



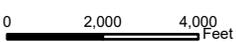
REVISED: AUG 03, 2023



Project Location is  
29.252473 Latitude  
-94.897818 Longitude  
Virginia Point and Lake Como Quadrangles  
NAD 83 State Plane Texas South Central

- Subject Tract (379 acres)
- Project Location

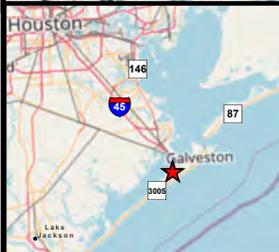
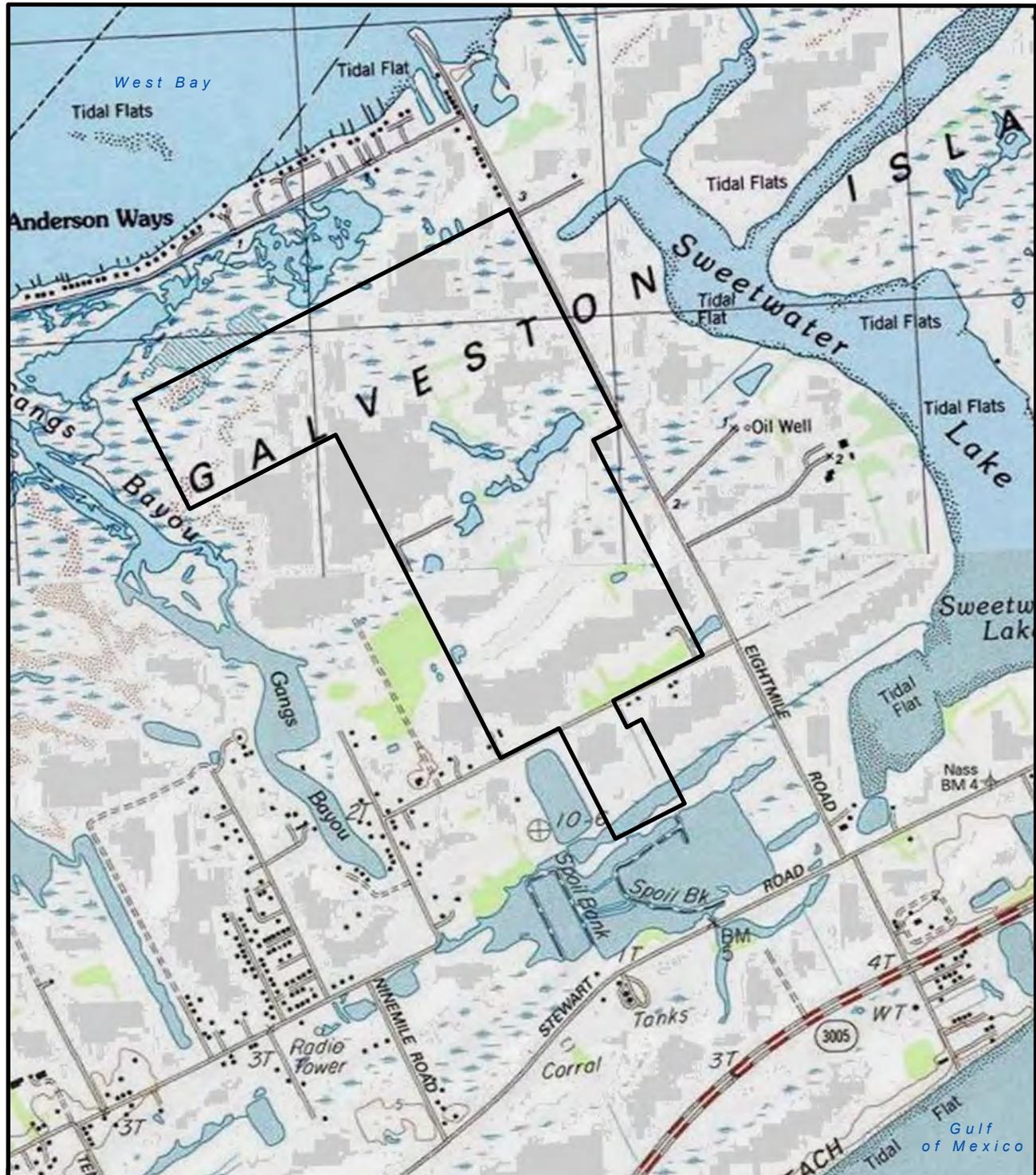
Datum: NAD 1983  
Projection: State Plane Texas  
South Central  
Units: Feet  
Basemap: ESRI Streets



Sheet 1 of 33  
Vicinity Map  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**  
**Galveston**  
Galveston County, Texas

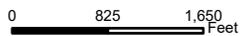
Job No.: 100079983	Scale: 1" = 4,000 feet
Prepared By: ATKINS/WHIT6392	Date: May 16, 2023

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 Survey Area

Datum: NAD 1983  
 Projection: State Plane Texas  
 South Central  
 Units: Feet  
 Basemap: ERSI USA Topo



**ATKINS**

Member of the SNC-Lavalin Group

Figure 3  
 Topographic Survey Area Map  
 Wetland Delineation Report

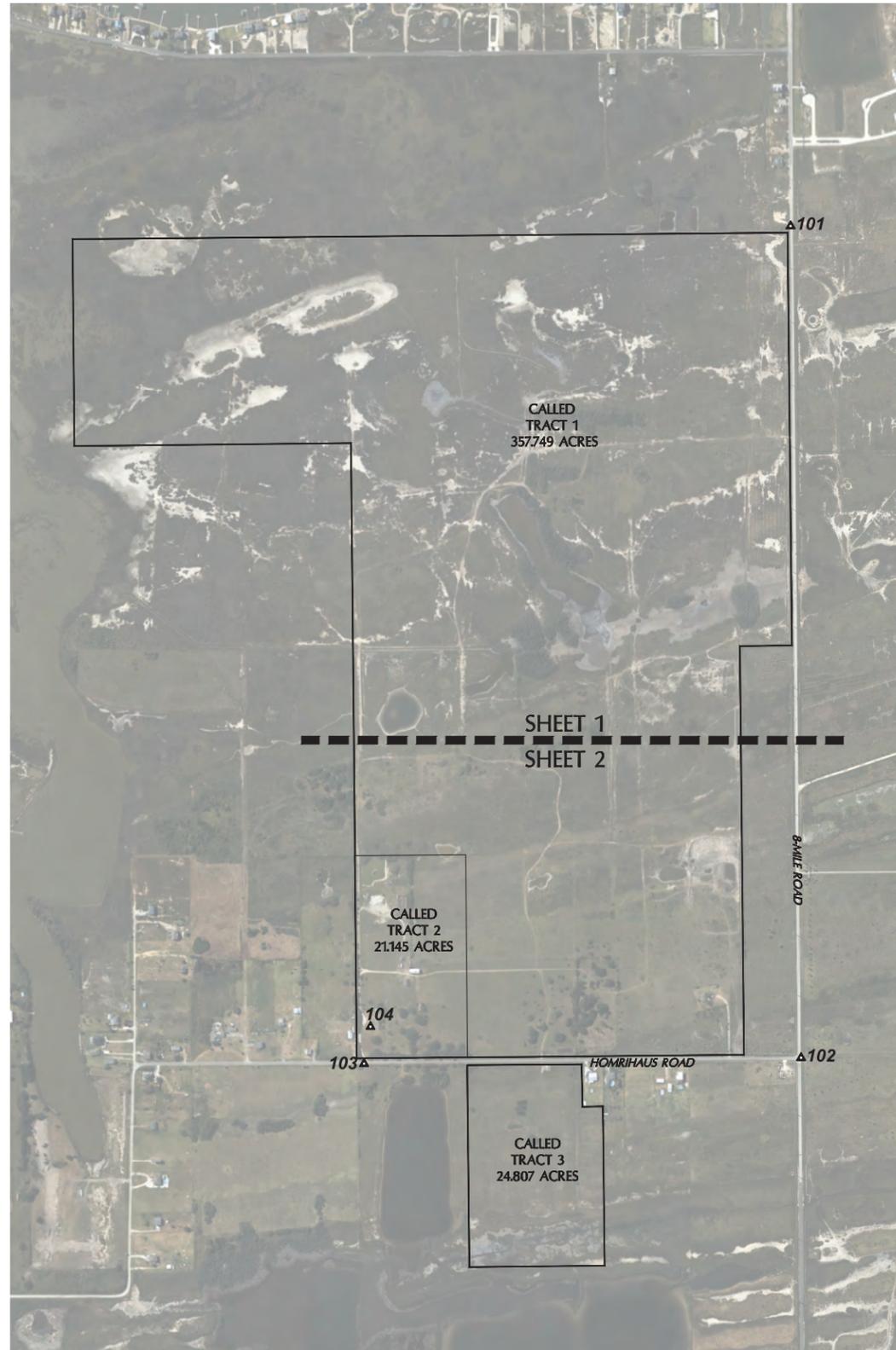
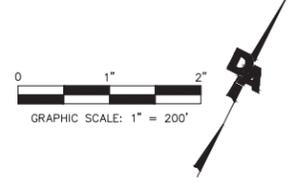
**Legacy Wetlands at Sullivan Ranch  
 Freshwater Improvement Project  
 Galveston  
 Galveston County, Texas**

Job No.: 100079983	Scale: 1" = 1,650 feet
Prepared By: ATKINS/WHIT6392	Date: Aug 29, 2022

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**LEGEND**

- 1/2" IRON ROD FOUND (UNLESS NOTED)
  - IRON PIPE FOUND [AS NOTED]
  - RIGHT OF WAY TYPE II MONUMENT FOUND
  - ▲ NAIL FOUND
  - 1/2" IRON ROD WITH "DOUCET" CAP SET
  - CLEAN OUT
  - BOLLARD
  - ⊠ ELECTRIC PULL BOX
  - ⊠ RADIO ANTENNA
  - ⊠ AIR CONDITIONING UNIT
  - ⊠ ELECTRIC MANHOLE
  - ⊠ FIRE HYDRANT
  - ⊠ GAS METER
  - ⊠ HANDICAP PARKING
  - ⊠ LIGHT POLE
  - ⊠ TRAFFIC SIGNAL
  - FENCE POST FOUND [AS NOTED]
  - MARKER POST [AS NOTED]
  - VALVE
  - WATER VALVE
  - ⊠ WATER METER
  - ⊠ STORM SEWER MANHOLE
  - ⊠ TELEPHONE PEDESTAL
  - ⊠ GREASE MANHOLE
  - ⊠ TELEPHONE MANHOLE
  - ⊠ SIGN [AS NOTED]
  - ⊠ POWER POLE
  - DOWN GUY
  - ⊠ BENCHMARK FOUND
  - ⊠ CALCULATED POINT
  - ⊠ COTTON SPINDLE FOUND
  - ⊠ ELECTRIC METER
  - ⊠ ELECTRIC TRANSFORMER
  - ⊠ GAS VALVE
  - ⊠ IRRIGATION CONTROL VALVE
  - ⊠ MAILBOX
  - ⊠ TELEPHONE SERVICE BOX
  - ⊠ TRAFFIC SIGNAL BOX
  - ⊠ WASTEWATER MANHOLE
  - ⊠ WATER MANHOLE
  - ⊠ SERVICE POLE
  - ⊠ CABLE PEDESTAL
  - ⊠ CONTROL POINT
- 
- PROPERTY LINE/SUBJECT EASEMENT
  - EXISTING PROPERTY LINE
  - EXISTING EASEMENT
  - ADJOINER PROPERTY LINE
  - BSL BUILDING SET BACK LINE
  - OE OVERHEAD ELECTRIC
  - OW OVERHEAD WIRES
  - X EXISTING WIRE FENCE
  - // EXISTING WOOD FENCE
  - /// EDGE OF PAVEMENT
  - ≈ APPROXIMATE SURVEY LINE
  - ⊘ APPROXIMATE COUNTY LINE
- 
- ▨ E2EM WETLAND AREA (PER OTHERS)
  - ▨ E2SS WETLAND AREA (PER OTHERS)



**REVISED: AUG 03, 2023**

Sheet 2 of 33 Surveyed Wetlands and Topographic Map <b>Legacy Wetlands at Sullivan Ranch</b> Habitat Improvement Project Galveston Galveston County, Texas	
Job No.: 100079983	Prepared by: Atkins/WHIT6392
Date: July 26, 2023	

**SURVEY NOTES:**

BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM 1983 (NAD83), 2011 ADJUSTMENT (EPOCH 2010) AND A VERTICAL DATUM OF NAVD83, GEOID 12B. ALL COORDINATE VALUES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO SURFACE BY USING THE SURFACE ADJUSTMENT FACTOR OF 0.999868017.

BOUNDARY AND EASEMENT INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY JUNE, 27, 2016 JOHN D. MERCER SURVEY (JOHN D. MERCER, RPLS TX 1924 SURVEYING FIRM NO. 10116600).

SURVEY COMPLETED ON THE GROUND SEPTEMBER 8, 2022. AERIAL IMAGERY AND LIDAR FLOWN JULY 2022.

SURVEY CONTROL				
POINT #	NORHTING	EASTING	ELEVATION	DESCRIPTION
101	13667125.78	3276855.57	4.03	MAGNL=CONTROL 101
102	13662391.67	3279287.29	4.57	MAGNL=CONTROL 102
103	13661108.57	3276794.06	6.08	MAGNL=CONTROL 103
104	13661338.75	3276725.60	6.46	IRS=5/BIN

**LEGACY WETLANDS AT SULLIVAN RANCH  
TOPOGRAPHIC SURVEY  
EXHIBIT**

**SURVEYOR'S CERTIFICATION:**

I HEREBY CERTIFY THIS SURVEY WAS MADE ON THE GROUND, AND THAT THIS PLAT CORRECTLY REPRESENTS THE FACTS FOUND AT THE TIME OF SURVEY AND THAT THIS PROFESSIONAL SERVICE CONFORMS TO THE TEXAS SOCIETY OF PROFESSIONAL SURVEYORS' STANDARDS AND SPECIFICATIONS FOR A CATEGORY 6, CONDITION II TOPOGRAPHIC SURVEY.

*J. Dillon Fugate* 05/25/2023  
 J. DILLON FUGATE DATE  
 REGISTERED PROFESSIONAL LAND SURVEYOR  
 TEXAS REGISTRATION NO. 6360  
 DOUCET & ASSOCIATES  
 DFLGATE@DOUCETENGINEERS.COM

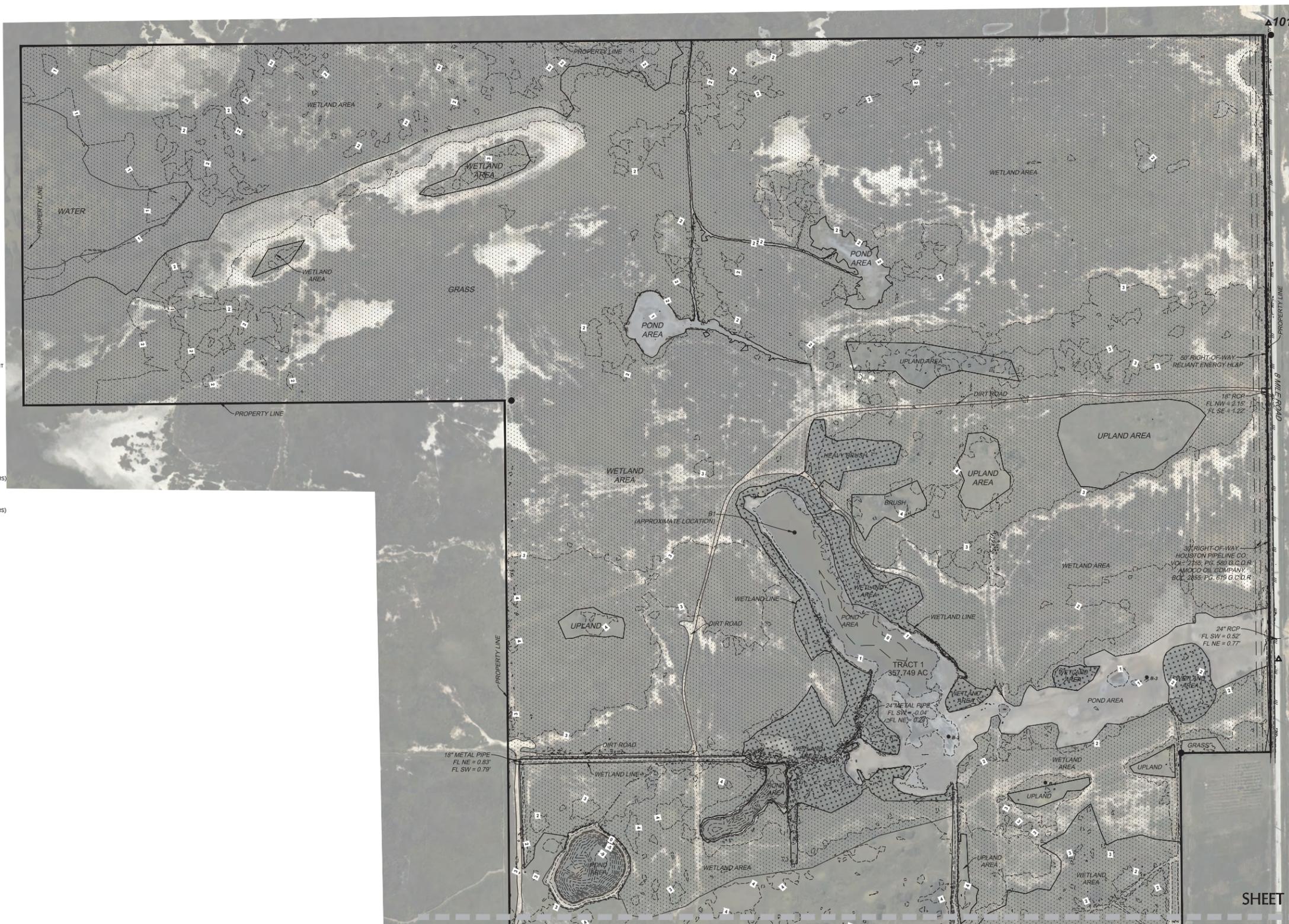


**LEGACY WETLANDS  
AT SULLIVAN RANCH**

 <b>DOUCET</b> Civil Engineering // Entitlements // Geospatial 7401 B. Highway 71 W, Ste. 160 Austin, TX 78735, Tel: (512)-583-2600 www.doucetengineers.com TBPE Firm Number: 3937 TBPELS Firm Number: 10105800	Date: 05/25/2023 Scale: 1" = 500' Drawn by: JS Reviewer: JDF Project: 1554-010 Sheet: 1 OF 3 Field Book: 0000 Party Chief: SH Survey Date: 09/07/2022
--	---

LEGEND

- 1/2" IRON ROD FOUND [UNLESS NOTED]
  - IRON PIPE FOUND [AS NOTED]
  - MONUMENT FOUND
  - RIGHT OF WAY TYPE II
  - NAIL FOUND
  - 1/2" IRON ROD WITH "DOUCET" CAP SET CLEAN OUT
  - BOLLARD
  - ELECTRIC PULL BOX
  - RADIO ANTENNA
  - AIR CONDITIONING UNIT
  - ELECTRIC MANHOLE
  - FIRE HYDRANT
  - GAS METER
  - HANDICAP PARKING
  - LIGHT POLE
  - TRAFFIC SIGNAL
  - FENCE POST FOUND [AS NOTED]
  - MARKER POST [AS NOTED]
  - VALVE
  - WATER VALVE
  - WATER METER
  - STORM SENEH MANHOLE
  - TELEPHONE PEDESTAL
  - GREASE MANHOLE
  - TELEPHONE MANHOLE
  - SIGN [AS NOTED]
  - POWER POLE
  - DOWN GUY
  - BENCHMARK FOUND
  - CALCULATED POINT
  - COTTON SPINDLE FOUND
  - ELECTRIC METER
  - ELECTRIC TRANSFORMER
  - GAS VALVE
  - IRRIGATION CONTROL VALVE
  - MAILBOX
  - TELEPHONE SERVICE BOX
  - TRAFFIC SIGNAL BOX
  - WASTEWATER MANHOLE
  - WATER MANHOLE
  - SERVICE POLE
  - CABLE PEDESTAL
  - CONTROL POINT
- 
- PROPERTY LINE/SUBJECT EASEMENT
  - EXISTING PROPERTY LINE
  - EXISTING EASEMENT
  - ADJOINER PROPERTY LINE
  - BSL BUILDING SET BACK LINE
  - OE OVERHEAD ELECTRIC
  - OW OVERHEAD WIRES
  - X EXISTING WIRE FENCE
  - // EXISTING WOOD FENCE
  - // EDGE OF PAVEMENT
  - s APPROXIMATE SURVEY LINE
  - c APPROXIMATE COUNTY LINE
- 
- EZEM WETLAND AREA (PER OTHERS)
  - EZSS WETLAND AREA (PER OTHERS)



**REVISED: AUG 03, 2023**

Sheet 3 of 33	
Surveyed Wetlands and Topographic Map	
Legacy Wetlands at Sullivan Ranch	
Habitat Improvement Project	
Galveston	
Galveston County, Texas	
Job No.: 100079983	Date: July 26, 2023
Prepared by: Atkins/WHIT6392	

**SURVEY NOTES:**  
BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM 1983 (NAD83), 2011 ADJUSTMENT (EPOCH 2010) AND A VERTICAL DATUM OF NAVD88, GEOID 12B. ALL COORDINATE VALUES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO SURFACE BY USING THE SURFACE ADJUSTMENT FACTOR OF 0.999868017.  
BOUNDARY AND EASEMENT INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY JUNE, 27, 2016 JOHN D. MERCER SURVEY (JOHN D. MERCER, RPLS TX 1924 SURVEYING FIRM NO. 10116600).  
SURVEY COMPLETED ON THE GROUND SEPTEMBER 8, 2022. AERIAL IMAGERY AND LIDAR FLOWN JULY 2022.

LEGACY WETLANDS AT SULLIVAN RANCH  
TOPOGRAPHIC SURVEY  
EXHIBIT

**LEGACY WETLANDS AT SULLIVAN RANCH**

**DOUCET**  
Civil Engineering // Entitlements // Geospatial  
7401 B. Highway 71 W, Ste. 160  
Austin, TX 78735, Tel: (512)-583-2600  
www.doucetengineers.com  
TBPE Firm Number: 3937  
TBPELS Firm Number: 10105800

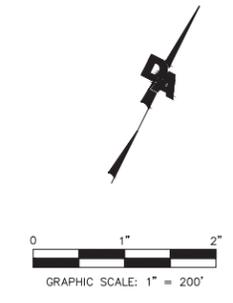
Date: 05/25/2023
Scale: 1" = 200'
Drawn by: JS
Reviewer: JDF
Project: 1554-010
Sheet: 2 OF 3
Field Book: 00000
Party Chief: SH
Survey Date: 09/07/2022

SHEET 1

SHEET 2

LEGEND

- 1/2" IRON ROD FOUND [UNLESS NOTED]
  - IRON PIPE FOUND [AS NOTED]
  - ▣ RIGHT OF WAY TYPE II
  - ▣ MONUMENT FOUND
  - NAIL FOUND
  - 1/2" IRON ROD WITH "DUCET" CAP SET CLEAN OUT
  - BOLLARD
  - ⊕ ELECTRIC PULL BOX
  - ⊕ RADIO ANTENNA
  - ⊕ AIR CONDITIONING UNIT
  - ⊕ ELECTRIC MANHOLE
  - ⊕ FIRE HYDRANT
  - ⊕ GAS METER
  - ⊕ HANDICAP PARKING
  - ⊕ LIGHT POLE
  - ⊕ TRAFFIC SIGNAL
  - FENCE POST FOUND [AS NOTED]
  - MARKER POST [AS NOTED]
  - VALVE
  - WATER VALVE
  - WATER METER
  - STORM SEWER MANHOLE
  - TELEPHONE PEDESTAL
  - GREASE MANHOLE
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  - EXISTING PROPERTY LINE
  - EXISTING EASEMENT
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  - OE OVERHEAD ELECTRIC
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  - / / EDGE OF PAVEMENT
  - ≈ APPROXIMATE SURVEY LINE
  - ≈ APPROXIMATE COUNTY LINE
- 
- ▨ EZEM WETLAND AREA (PER OTHERS)
  - ▨ EZSS WETLAND AREA (PER OTHERS)



**REVISED: AUG 03, 2023**

Sheet 4 of 33 Surveyed Wetlands and Topographic Map <b>Legacy Wetlands at Sullivan Ranch</b> Habitat Improvement Project Galveston Galveston County, Texas	
Job No.: 100079983	Date: July 26, 2023
Prepared by: Atkins/WHIT6392	

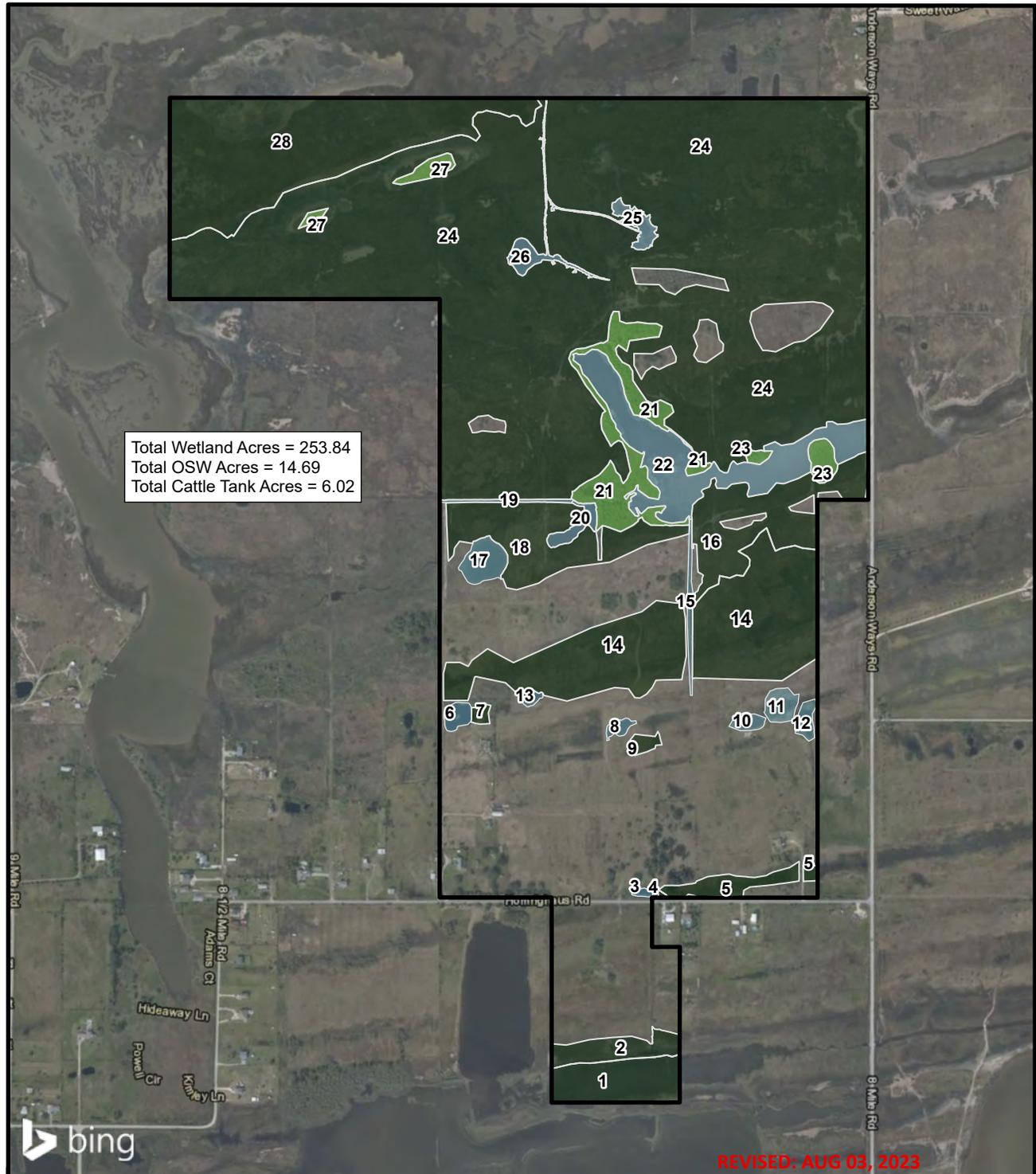


**LEGACY WETLANDS**  
AT SULLIVAN RANCH

<p><b>DOUCET</b></p> Civil Engineering // Entitlements // Geospatial 7401 B. Highway 71 W, Ste. 160 Austin, TX 78735, Tel: (512)-583-2600 www.doucetengineers.com TBPE Firm Number: 3937 TBPELS Firm Number: 10105800	Date: 05/25/2023 Scale: 1" = 200' Drawn by: JS Reviewer: JDF Project: 1554-010 Sheet: 3 OF 3 Field Book: 0000 Party Chief: SH Survey Date: 09/07/2022
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**LEGACY WETLANDS AT SULLIVAN RANCH**  
**TOPOGRAPHIC SURVEY**  
**EXHIBIT**

**SURVEY NOTES:**  
BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM 1983 (NAD83), 2011 ADJUSTMENT (EPOCH 2010) AND A VERTICAL DATUM OF NAVD88, GEOID 12B. ALL COORDINATE VALUES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO SURFACE BY USING THE SURFACE ADJUSTMENT FACTOR OF 0.999868017.  
BOUNDARY AND EASEMENT INFORMATION SHOWN HEREON IS BASED ON INFORMATION PROVIDED BY JUNE, 27, 2016 JOHN D. MERCER SURVEY (JOHN D. MERCER, RPLS TX 1924 SURVEYING FIRM NO. 10116600).  
SURVEY COMPLETED ON THE GROUND SEPTEMBER 8, 2022. AERIAL IMAGERY AND LIDAR FLOWN JULY 2022.

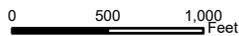


REVISED: AUG 03, 2023



Datum: NAD 1983  
Projection: State Plane Texas  
South Central  
Units: Feet  
Basemap: Bing Maps Aerial

- Survey Area
- Wetland Type
  - E2EM (Estuarine, Intertidal, Emergent) Wetland
  - E2SS (Scrub-Shrub, Intertidal, Estuarine) Wetland
  - OSW (Other Surface Water)
- ## Map Reference Number



**ATKINS**

Member of the SNC-Lavalin Group

Sheet 5 of 33  
Wetland Delineation Overview

**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston**  
Galveston County, Texas

Job No.: 100079983      Scale: 1" = 1,000 feet

Prepared By: ATKINS/WHIT6392      Date: Aug 04, 2023

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Name	Type	Acres	Lat (decimal degrees)	Long (decimal degrees)	Map Reference Number
Wetland 14	E2EM (Estuarine, Intertidal, Emergent)	5.33	29.242850	-94.893118	1
Wetland 13	E2EM (Estuarine, Intertidal, Emergent)	2.84	29.243374	-94.893096	2
OSW 01	Other Surface Water	0.13	29.245960	-94.894204	3
Wetland 01	E2EM (Estuarine, Intertidal, Emergent)	0.04	29.246075	-94.893900	4
Wetland 02	E2EM (Estuarine, Intertidal, Emergent)	2.25	29.246212	-94.893600	5
OSW 08	Other Surface Water	0.62	29.247452	-94.899282	6
Wetland 07	E2EM (Estuarine, Intertidal, Emergent)	0.32	29.247726	-94.898721	7
OSW 05	Other Surface Water	0.34	29.248499	-94.896082	8
Wetland 03	E2EM (Estuarine, Intertidal, Emergent)	0.49	29.248269	-94.895558	9
OSW 04	Other Surface Water	0.48	29.249565	-94.893756	10
OSW 03	Other Surface Water	0.94	29.250060	-94.893238	11
OSW 02	Other Surface Water	0.58	29.249966	-94.892621	12
OSW 06	Other Surface Water	0.29	29.248312	-94.898035	13
Wetland 04	E2EM (Estuarine, Intertidal, Emergent)	27.20	29.250291	-94.896187	14
OSW 07	Other Surface Water	0.68	29.251084	-94.895847	15
Wetland 05	E2EM (Estuarine, Intertidal, Emergent)	9.91	29.252177	-94.895535	16
OSW 09	Other Surface Water	1.58	29.250186	-94.900068	17
Wetland 08	E2EM (Estuarine, Intertidal, Emergent)	10.23	29.250313	-94.898972	18
OSW 10	Other Surface Water	0.37	29.251401	-94.900035	19
OSW 10-A	Other Surface Water	0.82	29.251653	-94.898530	20
Wetland 10	E2SS (Scrub-Shrub, Intertidal, Estuarine)	7.61	29.254128	-94.898034	21
OSW 11	Other Surface Water	11.66	29.253148	-94.897448	22
Wetland 06	E2SS (Scrub-Shrub, Intertidal, Estuarine)	1.24	29.254307	-94.894325	23
Wetland 09	E2EM (Estuarine, Intertidal, Emergent)	166.14	29.254656	-94.895786	24
OSW 12	Other Surface Water	1.05	29.256968	-94.900176	25
OSW 13	Other Surface Water	1.17	29.255475	-94.901936	26
Wetland 11	E2SS (Scrub-Shrub, Intertidal, Estuarine)	1.05	29.256376	-94.904273	27
Wetland 12	E2EM (Estuarine, Intertidal, Emergent)	27.37	29.255566	-94.906543	28

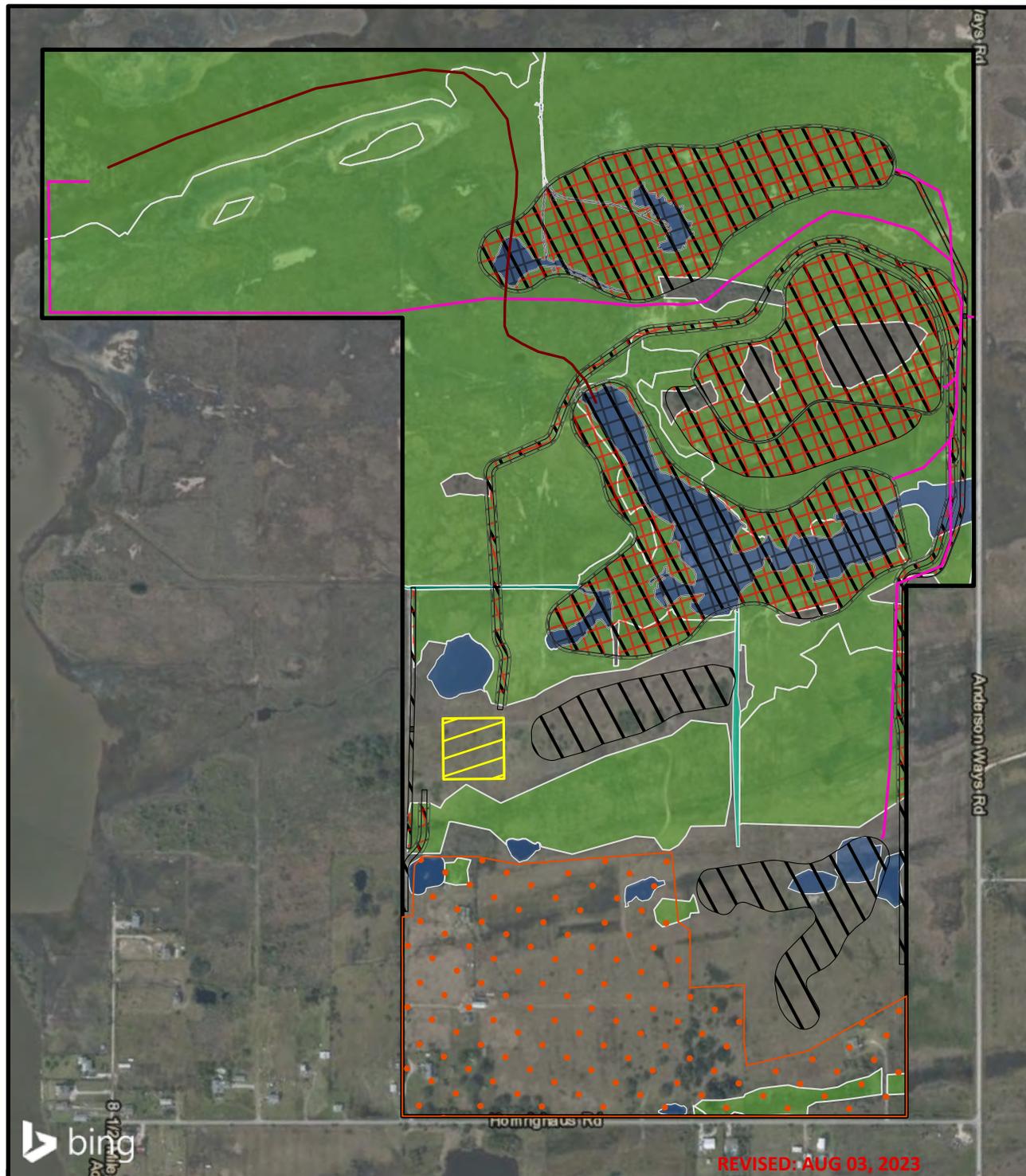


REVISED: AUG 03, 2023



Sheet 6 of 33  
Wetland Delineation Table  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**  
**Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: Aug 02, 2023

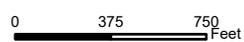


REVISED: AUG 03, 2023



Datum: NAD 1983  
Projection: State Plane Texas  
South Central  
Units: Feet  
Basemap: Bing Maps Aerial

- Property Boundary
- Temporary Access Path
- Temporary Thin Layer Placement Piping Route
- Temporary Staging/Laydown Area
- Proposed Culvert
- Wetland
- Open Water/Cattle Tank
- Ditch
- Permanent Impact
- Temporary Impact
- Proposed Footprint Area
- Grazing Areas (Excluded from Habitat Restoration)

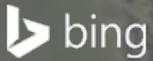


Sheet 7 of 33  
Proposed Site Plan - With Wetland Impacts  
Overview  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 750 feet
Prepared By: ATKINS/WHIT6392	Date: Aug 02, 2023

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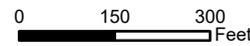
REVISED: AUG 03, 2023



- Property Boundary
- Temporary Access Path
- Temporary Staging/Laydown Area
- Proposed Culvert
- Wetland
- Open Water/Cattle Tank
- Ditch
- Permanent Impact
- Temporary Impact
- Proposed Footprint Area

- Temporary Thin Layer Placement Piping Route
- Grazing Areas (Excluded from Habitat Restoration)

Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.



Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial

Member of the SNC-Lavalin Group

Sheet 8 of 33  
 Proposed Site Plan - With Wetland Impacts  
 Page 1 of 6  
**Legacy Wetlands at Sullivan Ranch**  
**Habitat Improvement Project**  
**Galveston**  
 Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
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Prepared By: Atkins/WHIT6392	Date: May 16, 2023
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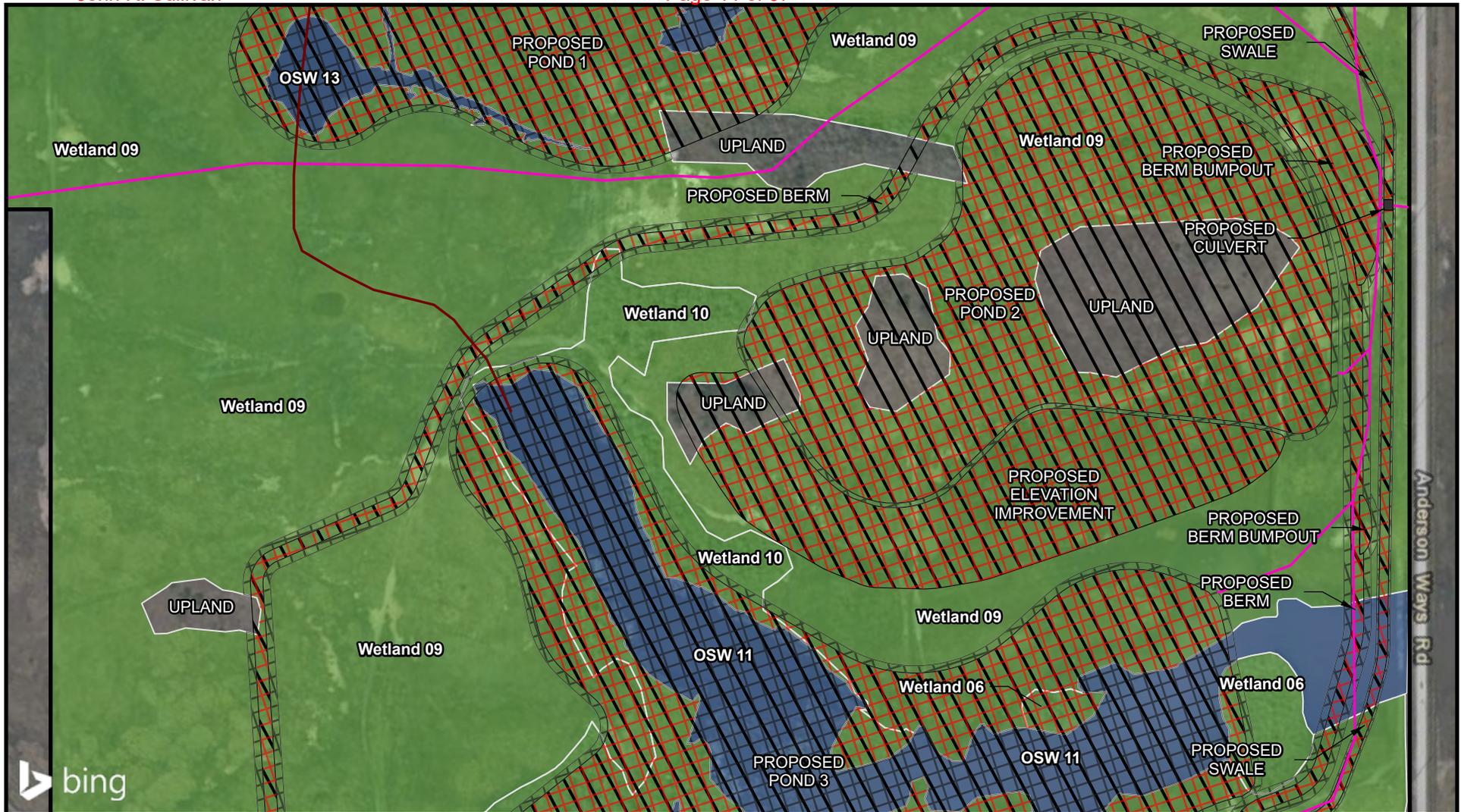


Anderson Ways Rd



<ul style="list-style-type: none"> <li> Property Boundary</li> <li> Temporary Access Path</li> <li> Temporary Staging/Laydown Area</li> <li> Proposed Culvert</li> <li> Wetland</li> <li> Open Water/Cattle Tank</li> <li> Ditch</li> <li> Permanent Impact</li> <li> Temporary Impact</li> <li> Proposed Footprint Area</li> </ul>	<ul style="list-style-type: none"> <li> Temporary Thin Layer Placement Piping Route</li> <li> Grazing Areas (Excluded from Habitat Restoration)</li> </ul> <p>Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.</p>
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<p>LEGACY WETLANDS AT SULLIVAN RANCH Member of the SNC-Lavalin Group</p>	
<p>Sheet 9 of 33 Proposed Site Plan - With Wetland Impacts Page 2 of 6 <b>Legacy Wetlands at Sullivan Ranch Habitat Improvement Project Galveston</b> Galveston County, Texas</p>	
Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023
Datum: NAD 1983 Projection: State Plane Texas Central Units: Feet Basemap: Bing Maps Aerial N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_Prop_footprintwets_landscape_v3.aprx	



Property Boundary	Temporary Thin Layer Placement Piping Route
Temporary Access Path	Grazing Areas (Excluded from Habitat Restoration)
Temporary Staging/Laydown Area	
Proposed Culvert	
Wetland	
Open Water/Cattle Tank	
Ditch	
Permanent Impact	
Temporary Impact	
Proposed Footprint Area	

Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.

Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial

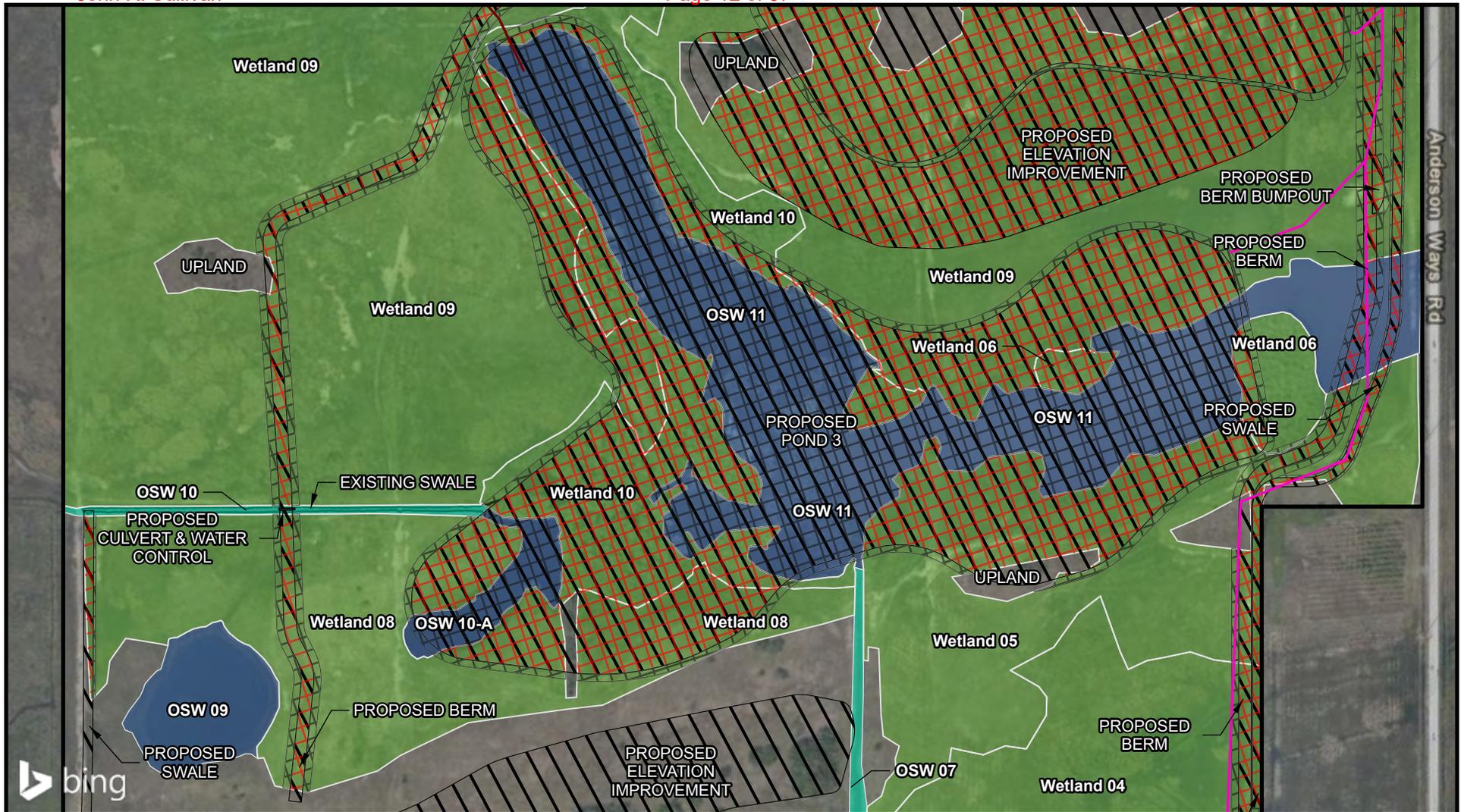
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Sheet 10 of 33  
Proposed Site Plan - With Wetland Impacts  
Page 3 of 6

**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

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<ul style="list-style-type: none"> <li> Property Boundary</li> <li> Temporary Access Path</li> <li> Temporary Staging/Laydown Area</li> <li> Proposed Culvert</li> <li> Wetland</li> <li> Open Water/Cattle Tank</li> <li> Ditch</li> <li> Permanent Impact</li> <li> Temporary Impact</li> <li> Proposed Footprint Area</li> </ul>	<ul style="list-style-type: none"> <li> Temporary Thin Layer Placement Piping Route</li> <li> Grazing Areas (Excluded from Habitat Restoration)</li> </ul> <p>Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.</p>
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  <small>Member of the SNC-Lavalin Group</small>	
Sheet 11 of 33 Proposed Site Plan - With Wetland Impacts Page 4 of 6 <b>Legacy Wetlands at Sullivan Ranch                  Habitat Improvement Project                  Galveston</b> Galveston County, Texas	
Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023
Datum: NAD 1983 Projection: State Plane Texas Central Units: Feet Basemap: Bing Maps Aerial N:\Clients\S_T\Sullivan\100079983\geo\figs\permit\permit_Prop_footprints\wets_landscape_v3.aprx	



Property Boundary	Temporary Thin Layer Placement Piping Route
Temporary Access Path	Grazing Areas (Excluded from Habitat Restoration)
Temporary Staging/Laydown Area	
Proposed Culvert	
Wetland	
Open Water/Cattle Tank	
Ditch	
Permanent Impact	
Temporary Impact	
Proposed Footprint Area	

Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.

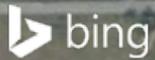
Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial

**ATKINS**  
Member of the SNC-Lavalin Group

Sheet 12 of 33  
Proposed Site Plan - With Wetland Impacts  
Page 5 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

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- Property Boundary
- Temporary Access Path
- Temporary Staging/Laydown Area
- Proposed Culvert
- Wetland
- Open Water/Cattle Tank
- Ditch
- Permanent Impact
- Temporary Impact
- Proposed Footprint Area

- Temporary Thin Layer Placement Piping Route
- Grazing Areas (Excluded from Habitat Restoration)

Notes: Temporary impact areas will be returned/revegetated to pre-construction conditions. Temporary sand storage areas, if required, will be within footprint of permanent and temporary impact areas.



Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial



Sheet 13 of 33  
Proposed Site Plan - With Wetland Impacts  
Page 6 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983      Scale: 1" = 300 feet

Prepared By: Atkins/WHIT6392      Date: May 16, 2023

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Overall Impacts				
Feature	Impact Area (acres)			
	Perm (wetland)	Perm (open water)	Temp (wetland)	Temp (open water)
Proposed Berms (fill)	3.64	0.16	3.91	0.18
Proposed Berm Bumpouts (fill)	0.93		0.20	
Proposed Elev Improvements (fill)	5.73			
Proposed Culverts (fill)	0.01			
<b>TOTAL FILL</b>	<b>10.31</b>	<b>0.16</b>	<b>4.11</b>	<b>0.18</b>
Proposed Swales (excavation)	1.34	0.10	0.52	0.05
Proposed Pond 1 (excavation)	19.03		1.57	2.10
Proposed Pond 2 (excavation)	11.74		1.04	
Proposed Pond 3 (excavation)	15.03		1.81	10.90
Proposed Pond 4 (excavation)				
<b>TOTAL EXCAVATION</b>	<b>47.14</b>	<b>0.10</b>	<b>4.94</b>	<b>13.05</b>
Temporary Access Path			2.47	0.01
Temporary Thin Layer Placement Pipeline			0.76	

Impacts by Wetland/OSW																				
Wetlands/OSWs	Features																Temporary Access Path	Temporary Thin Layer Placement Pipeline		
	Fill								Excavation											
	Proposed Berms		Proposed Berm Bumpouts		Proposed Elev Improvements		Proposed Culverts		Proposed Swales		Proposed Pond 1		Proposed Pond 2		Proposed Pond 3				Proposed Pond 4	
	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Temp	Temp
OSW 10-A																0.77				
OSW 11	0.16	0.18							0.10	0.05						10.13			0.01	
OSW 12											1.05									
OSW 13											1.05									
<b>OSW TOTAL</b>	<b>0.16</b>	<b>0.18</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.10</b>	<b>0.05</b>	<b>0.00</b>	<b>2.10</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>10.90</b>	<b>0.00</b>	<b>0.00</b>	<b>0.01</b>	<b>0.00</b>
Wetland 01																				
Wetland 02																				
Wetland 03																				
Wetland 04	0.59	0.54							0.21	0.03									0.23	
Wetland 05	0.34	0.30							0.30	0.07					2.74	0.26			0.03	
Wetland 06		0.02												0.47	0.10					
Wetland 07																				
Wetland 08	0.35	0.40							0.12	0.04					2.41	0.35				
Wetland 09	2.33	2.62	0.93	0.20	5.73		0.01		0.71	0.38	19.03	1.57	11.74	1.03	4.46	0.67			2.04	0.35
Wetland 10	0.03	0.03												0.01	4.95	0.43				0.003
Wetland 11																				
Wetland 12																			0.17	0.41
<b>WETLAND TOTAL</b>	<b>3.64</b>	<b>3.91</b>	<b>0.93</b>	<b>0.20</b>	<b>5.73</b>	<b>0.00</b>	<b>0.01</b>	<b>0.00</b>	<b>1.34</b>	<b>0.52</b>	<b>19.03</b>	<b>1.57</b>	<b>11.74</b>	<b>1.04</b>	<b>15.03</b>	<b>1.81</b>	<b>0.00</b>	<b>0.00</b>	<b>2.47</b>	<b>0.76</b>
<b>TOTAL PERM</b>	<b>10.47</b>								<b>47.24</b>								<b>N/A</b>			
<b>TOTAL TEMP</b>	<b>4.29</b>								<b>17.99</b>								<b>2.48</b>		<b>0.76</b>	



**SUBJECT TRACT**  
= 379 ACRES

**TOTAL HABITAT IMPROVEMENT AREA**  
= 327 ACRES

**TOTAL WETLANDS**  
= 253.84 ACRES

**TOTAL OSW**  
= 14.69 ACRES

**TOTAL CATTLE TANKS**  
= 6.02

**REVISED: AUG 03, 2023**

**10.47 ACRES OF FILL IN WETLAND/OSWS**  
= 10.31 ACRES OF FILL IN WETLANDS  
= 0.16 ACRES OF FILL IN OSWS

**47.24 ACRES OF EXCAVATION IN WETLAND/OSWS**  
= 47.14 ACRES OF EXCAVATION IN WETLANDS  
= 0.10 ACRES OF EXCAVATION IN OSWS




Member of the SNC-Lavalin Group

Sheet 14 of 33  
Impacts Tables

**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: Aug 04, 2023

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-  Survey Area
-  Avoided Shorebird Habitat
-  Proposed Thin Layer Placement Area

Datum: NAD 1983  
Projection: State Plane Texas  
South Central  
Units: Feet  
Basemap: ESRI Streets



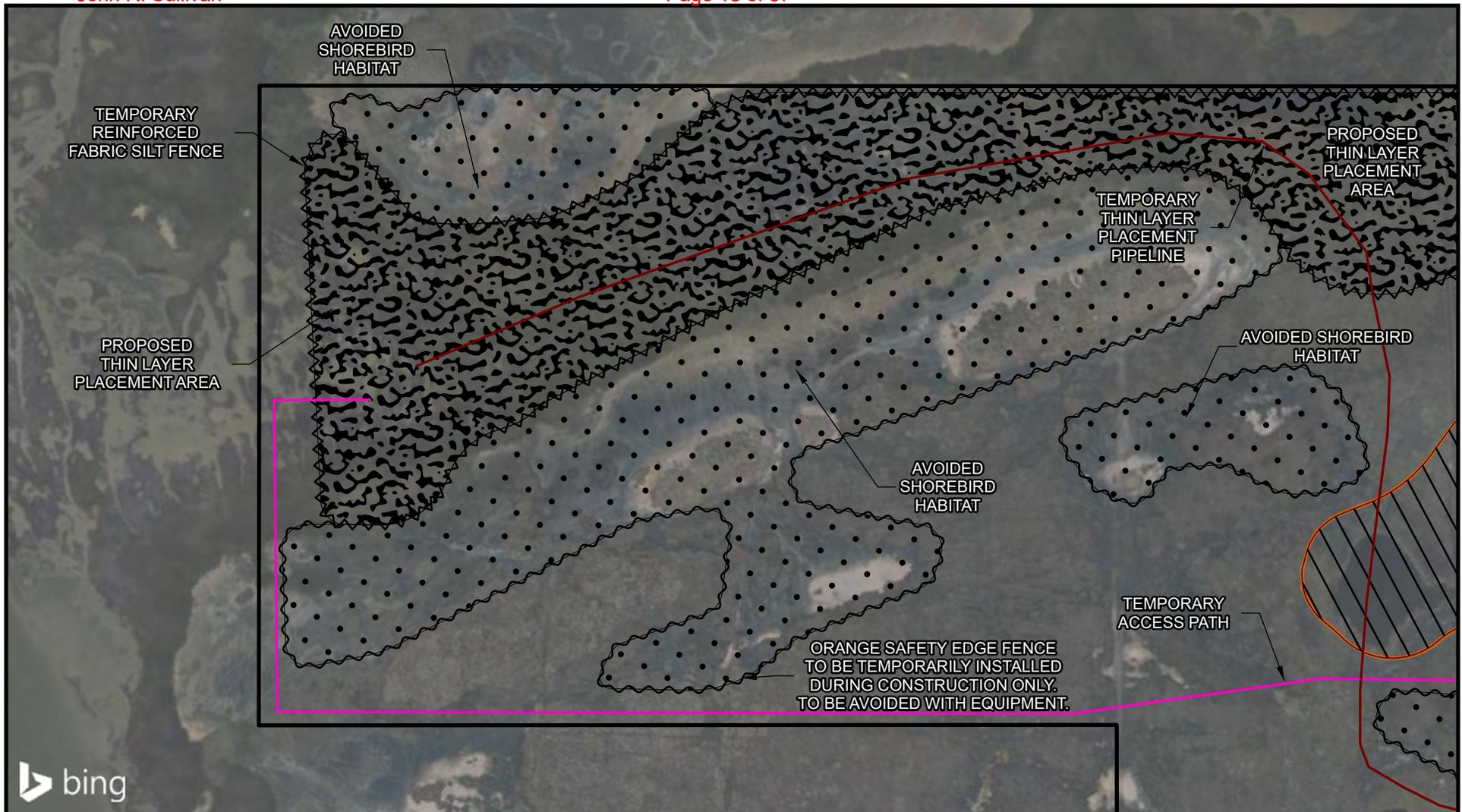
**ATKINS**

Member of the SNC-Lavalin Group

Exhibit 4  
Shorebird Nesting Protection Areas  
with Thin Layer Placement  
Habitat Plan  
**Legacy Wetlands at Sullivan Ranch**  
**Habitat Improvement Project**  
**Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 800 feet
Prepared By: ATKINS/WHIT6392	Date: May 17, 2023

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Property Boundary	Proposed Upland Elevation Improvement
Coastal Prairie	Proposed Thin Layer Placement Area
Floating/Submerged	Proposed Berm
Marsh Margin	Proposed Swale
Oak Mottes	Proposed Pond Limit
Shallow Emergent Marsh	Temporary Thin Layer Placement Piping Route
Tall Emergent Marsh	Temporary Access Path
Vegetative Swale	Grazing Areas (Excluded from Habitat Restoration)
Vegetative Edge Fringe Marsh	Temporary Reinforced Fabric Silt Fence
Neotropical Migrant Bird	Temporary Orange Safety Edge Fence
Avoided Shorebird Habitat	Temporary Staging/Laydown Area
Proposed Berm Bumpout	Moist Soil Management Area
	Proposed Culvert

LEGACY WETLANDS  
AT SULLIVAN RANCH

**ATKINS**  
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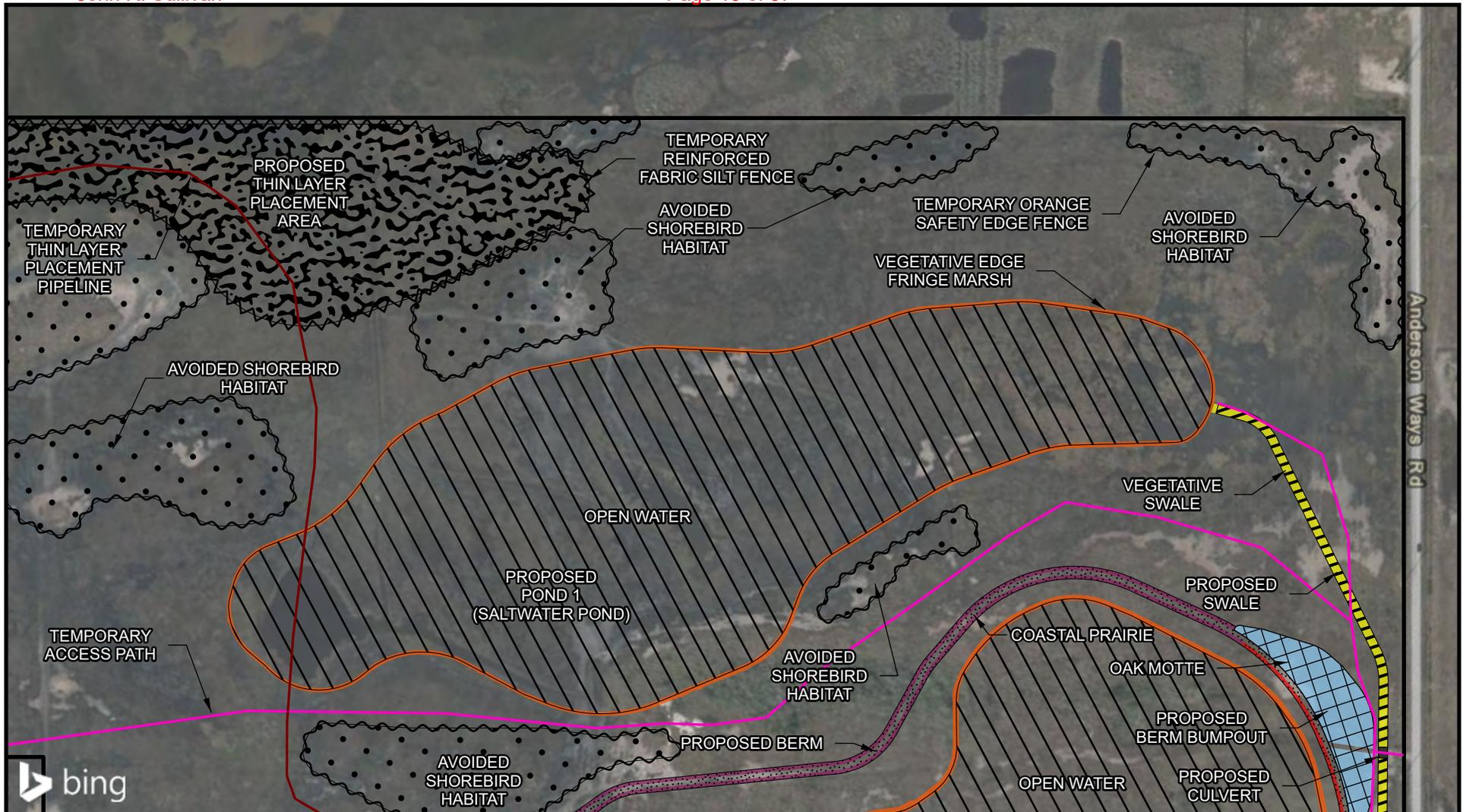
Sheet 16 of 33  
Proposed Site Plan - With Habitat Improvements  
Page 1 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial

0 150 300  
Feet

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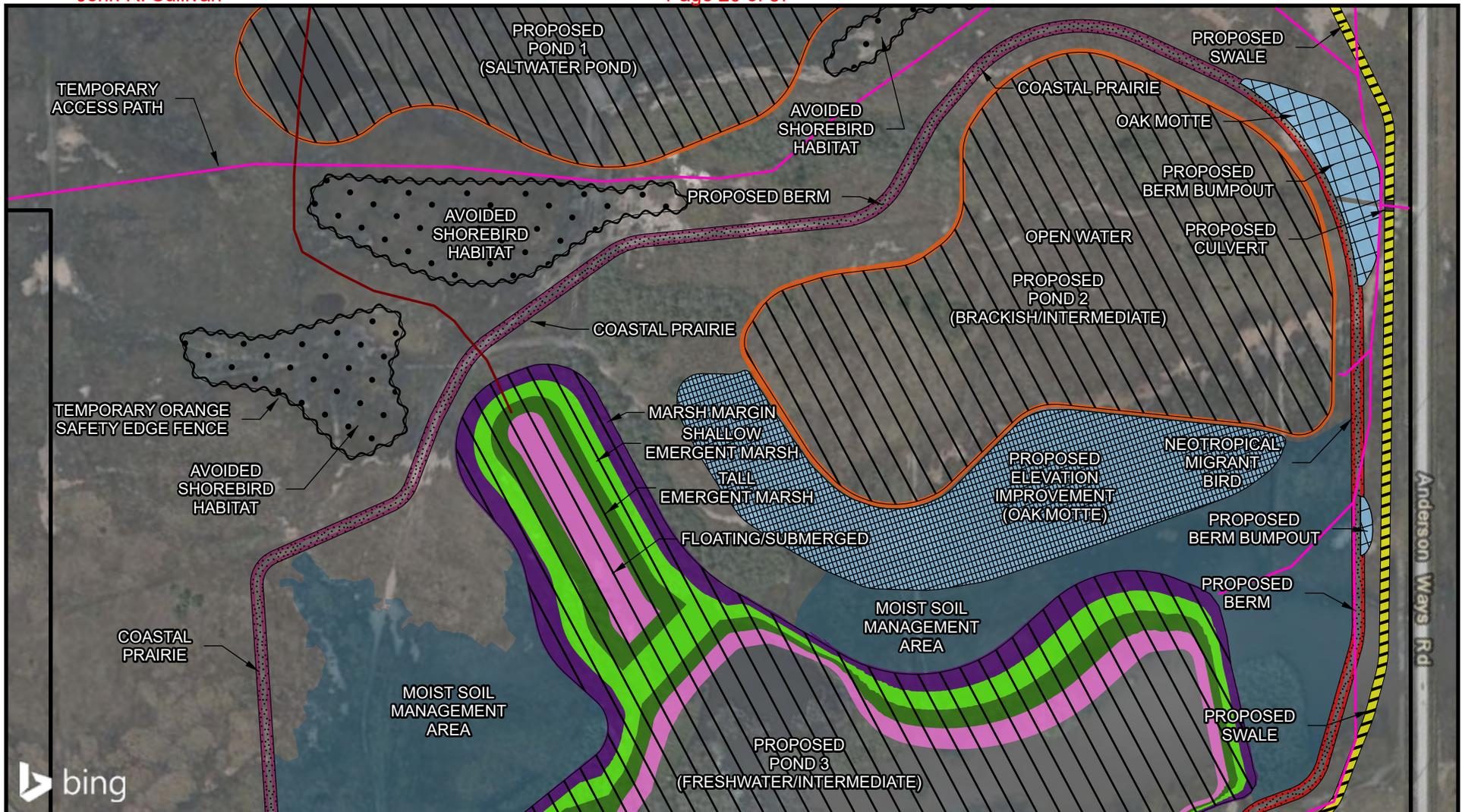
Property Boundary	Proposed Upland Elevation Improvement
Coastal Prairie	Proposed Thin Layer Placement Area
Floating/Submerged	Proposed Berm
Marsh Margin	Proposed Swale
Oak Mottes	Proposed Pond Limit
Shallow Emergent Marsh	Temporary Thin Layer Placement Piping Route
Tall Emergent Marsh	Temporary Access Path
Vegetative Swale	Grazing Areas (Excluded from Habitat Restoration)
Vegetative Edge Fringe Marsh	Temporary Reinforced Fabric Silt Fence
Neotropical Migrant Bird	Temporary Orange Safety Edge Fence
Avoided Shorebird Habitat	Temporary Staging/Laydown Area
Proposed Berm Bumpout	Moist Soil Management Area
Proposed Berm Bumpout	Proposed Culvert

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Sheet 17 of 33  
Proposed Site Plan - With Habitat Improvements  
Page 2 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial



Property Boundary	Proposed Upland Elevation Improvement
Coastal Prairie	Proposed Thin Layer Placement Area
Floating/Submerged	Proposed Berm
Marsh Margin	Proposed Swale
Oak Mottes	Proposed Pond Limit
Shallow Emergent Marsh	Temporary Thin Layer Placement Piping Route
Tall Emergent Marsh	Temporary Access Path
Vegetative Swale	Grazing Areas (Excluded from Habitat Restoration)
Vegetative Edge Fringe Marsh	Temporary Reinforced Fabric Silt Fence
Neotropical Migrant Bird	Temporary Orange Safety Edge Fence
Avoided Shorebird Habitat	Temporary Staging/Laydown Area
Proposed Berm Bumpout	Moist Soil Management Area
Proposed Berm	Proposed Culvert

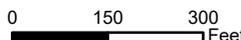


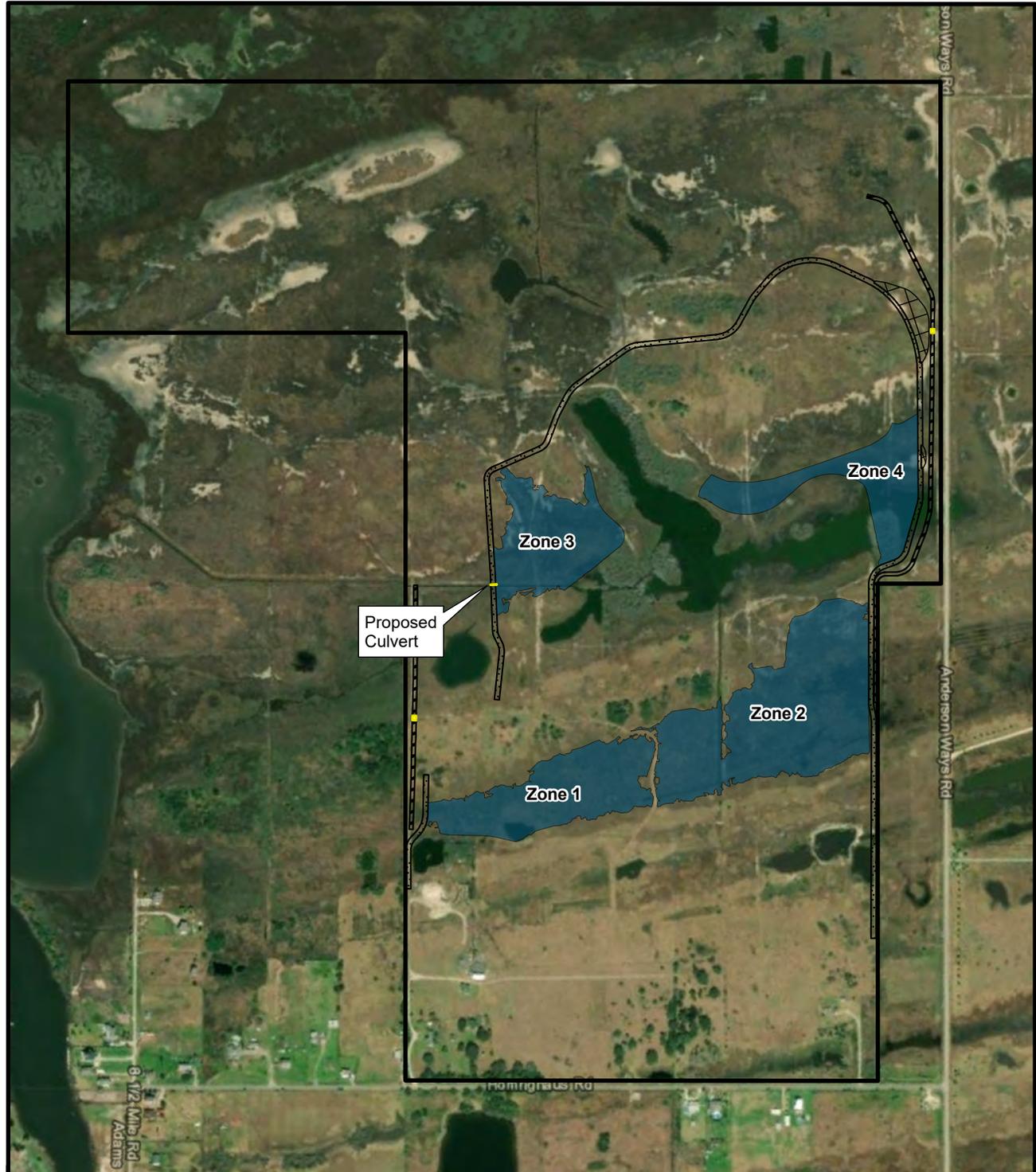

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Sheet 18 of 33  
Proposed Site Plan - With Habitat Improvements  
Page 3 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial



- Survey Area
- Moist Soil Management Area
- Proposed Culvert
- Proposed Berm Bumpout
- Proposed Berm
- Proposed Swale

Datum: NAD 1983  
Projection: State Plane Texas  
South Central  
Units: Feet  
Basemap: ESRI Streets



**ATKINS**  
Member of the SNC-Lavalin Group

Exhibit 3  
Moist Soil Management Areas  
Habitat Plan  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston**  
Galveston County, Texas

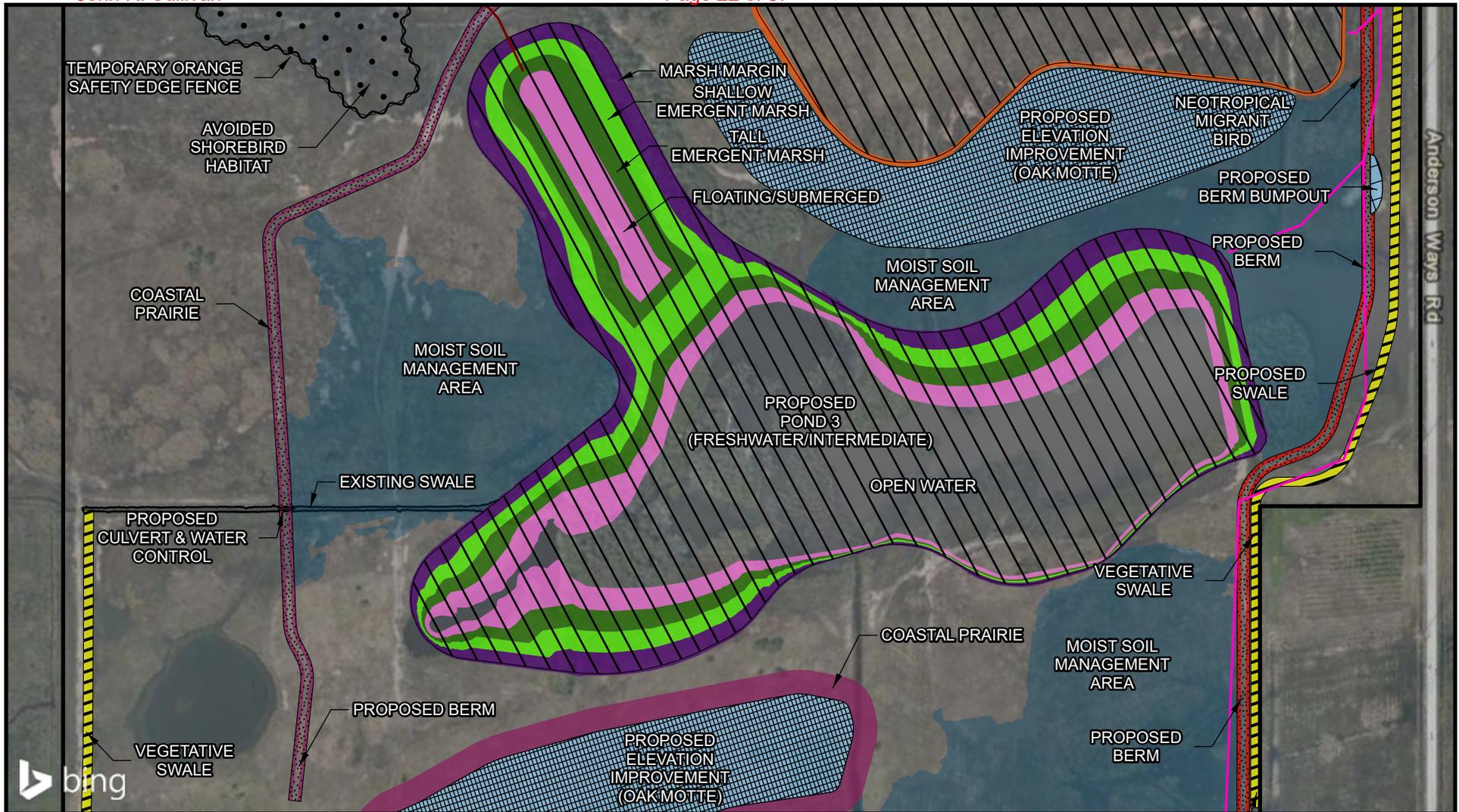
Job No.: 100079983

Scale: 1" = 800 feet

Prepared By: ATKINS/WHIT6392

Date: May 17, 2023

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Property Boundary	Proposed Upland Elevation Improvement
Coastal Prairie	Proposed Thin Layer Placement Area
Floating/Submerged	Proposed Berm
Marsh Margin	Proposed Swale
Oak Mottes	Proposed Pond Limit
Shallow Emergent Marsh	Temporary Thin Layer Placement Piping Route
Tall Emergent Marsh	Temporary Access Path
Vegetative Swale	Grazing Areas (Excluded from Habitat Restoration)
Vegetative Edge Fringe Marsh	Temporary Reinforced Fabric Silt Fence
Neotropical Migrant Bird	Temporary Orange Safety Edge Fence
Avoided Shorebird Habitat	Temporary Staging/Laydown Area
Proposed Berm Bumpout	Moist Soil Management Area
Proposed Culvert	Proposed Berm

LEGACY WETLANDS  
AT SULLIVAN RANCH

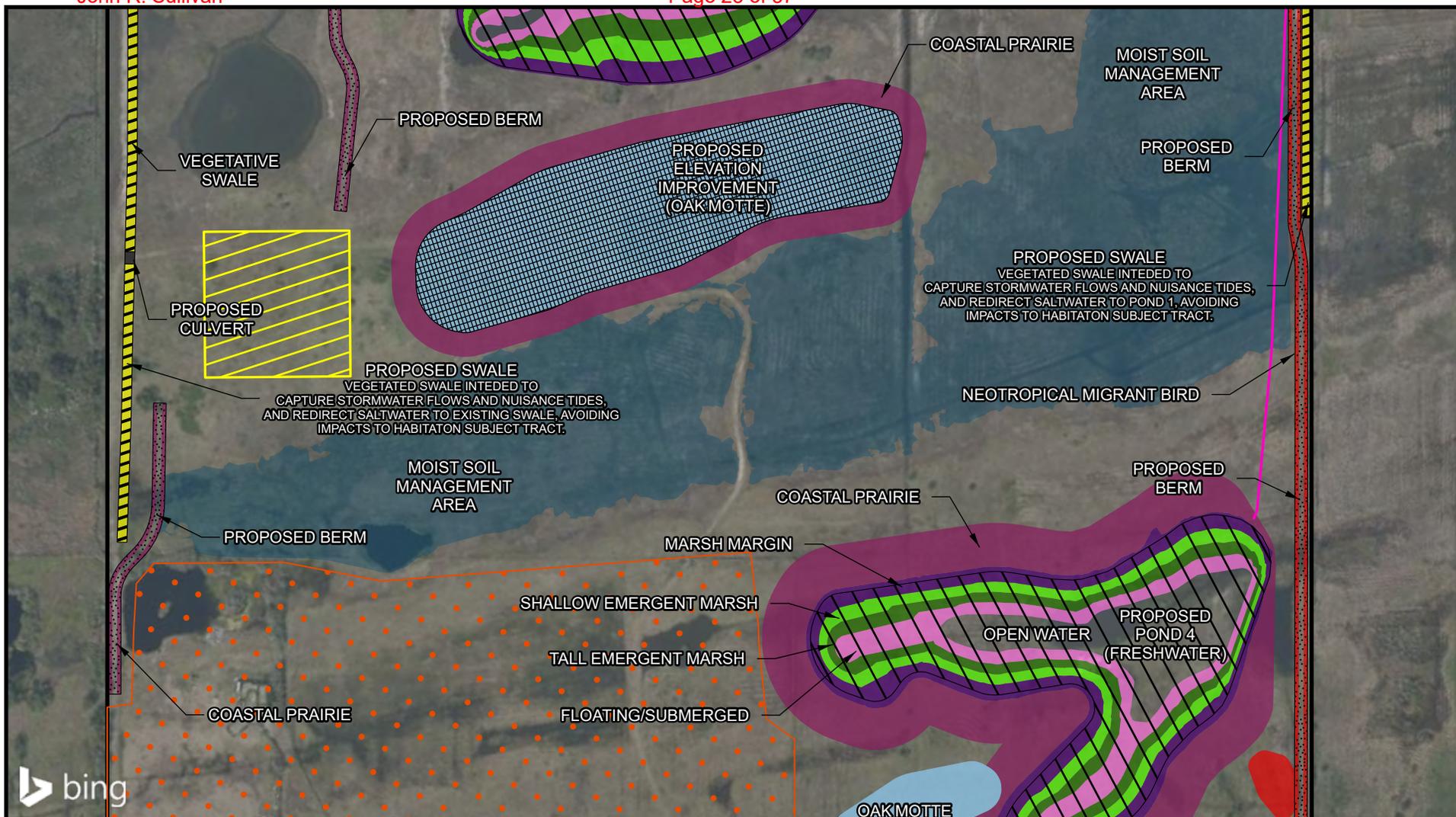
**ATKINS**  
Member of the SNC-Lavalin Group

Sheet 19 of 33  
Proposed Site Plan - With Habitat Improvements  
Page 4 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial

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REVISED: AUG 03, 2023

Property Boundary	Proposed Upland Elevation Improvement
Coastal Prairie	Proposed Thin Layer Placement Area
Floating/Submerged	Proposed Berm
Marsh Margin	Proposed Swale
Oak Mottes	Proposed Pond Limit
Shallow Emergent Marsh	Temporary Thin Layer Placement Piping Route
Tall Emergent Marsh	Temporary Access Path
Vegetative Swale	Grazing Areas (Excluded from Habitat Restoration)
Vegetative Edge Fringe Marsh	Temporary Reinforced Fabric Silt Fence
Neotropical Migrant Bird	Temporary Orange Safety Edge Fence
Avoided Shorebird Habitat	Temporary Staging/Laydown Area
Proposed Berm Bumpout	Moist Soil Management Area
	Proposed Culvert

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Sheet 20 of 33  
Proposed Site Plan - With Habitat Improvements  
Page 5 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial

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-  Survey Area
-  Livestock Grazing Allowed
-  Livestock Exclusion Fencing

Datum: NAD 1983  
 Projection: State Plane Texas  
 South Central  
 Units: Feet  
 Basemap: ESRI Streets



**ATKINS**  
 Member of the SNC-Lavalin Group

Exhibit 5  
 Livestock Grazing Areas  
 Habitat Plan  
**Legacy Wetlands at Sullivan Ranch  
 Habitat Improvement Project**

**Galveston**  
 Galveston County, Texas

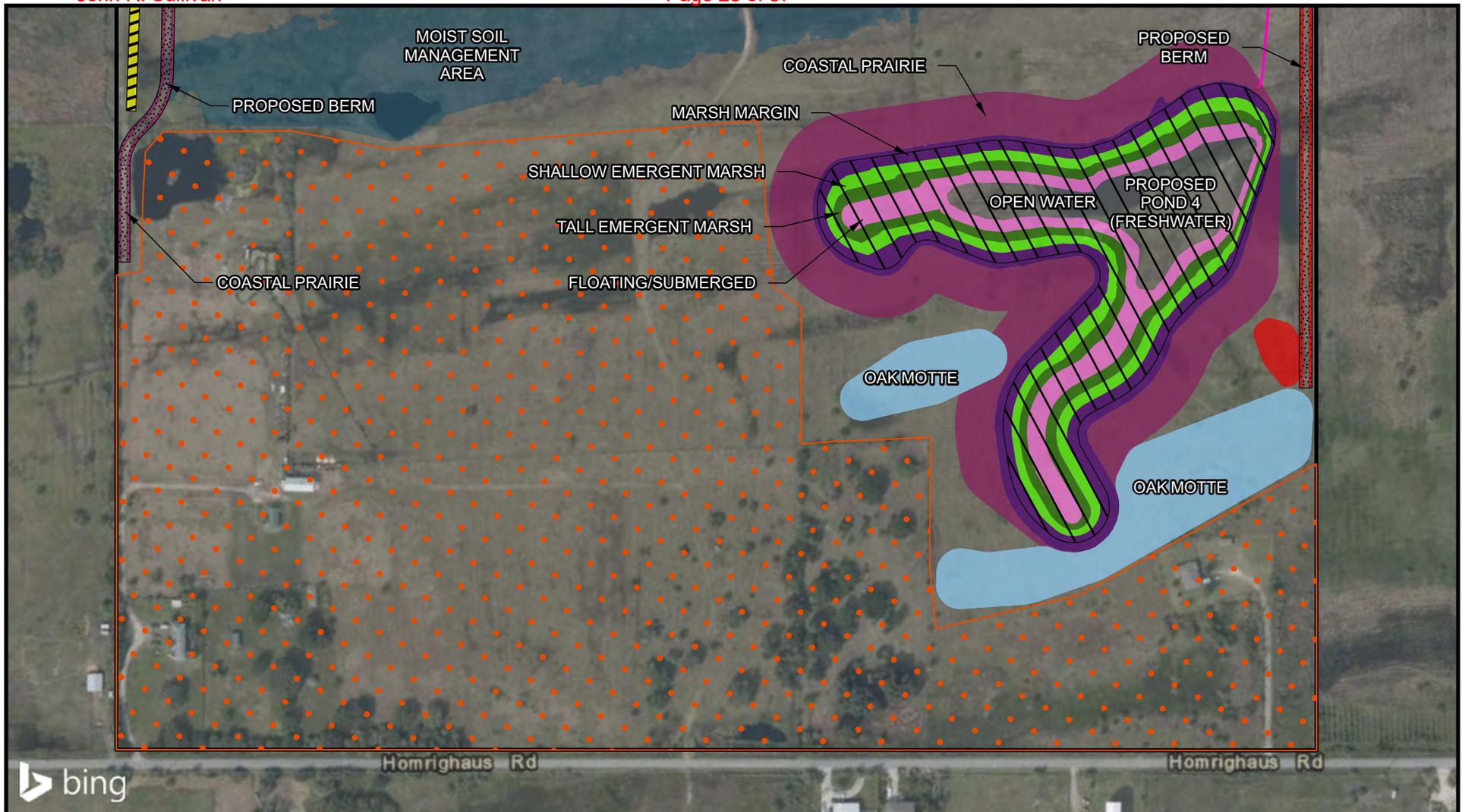
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Scale: 1" = 950 feet

Prepared By: ATKINS/WHIT6392

Date: Aug 02, 2023

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Property Boundary	Proposed Upland Elevation Improvement
Coastal Prairie	Proposed Thin Layer Placement Area
Floating/Submerged	Proposed Berm
Marsh Margin	Proposed Swale
Oak Mottes	Proposed Pond Limit
Shallow Emergent Marsh	Temporary Thin Layer Placement Piping Route
Tall Emergent Marsh	Temporary Access Path
Vegetative Swale	Grazing Areas (Excluded from Habitat Restoration)
Vegetative Edge Fringe Marsh	Temporary Reinforced Fabric Silt Fence
Neotropical Migrant Bird	Temporary Orange Safety Edge Fence
Avoided Shorebird Habitat	Temporary Staging/Laydown Area
Proposed Berm Bumpout	Moist Soil Management Area
	Proposed Culvert

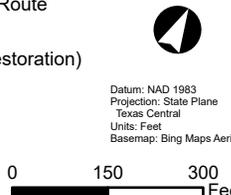



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Sheet 21 of 33  
Proposed Site Plan - With Habitat Improvements  
Page 6 of 6  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project  
Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: 1" = 300 feet
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

Datum: NAD 1983  
Projection: State Plane  
Texas Central  
Units: Feet  
Basemap: Bing Maps Aerial



Feature	Overall Habitat Improvement Area (acres)											
	Dry Habitat (28.14 acres)						Moist Habitat (128.23 acres)					
	Coastal Prairie	Oak Mottes	Neotropical Migrant Bird	Floating/Submerged	Marsh Margin	Shallow Emergent Marsh	Tall Emergent Marsh	Vegetative Swale	Vegetative Edge Fringe Marsh	Open Water	Thin Layer Placement	Moist Soil Management
Proposed Swales								1.85				
Proposed Berms	1.60		1.21									
Proposed Berm Bumpouts		0.91										
Proposed Elev Improvements	2.92	11.72										
Proposed Pond 1									1.03	20.89		
Proposed Pond 2									0.99	15.31		
Proposed Pond 3				3.95	3.88	3.81	3.51			4.80		
Proposed Pond 4	5.86			1.69	2.64	1.55	1.52			1.71		
Other		3.68	0.24									
<b>TOTAL</b>	<b>10.38</b>	<b>16.31</b>	<b>1.45</b>	<b>5.64</b>	<b>6.52</b>	<b>5.36</b>	<b>5.03</b>	<b>1.85</b>	<b>2.02</b>	<b>42.71</b>	<b>22.00</b>	<b>37.10</b>

Wetlands/OSWs	Habitat Features by Wetland/OSW										
	Features										
	Coastal Prairie	Oak Mottes	Neotropical Migrant Bird	Floating/Submerged	Marsh Margin	Shallow Emergent Marsh	Tall Emergent Marsh	Vegetative Swale	Vegetative Edge Fringe Marsh	Open Water	
OSW 10-A				0.39	0.03	0.04	0.06				
OSW 11			0.10	1.46	0.26	0.97	0.99	0.10			
OSW 12									0.001		
OSW 13									0.006		
Wetland 01											
Wetland 02											
Wetland 03	0.14										
Wetland 04	0.20		0.27					0.21			
Wetland 05			0.21	0.13	0.12	0.06	0.07	0.30		2.41	
Wetland 06				0.16	0.12	0.08	0.04			0.08	
Wetland 07											
Wetland 08	0.21			0.43	0.77	0.65	0.64	0.12		0.02	
Wetland 09	1.09	6.64	0.30	0.50	1.72	1.35	0.90	0.71	1.90	30.18	
Wetland 10	0.02			0.83	0.80	0.61	0.75		0.005	2.00	
Wetland 11											
Wetland 12											
<b>TOTAL</b>	<b>1.66</b>	<b>6.64</b>	<b>0.88</b>	<b>3.90</b>	<b>3.82</b>	<b>3.76</b>	<b>3.45</b>	<b>1.44</b>	<b>1.91</b>	<b>34.69</b>	

Avoided Habitat Areas	
Area	Acres
Unimpacted Sand Flats (Avoided Shorebird Habitat)	35.10
Unimpacted Existing Wetlands	128.56
Unimpacted Open Water	7.15

REVISED: AUG 03, 2023



**SUBJECT TRACT = 379 ACRES**  
**TOTAL HABITAT IMPROVEMENT AREA = 327 ACRES**

**2.6:1 HABITAT CREATION TO WETLAND/OSW IMPACT RATIO**  
= 27.46 ACRES OF HABITAT IMPROVEMENTS IN WETLAND/OSWS  
= 10.47 ACRES OF FILL IN WETLANDS/OSWS

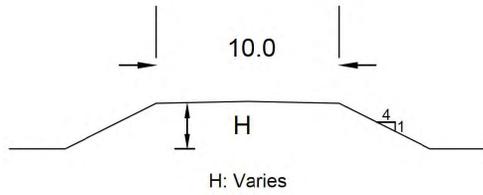
**156.37 ACRES OF OVERALL IMPROVEMENTS**  
= 28.14 ACRES OF DRY HABITAT  
= 128.23 ACRES OF MOIST HABITAT



Sheet 22 of 33  
Habitat Improvements Tables  
**Legacy Wetlands at Sullivan Ranch**  
**Habitat Improvement Project**  
**Galveston**  
Galveston County, Texas

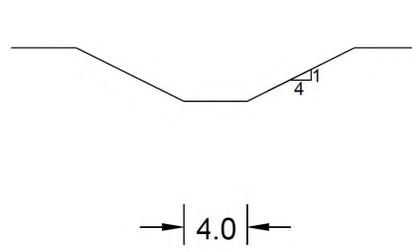
Job No.: 100079983      Scale: Not to Scale  
Prepared By: Atkins/WHIT6392      Date: Aug 08, 2023

TYPICAL CROSS SECTION BERM



SCALE : NTS

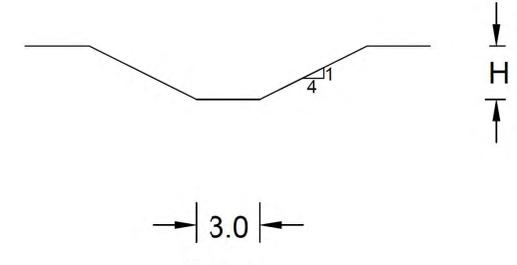
TYPICAL CROSS SECTION SWALE 01



H: Varies

SCALE : NTS

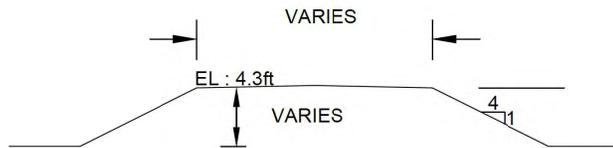
TYPICAL CROSS SECTION SWALE 02



H: Varies

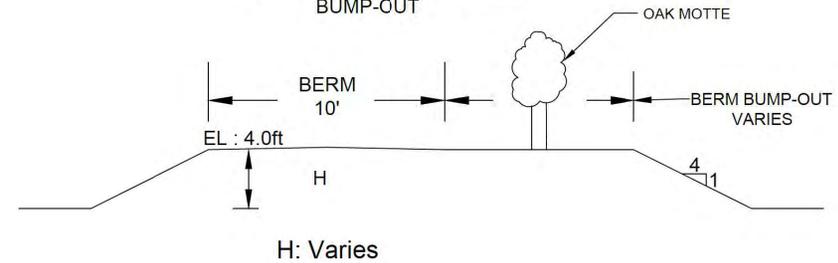
SCALE : NTS

TYPICAL CROSS SECTION MATERIAL  
PLACEMENT AREA SECTION



SCALE : NTS

TYPICAL CROSS SECTION BERM  
BUMP-OUT



SCALE : NTS

REVISED: AUG 03, 2023



NOTES:

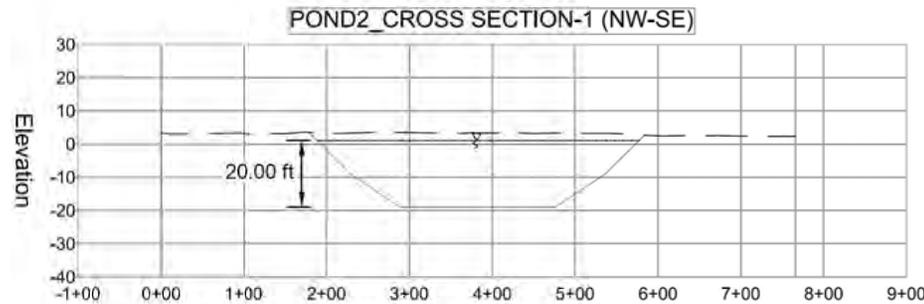
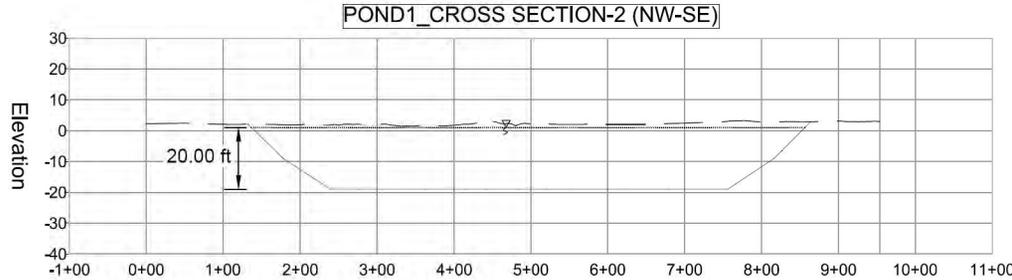
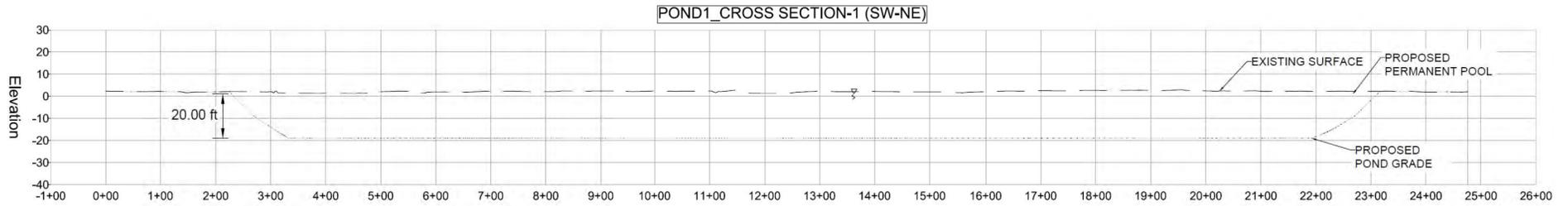
1. Install silt fence around salt flats to prevent access to equipment during construction activities to protect shorebird habitat.
2. Spray/apply up to 5" of flowable excavated material to thin layer placement area. Place silt fencing, hay bales, and employ sediment best management practices to prevent temporary turbidity impact. Minimize heavy equipment use in the thin layer placement area.
3. Provide floating sediment boom/curtain along northwestern boundary of property to prevent turbidity from entering adjoining bayou. Location to be determined by contractor and confirmed by the engineer.
4. Provide 24" Tideflex (TM) check valve (series TF-1) for backflow prevention or engineered approved equivalent.



Sheet 23 of 33  
Typical Cross Sections  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**  
**Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

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REVISED: AUG 03, 2023



LEGEND:

	EXISTING SURFACE
	PROPOSED POND GRADE
	PROPOSED PERMANENT POOL

SCALE : H-1:100  
V-1:25



Sheet 24 of 33  
Grading Sections

Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project

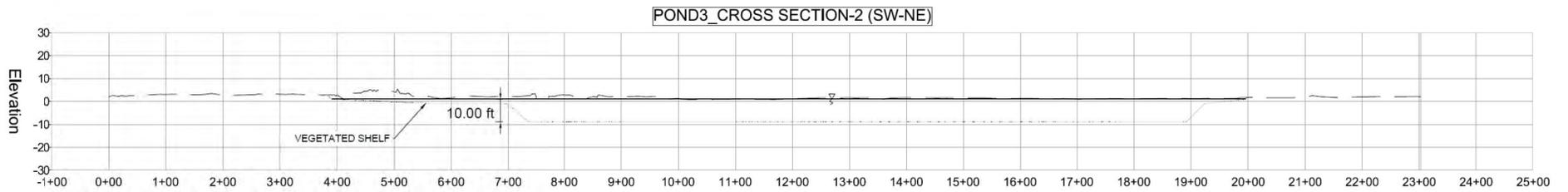
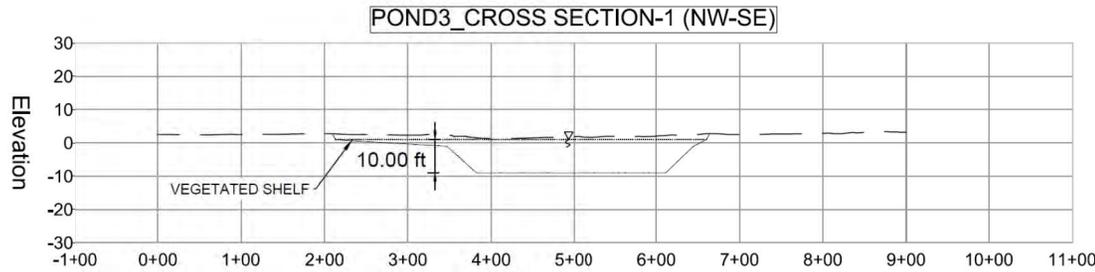
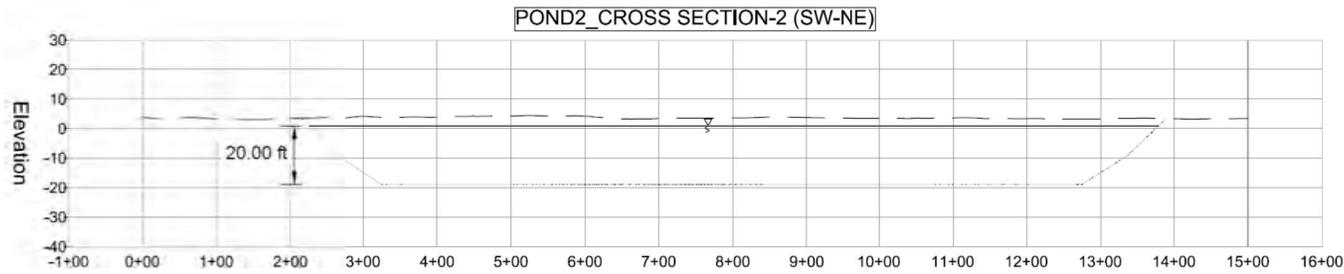
Galveston  
Galveston County, Texas

Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: May 16, 2023



REVISED: AUG 03, 2023



LEGEND:

	EXISTING SURFACE
	PROPOSED POND GRADE
	PROPOSED PERMANENT POOL

SCALE : H-1:100  
V-1:25



Sheet 25 of 33  
Grading Sections

Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project

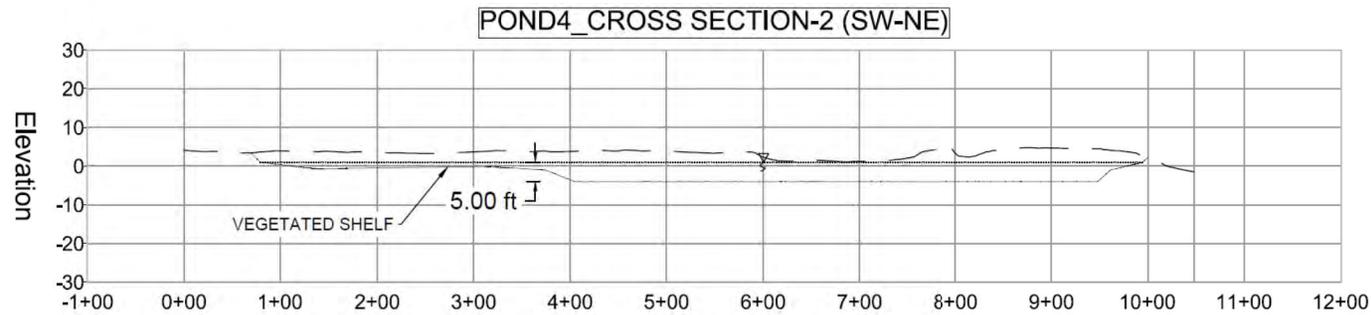
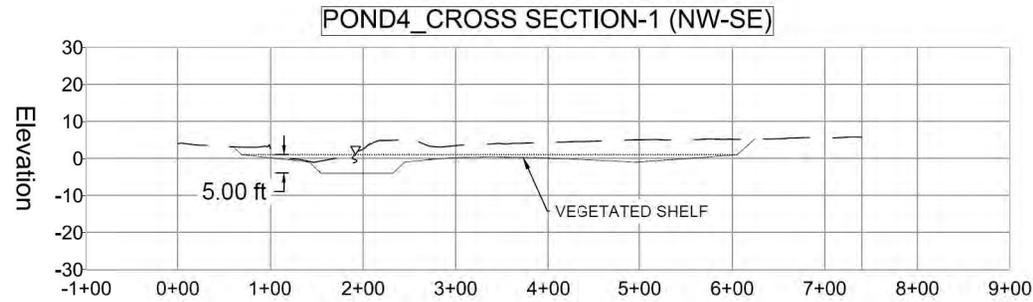
Galveston  
Galveston County, Texas

Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: May 16, 2023



REVISED: AUG 03, 2023



**LEGEND:**

	EXISTING SURFACE
	PROPOSED POND GRADE
	PROPOSED PERMANENT POOL

SCALE : H-1:100  
V-1:25

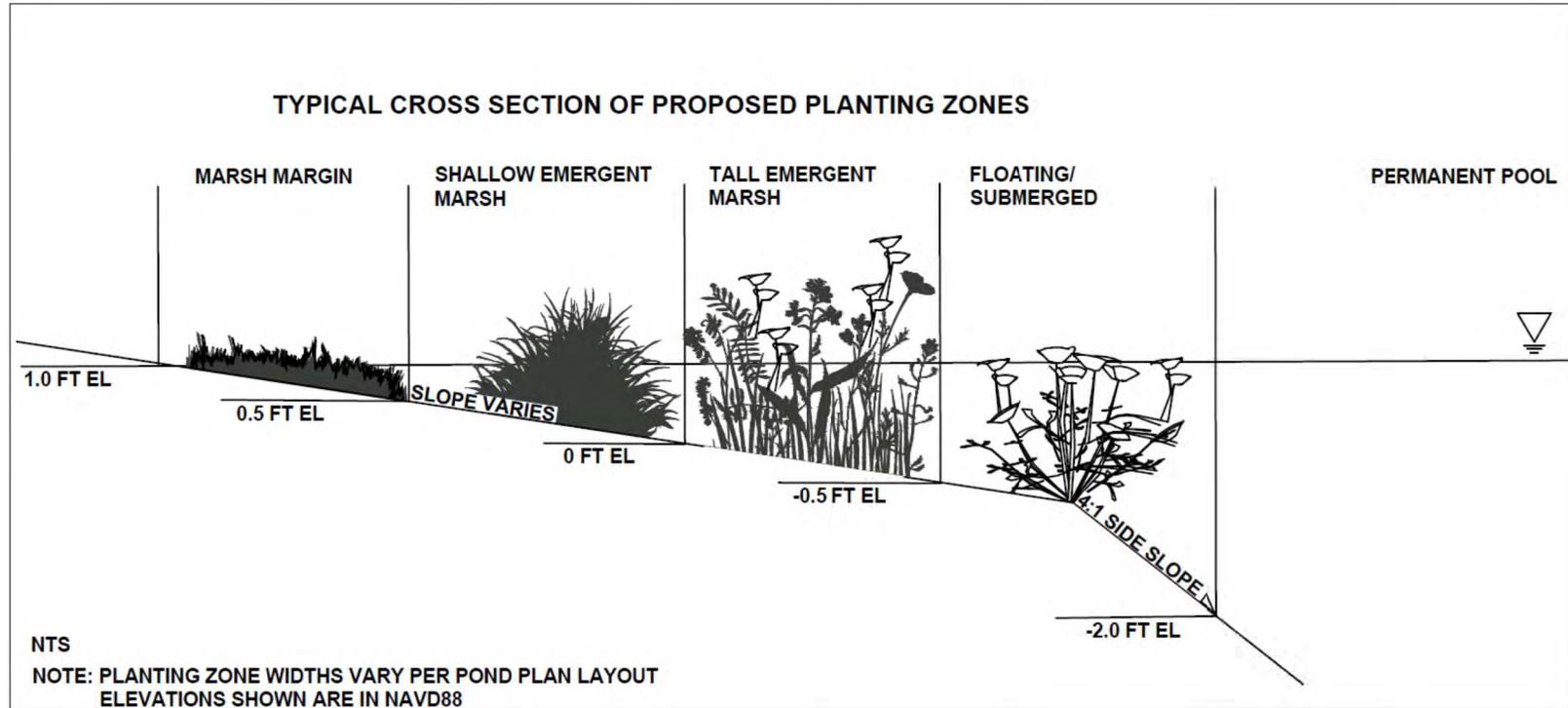


Sheet 26 of 33  
Grading Sections

**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston  
Galveston County, Texas**

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: May 16, 2023



REVISED: AUG 03, 2023



Sheet 27 of 33  
Pond Planting Zones

**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston  
Galveston County, Texas**

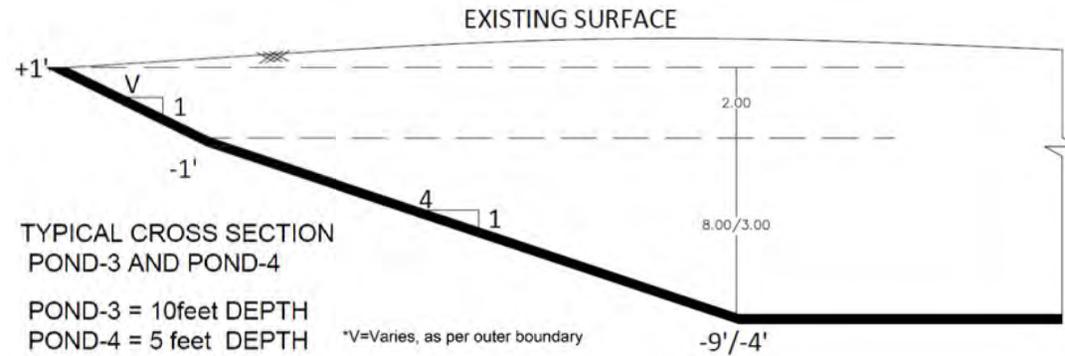
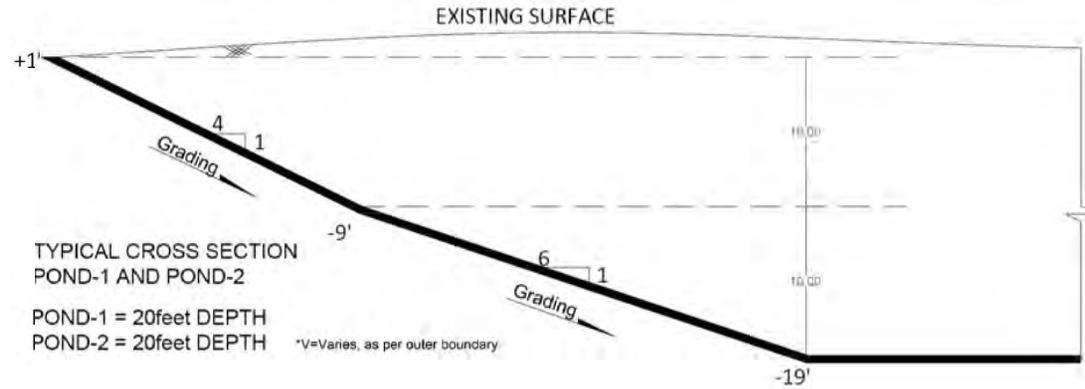
Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: Aug 02, 2023

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REVISED: AUG 03, 2023



Sheet 28 of 33  
Grading Sections

Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project

Galveston  
Galveston County, Texas

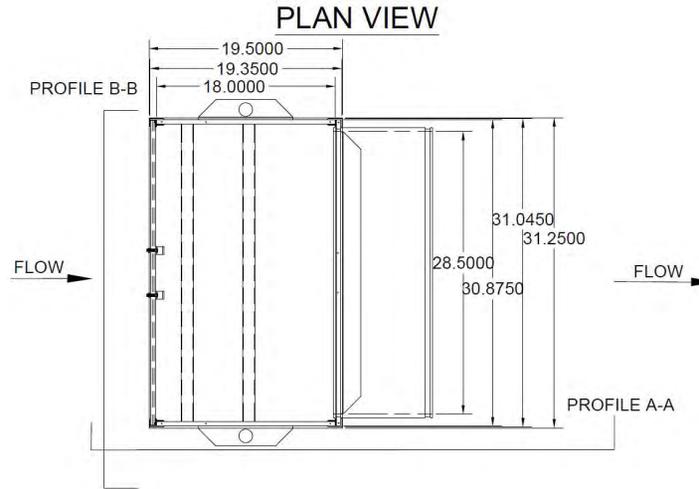
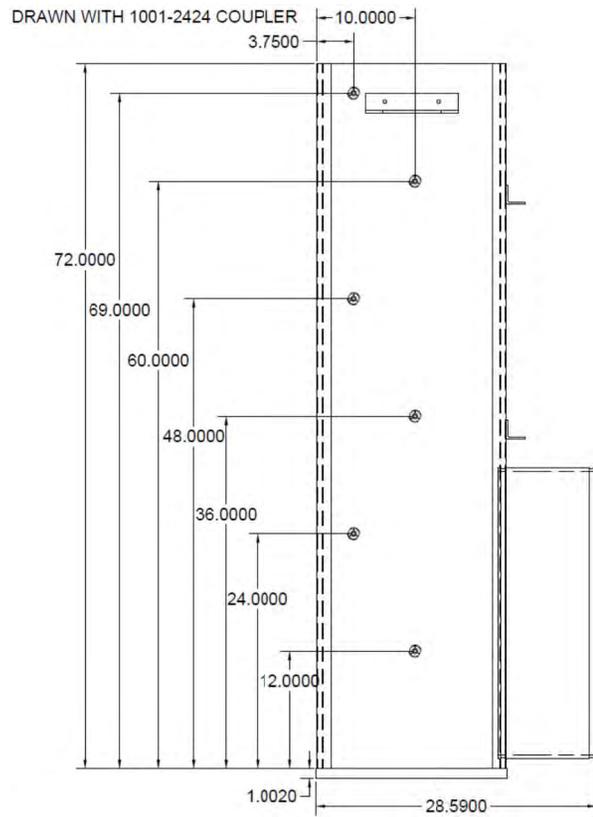
Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: May 16, 2023

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REVISED: AUG 03, 2023



NOTES:

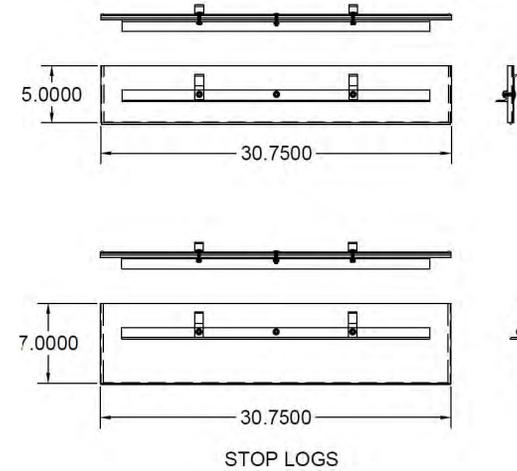
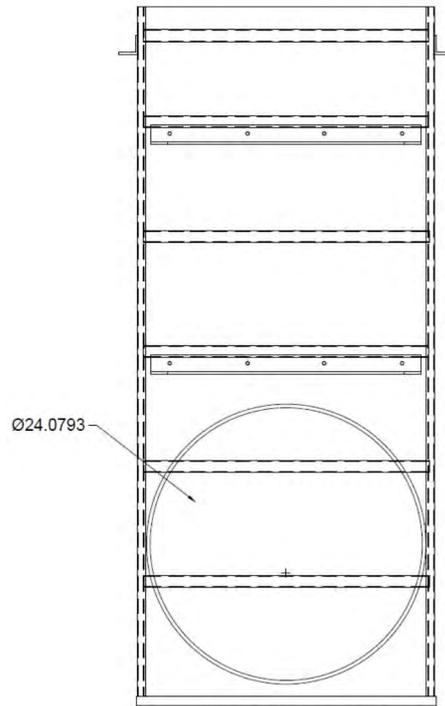
1. All dimensions are in inches.
2. The information in the drawing is for reference.
3. All information contained in this document is proprietary to Agri Drain Corp.



Sheet 29 of 33  
Water Level Control Structure Details  
**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston**  
Galveston County, Texas

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: May 16, 2023



REVISED: AUG 03, 2023



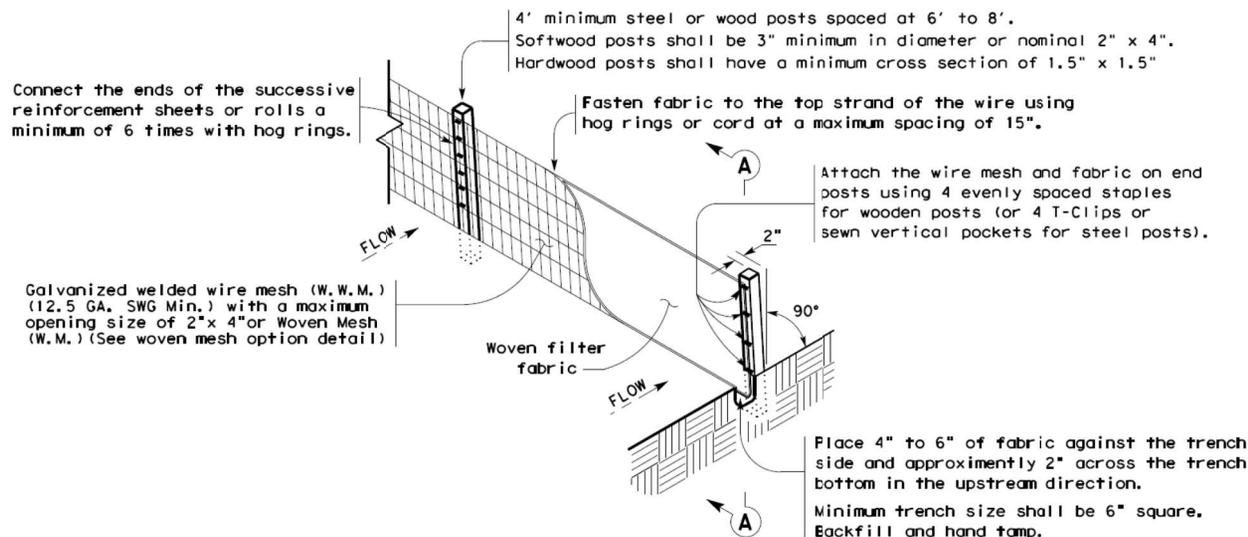
NOTES:

1. All dimensions are in inches.
2. The information in the drawing is for reference.
3. All information contained in this document is proprietary to Agri Drain Corp.



Sheet 30 of 33  
 Water Level Control Structure Details  
**Legacy Wetlands at Sullivan Ranch  
 Habitat Improvement Project**  
**Galveston**  
 Galveston County, Texas

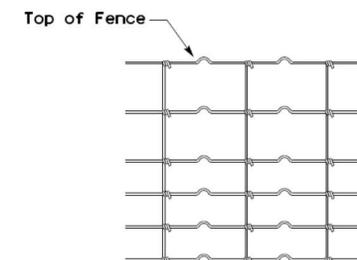
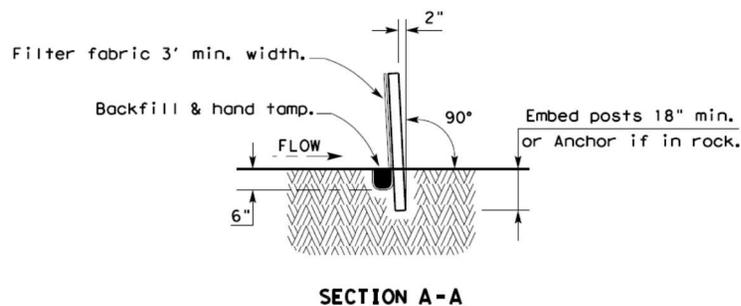
Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: May 16, 2023



Warning Sign Details



**TEMPORARY SEDIMENT CONTROL FENCE**



**HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL**

Galvanized hinge joint knot woven mesh (12.5 GA, SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

**REVISED: AUG 03, 2023**



**SEDIMENT CONTROL FENCE USAGE GUIDELINES:**

1. A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.
  2. Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FTSQ. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.
- \*Standard designed by TxDOT, 2016.



Sheet 31 of 33  
Temporary Reinforced Fabric Silt Fence Detail

**Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project**

**Galveston  
Galveston County, Texas**

Job No.: 100079983	Scale: Not to Scale
Prepared By: Atkins/WHIT6392	Date: May 16, 2023

Planting Zone	Common Name	Genus/Species	Lower Elevation	Upper Elevation	Approximate Area Planted (acres)
Marsh Margin	Water Hyssop	Bacopa spp.	0.5	1	6.52
	Sedges	Carex spp.	0.5	1	
	Sand Spike Rush	Eleocharis montevidensis	0.5	1	
	Swamp Rose Mallow	Hibiscus moscheutos	0.5	1	
	Blue flag Iris	Iris virginicus	0.5	1	
	Soft Rush	Juncus effusus	0.5	1	
	Smartweed	Polygonum hydropiperoides	0.5	1	
	Prairie Cordgrass	Spartina pectinate	0.5	1	
	Maidencane	Panicum hemitomom	0.5	1	
	White Topped sedge	Rhynchospora colorata	0.5	1	
Shallow Emergent Marsh	Mountain Spike Rush	Eleocharis Montana	0	0.5	5.36
	Squarestem Spike Rush	Eleocharis quadrangulate	0	0.5	
	Duck Potato	Sagittaria lancifolia	0	0.5	
	Grassy Arrowhead	Sagittaria graminea	0	0.5	
	Delta Arrowhead	Sagittaria platyphylla	0	0.5	
	Pickerelweed	Pontederia cordata	0	0.5	
	Fire Flag	Thalia dealbata	0	0.5	
	Olney Bulrush	Scirpus americanus	0	0.5	
Tall Emergent Marsh	Giant Bulrush	Scirpus californicus	-0.5	0	5.03
	Softstem Bulrush	Scirpus Validus	-0.5	0	
	Hardstem Bulrush	Scirpus Acutus	-0.5	0	
	Giant Cutgrass	Zizaniopsis milacea	-0.5	0	
Moist Soil Management			1	3	37.10
Floating/Submerged	Pondweed	Potamogeton spp.	-2	-0.5	5.64
	Widgeon Grass	Ruppia maritima	-2	-0.5	
	Water Shield	Brasenia schreberi	-2	-0.5	
	Coontail	Ceratophyllum demursum	-2	-0.5	
	White Water Lily	Nymphaea odorata	-2	-0.5	
	Floating Hearts	Nymphoides aquatica	-2	-0.5	

REVISED: AUG 03, 2023



NOTES:

- Majority of marsh plantings will be installed as bare root plugs with a root mass approximately 3" x 3" with multiple stems, depending on individual species.
- Tree and shrub species will be provided as contained grown, to add to diversity they will be either 1, 6, or 16 gallon size. 1-gallon will have a trunk caliper of less than .6 inch. 6-gallon will have a trunk caliper of .75-1.0 inch. 15-gallon will have a trunk caliper of 1.25-1.75 inch.
- Oak Mottes will have tree sizes of 5, 15, 30 and 45 gallon size. Caliper size will range from .5 inch to 3.5 inch.
- Actual plant species used will be based on availability at time of planting.



Sheet 32 of 33  
Planting Summary

Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project

Galveston  
Galveston County, Texas

Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: May 16, 2023

Planting Zone	Common Name	Genus/Species	Lower Elevation	Upper Elevation	Approximate Area Planted (acres)
Vegetative Edge Fringe Marsh	Saltwort	Batis maritima	1	3	2.02
	Saltgrass	Distichlis spicata	1	3	
	American Glasswort	Salicornia virginica	1	3	
	Gulf Cordgrass	Spartina spartinae	1	3	
	Seashore Paspalum	Paspalum vaginatum	1	3	
	Sea Ox Eye Daisy	Borrchia frutescens	1	3	
	Marsh Hay Cordgrass	Spartina patens	1	3	
	Black Needle Rush	Juncus roemarianus	1	3	
	Seaside Heliotrope	Heliotropium curassavicum	1	3	
	Eastern Baccharis	Baccharis halimifolia	1	3	
Vegetative Swale	Carolina Wolfberry	Lycium carolinianum	1	3	1.85
	Marsh Hay Cordgrass	Spartina patens	1	2	
Coastal Prairie	Alkali Bulrush	Schoenoplectus robustus	1	2	10.38
	Smooth Cordgrass	Spartina alterniflora	1	2	
	Marsh Hay Cordgrass	Spartina spartinae	3	5	
	Marsh Hay Cordgrass	Spartina patens	1	5	
	Prairie Cordgrass	Spartina pectinate	3	5	
	Eastern Gama Grass	Tripsacum dactyloides	3	5	
	Big Bluestem	Andropogon gerardii	3	5	
	Little Bluegrass	Schizachyrium scoparium	3	5	
	Switchgrass	Panicum virgatum	3	5	
	Sugar Cane Plumegrass	Erianthus giganteus	3	5	
Neotropical Migrant Bird	Buttonbush	Cephalanthus occidentalis	3.5	5	1.45
	Swamp Privet	Foresteria accuminata	3.5	5	
	Possum Haw	Ilex decidua	3.5	5	
	Native Yaupon	Ilex decidua	4	N/A	
	Wax Myrtle	Myrica cerifera	4	N/A	
	Eastern Baccharis	Baccharis halimifolia	3.5	5	
	Swamp Dogwood	Cornus drummondii	3.5	5	
	Willow Oak	Quercus phellos	3.5	5	
	Swamp Laurel Oak	Quercus laurifolia	3.5	5	
	Live Oak	Quercus fusiformus	4	N/A	
	Cedar Elm	Ulmus crassifolia	3.5	5	
	Texas Ebony	Ebenopsis ebano	3.5	5	
	Hackberry	Celtis occidentalis	3.5	5	
Oak Mottes	Black Willow	Salix nigra	3.5	5	16.31
	Live Oak	Quercus fusiformus	4	N/A	
	Native Yaupon	Ilex decidua	4	N/A	
	Wax Myrtle	Myrica cerifera	4	N/A	

REVISED: AUG 03, 2023



NOTES:

- Majority of marsh plantings will be installed as bare root plugs with a root mass approximately 3" x 3" with multiple stems, depending on individual species.
- Tree and shrub species will be provided as contained grown, to add to diversity they will be either 1, 6, or 16 gallon size. 1-gallon will have a trunk caliper of less than .6 inch. 6-gallon will have a trunk caliper of .75-1.0 inch. 15-gallon will have a trunk caliper of 1.25-1.75 inch.
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- Actual plant species used will be based on availability at time of planting.



Sheet 33 of 33  
Planting Summary

Legacy Wetlands at Sullivan Ranch  
Habitat Improvement Project

Galveston  
Galveston County, Texas

Job No.: 100079983

Scale: Not to Scale

Prepared By: Atkins/WHIT6392

Date: May 16, 2023