



HYDROTERRA
TECHNOLOGIES, LLC
LAND SURVEY AND HYDROGRAPHIC SOLUTIONS

SURVEY METHODOLOGY REPORT

March 9, 2017

STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION AUTHORITY (CPRA)

TOPOGRAPHIC AND BATHYMETRIC SURVEY OF THE WEST BELLE PASS
BARRIER HEADLAND RESTORATION (TE-52) PROJECT

LAFOURCHE PARISH, LOUISIANA

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Section 1: General Project Description

Project Overview

The West Belle Pass Barrier Headland Restoration (TE-52) project is located approximately 2 miles southwest of Port Fourchon and is positioned 0.3 miles west of the Belle Pass Rock Jetties in Lafourche Parish, Louisiana (See Figure 1). The TE-52 project area occupies 411 acres (166 ha) and created or enhanced beach, dune, and marsh habitats.

The Operations Division of the Coastal Protection and Restoration Authority of Louisiana (CPRA) is responsible for monitoring, maintaining, and operating projects that restore, create, enhance, and maintain coastal wetlands in Louisiana. Tasked with these functions, CPRA periodically evaluate orthometric heights to determine project success and ecosystem sustainability. Analysis of elevation change is an important tool used to evaluate geomorphic alterations in headland and barrier island systems because these ephemeral environments are shaped by erosional and longshore transport processes.

This Scope of Services provided for topographic and bathymetric orthometric height surveys of littoral, beach, washover, marsh, and bay environments for the West Belle Pass Barrier Headland Restoration (TE-52) project.

This survey was the second (2nd) in a series of five post-construction surveys to be conducted for the West Belle Pass Barrier Headland Restoration (TE-52) project. A pre-construction survey was completed in Aug 2008, the as-built survey was completed in Oct 2012, and the first (1st) post-construction survey was completed in Jan 2015. Elevation data collected as part of this scope will be used to evaluate the created environments, detect shoreface and headland migration trends, and provide data for an upcoming sheetpile removal and containment dike gapping maintenance event. The TE-52 project is located on the downdrift side of the Belle Pass Jetties; and as a result, very little sediment is expected to nourish the project area from the larger eastern portion of the Caminada-Moreau Headland.

Project Timeline

Project #	Group	Date
TE-52	SECURE LANDOWNER PERMISSION	01/12/2017
TE-52	INITIAL PROJECT SETUP	01/16/2017
TE-52	HYDROGRAPHIC SURVEY N-S TRANSECTS	01/24/2017
TE-52	TOPOGRAPHIC SURVEY N-S TRANSECTS, SURVEY SETTLEMENT PLATE SP-9	01/25/2017
TE-52	PROCESS AND QA/QC HYDROGRAPHIC TRANSECTS	01/25/2017
TE-52	TOPOGRAPHIC AND HYDRO BEACH TIE-IN SURVEY N-S TRANSECTS, SURVEY SETTLEMENT PLATE SP-1	01/26/2017
TE-52	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS	01/26/2017
TE-52	PROCESS AND QA/QC TOPOGRAPHIC AND HYDRO BEACH TIE IN TRANSECTS	01/27/2017
TE-52	HYDROGRAPHIC SURVEY N-S TRANSECTS, TOPOGRAPHIC SURVEY N-S AND E-W TRANSECTS, SHEET PIPE PROFILE, SURVEY SETTLEMENT PLATE SP-5	02/01/2017
TE-52	PROCESS AND QA/QC TOPOGRAPHIC AND HYDROGRAPHIC TRANSECTS	02/01/2017
TE-52	TOPOGRAPHIC SURVEY N-S TRANSECTS, SURVEY SETTLEMENT PLATES SP-2, SP-4 AND SP-7	02/02/2017
TE-52	PROCESS AND QA/QC TOPOGRAPHIC AND HYDROGRAPHIC TRANSECTS	02/03/2017
TE-52	COMPLETE TOPOGRAPHIC SURVEY N-S TRANSECTS	02/03/2017
TE-52	PROJECT MANAGEMENT AND BUDGET ANALYSIS	02/08/2017
TE-52	CREATE CAD FILES TO REPRESENT SURVEY DATA	02/08/2017
TE-52	PREPARE SURVEY METHODOLOGY REPORT AND SENT TO CLIENT FOR REVIEW AND COMMENT	02/28/2017
TE-52	COMPLETE CAD DRAWINGS FOR SUBMITTALS	03/01/2017
TE-52	CONVERT DATA FILES TO SUBMITTAL FORMAT AND SEND TO CLIENT FOR REVIEW AND COMMENT	03/02/2017
TE-52	REMAP HYDROGRAPHIC TRANSECTS FOR CREATION OF CROSS SECTIONS	03/02/2017

Vicinity Map



Figure 1

Section 2: Project Planning

Data Collection Reference Systems and Project Control

Horizontal Datum (Epoch): NAD 83 (CORS) Louisiana South US Feet.

Vertical Datum (Epoch): GPS derived NAVD 88 (GEOID 12A) Feet.

All surveys performed were adjusted and calibrated to the specified secondary monument TE-23-SM-01 listed below (See **Appendix A** for Data Sheet), using industry accepted RTK GPS equipment and methodologies as outlined in this document.

TE-23-SM-01 was statically surveyed into the LCZ GPS network using the Geoid12A model. This monument is identified by the Louisiana State Plane Coordinate System South Zone (LSZ), the North American Horizontal Datum of 1983 (NAD 83), and the North American Vertical Datum of 1988 (NAVD88).

Section 3: Bathymetric and Topographic Survey

Hydroterra Technologies collected bathymetric and topographic data using a standard echo-based surveying technique (fathometer) and Real Time Kinematic (RTK) methods. Boat-based echo soundings data was corrected to compensate for water-level fluctuations caused by surface waves, list, and astronomical tides. In addition, a sampling rate of at least 5 Hz (5 points/second) was used during data collection. The tide correction was determined from Real time RTK corrections.

All topographic and bathymetric RTK surveys were conducted as per the January 2013 Contractors Guide to Minimum Standards as required by the Coastal Protection and Restoration Authority of Louisiana (CPRA).

Equipment

Equipment utilized during survey:

- One (1) Trimble Survey Grade RTK System including but not limited to 5700, R7, R8-2, R8-3 and R-10 Receivers (Includes Base and Rover and accessories).
- One (1) Teledyne Odom MK III Fathometer with 200kHz Transducer
- One (1) YSI Cast Away CTD Probe (Velocimeter)
- One (1) Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod.
- One (1) Desktop Computer with Hypack© Navigation Software Version 2016.
- One (1) Closed Cabin Survey Vessel.
- One (1) Airboat

The manufacturer's specification sheet can be found in **Appendix B** at the end of this document.

Field Data Acquisition Methodology

Survey Control

The survey began with the location and verification of the project survey monument TE-23-SM-01. Once the project monument was located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Data Acquisition

Topographic and bathymetric surveys were performed on the littoral, beach, dune, marsh, and bay environments (See Figure 2).

Hydroterra Technologies topographically surveyed the subaerial (terrestrial) segments of the 37 N-S and 4 E-W survey transects defined in figure 2 using Real Time Kinematic (RTK) methods. E-W transect 40 was a topographic profile survey of the top (crown) of an existing sheetpile wall that is slated for removal. The topographic portions of all transects were merged with the bathymetric portions at the land/water interfaces. The topographic portions began in the wading depth part of the shoreface and extended landward along the survey transects. Moreover, the topographic and bathymetric portions of these transects were separated by no more than 25 ft. All topographic points were collected at significant breaks in the slope (i.e., dune crests; dune toes; seaward berm; at all changes in elevation of 0.5 feet or greater, etc.) so that the resulting data accurately depict the headland morphology. Survey points were no more than 25 feet apart and may be closer depending on island or structure topography. N-S Transects 8-21 bisect the northern containment dike and extended 100 ft past the edge of the bay shoreline. All other N-S cross sections (1B-7 and 22-39) terminated at the northern limits of their respective transect line. The E-W survey transects (36-39) were conducted topographically if water depth allows.

Bathymetric data was collected using a standard echo-based surveying technique (fathometer) and Real Time Kinematic (RTK) methods. Boat-based echo soundings data were corrected to compensate for water-level fluctuations caused by surface waves, list, and astronomical tides. In addition, a sampling rate of at least 5 Hz (5 points/second) was used during data collection. The tide correction was determined by Real time RTK Corrections.

The bathymetric survey included the subaqueous (aquatic) segments of the 37 N-S and 4 E-W cross sectional transects. The survey began at the southern boundary of each transect line and proceeded north for all 37 N-S transects while the 4 E-W survey transects began at the western boundary of each transect line and proceeded east. The bathymetric segments were merged with the topographic survey at the land/water interface. Moreover, the point separation between the topographic and bathymetric portions of each transect did not exceed 25 ft.

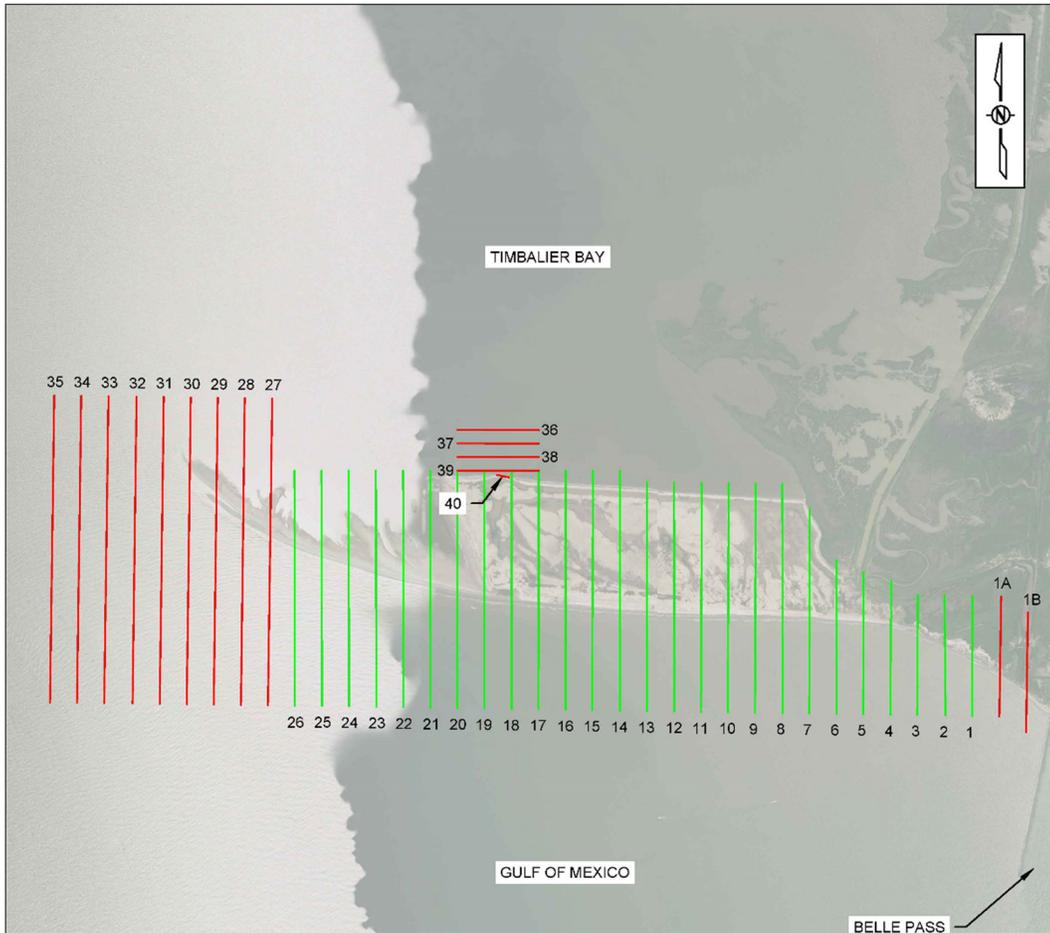


Figure 2

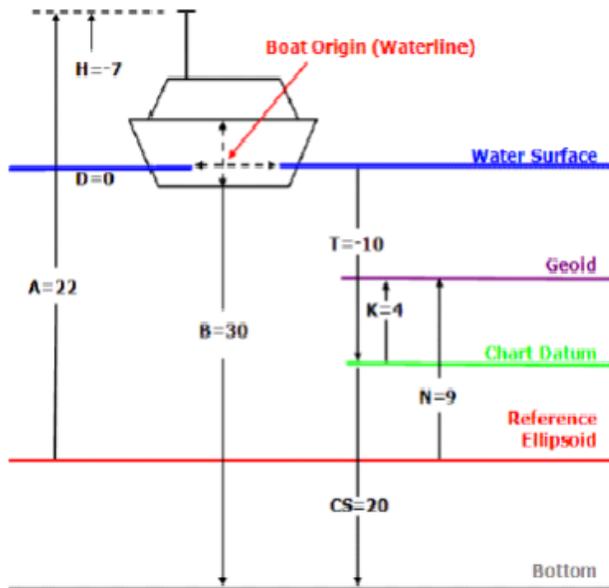
Data Processing

All bathymetric data was processed using the Hypack© 2016 Single Beam Editor software.

All topographic data was processed using Trimble’s Geomatics Office software version 1.62.

All processed data was represented visually using an AutoCAD Civil 3D software version specified in the specifications for analysis.

Equipment Calibration for Bathymetric Surveys



Once the survey control is verified, the RTK system and the echo sounder transducer will be hard mounted to the survey vessel using specially designed mounts welded to the hull on the bow or stern of the vessel.

The RTK antenna and transducer positional offsets are then measured and entered into the Hypack© Navigation Software for the tide and draft corrections to be applied.

A “Bar Check” of this system is then performed. A velocity probe is lowered into the water within the project site down to the sea floor to obtain velocities throughout the water column and

determine an average. The average water velocity is then entered into the echo sounder and set. Then, a minimum 1'x1' plate is lowered below the transducer at 5' increments down to the deepest survey depth to obtain the correct draft and index of the transducer and to calibrate the water velocities at each 5' increment. The “Bar Check” is recorded electronically in the Odom E-chart Software.

Section 4: RTK Topographic Settlement Plate Survey

Hydroterra Technologies surveyed six (6) settlement plates (SP-1, SP-2, SP-4, SP-5, SP-7 and SP-9) inside the TE-52 project area using Real Time Kinematic (RTK) methods (Figure 3).

Ten (10) settlement plates were originally installed for the project, but the beach and dune features have experienced substantial shoreline erosion since construction and their settlement plates are currently in the Gulf of Mexico. Therefore, settlement plates SP-3, SP-6, and SP-10 were not surveyed.

A single elevation point was taken at the top of each settlement plate pipe on the threaded or welded cap and a single elevation point was taken on the ground surface at the base of the settlement plates. Also, the condition of the settlement plates was described (is the pipe leaning, damaged, etc.) in the field notes.

Equipment

Equipment utilized during survey:

- One (1) Trimble Survey Grade RTK System including but not limited to 5700, R7, R8-2, R8-3 and R-10 Receivers (Includes Base and Rover and accessories)
- One (1) Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod.
- One (1) Airboat

The manufacturer's specification sheet can be found in **Appendix B** at the end of this document.

Field Data Acquisition Methodology

Survey Control

The survey began with the location and verification of the project survey monument TE-23-SM-01. Once the project monument was located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Data Acquisition

A single elevation point was taken at the top of each settlement plate pipe on the threaded or welded cap and a single elevation point was taken on the ground surface at the base of the settlement plates. Also, the condition of the settlement plates was described (is the pipe leaning, damaged, etc.) in the field notes.

Data Processing

All topographic data was processed using Trimble's Geomatics Office software version 1.62.

All processed data was represented visually using an AutoCAD Civil 3D software version specified in the specifications for analysis.



Figure 3

Section 6: Deliverables

Upon completion of the survey, a Survey Methodology Report was provided to CPRA (for review and comments) in Microsoft Word format. After any comments were incorporated into the report, two copies of the final report were bound and written to a compact disc (CD) and inserted within the 8 ½” x 11” bound hard copy of the report.

The hard copies were signed and stamped by the Registered/Professional Land Surveyor in the State of Louisiana who was directly involved with the project

The Survey Methodology Report shall contain and not be limited to the following information:

- ***Project Description***
- ***Planning and layout of the GPS Survey***
- ***Chronological Summary of Work***
- ***Information on Secondary Monuments used as reference stations***
- ***The GPS RTK Survey including quality control (elevation check) procedures***
- ***Equipment used for data collection***
- ***Downloading and Processing procedures***

Field Notebook Records

The information to be included in the field notebook will be as follows:

- ***Project name***
- ***Date of survey***
- ***Crew members***
- ***RTK Base Monument name***
- ***Sketch of Location***
- ***RTK point numbers, descriptions, and elevations observed***

Drawing Files

The following 11”x17” drawings were completed as a requirement of this scope, a plan view drawing and a transect cross section views. The plan view drawing included a recent aerial image of the West Belle Pass vicinity, the survey transects, settlement plates, and the TE23-SM-01 benchmark. The cross section drawings illustrated the elevation cross section results from the survey. All variables were clearly labeled and accurately plotted. The drawing files were provided in a digital format such as AutoCAD (*.dwg or *.dxf) and written to the compact disk (CD) along with two hard copies each bound in the final Survey Methodology Report and folded to fit within the 8 ½” x 11” methodology report.

Additional information included on the Plan View and Elevation Contour Drawings were as follows:

- ***Project Name***
- ***Contractor Name***
- ***Digital aerial or USGS Quadrangle with monuments plotted correctly***
- ***Monument Names***
- ***Horizontal and Vertical Datum***
- ***Map Date***
- ***Map Scale***
- ***North Arrow***

Survey Data

The topographic and bathymetric survey point files and survey track lines data were delivered by Hydroterra Technologies in CPRA's LASARD format.

For each elevation data set two (2) sets of point files were delivered in a .csv format – a State Plane in feet and a Universal Transverse Mercator (UTM) in meters.

This survey bisected two (2) data delivery grids (9025029125 and 9037529125) as a result the point data was also separated spatially into different point files by delivery grid and utilized the LAZARD File Naming Convention.

Hydroterra Technologies prepared and delivered one (1) draft copy of the deliverables (excluding the inserted CD) described above to CPRA. This draft copy was sent to the following CPRA representative for review:

Glen Curole

CPRA

1440 Tiger Drive, Suite B

Thibodaux, LA 70301

TEL: (985) 447-0995

FAX: (985) 447-0997

Drafts were reviewed by CPRA and two (2) final deliverables were delivered to CPRA two weeks after receipt of comments.

CERTIFICATION

All deliverables were certified by a professional land surveyor licensed by the State of Louisiana.

APPENDIX A SURVEY CONTROL SHEET



VICINITY MAP Scale: 1" = 2000'

2013 NAIP Imagery provided by USDA Farm Service Agency

Station Name: "TE23-SM-01"

Location: Station is located southeast of Port Fourchon, 40' east of the centerline of La. Hwy. 3090 and 65' northeast of bridge approach near Pass Fourchon.

Monument Description: NGS style floating sleeve monument; datum point set on 9/16" stainless steel sectional rods driven 96 feet to refusal, set in sand filled 6" PVC pipe set in concrete with access cover.

Stamping: TE23-SM-01

Installation Date: September 2003 **Date of Survey:** May 2014

Monument Established By: Morris P. Hebert, Inc.

For: Louisiana Department of Natural Resources, CRD

Adjusted NAD 83 Geodetic Position

Lat. 29°06'42.2851" N

Long. 90°11'26.9637"W

Adjusted NAD 83 Datum LSZ (1702) Feet

N= 224,296.37

E= 3,645,688.81

Adjusted UTM, NAD 83 Datum (Zone 15) Meters

N = 3,223,628.371

E= 773,376.916

Adjusted NAVD88 (2011) Height

Elevation Geoid12A = 7.30 ft (2.224 mtrs)

Elevation Geoid99 = 8.05 feet (2.454 Mtrs)

Ellipsoid Height = -21.569 mtrs

Geoid 12A Height = -23.793 mtrs

Ellipsoid Height = -21.569 Mtrs.

Geoid99 Height = -24.023 Mtrs.



Adjusted Position Established by T. Baker Smith, LLC for the Coastal Protection and Restoration Authority.

APPENDIX B EQUIPMENT DATA SHEETS

TRIMBLE R8 GNSS SYSTEM

KEY FEATURES

Advanced satellite tracking with Trimble 360 receiver technology

Includes Trimble Maxwell 6 chips with 440 channels

Unmatched GNSS tracking performance

Web user interface and remote configuration

Base and rover communications options to suit any application



THE INDUSTRY LEADING TOTAL GNSS SOLUTION

The Trimble® R8 GNSS system has long set the bar for advanced GNSS surveying systems. Through advanced Trimble 360 tracking technology and a comprehensive set of communication options integrated into a flexible system design, this integrated GNSS system delivers industry-leading performance. For surveyors facing demanding RTK applications, the Trimble R8 is an invaluable GNSS partner.

TRIMBLE 360 RECEIVER TECHNOLOGY

Future-proof your investment

Powerful Trimble 360 receiver technology integrated in the Trimble R8 supports signals from all existing and planned GNSS constellations and augmentation systems providing unmatched GNSS tracking performance. With this leading-edge technology, it is now possible for surveyors to expand the reach of their GNSS rovers into areas that were previously too obscured, such as under trees and in dense urban areas.

With two integrated Trimble Maxwell™ 6 chips, the Trimble R8 offers an unparalleled 440 GNSS channels. Also capable of tracking carrier signals from a wide range of satellite systems, including GPS, GLONASS, Galileo, BeiDou (COMPASS), and QZSS, the Trimble R8 provides a robust solution for surveyors.

The CMRx communications protocol in the Trimble R8 provides unprecedented correction compression for optimized bandwidth and full utilization of all of the satellites in view, giving you the most reliable positioning performance.

Designed with the future in mind, Trimble 360 technology is optimized to receive future planned signals as the number of available satellites continues to grow. With Trimble 360 technology, the Trimble R8 delivers business confidence with a sound GNSS investment for today and long into the future.

FLEXIBLE SYSTEM DESIGN

The Trimble R8 combines the most comprehensive feature set into an integrated and flexible system design for demanding surveying applications. Connect directly to the controller, receive RTK network corrections, and connect to the Internet via comprehensive communication options. With a built-in transmit/receive UHF radio, the Trimble R8 enables ultimate flexibility for rover or base operation. As a base station, the internal NTRIP caster provides you customized access¹ to base station corrections via the Internet.

¹ Cellular modem required.

Trimble's exclusive Web UI™ eliminates travel requirements for routine monitoring of base station receivers. Now you can assess the health and status of base receivers and perform remote configurations from the office. Likewise, you can download post-processing data through Web UI and save additional trips out to the field.

AN INDUSTRY LEADING FIELD SOLUTION

If you're seeking the industry leading field solution, pair the Trimble R8 GNSS receiver with one of our powerful Trimble controllers, such as the Trimble TSC3, Trimble CU or Trimble Tablet Rugged PC featuring Trimble Access™ field software. These rugged controllers bring the power of the office to the field through an intuitive Windows-based interface.

Trimble Access field software offers numerous features and capabilities to streamline the flow of everyday surveying work. Streamlined workflows such as Roads, Monitoring, Mines, and Tunnels—guide crews through common project types and allows crews to get the job done faster with less distractions. Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK).

Need to get data back to the office immediately? Benefit from real-time data sharing via Trimble Access Services, now available with any valid Trimble Access maintenance agreement.

Back in the office, seamlessly transfer your field data using Trimble Business Center. Edit, process, and adjust collected data with confidence.

The Trimble R8 GNSS system—the industry leader for GNSS surveying applications.





KEY FEATURES

Proven GNSS technology from Trimble

Internal GSM/GPRS modem for fast Internet connection and data transfer

Lightweight, ergonomic, and cable free

Designed to optimally support the Trimble GNSS infrastructure solution



The Trimble® R8 GNSS VRS™ Rover is a multi-channel, multi-frequency GNSS (Global Navigation Satellite System) receiver, antenna, and data-link radio combined in one compact unit. The VRS rover combines advanced receiver technology with a proven system design to provide maximum accuracy and productivity.

TRIMBLE R-TRACK TECHNOLOGY FOR COMPREHENSIVE GNSS SUPPORT

Powered by an enhanced RTK engine, Trimble R-Track™ technology in the Trimble R8 GNSS VRS Rover supports the modernized GPS L2C and L5 signals as well as GLONASS L1/L2 signals. This extensive GNSS support is capable of providing surveying professionals with real field benefits.

With the world's GNSS in constant development, surveying businesses small and large can be confident that investment in a Trimble GNSS system is protected. Trimble, already proven in GPS technology, will continue to lead the industry in GNSS support.

PROVEN SYSTEM DESIGN

From its powerful Trimble field software and controller to the receiver itself, the Trimble R8 GNSS VRS Rover's overall design has been tried, tested, and proven. It's rugged, lightweight and cable free for unsurpassed ergonomics and productivity in the field. Additionally, the Trimble R8 GNSS VRS rover consumes very little power and includes internal memory. These features also assist you in the field, enabling you to work longer without changing batteries or transferring data.

The Trimble R8 GNSS VRS Rover works optimally with Trimble controllers such as the Trimble CU or Trimble® TSC2® controller. Both controllers run industry-standard Microsoft® Windows™ operating systems, which are familiar and easy to use. They are also flexible for running both Trimble field software and other specialized applications.

The VRS rover includes an internal GSM/GPRS cell modem for wireless connection to the Internet via NTRIP (Networked Transport of RTCM via Internet Protocol). Quickly and easily access GNSS data from a Trimble GNSS infrastructure solution over the Internet. No additional cellphone or external modem is required.

AN IMPORTANT COMPONENT OF A TRIMBLE GNSS INFRASTRUCTURE SOLUTION

Trimble® GNSS Infrastructure is the most established and widely used GNSS infrastructure solution available. Additionally, all components of Trimble GNSS infrastructure—including the Trimble R8 GNSS VRS Rover—are designed to work together. This means the solution is scalable; that is, it will grow with you as your business needs change. And the solution is part of Trimble's Connected Site model, where products, techniques, services, and relationships combine to take your business to all-new levels of achievement.

With numerous fully modeled networks all over the world and dedicated GNSS infrastructure engineers on hand to support your unique needs, Trimble GNSS infrastructure solutions are always a wise investment. Surveying professionals like you can rely on Trimble's experience and expertise in this field, and be confident that choosing a Trimble GNSS infrastructure solution is the right decision.





The CastAway™-CTD with profiling and analysis software



The YSI CastAway-CTD is a lightweight, easy to use hydrographic instrument designed for quick and accurate conductivity, temperature, and depth profiles. Starting with a unique six-electrode array and a flow-through cell, the CastAway makes use of commercial Bluetooth and GPS technology to make an instrument that is as usable as it is accurate.



The palm-sized CastAway-CTD can easily be deployed by hand. Each cast is referenced with both time and location using its built-in GPS receiver. Latitude and longitude are acquired both before and after each profile. Plots of conductivity, temperature, salinity and sound speed versus depth can be viewed immediately on the CastAway's integrated color LCD screen in the field.

The CastAway is a multifunctional tool that incorporates the most modern technology available - yet is simple to use. It is designed for CTD profiling down to 100 m and is easy to deploy.

Raw data can be easily downloaded via Bluetooth to a Windows computer for detailed analysis and/or export at any time. Rugged, non-corrosive housing, AA battery power and tool-free operation reflect the technician-friendly pedigree of the CastAway-CTD. So do the simple, intuitive features – everything an operator needs to know about deploying the CastAway-CTD, viewing data and downloading the files fits in the lunchbox-sized carrying case.



Best used in:

- Coastal Oceanography
- Hydrology
- Aquaculture/Fisheries

When needed for:

- Saltwater Intrusion
- Surveying/Hydrography
- Sound Velocity Profiles
- Field Sensor Verification
- Estuarine Research

*The CastAway-CTD
Instant, reliable data in the
palm of your hand!*

Pure
Data for a
Healthy
Planet.®

- GPS position, date and time
- Fast sampling and sensor response
- Waterproof interface works in and out of the water
- Bluetooth wireless communication
- No user calibration required
- No tools, computers or cables required!

www.y.si.com/castaway

▶ ECHOTRAC™ MKIII



MODEL DF3200

- ▶ Interchangeable paper chart or color LCD
- ▶ Frequency agile (both channels)
- ▶ Internal data storage and playback with color LCD
- ▶ Four serial ports and Ethernet interface
- ▶ Optional built-in DGPS
- ▶ AC/DC power input

 **TELEDYNE
ODOM HYDROGRAPHIC**
A Teledyne Technologies Company



APPENDIX C FIELD NOTES

Job: 2171001 Files 01 & 17 Jan 10

W. Belle Pass Barrier Headland Rest. CTE

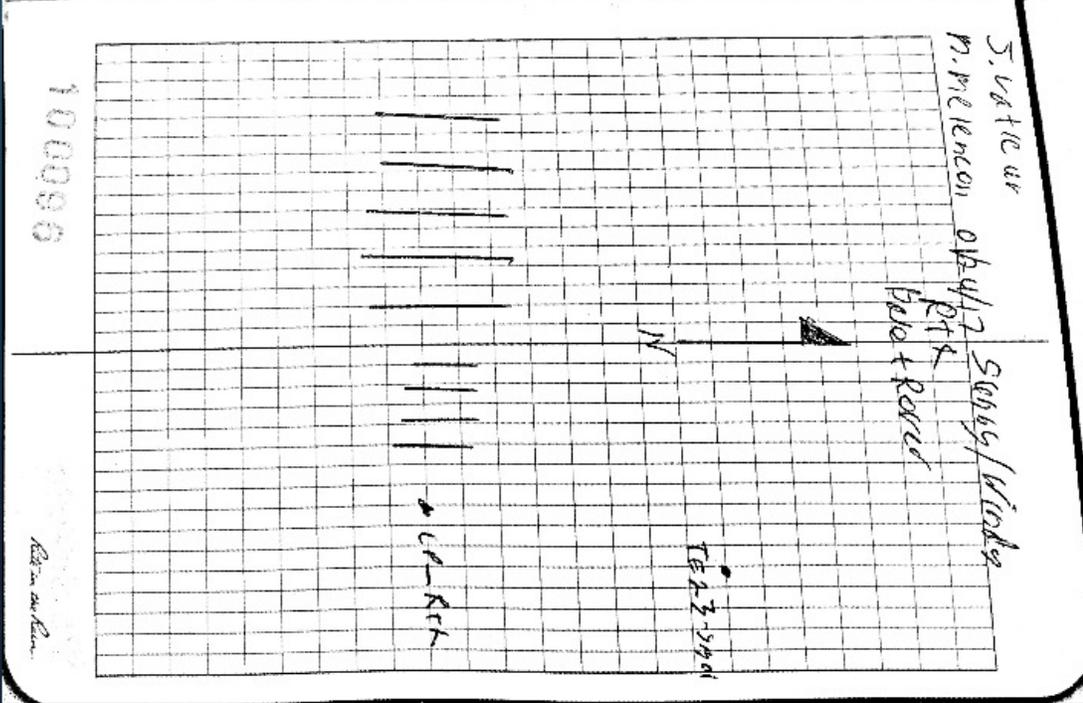
CPRH

TE 23-SM-01 @ 1.5M

PT# 003-004 Water top
 004-007 A8C
 007-24 Water top
 024R-CP Rtk Set Point
 25-27- Water top

Drect = L.O.
 Velocity = 4978
 Vertical = 8.1'

1000096

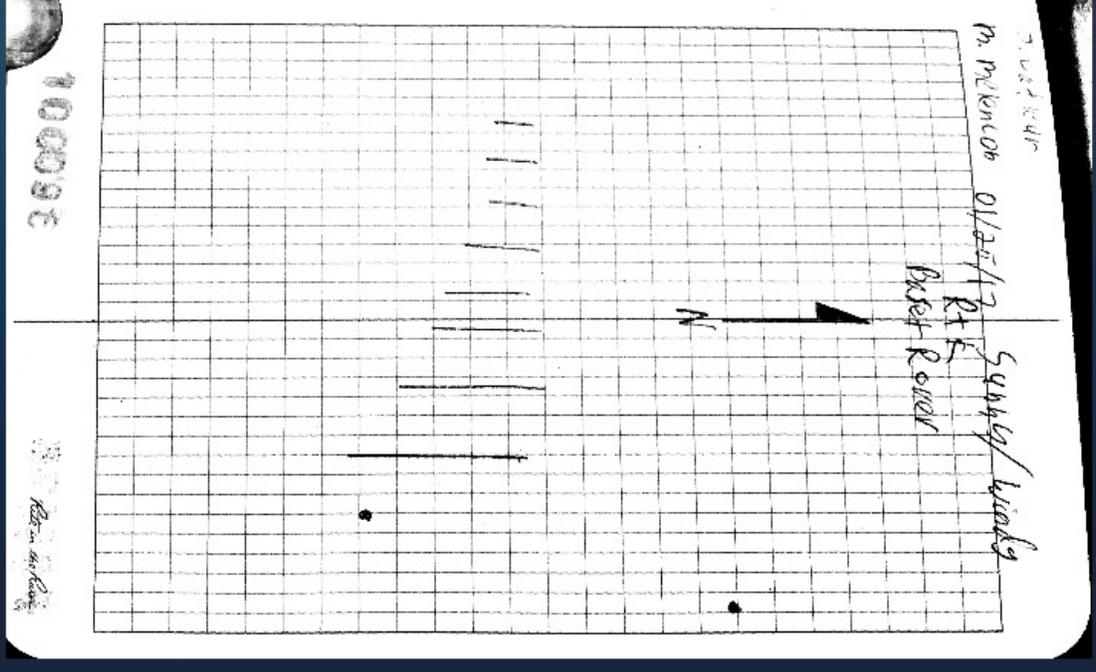


TOP: 0171001
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 C.P.A.
 W. Belle Pass Barrier
 Headland Rest. (TE-52)

Basalt play 175M-025K @ 1.5M
 (check) TE 23-5M-01 ~~015~~ IN rthool

Pt # 002 - 773 N6 poles on level
 Marsh Transsects

NO 010986

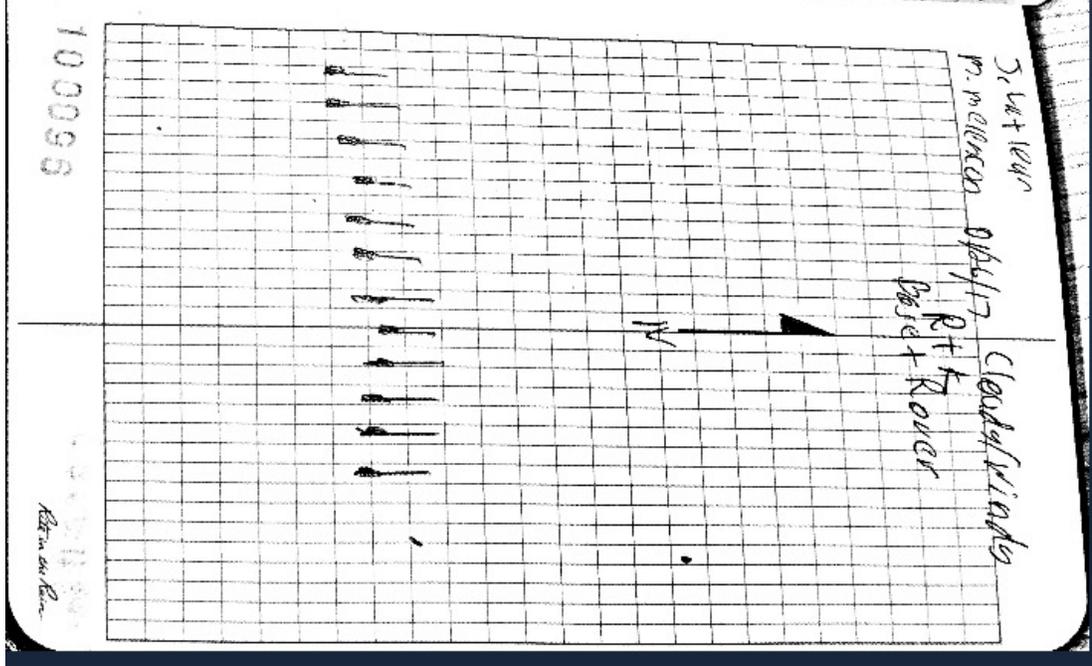


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 CPRA
 W Belle Pass Barrier
 Headland Rest. (TE-52)

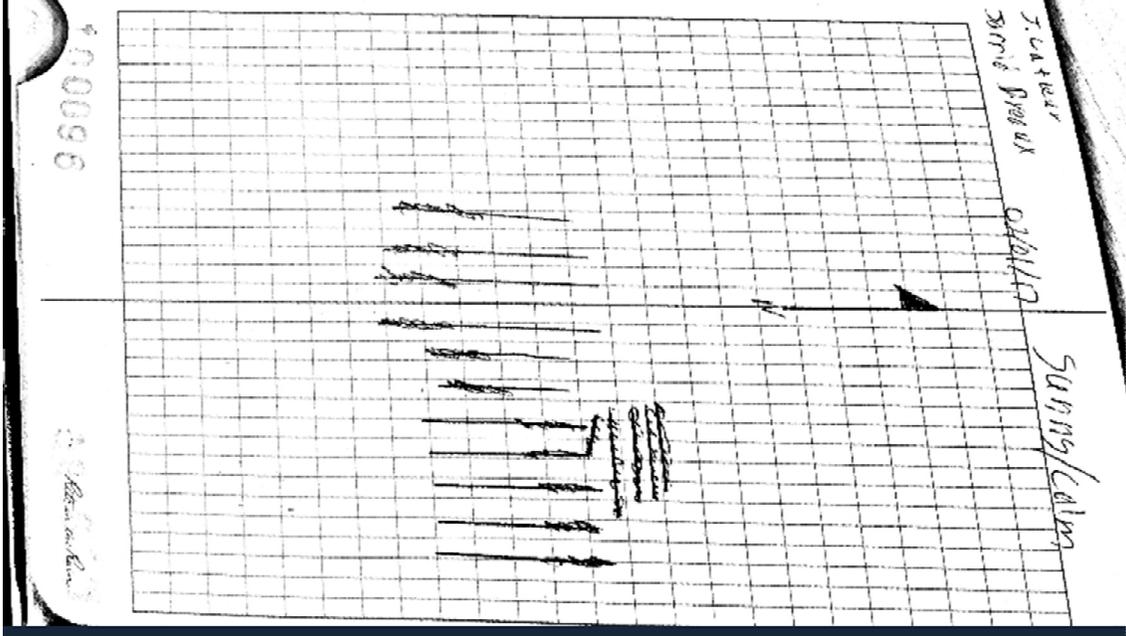
Based on 17 5M 0417 @ 12:51
 Checked Teas-5M-01 @ 2:27 PM 11/001

Pt H 1008 - 802 Pole Sounded Bell
 Transsects up to 6 W/F.

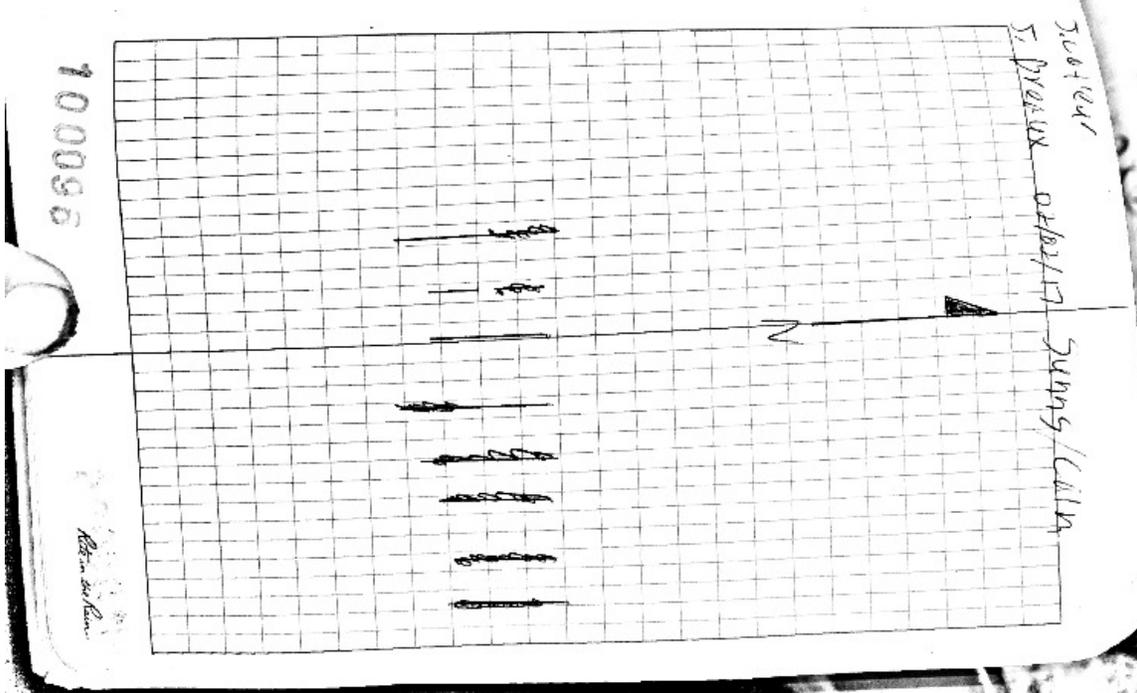
1100996



SB, 2171001
 File: 020112JML
 C P R A
 W Belle Pass Barrier
 Headland Rest. (TE-52)
 Ran Hydro on Remaining
 Transacts.
 Pale Sounded Transacts on Northside
 Base @ 01247 JML 024 R @ 17M
 Cased TE 23 - SW - 01 @ 2m Pthool
 PTH 002-004 Water Top 8.2m
 PTH 004-009 ~~Water Top~~ 0'
 PTH 009-063 Water Top 8.7'
 PTH 064-845 WG 8'
 PTH 846-870 Sheet Pile P'
 Vort = 8.7
 velocity = 48.25
 #00096



JOB: 2171001
 FILE: 020R175ML02
 CPRA
 W Belle Pass Barrier
 Headland Rest. (DE-52)
 Pole Soundings
 Run Hydro on Remaining
 Town Sect 5.
 Based on 0124D JMC 024 R 01.5M
 Check TE 23-51M -01 @ 24 FF#001
 1910
 FF# 001 - 890 No Pole Sounded
 N, S Town Sect 5.
 1100095



TPB: 217101

Files 020317 JPH

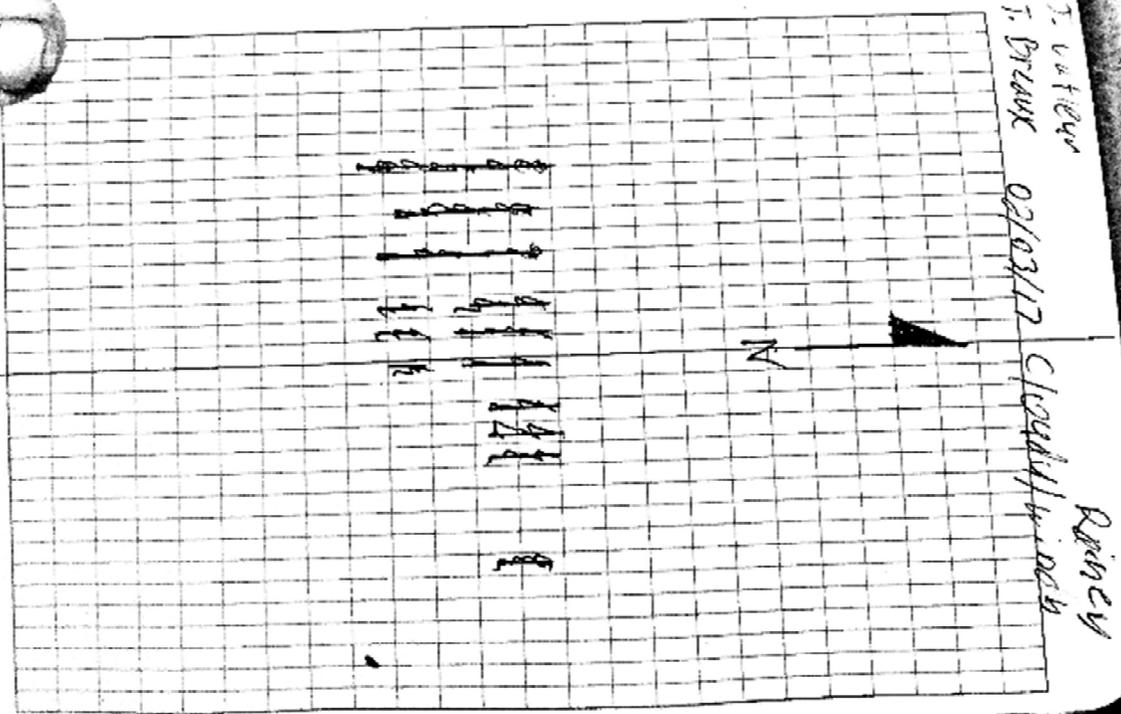
CRA

W Belle Pass Barrier

Headland Rest. (E-58)

Base @ 012417 ML over @ 1.5m
check TE-58-5M-01 Dam Pit 001

Pt H002 - 886 Poles and all Lines
Remain. Ring.



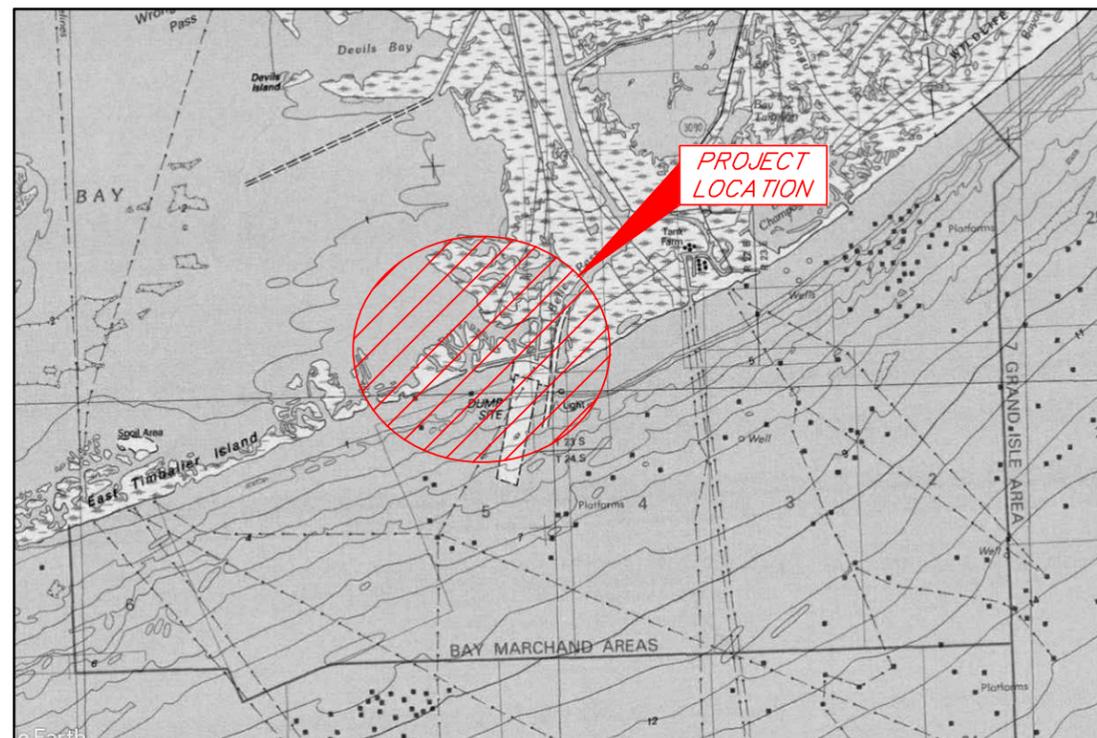
Rest. on Dam

STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION AUTHORITY (CPRA)

**WEST BELLE PASS BARRIER HEADLAND
RESTORATION PROJECT (TE-52)**

TOPOGRAPHIC AND BATHYMETRIC SURVEY
JANUARY - FEBRUARY 2017

LAFOURCHE PARISH, LOUISIANA



VICINITY MAP (N.T.S.)

INDEX TO SHEETS

SHEET NO.	DESCRIPTION
1	TITLE PAGE
2	OVERALL PLAN VIEW
3 - 4	SURVEY PLAN VIEWS
5 - 14	CROSS-SECTION VIEWS
15	SHEETPILE WALL DETAIL



THIS MAP REPRESENTS AN ACTUAL FIELD SURVEY MADE UNDER DIRECT SUPERVISION OF THE UNDERSIGNED.

Keith J. Roberts

KEITH J. ROBERTS, PLS # 4780
HYDROTERRA TECHNOLOGIES, LLC
LAND SURVEYING FIRM NO. 614
202 JACOBS RUN
SCOTT, LOUISIANA 70583
(337) 706-8219

REVISED BY:	DATE:
PLAN SCALE SCALE: NTS 	
DATE: 03/02/2017	JOB# 2171001



STATE OF LOUISIANA (CPRA)
WEST BELLE PASS HEADLAND
RESTORATION PROJECT (TE-52)
TOPOGRAPHIC AND BATHYMETRIC SURVEY
TITLE PAGE
LAFOURCHE PARISH, LA

PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583

FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

SHEET: 1 OF 15

Survey Control Point Table				
Point Name	Northing (ft) NAD83 LA SOUTH ZONE	Easting (ft) NAD83 LA SOUTH ZONE	Description	Elevation NAVD88 (USft)
TE23-SM-01	224296.37'	3645688.81'	CP_MON TE23-SM-01	7.30'
012417JML025R	215809.13'	3634096.04'	90D NAIL SET IN GROUND	2.46'

LOUISIANA SOUTH ZONE - NAD83 HPGN DATUM
DERIVED VIA GPS KINEMATIC OBSERVATIONS

TIMBALIER BAY

PORT FOURCHON

(W-E BASELINE) 7+50
NORTHING: 220945.50
EASTING: 3623285.71

(W-E BASELINE) 0+00
NORTHING: 220195.50
EASTING: 3623284.65

(N-S BASELINE) 180+24
NORTHING: 215907.61
EASTING: 3615764.17

(N-S BASELINE)

0+00 (N-S BASELINE)
NORTHING: 215645.92
EASTING: 3633786.37

GULF OF MEXICO



© Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2017 Microsoft Corporation

NOTES:

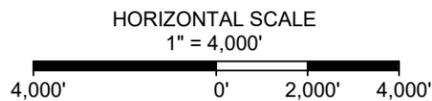
- ALL HORIZONTAL COORDINATES ARE BASED ON LOUISIANA SOUTH ZONE - NAD83 HPGN DATUM, US SURVEY FOOT AS DERIVED FROM PROJECT CONTROL MONUMENT "TE23-SM-01."
- ELEVATIONS ARE BASED ON NAVD 88 US SURVEY FEET (GEOID12a) AS DERIVED FROM PROJECT CONTROL MONUMENT "TE23-SM-01."
- THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF SURVEY.

LEGEND

- TE-52 SURVEY TRANSECTS
- TE-52 EXTENDED TRANSECTS
- SURVEY CONTROL POINT

REVISED BY:

DATE:



STATE OF LOUISIANA (CPRA)
WEST BELLE PASS HEADLAND
RESTORATION PROJECT (TE-52)
TOPOGRAPHIC AND BATHYMETRIC SURVEY
OVERALL PLAN VIEW
LAFOURCHE PARISH, LA

PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583

DATE: 03/02/2017

JOB# 2171001

FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

SHEET: 2 OF 15

LOUISIANA SOUTH ZONE - NAD83 HPGN DATUM
DERIVED VIA GPS KINEMATIC OBSERVATIONS

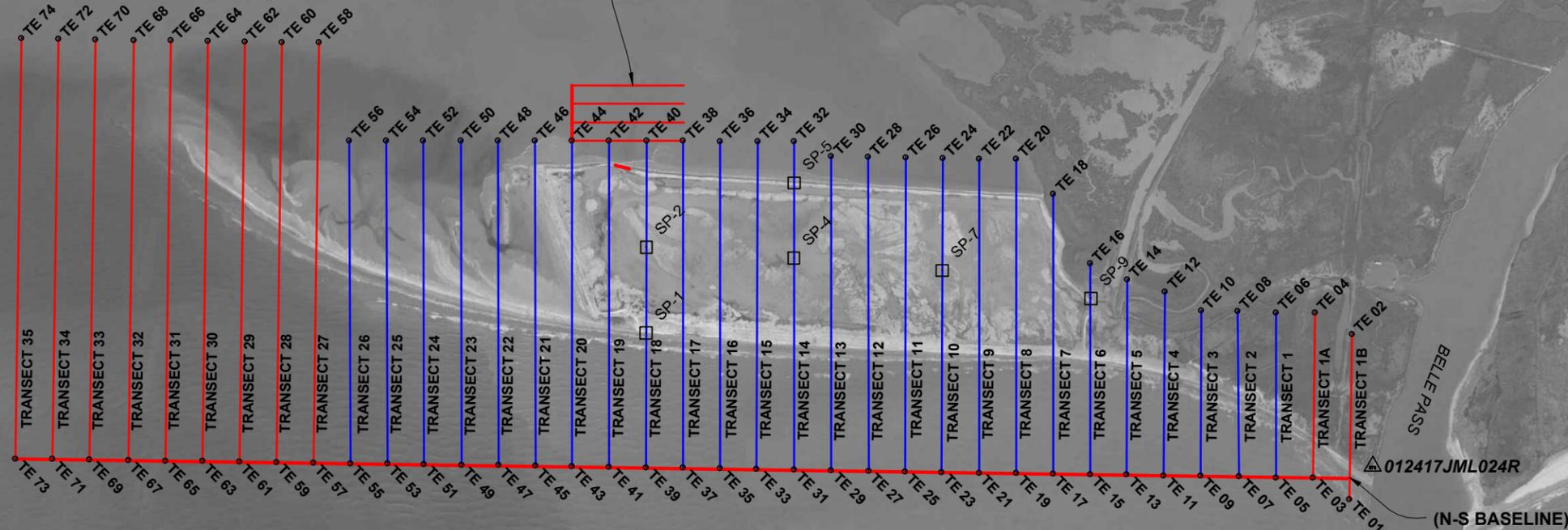
TIMBALIER BAY

TE-52 SETTLEMENT PLATE POINT TABLE					
Point Name	Northing (ft)	Easting (ft)	Elevation (ft) Top of Post	Elevation (ft) Ground @ Sett Plate	Settlement Plate
012617jml259	217605.09	3624282.83	10.34	-1.23	SP-1
020217jml981	218761.07	3624285.20	7.41	2.18	SP-2
020217jml606	218615.19	3626278.28	8.15	2.13	SP-4
020117jml359	219630.52	3626280.69	9.84	4.69	SP-5
020217jml278	218448.14	3628281.99	8.09	2.29	SP-7
012517JML735	218069.38	3630289.82	7.65	3.54	SP-9

Survey Transect Endpoint Table		
Point Name	Northing (ft)	Easting (ft)
TE 01	215364.42'	3633782.23'
TE 02	217583.48'	3633814.92'
TE 03	215653.27'	3633287.01'
TE 04	217875.14'	3633319.67'
TE 05	215654.26'	3632787.16'
TE 06	217882.29'	3632792.02'
TE 07	215668.63'	3632295.24'
TE 08	217897.75'	3632273.64'
TE 09	215676.06'	3631772.43'
TE 10	217904.61'	3631783.81'
TE 11	215681.17'	3631276.88'
TE 12	218164.23'	3631292.67'
TE 13	215692.17'	3630776.65'
TE 14	218325.60'	3630780.77'
TE 15	215696.12'	3630284.89'
TE 16	218540.82'	3630280.85'
TE 17	215703.28'	3629780.19'
TE 18	219480.55'	3629786.44'
TE 19	215711.88'	3629284.45'
TE 20	219951.66'	3629280.71'
TE 21	215716.67'	3628778.46'
TE 22	219955.70'	3628785.73'
TE 23	215725.42'	3628276.21'
TE 24	219962.08'	3628288.05'
TE 25	215730.66'	3627781.04'
TE 26	219966.63'	3627790.01'
TE 27	215742.17'	3627288.90'
TE 28	219977.64'	3627284.12'
TE 29	215749.76'	3626783.07'
TE 30	219984.41'	3626785.01'
TE 31	215758.53'	3626284.49'
TE 32	220191.25'	3626284.92'
TE 33	215765.75'	3625774.68'
TE 34	220191.96'	3625787.43'
TE 35	215773.79'	3625284.95'
TE 36	220192.67'	3625281.52'
TE 37	215783.85'	3624781.10'
TE 38	220193.37'	3624786.44'

Survey Transect Endpoint Table		
Point Name	Northing (ft)	Easting (ft)
TE 39	215786.84'	3624285.15'
TE 40	220194.08'	3624288.27'
TE 41	215798.35'	3623783.33'
TE 42	220194.80'	3623781.88'
TE 43	215806.08'	3623281.89'
TE 44	220195.50'	3623284.65'
TE 45	215811.22'	3622790.21'
TE 46	220196.21'	3622783.35'
TE 47	215819.41'	3622290.90'
TE 48	220196.92'	3622283.29'
TE 49	215827.81'	3621786.97'
TE 50	220197.63'	3621779.77'
TE 51	215833.96'	3621286.45'
TE 52	220198.34'	3621277.14'
TE 53	215840.06'	3620787.82'
TE 54	220199.05'	3620775.39'
TE 55	215845.62'	3620286.60'
TE 56	220199.76'	3620276.05'
TE 57	215855.40'	3619787.15'
TE 58	221522.17'	3619865.95'
TE 59	215862.47'	3619287.38'
TE 60	221529.20'	3619361.02'
TE 61	215868.93'	3618787.64'
TE 62	221536.15'	3618861.63'
TE 63	215875.40'	3618287.89'
TE 64	221543.10'	3618362.04'
TE 65	215881.86'	3617788.14'
TE 66	221550.05'	3617862.49'
TE 67	215888.31'	3617288.38'
TE 68	221557.01'	3617361.58'
TE 69	215894.95'	3616763.67'
TE 70	221564.24'	3616842.52'
TE 71	215901.28'	3616263.92'
TE 72	221571.19'	3616342.78'
TE 73	215907.61'	3615764.17'
TE 74	221578.14'	3615843.04'

SEE SHEET 4 FOR DETAIL SHOWING
ADDITIONAL W-E TRANSECTS



GULF OF MEXICO

- NOTES:
- ALL HORIZONTAL COORDINATES ARE BASED ON LOUISIANA SOUTH ZONE - NAD83 HPGN DATUM, US SURVEY FOOT AS DERIVED FROM PROJECT CONTROL MONUMENT "TE23-SM-01."
 - ELEVATIONS ARE BASED ON NAVD 88 US SURVEY FEET (GEOID12a) AS DERIVED FROM PROJECT CONTROL MONUMENT "TE23-SM-01."
 - BATHYMETRIC SURVEY DATA ACQUISITION PERFORMED USING ODOM MKIII ECHOTRAC (200/24kHz) INTEGRATED WITH RTK TIDES. 200kHz DATA IS REPRESENTED IN CROSS-SECTION VIEWS.
 - ADDITIONAL SURVEY DATA ACQUISITION PERFORMED USING RTK POLING METHOD.
 - THIS DRAWING INDICATES GENERAL CONDITIONS AT THE TIME OF SURVEY.
 - SURVEY DATA ACQUISITION WAS PERFORMED BY HYDROTERRA TECHNOLOGIES, LLC JANUARY 24 - 16, 2017, AND FEBRUARY 1 - 3, 2017.

LEGEND	
	TE-52 SURVEY TRANSECTS
	TE-52 EXTENDED TRANSECTS
	SURVEY CONTROL POINT
	TRANSECT ENDPOINT
	SETTLEMENT PLATE

REVISED BY: _____ DATE: _____

HORIZONTAL SCALE
1" = 2,000'

DATE: 03/02/2017 JOB# 2171001

LAND SURVEY AND HYDROGRAPHIC SOLUTIONS

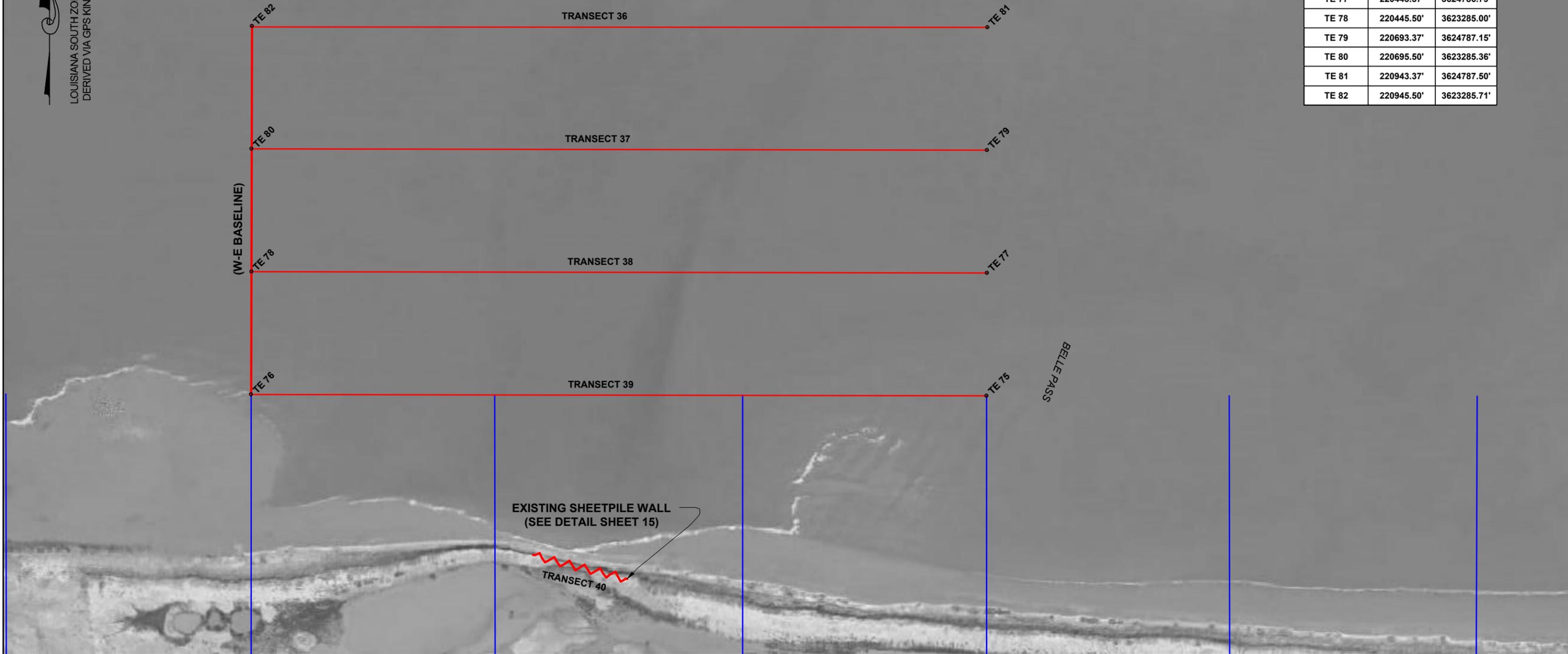
PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583

STATE OF LOUISIANA (CPRA)
WEST BELLE PASS HEADLAND
RESTORATION PROJECT (TE-52)
TOPOGRAPHIC AND BATHYMETRIC SURVEY
SURVEY PLAN VIEW
LAFOURCHE PARISH, LA

LOUISIANA SOUTH ZONE - NAD83 HPGN DATUM
 DERIVED VIA GPS KINEMATIC OBSERVATIONS

TIMBALIER BAY

Survey Transect Endpoint Table		
Point Name	Northing (ft)	Easting (ft)
TE 75	220193.37'	3624786.44'
TE 76	220195.50'	3623284.65'
TE 77	220443.37'	3624786.79'
TE 78	220445.50'	3623285.00'
TE 79	220693.37'	3624787.15'
TE 80	220695.50'	3623285.36'
TE 81	220943.37'	3624787.50'
TE 82	220945.50'	3623285.71'

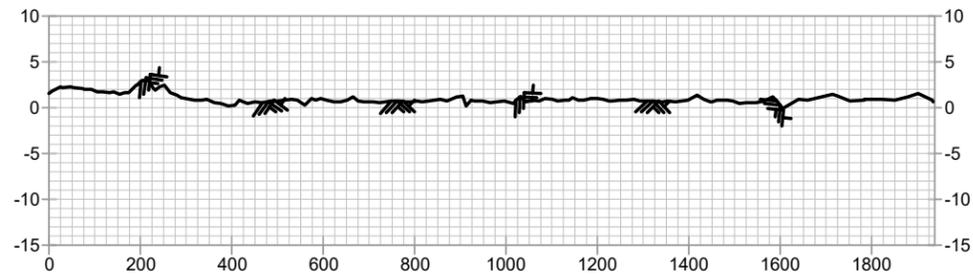


LEGEND	
	TE-52 SURVEY TRANSECTS
	TE-52 EXTENDED TRANSECTS
	SURVEY CONTROL POINT
	TRANSECT ENDPOINT

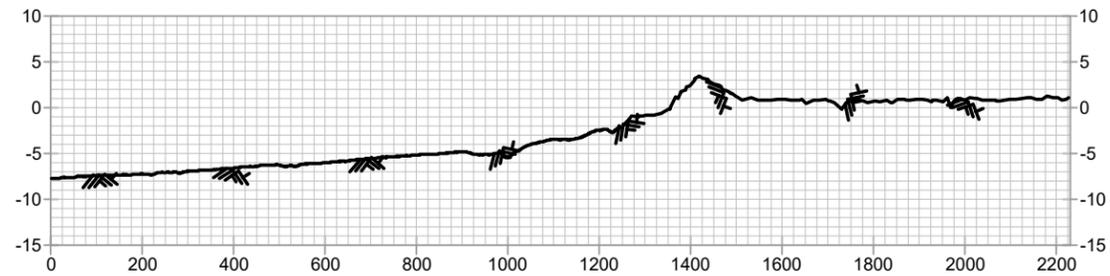
REVISED BY:	DATE:
HORIZONTAL SCALE 1" = 200' 	

HYDROTERRA
 TECHNOLOGIES, LLC
 LAND SURVEY AND HYDROGRAPHIC SOLUTIONS

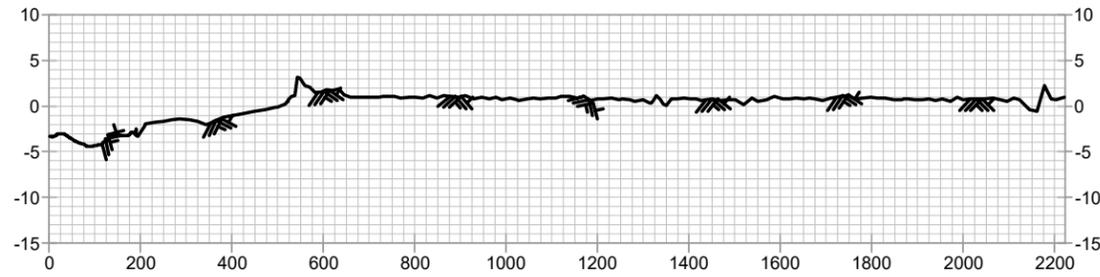
STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 SURVEY PLAN VIEW
 LAFOURCHE PARISH, LA



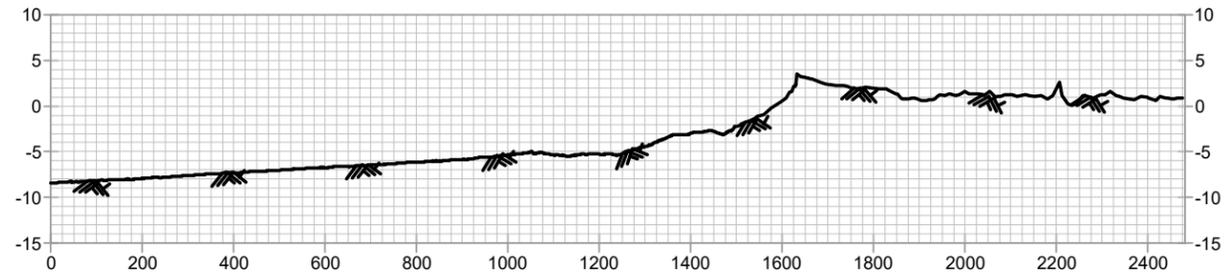
TRANSECT 1B



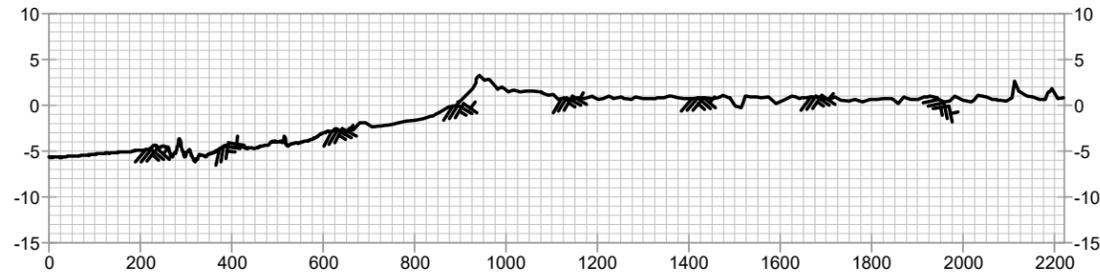
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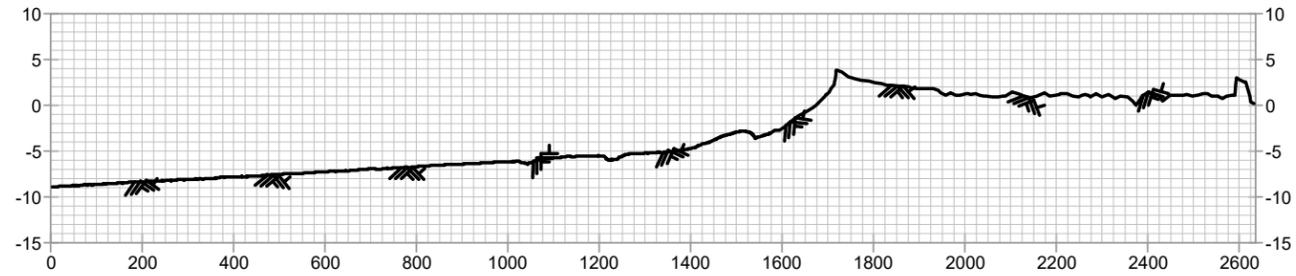
TRANSECT 1A



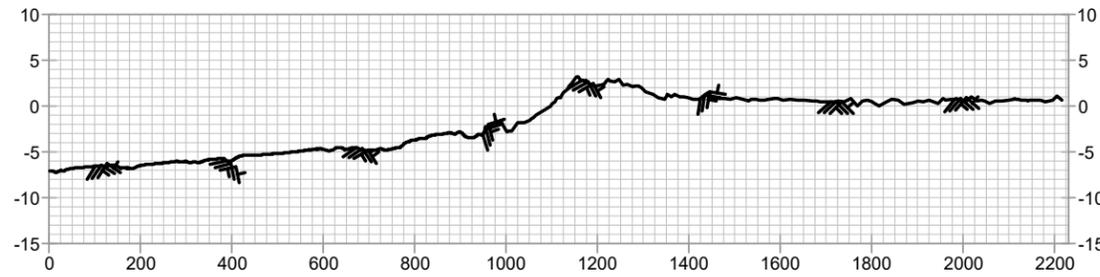
TRANSECT 4



TRANSECT 1



TRANSECT 5



TRANSECT 2



LEGEND

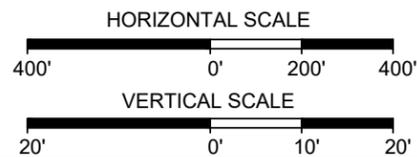
 2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY:

DATE:



STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA



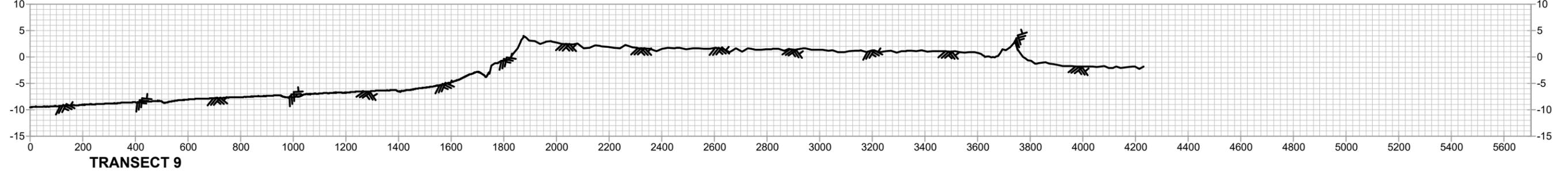
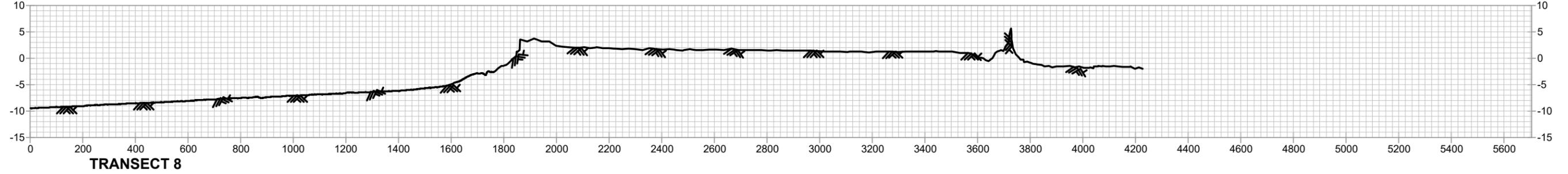
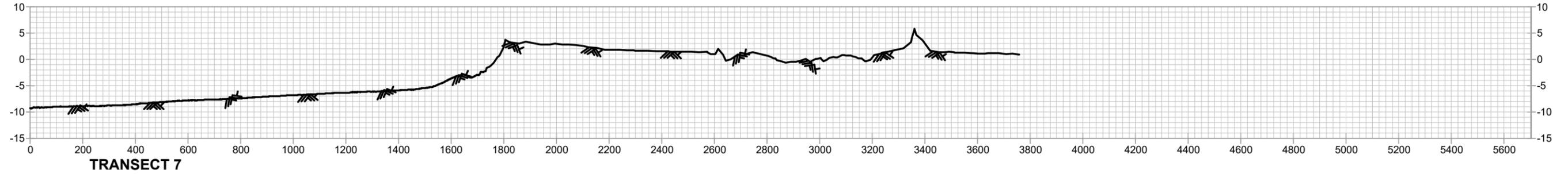
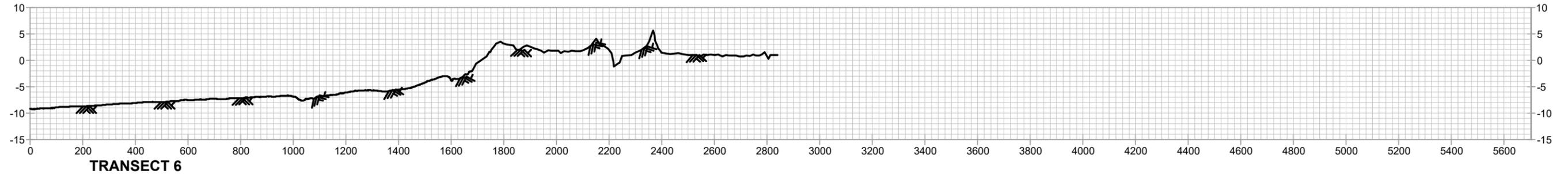
PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583

DATE: 03/02/2017

JOB# 2171001

FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

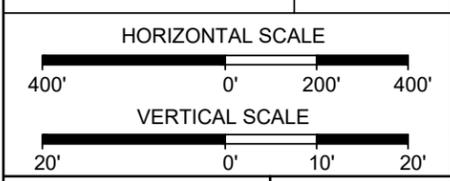
SHEET: 5 OF 15



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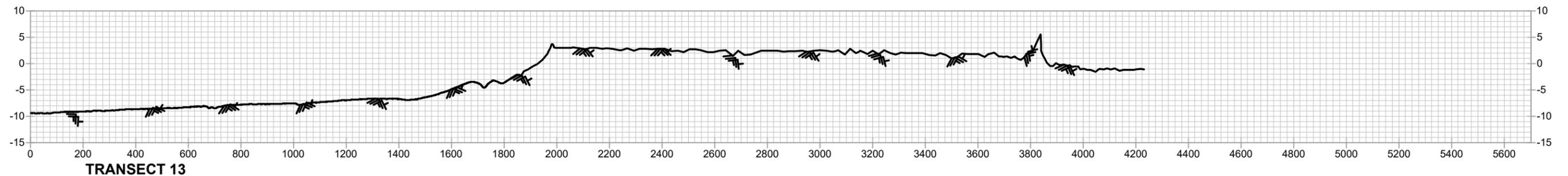
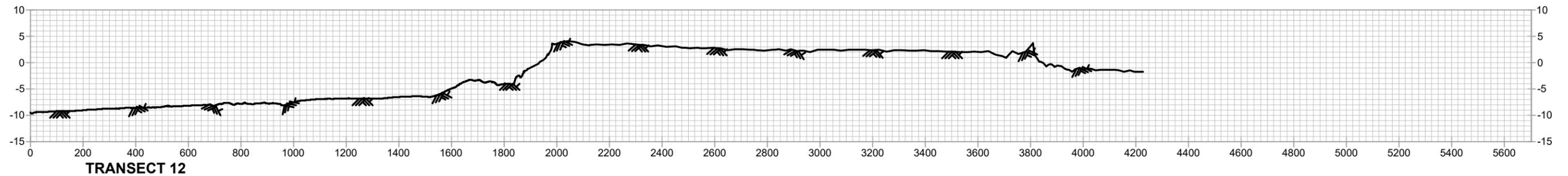
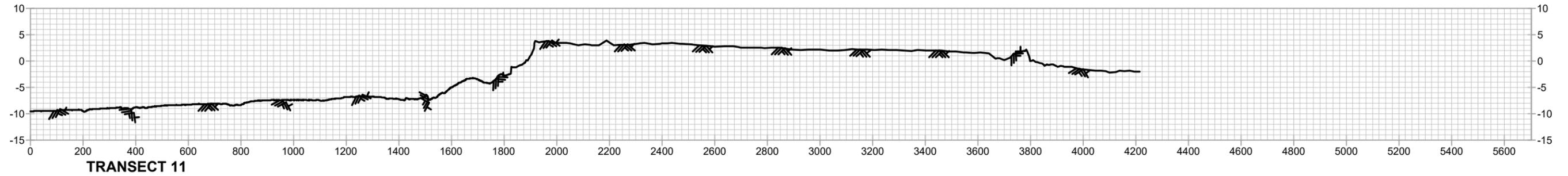
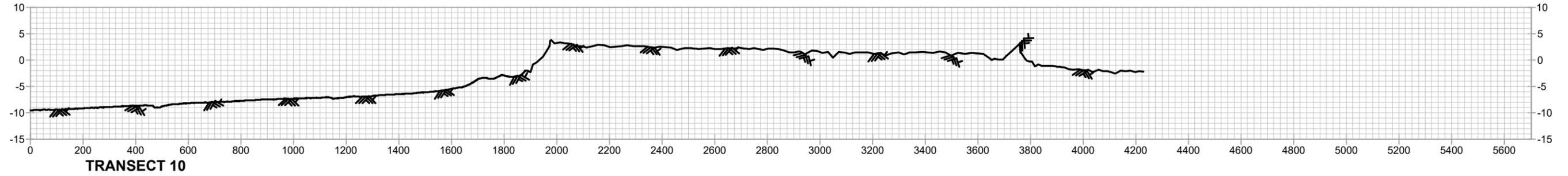
 2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

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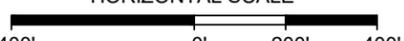
**STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA**

PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583
 DATE: 03/02/2017 JOB# 2171001 FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg SHEET: 6 OF 15



LEGEND
 2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY: _____ DATE: _____

HORIZONTAL SCALE


VERTICAL SCALE

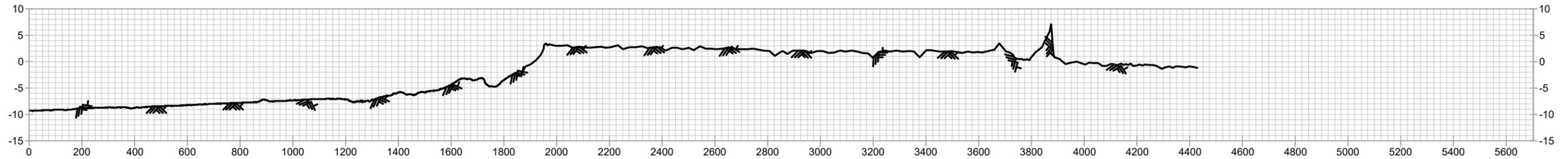

DATE: 03/02/2017 JOB# 2171001



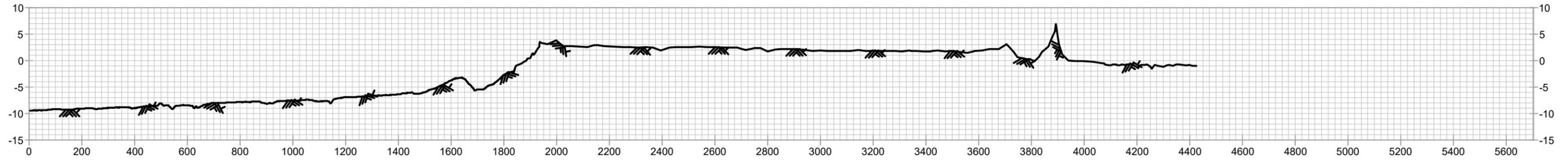
STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA

PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583

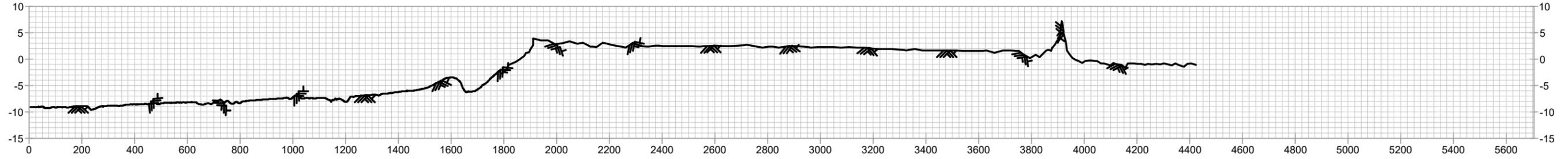
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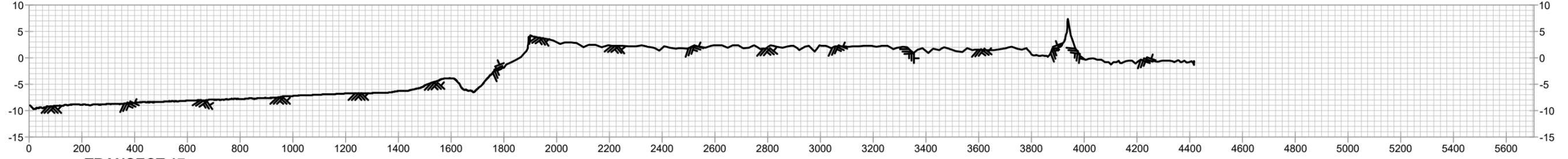
TRANSECT 14



TRANSECT 15



TRANSECT 16



TRANSECT 17



LEGEND

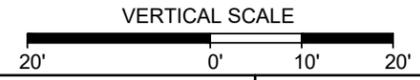
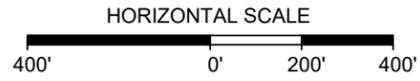
2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY:

DATE:



STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA



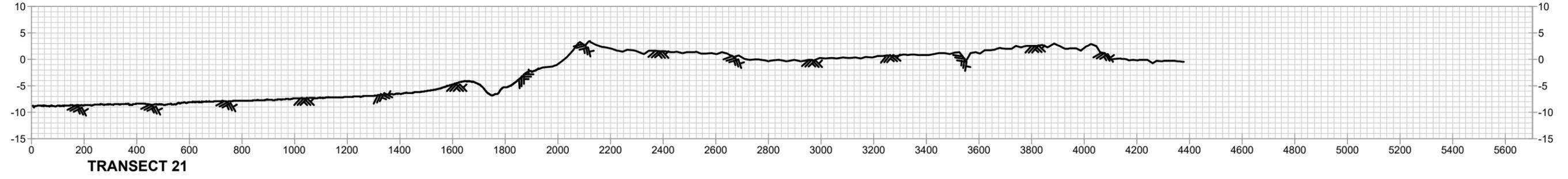
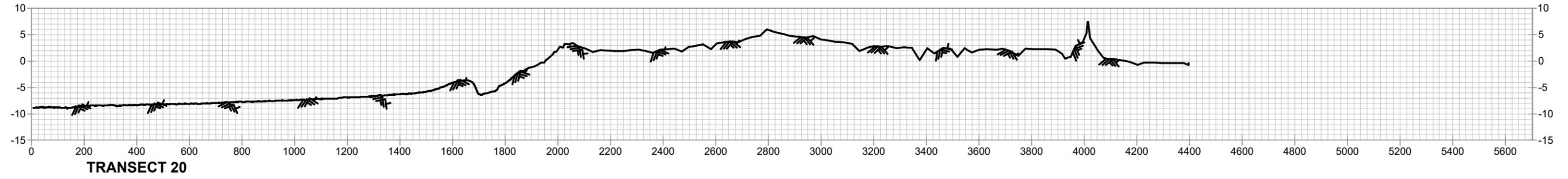
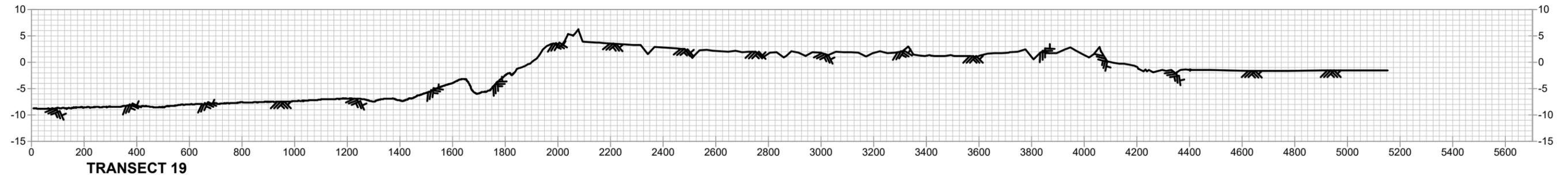
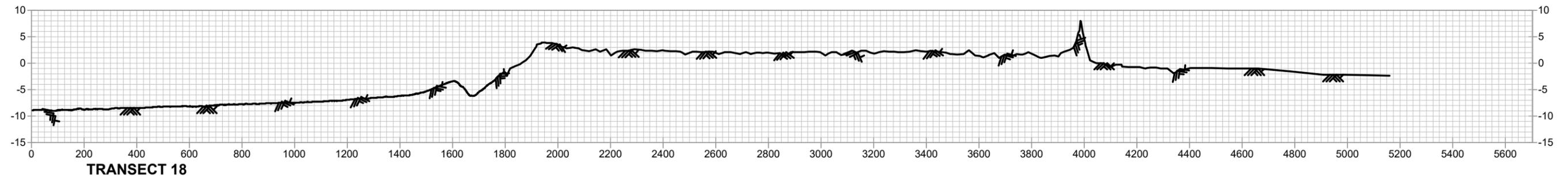
PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583

DATE: 03/02/2017

JOB# 2171001

FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

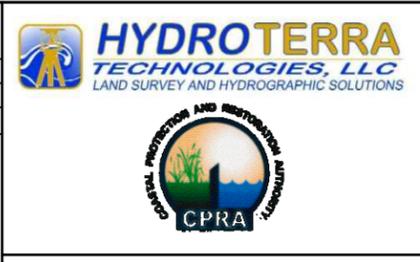
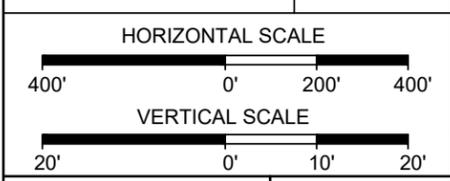
SHEET: 8 OF 15



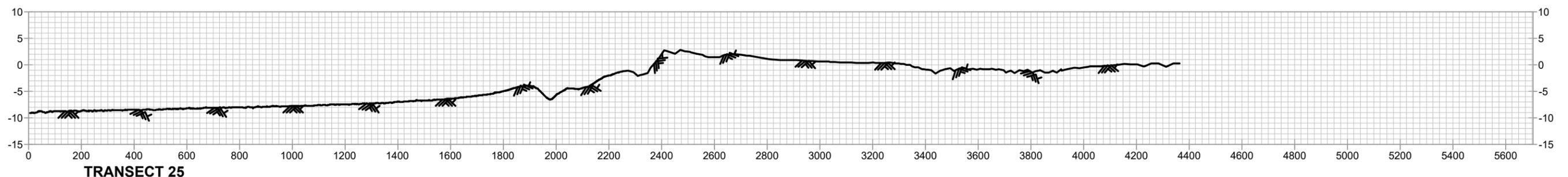
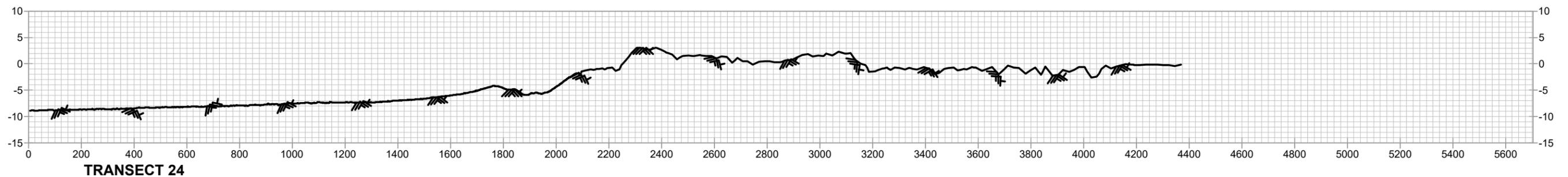
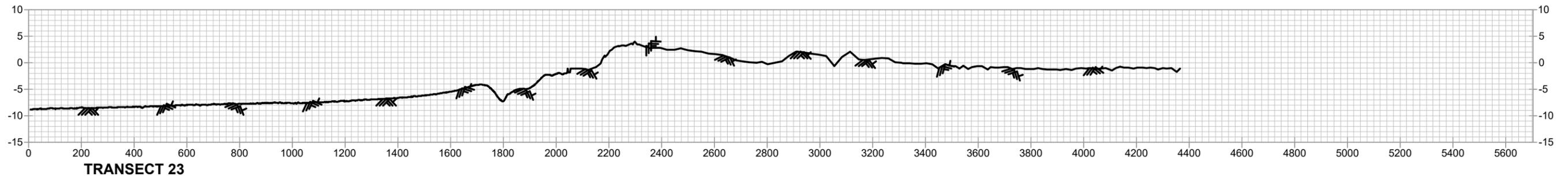
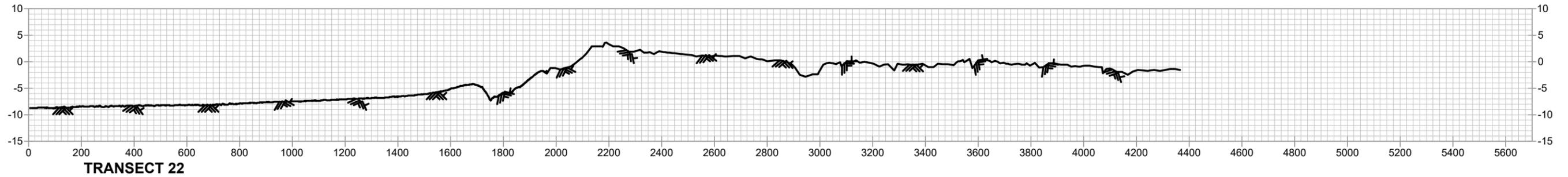
LEGEND

 2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY: _____ DATE: _____

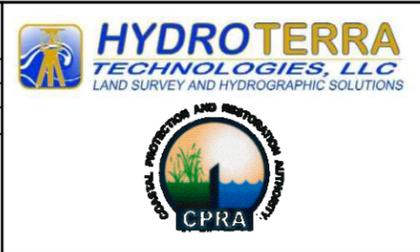
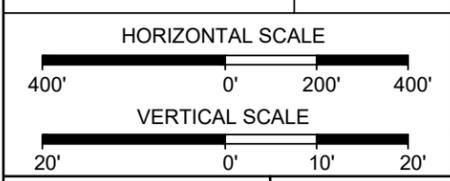


**STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA**

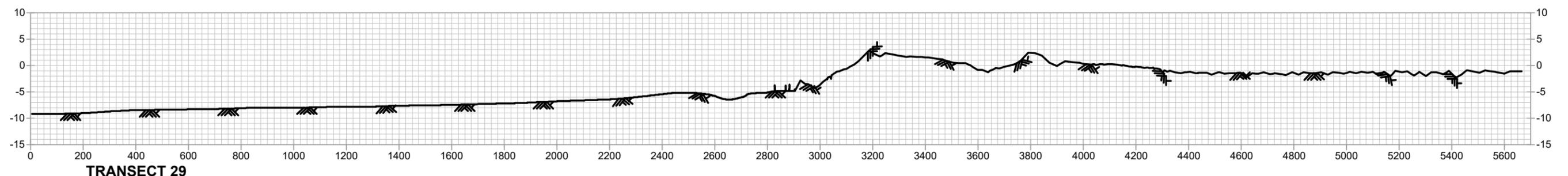
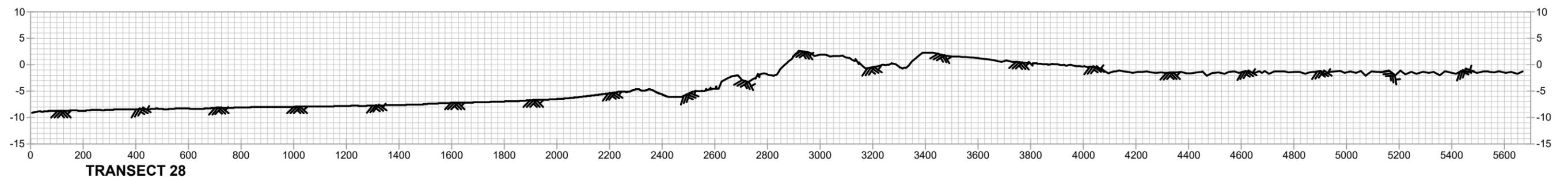
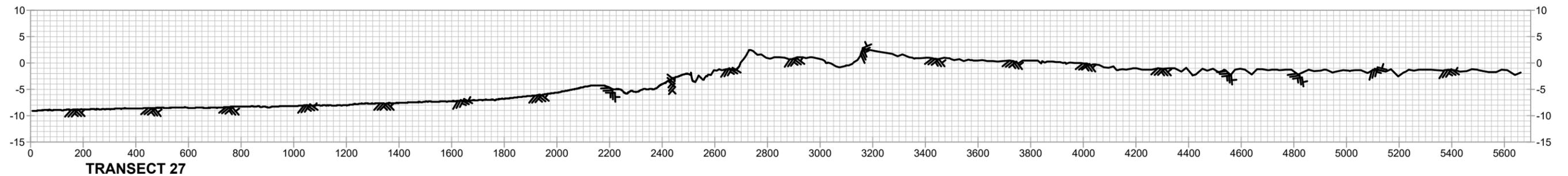
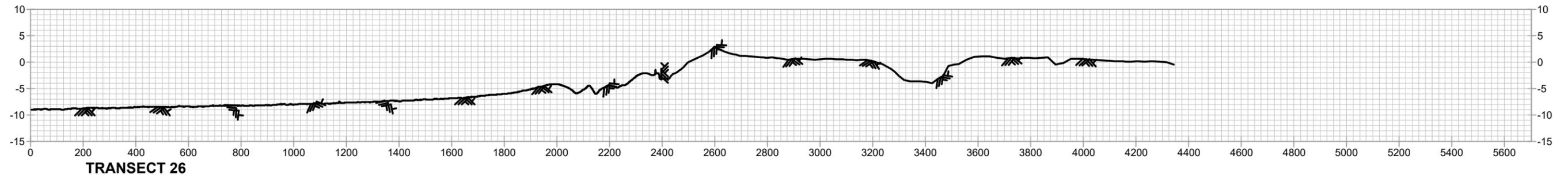


LEGEND
 2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY: _____ DATE: _____

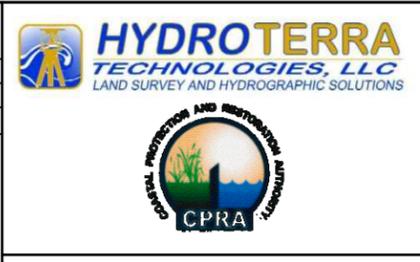
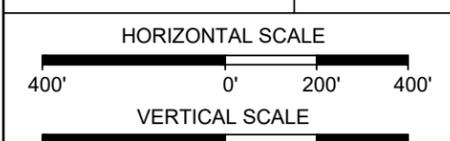


**STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA**

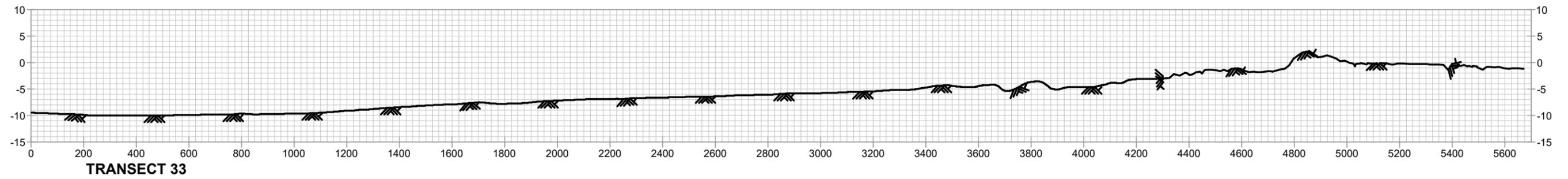
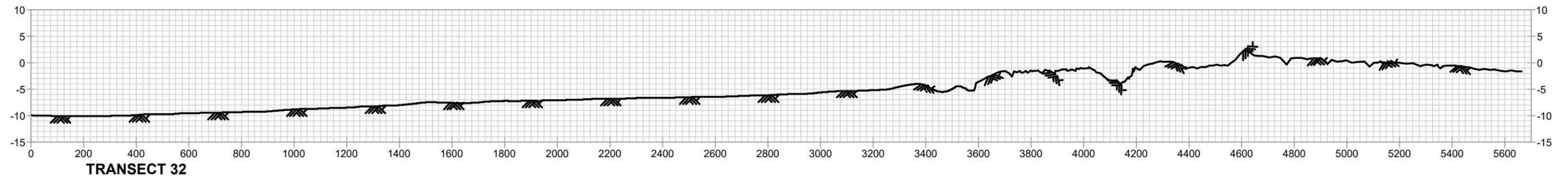
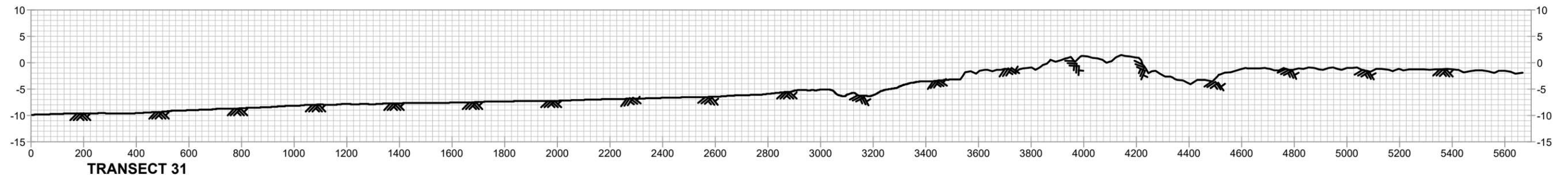
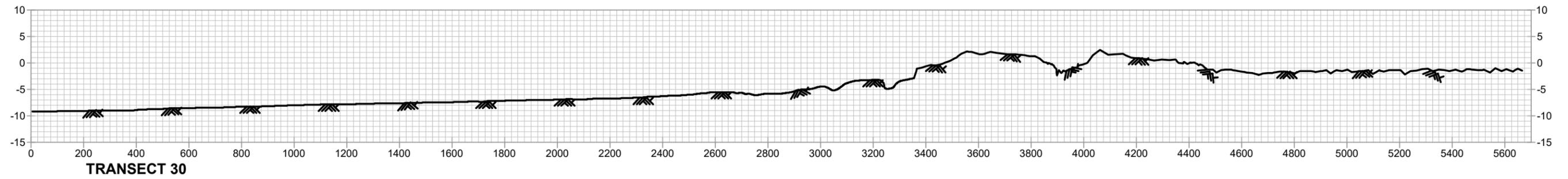


LEGEND
 2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY: _____ DATE: _____



STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA



LEGEND	
	2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

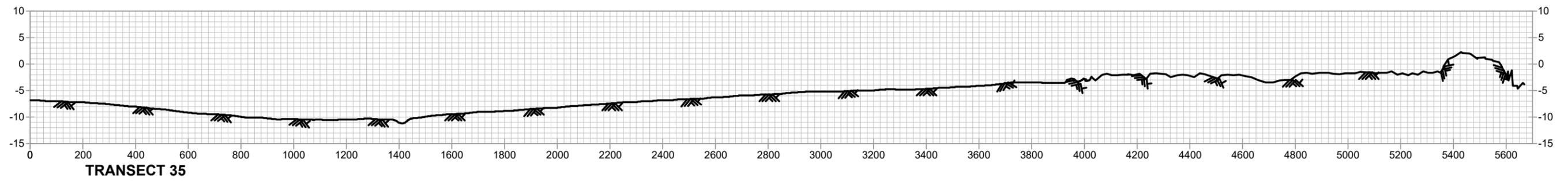
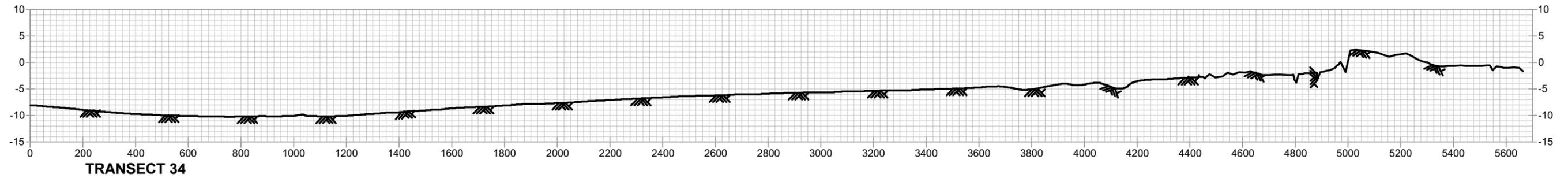
REVISED BY:	DATE:
HORIZONTAL SCALE 	
VERTICAL SCALE 	
DATE: 03/02/2017	JOB# 2171001

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STATE OF LOUISIANA (CPRA)
WEST BELLE PASS HEADLAND
RESTORATION PROJECT (TE-52)
TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA

FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

SHEET: 12 OF 15



LEGEND	
	2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY:	DATE:
HORIZONTAL SCALE VERTICAL SCALE 	
DATE: 03/02/2017	JOB# 2171001

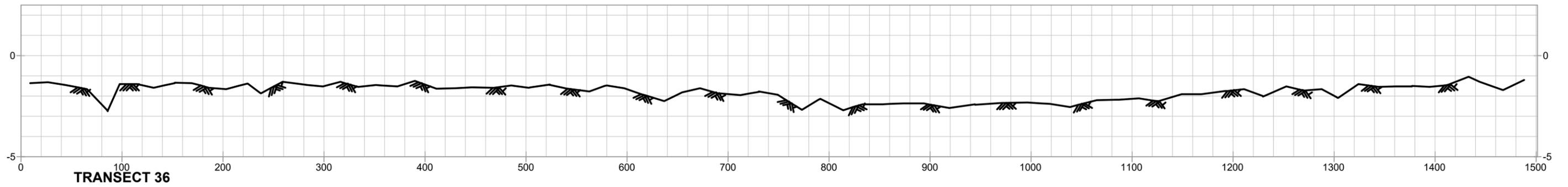
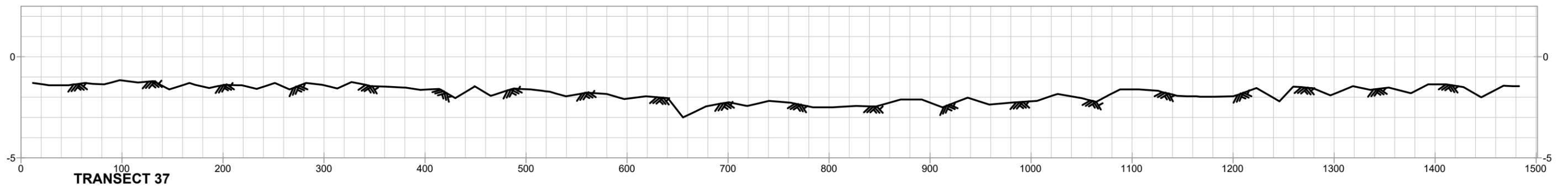
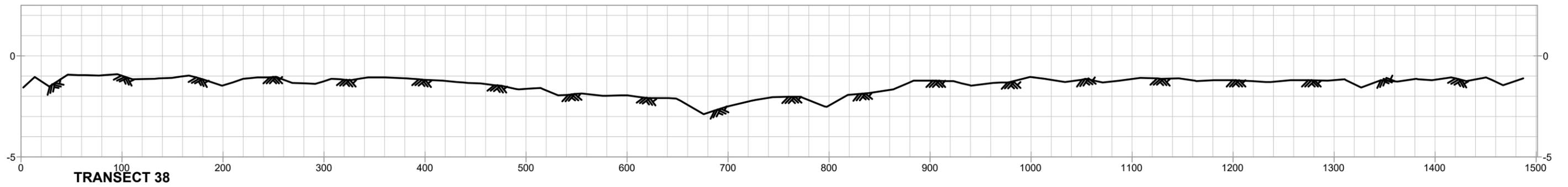
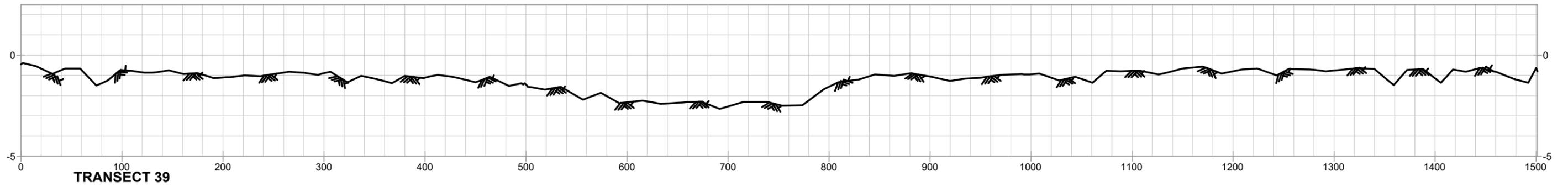
LAND SURVEY AND HYDROGRAPHIC SOLUTIONS

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STATE OF LOUISIANA (CPRA)
WEST BELLE PASS HEADLAND
RESTORATION PROJECT (TE-52)
TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (N-S TRANSECTS)
 LAFOURCHE PARISH, LA

FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

SHEET: 13 OF 15

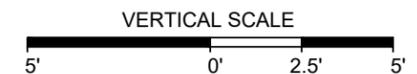
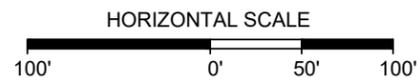


LEGEND

2017 TOPOGRAPHIC AND BATHYMETRIC SURVEY

REVISED BY:

DATE:



STATE OF LOUISIANA (CPRA)
 WEST BELLE PASS HEADLAND
 RESTORATION PROJECT (TE-52)
 TOPOGRAPHIC AND BATHYMETRIC SURVEY
 CROSS-SECTION VIEWS (W-E TRANSECTS)
 LAFOURCHE PARISH, LA

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DATE: 03/02/2017

JOB# 2171001

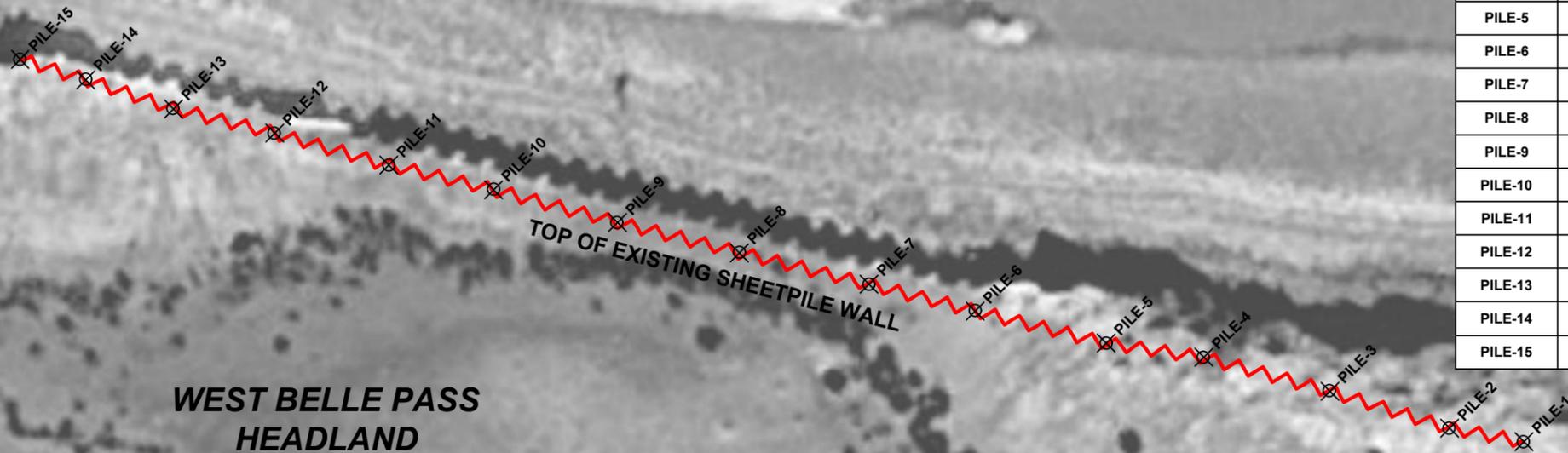
FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

SHEET: 14 OF 15

LOUISIANA SOUTH ZONE - NAD83 HPGN DATUM
DERIVED VIA GPS KINEMATIC OBSERVATIONS

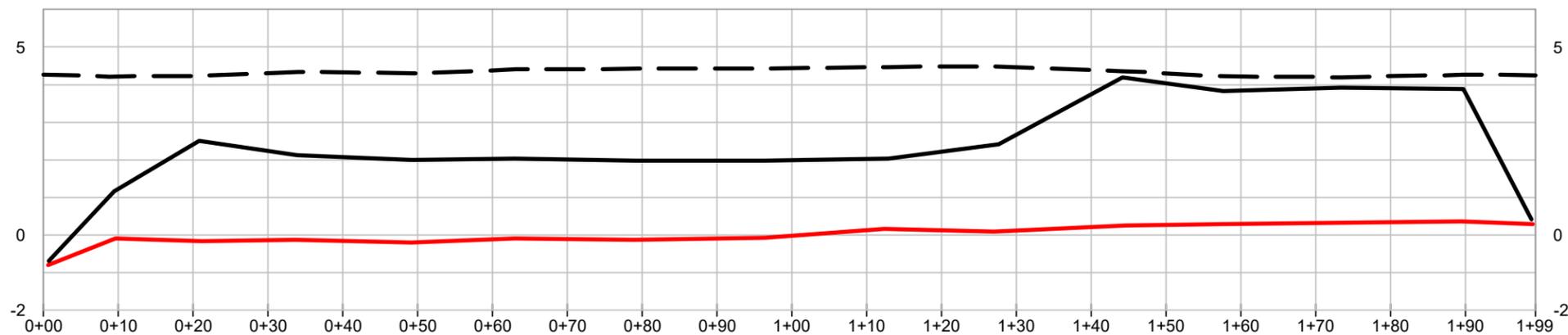
TIMBALIER BAY

WEST BELLE PASS HEADLAND



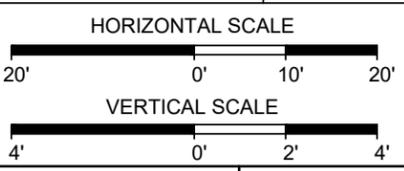
Existing Sheetpile Wall Point Table				
Point Name	Northing (ft)	Easting (ft)	Description	Elevation (ft)
PILE-1	219820.16'	3624052.56'	SHEET_PILE TOP	4.25'
PILE-2	219821.90'	3624042.99'	SHEET_PILE TOP	4.26'
PILE-3	219826.64'	3624027.64'	SHEET_PILE TOP	4.20'
PILE-4	219830.97'	3624011.47'	SHEET_PILE TOP	4.22'
PILE-5	219832.80'	3623998.95'	SHEET_PILE TOP	4.36'
PILE-6	219836.92'	3623982.11'	SHEET_PILE TOP	4.49'
PILE-7	219840.34'	3623968.47'	SHEET_PILE TOP	4.47'
PILE-8	219844.40'	3623951.85'	SHEET_PILE TOP	4.42'
PILE-9	219848.27'	3623936.20'	SHEET_PILE TOP	4.42'
PILE-10	219852.46'	3623920.30'	SHEET_PILE TOP	4.41'
PILE-11	219855.61'	3623906.85'	SHEET_PILE TOP	4.30'
PILE-12	219859.70'	3623892.16'	SHEET_PILE TOP	4.34'
PILE-13	219862.85'	3623879.16'	SHEET_PILE TOP	4.23'
PILE-14	219866.58'	3623867.95'	SHEET_PILE TOP	4.22'
PILE-15	219869.18'	3623859.52'	SHEET_PILE TOP	4.26'

Existing Sheetpile



LEGEND	
	TOP OF EXISTING SHEETPILE WALL
	GROUND PROFILE ON HEADLAND SIDE OF SHEETPILE WALL (SOUTH)
	GROUND PROFILE ON BAY SIDE OF SHEETPILE WALL (NORTH)

REVISED BY: _____ DATE: _____



STATE OF LOUISIANA (CPRA)
WEST BELLE PASS HEADLAND
RESTORATION PROJECT (TE-52)
TOPOGRAPHIC AND BATHYMETRIC SURVEY
PROFILE VIEW (EXISTING SHEETPILE WALL)
LAFOURCHE PARISH, LA

PREPARED BY: HYDROTERRA TECHNOLOGIES, LLC. - 202 JACOBS RUN, SCOTT, LA 70583

DATE: 03/02/2017 JOB# 2171001

FILE: West Belle Pass Topo and Bathy Survey (Rev 03-07-17).dwg

SHEET: 15 OF 15