

Draft Environmental Assessment
St. Bernard Parish
St. Bernard Basin Back Protection Levee
System Extension, Violet, Louisiana

FEMA-1603-DR-LA

St. Bernard Parish, Louisiana

Hazard Mitigation Grant Program

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Louisiana Recovery Office
1500 Main Street
Baton Rouge, LA 70802

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Project Authority	1
1.2	Background	1
2.0	PURPOSE AND NEED.....	4
3.0	ALTERNATIVES.....	5
3.1	No Action Alternative	6
3.2	Proposed Action: Violet Canal North Bank Levee Realignment.....	6
3.3	Considered Alternative: Construction of 1,375 Linear Foot Sheet Pile Wall along the Interior of the Violet Canal Stretch.....	8
4.0	AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS	9
4.1	Impact Summary	9
4.2	Hydrology and Floodplains.....	29
5.0	CUMULATIVE IMPACTS.....	35
6.0	CONDITIONS AND MITIGATION MEASURES	42
7.0	AGENCY COORDINATION AND PUBLIC INVOLVEMENT	44
7.1	Agency Coordination	45
7.2	Public Involvement	45
8.0	CONCLUSION.....	45
9.0	REFERENCES	46
10.0	LIST OF PREPARERS.....	47

APPENDICES

Appendix A	Site Photographs
Appendix B	Site Plan Drawings for Proposed Alternative
Appendix C	External Agency Correspondence
Appendix D	Hydrologic and Hydraulic Study
Appendix E	Other Information (Public Notice, 8-Step Process, FONSI, etc.)

LIST OF TABLES

Table 1: Affected Environment and Environmental Consequences Matrix: Violet Canal North Bank Levee Realignment and Drainage through Design Reconfiguration (Preferred)	10
Table 2: Affected Environment and Environmental Consequences Matrix: Affected Environment and Environmental Consequences Matrix-Construction of 1,375 Linear Foot Sheet Pile Wall along the Interior of the Violet Canal Stretch (Considered)	20
Table 3: Known Present, Past, and Reasonably Foreseeable Infrastructure and Recovery Improvements Projects.....	40

LIST OF FIGURES

Figure 1: Location of St. Bernard Parish, LA.....	2
Figure 2: Study Area (Source: Southeast Louisiana Flood Protection Authority)	4
Figure 3: Violet, LA Proposed Levee Improvements Map.....	7
Figure 4: Flood Hazard Data for Portion of the Study Area in St. Bernard Parish	30
Figure 5: Flood Hazard Data for the Immediate Project Area.....	30
Figure 6: Flood Hazard Data for Portion of the Study Area in Orleans Parish	31
Figure 7: Violet, LA Existing Drainage Map.....	31
Figure 8: Violet, LA Proposed Conditions Map.....	33
Figure 9: Violet, LA Proposed Storm Drainage Improvements System #1 Map	34
Figure 10: Violet, LA Proposed Storm Drainage Improvements System #2 Map	34
Figure 11: Affected Area Map for St. Bernard Basin Back Protection Levee System Extension, Violet Louisiana.....	37
Figure 12: One-Mile Buffer Area Map St. Bernard Basin Back Protection Levee System Extension, Violet Louisiana.....	38

LIST OF ACRONYMS

ABFE	Advisory Base Flood Elevation
ACTT	Alabama-Coushatta Tribe of Texas
APE	Area of Potential Effects
BMPs	Best Management Practices
BPLS	Back Protection Levee System
CAA	Clean Air Act
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources System
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFS	Cubic Feet Per Second
CH ₄	Methane
CNO	Choctaw Nation of Oklahoma
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CT	Coushatta Tribe of Louisiana
CUP	Coastal Use Permit
CWA	Clean Water Act
CWU	Central Wetlands Unit
CZMA	Coastal Zone Management Act
DA	Department of the Army
dB	Decibels
DFIRMS	Digital Flood Insurance Rate Map
DHS	Department of Homeland Security
DNL	Day-Night Average Sound Level
EA	Environmental Assessment
ECDs	Erosion Control Devices
EHP	Environmental and Historic Preservation
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
GHG	Greenhouse Gases
GCR	General Conformity Rule
GOHSEP	Governor's Office of Homeland Security and Emergency Preparedness
HFCs	Hydrofluorocarbons
HMGP	Hazardous Mitigation Grant Program
HP	FEMA Historic Preservation

HSDRRS	Hurricane and Storm Damage Risk Reduction System
JBCI	Jena Band of Choctaw Indians
LAC	Louisiana Administrative Code
LADOTD	Louisiana Department of Transportation and Development
LA HMGP PA	Louisiana State-Specific Hazard Mitigation Grant Program Programmatic Agreement
LBBLD	Lake Borgne Basin Levee District
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LNHP	Louisiana Natural Heritage Program
LPDES	Louisiana Pollutant Discharge Elimination System
LSB	Louisiana State Brownfield
MCN	Muscogee Creek Nation
MRGO	Mississippi River Gulf Outlet
NAAQS	National Ambient Air Quality Standards
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
N ₂ O	Nitrus Oxide
NO ₂	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NRCS	Natural Resources Conservation Services
O ₃	Ozone
OPA	Otherwise Protected Area
OSHA	Occupational Safety and Health Act
PAL	Provisional Accredited Levee
Pb	Lead
PM	Particulate Matter
PFC	Perfluorocarbons
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Act
ROW	Right of Way
SDWA	Safe Drinking Water Act
SF ₆	Sulfur Hexafluride
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office/Officer
SLFPA-E	Southeast Louisiana Flood Protection Authority-East
SNO	Seminole Nation of Oklahoma
SO ₂	Sulfur Dioxide
SOV	Solicitation of View
SPOC	Single-Point-of-Contact
TBTL	Tunica-Biloxi Tribe of Louisiana

TDSRS	Temporary Debris Staging and Reduction Sites
THPO	Tribal Historic Preservation Office/Officer
TSCA	Toxic Substances Control Act of 1976
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
VOCs	Volatile Organic Compounds

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1.0 INTRODUCTION

1.1 Project Authority

On August 29, 2005 Hurricane Katrina, a category 3 hurricane with a storm surge well above normal high tide levels, moved across the Louisiana, Mississippi, and Alabama Gulf Coasts. Maximum sustained winds at landfall were estimated at 140 miles per hour. President George W. Bush declared a major disaster for the state of Louisiana due to damages from Hurricane Katrina and signed a disaster declaration (FEMA-1603-DR-LA) authorizing the Department of Homeland Security's Federal Emergency Management Agency (FEMA) to provide federal assistance in designated areas of Louisiana. FEMA is administering this disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), PL 93-288, as amended 42 United States Code (U.S.C.) 5121, *et seq.* Section 404 of the Stafford Act authorizes FEMA's Hazard Mitigation Grant Program (HMGP) to provide funds to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration.

This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations Parts 1500-1508), and FEMA's procedures for implementing NEPA (FEMA Instruction 108-1-1).

The Lake Borgne Basin Levee District (LBBLD) with The Southeast Louisiana Flood Protection Authority-East (SLFPA-E), through the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) applied for funding under FEMA HMGP. The SLFPA-E is pursuing a FEMA certification of an existing interior levee system that connects to the federal levee system within Orleans Parish and St. Bernard Parish. The 40 Arpent Levee System is part of this interior levee system and extends from the Orleans/St. Bernard Parish line, where it connects to the Florida Avenue Levee, to south of the town of Verret, where it ties into high ground adjacent to the Hurricane and Storm Damage Risk Reduction System (HSDRRS). FEMA will use the findings in this EA to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

1.2 Background

St. Bernard Parish is part of the New Orleans–Metairie–Kenner metropolitan statistical area. The city of Chalmette serves as the Parish seat. The Parish is approximately 2,158 square miles, of which 378 square miles (approximately 12%) is land and the remainder is open water, 781 square miles (approximately 83%) (Figure 1). St. Bernard Parish is bordered to the east by the Gulf of Mexico, to the north by Lake Borgne, and southwest by the Mississippi River. St. Bernard Parish has approximately 35,897 residents according to 2010 census figures and is located southeast of the City of New Orleans.

The City of Violet is a census-designated place in St. Bernard Parish, Louisiana, United States with a population of approximately 6,651 as of the 2010 census. Violet is located on the east bank of the Mississippi River, approximately 7.5 miles (12.1 km) southeast of New Orleans.



Figure 1: Location of St. Bernard Parish, LA

In July 2005, FEMA began to collect data using state-of-the-art technology to increase the quality, reliability, and availability of flood hazard maps for many of the Louisiana coastal parishes. This was a part of the Flood Map Modernization effort through FEMA’s National Flood Insurance Program (NFIP). These efforts were necessary because the flood hazard and risk information shown on many FIRMs was developed during the 1970s, and the physical terrain had changed significantly since that time, to include significant land subsidence and major wetland loss in some areas. After Hurricanes Katrina and Rita, FEMA expanded the scope of this work to include all of coastal Louisiana. The magnitude of the impacts of Hurricanes Katrina reinforced the urgency to obtain additional flood recovery data for the coastal zones of Louisiana. More detailed analysis was possible because new data obtained after the hurricanes included information on levees and levee systems, new high-water marks, and new hurricane parameters.

During an initial post-hurricane analysis, FEMA determined that the “100-year” or 1-percent-annual-chance storm flood elevations, referred to as base flood elevations (BFEs), on FIRMs for many Louisiana communities, were too low. FEMA created recovery maps showing the extent and magnitude of Hurricanes Katrina’s and Rita’s surge, as well as information on other storms over the past 25 years. The 2006 advisory flood data shown on the recovery maps for the Louisiana-declared disaster areas show high-water marks surveyed after the storm; flood limits developed from these surveyed points; and Advisory Base Flood Elevations, or ABFEs. The recovery maps and other advisory data were developed to assist parish officials, homeowners, business owners, and other affected citizens with their recovery and rebuilding efforts.

Following this intensive five-year mapping initiative, FEMA provided updated preliminary flood hazard maps, known as Preliminary Digital Flood Insurance Rate Maps (DFIRMs), to Louisiana's coastal parish communities. First released in 2008, these maps were based on the most technically advanced studies ever and were subjected to multiple levels of review. The DFIRMs provided communities with a more scientific approach to economic development, hazard mitigation planning, emergency response, and post-flood recovery.

Thereafter, the USACE completed upgrades of the Hurricane and Storm Damage Risk Reduction System (HSDRRS) for the Greater New Orleans (GNO) area, including the area of the proposed action in this EA. This 350-mile system of levees, floodwalls, surge barriers, and pump stations reduces the flood risk associated with a storm event. A perimeter levee system protects the area from the coastal surge and the Mississippi River flooding. Pump stations are located along the perimeter levee to discharge polder runoff into the exterior lakes or the Mississippi River. Local pump stations perform the same function along interior levees and discharge to marshy areas designated to collect flood water from developed areas. Two major closure complexes, the West Closure Structure Complex and the Inner Harbor Navigation Canal Complex keep storm surge from entering the major canals and navigation channels within the New Orleans area. The HSDRRS is designed and accredited to protect the GNO area from the 1-percent-annual-chance flood.

FEMA specifies that all levees must have a minimum freeboard of three (3) feet against 1-percent-annual-chance flooding to be considered a safe flood protection structure. The HSDRRS meets the FEMA freeboard requirement. In September of 2011, the USACE provided FEMA with assurances that the HSDRRS is capable of defending against a storm surge with a 1-percent-annual-chance of occurring in any given year.

Accordingly, FEMA subsequently revised the preliminary DFIRMS for areas within the HSDRRS to incorporate the reduced flood risk associated with the system improvements. These Revised Preliminary DFIRMS are currently viewed as the best available flood risk data for the GNO. In many areas, the flood risk has been significantly reduced due to heightened protection. Areas protected by the HSDRRS includes much of the area of the proposed action but some work may occur outside levee-protected areas and within SFHAs.

The Back Protection Levee System (BPLS), also referred to as the 40 Arpent Levee System, is a non-federal system along the northern edge of the Lower Ninth Ward (Orleans Parish) and St. Bernard Parish (herein referred to collectively as the St. Bernard Basin) continuing from the Inner Harbor Navigational Canal to eastern St. Bernard Parish. Although the 40 Arpent Levee System and the BPLS are used interchangeably, it will be referred to as the BPLS within the text of this document. The BPLS is situated along the southern edge of the Central Wetlands Unit (CWU), a vast area of wetlands located between the St. Bernard Basin, the former Mississippi River Gulf Outlet (MRGO) and the Hurricane & Storm Damage Risk Reduction System (HSDRRS). The LBBLD is responsible for the operation and the maintenance of the 26 miles of the BPLS. In addition to containing storm water discharge from outfalls and pumping stations during normal municipal drainage operations, the BPLS also functions as a secondary storm surge barrier for the St. Bernard Basin during hurricane events. Storm surge caused a number of breaches in the federal hurricane protection system along the MRGO during Hurricane Katrina (2005). The storm surge filled the CWU and overtopped the BPLS, contributing to massive flooding, hundreds of fatalities

and unprecedented property loss throughout the St. Bernard Basin (The Data Center, 2016). A map showing the current location of the Federal Levee System and the non-federal BPLS is provided below (Figure 2).



Figure 2: Study Area (Source: Southeast Louisiana Flood Protection Authority)
Yellow rectangle indicates the project area

A survey of the proposed site was provided by BFM Corporation, LLC, a professional land and surveying company, and contracted by the applicant between November 2013 and February 2014. Based on the survey, the existing earthen levee serves as the drainage divide, and separates runoff that flows south to the Violet Canal and runoff that flows north toward the east-west natural drainage ditch at the eastern end of General Pershing Street. A storm drain system starts on the south-side of Pakenham Road, diverges northward at the Fifth Street intersection and discharges into the east-west natural drainage ditch at the eastern end of General Pershing Street. An additional storm drain, located approximately 400 feet west of Sixth Street, conveys flow under Pakenham Road to a north-south natural drainage ditch that connects to the east-west natural drainage ditch located on the eastern end of General Pershing Street. The topographic slopes adjacent to the project site are approximately 0.005 and 0.03 (ft/ft) for areas north and south of the existing levee, respectively. Areas adjacent to the project site consisting of a Lafitte Frozen Foods (i.e. Shrimp Factory), scattered buildings, and open spaces covered with grass or gravel pavements were also observed during the survey provided by BFM Corporation, LLC.

2.0 PURPOSE AND NEED

The HMGP provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the

loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

On August 29, 2005, the community was devastated by storm surge and wind associated with Hurricane Katrina which topped the BPLS and destroyed the MRGO levee. According to the project application, as a result of Hurricane Katrina, St. Bernard Parish accounted for nearly 40,000 NFIP claims amounting to over \$1.7 billion in damages. St. Bernard Parish would later account for nearly 3,000 claims amount to \$7 million in damages following Hurricane Gustav (2008). In Orleans Parish, there are 204 repetitive loss structures in the Lower Ninth Ward that have accounted for over 600 NFIP claims amounting to over \$14.7 in damages since the City of New Orleans began participating in the NFIP. In an effort to reduce flooding in these communities, NFIP claims, and NFIP participation costs for residents, SLFPA-E is proposing to have the BLPS accredited by FEMA and included in the forthcoming FIRM for St. Bernard and Orleans parishes. The SLFPA-E entered into a Provisional Accredited Levee (PAL) agreement with FEMA in 2012. The PAL agreement provided the LBBLD with a path to having the BPLS federally accredited, provided that the SLFPA-E conducted a complete assessment of the levee system and corrected any deficiencies.

In accordance with the PAL agreement, the SLFPA-E contracted an assessment of the levee system and its suitability to Tetra Tech, Inc. of Baton Rouge, Louisiana, an engineering company (herein referred as Tetra Tech). Tetra-Tech confirmed suitability for the entire BPLS with an exception of a 1,200 foot stretch of levee along the upper-river bank of the Violet Canal. At this location (1,200 foot stretch), the Lafitte Frozen Food Company (i.e. Shrimp Factory), constructed circa 1920, straddles the BLPS rendering a portion of the levee inaccessible (Tetra Tech, 2013).

As part of the evaluation of the BLPS, it was determined the deficient area along the north bank of the Violet Canal required improvements to meet the FEMA NFIP regulations (44 CFR 65.10) for 100-year level flood protection. Although the area in which construction activities would occur are located on the Violet Canal North Bank, the potential impact area includes the entire St. Bernard Basin encompassing the Lower Ninth Ward, Arabi, Meraux and Violet (the study area). The study area is bound by the BLPS to the East, West and South and the Federal Levee System (HSSDRS) to the north (Figure 2).

3.0 ALTERNATIVES

NEPA requires that the potential environmental impacts of each alternative be identified and used in determining which alternatives should be advanced through the NEPA analysis and selection process (as long as they also meet the project purpose and need). The selection of reasonable alternatives should be based on: 1) consideration of alternatives that avoid impacts; 2) consideration of the alternatives that minimize impacts; and 3) consideration of the potential mitigation of impacts of each alternative, all while meeting the project purpose and need. This section describes alternatives proposed and considered in addressing the purpose and need stated in Section 2.0 above.

Three alternatives are being considered including: 1) no action alternative; 2) Violet Canal North Bank Levee Realignment; and 3) Construction of 1,375 Linear Foot Sheet Pile Wall along the Interior of the Violet Canal Stretch.

3.1 No Action Alternative

Under the No Action Alternative, no tie into the existing levees of St. Bernard Parish would be constructed along the existing BPLS and flooding would not be abated or alleviated. The purpose of the proposed project is to alleviate flooding within the St. Bernard Basin, and have the BPLS accredited by FEMA and included in the forthcoming FIRM for St. Bernard and Orleans parishes. This alternative does not meet the purpose and need, and a summary of the impacts of the No Action Alternative is discussed in Section 4 of this EA. The No Action Alternative serves as a baseline comparison of impacts from other action alternatives.

3.2 Proposed Action: Violet Canal North Bank Levee Realignment

According to the construction proposal submitted by the applicant, dated July 24, 2015, the proposed project would construct a new earthen levee (approximately 1,280 linear feet) that would attach to the existing BLPS at two points, completely enclosing the inaccessible portion of the existing levee and the Lafitte Frozen Foods Company. The existing BPLS levee acts as the drainage divide along the south side of Lafitte Frozen Foods. According to a Hydrologic Modification Analysis Report conducted in May, 2015, this portion of the levee doesn't meet FEMA accreditation standards because it is higher along the south side of the Shrimp Factory than the FEMA 100-year water surface elevation and prevents flow onto the shrimp factory property by containing the 100-year flood flow to the Violet Canal. Phase I of this project, a levee alignment to the east of the proposed action has already been completed by the applicant. The proposed project is located near 2525 Packenham Road, Violet Louisiana along the existing BPLS, on the river bank of the Violet Canal which is located within the following coordinates:

29.901024, -89.896604 (Northwest Corner)
29.900345, -89.896535 (Southwest Corner)
29.901665, -89.894156 (Northeast Corner)
29.901037, -89.893960 (Southeast Corner)

Figure 2 provides an overall site lay out of the work that is proposed to take place within these four (4) corner coordinates.



Figure 3: Violet, LA Proposed Levee Improvements Map

The proposed levee improvement would consist of constructing a compacted earthen embankment approximately 1,280 feet long with two (2) proposed stop log structures on Packenham Road. The maximum levee side slope would be 3H: 1V (horizontal to vertical) to account for stability as well as maintenance and mowing. The top of the levee would be constructed in an effort to provide a minimum width of 12 feet with a 15-foot buffer from the levee toe (flood side and landside) to allow for embankment access and inspection. Anticipated settlement has been incorporated into the design elevation. As part of the project; there would be drainage improvements and two stop log structures where the proposed levee alignment will cross Packenham road. Additionally, the applicant has acquired five residential sites and one servitude through a voluntary buyout program, according to an affidavit signed by the Executive Director of Lake Borgne Basin. Four of the sites have homes, two structures are being relocated and two are being demolished in order to make room for the levee alignment and remove the homes from the special flood hazard area.

There are two (2) concurrent storm drainage systems proposed, and are summarized below:

The proposed storm drain system #1 consists of a new catch basin located at the northwest corner of Packenham Road and Fifth Street with a new storm drain pipe crossing Packenham Road and joining the existing storm drain on the south side of Packenham Road. This existing storm drain pipe travels west approximately 100 feet and connects to a proposed catch basin. A proposed slide gate and storm drain pipe, approximately 140 feet in length, would exit to the existing natural ditch. This natural ditch would be re-graded to flow west joining the existing storm drain system located at Fourth Street. The flow changing direction is approximately 1.53 acres, which would be served by the proposed storm system #1. The proposed storm drain system #1 would convey at least the 10-year flood event and the 10-year peak flow, as computed in accordance with the Louisiana Department of Transportation and Development (LADOTD) 2011 Hydraulics Manual.

The proposed storm drain system #2 consists of a new catch basin located at the northwest corner of Pakenham Road and Sixth Street with a new storm drain pipe on the north side of Pakenham Road traveling east for approximately 260 feet and joining another proposed catch basin that connects a proposed storm drain pipe from the south of Pakenham Road. The proposed storm drain pipe with a proposed slide gate would be extended approximately 140 feet to outlet at the existing north-south natural drainage ditch. The reconfigured flow direction extends approximately 3.64 acres and would serve the proposed storm system #2. This system #2 would convey drainage during a 10-year flood event (LADOTD 2011). The 10-year peak flow is estimated to be 20.11 cubic feet per second (cfs) for the proposed storm drain system #2.

Under the proposed conditions, the area between the existing berm and the proposed levee could be inundated during the 100-year flood event when the stop log structures are in place and slide gates on Pakenham Road are closed. As floodwaters recede and the stop log structures and slide gates are open, the flow would be drained by the proposed storm drain system #1 to the existing storm drain system located at 4th Street and the proposed storm drain system #2 to the north-south natural drainage ditch located on the east side of the proposed levee. Both existing drainage systems discharge into the east-west natural drainage ditch at the eastern end of General Persing Street. By re-grading the areas between the flood-side (south) of the levee and the existing berm, the receding flood flow will be able to flow more efficiently by the proposed storm drain systems to the existing drainage systems and eventually outlet into the east-west natural drainage ditch located at the eastern end of General Persing Street. The runoff for the pre- and post-conditions will be conveyed into the same drainage systems (i.e. the east-west natural drainage ditch and the drainage system at the east end of General Persing Street). Properties on the landside (north) of the proposed levee will be protected during the 100-year flood and the finished floor elevation of the Shrimp Factory is at or above the FEMA 100-year flood elevation of 4 feet. Through a voluntary residential buyout and relocation, no residences will be inhabited on the floodside of the proposed levee after the completion of the project. Therefore, no mitigation measures are required in addition to the proposed project improvements.

3.3 Considered Alternative: Construction of 1,375 Linear Foot Sheet Pile Wall along the Interior of the Violet Canal Stretch

Another alternative considered would be to correct the deficient area of the levee system. It would include the construction of a 1,375 linear foot wall of sheet pile along the interior (Violet Canal side) stretch under the Shrimp Factory which would tie back into the existing earthen levee on the south side of the building and into a newly-constructed 415 linear foot earthen levee on the north side of the building. Comparable to the proposed levee extension, the sheet pile design would close the loop in the levee system and ensure the 100-year flood protection. This alternative meets the purpose and need, however; was dismissed by the applicant due to soil conditions and costs. Solicitation of Views (SOV) were solicited for the both the proposed action and considered alternative; however, resources agencies responded to the proposed alternative only and permit applications were submitted only for the proposed alternative. If this alternative becomes the preferred or proposed action, then FEMA would carry out a full analysis for this action.

4.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

4.1 Impact Summary

FEMA-EHP has reviewed and assessed whether or not there are potential impacts to the natural and human environment by the proposed action and the no action alternatives. As stated above, the considered alternative meets the purpose and need but was not carried forward for complete analysis. However, if this alternative becomes the preferred or proposed action, then FEMA would carry out a full analysis for this action.

The matrix below summarizes the results of the environmental review process for the proposed alternative and the considered alternative (Table 1&2). Table 1 is for the proposed alternative and Table 2 is for the considered action/alternative. A complete analysis would be carried out on the considered alternative, it were to become the proposed action. Potential environmental or cultural impacts that were found to be negligible are not further evaluated. Resource areas that have the potential for impacts of minor, moderate, or major intensity are further developed in the subsequent sections. Definitions of impact intensity are described below:

- **Negligible:** The resource area (e.g., geology) would either not be affected, changes would be non-detectable, or if detected, would have effects that would be slight and local. Impacts would be well below regulatory standards, as applicable. Effects to Cultural Resources would be either non-existent, i.e., a building is less than 50 years old and/or no known archeological sites are present on the site, or the project is determined not likely to affect and State Historic Preservation Officer (SHPO)/Tribal Historic Preservation Officer (THPO) concurs. No mitigation is needed.
- **Minor:** Changes to the resource would be measurable, although the changes would be small and localized. Impacts would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects. Effects to Cultural Resources are not likely, i.e., building is at least 50 years old and/or known archeological sites are near the project area, but special conditions/mitigation are sufficient to maintain the “not likely to affect” determination.
- **Moderate:** Changes to the resource would be measurable and have both localized and regional scale impacts. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary to reduce any potential adverse effects. Effects to Cultural Resources are likely, i.e., building is 50 years old and/or known archeological sites are in the project area. Impacts would have at least local and possibly regional scale impacts.
- **Major:** Changes would be readily measurable and would have substantial consequences on a local and regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, although long-term changes to the resource would be expected. Effects to Cultural Resources are likely, i.e., building is at least 50 years old and/or known archeological sites are in the project area. Impacts would have substantial consequences on a local and regional level.

**Table 1: Affected Environment and Environmental Consequences Matrix:
Proposed Action: Violet Canal North Bank Levee Realignment and Drainage Improvement through Design Reconfiguration**

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigations and Conditional Measures
Geology and Soils	Negligible	<p>The Farmland Protection Policy Act (FPPA: Public Law 97-98, Section 1539-1549; 7 U.S.C. 4201, <i>et seq.</i>), enacted in 1981, is intended to minimize the impact federal actions may have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It assures that, to the extent possible, federal programs and policies are administered to be compatible with state and local farmland protection policies and programs.</p> <p>Per review of the National Resources Conservation Services (NRCS) Web Soil Survey, the soils located on the proposed project area (Cancienne silty clay loam, 0 to 1% slope and Schriver silty clay loam, 0 to 1% slope) are classified as prime farmland soil; however, the proposed project is “land already in or committed to urban development” within the meaning of 7 CFR 658.2(a), and are therefore not farmland for purposes of the FPPA.</p> <p>Only the soils and geology for the proposed project location were evaluated, because the levee is existing the soils and geology for the entire study area will not be impacted.</p>	NRCS Web Soil Survey accessed on 9/1/2016	<p>Implement construction Best Management Practices (BMPs); install silt fences/straw bales to reduce sedimentation. Area soils would be covered and/or wetted during construction.</p> <p>If fill is stored on site as part of unit installation or removal, the contractor would be required to appropriately cover it.</p> <p>Construction contractor would be required to obtain a Louisiana Pollutant Discharge Elimination System (LPDES) permit, if applicable, and implement stormwater pollution prevention plan.</p> <p>The Louisiana Department of Environmental Quality (LDEQ) has stormwater general permits for construction areas equal to or greater than one (1) acre. It is recommended that the LDEQ Water Permit Division be contacted at 225-219-3181 to determine whether the proposed improvements require one of these permits.</p> <p>All precaution should be observed to control nonpoint source pollution from construction activities.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>
Hydrology and Floodplains (Executive Order 11988)	Minor	<p>Executive Order (EO) 11988 (Floodplain Management) requires Federal agencies to avoid direct or indirect support or development within the 100-year floodplain whenever there is a practicable alternative. FEMA’s regulations for complying with EO 11988 are found at 44 CFR Part 9. Per the Preliminary Digital Flood Insurance Rate Map (DFIRM) panel Panels 22087C0757D, 22087C0460D, 22087C0478D, 22087C0479D, 22087C0480D, 22087C0483D, 22087C0492D, 22087C0494D, 22087C0515D, 22087C0520D, 22087C0752D, and 22087C0756D, dated September 29, 2015., the study area spans multiple flood zones, including X, X protected by levee, 0.2 percent annual chance flood hazard area; A, and AE zones with and without Base Flood Elevations determined. The proposed project will ensure the BPLS will be included on the upcoming version of the effective FIRM for the entire study area. The proposed project area, will benefit the most as the level of protection will increase for homeowners and businesses immediately adjacent to improvements. The area is currently developed and protected by the levee, so impacts to the floodplain will be minor. See also section 4.2 and 8-step process in appendix E</p>	<p>The Preliminary Digital FIRMS can be accessed via http://www.lsuagcenter.com/topics/family_home/home/design_construction/licenses%20permits/getting%20a%20permit/your%20flood%20zone/flood_maps. See also Section 4.2 and 8-step process in Appendix E.</p>	<p>The applicant is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities.</p> <p>All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files. The project area must be kept cleared so as not to interfere with floodplain functions see also Section 6.0 Conditions and Mitigation Measures.</p>

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Wetlands (EO 11990)	Negligible	<p>EO 11990, Protection of Wetlands, directs Federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the values of wetlands for federally funded projects. FEMA regulations for complying with EO 11990 are found at 44 CFR Part 9, Floodplain Management and Protection of Wetlands.</p> <p>U.S. Fish and Wildlife Service (USFWS) - National Wetlands Inventory map http://www.fws.gov/wetlands/Wetlands-Mapper.html queried on 4/4/2016 shows that the adjacent Violet Canal is a mapped riverine wetland, therefore mitigation measures would be carried out to prevent any potential or indirect adverse impacts to these systems. The U.S. Environmental Protection Agency (USEPA) regulates discharges to waters of the United States through permits issued under Section 402 of the CWA, entitled the National Pollutant Discharge Elimination System (NPDES), which authorizes and sets forth standards for state administered permitting programs regulating the discharge of pollutants into navigable waters within each state's jurisdiction. On August 27, 1996, USEPA Region VI delegated the authority to administer the NPDES program for matters within the jurisdiction of the State of Louisiana. Per correspondence from U.S. Environmental Protection Agency (EPA), jurisdictional waters of the U.S. do occur on the proposed project area, however, the EPA does not object to the projects as proposed at this time and recommends coordination with the United States Army Corps of Engineers (USACE).</p> <p>The applicant submitted a Joint Permit Application and Jurisdictional Determination (JD) on 3/20/2015. The USACE accepted the JD on 5/20/2015. The USACE determined the proposed site is not in a wetland and therefore not subject to USACE jurisdiction. The USACE also determined that a Department of Army (DA) permit under Section 404 of the CWA would not be required for this proposed project and has no objections to the proposed work.</p> <p>See also section 4.2 and 8-step process in appendix E</p>	<p>A solicitation of views (SOV) was prepared and sent out was prepared and sent out to the Resource Agencies by FEMA on 02/29/2016. EPA response letter dated 4/19/2016. Joint Permit Application for work within the Louisiana Coastal Zone dated 3/20/2015. USACE response dated, 6/9/2015 and 7/29/2016. See Appendix C External Agency Correspondence.</p>	<p>The project is in close proximity and directly adjacent to wetlands. Extreme care should be taken during the construction process through the appropriate use and maintenance of BMPs. Erosion Control Devices (ECDs) such as silt fencing, hay bales, sediment traps, etc. must be used and maintained extensively to prevent any potential direct or indirect adverse impacts to nearby wetland areas per the EO 11990. Potential concerns include but are not limited to silting-in and contamination from spills. Proper signage is required to clearly identify the adjacent wetland boundaries to help prevent any potential adverse impacts from construction vehicles/equipment/supplies accidentally leaving the boundaries of the approved Right of Way (ROW). Any adverse impacts to adjacent wetlands resulting from the construction of this project will jeopardize receipt of federal funding. Any changes or modifications to the proposed project will require a revised determination. Off-site locations of activities such as borrow, disposals, haul- and detour roads, and work mobilization site developments may be subject to USACE regulatory requirements. The approved Jurisdictional Determination is valid for a period of 5 years.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>

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Surface Water and Water Quality	Negligible	<p>USACE regulates the discharge of dredged or fill material into waters of the U.S., including wetlands, pursuant to Section 401 and 404 of the CWA. The USACE also regulates the building of structures in waters of the U.S. pursuant to Section 9 and 10 of the Rivers and Harbors Act (RHA). Section 402 of the CWA, entitled National Pollutant Discharge Elimination System (NPDES), authorizes and sets forth standards for state administered permitting programs regulating the discharge of pollutants into navigable waters within the state's jurisdiction, is regulated by the LADEQ.</p> <p>Although there is potential for short-term localized increase in sedimentation during construction, the project as proposed would not have significant long term impacts to water quality. According to the responses from the USACE they have no objection to the proposed work and a DA permit under Section 404 of the CWA would not be required for this proposed project. Per the design report, temporary control fencing would be installed approximately 15 feet away from the project construction zone. The land use and cover types for the pre and post project conditions would remain unchanged. Therefore, water quality of the flood flow from the Violet Canal would not be impacted by the completion of the project.</p>	<p>An SOV was prepared and sent out to the Resource Agencies by FEMA on 02/29/2016. EPA response letter dated 4/19/2016. LADEQ response 07/14/2016. Joint Permit Application for work within the Louisiana Coastal Zone dated 3/20/2015. USACE response dated, 6/9/2015 and 7/29/2016.</p> <p>See Appendix C External Agency Correspondence</p>	<p>Based on coordination with the USACE, no permit would be required under Section 404 of the CWA prior to the start of construction. If the project results in a discharge to waters of the State; submittal of a LPDES application is necessary. All precautions must be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one (1) acre. The applicant must contact the LDEQ Water Permits Division at (225) 219-9371 to determine if the proposed project requires a permit</p> <p>Additional information: http://www.deq.louisiana.gov/portal/tabid/2296/Default.aspx or by contacting the LDEQ Water Permits Division at (225) 219-9371. All precautions should be observed to protect the groundwater of the region. If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 is required. ECDs such as silt fencing, hay bales, sediment traps, etc. must be used and maintained extensively to prevent any potential direct or indirect adverse impacts to nearby waterways. See also Section 6.0 Conditions and Mitigation Measures.</p>
Groundwater	Negligible	<p>The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. St Bernard Parish does not overlay a Sole Source Aquifer. Project as proposed is not expected to affect any groundwater.</p>	<p>EPA response letter dated 4/19/2016. LDEQ response letter dated 6/14/2014. See Appendix C External Agency Correspondence.</p>	<p>The contractor must observe all precautions to protect the groundwater of the region. See also Section 6.0 Conditions and Mitigation Measures.</p>
Wild and Scenic River	Negligible	<p>The Wild and Scenic Rivers Act, (P. L. 90-543 as amended: 16 U.S.C. 1271-1287) established a method for providing federal protection for certain free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations.</p> <p>There are no Wild and Scenic Rivers in the project vicinity.</p>	<p>National Wild and Scenic Rivers http://www.rivers.gov/louisiana.php queried on 3/30/2016.</p>	

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Coastal Resources	Negligible	<p>The Coastal Zone Management Act of 1972 (CZMA) encourages the management of coastal zone areas and provides grants to be used in maintaining coastal zone areas. It is intended to ensure that federal activities are consistent with state programs for the protection and, where, possible, enhancement of the nation's coastal zones. The Louisiana Department of Natural Resources (LDNR) regulates the coastal zone in Louisiana. The applicant submitted a joint permit application for work within the Louisiana Coastal Zone on 03/20/2015. The (LDNR) responded on 03/25/2016 requesting more information regarding potential impacts to surface water. On 5/18/2015 the applicant submitted the requested information and the LDNR responded on 5/20/2015 with the determination that the project is exempt.</p> <p>The USFWS regulates federal funding in Coastal Barrier Resource System (CBRS) units under the Coastal Barrier Resources Act (CBRA). This Act protects undeveloped coastal barriers and related areas (<i>i.e.</i>, Otherwise Protected Areas [OPAs]) by prohibiting direct or indirect Federal funding of projects that support development in these areas. The project is not located within the CBRS.</p>	<p>Louisiana Coastal Zone maps, referenced 3/30/2016. Joint Permit Application for work within the Louisiana Coastal Zone dated 3/20/2015. LADNR response dated 3/20/2016 and 5/20/2016</p>	

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Air Quality	Negligible	<p>The Clean Air Act (CAA) requires the State of Louisiana to adopt ambient air quality standards to protect the public from potentially harmful amounts of pollutants. The LDEQ has designated areas meeting the state’s ambient air quality standards by their monitoring and modeling program efforts. The EPA has set National Ambient Air Quality Standards (NAAQS) for the following six (6) criteria pollutants: ozone (O₃), Particulate Matter (PM)_{2.5}, PM₁₀, nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), and lead (Pb). The EPA has designated specific areas as NAAQS attainment or non-attainment areas. Non-attainment areas are any areas that do not meet the quality standard for a pollutant, while attainment areas do meet ambient air quality standards. St. Bernard Parish is a non-attainment parish with the NAAQS for SO₂ (EPA, 2014). The General Conformity Rule (GCR) currently applies to all Federal actions that are taken in designated non-attainment or maintenance areas, with the following exceptions: (1) actions covered by the transportation conformity rule; (2) actions with associated emissions clearly at or below specified <i>de minimis</i> levels; (3) actions listed as exempt in the rule; or, (4) actions covered by a Presumed-to-Conform approved list (40 CFR § 93.153(c). When the total direct and indirect emissions from the project or action are clearly below the <i>de minimis</i> levels, the project or action would not be subject to a conformity determination, and may proceed [40 CFR §93.153(b) and (c)]. If, on the other hand, emissions are equal to or exceed 40 CFR. §93.153 or Louisiana Administrative Code (LAC) 33:III.1405.B <i>de minimis</i> levels, a general conformity determination must be made by the Federal agency involved. LDEQ requests a “general conformity applicability determination” in order to demonstrate that a formal general conformity determination is not required. Project-associated emissions are quantified using (1) direct emissions, and (2) indirect emissions within the scope of the Federal agency’s authority. <i>See</i> 40 CFR § 93.158(a).</p> <p>Negligible impacts to air quality would be anticipated from movement of heavy equipment during construction activities. The effects would be localized and of short duration. Compliance with the CAA NAAQS has been fully coordinated with the Air Quality Section of the LDEQ. An air quality determination for emissions from the proposed Federal action was made using methods described in LAC 33:III.1411. Therefore, the analysis was based upon direct emissions for estimated construction hours. The LDEQ concurred with FEMA’s air quality analysis for the proposed project which resulted in a finding of anticipated SO₂ emissions of no more than 0.0030986 tons, while the <i>de minimis</i> threshold is 100 tons/yr. (See Appendix B). This project meets exception two (2) above.</p>	LDEQ response dated 6/14/2016. See Appendix C External Agency Correspondence.	<p>The contractor would be responsible for keeping all excavated areas periodically sprayed with water, all equipment maintained in good working order, and all construction vehicles would be limited to 15 mph to minimize pollution/fugitive dust.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>

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Vegetation and Wildlife	Negligible	<p>The Fish and Wildlife Coordination Act (FWCA) provides the basic authority for the USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It also requires Federal agencies that construct, license or permit water resource development projects to first consult with the Service (and the National Marine Fisheries Service [NMFS] in some instances) and State fish and wildlife agency regarding the impacts on fish and wildlife resources and measures to mitigate these impacts. The site is developed in an urban area with little native vegetation present. In addition the project does not involve the diversion, modification, or control of a waterway. The project is directly adjacent to canal waters but there would be no permanent impacts to vegetation and wildlife.</p>	<p>Louisiana Department of Wildlife and Fisheries (LDWF) response letter dated 3/18/2016. See Appendix C External Agency Correspondence.</p>	<p>Extreme care must be taken during the construction process through the appropriate use and maintenance of BMP's. If at any time Heritage tracked species are encountered within the project area, please contact the Louisiana Natural Heritage Program (LNHP) Data Manager at 225-765-2643. See also Section 6.0 Conditions and Mitigation Measures.</p>
Threatened and Endangered Species (Endangered Species Act Section 7)	Negligible	<p>The Endangered Species Act (ESA) of 1973 prohibits the taking of listed, threatened, and endangered species unless specifically authorized by permit from the USFWS or the NMFS. The LDWF concurred with FEMA's determination that no rare, threatened, or endangered species are present on the site, and that no impacts to rare, threatened, or endangered species or critical habitats are anticipated for the proposed project. No state or Federal parks, wildlife refuges, or wildlife management areas are known at the site. As per the USFWS self-screening tool, and the information provided, the proposed project is not an activity that would affect a federally listed threatened or endangered species or designated critical habitat.</p>	<p>LDWF response letter dated 3/18/2016. As previously directed by USFWS, FEMA utilized the self-screening website, www.fws.gov/lafayette, on 3/31/2016. See Appendix C External Agency Correspondence.</p>	<p>If the proposed project has not been initiated within one (1) year, follow-up coordination via this website www.fws.gov/lafayette, should be accomplished prior to making expenditures because threatened and endangered species information is updated periodically. If the scope or location of the proposed project is changed, coordination via this website should occur as soon as such changes are made. See also Section 6.0 Conditions and Mitigation Measures.</p>

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigations and Conditional Measures
Cultural Resources (National Historic Preservation Act Section 106)	Negligible	<p>Historic Properties within the Area of Potential Effect (APEs) were identified during background research and site visits conducted on March 31st, 2015 and January 19, 2016 by FEMA Historic Preservation (HP) staff. Although there are no previously recorded archaeological sites within the defined APE for the Undertaking, there are recorded archaeological sites nearby. Therefore, FEMA archaeologists performed additional investigations within the project APE in association with this Undertaking. Two (2) shovel tests were conducted within the project APE. Both shovel tests were negative and primarily encountered sand fill, oyster shell and clay. Based on all the available evidence, including the negative findings of prior cultural resource surveys in the area, extensive archaeological monitoring performed in the vicinity, and negative test results of the current field investigations, FEMA has determined the likelihood of encountering significant archaeological resources within the APE is minimal. Additionally, FEMA identified one (1) property over 50 years of age within the standing structures APE; however, it was determined that the building is neither individually eligible for listing in the National Register of Historic Places (NRHP), nor does it contribute to a National Register listed or eligible Historic District. In accordance with FEMA's 2011 Louisiana State-Specific Hazard Mitigation Grant Program Programmatic Agreement (LA HMGP PA) dated January 31, 2011. Based on the aforementioned identification and evaluation, FEMA has determined that there are no historic properties as defined in 36 CFR 800.16(1) within the standing structures or archaeological APE. Therefore, FEMA has determined a finding of No Historic Properties Affected for this Undertaking (i.e. No Impact to Cultural Resources).</p> <p>The applicant must comply with the National Historic Preservation Act (NHPA) conditions set forth in this EA.</p>	<p>On 03/04/2016 , FEMA submitted a finding of <u>No Historic Properties Affected</u> to the affected tribes, (the Alabama-Coushatta Tribe of Texas [ACTT] , the Choctaw Nation of Oklahoma [CNO], the Coushatta Tribe of Louisiana [CT], the Jena Band of Choctaw Indians [JBCI], the Muscogee Creek Nation [MCN], the Seminole Nation of Oklahoma [SNO], and the Tunica-Biloxi Tribe of Louisiana [TBTL] per FEMA's Programmatic Agreement dated 1/31 2011. Subsequent to that, on 4/12/2016, FEMA submitted the same finding of No Historic Properties Affected to the Louisiana SHPO. Concurrence with FEMA's determination was received from the JBCI on 4/05/2016, and from SHPO on 4/27/2016. The MCN responded on 3/21/2016 and deferred to the other tribes. The CNO concurred on 5/13/2016. The remaining tribes did not object within the regulatory timeframes.</p>	<p>If human bone or unmarked grave(s) are present within the project area, compliance with the Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671 et seq.) is required. The applicant shall notify the law enforcement agency of the jurisdiction where the remains are located within 24 hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within 72 hours of the discovery. (Louisiana Unmarked Human Burial Sites Preservation Act)</p> <p>If during the course of work, archaeological artifacts (prehistoric or historic) are discovered, the applicant shall stop work in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the finds. The applicant shall inform their, GOSHEP State Applicant Liaison and Hazard Mitigation Assistance contacts at FEMA, who will in turn contact FEMA Historic HP staff. The applicant will not proceed with work until FEMA HP completes consultation with the SHPO, and others as appropriate Inadvertent (Discovery Clause). See also Section 6.0 Conditions and Mitigation Measures.</p>

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Environmental Justice (EO 12898)/Socioeconomics	Negligible	<p>EO 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was signed on February 11, 1994. The EO directs federal agencies to make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high adverse human health, environmental, economic, and social effects of its programs, policies and activities on minority or low-income populations.</p> <p>According to the 2010 U.S. Census Demographic Profile, the total population within the entire study area as depicted in Figure 2 above, is 35,093 with 62% White, 30% Black, 1% American Indian, 2% Asian and 8% Hispanic. 46% of the population is considered to be below the poverty threshold.</p> <p>An analysis was completed for the area north of the immediate project area and consists of the properties that have been acquired. According to the 2010 U.S. Census Demographic Profile, this area population is 6,739 with 50% White, 44% Black, 1% American Indian, 1% Asian and 6% Hispanic. 29% of the population is considered to be below the poverty threshold.</p> <p>The purpose and need of the proposed project is to reduce flooding and lower insurance rates, thus providing a benefit to the entire study area. The population being protected by the proposed project includes over 45,000 residents of both St. Bernard and Orleans parishes.</p> <p>The proposed project would include the acquisition of five (5) adjacent resident lots and one servitude. A total of four (4) currently occupied mobile homes would be relocated or demolished and a concrete parking lot on the Shrimp Factory property would be removed. The LBBLD obtained appraisals of the market value of the all property-owned parcels necessary for the project. The district also obtained a review appraisal of each appraisal. According to an affidavit signed by the Executive Director of Lake Borgne Basin – “all parcels were acquired voluntarily. The owners willingly sold or transferred their property or easements over their property, as appropriate to the district. District paid the owners at least the market value of their property or easements as determined by appraisal and review appraisal.”</p>	<p>EPA EJSCREEN accessed 9/2/2016. https://ejscreen.epa.gov/mapper/ State of Louisiana, Parish of St. Bernard Affidavit signed on 6/27/2016.</p>	

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigations and Conditional Measures
Resource Recovery and Conservation Act (RCRA)	Negligible	<p>The objectives of the RCRA are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner. RCRA regulates the management of solid waste (e.g., garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals.</p> <p>Project involves excavation of soil and existing culvert and/or piping. All debris would be disposed of at a permitted landfill.</p>	<p>LDEQ response dated 6/14/2016. See Appendix C External Agency Correspondence.</p>	<p>If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's SPOC at 225-219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.</p> <p>Unusable equipment, debris and material shall be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during implementation of the project applicant shall handle, manage, and dispose of petroleum products, hazardous materials and/or toxic waste in accordance to the requirements and to the satisfaction of the governing local, state and federal agencies. Applicant is responsible for acquiring LDEQ permits for the temporary debris staging and reduction sites (TDSRS) associated with this project prior to project closeout. Failure to provide FEMA with LDEQ approval may jeopardize project funding eligibility. All debris would be disposed of at a permitted landfill.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>
Noise	Negligible	<p>Noise is commonly defined as unwanted or unwelcome sound, and most commonly measured in decibels (dB) on the A-weighted scale, which is the scale most similar to the range of sounds that the human ear can hear. Sound is federally regulated by the Noise Control Act of 1972, which charges the EPA with preparing guidelines for acceptable ambient noise levels. EPA guidelines, and those of many other federal agencies, state that outdoor sound levels in excess of 55 dB day-night average sound level (DNL) are "normally unacceptable" for noise-sensitive land uses including residences, schools, or hospitals.</p> <p>During the construction period there would be a short-term increase in noise levels.</p>	<p>St Bernard Parish Noise Ordinance, Article VI, Noise Provisions and Prohibitions, Section 11 131-159.</p>	<p>Mitigation and abatement measures would be required to reduce the noise levels to a range that would be considered acceptable. The applicant must comply with the St Bernard Parish Noise Ordinance, Article VI, Noise Provisions and Prohibitions, Section 11 131-159.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>
Public Safety and Access	Negligible	<p>Congress passed the Occupational and Safety Health Act (OSHA) to ensure worker and workplace safety. The goal was to make sure employers provide their workers a place of employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions.</p> <p>During construction heavy equipment would be located in a populated area. Impacts to public safety and security would be minimized with mitigation measures, including following OSHA regulations.</p>		<p>The contractor must place fencing around the work area perimeters to protect nearby residents from vehicular traffic.</p> <p>To minimize worker and public health and safety risks from project construction and closure, all construction and closure work must be done using qualified personnel trained in the proper use of construction equipment, including all appropriate safety precautions. Additionally, all activities must be conducted in a safe manner in accordance with the standards specified in OSHA regulations and the USACE safety manual.</p> <p>The contractor must post appropriate signage and fencing to minimize potential adverse public safety concerns.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>
Traffic and Transportation	Negligible	<p>Traffic volumes near the respective work access areas would increase temporarily during work activities.</p>		<p>Appropriate signage and barriers should be in place prior to construction activities in order to alert pedestrians and motorists of project activities and traffic pattern changes.</p> <p>The contractor must implement traffic control measures, as necessary.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigations and Conditional Measures
Hazardous Materials and Toxic Wastes	Negligible	<p>The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); the Toxic Substances Control Act of 1976 (TSCA); the Emergency Planning and Community Right-to-Know Act; the Hazardous Materials Transportation Act; and the Louisiana Voluntary Investigation and Remedial Action statute. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of these materials. Some of these laws provide for the investigation and cleanup of sites already contaminated by releases of hazardous materials, wastes, or substances.</p> <p>Per NEPAAssist database search, there are no Louisiana State Brownfield (LSB), Superfund, or Toxic Release Inventory sites located within 0.5 mile of the site. There are two (2) hazardous waste (RCRA) within 0.5 mile of the site, Cure Oil and Diesel Inc. (a Used Oil Program participant) and Ricords Oil Service (a Transporter Handler Type).</p>	<p>LDEQ response dated 4/12/2016. See Appendix C External Agency Correspondence. NEPAAssist-EPA website http://nepassisttool.epa.gov/nepassist/entry.aspx referenced 4/14/2016 .</p>	<p>If hazardous materials are unexpectedly encountered in the project area during the proposed construction operations, appropriate measures for the proper assessment, remediation, management and disposal of the contamination would be initiated in accordance with applicable federal, state, and local regulations. The contractor would be required to take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction area. If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's SPOC at 225-219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents. The LDNR Office of Conservation should be contacted at 225-342-5540 if any unregistered wells of any type are encountered during construction work. For pipelines and other underground hazards, Louisiana One Call should be contacted at 800-272-3020 prior to commencing operations. See also Section 6.0 Conditions and Mitigation Measures.</p>
Climate Change	Negligible	<p>EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance, signed on 10/5/2009, directs federal agencies to reduce greenhouse gases (GHG) emissions and address climate change in NEPA analyses. EO 13514 identifies numerous energy goals in several areas, including GHG management, management of sustainable buildings and communities, and fleet and transportation management. The GHGs covered by this EO are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). These GHGs have varying heat-trapping abilities and atmospheric lifetimes (U.S. President 2009).</p> <p>EO 13653, Preparing the United States for the Impacts of Climate Change, agencies "reform policies and Federal funding programs that may, perhaps unintentionally, increase the vulnerability of natural or built systems, economic sectors, natural resources, or communities to climate change related risks." In response to this directive, FEMA has begun augmenting its flood risk information to reflect potential sea level rise, considering climate change in hazard mitigation planning, and affording grantees the opportunity to incorporate climate resilience measures in alternate projects (Department of Homeland Security [DHS] 2013, 2014).</p> <p>This alternative potentially includes short-term impacts to air quality resulting from construction activities. Particulate emissions from the generation of fugitive dust during project construction would likely be increased temporarily in the immediate project vicinity. Other emission sources on site could include internal combustion engines from work vehicles, air compressors, or other types of construction equipment. These effects would be localized and of short duration. No significant post-construction change in GHG emissions would be expected.</p>		<p>To reduce potential short term effects to air quality from construction-related activities, the contractor would be responsible for using BMPs to reduce fugitive dust generation and diesel emissions. Emissions from the burning of fuel by internal combustion engines would temporarily increase the levels of some of the criteria pollutants, including CO, NO_x, O₃, and PM₁₀, and non-criteria pollutants such as Volatile Organic Compounds (VOCs). To reduce these emissions, running times for fuel-burning equipment should be kept to a minimum and engines should be properly maintained.</p>

**Table 2: Affected Environment and Environmental Consequences Matrix:
Considered Action: Construction of 1,375 Linear Foot Sheet Pile Wall along the Interior of the Violet Canal Stretch**

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Geology and Soils	Negligible	<p>The Farmland Protection Policy Act (FPPA: Public Law 97-98, Section 1539-1549; 7 U.S.C. 4201, <i>et seq.</i>), enacted in 1981, is intended to minimize the impact federal actions may have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It assures that, to the extent possible, federal programs and policies are administered to be compatible with state and local farmland protection policies and programs.</p> <p>Per review of the National Resources Conservation Services (NRCS) Web Soil Survey, the soils located on the proposed project area (Cancienne silty clay loam, 0 to 1% slope and Schriver silty clay loam, 0 to 1% slope) are classified as prime farmland soil; however, the proposed project is "land already in or committed to urban development" within the meaning of 7 CFR 658.2(a), and are therefore not farmland for purposes of the FPPA.</p> <p>Only the soils and geology for the proposed project location were evaluated, because the levee is existing the soils and geology for the entire study area will not be impacted.</p>	NRCS Web Soil Survey	<p>Implement construction BMPs; install silt fences/straw bales to reduce sedimentation. Area soils would be covered and/or wetted during construction. If fill is stored on site as part of unit installation or removal, the contractor would be required to appropriately cover it.</p>
Hydrology and Floodplains (EO 11988)	Minor	<p>Executive Order (EO) 11988 (Floodplain Management) requires Federal agencies to avoid direct or indirect support or development within the 100-year floodplain whenever there is a practicable alternative. FEMA's regulations for complying with EO 11988 are found at 44 CFR Part 9. Per the Preliminary Digital Flood Insurance Rate Map (DFIRM) panel Panels 22087C0757D, 22087C0460D, 22087C0478D, 22087C0479D, 22087C0480D, 22087C0483D, 22087C0492D, 22087C0494D, 22087C0515D, 22087C0520D, 22087C0752D, and 22087C0756D, dated September 29, 2015., the study area spans multiple flood zones, including X, X protected by levee, 0.2 percent annual chance flood hazard area; A, and AE zones with and without Base Flood Elevations determined. The proposed project will ensure the BPLS will be included on the upcoming version of the effective FIRM for the entire study area. The proposed project area, will benefit the most as the level of protection will increase for homeowners and businesses immediately adjacent to improvements. The area is currently developed and protected by the levee, so impacts to the floodplain will be minor. See also section 4.2 and 8-step process in appendix E</p>	<p>The Preliminary Digital FIRMS can be accessed via http://www.lsuagcenter.com/topics/family_home/home/design_construction/laws%20licenses%20permits/getting%20a%20permit/your%20flood%20zone/flood_maps. See also Section 4.2 and 8-step process in Appendix E.</p>	<p>The applicant is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities. All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files. The project area must be kept cleared so as not to interfere with floodplain functions see also Section 6.0 Conditions and Mitigation Measures.</p>

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Wetlands (EO 11990)	Negligible	<p>EO 11990, Protection of Wetlands, directs Federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the values of wetlands for federally funded projects. FEMA regulations for complying with EO 11990 are found at 44 CFR Part 9, Floodplain Management and Protection of Wetlands.</p> <p>U.S. Fish and Wildlife Service (USFWS) - National Wetlands Inventory map http://www.fws.gov/wetlands/Wetlands-Mapper.html queried on 4/4/2016 shows that the adjacent Violet Canal is a mapped riverine wetland. , therefore mitigation measures would be carried out to prevent any potential direct or indirect adverse impacts to these systems. The U.S. Environmental Protection Agency (USEPA) regulates discharges to waters of the United States through permits issued under Section 402 of the CWA, entitled the National Pollutant Discharge Elimination System (NPDES), which authorizes and sets forth standards for state administered permitting programs regulating the discharge of pollutants into navigable waters within each state's jurisdiction. On August 27, 1996, USEPA Region VI delegated the authority to administer the NPDES program for matters within the jurisdiction of the State of Louisiana.</p> <p>See also section 4.2 and 8-step process in appendix E</p>	<p>An SOV was prepared and sent out to the Resource Agencies by FEMA on 9/28/2015. LADEQ response 07/14/2016. EPA and USACE did not respond regarding the considered action.</p> <p>See Appendix C External Agency Correspondence.</p>	<p>The applicant would be responsible for coordinating with and obtaining any required Section 401 and Section 404 Permit(s) from USACE prior to initiating work. All conditions of the permit must be adhered to. Failure to do so would jeopardize receipt of federal funding. All coordination pertaining to these activities should be documented and copies forwarded to the State and FEMA as part of the permanent project files. The project is in close proximity and directly adjacent to wetlands. Extreme care should be taken during the construction process through the appropriate use and maintenance of BMP's. Erosion Control Devices (ECD's) such as silt fencing, hay bales, sediment traps, etc. must be used and maintained extensively to prevent any potential direct or indirect adverse impacts to nearby wetland areas per the CWA and EO 11990. Potential concerns include but are not limited to silting-in and contamination from spills. Proper signage is required to clearly identify the adjacent wetland boundaries to help prevent any potential adverse impacts from construction vehicles/equipment/supplies accidentally leaving the boundaries of the approved ROW. Any adverse impacts to adjacent wetlands resulting from the construction of this project will jeopardize receipt of federal funding. Any changes or modifications to the proposed project will require a revised determination. Off-site locations of activities such as borrow, disposals, haul- and detour roads, and work mobilization site developments may be subject to USACE regulatory requirements.</p>
Surface Water and Water Quality	Negligible	<p>USACE regulates the discharge of dredged or fill material into waters of the U.S., including wetlands, pursuant to Section 401 and 404 of the CWA. The USACE also regulates the building of structures in waters of the U.S. pursuant to Section 9 and 10 of the Rivers and Harbors Act (RHA). Section 402 of the CWA, entitled National Pollutant Discharge Elimination System (NPDES), authorizes and sets forth standards for state administered permitting programs regulating the discharge of pollutants into navigable waters within the state's jurisdiction, is regulated by the LADEQ.</p> <p>Although there is potential for short-term localized increase in sedimentation during construction, the project as proposed would not have significant long term impacts to water quality.</p>	<p>An SOV was prepared and sent out to the Resource Agencies by FEMA on 02/29/2016. EPA and USACE did not respond regarding the considered action</p> <p>See Appendix C External Agency Correspondence.</p>	<p>Applicant must coordinate with USACE and LDEQ prior to the start of construction to acquire any necessary permits or authorizations, if any, are required.</p> <p>Applicant must comply with all conditions of the permit and forward all correspondence to GOHSEP and FEMA for inclusion in the project files.</p> <p>The project results in a discharge to waters of the State; submittal of a LPDES application is necessary.</p> <p>All precautions must be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one (1) acre. The applicant must contact the LDEQ Water Permits Division at 225- 219-9371 to determine if the proposed project requires a permit.</p> <p>Additional information may be obtained on the LDEQ website at http://www.deq.louisiana.gov/portal/tabid/2296/Default.aspx or by contacting the LDEQ Water Permits Division at 225- 219-9371.</p> <p>If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's SPOC at 225-219-3640 is required. Additionally, precautions must be taken to protect workers from these hazardous constituents.</p> <p>ECD's such as silt fencing, hay bales, sediment traps, etc. must be used and maintained extensively to prevent any potential direct or indirect adverse impacts to nearby waterways.</p>

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Groundwater	Negligible	The SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. St Bernard Parish does not overlay a Sole Source Aquifer. Project as proposed is not expected to affect any groundwater.	LDEQ response letter dated 6/14/2014.	The contractor must observe all precautions to protect the groundwater of the region. Applicant must coordinate with LDEQ prior to the start of construction to acquire any necessary permits or authorizations, if any, are required.
Wild and Scenic River	Negligible	The Wild and Scenic Rivers Act (Act), (P. L. 90-543 as amended: 16 U.S.C. 1271-1287) established a method for providing federal protection for certain free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations. There are no Wild and Scenic Rivers in the project vicinity.	National Wild and Scenic Rivers http://www.rivers.gov/louisiana.php queried on 3/30/2016.	
Coastal Resources	Negligible	The CZMA encourages the management of coastal zone areas and provides grants to be used in maintaining coastal zone areas. It is intended to ensure that federal activities are consistent with state programs for the protection and, where, possible, enhancement of the nation's coastal zones. The USFWS regulates federal funding in CBRS units under the CBRA. This Act protects undeveloped coastal barriers and related areas (OPAs) by prohibiting direct or indirect Federal funding of projects that support development in these areas. According to the Louisiana Coastal Zone Maps, the project site is located within the Louisiana Coastal Zone. The project is not located within the CBRS.	Louisiana Coastal Zone maps, referenced 3/30/2016. Louisiana CBRS Maps referenced 3/30/2016.	The considered alternative may require a CUP from the LDNR. The applicant is required to complete a Joint Permit Application and submit the packet to LDNR in order to make this determination. The submission should include locality maps, construction plats and plans with cross section views, etc., along with the appropriate application fee. The applicant shall comply with all conditions of the required permit. All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Air Quality	Negligible	<p>The CAA requires the State of Louisiana to adopt ambient air quality standards to protect the public from potentially harmful amounts of pollutants. The LDEQ has designated areas meeting the state’s ambient air quality standards by their monitoring and modeling program efforts. The EPA has set NAAQS for the following six (6) criteria pollutants: O₃, PM_{2.5}, PM₁₀, NO₂, CO, SO₂, and Pb. The EPA has designated specific areas as NAAQS attainment or non-attainment areas. Non-attainment areas are any areas that do not meet the quality standard for a pollutant, while attainment areas do meet ambient air quality standards. St. Bernard Parish is a non-attainment parish with the NAAQS for SO₂ (EPA, 2014). The GCR currently applies to all Federal actions that are taken in designated non-attainment or maintenance areas, with the following exceptions: (1) actions covered by the transportation conformity rule; (2) actions with associated emissions clearly at or below specified <i>de minimis</i> levels; (3) actions listed as exempt in the rule; or, (4) actions covered by a Presumed-to-Conform approved list (40 CFR § 93.153(c). When the total direct and indirect emissions from the project or action are clearly below the <i>de minimis</i> levels, the project or action would not be subject to a conformity determination, and may proceed [40 CFR §93.153(b) and (c)]. If, on the other hand, emissions are equal to or exceed 40 CFR. §93.153 or LAC 33:III.1405.B <i>de minimis</i> levels, a general conformity determination must be made by the Federal agency involved. LDEQ requests a “general conformity applicability determination” in order to demonstrate that a formal general conformity determination is not required. Project-associated emissions are quantified using (1) direct emissions, and (2) indirect emissions within the scope of the Federal agency’s authority. <i>See</i> 40 CFR § 93.158(a). Negligible impacts to air quality would be anticipated from movement of heavy equipment during construction activities. The effects would be localized and of short duration. Compliance with the CAA NAAQS for this alternative has not been coordinated with the Air Quality Section of the LDEQ. An air quality determination for emissions from this alternative Federal action would be required using methods described in Louisiana LAC 33:III.1411. Therefore, the analysis would be based upon direct emissions for estimated construction hours. FEMA’s air quality analysis for this alternative has not been conducted although it is anticipated that the SO₂ emissions would be less than the <i>de minimis</i> threshold of 100 tons/yr. Should this alternative become the proposed, FEMA-EHP would conduct all necessary calculations and coordinate with the LDEQ accordingly.</p>	LDEQ response dated 6/14/2016. See Appendix C External Agency Correspondence.	Vehicle operation times would be kept to a minimum. Area soils must be covered and/or wetted during construction to minimize dust.

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Vegetation and Wildlife	Negligible	<p>The FWCA provides the basic authority for the USFWS involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It requires that fish and wildlife resources receive equal consideration to other project features. It also requires Federal agencies that construct, license or permit water resource development projects to first consult with the Service (and the NMFS in some instances) and State fish and wildlife agency regarding the impacts on fish and wildlife resources and measures to mitigate these impacts.</p> <p>The site is developed in an urban area with little native vegetation present. In addition the project does not involve the diversion, modification, or control of a waterway. The project is directly adjacent to canal waters but there would be no permanent impacts to vegetation and wildlife.</p>	LDWF response letter dated 3/18/2016. See Appendix C External Agency Correspondence.	<p>Extreme care must be taken during the construction process through the appropriate use and maintenance of BMPs.</p> <p>If at any time Heritage tracked species are encountered within the project area, please contact the LNHP Data Manager at 225-765-2643.</p>
Threatened and Endangered Species (Endangered Species Act Section 7)	Negligible	<p>The ESA of 1973 prohibits the taking of listed, threatened, and endangered species unless specifically authorized by permit from the USFWS or the NMFS. The LDWF and USFWS concurred with FEMA that no rare, threatened, or endangered species are present on the site, and no impacts to rare, threatened, or endangered species or critical habitats are anticipated for the proposed project. No state or Federal parks, wildlife refuges, or wildlife management areas are known at the site.</p>	As previously directed by USFWS, FEMA utilized the self-screening website, www.fws.gov/lafayette , on 3/31/2016. LDWF response letter dated 3/18/2016. See Appendix C External Agency Correspondence.	If the proposed project has not been initiated within one (1) year, follow-up coordination via this website www.fws.gov/lafayette , should be accomplished prior to making expenditures because threatened and endangered species information is updated periodically. If the scope or location of the proposed project is changed, coordination via this website should occur as soon as such changes are made.

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Cultural Resources (National Historic Preservation Act Section 106)	Negligible	The considered alternative indicates the need to expand the Area of Potential Effects for historic properties and therefore would likely require additional review and consultation to identify any presently un-recorded historic resources. FEMA would follow its Section 106 review procedures if this proposed action is submitted to FEMA for funding consideration. Any additional conditions or requirements would be documented at that time.	Would likely require additional consultation with SHPO and Tribes.	<p>If human bone or unmarked grave(s) are present within the project area, compliance with the Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671 et seq.) is required. The applicant shall notify the law enforcement agency of the jurisdiction where the remains are located within 24 hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within 72 hours of the discovery. (Louisiana Unmarked Human Burial Sites Preservation Act).</p> <p>If during the course of work, archaeological artifacts (prehistoric or historic) are discovered, the applicant shall stop work in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the finds. The applicant shall inform their, GOSHEP State Applicant Liaison and Hazard Mitigation Assistance contacts at FEMA, who will in turn contact FEMA HP staff. The applicant will not proceed with work until FEMA HP completes consultation with the SHPO, and others as appropriate (Inadvertent Discovery Clause).</p>

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Environmental Justice (EO 12898)/Socioeconomics	Negligible	<p>EO 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was signed on February 11, 1994. The EO directs federal agencies to make achieving environmental justice part of their missions by identifying and addressing, as appropriate, disproportionately high adverse human health, environmental, economic, and social effects of its programs, policies and activities on minority or low-income populations.</p> <p>According to the 2010 U.S. Census Demographic Profile, the total population within the entire study area as depicted in Figure 2 above, is 35,093 with 62% White, 30% Black, 1% American Indian, 2% Asian and 8% Hispanic. 46% of the population is considered to be below the poverty threshold.</p> <p>An analysis was completed for the area north of the immediate project area and consists of the properties that have been acquired. According to the 2010 U.S. Census Demographic Profile, this area population is 6,739 with 50% White, 44% Black, 1% American Indian, 1% Asian and 6% Hispanic. 29% of the population is considered to be below the poverty threshold.</p> <p>The purpose and need of the proposed project is to reduce flooding and lower insurance rates, thus providing a benefit to the entire study area. The population being protected by the proposed project includes over 45,000 residents of both St. Bernard and Orleans parishes.</p>	EPA EJS SCREEN accessed 9/2/2016.	
RCRA	Negligible	<p>The objectives of the RCRA are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner. RCRA regulates the management of solid waste (e.g., garbage), hazardous waste, and underground storage tanks holding petroleum products or certain chemicals. Project involves excavation of soil and existing culvert and/or piping. All debris would be disposed of at a permitted landfill.</p>		<p>If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ’s SPOC at 225-219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents. Unusable equipment, debris and material shall be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during implementation of the project applicant shall handle, manage, and dispose of petroleum products, hazardous materials and/or toxic waste in accordance to the requirements and to the satisfaction of the governing local, state and federal agencies. Applicant is responsible for acquiring LDEQ permits for the TDSRS associated with this project prior to project closeout. Failure to provide FEMA with LDEQ approval may jeopardize project funding eligibility. All debris would be disposed of at a permitted landfill.</p>

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Noise	Negligible	Noise is commonly defined as unwanted or unwelcome sound, and most commonly measured in dB on the A-weighted scale, which is the scale most similar to the range of sounds that the human ear can hear. Sound is federally regulated by the Noise Control Act of 1972, which charges the EPA with preparing guidelines for acceptable ambient noise levels. EPA guidelines, and those of many other federal agencies, state that outdoor sound levels in excess of 55 dB DNL are “normally unacceptable” for noise-sensitive land uses including residences, schools, or hospitals. During the construction period there would be a short-term increase in noise levels.	St Bernard Parish Noise Ordinance, Article VI, Noise Provisions and Prohibitions, Section 11 131-159.	Mitigation and abatement measures would be required to reduce the noise levels to a range that would be considered acceptable. The applicant must comply with the local ordinance.
Public Safety and Access	Negligible	Congress passed the OSHA to ensure worker and workplace safety. The goal was to make sure employers provide their workers a place of employment free from recognized hazards to safety and health, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, or unsanitary conditions. During construction heavy equipment would be located in a populated area. Impacts to public safety and security would be minimized with mitigation measures, including following OSHA regulations.		The contractor must place fencing around the work area perimeters to protect nearby residents from vehicular traffic. To minimize worker and public health and safety risks from project construction and closure, all construction and closure work must be done using qualified personnel trained in the proper use of construction equipment, including all appropriate safety precautions. Additionally, all activities must be conducted in a safe manner in accordance with the standards specified in OSHA regulations and the USACE safety manual. The contractor must post appropriate signage and fencing to minimize potential adverse public safety concerns.
Traffic and Transportation	Negligible	Traffic volumes near the respective work access areas would increase temporarily during work activities.		Appropriate signage and barriers should be in place prior to construction activities in order to alert pedestrians and motorists of project activities and traffic pattern changes. The contractor must implement traffic control measures, as necessary.
Hazardous Materials and Toxic Wastes	Negligible	The management of hazardous materials is regulated under various federal and state environmental and transportation laws and regulations, including the CERCLA; the TSCA; the Emergency Planning and Community Right-to-Know Act; the Hazardous Materials Transportation Act; and the Louisiana Voluntary Investigation and Remedial Action statute. The purpose of the regulatory requirements set forth under these laws is to ensure the protection of human health and the environment through proper management (identification, use, storage, treatment, transport, and disposal) of these materials. Some of these laws provide for the investigation and cleanup of sites already contaminated by releases of hazardous materials, wastes, or substances. Per NEPAassist database search, there are no LSB, Superfund, or Toxic Release Inventory sites located within 0.5 mile of the site. There are two (2) hazardous waste (RCRA) within 0.5 mile of the site, Cure Oil and Diesel Inc. (a Used Oil Program participant) and Ricords Oil Service (a Transporter Handler Type).	NEPAassist-EPA website http://nepassistool.epa.gov/nepassist/entry.aspx referenced April 14, 2016.	Applicant must coordinate with EPA and LDEQ prior to the start of construction to acquire any necessary permits or authorizations, if any, are required. If hazardous materials are unexpectedly encountered in the project area during the proposed construction operations, appropriate measures for the proper assessment, remediation, management and disposal of the contamination would be initiated in accordance with applicable federal, state, and local regulations. The contractor would be required to take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction area. If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ’s SPOC at 225-219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents. The LDNR Office of Conservation should be contacted at 225-342-5540 if any unregistered wells of any type are encountered during construction work. For pipelines and other underground hazards, Louisiana One Call should be contacted at 800-272-3020 prior to commencing operations.

Resource Area	Impact	Impact Summary	Agency Coordination / Permits	Mitigation
Climate Change	Negligible	<p>EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance, signed on 10/5/2009, directs federal agencies to reduce GHG emissions and address climate change in NEPA analyses. EO 13514 identifies numerous energy goals in several areas, including GHG management, management of sustainable buildings and communities, and fleet and transportation management. The GHGs covered by this EO are: CO₂, CH₄, N₂O, SF₆, HFCs, and PFCs. These GHGs have varying heat-trapping abilities and atmospheric lifetimes (U.S. President 2009). EO 13653, Preparing the United States for the Impacts of Climate Change, agencies “reform policies and Federal funding programs that may, perhaps unintentionally, increase the vulnerability of natural or built systems, economic sectors, natural resources, or communities to climate change related risks.” In response to this directive, FEMA has begun augmenting its flood risk information to reflect potential sea level rise, considering climate change in hazard mitigation planning, and affording grantees the opportunity to incorporate climate resilience measures in alternate projects (DHS 2013, 2014).</p> <p>This alternative potentially includes short-term impacts to air quality resulting from construction activities. Particulate emissions from the generation of fugitive dust during project construction would likely be increased temporarily in the immediate project vicinity. Other emission sources on site could include internal combustion engines from work vehicles, air compressors, or other types of construction equipment. These effects would be localized and of short duration. No significant post-construction change in GHG emissions would be expected.</p>		<p>To reduce potential short term effects to air quality from construction-related activities, the contractor would be responsible for using BMPs to reduce fugitive dust generation and diesel emissions. Emissions from the burning of fuel by internal combustion engines would temporarily increase the levels of some of the criteria pollutants, including CO, NOx, O₃, and PM₁₀, and non-criteria pollutants such as VOCs. To reduce these emissions, running times for fuel-burning equipment should be kept to a minimum and engines should be properly maintained.</p>

4.2 Hydrology and Floodplains

EO 11988 (Floodplain Management) requires federal agencies to avoid direct or indirect support of development within the 100-year floodplain whenever there is a practicable alternative. A floodplain is defined as the lowland and relatively flat areas adjoining inland and coastal waters, including at a minimum that area subject to a one (1) percent or greater chance of flooding in any given year. FEMA complies with EO 11988 through 44 CFR Part 9, Floodplain Management and Protection of Wetlands. FIRMs created by the NFIP represent the best available flood data. However, in cases where overwhelming evidence exists, typically due to recent flood events, FEMA may use Advisory Base Flood Elevation Maps (ABFE) or preliminary DFIRMs as best available data. Per the St. Bernard Parish Preliminary Digital Flood Insurance Rate Map (DFIRM) panel Panels 22087C0757D, 22087C0460D, 22087C0478D, 22087C0479D, 22087C0480D, 22087C0483D, 22087C0492D, 22087C0494D, 22087C0515D, 22087C0520D, 22087C0752D, and 22087C0756D, dated September 29, 2015 and the Orleans parish Preliminary DFIRM panels 22071C0234F, 22071C0232F, dated December 1, 2015 the study area spans multiple flood zones, including X, X protected by levee, 0.2 percent annual chance flood hazard area; A, and AE zones with and without Base Flood Elevations determined. It should be noted the Orleans Parish Preliminary DFIRMS will become effective on September 30, 2016. The Preliminary DFIRM data takes into account the BPLS as a provisionally accredited levee. Per the St. Bernard Parish Preliminary DFIRM panel 22087C0494D, the immediate project area is located partially within a .2 pct annual chance flood hazard area and an AE zone. It also assumes the Lafitte Frozen Foods is partially within the levee. Figures 3 -5

The hydrology, hydraulic calculations, and the benefits/cost analyses for the project was taken from the *Violet Canal North Realignment Phase 2 Hydraulic Modification Impact Analysis Report*, dated May 2015 (Appendix D). A survey of the site was conducted between November 2013 and February 2014. The horizontal control of the topography and BPLS baseline alignment is based on the Louisiana State Plane South Coordinate System Federal Information Processing Standards, North American Datum of 1983 (NAD 83), High Accuracy Reference Network, and the vertical control is based on the North American Vertical Datum of 1988 (NAVD 88). All units are in U.S. survey feet. All elevations referred to in the referenced report are based on these horizontal controls and vertical datum. Based on the survey data, the existing drainage divide (i.e., the existing earthen berm along the canal) was determined and shown on Figure 3. Areas adjacent to the project site consist of a Shrimp Factory, scattered buildings, and open spaces covered with grass or gravel pavements. The existing drainage patterns shown as blue arrows are depicted on Figure 6. A storm drain system starts on the south side of Pakenham Road and turns northward at the Fifth Street intersection and discharges into the east-west natural drainage ditch at the eastern end of General Pershing Street. Another storm drain located approximately 400 feet west of Sixth Street conveys flow under Pakenham Road to a north-south natural drainage ditch that connects to the east-west natural drainage ditch located on the eastern end of General Pershing Street. The existing berm shown on Figure 3 separates runoff that flows south to the Violet Canal and runoff that flows north toward the east-west natural drainage ditch at the eastern end of General Pershing Street. The topographic slopes adjacent to the project site are approximately 0.005 and 0.03 (ft/ft) for areas north and south of the existing berm, respectively.

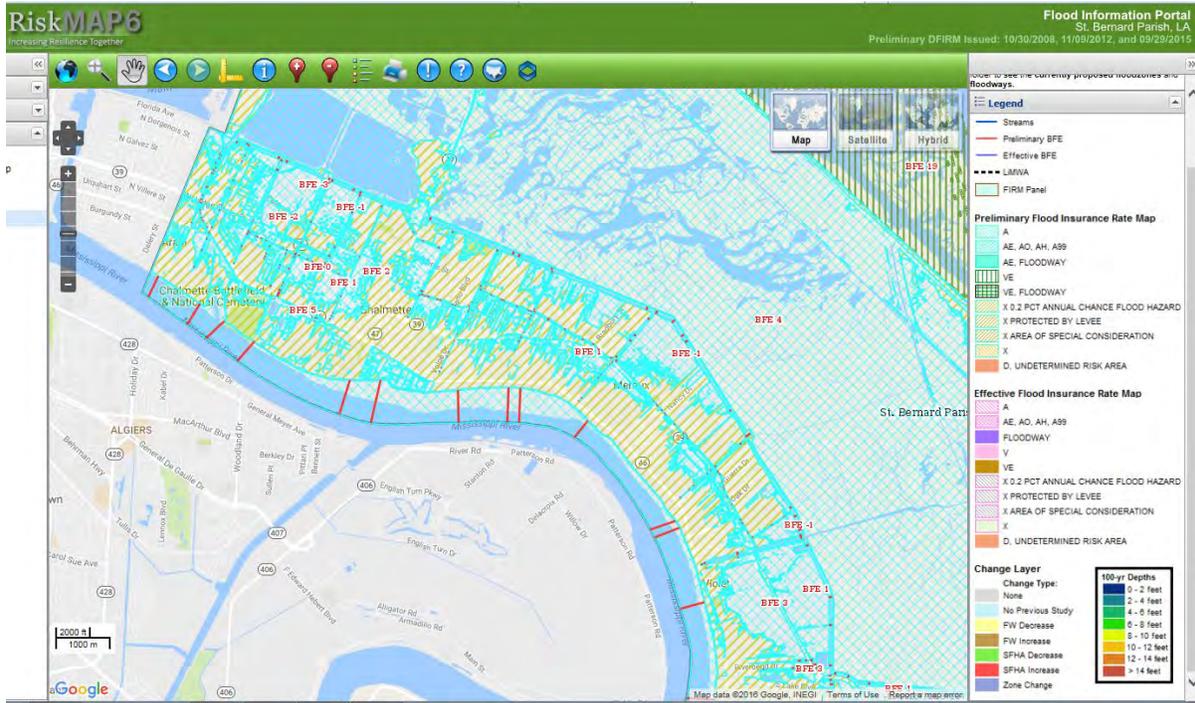


Figure 4: Flood Hazard Data for Portion of the Study Area in St. Bernard Parish

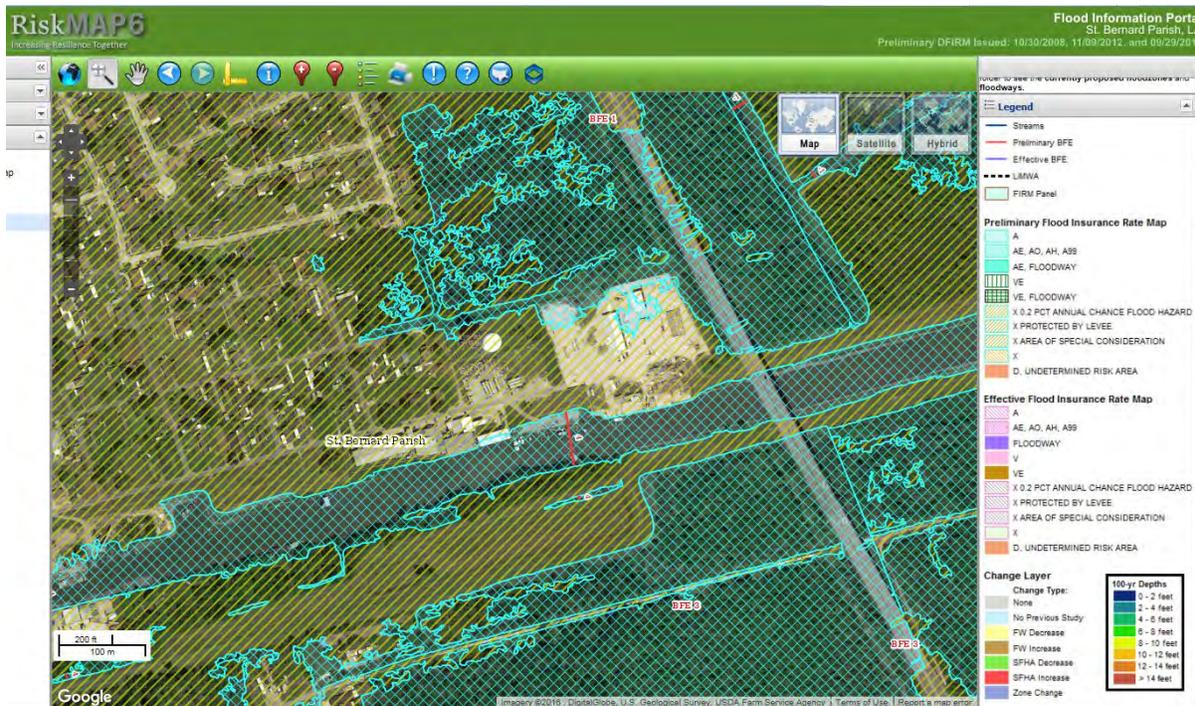


Figure 5: Flood Hazard Data for the Immediate Project Area

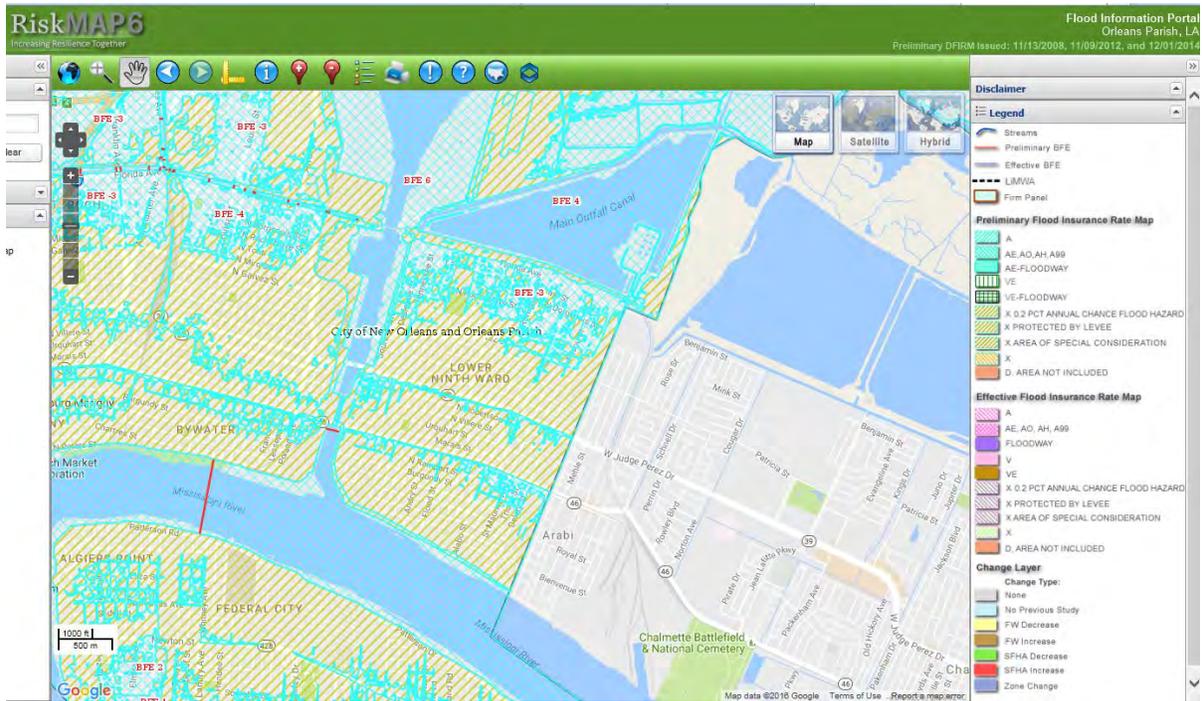


Figure 6: Flood Hazard Data for Portion of the Study Area in Orleans Parish



Figure 7: Violet, LA Existing Drainage Map

EO 11988 requires federal agencies proposing activities in a 100-year floodplain to consider alternatives and avoid adverse effects and incompatible development in the floodplain. If no practicable alternative exists to implementing an action in the floodplain, the action must be designed to minimize potential harm to or within the floodplain. A notice must be publicly circulated explaining the action and the reasons for implementing an action in a floodplain.

When evaluating actions in the floodplain, FEMA utilizes the decision process described in 44 CFR Part 9, referred to as the 8-Step Process. The 8-Step Process ensures that the action is consistent with EO 11988.

No Action Alternative: As mentioned at the beginning of this EA, storm surge caused a number of breaches in the federal hurricane protection system along the MRGO during Hurricane Katrina. The storm surge filled the CWU and overtopped the BPLS, contributing to massive flooding, hundreds of fatalities, and unprecedented property loss throughout the St. Bernard Basin.

No Action: Under the No Action Alternative, flooding would not be abated or improved. The purpose of the proposed project is to alleviate flooding within portions of Orleans and St. Bernard Parish and to obtain FEMA accreditation for the BPLS. This alternative does not meet the purpose and need of the project

Proposed Action: Per the *Violet Canal North Realignment Phase 2 Hydraulic Modification Impact Analysis Report* (Appendix D), the proposed action would not have any upstream or downstream impacts on Violet Canal flood elevations during a 100-year recurrence rainfall type flood. The levee realignment, new catch basins, and drainage modifications / redirections are likely to reduce flood losses up to and including the 100-year or 1% flood event, and the engineering analyses show the modifications would bring the 40 Arpents Levee System to NFIP standards.

According to the report (see Appendix D), with the proposed conditions, the area between the existing berm and the proposed levee could be inundated during the 100-year flood event when the stop log structures are in place and slide gates on Pakenham Road are closed. As floodwaters recede and the stop log structures and slide gates are open, the flow would be drained by the proposed storm drain system #1 to the existing storm drain system located at Fourth Street and the proposed storm drain system #2 to the north-south natural drainage ditch located on the east side of the proposed levee. Both existing drainage systems discharge unto the east-west natural drainage ditch at the eastern end of General Pershing Street (Figure 7). The area changing flow directions would be approximately 3.64 acres which would be served by the proposed storm system #2. The proposed drainage system #2 should convey at least the 10-year flood event which is estimated to be 20.11 cfs (LADOTD 2011). There would be no net increase in runoff for different frequency and/or duration of storm events.



Figure 8: Violet, LA Proposed Conditions Map

By re-grading the areas between the flood-side (south) of the levee and the existing berm, the receding flood flow would be able to flow more efficiently by the proposed storm drain systems to the existing drainage systems and eventually exit into the east-west natural drainage ditch located at the eastern-end of General Pershing Street in Violet, LA. The runoff for the pre- and post-conditions would be conveyed into the same drainage systems (i.e. the east-west natural drainage ditch and the drainage system at the east end of General Pershing Street). Properties on the landside (north), including area adjacent to the proposed project would be protected during the 100-year flood and the finished floor elevation of the Shrimp Factory is at or above the FEMA 100-year flood elevation of four (4) feet. It is also anticipated that the all the properties within the project area would benefit from reduced flooding as a result of the proposed project. Through residential buyout and relocation, no homes would be inhabited on the flood-side of the proposed levee after the completion of the project (Figures 8 and 9).

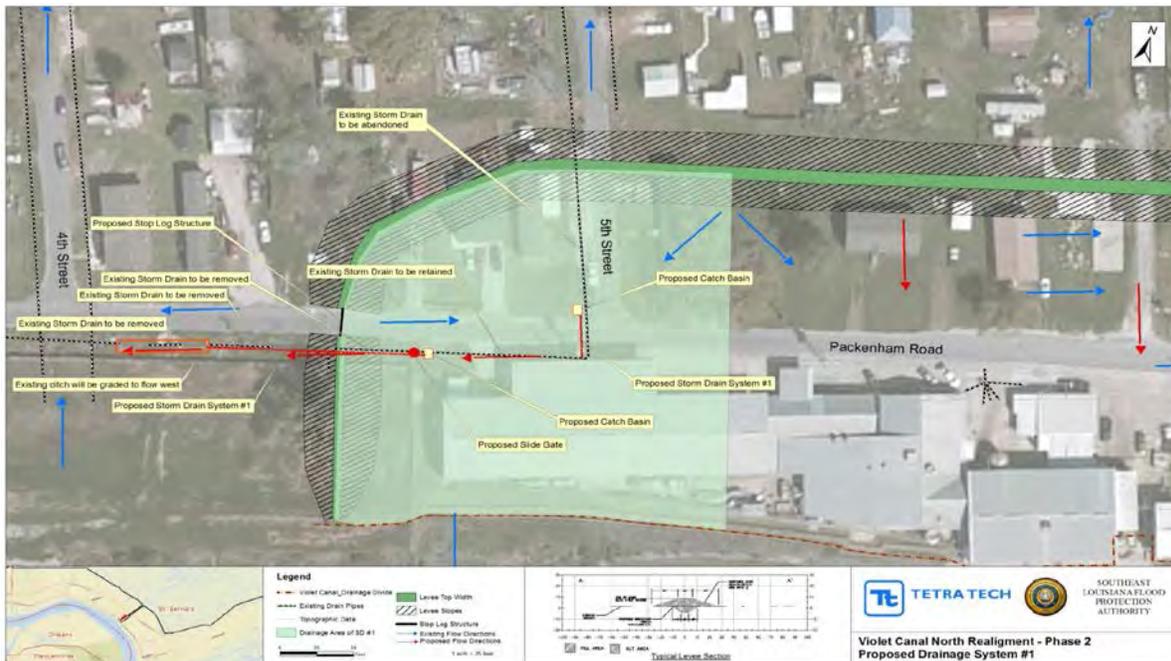


Figure 9: Violet, LA Proposed Storm Drainage Improvements System #1 Map

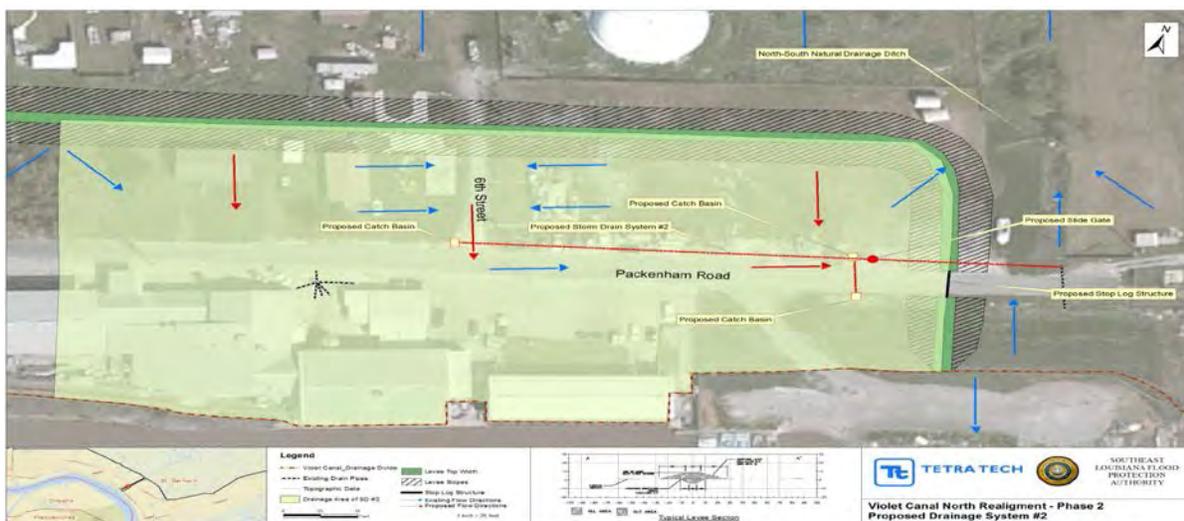


Figure 10: Violet, LA Proposed Storm Drainage Improvements System #2 Map

In accordance with EO 11988 (Floodplain Management) and EO 11990 (Wetland Protection), an 8 Step-Process assessment was prepared by FEMA to evaluate the impacts related to the construction of the Proposed Action within the 500-year floodplain (Appendix E). The entire study area is included in the 8 Step-Process assessment. The 8-Step Process reviewed practicable alternatives, identified direct and indirect impacts, minimization and mitigation of impacts, and provided an evaluation of the Proposed Action’s location within the floodplain.

No significant direct impact would occur to floodplains under the Proposed Action; however, indirect short-term impacts to the surrounding area could occur during construction.

The applicant is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities.

New construction must be compliant with current codes and standards. Per 44 CFR 9.11(d)(6), no project should be built to a floodplain management standard that is less protective than what the community has adopted in local ordinances through their participation in the National Flood Insurance Program.

All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

Considered Alternative: The construction of a 1,375 linear foot wall of sheet pile along the interior (Violet Canal side) stretch under the Shrimp Factory which would tie back into the existing earthen levee on the south side of the building and into a newly-constructed 415 linear foot earthen levee on the north side of the building, would close the loop in the levee system and ensure the 100-year flood protection. As indicated previously, if this alternative were to become the proposed alternative then another H&H study would be required and resubmitted for review and approval. Additionally, re-evaluation and a public notice would be required.

5.0 CUMULATIVE IMPACTS

The CEQ's regulations state that cumulative impacts represent the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR § 1508.7).

In its comprehensive guidance on cumulative impacts analysis under NEPA, the CEQ notes that: "[t]he range of actions that must be considered includes not only the project proposal, but all connected and similar actions that could contribute to cumulative effects" (CEQ, 1997). The term "similar actions" may be defined as "reasonably foreseeable or proposed agency actions [with] similarities that provide a basis for evaluating the environmental consequences together, such as common timing or geography" (40 CFR § 1508.25[a][3]; see also 40 CFR Section 1508.25[a][2] and [c]).

Not all potential issues identified during cumulative effects scoping need be included in an EA. Because some effects may be irrelevant or inconsequential to decisions about the proposed action and the alternative, the focus of the cumulative effects analysis should be narrowed to important issues of national, regional, or local significance. To assist agencies in this narrowing process, CEQ (2007) provides a list of several basic questions, including: (1) Is the proposed action one (1) of several similar past, present, or future actions in the same geographic area? (2) Do other activities (governmental or private) in the region have environmental effects similar to those of the proposed action? (3) Have any recent or ongoing NEPA analyses of similar actions or nearby actions identified important adverse or beneficial cumulative effect issues? and, (4) Has the impact been historically significant, such that the importance of the resource is defined by past loss, past gain, or investments to restore resources?

It is normally insufficient when analyzing the contribution of a proposed action to cumulative effects to merely analyze effects within the immediate area of the proposed action. Geographic boundaries should be expanded for cumulative effects analysis, and conducted on the scale of human communities, landscapes, watersheds, or airsheds. Temporal frames should be extended to encompass additional effects on the resources, ecosystems, and human communities of concern. A useful concept in determining appropriate geographic boundaries for a cumulative effects analysis is the project impact zone; that is, the area (and resources within that area) that could be affected by the proposed action. The area appropriate for analysis of cumulative effects would, in most instances, be a larger geographic area occupied by resources outside of the project impact zone (CEQ 2007).

The proposed project site is centered at Latitude 29.901110, Longitude -89.895056 near the center of zip code 70092. FEMA has determined that the larger geographic area protected by the BPLS consisting of areas in zip codes 70092, 70075, 70117, 70032, and 70043 which include St Bernard and Orleans Parishes in Louisiana, constitutes an appropriate project impact zone; and the area within a one (1) mile buffer zone of the site constitutes an appropriate boundary for a cumulative impact analysis of the proposed action and the alternatives. See Figures 7 and 8.

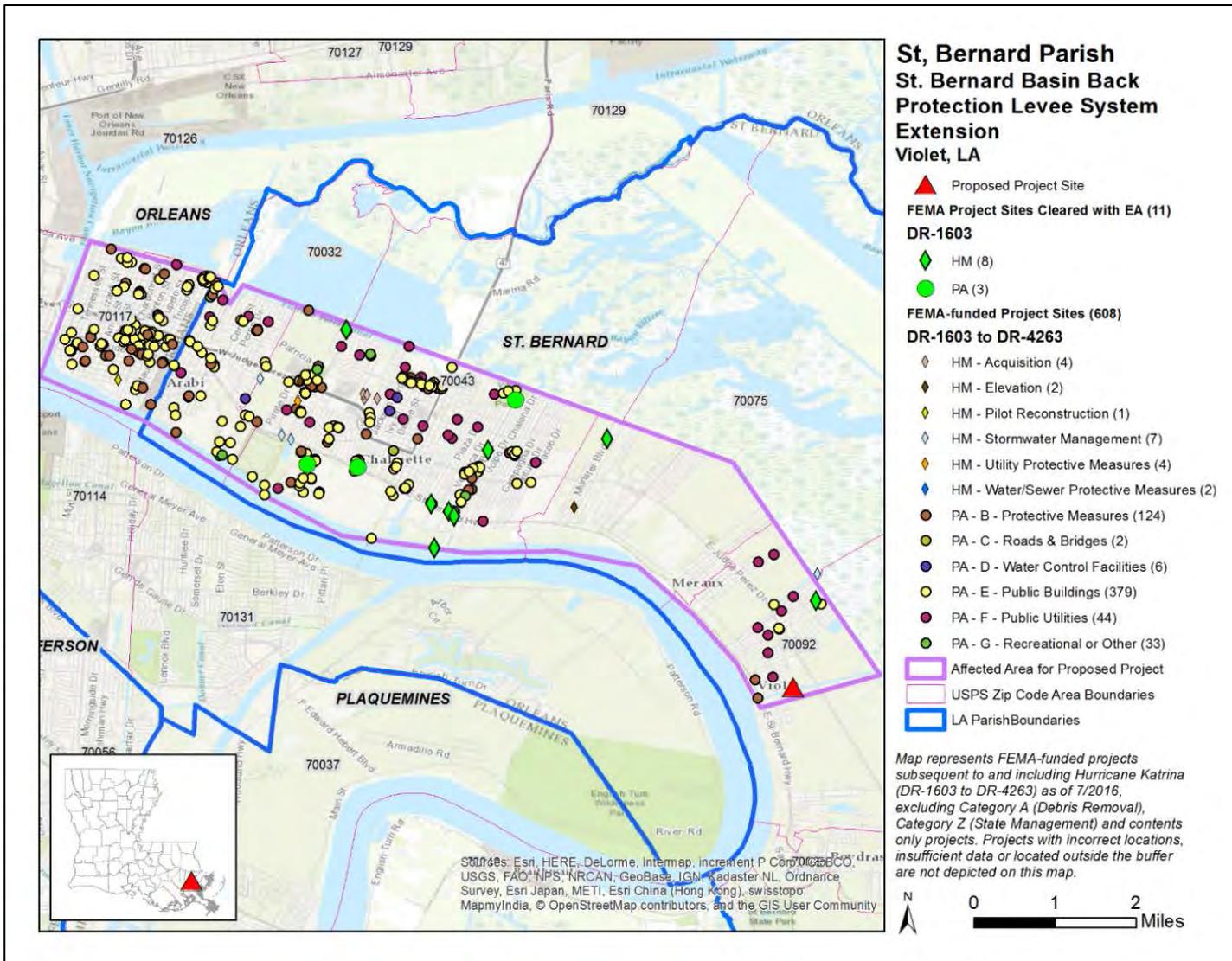


Figure 11: Affected Area Map for St. Bernard Basin Back Protection Levee System Extension, Violet Louisiana

(FP&C) have numerous recovery and other construction projects planned or ongoing throughout the parish. Although these projects can be expected to have cumulative effects to the built and natural environment of the parish, the subject proposed project is not anticipated to contribute to any adverse effects.

From August 2005 continuing to February 2016, within the one (1) mile buffer zone, Public Assistance and HMGP program funded, along with non-FEMA funded, debris removal, protective measures, mitigation, and repair projects have occurred, are occurring, or are reasonably foreseen to occur (developed with enough specificity to provide useful information to a decision maker and the interested public) (Figure 7). FEMA-funded undertakings are divided into six (6) categories, four (4) of which are represented with the subject one (1) mile radius of the proposed project area: Category B – Protective Measures, Category E – Public Buildings, Category F – Public Utilities, and Category G – Recreational or Other. FEMA-funded actions are subjected to various levels of environmental review as requirement for the receipt of federal funding. An applicant's failure to comply with any required environmental permitting or other conditions is a serious violation which can result in the loss of Federal assistance, including funding.

FEMA has determined that the incremental effects of the other infrastructure recovery and improvement actions are likely to be similar to the impacts and effects this EA previously described for the present proposed action, in that the effects to socioeconomic resources are expected to be beneficial, and effects to other resources expected to be either non-existent or minimal and temporary. FEMA has further determined that the incremental impact of the present proposed project, when combined with the effects of other past, present, and reasonably foreseeable future projects, is neither cumulatively considerable nor significant.

These infrastructure actions, some of which have already occurred, and many of which would occur concurrent with and/or subsequent to the proposed action, are necessary in order to restore conditions from previous disasters and to mitigate future damage. Considered in relation to past, present, and reasonably foreseeable future actions, the cumulative impact of the proposed action to the built and natural environment would be minimal, beneficial rather than detrimental, and is not expected to contribute to any adverse effects or to otherwise significantly affect the human environment.

Table 3 below lists and briefly describes known present, past, and reasonably foreseeable infrastructure and recovery improvements projects, including activities identified by FEMA and not by FEMA-funded for which environmental assessments were performed, and/or that may have the potential for cumulative impacts when combined with the effects of the present proposed action. The table also identifies the potential for cumulative impacts when combined with the effects of the proposed action and the rationale for that assessment.

Table 3: Known Present, Past, and Reasonably Foreseeable Infrastructure and Recovery Improvements Projects

Project Name	Lead Agency or Firm	Location	Description	Cumulative Impact	Rationale
Violet Park #1 Concession and Restroom Building	FEMA	Violet Park #1, E. St. Bernard Hwy., 70092.	Building of a restroom and concession building at Violet Park.	Negligible	Construction of a restroom and concession facility at Violet Park would not have a significant impact on the proposed project in this EA.
Saint Bernard Parish Government Pump Station Upgrades	FEMA	4200 B Jean Lafitte Pkwy, Chalmette, LA and 3200 Guerra Drive, Violet, LA.	Upgrading equipment at two (2) existing pump stations, 1 and 4, located at 4200 B Jean Lafitte Parkway in Chalmette and 3200 Guerra Drive in Violet respectively.	Negligible	This project has been determined to be Categorical Excluded from the need to prepare either an Environmental Impact Statement or Environmental Assessment in accordance with 44 CFR Part 10.8(d)(2)(xv) - "Repair, reconstruction, restoration, elevation, retrofitting, upgrading to current codes and standards, or replacement of any facility in a manner that substantially conforms to the preexisting design, function, and location".
St Bernard 3 Drainage Canal Upgrades	FEMA	Congressman Hebert Drive, starting near West St. Bernard Highway and running approximately 2,500 feet to the Blue Bird Canal. Creely Canal runs south to north along Creely Drive.	Upgrades to an existing drainage system by regrading and lining the drainage channels at Creely canal and Congressman Hebert canals.	Negligible	Upgrades to existing drainage systems will not have significant cumulative impacts associated with the proposed project in this EA. The project area for St. Bernard 3 Drainage Canal upgrade is approximately 6.3 miles north west of the project being proposed in this EA and would not contribute to significant cumulative impacts.
St Bernard Palmisano Drainage Upgrades	FEMA	East St. Bernard Hwy Canal, Palmisano Blvd Canal, and the 20 Arpent Canal	Upgrade of the Plaza Drive Lift Station, and to improve the drainage within the East St. Bernard Hwy Canal, Palmisano Blvd Canal, and the 20 Arpent Canal.	Negligible	The St. Bernard Pamissan Drainage upgrade project is on the north west bank of the Mississippi River, approximately 12.7 miles west of the project proposed in this project and will not contribute to significant cumulative impacts.
St Bernard WWTS Improvements	FEMA	Munster Plant, DRAVO Pump Station, and Violet Pump Station, Chalmette, LA.	The project is to minimize ancillary flooding and decrease the frequency of disruptions to the sewage disposal system during and after storm events in St. Bernard Parish.	Negligible	This project involves the upgrade to existing pump stations that would allow for a more efficient sewage and disposal system during and after storm events and would not be expected to have any cumulative impacts associated with the project being proposed in this EA.
New Orleans Lakefront Levee, West of Inner Harbor Navigational Canal	USACE	West of Inner Harbor Navigation Canal, New Orleans, LA	Installing high-performance mats and roll sod over them on the backside of the levee. The mats will help anchor the roots into the ground, that way if a hurricane surges over the levee, there's less chance of erosion.	Less than significant	This project is to protect residents from the 1% chance flood event and will not have a cumulative impact on the proposed action. Based on the distance from the proposed action this project would have less than significant impact.

Project Name	Lead Agency or Firm	Location	Description	Cumulative Impact	Rationale
Outfall Canal Closure Structures, 17th Street Canal, Orleans Avenue Canal and London Avenue Canal	USACE	17th Street Canal, Orleans Avenue Canal and London Avenue Canal	The interim closure structures at the three outfall canals are composed of both gated structures and various pumps. These pumps move rainwater out of the canals, around the gates and into Lake Pontchartrain during a tropical weather event. The 17th Street Canal consists of 18 hydraulic pumps, 11 direct drive pumps, 14 bridge pumps, and has a pumping capacity of 9,200 cubic feet per second (cfs). The Orleans Avenue Canal consists of 10 hydraulic pumps and has a pumping capacity of 2,200 cfs. The London Avenue Canal consists of 12 hydraulic pumps, 8 direct drive pumps, and has a pumping capacity of 5,200 cfs.	Less than significant	Due to the broad scope of this project, the project being proposed in this EA would have less than significant impacts associated with the St. Bernard System project.
Citrus Lakefront Levee	USACE	Citrus Lakefront Levee, New Orleans East	Raise levee to elevation 13 ft., install positive cutoff / drainage culverts for Citrus and Janacek Pump Station.	Less than significant	This project involves the upgrade to existing structure would not be expected to have any cumulative impacts associated with the project being proposed in this EA.
New Orleans East Lakefront to Michoud Canal	USACE	New Orleans East Lakefront to Michoud Canal	This project currently defends against a storm surge that has a 1 percent chance of occurring in any given year, or a 100-year storm surge. The permanent 100-year level of risk reduction was attained on June 1, 2011. This project is scheduled to be completed in summer 2012.	Less than significant	This project contributes to the overall protection of the greater New Orleans Metropolitan Area from the impacts of a 1% flood event.
Bayou Dupre Control Structure	USACE	South bank of the Mississippi River Gulf Outlet (MRGO), in the northwest portion of St. Bernard Parish.	Construction of a new flood control structure with steel sector gates and flood wall tie-ins, constructed on the floodside of and adjacent to the existing structure.	Less than significant	This project contributes to the overall protection of the greater New Orleans Metropolitan Area from the impacts of a 1% flood event.
Caernarvon Floodwall	USACE		The new alignment will tie-in to the Mississippi River Levee system and include new floodgates across Highway 39 and Norfolk Southern Railroad. A 56-foot wide navigable structure across the Caernarvon Canal is also part of the proposed action.	Less than significant	This project contributes to the overall protection of the greater New Orleans Metropolitan Area from the impacts of a 1% flood event.
Violet Park #1 Concession and Restroom Building	FEMA	Violet Park #1, E. St. Bernard Hwy., 70092.	Building of a restroom and concession building at Violet Park.	Negligible	Construction of a restroom and concession facility at Violet Park would not have a significant impact on the proposed project in this EA.

6.0 CONDITIONS AND MITIGATION MEASURES

The following conditions must be met as part of the implementation of the project. Failure to comply with these conditions may jeopardize federal funds.

- The applicant is required to comply with all federal, state, and local laws, EOs, and regulations. Failure to do so will jeopardize federal funding.
- Implement construction BMPs; install silt fences/straw bales to reduce downslope sedimentation. Area soils must be covered and/or wetted during construction.
- If fill is stored on site as part of unit installation or removal, the contractor is required to appropriately cover it.
- Construction contractor is required to obtain applicable LPDES permit, and implement stormwater pollution prevention plan.
- The applicant is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities. All correspondence must be submitted to FEMA and FEMA-EHP for inclusion in the project files. Should the site plans (including drainage design) change the applicant must submit changes to FEMA-EHP for review and approval prior to the start of construction.
- New construction must be compliant with current codes and standards.
- During construction activities, the project area must be kept cleared so as not to interfere with floodplain functions.
- Per 44 CFR 9.11(d)(6), no project should be built to a floodplain management standard that is less protective than what the community has adopted in local ordinances through their participation in the National Flood Insurance Program.
- The project is in close proximity and directly adjacent to wetlands. Extreme care should be taken during the construction process through the appropriate use and maintenance of BMP's. ECD's such as silt fencing, hay bales, sediment traps, etc. **must be used and maintained extensively** to prevent any potential direct or indirect adverse impacts to nearby wetland areas per the CWA and EO 11990. Potential concerns include but are not limited to silting-in and contamination from spills.
- Proper signage is required to clearly identify the adjacent wetland boundaries to help prevent any potential adverse impacts from construction vehicles/equipment/supplies accidentally leaving the boundaries of the approved ROW.
- Any adverse impacts to adjacent wetlands resulting from the construction of this project will jeopardize receipt of federal funding.
- Any changes or modifications to the proposed project will require a revised determination. Off-site locations of activities such as borrow, disposals, haul- and detour roads, and work mobilization site developments may be subject to USACE regulatory requirements.
- If the project results in a discharge to waters of the State; submittal of a LPDES application is necessary.
- If proposed work is located in wetlands or other areas subject to the jurisdiction of the USACE, USACE should be contacted directly to inquire about the possible necessity for

permits. If a USACE permit is required, part of the application process may involve a water quality certification from LDEQ.

- All precautions must be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one (1) acre. The applicant must contact the LDEQ Water Permits Division at 225-219-9371 to determine if the proposed project requires a permit. Additional information may be obtained on the LDEQ website at <http://www.deq.louisiana.gov/portal/tabid/2296/Default.aspx> or by contacting the LDEQ Water Permits Division at 225- 219-9371.
- If hazardous materials are unexpectedly encountered in the project area during the proposed construction operations, appropriate measures for the proper assessment, remediation, management and disposal of the contamination would be initiated in accordance with applicable federal, state, and local regulations. The contractor would be required to take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction area.
- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's SPOC at 225-219-3640 is required. Additionally, precautions must be taken to protect workers from these hazardous constituents.
- The contractor must observe all precautions to protect the groundwater of the region.
- Vehicle operation times should be kept to a minimum. Area soils must be covered and/or wetted during construction to minimize dust.
- If human bone or unmarked grave(s) are present within the project area, compliance with the Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671 et seq.) is required. The applicant shall notify the law enforcement agency of the jurisdiction where the remains are located within 24 hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within 72 hours of the discovery (Louisiana Unmarked Human Burial Sites Preservation Act).
- If during the course of work, archaeological artifacts (prehistoric or historic) are discovered, the applicant shall stop work in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the finds. The applicant shall inform their, GOSHEP State Applicant Liaison and Hazard Mitigation Assistance contacts at FEMA, who will in turn contact FEMA Historic Preservation (HP) staff. The applicant will not proceed with work until FEMA HP completes consultation with the SHPO, and others as appropriate (Inadvertent Discovery Clause).
- If at any time Heritage tracked species are encountered within the project area, please contact the LNHP Data Manager at 225-765-2643.
- If the proposed project has not been initiated within one (1) year, follow-up coordination via this website www.fws.gov/lafayette, should be accomplished prior to making expenditures because threatened and endangered species information is updated periodically. If the scope or location of the proposed project is changed, coordination via this website should occur as soon as such changes are made.
- Unusable equipment, debris and material shall be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during

implementation of the project applicant shall handle, manage, and dispose of petroleum products, hazardous materials and/or toxic waste in accordance to the requirements and to the satisfaction of the governing local, state and federal agencies.

- Applicant is responsible for acquiring LDEQ permits for the TDSRS's associated with this project prior to project closeout. Failure to provide FEMA with LDEQ approval may jeopardize project funding eligibility.
- All debris must be disposed of at a permitted landfill.
- Mitigation and abatement measures would be required to reduce the noise levels to a range that would be considered acceptable in accordance with St. Bernard Parish City Ordinance Chapter 11, Article 5, Sec. 11-132. The applicant must comply with the local ordinance.
- To minimize worker and public health and safety risks from project construction and closure, all construction and closure work must be done using qualified personnel trained in the proper use of construction equipment, including all appropriate safety precautions. Additionally, all activities must be conducted in a safe manner in accordance with the standards specified in OSHA regulations and the USACE safety manual.
- The contractor must post appropriate signage and fencing to minimize potential adverse public safety concerns, and to protect nearby residents from vehicular traffic. Appropriate signage and barriers must be in place prior to construction activities in order to alert pedestrians and motorists of project activities and traffic pattern changes.
- The contractor must implement traffic control measures, as necessary.
- The LDNR Office of Conservation should be contacted at 225-342-5540 if any unregistered wells of any type are encountered during construction work.
- For pipelines and other underground hazards, Louisiana One Call should be contacted at 800-272-3020.
- To reduce potential short term effects to air quality from construction-related activities, the contractor would be responsible for using BMPs to reduce fugitive dust generation and diesel emissions. Emissions from the burning of fuel by internal combustion engines would temporarily increase the levels of some of the criteria pollutants, including CO, NO₂, O₃, and PM₁₀, and non-criteria pollutants such as VOCs. To reduce these emissions, running times for fuel-burning equipment should be kept to a minimum and engines should be properly maintained.

Failure to comply with these conditions may make part or all of these projects ineligible for FEMA funding.

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

FEMA is the lead federal agency for the NEPA compliance process for this HMGP Project. It is the responsibility of the lead agency to conduct the preparation and review of NEPA documents in a way that is responsive to the needs of the Parish communities while meeting the spirit and intent of NEPA and complying with all NEPA provisions. As part of the development of early interagency coordination related to the proposed action, state and federal resource protection agencies were contacted and FEMA distributed an informal scoping notification through a Solicitation of Views.

7.1 Agency Coordination

- U.S. Army Corps of Engineers (USACE)
- Louisiana Department of Environmental Quality (LDEQ)
- Louisiana Department of Natural Resources (LDNR)
- Louisiana Department of Wildlife and Fisheries (LDWF)
- Environmental Protection Agency (EPA)
- Louisiana State Historic Preservation Officer (SHPO)
- U.S. Fish and Wildlife Service (USFWS)

FEMA has received no objections to the project as proposed subsequent to these notifications. Comments and conditions received from the agencies have been incorporated into this Environmental Assessment (*Appendix C*).

In accordance with applicable local, state, and federal regulations, the applicant would be responsible for acquiring any necessary permits prior to commencing construction at the proposed project site.

7.2 Public Involvement

A public notice will be published in local newspapers. The public notices will run in the The St. Bernard Voice, Friday September 16 2016; and Friday, September 23, 2016; and in the Advocate (New Orleans edition) on Friday through Thursday, September 16-22, 2016.

The draft EA and draft FONSI can be viewed at the St. Bernard Parish Library located at 2600 Palmisano Blvd, Chalmette, LA 70043 Mondays – Thursdays 9 am – 7pm, Fridays – Saturdays 9 am-5pm, closed Sundays and Holidays. An electronic version of the draft EA can be viewed at FEMA's website at <http://www.fema.gov/resource-document-library>.

8.0 CONCLUSION

Construction of the proposed action alternative at the proposed location was analyzed based on the studies, consultations, and reviews undertaken as reported in this draft EA. If the considered alternative were to become the proposed action, then it would be analyzed in complete detail. The findings of this EA conclude that the proposed action at the proposed site would result in no significant adverse impacts to geology, groundwater, floodplains, public health and safety, hazardous materials, socioeconomic resources, environmental justice, or cultural resources.

During project construction, short-term impacts to soils, surface water, transportation, air quality, and noise are anticipated and conditions have been incorporated to mitigate and minimize the effects. Project short-term adverse impacts would be mitigated using BMPs, such as silt fences, proper vehicle and equipment maintenance, and appropriate signage. No long-term adverse impacts are anticipated from the proposed project. Therefore, FEMA presently finds the proposed action meets the requirements for a FONSI under NEPA and the preparation of an EIS will not be required. If new information is received that indicates there may be significant adverse effects, then FEMA would revise the findings and issue a second public notice, for additional comments. However, if there are no changes, this Draft EA will become the Final EA.

Based upon the studies and consultations undertaken in this EA, and given the precautionary and mitigating measures, there does not appear to be any significant environmental impacts associated with the St. Bernard Back Basin Protection Levee System Extension, Violet Louisiana.

9.0 REFERENCES

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10.0 LIST OF PREPARERS

Tiffany Spann-Winfield, Deputy Environmental Liaison Officer, Federal Emergency Management Agency, Louisiana Recovery Office

David Martin, Environmental Protection Specialist (contractor), Federal Emergency Management Agency, Louisiana Recovery Office

Jason Emery, Archaeologist, Federal Emergency Management Agency, Louisiana Recovery Office

Amber Martinez, Environmental Protection Specialist, Federal Emergency Management Agency, Louisiana Recovery Office

Melanie Pitts, Lead Environmental Protection Specialist, Federal Emergency Management Agency, Louisiana Recovery Office

Kimberly Smith-Jones, Environmental Protection Specialist, Federal Emergency Management Agency, Louisiana Recovery Office

Joan Gillard, Historic Preservation Specialist, Federal Emergency Management Agency, Louisiana Recovery Office

Bridget Zachary, Environmental Protection Specialist (contractor), Federal Emergency Management Agency, Louisiana Recovery Office

APPENDICES

Note: Several pages of the following are not fully Section 508 compliant due to technical limitations. Therefore, some individuals with disabilities may find it difficult to access. If you require assistance in accessing the full content of this document please contact FEMA at FEMA-NOMA@fema.dhs.gov

APPENDIX A
SITE PHOTOGRAPHS



Photo 1. Western terminus of project area, facing south.



Photo 2. Location of northern edge of proposed levee facing east.



Photo 3. View east along proposed levee route—large tree to be removed, facing east.

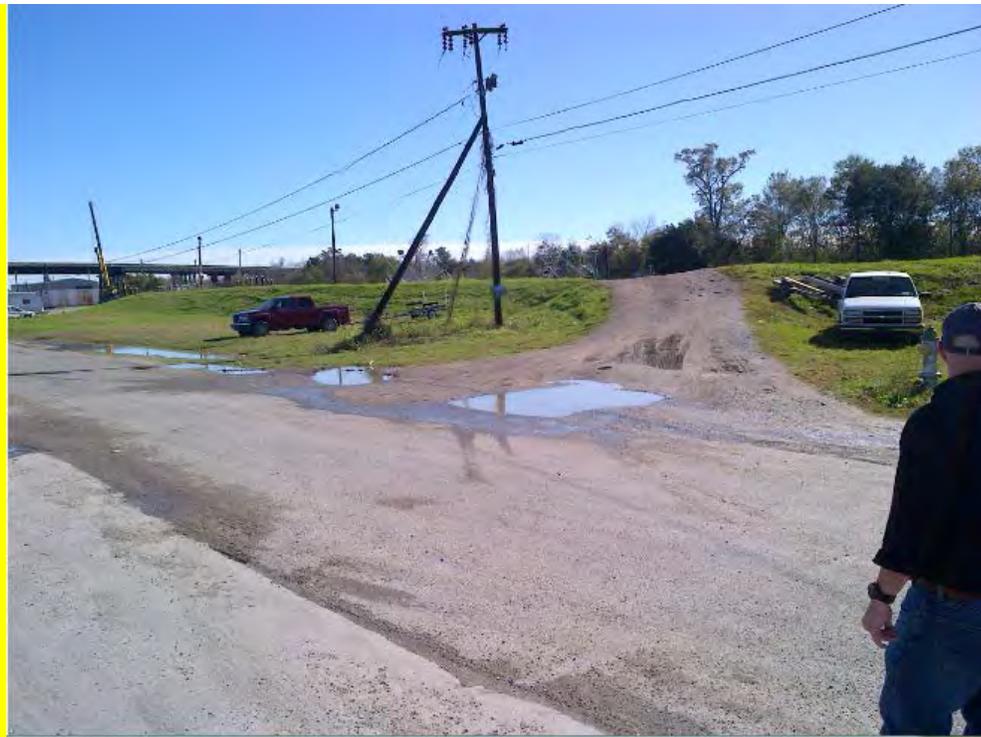


Photo 4. Eastern terminus of proposed levee, facing southeast.



Photo 5. View east to Phase I area proposed work, facing east.



Photo 6. Lafitte's Frozen Foods building, facing southwest.



Photo 7. Lafitte's Frozen Foods building, Facing west.



Photo 8. Concrete parking area to be removed, facing west.



Photo 9. Home to be moved.



Photo 10. Home to be moved



Photo 11. Home to be moved.

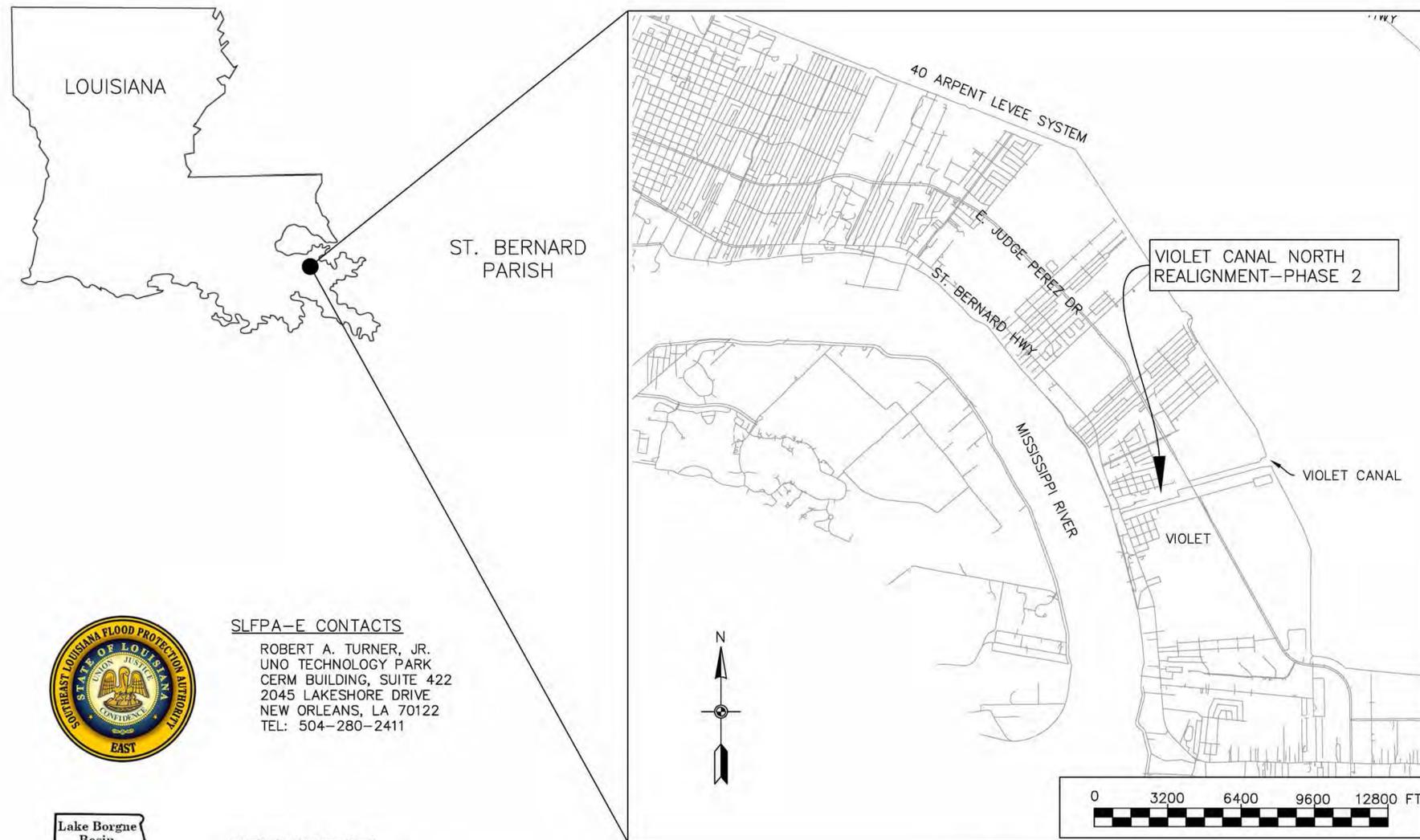


Photo 12. Home to be moved.

APPENDIX B
SITE PLAN DRAWINGS FOR PROPOSED ALTERNATIVE

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST
 LAKE BORGNE BASIN LEVEE DISTRICT
 ST. BERNARD PARISH

VIOLET CANAL NORTH REALIGNMENT—PHASE 2
 200—FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD



LOCATION MAP

SHEET INDEX	SHEET NO.
TITLE SHEET AND SHEET INDEX	1
GENERAL NOTES	2
LEGEND AND ABBREVIATIONS	3
RIGHT OF WAY	4
SURVEY CONTROL	5
LEVEE GEOMETRIC CONTROL	6
PROJECT LAYOUT	7
DEMOLITION PLAN	8
PLAN AND PROFILE LEVEE STA 10+00 — STA 13+00	9
PLAN AND PROFILE LEVEE STA 13+00 — STA 17+00	10
PLAN AND PROFILE LEVEE STA 17+00 — STA 21+00	11
PLAN AND PROFILE LEVEE STA 21+00 — STA 24+00	12
PLAN AND PROFILE WATER TOWER ACCESS	13
TYPICAL SECTIONS	14
PROPOSED DRAINAGE	15
CROSS SECTION LEVEE STA 11+00 AND STA 12+00	16
CROSS SECTION LEVEE STA 13+00 AND STA 14+00	17
CROSS SECTION LEVEE STA 15+00 AND STA 16+00	18
CROSS SECTION LEVEE STA 17+00 AND STA 18+00	19
CROSS SECTION LEVEE STA 19+00 AND STA 20+00	20
CROSS SECTION LEVEE STA 21+00 AND STA 22+00	21
CROSS SECTION LEVEE STA 23+00	22
UTILITY PLAN LEVEE STA 10+00 — 17+00	23
UTILITY PLAN LEVEE STA 17+00 — 24+00	24
UTILITY DISPOSITION	25
TYPICAL LEVEE SURFACE CROSSING	26
TYPICAL PIPE THRU SHEET PILING	27
STANDARD BEDDING AND BACKFILL FOR PIPING	28
PAVEMENT RESTORATION DETAILS	29
SEWER MANHOLE DETAILS	30
PRECAST DRAINAGE STRUCTURE	31
STANDARD VALVE DETAILS	32
HIGH PERFORMANCE TURF REINFORCING MAT DETAILS	33
CONCRETE EROSION PAD DETAILS	34
STRUCTURAL NOTES	35
CLOSURE STRUCTURE PLAN AND DETAILS	36
PILING DETAILS	37
SHEET PILE WALL TO CLOSURE STRUCTURE CONNECTION DETAILS 1	38
SHEET PILE WALL TO CLOSURE STRUCTURE CONNECTION DETAILS 2	39
TEMPORARY EROSION CONTROL PLAN	40
TEMPORARY EROSION CONTROL DETAILS	41
TRAFFIC CONTROL PLAN WEST CLOSURE STRUCTURE	42
TRAFFIC CONTROL PLAN EAST CLOSURE STRUCTURE	43
OBJECT MARKER INSTALLATION AT CLOSURE STRUCTURES	44
TRAFFIC CONTROL DETAILS	45
TRAFFIC CONTROL DETAILS	46

SLFPA—E CONTACTS

ROBERT A. TURNER, JR.
 UNO TECHNOLOGY PARK
 CERM BUILDING, SUITE 422
 2045 LAKESHORE DRIVE
 NEW ORLEANS, LA 70122
 TEL: 504-280-2411

LBBLD CONTACTS

NICHOLAS P. CALI
 6136 EAST SAINT BERNARD HIGHWAY
 VIOLET, LA 70092
 TEL: 504-682-5491



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 VIOLET, SAINT BERNARD PARISH, LA

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 SHEET
 1

LEGEND

- EX BUILDING
- EX RIGHT OF WAY
- EX SERVITUDE
- EX CATCH BASIN
- EX CULVERT
- EX DROP INLET, DRAIN LINE
- EX DROP INLET, DRAIN LINE
- EX COMMUNICATIONS MANHOLE, LINE
- EX DRAIN MANHOLE, DRAIN LINE
- EX ELECTRICAL MANHOLE, ELECTRICAL LINE
- EX GAS MANHOLE, GAS LINE
- EX SEWER MANHOLE, SEWER LINE
- EX TELEPHONE LINE, TELEPHONE LINE
- EX TRAFFIC MANHOLE, TRAFFIC LINE
- EX WATER MANHOLE, WATER LINE
- EX UTILITY POLE / OVERHEAD LINE, ELECTRICAL, TELEPHONE, CABLE TV
- EX FIBER OPTIC RISER / LINE
- EX FENCE
- EX TELCO RISER / PEDESTAL
- EX UTILITY CLEANOUT
- EX UTILITY METER
- EX UTILITY PEDESTAL
- EX UTILITY VALVE
- EX UTILITY VALVE VAULT
- EX FIRE HYDRANT
- EX LIGHT STANDARD
- EX TRAFFIC SIGNAL POLE
- EX TRAFFIC LIGHT POWER VAULT
- EX CANOPY SUPPORT
- EX BOLLARD
- EX DROP INLET
- EX SIGN
- EX TREE
- EX RESIDENTIAL MAILBOX
- EX PP DEADMAN
- EX CONTOUR
- CONTOUR
- SLOPE ARROW
- APPROX DAYLIGHT
- CENTERLINE
- TEMPORARY BENCHMARK
- EX CONCRETE
- EX GRAVEL
- GRAVEL
- EX ASPHALT PAVEMENT
- RIGHT-OF-WAY
- EXCAVATION
- FILL
- OVER-EXCAVATION

ABBREVIATIONS

- ABAND. ABANDONED
- ABC AGGREGATE BASE COURSE
- AC ASPHALTIC CONCRETE
- APPROX. APPROXIMATE
- AVE AVENUE
- BEG BEGINNING
- BC BEGIN CURVE
- CEP CONCRETE EROSION CONTROL PAD
- CFS CUBIC FEET PER SECOND
- CH CHANNEL
- CL CENTER LINE
- CMP CORRUGATED METAL PIPE
- COE CORPS OF ENGINEERS
- CONC CONCRETE
- CY CUBIC YARD
- DBL DOUBLE
- DIA DIAMETER
- DR DRIVE
- E EAST, EASTING
- EA EACH
- EC END CURVE
- ECB EXISTING CATCH BASIN
- EG EXISTING GRADE
- EL ELEVATION
- EW EACH WAY
- EX EXISTING
- EOP EDGE OF PAVEMENT
- FG FINISH GRADE
- FL FLOWLINE
- FS FINISH SURFACE
- FT FEET
- FWY FREEWAY
- GALV GALVANIZED
- GB GRADE BREAK
- HOR HORIZONTAL
- H HEIGHT
- HPTRM HIGH PERFORMANCE TURF REINFORCEMENT MAT
- HT HEIGHT
- IMP IMPERVIOUS
- ID INSIDE DIAMETER
- IN INCH
- INV INVERT ELEVATION
- LBBLD LAKE BORGNE BASIN LEVEE DISTRICT
- LBS POUNDS
- LF LINEAR FEET
- LT LEFT
- MAX MAXIMUM
- MH MANHOLE
- MIN MINIMUM
- N NORTH, NORTHING
- NAD NORTH AMERICAN DATUM
- NAVD NORTH AMERICAN VERTICAL DATUM
- NTS NOT TO SCALE
- OC ON CENTER
- PCB PROPOSED CATCH BASIN
- PED PEDESTRIAN
- PERF. PERFORATED
- PCC POINT OF COMPOUND CURVE
- PDEA PERCUSSION DRIVEN EARTH ANCHOR
- PI PROTECT IN PLACE
- PIP POINT OF REVERSE CURVE
- PROP PROPOSED
- PCB PROPOSED CATCH BASIN
- PMH PROPOSED MANHOLE
- PVC POLYVINYL CHLORIDE
- R RADIUS
- RCB REINFORCED CONCRETE BOX
- RCP REINFORCED CONCRETE PIPE
- RD ROAD
- RDWY ROADWAY
- RET RETAINING
- ROW RIGHT-OF-WAY
- RT RIGHT
- S SLOPE, SOUTH
- SD STORM DRAIN
- SF SQUARE FEET
- SHT SHEET
- SHTS SHEETS
- SLFPA SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY
- STA STATION
- STD STANDARD
- ST STREET
- STR STRUCTURE
- SURF SURFACE
- TBD TO BE DETERMINED
- TBM TEMPORARY BENCHMARK
- TF TOP OF FOOTING
- TOA TOP OF AGGREGATE
- TOL TOP OF LEVEE
- TOS TOP OF SLURRY TRENCH
- TOT TOP OF TOE DRAIN
- TOR TOP OF RAMP
- TYP TYPICAL
- UG UNDERGROUND
- U.S. UNITED STATES
- VER VERTICAL
- W WEST/WIDTH
- W/L WALL LINE
- WSE WATER SURFACE ELEVATION

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VIOLET, SAINT BERNARD PARISH, LA

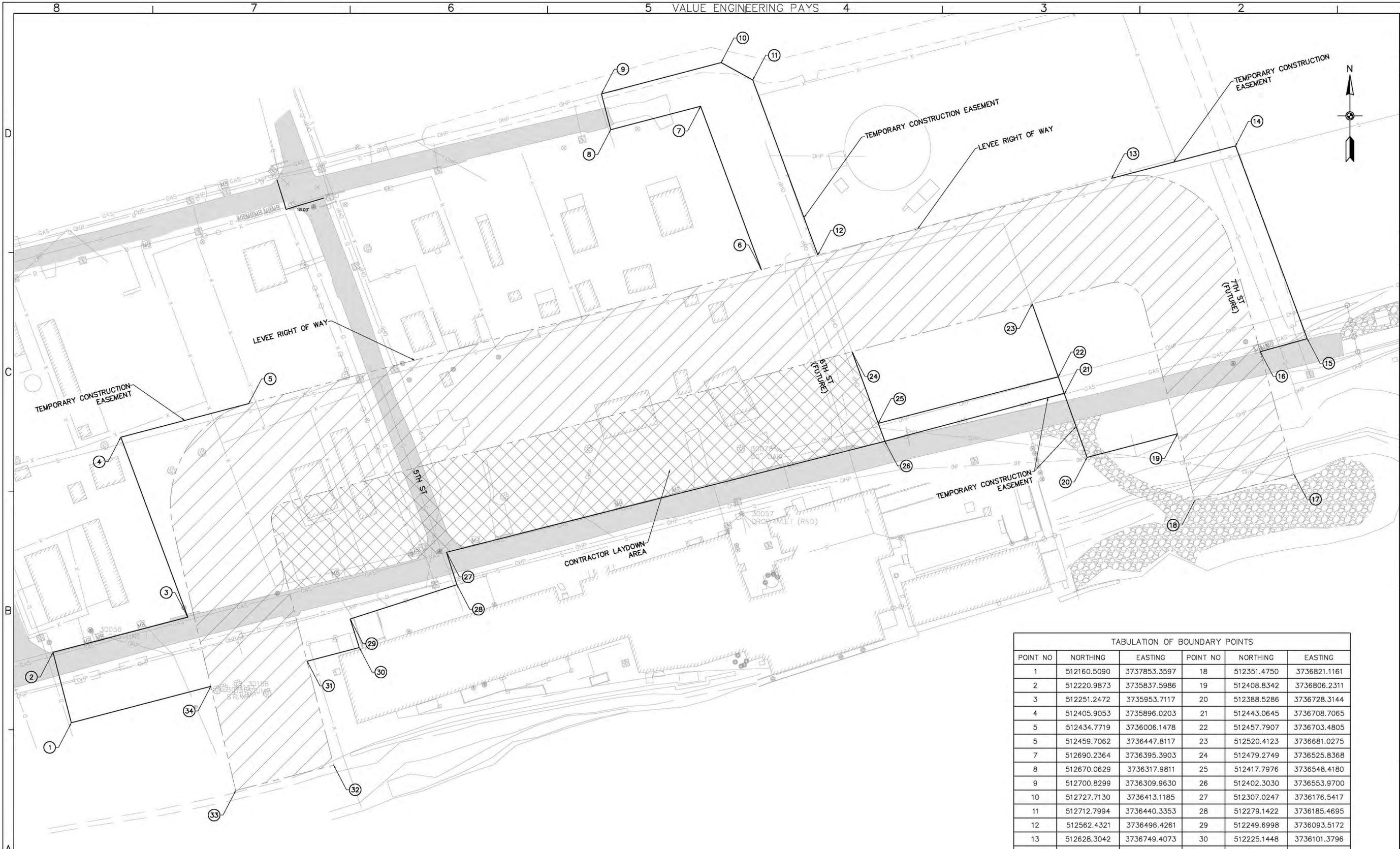
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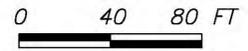


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 NAVD 88 (GEOID 12A).

TABULATION OF BOUNDARY POINTS					
POINT NO	NORTHING	EASTING	POINT NO	NORTHING	EASTING
1	512160.5090	3737853.3597	18	512351.4750	3736821.1161
2	512220.9873	3735837.5986	19	512408.8342	3736806.2311
3	512251.2472	3735953.7117	20	512388.5286	3736728.3144
4	512405.9053	3735896.0203	21	512443.0645	3736708.7065
5	512434.7719	3736006.1478	22	512457.7907	3736703.4805
5	512459.7062	3736447.8117	23	512520.4123	3736681.0275
7	512690.2364	3736395.3903	24	512479.2749	3736525.8368
8	512670.0629	3736317.9811	25	512417.7976	3736548.4180
9	512700.8299	3736309.9630	26	512402.3030	3736553.9700
10	512727.7130	3736413.1185	27	512307.0247	3736176.5417
11	512712.7994	3736440.3353	28	512279.1422	3736185.4695
12	512562.4321	3736496.4261	29	512249.6998	3736093.5172
13	512628.3042	3736749.4073	30	512225.1448	3736101.3796
14	512656.1270	3736856.1688	31	512213.4264	3736056.4141
15	512490.5450	3736917.9347	32	512124.1034	3736079.3272
16	512479.3593	3736877.4614	33	512102.3135	3735994.9957
17	512373.7160	3736906.6584	34	512191.8309	3735973.5478



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RIGHT OF WAY

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DESIGNED BY:
B.K.R.

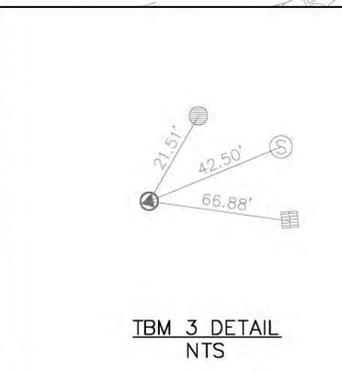
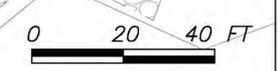
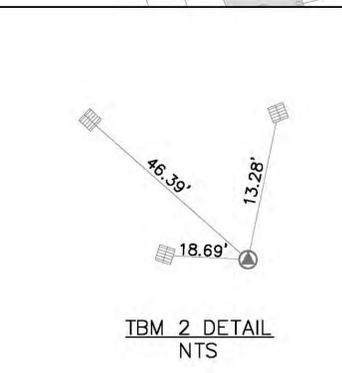
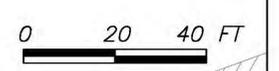
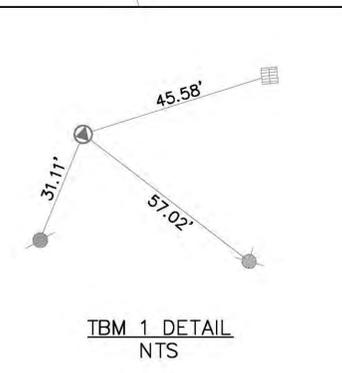
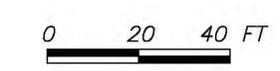
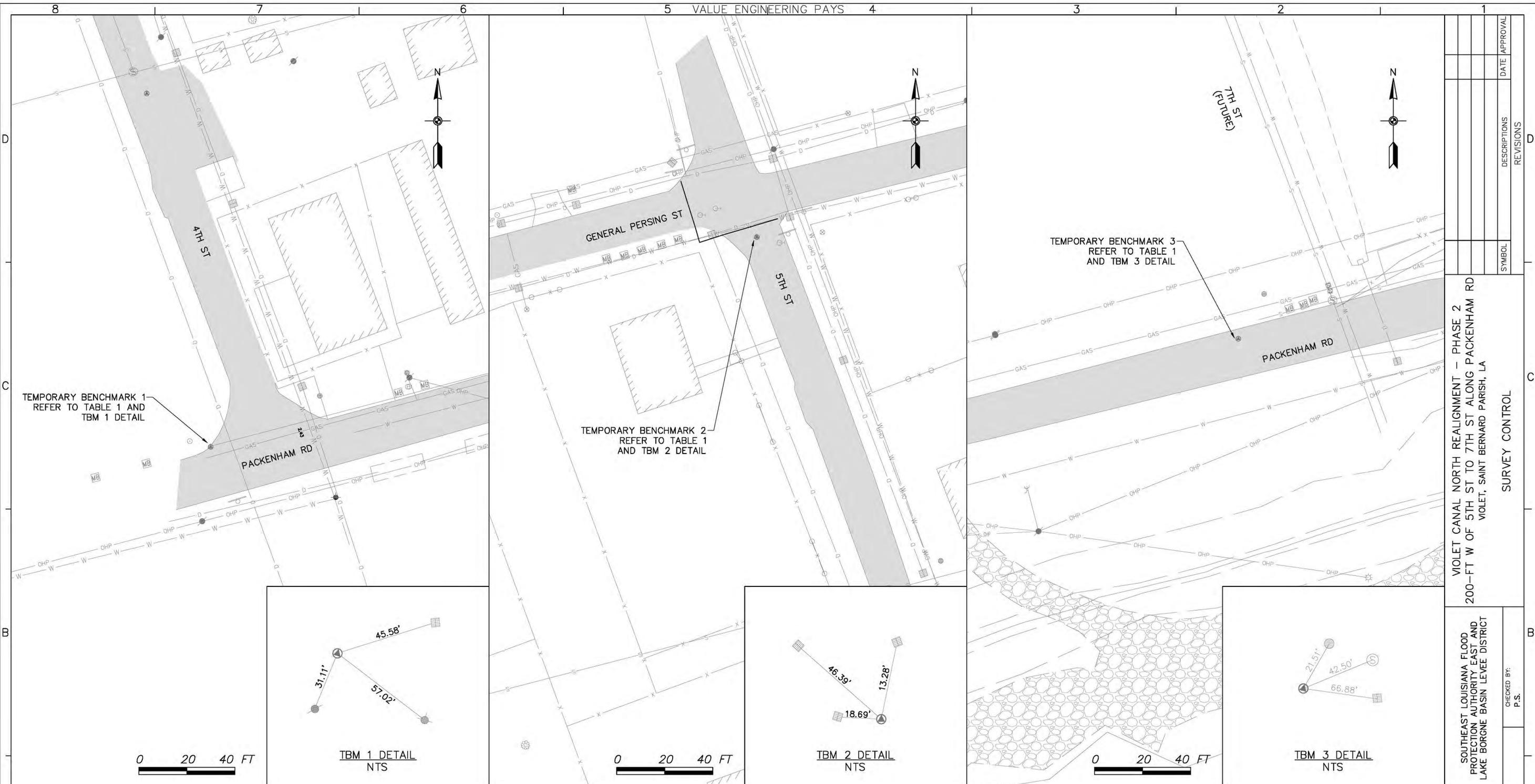


TABLE 1: TEMPORARY BENCHMARKS

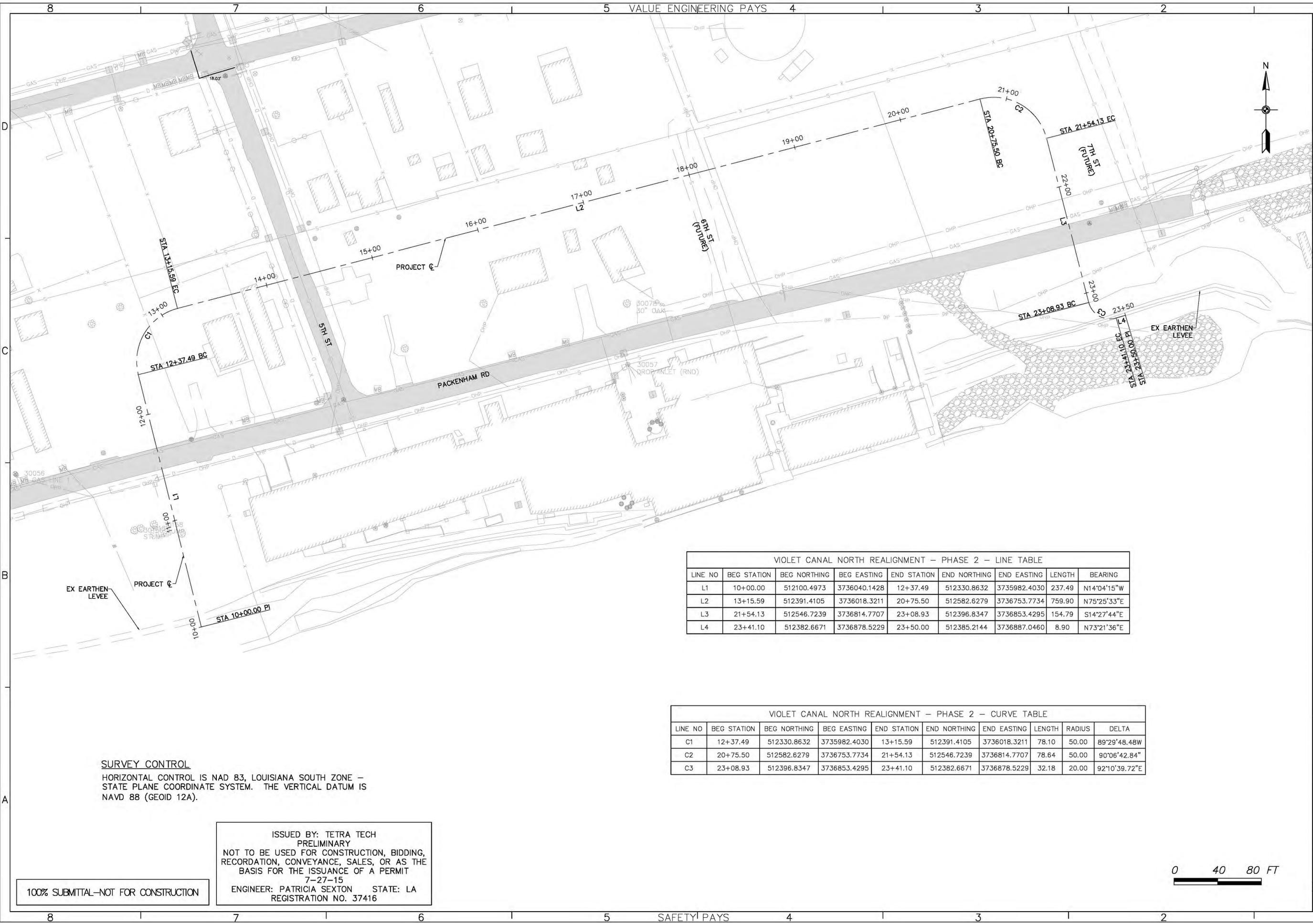
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1	512208.4497	3735788.8984	2.23	60 D NAIL
2	512603.7700	3736062.1668	1.21	60 D NAIL
3	512469.2078	3736854.1637	1.99	60 D NAIL

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				DATE APPROVAL



SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

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 LAKE BORGNE BASIN LEVEE DISTRICT

TETRA TECH, INC.
 748 Metairie Street, Suite B
 Baton Rouge, LA 70802
 Phone (225) 383-1786, FAX (225) 387-0203

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 CHECKED BY: P.S.

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VIOLET CANAL NORTH REALIGNMENT - PHASE 2 - LINE TABLE

LINE NO	BEG STATION	BEG NORTHING	BEG EASTING	END STATION	END NORTHING	END EASTING	LENGTH	BEARING
L1	10+00.00	512100.4973	3736040.1428	12+37.49	512330.8632	3735982.4030	237.49	N14°04'15"W
L2	13+15.59	512391.4105	3736018.3211	20+75.50	512582.6279	3736753.7734	759.90	N75°25'33"E
L3	21+54.13	512546.7239	3736814.7707	23+08.93	512396.8347	3736853.4295	154.79	S14°27'44"E
L4	23+41.10	512382.6671	3736878.5229	23+50.00	512385.2144	3736887.0460	8.90	N73°21'36"E

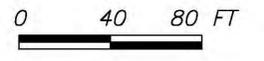
VIOLET CANAL NORTH REALIGNMENT - PHASE 2 - CURVE TABLE

LINE NO	BEG STATION	BEG NORTHING	BEG EASTING	END STATION	END NORTHING	END EASTING	LENGTH	RADIUS	DELTA
C1	12+37.49	512330.8632	3735982.4030	13+15.59	512391.4105	3736018.3211	78.10	50.00	89°29'48.48W
C2	20+75.50	512582.6279	3736753.7734	21+54.13	512546.7239	3736814.7707	78.64	50.00	90°06'42.84"
C3	23+08.93	512396.8347	3736853.4295	23+41.10	512382.6671	3736878.5229	32.18	20.00	92°10'39.72"E

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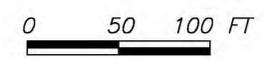
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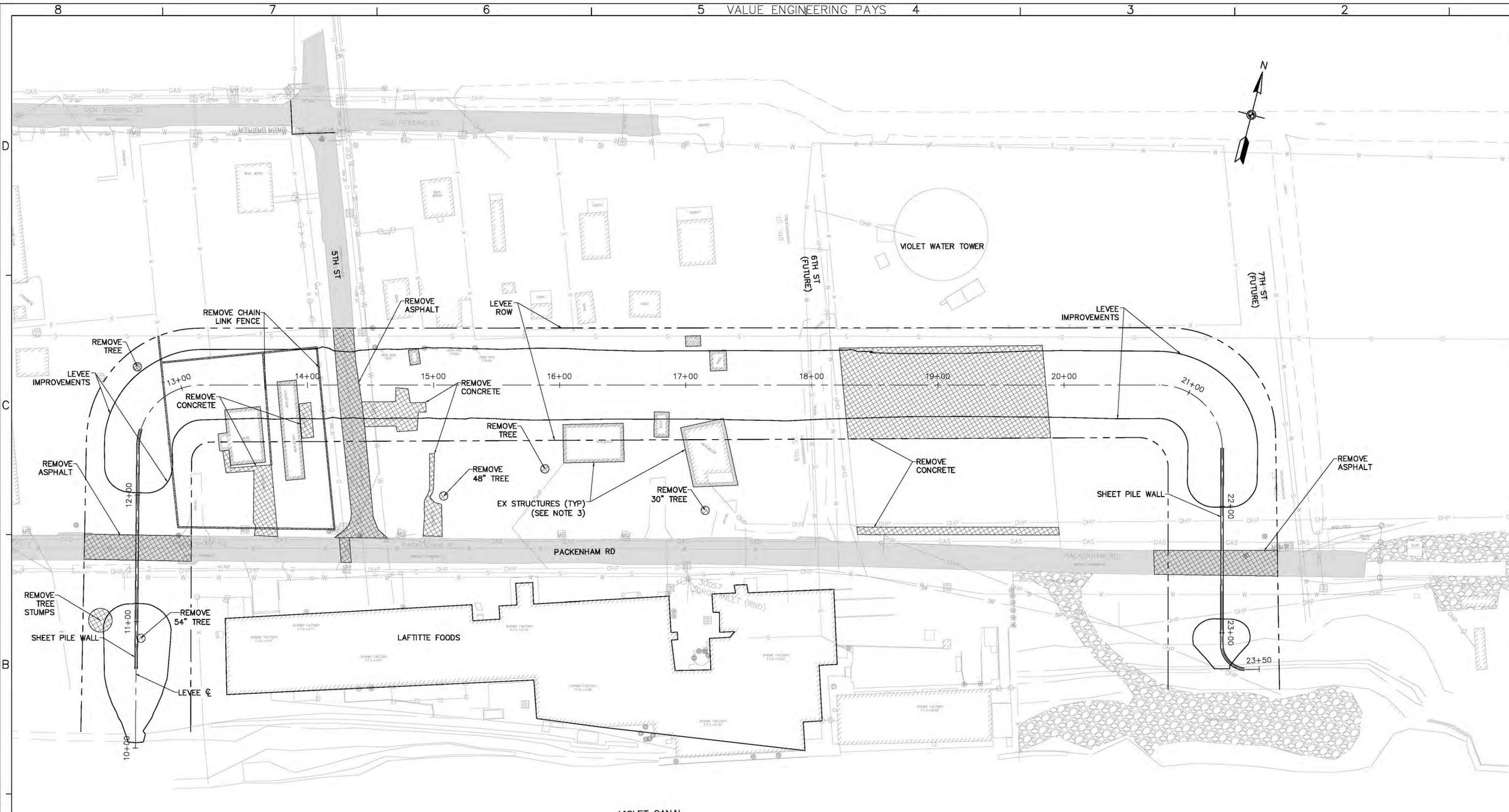




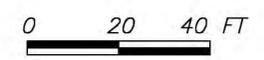
PROJECT LAYOUT		SYMBOL	DESCRIPTIONS	DATE	APPROVAL
VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA					
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORNE BASIN LEVEL DISTRICT					
TETRA TECH, INC. <small>748 Main Street, Suite B Baton Rouge, LA 70802 Phone (225) 353-1786, Fax (225) 387-0223</small>		DESIGNED BY:	B.K.R.	CHECKED BY:	P.S.
ISSUED BY: TETRA TECH PRELIMINARY NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT 7-27-15 ENGINEER: PATRICIA SEXTON STATE: LA REGISTRATION NO. 37416		Scale: AS SHOWN SHEET 7			

100% SUBMITTAL--NOT FOR CONSTRUCTION





- NOTES:**
1. FOR THE DURATION OF THIS CONTRACT, CONTRACTOR SHALL PROVIDE ACCESS TO ALL BUSINESSES ALONG PACKENHAM DRIVE AND THE ONGOING PHASE 1 CONSTRUCTION.
 2. CONTRACTOR SHALL VERIFY LIMITS OF DEMOLITION.
 3. EXISTING STRUCTURES ENCOUNTERED DURING CONSTRUCTION SHALL BE REMOVED UPON APPROVAL BY THE LBLD.



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 7-27-15
 ENGINEER: PATRICIA SEXTON STATE: LA
 REGISTRATION NO. 37416

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VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEE DISTRICT

TETRA TECH, INC.
 748 Main Street, Suite B
 Baton Rouge, LA 70802
 Phone (225) 353-1786, Fax (225) 387-0223

Scale: AS SHOWN
 SHEET
 08

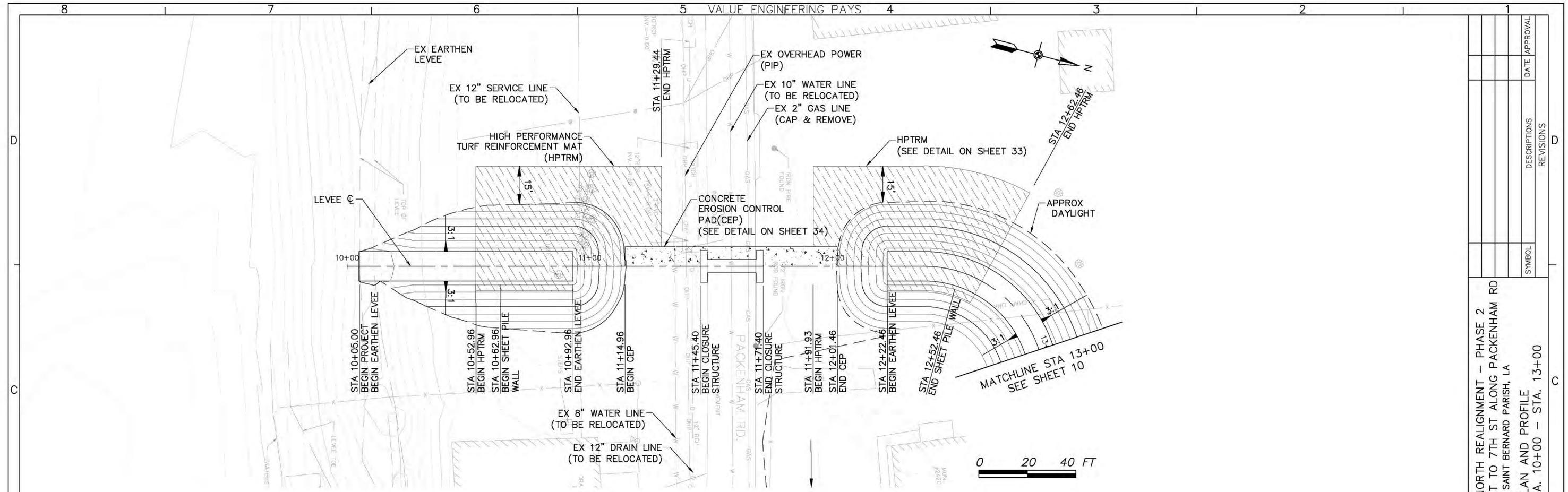
SYMBOL	DESCRIPTIONS	DATE	APPROVAL

DEMOLITION PLAN

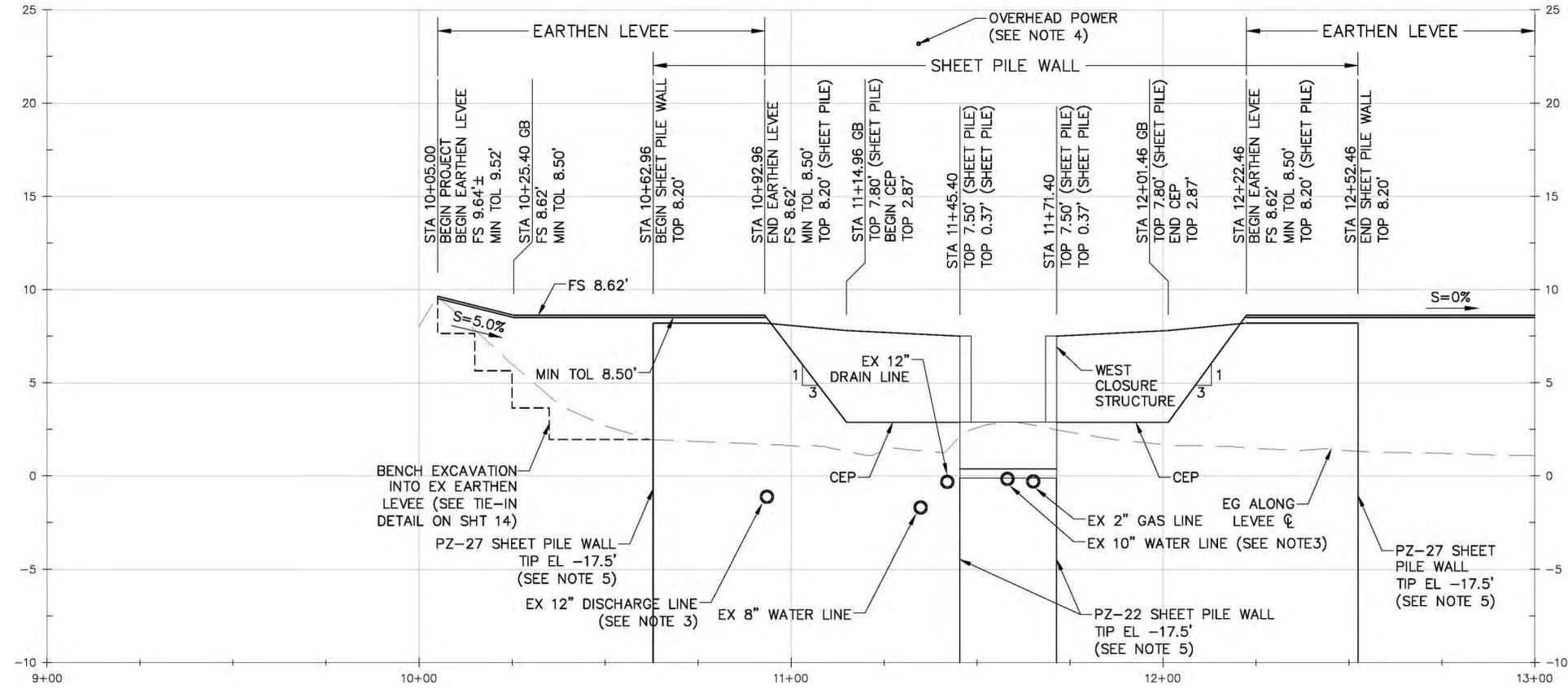
CHECKED BY:
 P.S.

DRAWN BY:
 B.K.R.

DESIGNED BY:
 B.K.R.



PLAN



PROFILE ALONG LEVEE C

SCALE: 1"=20' (HOR)
1"= 4' (VERT)

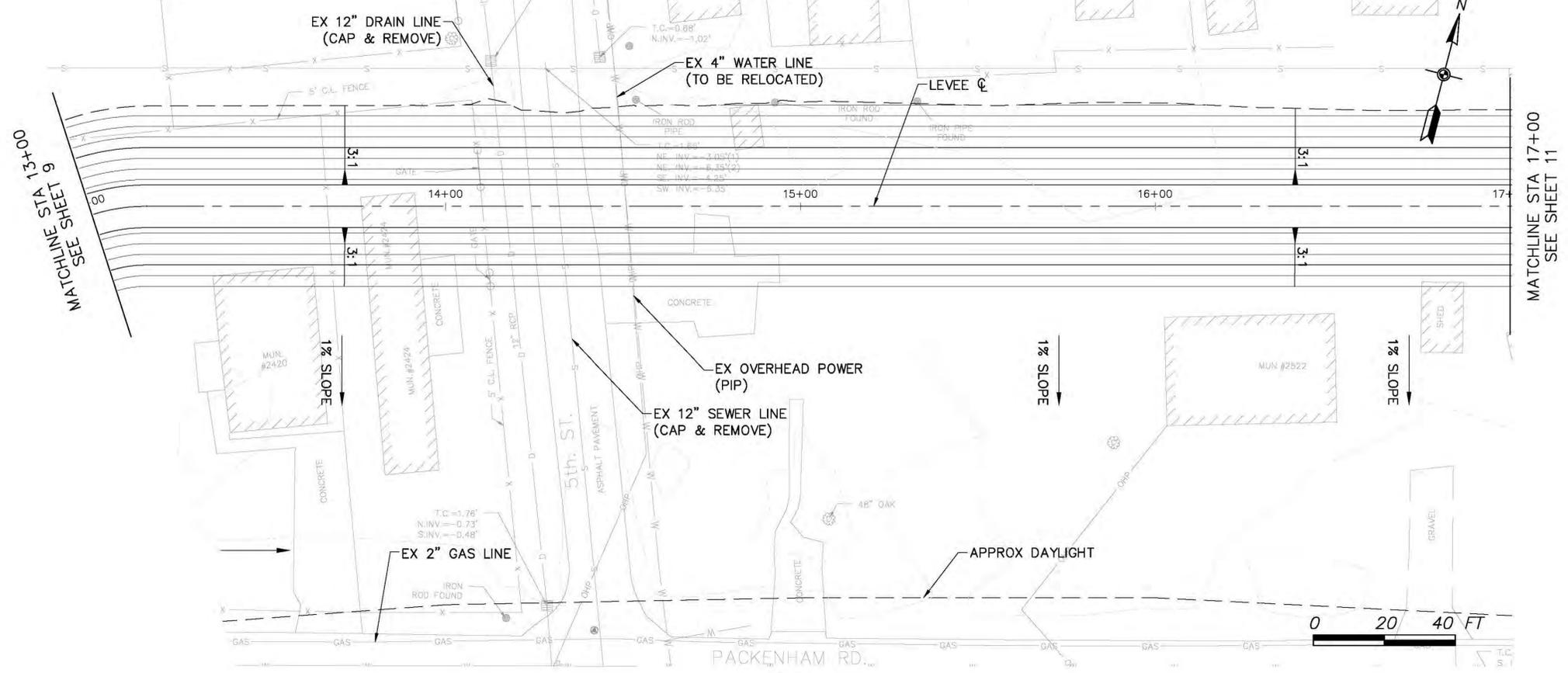
- NOTES:
1. PROPOSED UTILITIES NOT SHOWN FOR CLARITY, SEE SHEETS 23, 24, 25 FOR PROPOSED UTILITY DETAILS.
 2. THE INFORMATION ON THESE SHEETS CONCERNING TYPE AND LOCATION OF UTILITIES MAY NOT BE ACCURATE AND ALL INCLUSIVE. LOCATION OF UTILITIES WERE DETERMINED FROM AVAILABLE UTILITY MAPS AND SURVEY DATA. THE LOCATIONS SHOULD BE CONSIDERED APPROXIMATE AND FIELD VERIFIED BY THE CONTRACTOR, PRIOR TO CONSTRUCTION.
 3. UTILITY NOT LOCATED DURING SURVEY. SIZE AND LOCATION ARE BASED ON DISCUSSIONS WITH SAINT BERNARD PARISH GOVERNMENT. SEE SHEETS 23, 24, 25 FOR UTILITY DETAILS.
 4. THERE ARE EXISTING OVERHEAD POWER LINES OVER AND NEAR THE PROPOSED CONSTRUCTION AREA. THE CONTRACTOR SHALL USE EXTREME CAUTION WHILE WORKING NEAR THE LINES.
 5. ALL SHEET PILE WALLS SHALL BE COATED WITH COAL TAR-EPOXY (BLACK) PAINT (FORMULA C-2000) FROM THE TOP OF WALL TO EL -5.0.

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7-27-15
ENGINEER: PATRICIA SEXTON STATE: LA
REGISTRATION NO. 37416

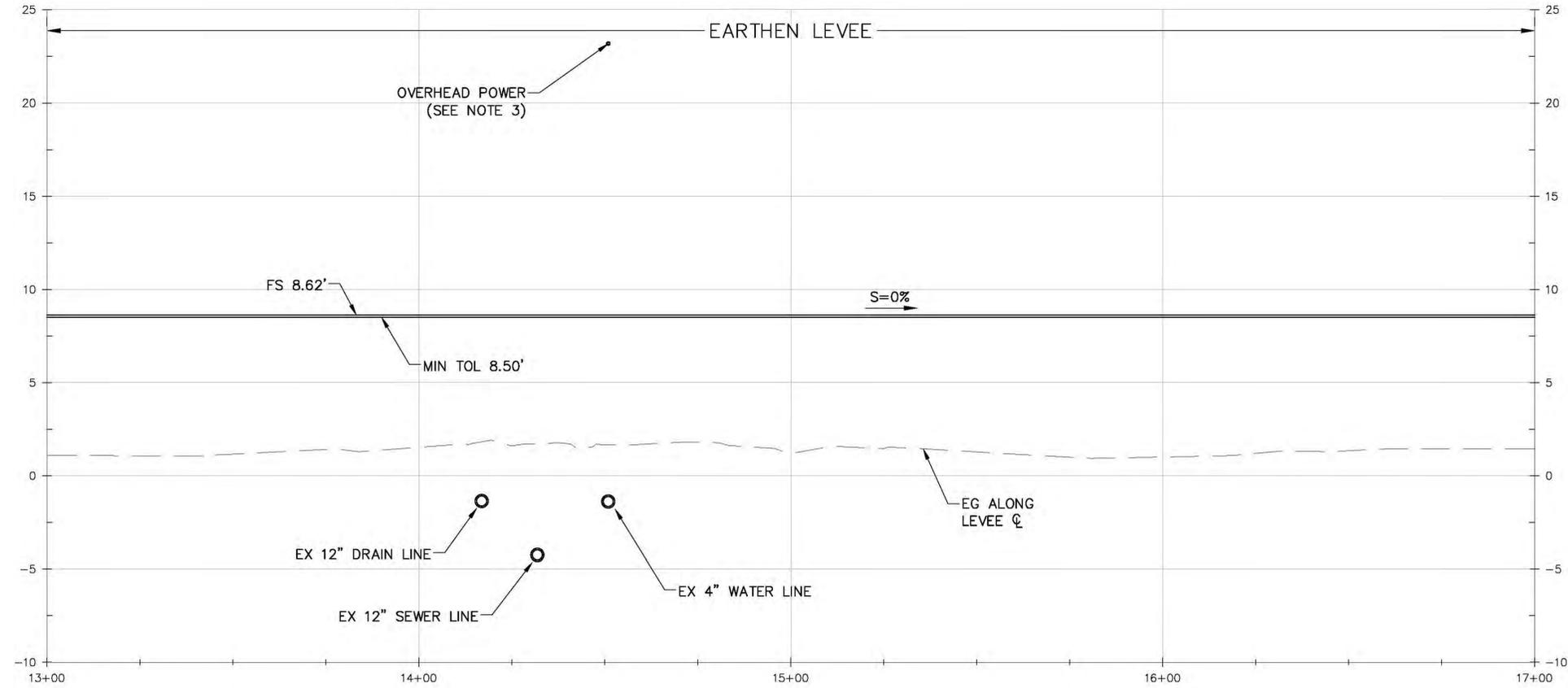
100% SUBMITTAL-NOT FOR CONSTRUCTION

VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA		DATE APPROVAL
PLAN AND PROFILE LEVEE STA. 10+00 - STA. 13+00		SYMBOL
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT		DESCRIPTIONS
CHECKED BY: P.S.		REVISIONS
DRAWN BY: B.K.R.		
DESIGNED BY: B.K.R.		
TETRA TECH, INC. 748 Metairie Street, Suite B Baton Rouge, LA 70802 Phone (225) 383-1786, FAX (225) 387-0203		
Scale: AS SHOWN		
SHEET		





PLAN



PROFILE ALONG LEVEE CL

SCALE: 1"=20' (HOR)
1"= 4' (VERT)

100% SUBMITTAL—NOT FOR CONSTRUCTION

- NOTES:
1. PROPOSED UTILITIES NOT SHOWN FOR CLARITY, SEE SHEETS 23, 24, 25 FOR PROPOSED UTILITY DETAILS.
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 3. THERE ARE EXISTING OVERHEAD POWER LINES OVER AND NEAR THE PROPOSED CONSTRUCTION AREA. THE CONTRACTOR SHALL USE EXTREME CAUTION WHILE WORKING NEAR THE LINES.

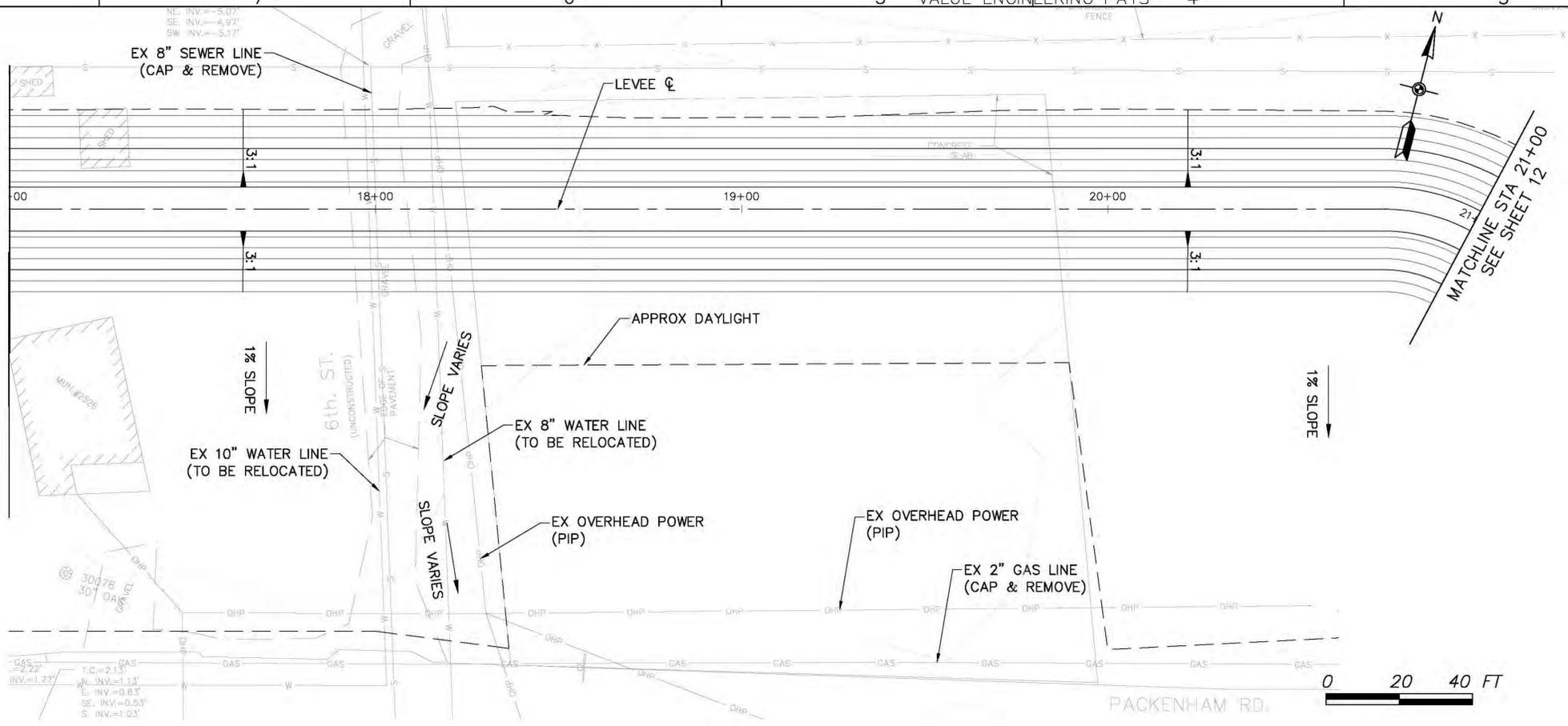
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7-27-15
ENGINEER: PATRICIA SEXTON STATE: LA
REGISTRATION NO. 37416

VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA		SYMBOL	DESCRIPTIONS	DATE	APPROVAL
LEVEE STA. 13+00 - STA. 17+00					
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT		DESIGNED BY:	B.K.R.	CHECKED BY:	P.S.
TETRA TECH, INC. 748 Metairie Street, Suite B Baton Rouge, LA 70802 Phone (225) 383-1786, FAX (225) 387-0233		DRAWN BY:	B.K.R.		
Scale: AS SHOWN		SHEET 10			

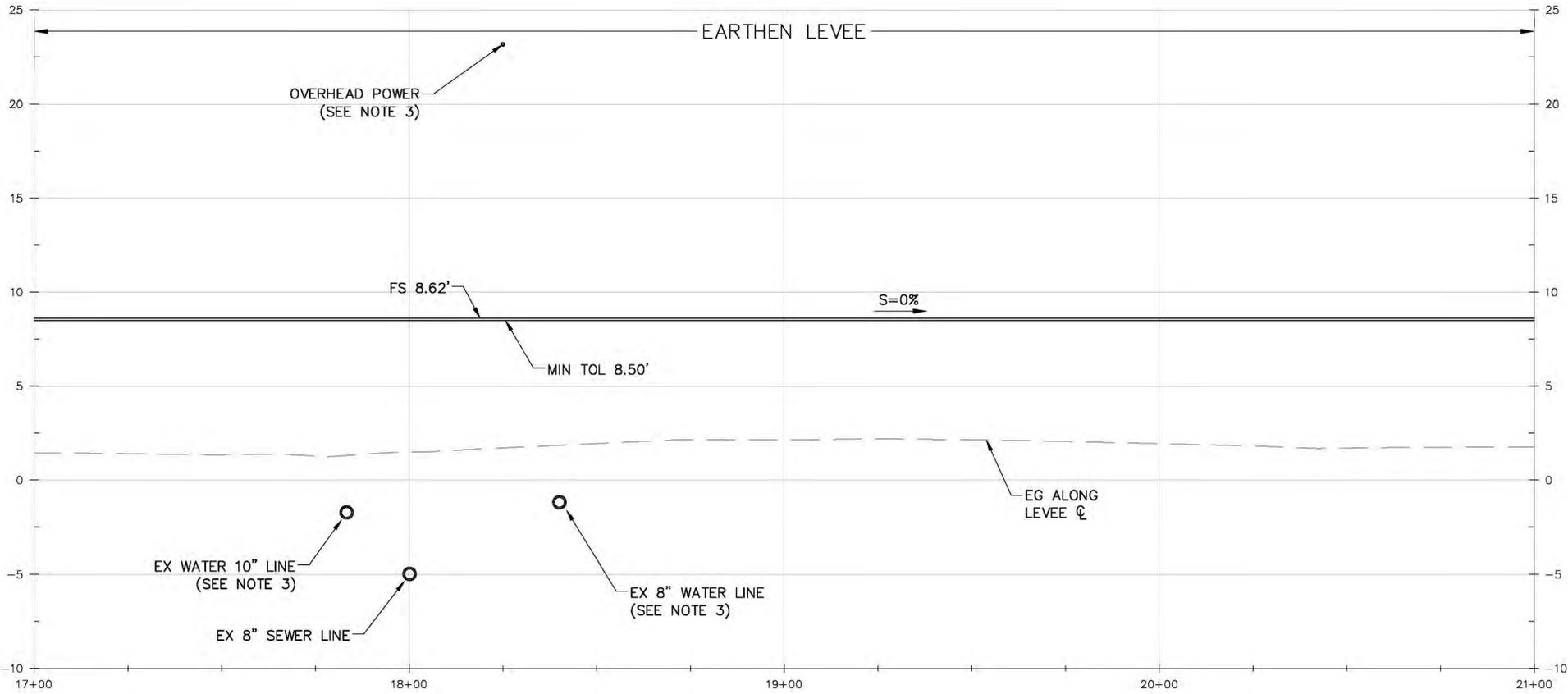
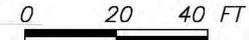


MATCHLINE STA 17+00
SEE SHEET 10

MATCHLINE STA 21+00
SEE SHEET 12



PLAN



PROFILE ALONG LEVEE Q

SCALE: 1"=20' (HOR)
1"= 4' (VERT)

- NOTES:
1. PROPOSED UTILITIES NOT SHOWN FOR CLARITY, SEE SHEETS 23, 24, 25 FOR PROPOSED UTILITY DETAILS.
 2. THE INFORMATION ON THESE SHEETS CONCERNING TYPE AND LOCATION OF UTILITIES MAY NOT BE ACCURATE AND ALL INCLUSIVE. LOCATION OF UTILITIES WERE DETERMINED FROM AVAILABLE UTILITY MAPS AND SURVEY DATA. THE LOCATIONS SHOULD BE CONSIDERED APPROXIMATE AND FIELD VERIFIED BY THE CONTRACTOR, PRIOR TO CONSTRUCTION.
 3. UTILITY NOT LOCATED DURING SURVEY. SIZE AND LOCATION ARE BASED ON DISCUSSIONS WITH SAINT BERNARD PARISH GOVERNMENT. SEE SHEETS 23, 24, 25 FOR UTILITY DETAILS
 4. THERE ARE EXISTING OVERHEAD POWER LINES OVER AND NEAR THE PROPOSED CONSTRUCTION AREA. THE CONTRACTOR SHALL USE EXTREME CAUTION WHILE WORKING NEAR THE LINES.

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7-27-15
ENGINEER: PATRICIA SEXTON STATE: LA
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VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT

TETRA TECH, INC.
748 Metairie Street, Suite B
Baton Rouge, LA 70802
Phone (225) 383-1786, FAX (225) 387-0233

Scale: AS SHOWN
SHEET 11

SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

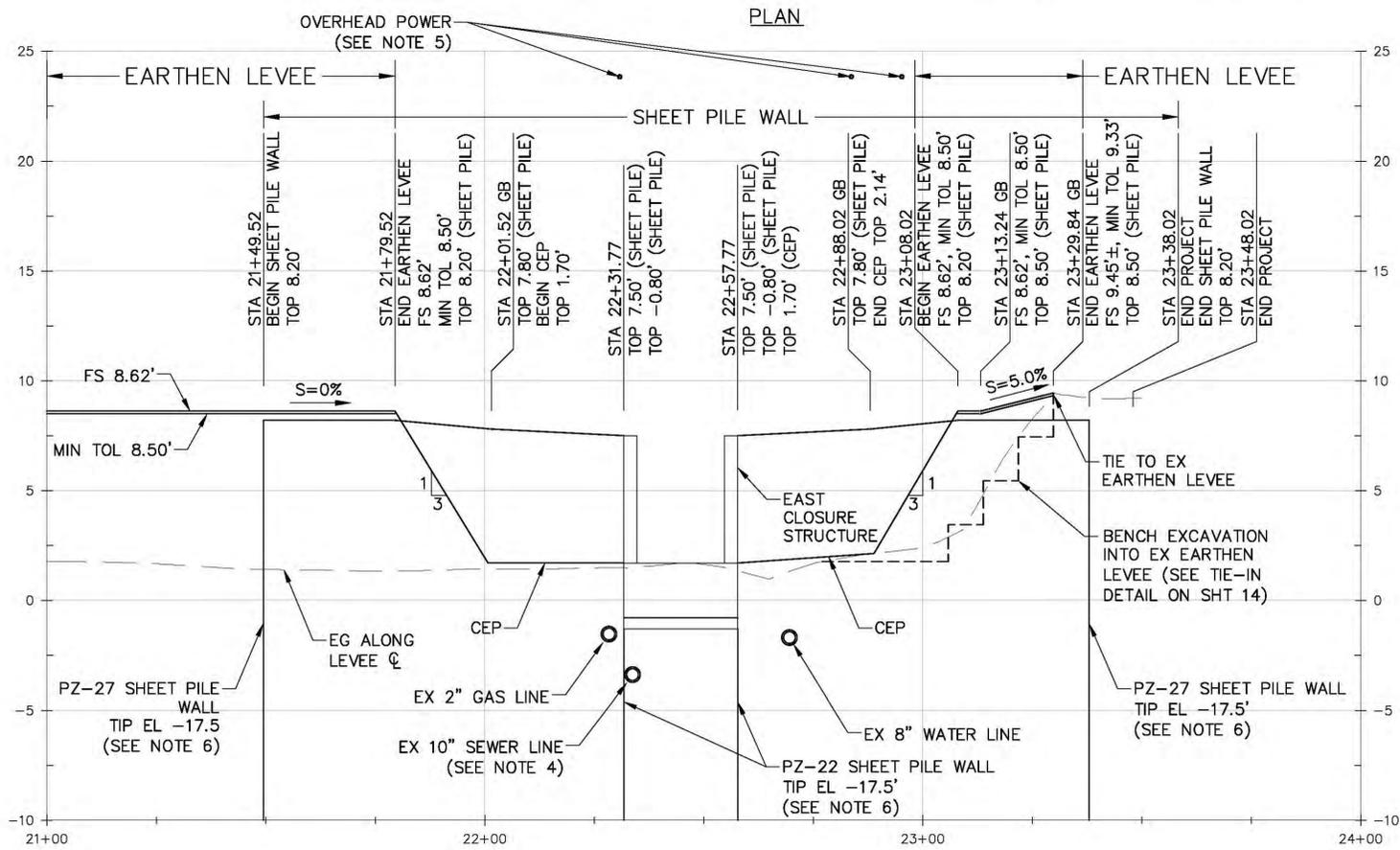
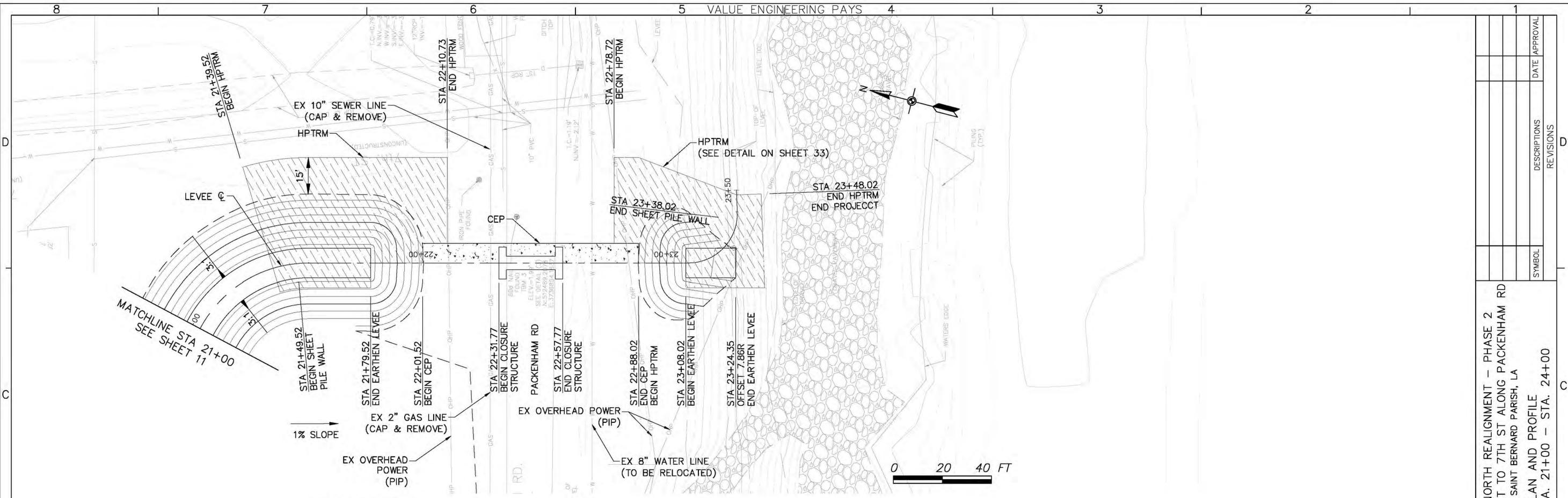
PLAN AND PROFILE
LEVEE STA. 17+00 - STA. 21+00

CHECKED BY:
P.S.

DRAWN BY:
B.K.R.

DESIGNED BY:
B.K.R.





- NOTES:
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 3. UTILITY NOT LOCATED DURING SURVEY. SIZE AND LOCATION ARE BASED ON DISCUSSIONS WITH SAINT BERNARD PARISH GOVERNMENT. SEE SHEET 23, 24, 25 FOR UTILITY DETAILS.
 4. SURVEY DOES NOT SHOW A TERMINATION POINT FOR THE SEWER LINE. IT IS ASSUMED THAT THE LINE CONTINUES TO THE WEST.
 5. THERE ARE EXISTING OVERHEAD POWER LINES OVER AND NEAR THE PROPOSED CONSTRUCTION AREA. THE CONTRACTOR SHALL USE EXTREME CAUTION WHILE WORKING NEAR THE LINES
 6. ALL SHEET PILE WALLS SHALL BE COATED WITH COAL TAR-EPOXY (BLACK) PAINT (FORMULA A-2000) FROM THE TOP OF SHEET PILE WALL TO EL -5.0.

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 ENGINEER: PATRICIA SEXTON STATE: LA
 REGISTRATION NO. 37416

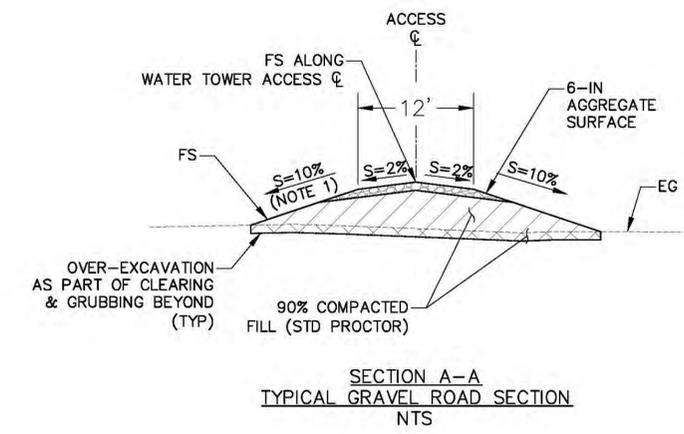
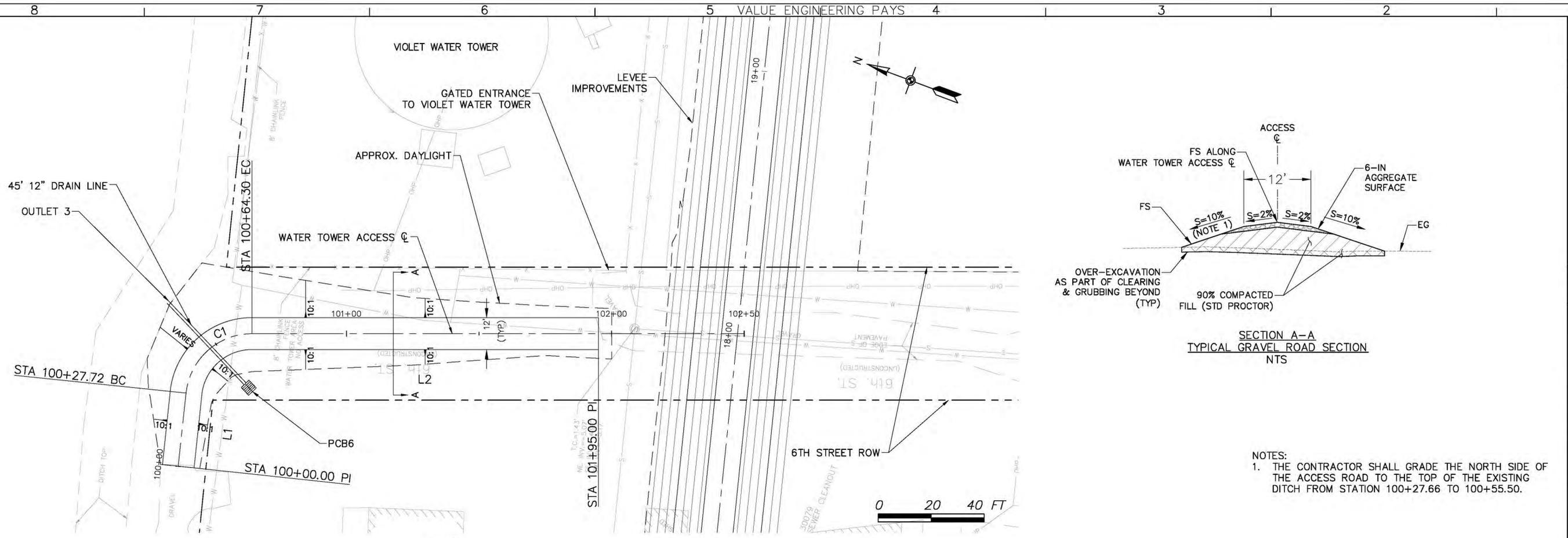
VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA	
PLAN AND PROFILE LEVEE STA. 21+00 - STA. 24+00	
DESIGNED BY: B.K.R.	CHECKED BY: P.S.
DRAWN BY: B.K.R.	DATE APPROVAL:
SYMBOL	
REVISIONS	
DESCRIPTIONS	
DATE APPROVAL	

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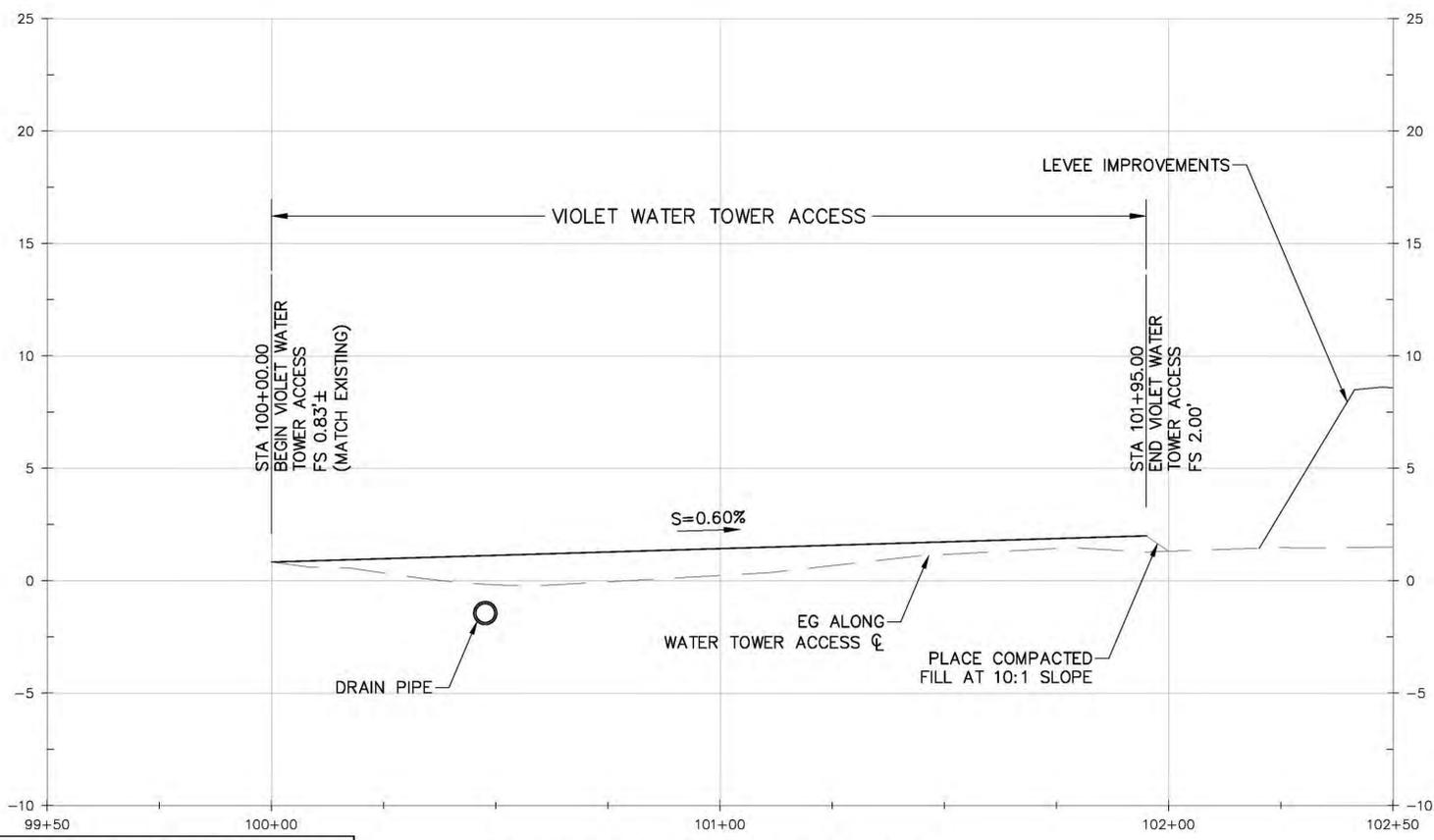
PROFILE ALONG LEVEE C
 SCALE: 1"=20' (HOR)
 1"= 4' (VERT)



Scale: AS SHOWN
 SHEET
 12



NOTES:
 1. THE CONTRACTOR SHALL GRADE THE NORTH SIDE OF THE ACCESS ROAD TO THE TOP OF THE EXISTING DITCH FROM STATION 100+27.66 TO 100+55.50.



LINE NO	BEG STATION	BEG NORTHING	BEG EASTING	END STATION	END NORTHING	END EASTING	LENGTH	BEARING
L1	100+00.00	512693.7819	3736367.5486	100+27.72	512700.6421	3736394.3393	27.72	N75°42'43"E
L2	100+64.30	512685.1611	3736423.9643	102+50.00	512511.1432	3736488.8744	185.73	S20°27'24"E

LINE NO	BEG STATION	BEG NORTHING	BEG EASTING	END STATION	END NORTHING	END EASTING	LENGTH	RADIUS	DELTA
C1	100+27.72	512700.6421	3736394.3393	100+64.30	512685.1611	3736423.9643	33.40	25.00	83°49'52.3"

DRAINAGE ID	NORTHING	EASTING	TOP	INVERT
PCB6	512679.1717	3736404.4924	0.50	-1.90
OUTLET 3	512718.8425	3736424.4260	N/A	-2.00

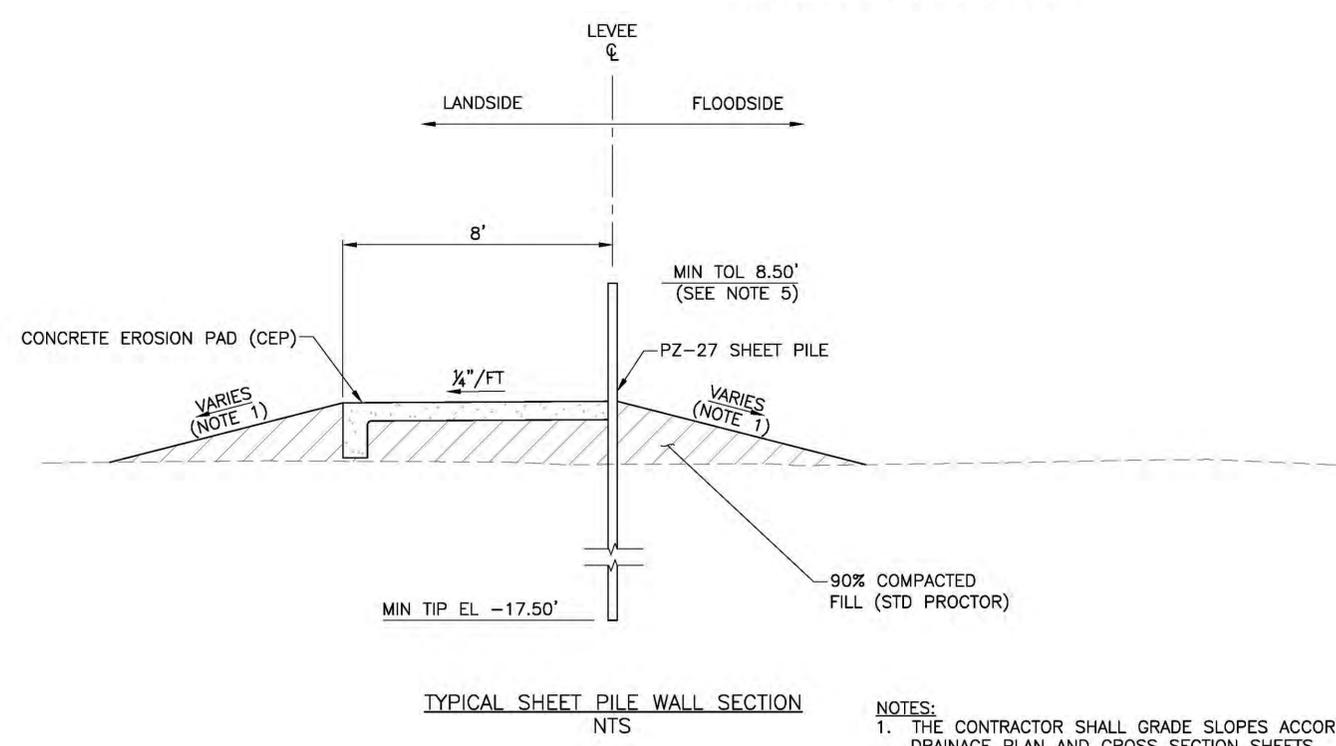
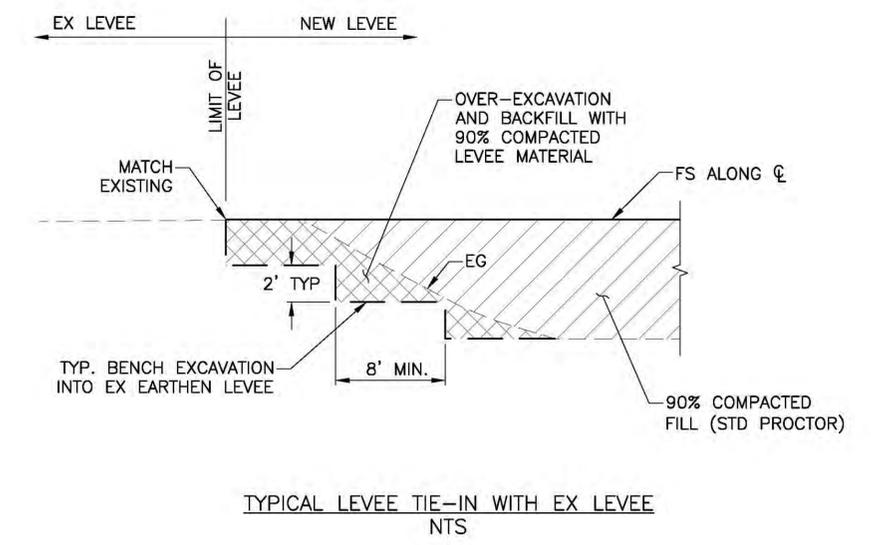
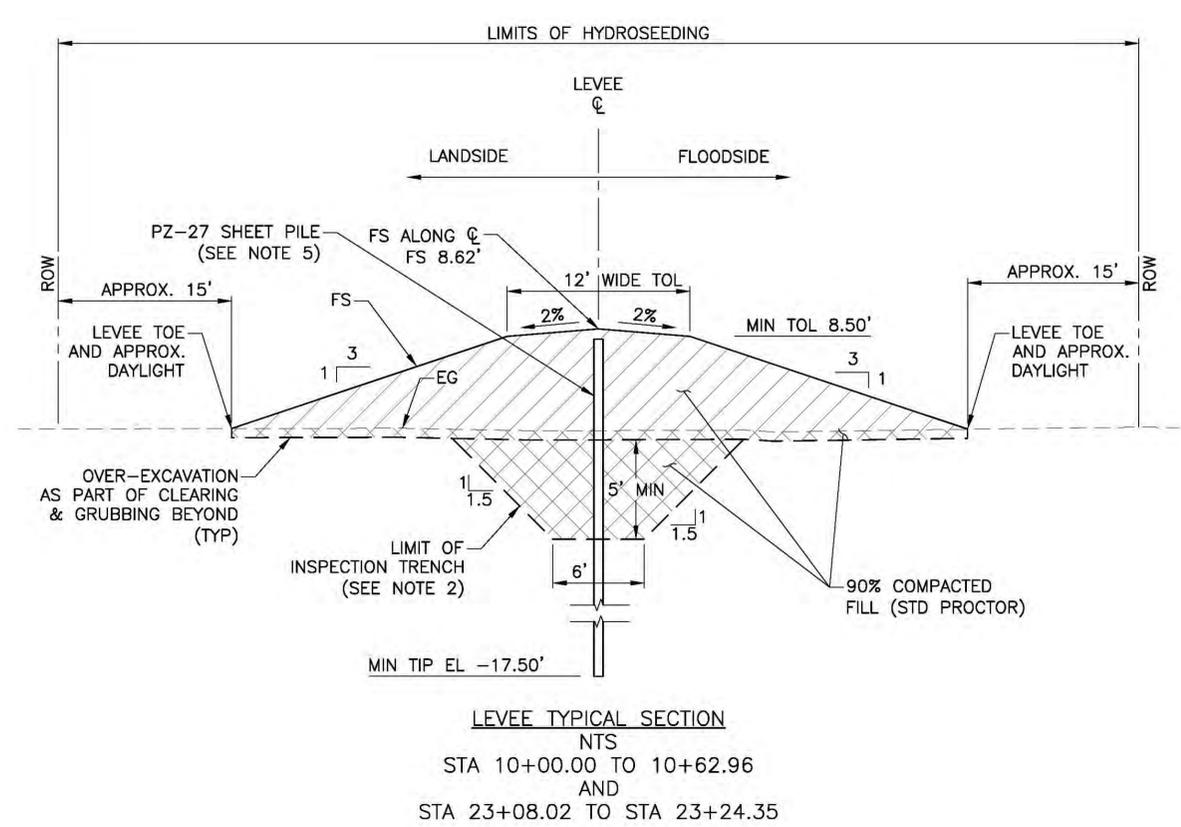
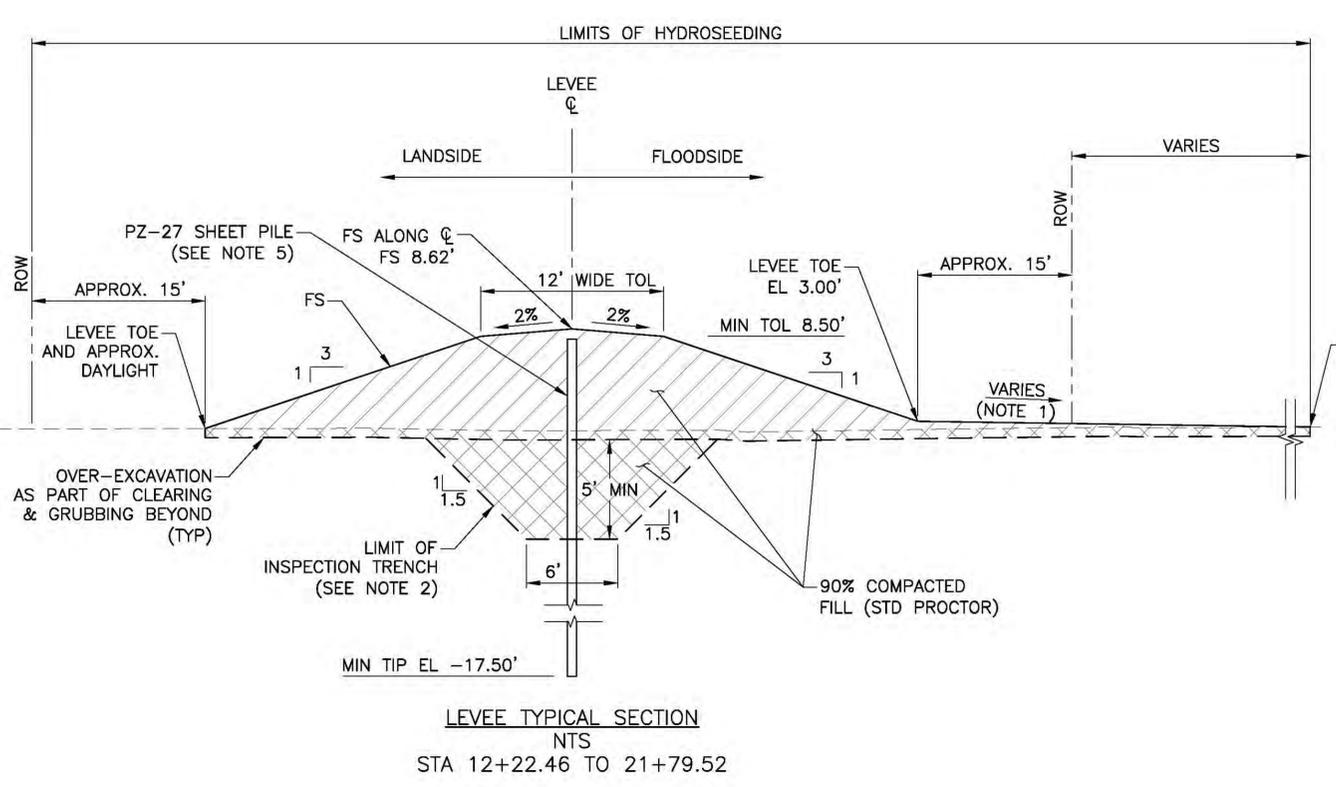
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 7-27-15
 ENGINEER: PATRICIA SEXTON STATE: LA
 REGISTRATION NO. 37416

100% SUBMITTAL-NOT FOR CONSTRUCTION

SCALE: 1"=20' (HOR)
 1"= 4' (VERT)



DESIGNED BY: B.K.R.	CHECKED BY: P.S.	VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA	SYMBOL	REVISIONS	DATE	APPROVAL
DRAWN BY: B.K.R.	SCALE: AS SHOWN		SHEET 13			



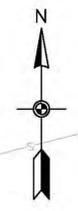
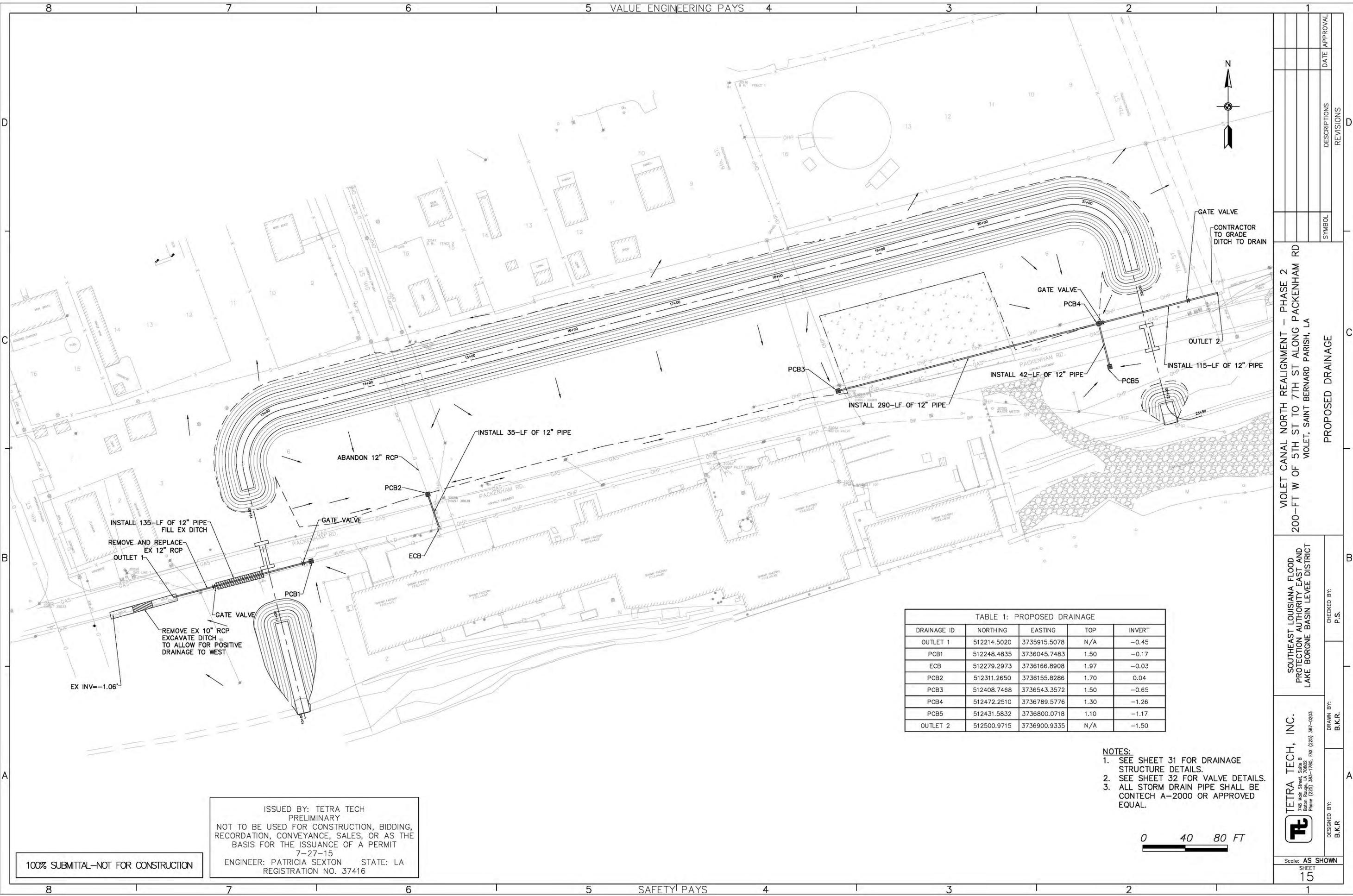
- NOTES:
1. THE CONTRACTOR SHALL GRADE SLOPES ACCORDING TO THE DRAINAGE PLAN AND CROSS SECTION SHEETS.
 2. INSPECTION TRENCH SHALL BE EXCAVATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE LBBLD REPRESENTATIVE.
 3. CONTRACTOR SHALL REFER TO GEOMETRIC CONTROL FOR LEVEE CENTERLINE.
 4. CONTRACTOR SHALL PERFORM CLEARING AND GRUBBING IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
 5. CONTRACTOR SHALL REFER TO THE LEVEE PLAN AND PROFILE SHEETS FOR LOCATION AND TOP OF SHEET PILE WALL ELEVATIONS.

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TYPICAL SECTIONS	
VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA	DESIGNER: B.K.R. CHECKED BY: P.S.
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT	DATE APPROVAL
TETRA TECH, INC. 748 Maple Street, Suite B Baton Rouge, LA 70802 Phone (225) 383-1786, Fax (225) 387-0203	REVISIONS
Scale: AS SHOWN	SYMBOL
SHEET 14	APPROVAL





SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEL DISTRICT

TETRA TECH, INC.
 748 Metairie Street, Suite B
 Metairie, LA 70002
 Phone (225) 383-1786, Fax (225) 387-0203

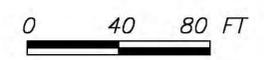
DESIGNED BY: B.K.R.
 CHECKED BY: P.S.
 DRAWN BY: B.K.R.

Scale: AS SHOWN
 SHEET 15

TABLE 1: PROPOSED DRAINAGE

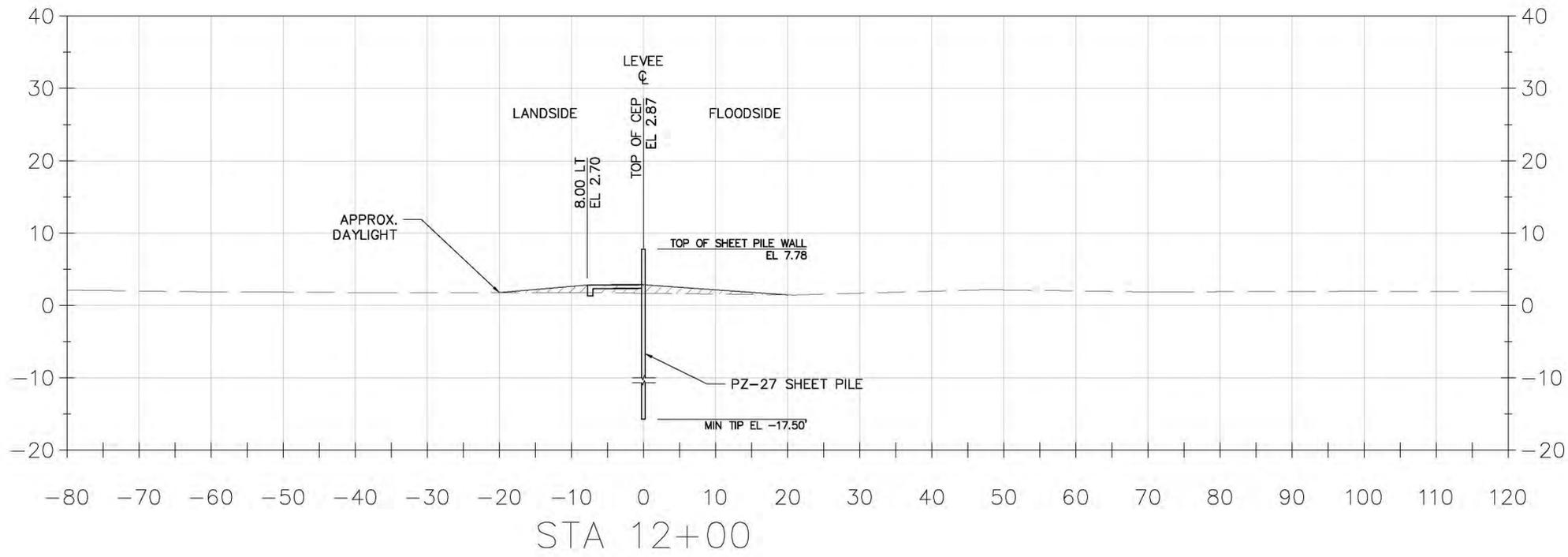
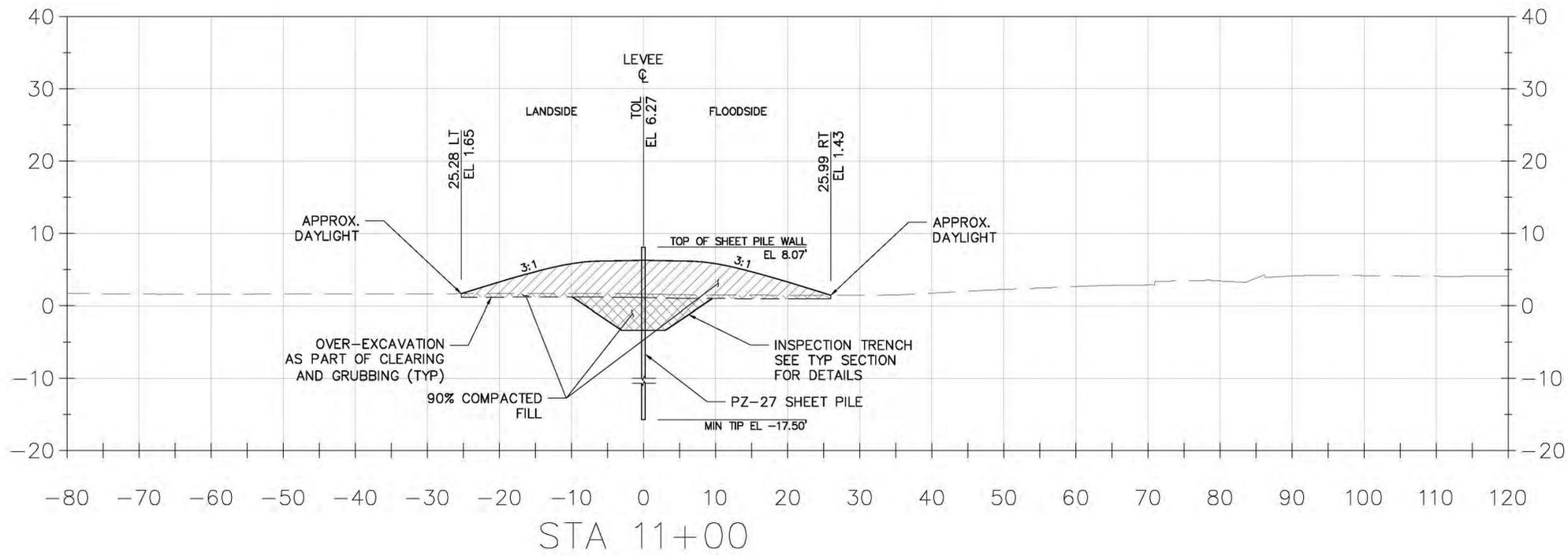
DRAINAGE ID	NORTHING	EASTING	TOP	INVERT
OUTLET 1	512214.5020	3735915.5078	N/A	-0.45
PCB1	512248.4835	3736045.7483	1.50	-0.17
ECB	512279.2973	3736166.8908	1.97	-0.03
PCB2	512311.2650	3736155.8286	1.70	0.04
PCB3	512408.7468	3736543.3572	1.50	-0.65
PCB4	512472.2510	3736789.5776	1.30	-1.26
PCB5	512431.5832	3736800.0718	1.10	-1.17
OUTLET 2	512500.9715	3736900.9335	N/A	-1.50

- NOTES:
 1. SEE SHEET 31 FOR DRAINAGE STRUCTURE DETAILS.
 2. SEE SHEET 32 FOR VALVE DETAILS.
 3. ALL STORM DRAIN PIPE SHALL BE CONTECH A-2000 OR APPROVED EQUAL.



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VIOLET CANAL NORTH REALIGNMENT - PHASE 2
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 Metairie, Louisiana 70002
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Scale: AS SHOWN
 SHEET
 16

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

CROSS SECTIONS
 LEVEE STA 11+00 AND STA 12+00

CHECKED BY:
 P.S.

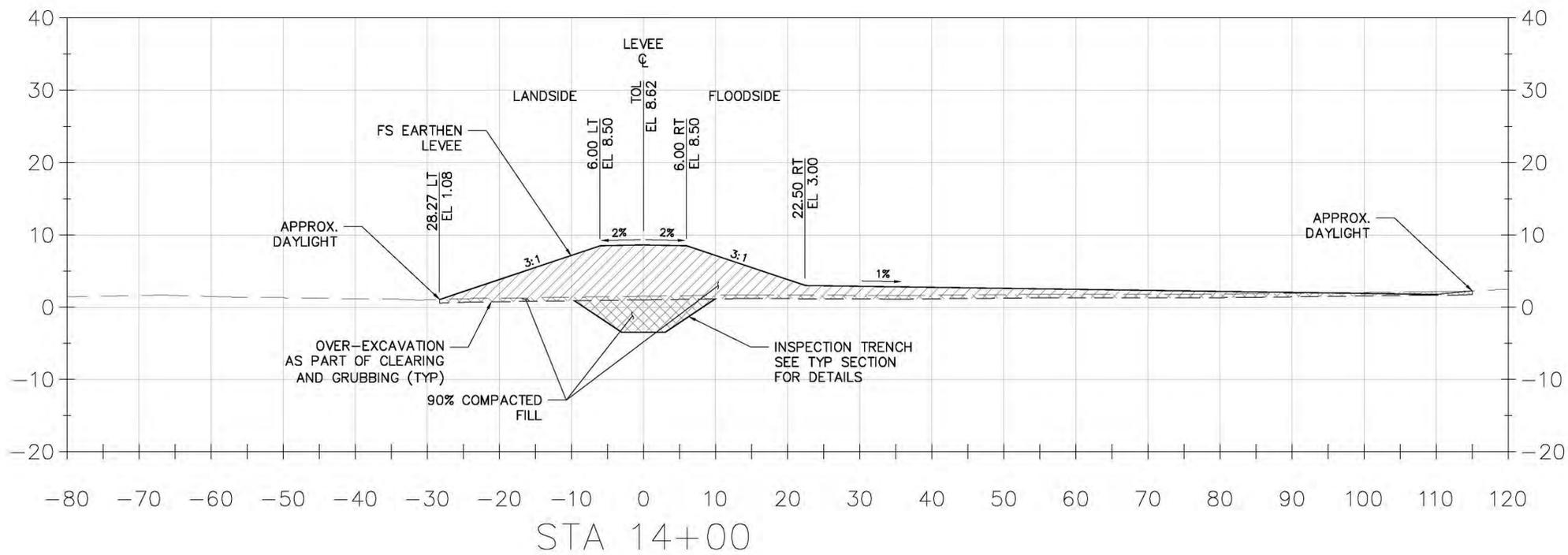
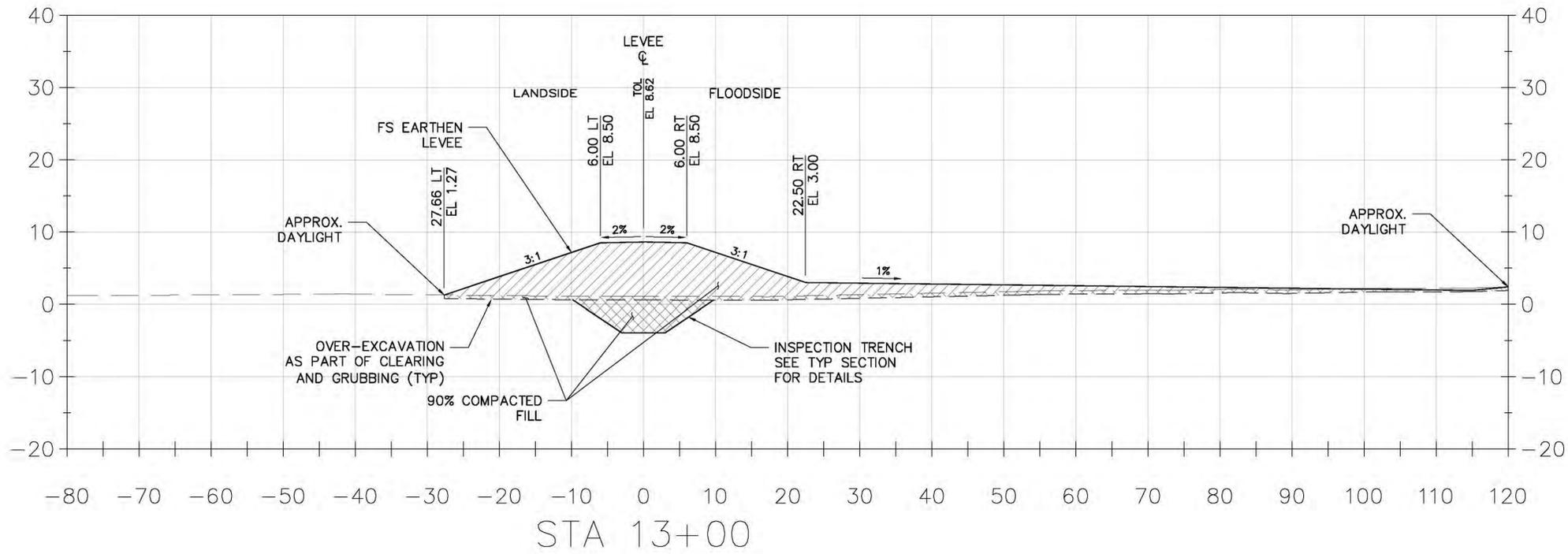
DESIGNED BY:
 B.K.R.
 DRAWN BY:
 B.K.R.

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SCALE: 1"=10' (HOR)
 1"=10' (VERT)





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 VIOLET, SAINT BERNARD PARISH, LA

CROSS SECTIONS
 LEVEE STA 13+00 AND STA 14+00

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEE DISTRICT

CHECKED BY:
 P.S.

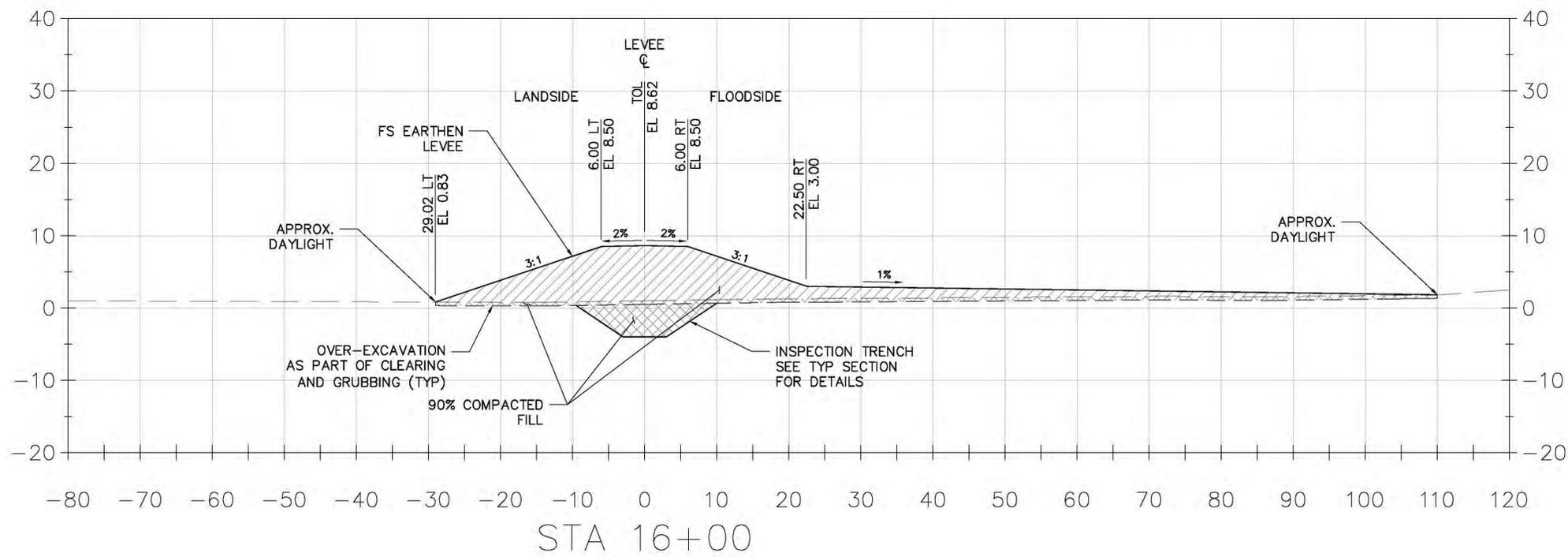
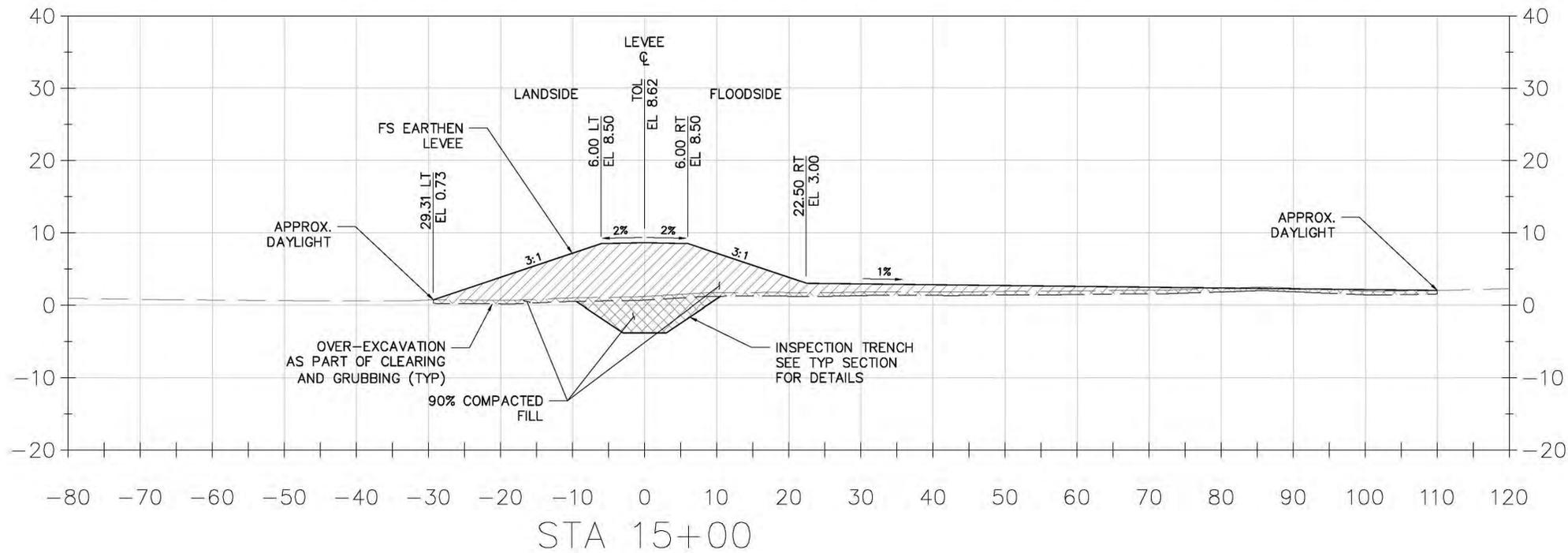
TETRA TECH, INC.
 748 Metairie Street, Suite B
 Metairie, Louisiana 70002
 Phone (225) 383-1790, Fax (225) 387-0203

DESIGNED BY:
 B.K.R.

DRAWN BY:
 B.K.R.

Scale: AS SHOWN
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 17





ISSUED BY: TETRA TECH
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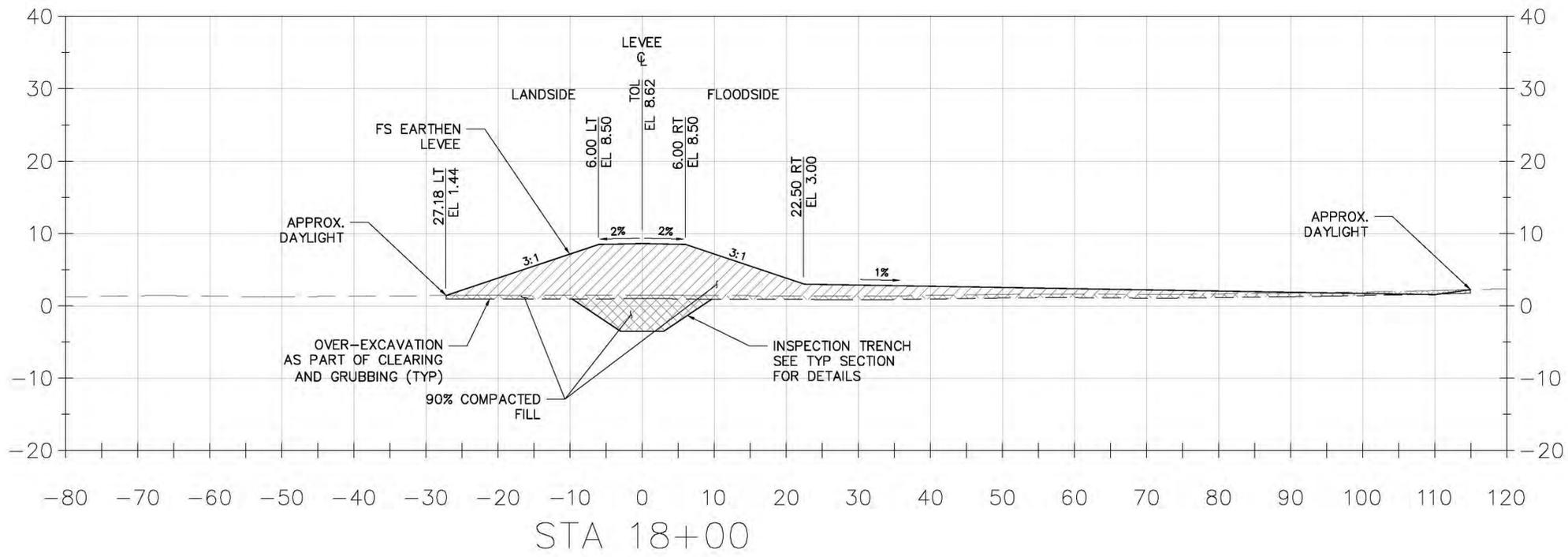
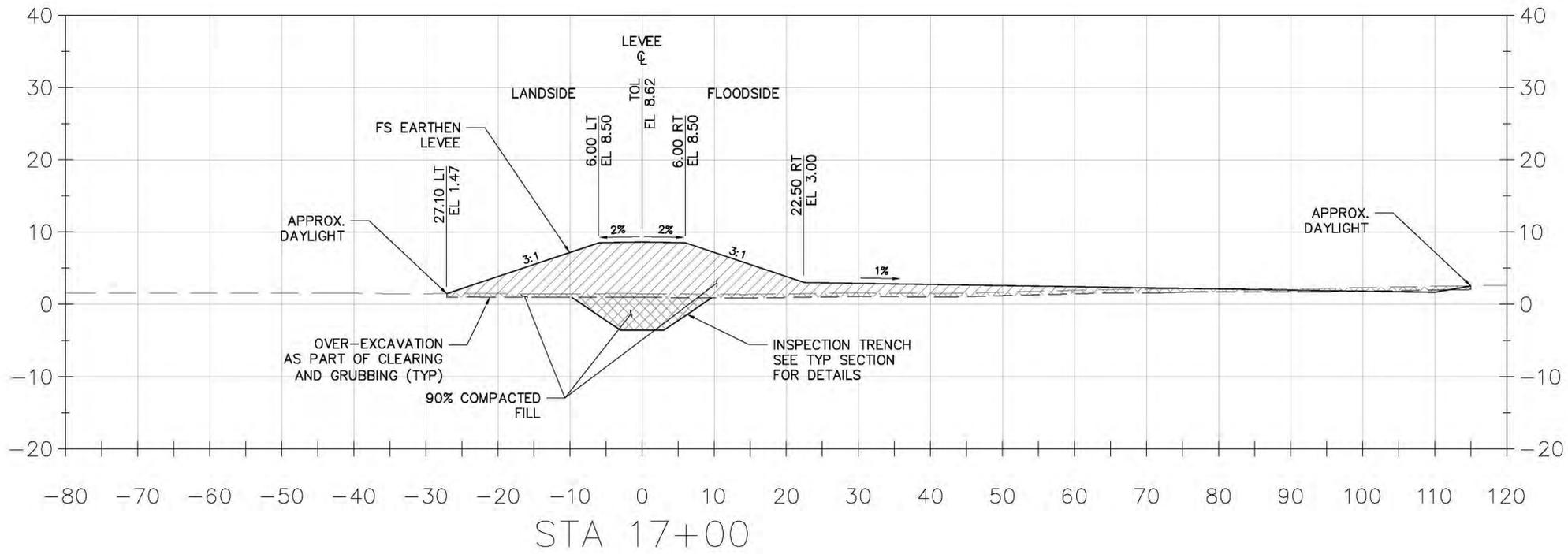
SYMBOL	DESCRIPTIONS	DATE	APPROVAL

CROSS SECTIONS
 LEVEE STA 15+00 AND STA 16+00

CHECKED BY:
 P.S.

DRAWN BY:
 B.K.R.

DESIGNED BY:
 B.K.R.



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 7-27-15
 ENGINEER: PATRICIA SEXTON STATE: LA
 REGISTRATION NO. 37416

100% SUBMITTAL—NOT FOR CONSTRUCTION

SCALE: 1"=10' (HOR)
 1"=10' (VERT)

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEE DISTRICT

TETRA TECH, INC.
 748 Metairie Street, Suite B
 Metairie, Louisiana 70002
 Phone (225) 383-1796, Fax (225) 387-0203

Scale: AS SHOWN
 SHEET
 19

CROSS SECTIONS
 LEVEE STA 17+00 AND STA 18+00

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 B.K.R.

DESIGNED BY:
 B.K.R.

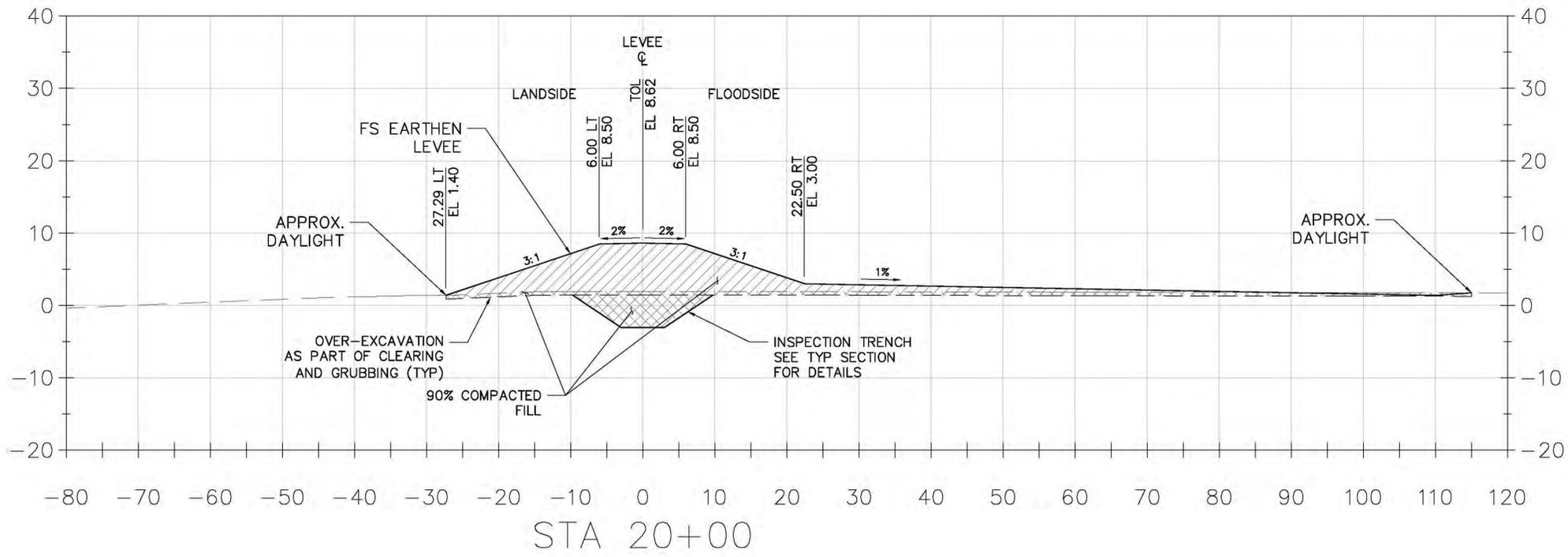
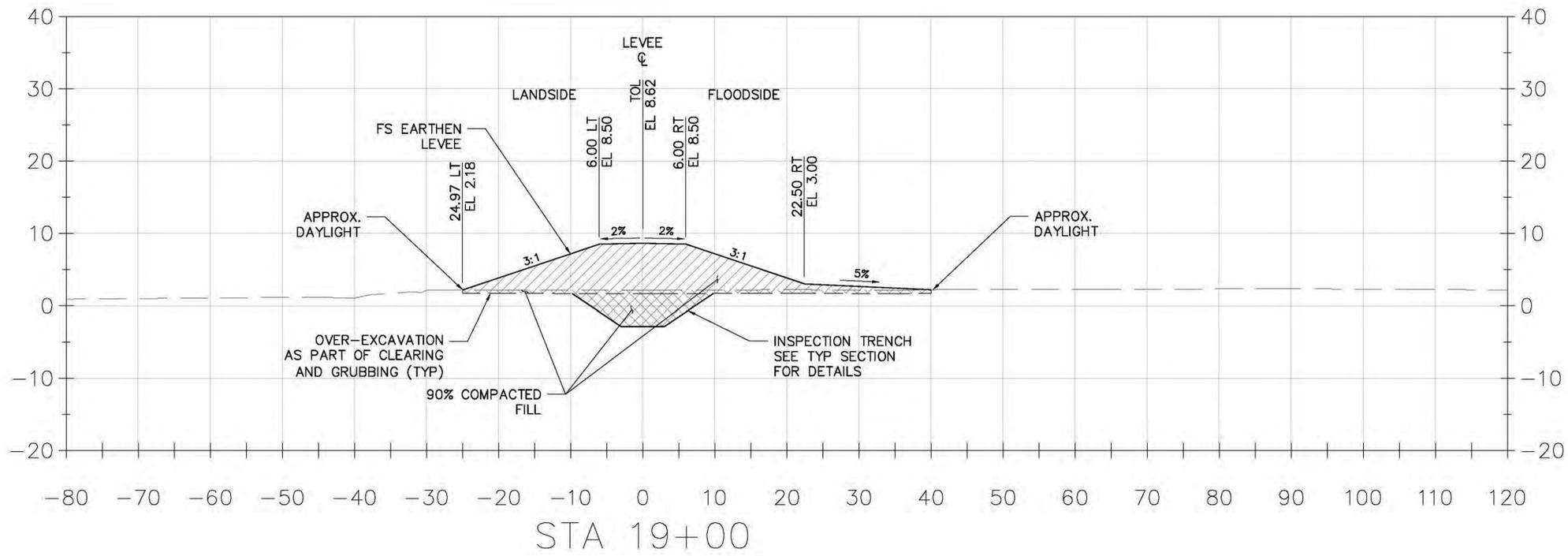
SYMBOL

DESCRIPTIONS

REVISIONS

DATE

APPROVAL



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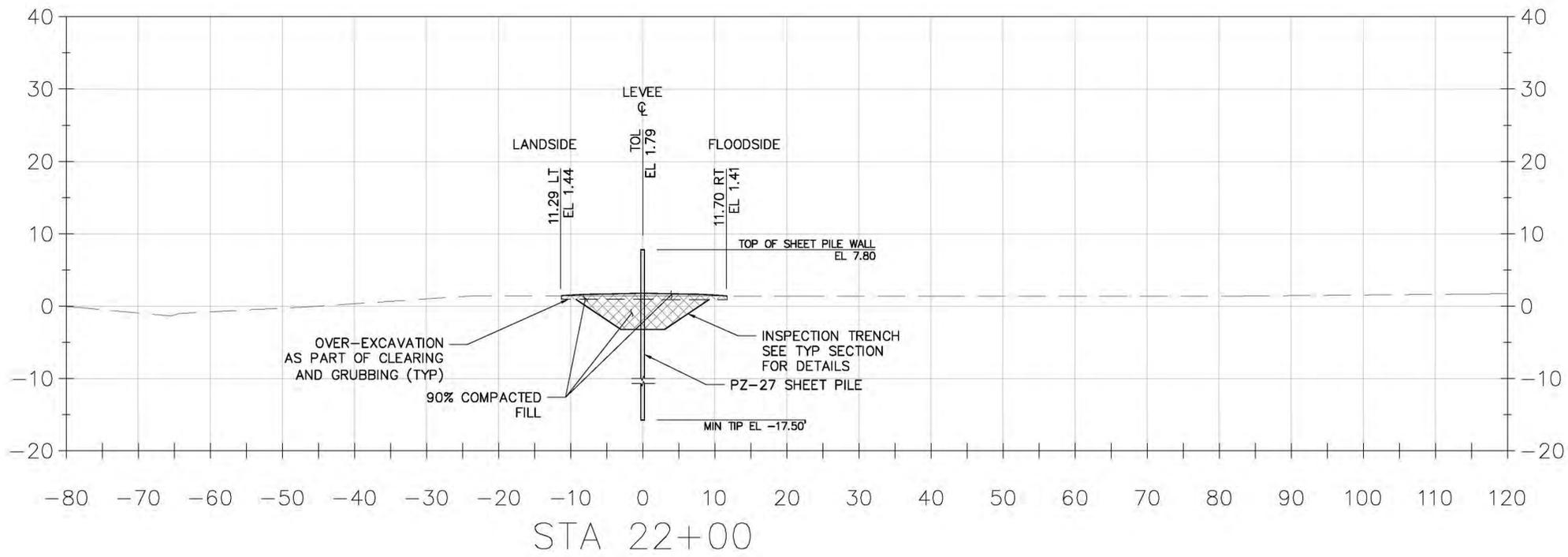
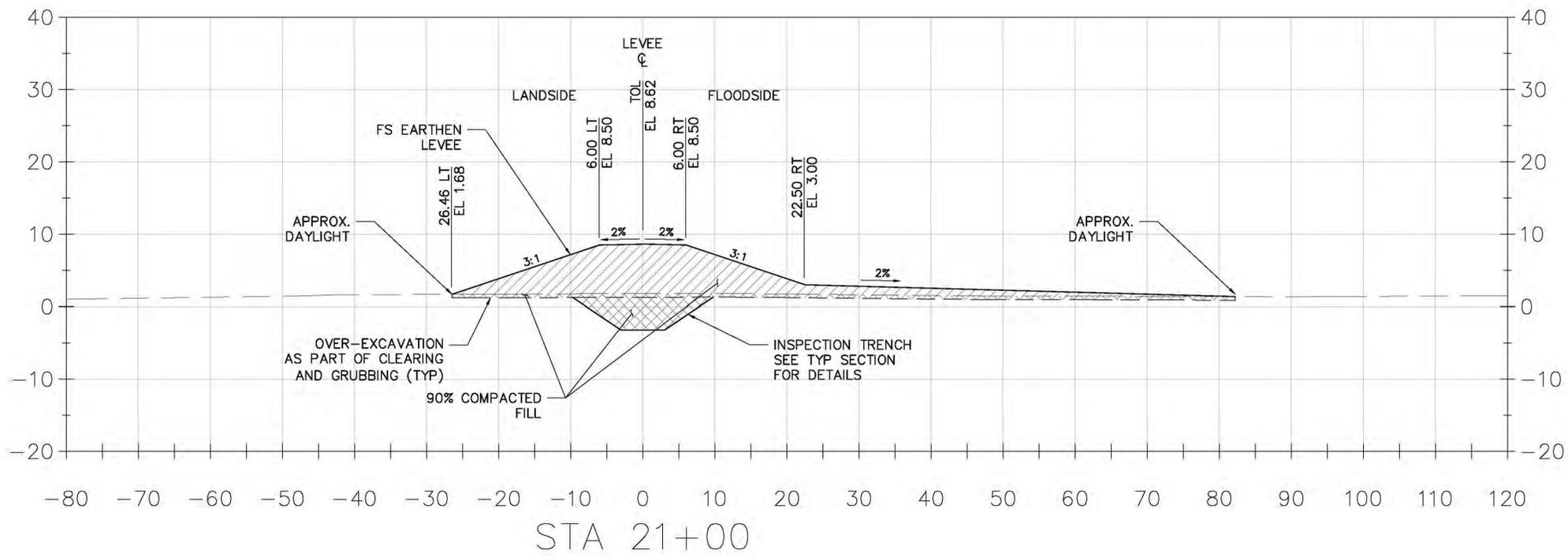
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 1"=10' (VERT)

TETRA TECH, INC. 748 Metairie Street, Suite B Metairie, Louisiana 70002 Phone (225) 383-1796, Fax (225) 387-0203		DESIGNED BY: B.K.R.	DRAWN BY: B.K.R.	CHECKED BY: P.S.	SOUTH EAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT	VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA	CROSS SECTIONS LEVEE STA 19+00 AND STA 20+00	SYMBOL DESCRIPTIONS REVISIONS	DATE APPROVAL
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 1"=10' (VERT)

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
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 VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEE DISTRICT

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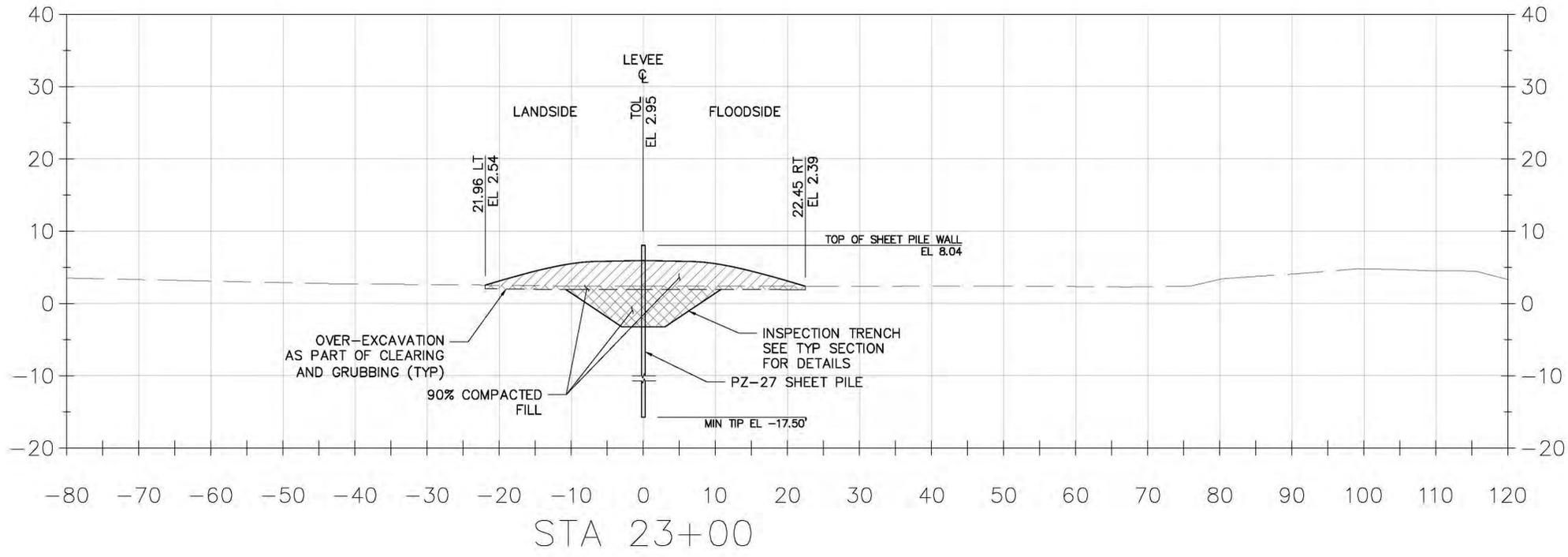
SYMBOL	DESCRIPTIONS	DATE	APPROVAL

CROSS SECTIONS
 LEVEE STA 21+00 AND STA 22+00

CHECKED BY:
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DRAWN BY:
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DESIGNED BY:
 B.K.R.



VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA
 CROSS SECTIONS
 LEVEE STA 23+00

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEE DISTRICT

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 DRAWN BY: B.K.R.
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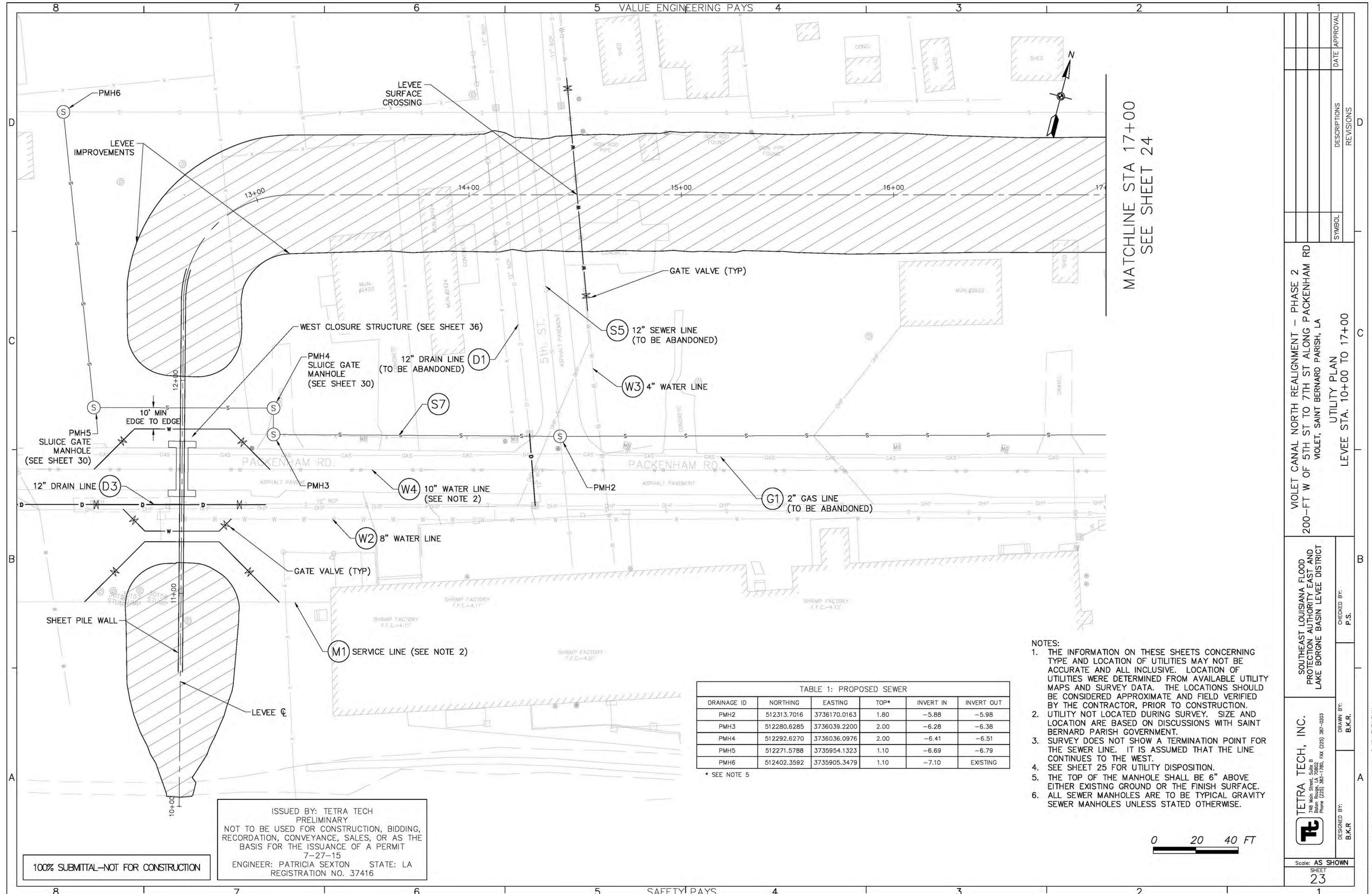
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SCALE: 1"=10' (HOR)
 1"=10' (VERT)





MATCHLINE STA 17+00
SEE SHEET 24

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD
PROTECTION AUTHORITY EAST AND
LAKE BORGNE BASIN LEVEE DISTRICT

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Scale: AS SHOWN
SHEET
23

SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

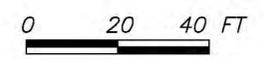
FILE NAME: C-10-UTILITY PLAN
Last Saved on 7/23/2015

TABLE 1: PROPOSED SEWER

DRAINAGE ID	NORTHING	EASTING	TOP*	INVERT IN	INVERT OUT
PMH2	512313.7016	3736170.0163	1.80	-5.88	-5.98
PMH3	512280.6285	3736039.2200	2.00	-6.28	-6.38
PMH4	512292.6270	3736036.0976	2.00	-6.41	-6.51
PMH5	512271.5788	3735954.1323	1.10	-6.69	-6.79
PMH6	512402.3592	3735905.3479	1.10	-7.10	EXISTING

* SEE NOTE 5

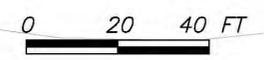
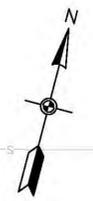
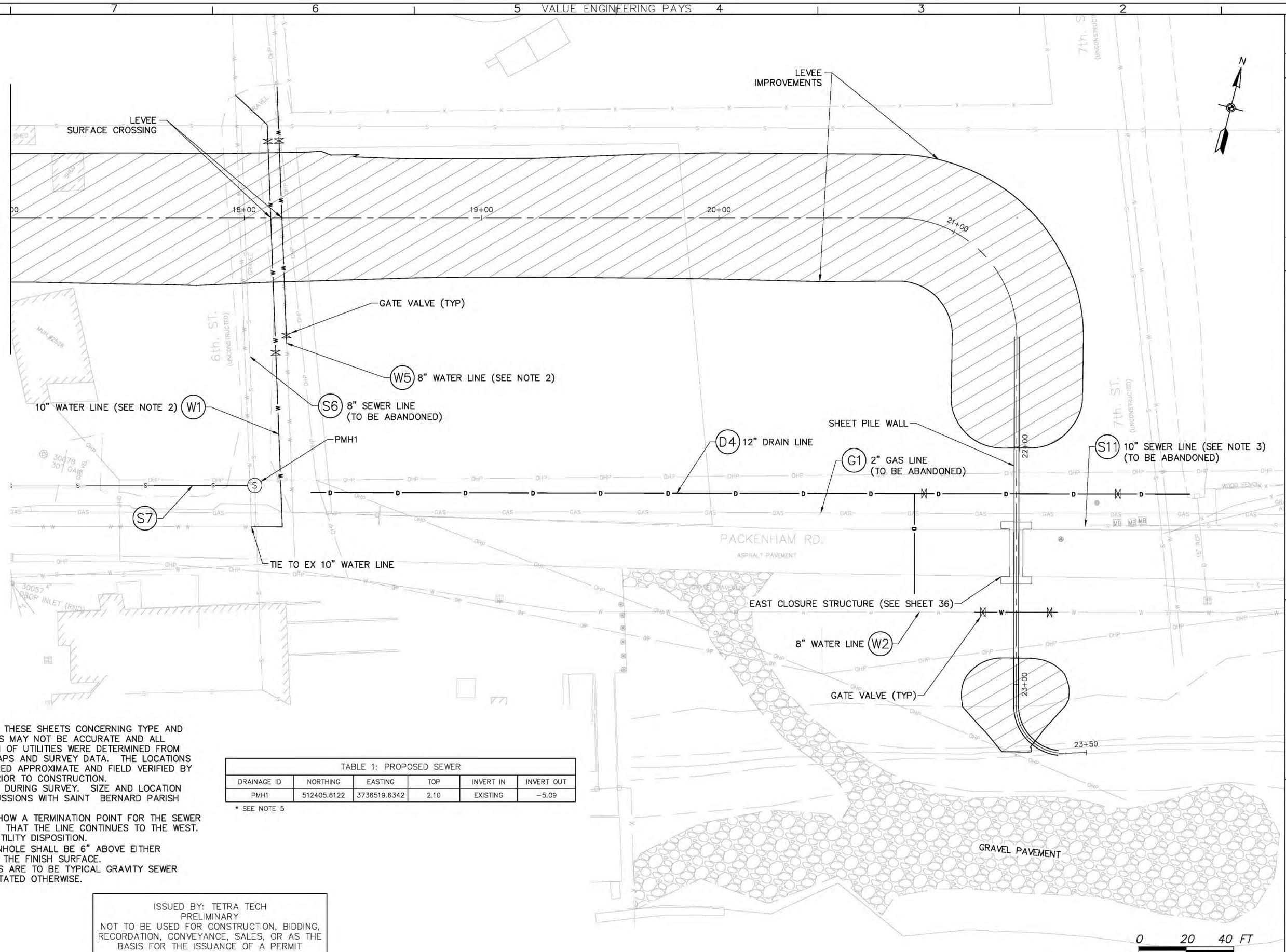
- NOTES:
1. THE INFORMATION ON THESE SHEETS CONCERNING TYPE AND LOCATION OF UTILITIES MAY NOT BE ACCURATE AND ALL INCLUSIVE. LOCATION OF UTILITIES WERE DETERMINED FROM AVAILABLE UTILITY MAPS AND SURVEY DATA. THE LOCATIONS SHOULD BE CONSIDERED APPROXIMATE AND FIELD VERIFIED BY THE CONTRACTOR, PRIOR TO CONSTRUCTION.
 2. UTILITY NOT LOCATED DURING SURVEY. SIZE AND LOCATION ARE BASED ON DISCUSSIONS WITH SAINT BERNARD PARISH GOVERNMENT.
 3. SURVEY DOES NOT SHOW A TERMINATION POINT FOR THE SEWER LINE. IT IS ASSUMED THAT THE LINE CONTINUES TO THE WEST.
 4. SEE SHEET 25 FOR UTILITY DISPOSITION.
 5. THE TOP OF THE MANHOLE SHALL BE 6" ABOVE EITHER EXISTING GROUND OR THE FINISH SURFACE.
 6. ALL SEWER MANHOLES ARE TO BE TYPICAL GRAVITY SEWER MANHOLES UNLESS STATED OTHERWISE.



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MATCHLINE STA 17+00
SEE SHEET 23



- NOTES:
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 2. UTILITY NOT LOCATED DURING SURVEY. SIZE AND LOCATION ARE BASED ON DISCUSSIONS WITH SAINT BERNARD PARISH GOVERNMENT.
 3. SURVEY DOES NOT SHOW A TERMINATION POINT FOR THE SEWER LINE. IT IS ASSUMED THAT THE LINE CONTINUES TO THE WEST.
 4. SEE SHEET 25 FOR UTILITY DISPOSITION.
 5. THE TOP OF THE MANHOLE SHALL BE 6" ABOVE EITHER EXISTING GROUND OR THE FINISH SURFACE.
 6. ALL SEWER MANHOLES ARE TO BE TYPICAL GRAVITY SEWER MANHOLES UNLESS STATED OTHERWISE.

DRAINAGE ID	NORTHING	EASTING	TOP	INVERT IN	INVERT OUT
PMH1	512405.6122	3736519.6342	2.10	EXISTING	-5.09

* SEE NOTE 5

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7-27-15
ENGINEER: PATRICIA SEXTON STATE: LA
REGISTRATION NO. 37416

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VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA		UTILITY PLAN STA 17+00 TO 23+50
DESIGNED BY: B.K.R.	CHECKED BY: P.S.	DATE APPROVAL
DRAWN BY: B.K.R.	SYMBOL	REVISIONS
TETRA TECH, INC. <small>748 Main Street, Suite B Baton Rouge, LA 70802 Phone (225) 383-1780, Fax (225) 387-0203</small>		SHEET 24
Scale: AS SHOWN		FILE NAME: C-10-UTILITY PLAN

UTILITY DESIGNATION	UTILITY TYPE	EXISTING				PROPOSED				
		UTILITY SIZE (IN)	MATERIAL	UTILITY CROSSING STATION	APPROXIMATE UTILITY INVERT AT LEVEE CROSSING	UTILITY SIZE (IN)	MATERIAL	UTILITY CROSSING STATION	APPROXIMATE UTILITY INVERT AT LEVEE CROSSING	UTILITY DISPOSITION
D1	DRAINAGE	12	RCP	14+16.92	-1.36	12	N/A	N/A	N/A	ABANDON AND REMOVE FROM LEVEE SECTION
D3	DRAINAGE	12	PVC	11+42.02	-0.25	12	A-2000	11+41.62	-0.25	PIPE THRU STEEL SHEET PILING
D4	DRAINAGE	N/A	N/A	N/A	N/A	12	A-2000	22+19.96	-1.20	PIPE THRU STEEL SHEET PILING
G1	GAS	2	DUCTILE IRON	11+65.14	N/A	N/A	N/A	N/A	N/A	ABANDONED BY ATMOS PRIOR TO CONSTRUCTION, REMOVE FROM LEVEE SECTION
			DUCTILE IRON	22+28.38	N/A	N/A	N/A	N/A	N/A	ABANDONED BY ATMOS PRIOR TO CONSTRUCTION, REMOVE FROM LEVEE SECTION
S5	SEWER	12	PVC	14+31.95	-4.51	N/A	N/A	N/A	N/A	ABANDON AND REMOVE FROM LEVEE SECTION
S6	SEWER	8	PVC	18+00.12	-5.10	N/A	N/A	N/A	N/A	ABANDON AND REMOVE FROM LEVEE SECTION
S7	SEWER	N/A	N/A	N/A	N/A	12	PVC	11+87.10	-6.51	PIPE THRU STEEL SHEET PILING
S11	SEWER	10	CONC	22+33.78	N/A	N/A	N/A	N/A	N/A	ABANDON AND REMOVE FROM LEVEE SECTION
W1	WATER	10	N/A	18+00.00	N/A	10	HDPE	18+11.13	8.50	LEVEE SURFACE CROSSING
W2	WATER	8	N/A	11+34.89	N/A	8	HDPE	11+29.27	MATCH EX	PIPE THRU STEEL SHEET PILING
			N/A	22+69.67	N/A	8	HDPE	22+69.67	MATCH EX	PIPE THRU STEEL SHEET PILING
W3	WATER	4	N/A	14+50.95	N/A	4	HDPE	14+50.95	8.50	LEVEE SURFACE CROSSING
W4	WATER	10	CONC	11+58.10	N/A	10	HDPE	11+77.15	MATCH EX	PIPE THRU STEEL SHEET PILING
W5	WATER	8	N/A		N/A	8	HDPE	18+16.13	8.50	LEVEE SURFACE CROSSING
M1	SERVICE	12	DUCTILE IRON	10+95.94	N/A	12	HDPE	11+24.27	MATCH EX	PIPE THRU STEEL SHEET PILING

- NOTES:
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 - REMOVE ALL BURIED PIPING WITHIN THE LEVEE SECTION.
 - THE CONTRACTOR HAS THE OPTION TO REMOVE OR ABANDON SEWER PIPING OUTSIDE OF THE LEVEE SECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EVACUATING OR "SKABING" THE SEWER PIPE BEFORE IT IS ABANDONED OR REMOVED. THE CONTENTS SHALL BE TREATED AS HAZARDOUS MATERIAL AND DISPOSED OF USING THE PROPER CRITERIA FROM THE LA DEPT. OF ENVIRONMENTAL QUALITY. IF ABANDONED, THE ENTIRE LENGTH OF PIPE SHALL BE COMPLETELY FILLED WITH FLOWABLE FILL.
 - ALL OTHER PIPING NOT REMOVED SHALL HAVE OPEN ENDS PLUGGED WITH CONCRETE OR FLOWABLE FILL A MINIMUM OF 18".
 - THE CONTRACTOR SHALL FURNISH, OPERATE, AND MAINTAIN ALL EQUIPMENT NECESSARY TO PROVIDE UTILITY SERVICE DURING CONSTRUCTION. NOTIFY THE APPROPRIATE UTILITY 48 HOURS PRIOR TO STARTING ANY CONSTRUCTION THAT COULD ADVERSELY IMPACT EXISTING UTILITIES.
 - ALL HOPE PIPE AND FITTINGS ARE TO BE HEAT FUSED.

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 ENGINEER: PATRICK E. TON, STATE LA REGISTRATION NO. 37498

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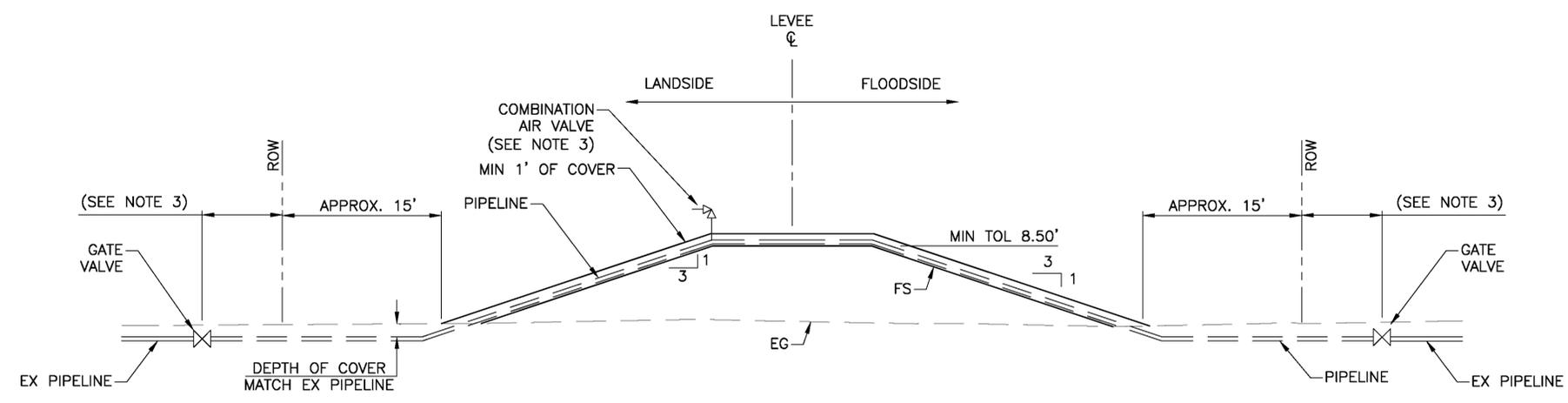
MOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACHENHAM RD
 MOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT

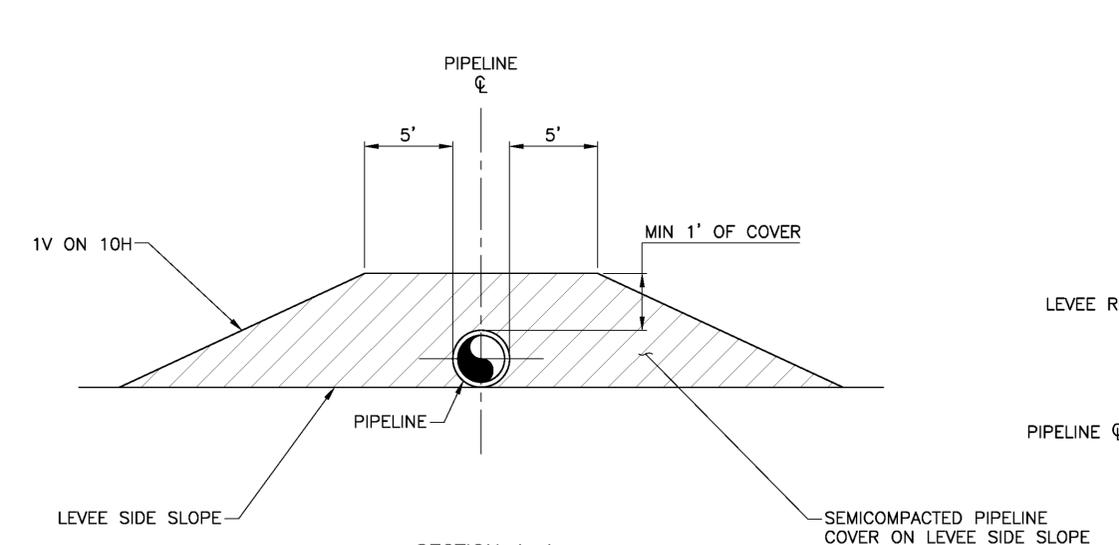
TETRA TECH, INC.
 17777 W. I-10, SUITE 200
 HOUSTON, TEXAS 77058

UTILITY DISPOSITION

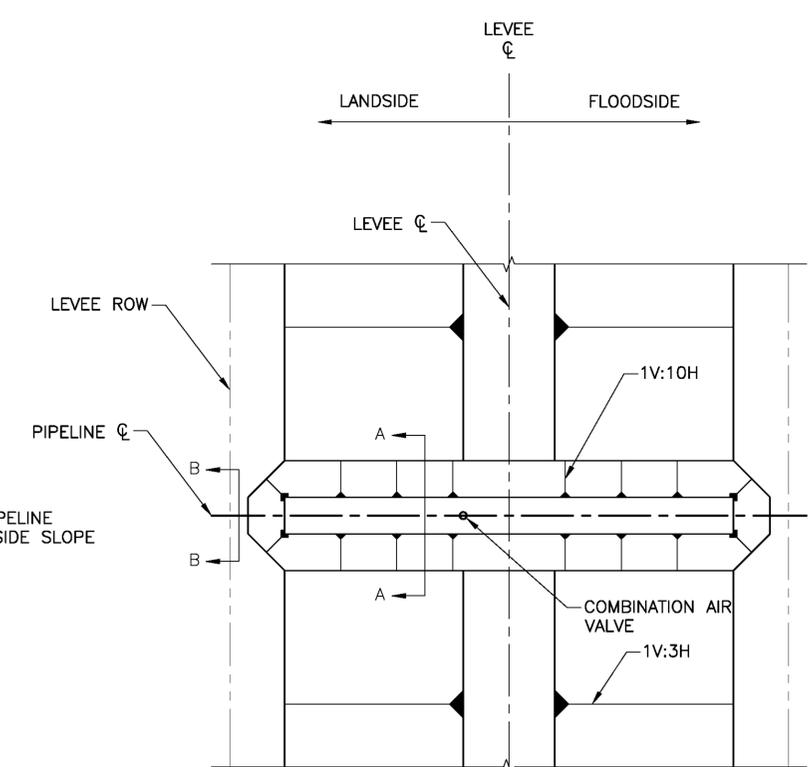
EITING
 SHEET NO. 25



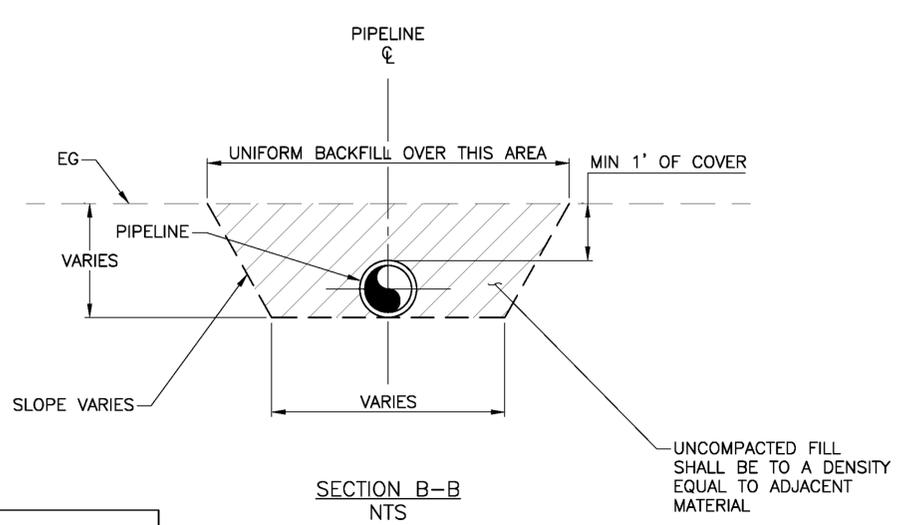
LEVEE SURFACE CROSSING NTS



SECTION A-A NTS



LEVEE SURFACE CROSSING-TYPICAL PLAN NTS



SECTION B-B NTS

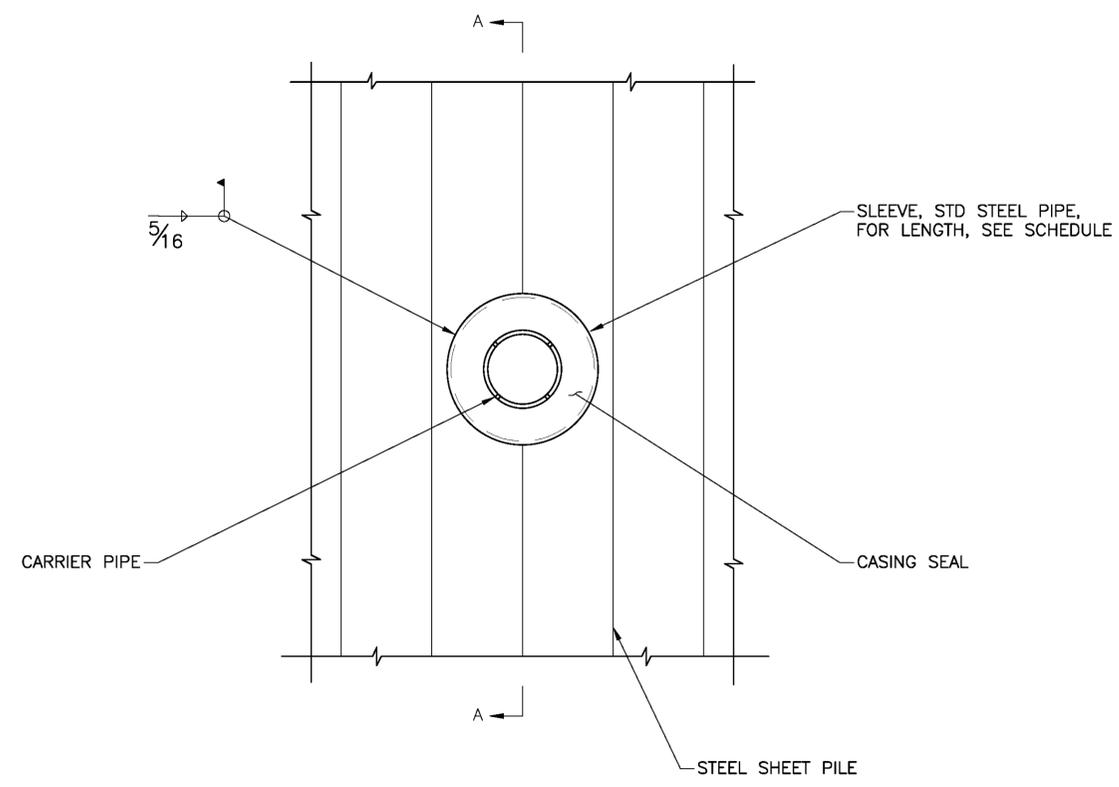
- NOTES:
1. THE PIPELINE SHALL BE LAID ON LEVEE SURFACE AS SHOWN IN SECTIONS A-A AND B-B. NO EXCAVATION INTO DESIGN SECTION WILL BE ALLOWED.
 2. SEE SHEET 32 FOR VALVE DETAILS.
 3. CONTRACTOR SHALL COORDINATE WITH UTILITY FOR PLACEMENT OF GATE VALVE AND COMBINATION AIR VALVE.

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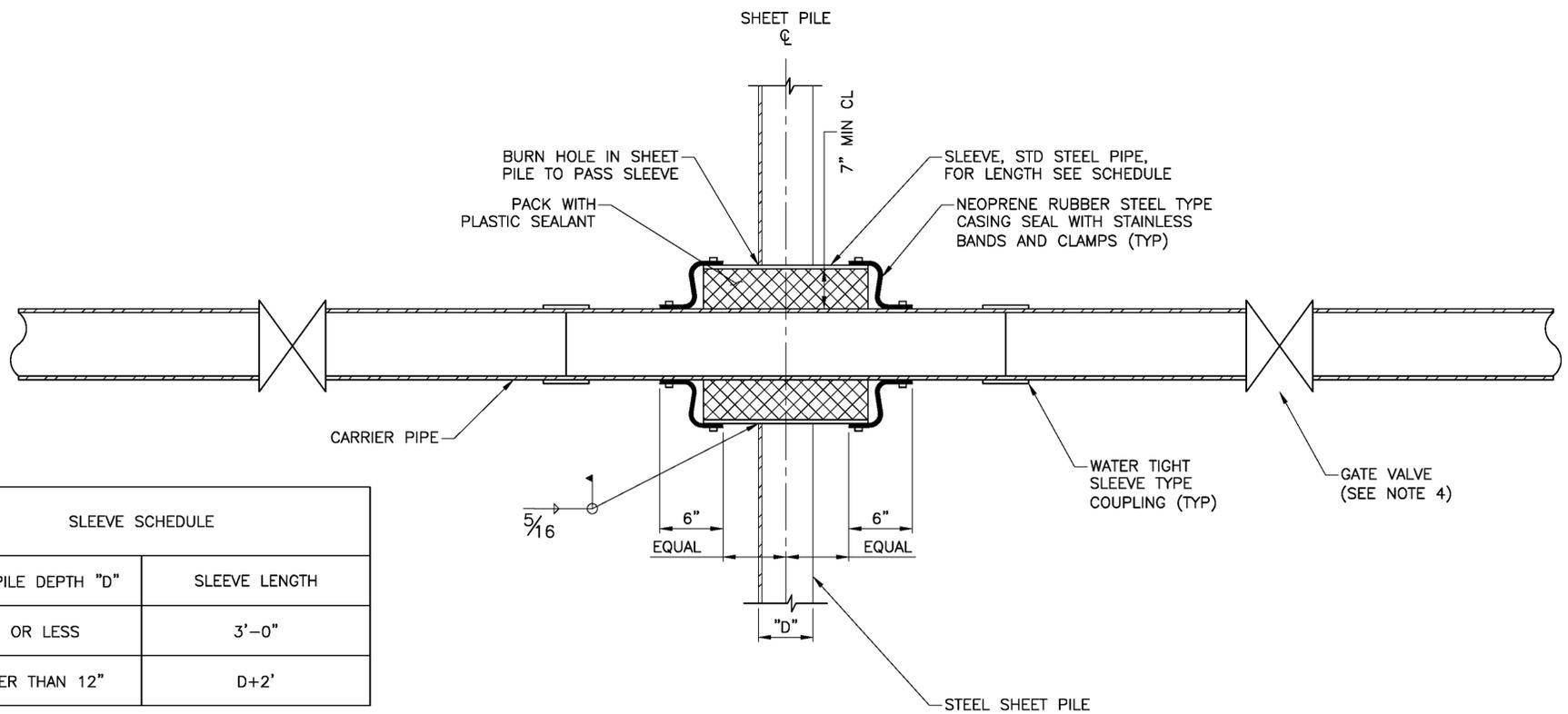
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VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA		SYMBOL	REVISIONS	DATE	APPROVAL
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT		CHECKED BY: P.S.	DESIGNED BY: B.K.R.	DRAWN BY: B.K.R.	SCALE: AS SHOWN
TETRA TECH, INC. 748 Metairie Street, Suite B Baton Rouge, LA 70802 Phone (225) 383-1786, FAX (225) 387-0203		SHEET 26			





ELEVATION
NTS



SECTION A-A
NTS

SLEEVE SCHEDULE	
SHEET PILE DEPTH "D"	SLEEVE LENGTH
12" OR LESS	3'-0"
GREATER THAN 12"	D+2'

NOTES:

1. STEEL PIPE SLEEVES UP TO 24" SHALL BE ASTM A53, TYPE S, GRADE B, PLAIN END. STEEL PIPE SLEEVES GREATER THAN 24" SHALL BE API 5L, SEAMLESS, GRADE B, PLAIN END.
2. PLASTIC SEALANT SHALL MEET FEDERAL SPECIFICATIONS SS-S-210A.
3. THE AREA OF THE SLEEVE IS LOCATED WHERE THE BOOTS ARE STRAPPED TO THE PIPE SLEEVE SHOULD BE FREE OF ANY MATERIAL THAT INHIBIT THE BOOT/STRAP FROM CREATING A WATER-TIGHT INTERFACE WITH THE PIPE SLEEVE.
4. CONTRACTOR SHALL COORDINATE WITH UTILITY FOR PLACEMENT OF GATE VALVE.
5. SEE SHEET 32 FOR STANDARD VALVE DETAILS.

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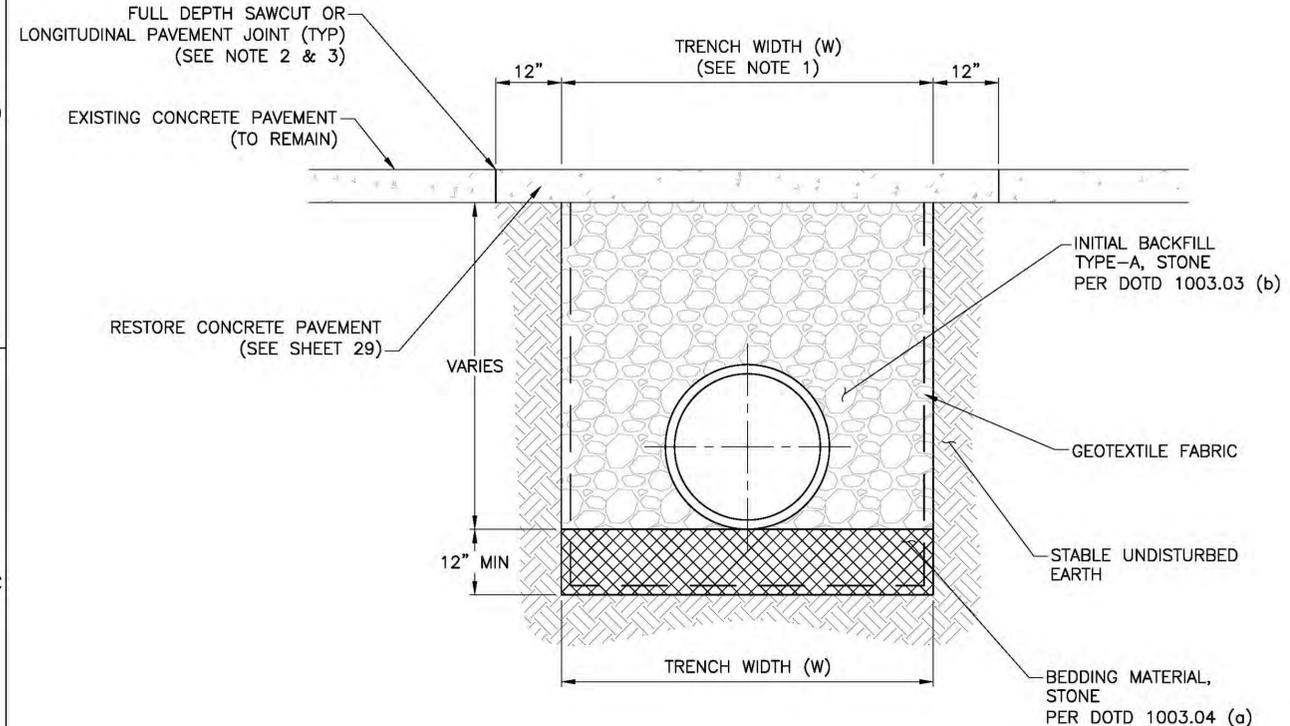
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VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

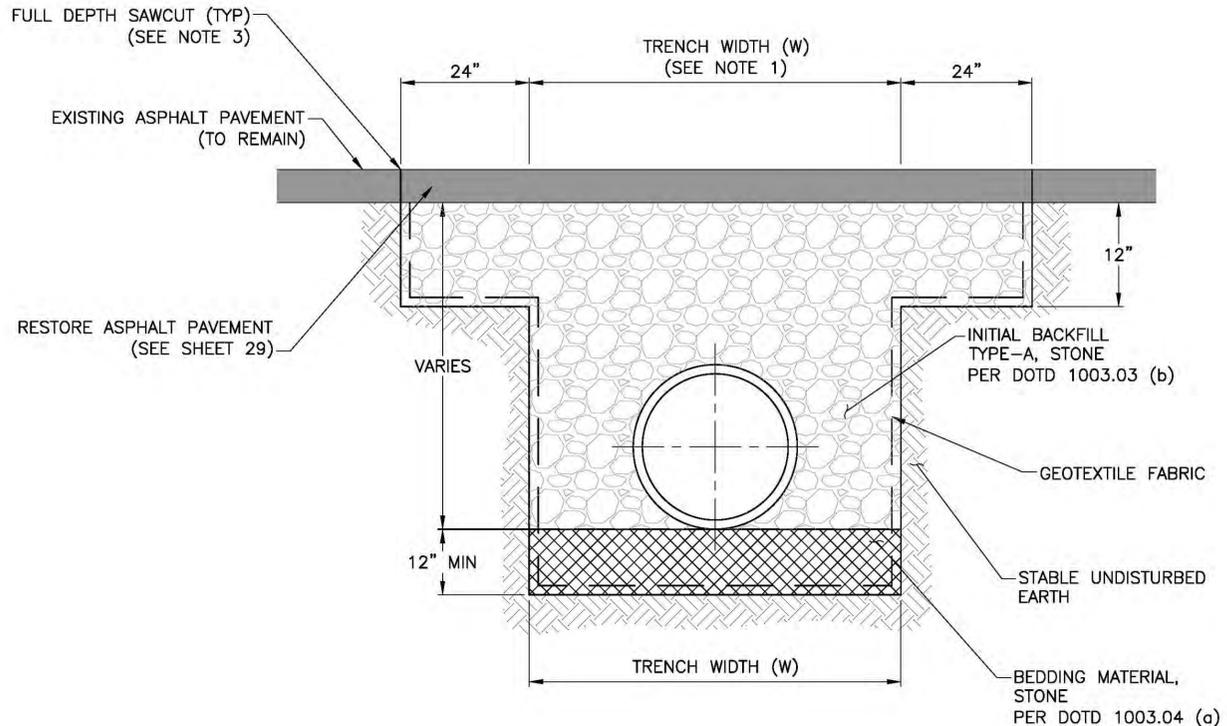
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEL DISTRICT

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Phone (225) 383-1780, FAX (225) 387-0203

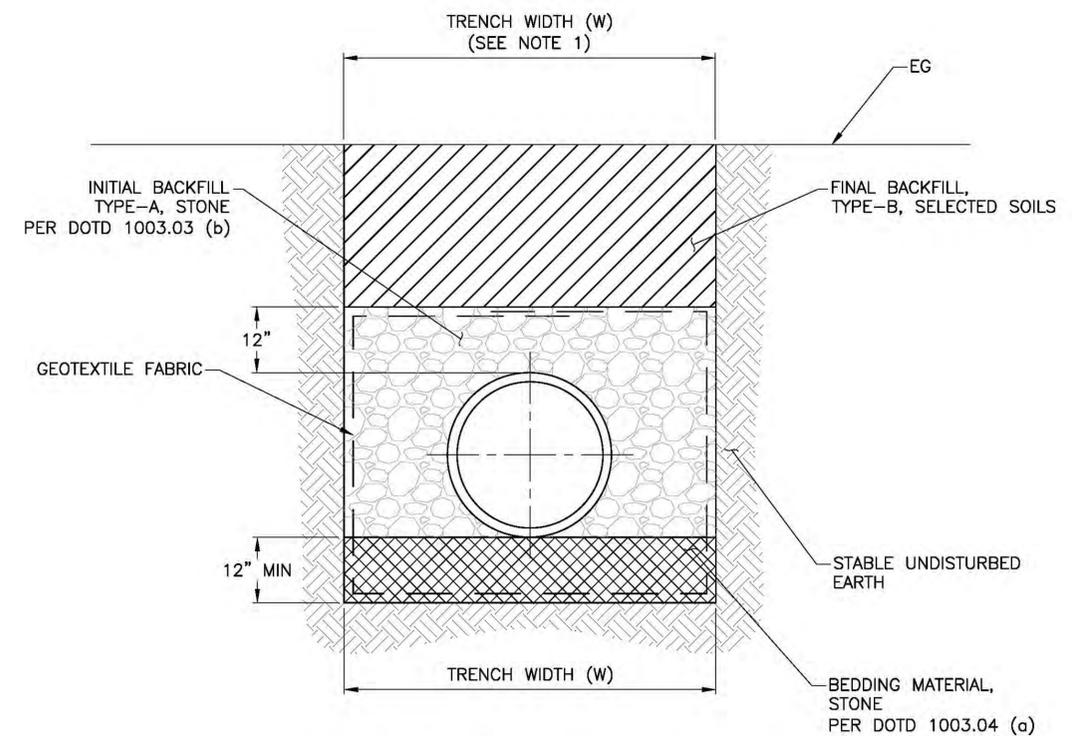
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TYPICAL PIPE UNDER OR WITHIN 5' OF CONCRETE PAVEMENT
NTS



TYPICAL PIPE UNDER OR WITHIN 5' OF ASPHALT PAVEMENT
NTS



TYPICAL PIPE OUTSIDE OF LIMITS OF PAVED SURFACES
NTS

- NOTES:**
1. TRENCH WIDTH (W) SHALL BE PIPE OUTSIDE DIAMETER + 18". PIPE SHALL BE CENTERED IN TRENCH.
 2. CONTRACTOR SHALL REMOVE AND REPLACE CONCRETE PAVEMENT SLABS AS SHOWN. IF NEW CONCRETE PAVEMENT JOINT IS WITHIN 2' OF EXISTING JOINT, REMOVE THE ENTIRE PAVEMENT TO JOINT LINE.
 3. FINAL EDGES ALONG PAVEMENT REMOVAL LIMITS SHALL BE STRAIGHT, CLEAN, SOLID, VERTICAL FACES FREE FROM LOOSE MATERIAL PRIOR TO PAVEMENT RESTORATION. SAWCUTTING AT LIMITS SHOWN SHALL BE PAID ONLY ONCE PER TRENCH PATCH. ANY ADDITIONAL SAWCUTS FOR THE CONVENIENCE OF THE CONTRACTOR SHALL BE AT NO EXPENSE TO THE OWNER.
 4. GEOTEXTILE FABRIC SHALL BE OVERLAPPED A MINIMUM OF 12".

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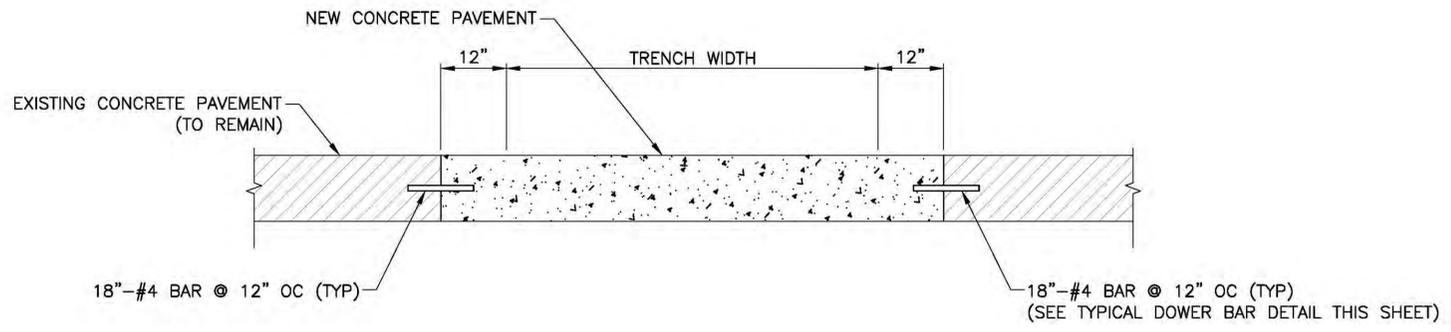
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VIOLET, SAINT BERNARD PARISH, LA

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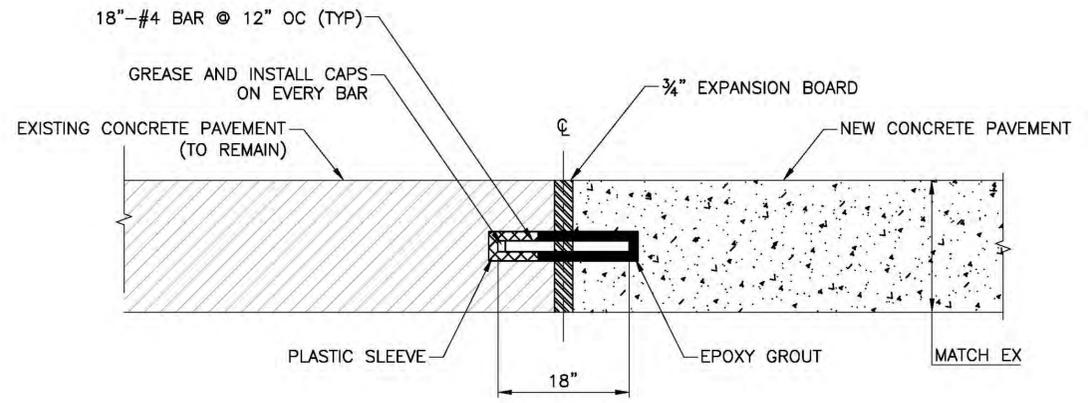
TETRA TECH, INC.
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SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

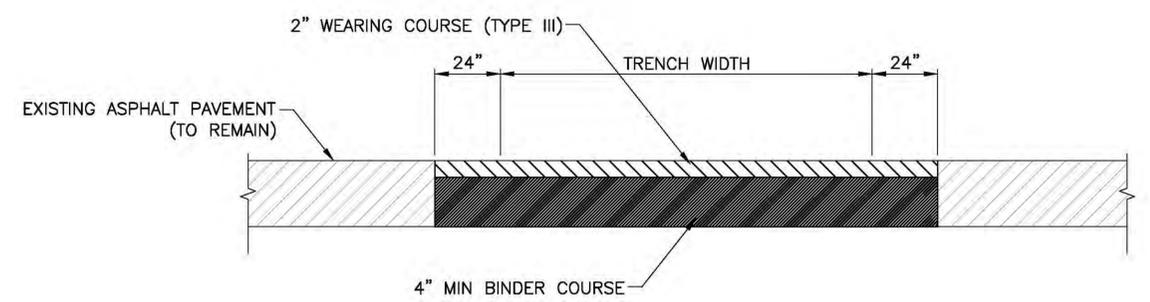
CHECKED BY: P.S.
DRAWN BY: B.K.R.
DESIGNED BY: B.K.R.



TYPICAL CONCRETE PAVEMENT RESTORATION
NTS



TYPICAL DOWEL BAR DETAIL
NTS



TYPICAL ASPHALT PAVEMENT RESTORATION
NTS

- GENERAL PAVEMENT NOTES:**
- DAMAGE TO EXISTING PAVEMENT CAUSED BY CONTRACTOR'S OPERATIONS BEYOND THE LIMITS SHOWN ON THE PLANS SHALL BE REMOVED AND REPLACED AT NO ADDITIONAL COST TO THE OWNER.
 - IF LESS THAN 2' FROM EDGE OF CUT TO EDGE OF ROAD, REMOVE AND REPLACE ALL PAVEMENT FROM WITHIN THIS STRIP AND INCLUDE IN THE PAY WIDTH.
 - PRIOR TO THE RESTORATION OF THE PAVEMENT, THE CONTRACTOR SHALL PROVIDE EITHER A CONCRETE MIX DESIGN OR ASPHALT JOB MIX FORMULA FOR APPROVAL.
 - DENSITY TESTS WILL BE REQUIRED FOR ALL PAVEMENT BASE MATERIALS WHERE REQUIRED IN THE CONTRACT. THE CONTRACTOR SHALL NOT BE ALLOWED TO RESTORE THE PAVEMENT UNTIL ALL DENSITY TESTS HAVE BEEN APPROVED.
 - DENSITY REQUIREMENTS (STANDARD PROCTOR)
 - TYPE-A, STONE - 95%
 - ALL CONSTRUCTION MATERIAL AND PROCEDURES SHALL CONFORM TO THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES (DOTD) LATEST EDITION.
 - SLOPE AND GRADE OF NEW PAVEMENT SHALL MATCH THE EXISTING PAVEMENT.
 - THE CONTRACTOR SHALL GIVE A MINIMUM NOTICE OF 24 HOURS (EXCLUDING WEEKENDS AND HOLIDAYS) TO SLFPA-E, LBBLD, AND THE ASSIGNED TESTING LABORATORY PRIOR TO THE RESTORATION OF ANY PAVEMENT.

- ASPHALT PAVEMENT NOTES:**
- JOB MIX FORMULA SHALL BE PER THE LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT STANDARDS.

- CONCRETE PAVEMENT NOTES:**
- ALL CONCRETE PAVEMENT SHALL BE NON-REINFORCED.
 - THE FINAL PAVEMENT SHALL HAVE A "DRAG FINISH" AS STIPULATED UNDER LOUISIANA "STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES" LATEST EDITION, UNLESS A DIFFERENT FINISH EXISTS.
 - CONCRETE REQUIREMENTS:
 - 7 SACKS OF CEMENT PER CUBIC YARD
 - 2" TO 4" SLUMP RANGE
 - THE PAVEMENT SHALL NOT BE OPENED TO TRAFFIC UNTIL A COMPRESSIVE STRENGTH OF 4,000 PSI IS ATTAINED. IN NO CASE SHALL THE PAVEMENT BE OPENED TO TRAFFIC WITHIN A THREE (3) DAY PERIOD AFTER THE CONCRETE HAS BEEN PLACED.
 - TESTING REQUIREMENTS:
 - ONE BASE THICKNESS VERIFICATION PER 600 SQUARE YARDS OR FRACTION THEREOF.
 - ONE DENSITY TEST ON SUB-BASE MATERIAL PER 600 SQUARE YARD OR FRACTION THEREOF.
 - ONE SLUMP TEST MINIMUM PER 100 CUBIC YARDS OR FRACTION THEREOF.
 - FOUR (4) CYLINDERS MINIMUM PER 100 CUBIC YARDS OF CONCRETE OR FRACTION THEREOF.
 - ONE PAVEMENT CORE FOR THICKNESS VERIFICATION PER 600 SQUARE YARDS OR FRACTION THEREOF.
 - IF THE EXPANSION BOARD IS DAMAGED AND CANNOT BE SALVAGED, REMOVED THE BOARD AND REPLACE.

SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT

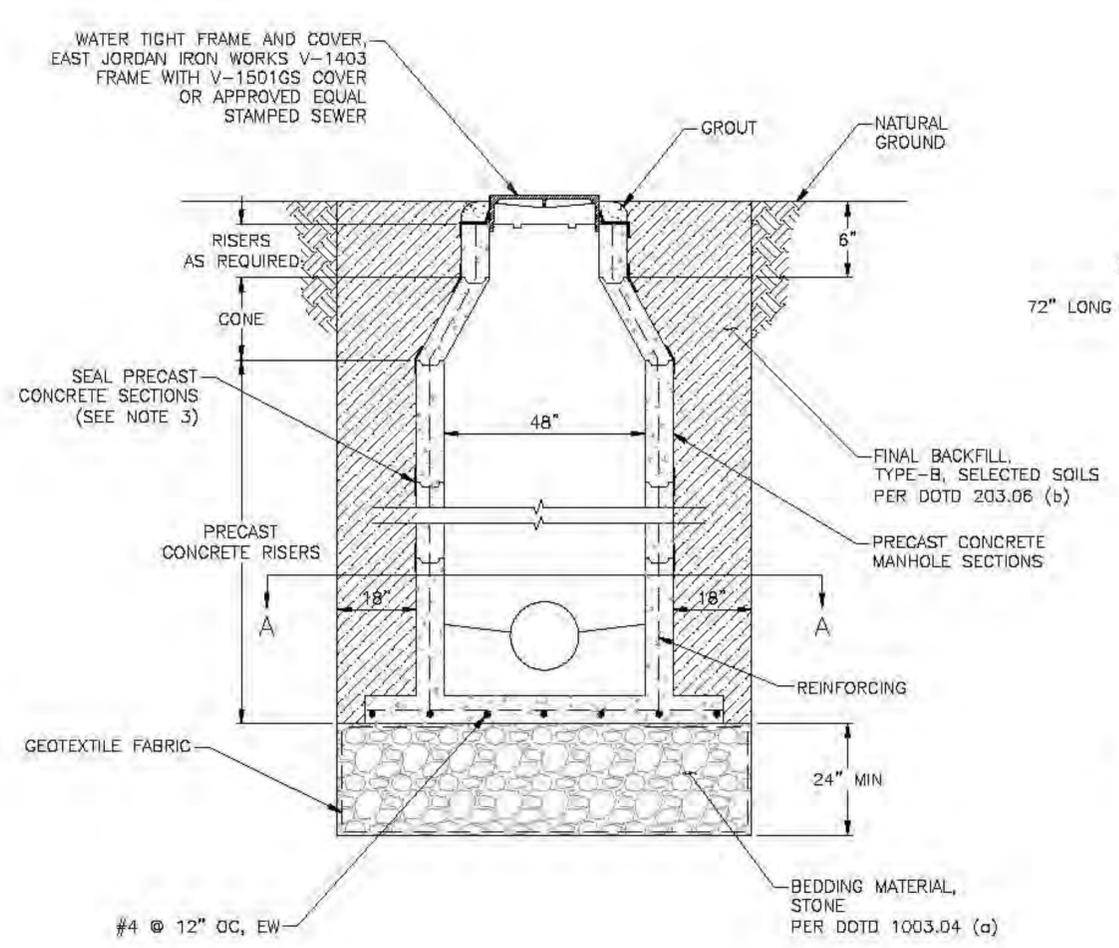
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SHEET 29

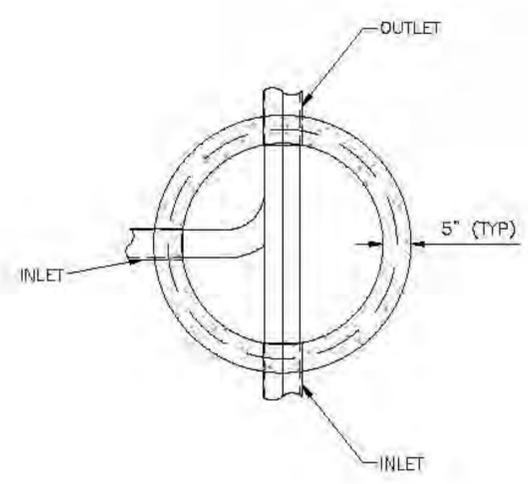
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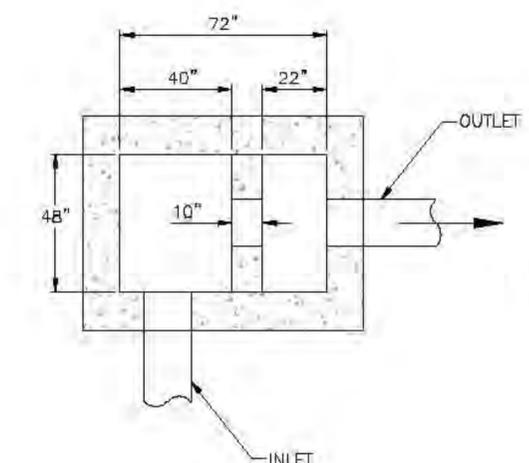




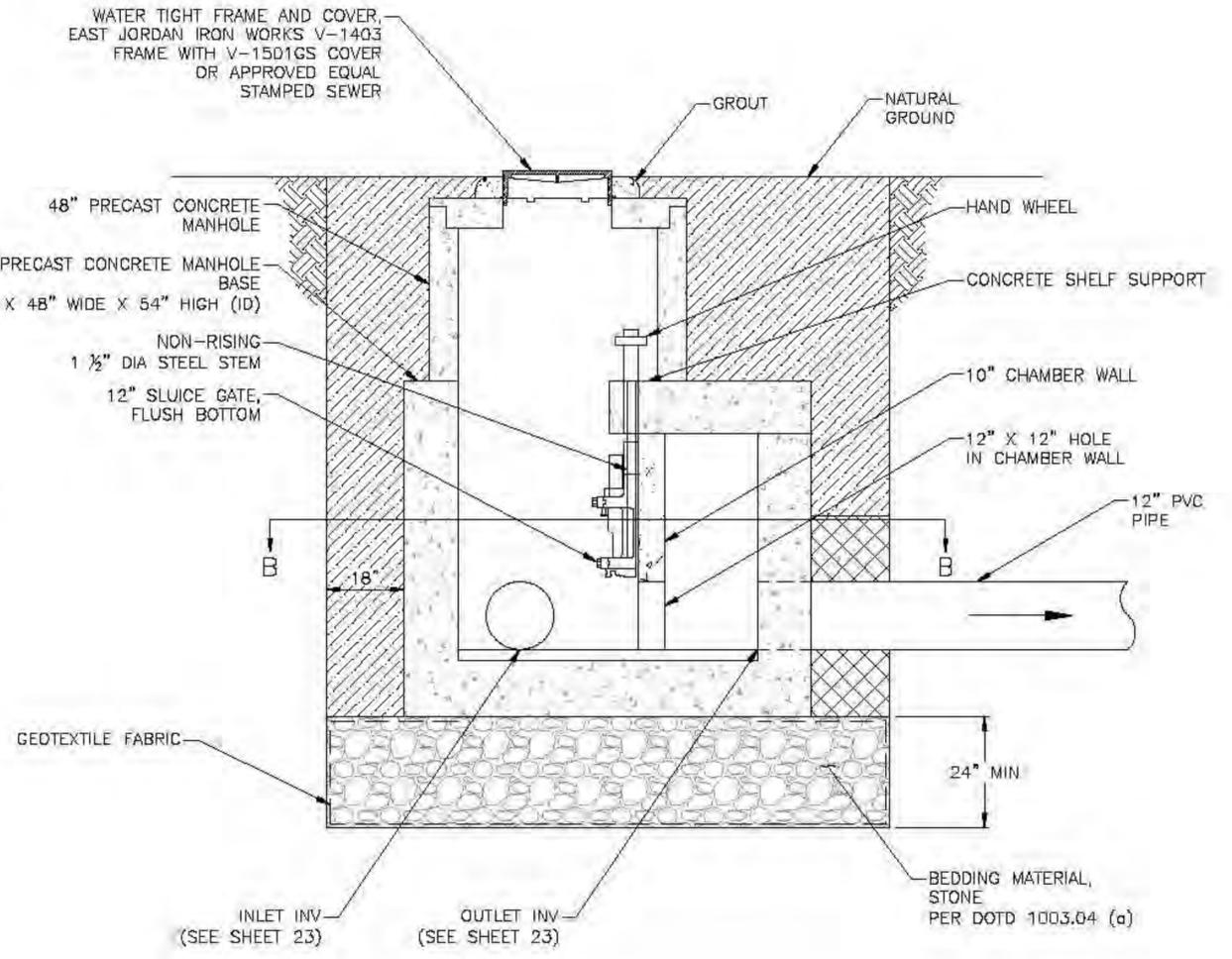
TYPICAL GRAVITY SEWER MANHOLE
NTS



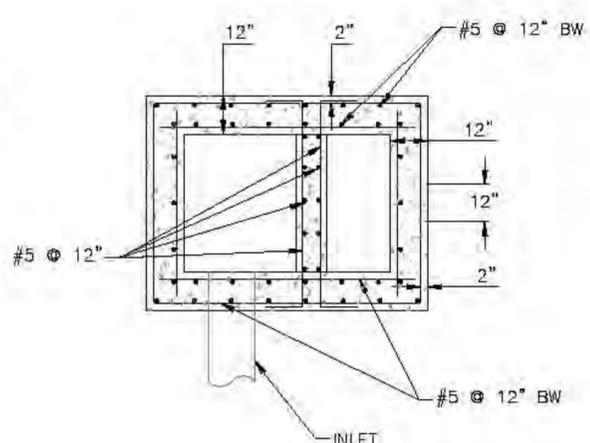
SECTION A-A
NTS



SECTION B-B
NTS



TYPICAL SLUICE GATE SEWER MANHOLE
NTS

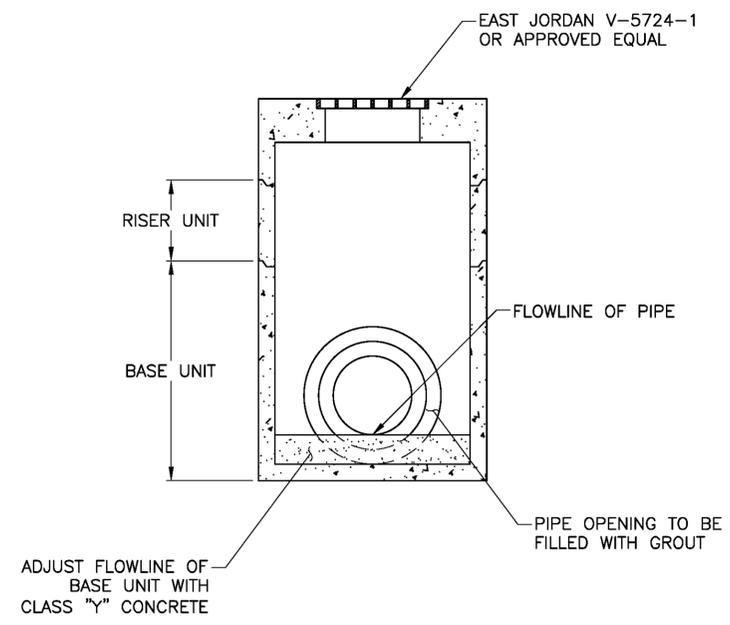


SECTION B-B REINFORCEMENT
NTS

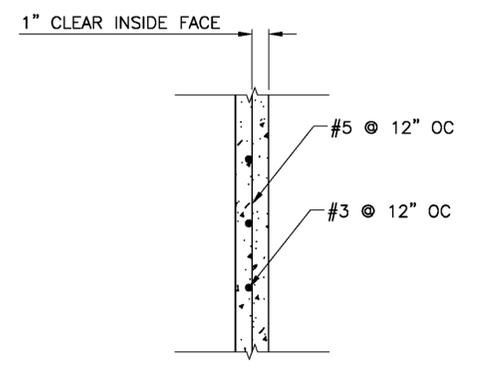
- NOTES:**
1. THE BENCH SHALL SLOPE TOWARD THE INVERT CHANNEL AT THE RATE OF (1.5"/FT), BUT MINIMUM OF 3" DIFFERENCE SHALL BE MAINTAINED FROM THE TOP OF THE CHANNEL TO THE WALL.
 2. THE DEPTH OF THE INVERT CHANNEL SHALL BE EQUAL TO HALF THE DIAMETER OF THE LARGEST DIAMETER SEWER PIPE IN THE MANHOLE.
 3. MANHOLE SECTIONS SHALL BE JOINED TOGETHER WITH FLEXIBLE WATERTIGHT RUBBER GASKETS AND EXTERNALLY SEALED AT THE JOINTS IN ACCORDANCE WITH THE SPECIFICATIONS.
 4. BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. SEE SPECIFICATIONS FOR MATERIAL REQUIREMENTS AND PLACEMENT AND COMPACTION OF PIPE BEDDING MATERIALS.
 5. PIPE PENETRATIONS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
 6. REINFORCING FOR PRE-CAST MANHOLES AS PER ASTM C478.
 7. SLUICE GATE TO BE INSTALLED AT DOWNSTREAM END OF PMH4 AND UPSTREAM END OF PMH5.

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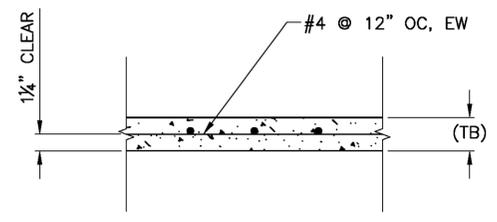
VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA		DESIGNED BY: B.K.R.	CHECKED BY: P.S.	DATE APPROVAL
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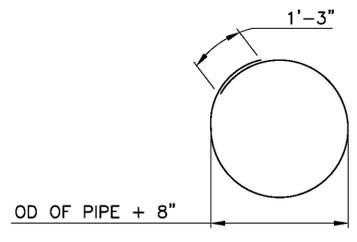
TYPICAL 4 X 4 PRECAST DRAINAGE UNIT
NTS



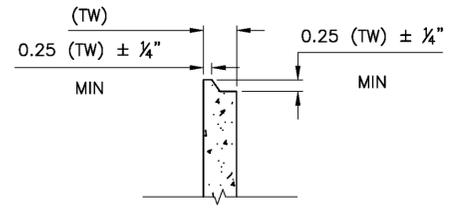
STANDARD PRECAST WALL DETAIL
NTS



BOTTOM SLAB DETAIL
NTS



#4 HOOP
NTS



JOINT DETAIL
NTS

NOTES:

1. ALL REINFORCING STEEL TO BE DEFORMED GRADE 60 MINIMUM REBAR. STEEL BAR SIZE AND SPACING MAY BE ADJUSTED AS LONG AS AREA OF STEEL IS MAINTAINED PER FOOT IN ACCORDANCE WITH ASTM C913-08.
2. MINIMUM CONCRETE COVER FOR REBAR STEEL IS TO BE 1" FOR PRECAST CONCRETE WALL AND 1-1/4" FOR OTHER PRECAST MEMBERS.
3. CONCRETE COMPRESSIVE STRENGTH FOR PRECAST STRUCTURES TO BE 5000 PSI AT 28 DAYS MINIMUM. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI BEFORE SHIPPING UNITS.
4. PIPE OPENING TO BE FORMED ONLY WHEN REQUIRED.
5. PIPE OPENING TO BE OUTSIDE DIAMETER OF PIPE + 4" ± 1/2".
6. ALL PIPE ENDS TO BE SET FLUSH WITH INTERIOR WALL FACE. PIPE ANNULAR SPACE IS TO BE GROUTED WITH NON-SHRINK GROUT AFTER INSTALLATION. GROUT AS REQUIRED TO CREATE INVERTS.
7. JOINT BETWEEN PRECAST UNITS TO BE SEALED WITH FLEXIBLE PLASTIC GASKET MATERIAL AND WRAPPED WITH A 12" WIDTH OF GEOTEXTILE FABRIC.
8. PRECAST CONCRETE INLETS CONFORMING TO STANDARD PLANS MAY BE FURNISHED. LEDGE WIDTH MAY BE REDUCED BY 1" AROUND INLET FRAMES TO 2- 1/2".
9. PRECAST UNITS SHALL CONFORM TO THE SPECIFICATIONS.
10. ALL PRECAST UNITS TO BE EQUIPPED WITH AT LEAST 2 COMMERCIALY MANUFACTURED EMBEDDED INSERTS RATED FOR THE STRUCTURE'S LIFT LOAD IN COMPLIANCE WITH APPLICABLE ANSI AND OSHA STANDARDS (MINIMUM SAFETY FACTOR OF 4). EMBEDDED INSERT TO BE CONSTRUCTED OF GALVANIZED STEEL OR CORROSION RESISTANT MATERIALS AND INSTALLED BY PRECAST MANUFACTURER IN ACCORDANCE WITH SUPPLIER'S INSTRUCTIONS. NO LIFT INSERTS SHALL REMAIN EXPOSED ON VISIBLE SURFACE AFTER THE STRUCTURE IS INSTALLED. NO LIFTING WITH CHAINS AROUND THE STRUCTURE IS PERMITTED.
11. PRECASTERS ARE REQUIRED TO BE NPCA CERTIFIED.
12. INSTALLATION OF PRECAST STRUCTURES ARE TO BE PER THE MANUFACTURER'S INSTRUCTIONS. ANY MODIFICATIONS TO STRUCTURES IN FIELD SHALL REQUIRE PRECASTER'S WRITTEN APPROVAL.

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
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PRECAST DRAINAGE STRUCTURE

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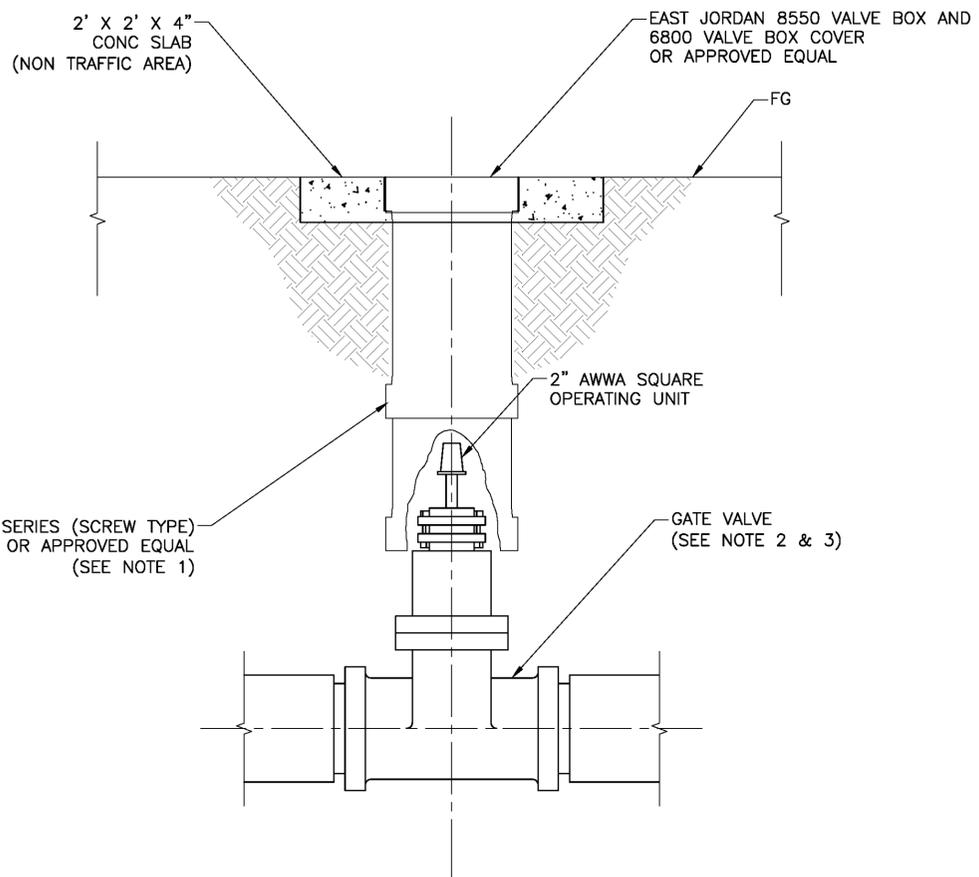
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SHEET 31

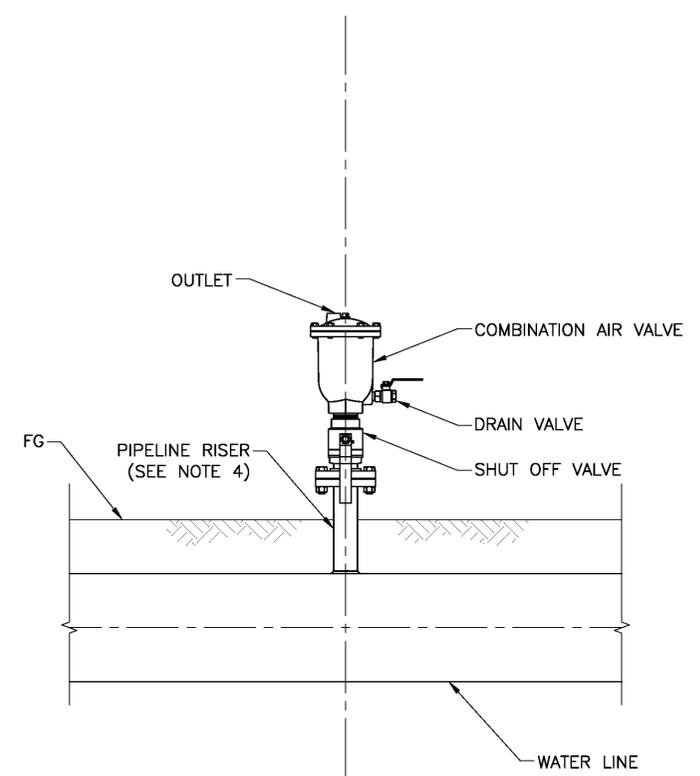
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TYPICAL VALVE AND VALVE BOX
NTS



TYPICAL COMBINATION AIR VALVE
NTS

- NOTES:**
1. CONTRACTOR SHALL PROVIDE A VALVE OPERATING EXTENSION STEM WITH 2 INCH OPERATING NUT TO BRING THE OPERATING NUT TO A POINT 6 INCHES BELOW THE SURFACE OF THE BOX COVER. EXTENSION STEM SHALL BE PINNED TO THE OPERATING NUT.
 2. GATE VALVES SHALL BE THE SAME SIZE AS THE ADJACENT PIPING UNLESS NOTED OTHERWISE.
 3. VALVE ENDS SHALL SUIT ADJACENT PIPING.
 4. PIPELINE RISER SHALL PROVIDE THE APPROPRIATE HEIGHT FOR PROPER OPERATION OF THE VALVE.
 5. VALVE COVERS SHALL BE STAMPED WITH THE APPROPRIATE UTILITY TYPE IN RAISED LETTERS.
 6. CONTRACTOR SHALL CORRDINATE WITH UTILITY FOR LOCATION OF GATE VALVE.

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SHEET
32

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD
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LAKE BORGNE BASIN LEVEL DISTRICT

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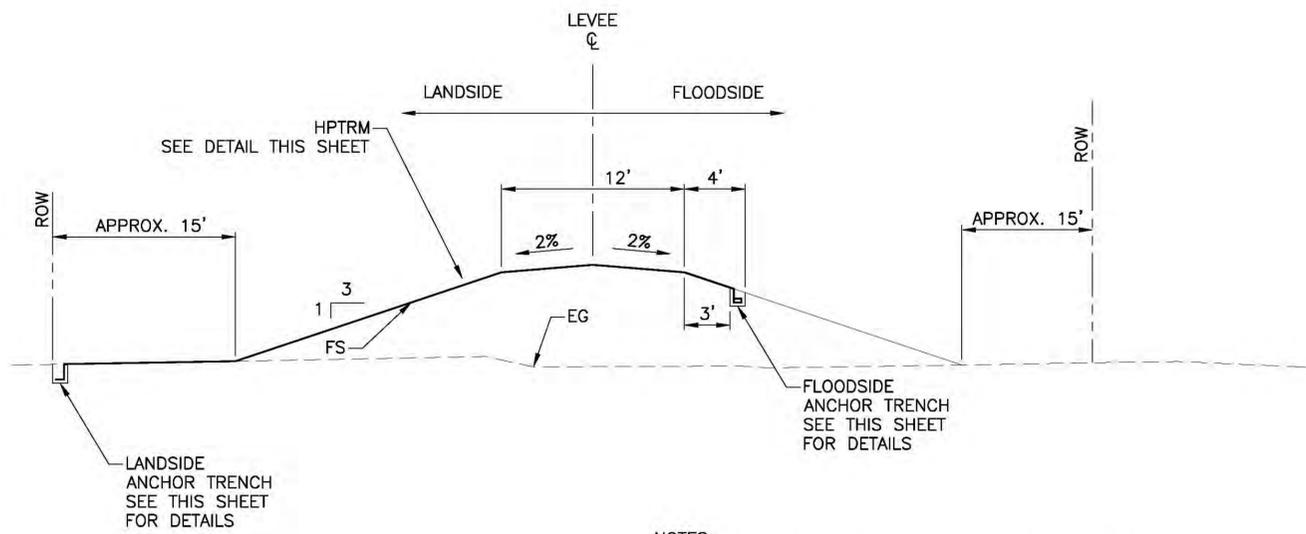
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STANDARD VALVE DETAILS

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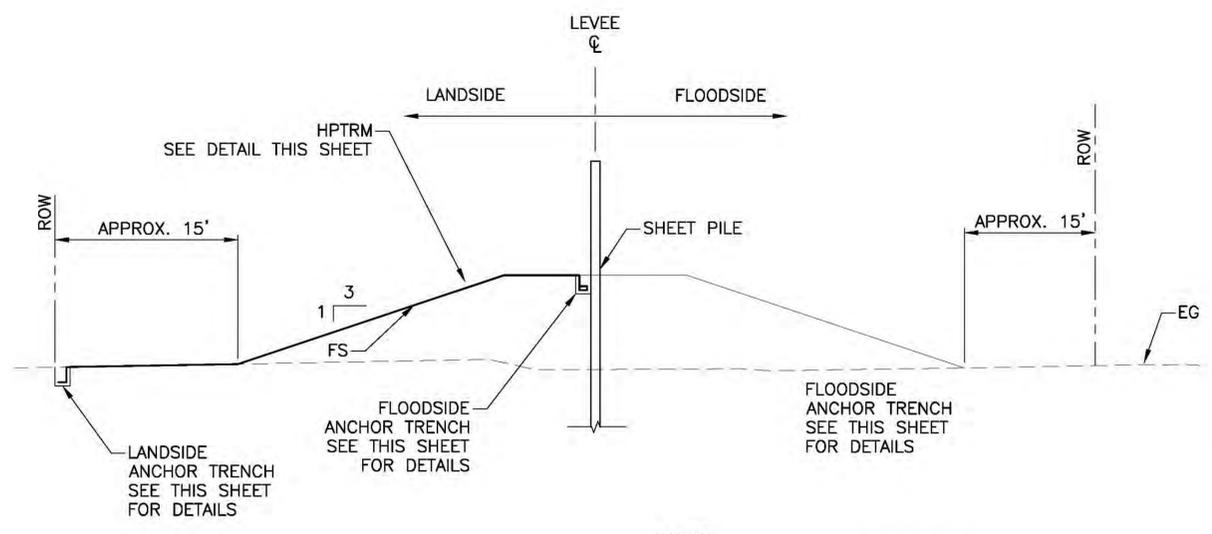
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DESIGNED BY:
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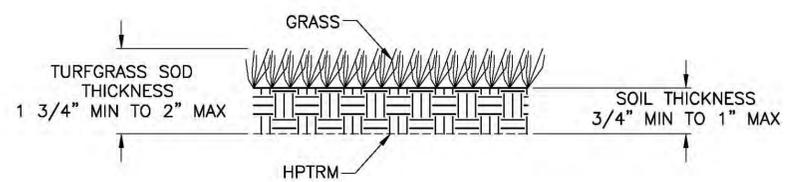
- NOTES:**
1. PERCUSSION DRIVEN EARTH ANCHORS (PDEA) AND PINS OMITTED FOR CLARITY. REFER TO SPECIFICATIONS FOR PLACEMENT REQUIREMENTS OF PDEAS AND ANCHORS.
 2. REFER TO SPECIFICATIONS FOR HPTRM, PDEA, PIN AND TURFGRASS SOD REQUIREMENTS.
 3. SEE "TYPICAL LEVEE SECTION" ON SHEET 14 FOR DIMENSIONS OF EXISTING LEVEE WITHIN PROJECT LIMITS.
 4. THERE SHALL BE NO DEGRADING OF LEVEE SECTION.

HPTRM TYPICAL LEVEE SECTION
NTS

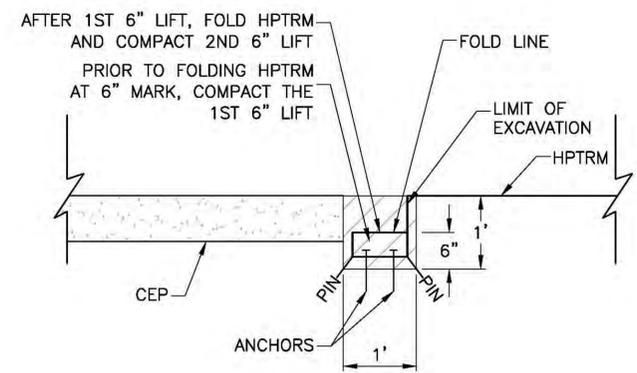


- NOTES:**
1. PDEA ANCHORS AND PINS OMITTED FOR CLARITY. REFER TO SPECIFICATIONS FOR PLACEMENT REQUIREMENTS OF PDEAS AND ANCHORS.
 2. REFER TO SPECIFICATIONS FOR HPTRM, PDEA, PIN AND TURFGRASS SOD REQUIREMENTS.
 3. SEE "TYPICAL LEVEE SECTION" ON SHEET 14 FOR DIMENSIONS OF EXISTING LEVEE WITHIN PROJECT LIMITS.
 4. THERE SHALL BE NO DEGRADING OF LEVEE SECTION.

HPTRM TYPICAL SHEET PILE WALL SECTION
NTS

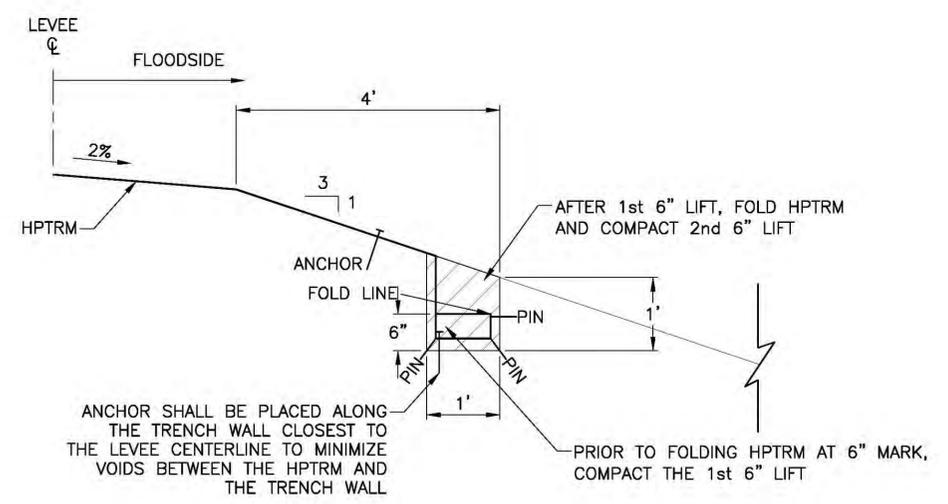


TURFGRASS SOD THICKNESS
NTS



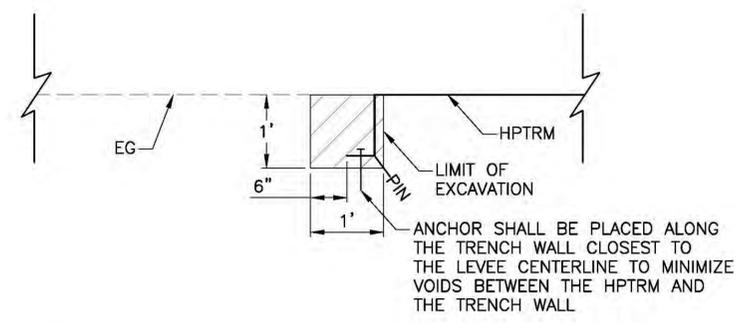
- NOTES:**
1. BACKFILL ANCHOR TRENCH WITH COMPACTED CLAY TO MATCH EXISTING GRADE.
 2. TURFING NOT SHOWN.
 3. REFER TO SPECIFICATIONS FOR PLACEMENT AND REQUIREMENTS OF PDEAS AND PINS.

TYPICAL HPTRM TIE TO CONCRETE EROSION PAD
NTS



- NOTES:**
1. BACKFILL ANCHOR TRENCH WITH COMPACTED CLAY TO MATCH EXISTING GRADE.
 2. TURFING NOT SHOWN.
 3. REFER TO SPECIFICATIONS FOR PLACEMENT AND REQUIREMENTS OF PDEAS AND PINS.

TYPICAL FLOODSIDE ANCHOR TRENCH
NTS



- NOTES:**
1. BACKFILL ANCHOR TRENCH WITH COMPACTED CLAY TO MATCH EXISTING GRADE.
 2. TURFING NOT SHOWN.
 3. REFER TO SPECIFICATIONS FOR PLACEMENT AND REQUIREMENTS OF PDEAS AND PINS.

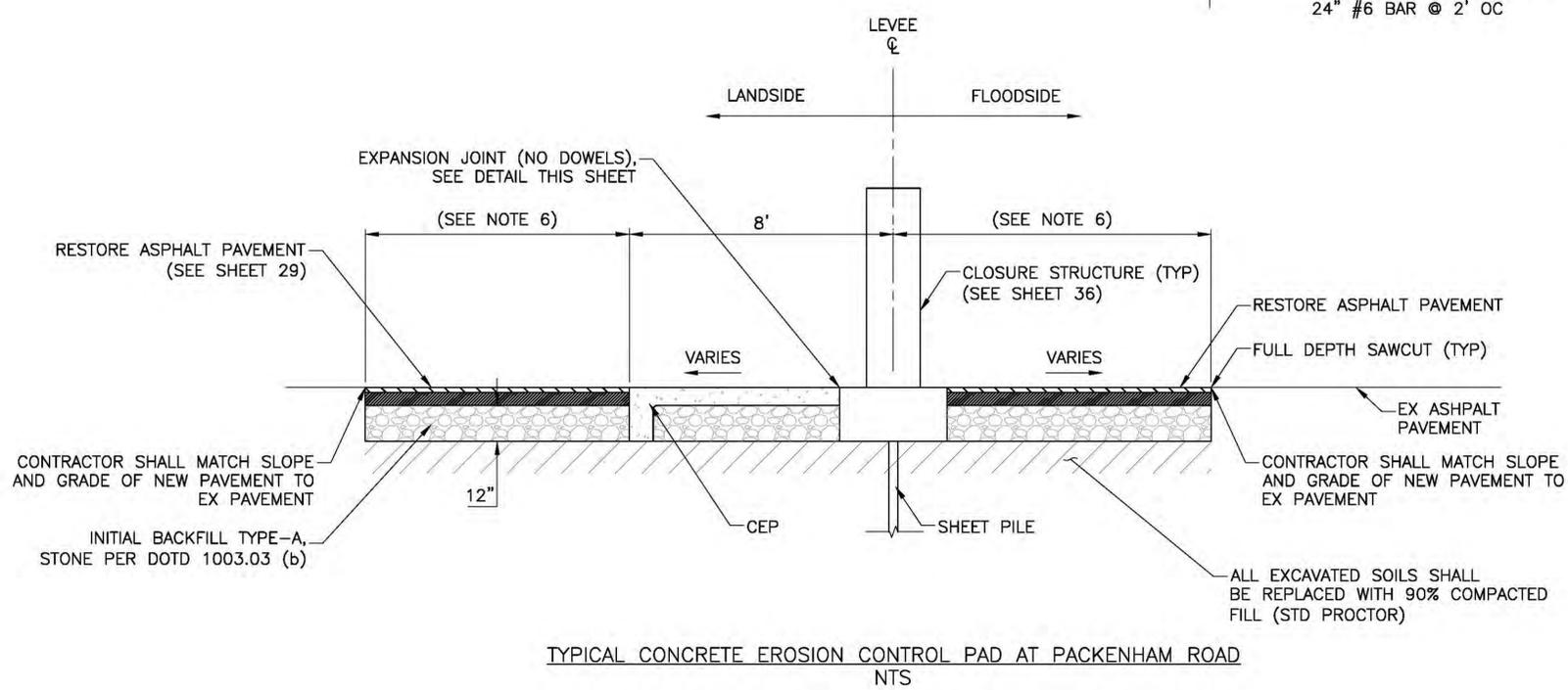
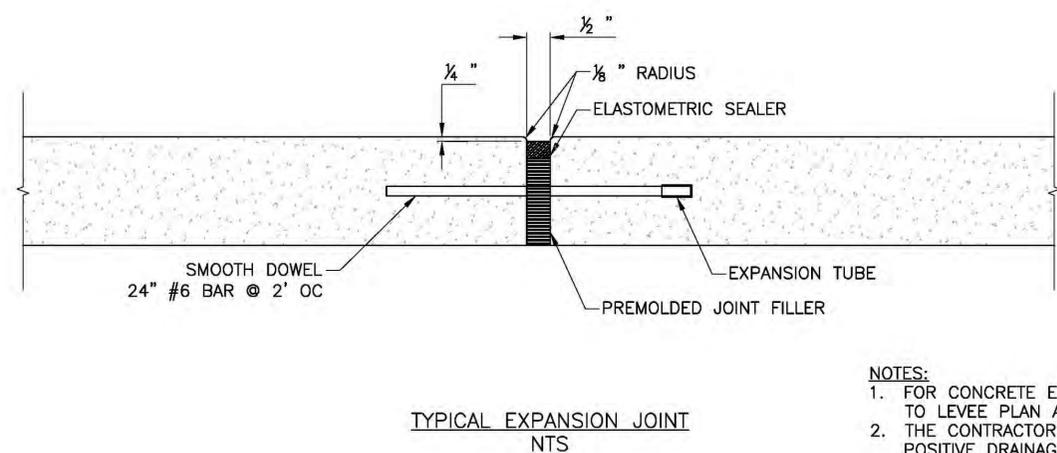
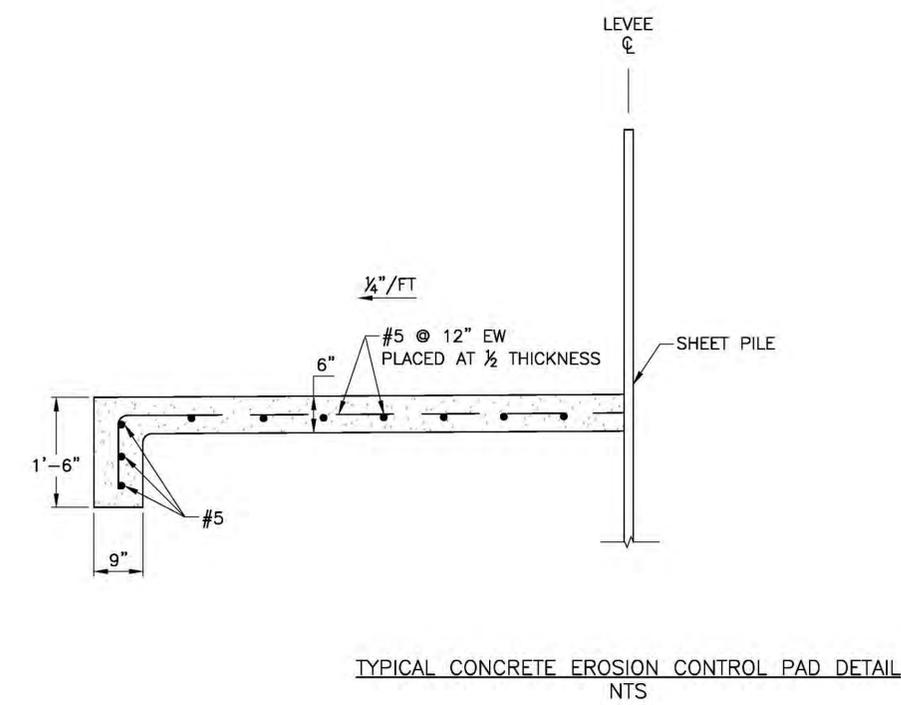
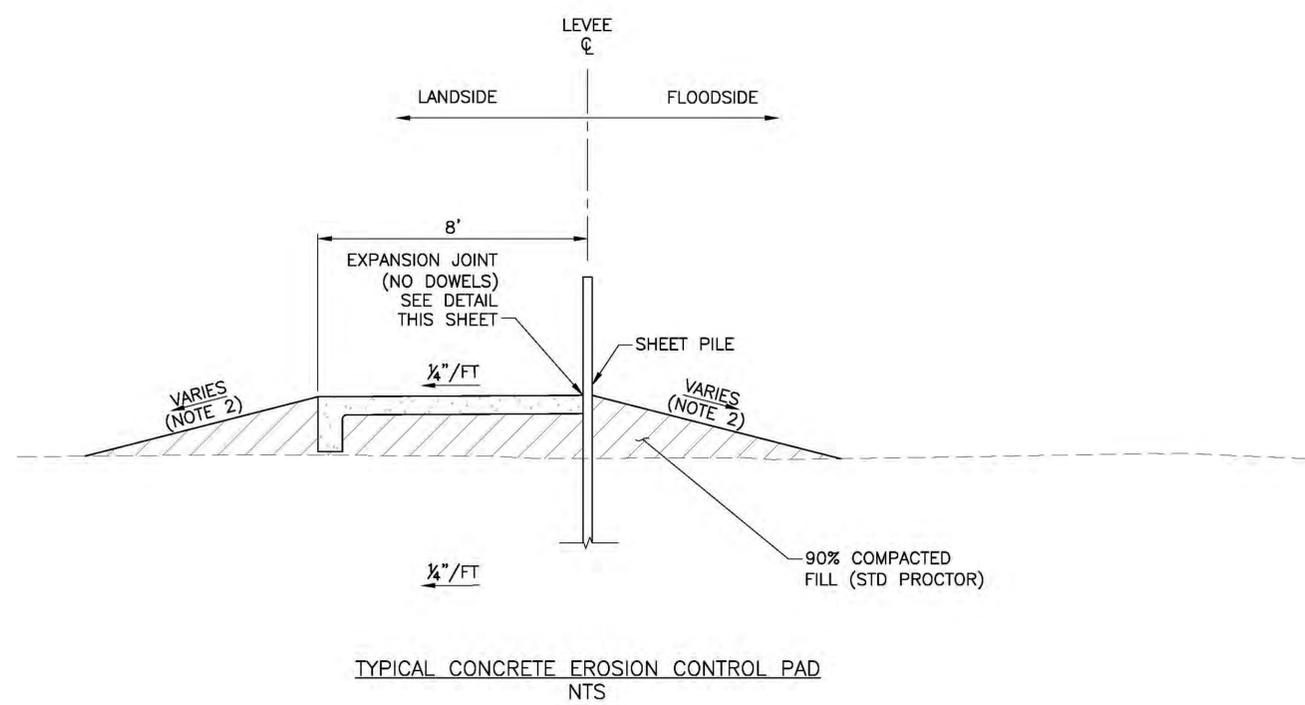
TYPICAL LANDSIDE ANCHOR TRENCH
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VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA		SYMBOL	REVISIONS	DATE	APPROVAL
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- NOTES:**
1. FOR CONCRETE EROSION PAD ELEVATIONS REFER TO LEVEE PLAN AND PROFILE SHEETS.
 2. THE CONTRACTOR SHALL GRADE TO ALLOW FOR POSITIVE DRAINAGE AWAY FROM THE SHEET PILE WALL.
 3. REFER TO SPECIFICATIONS FOR BEDDING MATERIAL REQUIREMENTS.
 4. CONTRACTION JOINTS SHALL BE SPACED 10 FT ON CENTER LONGITUDINAL AND LATERAL FOR ALL CONCRETE SLABS.
 5. TRANSVERSE EXPANSION JOINTS AT 30 FT SPACING COINCIDENT WITH SHEET PILE INTERLOCK OR WALL EXPANSION JOINT.
 6. CONTRACTOR SHALL REMOVE PAVEMENT NECESSARY TO CONSTRUCT THE REQUIRED LEVEE IMPROVEMENTS AND TIE THE NEW PAVEMENT TO THE EXISTING PAVEMENT.

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SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
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 VIOLET, SAINT BERNARD PARISH, LA
 CONCRETE EROSION PAD
 DETAILS

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT
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 Baton Rouge, LA 70802
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 34

GENERAL STRUCTURAL NOTES (FOR CLOSURE STRUCTURES)

A. GENERAL REFERENCES

DESIGN GUIDELINES, DESIGN BASIS, ENGINEERING MANUALS, DESIGN CODES, AND SPECIFICATIONS

- HURRICANE AND STORM DAMAGE RISK REDUCTION SYSTEM DESIGN GUIDELINES (HSDRRS), OCTOBER 2007; AND CHAPTER 5, MARCH 2012.
- DESIGN APPROACH: ALLOWABLE STRESS FOR SERVICEABILITY AND STRENGTH METHOD FOR STRENGTH.
- EM 1110-2-2104 STRENGTH DESIGN FOR REINFORCED-CONCRETE HYDRAULIC STRUCTURES, AUGUST 2003.
- EM 1110-2-2105 DESIGN OF HYDRAULIC STEEL STRUCTURES MAY 1994.
- EM 1110-2-2906 DESIGN OF PILE FOUNDATIONS, JANUARY 1991.
- BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-11) AND COMMENTARY, UNLESS OTHERWISE NOTED.
- AISC MANUAL OF STEEL CONSTRUCTION ASD, 9TH EDITION.
- MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-10.

B. DESIGN LOADS

- MATERIAL UNIT WEIGHTS:

WATER	64 LB/FT ³
REINFORCED CONCRETE UNIT WEIGHT	150 LB/FT ³
STRUCTURAL STEEL	490 LB/FT ³
- TRAFFIC LOADS: HL 93
- HYDROSTATIC LOAD COMBINATIONS ARE PER THE BELOW TABLE.

LOAD COMBINATION	HYDROSTATIC LOAD FUTURE CONDITIONS	
	WATER EL FLOODSIDE (FT)	WATER EL PROTECTED SIDE (FT)
STILL WATER LEVEL (SWL)	4.00	0.00
REVERSE HEAD	N/A	N/A
TOP OF STRUCTURE	7.50	0.00

- WAVE LOAD: 3'-0" HIGH ABOVE STILL WATER LEVEL
- WIND PRESSURE: (MINIMUM 50 PSF)

BASIC WIND SPEED, 3-SEC GUST	140 MPH
IMPORTANCE FACTOR	1.15
- IMPACT 500 PLF DEBRIS LOAD

C. REINFORCED CONCRETE

- MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (90 DAYS IF POZZOLAN OR GGBF SLAG IS USED) $f_c=4000$ PSI
- ALL REINFORCING STEEL BARS SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED BARS.
- IN BASE SLAB, NO REINFORCING BAR SPLICES SHALL BE ALLOWED.
- SUBMIT SHOP DRAWINGS FOR APPROVAL 30 DAYS PRIOR TO FABRICATION. SEE SPECIFICATIONS.
- MAXIMUM AGGREGATE SIZE (MAS) 1 TO 3/4 INCH.
- CONSTRUCTION JOINTS SHALL NOT BE ALLOWED, UNLESS INDICATED OTHERWISE.
- NONSHRINK GROUT SHALL CONFORM TO ASTM C1107/C1107M AND SHALL BE A COMMERCIAL FORMULATION SUITABLE FOR THE APPLICATION PROPOSED.
- REINFORCING PLACEMENT TOLERANCES SHALL BE IN ACCORDANCE WITH ACI 117.
- CHAMFERS SHALL BE 3/4" UNLESS NOTED OTHERWISE.
- PROVIDE 3" CLEAR COVER UNLESS NOTED OTHERWISE.

D. PRECAST/PRESTRESSED CONCRETE PILES

- ALL PRESTRESSING STEEL STRANDS SHALL BE 1/2" ϕ LOW-RELAXATION SEVEN WIRE STRANDS HAVING ULTIMATE STRENGTH OF 270 KSI, ASTM A416, GRADE 270.
- MINIMUM COMPRESSIVE STRENGTH:

AT PRESTRESSING TRANSFER	$f_{ci} = 4.0$ KSI
AT 28 DAYS, SHIPPING AND INSTALLATION	$f_c = 6.0$ KSI
- ALLOWABLE STRESSES:

PRESTRESSING STEEL	
JACKING STRANDS	$0.75 f_{pu} = 202.5$ KSI
CONCRETE:	
IMMEDIATELY AFTER PRESTRESS TRANSFER	
EXTREME FIBER STRESS IN COMPRESSION	$0.60 f_{ci} = 2.70$ KSI
EXTREME FIBER STRESS IN TENSION	0.00 KSI
IN SERVICE (AFTER ALL PRESTRESS LOSSES BUT WITH NO OVERSTRESS FACTOR)	
EXTREME FIBER STRESS IN COMPRESSION	$0.45 f_c = 2.70$ KSI
EXTREME FIBER STRESS IN TENSION	0.00 KSI
- REINFORCING SPIRAL WIRE SHALL BE W4 (0.422" ϕ) AND SHALL CONFORM TO ASTM A82. REINFORCING STEEL FOR TENSION PILE ANCHORAGES SHALL BE ASTM A615, GRADE 60, DEFORMED BARS.
- SEE DRAWINGS FOR ADDITIONAL NOTES.

E. FORMWORK FOR CONCRETE

- THE WORK COVERED BY THESE NOTES CONSISTS OF FURNISHING ALL MATERIALS AND EQUIPMENT AND PERFORMING ALL LABOR FOR THE FORMING OF CONCRETE IN THE STRUCTURES.
- THE PUBLICATION THAT FOLLOWS FORMS A PART OF THIS REQUIREMENT TO THE EXTENT REFERENCED: ACI 347 (2004) GUIDE TO FORMWORK FOR CONCRETE.
- THE DESIGN, ENGINEERING, AND CONSTRUCTION OF THE FORMWORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF LOUISIANA. ALL DESIGN DATA SHALL BE CHECKED AND DOCUMENTED AS SUCH, PRIOR TO SUBMITTAL. THE FORMWORK SHALL BE DESIGNED FOR ANTICIPATED LIVE, DEAD LOADS AND DOWN DRAG LOADS AND SHALL COMPLY WITH THE TOLERANCES SPECIFIED IN SPECIFICATION SECTION 03 31 00.00 12, CAST-IN-PLACE STRUCTURAL CONCRETE PARAGRAPH, "CONSTRUCTION TOLERANCES". THE FORMWORK SHALL BE DESIGNED AS A COMPLETE SYSTEM WITH CONSIDERATION GIVEN TO THE EFFECTS OF CEMENTITIOUS MATERIALS AND MIXTURE ADDITIVES SUCH AS FLY ASH, CEMENT TYPE, PLASTICIZERS, ACCELERATORS, RETARDERS, AIR ENTRAINMENT AND OTHERS.
- SUBMITTALS: SHOP DRAWINGS AND DESIGN COMPUTATIONS FOR ALL FORMWORK REQUIRED SHALL BE SUBMITTED AT LEAST 30 DAYS, PRIOR TO FABRICATION ON SITE OR BEFORE DELIVERY OF PREFABRICATED FORMS.
- FORMS, EMBEDDED ITEMS, TIES AND OTHER ACCESSORIES, AS SPECIFIED IN SPECIFICATION SECTION 03 31 00.00 12 CAST-IN-PLACE STRUCTURAL CONCRETE SHALL BE INSPECTED IN SUFFICIENT TIME PRIOR TO EACH CONCRETE PLACEMENT BY THE CONTRACTOR IN ORDER TO CERTIFY TO THE OWNER THAT THEY ARE READY TO RECEIVE CONCRETE. INSPECTION OF FORMS FOR CONCRETE SHALL INCLUDE A DETAILED EVALUATION OF LEAKAGE CONTROL MEASURES, TYPE AND APPLICATION OF RELEASE AGENT, AND FORM CLEANLINESS TO AVOID DIRT TRANSFER TO THE CONCRETE.
 - THE RESULTS OF EACH INSPECTION SHALL BE REPORTED IN WRITING, WITH THE FINDINGS AND FINAL DISPOSITION TO THE OWNER. THE ORIGINAL AND TWO COPIES OF THESE REPORTS, AS WELL AS CORRECTIVE ACTION TAKEN, SHALL BE FURNISHED TO THE OWNER.
- FORMS SHALL BE FABRICATED WITH FACING MATERIALS THAT WILL PRODUCE A FINISH MEETING THE SPECIFIED CONSTRUCTION TOLERANCE REQUIREMENTS AND THE SURFACE CLASSIFICATIONS AS DEFINED IN ACI 347.
 - FORM COATING SHALL BE COMMERCIAL FORMULATION THAT WILL NOT BOND WITH, STAIN, CAUSE DETERIORATION, OR ANY OTHER DAMAGE TO CONCRETE SURFACES. THE COATING SHALL NOT IMPAIR SUBSEQUENT TREATMENT OF CONCRETE SURFACES DEPENDING UPON BOND OR ADHESION NOR IMPEDE THE WETTING OF SURFACES TO BE CURED WITH WATER OR CURING COMPOUNDS.

- FORMS SHALL BE CONSTRUCTED TRUE TO THE STRUCTURAL DESIGN AND REQUIRED ALIGNMENT. THE FORM SURFACE AND JOINTS SHALL BE MORTAR TIGHT AND SUPPORTED TO ACHIEVE SAFE PERFORMANCE DURING CONSTRUCTION, CONCRETE PLACEMENT, AND FORM REMOVAL.
 - FORMS FOR EXPOSED OR PAINTED SURFACES SHALL BE COATED WITH FORM OIL OR A FORM-RELEASE AGENT BEFORE THE FORM OR REINFORCEMENT IS PLACED IN FINAL POSITION. THE USE OF WASTE OIL OR USED OIL AS A FORM-RELEASE AGENT OR FORM OIL IS PROHIBITED.
 - FORMWORK FOR WALLS, COLUMNS, SIDES OF BEAMS, GRAVITY STRUCTURES, AND OTHER VERTICAL TYPE FORMWORK NOT SUPPORTING THE WEIGHT OF CONCRETE SHALL NOT BE REMOVED IN LESS THAN 24 HOURS AFTER CONCRETE PLACEMENT IS COMPLETED AND EVIDENCE FROM COMPRESSIVE TESTS ON FIELD-CURED CONCRETE CONTROL CYLINDERS INDICATES THAT THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF AT LEAST 2,500 PSI.
- FORMS AND EMBEDDED ITEMS SHALL BE INSPECTED IN SUFFICIENT TIME PRIOR TO EACH CONCRETE PLACEMENT BY THE CONTRACTOR IN ORDER TO CERTIFY TO THE OWNER THAT THEY ARE READY TO RECEIVE CONCRETE. THE RESULTS OF EACH INSPECTION SHALL BE REPORTED IN WRITING. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY AFTER THE FORMS ARE REMOVED SO THAT AN ON-SITE INSPECTION OF THE CONCRETE WORK CAN BE MADE. NO PATCHING OR REPAIR SHALL BE PERMITTED UNTIL AFTER THE INSPECTION IS MADE. CUTTING OPERATIONS SHALL NOT BE ALTERED. RECOMMENDATIONS AS A RESULT OF THE INSPECTION SHALL BE MADE PART OF THE CONTRACTOR'S QUALITY CONTROL FOR ALL FUTURE CONCRETE WORK.

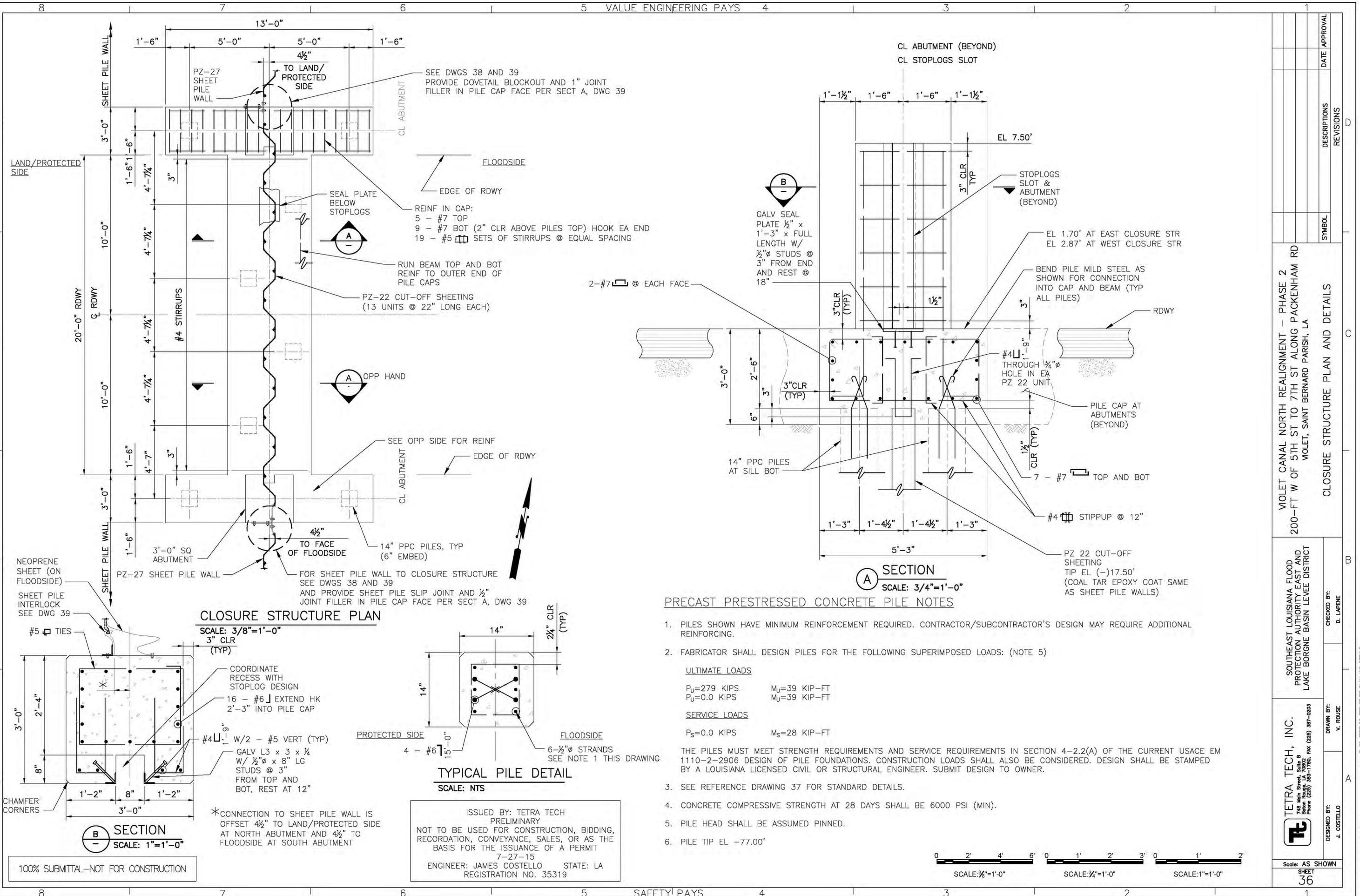
F. STOPLOGS - SEE SPECIFICATIONS.

- SUBMIT SHOP DRAWINGS FOR APPROVAL 30 DAYS PRIOR TO FABRICATION. SEE SPECIFICATIONS.

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 7-27-15
 ENGINEER: JAMES COSTELLO STATE: LA
 REGISTRATION NO. 35319

DATE	APPROVAL	REVISIONS	SYMBOL	STRUCTURAL NOTES
DESCRIPTIONS	DATE			
VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA				
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT CHECKED BY: D. LAPENE				
TETRA TECH, INC. 748 Main Street, Suite B Baton Rouge, LA 70802 Phone (225) 383-1786, FAX (225) 387-0203 DRAWN BY: V. ROUSE				
DESIGNED BY: J. COSTELLO				
Scale: AS SHOWN SHEET 35				



CLOSURE STRUCTURE PLAN

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

SECTION A

SCALE: 3/4"=1'-0"

TYPICAL PILE DETAIL

SCALE: NTS

PRECAST PRESTRESSED CONCRETE PILE NOTES

1. PILES SHOWN HAVE MINIMUM REINFORCEMENT REQUIRED. CONTRACTOR/SUBCONTRACTOR'S DESIGN MAY REQUIRE ADDITIONAL REINFORCING.
2. FABRICATOR SHALL DESIGN PILES FOR THE FOLLOWING SUPERIMPOSED LOADS: (NOTE 5)

ULTIMATE LOADS

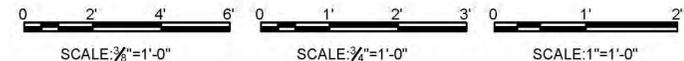
$P_U = 279$ KIPS $M_U = 39$ KIP-FT
 $P_U = 0.0$ KIPS $M_U = 39$ KIP-FT

SERVICE LOADS

$P_S = 0.0$ KIPS $M_S = 28$ KIP-FT

THE PILES MUST MEET STRENGTH REQUIREMENTS AND SERVICE REQUIREMENTS IN SECTION 4-2.2(A) OF THE CURRENT USACE EM 1110-2-2906 DESIGN OF PILE FOUNDATIONS. CONSTRUCTION LOADS SHALL ALSO BE CONSIDERED. DESIGN SHALL BE STAMPED BY A LOUISIANA LICENSED CIVIL OR STRUCTURAL ENGINEER. SUBMIT DESIGN TO OWNER.

3. SEE REFERENCE DRAWING 37 FOR STANDARD DETAILS.
4. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS SHALL BE 6000 PSI (MIN).
5. PILE HEAD SHALL BE ASSUMED PINNED.
6. PILE TIP EL -77.00'



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VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEL DISTRICT

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 Baton Rouge, LA 70802
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36

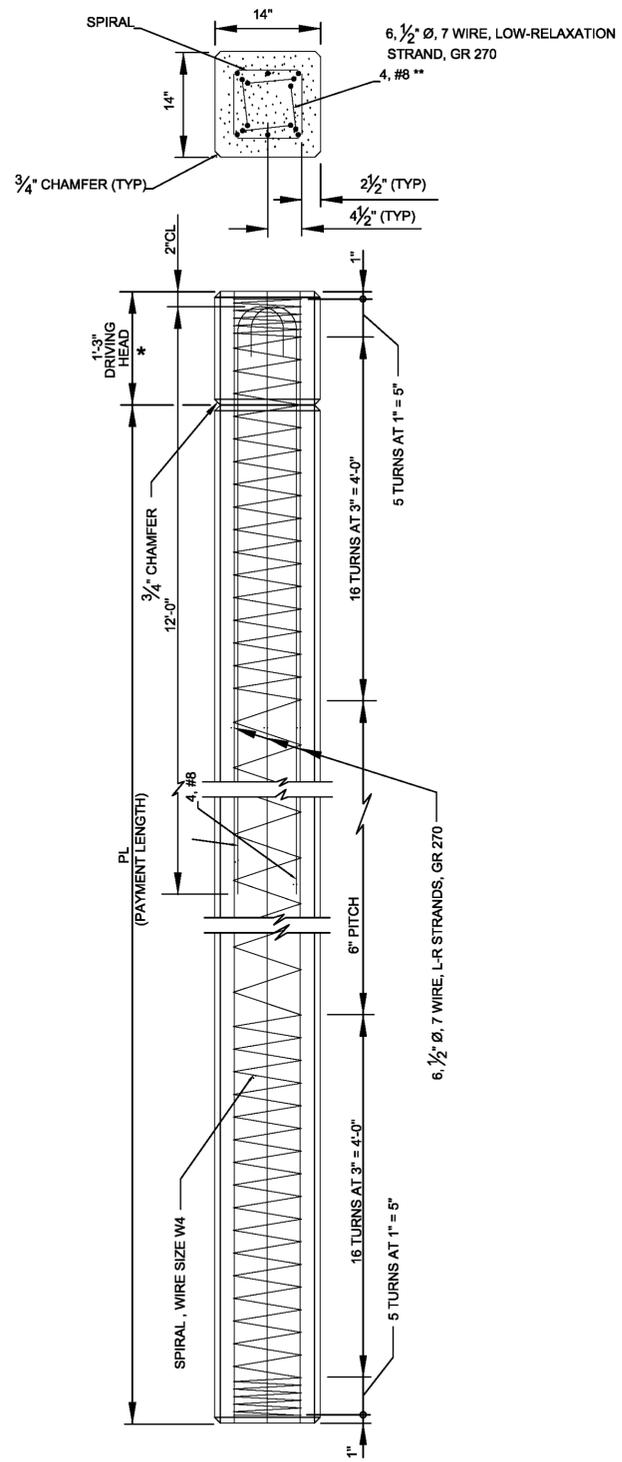
REVISIONS	SYMBOL	DESCRIPTIONS	DATE	APPROVAL

CLOSURE STRUCTURE PLAN AND DETAILS

CHECKED BY:
D. LAFRENE

DRAWN BY:
V. ROUSE

DESIGNED BY:
J. COSTELLO



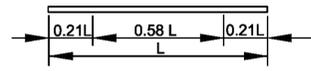
NOTE:
GRIND PRESTRESSED STRANDS FLUSH
WITH PILE HEAD AND PILE TIP.

**14" X 14"
PRESTRESSED PRECAST
CONCRETE PILE**

NTS

- * DRIVING HEAD CONCRETE, STRANDS AND SPIRALS TIES TO BE REMOVED AFTER DRIVING TO EXPOSE HOOKS. (NO PAYMENT)**
- ** STANDARD 180° HOOK ON REINFORCING FOR ALL PILES. TO ALLOW FOR PROPER PLACEMENT OF CONCRETE, HOOKS SHOULD BE PLACED SO THAT BEND OF HOOK IS APPROXIMATELY PARALLEL TO ADJACENT FACE OF PILE AS SHOWN.**

- NOTES**
1. DETAILS SHOWN ON THIS DRAWING ARE TAKEN FROM HSDRRS TYPICAL DRAWINGS AND DETAILS. CONTRACTOR TO ADAPT AS REQUIRED AND SUBMIT SHOP DRAWINGS FOR APPROVAL.
 2. ONLY 5,000 OR 6,000 PSI CONCRETE SHALL BE USED FOR PRESTRESSED CONCRETE PILES.
 3. PICKUP POINTS TO BE PLAINLY MARKED ON PILES.
 4. PICKUP POINTS SHOWN FOR 5,000 PSI CONCRETE ONLY.



2 POINT PICKUP (L < 84') 14" X 14" PILE

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SHEET
37

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

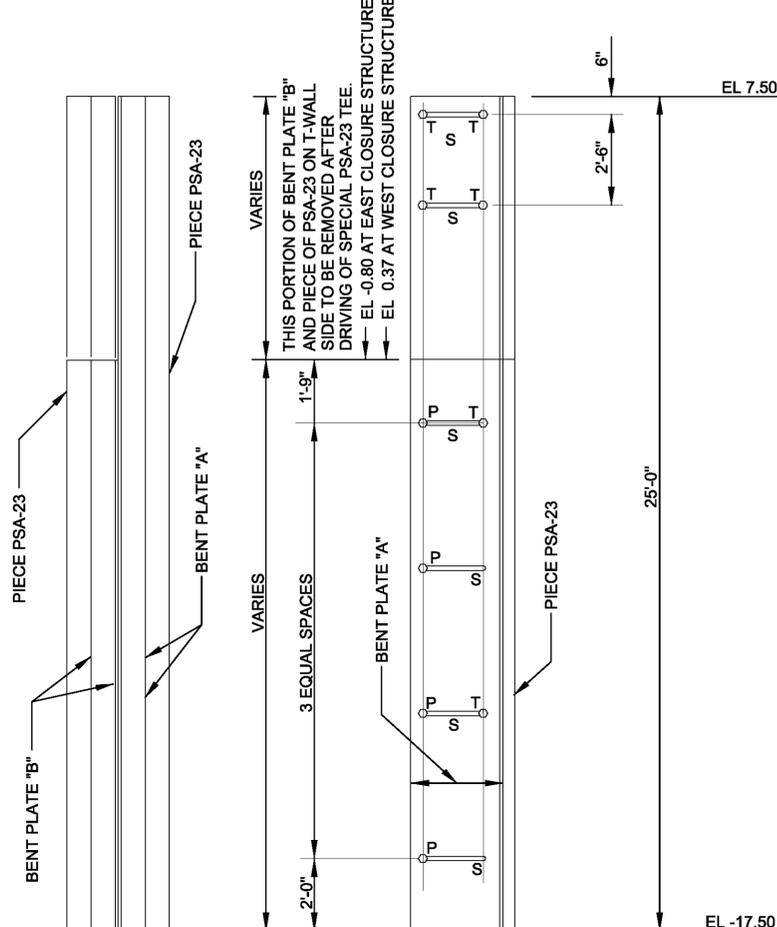
PILING DETAILS

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DRAWN BY: V. ROUSE
CHECKED BY: D. LAPENE

SYMBOL	DESCRIPTIONS	DATE	APPROVAL



PROTECTED SIDE ELEVATION
I-WALL SIDE ELEVATION

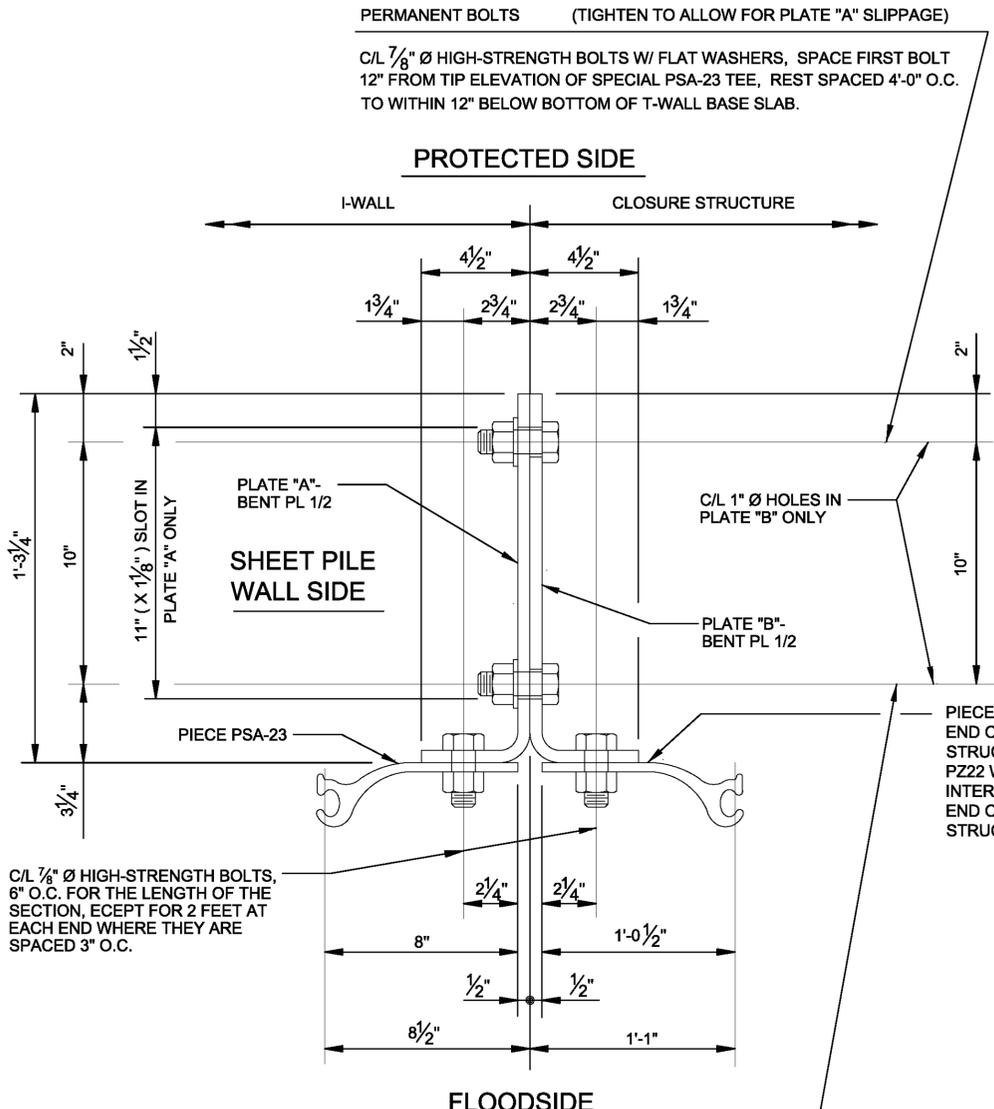
ELEVATION OF SPECIAL PSA-23 TEE SHOWING BENT PLATES BOLT SPACING

NTS

LEGEND

P = PERMANENT BOLT
T = TEMPORARY BOLT
S = SLOTTED HOLE (PLATE "A" ONLY)

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1
39

SPECIAL PSA-23 TEE DETAIL

NTS

NOTE:

7/8" Ø HIGH-STRENGTH BOLTS SHALL BE HEAVY HEX BOLTS, ASTM A325M, TYPE 3 W/ HEAVY HEX NUTS, ASTM A563, GRADE C3, PLAIN, WEATHERING STEEL AND HARDENED STEEL WASHERS (WHERE REQUIRED),

- NOTES**
1. DETAILS SHOWN ON THIS DRAWING ARE MODIFIED FROM HSDRRS TYPICAL DRAWINGS AND DETAILS. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL.
 2. TEE CONNECTION AND CUT-OFF SHEETING SHALL BE COAL TAR EPOXY COATED SAME AS SHEET PILE WALLS.

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VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

SHEET PILE WALL TO CLOSURE STRUCTURE CONNECTION DETAILS 1

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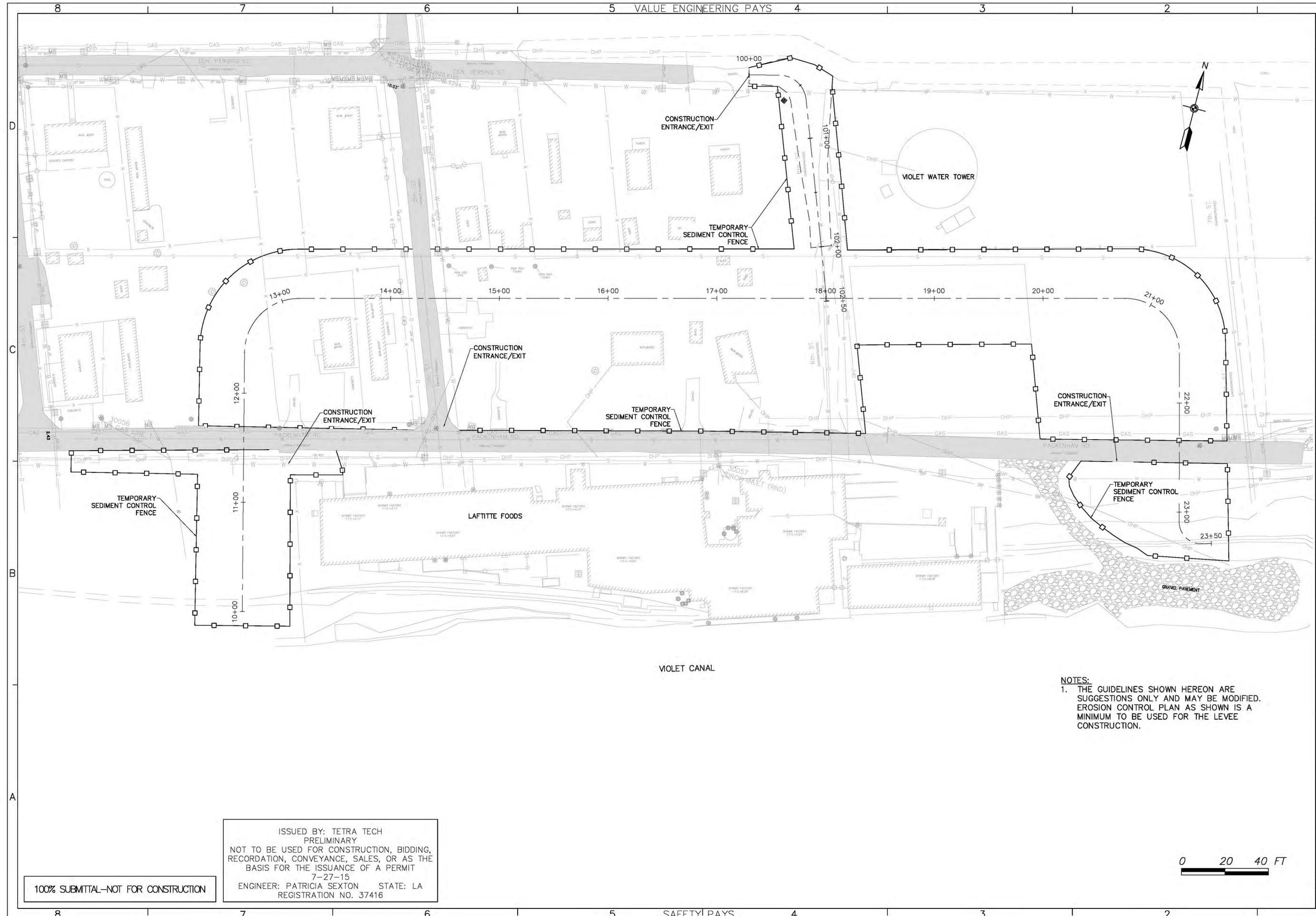
CHECKED BY: D. LAPENE

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748 Main Street, Suite B
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DESIGNED BY: J. COSTELLO

Scale: AS SHOWN
SHEET 38

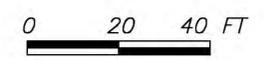




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 ENGINEER: PATRICIA SEXTON STATE: LA
 REGISTRATION NO. 37416

NOTES:
 1. THE GUIDELINES SHOWN HEREON ARE
 SUGGESTIONS ONLY AND MAY BE MODIFIED.
 EROSION CONTROL PLAN AS SHOWN IS A
 MINIMUM TO BE USED FOR THE LEVEE
 CONSTRUCTION.

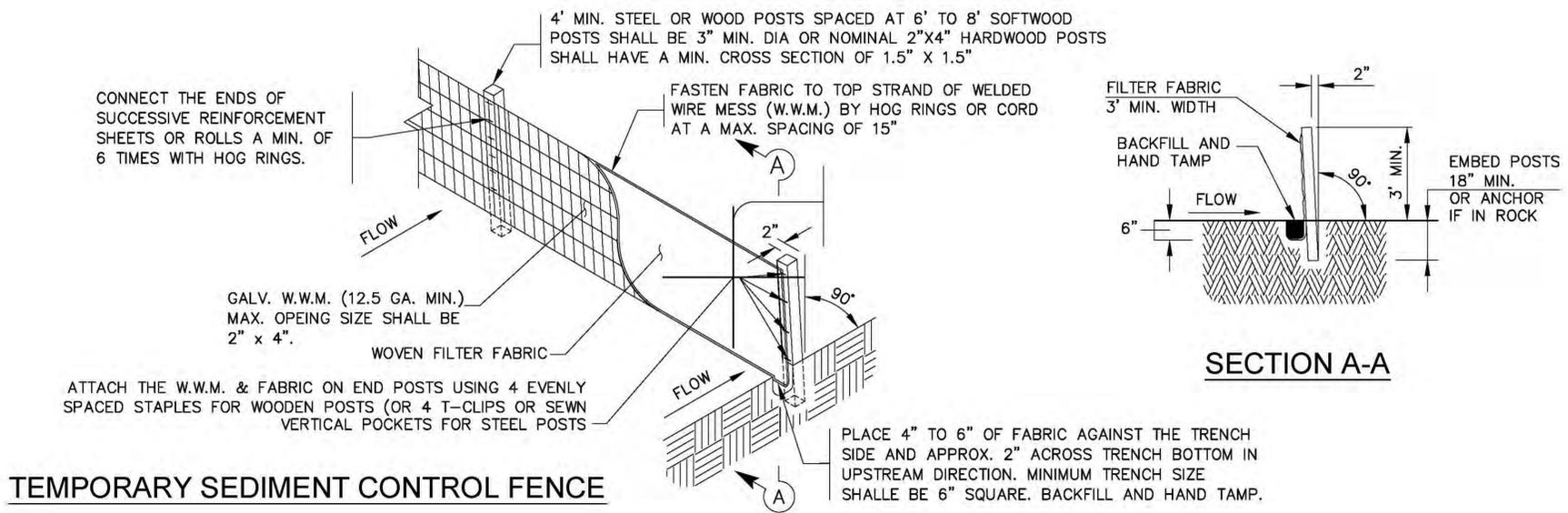


TETRA TECH, INC. 748 Main Street, Suite B Baton Rouge, LA 70802 Phone (225) 383-1786, Fax (225) 387-0233		DESIGNED BY: B.K.R.	CHECKED BY: P.S.	SOUTH EAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEL DISTRICT
Scale: AS SHOWN SHEET 40		TEMPORARY EROSION CONTROL PLAN		VIOLET CANAL NORTH REALIGNMENT - PHASE 2 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD VIOLET, SAINT BERNARD PARISH, LA
DATE APPROVAL		REVISIONS		SYMBOL

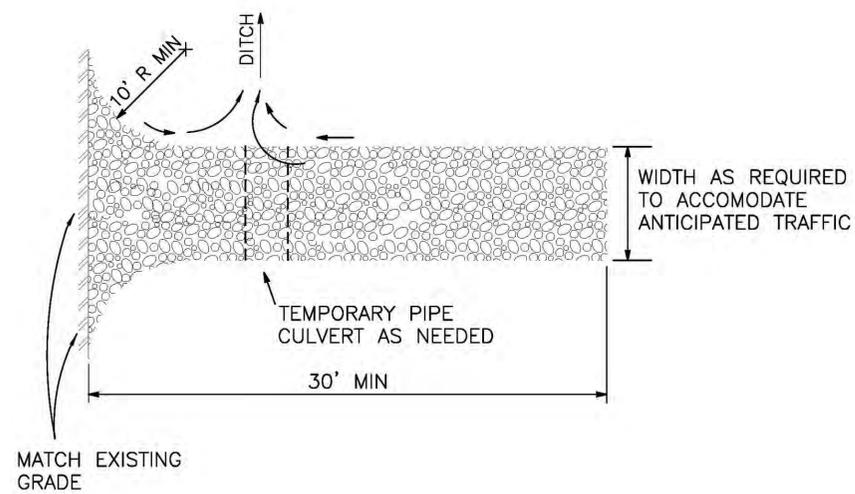
SEDIMENT CONTROL FENCE USAGE GUIDELINES

A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A 2-YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAX. FLOW THROUGH RATE OF 100 GPM/FT². SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

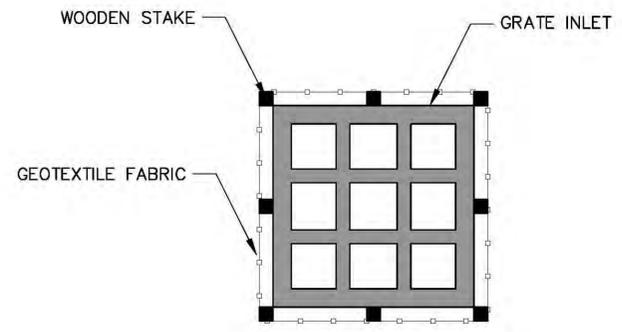


TEMPORARY SEDIMENT CONTROL FENCE



TEMPORARY STONE CONSTRUCTION ENTRANCE

- NOTES:**
- IF THE STONE CONSTRUCTION ENTRANCE IS NOT SUFFICIENT TO REMOVE THE MAJORITY OF DEBRIS FROM TIRES, CONTRACTOR SHALL WASH TIRES BEFORE ENTERING PUBLIC ROADS.
 - STONE SHALL BE 6" THICK.
 - A GEOTEXTILE UNDERLINER IS REQUIRED. THE GEOTEXTILE FABRIC SHALL BE PER THE SPECIFICATIONS.



TEMPORARY INLET SILT TRAP

- NOTES:**
- WOODEN STAKES SUPPORTING THE FABRIC SHALL BE 2" X 2" WITH A MINIMUM LENGTH OF 3'. THE STAKES SHALL BE PLACED AROUND THE INLET AT A MAXIMUM SPACING OF 3'.
 - THE HEIGHT OF THE SILT FENCE ABOVE THE INLET SHALL BE LIMITED TO 1.5' AND THE BOTTOM OF THE FABRIC SHALL BE BURIED IN A TRENCH APPROXIMATELY 4" X 4". THE FABRIC SHALL BE STAPLED WITH 1/2" STAPLES.

- NOTES:**
- THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED. EROSION CONTROL PLAN AS SHOWN IS A MINIMUM TO BE USED FOR THE LEVEE CONSTRUCTION.

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REGISTRATION NO. 37416

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

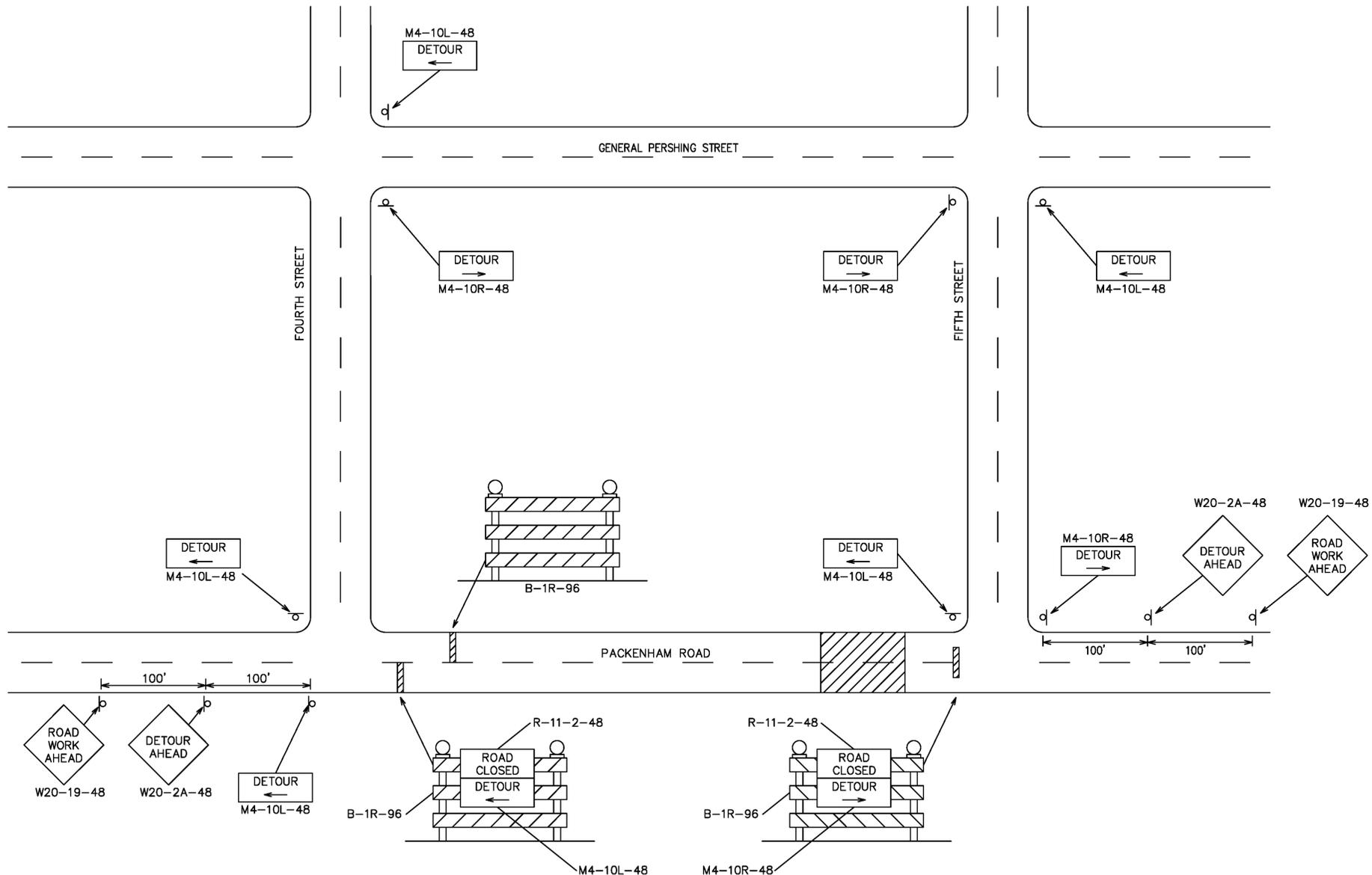
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEE DISTRICT

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SHEET
41

TEMPORARY EROSION CONTROL DETAILS

SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL



- NOTES:**
- SIGNS SHALL MEET SPECIFICATIONS IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)(CURRENT EDITION).
 - TYPE III BARRICADES SHALL BE PLACED AS SHOWN ON THE PLANS.
 - BARRICADES EXTENDING ACROSS A ROADWAY SHOULD HAVE STRIPES THAT SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING.
 - IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON THE BACK OF THE BARRICADE RAILS. THE MAXIMUM HEIGHT OF LETTER AND/OR COMPANY LOGOS SHALL BE 1".
 - WARNING LIGHTS SHALL BE INSTALLED ON BARRICADES.
 - BARRICADES SHALL NOT BE PLACED PARALLEL TO TRAFFIC.
 - WHERE BARRICADES REQUIRE THE USE OF WEIGHTS TO KEEP FOR TURNING OVER, THE USE OF SANDBAGS WITH DRY, COHESIONLESS SAND IS RECOMMENDED. THE SANDBAGS SHALL BE TIED SHUT TO KEEP THE SAND FROM SPILLING AND TO MAINTAIN A CONSTANT WEIGHT. ROCK, CONCRETE, IRON, STEEL, OR OTHER SOLID OBJECTS WILL NOT BE PERMITTED. SANDBAGS SHOULD WEIGH A MINIMUM OF 35 POUNDS AND A MAXIMUM OF 50 POUNDS. SANDBAGS SHALL BE MADE OF A DURABLE MATERIAL THAT TEARS UPON VEHICULAR IMPACT. SANDBAGS SHALL ONLY BE PLACED ALONG OR UPON THE BASE SUPPORTS OF THE DEVICE AND SHALL NOT BE SUSPENDED ABOVE LEVEL OR HUNG WITH ROPE, WIRE, CHAINS OR OTHER FASTENERS.
 - THE THREE RAILS ON TYPE III BARRICADES SHALL BE REFLECTORIZED ORANGE AND REFLECTIVE WHITE STRIPES ON ONE SIDE FACING ONE-WAY TRAFFIC AND BOTH SIDES FOR TWO-WAY TRAFFIC.

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SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

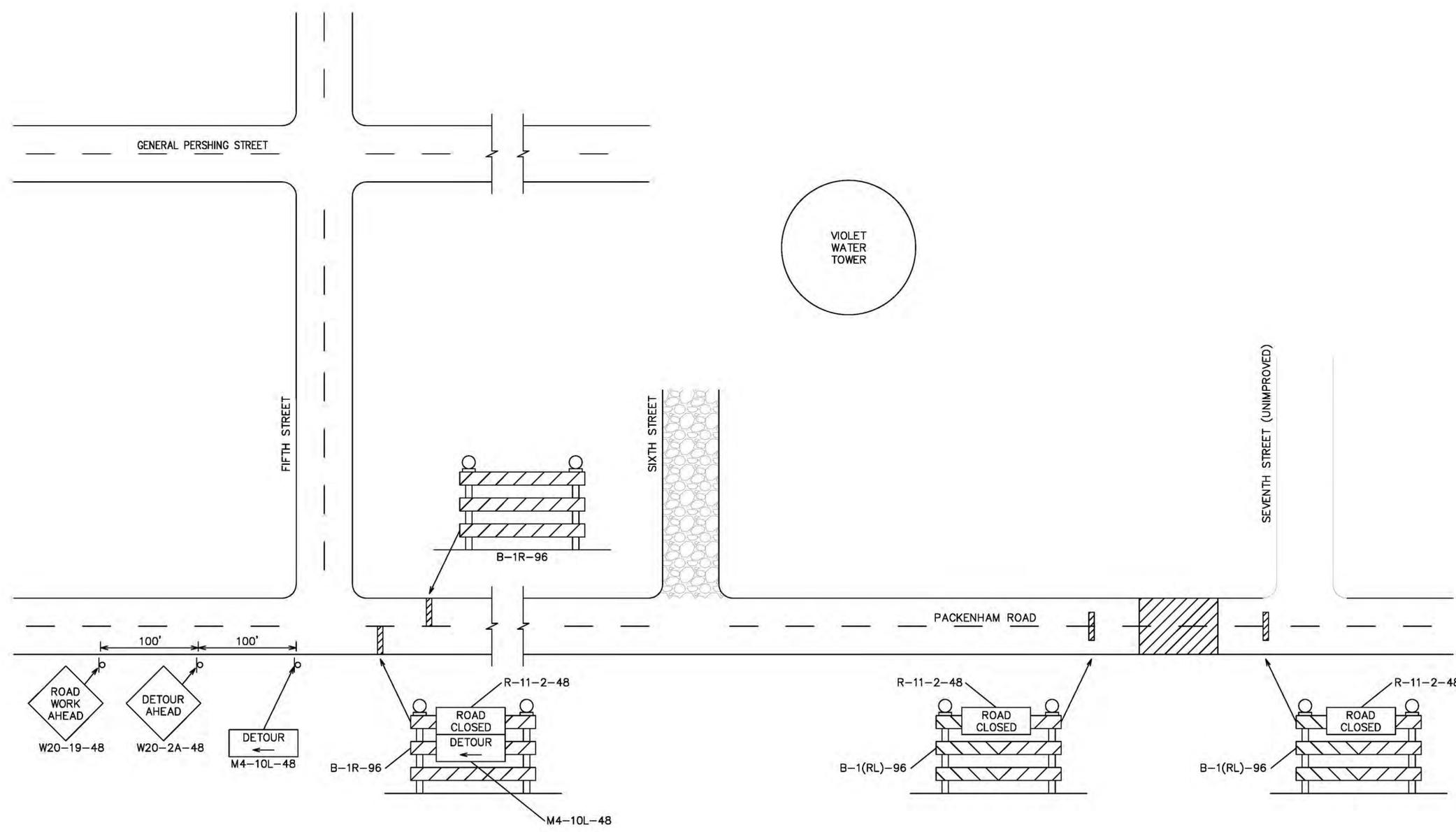
VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA
 TRAFFIC CONTROL PLAN
 WEST CLOSURE STRUCTURE

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEL DISTRICT

DESIGNED BY: B.K.R.
 DRAWN BY: B.K.R.
 CHECKED BY: P.S.

Scale: AS SHOWN
 SHEET
 42





- NOTES:**
- FOR THE DURATION OF THIS CONTRACT, THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL BUSINESSES ALONG PACKENHAM DRIVE AND THE ONGOING PHASE 1 CONSTRUCTION.
 - SIGNS SHALL MEET SPECIFICATIONS IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)(CURRENT EDITION).
 - TYPE III BARRICADES SHALL BE PLACED AS SHOWN ON THE PLANS.
 - BARRICADES EXTENDING ACROSS A ROADWAY SHOULD HAVE STRIPES THAT SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING.
 - IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON THE BACK OF THE BARRICADE RAILS. THE MAXIMUM HEIGHT OF LETTER AND/OR COMPANY LOGOS SHALL BE 1".
 - WARNING LIGHTS SHALL BE INSTALLED ON BARRICADES.
 - BARRICADES SHALL NOT BE PLACED PARALLEL TO TRAFFIC.
 - WHERE BARRICADES REQUIRE THE USE OF WEIGHTS TO KEEP FOR TURNING OVER, THE USE OF SANDBAGS WITH DRY, COHESIONLESS SAND IS RECOMMENDED. THE SANDBAGS SHALL BE TIED SHUT TO KEEP THE SAND FROM SPILLING AND TO MAINTAIN A CONSTANT WEIGHT. ROCK, CONCRETE, IRON, STEEL, OR OTHER SOLID OBJECTS WILL NOT BE PERMITTED. SANDBAGS SHOULD WEIGH A MINIMUM OF 35 POUNDS AND A MAXIMUM OF 50 POUNDS. SANDBAGS SHALL BE MADE OF A DURABLE MATERIAL THAT TEARS UPON VEHICULAR IMPACT. SANDBAGS SHALL ONLY BE PLACED ALONG OR UPON THE BASE SUPPORTS OF THE DEVICE AND SHALL NOT BE SUSPENDED ABOVE LEVEL OR HUNG WITH ROPE, WIRE, CHAINS OR OTHER FASTENERS.
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VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEL DISTRICT

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 7-27-15
 ENGINEER: PATRICIA SEXTON STATE: LA
 REGISTRATION NO. 37416

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SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

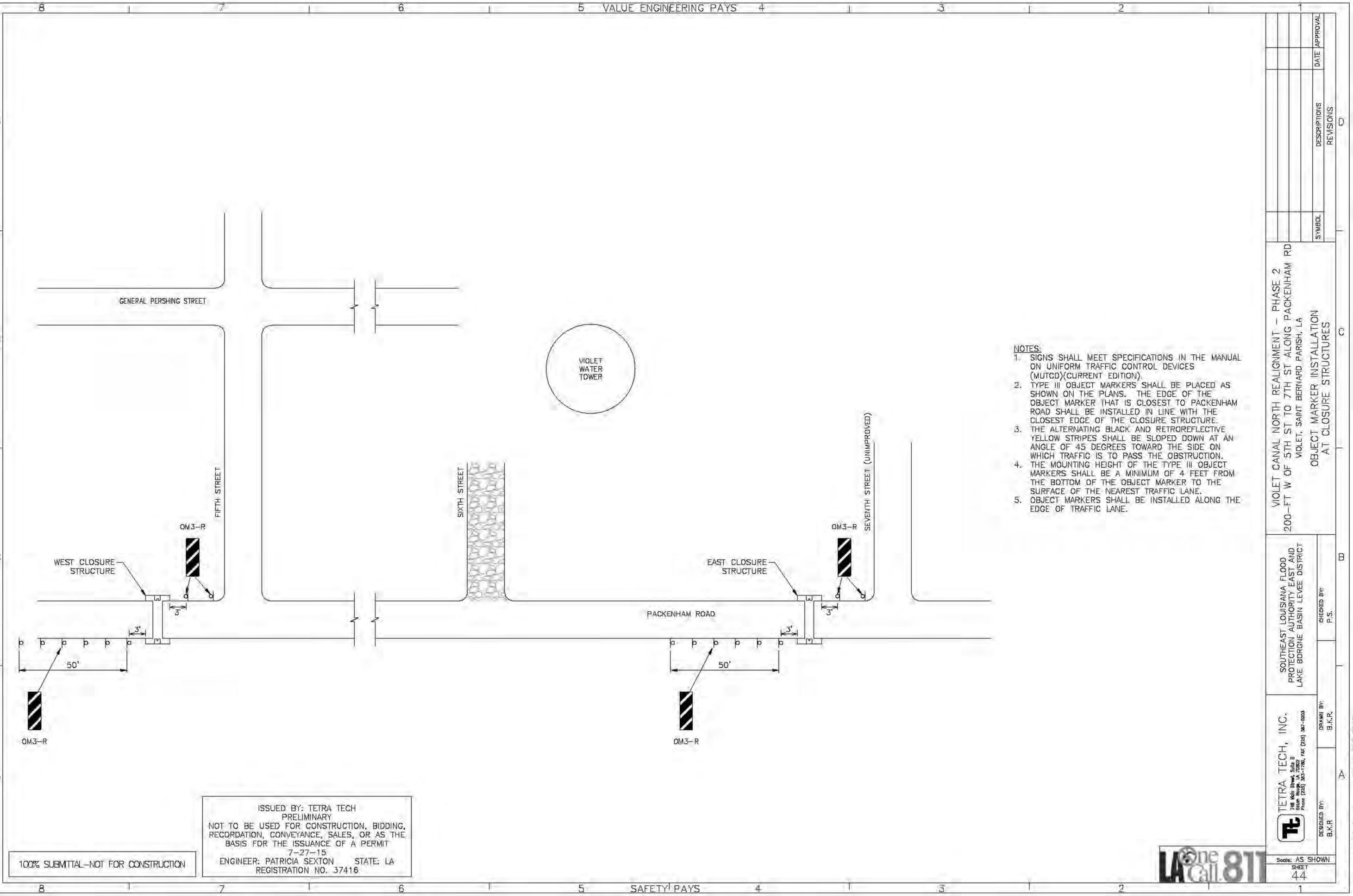
TRAFFIC CONTROL PLAN
 EAST CLOSURE STRUCTURE

CHECKED BY: P.S.

DESIGNED BY: B.K.R.

Scale: AS SHOWN
 SHEET 43





- NOTES:**
1. SIGNS SHALL MEET SPECIFICATIONS IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)(CURRENT EDITION).
 2. TYPE III OBJECT MARKERS SHALL BE PLACED AS SHOWN ON THE PLANS. THE EDGE OF THE OBJECT MARKER THAT IS CLOSEST TO PACKENHAM ROAD SHALL BE INSTALLED IN LINE WITH THE CLOSEST EDGE OF THE CLOSURE STRUCTURE.
 3. THE ALTERNATING BLACK AND RETROREFLECTIVE YELLOW STRIPES SHALL BE SLOPED DOWN AT AN ANGLE OF 45 DEGREES TOWARD THE SIDE ON WHICH TRAFFIC IS TO PASS THE OBSTRUCTION.
 4. THE MOUNTING HEIGHT OF THE TYPE III OBJECT MARKERS SHALL BE A MINIMUM OF 4 FEET FROM THE BOTTOM OF THE OBJECT MARKER TO THE SURFACE OF THE NEAREST TRAFFIC LANE.
 5. OBJECT MARKERS SHALL BE INSTALLED ALONG THE EDGE OF TRAFFIC LANE.

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
 200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
 VIOLET, SAINT BERNARD PARISH, LA
 OBJECT MARKER INSTALLATION
 AT CLOSURE STRUCTURES

SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY EAST AND
 LAKE BORGNE BASIN LEVEL DISTRICT

TETRA TECH, INC.
 746 West Street, Suite B
 Baton Rouge, LA 70802
 Phone (225) 383-1786, fax (225) 387-0033

DESIGNED BY: B.K.R.
 DRAWN BY: B.K.R.
 CHECKED BY: P.S.

ISSUED BY: TETRA TECH
 PRELIMINARY
 NOT TO BE USED FOR CONSTRUCTION, BIDDING,
 RECORDATION, CONVEYANCE, SALES, OR AS THE
 BASIS FOR THE ISSUANCE OF A PERMIT
 7-27-15
 ENGINEER: PATRICIA SEXTON STATE: LA
 REGISTRATION NO. 37416

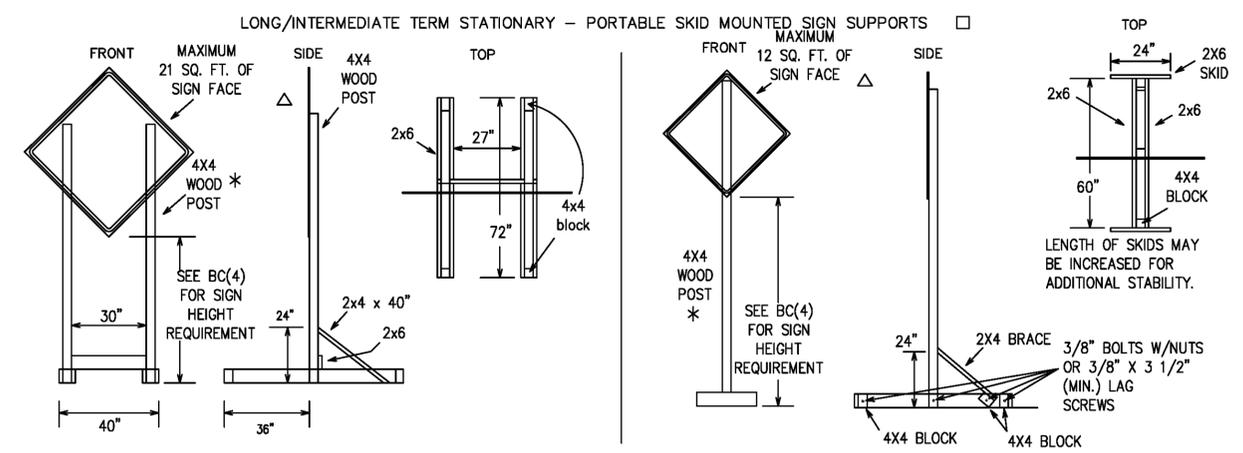
100% SUBMITTAL--NOT FOR CONSTRUCTION



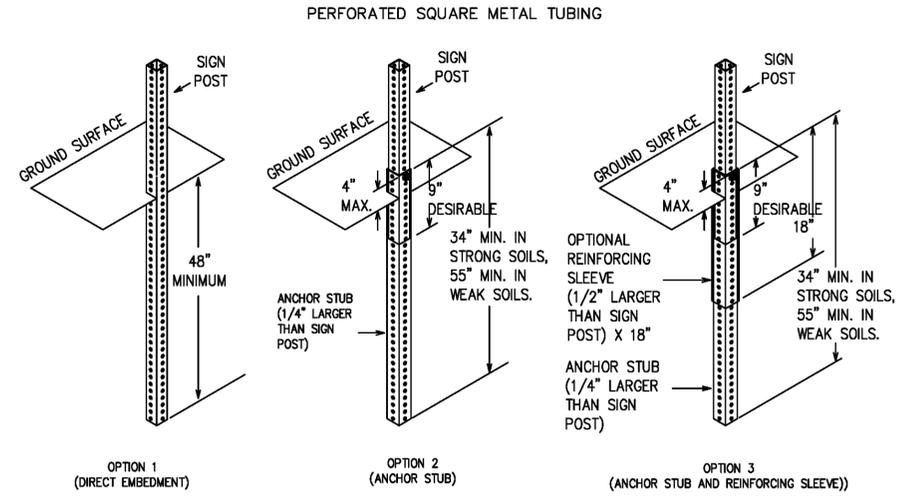
Scale: AS SHOWN
 SHEET
 44

SYMBOL	DESCRIPTIONS	REVISIONS	DATE	APPROVAL

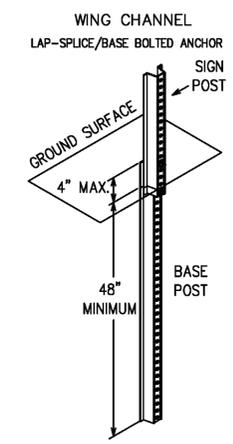
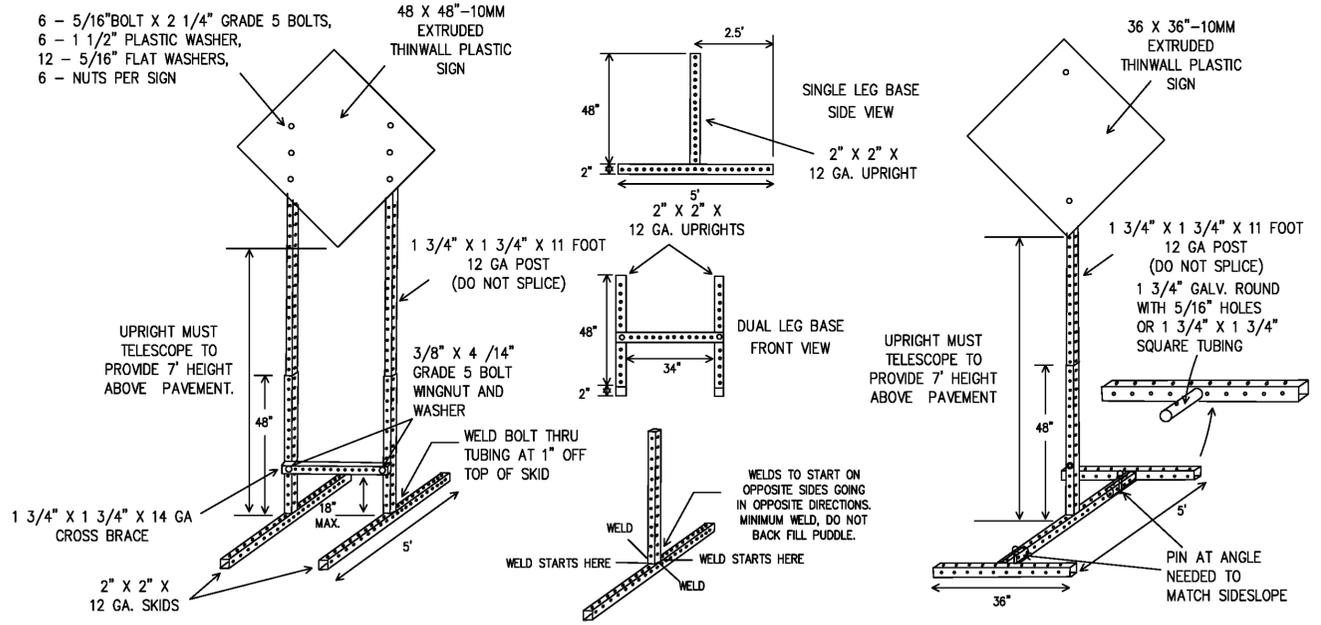
SKID MOUNTED WOOD SIGN SUPPORTS



REFER TO THE MANUFACTURER'S INSTALLATION PROCEDURE FOR EACH TYPE SIGN SUPPORT. THE MAXIMUM SIGN SQUARE FOOTAGE SHALL ADHERE TO THE MANUFACTURER'S RECOMMENDATION. TWO POST INSTALLATIONS CAN BE USED FOR LARGER SIGNS.



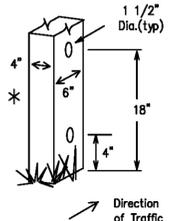
SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



- GENERAL NOTES
1. NAILS MAY BE USED IN THE ASSEMBLY OF WOODEN SIGN SUPPORTS, BUT 3/8" BOLTS WITH NUTS OR 3/8" X 3 1/2" LAG SCREWS MUST BE USED ON EVERY JOINT FOR FINAL CONNECTION.
 2. MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST.
 3. NO MORE THAN 2 SIGN POSTS SHALL BE PLACED WITHIN A 7 FT. CIRCLE, EXCEPT FOR SPECIFIC MATERIALS.
 4. WHEN PROJECT IS COMPLETED, ALL SIGN SUPPORTS AND FOUNDATIONS SHALL BE REMOVED FROM THE PROJECT SITE.

WEDGE ANCHORS

BOTH STEEL AND PLASTIC WEDGE ANCHOR SYSTEMS AS SHOWN ON THE SMD STANDARD SHEETS MAY BE USED AS TEMPORARY SIGN SUPPORTS FOR SIGNS UP TO 10 SQUARE FEET OF SIGN FACE. THEY MAY BE SET IN CONCRETE OR IN STURDY SOILS IF APPROVED BY THE ENGINEER. (SEE WEB ADDRESS FOR "TRAFFIC ENGINEERING STANDARD SHEETS").



WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS

NOMINAL POST SIZE	NO. OF POSTS	MAXIMUM SQ. FEET OF SIGN FACE	MINIMUM SOIL EMBEDMENT	DRILLED HOLE(S) REQUIRED
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

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7-27-15
ENGINEER: PATRICIA SEXTON STATE: LA
REGISTRATION NO. 37416

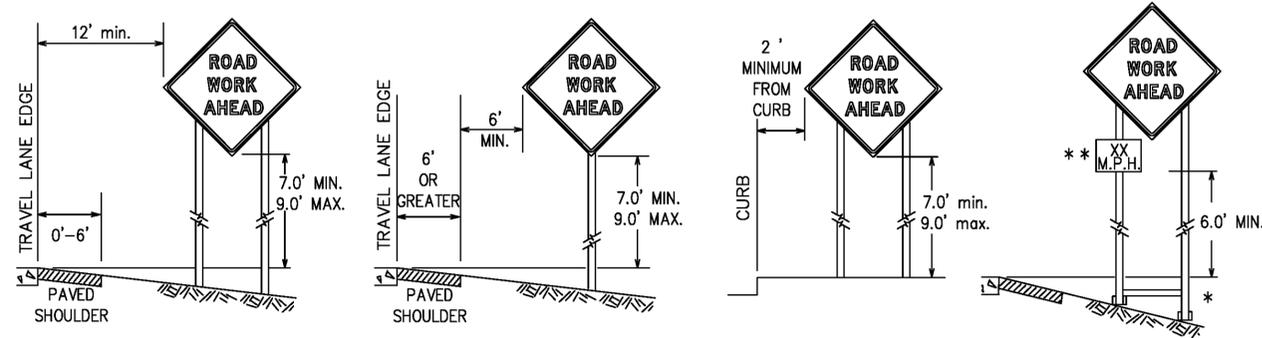
VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEL DISTRICT

TETRA TECH, INC.
748 Main Street, Suite B
Baton Rouge, LA 70802
Phone (225) 383-1786, FAX (225) 387-0203

Scale: AS SHOWN
SHEET 45

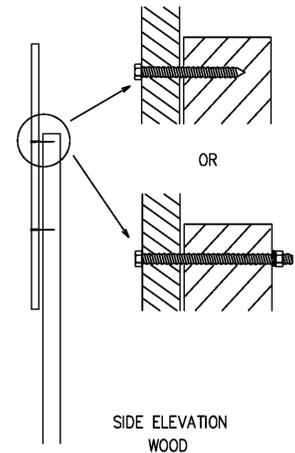
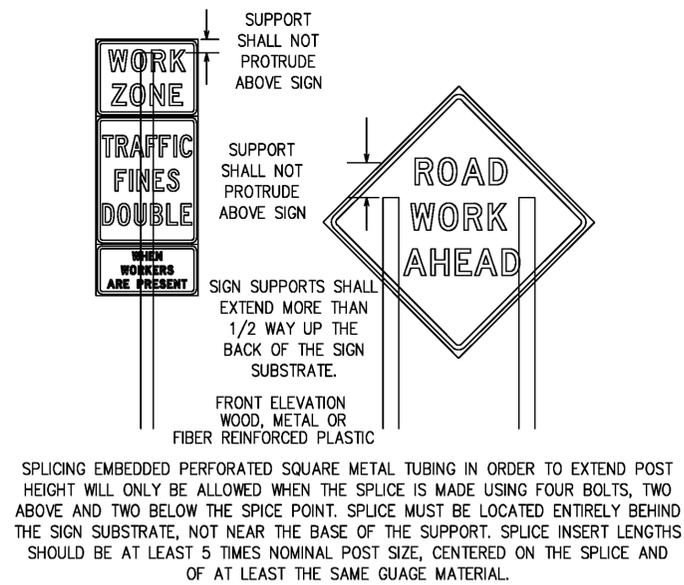
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* WHEN PLACING SKID SUPPORTS ON UNLEVEL GROUND, THE LEG POST LENGTHS MUST BE ADJUSTED SO THE SIGN APPEARS STRAIGHT AND PLUMB. OBJECTS SHALL NOT BE PLACED UNDER SKIDS AS A MEANS OF LEVELING.

** WHEN PLAQUES ARE PLACED ON DUAL-LEG SUPPORTS, THEY SHOULD BE ATTACHED TO THE UPRIGHT NEAREST THE TRAVEL LANE. SUPPLEMENTAL PLAQUES (ADVISORY OR DISTANCE) SHOULD NOT COVER THE SURFACE OF THE PARENT SIGN.

ATTACHMENT FOR SIGN SUPPORTS



ATTACHMENT TO WOODEN SUPPORTS WILL BE BY BOLTS AND NUTS OR SCREWS. USE MANUFACTURER'S RECOMMENDED PROCEDURES FOR ATTACHING SIGN SUBSTRATES TO OTHER TYPES OF SIGN SUPPORTS

NAILS WILL NOT BE ALLOWED.

EACH SIGN SHALL BE ATTACHED DIRECTLY TO THE SIGN SUPPORT. MULTIPLE SIGNS SHALL NOT BE JOINED OR SPLICED BY ANY MEANS. WOOD SUPPORTS SHALL NOT BE EXTENDED OR REPAIRED BY SPLICING OR OTHER MEANS.

VIOLET CANAL NORTH REALIGNMENT - PHASE 2
200-FT W OF 5TH ST TO 7TH ST ALONG PACKENHAM RD
VIOLET, SAINT BERNARD PARISH, LA

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY EAST AND LAKE BORGNE BASIN LEVEL DISTRICT

TETRA TECH, INC.
748 Main Street, Suite B
Baton Rouge, LA 70802
Phone (225) 383-1786, FAX (225) 387-0203

Scale: AS SHOWN
SHEET 46

TRAFFIC CONTROL DETAILS

SYMBOL	DESCRIPTIONS	DATE	APPROVAL

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7-27-15
ENGINEER: PATRICIA SEXTON STATE: LA
REGISTRATION NO. 37416



APPENDIX C
EXTERNAL AGENCY CORRESPONDENCE

From: Smith-Jones, Kimberly

Sent: Monday, February 29, 2016 4:19 PM

To: Amy.E.Powell@usace.army.mil; gutierrez.raul@epa.gov; john_savell@fws.gov;
Linda.Hardy@la.gov; cmichon@wlf.la.gov

Cc: Spann, Tiffany; Pitts, Melanie; Smith-Jones, Kimberly

Subject: FW: Scoping Notification/Solicitation of Views

Attachments: image001.png image002.png; 1603-0438 SOW.docx; Plans-and-Specs-II-1603-438-Lake-Borgne-48005-41246.pdf Google Earth2.PNG



U.S. Department of Homeland Security
Federal Emergency Management Agency
FEMA-DR 1603 LA
Louisiana Recovery Office
1500 Main Street
Baton Rouge, LA 70802

February 29, 2016

MEMORANDUM TO: See Distribution

SUBJECT: Scoping Notification/Solicitation of Views

To Whom It May Concern:

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) is mandated by the U.S. Congress to administer Federal disaster assistance pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), PL 93-288, as amended. FEMA's Hazard Mitigation Grant Program (HMGP) to provide funds to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. FEMA is considering providing Hazard Mitigation Grant Program funding for the attached project in relation to Hurricanes Katrina and Rita (FEMA-1603/1607-DR-LA).

The Southeast Louisiana Flood Protection Authority-East (SLFPA-E) is pursuing a FEMA certification of the interior levee system that connects to the federal levee system within Orleans Parish and St. Bernard Parish. The 40 Arpent Levee System is part of the interior levee system and is located in both Orleans Parish and St. Bernard Parish. The levee system extends from the Orleans/St. Bernard Parish line to south of the town of Verret, where the levee ties into high ground adjacent to the Hurricane and Storm Damage Risk Reduction System (HSDRRS).

As part of the evaluation of the 40 Arpent Levee System, it was determined that the Violet Canal North Bank required improvements to meet the FEMA National Flood Insurance Program (NFIP) regulations (44 CFR 65.10) for 100-year level flood protection.

The proposed improvement reach is adjacent to a Lafitte Frozen Foods building (i.e. Shrimp Factory) and extends approximately 1,280 linear feet. The proposed levee would consist of a

compacted grass-lined earthen embankment built with 3H: V1 side (horizontal to vertical) slopes to an elevation of 8.5 feet NAVD88. Two (2) stop log structures would be incorporated into the project on Packenham Road to form a complete flood protection system during a 100-year flood event.

To ensure compliance with the National Environmental Policy Act (NEPA), Executive Orders (EOs), and other applicable Federal regulations, FEMA EHP will be preparing an EA. To assist us in preparation of the EA, we request that your office review the attached documents for a determination as to the requirements of any formal consultations, regulatory permits, determinations, or authorizations.

The proposed project scope of work and the considered alternative is included in the attached description and drawings.

Please respond within 30 calendar days of the date of this scoping notification. If our office receives no comments at the close of this period, we will assume that your agency does not object to the project as proposed.

Comments may be emailed to kimberly.smith-jones@fema.dhs.gov or mailed to the attention of Kimberly Smith-Jones, Environmental Department, at the address above.

For questions regarding this matter, please contact Kimberly Smith-Jones, Environmental Protection Specialist at (202) 765-9120.

Thanks,

Tiffany Spann-Winnfield
Deputy Environmental Liaison Officer

Distribution: USACE, USEPA, LDWF, LDEQ, LDNR

Kimberly Smith-Jones
Environmental Protection Specialist
U.S. Department of Homeland Security (DHS) FEMA
Region VI
Louisiana Recovery Office 1100
Robert E. Lee Boulevard, New
Orleans, Louisiana 70124 (202)
765-9120
Kimberly.Smith-Jones@fema.dhs.gov



From: Martin, David W (CTR)
To: "Linda.Hardy@la.gov"; "Yasoob.Zia@LA.GOV"
Cc: [Pitts, Melanie](#); [Spann, Tiffany](#)
Subject: FW: DEQ SOV 160330/0265 Violet Canal North Bank Levee Realignment
Date: Monday, April 18, 2016 1:45:00 PM
Attachments: CAA-ApplicabilityDetermination-Violet Canal-2016.xlsx

Dear Linda Hardy & Yasoob Zia,

The attachments contain the general conformity applicability determinations for the subject project referenced above.

This conformity is in reference to a solicitation of views response dated April 12, 2016 from FEMA. The projects Sulphur Dioxide emissions are well below the de minimis threshold for SO₂.

Please let us know if you have any questions.

Thanks,

David

David W. Martin (CTR)
Environmental & Historic Preservation
(EHP) Environmental Protection Specialist
1603/1607-DR-LA
(225) 678-8783

From: Linda (Brown) Hardy [mailto:Linda.Hardy@la.gov]
Sent: Tuesday, April 12, 2016 04:11 PM
To: Smith-Jones, Kimberly
Cc: Yasoob Zia <Yasoob.Zia@LA.GOV>
Subject: DEQ SOV 160330/0265 Violet Canal North Bank Levee Realignment

April 12, 2016

Tiffany Spann-Winfield
Deputy Environmental Liaison Officer, FEMA LRO
1500 Main St
Baton Rouge, LA 70802
kimberly.smith-jones@fema.dhs.gov

RE: 160330/0265 Violet Canal North Bank Levee Realignment
 FEMA Funding
 Orleans and St. Bernard Parishes

Dear Ms. Spann-Winfield:

The Assessment Division of the Office of Environmental Compliance has reviewed the information provided in your letter, dated February 29, 2016, regarding the referenced project. Effective October 4, 2013, St. Bernard Parish was designated by EPA as an Sulfur Dioxide (SO₂) nonattainment parish for the 2010 Sulfur Dioxide standard (Federal Register Volume 78, Number 150 (Monday, August 5, 2013)). As part of a nonattainment area, federal activities proposed in St. Bernard Parish may be subject to the State's general conformity regulations as promulgated under LAC 33:III.Chapter 14, Subchapter A, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*.

In order to determine if the proposed project in St. Bernard Parish is subject to the full requirements of the general conformity regulations, the project sponsor must first make a general conformity applicability determination. This determination can be made by summing the total of direct and indirect Sulfur Dioxide (SO₂) emissions caused by the project. If the net total of SO₂ emissions is determined to be less than the prescribed *de minimis* level of 100 tons per year per pollutant, then this action will comply with the conformity provisions of Louisiana's State Implementation Plan (SIP) and the Assessment Division will not object to implementation of the project.

Please email your general conformity applicability determination to linda.hardy@la.gov. Should you have any questions regarding state rules and regulations pertaining to general conformity, please contact me at (225) 219-2969. Thank you for affording us the opportunity to comment on the proposed action.

Sincerely,

Yasoob Zia

Environmental Senior Scientist
Assessment Division

SOV #160330/0265

Linda M. Hardy

Louisiana Department of Environmental Quality
Office of the Secretary
P.O. Box 4301
Baton Rouge, LA 70821-4301
Ph: (225) 219-3954
Fax: (225) 219-3971
Email: linda.hardy@la.gov

**Results of Clean
Air Act applicability
determination - Sulfur
Dioxide**

Violet Canal Realignment
St. Bernard Parish

	Fuel Density (g/gal)	Fuel Economy (mi/gal)			Episodic Weight Fraction of Sulfur in Fuel	Fraction of Fuel Sulfur Converted Directly to SO ₄	Weight Ratio of SO ₂ to Sulfur		Calculated Gaseous SO ₂ Emission Factor (g/mi)	Miles of Travel per Trip	Total Number of Trips	Total Emissions (metric tons)	Total Emissions (U.S. tons)
Section 1 - Road Vehicles													
<i>Heavy duty diesel vehicles</i>													
Dump Truck (12 CY) SO ₂	3225.039	6.59	N/A	N/A	0.000015	0.02	2	0.0143879	1500	20	0.000432	0.000476	
Heavy Duty Pickup with Loaded Trailer SO ₂	3225.039	6.59	N/A	N/A	0.000015	0.02	2	0.0143879	200	5	0.000014	0.000016	
Concrete Mixer SO ₂	3225.039	6.30	N/A	N/A	0.000015	0.02	2	0.0150502	160	2	0.000005	0.000005	
6x4 Truck, 3 axle SO ₂	3225.039	6.59	N/A	N/A	0.000015	0.02	2	0.0143879	80	2	0.000002	0.000003	
<i>Light duty gasoline trucks 1</i>													
2-Wheel Drive P/U SO ₂	2812.724	18.34	N/A	N/A	0.000095	0.02	2	0.0285567	120	65	0.000223	0.000246	
<i>Light duty gasoline trucks 2</i>													
4-Wheel Drive P/U SO ₂	2812.724	18.32	N/A	N/A	0.000095	0.02	2	0.0285878	120	65	0.000223	0.000246	
<i>Light duty gasoline vehicles</i>													
Automobile SO ₂	2812.724	23.97	N/A	N/A	0.000095	0.02	2	0.0218494	120	65	0.000170	0.000188	
Table:	X.2D								↑			↑	↑
Formula:									Formula 1			Formula 2	Formula 3

Section 1 -	Formula 1	Formula 2	Formula 3
Table of Formulas:	(Col. D x Col. H x (1 - Col. I) x Col. J) ÷ Col. E	(Col. K x Col. L x Col. M) ÷ 1000000	Col. N x 1.1023

Formulas and fuel economy data taken from tabular or calculated values derived from EPA publication AP-42 Vol. 2, planned 5th edition (<http://www.epa.gov/oms/ap42.htm>) and from various computer model updates, as well as from NRDC publication "Environmental Assessment of Plug-In Hybrid Electric Vehicles." Fuel sulfur values based on current EPA standards.

Sub-Total Road Vehicles:

Road Sub-Total SO₂ (tons)

0.0010693 0.0011787

BSFC - SO ₂	Transient Adjustment	Temperature Correction	Episodic	Fraction of	Calculated		
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		Brake-Specific Fuel Consumption (g/hp-hr)	Factor (Certain Spark Ignition >25 HP and All Diesel)	Deterioration Factor	Factor (Certain 4-Stroke Spark Ignition Only)	Weight Fraction of Sulfur in Fuel	Fuel Sulfur Converted Directly to PM	Weight Ratio of SO ₂ to Sulfur	Gaseous SO ₂ Emission Factor (g/hp-hr)	Number of HP	Number of Hours	Total Emissions (metric tons)	Total Emissions (U.S. tons)
Section 2 - Non-Road Equipment													
<i>Compression ignition engines</i>													
Water Tanker	SO ₂	166.468	1.05	1.0020481	N/A	0.000015	0.02247	2	0.0051312	325	150	0.0002501	0.0002757
Excavator, wheel	SO ₂	185.066	1.05	1.0270000	N/A	0.000015	0.02247	2	0.0058465	90	700	0.0003683	0.0004060
Front-end Loader	SO ₂	185.066	1.05	1.0207803	N/A	0.000015	0.02247	2	0.0058111	95	100	0.0000552	0.0000609
Excavator, crawler	SO ₂	166.468	1.05	1.0340000	N/A	0.000015	0.02247	2	0.0052892	165	40	0.0000349	0.0000385
Roller	SO ₂	166.468	1.05	1.0207530	N/A	0.000015	0.02247	2	0.0052264	100	200	0.0001045	0.0001152
Asphalt Paver	SO ₂	166.468	1.05	1.0224187	N/A	0.000015	0.02247	2	0.0052349	200	200	0.0002094	0.0002308
Crawler Crane	SO ₂	166.468	1	1.0197024	N/A	0.000015	0.02247	2	0.0049724	185	200	0.0001840	0.0002028
Articulated Grader	SO ₂	185.066	1.05	1.0340000	N/A	0.000015	0.02247	2	0.0058804	95	200	0.0001117	0.0001232
Diesel Generator	SO ₂	185.066	1	1.0125574	N/A	0.000015	0.02247	2	0.0054786	10	700	0.0000384	0.0000423
Air compressor	SO ₂	185.066	1	1.0189243	N/A	0.000015	0.02247	2	0.0055131	7.5	700	0.0000289	0.0000319
Pile Driver	SO ₂	166.468	1.05	1.0165478	N/A	0.000015	0.02247	2	0.0052054	300	200	0.0003123	0.0003443

Table:
Formula:

↑
Formula 4

↑
Formula 5

↑
Formula 6

Section 2 - Table of Compression Formulas:	Formula 4 (Col. D x Col. E x Col. F x (1 - Col. I) - Calc. HC Em. Factor) x Col. H x Col. J	Formula 5 (Col. K x Col. L x Col. M) ÷ 1000000	Formula 6 Col. N x 1.1023
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All non-road emissions factors taken from tabular or calculated values derived from various EPA non-road engine technical reports (<http://www.epa.gov/otaq/nonrdmdl.htm#techrept>) and current fuel sulfur standards.

<i>Spark ignition engines</i>													
Concrete Saw	SO ₂	394.625	N/A	1.2010000	N/A	0.000095	0.03	2	0.0399027	11	100	0.0000439	0.0000484
Sub-Total - Non-Road:								<i>Non-Road Sub-Total SO₂ (tons)</i>				0.0017417	0.0019199
Grand Total:						The <i>de minimis</i> threshold for SO ₂ is 100 tons/year within St. Bernard Parish			Total SO ₂ Emissions (tons)		0.0028110	0.0030986	

Developed by R. Darrell Smith, Ph.D. - 2014-15

NISTAC contractor for FEMA LRO

X <= Enter "X" here to remove warning in D1 for printing



Louisiana Ecological Services Office

ESA Technical Assistance Form

General Information

Name: FEMA

Point of Contact: David Martin

Address: 1500 Main Street

City: Baton Rouge

State: Louisiana

Zip Code: 70802

Phone Number 1: 225-678-8783

Phone Number 2: _____

Email Address: david.martin@associates.fema.dhs.gov

Proposed Project Information

Project Reference ID: 7735

Project Latitude: 29.901024 **Project Longitude:** -89.896604

Project Parish(es): Saint Bernard

Project Description: The proposed project would construct a levee which would tie into the existing levees of St. Bernard Parish. The proposed project is located near 2525 Pakenham Road, Violet Louisiana along the existing BPLS, on the river bank of the Violet Canal which is located within the following coordinates:

29.901024, -89.896604 (Northwest Corner)

29.900345, -89.896535 (Southwest Corner)

29.901665, -89.894156 (Northeast Corner)

29.901037, -89.893960 (Southeast Corner)

Figure 2 provides an overall site lay out of the work that is proposed to take place within these four (4) corner coordinates.

Figure 2: Violet, LA Proposed Levee Improvements Map

A survey of the site was provided by BFM Corporation, LLC, a professional land and surveying company, and contracted by the applicant between November 2013 and February 2014. Based on the survey, the existing earthen levee serves as the drainage



Louisiana Ecological Services Office

ESA Technical Assistance Form

divide, and separates runoff that flows south to the Violet Canal and runoff that flows north toward the east-west natural drainage ditch at the eastern end of General Pershing Street. A storm drain system starts on the south side of Pakenham Road, diverges northward at the Fifth Street intersection and discharges into the east-west natural drainage ditch at the eastern end of General Pershing Street. An additional storm drain, located approximately 400 feet west of Sixth Street, conveys flow under Pakenham Road to a north-south natural drainage ditch that connects to the east-west natural drainage ditch located on the eastern end of General Pershing Street. The topographic slopes adjacent to the project site are approximately 0.005 and 0.03 (ft/ft) for areas north and south of the existing levee, respectively. Areas adjacent to the project site consist of a Lafitte Frozen Foods (i.e. Shrimp Factory), scattered buildings, and open spaces covered with grass or gravel pavements.

The proposed levee improvement would consist of constructing a compacted earthen embankment approximately 1,280 feet long with two (2) proposed stop log structures on Pakenham Road. The maximum levee side slope would be 3H: 1V (horizontal to vertical) to account for stability as well as maintenance and mowing. The top of the levee would be constructed in an effort to provide a minimum width of 12 feet with a 15-foot buffer from the levee toe (flood side and landside) to allow for embankment access and inspection. Anticipated settlement has been incorporated into the design elevation. Additionally, three (3) storm drain lines with two (2) slide gates are proposed along Pakenham Road as the levee acts as the drainage divide along the south side of the Shrimp Factory. This divide would be higher than the FEMA 100-year water surface elevation which would prevent flow by containing the 100-year flood flow to the Violet Canal.

There are two (2) concurrent storm drainage systems proposed, and are summarized below:



Louisiana Ecological Services Office

ESA Technical Assistance Form

The proposed storm drain system #1 consists of a new catch basin located at the northwest corner of Pakenham Road and Fifth Street with a new storm drain pipe crossing Pakenham Road and joining the existing storm drain on the south side of Pakenham Road. This existing storm drain pipe travels west approximately 100 feet and connects to a proposed catch basin. A proposed slide gate and storm drain pipe, approximately 140 feet in length, would exit to the existing natural ditch. This natural ditch would be re-graded to flow west joining the existing storm drain system located at Fourth Street. The flow changing direction is approximately 1.53 acres, which would be served by the proposed storm system #1. The proposed storm drain system #1 would convey at least the 10-year flood event and the 10-year peak flow, as computed in accordance with the Louisiana Department of Transportation and Development (LADOTD) 2011 Hydraulics Manual.

The proposed storm drain system #2 consists of a new catch basin located at the northwest corner of Pakenham Road and Sixth Street with a new storm drain pipe on the north side of Pakenham Road traveling east for approximately 260 feet and joining another proposed catch basin which connects a proposed storm drain pipe from the south of Pakenham Road. The proposed storm drain pipe with a proposed slide gate would be extended approximately 140 feet to outlet at the existing north-south natural drainage ditch. The reconfigured flow direction extends approximately 3.64 acres and would serve the proposed storm system #2. This system #2 would convey drainage during a 10-year flood event (LADOTD 2011). The 10-year peak flow is estimated to be 20.11 cubic feet per second (cfs) for the proposed storm drain system #2.

A portion of the flood flow would be conveyed by the storm drain system located at Fifth Street to the storm drain system along General Pershing Street while discharging into the east-west natural drainage ditch. The residual flood flow would flow northeasterly toward the same east-west natural drainage ditch located at the eastern end of General Pershing Street.



Louisiana Ecological Services Office

ESA Technical Assistance Form

Properties on the landside (north) of the proposed levee would be protected during the 100-year flood and the finished floor elevation of the Shrimp Factory would be at or above the FEMA 100-yr flood elevation of four (4) feet. Through residential buyout and relocation, no buildings would be inhabited on the flood side of the proposed levee after the completion of the project.

Based on the information provided, the proposed project is not an activity that would affect a federally listed threatened or endangered species or designated critical habitat.

No further ESA coordination with the Service is necessary for the proposed action, unless there are changes in the scope or location of the proposed project or the project has not been initiated one year from the date of this letter.

If the proposed project has not been initiated within one year, follow-up coordination via this website should be accomplished prior to making expenditures because our threatened and endangered species information is updated periodically. If the scope or location of the proposed project is changed, coordination via this website should occur as soon as such changes are made.

If your project is located adjacent to a wildlife management area, refuge, or other area that is managed as a bird preserve, we recommend that you contact the adjacent land management office.

This finding completes project review by the Service for effects to Federal trust resources under our jurisdiction and currently protected by the ESA.

Please keep a copy of this pre-development coordination for your records. Do not send it to the Lafayette ES Office.

If you have additional questions, please contact Louisiana ES Office Biological Science Technician at 337/291-3100 for further assistance.



Louisiana Ecological Services Office

ESA Technical Assistance Form

Project Type: Non-Emergency FEMA Project

Does the project propose to obtain, remodel, refurbish, or rehabilitate existing structures in such a way that does not significantly alter the present capacity or use, and does not alter surrounding land areas that were previously undisturbed? **Yes**



JOHN BEL EDWARDS
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

CHARLIE MELANCON
SECRETARY
JIMMY L. ANTHONY
ASSISTANT SECRETARY

Date March 18, 2016

Name Kimberly Smith-Jones

Company FEMA

Street Address 1500 Main St

City, State, Zip Baton Rouge, LA 70802

Project Violet Canal North Bank Levee Realignment
& Drainage Improvements

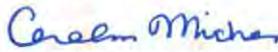
Project ID 512016

Invoice Number 16031809

Personnel of the Coastal & Nongame Resources Division have reviewed the preliminary data for the captioned project. After careful review of our database, no impacts to rare, threatened, or endangered species or critical habitats within Louisiana's boundary are anticipated for the proposed project. No state or federal parks, wildlife refuges or scenic streams are known at the specified site within Louisiana's boundaries.

The Louisiana Natural Heritage Program (LNHP) has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. Heritage reports summarize the existing information known at the time of the request regarding the location in question. The quantity and quality of data collected by the LNHP are dependent on the research and observations of many individuals. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Louisiana have not been surveyed. This report does not address the occurrence of wetlands at the site in question. Heritage reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. LNHP requires that this office be acknowledged in all reports as the source of all data provided here. If at any time Heritage tracked species are encountered within the project area, please contact the LNHP Data Manager at 225-765-2643. If you have any questions, or need additional information, please call 225-765-2357.

Sincerely,

for 
Amity Bass, Coordinator
Natural Heritage Program



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

Application Number: 18791 **Permit Number:** P20150290 **Date Received:** 03/20/2015

Step 1 of 15 - Applicant Information

Applicant Name: Southeast Louisiana Flood Protection Authority - East **Applicant Type:** GOVERNMENT AGENCY

Mailing Addr : 2045 Lakeshore Drive
Room 422
New Orleans, LA 70122

Contact Info: Robert Turner

Phone: (504) 280-2411 **Fax:** (205) 280-2412 **Email:** rturner@slfpae.com

Step 2 of 15 - Agent Information

Agent Name: Tetra Tech/Benjamin Richard

Mailing Addr: 748 Main Street
Suite B
Baton Rouge, LA 70802

Contact Info: Benjamin Richard

Phone: (225) 383-1780 **Fax:** (225) 387-0203 **Email:** benjamin.richard@tetrattech.com

Step 3 of 15 - Permit Type

Coastal Use Permit (CUP) Solicitation of Views (SOV) Request for Determination (RFD)

Step 4 of 15 - Pre- Application Activity

a. Have you participated in a Pre- Application or Geological Review Meeting for the proposed project?

No Yes Date meeting was held:

Attendees:

(Individual or Company Rep)

(OCM Representative)

(COE Representative)

b. Have you obtained an official wetland determination from the COE for the project site?

No Yes **If Yes, Please upload a copy with your application.**

JD Number:

c. Is this application a mitigation plan for another CUP?

No Yes OCM Permit Number:



Joint Permit Application For Work Within the Louisiana Coastal Zone



Step 5 of 15 - Project Information

a. Describe the project.

The Southeast Louisiana Flood Protection Authority-East (SLFPA-E) is pursuing Federal Emergency Management Agency (FEMA) certification of the interior levee system that connects with the federal levee system within Orleans Parish and St. Bernard Parish. The 40 Arpent Levee System is part of the interior levee system and is located in both Orleans Parish and St. Bernard Parish. The levee system extends from the Orleans/St. Bernard Parish line to south of the town of Verret, where the levee ties into high ground adjacent to the Hurricane and Storm Damage Risk Reduction System (HSDRRS).

The inspection performed along the 40 Arpent Levee System identified potential freeboard deficiencies at the project site where the 100-year level of protection was not met. At the project site along the north side of the Violet Canal, the 100-year flood elevation is 4.0 feet. With three feet of FEMA freeboard, the required 100-year level of protection is 7.0 feet. The proposed levee improvements will raise the level of protection to an elevation of 8.5 feet to meet the FEMA freeboard requirements with an additional 1.5-feet of protection, thus allowing the levee to be accredited on the FEMA Flood Insurance Rate Maps (FIRMS).

b. Is this application a change to an existing permit?

No

Yes

OCM Permit Number:

c. Have you previously applied for a permit or emergency authorization for all or any part of the proposed project?

No

Yes

Agency	Contact	Permit Number	Decision Status	Decision Date
OCM	Crystal Dunn	P20150239	Pending	
COE				
Other				

Step 6 of 15 - Project Location

a. Physical Location

Street: Packenham Drive

City: Violet, Louisiana

Parish: Saint Bernard

Zip: 70092

Water Body: Violet Canal

b. Latitude and Longitude

Latitude: 29 54 5.54

Longitude: -89 53 43.1



Louisiana Department of Natural
Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

c. Section, Township, and Range



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

The inspection performed along the 40 Arpent Levee System identified potential freeboard deficiencies at the project site where the 100-year level of protection was not met. At the project site along the north side of the Violet Canal, the 100-year flood elevation is 4.0 feet. With three feet of FEMA freeboard, the required 100-year level of protection is 7.0 feet. The proposed levee improvements will raise the level of protection to an elevation of 8.5 feet to meet the FEMA freeboard requirements with an additional 1.5-feet of protection, thus allowing the levee to be accredited on the FEMA Flood Insurance Rate Maps (FIRMS).

Step 9 of 15 - Project Status

a. Proposed start date: 06/01/2015 **Proposed completion date:** 12/01/2015

b. Is any of the project work in progress?

No Yes

c. Is any of the project work completed?

No Yes

Step 10 of 15 - Structures, Materials, and Methods for the Proposed Project

a. Excavations

3500 Cubic Yards Acres

b. Fill Areas

14,100 Cubic Yards Acres

c. Fill Materials

<input type="checkbox"/> Concrete:	Cubic Yards	<input type="checkbox"/> Rock:	Cubic Yards
<input type="checkbox"/> Crushed Stone or Gravel:	Cubic Yards	<input type="checkbox"/> Sand:	Cubic Yards



Louisiana Department of Natural
Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

14,100 Cubic Yards



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

- | | | |
|--|-------------|---|
| <input type="checkbox"/> Excavated and Placed onsite : | Cubic Yards | <input checked="" type="checkbox"/> Hauled in Topsoil/Dirt: |
| <input type="checkbox"/> Excavated and hauled offsite: | Cubic Yards | |
| <input type="checkbox"/> Other: | Cubic Yards | |

d. What equipment will be used for the proposed project?

- | | | |
|--|--|--|
| <input type="checkbox"/> Airboat | <input checked="" type="checkbox"/> Bulldozer/Grader | <input type="checkbox"/> Marsh Buggy |
| <input checked="" type="checkbox"/> Backhoe | <input type="checkbox"/> Dragline/Excavator | <input type="checkbox"/> Other Tracked or Wheeled Vehicles |
| <input type="checkbox"/> Barge Mounted Bucket Dredge | <input type="checkbox"/> Handjet | <input type="checkbox"/> Self Propelled Pipe Laying Barge |
| <input type="checkbox"/> Barge Mounted Drilling Rig | <input type="checkbox"/> Land Based Drilling Rig | <input type="checkbox"/> Tugboat |
| <input type="checkbox"/> Other: | | |

Step 11 of 15 - Project Alternatives

a. Total acres of wetlands and/or waterbottoms filled and/or excavated.

0 acres

b. What alternative locations, methods, and access routes were considered to avoid impact to wetlands and/or waterbottoms?

Four alternatives were analyzed, and the selected alternative will have no impacts to wetlands or water bottoms.

c. What efforts were made to minimize impact to wetlands and/or waterbottoms?

here will be no impacts to wetlands or water bottoms.

d. How are unavoidable impacts to vegetated wetlands to be mitigated

No mitigation should be required, all work will be performed in a non-wetland area.

Step 12 of 15 - Permit Type and Owners



Louisiana Department of Natural Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

a. Are you applying for a Coastal Use Permit?

No Yes

b. Are you the sole landowner / oyster lease holder?

No Yes

The applicant is an owner of the property on which the proposed described activity is to occur.

The applicant has made reasonable effort to determine the identity and current address of the owner(s) of the land on which the proposed described activity is to occur, which included, a search of the public records of the parish in which the proposed activity is to occur.

The applicant hereby attests that a copy of the application has been distributed to the following landowners / oyster lease holders. See attached list.

c. Does the project involve drilling, production, and/or storage of oil and gas?

No Yes **If yes, you must attach a list of all state and federal laws and rules and regulations**

Step 13 of 15 - Maps and Drawing Instructions

Note: OCM Compiled Plats consist of a complete and current set of plats that have been pieced together by OCM using only the most current portions of the plat files provided by the applicant/agent. All out-of-date plats have been excluded.

20150313_VioletCanalNorthRealignmentPhase2-CoastalUsePermit.pdf

03/20/2015 12:57:01 PM

Step 14 of 15 - Payment

The fee for this permit is: \$ 100.00

Step 15 of 15 - Payment Processed

Applicant Information

Applicant Name: Southeast Louisiana Flood Protection Authority - East
Address: 2045 Lakeshore Drive
Room 422
New Orleans, LA 70122

To the best of my knowledge the proposed activity described in this permit application complies with, and will be conducted in a manner that is consistent with the Louisiana Coastal Resources Program. If applicable, I also certify that the declarations in Step 12c, oil spill response, are complete and accurate.



Louisiana Department of Natural
Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

Landowners List

Landowner

Alfred J. Ramirez
2100 Repose Street
Violet, LA 70092

Landowner

Charles Allen McKay, Jr.
2526 Pakenham Drive
Violet, LA 70092

Landowner

Freda Garcia Bauer and Peter S. Bauer
2522 Pakenham Drive
Violet, LA 70092

Landowner

Gulf Quality, Inc.
P. O. Box 188
Violet, LA 70092

Landowner

Peggy Garcia Henery
2521 General Pershing
Violet, LA 70092

Landowner

Quality Shrimp Packers, Inc.
5165 Caroline Street
Lafitte, LA 70067



Louisiana Department of Natural
Resources
Office of Coastal Management

Joint Permit Application For Work Within the Louisiana Coastal Zone



U.S. Army Corps of Engineers
(COE)
New Orleans District

Landowner

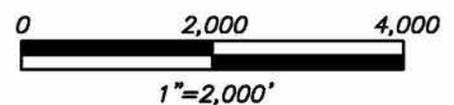
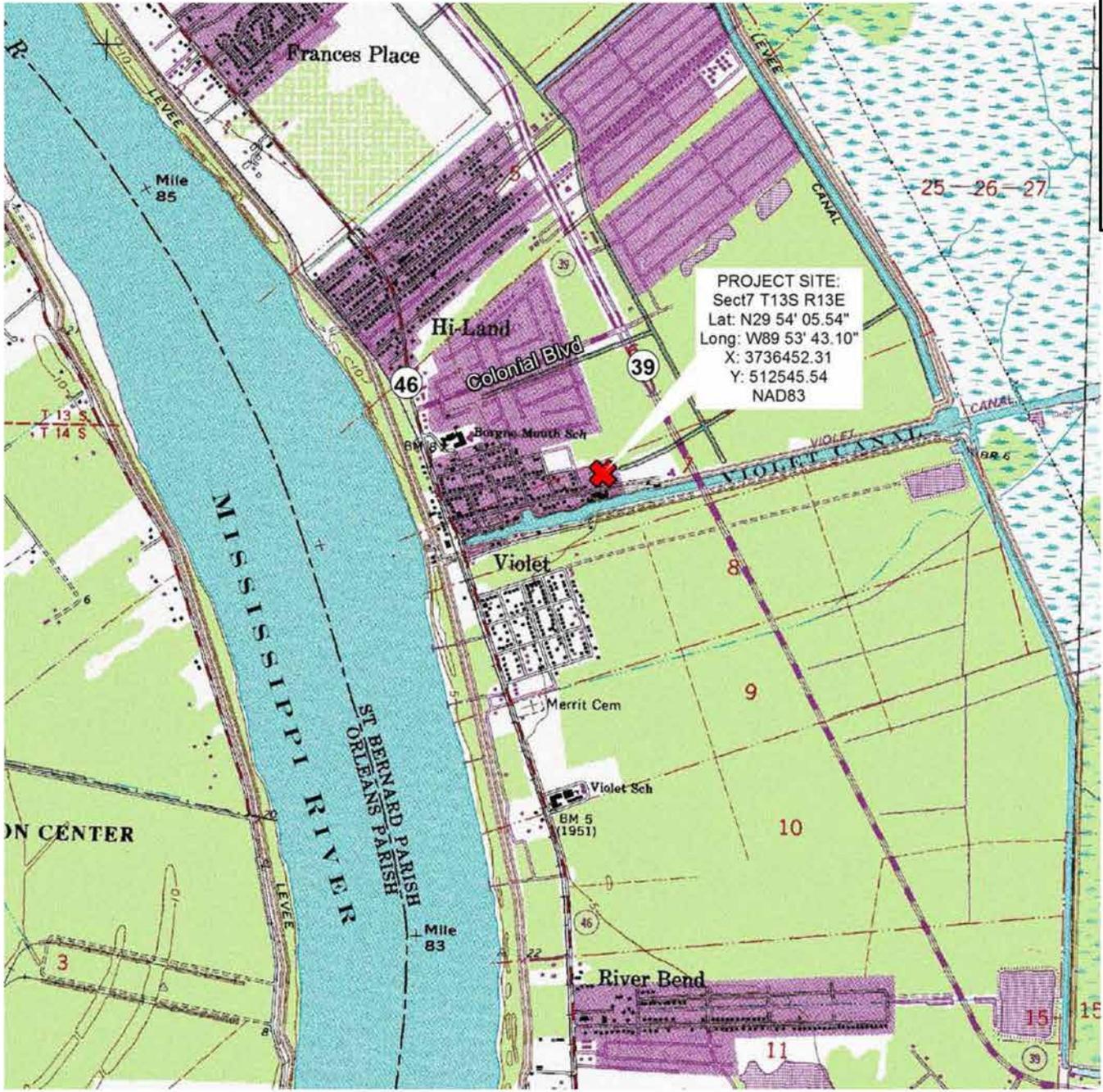
Todd J. Adams

2195 Jacob Drive

Chalmette, LA 70043

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.



TETRA TECH, INC.
 17885 Von Karman Avenue, Suite 500
 Irvine, CA 92614
 Phone (949) 809-6000, FAX (949) 809-6003

**SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY-EAST**
VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA

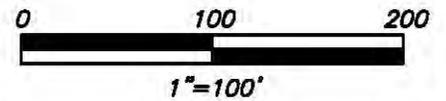
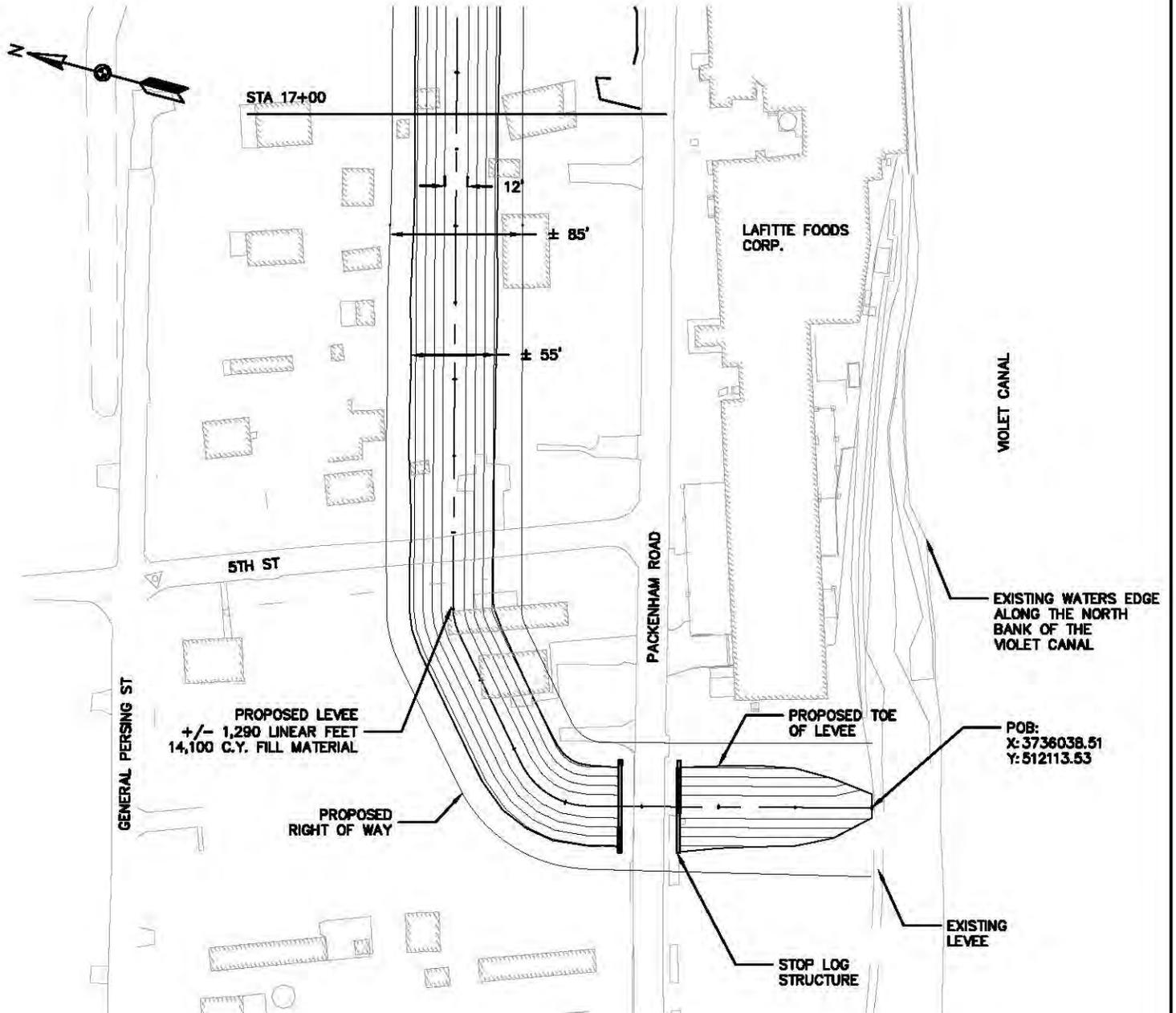
APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
 DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

VICINITY MAP

DATE:	03/13/2015
SHEET:	01 OF 04
SCALE:	1" = 2,000'

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.



NOTES:

1. NO PROJECT WORK WILL OCCUR IN THE VIOLET CANAL.
2. ALL FILL MATERIAL WILL SUPPLIED FROM AN OFF SITE LOCATION.



TETRA TECH, INC.
 17885 Von Karman Avenue, Suite 500
 Irvine, CA 92614
 Phone (949) 809-5000, FAX (949) 809-5003

**SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY-EAST**
VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA

APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
 DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

PLAN VIEW

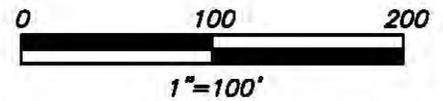
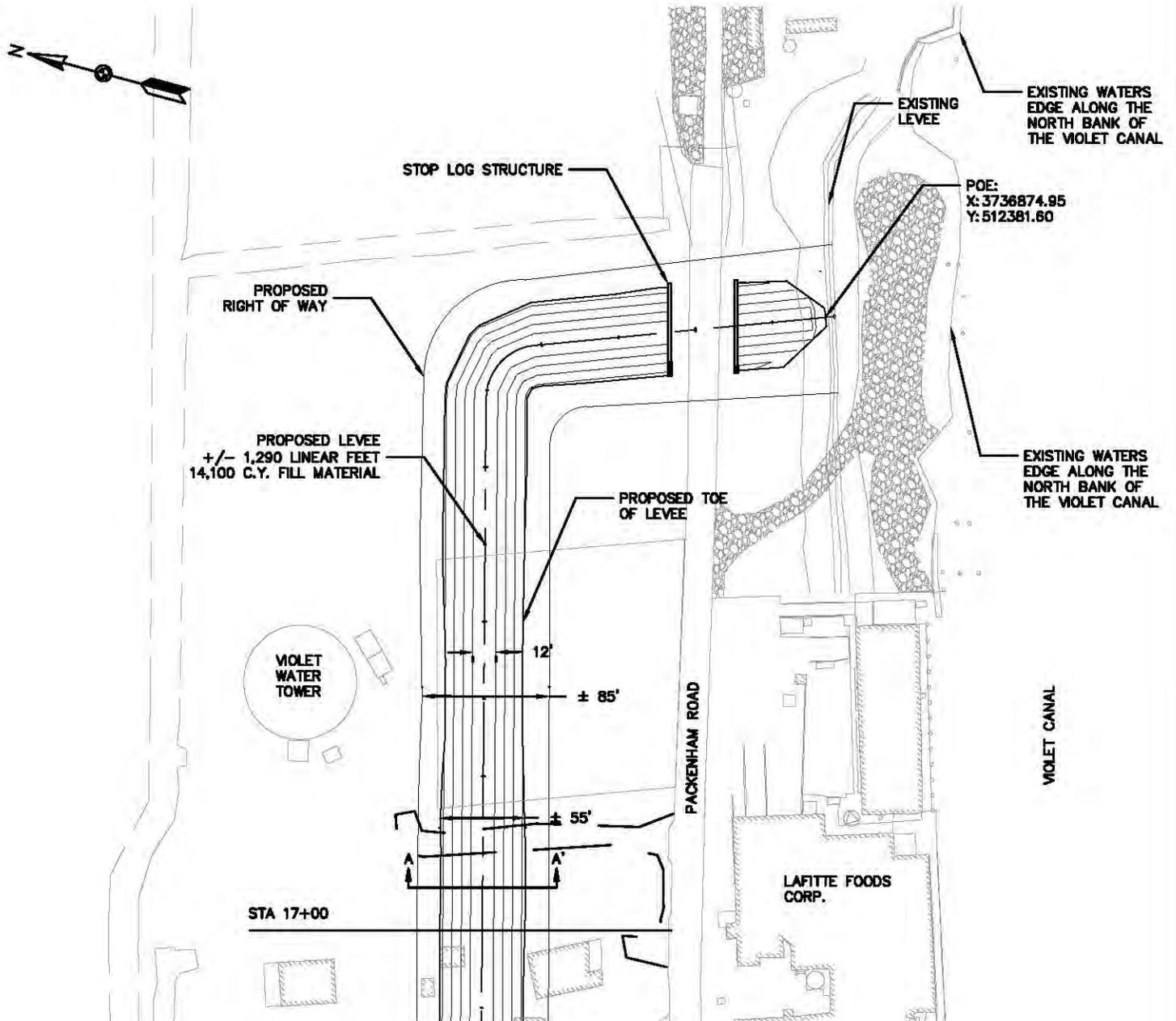
DATE: 03/13/2015

SHEET: 02 OF 04

SCALE: 1" = 100'

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA SECTION 7, TOWNSHIP 13S., RANGE 13E.



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TETRA TECH, INC.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614
Phone (949) 808-5000, FAX (949) 808-5003

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY-EAST VIOLET CANAL NORTH REALIGNMENT PHASE 2 SAINT BERNARD PARISH, LOUISIANA

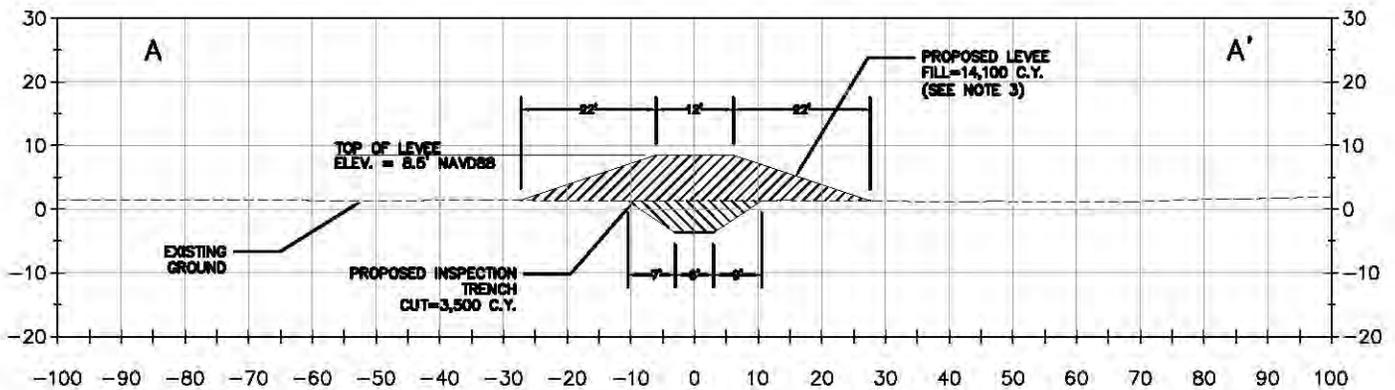
APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

PLAN VIEW

DATE:	03/13/2015
SHEET:	03 OF 04
SCALE:	1" = 100'

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

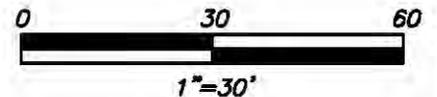
SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.



-  FILL AREA
-  CUT AREA

CROSS SECTION
A-A'

- NOTES:**
1. SIDE SLOPES OF LEVEE FILL ARE EQUAL TO 3H:1V.
 2. INSPECTION TRENCH SIDE SLOPES ARE EQUAL TO 1.5H:1V.
 3. PROPOSED LEVEE FILL = FILL ABOVE EXISTING GROUND + FILL TO ENCLOSE THE INSPECTION TRENCH.



TETRA TECH, INC.
 17885 Von Karman Avenue, Suite 500
 Irvine, CA 92614
 Phone (949) 809-5000, FAX (949) 809-5003

**SOUTHEAST LOUISIANA FLOOD
 PROTECTION AUTHORITY-EAST**
VIOLET CANAL NORTH REALIGNMENT PHASE 2
 SAINT BERNARD PARISH, LOUISIANA

APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
 DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

CROSS SECTION

DATE:	03/13/2015
SHEET:	04 OF 04
SCALE:	1" = 30'



State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT

03/25/2015

TETRA TECH/BENJAMIN RICHARD
748 MAIN STREET B
BATON ROUGE, LA 70802
Attn: Benjamin Richard

RE: P20150290, Coastal Use Permit Application
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY - EAST
Description: Levee improvements will raise the level of protection to an elevation of 8.5 feet to meet the FEMA freeboard requirements with an additional 1.5-feet of protection, thus allowing the levee to be accredited on the FEMA Flood Insurance Rate Maps (FIRMS). Approx. 3,500 cu yds of native material will be excavated and 14,100 cu yds of dirt material will be hauled-in and used as fill.

Location: Lat 29° 54' 5.54"N / Long -89° 53' 43.1"W; Section 7, T13S-R13E; Violet, LA.
Saint Bernard Parish, LA

Dear Benjamin Richard:

After careful review of your application for a Coastal Use Permit, we have determined that we are unable to continue the processing of the application until we receive the following information:

Project Specific Requirements

A new OCM policy (La. RS 49:214.27.B & C) requires that all applications must be reviewed for potential impacts to surface waters. A Hydrologic Modification Impact Analysis (HMIA) has been developed to investigate pre- and post-development surface water conditions to determine if adverse impacts to adjacent lands and/or waterways will occur as a result of the proposed project. Proposed activities submitted in your application qualify under the Intermediate Modification Level (Level 2). Level 2 projects must identify existing surface water

discharge patterns, quantity and rate and affected water quality parameters. A HMIA must explain how the development will modify existing conditions and must identify measures taken to reduce adverse impacts resulting from the modifications. The Level 2 HMIA shall include, at a minimum, the following:

Hydrology:

1. A map showing existing and proposed water flow patterns.
2. Identification of the design storm event and the drainage network to be impacted.
3. Information relative to the pre-and post-project volume/rate of runoff expected for the design storm event.
4. Information on the pre- and post-project hydrologic conditions, including at a minimum, local topography, slope, surface condition, drainage pattern, response to storm event, etc.
5. A discussion of how the runoff identified in #4 above will affect adjacent and other properties and the existing drainage network.
6. Identification of measures to be taken to lessen impact on adjacent and other properties and the existing drainage network.

Water Quality:

1. Identification of water quality parameters to be affected by the proposed development (TSS and other applicable parameters.)
2. Identification of the steps, procedures and/or BMPs to be used to lessen point source and non-point source impacts on surface water quality.
3. Identification of the necessary permits to be obtained from other federal, state and local authorities.

This information is being requested pursuant to the Louisiana Administrative Code, Title 43, Part I, Chapter 7, § 723.c.7 and must be submitted within 30 days of the date of this letter. In accordance with the Rules and Procedures for Coastal Use Permits, Part III G(1), we will resume processing your application when the above information is received. Further information may be required based, on your answers to the above questions or to questions which may arise during processing.

P20150290, Coastal Use Permit Application
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY - EAST
03/25/2015
Page 3

Please refer to the above Coastal Use Permit number when responding to this request. If you have any questions, call me at (225) 342-6859.

Sincerely,



Crystal Dunn
Permit Analyst

CD

cc: Martin Mayer, COE w/attachment
SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY - EAST



REPLY TO
ATTENTION OF

Operations Division
Surveillance and Enforcement Section

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

JUN 09 2015

Mr. Benjamin Richard
Tetra Tech
748 Main Street, Suite B
Baton Rouge, LA 70802

Dear Mr. Richard:

Reference is made to your application, on behalf of Southeast Louisiana Flood Protection Authority-East, for a Department of the Army (DA) to construct 1,290 linear feet of levee (Violet Canal North Realignment Phase 2) along Packenham Drive, north of the Violet Canal on property located in Section 7, Township 13 South, Range 13 East, St. Bernard Parish, Louisiana (enclosed map).

Based on review of recent maps, aerial photography, soils data, and the information provided with your application, we have determined that the specific site of your project is not in a wetland subject to U.S. Army Corps of Engineers' jurisdiction. A DA permit under Section 404 of the Clean Water Act will not be required for the deposition or redistribution of dredged or fill material on this site. Therefore, we are returning your application. Any changes or modifications to the proposed project will require a revised determination.

You and your client are advised that this approved jurisdictional determination is valid for a period of 5 years from the date of this letter unless new information warrants revision prior to the expiration date or the District Commander has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

Please be advised that this property is in the Louisiana Coastal Zone and a Coastal Use Permit may be required prior to initiation of any activities on this site. For additional information, contact Ms. Christine Charrier, Office of Coastal Management, Louisiana Department of Natural Resources at (225) 342-7953.

Additionally, federal projects are known to exist in this area that may require your proposal to undergo further engineering review. For more information, please contact Mr. Ray Newman of our Operations Division at (504) 862-2050.

Should there be any questions concerning these matters, please contact Mr. Kyle Gordon at (504) 862-1627 and reference our Account No. MVN-2015-00979-SK. If you

have specific questions regarding the permit process or permit applications, please contact our Eastern Evaluation Section at (504) 862-2292.

Sincerely,



 Martin S. Mayer
Chief, Regulatory Branch

Enclosures

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.

USACE

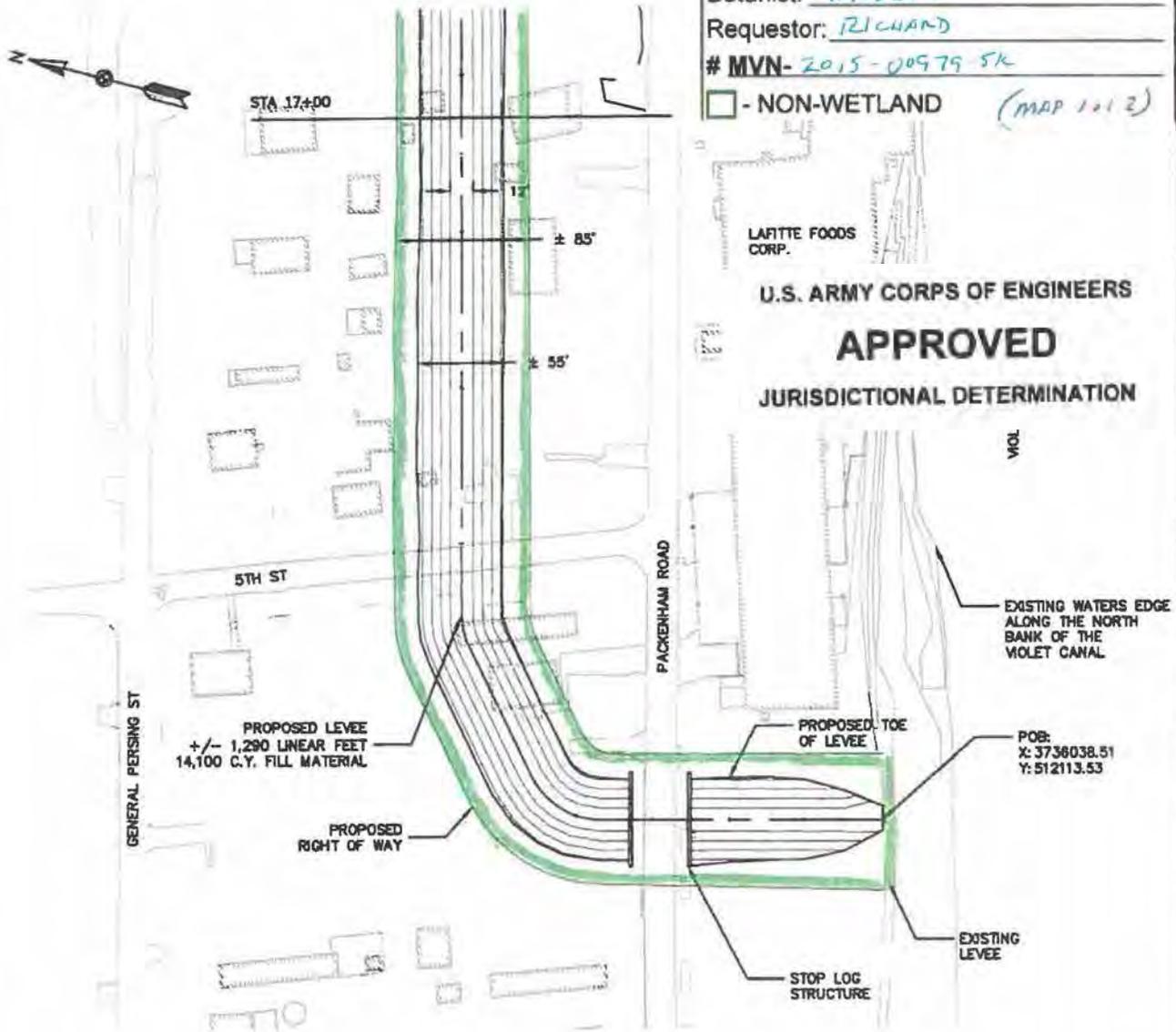
FSV 1 (H) Date: 5/26/15

Botanist: WINDUAIN

Requestor: RICHARD

MVN-2015-00979 SK

- NON-WETLAND (MAP 1012)



U.S. ARMY CORPS OF ENGINEERS
APPROVED
JURISDICTIONAL DETERMINATION

PROPOSED LEVEE
+/- 1,290 LINEAR FEET
14,100 C.Y. FILL MATERIAL

PROPOSED RIGHT OF WAY

PROPOSED TOE OF LEVEE

POB:
X: 3736038.51
Y: 512113.53

EXISTING LEVEE

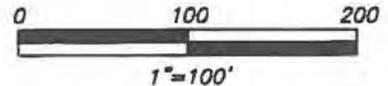
STOP LOG STRUCTURE

VOL

EXISTING WATERS EDGE
ALONG THE NORTH
BANK OF THE
VIOLET CANAL

NOTES:

1. NO PROJECT WORK WILL OCCUR IN THE VIOLET CANAL.
2. ALL FILL MATERIAL WILL SUPPLIED FROM AN OFF SITE LOCATION.



TETRA TECH, INC.
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Irvine, CA 92614
Phone: (949) 509-5000 FAX: (949) 809-5003

**SOUTHEAST LOUISIANA FLOOD
PROTECTION AUTHORITY-EAST**
VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA

APPLICATION BY
DATE 03/27/2015

SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
VIOLET, SAINT BERNARD PARISH, LOUISIANA

PLAN VIEW

DATE 03/13/2015

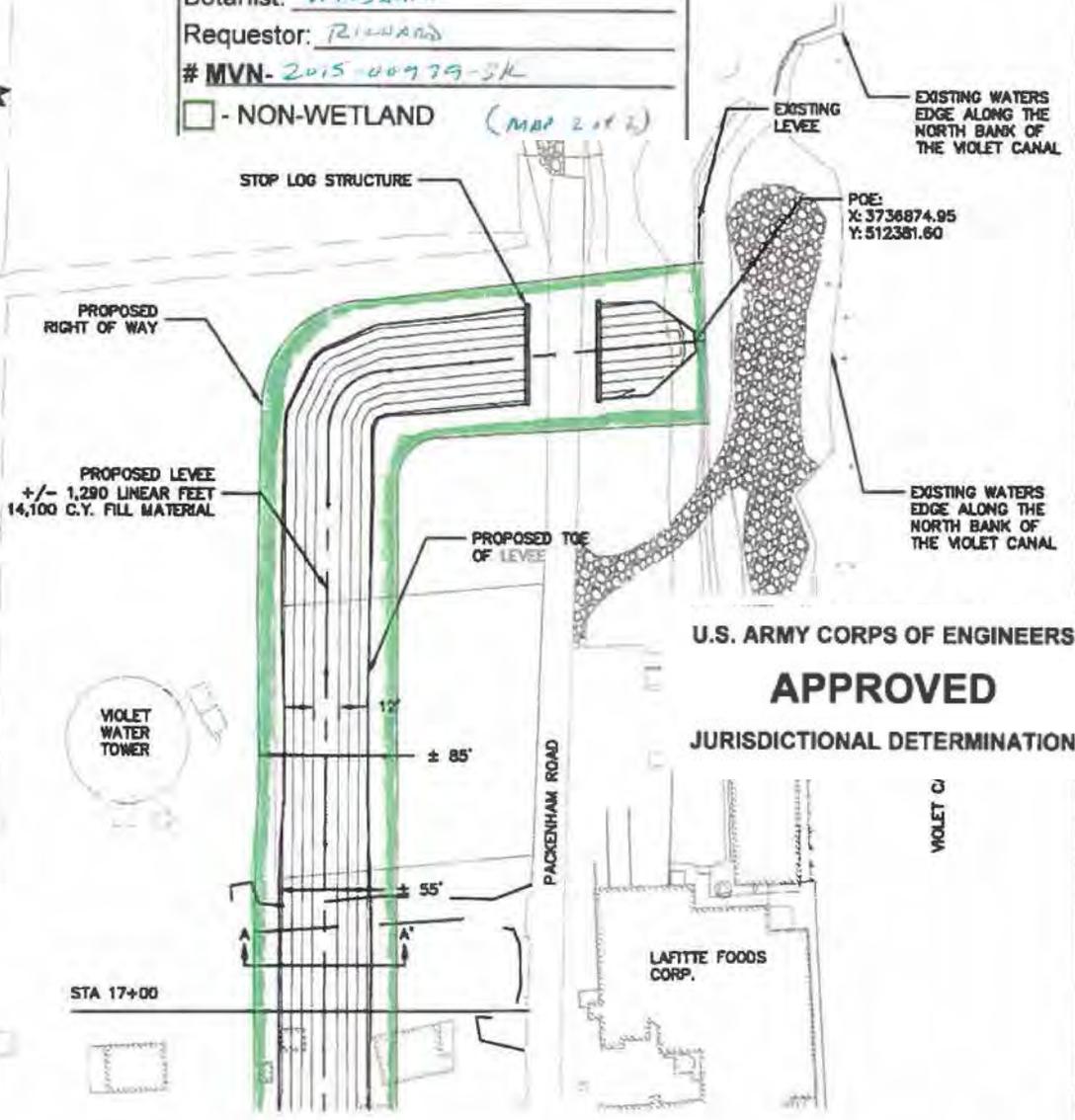
SHEET: 02 OF 04

SCALE: 1" = 100'

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

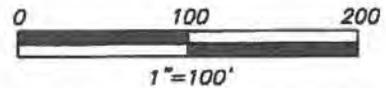
SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.

USACE
 FSV 1 (H) Date: 5/20/15
 Botanist: WINDHAM
 Requestor: RICHARD
 # MVN-2015-00979-SK
 - NON-WETLAND (MAP 2 of 2)



U.S. ARMY CORPS OF ENGINEERS
APPROVED
JURISDICTIONAL DETERMINATION

- NOTES:**
 1. NO PROJECT WORK WILL OCCUR IN THE VIOLET CANAL.
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TETRA TECH, INC.
 17895 Von Kerman Avenue, Suite 500
 Irvine, CA 92614
 Phone (949) 809-5000 FAX (949) 809-5003

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY-EAST
VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA

APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY EAST
 DATE: 02/27/2015 VIOLET SAINT BERNARD PARISH LOUISIANA

PLAN VIEW

DATE:	03/13/2015
SHEET:	03 OF 04
SCALE:	1" = 100'



Louisiana Department of Natural
Resources
Office of Coastal Management
(OCM)

Joint Permit Application

For Work Within the Louisiana
Coastal Zone



U.S. Army Corps Of Engineers
(COE)
New Orleans District

Print Application

Permit Number: P20150290

Date Received: 03/20/2015

Step 1 of 15 - Applicant Information

Applicant/Company Name: Southeast Louisiana Flood Protection Authority - East **Applicant Type:** GOVERNMENT AGENCY

Mailing Address: 2045 Lakeshore Drive
Room 422
New Orleans, LA 70122

Contact Information: Robert Turner

Daytime: 504 280 2411 **Fax:** 205 280 2412 **Contact Email:** rturner@slfpae.com

Step 2 of 15 - Agent Information

Company Name: Tetra Tech/Benjamin Richard

Mailing Address: 748 Main Street
Suite B
Baton Rouge, LA 70802

Contact Information: Benjamin Richard

Daytime: 225 383 1780 **Fax:** 225 387 0203 **Contact Email:** benjamin.richard@tetrattech.com

Step 3 of 15 - Permit Type

Coastal Use Permit (CUP) Solicitation of Views (SOV) Request for Determination (RFD)

Step 4 of 15 - Pre-Application Activity

a. Have you participated in a Pre-Application or Geological Review Meeting for the proposed project?

APPROVED JURISDICTIONAL DETERMINATION FORM

U.S. Army Corps of Engineers

To view the unedited version of the form go to: <http://www.mvn.usace.army.mil/regulatory/finalform.htm>.

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): May 20, 2015

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: MVN-2015-00979-SK

C. PROJECT LOCATION AND BACKGROUND INFORMATION: Violet Canal North Realignment Phase 2

State: LA County/parish/borough: St. Bernard City: Violet
Center coordinates of site (lat/long in degree decimal format): Lat. 29.90150° N, Long. -89.89530° W.
Universal Transverse Mercator:

Name of nearest waterbody: Violet Canal

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: N/A

Name of watershed or Hydrologic Unit Code (HUC): 08090203

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date: May 20, 2015

Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

SECTION III THRU V. Not Applicable

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:

Data sheets prepared/submitted by or on behalf of the applicant/consultant.

Office concurs with data sheets/delineation report.

Office does not concur with data sheets/delineation report.

Data sheets prepared by the Corps:

Corps navigable waters' study:

U.S. Geological Survey Hydrologic Atlas:

USGS NHD data.

USGS 8 and 12 digit HUC maps.

U.S. Geological Survey map(s). Cite scale & quad name: Chalmette.

USDA Natural Resources Conservation Service Soil Survey. Citation: St. Bernard NRCS WSS.

National wetlands inventory map(s). Cite name:

State/Local wetland inventory map(s):

FEMA/FIRM maps:

100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)

Photographs: Aerial (Name & Date): 1995-2013 ArcMap.

or Other (Name & Date):

Previous determination(s). File no. and date of response letter:

Applicable/supporting case law:

Applicable/supporting scientific literature:

Other information (please specify): 2015-00866-SA.

B. ADDITIONAL COMMENTS TO SUPPORT JD: The project site consist of uplands.

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: Southeast Louisiana Flood Protection	File No.: MVN-2015-00979-SK	Date: JUN 09 2015
Attached is:		See Section below
<input type="checkbox"/>	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/>	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/>	PERMIT DENIAL	C
<input checked="" type="checkbox"/>	APPROVED JURISDICTIONAL DETERMINATION	D
<input type="checkbox"/>	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Mr. Rob Heffner
Chief, Surveillance and Enforcement Section
U.S. Army Corps of Engineers, New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267
504-862-1288

If you only have questions regarding the appeal process you may also contact the Division Engineer through:

Mr. Thomas McCabe
Administrative Appeals Review Officer
Mississippi Valley Division
P.O. Box 80 (1400 Walnut Street)
Vicksburg, MS 39181-0080
601-634-5820 FAX: 601-634-5816

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date: _____

Telephone number: _____

Richard, Brady

From: Richard, Ben
Sent: Wednesday, May 20, 2015 9:00 AM
To: Richard, Brady; Sexton, Patti
Subject: FW: P20150290 - Processing Complete

Please see below for the Phase 2 Authorization.

Benjamin Richard

Office: 225.383.1780 | Cell: 225.229.0935
benjamin.richard@tetrattech.com

From: Office of Coastal Management [mailto:bpel.mail@la.gov]
Sent: Wednesday, May 20, 2015 8:58 AM
To: CRAIG.LEBLANC@LA.GOV; FRANK.COLE@LA.GOV; Richard, Ben; WMCCARTNEY@SBPG.NET;
DBUTLER@WLF.LA.GOV; BILLY.WALL@LA.GOV; CRYSTAL.DUNN@LA.GOV; RTURNER@SLFPAE.COM;
UCM_MAIL@LA.GOV
Subject: P20150290 - Processing Complete



If you would like to respond, provide comment or contact someone about this application please click the OCM Analyst name below to send an email to the permit analyst, use the "Make Comments" link below to post a comment to the administrative record or call the OCM Analyst at 225-342-7591 or 800-267-4019. Be sure to reference your P# as found in the subject of this email. Do not use the "reply" button to respond to this email as this account is not monitored for incoming messages.

Coastal Use Permit Application Information

Applicant: Southeast Louisiana Flood Protection Authority - East
Project: Violet Canal North Realignment Phase 2
Project Parish(es): SAINT BERNARD

OCM Analyst: crystal.dunn@la.gov
Final Determination: Exempt
Application Modification: Modified step 10 of the application form. No changes to project scope. 5/18/15 cd

Processing of the above application has been completed. Click the link below to view the final determination:

[Authorization](#)

From: Gutierrez, Raul [mailto:Gutierrez.Raul@epa.gov]
Sent: Tuesday, April 19, 2016 12:39 PM
To: Smith-Jones, Kimberly
Subject: RE: Scoping Notification/Solicitation of Views

The U.S. Environmental Protection Agency (EPA) has completed your request for a solicitation of views concerning the 40 Arpent Levee System in Verret, Louisiana. The scope of the work for the project includes construction of a levee which would tie into the existing levees of St. Bernard Parish. The comments that follow are being provided relative to the EPA's *404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230)* and *Executive Order 11990*.

Our preliminary review revealed that jurisdictional waters of the U.S. do occur on the proposed site, namely the Violet Canal and areas adjacent to it. At this time, the EPA does not object to the project as proposed and recommends coordination with the U.S. Army Corps of Engineers at the New Orleans District Office to verify which permits are needed. Thanks for the opportunity to review the proposed project. If you have any questions or would like to discuss the issue further, please do not hesitate to contact me at (504) 862-2371.

Raul Gutierrez, Ph.D.
Wetlands Section (6WQ-EM)
US EPA Region 6
(504) 862-2371

Office:
US Army Corps of Engineers
New Orleans District
CEMVN-OD-SC
Post Office Box 60267
New Orleans, Louisiana 70160-0267



U.S. Department of Homeland Security
FEMA

Federal Emergency Management Agency
FEMA-1603/1607 -DR-LA
FEMA Louisiana Recovery Office
Environmental/Historic Preservation
1500 Main Street
Baton Rouge, LA 70802

March 4, 2016

Phillip E. Boggan II
State Historic Preservation Officer
Department of Culture, Recreation & Tourism
P.O. Box 44247
Baton Rouge LA 70804

RE: Section 106 Review Consultation, Hurricane Katrina, FEMA-1603-DR-LA

Applicant: Lake Borgne Basin Levee District

Undertaking: St. Bernard Basin Back Protection Levee System Extension at Violet, LA
(HMA-1603-0438)

Determination: No Historic Properties Affected

Dear Mr. Boggan II:

The Federal Emergency Management Agency (FEMA) will be providing funds authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended, in response to the following major Disaster Declarations:

FEMA-1603-DR-LA, dated August 29, 2005, as amended.

FEMA, through its Hazard Mitigation Assistance Program, proposes to fund the St. Bernard, Basin Back Protection Levee System Extension at Violet, LA (HMA-1603-0438)(Undertaking) as requested by the Lake Borgne Basin Levee District (LBBLD) (Applicant). FEMA is initiating Section 106 review for the above referenced properties in accordance with the Louisiana State-Specific Programmatic Agreement among FEMA, the Louisiana Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), the Louisiana State Historic Preservation Officer of the Department of Culture Recreation and Tourism (SHPO), the Alabama-Coushatta Tribe of Texas (ACTT), the Chitimacha Tribe of Louisiana (CTL), the Choctaw Nation of Oklahoma (CNO), the Jena Band of Choctaw Indians (JBCI), the Mississippi Band of Choctaw Indians (MBCI), the Seminole Tribe of Florida (STF), and the Advisory Council on Historic Preservation (ACHP) regarding FEMA's Hazard Mitigation Grant Program (2011 LA HMGP PA) dated January 31st, 2011 and providing the State Historic Preservation Office with the opportunity to consult on the proposed Undertaking. Documentation in this letter is consistent with the requirements in 36 CFR §800.11(d).

Description of the Undertaking

This undertaking was developed in order to have the non-federal Back Protection Levee System (BPLS) incorporated into the federal hurricane protection system and included in the forthcoming Flood Insurance Rate Maps (FIRMs) for St. Bernard and Orleans parishes. In order to have the BPLS federally accredited, the LBBLD is required to conduct a complete assessment of the current system

and correct any deficiencies identified during this inspection. This assessment is nearly complete, with the exception of a 1,200 foot stretch of levee along the upriver bank of the Violet Canal (Figure 1). At this location, the Lafitte Frozen Foods Company (constructed ca. 1920) straddles the BPLS, making this portion of the levee inaccessible. To meet the federal requirements, the LBBLD proposes construction of a new earthen levee, approximately 1,700 feet in length that would attach to the existing BLPS at two points, completely enclosing the inaccessible portion of the existing levee and the Lafitte Frozen Foods Company (Figure 2). This undertaking would effectively: 1) close the loop in the BLPS, thereby providing an additional layer of 100-year flood protection for the entire St. Bernard Basin; and 2) allow the BPLS to be federally accredited and factored into the pending FIRMs for St. Bernard and Orleans parishes.

To successfully construct the proposed BPLS extension, the following project activities and improvements are proposed as part of this project:

1. Acquiring five (5) adjacent residential lots where the proposed BPLS will be constructed;
2. Demolishing two (2) existing residential structures, clearing and grubbing existing trees and vegetation;
3. Relocating existing utilities;
4. Planting vegetation on 4.5 acres of the surface area on the project site;
5. Installing two (2) stop log (gate) structures;
6. Constructing an access road to the nearby water tower; and
7. Installing various drainage improvements on the project site.

Area of Potential Effects (APE)

In accordance with Stipulation VII.B of the 2011 HMGP PA, this letter serves as consultation for both the proposed Undertaking and the delineation of the APE. The APE for standing structures is incorporates direct effects (access, staging, and construction areas) and indirect effects (visual) for the properties within the immediate view shed. The archaeological APE encompasses the entire footprint of the proposed new levee, an area measuring approximately 6.08 acres or 2.45 hectares (Figures 3 and 4).

Identification and Evaluation

Historic Properties within the APEs were identified based on FEMA's review of the National Register of Historic Places (NRHP) database, the Louisiana Cultural Resources Map, historic map research, and site visits conducted on March 31, 2015 and January 19, 2016 by FEMA Historic Preservation staff. This data was evaluated by FEMA using the National Register (NR) Criteria. There are no previously recorded archaeological sites within the defined APE for this Undertaking. However, there are two recorded archaeological sites located nearby: 16SB123 and 16SB105. The latter consists of the remains of the Lake Borgne Canal Lock. It is no longer operable and is now blocked by the levee. The site was recorded by Iroquois Research Institute during a 1982 survey conducted for the U.S. Army Corps of Engineers. They did not consider the site eligible for inclusion in the NRHP, and it will not be affected by the current proposed Undertaking (this survey is discussed in greater detail below). 16SB123 consists of the sugar mill remains of the Guichard Plantation. The original site form described the area around the mill ruins as having little research potential due to heavy disturbance around the site area. However, since the site was not specifically listed as non-NRHP eligible, FEMA treated the site as potentially eligible and conducted archaeological monitoring and both pre- and

post-demolition inspections at 25 addresses located within or adjacent to the site polygon (FEMA consultation letter dated July 17, 2007). No evidence of the site was recorded at any of these localities and a subsequent site update form list the site as “destroyed.” While none of these inspections occurred within the current APE, many of them were located only one block to the west, along Pakenham Road, between 3rd and 4th Streets.

Two prior cultural resources were conducted partially within the existing APE (Figure 5). The first is the aforementioned 1982 survey conducted by Iroquois Research Institute (IRI) (Garson, et al. 1982). This survey was conducted on behalf of the Corps of Engineers in association with construction of 14 concrete revetments and/or levee enlargements along the main channel of the Mississippi River. Based on geomorphic analysis, IRI divided portions of their study area into high and low probability areas in terms of archaeological survey effort. The current APE falls into IRI’s Item 15 (Poydras revetment) which was surveyed at a high probability level. In total for this Item, IRI surveyed 203 acres along the River batture, including the Violet Canal. Although Garson and his team did conduct sub-surface testing in “selected” areas, it is unclear exactly how many such tests were conducted within the present APE, and no sites were identified within the current APE.

The second relevant cultural resource survey was conducted by R. Christopher Goodwin and Associates (RCGA) in 2006 (Handley, et al. 2006). This work was also conducted for the Corps of Engineers in association with levee repairs following Hurricane Katrina. RCGA conducted a review of cartographic, archival, and archaeological data for the study area and performed a field reconnaissance consisting of windshield and limited pedestrian survey. Based on their analysis, RCGA initially considered the area along both sides of the Violet Canal as high probability areas, and therefore conducted a reconnaissance level windshield survey of the area. However, following this reconnaissance RCGA determined that the area did not warrant sub-surface investigation, citing significant impacts through commercial and industrial development adjacent to the Canal.

Despite the negative findings of previous cultural resource investigations in the vicinity, FEMA archaeologists performed additional investigations within the project APE in association with this Undertaking. Fieldwork was performed on January 19, 2016, at which time two sub-surface shovel tests were conducted (Figure 3 and Figure 4). Shovel test 1 was placed near the approximate center of the APE, between 5th and 6th streets, in a now-vacant lot. This test encountered sand fill in the upper 10cm (probably representing post-demolition fill and grading). This stratum was underlain by a dense layer of oyster shell, both whole and fragmented, within a silty clay matrix extending to 27cm below surface. From 27-50cm below surface, sediments consisted of silty clay with some decomposed brick “smear;” one piece of machine made bottle glass was recovered from this stratum. From 52-60cm was a dense bluish gray clay, with the water table encountered at 60cm below surface.

Shovel test 2 was located in the eastern project area, in a vacant lot next to a paved parking area near the water-tower. It encountered similar stratigraphy to shovel test 1: from 0-35 cm was a clean sand fill; 35-50 cm was a dense layer of oyster shell within a silty clay matrix; and from 50-55 cm was a blue-gray clay. No artifacts were recovered from this shovel test. A local resident informed us that just to the north where this test was excavated was a former swimming pool, now filled in.

Also of note within the project APE were disturbances in the form of both current and former utility lines, including underground water and gas lines to the former residences. Most of the former

structures in the area were modular homes with septic tank sewage disposal systems, resulting in additional disturbance throughout the APE. Based upon the negative findings of prior cultural resource surveys in the area, the extensive archaeological monitoring performed in the vicinity, and the negative results of the current field investigations, it is FEMA's opinion that the likelihood of encountering significant archaeological resources within the APE is minimal.

Standing Structures

Based on background research, it was determined that none of the properties within the project area are located within a listed or eligible National Register Historic District, nor are they located within the viewshed of a property individually listed in the NRHP. It should be noted that according to the project scope of work five residential lots will be acquired. Situated on four of the five lots to be acquired are residences with associated outbuildings, two of which are modern c. 1990s manufactured homes which will be relocated elsewhere outside of the project area (Figure 6 and Figure 7). The remaining two residences constructed c. 1995 and c. 2007 located within the identified APE boundary will be demolished according to project plans (Figure 8 and Figure 9). The viewshed from the project APE/ earthen levee to be constructed consists of four residential blocks which encompasses a portion of Fourth and Fifth Streets and a disconnected portion of Sixth Street and what would be Seventh Street (Figure 4). A pedestrian survey conducted January 19, 2016 of the standing structures APE along with reviewing historic aerials revealed that the surrounding neighborhood is comprised of modern c. 1990s - 2010s manufactured homes and c. 1970s - 2000s single family residences. Additionally, FEMA has prepared a written Determination of Eligibility (DOE) according to NRHP criteria for one (1) property that is over fifty years of age (Lafitte Frozen Foods Processing Plant) located at 2521 Packerham Road in Violet (see Attachment) and has determined that the building is neither individually eligible for listing in the NRHP, nor does it contribute to a National Register listed or eligible Historic District.

Assessment of Effects

Based on the aforementioned identification and evaluation, FEMA has determined that there are no historic properties as defined in 36 CFR 800.16(1) within the APE. Therefore, FEMA has determined a finding of **No Historic Properties Affected** for this Undertaking and is submitting this Undertaking to you for your review and comment. FEMA requests your comments within 15 days.

We look forward to your concurrence with this determination. Should you have any questions or need additional information regarding this undertaking, please contact me Kathryn Wollan, Lead Historic Preservation Specialist at (504) 289-1941 or kathryn.wollan@fema.dhs.gov or Jason Emery, Lead Historic Preservation Specialist at (504) 570-7292 or jason.emery@fema.dhs.gov.

Sincerely,

JERAME J
CRAMER

Digitally signed by JERAME J CRAMER
DN: c=US, o=U.S. Government, ou=Department
of Homeland Security, ou=FEMA, ou=People,
cn=JERAME J CRAMER,
0.9.2342.1.9200300.100.1.1=0972893910.FEMA
Date: 2016.03.04 12:47:22 -06'00'

Jeramé J. Cramer
Environmental Liaison Officer
FEMA-DR-1603-LA, FEMA-DR-1607-LA

No known historic properties will be affected by this undertaking. Therefore, our office has no objection to the implementation of this project. This effect determination could change should new information come to our attention.



Phil Boggan
State Historic Preservation Officer

Date

04/27/2016

Page 5 of 12
March 4, 2016
Violet BPLS HMA-1603-0438

CC: File
Division of Archaeology Reviewer
Division of Historic Preservation Reviewer
State Historic Preservation Office

Enclosures

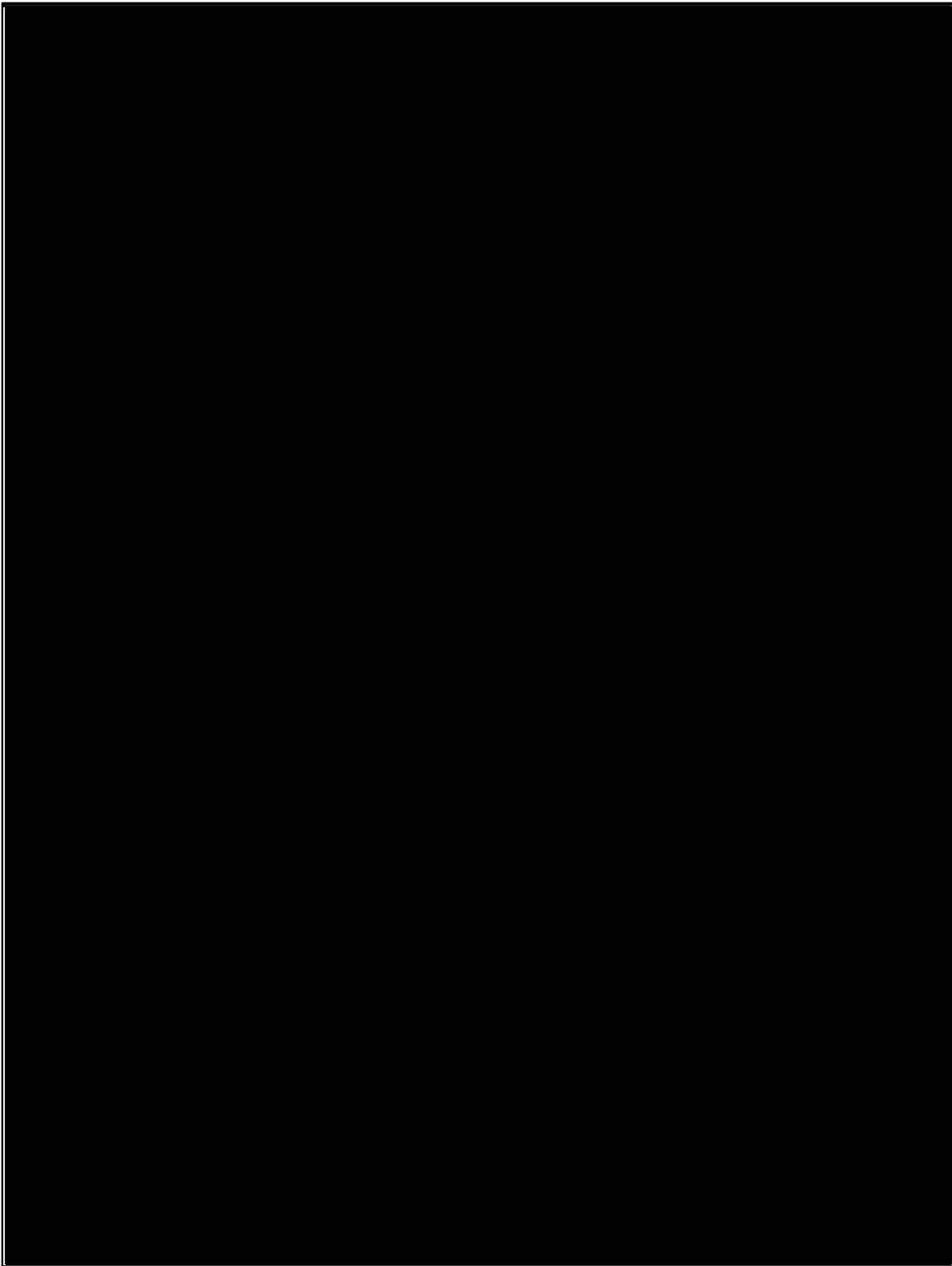


Figure 1. Project location and nearby archaeological sites

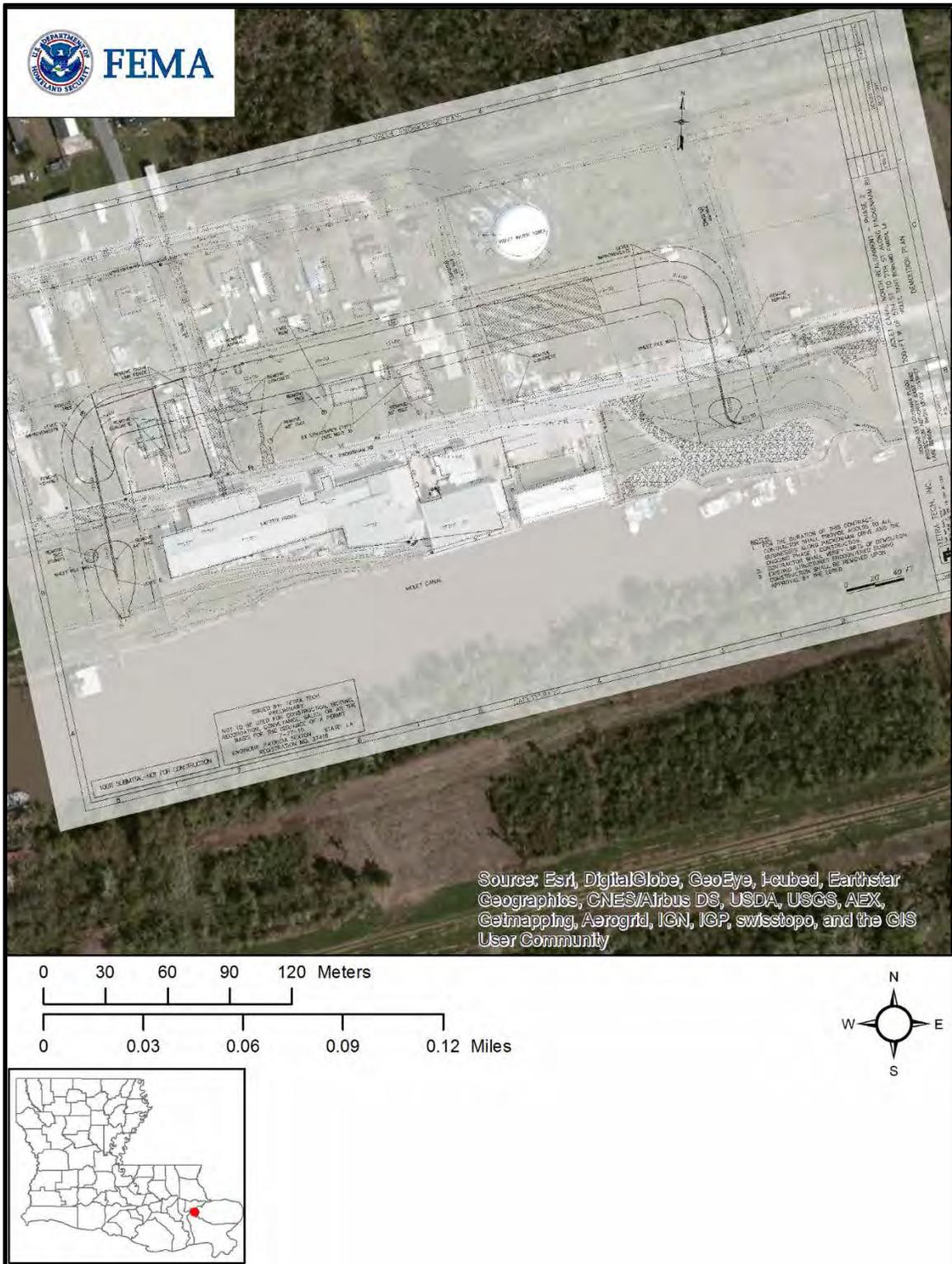


Figure 2. Levee extension plans overlaid on aerial of project area.

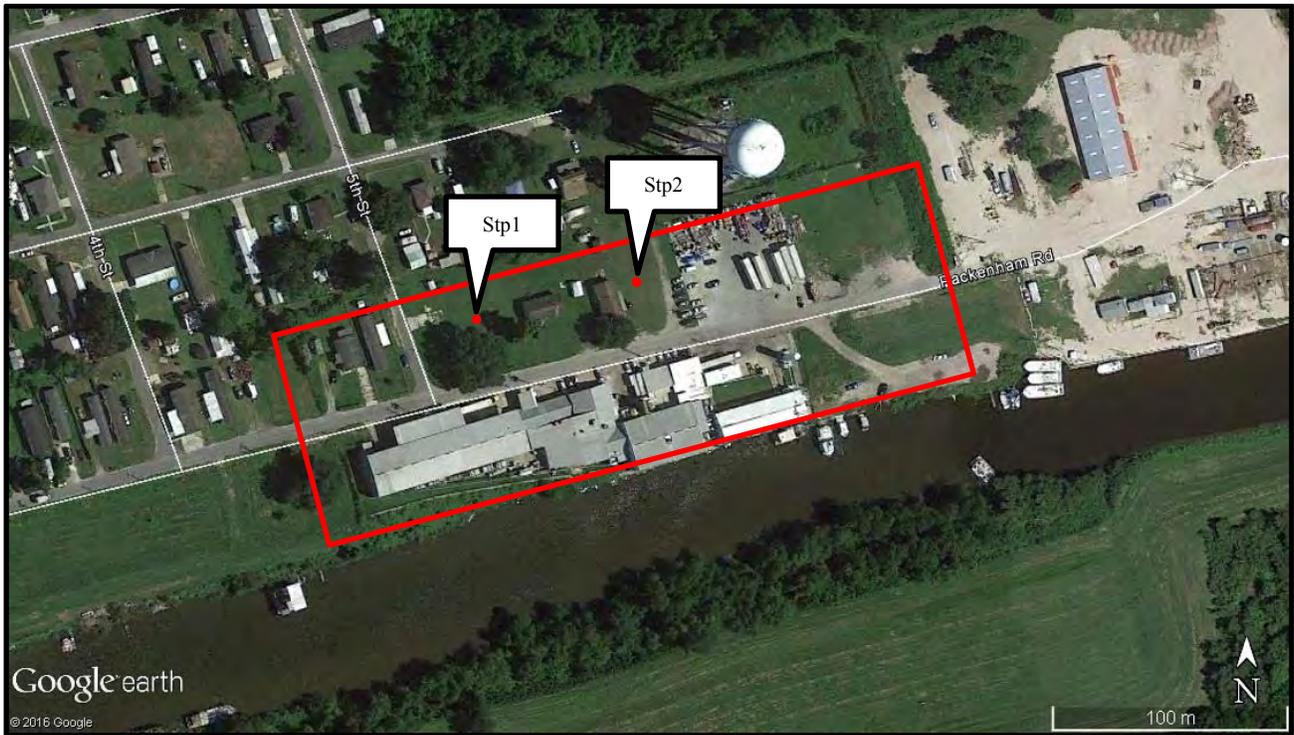


Figure 3. Project and Archaeological APE (red outline) with shovel test pit locations (red points).



Figure 4. Map showing the Project and Archaeological APE outlined in red, the Standing Structures APE outlined in yellow, and the red points indicated as shovel test pits.

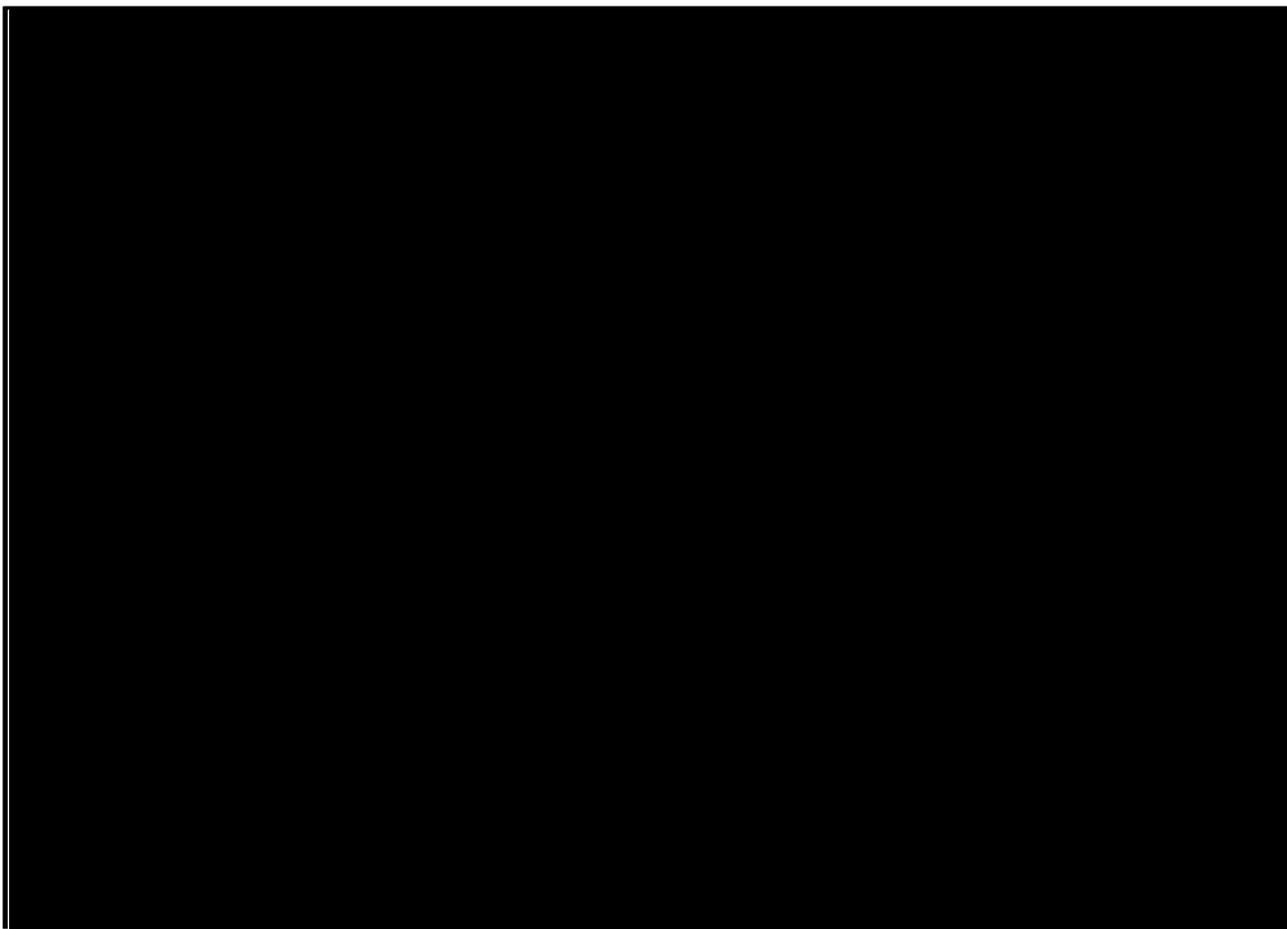


Figure 5. Previous cultural resource surveys (purple shaded area) in relation to current project area.

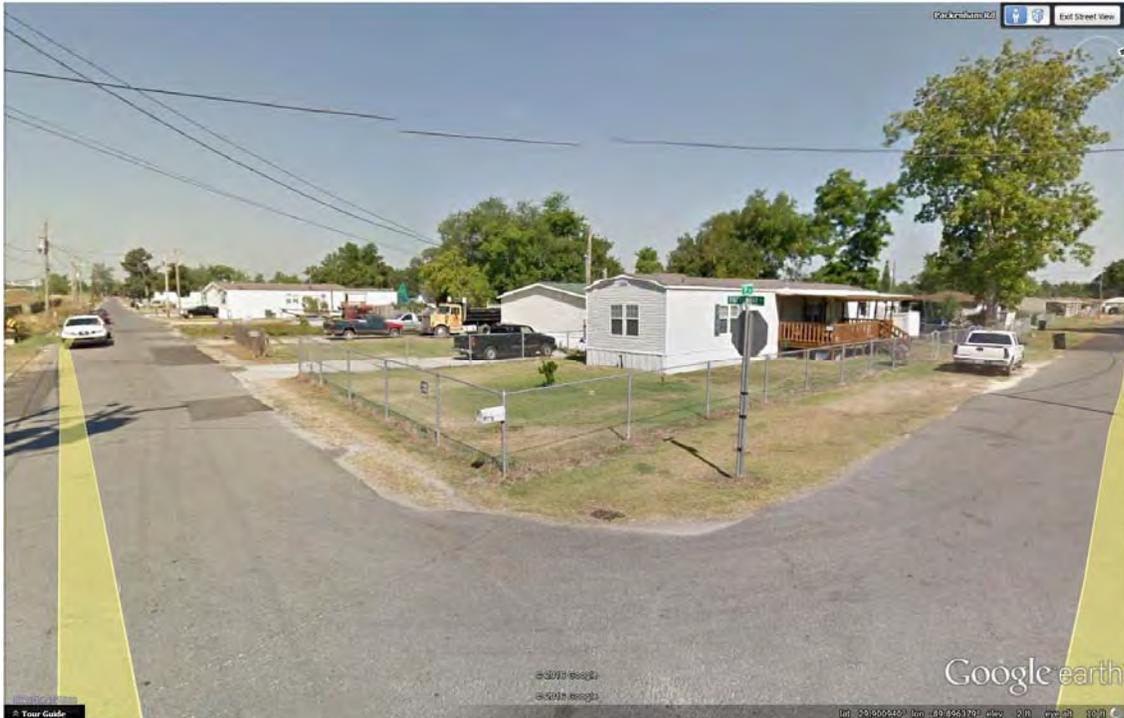


Figure 6. Two manufactured homes in the foreground to be moved. Photograph taken from Google Earth February 2016.



Figure 7. Two manufactured homes in the foreground to be moved. Manufactured home in the background has already been moved. Photograph taken from Google Earth February 2016.



Figure 8. Circa 2007 house to be demolished. Photograph taken from Google Earth February 2016.



Figure 9. Circa 1995 house to be demolished. Photograph taken from Google Earth 2016.

From: Section106 [<mailto:Section106@mcn-nsn.gov>]

Sent: Monday, March 21, 2016 3:47 PM

To: Carroll, Annette <<mailto:annette.carroll@fema.dhs.gov>>

Subject: RE: FEMA 106:St. Bernard Basin Back Protection Levee System Extension at Violet, LA (HMA-1603-0438) (HMA-1603-0438)

Ms. Annette Carroll
Historic Preservation Specialist
FEMA Area Field Office
Southern Regional Research Center
U. S. Department of Agriculture
1100 Robert E. Lee Blvd
New Orleans, LA 70124

Ms. Carroll:

Thank you for the correspondence regarding the proposed levee system extension at Violet, LA improvements. Portions of Louisiana Parishes are within the historic area of interest to the Muscogee (Creek) Nation. Upon closer review of the specific project location, this project does not lie within our area of interest. We respectfully defer to the other Tribes that have been contacted. If you have any further questions or concerns, please give us a call.

Thank You,

David J. Proctor, Cultural Advisor
Cultural Preservation Office
Muscogee (Creek) Nation
PO Box 580
Okmulgee, Ok 74447
davidp@mcn-nsn.gov

Federal and state agencies, museums, and consulting partners, as of October 1, 2015 please send all Section 106 project notices as well as all NAGPRA notices to our new section106@mcn-nsn.gov. Notices concerning these projects will no longer be sent to individual staff member's emails. We will be accepting and responding using the new Section 106 email. If you have any questions, please give us a call at 918-732-7733.

From: Alina Shively [<mailto:ashively@jenachoctaw.org>]

Sent: Tuesday, April 05, 2016 10:50 AM

To: Carroll, Annette <<mailto:annette.carroll@fema.dhs.gov>>

Subject: RE: FEMA 106:St. Bernard Basin Back Protection Levee System Extension at Violet, LA (HMA-1603-0438) (HMA-1603-0438)

Dear Ms. Carroll:

Regarding the above-mentioned project, the Jena Band of Choctaw Indians' THPO hereby concurs with the determination of No Properties. Should any inadvertent discoveries or unanticipated impacts occur, please contact all Tribes with interest in this area. Thank you.

Sincerely,

Alina J. Shively
Jena Band of Choctaw Indians
Tribal Historic Preservation Officer
P.O. Box 14
Jena, LA 71342
(318) 992-1205
ashively@jenachoctaw.org

From: Lindsey Bilyeu [<mailto:lbilyeu@choctawnation.com>]

Sent: Friday, May 13, 2016 3:22 PM

To: Emery, Jason <<mailto:Jason.Emery@fema.dhs.gov>>

Subject: RE: FEMA 106:St. Bernard Basin Back Protection Levee System Extension at Violet, LA (HMA-1603-0438) (HMA-1603-0438)

Mr. Emery,

The Choctaw Nation of Oklahoma thanks FEMA for the correspondence regarding the above referenced project. St. Bernard Parish lies in the Choctaw Nation's area of historic interest. Since the 30 day review period for the project has expired, the Choctaw Nation Historic Preservation Department asks that work be stopped and our office contacted immediately in the event that Native American artifacts or human remains are encountered.

If you have any questions, please contact me.

Thank you,

Lindsey D. Bilyeu
Senior Compliance Review Officer
Historic Preservation Department
Choctaw Nation of Oklahoma
P.O. Box 1210
Durant, OK 74702



APPENDIX D
HYDROLOGIC AND HYDRAULIC STUDY

**Southeast Louisiana Flood Protection Authority – East
Lake Borgne Basin Levee District**



**Violet Canal North Realignment
Phase 2
Saint Bernard Parish, LA**

Hydrologic Modification Impact Analysis Report

May 2015



TETRA TECH, INC.

748 Main Street, Suite B
Baton Rouge, LA 70802

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**Violet Canal North Realignment
Phase 2
Saint Bernard Parish, Louisiana**

Hydrologic Modification Impact Analysis Report



**Prepared for:
Southeast Louisiana Flood Protection Authority – East
Lake Borgne Basin Levee District**

**Prepared by:
Tetra Tech, Inc.
748 Main Street, Suite B
Baton Rouge, LA 70802**

May 2015

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TABLE OF CONTENTS

1. Purpose of Project.....	1
2. Purpose of Hydrologic Modification Impact Analysis.....	5
3. Hydrology.....	7
3.1 Design Storm.....	7
3.2 Existing Conditions.....	7
3.3 Proposed Conditions.....	7
3.4 Conclusions.....	8
4. Water Quality.....	15

LIST OF FIGURES

Figure 1.1 – Location Map.....	3
Figure 3.1 – Existing Conditions Drainage Map.....	10
Figure 3.2 – Proposed Conditions Drainage Map.....	11
Figure 3.3 – Proposed Storm Drain System #1 Drainage Map.....	12
Figure 3.4 – Proposed Storm Drain System #2 Drainage Map.....	13

APPENDICES

- Appendix A – Hydrology
- Appendix B – Permit Drawings

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1. Purpose of Project

The Southeast Louisiana Flood Protection Authority-East (SLFPA-E) is pursuing Federal Emergency Management Agency (FEMA) certification of the interior levee system that connects with the federal levee system within Orleans Parish and St. Bernard Parish. The 40 Arpent Levee System is part of the interior levee system and is located in both Orleans Parish and St. Bernard Parish. The levee system extends from the Orleans/St. Bernard Parish line to south of the town of Verret, where the levee ties into high ground adjacent to the Hurricane and Storm Damage Risk Reduction System (HSDRRS).

As part of the evaluation of the 40 Arpent Levee system, it was determined that the Violet Canal North Bank required improvements to meet the FEMA National Flood Insurance Program (NFIP) regulations (44 CFR 65.10) for 100-year level flood protection. The proposed improvement reach was divided into two phases to aid in contracting and construction. This report addresses Phase 2 which consists of the west portion of the North Bank as shown in Figure 1. Phase 2 is adjacent to the Shrimp Factory and extends approximately 1,280 feet. It consists of an earthen embankment built with 3:1 side slopes to an elevation of 8.5 feet NAVD88. The embankment will be grass-lined. Two stop log structures are incorporated into the project on Pakenham Road to form a complete flood protection system during 100-year flood event. Phase 1 is located to the east of Phase 2 in the vicinity of the Soap Factory.

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Violet Canal North Bank Realignment Phase 2
St. Bernard Parish, LA

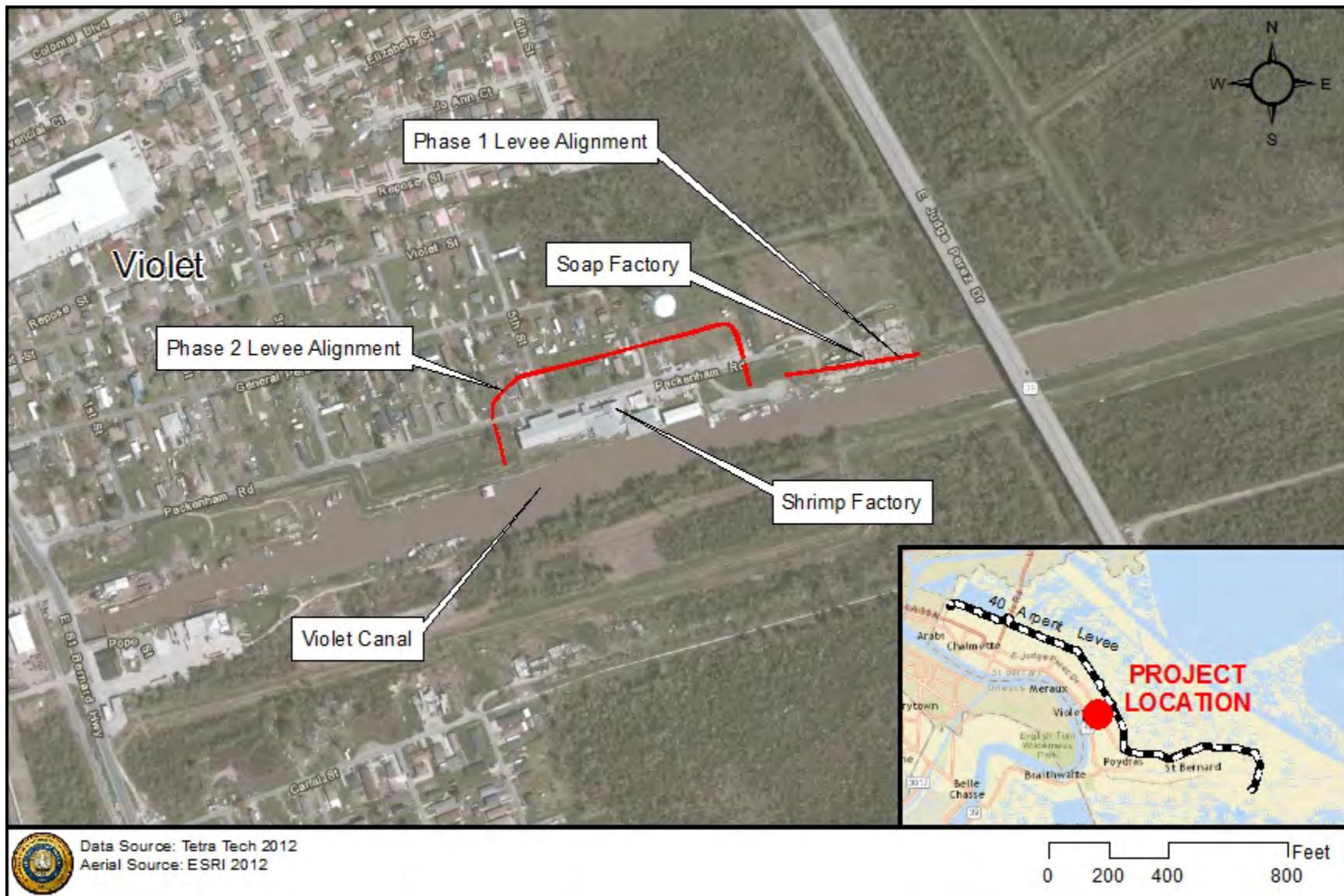


Figure 1.1 – Location Map

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2. Purpose of Hydrologic Modification Impact Analysis

A new OCM policy (La. RS 49:214.27.B & C) requires that all Coastal Use Permit applications be reviewed for potential impacts to surface waters. A Hydrologic Modification Impact Analysis (HMIA) has been developed to investigate pre- and post- development surface water conditions to determine if adverse impacts to adjacent lands and/or waterways will occur as a result of the proposed project.

The proposed Phase 2 project is classified as the Intermediate Modification Level (Level 2) due to, but not limited to, the following:

- Projects that involve six (6) or more inches of fill
- Projects that involve one (1) or more acres being developed
- Small subdivisions (10 or less houses on 5 or less acres, no new access)
- Small marinas (boat launch, pier/wharf, bait shop/store/diner, parking)
- Pipelines, utilities, seismic surveys (determined on a case-by-case basis)
- Minor alteration of existing drainage features

Level 2 projects must identify existing surface water discharge patterns, quantity and rate and affected water quality parameters.

The following sections explain how the proposed project will modify existing conditions and the results and impacts of the modifications.

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3. Hydrology

3.1 Design Storm

The design storm is the 100-year 24-hour duration storm with a total rainfall depth of 14.5 inches obtained from the National Weather Service Precipitation Frequency Data Server (PFDS) for Violet, Louisiana. Precipitation-frequency data are included in Appendix A.

3.2 Existing Conditions

Survey of the site was provided by BFM Corporation, LLC between November 2013 and February 2014. The horizontal control of the topography and 40 Arpent Levee Baseline Alignment is based on the Louisiana State Plane South Coordinate System FIPS (Federal Information Processing Standards), North American Datum of 1983 (NAD 83) HARN (High Accuracy Reference Network), and the vertical control is based on the North American Vertical Datum of 1988 (NAVD 88). All units are in U.S. survey feet. All elevations referred to in this report are based on these horizontal control and vertical datum.

Based on the survey data, the existing drainage divide (i.e., the existing earthen berm along the canal) was determined and shown on Figure 3.1. Areas adjacent to the project site consist of a Shrimp Factory, scattered buildings, and open spaces covered with grass or gravel pavements. The existing drainage patterns shown as blue arrows are depicted on Figure 3.1. A storm drain system starts on the south side of Pakenham Road and turns northward at the 5th Street intersection and discharges into the east-west natural drainage ditch at the eastern end of General Persing Street. Another storm drain located approximately 400 feet west of 6th Street conveys flow under Pakenham Road to a north-south natural drainage ditch that connects to the east-west natural drainage ditch located on the eastern end of General Persing Street. The existing berm shown on Figure 3.1 separates runoff that flows south to the Violet Canal and runoff that flows north toward the east-west natural drainage ditch at the eastern end of General Persing Street. The topographic slopes adjacent to the project site are approximately 0.005 and 0.03 (ft/ft) for areas north and south of the existing berm, respectively.

3.3 Proposed Conditions

The proposed levee (Figure 3.2) consists of compacted earthen embankment of approximately 1,280 feet long and two stop log structures on Pakenham Road. The maximum levee side slope will be 3H: 1V (horizontal to vertical) to account for stability as well as maintenance and mowing. The top of the levee will be constructed to provide a minimum width of 12 feet and a 15-foot buffer from the levee toe (floodside and landside) will be provided to allow for access and inspection. Anticipated settlement has been incorporated into the design elevation. In addition, three storm drain lines with two slide gates are proposed along Peckenham Road (Figure 3.2).

It should be noted that the berm which acts as the drainage divide along the south side of the Shrimp Factory is higher than the FEMA 100-year water surface elevation of 4 feet which will

restrict the 100-year flood flow in the Violet Canal. The berm does not have adequate freeboard to meet FEMA standards which is why a new alignment at a higher elevation is proposed.

Drainage patterns that differ from the existing flow patterns are identified in red arrows and shown on Figure 3.2. The proposed storm drain systems with slide gates along Packerham Road are depicted on Figures 3.3 and 3.4.

The proposed storm drain system #1 (Figure 3.3) consists of a new catch basin located at the northwest corner of Peckenham Road and 5th Street with a new storm drain pipe crossing Peckenham Road and joining the existing storm drain on the south side of Peckenham Road. The existing storm drain pipe travels west to approximately 100 feet and connects to another proposed catch basin with a proposed slide gate, and a proposed storm drain pipe approximately 140 feet in length and finally exits to the existing natural ditch. This ditch will be re-graded to flow west and joins the existing storm drain system located at 4th Street. The area changing in flow directions is approximately 1.53 acres which would be served by the proposed storm system #1. The proposed storm drain system #1 should convey at least the 10-year flood event per Hydraulics Manual (LADOTD 2011) and the 10-year peak flow can be computed using the Rational Method (LADOTD 2011) as follows:

$$Q=CiA$$

Where: Q = Peak flow rate (ft³/s)

C = Runoff coefficient

i = Average rainfall intensity at the time of concentration (in./hr)

A = Drainage area (acres)

Following the procedure outlined in the Hydraulics Manual (LADOTD 2011), the 10-year peak flow is estimated to be 9.22 cubic feet per second (cfs) for the proposed storm drain system #1.

The proposed storm drain system #2 (Figure 3.4) consists of a new catch basin located at the northwest corner of Peckenham Road and 6th Street with a new storm drain pipe on the north side of Peckenham Road traveling east for approximately 260 feet and joining another catch basin which connects a proposed storm drain pipe from the south of Packerham Road. The proposed storm drain pipe with a slide gate will be extended approximately 140 feet to outlet at the existing north-south natural drainage ditch. The area changing in flow directions is approximately 3.64 acres which would be served by the proposed storm system #2. The proposed storm drain system #2 should convey at least the 10-year flood event (LADOTD 2011). The 10-year peak flow is estimated to be 20.11 cfs for the proposed storm drain system #2. Detailed Rational Method computations are provided in Appendix A.

It should be noted that the land use and cover types for the pre- and post- project conditions would be remained unchanged. It results in no net increase in runoff quantity for different frequency and/or duration of storm events.

3.4 Conclusions

Under existing conditions, the 100-year flood could overtop the existing berm. Portion of the flood flow would be conveyed by the storm drain system located at 5th Street to the storm drain

system along General Persing Street then discharging unto the east-west natural drainage ditch. Rest of the flood flow would flow northeasterly toward the same east-west natural drainage ditch located at the eastern end of General Persing Street.

Under the proposed conditions, the area between the existing berm and the proposed levee could be inundated during the 100-year flood event when the stop log structures are in place and slide gates on Packerham Road are closed. As floodwaters recede and the stop log structures and slide gates are open, the flow would be drained by the proposed storm drain system #1 to the existing storm drain system located at 4th Street and the proposed storm drain system #2 to the north-south natural drainage ditch located on the east side of the proposed levee. Both existing drainage systems discharge unto the east-west natural drainage ditch at the eastern end of General Persing Street.

By re-grading the areas between the flood-side (south) of the levee and the existing berm, the receding flood flow will be able to flow more efficiently by the proposed storm drain systems to the existing drainage systems and eventually outlet unto the east-west natural drainage ditch located at the eastern end of General Persing Street. The runoff for the pre- and post-conditions will be conveyed into the same drainage systems (i.e. the east-west natural drainage ditch and the drainage system at the east end of General Persing Street).

Properties on the landside (north) of the proposed levee will be protected during the 100-year flood and the finished floor elevation of the Shrimp Factory is at or above the FEMA 100-year flood elevation of 4 feet. Through residential buyout and relocation, no buildings will be inhabited on the floodside of the proposed levee after the completion of the project. Therefore, no mitigation measures are required in addition to the proposed project improvements.

Violet Canal North Bank Realignment Phase 2
 St. Bernard Parish, LA

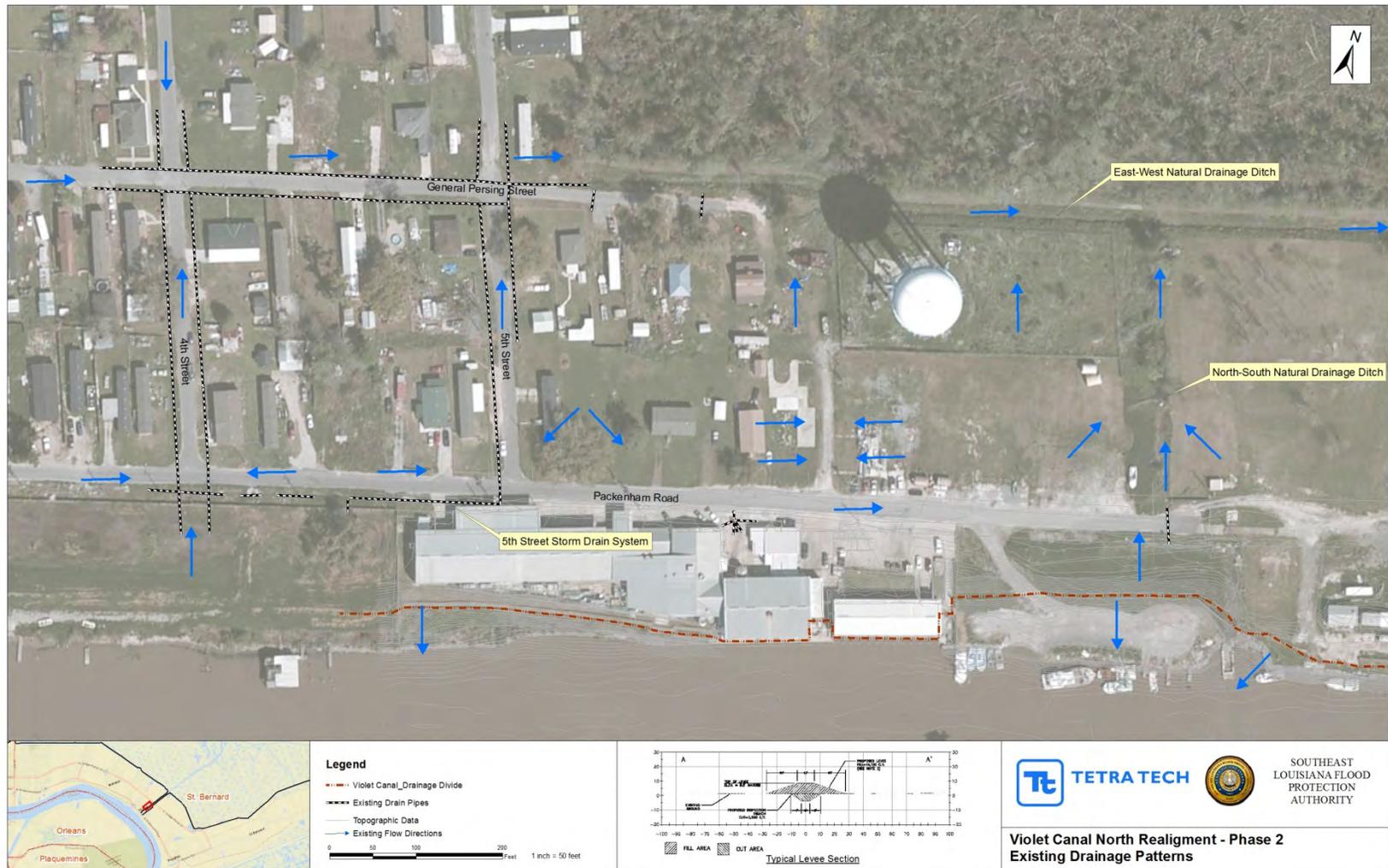


Figure 3.1 – Existing Conditions Drainage Map

Violet Canal North Bank Realignment Phase 2
 St. Bernard Parish, LA

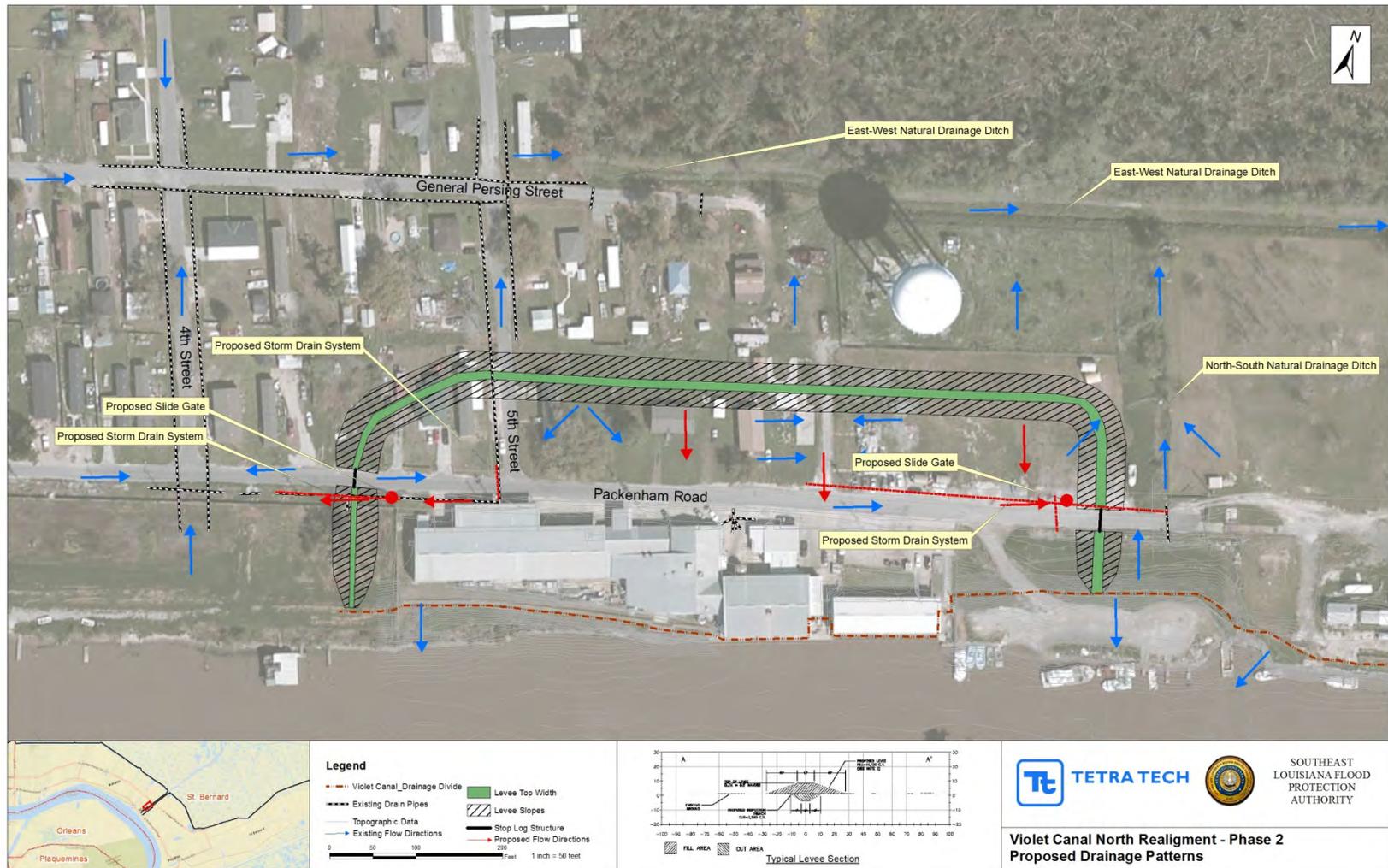


Figure 3.2 – Proposed Conditions Drainage Map

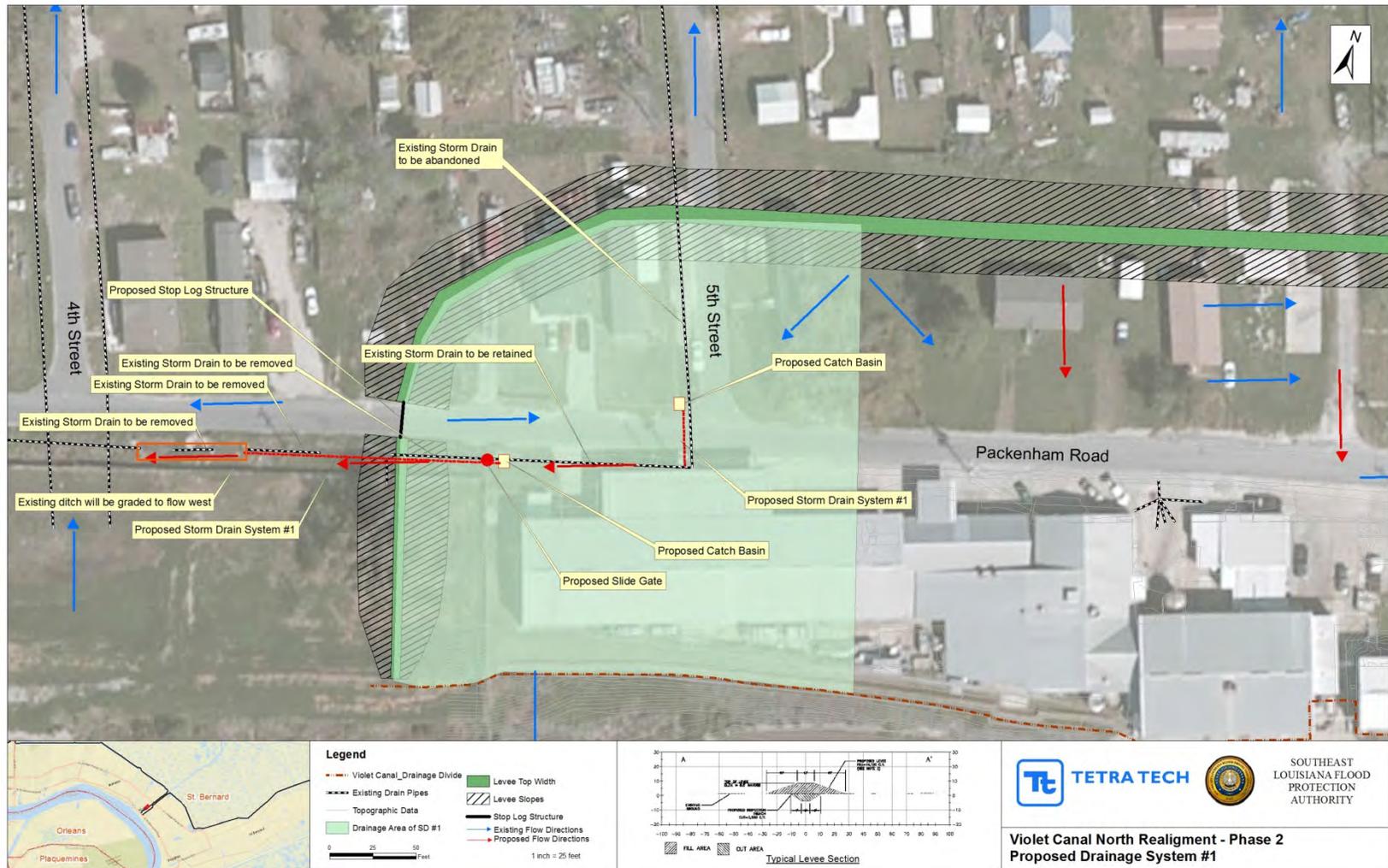


Figure 3.3 – Proposed Storm Drain System #1 Drainage Map

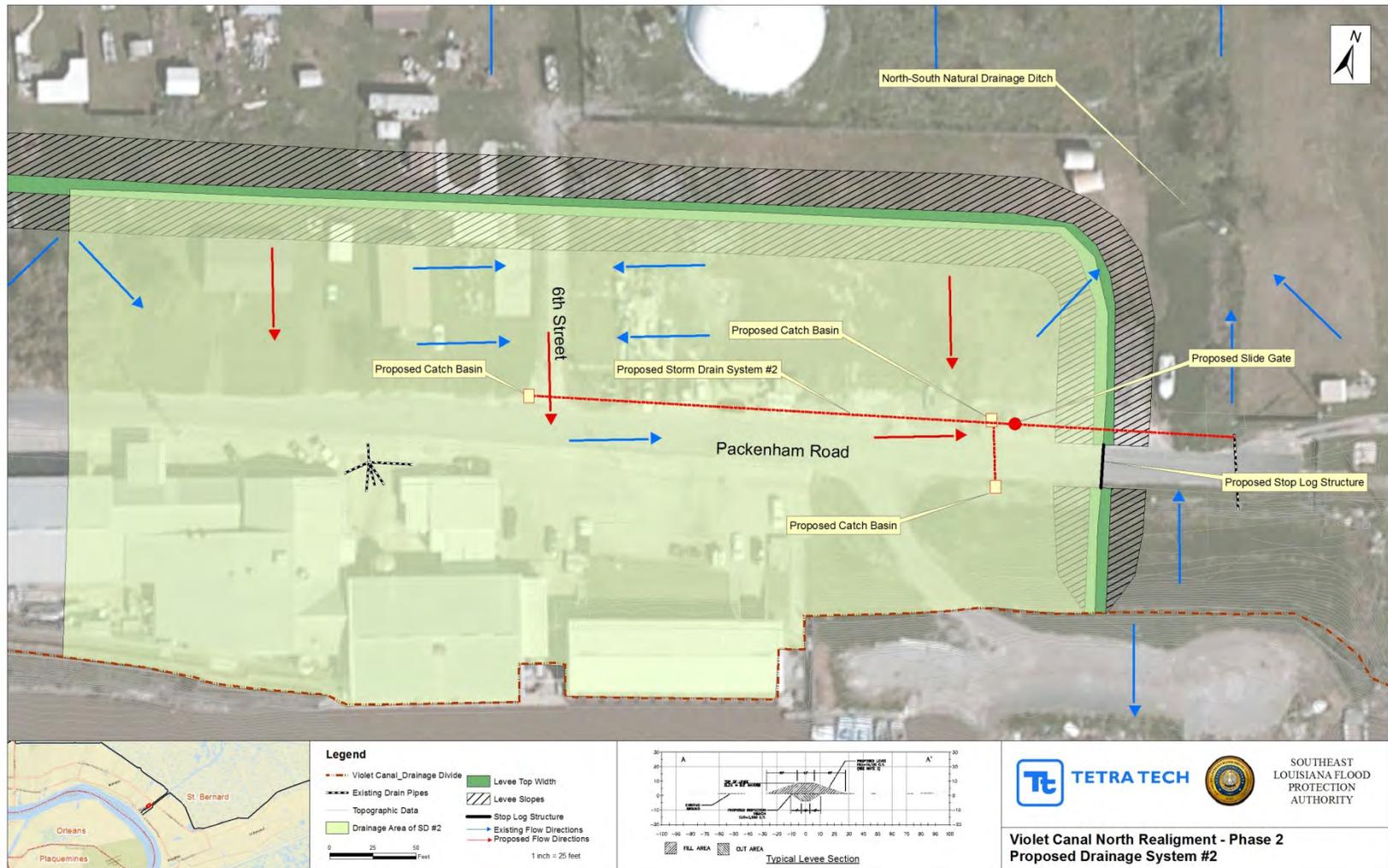


Figure 3.4 – Proposed Storm Drain System #2 Drainage Map

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4. Water Quality

Total suspended solids (TSS) will be the constituent of concern during the construction phase. Construction BMPs will be provided in the construction site and no permanent BMPs will be required for post-project conditions. Temporary sediment control fence will be installed approximately 15 feet away from the project construction zone and it has been incorporated into Phase 2 design plans as a minimal requirement.

The proposed levee will provide protection to adjacent areas during the 100-year flood event. The flood water will be temporarily retained on the floodside of the levee and be conveyed to the east-west natural drainage ditch located at the eastern end of General Persing Street after the flood receded via the proposed and existing drainage systems. The land use and cover types for the pre- and post- project conditions would be remained unchanged. Therefore, water quality of the flood flow from the Violet Canal would not be impacted by the completion of the project.

No additional permits are required for the proposed project except the Coastal Use Permit required by the State of Louisiana.

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5. References

Louisiana Department of Natural Resources (LDRN) 2008. Best Management Practices for Coastal Louisiana Nonpoint Source Pollution, Hydromodification. Coastal Management Division, Baton Rouge, Louisiana.

Louisiana Department of Transportation and Development (LADOTD) 2011. Hydraulics Manual. Baton Rouge, Louisiana.

National Oceanic and Atmosphere Administration (NOAA) 2013. NOAA Atlas 14 Precipitation-Frequency Atlas of United States, Volume 9, Version 2.0: Southeastern States (Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi). National Weather Service, Silver Spring, Maryland.

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Appendix A

Hydrology

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Precipitation Frequency Data

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NOAA Atlas 14, Volume 9, Version 2
 Location name: Violet, Louisiana, US*
 Latitude: 29.9015°, Longitude: -89.8935°
 Elevation: 2 ft*
 * source: Google Maps



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk,
 Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.543 (0.428 0.686)	0.636 (0.500 0.803)	0.787 (0.617 0.996)	0.911 (0.711 1.16)	1.08 (0.814 1.42)	1.21 (0.892 1.61)	1.35 (0.954 1.83)	1.48 (1.01 2.07)	1.65 (1.08 2.38)	1.79 (1.14 2.61)
10-min	0.795 (0.627 1.00)	0.931 (0.732 1.18)	1.15 (0.903 1.46)	1.34 (1.04 1.70)	1.59 (1.19 2.08)	1.78 (1.31 2.36)	1.97 (1.40 2.68)	2.17 (1.47 3.03)	2.42 (1.58 3.48)	2.62 (1.66 3.83)
15-min	0.970 (0.764 1.22)	1.14 (0.893 1.43)	1.41 (1.10 1.78)	1.63 (1.27 2.07)	1.93 (1.45 2.53)	2.17 (1.59 2.88)	2.40 (1.70 3.27)	2.64 (1.79 3.69)	2.95 (1.93 4.25)	3.19 (2.03 4.67)
30-min	1.48 (1.16 1.86)	1.75 (1.37 2.21)	2.19 (1.71 2.77)	2.55 (1.99 3.24)	3.04 (2.28 3.98)	3.42 (2.51 4.54)	3.79 (2.69 5.15)	4.16 (2.83 5.82)	4.65 (3.04 6.69)	5.02 (3.19 7.34)
60-min	2.02 (1.59 2.55)	2.36 (1.86 2.98)	2.95 (2.31 3.73)	3.48 (2.71 4.42)	4.27 (3.24 5.67)	4.92 (3.64 6.61)	5.61 (4.00 7.72)	6.36 (4.35 8.98)	7.41 (4.86 10.7)	8.26 (5.25 12.1)
2-hr	2.57 (2.04 3.23)	2.97 (2.35 3.73)	3.71 (2.93 4.67)	4.41 (3.46 5.57)	5.49 (4.22 7.31)	6.42 (4.80 8.63)	7.44 (5.37 10.2)	8.56 (5.92 12.1)	10.2 (6.75 14.7)	11.5 (7.39 16.7)
3-hr	2.92 (2.33 3.65)	3.34 (2.65 4.17)	4.16 (3.29 5.21)	4.98 (3.92 6.26)	6.31 (4.91 8.45)	7.50 (5.65 10.1)	8.83 (6.42 12.2)	10.3 (7.20 14.6)	12.5 (8.38 18.1)	14.4 (9.28 20.8)
6-hr	3.52 (2.82 4.36)	3.98 (3.19 4.95)	4.96 (3.96 6.18)	5.99 (4.75 7.49)	7.71 (6.07 10.3)	9.27 (7.07 12.5)	11.1 (8.13 15.2)	13.1 (9.22 18.4)	16.1 (10.9 23.2)	18.6 (12.2 26.8)
12-hr	4.08 (3.29 5.04)	4.67 (3.76 5.76)	5.86 (4.70 7.25)	7.07 (5.65 8.78)	9.06 (7.17 12.0)	10.9 (8.33 14.5)	12.9 (9.54 17.6)	15.2 (10.8 21.2)	18.6 (12.7 26.5)	21.4 (14.1 30.5)
24-hr	4.71 (3.83 5.77)	5.44 (4.41 6.67)	6.84 (5.53 8.41)	8.22 (6.61 10.1)	10.4 (8.28 13.7)	12.4 (9.54 16.3)	14.5 (10.8 19.6)	16.9 (12.1 23.4)	20.5 (14.1 29.0)	23.4 (15.6 33.2)
2-day	5.45 (4.45 6.63)	6.30 (5.15 7.68)	7.92 (6.44 9.67)	9.47 (7.67 11.6)	11.9 (9.51 15.4)	14.0 (10.9 18.4)	16.4 (12.3 21.9)	19.0 (13.7 26.0)	22.8 (15.8 32.0)	25.9 (17.4 36.5)
3-day	5.88 (4.83 7.13)	6.83 (5.59 8.28)	8.60 (7.03 10.5)	10.3 (8.36 12.6)	12.9 (10.4 16.7)	15.2 (11.9 19.8)	17.8 (13.4 23.6)	20.6 (14.9 28.0)	24.6 (17.2 34.4)	27.9 (18.9 39.1)
4-day	6.23	7.23	9.12	10.9	13.7	16.1	18.8	21.7	26.0	29.4

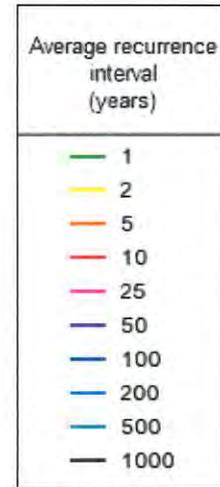
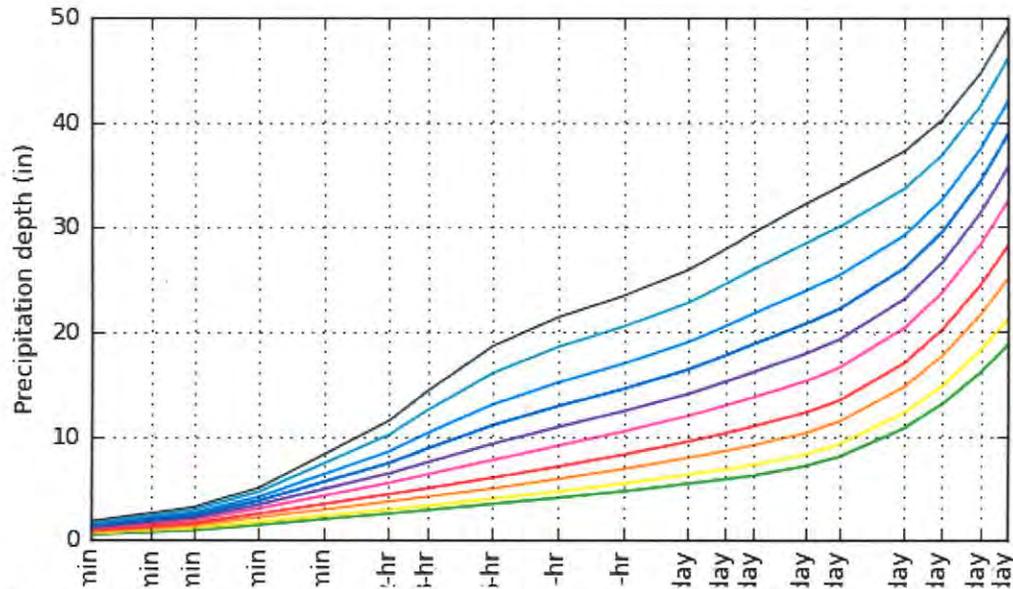
	(5.12 7.53)	(5.94 8.75)	(7.47 11.1)	(8.89 13.3)	(11.0 17.6)	(12.6 20.9)	(14.2 24.9)	(15.8 29.5)	(18.2 36.2)	(20.0 41.2)
7-day	7.16 (5.92 8.61)	8.25 (6.82 9.93)	10.3 (8.48 12.4)	12.2 (10.0 14.8)	15.3 (12.3 19.5)	17.9 (14.1 23.0)	20.7 (15.8 27.3)	23.9 (17.5 32.3)	28.5 (20.1 39.4)	32.2 (22.1 44.8)
10-day	8.05 (6.68 9.64)	9.21 (7.64 11.0)	11.4 (9.40 13.7)	13.4 (11.0 16.2)	16.5 (13.4 21.0)	19.2 (15.2 24.6)	22.1 (16.9 29.0)	25.4 (18.7 34.1)	30.0 (21.3 41.4)	33.8 (23.3 46.9)
20-day	10.7 (8.98 12.8)	12.2 (10.2 14.5)	14.7 (12.2 17.6)	17.0 (14.1 20.3)	20.3 (16.5 25.4)	23.1 (18.3 29.2)	26.0 (20.0 33.7)	29.2 (21.6 38.8)	33.6 (24.1 45.8)	37.2 (25.9 51.2)
30-day	13.1 (11.0 15.5)	14.8 (12.4 17.5)	17.7 (14.8 21.0)	20.2 (16.8 24.1)	23.7 (19.2 29.3)	26.6 (21.1 33.3)	29.5 (22.8 37.9)	32.6 (24.3 43.0)	36.9 (26.5 49.9)	40.2 (28.2 55.1)
45-day	16.1 (13.6 19.0)	18.2 (15.3 21.5)	21.6 (18.1 25.5)	24.4 (20.4 29.0)	28.3 (23.0 34.6)	31.3 (24.9 38.9)	34.4 (26.6 43.7)	37.4 (27.9 48.9)	41.5 (30.0 55.7)	44.6 (31.5 60.9)
60-day	18.7 (15.8 22.0)	21.1 (17.8 24.8)	25.0 (21.0 29.5)	28.1 (23.6 33.4)	32.4 (26.3 39.4)	35.6 (28.4 44.0)	38.8 (30.0 49.0)	41.9 (31.3 54.4)	46.0 (33.3 61.4)	49.0 (34.7 66.7)

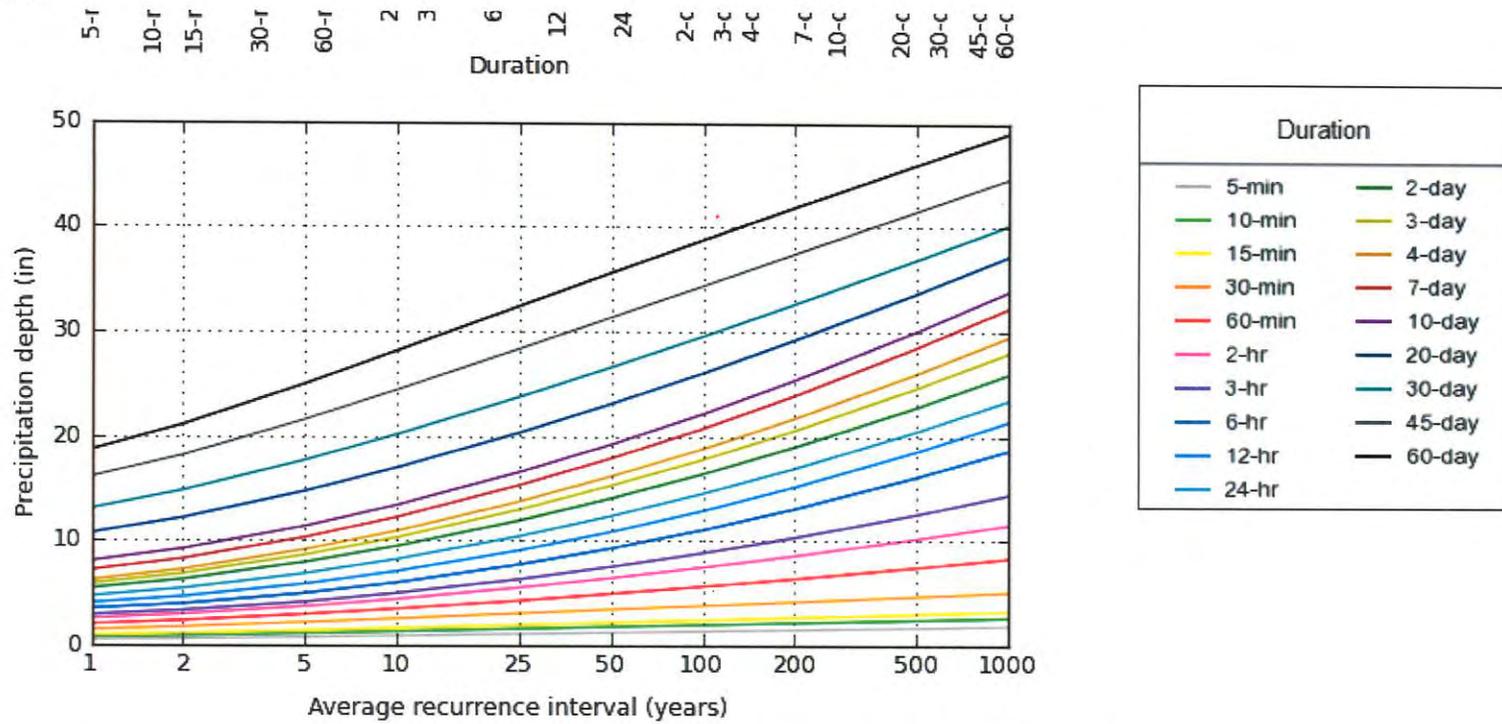
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves
 Latitude: 29.9015°, Longitude: -89.8935°





NOAA Atlas 14, Volume 9, Version 2

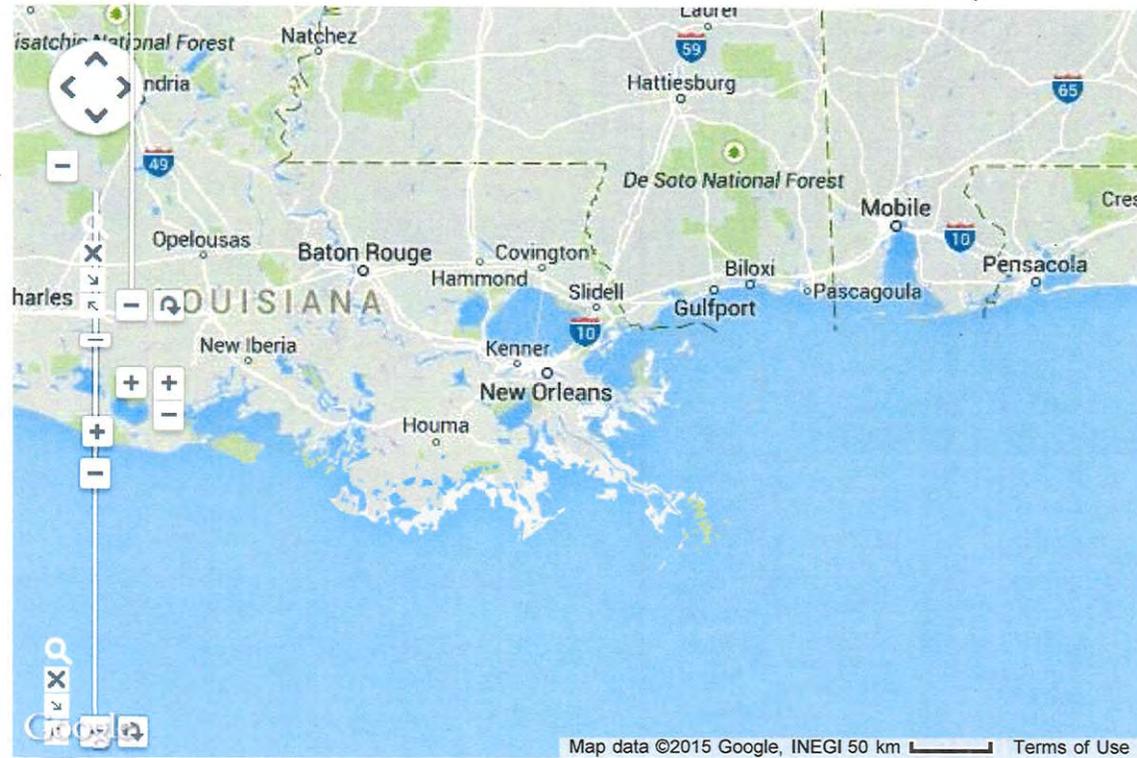
Created (GMT): Mon Apr 13 22:50:06 2015

[Back to Top](#)

Maps & aerials

Small scale terrain



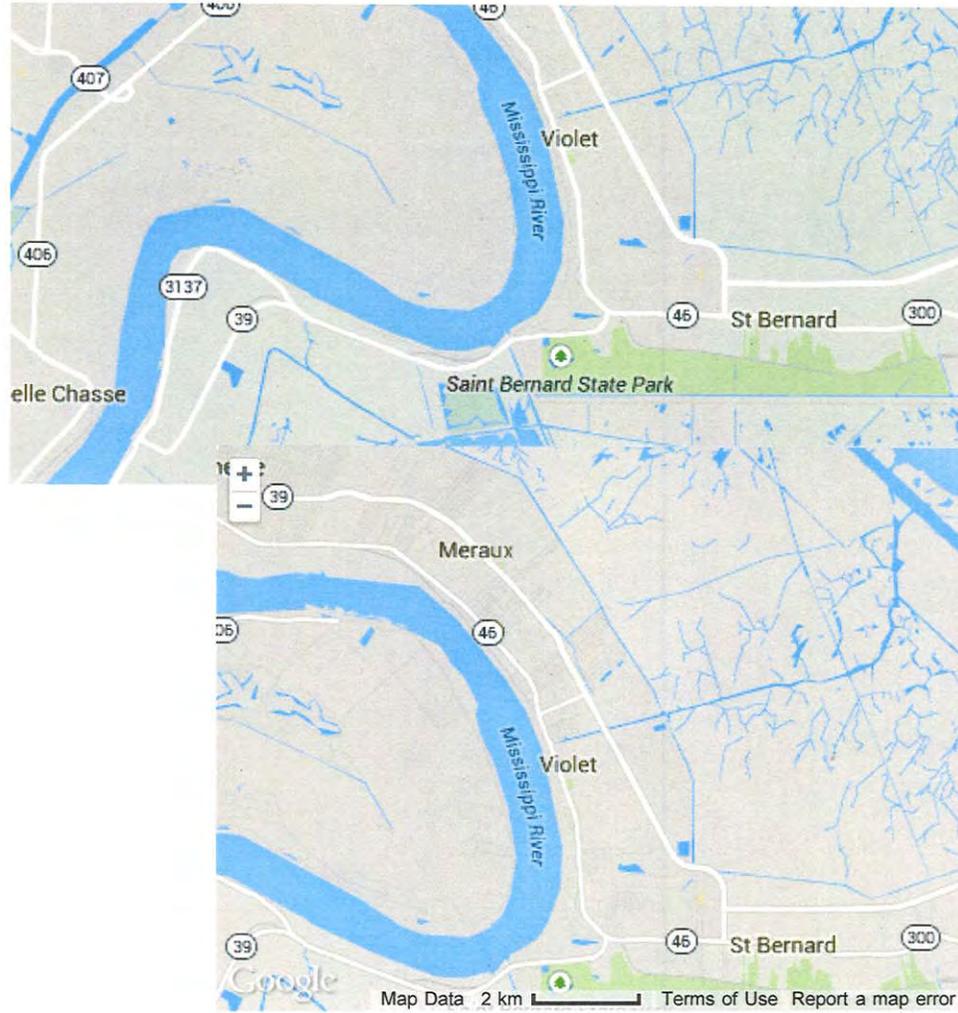


+ +
+ -

Large scale terrain



Large scale map



Large scale aerial





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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Rational Method Analysis

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STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245
Baton Rouge, Louisiana 70804-9245
<http://www.dotd.la.gov/>

2011 HYDRAULICS MANUAL

Hydraulics
(225) 379-1306

CHAPTER 3 – PART C RATIONAL METHOD

3-C.1 INTRODUCTION

The Rational Method computes only peak runoff values, neglecting flow variations with time and routing of the flow through the watershed and the collection system.

For a more detailed discussion of the theory and use of the Rational Method, refer to these references or the latest publications/websites from the following agencies:

- A.) ASCE Manual of Engineering Practice No. 37, Chapter IV, Design and Construction of Sanitary and Storm Sewers, 1976.
- B.) Highway Hydrology, Hydraulic Design Series No. 2, FHWA, Washington, D.C., 2nd Edition, October 2002.

3-C.2 DESIGN ASSUMPTIONS

Assumptions basic to the Rational Method are:

- A.) Limited to drainage areas less than 200 acres
- B.) The maximum runoff rate to any location is a function of the average rate of rainfall during the time of concentration.
- C.) The maximum rate of rainfall occurs during the time of concentration.
- D.) The variability of the storm pattern is not taken into consideration.

3-C.3 HYDROLOGIC ANALYSIS

The Rational Method Equation is:

$$Q=CiA \qquad \text{Eq. 3-C.3-1}$$

Where: Q = Peak runoff rate (ft³/s)
C = Runoff coefficient (Section 3-C.3.1)
i = Average rainfall intensity at the time of concentration (in./hr)
(Section 3-C.3.2 and Section 3.4.3)
A = Drainage area (acres)

3-C.3.1 Runoff Coefficient, C

The runoff coefficient, C, in the Rational Equation represents the fraction of rainfall on a given area which may be expected to become runoff.

Table 3-C.3-1 from Sewer Design and Construction - ASCE Manual No. 37, provides general guidelines for the selection of runoff coefficient factors.

Table 3-C.3-1 Runoff Coefficients

DESCRIPTION OF AREA	RUNOFF COEFFICIENTS
Business: Downtown areas Neighborhood areas	0.70 to 0.95 0.50 to 0.70
Residential: Single-family areas Multi-units, detached Multi-units, attached	0.30 to 0.50 0.40 to 0.60 0.60 to 0.75
Residential (suburban)	0.25 to 0.40
Apartment dwelling areas	0.50 to 0.70
Industrial: Light areas Heavy areas	0.50 to 0.80 0.60 to 0.90
Parks, cemeteries	0.10 to 0.25
Playgrounds	0.20 to 0.35
Railroad yard areas	0.20 to 0.40
Unimproved areas	0.10 to 0.30

3-C.3.2 Time of Concentration

Time of concentration (TC) is defined as the flow time from the most remote point in the drainage area to the point under consideration. Usually it is considered to be composed of time of concentration for drainage inlets plus time of flow in pipes. Figure 3-C.3-1 (adapted from Elwyn E. Seelye, "Databook for Civil Engineers", Volume 1 – Design, Second Edition, New York: John Wiley and sons inc., 1951) is provided to assist in estimating the overland flow time, which will be considered the time of concentration for drainage inlets.

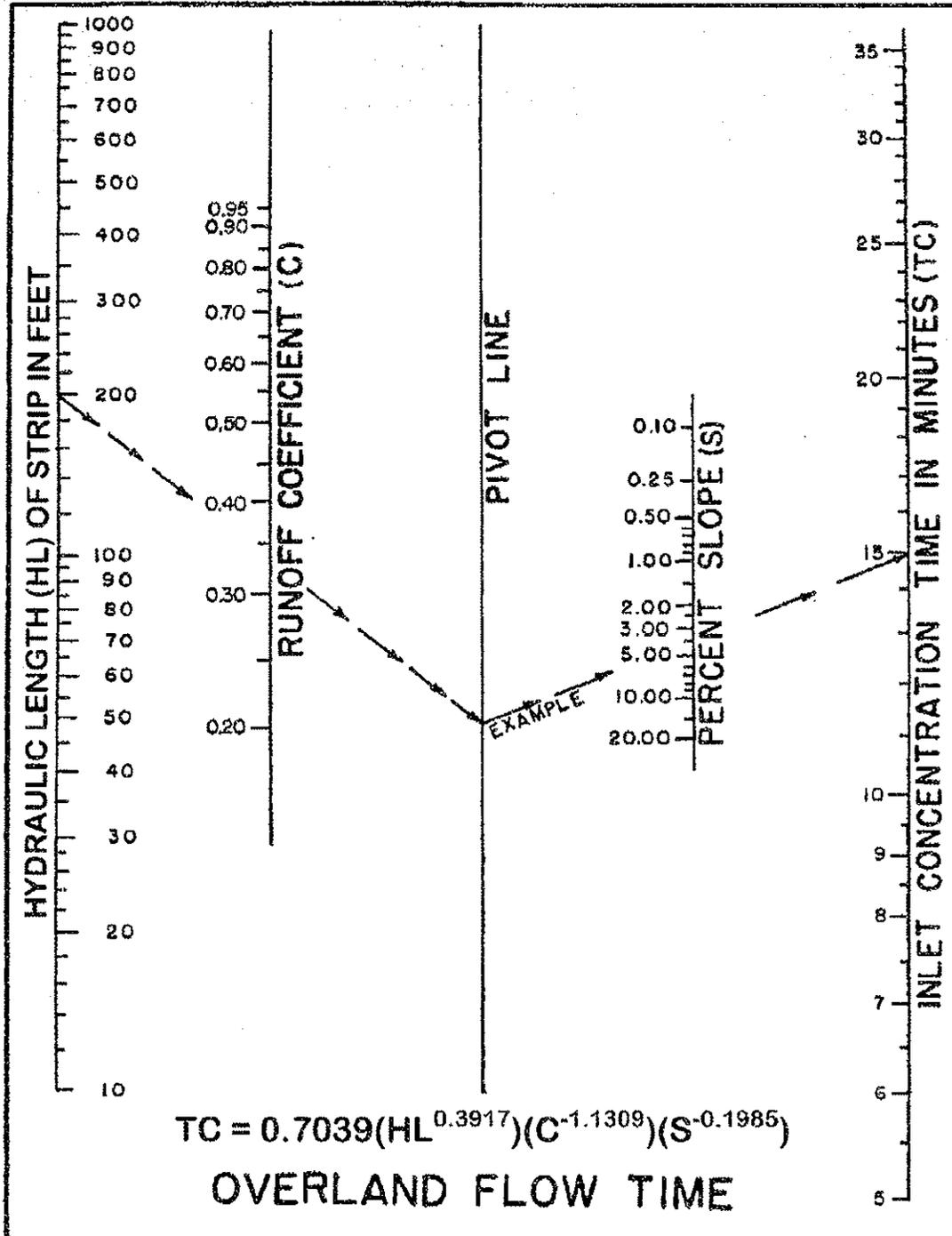


Figure 3-C.3-1 Time of Concentration

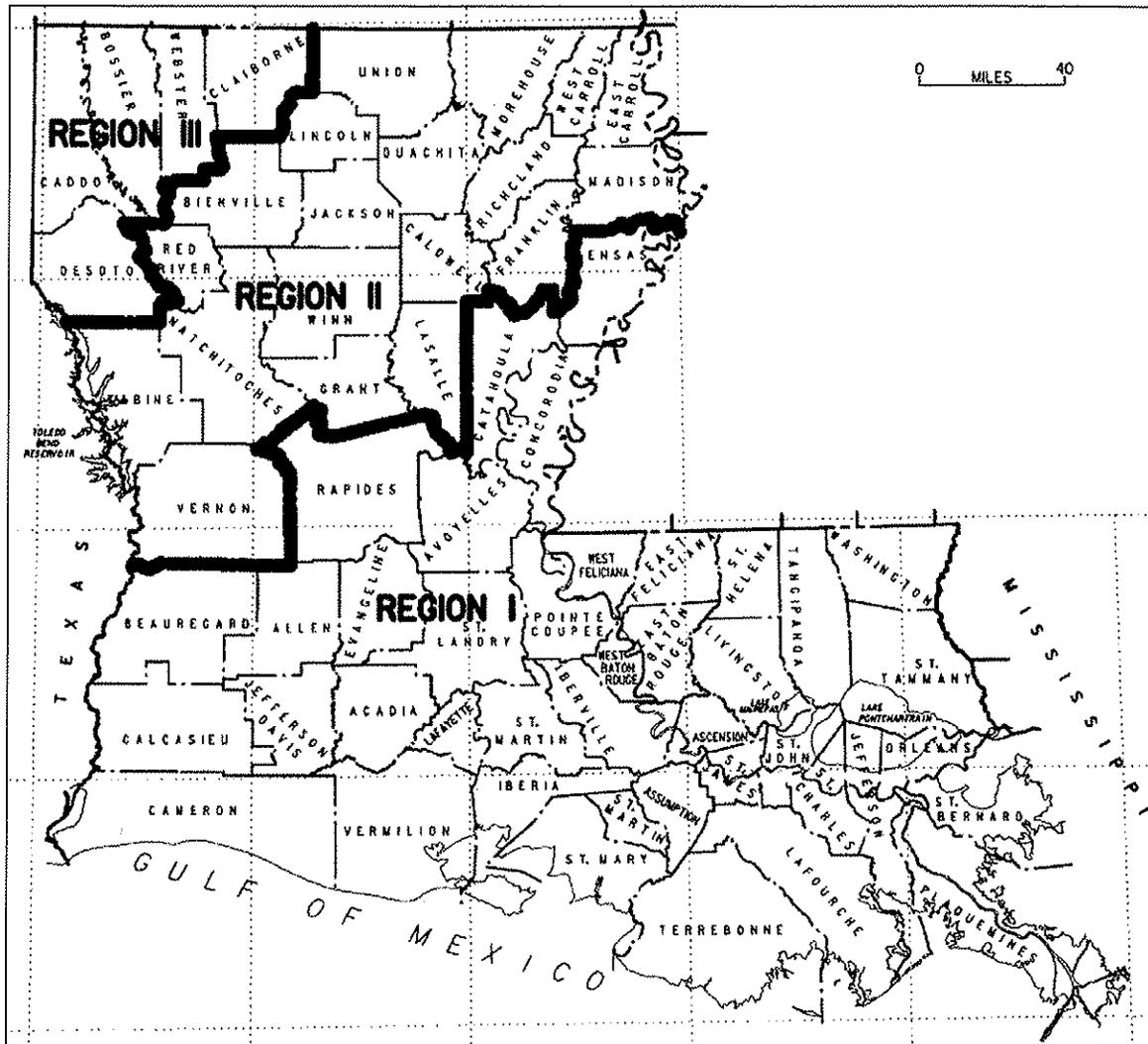


Figure 3.4-2 Louisiana Rainfall Regions

This map was developed by the Louisiana Transportation Research Center (LTRC). Use this map when determining the peak runoff by the NRCS and Rational Methods.

REGION 1

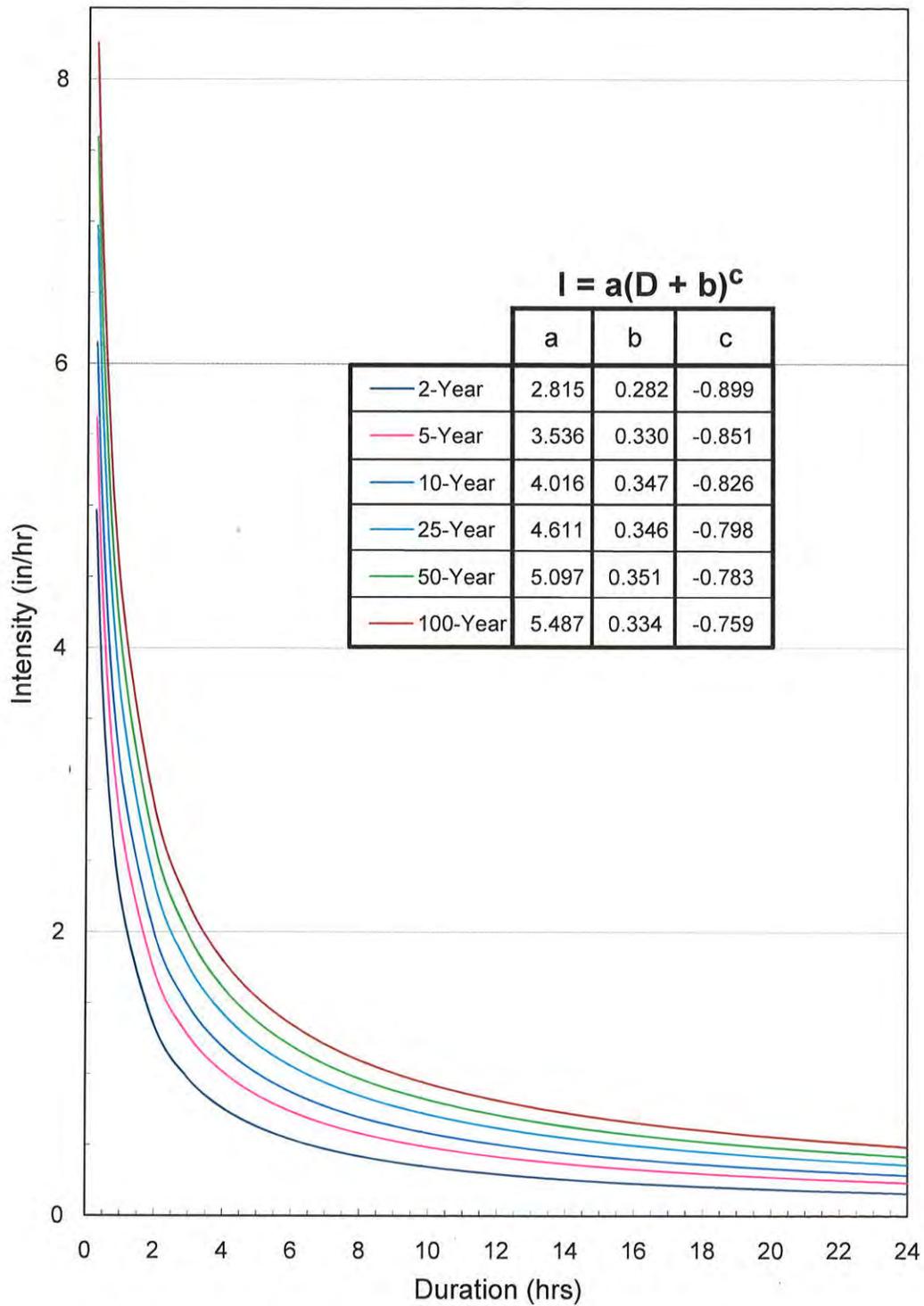


Figure 3.4-3 Region 1 Rainfall Intensity Curve (Rational Method)

Q = CiA				<== Eq. 3-C.3-1				
C = runoff coefficient				<== Table 3-C.3-1				
i = rainfall intensity (Tc)				<== Figures 3.4-2 & 3.4-3				
A = drainage area								
i = a(D+b) ^c				<== Figure 3.4-3				
Region 1	a	b	c					
10-yr	4.016	0.347	-0.826					
Tc = 0.7039(HL ^{0.3917})(C ^{-1.1309})(S ^{-0.1985})				<== Figure 3-C.3-1				
Storm Drain	Q (cfs)	C	i (in/hr)	A (ac)	Tc (min)	HL (ft)	S (%)	
#1	9.22	0.8	7.53	1.53	7.20	140	0.5	
#2	20.11	0.8	6.90	3.64	10.31	350	0.5	
Reference: Hydraulics Manual, State of Louisiana, Department of Transportation and Development, 2011.								

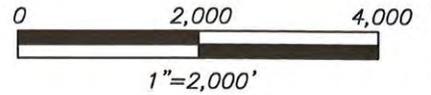
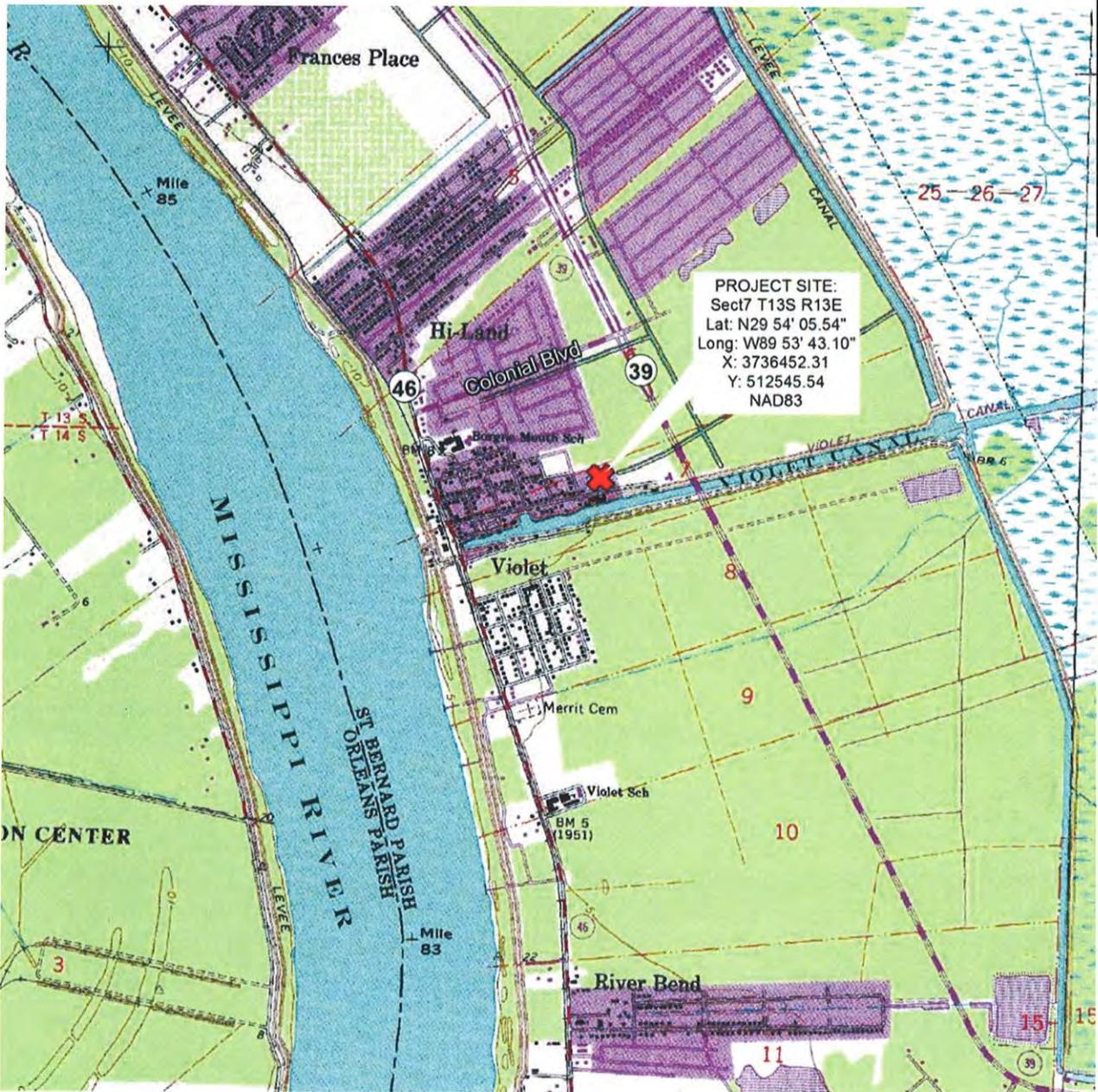
Appendix B

Permit Drawings

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NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.



TETRA TECH, INC.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614
Phone (949) 809-5000, FAX (949) 809-5003

**SOUTHEAST LOUISIANA FLOOD
PROTECTION AUTHORITY-EAST
VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA**

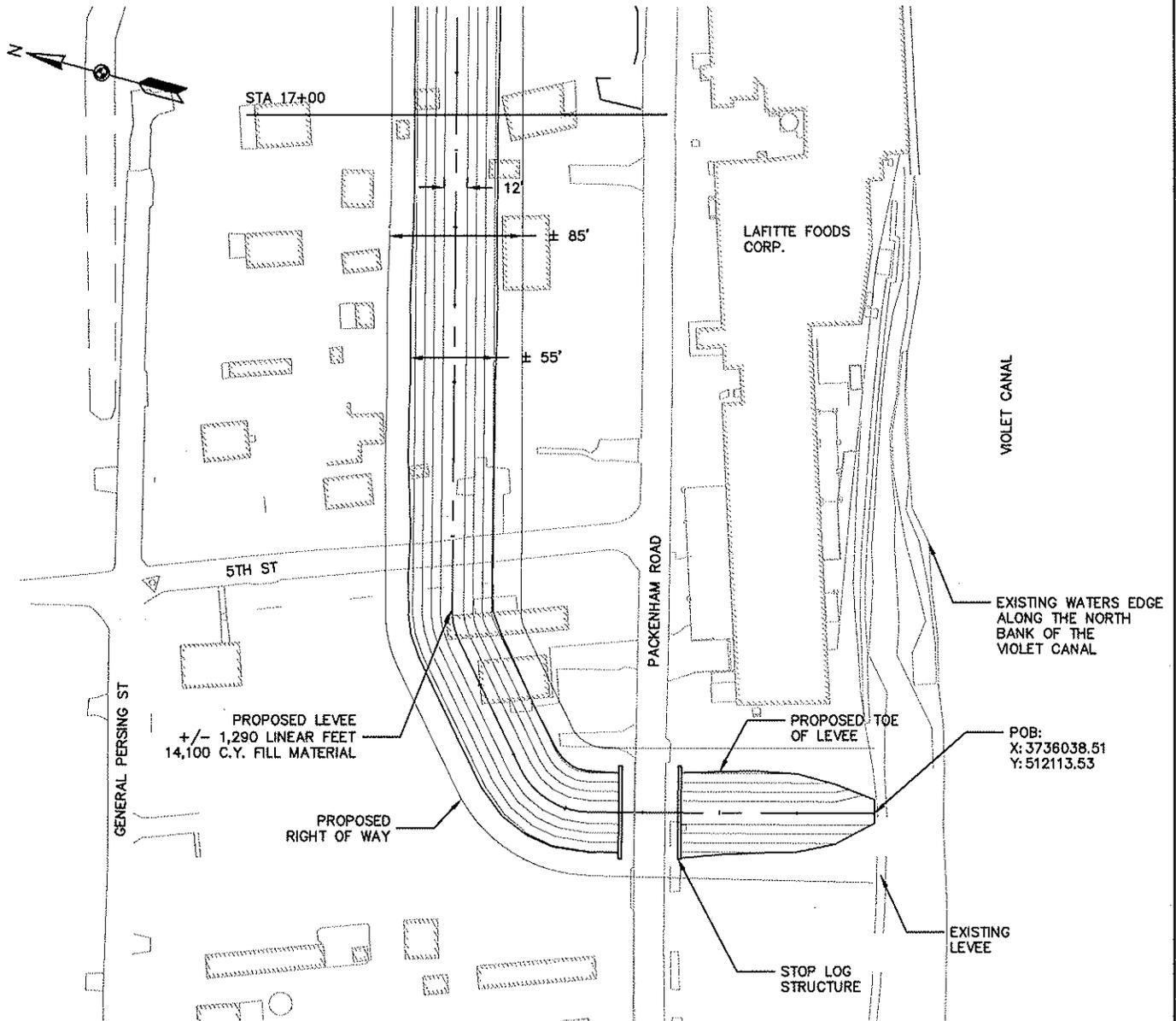
APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

VICINITY MAP

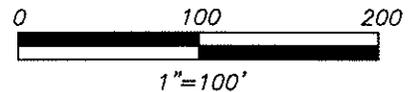
DATE:	03/13/2015
SHEET:	01 OF 04
SCALE:	1" = 2,000'

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.



- NOTES:
 1. NO PROJECT WORK WILL OCCUR IN THE VIOLET CANAL.
 2. ALL FILL MATERIAL WILL SUPPLIED FROM AN OFF SITE LOCATION.



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 PROTECTION AUTHORITY-EAST**
VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA

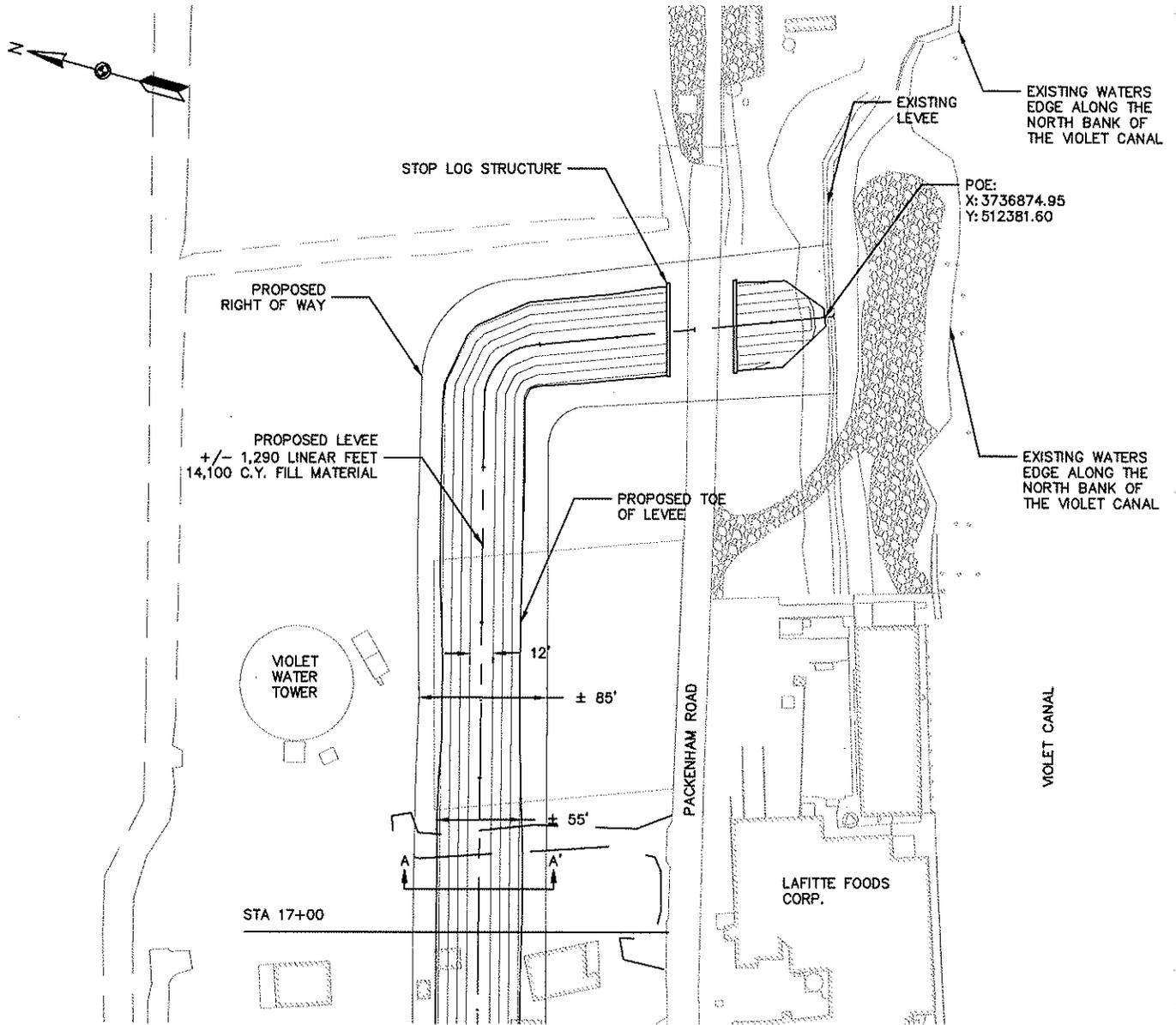
APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
 DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

PLAN VIEW

DATE:	03/13/2015
SHEET:	02 OF 04
SCALE:	1" = 100'

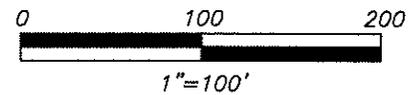
NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.



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**SOUTHEAST LOUISIANA FLOOD
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VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA**

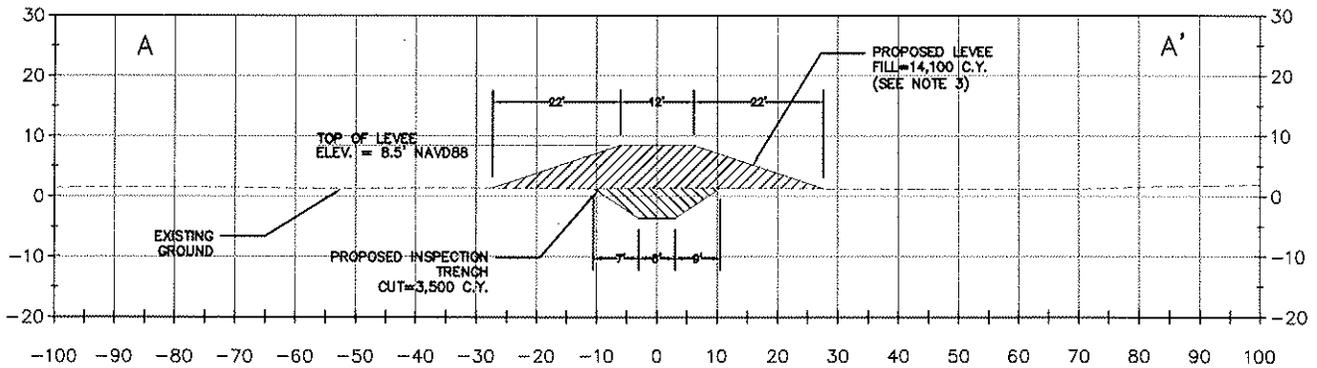
APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

PLAN VIEW

DATE:	03/13/2015
SHEET:	03 OF 04
SCALE:	1" = 100'

NOTE: THESE DRAWINGS ARE TO BE USED EXCLUSIVELY FOR ACQUISITION OF REGULATORY PERMITS.

SAINT BERNARD PARISH, LOUISIANA
SECTION 7, TOWNSHIP 13S., RANGE 13E.



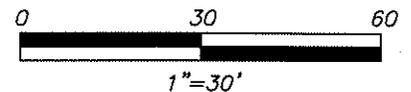
 FILL AREA

 CUT AREA

CROSS SECTION
A-A'

NOTES:

1. SIDE SLOPES OF LEVEE FILL ARE EQUAL TO 3H:1V.
2. INSPECTION TRENCH SIDE SLOPES ARE EQUAL TO 1.5H:1V.
3. PROPOSED LEVEE FILL = FILL ABOVE EXISTING GROUND + FILL TO ENCLOSE THE INSPECTION TRENCH.



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17885 Von Karman Avenue, Suite 500
Irvine, CA 92614
Phone (949) 809-5000, FAX (949) 809-5003

SOUTHEAST LOUISIANA FLOOD PROTECTION AUTHORITY-EAST
VIOLET CANAL NORTH REALIGNMENT PHASE 2
SAINT BERNARD PARISH, LOUISIANA

APPLICATION BY: SOUTHEAST FLOOD PROTECTION AUTHORITY-EAST
DATE: 02/27/2015 VIOLET, SAINT BERNARD PARISH, LOUISIANA

CROSS SECTION

DATE: 03/13/2015

SHEET: 04 OF 04

SCALE: 1" = 30'

APPENDIX E
OTHER INFORMATION (PUBLIC NOTICE,
8-STEP PROCESS, DRAFT FONSI)

**FEMA NOTICE OF AVAILABILITY FOR THE
DRAFT ENVIRONMENTAL ASSESSMENT AND
DRAFT FINDING OF NO SIGNIFICANT IMPACT
MITIGATION PROPOSAL FOR THE
ST. BERNARD BASIN BACK PROTECTION LEVEE SYSTEM EXTENSION,
ST BERNARD PARISH, LOUISIANA**

Interested parties are hereby notified that the Federal Emergency Management Agency (FEMA) has prepared a draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI) in compliance with the National Environmental Policy Act (NEPA). The purpose of the EA is to assess the effects on the human and natural environment for the St. Bernard Basin Back Levee Extension project, which proposes to realign a portion of the back basin levee along Violet Canal and improve drainage through design reconfiguration in an effort to have the back basin levee incorporated into the federal hurricane protection system and included in the forthcoming Flood Insurance Rate Map (FIRM) for St. Bernard and Orleans Parishes.

In an effort to reduce flooding, National Flood Insurance Program (NFIP) claims, and NFIP participation costs for residents, Southeast Louisiana Flood Protection Authority – East is working to get the Back Protection Levee System (BPLS) incorporated into the federal hurricane protection system and included in the forthcoming FIRM for St. Bernard and Orleans Parishes. As part of the evaluation of the BPLS and the 40 Arpent Levee system, it was determined that the Violet Canal North Bank required improvements to meet the FEMA NFIP regulations (44 CFR 65.10) for 100-year level flood protection.

The purpose of the draft EA is to analyze the potential environmental impacts associated with the preferred action and alternatives. The draft EA evaluates a No Action Alternative, the Preferred Action Alternative, which would realign a portion of the back basin levee along Violet Canal and improve drainage through design reconfiguration, and a Considered Action Alternative which would construct a 1,375 linear foot sheet pile wall along the interior of the Violet Canal stretch. The draft FONSI is FEMA's finding that the preferred action would not have a significant effect on the human and natural environment.

The draft EA and draft FONSI are available for review at the following location: at the St. Bernard Parish Library Main Branch located at 2600 Palmisano Blvd., Chalmette, LA 70043 Mondays – Thursdays 9 am – 7pm, Fridays – Saturdays 9 am-5pm, closed Sundays and Holidays. This public notice will run in the local newspaper, The St. Bernard Voice, Friday August 19, 2016; and Friday, August 26, 2016; and in the Advocate (New Orleans edition) on Friday through Thursday, August 19-25, 2016. An electronic version of the draft EA can be viewed and downloaded at FEMA's website at <http://www.fema.gov/resource-document-library> There is a 15 day comment period, beginning on August 27, 2016 and concluding on September 10, 2016 at 4 pm. Comments may be mailed to: DEPARTMENT OF HOMELAND SECURITY-FEMA EHP, 1500 MAIN STREET, BATON ROUGE, LOUISIANA 70802. Comments may be emailed to: FEMA-NOMA@fema.dhs.gov or faxed to 225-346-5848. Verbal comments will be accepted or recorded at 504-427-8000. If no substantive comments are received, the draft EA and associated draft FONSI will become final.

8-STEP PROCESS

EO 11988-FLOODPLAIN MANAGEMENT EO 11990-WETLAND PROTECTION

Date: 9-2-2016

Prepared by: Melanie Pitts, Lead Environmental Protection Specialist and Amber Martinez, Environmental Historic Preservation

Project: St. Bernard Back Basin Protection Levee System (BPLS) Extension, Hazard Mitigation Grant Program Project No. 1603-0438, FEMA Disaster 1603-DR-LA

On August 29, 2005, the community was devastated by storm surge and wind associated with Hurricane Katrina which topped the BPLS and destroyed the MRGO levee. According to the project application, as a result of Hurricane Katrina, St. Bernard Parish accounted for nearly 40,000 NFIP claims amounting to over \$1.7 billion in damages. St. Bernard Parish would later account for nearly 3,000 claims amount to \$7 million in damages following Hurricane Gustav (2008). In Orleans Parish, there are 204 repetitive loss structures in the Lower Ninth Ward that have accounted for over 600 NFIP claims amounting to over \$14.7 in damages since the City of New Orleans began participating in the NFIP. In an effort to reduce flooding in these communities, NFIP claims, and NFIP participation costs for residents, SLFPA-E is proposing to have the BLPS accredited by FEMA and included in the forthcoming FIRM for St. Bernard and Orleans parishes. The SLFPA-E entered into a Provisional Accredited Levee (PAL) agreement with FEMA in 2012. The PAL agreement provided the LBBLD with a path to having the BPLS federally accredited, provided that the SLFPA-E conducted a complete assessment of the levee system and corrected any deficiencies.

In accordance with the PAL agreement, the SLFPA-E contracted an assessment of the levee system and its suitability to Tetra Tech, Inc. of Baton Rouge, Louisiana, an engineering company (herein referred as (Tetra Tech). Tetra-Tech confirmed suitability for the entire BPLS with an exception of a 1,200 foot stretch of levee along the upper-river bank of the Violet Canal. At this location, the Lafitte Frozen Food Company (i.e. Shrimp Factory), constructed circa 1920, straddles the BLPS rendering a portion of the levee inaccessible (Tetra Tech, 2013).

As part of the evaluation of the BLPS, it was determined the deficient area along the north bank of the Violet Canal required improvements to meet the FEMA NFIP regulations (44 CFR 65.10) for 100-year level flood protection. Although the area in which construction activities would occur are located on the Violet Canal North Bank, the potential impact area includes the entire St. Barnard Basin encompassing the Lower Ninth Ward, Arabia, Meraux and Violet (the study area). The study area is bound by the BLPS to the East, West and South and the Federal Levee System (HSSDRS) to the north

Location: The project area includes the entire St. Bernard Basin, including;, Arabi, Chalmette, Mereux and Violet, Louisiana and the Lower ninth ward in Orleans Parish.

STEP 1 Determine whether the proposed action is located in a wetland and/or the 100-yr floodplain (500-year floodplain for critical actions [44 CFR 9.4]), or whether it has the potential to affect or be affected by a floodplain or a wetland (see 44 CFR 9.7).

Per the St. Bernard Parish Preliminary Digital Flood Insurance Rate Map (DFIRM) panel Panels 22087C0757D, 22087C0460D, 22087C0478D, 22087C0479D, 22087C0480D, 22087C0483D, 22087C0492D, 22087C0494D, 22087C0515D, 22087C0520D, 22087C0752D, and 22087C0756D, dated September 29, 2015 and the Orleans parish Preliminary DFIRM panels 22071C0234F, 22071C0232F, dated December 1, 2015 the study area spans multiple flood zones, including X, X protected by levee, 0.2 percent annual chance flood hazard area; A, and AE zones with and without Base Flood Elevations determined. It should be noted the Orleans Parish Preliminary DFIRMS will become effective on September 30, 2016. The Preliminary DFIRM data takes into account the BPLS as a provisionally accredited levee.

Per the St. Bernard Parish Preliminary DFIRM panel 22087C0494D, the immediate project area is located partially within a.2 pct annual chance flood hazard area and an AE zone. It also assumes the Lafitte Frozen Foods is partially within the levee.

Per the National Wetlands Inventory Map, the Violet Canal is classified as a E1UBL wetland- Estuarine, Subtidal, Unclassified Bottom, Subtidal- See EA for further definition of this wetland. No other wetlands were identified within the project area and a DA permit under Section 404 of the Clean Water Act is not required for the project, USACE letter dated June 9, 2015.

STEP 2 Notify the public at the earliest possible time of the intent to carry out an action in a floodplain or wetland, and involve the affected and interested public in the decision making process (see 44 CFR 9.8).

A cumulative public notice concerning the Hazard Mitigation Grant Program (HMGP) Assistance in floodplain and wetland areas has been published in the New Orleans Times-Picayune, Baton Rouge Advocate, Lafayette Daily Advertiser, Lake Charles American Press, Hammond Star, Monroe News-Star, Shreveport Times, and the Alexandria Daily Town Talk. Additionally, a public notice announcing the availability of the Draft Environmental Assessment will be published in the local newspaper, The St. Bernard Voice, Friday September 16

2016; and Friday, September 23, 2016; and in the Advocate (New Orleans edition) on Friday through Thursday, September 16-22, 2016.

STEP 3 Identify and evaluate practicable alternatives to locating the proposed action in a floodplain or wetland (including alternative sites, actions and the "no action" option) [see 44 CFR 9.9]. If a practicable alternative exists outside the floodplain or wetland, FEMA must locate the action at the alternative site.

No Action: Under the No Action Alternative, flooding would not be abated or improved. The purpose of the proposed project is to alleviate flooding within portions of Orleans and St. Bernard Parish and to obtain FEMA accreditation for the BPLS. This alternative does not meet the purpose and need of the project

Proposed Action: St. Bernard Back Basin Protection Levee System (BPLS) Extension

The proposed project would construct a new earthen levee (approximately 1,280 linear feet) that would attach to the existing BLPS at two points, completely enclosing the inaccessible portion of the existing levee near 22525 Packenham Road, Violet Louisiana. The project also consists of stop log structures along Packenham Rd. and associated drainage work to alleviate flooding within area between the existing BPLS and the proposed extension. Phase I of this project, a levee alignment to the east of the proposed project has already been completed by the applicant. The footprint of the proposed project is located near 2525 Packenham Road, Violet Louisiana along the existing BPLS, on the river bank of the Violet Canal which is located within the following coordinates:

29.901024, -89.896604 (Northwest Corner)
29.900345, -89.896535 (Southwest Corner)
29.901665, -89.894156 (Northeast Corner)
29.901037, -89.893960 (Southeast Corner)

Considered Alternative: Construction of 1,375 Linear Foot Sheet Pile Wall along the Interior of the Violet Canal Stretch

This alternative would include the construction of a 1,375 linear foot wall of sheet pile along the interior (Violet Canal side) stretch under the Shrimp Factory which would tie back into the existing earthen levee on the south side of the building and into a newly-constructed 415 linear foot earthen levee on the north side of the building. The sheet pile design would meet the purpose and need of the project as it would close the loop in the levee system and ensure the 100-year flood

protection. However; this alternative was dismissed due to unfavorable soil conditions and costs.

STEP 4 Identify the full range or potential direct or indirect impacts associated with, the occupancy or modification of floodplains and wetlands and the potential direct and indirect support of floodplain and wetland development that could result from the proposed action (see 44 CFR 9.10).

Proposed Alternative: Per the *Violet Canal North Realignment Phase 2 Hydraulic Modification Impact Analysis Report*, dated May 2015, the proposed action would not have any upstream or downstream impacts on Violet Canal flood elevations during a 100-year recurrence rainfall type flood. The runoff for the pre- and post-conditions will be conveyed into the same drainage systems. The levee realignment, new catch basins and drainage modifications / redirections are likely to reduce flood losses in the entire BPLS study area up to and including the 100-year flood event and the engineering analyses show the modifications will bring the BPLS to NFIP standards.

According to the report, with the proposed conditions, the area between the existing berm and the proposed levee could be inundated during the 100-year flood event when the stop log structures are in place and slide gates on Packerham Road are closed. As floodwaters recede and the stop log structures and slide gates are open, the flow would be drained by the proposed storm drain system #1 to the existing storm drain system located at Fourth Street and the proposed storm drain system #2 to the north-south natural drainage ditch located on the east side of the proposed levee. Both existing drainage systems discharge unto the east-west natural drainage ditch at the eastern end of General Pershing Street

By re-grading the areas between the flood-side (south) of the levee and the existing berm, the receding flood flow would be able to flow more efficiently by the proposed storm drain systems to the existing drainage systems and eventually outlet unto the east-west natural drainage ditch located at the eastern end of General Pershing Street. The runoff for the pre- and post-conditions would be conveyed into the same drainage systems (i.e. the east-west natural drainage ditch and the drainage system at the east end of General Pershing Street). Properties on the landside (north) of the proposed levee will be protected during the 100-year flood and the finished floor elevation of the Shrimp Factory is at or above the FEMA 100-year flood elevation of four (4) feet. Through residential buyout and relocation, no homes would be inhabited on the flood-side of the proposed levee after the completion of the project.

This project site would not affect the Violet Canal wetlands.

STEP 5 Minimize the potential adverse impacts and support to or within floodplains and wetlands to be identified under step # 4, restore and preserve the natural and beneficial values served by floodplains, and preserve and enhance the natural and beneficial values served by wetlands (see 44 CFR 9.11).

The proposed action would not have any upstream or downstream impacts on Violet Canal flood elevations during a 100-year recurrence rainfall type flood. The runoff for the pre- and post-conditions will be conveyed into the same drainage systems. The levee realignment, new catch basins and drainage modifications / redirections are likely to reduce flood losses in the entire BPLS study area up to and including the 100-year flood event and the engineering analyses show the modifications will bring the BPLS to NFIP standards.

There is no planned future development in the St. Bernard Basin, although residential and commercial infill development will continue to occur as a result of the ongoing hurricane Katrina recovery. St. Bernard Parish will continue to regulate substantial improvements in accordance with its floodplain management ordinance (Chapter 10.5 of the St. Bernard Parish Code of Ordinances).

The applicant is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities.

New construction must be compliant with current codes and standards.

Per 44 CFR 9.11(d)(6), no project should be built to a floodplain management standard that is less protective than what the community has adopted in local ordinances through their participation in the National Flood Insurance Program.

All coordination pertaining to these activities and applicant compliance with any conditions should be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

The project site would not directly impact the Violet Canal; however, the following conditions would minimize any indirect impacts to wetlands:

Implement construction BMPs; install silt fences/straw bales to reduce downslope sedimentation. Area soils must be covered and/or wetted during construction.

Extreme care should be taken during the construction process through the appropriate use and maintenance of BMP's. ECD's such as silt fencing, hay bales, sediment traps, etc. must be used and maintained extensively to prevent any

potential direct or indirect adverse impacts to nearby wetland areas per the CWA and EO 11990. Potential concerns include but are not limited to silting-in and contamination from spills.

STEP 6 **Reevaluate the proposed action to determine first, if it is still practicable in light of its exposure to flood hazards, the extent to which it will aggravate the hazards to others. And it's potential to disrupt floodplain and wetland values and second, if alternatives preliminarily rejected at step # 3 are practicable in light of the information gained in steps # 4 and # 5. FEMA shall not act in a floodplain or wetland unless it is the only practicable location (see 44 CFR 9.9).**

The action proposed is located in the only practicable location. The project site is the only deficient location identified in order to have the BPLS federally accredited.

STEP 7 **Prepare and provide the public with a finding and public explanation of any final decision that the floodplain or wetland is the only practicable alternative (see 44 CFR 9.12).**

The Draft EA will be available for public review and a notice will be published in the St. Bernard Voice, Friday September 16 2016; and Friday, September 23, 2016; and in the Advocate (New Orleans edition) on Friday through Thursday, September 16-22, 2016. There will be a fifteen (15) day comment period, beginning on September 24, 2016 and concluding on October 8, 2016 at 4 pm.

STEP 8 **Review the implementation and post-implementation phases of the proposed action to ensure that the requirements of the order are fully implemented. Oversight responsibility shall be integrated into existing processes.**

Project shall be reviewed by FEMA at grant closeout to ensure the project was completed in accordance with all relevant and applicable floodplain ordinances, codes and standards and that all project actions were undertaken in accordance with terms and conditions stipulated to mitigate and minimize adverse effects in or to the floodplain and wetlands. Approval conditioned on reviews of implementation and post implementation phases to ensure compliance with the order(s).

Project has been reviewed for compliance with 44 CFR Part 9.



FEMA

U.S. Department of Homeland Security
Louisiana Recovery Office
1500 Main Street
Baton Rouge, LA 70802

**DRAFT FINDING OF NO SIGNIFICANT IMPACT
FOR THE
ST. BERNARD BASIN BACK PROTECTION LEVEE SYSTEM EXTENSION,
VIOLET, LOUISIANA
ST BERNARD PARISH, LOUISIANA
HMGP 1603-0438
*FEMA-1603-DR-LA***

BACKGROUND

The Lake Borgne Basin Levee District; the applicant; with The Southeast Louisiana Flood Protection Authority-East, through the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) has requested federal funding through the Federal Emergency Management's (FEMA) 404 Hazard Mitigation Grant Program to realign a portion of the back basin levee along Violet Canal and improve drainage through design reconfiguration in an effort to have the back basin levee incorporated into the federal hurricane protection system and included in the forthcoming Flood Insurance Rate Map (FIRM) for St. Bernard and Orleans parishes.

In accordance with 44 Code of Federal Regulations (CFR) Part 10, FEMA regulations to implement the National Environmental Policy Act, an Environmental Assessment (EA) was prepared. The purpose of the EA was to analyze the potential environmental impacts associated with levee realignment and drainage reconfiguration and to determine whether to prepare an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI).

As part of the evaluation of the Back Protection Levee System (BPLS) and the 40 Arpent Levee system, it was determined that the Violet Canal North Bank required improvements to meet the FEMA National Flood Insurance Program (NFIP) regulations (44 CFR 65.10) for 100-year level flood protection. In an effort to reduce flooding, NFIP claims, and NFIP participation costs for residents, Southeast Louisiana Flood Protection Authority – East is working to get the BPLS incorporated into the federal hurricane protection system and included in the forthcoming FIRM for St. Bernard and Orleans parishes.

If the levee is left unincorporated the entire St Bernard Basin (over 45,500 St. Bernard and Orleans Parish residents) would be denied 100-year flood protection. Furthermore, the pending FIRMs for both parishes would drastically change, reflecting increased risk and flood insurance premiums. Changes to the pending FIRMs would further delay adoption of the new maps in both parishes and would undoubtedly have a devastating impact on post-Katrina redevelopment efforts. The alternatives considered include: 1) No Action, 2) Violet Canal North Bank Levee Realignment and Drainage Improvement through Design Reconfiguration (Proposed Action), and 3) Construction of 1,375 Linear Foot Sheet Pile Wall along the Interior of the Violet Canal Stretch (Considered Action).

FINDINGS

FEMA has evaluated the proposed project for significant adverse impacts to geology, soils, water resources (surface water, groundwater, and wetlands), floodplains, coastal resources, air quality, biological resources (vegetation, fish and wildlife, Federally-listed threatened or endangered species and critical habitats), cultural resources, socioeconomics (including minority and low income populations), safety, noise, and hazardous materials. The results of these evaluations as well as consultations and input from other federal and state agencies are presented in the EA.

CONDITIONS

- The applicant is required to comply with all federal, state, and local laws, Executive Orders (EOs), and regulations. Failure to do so will jeopardize federal funding.
- Implement construction Best Management Practices (BMPs); install silt fences/straw bales to reduce downslope sedimentation. Area soils must be covered and/or wetted during construction.
- If fill is stored on site as part of unit installation or removal, the contractor is required to appropriately cover it.
- Construction contractor is required to obtain applicable Louisiana Pollutant Discharge Elimination System (LPDES) permit, and implement stormwater pollution prevention plan.
- The applicant is required to coordinate with the local floodplain administrator regarding floodplain permit(s) prior to the start of any activities. All correspondence must be submitted to FEMA and FEMA-Environmental Historic Preservation (FEMA-EHP) for inclusion in the project files. Should the site plans (including drainage design) change the applicant must submit changes to FEMA-EHP for review and approval prior to the start of construction.
- New construction must be compliant with current codes and standards.
- The project area must be kept cleared so as not to interfere with floodplain functions.
- Per 44 CFR 9.11(d)(6), no project should be built to a floodplain management standard that is less protective than what the community has adopted in local ordinances through their participation in the NFIP.
- The project is in close proximity and directly adjacent to wetlands. Extreme care should be taken during the construction process through the appropriate use and maintenance of BMP's. Erosion Control Devices such as silt fencing, hay bales, sediment traps, etc. **must be used and maintained extensively** to prevent any potential direct or indirect adverse impacts to nearby wetland areas per the Clean Water Act and EO 11990. Potential concerns include but are not limited to silting-in and contamination from spills.

- Proper signage is required to clearly identify the adjacent wetland boundaries to help prevent any potential adverse impacts from construction vehicles/equipment/supplies accidentally leaving the boundaries of the approved Right of Way.
- Any adverse impacts to adjacent wetlands resulting from the construction of this project will jeopardize receipt of federal funding.
- Any changes or modifications to the proposed project will require a revised determination. Off-site locations of activities such as borrow, disposals, haul- and detour roads, and work mobilization site developments may be subject to United States Army Corps of Engineers (USACE) regulatory requirements.
- If the project results in a discharge to waters of the State; submittal of a LPDES application is necessary.
- If proposed work is located in wetlands or other areas subject to the jurisdiction of the USACE, USACE should be contacted directly to inquire about the possible necessity for permits. If a USACE permit is required, part of the application process may involve a water quality certification from the Louisiana Department of Environmental Quality (LDEQ).
- All precautions must be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one (1) acre. The applicant must contact the LDEQ Water Permits Division at 225-219-9371 to determine if the proposed project requires a permit. Additional information may be obtained on the LDEQ website at <http://www.deq.louisiana.gov/portal/tabid/2296/Default.aspx> or by contacting the LDEQ Water Permits Division at 225- 219-9371.
- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQs Single-Point-of-Contact at 225-219-3640 is required. Additionally, precautions must be taken to protect workers from these hazardous constituents.
- The contractor must observe all precautions to protect the groundwater of the region.
- Vehicle operation times would be kept to a minimum. Area soils must be covered and/or wetted during construction to minimize dust.
- If human bone or unmarked grave(s) are present within the project area, compliance with the Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671 et seq.) is required. The applicant shall notify the law enforcement agency of the jurisdiction where the remains are located within 24 hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at

225-342-8170 within 72 hours of the discovery (Louisiana Unmarked Human Burial Sites Preservation Act).

- If at any time Heritage tracked species are encountered within the project area, please contact the Louisiana Natural Heritage Program Data Manager at 225-765-2643.
- If the proposed project has not been initiated within one (1) year, follow-up coordination via this website www.fws.gov/lafayette, should be accomplished prior to making expenditures because threatened and endangered species information is updated periodically. If the scope or location of the proposed project is changed, coordination via this website should occur as soon as such changes are made.
- If during the course of work, archaeological artifacts (prehistoric or historic) are discovered, the applicant shall stop work in the vicinity of the discovery and take all reasonable measures to avoid or minimize harm to the finds. The applicant shall inform their, GOHSEP State Applicant Liaison and Hazard Mitigation Assistance contacts at FEMA, who will in turn contact FEMA-HP staff. The applicant will not proceed with work until FEMA-HP completes consultation with the State Historic Preservation Officer, and others as appropriate (Inadvertent Discovery Clause).
- Unusable equipment, debris and material shall be disposed of in an approved manner and location. In the event significant items (or evidence thereof) are discovered during implementation of the project applicant shall handle, manage, and dispose of petroleum products, hazardous materials and/or toxic waste in accordance to the requirements and to the satisfaction of the governing local, state and federal agencies.
- Applicant is responsible for acquiring LDEQ permits for the temporary debris staging and reduction sites associated with this project prior to project closeout. Failure to provide FEMA with LDEQ approval may jeopardize project funding eligibility.
- All debris would be disposed of at a permitted landfill.
- Mitigation and abatement measures would be required to reduce the noise levels to a range that would be considered acceptable. The applicant must comply with the local ordinance.
- To minimize worker and public health and safety risks from project construction and closure, all construction and closure work must be done using qualified personnel trained in the proper use of construction equipment, including all appropriate safety precautions. Additionally, all activities must be conducted in a safe manner in accordance with the standards specified in the Occupation Safety and Health Administration regulations and the USACE safety manual.

- The contractor must post appropriate signage and fencing to minimize potential adverse public safety concerns, and to protect nearby residents from vehicular traffic.
- Appropriate signage and barriers must be in place prior to construction activities in order to alert pedestrians and motorists of project activities and traffic pattern changes.
- The contractor must implement traffic control measures, as necessary.
- The contractor must post appropriate signage and fencing to minimize potential adverse public safety concerns.
- If hazardous materials are unexpectedly encountered in the project area during the proposed construction operations, appropriate measures for the proper assessment, remediation, management and disposal of the contamination would be initiated in accordance with applicable federal, state, and local regulations. The contractor would be required to take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction area.
- The Louisiana Department of Natural Resources Office of Conservation should be contacted at 225-342-5540 if any unregistered wells of any type are encountered during construction work.
- For pipelines and other underground hazards, Louisiana One Call should be contacted at 800-272-3020.
- To reduce potential short term effects to air quality from construction-related activities, the contractor would be responsible for using BMPs to reduce fugitive dust generation and diesel emissions. Emissions from the burning of fuel by internal combustion engines would temporarily increase the levels of some of the criteria pollutants, including Carbon Dioxide, Nitrogen Oxide, Ozone, and Particle Matter (PM₁₀), and non-criteria pollutants such as Volatile Organic Compounds. To reduce these emissions, running times for fuel-burning equipment should be kept to a minimum and engines should be properly maintained.

CONCLUSIONS

Based upon the incorporated EA, and in accordance with Presidential Executive Orders 12898 (Environmental Justice), 11988 (Floodplain Management), and 11990 (Wetland Protection), FEMA has determined that the proposed action implemented with the conditions and mitigation measures outlined above and in the EA will not have any significant adverse effects on the quality of the natural and human environment. As a result of this FONSI, an EIS will not be prepared (44 CFR Part 10.8) and the proposed action alternative as described in the EA may proceed.

APPROVALS

Jerame Cramer	Date
Environmental Liaison Officer	
Louisiana Recovery Office, Region VI	
FEMA 1603-1607-DR-LA	

Thomas M. (Mike) Womack	Date
Director of the Louisiana Recovery Office	
Region VI	
FEMA 1603-1607-DR-LA	