



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, MOBILE DISTRICT
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

September 30, 2015

South Mississippi Branch
Regulatory Division

**ADDENDUM
JOINT PUBLIC NOTICE SAM-2013-00088-MJF
U.S. ARMY CORPS OF ENGINEERS**

**MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF POLLUTION CONTROL**

**MISSISSIPPI DEPARTMENT OF MARINE RESOURCES
DMR-140197**

**PROPOSED
CREATION OF MARSH HABITAT, CREATION OF SUBTIDAL REEF HABITAT; AND
CONSTRUCTION OF BREAKWATERS,
HANCOCK COUNTY, MISSISSIPPI**

TO WHOM IT MAY CONCERN:

This District has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Please communicate this information to interested parties.

APPLICANT: **Mississippi Department of Environmental Quality
Attention: Mr. Richard Harrell
P.O. Box 2261
Jackson, Mississippi 39225**

AGENT: **Covington Civil and Environmental, LLC
Attention: Ms. Alane Young
2510 14th Street, Suite 1010
Gulfport, Mississippi 39501**

LOCATION: **In the Mississippi Sound, between Bayou Caddy and the mouth of the East Pearl River, Section 11, Township 10 South, Range 15 West, Hancock County, Mississippi [Bounding Coordinates: West – (-89.530W/30.184N) South – (-89.462W/30.169N) East – (-89.415W/30.233N) North – (-89.53W/30.184W) Centroid – (-89.457W/30.19N).**

INITIALLY PROPOSED WORK: The applicant proposed to place fill material for the creation of 46 acres of salt marsh; place fill material for the creation of 46 acres of oyster cultch; construct 5.9 miles of breakwater structures; and dredge approximately 650,000 cubic yards of material for the construction of 55,008-linear feet of barge access channels.

CHANGES TO PROPOSED WORK: As a result of further engineering, hydrodynamic modeling, geotechnical and biological evaluations, the breakwater design and footprint and the subtidal reef and marsh creation locations have been refined and finalized.

1. **Breakwaters would be constructed at two locations:** The first is an approximately 4 mile long structure along St. Joseph’s Point and the second is approximately 1.9 miles from the Pearl River to Heron Bay. The breakwater crest elevation would be increased from Mean Low Water (MLW) to Mean Higher High Water (MHHW) to facilitate increased marsh shoreline protection. Commensurate with the height increase, the breakwater base width would be increased from 30 feet to 60 feet wide resulting in a breakwater footprint net increase of 20.1 acres. Additionally, proposed bagged oyster veneer has proved to be unstable and has been removed from the proposal. The breakwaters would be installed in segments with each segment being approximately 180 feet with 30-foot gaps between segments. The breakwaters would consist of riprap underlain by geotextile fabric to minimize settlement. The structure would have a 15-foot crest width and 60-foot width at the base, and would be approximately 5.0-8.5 -feet in total height, with a total footprint of approximately 40.3 acres. The gap areas would also be underlain by geotextile fabric with a minimum of 1.5 feet of riprap covering the fabric. The target depth for deployment of the breakwaters would be approximately -3.5 feet North American Vertical Datum of 1988 (NAVD 88). The volume of material for the St. Joseph's segment would be approximately 132,000 cubic yards of rock material. The volume of material for the Pearl River-Heron Bay segment would be approximately 58,000 cubic yards of rock material. The project will be marked as required by U.S. Coast Guard.

All proposed temporary flotation channels proposed for the construction of the breakwater have been eliminated from the project resulting in a 123.9-acre reduction in impacts from the proposed channel footprint and sidecast of spoil.

Figure 1: Initially proposed breakwater specifications:

Living Shoreline (Breakwater) Design Data	St. Joseph’s Point Breakwater (eastern reach)	Pearl River to Heron Bay Breakwater (western reach):
Total project length	Approx. 4 miles	Approx. 1.9 miles
Total project acreage	14.4 acres	5.5 acres
Crest width	15.0 feet	15.0 feet
Base width	30 feet	30 feet
Assumed bottom elevation	-3.5 MLLW	-3.5 MLLW
Total structure height	3.75 feet	3.75 feet
Bagged shell veneer thickness	9 inches	9 inches
Riprap Core volume	51,600 cubic yards	16,900 cubic yards
Bagged shell volume	16,400 cubic yards	6,300 cubic yards
Depth of material (riprap/marine mattress)	3 feet	3 feet
Estimate initial settlement	1 foot	1 foot
Design side slopes	2v:1h	2v:1h

Breakwater distance from shoreline	30'-90'	30'-90'
Reach of each breakwater	75 feet	75 feet
Length of each gap between breakwater	25 feet	25 feet

Figure 2: Finalized breakwater specifications:

Breakwater Design Criteria	St. Joseph's Point Breakwater (eastern reach)	Pearl River to Heron Bay Breakwater (western reach):
Total project length	Approx. 4 miles	Approx. 1.9 miles
Total project acreage	28.1 acres	12.2 acres
Crest width	15.0 ft.	15.0 ft.
Base width	60 ft. (maximum)	60 ft. (maximum)
Assumed bottom elevation	-3.5 NAVD 88	-3.5 NAVD 88
Total structure height	5.0 to 8.5 ft.	5.0 to 8.5 ft.
Riprap volume	132,000 cubic yards	58,000 cubic yards
Thickness of material (riprap)	5.0 to 8.5 ft.	5.0 to 8.5 ft.
Estimated initial settlement	0.5 – 0.9 ft.	0.5 – 0.9 ft.
Design side slopes (Seaward Face)	5v:1h	5v:1h
Design side slopes (Landward Face)	3v:1h	3v:1h
Breakwater distance from shoreline	20 to 400 ft.	40 to 150 ft.
Reach of each breakwater	180 ft.	180 ft.
Design Crest Elevation	1.4 ft. NAVD88 (MHHW)	1.4 ft. NAVD 88 (MHHW)
Width of gaps between breakwaters at design crest height	30 ft.	30 ft.

- 2. Creation of 46 acres of salt marsh.** The potential marsh creation area has been finalized based on field studies. The final marsh creation area is an approximately 78 acre area in the southeastern portion of Heron Bay. Approximately 46 acres of marsh would be created in one of several locations within this area. (See figure 3 below). The applicant proposes the placement of fill material for the construction of 46 acres of tidal marsh within an identified 78 acres in the southeastern portion of Heron Bay. A dike (containment structure) would be constructed by excavating existing material from unvegetated waterbottoms within the marsh creation site and possibly with suitable permitted dredged materials from other sources, filling the area within the dike with appropriate dredged material to final marsh grade, and allowing the area to vegetate by natural colonization of estuarine marsh species. Sediment would be pumped through a floating pipeline from a hydraulic dredge located where suitable fill material is available. Pumps and sediment controls would remain in place throughout the dredging and filling process and after initial settling. Dredged material would be obtained from a tested and permitted dredge project or some other suitable, permitted source. Once the entire marsh area(s) is constructed, the area would be monitored for natural re-vegetation. The applicant anticipates natural vegetative colonization would occur within one to three

years. Dredged material would be obtained through the Mississippi Beneficial Sediment Use Program as available or excavated from a suitable borrow source. Once the entire marsh area(s) is constructed, the area would be monitored for natural re-vegetation. The applicant anticipates natural vegetative colonization would occur within one to three years.

- 3. **Placement of 46 acres for Subtidal Reef.** The subtidal reef deployment area has been finalized based on field studies. The final subtidal reef deployment area is an approximately 194 acre area in the western portion of Heron Bay. Approximately 46 acres of subtidal reef habitat would be created in one to several location with this area. (See figure 3 below). The applicant proposes to deploy cultch material in approximately 46 acres within an identified 194 acres in the western portion of Heron Bay. Cultch deployment would occur generally in water depths of -3 to -5 feet NAVD 88. The subtidal reef(s) would be sited based on data from an oyster presence survey and would consist of approximately 6- to 9-inch thick layer of limestone or other suitable material. Deployment would be by a barge-mounted crane with clam shell bucket. As a construction alternative, water jetting of cultch material may be used in case of water depth constraints.

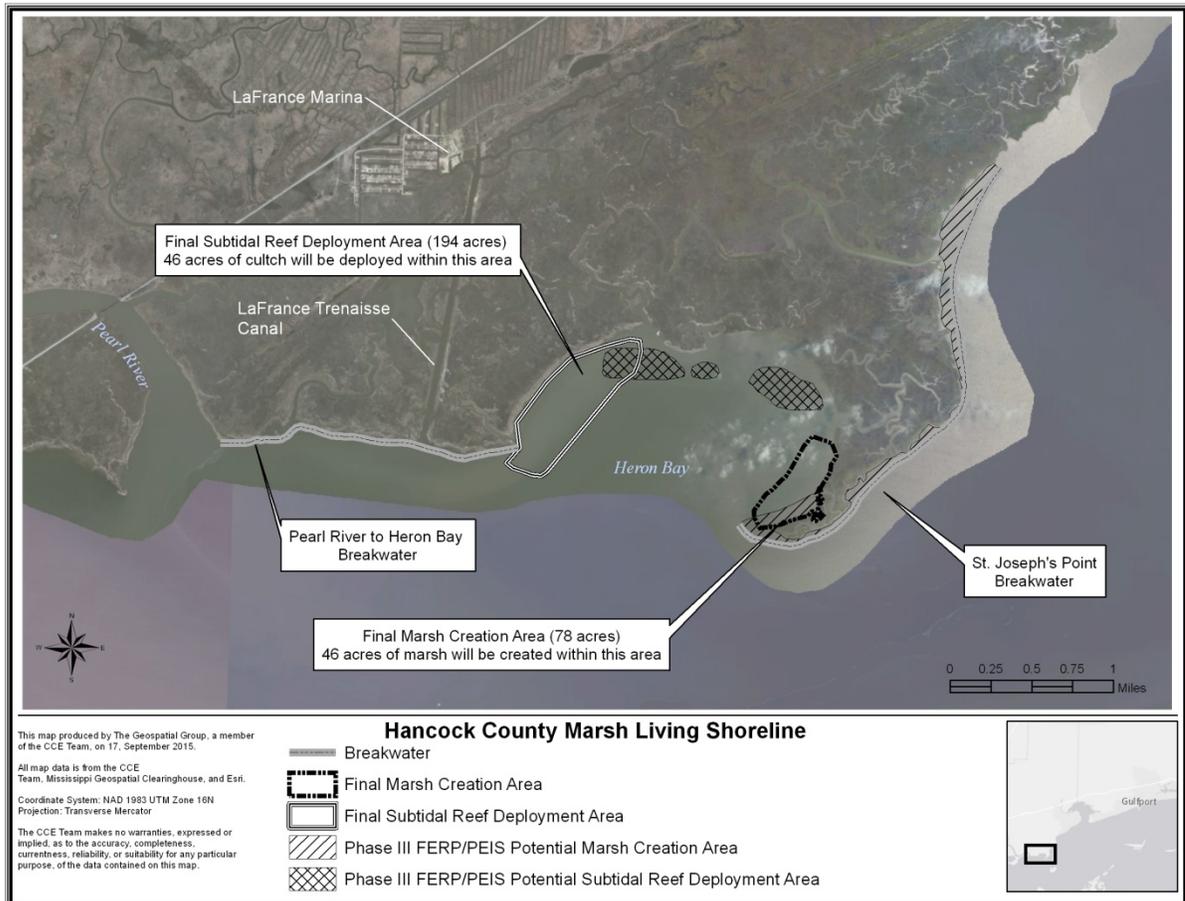


Figure 3: Refined Structure Locations.

Table 1. Summary of Originally Identified Impacts and Modified Impacts.

Project Component	Impact Type	Revised Impact Type (per Design Change)	Duration of Impact	Habitat Type Impacted	Acreage of Impact (per Phase 3 PEIS)	Revised Acreage of Impact (per Design Change)	Increase/(Decrease) in Acreage of Impact (per Design Change)
St. Joseph's Point Area Breakwater Construction Activity Area	Filling fine-grained sediment with riprap, covered with bagged shell veneer	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Long-Term	Shallow water/fine-grained sediment bottom	14.4	29.1	14.7
Pearl River to Heron Bay Breakwater Construction Activity Area	Filling fine-grained sediment with riprap, covered with bagged shell veneer	Filling fine-grained sediment with riprap over geotextile/geogrid layer	Permanent	Shallow water/fine-grained sediment bottom	5.5	13.8	8.3
Temporary Flotation Channels (breakwaters and subtidal reefs)	Excavation of sea bottom	None	Short-Term	Water depths of 2 to 8 feet with fine-grained sediment bottom	101	0	(101.0)
Temporary Flotation Channel Sidecast material	Placement of excavated sea bottom of seaward side of flotation channels or for use in marsh creation	None	Short-Term	Water depths of 2 to 8 feet with fine-grained sediment bottom	22.9	0	(22.9)
Subtidal Reefs in Heron Bay	Filling with Cultch (shells, limestone)	Filling with Cultch (shells, limestone); siting refined based on siting study	Long-Term	Shallow water/hard bottom	46	46	0.0
Marsh Creation (Inside Heron Bay)	Filling with suitable material	Filling with suitable material; site for marsh creation selected	Long-Term	Shallow water with fine-grained sediment bottom	46	46	0.0
Total Temporary Impacts					123.9	0	(123.9)
Total Permanent Impacts					111.9	134.9	23.0
Total Impacts					242.2	134.9	(100.9)

The applicant proposes to conduct post-construction performance monitoring for a period of seven (7) years following completion. The applicant proposes to monitor the project's performance with respect to erosion control, marsh habitat creation, and the support of secondary productivity. Information collected and evaluated would include water quality parameters; structural integrity of breakwater structure; height/elevation

and area of structure; consolidation rate of breakwater structure; shoreline profile; bivalve density, size, biomass and survival; non-bivalve invertebrate density and biomass; and percent cover of marsh vegetation. The applicant states that the project would incorporate a mix of long-term monitoring efforts to ensure project designs are correctly implemented during construction, and to identify any potential unanticipated erosion/sediment accumulation issues associated with the project. Corrective actions would be addressed through the maintenance budget included in the overall project budget.

EXISTING CONDITIONS: The project is located in open water within the Mississippi Sound and Heron Bay. This area is a relatively shallow water habitat. Recent sampling within the project footprint found soft silty clays with an interbedded layer of loose silty sands from East Pearl River to Heron Bay. The area westward of Heron Bay contained sediments consisting primarily of soft silty clays. Current resources within the project area consist of estuarine and marine wetlands and shallow water habitats such as tidal creeks, lagoons, bayous, and bays along the Pearl River estuary, the Hancock County marsh shoreline, and the Mississippi Sound.

PROJECT PURPOSE: As stated by the applicant, “The purpose of this project is to employ living shoreline techniques including natural and artificial breakwater material and marsh creation to reduce shoreline erosion by dampening wave energy while encouraging reestablishment of habitat that was once present in the region”. The U.S. Army Corps of Engineers (USACE) initially determined the basic project purpose is shoreline protection and would be considered a water dependent activity. Additional review will be performed by the USACE and cooperating agencies.

ALTERNATIVES: The USACE’ initial review of alternatives submitted by the applicant consists of two sites in addition to the proposed location, all located within southwestern Hancock County; two on-site alternative construction methods; and a “no action” alternative. The applicant expanded the analysis to consider a total of five sites and the “no action” alternative. Additional review of alternatives will be performed by the USACE and cooperating agencies.

MITIGATION: No mitigation was proposed by the applicant. The agent for the applicant states: “The applicant has designed the project to avoid and minimize impacts to waters of the U.S. The proposed project is an environmental restoration project, intended to accelerate meaningful restoration of injured natural resources and their services resulting from the *Deepwater Horizon* Oil Spill and related response actions (the Spill). The Hancock County Marsh, one of the largest remaining intact marsh habitats in Mississippi, was not only directly impacted by oiling from the Spill, but it is experiencing high rates of shoreline erosion and marsh loss. The project would include shoreline/marsh protection, marsh creation, subtidal reef restoration, and increased benthic secondary productivity, thus providing net positive long-term benefits to hydrology and water quality, living coastal and marine resources, socioeconomics, tourism and recreation. Thus, no compensatory mitigation is required.” Additional review of mitigation requirements will be performed by the USACE and cooperating agencies. Final compensatory mitigation will be evaluated by

the USACE and cooperating resource agencies throughout the review process for the proposed project.

The applicant has applied for certification from the State of Mississippi in accordance with Section 401(a)(1) of the Clean Water Act and upon completion of the required advertising; a determination relative to certification will be made.

The applicant has applied for coastal zone consistency from the State of Mississippi Department of Marine Resources in accordance with Section 57-15-6 of the Mississippi Code Annotated. (DMR-140157).

This public notice is being distributed to all known interested persons in order to assist in developing facts on which a decision by the USACE can be based. For accuracy and completeness of the record, all data in support of or in opposition to the proposed work should be submitted in writing setting forth sufficient detail to furnish a clear understanding of the reasons for support or opposition.

The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production and in general, the needs and welfare of the people.

The USACE is soliciting comments from the public; Federal, State and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the USACE to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held for consideration of this application. Requests for public hearings shall state with particularity, the reasons for holding a public hearing.

Evaluation of the probable impacts involving deposits of dredged or fill material into waters of the United States will include the application of guidelines established by the Administrator of the U.S. Environmental Protection Agency.

In accordance with Section 106 of the National Historic Preservation Act, and Appendix C of 33 CFR 325, the undertaking defined in this notice is being considered for the potential to effect cultural and historic properties within the permit area. In accordance with Appendix C of 33 CFR Part 325, the USACE has determined that the permit area is the overall project footprint and nearby surrounding environment. The National Park Service, National Register of Historic Places (NRHP) database has been consulted and the applicant performed a Cultural Resource Feasibility Study. The Feasibility Study included a desktop study of the project area (MDAH records, NOAA Shipwreck database), and a field magnetometer survey of the proposed breakwater footprint. Several prehistoric terrestrial sites are known to be located within or near the project area, as well as several shipwrecks. The proposed project **may have potential to cause effects** on cultural resources in the permit area.

Cultural Resource surveys have been completed and are currently in review by the USACE. We are seeking comment from the State Historic Preservation Officer, federally-recognized American Indian tribes, local historical societies, museums, universities, the National Park Service, in-house expertise, and the general public regarding the existence or the potential for existence of significant cultural and historic properties which may be affected by the work.

Preliminary review of this application and the U.S. Department of the Interior List of Endangered and Threatened Wildlife and Plants indicated the following species may be present onsite: the Gulf sturgeon (*Acipenser*) listed as threatened with critical habitat (TCH), the Green sea turtle (*Chelonia*) (T), the Kemp's ridley turtle (*Lepidochelys kempii*) (E), the Leatherback sea turtle (*Dermochelys comacea*) (E), the Hawksbill Sea Turtle (*Eretmochelys imbricate*) (E) the Loggerhead sea turtle (*Caretta caretta*) (T), the Piping Plover (*Charadrius melodus*) (TCH), and The West India manatee (*Trichechus manatus*) (E). Preliminary review of this application and the U.S. Department of the Interior List of Endangered and Threatened Wildlife and Plants for the 12-HUC watershed suggest that the proposed activity **may affect but is not likely to adversely affect** listed endangered or threatened species. Specifically, **the West India manatee, the Gulf sturgeon and its critical habitat and the Kemp's ridley, Loggerhead and Green sea turtles** may be affected by this project. The Hawksbill and Leatherback sea turtles are not typically found in nearshore and inshore coastal waters. The Piping plover utilizes beaches and mudflats. The proposed work will have no effect on the Piping plover as the project is not located within designated critical habitat and required habitat is not found within the project location.

By letter dated January 13, 2014, the **U.S. Fish and Wildlife Service** (USFWS), Deputy Deepwater Horizon Department of the Interior Natural Resource Damage Assessment and Restoration (NRDAR) Case Manager determined the proposed project may affect, but is not likely to adversely affect West Indian manatee and initiated an informal intra-service Section 7 consultation. The USFWS provided concurrence by signature dated January 24, 2014. **The USACE will re-initiate consultation with the USFWS by action of the Amended Public Notice.**

The National Oceanic and Atmospheric Administration (NOAA) Restoration Center requested **National Marine Fisheries Service** (NMFS) concurrence under Section 7 of the Endangered Species Act with their determination of "may affect, but not likely to adversely affect the green, hawksbill, Kemp's ridley, leatherback and loggerhead sea turtles, the Gulf sturgeon, smalltooth

sawfish, and designated Gulf sturgeon critical habitat. Consultation was initiated on March 19, 2014 (SER-2014-12925). By letter dated April 11, 2014, NMFS-PRD (Protected Resources Division) provided concurrence with this determination providing applicant utilizes floating turbidity curtains, perform work within a May-October timeframe to avoid potential impacts to migrating Gulf sturgeon, and follows NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*, dated March 23, 2006; *Measures for Reducing Entrapment Risk to Protected Species*, revised May 22, 2012; and USFWS *Standard Manatee Conditions for In-Water Work*, dated 2011. By letter dated September 26, 2014, the NMFS removed the timeframe restrictions as well as the need for turbidity curtains. **Project refinements would result in the elimination of 123.9 acres of dredging and spoil for the construction of temporary flotation channels and an increase of 23.0 acres of filling of soft bottom sediment for the construction of the expanded breakwater. The USACE will re-initiate ESA consultation with NMFS.**

Essential Fish Habitat (EFH). The proposal would impact approximately 40.3 acres for breakwaters, 46 acres for marsh creation, and 46 acres for oyster cultch, for a total impact of 132.3 acres of marine substrate utilized by various life stages of red drum, shrimp, coastal migratory pelagic and highly migratory species. Our initial determination is that the proposed action may affect but not likely to adversely affect EFH or federally managed fisheries. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service (NMFS).

By electronic mail dated February 20, 2014, NOAA Restoration Center transmitted their EFH assessment to the NMFS-HCD (Habitat Conservation Division) for review and concurrence. By letter dated March 26, 2014, the NMFS Southeast Region's Habitat Conservation Division (SER HCD) issued concurrence with EFH assessment, stating "We concur with the EFH assessment that the project may result in minor, adverse short-term impacts to EFH; however, the project is anticipated to result in long-term benefits to EFH. The SER HCD has no EFH conservation recommendations to provide pursuant to Section 305(b)(2) of the Magnuson-Stevens Act at this time. Further consultation is not necessary unless future modifications are proposed and such actions may result in adverse impacts to EFH". **By letter dated August 14, 2015, NOAA Restoration Center submitted a request for review and updated concurrence to NOAA HCD, based on modification to the project design (elimination of the flotation channels, the increased breakwater height and base width, and refinement of the siting of the subtidal reef and marsh creation components). Based on the updated assessment of the project refinements, NOAA Restoration Center is of the opinion that the proposed project refinements would not result in additional long-term impacts to EFH.**

Correspondence concerning this Public Notice should refer to Public Notice Number **SAM-2013-00088-MJF** and should be directed to the District Engineer, USACE, Mobile District, Attention: Ms. Maryellen Farmer, 1141 Bayview Avenue, Suite 501, Biloxi, Mississippi 39530, Attention: USACE Biloxi Field Office, with a copy to the Mississippi Department of Environmental Quality, Office of Pollution Control, Attention: Ms. Florance Bass, P.E., Post Office Box 2261, Jackson, Mississippi 39225 and the Mississippi Department of Marine Resources, Attention: Ms. Willa Brantley, 1141 Bayview Avenue, Suite 501, Biloxi, Mississippi 39530, in time to be received within **15 days** of the date of this public notice.

If you have any questions concerning this publication, you may contact the project manager for this application, Ms. Maryellen Farmer (maryellen.j.farmer@usace.army.mil), phone (228) 523-4116. Please refer to the above Public Notice number.

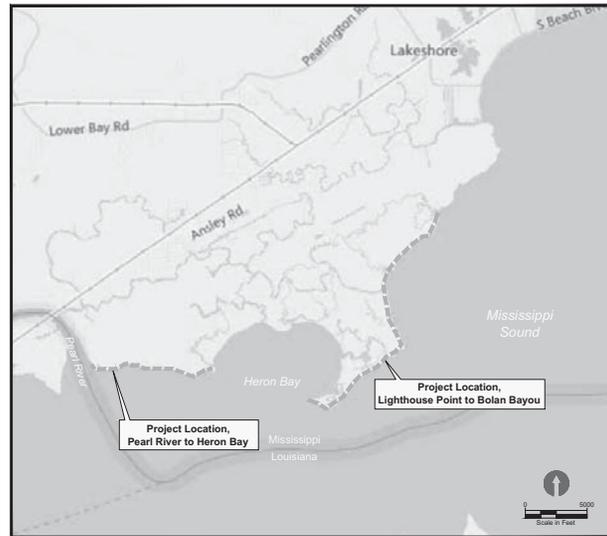
For additional information about our Regulatory Program, please visit our web site at: www.sam.usace.army.mil/Missions/Regulatory.aspx.

MOBILE DISTRICT
U.S. Army Corps of Engineers

Enclosures

HANCOCK COUNTY MARSH LIVING SHORELINE

HANCOCK COUNTY, MISSISSIPPI



DRAWING INDEX		
SHEET	DRAWING	TITLE
1	G1	TITLE SHEET
2	C1	PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 0+00 TO 13+00
3	C2	PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 13+00 TO 28+40
4	C3	PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 28+40 TO 44+00
5	C4	PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 44+00 TO 58+80
6	C5	PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 58+80 TO 75+60
7	C6	PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 75+60 TO 90+20
8	C7	PEARL RIVER TO HERON BAY PROJECT LAYOUT, STA. 90+20 TO 102+70
9	C8	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 0+00 TO 16+60
10	C9	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 16+60 TO 33+40
11	C10	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 33+40 TO 46+00
12	C11	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 46+00 TO 57+80
13	C12	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 57+80 TO 74+80
14	C13	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 74+80 TO 87+40
15	C14	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 87+40 TO 98+00
16	C15	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 98+00 TO 108+40
17	C16	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 108+40 TO 119+00
18	C17	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 119+00 TO 129+40
19	C18	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 129+40 TO 144+00
20	C19	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 144+00 TO 154+60
21	C20	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 154+60 TO 167+20
22	C21	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 167+20 TO 180+60
23	C22	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 180+60 TO 196+60
24	C23	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 196+60 TO 209+20
25	C24	LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT LAYOUT, STA. 209+20 TO 215+60
26	C25	TYPICAL BREAKWATER SECTIONS AND DETAILS
27	C26	HERON BAY REEF PROBE LOCATIONS FOR PROPOSED SUB-TIDAL REEF
28	C27	HERON BAY MARSH PROBE LOCATIONS FOR PROPOSED MARSH FILL PLACEMENT

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REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

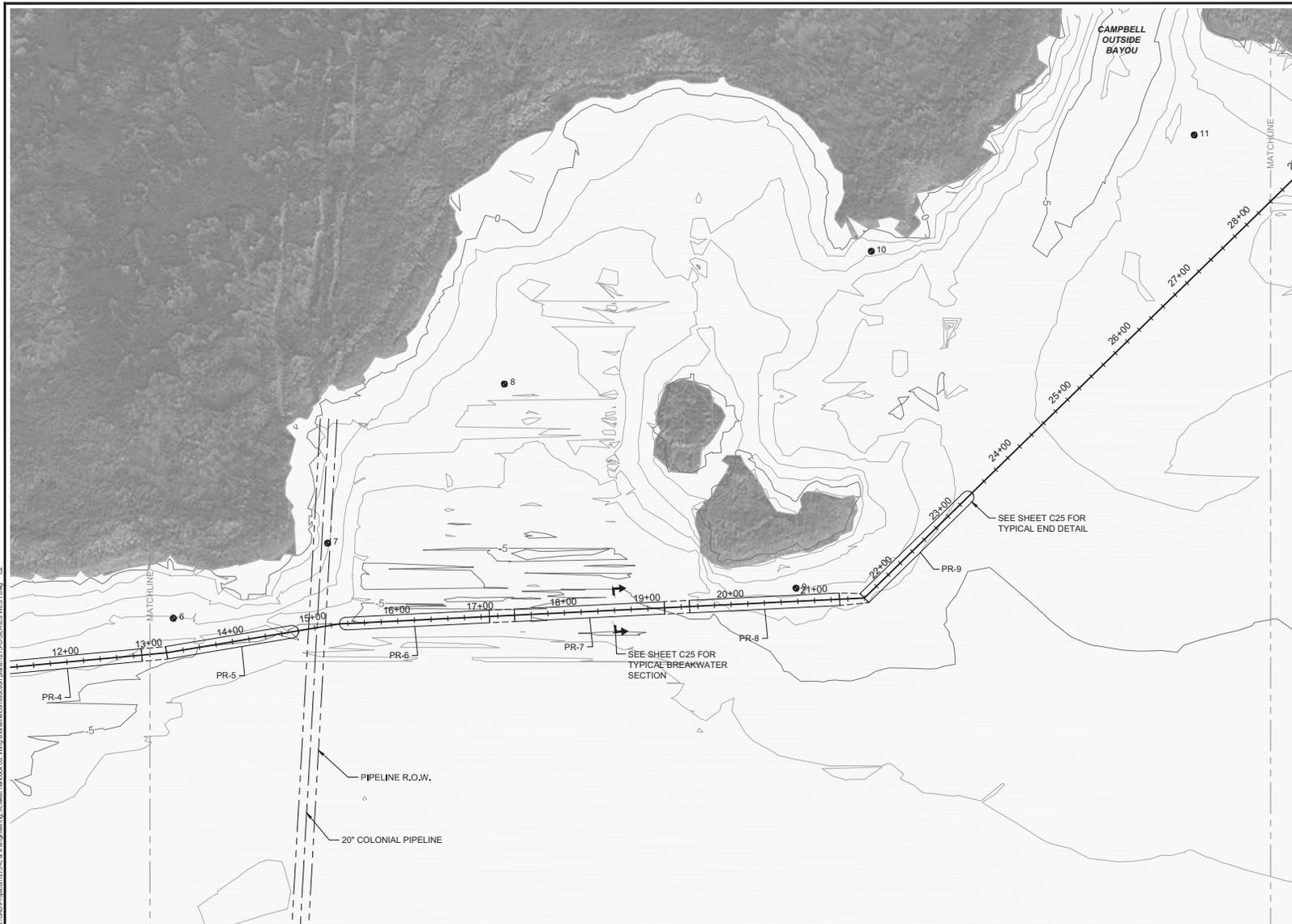
HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

TITLE SHEET

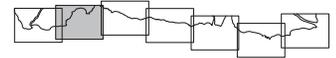
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SHEET NO. 1 OF 28

ONE INCH
 AT FULL SIZE IF NOT ONE
 INCH SCALE ACCORDINGLY



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 1 GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (SOIL TEST)
- B-1B GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- 15 SICT SAMPLE BY ANCHOR OEA (2015)
- 5 BATHYMETRIC CONTOUR (1-FOOT INTERVAL)



NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, PEARL RIVER TO HERON BAY. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CREST WIDTH.
7. PIPELINE RIGHT-OF-WAY INFORMATION PROVIDED BY COLONIAL PIPELINE.

ONE INCH = 100 FEET AT FULL SCALE ACCORDINGLY



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

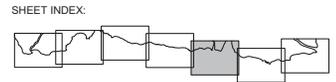
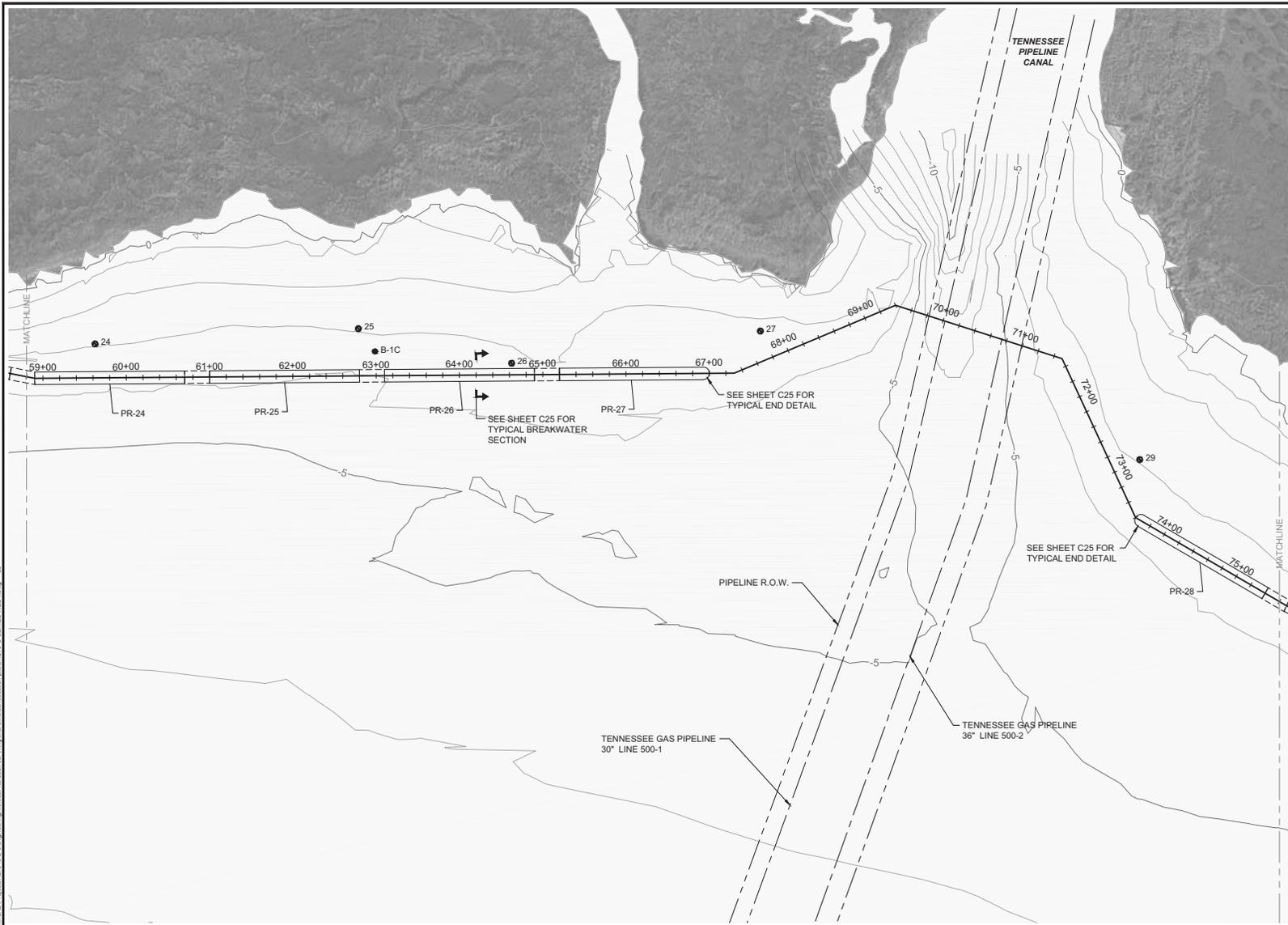
**HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MJF / DMR-140197**

**PEARL RIVER TO HERON BAY PROJECT LAYOUT,
 STA. 13+00 TO 28+40**

C2

SHEET NO. 3 OF 28

July 22, 2015 4:59pm tholmer m:\CAD\Projects\127146 & 4\amplanning\lowest_hancock_co_fing ShorelineRestoration\plan\1271-C-SHORES WEST.dwg



- LEGEND:
- MARSH AREA ABOVE ELEVATION +1 NAVD88
 - PR-1 BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
 - BREAKWATER GAP (SEE SHEET C25)
 - PROJECT ALIGNMENT AND STATION
 - 1 GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
 - B-1B GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
 - 15 SICT01 SICT SAMPLE BY ANCHOR OEA (2015)
 - 5 BATHYMETRIC CONTOUR (1-FOOT INTERVAL)



- NOTES:
1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
 2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
 3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
 4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
 5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, PEARL RIVER TO HERON BAY. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
 6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER, ONLY THE 15' CREST WIDTH.
 7. PIPELINE RIGHT-OF-WAY INFORMATION PROVIDED BY TENNESSEE PIPELINE.

m:\CAD\Projects\1271-06_4\amp\p\dwg\1271-06-4\amp\p\dwg\1271-06-4-01.dwg
 08/22/2015 4:59pm tholmer



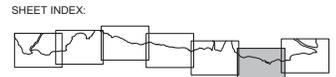
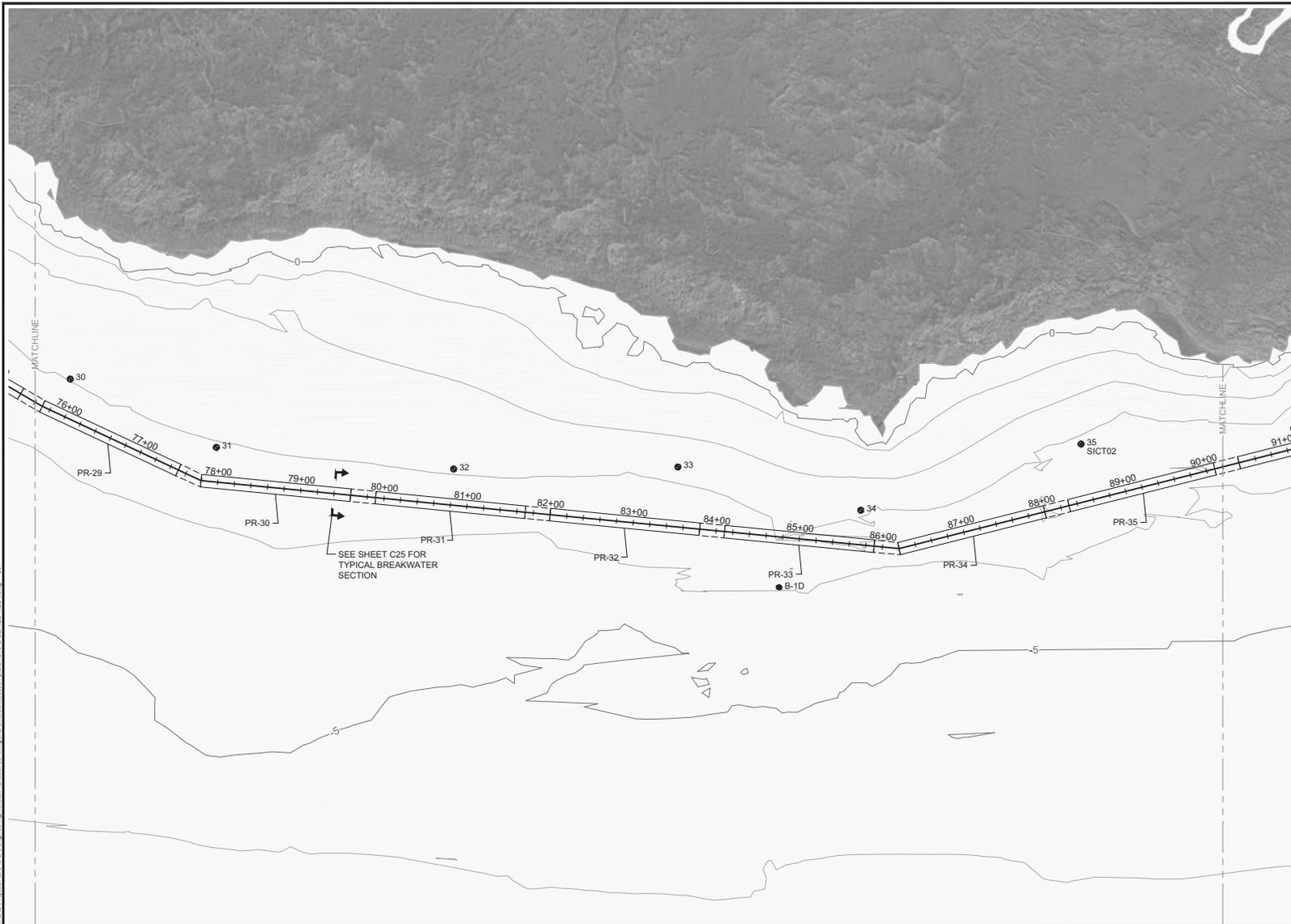
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REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

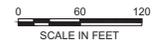
HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197
PEARL RIVER TO HERON BAY PROJECT LAYOUT,
STA. 58+80 TO 75+60

C5
 SHEET NO. 6 OF 28

ONE INCH = FIFTY FEET
 ALL DIMENSIONS IN FEET UNLESS OTHERWISE NOTED



- LEGEND:
- MARSH AREA ABOVE ELEVATION +1 NAVD88
 - BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
 - BREAKWATER GAP (SEE SHEET C25)
 - PROJECT ALIGNMENT AND STATION
 - GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
 - GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
 - SICT SAMPLE BY ANCHOR QEA (2015)
 - BATHYMETRIC CONTOUR (1-FOOT INTERVAL)



- NOTES:
1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
 2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
 3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
 4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
 5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, PEARL RIVER TO HERON BAY. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
 6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH = 120 FEET AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY

July 22, 2015 4:51 pm tholmer m:\CAD\Projects\127166 - Landmarking & Engineering\127166 - Landmarking\127166-C-SERIES WEST.dwg



REVISIONS				
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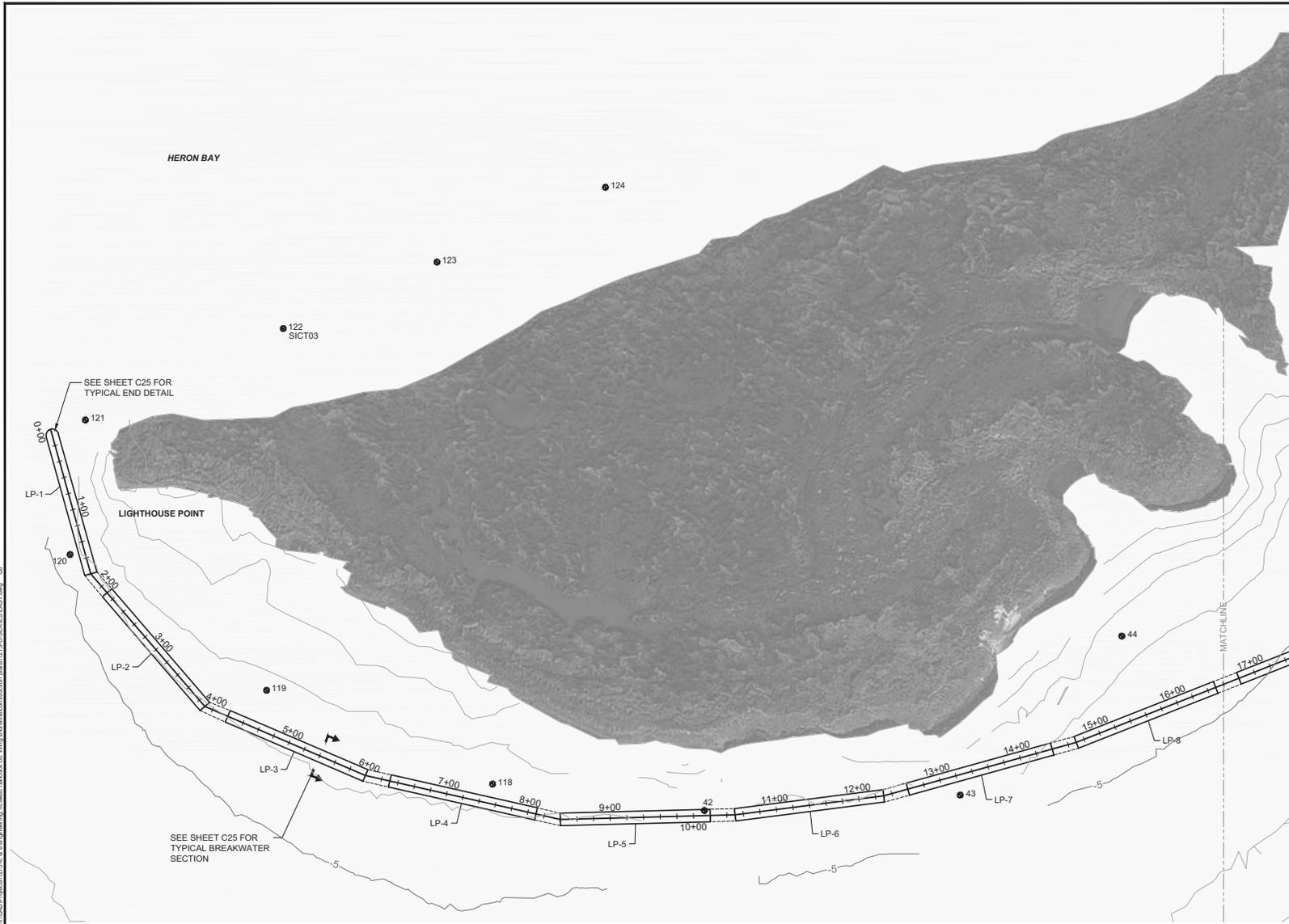
DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

**HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MJF / DMR-140197**

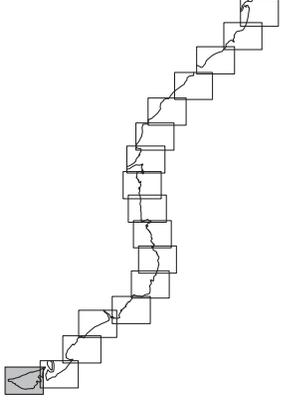
**PEARL RIVER TO HERON BAY PROJECT LAYOUT,
 STA. 75+60 TO 90+20**

C6

SHEET NO. 7 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH = FIFTY FEET AT FULL SCALE ACCORDINGLY

July 22, 2015 4:51 pm thornier m:\CAD\Projects\127186_4\amp\plans\127186-4\amp\plans\127186-4.dwg



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

**HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MJF / DMR-140197**

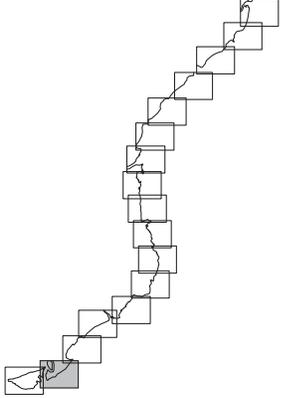
**LIGHTHOUSE POINT TO BOLAN BAYOU PROJECT
 LAYOUT, STA. 0+00 TO 16+60**

C8

SHEET NO. 9 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH = FIFTY FEET AT FULL SCALE ACCORDINGLY

July 22, 2015 4:51 pm Anchor QEA Engineering, Inc. 12756 S. Airport Blvd., Suite 100, Houston, TX 77060



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

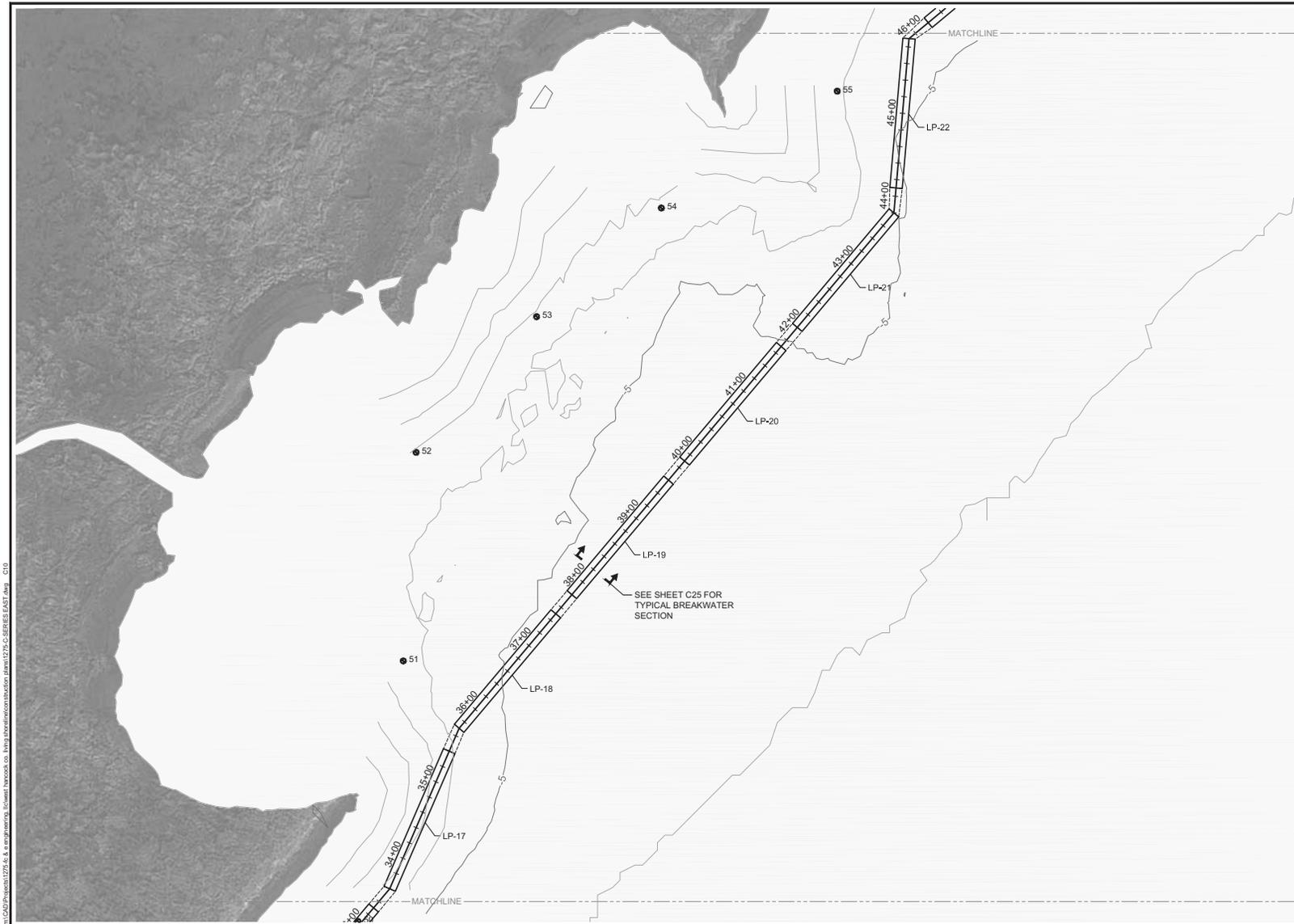
DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

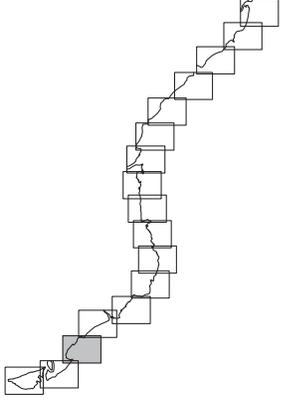
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 16+60 TO 33+40

C9

SHEET NO. 10 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 14+00
- 1 GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- B-1B GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- 15 SICT01 SICT SAMPLE BY ANCHOR QEA (2015)
- 5 BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120 SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

May 22, 2015 4:51 pm (Printer) m:\CAD\Projects\1275-06-00-Engineering\Hancock Co. Living Shoreline\Construction Plans\1275-C-SERIES EAST.dwg C10



REVISIONS				
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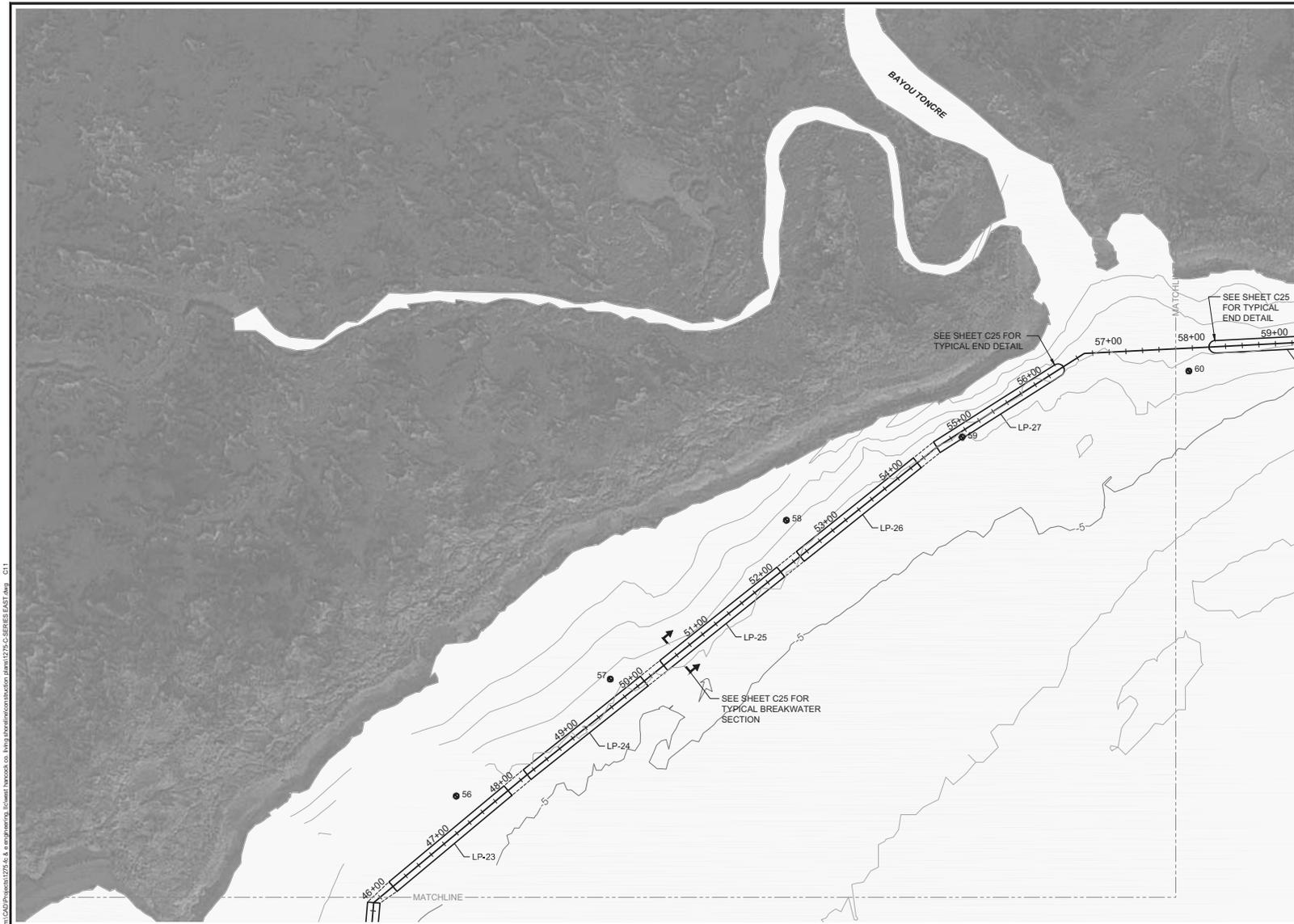
DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

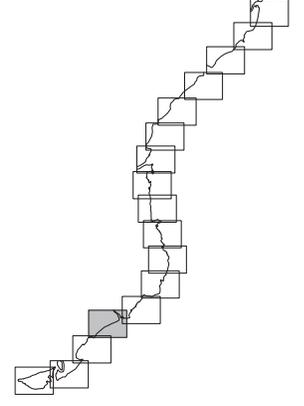
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 33+40 TO 46+00

C10
 SHEET NO. 11 OF 28

ONE INCH = 10 FEET
 AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- LP-1 BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 1 GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- B-1B GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- 15 SICT01 SICT SAMPLE BY ANCHOR QEA (2015)
- 5- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH = 100 FEET AT FULL SCALE ACCORDINGLY

July 22, 2015 4:51 pm tholmer m:\CAD\Projects\1275-06 - Living Shoreline\Construction Plans\1275-C-SERIES EAST.dwg C11



REVISIONS				
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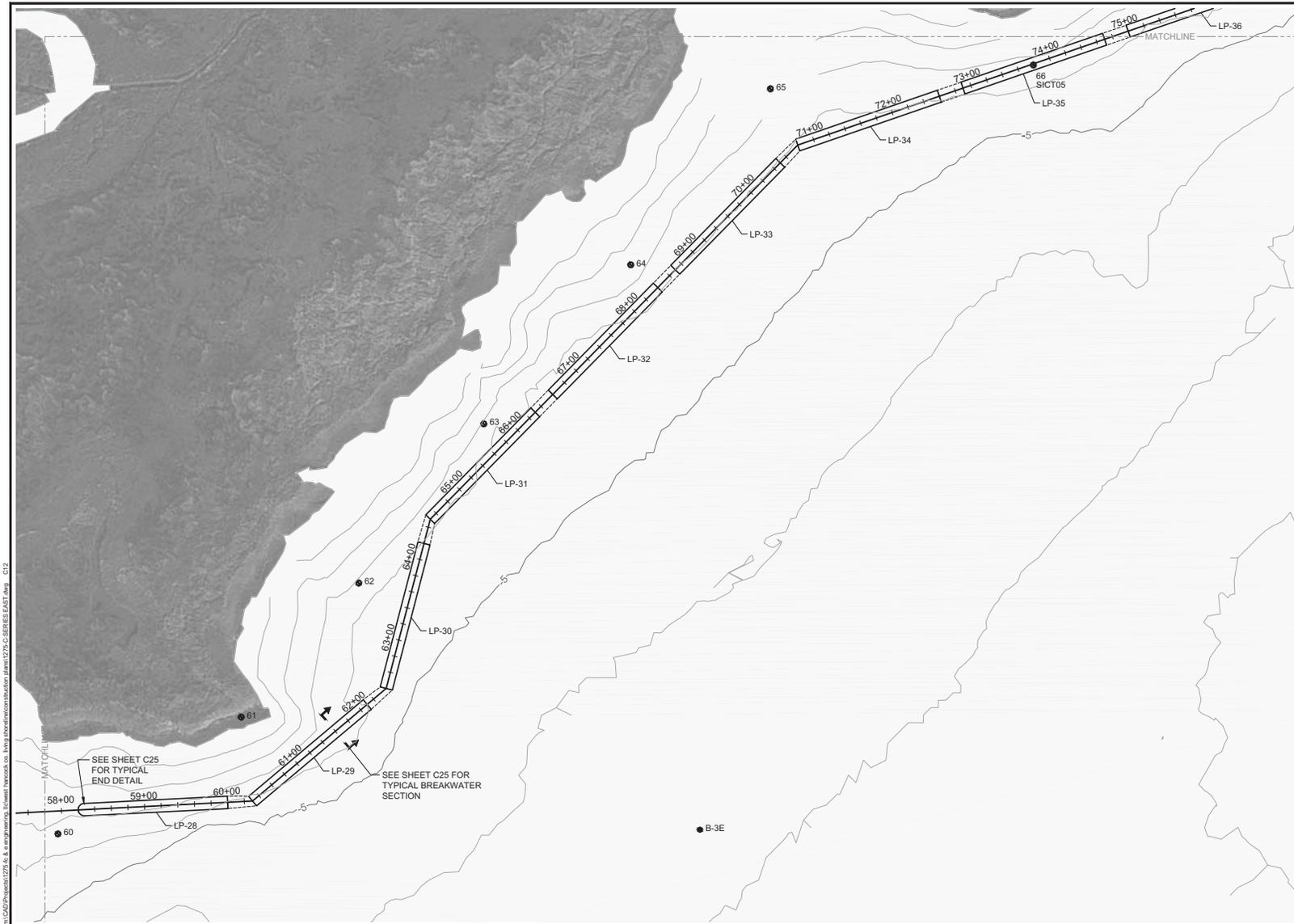
DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

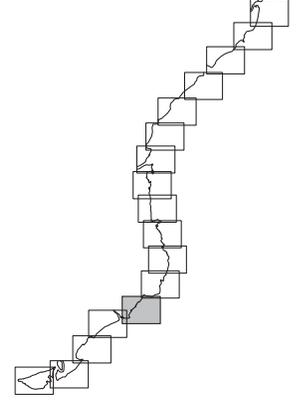
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 46+00 TO 57+80

C11

SHEET NO. 12 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

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 Job 22, 2015, 4:55pm thurmer



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

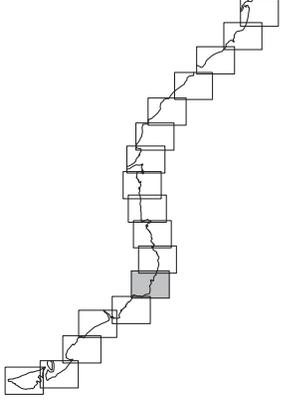
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 57+80 TO 74+80

C12
 SHEET NO. 13 OF 28

ONE INCH = FIFTY FEET
 AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH = FIFTY FEET AT FULL SCALE ACCORDINGLY

July 22, 2015 4:55pm (initial) m:\CAD\Projects\127166_4\Engineering\Hancock Co. Living Shoreline\Construction Plans\127166-C-SERIES (EAST) - C13.dwg



REVISIONS				
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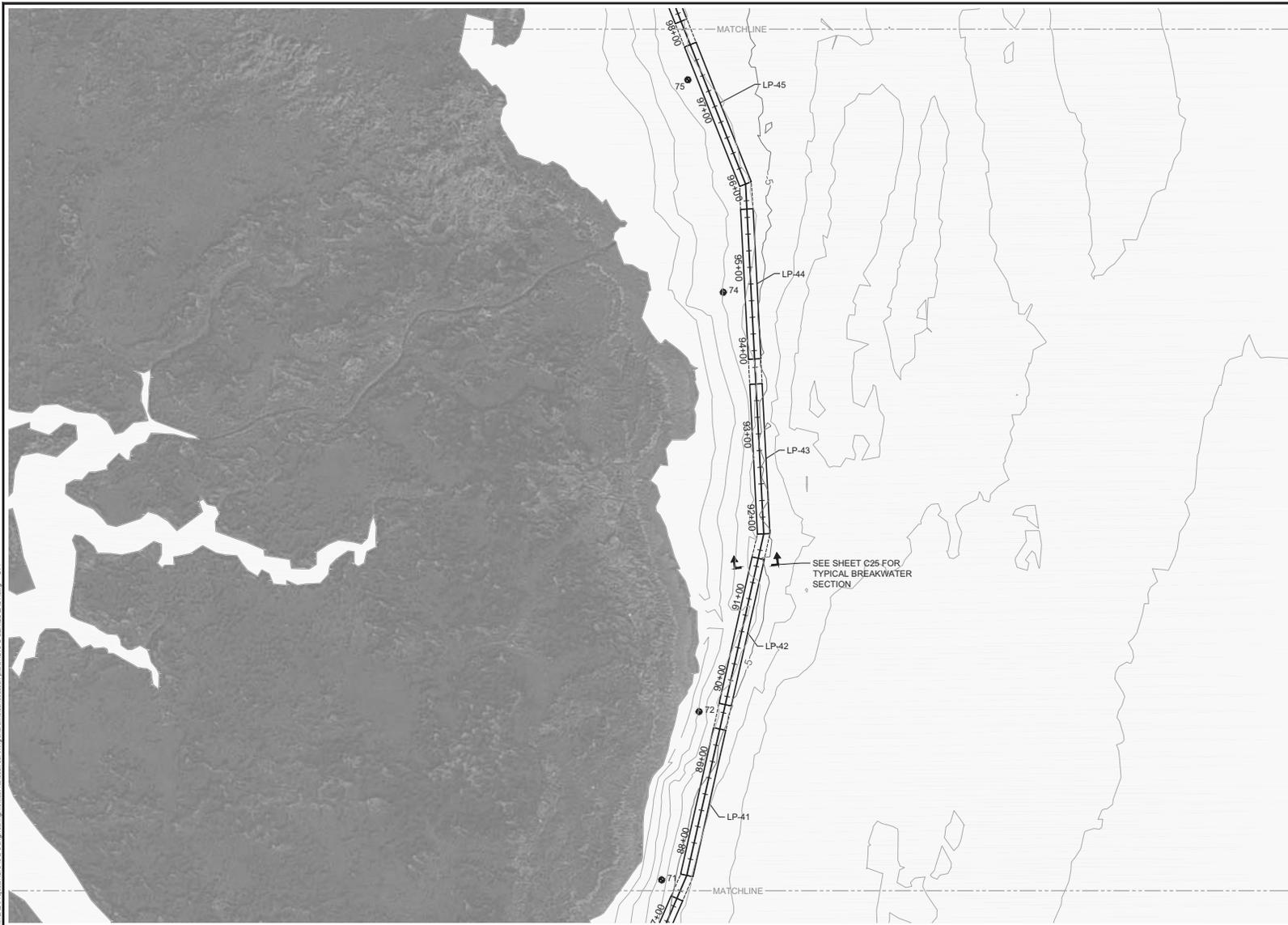
DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

**HANCOCK COUNTY MARSH LIVING SHORELINE, MS
 SAM-2013-00088-MJF / DMR-140197**

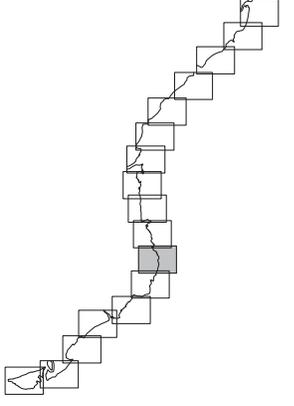
**LIGHTHOUSE POINT TO BOLAN BAYOU
 PROJECT LAYOUT, STA. 74+80 TO 87+40**

C13

SHEET NO. 14 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
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4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH AT FULL SCALE REPRESENTS ONE HUNDRED FEET AT THIS SCALE ACCORDINGLY

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REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

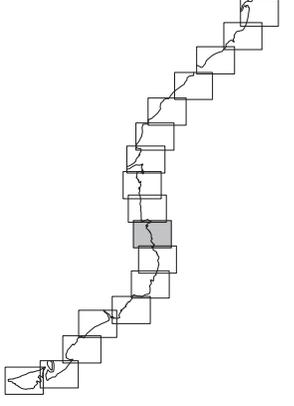
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 87+40 TO 98+00

C14

SHEET NO. 15 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120
SCALE IN FEET

NOTES:

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6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH AT FULL SIZE IS ONE INCH SCALE ACCORDINGLY.

m:\CAD\projects\127186 & 4\engineering\licent\hancock_co_fing\shoreline\structure\plan\1271-C-SERIES EAST.dwg C15
July 22, 2015 4:55pm tholmer



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

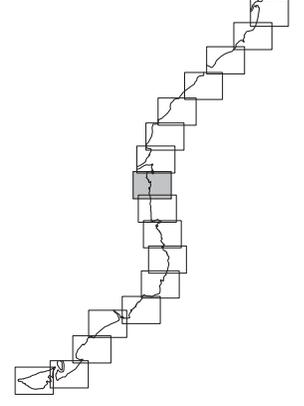
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 98+00 TO 108+40

C15

SHEET NO. 16 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH = 100 FEET AT FULL SIZE. IF NOT ONE INCH SCALE ACCORDINGLY.



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

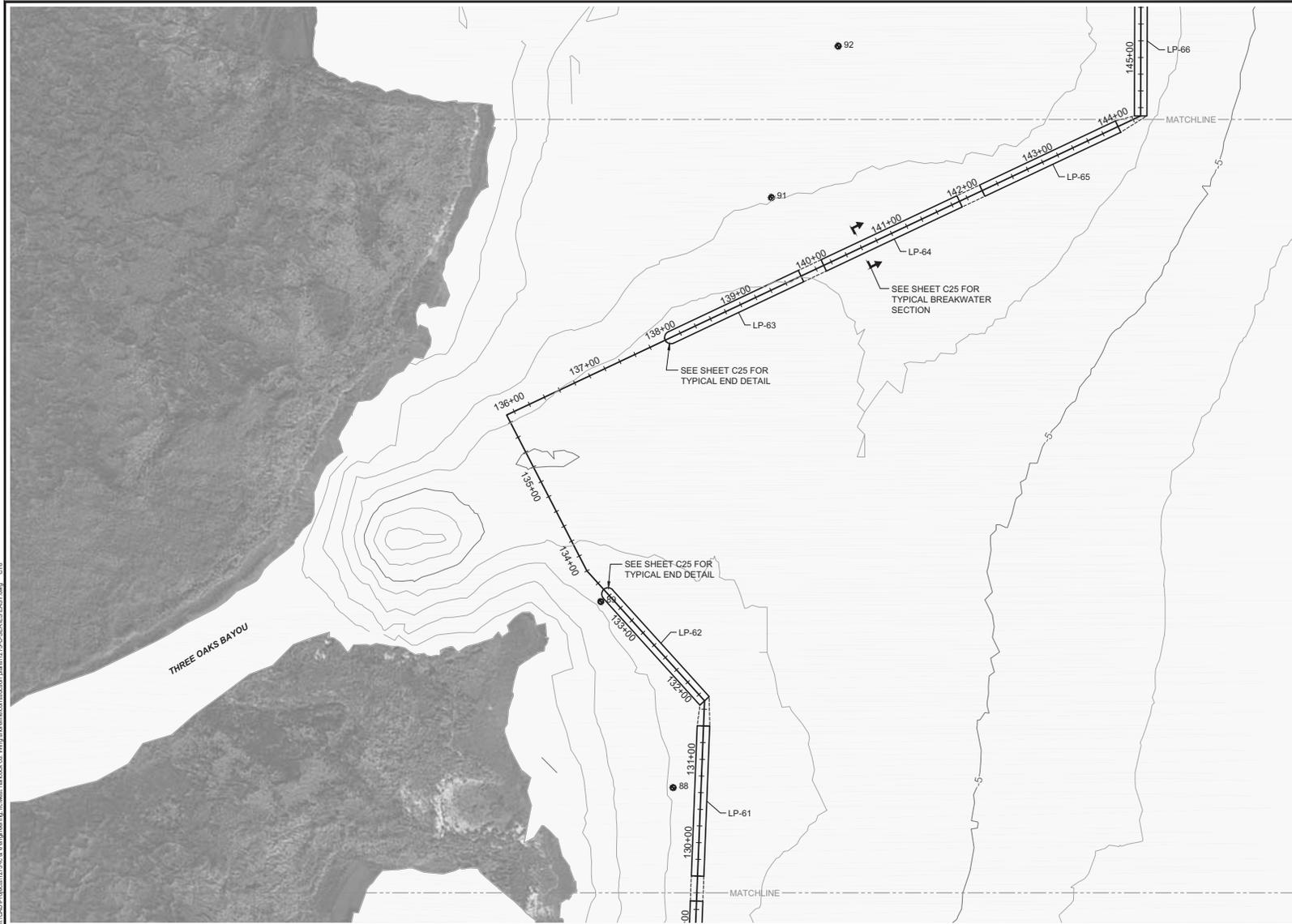
DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

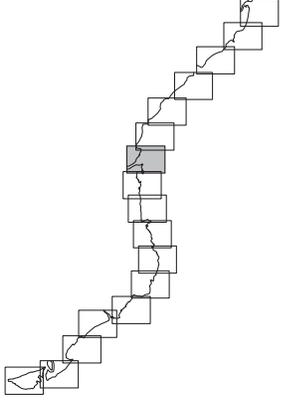
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 119+00 TO 129+40

C17

SHEET NO. 18 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

ONE INCH = 100 FEET AT FULL SCALE ACCORDINGLY

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REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

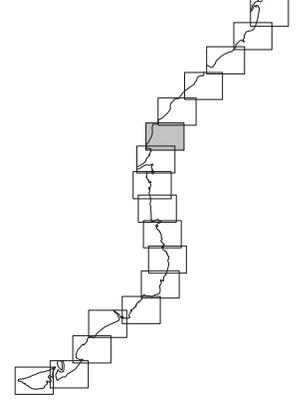
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 129+40 TO 144+00

C18

SHEET NO. 19 OF 28



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- 1 GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- B-1B GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- 15 SICT01 SICT SAMPLE BY ANCHOR QEA (2015)
- 5 BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH



NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

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 July 22, 2015 4:55pm tholmer



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

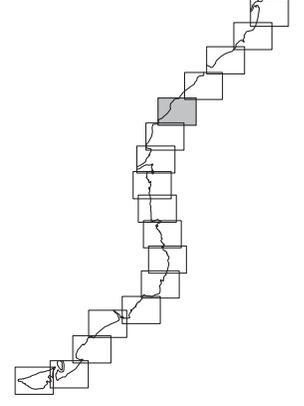
HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 144+00 TO 154+60

C19
 SHEET NO. 20 OF 28

ONE INCH = 100 FEET
 AT FULL SIZE IF NOT ONE INCH SCALE ACCORDINGLY



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120
SCALE IN FEET

NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

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REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

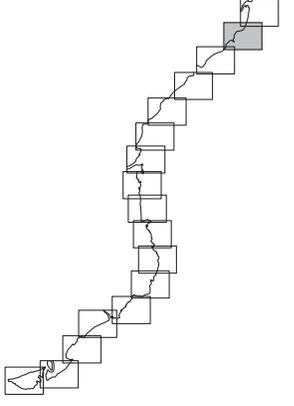
HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 154+60 TO 167+20

C20
 SHEET NO. 21 OF 28

ONE INCH
 AT FULL SIZE IS EQUAL TO ONE
 INCH SCALE ACCORDINGLY



SHEET INDEX:



LEGEND:

- MARSH AREA ABOVE ELEVATION +1 NAVD88
- BREAKWATER CREST AND DESIGNATION (SEE NOTE 6)
- BREAKWATER GAP (SEE SHEET C25)
- PROJECT ALIGNMENT AND STATION
- GEOTECHNICAL BORING BY BURNS, COOLEY, DENNIS, INC. (MAY 2015)
- GEOTECHNICAL BORING BY SOILTECH CONSULTANTS (JUNE 2013)
- SICT SAMPLE BY ANCHOR QEA (2015)
- BATHYMETRIC CONTOUR (1-FOOT INTERVAL)
- NORTH
- 0 60 120
SCALE IN FEET

NOTES:

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4. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO, 2015.
5. SURVEY BY HYDROTERRA, MISSISSIPPI LIVING SHORELINE RESTORATION PROJECT, LIGHTHOUSE BAYOU TO BOLAN BAYOU. SURVEY PERFORMED DECEMBER 2014, JANUARY TO MARCH 2015.
6. PLANS DO NOT SHOW FULL EXTENT OF BREAKWATER; ONLY THE 15' CREST WIDTH.

m:\CAD\Projects\127186_4_anchor_qea\engineering\bolan_bayou\living_shoreline\breakwater_plans\1271-C-SHEET EAST.dwg C24
 Job 22, 2015 4:55pm tholmer



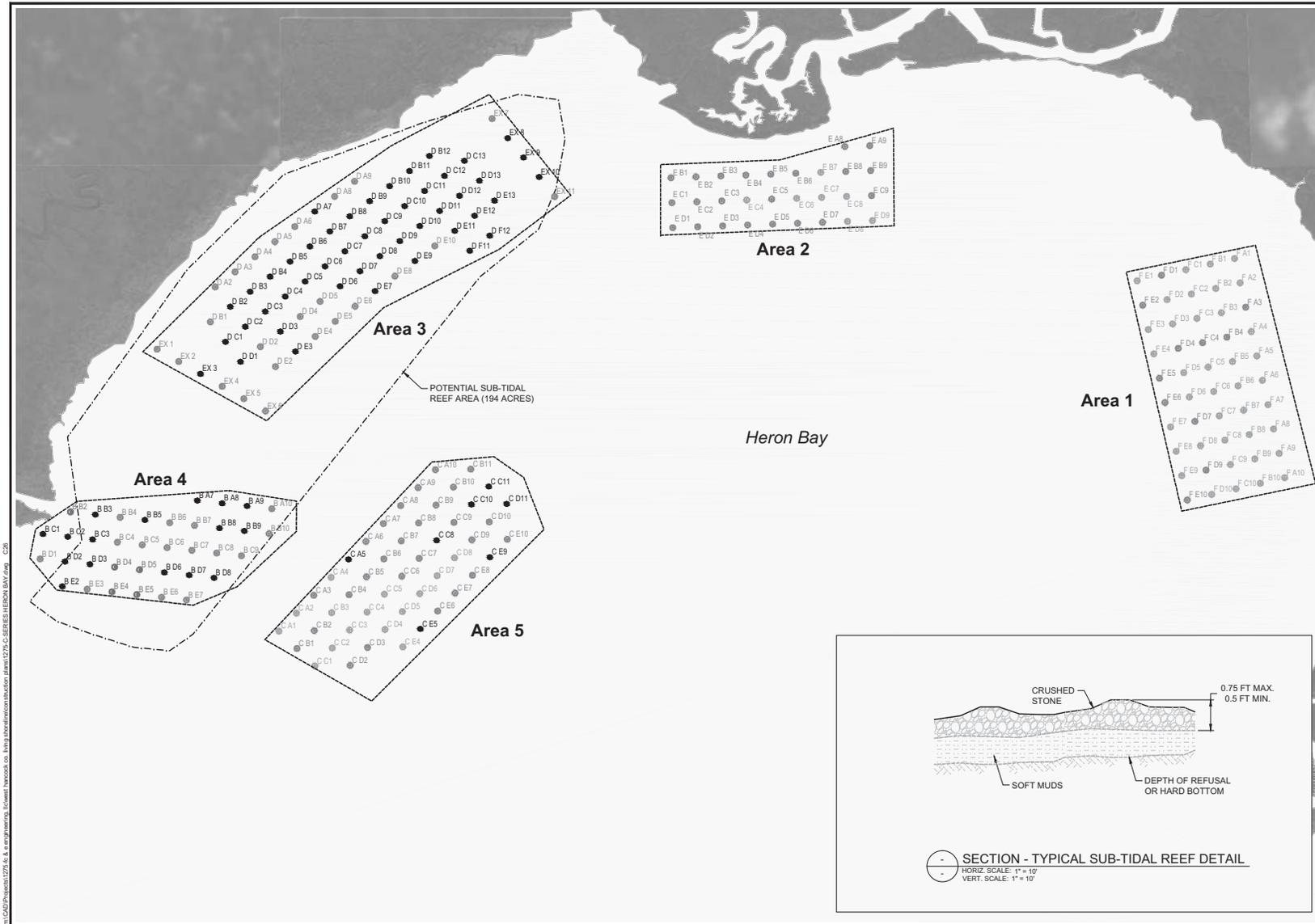
REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
 SCALE: AS NOTED
 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197
LIGHTHOUSE POINT TO BOLAN BAYOU
PROJECT LAYOUT, STA. 196+60 TO 209+20

C24
 SHEET NO. 24 OF 28

ONE INCH
 AT FIELD SIZE IS ONE
 INCH SCALE ACCORDINGLY



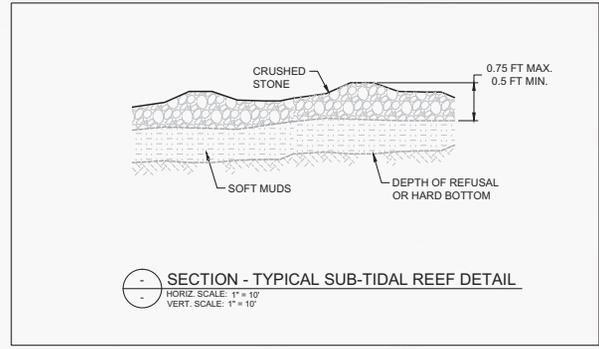
LEGEND:

- B E5 ● LESS THAN 0.3 FT OF SOFT MUD OR SILT, REFUSAL INTO HARD MUD
- D D8 ● MORE THAN 0.3 FT OF SOFT MUD, REFUSAL OR INCLUSIONS OF SHELL OR SHELL HASH
- F D7 ● MORE THAN 0.3 FT OF SOFT MUD, REFUSAL INTO HARD MUD
- F A9 ● SOFT MATERIALS > 2.0 FEET THICK OR NO REFUSAL NOTED
- MARSH AREA ABOVE ELEVATION +1 NAVD88



NOTES:

1. HORIZONTAL DATUM: MISSISSIPPI STATE PLANES EAST ZONE, NAD 83, U.S. FEET.
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
3. 0.0 FEET MEAN LOWER LOW WATER (MLLW) = -0.3 FEET NAVD88
4. AERIAL PHOTOGRAPH FROM ESRI.
5. 46 ACRE SUB-TIDAL REEF TO BE CREATED WITHIN THE 194 ACRES SHOWN (AREAS 1 - 5)
6. PROBING SURVEY PERFORMED BY DIMCO ON JULY 7, 2015.



m:\CAD\Projects\127146 - 4 - Campgrounds - Hancock Co. - Long Shore\Information\Structure Plans\1271-C-REEF-Heron Bay.dwg
 2015-08-22 10:54 am
 User: dholmer



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

DESIGNED BY: R. ROBERTSON
 DRAWN BY: D. HOLMER
 CHECKED BY: W. MEARS
 APPROVED BY: W. MEARS
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 DATE: AUGUST 2015

HANCOCK COUNTY MARSH LIVING SHORELINE, MS
SAM-2013-00088-MJF / DMR-140197

HERON BAY REEF PROBE LOCATIONS
FOR PROPOSED SUB-TIDAL REEF

C26
 SHEET NO. 27 OF 28

ONE INCH = ONE HUNDRED FEET SCALE ACCORDINGLY

