

DEPARTMENT OF THE ARMY PERMIT

Permittee Texas Parks and Wildlife Department

Permit No. SWG-2012-00631

Issuing Office Galveston District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: To discharge approximately 3,900 cubic yards of fill material into 2.67 acres of wetlands and secondary impacts to 0.41-acre of wetlands for the construction of multi-use campsites, park offices, parking facilities, restroom, picnic shelters, and dune walkovers associated with the redevelopment of the campground facilities. As compensation for impacts, the permittee will establish 9.98 acres of freshwater emergent wetlands and rehabilitate 2.9 acres of freshwater emergent wetlands. In addition, 0.2-acre of drainage ditches within the 191-acre tract will be plugged to stop the artificial drainage. The project will be conducted in accordance with the attached plans, in 22 sheets, and the mitigation plan, Attachment A, in 44 sheets.

Project Location: The 191-acre project tract is located within the Galveston Island State Park property at 14901 Farm-to-Market (FM) Road 3005, in Galveston, Galveston County, Texas.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on 31 December 2019. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.


5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

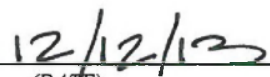
- a. You fail to comply with the terms and conditions of this permit.
- b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
- c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

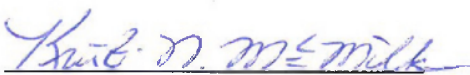
6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

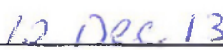
Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

  
\_\_\_\_\_  
(PERMITTEE)  
TEXAS PARKS AND WILDLIFE DEPARTMENT

  
\_\_\_\_\_  
(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

  
\_\_\_\_\_  
(DISTRICT ENGINEER)  
KRISTIN N. MCMILLAN, LEADER  
CENTRAL EVALUATION UNIT  
FOR COLONEL RICHARD P. PANNELL

  
\_\_\_\_\_  
(DATE)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

\_\_\_\_\_  
(TRANSFEREE -- Typed/Printed Name)

\_\_\_\_\_  
(DATE)

\_\_\_\_\_  
(TRANSFEREE - Signature)

\_\_\_\_\_  
(Mailing Address)

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

Applicant: Texas Parks and Wildlife Department	File Number: SWG-2012-00631	Date: 12/12/2013
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Attached is:	See Section below
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X	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

**SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at [http://www.usace.army.mil/CECW/Pages/reg\\_materials.aspx](http://www.usace.army.mil/CECW/Pages/reg_materials.aspx) or Corps regulations at 33 CFR Part 331.**

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

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

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

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

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

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

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

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

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

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

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

**POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

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

Ms. Andria Davis, Regulatory Specialist  
CESWG-PE-RE, P.O. Box 1229  
Galveston, Texas 77553-1229  
Telephone: 409-766-6389; FAX: 409-766-6301

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

Mr. Elliott Carman  
Administrative Appeals Review Officer (CESWD-PDO)  
U.S. Army Corps of Engineers  
1100 Commerce Street, Suite 831  
Dallas, Texas 75242  
469-487-7061 (phone)

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

\_\_\_\_\_  
Signature of appellant or agent.

Date: \_\_\_\_\_

Telephone number: \_\_\_\_\_



This notice of authorization must be  
conspicuously displayed at the site of work.

United States Army Corps of Engineers

12 Dec 2013

A permit to discharge approximately 3,900 cubic yards of fill  
at 14901 Farm-to-Market Road 3005, in Galveston, TX,

has been issued to Texas Parks and Wildlife on 12 Dec 2013

Address of Permittee 4200 Smith School Road, Austin, TX

Permit Number

SWA-2012-00631

*Kristi N. McMillan*  
for Kristi N. McMillan  
Col. Richard P. Pannell  
District Commander



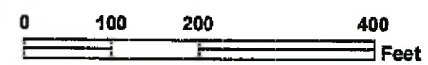
Date: 1/11/2013

NOV 12 2013



- GISP Site Boundary
- Project Area
- Maximum Project Footprint
- Planned Infrastructure
- Existing Delineated Wetland

- Permanent Wetland Impacts due to Construction of Facilities (2.67 ac)
- Secondary Wetland Impacts due to Construction of Facilities (0.41 ac)
- Permanent Wetland Impacts due to Wetland Mitigation (0.20 ac)

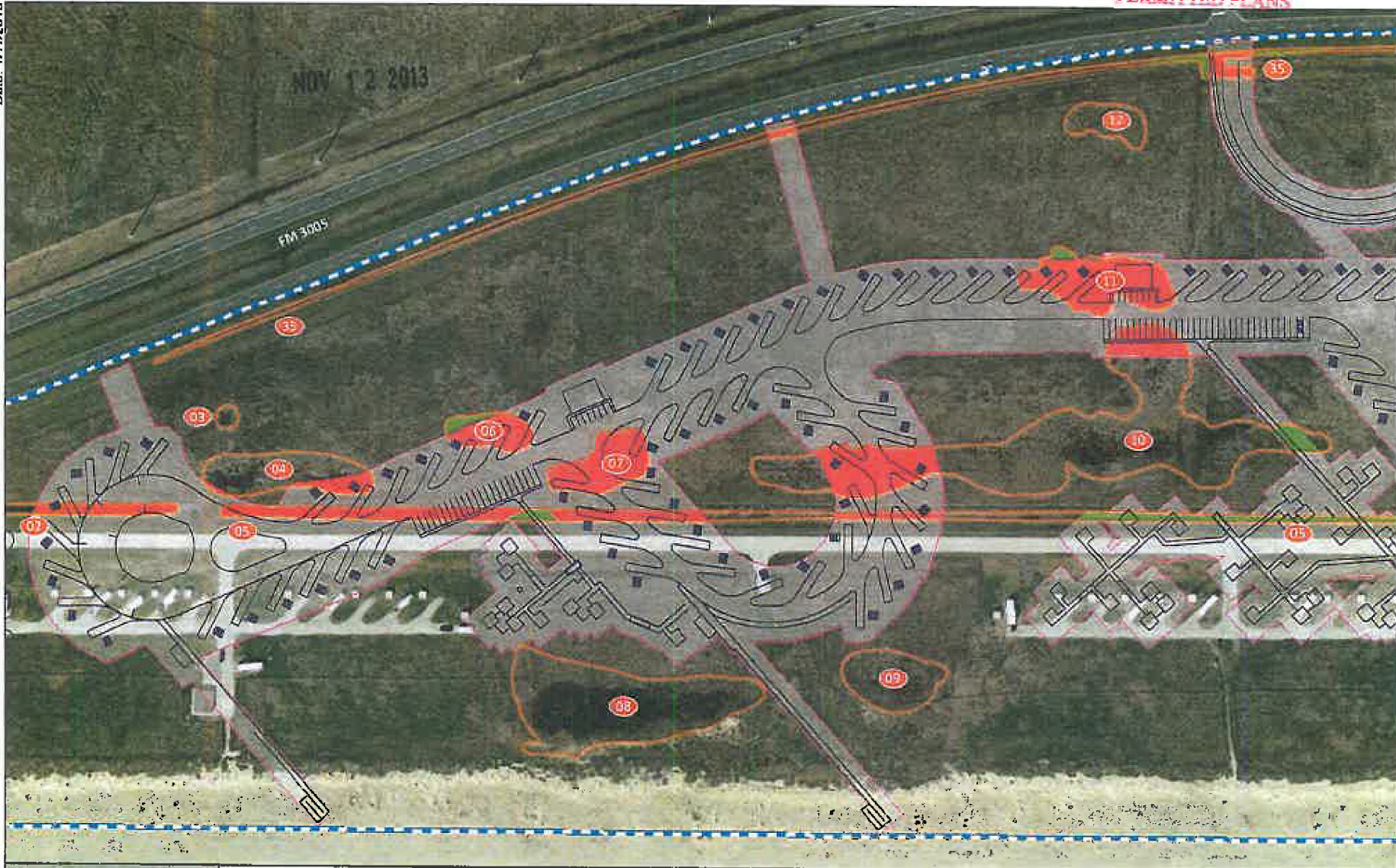


Applicant: Texas Parks and Wildlife Department / Source: Bing Maps Aerials (2011)

Galveston Island State Park  
Beach Redevelopment

SWG-2012-00631 TPWD  
Project Plans  
11/26/13 Page 2 of 22

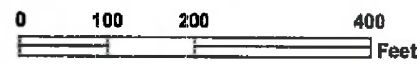
Date: 11/12/2013



PERMITTED PLANS



-  GISP Site Boundary
-  Project Area
-  Maximum Project Footprint
-  Planned Infrastructure
-  Existing Delineated Wetland
-  Permanent Wetland Impacts due to Construction of Facilities (2.67 ac)
-  Secondary Wetland Impacts due to Construction of Facilities (0.41 ac)
-  Permanent Wetland Impacts due to Wetland Mitigation (0.20 ac)



Applicant: Texas Parks and Wildlife Department / Source: Bing Maps Aerials (2011)

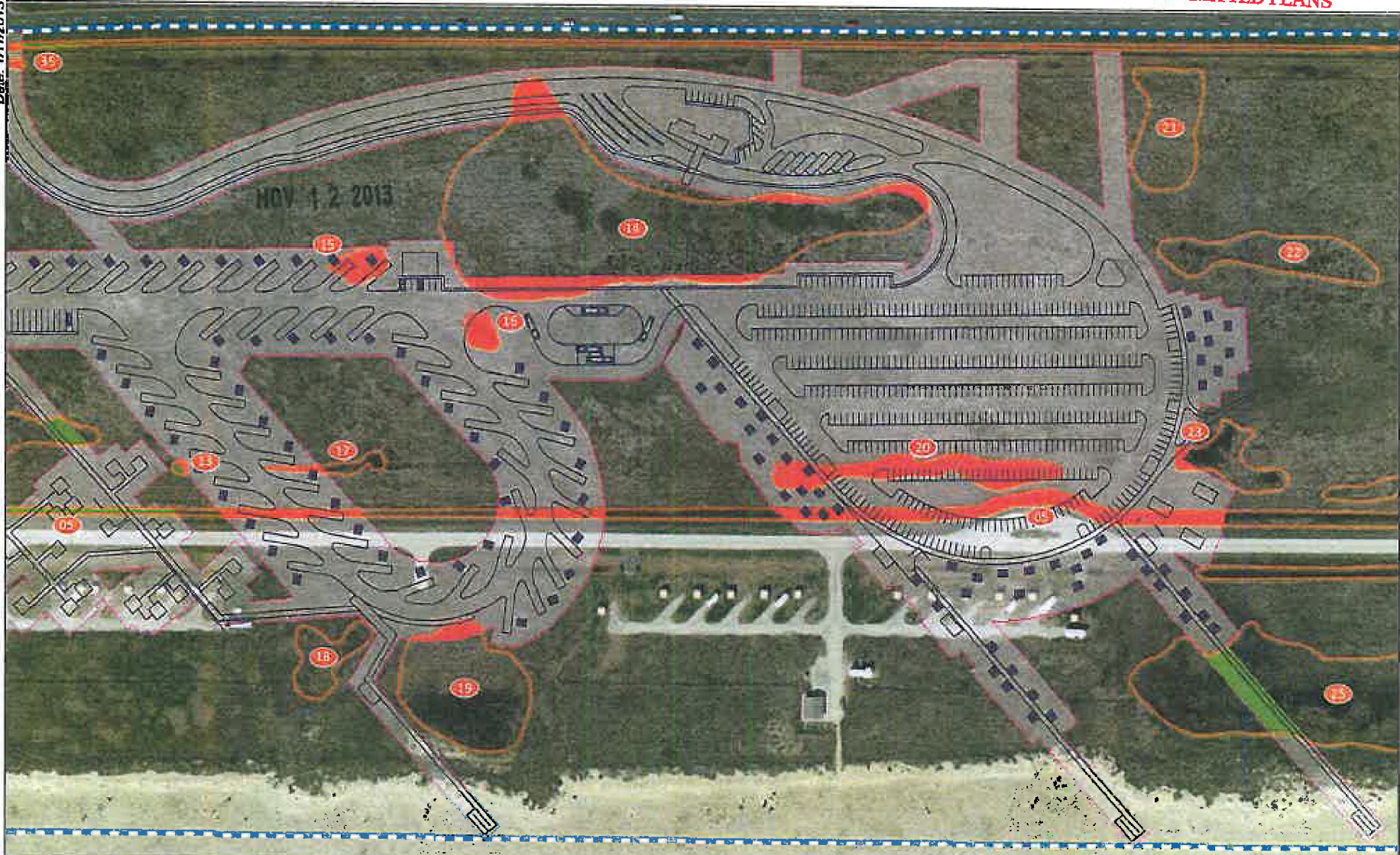
Galveston Island State Park  
Beach Redevelopment

SWG-2012-00631 TPWD  
 Project Plans  
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DWH-AR0239120



Date: 1/11/2013



GISP Site Boundary	Permanent Wetland Impacts due to Construction of Facilities (2.67 ac)	 
Project Area	Secondary Wetland Impacts due to Construction of Facilities (0.41 ac)	
Maximum Project Footprint	Permanent Wetland Impacts due to Wetland Mitigation (0.20 ac)	
Planned Infrastructure		
Existing Delineated Wetland		

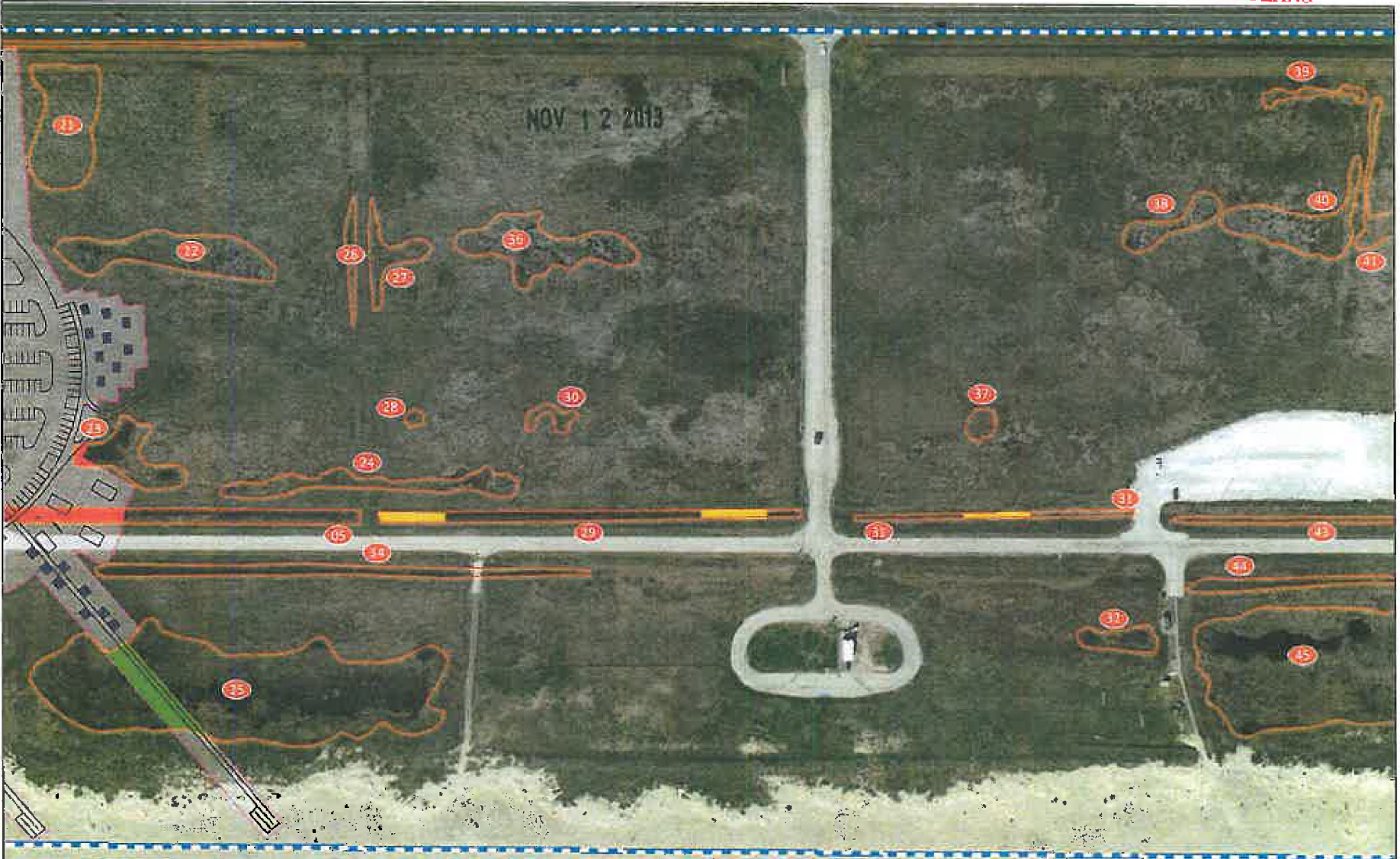
Applicant: Texas Parks and Wildlife Department / Source: Bing Maps Aerials (2011)

Galveston Island State Park  
Beach Redevelopment

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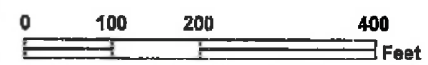
Date: 1/11/2013

PERMITTED PLANS



- GISP Site Boundary
- Project Area
- Maximum Project Footprint
- Planned Infrastructure
- Existing Delineated Wetland

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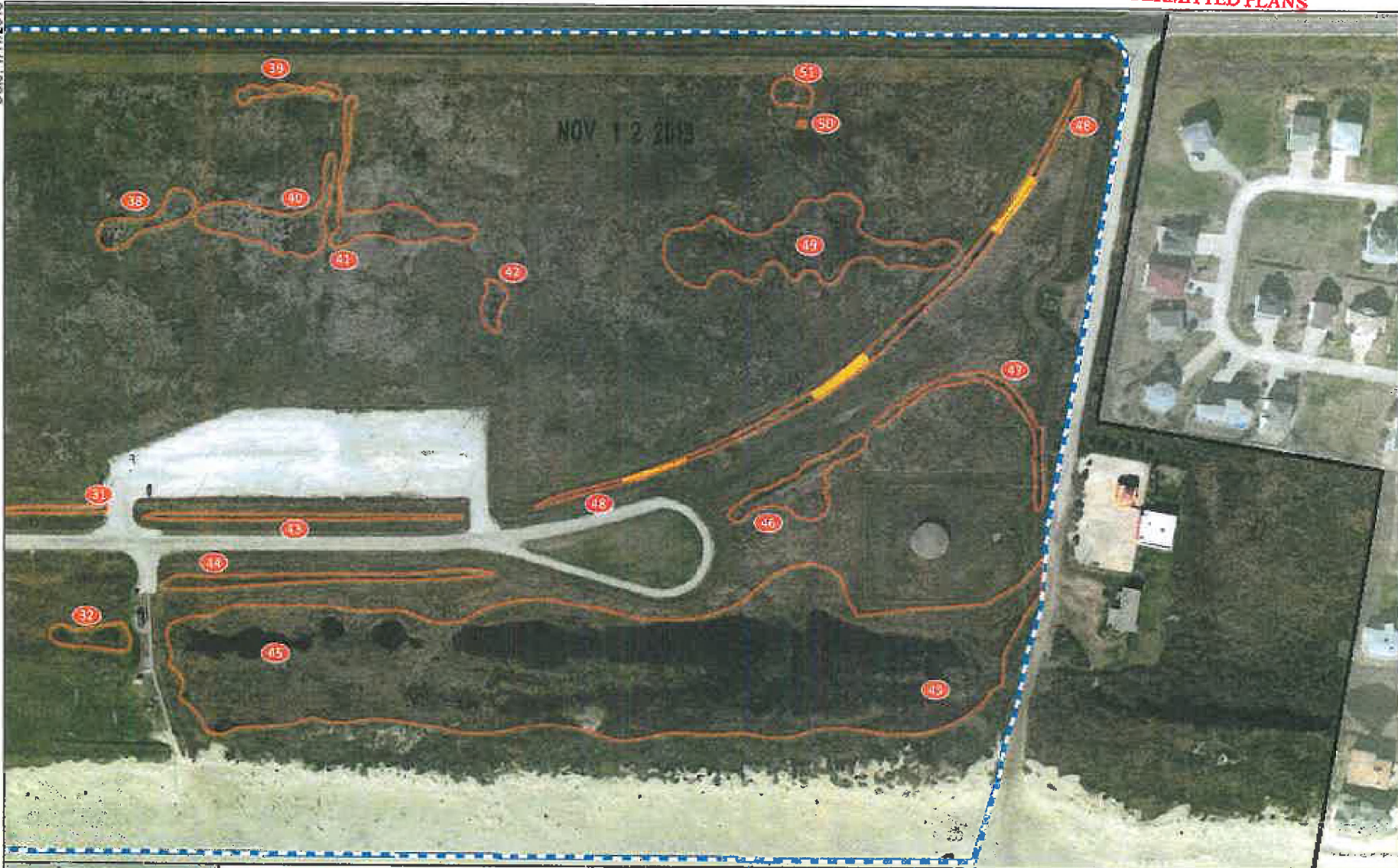
Applicant: Texas Parks and Wildlife Department / Source: Bing Maps Aerials (2011)

Galveston Island State Park  
Beach Redevelopment

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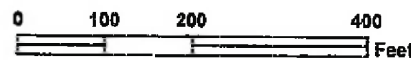
Date: 1/11/2013

PERMITTED PLANS



- GISP Site Boundary
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Applicant: Texas Parks and Wildlife Department / Source: Bing Maps Aerials (2011)

Galveston Island State Park  
Beach Redevelopment

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LEGEND

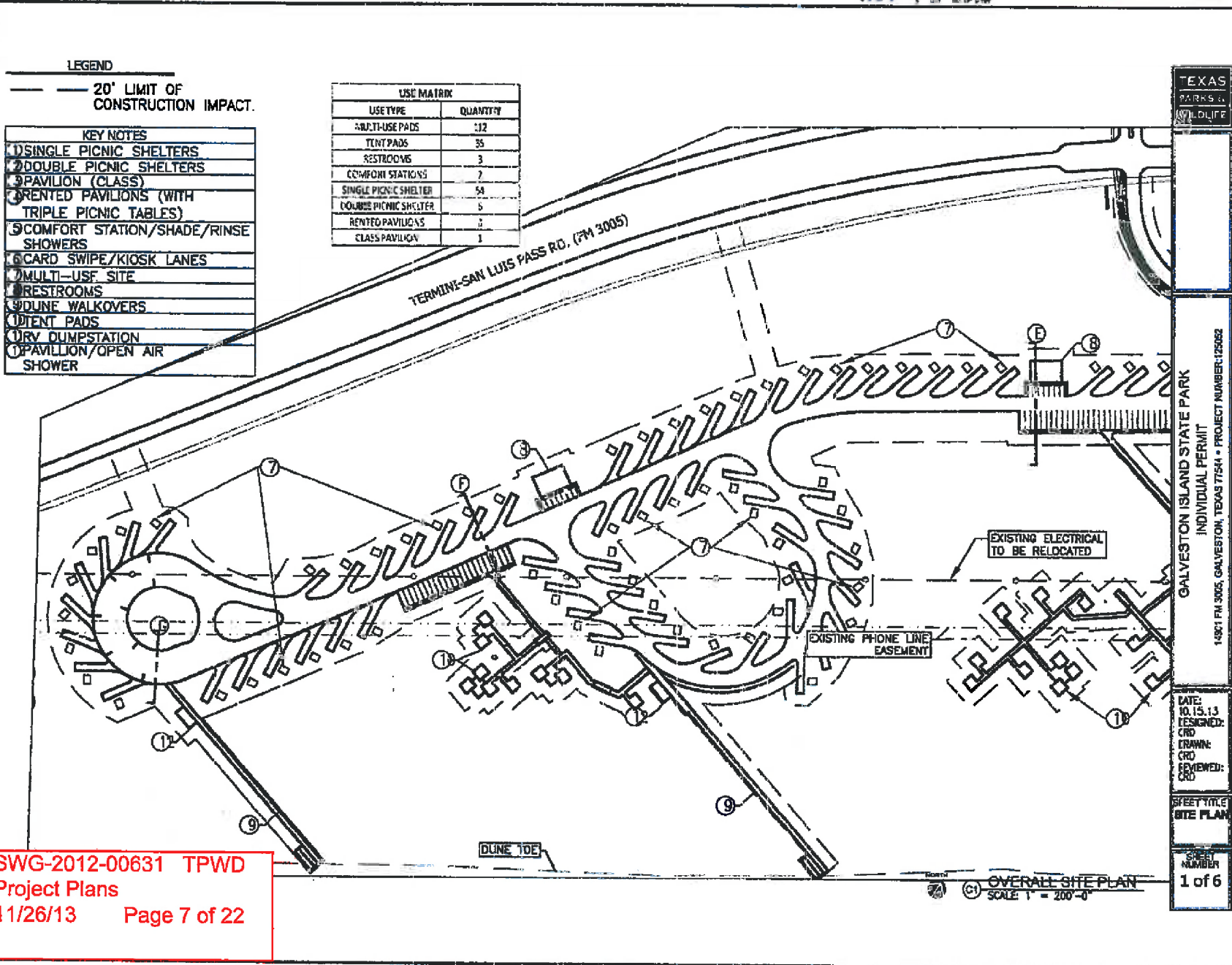
— 20' LIMIT OF CONSTRUCTION IMPACT.

KEY NOTES

- 1) SINGLE PICNIC SHELTERS
- 2) DOUBLE PICNIC SHELTERS
- 3) PAVILION (CLASS)
- 4) RENTED PAVILIONS (WITH TRIPLE PICNIC TABLES)
- 5) COMFORT STATION/SHADE/RINSE SHOWERS
- 6) CARD SWIPE/KIOSK LANES
- 7) MULTI-USE SITE
- 8) RESTROOMS
- 9) DUNE WALKOVERS
- 10) TENT PADS
- 11) DRY DUMPSTATION
- 12) PAVILLION/OPEN AIR SHOWER

USE MATRIX

USE TYPE	QUANTITY
MULTI-USE PADS	112
TENT PADS	35
RESTROOMS	3
COMFORT STATIONS	7
SINGLE PICNIC SHELTER	54
DOUBLE PICNIC SHELTER	5
RENTED PAVILIONS	1
CLASS PAVILION	1



TEXAS  
PARKS &  
WILDLIFE

GALVESTON ISLAND STATE PARK  
INDIVIDUAL PERMIT  
14971 FM 3005, GALVESTON, TEXAS 7754 • PROJECT NUMBER: 12062

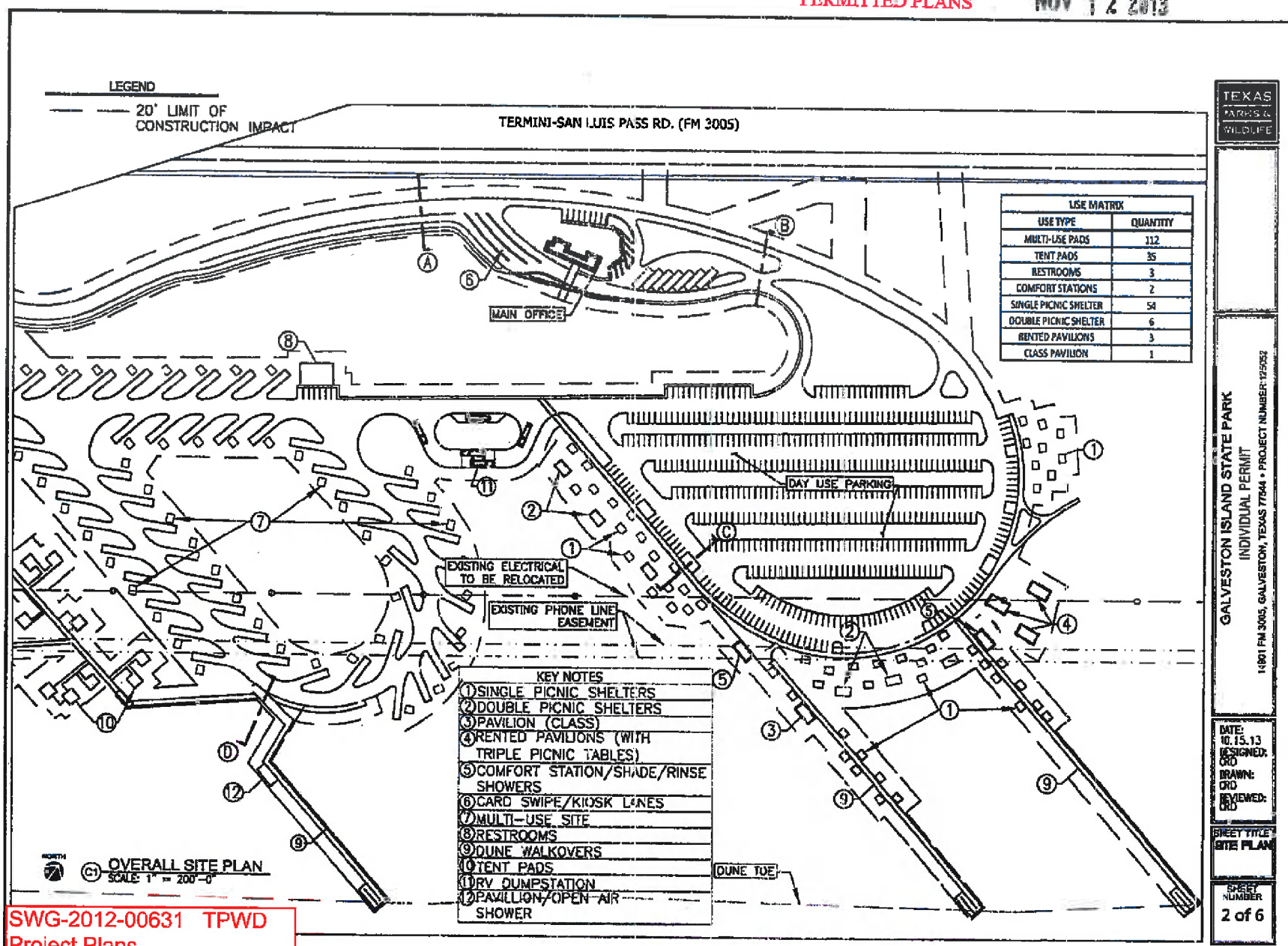
DATE: 10.15.13  
DESIGNED: CRD  
DRAWN: CRD  
REVIEWED: CRD

SHEET TITLE  
SITE PLAN

SHEET NUMBER  
1 of 6

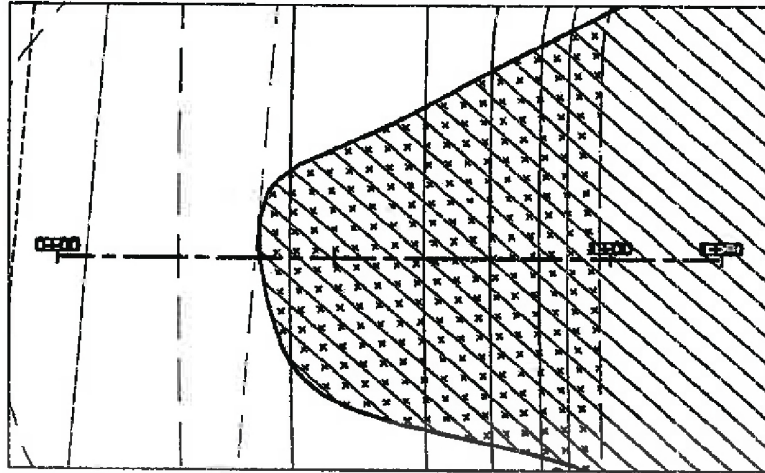
SWG-2012-00631 TPWD  
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OVERALL SITE PLAN  
SCALE: 1" = 200'-0"



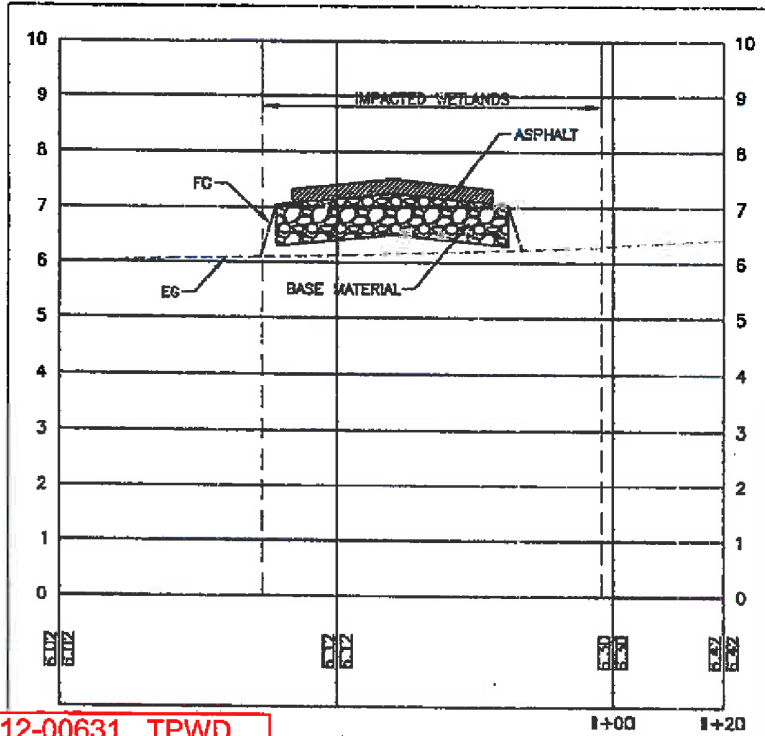
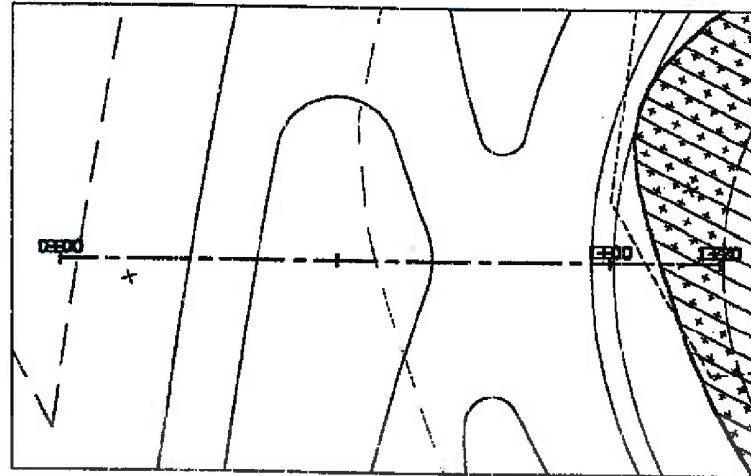
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WETLAND 14

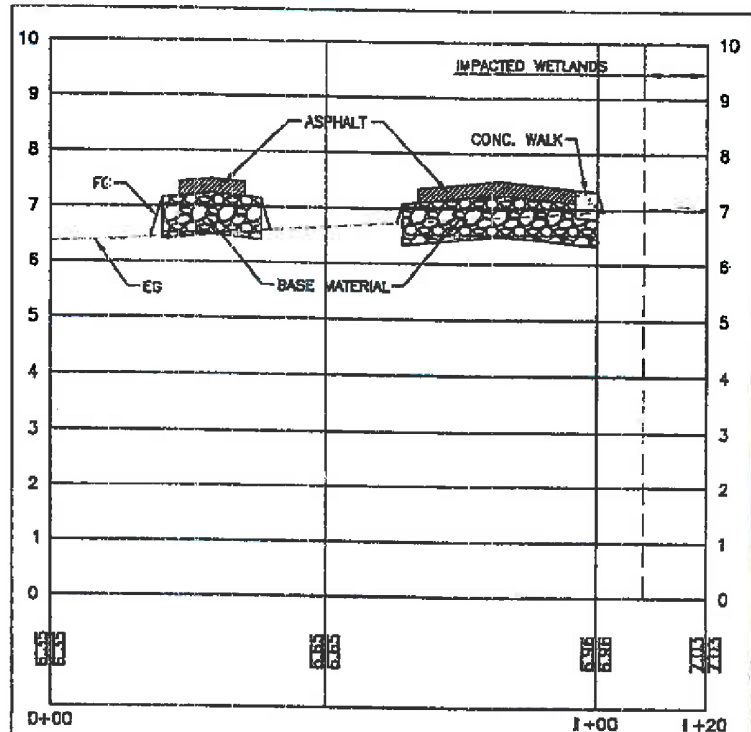


WETLAND 14

NOV 12 2013



SECTION "A"



SECTION "B"

HORZ. SCALE 1" = 30'-0"  
VERT. SCALE 1" = 3'-0"



GALVESTON ISLAND STATE PARK  
INDIVIDUAL PERMIT

14501 FM 3605, GALVESTON, TEXAS 77544 • PROJECT NUMBER: 125032

DATE: 10/15/13  
DESIGNED: CRD  
DRAWN: CRD  
REVIEWED: CRD

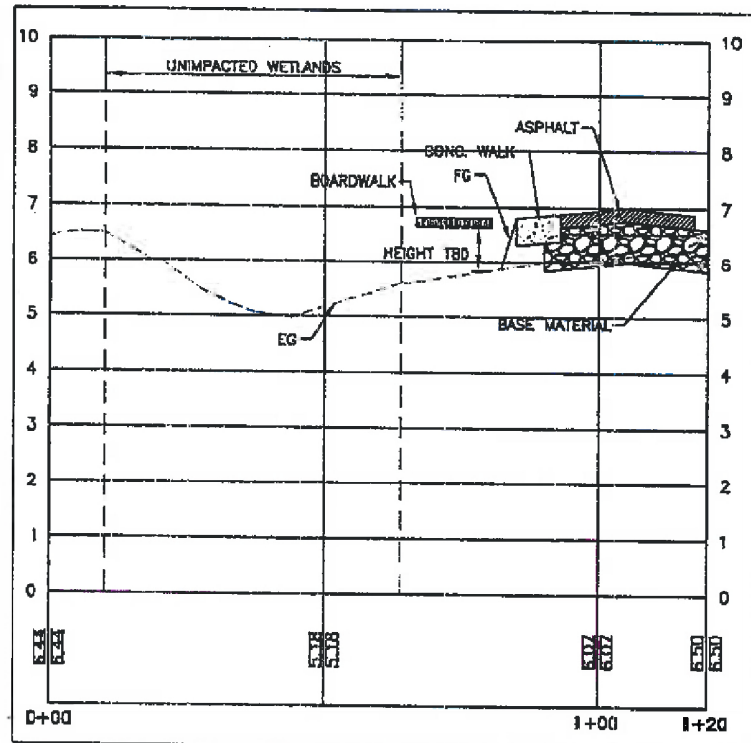
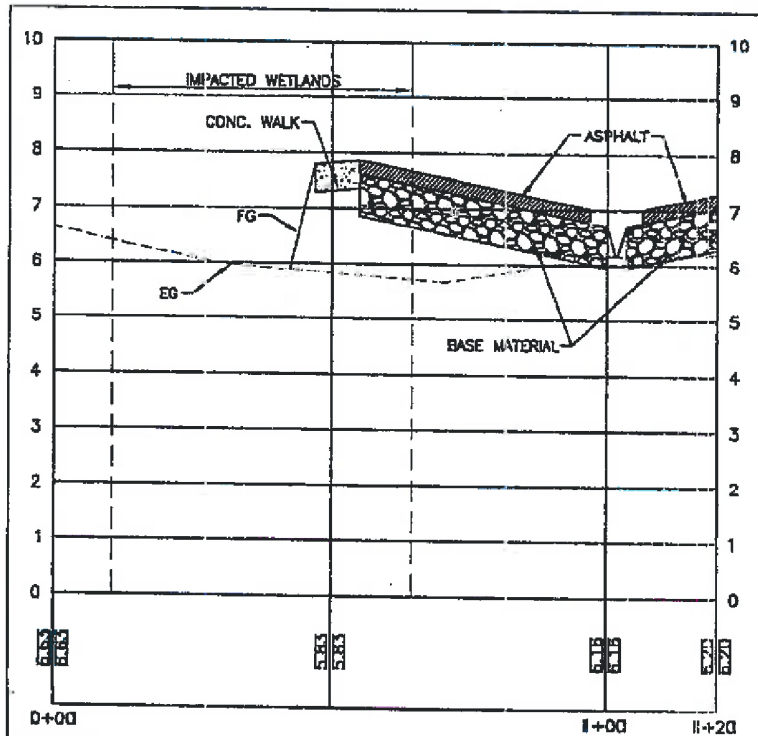
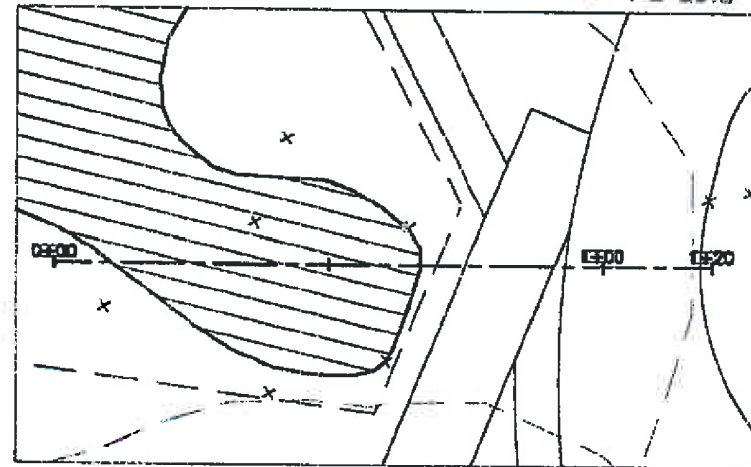
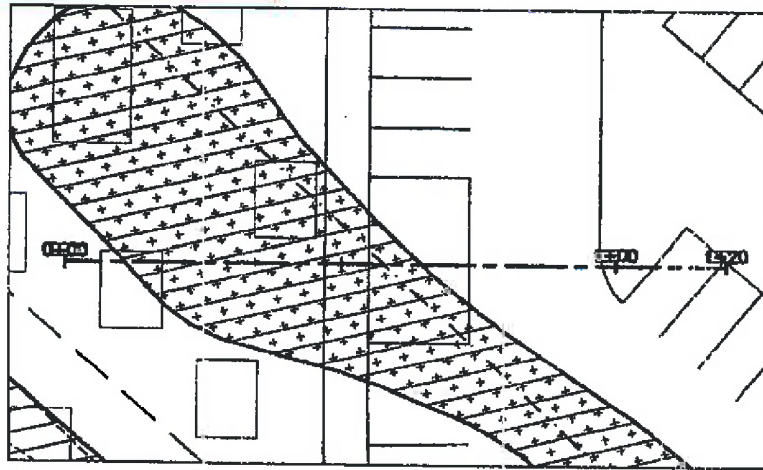
SHEET TITLE:  
CROSS SECTIONS

SHEET NUMBER  
3 of 6

WETLAND 20

WETLAND 18

NOV 12 2013



SECTION "C"

SECTION "D"

HORIZ. SCALE: 1" = 30'-0"  
 VERT. SCALE: 1" = 3'-0"

TEXAS  
 PARKS &  
 WILDLIFE

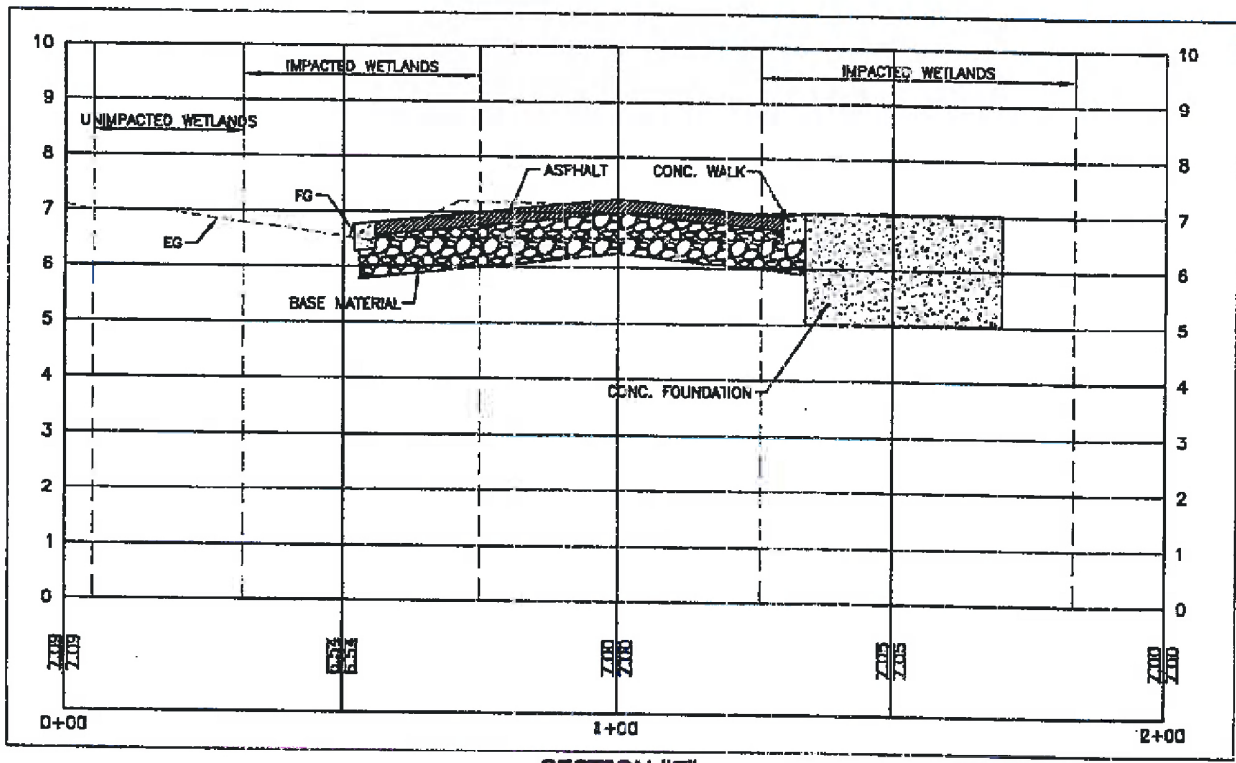
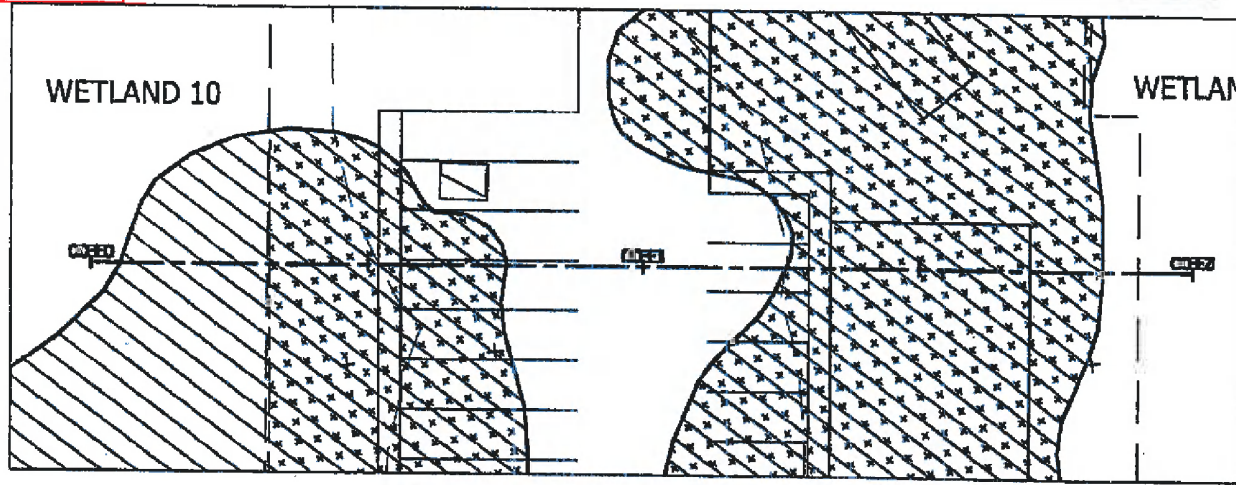
GALVESTON ISLAND STATE PARK  
 INDIVIDUAL PERMIT  
 14901 FM 3005, GALVESTON, TEXAS 77544 • PROJECT NUMBER: 125032

DATE: 10.15.13  
 DESIGNED: CRB  
 DRAWN: CRB  
 REVIEWED: CRB

SHEET TITLE:  
 CROSS SECTIONS

SHEET NUMBER:  
 4 of 6

NOV 12 2013



SECTION "E"

HORIZ. SCALE: 1" = 30'  
 VERT. SCALE: 1" = 5'

TEXAS  
 PARKS &  
 WILDLIFE

GALVESTON ISLAND STATE PARK  
 INDIVIDUAL PERMIT  
 14601 FM 3005, GALVESTON, TEXAS 77544 • PROJECT NUMBER: 125052

DATE: 10.15.13  
 DESIGNED: ORD  
 DRAWN: ORD  
 REVIEWED: ORD

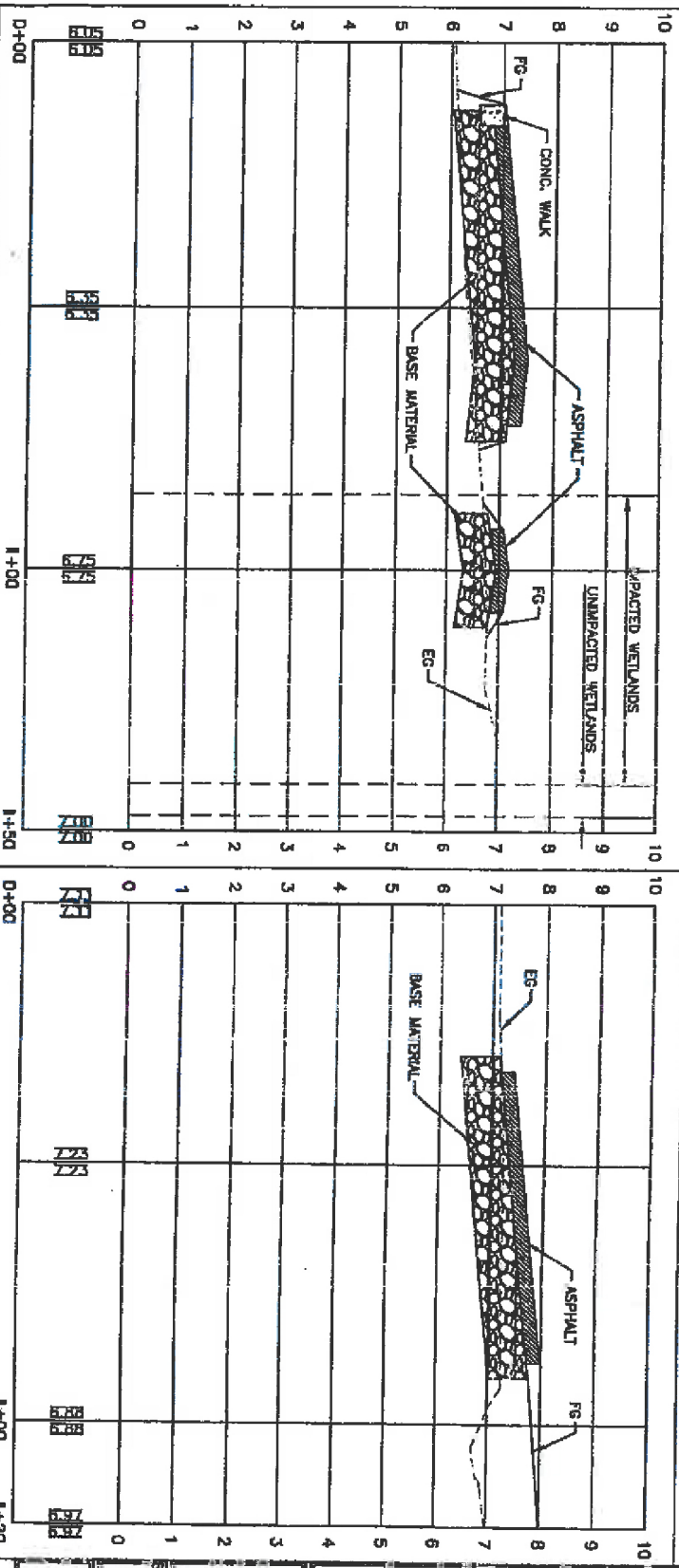
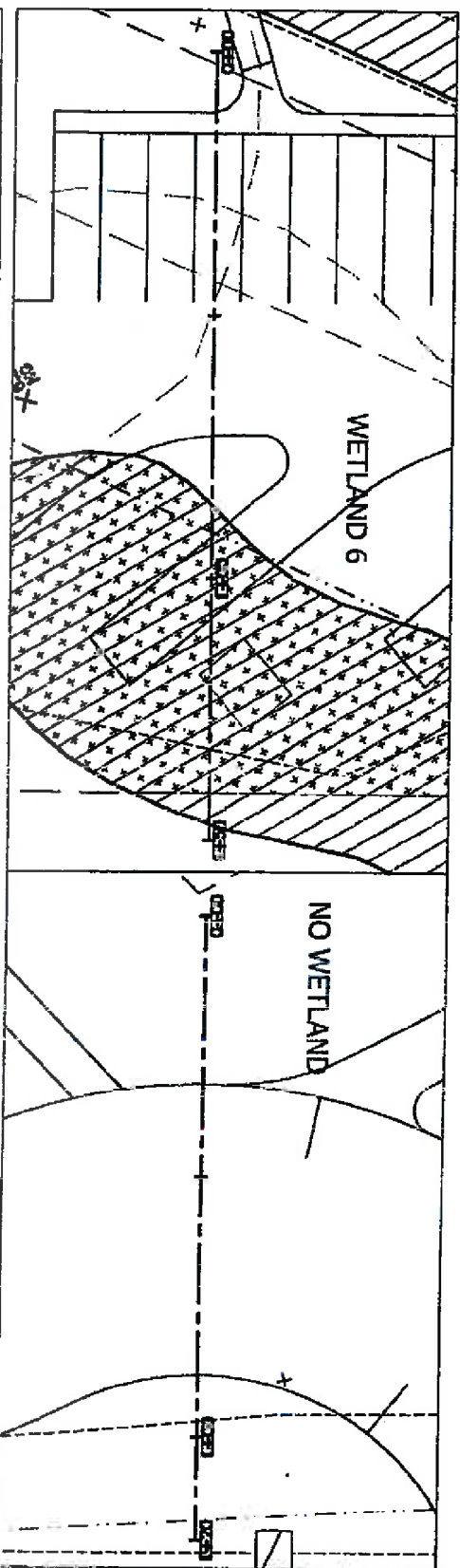
SHEET TITLE:  
 CROSS SECTIONS

5 of 6



PERMITTED PLANS

NOV 12 2013



SECTION "F"

SECTION "G"

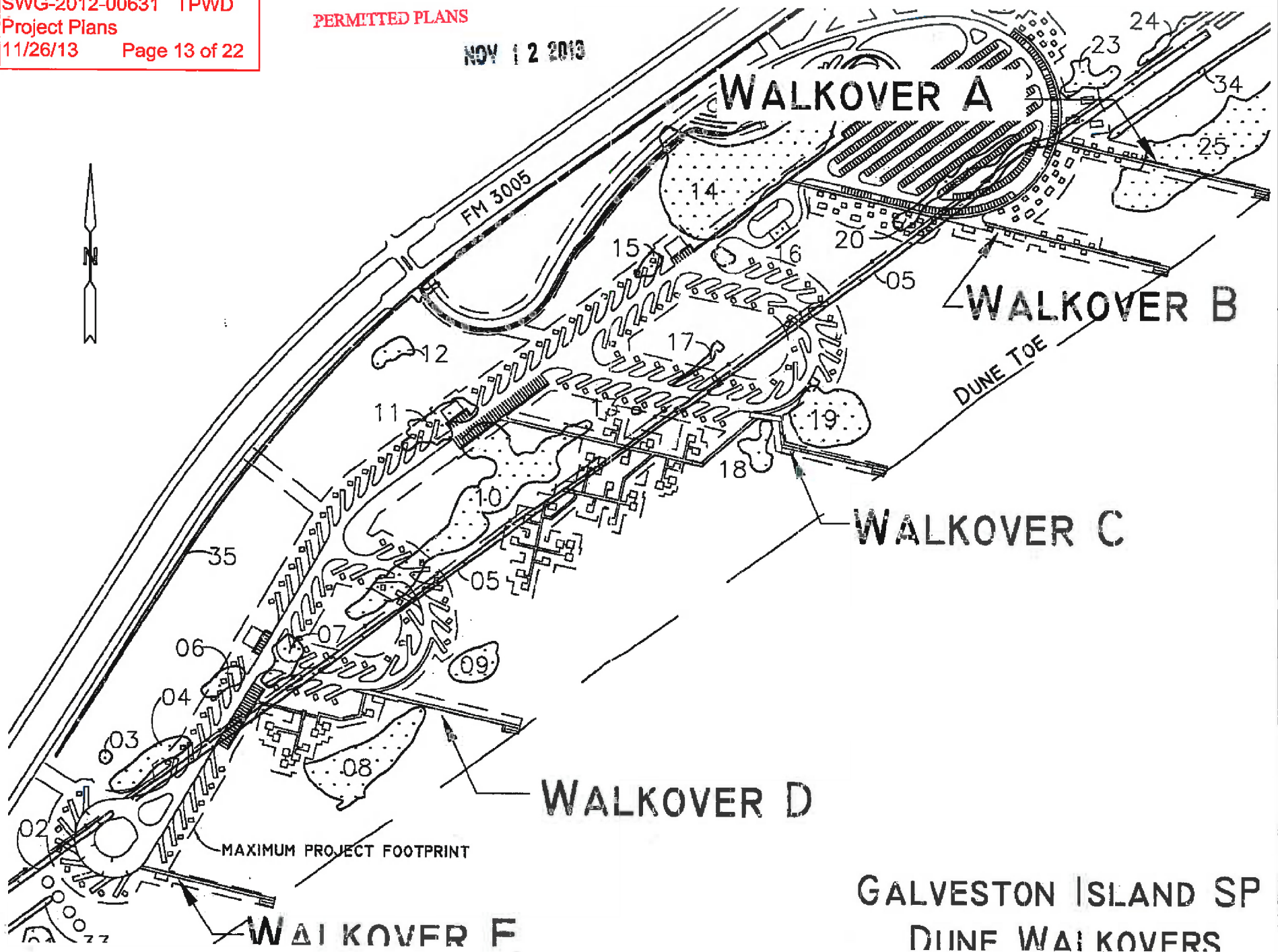
HORIZ. SCALE: 1" = 30'-0"  
 VERT. SCALE: 1" = 3'-0"

TEXAS PARKS & WILDLIFE	GALVESTON ISLAND STATE PARK INDIVIDUAL PERMIT 14901 FM 3005, GALVESTON, TEXAS 77544 • PROJECT NUMBER: 125052	
	DATE: 10.15.13 DESIGNED: RSD DRAWN: RSD REVIEWED: CRD	SHEET TITLE: CROSS SECTIONS

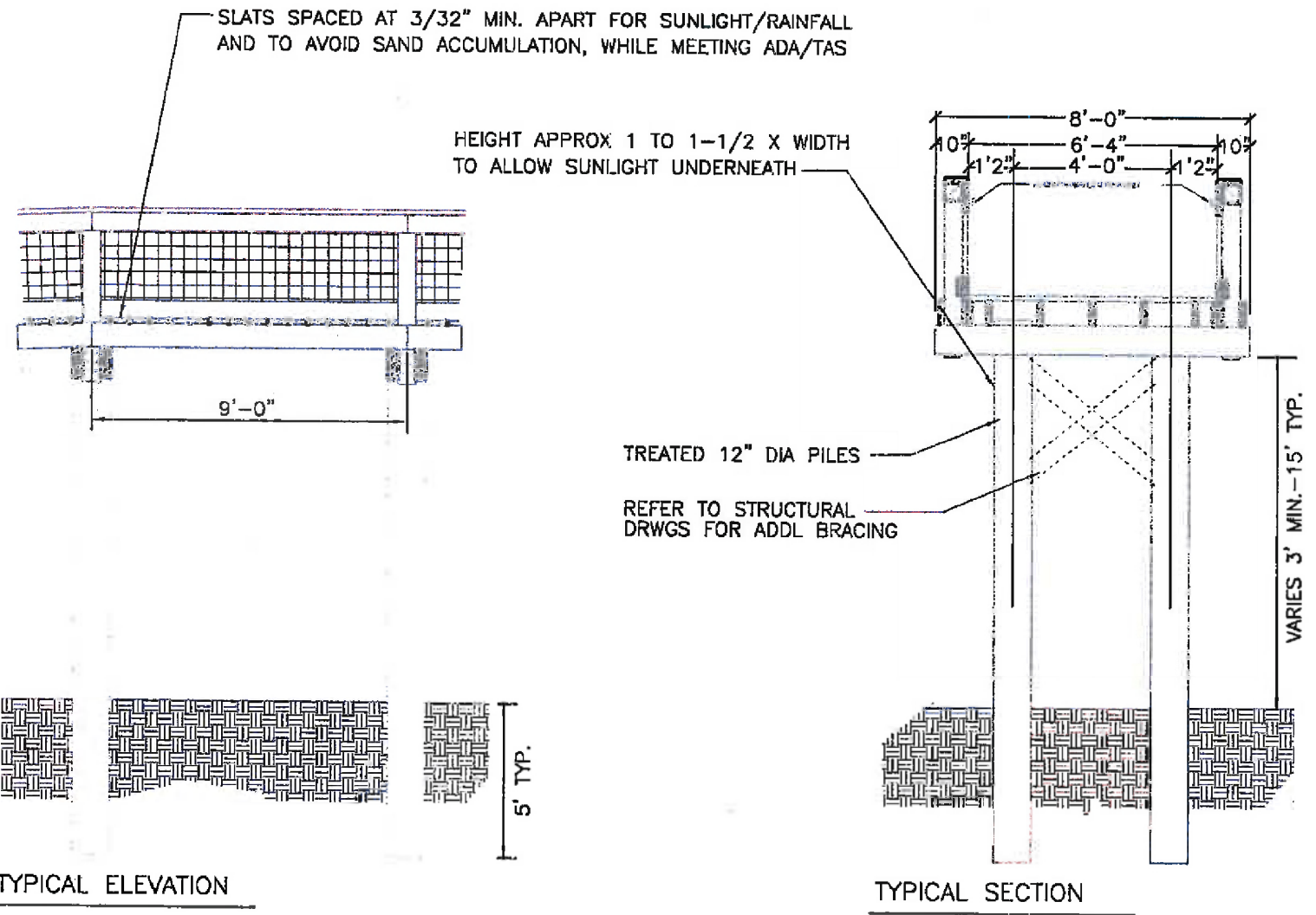
6 of 6

PERMITTED PLANS

NOV 12 2013



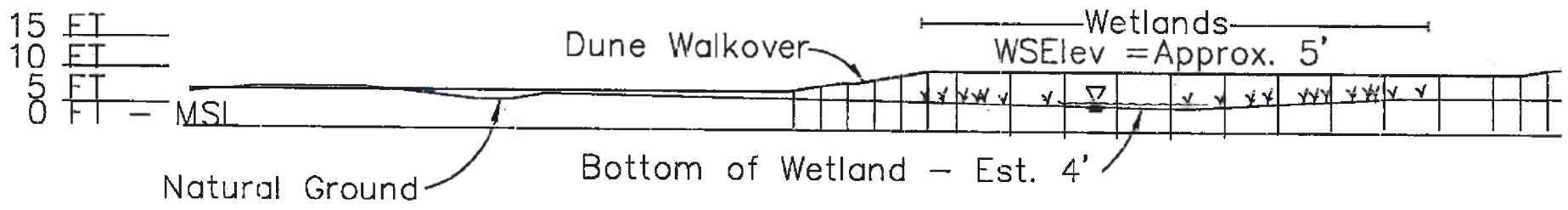
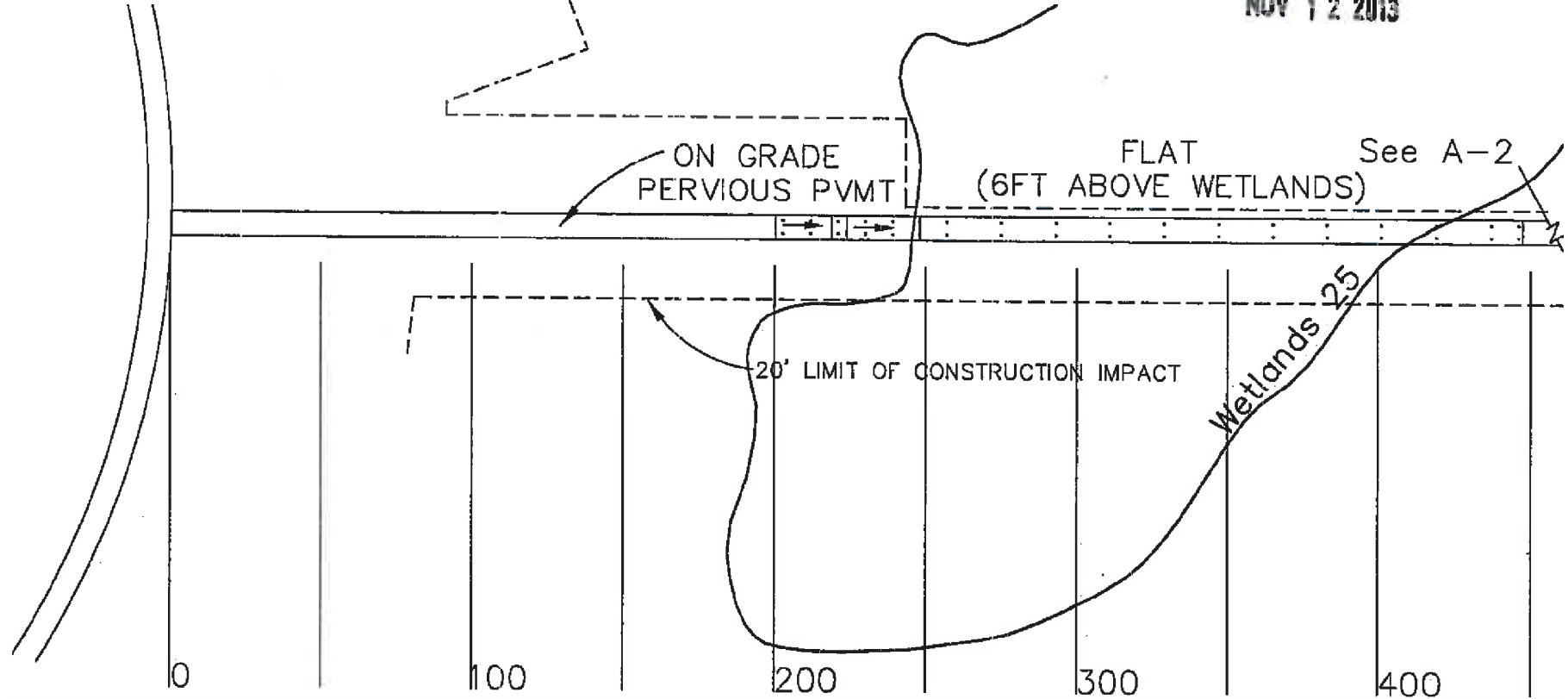
GALVESTON ISLAND SP  
DUNE WALKOVERS



DUNE WALKOVERS

PERMITTED PLANS  
NOV 12 2013

BOARDWALK WIDTH = 8 FT



# Walkover A-1

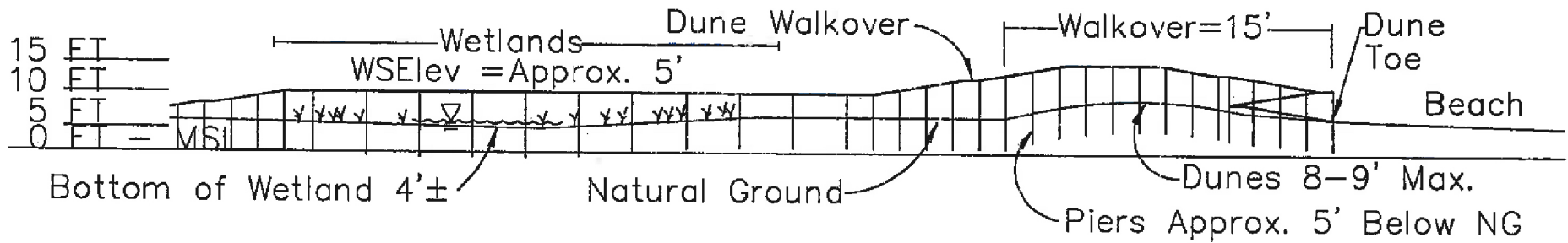
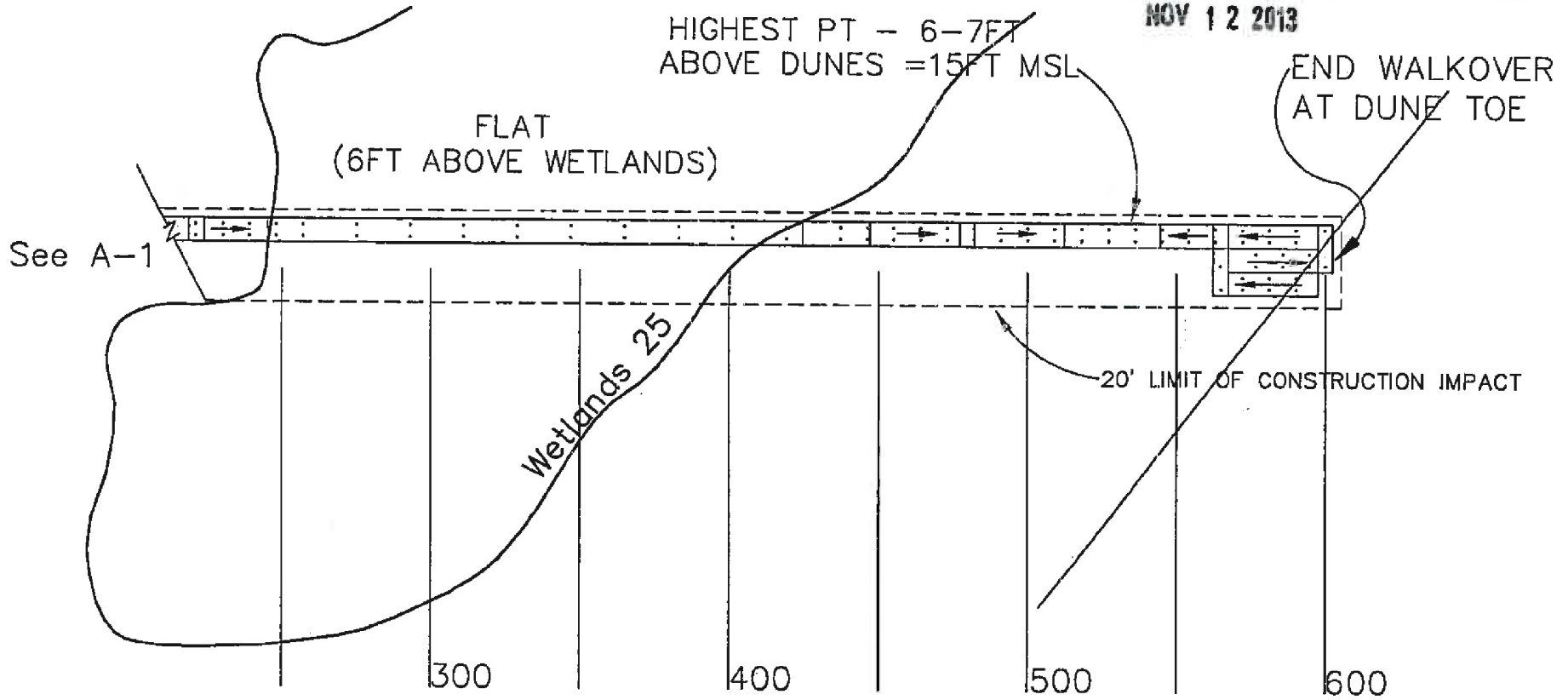
See Site Plan for Location

SWG-2012-00631 TPWD  
 Project Plans  
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Horiz: 1" = 50'  
 VE = 2X

PERMITTED PLANS

NOV 12 2013



# Walkover A-2

See Site Plan for Location

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 Project Plans  
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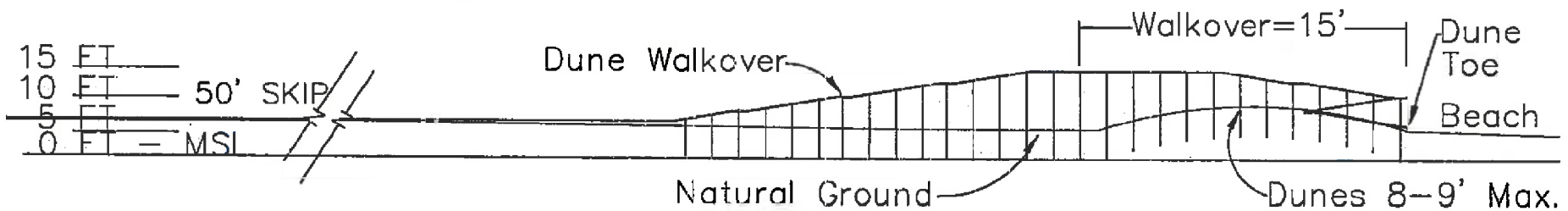
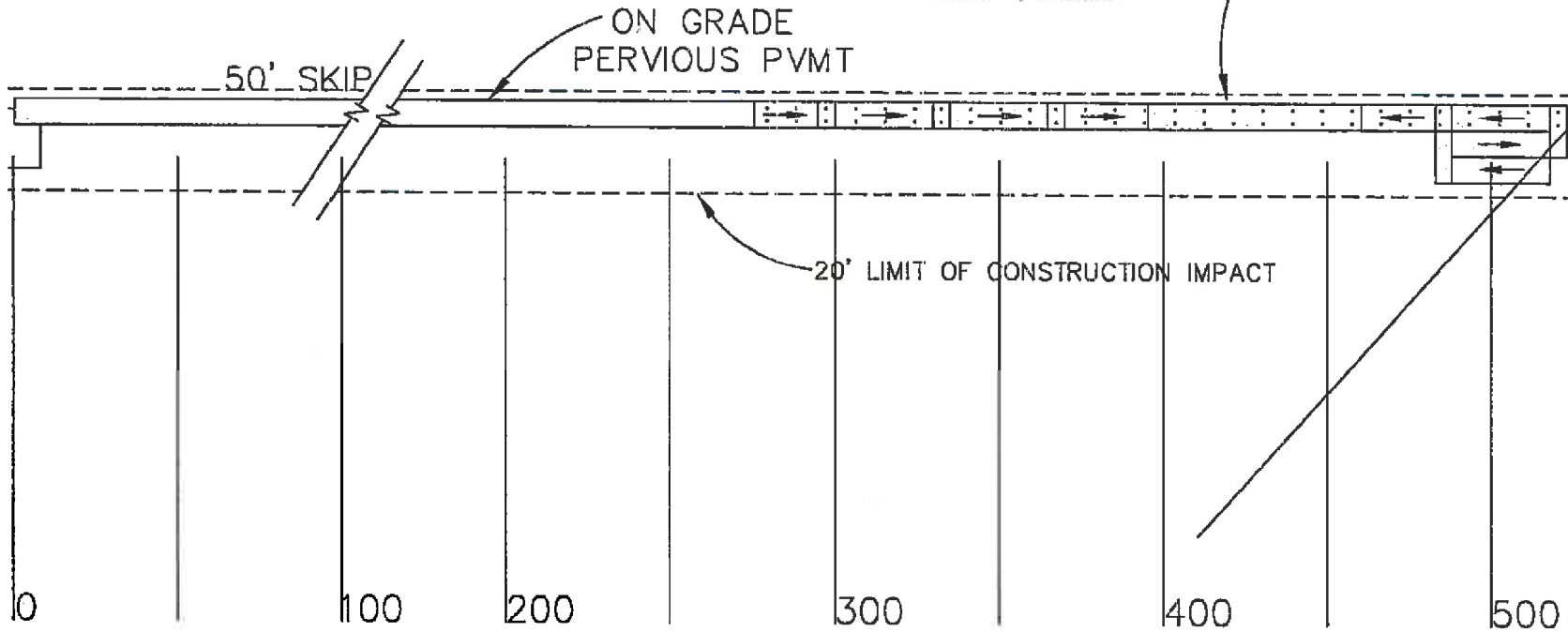
Horiz: 1" = 50'  
 VE = 2X

BOARDWALK WIDTH = 8 FT

PERMITTED PLANS

NOV 12 2013

HIGHEST PT - 6-7FT ABOVE DUNES = 15FT MSL



# Walkover B

See Site Plan for Location

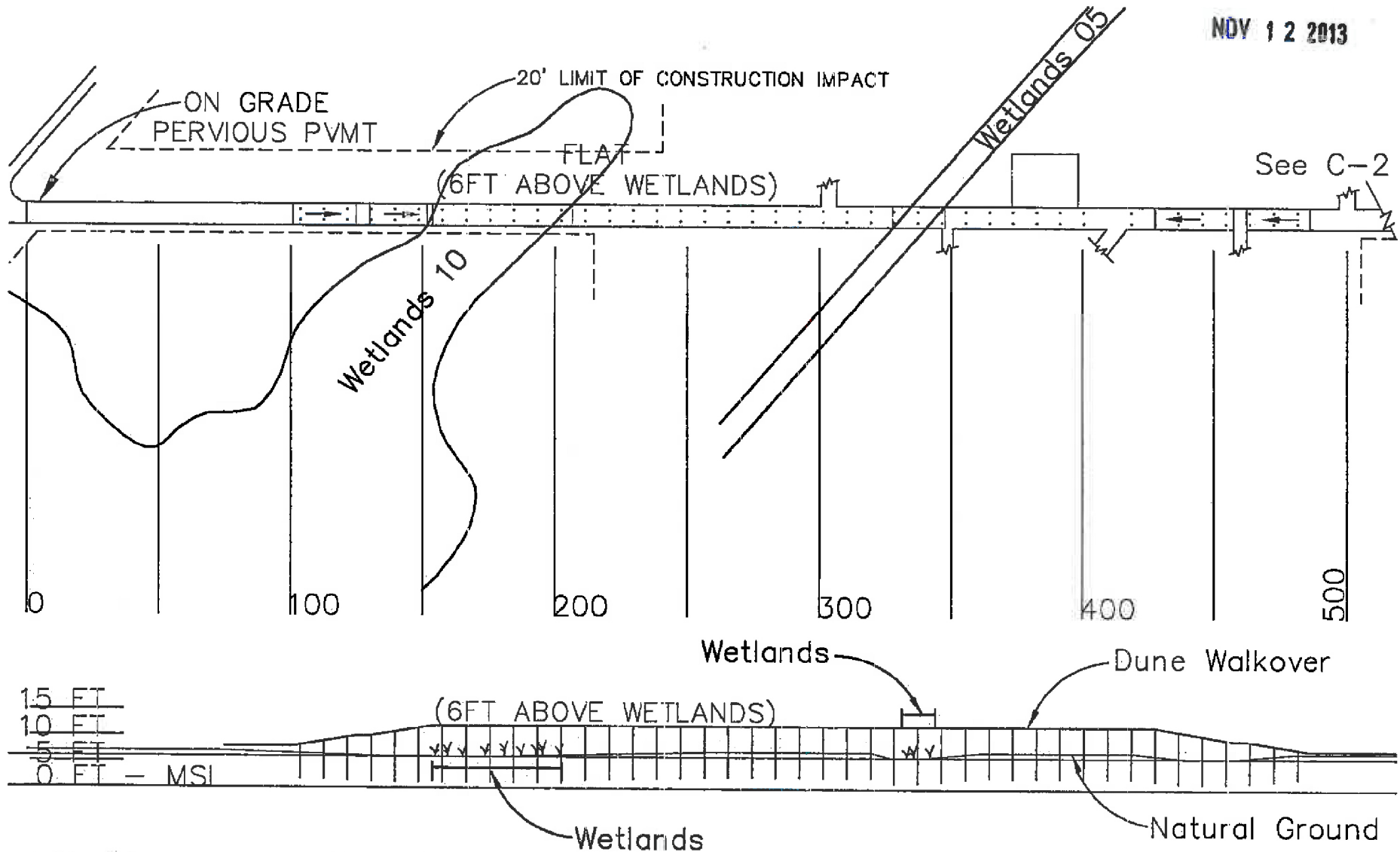
SWG-2012-00631 TPWD  
 Project Plans  
 11/26/13 Page 17 of 22

Horiz: 1" = 50'  
 VE = 2X

BOARDWALK WIDTH = 8 FT

PERMITTED PLANS

NOV 12 2013



# Walkover C-1

See Site Plan for Location

SWG-2012-00631 TPWD  
 Project Plans  
 11/26/13 Page 18 of 22

Horiz: 1" = 50'  
 VE = 2X

PERMITTED PLANS  
NOV 12 2013

END WALKOVER  
AT DUNE TOE

ON GRADE  
PERVIOUS PVMT

Wetlands 19

Wetlands 18

20' LIMIT OF CONSTRUCTION IMPACT

See C-1

600

700

800

900

1000

Wetlands

Dune Walkover

Walkover=15'

Beach

15 FT  
10 FT  
5 FT  
0 FT - MSI

Natural Ground

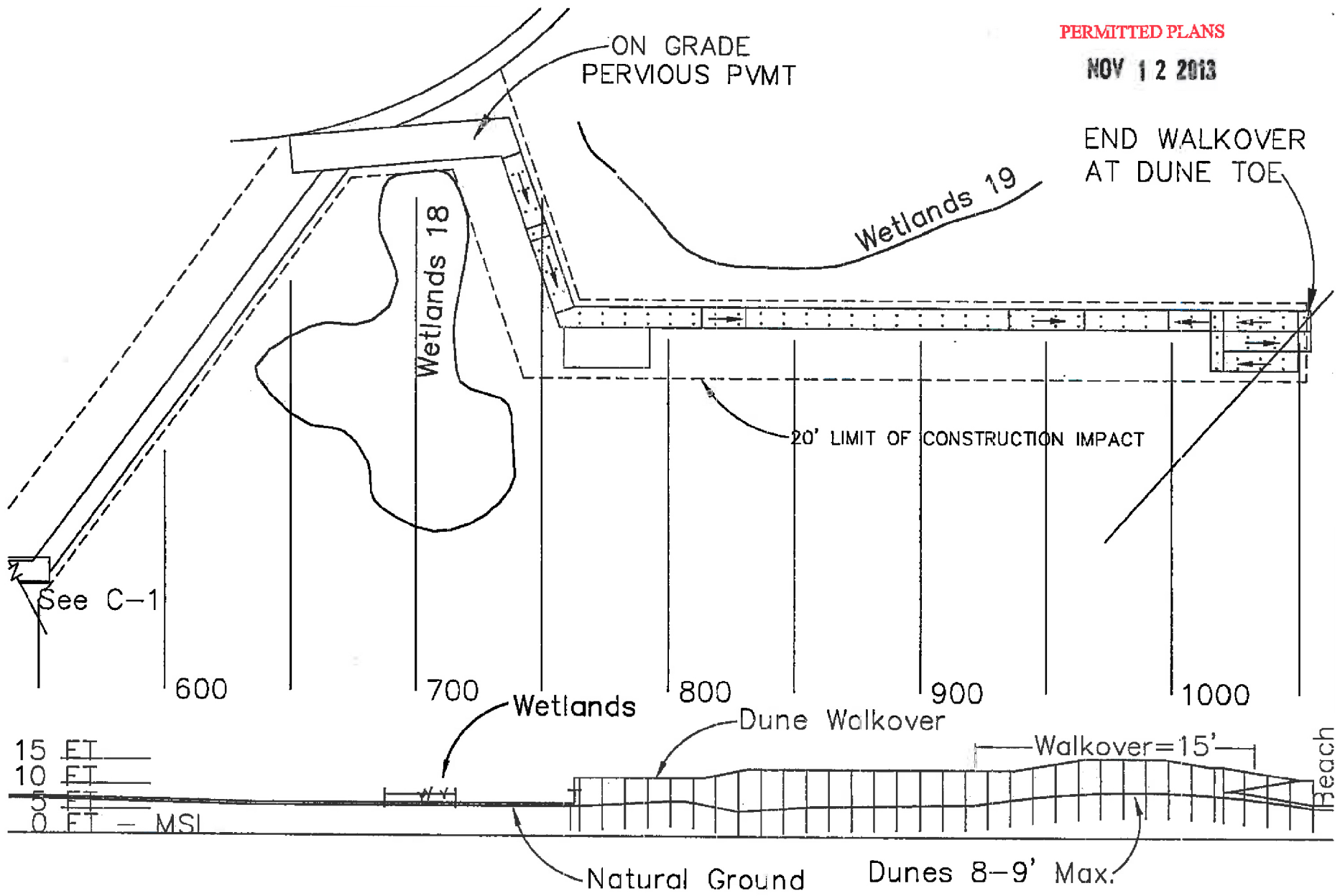
Dunes 8-9' Max.

# Walkover C-2

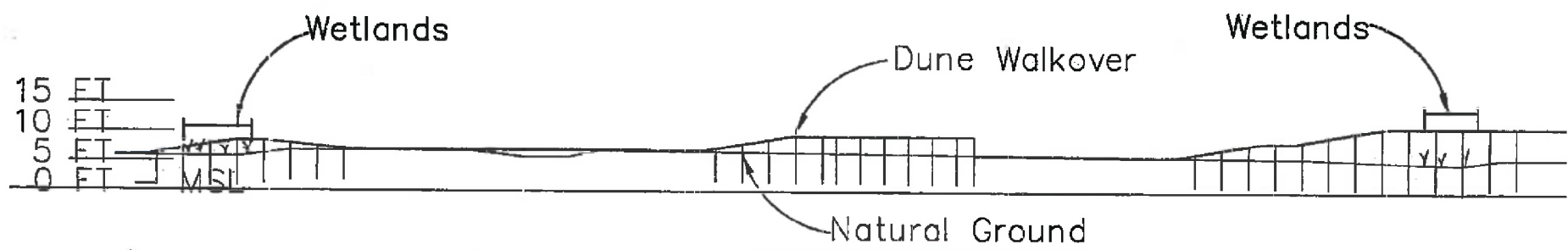
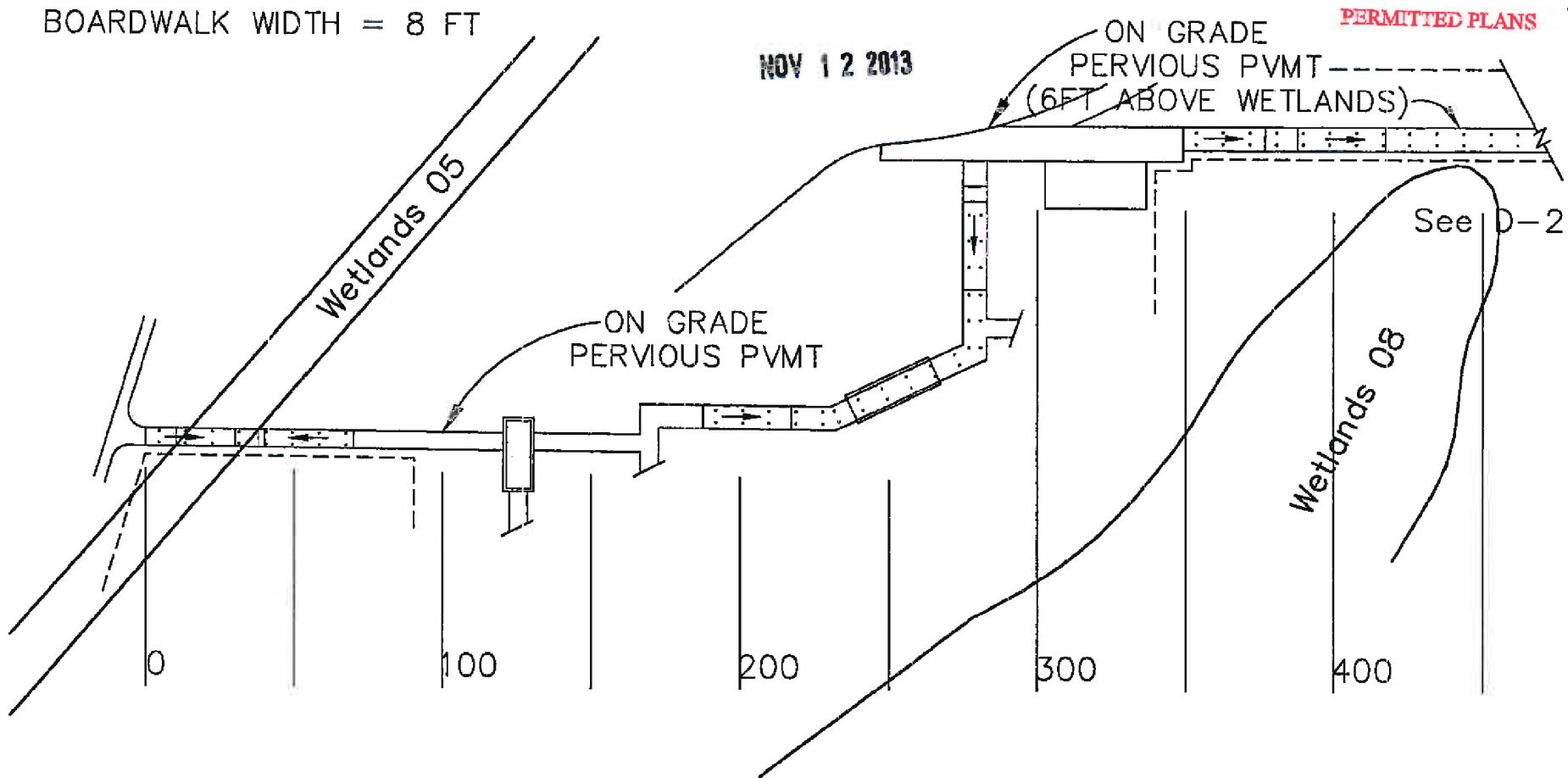
See Site Plan for Location

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Horiz: 1" = 50'  
VE = 2X



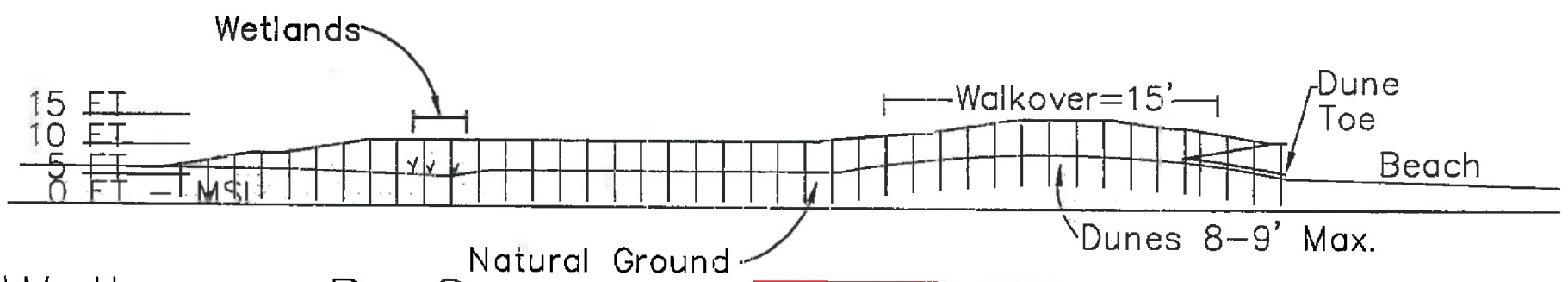
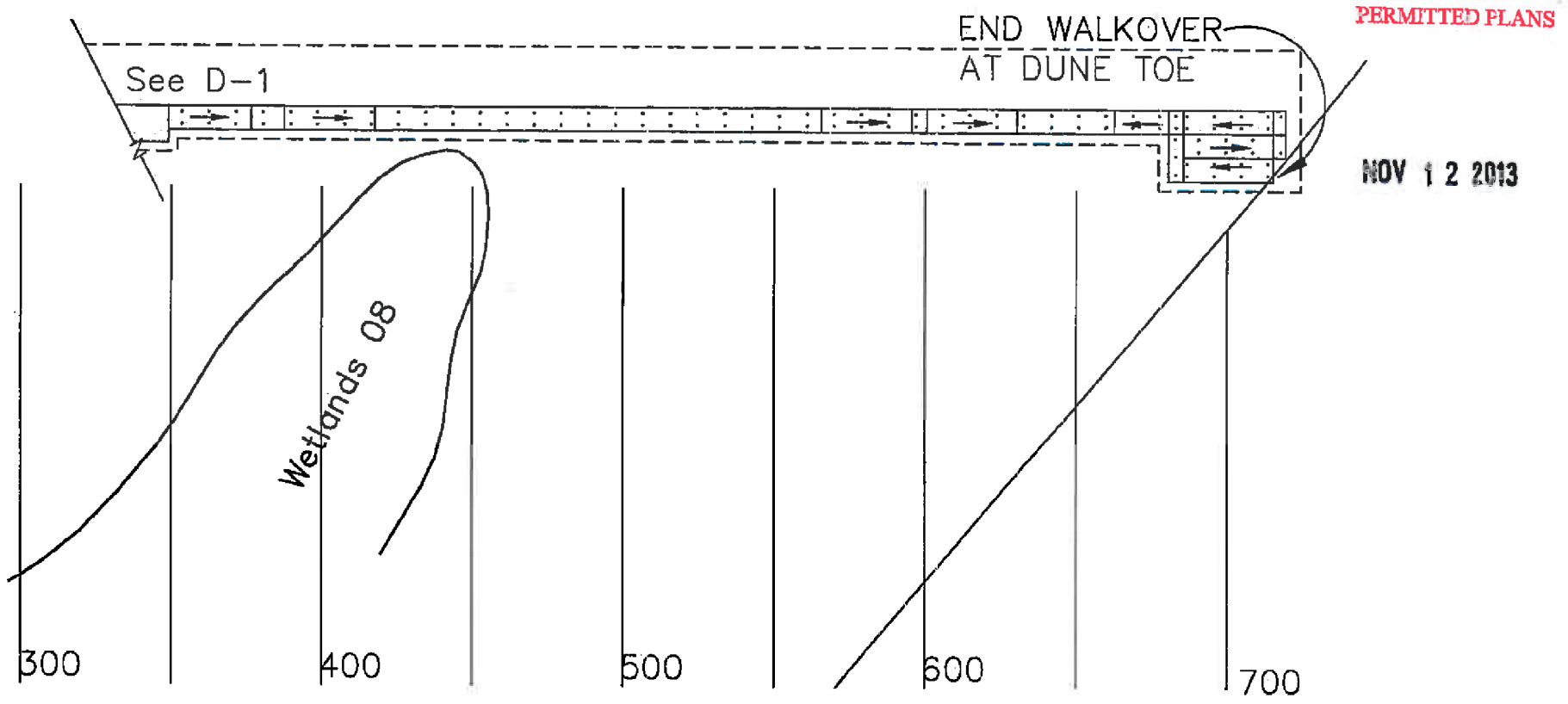




Walkover D-1  
See Site Plan for Location

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Project Plans  
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Horiz: 1" = 50'  
VE = 2X



# Walkover D-2

See Site Plan for Location

SWG-2012-00631 TPWD  
 Project Plans  
 11/26/13 Page 21 of 22

Horiz: 1" = 50'  
 VE = 2X

## **Compensatory Wetland Mitigation Plan**

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Galveston Island State Park Beach Redevelopment  
Galveston County, Texas

Prepared by:



and



October 2013

NOV 26 2013

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## Appendices

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Appendix A Figures

Figure 1: Vicinity Map

Figure 2: Proposed Mitigation Features

Appendix B Target Vegetation List

Appendix C Plans

## List of Preparers

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Andrew Sipocz	Document Preparation
Bonnie Doggett	Quality Assurance & Wetland Scientist
Andy Atlas, AICP	Quality Control
Sarah Itz	Wetland Scientist
Kaci Blaney	GIS Analyst

## Objectives

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The objective of this Mitigation Plan is to replace all wetland losses on site through creation and enhancement. All compensatory wetland mitigation will be constructed concurrent with the initial development. As seen in the tables in the following section, the mitigation plan includes approximately 9.98 acres of wetland creation, 2.90 acres of wetlands enhanced through the blocking of drainage ditches, and 10.00 acres of upland buffer prairie plantings which will be constructed and planted concurrent with Phase I project construction.

All compensatory mitigation will be the Interdunal Swale type. The created wetlands will be excavated to a variety of depths to produce a ponding level and duration representative of the range and mode of the interdunal swale wetlands being filled for the project (**Figure 2 in Appendix A**). They will be vegetated with the same species currently present in existing interdunal swale wetlands to be impacted. This will be accomplished by transplanting the top soil and its wetland seed bank from the affected wetlands into the created wetlands. Target vegetation is based on the same species found in interdunal swale wetlands and is listed in **Appendix B**. The enhanced wetlands consist of existing interdunal swale wetlands whose hydrology will be restored to natural conditions through the blocking of adjacent drainage ditches. The hydrological enhancement will increase the prevalence of facultative wet and obligate wetland species already present (see the list in **Appendix B**).

## Site Selection

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The mitigation site was selected to be on-site within the 191-acre project boundary (**Figure 1 in Appendix A**). Interdunal swale wetlands are important for maintaining the water and habitat quality of the adjacent Gulf and Bay waters. Interdunal swale wetlands are also the only natural freshwater source for wildlife on Galveston Island. It is impossible to replace or replicate this wetland function off-site. The mitigation area is also within the largest piece of conserved land on the Island and is specifically managed for native plant and wildlife communities.

The location of the compensatory wetlands will allow for the replication of the three parameters; soil, hydrology and vegetation, thus greatly increasing the chance of creating fully functioning replacement wetlands. The created mitigation wetlands will be excavated within the same soil type and will have the same water source as the wetlands being impacted by the project. The created wetlands will be at the same elevation as those being lost and will be same distance to the adjacent waters they ultimately drain into. This will allow the replication of natural hydrology simply by matching the excavated and existing depths of the created and natural wetlands respectively. In addition, the close proximity of the creation site to the wetlands being filled allows the transfer of topsoil and its intact seed bank to provide the created areas with a fully intact plant community. The intimate proximity of the created wetlands to unimpacted wetlands allows a free exchange of plant and wildlife species.

## Site Protection Instrument

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The compensatory mitigation site is wholly located on a 191-acre project site within Galveston Island State Park and is protected from sale by rules governing the sale of park land purchased with federal funding. While parks have been transferred to other entities in the past, a land protection instrument is part of the exchange.

TPWD's Land Transaction, Conservation and Facility Closure and Transfer Policy (LF-03-01) states that any state park land transferred to a local government entity must be permanently dedicated for public park and recreation purposes and shall revert to TPWD if the governmental entity fails to use the property for these purposes.

TPWD's legal authority for various land transaction is found in the Parks and Wildlife Code Section SS13.008 – Solicitation, Receipt, and Transfer of Land and states that properties to be exchanged shall continue to be dedicated park properties and used for park purposes.

Any future park planning documents, facility development plans and resource management plans will show the mitigation site and will specify that no activities will be allowed that would harm the site.



## Baseline Information

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### Description of Project Sites

The 191-acre project site consists of the Beach Unit at Galveston Island State Park; demarcated by the Gulf of Mexico beach above mean high water, FM 3005, 13-Mile Road and the City of Jamaica Beach. The landscape consists of secondary dunes, swales, and existing Park facilities. Freshwater wetlands and prairie occur on undeveloped lands. A wetland delineation was completed and field verified by the Galveston District of the Corps of Engineers on 11 October 2011. The project site contains 54 wetlands totally 24.95 acres in area. These are mostly interdunal swale wetlands along with a small amount of roadway ditch. Dominant and other native wetland plant species found in the delineated wetlands are listed in **Appendix B**. The wetlands varied greatly in depth with the largest and deepest wetlands occurring immediately behind the active dune field and nearest the beach. Several topographic surveys of the entire beach side were conducted in July 2012 and related to local benchmarks. These surveys were used to determine the elevations of the jurisdictional wetlands relative to surrounding uplands, including areas proposed for wetland creation. The topographic surveys confirmed that the beach side is made of a series of ridges and swales; dunes and inter dune areas created as the beach accreted seaward during Galveston Island's formation (Garner, 1997) and that jurisdictional wetlands are found only in the deeper swales. The seasonal high water table under the beach side, as indicated by the upper elevation of soil iron oxide deposits observed in soil pits, generally conforms to the land's surface elevation; it is higher where the land is higher in the center of the beach side and dips down towards the beach. It is close to or above the surface in the swales and a few feet below the ridges. Wetland hydrology results from groundwater movement and surface runoff from the adjacent dune ridges which are currently 1 foot to 3 feet higher than the swales. The water table is perched on either a permanent saltwater table or Galveston Island's Pleistocene clay base dependent upon how close it is to the beach. These findings agree with what was found in a long term piezometer study conducted on Galveston Island four miles west of GISP by Lambert (1998).

Several large swales investigated during the approved wetland delineation failed to meet the hydrology or hydric soil criteria of the Atlantic and Gulf Coastal Plain Regional Supplement to the 1987 Wetland Delineation Manual due to an insufficiently high water table. The topographic survey and soil pits confirmed that these swales were slightly elevated relative to adjacent wetlands and that their seasonal high water table lay within 7 inches to 12 inches of the surface for long periods.

### Description of Created Wetlands

A total of 9.98 acres of interdunal swale wetlands will be created by lowering the surface of selected upland areas below the seasonal high water table. This work will occur in several large upland swales currently of insufficient depth to support wetland hydrology or soils. In two cases existing facilities that will no longer be used will be demolished and removed to make way for wetland excavation. Wetland hydrology will be established by excavations of 8 inches to 14 inches below the natural ground surface to expose the water table during the winter and spring. Existing nearby ditches will be plugged throughout the mitigation site and an earthen berm will be built adjacent to one of the created wetlands to halt surface and groundwater outflows resulting from past drainage attempts and road construction (**Figure 2 in Appendix A**).

Wetland vegetation will be established by salvaging the first 4 inches of top soil and the accompanying seed bank from impacted wetlands and swales will be saved and transferred to the created wetlands. The list of target wetland species to be established within the created wetlands is the same as the vegetation community that now occurs within the impact sites. This list is provided in **Appendix B**. The wetland creation sites occur on lands within the project site. The mitigation area boundaries are shown in the mitigation plan.

### Description of Enhanced Wetlands

Seven sections of roadside ditches will be plugged to enhance 2.90 acres of existing wetlands on the beach side and allow for natural recruitment. The ditches are associated with the current camping loop access road and will no longer be needed (**Figure 2 in Appendix A**). The ditches either intercept or are within 100 feet of these wetlands and reduce their depth and hydroperiod by artificially drawing off surface water and drawing down the water table. Agricultural guidelines for drainage systems in southeastern U.S. sandy soils (Ford, 1968) were used to determine the 100-foot wide zone of impact. The blocking of the ditches will increase the hydroperiod of the enhanced wetlands and will allow for the natural recruitment of facultative wet and obligate vegetation within them. A list of target vegetation is included as **Appendix B**.

### Description of Upland Buffers

The uplands at GISP, especially those on the beach side, had been severely overgrazed by the prior land owner and this habitat is now dominated by early successional species such as western ragweed (*Ambrosia psilostachya*), bushy goldentop (*Euthamia leptoccephala*), dewberry (*Rubus* sp.), rosette grass (*Dicanthelium acuminatum*), and witch grass (*Panicum* sp.) with little or none of the tall grasses needed as cover by nesting mottled ducks (*Anas fulvigula*) or migratory grassland birds and other wildlife. Native strand prairie will be restored within 10.00 acres of intervening upland ridge habitat adjacent to the created and restored wetlands by planting tall, perennial bunch grasses grown within an on-site nursery from seed collected on nearby Follets Island or from within the Park (**Figure 2 in Appendix A**).

## Determination of Credits for Permittee-Responsible Mitigation

Credits were determined on a simple ratio basis. The goal was to meet a 4 to 1 wetland mitigation to loss ratio. This was met and nearly a 5 to 1 ratio was achieved when including existing but enhanced wetlands.

Table 1. Summary of Wetland Mitigation

Wetland Type	Permanently Impacted (acres)	Mitigated (acres)	
		Created	Enhanced
Freshwater Emergent Marsh (Interdunal Swale)	2.67*	9.98	2.90
Total	2.67	12.88	

\* Permanently impacted due to construction of facilities. An additional 0.20 acres will be permanently impacted due to wetland mitigation (plugging the ditches for enhancement).

Table 2. Wetland Impacts\*

Wetland ID	Approx. Size (acres)	Permanent Wetland Impacts (acres)	Secondary Wetland Impacts (acres)	Impacts from Mitigation (acres)*
1	1.15	-	-	-
2	0.21	0.08	-	0.04
3	0.02	-	-	-
4	0.30	0.06	-	-
5	1.30	0.69	0.14	-
6	0.14	0.11	0.02	-
7	0.20	0.20	-	-
8	0.84	-	0.01	-
9	0.25	-	-	-
10	1.63	0.34	0.04	-
11	0.33	0.32	0.01	-
12	0.13	-	-	-
13	0.01	0.01	0.01	-
14	2.49	0.33	-	-
15	0.07	0.07	-	-
16	0.05	0.05	-	-
17	0.05	0.01	-	-
18	0.16	-	-	-
19	0.65	0.04	-	-
20	0.30	0.30	-	-
21	0.37	-	-	-
22	0.35	-	-	-
23	0.19	0.02	-	-
24	0.22	-	-	-
25	1.77	-	0.14	-

Table 2. Wetland Impacts\*

Wetland ID	Approx. Size (acres)	Permanent Wetland Impacts (acres)	Secondary Wetland Impacts (acres)	Impacts from Mitigation (acres)*
26	0.05	-	-	-
27	0.11	-	-	-
28	0.01	-	-	-
29	0.23	-	-	0.07
30	0.04	-	-	-
31	0.09	-	-	0.02
32	0.09	-	-	-
33	0.14	-	-	-
34	0.25	-	-	-
35	0.61	0.04	0.04	-
36	0.33	-	-	-
37	0.04	-	-	-
38	0.11	-	-	-
39	0.05	-	-	-
40	0.26	-	-	-
41	0.21	-	-	-
42	0.05	-	-	-
43	0.08	-	-	-
44	0.15	-	-	-
45	5.31	-	-	-
46	0.19	-	-	-
47	0.11	-	-	-
48	0.27	-	-	0.08
49	0.69	-	-	-
50	< 0.01	-	-	-
51	0.05	-	-	-
52	0.16	-	-	-
53	2.07	-	-	-
54	0.02	-	-	-
<b>Total</b>	<b>24.94</b>	<b>2.67</b>	<b>0.41</b>	<b>0.20</b>

\* This information can be viewed in Figure 2.

Table 3. Mitigation Features\*

Mitigation ID	Approx. Size (acres)	Type
B1	0.19	Berm
C1	0.58	Created Wetland
C2	0.66	Created Wetland
C3	0.84	Created Wetland
C4	0.85	Created Wetland
C5	4.53	Created Wetland
C6	0.85	Created Wetland
C7	1.67	Created Wetland
D1	0.04	Ditch Fill
D2	0.04	Ditch Fill
D3	0.03	Ditch Fill
D4	0.02	Ditch Fill
D5	0.02	Ditch Fill
D6	0.04	Ditch Fill
D7	0.03	Ditch Fill
04	0.25	Enhanced Wetland
10	1.23	Enhanced Wetland
17	0.04	Enhanced Wetland
23	0.17	Enhanced Wetland
24	0.22	Enhanced Wetland
46	0.19	Enhanced Wetland
47	0.11	Enhanced Wetland
49	0.69	Enhanced Wetland
Totals	0.19 acres of Berms	
	9.98 acres of Created Wetlands	
	0.20 acres of Ditch Fill	
	2.90 acres of Enhanced Wetlands	

Establishment

Rehabilitation

\* This information can be viewed in Figure 2.

## Mitigation Work Plan

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### Timing

The compensatory mitigation plan will be enacted concurrent with project construction. Wetland creation and enhancement will be completed within two years of the beginning of work within wetlands. Upland prairie buffer plantings will begin as soon as the permit is approved and will be completed within two years of the beginning of work within wetlands. Wetland monitoring will begin as soon as the created wetlands are excavated and top soil is replaced. The section discussing Success Criteria has additional timing requirements for the project.

### Wetland Creation

All earth moving for the mitigation plan will be concurrent with construction of the new roadways and RV parking pads (Wetland construction plans are in **Appendix C**). The water tank and parking lot will be demolished and removed.

Wetland creation sites will first have their boundaries outlined by a bulldozer following a set of wooden lathe stakes. The first 4 inches of top soil will then be stripped from the interior of mitigation sites where natural soils are present and stored nearby. The remaining excavation will then occur and the saved topsoil replaced. Topsoil salvaged from filled wetlands will also be laid down in a 4-inch thick layer at sites where natural topsoils weren't present (i.e., the locations where the water tank and parking lot were removed). Each site is located such that an existing roadway is adjacent and can be accessed by the construction equipment and dump trucks needed for the work. Excavated material will either be used on site to construct new dunes (**Figure 2 in Appendix A**), or will be hauled to a designated upland disposal location. This will likely be the Park's amphitheater site located across FM 3005, along 13-mile Road. The new dunes would be located on top of the now demolished, old camping loops. These locations were either pavement or filled bermudagrass lawns prior to Hurricane Ike. The new wetlands would be built with 3:1 side slopes in anticipation that the loose sand will blow and slump after construction. The swale bottoms will be constructed flat as their narrow width makes excavation of a diverse bottom elevation impractical and unnecessary. The long, sinuous nature of the swales will provide much edge habitat.

### Wetland Enhancement

Concurrent with the construction of the created wetlands, some of the excavated soils will be used to fill ditches to enhance the hydrology of existing wetlands. There are 2.90 acres of existing wetlands that are currently being partially drained by these ditches. The ditch plugs will be covered with salvaged top soil and sprigged with upland prairie vegetation in the same manner as the upland prairie buffers.

### Wetland Vegetation Establishment

The first 4 inches of top soil from all of the swale excavation areas plus the wetland impact areas will be salvaged and later placed over the created wetlands. The seed bank within the soils will be used to establish wetland vegetation within the created wetlands. A list of target vegetation is found in **Appendix B**.

- The enhancement wetlands are already fully vegetated; however their plant communities will shift towards wetter species as the ditches are plugged and hydrology is increased. The list of target vegetation for the enhancement wetlands is found in **Appendix B**.

### Upland Prairie Buffer Vegetation Restoration

The upland prairie matrix within the beachside area has been degraded by past cattle grazing and is missing most of its perennial tall grass component. Native Strand Prairie grasses will be planted on the existing dune ridges that lie between the swales containing the existing and proposed mitigation wetlands as soon as the permit is approved. Strand Prairie is made up of a subset of Tall-Grass Prairie species tolerant of somewhat salty soil resulting from salt spray and hurricane storm surge. Sprigs of these grasses will be grown in gallon pots in an on-site nursery from seed collected from either GISP or nearby Follets Island. They will be transplanted into 10.00 acres of upland surrounding the mitigation wetlands, the berm built around created *Wetland C7*, and any lands where existing facilities are demolished at a rate of 784 sprigs per acre. They will be installed in multi-species clumps of four sprigs on a 15-foot spaced grid. The species to be used include:

- Little Bluestem (*Schizachyrium scoparium* var. *scoparium*)
- Gulf Muhly (*Muhlenbergia capillaris*)
- Gulf Dunes Paspalum (*Paspalum monostachyum*)
- Brown Seed Paspalum (*Paspalum plicatulum*)

## Maintenance Plan

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Most site maintenance will involve the removal of unwanted invasive species that may take advantage of temporarily bare soils to establish on. These will be controlled by spot treatment with herbicides. Annual vegetation monitoring of the mitigation site will be used to identify the occurrence of invasive species beginning once the wetlands have been excavated. Prescribed fire will first be applied to the site within three (3) years after mitigation construction has been completed. This will further control invasive species and encourage native ones. There will be no watering of the wetland mitigation sites. They will be wholly dependent upon rainfall.



## Performance Standards

### Created and Enhanced Wetland Vegetation Performance Standards

The wetland vegetation goal is to establish a hydrophytic dominated by FACW or wetter plant community within created and enhanced wetlands made up of species currently found in the existing beachside wetlands. A list of target vegetation is found in **Appendix B**. A five year monitoring period is specified. It begins immediately after mitigation construction is complete.

#### Wetland Vegetation Success Criteria

1. Establishment of 30% aerial coverage of target vegetation by end of 1<sup>st</sup> year following completion of mitigation construction.
2. Establishment of 50% aerial coverage of target vegetation by end of 2<sup>nd</sup> year following completion of mitigation construction.
3. Establishment of 70% aerial coverage of target vegetation by end of 3<sup>rd</sup> year following completion of mitigation construction.
4. Establishment of 70% aerial coverage of target vegetation by end of 5<sup>th</sup> year following the completion of mitigation. The additional two years (years 4 and 5) will provide time for site corrections and to assure the vegetation is sustainable once established. Any change to the mitigation plan will be coordinated with the CE for approval. If mitigation is determined to be unsuccessful by the CE at end of the monitoring period, TPWD will be required to take necessary corrective measures, as approved by the CE to ensure success.
5. Less than 5% aerial coverage of non-native invasive species in the mitigation area. These include guinea grass, (*Urochloa maxima*), Vasey Grass (*Paspalum urvillei*) deep-rooted sedge (*Carex entriarianus*), Chinese tallow (*Triadica sebiferum*), castor bean (*Ricinus communis*), Japanese honeysuckle (*Lonicera japonica*), salt cedar (*Tamarix* sp.) and cabbage palm (*Sabal palmetto*).

### Upland Prairie Buffer Vegetation Performance Standards

The upland prairie buffer vegetation goal is to establish the four main species of tall grass prairie species [little bluestem (*Schizachyrium scoparium*), gulf muhly (*Muhlenbergia capillaris*), dunes paspalum (*Paspalum monostachyum*), and brownseed paspalum (*Paspalum plicatulum*)] within 10.00 acres of the mitigation site and to exclude invasive, non-native species. A five year monitoring period is specified and it begins immediately after the initial planting of grass sprigs begins. Sprigs will be planted as single species clumps of four plants on 15' centers for a total of 784 sprigs per acre. The locations of the 10.00 acres of proposed prairie plantings can be seen on **Figure 2 in Appendix A**.

#### Upland Prairie Buffer Vegetation Performance Standards

1. Success criteria include an initial 50% survival of planted sprigs as measured 60 days after their planting, with 5% cover by the four target species (listed above) in year 1, 10% in year 2, 20% in year 3 and 30% in year 3, 4, and 5.
2. 30% or more aerial cover of the four target native grasses (listed above) within the upland prairie buffer within five years after the initial planting with an additional 60% cover by other native prairie plants.

3. 5% or less aerial coverage of non-native invasive species in the upland prairie buffer areas. These include guinea grass (*Urochloa maxima*), Vasey Grass (*Paspalum urvillei*), deep-rooted sedge (*Carex entriarianus*), Chinese tallow (*Triadica sebiferum*), castor bean (*Ricinus communis*), Japanese honeysuckle (*Lonicera japonica*), salt cedar (*Tamarix* sp.), and cabbage palm (*Sabal palmetto*).

## Monitoring Requirements

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The permittee must notify the U.S. Army Corps of Engineers (USACE) Galveston District, Chief, Compliance Section, Galveston Regulatory Branch, in writing, at the start of construction in jurisdictional areas and upon the completion of construction of mitigation. Annual monitoring reports will be sent to the compliance section of the USACE office in Galveston, Texas. Monitoring will begin one year after wetland mitigation construction has been completed and will continue for five (5) years. Annual reports will be due within three (3) months after the year's monitoring has been completed.

### Wetland Hydrology Monitoring

Wetland hydrology will be monitored on an annual basis for five years beginning with wetland construction to provide information on how the created and enhanced wetlands are functioning. The information will be helpful in diagnosing problems that may result in the failure of wetland vegetation establishment. Water level and precipitation graphs will accompany annual monitoring reports.

#### Monitoring Methods Used to Evaluate Wetland Hydrology:

1. The determination of each created or restored wetland's yearly maximum water depth through direct measurement using a yardstick during the time of year when it appears ponding is at its greatest depth.
2. The determination of the annual hydroperiod for two representative created wetlands through the use of continuously recording automated water level gages.
3. The documentation of rainfall as determined by an on-site gage or one of several continuous, real-time web-based stations located adjacent to and on either side of GISP or with an on-site rain gage situated at GISP headquarters.

### Wetland and Upland Prairie Vegetation Monitoring

#### Monitoring Methods Used to Evaluate Success of the Wetland and Upland Buffer Vegetation Success Criteria:

1. The determination of plant aerial cover within each created and enhanced wetland, and within the upland prairie buffers using 10 evenly spaced 1m<sup>2</sup> quadrats placed along a transect running the length of each mitigation unit (each created or enhanced wetland basin and each upland buffer area) on an annual basis. The data will be reported as cover by species, presence on the target list, and hydrophytic rating averaged over all of the quadrats.
2. The determination of initial percent survival of planted upland grass sprigs within the buffers by examining 25% of the planted grass clumps within 60 days of installation.
3. The determination of the presence of invasive non-native plant species within each wetland and buffer site using data from all of the above quadrats during each year of the monitoring period.

## Long Term Site Management

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The mitigation sites will be managed as a natural area with the long term goal of reestablishing its pre-European settlement flora and fauna in conjunction with the rest of GISP. There currently are two permanent vegetation monitoring sites located within the proposed mitigation area that can provide a snapshot of pre-project upland vegetation condition. The mitigation area will be managed using spot treatment with herbicides to remove non-native invasive species. A *Wildland Fire Management Plan* has been completed and enacted for GISP and prescribed fire is currently conducted within the beachside mitigation area approximately every 3 to 7 years to maintain the prairie. No facilities other than hiking trails will be located within the mitigation sites. Any wetland crossings will be accomplished with boardwalks built when the site is dry.

## Adaptive Management

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Frequent monitoring of the site will identify mitigation problems early on as well as the means of solving them through alteration of the plan.

Management of the site will begin with preconstruction meetings with the chosen contractors to assure that the needed materials are available and that installation methods are agreed upon. TPWD's regional natural resource coordinator will make frequent site visits and work with park staff to assure that the wetlands are constructed to the proper depth and configuration, and that salvaged top soils are being stored in such a manner as to assure seed bank viability. The natural resource coordinator will also supervise the seed collection and propagation of upland prairie plants.

Monitoring of the mitigation sites will occur each year for five years following the end of construction of the compensatory wetland mitigation. If one or more of the success criteria are not met within the five (5) year monitoring period, corrective action will be taken. This will entail either directly planting sites or altering their hydrology with further excavation to meet goals.

Park staff or a consulting team will be tasked with monitoring duties, including:

- Once a month downloading and maintenance of water level gages,
- Once a year peak water level determination in all mitigation wetlands,
- Yearly vegetation monitoring via 1m<sup>2</sup> quadrats, and
- Initial 60-day determination of % survival of planted sprigs.

All collected data will be sent to the regional natural resource coordinator to assure data quality and to identify potential problems with both monitoring methods and mitigation success. Quarterly meetings and site visits will occur during construction. After that, yearly site visits and meetings will be held between park staff and the regional resource coordinator to plot out needed course corrections. Yearly monitoring reports will be sent to the Galveston USACE compliance section. Any needed changes to the mitigation plan will be coordinated with and approved by the Galveston USACE compliance section prior to action.

## Financial Assurances

---

TPWD has secured the following funding to redevelop Galveston Island State Park following extensive damage from Hurricane Ike:

- Fund 1: \$1.2 million, for beachside restroom construction
- TXDOT Funds: \$5 million, for all beachside paving of parking, roads and camp spurs
- BP Grant Funds: \$10.7 million, for all other construction, including wetland mitigation grading

The wetland mitigation grading will be included in the overall beachside construction contract.

There is a well-established TPWD staff and volunteer program in place for native planting at Galveston Island State Park. Wetland mitigation plantings are directed by the TPWD regional resources specialist. Since January 2009, a few months after Hurricane Ike, work parties have planted acres of dune grasses, upland and wetland native plants on site, with the goal of restoring a healthy dune system. There are currently approximately 1,000 wetland plants growing at the GISP nursery in anticipation of the proposed beachside plantings. A new plant nursery was constructed adjacent to the new maintenance building to fulfill the planting needs.

## Bibliography

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- Garner, L.E. (1997). Geologic History, Depositional Environment, Processes, and Hydrology of Galveston Island, Texas. Final Report for Texas Parks and Wildlife Department. Bureau of Economic Geology, University of Texas at Austin, Austin, Texas. 24pp.
- Griffith, G. E., Bryce, S. A., Omernik, J. M., Comstock, J. A., Rogers, A. C., Harrison, B., et al. (2004). Ecoregions of Texas (color poster with map, descriptive text, and photographs). Reston, Virginia: U.S. Geological Survey.
- Lambert, C.C. (1998). Soils and Groundwater Monitoring of a Seasonal Wetland, West Beach, Galveston, Texas. Masters Thesis, Baylor University, Waco, Texas. 135pp.

PERMITTED PLANS

## APPENDIX A FIGURES

NOV 26 2013





Galveston Island State Park  
Beach Redevelopment

Applicant:  
Texas Parks and Wildlife Department

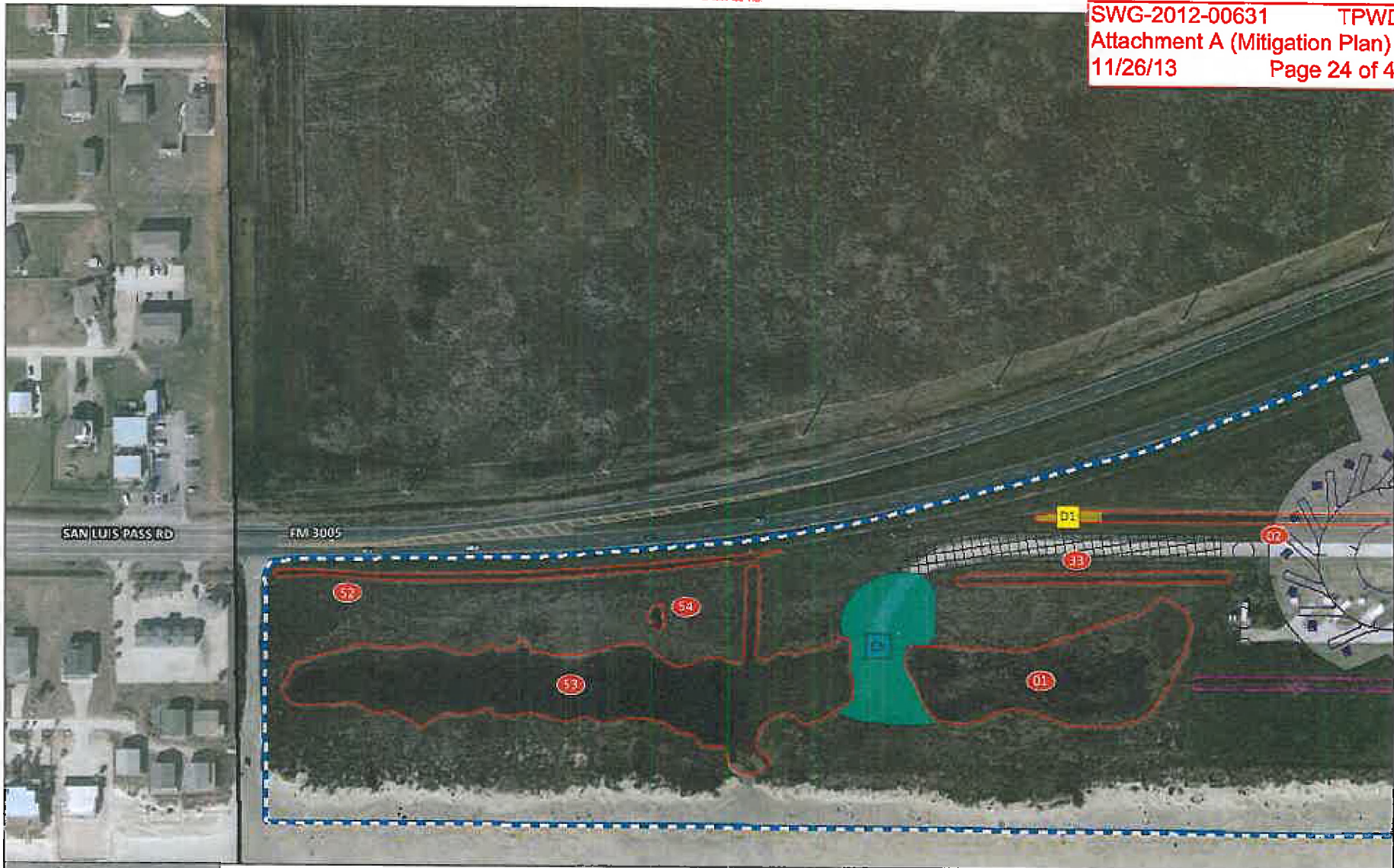
WETLAND MITIGATION PLAN  
Vicinity Map

**FIGURE 1**

NOV 26 2013

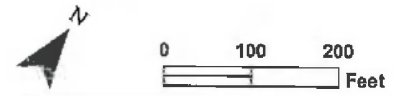
PERMITTED PLANS

SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
 11/26/13 Page 24 of 44



- |                             |                                     |                               |
|-----------------------------|-------------------------------------|-------------------------------|
| GISP Site Boundary          | <b>Proposed Mitigation Features</b> | Prairie Plantings (10.00 ac)  |
| Project/Mitigation Area     | Created (9.98 ac)                   | Facility Conversion (2.64 ac) |
| Existing Delineated Wetland | Enhanced (2.90 ac)                  | New Dunes (1.13 ac)           |
| Maximum Project Footprint   | Ditch Fill (0.20 ac)                |                               |
|                             | Berm (0.19 ac)                      |                               |

Source: Bing Maps Aerials (2011)  
 Applicant: Texas Parks and Wildlife Department



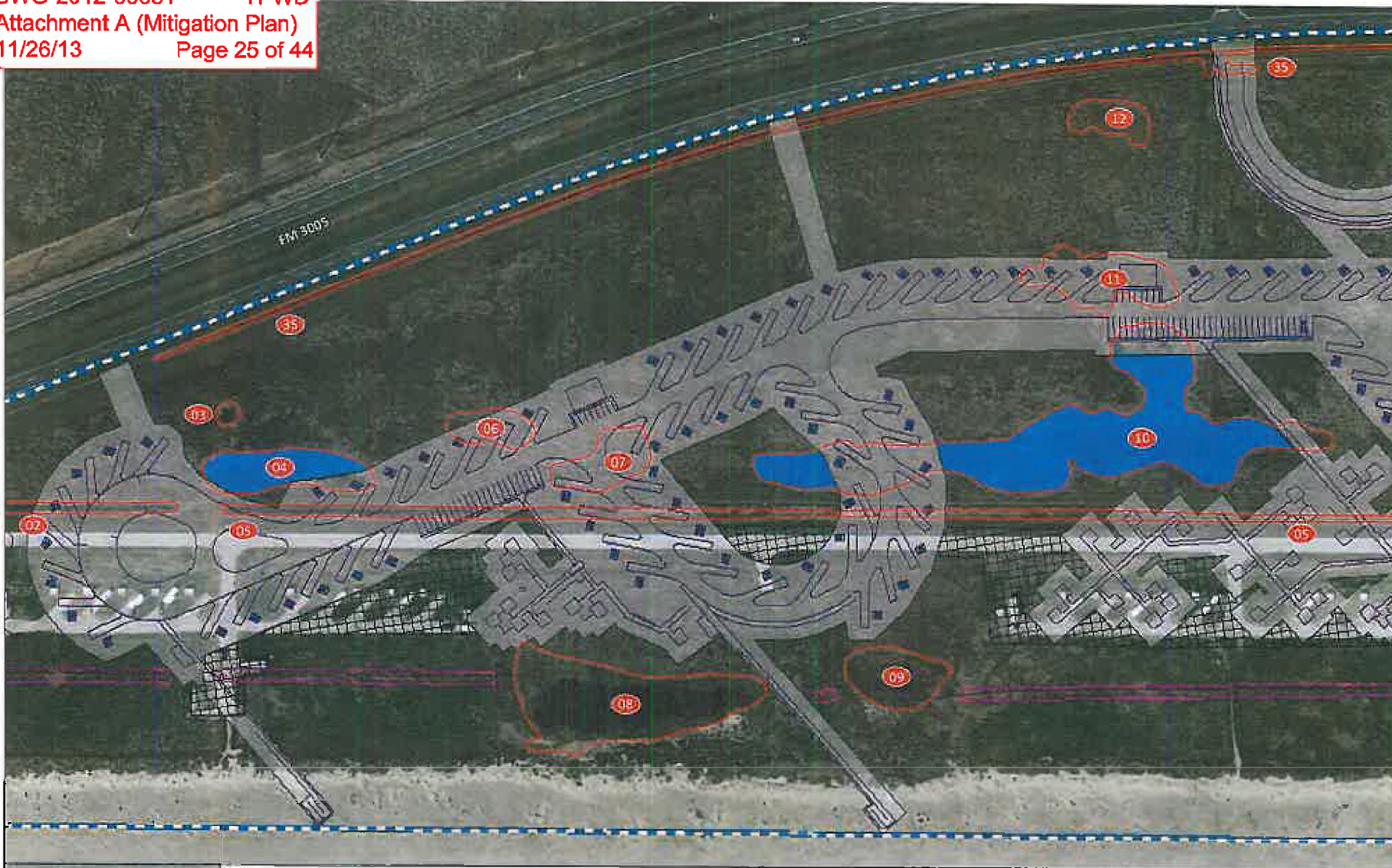
Galveston Island State Park  
 Beach Redevelopment

WETLAND MITIGATION PLAN  
 Proposed Mitigation Features

**FIGURE 2a**

NOV 26 2013

DWH-AR0239162



NOV 26 2013



- |                             |                                     |                               |
|-----------------------------|-------------------------------------|-------------------------------|
| GISP Site Boundary          | <b>Proposed Mitigation Features</b> | Prairie Plantings (10.00 ac)  |
| Project/Mitigation Area     | Created (9.98 ac)                   | Facility Conversion (2.64 ac) |
| Existing Delineated Wetland | Enhanced (2.90 ac)                  | New Dunes (1.13 ac)           |
| Maximum Project Footprint   | Ditch Fill (0.20 ac)                |                               |
|                             | Berm (0.19 ac)                      |                               |

Source: Bing Maps Aerials (2011)  
 Applicant: Texas Parks and Wildlife Department

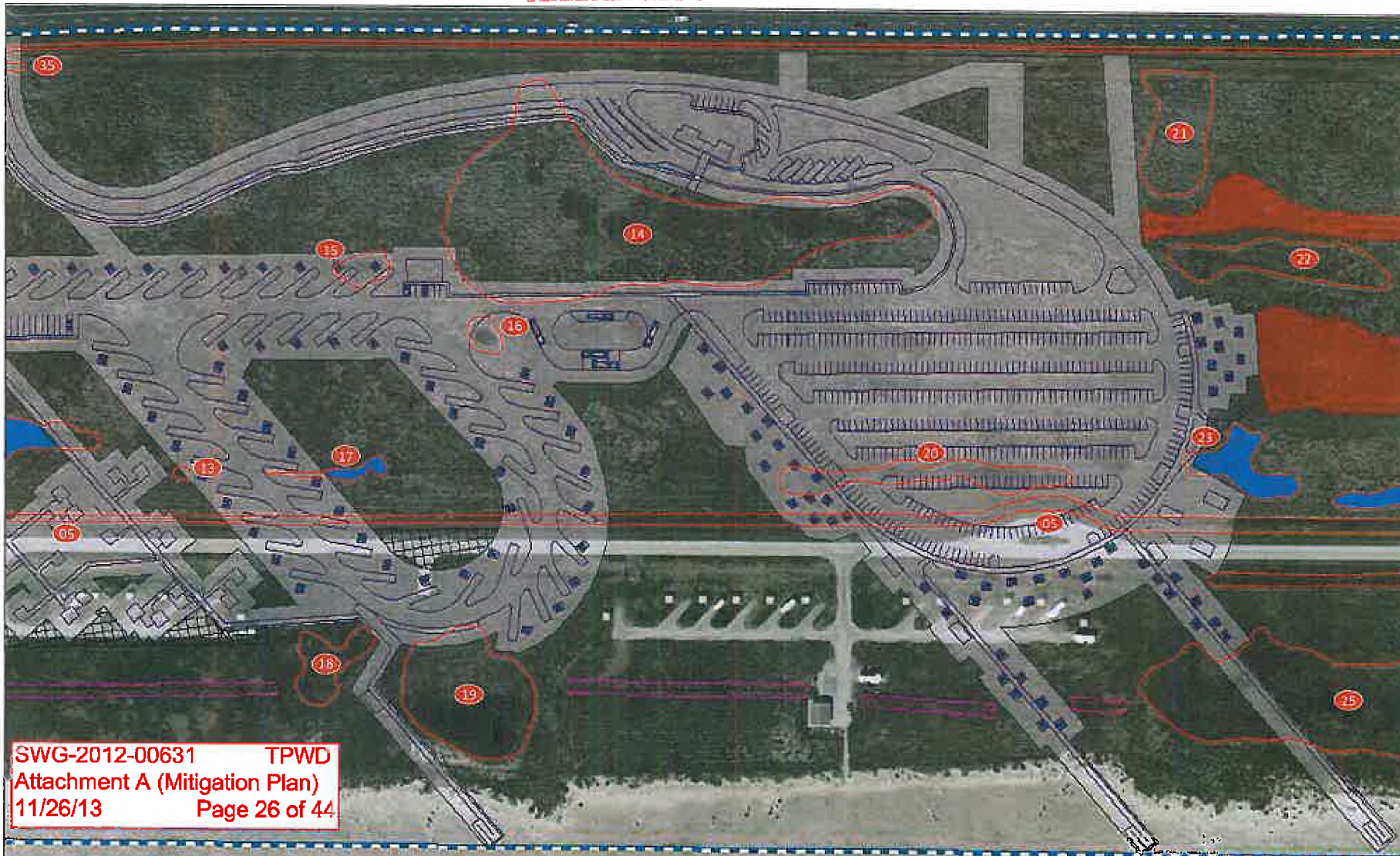


Galveston Island State Park  
 Beach Redevelopment

WETLAND MITIGATION PLAN  
 Proposed Mitigation Features

**FIGURE 2b**

PERMITTED PLANS



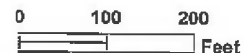
SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
 11/26/13 Page 26 of 44

NOV 25 9:04 AM



- |                             |                                     |                               |
|-----------------------------|-------------------------------------|-------------------------------|
| GISP Site Boundary          | <b>Proposed Mitigation Features</b> | Prairie Plantings (10.00 ac)  |
| Project/Mitigation Area     | Created (9.98 ac)                   | Facility Conversion (2.64 ac) |
| Existing Delineated Wetland | Enhanced (2.90 ac)                  | New Dunes (1.13 ac)           |
| Maximum Project Footprint   | Ditch Fill (0.20 ac)                |                               |
|                             | Berm (0.19 ac)                      |                               |

Source: Bing Maps Aerials (2011)  
 Applicant: Texas Parks and Wildlife Department

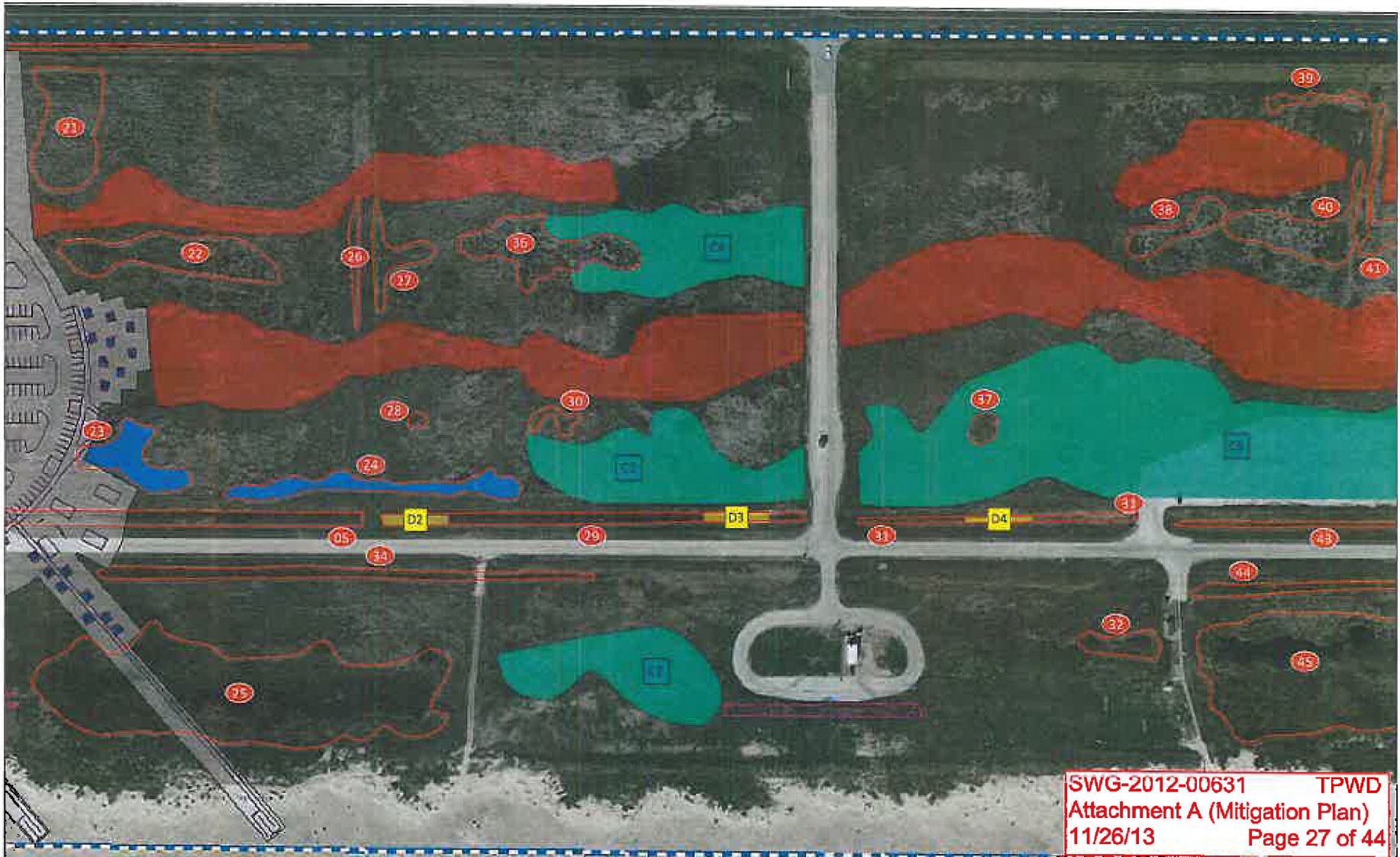


Galveston Island State Park  
 Beach Redevelopment

WETLAND MITIGATION PLAN  
 Proposed Mitigation Features

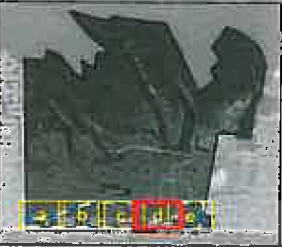
FIGURE 2c

PERMITTED PLANS



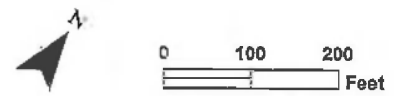
SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
 11/26/13 Page 27 of 44

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- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li> GISP Site Boundary</li> <li> Project/Mitigation Area</li> <li> Existing Delineated Wetland</li> <li> Maximum Project Footprint</li> </ul> | <p><b>Proposed Mitigation Features</b></p> <ul style="list-style-type: none"> <li> Created (9.98 ac)</li> <li> Enhanced (2.90 ac)</li> <li> Ditch Fill (0.20 ac)</li> <li> Berm (0.19 ac)</li> </ul> | <ul style="list-style-type: none"> <li> Prairie Plantings (10.00 ac)</li> <li> Facility Conversion (2.64 ac)</li> <li> New Dunes (1.13 ac)</li> </ul> |
|---|--|---|

Source: Bing Maps Aerials (2011)  
 Applicant: Texas Parks and Wildlife Department

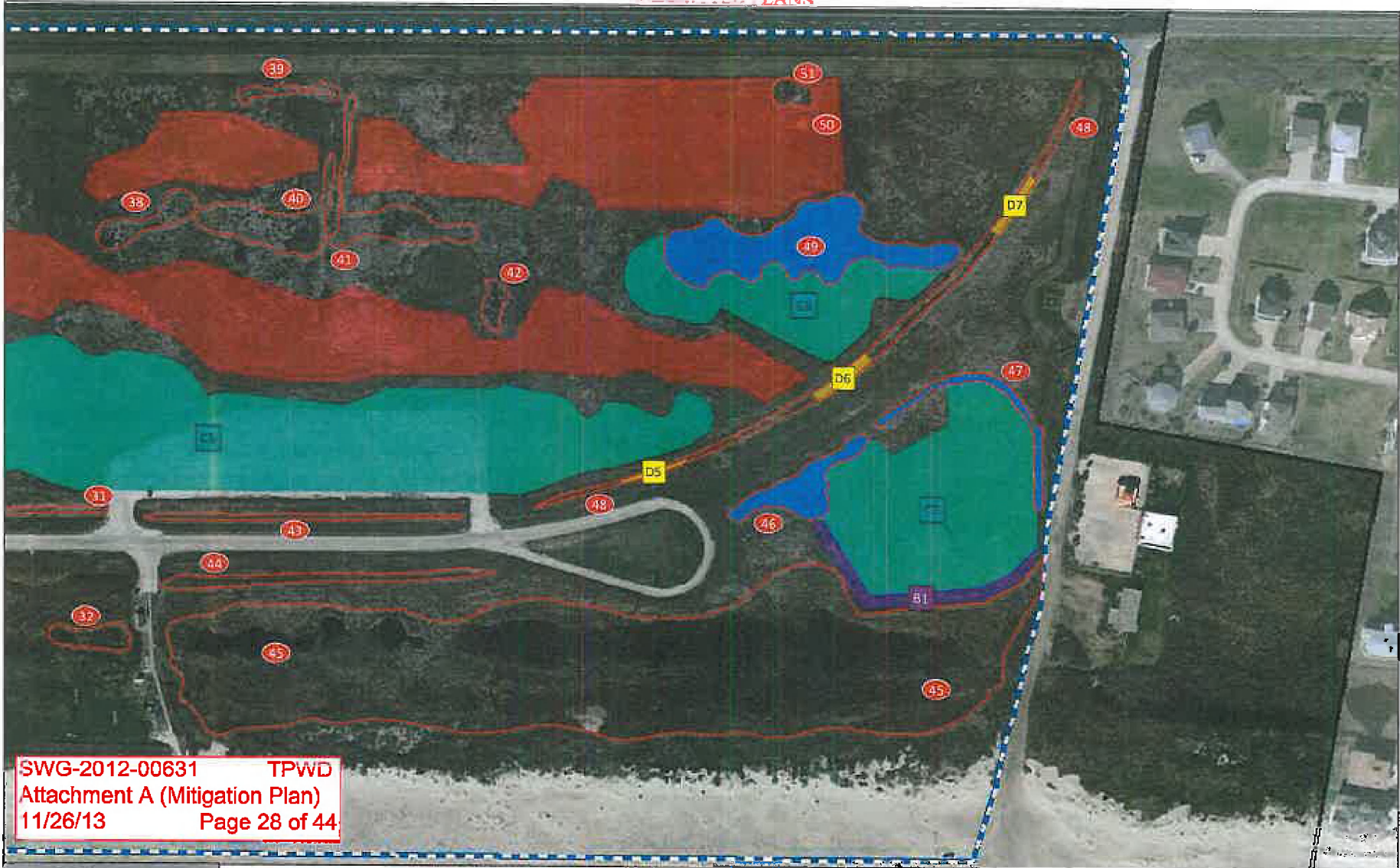


Galveston Island State Park  
 Beach Redevelopment

WETLAND MITIGATION PLAN  
 Proposed Mitigation Features

**FIGURE 2d**

PERMITTED PLANS



SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
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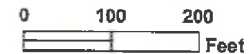
- GISP Site Boundary
- Project/Mitigation Area
- Existing Delineated Wetland
- Maximum Project Footprint

**Proposed Mitigation Features**

- Created (9.98 ac)
- Enhanced (2.90 ac)
- Ditch Fill (0.20 ac)
- Berm (0.19 ac)

- Prairie Plantings (10.00 ac)
- Facility Conversion (2.64 ac)
- New Dunes (1.13 ac)

Source: Bing Maps Aerials (2011)  
 Applicant: Texas Parks and Wildlife Department



Galveston Island State Park  
 Beach Redevelopment

WETLAND MITIGATION PLAN  
 Proposed Mitigation Features

**FIGURE 2e**

NOV 26 2013

DWH-AR0239166

**APPENDIX B  
TARGET VEGETATION LIST**

NOV 26 2013

## Target Plant List

The following plant species are considered to be desirable within the mitigation wetlands and their aerial cover will be used to determine their success.

### Dominant Native Plants in Existing Project Site Wetlands:

*Ambrosia psilostachya*  
*Bacopa monieri*  
*Dichanthelium acuminatum*  
*Dichanthelium scoparium*  
*Diodia virginiana*  
*Eleocharis montevidensis*  
*Eleocharis palustris*  
*Heterotheca subaxillaris*  
*Kosteletzkya virginica*  
*Phytolacca americana*  
*Pluchea odorata*  
*Polygonum hydropiperoides*  
*Polygonum punctatum*  
*Scirpus pungens*  
*Sesuvium maritimum*  
*Spartina patens*  
*Sporobolus virginicus*  
*Typha latifolia*  
*Typha domingensis*

### Other Native Plants in the Existing Project Site Wetlands:

*Andropogon glomeratus*  
*Batis maritima*  
*Borrchia frutescens*  
*Cyperus virens*  
*Eupatorium serotinum*  
*Fimbristylis castanea*  
*Hydrocotyle bonariensis*  
*Ipomoea sagittata*  
*Juncus marginatus*  
*Lemna minor*  
*Limnoscadium pinnatum*  
*Paspalidium geminatum*  
*Paspalum vaginatum*  
*Phyla lanceolata*  
*Pluchea foetida*  
*Sesbania drummondii*  
*Vigna luteola*

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PERMITTED PLANS

**APPENDIX C  
PLANS**

NOV 26 2013

SWG-2012-00631 TPWD  
Attachment A (Mitigation Plan)  
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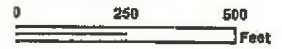


NOV 26 2013



- Planned Infrastructure
- Existing Delineated Wetland
- Proposed Mitigation Features

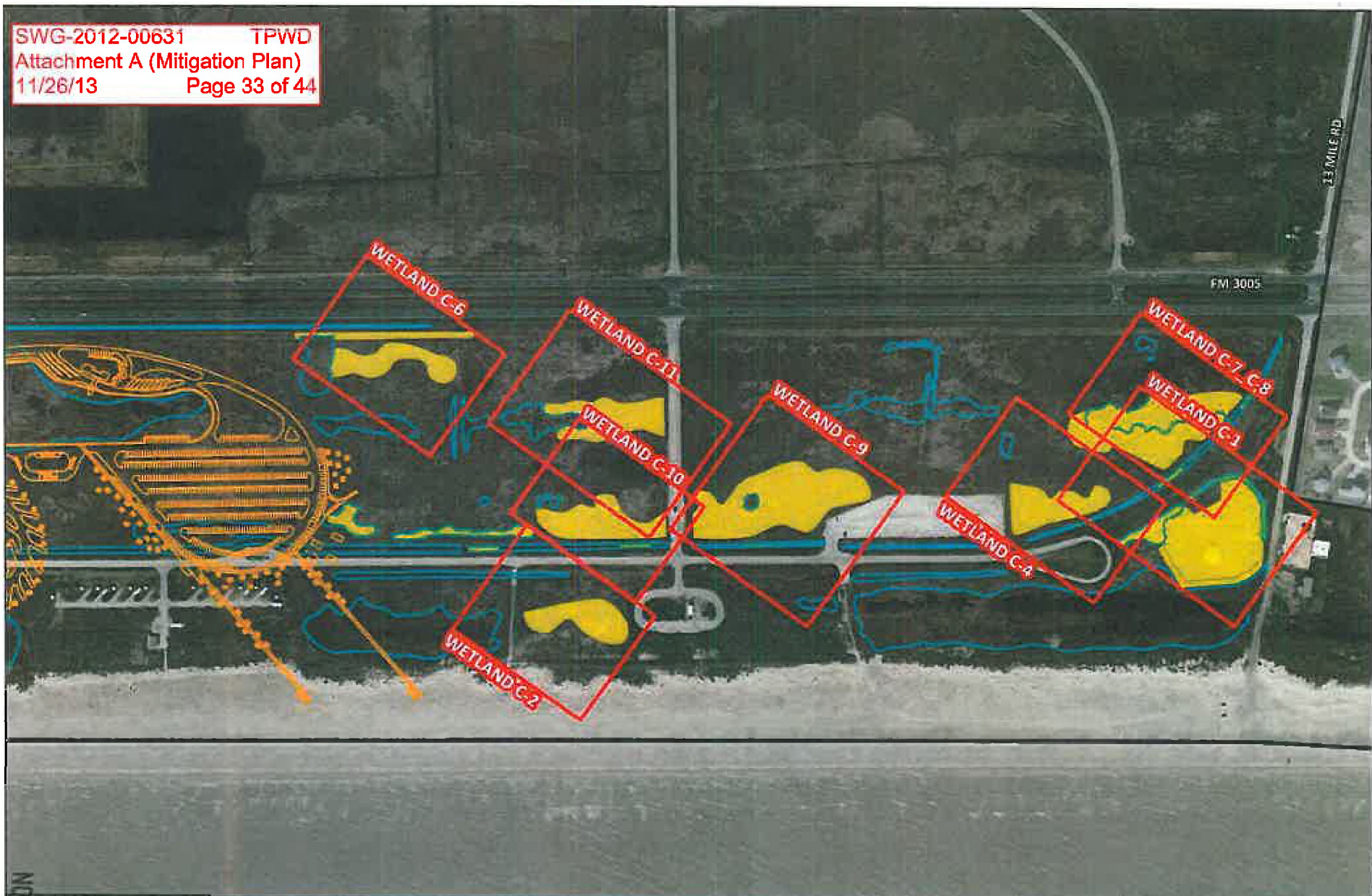
\* This key refers to the Plan & Profile sheets



**GISP BEACH  
REDEVELOPMENT  
MITIGATION WETLANDS**

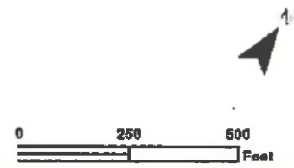
**PLAN KEY** page 1 of 2

DWH-AR0239170



- Planned Infrastructure
- Existing Delineated Wetland
- Proposed Mitigation Features

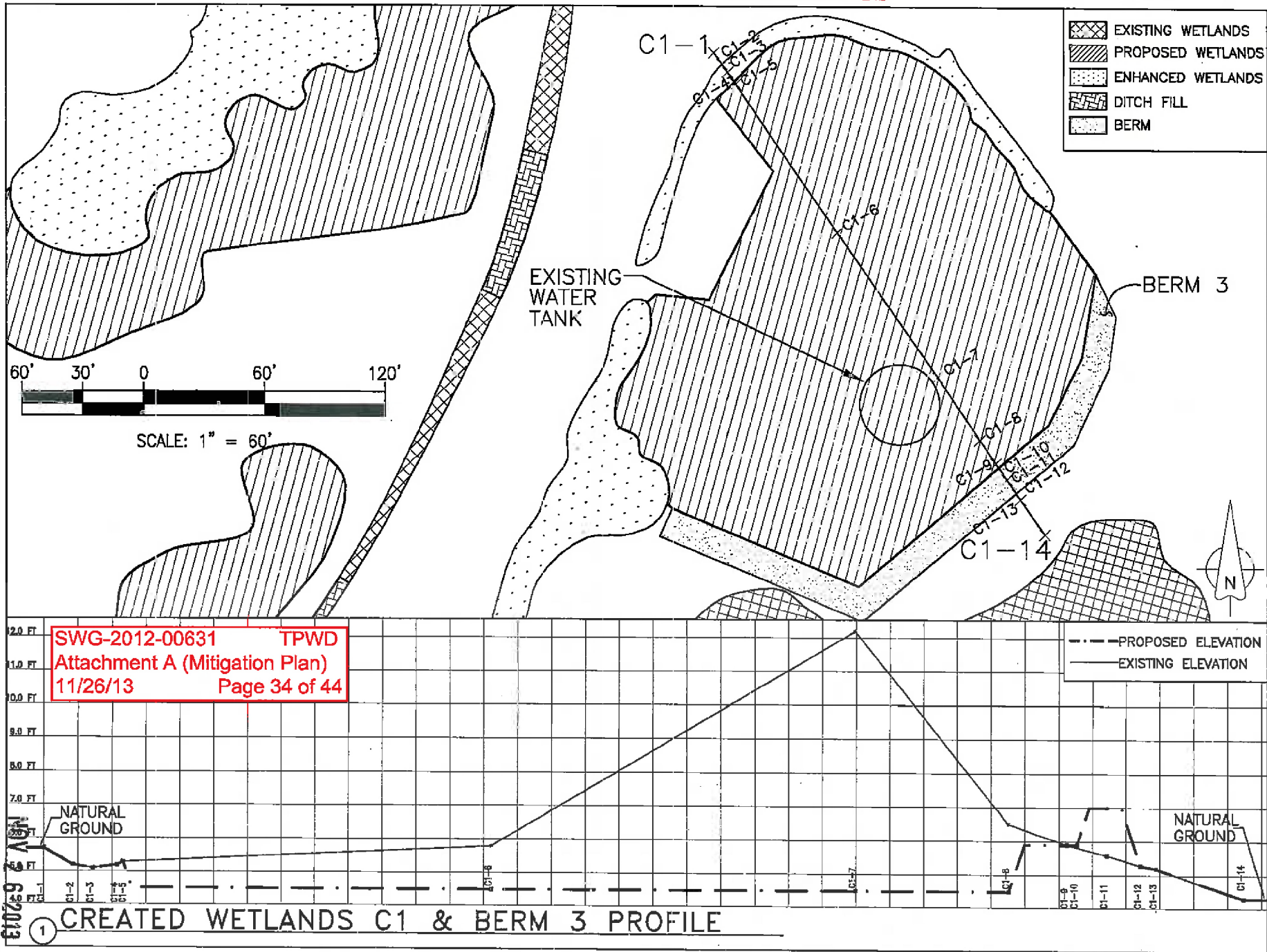
\* This key refers to the Plan & Profile sheets






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MITIGATION WETLANDS**

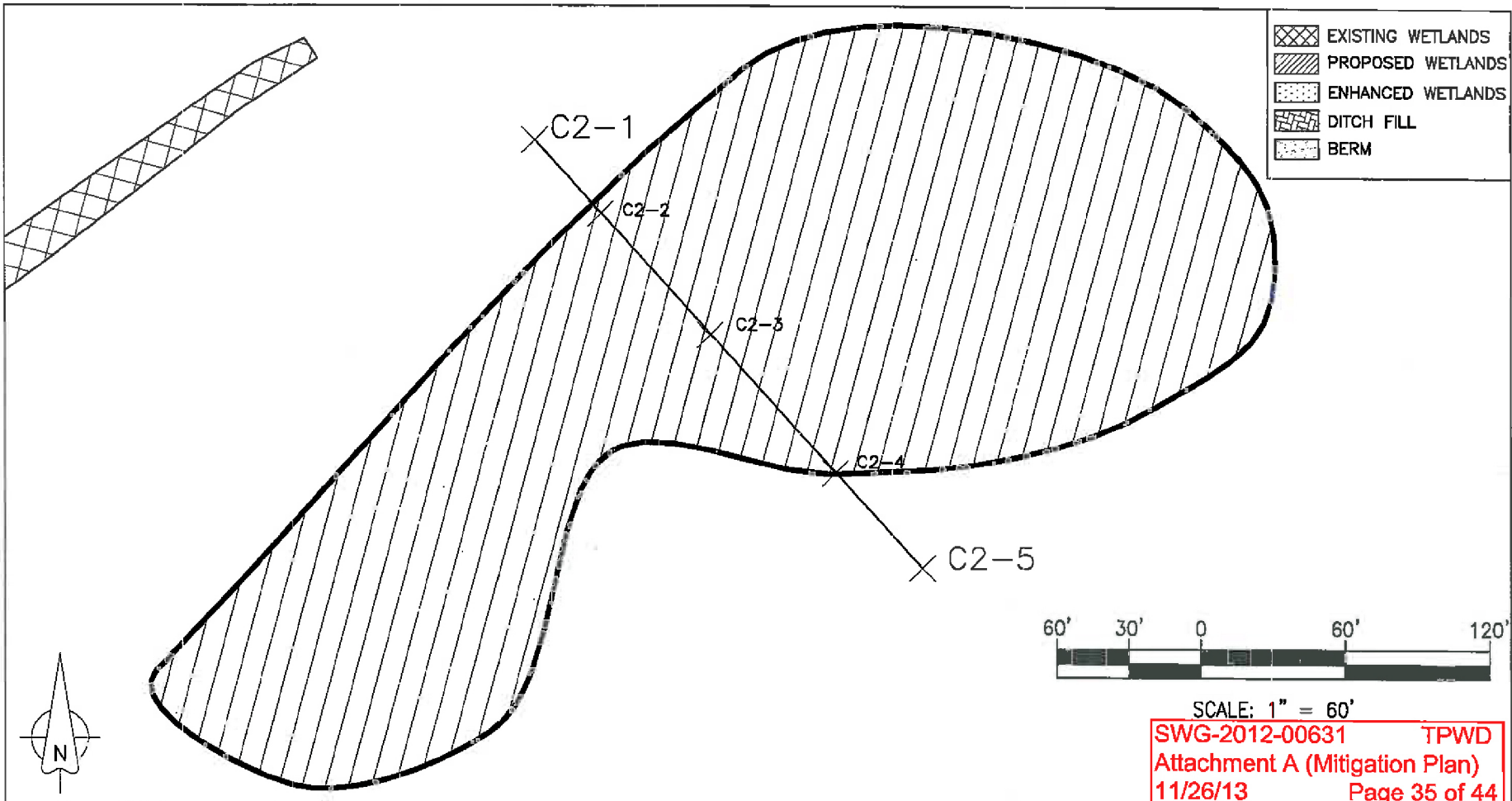
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PERMITTED PLANS

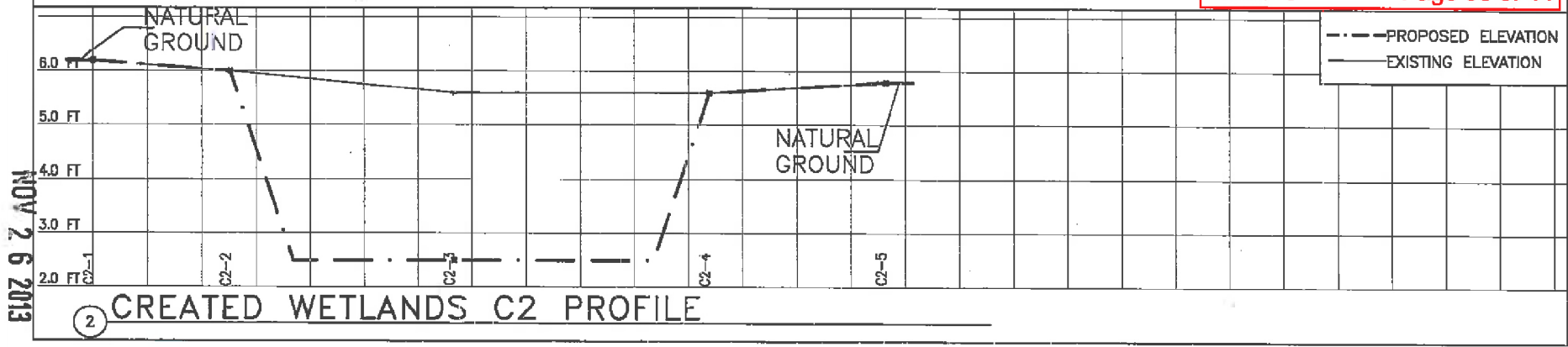


PERMITTED PLANS

-  EXISTING WETLANDS
-  PROPOSED WETLANDS
-  ENHANCED WETLANDS
-  DITCH FILL
-  BERM



SCALE: 1" = 60'  
 SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
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2 CREATED WETLANDS C2 PROFILE

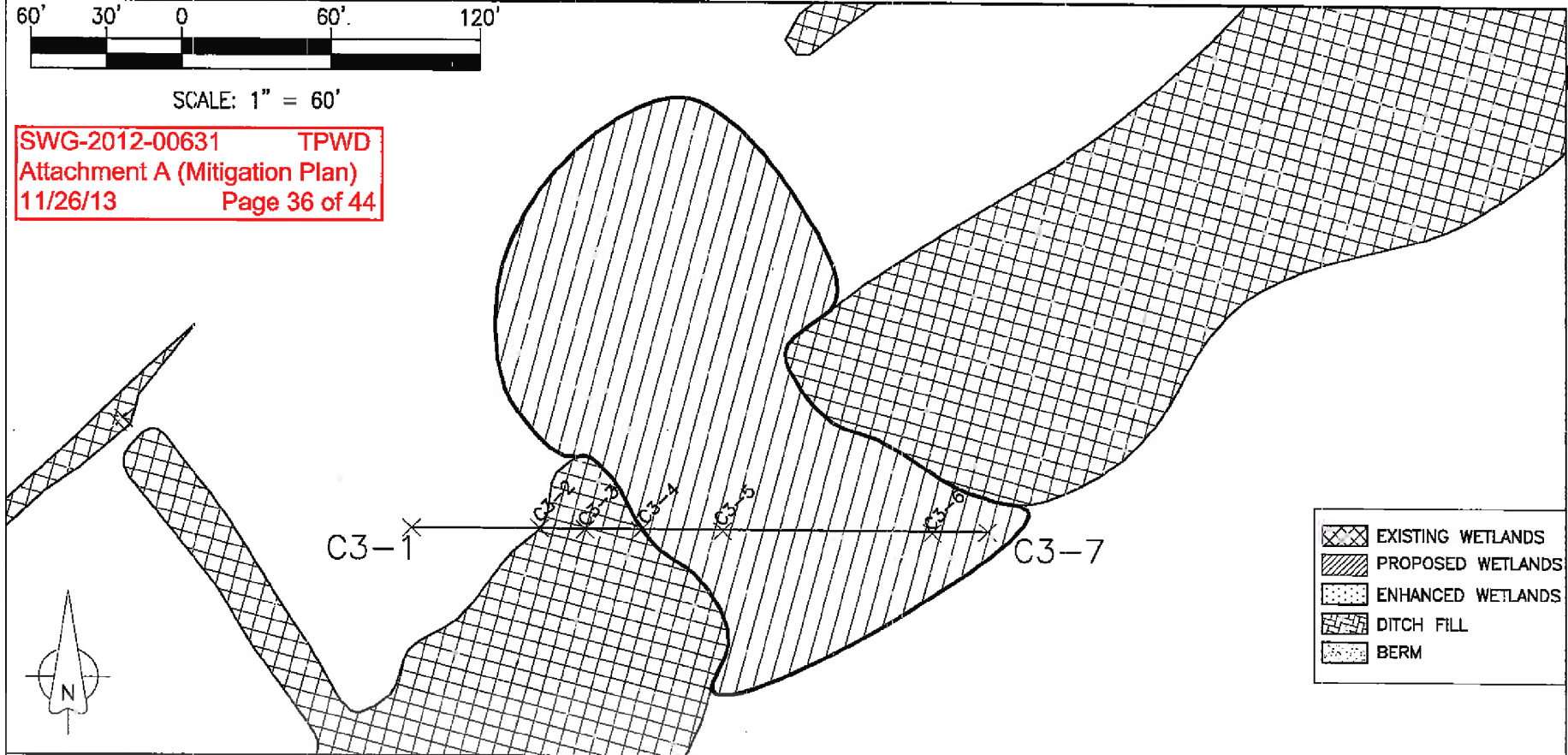
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NOV 26 2013

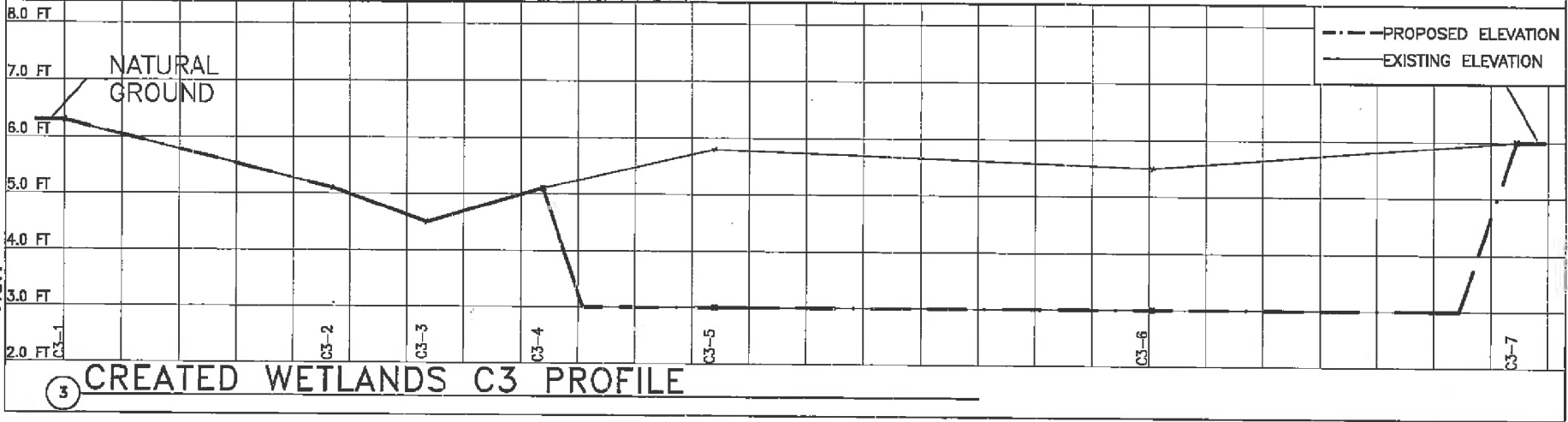


SCALE: 1" = 60'

SWG-2012-00631 TPWD  
Attachment A (Mitigation Plan)  
11/26/13 Page 36 of 44



- EXISTING WETLANDS
- PROPOSED WETLANDS
- ENHANCED WETLANDS
- DITCH FILL
- BERM

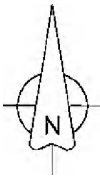
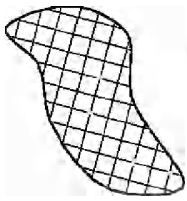
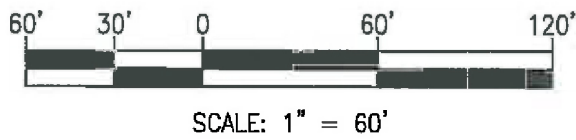







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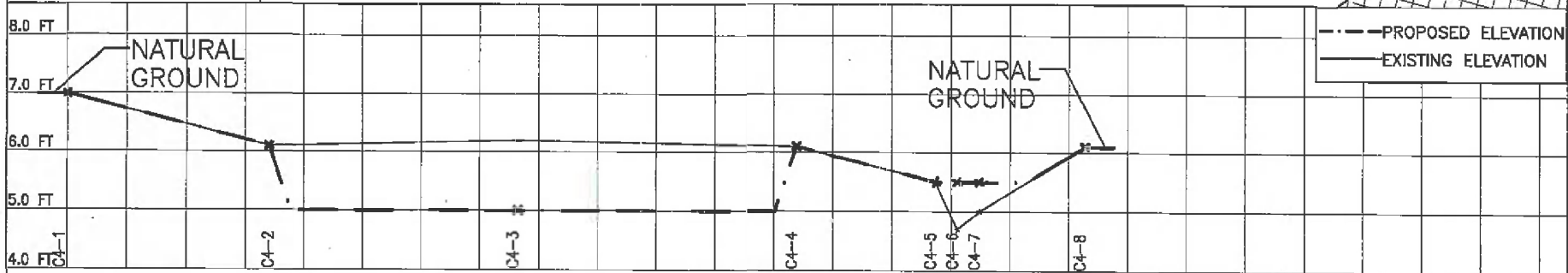
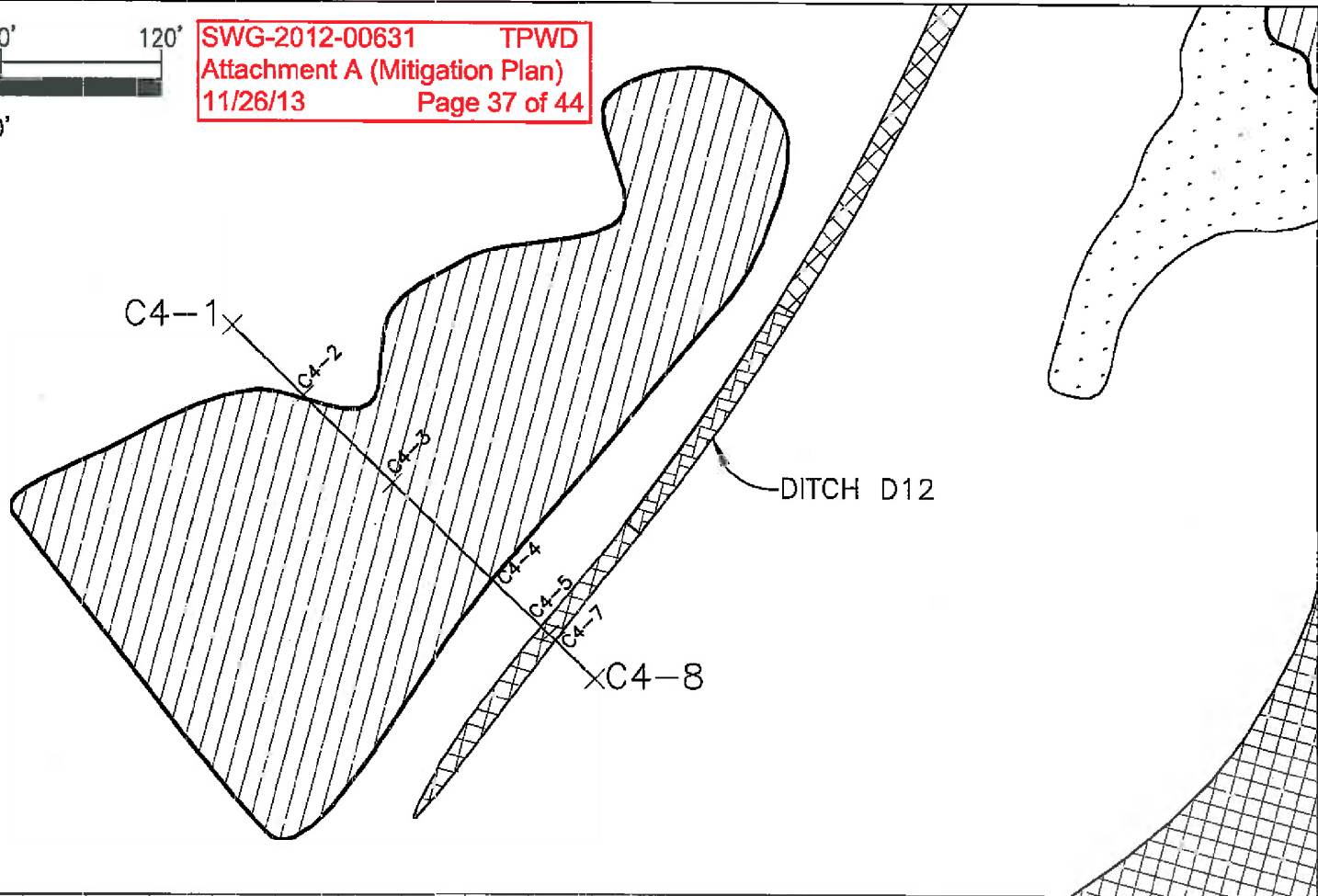
NOV 26 2013

PERMITTED PLANS

SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
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-  EXISTING WETLANDS
-  PROPOSED WETLANDS
-  ENHANCED WETLANDS
-  DITCH FILL
-  BERM

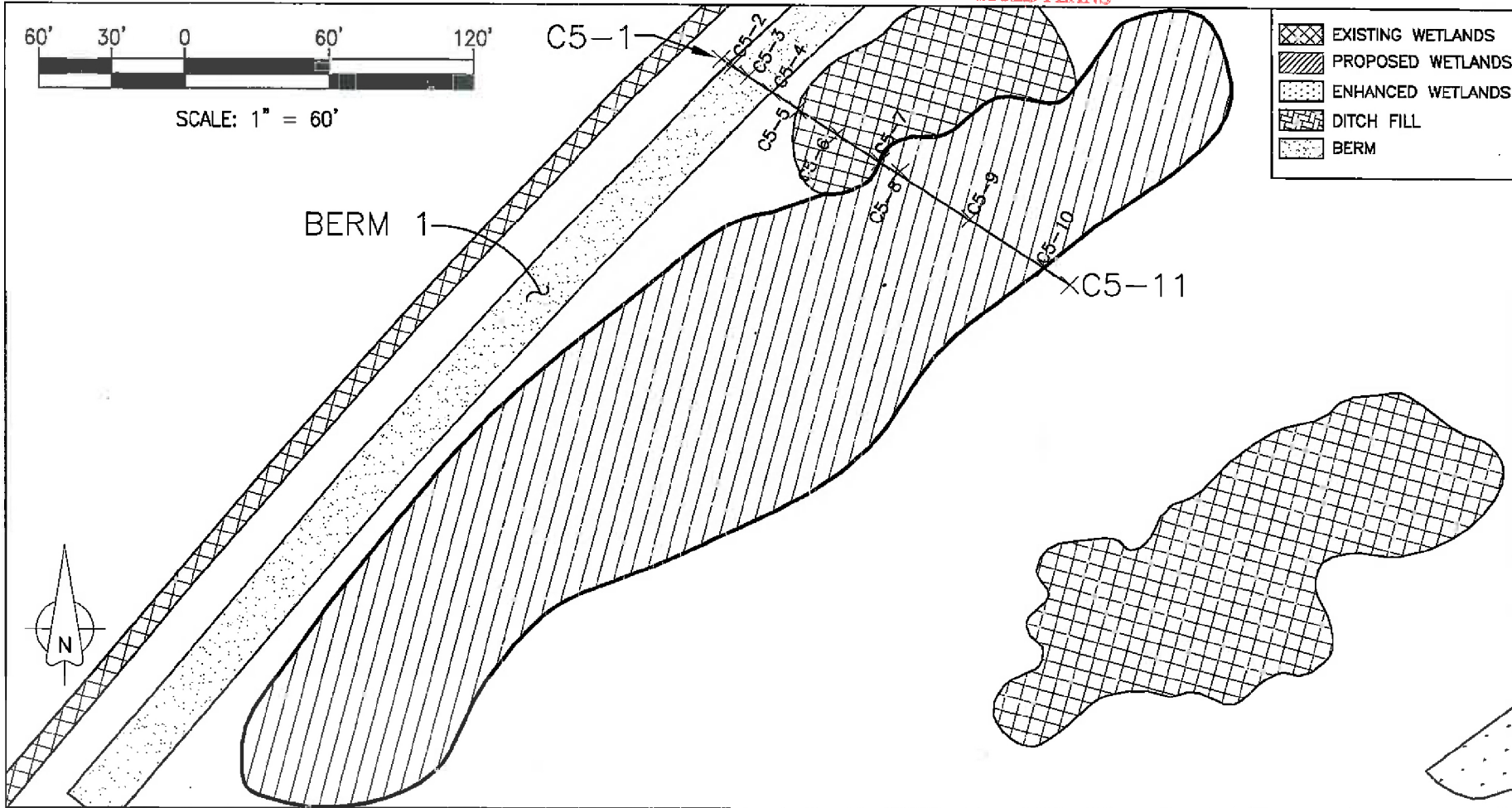


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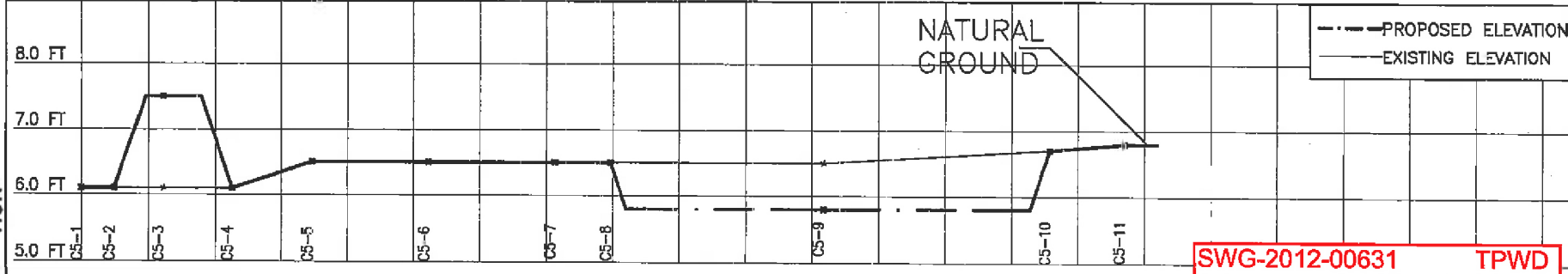
NOV 26 2013

DWH-AR0239175

PERMITTED PLANS



- EXISTING WETLANDS
- PROPOSED WETLANDS
- ENHANCED WETLANDS
- DITCH FILL
- BERM



- PROPOSED ELEVATION
- EXISTING ELEVATION

5 CREATED WETLANDS C5 & BERM 1 PROFILE

SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
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NOV 26 2013  
 DWH-AR0239176

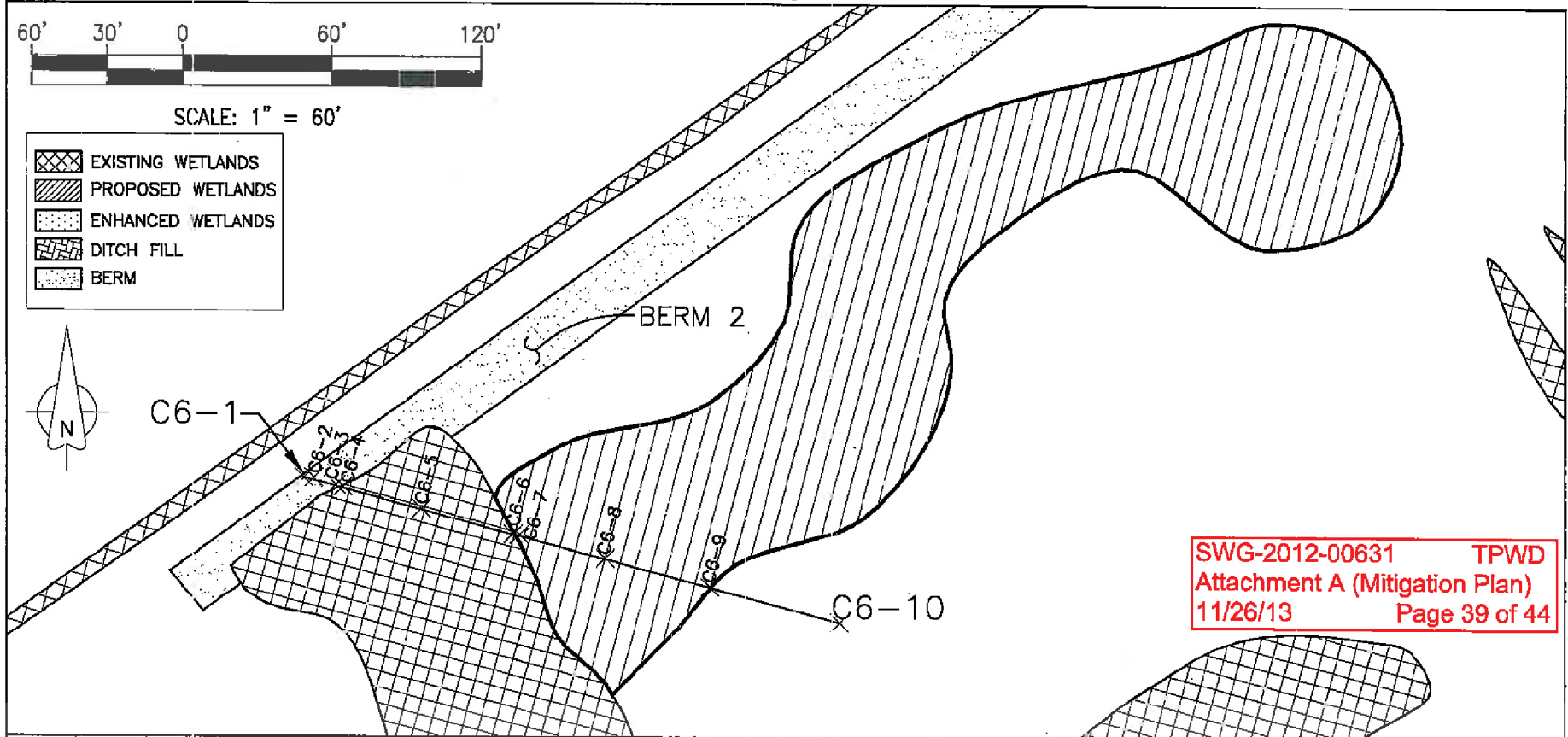
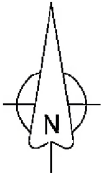


PERMITTED PLANS

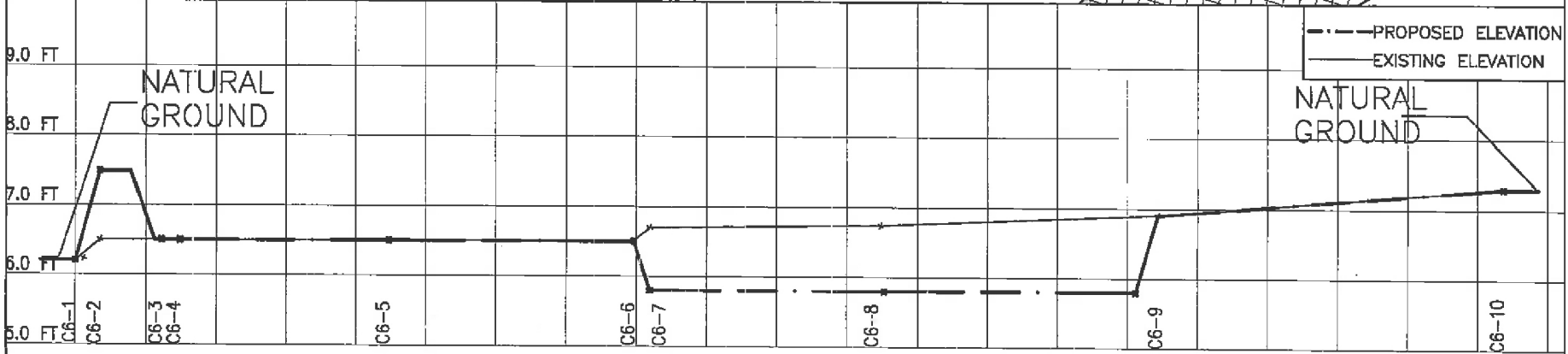


SCALE: 1" = 60'

- EXISTING WETLANDS
- PROPOSED WETLANDS
- ENHANCED WETLANDS
- DITCH FILL
- BERM



SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
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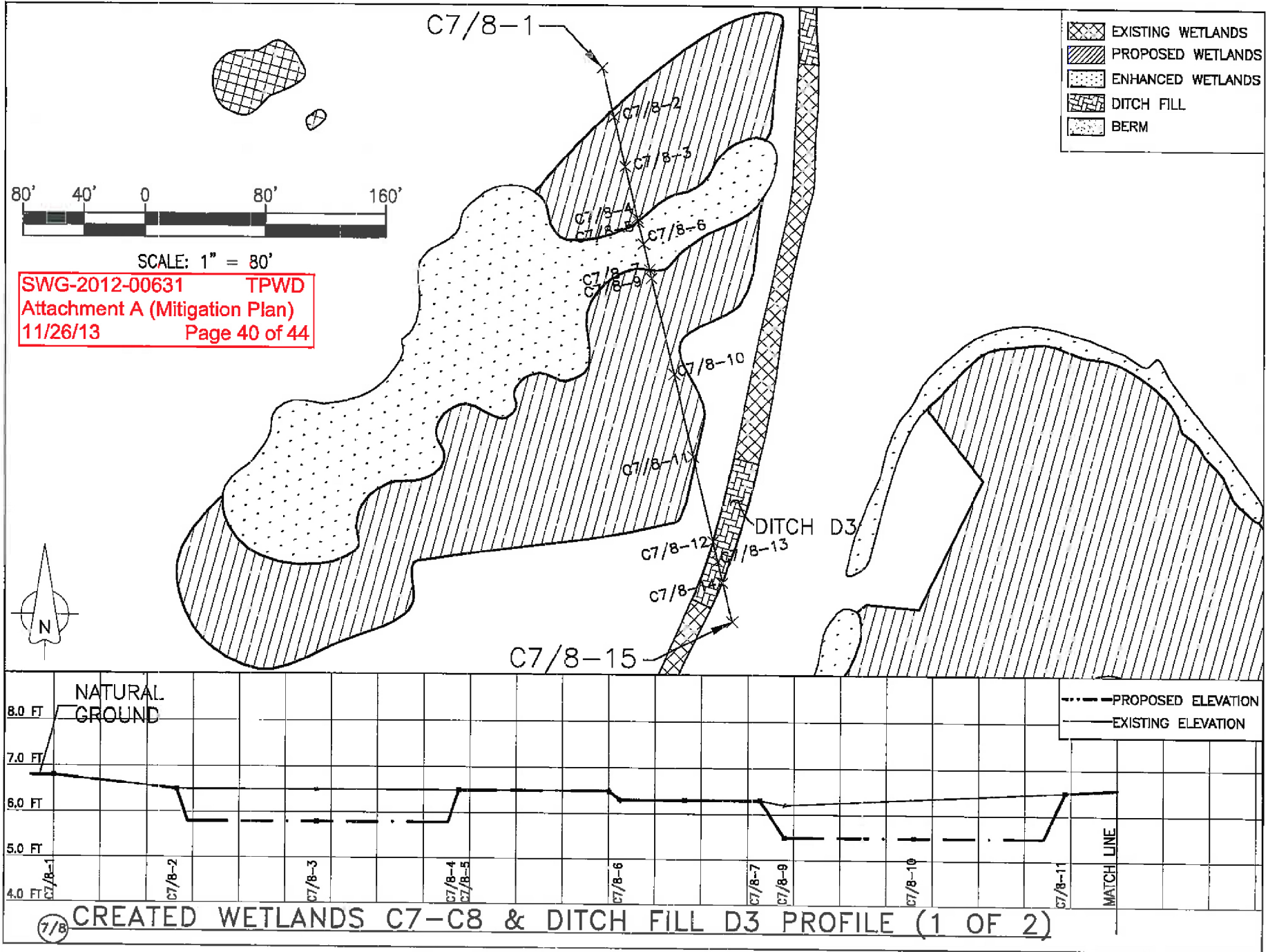


6 CREATED WETLANDS C6 & BERM 2 PROFILE

NOV 26 2013

DWH-AR0239177

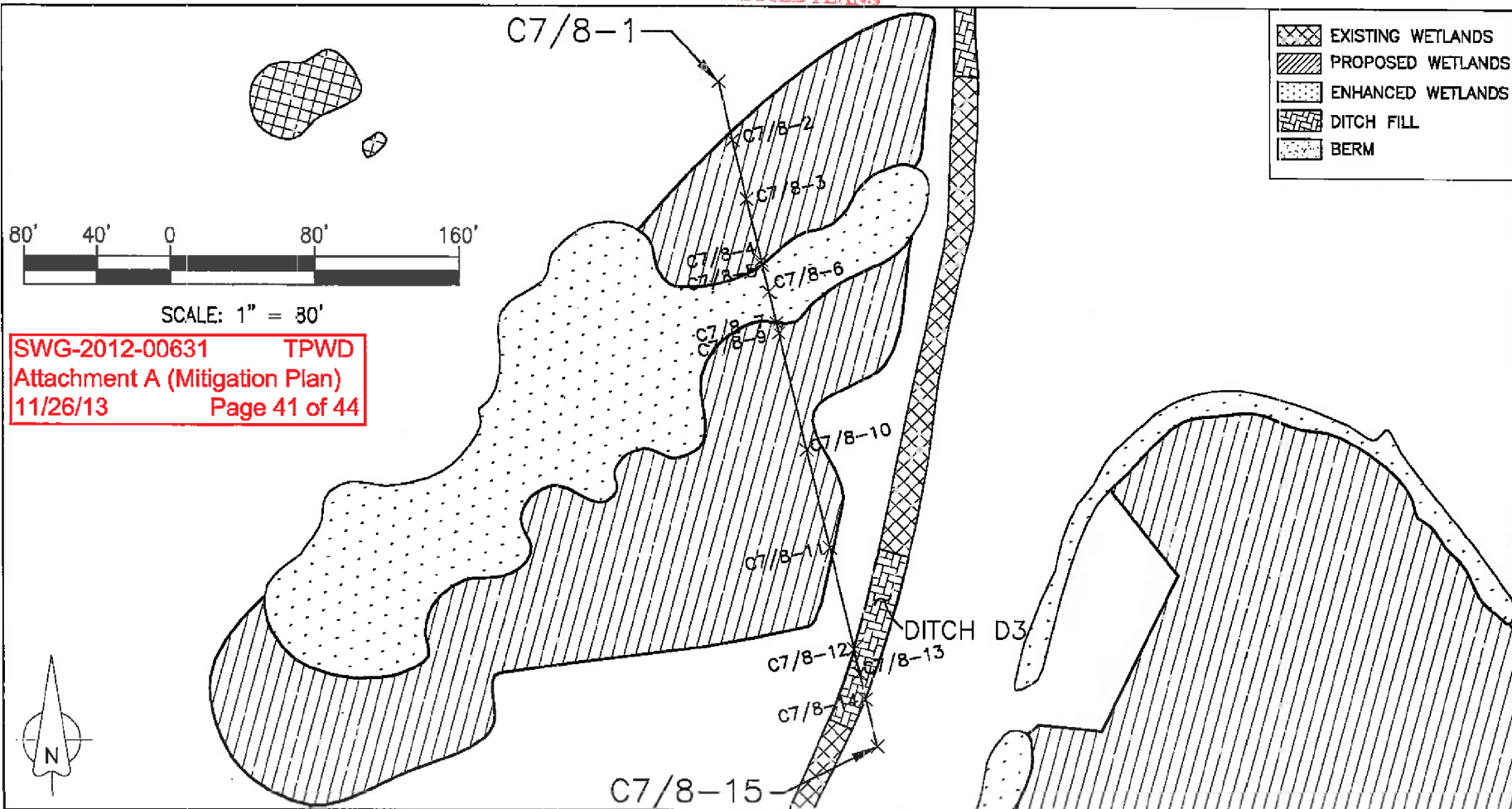
PERMITTED PLANS



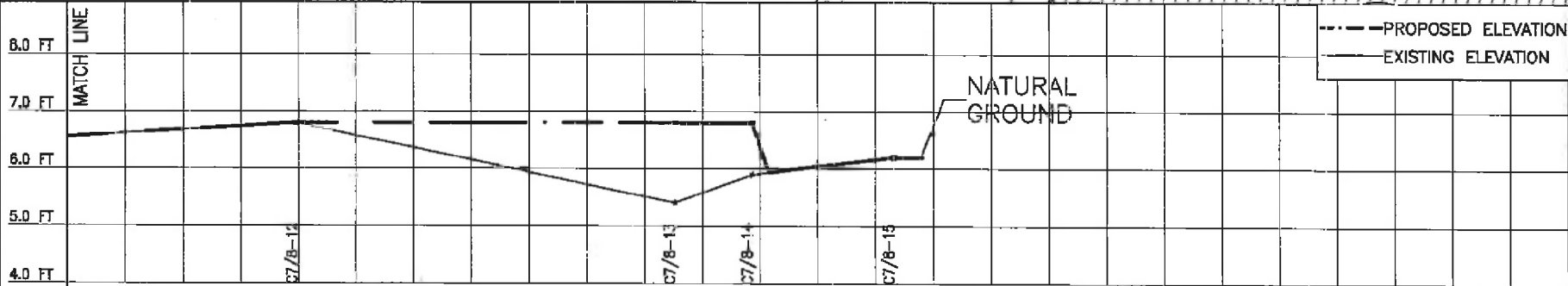
SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
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NOV 26 2013  
 DWH-AR0239178

PERMITTED PLANS



SWG-2012-00631 TPWD  
 Attachment A (Mitigation Plan)  
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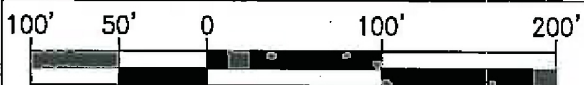


7/B CREATED WETLANDS C7-C8 & DITCH FILL D3 PROFILE (2 OF 2)

NOV 26 2013

DWH-AR0239179

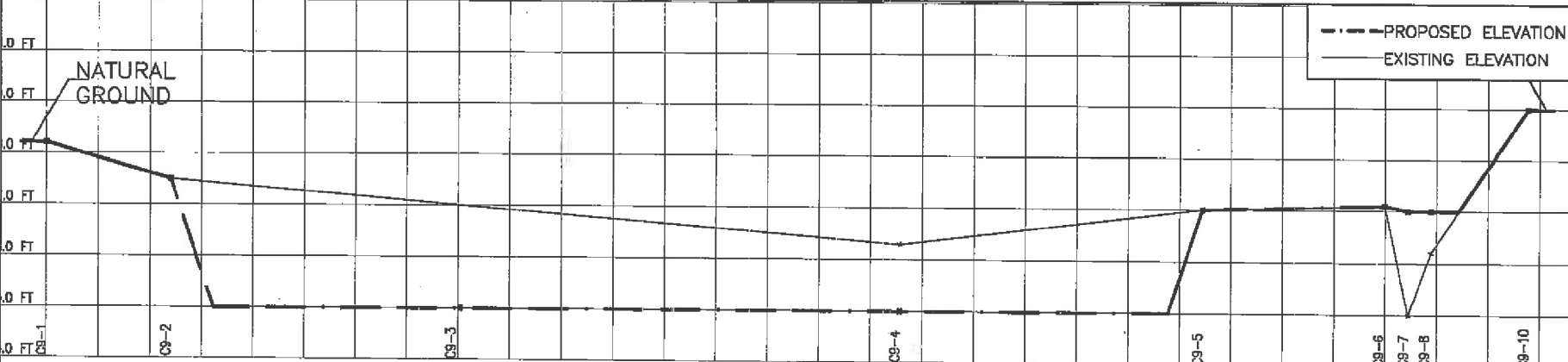
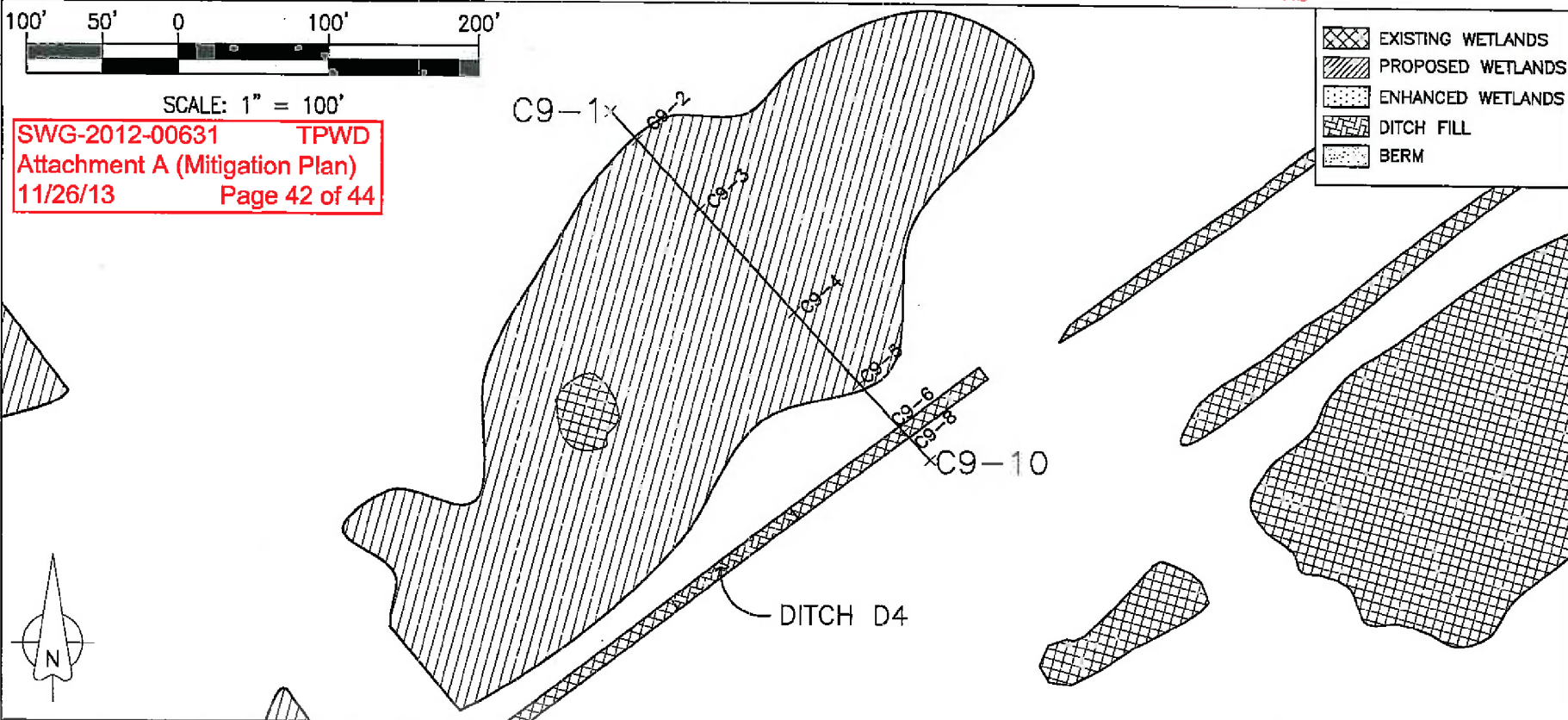
PERMITTED PLANS



SCALE: 1" = 100'

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Attachment A (Mitigation Plan)  
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- EXISTING WETLANDS
- PROPOSED WETLANDS
- ENHANCED WETLANDS
- DITCH FILL
- BERM



9 CREATED WETLANDS C9 & DITCH FILL D4 PROFILE

NOV 26 2013

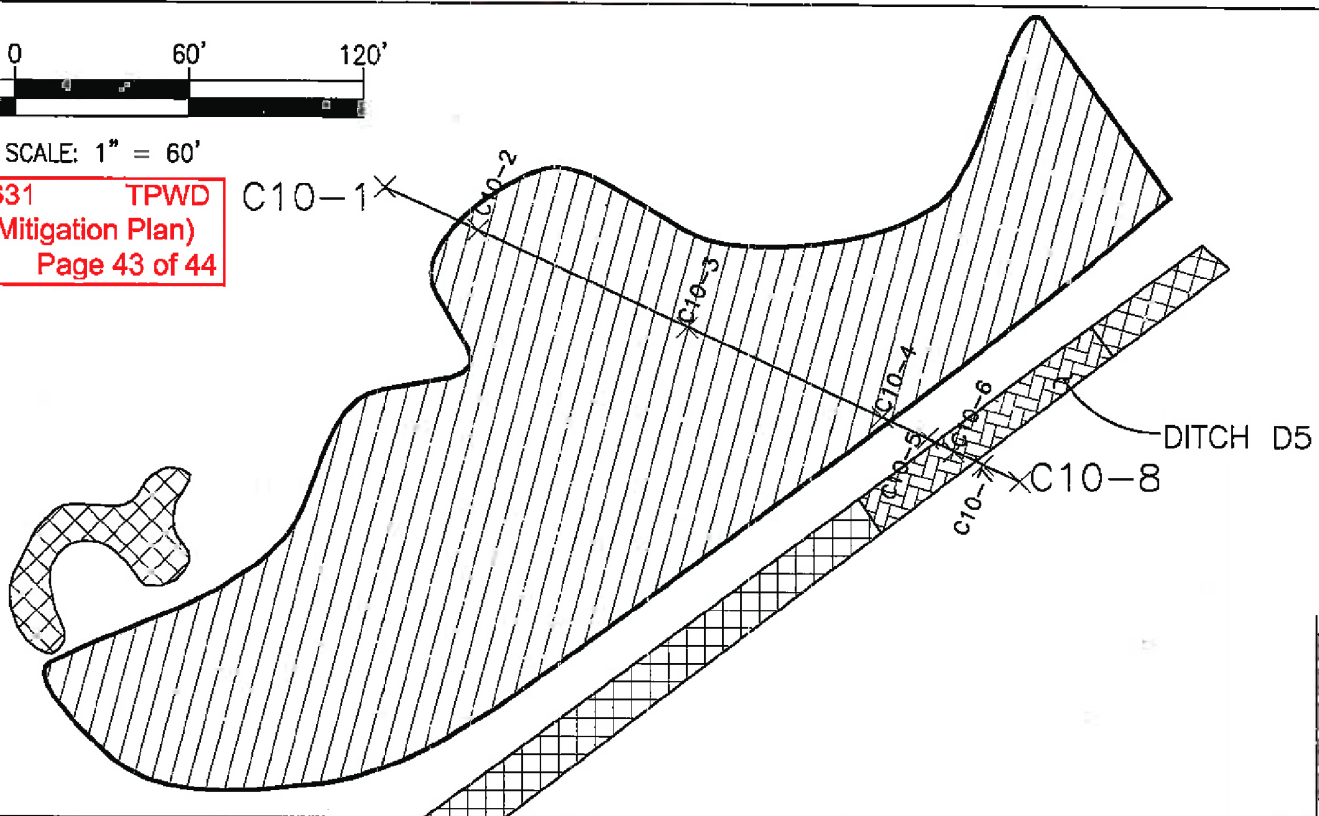
DWH-AR0239180

PERMITTED PLANS



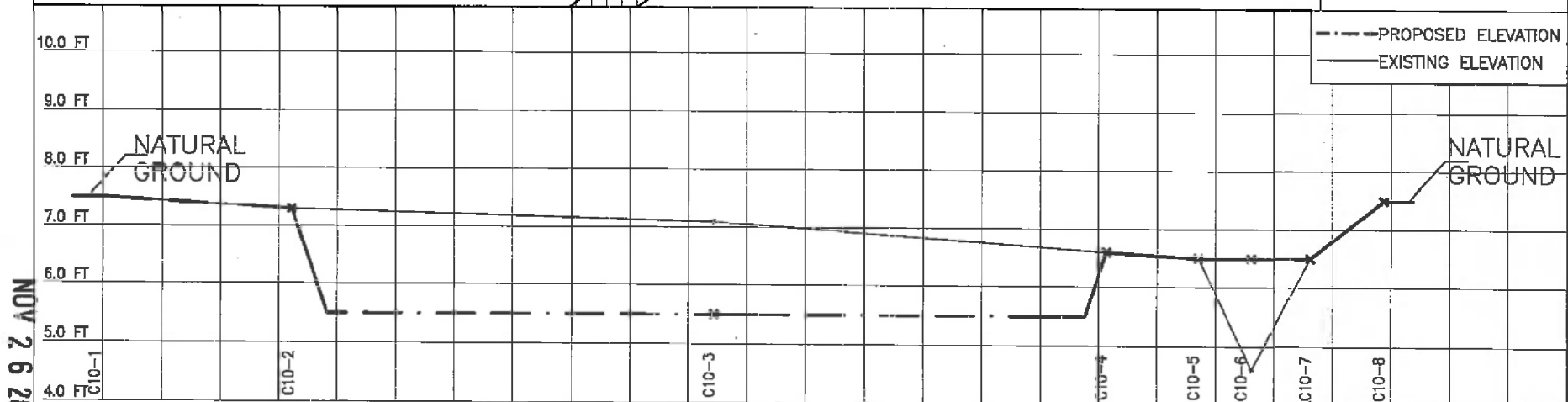
SCALE: 1" = 60'

SWG-2012-00631 TPWD  
Attachment A (Mitigation Plan)  
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- EXISTING WETLANDS
- PROPOSED WETLANDS
- ENHANCED WETLANDS
- DITCH FILL
- BERM

- PROPOSED ELEVATION
- EXISTING ELEVATION



10 CREATED WETLANDS C10 & DITCH FILL D5 PROFILE

NOV 26 2013

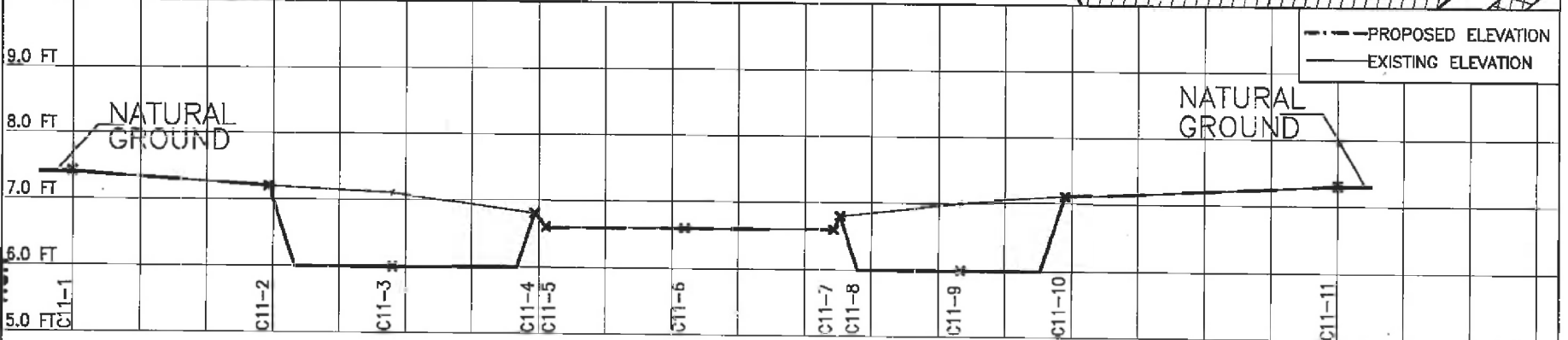
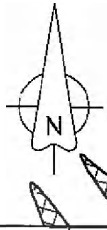
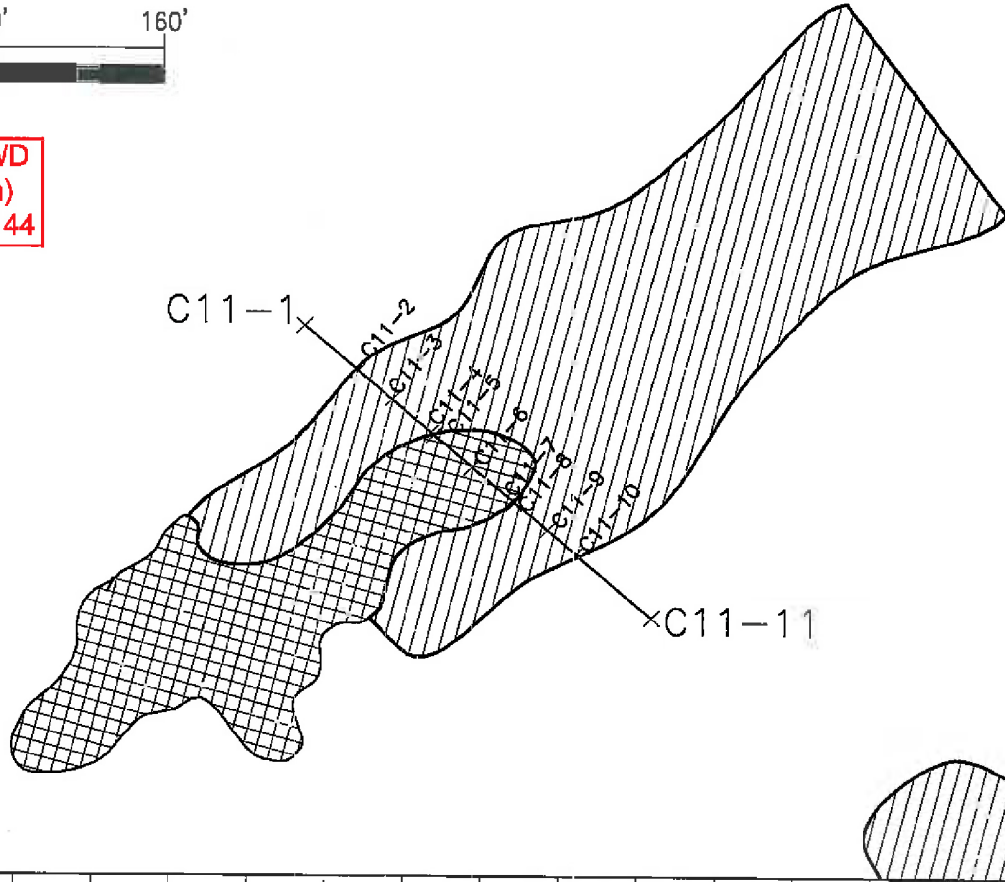
PERMITTED PLANS



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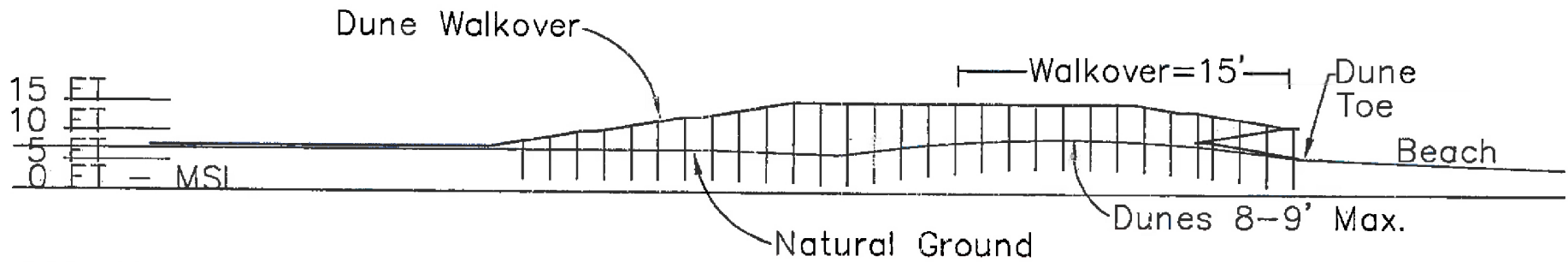
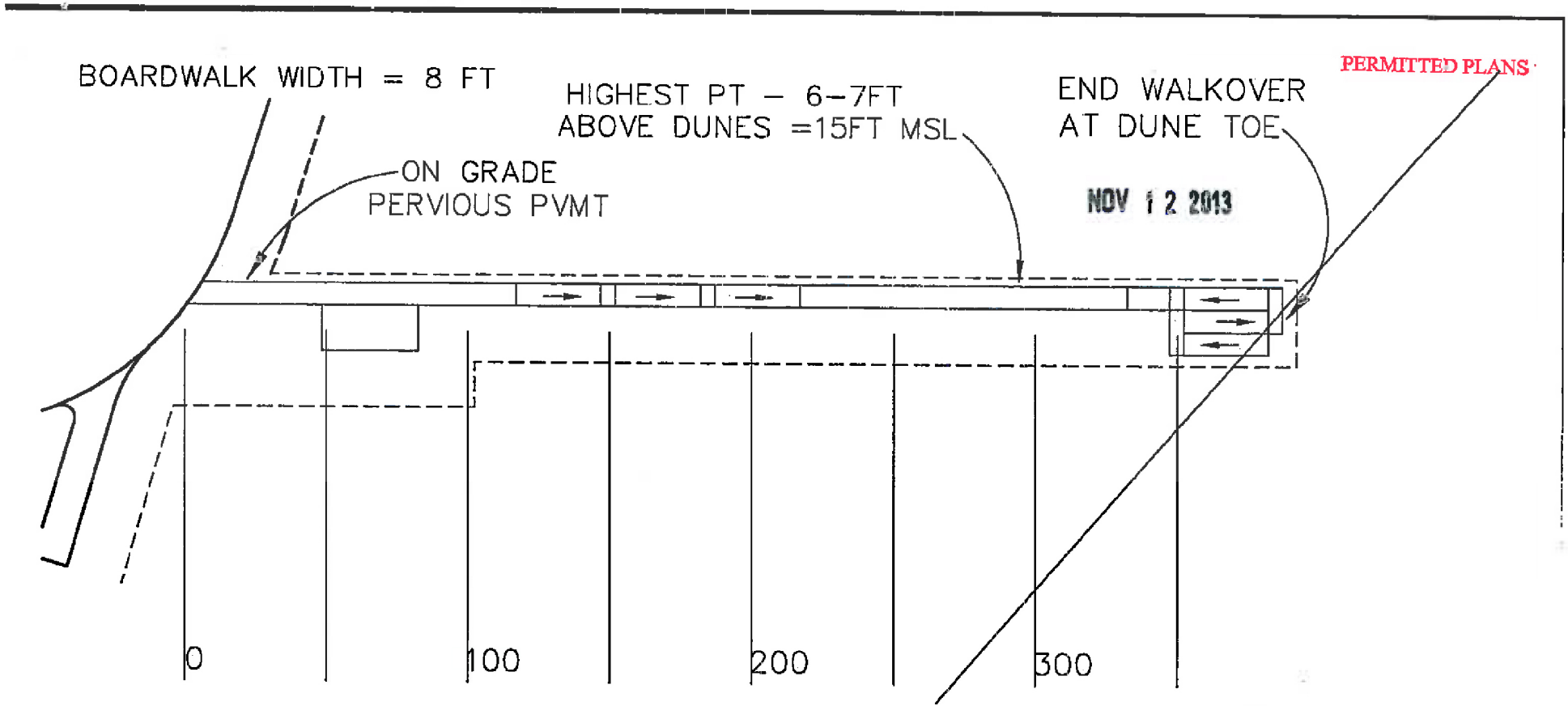
SWG-2012-00631 TPWD  
Attachment A (Mitigation Plan)  
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- EXISTING WETLANDS
- PROPOSED WETLANDS
- ENHANCED WETLANDS
- DITCH FILL
- BERM



11 CREATED WETLANDS C11 PROFILE

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# Walkover E

See Site Plan for Location

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 Project Plans  
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Horiz: 1" = 60'  
 VE = 2X