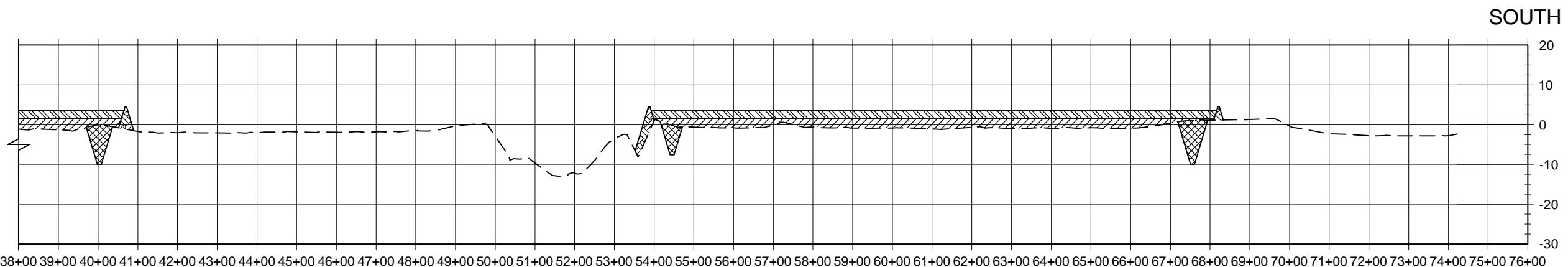
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REV.	DATE	DESCRIPTION	BY			
					FEDERAL PROJECT NUMBER: TE-72	
					APPROVED BY: JASON LANCLOS, P.E.	
						SHEET 38 OF 53



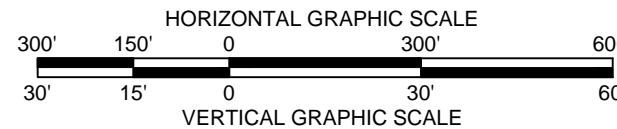
T-61



T-62



T-62 CONT'D.



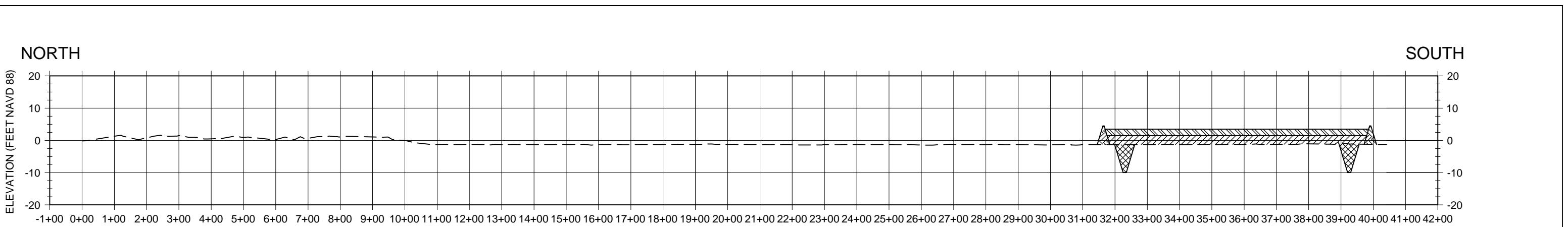
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REV.	DATE	DESCRIPTION	BY			

DRAWN BY: SHANE FAUST

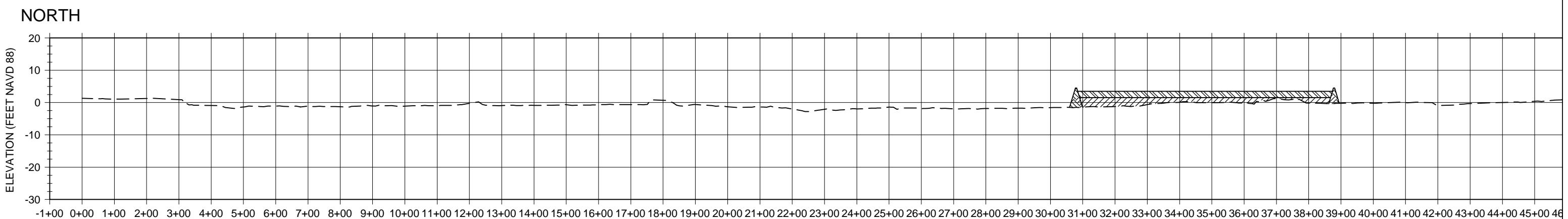
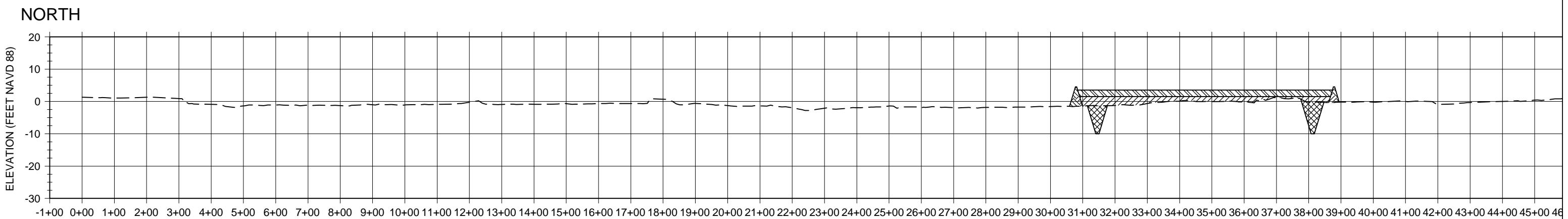
DESIGNED BY: TRAVIS BYLAND, E.I.

APPROVED BY: JASON LANCLOS, P.E.

SHEET 39 OF 53



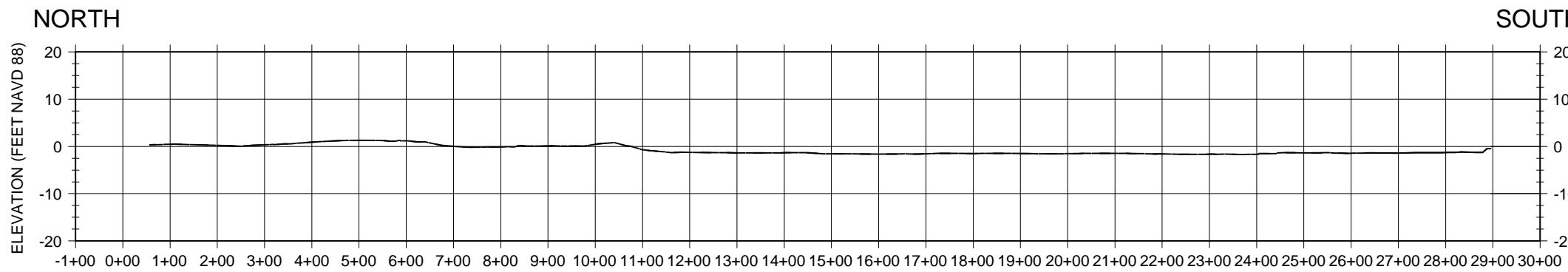
T-63



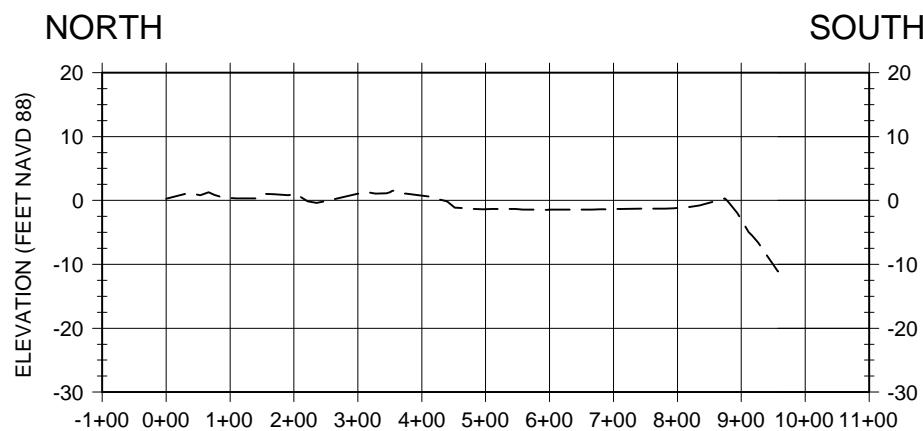
HORIZONTAL GRAPHIC SCALE
300' 150' 0 300' 600'
30' 15' 0 30' 60'

VERTICAL GRAPHIC SCALE

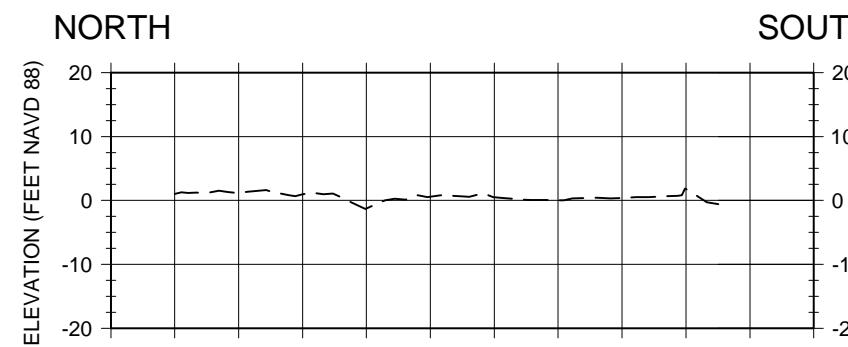
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REV.	DATE	DESCRIPTION	BY			
DRAWN BY:	SHANE FAUST	DESIGNED BY:	TRAVIS BYLAND, E.I.	APPROVED BY:	JASON LANCLOS, P.E.	SHEET 40 OF 53



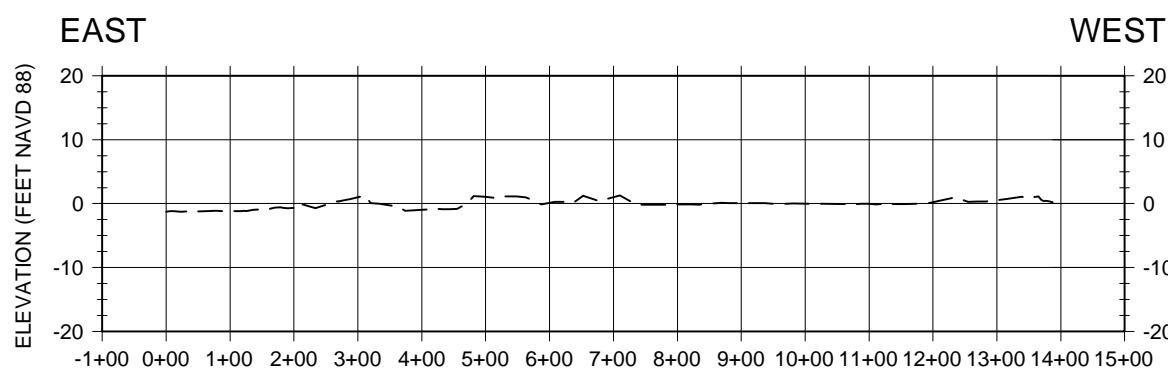
T-65



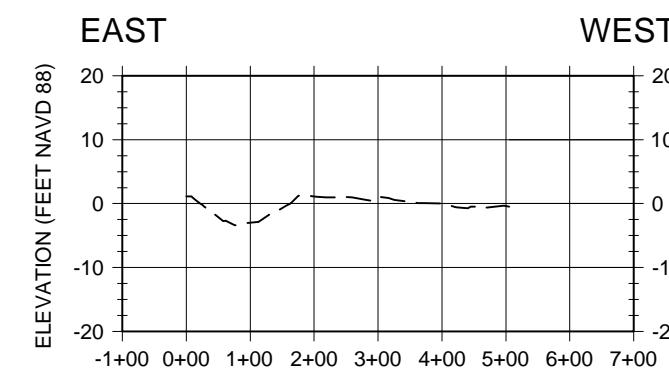
T-66



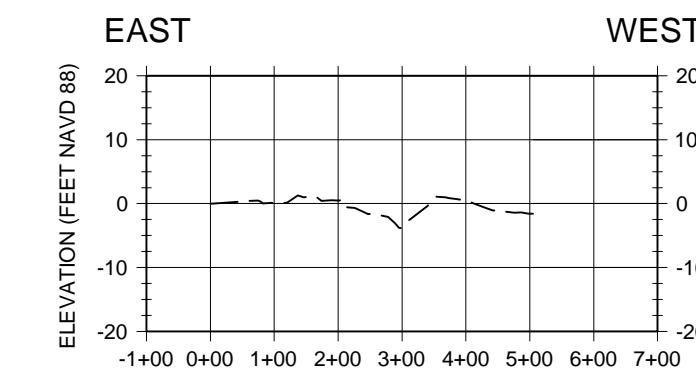
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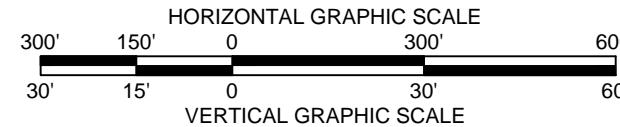
T-68



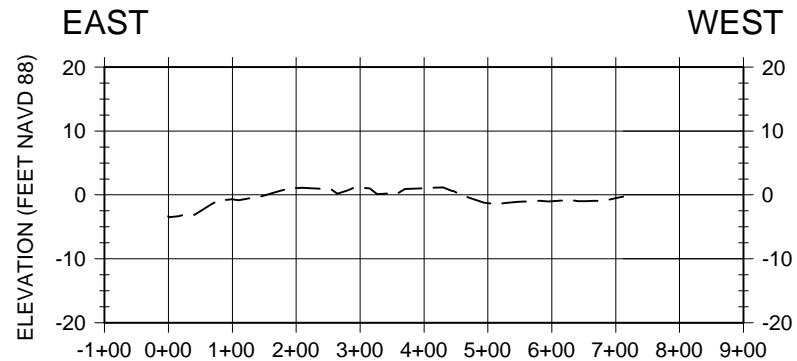
T-69



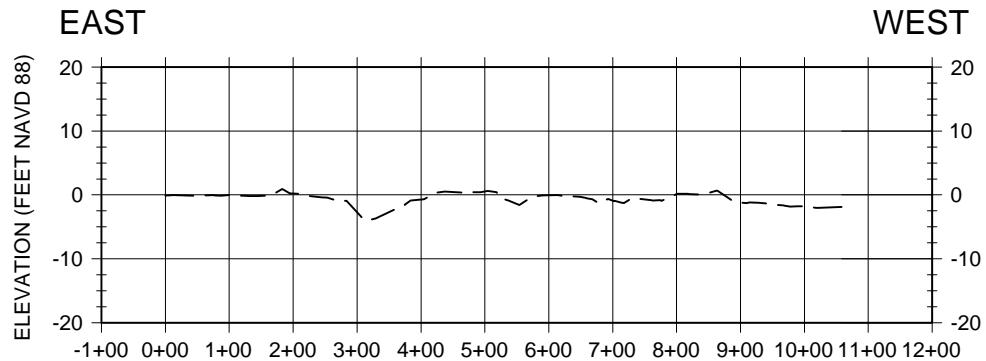
T-70



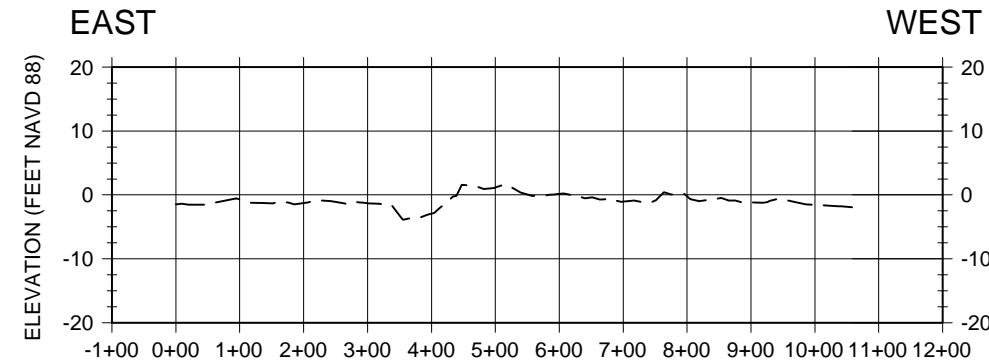
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REV.	DATE	DESCRIPTION	BY			
		DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.			
				APPROVED BY: JASON LANCLOS, P.E.		SHEET 41 OF 53



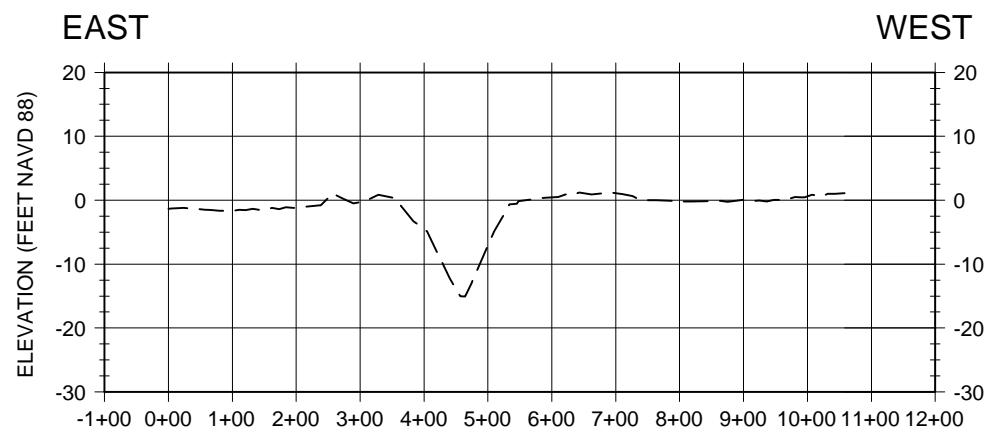
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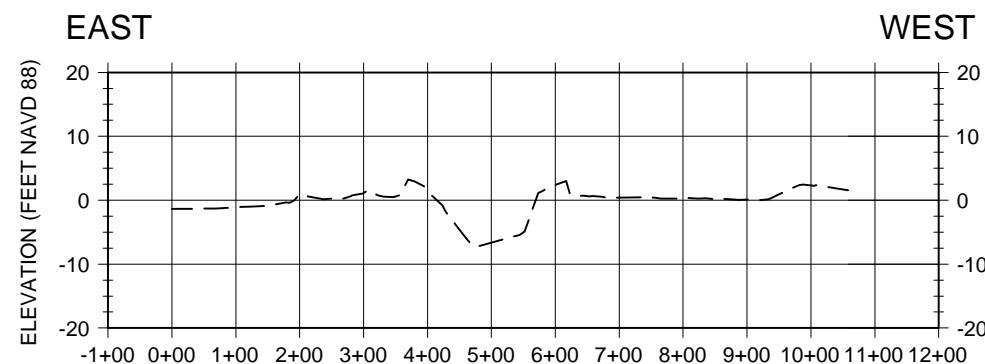
T-72



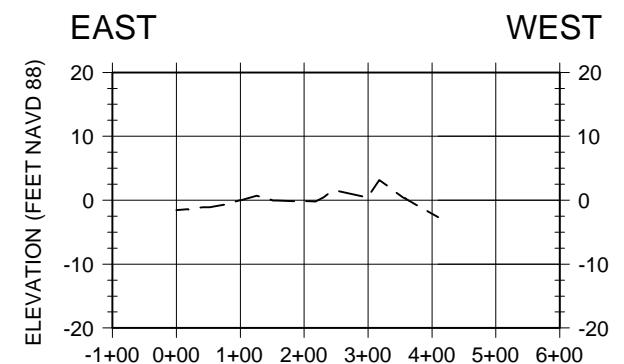
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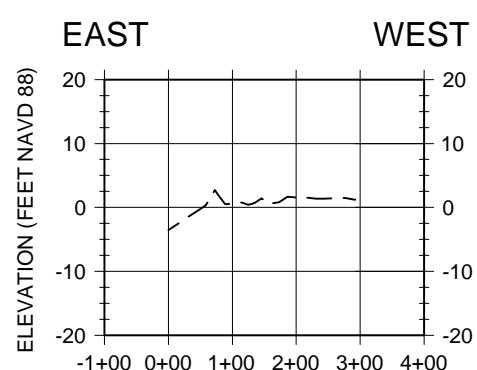
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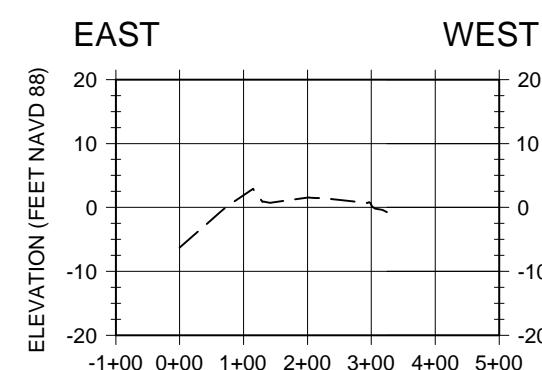
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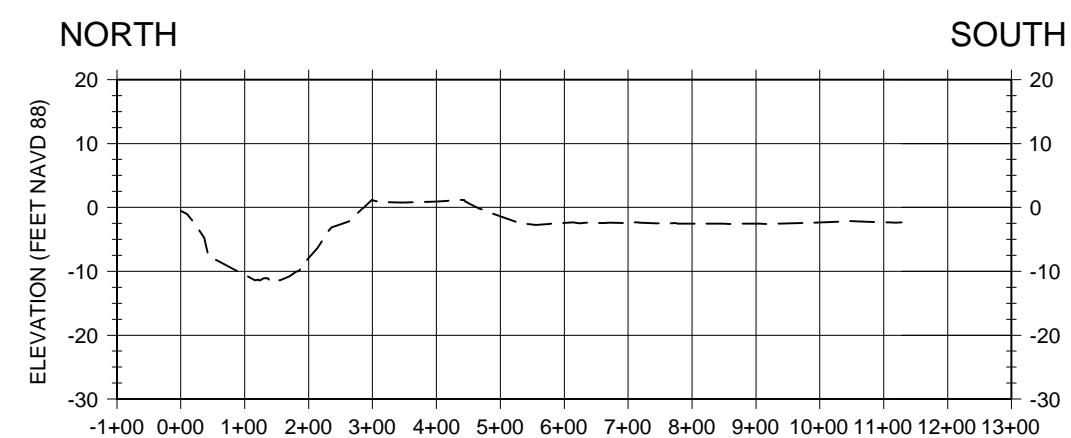
T-76



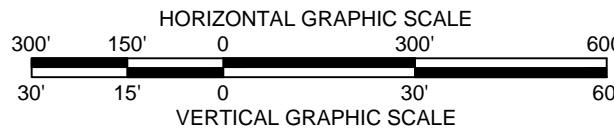
T-77



T-78



T-79



**COASTAL PROTECTION AND
RESTORATION AUTHORITY**

450 LAUREL STREET STREET
BATON ROUGE, LOUISIANA 70801

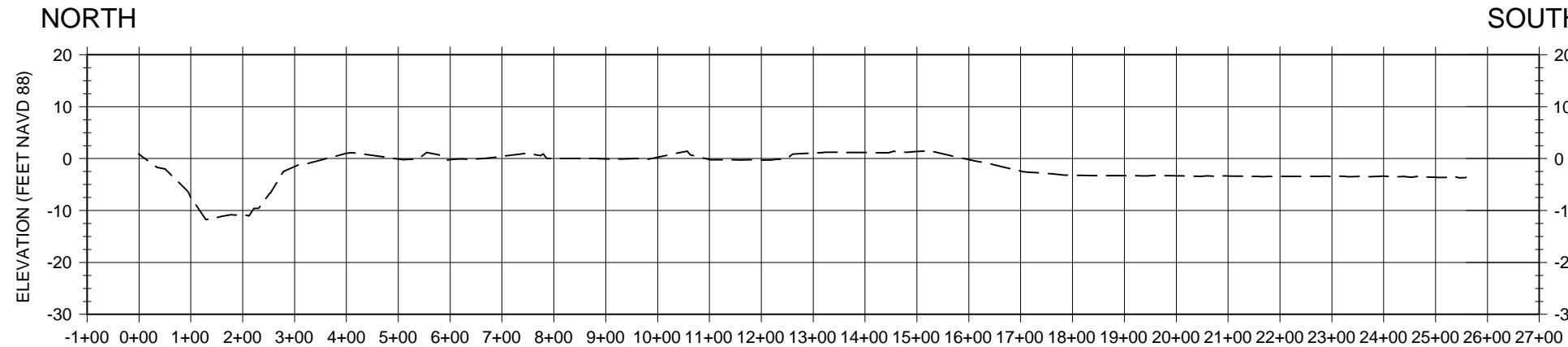
LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION

TE PROJECT NUMBER: TE-72

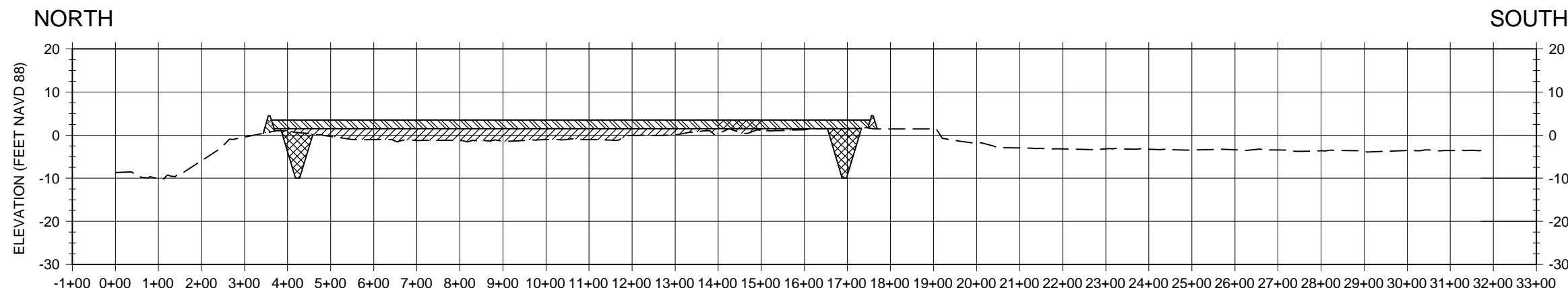
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CROSS SECTIONS

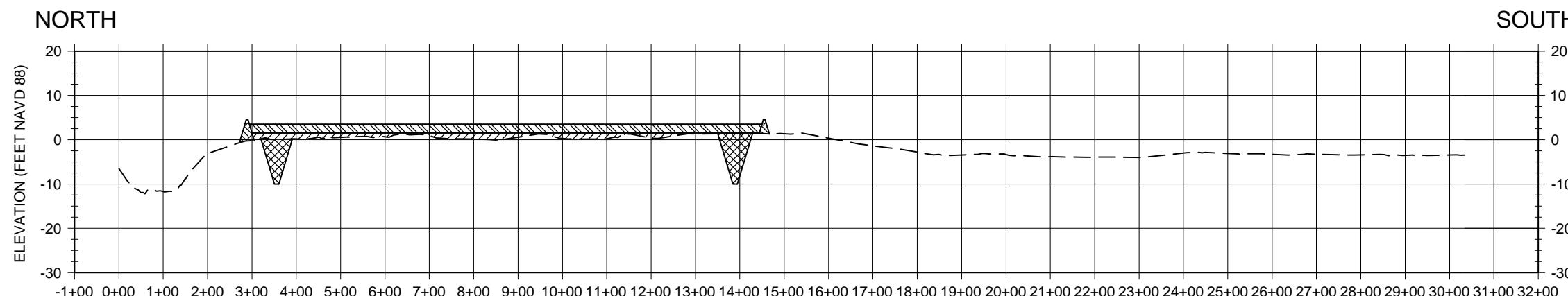
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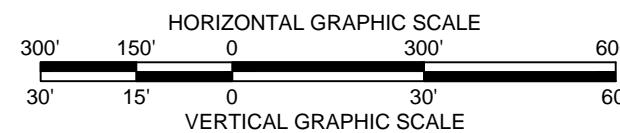
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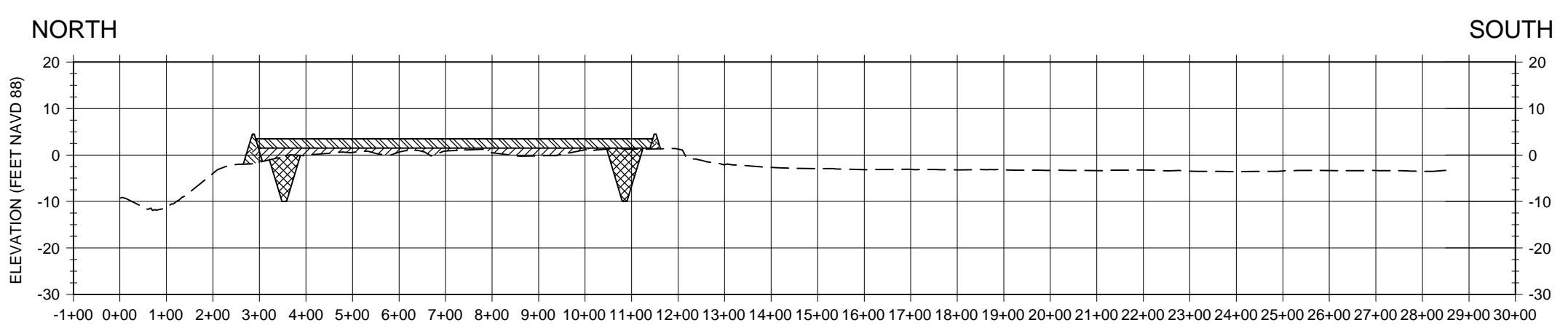
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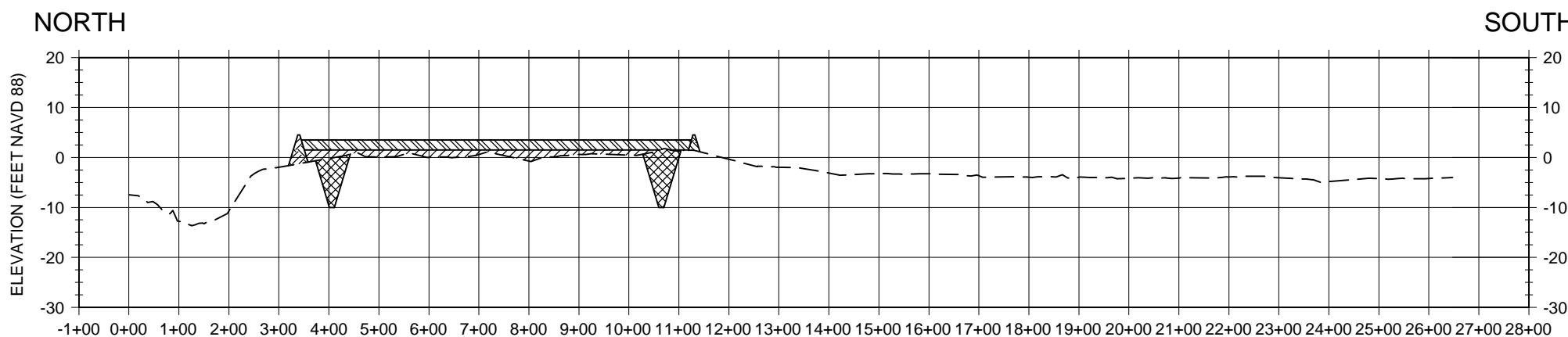
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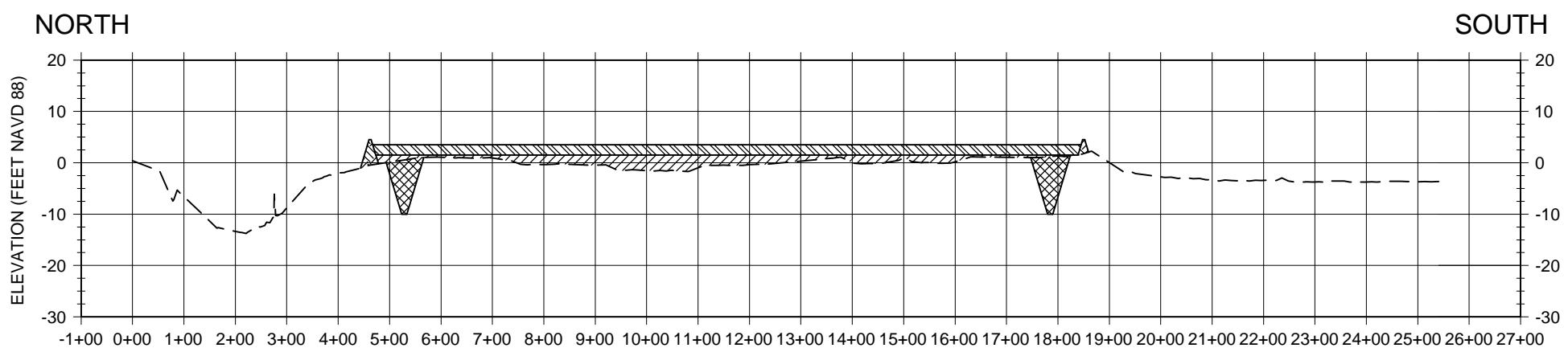
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					STATE PROJECT NUMBER: TE-72	
					FEDERAL PROJECT NUMBER: TE-72	
REV.	DATE	DESCRIPTION	BY	DRAWN BY: SHANE FAUST	DESIGNED BY: TRAVIS BYLAND, E.I.	DATE: APRIL 2012
					APPROVED BY: JASON LANCLOS, P.E.	SHEET 44 OF 53



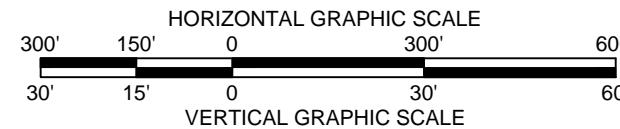
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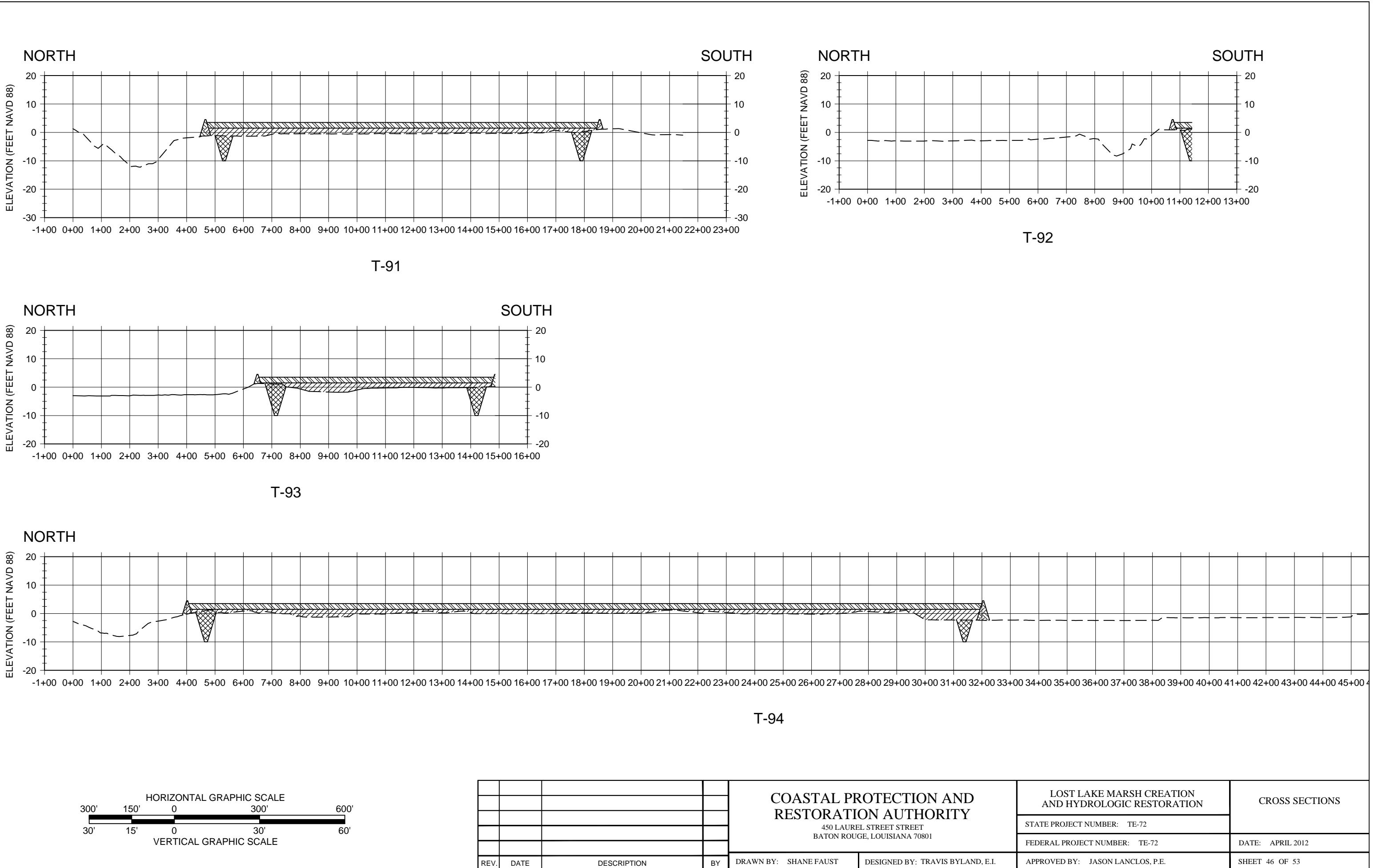
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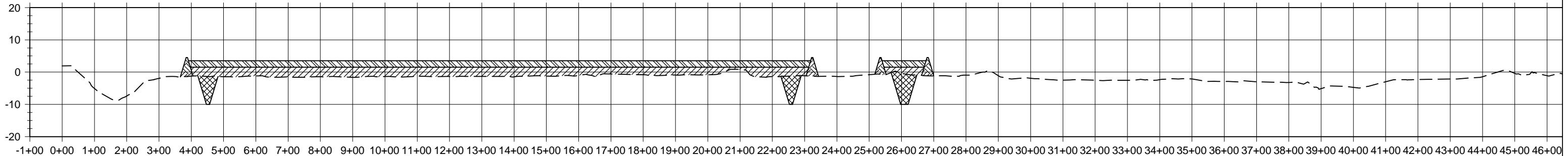
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REV.	DATE	DESCRIPTION	BY			
APPROVED BY:	JASON LANCLOS, P.E.					SHEET 45 OF 53

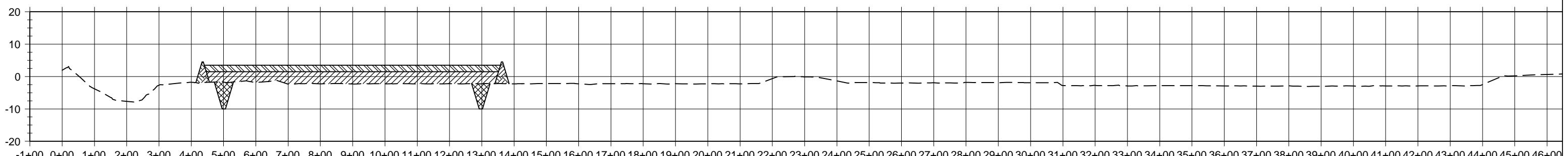


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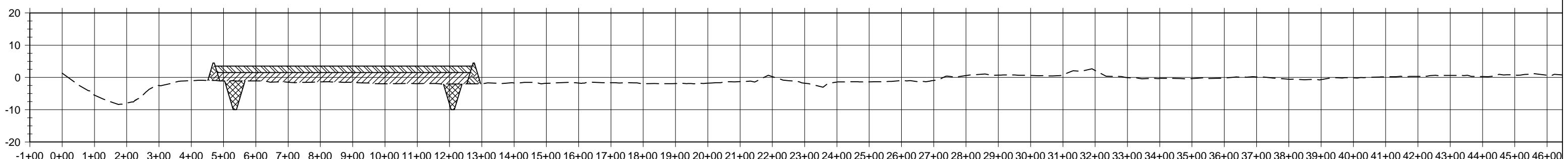
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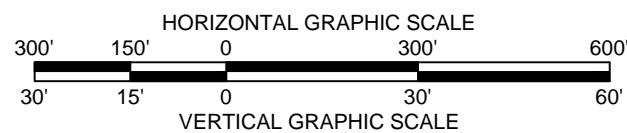


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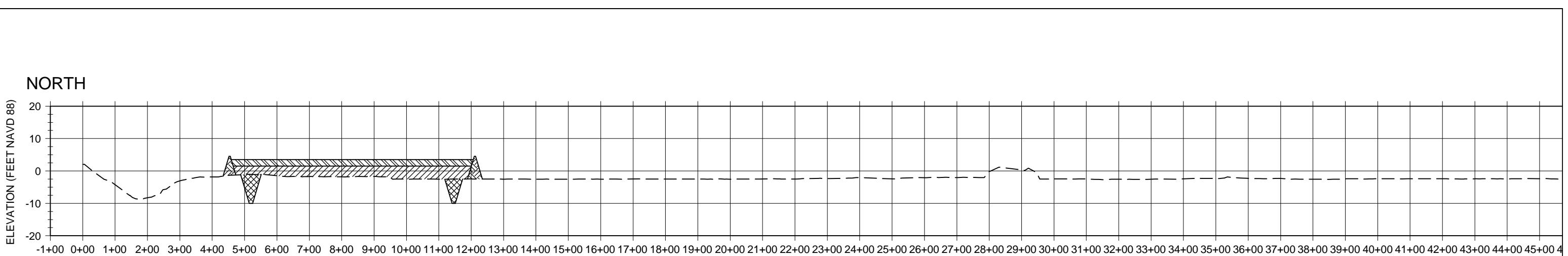
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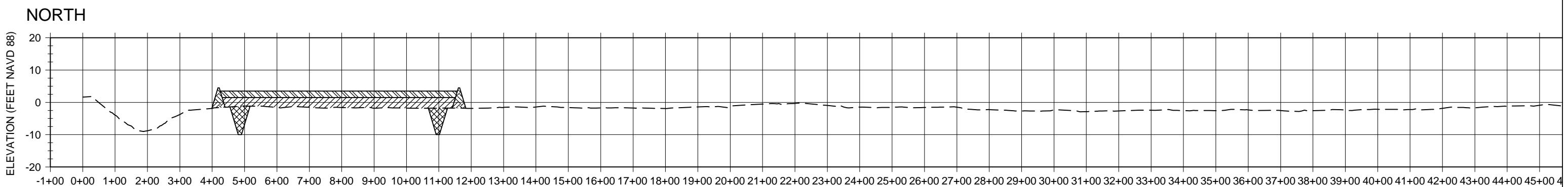
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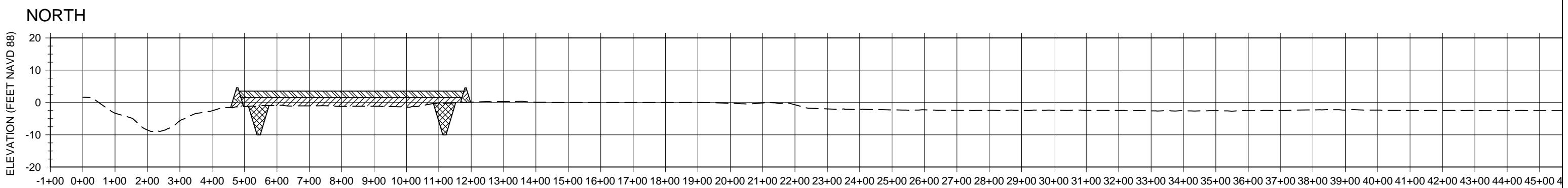
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REV.	DATE	DESCRIPTION	BY			



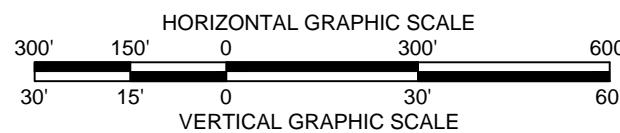
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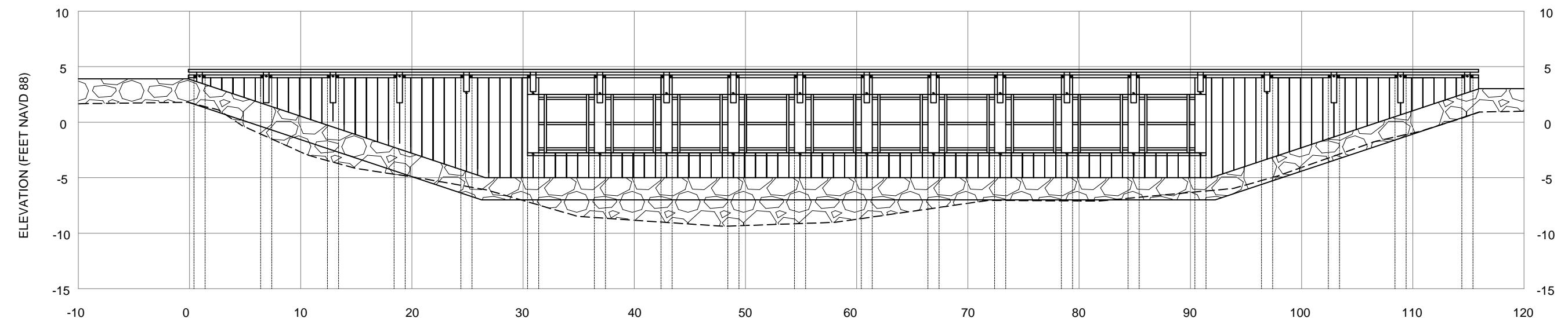
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T-100



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REV.	DATE	DESCRIPTION	BY			
APPROVED BY:	JASON LANCLOS, P.E.					SHEET 48 OF 53



WC-1



WC-3

HORIZONTAL GRAPHIC SCALE
10' 5' 0 10' 20'
10' 5' 0 10' 20'

VERTICAL GRAPHIC SCALE

REV.	DATE	DESCRIPTION	BY
			DRAWN BY: SHANE FAUST
			DESIGNED BY: TRAVIS BYLAND, E.I.
			APPROVED BY: JASON LANCLOS, P.E.

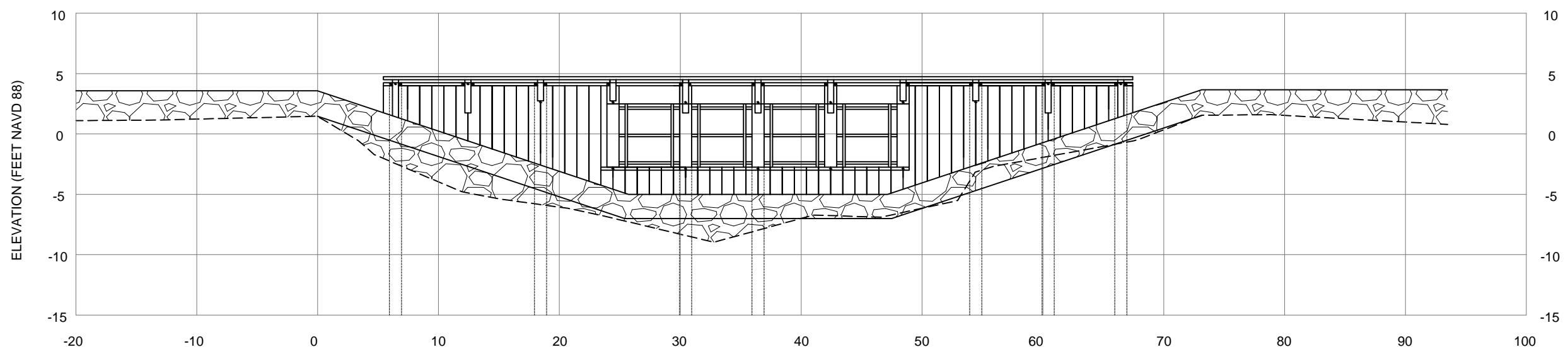
COASTAL PROTECTION AND RESTORATION AUTHORITY
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION
STATE PROJECT NUMBER: TE-72

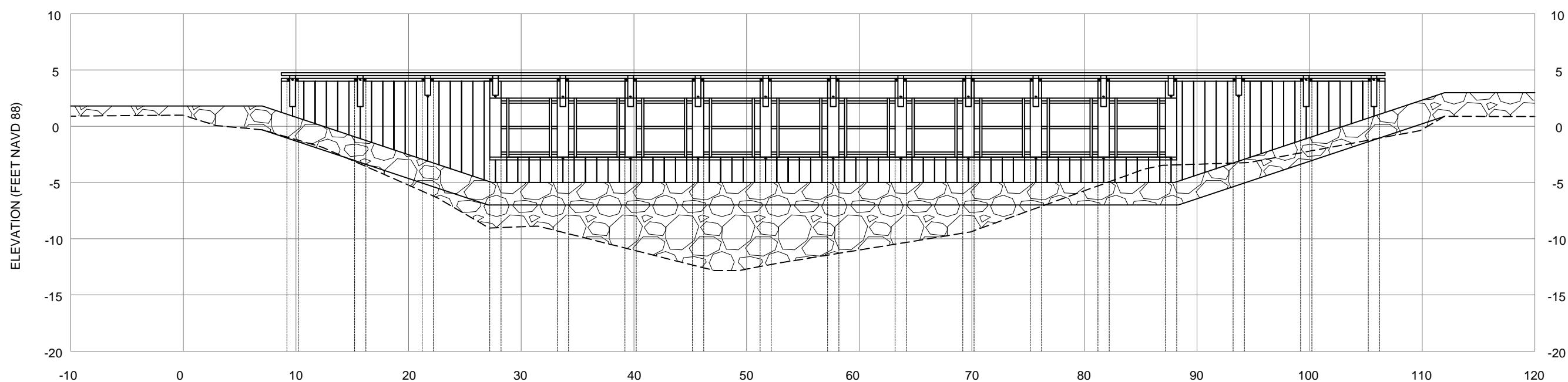
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DATE: APRIL 2012

FEDERAL PROJECT NUMBER: TE-72

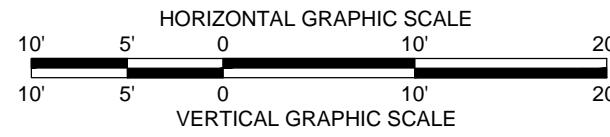
SHEET 50 OF 53



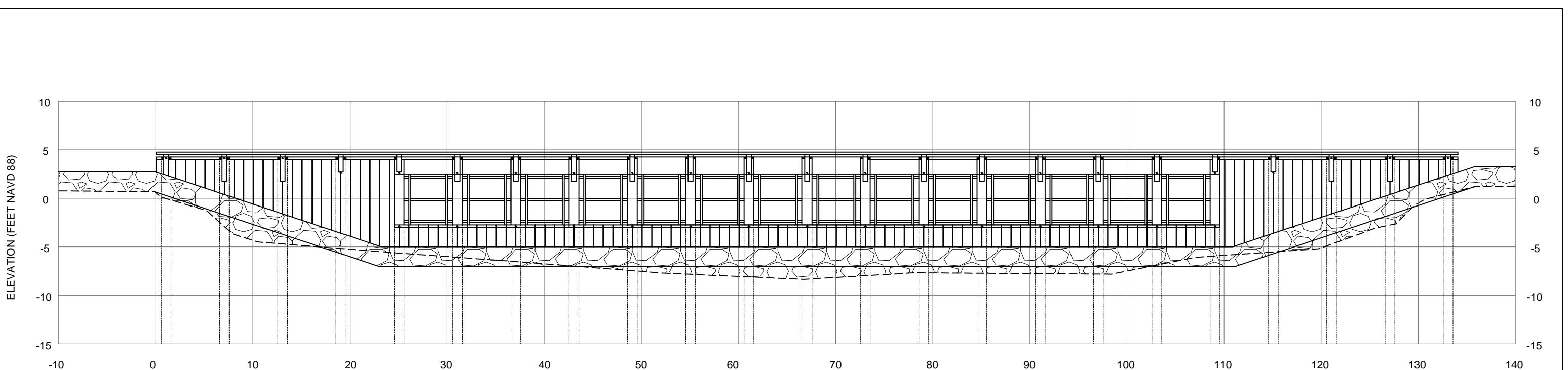
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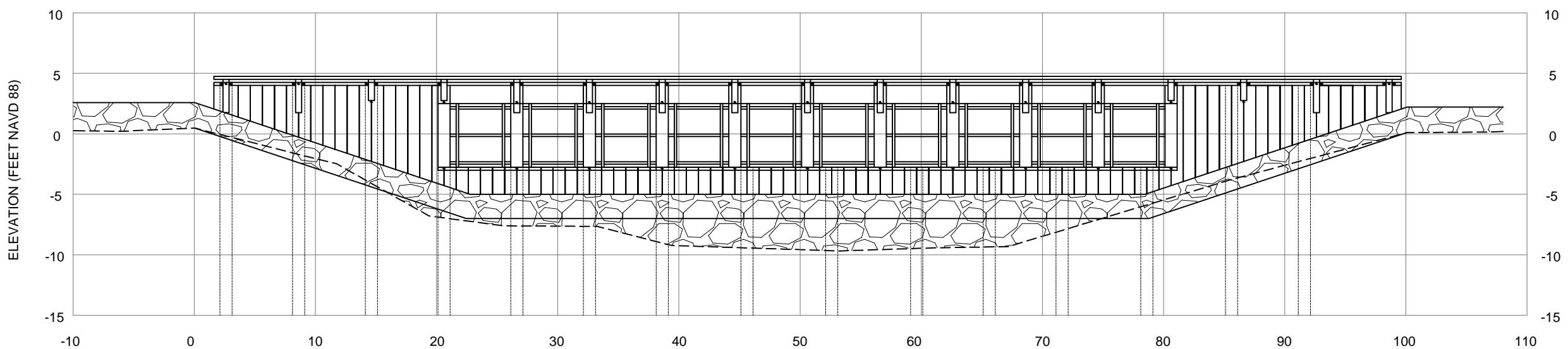
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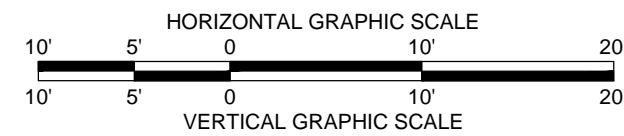
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					STATE PROJECT NUMBER: TE-72	
					FEDERAL PROJECT NUMBER: TE-72	DATE: APRIL 2012
REV.	DATE	DESCRIPTION	BY		DRAWN BY: SHANE FAUST DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E. SHEET 51 OF 53



WC-6



WC-10



REV.	DATE	DESCRIPTION	BY

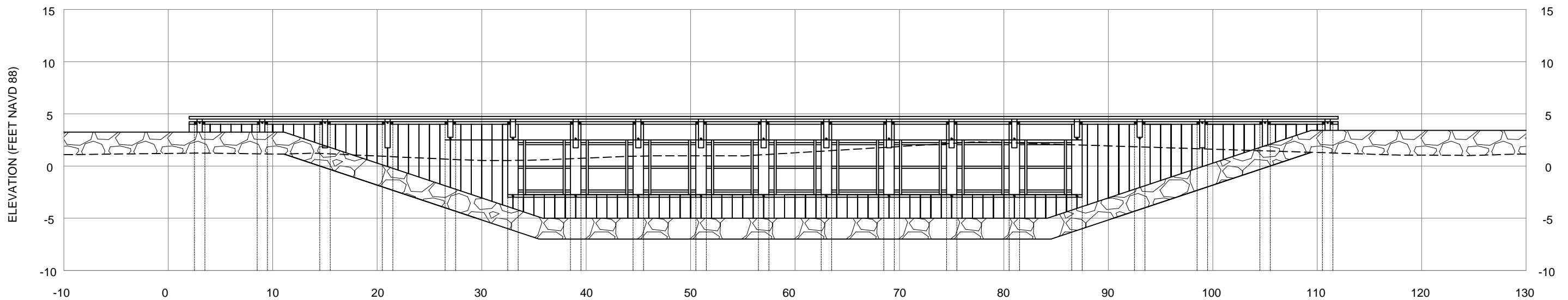
COASTAL PROTECTION AND
RESTORATION AUTHORITY
450 LAUREL STREET
BATON ROUGE, LOUISIANA 70801

LOST LAKE MARSH CREATION
AND HYDROLOGIC RESTORATION
STATE PROJECT NUMBER: TE-72

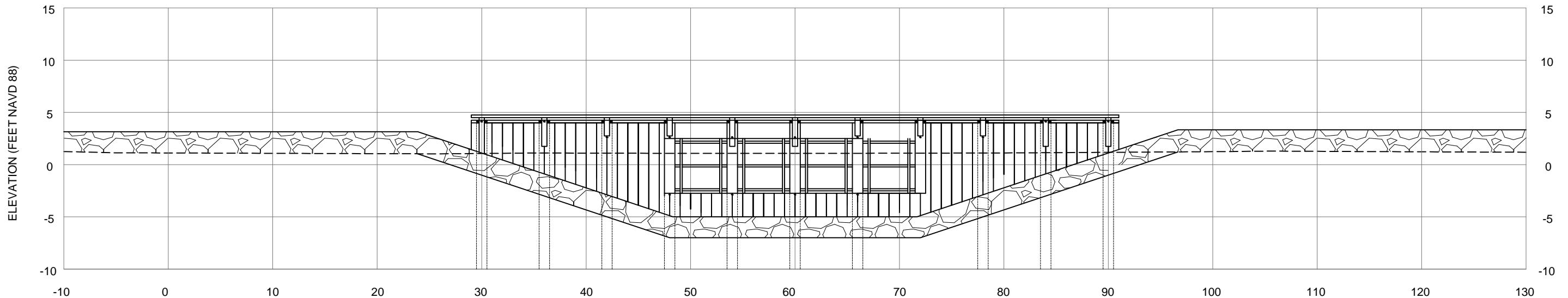
FEDERAL PROJECT NUMBER: TE-72

WEIR SECTIONS
DATE: APRIL 2012
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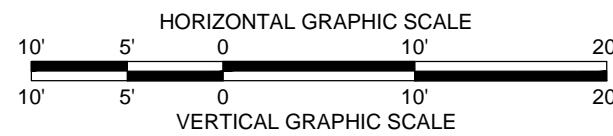
DRAWN BY: SHANE FAUST
DESIGNED BY: TRAVIS BYLAND, E.I.
APPROVED BY: JASON LANCLOS, P.E.



WC-12



WC-13



				COASTAL PROTECTION AND RESTORATION AUTHORITY 450 LAUREL STREET BATON ROUGE, LOUISIANA 70801	LOST LAKE MARSH CREATION AND HYDROLOGIC RESTORATION	WEIR SECTIONS
					STATE PROJECT NUMBER: TE-72	
					FEDERAL PROJECT NUMBER: TE-72	DATE: APRIL 2012
REV.	DATE	DESCRIPTION	BY		DRAWN BY: SHANE FAUST DESIGNED BY: TRAVIS BYLAND, E.I.	APPROVED BY: JASON LANCLOS, P.E. SHEET 53 OF 53