Final Location Hydraulic Report

Florida Department of Transportation

District One

SR 70 Project Development and Environment (PD&E) Study

From Lonesome Island Road to the Southern Leg of CR 721

Highlands County, Florida

Financial Management Number: 449851-1

ETDM Number: 14490

Date: 08-05-2025

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

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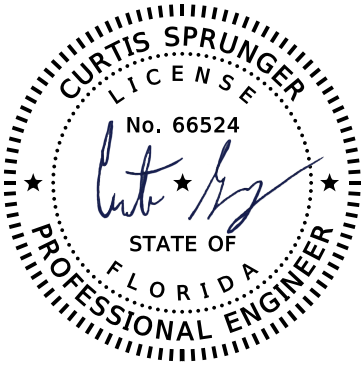

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SR 70
From Lonesome Island Road to the Southern Leg of CR 721
Project Development & Environment (PD&E) Study

Final Location Hydraulic Report

Financial Project ID No. 449851-1-22-01
ETDM Project No. 14490
Highlands County, Florida

Prepared for:

Florida Department of Transportation
District One

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August 2025

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environment (PD&E) study for proposed improvements to the State Road (SR) 70 corridor in Highlands County. The intent is to provide enhanced safety along the SR 70 corridor, a major east-west roadway spanning the length of the state. The project limits extend approximately 7.6 miles from Lonesome Island Road to the southern leg of County Road (CR) 721. SR 70 is classified as a rural principal arterial and designated hurricane evacuation route part of Florida's Strategic Intermodal System (SIS). Facilities on the SIS are subject to special standards and criteria for design speed, level of service (LOS) and other requirements. SR 70 in the existing condition does not meet SIS facility criteria.

The study focuses on improving safety of this section of SR 70. Alternatives to be evaluated include adding an additional through lane in each direction, adding a median, and widening travel lanes from 10 feet to 12 feet as part of the project. Multimodal facilities (i.e., a share use path) will also be considered along the project. Each alternative will be evaluated to determine social and environmental impacts, safety enhancements, additional right-of-way (ROW) needs, and traffic performance.

The PD&E study objectives include determining proposed typical sections and developing preliminary conceptual design plans for proposed improvements while minimizing impacts to the environment, considering agency and public comments, and ensuring project compliance with all applicable federal and state laws. Proposed drainage improvements will include construction of stormwater management facilities (SMF) and floodplain compensation (FPC) sites. Stormwater runoff will be collected and conveyed to proposed SMF sites via a series of roadside swales for water quality treatment and water quantity attenuation. The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases (design, right of way acquisition, and construction).

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List of Acronyms

AADT	Annual Average Daily Traffic
CMF	Crash Modification Factors
CR	County Road
CSM	Cubic Feet per Second per Square Mile
ERP	Environmental Resource Permit
ETAT	Environmental Technical Advisory Team
ETDM	Efficient Transportation Decision Making
FAC	Florida Administrative Code
FDEM	Florida Division of Emergency Management
FDM	FDOT Design Manual
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Florida Insurance Rate Map
FPC	Floodplain Compensation Site
Ft	Foot or Feet
FY	Fiscal Year
HSG	Hydrologic Soil Group
LOS	Level of Service
LRTP	Long Range Transportation Plan
NEPA	National Environmental Policy Act
OA	Other Arterial
OEM	Office of Environmental Management
Mph	Miles Per Hour
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resources Conservation Services
PD&E	Project Development and Environment
ROW	Right of Way
SCS	Soil Conservation Service
SFWMD	South Florida Water Management District
SHWT	Seasonal High-Water Table
SIS	Strategic Intermodal System
SMF	Stormwater Management Facility
SR	State Road
SSOGIS	State Safety Office Geographic Information System
STIP	State Transportation Improvement Plan
TIP	Transportation Improvement Plan

TPO	Transportation Planning Organization
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WBID	Water Body Identification Number

SECTION 1 INTRODUCTION

1.1 PD&E STUDY PURPOSE

The objective of the Project Development & Environment (PD&E) study is to assist the Florida Department of Transportation (FDOT) Office of Environmental Management (OEM) in reaching a decision on the type, location, and conceptual design of the proposed improvements for the widening of State Road (SR) 70. This study documents the need for improvements as well as the procedures utilized to develop and evaluate various improvements, including elements such as proposed typical sections, preliminary horizontal alignments, Stormwater Management Facility (SMF) and Floodplain Compensation Site (FPC) sites and intersection enhancements.

The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases (design, right of way acquisition, and construction). This project was screened through the FDOT's Efficient Transportation Decision Making (ETDM) process as ETDM Project No. 14490. The ETDM Programming Screen Summary Report was published on June 1, 2023, containing details concerning agency comments from the Environmental Technical Advisory Team (ETAT) on the project's potential effects to natural, cultural, and community resources; and provide additional documentation of activities related to the Programming Phase of the project.

1.2 PROJECT PURPOSE AND NEED

1.2.1 Purpose

The purpose of this project is to address traffic safety conditions on SR 70 from Lonesome Island Road to the southern leg of County Road (CR) 721 within Highlands County. Other goals of the project are to maintain important east-west connectivity within the regional transportation network and accommodate freight activity within the area.

1.2.2 Need

This project is needed to improve traffic safety conditions, emergency evacuation, and incident response times. Other goals of the project are to maintain important east-west connectivity within the regional transportation network and accommodate freight activity within the area.

1.2.3 Safety

Crash data was collected for the years 2018 to 2022 from the FDOT State Safety Office Geographic Information System (SSOGIS) and Signal Four Analytics database. A total of 84 crashes were reported along the SR 70 project corridor during the five-year period. Of the 84 crashes along the project corridor, 13 (15%) were guardrail crashes and 13 (15%) were sideswipe, opposite direction crashes. The average crash rate for this section of SR 70 is 1.073, 36% more than the statewide average of 0.789 and 19.4% higher than the Highlands County crash rate of 0.898 for similar facilities. Eight fatal crashes occurred on this

segment of SR 70 during the five-year period. One of the fatal crashes were reported as a front to front crash that was caused by improper passing.

The project section of SR 70 presently features ten-foot travel lanes and eight-foot shoulders, with four feet paved. Guardrails along the roadway are also minimally set back from the travel lanes (less than seven feet). With a context classification of C2-Rural, the existing typical section does not meet 2023 FDOT Design Manual (FDM) standards. The substandard lane and shoulder widths and proximity of the guardrails to the travel lanes restrict the ability of drivers to avoid hazards within each directional travel lane without veering off the roadway causing direct impacts. According to "Evaluation of the Safety Effectiveness of the Conversion of Two-Lane roadways to Four-Lane Divided Roadways: Bayesian vs. Empirical Bayes" referenced on the Federal Highway Administration (FHWA) Crash Modification Factors (CMF) Clearinghouse, widening a rural two-lane roadway to a four-lane divided roadway can help decrease fatal and injury crashes by 45%. In addition, due to the roadway's current configuration, there is limited space for an emergency service vehicle to pass to respond to a situation during periods of congestion or to accommodate a disabled vehicle to prevent it from obstructing traffic flow. According to the Highlands County Sheriff's Office, one of the two travel lanes (if not both) is often blocked during traffic incidents.

SR 70 is part of the emergency evacuation route network designated by the Florida Division of Emergency Management (FDEM) as well as the network established by Highlands County. This roadway is critical in facilitating traffic during emergency evacuation periods as it connects to other arterials and highways of the state evacuation route network [such as US 27 (on the west) and CR 721 (on the east)] and serves as only one of two east-west facilities [SR 66/US 98 being the other] that traverses Highlands County. Under various FDEM evacuation scenarios for different storm events, FDEM noted that SR 70 has some of the longest lasting vehicle queues in the Central Florida region, contributing to prolonged clearance times. Clearance time, comprised of time required for mobilization of the evacuating populating, travel tie, and the delay time caused by traffic congestion, is one input used by County emergency managers to determine when to recommend an evacuation order and is a key factor pertaining to public safety during an evacuation event.

The project is anticipated to address deficiencies of the roadway which may reduce crashes (including fatalities) and lead to enhanced emergency evacuation capabilities and incident response times.

1.2.4 Area Wide Network/System Linkage

SR 70 is one of four corridors connecting Central and South Florida's west and east coasts as it spans from US 41 in Manatee County (west coast) to US 1 in St. Lucie County (east coast). It also connects to several major north-south transportation facilities of the state, including US 41, I 75, US 17, US 27, US 441, Florida's Turnpike, I-95, and US 1. With the nearest available parallel east-west facilities being located over 10 miles to the north and south, SR 70 is integral to facilitating east-west travel within the regional transportation network of Florida's heartland.

The project is intended to complement other SR 70 corridor safety and traffic operational improvements identified in the 2029 - 2045 SIS Long Range Cost Feasible Plan from CR 675 in Manatee County to US 98 in Okeechobee County. In turn, the improvements are anticipated to maintain the corridor's function as a designated SIS highway corridor and important east-west connection for freight and commuters across the Central Florida region and state.

1.2.5 Transportation Demand

As part of Florida's SIS highway network, SR 70 connects regionally important routes (such as I-75, US 27, Florida's Turnpike, and I-95) as well as serves as a regional through route for long-haul truck volumes and provides access to agricultural/ranching operations, industrial/commercial areas, and other intensive freight activity centers within Central Florida. The 2022 Annual Average Daily Traffic (AADT) volume for the project corridor of is 5,600 vehicles per day, of which 32% is truck traffic. Truck volumes along SR 70 are expected to increase in the future as freight distribution and logistics activities continue to gain economic significance in Central Florida counties through the rapid growth occurring along the Interstate 4 and Interstate 75 corridors within the broader region. According to the Heartland Regional Transportation Planning Organization's (TPO) 2045 Long Range Transportation Plan (LRTP), Highlands County is in the process of diversifying their economy, expanding the potential for freight distribution and logistics activity development. With the major metro markets of Orlando, Tampa, and Fort Myers being located nearly equidistant to Highlands County and more than 86% of Florida's population being located within a 150-mile (or two-hour) radius of Highlands County, the SR 70 improvements are intended to accommodate increased population and employment growth as well as support the vision of the county and larger region to grow as a trade hub.

According to the FDOT District 1 Freight Mobility and Trade Study: Technical Memorandum 5 - Freight Improvements Prioritization, improvements to SR 70 are the #1 long-term priority in Highlands County to facilitate the future growth of freight traffic in the region. Additionally, the Heartland Regional TPO, its committees, and community stakeholders have identified SR 70 as the highest priority transportation facility in the region in need of improvements due to concerns pertaining to safety, freight mobility, and economic growth. The project improvements are aligned with the goals of these plans and SIS objectives of promoting interregional transportation linked to economic development.

1.2.6 Project Status

The proposed improvements along SR 70 from East of Lonesome Island Road to NW 38th Terrace (near downtown Okeechobee) are identified in the Heartland Regional TPO 2045 LRTP Cost Feasible Plan with Other Arterial (OA) Future Funding fiscal year (FY) 2031-2035 for safety improvements and/or a PD&E Study. The projects improvements are not identified in the Heartland Regional TPO's FY 2021/22 – 2025/26 Transportation Improvement Program (TIP). The FDOT State Transportation Improvement Program (STIP) and the FY 2022-2027 Work Program identify the project improvements programmed for the PD&E Study in FY 2023-2024. The project improvements on SR 70 from East of Lonesome Island Road to NW 38th Terrace are identified in the SIS Long Range Cost Feasible Plan FY 2029-2045 for the PD&E Study in FY 2028/29 – 2034/35 and for the Preliminary Engineering phase in FY 2035/36 – 2039/40. As

noted, funding for the project as well as the project limits differ across plans; the identified plans will need to be modified to reflect consistency.

1.3 PROJECT DESCRIPTION

This roadway project proposes the widening of a two-lane facility a four-lane, divided facility and/or the inclusion of operational improvements along 7.6 miles of SR 70 from Lonesome Island Road to the southern leg of CR 721 in Highlands County. Travel lane widths will be widened from 10 feet to 12 feet as part of the project. Multimodal facilities will also be considered along the project segment, where appropriate.

SR 70 is part of Florida's SIS highway network and designated state hurricane evacuation route network. As part of the National Highway System, SR 70 is critical in the transportation network as it facilitates local and regional traffic and the movement of goods/freight. SR 70 is functionally classified as "Rural Principal Arterial – Other" within the project area and the project segment of the roadway has an existing context classification of C2-Rural. The existing typical section consists of a two-lane undivided facility with 10-foot travel lanes. There are eight-foot shoulders, four feet of which are paved; however, there are no designated bicycle lanes or sidewalks present on either side. The posted speed limit along the project corridor is 60 miles per hour (mph).

The existing right-of-way (ROW) along SR 70 project segment is generally 50-70 feet. A deep canal runs intermittently along the southern border of the project limits. Additional ROW is expected to accommodate the proposed improvements. A project location map is provided in **Figure 1-1** and can also be found in **Appendix A, A-1**.

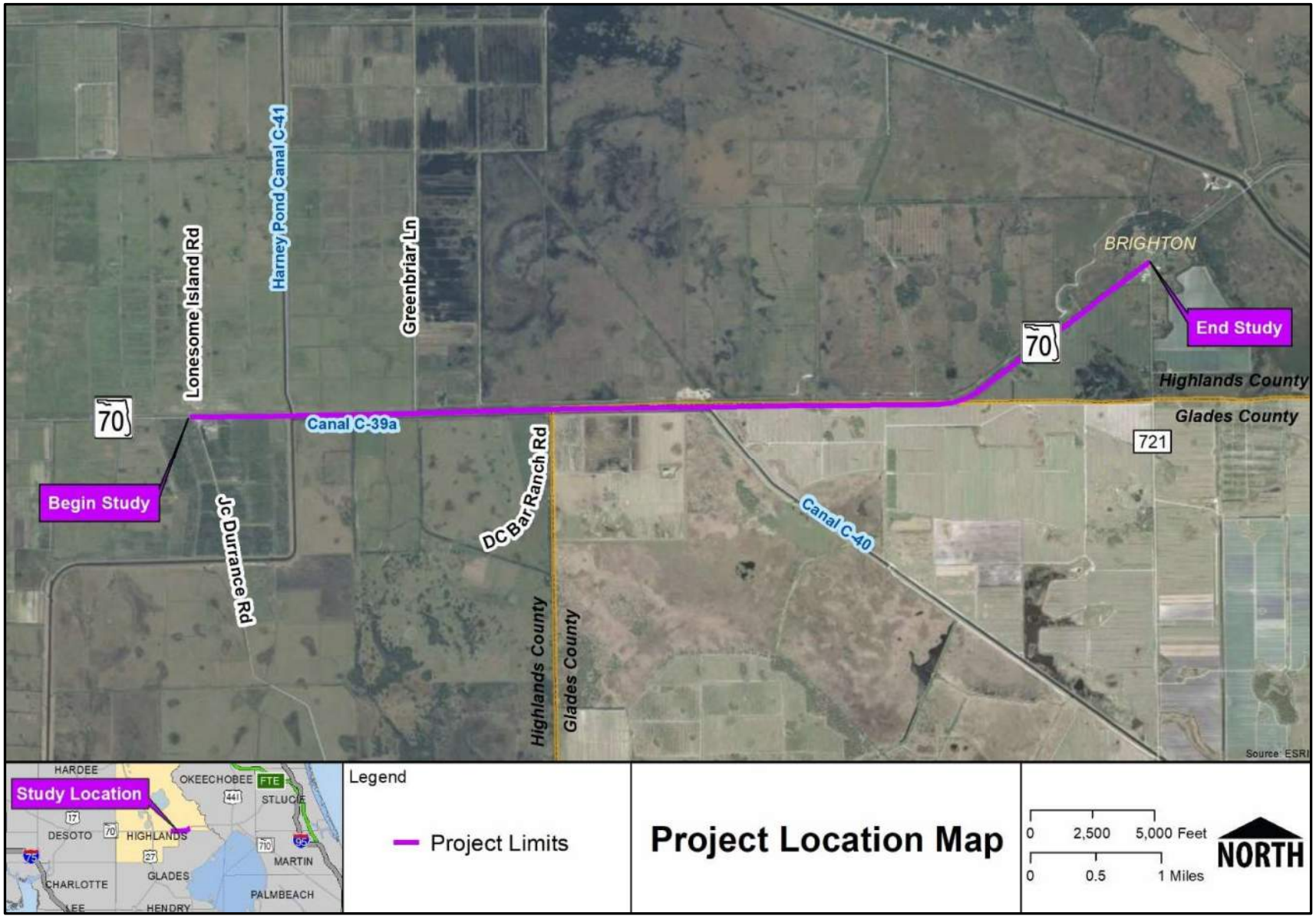


Figure 1-1 Project Location Map

1.4 EXISTING ROADWAY AND PROPOSED IMPROVEMENTS

1.4.1 Existing Roadway

Within the project area, SR 70 is currently a two-lane undivided roadway functionally classified as a rural principal arterial other roadway with a posted speed limit of 60 mph. The roadway has one 10-ft lane in each direction, with shoulders that are approximately 8-ft wide (4-ft paved) on both the south and north side throughout the corridor with no dedicated bicycle lanes or sidewalk. The existing ROW varies along the corridor, but is a minimum of 50 feet. There are two existing typical sections within the study limits. The limits of the first existing roadway typical section is from Lonesome Island Road to Harney Pond Canal C-41 and from Indian Prairie Canal C-40 to CR 721 (Southern Leg) and is provided as **Figure 1-2**. The limits of the second existing roadway typical section are from Harney Pond Canal C-41 to Indian Prairie Canal C-40 and is provided as **Figure 1-3**.

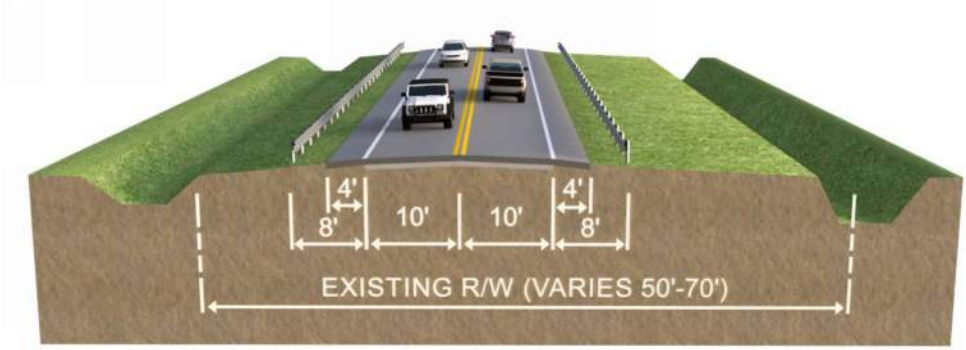


Figure 1-2 SR 70 – Existing Roadway Typical Section One

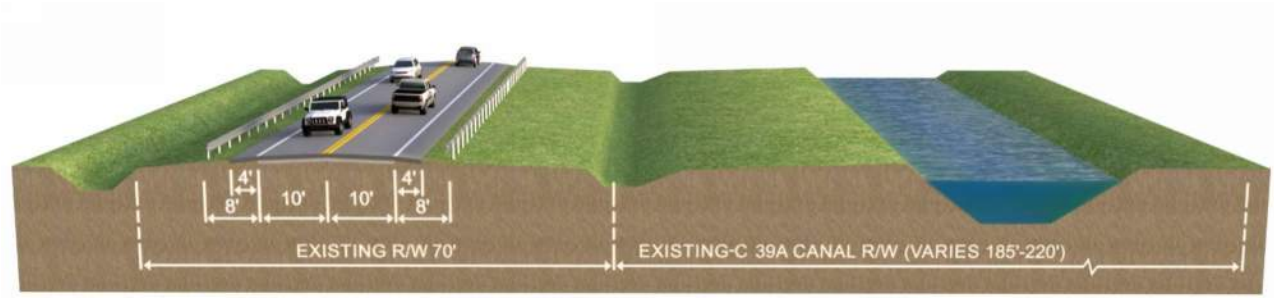


Figure 1-3 SR 70 – Existing Roadway Typical Section Two

1.4.2 Proposed Improvements

The proposed typical section shows widening of SR 70 to a four-lane divided rural roadway with a 40-foot median. There will be two 12-ft travel lanes in each direction, with outside shoulders that are 10-ft wide (5-ft paved) throughout the corridor a 12-ft shared use path is proposed along the south side of the road. The proposed ROW varies along the corridor, but is a minimum of an additional 60 feet. There are two proposed typical sections within the study limits. The limits of the first proposed typical section is from Lonesome Island Road to Harney Pond Canal C-41 and from Indian Prairie Canal C-40 to CR 721 (Southern

Leg) and is provided as **Figure 1-4**. The limits of the second proposed typical section is from Harney Pond Canal C-41 to Indian Prairie Canal C-40 and is provided as **Figure 1-5**.

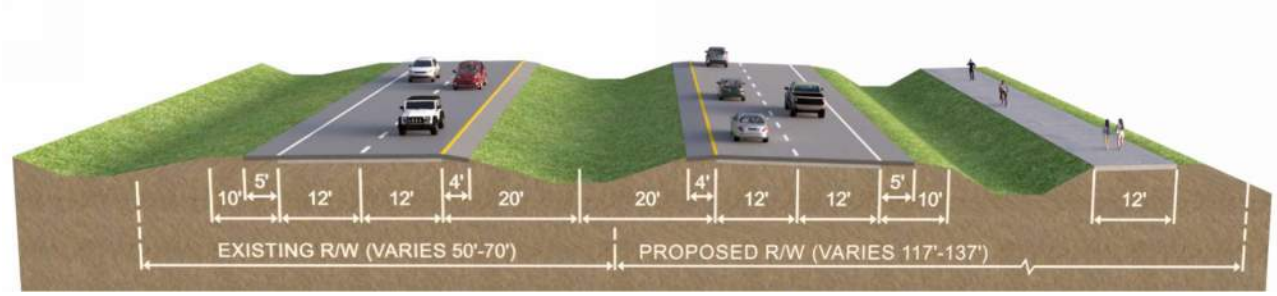


Figure 1-4 SR 70 – Proposed Roadway Typical Section One

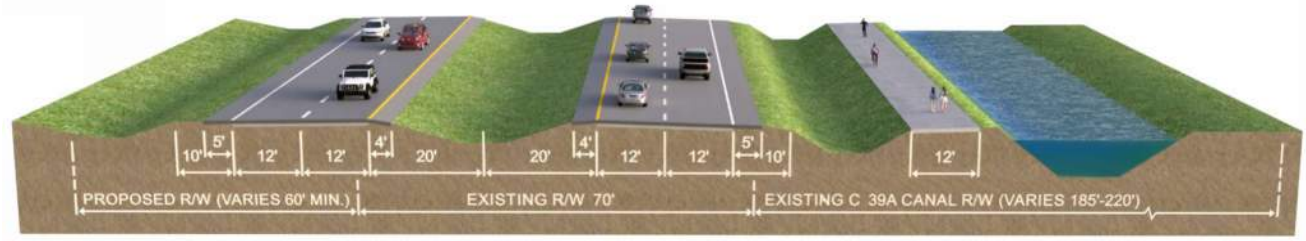


Figure 1-5 SR 70 – Proposed Roadway Typical Section Two

Each proposed typical section will be evaluated to determine social and environmental impacts, safety enhancements, additional right-of-way needs, and traffic performance. The project includes the evaluation of SMF and FPC sites. Additional ROW will be required at some locations along SR 70 for SMF and FPC sites.

1.5 REPORT PURPOSE

The purpose of this Location Hydraulic Report is to document base floodplain encroachments resulting from the roadway improvements evaluated in the SR 70 PD&E Study. This Location Hydraulic Report was conducted in accordance with Executive Order 11988 "Floodplain Management", USDOT Order 5650.2, "Floodplain Management Protection", and Federal-Aid Policy Guide 23 CFR 650A. The intent of these regulations is to avoid or minimize encroachments that reduce storage and increase water surface elevations with the 100-year floodplain.

SECTION 2 PROJECT INFORMATION

2.1 SOIL CHARACTERISTICS

Map Unit Name/ Unit Number	HSG	Description
Felda fine sand (13,10)	A/D	Nearly level to gently sloping poorly drained soil and Depth to SHWT of 3 to 18 inches with percentage of 34%.
Valkaria fine sand (16,4)	A/D	Nearly level to gently sloping poorly drained soil and depth to SHWT of 3 to 18 inches with percentage of 12%.
Basinger fine sand (14,12)	A/D	Nearly level to gently sloping poorly drained soil and depth to SHWT of 0 to 12 inches with percentage of 14%.
Immokalee sand (8)	B/D	Nearly level to gently sloping poorly drained soil and depth to SHWT of 6 to 18 inches with percentage of 8%.
Tequesta muck (26)	A/D	Nealy level to gently sloping very poorly drained soils and depth to water table of 0 inches with percentage of 6%.
Kaliga muck (18)	C/D	Nearly level to gently sloping very poorly drained soil and depth to SHWT of 0 inches with percentage of 5%.
Hicoria mucky sand (19)	C/D	Nearly level to gently sloping very poorly drained soil and depth to SHWT of 3 to 18 inches with percentage of 4%.
Malabar fine sand (17,6)	A/D	Nearly level to gently sloping very poorly drained soil and depth to SHWT of 0 inches with percentage of 2%.
Bradenton fine sand (15)	B/D	Nearly level to gently sloping very poorly drained soil and depth to SHWT of 3 to 18 inches with percentage of 1%.
Floridana fine sand (16)	C/D	Nealey level to gently sloping very poorly drained soils and depth to SHWT 0 feet with percentage of 4%.
Pineda-Pineda wet, fine sand (15)	A/D	Nearly level to gently sloping poorly drained soils wand depth to SHWT of 0 inches with percentage of 3%.

Table 2-1 Soil Characteristic

The Soil Survey of Highlands County classifies the majority of soils within the project area as Felda fine sand (13), Valkaria fine sand (16), Basinger fine sand (12), Immokalee sand (8), Tequesta muck (26), Kaliga muck (18), Hicoria mucky sand (19), Malabar fine sand (17), and Bradenton fine sand (15). The Soil Survey of Glades County classifies the majority of soils within the project area as Felda fine sand (10), Basinger fine sand (14), Floridana fine sand (16), Pineda-Pineda wet, fine sand (15), Malabar fine sand (6), and Valkaria fine sand (4). Felda fine sand (13,10) is described as nearly level to gently sloping poorly drained soils with Hydrologic Soil Group (HSG) Type A/D and depth to Seasonal High-Water Table (SHWT) of 3 to 18 inches. Basinger fine sand (14,12) is described as nearly level to gently sloping poorly drained soils with HSG Type A/D and depth to SHWT of 0 to 12 inches. Valkaria fine sand (16,4) is described as nearly level to gently sloping poorly drained soils with HSG Type A/D and depth to SHWT of 3 to 18 inches. Immokalee sand is described as nearly level to gently sloping poorly drained soils with HSG Type B/D and depth to SHWT of 6 to 18 inches. Tequesta muck (26) is described as

nearly level to gently sloping very poorly drained soils with HSG Type A/D and depth to water table of 0 inches. Kaliga muck (18) is described as nearly level to gently sloping very poorly drained soils with HSG Type C/D and depth to SHWT of 0 inches. Floridana fine sand (16) is described as nearly level to gently sloping very poorly drained soils with HSG type C/D and depth to SHWT 0 feet. Hicoria mucky sand (19) is described as nearly level to gently sloping very poorly drained soils with HSG Type C/D and depth to SHWT of 0 inches. Pineda-Pindeda wet, fine sand (15) is described as nearly level to gently sloping poorly drained soils with HSG Type A/D and depth to SHWT of 0 inches. Malabar fine sand (17,6) is described as nearly level to gently sloping poorly drained soils with HSG Type A/D and depth to SHWT of 3 to 18 inches. Bradenton fine sand (15) is described as nearly level to gently sloping poorly drained soils with HSG Type B/D and depth to SHWT of 3 to 18 inches. The percentages of each soil are as follows: Felda (34%), Basinger (14%), Valkaria (12%), Immokalee (8%), Tequesta (6%), Kaliga (5%), Floridana (4%), Hicoria (4%), Pineda-Pineda (3%), Malabar (5%), Bradenton (1%). Refer to **Appendix H, H-1** for the complete National Resources Conservation Services (NRCS) Custom Soil Resource Report.

2.2 LAND USE

The existing land use within the project corridor is characterized by: Low Density, <2 dwelling units/acre (110), Commercial and Services (140), Improved Pastures (211), Unimproved Pastures (212), Row Crops (214), Sugar Cane (215), Citrus Groves (221), Abandoned Groves (224), Herbaceous (Dry Prairie) (310), Upland Shrub and Brushland (320), Oak – Cabbage Palm Forest (427), Cabbage Palm (428), Channelized Waterways, Canals (512), Streams and Waterways (510), Reservoirs (530), Bay Swamps (611), Mixed Shrubs (617), Cabbage Palm Wetland (618), Freshwater Marshes/Graminoid Prairie – Marsh (641), Wet Prairie (643), Emergent Aquatic Vegetation (644), Roads and Highways (810). Detailed land use information is presented in **Appendix A, A-3 - A-9.**

2.3 FEMA FLOODPLAIN INFORMATION

The project site is located in the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community-Panel Numbers 12055C0555C, 12055C0560C, and 12055C0580C (effective date November 18, 2015) in Highlands County and Community-Panel Numbers 12043C0025C and 12043C0050C (effective date September 26, 2014) in Glades County. The project does not include any FEMA floodways. The proposed alignment impacts several areas designated as Zone A, which are areas of the 100-year floodplain where the base flood elevation has not been determined. Refer to **Appendix F, F-1** for complete FIRM maps.

2.4 DRAINAGE REFERENCE AND RESOURCE INFORMATION

The following sources were used to locate and size the floodplain compensation sites:

- FDOT Drainage Manual 2025
- FDOT Drainage Design Guide 2025
- South Florida Water Management District Environmental Resource Permit (SFWMD ERP) Applicant's Handbook II

- Contours derived from Lidar, National Oceanic and Atmospheric Administration (NOAA) 2018
- United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Highlands County, Florida, August 2023
- USDA SCS Soil Survey of Glades County, Florida, September 2023
- United States Geological Survey (USGS) Quadrangle Maps
- FEMA FIRM, effective November 18, 2015 (12055C0555C, 12055C0560C, and 12055C0580C)
- FEMA FIRM, effective September 26, 2014 (12043C0025C and 12043C0050C)
- Preliminary Cultural Resource Assessment Probability Analysis for Proposed Pond Sites
- Contamination Technical Memorandum
- Wetland and Protected Species Evaluation

SECTION 3 EXISTING DRAINAGE CHARACTERISTICS

3.1 WATERSHED DESCRIPTIONS

SR 70 is currently a two-lane undivided roadway that drains through roadside ditches to the seven existing cross drains within the project limits. Stormwater ultimately discharges to canals along the north and south sides of the roadway. The projects falls within the Upper Bay Swamp and North Indian Prairie Canal watersheds **(See Appendix A, A-10)** of the South Florida Water Management District (SFWMD) with ultimate outfalls to the Harney Pond Canal Water Body Identification number (WBID 3204) and the Indian Prairie Canal (WBID 3206) both of which are impaired for nutrients **(See Appendix A, A-11)**. There are no existing stormwater management facilities present on or offsite. The existing drainage patterns were determined using United States Geological Survey (USGS) quadrangle maps and LiDAR contours.

3.2 CROSS DRAINS

There are seven existing cross drains along the existing SR 70 alignment. Refer to **Table 3-1** for a description of the existing cross drains. Photos of the documented cross drains taken in May 2024 can be located in **Appendix D, D-1**. These cross drains are also labeled on the FDOT Straight Line Diagram provided in **Appendix E, E-1**.

No.	MP	Station	Existing Description
CD-1	22.645	2 - 295+69.58	84” PIPE
CD-2	23.941	2 - 364+04.00	84” PIPE
CD-3	25.785	2 - 461+03.69	60” PIPE
CD-4	27.391	2 - 546+89.24	2-9’x7’ CBC
CD-5	27.950	2 - 576+39.76	18” PIPE
CD-6	27.977	2 - 577+81.93	2-7’x5’ CBC
CD-7	29.253	2 - 651+23.51	24” PIPE

Table 3-1 Existing Cross Drain Summary

SECTION 4 PROPOSED DRAINAGE CHARACTERISTICS

4.1 DESIGN

Stormwater runoff from SR 70 will be collected and conveyed to stormwater management facilities through roadside swales. These stormwater management facilities will provide water quality (treatment) and water quantity (attenuation). The design of the drainage and stormwater facilities will comply with the standards set forth by the FDOT Drainage Manual, FDOT Drainage Design Guide, and the SFWMD ERP Applicant's Handbook II. For more information regarding the proposed drainage design, refer to the **SR 70 PD&E Study Pond Siting Report (KCA)**.

4.2 FLOODPLAIN IMPACTS

Impacts to the 100-year floodplain will occur in three ways:

- Transverse impacts resulting from cross drain extensions and bridge widening.
- Longitudinal impacts resulting from the road widening in areas of 100-year floodplain.
- Impacts due to stormwater management facilities located adjacent to wetland and storage areas.

All of the anticipated impacts to the floodplain occur in Zone A which does not have a determined base floodplain elevation and a study has not been conducted. Using available resources and best engineering judgement, base flood elevations were determined at various points along the proposed alignment. It is estimated there will be approximately 166 acres per foot of encroachment into the floodplain due to proposed improvements. See **Appendix G, G-2 to G-19** for encroachment calculations.

4.3 FLOODPLAIN COMPENSATION

Floodplain compensation sites will be required to offset the floodplain impacts located along the project corridor. Aerial photographs, field reconnaissance, and information from the Highlands County and Glades County Property Appraiser websites were used to locate these compensation sites. During the design phase of the project, FPC configurations may vary from the assumptions in this report based on actual conditions. Compensation for floodplain impacts will be provided in floodplain compensation ponds to show no adverse floodplain stage increases.

Compensation sites will be located in a total of six basins and will contain two alternatives per basin. Compensation calculations are provided in **Appendix G, (G-20 to G-25)** and a summary of encroachment/compensation within the floodplain is located in **Appendix G, G-1**. Additionally, alternative sites are depicted in **Appendix I**.

4.4 CROSS DRAINS

The proposed typical section will require increasing the size of all the existing cross drains. However, they will all remain in their current location. Refer to **Table 4-1** for a description of the proposed cross drains. Cross drain characteristics have been analyzed in the existing and proposed condition using the modeling program HY-8. Refer to **Appendix C, C-1** for the Cross Drain Analysis in the existing condition and **Appendix C, C-73** for the Cross Drain Analysis in the developed condition.

No.	MP	Station	Proposed Description
CD-1	22.645	295+69.58	90” PIPE
CD-2	23.941	364+04.00	90” PIPE
CD-3	25.785	461+03.69	66” PIPE
CD-4	27.391	546+89.24	2-10’x7’ CBC
CD-5	27.950	576+39.76	24” PIPE
CD-6	27.977	577+81.93	2-8’x6’ CBC
CD-7	29.253	651+23.51	30” PIPE

Table 4-1 Proposed Cross Drain Summary

SECTION 5 RISK EVALUATION

The proposed improvements include floodplain impact reduction measures such as the relocation and widening of the existing canals, addition of floodplain compensation areas, and modification of existing cross drains to improve overall watershed flow within the project corridor.

There is no change in flood risk or floodplain impacts associated with this project. The following floodplain statement is a slightly modified version of statement Number 4 in the FDOT *PD&E Manual* (see part 2, Chapter 13), tailored for this project:

The construction of fill within the floodplain and the modification of existing drainage structures for this project will be mitigated by floodplain compensation where required. The proposed structures will perform hydraulically in a manner equal to or better than the existing structures, and backwater surface elevations are not expected to increase. These changes may cause minimal increases in flood heights and flood limits; however, will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant changes in flood risk or damage. There will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. In fact, construction of the proposed project will greatly enhance existing evacuation facilities in the area. Therefore, it has been determined that this encroachment is not significant.

SECTION 6 PD&E MANUAL REQUIREMENTS WITH MINIMAL ENCROACHMENT

The following items must be addressed per Part 2, Chapter 13.2.2.5, FDOT Project Development & Environment Manual, to document the anticipated impacts and risks associated with encroachment classified as "minimal";

1. The history of flooding of the existing facilities and/or measures to minimize any impacts due to the proposed improvements;

   There does not appear to be a history of flooding of the existing facilities. Floodplain compensation areas will be constructed to mitigate the loss of storage due to the proposed improvements. The project will have no adverse impact on the existing condition.

2. Determination of whether the encroachment is longitudinal or transverse, and if it is a longitudinal encroachment an evaluation and discussion of practicable avoidance alternatives;

   There will be both longitudinal and transverse impacts to the floodplain due to the proposed improvements. Maximum allowable roadway embankment slopes will be used to minimize longitudinal impacts. With the roadway bisecting these areas of floodplain, there are no economically feasible avoidance alternatives.

3. The practicability of avoidance alternatives and/or measures to minimize impacts;

   The project design will make every effort to minimize the floodplain impacts resulting from the required roadway fill. The maximum allowable roadway embankment slopes will be used within the floodplain areas to minimize the floodplain impacts. Floodplain impacts will be compensated by constructing floodplain compensation areas.

4. Impact of the proposed improvements on emergency services and evacuation;

   This project is being proposed to improve traffic safety conditions, emergency evacuation, and incident response times through additional travel lanes. The proposed cross drains and floodplain compensation areas will perform hydraulically in a manner equal to or greater than the existing condition, and backwater surface elevations are not expected to increase. As a result, there will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or in emergency evacuation routes.

5. Impacts of the proposed improvement on the base flood, likelihood of flood risk, overtopping, location of overtopping, backwater, etc.;

   The proposed cross drains and floodplain compensation areas will perform hydraulically in a manner equal to or greater than the existing condition, and backwater surface elevations are not expected to increase. As a result, there will be no significant change in flood risk or overtopping.

6. Determination of the impact of the proposed improvements on regulatory floodways, if any, and documentation of coordination with FEMA and local agencies to determine the project's consistency with the regulatory floodway.

   There are no regulatory floodway within the limits of the project.

7. The impacts on natural and beneficial floodplain values, and measures to restore and preserve these values (this information may also be addressed as part of the wetland impact evaluation and recommendations);

   See the SR 70 From Lonesome Island Road to the Southern Leg of CR 721 PD&E Study Pond Siting Report, Wetland and Protected Species Evaluation – Appendix K.

8. Consistency of the proposed improvements with the local floodplain development plan or the land use elements in the Comprehensive Plan, and the potential of encouraging development in the base floodplain;

   The project will remain consistent with local floodplain development plans. The project will not support base floodplain development that is incompatible with existing floodplain management programs.

9. A map showing project, location and impacted floodplains. Copies of applicable FIRM maps should be included in the appendix;

   Copies of applicable FIRM maps are included in Appendix F.

10. Results of any and all project risk assessments performed;

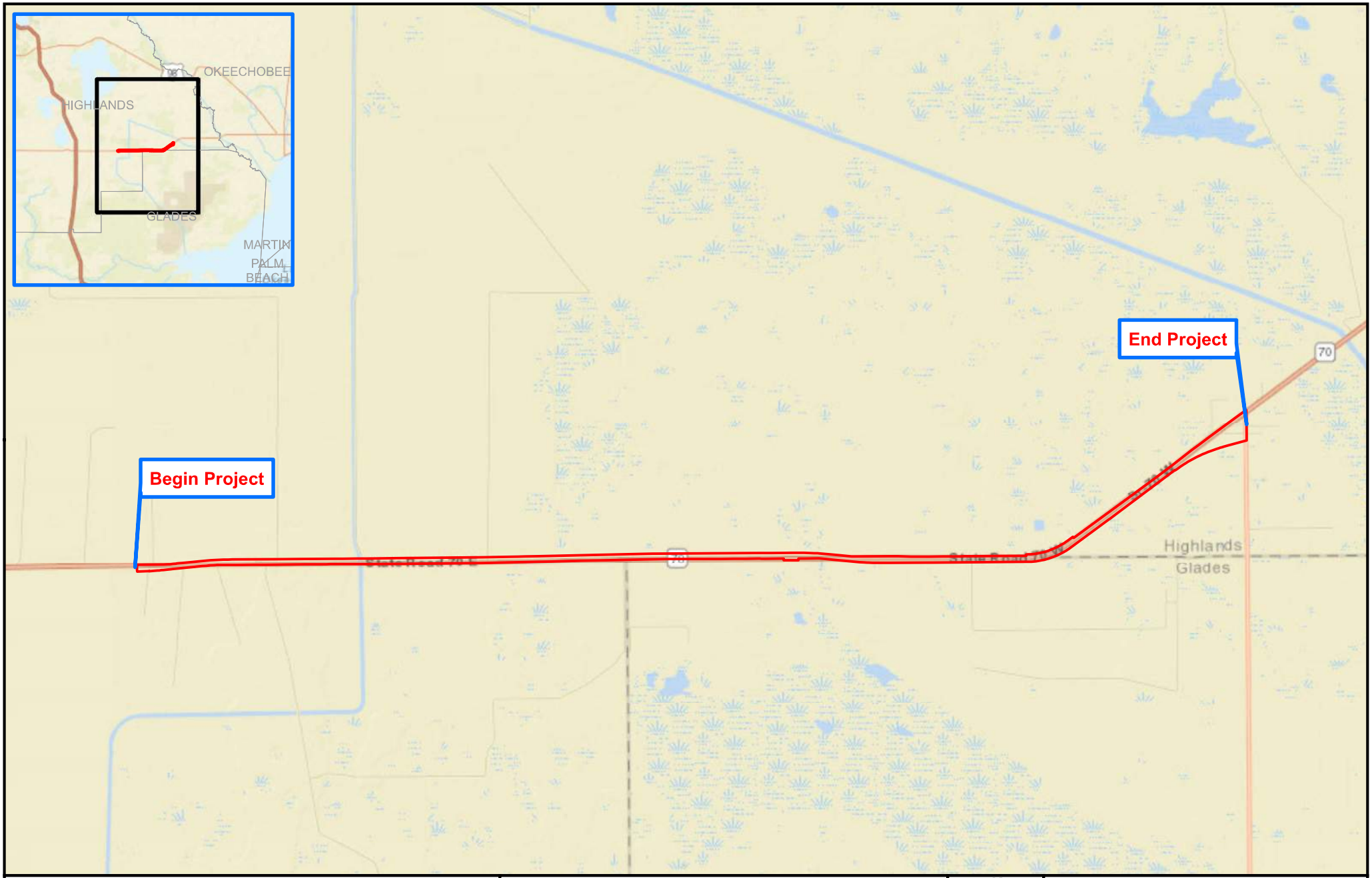
    The proposed cross drains and floodplain compensation areas will perform hydraulically in a manner equal to or greater than the existing condition, and backwater surface elevations are not expected to increase. As a result, there will be no significant change in flood risk.

SECTION 7 CONCLUSIONS

The widening of the SR 70 roadway will result in an insignificant change in the capacity to carry floodwater. This change will cause no increases in flood heights and flood limits through the proposed cross drains and floodplain compensation areas. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in flood risks or damage. There will be no significant change in potential interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

APPENDIX A

Figures



Legend

Project Area

Project Location Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
FPID No. 449851-1-22-01

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Feet

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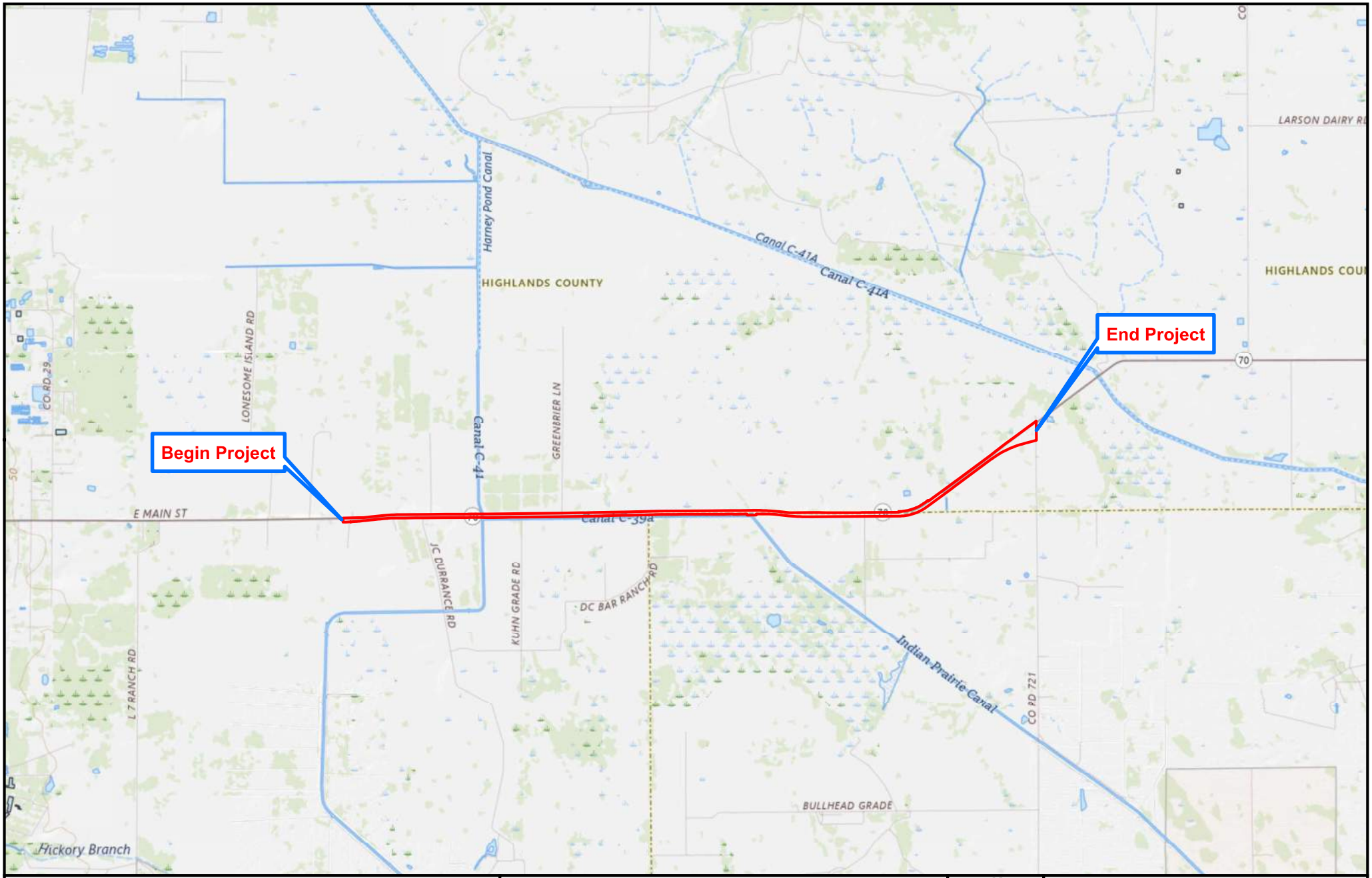

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Project Area

USGS Quadrangle Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
FPID No. 449851-1-22-01

N W E S

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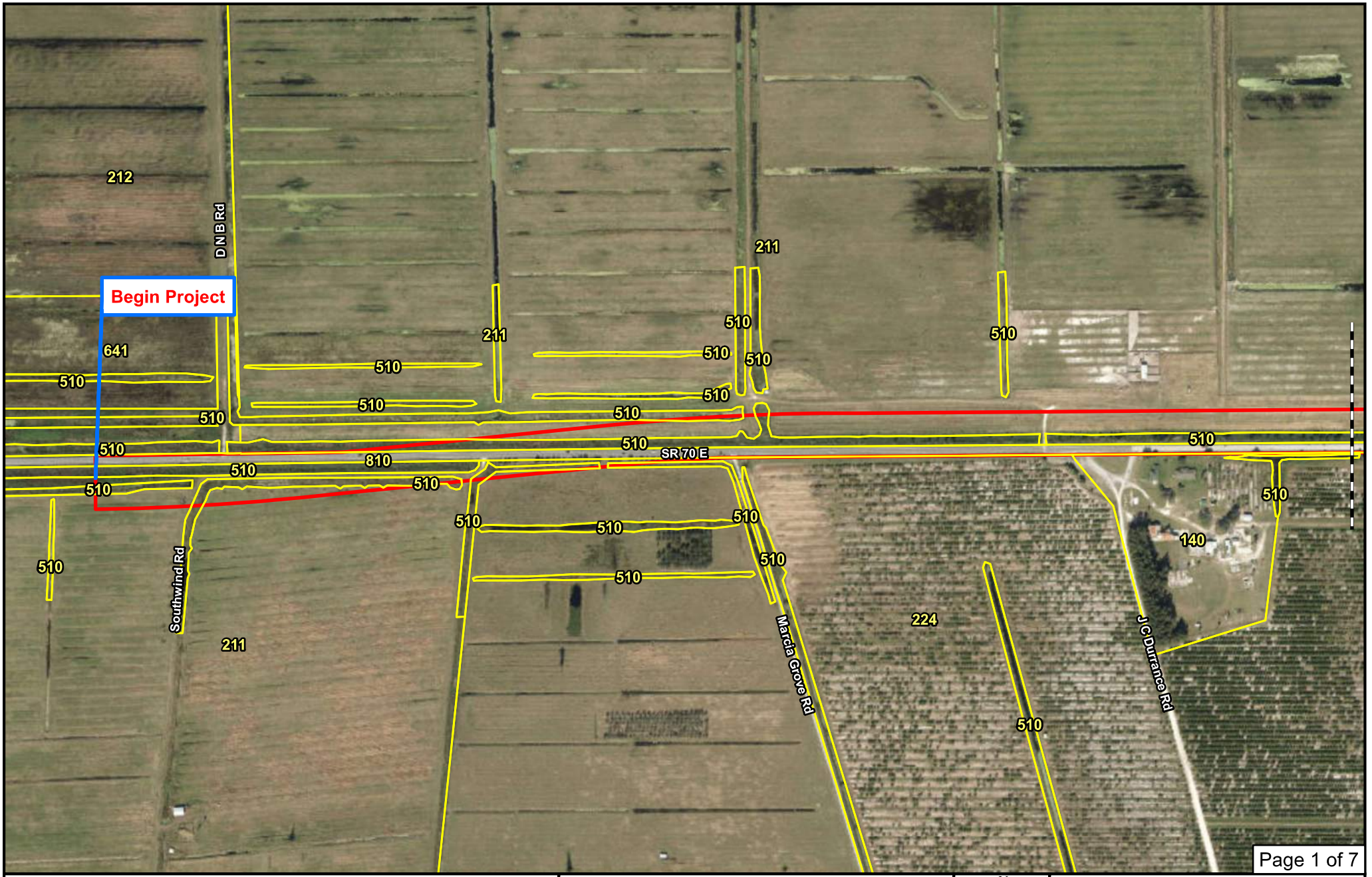

Legend

- Project Area
- 140: Commercial and Services
- 211: Improved Pastures
- 212: Unimproved Pastures
- 224: Abandoned Groves
- 510: Streams and Waterways
- 641: Freshwater Marshes / Graminoid Prairie - Marsh
- 810: Roads and Highways

FLUCFCS Land Use Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
FPID No. 449851-1-22-01

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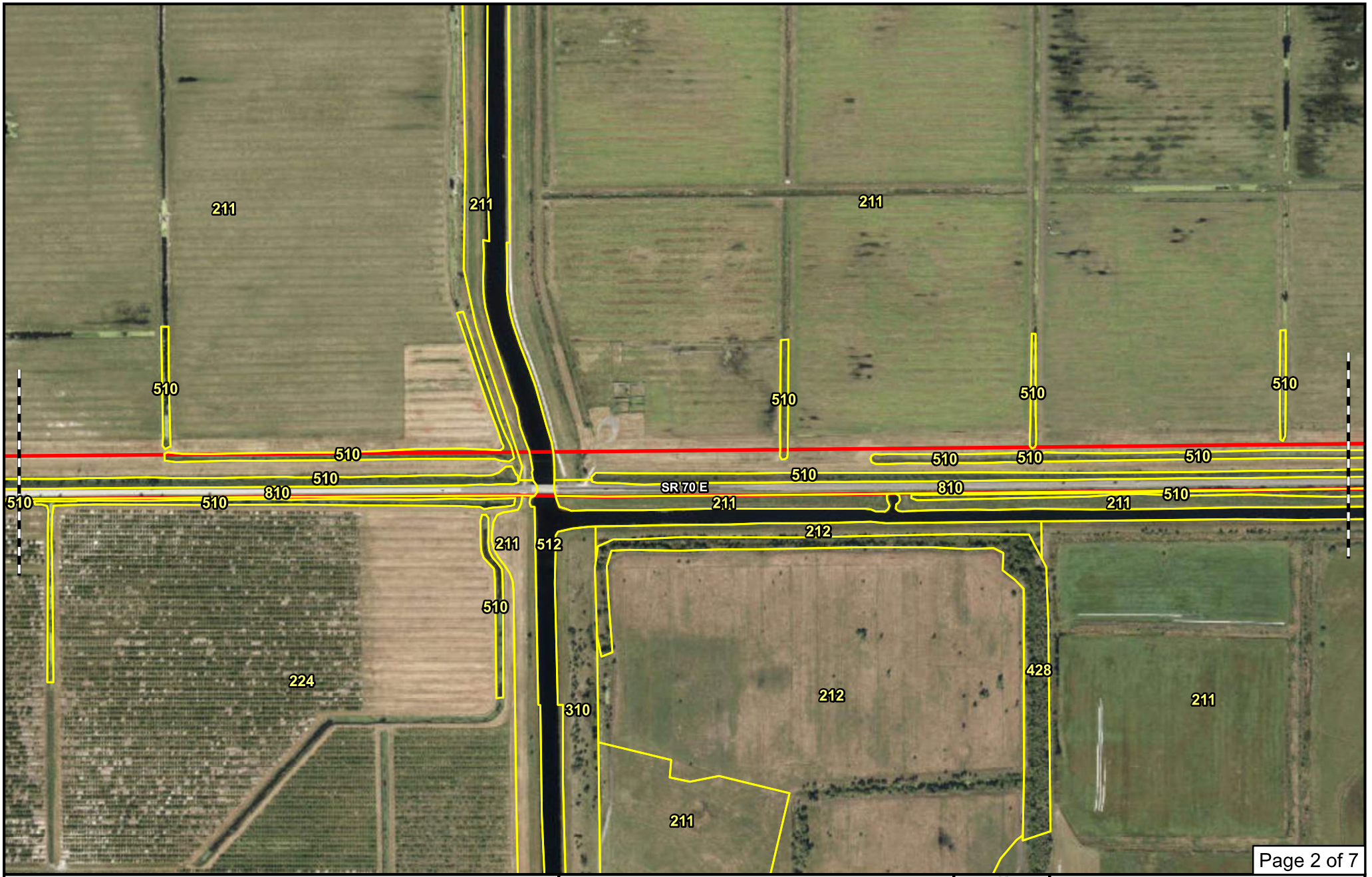

Page 2 of 7

Legend

- Project Area
- 211: Improved Pastures
- 212: Unimproved Pastures
- 224: Abandoned Groves
- 310: Herbaceous (Dry Prairie)
- 428: Cabbage Palm
- 510: Streams and Waterways
- 512: Channelized Waterways, Canals
- 810: Roads and Highways

FLUCFCS Land Use Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
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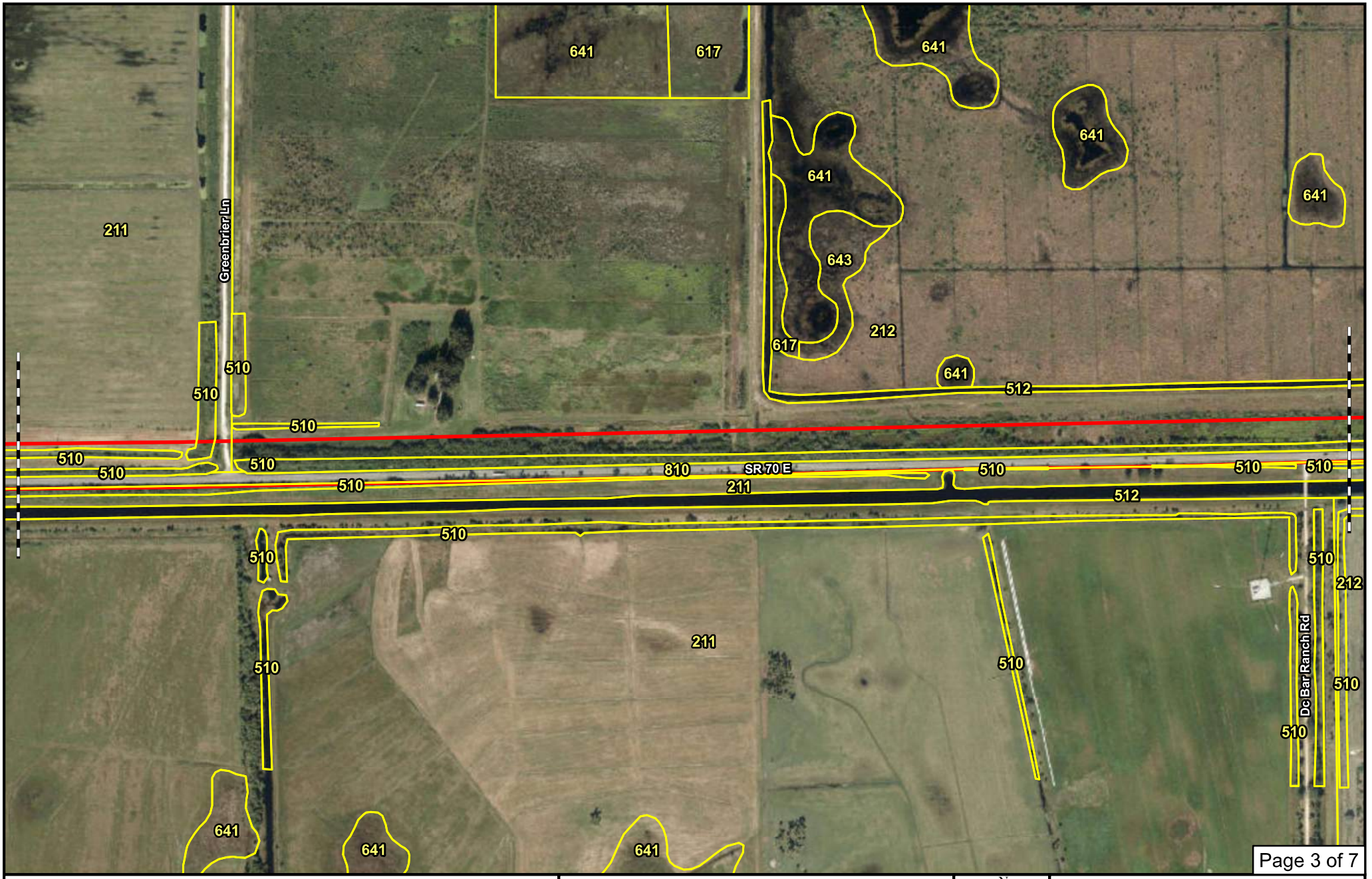

Legend

- Project Area
- 211: Improved Pastures
- 212: Unimproved Pastures
- 510: Streams and Waterways
- 512: Channelized Waterways, Canals
- 617: Mixed Shrubs
- 641: Freshwater Marshes / Graminoid Prairie - Marsh
- 643: Wet Prairie
- 810: Roads and Highways

FLUCFCS Land Use Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
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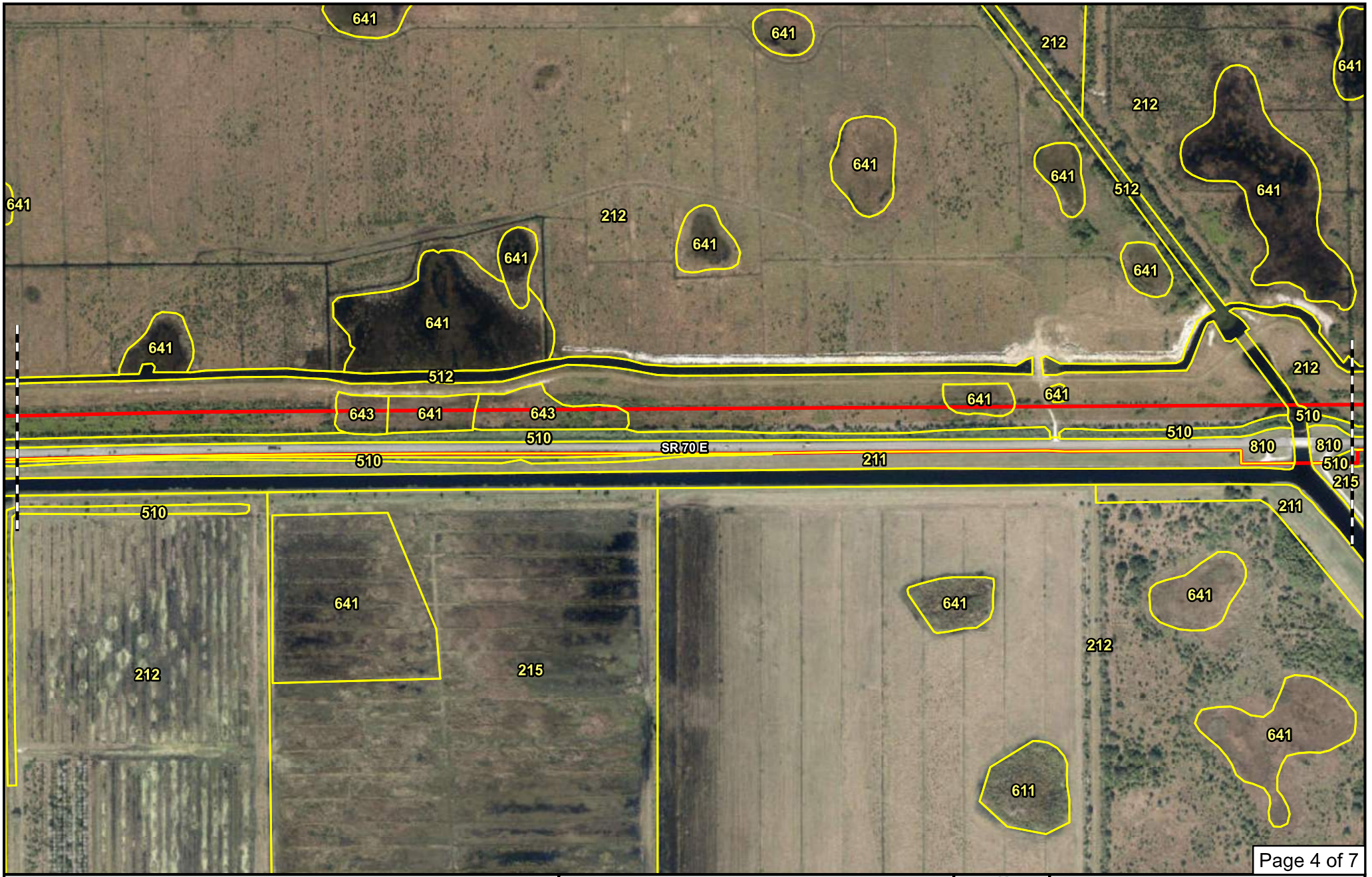

Page 4 of 7

Legend

- Project Area
- 211: Improved Pastures
- 212: Unimproved Pastures
- 215: Sugar Cane
- 510: Streams and Waterways
- 512: Channelized Waterways, Canals
- 611: Bay Swamps
- 641: Freshwater Marshes / Graminoid Prairie - Marsh
- 643: Wet Prairie
- 810: Roads and Highways

FLUCFCS Land Use Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
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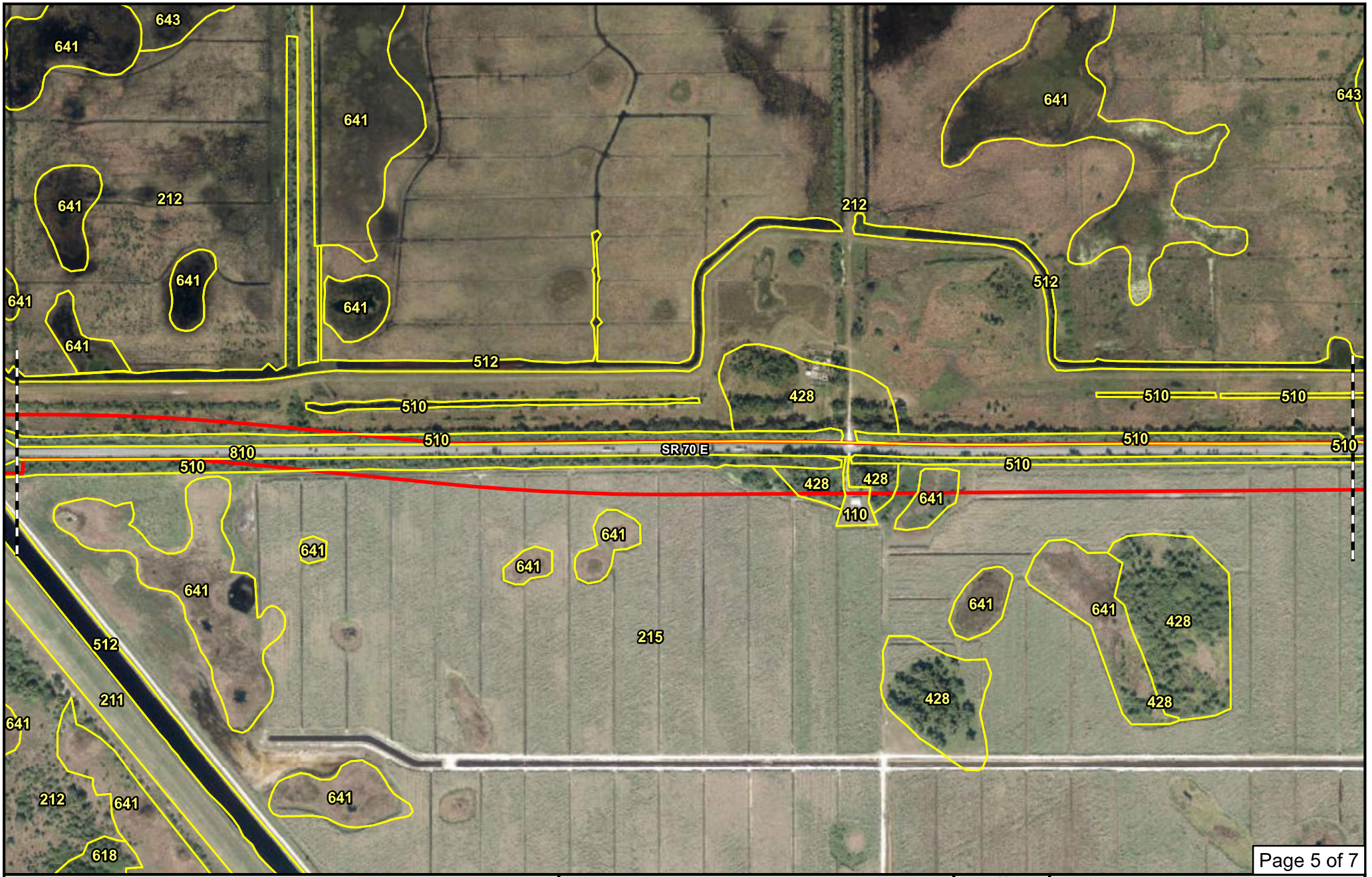

Legend

- Project Area
- 110: Low Density, <2 dwelling units/acre
- 211: Improved Pastures
- 212: Unimproved Pastures
- 215: Sugar Cane
- 428: Cabbage Palm
- 510: Streams and Waterways
- 512: Channelized Waterways, Canals
- 618: Cabbage Palm Wetland
- 641: Freshwater Marshes / Graminoid Prairie - Marsh
- 643: Wet Prairie
- 810: Roads and Highways

FLUCFCS Land Use Map

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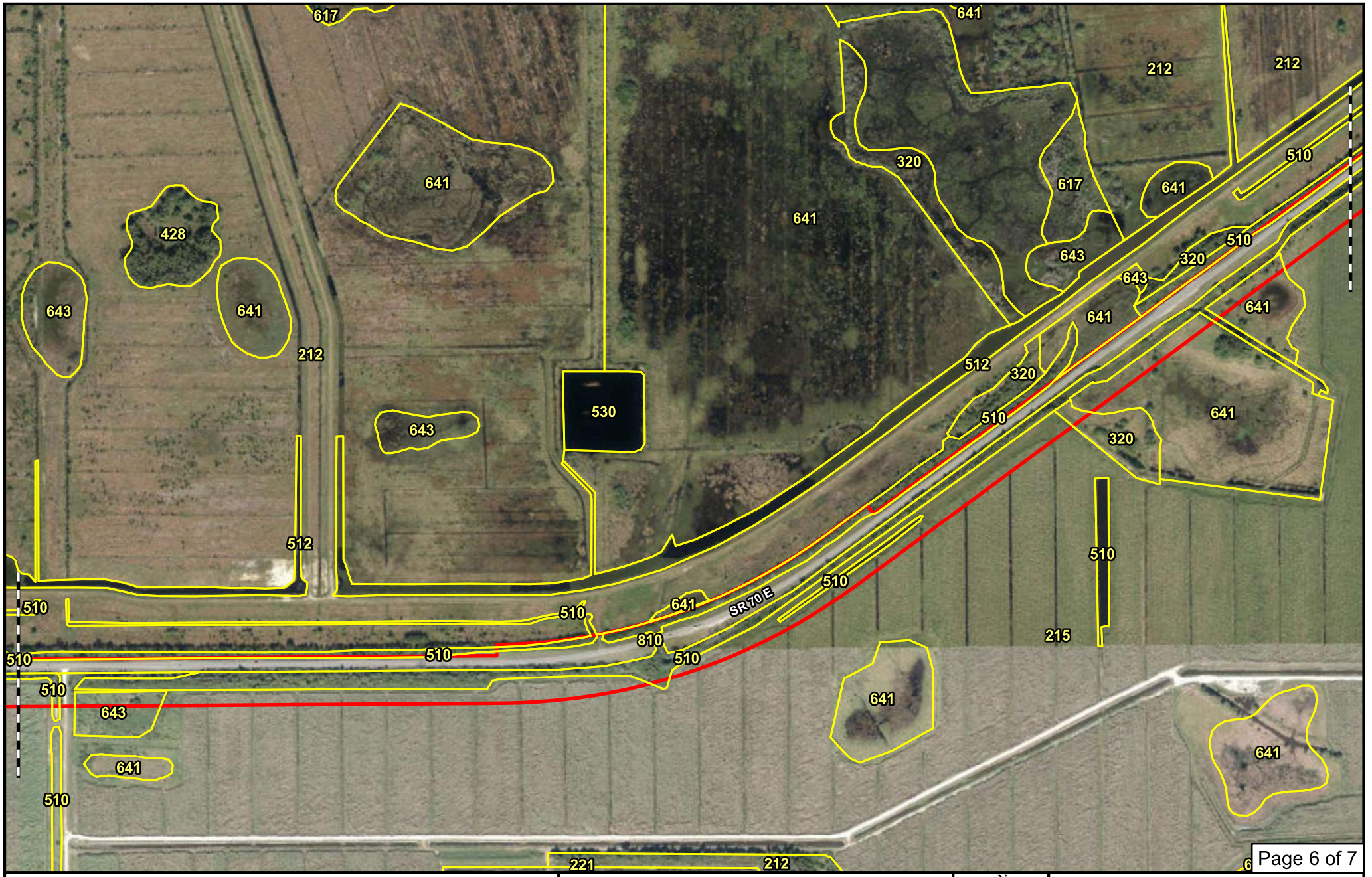

Legend

- Project Area
- 212: Unimproved Pastures
- 215: Sugar Cane
- 221: Citrus Groves
- 320: Upland Shrub and Brushland
- 428: Cabbage Palm
- 510: Streams and Waterways
- 512: Channelized Waterways, Canals
- 530: Reservoirs
- 617: Mixed Shrubs
- 641: Freshwater Marshes / Graminoid Prairie - Marsh
- 643: Wet Prairie
- 810: Roads and Highways

FLUCFCS Land Use Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
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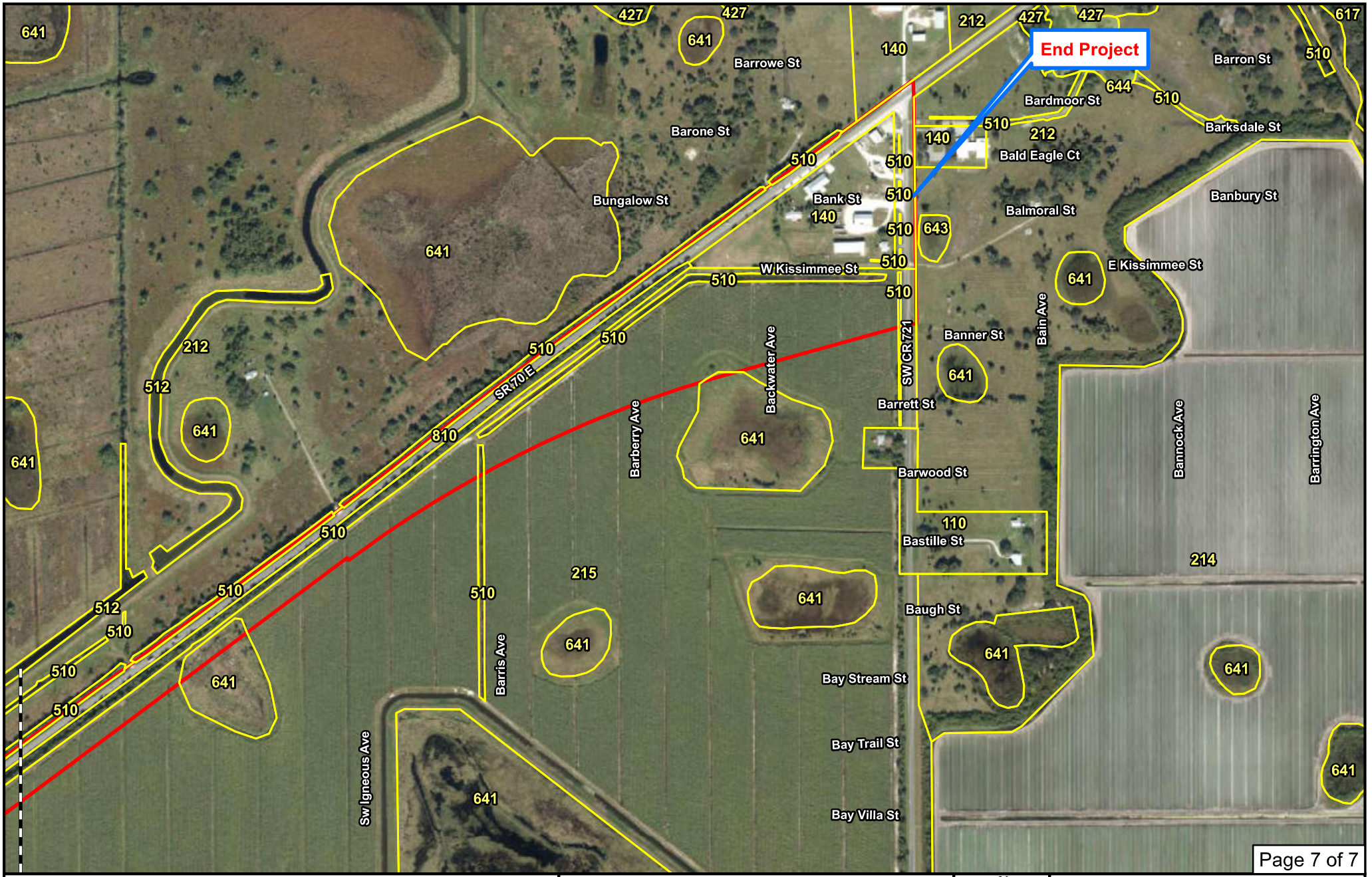

Legend

- Project Area
- 110: Low Density, <2 dwelling units/acre
- 140: Commercial and Services
- 212: Unimproved Pastures
- 214: Row Crops
- 215: Sugar Cane
- 427: Oak - Cabbage Palm Forest
- 510: Streams and Waterways
- 512: Channelized Waterways, Canals
- 617: Mixed Shrubs
- 641: Freshwater Marshes / Graminoid Prairie - Marsh
- 643: Wet Prairie
- 644: Emergent Aquatic Vegetation
- 810: Roads and Highways

FLUCFCS Land Use Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
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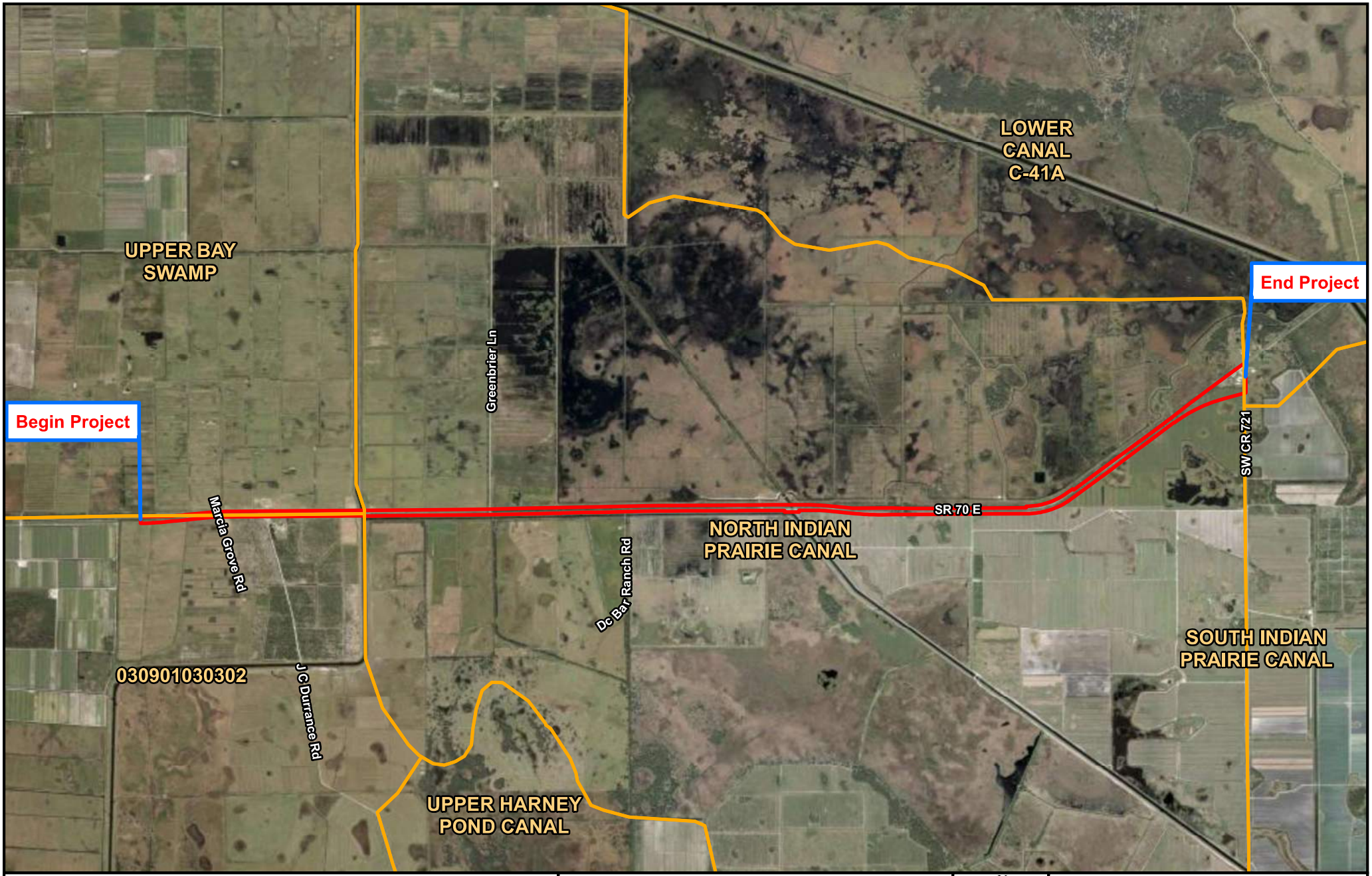

Legend

- Project Area
- Waterhsed Boundary

Watershed Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
FPID No. 449851-1-22-01

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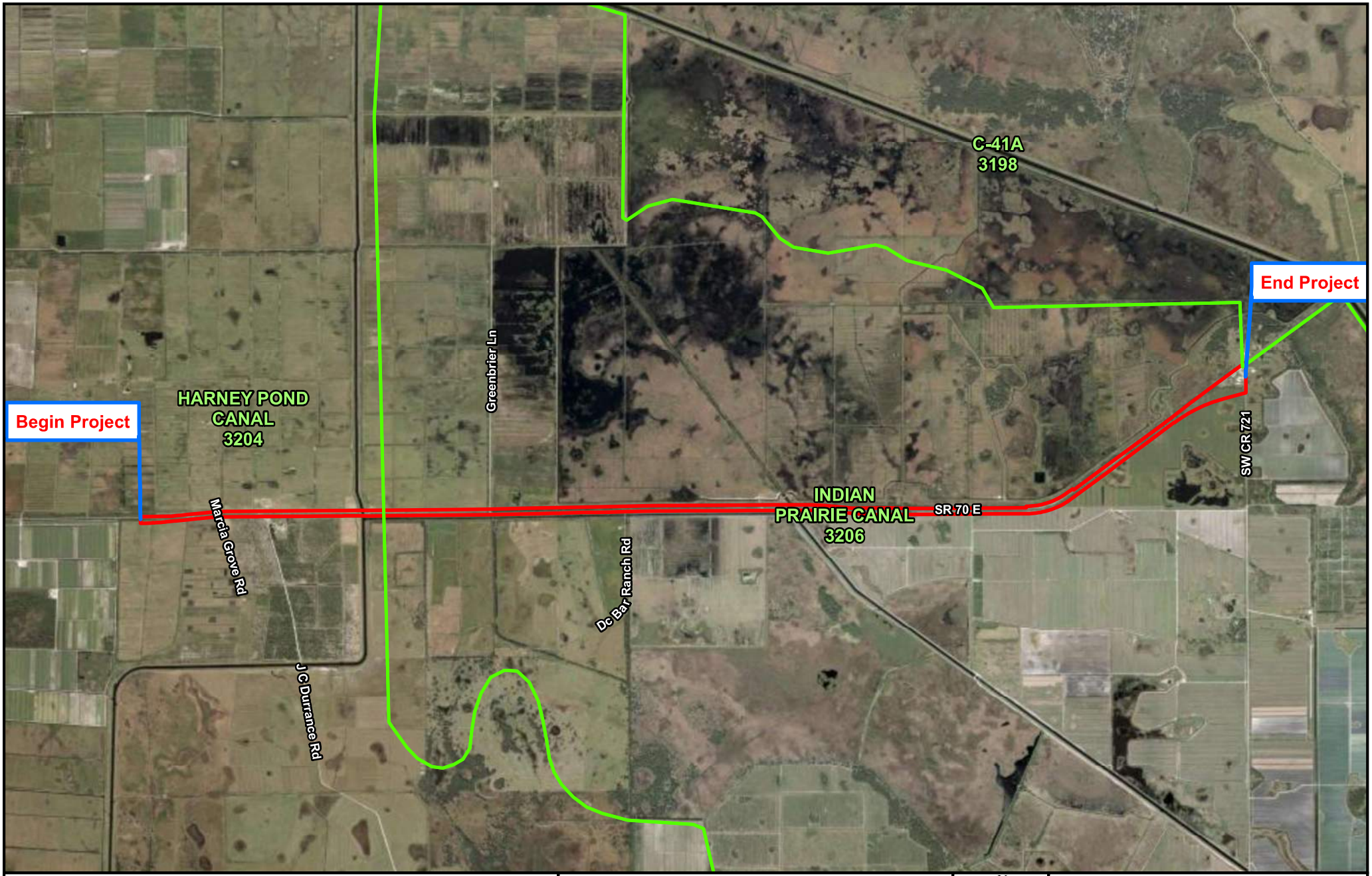

Legend

- Project Area
- WBID Boundary

WBID Map

SR 70 from Lonesome Island Road to CR 721

Highlands County, Florida
FPID No. 449851-1-22-01

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APPENDIX B

Correspondence

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APPENDIX C

Cross Drain Analysis

HY-8 Culvert Analysis Report

Pre-Condition

HY-8 Culvert Analysis Report (CD-1 PRE)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 231.00 cfs

Design Flow: 289.00 cfs

Maximum Flow: 486.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-1 PRE

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
31.24	231.00	231.00	0.00	1
31.60	256.50	256.50	0.00	1
32.05	289.00	285.78	3.04	12
32.14	307.50	291.49	15.66	6
32.24	333.00	297.50	35.35	6
32.33	358.50	302.46	55.82	5
32.40	384.00	306.87	77.00	5
32.47	409.50	310.88	98.25	4
32.54	435.00	314.67	120.08	4
32.60	460.50	318.22	142.11	4
32.66	486.00	321.58	164.30	4
32.00	282.81	282.81	0.00	Overtopping

Rating Curve Plot for Crossing: CD-1 PRE

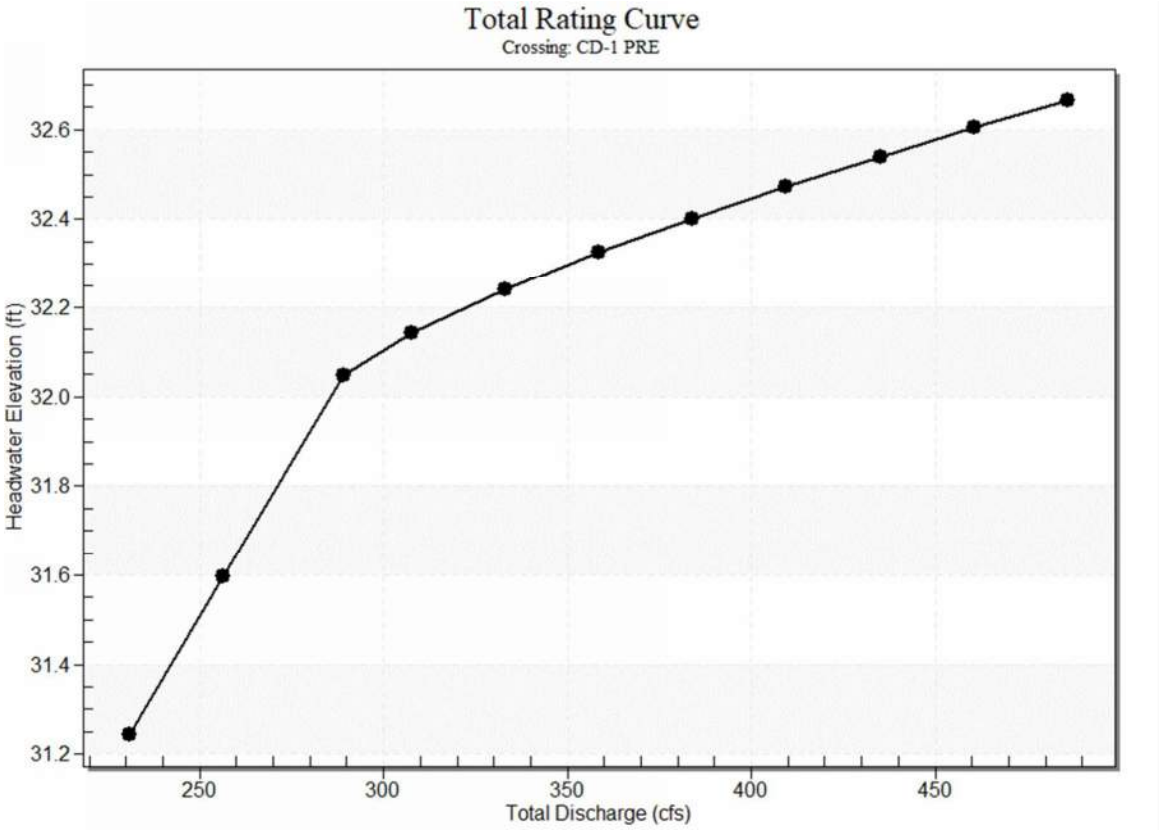


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
231.00	231.00	31.24	6.44	8.264	4-FFf	7.00	3.98	7.00	7.00	6.00	0.00
256.50	256.50	31.60	6.94	8.617	4-FFf	7.00	4.20	7.00	7.00	6.67	0.00
289.00	285.78	32.05	7.55	9.068	4-FFf	7.00	4.44	7.00	7.00	7.43	0.00
307.50	291.49	32.14	7.67	9.161	4-FFf	7.00	4.49	7.00	7.00	7.57	0.00
333.00	297.50	32.24	7.80	9.262	4-FFf	7.00	4.54	7.00	7.00	7.73	0.00
358.50	302.46	32.33	7.91	9.346	4-FFf	7.00	4.58	7.00	7.00	7.86	0.00
384.00	306.87	32.40	8.01	9.423	4-FFf	7.00	4.61	7.00	7.00	7.97	0.00
409.50	310.88	32.47	8.09	9.493	4-FFf	7.00	4.64	7.00	7.00	8.08	0.00
435.00	314.67	32.54	8.18	9.560	4-FFf	7.00	4.67	7.00	7.00	8.18	0.00
460.50	318.22	32.60	8.26	9.624	4-FFf	7.00	4.70	7.00	7.00	8.27	0.00
486.00	321.58	32.66	8.34	9.685	4-FFf	7.00	4.72	7.00	7.00	8.36	0.00

****

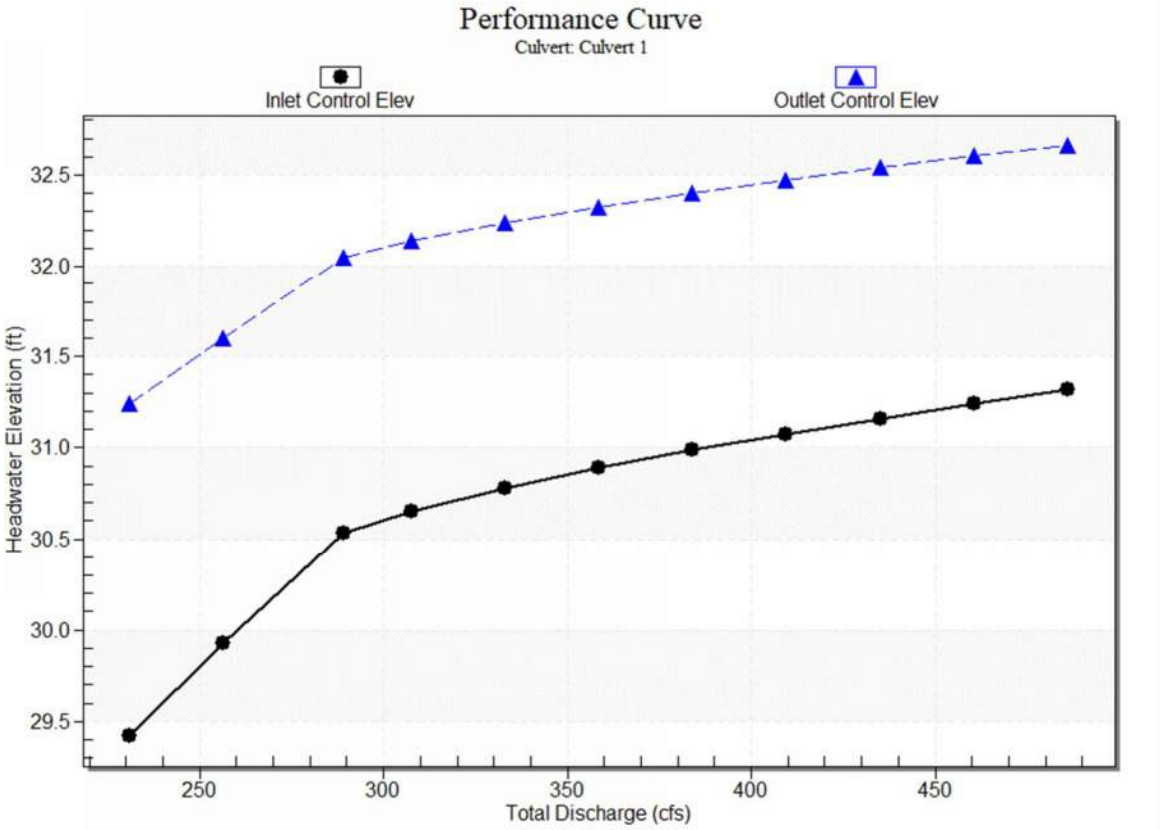
Straight Culvert

Inlet Elevation (invert): 22.98 ft, Outlet Elevation (invert): 22.73 ft

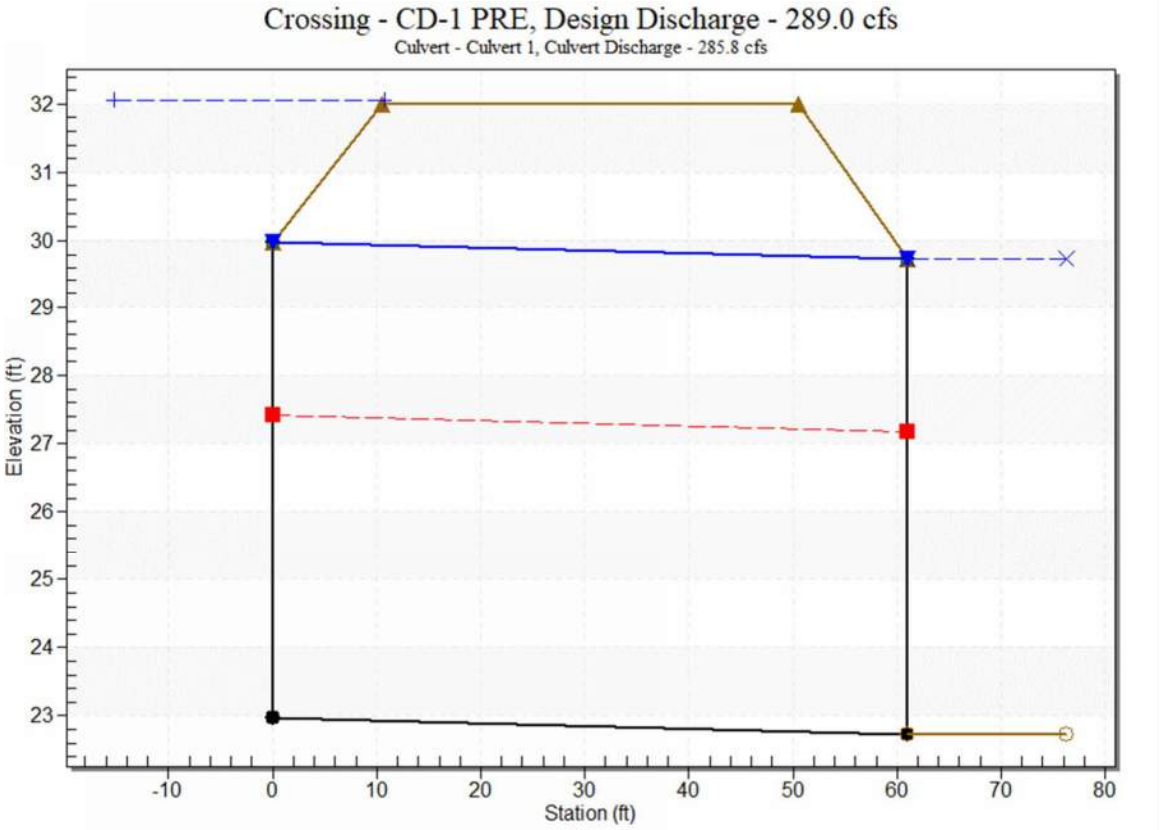
Culvert Length: 61.06 ft, Culvert Slope: 0.0041

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.98 ft

Outlet Station: 61.06 ft

Outlet Elevation: 22.73 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 7.00 ft

Barrel Material: Corrugated Aluminum

Embedment: 0.00 in

Barrel Manning's n: 0.0310

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting (Ke=0.9)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-1 PRE)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
231.00	29.73	7.00
256.50	29.73	7.00
289.00	29.73	7.00
307.50	29.73	7.00
333.00	29.73	7.00
358.50	29.73	7.00
384.00	29.73	7.00
409.50	29.73	7.00
435.00	29.73	7.00
460.50	29.73	7.00
486.00	29.73	7.00

Tailwater Channel Data - CD-1 PRE

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.73 ft

Roadway Data for Crossing: CD-1 PRE

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-2 PRE)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 231.00 cfs

Design Flow: 289.00 cfs

Maximum Flow: 486.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-2 PRE

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
31.31	231.00	231.00	0.00	1
31.66	256.50	256.50	0.00	1
32.07	289.00	283.36	5.33	10
32.16	307.50	288.78	18.43	6
32.25	333.00	294.62	37.99	5
32.34	358.50	299.61	58.69	5
32.41	384.00	304.03	79.85	5
32.48	409.50	308.02	101.13	4
32.55	435.00	311.84	122.92	4
32.61	460.50	315.40	144.94	4
32.67	486.00	318.78	167.11	4
32.00	278.99	278.99	0.00	Overtopping

Rating Curve Plot for Crossing: CD-2 PRE

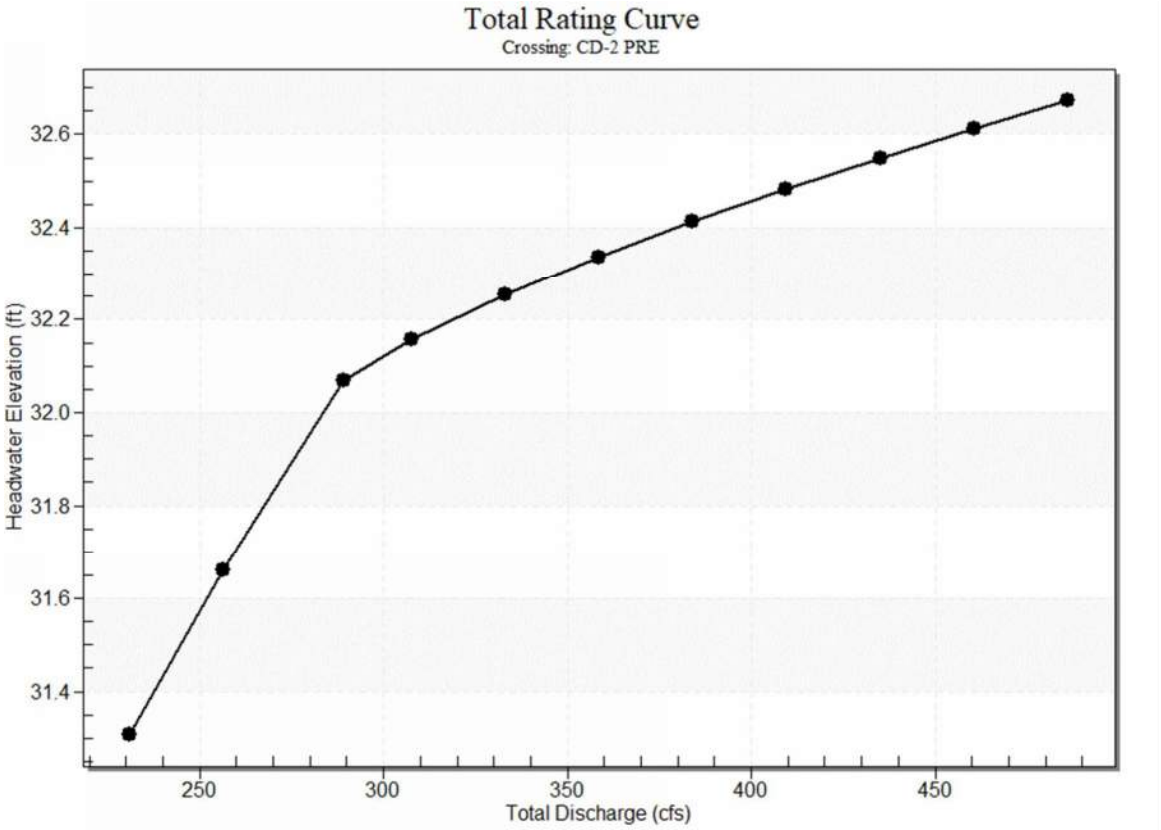


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
231.00	231.00	31.31	6.45	8.488	4-FFf	7.00	3.98	7.00	7.00	6.00	0.00
256.50	256.50	31.66	6.96	8.840	4-FFf	7.00	4.20	7.00	7.00	6.67	0.00
289.00	283.36	32.07	7.51	9.249	4-FFf	7.00	4.42	7.00	7.00	7.36	0.00
307.50	288.78	32.16	7.63	9.337	4-FFf	7.00	4.47	7.00	7.00	7.50	0.00
333.00	294.62	32.25	7.75	9.433	4-FFf	7.00	4.51	7.00	7.00	7.66	0.00
358.50	299.61	32.34	7.86	9.517	4-FFf	7.00	4.55	7.00	7.00	7.79	0.00
384.00	304.03	32.41	7.96	9.593	4-FFf	7.00	4.59	7.00	7.00	7.90	0.00
409.50	308.02	32.48	8.04	9.662	4-FFf	7.00	4.62	7.00	7.00	8.00	0.00
435.00	311.84	32.55	8.13	9.729	4-FFf	7.00	4.65	7.00	7.00	8.10	0.00
460.50	315.40	32.61	8.21	9.792	4-FFf	7.00	4.68	7.00	7.00	8.20	0.00
486.00	318.78	32.67	8.29	9.852	4-FFf	7.00	4.70	7.00	7.00	8.28	0.00

****

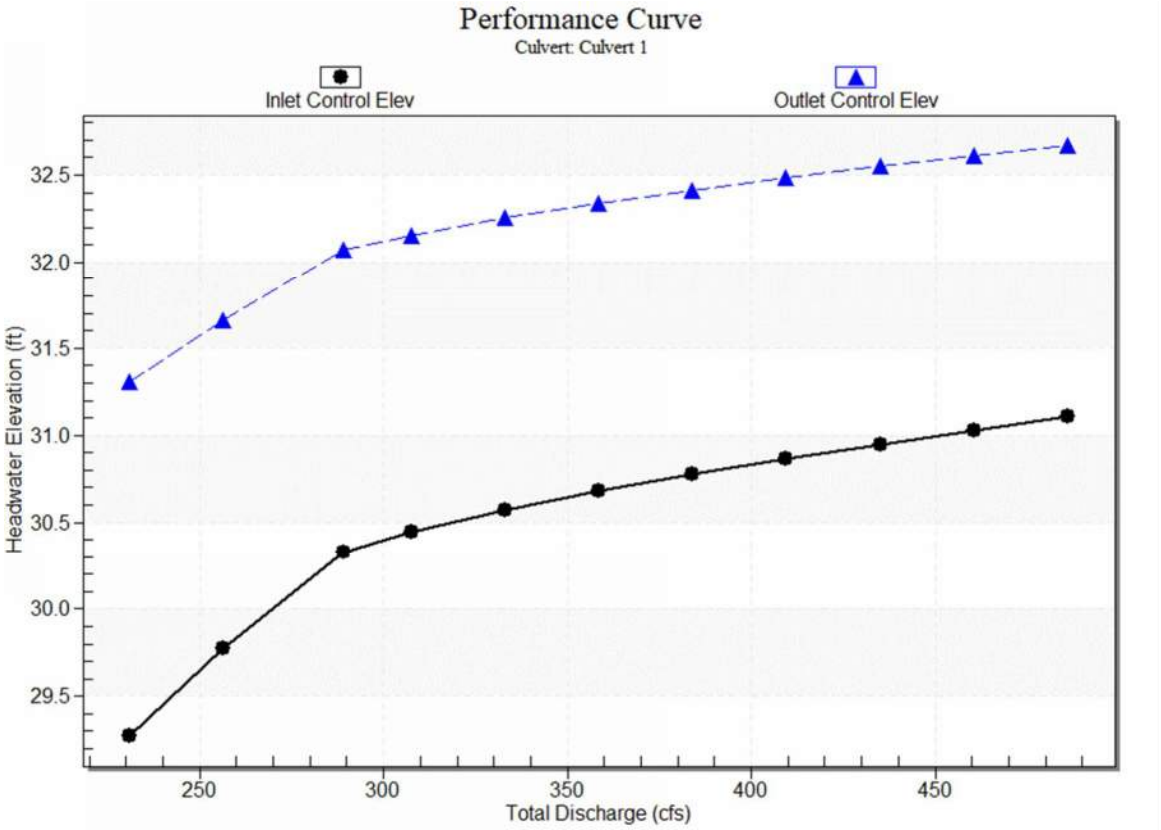
Straight Culvert

Inlet Elevation (invert): 22.82 ft, Outlet Elevation (invert): 22.80 ft

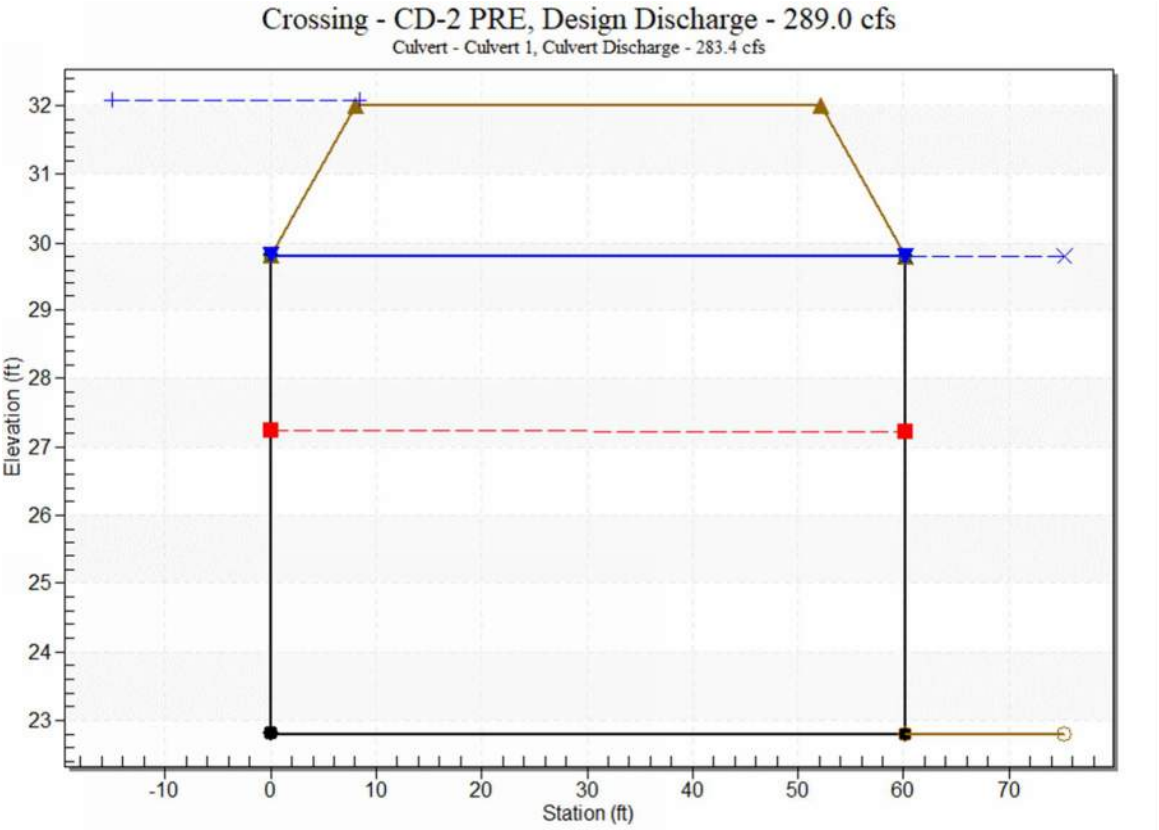
Culvert Length: 60.23 ft, Culvert Slope: 0.0003

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.82 ft

Outlet Station: 60.23 ft

Outlet Elevation: 22.80 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 7.00 ft

Barrel Material: Corrugated Aluminum

Embedment: 0.00 in

Barrel Manning's n: 0.0310

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting (Ke=0.9)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-2 PRE)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
231.00	29.80	7.00
256.50	29.80	7.00
289.00	29.80	7.00
307.50	29.80	7.00
333.00	29.80	7.00
358.50	29.80	7.00
384.00	29.80	7.00
409.50	29.80	7.00
435.00	29.80	7.00
460.50	29.80	7.00
486.00	29.80	7.00

Tailwater Channel Data - CD-2 PRE

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.80 ft

Roadway Data for Crossing: CD-2 PRE

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 44.00 ft

HY-8 Culvert Analysis Report (CD-3 PRE)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 117.60 cfs

Design Flow: 147.00 cfs

Maximum Flow: 425.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-3 PRE

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
29.01	117.60	117.60	0.00	1
30.00	147.00	147.00	0.00	1
31.32	179.08	179.08	0.00	1
32.13	209.82	196.05	13.71	8
32.27	240.56	198.82	41.50	6
32.38	271.30	200.99	70.04	5
32.48	302.04	202.89	99.04	5
32.56	332.78	204.59	127.93	4
32.65	363.52	206.18	157.20	4
32.72	394.26	207.66	186.51	4
32.80	425.00	209.05	215.54	3
32.00	193.42	193.42	0.00	Overtopping

Rating Curve Plot for Crossing: CD-3 PRE

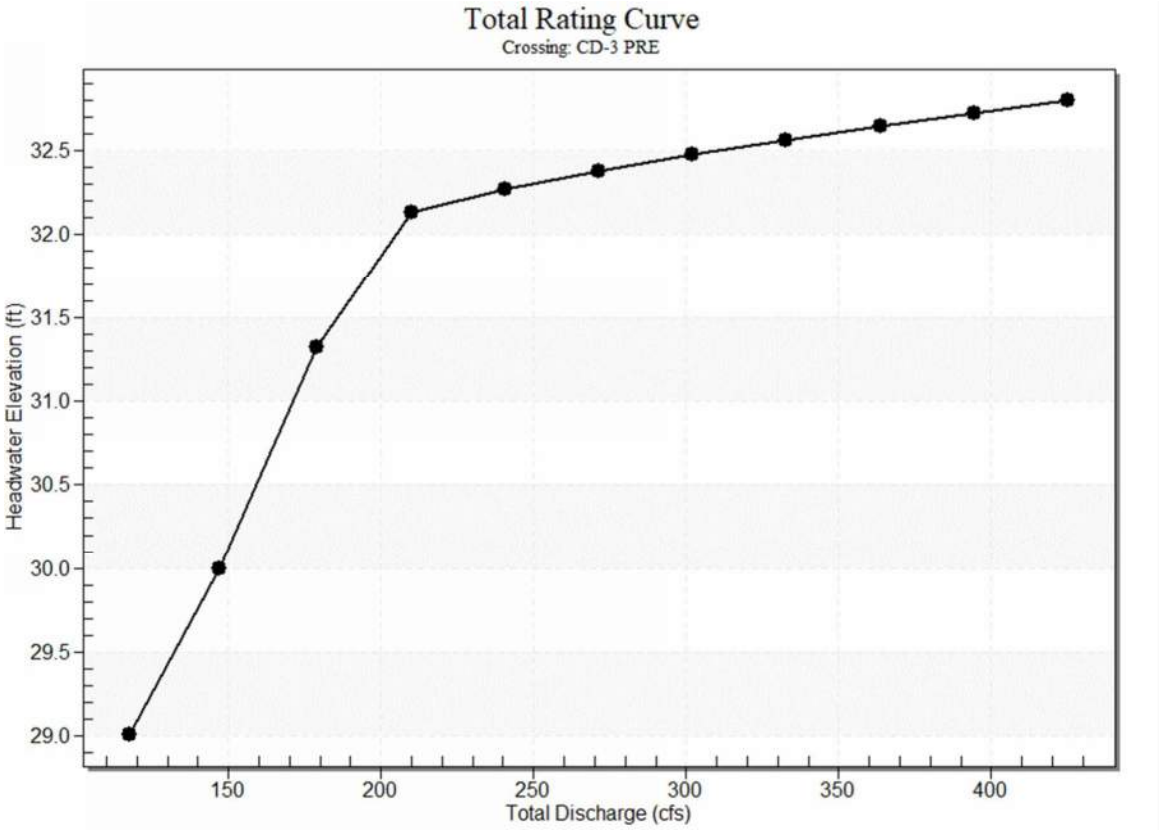


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
117.60	117.60	29.01	5.19	6.422	4-FFf	5.00	3.10	5.00	5.00	5.99	0.00
147.00	147.00	30.00	6.27	7.408	4-FFf	5.00	3.47	5.00	5.00	7.49	0.00
179.08	179.08	31.32	7.67	8.733	4-FFf	5.00	3.83	5.00	5.00	9.12	0.00
209.82	196.05	32.13	8.53	9.540	4-FFf	5.00	4.00	5.00	5.00	9.98	0.00
240.56	198.82	32.27	8.68	9.678	4-FFf	5.00	4.03	5.00	5.00	10.13	0.00
271.30	200.99	32.38	8.80	9.788	4-FFf	5.00	4.05	5.00	5.00	10.24	0.00
302.04	202.89	32.48	8.90	9.885	4-FFf	5.00	4.06	5.00	5.00	10.33	0.00
332.78	204.59	32.56	9.00	9.973	4-FFf	5.00	4.08	5.00	5.00	10.42	0.00
363.52	206.18	32.65	9.09	10.056	4-FFf	5.00	4.09	5.00	5.00	10.50	0.00
394.26	207.66	32.72	9.17	10.134	4-FFf	5.00	4.11	5.00	5.00	10.58	0.00
425.00	209.05	32.80	9.25	10.207	4-FFf	5.00	4.12	5.00	5.00	10.65	0.00

****

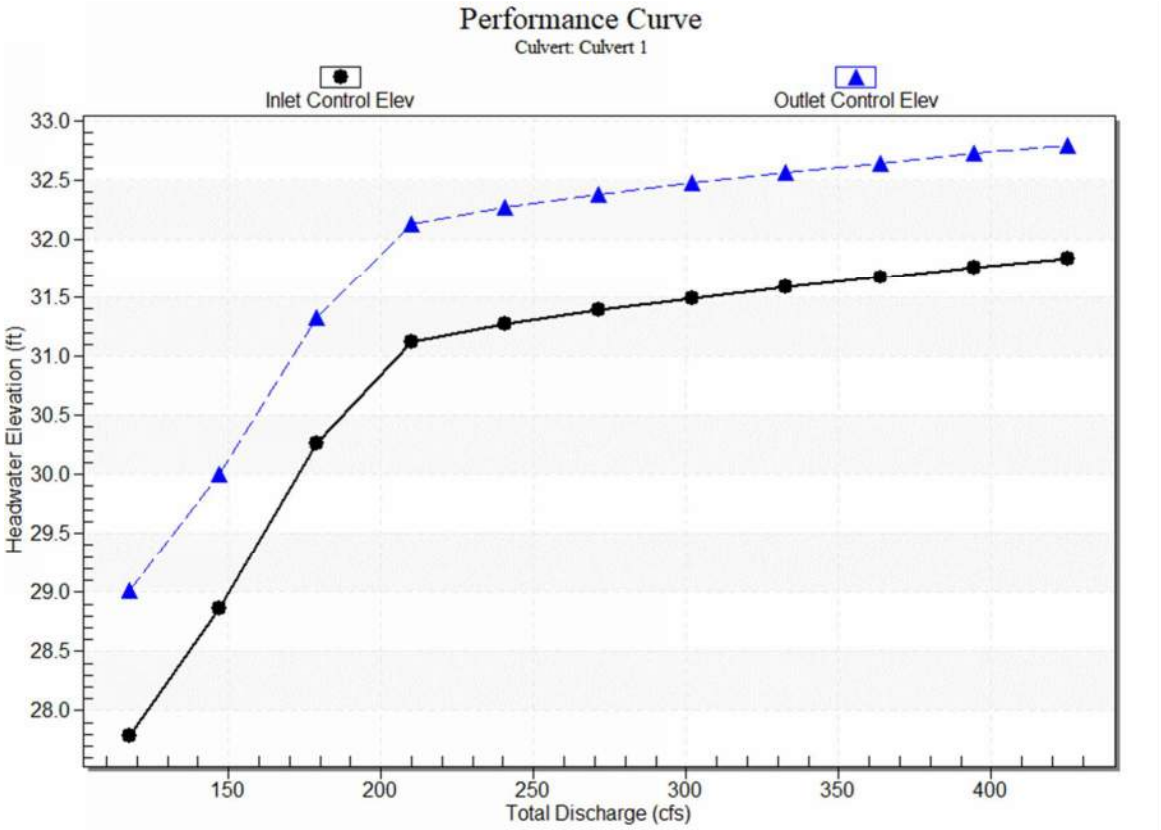
Straight Culvert

Inlet Elevation (invert): 22.59 ft, Outlet Elevation (invert): 22.26 ft

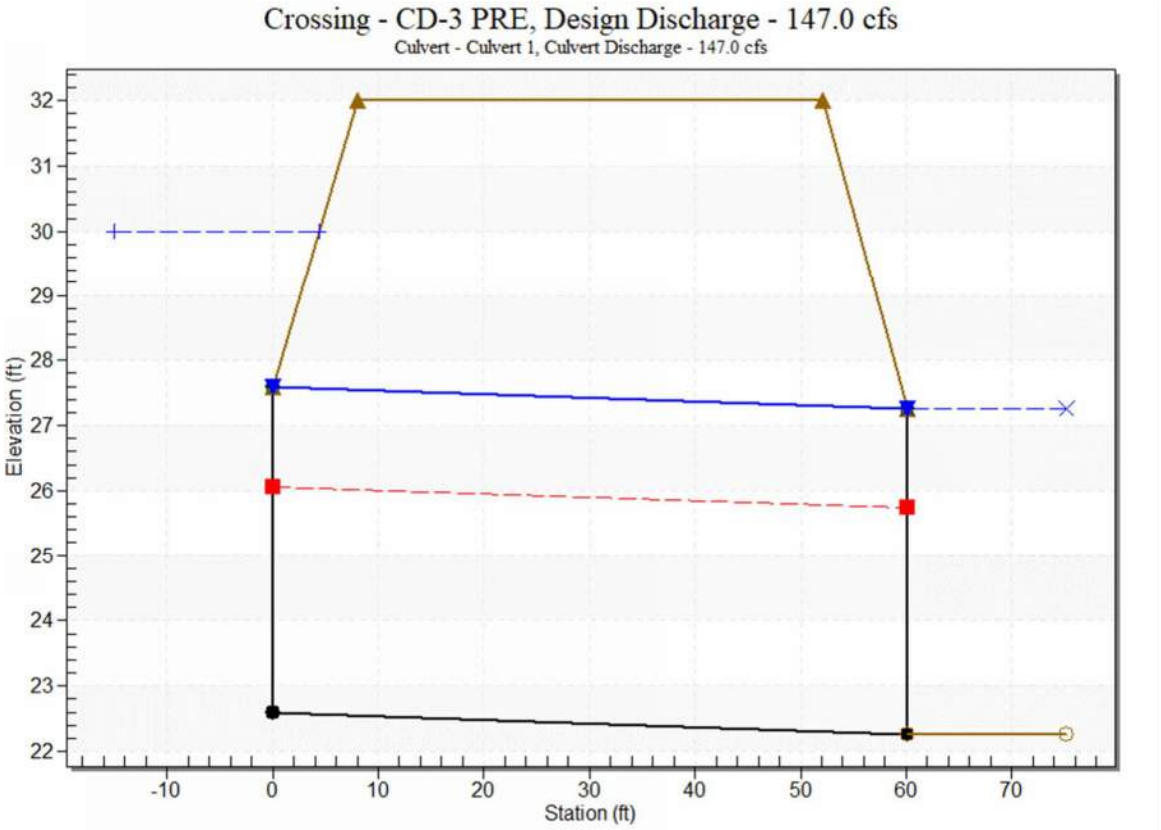
Culvert Length: 60.18 ft, Culvert Slope: 0.0055

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.59 ft

Outlet Station: 60.18 ft

Outlet Elevation: 22.26 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 5.00 ft

Barrel Material: Corrugated Aluminum

Embedment: 0.00 in

Barrel Manning's n: 0.0310

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting (Ke=0.9)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-3 PRE)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
117.60	27.26	5.00
147.00	27.26	5.00
179.08	27.26	5.00
209.82	27.26	5.00
240.56	27.26	5.00
271.30	27.26	5.00
302.04	27.26	5.00
332.78	27.26	5.00
363.52	27.26	5.00
394.26	27.26	5.00
425.00	27.26	5.00

Tailwater Channel Data - CD-3 PRE

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 27.26 ft

Roadway Data for Crossing: CD-3 PRE

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 44.00 ft

HY-8 Culvert Analysis Report (CD-4 PRE)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 756.00 cfs

Design Flow: 945.00 cfs

Maximum Flow: 1587.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-4 PRE

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Culvert 2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.62	756.00	378.56	378.33	0.00	9
30.79	839.10	419.59	419.57	0.00	4
31.03	945.00	472.53	472.51	0.00	4
31.17	1005.30	502.80	502.77	0.00	3
31.39	1088.40	544.31	544.28	0.00	3
31.63	1171.50	585.74	585.71	0.00	4
31.88	1254.60	627.17	627.14	0.00	5
32.11	1337.70	662.95	662.91	11.53	4
32.30	1420.80	685.57	686.13	48.97	5
32.48	1503.90	700.88	701.44	101.02	4
32.65	1587.00	714.48	715.03	157.16	4
32.00	1290.86	645.45	645.41	0.00	Overtopping

Rating Curve Plot for Crossing: CD-4 PRE

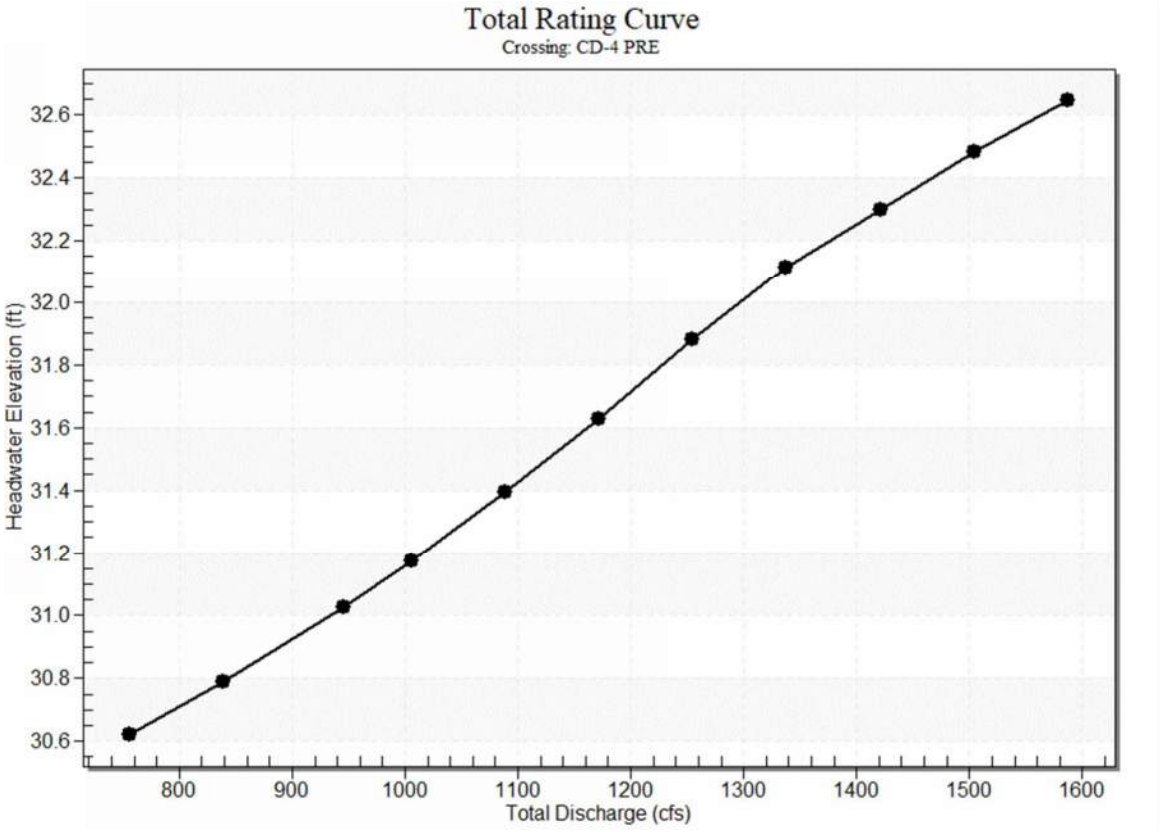


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
756.00	378.56	30.62	6.00	7.672	4-FFf	5.86	3.80	7.00	7.00	6.01	0.00
839.10	419.59	30.79	6.43	7.837	4-FFf	6.35	4.07	7.00	7.00	6.66	0.00
945.00	472.53	31.03	6.99	8.075	4-FFf	7.00	4.41	7.00	7.00	7.50	0.00
1005.30	502.80	31.17	7.31	8.224	4-FFf	7.00	4.59	7.00	7.00	7.98	0.00
1088.40	544.31	31.39	7.76	8.443	4-FFf	7.00	4.84	7.00	7.00	8.64	0.00
1171.50	585.74	31.63	8.21	8.679	4-FFf	7.00	5.09	7.00	7.00	9.30	0.00
1254.60	627.17	31.88	8.67	8.932	4-FFf	7.00	5.32	7.00	7.00	9.96	0.00
1337.70	662.95	32.11	9.08	9.165	4-FFf	7.00	5.52	7.00	7.00	10.52	0.00
1420.80	685.57	32.30	9.35	9.319	4-FFf	7.00	5.65	7.00	7.00	10.88	0.00
1503.90	700.88	32.48	9.53	9.425	4-FFf	7.00	5.73	7.00	7.00	11.13	0.00
1587.00	714.48	32.65	9.70	9.522	4-FFf	7.00	5.81	7.00	7.00	11.34	0.00

****

Straight Culvert

Inlet Elevation (invert): 22.95 ft, Outlet Elevation (invert): 22.90 ft

Culvert Length: 52.03 ft, Culvert Slope: 0.0010

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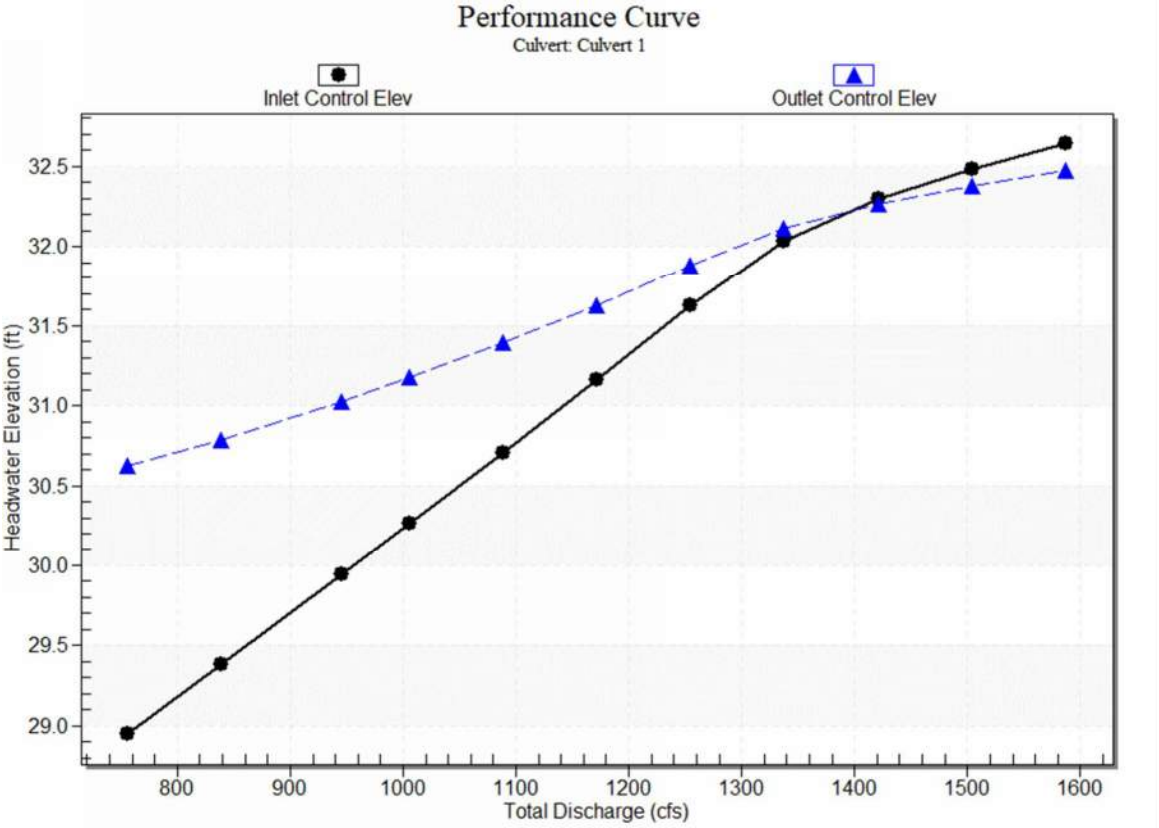
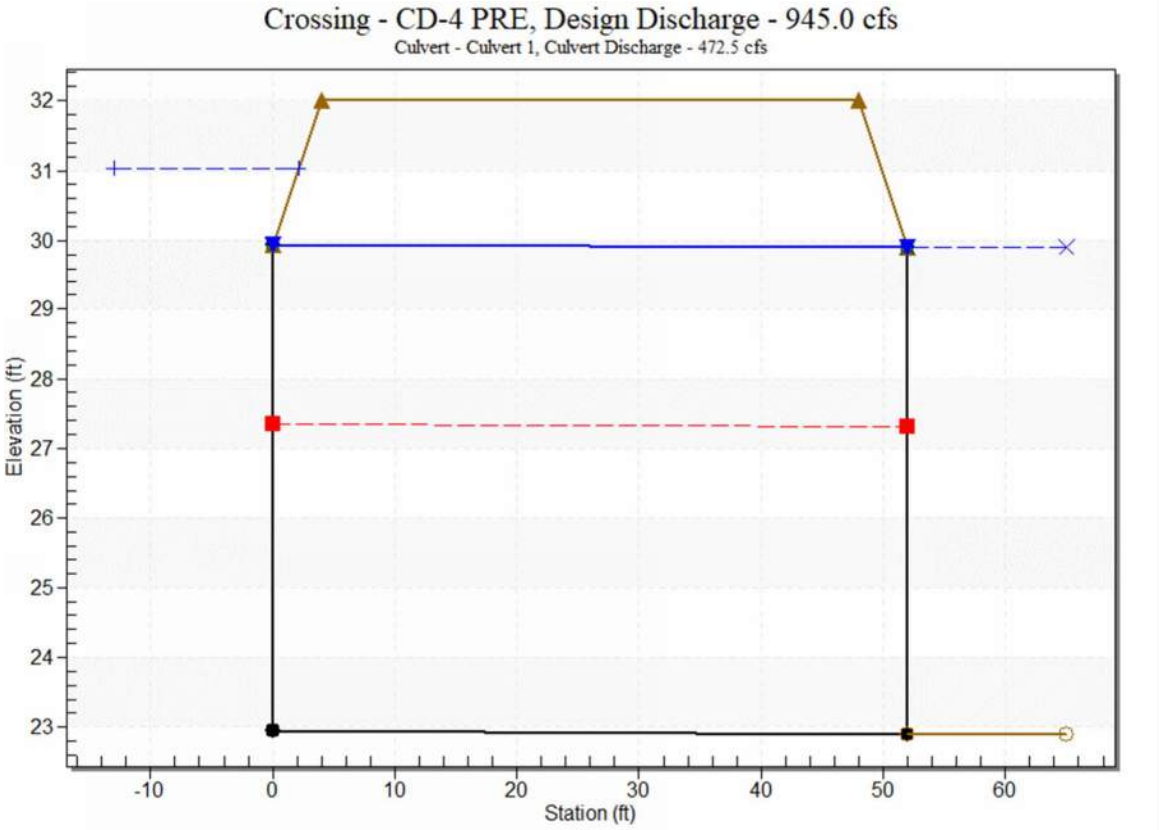
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.95 ft

Outlet Station: 52.03 ft

Outlet Elevation: 22.90 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 9.00 ft

Barrel Rise: 7.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: 1:1 Bevel Headwall (Ke=0.2)

Inlet Depression: None

Table 3 - Culvert Summary Table: Culvert 2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
756.00	378.33	30.62	5.99	7.672	3-M1f	3.87	3.80	7.00	7.00	6.01	0.00
839.10	419.57	30.79	6.42	7.837	4-FFf	4.18	4.07	7.00	7.00	6.66	0.00
945.00	472.51	31.03	6.98	8.075	4-FFf	4.57	4.41	7.00	7.00	7.50	0.00
1005.30	502.77	31.17	7.30	8.224	4-FFf	4.79	4.59	7.00	7.00	7.98	0.00
1088.40	544.28	31.39	7.75	8.443	4-FFf	5.09	4.84	7.00	7.00	8.64	0.00
1171.50	585.71	31.63	8.20	8.679	4-FFf	5.38	5.09	7.00	7.00	9.30	0.00
1254.60	627.14	31.88	8.67	8.932	4-FFf	5.67	5.32	7.00	7.00	9.95	0.00
1337.70	662.91	32.11	9.08	9.165	4-FFf	5.92	5.52	7.00	7.00	10.52	0.00
1420.80	686.13	32.30	9.35	9.323	4-FFf	6.08	5.65	7.00	7.00	10.89	0.00
1503.90	701.44	32.48	9.53	9.430	4-FFf	6.19	5.74	7.00	7.00	11.13	0.00
1587.00	715.03	32.65	9.70	9.527	4-FFf	6.28	5.81	7.00	7.00	11.35	0.00

****

Straight Culvert

Inlet Elevation (invert): 22.95 ft, Outlet Elevation (invert): 22.80 ft

Culvert Length: 52.13 ft, Culvert Slope: 0.0029

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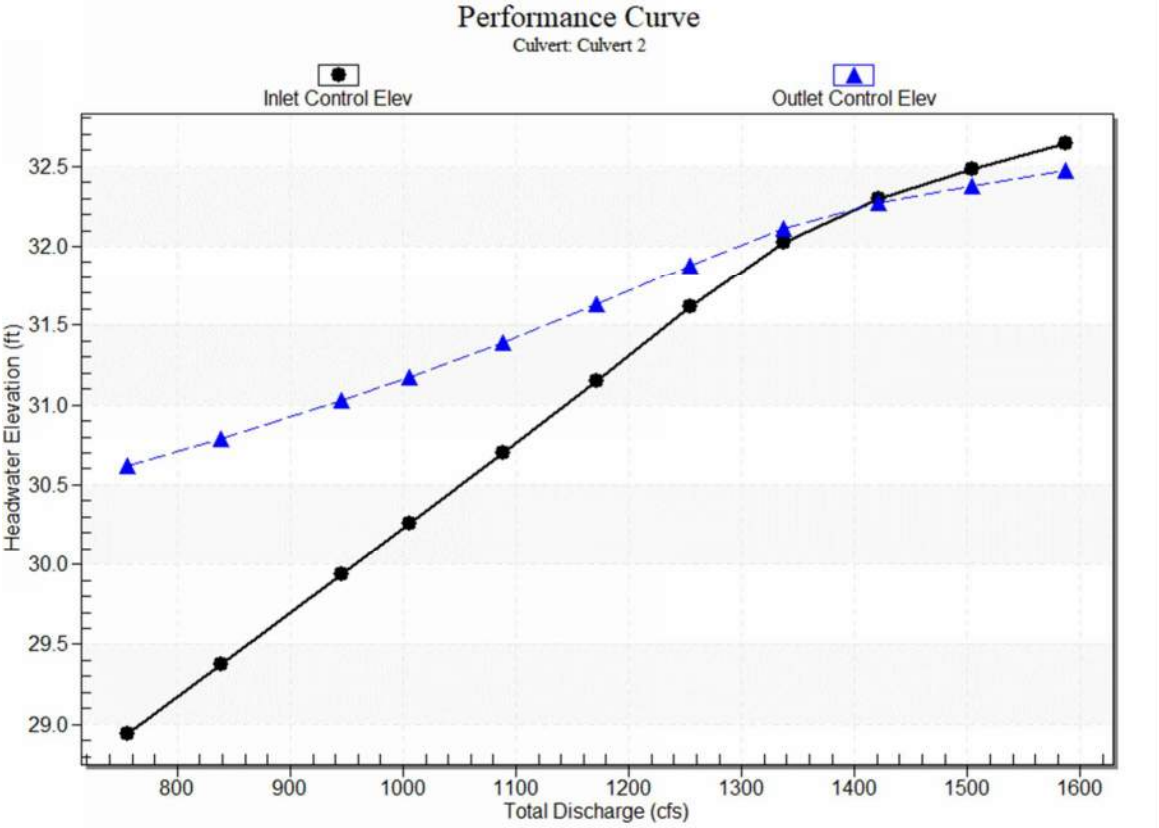
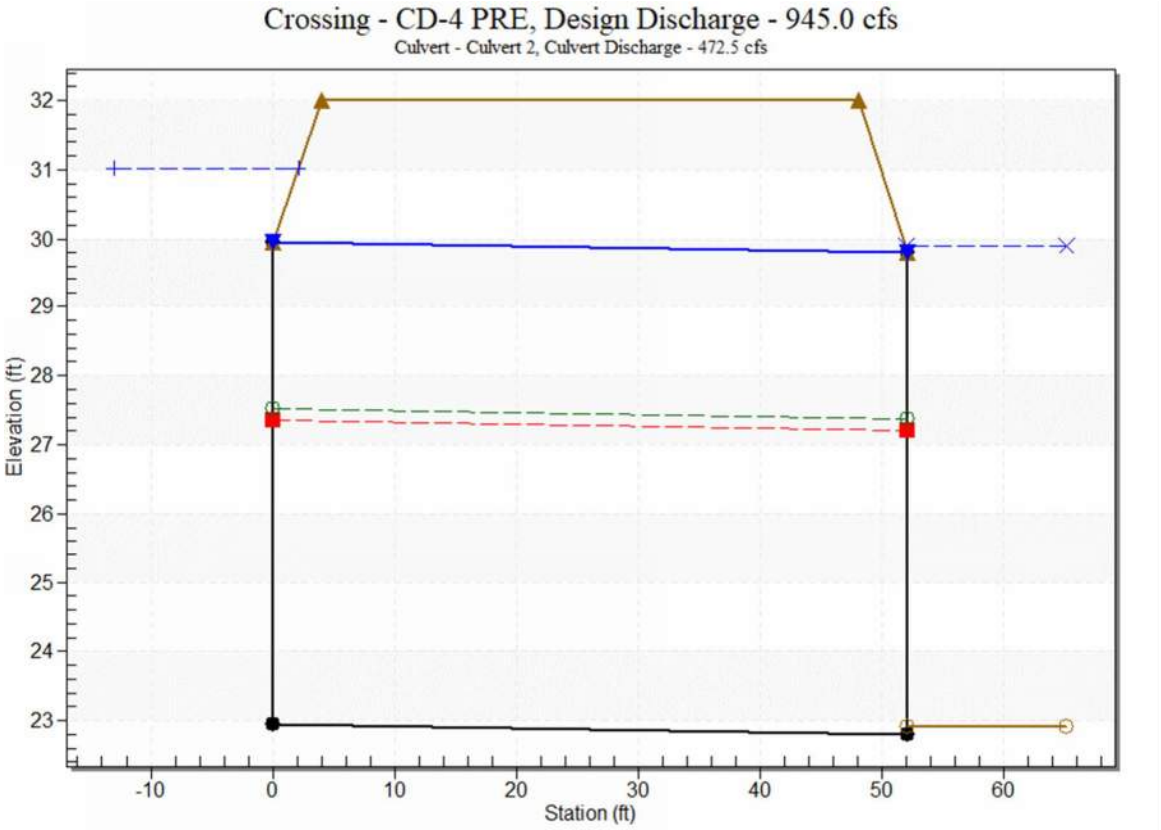
Culvert Performance Curve Plot: Culvert 2



Water Surface Profile Plot for Culvert: Culvert 2



Site Data - Culvert 2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.95 ft

Outlet Station: 52.13 ft

Outlet Elevation: 22.80 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 2

Barrel Shape: Concrete Box

Barrel Span: 9.00 ft

Barrel Rise: 7.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: 1:1 Bevel Headwall (Ke=0.2)

Inlet Depression: None

Table 4 - Downstream Channel Rating Curve (Crossing: CD-4 PRE)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
756.00	29.90	7.00
839.10	29.90	7.00
945.00	29.90	7.00
1005.30	29.90	7.00
1088.40	29.90	7.00
1171.50	29.90	7.00
1254.60	29.90	7.00
1337.70	29.90	7.00
1420.80	29.90	7.00
1503.90	29.90	7.00
1587.00	29.90	7.00

Tailwater Channel Data - CD-4 PRE

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.90 ft

Roadway Data for Crossing: CD-4 PRE

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 44.00 ft

HY-8 Culvert Analysis Report (CD-5 PRE)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 11.00 cfs

Design Flow: 14.00 cfs

Maximum Flow: 23.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-5 PRE

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
31.27	11.00	11.00	0.00	1
31.72	12.20	12.20	0.00	1
32.01	13.40	12.94	0.37	35
32.02	14.00	12.96	0.90	4
32.04	15.80	13.02	2.64	4
32.06	17.00	13.05	3.89	4
32.07	18.20	13.08	5.02	3
32.08	19.40	13.10	6.21	3
32.09	20.60	13.13	7.41	3
32.10	21.80	13.15	8.60	3
32.10	23.00	13.17	9.80	3
32.00	12.91	12.91	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5 PRE

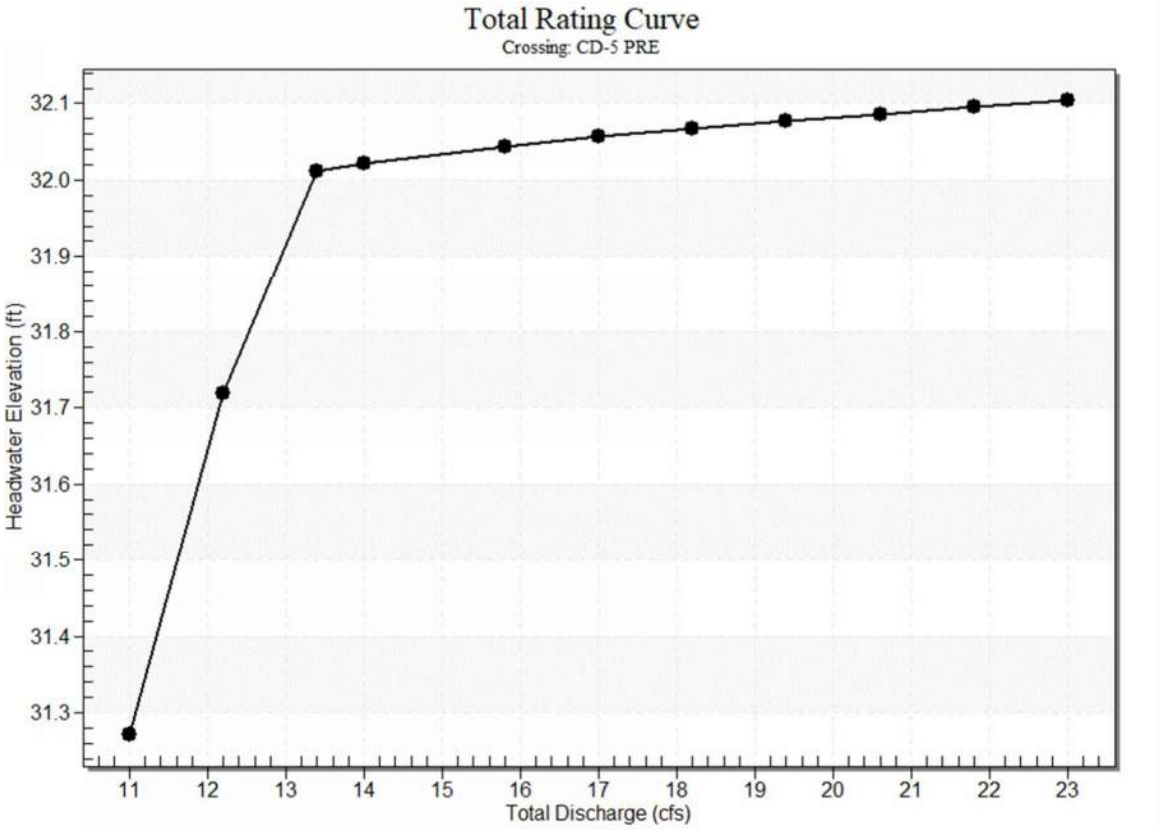


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
11.00	11.00	31.27	2.89	2.388	5-JS1f	1.13	1.27	1.50	1.50	6.22	0.00
12.20	12.20	31.72	3.34	2.738	5-S1f	1.25	1.32	1.50	1.50	6.90	0.00
13.40	12.94	32.01	3.63	3.036	4-FFf	1.50	1.35	1.50	1.50	7.32	0.00
14.00	12.96	32.02	3.64	3.044	4-FFf	1.50	1.35	1.50	1.50	7.34	0.00
15.80	13.02	32.04	3.66	3.064	4-FFf	1.50	1.35	1.50	1.50	7.37	0.00
17.00	13.05	32.06	3.68	3.076	4-FFf	1.50	1.35	1.50	1.50	7.39	0.00
18.20	13.08	32.07	3.69	3.085	4-FFf	1.50	1.35	1.50	1.50	7.40	0.00
19.40	13.10	32.08	3.70	3.094	4-FFf	1.50	1.35	1.50	1.50	7.41	0.00
20.60	13.13	32.09	3.71	3.103	4-FFf	1.50	1.36	1.50	1.50	7.43	0.00
21.80	13.15	32.10	3.72	3.111	4-FFf	1.50	1.36	1.50	1.50	7.44	0.00
23.00	13.17	32.10	3.72	3.119	4-FFf	1.50	1.36	1.50	1.50	7.45	0.00

****

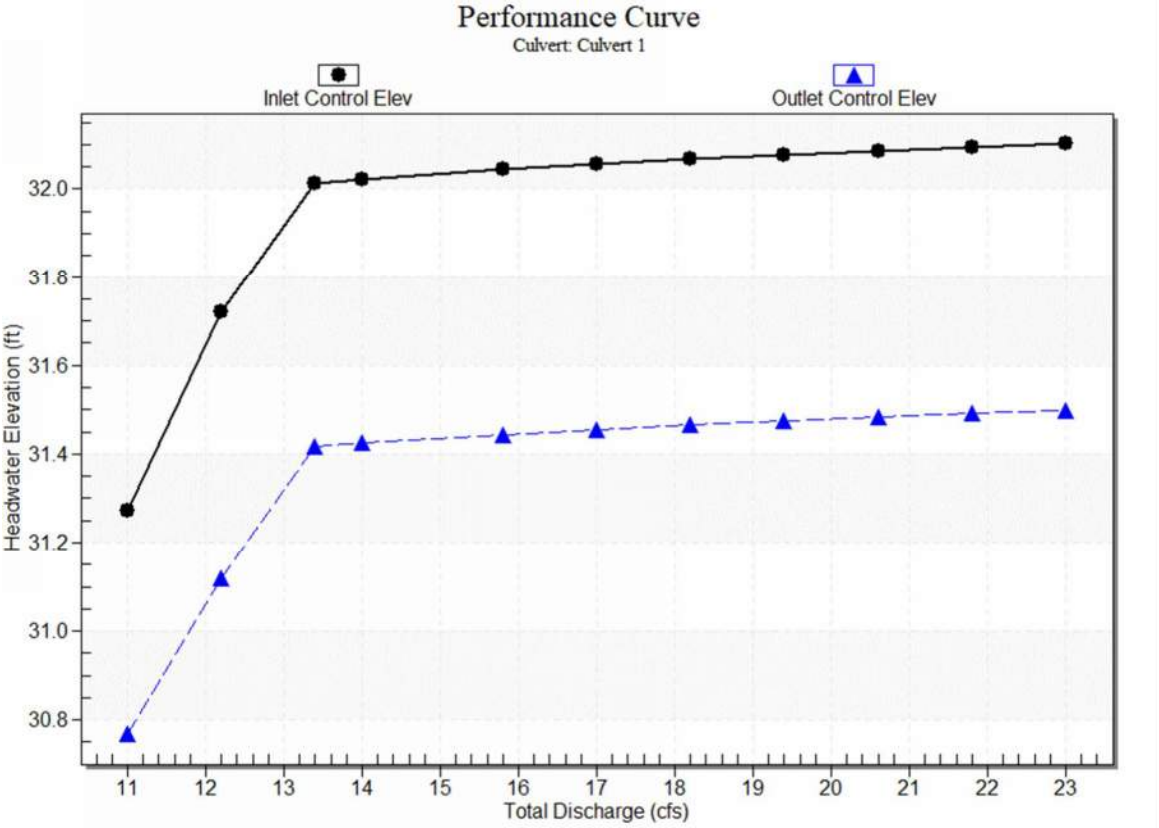
Straight Culvert

Inlet Elevation (invert): 28.38 ft, Outlet Elevation (invert): 27.58 ft

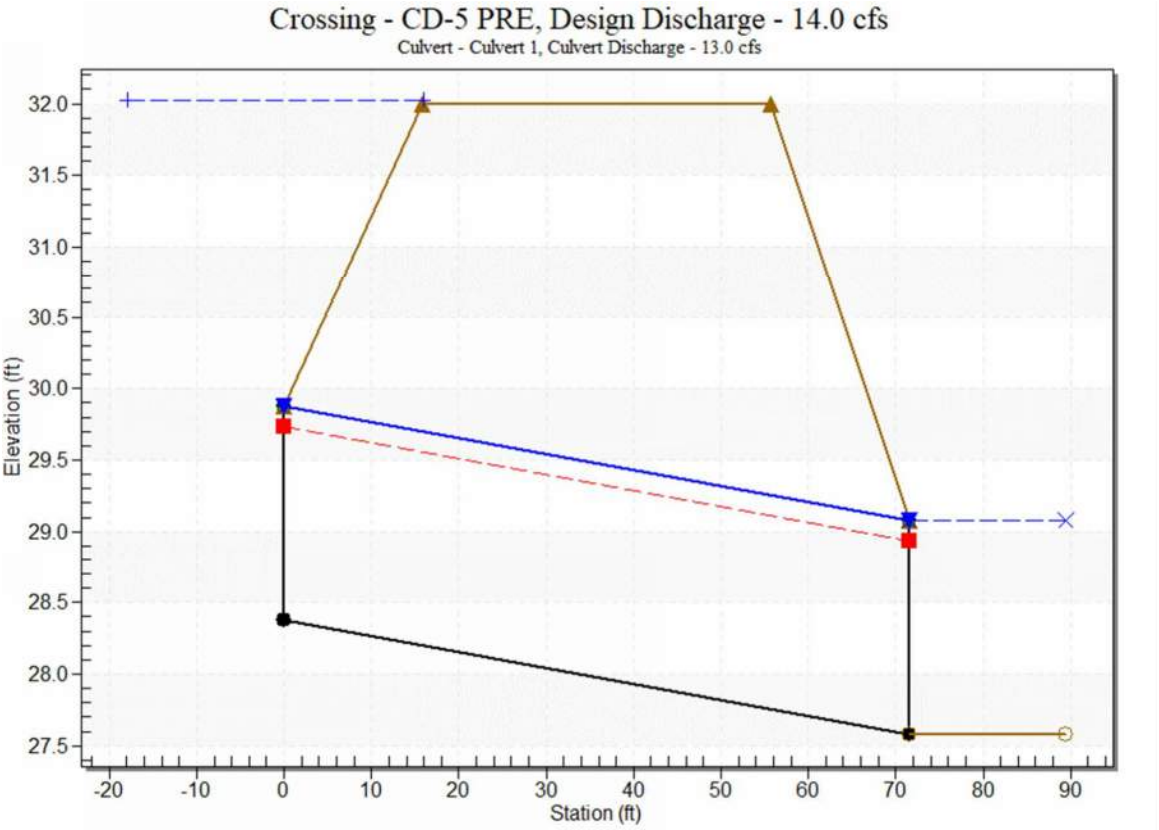
Culvert Length: 71.55 ft, Culvert Slope: 0.0112

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 28.38 ft

Outlet Station: 71.55 ft

Outlet Elevation: 27.58 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Mitered to Conform to Slope (Ke=0.7)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-5 PRE)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
11.00	29.08	1.50
12.20	29.08	1.50
13.40	29.08	1.50
14.00	29.08	1.50
15.80	29.08	1.50
17.00	29.08	1.50
18.20	29.08	1.50
19.40	29.08	1.50
20.60	29.08	1.50
21.80	29.08	1.50
23.00	29.08	1.50

Tailwater Channel Data - CD-5 PRE

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.08 ft

Roadway Data for Crossing: CD-5 PRE

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-6 PRE)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 504.00 cfs

Design Flow: 630.00 cfs

Maximum Flow: 1058.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-6 PRE

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Culvert 2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.02	504.00	252.08	252.10	0.00	4
30.29	559.40	279.70	279.72	0.00	4
30.67	630.00	314.99	315.03	0.00	4
30.91	670.20	335.13	335.17	0.00	3
31.26	725.60	362.85	362.89	0.00	3
31.64	781.00	390.44	390.51	0.00	6
32.03	836.40	417.23	417.25	1.74	10
32.23	891.80	429.78	429.83	32.05	6
32.37	947.20	439.10	439.16	68.80	5
32.50	1002.60	447.09	447.17	107.97	4
32.62	1058.00	454.37	454.46	148.95	4
32.00	830.19	415.06	415.13	0.00	Overtopping

Rating Curve Plot for Crossing: CD-6 PRE

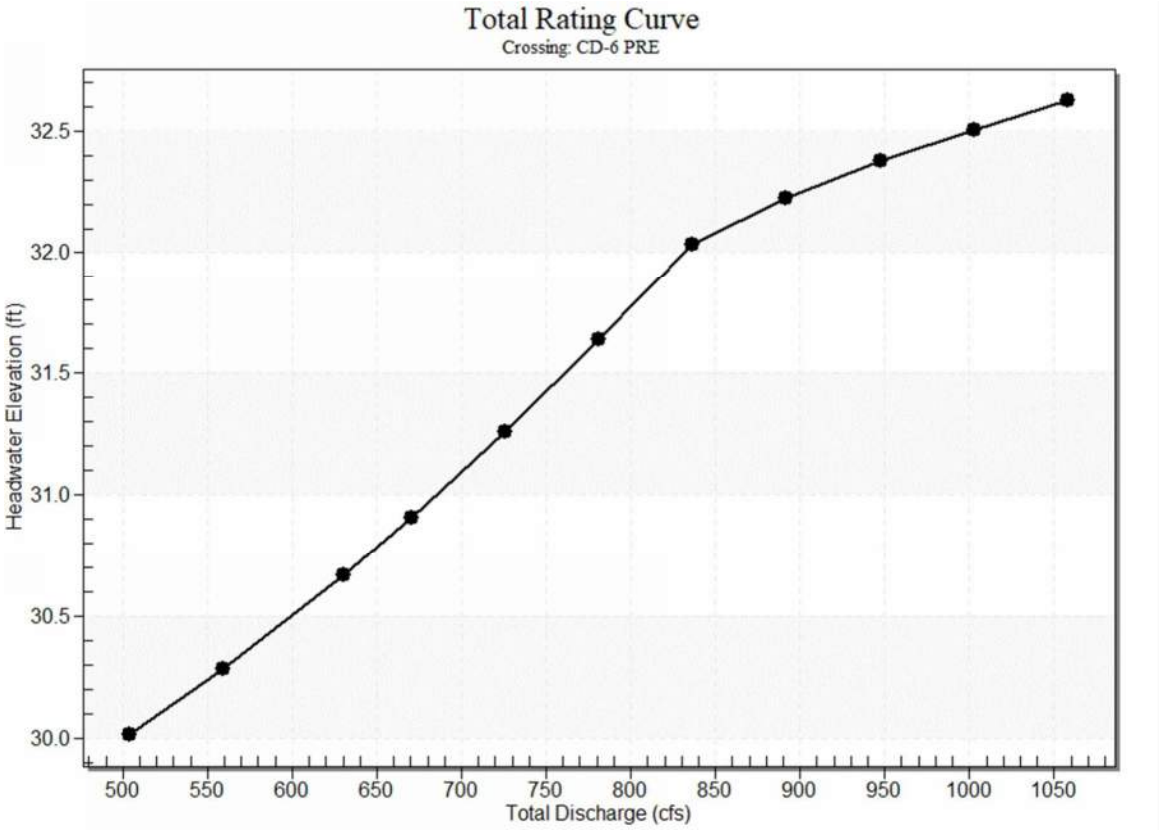


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
504.00	252.08	30.02	5.48	6.868	4-FFf	3.57	3.43	5.00	6.00	7.20	0.00
559.40	279.70	30.29	5.94	7.136	4-FFf	3.87	3.67	5.00	6.00	7.99	0.00
630.00	314.99	30.67	6.55	7.518	4-FFf	4.23	3.98	5.00	6.00	9.00	0.00
670.20	335.13	30.91	6.91	7.757	4-FFf	4.44	4.14	5.00	6.00	9.58	0.00
725.60	362.85	31.26	7.44	8.109	4-FFf	4.72	4.37	5.00	6.00	10.37	0.00
781.00	390.44	31.64	7.99	8.488	4-FFf	5.00	4.59	5.00	6.00	11.16	0.00
836.40	417.23	32.03	8.55	8.882	4-FFf	5.00	4.80	5.00	6.00	11.92	0.00
891.80	429.78	32.23	8.83	9.076	4-FFf	5.00	4.89	5.00	6.00	12.28	0.00
947.20	439.10	32.37	9.04	9.224	4-FFf	5.00	4.96	5.00	6.00	12.55	0.00
1002.60	447.09	32.50	9.22	9.353	4-FFf	5.00	5.00	5.00	6.00	12.77	0.00
1058.00	454.37	32.62	9.39	9.472	4-FFf	5.00	5.00	5.00	6.00	12.98	0.00

****

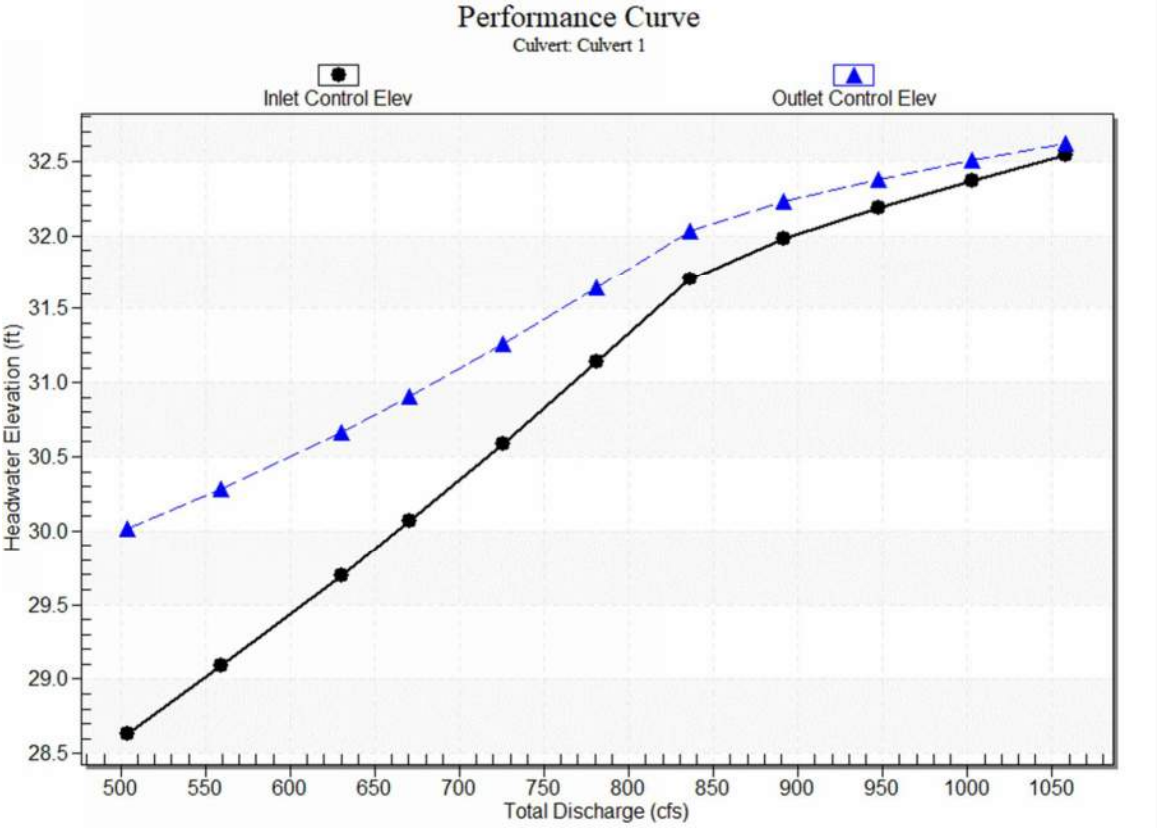
Straight Culvert

Inlet Elevation (invert): 23.15 ft, Outlet Elevation (invert): 22.86 ft

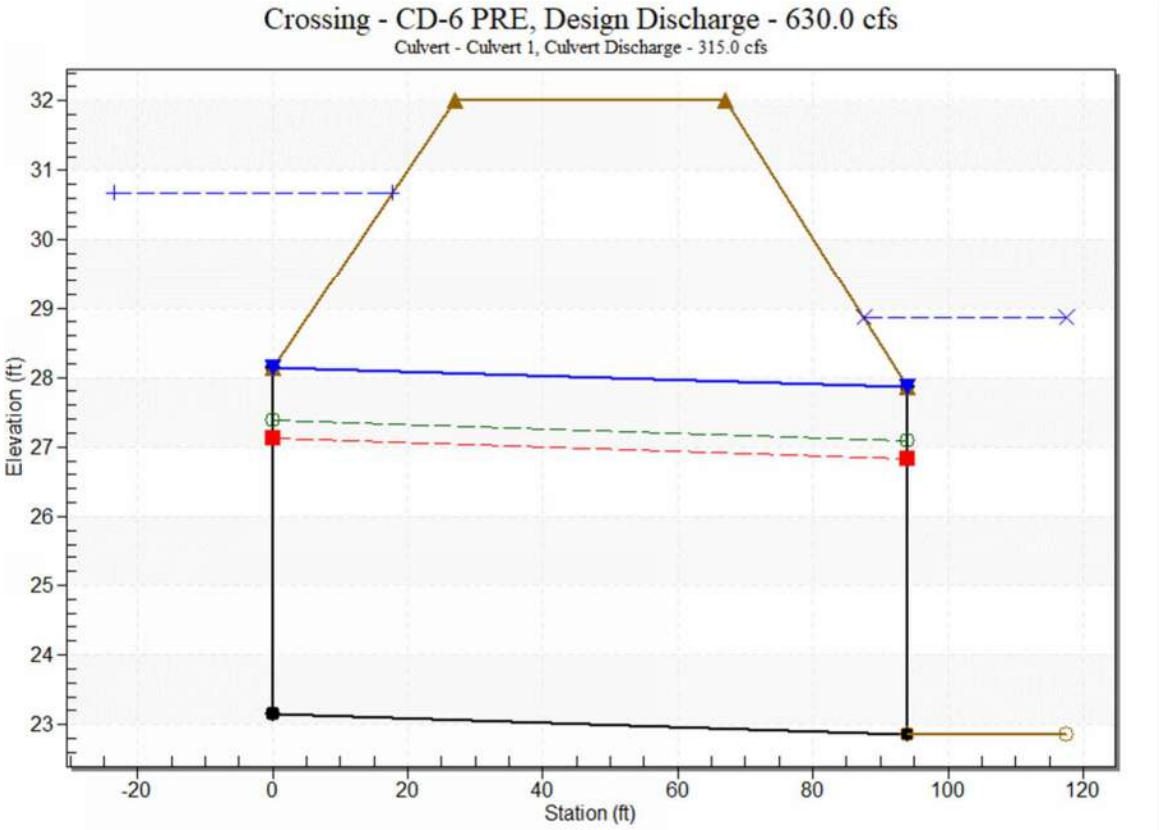
Culvert Length: 94.09 ft, Culvert Slope: 0.0031

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 23.15 ft

Outlet Station: 94.09 ft

Outlet Elevation: 22.86 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 5.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: 1:1 Bevel Headwall (Ke=0.2)

Inlet Depression: None

Table 3 - Culvert Summary Table: Culvert 2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
504.00	252.10	30.02	5.49	7.288	4-FFf	-1.00	3.43	5.00	6.00	7.20	0.00
559.40	279.72	30.29	5.95	7.556	4-FFf	-1.00	3.67	5.00	6.00	7.99	0.00
630.00	315.03	30.67	6.56	7.938	4-FFf	-1.00	3.98	5.00	6.00	9.00	0.00
670.20	335.17	30.91	6.92	8.177	4-FFf	-1.00	4.14	5.00	6.00	9.58	0.00
725.60	362.89	31.26	7.45	8.529	4-FFf	-1.00	4.37	5.00	6.00	10.37	0.00
781.00	390.51	31.64	8.00	8.908	4-FFf	-1.00	4.59	5.00	6.00	11.16	0.00
836.40	417.25	32.03	8.56	9.302	4-FFf	-1.00	4.80	5.00	6.00	11.92	0.00
891.80	429.83	32.23	8.84	9.496	4-FFf	-1.00	4.89	5.00	6.00	12.28	0.00
947.20	439.16	32.37	9.05	9.644	4-FFf	-1.00	4.96	5.00	6.00	12.55	0.00
1002.60	447.17	32.50	9.23	9.773	4-FFf	-1.00	5.00	5.00	6.00	12.78	0.00
1058.00	454.46	32.62	9.40	9.893	4-FFf	-1.00	5.00	5.00	6.00	12.98	0.00

****

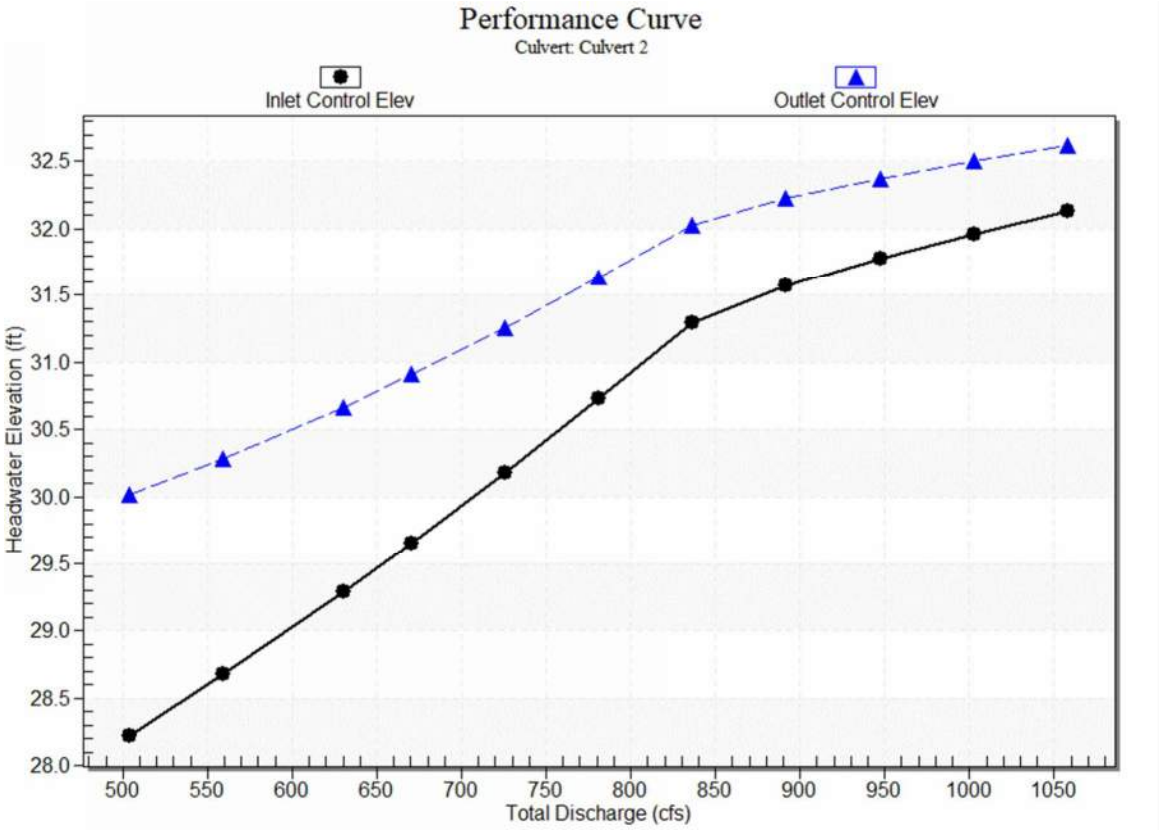
Straight Culvert

Inlet Elevation (invert): 22.73 ft, Outlet Elevation (invert): 22.79 ft

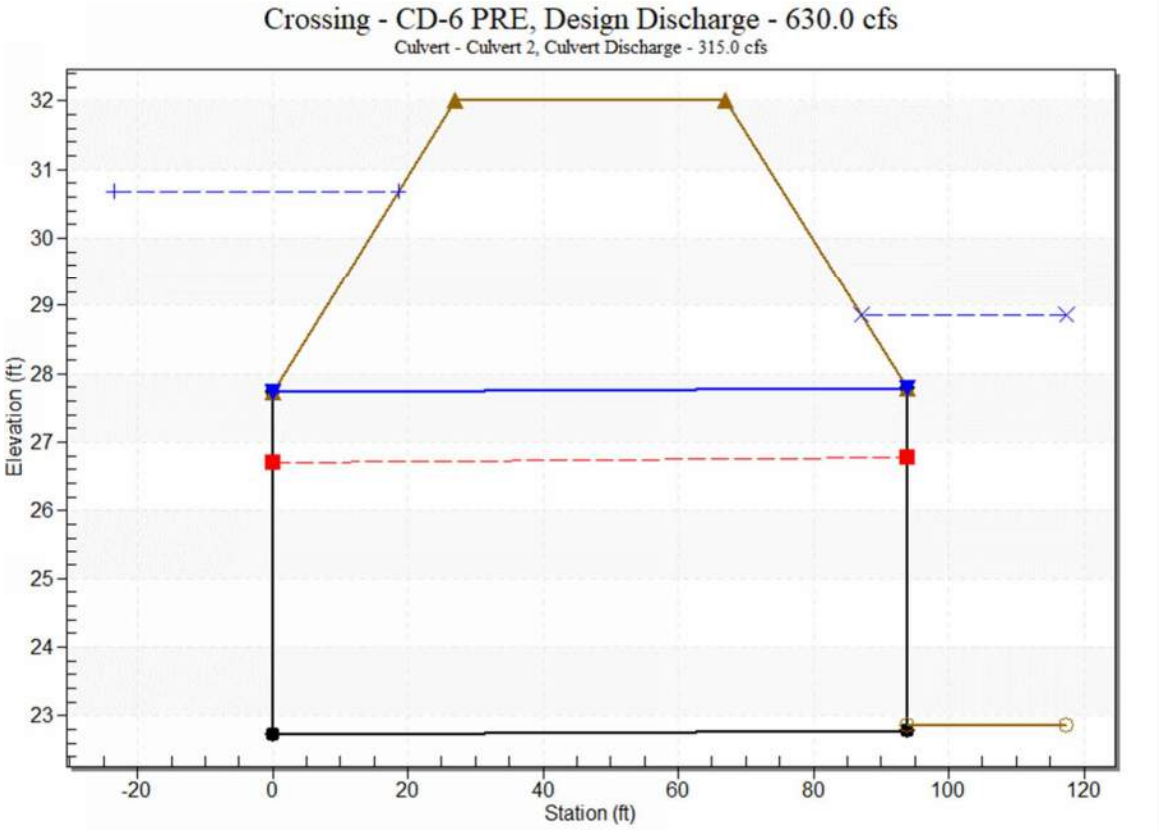
Culvert Length: 94.00 ft, Culvert Slope: -0.0006

****

Culvert Performance Curve Plot: Culvert 2



Water Surface Profile Plot for Culvert: Culvert 2



Site Data - Culvert 2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.73 ft

Outlet Station: 94.00 ft

Outlet Elevation: 22.79 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 2

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 5.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: 1:1 Bevel Headwall (Ke=0.2)

Inlet Depression: None

Table 4 - Downstream Channel Rating Curve (Crossing: CD-6 PRE)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
504.00	28.86	6.00
559.40	28.86	6.00
630.00	28.86	6.00
670.20	28.86	6.00
725.60	28.86	6.00
781.00	28.86	6.00
836.40	28.86	6.00
891.80	28.86	6.00
947.20	28.86	6.00
1002.60	28.86	6.00
1058.00	28.86	6.00

Tailwater Channel Data - CD-6 PRE

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 28.86 ft

Roadway Data for Crossing: CD-6 PRE

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-7 PRE)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 19.00 cfs

Design Flow: 24.00 cfs

Maximum Flow: 43.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-7 PRE

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.03	19.00	19.00	0.00	1
30.90	21.40	21.40	0.00	1
31.96	24.00	24.00	0.00	1
32.03	26.20	24.18	1.88	9
32.06	28.60	24.23	4.28	5
32.08	31.00	24.28	6.61	4
32.10	33.40	24.32	9.02	4
32.11	35.80	24.36	11.29	3
32.13	38.20	24.39	13.68	3
32.14	40.60	24.43	16.08	3
32.16	43.00	24.46	18.47	3
32.00	24.10	24.10	0.00	Overtopping

Rating Curve Plot for Crossing: CD-7 PRE

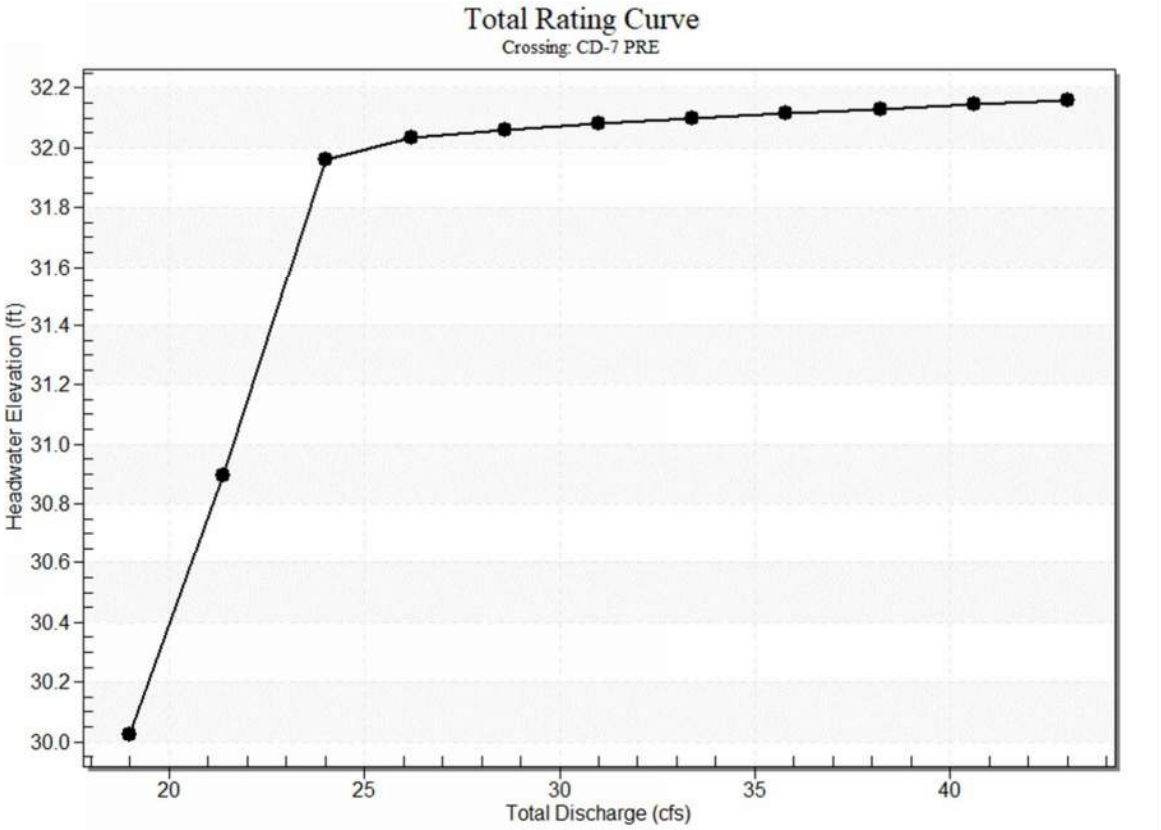


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
19.00	19.00	30.03	2.75	4.045	4-FFf	2.00	1.57	2.00	2.00	6.05	0.00
21.40	21.40	30.90	3.12	4.917	4-FFf	2.00	1.66	2.00	2.00	6.81	0.00
24.00	24.00	31.96	3.58	5.978	4-FFf	2.00	1.73	2.00	2.00	7.64	0.00
26.20	24.18	32.03	3.61	6.055	4-FFf	2.00	1.74	2.00	2.00	7.70	0.00
28.60	24.23	32.06	3.62	6.080	4-FFf	2.00	1.74	2.00	2.00	7.71	0.00
31.00	24.28	32.08	3.63	6.100	4-FFf	2.00	1.74	2.00	2.00	7.73	0.00
33.40	24.32	32.10	3.64	6.118	4-FFf	2.00	1.74	2.00	2.00	7.74	0.00
35.80	24.36	32.11	3.64	6.134	4-FFf	2.00	1.74	2.00	2.00	7.75	0.00
38.20	24.39	32.13	3.65	6.149	4-FFf	2.00	1.75	2.00	2.00	7.76	0.00
40.60	24.43	32.14	3.66	6.164	4-FFf	2.00	1.75	2.00	2.00	7.77	0.00
43.00	24.46	32.16	3.66	6.177	4-FFf	2.00	1.75	2.00	2.00	7.78	0.00

****

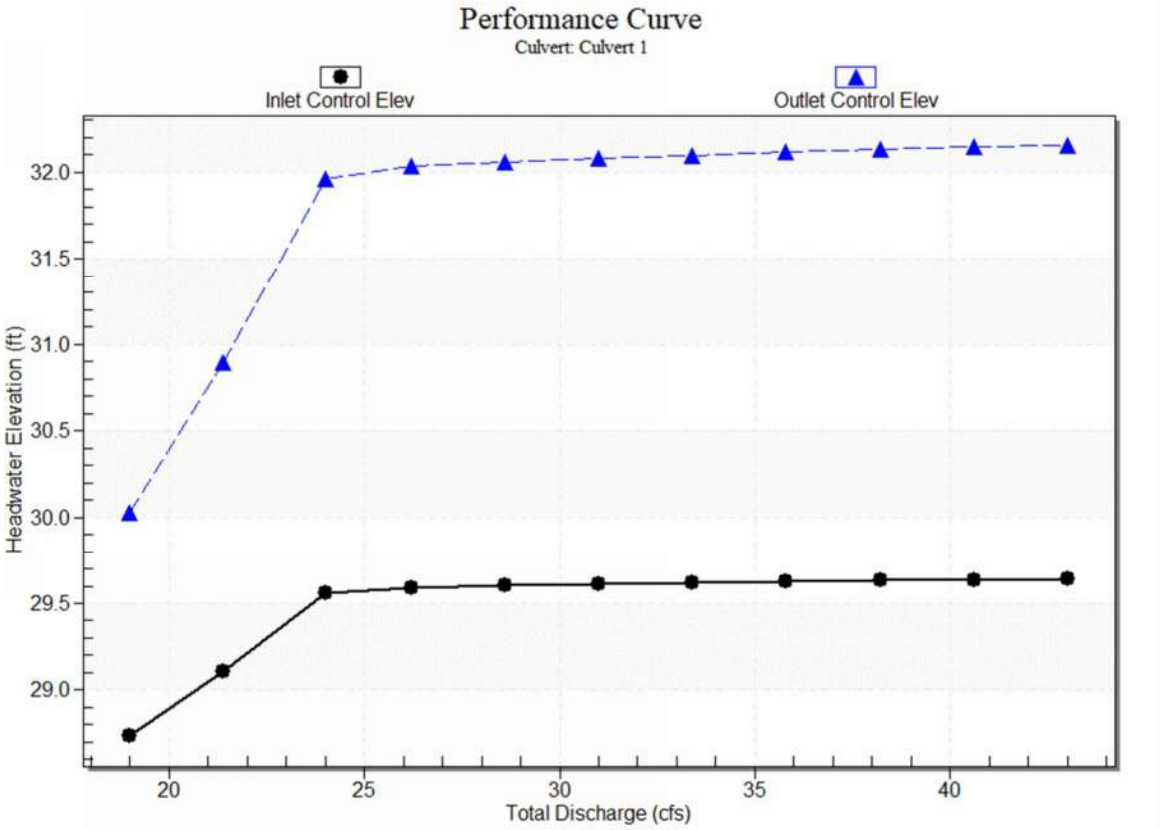
Straight Culvert

Inlet Elevation (invert): 25.98 ft, Outlet Elevation (invert): 24.78 ft

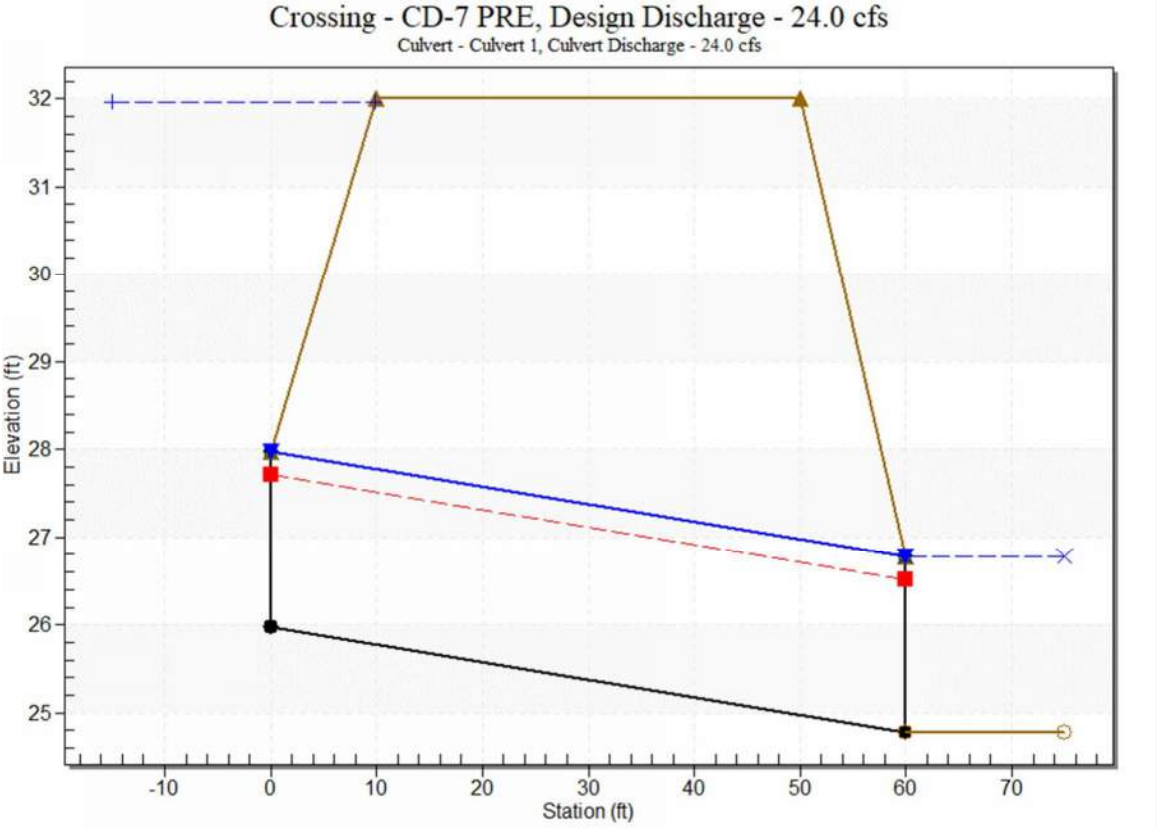
Culvert Length: 60.01 ft, Culvert Slope: 0.0200

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 25.98 ft

Outlet Station: 60.00 ft

Outlet Elevation: 24.78 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Corrugated Aluminum

Embedment: 0.00 in

Barrel Manning's n: 0.0310

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-7 PRE)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
19.00	26.78	2.00
21.40	26.78	2.00
24.00	26.78	2.00
26.20	26.78	2.00
28.60	26.78	2.00
31.00	26.78	2.00
33.40	26.78	2.00
35.80	26.78	2.00
38.20	26.78	2.00
40.60	26.78	2.00
43.00	26.78	2.00

Tailwater Channel Data - CD-7 PRE

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 26.78 ft

Roadway Data for Crossing: CD-7 PRE

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report

Post-Condition

HY-8 Culvert Analysis Report (CD-1 POST)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 231.00 cfs

Design Flow: 289.00 cfs

Maximum Flow: 486.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-1 POST

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.42	231.00	231.00	0.00	1
30.57	256.50	256.50	0.00	1
30.80	289.00	289.00	0.00	1
30.94	307.50	307.50	0.00	1
31.15	333.00	333.00	0.00	1
31.38	358.50	358.50	0.00	1
31.62	384.00	384.00	0.00	1
31.88	409.50	409.50	0.00	1
32.16	435.00	435.00	0.00	1
32.45	460.50	460.50	0.00	1
32.76	486.00	486.00	0.00	1
33.00	504.95	504.95	0.00	Overtopping

Rating Curve Plot for Crossing: CD-1 POST

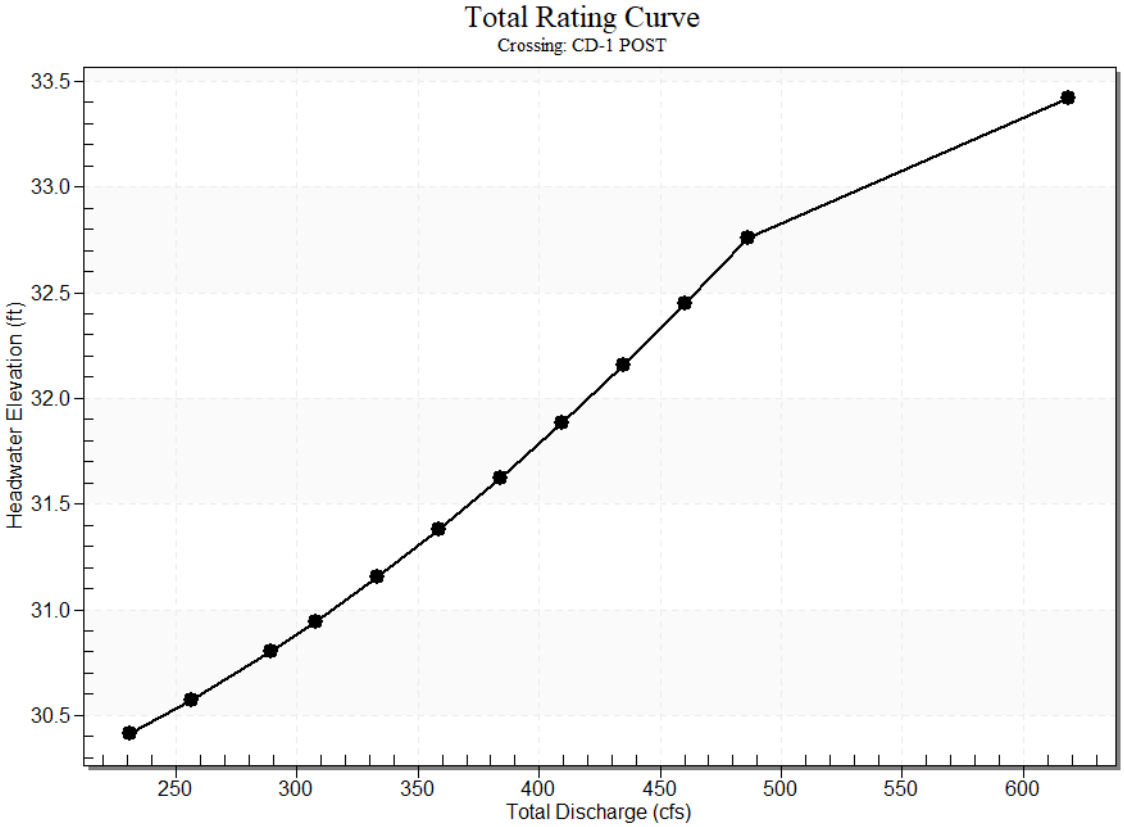


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
231.00	231.00	30.42	5.76	7.935	1-S1f	3.07	3.89	7.50	7.63	5.23	0.00
256.50	256.50	30.57	6.14	8.095	1-S1f	3.25	4.11	7.50	7.63	5.81	0.00
289.00	289.00	30.80	6.62	8.322	1-S1f	3.48	4.38	7.50	7.63	6.54	0.00
307.50	307.50	30.94	6.89	8.464	1-S1f	3.61	4.52	7.50	7.63	6.96	0.00
333.00	333.00	31.15	7.27	8.673	1-S1f	3.78	4.71	7.50	7.63	7.54	0.00
358.50	358.50	31.38	7.65	8.899	1-S1f	3.95	4.90	7.50	7.63	8.11	0.00
384.00	384.00	31.62	8.05	9.142	1-S1f	4.12	5.07	7.50	7.63	8.69	0.00
409.50	409.50	31.88	8.46	9.401	1-S1f	4.29	5.24	7.50	7.63	9.27	0.00
435.00	435.00	32.16	8.90	9.677	1-S1f	4.46	5.40	7.50	7.63	9.85	0.00
460.50	460.50	32.45	9.35	9.969	1-S1f	4.63	5.56	7.50	7.63	10.42	0.00
486.00	486.00	32.76	9.82	10.279	1-S1f	4.80	5.71	7.50	7.63	11.00	0.00

****

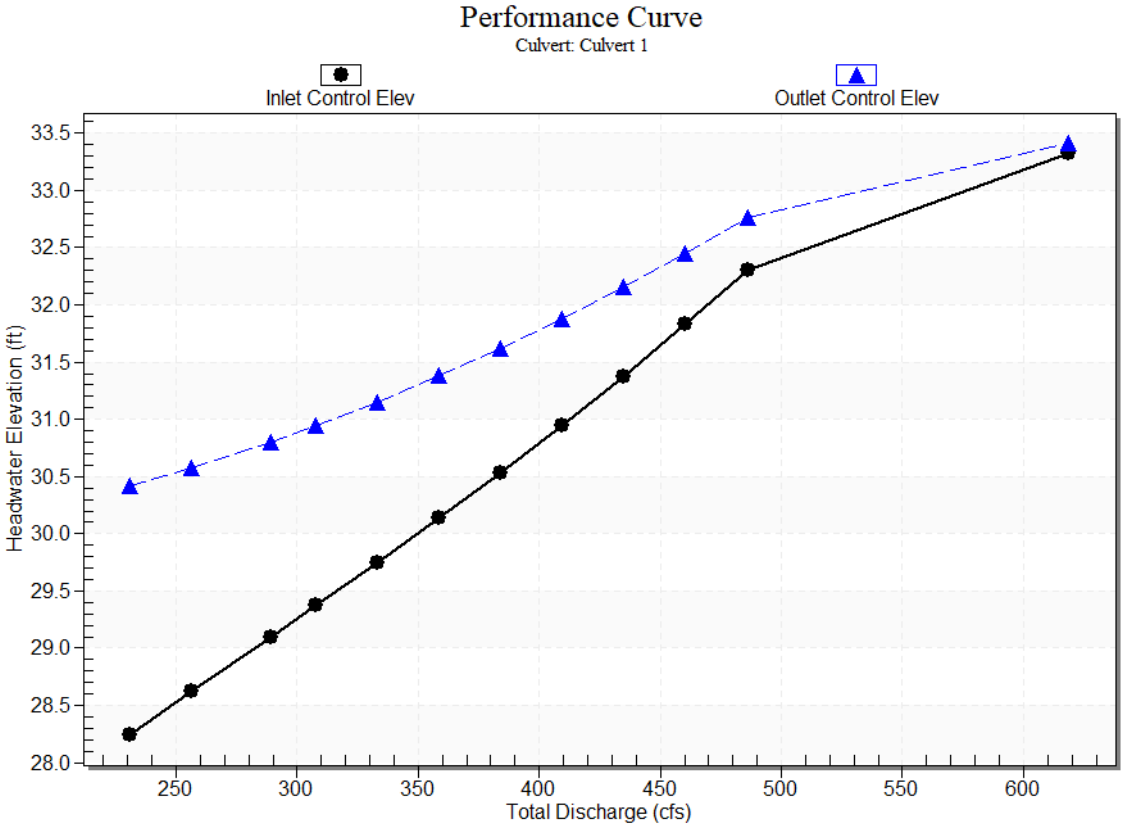
Straight Culvert

Inlet Elevation (invert): 22.48 ft, Outlet Elevation (invert): 22.10 ft

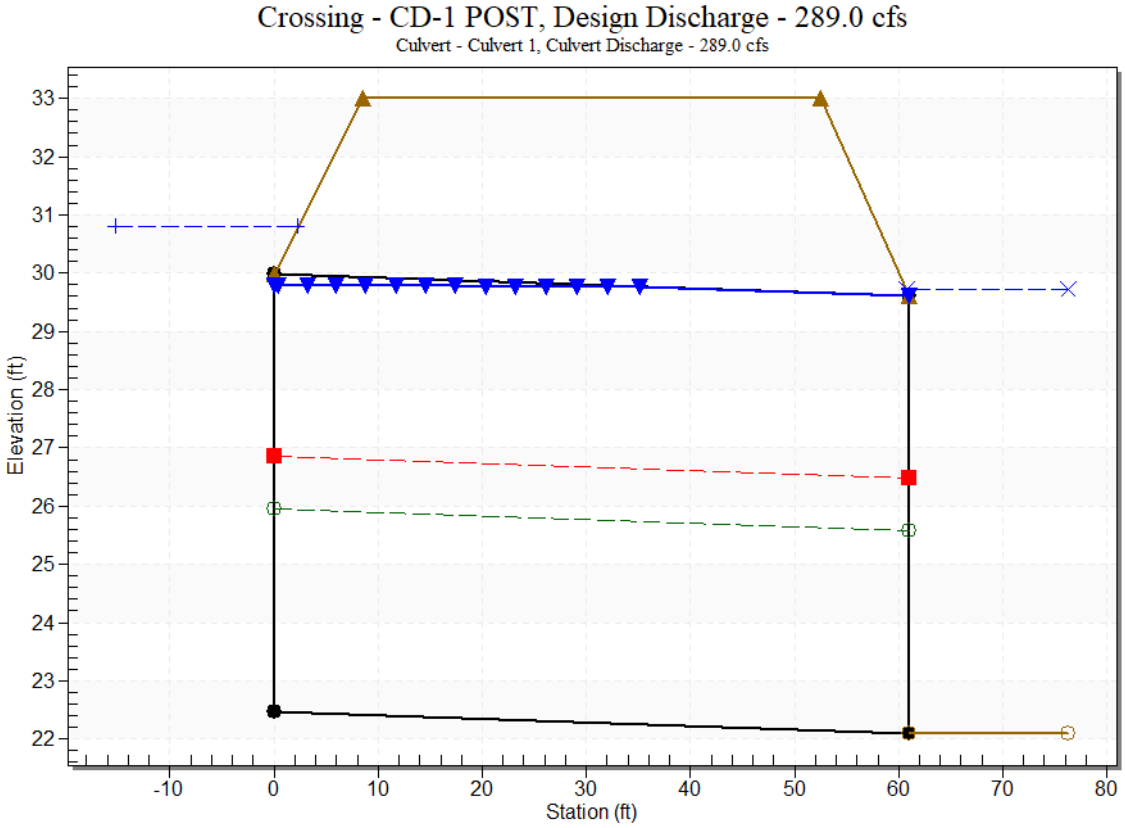
Culvert Length: 61.06 ft, Culvert Slope: 0.0062

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.48 ft

Outlet Station: 61.06 ft

Outlet Elevation: 22.10 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 7.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-1 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
231.00	29.73	7.63
256.50	29.73	7.63
289.00	29.73	7.63
307.50	29.73	7.63
333.00	29.73	7.63
358.50	29.73	7.63
384.00	29.73	7.63
409.50	29.73	7.63
435.00	29.73	7.63
460.50	29.73	7.63
486.00	29.73	7.63

Tailwater Channel Data - CD-1 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.73 ft

Roadway Data for Crossing: CD-1 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 33.00 ft

Roadway Surface: Paved

Roadway Top Width: 44.00 ft

HY-8 Culvert Analysis Report (CD-2 POST)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 231.00 cfs

Design Flow: 289.00 cfs

Maximum Flow: 486.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-2 POST

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.48	231.00	231.00	0.00	1
30.64	256.50	256.50	0.00	1
30.87	289.00	289.00	0.00	1
31.01	307.50	307.50	0.00	1
31.22	333.00	333.00	0.00	1
31.44	358.50	358.50	0.00	1
31.69	384.00	384.00	0.00	1
31.95	409.50	409.50	0.00	1
32.11	435.00	424.49	10.17	7
32.20	460.50	433.25	27.10	6
32.28	486.00	440.56	45.23	5
32.00	414.59	414.59	0.00	Overtopping

Rating Curve Plot for Crossing: CD-2 POST

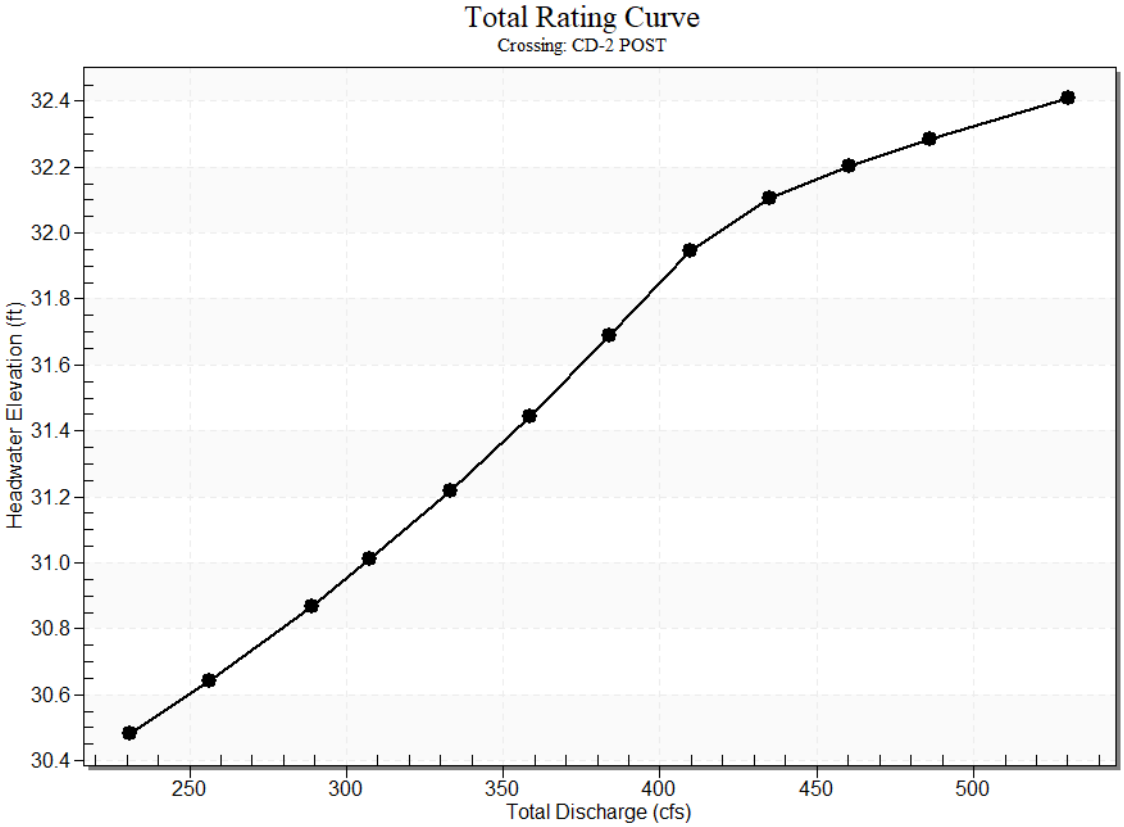


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
231.00	231.00	30.48	5.77	8.163	4-FFf	3.57	3.89	7.50	7.70	5.23	0.00
256.50	256.50	30.64	6.15	8.322	4-FFf	3.79	4.11	7.50	7.70	5.81	0.00
289.00	289.00	30.87	6.63	8.549	4-FFf	4.07	4.38	7.50	7.70	6.54	0.00
307.50	307.50	31.01	6.90	8.690	4-FFf	4.23	4.52	7.50	7.70	6.96	0.00
333.00	333.00	31.22	7.28	8.899	4-FFf	4.45	4.71	7.50	7.70	7.54	0.00
358.50	358.50	31.44	7.66	9.125	4-FFf	4.68	4.90	7.50	7.70	8.11	0.00
384.00	384.00	31.69	8.06	9.367	4-FFf	4.90	5.07	7.50	7.70	8.69	0.00
409.50	409.50	31.95	8.47	9.626	4-FFf	5.14	5.24	7.50	7.70	9.27	0.00
435.00	424.40	32.11	8.72	9.786	4-FFf	5.28	5.34	7.50	7.70	9.61	0.00
460.50	433.20	32.20	8.87	9.882	4-FFf	5.36	5.39	7.50	7.70	9.81	0.00
486.00	440.50	32.28	9.00	9.964	4-FFf	5.43	5.44	7.50	7.70	9.97	0.00

****

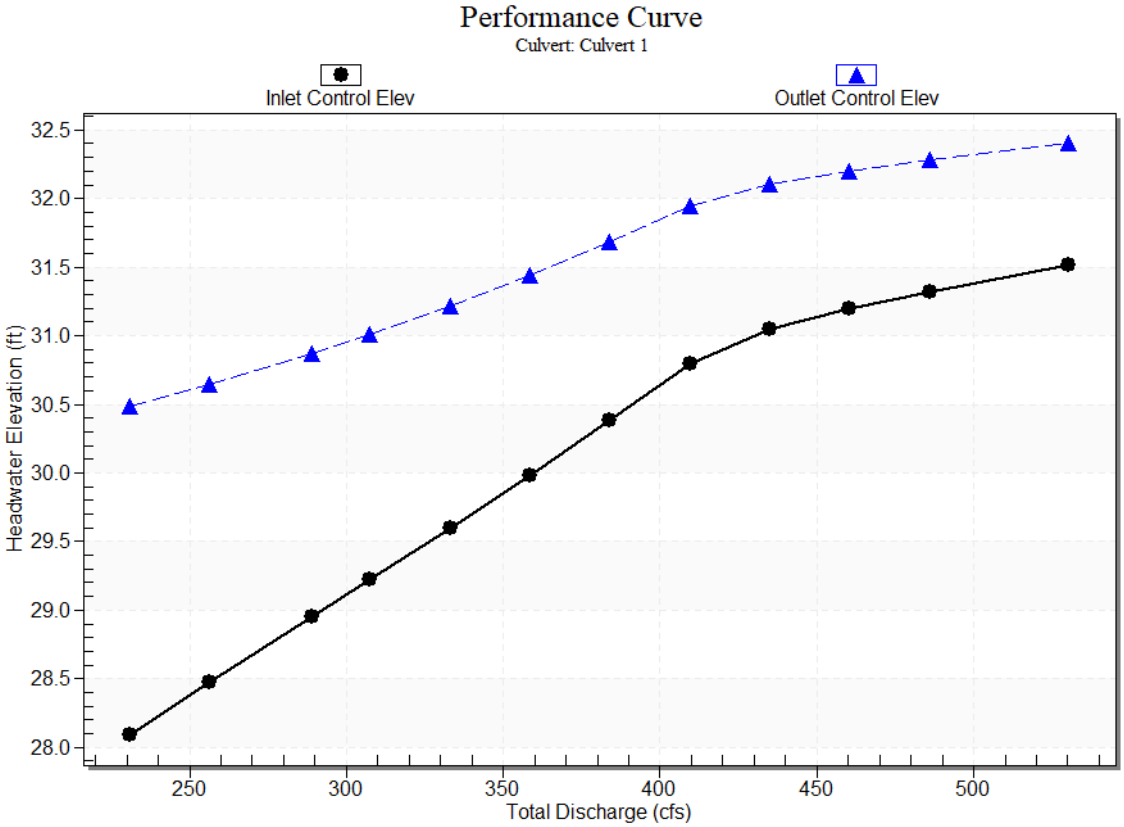
Straight Culvert

Inlet Elevation (invert): 22.32 ft, Outlet Elevation (invert): 22.10 ft

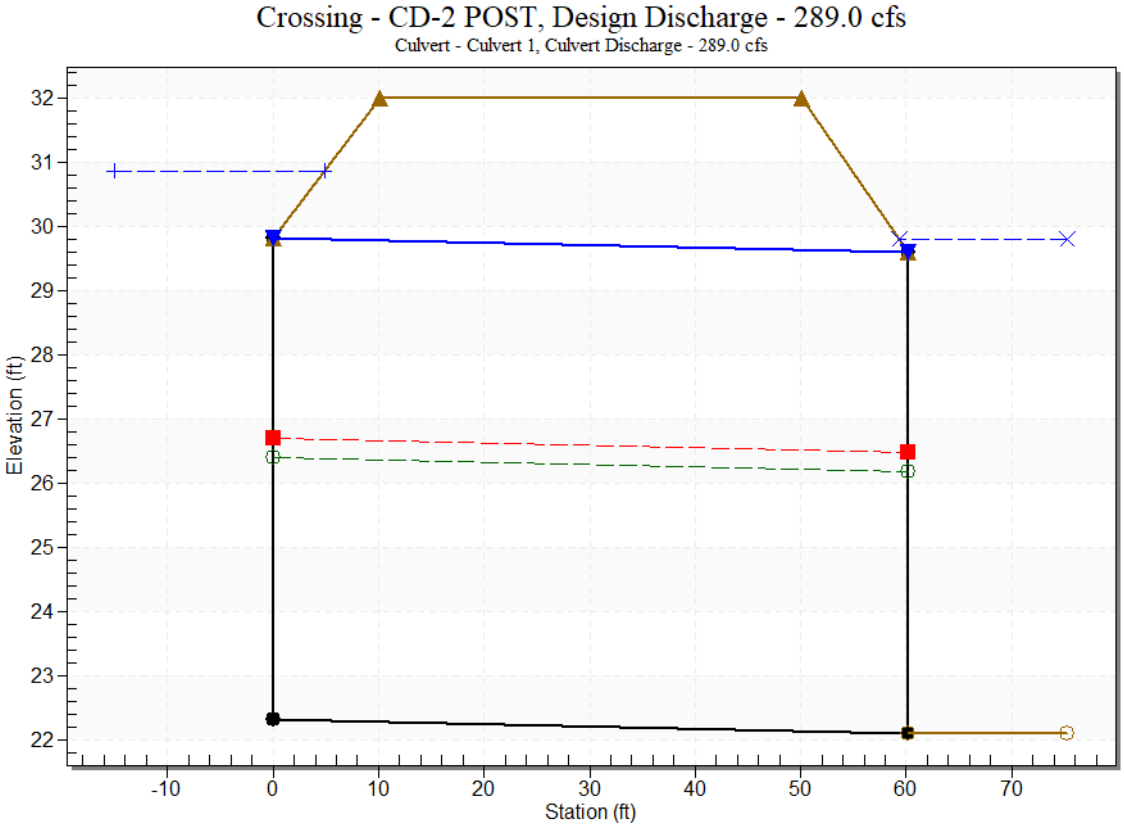
Culvert Length: 60.23 ft, Culvert Slope: 0.0037

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.32 ft

Outlet Station: 60.23 ft

Outlet Elevation: 22.10 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 7.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-2 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
231.00	29.80	7.70
256.50	29.80	7.70
289.00	29.80	7.70
307.50	29.80	7.70
333.00	29.80	7.70
358.50	29.80	7.70
384.00	29.80	7.70
409.50	29.80	7.70
435.00	29.80	7.70
460.50	29.80	7.70
486.00	29.80	7.70

Tailwater Channel Data - CD-2 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.80 ft

Roadway Data for Crossing: CD-2 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-3 POST)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 118.00 cfs

Design Flow: 147.00 cfs

Maximum Flow: 425.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-3 POST

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
27.95	118.00	118.00	0.00	1
28.33	147.00	147.00	0.00	1
28.86	179.40	179.40	0.00	1
29.47	210.10	210.10	0.00	1
30.32	240.80	240.80	0.00	1
31.40	271.50	271.50	0.00	1
32.12	302.20	289.94	12.16	9
32.26	332.90	293.37	39.28	6
32.37	363.60	296.04	67.28	5
32.47	394.30	298.36	95.82	5
32.55	425.00	300.45	124.29	4
32.00	286.97	286.97	0.00	Overtopping

Rating Curve Plot for Crossing: CD-3 POST

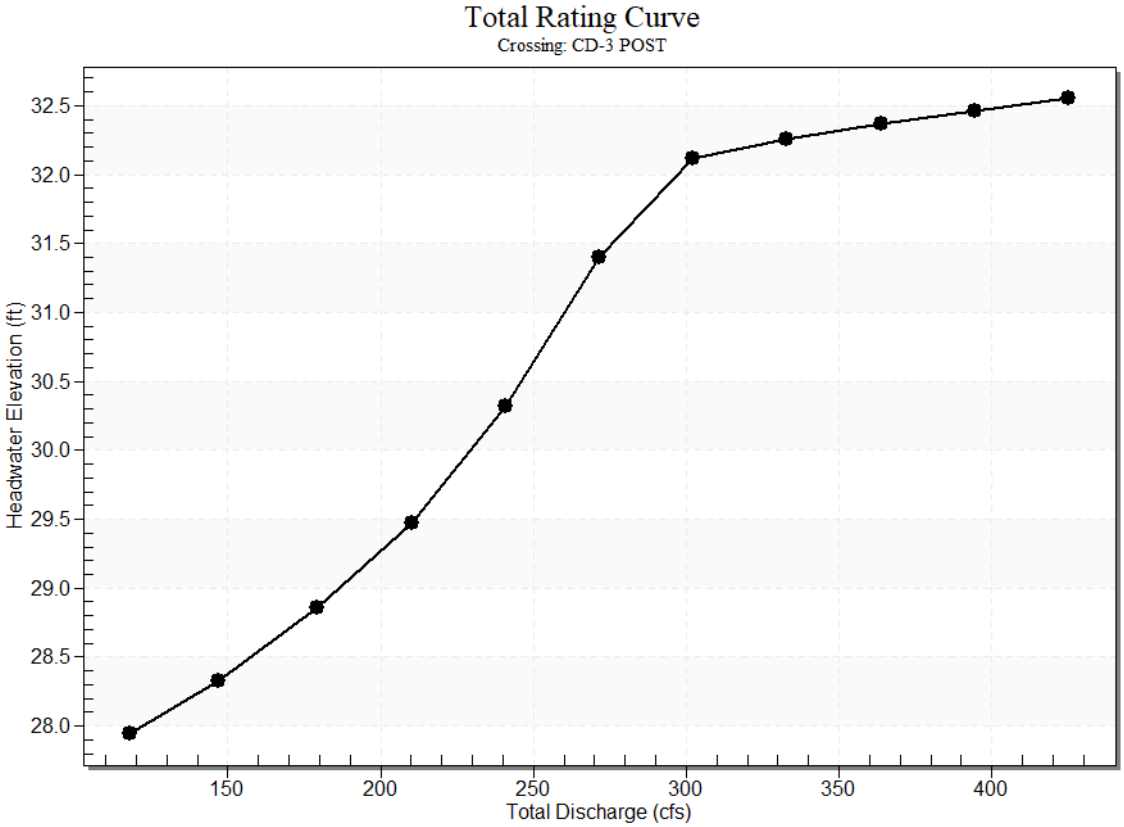


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
118.00	142.00	27.95	4.49	5.357	1-S1t	2.16	3.01	5.26	5.26	5.05	0.00
147.00	159.90	28.33	5.17	5.739	1-S1t	2.44	3.38	5.26	5.26	6.29	0.00
179.40	178.00	28.86	5.96	6.268	1-S1t	2.74	3.75	5.26	5.26	7.67	0.00
210.10	195.70	29.47	6.79	6.879	1-S1t	3.01	4.06	5.26	5.26	8.98	0.00
240.80	213.60	30.32	7.73	7.325	5-JS1t	3.29	4.33	5.26	5.26	10.30	0.00
271.50	231.50	31.40	8.81	8.045	5-S2n	3.56	4.57	4.01	5.26	14.64	0.00
302.20	289.90	32.12	9.53	8.519	5-S2n	3.73	4.70	4.17	5.26	15.00	0.00
332.90	293.30	32.26	9.67	8.611	5-S2n	3.77	4.72	4.20	5.26	15.07	0.00
363.60	296.04	32.37	9.78	8.683	5-S2n	3.79	4.74	4.22	5.26	15.13	0.00
394.30	298.36	32.47	9.88	8.746	5-S2n	3.81	4.76	4.24	5.26	15.17	0.00
425.00	300.45	32.55	9.96	8.803	5-S2n	3.83	4.77	4.26	5.26	15.22	0.00

****

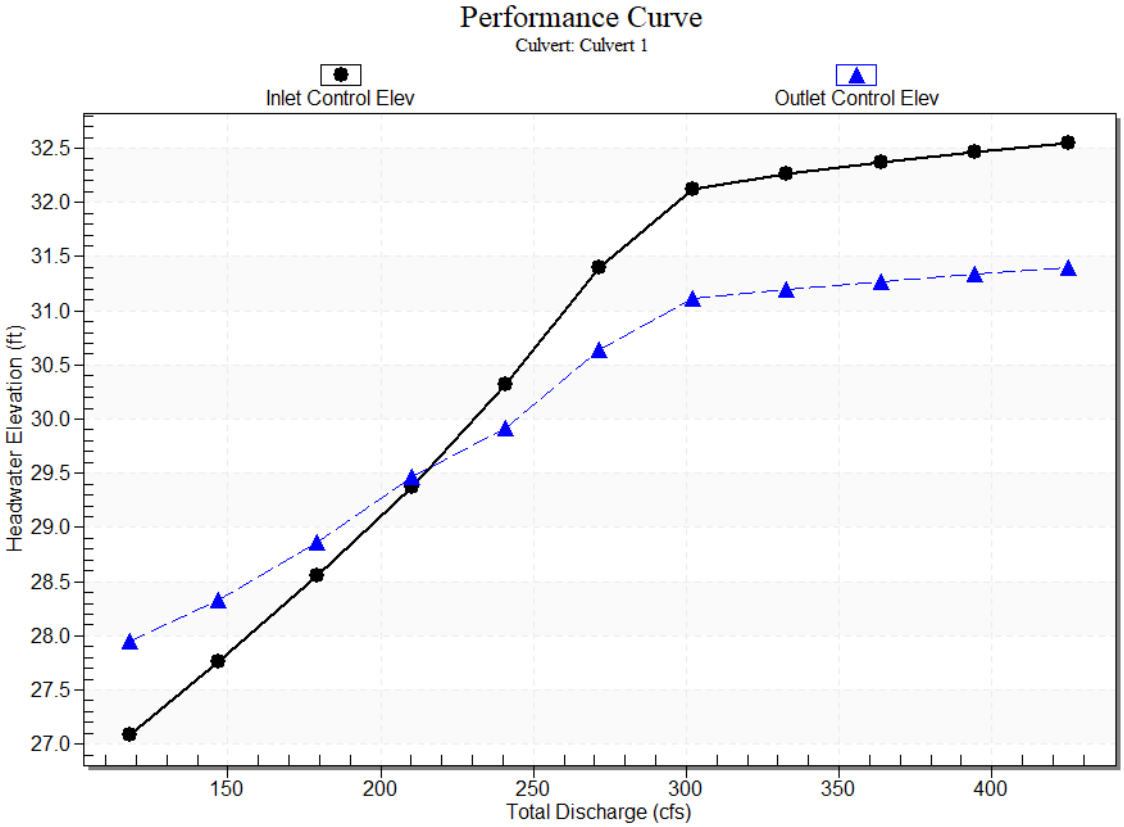
Straight Culvert

Inlet Elevation (invert): 22.59 ft, Outlet Elevation (invert): 22.00 ft

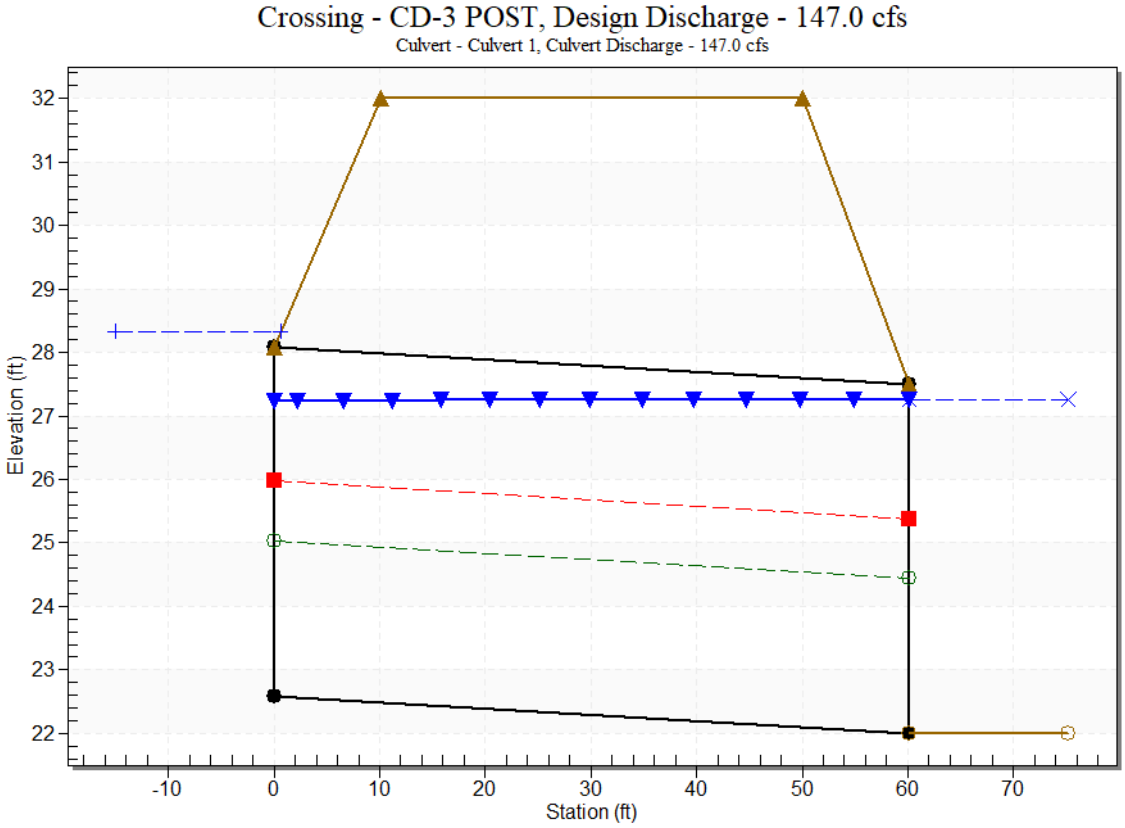
Culvert Length: 60.18 ft, Culvert Slope: 0.0098

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.59 ft

Outlet Station: 60.18 ft

Outlet Elevation: 22.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 5.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-3 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
118.00	27.26	5.26
147.00	27.26	5.26
179.40	27.26	5.26
210.10	27.26	5.26
240.80	27.26	5.26
271.50	27.26	5.26
302.20	27.26	5.26
332.90	27.26	5.26
363.60	27.26	5.26
394.30	27.26	5.26
425.00	27.26	5.26

Tailwater Channel Data - CD-3 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 27.26 ft

Roadway Data for Crossing: CD-3 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-4 POST)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 756.00 cfs

Design Flow: 945.00 cfs

Maximum Flow: 1587.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-4 POST

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Culvert 2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.62	756.00	378.45	378.49	0.00	9
30.78	839.10	419.58	419.58	0.00	4
31.02	945.00	472.55	472.50	0.00	4
31.17	1005.30	502.81	502.76	0.00	3
31.39	1088.40	544.32	544.26	0.00	3
31.62	1171.50	585.72	585.66	0.00	4
31.87	1254.60	627.14	627.08	0.00	5
32.11	1337.70	663.51	663.54	10.58	5
32.28	1420.80	688.44	688.38	43.72	3
32.45	1503.90	707.13	705.09	91.27	4
32.62	1587.00	720.92	718.98	146.75	4
32.00	1293.78	646.92	646.85	0.00	Overtopping

Rating Curve Plot for Crossing: CD-4 POST

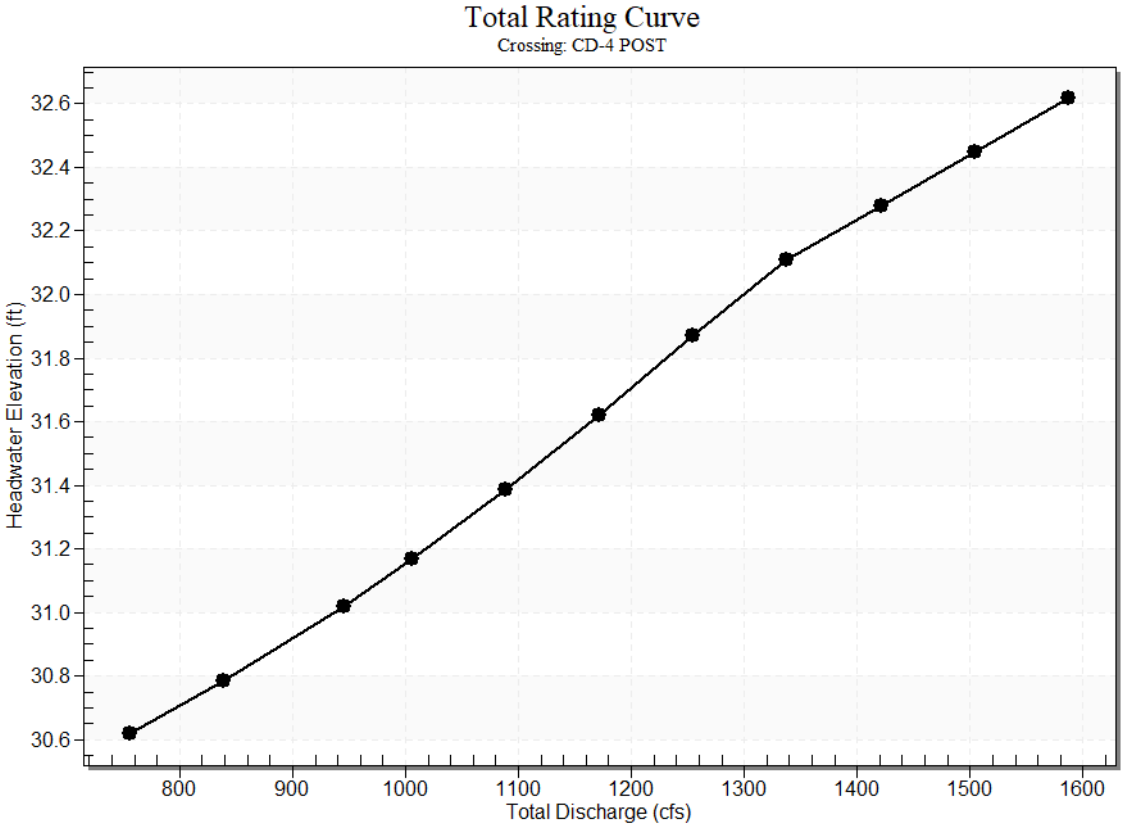


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
756.00	378.45	30.62	5.95	7.670	1-S1f	2.10	3.54	7.00	7.25	5.41	0.00
839.10	419.58	30.78	6.38	7.834	1-S1f	2.25	3.80	7.00	7.25	5.99	0.00
945.00	472.55	31.02	6.93	8.070	4-FFf	2.45	4.11	7.00	7.25	6.75	0.00
1005.30	502.81	31.17	7.24	8.218	4-FFf	2.55	4.28	7.00	7.25	7.18	0.00
1088.40	544.32	31.39	7.68	8.436	4-FFf	2.70	4.51	7.00	7.25	7.78	0.00
1171.50	585.72	31.62	8.12	8.671	4-FFf	2.84	4.74	7.00	7.25	8.37	0.00
1254.60	627.14	31.87	8.58	8.923	4-FFf	2.98	4.96	7.00	7.25	8.96	0.00
1337.70	663.51	32.11	8.99	9.158	4-FFf	3.10	5.15	7.00	7.25	9.48	0.00
1420.80	688.44	32.28	9.28	9.327	4-FFf	3.18	5.28	7.00	7.25	9.83	0.00
1503.90	707.13	32.45	9.50	9.458	4-FFf	3.25	5.38	7.00	7.25	10.10	0.00
1587.00	720.92	32.62	9.67	9.557	4-FFf	3.29	5.44	7.00	7.25	10.30	0.00

****

Straight Culvert

Inlet Elevation (invert): 22.95 ft, Outlet Elevation (invert): 22.30 ft

Culvert Length: 52.03 ft, Culvert Slope: 0.0125

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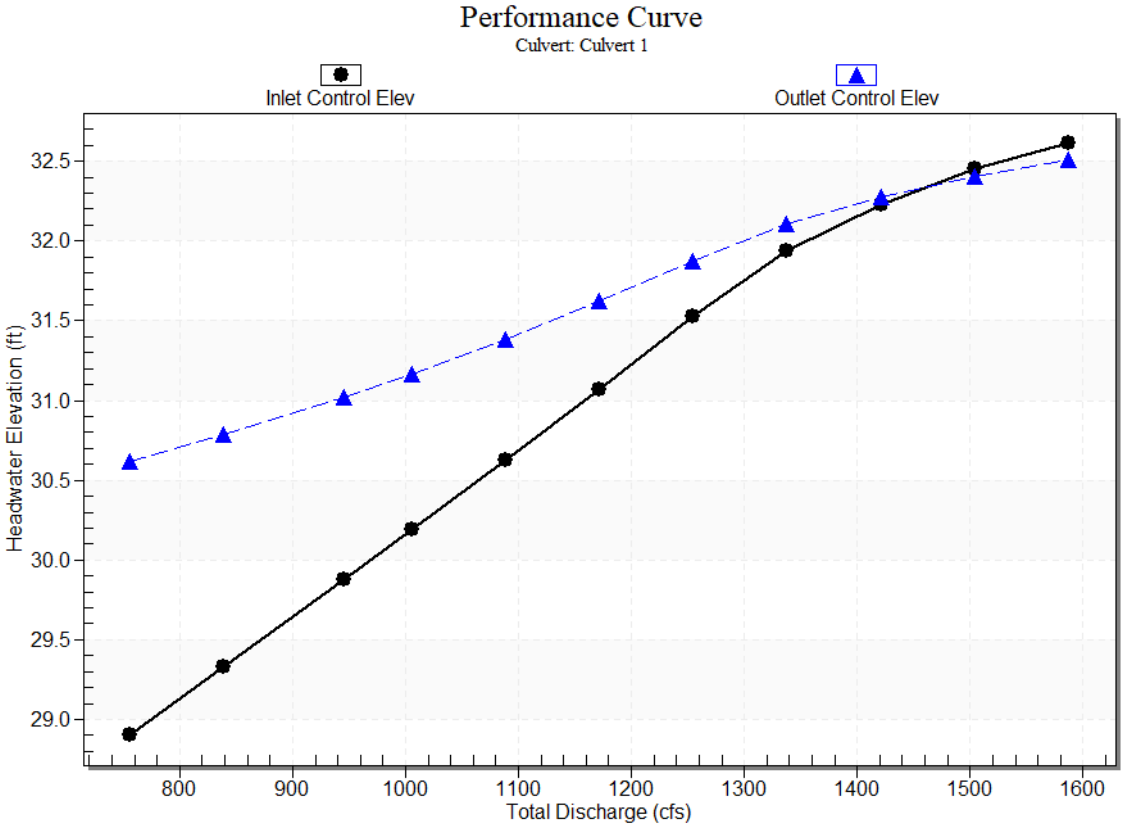
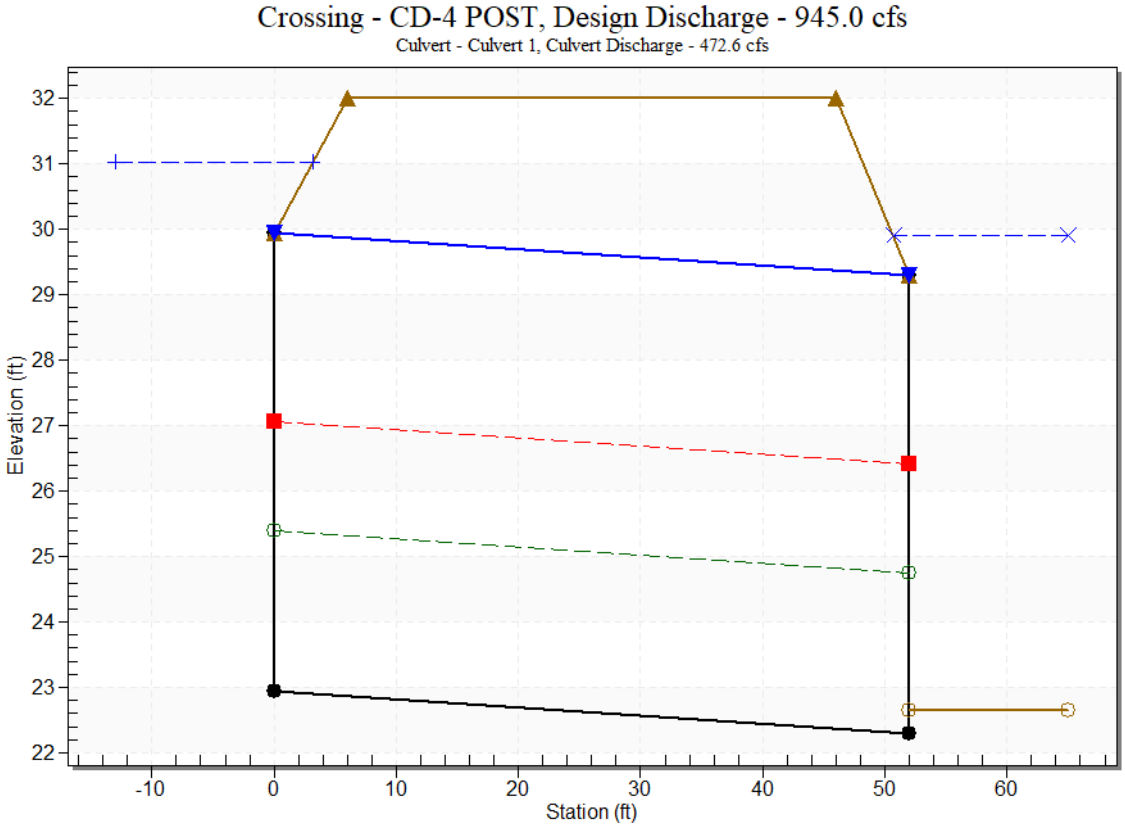
Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.95 ft

Outlet Station: 52.03 ft

Outlet Elevation: 22.30 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 10.00 ft

Barrel Rise: 7.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall (Ke=0.5)

Inlet Depression: None

Table 3 - Culvert Summary Table: Culvert 2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
756.00	378.49	30.62	5.97	7.670	1-S1f	2.75	3.54	7.00	7.25	5.41	0.00
839.10	419.58	30.78	6.40	7.834	1-S1f	2.95	3.80	7.00	7.25	5.99	0.00
945.00	472.50	31.02	6.95	8.070	4-FFf	3.21	4.11	7.00	7.25	6.75	0.00
1005.30	502.76	31.17	7.27	8.218	4-FFf	3.36	4.28	7.00	7.25	7.18	0.00
1088.40	544.26	31.39	7.70	8.436	4-FFf	3.55	4.51	7.00	7.25	7.78	0.00
1171.50	585.66	31.62	8.14	8.671	4-FFf	3.74	4.74	7.00	7.25	8.37	0.00
1254.60	627.08	31.87	8.60	8.923	4-FFf	3.94	4.96	7.00	7.25	8.96	0.00
1337.70	663.54	32.11	9.01	9.159	4-FFf	4.10	5.15	7.00	7.25	9.48	0.00
1420.80	688.38	32.28	9.30	9.327	4-FFf	4.21	5.28	7.00	7.25	9.83	0.00
1503.90	705.09	32.45	9.50	9.444	4-FFf	4.29	5.36	7.00	7.25	10.07	0.00
1587.00	718.98	32.62	9.67	9.543	4-FFf	4.35	5.43	7.00	7.25	10.27	0.00

****

Straight Culvert

Inlet Elevation (invert): 22.95 ft, Outlet Elevation (invert): 22.65 ft

Culvert Length: 52.13 ft, Culvert Slope: 0.0058

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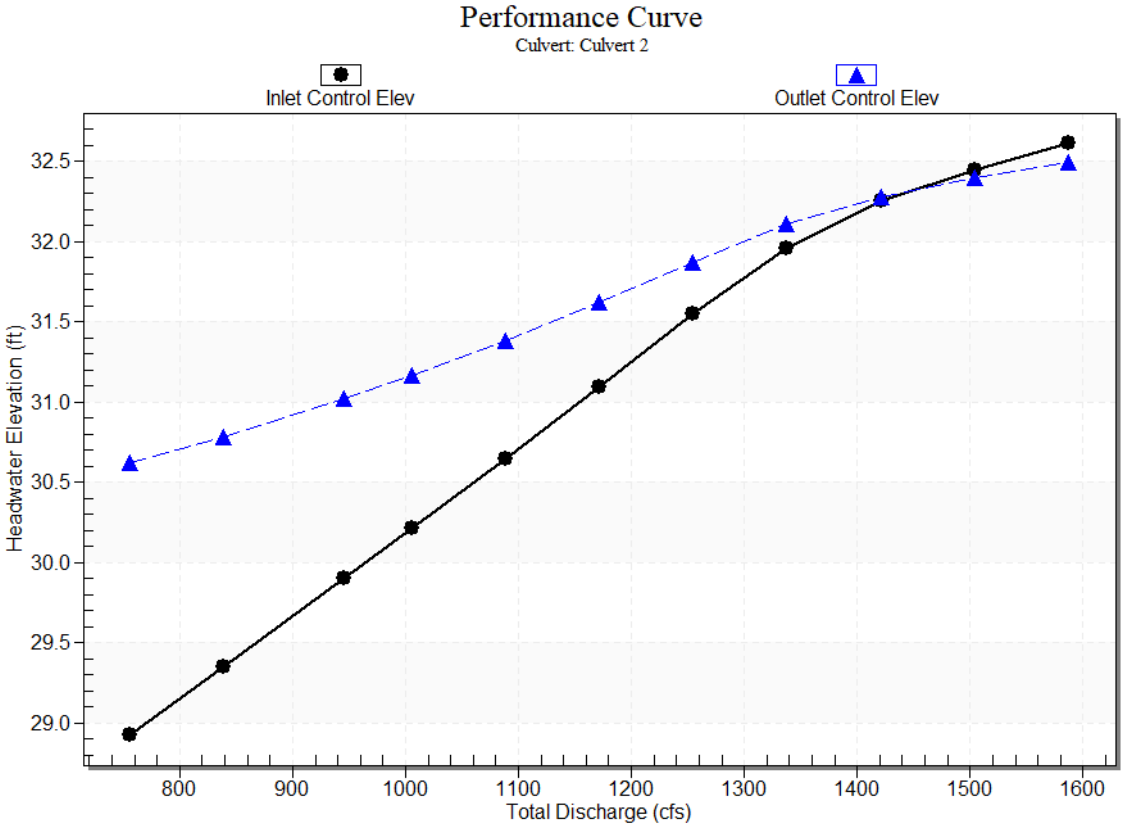
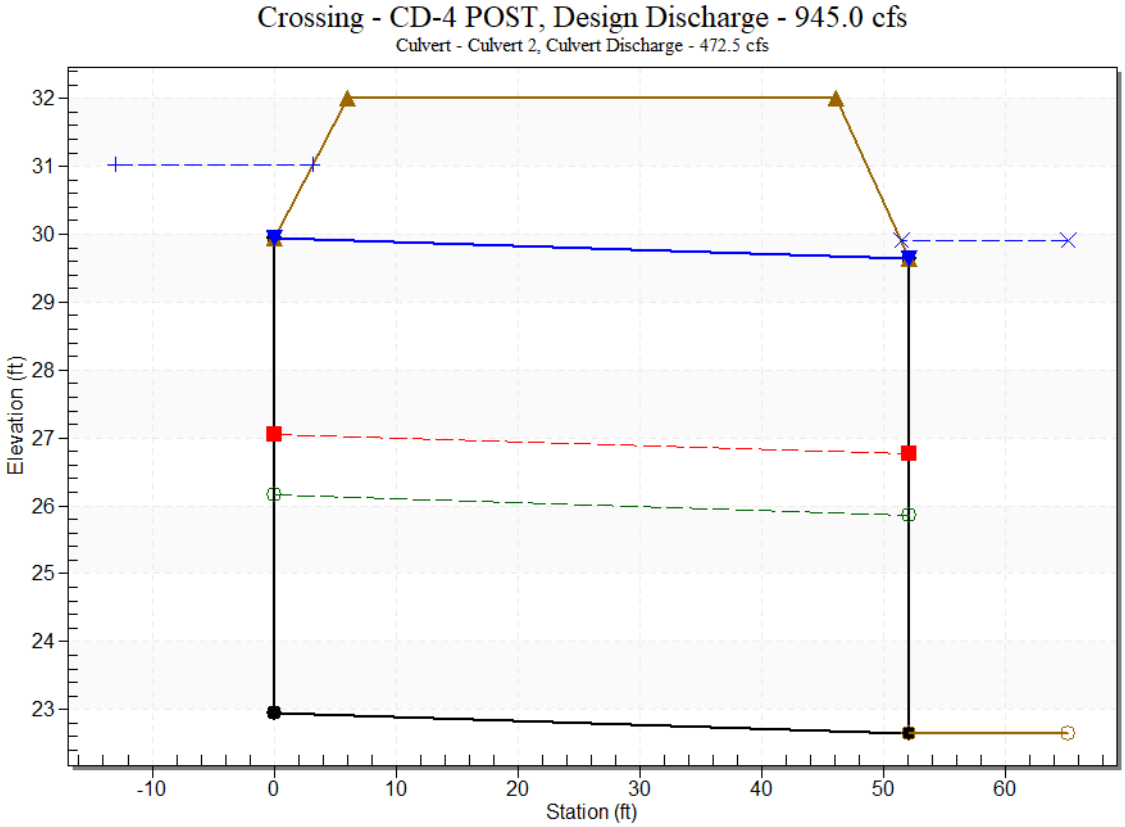
Culvert Performance Curve Plot: Culvert 2



Water Surface Profile Plot for Culvert: Culvert 2



Site Data - Culvert 2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.95 ft

Outlet Station: 52.13 ft

Outlet Elevation: 22.65 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 2

Barrel Shape: Concrete Box

Barrel Span: 10.00 ft

Barrel Rise: 7.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall (Ke=0.5)

Inlet Depression: None

Table 4 - Downstream Channel Rating Curve (Crossing: CD-4 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
756.00	29.90	7.25
839.10	29.90	7.25
945.00	29.90	7.25
1005.30	29.90	7.25
1088.40	29.90	7.25
1171.50	29.90	7.25
1254.60	29.90	7.25
1337.70	29.90	7.25
1420.80	29.90	7.25
1503.90	29.90	7.25
1587.00	29.90	7.25

Tailwater Channel Data - CD-4 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.90 ft

Roadway Data for Crossing: CD-4 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-5 POST)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 11.00 cfs

Design Flow: 14.00 cfs

Maximum Flow: 23.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-5 POST

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.23	11.00	11.00	0.00	1
30.38	12.20	12.20	0.00	1
30.54	13.40	13.40	0.00	1
30.62	14.00	14.00	0.00	1
30.90	15.80	15.80	0.00	1
31.10	17.00	17.00	0.00	1
31.32	18.20	18.20	0.00	1
31.55	19.40	19.40	0.00	1
31.80	20.60	20.60	0.00	1
32.01	21.80	21.53	0.16	33
32.03	23.00	21.61	1.28	5
32.00	21.49	21.49	0.00	Overtopping

Rating Curve Plot for Crossing: CD-5 POST

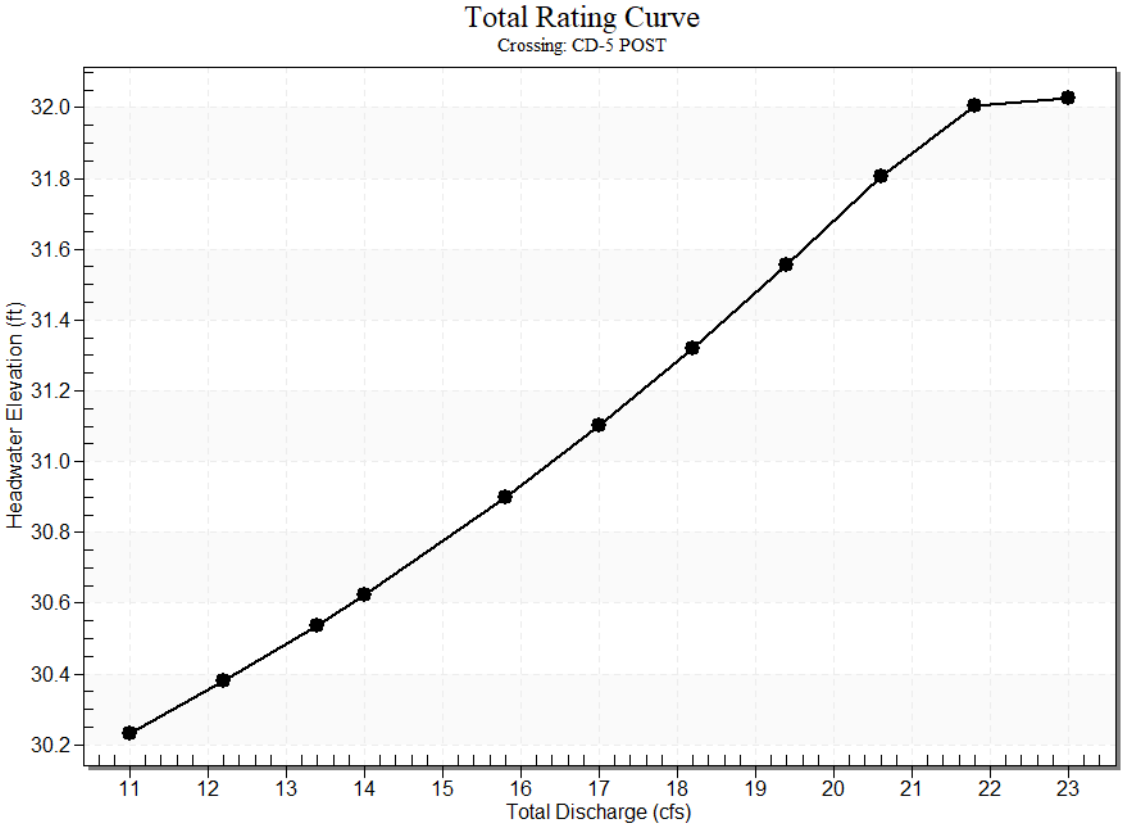


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
11.00	11.00	30.23	1.85	1.167	1-JS1f	0.78	1.19	2.00	2.08	3.50	0.00
12.20	12.20	30.38	2.00	1.274	1-JS1f	0.83	1.26	2.00	2.08	3.88	0.00
13.40	13.40	30.54	2.16	1.393	5-JS1f	0.87	1.32	2.00	2.08	4.27	0.00
14.00	14.00	30.62	2.24	1.456	5-JS1f	0.89	1.35	2.00	2.08	4.46	0.00
15.80	15.80	30.90	2.52	1.663	5-S2n	0.96	1.43	1.01	2.08	9.93	0.00
17.00	17.00	31.10	2.72	1.815	5-S2n	1.00	1.49	1.05	2.08	10.12	0.00
18.20	18.20	31.32	2.94	1.978	5-S2n	1.04	1.54	1.10	2.08	10.30	0.00
19.40	19.40	31.55	3.17	2.152	5-S2n	1.08	1.58	1.14	2.08	10.46	0.00
20.60	20.60	31.80	3.42	2.338	5-S2n	1.12	1.63	1.19	2.08	10.61	0.00
21.80	21.53	32.01	3.63	2.488	5-S2n	1.15	1.66	1.22	2.08	10.71	0.00
23.00	21.61	32.03	3.65	2.502	5-S2n	1.16	1.66	1.22	2.08	10.72	0.00

****

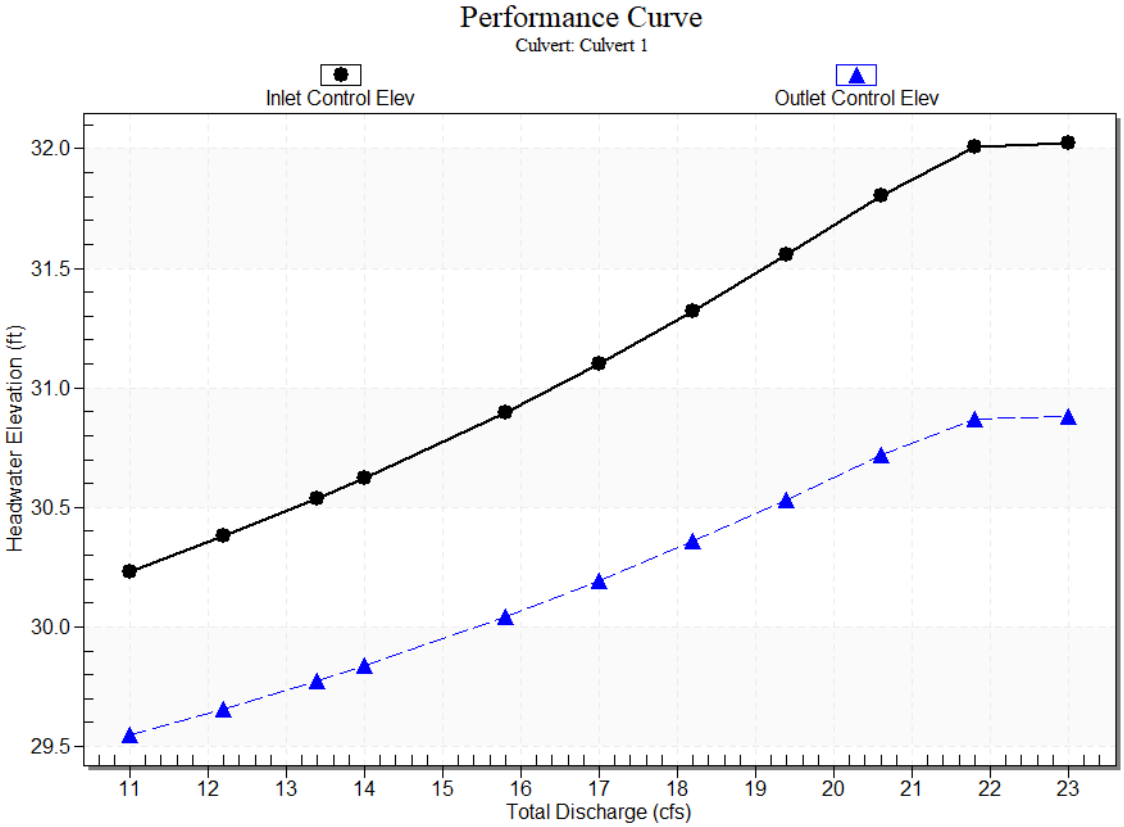
Straight Culvert

Inlet Elevation (invert): 28.38 ft, Outlet Elevation (invert): 27.00 ft

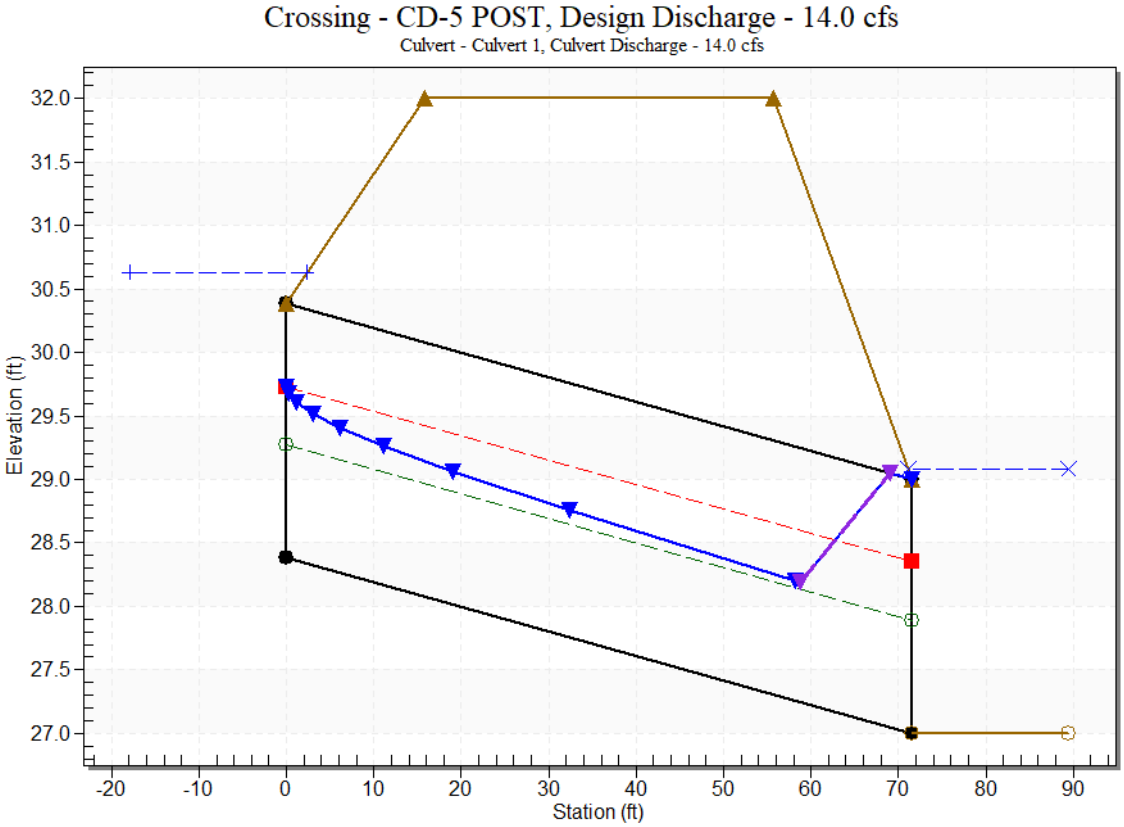
Culvert Length: 71.56 ft, Culvert Slope: 0.0193

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 28.38 ft

Outlet Station: 71.55 ft

Outlet Elevation: 27.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Mitered to Conform to Slope (Ke=0.7)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-5 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
11.00	29.08	2.08
12.20	29.08	2.08
13.40	29.08	2.08
14.00	29.08	2.08
15.80	29.08	2.08
17.00	29.08	2.08
18.20	29.08	2.08
19.40	29.08	2.08
20.60	29.08	2.08
21.80	29.08	2.08
23.00	29.08	2.08

Tailwater Channel Data - CD-5 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 29.08 ft

Roadway Data for Crossing: CD-5 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-6 POST)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 504.00 cfs

Design Flow: 630.00 cfs

Maximum Flow: 1058.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-6 POST

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Culvert 2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
29.59	504.00	251.74	252.87	0.00	9
29.76	559.40	279.14	280.39	0.00	4
30.00	630.00	314.34	315.69	0.00	4
30.15	670.20	334.50	335.89	0.00	3
30.37	725.60	362.09	363.52	0.00	4
30.60	781.00	389.81	391.20	0.00	4
30.86	836.40	417.61	418.81	0.00	4
31.18	891.80	440.58	451.25	0.00	4
31.54	947.20	462.62	484.62	0.00	4
32.01	1002.60	490.47	511.47	0.41	11
32.23	1058.00	502.66	523.22	31.92	6
32.00	1000.51	489.74	510.77	0.00	Overtopping

Rating Curve Plot for Crossing: CD-6 POST

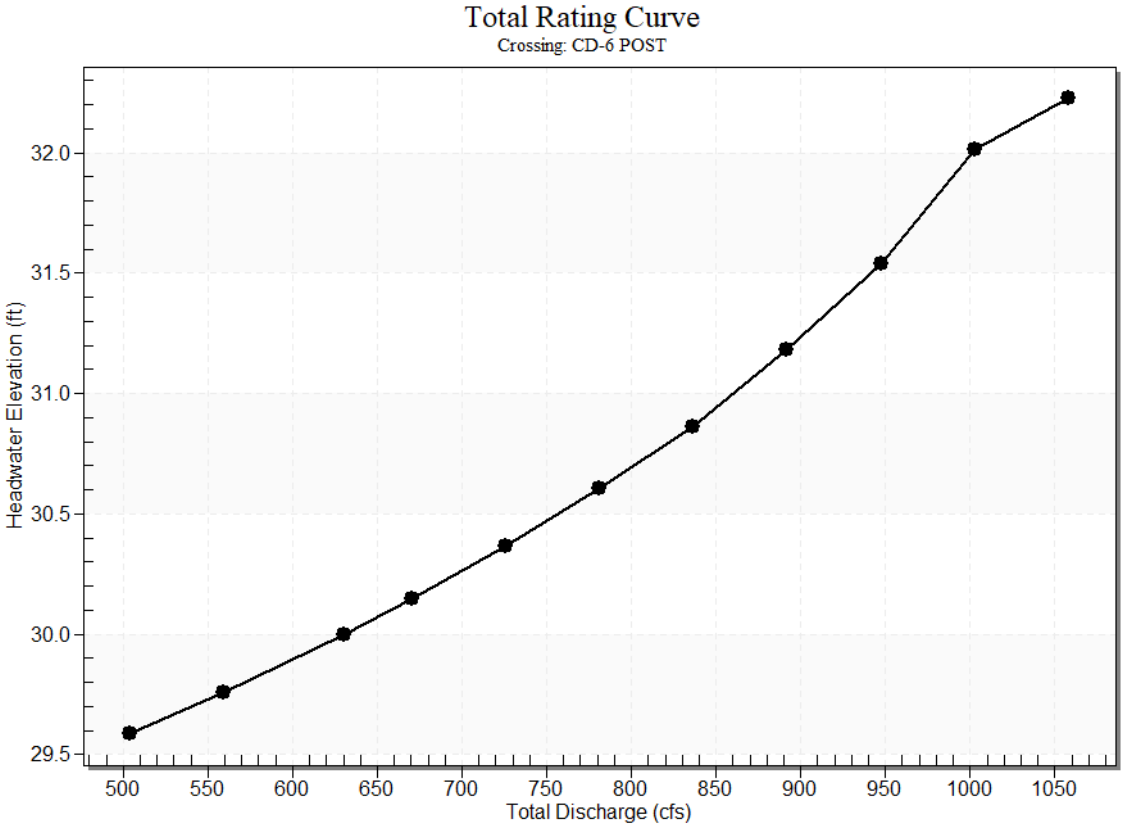


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
504.00	251.74	29.59	5.29	6.439	1-S1f	2.68	3.13	6.00	6.16	5.24	0.00
559.40	279.14	29.76	5.67	6.606	1-S1f	2.88	3.36	6.00	6.16	5.82	0.00
630.00	314.34	30.00	6.16	6.846	1-S1f	3.14	3.63	6.00	6.16	6.55	0.00
670.20	334.50	30.15	6.45	6.996	1-S1f	3.29	3.79	6.00	6.16	6.97	0.00
725.60	362.09	30.37	6.84	7.216	1-S1f	3.48	3.99	6.00	6.16	7.54	0.00
781.00	389.81	30.60	7.25	7.454	1-S1f	3.68	4.19	6.00	6.16	8.12	0.00
836.40	417.61	30.86	7.67	7.709	1-S1f	3.87	4.39	6.00	6.16	8.70	0.00
891.80	440.58	31.18	8.03	7.932	5-S1f	4.03	4.55	6.00	6.16	9.18	0.00
947.20	462.62	31.54	8.39	8.155	5-S1f	4.18	4.70	6.00	6.16	9.64	0.00
1002.60	490.47	32.01	8.86	8.452	4-FFf	4.37	4.89	6.00	6.16	10.22	0.00
1058.00	502.66	32.23	9.08	8.590	4-FFf	4.45	4.97	6.00	6.16	10.47	0.00

****

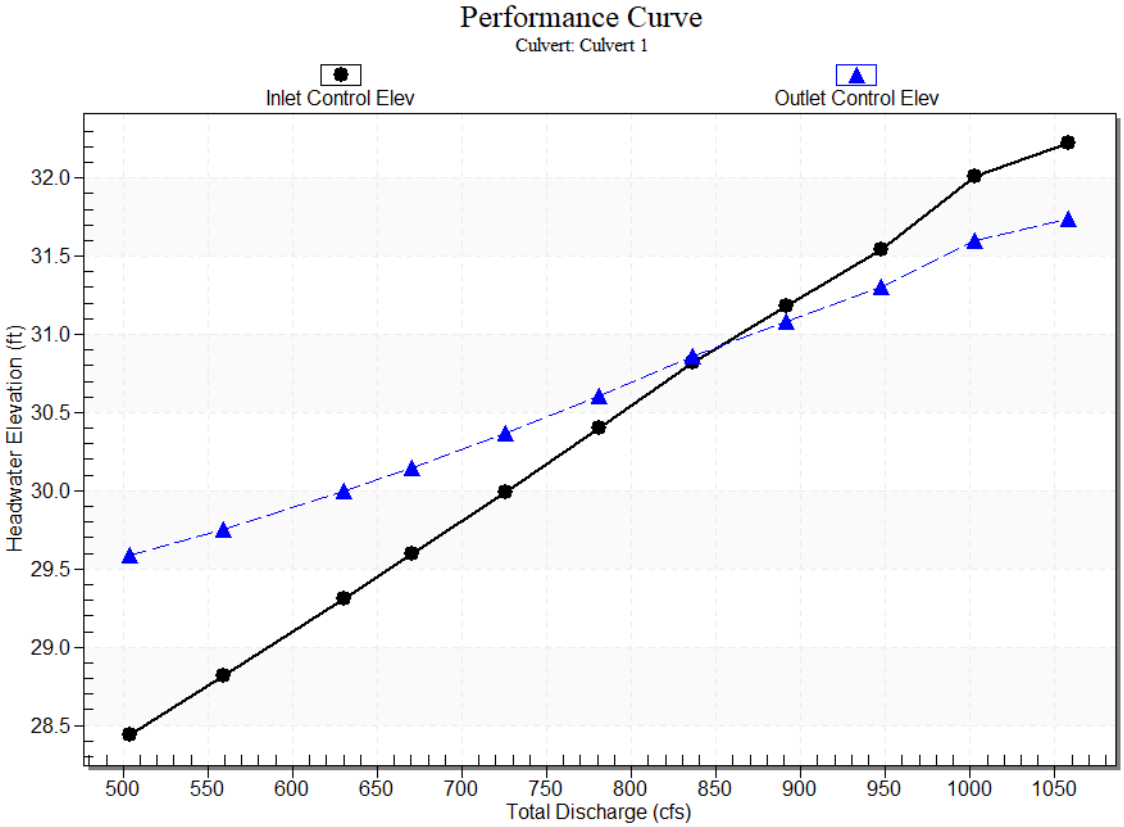
Straight Culvert

Inlet Elevation (invert): 23.15 ft, Outlet Elevation (invert): 22.70 ft

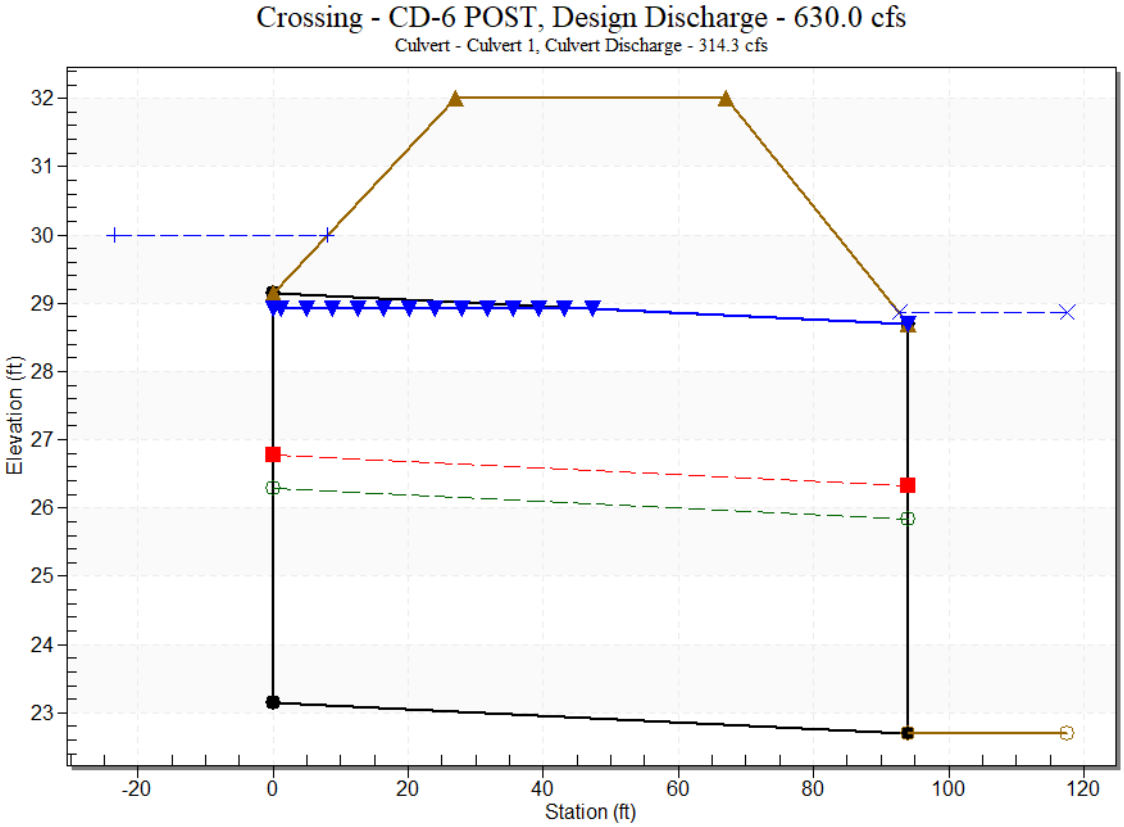
Culvert Length: 94.09 ft, Culvert Slope: 0.0048

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 23.15 ft

Outlet Station: 94.09 ft

Outlet Elevation: 22.70 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Box

Barrel Span: 8.00 ft

Barrel Rise: 6.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall (Ke=0.5)

Inlet Depression: None

Table 3 - Culvert Summary Table: Culvert 2

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
504.00	252.87	29.59	5.29	6.799	4-FFf	2.20	3.14	6.00	6.16	5.27	0.00
559.40	280.39	29.76	5.68	6.966	4-FFf	2.37	3.37	6.00	6.16	5.84	0.00
630.00	315.69	30.00	6.17	7.206	4-FFf	2.57	3.64	6.00	6.16	6.58	0.00
670.20	335.89	30.15	6.46	7.356	4-FFf	2.69	3.80	6.00	6.16	7.00	0.00
725.60	363.52	30.37	6.85	7.576	4-FFf	2.85	4.00	6.00	6.16	7.57	0.00
781.00	391.20	30.60	7.26	7.814	4-FFf	3.00	4.20	6.00	6.16	8.15	0.00
836.40	418.81	30.86	7.68	8.069	4-FFf	3.15	4.40	6.00	6.16	8.73	0.00
891.80	451.25	31.18	8.19	8.391	4-FFf	3.33	4.62	6.00	6.16	9.40	0.00
947.20	484.62	31.54	8.75	8.747	4-FFf	3.51	4.85	6.00	6.16	10.10	0.00
1002.60	511.47	32.01	9.22	9.052	4-FFf	3.65	5.03	6.00	6.16	10.66	0.00
1058.00	523.22	32.23	9.44	9.190	4-FFf	3.71	5.10	6.00	6.16	10.90	0.00

****

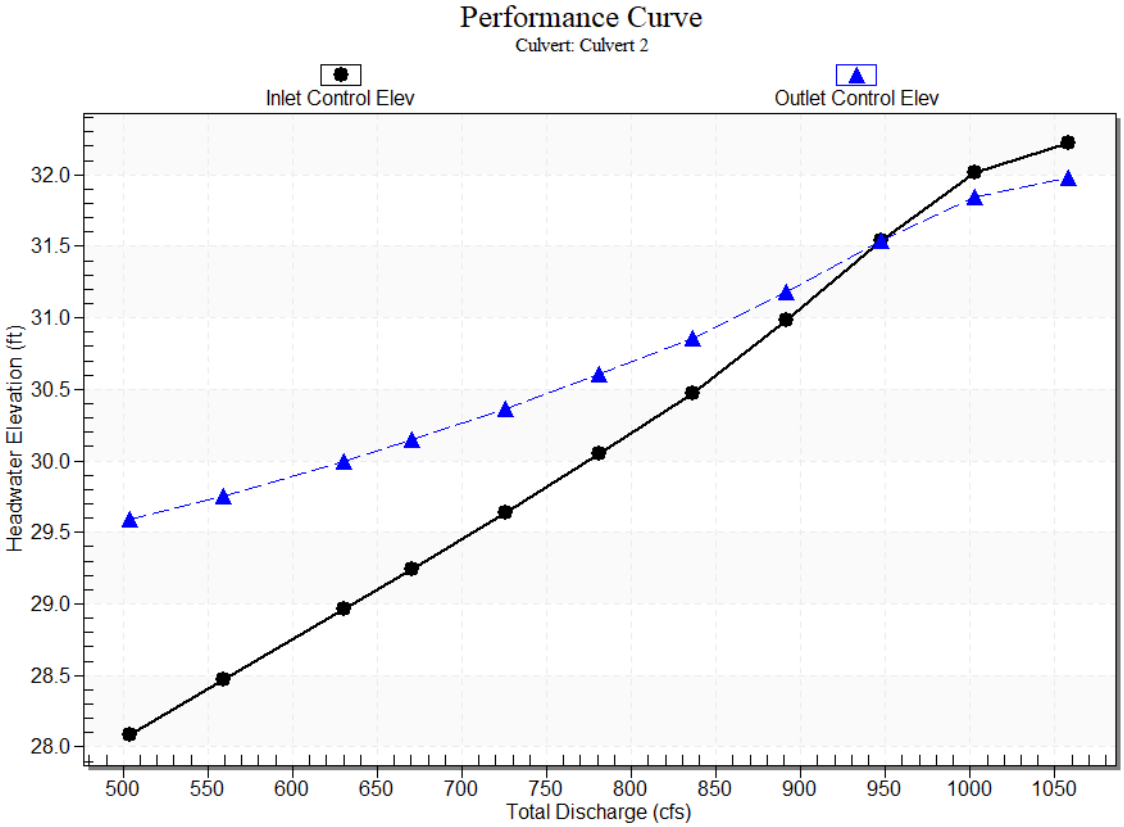
Straight Culvert

Inlet Elevation (invert): 22.79 ft, Outlet Elevation (invert): 22.00 ft

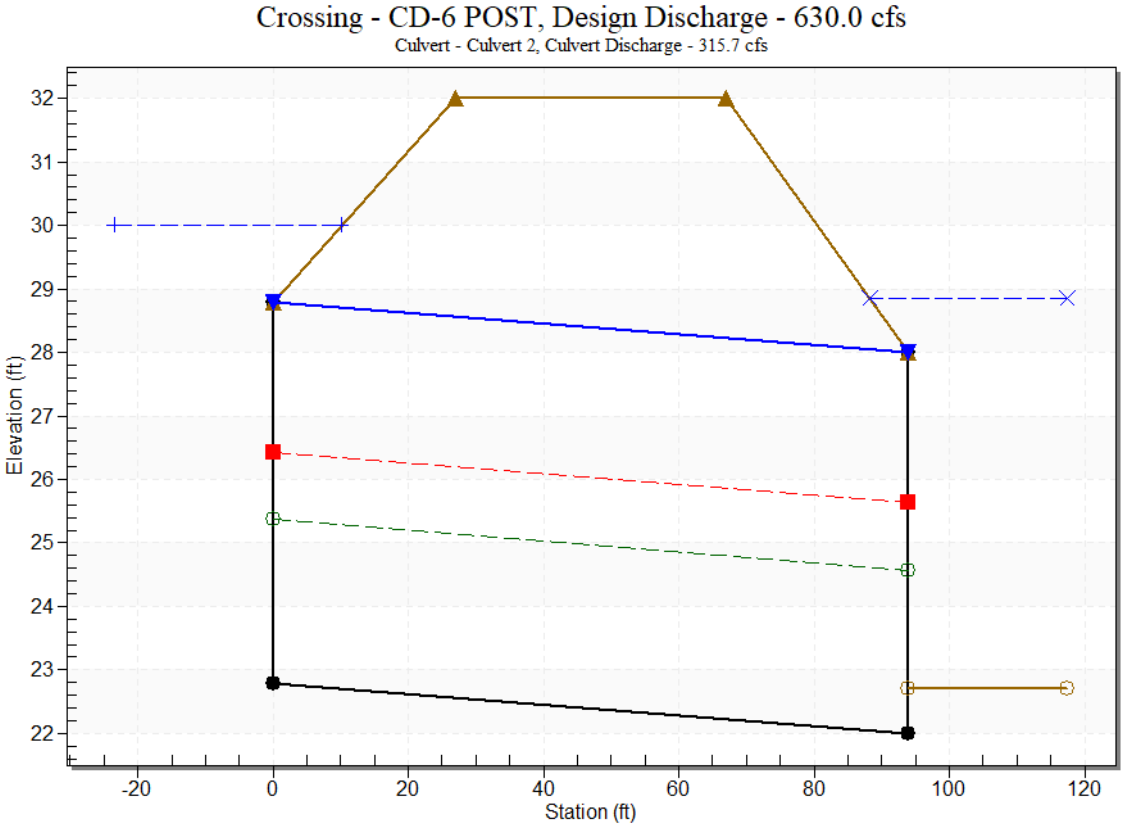
Culvert Length: 94.00 ft, Culvert Slope: 0.0084

****

Culvert Performance Curve Plot: Culvert 2



Water Surface Profile Plot for Culvert: Culvert 2



Site Data - Culvert 2

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 22.79 ft

Outlet Station: 94.00 ft

Outlet Elevation: 22.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 2

Barrel Shape: Concrete Box

Barrel Span: 8.00 ft

Barrel Rise: 6.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall (Ke=0.5)

Inlet Depression: None

Table 4 - Downstream Channel Rating Curve (Crossing: CD-6 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
504.00	28.86	6.16
559.40	28.86	6.16
630.00	28.86	6.16
670.20	28.86	6.16
725.60	28.86	6.16
781.00	28.86	6.16
836.40	28.86	6.16
891.80	28.86	6.16
947.20	28.86	6.16
1002.60	28.86	6.16
1058.00	28.86	6.16

Tailwater Channel Data - CD-6 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 28.86 ft

Roadway Data for Crossing: CD-6 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

HY-8 Culvert Analysis Report (CD-7 POST)

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 19.00 cfs

Design Flow: 24.00 cfs

Maximum Flow: 43.00 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-7 POST

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
28.19	19.00	19.00	0.00	1
28.37	21.40	21.40	0.00	1
28.58	24.00	24.00	0.00	1
28.76	26.20	26.20	0.00	1
28.97	28.60	28.60	0.00	1
29.20	31.00	31.00	0.00	1
29.45	33.40	33.40	0.00	1
29.72	35.80	35.80	0.00	1
30.00	38.20	38.20	0.00	1
30.31	40.60	40.60	0.00	1
30.64	43.00	43.00	0.00	1
32.00	51.65	51.65	0.00	Overtopping

Rating Curve Plot for Crossing: CD-7 POST

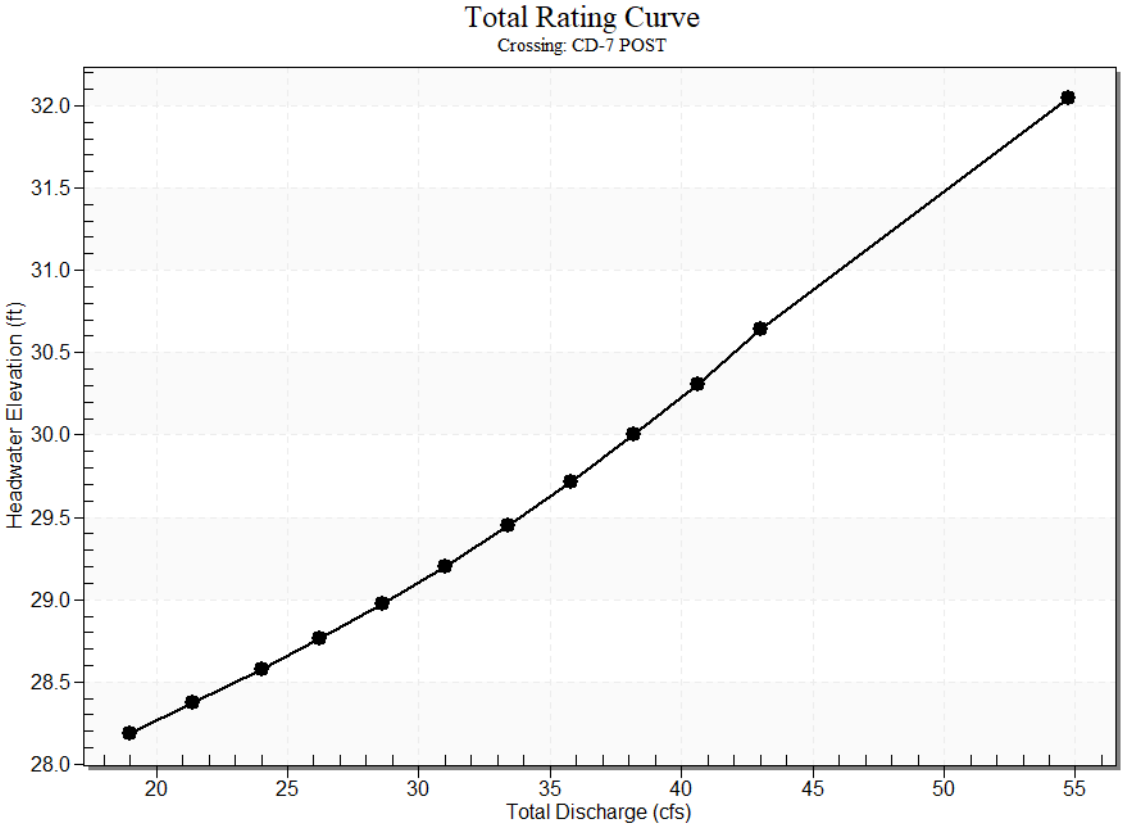


Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
19.00	19.00	28.19	2.21	1.257	1-JS1f	0.82	1.48	2.50	2.78	3.87	0.00
21.40	21.40	28.37	2.39	1.380	1-S2n	0.88	1.57	0.97	2.78	12.16	0.00
24.00	24.00	28.58	2.60	1.530	5-S2n	0.93	1.67	1.04	2.78	12.40	0.00
26.20	26.20	28.76	2.78	1.670	5-S2n	0.98	1.74	1.09	2.78	12.67	0.00
28.60	28.60	28.97	2.99	1.837	5-S2n	1.03	1.82	1.16	2.78	12.86	0.00
31.00	31.00	29.20	3.22	2.018	5-S2n	1.07	1.90	1.22	2.78	13.08	0.00
33.40	33.40	29.45	3.47	2.215	5-S2n	1.12	1.97	1.27	2.78	13.31	0.00
35.80	35.80	29.72	3.74	2.425	5-S2n	1.16	2.03	1.33	2.78	13.52	0.00
38.20	38.20	30.00	4.02	2.651	5-S2n	1.21	2.09	1.38	2.78	13.71	0.00
40.60	40.60	30.31	4.33	2.891	5-S2n	1.25	2.14	1.44	2.78	13.91	0.00
43.00	43.00	30.64	4.66	3.145	5-S2n	1.30	2.19	1.49	2.78	14.11	0.00

****

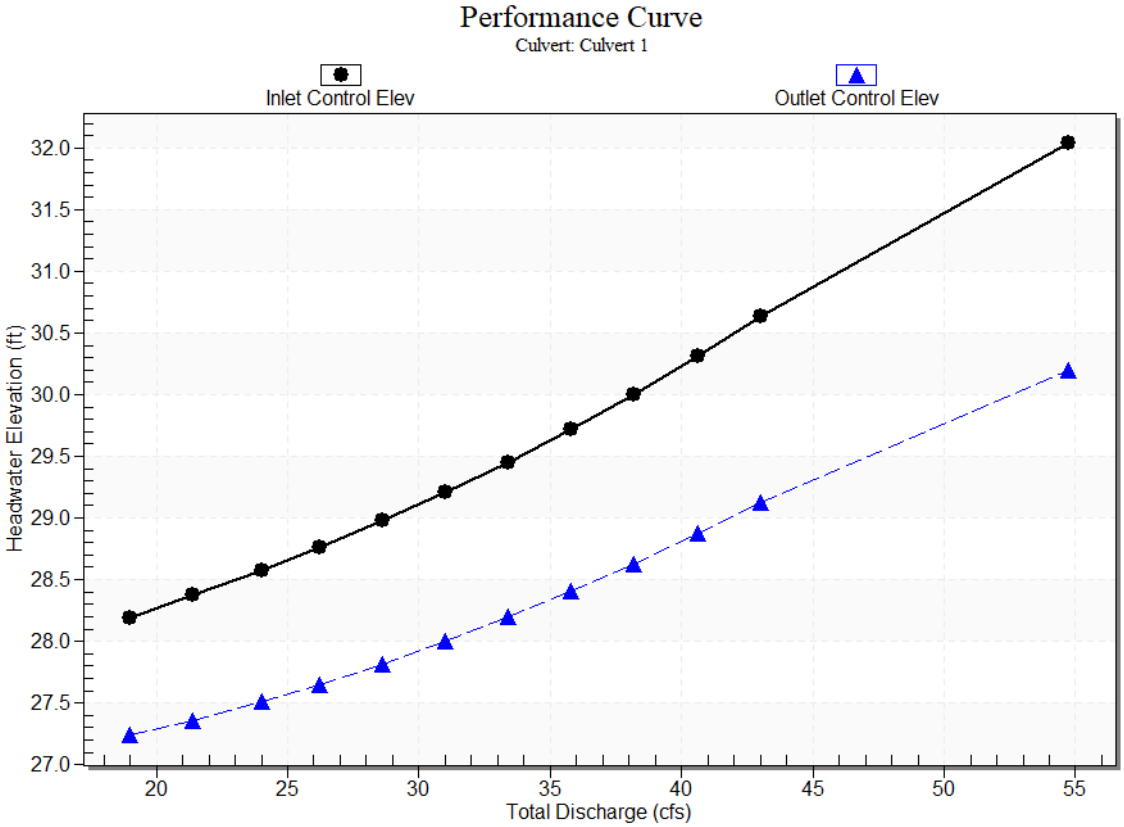
Straight Culvert

Inlet Elevation (invert): 25.98 ft, Outlet Elevation (invert): 24.00 ft

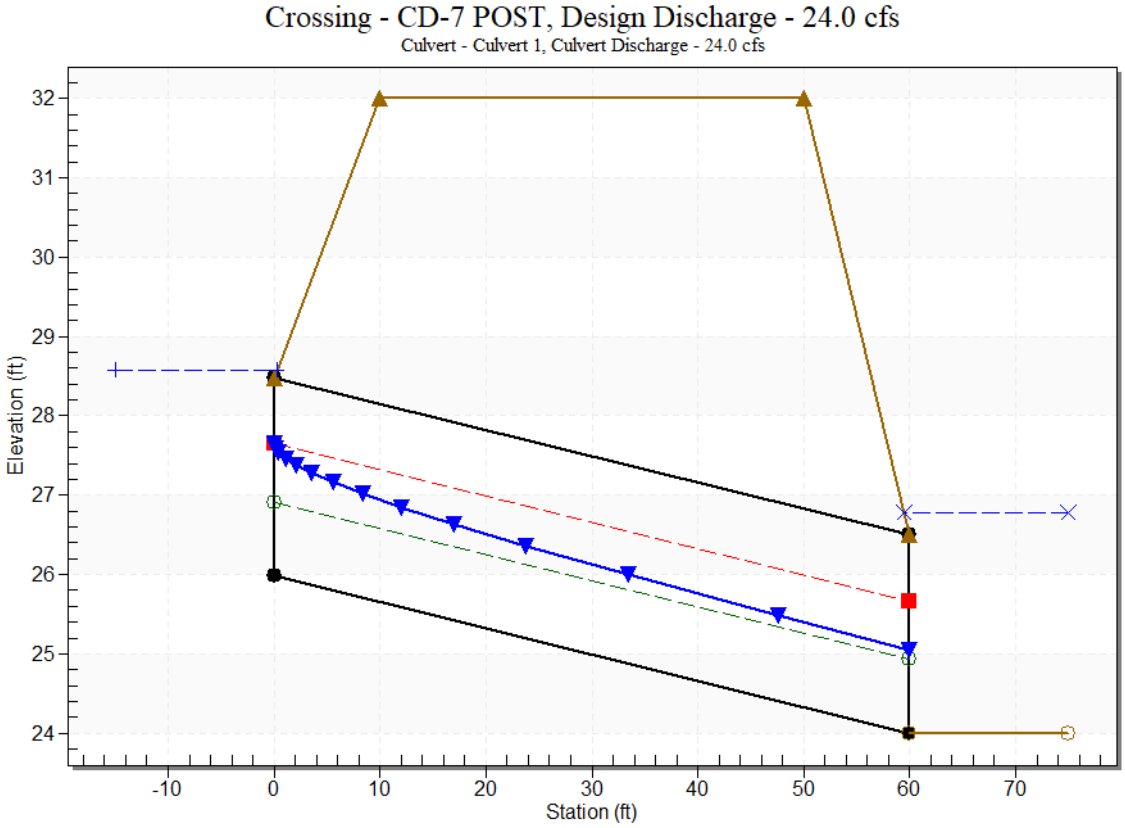
Culvert Length: 60.03 ft, Culvert Slope: 0.0330

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 25.98 ft

Outlet Station: 60.00 ft

Outlet Elevation: 24.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall (Ke=0.5)

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: CD-7 POST)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
19.00	26.78	2.78
21.40	26.78	2.78
24.00	26.78	2.78
26.20	26.78	2.78
28.60	26.78	2.78
31.00	26.78	2.78
33.40	26.78	2.78
35.80	26.78	2.78
38.20	26.78	2.78
40.60	26.78	2.78
43.00	26.78	2.78

Tailwater Channel Data - CD-7 POST

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 26.78 ft

Roadway Data for Crossing: CD-7 POST

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 100.00 ft

Crest Elevation: 32.00 ft

Roadway Surface: Paved

Roadway Top Width: 40.00 ft

APPENDIX D

Cross Drain Photos

CD-1: 84” Pipe (Sta. 295+70)

N. Side of SR 70

S. Side of SR 70

CD-2: 84” Pipe (Sta. 364+04)

N. Side of SR 70

S. Side of SR 70

CD-3: 60” Pipe (Sta. 461+04)

N. Side of SR 70

S. Side of SR 70

CD-4: 2-9'x7' Pipes (Sta. 546+84)

N. Side of SR 70

S. Side of SR 70

CD-5: 18” Pipe (Sta. 576+40)

N. Side of SR 70

S. Side of SR 70

CD-6: 2-7'x5' Pipes (Sta. 577+80)

N. of SR 70

S. of SR 70

CD-7: 24” Pipe (Sta. 651+24)

N. Side of SR 70

S. Side of SR 70

APPENDIX E

Straight Line Diagram

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	02/01/2023	04/17/2023				
BY	FTE	FTE				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 70	HIGHLANDS	01	09060000	4 OF 7

17.0 18.0 19.0 20.0

ROADWAY FEATURES

17.000 OUTSIDE CITY & URBAN
*|<=SR-70
*|<SR 70

29
CR 29
17.245

LONESOME ISLAND RD
19.791

LANE WIDTHS ARE AVERAGED

17.000 38.0' - 22.0'
2 - 11.0' RDWY
2 - 4.0' PVD SHLD1
2 - 4.0' LWN SHLD2

18.207 38.0' - 22.0'
2 - 11.0' RDWY
2 - 4.0' WARN SHLD1
2 - 4.0' LWN SHLD2

ROADWAY COMPOSITION

17.000 28/FC-2

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

PI=17.543
Δ=2°00'00.00"
B=S88°00'00"E

Δ=3°00'00.00"
PI=18.203
B=N89°00'00"E

PI=18.688
Δ=3°00'00.00"
B=S88°00'00"E

Δ=2°00'00.00"
PI=19.080

Δ=2°00'00.00"
PI=19.483
B=N88°00'00"E

STRUCTURE DESCRIPTION

17.900
1 - 36" X 42" CMP

19.251
1 - 120" X 60" CMP

DISTRICT USE

SIS

FUN CLASS

17.000 CORRIDOR

17.000 RURAL PRIN ART OTHER

20.0 21.0 22.0 23.0

ROADWAY FEATURES

20.000 OUTSIDE CITY & URBAN
*|<=SR-70
*|<SR 70

DENCO RD
20.288

Begin Project

21.038
SOUTHWIND RD

MARCIA GROVE RD
21.269

CANAL

HARNEY POND

LANE WIDTHS ARE AVERAGED

20.000 38.0' - 22.0'
2 - 11.0' RDWY
2 - 4.0' WARN SHLD1
2 - 4.0' LWN SHLD2

21.269 46.0' - 22.0'
2 - 11.0' RDWY
2 - 4.0' WARN SHLD1
4.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

21.534 46.0' - 22.0'
2 - 11.0' RDWY
2 - 4.0' PVD SHLD1
4.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

21.742 38.0' - 22.0'
2 - 11.0' RDWY
2 - 4.0' PVD SHLD1
2 - 4.0' LWN SHLD2

22.254 48.0' - 22.0'
2 - 11.0' RDWY
2 - 8.0' WARN SHLD1
2 - 5.0' LWN SHLD2

22.409 35.0' - 20.0'
2 - 10.0' RDWY
2 - 4.0' WARN SHLD1
3.0' LWN SHLD2 - LT
4.0' LWN SHLD2 - RT

ROADWAY COMPOSITION

20.000 28/FC-2

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

PI=20.015
Δ=2°00'00.00"
B=N90°00'00"E

CD1

STRUCTURE DESCRIPTION

21.017
2 - 120" X 60" CMP

22.320
#0920
121.4'
BR
22.343

22.645
1 - 88" X 60" CMP

DISTRICT USE

SIS

FUN CLASS

20.000 CORRIDOR

20.000 RURAL PRIN ART OTHER

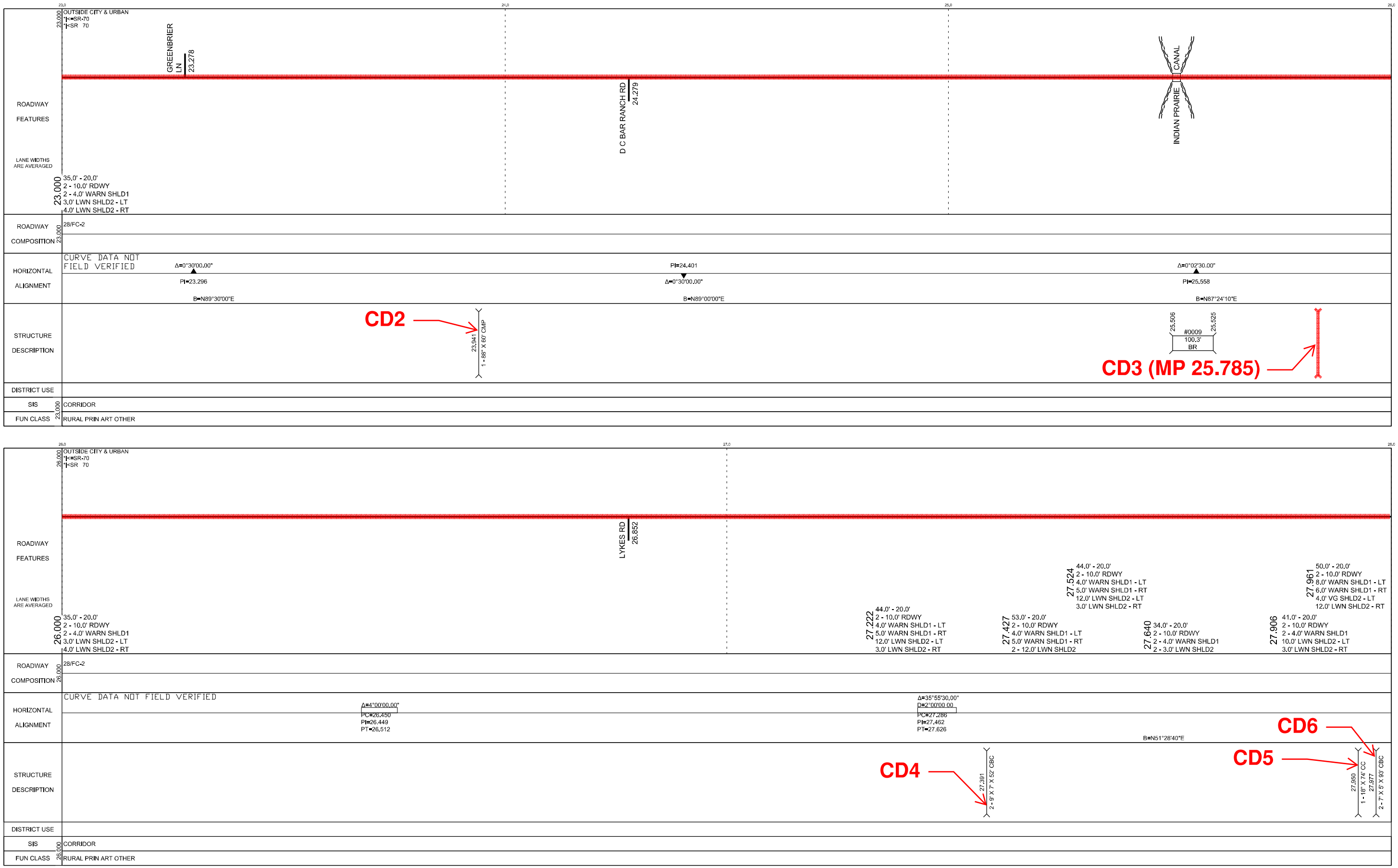
Version: 1.4.2.27 04/17/2023

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	02/01/2023	04/17/2023				
BY	FTE	FTE				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 70	HIGHLANDS	01	09060000	5 OF 7



Version: 1.4.2.27 04/17/2023

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	02/01/2023	04/17/2023				
BY	FTE	FTE				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO.
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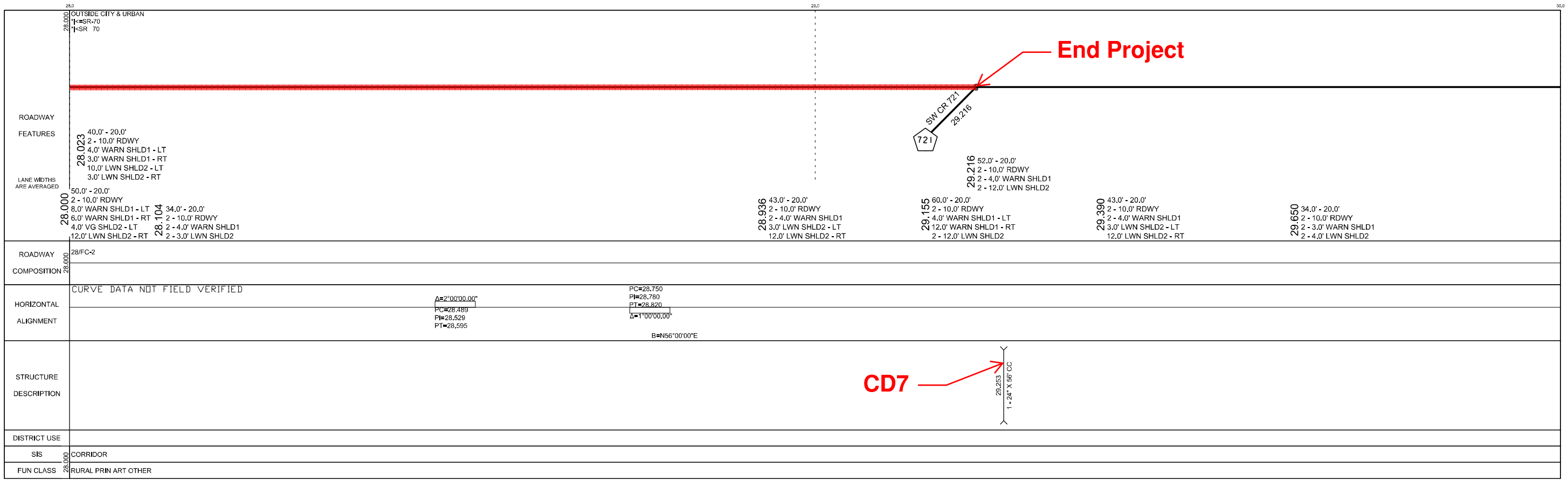
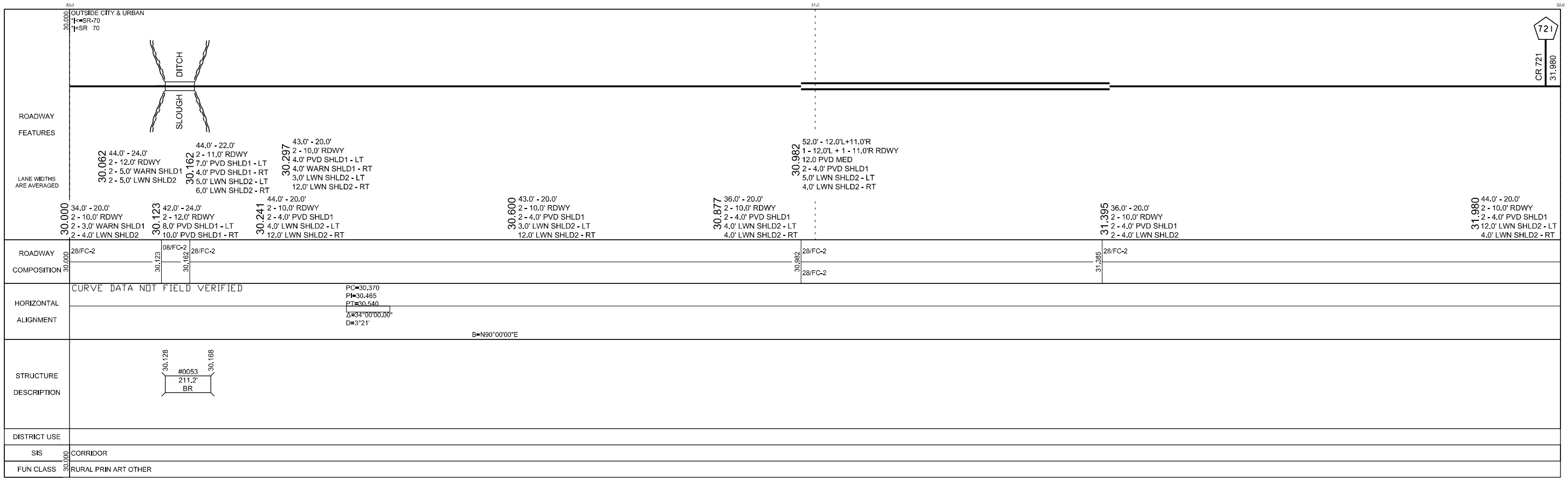




Version: 1.4.2.27 04/17/2023

APPENDIX F

FEMA FIRM Maps

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation information presented in the FIS report should be utilized in conjunction with the **FIRM** for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this **FIRM**.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

Base map information shown on this FIRM was provided in digitial format by the Southwest Florida Water Management District. The original orthophotographic base imagery was provided in color with a on-foot pixel resolution at a scale of 1" = 200' from photography flown January - February 2008.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/national-flood-insurance-program.

DATUM INFORMATION

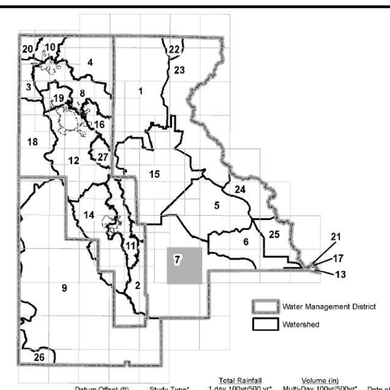
The **projection** used in the preparation of this map was State Plane Florida East. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane Zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Base Flood Elevations (BFEs)on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

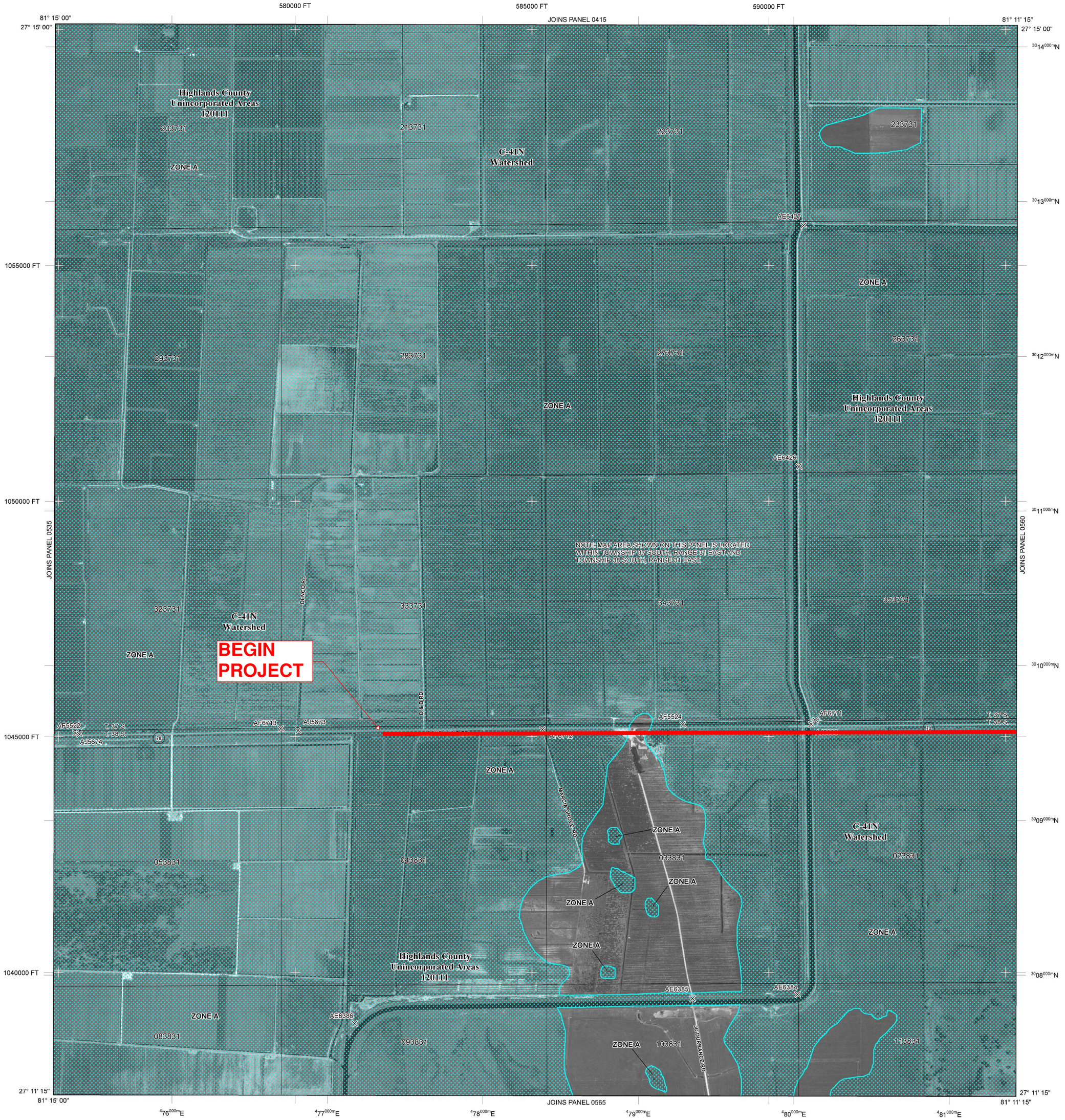
To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/



ID	Watershed	Datum Offset (ft)	Study Type*	Total Rainfall 1 day 100yr/500 yr*	Volume (in) Multi-Day, 100yr/500yr*	Date of Model*
1	Arbuckle Creek	-1.13				
2	Bay Swamp	-1.13				
3	Bee Branch	-1.13				
4	Buck Creek	-1.13				
5	C-41 A/B	-1.13				
6	C-41 AB	-1.13				
7	C-41 N	-1.13				
8	Carter Creek	-1.13				
9	Fisheating Creek	-1.13				
10	Josephine Creek (north)	-1.13				
11	Josephine Creek (central)	-1.13				
12	Josephine Creek	-1.13				
13	L-56E	-1.13				
14	Lake Francis Outlet	-1.13				
15	Lake Istokpoga	-1.13				
16	Lake Lucas	-1.13				
17	Lake Okeechobee	-1.13				
18	Little Charley Bowlegs	-1.13				
19	Little Red Water Lake	-1.13				
20	Old Town Creek	-1.13				
21	S-154C	-1.13				
22	S-65A	-1.13				
23	S-65BC	-1.13				
24	S-65D	-1.13				
25	S-65E	-1.13				
26	Shell Creek	-1.13				
27	Yellow Bluff Creek	-1.13				

* Multiple study types, rainfall volumes, and/or model dates found within specific watersheds, refer to the Flood Insurance Study (FIS) for details.

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the Southwest Florida Water Management District (SWFWMD), South Florida Water Management District (SFWMD), Highlands County, Federal Emergency Management Agency (FEMA) and the associated communities within Highlands County.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot; and areas protected by levees from 1% annual chance flood. See additional note in Watershed Table on left collar[1]

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- $^{4}75^{000m}$E — 1000-meter Universal Transverse Mercator grid ticks, Zone 17 W
- 6000000 FT — 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPSZONE 0901), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile
- 222218 — Section · Township · Range
- 7NX1000 — Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
- Watershed Boundaries

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
November 18, 2015

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0555C

FIRM

FLOOD INSURANCE RATE MAP

HIGHLANDS COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 555 OF 710
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HIGHLANDS COUNTY	120111	0555	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12055C0555C
EFFECTIVE DATE
NOVEMBER 18, 2015

Federal Emergency Management Agency

NOTES TO USERS

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1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

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using datum offset table below
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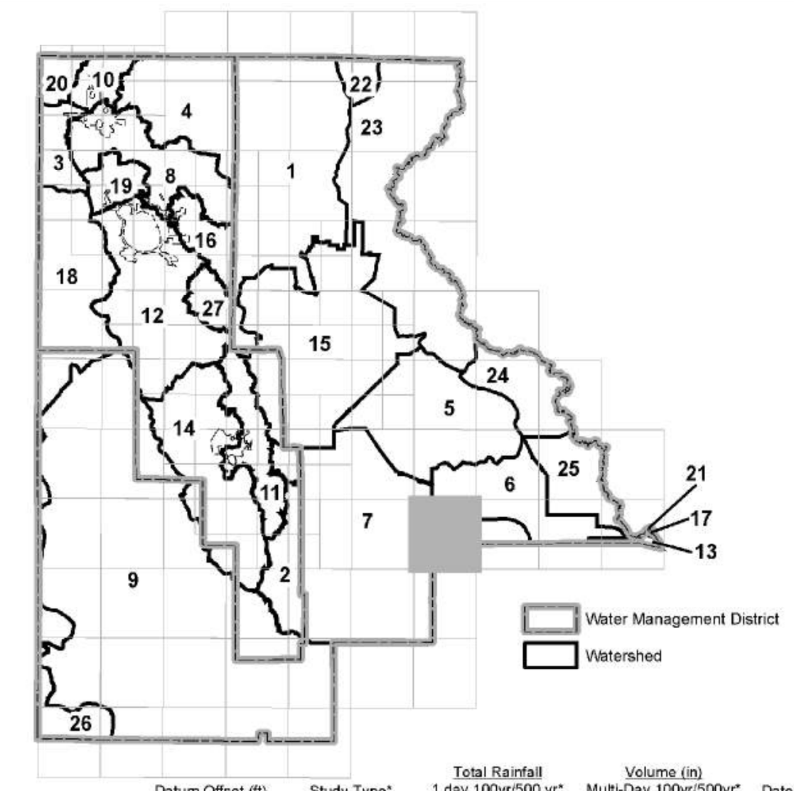

ID	Watershed	Datum Offset (ft)	Study Type*	Total Rainfall 1 day 100yr/500 yr*	Volume (in) Multi-Day 100yr/500yr*	Date of Model*
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3	Bee Branch	-1.13				
4	Bonnet Creek	-1.13				
5	C-41 AN	-1.13				
6	C-41 AS	-1.13				
7	C-41 N	-1.13				
8	Carter Creek	-1.13				
9	Fisheating Creek	-1.13				
10	Grassy Creek (north)	-1.13				
11	Grassy Creek (central)	-1.13				
12	Josephine Creek	-1.13				
13	L-59E	-1.13				
14	Lake Francis Outlet	-1.13				
15	Lake Istokpoga	-1.13				
16	Lake Lucas	-1.13				
17	Lake Okeechobee	-1.13				
18	Little Charley Bowlegs	-1.13				
19	Little Red Water Lake	-1.13				
20	Old Town Creek	-1.13				
21	S-154C	-1.13				
22	S-65A	-1.13				
23	S-65BC	-1.13				
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* Multiple study types, rainfall volumes, and/or model dates found within specific watersheds; refer to the Flood Insurance Study (FIS) for details.

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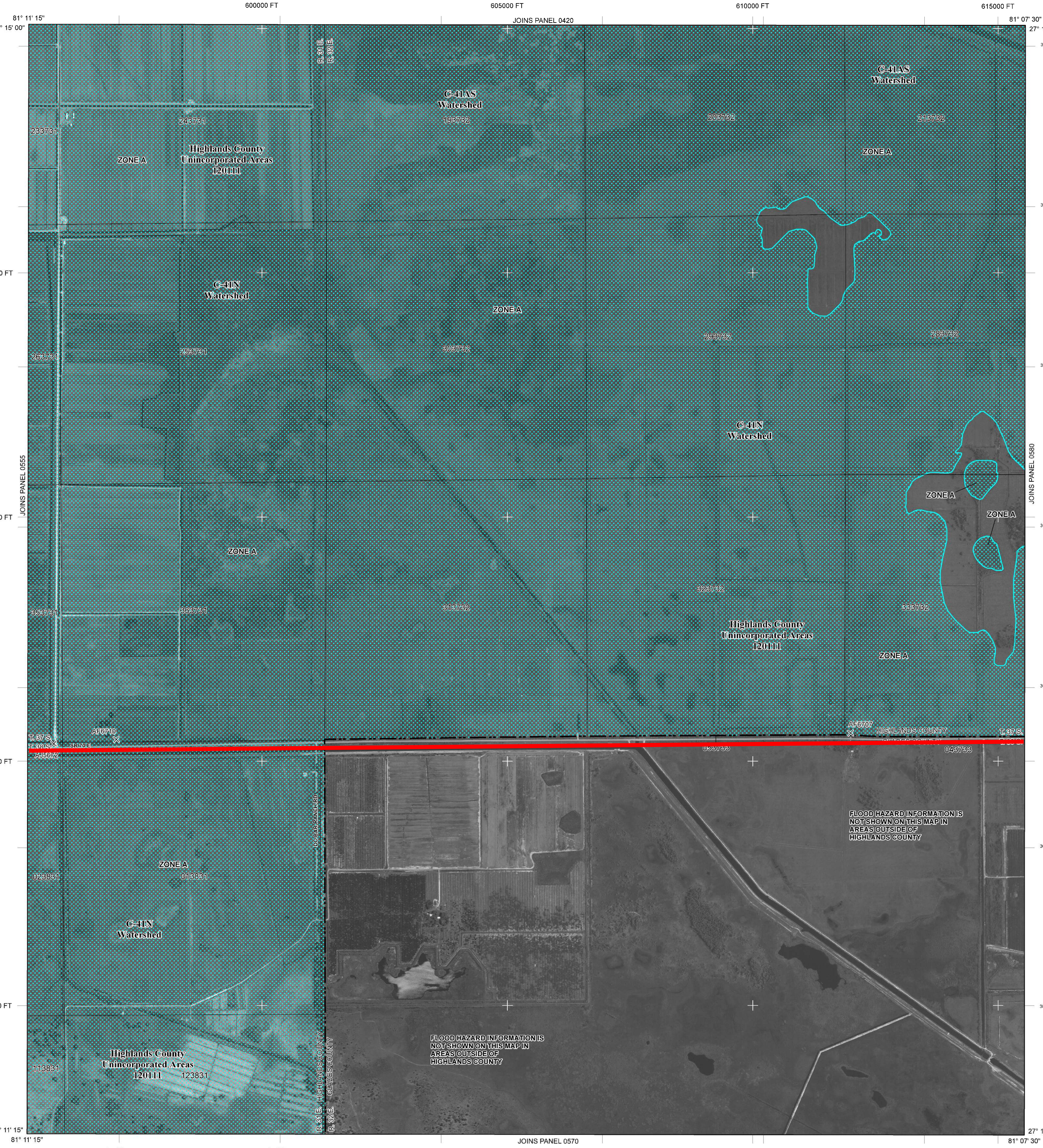

LEGEND

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ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot; and areas protected by levees from 1% annual chance flood. See additional note in Watershed Table on left collar§

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A: Cross section line

23 — 23: Transect line

97°07'30", 32°22'30": Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

4275000mE: 1000-meter Universal Transverse Mercator grid ticks, Zone 17 W

6000000 FT: 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPSZONE 0901), Transverse Mercator projection

DX5510 ×: Bench mark (see explanation in Notes to Users section of this FIRM panel)

• M1.5: River Mile

222218: Section - Township - Range

7NX1000: Junction - Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).

Watershed Boundaries

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
November 18, 2015

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500	0	1000	2000 FEET
300	0	300	600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0560C

FIRM
FLOOD INSURANCE RATE MAP
HIGHLANDS COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 560 OF 710
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HIGHLANDS COUNTY	120111	0560	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12055C0560C

EFFECTIVE DATE
NOVEMBER 18, 2015

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

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Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was State Plane Florida East FIPS 0901. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by the U.S. Geological Survey, U.S. Bureau of the Census, Bureau of Land Management, and the local communities of Glades County. This information was compiled from the National Geodetic Survey, 2004, the Geological Survey of Florida, 1998, the U.S. Department of Commerce, 2001, U.S. Geological Survey, 2004, and Glades County Tax Assessors Office, 2005. Additional information was photogrammetrically compiled at a scale of 1:12,000 from U.S. Geological Survey aerial photography dated 1997 to 1999.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

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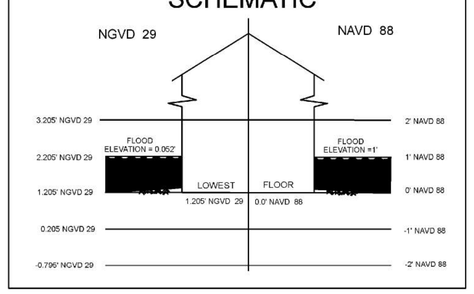
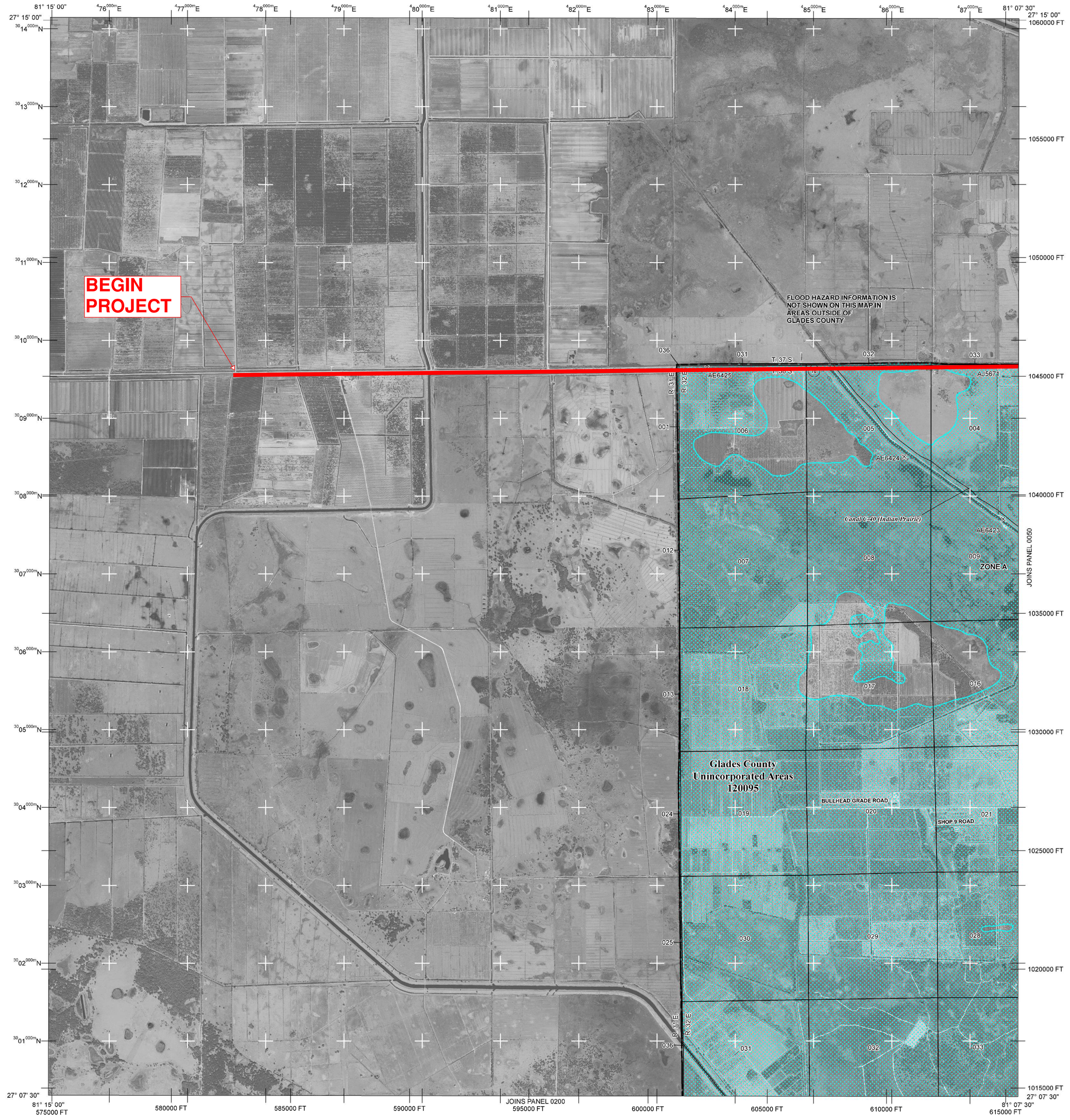
Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map.The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.

Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard Conversion factor.To get the conversion from NGVD 29 to NAVD 88, subtract 1.205 feet from the NGVD 29 elevation. The 1.205 feet value is an average for the entire county. The Datum Conversion Schematic below illustrates this conversion.

DATUM CONVERSION SCHEMATIC





LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97° 07' 30", 32° 22' 30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 600000 FT — 1000-meter Universal Transverse Mercator grid values, zone 17
- 5000-foot grid ticks: Florida State Plane coordinate system, East zone (FIPSZONE 0901), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL
September 26, 2014
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1,000 0 1,000 2,000 3,000 4,000 FEET
600 0 600 1,200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0025C

FIRM

FLOOD INSURANCE RATE MAP
GLADES COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 25 OF 575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GLADES COUNTY	120095	0025	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12043C0025C

EFFECTIVE DATE
SEPTEMBER 26, 2014

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was State Plane Florida East FIPS 0901. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by the U.S. Geological Survey, U.S. Bureau of the Census, Bureau of Land Management, and the local communities of Glades County. This information was compiled from the National Geodetic Survey, 2004, the Geological Survey of Florida, 1998, the U.S. Department of Commerce, 2001, U.S. Geological Survey, 2004, and Glades County Tax Assessors Office, 2005. Additional information was photogrammetrically compiled at a scale of 1:12,000 from U.S. Geological Survey aerial photography dated 1997 to 1999.

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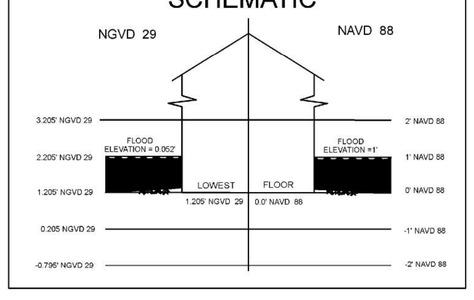

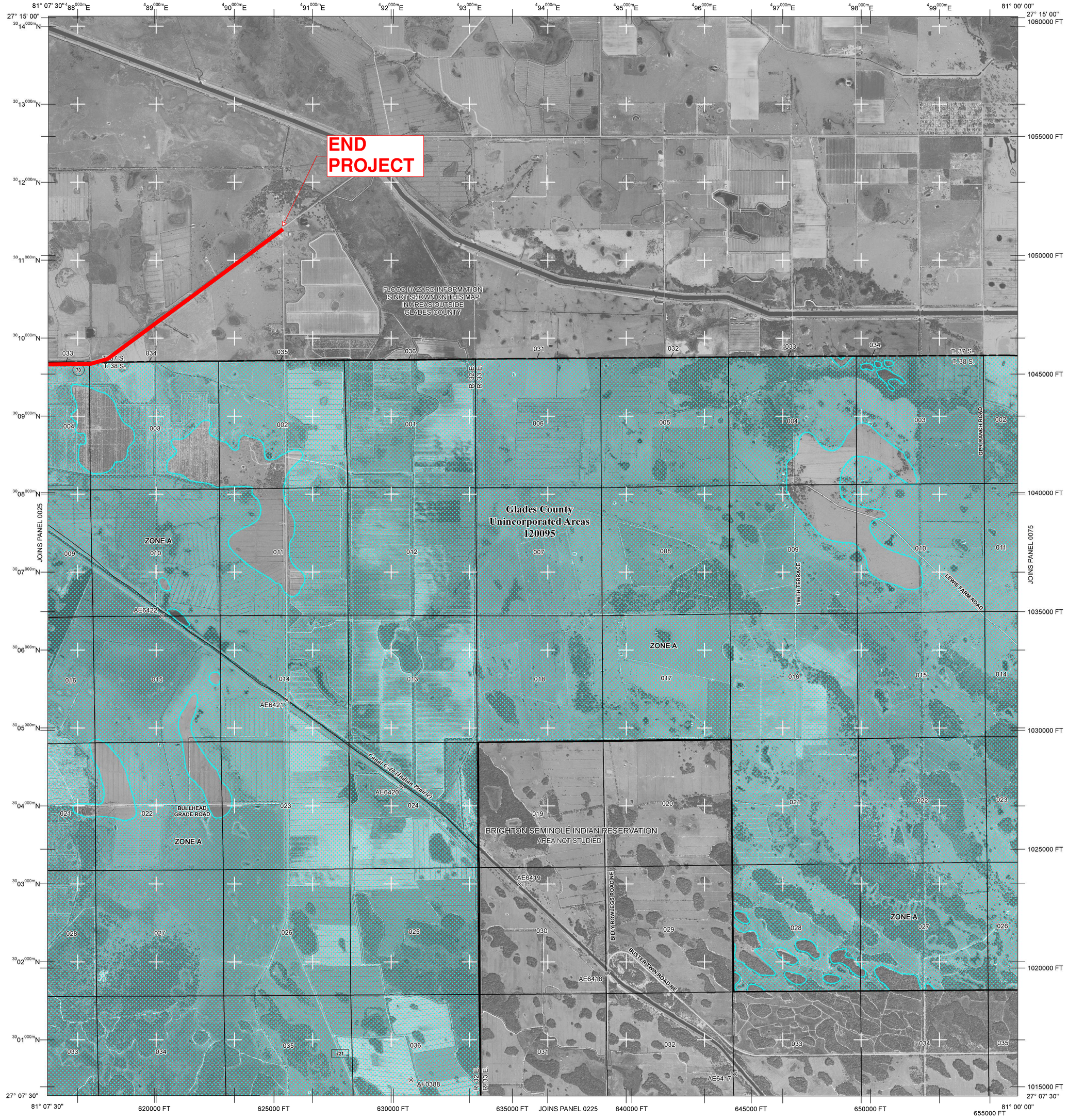

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

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ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA Boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
*Referenced to the North American Vertical Datum of 1988
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97° 07' 30", 32° 22' 30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
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DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL
September 26, 2014
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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1,000 0 1,000 2,000 3,000 4,000 FEET
600 0 600 1,200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0050C

FIRM

FLOOD INSURANCE RATE MAP
GLADES COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 50 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GLADES COUNTY	120095	0050	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12043C0050C

EFFECTIVE DATE
SEPTEMBER 26, 2014

Federal Emergency Management Agency

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Base map information shown on this FIRM was provided in digitial format by the Southwest Florida Water Management District. The original orthophotographic base imagery was provided in color with a on-foot pixel resolution at a scale of 1" = 200' from photography flown January - February 2008.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

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If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/national-flood-insurance-program.

DATUM INFORMATION

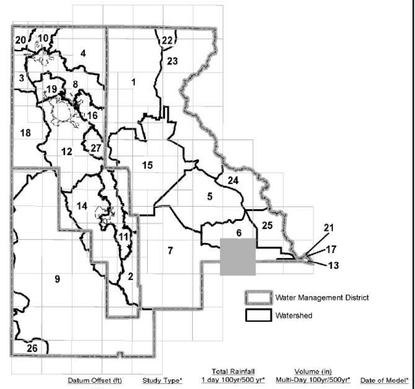
The **projection** used in the preparation of this map was State Plane Florida East. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane Zone used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Base Flood Elevations (BFEs)on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3242

Example Datum Offset Calculation
using datum offset table below
NAVD88 = NGVD29 + (datum offset value)

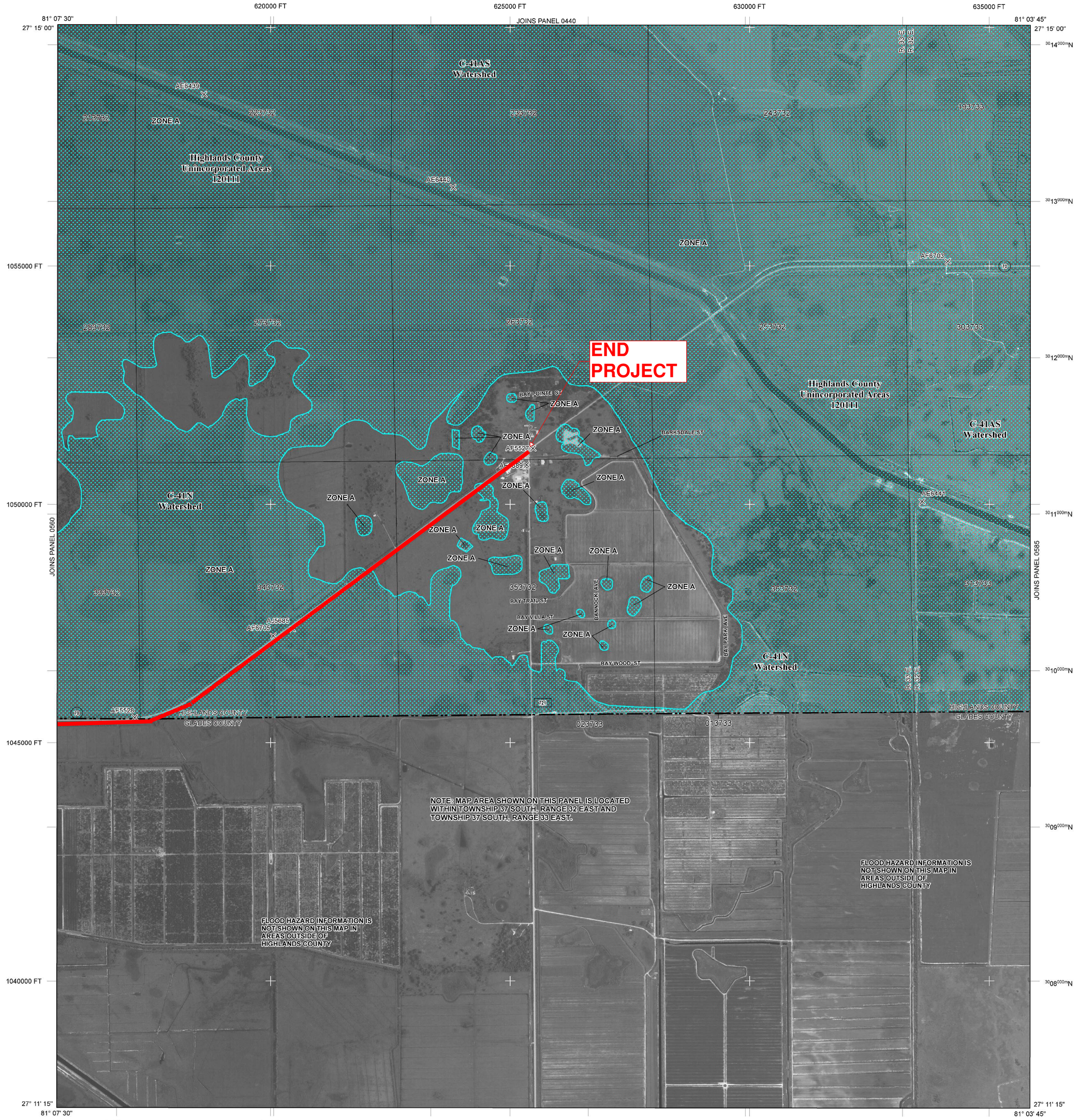
To obtain current elevation, description, and/or location information for **benchmarks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/



ID	Watershed	Datum Offset (ft)	Study Types*	Total Rainfall 1 day 100yr/500 yr*	Volume (ac) Multi-Day 100yr/500yr*	Date of Model*
1	Arbuckle Creek	-1.13				
2	Bay Swamp	-1.13				
3	Bee Branch	-1.13				
4	Brighton Creek	-1.13				
5	C-41 A/C	-1.13				
6	C-41 AS	-1.13				
7	C-41 N	-1.13				
8	Carter Creek	-1.13				
9	Fisheating Creek	-1.13				
10	Grassy Creek (north)	-1.13				
11	Grassy Creek (central)	-1.13				
12	Josephine Creek	-1.13				
13	L-59E	-1.13				
14	Lake Francis Outlet	-1.13				
15	Lake Istokpoga	-1.13				
16	Lake Lucas	-1.13				
17	Little Charlie Apopka	-1.13				
18	Little Fisheating Bowlegs	-1.13				
19	Little Red Water Lake	-1.13				
20	Old Town Creek	-1.13				
21	S-154C	-1.13				
22	S-65A	-1.13				
23	S-65AC	-1.13				
24	S-65D	-1.13				
25	S-65E	-1.13				
26	Shell Creek	-1.13				
27	Yellow Bluff Creek	-1.13				

*Multiple study types, rainfall volumes, and/or model dates found within specific watersheds, refer to the Flood Insurance Study (FIS) for details.

This digital Flood Insurance Rate Map (FIRM) was produced through a cooperative partnership between the Southwest Florida Water Management District (SWFWMD), South Florida Water Management District (SFWMD), Highlands County, Federal Emergency Management Agency (FEMA) and the associated communities within Highlands County.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot; and areas protected by levees from 1% annual chance flood. See additional note in Watershed Table on left collar[1]

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
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- 513 — Base Flood Elevation line and value; elevation in feet*
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* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
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- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- $^{4}75^{000m}$E — 1000-meter Universal Transverse Mercator grid ticks, Zone 17 W
- 6000000 FT — 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPSZONE 0901), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile
- 222218 — Section · Township · Range
- 7NX1000 — Junction · Points defining locations of flow accumulation or hydraulic connectivity. The first two characters of the Junction name represents the specific watershed (as shown in the map collar locator map) in which the Junction is located (note that boundary Junctions, without an associated floodplain, are also shown).
- Watershed Boundaries

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
November 18, 2015

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0580C

FIRM

FLOOD INSURANCE RATE MAP

HIGHLANDS COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 580 OF 710
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HIGHLANDS COUNTY	120111	0580	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12055C0580C
EFFECTIVE DATE
NOVEMBER 18, 2015

Federal Emergency Management Agency

APPENDIX G

Floodplain Calculations

FLOODPLAIN SUMMARY TABLE

Station	Enchroachment (Ac-ft)	Required Compensation	Ac-ft	Provided Compensation	Ac-ft
1 - 443-477 *	4.27	FPC 1 =	11.07	FPC 1A =	15.75
1 - 477-482	N/A				
1 - 482-492	1.97			FPC 1B =	13.25
1 - 492-514	4.83				
1 - 514-518+40	1.99	FPC 2-3 =	78.02	FPC 2-3A =	83.63
2 - 282-317	15.72				
2 - 317-355	13.96				
2 - 355-396	20.00				
2 - 396-410	8.08			FPC 2-3B =	81.46
2 - 410-434	12.28				
2 - 434-450	5.99				
2 - 450-462	6.78	FPC 4 =	17.69	FPC 4A =	37.20
2 - 462-474	5.35				
2 - 474-486	5.56			FPC 4B =	45.84
2 - 486-498	6.39	FPC 5 =	36.17	FPC 5A =	39.48
2 - 498-538	18.85				
2 - 538-557	10.93			FPC 5B =	38.74
2 - 557-576	11.38	FPC 6 =	11.38	FPC 6A =	13.52
				FPC 6B =	13.54
2 - 576-597	11.79	FPC 7 =	11.79	FPC 7A =	13.22
				FPC 7B =	13.08
Totals	163.95	Totals	166.12	Totals	
				Alternative A	202.79
				Alternative B	205.90

* Note: 50% of the encroachment within 1 - 443-477 was accounted for in a previous job. Within this range, 4.27 Ac-ft of encroachment will be considered in the required compensation

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **1**

Location **STA 443 - 477**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	147983.00	
		138117.50
32.00	128252.00	
		123319.00
31.00	118386.00	
		110987.00
30.00	103588.00	
TOTAL (ft^3)		**372,424**
TOTAL (ac-ft)		**8.55**

SHW **30.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **8, 13, 26**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **1**

Location **STA 482 - 492**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	34075.00	
		31803.50
32.00	29532.00	
		28396.00
31.00	27260.00	
		25421.50
30.00	23583.00	
TOTAL (ft^3)		**85,621**
TOTAL (ac-ft)		**1.97**

SHW **30.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **8, 17**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **1**

Location **STA 492 - 514**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	80103.00	
		77600.00
32.00	75097.00	
		70090.50
31.00	65084.00	
		62581.00
30.00	60078.00	
TOTAL (ft^3)		**210,272**
TOTAL (ac-ft)		**4.83**

SHW **30.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **8, 13, 17**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **1**

Location **STA 514 - 518+40**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	25155.00	
		24537.50
32.00	23920.00	
		22985.00
31.00	22050.00	
		20580.00
30.00	19110.00	
		18375.00
29.00	17640.00	
TOTAL (ft^3)		**86,478**
TOTAL (ac-ft)		**1.99**

SHW **29.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **13**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 282 - 317**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	162555.00	
		160092.00
32.00	157629.00	
		152703.00
31.00	147777.00	
		137925.50
30.00	128074.00	
		123148.00
29.00	118222.00	
		110833.00
28.00	103444.00	
TOTAL (ft^3)		**684,702**
TOTAL (ac-ft)		**15.72**

SHW **28.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **13, 26**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 317 - 355**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	182749.00	
		176991.50
32.00	171234.00	
		159818.50
31.00	148403.00	
		142694.50
30.00	136986.00	
		128425.00
29.00	119864.00	
TOTAL (ft^3)		**607,930**
TOTAL (ac-ft)		**13.96**

SHW **29.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **13, 15**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 355 - 396**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	206831.00	
		203697.00
32.00	200563.00	
		194295.50
31.00	188028.00	
		175492.50
30.00	162957.00	
		156689.50
29.00	150422.00	
		141020.50
28.00	131619.00	
TOTAL (ft^3)		**871,195**
TOTAL (ac-ft)		**20.00**

SHW **28.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **10, 13**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 396 - 410**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	86829.00	
		82296.50
32.00	77764.00	
		76343.00
31.00	74922.00	
		72581.00
30.00	70240.00	
		65568.50
29.00	60897.00	
		55032.00
28.00	49167.00	
TOTAL (ft^3)		**351,821**
TOTAL (ac-ft)		**8.08**

SHW **28.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **10, 13, 16, 19**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 410 - 434**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	127481.00	
		125258.50
32.00	123036.00	
		119191.00
31.00	115346.00	
		107656.50
30.00	99967.00	
		96121.50
29.00	92276.00	
		86509.50
28.00	80743.00	
TOTAL (ft^3)		**534,737**
TOTAL (ac-ft)		**12.28**

SHW **28.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **10, 13**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 434 - 450**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	77698.00	
		75221.50
32.00	72745.00	
		69109.00
31.00	65473.00	
		61835.00
30.00	58197.00	
		54560.00
29.00	50923.00	
TOTAL (ft^3)		**260,726**
TOTAL (ac-ft)		**5.99**

SHW **29.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **10, 12, 13**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 450 - 462**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	62279.00	
		59755.50
32.00	57232.00	
		55547.50
31.00	53863.00	
		52179.50
30.00	50496.00	
		47130.00
29.00	43764.00	
		42081.00
28.00	40398.00	
		38714.00
27.00	37030.00	
TOTAL (ft^3)		**295,408**
TOTAL (ac-ft)		**6.78**

SHW **27.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **12**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 462 - 474**

100 YR= **32.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
32.00	58266.00	
		54432.50
31.00	50599.00	
		49830.00
30.00	49061.00	
		47529.50
29.00	45998.00	
		43698.50
28.00	41399.00	
		37385.50
27.00	33372.00	
TOTAL (ft^3)		**232,876**
TOTAL (ac-ft)		**5.35**

SHW **27.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **12, 14**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 474 - 486**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	58681.00	
		56235.50
32.00	53790.00	
		52161.00
31.00	50532.00	
		48904.50
30.00	47277.00	
		44831.50
29.00	42386.00	
		39926.50
28.00	37467.00	
TOTAL (ft^3)		**242,059**
TOTAL (ac-ft)		**5.56**

SHW **28.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **10, 14**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 486 - 498**

100 YR= **34.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
34.00	59561.00	
		56341.50
33.00	53122.00	
		52317.00
32.00	51512.00	
		49902.00
31.00	48292.00	
		45072.00
30.00	41852.00	
		39437.50
29.00	37023.00	
		35414.00
28.00	33805.00	
TOTAL (ft^3)		**278,484**
TOTAL (ac-ft)		**6.39**

SHW **28.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **10**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 498 - 538**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	197706.00	
		189468.00
32.00	181230.00	
		175738.50
31.00	170247.00	
		164755.00
30.00	159263.00	
		151025.00
29.00	142787.00	
		140041.50
28.00	137296.00	
TOTAL (ft^3)		**821,028**
TOTAL (ac-ft)		**18.85**

SHW **27.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **4, 15**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 538 - 557**

100 YR= **35.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
35.00	116315.00	
		109893.00
34.00	103471.00	
		102034.00
33.00	100597.00	
		97453.50
32.00	94310.00	
		88057.50
31.00	81805.00	
		78658.50
30.00	75512.00	
TOTAL (ft^3)		**476,097**
TOTAL (ac-ft)		**10.93**

SHW **30.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **16**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 557 - 576**

100 YR= **33.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
33.00	121016.00	
		114474.50
32.00	107933.00	
		106299.50
31.00	104666.00	
		101393.50
30.00	98121.00	
		91579.50
29.00	85038.00	
		81992.50
28.00	78947.00	
TOTAL (ft^3)		**495,740**
TOTAL (ac-ft)		**11.38**

SHW **28.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **16, 19**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

FLOODPLAIN ENCROACHMENT CALCULATIONS

Alignment **2**

Location **STA 557 - 597**

100 YR= **34.00** **NAVD**

ENCROACHMENT

Existing Elevation (ft)	Area (ft^2)	Vol (ft^3)
34.00	125838.00	
		119035.50
33.00	112233.00	
		110526.50
32.00	108820.00	
		105425.00
31.00	102030.00	
		95228.50
30.00	88427.00	
		83325.00
29.00	78223.00	
TOTAL (ft^3)		**513,541**
TOTAL (ac-ft)		**11.79**

SHW **29.00** **NAVD**

Depth to SHW **1.00** **ft**

Map Unit Symbol **16, 19**

Notes: Accounts for proposed roadway and trail limits only, excluding existing roadway and unimproved areas, from BFE to estimated SHW

STAGE STORAGE CALCULATIONS - FPC1A

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	34.00	15.90				15.75
			15.83	0.50	7.91	
	33.50	15.75				7.83
			15.67	0.50	7.83	
Tailwater	33.00	15.58				0.00

SHW = 33.0 NAVD
Tailwater= 33.0 NAVD

Note: If constructed, FPC 1A will be an addition to FPC 2B which was designed under FPID 414506-5-22-01. FPC 2B has an existing ground at elevation 34' and a SHW table at 33'. This will not require additional driveway or hydraulic connection. See FPC Alternatives Exhibit 9 **(Appendix I, I-11)** for more information.

COMPENSATION REQUIRED = 11.07 Ac-Ft

COMPENSATION PROVIDED = 15.75 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC1B

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	34.00	13.40				13.25
			13.33	0.50	6.66	
	33.50	13.25				6.59
			13.18	0.50	6.59	
Tailwater	33.00	13.11				0.00

SHW = 33.0 NAVD
Tailwater= 33.0 NAVD

Note: If constructed, FPC 1B will be an addition to FPC 2B which was designed under FPID 414506-5-22-01. FPC 2B has an existing ground at elevation 34' and a SHW table at 33'. This will not require additional driveway or hydraulic connection. See FPC Alternatives Exhibit 9 **(Appendix I, I-11)** for more information.

COMPENSATION REQUIRED = 11.07 Ac-Ft

COMPENSATION PROVIDED = 13.25 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC2-3A

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	28.00	56.30				83.63
			55.94	1.00	55.94	
SHW	27.00	55.57				27.69
			55.39	0.50	27.69	
Tailwater	26.50	55.20				0.00

SHW = 27.0 NAVD
Tailwater= 26.5 NAVD

Note: 26.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 78.02 Ac-Ft

COMPENSATION PROVIDED = 83.63 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC2-3B

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	28.00	54.80				81.46
			54.47	1.00	54.47	
SHW	27.00	54.14				26.99
			53.98	0.50	26.99	
Tailwater	26.50	53.82				0.00

SHW = 27.0 NAVD
Tailwater= 26.5 NAVD

Note: 26.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 78.02 Ac-Ft

COMPENSATION PROVIDED = 81.46 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC4A

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	27.20	14.00				37.20
			13.85	1.20	16.62	
	27.00	13.85				20.58
			13.78	1.00	13.78	
SHW	26.00	13.70				6.81
			13.61	0.50	6.81	
Tailwater	25.50	13.52				0.00

SHW = 26.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 17.69 Ac-Ft

COMPENSATION PROVIDED = 37.20 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC4B

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	27.20	17.20				45.84
			17.05	1.20	20.46	
	27.00	17.05				25.38
			16.98	1.00	16.98	
SHW	26.00	16.90				8.40
			16.80	0.50	8.40	
Tailwater	25.50	16.70				0.00

SHW = 26.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 17.69 Ac-Ft

COMPENSATION PROVIDED = 45.84 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC5A

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	29.00	11.80				39.48
			11.60	1.00	11.60	
	28.00	11.40				27.88
			11.30	1.00	11.30	
SHW	27.00	11.20				16.58
			11.10	1.00	11.10	
	26.00	11.00				5.48
			10.95	0.50	5.48	
Tailwater	25.50	10.90				0.00

SHW = 27.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 36.17 Ac-Ft

COMPENSATION PROVIDED = 39.48 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC5B

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	29.00	11.60				38.74
			11.45	1.00	11.45	
	28.00	11.30				27.29
			11.15	1.00	11.15	
SHW	27.00	10.99				16.14
			10.84	1.00	10.84	
	26.00	10.68				5.30
			10.61	0.50	5.30	
Tailwater	25.50	10.53				0.00

SHW = 27.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 36.17 Ac-Ft

COMPENSATION PROVIDED = 38.74 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC6A

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	27.20	8.20				13.52
			8.14	0.20	1.63	
	27.00	8.08				11.90
			7.98	1.00	7.98	
SHW	26.00	7.88				3.92
			7.83	0.50	3.92	
Tailwater	25.50	7.78				0.00

SHW = 26.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 11.38 Ac-Ft

COMPENSATION PROVIDED = 13.52 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC6B

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	28.00	5.80				13.54
			5.64	1.00	5.64	
	27.00	5.47				7.90
			5.34	1.00	5.34	
SHW	26.00	5.20				2.57
			5.14	0.50	2.57	
Tailwater	25.50	5.07				0.00

SHW = 26.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 11.38 Ac-Ft

COMPENSATION PROVIDED = 13.54 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC7A

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	28.00	5.70				13.22
			5.54	1.00	5.54	
	27.00	5.37				7.69
			5.21	1.00	5.21	
SHW	26.00	5.04				2.48
			4.96	0.50	2.48	
Tailwater	25.50	4.88				0.00

SHW = 26.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 11.79 Ac-Ft

COMPENSATION PROVIDED = 13.22 Ac-Ft

STAGE STORAGE CALCULATIONS - FPC7B

	ELEV.	AREA (AC)	AVG AREA (AC)	DELTA (FT)	DELTA STORAGE (AC-FT)	SUM STORAGE (AC-FT)
INSIDE BERM	28.00	5.60				13.08
			5.46	1.00	5.46	
	27.00	5.31				7.63
			5.16	1.00	5.16	
	26.00	5.01				2.47
			4.94	0.50	2.47	
Tailwater	25.50	4.86				0.00

SHW = 26.0 NAVD
Tailwater= 25.5 NAVD

Note: 25.5 tailwater comes from agriculture ditch to the south.

COMPENSATION REQUIRED = 11.79 Ac-Ft

COMPENSATION PROVIDED = 13.08 Ac-Ft

APPENDIX H

NRCS Custom Soil Resource Report

United States Department of Agriculture

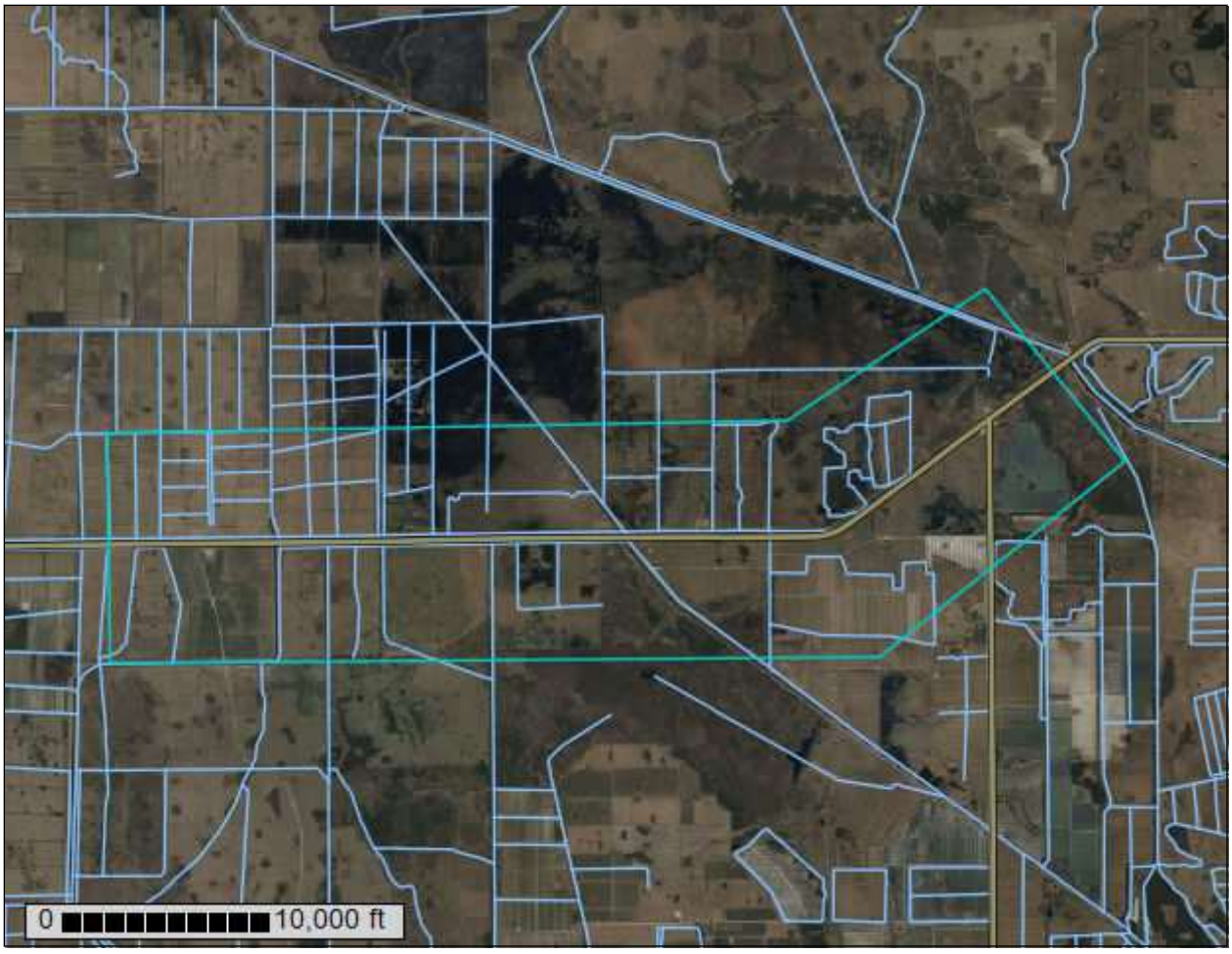
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Glades County, Florida, and Highlands County, Florida

SR70 - Lonesome to CR721



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

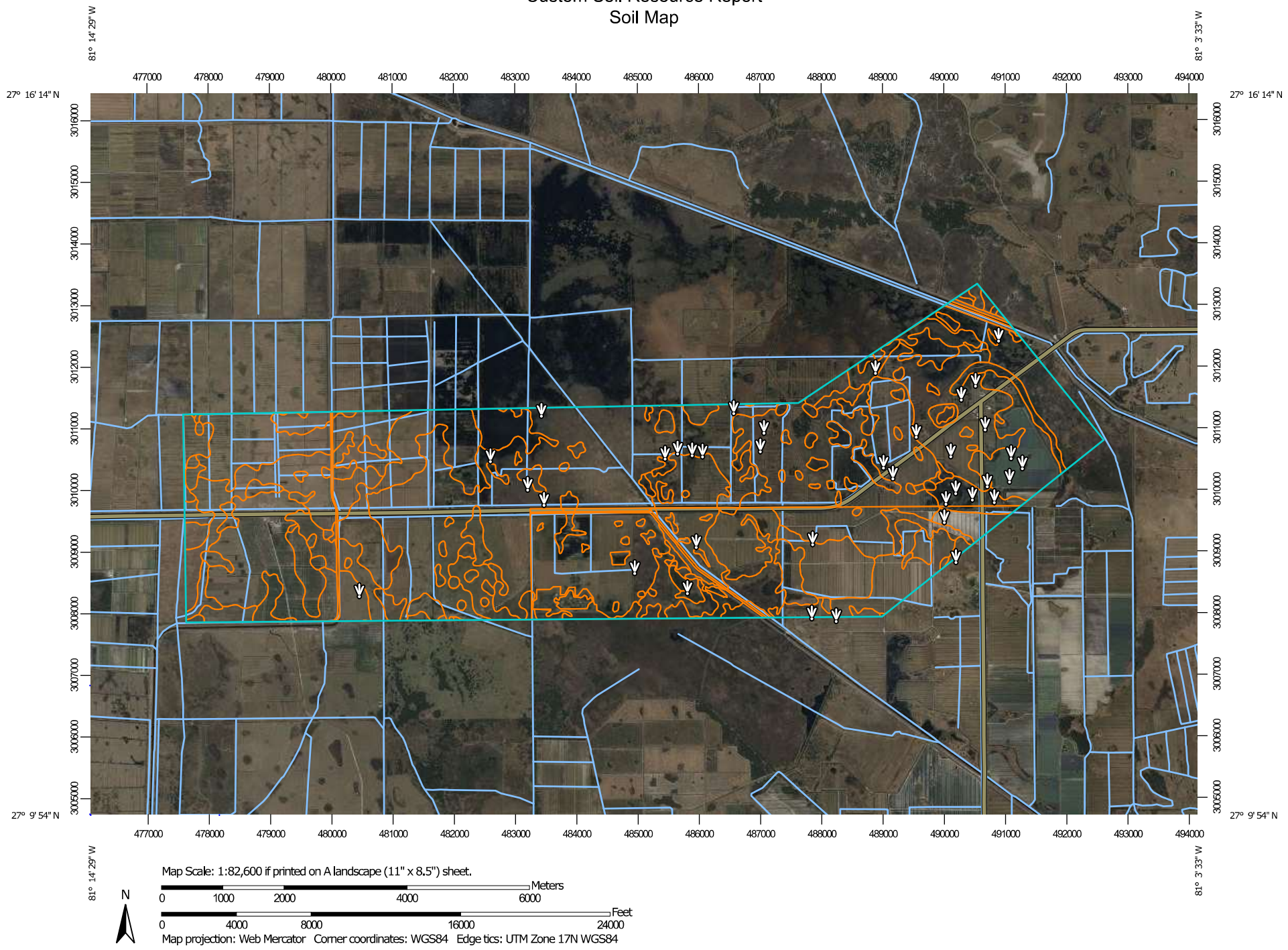
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Highlands County, Florida
Survey Area Data: Version 23, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 30, 2022—Mar 2, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Valkaria fine sand, 0 to 2 percent slopes	285.1	2.3%
6	Malabar fine sand, 0 to 2 percent slopes	389.2	3.1%
7	Pople fine sand, 0 to 2 percent slopes	15.9	0.1%
8	Gator muck, frequently ponded, 0 to 1 percent slopes	3.1	0.0%
10	Felda fine sand, 0 to 2 percent slopes	835.1	6.6%
11	Tequesta muck, drained	15.7	0.1%
14	Basinger fine sand, 0 to 2 percent slopes	509.3	4.1%
15	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	409.6	3.3%
16	Floridana fine sand, frequently ponded, 0 to 1 percent slopes	487.4	3.9%
36	Malabar fine sand, high, 0 to 2 percent slopes	32.4	0.3%
99	Water	65.9	0.5%
Subtotals for Soil Survey Area		**3,048.6**	**24.3%**
Totals for Area of Interest		**12,567.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Basinger fine sand, frequently ponded, 0 to 1 percent slopes	72.4	0.6%
7	Placid fine sand, frequently ponded, 0 to 1 percent slopes	112.4	0.9%
8	Immokalee sand, 0 to 2 percent slopes	1,051.7	8.4%
10	Myakka fine sand, 0 to 2 percent slopes	52.0	0.4%
12	Basinger fine sand, 0 to 2 percent slopes	1,186.3	9.4%
13	Felda fine sand, 0 to 2 percent slopes	3,429.3	27.3%
15	Bradenton fine sand, 0 to 2 percent slopes	133.1	1.1%
16	Valkaria fine sand, 0 to 2 percent slopes	1,221.7	9.7%
17	Malabar fine sand, 0 to 2 percent slopes	174.1	1.4%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
18	Kaliga muck, frequently ponded, 0 to 1 percent slopes	601.5	4.8%
19	Hicoria mucky sand, depressional	519.8	4.1%
20	Samsula muck, frequently ponded, 0 to 1 percent slopes	28.7	0.2%
24	Pineda sand, 0 to 2 percent slopes	87.0	0.7%
26	Tequesta muck, frequently ponded, 0 to 1 percent slopes	745.8	5.9%
30	Oldsmar fine sand, 0 to 2 percent slopes	6.6	0.1%
31	Felda fine sand, frequently ponded, 0 to 1 percent slopes	26.3	0.2%
32	Arents, very steep	30.1	0.2%
99	Water	38.7	0.3%
Subtotals for Soil Survey Area		**9,517.3**	**75.7%**
Totals for Area of Interest		**12,567.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor

components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Glades County, Florida

4—Valkaria fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw5
Elevation: 0 to 110 feet
Mean annual precipitation: 44 to 61 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Valkaria and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valkaria

Setting

Landform: Drainageways on flats on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 16 inches: fine sand
Bw - 16 to 51 inches: fine sand
C - 51 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)

Hydric soil rating: Yes

Minor Components

Myakka

Percent of map unit: 5 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Malabar

Percent of map unit: 4 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pineda

Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Satellite

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces, rises on marine terraces
Landform position (three-dimensional): Tread, talf, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

6—Malabar fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svz3
Elevation: 10 to 140 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Malabar and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Malabar

Setting

Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 17 inches: fine sand
Bw - 17 to 42 inches: fine sand
Btg - 42 to 59 inches: fine sandy loam
Cg - 59 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Valkaria
Percent of map unit: 5 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pineda
Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Oldsmar
Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Basinger
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

7—Pople fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2y9gr
Elevation: 10 to 70 feet
Mean annual precipitation: 42 to 55 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Pople and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pople

Setting

Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits

Typical profile

Ap - 0 to 8 inches: fine sand
E - 8 to 15 inches: fine sand
Bk - 15 to 30 inches: fine sand
Btkg - 30 to 38 inches: sandy clay loam
Cg - 38 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D

Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Wetland Hardwood Hammock (R155XY012FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: No

Minor Components

Ft. drum

Percent of map unit: 4 percent
Landform: Rises on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, rise, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Malabar

Percent of map unit: 4 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pineda

Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Valkaria

Percent of map unit: 3 percent
Landform: Drainageways on flats on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

8—Gator muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzwz
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 56 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Gator and similar soils: 83 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gator

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy and loamy marine deposits

Typical profile

Oa - 0 to 18 inches: muck
Cg1 - 18 to 36 inches: sandy clay loam
Cg2 - 36 to 55 inches: fine sandy loam
Cg3 - 55 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 13.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D

Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Minor Components

Terra ceia

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Chobee

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)

Hydric soil rating: Yes

Pompano

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

10—Felda fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzvy
Elevation: 0 to 180 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Felda and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Felda

Setting

Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
Eg - 4 to 35 inches: fine sand
Btg - 35 to 43 inches: fine sandy loam
Cg - 43 to 80 inches: extremely paragravelly fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Wabasso

Percent of map unit: 6 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Oldsmar

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Valkaria

Percent of map unit: 4 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

11—Tequesta muck, drained

Map Unit Setting

National map unit symbol: 1kskc
Elevation: 10 to 60 feet
Mean annual precipitation: 42 to 50 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Tequesta, drained, and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tequesta, Drained

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Stratified sandy and loamy marine deposits

Typical profile

Oa - 0 to 9 inches: muck
A - 9 to 24 inches: fine sand
Eg - 24 to 36 inches: fine sand
Btg - 36 to 42 inches: fine sandy loam
Cg - 42 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D

Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Minor Components

Floridana, depressional
Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Basinger, depressional
Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Gator
Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Sanibel
Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

14—Basinger fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svym
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Basinger and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Basinger

Setting

Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, convex
Across-slope shape: Concave, linear
Parent material: Sandy marine deposits

Typical profile

Ag - 0 to 2 inches: fine sand
Eg - 2 to 18 inches: fine sand
Bh/E - 18 to 36 inches: fine sand
Cg - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Myakka

Percent of map unit: 6 percent
Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Pompano

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Immokalee

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Placid

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip

Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 1 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

15—Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svyp
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Pineda and similar soils: 45 percent
Pineda, wet, and similar soils: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pineda

Setting

Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 1 inches: fine sand
E - 1 to 5 inches: fine sand
Bw - 5 to 36 inches: fine sand
Btg/E - 36 to 54 inches: fine sandy loam
Cg - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Description of Pineda, Wet

Setting

Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 1 inches: fine sand
E - 1 to 5 inches: fine sand
Bw - 5 to 36 inches: fine sand
Btg/E - 36 to 54 inches: fine sandy loam
Cg - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

Minor Components

Felda

Percent of map unit: 6 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Brynwood

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Valkaria

Percent of map unit: 2 percent
Landform: Drainageways on flats on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Cypress lake

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

16—Floridana fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2sm53
Elevation: 0 to 90 feet
Mean annual precipitation: 42 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Floridana and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Floridana

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 19 inches: fine sand
Eg - 19 to 25 inches: fine sand
Btg - 25 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Tequesta

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Riviera

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Convex, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Gator

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

36—Malabar fine sand, high, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svz4
Elevation: 0 to 80 feet
Mean annual precipitation: 42 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 355 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Malabar, high, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Malabar, High

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 17 inches: fine sand
Bw - 17 to 42 inches: fine sand
Bt - 42 to 59 inches: fine sandy loam
Cg - 59 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Oldsmar

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Pineda

Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Basinger

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Highlands County, Florida

3—Basinger fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2v16v
Elevation: 0 to 70 feet
Mean annual precipitation: 43 to 55 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Basinger and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Basinger

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 14 inches: fine sand
Bh/E - 14 to 36 inches: fine sand
Cg - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)

Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Minor Components

Smyrna
Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Samsula
Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Floridana
Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

7—Placid fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting
National map unit symbol: 2tzx9
Elevation: 0 to 160 feet
Mean annual precipitation: 44 to 61 inches
Mean annual air temperature: 70 to 77 degrees F

Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Placid and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Placid

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 24 inches: fine sand
Cg - 24 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 7 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Myakka

Percent of map unit: 5 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Samsula

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Gentry

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

8—Immokalee sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2s3ll
Elevation: 0 to 150 feet
Mean annual precipitation: 42 to 57 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Immokalee and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 9 inches: sand
E - 9 to 36 inches: sand
Bh - 36 to 55 inches: sand
C - 55 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Valkaria

Percent of map unit: 5 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Oldsmar

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pomello

Percent of map unit: 3 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Satellite

Percent of map unit: 2 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Felda

Percent of map unit: 1 percent

Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

10—Myakka fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2s3lg
Elevation: 0 to 130 feet
Mean annual precipitation: 42 to 56 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Myakka and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myakka

Setting

Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 20 inches: fine sand
Bh - 20 to 36 inches: fine sand
C - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Basinger

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Cassia

Percent of map unit: 3 percent
Landform: Rises on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Immokalee

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Satellite
Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces, rises on marine terraces
Landform position (three-dimensional): Tread, talf, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

12—Basinger fine sand, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2svym
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition
Basinger and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Basinger

Setting
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, convex
Across-slope shape: Linear, concave
Parent material: Sandy marine deposits

Typical profile
Ag - 0 to 2 inches: fine sand
Eg - 2 to 18 inches: fine sand
Bh/E - 18 to 36 inches: fine sand
Cg - 36 to 80 inches: fine sand

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Myakka

Percent of map unit: 6 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pompano

Percent of map unit: 4 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Immokalee

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Placid

Percent of map unit: 4 percent

Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

13—Felda fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzvy
Elevation: 0 to 180 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Felda and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Felda

Setting

Landform: Drainageways on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
Eg - 4 to 35 inches: fine sand
Btg - 35 to 43 inches: fine sandy loam
Cg - 43 to 80 inches: extremely paragravelly fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

Minor Components

Wabasso

Percent of map unit: 6 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Oldsmar

Percent of map unit: 5 percent

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Valkaria

Percent of map unit: 4 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

15—Bradenton fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svzf
Elevation: 0 to 130 feet
Mean annual precipitation: 45 to 63 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Bradenton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bradenton

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 10 inches: fine sand
Btg - 10 to 19 inches: fine sandy loam
Btkg - 19 to 26 inches: fine sandy loam
Ckg - 26 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F155XY140FL - Loamy and Clayey Hardwood Hammocks
Forage suitability group: Loamy and clayey soils on flats of hydric or mesic lowlands (G155XB341FL)
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G155XB341FL), Wetland Hardwood Hammock (R155XY012FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

Minor Components

Felda

Percent of map unit: 5 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

Malabar

Percent of map unit: 4 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Floridana

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip

Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pineda

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

16—Valkaria fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw5
Elevation: 0 to 110 feet
Mean annual precipitation: 44 to 61 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Valkaria and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valkaria

Setting

Landform: Drainageways on flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Sandy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 16 inches: fine sand
Bw - 16 to 51 inches: fine sand
C - 51 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Myakka

Percent of map unit: 5 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pineda

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flats on marine terraces

Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Malabar

Percent of map unit: 4 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Satellite

Percent of map unit: 2 percent
Landform: Rises on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, rise, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F155XY150FL - Sandy Upland Mesic Flatwoods and Hammocks on Rises and Knolls
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G155XB131FL), Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

17—Malabar fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svz3
Elevation: 10 to 140 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Malabar and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Malabar

Setting

Landform: Drainageways on marine terraces, flats on marine terraces

Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 17 inches: fine sand
Bw - 17 to 42 inches: fine sand
Btg - 42 to 59 inches: fine sandy loam
Cg - 59 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Valkaria

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Oldsmar

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear

Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Pineda

Percent of map unit: 4 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Basinger

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

18—Kaliga muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzw6
Elevation: 0 to 130 feet
Mean annual precipitation: 44 to 55 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Kaliga and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kaliga

Setting

Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave

Across-slope shape: Concave, linear
Parent material: Herbaceous organic material over loamy marine deposits

Typical profile

Oa - 0 to 25 inches: muck
C1 - 25 to 35 inches: fine sandy loam
C2 - 35 to 60 inches: sandy clay loam
C3 - 60 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 15.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Samsula

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Felda

Percent of map unit: 4 percent
Landform: Depressions on marine terraces, flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks

Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Chobee

Percent of map unit: 4 percent
Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Placid

Percent of map unit: 3 percent
Landform: Depressions on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

19—Hicoria mucky sand, depressional

Map Unit Setting

National map unit symbol: 1jfwd
Elevation: 10 to 100 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 277 to 307 days
Farmland classification: Not prime farmland

Map Unit Composition

Hicoria and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hicoria

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: mucky sand
E - 4 to 21 inches: fine sand
Btg - 21 to 52 inches: fine sandy loam
BCg - 52 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: C/D
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Felda, depressional

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave

Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Hydric soil rating: Yes

Placid, depressional

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Sanibel

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

20—Samsula muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzw9
Elevation: 0 to 250 feet
Mean annual precipitation: 44 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 335 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Samsula and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Samsula

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa1 - 0 to 24 inches: muck
Oa2 - 24 to 32 inches: muck
Cg1 - 32 to 35 inches: sand
Cg2 - 35 to 44 inches: sand
Cg3 - 44 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 13.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G155XB645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Kaliga

Percent of map unit: 3 percent
Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear

Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Myakka

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Basinger

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Sanibel

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Anclote

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G155XB145FL)
Hydric soil rating: Yes

Floridana

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave

Across-slope shape: Linear, concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

24—Pineda sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2x1nb
Elevation: 0 to 100 feet
Mean annual precipitation: 47 to 58 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 355 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Pineda and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pineda

Setting

Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 5 inches: sand
E - 5 to 19 inches: sand
Bw - 19 to 35 inches: sand
Btg/E - 35 to 38 inches: sandy loam
Btg - 38 to 60 inches: sandy loam
Cg - 60 to 80 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 3 to 18 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Forage suitability group: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Minor Components

Malabar

Percent of map unit: 6 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Wabasso

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Valkaria

Percent of map unit: 2 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Brynwood

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

26—Tequesta muck, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzwx
Elevation: 0 to 40 feet
Mean annual precipitation: 47 to 61 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Farmland of unique importance

Map Unit Composition

Tequesta and similar soils: 87 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tequesta

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy and loamy marine deposits

Typical profile

Oa - 0 to 12 inches: muck
A - 12 to 25 inches: fine sand
Eg - 25 to 44 inches: fine sand
Btg/E - 44 to 56 inches: fine sandy loam
Btg - 56 to 72 inches: fine sandy loam
2Ck - 72 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G156AC645FL)
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Holopaw

Percent of map unit: 3 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Sanibel

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Kaliga

Percent of map unit: 3 percent
Landform: Depressions on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

30—Oldsmar fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2sm4t
Elevation: 0 to 100 feet
Mean annual precipitation: 44 to 64 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Oldsmar and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oldsmar

Setting

Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 35 inches: fine sand
Bh - 35 to 50 inches: fine sand
Btg - 50 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Forage suitability group: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Minor Components

Malabar

Percent of map unit: 5 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Nettles

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Basinger

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Pineda

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), Slough (R155XY011FL)
Hydric soil rating: Yes

Cypress lake

Percent of map unit: 2 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Ecological site: F155XY130FL - Sandy over Loamy Flatwoods and Hammocks
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: Yes

31—Felda fine sand, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzxb
Elevation: 0 to 150 feet
Mean annual precipitation: 46 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 335 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Felda and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Felda

Setting

Landform: Depressions on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: fine sand
Eg - 7 to 24 inches: fine sand
Btg - 24 to 36 inches: fine sandy loam
Cg - 36 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Forage suitability group: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL)
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Minor Components

Floridana

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G155XB245FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Basinger

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY070FL - Sandy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Eaton

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: F154XA012FL - Wet Rich Forests And Woodlands
Other vegetative classification: Freshwater Marshes and Ponds (R154XY010FL), Loamy and clayey soils on stream terraces, flood plains, or in depressions (G154XB345FL)
Hydric soil rating: Yes

Winder

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY090FL - Loamy and Clayey Freshwater Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL), Loamy and clayey soils on stream terraces, flood plains, or in depressions (G155XB345FL)
Hydric soil rating: Yes

Sanibel

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Myakka

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Kaliga

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R155XY100FL - Organic Freshwater Isolated Marshes and Swamps
Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL), Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

32—Arents, very steep

Map Unit Setting

National map unit symbol: 1jfws
Elevation: 0 to 150 feet
Mean annual precipitation: 47 to 55 inches
Mean annual air temperature: 68 to 75 degrees F
Frost-free period: 277 to 307 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

C - 0 to 80 inches: variable

Properties and qualities

Slope: 45 to 65 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: No

99—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified

Forage suitability group: Forage suitability group not assigned (G155XB999FL)

Other vegetative classification: Forage suitability group not assigned (G155XB999FL)

Hydric soil rating: Unranked

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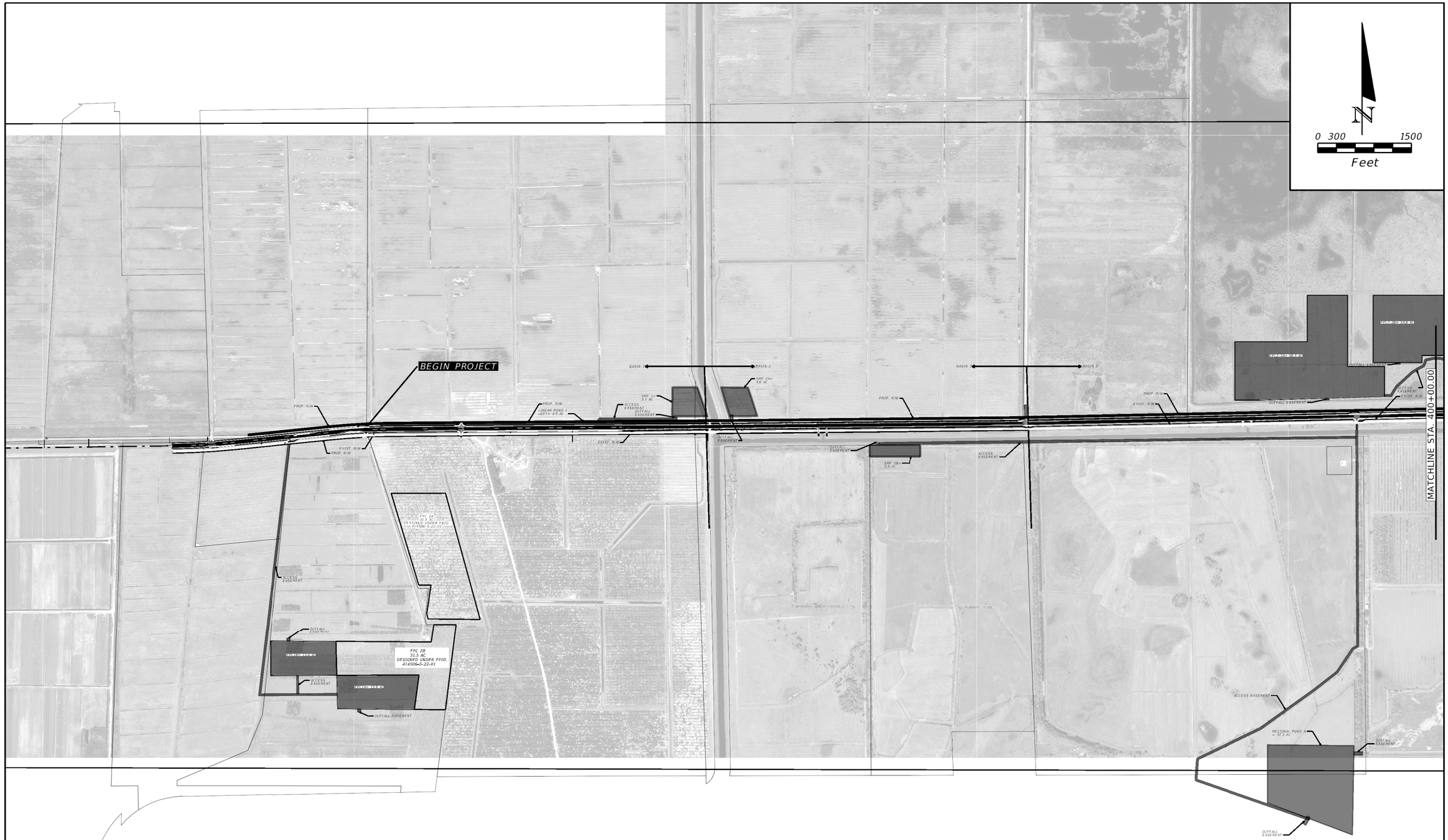
APPENDIX I

Exhibits



REVISIONS				Kisinger Campo & Associates Corp. 201 N. Franklin Street, Suite 400 Tampa, Florida 33602	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			MASTER ALTERNATIVES EXHIBIT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				I-1	SR 70	HIGHLANDS	449851-1-22-01		

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Feet

END PROJECT

MATCHLINE STA. 400+00.00

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Tampa, Florida 33602

I-2

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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SR 70	HIGHLANDS	449851-1-22-01

MASTER ALTERNATIVES EXHIBIT

SHEET NO.

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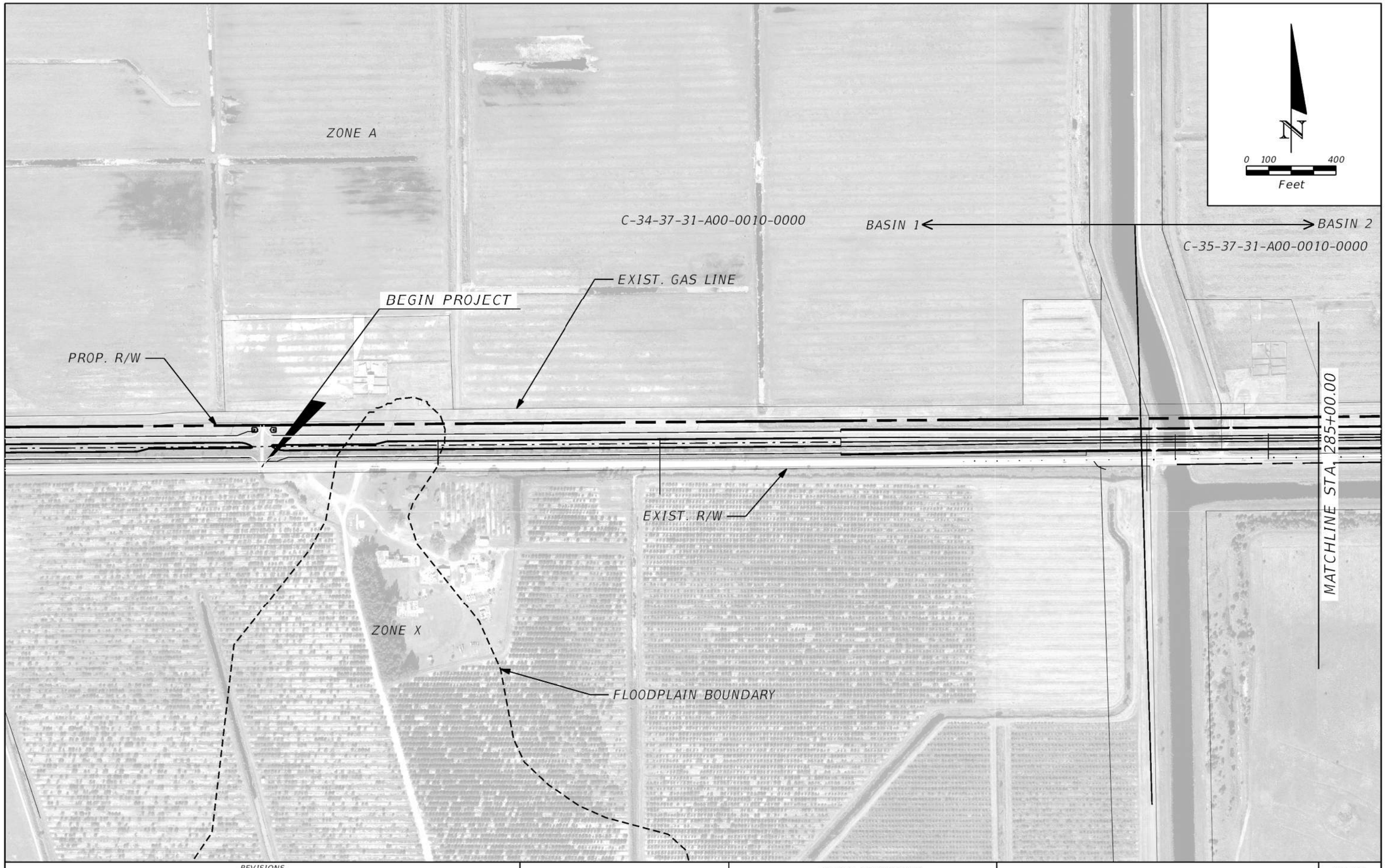

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I-3

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES
EXHIBIT 1

SHEET NO.

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I-4

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES EXHIBIT 2

SHEET NO.

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I-5

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES
EXHIBIT 3

SHEET NO.

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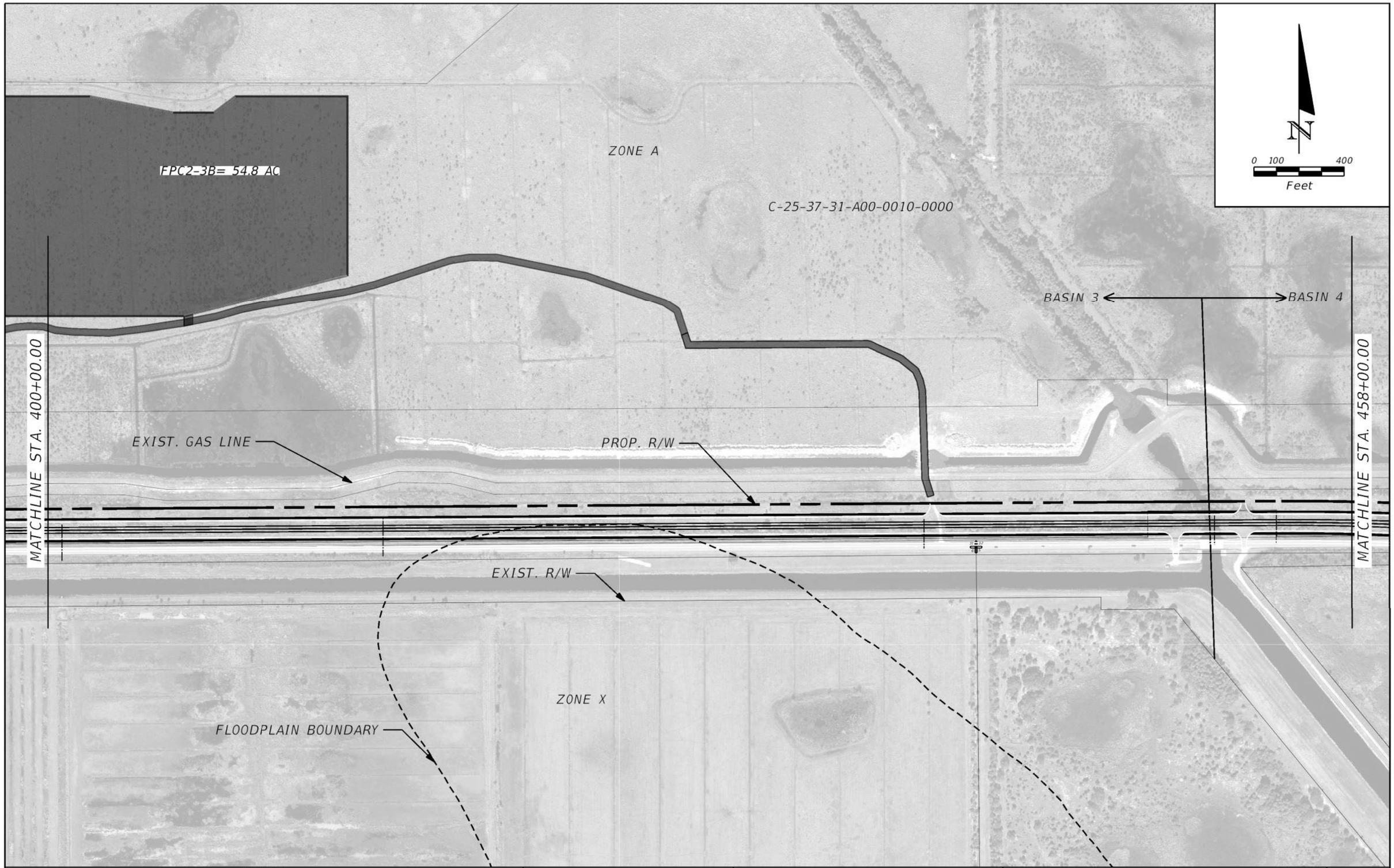

REVISIONS			
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I-6

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES EXHIBIT 4

SHEET NO.

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I-7

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES
EXHIBIT 6

SHEET NO.

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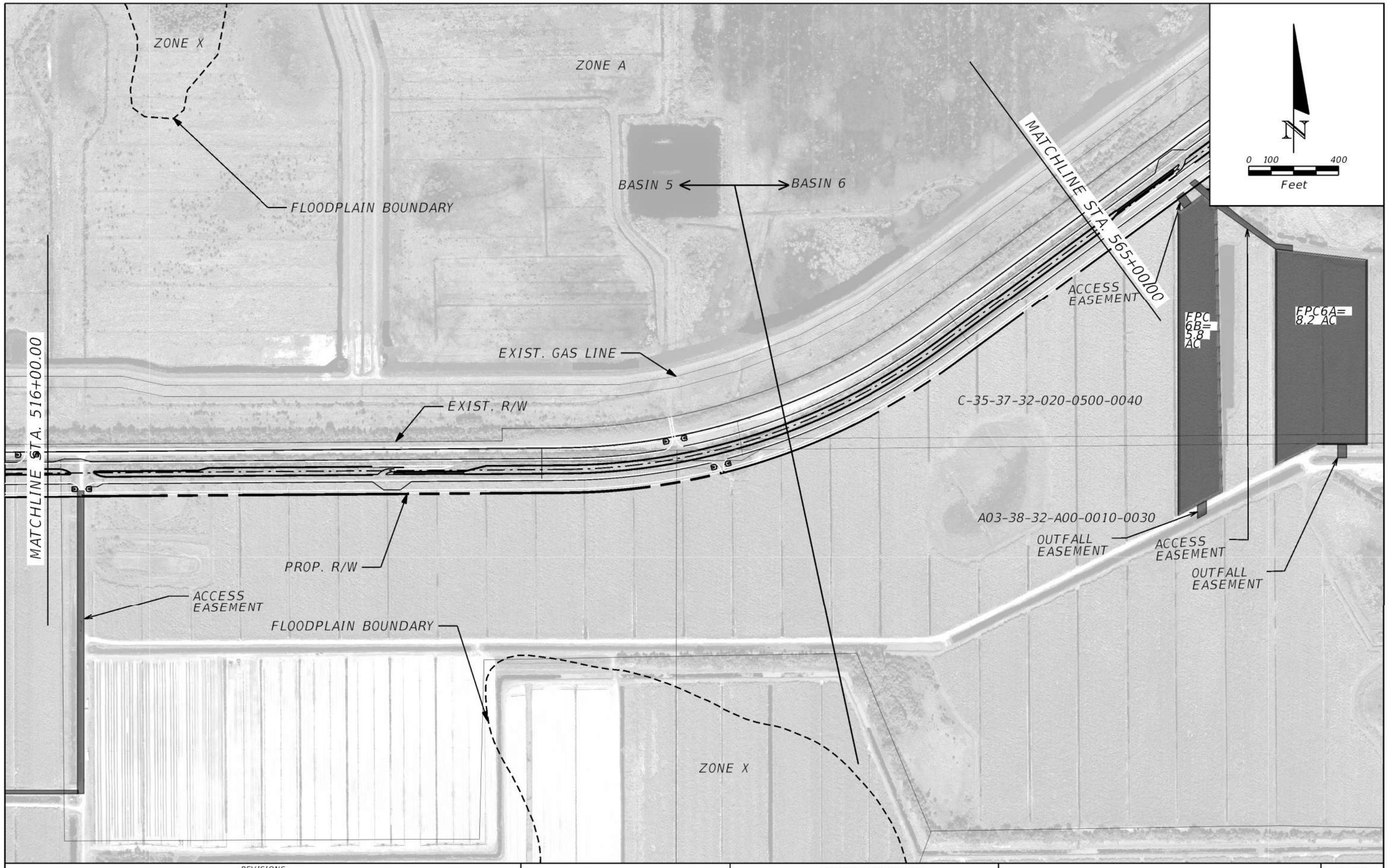

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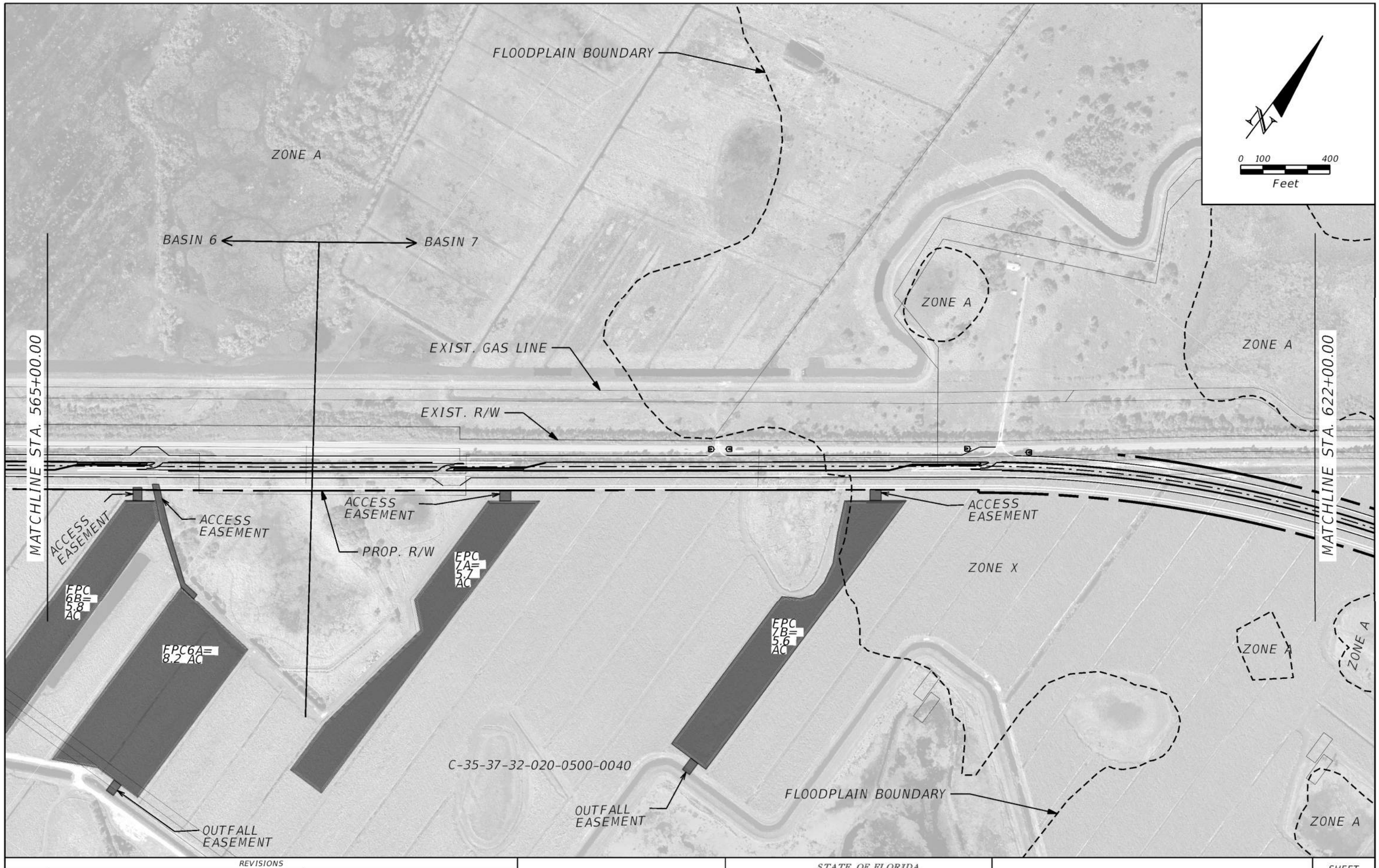
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				I-8	SR 70	HIGHLANDS	449851-1-22-01		

$USER$ $DATE$ $TIME$ $MODELNAME$ C:\Users\abasil\KCA\6202212 SR70 Lonesome-CR721 - Documents\Engineering\Pond Siting Report\DRMPRD006.dgn



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Kisinger Campo & Associates Corp.
201 N. Franklin Street, Suite 400
Tampa, Florida 33602

I-9

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES
EXHIBIT 7

SHEET NO.

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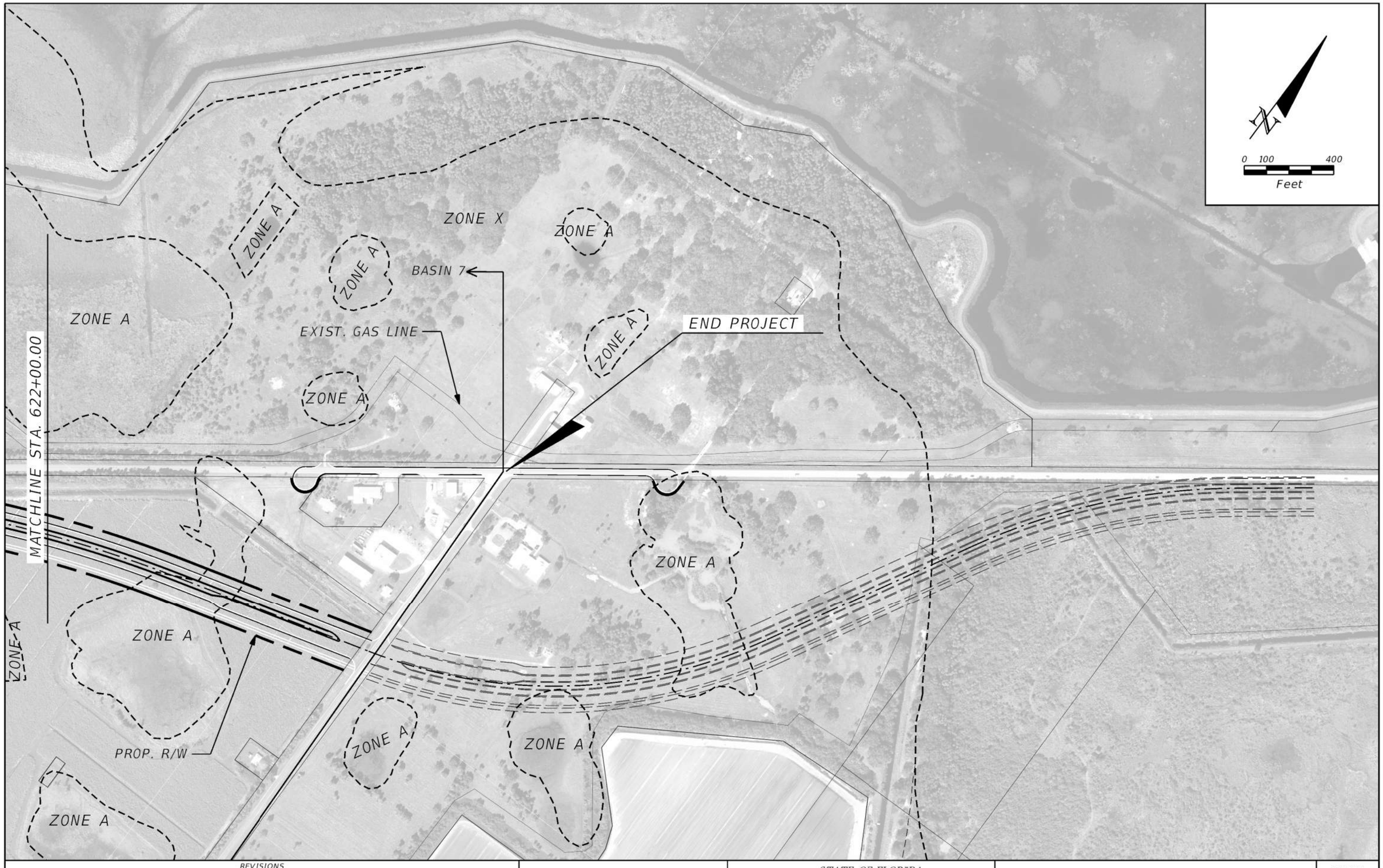

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Kisinger Campo & Associates Corp.
201 N. Franklin Street, Suite 400
Tampa, Florida 33602

I-10

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES
EXHIBIT 8

SHEET NO.

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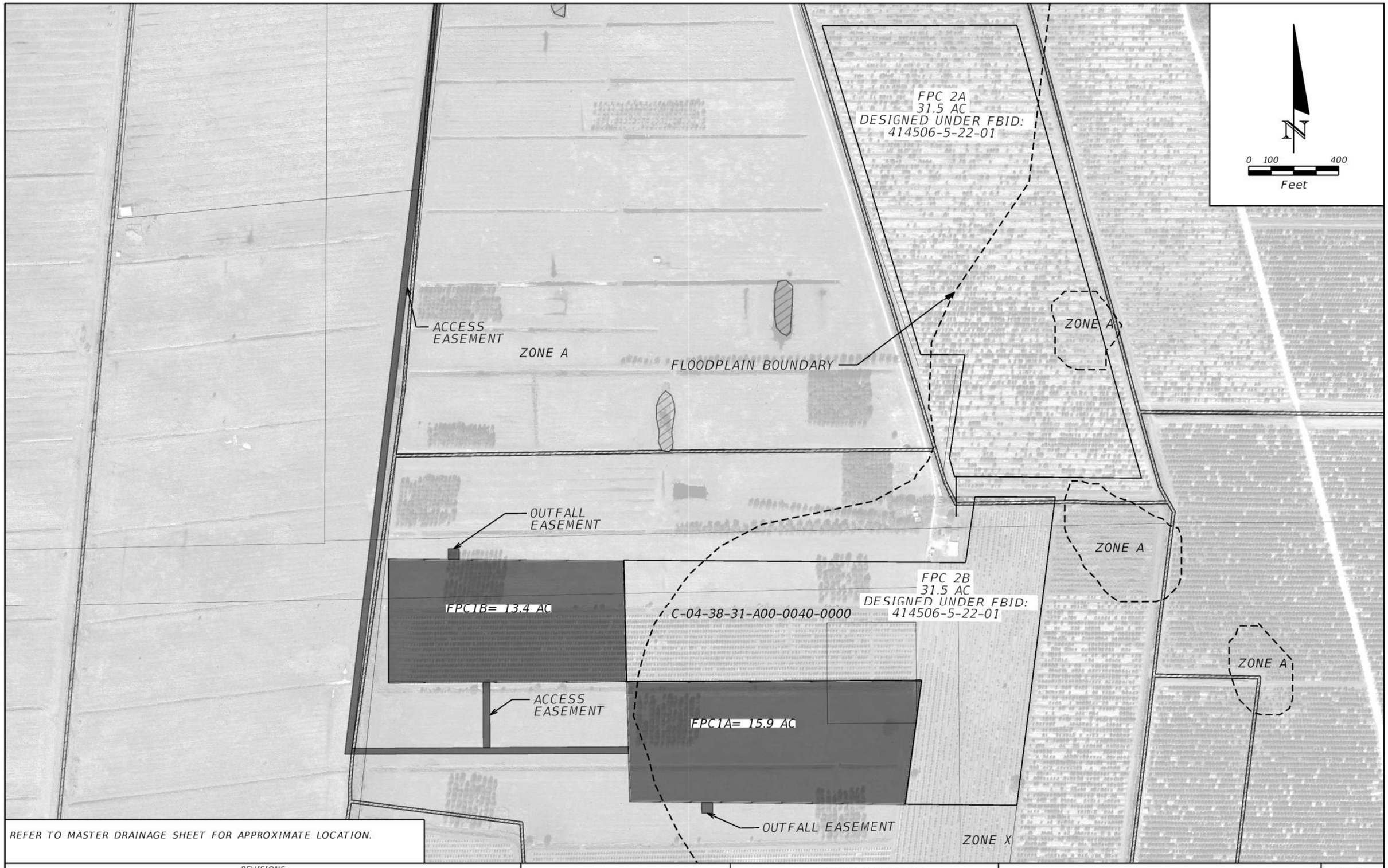

REFER TO MASTER DRAINAGE SHEET FOR APPROXIMATE LOCATION.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Kisinger Campo & Associates Corp.
201 N. Franklin Street, Suite 400
Tampa, Florida 33602

I-11

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 70	HIGHLANDS	449851-1-22-01

FPC ALTERNATIVES
EXHIBIT 9

SHEET NO.

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