APPENDIX D. PROJECT ALTERNATIVES EVALUATION

The Water Institute of the Gulf (the Institute) and partners established The Partnership for Our Working Coast (POWC) with Chevron, Shell, Danos, and the Greater Lafourche Port Commission (GLPC) in 2017 (Allison et al., 2018; The Water Institute of the Gulf, 2018). GLPC plans to deepen Belle Pass and its slips incrementally from its present range of approximately -23 to -26 ft, first to -30 ft, and then later to -50 ft to service larger vessels. This dredging project will generate between 10 and 20 million cubic yards of uncontaminated material as well as a smaller, more continuous supply from maintenance dredging.

In 2017-2018, the Institute assisted GLPC (the Port) with an analysis to support permit modification under Section 203 of the Water Resources Development Act (WRDA) of 1986 and worked closely with the U.S. Army Corps of Engineers (USACE) and other federal regulatory agencies in support of dredging authorizations (GIS Engineering, LLC, 2018). Beneficial use wetland creation is included as a component of the overall deepening project for any current and future permit applications. The Port is organizing financing for the nearly $350 million channel deepening project, which is expected to commence in 2022-2023.

In Phase 1 of the Institute's work with the GLPC (associated with the Port's Environmental Impact Statement [EIS] and feasibility study under Section 203 of WRDA) sites for beneficial use wetland creation were selected based on several criteria including distance from the channel deepening location and water depth at the potential placement sites. The screening process that resulted in the preliminary site selection, as well as project types that advanced, was refined in Phase 2 (the present phase) to incorporate aspects of social and ecological resilience, utilizing hydrological and ecological modeling, social vulnerability and risk assessment, and participatory modeling described in the main report. The science was applied to inform design of nature-based defenses to function with the natural system, best serve the long-term needs of the local stakeholders, and improve ecosystem services. The work analyzed and reported on optimal locations and configurations for the wetland restoration projects in the context of future coastal evolution, sea-level rise, and storm scenarios over the next 30 years. This type of long-term modelling is essential for assessing resilience into the future.

Using time series bathymetric change maps dating to the 1890s, Miner et al. (2009) demonstrated that there is a deficit in the coastal sediment budget in the vicinity of Port Fourchon that exceeds 1 billion cubic yards per century. Because the sediment supply in and around Port Fourchon is limited, wetland restoration in the vicinity of Port Fourchon is essential for enhancing Port and community resilience. Both the historical land loss in Port Fourchon and the future land loss projected in the 2017 Louisiana Coastal Master Plan (CMP), demonstrate the importance of optimizing beneficial use of the limited sediment resources available (Coastal Protection and Restoration Authority of Louisiana [CPRA], 2017). Even with implantation of the coastal restoration projects that are proposed in the 2017 CMP, the Port Fourchon area is expected to lose wetlands (Coastal Protection and Restoration Authority of Louisiana, 2017). As such, additional opportunities, such as those provided by the GLPC's channel deepening project, will be necessary to conserve and maximize benefits of valuable sediment resources to improve the resilience of this important area.

PROJECT DEVELOPMENT

Existing Restoration Projects in the Vicinity of Port Fourchon

Several recently constructed projects as well as projects in various stages of planning, design, or construction exist in the immediate vicinity of Port Fourchon. These projects have been implemented or are currently proposed by entities that include CPRA, CPRA's federal partners such as the U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service (USFWS), the National Oceanographic and Atmospheric Administration (NOAA), and the GLPC. State and federal restoration projects are summarized in Table D-1 and categorized based on their status. GLPC capital planning and mitigation projects are summarized in Table D-2. Figure D-1 depicts the location of these projects.

Table D-1. State and federal restoration projects in the Vicinity of Port Fourchon, with notation of which projects were input into the POWC Future Without Action (FWOA) landscape in the models. All descriptions and costs taken from CPRA's Fiscal Year 2023 Annual plan (Coastal Protection and Restoration Authority, 2022) and the CPRA Coastal Information Management System (CIMS) web portal (CPRA, n.d.).

Project (CPRA ID # in (parenthesis)	Implementation Program	Status	Description	In POWC FWOA?
Caminada Headlands Increment I (BA-0045)	Coastal Impact Assistance Program (CIAP)	Constructed in 2014	This project restored 303 acres of beach and dune habitat on Caminada Headland in Lafourche Parish (beginning at Belle Pass and extends approximately six miles east towards Bayou Moreau) through the direct placement of approximately 3.3 million cubic yards of sandy material from Ship Shoal (an offshore borrow source). It cost $70.1 million.	Yes
Caminada Headland Beach and Dune Restoration Increment 2 (BA-0143)	National Fish and Wildlife Foundation (NFWF)	Constructed in 2016	This project restored 489 acres of beach and dune habitat on more than seven miles of Caminada Headland in Jefferson and Lafourche parishes through the direct placement of approximately 5.4 million cubic yards of sandy material from Ship Shoal (an offshore borrow source). It cost $147.1 million.	Yes
Caminada Headlands Back Barrier Marsh Creation Increment I (BA-0171)	Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA)	Construction ongoing as of March, 2022	This project will create and nourish 385 acres of back barrier intertidal marsh behind 3.5 miles of Caminada Headland in Lafourche Parish using material dredged from the Gulf of Mexico. This project will work synergistically with existing Caminada Headland dune and back barrier marsh projects (BA-0045 and BA-0143), expanding the restored back barrier marsh platform and improving the longevity of the barrier shoreline. It cost $32.3 million	Yes
Caminada Headlands Back Barrier Marsh Creation Increment II (BA-0193)	CWPPRA	Construction ongoing as of March, 2022	This project will create and/or nourish 444 acres of back barrier intertidal marsh along Caminada Headland in Lafourche Parish and create a platform upon which the beach and dune can migrate. This project will work synergistically with existing Caminada Headland dune and back barrier marsh projects (BA-0045 and BA-0143), expanding the restored back barrier marsh platform and improving the longevity of the barrier shoreline. It is expected to cost $26 million.	Yes
West Belle Pass Headland Restoration (TE-0052)	CWPPRA	Constructed in 2012	This project reestablished the West Belle headland in Lafourche Parish by rebuilding approximately 9,300 linear feet (362 acres) of beach, dune, and back barrier marsh using 4.2 million cubic	Yes

Project (CPRA ID # in (parenthesis)	Implementation Program	Status	Description	In POWC FWOA?
			yards of sediment dredged from the Gulf of Mexico. It cost $34.2 million.	
Terrebonne Basin Barrier Island Restoration, West Belle Pass component (TE-0143)	NFWF	Constructed in 2020-2022	The original design included extending and renourishing the original West Belle Pass Barrier Headland Restoration (TE-0052) project. A sand spit extending from the fill limits of the original TE-0052 was used as a platform to construct the recommended design template, following the natural shoreline geometry for alignment. The original restoration template included approximately 545 acres of beach, dune, and marsh components and 3.1 miles of beach. The constructed template was heavily damaged in October 2020 by Hurricane Zeta. Prior to Hurricane Zeta's landfall, 442 acres of beach, dune, and marsh habitat and 2.4 miles of beach had been constructed. After the storm, the work plan was revised to construct a feeder beach near West Belle Pass, which includes 79-acres and 1 mile of beach. The new feeder beach provides high quality nesting habitat, helps protect West Belle Pass from breaching at the flank, and provides a sediment source to nourish downdrift West Belle Headland.	Yes[6]
West Fourchon Marsh Creation (TE-0134)	CWPPRA	Expected to be constructed in 2023-2024	This project involves the creation of 302 acres and nourishment of 312 acres of marsh between Bayou Lafourche and Timbalier Bay in Lafourche Parish using sediment dredged from the Gulf of Mexico or Bayou Lafourche. It is expected to cost $30.7 million.	No
Port Fourchon Marsh Creation (TE-0171)	CWPPRA	In Planning	The primary goals of this project are to restore degraded wetland habitat and provide increased protection from storm surge and flooding. Specific goals of the project are to create approximately 514 acres and nourish approximately 91 acres of marsh with dredged material from Belle Pass. This project does not yet have an estimated cost.	No

[6] The original constructed template was included in the FWOA landscape. Hurricane Zeta hit after modeling for the project had already commenced.

Project (CPRA ID # in (parenthesis)	Implementation Program	Status	Description	In POWC FWOA?
East Leeville Marsh Creation and Nourishment (BA-0194)	CWPPRA	In Planning	The project goal is to create approximately 297 acres of saline marsh east of Leeville in Lafourche Parish using sediment dredged from Caminada Bay. It is expected to cost $35.1 million.[7]	No
Port Fourchon Shoreline Protection (BA-0251)	Gulf of Mexico Energy Securities Act (GOMESA)	In Planning	The goal of this project is to construct and repair shoreline protection features on the Caminada Headland to the south of Port Fourchon. It is expected to cost $2.0 million.[8]	No

Table D-2. GLPC Capital Improvement and Mitigation Projects. All project costs and descriptions were provided by the GLPC.

Project	Status	Description	In FWOA?
30-foot deepening	Permitted	Deepening of the northern slips, Pass Fourchon, and Belle Pass to -30 ft. MLLW.	Yes
50-foot deepening	In Planning	Deepening of the northern slips, Pass Fourchon, and Belle Pass to -50 ft. MLLW.	No
Fourchon Island Slip and Mitigation	In Planning	Construction of a new slip ranging from -30 to -85 ft deep in the marsh area bounded by the Gulf of Mexico, Belle Pass, and Pass Fourchon.	No

[7] This project is on hold and not currently being advanced within the CWPPRA program.
[8] This project was not part of the analysis as it was proposed after the substantial completion of the modeling or report, and it did not yet have defined features.

Figure D-1. Constructed and Planned Projects in the vicinity of Port Fourchon, LA.

The complied list of projects (Table D-1 and Table D-2) was used for multiple purposes including the determination of which projects should be considered in the model's Future Without Action (FWOA) landscape, which projects should be modeled in the Future With Project (FWP) scenario, and for referencing project design characteristics of similar projects in the area (e.g., average constructed elevation, settlement rates, cut-fill ratios for dredging, cost per acre, etc.). All projects that had funding for construction as of 2021 were considered part of the FWOA landscape due to the certainty of their implementation. These project features were edited into the base Digital Elevation Model (DEM) landscape that formed the basis of modeling analysis.

The GLPC desires to deepen the Port's channels and slips to service larger vessels that are currently receiving service in other ports. There are several different potential futures for infrastructure at Port Fourchon, depending on which dredging alternatives are built and how much sediment is eventually dredged (Figure D-2; GIS Engineering, LLC, 2018) At the time of writing this report, the GLPC had received authorization to dredge to -30 ft Mean Lower Low Water (MLLW) datum. Future dredging plans include dredging the channel to -50 ft MLLW, with the possibility of also dredging a turning basin, slip, and deep loading hole to use for large ship and rig repair, named the Fourchon Island development. The slip was originally envisioned to be dredged to -85 ft deep, but later revised to -30 ft MLLW (Figure D-3; GIS Engineering, LLC 2022). The excavation of the slip would create 514 acres of mitigation requiring 2.7 million CY of material. The amount of sediment produced, and thus the number of different beneficial use restoration projects that can be built, from these different dredging alternatives ranges widely. The modeling approach considered sets of projects that could be built from the sediment likely to be generated, between 13.2 million and 20.1 million CY from the first-cut excavation of the channel and slips only, with the understanding that additional sediment could be directed to multiple sets of projects or maintaining existing wetlands over time. Because of the uncertainty related to the decision to build the turning basin, slip, and deep loading hole, these were excluded from the modeling. Only the -30 ft MLLW channel depth was constructed in the model.

Full engineering permit plats for the TE-0134 West Fourchon project as well as the GLPC's proposed capital expansion are provided in *Attachment A. TE-0134 Permit Plats*, and *Attachment B. GLPC Expansion Permit Plats.*

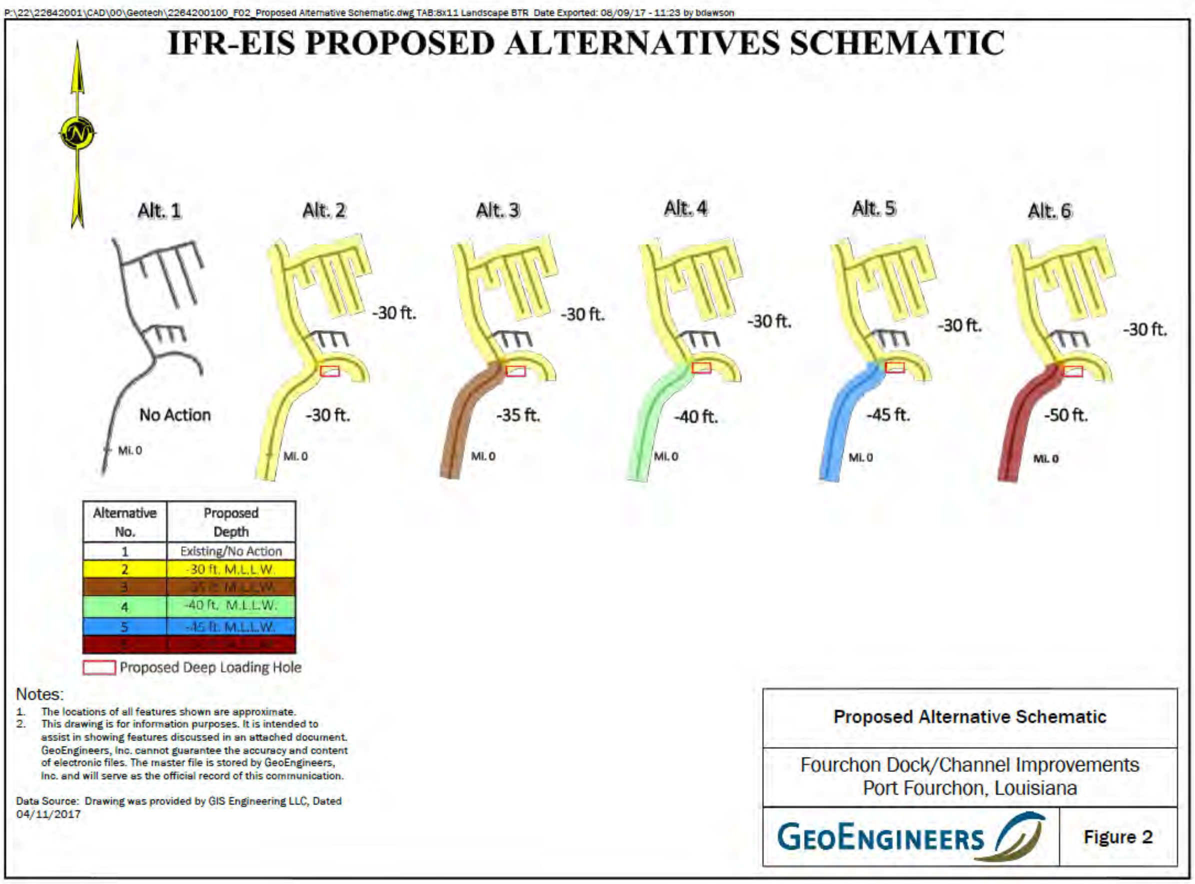

Figure D-2. Proposed alternative dredging strategies at Port Fourchon (GeoEngineers, 2019).

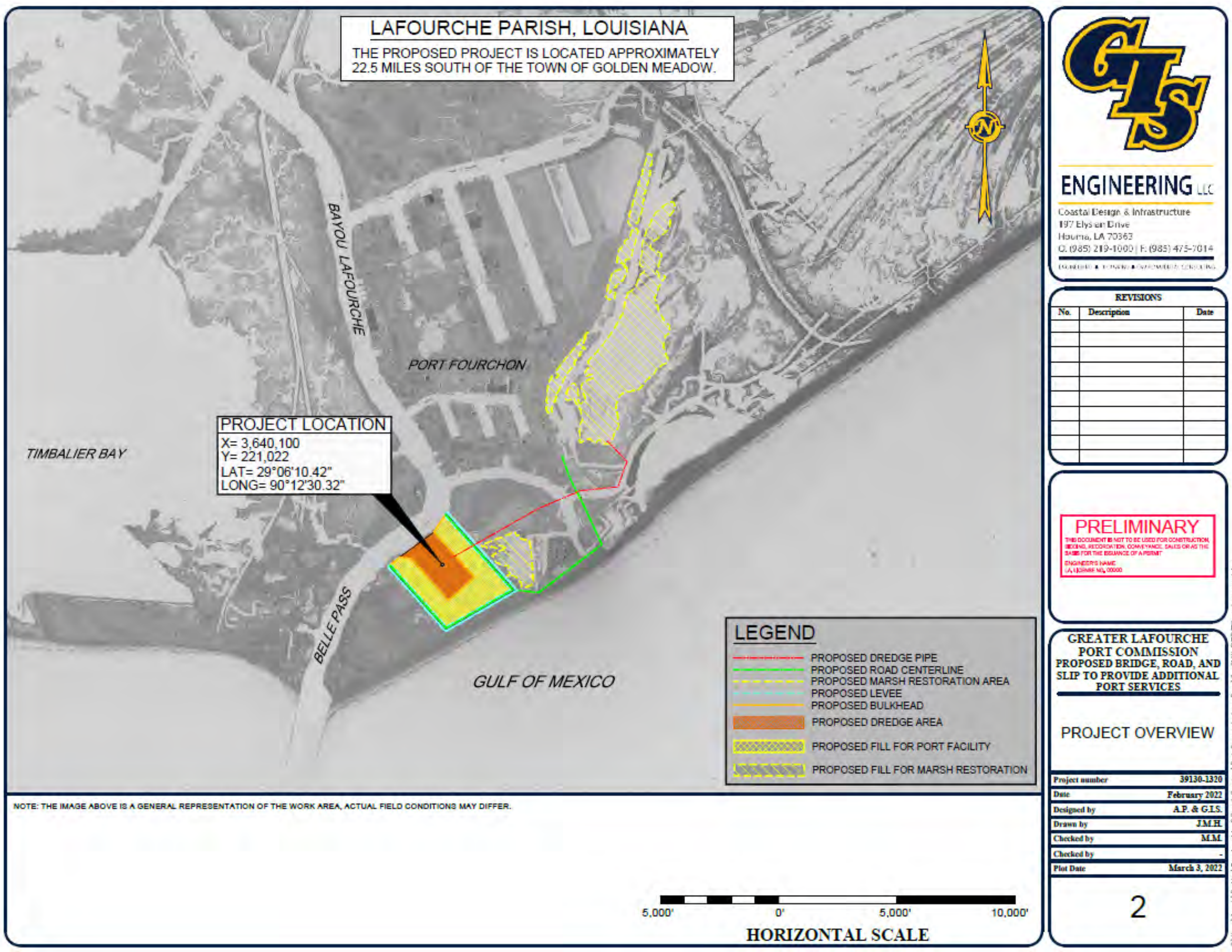

Figure D-3. Proposed Fourchon Island development and wetland mitigation areas at Port Fourchon. (GIS Engineering, Inc., 2022).

Restoration Projects Analyzed

The list of proposed wetland restoration polygons was developed in consultation with community stakeholders. Virtual meetings were conducted during the 2020 COVID-19 pandemic to generate proposed project polygons with the Environmental Competency Group (ECG) after participants were briefed by Institute staff members on constraints related to modeling limitations, the material composition of the borrow, and ongoing projects in the area where it was not necessary to propose further work (e.g., cohesive material not suitable for stacking on beaches or other tall features, not proposing in areas of active project construction, etc.). The analysis was guided by the ECG (stakeholders who are separate from the project’s funders), the Kitchen Cabinet (a group of representatives from the POWC), federal agency stakeholders with ongoing projects in the area, and technical staff from the Institute. The complete list of project polygons and alternatives was developed collectively by the groups as follows:

1. The ECG was engaged virtually through which polygons of proposed wetland restoration were proposed on maps.

2. The Institute team then engaged with other stakeholders, including federal agencies involved with the CWPPRA program (namely NOAA, USEPA, USFWS) after the ECG interactions to ensure other ongoing project proposal pursuits in the area were captured.

3. The Institute team then presented the summation of the proposed wetland restoration areas to the Kitchen Cabinet, who provided comment and approval of the list to model.

From this list, the Institute team subdivided the proposed wetland creation polygons into six groupings of project alternatives to be modeled. These project alternatives were generated through a combination of considerations including geographic proximity to limit project interactions during modeling simulation as well as with considerations on the amount of computational capacity, funding, and time available within the project’s schedule. Figure D-4 displays the six project groupings modeled under each of the two environmental scenarios. Polygons numbers are shown and were used for internal tracking purposes across various calculations.

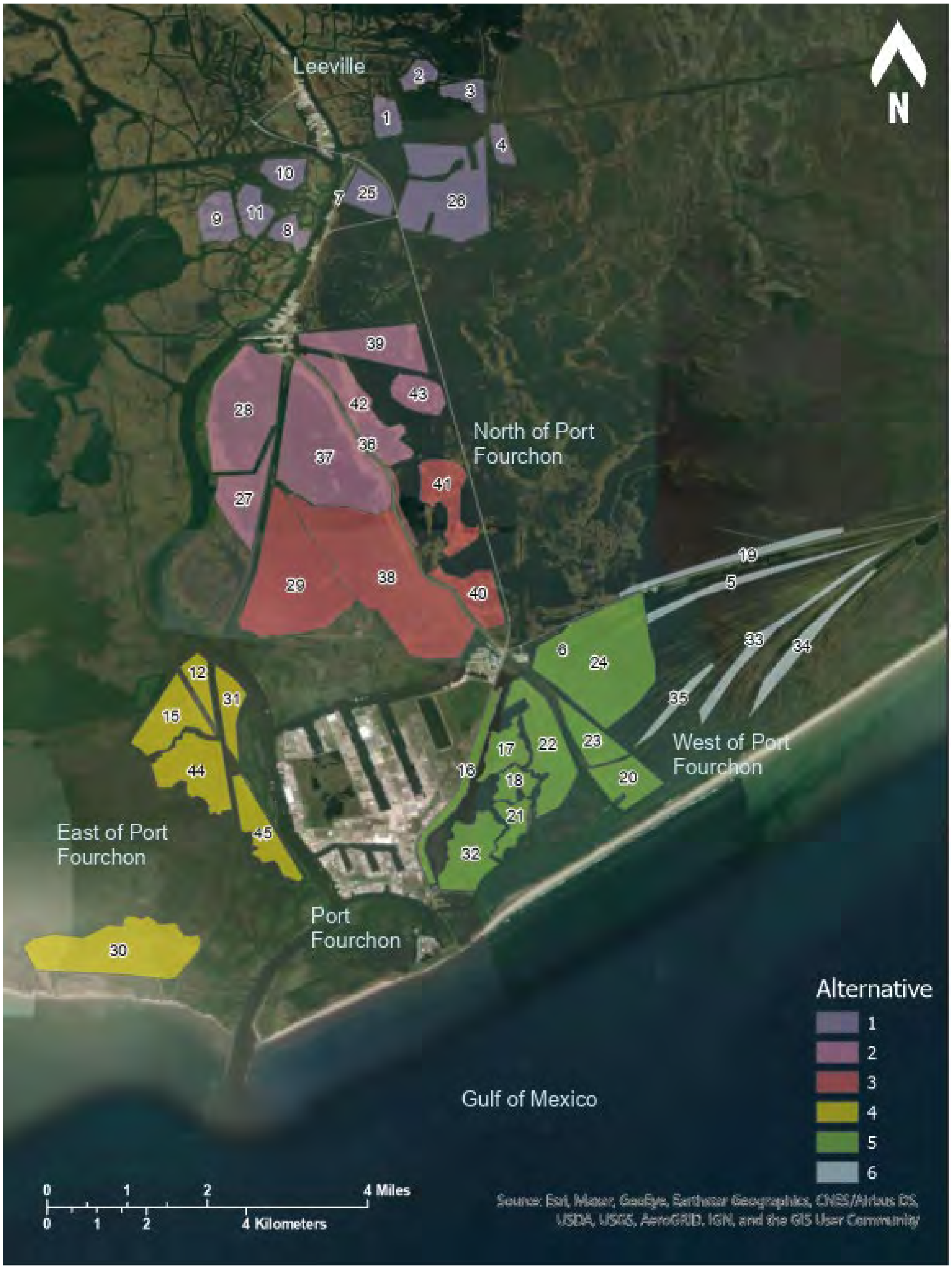

Figure D-4. Project groupings for modeling and cost analysis.

PROJECT ATTRIBUTES ASSUMPTIONS AND DEFINITIONS

Project Feature Development

In order to define the set of characteristics necessary to estimate project costs and to insert project alternatives into the modeling suite, a series of assumptions was required. These assumptions characterize the shape and elevation of the features, the methods for estimating dredge fill volumes, and the geotechnical properties of the sediment and underlying soils in borrow and placement areas, which impact settlement, subsidence, and cut/fill dredging ratios. A summary of the assumptions and rationale behind each assumption is presented in this section.

Typical Section

Numerous other restoration projects have been conducted within the study area. Data from design reports related to projects listed in Table D-2 was assimilated to confirm what type of material may be expected from channel deepening. In general, fine grained, cohesive sediments conducive to wetland restoration are expected. As such, all projects analyzed were assumed to conform to the typical section shown in Figure D-5 below, with a design elevation, containment dikes, and interior containment dike borrow channels. All geometries in Figure D-5 for illustrative purposes; the following sections provide further detail on how each was customized for this analysis.

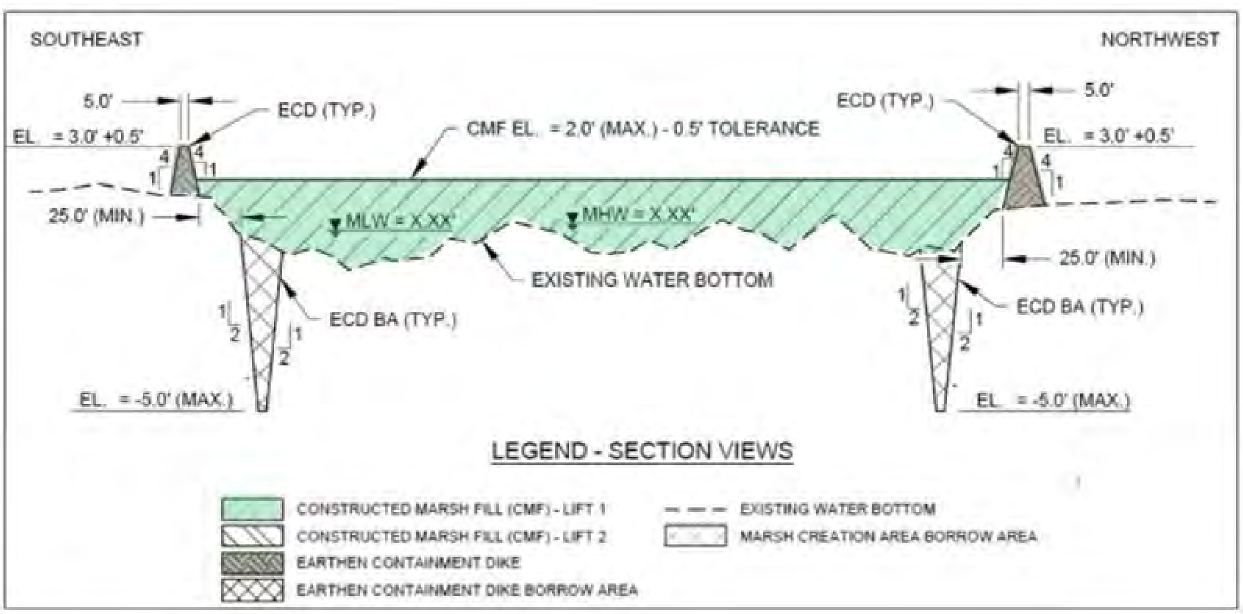

Figure D-5. Marsh creation typical section. All elevations and dimensions are for illustrative purposes only. Project-specific geometries are discussed later in this document. Adopted from CPRA's Marsh Creation Design Guidelines (Coastal Protection and Restoration Authority, 2017).

Sediment Properties at the Borrow and Fill Areas

Due to the varied nature of the proposed wetland fill areas, simplifying assumptions were made concerning the geotechnical properties of available wetland fill material. Of the nearby projects, the East

Leeville Marsh Creation project (BA-0194) had borrow area characteristics with the greatest similarity to what may be expected from dredging of the Port Fourchon water bottoms, consisting of very soft clays, silty clays, organic materials, and sparse amounts of very fine sands with median grain sizes (D_{50}) ranging from approximately 0.11 to 0.06 mm (GeoEngineers LLC, 2018).

Geotechnical investigations and design reports were compiled from relevant projects and are summarized in Table D-3 and Table D-4 below. Averaged values were used to inform both cost estimation of the projects as well as how the projects were inserted into the model DEMs at the initiation of model runs. A summary of how each table element was used in project definition is as follows:

- Constructed elevation and cut/fill ratio: Constructed elevation was used in conjunction with GIS analysis of existing topography and bathymetry of the project polygons to generate estimates of dredge fill quantities for wetland restoration areas. Initial 1:1 fill volume estimates were then increased by the cut/fill ratio to account for losses in the dredging process and the consolidation of underlying soils which occurs under the weight of placed material, causing volume losses in the fill template. Constructed elevations implicitly account for Relative Sea Level Rise (RSLR) as well as local geotechnical conditions since they are averaged from multiple nearby projects' geotechnical investigations.
- Year 5 elevation: Since the model runs occurred at 5-year timesteps over the 30-year planning horizon and because the modeling suite was unable to represent the drastic post-construction self-weight consolidation and settlement of wetland fill areas, the projects were inserted into the DEM at the 5-year post-construction elevations from settlement curves found in the project design reports for BA-0171, BA-0193, BA-0194, and TE-0134 (Ardaman & Associates, 2018c), (Ardaman & Associates, 2018a), (GeoEngineers LLC, 2018), and (Ardaman & Associates, 2018b).
- Earthen containment dike cut/fill ratio and fill volume per linear foot: Since earthen containment dike fill is typically excavated from the interior of the wetland restoration fill cells as shown in Table D-5, dredged volumes must account for filling the excavated containment dike borrow channels in addition to the wetland fill area itself. This information was used in conjunction with the containment dike length to estimate the additional fill volume required.

Table D-3. Proximal Project Fill Characteristics. All elevations are in ft, NAVD88, geoid 12b.

Projects	Constructed elevation (first lift)	Year 5 elevation	Cut/fill ratio
BA-193 Reach 1	2.5	0.75	1.35
BA-193 Reach 2	2.5	0.75	1.35
BA-193 Reach 3	2.5	0.75	1.35
BA-194	3.0	1.2	1.20
BA-171	2.0	0.85	1.30
TE-134 Reach 1	2.5	1.2	1.10
TE-134 Reach 2	2.5	1.0	1.10
TE-134 Reach 3	2.5	1.15	1.10
Average	2.5	1.0	1.23

Table D-4. Proximal Project Containment Dike Characteristics. All elevations are in ft, NAVD88, geoid 12b.

Projects	containment dike top elevation	cont. dike side slope H:V	cont. dike cut volume (cy/LF)	cont. dike fill volume (cy/LF)
BA-193 Reach 1	4	4:1	7.4	6.4
BA-193 Reach 2	4	4:1	9.2	6.4
BA-193 Reach 3	4	4:1	10.6	7.1
BA-194	4	5:1	12.3	6.2
BA-171	4.5	4:1	n/a	n/a
TE-134 Reach 1	3.5	4.5:1	6.2	3.6
TE-134 Reach 2	3.5	4.5:1	4.6	3
TE-134 Reach 3	3.5	4.5:1	5.6	3.4
Average	3.9	3.9:1	8.0	5.2

Dredge Fill Volumes

Fill volumes for wetland restoration were calculated by superimposing the constructed elevation from Table 2 over the initial conditions DEM used for the modeling. The volumetric difference in surfaces was then calculated using GIS software. Certain limitations to the fill assumptions were added in the calculation:

- All areas within the project polygon less than -5 ft (-1.5 m) NAVD88 (GEOID 12b) were filled to 100%.
- Open water areas greater than -5 ft (1.5 m) deep were not filled, as common construction practice in south Louisiana is limited in deeper waters, where containment dike construction becomes increasingly difficult.
- Areas with elevations greater than the design elevation had no material placed.

In addition to the GIS-based volume calculation, the GIS lengths of containment dike were multiplied by the cut volume (CY/LF from Table D-4 above) since containment dike excavation occurs on the interior of the fill area as shown in Figure D-6.

Project Cost Development

Wetlands creation in open water areas through placement of dredged material and vegetative plantings restore landscape and ecosystem processes and may provide storm surge and wave attenuation in certain cases. The cost of wetland restoration projects in Louisiana is influenced by the type of material to be dredged, the distance from the dredge location to the fill location, fuel costs, and mobilization/demobilization cost (the cost for the contractor to bring equipment to the site before construction and remove all equipment after construction). Mobilization and demobilization cost are influenced by project size, borrow source, dredging distance, pipeline corridor, dredging equipment, and dredging volume. This section provides a summary of the calculations and assumptions used to compute the main cost drivers for each proposed restoration area. All costs reported are in 2021 dollars. Where necessary, the USACE's Civil Works Construction Cost Index System was used to inflate costs from prior years to present day dollars (USACE, 2021). All costs presented are intended to provide planning-level insights under significant uncertainty and are not intended to represent design or bid levels of detail or accuracy.

Main Cost items

Mobilization and Demobilization

Mobilization and demobilization costs are a function of the type and amount of equipment required to accomplish the construction project. For the wetland restoration projects analyzed, assumptions were made that all work would consist of a 30-inch cutterhead suction dredge, as is typical in inland channel excavation projects in coastal Louisiana such as the ones analyzed. Most dredges' inboard pumps can move material through discharge pipes for a distance, after which, booster pumps are required for increases in incremental pumping distance from the borrow location to the fill location. Cost calculations used standard values from CPRA's 2017 CMP, which assume a dredge's onboard pumps can move material through 25,000 ft of pipeline, and each incremental booster pump can move material an additional 15,000 ft. (McMann et al., 2017). Pipeline lengths and types (pre-lay line, pickup line, subline, and pontoon line) also used the 2017 CMP cost estimating rubric, where lengths for each are calculated in GIS and unique to each proposed fill polygon within a project alternative. Figure D-6 depicts all dredge material pipeline routes assumed for the proposed fill cells, which run from the nearest edge of the borrow area (the Port's slips and channels) to the centroid of each fill cell. Many of the pipeline routes to individual polygons share "main" trunk lines and then "branch" into individual lines to each polygon. Lengths were calculated and reported such that groups of project polygons may share a common main length of pipe (to eliminate the potential to overcount the same length of pipe multiple times) but have individual, unique branches of pipe to each polygon. Dredge pipeline distances were further broken down by pipeline type (land-based within fill cells or over existing wetlands versus water-based transiting through channels or open water areas), as the costs vary between the two. Table D-5 displays all pipeline types and routes assumed for the analysis reported using the "branch" and "main" nomenclature.

Figure D-6. Assumed dredge pipeline routes for all restoration projects analyzed.

Table D-5. Dredge pipeline lengths and types used for cost calculations.

Project Alternative	Dredge Pipeline Type Lengths (ft)			
	Branch		Main	
	Land-based	Water-based	Land-based	Water-based
1	16,867	4,088	0	36,030
2	7,513	12,956	18,763	7,356
3	7,356	2,707	0	7,251
4	3,159	0	4,751	781
5	7,228	0	0	17,080
6	22,648	0	0	10,079

Fill Unit Cost

Fill unit costs, typically reported in dollars per cubic yard ($/CY) for the dredging, transportation, and placement of fill material is the largest cost component for wetland restoration projects. For this planning level analysis, parametric cost relationships from CPRA's 2023 CMP (which is yet to be published), were provided via personal communication with CPRA's CMP team (Chett Chiasson, Personal Communications, March 11, 2022). CPRA maintains an internal database of bid tabulations from constructed projects and has built relationships between the unit cost of material (in $/CY) versus the distance to transport the dredged material and type of material (such as offshore sand, Mississippi River sand, interior mixed sediments, etc.). The parametric unit cost relationship has a static base price over a certain initial distance (e.g., within a certain distance, $/CY unit costs remain constant), but then increases with added distance. Table D-6 displays the unit costs used for each of the alternatives.

Table D-6. Fill unit costs used for cost calculation in $/CY.

Alternative	Unit Cost ($/CY)
1	7.86
2	7.19
3	5.31
4	5.31
5	7.48
6	5.31

Containment Dike Unit Cost

Containment dikes are employed to capture the dredged slurry within the restoration area and allow the sediments to fall out of suspension, commonly referred to as dewatering. Containment dikes ring the perimeter of the wetland restoration area. Additionally, interior containment dikes are required to avoid deep waterbodies or other areas not desired to be filled, such as oil and gas pipeline corridors, within the wetland restoration area. Perimeter calculations for each wetland restoration area were performed in GIS. Since the analysis is at a planning level, interior containment dikes were not specified for each wetland restoration area; instead, a multiplier of 1.5 was added to the perimeter length to account for interior containment dikes required. A parametric cost relationship of $60.10/linear foot (LF) from CPRA's 2017 Coastal Master Plan was used for containment dikes. (McMann et al., 2017).

Other Unit Costs

As part of the cost estimation, several other parametric unit costs were employed to account for minor activities or materials required, such as settlement plates ($/plate based on 1 plate per 50 acres of the fill area) and vegetative plantings ($/acre based on planting 60% of the fill area).

Percentage-based Cost Items

Standard industry practice for some cost components for wetland restoration projects is to designate cost estimates based on a percentage of the estimated construction cost. Such cost components include construction surveys, project contingency, engineering and design costs, construction management costs, and operations and maintenance costs. A summary of percentage values employed is provided in Table D-7.

Table D-7. Percentage-based cost items.

Cost Item	Percentage Add-on to Construction Cost	Cost Item Description
Construction Surveys	2.5%	A 2.5% multiplier is applied to the sum of the cost of all construction items except mobilization and demobilization to calculate this cost item, which includes activities related to surveying the borrow and fill areas of the project during construction.
Project Contingency	20%	A 20% multiplier is applied to the sum of the cost of all construction items to calculate this cost item, which is used to capture uncertainties and unexpected costs outside of the quantifiable aspects of the cost estimate.
Engineering and Design	10%	A 10% multiplier is applied to the sum of the cost of all construction items (but before contingency is applied) to calculate this cost item.
Construction Management	5%	A 5% multiplier is applied to the sum of the cost of all construction items (but before contingency is applied) to calculate this cost item.
Operations and Maintenance	5%	A 5% multiplier is applied to the sum of the cost of all construction items (but before contingency is applied) to calculate this cost item, which is related to surveying and monitoring after construction completion.

PROJECT SUMMARIES

This section summarizes all project costs for each of the modeled alternatives analyzed. These project costs are used by other aspects of the analysis, such as those reported in the *Social Return on Investment (SROI) Results* section. All costs are rounded to the nearest thousand.

Please note that acreages reported, while similar, can vary slightly across project documents. This is due to vegetation and wetland modeling, which calculates and accounts for vegetated acreage within each wetland restoration area differently than for cost estimating purposes. When marsh creation projects are implemented on the ground, they often do not result in the restoration footprint being populated completely by supratidal fill and vegetation. Differential settlement, material consolidation, dewatering, and a number of other factors lead to heterogeneous fill elevations and thus a mix of benefitted wetland and open waters within each restoration cell or polygon. Many of the components of implementation cost, especially mobilization and demobilization, design, construction management, and containment dikes are agnostic to the final land/water ratio created within a wetland creation cell.

The aim of the SROI analysis is to value each created wetland unit area (vegetated areas in acres). Thus, the SROI analysis documented in the report takes an average cost per acre from the applicable Alternative in this analysis and applies that average (and not the Alternative costs presented in this section) to apply to the direct acres created as opposed to the total benefitted acreage (including open waters) within a wetland restoration polygon.

Alternative 1

Alternative 1 would create wetlands within a 1,430-acre area in open waters immediately east, southeast, and southwest of Leeville, LA, which is 7 miles north of Port Fourchon. Figure D-7 depicts the dredge fill areas, dredge pipeline corridors, and dredge areas for Alternative 1. Table D-8 summarizes the cost estimate for Alternative 1.

Figure D-7. Alternative 1 fill areas, dredge pipeline corridors, and dredge area.

Table D-8. Alternative 1 cost estimate.

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Mobilization and Demobilization	1	LS	$9,052,000	$9,052,000
2	Wetland Restoration	12,034,403	CY	$7.86	$94,573,000
3	Earthen Containment Dikes	178,501	LF	$60.10	$10,728,000
4	Settlement Plates	29	per plate	$4,000	$116,000
5	Vegetative Plantings	859	Acre	$5,000	$4,295,000
6	Construction Surveys	1	LS	$2,743,000	$2,743,000
Estimated Construction Cost					$121,507,000
8	Contingency				$24,301,000
9	Engineering and Design				$12,151,000
10	Construction Management				$6,075,000
11	Operations and Maintenance				$6,075,000
Total Cost					**$170,109,000**

Alternative 2

Alternative 2 would create wetlands within a 2,490-acre area south of Leeville, LA, and 3.5 miles north of Port Fourchon. Project sites are bounded by Bayou Lafourche to the west and LA Highway 1 to the east. Figure D-8 depicts the dredge fill areas, dredge pipeline corridors, and dredge areas for Alternative 2. Table D-9 summarizes the cost estimate for Alternative 2.

Figure D-8. Alternative 2 fill areas, dredge pipeline corridors, and dredge area.

Table D-9. Alternative 2 cost estimate.

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Mobilization and Demobilization	1	LS	$6,393,000	$6,393,000
2	Wetland Restoration	18,143,116	CY	$7.19	$130,378,000
3	Earthen Containment Dikes	174,567	LF	$60.10	$10,491,000
4	Settlement Plates	50	per plate	$4,000	$200,000
5	Vegetative Plantings	1,494	Acre	$5,000	$7,470,000
6	Construction Surveys	1	LS	$3,713,000	$3,713,000
Estimated Construction Cost					$158,645,000
8	Contingency				$31,729,000
9	Engineering and Design				$15,865,000
10	Construction Management				$7,932,000
11	Operations and Maintenance				$7,932,000
Total Cost					**$222,103,000**

Alternative 3

Alternative 3 would create wetlands within a 2,460-acre area immediately north of existing wetland mitigation areas north of Port Fourchon. Project sites are bounded by Bayou Lafourche to the west and LA Highway 1 to the east. Figure D-9 depicts the dredge fill areas, dredge pipeline corridors, and dredge areas for Alternative 3. Table D-10 summarizes the cost estimate for Alternative 3.

Figure D-9. Alternative 3 fill areas, dredge pipeline corridors, and dredge area.

Table D-10. Alternative 3 cost estimate.

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Mobilization and Demobilization	1	LS	$3,322,000	$3,322,000
2	Wetland Restoration	18,604,775	CY	$5.31	$98,791,000
3	Earthen Containment Dikes	186,934	LF	$60.10	$11,235,000
4	Settlement Plates	49	per plate	$4,000	$196,000
5	Vegetative Plantings	1,475	Acre	$5,000	$7,373,000
6	Construction Surveys	1	LS	$2,940,000	$2,940,000
Estimated Construction Cost					$123,857,000
8	Contingency				$24,771,000
9	Engineering and Design				$12,386,000
10	Construction Management				$6,193,000
11	Operations and Maintenance				$6,193,000
Total Cost					**$173,400,000**

Alternative 4

Alternative 4 would create wetlands within a 1,676-acre area east of Bayou Lafourche and Port Fourchon and immediately north of the West Bell Pass headland. Portions of these project polygons include those being pursued for construction for the CWPPRA West Fourchon Marsh Creation (TE-0134), which, at the time of the analysis, did not have construction funding and thus were not included in FWOA. Figure D-10 depicts the dredge fill areas, dredge pipeline corridors, and dredge areas for Alternative 4. Table D-11 summarizes the cost estimate for Alternative 4.

Figure D-10. Alternative 4 fill areas, dredge pipeline corridors, and dredge area.

Table D-11. Alternative 4 cost estimate

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Mobilization and Demobilization	1	LS	$2,044,000	$2,044,000
2	Wetland Restoration	8,820,745	CY	$5.31	$46,838,000
3	Earthen Containment Dikes	156,507	LF	$60.10	$9,406,000
4	Settlement Plates	34	per plate	$4,000	$136,000
5	Vegetative Plantings	1,006	Acre	$5,000	$5,029,000
6	Construction Surveys	1	LS	$1,535,000	$1,535,000
Estimated Construction Cost					$64,988,000
8	Contingency				$12,998,000
9	Engineering and Design				$6,499,000
10	Construction Management				$3,249,000
11	Operations and Maintenance				$3,249,000
Total Cost					**$90,983,000**

Alternative 5

Alternative 5 would create wetlands within a 2,350-acre area immediately west of Port Fourchon and LA Highway 3090. Project sites are bounded by Port Fourchon to the north and west, LA Highway 1 to the North, and the Caminada Headland shore to the south. Figure D-11 depicts the dredge fill areas, dredge pipeline corridors, and dredge areas for Alternative 5. Table D-12 summarizes the cost estimate for Alternative 5.

Figure D-11. Alternative 5 fill areas, dredge pipeline corridors, and dredge area.

Table D-12. Alternative 5 cost estimate.

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Mobilization and Demobilization	1	LS	$4,779,000	$4,779,000
2	Wetland Restoration	15,497,685	CY	$5.31	$82,293,000
3	Earthen Containment Dikes	236,212	LF	$60.10	$14,196,000
4	Settlement Plates	47	per plate	$4,000	$188,000
5	Vegetative Plantings	1,411	Acre	$5,000	$7,054,000
6	Construction Surveys	1	LS	$2,593,000	$2,593,000
Estimated Construction Cost					$111,103,000
8	Contingency				$22,221,000
9	Engineering and Design				$11,110,000
10	Construction Management				$5,555,000
11	Operations and Maintenance				$5,555,000
Total Cost					**$155,544,000**

Alternative 6

Alternative 6 would create wetlands within a 699-acre area along remnant ridges east of Port Fourchon and south of LA Highway 1. Figure D-12 depicts the dredge fill areas, dredge pipeline corridors, and dredge areas for Alternative 6. Table D-13 summarizes the cost estimate for Alternative 6.

Figure D-12. Alternative 6 fill areas, dredge pipeline corridors, and dredge area.

Table D-13. Alternative 6 cost estimate.

Item No.	Work or Material	Quantity	Unit	Unit Cost	Amount
1	Mobilization and Demobilization	1	LS	$5,010,000	$5,010,000
2	Wetland Restoration	4,090,115	CY	$5.31	$21,719,000
3	Earthen Containment Dikes	212,415	LF	$60.10	$12,766,000
4	Settlement Plates	14	per plate	$4,000	$56,000
5	Vegetative Plantings	419	Acre	$5,000	$2,097,000
6	Construction Surveys	1	LS	$916,000	$916,000
Estimated Construction Cost					$42,564,000
8	Contingency				$8,513,000
9	Engineering and Design				$4,256,000
10	Construction Management				$2,128,000
11	Operations and Maintenance				$2,128,000
Total Cost					**$59,589,000**

COST CALIBRATION

A cost calibration exercise was performed to compare estimated costs from this analysis to recently estimated costs by others for a similar project in the study area in to verify accuracy. The West Fourchon Marsh Creation CWPPRA project (TE-0134) provided a unique opportunity to compare cost estimates with 3rd-party planning level estimates for the same project since it was selected for CWPPRA Phase II implementation during the analysis period for this study. The overlapping polygons in Alternative 4 and TE-0134 (Figure D-13) were extracted to perform a comparison to the cost estimated in the CWPPRA program of $30.4M (CWPPRA, 2021). The estimated total cost from this POWC analysis was $30.6M, which was less than a 1% difference, giving the analysis team confidence the cost estimates were of acceptable accuracy.

Figure D-13. Overlapping polygons of TE-0134, West Fourchon Marsh Creation, which underwent modeling and cost estimation under the POWC analysis and separately by the CWPPRA program.

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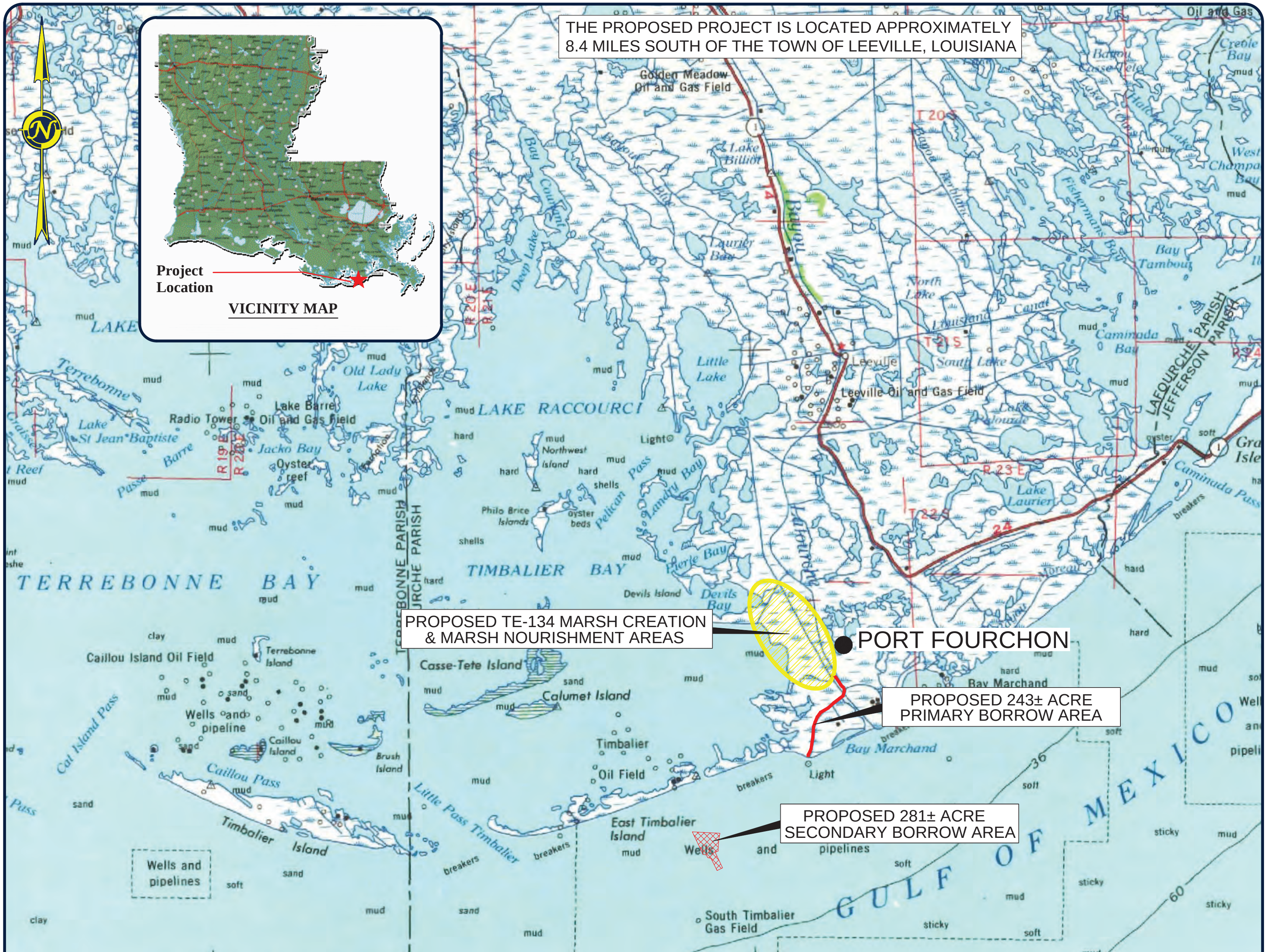
ATTACHMENT A. TE-0134 PERMIT PLATS



NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

4 MILES 0' 4 MILES 8 MILES 12 MILES

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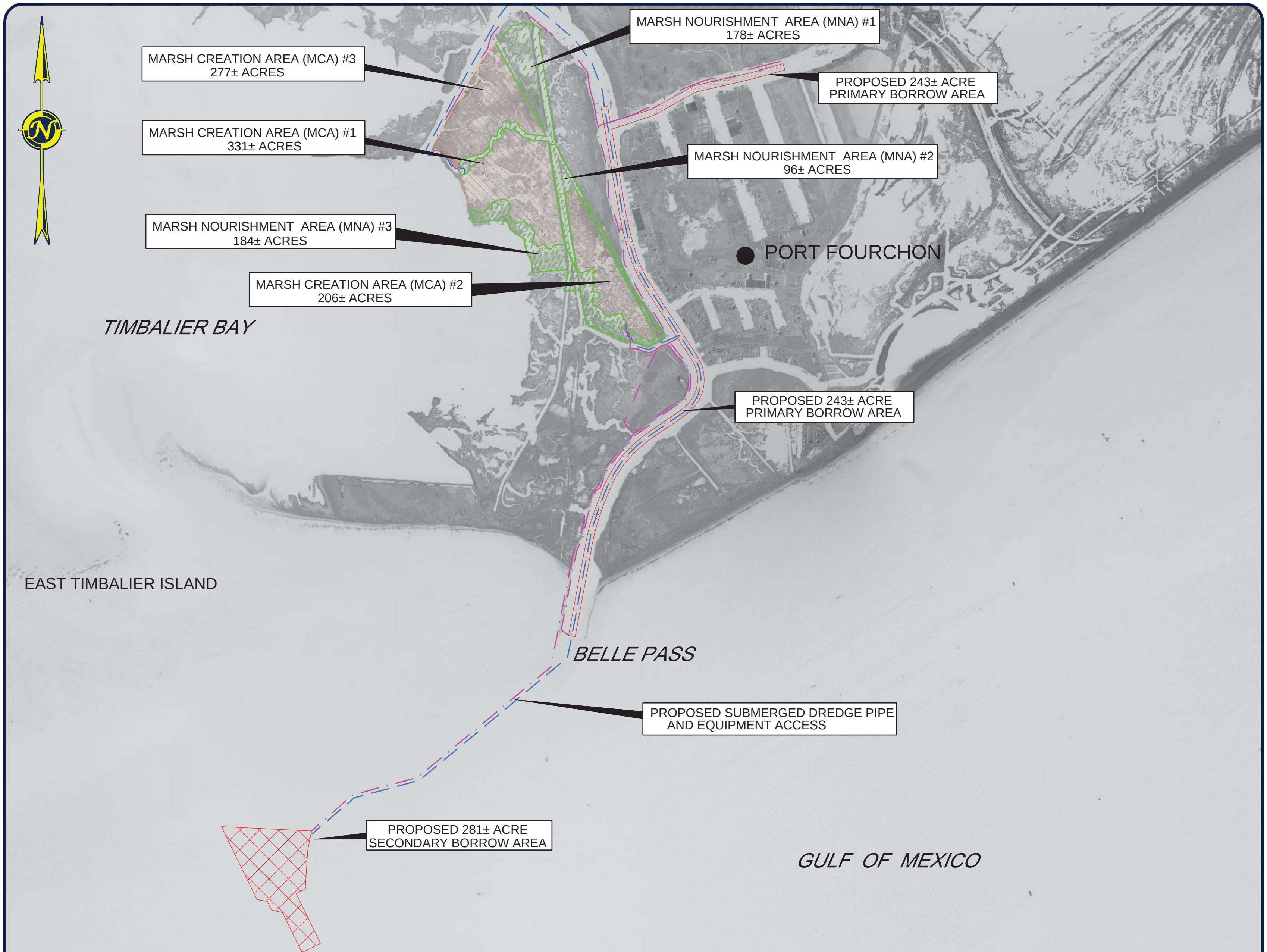
GREATER LAFOURCHE PORT COMMISSION

PROPOSED CWPPRA TE-0134 WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

VICINITY MAP

Project number	39130-1162-0701
Date	Dec 2021
Designed by	CPRA
Drawn by	JMH
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022



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- DREDGE SEDIMENT PIPE
- ACCESS ROUTE
- PRIMARY BORROW SITE
- SECONDARY BORROW SITE
- MARSH CREATION AREA
- MARSH NOURISHMENT AREA

6,500' 0' 6,500' 13,000' 19,500'

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PROPOSED CWPPRA TE-0134 WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

PROJECT OVERVIEW

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Date	Dec 2021
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Drawn by	JMH
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022

2

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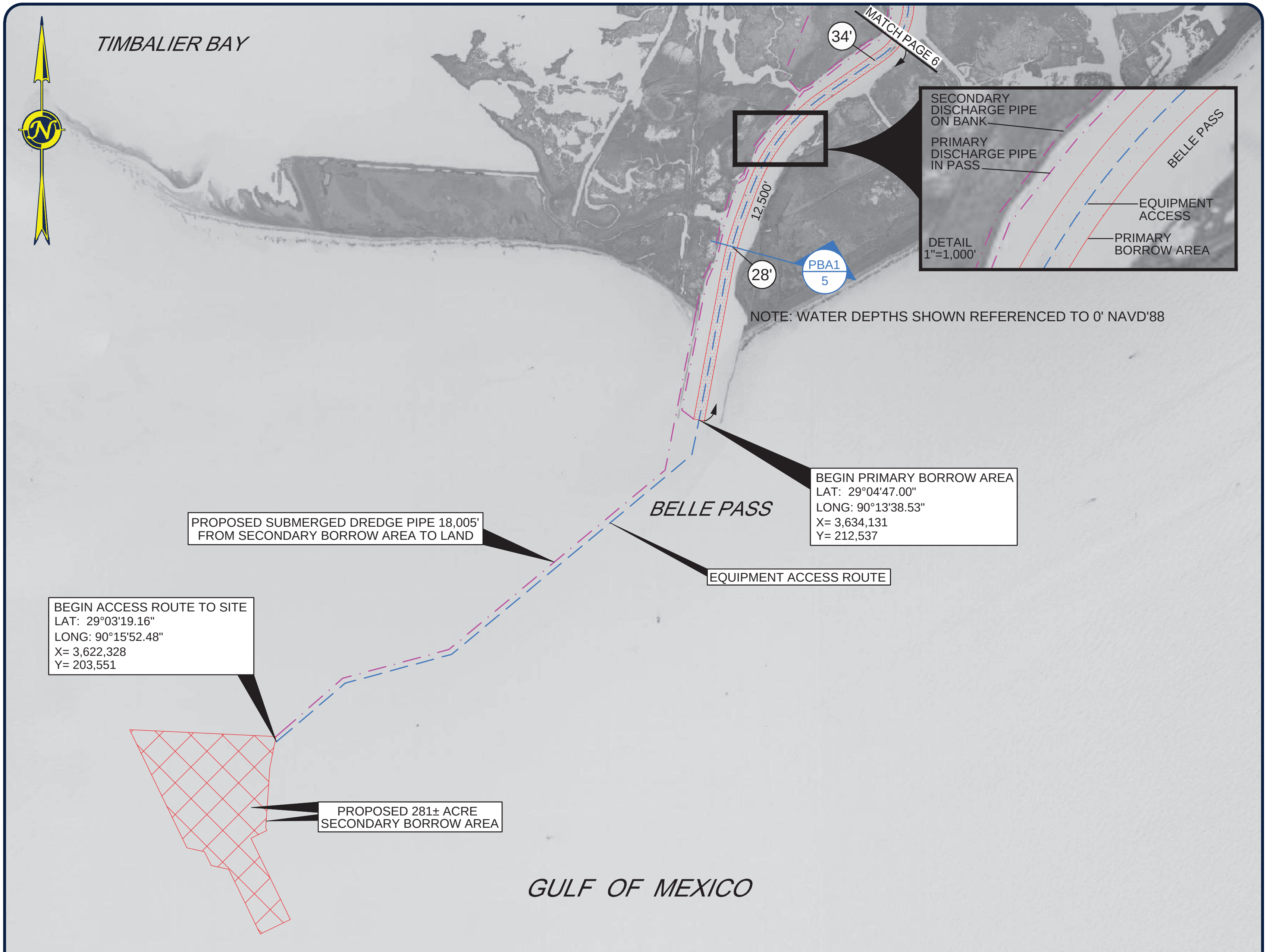

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PBA1 — SECTION NUMBER
5 — PAGE NUMBER

28' — WATER DEPTH (0' NAVD '88)

DREDGE SEDIMENT PIPE
ACCESS ROUTE
PRIMARY BORROW SITE
SECONDARY BORROW SITE

4,000' 0' 4,000' 8,000' 12,000'

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ACCESS & PRIMARY BORROW AREA

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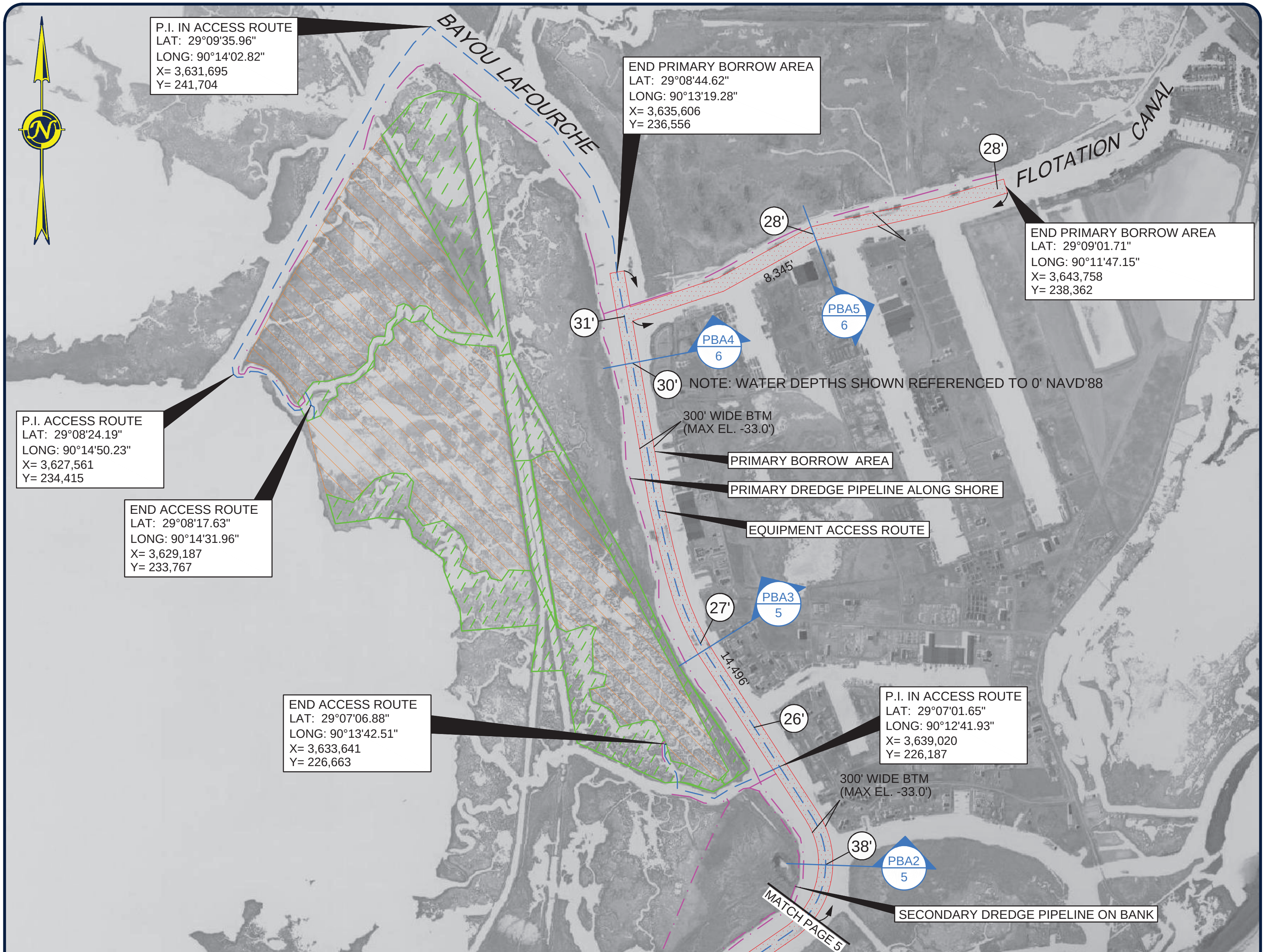

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PBA1 / 5 — SECTION NUMBER / PAGE NUMBER

28' — WATER DEPTH (0' NAVD '88)

- DREDGE SEDIMENT PIPE
- ACCESS ROUTE
- PRIMARY BORROW SITE
- MARSH CREATION AREA
- MARSH NOURISHMENT AREA

3,000' 0' 3,000' 6,000' 9,000'

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ACCESS & PRIMARY BORROW AREA

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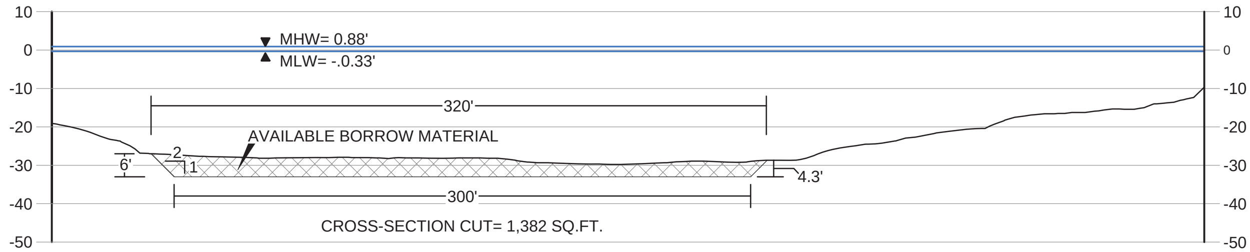
PRIMARY BORROW AREA SECT. 1



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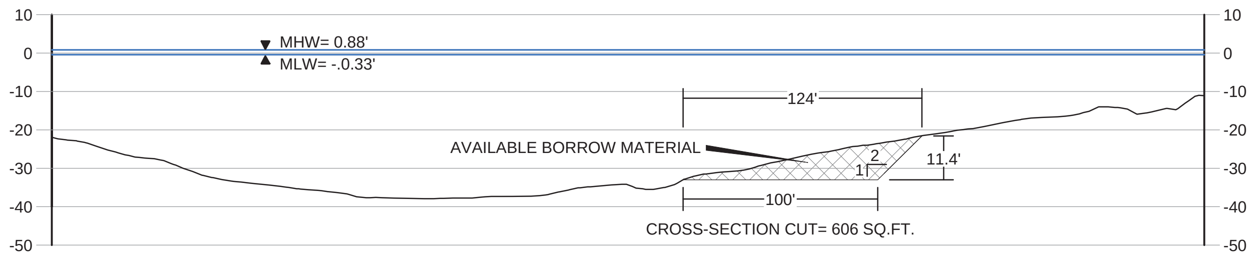

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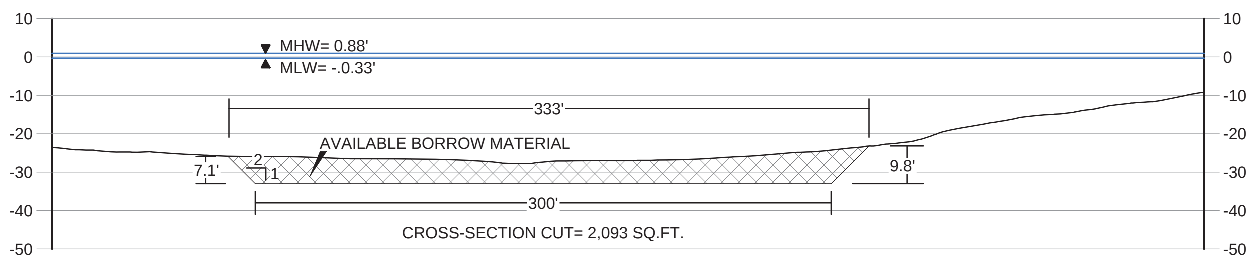

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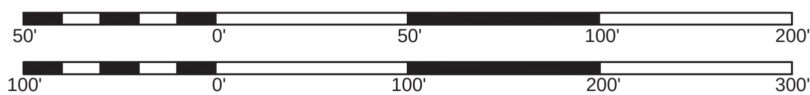
AVAILABLE BORROW MATERIAL

VERTICAL SCALE



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PRIMARY BORROW AREA CROSS SECTIONS

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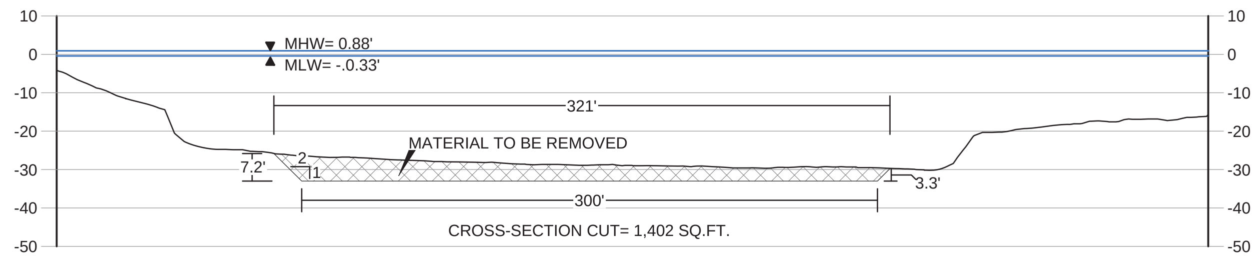
PRIMARY BORROW AREA SECT. 4



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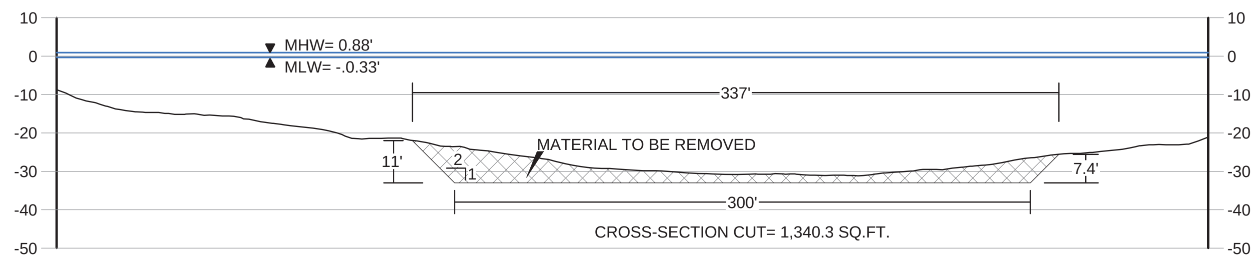

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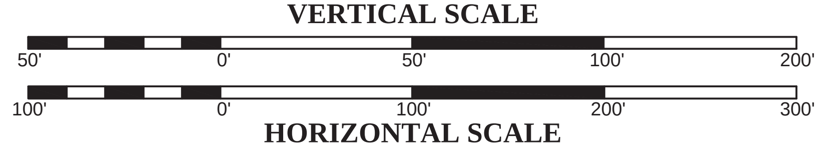
AVAILABLE BORROW MATERIAL



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PRIMARY BORROW AREA CROSS SECTIONS

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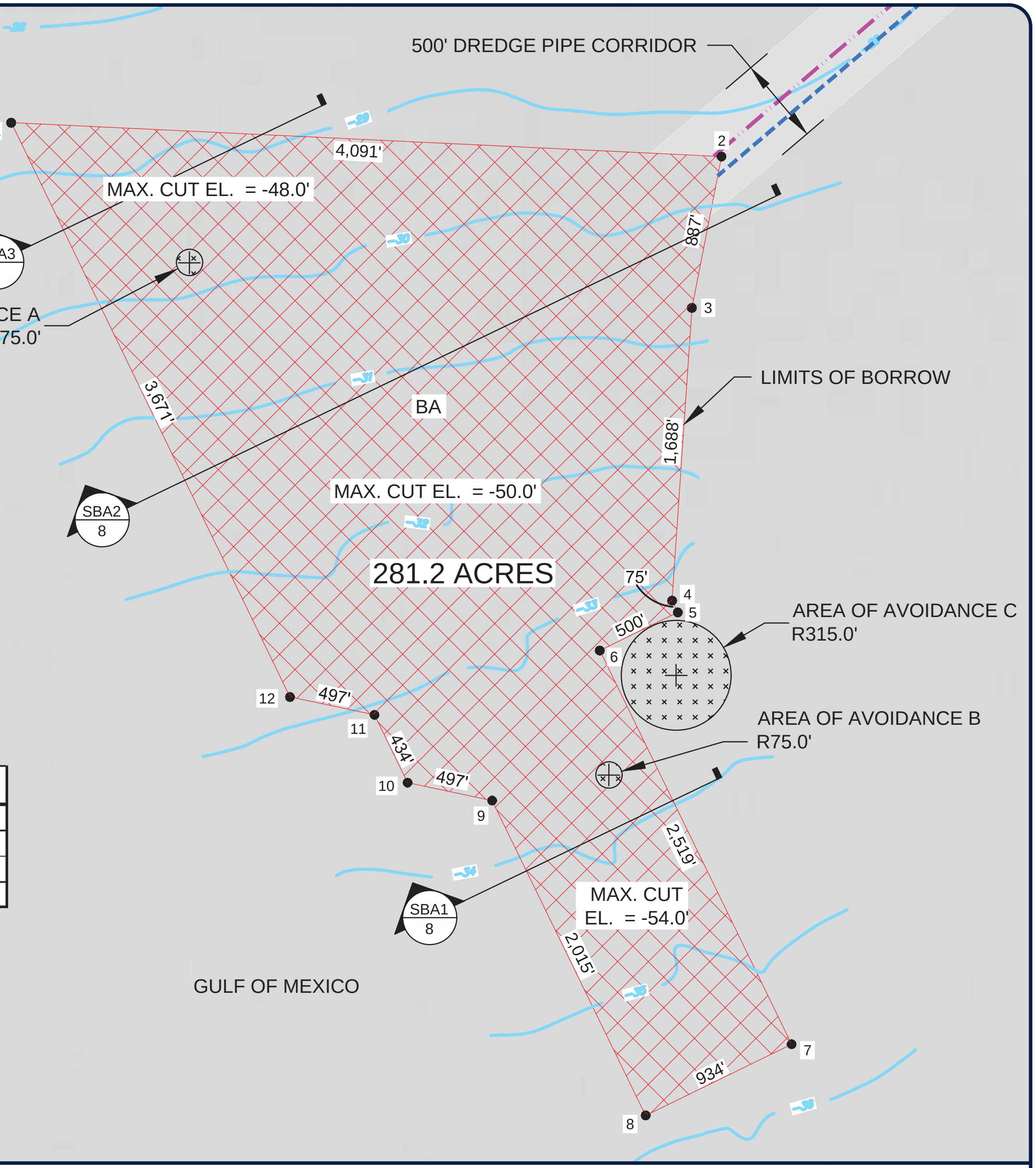

SECONDARY BORROW AREA

	LATITUDE	LONGITUDE
1	29° 03' 22.94"	90° 16' 38.60"
2	29° 03' 20.64"	90° 15' 52.58"
3	29° 03' 12.04"	90° 15' 54.59"
4	29° 02' 55.38"	90° 15' 56.05"
5	29° 02' 54.71"	90° 15' 55.69"
6	29° 02' 52.58"	90° 16' 00.77"
7	29° 02' 30.06"	90° 15' 48.58"
8	29° 02' 26.09"	90° 15' 58.07"
9	29° 02' 44.10"	90° 16' 07.84"
10	29° 02' 45.16"	90° 16' 13.31"
11	29° 02' 49.04"	90° 16' 15.41"
12	29° 02' 50.10"	90° 16' 20.88"

AREA OF AVOIDANCE

	LATITUDE	LONGITUDE	RADIUS (FT)
A	29° 03' 14.88"	90° 16' 27.14"	75
B	29° 02' 45.48"	90° 16' 00.26"	75
C	29° 02' 51.12"	90° 15' 55.84"	315

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

SBA1 / 4 — SECTION NUMBER / PAGE NUMBER

SECONDARY BORROW AREA

AREA OF AVOIDANCE

DREDGE PIPELINE CORRIDOR

EQUIPMENT ACCESS CORRIDOR

1,000' 0' 1,000' 2,000' 3,000'

HORIZONTAL SCALE

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SECONDARY BORROW AREA

Project number	39130-1162-0701
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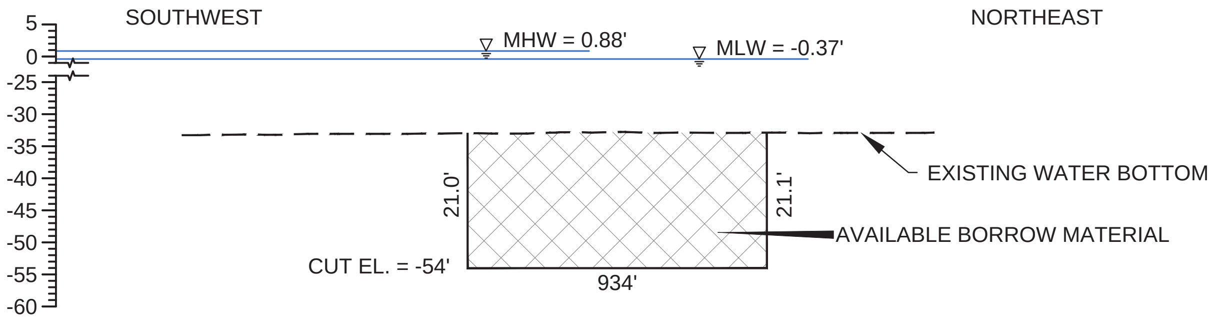
SECONDARY BORROW AREA SECTION SBA1



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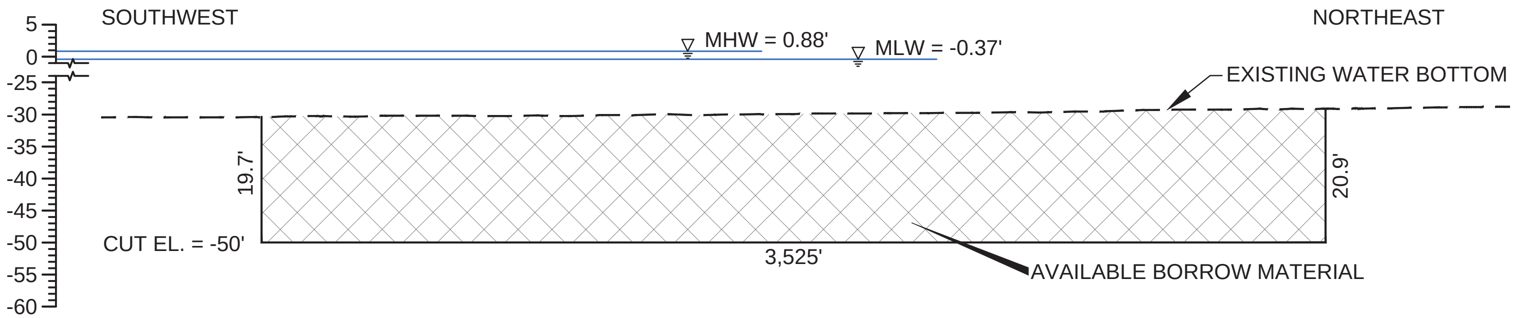

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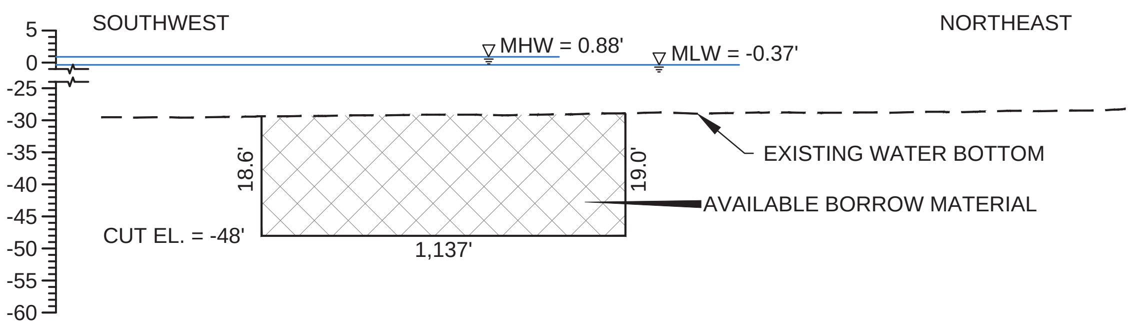

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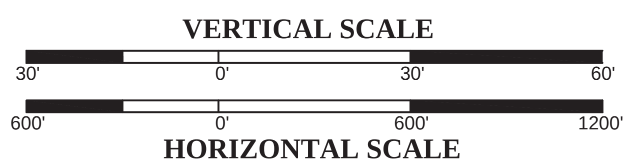
NOTE:
ELEVATIONS ARE REFERENCED TO NAVD 88, US FEET, GEOID 12A.

AVAILABLE BORROW MATERIAL

EXISTING WATER BOTTOM



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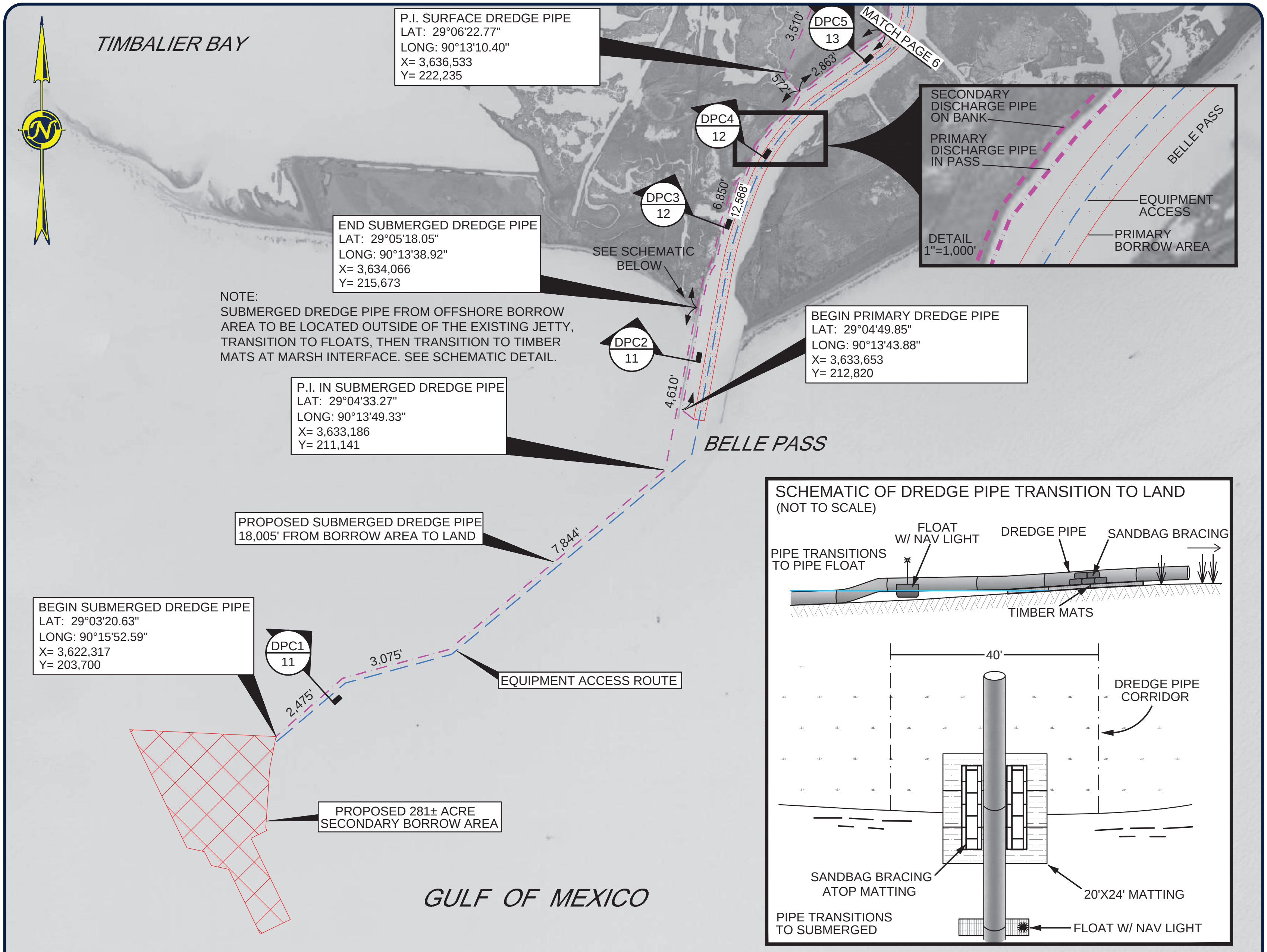
GREATER LAFOURCHE PORT COMMISSION
PROPOSED CWPPRA TE-0134
WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

SECONDARY BORROW AREA SECTIONS

Project number	39130-1162-0701
Date	Dec 2021
Designed by	CPRA
Drawn by	JMH
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022

8

C:\Users\jhorgis\Desktop\CPRA- Fourchon\Permit Drawings\PERMIT DWG IN ORDER\Dustin's Revision\POST CLIENT REVIEW DWG\8 BORROW AREA SECTIONS.dwg



NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

DPC1 / 11 — DREDGE PIPE CORRIDOR SECT. No. / PAGE NUMBER

DREDGE SEDIMENT PIPE

ACCESS ROUTE

PRIMARY BORROW SITE

SECONDARY BORROW SITE

4,000' 0' 4,000' 8,000' 12,000'

HORIZONTAL SCALE

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PROPOSED CWPPRA TE-0134 WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

DREDGE PIPELINE ROUTE

Project number	39130-1162-0701
Date	Dec 2021
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Checked by	MM
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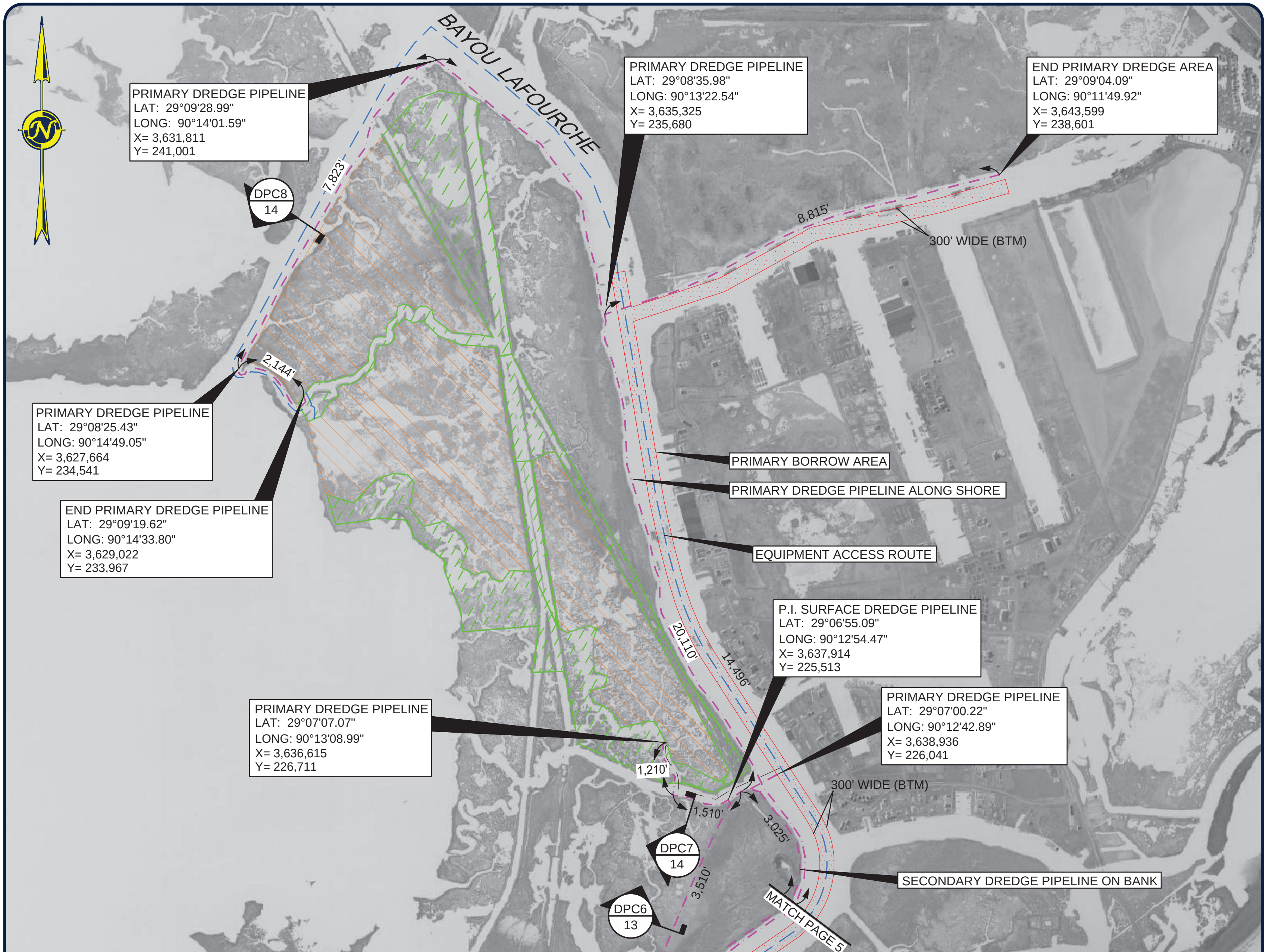

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DPC1 / 11 — DREDGE PIPE CORRIDOR SECT. No. / PAGE NUMBER

DREDGE SEDIMENT PIPE
ACCESS ROUTE
PRIMARY BORROW SITE
SECONDARY BORROW SITE
MARSH CREATION AREA
MARSH NOURISHMENT AREA

3,000' 0' 3,000' 6,000' 9,000'

HORIZONTAL SCALE

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PROPOSED CWPPRA TE-0134
WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

DREDGE PIPELINE ROUTES

Project number	39130-1162-0701
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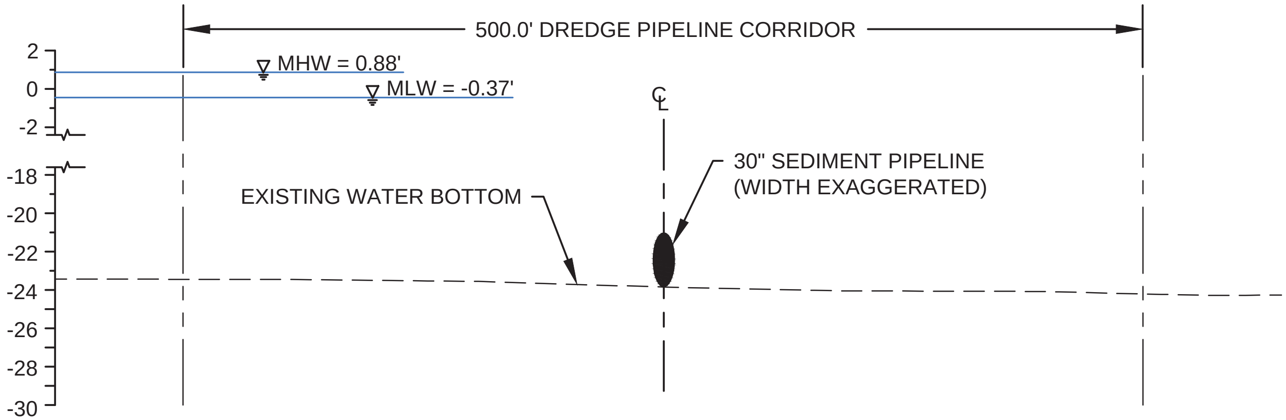
DREDGE PIPE CORRIDOR SECTION DPC 1



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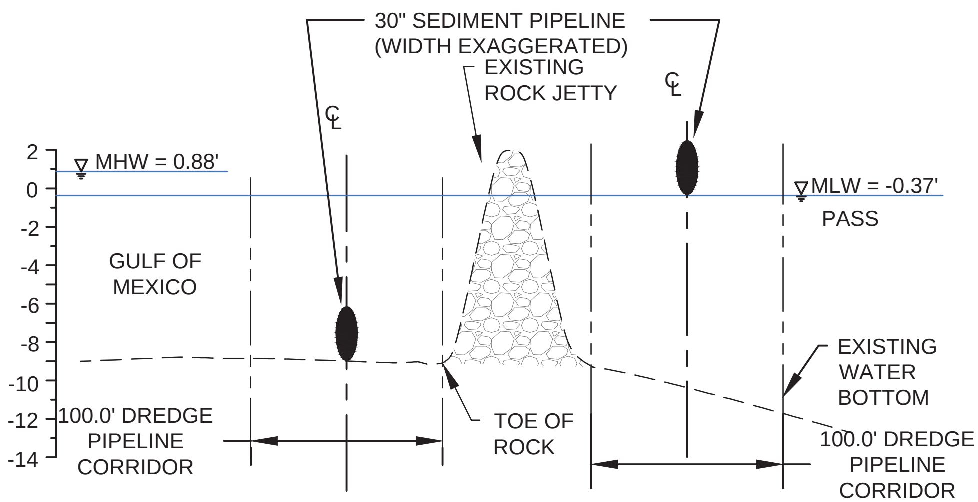

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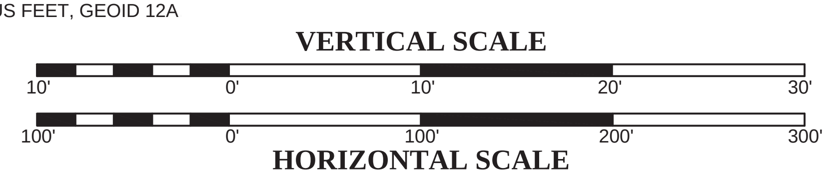

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WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

DREDGE PIPELINE CORRIDOR SECTIONS

Project number	39130-1162-0701
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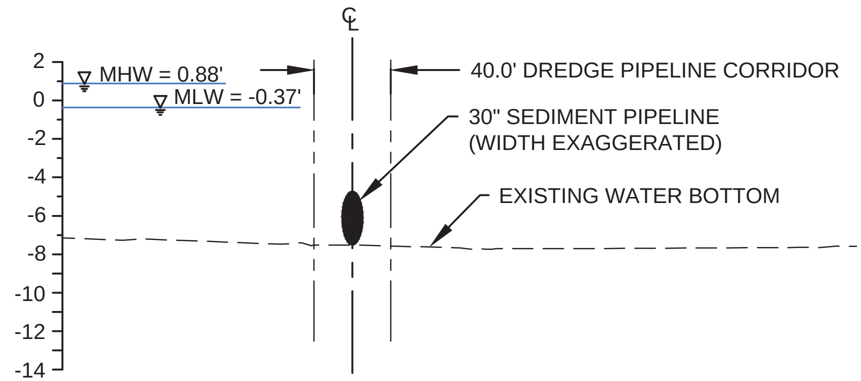
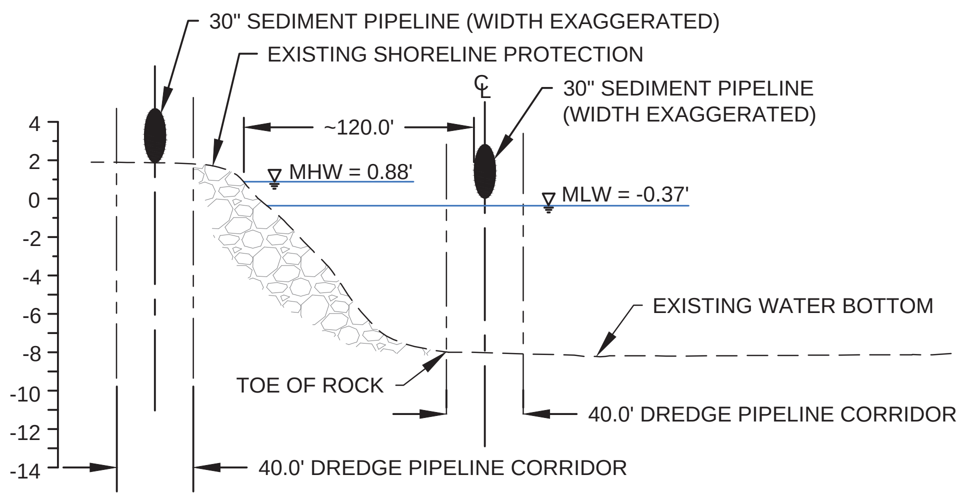
DREDGE PIPE CORRIDOR SECTION DPC 3



DREDGE PIPE CORRIDOR SECTION DPC 4



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NOTE:
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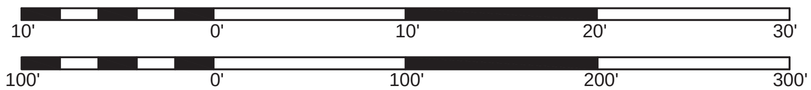
VERTICAL SCALE



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DREDGE PIPELINE CORRIDOR SECTIONS

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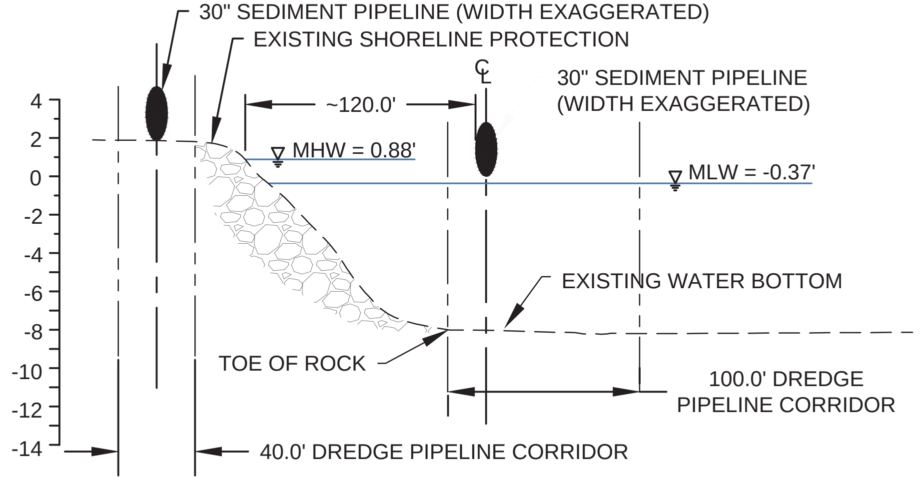
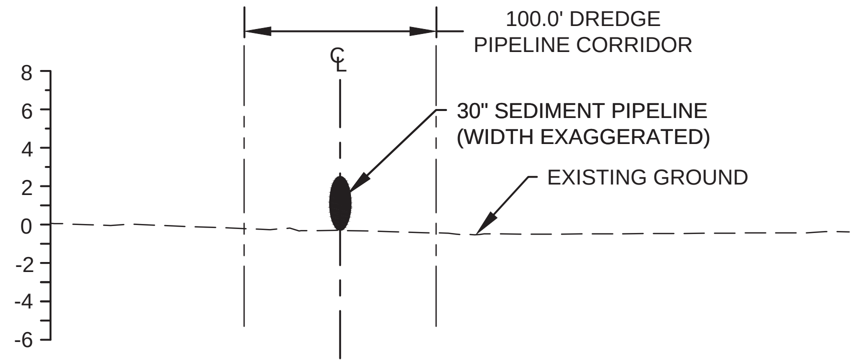
DREDGE PIPELINE CORRIDOR SECTION DPC 5



DREDGE PIPELINE CORRIDOR SECTION DPC 6



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NOTE:
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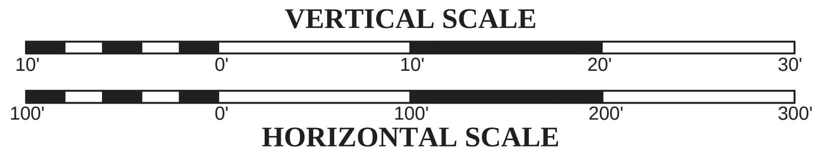

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DREDGE PIPELINE CORRIDOR SECTIONS

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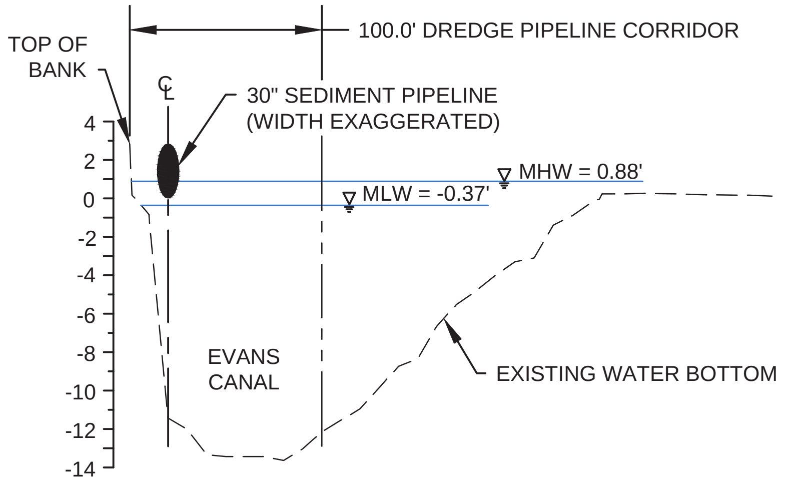
DREDGE PIPELINE CORRIDOR SECTION DPC 7



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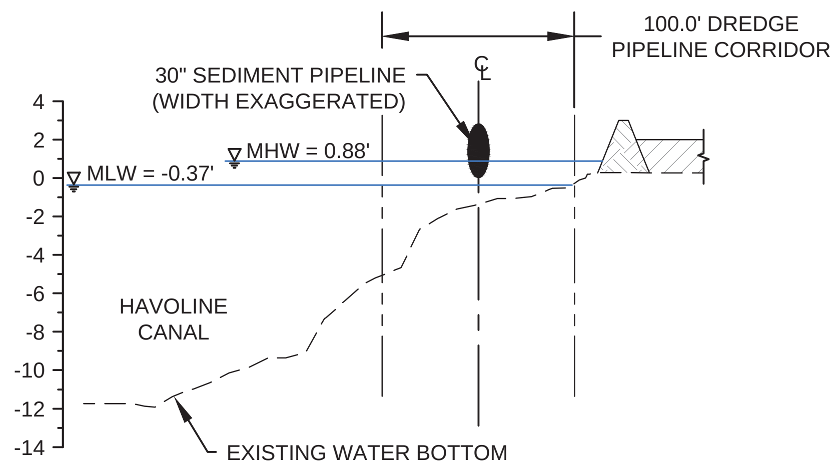

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NOTE:
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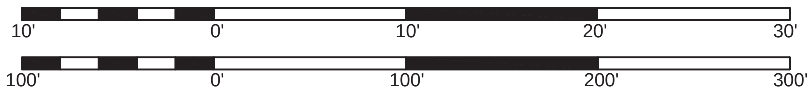
VERTICAL SCALE



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DREDGE PIPELINE CORRIDOR SECTIONS

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14

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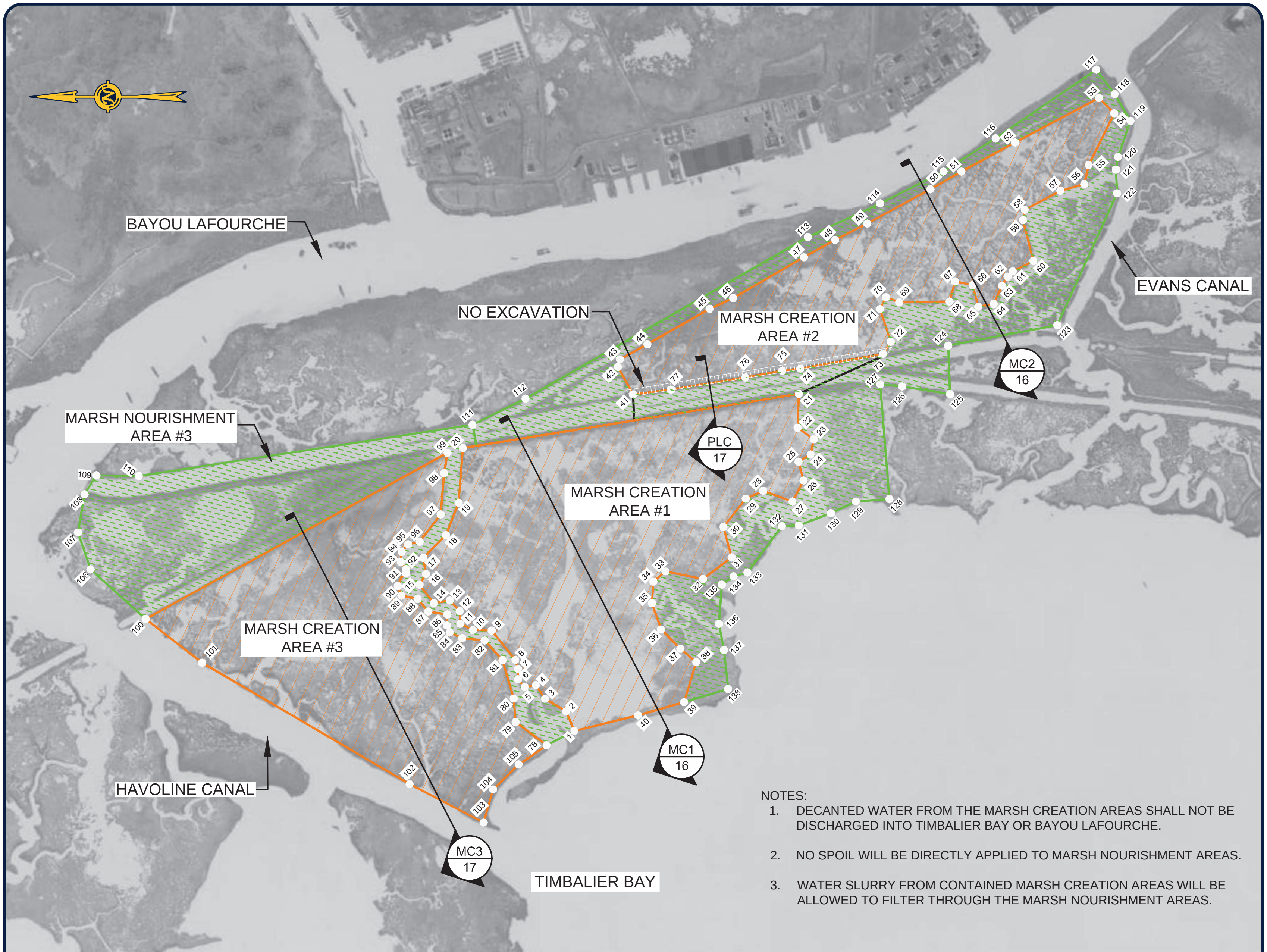

NOTES:

1. DECANTED WATER FROM THE MARSH CREATION AREAS SHALL NOT BE DISCHARGED INTO TIMBALIER BAY OR BAYOU LAFOURCHE.
2. NO SPOIL WILL BE DIRECTLY APPLIED TO MARSH NOURISHMENT AREAS.
3. WATER SLURRY FROM CONTAINED MARSH CREATION AREAS WILL BE ALLOWED TO FILTER THROUGH THE MARSH NOURISHMENT AREAS.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

MARSH CREATION AREA (MCA)

MARSH NOURISHMENT AREA

EARTHEN CONTAINMENT DIKE

MC3 / 12 — MARSH CREATION AREA SECTION No. / PAGE NUMBER

PLC / 17 — PIPELINE CORRIDOR CROSS-SECTION / PAGE NUMBER

3,000' 0' 3,000' 6,000' 9,000'

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GREATER LAFOURCHE PORT COMMISSION

PROPOSED CWPPRA TE-0134 WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

BOUNDARIES OF MARSH CREATION & NOURISHMENT AREAS

Project number	39130-1162-0701
Date	Dec 2021
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MARSH CREATION & NOURISHMENT		
	LATITUDE	LONGITUDE
1	29°08'14.31"	90°14'32.86"
2	29°08'15.42"	90°14'29 76"
3	29°08'18.32"	90°14'27.75"
4	29°08'19.56"	90°14'25.60"
5	29°08'21 11"	90°14'25 85"
6	29°08'22 01"	90°14'24 65"
7	29°08'22.01"	90°14'23.00"
8	29°08'22.36"	90°14'21.59"
9	29°08'25.62"	90°14'16 92"
10	29°08'28.19"	90°14'16.82"
11	29°08'29.93"	90°14'15 81"
12	29°08'29 99"	90°14'13 81"
13	29°08'31.35"	90°14'12.13"
14	29°08'33.57"	90°14'12.54"
15	29°08'35 52"	90°14'09 61"
16	29°08'34.61"	90°14'07 93"
17	29°08'34.97"	90°14'05.40"
18	29°08'31.80"	90°14'01 84"
19	29°08'29.99"	90°13'56.78"
20	29°08'29.36"	90°13'48.17"
21	29°07'42 83"	90°13'40 15"
22	29°07'43 06"	90°13'45 48"
23	29°07'40.83"	90°13'47.30"
24	29°07'41.29"	90°13'49.69"
25	29°07'42.96"	90°13'50 82"
26	29°07'42.30"	90°13'53.77"
27	29°07'43.87"	90°13'57 08"
28	29°07'47 87"	90°13'55 34"
29	29°07'50.30"	90°13'56.55"
30	29°07'53.43"	90°14'00.99"
31	29°07'52 34"	90°14'05 78"
32	29°07'56.33"	90°14'09 13"
33	29°08'01.51"	90°14'07.88"
34	29°08'03.20"	90°14'09 48"
35	29°08'03.42"	90°14'12.68"
36	29°08'02.21"	90°14'17.02"
37	29°07'59 55"	90°14'20 09"
38	29°07'57 37"	90°14'22 20"
39	29°07'59.10"	90°14'28.49"
40	29°08'05.48"	90°14'30.50"
41	29°08'05.74"	90°13'39 98"
42	29°08'07.80"	90°13'35.63"
43	29°08'07.51"	90°13'34 45"
44	29°08'03 71"	90°13'32 10"
45	29°07'55.06"	90°13'26.64"
46	29°07'51.79"	90°13'24.97"
47	29°07'41 96"	90°13'18 65"
48	29°07'37.61"	90°13'15 96"
49	29°07'33.15"	90°13'13.45"
50	29°07'24.37"	90°13'08 14"

MARSH CREATION & NOURISHMENT		
	LATITUDE	LONGITUDE
51	29°07'20.07"	90°13'05.41"
52	29°07'12.62"	90°13'00.92"
53	29°07'00.95"	90°12'54.04"
54	29°06'58.87"	90°12'56.48"
55	29°07'02.47"	90°13'04.57"
56	29°07'03.09"	90°13'07.57"
57	29°07'06.42"	90°13'08.59"
58	29°07'11.37"	90°13'11.51"
59	29°07'11.61"	90°13'13.15"
60	29°07'10.24"	90°13'19.60"
61	29°07'13.10"	90°13'21.20"
62	29°07'13.82"	90°13'22.01"
63	29°07'14.62"	90°13'23.44"
64	29°07'15.78"	90°13'26.29"
65	29°07'17.93"	90°13'26.72"
66	29°07'18.68"	90°13'23.29"
67	29°07'21.09"	90°13'22.70"
68	29°07'21.88"	90°13'25.85"
69	29°07'28.83"	90°13'25.89"
70	29°07'30.68"	90°13'25.06"
71	29°07'31.50"	90°13'26.92"
72	29°07'30.06"	90°13'32.10"
73	29°07'31.13"	90°13'33.99"
74	29°07'42.61"	90°13'36.18"
75	29°07'45.12"	90°13'36.48"
76	29°07'50.20"	90°13'37.50"
77	29°08'00.50"	90°13'39.28"
78	29°08'25.97"	90°14'07.04"
79	29°08'22.41"	90°14'31.37"
80	29°08'22.64"	90°14'27.68"
81	29°08'24.15"	90°14'21.60"
82	29°08'26.58"	90°14'18.47"
83	29°08'29.70"	90°14'18.08"
84	29°08'31.41"	90°14'17.15"
85	29°08'31.78"	90°14'16.05"
86	29°08'31.71"	90°14'14.34"
87	29°08'34.35"	90°14'13.84"
88	29°08'35.79"	90°14'11.84"
89	29°08'38.03"	90°14'11.30"
90	29°08'38.53"	90°14'09.79"
91	29°08'37.37"	90°14'07.81"
92	29°08'37.37"	90°14'07.13"
93	29°08'38.07"	90°14'06.00"
94	29°08'37.94"	90°14'04.41"
95	29°08'37.04"	90°14'03.22"
96	29°08'35.44"	90°14'02.85"
97	29°08'32.49"	90°13'58.58"
98	29°08'31.97"	90°13'52.08"
99	29°08'31.47"	90°13'48.90"
100	29°09'13.42"	90°14'14.60"

MARSH CREATION & NOURISHMENT		
	LATITUDE	LONGITUDE
101	29°09'05.66"	90°14'21.55"
102	29°08'37.16"	90°14'40.97"
103	29°08'26.96"	90°14'47.13"
104	29°08'25.62"	90°14'41.93"
105	29°08'22.05"	90°14'38.03"
106	29°09'20.96"	90°14'06.70"
107	29°09'20.91"	90°14'00.89"
108	29°09'22.60"	90°13'54.85"
109	29°09'20.03"	90°13'51.89"
110	29°09'14.18"	90°13'52.08"
111	29°08'27.98"	90°13'44.51"
112	29°08'20.62"	90°13'40.48"
113	29°07'41.38"	90°13'15.48"
114	29°07'31.34"	90°13'10.31"
115	29°07'22.54"	90°13'05.37"
116	29°07'15.30"	90°13'00.22"
117	29°07'01.30"	90°12'49.59"
118	29°06'58.78"	90°12'53.46"
119	29°06'56.63"	90°12'57.69"
120	29°06'58.40"	90°13'03.34"
121	29°06'58.70"	90°13'05.36"
122	29°06'58.59"	90°13'09.08"
123	29°07'07.02"	90°13'29.74"
124	29°07'22.12"	90°13'32.78"
125	29°07'21.94"	90°13'40.42"
126	29°07'28.53"	90°13'39.14"
127	29°07'31.57"	90°13'38.78"
128	29°07'30.46"	90°13'56.83"
129	29°07'35.09"	90°13'57.16"
130	29°07'38.56"	90°13'58.99"
131	29°07'43.00"	90°14'00.86"
132	29°07'45.35"	90°14'00.93"
133	29°07'50.17"	90°14'08.17"
134	29°07'52.11"	90°14'08.76"
135	29°07'53.72"	90°14'10.05"
136	29°07'54.18"	90°14'16.22"
137	29°07'53.52"	90°14'20.34"
138	29°07'53.00"	90°14'26.48"

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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REVISIONS

No.	Description	Date

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED CWPPRA TE-0134
WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

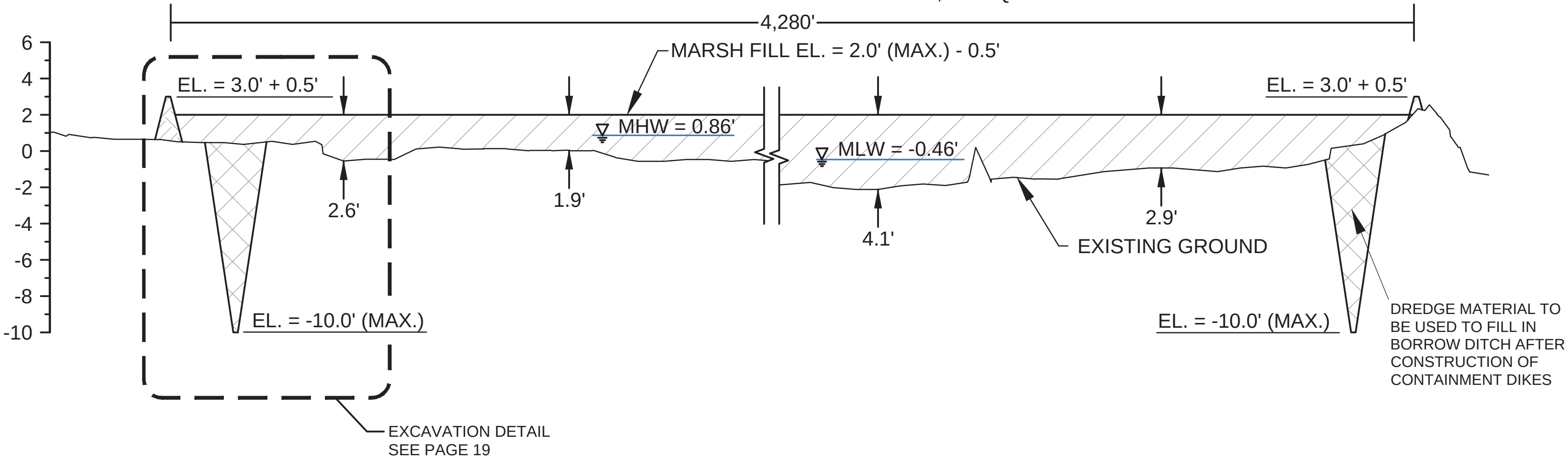
BOUNDARIES OF MARSH CREATION & NOURISHMENT AREAS

Project number	39130-1162-0701
Date	Dec 2021
Designed by	CPRA
Drawn by	JMH
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022

C:\Users\jhorgis\Desktop\CPRA- Fourchon\Permit Drawings\PERMIT DWG IN ORDER\Dustin's Revision\15-16 MARSH CREATION AREA & CHART.dwg

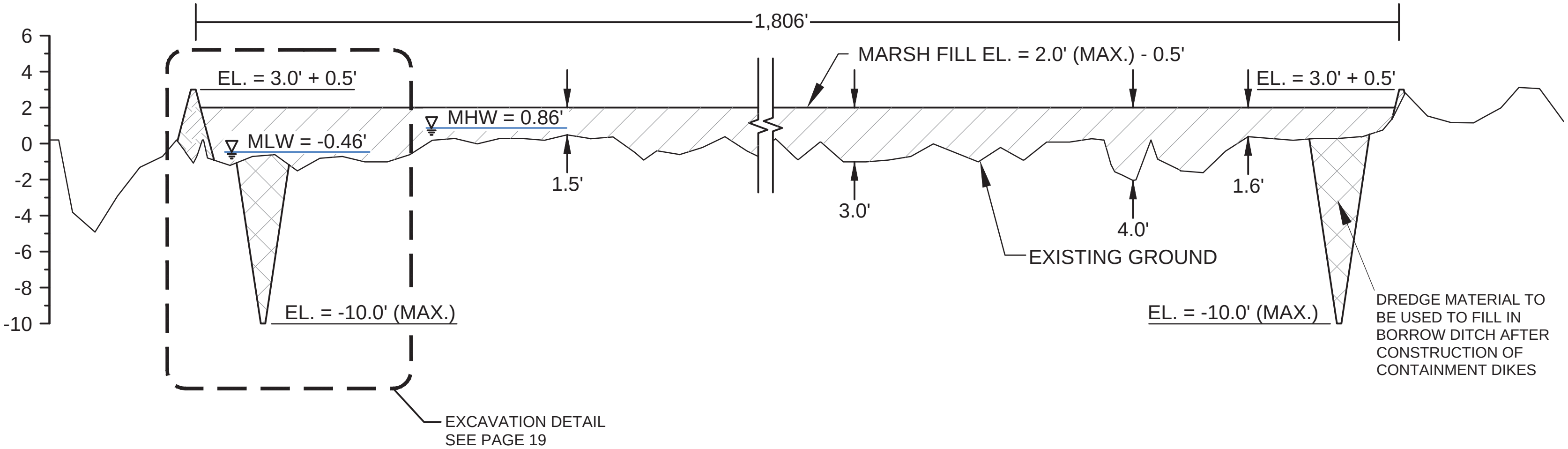
MARSH CREATION AREA 1 CROSS-SECTION

CROSS-SECTIONAL FILL AREA = 7,810 SQ. FT.



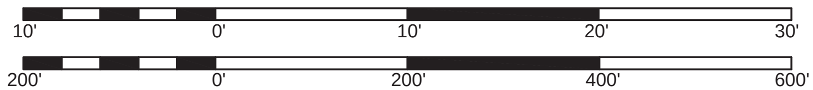
MARSH CREATION AREA 2 CROSS-SECTION

CROSS-SECTIONAL FILL AREA = 4,595 SQ. FT.



NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

VERTICAL SCALE



HORIZONTAL SCALE

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REVISIONS

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED CWPPRA TE-0134
WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

MARSH CREATION AREA SECTIONS

Project number	39130-1162-0701
Date	Dec 2021
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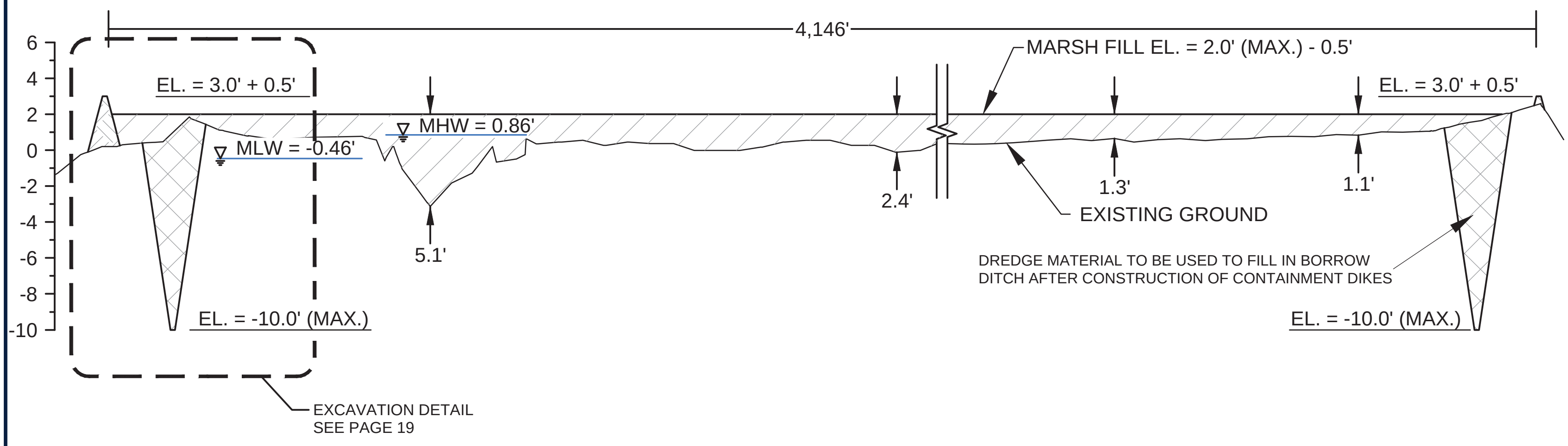
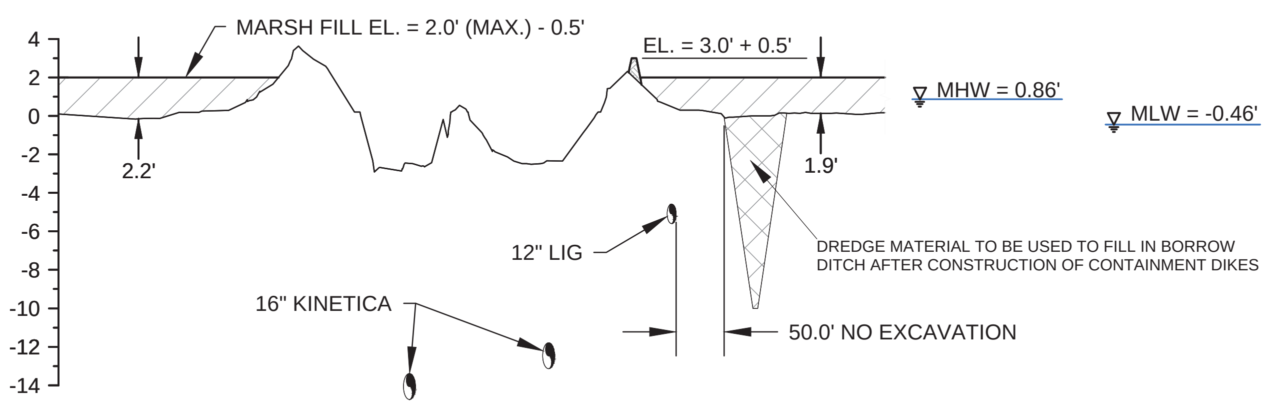
MARSH CREATION AREA 3 CROSS-SECTION

CROSS-SECTIONAL FILL AREA = 8,307 SQ. FT.



OIL AND GAS PIPELINE CORRIDOR CROSS-SECTION



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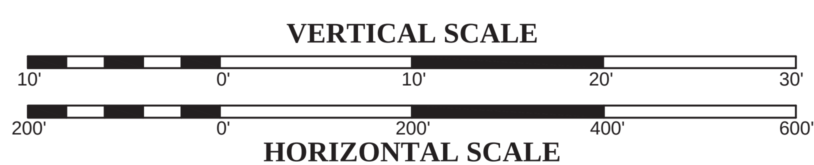

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GREATER LAFOURCHE PORT COMMISSION

PROPOSED CWPPRA TE-0134 WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

MARSH CREATION AREA SECTIONS

Project number	39130-1162-0701
Date	Dec 2021
Designed by	CPRA
Drawn by	JMH
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022

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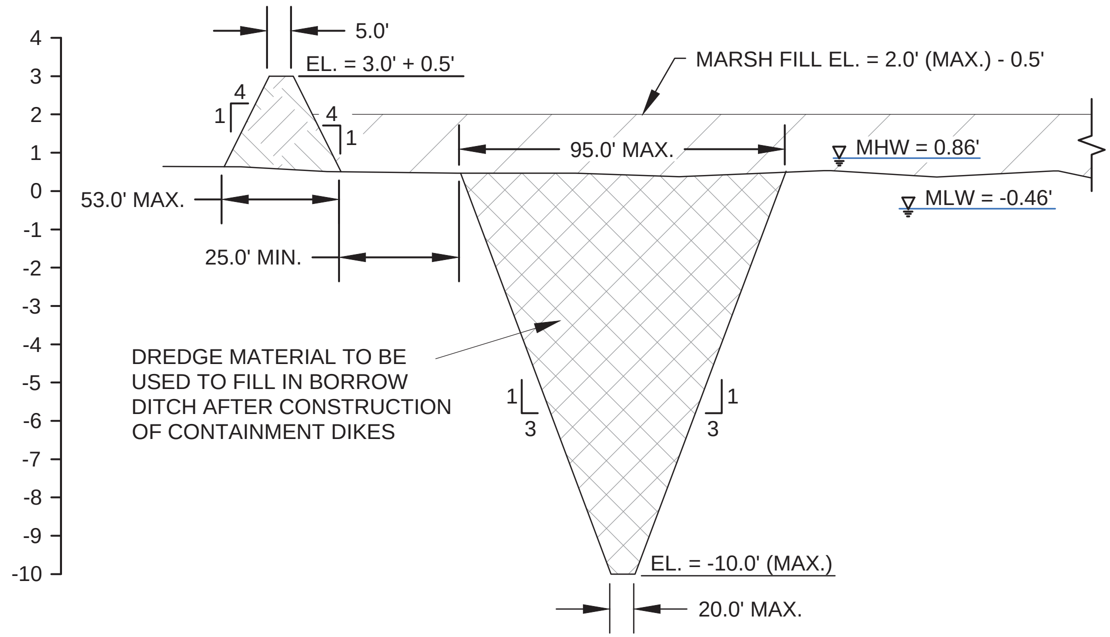
EARTHEN CONTAINMENT DIKE DETAIL



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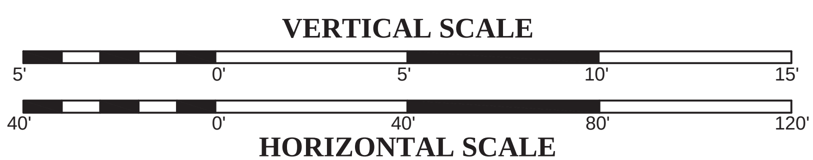

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PROPOSED CWPPRA TE-0134 WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

CONTAINMENT DIKE DETAILS

Project number	39130-1162-0701
Date	Dec 2021
Designed by	CPRA
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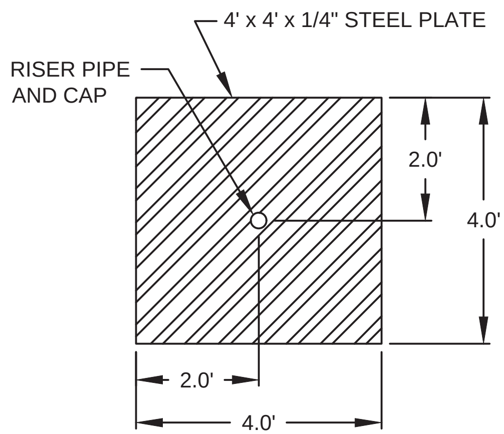
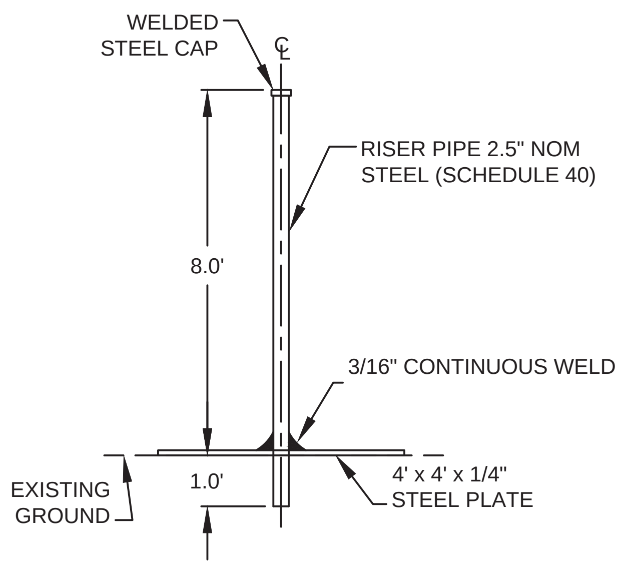
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022

NOTE:
CONTRACTOR TO DRIVE STAND PIPE BELOW GRADE TO THE DEPTH DETERMINED BY THE ENGINEER IN THE FIELD.



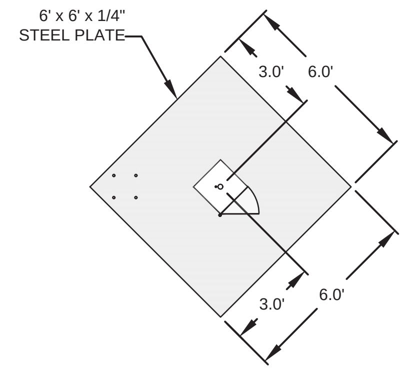
PLAN VIEW



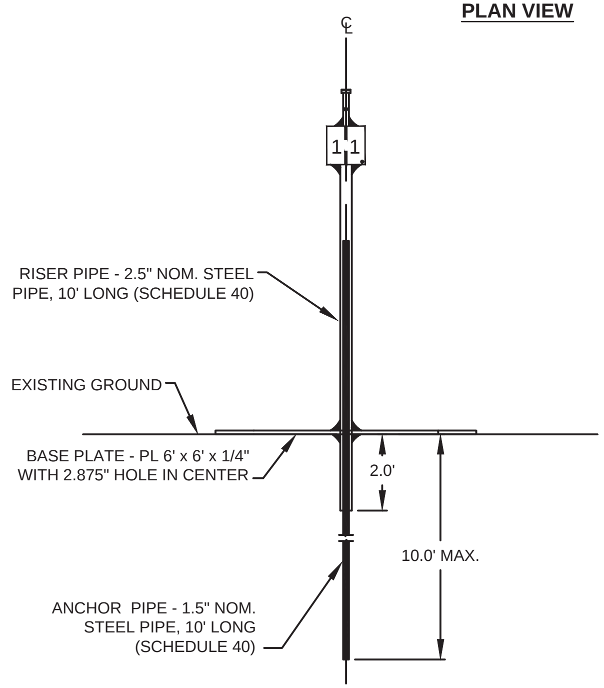
PROFILE VIEW

MARSH CREATION AREA SETTLEMENT PLATE

NTS



PLAN VIEW



PROFILE VIEW

INSTRUMENTED SETTLEMENT PLATE

NTS

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED CWPPRA TE-0134
WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

SETTLEMENT PLATE & GRADE STAKES

Project number	39130-1162-0701
Date	Dec 2021
Designed by	CPRA
Drawn by	JMH
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022

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Project Notes

The proposed project is for the proposed restoration and nourishment of existing marsh located west of Port Fourchon, Louisiana. Material borrow sites located both offshore and inshore are to be dredged to provide suitable material for the proposed restoration activities. Dredge material conveyance pipelines are to be installed along the water bottom, on the bank line, and floated along the bank line. Containment dikes are to be constructed to hold the dredge slurry for dewatering and settlement. Monitoring of the fill material elevation is to be performed during the fill operations.

- Approximately 814 acres of marsh are to be restored/recreated by dredge fill material.
- Approximately 4,050,000 cubic yards of material may be required for restoration and nourishment activities.
- Approximately 458 acres of existing marsh may receive supplemental nourishment from the decanted water to be discharged from the Marsh Creation Area containment dikes.
- The combined inshore primary borrow areas in Belle Pass, Bayou Lafourche, and Flotation Canal total approximately 243 acres and offers approximately 2,500,000 cubic yards of material.
- The proposed offshore secondary borrow area is approximately 281 acres and has the potential to provide 9,050,000 cubic yards of material.
- Approximately 18,004' of a submerged dredge pipeline is to be temporarily installed on the water bottom at the offshore borrow site and to the shoreline at Belle Pass.
- Approximately 19,540' of dredge pipeline is to be installed on the banks. Doing so will require a 40' wide workspace and thus represents a 17.9 acres surface impact.
- Approximately 51,462' of floating dredge pipeline may be utilized in Belle Pass, Bayou Lafourche, and Havoline Canal.

NDSI Notes

- As-built drawings and/or plats shall have written on them the date of completion of said activities and shall be submitted to the Louisiana Department of Natural Resources, Office of Coastal Management, P. O. Box 44487, Baton Rouge, LA 70804-4487 within 30 days following project completion.
- All structures built under the authorization and conditions of this permit shall be removed from the site within 120 days of abandonment of the facilities for the herein permitted use, or when these structures fall into a state of disrepair such that they can no longer function as intended. This condition does not preclude the necessity for revising the current permit or obtaining a separate Coastal Use Permit, should one be required, for such removal activities.
- Structures must also be marked/lighted in accordance with U. S. Coast Guard regulations.
- In order to ensure the safety of all parties, the permittee shall contact the Louisiana One Call System (1-800-272-3020) a minimum of 48 hours prior to the commencement of any excavation (digging, dredging, jetting, etc.) or demolition activity.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED CWPPRA TE-0134
WEST FOURCHON MARSH RESTORATION AND NOURISHMENT PROJECT

NOTES

Project number	39130-1162-0701
Date	Dec 2021
Designed by	CPRA
Drawn by	JMH
Checked by	MM
Checked by	MM
Plot Date	January 23, 2022

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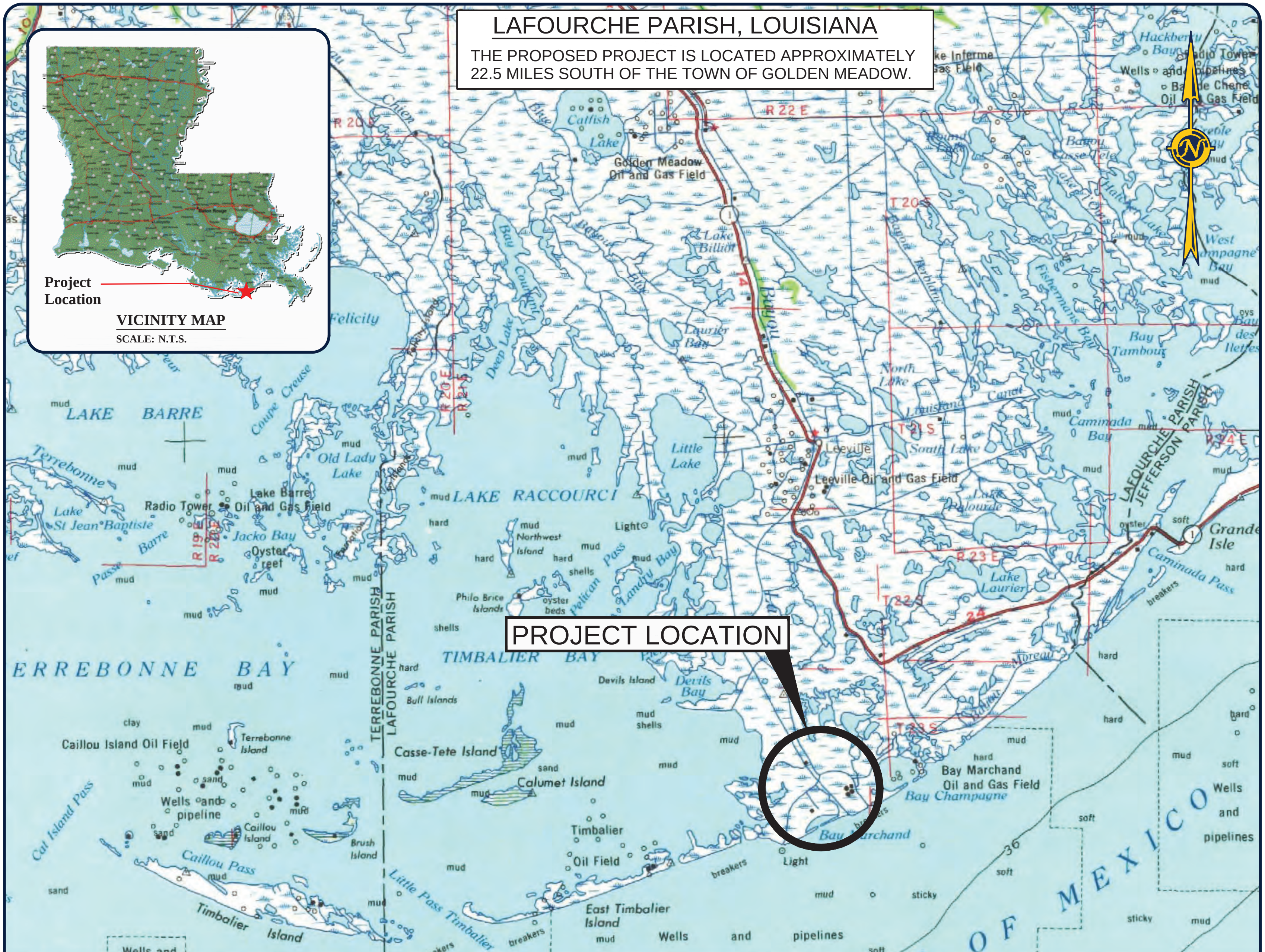
ATTACHMENT B. GLPC EXPANSION PERMIT PLATS



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4 miles 0' 4 miles 8 miles

HORIZONTAL SCALE

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LA. LICENSE NO. 00000

GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

VICINITY

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

1

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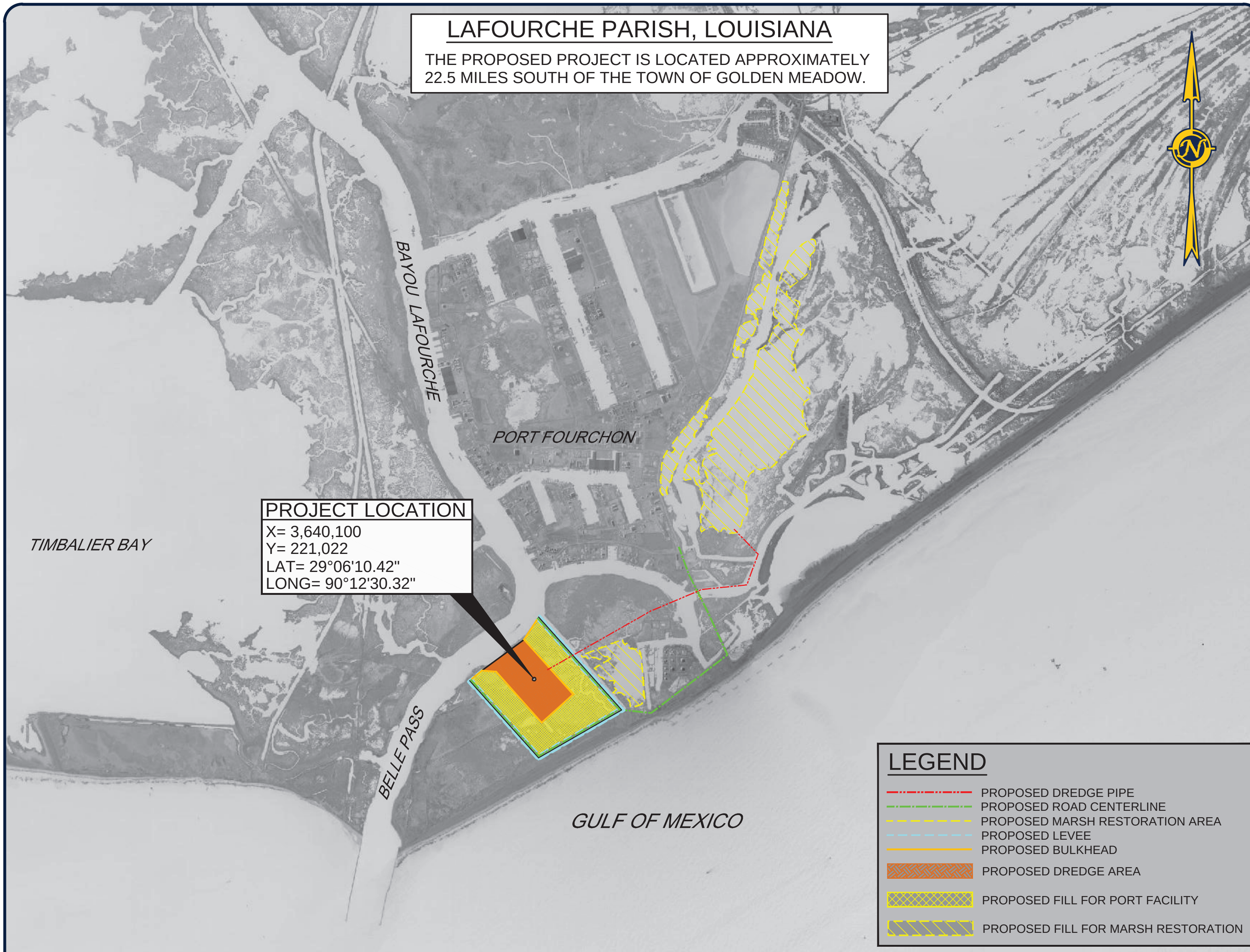

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5,000' 0' 5,000' 10,000'

HORIZONTAL SCALE

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ENGINEER'S NAME
LA. LICENSE NO. 00000

GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROJECT OVERVIEW

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

2

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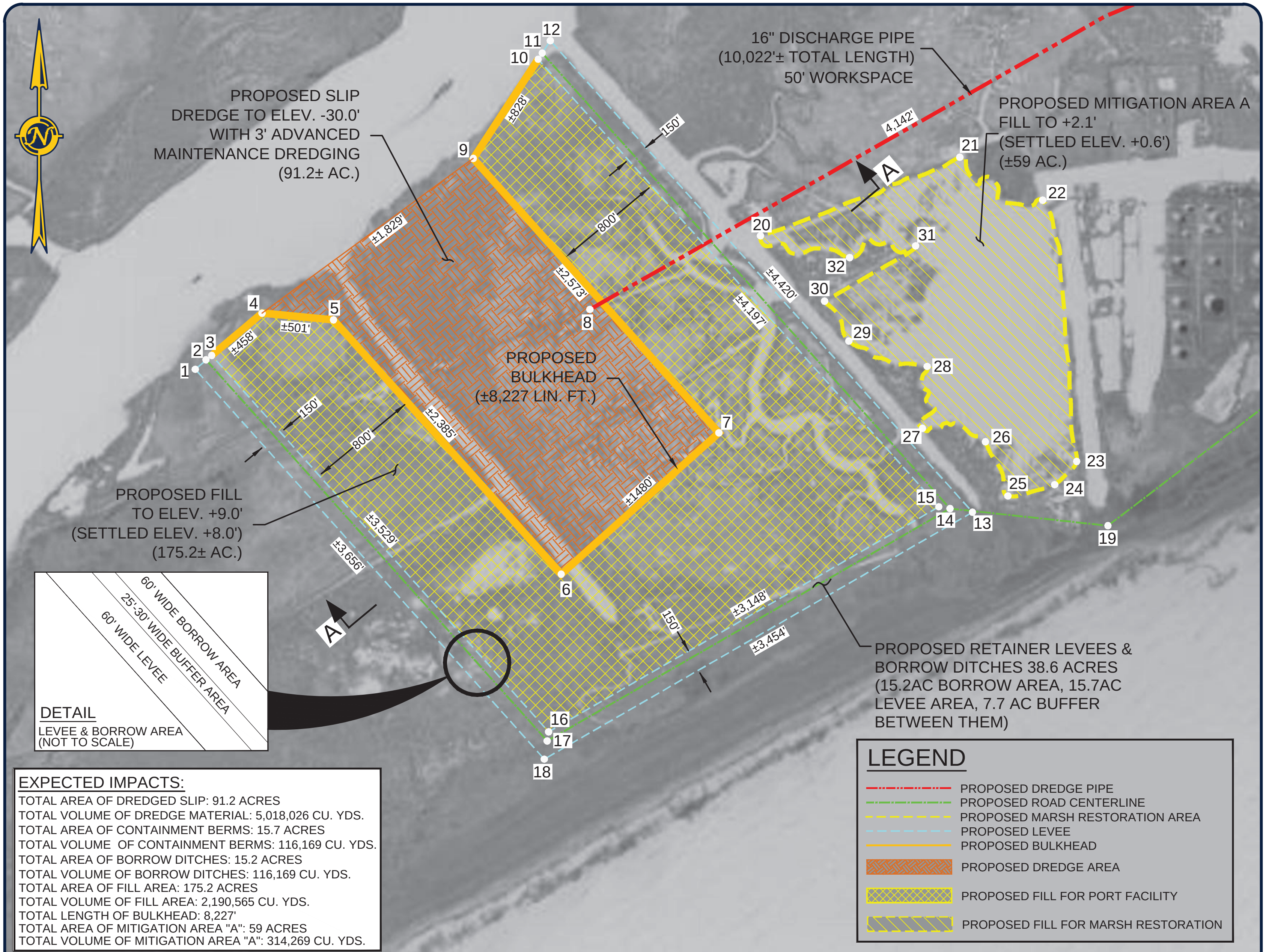

EXPECTED IMPACTS:

TOTAL AREA OF DREDGED SLIP: 91.2 ACRES
TOTAL VOLUME OF DREDGE MATERIAL: 5,018,026 CU. YDS.
TOTAL AREA OF CONTAINMENT BERMS: 15.7 ACRES
TOTAL VOLUME OF CONTAINMENT BERMS: 116,169 CU. YDS.
TOTAL AREA OF BORROW DITCHES: 15.2 ACRES
TOTAL VOLUME OF BORROW DITCHES: 116,169 CU. YDS.
TOTAL AREA OF FILL AREA: 175.2 ACRES
TOTAL VOLUME OF FILL AREA: 2,190,565 CU. YDS.
TOTAL LENGTH OF BULKHEAD: 8,227'
TOTAL AREA OF MITIGATION AREA "A": 59 ACRES
TOTAL VOLUME OF MITIGATION AREA "A": 314,269 CU. YDS.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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

HORIZONTAL SCALE

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED SLIP, FILL LEVEE, ROAD, & MARSH RESTORATION

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 4, 2022

3

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LOCATION OF PROPOSED SLIP, LEVEE, FILL, BULKHEAD, & ROAD

POINT NO.	LOUISIANA STATE PLANE X= LA-S '83 FT	Y= LA-S '83 FT	GEOGRAPHICAL LATITUDE	LONGITUDE	FEATURES / DESCRIPTION
1	3,637,808	220,931	29°06'09.74"	90°12'56.17"	PROPOSED LEVEE
2	3,637,883	220,998	29°06'10.39"	90°12'55.32"	END OF PROPOSED ROAD
3	3,637,923	221,027	29°06'10.68"	90°12'54.86"	PROPOSED LEVEE/BULKHEAD
4	3,638,275	221,323	29°06'13.58"	90°12'50.86"	LIMITS OF PROPOSED DREDGE AREA/FILL/BULKHEAD
5	3,638,774	221,276	29°06'13.06"	90°12'45.24"	LIMITS OF PROPOSED DREDGE AREA/FILL/BULKHEAD
6	3,640,365	219,500	29°05'55.32"	90°12'27.50"	LIMITS OF PROPOSED DREDGE AREA/FILL/BULKHEAD
7	3,641,468	220,487	29°06'04.99"	90°12'14.97"	LIMITS OF PROPOSED DREDGE AREA/FILL/BULKHEAD
8	3,640,566	221,349	29°06'13.61"	90°12'25.04"	BEGIN DREDGE SEDIMENT CONVEYANCE PIPELINE
9	3,639,751	222,404	29°06'24.13"	90°12'34.11"	LIMITS OF PROPOSED DREDGE AREA/FILL/BULKHEAD
10	3,640,204	223,097	29°06'30.95"	90°12'28.92"	PROPOSED LEVEE/BULKHEAD
11	3,640,233	223,140	29°06'31.37"	90°12'28.59"	END OF PROPOSED ROAD
12	3,640,289	223,227	29°06'32.22"	90°12'27.95"	PROPOSED LEVEE
13	3,643,240	219,933	29°05'59.33"	90°11'55.06"	PROPOSED LEVEE
14	3,643,083	219,958	29°05'59.60"	90°11'56.82"	P.I. IN PROPOSED ROAD
15	3,643,005	219,971	29°05'59.73"	90°11'57.70"	PROPOSED LEVEE
16	3,640,278	218,399	29°05'44.43"	90°12'28.61"	PROPOSED LEVEE
17	3,640,267	218,335	29°05'43.81"	90°12'28.74"	P.I. IN PROPOSED ROAD
18	3,640,247	218,208	29°05'42.55"	90°12'28.98"	PROPOSED LEVEE
19	3,644,187	219,839	29°05'58.31"	90°11'44.40"	P.I. IN PROPOSED ROAD
20	3,641,758	221,862	29°06'18.57"	90°12'11.54"	PROPOSED MITIGATION AREA
21	3,643,149	222,411	29°06'23.87"	90°11'55.80"	PROPOSED MITIGATION AREA
22	3,643,730	222,113	29°06'20.86"	90°11'49.28"	PROPOSED MITIGATION AREA
23	3,643,968	220,288	29°06'02.77"	90°11'46.81"	PROPOSED MITIGATION AREA
24	3,643,814	220,125	29°06'01.18"	90°11'48.56"	PROPOSED MITIGATION AREA
25	3,643,488	220,046	29°06'00.43"	90°11'52.25"	PROPOSED MITIGATION AREA
26	3,643,330	220,425	29°06'04.19"	90°11'53.98"	PROPOSED MITIGATION AREA
27	3,642,890	220,518	29°06'05.16"	90°11'58.93"	PROPOSED MITIGATION AREA
28	3,642,924	220,950	29°06'09.43"	90°11'58.51"	PROPOSED MITIGATION AREA
29	3,642,376	221,128	29°06'11.25"	90°12'04.66"	PROPOSED MITIGATION AREA
30	3,642,206	221,407	29°06'14.03"	90°12'06.55"	PROPOSED MITIGATION AREA
31	3,642,843	221,793	29°06'17.79"	90°11'59.32"	PROPOSED MITIGATION AREA
32	3,642,382	221,711	29°06'17.02"	90°12'04.53"	PROPOSED MITIGATION AREA

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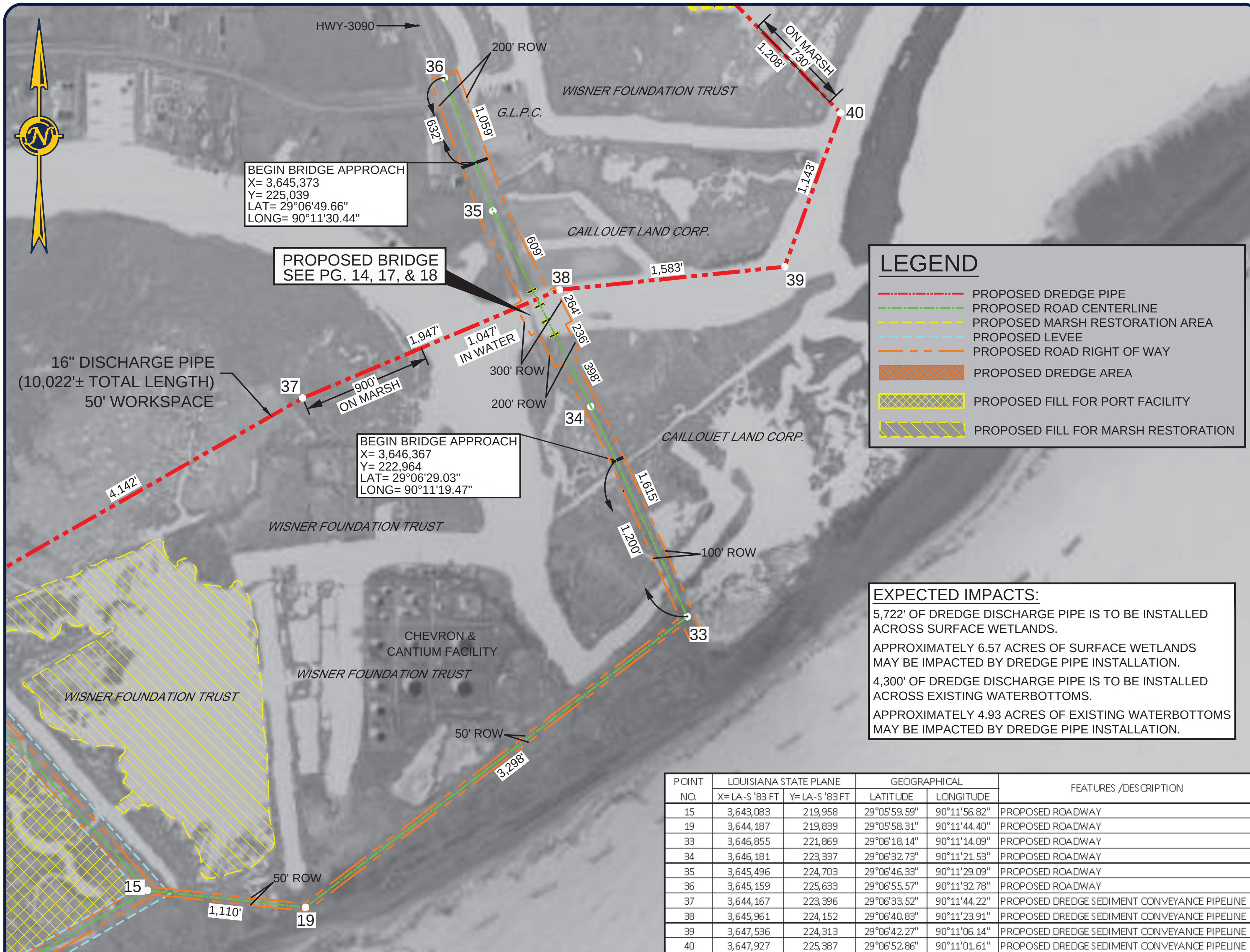
GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

COORDINATE LOCATIONS OF SHEET 3 FEATURES

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022



LEGEND

- PROPOSED DREDGE PIPE
- PROPOSED ROAD CENTERLINE
- PROPOSED MARSH RESTORATION AREA
- PROPOSED LEVEE
- PROPOSED ROAD RIGHT OF WAY
- PROPOSED DREDGE AREA
- PROPOSED FILL FOR PORT FACILITY
- PROPOSED FILL FOR MARSH RESTORATION

EXPECTED IMPACTS:

5,722' OF DREDGE DISCHARGE PIPE IS TO BE INSTALLED ACROSS SURFACE WETLANDS.

APPROXIMATELY 6.57 ACRES OF SURFACE WETLANDS MAY BE IMPACTED BY DREDGE PIPE INSTALLATION.

4,300' OF DREDGE DISCHARGE PIPE IS TO BE INSTALLED ACROSS EXISTING WATERBOTTOMS.

APPROXIMATELY 4.93 ACRES OF EXISTING WATERBOTTOMS MAY BE IMPACTED BY DREDGE PIPE INSTALLATION.

POINT NO.	LOUISIANA STATE PLANE X= LA-S '83 FT	Y= LA-S '83 FT	GEOGRAPHICAL LATITUDE	LONGITUDE	FEATURES /DESCRIPTION
15	3,643,083	219,958	29°05'59.59"	90°11'56.82"	PROPOSED ROADWAY
19	3,644,187	219,839	29°05'58.31"	90°11'44.40"	PROPOSED ROADWAY
33	3,646,855	221,869	29°06'18.14"	90°11'14.09"	PROPOSED ROADWAY
34	3,646,181	223,337	29°06'32.73"	90°11'21.53"	PROPOSED ROADWAY
35	3,645,496	224,703	29°06'46.33"	90°11'29.09"	PROPOSED ROADWAY
36	3,645,159	225,633	29°06'55.57"	90°11'32.78"	PROPOSED ROADWAY
37	3,644,167	223,396	29°06'33.52"	90°11'44.22"	PROPOSED DREDGE SEDIMENT CONVEYANCE PIPELINE
38	3,645,961	224,152	29°06'40.83"	90°11'23.91"	PROPOSED DREDGE SEDIMENT CONVEYANCE PIPELINE
39	3,647,536	224,313	29°06'42.27"	90°11'06.14"	PROPOSED DREDGE SEDIMENT CONVEYANCE PIPELINE
40	3,647,927	225,387	29°06'52.86"	90°11'01.61"	PROPOSED DREDGE SEDIMENT CONVEYANCE PIPELINE

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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

HORIZONTAL SCALE

GIS ENGINEERING LLC
Coastal Design & Infrastructure
197 Elysian Drive
Houma, LA 70363
O: (985) 219-1000 | F: (985) 475-7014
ENGINEERING • PLANNING • ENVIRONMENTAL CONSULTING

REVISIONS

No.	Description	Date

PRELIMINARY

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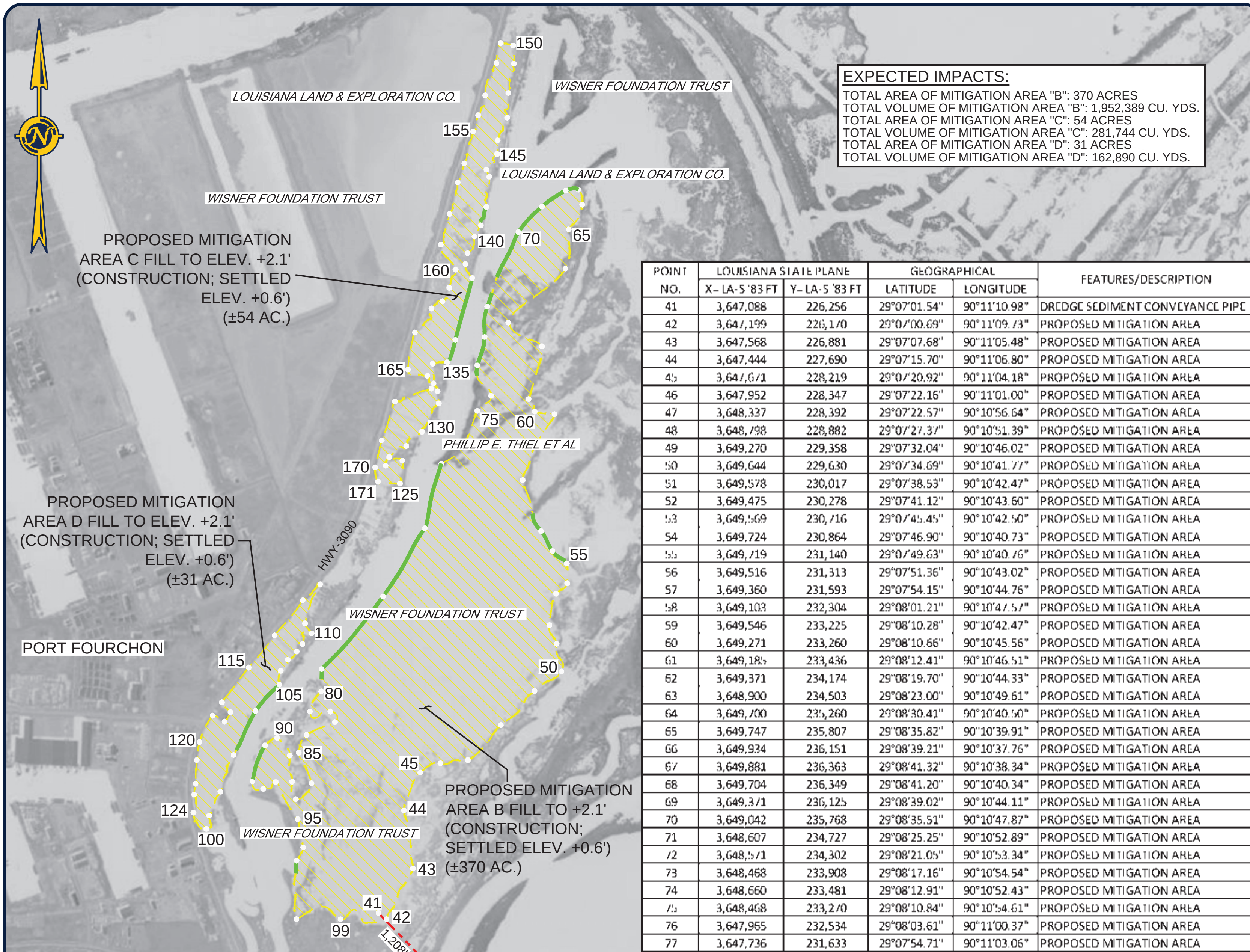
ENGINEER'S NAME
LA. LICENSE NO. 00000

GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED ROAD & DREDGE PIPE ROUTE

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

C:\Users\jhargis\Desktop\Fourchon Island\Permit Drawings\Post Comments from Bryce\5-ROADWAY- post comment.dwg



EXPECTED IMPACTS:

TOTAL AREA OF MITIGATION AREA "B": 370 ACRES
TOTAL VOLUME OF MITIGATION AREA "B": 1,952,389 CU. YDS.
TOTAL AREA OF MITIGATION AREA "C": 54 ACRES
TOTAL VOLUME OF MITIGATION AREA "C": 281,744 CU. YDS.
TOTAL AREA OF MITIGATION AREA "D": 31 ACRES
TOTAL VOLUME OF MITIGATION AREA "D": 162,890 CU. YDS.

POINT NO.	LOUISIANA STATE PLANE		GEOGRAPHICAL		FEATURES/DESCRIPTION
	X- LA-S '83 FT	Y- LA-S '83 FT	LATITUDE	LONGITUDE	
41	3,647,088	226,256	29°07'01.54"	90°11'10.98"	DREDGE SEDIMENT CONVEYANCE PIPE
42	3,647,199	226,170	29°07'00.69"	90°11'09.73"	PROPOSED MITIGATION AREA
43	3,647,568	226,881	29°07'07.68"	90°11'05.48"	PROPOSED MITIGATION AREA
44	3,647,444	227,690	29°07'15.70"	90°11'06.80"	PROPOSED MITIGATION AREA
45	3,647,671	228,219	29°07'20.92"	90°11'04.18"	PROPOSED MITIGATION AREA
46	3,647,952	228,347	29°07'22.16"	90°11'01.00"	PROPOSED MITIGATION AREA
47	3,648,337	228,392	29°07'22.57"	90°10'56.64"	PROPOSED MITIGATION AREA
48	3,648,798	228,882	29°07'27.37"	90°10'51.39"	PROPOSED MITIGATION AREA
49	3,649,270	229,358	29°07'32.04"	90°10'46.02"	PROPOSED MITIGATION AREA
50	3,649,644	229,630	29°07'34.69"	90°10'41.77"	PROPOSED MITIGATION AREA
51	3,649,578	230,017	29°07'38.53"	90°10'42.47"	PROPOSED MITIGATION AREA
52	3,649,475	230,278	29°07'41.12"	90°10'43.60"	PROPOSED MITIGATION AREA
53	3,649,569	230,716	29°07'45.45"	90°10'42.50"	PROPOSED MITIGATION AREA
54	3,649,724	230,864	29°07'46.90"	90°10'40.73"	PROPOSED MITIGATION AREA
55	3,649,719	231,140	29°07'49.63"	90°10'40.76"	PROPOSED MITIGATION AREA
56	3,649,516	231,313	29°07'51.36"	90°10'43.02"	PROPOSED MITIGATION AREA
57	3,649,360	231,593	29°07'54.15"	90°10'44.76"	PROPOSED MITIGATION AREA
58	3,649,103	232,304	29°08'01.21"	90°10'47.57"	PROPOSED MITIGATION AREA
59	3,649,546	233,225	29°08'10.28"	90°10'42.47"	PROPOSED MITIGATION AREA
60	3,649,271	233,260	29°08'10.66"	90°10'45.56"	PROPOSED MITIGATION AREA
61	3,649,185	233,436	29°08'12.41"	90°10'46.51"	PROPOSED MITIGATION AREA
62	3,649,371	234,174	29°08'19.70"	90°10'44.33"	PROPOSED MITIGATION AREA
63	3,648,900	234,503	29°08'23.00"	90°10'49.61"	PROPOSED MITIGATION AREA
64	3,649,700	235,260	29°08'30.41"	90°10'40.50"	PROPOSED MITIGATION AREA
65	3,649,747	235,807	29°08'35.82"	90°10'39.91"	PROPOSED MITIGATION AREA
66	3,649,934	236,151	29°08'39.21"	90°10'37.76"	PROPOSED MITIGATION AREA
67	3,649,881	236,363	29°08'41.32"	90°10'38.34"	PROPOSED MITIGATION AREA
68	3,649,704	236,349	29°08'41.20"	90°10'40.34"	PROPOSED MITIGATION AREA
69	3,649,371	236,125	29°08'39.02"	90°10'44.11"	PROPOSED MITIGATION AREA
70	3,649,042	235,768	29°08'35.51"	90°10'47.87"	PROPOSED MITIGATION AREA
71	3,648,607	234,727	29°08'25.25"	90°10'52.89"	PROPOSED MITIGATION AREA
72	3,648,571	234,302	29°08'21.05"	90°10'53.34"	PROPOSED MITIGATION AREA
73	3,648,468	233,908	29°08'17.16"	90°10'54.54"	PROPOSED MITIGATION AREA
74	3,648,660	233,481	29°08'12.91"	90°10'52.43"	PROPOSED MITIGATION AREA
75	3,648,468	233,270	29°08'10.84"	90°10'54.61"	PROPOSED MITIGATION AREA
76	3,647,965	232,534	29°08'03.61"	90°11'00.37"	PROPOSED MITIGATION AREA
77	3,647,736	231,633	29°07'54.71"	90°11'03.06"	PROPOSED MITIGATION AREA

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

LEGEND

- PROPOSED TEMP. CONTAINMENT LEVEE
- PROPOSED DREDGE PIPE
- PROPOSED MARSH RESTORATION AREA
- PROPOSED FILL FOR MARSH RESTORATION

2,000' 0' 2,000' 4,000'

HORIZONTAL SCALE

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REVISIONS

No.	Description	Date

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ENGINEER'S NAME
LA. LICENSE NO. 00000

GREATER LAFOURCHE PORT COMMISSION

PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED ROAD & DREDGE PIPE ROUTE

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 4, 2022

POINT NO.	LOUISIANA STATE PLANE X= LA-S '83 FT	Y= LA-S '83 FT	GEOGRAPHICAL LATITUDE	LONGITUDE	FEATURES/DESCRIPTION
78	3,647,151	230,679	29°07'45.32"	90°11'09.76"	PROPOSED MITIGATION AREA
79	3,646,292	229,664	29°07'35.36"	90°11'19.56"	PROPOSED MITIGATION AREA
80	3,646,287	229,352	29°07'32.27"	90°11'19.65"	PROPOSED MITIGATION AREA
81	3,646,129	229,070	29°07'29.50"	90°11'21.47"	PROPOSED MITIGATION AREA
82	3,646,415	229,070	29°07'29.47"	90°11'18.24"	PROPOSED MITIGATION AREA
83	3,646,479	228,923	29°07'28.01"	90°11'17.54"	PROPOSED MITIGATION AREA
84	3,646,083	228,744	29°07'26.27"	90°11'22.02"	PROPOSED MITIGATION AREA
85	3,645,974	228,495	29°07'23.82"	90°11'23.28"	PROPOSED MITIGATION AREA
86	3,646,151	228,070	29°07'19.59"	90°11'21.33"	PROPOSED MITIGATION AREA
87	3,645,931	227,848	29°07'17.41"	90°11'23.83"	PROPOSED MITIGATION AREA
88	3,645,880	228,090	29°07'19.81"	90°11'24.38"	PROPOSED MITIGATION AREA
89	3,645,848	228,456	29°07'23.45"	90°11'24.70"	PROPOSED MITIGATION AREA
90	3,645,669	228,702	29°07'25.90"	90°11'26.69"	PROPOSED MITIGATION AREA
91	3,645,501	228,599	29°07'24.89"	90°11'28.59"	PROPOSED MITIGATION AREA
92	3,645,326	228,097	29°07'19.95"	90°11'30.63"	PROPOSED MITIGATION AREA
93	3,645,475	227,991	29°07'18.88"	90°11'28.96"	PROPOSED MITIGATION AREA
94	3,645,651	228,086	29°07'19.80"	90°11'26.96"	PROPOSED MITIGATION AREA
95	3,645,959	227,568	29°07'14.64"	90°11'23.55"	PROPOSED MITIGATION AREA
96	3,646,035	227,174	29°07'10.74"	90°11'22.73"	PROPOSED MITIGATION AREA
97	3,645,941	226,988	29°07'08.90"	90°11'23.81"	PROPOSED MITIGATION AREA
98	3,645,940	226,170	29°07'00.81"	90°11'23.92"	PROPOSED MITIGATION AREA
99	3,646,558	226,169	29°07'00.73"	90°11'16.96"	PROPOSED MITIGATION AREA
100	3,644,681	227,430	29°07'13.41"	90°11'37.97"	PROPOSED MITIGATION AREA
101	3,644,721	227,617	29°07'15.26"	90°11'37.50"	PROPOSED MITIGATION AREA
102	3,644,877	227,950	29°07'18.53"	90°11'35.71"	PROPOSED MITIGATION AREA
103	3,645,064	228,463	29°07'23.60"	90°11'33.54"	PROPOSED MITIGATION AREA
104	3,645,367	229,079	29°07'29.66"	90°11'30.05"	PROPOSED MITIGATION AREA
105	3,645,701	229,446	29°07'33.26"	90°11'26.24"	PROPOSED MITIGATION AREA
106	3,645,721	229,639	29°07'35.17"	90°11'25.99"	PROPOSED MITIGATION AREA
107	3,645,821	229,793	29°07'36.69"	90°11'24.86"	PROPOSED MITIGATION AREA
108	3,645,945	229,909	29°07'37.82"	90°11'23.45"	PROPOSED MITIGATION AREA
109	3,646,024	230,014	29°07'38.85"	90°11'22.54"	PROPOSED MITIGATION AREA
110	3,646,154	230,164	29°07'40.32"	90°11'21.06"	PROPOSED MITIGATION AREA
111	3,646,061	230,303	29°07'41.71"	90°11'22.10"	PROPOSED MITIGATION AREA
112	3,646,271	230,849	29°07'47.09"	90°11'19.66"	PROPOSED MITIGATION AREA
113	3,646,030	230,626	29°07'44.91"	90°11'22.41"	PROPOSED MITIGATION AREA
114	3,645,635	230,135	29°07'40.09"	90°11'26.92"	PROPOSED MITIGATION AREA
115	3,645,273	229,685	29°07'35.67"	90°11'31.04"	PROPOSED MITIGATION AREA
116	3,644,899	229,201	29°07'30.92"	90°11'35.32"	PROPOSED MITIGATION AREA
117	3,645,019	229,063	29°07'29.53"	90°11'33.98"	PROPOSED MITIGATION AREA
118	3,644,935	228,929	29°07'28.22"	90°11'34.94"	PROPOSED MITIGATION AREA
119	3,644,770	229,014	29°07'29.07"	90°11'36.79"	PROPOSED MITIGATION AREA
120	3,644,586	228,645	29°07'25.44"	90°11'38.91"	PROPOSED MITIGATION AREA
121	3,644,549	228,393	29°07'22.95"	90°11'39.35"	PROPOSED MITIGATION AREA
122	3,644,531	228,062	29°07'19.68"	90°11'39.60"	PROPOSED MITIGATION AREA
123	3,644,511	227,911	29°07'18.18"	90°11'39.83"	PROPOSED MITIGATION AREA
124	3,644,501	227,659	29°07'15.69"	90°11'39.97"	PROPOSED MITIGATION AREA

POINT NO.	LOUISIANA STATE PLANE X= LA-S '83 FT	Y= LA-S '83 FT	GEOGRAPHICAL LATITUDE	LONGITUDE	FEATURES/DESCRIPTION
125	3,647,388	232,257	29°08'00.92"	90°11'06.92"	PROPOSED MITIGATION AREA
126	3,647,420	232,575	29°08'04.06"	90°11'06.52"	PROPOSED MITIGATION AREA
127	3,647,188	232,505	29°08'03.39"	90°11'09.14"	PROPOSED MITIGATION AREA
128	3,647,236	232,626	29°08'04.59"	90°11'08.58"	PROPOSED MITIGATION AREA
129	3,647,475	232,780	29°08'06.09"	90°11'05.87"	PROPOSED MITIGATION AREA
130	3,647,606	232,979	29°08'08.03"	90°11'03.36"	PROPOSED MITIGATION AREA
131	3,647,931	233,377	29°08'11.96"	90°11'00.66"	PROPOSED MITIGATION AREA
132	3,647,913	233,545	29°08'13.62"	90°11'00.84"	PROPOSED MITIGATION AREA
133	3,647,857	233,655	29°08'14.71"	90°11'01.47"	PROPOSED MITIGATION AREA
134	3,647,845	233,930	29°08'17.43"	90°11'01.57"	PROPOSED MITIGATION AREA
135	3,648,046	233,952	29°08'17.63"	90°10'59.30"	PROPOSED MITIGATION AREA
136	3,648,161	234,267	29°08'20.69"	90°10'57.96"	PROPOSED MITIGATION AREA
137	3,648,397	235,127	29°08'29.23"	90°10'55.21"	PROPOSED MITIGATION AREA
138	3,648,302	235,323	29°08'31.18"	90°10'56.26"	PROPOSED MITIGATION AREA
139	3,648,333	235,473	29°08'32.66"	90°10'55.89"	PROPOSED MITIGATION AREA
140	3,648,430	235,706	29°08'34.96"	90°10'54.78"	PROPOSED MITIGATION AREA
141	3,648,519	235,865	29°08'36.52"	90°10'53.75"	PROPOSED MITIGATION AREA
142	3,648,594	236,120	29°08'39.04"	90°10'52.88"	PROPOSED MITIGATION AREA
143	3,648,633	236,542	29°08'43.21"	90°10'52.38"	PROPOSED MITIGATION AREA
144	3,648,596	236,640	29°08'44.19"	90°10'52.79"	PROPOSED MITIGATION AREA
145	3,648,745	236,859	29°08'46.33"	90°10'51.09"	PROPOSED MITIGATION AREA
146	3,648,752	237,050	29°08'48.23"	90°10'50.99"	PROPOSED MITIGATION AREA
147	3,648,885	237,367	29°08'51.35"	90°10'49.45"	PROPOSED MITIGATION AREA
148	3,648,902	237,713	29°08'54.77"	90°10'49.23"	PROPOSED MITIGATION AREA
149	3,648,979	238,120	29°08'58.80"	90°10'48.30"	PROPOSED MITIGATION AREA
150	3,648,968	238,373	29°09'01.31"	90°10'48.40"	PROPOSED MITIGATION AREA
151	3,648,796	238,410	29°09'01.69"	90°10'50.34"	PROPOSED MITIGATION AREA
152	3,648,735	238,129	29°08'58.91"	90°10'51.06"	PROPOSED MITIGATION AREA
153	3,648,579	237,679	29°08'54.48"	90°10'52.87"	PROPOSED MITIGATION AREA
154	3,648,480	237,402	29°08'51.75"	90°10'54.02"	PROPOSED MITIGATION AREA
155	3,648,409	237,173	29°08'49.48"	90°10'54.84"	PROPOSED MITIGATION AREA
156	3,648,286	236,728	29°08'45.09"	90°10'56.28"	PROPOSED MITIGATION AREA
157	3,648,195	236,463	29°08'42.47"	90°10'57.33"	PROPOSED MITIGATION AREA
158	3,648,079	236,023	29°08'38.13"	90°10'58.69"	PROPOSED MITIGATION AREA
159	3,647,958	235,593	29°08'33.89"	90°11'00.11"	PROPOSED MITIGATION AREA
160	3,648,164	235,246	29°08'30.43"	90°10'57.82"	PROPOSED MITIGATION AREA
161	3,648,075	234,990	29°08'27.91"	90°10'58.85"	PROPOSED MITIGATION AREA
162	3,647,980	234,802	29°08'26.05"	90°10'59.95"	PROPOSED MITIGATION AREA
163	3,647,827	234,702	29°08'25.07"	90°11'01.68"	PROPOSED MITIGATION AREA
164	3,647,596	234,366	29°08'21.77"	90°11'04.33"	PROPOSED MITIGATION AREA
165	3,647,498	233,848	29°08'16.65"	90°11'05.49"	PROPOSED MITIGATION AREA
166	3,647,768	233,761	29°08'15.77"	90°11'02.46"	PROPOSED MITIGATION AREA
167	3,647,827	233,583	29°08'14.01"	90°11'01.82"	PROPOSED MITIGATION AREA
168	3,647,317	233,401	29°08'12.25"	90°11'07.58"	PROPOSED MITIGATION AREA
169	3,647,131	232,859	29°08'06.91"	90°11'09.74"	PROPOSED MITIGATION AREA
170	3,647,040	232,484	29°08'03.20"	90°11'10.80"	PROPOSED MITIGATION AREA
171	3,647,081	232,281	29°08'01.18"	90°11'10.37"	PROPOSED MITIGATION AREA

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

2,000' 0' 2,000' 4,000'

HORIZONTAL SCALE

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REVISIONS

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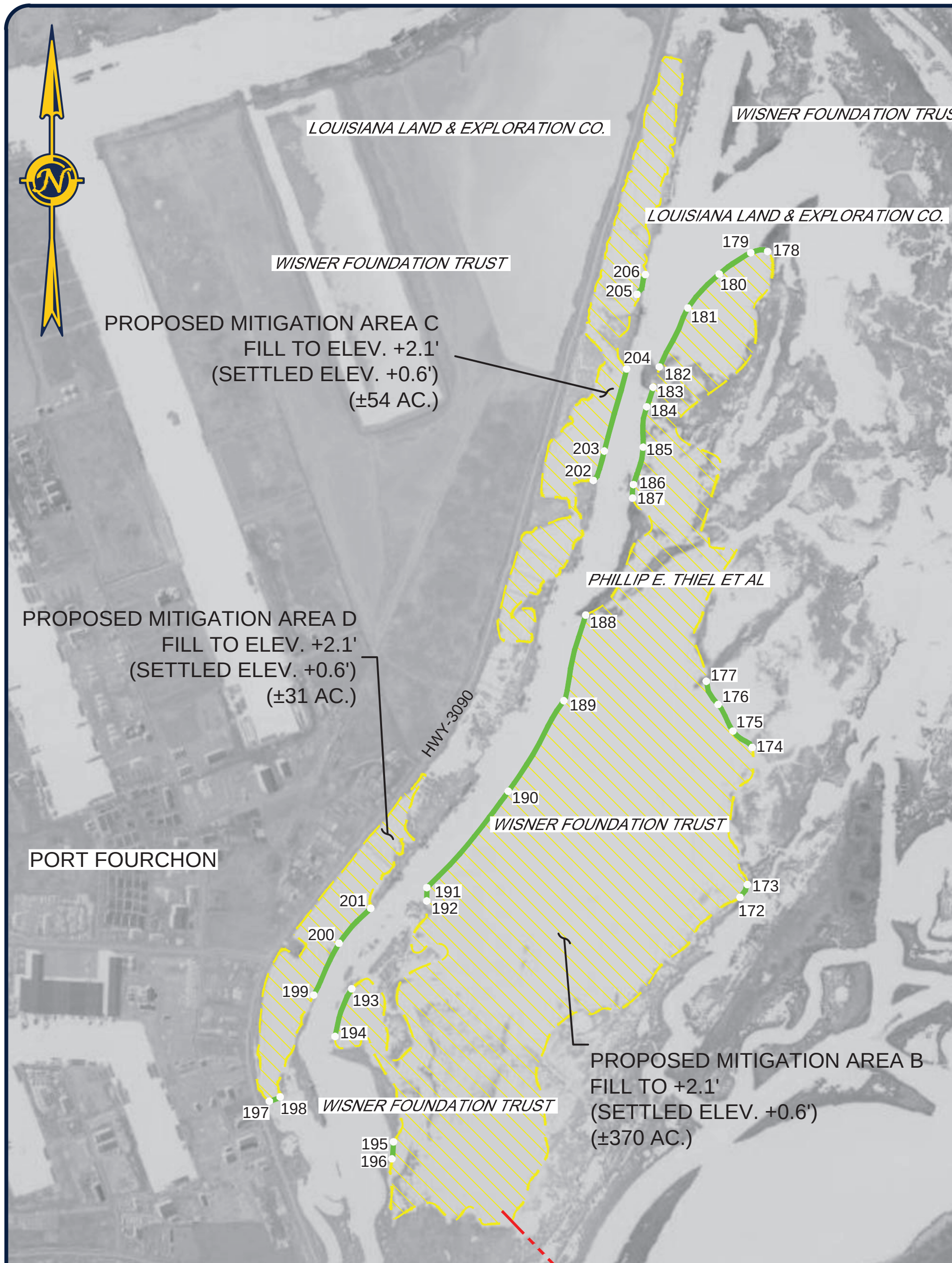
ENGINEER'S NAME
LA. LICENSE NO. 00000

GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED ROAD
&
DREDGE PIPE ROUTE

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

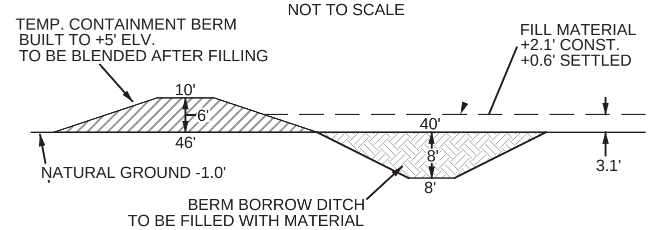


EXPECTED IMPACTS:

TOTAL LENGTH OF BERMS: 10,833'
TOTAL AREA OF BORROW DITCHES: 10 ACRES
TOTAL VOLUME OF BORROW DITCHES: 77,035 CU. YDS.
TOTAL AREA OF CONTAINMENT BERMS: 11.4 ACRES
TOTAL VOLUME OF CONTAINMENT BERMS: 77,035 CU. YDS.

CONTAINMENT BERMS

NOT TO SCALE



TEMPORARY CONTAINMENT BERMS

POINT NO.	LOUISIANA STATE PLANE X= LA-S '83 FT	LOUISIANA STATE PLANE Y= LA-S '83 FT	GEOGRAPHICAL LATITUDE	GEOGRAPHICAL LONGITUDE	FEATURES /DESCRIPTION	SEGMENT LENGTHS
172	3,649,591	229,562	29°07'34.02"	90°10'42.38"	TEMP. CONTAINMENT AREA B	0, 183'
173	3,649,668	229,696	29°07'35.34"	90°10'41.49"	TEMP. CONTAINMENT AREA B	
174	3,649,718	231,142	29°07'49.64"	90°10'40.76"	TEMP. CONTAINMENT AREA B	
175	3,649,516	231,313	29°07'51.36"	90°10'43.02"	TEMP. CONTAINMENT AREA B	0, 867'
176	3,649,360	231,593	29°07'54.15"	90°10'44.76"	TEMP. CONTAINMENT AREA B	
177	3,649,235	231,838	29°07'56.59"	90°10'46.13"	TEMP. CONTAINMENT AREA B	
178	3,649,881	236,363	29°08'41.32"	90°10'38.34"	TEMP. CONTAINMENT AREA B	
179	3,649,704	236,349	29°08'41.20"	90°10'40.34"	TEMP. CONTAINMENT AREA B	
180	3,649,371	236,125	29°08'39.02"	90°10'44.11"	TEMP. CONTAINMENT AREA B	1, 768'
181	3,649,042	235,768	29°08'35.51"	90°10'47.87"	TEMP. CONTAINMENT AREA B	
182	3,648,741	235,147	29°08'29.39"	90°10'51.33"	TEMP. CONTAINMENT AREA B	
183	3,648,675	234,933	29°08'27.28"	90°10'52.10"	TEMP. CONTAINMENT AREA B	
184	3,648,607	234,727	29°08'25.25"	90°10'52.89"	TEMP. CONTAINMENT AREA B	
185	3,648,571	234,302	29°08'21.05"	90°10'53.34"	TEMP. CONTAINMENT AREA B	1, 185'
186	3,648,468	233,908	29°08'17.16"	90°10'54.54"	TEMP. CONTAINMENT AREA B	
187	3,648,459	233,766	29°08'15.75"	90°10'54.66"	TEMP. CONTAINMENT AREA B	
188	3,647,965	232,534	29°08'03.61"	90°11'00.37"	TEMP. CONTAINMENT AREA B	
189	3,647,736	231,633	29°07'54.71"	90°11'03.06"	TEMP. CONTAINMENT AREA B	
190	3,647,151	230,679	29°07'45.32"	90°11'09.76"	TEMP. CONTAINMENT AREA B	3, 525'
191	3,646,292	229,664	29°07'35.36"	90°11'19.56"	TEMP. CONTAINMENT AREA B	
192	3,646,292	229,523	29°07'33.97"	90°11'19.58"	TEMP. CONTAINMENT AREA B	
193	3,645,501	228,599	29°07'24.89"	90°11'28.59"	TEMP. CONTAINMENT AREA B	0, 535'
194	3,645,326	228,097	29°07'19.95"	90°11'30.63"	TEMP. CONTAINMENT AREA B	
195	3,645,941	226,988	29°07'08.90"	90°11'23.81"	TEMP. CONTAINMENT AREA B	0, 172'
196	3,645,925	226,808	29°07'07.13"	90°11'24.01"	TEMP. CONTAINMENT AREA B	
197	3,644,633	227,416	29°07'13.27"	90°11'38.51"	TEMP. CONTAINMENT AREA D	0, 143'
198	3,644,748	227,460	29°07'13.70"	90°11'37.21"	TEMP. CONTAINMENT AREA D	
199	3,645,101	228,532	29°07'24.27"	90°11'33.11"	TEMP. CONTAINMENT AREA D	
200	3,645,367	229,079	29°07'29.66"	90°11'30.05"	TEMP. CONTAINMENT AREA D	1, 103'
201	3,645,701	229,446	29°07'33.26"	90°11'26.24"	TEMP. CONTAINMENT AREA D	
202	3,648,046	233,952	29°08'17.63"	90°10'59.30"	TEMP. CONTAINMENT AREA C	
203	3,648,161	234,262	29°08'20.69"	90°10'57.96"	TEMP. CONTAINMENT AREA C	1, 126'
204	3,648,397	235,127	29°08'29.23"	90°10'55.21"	TEMP. CONTAINMENT AREA C	
205	3,648,505	235,912	29°08'36.99"	90°10'53.90"	TEMP. CONTAINMENT AREA C	0, 226'
206	3,648,594	236,120	29°08'39.04"	90°10'52.88"	TEMP. CONTAINMENT AREA C	
TOTAL LENGTH OF TEMPORARY CONTAINMENT BERMS						10,833'

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

LEGEND

- PROPOSED TEMP. CONTAINMENT BERMS
- PROPOSED DREDGE PIPE
- PROPOSED MARSH RESTORATION AREA
- PROPOSED FILL FOR MARSH RESTORATION

2,000' 0' 2,000' 4,000'

HORIZONTAL SCALE

ENGINEERING LLC
Coastal Design & Infrastructure
197 Elysian Drive
Houma, LA 70363
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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

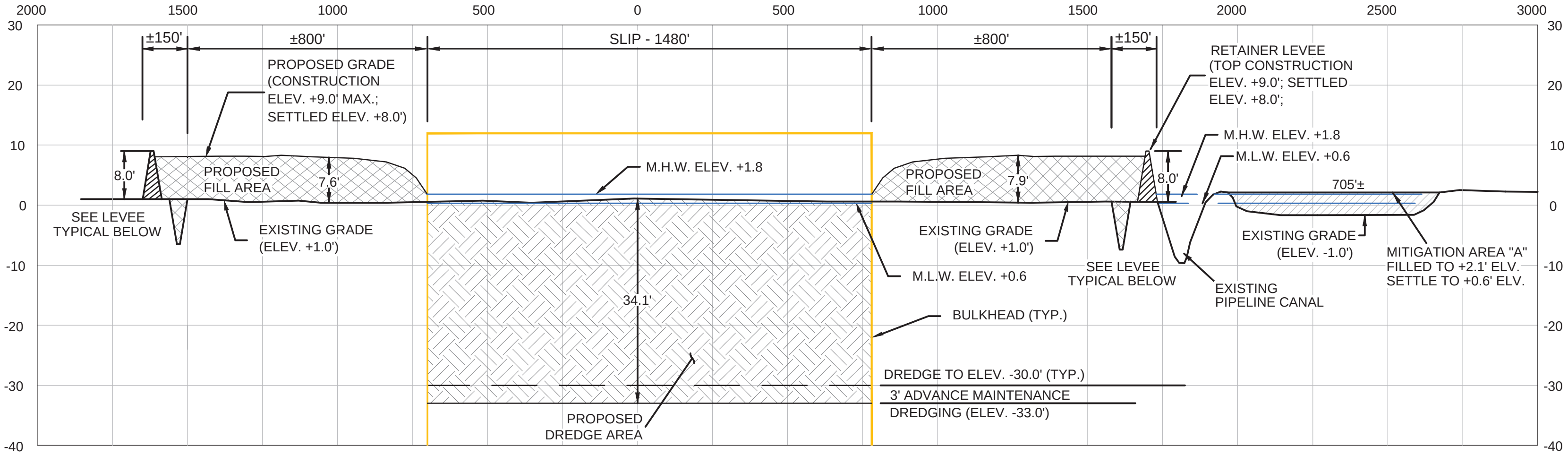
CONTAINMENT BERMS

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

CROSS SECTION OF SLIP DREDGE & FILL AREA AND MITIGATION AREA "A"

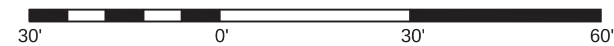
SECTION "A"

SCALE: HORIZ. 1"=600' VERT. 1" = 30'



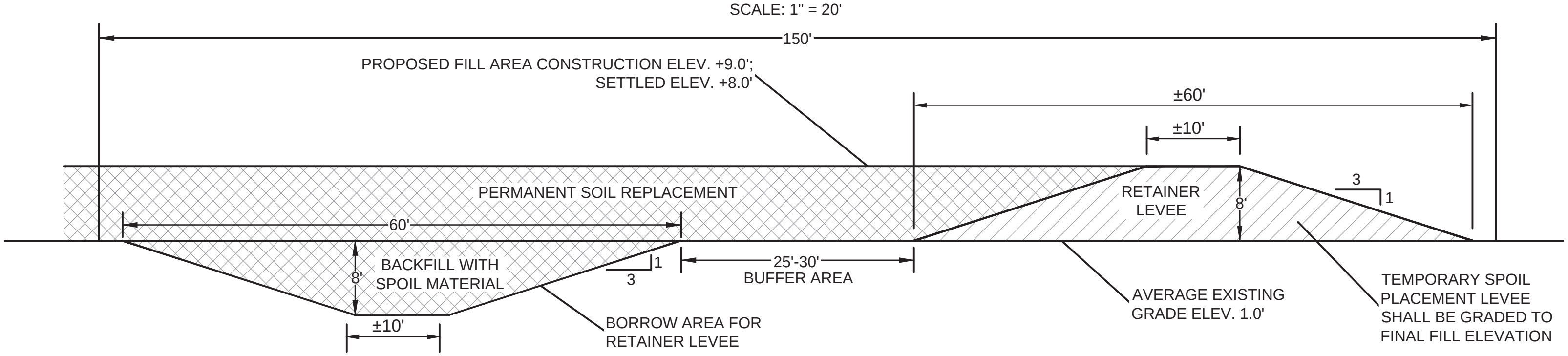
HORIZONTAL SCALE

VERTICAL SCALE



TYPICAL RETAINER LEVEE

SCALE: 1" = 20'



HORIZONTAL SCALE

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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GREATER LAFOURCHE PORT COMMISSION

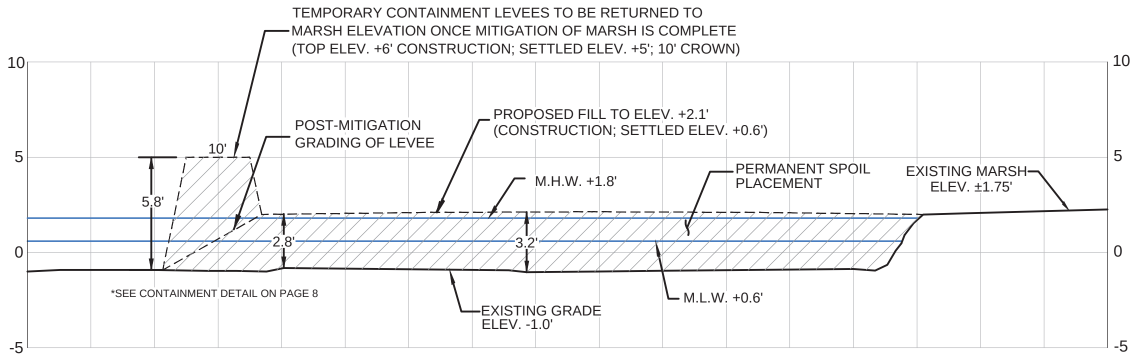
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

CROSS SECTION "A"
SLIP, SITE FILL, &
RETAINER LEVEE

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 4, 2022

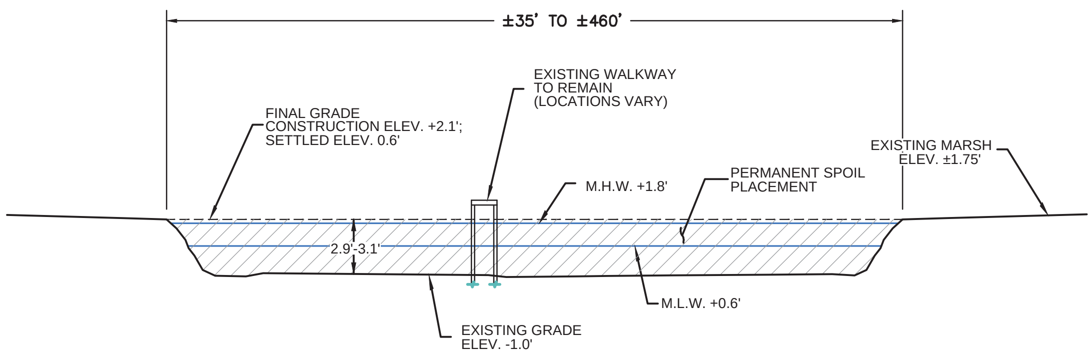
MITIGATION AREA B SECTION

SCALE: HORIZ. 1"=20'
VERT. 1"=10'



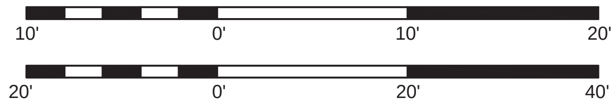
TYPICAL MITIGATION AREAS C&D ALONG LA HWY 3090 SECTION

SCALE: HORIZ. 1"=20'
VERT. 1"=10'



NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

VERTICAL SCALE



HORIZONTAL SCALE

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

CROSS SECTIONS
MITIGATION AREAS

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

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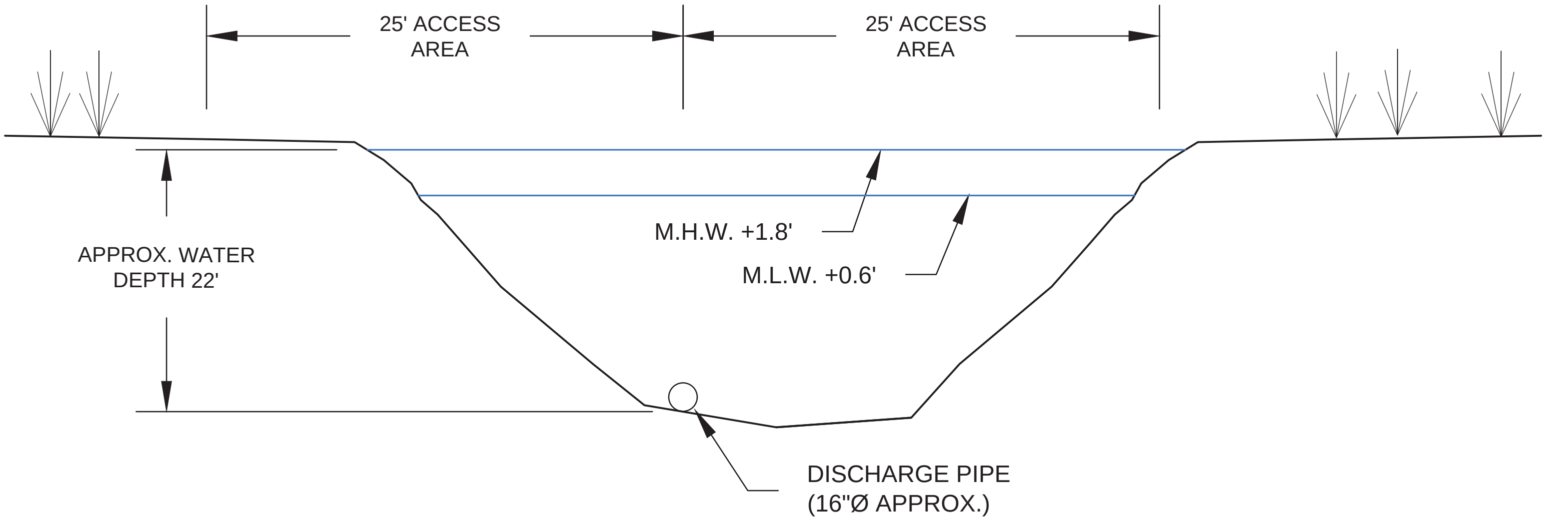
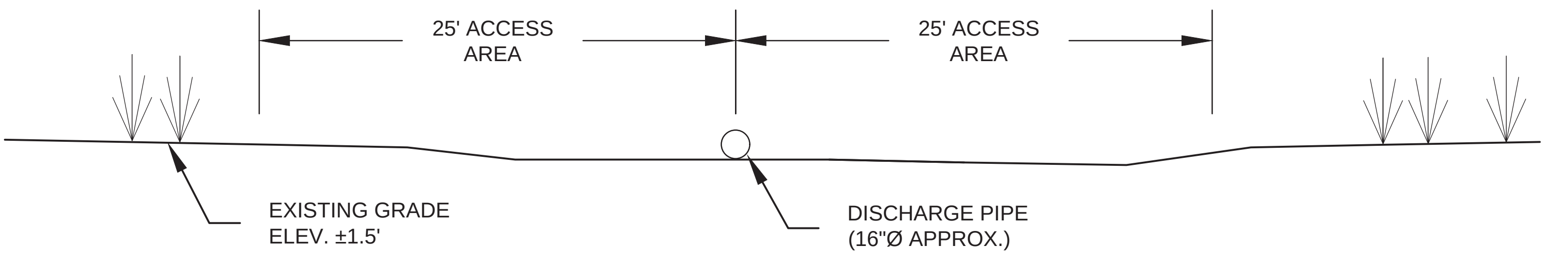
TYPICAL DISCHARGE PIPE SECTION ON WATERBOTTOM

SCALE: N.T.S.



TYPICAL DISCHARGE PIPE SECTION OVER LAND

SCALE: 1" = 10'



NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

10' 0' 10' 20'

HORIZONTAL SCALE

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

DISCHARGE PIPE TYPICALS

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

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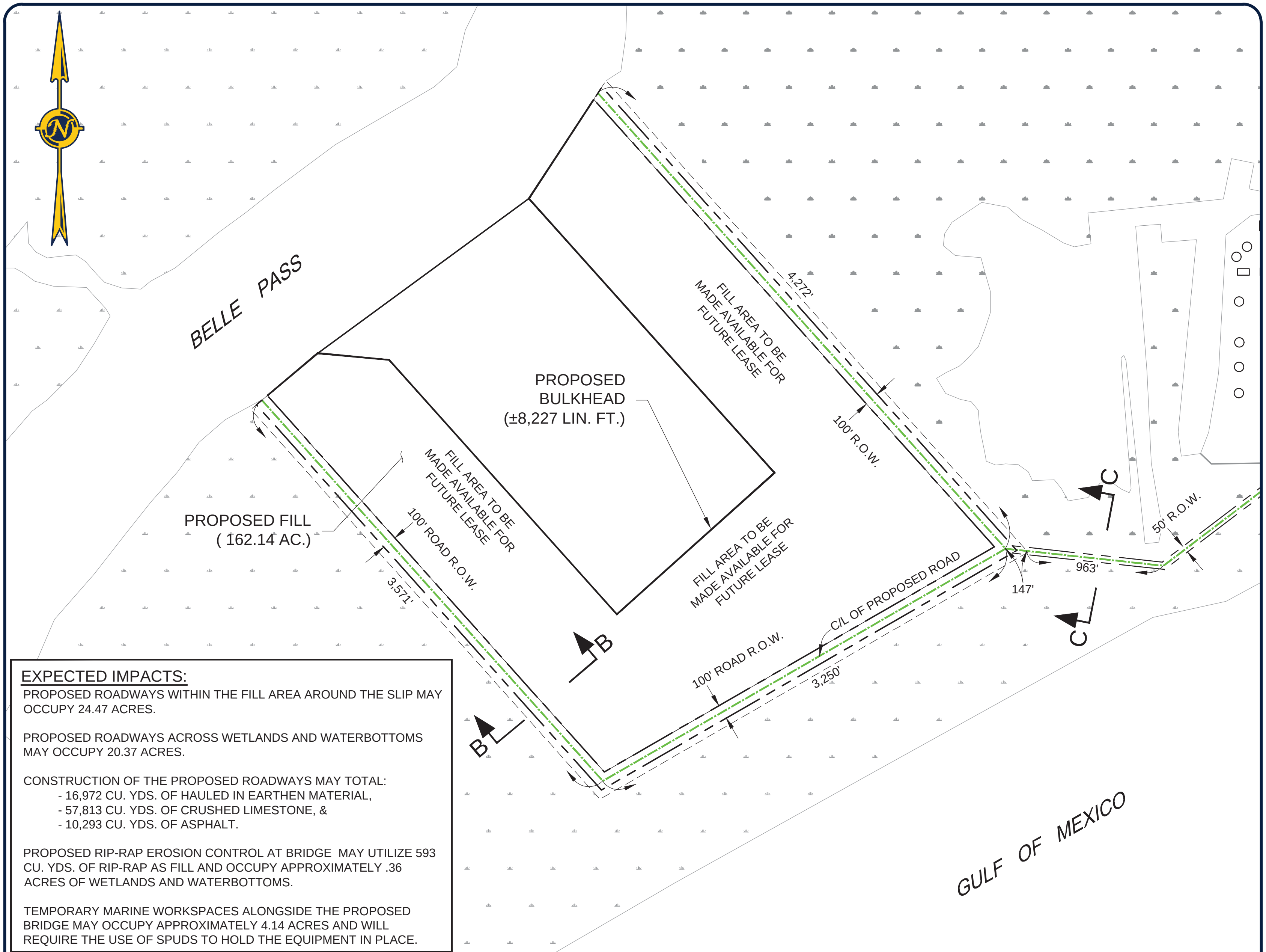

EXPECTED IMPACTS:

PROPOSED ROADWAYS WITHIN THE FILL AREA AROUND THE SLIP MAY OCCUPY 24.47 ACRES.

PROPOSED ROADWAYS ACROSS WETLANDS AND WATERBOTTOMS MAY OCCUPY 20.37 ACRES.

CONSTRUCTION OF THE PROPOSED ROADWAYS MAY TOTAL:

- 16,972 CU. YDS. OF HAULED IN EARTHEN MATERIAL,
- 57,813 CU. YDS. OF CRUSHED LIMESTONE, &
- 10,293 CU. YDS. OF ASPHALT.

PROPOSED RIP-RAP EROSION CONTROL AT BRIDGE MAY UTILIZE 593 CU. YDS. OF RIP-RAP AS FILL AND OCCUPY APPROXIMATELY .36 ACRES OF WETLANDS AND WATERBOTTOMS.

TEMPORARY MARINE WORKSPACES ALONGSIDE THE PROPOSED BRIDGE MAY OCCUPY APPROXIMATELY 4.14 ACRES AND WILL REQUIRE THE USE OF SPUDS TO HOLD THE EQUIPMENT IN PLACE.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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

HORIZONTAL SCALE

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED ROADWAY AROUND SLIP

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

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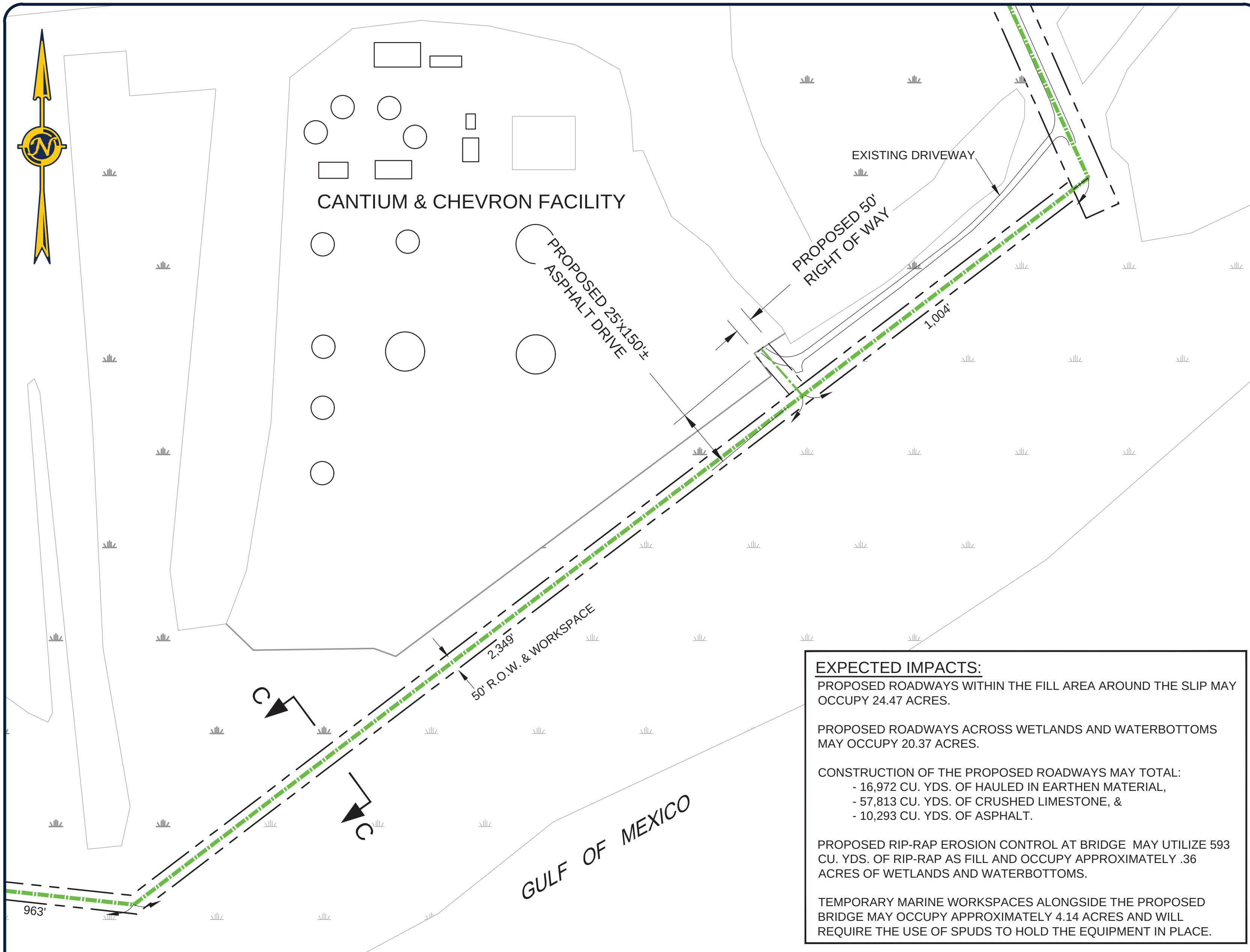

EXPECTED IMPACTS:

PROPOSED ROADWAYS WITHIN THE FILL AREA AROUND THE SLIP MAY OCCUPY 24.47 ACRES.

PROPOSED ROADWAYS ACROSS WETLANDS AND WATERBOTTOMS MAY OCCUPY 20.37 ACRES.

CONSTRUCTION OF THE PROPOSED ROADWAYS MAY TOTAL:
- 16,972 CU. YDS. OF HAULED IN EARTHEN MATERIAL,
- 57,813 CU. YDS. OF CRUSHED LIMESTONE, &
- 10,293 CU. YDS. OF ASPHALT.

PROPOSED RIP-RAP EROSION CONTROL AT BRIDGE MAY UTILIZE 593 CU. YDS. OF RIP-RAP AS FILL AND OCCUPY APPROXIMATELY .36 ACRES OF WETLANDS AND WATERBOTTOMS.

TEMPORARY MARINE WORKSPACES ALONGSIDE THE PROPOSED BRIDGE MAY OCCUPY APPROXIMATELY 4.14 ACRES AND WILL REQUIRE THE USE OF SPUDS TO HOLD THE EQUIPMENT IN PLACE.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

400' 0' 400' 800'

HORIZONTAL SCALE

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED ROADWAY AROUND FACILITY

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

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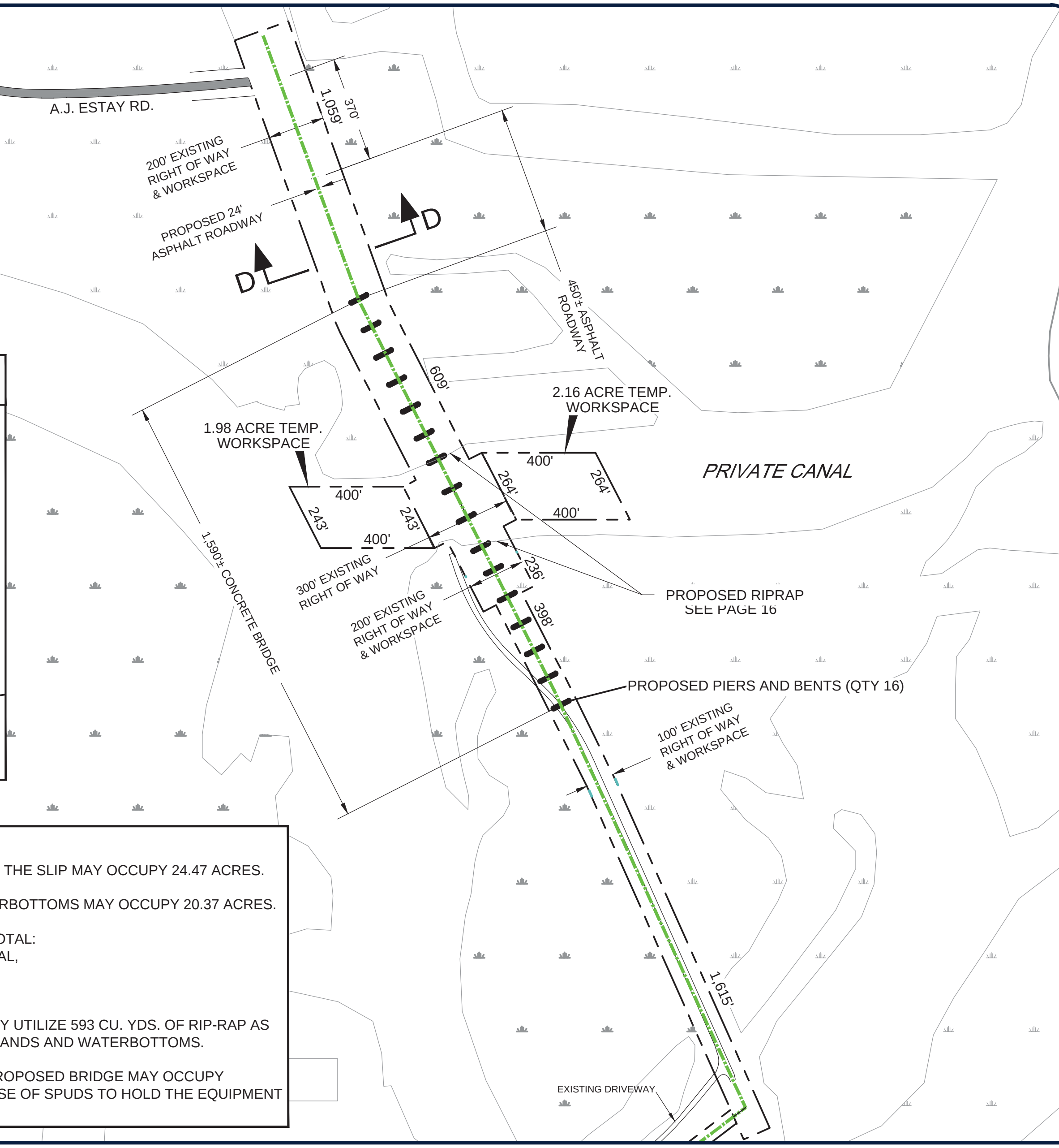

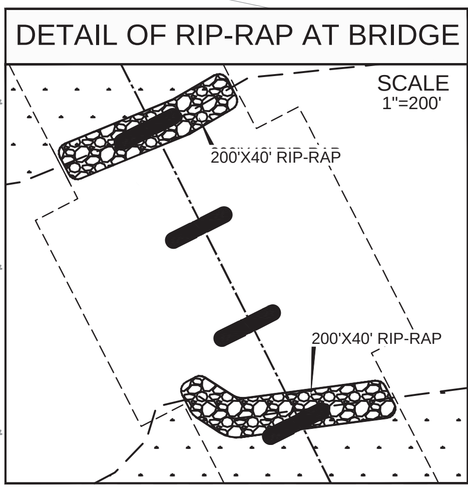

EXPECTED IMPACTS:

PROPOSED ROADWAYS WITHIN THE FILL AREA AROUND THE SLIP MAY OCCUPY 24.47 ACRES.

PROPOSED ROADWAYS ACROSS WETLANDS AND WATERBOTTOMS MAY OCCUPY 20.37 ACRES.

CONSTRUCTION OF THE PROPOSED ROADWAYS MAY TOTAL:
- 16,972 CU. YDS. OF HAULED IN EARTHEN MATERIAL,
- 57,813 CU. YDS. OF CRUSHED LIMESTONE, &
- 10,293 CU. YDS. OF ASPHALT.

PROPOSED RIP-RAP EROSION CONTROL AT BRIDGE MAY UTILIZE 593 CU. YDS. OF RIP-RAP AS FILL AND OCCUPY APPROXIMATELY .36 ACRES OF WETLANDS AND WATERBOTTOMS.

TEMPORARY MARINE WORKSPACES ALONGSIDE THE PROPOSED BRIDGE MAY OCCUPY APPROXIMATELY 4.14 ACRES AND WILL REQUIRE THE USE OF SPUDS TO HOLD THE EQUIPMENT IN PLACE.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

600' 0' 600' 1,200'

HORIZONTAL SCALE

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED ROADWAY DETAILS

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

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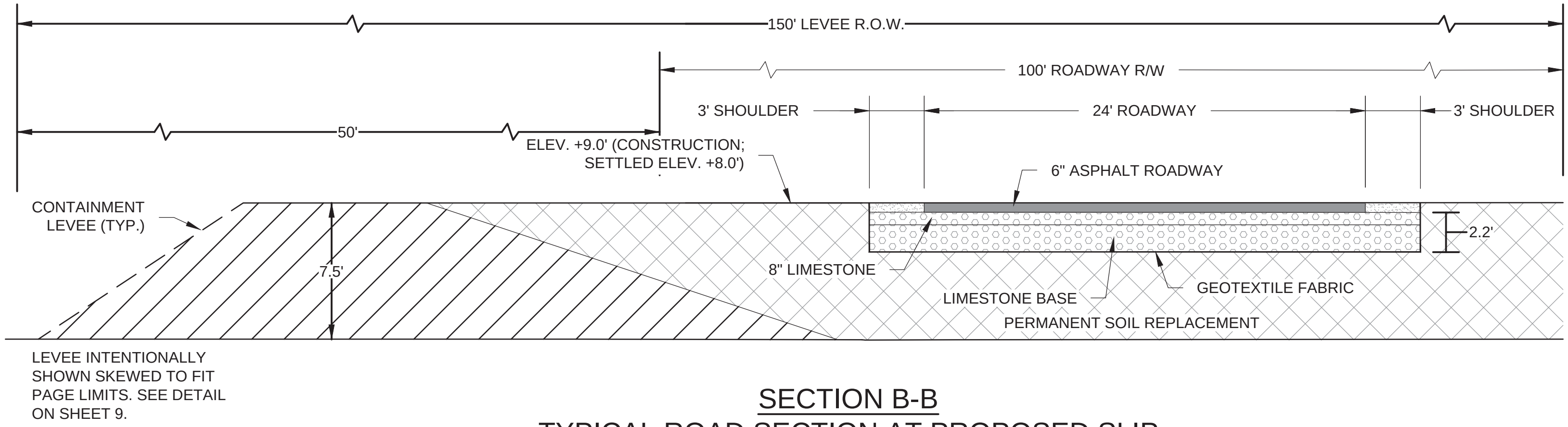
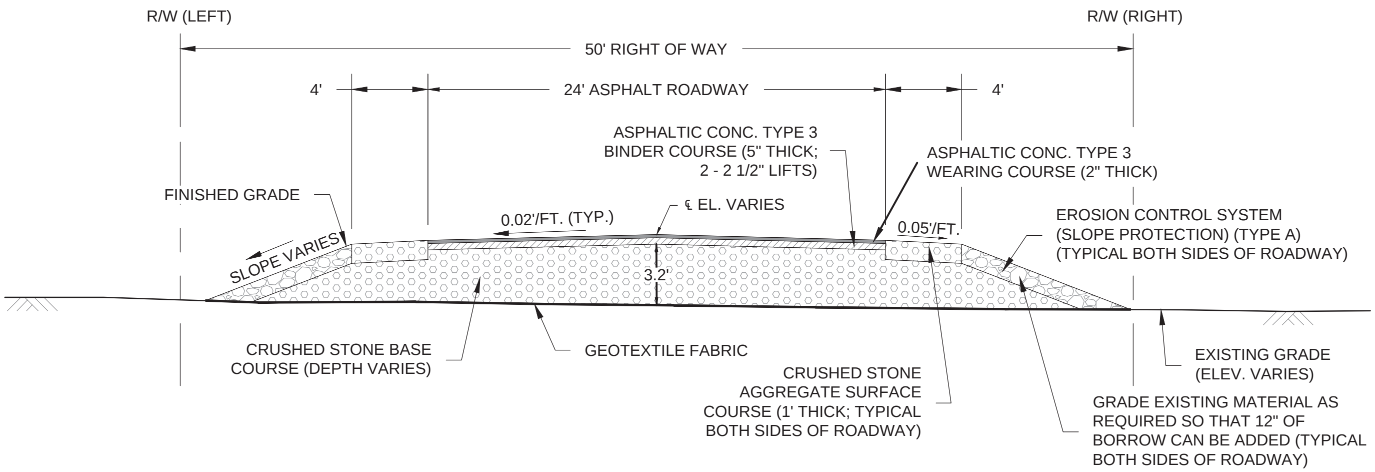


SECTION B-B
TYPICAL ROAD SECTION AT PROPOSED SLIP

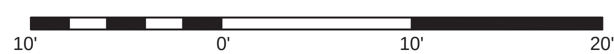
SCALE: 1" = 10'



SECTION C-C
TYPICAL NEW ROADWAY SECTION

SCALE: 1" = 10'

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.



HORIZONTAL SCALE

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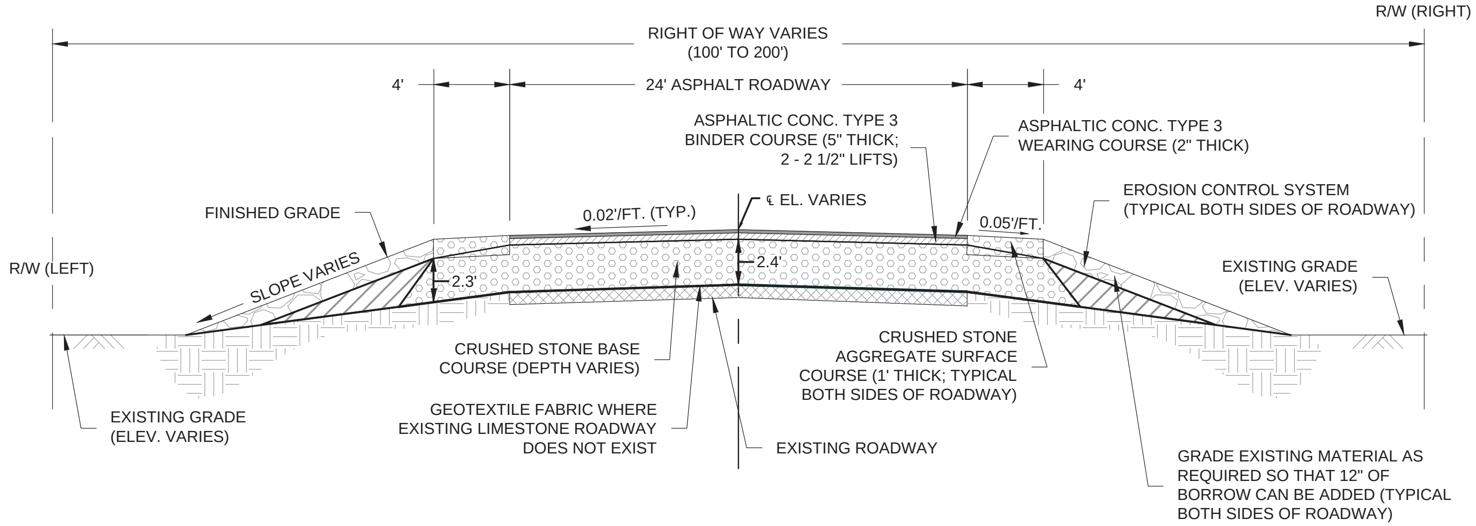
GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

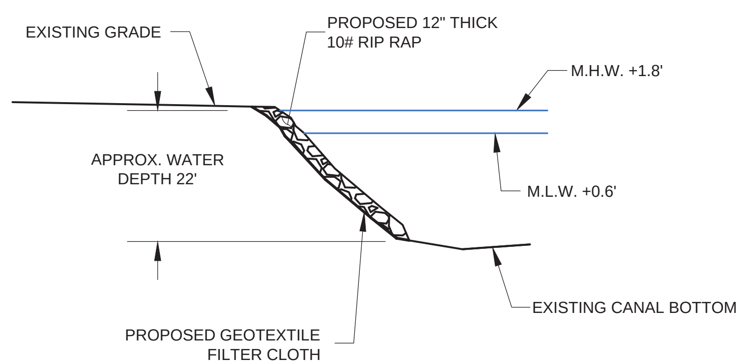
PROPOSED ROADWAY TYPICALS & SECTIONS

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022



SECTION D-D
TYPICAL ROADWAY SECTION AT EXISTING ROADWAY

SCALE: 1" = 10'



TYPICAL RIPRAP SECTION

SCALE: N.T.S.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

20' 0' 20' 40'

HORIZONTAL SCALE

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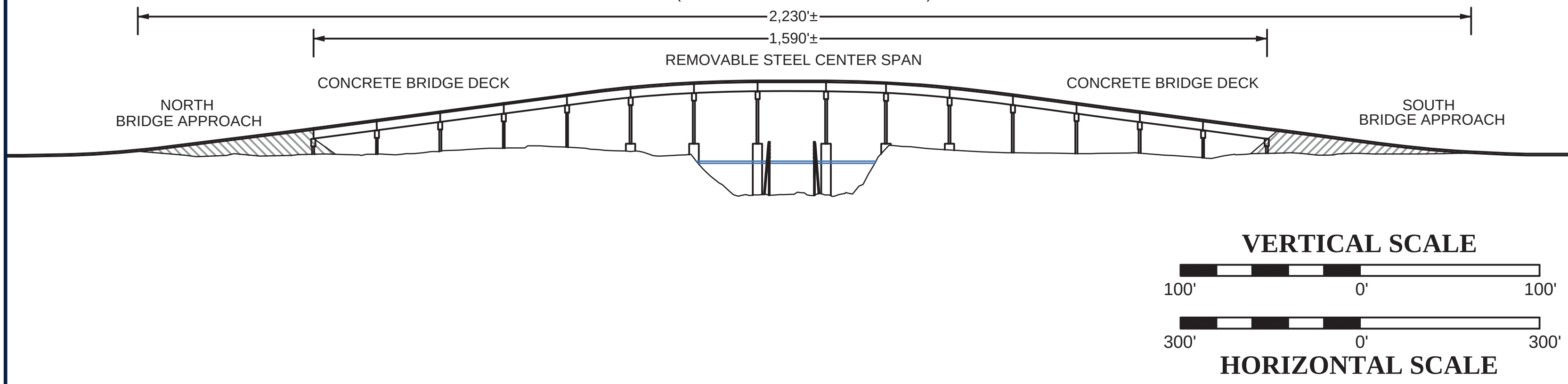
GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED ROADWAY TYPICALS & SECTIONS

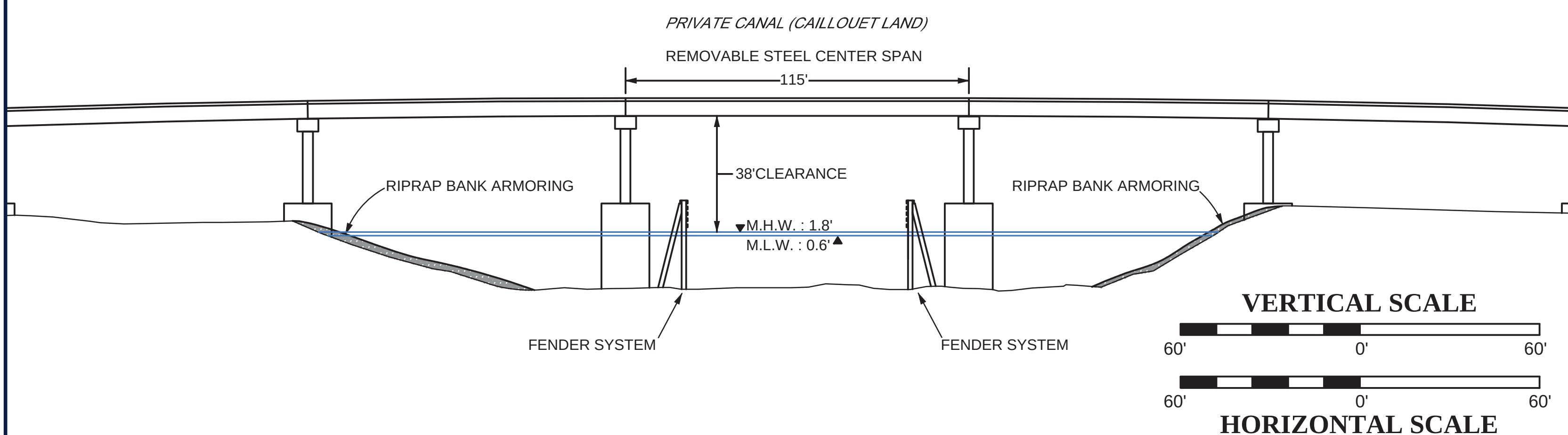
Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

PROFILE OF THE PROPOSED BRIDGE

(EXAGGERATED VERTICAL SCALE)



PROPOSED BRIDGE CROSSING



NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED BRIDGE DETAILS

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

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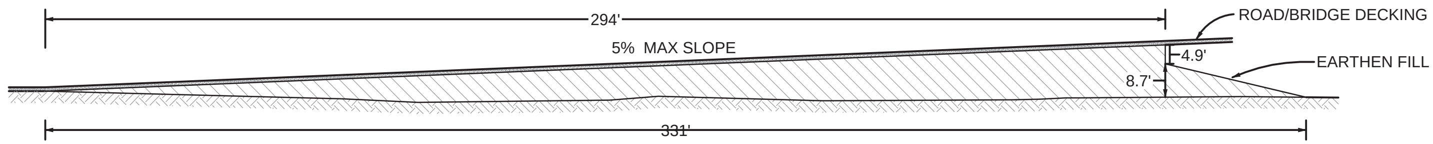
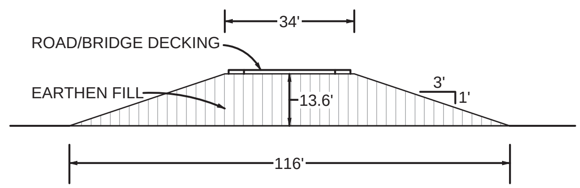
NORTH BRIDGE APPROACH

PROFILE VIEW

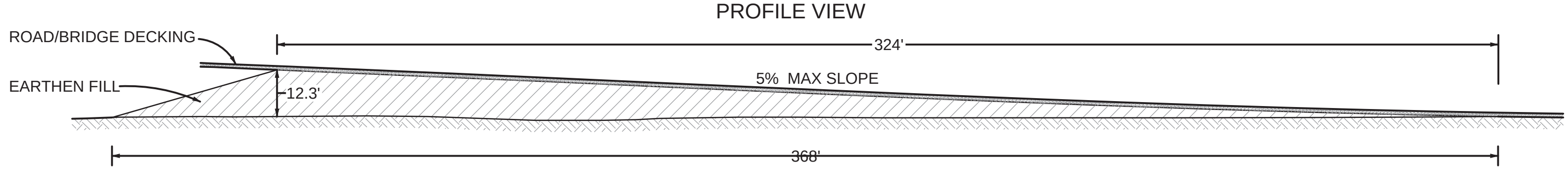


CROSS SECTION VIEW

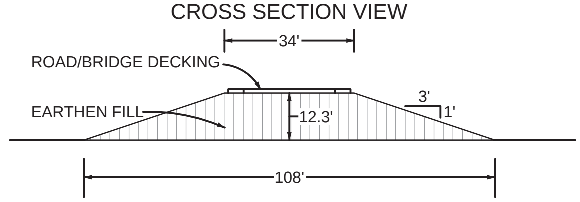


SOUTH BRIDGE APPROACH

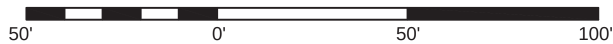
PROFILE VIEW



CROSS SECTION VIEW



NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.



HORIZONTAL SCALE

GIS ENGINEERING LLC
Coastal Design & Infrastructure
197 Elysian Drive
Houma, LA 70363
O: (985) 219-1000 | F: (985) 475-7014
ENGINEERING ● PLANNING ● ENVIRONMENTAL CONSULTING

REVISIONS

No.	Description	Date

PRELIMINARY
THIS DOCUMENT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, RECORDATION, CONVEYANCE, SALES OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT
ENGINEER'S NAME
LA. LICENSE NO. 00000

GREATER LAFOURCHE PORT COMMISSION
PROPOSED BRIDGE, ROAD, AND SLIP TO PROVIDE ADDITIONAL PORT SERVICES

PROPOSED BRIDGE DETAILS

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 3, 2022

PROJECT NOTES

- The proposed slip is approximately 91.2 acres and is estimated to require the removal of 5,018,026 cubic yards of material.
- The retaining levees (including borrow ditches and space between them) around the proposed fill area adjacent to the slip are expected to require 38.6 acres.
- Approximately 116,169 cubic yards of material is expected to be removed and used to construct the retaining levees around the proposed fill areas adjacent to the slip.
- Approximately 175.2 acres are to be filled in around the proposed slip for future development as port facilities. This fill portion is expected to require 2,190,565 cubic yards of material.
- Four mitigation areas are to be part of this project to restore area marsh. The four mitigation areas are expected to total 514 acres and will require approximately 2,711,292 cubic yards of material.
- Approximately 10,833' of retaining levees are to be constructed for some portions of the mitigation areas. These berms and borrow areas are expected to require 21.4 acres of existing waterbottoms and 77,035 cubic yards of material.
- 10,022 feet of dredge discharge pipe with a 50' workspace is to be required, thus temporarily affecting 11.50 acres of wetlands and waterbottoms.
- The proposed roadways leading to the proposed slip are expected to occupy 24.24 acres.
- The proposed roadways around the proposed slip are expected to occupy 20.81 acres.
- Construction of these proposed roadways are expected to require:
  16,972 cubic yards of hauled in earthen material
  57,813 cubic yards of crushed limestone
  10,293 cubic yards of asphalt
- Proposed rip-rap erosion control at the bridge site may utilize 593 cubic yards of rip-rap and occupy approximately 0.34acres of wetlands and waterbottoms.
- Temporary marine workspaces alongside the proposed bridge may occupy 4.14 acres and will require the use of spuds to hold the equipment in place during construction activities.

NDSI Notes

- As-built drawings and/or plats shall have written on them the date of completion of said activities and shall be submitted to the Louisiana Department of Natural Resources, Office of Coastal Management, P. O. Box 44487, Baton Rouge, LA 70804-4487 within 30 days following project completion.
- All structures built under the authorization and conditions of this permit shall be removed from the site within 120 days of abandonment of the facilities for the herein permitted use, or when these structures fall into a state of disrepair such that they can no longer function as intended. This condition does not preclude the necessity for revising the current permit or obtaining a separate Coastal Use Permit, should one be required, for such removal activities.
- Structures must also be marked/lighted in accordance with U. S. Coast Guard regulations.
- In order to ensure the safety of all parties, the permittee shall contact the Louisiana One Call System (1-800-272-3020) a minimum of 48 hours prior to the commencement of any excavation (digging, dredging, jetting, etc.) or demolition activity.

NOTE: THE IMAGE ABOVE IS A GENERAL REPRESENTATION OF THE WORK AREA, ACTUAL FIELD CONDITIONS MAY DIFFER.

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PROJECT NOTES

Project number	39130-1320
Date	February 2022
Designed by	A.P. & G.I.S.
Drawn by	J.M.H.
Checked by	M.M.
Checked by	-
Plot Date	March 4, 2022

THE WATER INSTITUTE
OF THE GULF®

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