

Draft Environmental Assessment

Little Bayou Castine Drainage Improvements

St. Tammany Parish, Louisiana

Hazard Mitigation Grant Program

Project Number 1603-0332

August 2015



FEMA

**U.S. Department of Homeland Security
Federal Emergency Management Agency, Region VI
Louisiana Recovery Office
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Other Information (Public Notice, 8-Step Process, FONSI, etc.)

LIST OF ACRONYMS

APE	Area of Potential Effects
ACHP	Advisory Council on Historic Preservation
BMP	Best Management Practices
CAA	Clean Air Act
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources System
CUP	Coastal Use Permit
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DEA	Draft Environmental Assessment
DFIRM	Digital Flood Insurance Rate Map
DOTD	Department of Transportation and Development
EA	Environmental Assessment
EHP	Environmental and Historic Preservation
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
GOHSEP	Governor's Office of Homeland Security and Emergency Preparedness
HMP	Hazard Mitigation Plan
HP	FEMA Historic Preservation
LA HMGP PA	Louisiana State-Specific Hazard Mitigation Grant Program Programmatic Agreement
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LSU	Louisiana State University
NAAQS	National Ambient Air Quality Standards
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act
NFI	National Flood Insurance
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NRCS	Natural Resources Conservation Services
OPA	Otherwise Protected Area
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Act
ROW	Right of Way
SDMI	Stephenson Disaster Management Institute
SFHA	Special Flood Hazard Area

SHPO	State Historic Preservation Office/Officer
SOW	Scope of Work
THPO	Tribal Historic Preservation Office/Officer
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WSRA	Wild and Scenic Rivers Act

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1.0 INTRODUCTION

1.1 Project Authority

On August 29, 2005 Hurricane Katrina, a Category 4 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 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 (EA) is being prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), the President's Council on Environmental Quality (CEQ) regulations implementing NEPA (Title 40 of the Code of Federal Regulations [CFR] Parts 1500 to 1508), and FEMA's regulations implementing NEPA (44 CFR Parts 9 and 10).

St. Tammany Parish, through the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP) applied for funding under Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP) to reduce flooding and inundation of the properties along the Little Bayou Castine and its tributaries. The purpose of this EA is to analyze potential environmental impacts of the proposed project. 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. Tammany Parish is located in southeastern Louisiana, on the north shore of Lake Pontchartrain. The Parish covers 877 square miles and is the fifth largest parish in the state. It is bordered to the east by Pearl River, to the south by Lake Pontchartrain, and to the west by the Tchefuncte River. To the southeast are the City of Slidell and U.S. Highways 11 and 90 and Interstate 10, the main roads to the eastern entry to New Orleans, Louisiana. In the northeast and east portions of the Parish, the predominant landscape feature is the floodplain of the Bogue Chitto and Pearl Rivers. Along the lake to the south, the land is mostly marsh. The project is located in the southwestern portion of St. Tammany Parish, in the city of Mandeville, LA. Mandeville is located on the north shore of Lake Pontchartrain, south of Interstate 12 and across the lake from the city of New Orleans (Figures 1 and 2).

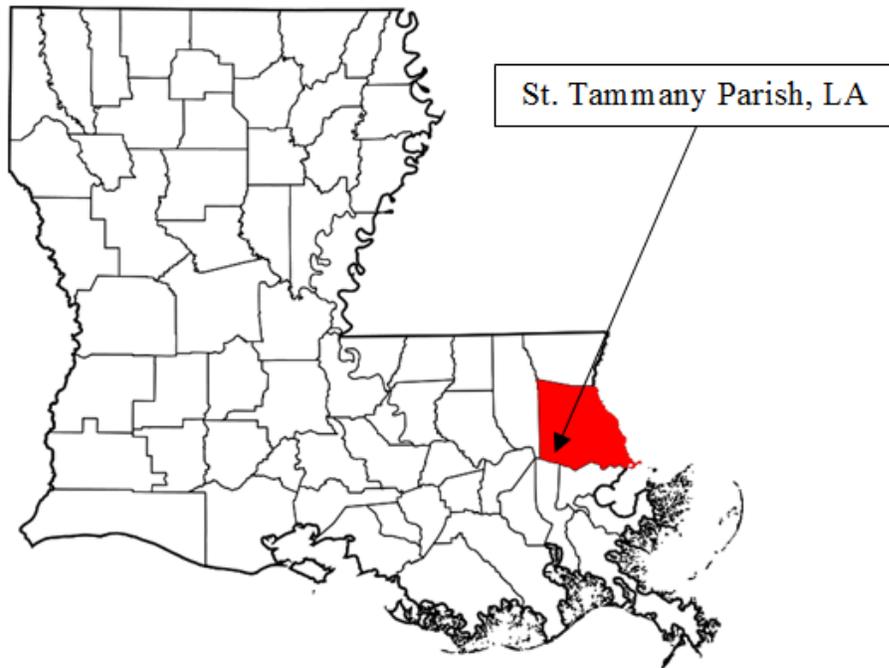


Figure 1. Location of St. Tammany Parish, LA

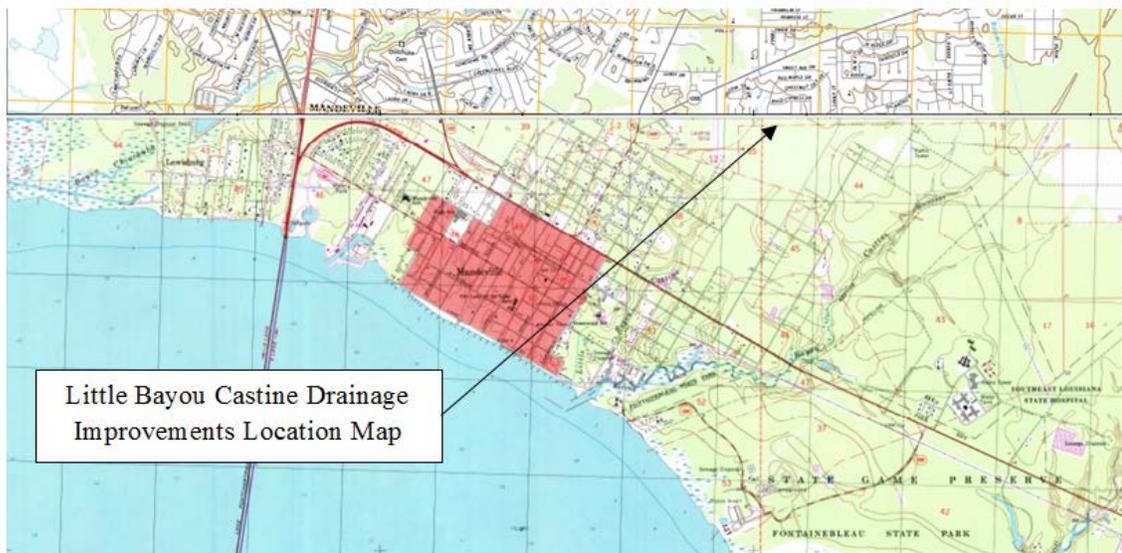


Figure 2. Little Bayou Castine Topographic View, St. Tammany Parish, LA

The City of Mandeville is subject to periodic flooding from a variety of sources. The low-lying areas within approximately 5 miles of Lake Pontchartrain can be flooded by intense rainfall, abnormally high tides in Lake Pontchartrain, hurricanes or lesser tropical storms, or any combination of these events. In the areas not adjacent to Lake Pontchartrain, flooding would result from periodic intense rainfall causing overflow of rivers and streams.

High stages from hurricanes have occurred in the coastal area of various parts of the St. Tammany Parish adjacent to Lake Pontchartrain in 1893, 1901, 1909, 1915, 1917, 1940, 1947, 1948, 1956, 1957, 1961, 1964, 1965, 1969, 1995, 1998, and 2002, respectively (St. Tammany Parish Flood Insurance Study (FIS) 2008). The highest reported elevation in Mandeville was 9.0 feet and occurred in September 1909. Stream flooding resulting from events other than hurricanes occur in the City of Mandeville as well. Principal flood problems within the City of Mandeville are caused by hurricane induced tidal surges from Lake Pontchartrain (Buchart Horn, Inc. 2015).

The principal causes of flooding are the inadequacy of the existing channel system to convey the storm runoff, relatively low flat floodplain areas which are easily inundated and high stages in Lake Pontchartrain created by hurricane. The flooding problem in the study area is compounded when high lake stages are accompanied by intense rainfall.

The majority of the flood events in the area have been the direct result of significant rainfall. Between 1989 and 2014, there have been forty-nine (49) recorded flood events in St. Tammany Parish (St. Tammany Parish HMP Update 2015). According to the Parish's HMP Update in 2015, St. Tammany Parish has received eight (8) Presidential Declarations as a result of flooding.

The specific sites for the proposed improvements are roughly bounded by LA Highway 1088 at the northeastern most extent (30.381012, -90.037005), Soult Street to the east (30.377061, -90.032340), Labarre Street to the south (30.367871, -90.046376), and Garon Drive to the west (30.376006, -90.041906) in Mandeville, St. Tammany Parish, Louisiana. See Figures 3 and 4 for the project area maps.

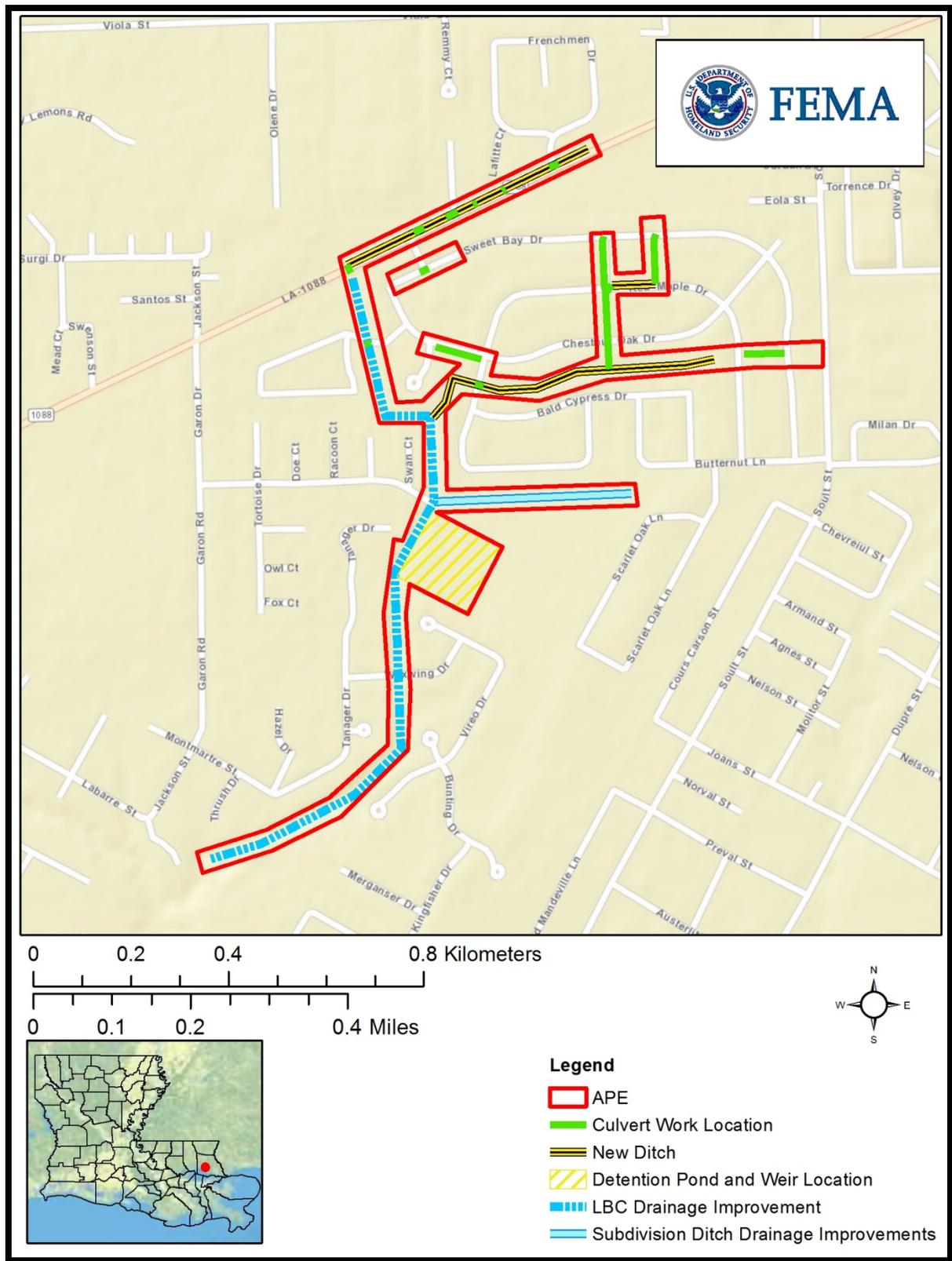


Figure 3. Little Bayou Castine Drainage Improvements Project Map, St. Tammany Parish, LA

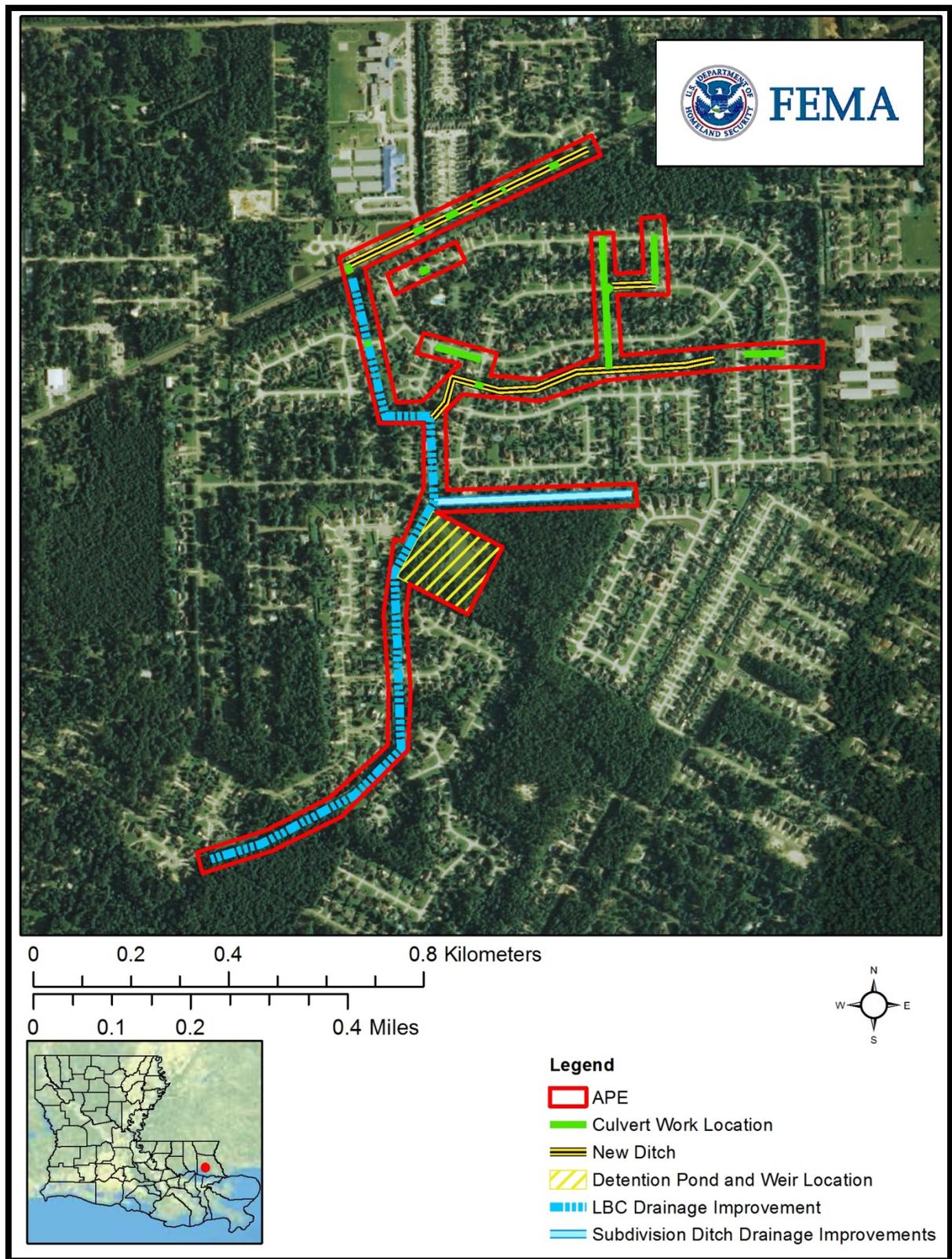


Figure 4. Little Bayou Castine Drainage Improvements Aerial Map, St. Tammany Parish, LA

A study by Buchart Horn, Inc. in June 2015 states that the Woodlands and surrounding neighborhood areas experience frequent flooding events due to multiple inadequate drainage structures throughout the system. During these events the neighborhoods flood because the water table rises quickly and inundates the surrounding area offering little capacity for proper drainage causing the streets to be flooded and affecting approximately 650 homes in the project area.

2.0 PURPOSE AND NEED

2.1 Purpose

St. Tammany Parish, as well as most municipalities, remain at high risk of water inundation from various sources, including flooding; failure of dams/levees and forced drainage systems, tornadoes and tropical cyclone activity (St. Tammany Parish HMP Update 2015). 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. In addition, implementation of this proposed project will:

- Ensure that adequate evacuation routes, streets, utilities, and public and emergency communications are maintained and available during and after a disaster.
- Protect homes and businesses from damage.
- Ensure that public services and critical facilities operate during and after a disaster.

2.2 Need

Existing pipes and ditches within the project area are presently undersized for the volume of water that frequently inundates the watershed during storm events. The increased run-off impacts the drainage in the project area along Little Bayou Castine and surrounding areas. The specific need of this project is to effectively alleviate major drainage and flooding problems experienced within residential subdivisions in the Little Bayou Castine drainage basin. Currently, the 100-year discharges at the downstream end of Little Bayou Castine are 2,310 cubic feet per second (CFS) and the existing facilities cannot adequately handle the flooding.

3.0 ALTERNATIVES

3.1 No Action Alternative

Under the No Action Alternative, flooding would not be abated or improved. The No Action Alternative would result in continued flooding within the Little Bayou Castine drainage basin and adjacent flooding in the area from low frequency storm events. This would result in hazardous conditions for not only the residents of St. Tammany Parish, but also businesses and emergency responders who utilize the roadways and live in this area. This alternative does not meet the purpose and need, but will continue to be evaluated throughout this EA and serve as a baseline comparison.

3.2 Proposed Action: Little Bayou Castine Drainage Improvements

The proposed action is to improve drainage in the headwaters of Little Bayou Castine by expanding the capacity of undersized culverts and ditches within the project area as well as constructing a 5-acre detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess water back into the watershed, thereby decreasing repetitive flood damage. Additionally, channel improvements are proposed for the upper stretch of Little Bayou Castine and Woodlawn Subdivision Ditch. Site photographs are exhibited in Appendix A. The extensive site plan drawings are shown in Appendix B. The following drainage improvements are proposed to protect subdivisions in the Little Bayou Castine basin from flooding which include:

North of LA Highway 1088

Ditch and pipe work along the northernmost side of the existing right-of-way (ROW) of LA Highway 1088 (Figures 3 and 4) including the expansion of 1,861.54 feet of ditch (latitude and longitude begin: 30.380948, -90.037302, end: 30.378909, -90.042505) and culvert/pipe replacements in six (6) locations (Table 1). The proposed culvert improvements are as follows:

Table 1. Proposed Culvert Improvements North of LA Highway 1088

Sub-Location	Existing	New	Latitude	Longitude
N of LA Hwy. 1088	Remove 60.22' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP)	Install 60.22' of 30' Chlorinated polyvinyl-chloride (CPVC)	30.380642	-90.038029
N of LA Hwy. 1088	Remove 23.22' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP)	Install 23.22' of 36" CPVC	30.380206	-90.039104
N of LA Hwy. 1088	Remove 23.21' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP)	Install 23.21' of double 36" CPVC	30.379967	-90.039731
N of LA Hwy. 1088	Remove 81.45' of 36" Reinforced Concrete Arch Pipe (RCPA)	Install 81.45' of double 36" CPVC	30.379777	-90.040238
N of LA Hwy. 1088	Remove 66.83' of double 36" RCPA	Install 66.83' of double 36" CPVC	30.379508	-90.040938
N-S of LA Hwy. 1088	Remove 57.44' of 46" x 36" SRPA (est.)	Install 57.44' of double 58.5" x 36" RCPA	30.378829	-90.042468

Woodlands Neighborhood Pipe and Ditch Improvements

Ditch and pipe work throughout the Woodlands neighborhood in multiple locations (Figures 3 and 4) including the excavation of 295.27 feet of new ditch (latitude and longitude begin: 30.378386, -90.036857, end: 30.378386, -90.035923) and culvert/pipe replacements in nine (9) locations (Table 2). The proposed culvert improvements are as follows:

Table 2. Proposed Culvert Replacements in Woodlands Neighborhood

Sub-Location	Existing	New	Latitude	Longitude
Tallow Tree Drive and Little Bayou Castine	Remove 32.00' of 64" (est.) Concrete Pipe	Install 32.00' of double 58.5" x 36" RCPA	30.377429	-90.042100
Mayhaw Drive	Remove 333.69' of 24" corrugated metal pipes Corrugated Metal Pipe (CMP)/38.09' of 28.5" x 18" RCPA	Replace with 77.87' of RCP and 293.91' of 36" CPVC	Begin: 30.379296/ End: 30.378279	Begin: -90.037004/ End: -90.036990
Mayhaw Drive	Remove 310.35' of 57 x 38" bituminous coated corrugated steel pipe (BCCSP)/32.00' of 51" x 31" RCPA/158.02' of BCCSP	Replace with 342.35' of double 46" x 36" steel spiral rib arch (SRPA) and 158.02' of double 53" x 41" SRPA	Begin: 30.378279 End: 30.376837	Begin: -90.036990 End: -90.036957
East of Mayhaw	Remove 34.23' of 29" x 18" RCPA/300.00' of 28" x 20" BCCSP	Replace with 34.23' of SPRA and 300.00' of 46" x 36" SRPA	Begin: 30.379316 End: 30.378386	Begin: -90.035886 End: -90.035922
Tributary 2 Ditch	Remove 271.42' of existing 24" BCCSP	Replace with 27" x 21" SRPA	Begin: 30.377046 End: 30.377056	Begin: -90.033208 End: -90.034077
Red Maple Drive	Remove 47.00' of 51" x 31" RCPA	Replace with triple 59.5" x 36" RCPA	30.376607	-90.039749
Chestnut Oak Drive	Remove 318.0' of existing 24" CMP	Replace with 36" CPVC pipes	Begin: 30.377334 End: 30.377083	Begin: -90.040657 End: -90.039685
Mayhaw and Red Maple Drive	Remove 57.44' of existing 28.5" x 18" RCPA	Replace with 46" x 36" SRPA	30.378329	-90.036912
Spring Blvd. and Sweet Bay Drive	Remove 96.83' of existing 24" CMP	Replace with double 24" RCPs	30.378755	-90.040853

Detention Pond and Broad-Crested Weir

St. Tammany Parish is proposing the construction of a 5-acre detention pond on the Parish owned land at the southeastern intersection of Little Bayou Castine and the Woodlands tributary. Part of the proposed detention pond location was formerly excavated between the years of 2007-2009 and the resultant depression is presently inundated. The design consists of a side-channel weir that allows low flows to bypass the pond and preserves the storage capacity of the pond for larger events. The weir structure will be a grass levee lined with a turf reinforcement mat located on the western side of the proposed detention pond. After a storm event, the pond will drain by gravity through an 18 inch outlet pipe back into the existing channel. This design would allow the pond to be dry during periods of no rainfall, and provide additional floodplain storage. The detention pond location and design parameters are as follows:

Northwest corner: 30.374301, -90.040802
Northeast corner: 30.373599, -90.039337
Southwest corner: 30.373093, -90.041609
Southeast corner: 30.372362, -90.040112

Bottom Elevation: 12.34 feet
Top of Bank; Elevation: 18.0 feet
Area of pond: 5 acres
Side Slope: 3:1

The weir-structure and outlet structure parameters are as follows:

Type: Broad-Crested Weir
Invert Elevation: 17.0 feet
Length: 50.0 feet
Breadth: 10.0 feet

Pipe Outlet Structure
Type: 18 inch RCP
Invert Elevation: 12.34 feet
Length: 40 feet

The primary benefit of the detention pond is to provide a reduction in the peak flows by providing additional off-line storage to the system.

Little Bayou Castine Channel Improvements

Little Bayou Castine flows north to south and defines the westernmost boundary of the project area (Figures 3 and 4). Along the upstream end of the Little Bayou Castine approximately 5,113.27 linear feet (latitude and longitude begin: 30.378738, -90.042420, end: 30.367967, -90.045736) of channel improvements are proposed including clearing the drainage channel of vegetation, brush, and trees within the cross-sectional area of the channel, and channel reshaping at various locations along the channel to redefine the channel cross-section. Proposed channel cross-sections range between 30-60 feet in breadth and average 52 feet in width.

Subdivision Ditch Improvements

Subdivision Ditch is located to the south of Red Maple Road and flows east to west until it discharges into Little Bayou Castine (Figures 3 and 4). Approximately 1,331.07 linear feet of ditch improvements are proposed (latitude and longitude begin: 30.374525, -90.036554, end: 30.374472, -90.040754) including clearing the drainage ditch of vegetation, brush, and trees within the cross-sectional area of the ditch, and ditch reshaping at various locations along the ditch to redefine the ditch cross-section.

Per the report from Buchart Horn, Inc. (2015), the proposed improvements will lower the water surface elevations up to 0.71 feet for a 100-year flood, and most of the conveyance of more frequent events (2-year through 50-year) will be contained within the culverts and channel systems. These improvements would alleviate drainage and flooding elevations through all recurrence intervals, reducing the flood damages for the 650 structures in the project area.

4.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

4.1 Impact Summary

FEMA-EHP consulted with resource agencies on July 21, 2015. To date, FEMA-EHP has not received responses/concurrence from all of the resource agencies. However, FEMA-EHP has reviewed the proposed action and the no action alternative and determined that there would be no significant impacts to any natural resources which are documented in the matrix below. This matrix summarizes the results of the environmental review process (Table 3). Potential environmental 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.

Potential environmental impacts for Proposed Action: Little Bayou Castine Drainage Improvements were analyzed and summarized in the Affected Environment and Environmental Consequences Matrix Table below (Table 3). This alternative would not result in significant impacts. This is due to the project location being located in an urban area, with most of the area being pre-disturbed and previously developed.

**Table 3. Affected Environment and Environmental Consequences Matrix:
Preferred Action: Little Bayou Castine Drainage Improvements**

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Geology and Soils	X				<p>The Farmland Protection Policy Act (FPPA: Public Law 97-98, §§ 1539-1549; 7 U.S.C. 4201, <i>et seq.</i>) was enacted in 1981 and 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 NRCS Web Soil Survey, the soils located on the proposed project area (Abita silt loam, poorly drained [Aa], Guyton silt loam, poorly drained [Gt], and Prentiss fine sandy loam, moderately well drained [Pr],) are not classified as a prime farmland soil; Farmland Protection Policy Act is precluded. The proposed construction areas are within urban areas and therefore exempt from the rules and regulations of the FPPA. Potential for short-term localized increase in soil erosion during construction.</p>	NRCS response letter dated 07/24/2015. See Appendix C External Agency Correspondence.	<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. If fill is stored on site as part of unit installation or removal, the contractor would be required to appropriately cover it. 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 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. All precaution should be observed to control nonpoint source pollution from construction activities. See also Section 6.0 Conditions and Mitigation Measures.</p>

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Hydrology and Floodplains (Executive Order 11988)		X			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. Preliminary Digital Flood Insurance Map (DFIRM) Panels; 22103C0320F, and 22103C 0431F, both dated 04/30/2008. Per 22103C 0431F, a portion of Little Bayou Castine project site is located in Flood Zone AE, Base Flood Elevation (BFE) 9 feet determined (North American Vertical Datum 88 (NAVD88)). Per 22103C 0320F and 22103C 0431F, most of the drainage project is in a zone X upstream, and contributing flood flows into the zone AE. See also Section 4.2 and 8-step process in Appendix E.	DFIRM Panels; 22103C0320F, and 22103C 0431F, both dated 04/30/2008.	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) (4) Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community. 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. See also Section 6.0 Conditions and Mitigation Measures.
Wetlands (Executive Order 11990)	X				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. U.S. Fish and Wildlife Service (USFWS) - National Wetlands Inventory map http://www.fws.gov/wetlands/Wetlands-Mapper.html queried on 08/04/2015 shows there are mapped riverine wetlands present in the northern portion of the proposed project area. See also Section 4.2 and 8-step process in Appendix E.	The U.S. Army Corps of Engineers (USACE) did not respond within the 30-day regulatory timeframe. See Appendix C External Agency Correspondence.	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. Applicant must coordinate with USACE at the New Orleans District to verify if jurisdictional waters of the U.S. occur on site and which permits or authorizations, if any, are required. Applicant must comply with all conditions of the permit and forward all correspondence to GOHSEP and FEMA for inclusion in the project files. Erosion Control Devices (ECD's) 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. Any adverse impacts to adjacent wetlands resulting from the construction of this project will jeopardize receipt of federal funding. See also Section 6.0 Conditions and Mitigation Measures.

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Surface Water and Water Quality	X				<p>USACE regulates the discharge of dredged or fill material into waters of the U.S., including wetlands, pursuant to §§ 401 and 404 of the Clean Water Act (CWA). 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. The USACE also regulates the building of structures in waters of the U.S. pursuant to §§ 9 and 10 of the Rivers and Harbors Act (RHA).</p> <p>Although there is potential for short-term localized increase in sedimentation during construction, the project as proposed would have significant long term impacts to water quality.</p>	<p>The USACE did not respond within the 30-day regulatory timeframe. See Appendix C External Agency Correspondence.</p>	<p>Applicant must coordinate with USACE at the New Orleans District prior to the start of construction to acquire any necessary permits or authorizations, if any, are required. 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. 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.</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 Single-Point-of-Contact (SPOC) at 225-219-3640 is required. Additionally, precautions must be taken to protect workers from these hazardous constituents.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>
Groundwater	X				<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.</p> <p>St. Tammany Parish does overlay a Sole Source Aquifer, Southern Hills Aquifer System. Project as proposed is not expected to affect any groundwater.</p>	<p>USEPA response dated 08/24/2015. See Appendix C External Agency Correspondence.</p>	<p>The contractor must observe all precautions to protect the groundwater of the region.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>
Wild and Scenic River	X				<p>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.</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 08/04/2015.</p>	

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Coastal Resources	X				<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.</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. According to the Louisiana Department of Natural Resources (LDNR), the project site is located within the Louisiana Coastal Zone and may require a Coastal Use Permit (CUP). The project is not located within the CBRS.</p>	LDNR response letter dated 07/24/2015. See Appendix C External Agency Correspondence.	The applicant is responsible for coordinating with and obtaining any required permit(s) from the LDNR Coastal Management Division prior to initiating work. 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.
Air Quality	X				<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. During construction, there is potential for a short-term localized increase in vehicle emissions and dust particles. St. Tammany Parish is classified as attainment under the National Ambient Air Quality Standards (NAAQS) and has no general conformity determination obligations. Overall impacts to air quality would be short-term and localized.</p>	LDEQ did not respond within the 30-day timeframe. 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. See also Section 6.0 Conditions and Mitigation Measures.

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Vegetation and Wildlife	X				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.	LDWF response letter dated 07/31/2015. See Appendix C External Agency Correspondence.	See also Section 6.0 Conditions and Mitigation Measures.
Threatened and Endangered Species (Endangered Species Act Section 7)	X				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 National Marine Fisheries Service. No rare, threatened, or endangered species are present on the site. 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.	LDWF response letter dated 07/31/2015. See Appendix C External Agency Correspondence. As previously directed by USFWS, FEMA utilized the self-screening website, www.fws.gov/lafayette , on July 28, 2015.	See also Section 6.0 Conditions and Mitigation Measures.

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Cultural Resources (National Historic Preservation Act Section 106)	X				<p>A review of this alternative was conducted in accordance with FEMA's 2011 Louisiana State-Specific Hazard Mitigation Grant Program Programmatic Agreement (LA HMGP PA) dated January 31st, 2011.</p> <p>While FEMA determined that the Area of Potential Effects (APE) is located within an area with potential for the presence of prehistoric archaeological resources, that soils data suggests that portions of this APE may have been moderately favorable to prehistoric and/or early historic occupation, no archaeological deposits were identified during pedestrian survey and judgmental shovel testing. Furthermore, with the exception of portions of the proposed Detention Pond and Broad-Crested Weir, it is likely that any archaeological deposits not identified within the present APE would likely have been heavily disturbed as a result of the construction of the ca. mid- to late-1990's sub-development, previous installation of extant ditch networks and culvert systems, extant road ROWs, and the channelization/maintenance of Little Bayou Castine. Based on all the available evidence, FEMA has determined that it is unlikely that this APE possess National Register of Historic Places (NRHP)-eligible archaeological deposits.</p>	<p>On 07/24/2015, FEMA submitted a finding of <u>No Historic Properties Affected</u> to SHPO, the Alabama-Coushatta Tribe of Texas, the Choctaw Nation of Oklahoma, the Chitimacha Tribe of Louisiana, the Jena Band of Choctaw Indians, the Mississippi Band of Choctaw Indians, and the Tunica-Biloxi Tribe of Louisiana. SHPO concurrence with this determination is pending. FEMA does not anticipate objections from the affected Tribes or SHPO. Should no consulting party object within the regulatory timeframes, FEMA may proceed with funding the undertaking assuming concurrence. See Appendix C External Agency Correspondence.</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 twenty-four hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within seventy-two 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 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). See also Section 6.0 Conditions and Mitigation Measures.</p>

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Environmental Justice (Executive Order 12898)/Socioeconomics	X				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. According to the 2010 U.S. Census Demographic Profile of 70448, Mandeville, LA; the total population is 24,851 with 90.9% White , 4.9% Black, and 5.6% Hispanic. The median household income is \$79,838 and 3.3% of the population is below poverty level. The proposed project would reduce flooding for all populations in the area, thus providing a benefit in the area.	U.S. Census Bureau, American Fact Finder, Data for Mandeville, Louisiana accessed July 28, 2015.	
Resource Recovery and Conservation Act (RCRA)	X				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.	LDEQ did not respond within the 30-day timeframe. See Appendix C External Agency Correspondence.	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 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. See also Section 6.0 Conditions and Mitigation Measures.

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Noise	X				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 Environmental Protection Agency (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. During the construction period there would be a short-term increase in noise levels.	St. Tammany Parish Noise Ordinance, Article IV, Noise and Sound, Section 14-035.00.	St Tammany Parish limits noise levels by receiving land use in residential, public, commercial, and industrial areas to decibel levels of 60 during the “daytime” hours of 7 AM to 10 PM. Construction activities should be limited to this schedule on weekdays. Mitigation and abatement measures will be required to reduce the noise levels to a range that would be considered acceptable. See also Section 6.0 Conditions and Mitigation Measures.
Public Safety and Access	X				Congress passed the Occupational and Safety Health Act 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 Occupational Safety and Health Administration (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. See also Section 6.0 Conditions and Mitigation Measures.
Traffic and Transportation	X				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. See also Section 6.0 Conditions and Mitigation Measures.

Resource Area	Impact Negligible	Impact Minor	Impact Moderate	Impact Major	Impact Summary	Agency Coordination / Permits	Mitigation
Hazardous Materials and Toxic Wastes	X				<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 1.0 mile of the site. There are nine (9) hazardous waste (RCRA) facilities within 1.0 mile of the site.</p>	<p>LDEQ did not respond within the 30-day timeframe.</p> <p>See Appendix C External Agency Correspondence.</p> <p>NEPAAssist-EPA website http://nepassisttool.epa.gov/nepassist/entry.aspx referenced July 28, 2015.</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.</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. The LDNR Office of Conservation should be contacted at 225-342-5540 if any unregistered wells of any type are encountered during construction work.</p> <p>For pipelines and other underground hazards, Louisiana One Call should be contacted at 800-272-3020 prior to commencing operations.</p> <p>See also Section 6.0 Conditions and Mitigation Measures.</p>
Climate Change	X				<p>The proposed drainage improvements within the Woodlands and surrounding neighborhoods in Mandeville, St. Tammany Parish, LA, would have a de minimis effect to the climate.</p>		

4.2 Hydrology and Floodplains

The project area is the upper most 2/3rd sq. mi. of the Little Bayou Castine basin, which flows into Lake Pontchartrain through Mandeville. The downstream limit of the project is Labarre Street. Over (15) fifteen culvert upsizes, channel excavations and 5 acres of stream retention pond are being proposed to reduce flood losses in the area north of LA 1088, and the Woodlawn subdivision.

Per the Bucharth Horn, Inc. Drainage Study and Cost Benefit Analysis for the Little Bayou Castine Drainage Project (Appendix D), dated June 29, 2015, the discharges would be reduced at the downstream end from 2,310 CFS to 2,030 CFS for the 100-year flood, with a max decrease in water surface elevation of 0.71 feet of flooding just upstream of LA Highway 1088. These findings were determined using standard, but very detailed analyses of the drainage system hydrology and hydraulic systems. Both the existing and proposed project systems were evaluated for the 2-year through 500-year recurrence rainfall flood events. No location, for any recurrence interval showed an increase flood elevation in the proposed condition relative to the existing condition.

The lowest portion of the project area, Labarre St, upstream to Waxwing Drive, shows the Little Bayou Castine channel area within a zone AE, Elevation 9, per preliminary DFIRM 22103C0320F, dated 04/30/2008. This floodplain is not listed in either the St. Tammany or Mandeville Flood Insurance Study (FIS). Little Bayou Castine drains a small coastal plain drainage basin of about 1.5 square miles, and the project area includes the upper 430 acres (0.67 square miles).

Executive Order (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 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. FEMA uses Flood Insurance Rate Maps (FIRM) created by the National Flood Insurance program (NFIP), and preliminary versions, in some cases, as the best available flood data. Digitally produced versions of these maps are called DFIRMS. According to the FEMA preliminary DFIRM Panel 22103C0431F, dated 04/30/2008, the project area includes a short portion from Labarre St. upstream to Waxwing Drive in the special flood hazard area (SFHA), zone AE, El 9 feet, NAVD. For the majority of the project area, and most modification, the area is zone X (unshaded), an area believed to be minimally flood prone. This determination of the project area is from a review of the preliminary DFIRM panels 22103C0431F, and north adjacent panel, 22103C0320F. See Figure 5. Floodplain development in undesignated floodways must be reviewed by the community on a case-by-case basis to ensure that increases in water surface elevations do not occur, or identify the need to adopt a floodway if adequate information is available.

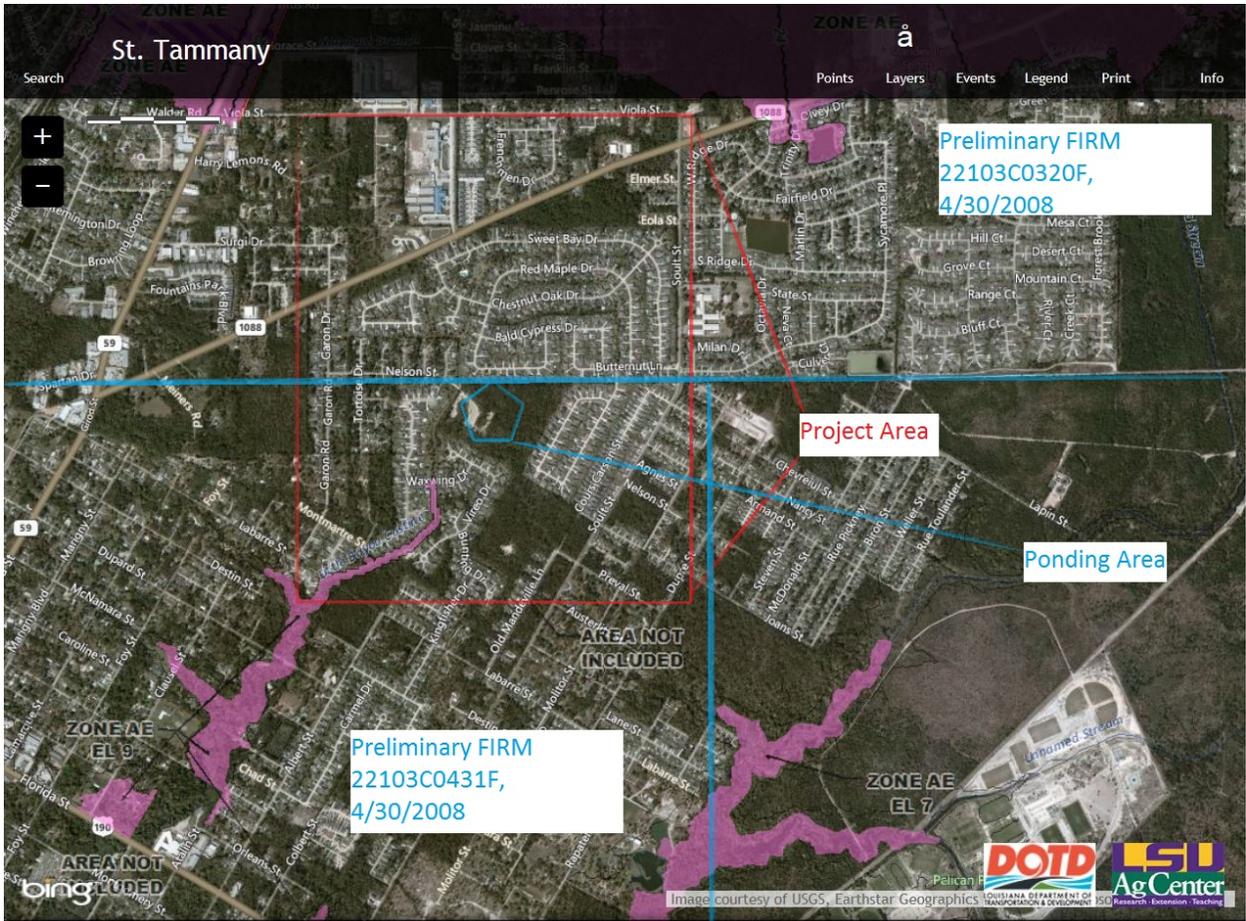


Figure 5. Preliminary DFIRM for the Little Bayou Castine Drainage Improvements Project, St. Tammany Parish, LA

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: The No Action Alternative would not improve the drainage and the area would continue to flood causing further damage to the community. Moderate ongoing impacts to floodplains are anticipated under the No Action Alternative due to localized flooding in an urban residential area, with associated erosional forces and potential contaminant plumes.

Proposed Action: Per the Buchart Horn, Inc. Drainage Study and Cost Benefit Analysis for the Little Bayou Castine Drainage Project (Appendix D), dated June 29, 2015, the

discharges would be reduced at the downstream end to 2,030 CFS for the 100-year flood, from 2,310 CFS without the proposed project. The maximum decrease in water surface elevation is 0.71 feet of flooding just upstream of LA Highway 1088 for the 100-year flood. These findings were determined using standard, but very detailed analyses of the drainage system hydrology and hydraulic systems. Both the existing and proposed project systems were evaluated for the 2-year through 500-year recurrence rainfall flood events. No location for any recurrence interval showed an increase flood elevation in the proposed condition relative to the existing condition. Hydraulic calculations for this action are provided in Appendix D and preliminary plans for this action are provided in Appendix B of the report.

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 100-year floodplain (Appendix E). 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. Based on the 8-Step Process evaluation, FEMA has determined that no other practicable alternative to the Proposed Action would meet the purpose and need of the project.

The results of the post project analysis conclude that the BFEs would not increase in any location within the zone AE SFHA as a result of the proposed improvements. Therefore, in compliance with 44CFR 9.11(d)(4), the 100-year water surface elevations would not increase in the area with an undesignated floodway, as demonstrated by the submitted model.

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.

4.3 Cultural Resources

4.3.1 Regulatory Setting

The consideration of impacts to historic and cultural resources is mandated under Section 101(b) 4 of the NEPA as implemented by 40 CFR Part 1501-1508. Section 106 of the NHPA requires Federal agencies to take into account their effects on historic properties (i.e. historic and cultural resources) and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. FEMA has chosen to address potential impacts to historic properties through the "Section 106 consultation process" of NHPA as implemented through 36 CFR Part 800.

In order to fulfill its Section 106 responsibilities, FEMA has initiated consultation on this project in accordance with the LA HMGP PA dated January 31, 2011, between the Louisiana SHPO, the Louisiana GOHSEP, the Alabama-Coushatta Tribe of Texas, the

Chitimacha Tribe of Louisiana, the Choctaw Nation of Oklahoma, Choctaw Nation of Oklahoma, the Jena Band of Choctaw Indians, the Mississippi Band of Choctaw Indians, the Seminole Tribe of Florida, and the Advisory Council on Historic Preservation (http://www.fema.gov/pdf/hazard/hurricane/2005katrina/LA_HMGP%20PA.pdf). The PA was created to streamline the Section 106 review process.

The “Section 106 process” outlined in the LA HMGP PA requires the identification of historic properties that may be affected by the proposed action or alternatives within the project’s APE. Historic properties, defined in Section 101(a)(1)(A) of NHPA, include districts, sites (archaeological and religious/cultural), buildings, structures, and objects that are listed in or determined eligible for listing in the NRHP. Historic properties are identified by qualified agency representatives in consultation with interested parties. Below is a consideration of various alternatives and their effects on historic properties.

4.3.2 Existing Conditions

On July 13, 2015, FEMA Historic Preservation Staff consulted the National Register of Historic Places (NRHP) database, the Louisiana Division of Archaeology (LDOA), Louisiana Cultural Resources Map (LDOA Website), and historic aerial photography. Map research reviewed for each elevation property included the following reference materials: the United States Department of Agriculture (USDA) Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov>), U.S. Geological Survey (USGS) Quadrangle Maps (<http://nationalmap.gov/historical>), and other available historic maps. Additional background information consulted included: the Louisiana Cultural Resources Management (CRM) Bibliography (LDOA Website), Louisiana Department of Archaeology (LDOA) Site Forms, and pertinent site and survey reports regarding previous investigations within 1-mile (1.6 km) of each archaeological APE. Additionally, site visits were conducted on July 14-17, 2015 to determine potential impacts to historic properties, if any.

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 §§ 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 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 will, 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 30.37331, Longitude -90.040996 in the Woodlawn Subdivision, near the center of the 70448 zip code geographic region (Figure 6). FEMA has determined that the area within the 300-acre APE constitutes an appropriate project impact zone, and the larger geographic area consisting of a five-mile buffer zone including areas in zip codes 70448 and in part, 70471, constitute an appropriate boundary for a cumulative impact analysis of the proposed action and the alternatives.

See Figure 7.

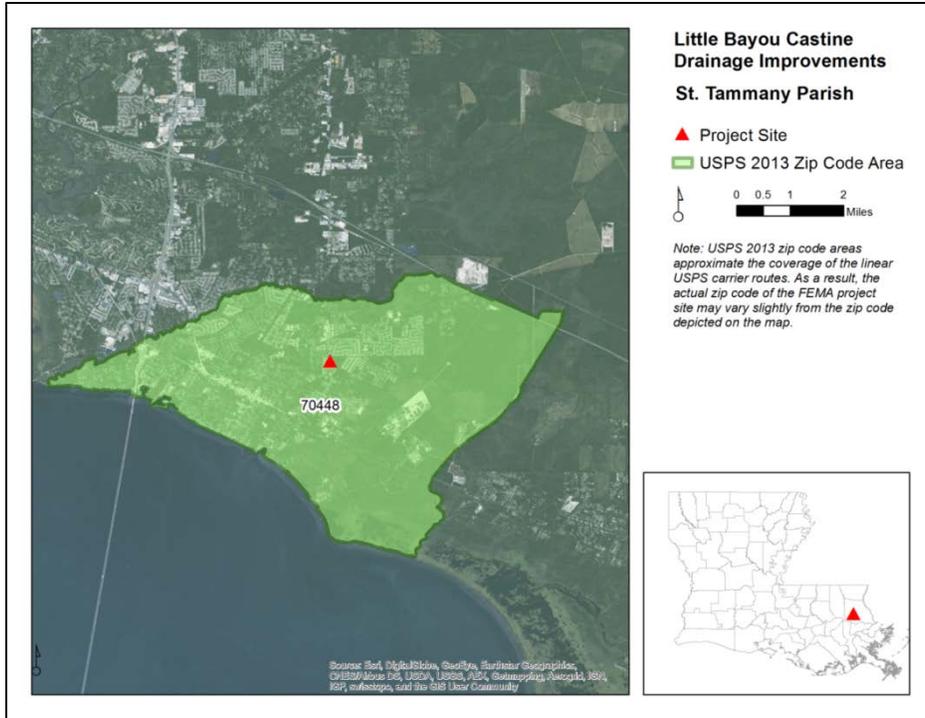


Figure 6. Zip Code Area Map for the Little Bayou Castine Drainage Improvements Project, Mandeville, St. Tammany Parish, LA

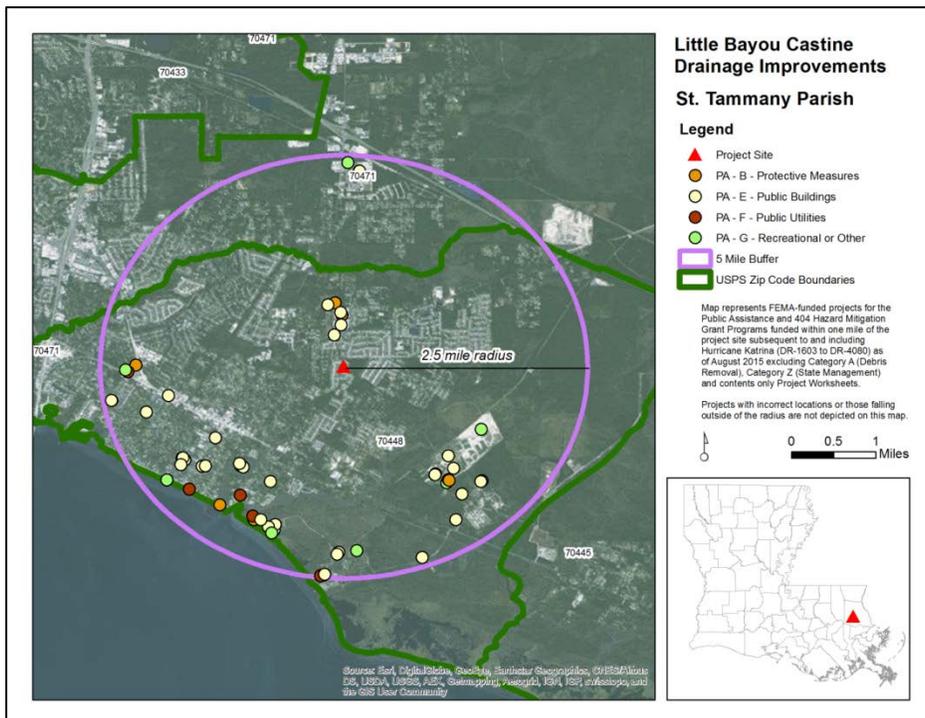


Figure 7. Five-Mile Buffer Area Map for the Little Bayou Castine Drainage Improvements Project, Mandeville, St. Tammany Parish, LA

In accordance with NEPA, and to the extent reasonable and practicable, this EA considered the combined effects of the Proposed Action Alternative, as well as other actions undertaken by FEMA and other public and private entities that also affect environmental resources the proposed action would affect, and that occur within the considered geographic area and temporal frame(s).

Specifically, a range of past, present, and reasonably foreseeable actions undertaken by FEMA within the designated geographic boundary area were reviewed: (1) for similarities such as scope of work, common timing, and geography; (2) to determine environmental effects similar to those of the proposed action, if any; and (3) to identify the potential for cumulative impacts. As part of the cumulative effects analysis, FEMA also reviewed known past, present, and reasonably foreseeable projects of Federal resource agencies and other parties within the designated geographic boundary. These reviews were performed in order to assess past proposed actions, as well as the effects of completed and ongoing actions in order to determine whether the incremental impacts of the current proposed action, when combined with the effects of other past, present, and reasonably foreseeable future projects, are cumulatively considerable or significant.

From August 2005 continuing to August 2015, within the 70448 geographic area, numerous Public Assistance and HMGP program funded, along with numerous 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) within a 2.5-mile radius of the proposed project (Figure 7). FEMA-funded undertakings are divided into six (6) categories, four (4) of which are represented within the subject 2.5-mile radius: Category B – emergency protective measures, Category E – public buildings, Category F – public utilities, and Category G – recreational or other. The percentage for each type of project is as follows: Category B – 9.3%, Category E – 66.3%, Category F – 8.1%, and Category G – 16.3%. FEMA-funded actions are subjected to various levels of environmental review as a requirement for the receipt of federal funding. An applicant's failure to comply with any required environmental permitting or other condition 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 will occur concurrent with and/or subsequent to the proposed action, are necessary as a result of the unprecedented devastation caused by the 2005 hurricanes, both Katrina and Rita, in order to restore pre-disaster conditions. 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.

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 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-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)(4), until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the

community. 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.

- 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.
- Any changes or modifications to the proposed project will require a revised wetland jurisdictional 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.
- Applicant must coordinate with USACE at the New Orleans District prior to the start of construction to acquire any necessary permits. The applicant must comply with all conditions of the permits and forward copies of all correspondence to GOHSEP and FEMA for inclusion in the project files.
- 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.
- Erosion Control Devices (ECD's) 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. Any adverse impacts to adjacent wetlands resulting from the construction of this project will jeopardize receipt of federal funding.
- 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. 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.
- The applicant is responsible for coordinating with and obtaining any required permit(s) from the LDNR Coastal Management Division prior to initiating work. 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.

- Vehicle operation times would be kept to a minimum. Area soils must be covered and/or wetted during construction to minimize dust.
- 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 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 twenty-four hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within seventy-two 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).
- 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.
- St. Tammany Parish limits noise levels by receiving land use in residential, public, commercial, and industrial areas to decibel levels of 60 during the “daytime” hours of 7 AM to 10 PM. Construction activities should be limited to this schedule on weekdays. Mitigation and abatement measures will be required to reduce the noise levels to a range that would be considered acceptable.
- 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.

- 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 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.

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

7.1 Agency Coordination

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

As part of the development of this EA, federal, state and local agencies were contacted. All initial Solicitation of Views letters and the respective responses from these agencies are included in Appendix C External Agency Correspondence.

7.2 Public Involvement

Per FEMA requirements, a public notice will be published in St. Tammany Farmer, on Thursdays, August 13 and August 20, 2015. This public notice will also run in The Times-Picayune on Monday, August 10 through Friday, August 14, 2015, to alert the public that the Draft EA and FONSI are available for review. There will be a 15 day comment period beginning on August 10, 2015 and concluding on August 25, 2015 at 4 p.m.

The Environmental Assessment was made available at the St. Tammany Parish Library, Mandeville Branch and published on FEMA's website. A copy of the Public Notice is attached in Appendix E.

Once the public comment period for the Draft EA is completed, comments will be addressed and incorporated into the Final EA as an appendix.

8.0 CONCLUSION

Construction of the proposed improvements at the proposed location was analyzed based on the studies, consultations, and reviews undertaken as reported in this draft EA. 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 environmental assessment, and given the precautionary and mitigating measures, there does not appear to be any significant environmental impacts associated with the Little Bayou Castine Drainage Improvements Project.

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APPENDIX A
SITE PHOTOGRAPHS



Photo 1. Northeastern-most extent of north of LA HWY 1088 improvements, facing west.



Photo 2. Culvert replacement location north of LA HWY 1088 improvements, facing west.



Photo 3. Culvert replacement location north of LA HWY 1088 improvements, facing west.



Photo 4. Culvert replacement location, westernmost extent north of LA HWY 1088 improvements, intersection of LA HWY 1088 and LBC, facing west.



Photo 5. Culvert replacement location, Spring Blvd. and Sweet Bay Drive northern section, facing north.



Photo 6. Culvert replacement location, Spring Blvd. and Sweet Bay Drive southern section, facing south.



Photo 7. Culvert replacement location, Woodlands Neighborhood, intersection of Tallow Tree Drive and Little Bayou Castine, facing south.



Photo 8. LBC Drainage Improvement corridor, facing north.



Photo 9. LBC Drainage Improvement corridor, facing north.



Photo 10. LBC Drainage Improvement corridor, facing north.



Photo 11. LBC Drainage Improvement corridor, facing south.



Photo 12. LBC Drainage Improvement corridor, facing south.



Photo 13. LBC Drainage Improvement corridor bank profile, facing east



Photo 14. Existing pond within proposed Detention Pond and Weir area, facing north.

APPENDIX B
SITE PLAN DRAWINGS FOR
PREFERRED ALTERNATIVE

INDEX TO SHEETS

SHEET NO. DESCRIPTION

GENERAL SHEETS

G-101 LITTLE BAYOU CASTINE

PLAN SHEETS

C-101 EXISTING CONDITIONS

LA DTD STANDARD DRAWINGS

SHEET NO. STD. PLAN REVISION DATE

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	BM-01 (2)	08-22-2007
	EC-01 (1)	10-01-2008
C-402	EC-01 (2)	10-01-2008
	HW-90RCP1	06-28-2001
	TC-00 (A)	03-19-2010
C-403	TC-00 (B)	03-08-2010
	TC-00 (C)	03-08-2010
	TC-00 (D)	03-08-2010
	TC-01	03-08-2010

CROSS SECTIONS

SHEET NO. DESCRIPTION

ST. TAMMANY PARISH, LOUISIANA DEPARTMENT OF ENGINEERING LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS

ST. TAMMANY PARISH PROJECT NO.:



LOCATION MAP
SCALE: 1"=1000'

ST. TAMMANY PARISH COUNCIL MEMBERS

PATRICIA B. BRISTER – PARISH PRESIDENT

MARTY DEAN	(DISTRICT 1)
F. DENNIS SHARP	(DISTRICT 2)
JAMES THOMPSON	(DISTRICT 3)
R. REID FALCONER, AIA	(DISTRICT 4)
MARTY GOULD	(DISTRICT 5)
RICHARD E. TANNER	(DISTRICT 6)
JACOB B. GROBY, III	(DISTRICT 7)
CHRIS CANULETTE	(DISTRICT 8)
E.L. BELLISARIO	(DISTRICT 9)
MAUREEN O'BRIEN	(DISTRICT 10)
STEVE STEFANGIK	(DISTRICT 11)
JERRY BINDER	(DISTRICT 12)
RICHARD ARTIGUE	(DISTRICT 13)
THOMAS J. SMITH	(DISTRICT 14)



PRIOR TO WORK COMMENCEMENT, THE CONTRACTOR IS RESPONSIBLE FOR FINAL VERIFICATION OF THE LOCATION OF THE UTILITIES SHOWN ON THESE PLANS. THE CONTRACTOR SHALL CALL 811 (ONE CALL, ONE CALL, ONE CALL) OR 800-272-2880 AND CITY PARISH DEPARTMENT OF PUBLIC WORKS TO THE UTILITIES LOCATED PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE UTILITY COMPANIES FOR ALL AREAS OF CONSTRUCTION.

PROJECT CLASSIFICATION: HEAVY
CONSTRUCTION TYPE: GRADING,
DRAINAGE STRUCTURES, EARTHWORK, &
MISC. CONCRETE

BUCHART HORN, INC.

ENGINEERS, ARCHITECTS AND PLANNERS



VICINITY MAP
NOT TO SCALE



PRELIMINARY
THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONTRACTS, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT.

PLANS PREPARED AND SUBMITTED BY:

MIRA K. PARA, P.E.
PROJECT ENGINEER
BUCHART HORN, INC. DATE

APPROVED BY:

EDDIE WILLIAMS
DIRECTOR OF ENGINEERING
ST. TAMMANY PARISH DATE

APPROVED BY:

PAUL CARROLL, P.E.
DRAINAGE ENGINEER
ST. TAMMANY PARISH DATE



LITTLE BAYOU CASTINE
DRAINAGE IMPROVEMENTS
ST. TAMMANY PARISH, LA

NO.	DATE	BY	REVISION

PROJECT NO.: 77026-00
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DRAWN BY: DMB
CHECKED BY: MKP
DATE: 06/26/2015

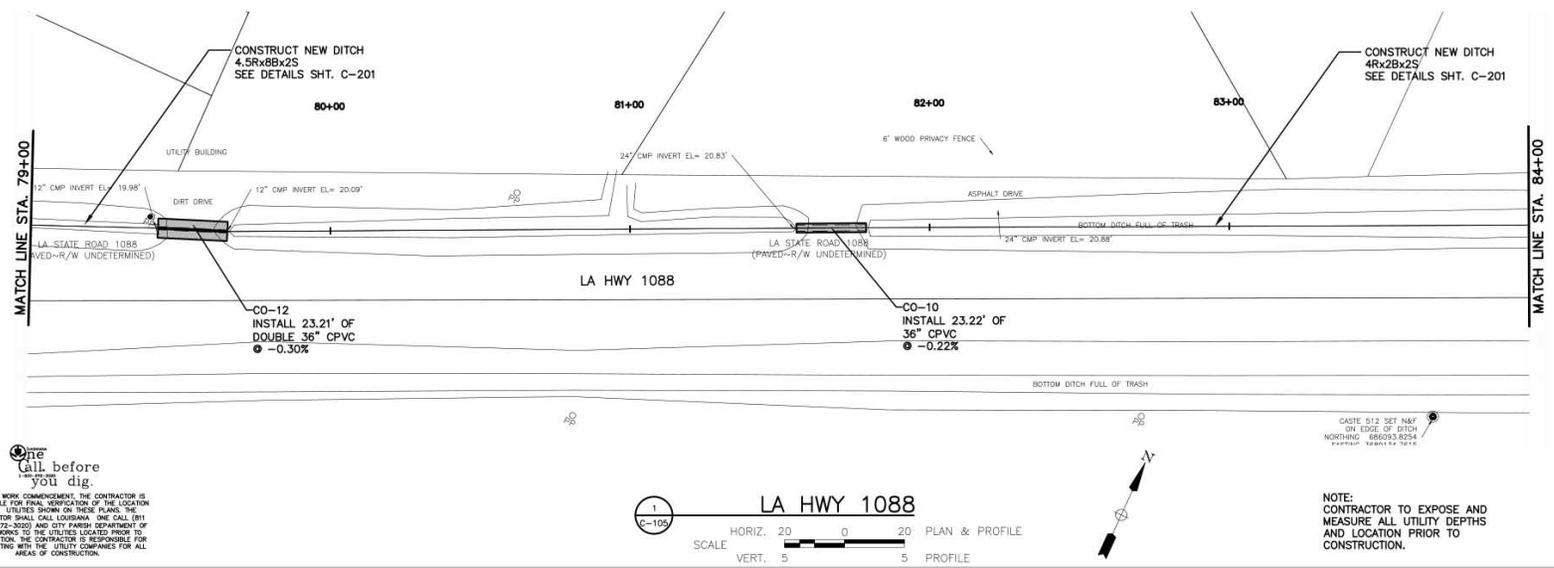
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TITLE SHEET

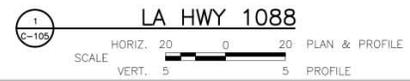
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SHEET 1 OF 34



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 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



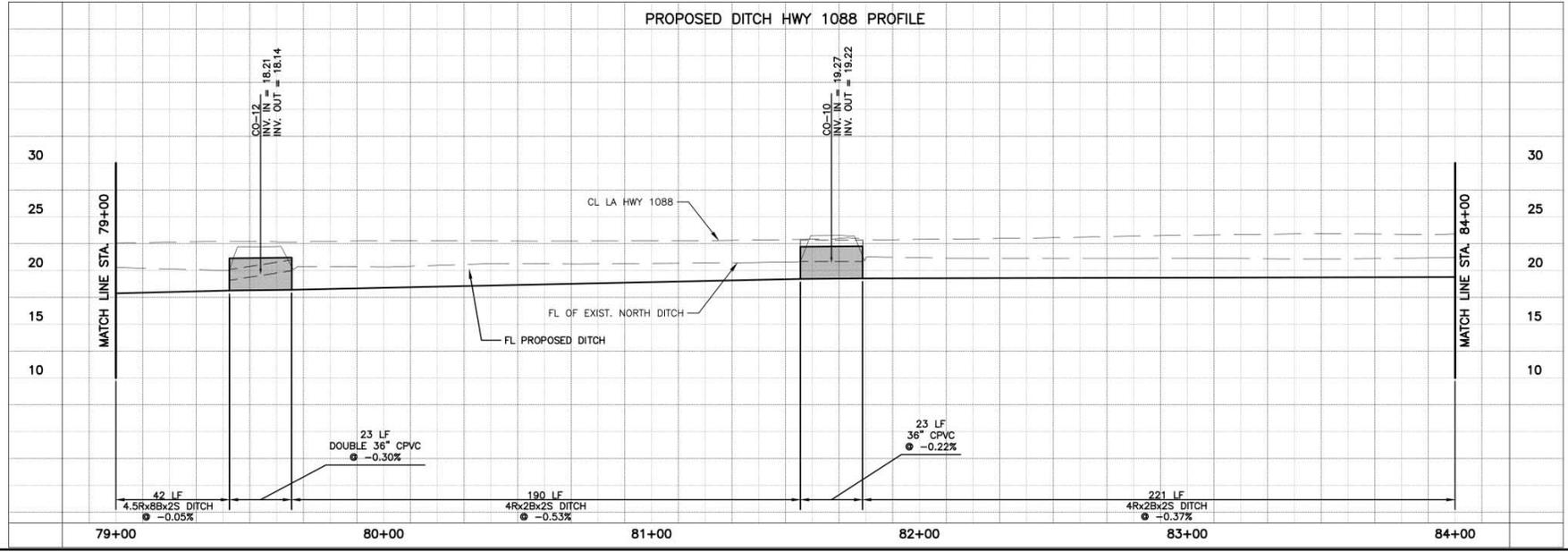
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 CONTRACTOR TO EXPOSE AND MEASURE ALL UTILITY DEPTHS AND LOCATION PRIOR TO CONSTRUCTION.

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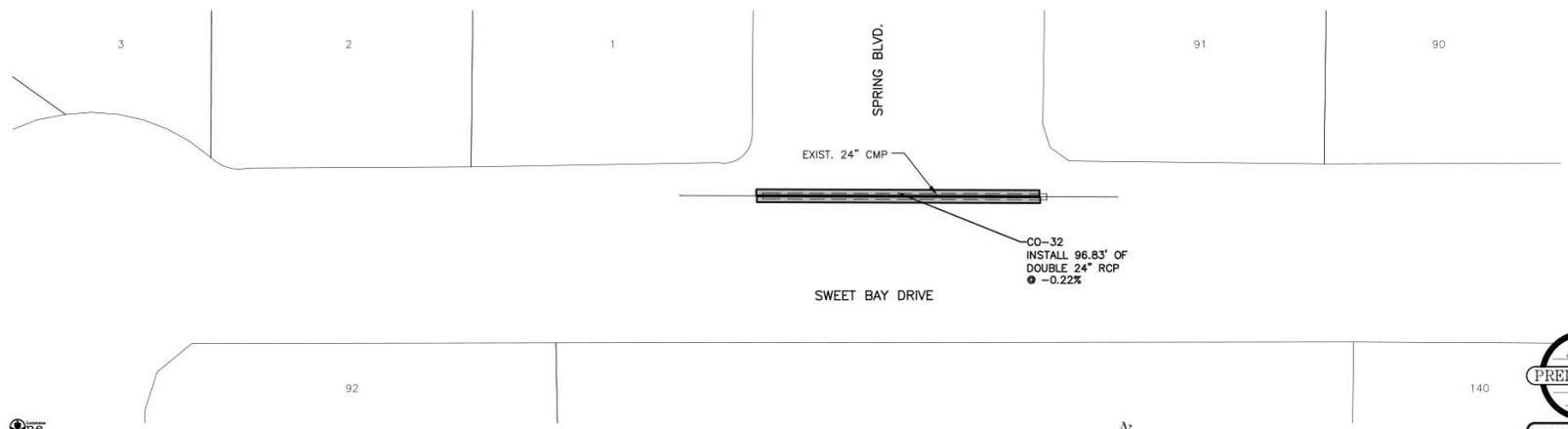
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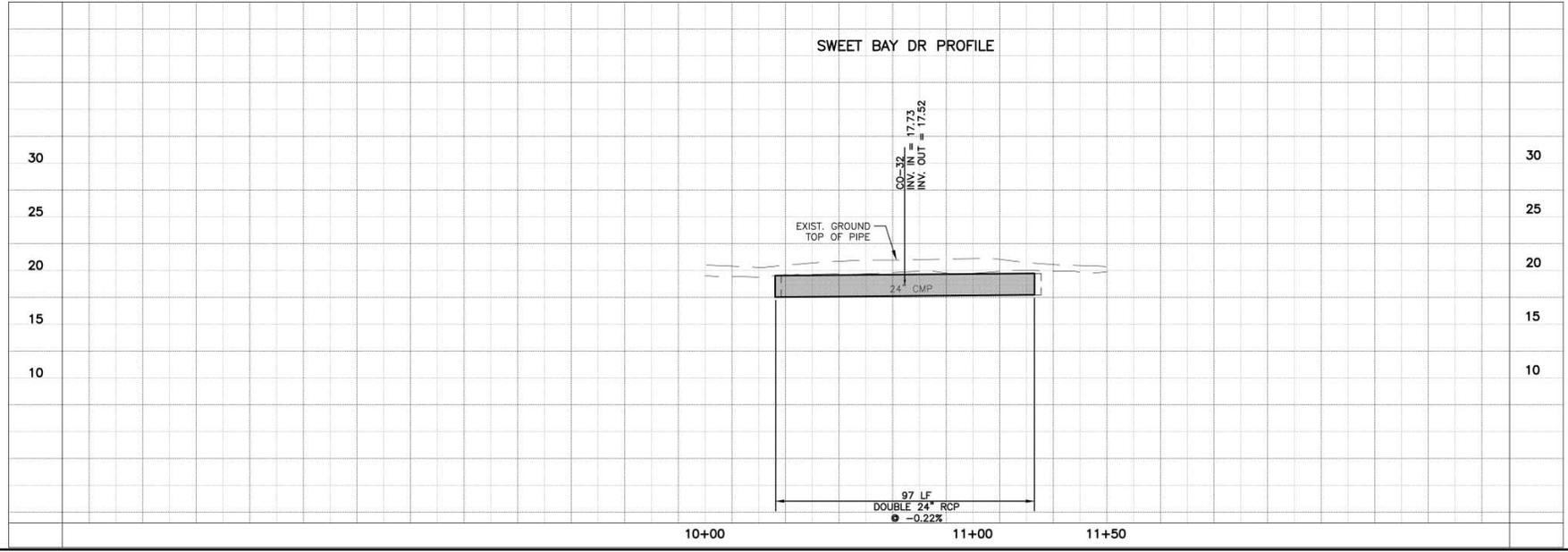
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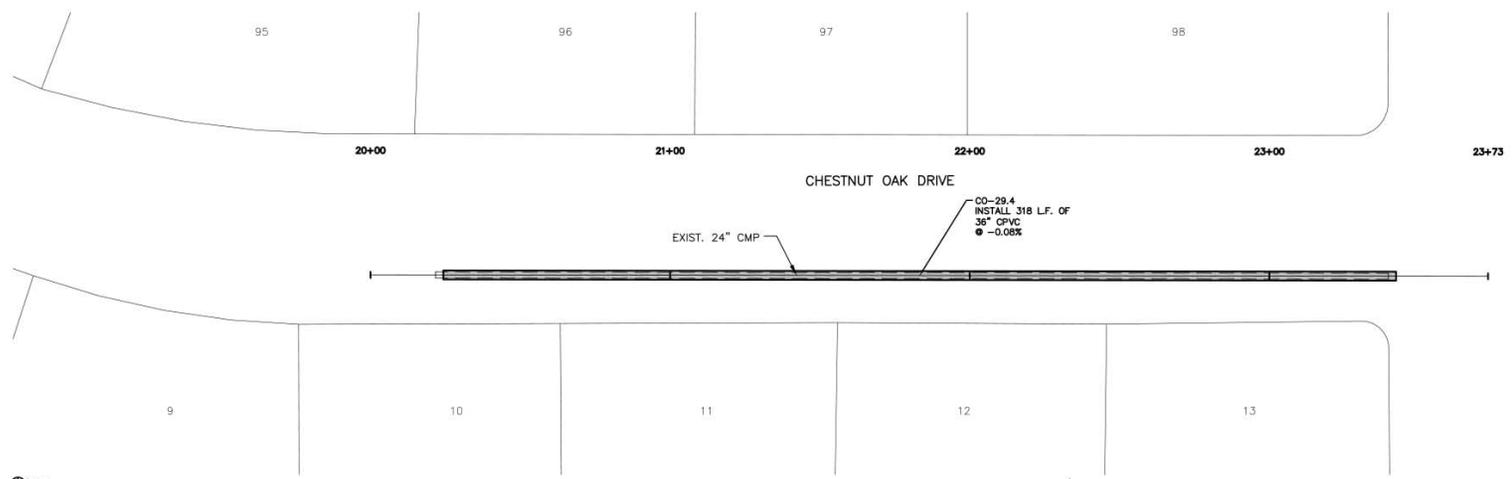
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 SHEET 8 OF 34

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DRAINAGE IMPROVEMENTS
LITTLE BAYOU CASTINE
ST. TAMMANY PARISH, LA

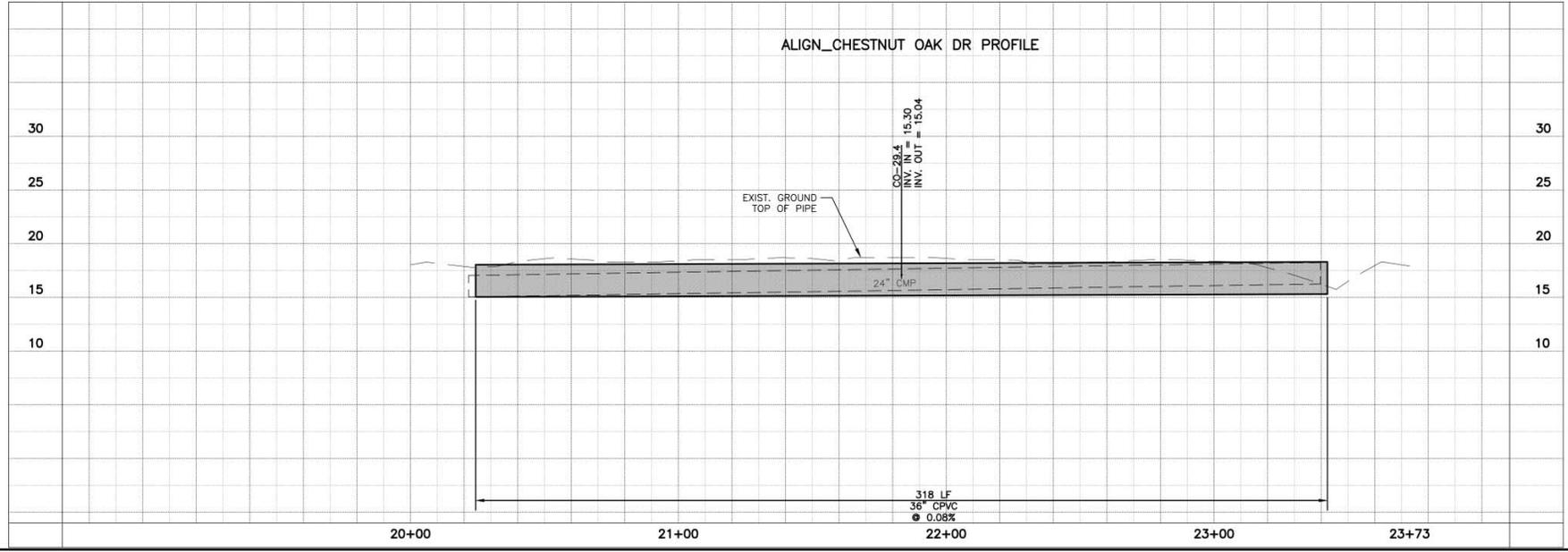


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CHESTNUT OAK DR
SCALE: HORIZ. 20' = 0' 20' PLAN & PROFILE
VERT. 5' = 5' PROFILE

NOTE:
CONTRACTOR TO EXPOSE AND MEASURE ALL UTILITY DEPTHS AND LOCATION PRIOR TO CONSTRUCTION.

ALIGN_CHESTNUT OAK DR PROFILE



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PROJECT NO: 77100-00
S&D FILE NAME: DWG
ENGR./ARCH: MKP
DESIGN BY: DM1
DRAWN BY: DMB
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DATE: 06/26/2015

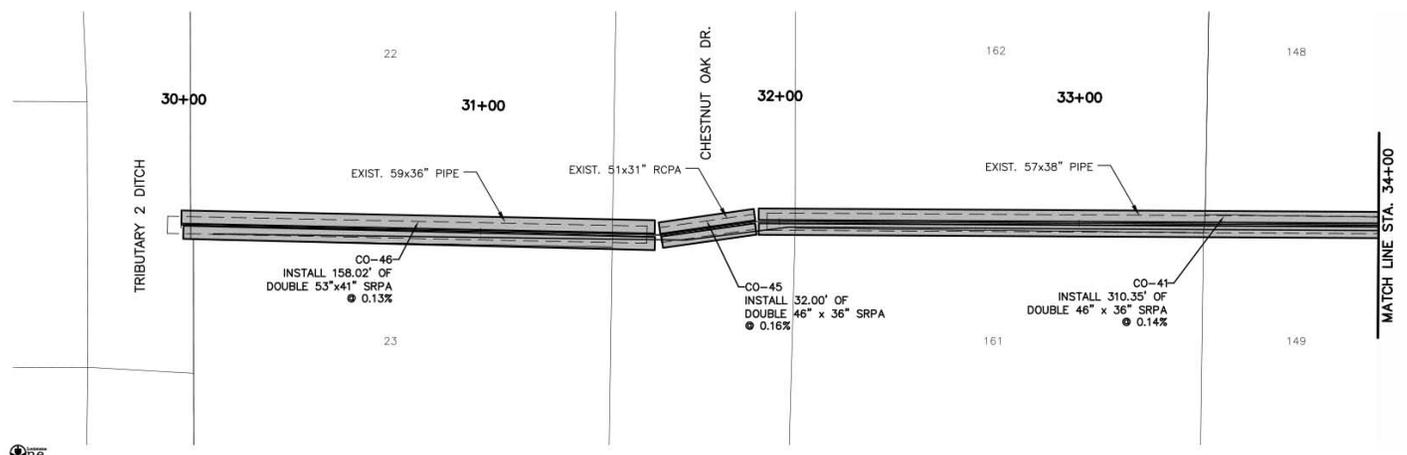
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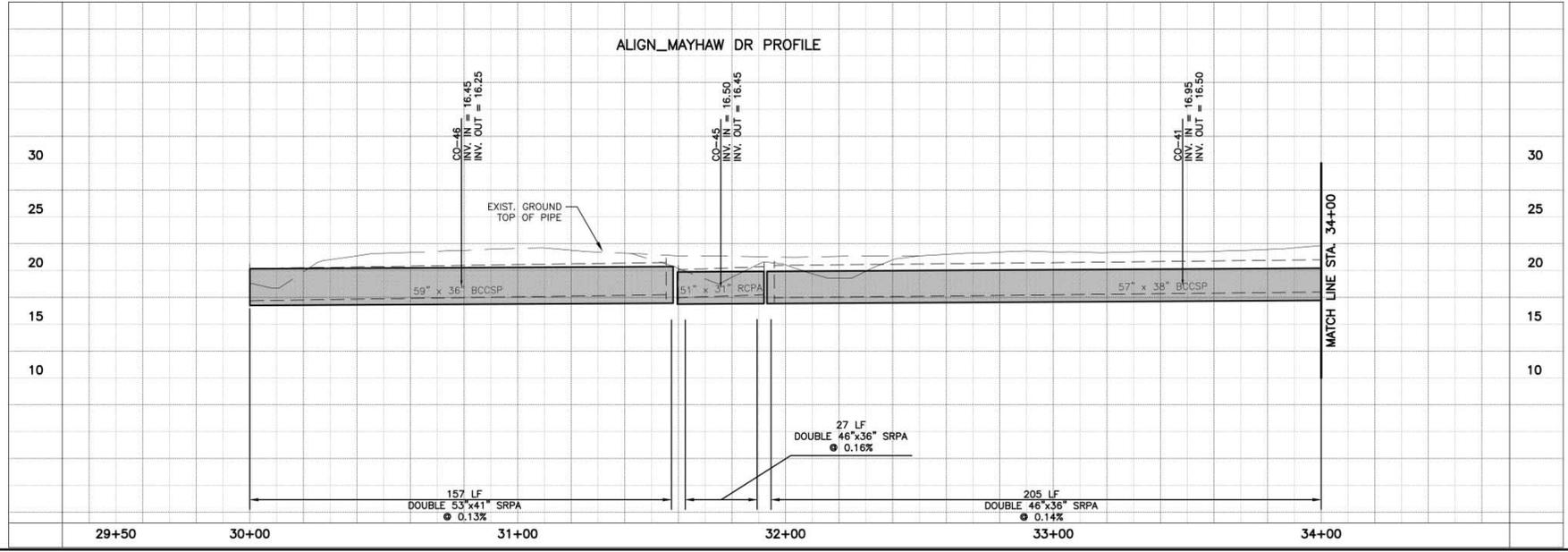
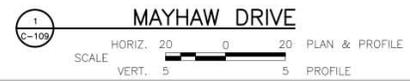


DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



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 MEASURE ALL UTILITY DEPTHS
 AND LOCATION PRIOR TO
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 DESIGN BY: MKP
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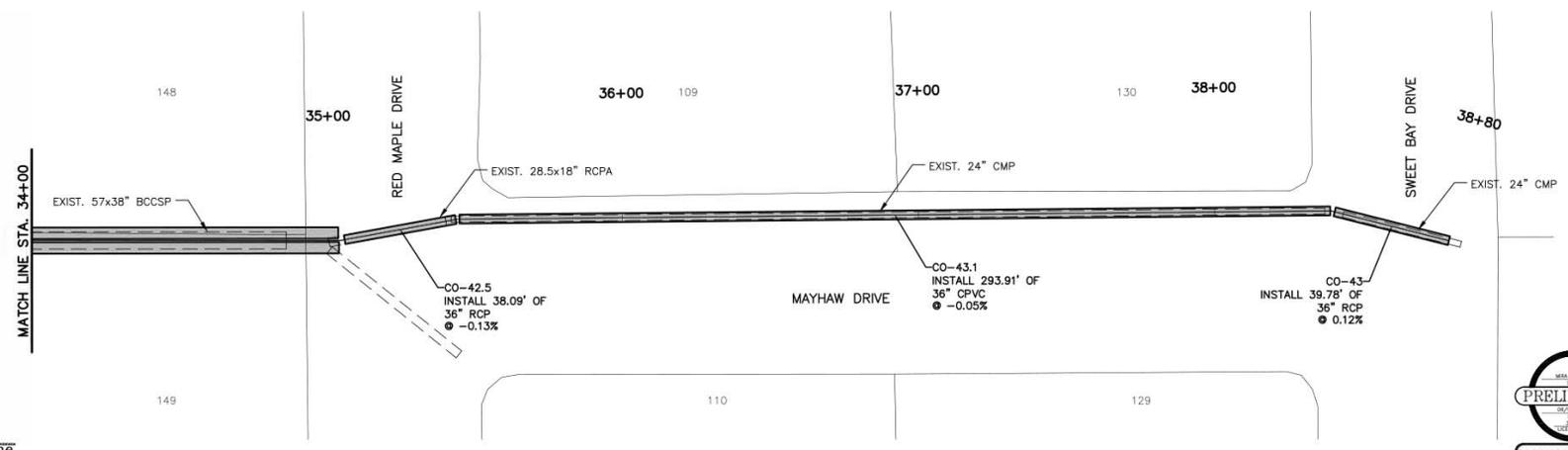
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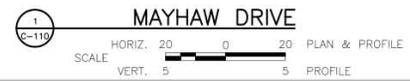
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 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



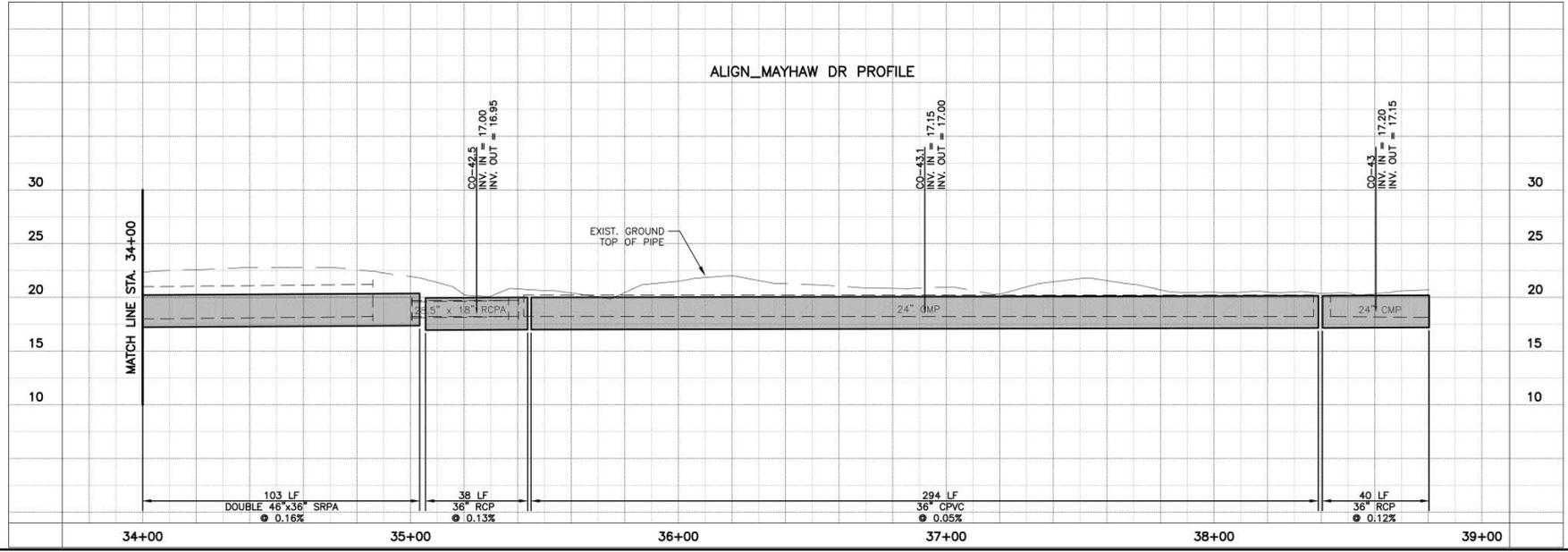
NOTE:
 CONTRACTOR TO EXPOSE AND
 MEASURE ALL UTILITY DEPTHS
 AND LOCATION PRIOR TO
 CONSTRUCTION.



Call before you dig.
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ALIGN_MAYHAW DR PROFILE



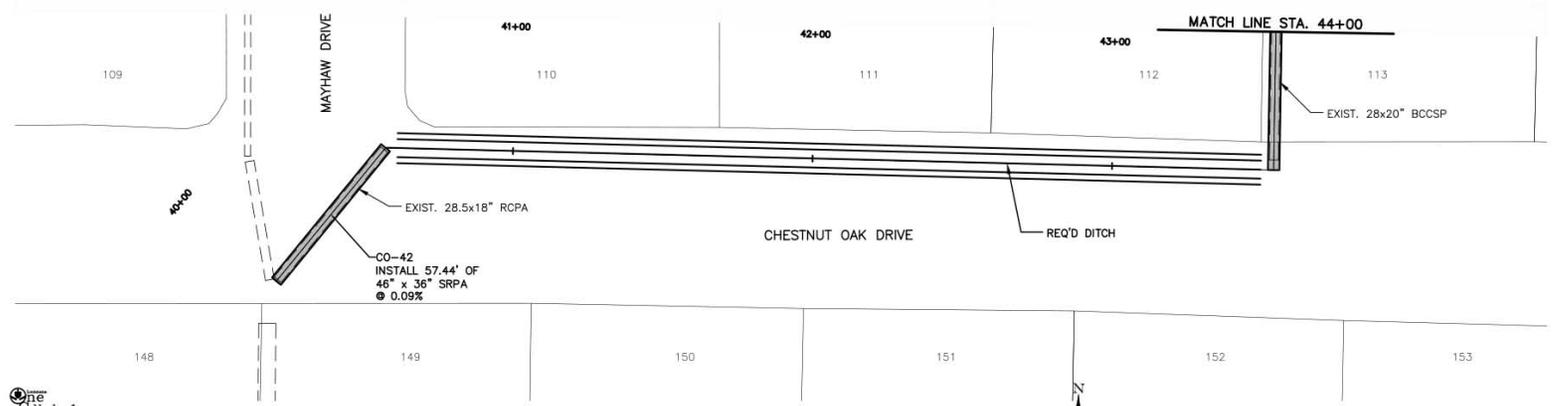
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PROJECT NO: 77100-00
 XSD FILE NAME: DWG
 ENGR./ARCH: MKP
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MAYHAW DRIVE
 DRAWING NO: C-110
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DRAINAGE IMPROVEMENTS
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EAST OF MAYHAW DR.
 SCALE: HORIZ. 20' = 1" PLAN & PROFILE
 VERT. 5' = 1" PROFILE



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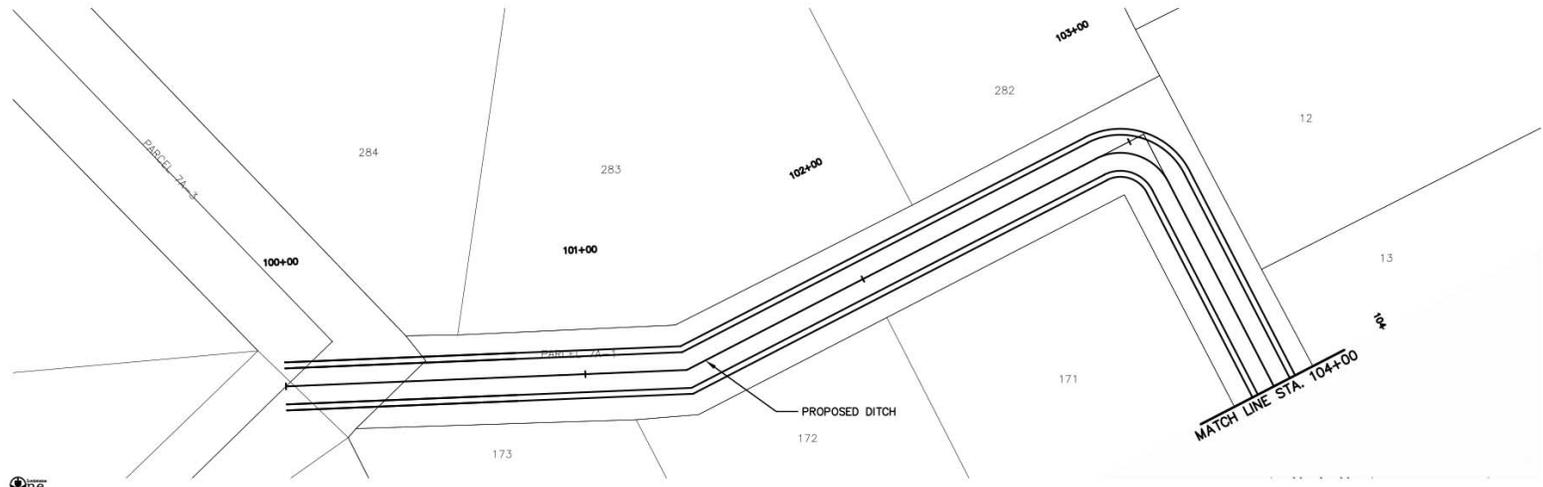
EAST OF MAYHAW DRIVE
 DRAWING NO.: C-111
 SHEET 12 06/26/2015



DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



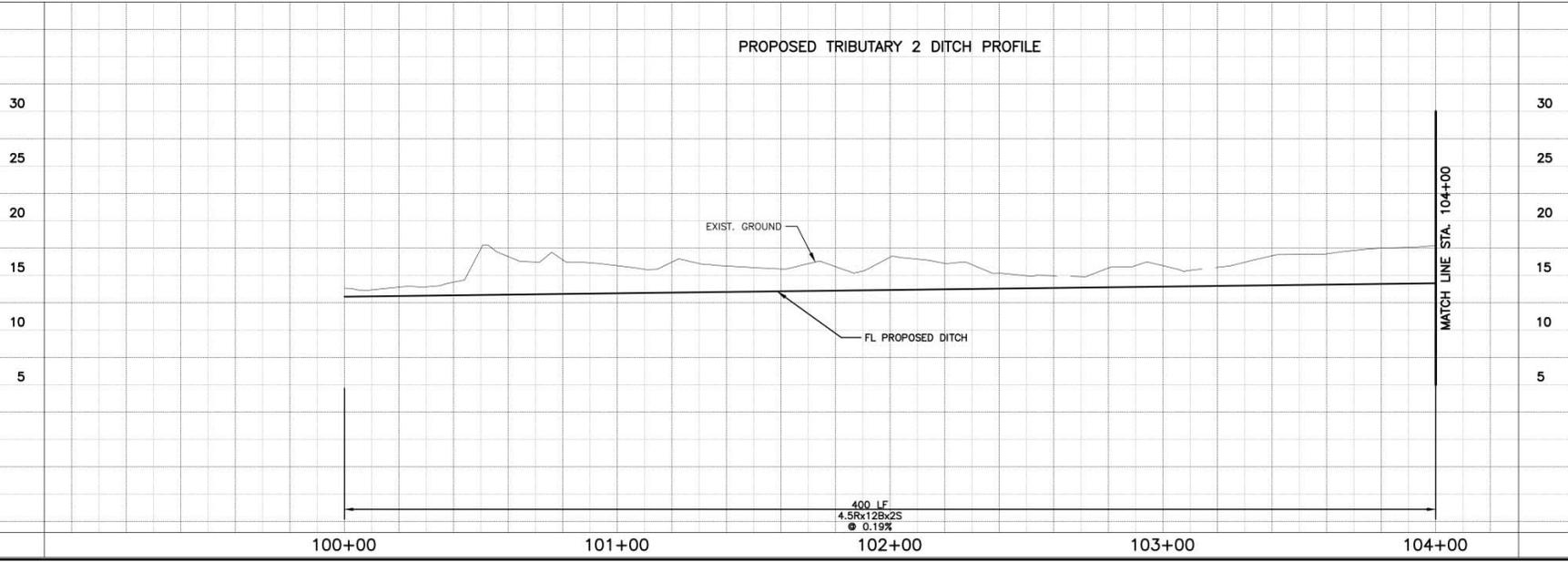
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C-113
TRIBUTARY 2 DITCH
 HORIZ. 20 0 20 PLAN & PROFILE
 SCALE VERT. 5 5 PROFILE

PROPOSED TRIBUTARY 2 DITCH PROFILE



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 DRAWING NO:
C-113
 SHEET 14 OF 34

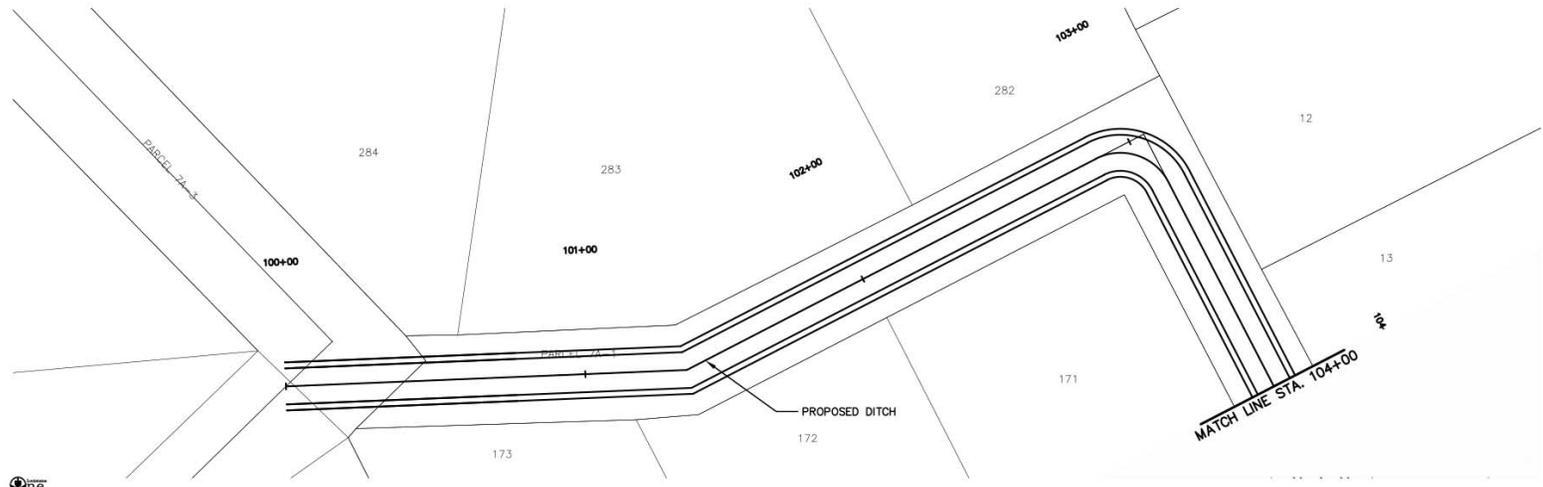
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DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



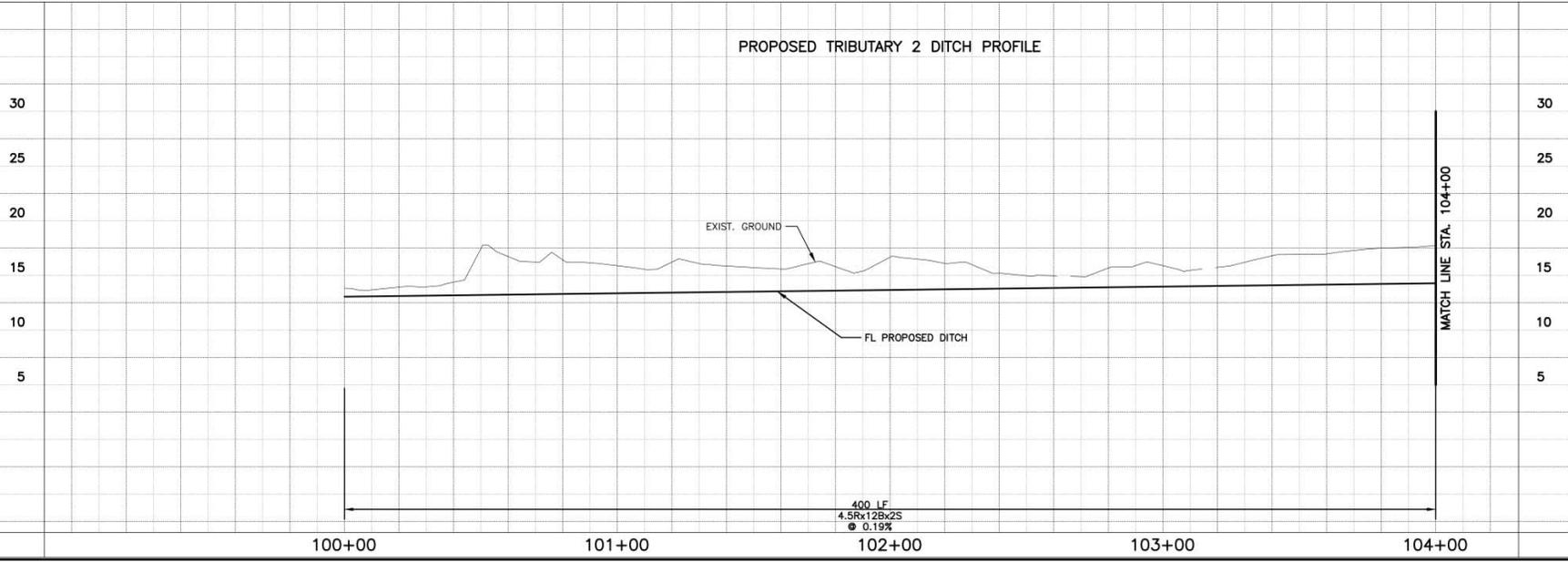
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C-113
TRIBUTARY 2 DITCH
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 SCALE VERT. 5 5 PROFILE

PROPOSED TRIBUTARY 2 DITCH PROFILE



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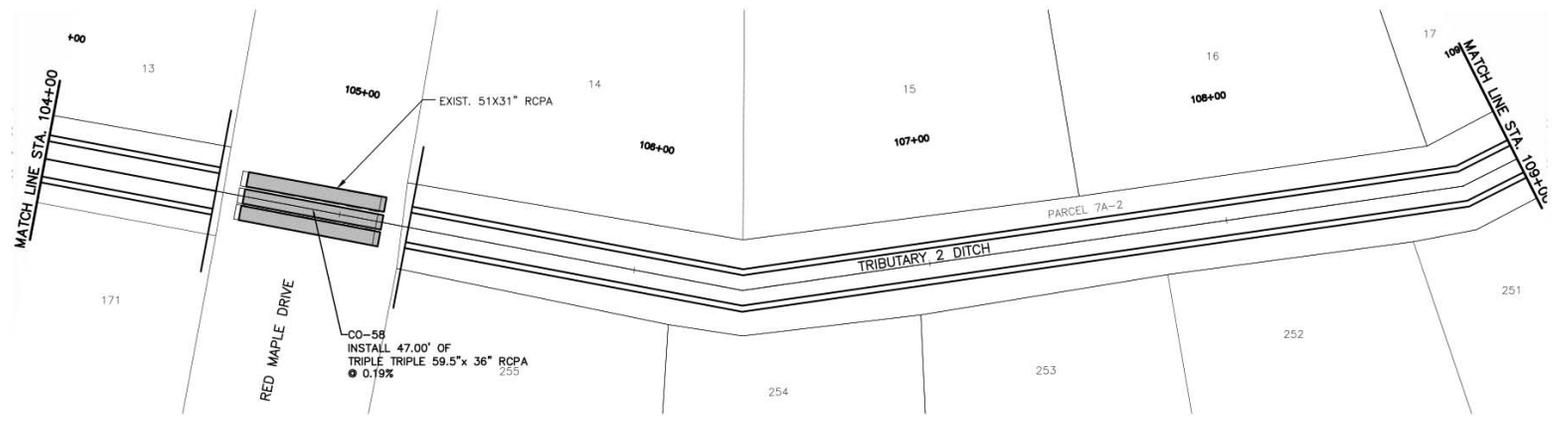
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**TRIBUTARY
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 DITCH**
 DRAWING NO:
C-113
 SHEET 14 OF 34

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DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



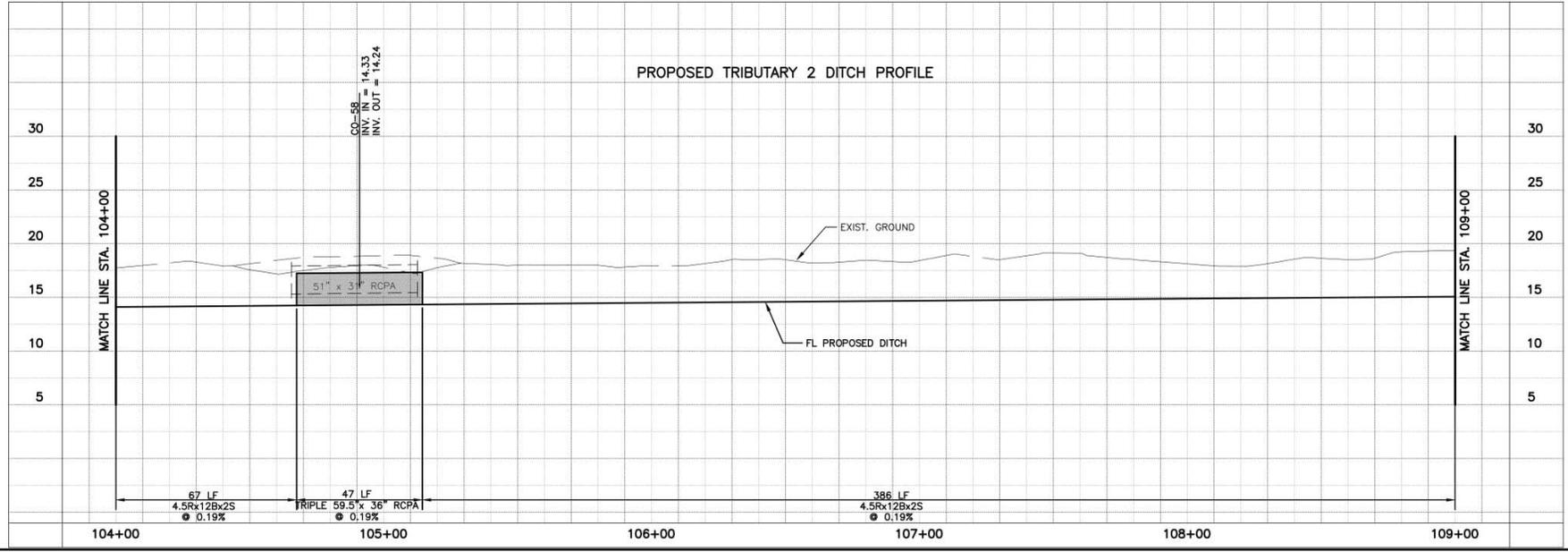
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 SHEET C-114
 SHEET 15 OF 34



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 LITTLE BAYOU CASTINE
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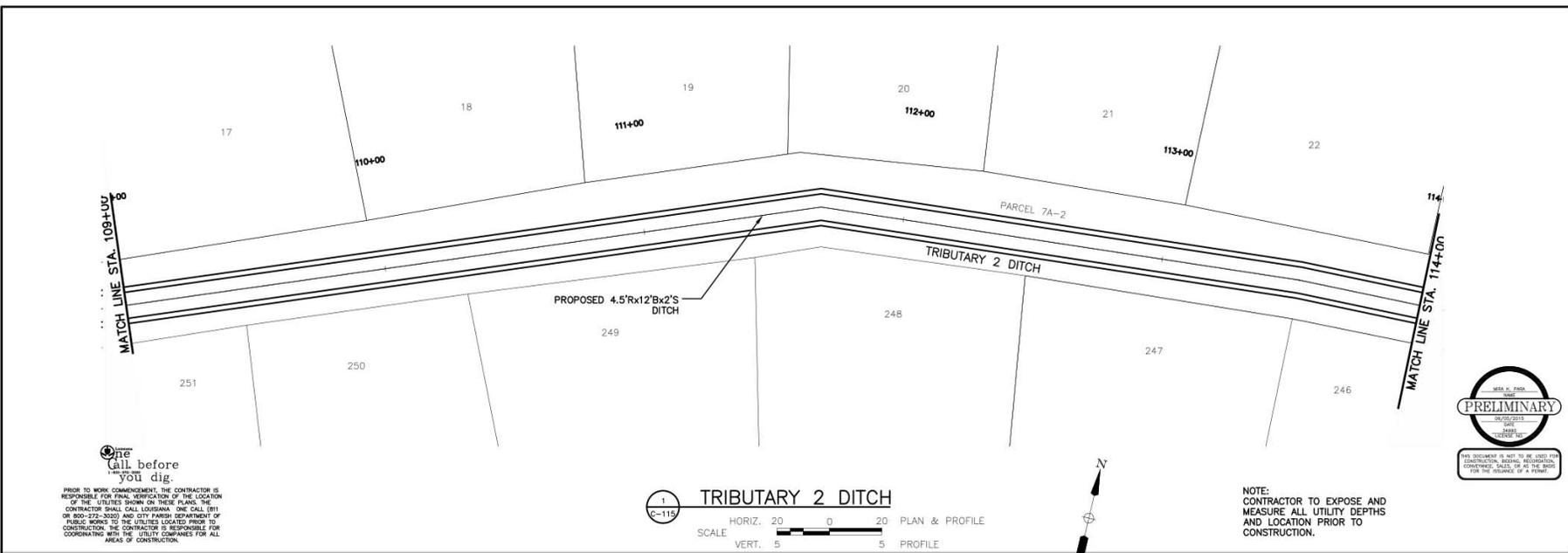
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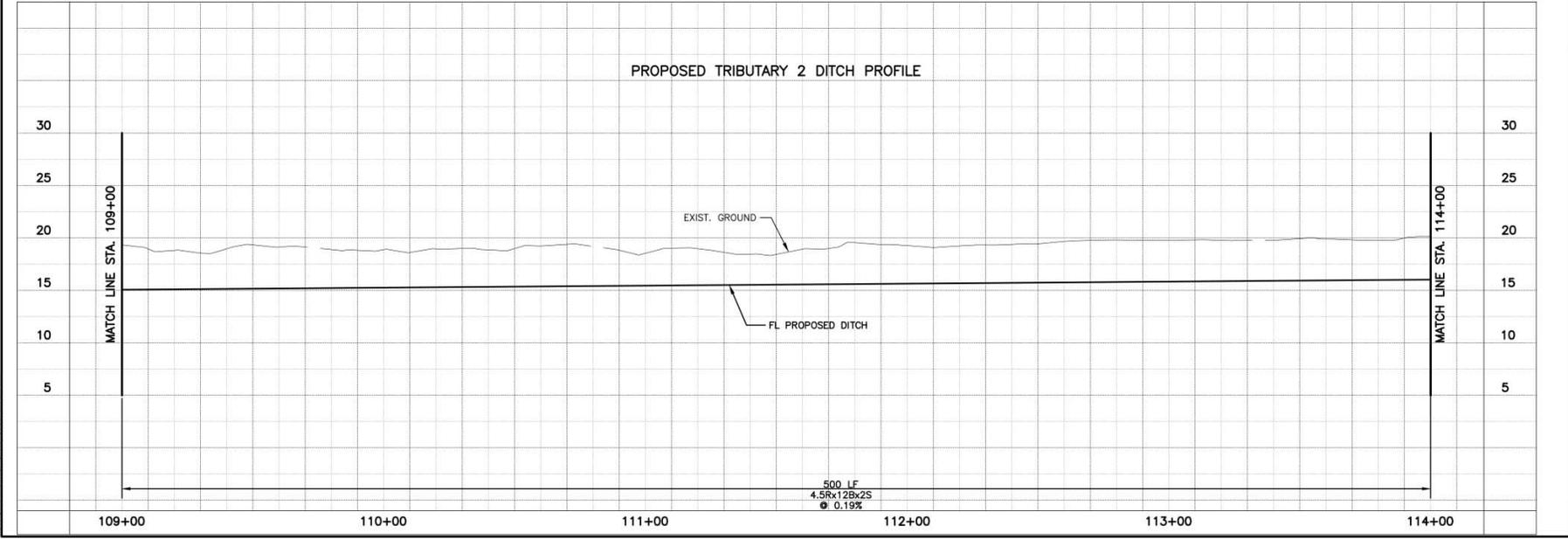
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SHEET 16 OF 34
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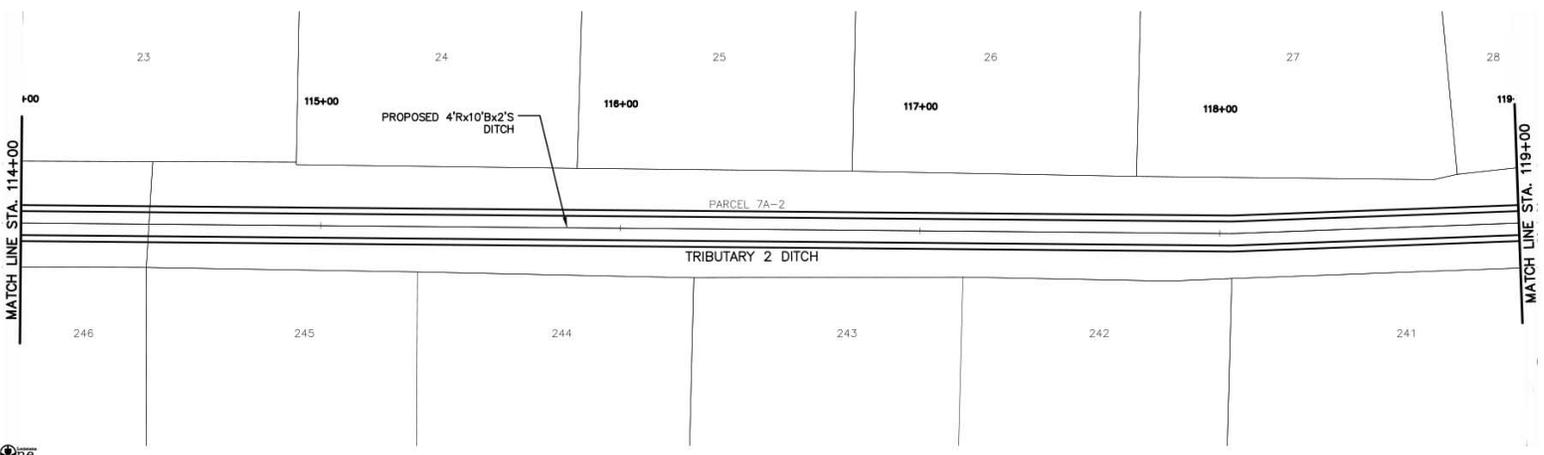
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ST. TAMMANY PARISH, LA

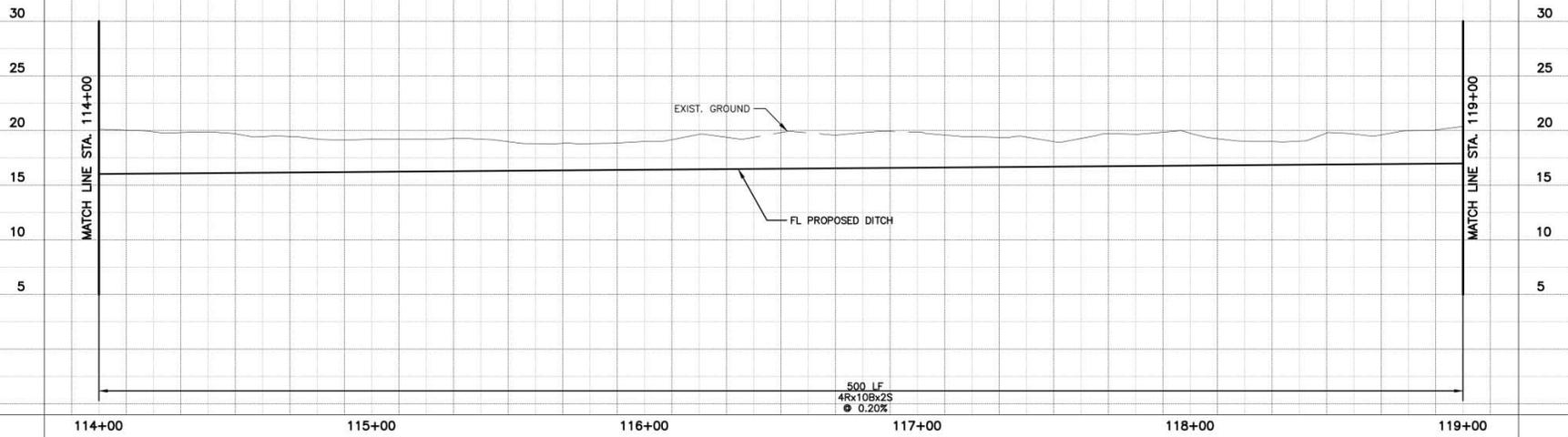


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PROJECT NO.: 77100-00
S&D FILE NAME: DWG
ENGR./ARCH.: MKP
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DATE: 06/26/2015
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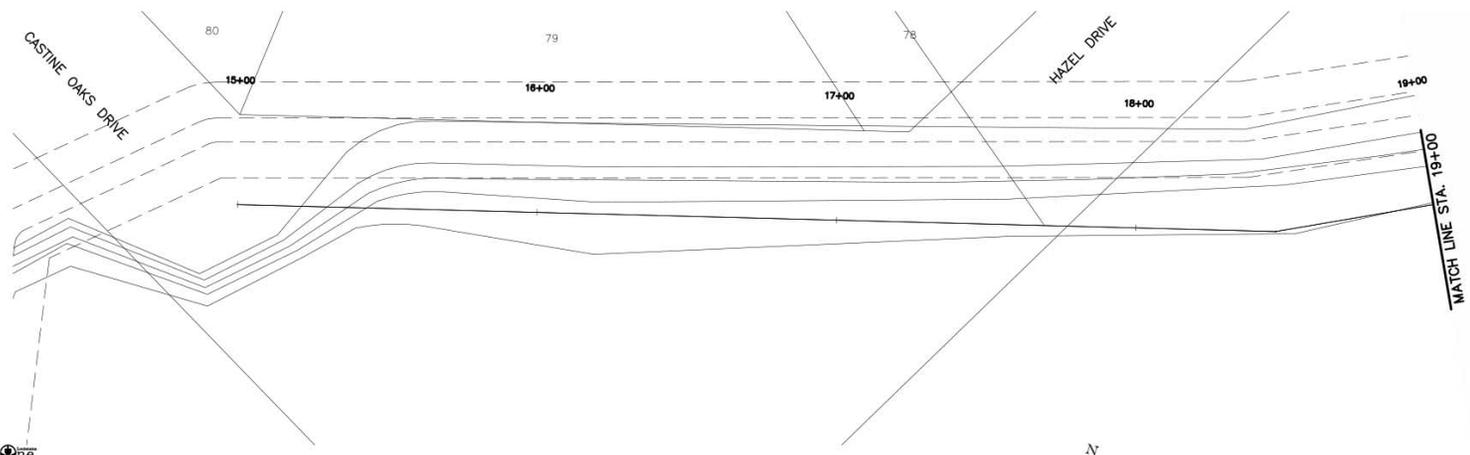
**TRIBUTARY
2
DITCH**
DRAWING NO.: C-116
SHEET 17 OF 34



DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



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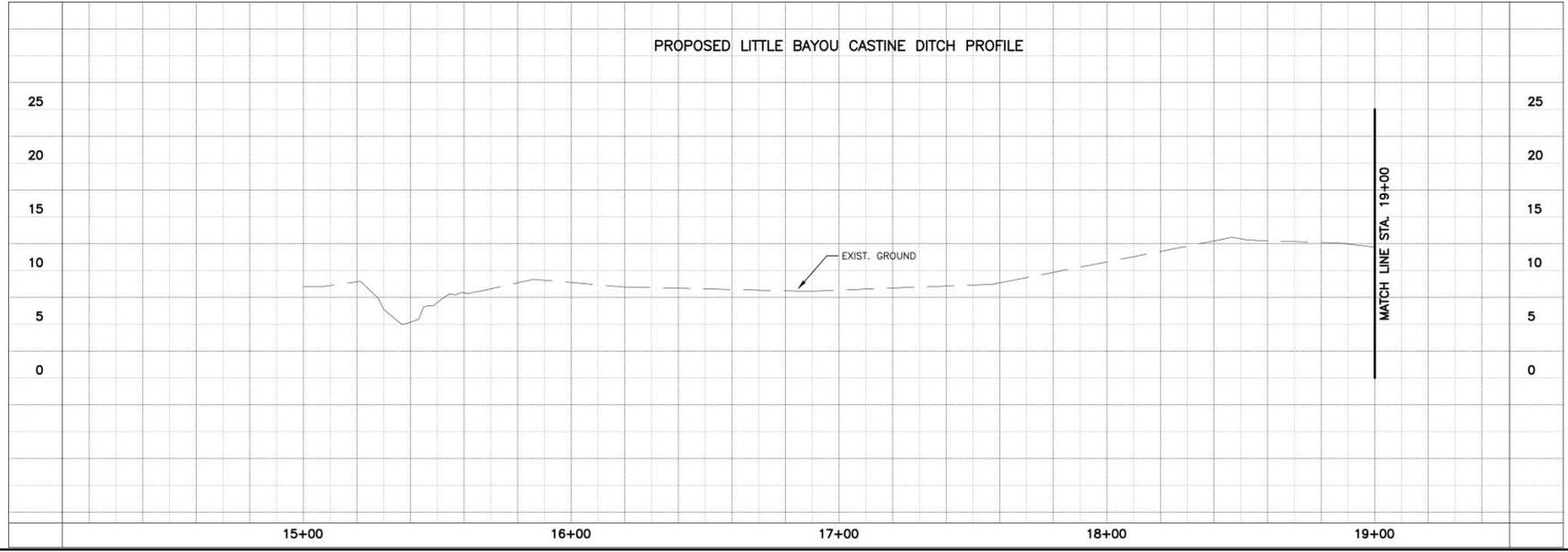


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LITTLE BAYOU CASTINE
 SCALE: HORIZ. 20' = 1" PLAN & PROFILE
 VERT. 5' = 1" PROFILE



PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



NO.	REVISION	BY	DATE

PROJECT NO.: 77100-00
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LITTLE BAYOU CASTINE

DRAWING NO.: C-119
 SHEET 20 OF 34

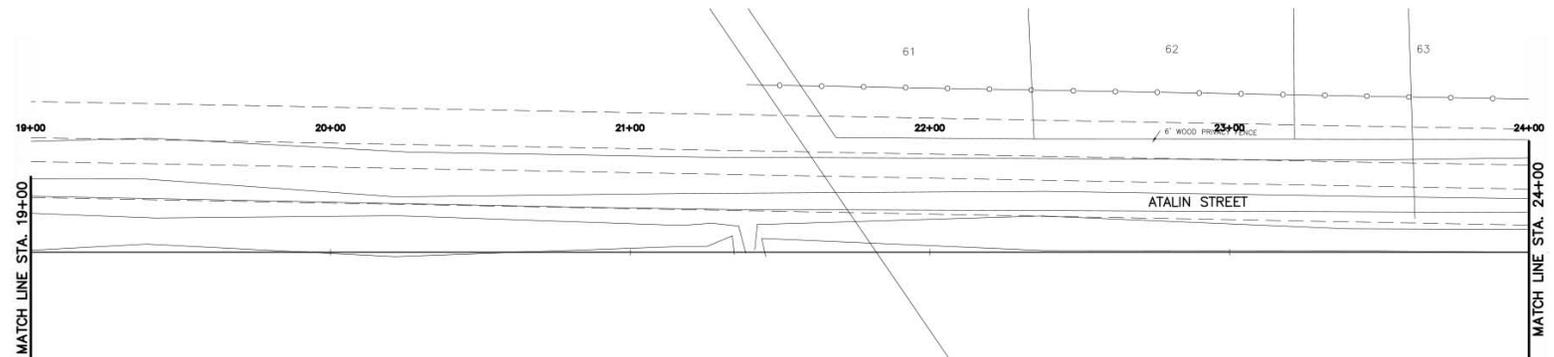
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LITTLE BAYOU CASTINE
ST. TAMMANY PARISH, LA



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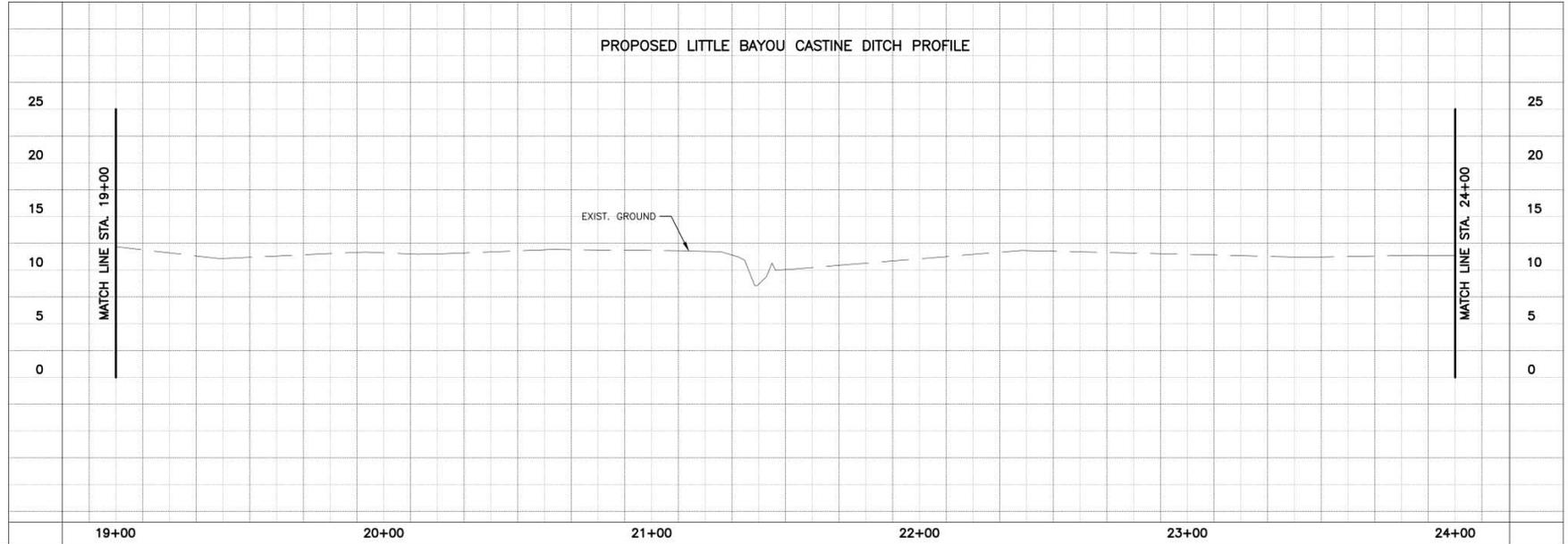


LITTLE BAYOU CASTINE

HORIZ. 20' 0' 20' PLAN & PROFILE
SCALE VERT. 5' 5' PROFILE

NOTE:
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PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



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PROJECT NO.: 77100-00
 CAD FILE NAME: DWG
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LITTLE BAYOU CASTINE

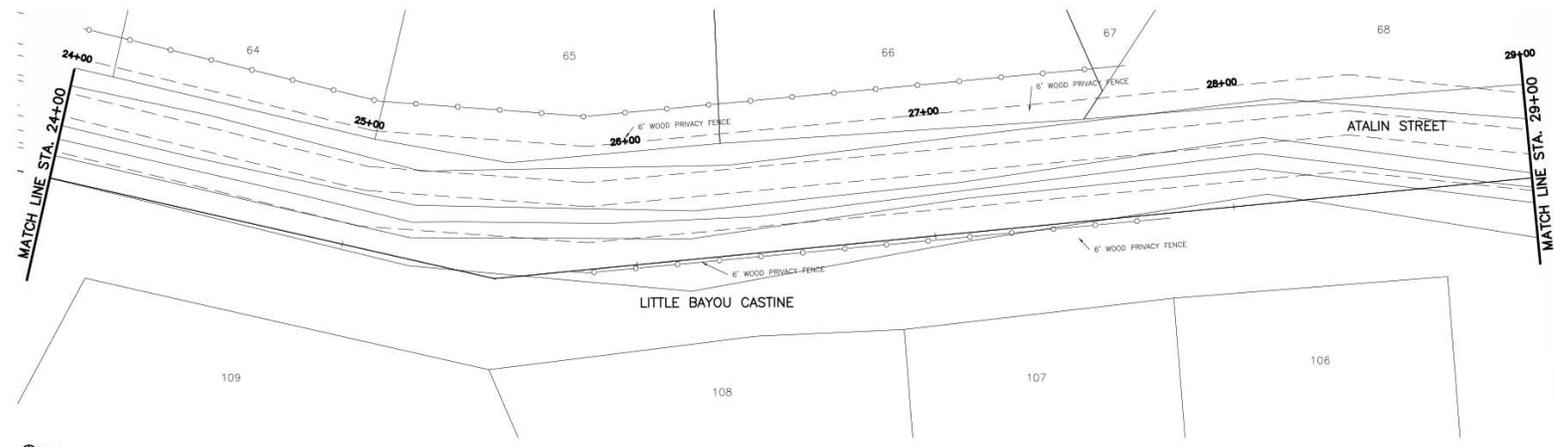
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C-120

SHEET 21 OF 34

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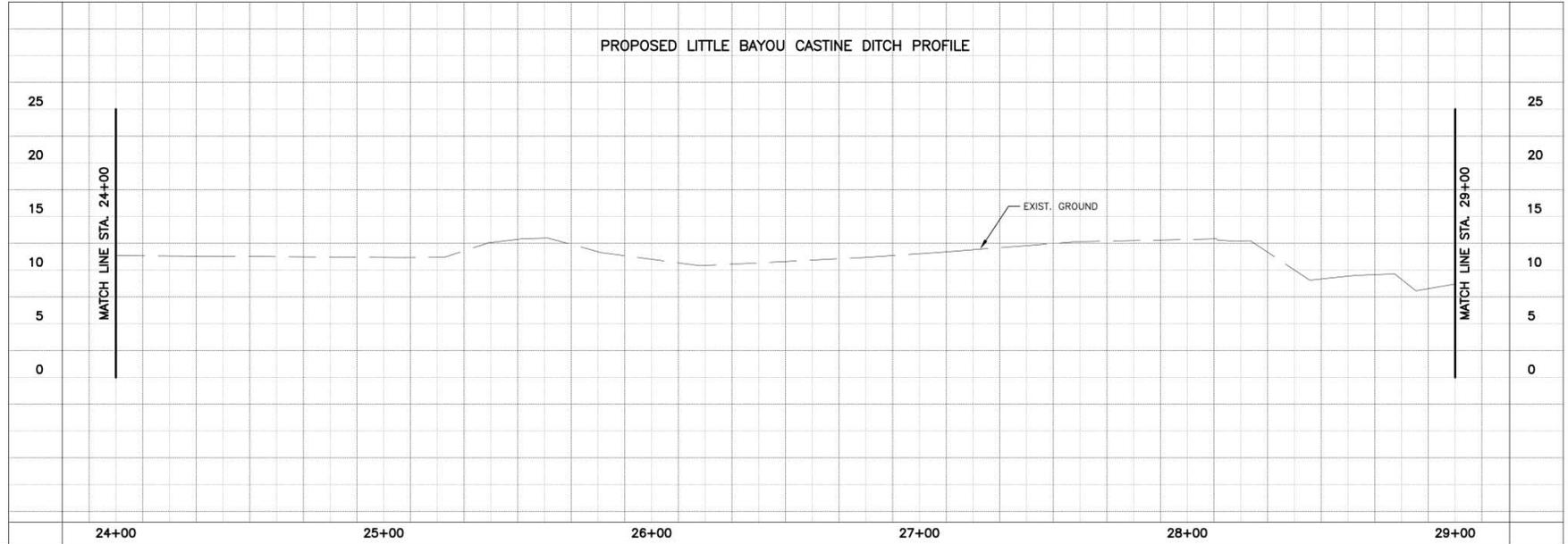


LITTLE BAYOU CASTINE

HORIZ. 20' 0' 20' PLAN & PROFILE
 SCALE VERT. 5' 5' PROFILE

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PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



NO.	REVISION	BY	DATE

PROJECT NO: 77100-00
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LITTLE BAYOU CASTINE

DRAWING NO: C-121
 SHEET 22 OF 34

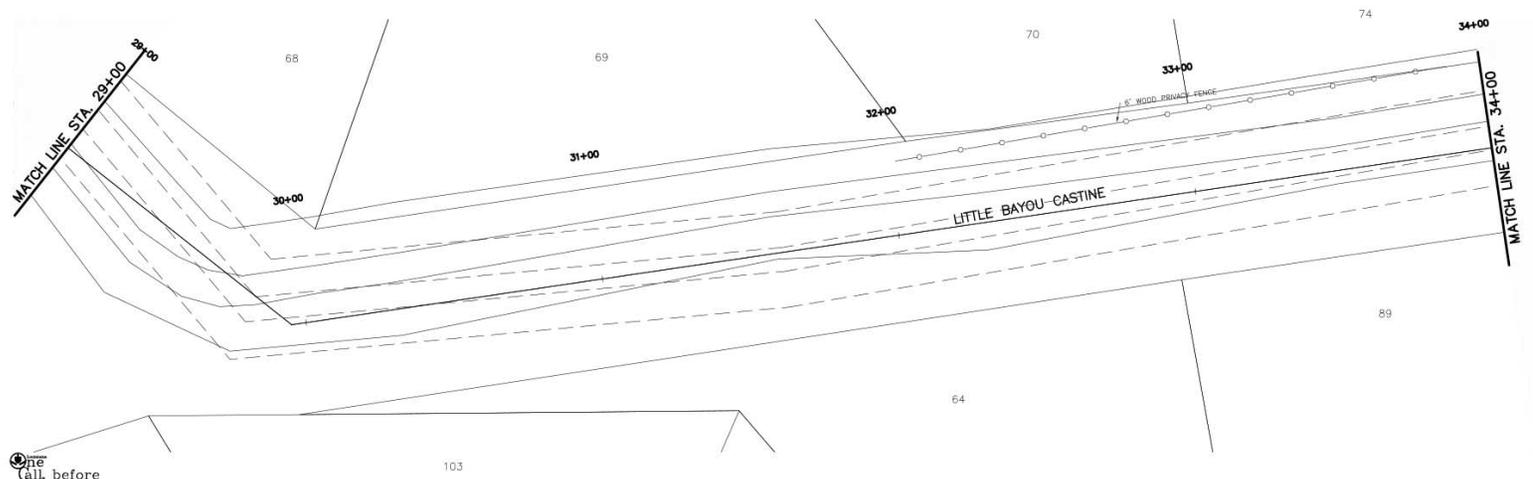
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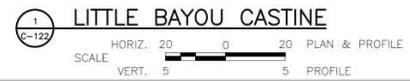
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 LITTLE BAYOU CASTINE
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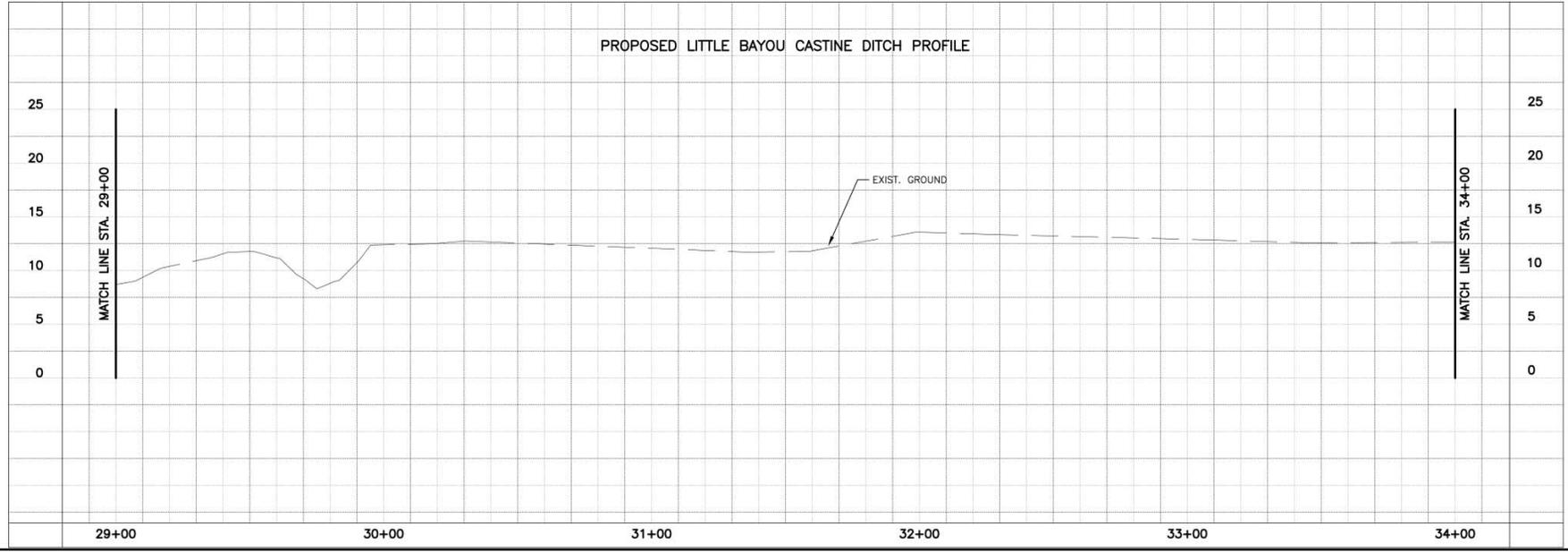
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PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



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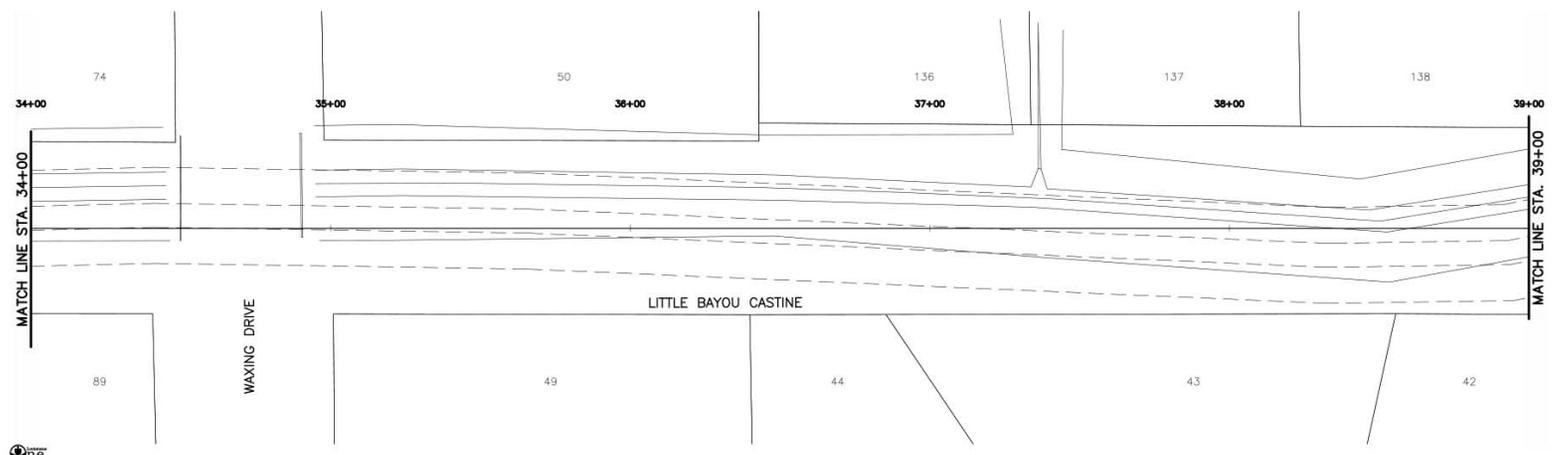
LITTLE
 BAYOU
 CASTINE
 SHEET 23 OF 34



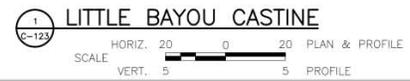
DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



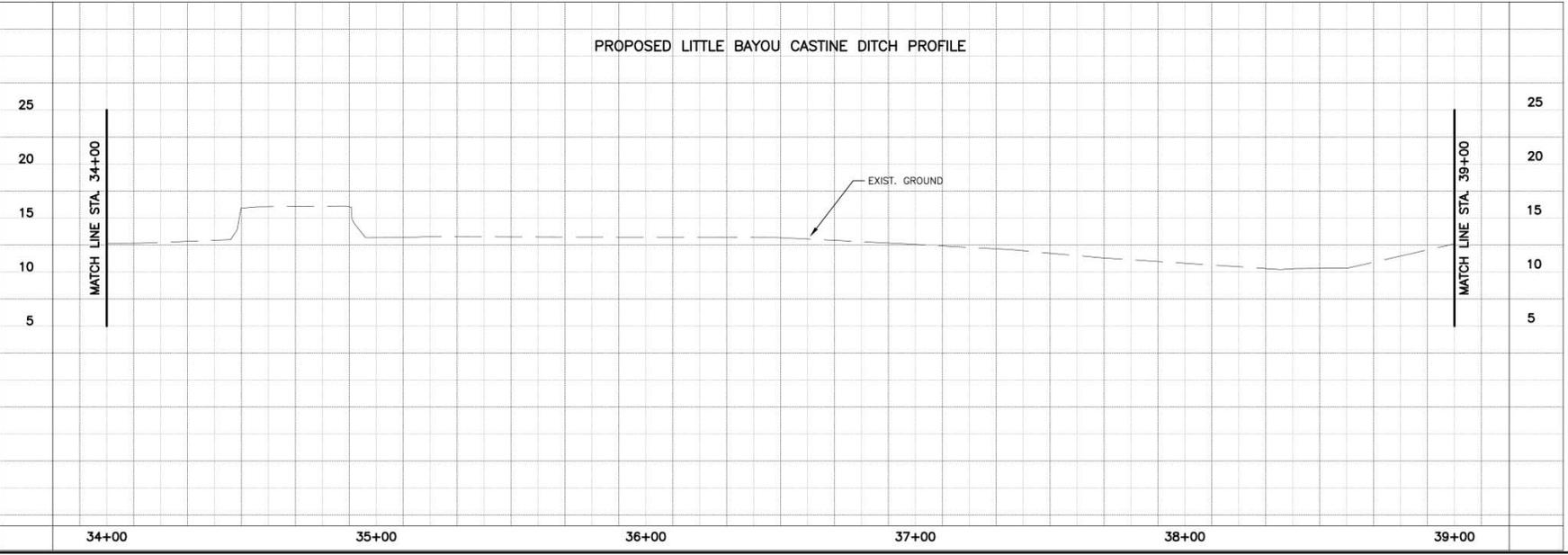
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PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



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LITTLE BAYOU CASTINE

SHEET 24 OF 34

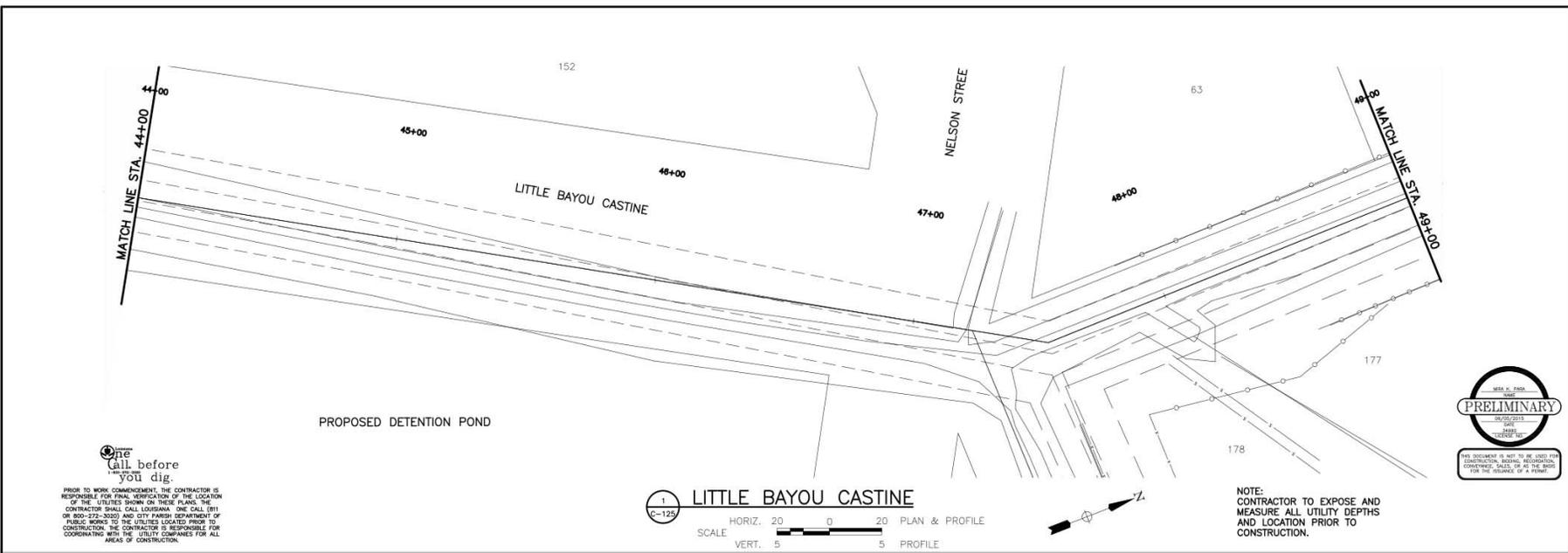
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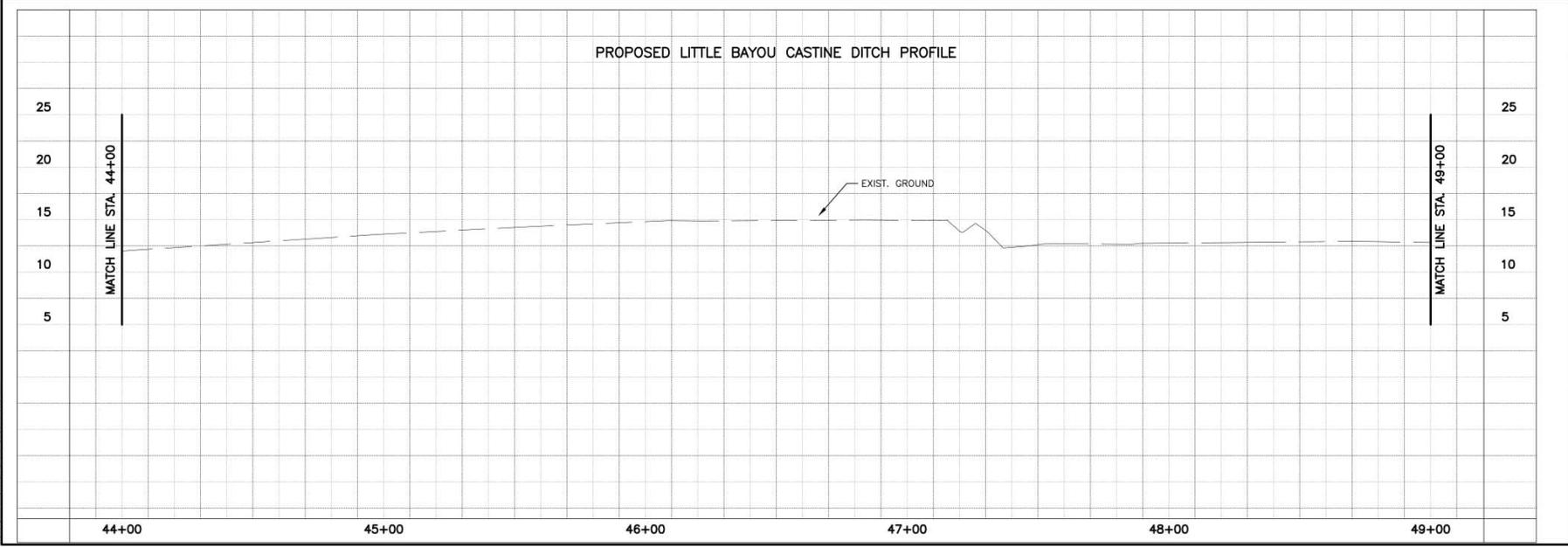
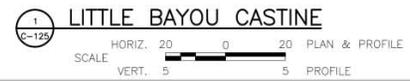
DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
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LITTLE BAYOU CASTINE
 DRAWING NO. C-125
 SHEET 26 OF 34

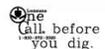
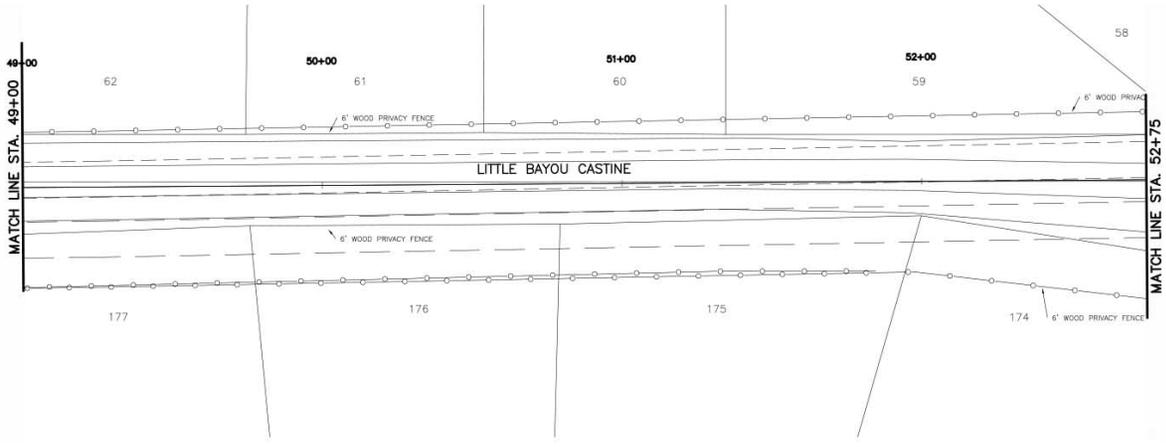
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DRAINAGE IMPROVEMENTS
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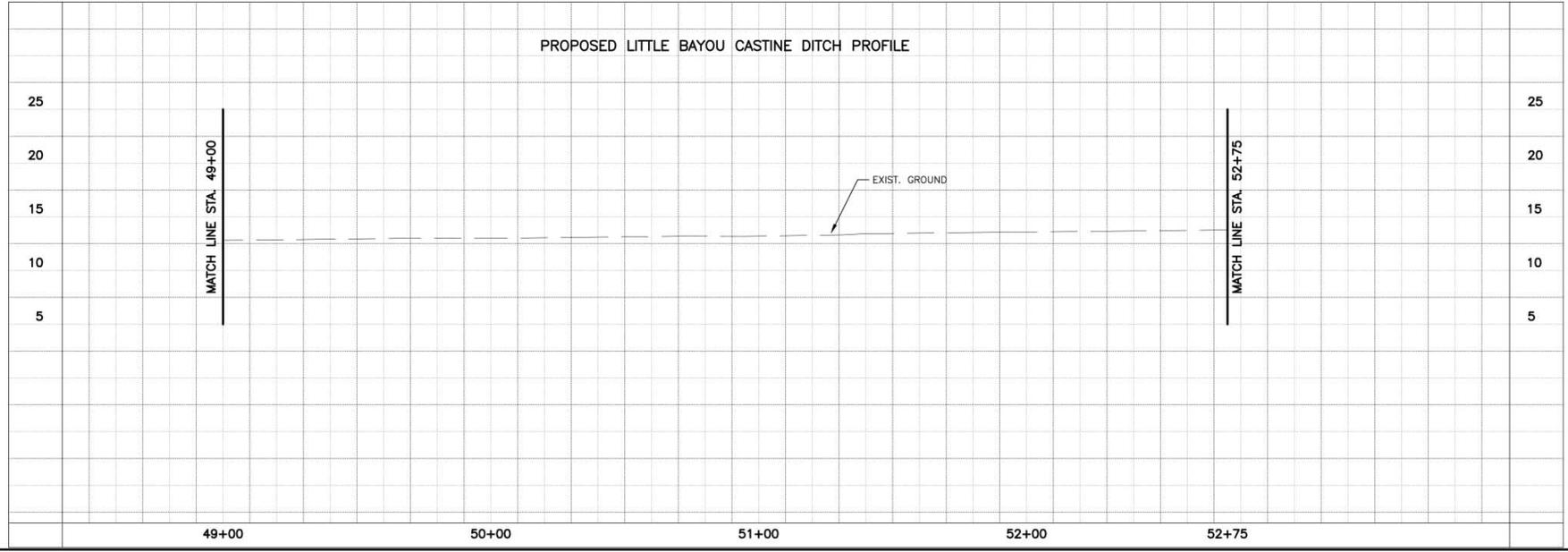
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LITTLE BAYOU CASTINE

SCALE: HORIZ. 1" = 20' 0" PLAN & PROFILE
 VERT. 1" = 5' PROFILE

PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



NO.	REVISION	BY	DATE

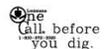
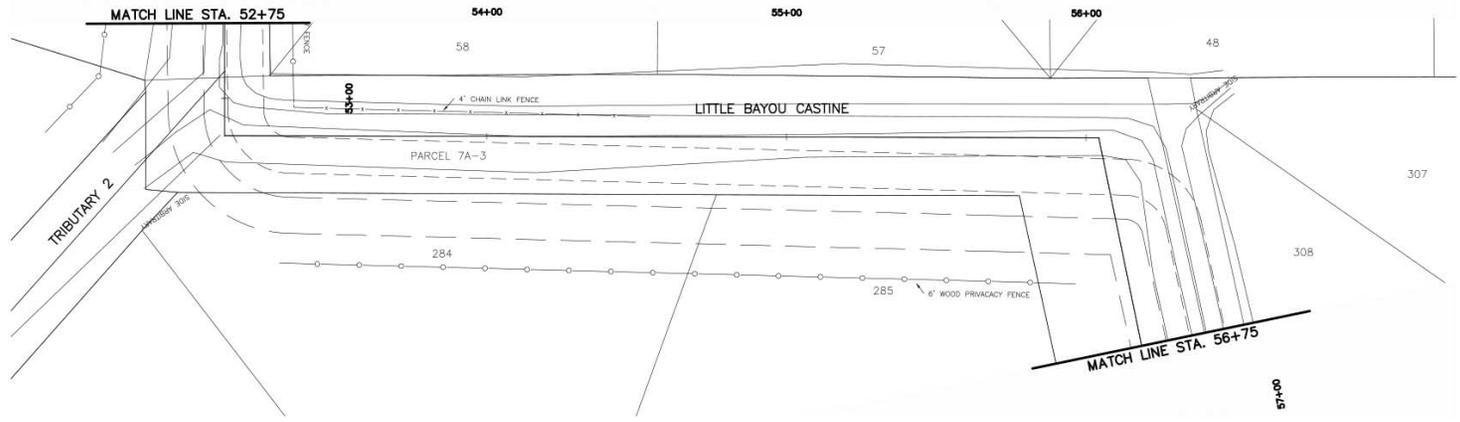
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LITTLE BAYOU CASTINE
 DRAWING NO.:
C-126
 SHEET 27 OF 34

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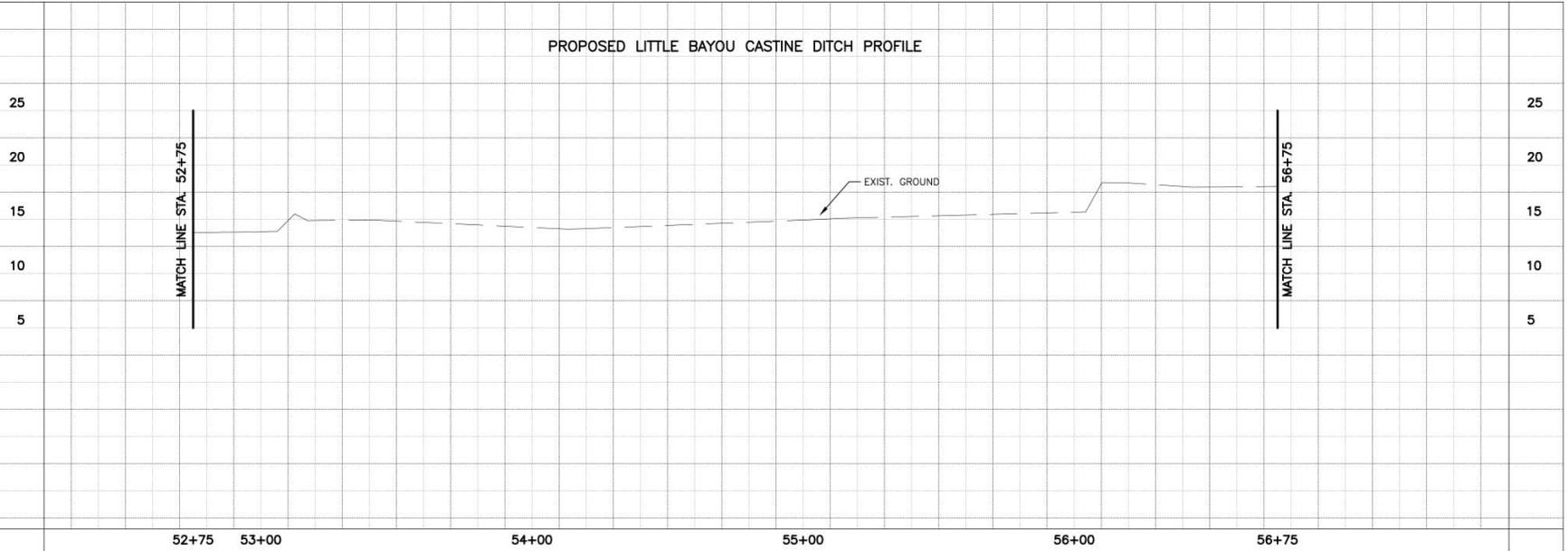
LITTLE BAYOU CASTINE

SCALE: HORIZ. 1" = 20' 0" 20' PLAN & PROFILE
 VERT. 1" = 5' 5' PROFILE



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PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



NO.	REVISION	DATE

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 DESIGN BY: DM1
 DRAWN BY: DMB
 CHECKED BY: MKP
 DATE: 06/26/2015

LITTLE BAYOU CASTINE

DRAWING NO: C-127
 SHEET 28 OF 34

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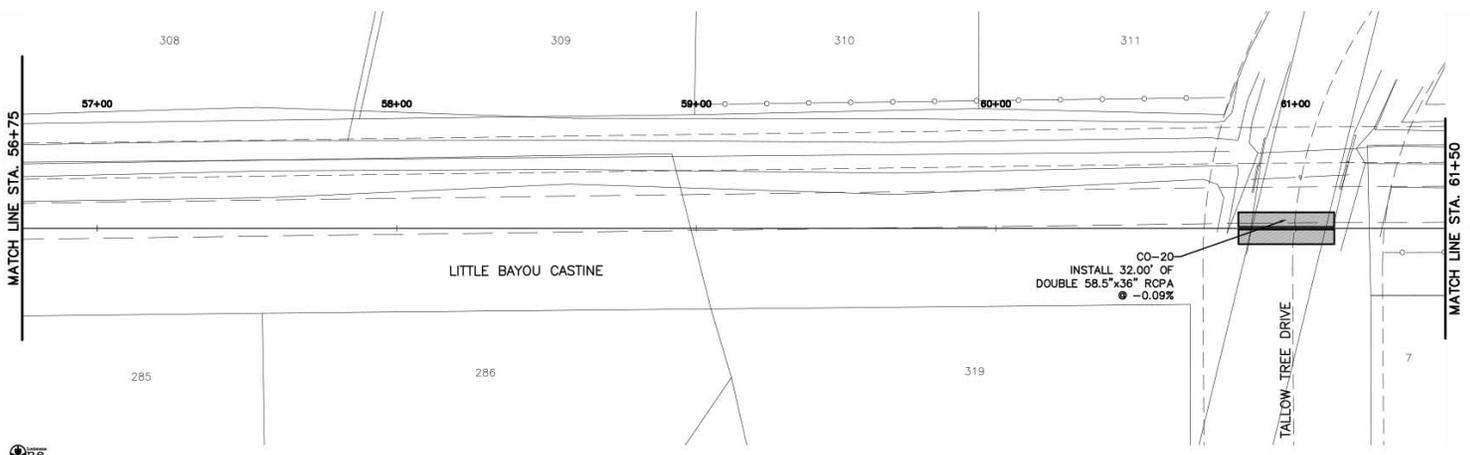
DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA

NO.	REVISION	BY	DATE

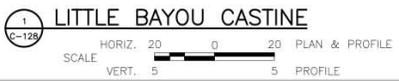
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 CHECKED BY: MKP
 DATE: 06/26/2015

LITTLE
 BAYOU
 CASTINE

SHEET 29 OF 34
 C-128

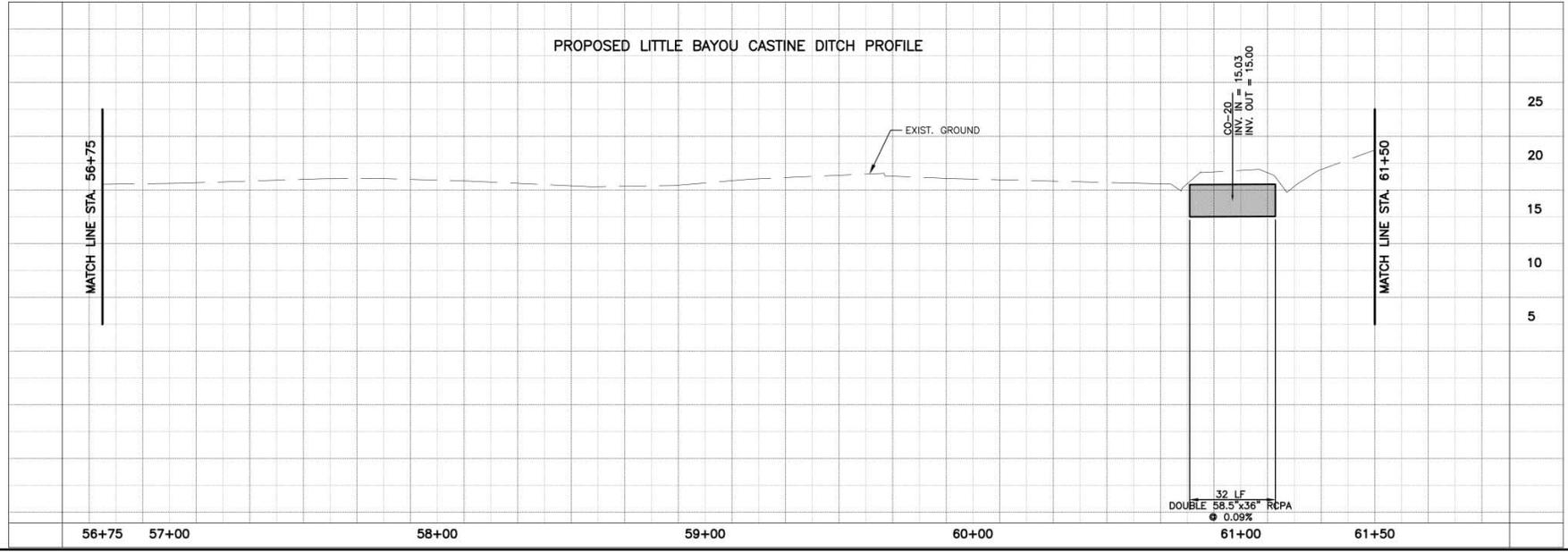


Call before you dig.
 PRIOR TO WORK COMMENCEMENT, THE CONTRACTOR IS RESPONSIBLE FOR FINAL VERIFICATION OF THE LOCATION OF THE UTILITIES SHOWN ON THESE PLANS. THE CONTRACTOR SHALL CALL LOUISIANA ONE CALL (811 OR 800-222-3829) AND CITY PARISH DEPARTMENT OF PUBLIC WORKS TO THE UTILITIES LOCATED PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE UTILITY COMPANIES FOR ALL AREAS OF CONSTRUCTION.



NOTE:
 CONTRACTOR TO EXPOSE AND MEASURE ALL UTILITY DEPTHS AND LOCATION PRIOR TO CONSTRUCTION.

PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



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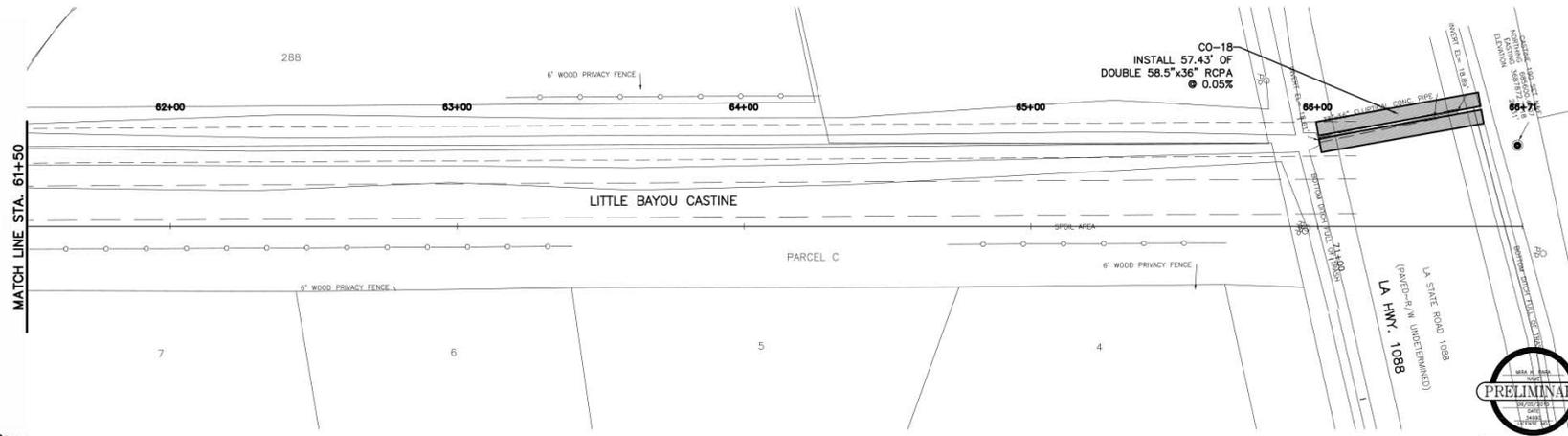
DRAINAGE IMPROVEMENTS
 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA

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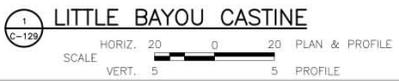
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 DATE: 06/26/2015

LITTLE BAYOU CASTINE

SHEET 30 OF 34

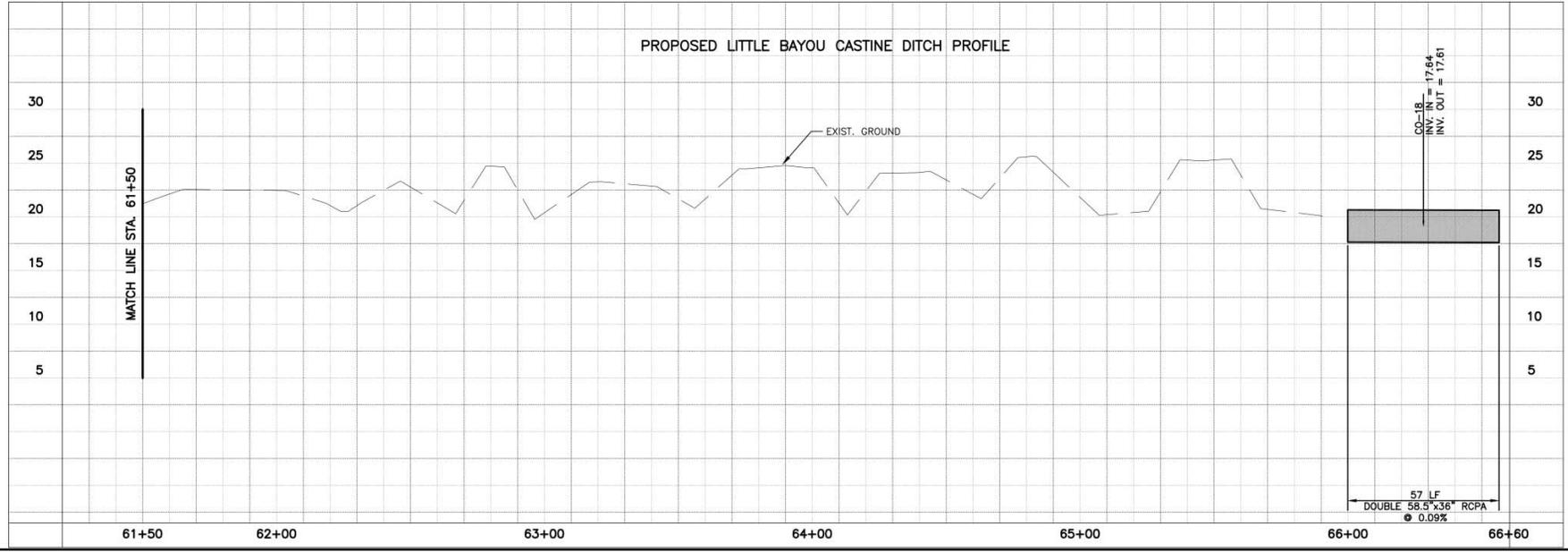


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NOTE:
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PROPOSED LITTLE BAYOU CASTINE DITCH PROFILE



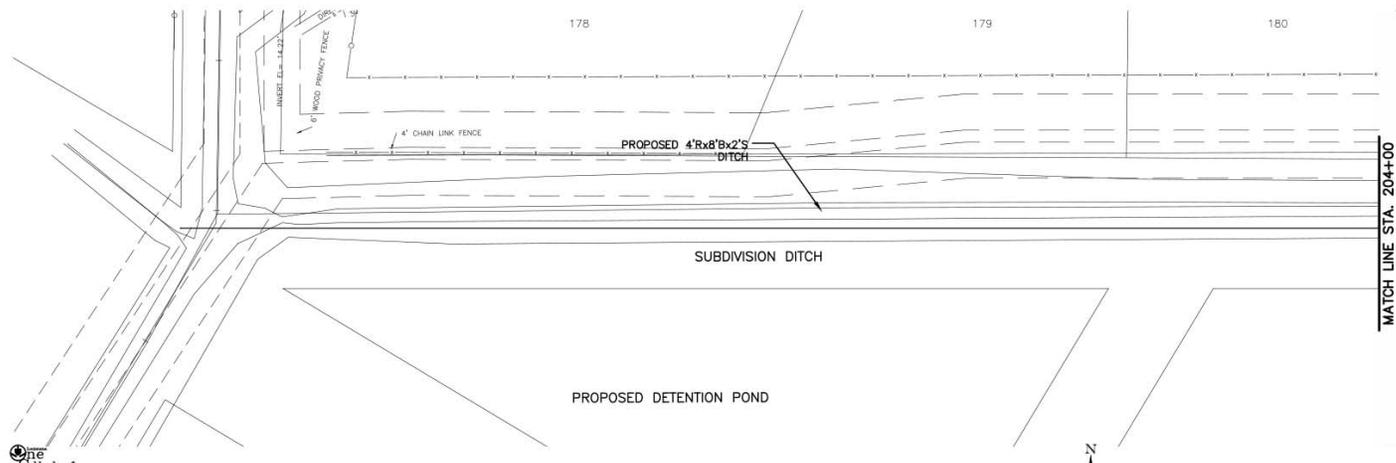
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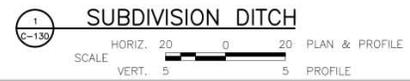
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 LITTLE BAYOU CASTINE
 ST. TAMMANY PARISH, LA



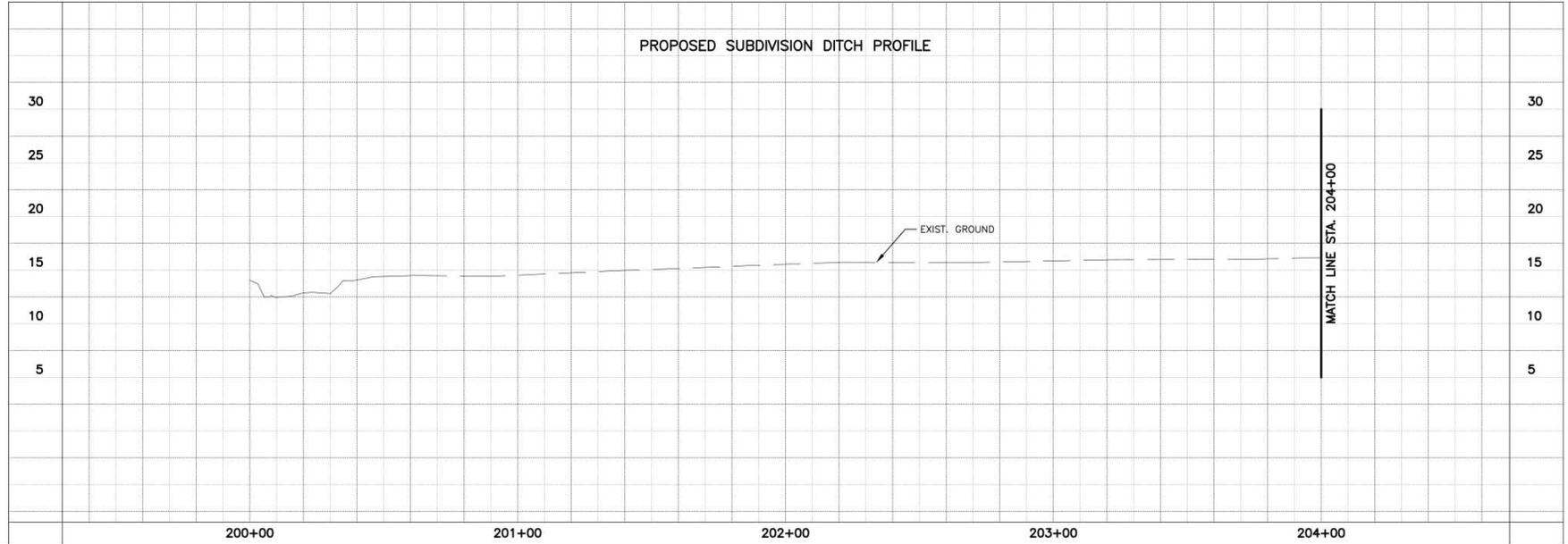
NOTE:
 CONTRACTOR TO EXPOSE AND
 MEASURE ALL UTILITY DEPTHS
 AND LOCATION PRIOR TO
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PROPOSED SUBDIVISION DITCH PROFILE

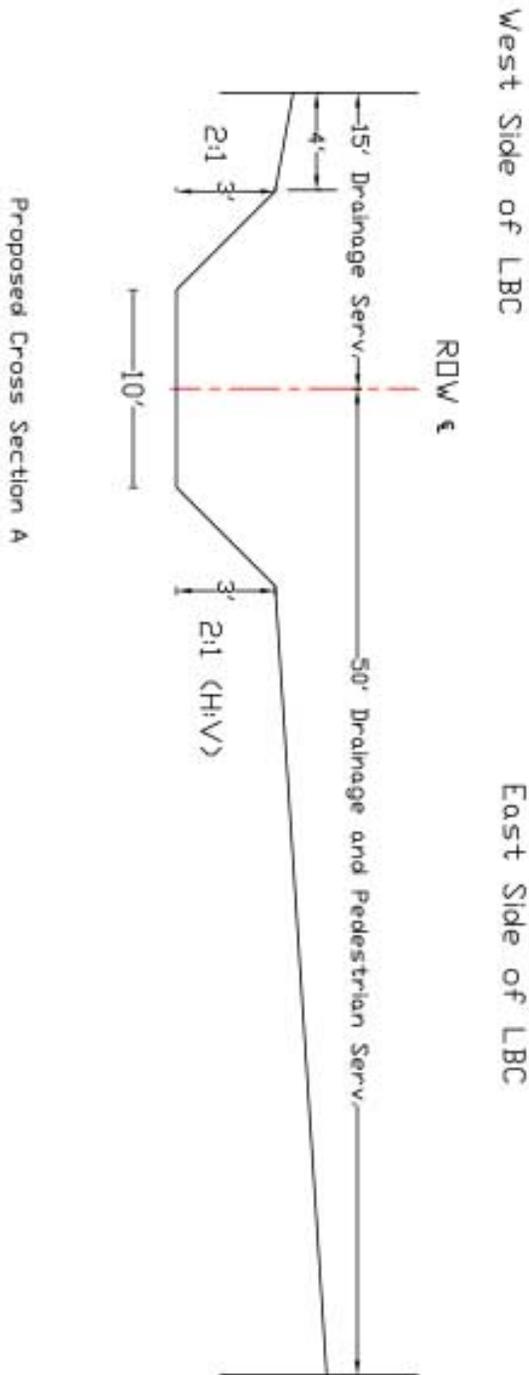


NO.	REVISION	BY	DATE

PROJECT NO: 77100-00
 S&D FILE NAME: DWG
 ENGR./ARCH: MKP
 DESIGN BY: DM1
 DRAWN BY: DMB
 CHECKED BY: MKP
 DATE: 06/26/2015

SUBDIVISION
 DITCH
 DRAWING NO: C-130
 SHEET 31 OF 34

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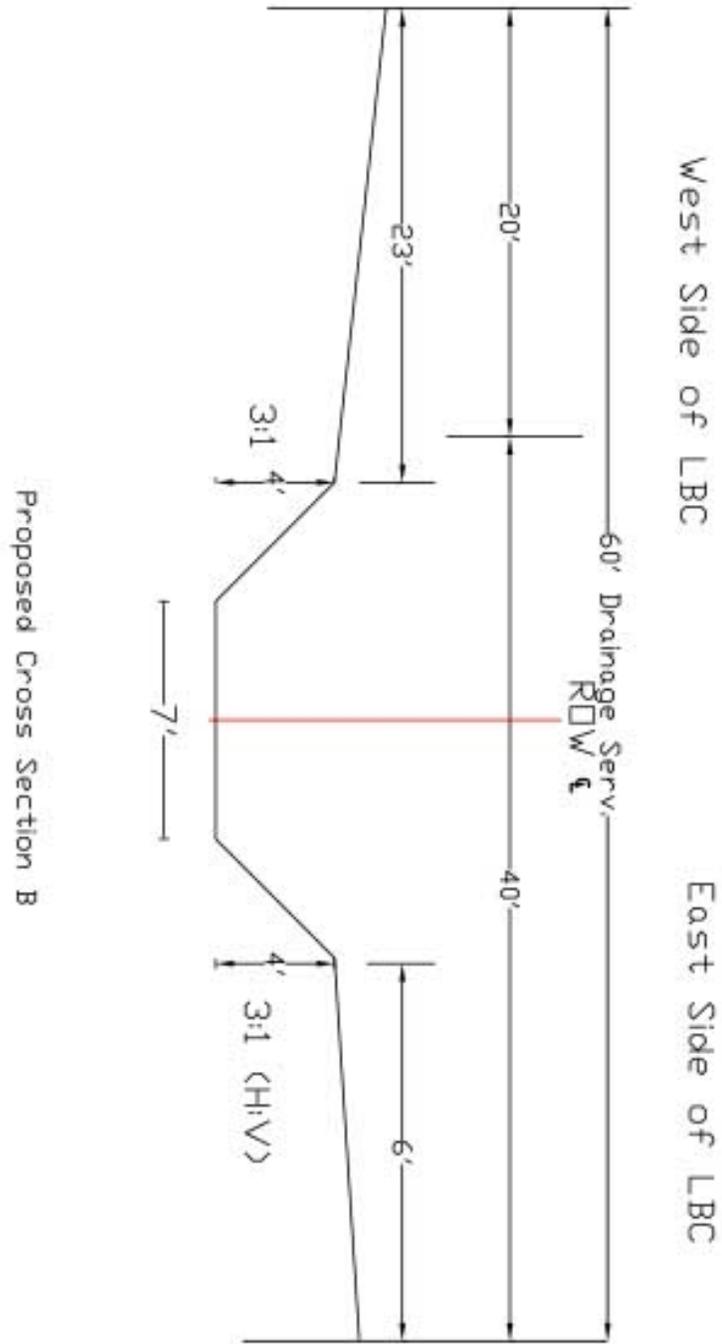


ENGR./ARCH.
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DESIGN
BY MKP
DRAWN
BY TJR
CHECK
BY MKP
DATE
7-27-10



PROJECT: Little Bayou Castine
Drainage Improvements

DRAWING NO.
1 of 5
SHEET NO.
CS-101
PROJECT NO.
75701-10



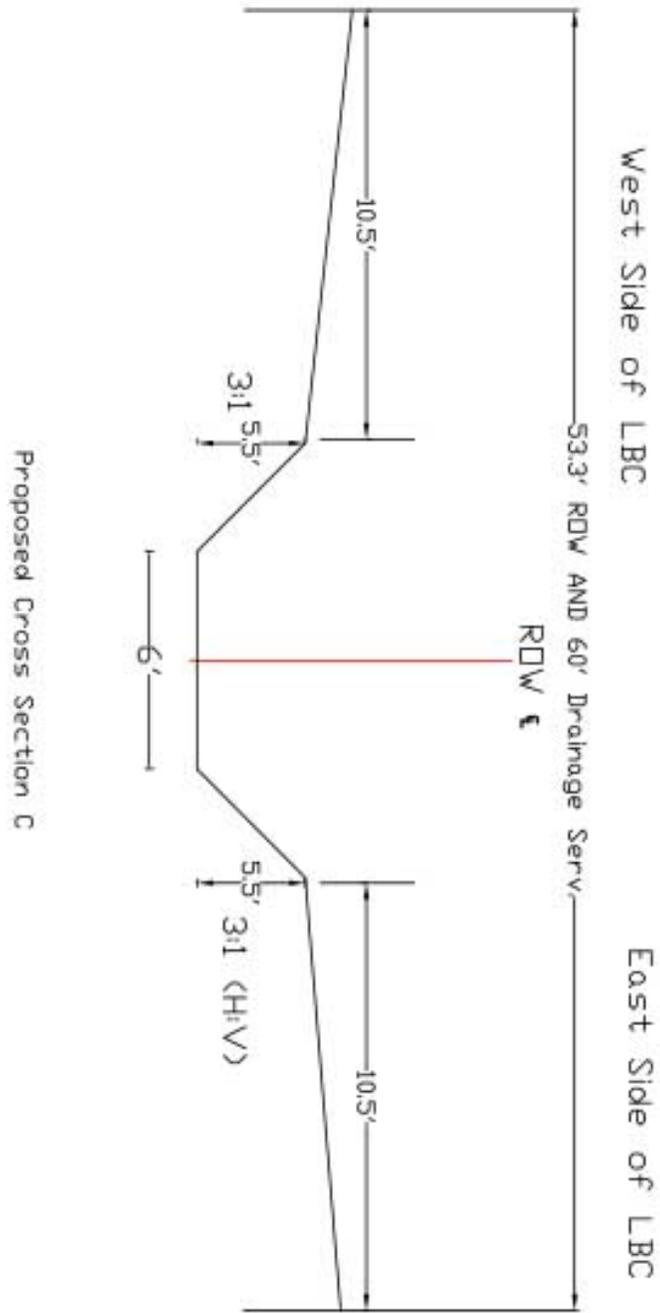
Proposed Cross Section B

ENGR./ARCH.
MKP
DESIGN
BY MKP
DRAWN
BY T.J.H.
CHECK
BY MKP
DATE
7-27-10



PROJECT: Little Bayou Castine
Drainage Improvements

DRAWING NO.
2 of 5
SHEET NO.
CS-102
PROJECT NO.
75701-10

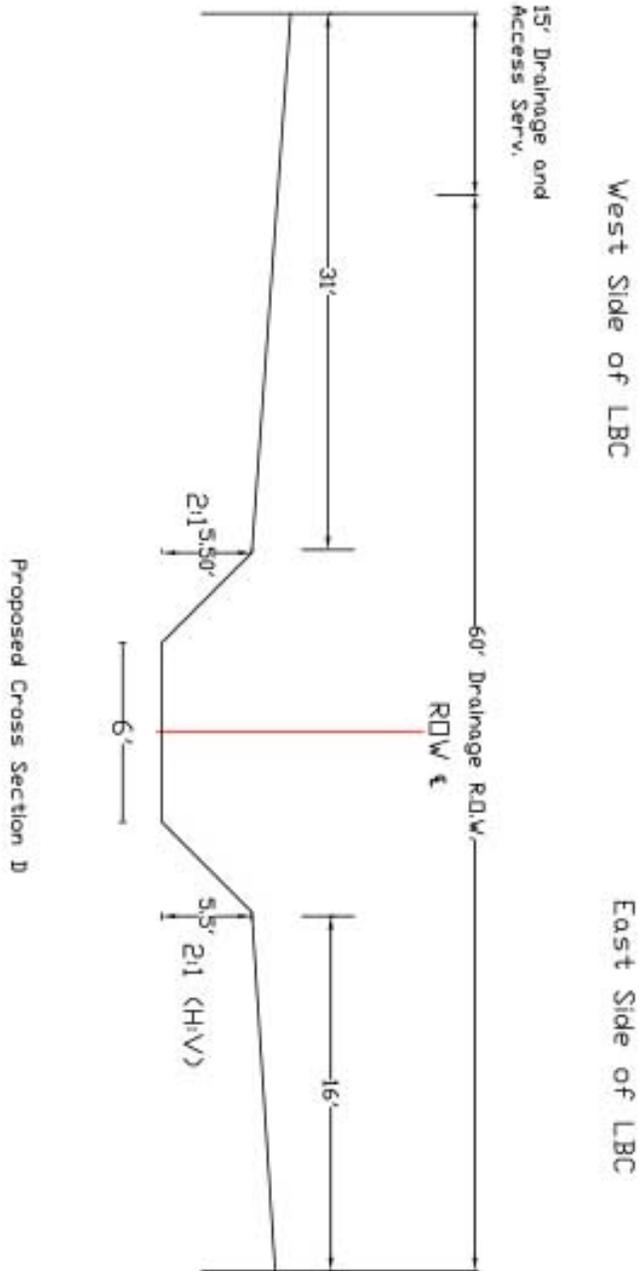


ENGR. / ARCH.
MKP
DESIGN
BY MKP
DRAWN
BY T.J.H.
CHECK
BY MKP
DATE
7-27-10



PROJECT: Little Bayou Castine
Drainage Improvements

DRAWING NO.
3 of 5
SHEET NO.
CS-103
PROJECT NO.
75701-10



ENGR./ARCH
MKP
DESIGN
BY MKP
DRAWN
BY TJM
CHECK
BY MKP
DATE
7-27-10

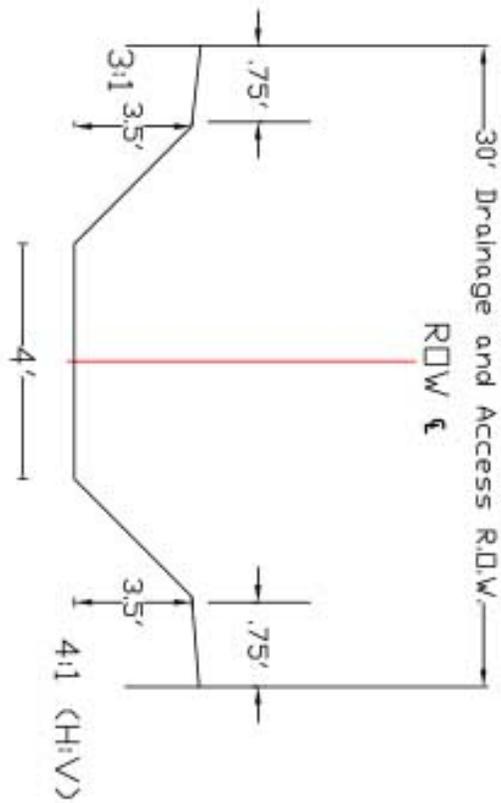


PROJECT: Little Bayou Castine
Drainage Improvements

DRAWING NO.
4 of 5
SHEET NO.
CS-104
PROJECT NO.
75701-10

North Side of LBC

South Side of LBC



Proposed Cross Section E

ENGR / ARCH
MKP
DESIGN
BY MKP
DRAWN
BY TJR
CHECK
BY MKP
DATE
7-27-10



PROJECT: Little Bayou Castine
Drainage Improvements

DRAWING NO.
5 of 5
SHEET NO.
CS-105
PROJECT NO.
75701-10

APPENDIX C
EXTERNAL AGENCY
CORRESPONDENCE

From: Schexnayder, Jamie
To: Linda.Hardy@la.gov; amy.e.powell@usace.army.mil; [Raul Gutierrez <Gutierrez.Raul@epamail.epa.gov>](mailto:Raul.Gutierrez.<Gutierrez.Raul@epamail.epa.gov>)
(Gutierrez.Raul@epamail.epa.gov); cmichon@wlf.la.gov
Cc: [Pitts, Melanie](mailto:Pitts.Melanie); [Holmes, Leschina](mailto:Holmes.Leschina); [Spann, Tiffany](mailto:Spann.Tiffany); karl.morgan@la.gov
Subject: Request for Solicitation of Views (SOV) for HMGP# 1603-0332 Little Bayou Castine Drainage Improvements
Date: Tuesday, July 21, 2015 1:47:00 PM
Attachments: [image001.png](#)
[image002.png](#)
[LBC Drainage Improvements SOV Consultation Information.pdf](#)
[Attachment 1 LITTLE BAYOU CASTINE PRELIMINARY PLANS.pdf](#)
[Attachment 2 Proposed Little Bayou Castine Cross sections.pdf](#)

July 21, 2015

U.S. Department of Homeland Security
Federal Emergency Management
Agency FEMA-DR 1603/1607 LA
Louisiana Recovery Office
1500 Main St., Baton Rouge, LA 70802



FEMA

MEMORANDUM TO: See Distribution

SUBJECT: Scoping Notification/Solicitation of Views
St. Tammany Parish, Little Bayou Castine Drainage Improvements, HMGP# 1603-0332, FEMA-1603-DR-LA

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. Section 404 and Section 406 of the Stafford Act authorizes FEMA's Hazard Mitigation Program 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).

Please review the attached project description to determine whether your office has any objections to the proposed project and whether any permits from your office would need to be obtained. The applicant is St. Tammany Parish.

This project is the applicant's request to expand the capacity of undersized culverts and ditches within St. Tammany Parish, Louisiana, as well as the construction of a 5-acre (2.0 ha) detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess water back into the watershed. The project site is roughly bounded by LA Highway 1088 at the northeastern most extent (30.381012, -90.037005), Soult Street to the east (30.377061, -90.032340), Labarre Street to the south (30.367871, -90.046376), and Garon Drive to the west (30.376006, -90.041906).

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

We would appreciate your comments on this project within thirty (30) days. If we do not receive comments from you within this time period, we will assume that you have no concerns or issues with the proposed project. If appropriate, FEMA will add the condition that the applicant will be required to obtain applicable permits from your office.

Comments may be emailed to jamie.schexnayder@fema.dhs.gov or mailed to the attention of Jamie Schexnayder, Environmental Department, at the address above. For questions regarding this matter, please contact Jamie Schexnayder, Environmental Protection Specialist at (225) 200-4961.

Sincerely,

Tiffany Spann-Winfield,
Deputy Environmental Liaison Officer, FEMA LRO
FEMA 1603/1607-DR-LA

Distribution: LDEQ, USEPA, LDWF, LDNR, USACE

Attachment: Scope of Work, Project Plans

Jamie Schexnayder, CFM
Environmental Protection Specialist
FEMA Region VI – LRO
1500 Main Street
Baton Rouge, LA 70802
BB (225) 200-4961
jamie.schexnayder@fema.dhs.gov



Scope of work for Little Bayou Castine Drainage Improvements:

The area of proposed drainage improvements is located in St. Tammany Parish, Louisiana, and is roughly bounded by LA Highway 1088 at the northeastern most extent (30.381012, -90.037005), Soult Street to the east (30.377061, -90.032340), Labarre Street to the south (30.367871, -90.046376), and Garon Drive to the west (30.376006, -90.041906). Existing pipes and ditches within the project area are presently undersized for the volume of water that frequently inundates the watershed during storm events. The present scope of work (SOW) proposes to expand the capacity of undersized culverts and ditches within the project area as well as the construction of a 5-acre (2.0 ha) detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess back into the watershed. Additionally channel improvements are proposed for the upper stretch of Little Bayou Castine and Subdivision Ditch. This project would improve existing drainage and reduce the risk of inundation for over 650 homes and would thereby decrease repetitive flood damage. Design plans for the St. Tammany Parish Little Bayou Castine Drainage Improvements are attached (Attachment 1).

North of LA Highway 1088

Ditch and pipe work along the northernmost side of the existing right-of-way (ROW) of LA Highway 1088 (Figure 1-2) includes the expansion of 1,861.54 feet (567.3 m) of ditch (begin: 30.380948, -90.037302; end: 30.378909, -90.042505; also see: Attachment 1 for Typical Ditch Section profile) and culvert/pipe replacements in six (6) locations (Table 1). The proposed culvert improvements are as follows:

Table 1. Culvert Construction North of LA Highway 1088

Sub-Location	Existing	New	Latitude	Longitude
N of LA Hwy. 1088	Remove 60.22' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP) ¹	Install 60.22' of 30" Chlorinated polyvinyl chloride (CPVC)	30.380642	-90.038029
N of LA Hwy. 1088	Remove 23.22' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP)	Install 23.22' of 36" CPVC	30.380206	-90.039104
N of LA Hwy. 1088	Remove 23.21' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP)	Install 23.21' of double 36" CPVC	30.379967	-90.039731
N of LA Hwy. 1088	Remove 81.45' of 36" Reinforced Concrete Arch Pipe (RCPA)	Install 81.45' of double 36" CPVC	30.379777	-90.040238
N of LA Hwy. 1088	Remove 66.83' of double 36" RCPA	Install 66.83' of double 36" CPVC	30.379508	-90.040938
N-S of LA Hwy. 1088	Remove 57.44' of 46" x 36" SRPA (est)	Install 57.44' of double 58.5" x 36" RCPA	30.378829	-90.042468

Woodlands Neighborhood Pipe and Ditch Improvements

Ditch and pipe work is proposed throughout the Woodlands neighborhood in multiple locations (Figure 1-2) including the excavation of 295.27 feet (89.9 m) of new ditch (begin: 30.378386, -90.036857; end: 30.378386, -90.035923; also see: Attachment 1 for Typical Ditch Section profile) and culvert/pipe replacements in nine (9) locations (Table 2). The proposed culvert improvements are as follows:

Table 2. Woodlands Neighborhood Culvert Replacements

Sub-Location	Existing	Replacement	Latitude	Longitude
Tallow Tree Drive and Little Bayou Castine	Remove 32.00' of (size) of Concrete Pipe	Install 32.00' of double 58.5" x 36" RCPA	30.377429	-90.042100
Mayhaw Drive	Remove 333.69' of 24" corrugated metal pipes Corrugated Metal Pipe (CMP)/38.09' of 28.5" x 18" RCPA	Replace with 77.87' of RCP and 293.91' of 36" CPVC	Begin: 30.379296/ End: 30.378279	Begin: -90.037004/ End: -90.036990
Mayhaw Drive	Remove 310.35' of 57 x 38" bituminous coated corrugated steel pipe (BCCSP)/32.00' of 51" x 31" RCPA/158.02' of BCCSP	Replace with 342.35' of double 46" x 36" steel spiral rib arch (SRPA) and 158.02' of double 53" x 41" SRPA	Begin: 30.378279 End: 30.376837	Begin: -90.036990 End: -90.036957
East of Mayhaw	Remove 34.23' of 29" x 18" RCPA/300.00' of 28" x 20" BCCSP	Replace with 34.23' of SRPA and 300.00' of 46" x 36" SRPA	Begin: 30.379316 End: 30.378386	Begin: -90.035886 End: -90.035922
Tributary 2 Ditch	Remove 271.42' of existing 24" BCCSP	Replace with 27" x 21" SRPA	Begin: 30.377046 End: 30.377056	Begin: -90.033208 End: -90.034077
Red Maple Drive	remove 47.00' of 51" x 31" RCPA	Replace with triple 59.5" x 36" RCPA	30.376607	-90.039749
Chestnut Oak Drive	Remove 318.0' of existing 24" CMP	Replace with 36" CPVC pipes	Begin: 30.377334 End: 30.377083	Begin: -90.040657 End: -90.039685
Mayhaw and Red Maple Drive	Remove 57.44' of existing 28.5" x 18" RCPA	Replace with 46" x 36" SRPA	30.378329	-90.036912
Spring Blvd. and Sweet Bay Drive	Remove 96.83' of existing 24" CMP	Replace with double 24" RCPs	30.378755	-90.040853

Detention Pond and Broad-Crested Weir

St. Tammany Parish is proposing the construction of a 5-acre (2.0 ha) detention pond on the Parish owned land at the southeastern intersection of Little Bayou Castine and the Woodlands tributary. **Part of the proposed Detention Pond location was formerly excavated between the years of ca. 2007-2009 (Figures 3-4) and the resultant depression is presently inundated.** The design consists of a side-channel weir that allows low flows to bypass the pond and preserves the storage capacity of the pond for larger events. The weir structure will be a grass levee lined with a turf reinforcement mat located on the western side of the proposed detention pond. After a storm event, the pond will drain by gravity through an 18foot (5.4 m) outlet pipe back into the existing channel. This design would allow the pond to be dry during periods of no rainfall, and provide additional floodplain storage. The detention pond location and design parameters are as follows:

Northwest corner: 30.374301, -90.040802

Northeast corner: 30.373599, -90.039337

Southwest corner: 30.373093, -90.041609

Southeast corner: 30.372362, -90.040112

Bottom Elevation: 12.34 feet (3.76 m)

Top of Bank; Elevation: 18.0 feet (5.4

m) Area of pond: 5 acres (2.0 ha)

Side Slope: 3:1

The weir-structure and outlet structure parameters are as follows:

Type: Broad-Crested Weir

Invert Elevation: 17.0 feet (5.18 m)

Length: 50.0 feet (15.24 m)

Breadth: 10.0 feet (3.04 m)

Pipe Outlet Structure

Type: 18" RCP

Invert Elevation: 12.34 feet (3.76 m)

Length: 40 feet (12.19 m)

Little Bayou Castine Channel Improvements

Little Bayou Castine (Figure 1-2) flows north to south and defines the westernmost boundary of the project area. Along the upstream end of the Little Bayou Castine approximately 5,113.27 linear feet (1558.52 m) of channel improvements are proposed (begin: 30.378738, -90.042420; end: 30.367967, -90.045736) including clearing the drainage channel of vegetation, brush, and trees within the cross-sectional area of the channel, and channel reshaping at various locations along the channel to redefine the channel cross-section. Proposed channel cross-sections (Attachment 2) range between 30-60 feet (9.1-18.2 m) in breadth and average 52 feet (15.84 m) in width.

Subdivision Ditch Improvements

Subdivision Ditch (Figure 1-2) is located to the south of Red Maple Road and flows east to west until it discharges into Little Bayou Castine. Approximately 1,331.07 linear feet (405.71 m) of ditch improvements are proposed (begin: 30.374525, -90.036554; end: 30.374472, -90.040754) including clearing the drainage ditch of vegetation, brush, and trees within the cross-sectional area of the ditch, and ditch reshaping at various locations along the ditch to redefine the ditch cross-section (also see: Attachment 1 for Typical Ditch Section profile).

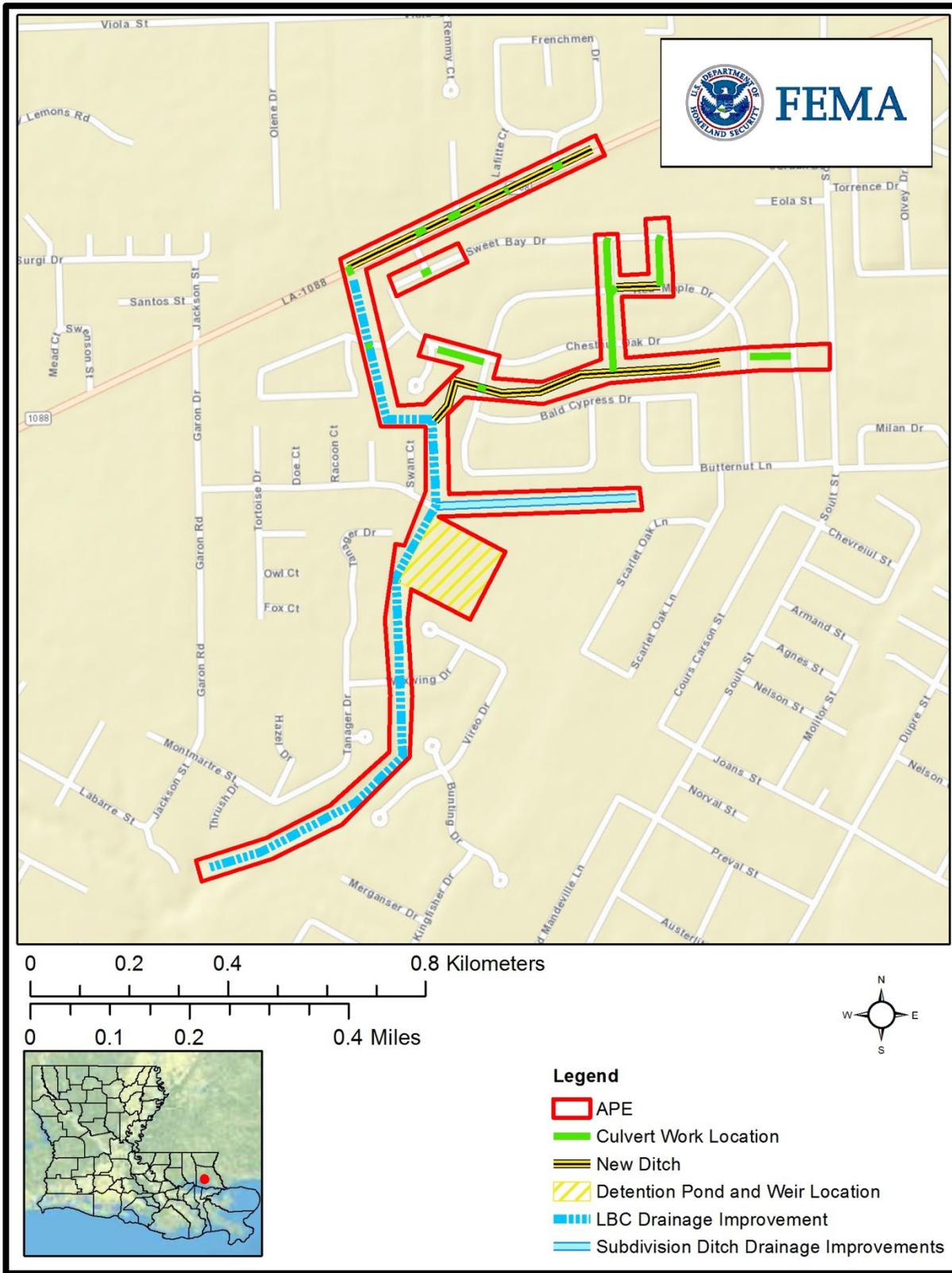


Figure 1: Site Location

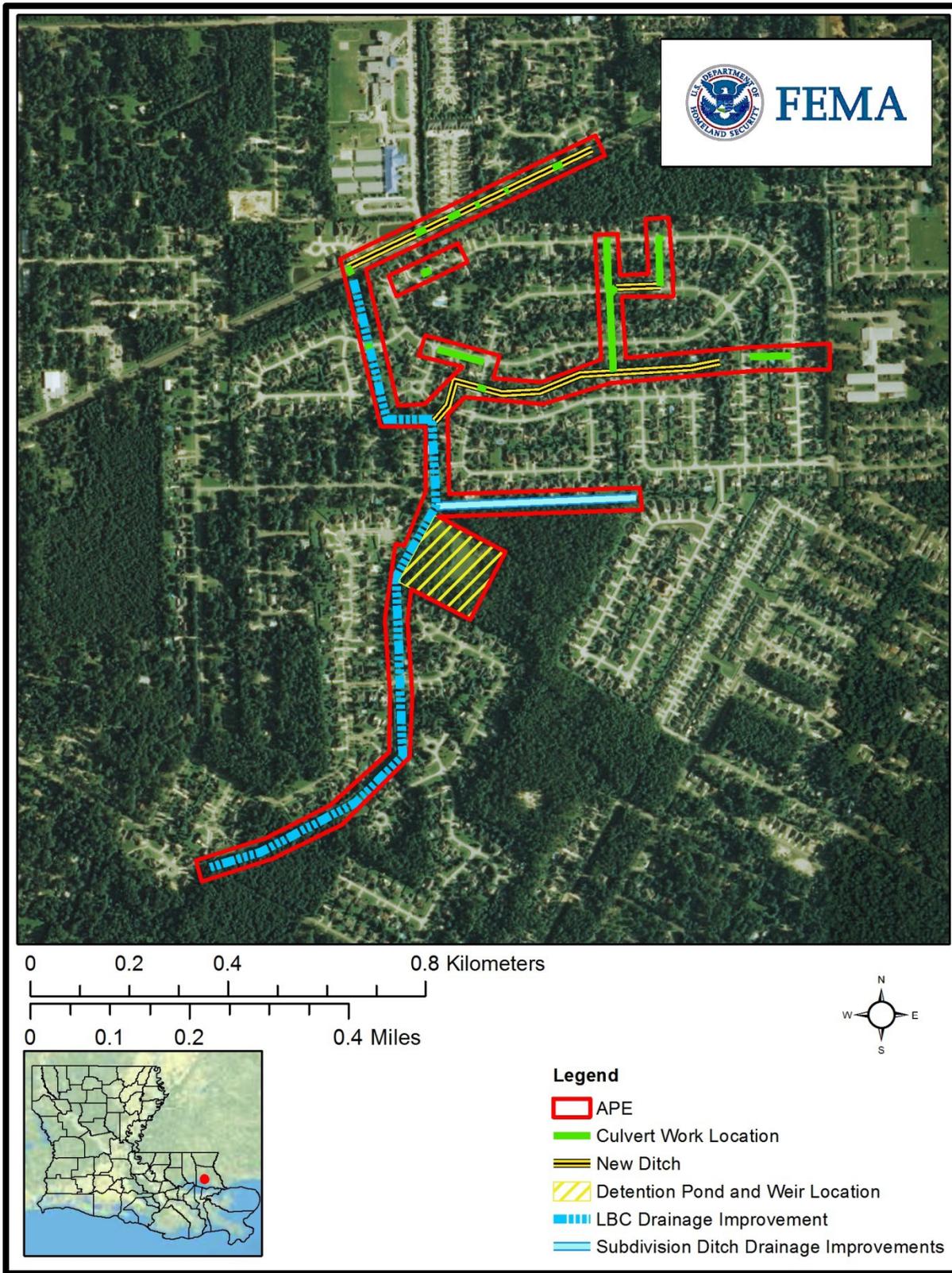


Figure 2: Aerial of Site Location

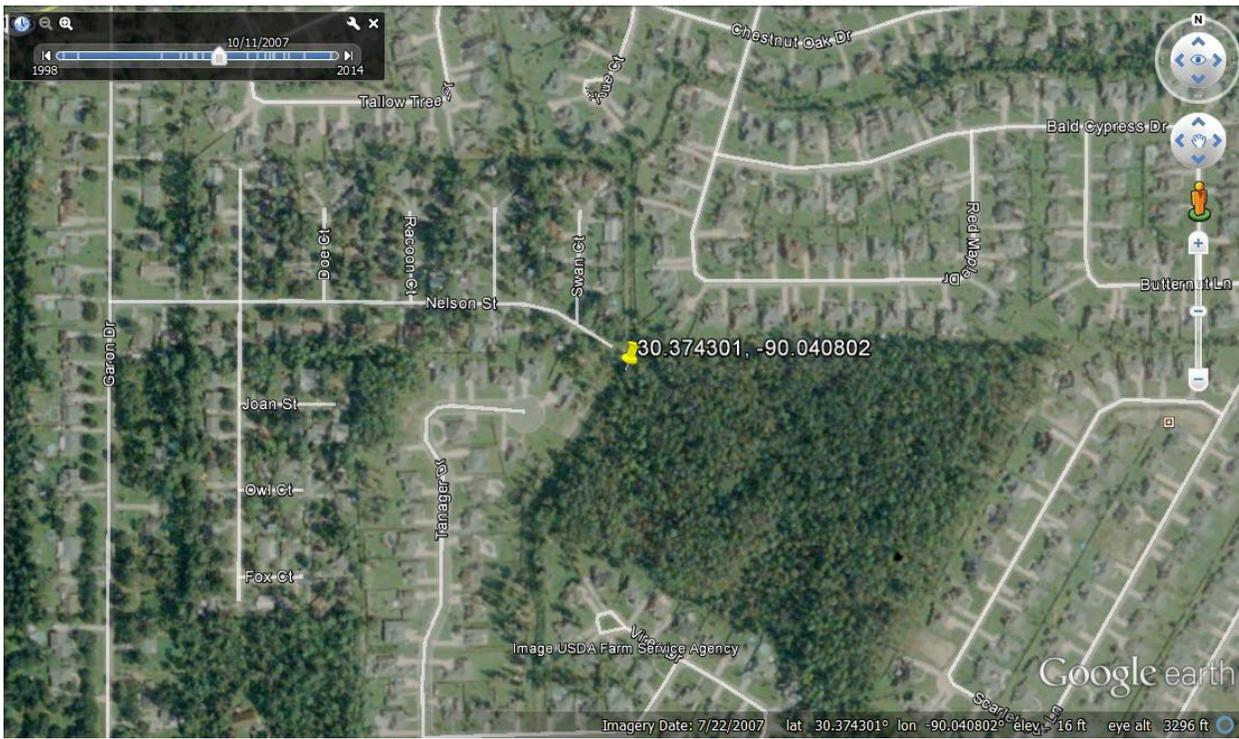


Figure 3. 2007 Google Earth Imagery of Proposed 5-acre Detention Pond Location.

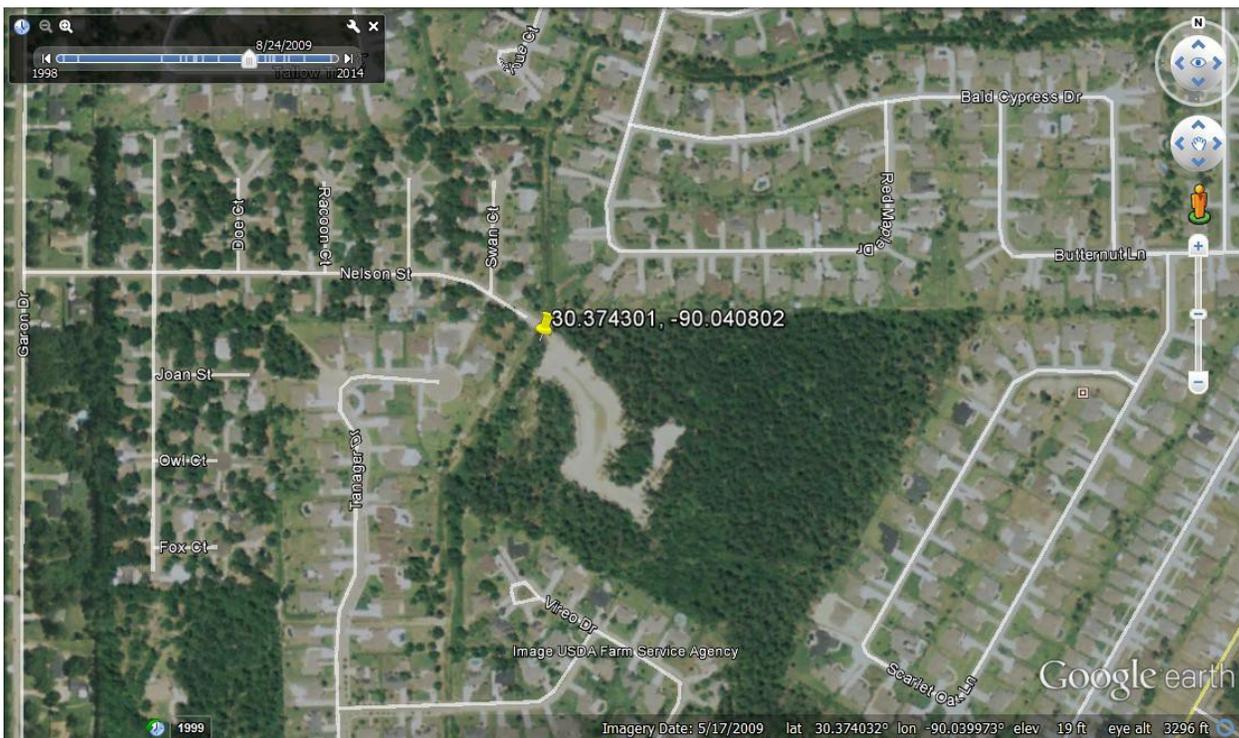


Figure 4. 2009 Google Earth Imagery of Proposed 5-acre Detention Pond Location displaying an excavated area.



FEMA

U.S. Department of Homeland Security
Federal Emergency Management Agency
FEMA-1603/1607 -DR-LA
FEMA Louisiana Recovery Office
Environmental/Historic Preservation
1500 Main Street
Baton Rouge, LA 70802

July 24, 2015

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

No known historic properties will be affected by this undertaking. This effect determination could change should new information come to our attention.
Phil Boggan 8-6-15
Phil Boggan Date
Deputy State Historic Preservation Officer

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

Applicant: Saint Tammany Parish
Undertaking: St. Tammany Parish Little Bayou Castine Drainage Improvements (HMGP Project # 1603-0332).
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 404 Hazard Mitigation Grant Program (HMGP), proposes to fund St. Tammany Parish Little Bayou Castine Drainage Improvements, located in St. Tammany Parish, Louisiana, to prevent potential flooding of residential areas in the Little Bayou Castine Drainage basin (Undertaking; Figures 1-3) as requested by St. Tammany Parish (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

Residential areas and infrastructure in the Little Bayou Castine drainage and its tributaries are at risk for repetitive flood damages. The proposed scope of work (SOW) intends to improve existing drainage and reduce the risk of inundation for over 650 homes and would thereby decrease repetitive flood damage and reduce the drain of the National Flood Insurance (NFI) fund. This will be accomplished in accordance with St. Tammany Parish Floodplain Regulations and the National Flood Insurance Program (NFIP) standards.

RECEIVED

JUL 24 2015

ARCHAEOLOGY

St. Tammany Parish Little Bayou Castine Drainage Improvements (HMGP Project # 1603-0332)

The area of proposed drainage improvements (Figures 1-3) is located in St. Tammany Parish, Louisiana, and is roughly bounded by LA- Highway 1088 at the northeastern most extent (30.381012, -90.037005), Soult Street to the east (30.377061, -90.032340), Labarre Street to the south (30.367871, -90.046376), and Garon Drive to the west (30.376006, -90.041906). Existing pipes and ditches within the project area are presently undersized for the volume of water that frequently inundates the watershed during storm events. The present SOW proposes to expand the capacity of undersized culverts and ditches within the project area as well as the construction of a 5-acre (2.0 ha) detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess back into the watershed. Additionally channel improvements are proposed for the upper stretch of Little Bayou Castine and Subdivision Ditch. Design plans for the St. Tammany Parish Little Bayou Castine Drainage Improvements are attached (Attachment 1). Area specific actions are discussed below.

North of LA Highway 1088

Ditch and pipe work along the northernmost side of the existing right-of-way (ROW) of LA Highway 1088 (Figures 1, 3) includes the expansion of 1,861.54 feet (567.3 m) of ditch (begin: 30.380948, -90.037302; end: 30.378909, -90.042505; also see: Attachment 1 for Typical Ditch Section profile) and culvert/pipe replacements in six (6) locations (Table 1).

Table 1. Culvert Construction North of LA Highway 1088

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N of LA Hwy. 1088	Remove 23.22' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP)	Install 23.22' of 36" CPVC	30.380206	-90.039104
N of LA Hwy. 1088	Remove 23.21' of 24" (est.) corrugated metal pipes Corrugated Metal Pipe (CMP)	Install 23.21' of double 36" CPVC	30.379967	-90.039731
N of LA Hwy. 1088	Remove 81.45' of 36" Reinforced Concrete Arch Pipe (RCPA)	Install 81.45' of double 36" CPVC	30.379777	-90.040238
N of LA Hwy. 1088	Remove 66.83' of double 36" RCPA	Install 66.83' of double 36" CPVC	30.379508	-90.040938
N-S of LA Hwy. 1088	Remove 57.44' of 46" x 36" SRPA (est.)	Install 57.44' of double 58.5" x 36" RCPA	30.378829	-90.042468

Woodlands Neighborhood Culvert/Pipe Improvements

Culvert and pipe work is proposed throughout the Woodlands neighborhood in multiple locations (Figure 1,3) including the excavation of 295.27 feet (89.9 m) of new ditch (begin: 30.378386, -90.036857; end: 30.378386, -90.035923; also see: Attachment 1 for Typical Ditch Section profile) and culvert/pipe replacements in nine (9) locations (Table 2).

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Table 2. Woodlands Neighborhood Culvert Replacements

Sub-Location	Existing	Replacement	Latitude	Longitude
Tallow Tree Drive and Little Bayou Castine	Remove 32.00' of 64" (est.) Concrete Pipe	Install 32.00' of double 58.5" x 36" RCPA	30.377429	-90.042100
Mayhaw Drive	Remove 333.69' of 24" corrugated metal pipes Corrugated Metal Pipe (CMP)/38.09' of 28.5" x 18" RCPA	Replace with 77.87' of RCP and 293.91' of 36" CPVC	Begin: 30.379296/ End: 30.378279	Begin: -90.037004/ End: -90.036990
Mayhaw Drive	Remove 310.35' of 57 x 38" bituminous coated corrugated steel pipe (BCCSP)/32.00' of 51" x 31" RCPA/158.02' of BCCSP	Replace with 342.35' of double 46" x 36" steel spiral rib arch (SRPA) and 158.02' of double 53" x 41" SRPA	Begin: 30.378279 End: 30.376837	Begin: -90.036990 End: -90.036957
East of Mayhaw	Remove 34.23' of 29" x 18" RCPA/300.00' of 28" x 20" BCCSP	Replace with 34.23' of SPRA and 300.00' of 46" x 36" SRPA	Begin: 30.379316 End: 30.378386	Begin: -90.035886 End: -90.035922
Tributary 2 Ditch	Remove 271.42' of existing 24" BCCSP	Replace with 27" x 21" SRPA	Begin: 30.377046 End: 30.377056	Begin: -90.033208 End: -90.034077
Red Maple Drive	remove 47.00' of 51" x 31" RCPA	Replace with triple 59.5" x 36" RCPA	30.376607	-90.039749
Chestnut Oak Drive	Remove 318.0' of existing 24" CMP	Replace with 36" CPVC pipes	Begin: 30.377334 End: 30.377083	Begin: -90.040657 End: -90.039685
Mayhaw and Red Maple Drive	Remove 57.44' of existing 28.5" x 18" RCPA	Replace with 46" x 36" SRPA	30.378329	-90.036912
Spring Blvd. and Sweet Bay Drive	Remove 96.83' of existing 24" CMP	Replace with double 24" RCPs	30.378755	-90.040853

Detention Pond and Broad-Crested Weir

St. Tammany Parish is proposing the construction of a 5-acre (2.0 ha) detention pond on the Parish owned land at the southeastern intersection of Little Bayou Castine and the Subdivision Ditch (Figures 1, 3, 6). The design consists of a side-channel weir that allows low flows to bypass the pond and preserves the storage capacity of the pond for larger events. The weir structure will be a grass levee lined with a turf reinforcement mat located on the western side of the proposed detention pond. After a storm event, the pond will drain by gravity through an 18foot (5.4 m) outlet pipe back into the existing channel. This design would allow the pond to be dry during periods of no rainfall, and provide additional floodplain storage. The detention pond location and design parameters are as follows:

Northwest corner: 30.374301, -90.040802
 Northeast corner: 30.373599, -90.039337
 Southwest corner: 30.373093, -90.041609
 Southeast corner: 30.372362, -90.040112

Bottom Elevation: 12.34 feet (3.76 m)
 Top of Bank; Elevation: 18.0 feet (5.4 m)—meaning the embankment is 5.66 feet in height
 Area of pond: 5 acres (2.0 ha)
 Side Slope: 3:1

The weir-structure and outlet structure parameters are as follows:

Type: Broad-Crested Weir
 Invert Elevation: 17.0 feet (5.18 m)
 Length: 50.0 feet (15.24 m)
 Breadth: 10.0 feet (3.04 m)

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Pipe Outlet Structure Type: 18" RCP
Invert Elevation: 12.34 feet (3.76 m)
Length: 40 feet (12.19 m)

Little Bayou Castine Channel Improvements

Little Bayou Castine (Figures 1, 3) flows north to south and defines the westernmost boundary of the project area. Along the upstream end of the Little Bayou Castine approximately 5,113.27 linear feet (1558.52 m) of channel improvements are proposed (begin: 30.378738, -90.042420; end: 30.367967, -90.045736) including clearing the drainage channel of vegetation, brush, and trees within the cross-sectional area of the channel, and channel reshaping at various locations along the channel to redefine the channel cross-section. Proposed channel cross-sections (Attachment 2) range between 30-60 feet (9.1-18.2 m) in breadth and average 52 feet (15.84 m) in width.

Subdivision Ditch Improvements

Subdivision Ditch (Figure 1, 2) is located to the south of Red Maple Road and flows east to west until it discharges into Little Bayou Castine. Approximately 1,331.07 linear feet (405.71 m) of ditch improvements are proposed (begin: 30.374525, -90.036554; end: 30.374472, -90.040754) including clearing the drainage ditch of vegetation, brush, and trees within the cross-sectional area of the ditch, and ditch reshaping at various locations along the ditch to redefine the ditch cross-section (also see: Attachment 1 for Typical Ditch Section profile).

Area of Potential Effects (APE)

This letter serves as consultation for the Area of Potential Effects (APE) in accordance with Stipulation of the 2011 HMGP PA. The APE (Figures 2-3) for both archaeology and standing structures is based on the design plans submitted by the Applicant (Attachment 1). The APE is discontinuous and in total measures 50.54 acres (20.45 hectares). The APE incorporates both direct effects (access, staging, and construction areas) and indirect effects (visual).

Identification and Evaluation

On July 13, 2015, FEMA Historic Preservation Staff consulted the National Register of Historic Places (NRHP) database, the Louisiana Division of Archaeology (LDOA), Louisiana Cultural Resources Map (LDOA Website), and historic aerial photography. Map research reviewed for each elevation property included the following reference materials: the United States Department of Agriculture (USDA) Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov>), U.S. Geological Survey (USGS) Quadrangle Maps (<http://nationalmap.gov/historical>), and other available historic maps. Additional background information consulted included: the Louisiana Cultural Resources Management (CRM) Bibliography (LDOA Website), Louisiana Department of Archaeology (LDOA) Site Forms, and pertinent site and survey reports regarding previous investigations within 1-mile (1.6 km) of each archaeological APE. Additionally, site visits were conducted on July 14-17, 2015 to determine potential impacts to historic properties, if any.

Standing Structures

There are no standing structures located within any of the APE, the APE is not located within a listed or eligible National Register Historic District, nor is the APE located within the view-shed of a property individually listed in the NRHP.

Archaeology

Soils within the APE (<http://websoilsurvey.nrcs.usda.gov>) consist of Guyton silt loam (approximately 70%), a soil type typically indicative of terraces, Abita silt loam (approximately 20%), a soil type typically indicative of flats, and Prentiss fine sandy loam (approximately 10%), a soil type typically indicative of interfluves. This suggests that portions of the project area may have been advantageous for Prehistoric and/or early-historic use.

No previous surveys have occurred within the APE and FEMA has additionally verified that presently no previously recorded archaeological sites are located within the APE. However, there are five (5) previously recorded sites located within 1-mile (1.6 km) of the present APE (Figure 2).

Five (5) sites are located within the APE and are defined in Smith et al. (1983), out of five (5) sites that represent a total of 13 individual cultural components, three (3) sites possessed prehistoric components, three (3) sites possess cultural components attributed to the 1803-1860 Antebellum Louisiana Cultural Unit, one (1) site possess cultural components attributed to the 1860-1890 War and Aftermath Cultural Unit, and three (3) sites possess cultural components attributed to the 1890-1940 Industrialization and Modernization Cultural Unit. Sites within 1 mile (1.6 km) of the present APE are not densely concentrated. Though based on the distribution of previously recorded sites there is potential for the presence of prehistoric deposits within the APE and archaeological deposits most likely to dating from the early-nineteenth-century through the present.

FEMA also conducted a review of historic maps and documentation pertinent to the APE. The current review of historic maps revealed that the 1848 La Tourette's reference map of the state of Louisiana provides coverage of the APE but does not indicate any development within the project area. However, this map does note that "B. Marigny" owned an expanse of property fronting Lake Pontchartrain named "Fontainebleau" to the south of the present APE. The 1935 USGS Covington, LA Quadrangle map (Figure 4) indicates that by this time LA Highway 1088 had been constructed within the northern portion of the present APE but otherwise indicates no additional development within the project area. The 1938 Covington, LA and the 1950 Covington, LA USGS Quadrangle maps do not provide any additional details beyond what is presented in the 1935 USGS map. The 1968 USGS Covington, LA and Mandeville, LA Quadrangle maps also depict no development within the APE but indicate that a partial residential street grid had been established to the south of the APE. The 1998 USGS Covington, LA and Mandeville, LA Quadrangle maps (Figure 5) first indicate that a street grid had been partially established within both the Woodlands neighborhood and the southern portion of the APE. Following the 1998 map aerial imagery depicts additional construction of residential structures within the vicinity of the project area and further indicates that in the location of the proposed Detention Pond and Weir limited excavation of a portion of the APE occurred between the years of ca. 2007-2009 and the resultant depression is presently inundated (Figure 21).

Primarily based on the proximity of the APE to water resources and previously recorded sites, it was determined by FEMA that a site visit would be conducted to ascertain the presence or absence of

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archaeological deposits. Site visits were conducted between July 14th and 17th, 2015 by FEMA archaeologist Jeremiah Kaplan.

The following standardized data collection procedures were followed when conducting site visits to determine if archaeological resources existed within the APE:

- Visual inspection of the ground surface at each project area, primarily focusing on observing ground disturbances, artifact concentrations, and above-ground cultural features.
- As warranted and based on the existing conditions, shovel tests were placed to assess if archaeological deposits existed within the APE. Shovel Tests also served the purpose of recording soil profile/s in order to define the soil conditions. Sub-surface testing was focused on areas of exposed soil with the lowest probability of disturbance.
- All recovered sediments were screened through ¼" mesh hardware cloth.
- Photography of the APE to document field and soil conditions.
- Production of a map of the APE indicating testing location(s).
- Appropriate documentation of the APE was recorded in field notes.

An additional post-field review of background data and construction documents (Attachment 1) was also conducted while taking into consideration the observed existing conditions within the APE. As well as reviewing the observed effects of past episodes of construction and sub-surface ground disturbance (e.g., utilities, construction of the existing ROW/culverts/crossings), landscape alteration, and modern development. All of this was taken into account and weighted against the potential impacts of each individual proposed project action (e.g., new culvert diameters, site access, and existing hardscape).

Pedestrian survey was conducted along the entire portion of the APE located north of LA Highway 1088, the entire Little Bayou Castine Channel Improvements corridor, and at various locations within the Subdivision Ditch Improvements location. A visual inspection of all proposed culvert/pipe improvements within the Woodlands neighborhood was also conducted. In all cases, no prehistoric or historic artifacts over 50 years in age were identified and cultural materials identified in all locations specified above consisted solely of recently discarded refuse.

The locations of the proposed ditch and pipe work along the northernmost side of LA Highway 1088 is heavily disturbed from the construction of the existing ROW, culverts, and sub-surface utilities (Figures 8- 11). Existing ditches presently extend into sub-soil and buried utilities are present throughout the majority of the ROW. Because of the amount of previous disturbance observed in the field the locations of the proposed ditch and pipe work along the northernmost side of LA Highway 1088 was deemed unlikely to contain any yet unidentified intact cultural deposits.

The locations of all proposed Woodlands Neighborhood Culvert/Pipe Improvements were inspected. In all cases, previously existing facilities are present and fall within heavily developed and/or paved residential areas and are unlikely to contain any yet unidentified intact cultural deposits (Figures 12-14).

The proposed corridor of the Little Bayou Castine Channel Improvements (Figures 15-19) is heavily channelized, especially within the Woodlands neighborhood. The area surrounding both sides of the

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existing channel is densely residentially developed throughout the majority of the proposed channel improvement corridor. Individual property lots with their rear-yards abutting Little Bayou Castine are largely separated from the bayou by wooden privacy fencing and there is little room for staging the proposed channel improvements within the APE. Much of the proposed improvements will likely need to occur from within Little Bayou Castine rather than from the surrounding banks. In many cases individual property lots have existing gravity-fed drain lines excavated into the bank that empty into the bayou. There are also many existing storm-runoff channels/ditches that intersect with the bayou and existing culverts/crossings constructed within the bayou. Furthermore, exposed utilities could be observed in various locations throughout the project corridor. At the time of this site visit, water levels within Little Bayou Castine were low and pedestrian survey largely occurred from within the channel. As possible, the ground surface on the tops of banks was inspected when properties could be accessed from the Bayou and exposed bank profiles (Figure 20) were thoroughly examined. Sub-soil was visible in exposed bank profiles and no indication of cultural deposits (e.g., middens, features, artifact concentrations) was observed. Because of the amount of previous disturbance observed and the constricted nature of the APE the corridor of the proposed Little Bayou Castine Channel Improvements was deemed unlikely to contain any yet unidentified intact cultural deposits.

It was determined that the location of the proposed Detention Pond and Broad-Crested Weir would require sub-surface testing to evaluate the presence/absence of archaeological deposits. Following a walkover of the footprint of the proposed pond and weir location (Figures 1, 3, 6) during which only modern refuse was identified a total of four (4) judgmentally placed shovel test pits (STPs) were excavated within this area (figure 6). No shovel tests were placed within inundated areas (i.e., the existing pond; Figure 21). In the western side of the APE, STPs 1-2 were spaced at 60 meter (196.8 ft) intervals in a northwest to southwest alignment and continuing from STP 2, STPs 3-4 were spaced at 60 meter (196.8 ft) intervals in a northwest to southeast alignment, roughly forming an "L" shaped transect that was spaced between the existing pond and the southern/eastern boundary of the APE (Figure 6).

No cultural materials were identified within STPs 1-4 (Figures 25-28). STPs 1-3 generally revealed a layer of 10YR 6/2 brownish gray clay loam mottled with 10YR 6/4 clay loam sub-soil overlain by a moist 10YR 5/3 Brown silty loam (Figure 22). There was a noticeable change in vegetation from primarily marsh-type grasses and low bushes to maturing pine trees and dense brambles when moving east-southeasterly between STPs 3-4 (Figure 23) and a slight rise in elevation was also noted; roughly corresponding to the transition from Guyton silt loam to Prentiss fine sandy loam soils indicated in Figure 7. STP 4 contained comparably better drained soils than those in STPs 1-3. Stratum I in STP 4 for consisted of a layer of 10YR 6/2 light brownish gray fine sandy loam that also appeared to have some of the qualities of a developing albic (E) horizon.

Summary of Archaeological Identification and Evaluation

While FEMA determined that the APE is located within an area with potential for the presence of prehistoric archaeological resources, that soils data suggests that portions of this APE may have been moderately favorable to prehistoric and/or early historic occupation, no archaeological deposits were identified during pedestrian survey and judgmental shovel testing. Furthermore, with the exception of portions of the proposed Detention Pond and Broad-Crested Weir, it is likely that any archaeological deposits not identified within the present APE would likely have been heavily disturbed as a result of the construction of the ca. mid- to late-1990's sub-development, previous installation of extant ditch networks and culvert systems, extant road ROWs, and the channelization/maintenance of Little Bayou

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Castine. Based on all the available evidence, FEMA has determined that it is unlikely that this APE possess NRHP-eligible archaeological deposits.

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 at (504) 247-7771 or jerame.cramer@fema.dhs.gov, or 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,
0.9.2342.19200300.100.1.1=0972893910.FEMA
Date: 2015.07.24 11:21:52 -05'00'

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

CC: File
«cc_1»
«Tribe_Body»

Enclosures

References:

La Tourette, John

1848 La Tourette's reference map of the state of Louisiana: from the original surveys of the United States, which show the townships, sections, or mile squares, Spanish grants, settlement rights & c., also the plantations with the owners names engraved thereon. New Orleans, John La Tourette, 1848.

Smith, Steven D., Phillip G. Rivet, Kathleen M. Byrd and Nancy W. Hawkins

1983 *Louisiana's Comprehensive Archaeological Plan*. State of Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, Division of Archaeology, Baton Rouge, Louisiana.

U.S. Geological Survey

1935 *Covington, LA* [Contours]. 1:62,500. 15 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

1939 *Covington, LA* [Contours]. 1:62,500. 15 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

1950 *Covington, LA* [Contours]. 1:62,500. 15 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

1968 *Covington, LA* [Contours]. 1:24,000. 7.5 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

1968 *Mandeville, LA* [Contours]. 1:24,000. 7.5 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

1998 *Covington, LA* [Contours]. 1:24,000. 7.5 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

1998 *Mandeville, LA* [Contours]. 1:24,000. 7.5 Minute Series (Topographic). Reston, VA: USGS. Copy on file, FEMA Historic Preservation, 1500 Main Street, Baton Rouge, LA 70802.

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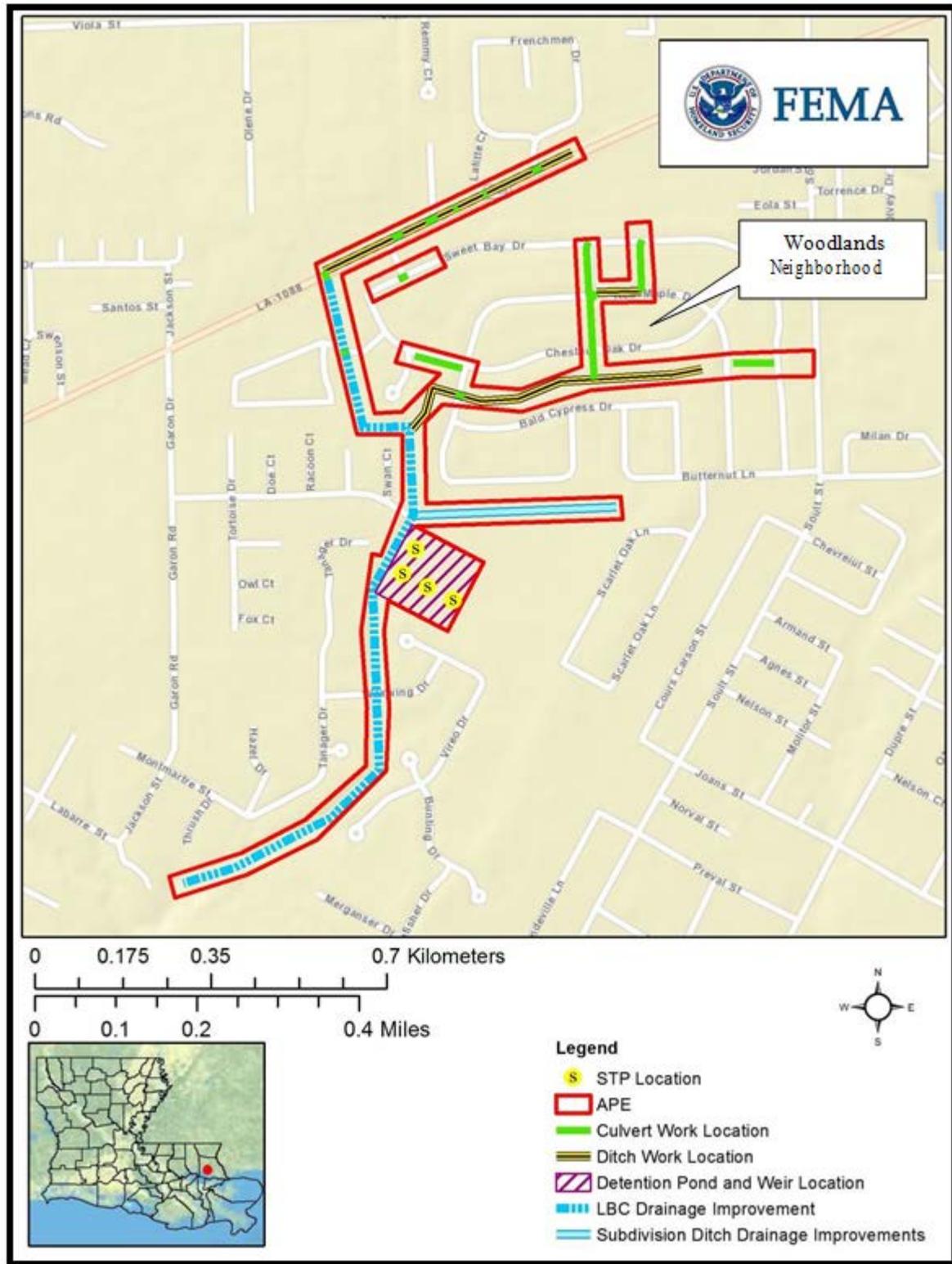


Figure 1. Vicinity map displaying the project location, proposed improvement locations, APE, and STP locations.

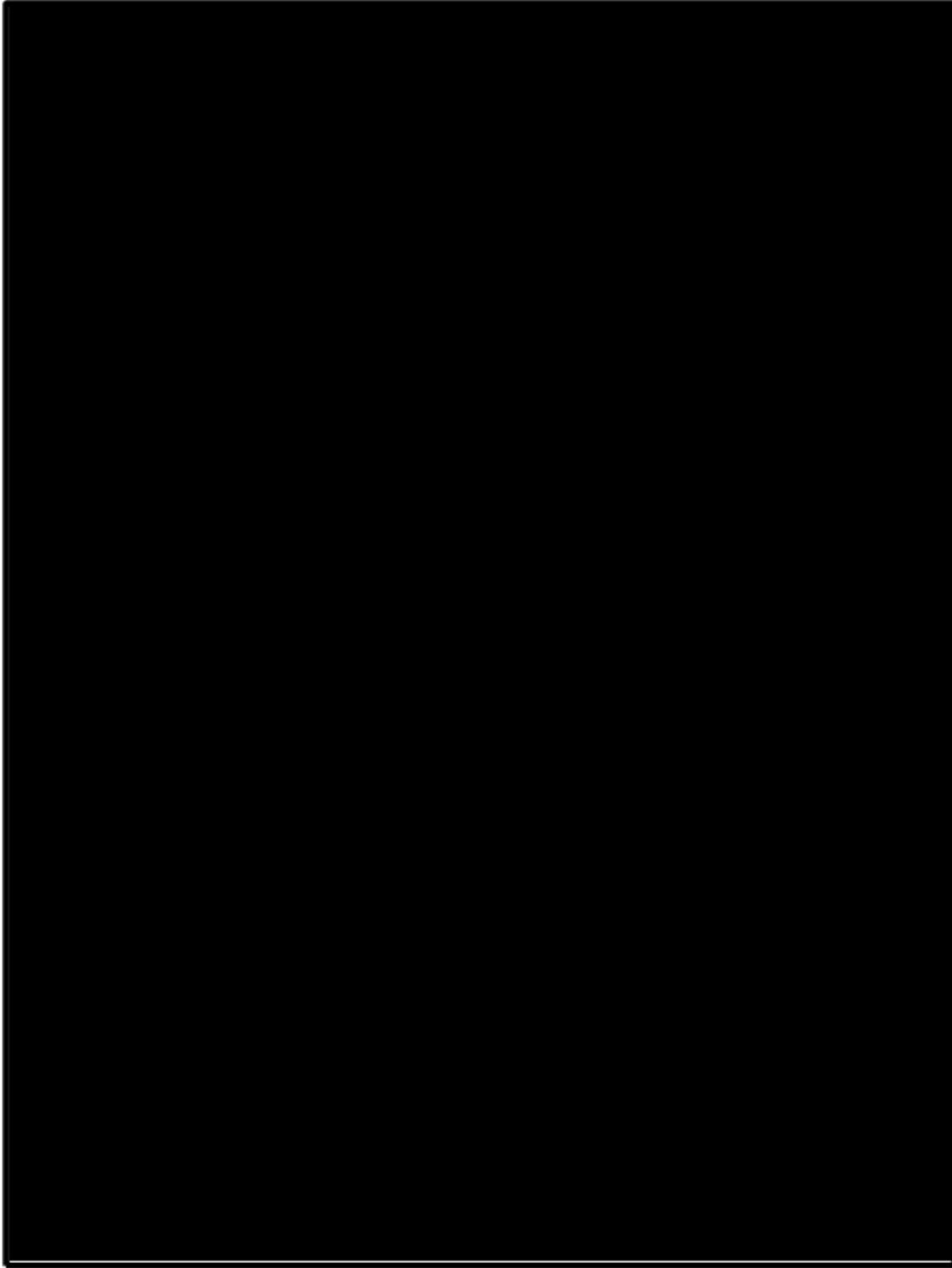


Figure 2. USGS Covington, LA and Mandeville, LA, 1:24,000. 7.5 Minute Series (Topographic) Quadrangle maps displaying APE location with existing LA SHPO Site Polygon boundaries.

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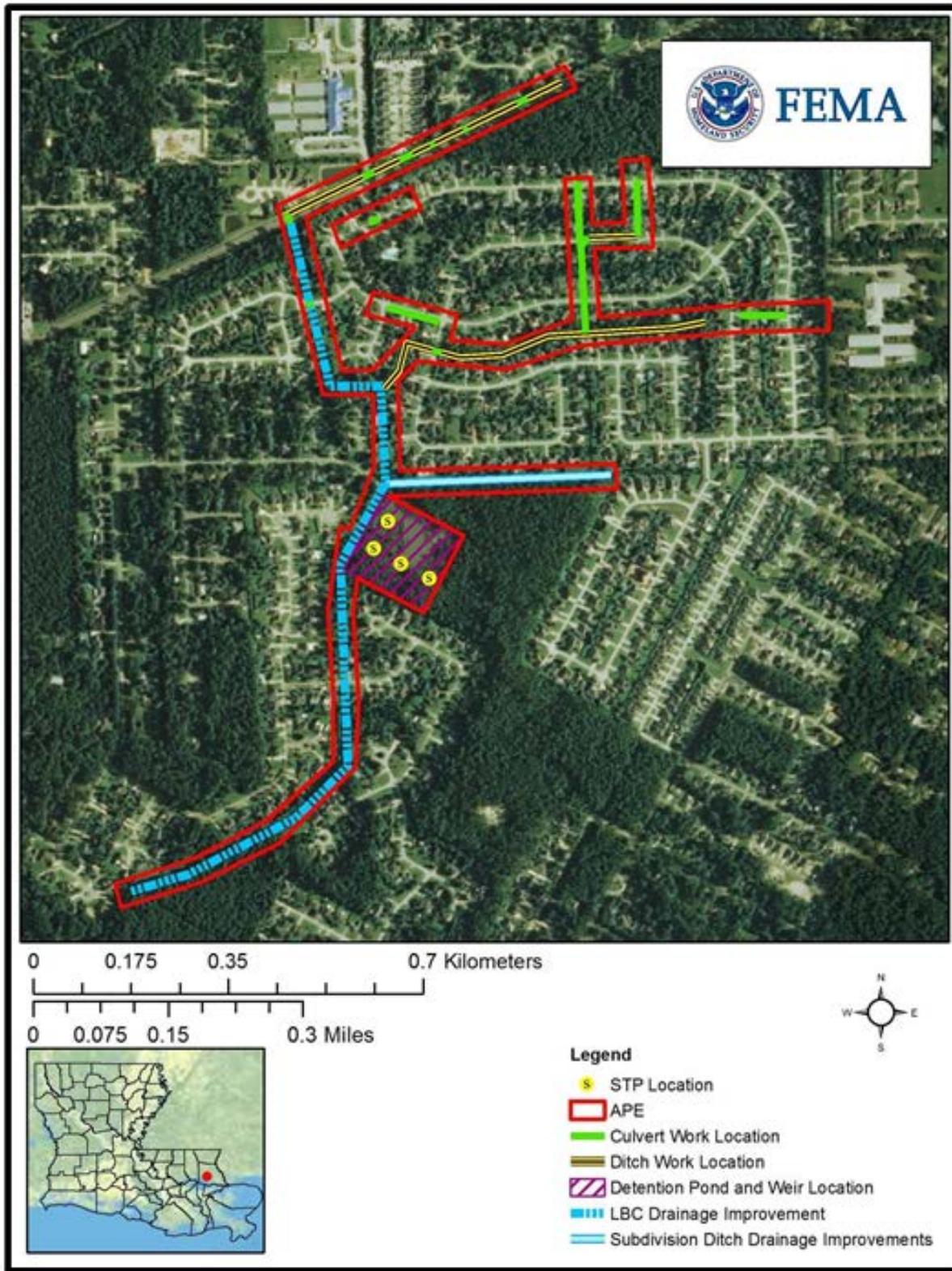


Figure 3. Satellite imagery displaying locations of proposed improvements, APE, and STP locations.

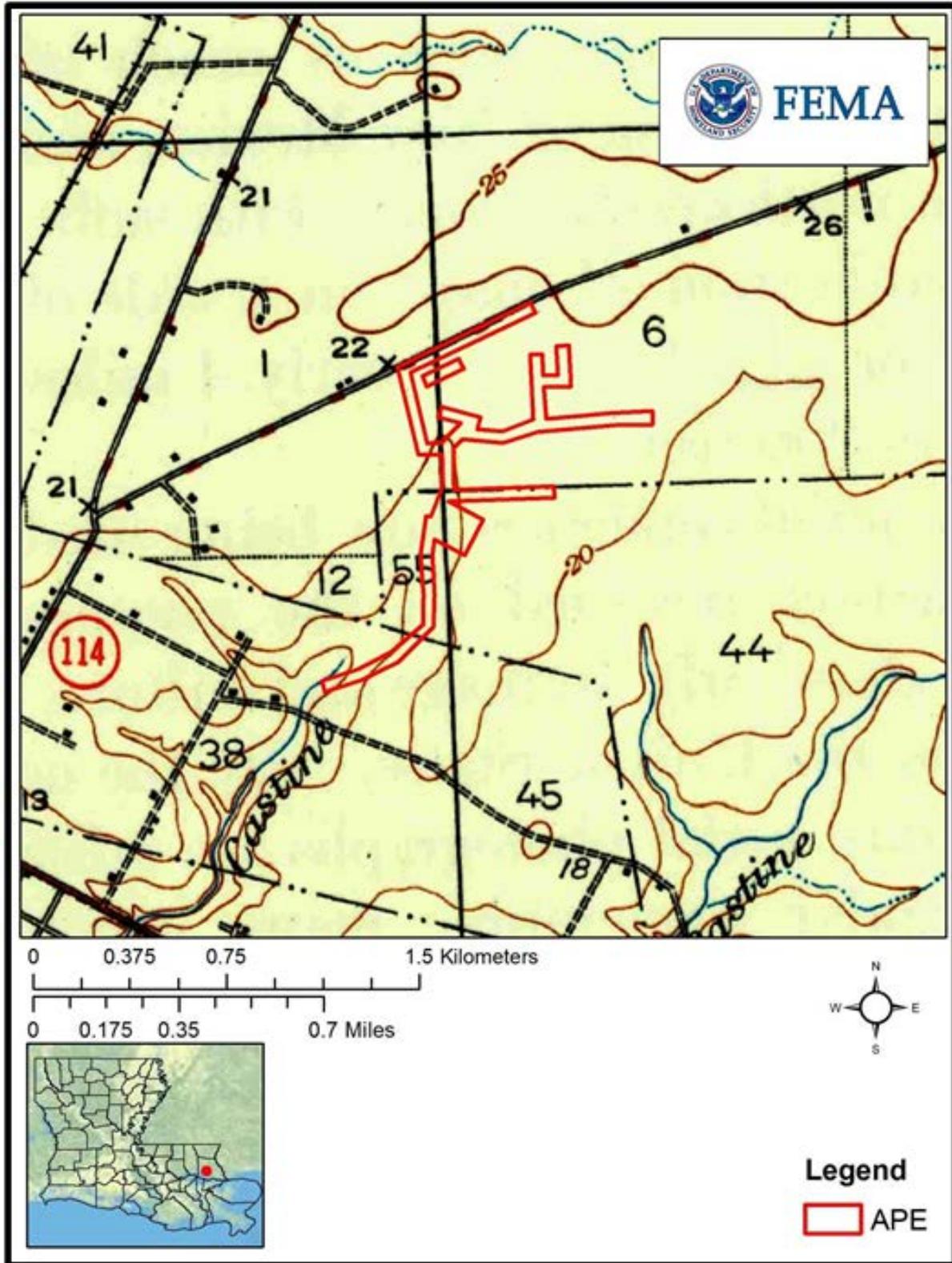


Figure 4. Excerpt from the 1935 U.S. Geological Survey, Covington, LA, 1:62,500, 15 Minute Series (Topographic) Quadrangle map with APE location projected.

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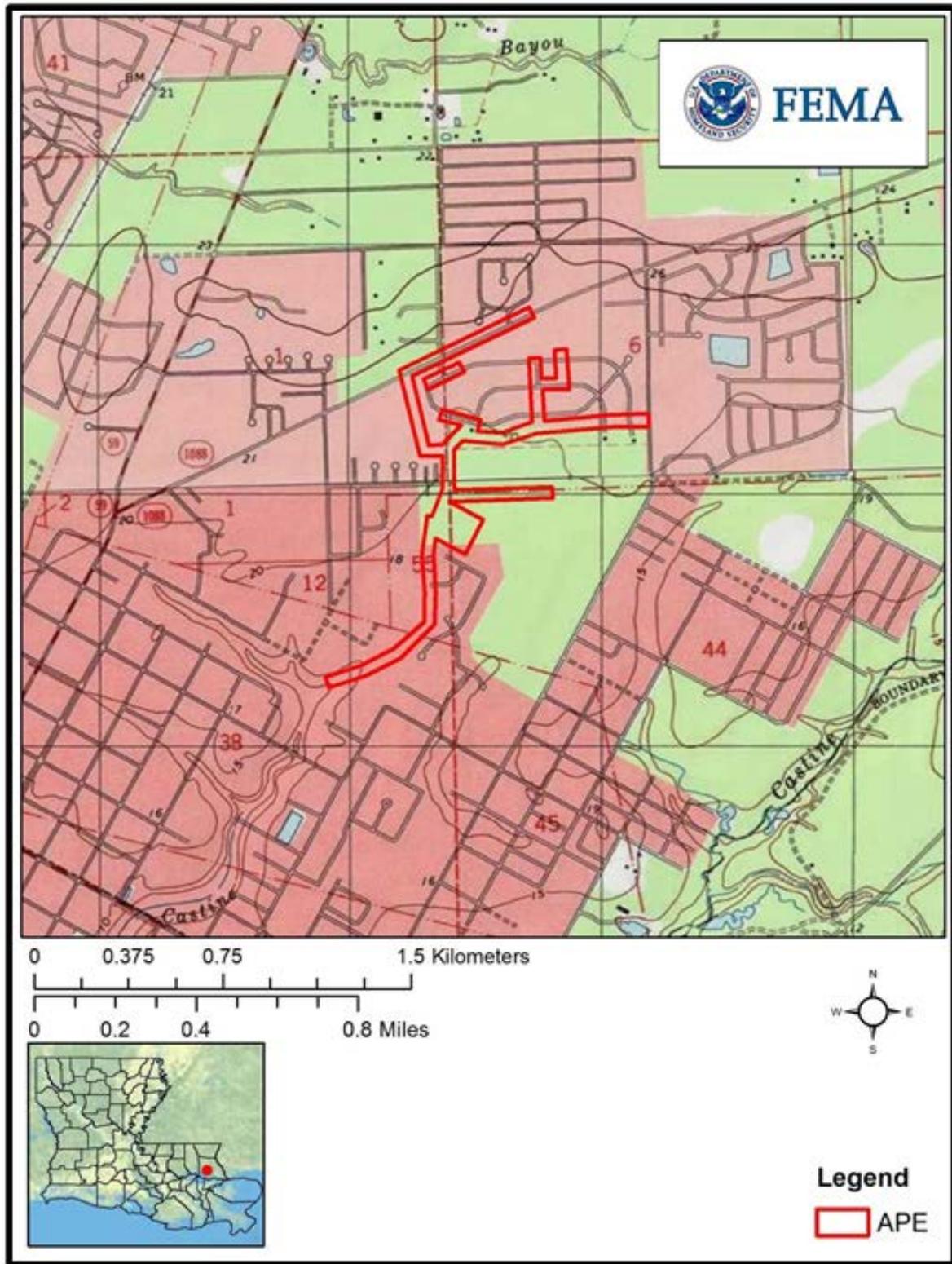


Figure 5. Excerpt from the 1998 U.S. Geological Survey, USGS Covington, LA and Mandeville, LA 1:24,000, 7.5 Minute Series (Topographic) Quadrangle maps with APE location projected.

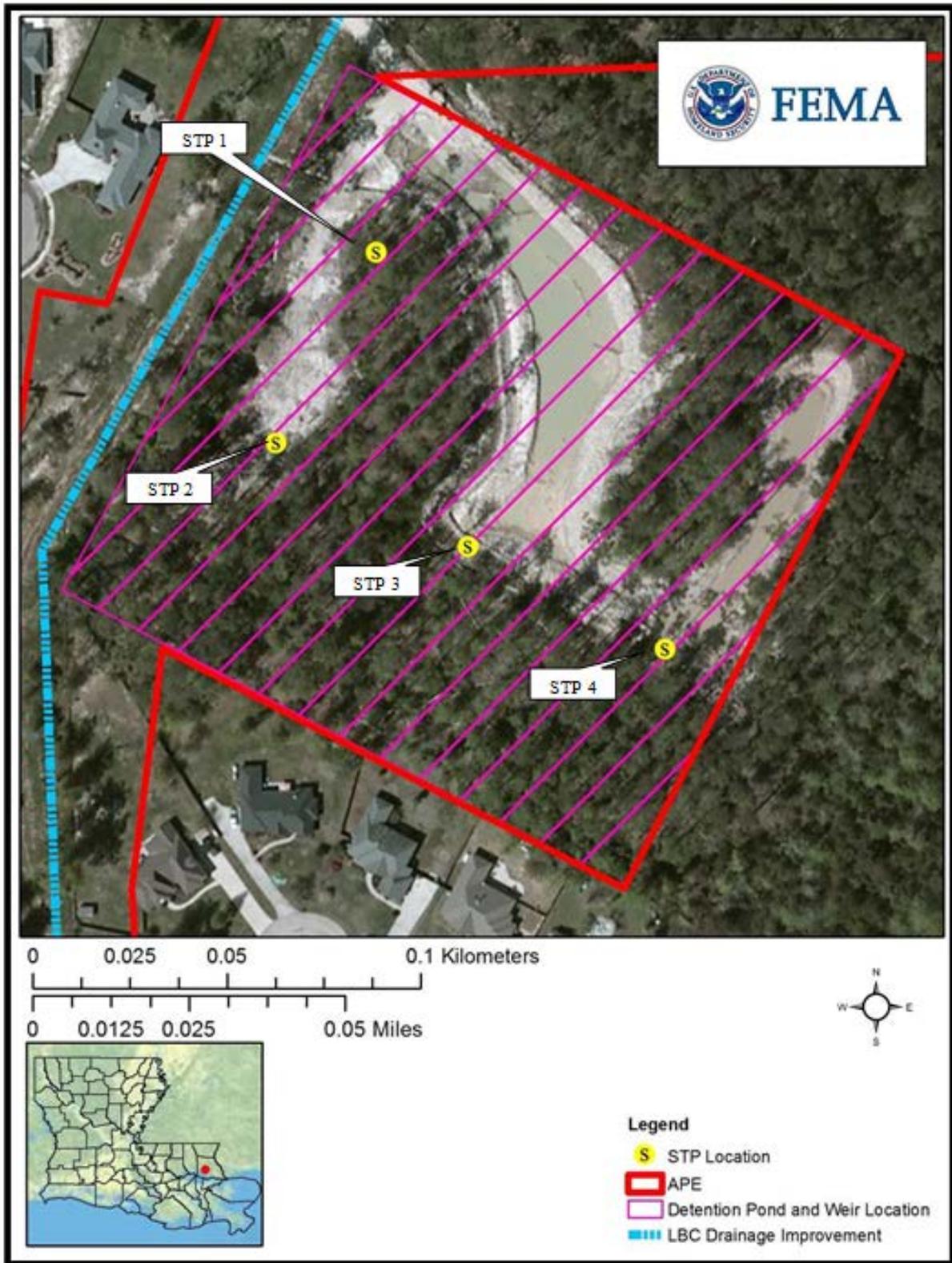


Figure 6. Imagery displaying Detention Pond and Broad-Crested Weir area and STP locations.



Figure 7. USDA Web Soil Survey imagery displaying Detention Pond and Broad-Crested Weir location.



Figure 8. Northeastern-most extent of north of LA HWY 1088 improvements, facing west.

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Figure 9. Culvert replacement location north of LA HWY 1088 improvements, facing west.



Figure 10. Culvert replacement location north of LA HWY 1088 improvements, facing west.

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Figure 11. Culvert replacement location, westernmost extent north of LA HWY 1088 improvements, intersection of LA HWY 1088 and LBC, facing west.



Figure 12. Culvert replacement location, Spring Blvd. and Sweet Bay Drive northern section, facing north.

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Figure 13. Culvert replacement location, Spring Blvd. and Sweet Bay Drive southern section, facing south.



Figure 14. Culvert replacement location, Woodlands Neighborhood, intersection of Tallow Tree Drive and Little Bayou Castine, facing south.

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Figure 15. LBC Drainage Improvement corridor, facing north



Figure 16. LBC Drainage Improvement corridor, facing north.



Figure 17. LBC Drainage Improvement corridor, facing north.



Figure 18. LBC Drainage Improvement corridor, facing south.

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Figure 19. LBC Drainage Improvement corridor, facing south.



Figure 20. LBC Drainage Improvement corridor bank profile, facing east



Figure 21. Existing pond within proposed Detention Pond and Weir area, facing north.



Figure 22. STP 1 base of excavation (BOE), facing west, representative profile for STPs 1-3.



Figure 23. STP 3 Location, facing southeast towards STP 4.



Figure 24. STP 4 BOE.

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Shovel Test Pit Form

Project Name: HMA-0332 Site Number: N/A
Project Location: Direction point + ground-crest of WC I
[Area] [Loc] [Transect] [Judgmental] [Other] (circle or specify)
Number: _____
STP Number 1 Recorder: JHK
Datum Elevation From: ground surface Northing/Easting: _____
Start Date: 7/15/2015 End Date: 7/15/2015

Associated Features or Disturbances (Give feature numbers, brief description, when first noted, etc.) Pow / oil mining area to E + SE.

Notes Regarding Associated Bags: (Include bag numbers and indicate any special sample bags and/or special handling instructions)
NAR

Notes: (Provide information on location, landform, vegetation, diagnostics, stratigraphy, interpretation, Photographs, Maps, etc.)
Use Reverse of Form for Additional Notes.

Located BM W of pond and approx 24 m/s of road

I
(8-54cm³)
1/4R 5/3 brown, silo

II
54-72 cm³
1/4R 2/2 Lt brownish grey ELW

III
72-90 cm³
1/4R 2/2 moist w/ 1/4R 2/4

B.O.E.

Additional Notes on Reverse (circle) Yes No

Figure 25. STP 1.



Shovel Test Pit Form

Project Name: HMA-0332 Site Number: N/A
Project Location: Reservoir Point + Brook Crested Weir
[Area] [Loci] [Transect] [Judgmental] [Other] (circle or specify)
Number: _____
STP Number 2 Recorder: JAK
Datum Elevation From: ground surf. Northing/Easting: _____
Start Date: 07/15/2015 End Date: 07/15/2015

Associated Features or Disturbances (Give feature numbers, brief description, when first noted, etc.) N/A

Notes Regarding Associated Bags: (Include bag numbers and indicate any special sample bags and/or special handling instructions) N/A

Notes: (Provide information on location, landform, vegetation, diagnostics, stratigraphy, interpretation, Photographs, Maps, etc.)
Use Reverse of Form for Additional Notes.

STP surrounded by wetland on grasses
poison ivy, silt bank, Sweet gum trees

I
(0-3 tabs)
1492 3/3 brown, silo
II (37-70ms)
1494 0/2 mustard w/
1498 0/4, CL
Bio/ST

Additional Notes on Reverse (circle) Yes No

Figure 26. STP 2.

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Shovel Test Pit Form

Project Name: HMA-0332 Site Number: N/A
Project Location: Destruction pond + Biou-Crested West
[Area] [Loci] [Transect] [Judgmental] [Other] (circle or specify)
Number: _____
STP Number 3 Recorder: JHR
Datum Elevation From: ground surface Northing/Easting: _____
Start Date: 07/15/15 End Date: 07/15/15

Associated Features or Disturbances (Give feature numbers, brief description, when first noted, etc.) N/A

Notes Regarding Associated Bags: (Include bag numbers and indicate any special sample bags and/or special handling instructions) N/A

Notes: (Provide information on location, landform, vegetation, diagnostics, stratigraphy, interpretation, Photographs, Maps, etc.)
Use Reverse of Form for Additional Notes.
Worked very brief.

I (0-32 curbs)
1 yr 5/3. Brown, Silo

II (32-40 curbs)
1 yr 2/2 worked w/
1 yr 2/4, CL

1/30/15

Additional Notes on Reverse (circle) Yes No

Figure 27. STP 3.

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Shovel Test Pit Form

Project Name: HMA-0332 Site Number: _____
Project Location: Retention Pond + Road-Crossed Weir
[Area] [Loci] [Transect] [Judgmental] [Other] (circle or specify)
Number: _____
STP Number: 4 Recorder: SAK
Datum Elevation From: ground surf. Northing/Easting: _____
Start Date: 8/15/15 End Date: 8/15/15

Associated Features or Disturbances (Give feature numbers, brief description, when first noted, etc.) Pond / topsoil mining area to E.

Notes Regarding Associated Bags: (Include bag numbers and indicate any special sample bags and/or special handling instructions) NAR

Notes: (Provide information on location, landform, vegetation, diagnostics, stratigraphy, interpretation, Photographs, Maps, etc.)
Use Reverse of Form for Additional Notes.

located near SW corner of existing drainage pond. Beginning of Pine area is S of APE. Slightly heterogeneous. Soils are composed w/ STPs 1, 2, and 3. Small tree sapling / seedling spot approx 10' W of STP. Some roots.

I (05-08cmbs)
10' x 12' x 1/2
27 bowls of soil

II (05-09cmbs)
10' x 12' x 1/2 worked w/
10' x 12' x 1/2 CL
B.P.E.

Additional Notes on Reverse (circle) Yes No

Figure 28. STP 4

BOBBY JINDAL
GOVERNOR



STEPHEN CHUSTZ
SECRETARY

State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL MANAGEMENT

07/24/2015

FEMA
1500 MAIN STREET
BATON ROUGE, LA 70802

RE: P20150716, Solicitation of Views

FEMA

Description: Proposed drainage project to replace existing undersized culverts, and expand ditches within the project area. Additionally, a 5-acre (2.0 ha) detention pond and broad-crested weir will be temporarily utilized to store storm runoff and help to regulate the release of excess watershed into the surrounding area.

Additionally channel improvements are proposed for the upper stretch of Little Bayou Castine and Subdivision Ditch.

Location: Lat. 30° 22' 24"N / Long. 90° 02' 26"W; along HWY 1088 near Bayou Castine.

Saint Tammany Parish, LA

Dear Jamie Schexnayder:

We have received your Solicitation of Views for the above referenced project, which has been found to be inside the Louisiana Coastal Zone. In order for us to properly review and evaluate this project, we require that a complete Coastal Use Permit Application packet (Joint Application Form, locality maps, project illustration plats with plan and cross section views, etc.) along with the appropriate application fee be submitted to our office. Using your complete application, we can provide you with an official determination, and begin the processing of any Coastal Use Permit that may be required for your project. You may obtain a free application packet by calling our office at (225) 342-7591 or (800)-267-4019, or by visiting our website at <http://www.dnr.state.la.us/crm/coastmgt/cup/cup.asp>.

We recommend that, during your planning process, you make every effort to minimize impacts to vegetated wetlands. As our legislative mandate puts great emphasis on avoiding damages to these habitats, in many cases the negotiations involved in reducing such disturbances and developing the required mitigation to offset the lost habitat values delay permit approval longer than any other factor.

Should you desire additional consultation with our office prior to submitting a formal application, we recommend that you call and schedule a pre-application meeting with our Permit Section staff. Such a preliminary meeting may be helpful, especially if a permit application that is as complete as possible is presented for evaluation at the pre-application meeting.

If you have any questions, would like to request an application packet or would like to schedule a pre-application meeting, please contact Brad Hester at (225) 342-9410 or Brad.Hester@LA.GOV.

Sincerely,

A handwritten signature in black ink that reads "Karl L. Morgan". The signature is written in a cursive style with a long, sweeping underline.

Karl L. Morgan
Administrator

Karl L. Morgan/bh

Attachments

Final Plats:

1) [P20150716](#) [Final Plats](#) [07/24/2015](#)

cc: Jessica Diez, OCM w/plats
Craig Leblanc, CMD/FI w/plats
Saint Tammany Parish w/plats



July 24, 2015

Ms. Jamie Schexnayder
Environmental Protection Specialist
FEMA Region VI – LRO
1500 Main Street
Baton Rouge, Louisiana 70802

RE: Little Bayou Castine Drainage Project - HMGP# 1603-0332

Dear Ms. Schexnayder:

I have reviewed the above referenced project for potential requirements of the Farmland Protection Policy Act (FPPA) and potential impact to Natural Resources Conservation Service projects in the immediate vicinity.

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a federal agency. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

The project map and narrative submitted with your request indicates that the proposed construction areas are within urban areas and therefore are exempt from the rules and regulations of the Farmland Protection Policy Act (FPPA)-Subtitle I of Title XV, Section 1539-1549. Enclosed is our completed form AD-1006. Furthermore, we do not predict impacts to NRCS work in the vicinity.

For specific information about the soils found in the project area, please visit our Web Soil Survey at the following location: <http://websoilsurvey.nrcs.usda.gov/>

Please direct all future correspondence to me at the address shown above.

Respectfully,



(ACTING FOR)
Kevin D. Norton
State Conservationist

Enclosure

U.S. Department of Agriculture
FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request 07/21/2015				
Name of Project Little Bayou Castine Drainage Project		Federal Agency Involved FEMA				
Proposed Land Use Culvert Upgrade/Ditch/Detention Pond		County and State St. Tammany Parish, Louisiana				
PART II (To be completed by NRCS)		Date Request Received By NRCS		Person Completing Form:		
Does the site contain Prime, Unique, Statewide or Local Important Farmland? (If no, the FPPA does not apply - do not complete additional parts of this form)		YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated	Average Farm Size	
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %	Amount of Farmland As Defined in FPPA Acres: %				
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS				
PART III (To be completed by Federal Agency)		Alternative Site Rating				
		Site A	Site B	Site C	Site D	
A. Total Acres To Be Converted Directly		50.54				
B. Total Acres To Be Converted Indirectly		249.46				
C. Total Acres in Site		300				
PART IV (To be completed by NRCS) Land Evaluation Information						
A. Total Acres Prime And Unique Farmland						
B. Total Acres Statewide Important or Local Important Farmland						
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted						
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value						
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)						
PART VI (To be completed by Federal Agency) Site Assessment Criteria (Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)		Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use		(15)				
2. Perimeter In Non-urban Use		(10)				
3. Percent Of Site Being Farmed		(20)				
4. Protection Provided By State and Local Government		(20)				
5. Distance From Urban Built-up Area		(15)				
6. Distance To Urban Support Services		(15)				
7. Size Of Present Farm Unit Compared To Average		(10)				
8. Creation Of Non-farmable Farmland		(10)				
9. Availability Of Farm Support Services		(6)				
10. On-Farm Investments		(20)				
11. Effects Of Conversion On Farm Support Services		(10)				
12. Compatibility With Existing Agricultural Use		(10)				
TOTAL SITE ASSESSMENT POINTS		160	0	0	0	0
PART VII (To be completed by Federal Agency)						
Relative Value Of Farmland (From Part V)		100	0	0	0	0
Total Site Assessment (From Part VI above or local site assessment)		160	0	0	0	0
TOTAL POINTS (Total of above 2 lines)		260	0	0	0	0
Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>				
Reason For Selection:						
Name of Federal agency representative completing this form:					Date:	

(See Instructions on reverse side)

Form AD-1006 (03-02)



Louisiana Ecological Services Office

7/28/2015

ESA Technical Assistance Form

General Information

Name: FEMA

Point of Contact: Jamie Schexnayder

Address: 1500 Main Street

State: Louisiana

Zip Code: 70802

City: Baton Rouge

Phone Number 1: 225-200-4961

Phone Number 2:

Email Address: jamie.schexnayder@fema.dhs.gov

Proposed Project Information

Project Reference ID: 5362

Project Latitude: 30.373311 **Project Longitude:** -90.040996

Project Parish(es): Saint Tammany

Project Description:

The area of proposed drainage improvements is located in St. Tammany Parish, Louisiana, and is roughly bounded by LA Highway 1088 at the northeastern most extent (30.381012, -90.037005), Soutl Street to the east (30.377061, -90.032340), Labarre Street to the south (30.367871, -90.046376), and Garon Drive to the west (30.376006, -90.041906). Existing pipes and ditches within the project area are presently undersized for the volume of water that frequently inundates the watershed during storm events. The present scope of work (SOW) proposes to expand the capacity of undersized culverts and ditches within the project area as well as the construction of a 5-acre (2.0 ha) detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess back into the watershed. Additionally channel improvements are proposed for the upper stretch of Little Bayou Castine and Subdivision Ditch. This project would improve existing drainage and reduce the risk of inundation for over 650 homes and would thereby decrease repetitive flood damage. Design plans for the St. Tammany Parish Little Bayou Castine Drainage Improvements are attached (Attachment 1).



ESA Technical Assistance Form

North of LA Highway 1088

Ditch and pipe work along the northernmost side of the existing right-of-way (ROW) of LA Highway 1088 (Figure 1-2) includes the expansion of 1,861.54 feet (567.3 m) of ditch (begin: 30.380948, -90.037302; end: 30.378909, -90.042505; also see: Attachment 1 for Typical Ditch Section profile) and culvert/pipe replacements in six (6) locations (Table 1). The proposed culvert improvements are as follows:

Table 1. Culvert Construction North of LA Highway 1088

Sub-Location	Existing	New	Latitude	Longitude
N of LA Hwy. 1088 Metal Pipe (CMP)	Remove 60.22' of 24" (est.) corrugated metal pipes	Install 60.22' of 30' Chlorinated polyvinyl chloride (CPVC)	30.380642	-90.038029
N of LA Hwy. 1088 Metal Pipe (CMP)	Remove 23.22' of 24" (est.) corrugated metal pipes	Install 23.22' of 36" CPVC	30.380206	-90.039104
N of LA Hwy. 1088 Metal Pipe (CMP)	Remove 23.21' of 24" (est.) corrugated metal pipes	Install 23.21' of double 36" CPVC	30.379967	-90.039731
N of LA Hwy. 1088	Remove 81.45' of 36" Reinforced Concrete Arch Pipe (RCPA)	Install 81.45' of double 36" CPVC	30.379777	-90.040238
N of LA Hwy. 1088	Remove 66.83' of double 36" RCPA	Install 66.83' of double 36" CPVC	30.379508	-90.040938
N-S of LA Hwy. 1088	Remove 57.44' of 46" x 36" SRPA (est)	Install 57.44' of double 58.5" x 36" RCPA	30.378829	-90.042468

Woodlands Neighborhood Pipe and Ditch Improvements

Ditch and pipe work is proposed throughout the Woodlands neighborhood in multiple locations (Figure 1-2) including the excavation of 295.27 feet (89.9 m) of new ditch (begin: 30.378386, -90.036857; end: 30.378386, -90.035923; also see: Attachment 1 for Typical Ditch Section profile) and culvert/pipe replacements in nine (9) locations (Table 2). The proposed culvert improvements are as follows:



ESA Technical Assistance Form

Table 2. Woodlands Neighborhood Culvert Replacements

Sub-Location	Existing	Replacement	Latitude	Longitude
Tallow Tree Drive and Little Bayou Castine	Remove 32.00' of (size) of Concrete Pipe	Install 32.00' of double 58.5" x 36" RCPA	90.042100	30.377429 -
Mayhaw Drive	Remove 333.69' of 24" corrugated metal pipes Pipe (CMP)/38.09' of 28.5" x 18" RCPA 36" CPVC	Replace with 77.87' of RCP and 293.91' of	Begin: 30.379296/ End: 30.378279 End: -90.036990	
Mayhaw Drive	Remove 310.35' of 57 x 38" bituminous coated corrugated steel pipe (BCCSP)/32.00' of 51" x 31" RCPA/158.02' of BCCSP	Replace with 342.35' of double 46" x 36" steel spiral rib arch (SRPA) and 158.02' of double 53" x 41" SRPA	Begin: 30.378279 End: 30.376837 End: -90.036957	
East of Mayhaw	Remove 34.23' of 29" x 18" RCPA/300.00' of 28" x 20" BCCSP	Replace with 34.23' of SPRA and 300.00' of 46" x 36" SRPA	Begin: 30.379316 End: 30.378386 End: -90.035922	
Tributary 2 Ditch	Remove 271.42' of existing 24" BCCSP 21" SRPA	Replace with 27" x	Begin: 30.377046 End: 30.377056 End: -90.034077	
Red Maple Drive	remove 47.00' of 51" x 31" RCPA	Replace with triple 59.5" x 36"		

**Louisiana Ecological Services Office****ESA Technical Assistance Form**

RCPA 30.376607 -90.039749

Chestnut Oak Drive Remove 318.0' of existing 24" CMP Replace with 36"
CPVC pipes Begin: 30.377334
End: 30.377083 Begin: -90.040657
End: -90.039685

Mayhaw and Red Maple Drive Remove 57.44' of existing 28.5" x 18" RCPA Replace
with 46" x 36" SRPA 30.378329 -90.036912

Spring Blvd. and Sweet Bay Drive Remove 96.83' of existing 24" CMP
Replace with double 24" RCPs 30.378755 -90.040853

Detention Pond and Broad-Crested Weir

St. Tammany Parish is proposing the construction of a 5-acre (2.0 ha) detention pond on the Parish owned land at the southeastern intersection of Little Bayou Castine and the Woodlands tributary. Part of the proposed Detention Pond location was formerly excavated between the years of ca. 2007-2009 (Figures 3-4) and the resultant depression is presently inundated. The design consists of a side-channel weir that allows low flows to bypass the pond and preserves the storage capacity of the pond for larger events. The weir structure will be a grass levee lined with a turf reinforcement mat located on the western side of the proposed detention pond. After a storm event, the pond will drain by gravity through an 18foot (5.4 m) outlet pipe back into the existing channel. This design would allow the pond to be dry during periods of no rainfall, and provide additional floodplain storage. The detention pond location and design parameters are as follows:

Northwest corner: 30.374301, -90.040802

Northeast corner: 30.373599, -90.039337

Southwest corner: 30.373093, -90.041609

Southeast corner: 30.372362, -90.040112



ESA Technical Assistance Form

Bottom Elevation: 12.34 feet (3.76 m)

Top of Bank; Elevation: 18.0 feet (5.4 m)

Area of pond: 5 acres (2.0 ha)

Side Slope: 3:1

The weir-structure and outlet structure parameters are as follows:

Type: Broad-Crested Weir

Invert Elevation: 17.0 feet (5.18 m)

Length: 50.0 feet (15.24 m)

Breadth: 10.0 feet (3.04 m)

Pipe Outlet Structure

Type: 18" RCP

Invert Elevation: 12.34 feet (3.76 m)

Length: 40 feet (12.19 m)

Little Bayou Castine Channel Improvements

Little Bayou Castine (Figure 1-2) flows north to south and defines the westernmost boundary of the project area. Along the upstream end of the Little Bayou Castine approximately 5,113.27 linear feet (1558.52 m) of channel improvements are proposed (begin: 30.378738, -90.042420; end: 30.367967, -90.045736) including clearing the drainage channel of vegetation, brush, and trees within the cross-sectional area of the channel, and channel reshaping at various locations along the channel to redefine the channel cross-section. Proposed channel cross-sections (Attachment 2) range between 30-60 feet (9.1-18.2 m) in breadth and average 52 feet (15.84 m) in width.

Subdivision Ditch Improvements

Subdivision Ditch (Figure 1-2) is located to the south of Red Maple Road and flows east



7/28/2015

Louisiana Ecological Services Office

ESA Technical Assistance Form

to west until it discharges into Little Bayou Castine. Approximately 1,331.07 linear feet (405.71 m) of ditch improvements are proposed (begin: 30.374525, -90.036554; end: 30.374472, -90.040754) including clearing the drainage ditch of vegetation, brush, and trees within the cross-sectional area of the ditch, and ditch reshaping at various locations along the ditch to redefine the ditch cross-section (also see: Attachment 1 for Typical Ditch Section profile).

Based on the information provided, the proposed project is not an activity that would affect a federally listed threatened or endangered species; nor is there proposed or designated critical habitat present within this Parish.

Therefore, a "no effect" conclusion is appropriate. 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 annually. If the scope or location of the proposed project is changed, coordination via this website should occur as soon as such changes are made.

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.



7/28/2015

Louisiana Ecological Services Office

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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**



BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

ROBERT J. BARNHAM
SECRETARY
JIMMY L. ANTHONY
ASSISTANT SECRETARY

Date July 31, 2015

Name Jamie Schexnayder

Company FEMA

Street Address 1500 Main St.

City, State, Zip Baton Rouge, LA 70802

Project HMGP# 1603-0332
Little Bayou Castine Drainage Improvements

Project ID

Invoice Number 150731 14

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, scenic streams, or wildlife management areas 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

From: [Gutierrez, Raul](#)
To: [Schexnayder, Jamie](#)
Subject: RE: Request for Solicitation of Views (SOV) for HMGP# 1603-0332 Little Bayou Castine Drainage Improvements
Date: Monday, August 24, 2015 12:22:26 PM
Attachments: [image001.png](#)
[image002.png](#)

The U.S. Environmental Protection Agency (EPA) has completed your request for a solicitation of views concerning the Little Bayou Castine drainage improvements near Mandeville, Louisiana. The scope of the work for the project includes expansion of the capacity of undersized culverts and ditches, as well as the construction of a 5-acre (2.0 ha) detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess water back into the watershed. The project site is roughly bounded by LA Highway 1088 at the northeastern most extent (30.381012, -90.037005), Soult Street to the east (30.377061, -90.032340), Labarre Street to the south (30.367871, -90.046376), and Garon Drive to the west (30.376006, -90.041906). 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. occur on the proposed site. At this time, the EPA 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.

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

From: Schexnayder, Jamie [mailto:jamie.schexnayder@fema.dhs.gov]
Sent: Tuesday, July 21, 2015 1:50 PM
To: Linda.Hardy@la.gov; amy.e.powell@usace.army.mil; Gutierrez, Raul; cmichon@wlf.la.gov
Cc: Pitts, Melanie; Holmes, Leschina; Spann, Tiffany; karl.morgan@la.gov
Subject: Request for Solicitation of Views (SOV) for HMGP# 1603-0332 Little Bayou Castine Drainage Improvements



FEMA

MEMORANDUM TO: See Distribution

SUBJECT: Scoping Notification/Solicitation of Views

St. Tammany Parish, Little Bayou Castine Drainage Improvements, HMGP# 1603-0332, FEMA-1603-DR-LA

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. Section 404 and Section 406 of the Stafford Act authorizes FEMA's Hazard Mitigation Program 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).

Please review the attached project description to determine whether your office has any objections to the proposed project and whether any permits from your office would need to be obtained. The applicant is St. Tammany Parish.

This project is the applicant's request to expand the capacity of undersized culverts and ditches within St. Tammany Parish, Louisiana, as well as the construction of a 5-acre (2.0 ha) detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess water back into the watershed. The project site is roughly bounded by LA Highway 1088 at the northeastern most extent (30.381012, -90.037005), Sout Street to the east (30.377061, -90.032340), Labarre Street to the south (30.367871, -90.046376), and Garon Drive to the west (30.376006, -90.041906).

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

We would appreciate your comments on this project within thirty (30) days. If we do not receive comments from you within this time period, we will assume that you have no concerns or issues with the proposed project. If appropriate, FEMA will add the condition that the applicant will be required to obtain applicable permits from your office.

Comments may be emailed to jamie.schexnayder@fema.dhs.gov or mailed to the attention of Jamie Schexnayder, Environmental Department, at the address above. For questions regarding this matter, please contact Jamie Schexnayder, Environmental Protection Specialist at (225) 200-4961.

Sincerely,

Tiffany Spann-Winfield,
Deputy Environmental Liaison Officer, FEMA LRO
FEMA 1603/1607-DR-LA

Distribution: LDEQ, USEPA, LDWF, LDNR, USACE

Attachment: Scope of Work, Project Plans

Jamie Schexnayder, CFM
Environmental Protection Specialist
FEMA Region VI – LRO
1500 Main Street
Baton Rouge, LA 70802
BB (225) 200-4961
jamie.schexnayder@fema.dhs.gov



APPENDIX D
HYDROLOGIC AND HYDRAULIC
STUDY

DRAINAGE STUDY
AND COST BENEFIT ANALYSIS
FOR THE
LITTLE BAYOU CASTINE
DRAINAGE PROJECT



PARISH PROJECT NO. 15-034

BH# 77100-00

JUNE 29, 2015



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1.0 Introduction

1.1 Background

In 2008 and 2010, Buchart Horn, Inc. (BH) was retained by St. Tammany Parish to perform a study of the Little Bayou Castine watershed and provide recommendations regarding improvements to the existing drainage system. The goal was to reduce flooding and inundation of the properties along the Little Bayou Castine and its tributaries. In 2015, St. Tammany Parish requested Buchart Horn update and revise the previous reports, and perform a Benefit Cost Analysis for the updated recommended improvements.

The study area is located in St. Tammany Parish, Louisiana, between Garon Dr. on the west, Soult Street on the East, Viola St. on the north, and Labarre St. on the south. The area experiences frequent flooding events, due to multiple inadequate drainage structures throughout the system.

1.2 Purpose and Scope of Project

The purpose of this report will be to analyze the existing watershed and provide recommended improvements that will effectively and economically reduce flooding within the Little Bayou Castine watershed.

This report will compare the recommended improvements with the existing conditions, and will determine if the recommendations are economically feasible. The procedures includes: collecting slab elevations and channel cross sections throughout the flooding area, developing HEC-HMS and HEC-RAS models to simulate pre- and post-project conditions during multiple storm events, and performing a HEC-FDA cost-benefit analysis to determine the economic feasibility of the project. The previously published analyses are being replaced by this report, which will effectively present the entire Little Bayou Castine Watershed Analysis, and should be the sole reference for Buchart Horn's Little Bayou Castine drainage study.

2.0 Project Site

2.1 Existing System

The following research and analysis was performed on the existing conditions:

- Existing culverts and other points of interest were obtained during the field survey and supplemented by record copies of the surrounding subdivisions construction plans as provided by the Parish.
- Based on our field observations, a Manning coefficient of 0.035 was used for all ditches and a Manning coefficient of 0.05 was used for the over bank areas.
- Starting water surface elevations were taken from Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels 225205 0360 C and 220202 0002 C. An elevation of 11 was used for the 100-year flood at the downstream end of the study area.
- An analysis using the Corps of Engineers' HEC-HMS, HEC-RAS, and Bentley Systems' StormCAD Modeling software was used to identify the inadequate pipes and ditches along the existing network. The systems analyzed included: LA Hwy. 1088 Cross Culverts between Garon Dr. and Soult Street, Little Bayou Castine from LA Hwy. 1088 to Labarre Street, and the drainage system within the Woodland Subdivision.

It was determined that multiple pipes and ditches were undersized for the watershed. In order to properly target this flooding, BH has proposed two recommendations. The recommended improvements consist of constructing a 5 acre detention pond and improving the capacity of several culverts and ditches within the watershed.

2.2 Recommendations

Culvert Improvements

Multiple culvert modifications have been identified that will help reduce frequent flooding problems in the area. The proposed modifications will more adequately convey frequent storm events (2-, 5-, and 10-year storms) and help reduce flooding during those events. The proposed design adjustments are as follows: To the north side of 1088, multiple pipe and ditch improvements occur. An existing 24" CMP pipe is being replaced with a 30" RCP pipe in two locations (locations 5 & 6 on Figure 1A)

- Pipe and ditch work along the north side of HWY 1088 and along the upstream end of the Little Bayou Castine.
- Pipe and ditch design throughout the Woodlands Neighborhood. (Near Mayhaw Dr., Bald Cypress Dr., Red Maple Dr., and Chestnut Oak Dr.)

(Refer to *Appendix B*, StormCAD Data, for a complete summary of the pipe and ditch replacements.)

The proposed culvert modifications were analyzed in StormCAD and the flooding flows were entered into the HEC-RAS model cross sections in order to compute the approximate water levels along the drainage system. (Existing and Proposed flow values for the pipe system are provided in *Appendix B*, StormCAD calculations).

Detention Pond

St. Tammany Parish requested that we evaluate the benefit of constructing a 5-acre detention pond on the Parish owned land at the southeastern intersection of Little Bayou Castine and the Woodlands tributary. This benefit will be evaluated using the United States Army, Corps of Engineers Hydraulic Engineering Center's, HEC-HMS and HEC-RAS.

The design consists of a side channel weir that allows low flows to bypass the pond and preserves the storage capacity of the pond for larger events. After the storm event, the pond will drain by gravity through an 18" outlet pipe back into the existing channel. This design would allow the pond to be dry during periods of no rainfall, and provide additional floodplain storage. The pond design parameters are as follows:

i. Pond Design:

Bottom Elevation: 12.34 Ft.
Top of Bank: Elev. 18.0'
Area of Pond: 5 acres
Side Slope: 3:1
Additional Storage Capacity: 28 Acre-ft.

ii. Weir Structure:

Type: Broad-Crested Weir

Invert Elev.: 17.0 Ft

Length: 50.0'

Breadth: 10.0'

Design: The weir structure will be a grass levee, lined with a woven turf reinforcement mat.

iii. Pipe Outlet Structure:

Type: 18" RCP

Invert Elev.: 12.34 Ft

Length: 40 Ft.

The primary benefit of the detention pond is a reduction in peak flows obtained by providing additional storage to the system. (Refer to *Appendix B*, HEC-HMS Data, for comparison tables of the flows before and after the pond construction).

3.0 Methodology

3.1 NRCS TR-55

The Tabular Hydrograph method described in the Natural Resource Conservation Service's Technical Release Number 55 (NRCS TR-55) was used as the basis for the watershed hydrology throughout the basin. This method uses the soil conditions, land use, runoff curve numbers, time of concentration, and initial abstraction to storage to generate a runoff hydrograph for the watershed. The HEC-HMS Computer Model was used to perform these NRCS TR-55 calculations.

3.2 HEC-HMS

The Hydraulic Engineering Center's Hydraulic Modeling System (HEC-HMS) is designed to simulate the hydraulic processes of a watershed system. The watershed was recreated in the program, and multiple rainfall events were analyzed. The HEC-HMS model calculated peak flows at key locations for the HEC-RAS model throughout the drainage basin.

3.3 StormCAD

Bentleys' Pipe Modeling System, StormCAD is designed to simulate the hydraulic processes of a pipe and ditch network. The existing network was recreated in the program, and multiple rainfall events were analyzed. The StormCAD model provided the water levels in multiple ditches, along with analysis of pipe capacity throughout the system. These flows were used in multiple locations in the HEC-RAS model.

3.4 HEC-RAS

The Hydraulic Engineering Center's River Analysis System (HEC-RAS) allows one to perform one-dimensional steady and unsteady flow river hydraulics calculations. The steady analysis was used for the purpose of this study. Existing and proposed river models were developed within the area of interest and peak flow rates from HEC-HMS were imputed to predict flood levels. The water surface elevations were compared at multiple cross sections along the river system.

3.5 HEC-FDA

The Hydraulic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) was used to evaluate the flood damage reduction using risk based analysis methods. Structure damage was analyzed using the HEC-RAS water levels for the existing and proposed plans. HEC-FDA calculates the estimated annual dollar savings for the proposed project. This information can be used to determine if the recommended improvements are economically feasible.

4.0 Hydrology and Precipitation

4.1 Subareas

The watershed area consists of approximately 430 acres of drainage. To examine runoff and peak discharges, the watershed area was broken into over 100 smaller basins. Drainage properties were gathered and the smaller basins were grouped into 12 larger basins when inputting into HEC-HMS. The calculations along with the Drainage Area Map are located in *Appendix A*. The properties for the 12 larger subbasins are shown in Table 1 – Subbasin Properties.

4.2 Land Use

Land cover type was analyzed throughout the watershed. This information was collected for the drainage area from St. Tammany Parish's GIS Database, along with Google Earth. The Land Use Map is provided in *Appendix A*.

4.3 Soil Conditions

All soils are classified into hydraulic soil groups according to their minimum infiltration rate. For this drainage study the soil types were collected from the USDA Web Soil Survey. The soils map is provided in *Appendix A*.

4.4 Runoff Curve Numbers

The curve number is a parameter formed from the soil type and land use in order to predict the runoff from each subarea. To compute this curve number, the values from each subbasin were used to calculate a weighted curve number for each subbasin. These calculations are provided in *Appendix A*.

4.5 Initial Abstraction to Storage

The initial abstraction to storage is the amount of water that is absorbed into the ground or retained as surface storage before runoff occurs. This value is determined using the potential maximum soil retention and the weighted curve numbers in each subarea. These calculated values can be seen in Table 1 – Subbasin Properties.

4.6 Time of Concentration

In this study, the NRCS TR-55 methodology was used to compute the times of concentration. This method analyzes water moving through each subarea in the following stages: sheet flow, shallow concentrated flow, and open channel flow. In each subarea, the T_c (Time of Concentration) was calculated along the longest flow path. These calculations are provided in *Appendix A* and the computed times of concentration for each of the subareas are shown in Table 1 – Subbasin Properties.

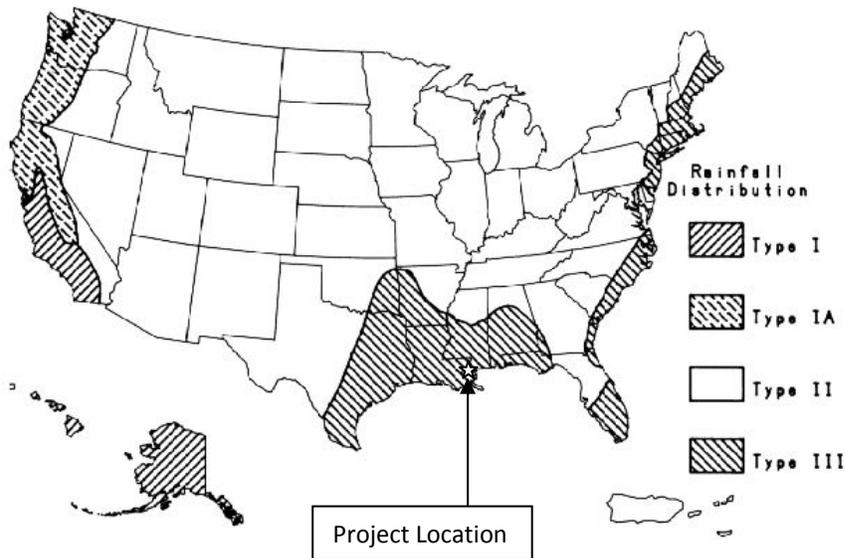
Table 1 – Subbasin Properties

Subbasin	Area (mi) ²	Curve Number	T _c (min)	Lag Time (min)	Initial Abstraction
1	0.0301481	85	45.296305	27.1777829	0.35294
2	0.0243585	88	35.800115	21.4800689	0.27273
3	0.0818491	81	26.208272	15.7249629	0.46914
4	0.0085118	81	24.668549	14.8011295	0.46914
5	0.0211664	85.2	23.767451	14.2604703	0.34742
6	0.14884	86	49.160978	29.4965871	0.32558
7	0.12582	85	49.935685	29.9614111	0.35294
8	0.0168032	86	26.735128	16.0410769	0.32558
9	0.085432	83	35.423456	21.2540735	0.40964
10	0.0361415	82	32.912515	19.7475089	0.43902
11	0.0905353	85	46.068453	27.641072	0.35294
12	0.0022139	87	19.720352	11.8322114	0.29885

4.7 Rainfall Distribution

The NRCS 24-hour duration Type III Rainfall Distribution was selected for this study based on the geographical location of the watershed and as recommended in TR-55.

Figure 1 – Geographic Boundaries for NRCS (SCS) Rainfall Distributions



4.8 Rainfall Depth

Historic rainfall depth was obtained using rain duration of 24 hours at multiple return frequencies. This information was determined from the NOAA Hydrometeorological Design Studies Center PFDS. These values can be seen in Table 2 – Rainfall Depth in Inches for 24 Hour Storm. The rainfall values were assumed to be consistent over the entire drainage basin.

Table 2 – Rainfall Depth in Inches for 24 Hour Storm

Duration	Average Recurrence Interval (Years)							
	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	200 Year	500 Year
24-hr	5.22	6.59	7.85	9.79	11.4	13.2	15.1	17.9

4.9 Runoff Transformation

The NRCS TR-55 tabular unit hydrograph was the runoff transformation method used for this study. Lag times were calculated from the time of concentration in accordance with TR-55 methodology. These calculations can be seen in Appendix A, and the lag times for each subbasin are shown in Table 1 – Subbasin Properties.

4.10 Routing

In the Little Bayou Castine watershed, each of the larger subareas drain to a stream or river. When the stream or river flows through an adjacent subarea the drainage path has been identified in the HEC-HMS model as a reach. Reach routing was modeled using the Muskingum-Cunge method. This method uses each reach’s length, slope, manning’s n, and cross section shape to model the hydrograph routing through each reach. A Manning’s n of 0.035 was used for all reaches.

5.0 HEC-HMS

5.1 Hydrology Model

Buchart Horn created a HEC-HMS model for the existing and proposed conditions using the techniques and data presented in the previous sections. The HEC-HMS model was developed in order to properly show the flow changes due to the proposed detention pond. An existing model was developed using all the previous calculations. This model was copied and a diversion and reservoir was added to the flowpath. This method gives us the changes in flow rates along the watershed for the existing and proposed conditions. The peak flowrates from the HEC-HMS models are provided in *Appendix A*. These peak flowrates were transferred to the HEC-RAS model where the existing and proposed water surface levels were calculated.

6.0 StormCAD

5.1 StormCAD Model

Buchart Horn created a StormCAD model for the existing and proposed conditions using the surveyed pipes and topography throughout the area. The StormCAD model was developed to analyze the existing pipe capacity and determine the recommended improvements. Pre and post project models were developed and the change in flowrates was calculated. The flowrates throughout the StormCAD model were transferred to the HEC-RAS cross sections. For the cross sections with underground piping only the flow that was over the design capacity was used. This is due to the underground pipe containing most of the flow, which does not change to the surface flooding.

7.0 HEC-RAS

7.1 Geometry

Two separate watershed geometries were modeled in HEC-RAS, existing and proposed. Cross sections were taken along the drainage system, using the LIDAR surface. The LIDAR data, which is available for free public download at the Louisiana State University Statewide Atlas, gives the ground elevations throughout the area. An overview of the HEC-RAS cross sections is provided in *Appendix C*.

The existing and proposed cross sections differed at the location of the Proposed Pond, and all the recommended improvement throughout the Woodlands neighborhood. These cross sections were adjusted to simulate an existing and proposed surface. All cross sections profiles are provided in *Appendix C*.

7.2 Flow Volumes

The existing and proposed peak flow values from HEC-HMS and StormCAD were used along the models. Flow values were taken from the StormCAD model throughout the Woodlands neighborhood, while the HMS values were used near the proposed detention pond. These peak flow values are provided in *Appendix C*.

7.3 Results and Discussion

The HEC-RAS peak water elevations were calculated at each cross section. The proposed model provided significant peak water surface elevation decreases throughout the area at multiple return frequencies, and this is reflected in the economic analysis. A summary of the reductions in peak water levels for the drainage area and the inundation maps created for the benefit area using the HEC-RAS Mapper feature are provided in *Appendix C*.

8.0 HEC-FDA

8.1 Corps of Engineers' Methodology

The Corps of Engineers have developed a methodology used to predict the economic benefit of flood damage reduction plans using risk and uncertainty analysis. This methodology uses the technical procedures described in the Corps' Engineer Manual (EM) 1110-2-1619, along with the software HEC-FDA to predict the benefit provided by the project. The procedure consists of the following: (1) identify all structures in area of interest, (2) calculate the replacement cost of each structure, (3) prepare stage-damage functions based on an estimated slab elevation and the HEC-RAS peak water surface elevations, and (4) develop a damage-probability curve in order to determine the annual damage reduction. The methods used in HEC-FDA are recommended by the Corps of Engineers for completing a flood damage reduction study.

8.2 Structure Properties

The structures used in this analysis are all of the structures located within the benefit area. There are 831 homes, one school, and one church (consisting of two structures) for a total of 834 structures. These 834 structures were broken into groups and paired with their respective cross sections along the HEC-RAS model. The values for the replacement cost of approximately 200 of the 834 structures in the benefit area were calculated using data for residential homes provided by the assessor's office which included square footage, type of construction and various cost rates per square foot based on type of construction. The square footage of the remaining homes was gathered using the footprint and the replacement cost was estimated using an estimated RSM price

per SQFT. The total replacement cost for all structures in the benefit area was estimated to be \$245,434,909. The complete list of structures and calculated values are provided in *Appendix D*.

A digital terrain model was created of the benefit area using the Louisiana State University (LSU) Statewide Atlas LIDAR data which is available for free public download. The slab elevations for 30 residential structures were surveyed for comparison with the LIDAR surface. The median difference between the two elevations was 0.82', and as a conservative estimate 1.0' was used. This value was added to the LIDAR surface elevation to estimate the slab elevation for all the other structures in the benefit area. Slab elevations are provided in *Appendix D*.

8.3 Stage-Damage Curves

A Stage-Damage curve is the relationship between the flood water levels and the direct economic impacts. The Corps of Engineers' Economic Guidance Memorandum 01-03, Generic Depth-Damage provides depth-damage curves for a variety of structures. These were applied to the structure inventory in order to develop depth-damage relationships for each home. The same method was used for content damages. These functions are shown in the following Tables 3 through 6.

Table 3 – One Story Structure Depth-Damage

One Story, No Basement (Structure Depth-Damage)			
Depth	Mean of Damage	Standard Deviation of Damage	
-2	0.0%	0.0%	
-1	2.5%	2.7%	
0	13.4%	2.0%	
1	23.3%	1.6%	
2	32.1%	1.6%	
3	40.1%	1.8%	
4	47.1%	1.9%	
5	53.2%	2.0%	
6	58.6%	2.1%	
7	63.2%	2.2%	
8	67.2%	2.3%	
9	70.5%	2.4%	
10	73.2%	2.7%	
11	75.4%	3.0%	
12	77.2%	3.3%	
13	78.5%	3.7%	
14	79.5%	4.1%	
15	80.2%	4.5%	
16	80.7%	4.9%	

Table 4 – Multiple Story Structure Depth-Damage

Multiple Story, No Basement (Structure Depth-Damage)			
Depth	Mean of Damage	Standard Deviation of Damage	
-2	0.0%	0.0%	
-1	3.0%	4.1%	
0	9.3%	3.4%	
1	15.2%	3.0%	
2	20.9%	2.8%	
3	26.3%	2.9%	
4	31.4%	3.2%	
5	36.2%	3.4%	
6	40.7%	3.7%	
7	44.9%	3.9%	
8	48.8%	4.0%	
9	52.4%	4.1%	
10	55.7%	4.2%	
11	58.7%	4.2%	
12	61.4%	4.2%	
13	63.8%	4.2%	
14	65.9%	4.3%	
15	67.7%	4.6%	
16	69.2%	5.0%	

Table 5 – One Story Content Depth-Damage

One Story, No Basement (Content Depth-Damage)			
Depth	Mean of Damage	Standard Deviation of Damage	
-2	0.0%	0.0%	
-1	2.4%	2.1%	
0	8.1%	1.5%	
1	13.3%	1.2%	
2	17.9%	1.2%	
3	22.0%	1.4%	
4	25.7%	1.5%	
5	28.8%	1.6%	
6	31.5%	1.6%	
7	33.8%	1.7%	
8	35.7%	1.8%	
9	37.2%	1.9%	
10	38.4%	2.1%	
11	39.2%	2.3%	
12	39.7%	2.6%	
13	40.0%	2.9%	
14	40.0%	3.2%	
15	40.0%	3.5%	
16	40.0%	3.8%	

Table 6 – Multiple Story Content Depth-Damage

Multiple Story, No Basement (Content Depth-Damage)			
Depth	Mean of Damage	Standard Deviation of Damage	
-2	0.0%	0.0%	
-1	1.0%	3.5%	
0	5.0%	2.9%	
1	8.7%	2.6%	
2	12.2%	2.5%	
3	15.5%	2.5%	
4	18.5%	2.7%	
5	21.3%	3.0%	
6	23.9%	3.2%	
7	26.3%	3.3%	
8	28.4%	3.4%	
9	30.3%	3.5%	
10	32.0%	3.5%	
11	33.4%	3.5%	
12	34.7%	3.5%	
13	35.6%	3.5%	
14	36.4%	3.6%	
15	36.9%	3.8%	
16	37.2%	4.2%	

8.4 Procedure

The structures inventory was entered into the HEC-FDA software, along with the HEC-RAS stage discharge curves. The 2, 5, 10, 25, 50, 100, 200, and 500-year return frequency of water surface levels were examined for the economic analysis. A project useful life of 50 years and the current discount rate of 0.75% were assumed for this project.

8.5 Results and Discussion

The results from HEC-FDA indicate that the annual flood damage for all structures in the benefit area without the project is approximately \$6.7M; and the annual flood damage after the project is constructed will be approximately \$5.4M. The annual benefit that the project will provide was calculated at \$1,273,046.

9.0 Proposed Detention Basin Cost Estimate

9.1 Engineers' Cost Estimate

The cost estimate details the construction costs associated with building the proposed detention basin and weir structure. Additional costs include maintenance and operation costs, which consist of weed and grass maintenance in project area. These costs are estimated at \$10,000/year.

ST. TAMMANY PARISH LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS					
					
ENGINEER'S OPINION OF PROBABLE COST - (Detention Pond and Culvert Improvements)					
ITEM NO.	ITEM	QUANTITY	UNIT	COST PER UNIT	BASE BID
201-01-00100	CLEARING AND GRUBBING	1	LS	\$100,000.00	\$100,000
202-01-00100	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	1	LS	\$10,000.00	\$10,000
203-01-00100	GENERAL EXCAVATION	40000	CY	\$10.00	\$400,000
203-03-00100	EMBANKMENT	5000	CY	\$4.00	\$20,000
203-08-00100	GEOTEXTILE FABRIC	222	SY	\$10.00	\$2,220
204-04-00100	TEMPORARY SEDIMENT BASINS	1	EA	\$2,000.00	\$2,000
204-05-00100	TEMPORARY SEDIMENT CHECK DAMS (HAY)	20	EA	\$200.00	\$4,000
204-05-00200	TEMPORARY SEDIMENT CHECK DAMS (STONE)	1	EA	\$1,000.00	\$1,000
204-07-00100	TEMPORARY STONE CONSTRUCTION ENTRANCE	1	EA	\$5,000.00	\$5,000
701-03-01040	24" RCP	194	LF	\$78	\$15,132
701-03-01060	30" PP (A-2000)	141	LF	\$100	\$14,100
701-03-01080	36" PP (A-2000)	1115	LF	\$130	\$144,950
701-04-01040	27"x21" SRPA (Ultra Flow)	272	LF	\$125	\$34,000
701-04-01100	36" x 58.5" RCPA	178	LF	\$250	\$44,500
701-04-02080	40"x31" SRPA (Ultra Flow)	34	LF	\$150	\$5,100
701-04-02100	46"x36" SRPA (Ultra Flow)	314	LF	\$160	\$50,240
713-01-00100	TEMPORARY SIGNS & BARRICADES	1	LS	\$5,000.00	\$5,000
714-01-00700	SLAB SODDING (CENTIPEDE)	6000	SY	\$5.00	\$30,000
727-01-00100	MOBILIZATION	1	LS	\$100,000.00	\$100,000
739-01-00100	HYDRO-SEEDING	30000	SY	\$3.00	\$90,000
740-01-00100	CONSTRUCTION LAYOUT	1	LS	\$30,000.00	\$30,000
TOTAL ESTIMATED CONSTRUCTION COST					\$1,107,242

10.0 Conclusion and Recommendations

10.1 Conclusion

Buchart Horn performed a drainage study and cost analysis for the recommended improvements, and concluded that the recommendations are economically feasible. The annual benefit after subtracting the annual maintenance costs would pay for the construction in less than one year. The improvements would benefit over 650 homes, and no adverse impacts are expected. The implemented recommendations will reduce flooding in all storm events, and will benefit the area for many years to come.

10.2 Recommendations

Based on the results of our analysis, Buchart Horn recommends that the following proposed improvements be constructed. Expand the existing detention pond on square 328, and provide storm drainage system improvements at key locations within the benefit area as described in Section 2 of this report.

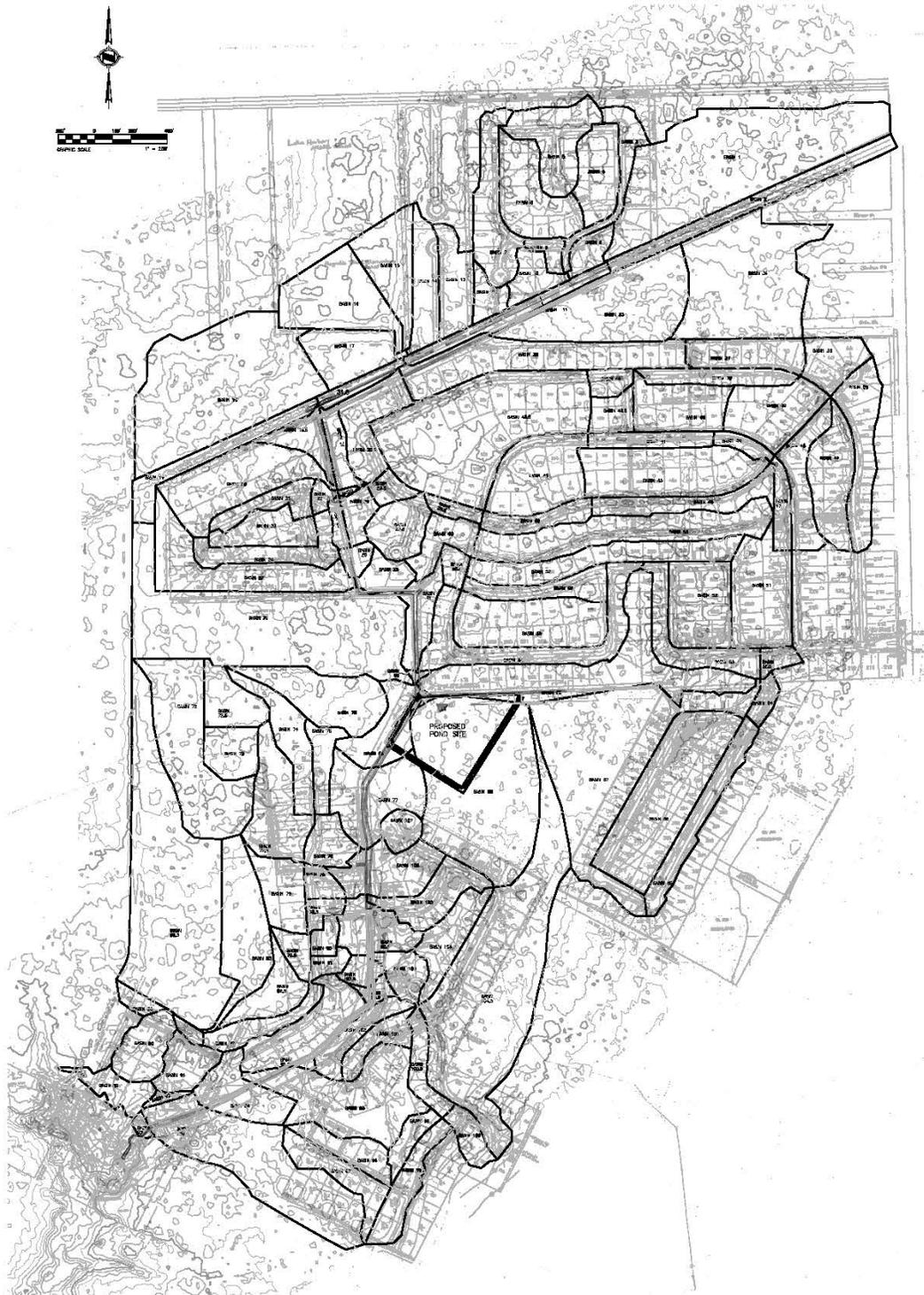
This watershed will also benefit from additional detention storage, such as the expansion of the proposed detention basin onto the adjacent undeveloped tracts.

**SUPPORTING DOCUMENTATION
FROM APPENDICES A-C OF THE
DRAINAGE STUDY AND COST
BENEFIT ANALYSIS FOR THE
LITTLE BAYOU CASTINE DRAINAGE
PROJECT, BY BUCHART HORN, INC.
DATED JUNE 29, 2015**

- Appendix A - This appendix contains Hydrology Calculations and the HEC-HMS model data.
- Appendix B - This appendix contains the Existing and Proposed StormCAD data.
- Appendix C - This appendix contains the existing and proposed HEC-RAS information.

Pertinent selected figures, tables and pages from the above report appendices which FEMA determined to be of interest to the general public follow.

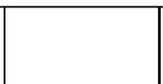
For a full version of this report, public requests may be sent to FEMA-NOLA@dhs.gov, fax: 225-346-5848, tel: 504-427-8000 or by mail to: Department of Homeland Security-FEMA, Attn: EHP- Little Bayou Castine Drainage Project, 1500 Main Street, Baton Rouge, Louisiana 70802.



SHEET 1 OF 5 PROJECT NO. 2020-10 DATE: JULY 11, 2020	FILE	BOUND	BY	DATE

**ANALYSIS AND RECOMMENDATIONS
 LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS
 ST. TAMMANY PARISH, LOUISIANA**

**DRAINAGE AREA
 MAP**



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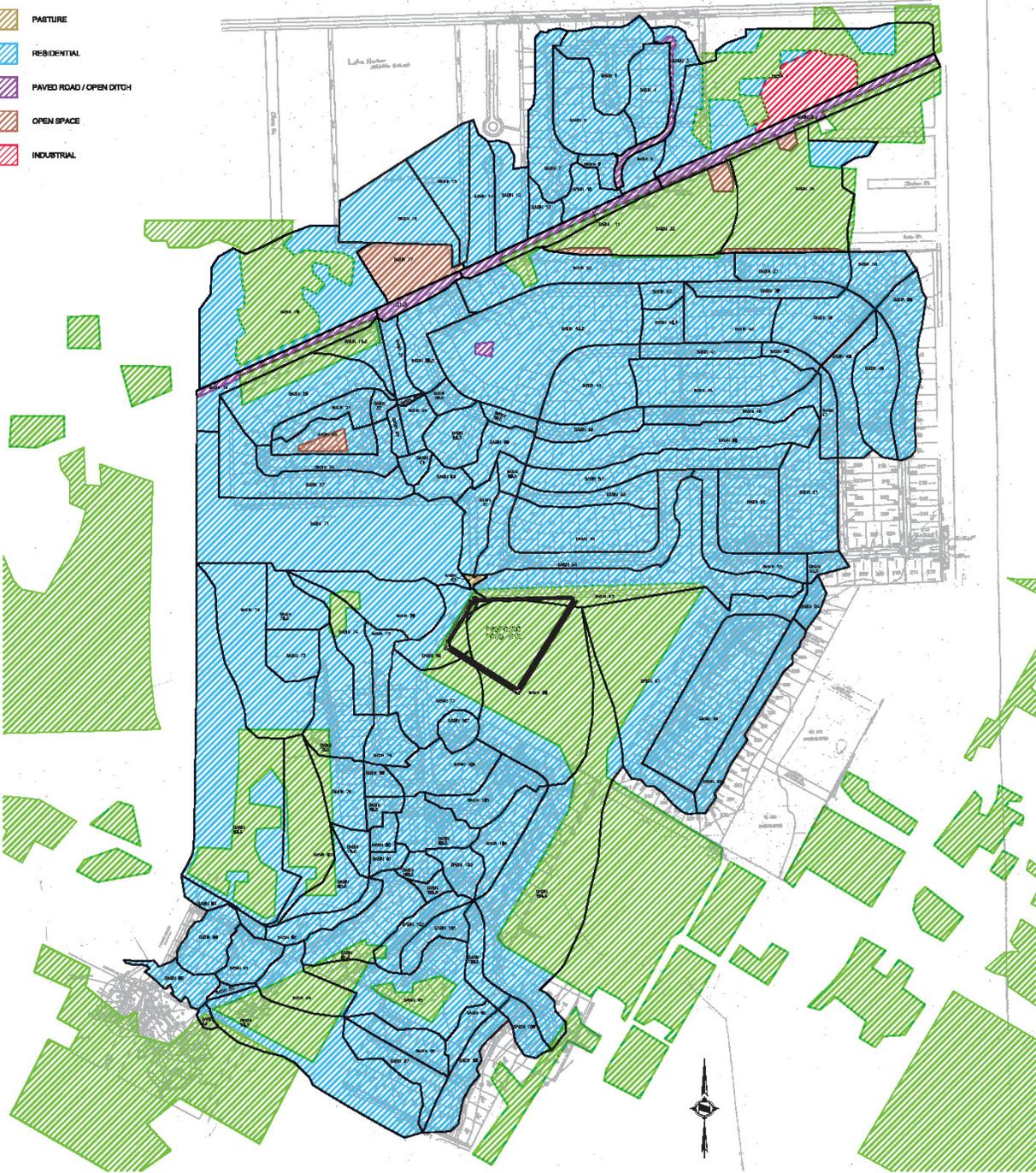
SHEET 1
 OF 5

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From Appendix A

LEGEND:

-  WOODS OR FOREST
-  PASTURE
-  RESIDENTIAL
-  PAVED ROAD / OPEN DITCH
-  OPEN SPACE
-  INDUSTRIAL



PROJECT NO.	DATE	REVISION	BY	DATE

**ANALYSIS AND RECOMMENDATIONS
LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS
ST. TAMMANY PARISH, LOUISIANA**

**LAND USE
EXHIBIT**



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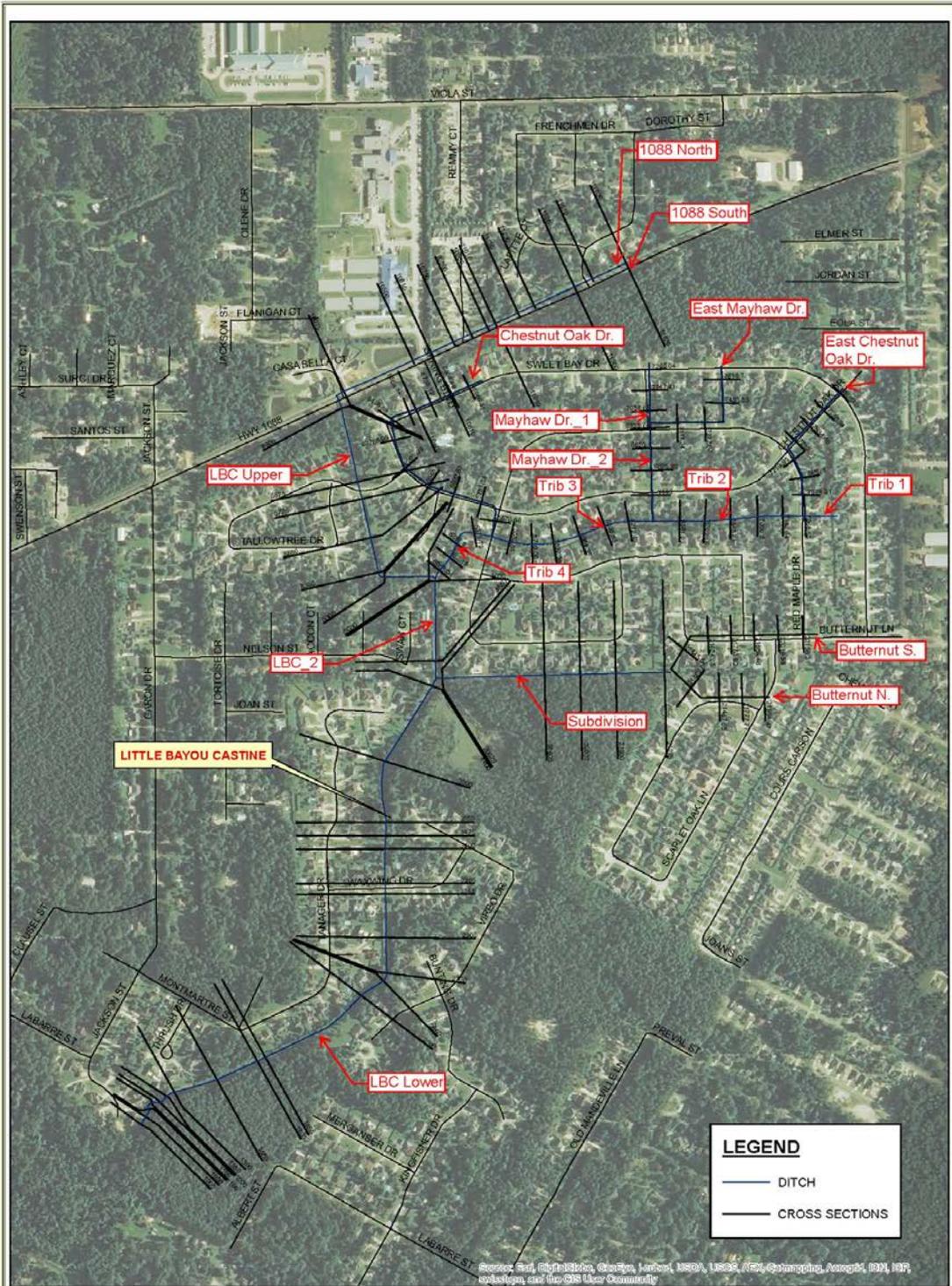
SHEET **3**
OF **5**

From Appendix A

Label	Proposed Changes for 10 yr	Proposed Changes for 25 yr	Proposed Changes for 50 yr	Proposed Changes for 100 yr
1088 North				
CO-9	1 @ 30 inch RPVCCP			
OC-9	4R x 2B x 2S Ditch			
CO-10	1 @ 36 inch RPVCCP			
OC-10	4R x 2B x 2S Ditch			
CO-12	2 @ 36 inch RPVCCP			
OC-12	4.5R x 8B x 2S Ditch			
CO-13	2 @ 36 inch RPVCCP	48 inch SRP		
OC-13	4.5R x 8B x 2S Ditch			
CO-14	2 @ 36 inch RPVCCP	48 inch SRP		
OC-14	5R x 8B x 2S Ditch			
1088 South				
CO-1				
OC-2				
CO-11				
CO-11.1				
OC-11		4R x 6B x 2S Ditch	4R x 8B x 2S Ditch	4R x 9B x 2.5S Ditch
LBC - 18-28				
CO-18	2 @ 58.5 x 36 RCPA			
OC-19				
CO-20	2 @ 58.5 x 36 RCPA	Good for 100 yr		
OC-22				
OC-25				
Tallow Tree N				
CO-21				
OC-21.1				
Tallow Tree S				
CO-23	Good for 100 yr			
CO-24				

Label	Proposed Changes for 10 yr	Proposed Changes for 25 yr	Proposed Changes for 50 yr	Proposed Changes for 100 yr
TRIB 2				
OC-47.1	4R x 8B x 2S Ditch	Good for 25 yr	4R x 10B x 2S Ditch	Good for 100 yr
OC-46.1	4R x 10B x 2S Ditch		4.5R x 12B x 2S Ditch	
CO-58	3 @ 58.5 x 36.0 RCPA		2 @ 8ft X 4ft RCB	
OC-58.1	4.5R x 12B x 2S Ditch		4.5R x 15B x 2S Ditch	
OC-28.6	4.5R x 12B x 2S Ditch		4.5R x 15B x 2S Ditch	
Red Maple Dr E				
CO-35	Good for 100 yr			
OC-59				
Red Maple Dr W				
CO-43.5	Good for 100 yr			
OC-59.5				
Chestnut Oak Ct				
CO-28.5	Good for 100 yr			
Chestnut Oak Dr				
CO-30.5				
OC-30.4			3R x 4B x 2S Ditch	3R x 6B x 2S Ditch
CO-29.5				2 @ 36 inch RCP
CO-29.4	1 @ 36 inch RPVCCP	2 @ 36 inch RPVCCP		2 @ 42 inch SRP
Sweet Bay Dr				
CO-32	2 @ 24 inch RCP	2 @ 36 x 23 RCPA	Good for 100 yr	
Mayhaw Dr				
CO-43	1 @ 36 inch RCP	Good for 100 yr		
CO-43.1	1 @ 36 inch RPVCCP			
CO-42.5	1 @ 36 inch RCP			
CO-41	2 @ 46 x 36 SRPA			
CO-45	2 @ 46 x 36 SRPA			
CO-46	2 @ 53 x 41 SRPA			
East of Mayhaw				
CO-37	1 @ 40 x 31 SRPA			
CO-38	1 @ 46 x 36 SRPA			
OC-38.1	4R x 6B x 2S Ditch	4R x 8B x 2S Ditch	Good for 50 yr	4R x 10B x 2S Ditch
CO-42	1 @ 46 x 36 SRPA			

Label	Proposed Changes for 10 yr	Proposed Changes for 25 yr	Proposed Changes for 50 yr	Proposed Changes for 100 yr
Chestnut Oak Dr East				
CO-36	Good for 100 yr			
OC-36.1				
CO-39				
CO-40				
OC-40.1				
East of Trib 2				
CO-50				
CO-49	1 @ 27 x 21 SRPA		Good for 100 yr	
CO-48				
CO-47				
SW corner Red Maple				
CO-55	Good for 100 yr			
CO-55.1				
Butternut Ln N				
CO-51	Good for 100 yr			
OC-51.1				
CO-52				
CO-53				
Butternut Ln S				
CO-52.5	Good for 100 yr			
CO-52.6				
Scarlet Oak Ln N				
CO-64	Good for 100 yr			
OC-64.1				
CO-67				
Scarlet Oak Ln S				
CO-65	Good for 100 yr			
OC-65.1				
CO-66				
Labarre St	2 @ 60 inch SRP	3 @ 60 inch SRP	Good for 100 yr	



LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS

CROSS SECTIONS



1 inch = 500 feet

From Appendix C



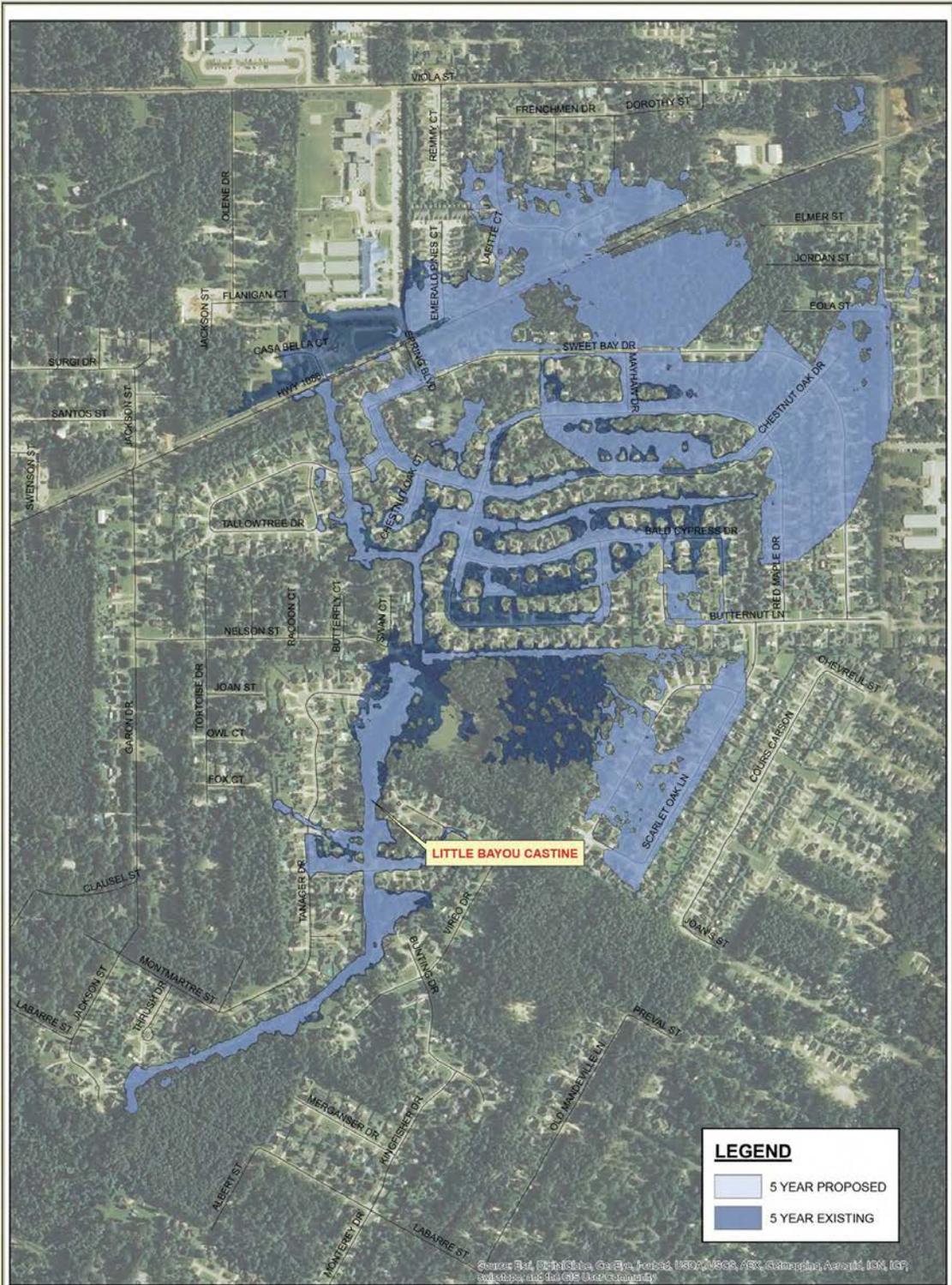
LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS

2 YEAR FLOOD MAP



1 inch = 500 feet

From Appendix C



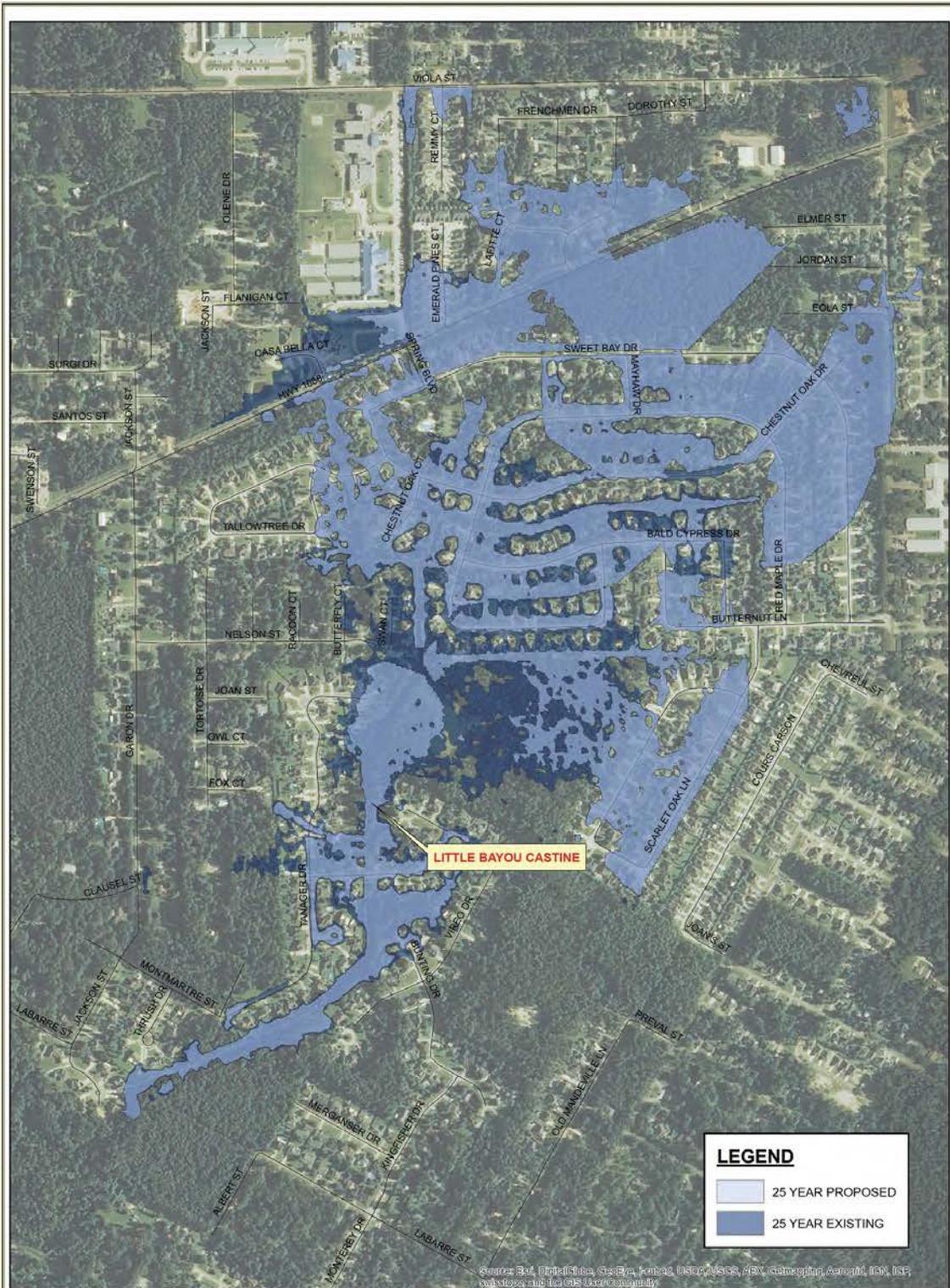
LITTLE BAYOU CASTINE **DRAINAGE IMPROVEMENTS**

5 YEAR FLOOD MAP



1 inch = 500 feet

From Appendix C

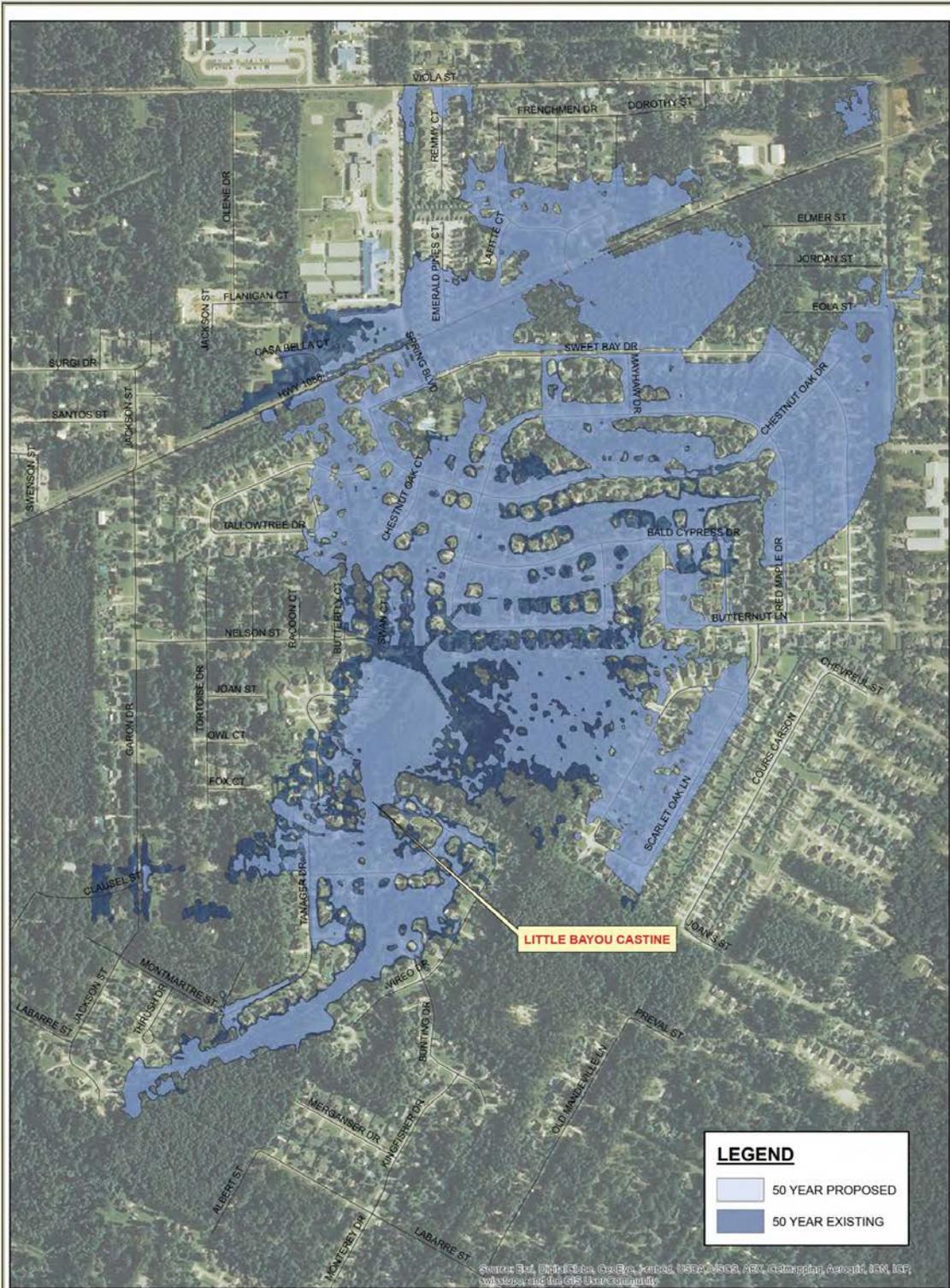


LITTLE BAYOU CASTINE **DRAINAGE IMPROVEMENTS**

25 YEAR FLOOD MAP



1 inch = 500 feet

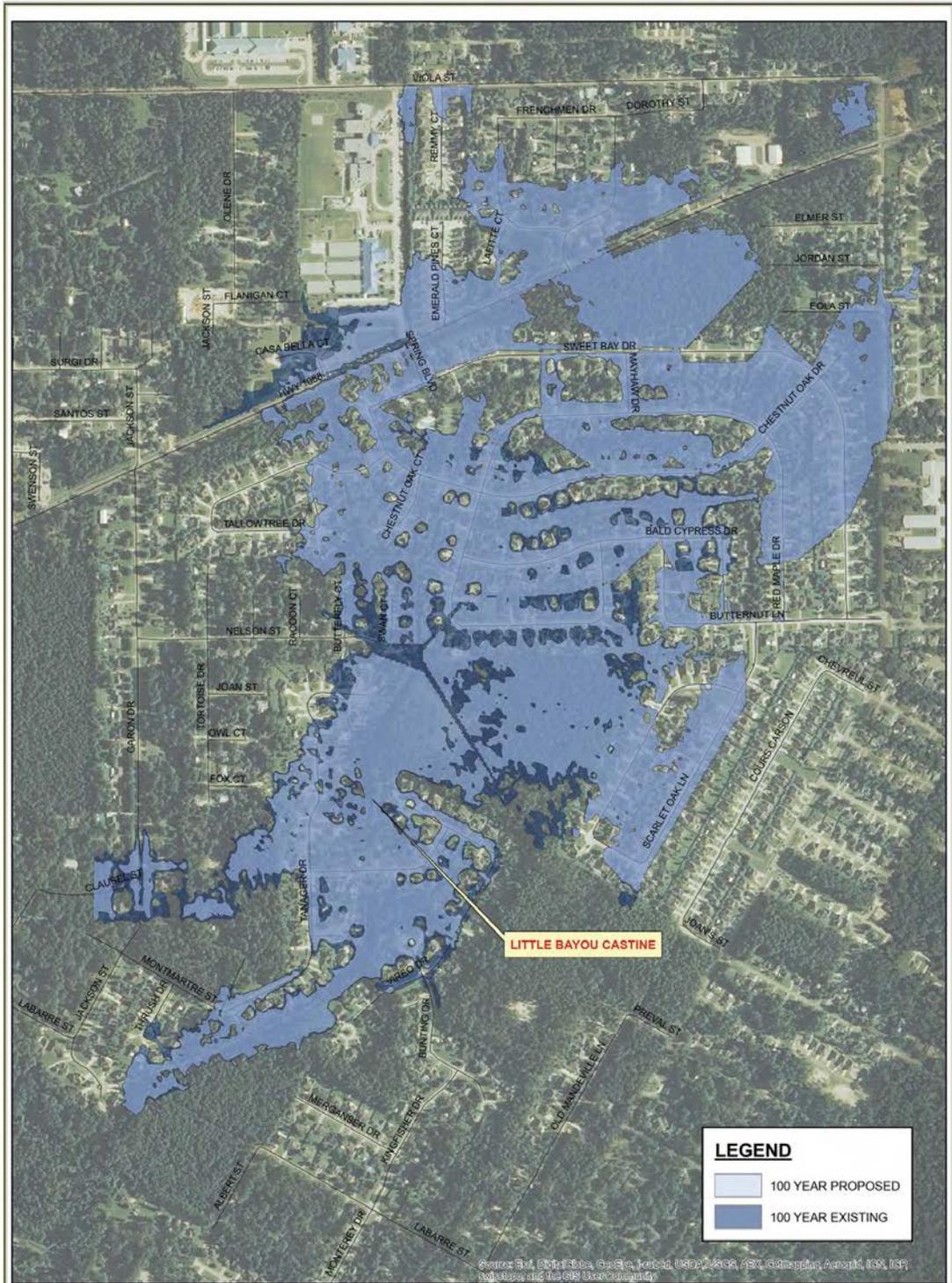


LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS

50 YEAR FLOOD MAP



1 inch = 500 feet



LITTLE BAYOU CASTINE
DRAINAGE IMPROVEMENTS
 100 YEAR FLOOD MAP



1 inch = 500 feet

From Appendix C

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

PUBLIC NOTICE
FEMA NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT
DRAFT FINDING OF NO SIGNIFICANT IMPACT
MITIGATION PROPOSAL FOR THE
LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS,
MANDEVILLE, ST. TAMMANY 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 Little Bayou Castine Drainage Improvements project, which proposes to implement drainage improvements to the existing drainage system to prevent potential flooding of residential subdivisions in the Little Bayou Castine watershed.

Residential areas and infrastructure in the Little Bayou Castine drainage area and its tributaries are at risk for repetitive flood damages. During significant rainfall events, flooding occurs in the Little Bayou Castine Drainage basin including the Woodlands, Grand Terre, Emerald Pines, Marigny Trace, and Trail Woods Subdivisions. Existing pipes and ditches within the project area are presently undersized for the volume of water that frequently inundates the watershed during storm events. To address these issues, the Applicant proposes to improve existing drainage and reduce the risk of inundation for over residential properties by expanding the capacity of the undersized culverts and ditches within the project area as well as the construction of a 5-acre detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess water back into the watershed. Additionally, channel improvements are proposed for the upper stretch of Little Bayou Castine and Subdivision Ditch.

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 and the Preferred Action Alternative, which would modify multiple culverts and ditches and provide additional storage to the drainage system.

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: St. Tammany Parish Library, Mandeville Branch, at 844 Girod Street, Mandeville, LA – Mondays through Thursdays 9:00am to 8:00pm; Fridays and Saturdays 9:00am to 5:00pm. This public notice will run in the local newspaper, the St. Tammany Farmer, on Thursday, August 13 and August 20, 2015; and in The Times-Picayune Wednesday, August 12, 2015; Friday, August 14, 2015; and Sunday, August 16, 2015. The documents can also be downloaded from FEMA's website at <http://www.fema.gov/resource-document-library>. There will be a fifteen (15) day comment period, beginning on August 10, 2015 and concluding on August 25, 2015 at 4 p.m. 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@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 FONSI will become final.

8-STEP PROCESS CHECKLIST

DATE: AUGUST 6, 2015

PREPARED BY: Alan Johnson, CFM, FEMA ENVIRONMENTAL

PROJECT: HAZARD MITIGATION GRANT PROGRAM (HMGP) 1603-332

LOCATION: Little Bayou Castine Basin, Mandeville, St. Tammany Parish, LA

EO 11988-FLOODPLAIN MANAGEMENT EO 11990-WETLAND PROTECTION

STEP 1 Determine whether the proposed action is located in a wetland and/or the 100-year 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).

The project is located in a floodplain as mapped by FIRM Panel #:

The Hazard Mitigation Grant Program (HMGP) proposed actions are shown on Preliminary FIRM 22103C 0431F, dated 04/30/2008, within zone AE, el 9, NAVD. Per 22103C 0320F and 22103C 0431F, most of the drainage project is in a zone X upstream, and contributing floodflows into the zone AE.

The project is located in a wetland as identified by:

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).

Not applicable - Project is not located in a floodplain or in a wetland.

Applicable - Notice will be or has been provided by:

A cumulative public concerning the Hazard Mitigation Grant Program (HMGP) Assistance in floodplain and wetland areas will be or 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.

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.

Not applicable - Project is not located in a floodplain or in a wetland.

- Applicable - Alternative identified in the EA Document or is described below:

ALTERNATIVE 1: **NO ACTION** is not considered a feasible alternative as it would leave the subdivisions and developed areas above the identified floodplain subject to local drainage flooding. Further, this alternative would leave many of these adjacent roads subject to frequent flooding, continuing frequent closures and associated repair or replacement without increased channel and culvert capacity increases. No Action could also result in a life and safety risk for the area residents and any potential rescuers.

ALTERNATIVE 2: **Clear and upsize culverts, and channel capacity, and add an off-line detention pond to the Little Bayou Castine drainage system.** By upsizing culverts at 15 locations above Waxwing Dr (upstream limit of zone AE), and installation of 5 acre detention pond, all locations for all recurrence intervals are showing decreased elevations relative to the existing conditions, including in the zone AE area downstream to Labarre Street (end of project, and analyses). All of these activities should be coordinated and comply with local floodplain administration and ordinance.

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).

- Not applicable - Project is not located in a floodplain or in a wetland.
- Applicable - Alternatives identified in the EA Document or is described below:

ALTERNATIVE 2: Clear and upsize culverts, and channel capacity, and add an off-line detention pond to the Little Bayou Castine drainage system. By upsizing culverts at 15 locations above Waxwing Dr (upstream limit of zone AE), and installation of 5 acre detention pond, all locations for all recurrence intervals are showing decreased elevations relative to the existing conditions, including in the zone AE area downstream to Labarre Street (end of project, and analyses). This project has minimal potential to adversely impact floodplain or wetlands. There should be no support of floodplain development due to the proposed project as most of the project is upstream of the upper limit of the identified zone AE, and all improvements in the portion in zone AE will serve to reduce the impacts more to the improved channel. In compliance with 44CFR9.11(d)(4), Per 44 CFR 9.11(d) (4) Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point

within the community. All of these activities should be coordinated and comply with local floodplain administration and ordinance.

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).

- Not applicable - Project is not located in a floodplain or in a wetland.
- Applicable - Mitigation measures identified in the EA Document or is described below:

ALTERNATIVE 2: Clear and upsize culverts, and channel capacity, and add an off-line detention pond to the Little Bayou Castine drainage system. By upsizing culverts at 15 locations above Waxwing Dr (upstream limit of zone AE), and installation of 5 acre detention pond, all locations for all recurrence intervals are showing decreased elevations relative to the existing conditions, including in the zone AE area downstream to Labarre Street (end of project, and analyses). This project has minimal potential to adversely impact floodplain or wetlands. There should be no support of floodplain development due to the proposed project as most of the project is upstream of the upper limit of the identified zone AE, and all improvements in the portion in zone AE will serve to reduce the impacts more to the improved channel. In compliance with 44CFR9.11(d)(4), Per 44 CFR 9.11(d) (4) Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community. All of these activities should be coordinated and comply with local floodplain administration and ordinance.

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 its 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).

- Not applicable - Project is not located in a floodplain or in a wetland.
- Applicable - Action proposed is located in the only practicable location as described below:

ALTERNATIVE 2: Clear and upsize culverts, and channel capacity, and add an off-line detention pond to the Little Bayou Castine drainage system. By upsizing culverts at 15 locations above Waxwing Dr (upstream limit of zone AE), and installation of 5 acre detention pond, all locations for all recurrence intervals are showing decreased elevations relative to the existing conditions, including in the zone AE area downstream to Labarre Street (end of project, and analyses). This project has minimal potential to adversely impact floodplain or wetlands. There should be no support of floodplain development due to the proposed project as most of the project is upstream of the upper limit of the identified zone AE, and all improvements in the portion in zone AE will serve to reduce the impacts more to the improved channel. In compliance with 44CFR9.11(d)(4), Per 44 CFR 9.11(d) (4) Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community. All of these activities should be coordinated and comply with local floodplain administration and ordinance.

- Applicable - Action proposed is not located in the only practicable location. Describe below:

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).

- Not applicable - Project is not located in a floodplain or in a wetland.
- Applicable - Finding is or will be prepared as described below:

A statewide final public notice was published 12/8/08- 12/12/-08.

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.

- Not applicable - Project is not located in a floodplain or in a wetland.
- Applicable - Approval conditioned on review of implementation and post-implementation phases to ensure compliance of 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
LITTLE BAYOU CASTINE DRAINAGE IMPROVEMENTS
MANDEVILLE, ST. TAMMANY PARISH, LOUISIANA
PROJECT NUMBER 1603-0332
FEMA-1603-DR-LA

BACKGROUND

Hurricane Katrina, a Category 4 hurricane with a storm surge above normal high tide levels, moved across the Louisiana, Mississippi and Alabama Gulf Coasts on August 29, 2005. With several pipes and ditches being undersized for the Little Bayou Castine watershed, multiple modifications have been identified to help reduce frequent flooding problems in the area subdivisions in St. Tammany Parish. The project area is roughly bounded by LA Highway 1088 at the northeastern most extent, Soutl Street to the east, Labarre Street to the south, and Garon Drive to the west in Mandeville, Louisiana, and includes approximately 650 homes in the Little Bayou Castine drainage basin.

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

The need for the proposed action is to effectively alleviate major drainage and flooding problems experienced within residential subdivisions in the Little Bayou Castine drainage basin. Presently, undersized pipes and ditches cannot handle the volume of water that frequently inundates the watershed during storm events. The increased run-off impacts the drainage in the project area along Little Bayou Castine and surrounding areas. If left unprotected, future storm events have the potential to jeopardize the well-being of the people of St. Tammany Parish and repeatedly damage homes and property in this area. The alternatives considered include: 1) No Action and 2) Little Bayou Castine Drainage Improvements (Proposed Action).

The proposed action is to improve drainage in the headwaters of Little Bayou Castine by expanding the capacity of undersized culverts and ditches within the project area as well as constructing a 5-acre detention pond and broad-crested weir that will temporarily store storm runoff and help to regulate the release of excess water back into the watershed, thereby decreasing repetitive flood damage. Additionally, channel improvements are proposed for the upper stretch of Little Bayou Castine and Woodlawn Subdivision Ditch.

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, 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-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)(4), until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one (1) foot at any point within the community. 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.

- 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.
- Any changes or modifications to the proposed project will require a revised wetland jurisdictional 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.
- Applicant must coordinate with USACE at the New Orleans District prior to the start of construction to acquire any necessary permits. The applicant must comply with all conditions of the permits and forward copies of all correspondence to GOHSEP and FEMA for inclusion in the project files.
- 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.
- Erosion Control Devices (ECD's) 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. Any adverse impacts to adjacent wetlands resulting from the construction of this project will jeopardize receipt of federal funding.
- 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. 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.
- The applicant is responsible for coordinating with and obtaining any required permit(s) from the LDNR Coastal Management Division prior to initiating work. 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.
- Vehicle operation times would be kept to a minimum. Area soils must be covered and/or wetted during construction to minimize dust.
- 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 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 twenty-four hours of the discovery. The applicant shall also notify FEMA and the Louisiana Division of Archaeology at 225-342-8170 within seventy-two 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).
- 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.
- St. Tammany Parish limits noise levels by receiving land use in residential, public, commercial, and industrial areas to decibel levels of 60 during the “daytime” hours of 7 AM to 10 PM. Construction activities should be limited to this schedule on weekdays. Mitigation and abatement measures will be required to reduce the noise levels to a range that would be considered acceptable.
- 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.
- 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 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.

CONCLUSIONS

Construction of the proposed improvements at the proposed location was analyzed based on the studies, consultations, and reviews undertaken as reported in this draft EA. 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.

APPROVALS

Kevin Jaynes
Regional Environmental Officer
Region VI
FEMA 1603-1607-DR-LA

Date

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

Date