DRAFT
LOCATION HYDRAULICS REPORT

Florida's Turnpike (SR 91)
Widening Project Development and Environment (PD&E) Study

From North of SR 70 to North of SR 60 MP 152 to MP 193

FPID: 423374-2-22-01
ETDM No. 14425

St. Lucie, Indian River, Okeechobee and Osceola Counties, FL

DRAFT

Prepared for:
Florida's Turnpike Enterprise
Turkey Lake Service Plaza
Ocoee, Florida 34761

Prepared by:
Metric Engineering, Inc.
13940 SW 136th St., Suite 200
Miami, FL 33186
Phone: (850) 596-1526
William S. Davis Jr., P.E. No. 90549

This item has been digitally signed and sealed by:

on the date adjacent to the seal.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

September 2024

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

Florida's Turnpike Enterprise (FTE) is conducting a Project Development and Environment (PD&E) study to evaluate the widening of Florida's Turnpike mainline (SR 91) from four to six lanes by adding one general toll lane in each direction from north of SR 70 (Fort Pierce/Okeechobee Road) to SR 60 (Yeehaw Junction), in St. Lucie, Indian River, Okeechobee and Osceola Counties. The purpose of this PD&E study is to evaluate engineering and environmental data and document information that will advise FTE in determining the location, type, and preliminary design of the proposed improvements. The total project length is approximately 41 miles. The study includes one existing interchange and service plaza.

The study area traverses several Federal Emergency Management Agency (FEMA) designated flood prone areas. Encroachments into the flood prone areas are anticipated for the construction of offsite stormwater facilities, where encroachment avoidance is not optional. The encroachments are longitudinal in nature. The level of significance of encroachment is minimal. Restoration and preservation of the floodplain will be in the proposed floodplain compensation areas FPC1A and FPC1B. Details of the floodplains and Flood Insurance Rate Maps (FIRMs) are shown in Table 3.6 and in Section 4.3.

There are a total of 42 existing mainline structures. This consists of 27 culverts, 4 bridge culverts, 18 Sonovoid bridges, and 4 AASHTO mainline Beam bridges within the project study limits. We do not anticipate any changes to headwaters associated with the cross drains based on a preliminary analysis of the culvert extensions and replacement. These culvert modifications will not have any impact on the existing floodplains, however we do recommend analysis during the design phase. There are no regulated floodways within the project limits.

There is no documented flooding history or current issues within the project limits per communication with the FTE drainage and maintenance departments in **Appendix H**. FTE has flood monitoring facilities within the project limits from Fort Drum Creek to Jim Green Creek (MP 180.8 – MP 186.4)

All proposed drainage culvert extensions and replacements are to be hydraulically equivalent structures. These structures are not anticipated to alter any upstream headwater elevations. The limitations to maintaining existing hydraulically equivalent is due to the restrictions imposed by the geometrics of design, existing development, cost, feasibility, or practicability. There is no history of flooding or current flooding within the project limits.

The encroachments into the floodplain will have no adverse impacts, given the size of the floodplain, the insignificance of the proposed fill and the creation of the proposed floodplain compensation (FPC) areas. There will be no change in the functioning of emergency services and/or evacuation route functionality in the project corridor.

1.0 INTRODUCTION

FTE is conducting a PD&E study to evaluate the capacity improvements to the existing Florida's Turnpike (SR 91) corridor in St. Lucie, Indian River, Okeechobee and Osceola Counties. The project limits extend from north of SR 70 (Fort Pierce/Okeechobee Road) at MP 152 to SR 60 (Yeehaw Junction) at MP 193, approximately 41 miles. The purpose of this PD&E study is to evaluate engineering and environmental data and document information that will aid FTE in determining the location, type, and preliminary design of the proposed improvements. The project consists of widening Florida's Turnpike to increase capacity, meet existing and future travel demands, and address roadway deficiencies.

Currently, Florida's Turnpike (SR 91) is a four (4) lane limited access toll facility. There is one interchange and one service plaza in the project study area. The project will widen from four to six lanes as well as evaluate potential new and/or modified interchange locations.

- Existing SR 60 interchange to be modified (MP 193)
- Fort Drum Service Plaza (MP 184)

2.0 PROJECT DESCRIPTION

The intent of this Location Hydraulics Report (LHR) is to identify the potential 100-year (base) floodplain encroachments resulting from the roadway and bridge improvements evaluated in this study. In accordance with 23 Code of Federal Regulation (CFR) 650 Subpart A, Section 650.111, floodplains are to be protected. The intent of these regulations is to avoid possible long and short-term adverse impacts associated with the modification of floodplains because of development. The regulations drive decisions based on where impacts are anticipated and promote alternatives when practical. Any development that would be detrimental to existing floodplains should be avoided. Conclusions and recommendations were developed using the best available data, conceptual roadway alignment, typical sections and As-built information. The cross-drain lengths and exact locations shall be verified during the design phase, when survey is available.

The study limits are the Turnpike mainline (SR 91) from north of SR 70 (Fort Pierce/Okeechobee Road) at MP 152 to SR 60 (Yeehaw Junction) at MP 193. The total project length is approximately 41 miles. The project is located within St. Lucie, Indian River, Okeechobee and Osceola Counties, Yeehaw Junction, and Fort Pierce cities. The project is located within the sections, townships, and ranges provided in **Table 2.1**. A Project Location Map is provided in **Figure 2-1.**

Table 2.1: Section, Township, and Range Data

Range	Township	Section(s)
34E	32S	2,3,11,14,23,24,25
35E	32S	30,31,32
35E	33S	5,8,9,15,16,22,26,27,35,36
36E	33S	31,32,33,34,35,36
37E	33S	31,32
37E	34S	3,4,5,10,11,13,14,24,25
38E	34S	30,31,32,33,34,35,36
39E	34S	31,32,33
39E	35S	3,4,10,14,15,23

Figure 2-1: Project Location Map

The datum used for this study is North American Vertical Datum of 1988 (NAVD 88). Please refer to **Appendix B** for the datum conversion used for each cross drain.

3.0 EXISTING CONDITIONS

The existing Turnpike roadway from north of SR 70 (Fort Pierce/Okeechobee Road) to SR 60 (Yeehaw Junction) consists of four travel lanes with a 40-foot grass median, including guardrail, and 12-foot paved outside shoulders on both sides. **Figure 3-1** shows the Existing Mainline Typical Section.

Figure 3-1: Existing Mainline Typical Section

Stormwater runoff sheet flows from the roadway into roadside ditches which flow into existing culverts and cross drains throughout the corridor. The culverts and cross drains discharge to existing canals or creeks, which carry the flow to three main water bodies: St. John's marsh, the Indian River lagoon, and the North Fork St. Lucie River via ten-mile creek. The two tidal water bodies discharge into the Atlantic Ocean. The general flow of surface waters within the project limits is from west to east. Ten Mile Creek is a Sovereign Submerged Lands (SSLs). Refer to **Appendix A** for the existing drainage maps. As presented in table 3.1 there are four Major basins along the corridor. The outfalls of which are one the three main water bodies.

Table 3.1: Basins

Basin	Extents	Final Receiving Waterbody	Open/closed
Yeehaw Junction	Kenansville Road (MP 196) to Fort Drum Plaza (MP 185.0)	St. john's marsh	Open
Fort drum	Fort Drum Plaza (MP 185.0) to Farm Road (MP 175.4)		Open
C-25	Farm Road (MP 175.4) to Angle Road (MP 157.9 Belcher Canal)	Indian River Lagoon	Open
North St. Lucie River Water Control District	Angle Road (MP 157.9) to North of SR 70 (MP 153.7)	Ten Mile Creek / North Fork St. Lucie River	Open

The project is divided into 54 sub-basins based on the existing roadway profile, roadside ditch profiles, and culvert and cross drain locations. Table 3.3 represents the culverts and basin each one is located in. The approximate station refers to the centerline of construction. Refer to the Straight-Line Diagrams in **Appendix C.**

3.1 SOILS

The majority of the soils within and bordering the project limits are sandy soils ranging from somewhat to very poorly drained. The Natural Resource Conservation Service (NRCS) Web Soil Surveys of St. Lucie, Indian River, Okeechobee and Osceola Counties were used to determine the soil types within the project limits. The Soil Survey reveals that the majority of the project contains a variety of sands. It is not known whether there is organic material (muck) beneath the existing roadway and adjacent areas but if present these materials should have been replaced with suitable fill during construction.

A thorough geotechnical investigation should be conducted before or during the design phase to determine if any muck or organic material is present underneath the existing and proposed embankment. A survey will also help determine the embankment design and need for removal of any unsuitable building material present.

After reviewing the best available data for the soils within the project limits, the materials are suitable for the proposed roadway improvements. **Appendix E** contains the soils map and **Table 3.2** provides the soil information by county.

Table 3.2: Soils

Soil Name	NRCS Map Unit	County	Hydrologic Soil Group	Drainage Class, Dominant Condition
Ankona and Farmton sands	2	St. Lucie	C/D	Poorly drained
Basinger and Placid soils, depressional	3	St. Lucie	A/D	Very poorly drained
Arents, 0 to 5 percent slopes	4	St. Lucie	A	Somewhat poorly drained
Arents, 45 to 65 percent slopes	5	St. Lucie	A	Well drained
Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	8	St. Lucie	A/D	Poorly drained
Riviera fine sand, 0 to 2 percent slopes	9	St. Lucie	A/D	Poorly drained
Ft. Drum fine sand	10	St. Lucie	B/D	Poorly drained
Chobee loamy sand, frequently ponded, 0 to 1 percent slopes	11	St. Lucie	C/D	Very poorly drained
Floridana sand, frequently ponded, 0 to 2 percent slopes	13	St. Lucie	C/D	Very poorly drained
Brynwood sand, 0 to 2 percent slopes	15	St. Lucie	A/D	Poorly drained
Hilolo loamy sand, 0 to 2 percent slopes	16	St. Lucie	B/D	Poorly drained

Soil Name	NRCS Map Unit	County	Hydrologic Soil Group	Drainage Class, Dominant Condition
Kaliga muck, frequently ponded, 0 to 1 percent slopes	20	St. Lucie	C/D	Very poorly drained
Arents, 0 to 5 percent slopes	23	St. Lucie	A	Somewhat poorly drained
Floridana sand, frequently ponded, 0 to 2 percent slopes	24	St. Lucie	C/D	Very poorly drained
Nettles and Oldsmar sands	25	St. Lucie	C/D	Poorly drained
Oldsmar sand, depressional	26	St. Lucie	A/D	Very poorly drained
Pepper and EauGallie sands	31	St. Lucie	D	Poorly drained
Pineda sand, 0 to 2 percent slopes	32	St. Lucie	C/D	Poorly drained
Riviera sand, frequently ponded, 0 to 1 percent slopes	37	St. Lucie	C/D	Very poorly drained
Riviera fine sand, 0 to 2 percent slopes	38	St. Lucie	A/D	Poorly drained
Malabar fine sand	39	St. Lucie	A/D	Poorly drained
Samsula muck, frequently ponded, 0 to 1 percent slopes	40	St. Lucie	A/D	Very poorly drained
Canova muck	41	St. Lucie	A/D	Very poorly drained
Susanna and Wauchula sands	43	St. Lucie	A/D	Poorly drained
Tantile and Pomona sands	44	St. Lucie	A/D	Poorly drained
Wabasso sand, 0 to 2 percent slopes	48	St. Lucie	C/D	Poorly drained
Wabasso fine sand, gravelly substratum	49	St. Lucie	C/D	Poorly drained
Waveland-Lawnwood complex, depressional	51	St. Lucie	C/D	Very poorly drained
Winder sand, frequently ponded, 0 to 1 percent slopes	54	St. Lucie	C/D	Very poorly drained
Winder loamy sand	55	St. Lucie	C/D	Poorly drained
Winder sand, shell substratum	56	St. Lucie	C/D	Poorly drained
Delray muck	61	St. Lucie	A/D	Very poorly drained
Chobee mucky loamy fine sand, depressional	62	St. Lucie	C/D	Very poorly drained
Chobee loamy fine sand, frequently ponded, 0 to 1 percent slopes	2	Indian River	C/D	Very poorly drained
Basinger and Placid soils, depressional	3	Indian River	A/D	Very poorly drained
Immokalee fine sand	4	Indian River	B/D	Poorly drained
Valkaria fine sand, 0 to 2 percent slopes	5	Indian River	A/D	Poorly drained
Oldsmar fine sand	6	Indian River	A/D	Poorly drained
Floridana, Riviera, and Placid soils, depressional	7	Indian River	C/D	Very poorly drained
Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	8	Indian River	A/D	Poorly drained

Soil Name	NRCS Map Unit	County	Hydrologic Soil Group	Drainage Class, Dominant Condition
Riviera fine sand, 0 to 2 percent slopes	9	Indian River	A/D	Poorly drained
Ft. Drum fine sand	10	Indian River	B/D	Poorly drained
Chobee loamy sand, frequently ponded, 0 to 1 percent slopes	11	Indian River	C/D	Very poorly drained
Floridana fine sand, frequently ponded, 0 to 1 percent slopes	12	Indian River	C/D	Very poorly drained
Wabasso-Wabasso, wet, fine sand, 0 to 2 percent slopes	13	Indian River	B/D	Poorly drained
Winder fine sand, 0 to 2 percent slopes	14	Indian River	C/D	Poorly drained
Manatee loamy fine sand, frequently ponded, 0 to 1 percent slopes	15	Indian River	B/D	Very poorly drained
Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	16	Indian River	A/D	Poorly drained
Floridana, Placid, and Okeelanta soils, frequently flooded	19	Indian River	C/D	Very poorly drained
Kaliga muck, frequently ponded, 0 to 1 percent slopes	20	Indian River	C/D	Very poorly drained
Pomello sand, 0 to 5 percent slopes	21	Indian River	A	Somewhat poorly drained
Myakka fine sand, 0 to 2 percent slopes	22	Indian River	A/D	Poorly drained
Arents, 0 to 5 percent slopes	23	Indian River	A	Somewhat poorly drained
Floridana sand, frequently ponded, 0 to 2 percent slopes	24	Indian River	C/D	Very poorly drained
Wabasso fine sand, 0 to 2 percent slopes	25	Indian River	A/D	Poorly drained
Jupiter fine sand	31	Indian River	A/D	Poorly drained
Pineda sand, 0 to 2 percent slopes	32	Indian River	C/D	Poorly drained
Satellite fine sand, 0 to 2 percent slopes	34	Indian River	A	Somewhat poorly drained
Riviera sand, frequently ponded, 0 to 1 percent slopes	37	Indian River	C/D	Very poorly drained
Riviera fine sand, 0 to 2 percent slopes	38	Indian River	A/D	Poorly drained
Malabar fine sand	39	Indian River	A/D	Poorly drained
Gator muck	40	Indian River	C/D	Very poorly drained
Canova muck	41	Indian River	A/D	Very poorly drained
Smyrna fine sand, 0 to 2 percent slopes	42	Indian River	A/D	Poorly drained

Soil Name	NRCS Map Unit	County	Hydrologic Soil Group	Drainage Class, Dominant Condition
Myakka fine sand, frequently ponded, 0 to 1 percent slopes	45	Indian River	A/D	Very poorly drained
Holopaw fine sand, 0 to 2 percent slopes	47	Indian River	A/D	Poorly drained
Wabasso sand, 0 to 2 percent slopes	48	Indian River	C/D	Poorly drained
Wabasso fine sand, gravelly substratum	49	Indian River	C/D	Poorly drained
Riviera fine sand, frequently ponded, 0 to 1 percent slopes	51	Indian River	A/D	Very poorly drained
Manatee mucky loamy fine sand, depressional	53	Indian River	B/D	Very poorly drained
Winder sand, frequently ponded, 0 to 1 percent slopes	54	Indian River	C/D	Very poorly drained
Floridana mucky fine sand, frequently ponded, 0 to 1 percent slopes	55	Indian River	C/D	Very poorly drained
Winder sand, shell substratum	56	Indian River	C/D	Poorly drained
Samsula muck, frequently ponded, 0 to 1 percent slopes	58	Indian River	A/D	Very poorly drained
Lokosee fine sand	59	Indian River	A/D	Poorly drained
Pompano fine sand, frequently ponded, 0 to 1 percent slopes	60	Indian River	A/D	Very poorly drained
Delray muck	61	Indian River	A/D	Very poorly drained
Chobee mucky loamy fine sand, depressional	62	Indian River	C/D	Very poorly drained
Basinger and Placid soils, depressional	3	Okeechobee	A/D	Very poorly drained
Immokalee fine sand	4	Okeechobee	B/D	Poorly drained
Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	5	Okeechobee	A/D	Poorly drained
Manatee loamy fine sand, frequently ponded, 0 to 1 percent slopes	6	Okeechobee	B/D	Very poorly drained
Floridana, Riviera, and Placid soils, depressional	7	Okeechobee	C/D	Very poorly drained
Immokalee fine sand, 0 to 2 percent slopes	11	Okeechobee	B/D	Poorly drained
Myakka fine sand, 0 to 2 percent slopes	14	Okeechobee	A/D	Poorly drained
Okeelanta muck, frequently ponded, 0 to 1 percent slopes	15	Okeechobee	A/D	Very poorly drained
Floridana, Placid, and Okeelanta soils, frequently flooded	19	Okeechobee	C/D	Very poorly drained
Pomello fine sand, 0 to 5 percent slopes	20	Okeechobee	A	Moderately well drained
St. Johns fine sand	23	Okeechobee	B/D	Poorly drained
Manatee mucky loamy fine sand, depressional	53	Okeechobee	B/D	Very poorly drained

Soil Name	NRCS Map Unit	County	Hydrologic Soil Group	Drainage Class, Dominant Condition
Pompano fine sand, frequently ponded, 0 to 1 percent slopes	60	Okeechobee	A/D	Very poorly drained
Delray muck	61	Okeechobee	A/D	Very poorly drained
Basinger and Placid soils, depressional	3	Osceola	A/D	Very poorly drained
Arents, 0 to 5 percent slopes	4	Osceola	A	Somewhat poorly drained
Immokalee fine sand	4	Osceola	B/D	Poorly drained
Basinger fine sand, 0 to 2 percent slopes	5	Osceola	A/D	Poorly drained
Basinger fine sand, depressional, 0 to 1 percent slopes	6	Osceola	A/D	Very poorly drained
Cassia fine sand, 0 to 2 percent slopes	9	Osceola	A	Somewhat poorly drained
Delray loamy fine sand, depressional	10	Osceola	A/D	Very poorly drained
Immokalee fine sand, 0 to 2 percent slopes	11	Osceola	B/D	Poorly drained
Floridana fine sand, frequently ponded, 0 to 1 percent slopes	12	Osceola	C/D	Very poorly drained
Myakka fine sand, 0 to 2 percent slopes	14	Osceola	A/D	Poorly drained
Okeelanta muck, frequently ponded, 0 to 1 percent slopes	15	Osceola	A/D	Very poorly drained
Immokalee fine sand, 0 to 2 percent slopes	16	Osceola	B/D	Poorly drained
Kaliga muck, frequently ponded, 0 to 1 percent slopes	17	Osceola	C/D	Very poorly drained
Floridana, Placid, and Okeelanta soils, frequently flooded	19	Osceola	C/D	Very poorly drained
Pomello fine sand, 0 to 5 percent slopes	20	Osceola	A	Moderately well drained
Pomello sand, 0 to 5 percent slopes	21	Osceola	A	Somewhat poorly drained
Myakka fine sand, 0 to 2 percent slopes	22	Osceola	A/D	Poorly drained
St. Johns fine sand	23	Osceola	B/D	Poorly drained
Floridana sand, frequently ponded, 0 to 2 percent slopes	24	Osceola	C/D	Very poorly drained
Oldsmar fine sand, 0 to 2 percent slopes	26	Osceola	A/D	Poorly drained
Paola sand, 0 to 5 percent slopes	28	Osceola	A	Excessively drained
Placid fine sand, frequently ponded, 0 to 1 percent slopes	32	Osceola	A/D	Very poorly drained

Soil Name	NRCS Map Unit	County	Hydrologic Soil Group	Drainage Class, Dominant Condition
Satellite fine sand, 0 to 2 percent slopes	34	Osceola	A	Somewhat poorly drained
Pomona fine sand, 0 to 2 percent slopes	35	Osceola	B/D	Poorly drained
Pompano fine sand, frequently ponded, 0 to 1 percent slopes	37	Osceola	A/D	Very poorly drained
Riviera fine sand, frequently ponded, 0 to 1 percent slopes	39	Osceola	A/D	Very poorly drained
Samsula muck, frequently ponded, 0 to 1 percent slopes	40	Osceola	A/D	Very poorly drained
Satellite sand, 0 to 2 percent slopes	41	Osceola	A	Somewhat poorly drained
Smyrna fine sand, 0 to 2 percent slopes	42	Osceola	A/D	Poorly drained
St. Lucie fine sand, 0 to 5 percent slopes	43	Osceola	A	Excessively drained
Tavares fine sand, 0 to 5 percent slopes	44	Osceola	A	Moderately well drained
Myakka fine sand, frequently ponded, 0 to 1 percent slopes	45	Osceola	A/D	Very poorly drained
Pompano fine sand, 0 to 2 percent slopes	49	Osceola	A/D	Poorly drained
Manatee mucky loamy fine sand, depressional	53	Osceola	B/D	Very poorly drained
Floridana mucky fine sand, frequently ponded, 0 to 1 percent slopes	55	Osceola	C/D	Very poorly drained
Samsula muck, frequently ponded, 0 to 1 percent slopes	58	Osceola	A/D	Very poorly drained

3.2 Land Use

The land use within and adjacent to the project limits varies from the beginning of the job to the end of construction. The main land use categories include roads and highways, wetlands, rural residential, cropland and pastureland, mixed forests, and marshes.

The beginning of the project from SR 70 to belcher canal is rural residential, open land, cropland, pastureland, pine flatwoods, and marshes. The next portion of the limits from belcher canal to the Indian river/ Okeechobee County line are cropland, pastureland, freshwater marshes, mixed forested wetlands, citrus groves and spoil areas. The last section of the project from the Indian river/Okeechobee County line to SR 60 is mixed wetland hardwoods, rural residential, woodland pastures, freshwater marshes, wetland prairies and pine flatwoods. A land use map will be provided in the future in **Appendix F**.

3.3 CROSS CULVERTS

There are 29 existing culverts and 11 existing bridge culverts within the project limits. **Table 3.3** provides a summary of the existing culverts; **Table 3.4** provides a summary of the existing bridge culverts.

Table 3.3: Existing Culverts

Basin	Approx. Mile Post	Approx. STA	Cross Culvert Size	Existing Length (ft)	Number of Barrels	Turnpike Structure Number	Waterbody ID	Waterbody Name
North St. Lucie River Water Control District	154.9	2053+00	12'x6'	175	1	94Q009	3194A	Ten Mile Creek
	155.5	2087+00	12'x5'	182	1	94Q010	3194A	Ten Mile Creek
	156.1	2116+50	10'x5'	160	1	94Q011	3194A	Ten Mile Creek
C-25	160.1	2330+80	12'x6'	181	1	94Q012	3163	Belcher Canal
	160.6	2357+00	12'x13'	110	1	94Q013	3160	C-25 Canal West
	161.6	2411+00	6'x5'	153	1	94Q014	3160	C-25 Canal West
	162.4	2452+50	9'x5'	174	1	94Q015	3160	C-25 Canal West
	162.9	2476+70	9'x9'	184	1	94Q016	3160	C-25 Canal West
	162.9	2477+50	12'x13'	109	1	94Q017	3160	C-25 Canal West
	164.7	2570+80	12'x6'	151	1	94Q018	3160	C-25 Canal West
	165.7	2624+50	10'x10'	164	1	94Q019	3160	C-25 Canal West
	168.9	2792+00	54"	164	1	94Q020	3160	C-25 Canal West
	169.8	2842+10	10'x5'	147	1	94Q021	3160	C-25 Canal West
	170.8	2892+10	12'x5'	149	1	94Q022	3160	C-25 Canal West
	171.8	2940+10	12'x5'	152	1	94Q023	3160	C-25 Canal West
	172.9	3004+30	12'x5'	144	1	94Q024	3160	C-25 Canal West
	174	3060+70	10'x10'	117	1	88Q001	3160	C-25 Canal West
	175	3114+70	10'x10'	118	2	88Q002	3160	C-25 Canal West
Fort Drum	176.4	3182+70	10'x10'	118	1	88Q003	2893S	Fort Drum Marsh
	177.1	3222+10	10'x10'	118	1	88Q004	2893S	Fort Drum Marsh
	179	3324+50	12'x13'	109	1	88Q005	2893S	Fort Drum Marsh
	179.5	3344+50	8'x4'	146	1	N/A	2893S	Fort Drum Marsh
	180.8	3418+70	8'x4'	147	1	N/A	2893S	Fort Drum Marsh
	181.9	3477+30	8'x4'	153	1	N/A	3154A	Fort Drum Creek
	183.5	3562+70	4'x4'	148	1	91Q003	3156	Jim Green Creek
	183.9	3586+70	4'x4'	149	1	91Q004	3156	Jim Green Creek
	184.3	3601+80	12'x13.5'	111	1	91Q001	3156	Jim Green Creek
Yeehaw Junction	185.7	3674+80	6'x4'	149	1	91Q002	3156	Jim Green Creek
	187.3	3760+70	4'x4'	150	1	N/A	3156	Jim Green Creek

Basin	Approx. Mile Post	Approx. STA	Cross Culvert Size	Existing Length (ft)	Number of Barrels	Turnpike Structure Number	Waterbody ID	Waterbody Name
Yeehaw Junction	188.4	3818+80	4'x4'	148	1	N/A	3152B	Padgett Branch
	188.6	3831+80	12'x13'	107	1	88Q007	3152B	Padgett Branch
	189.7	3895+80	4'x4'	150	1	N/A	3152B	Padgett Branch
	190.4	3925+80	10'x10'	109	1	88Q008	3149	Cow Log Branch

Table 3.4: Existing Bridge Culverts

Basin	Structure Description	Approx. Mile Post	Approx. STA	Turnpike Structure Number	Existing Length (ft)	Number of Barrels	Bridge Culvert Size	Waterbody ID	Waterbody Name
North St. Lucie River Water Control District	Bridge Culvert	153.7	1988+60	940064	188	2	11'x7'	3194A	Ten Mile Creek
	Bridge Culvert	154.3	2020+40	940110	188	2	10'x5'	3194A	Ten Mile Creek
	Bridge Culvert	156.6	2143+50	940065	170	2	10'x5'	3194A	Ten Mile Creek
C-25	Bridge Culvert	167.2	2702+00	940066	145	2	10'x6'	3160	C-25 Canal West

3.4 BRIDGE STRUCTURES

There are 18 Sonovoid bridges, and 4 AASHTO mainline Beam bridges within the project study limits. The widening or reconstruction of the existing bridge structures are recommended to improve existing vertical clearance, accommodate future plans, meet current design criteria, and address other outstanding issues. within the project limits. See **Table 3.5** for a list and location of all proposed bridge improvements.

Table 3.5: Existing Bridges

Bridge Structure description	Approx. Mile Post	Approx. STA	Turnpike Structure Number	Waterbody ID	Waterbody Name
Bridge (Picos Road) Crossing SR 91	154.9	2054+40	940055	N/A	N/A
Bridge (CR 68) Crossing SR 91	156.1	2115+20	940056	N/A	N/A
Bridge Crossing Angle Rd and Belcher Canal	157.9	2215+00	NB: 940073 SB: 940057	3163B	C-25 Canal East
Bridge Crossing L-20 Canal	158.6	2250+50	NB: 940083 SB: 940058	3163	Belcher Canal
Bridge (Minute Maid Rd) Crossing SR 91	165	2610+60	940059	N/A	N/A
Bridge (Radebaugh Rd) Crossing SR 91	170.1	2857+60	940060	N/A	N/A
Bridge Crossing Canal and Farm Road	175.4	3134+00	NB: 880065 SB: 880057	3160	C-25 Canal West
Bridge Crossing Canal	178.0	3272+70	NB: 880066 SB: 880058	2893S	Fort Drum Marsh
Bridge Crossing Canal	180.2	3384+50	NB: 880067 SB: 880059	2893S	Fort Drum Marsh
Bridge Crossing Fort Drum Creek	182.3	3499+00	NB: 910058 SB: 910056	3154A	Fort Drum Creek
Bridge Crossing Jim Green Creek	184.6	3617+70	NB: 910060 SB: 910059	3156	Jim Green Creek
Bridge Crossing Jim Green Creek	186.5	3714+70	NB: 910064 SB: 910062	3156	Jim Green Creek
Bridge Crossing Padgett Branch Creek	189.1	3856+50	NB: 880068 SB: 880060	3152B	Padgett Branch
Bridge Crossing Cow Log Branch Canal	190.9	3952+00	NB: 920124 SB: 920055	3149	Cow Log Branch
Bridge Crossing Cow Log Branch Canal	192.4	4032+00	NB: 920125 SB: 920056	3151	Un-named Tributary to Cow log branch

Bridge Structure description	Approx. Mile Post	Approx. STA	Turnpike Structure Number	Waterbody ID	Waterbody Name
Bridge (SR 60) Crossing SR 91	193.1	4069+00	WB: 920200	N/A	N/A
Bridge (SR 60 Ramp) Crossing SR 91	193.4	4087+00	920057	N/A	N/A

3.5 FLOODPLAINS AND FLOODWAYS

The FEMA FIRMs for St. Lucie, Indian River, Okeechobee and Osceola Counties show the location of the FEMA floodplains within the project limits. This information was used in the floodplain analysis later in the report. **Table 3.6** provides a summary of the FEMA FIRMs and **Appendix D** contains the source of this information.

Table 3.6: FEMA FIRMs Information

FEMA Panel Name	FEMA Panel Number	Effective Date
FIRM St. Lucie County, Florida And Incorporated Areas	12111C0167J	February 16, 2012
FIRM St. Lucie County, Florida And Incorporated Areas	12111C0160J	February 16, 2012
FIRM St. Lucie County, Florida And Incorporated Areas	12111C0170J	February 16, 2012
FIRM St. Lucie County, Florida And Incorporated Areas	12111C0155J	February 16, 2012
FIRM St. Lucie County, Florida And Incorporated Areas	12111C0150J	February 16, 2012
FIRM St. Lucie & Indian River County, Florida And Incorporated Areas	12111C0050J	February 16, 2012
FIRM St. Lucie County, Indian River & Okeechobee Florida And Incorporated Areas	12111C0025J	February 16, 2012
FIRM St. Lucie County, Indian River & Okeechobee Florida And Incorporated Areas	12061C0325H	December 04, 2012
FIRM Indian River & Okeechobee Florida And Incorporated Areas	12061C0300H	December 04, 2012
FIRM Indian River & Okeechobee Florida And Incorporated Areas	12093C0195C	July 16, 2015
FIRM Indian River & Okeechobee Florida And Incorporated Areas	12093C0185C	July 16, 2015
FIRM Okeechobee County, Florida And Incorporated Areas	12093C0180C	July 16, 2015
FIRM Indian River & Okeechobee Florida And Incorporated Areas	12093C0100C	July 16, 2015
FIRM Indian River & Osceola Florida And Incorporated Areas	12097C0875G	June 18, 2013

There are no regulatory floodways and there are four Flood Insurance Studies (FIS) for the counties encompassing the project limits. The flood insurance studies are the St. Lucie County FIS 12011CV001B -

12011CV003B (effective 07/31/2024), Indian River County FIS 12061CV001B - 12061CV006B (effective 01/26/2023), Okeechobee County FIS 12093CV000A (effective 07/16/2015), Osceola County FIS 12097CV000A (effective 06/18/2013).

3.5.1 NORTH ST. LUCIE RIVER WATER CONTROL DISTRICT BASIN FLOODPLAIN

The floodplain at the beginning of the corridor located in the North St. Lucie River water control district basin begins at MP 153.7 and ends at MP 157.9 where the bridge begins crossing the C-25 Belcher canal. The area adjacent to the turnpike is classified as Zone X (Area of minimal flood hazard), with a 0.2% annual chance of flood, (FIRM Panel No. 12111C0167J, 12111C0160J, 12111C0170J, 12111C0155J).

3.5.2 C-25 CANAL BASIN FLOODPLAIN

The C-25 Canal Basin Floodplain begins where the most southern portion of the belcher Canal crosses the turnpike flowing from west to east (MP 157.9) and continues to a farm road crossing (MP 175.4). This is one of the largest floodplains in the corridor residing mainly in St. Lucie County with small parts within Indian river and Okeechobee County as well. The portion of the floodplain located in St. Lucie county, South Florida Water Management District (SFWMD) (MP 157.9 to MP 172.9) is classified as Zone X (Area of minimal flood hazard), with a 0.2% annual chance of flood. The turnpike then crosses into Indian River county, St. John's River Water Management District (SJRWMD) (MP 172.9 to MP 175.4). This area of the turnpike is classified as Zone A (Special flood hazard area without base flood elevation) within the turnpike R/W and North of the roadway as well. From the southern r/w line south is Zone X in St. Lucie county and becomes Okeechobee county Zone A at MP 175.2. (FIRM Panel Nos. 12111C0155J, 12111C0150J, 12111C0050J, 12111C0025J, 12061C0325H).

3.5.3 FORT DRUM CREEK FLOODPLAINS

The Fort Drum Basin Floodplain begins at farm road crossing (MP 175.4) and extends to Jim Green Creek (MP 184.5). This floodplain is in Indian River county, Okeechobee county and St. John's River Water Management District. The area of the floodplain from the farm road MP 175.4 to MP 180.8 is classified as Zone A (Special flood hazard area without base flood elevation). After this area the majority of the roadway is classified as Zone X (Area of minimal flood hazard), with a 0.2% annual chance of flooding except for portions of the Zone A floodplain which encroach into the r/w around MP 182.4. (FIRM Panel Nos. 12061C0325H, 12061C0300H, 12093C0195C, 12093C0185C, 12093C0180C).

3.5.4 JIM GREEN CREEK FLOODPLAIN

The Jim green creek floodplain begins at Jim Green Creek MP 184.5 and continues until the Okeechobee/Osceola County line around MP 188.4 This floodplain is located in only Okeechobee county and is part of the St. John's River water management district. The roadway within is segment of the corridor is located within Zone X (Area of minimal flood hazard), with a 0.2% annual chance of flood but also has a portion of the R/w located with the Zone A Classification (Special flood hazard area without base flood elevation) at MP 185.7 (FIRM Panel Nos. 12093C0180C, 12093C0100C).

3.5.5 PADGETT / COW LOG BRANCH FLOODPLAIN

The Padgett and Cow log branch floodplain are located from the Okeechobee/ Osceola county line MP 188.4 to the end of the project limits around MP 193. The roadway and r/w limits within this floodplain are classified as both Zone X (Area of minimal flood hazard), with a 0.2% annual chance of flood and Zone A (Special flood hazard area without base flood elevation). (FIRM Panel Nos. 12093C0100C, 12097C0875G).

4.0 PROPOSED CONDITIONS

The proposed widening for the Turnpike mainline consists of four existing 12-foot lanes to six 12-foot lanes by adding one general toll lane in each direction and widening both the inside and outside shoulders from 10-feet to 12-feet. The proposed Mainline Typical Section is shown in **Figure 4-1**

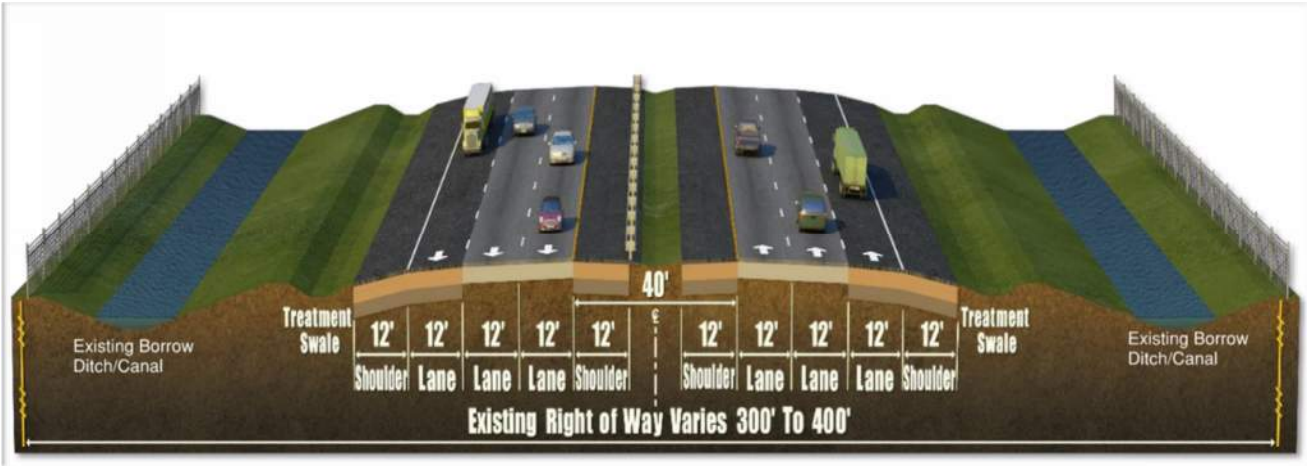


Figure 4-1: Proposed Mainline Typical Section

4.1 CROSS CULVERTS

The roadway widening will require extensions or replacement to most existing cross drains along the Turnpike mainline. The proposed extensions or replacement of each culvert is shown in Table 4.1. The As-Built plans show that the culverts were constructed anywhere from 1956 to 1964 giving them an existing age ranging from 60 to 69 years old. A culvert inspection assessment was performed to analyze the condition of the existing culverts within the project limits and can be found in the Bridge Analysis Report. An individual sufficiency rating and health index was assigned to each culvert and used to determine if the culvert merely had to be extended or was in poor condition and is recommended to be replaced. A total of 13 existing culverts are proposed to be replaced. A total of 15 culverts are proposed to be extended and one will remain as is.

Table 4.1: Proposed Culvert Modifications

Approx. Mile Post	Approx. STA	Turnpike Structure Number	Cross Culvert Size	Number of Barrels	Existing Length (ft)	Approx. Proposed extension or replacement (ft)	Proposed improvement or modification	Notes
154.9	2053+00	94Q009	12'x6'	1	175	77	Extension	
155.5	2087+00	94Q010	12'x5'	1	182	30	Extension	
156.1	2116+50	94Q011	10'x5'	1	160	18	Extension	
160.1	2330+80	94Q012	12'x6'	1	181	3	Extension	
160.6	2357+00	94Q013	12'x13'	1	110	75	Extension	
161.6	2411+00	94Q014	6'x5'	1	153	32	Extension	
162.4	2452+50	94Q015	9'x5'	1	174	11	Extension	
162.9	2476+70	94Q016	9'x9'	1	184	0	Extension	
162.9	2477+50	94Q017	12'x13'	1	109	76	Extension	
164.7	2570+80	94Q018	12'x6'	1	151	34	Extension	
165.7	2624+50	94Q019	10'x10'	1	164	20	Extension	
168.9	2792+00	94Q020	54"	1	164	21	Extension	
169.8	2842+10	94Q021	10'x5'	1	147	37	Extension	
170.8	2892+10	94Q022	12'x5'	1	149	35	Extension	
171.8	2940+10	94Q023	12'x5'	1	152	32	Extension	
172.9	3004+30	94Q024	12'x5'	1	144	41	Extension	
174	3060+70	88Q001	10'x10'	1	117	67	Extension	
175	3114+70	88Q002	10'x10'	2	118	67	Extension	
176.4	3182+70	88Q003	10'x10'	1	118	67	Extension	
177.1	3222+10	88Q004	10'x10'	1	118	67	Extension	
179	3324+50	88Q005	12'x13'	1	109	76	Extension	
179.5	3344+50	N/A	8'x4'	1	146	38	Extension	
180.8	3418+70	N/A	8'x4'	1	147	38	Extension	
181.9	3477+30	N/A	8'x4'	1	153	31	Extension	
183.5	3562+70	91Q003	4'x4'	1	148	37	Extension	
183.9	3586+70	91Q004	4'x4'	1	149	36	Extension	
184.3	3601+80	91Q001	12'x13.5'	1	111	74	Extension	
185.7	3674+80	91Q002	6'x4'	1	149	38	Extension	
187.3	3760+70	N/A	4'x4'	1	150	35	Extension	
188.4	3818+80	N/A	4'x4'	1	148	36	Extension	
188.6	3831+80	88Q007	12'x13'	1	107	76	Extension	
189.7	3895+80	N/A	4'x4'	1	150	34	Extension	
190.4	3925+80	88Q008	10'x10'	1	109	76	Extension	

Based on correspondence with the Turnpike **Appendix H**, there is no known history of flooding or current flooding issues within the project limits. However, these culvert extensions should be analyzed further during the design phase to ensure the extension or replacement does not result in significant changes to the headwater elevations.

4.1.1 INTERCHANGE CULVERTS

Proposed cross drains at the interchange will be required to maintain existing flow patterns. These interchange culverts are intended to maintain existing conveyances and hydraulic performance to prevent adverse effects to offsite areas. Adjustments to these systems may be necessary depending on the final design objective.

4.2 BRIDGE STRUCTURES

There are 12 AASHTO bridges within the scope of this project that will be replaced. Picos Road, Orange Ave, Minute Maid Road, and Radebaugh Ave are all overpasses that carry roads over the Turnpike. Angle Road and L-20 Canal are mainline bridges that carry the Turnpike over local roads and canals. These bridges were built between 1960 and 1964. Several of them have had modifications or repairs in later years. The four overpass locations will be replaced to accommodate the widening of the Turnpike. Due to substandard shoulder widths, as well as the future 8 lane condition, the existing pier or support placement must be changed in order to comply with shoulder width. Each replacement will provide sufficient room to meet the 8 lane condition.

Table 4.2: Proposed Improvements and Modifications to Bridge Structures within Project Limits

Structure Description	Approx. Mile Post	Approx. STA	Turnpike Structure Number	Proposed improvement or modification
Bridge Culvert crossing NSLRWCD Canal 49	153.7	1988+60	940064	Replacement
Bridge Culvert crossing NSLRWCD Canal 48	154.3	2020+40	940110	Replacement
Bridge (Picos Road) Crossing SR 91	154.9	2054+40	940055	Replacement
Bridge (CR 68) Crossing SR 91	156.1	2115+20	940056	Replacement
Bridge Culvert crossing NSLRWCD Canal 44	156.6	2143+50	940065	Replacement
Bridge Crossing Angle Rd and Belcher Canal	157.9	2215+00	NB: 940073 SB: 940057	Replacement
Bridge Crossing L-20 Canal	158.6	2250+50	NB: 940083 SB: 940058	Replacement
Bridge Culvert crossing Canal	167.2	2702+00	940066	Replacement
Bridge Crossing Canal and Farm Road	175.4	3134+00	NB: 880065 SB: 880057	Replacement
Bridge Crossing Canal	178	3272+70	NB: 880066 SB: 880058	Replacement

Structure Description	Approx. Mile Post	Approx. STA	Turnpike Structure Number	Proposed improvement or modification
Bridge Crossing Canal	180.2	3384+50	NB: 880067 SB: 880059	Replacement
Bridge Crossing Fort Drum Creek	182.3	3499+00	NB: 910058 SB: 910056	Replacement
Bridge Crossing Jim Green Creek	184.6	3617+70	NB: 910060 SB: 910059	Replacement
Bridge Crossing Padgett Branch Creek	189.1	3856+50	NB: 880068 SB: 880060	Replacement
Bridge Crossing Cow Log Branch Canal	190.9	3952+00	NB: 920124 SB: 920055	Replacement
Bridge Crossing Cow Log Branch Canal	192.4	4032+00	NB: 920125 SB: 920056	Replacement
Bridge (SR 60) Crossing SR 91	193.1	4069+00	WB: 920200	Widening

4.3 FLOODPLAINS AND FLOODWAYS

The Project traverses several Special Flood Hazard Areas (SFHA) boundary areas. These flood prone areas identified as Zone "A." These are areas without base flood elevations and where the floodplain boundaries were established using approximate methods and methodologies. However, all developments in these areas are required to comply with floodplain development standards. The flood prone areas are all in the SJRWMD area of the project. There are no flood prone areas depicted on the FEMA panels in the SFWMD controlled area of the project. There are no Floodplain impacts as a result of roadway widening. Floodplain impacts in SJRWMD are expected to be minimal and are predominantly longitudinal in nature with some of the cross drain extensions resulting in transverse encroachment to the floodplain. The longitudinal impacts are associated with the construction of stormwater ponds where construction outside the flood prone boundary is not feasible. As an option, impact and compensation may be assessed based on the "de minimis" principle when compensation is too trivial or minor to merit compensation consideration in areas of single ownership and/ or in large floodplains. Most floodplain maps, in general, were developed as part of the National Flood Insurance Program (NFIP) and based on U.S. Geological Survey quadrangle maps with 5- or 10-foot contour intervals. Zone A areas could therefore be at a much lower risk of flooding or higher and may justify amending the maps with a Letter of Map Amendment (LOMA) through FEMA in the design Phase of the project. To approximate potential impacts and associated compensation in the PD&E phase, lidar data was used to create 1.0 ft contours to approximate the Base Flood Elevation (BFE). This is in accordance with the procedures outlined in the FEMA "Guide to Approximate Zone A areas," using the contour interpolation method. Lidar based data implies an estimated BFE elevation of 26.0 ft in the area. This BFE elevation appeared to be consistent with zone "A" flood prone shapes on the local FEMA panels. The average Seasonal High Water (SHW) was estimated to be 2-3 ft. below the BFE in

the area. The project floodplain impacts are all associated with the construction of Stormwater ponds SMF 23-1 to SMF 27-1 in flood prone zone "A". Total impacts from the construction (maintenance berms) are estimated at +/- 22.7 ac-ft. Compensation for the impacts could be partially provided in the referenced ponds but require details not available in the PD&E phase. Two regional flood plain compensation areas, FPC1A and FPC1BI of +/- 6 ac each, are in the same floodplain and sized for full compensation (+/-22.7 ac-ft). See Appendix D of the PSR for preliminary calculations, locations and details.

Floodplain impacts for the interchange improvements are not anticipated.

4.4 PROJECT CLASSIFICATION

The floodplain areas within the project limits are mainly wetlands, rural residential, cropland and pastureland, mixed forests, and marshes. The floodplain encroachment resulting from the proposed improvements is classified as minimal. The impact on human life, transportation facilities, and natural floodplain values are not significant and will require minimal effort to resolve encroachment. To not significantly affect any flood elevations or limits, the FDOT's drainage design standards and water management districts procedures will be utilized throughout the project's lifespan.

4.5 RISK EVALUATION

The proposed improvements were evaluated to determine whether there would be adverse floodplain impacts. A preliminary hydraulic analysis was conducted on the cross drains and it was determined that any extensions or replacement of the cross drains with hydraulically equivalent structures showed no impact of these changes on headwaters.

All proposed drainage culvert extensions and replacements are to be hydraulically equivalent structures. These structures are not anticipated to alter any upstream headwater elevations. The limitations to maintaining existing hydraulically equivalent is due to the restrictions imposed by the geometrics of design, existing development, cost, feasibility, or practicability. Since there is no history of flooding conditions in the project area, there is no reason to believe any flooding will occur as the result of the construction of this project.

Based on the FDOT's floodplain categories, this project falls under Category 3: "projects involving modification to existing drainage structures." Floodplain encroachments do not vary significantly with any of the alternatives and FPC sites will be provided for volume compensation (cup for cup) for all floodplain impacts because of the floodplain encroachments. The modifications to drainage structures included in this project will result in an insignificant change in their capacity to carry floodwater. This change will cause minimal increases in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values or any notable change in flood risks or damage. The floodplains adjacent to the project are one contiguous area so there will be no impacts or rise in flood elevation. There will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

4.6 COORDINATION WITH LOCAL AGENCIES

The Project Development and Environmental (PD&E) Study has included coordination with local agencies including:

- South Florida Water Management District (SFWMD)
- Florida's Turnpike Maintenance and Drainage Departments
- North St. Lucie River Water control district (NSLRWCD)
- St. John's River Water Management District (SJRWMD)

Pre-Application Meetings were held with SFWMD, SJRWMD and NSLRWCD and copies of the meeting minutes for each are provided in **Appendix G.**

4.7 PD&E REQUIREMENTS

4.7.1 HISTORY OF FLOODING

There is no documented history of flooding within the project limits. Although there is no flooding, there is documentation of reoccurring siltation build-up at culvert 94Q016 at MP 163. Culvert 94Q016 is a 9'x9' concrete box culvert located within Turnpike MP 163. This culvert is part of the SFWMD Basin C-25 Watershed. The C-25 basin is approximately 98,527 acres. Culvert 94Q016 flows from North to South into the Belcher Canal (C-25) making its way east to Spillway Structure S-99. The upstream area of the culvert is agricultural land that uses detention canals and pumps to send water to reservoirs for irrigation. This land is owned by Sunshine Farms Treasure Coast LLC (Permit No. 56-0004-P-02). The Florida Turnpike divides the farm into two separate stormwater management (SWM) systems: one in the north and another in the south. These systems will function independently. Results show that when you reduce the box culvert size from 9 ft by 9 ft (No silt scenario) to a 9 ft by 6 ft (with silt scenario), the hydraulic capacity of the culvert decreases. However, since the tailwater condition is submerged, the flow is primarily controlled by the tailwater level. The culvert is outlet controlled (meaning that the water level downstream is higher than the critical depth of the CBC barrel), the tailwater level dictates the flow rate through the culvert. Culvert reduced capacity due to silt is offset by the high tailwater level resulting in consistent headwater elevations. Documentation for this can be found in **Appendix H**. A permanent solution to the consistent siltation issue will be addressed during the design phase of this project.

4.7.2 FLOODPLAIN ENCHROCHMENT

Floodplain impacts are expected to be minimal and are predominantly longitudinal in nature with some of the cross drain extensions resulting in transverse encroachment to the floodplain. The longitudinal impacts cannot be avoided since the floodplains associated with existing canals, water bodies and depressional areas extend parallel to the Turnpike in both directions of travel. This resulted in no practical avoidance alternatives in these areas.

5.0 RECOMMENDATIONS AND CONCLUSIONS

The proposed improvements to the corridor will encroach into the adjacent floodplains. A thorough analysis of the floodplain volume encroachment and compensation has been provided in more detail in the Pond Siting Report. The 100-year floodplain does not encroach on the existing roadway footprint. There is no established BFE in zone "A" but based on lidar and the existing embankment elevations there are no floodplain impacts anticipated to the roadway. The minimal encroachments on the floodplains will be longitudinal in nature. The floodplain compensation provided will be cup for cup restoration and mitigation. No substantial modifications are needed to the vertical geometry of the roadway because there is no history of flooding and the estimated BFE is below the existing embankment. During the design phase a thorough survey will be needed to obtain better elevation data especially in overgrown vegetated areas. Since the floodplain encroachment level is minimal, there will be no adverse effect on flood heights or limits.

6.0 REFERENCES

- FEMA FIRM Maps for St. Lucie, Indian River, Okeechobee and Osceola Counties
- Flood Insurance Studies for St. Lucie, Indian River, Okeechobee and Osceola Counties
- FDOT Project Development and Environment Manual, Effective: July 31, 2024 FDOT Drainage Manual, Effective January 2024
- FDOT Drainage Design Guide, January 2024
- NRCS – USDA Soil Surveys for St. Lucie, Indian River, Okeechobee and Osceola Counties, FL
- FPID 436517-1-52-01 & 436517-3-52-01 Roadway Plans, November 1, 2017
- FPID 97940-0071 – 97940-0074 Final As-Built Roadway Plans
- FPID 97910-0081 – 97910-0084 Final As-Built Roadway Plans
- FPID 97920-0091 – 97920-0092 Final As-Built Roadway Plans

APPENDIX A
DRAINAGE MAPS

PRE DEVELOPMENT DRAINAGE MAP

BEGIN PROJECT
STA. 1979+94.26

N

1"=500'

BASIN 1
TOTAL=8.01 AC
IMPERVIOUS=1.74 AC
PERVIOUS=6.27 AC

CANAL 49 (NSLRWCD)

R/W LINE

BASIN 2
TOTAL=28.97 AC
IMPERVIOUS= 6.33 AC
PERVIOUS= 22.64 AC

COOLIDGE RD

CANAL 48 (NSLRWCD)

COOLIDGE RD

12'X6' CONCRETE BOX CULVERT

BASIN 3
TOTAL=29.12 AC
IMPERVIOUS=6.18 AC
PERVIOUS= 22.94 AC

1980 1990 2000 2010 2020 2030 2040 2050

COOLIDGE RD

R/W LINE

SR 91

S ROCK RD

R/W LINE

FGT
EASEMENT

11'X7' CONCRETE DOUBLE BOX CULVERT

10'X5' CONCRETE DOUBLE BOX CULVERT

HOEFFNER LN

RESEARCH CENTER RD

ROCK RD

PICOS RD

CANAL 47 (NSLRWCD)

CANAL 40

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

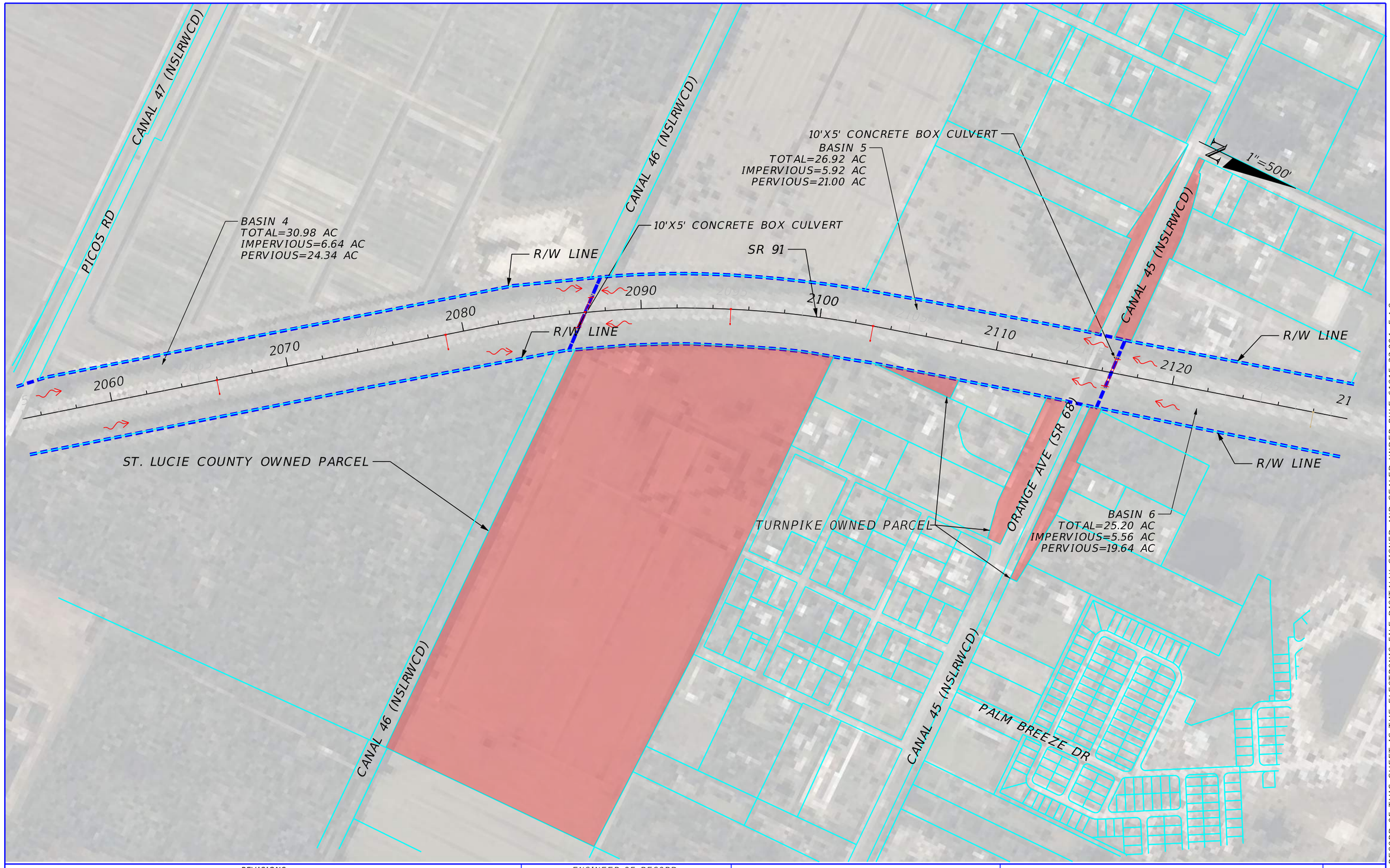
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT [SHEET]
RoshanM 1/3/2025 10:58:05 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

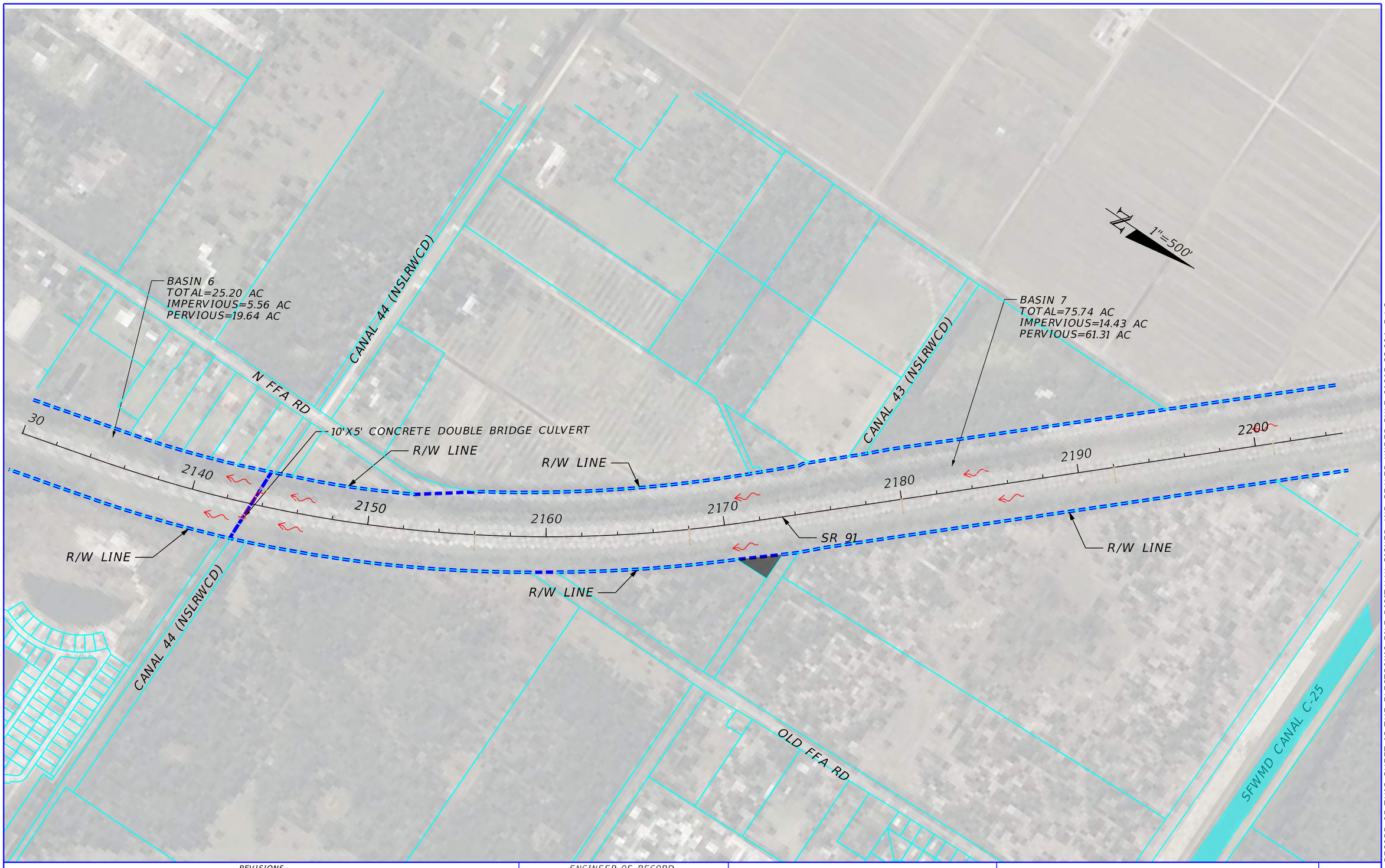
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO. 2

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-1 [SHEET]
RoshanM 1/3/2025 10:58:12 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

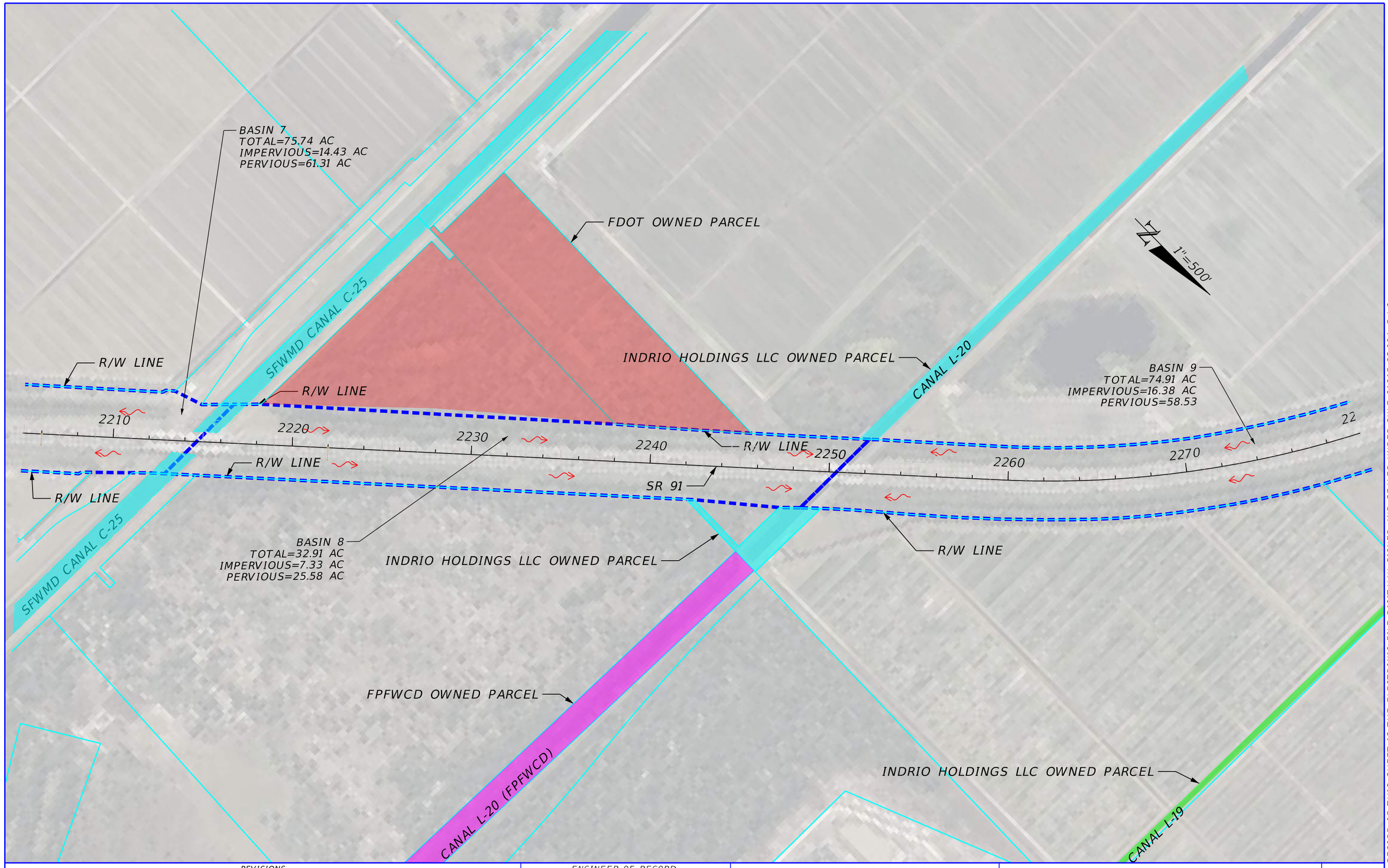
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
3

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-2 [SHEET]
RoshanM 1/3/2025 10:58:18 AM



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP PRE-DEVELOPMENT

SHEET NO. 4

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-3 [SHEET]
RoshanM 1/3/2025 10:58:24 AM

INDRIO HOLDINGS LLC OWNED PARCEL

COMPREHENSIVE EVERGLADES
RESTORATION PLAN (CERP) PROJECT

N

1"=500'

BASIN 9
TOTAL=74.91 AC
IMPERVIOUS=16.38 AC
PERVIOUS=58.53

12'X6' CONCRETE BOX CULVERT

'80

R/W LINE

2290

2300

2310

2320

2330

2340

2350

SR 91

CANAL L-19

CANAL L-19

R/W LINE

CANAL L-19

INDRIO HOLDINGS
LLC OWNED PARCELS

BASIN 10
TOTAL=24.40 AC
IMPERVIOUS=5.31 AC
PERVIOUS=19.09 AC

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704 JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	DRAINAGE MAP PRE-DEVELOPMENT	5
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-4 [SHEET]
RoshanM 1/2/2025 10:58:20 AM

COMPREHENSIVE EVERGLADES
RESTORATION PLAN (CERP) PROJECT

SFWMD OWNED PARCELS
(NOT CONSERVATION LANDS)

N
1"=500'

BASIN 11
TOTAL=49.29 AC
IMPERVIOUS=10.44 AC
PERVIOUS=38.85 AC

R/W LINE

SR 91

6'X5' CONCRETE BOX CULVERT

BASIN 12
TOTAL=38.25 AC
IMPERVIOUS=8.25 AC
PERVIOUS=30.00 AC

2360 2370 2375 2380 2390 2395 2400 2410 2415 2420 24

12'X13' BRIDGE CULVERT

R/W LINE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
6

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-5 [SHEET]
RoshanM 1/3/2025 10:58:36 AM

SFWMD OWNED PARCELS
(NOT CONSERVATION LANDS)

BASIN 12
TOTAL=38.25 AC
IMPERVIOUS=8.25 AC
PERVIOUS=30.00 AC

9'X5' CONCRETE BOX CULVERT

BASIN 13
TOTAL=22.24 AC
IMPERVIOUS=4.97 AC
PERVIOUS=17.27 AC

9'X9' BOX CULVERT

12'X13' BRIDGE CULVERT

BASIN 14
TOTAL=86.18 AC
IMPERVIOUS=19.12 AC
PERVIOUS=67.06 AC

R/W LINE

R/W LINE

SR 91

2430 2440 2450 2460 2470 2480 2490 2500

N
1"=500'

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

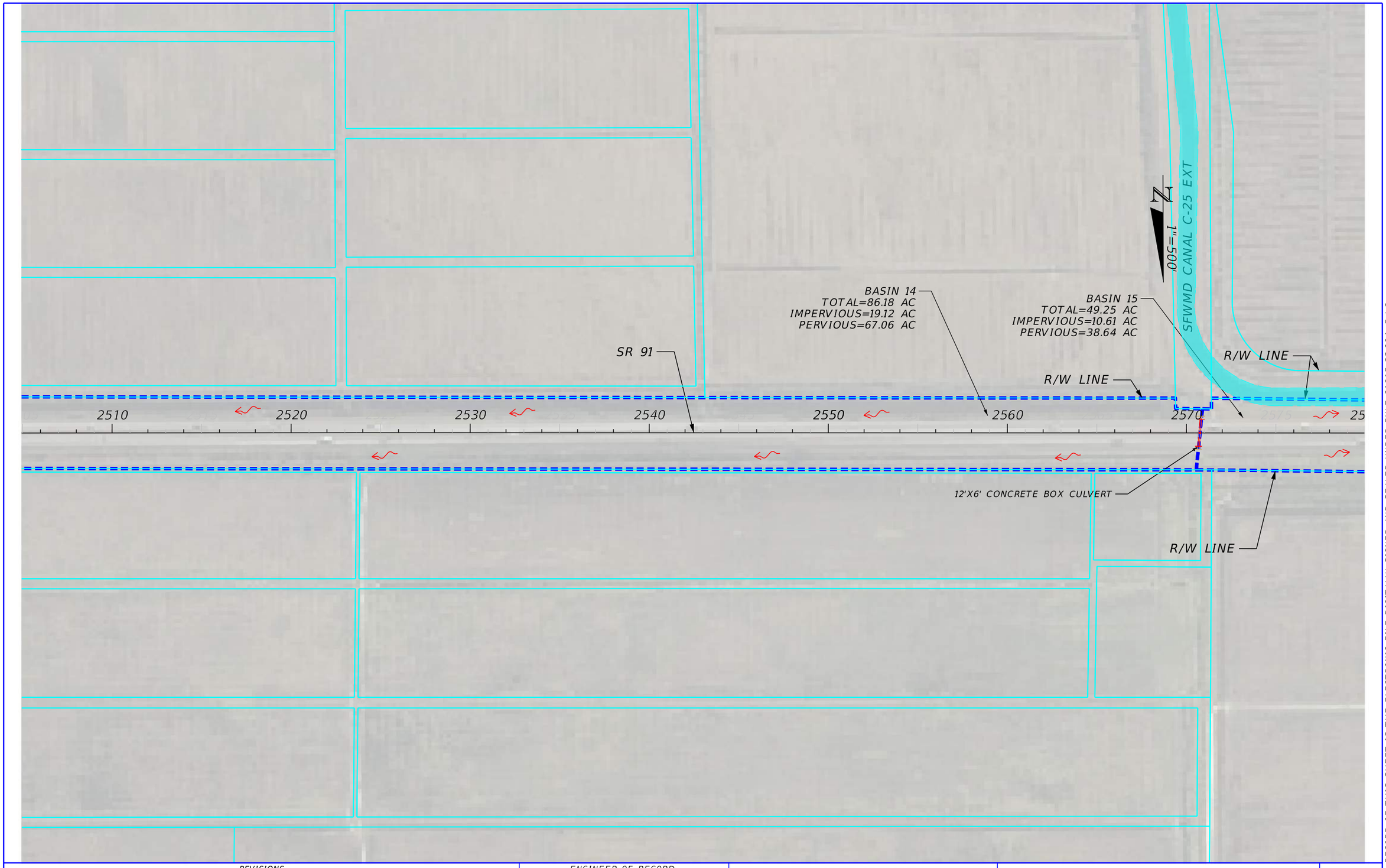
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
7

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-6 [SHEET]
RoshanM 1/3/2025 10:58:42 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

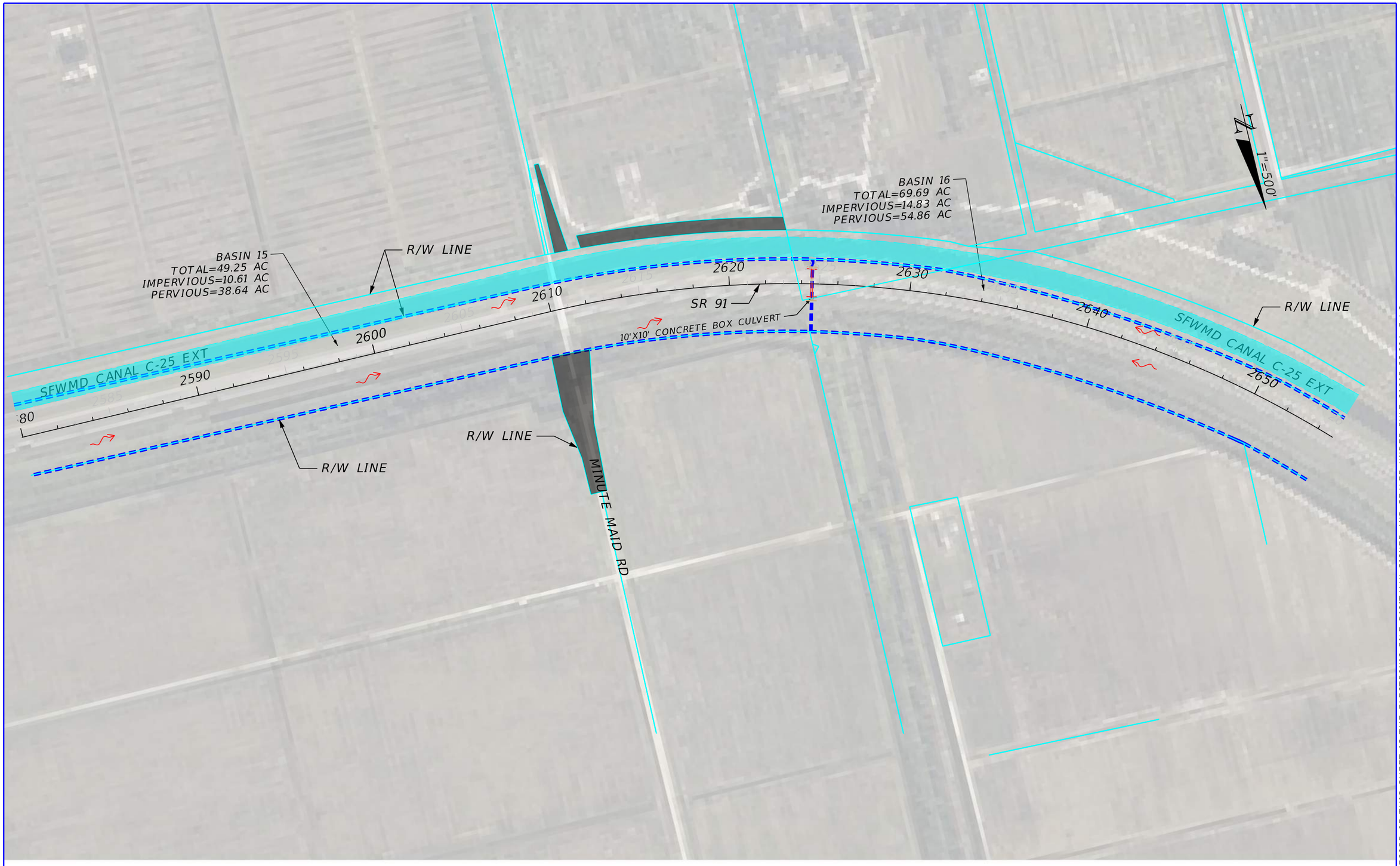
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
8

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

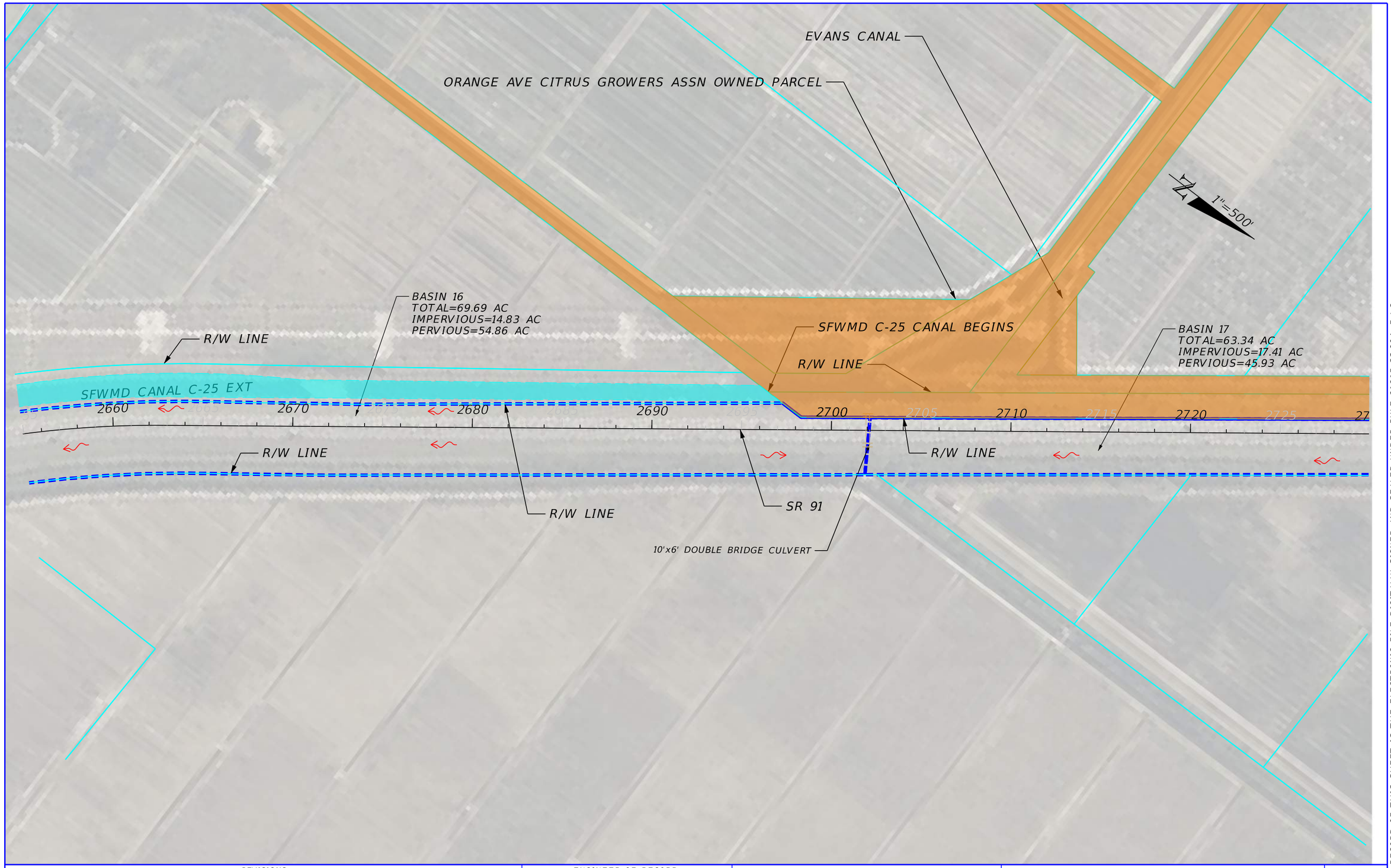
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-7 [SHEET]
RoshanM 1/3/2025 10:58:47 AM



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704 JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	DRAINAGE MAP PRE-DEVELOPMENT	9
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-8 [SHEET]
RoshanM 10/2025 10:58:54 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

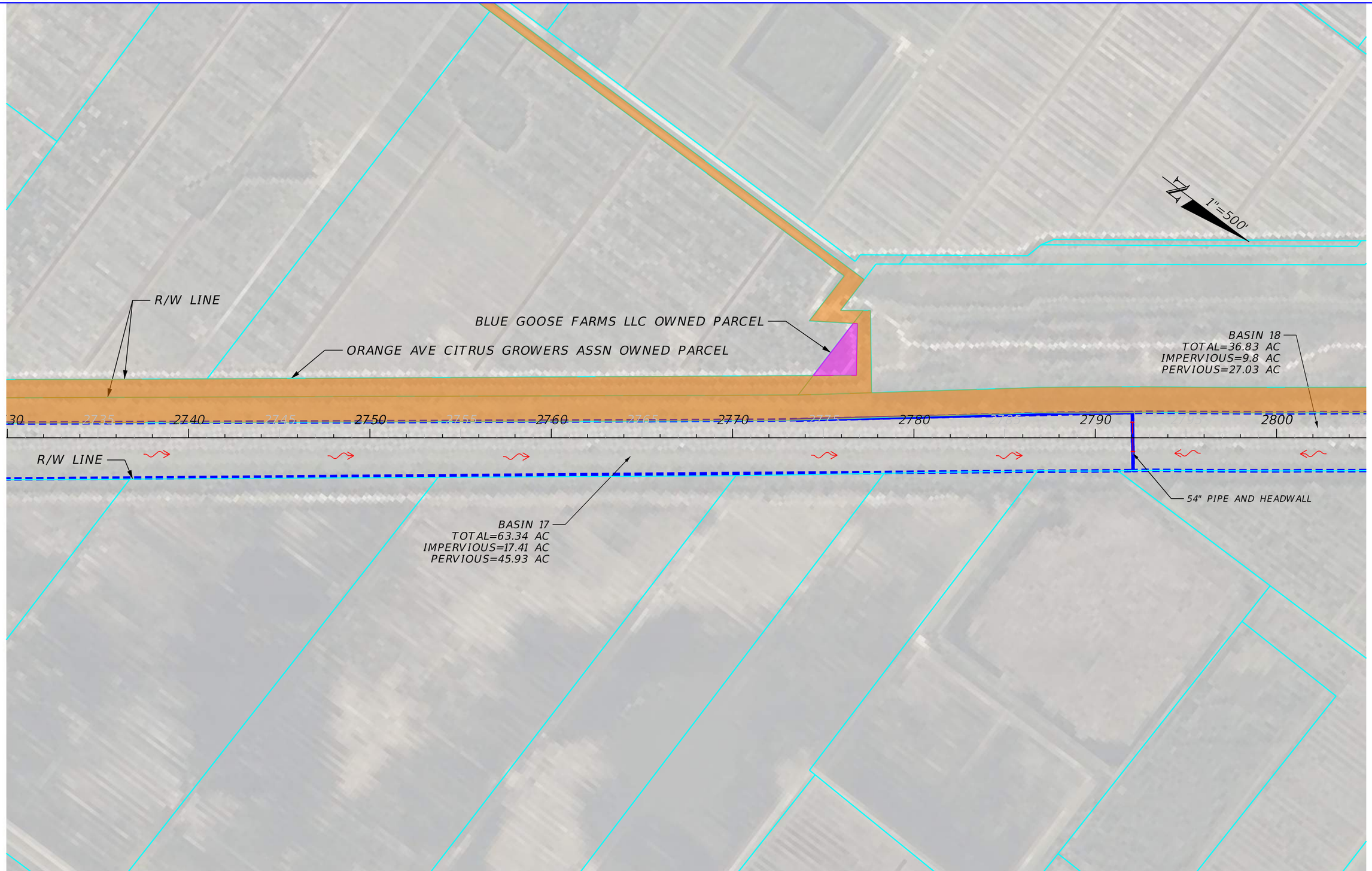
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
10

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

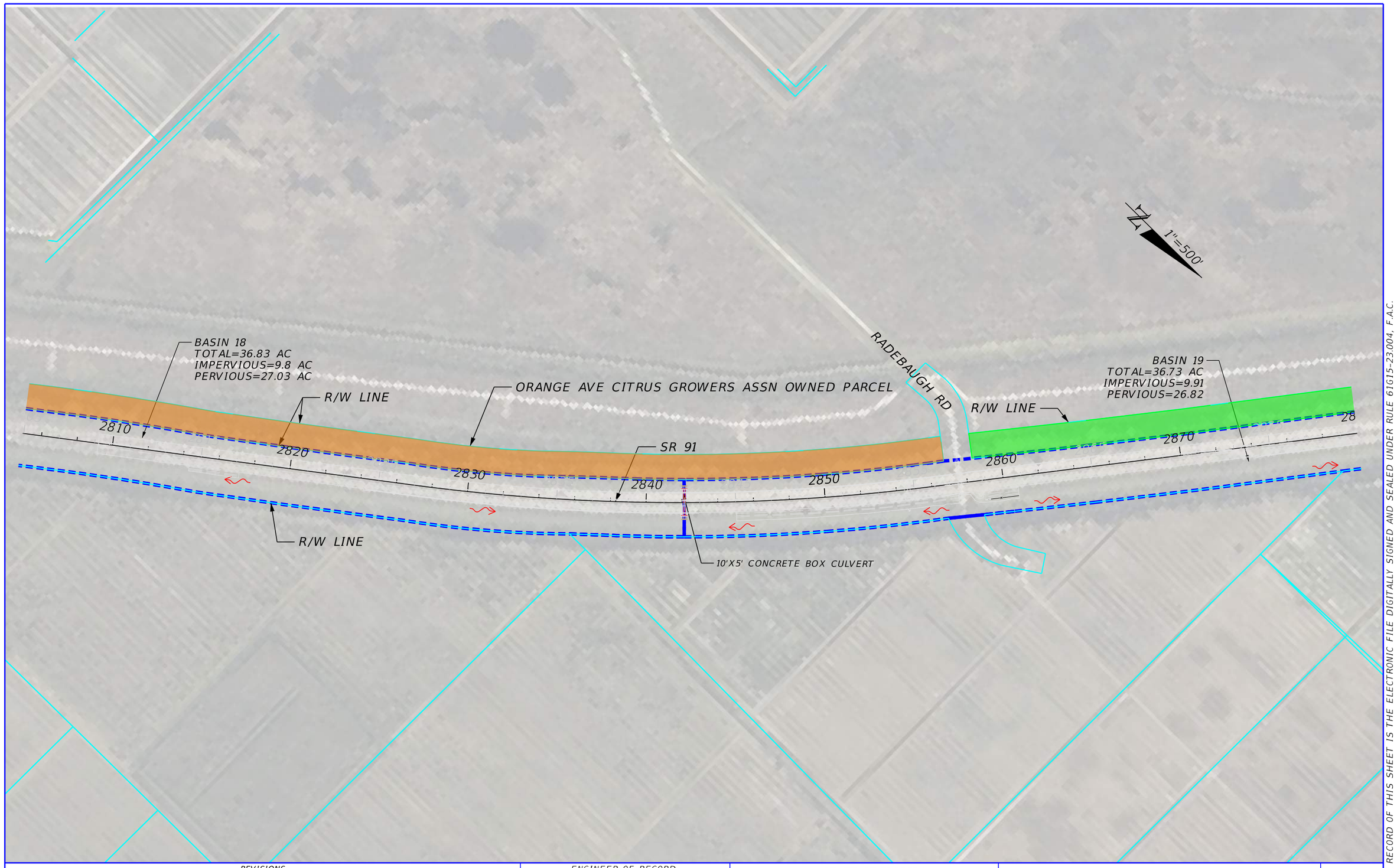
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-9 [SHEET]
RoshanM 1/3/2025 10:59:00 AM



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704 JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	DRAINAGE MAP PRE-DEVELOPMENT	11
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-10 [SHEET]
RoshanM 1/3/2025 10:59:06 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

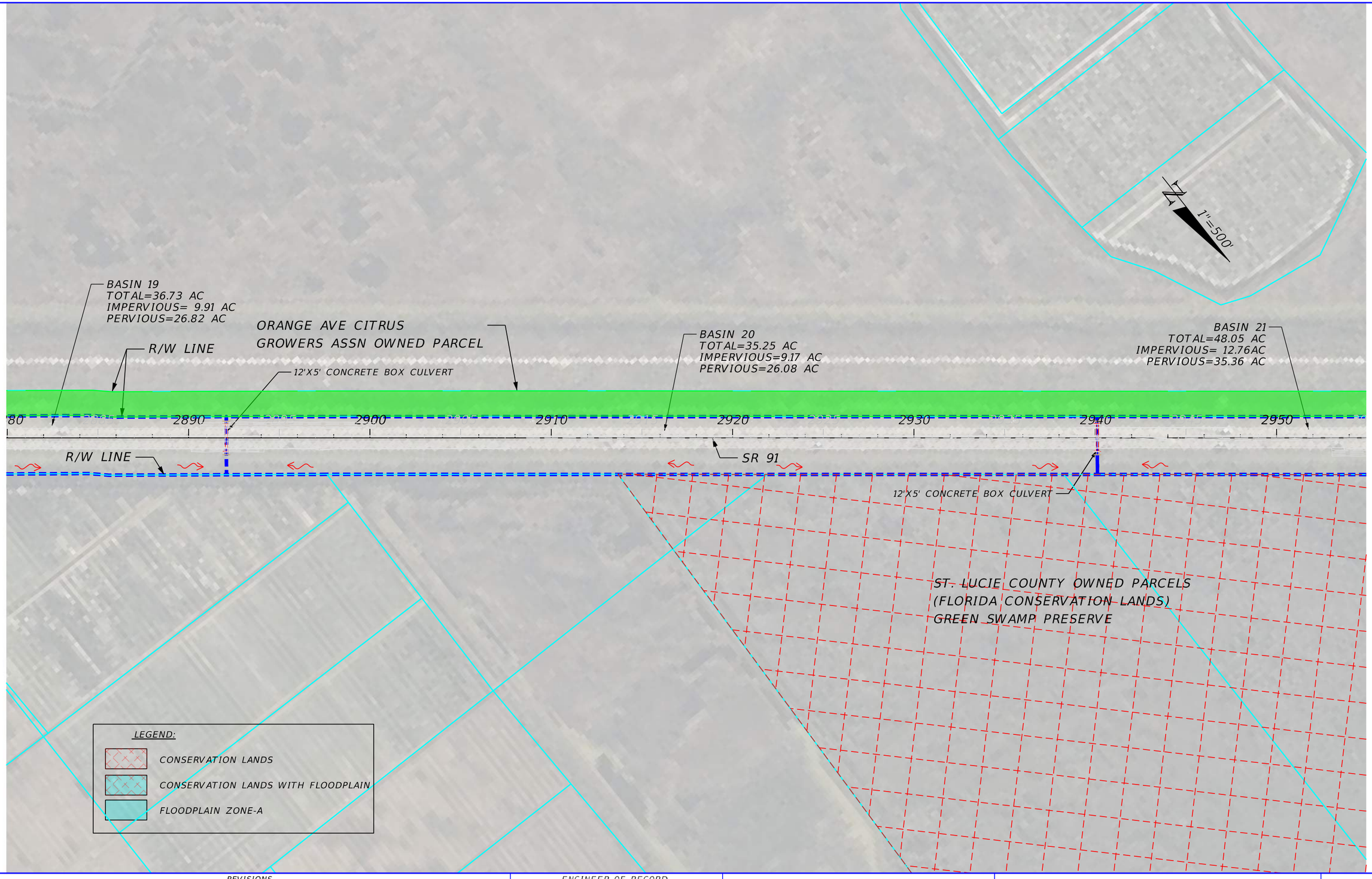
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO. 12

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-11 [SHEET]
RoshanM 1/3/2025 12:59:12 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
13

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-12 [SHEET]
RoshanM 1/3/2025 10:59:18 AM

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

1"=500'

BASIN 21
TOTAL=48.05 AC
IMPERVIOUS=
12.76AC
PERVIOUS=35.36
AC

BASIN 22
TOTAL=56.69AC
IMPERVIOUS=45.04AC
PERVIOUS=11.65AC

12'X5' CONCRETE BOX CULVERT

R/W LINE

ORANGE AVE CITRUS
GROWERS ASSN OWNED PARCEL

2960
2970
2980
2990
3000
3010
3020
30

R/W LINE

SR 91

ST. LUCIE COUNTY OWNED PARCELS
(FLORIDA CONSERVATION LANDS)
GREEN SWAMP PRESERVE

ST. LUCIE COUNTY LINE
INDIAN RIVER COUNTY LINE

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP PRE-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704 JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		14
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-13 [SHEET]
RoshanM 1/3/2025 10:59:25 AM

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

N

1"=500'

BASIN 22
TOTAL=56.69AC
IMPERVIOUS=45.04AC
PERVIOUS=11.65AC

10'X10' CONCRETE BOX CULVERT

BASIN 23
TOTAL=46.36 AC
IMPERVIOUS=11.3 AC
PERVIOUS=35.06 AC

R/W LINE

ST. LUCIE COUNTY LINE

INDIAN RIVER COUNTY LINE

3030 3040 3050 3060 3070 3080 3090 3100

SR 91

R/W LINE

CORRIGAN RD

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

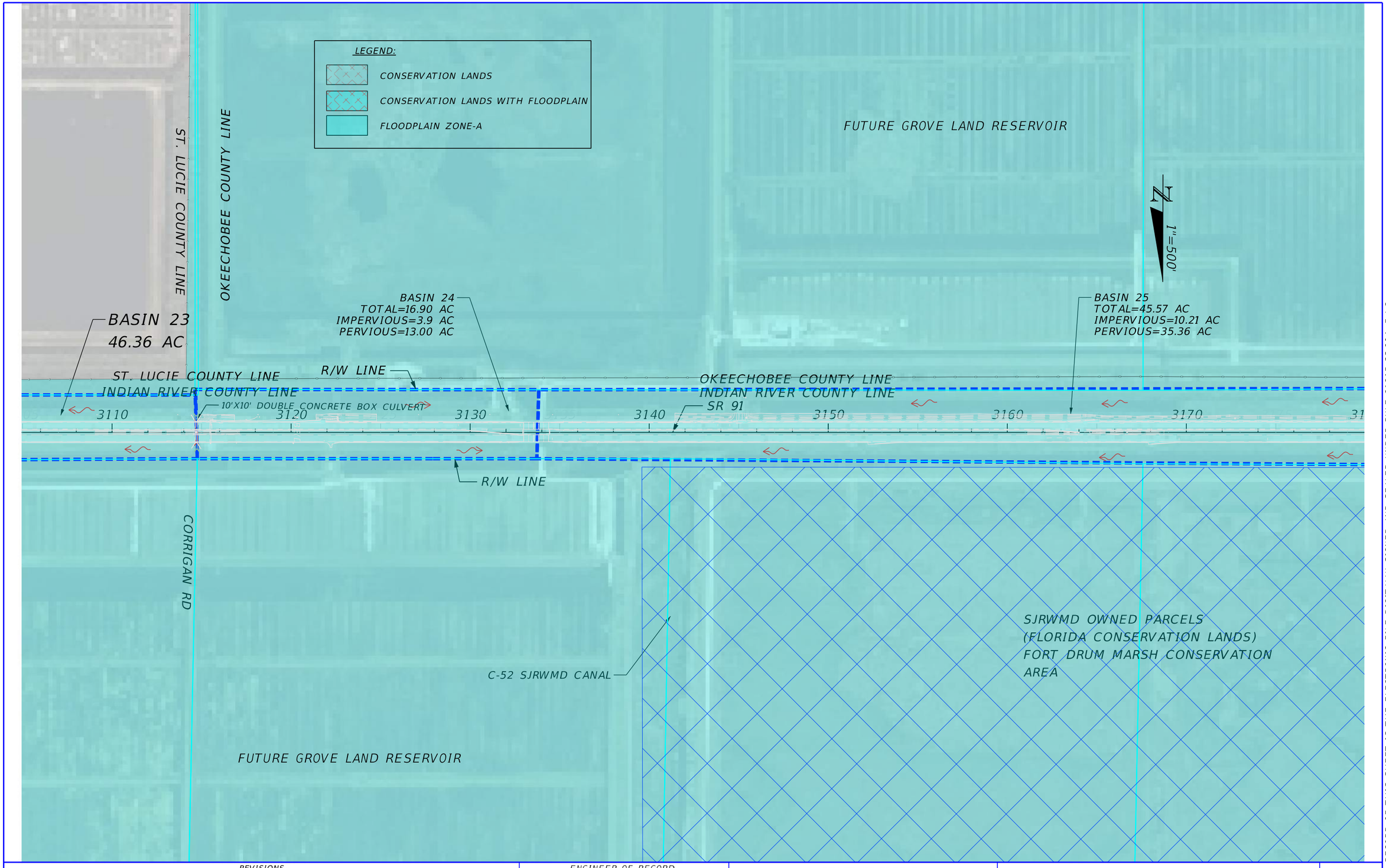
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.

15

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-14 [SHEET]
RoshanM 12/2025 10:50:21 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO. 16

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

N

1"=500'

BASIN25
TOTAL=45.57 AC
IMPERVIOUS=10.21 AC
PERVIOUS=35.36 AC

BASIN 26
TOTAL=40.64 AC
IMPERVIOUS=8.12 AC
PERVIOUS=32.52 AC

BASIN 27
TOTAL=49.11 AC
IMPERVIOUS=10.63 AC
PERVIOUS=38.48 AC

R/W LINE

OKEECHOBEE COUNTY LINE

INDIAN RIVER COUNTY LINE

80 3190 3200 3210 3220 3230 3240 3250

SR 91

10'X10' CONCRETE BOX CULVERT

R/W LINE

10'X10' CONCRETE BOX CULVERT

SJRWMD OWNED PARCELS
(FLORIDA CONSERVATION LANDS)

FORT DRUM MARSH CONSERVATION AREA

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

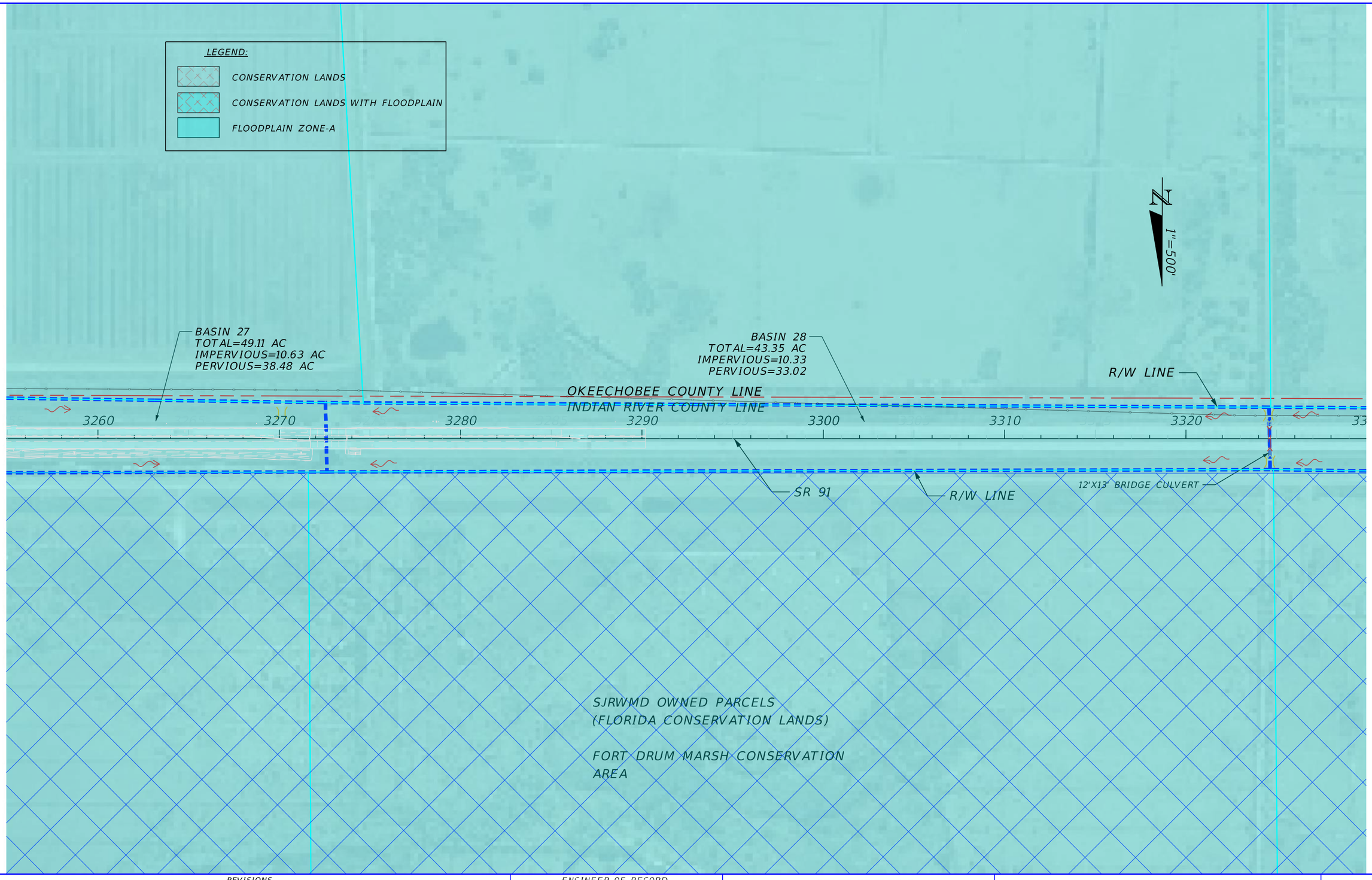
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
17

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-16 [SHEET]
RoshanM 1/3/2025 10:59:44 AM



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704 JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	DRAINAGE MAP PRE-DEVELOPMENT	18
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-17 [SHEET]
RoshanM 1/3/2025 10:59:51 AM

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

N

1"=500'

BASIN 29
TOTAL=16.25 AC
IMPERVIOUS=3.84 AC
PERVIOUS=12.41 AC

BASIN 30
TOTAL=33.18 AC
IMPERVIOUS=7.6 AC
PERVIOUS=25.58 AC

SJRWMD OWNED PARCELS

BASIN 31
TOTAL=31.46 AC
IMPERVIOUS=6.67 AC
PERVIOUS=24.79 AC

R/W LINE

SR 91

INDIAN RIVER COUNTY LINE
OKEECHOBEE COUNTY LINE

3330 3340 3350 3360 3370 3380 3390 3400

R/W LINE

8'X4' CONCRETE BOX CULVERT

SJRWMD OWNED PARCELS
(FLORIDA CONSERVATION LANDS)

FORT DRUM MARSH CONSERVATION AREA

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.

19

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-18 [SHEET]
RoshanM 1/3/2025 10:59:58 AM

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

BASIN 31
TOTAL=31.46 AC
IMPERVIOUS=6.67 AC
PERVIOUS=24.79 AC

OKEECHOBEE COUNTY LINE

OKEECHOBEE COUNTY LINE

FORT DRUM MARSH CONSERVATION AREA
SJRWMD OWNED PARCELS
(FLORIDA CONSERVATION LANDS)

R/W LINE

RED BAY FOUNDATION PRESERVE
FLORIDA CONSERVATION LANDS

1"=500'

BASIN 32
TOTAL=54.03 AC
IMPERVIOUS=11.59 AC
PERVIOUS=42.44 AC

3410 3420 3430 3440 3450 3460 3470 34

SR 91

R/W LINE

8'X4' CONCRETE BOX CULVERT

8'X4' CONCRETE BOX CULVERT

INDIAN RIVER COUNTY LINE

SJRWMD OWNED PARCELS
(FLORIDA CONSERVATION LANDS)

FORT DRUM MARSH CONSERVATION AREA

FLORIDA CONSERVATION LANDS

WEDEWORTH FARM CONSERVATION EASEMENT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

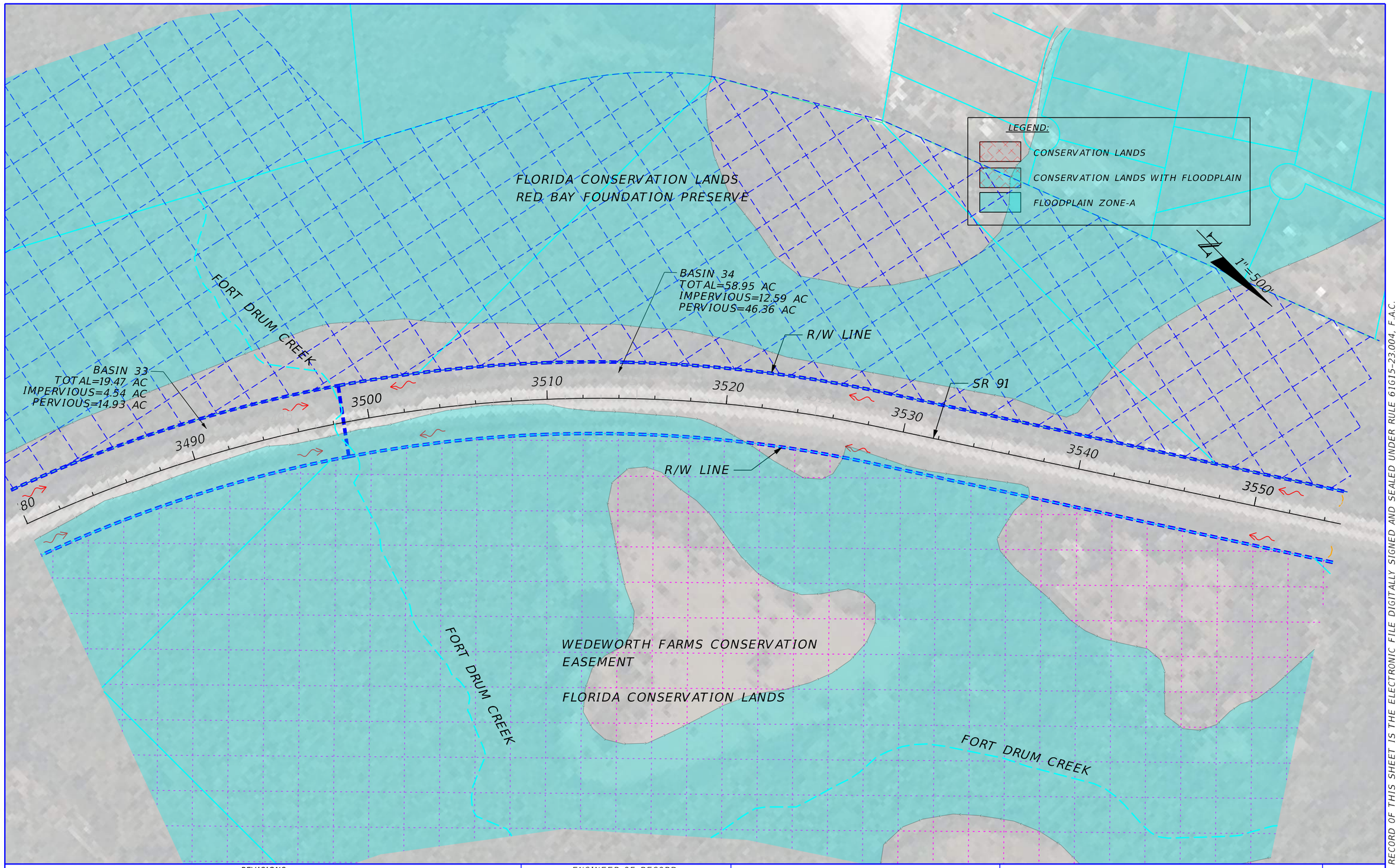
DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.

20

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-19 [SHEET]
RoshanM 1/3/2025 11:00:05 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
21

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-20 [SHEET]
RoshanM 1/3/2025 11:00:12 AM

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

FLORIDA CONSERVATION LANDS

BASIN 34
TOTAL=58.95 AC
IMPERVIOUS=12.59 AC
PERVIOUS=46.36 AC

BASIN 35
TOTAL=21.99 AC
IMPERVIOUS=4.74 AC
PERVIOUS=17.25 AC

4'X4' CONCRETE BOX CULVERT

BASIN 36
TOTAL=13.87 AC
IMPERVIOUS=3.37 AC
PERVIOUS=10.50 AC

OSOWOU RD

FLORIDA CONSERVATION LANDS
RUSSAKIS RANCH GOPHER TORTOISE LONGTERM
RECIPIENT SITE

12'X13.5' BRIDGE CULVERT

BASIN 37
TOTAL=14.45 AC
IMPERVIOUS=3.09 AC
PERVIOUS=11.36 AC

JIM GREEN CREEK

1"=500'

R/W LINE

3560 3570 3580 3590 3600 3610 3620

10 10 20 20

4'X4' CONCRETE BOX CULVERT

366TH TRAIL

SR 91

R/W LINE

FLORIDA CONSERVATION LANDS
WEDEWORTH FARMS CONSERVATION
EASEMENT

JIM GREEN CREEK

FORT DRUM CREEK

FORT DRUM CREEK

FORT DRUM CREEK

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO. 22

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-21 [SHEET]
RoshanM 11/3/2025 11:00:19 AM

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

1"=500'

FLORIDA CONSERVATION LANDS

RUSSAKIS RANCH GOPHER TORTOISE LONGTERM

RECIPIENT SITE

JIM GREEN CREEK

BASIN 38
TOTAL=23.48 AC
IMPERVIOUS=7.58 AC
PERVIOUS=15.90 AC

BASIN 39
TOTAL=25.05 AC
IMPERVIOUS=8.56 AC
PERVIOUS=16.49 AC

BASIN 40
TOTAL=36.71 AC
IMPERVIOUS=7.79 AC
PERVIOUS=28.92 AC

R/W LINE

SR 91

R/W LINE

6'X4' CONCRETE BOX CULVERT

FORT DRUM SERVICE PLAZA

PACKAGE PLANT POND THAT TREATS EFFLUENT
PERMITTED THROUGH DEP (WASTE WATER TREATMENT PONDS)
IS OWNED BY FTE.

FORT DRUM CREEK

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
23

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-22 [SHEET]
RoshanM 1/3/2025 11:00:26 AM

JIM GREEN CREEK

FLORIDA CONSERVATION LANDS
GRASSLAND RESERVE PROGRAM
EASEMENT#102

JIM GREEN CREEK

1"=500'

FLORIDA CONSERVATION LANDS

BASIN 40
TOTAL=36.71 AC
IMPERVIOUS=7.79 AC
PERVIOUS=28.92 AC

BASIN 41
TOTAL=27.35 AC
IMPERVIOUS=5.69 AC
PERVIOUS=21.66 AC

R/W LINE

SR 91

BASIN 42
TOTAL=14.86 AC
IMPERVIOUS=3.15 AC
PERVIOUS=11.71 AC

BASIN 43
TOTAL=54.93 AC
IMPERVIOUS=11.29 AC
PERVIOUS=43.64 AC

3710 3720 3730 3740 3750 3760 3770 37

4'X4' CONCRETE BOX CULVERT

R/W LINE

FLORIDA CONSERVATION LAND

FLORIDA CONSERVATION LANDS
WEDEWORTH FARMS CONSERVATION
EASEMENT

LEGEND:

CONSERVATION LANDS

CONSERVATION LANDS WITH FLOODPLAIN

FLOODPLAIN ZONE-A

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

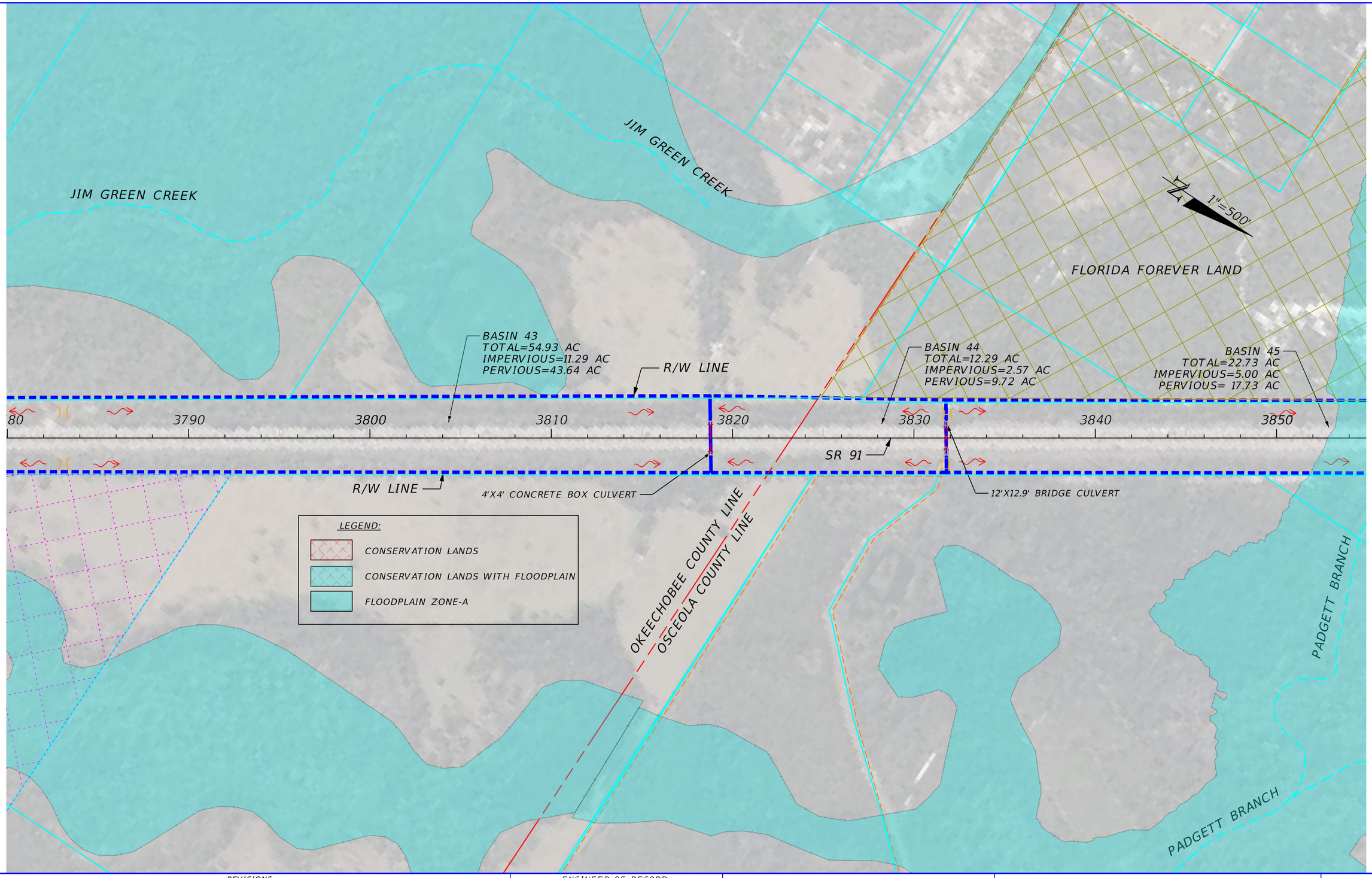
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
24

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-23 [SHEET]
RoshanM 1/3/2025 11:00:33 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

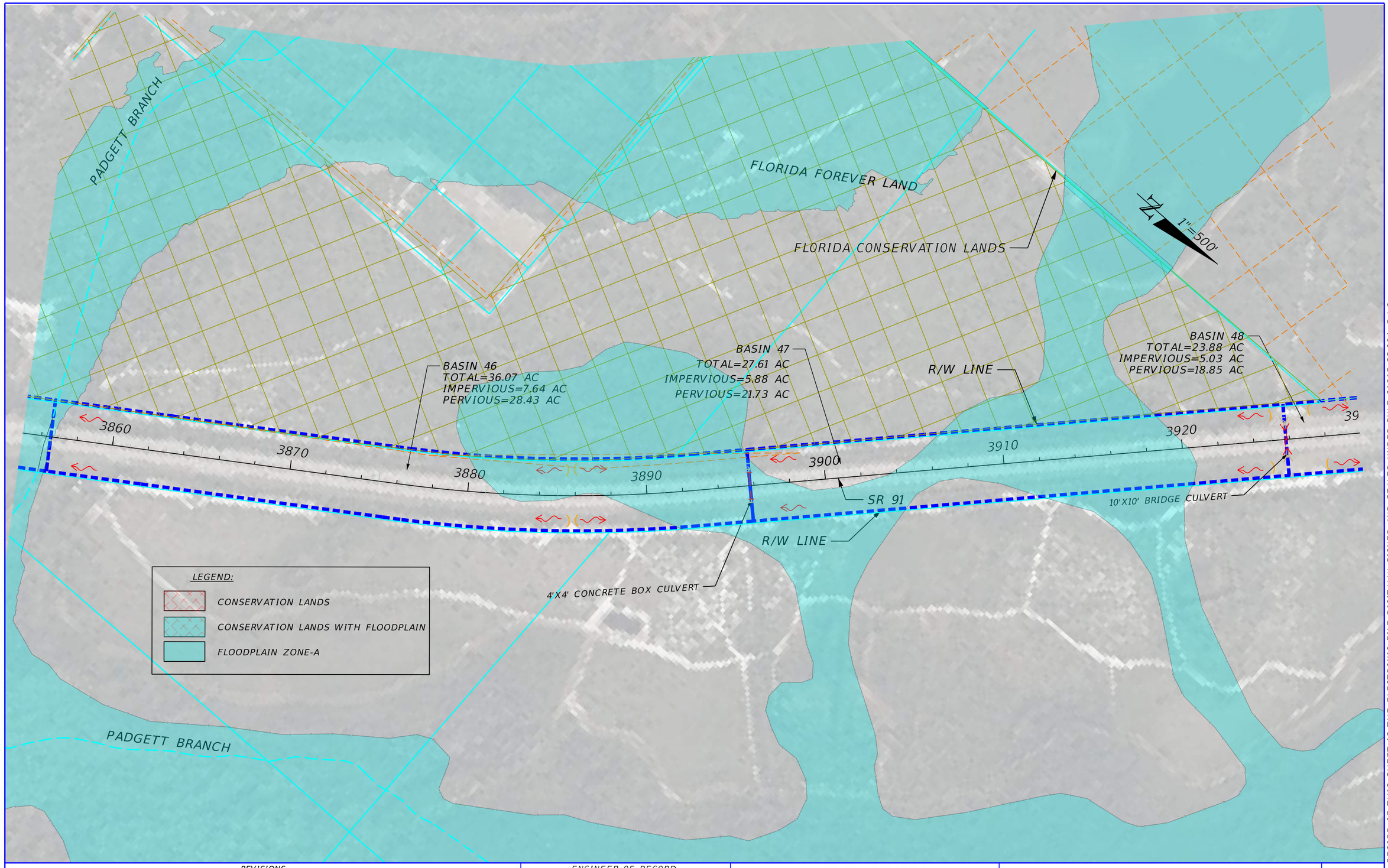
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
25

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-24 [SHEET]
RoshanM 1/3/2025 11:00:43 AM



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
26

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-25 [SHEET]
RoshanM 1/3/2025 11:00:52 AM

FLORIDA CONSERVATION LANDS

COW LOG BRANCH

DELUCA PRESERVE

1"=500'

BASIN 48
TOTAL=23.88 AC
IMPERVIOUS=5.03 AC
PERVIOUS=18.85 AC

R/W LINE

BASIN 49
TOTAL=43.93 AC
IMPERVIOUS=9.25 AC
PERVIOUS=34.68 AC

BASIN 50
TOTAL=29.54 AC
IMPERVIOUS=6.34 AC
PERVIOUS=23.20 AC

3930 3940 3950 3960 3970 3980 3990 4000

SR 91

R/W LINE

LEGEND:

- CONSERVATION LANDS
- CONSERVATION LANDS WITH FLOODPLAIN
- FLOODPLAIN ZONE-A

COW LOG BRANCH

COW LOG BRANCH

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

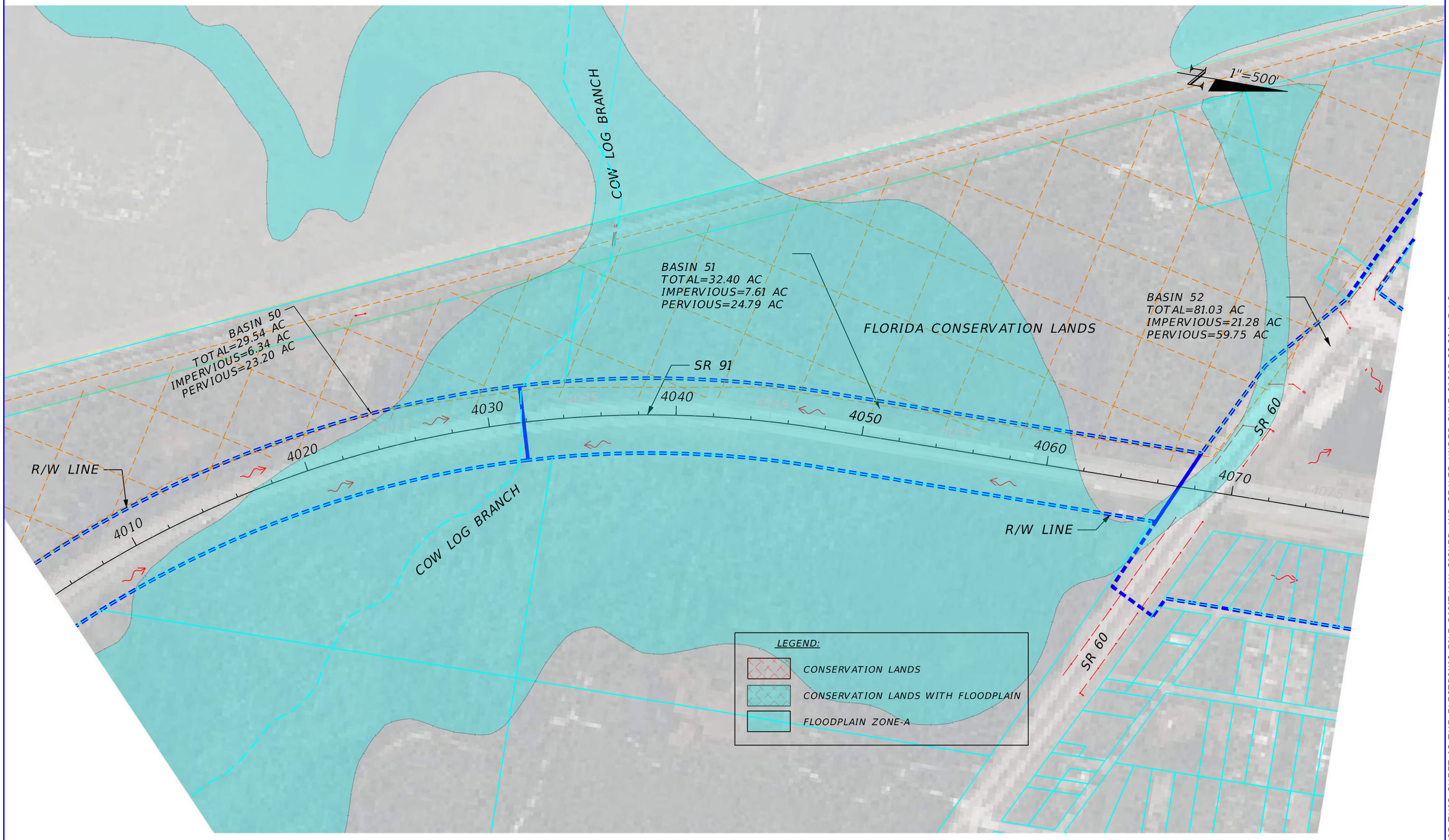
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO. 27

C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn : PRE DEVELOPMENT-26 [SHEET]
RoshanM 11/3/2025 11:01:01 AM



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

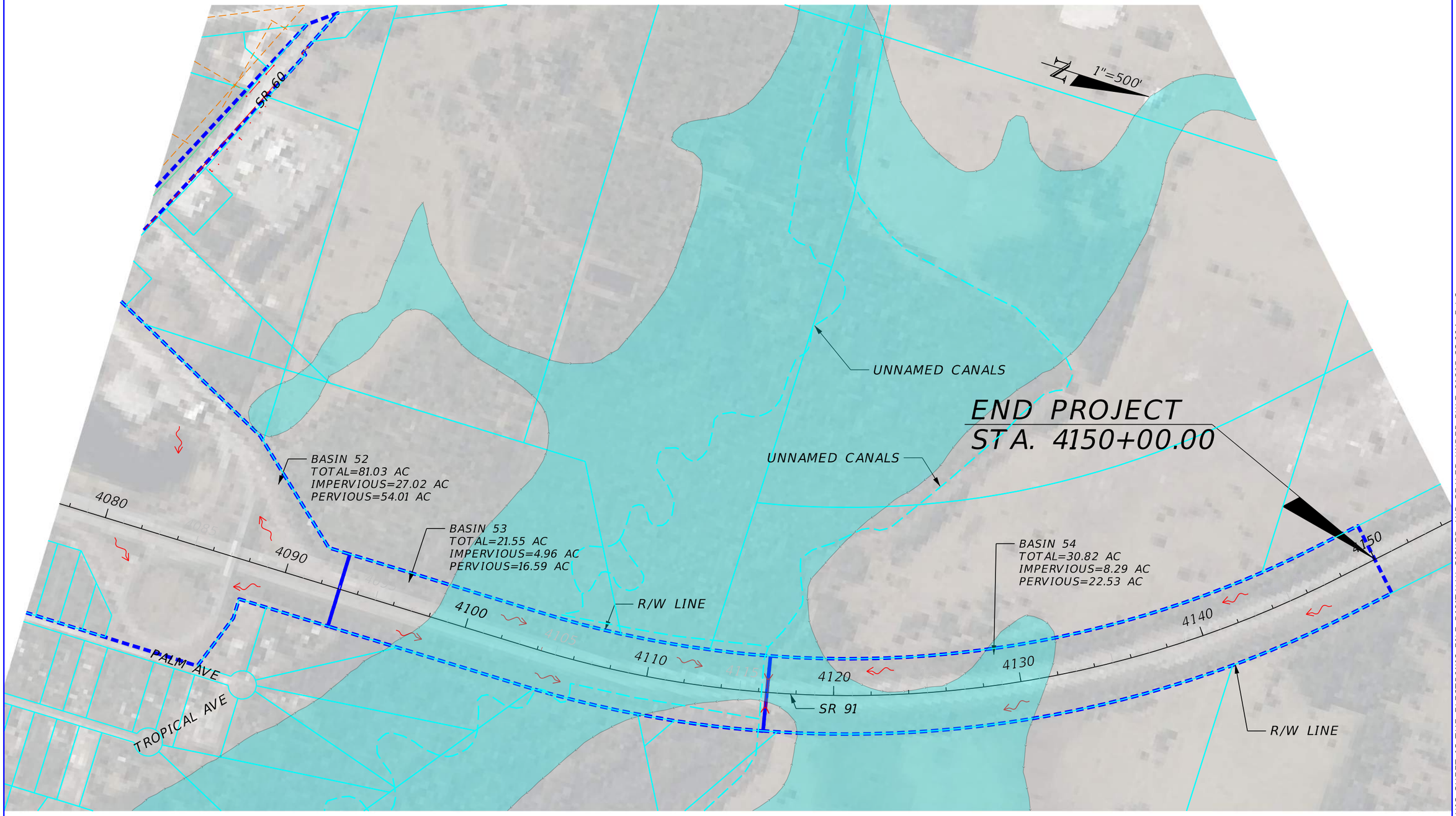
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP PRE-DEVELOPMENT

SHEET NO. 28

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

C:\Users\ToaiChau\OneDrive - APEX-ENGINEERS\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn: PRE DEVELOPMENT-27 [SHEET]
RoshanM 1/3/2025 11:01:09 AM



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

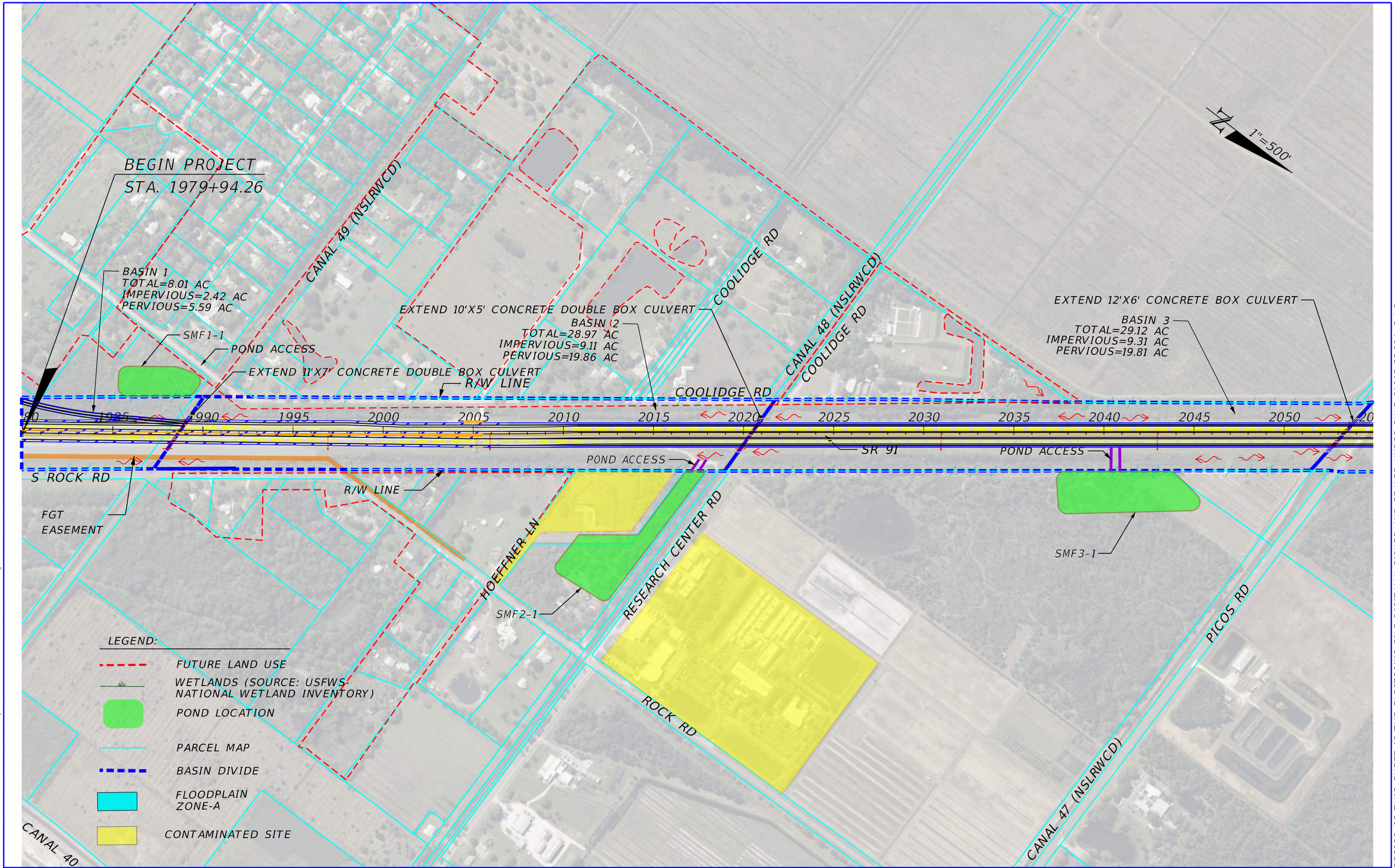
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
PRE-DEVELOPMENT

SHEET NO.
29

C:\Users\ToaiChau\OneDrive - APEX-ENGINEERS\42337422201\Drainage\DRMPRD01 Pre Development Test.dgn: PRE DEVELOPMENT-28 [SHEET]
RoshanM 1/3/2025 11:01:18 AM

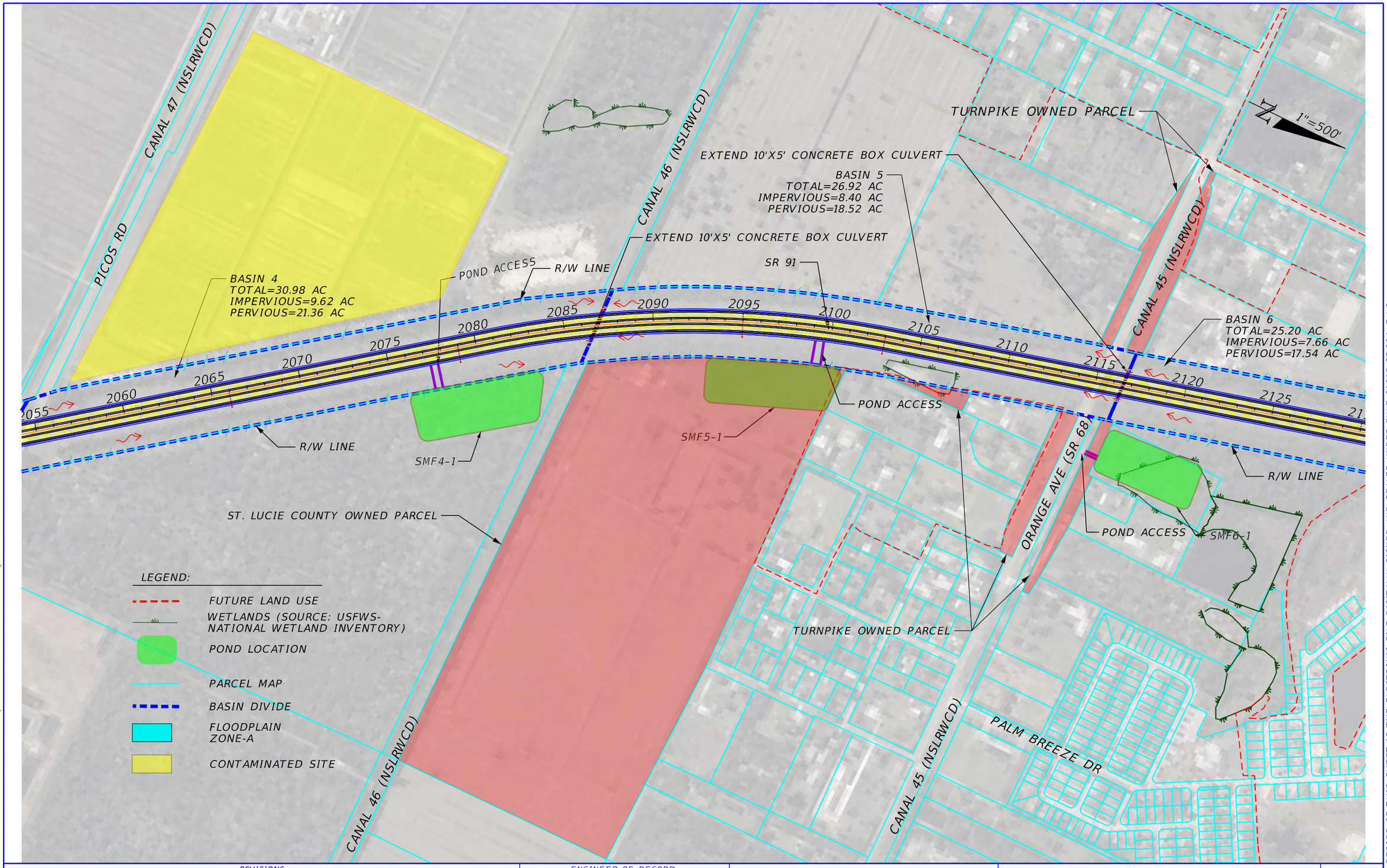
POST DEVELOPMENT DRAINAGE MAP



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		1
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 10:43:31 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		2
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:50:53 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRNPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

BASIN 6
TOTAL=25.20 AC
IMPERVIOUS=7.66 AC
PERVIOUS=17.54 AC

CANAL 44 (NSLRWCD)

N FFA RD

R/W LINE

CANAL 43 (NSLRWCD)

1"=500'

30 2135 2140 2145 2150 2155 2160 2165 2170 2175 2180 2185 2190 2195 2200

R/W LINE

SR 91

R/W LINE

R/W LINE

EXTEND 10'X5' CONCRETE DOUBLE BRIDGE CULVERT

CANAL 44 (NSLRWCD)

SMF7-1

POND ACCESS

BASIN 7
TOTAL=75.74 AC
IMPERVIOUS=20.30 AC
PERVIOUS=55.44 AC

TURNPIKE OWNED PARCEL

OLD FFA RD

SFWMD CANAL C-25

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A
- CONTAMINATED SITE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

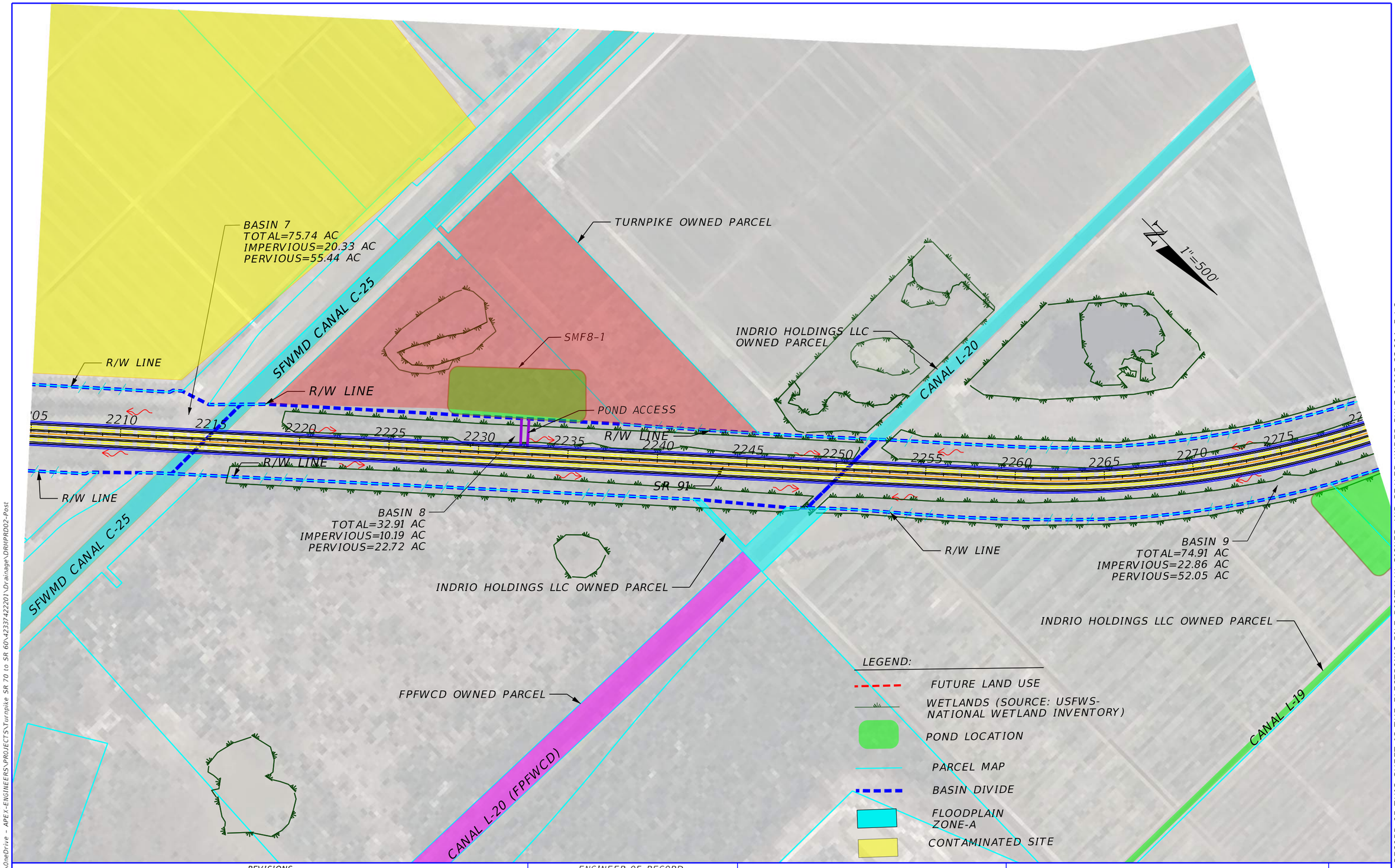
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
POST-DEVELOPMENT

SHEET NO. 3

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

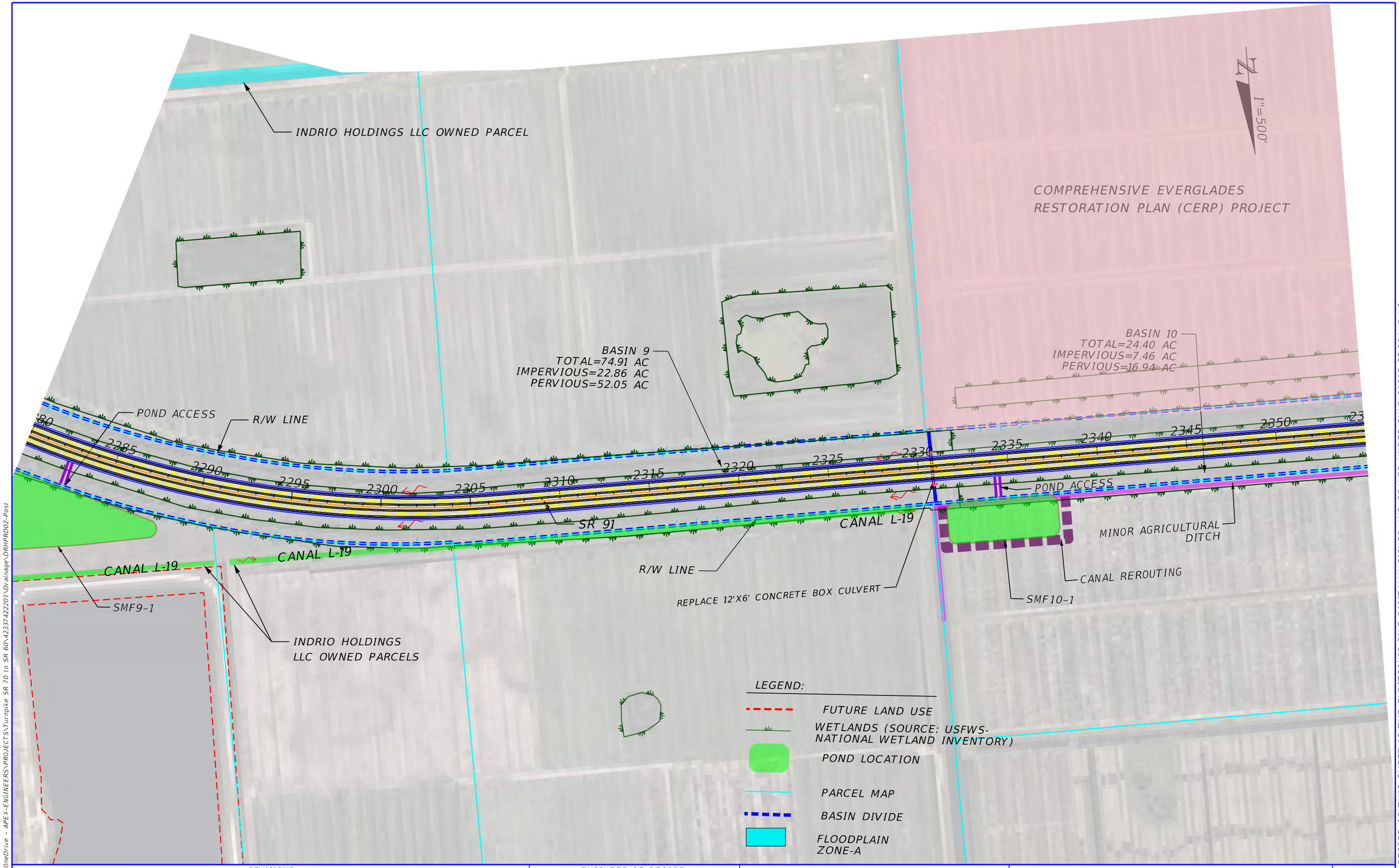
12/26/2024 9:50:59 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRNPRD02-Post Development.dgn



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	DRAINAGE MAP POST-DEVELOPMENT	4
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:51:07 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		5
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:51:13 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

COMPREHENSIVE EVERGLADES
RESTORATION PLAN (CERP) PROJECT

SFWMD OWNED PARCELS
(NOT CONSERVATION LANDS)

N

1"=500'

EXTEND 12'X13' BRIDGE CULVERT

BASIN 11
TOTAL=49.29 AC
IMPERVIOUS=15.31 AC
PERVIOUS=33.98 AC

R/W LINE

SR 91

EXTEND 6'X5' CONCRETE BOX CULVERT

BASIN 12
TOTAL=38.25 AC
IMPERVIOUS=11.87 AC
PERVIOUS=26.38 AC

2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 2405 2410 2415 2420 2425

POND ACCESS

POND ACCESS

MINOR AGRICULTURAL
DITCH

R/W LINE

SMF11-1

CANAL REROUTING

SMF12-1

CANAL REROUTING

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A
- Contaminated Site

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		6
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:51:20 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

SFWMD OWNED PARCELS
(NOT CONSERVATION LANDS)

BASIN 12
TOTAL=38.25 AC
IMPERVIOUS=11.87 AC
PERVIOUS=26.38 AC

EXTEND 9'X5' CONCRETE BOX CULVERT

BASIN 13
TOTAL=22.24 AC
IMPERVIOUS=6.90 AC
PERVIOUS=15.34 AC

EXIST. 9'X9' BOX CULVERT

EXTEND 12'X13' BRIDGE CULVERT

BASIN 14
TOTAL=86.18 AC
IMPERVIOUS=26.77 AC
PERVIOUS=59.41 AC

R/W LINE

SR 91

2430 2435 2440 2445 2450 2455 2460 2465 2470 2475 2480 2485 2490 2495 2500 25

POND ACCESS

R/W LINE

MINOR AGRICULTURAL DITCH

SMF13-1

CANAL REROUTING

TREASURE COAST MITIGATION BANK
CONSERVATION EASEMENT

1"=500'

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A
- CONTAMINATED SITE

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		7
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:51:27 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A
- TREASURE COAST MITIGATION BANK CONSERVATION EASEMENT

1"=500'

SFWMD CANAL C-25 EXT

BASIN 14
TOTAL=86.18 AC
IMPERVIOUS=26.77 AC
PERVIOUS=59.41 AC

BASIN 15
TOTAL=49.25 AC
IMPERVIOUS=15.29 AC
PERVIOUS=33.96 AC

R/W LINE

SR 91

2505 2510 2515 2520 2525 2530 2535 2540 2545 2550 2555 2560 2565 2570 2575 25

POND ACCESS

REPLACE 12'X6' CONCRETE BOX CULVERT

R/W LINE

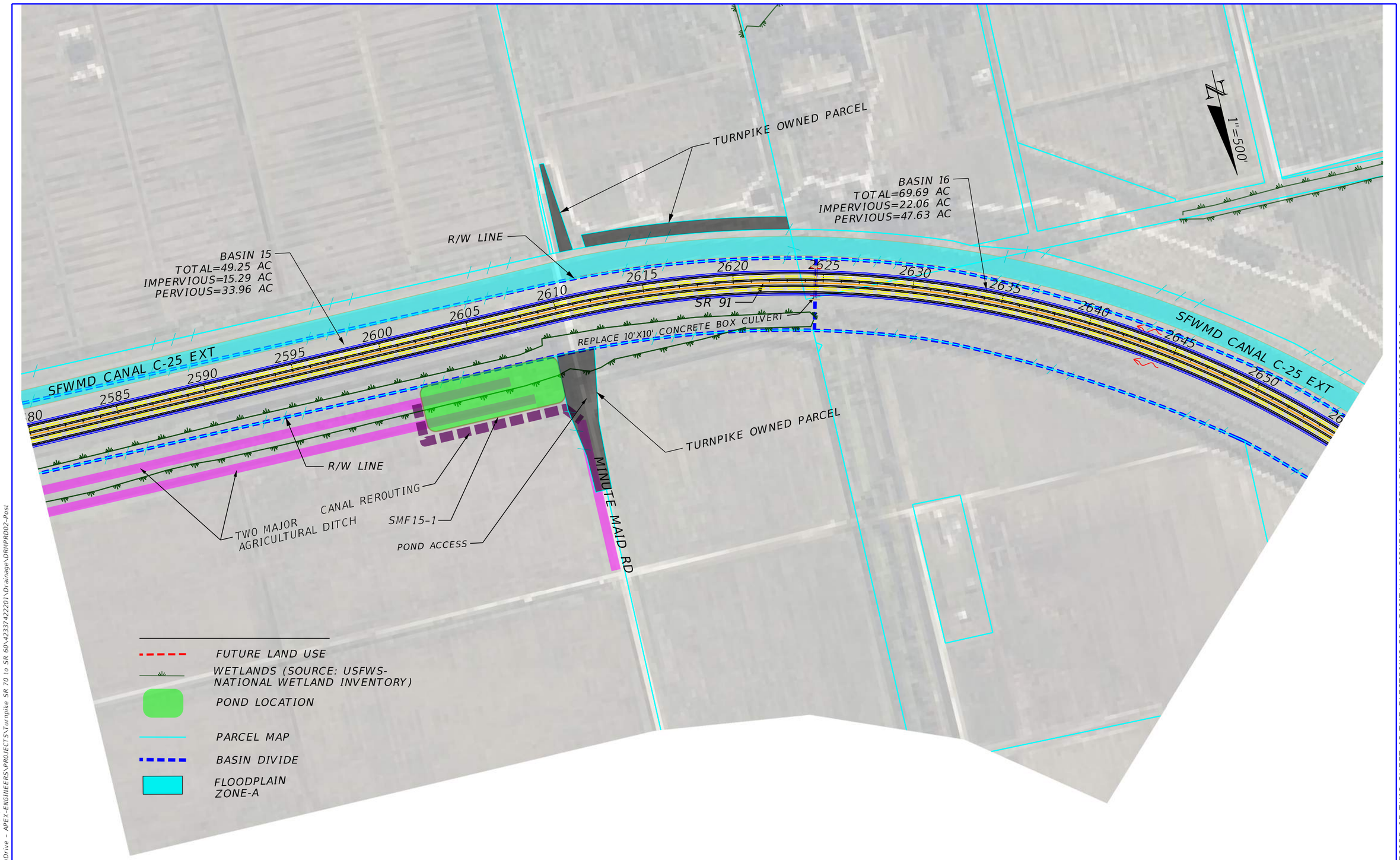
SMF14-1

TREASURE COAST MITIGATION BANK
CONSERVATION EASEMENT

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		8
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:51:34 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222O1\Drainage\DRNPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		9
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:51:41 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRNPRD02-Post Development.dgn

EVANS CANAL

ORANGE AVE CITRUS GROWERS ASSN OWNED PARCEL

1"=500'

MAJOR CANAL

BASIN 16
TOTAL=69.69 AC
IMPERVIOUS=22.06 AC
PERVIOUS=47.63 AC

SFWMD C-25 CANAL BEGINS

BASIN 17
TOTAL=63.34 AC
IMPERVIOUS=25.62 AC
PERVIOUS=37.72 AC

R/W LINE

R/W LINE

SFWMD CANAL C-25 EXT

2660 2665 2670 2675 2680 2685 2690 2695 2700 2705 2710 2715 2720 2725

POND ACCESS

SR 91

R/W LINE

MAJOR AGRICULTURAL CANAL

EXTEND 10'x6' DOUBLE BRIDGE CULVERT

R/W LINE

MAJOR AGRICULTURAL CANAL

SMF16-1

CANAL REROUTING

*) CONTAMINATED SITE
*) USDA-NRCS CONSERVATION EASEMENT

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A
- CONTAMINATED SITE & USDA-NRCS CONSERVATION EASEMENT

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP POST-DEVELOPMENT

SHEET NO. 10

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 10:03:10 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

LEGEND:

FUTURE LAND USE

WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)

POND LOCATION

PARCEL MAP

BASIN DIVIDE

FLOODPLAIN ZONE-A

CONTAMINATED SITE & USDA- NRCS CONSERVATION EASEMENT

1"=500'

R/W LINE

MAJOR CANAL

ORANGE AVE CITRUS GROWERS ASSN OWNED PARCEL

BLUE GOOSE FARMS LLC OWNED PARCEL

BASIN 18
TOTAL=36.83 AC
IMPERVIOUS=14.23 AC
PERVIOUS=22.60 AC

2730 2735 2740 2745 2750 2755 2760 2765 2770 2775 2780 2785 2790 2795 2800 28

EXTEND 54" PIPE AND HEADWALL

BASIN 17
TOTAL=63.34 AC
IMPERVIOUS=25.62 AC
PERVIOUS=37.72 AC

R/W LINE

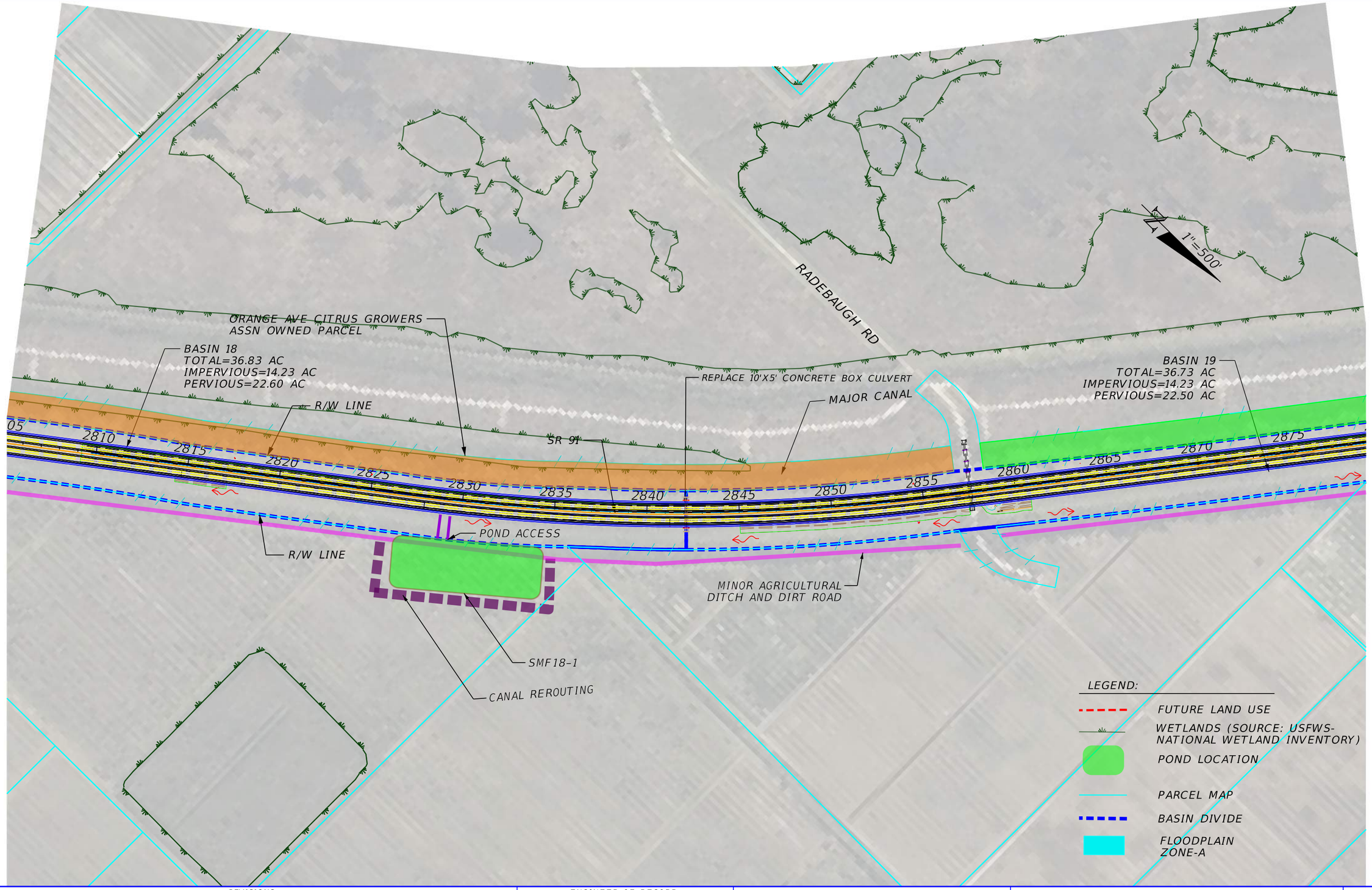
MINOR AGRICULTURAL CANAL

*) CONTAMINATED SITE
*) USDA-NRCS CONSERVATION EASEMENT

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		11
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:51:57 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		12
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:52:04 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

LEGEND:

FUTURE LAND USE

WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)

POND LOCATION

PARCEL MAP

BASIN DIVIDE

FLOODPLAIN ZONE-A

1"=500'

BASIN 19
TOTAL=36.73 AC
IMPERVIOUS=14.23 AC
PERVIOUS=22.50 AC

ORANGE AVE CITRUS GROWERS ASSN OWNED PARCEL

BASIN 20
TOTAL=35.25 AC
IMPERVIOUS=13.66 AC
PERVIOUS=21.59 AC

MAJOR CANAL

BASIN 21
TOTAL=48.05 AC
IMPERVIOUS=18.29 AC
PERVIOUS=29.76 AC

R/W LINE

REPLACE 12'X5' CONCRETE BOX CULVERT

SR 91

80 2885 2890 2895 2900 2905 2910 2915 2920 2925 2930 2935 2940 2945 2950 29

R/W LINE

MINOR AGRICULTURAL DITCH & ACCESS ROAD

REPLACE 12'X5' CONCRETE BOX CULVERT

ST. LUCIE COUNTY OWNED PARCELS
(FLORIDA CONSERVATION LANDS)
GREEN SWAMP PRESERVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
POST-DEVELOPMENT

SHEET NO. 13

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:52:11 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

BASIN 21
TOTAL=48.05 AC
IMPERVIOUS=18.29 AC
PERVIOUS=29.76 AC

R/W LINE

MAJOR CANAL

REPLACE 12'X5' CONCRETE BOX CULVERT

ORANGE AVE CITRUS
GROWERS ASSN OWNED PARCEL

BASIN 22
TOTAL=56.69 AC
IMPERVIOUS=16.08
PERVIOUS=40.61

POND ACCESS THROUGH
FPL MAINTENANCE ROAD

SMF22-1

1"=500'

2955 2960 2965 2970 2975 2980 2985 2990 2995 3000 3005 3010 3015 3020 3025 30

R/W LINE

SR 91

MAJOR AGRICULTURAL CANAL

ST. LUCIE COUNTY OWNED PARCELS
(FLORIDA CONSERVATION LANDS)
GREEN SWAMP PRESERVE

ST. LUCIE COUNTY LINE
INDIAN RIVER COUNTY LINE

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

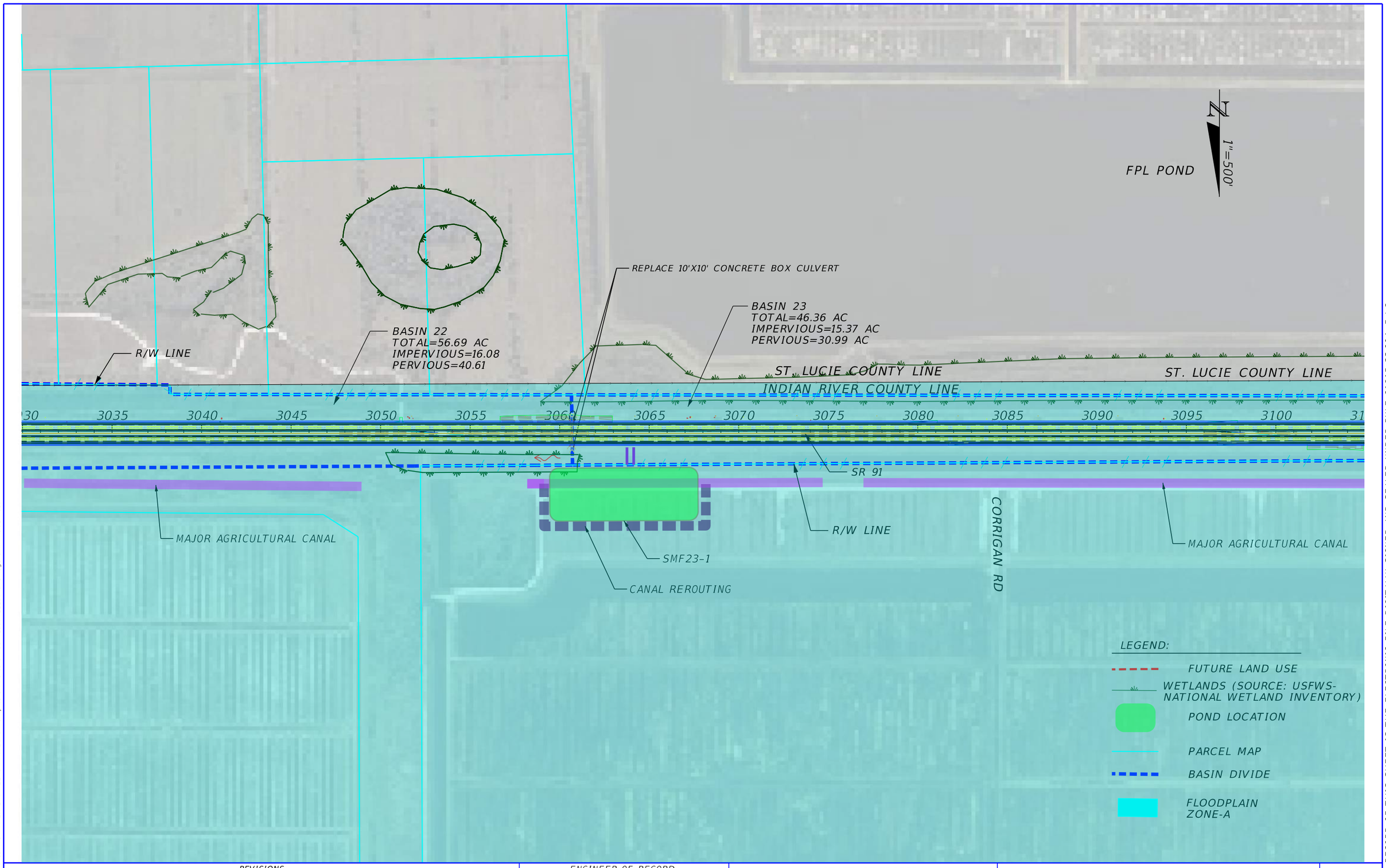
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
POST-DEVELOPMENT

SHEET NO. 14

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

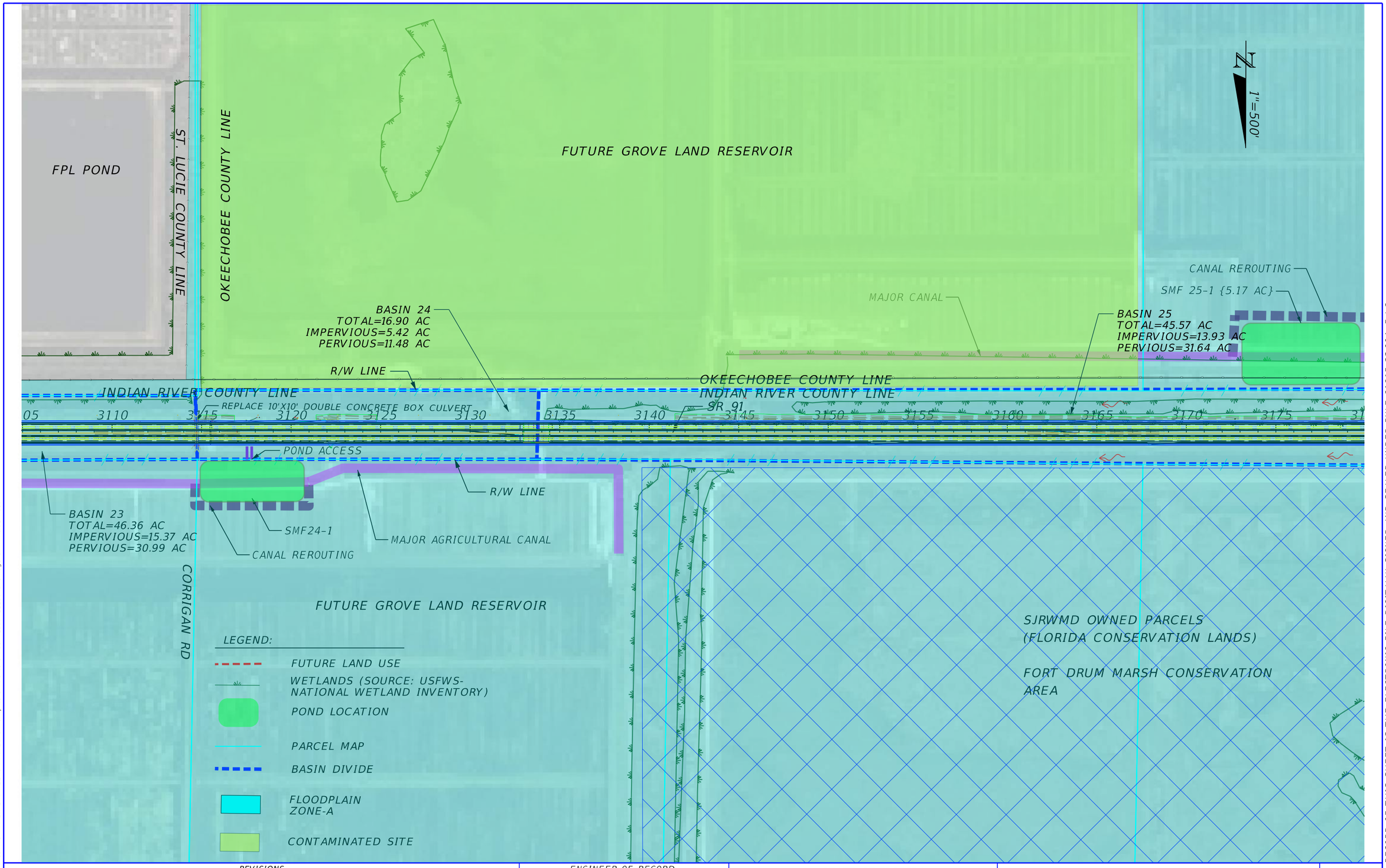
12/26/2024 9:52:19 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRNPRD02-Post Development.dgn



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		15
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:52:26 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP POST-DEVELOPMENT

SHEET NO. 16

12/26/2024 9:52:33 AM RoshanM
C:\Users\Roshan\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRNPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A

1"=500'

BASIN 25
TOTAL=45.57 AC
IMPERVIOUS=13.93 AC
PERVIOUS=31.64 AC

CANAL REROUTING

SMF 26-1 {4.38 AC}

POND ACCESS

BASIN 26
TOTAL=40.64 AC
IMPERVIOUS=11.17 AC
PERVIOUS=29.47 AC

MAJOR CANAL

R/W LINE

CANAL REROUTING

SMF27-1

POND ACCESS

BASIN 27
TOTAL=49.11 AC
IMPERVIOUS=14.40 AC
PERVIOUS=34.71 AC

OKEECHOBEE COUNTY LINE

INDIAN RIVER COUNTY LINE

3180 3185 3190 3195 3200 3205 3210 3215 3220 3225 3230 3235 3240 3245 3250

SR 91

REPLACE 10'X10' CONCRETE BOX CULVERT

R/W LINE

REPLACE 10'X10' CONCRETE BOX CULVERT

SJRWMD OWNED PARCELS
(FLORIDA CONSERVATION LANDS)

FORT DRUM MARSH CONSERVATION AREA

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
POST-DEVELOPMENT

SHEET NO. 17

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:52:42 AM RoshanM
C:\Users\Roshan\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A

N

1"=500'

BASIN 27
TOTAL=49.11 AC
IMPERVIOUS=14.40 AC
PERVIOUS=34.71 AC

CANAL REROUTING
SMF28-1
POND ACCESS

BASIN 28
TOTAL=43.35 AC
IMPERVIOUS=14.80 AC
PERVIOUS=28.55 AC

MINOR AGRICULTURAL CANAL

CANAL REROUTING
POND ACCESS
SMF29-1

R/W LINE

OKEECHOBEE COUNTY LINE
INDIAN RIVER COUNTY LINE

3255 3260 3265 3270 3275 3280 3285 3290 3295 3300 3305 3310 3315 3320 3325 33

SR 91

R/W LINE

EXTEND 12'X13' BRIDGE CULVERT

BASIN 29
TOTAL=16.25 AC
IMPERVIOUS=5.75 AC
PERVIOUS=10.50 AC

SJRWMD OWNED PARCELS
(FLORIDA CONSERVATION LANDS)

FORT DRUM MARSH CONSERVATION AREA

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		18
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:52:49 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222001\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A

1"=500'

BASIN 29
TOTAL=16.25 AC
IMPERVIOUS=5.75 AC
PERVIOUS=10.50 AC

R/W LINE

CANAL REROUTING

SMF30-1

POND ACCESS

BASIN 30
TOTAL=33.18 AC
IMPERVIOUS=11.27 AC
PERVIOUS=21.91 AC

SR 91

INDIAN RIVER COUNTY LINE
OKEECHOBEE COUNTY LINE

MINOR AGRICULTURAL CANAL

CANAL REROUTING

SMF31-1

POND ACCESS

SJRWMD OWNED PARCELS

3335 3340 3345 3350 3355 3360 3365 3370 3375 3380 3385 3390 3395 3400

EXTEND 8'X4' CONCRETE BOX CULVERT

R/W LINE

BASIN 31
TOTAL=31.46 AC
IMPERVIOUS=9.79 AC
PERVIOUS=21.67 AC

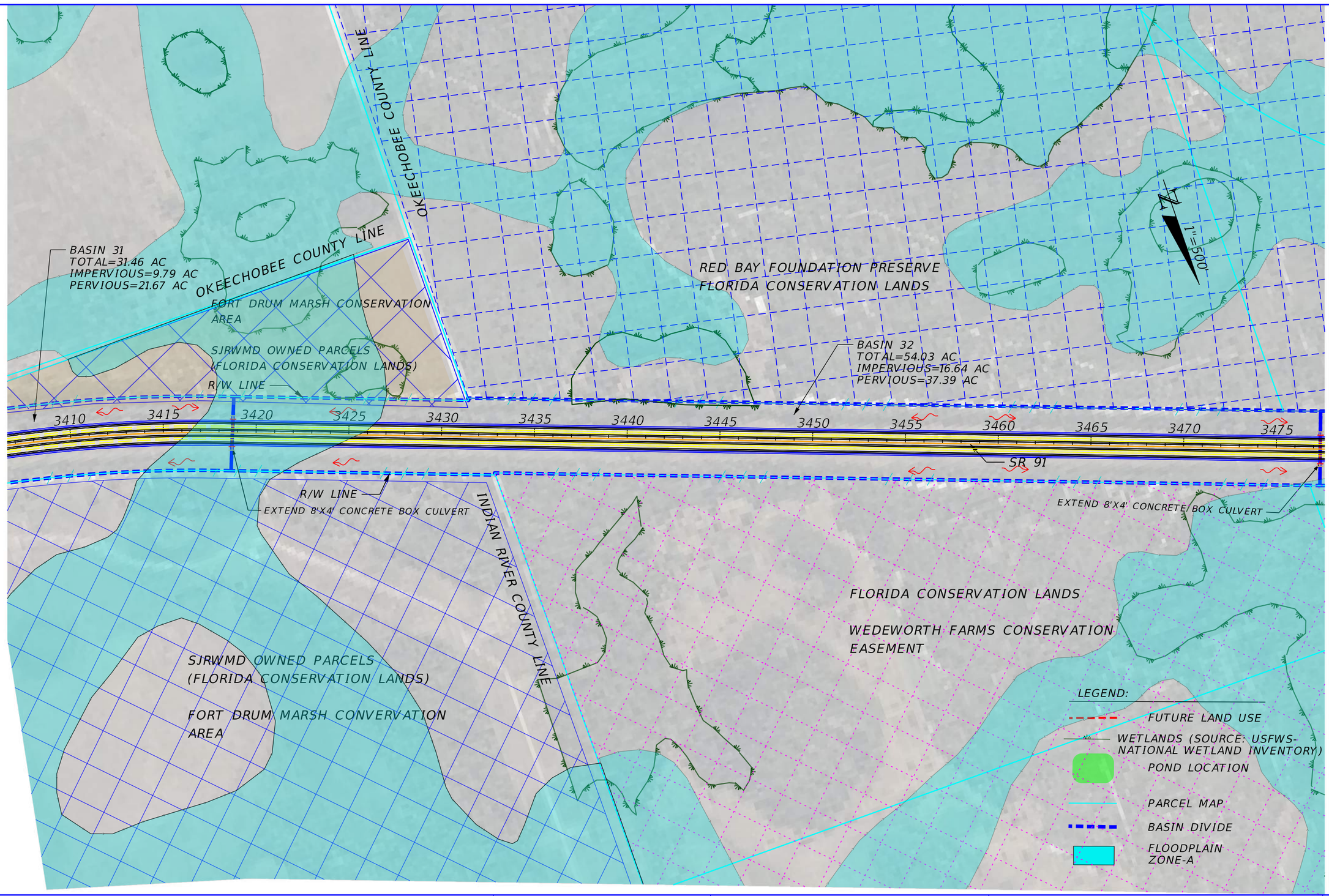
SJRWMD OWNED PARCELS
(FLORIDA CONSERVATION LANDS)

FORT DRUM MARSH CONSERVATION AREA

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		19
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

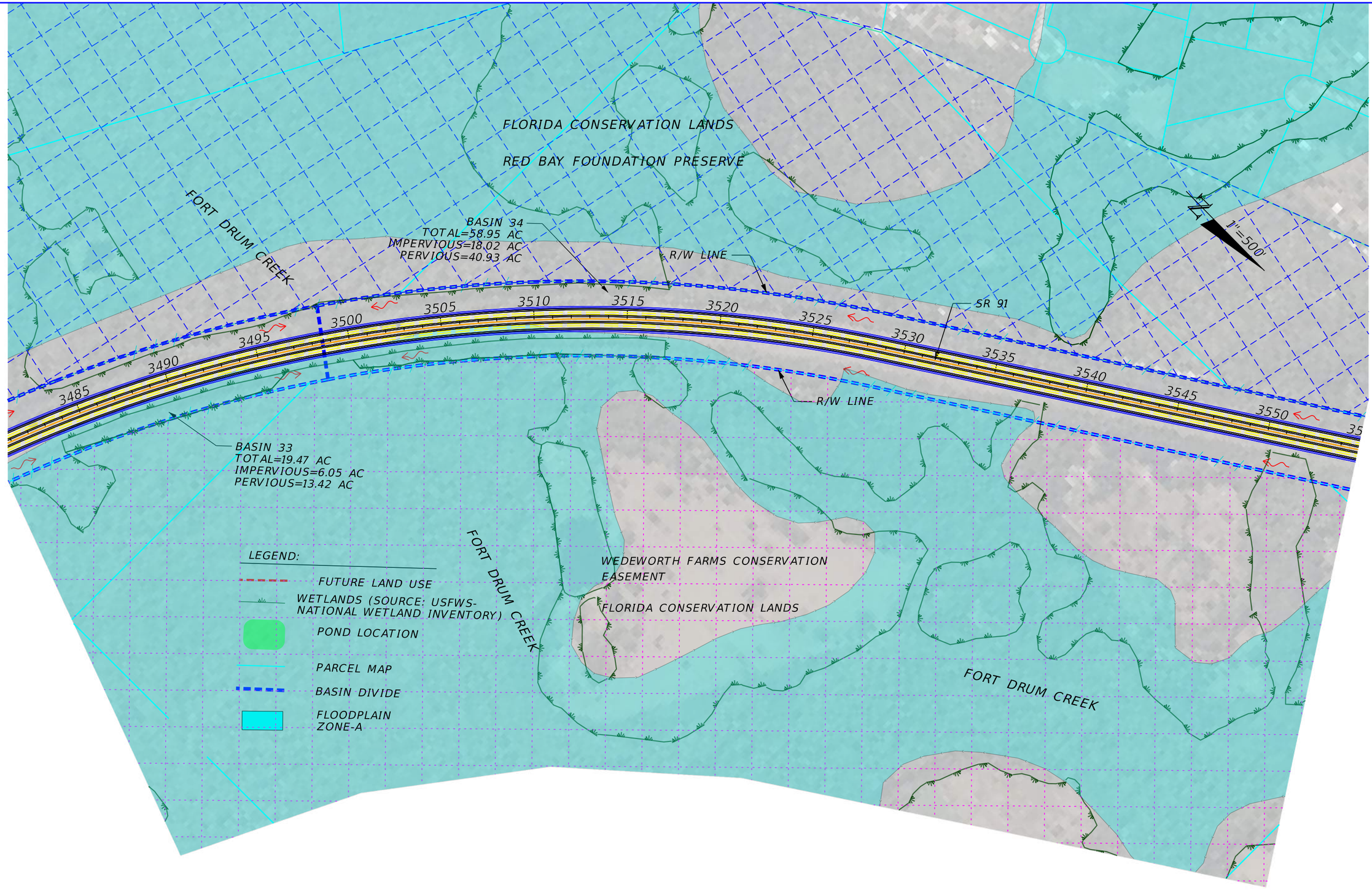
12/26/2024 9:52:57 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		20
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:53:04 AM RoshanM
C:\Users\Roshan\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222\Drainage\DRNPRD02-Post Development.dgn



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		21
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:53:12 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

FLORIDA CONSERVATION LANDS

BASIN 34
TOTAL=58.95 AC
IMPERVIOUS=18.02 AC
PERVIOUS=40.93 AC

RED BAY FOUNDATION PRESERVE

BASIN 35
TOTAL=21.99 AC
IMPERVIOUS=7.12 AC
PERVIOUS=14.87 AC

REPLACE 4'X4' CONCRETE BOX CULVERT

BASIN 36
TOTAL=13.87 AC
IMPERVIOUS=4.30 AC
PERVIOUS=9.57 AC

POND ACCESS THROUGH
OSOWOU ROAD
SMF36-1

OSOWOU RD

FLORIDA CONSERVATION LANDS
RUSSAKIS RANCH GOPHER TORTOISE LONGTERM
RECIPIENT SITE

EXTEND 12'X13.5' BRIDGE CULVERT

BASIN 37
TOTAL=14.45 AC
IMPERVIOUS=4.47 AC
PERVIOUS=9.98 AC

R/W LINE

JIM GREEN CREEK

1"=500'

3555 3560 3565 3570 3575 3580 3585 3590 3595 3600 3605 3610 3615 3620 3625 3630 3635

10 15 20

REPLACE 4'X4' CONCRETE BOX CULVERT

366TH TRAIL

SR 91

R/W LINE

FLORIDA CONSERVATION LANDS
WEDEWORTH FARMS CONSERVATION
EASEMENT

JIM GREEN CREEK

FORT DRUM CREEK

FORT DRUM CREEK

FORT DRUM CREEK

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A
- CONTAMINATED SITE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP POST-DEVELOPMENT

SHEET NO. 22

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:53:19 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRNPRD02-Post Development.dgn

FLORIDA CONSERVATION LANDS
RUSSAKIS RANCH GOPHER TORTOISE LONGTERM
RECIPIENT SITE

JIM GREEN CREEK

BASIN 38
TOTAL=23.48 AC
IMPERVIOUS=8.21 AC
PERVIOUS=15.27 AC

BASIN 39
TOTAL=25.05 AC
IMPERVIOUS=9.65 AC
PERVIOUS=15.40 AC

BASIN 40
TOTAL=36.71 AC
IMPERVIOUS=11.40 AC
PERVIOUS=25.31 AC

1"=500'

R/W LINE

SR 91

EXTEND 6'X4' CONCRETE BOX CULVERT

PACKAGE PLANT POND THAT TREATS EFFLUENT
PERMITTED THROUGH DEP (WASTE WATER TREATMENT PONDS)
IS OWNED BY FTE.

FORT DRUM SERVICE PLAZA

FORT DRUM CREEK

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
POST-DEVELOPMENT

SHEET NO. 23

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:53:27 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

JIM GREEN CREEK

FLORIDA CONSERVATION LANDS
GRASSLAND RESERVE PROGRAM
EASEMENT#102

JIM GREEN CREEK

FLORIDA CONSERVATION LANDS

1"=500'

BASIN 41
TOTAL=27.35 AC
IMPERVIOUS=8.45 AC
PERVIOUS=18.90 AC

R/W LINE

SR 91

BASIN 42
TOTAL=14.86 AC
IMPERVIOUS=4.63 AC
PERVIOUS=10.23 AC

BASIN 43
TOTAL=54.93 AC
IMPERVIOUS=16.52 AC
PERVIOUS=38.41 AC

3705 3710 3715 3720 3725 3730 3735 3740 3745 3750 3755 3760 3765 3770 3775 37

EXTEND 4'X4' CONCRETE BOX CULVERT

R/W LINE

BASIN 40
TOTAL=36.71 AC
IMPERVIOUS=11.40 AC
PERVIOUS=25.31 AC

FLORIDA CONSERVATION LAND
WEDEWORTH FARMS CONSERVATION
EASEMENT

FLORIDA CONSERVATION LAND

LEGEND:

FUTURE LAND USE

WETLANDS (SOURCE: USFWS-
NATIONAL WETLAND INVENTORY)

POND LOCATION

PARCEL MAP

BASIN DIVIDE

FLOODPLAIN
ZONE-A

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP
POST-DEVELOPMENT

SHEET NO.
24

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:53:35 AM RoshanM
C:\Users\Roshan\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222001\Drainage\DRNPRD02-Post Development.dgn

BASIN 43
TOTAL=54.93 AC
IMPERVIOUS=16.52 AC
PERVIOUS=38.41 AC

JIM GREEN CREEK

JIM GREEN CREEK

FPC 1-A (4.45 AC)

FPC 1-B (7.67 AC)

R/W LINE

SMF43-1

SMF44-1

POND ACCESS

POND ACCESS

POND ACCESS

POND ACCESS

BASIN 44
TOTAL=12.29 AC
IMPERVIOUS=3.70 AC
PERVIOUS=8.59 AC

BASIN 45
TOTAL=22.73 AC
IMPERVIOUS=7.03 AC
PERVIOUS=15.70 AC

FLORIDA FOREVER LAND

1"=500'

3780 3785 3790 3795 3800 3805 3810 3815 3820 3825 3830 3835 3840 3845 3850 38

SR 91

R/W LINE

EXTEND 4'X4' CONCRETE BOX CULVERT

EXTEND 12'X42.9' BRIDGE CULVERT

OKEECHOBEE COUNTY LINE
OSCEOLA COUNTY LINE

SMF45-1

PADGETT BRANCH

PADGETT BRANCH

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A
- FPC- FLOODPLAIN COMPENSATION POND

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

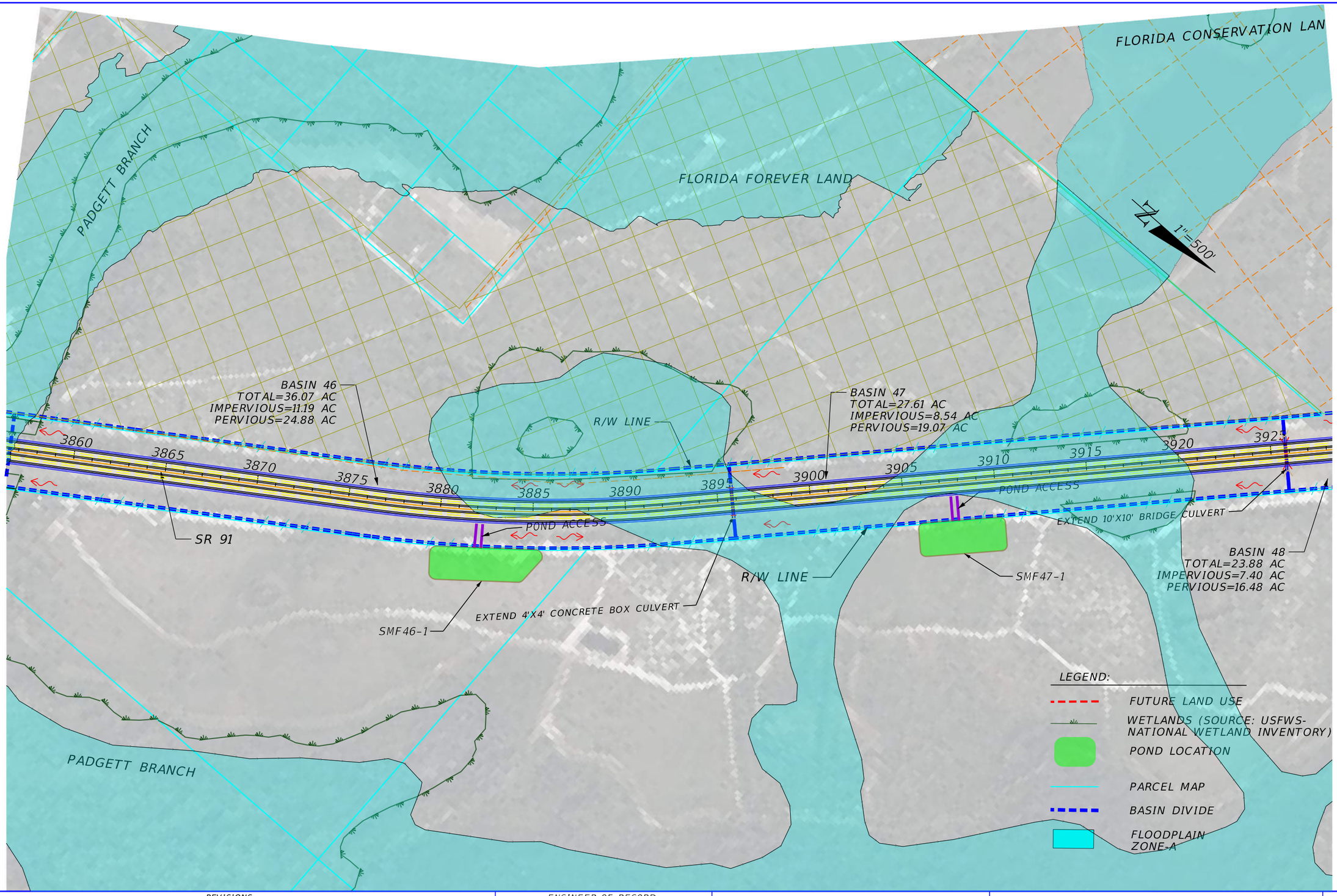
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP POST-DEVELOPMENT

SHEET NO. 25

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:53:45 AM RoshanM
C:\Users\Roshan\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		26
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:53:55 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222O1\Drainage\DRNPRD02-Post Development.dgn

DS

FLORIDA CONSERVATION LANDS

COW LOG BRANCH

DELUCA PRESERVE

N

1"=500'

BASIN 49
TOTAL=43.93 AC
IMPERVIOUS=13.61 AC
PERVIOUS=30.32 AC

BASIN 50
TOTAL=29.54 AC
IMPERVIOUS=9.19 AC
PERVIOUS=20.35 AC

R/W LINE

3930 3935 3940 3945 3950 3955 3960 3965 3970 3975 3980 3985 3990 3995 4000 40

POND ACCESS

POND ACCESS

SR 91

R/W LINE

SMF48-1

BASIN 48
TOTAL=23.88 AC
IMPERVIOUS=7.40 AC
PERVIOUS=16.48 AC

SMF49-1

COW LOG BRANCH

COW LOG BRANCH

LEGEND:

- FUTURE LAND USE
- WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)
- POND LOCATION
- PARCEL MAP
- BASIN DIVIDE
- FLOODPLAIN ZONE-A

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

CHANDRA S. RAMAN, P.E.
LICENSE NUMBER: 58740
APEX ENGINEERS, INC.
10175 FORTUNE PARKWAY, UNIT 704.
JACKSONVILLE, FLORIDA 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

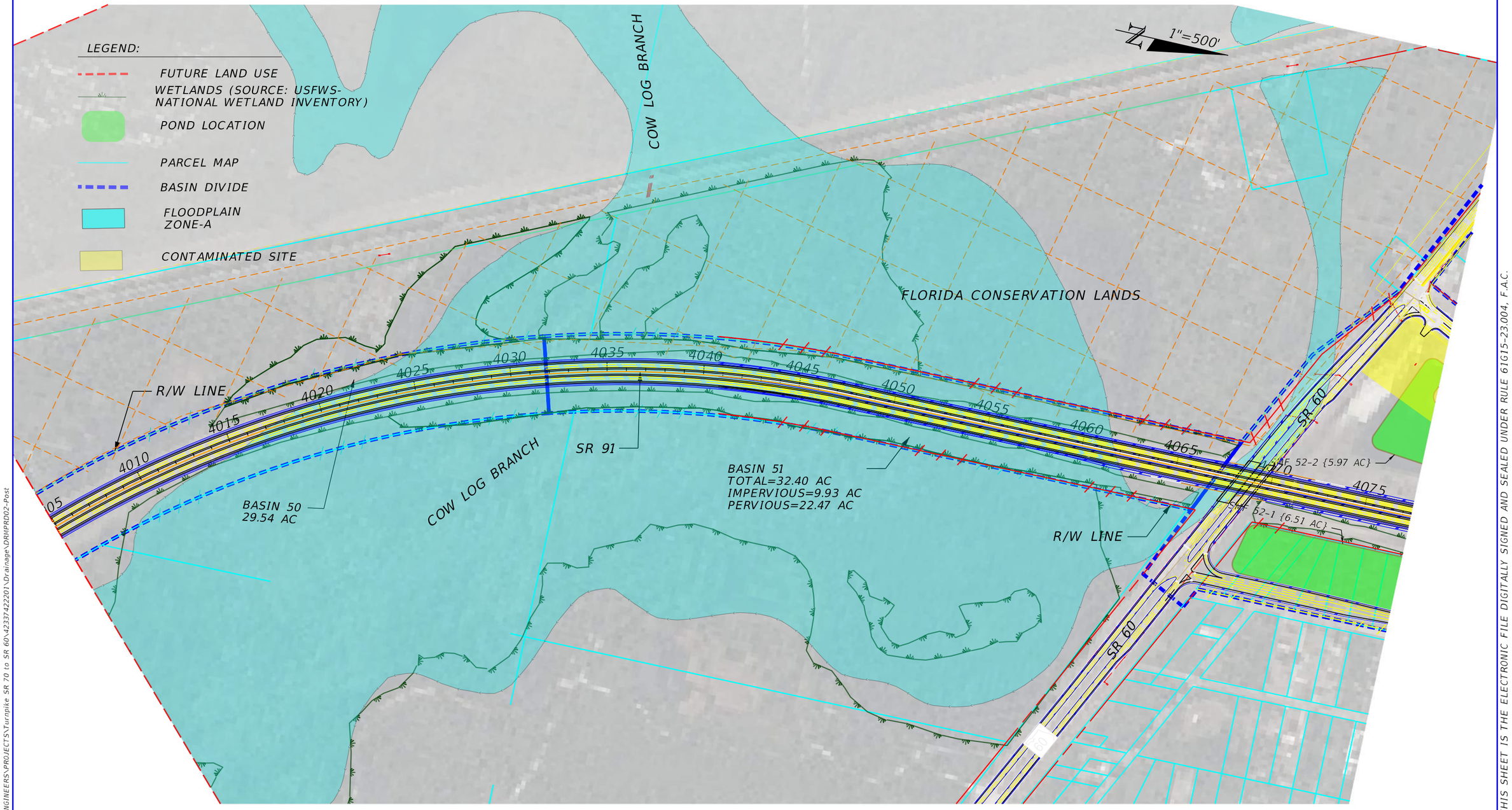
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01

DRAINAGE MAP POST-DEVELOPMENT

SHEET NO. 27

12/26/2024 9:54:05 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222O1\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		28
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

12/26/2024 9:54:15 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

LEGEND:

FUTURE LAND USE

WETLANDS (SOURCE: USFWS-NATIONAL WETLAND INVENTORY)

POND LOCATION

PARCEL MAP

BASIN DIVIDE

FLOODPLAIN ZONE-A

CONTAMINATED SITE

1"=500'

SR 60

BASIN 52
TOTAL=81.03 AC
IMPERVIOUS=24.02 AC
PERVIOUS=57.01 AC

SMF 52-2 (5.97 AC)

SMF 52-1 (6.51 AC)

BASIN 53
TOTAL=21.55 AC
IMPERVIOUS=6.53 AC
PERVIOUS=15.02 AC

R/W LINE

PALM AVE

TROPICAL AVE

UNNAMED CANALS

UNNAMED CANALS

END PROJECT
STA. 4150+00.00

BASIN 54
TOTAL=30.82 AC
IMPERVIOUS=9.27 AC
PERVIOUS=21.55 AC

SR 91

R/W LINE

4080 4085 4090 4095 4100 4105 4110 4115 4120 4125 4130 4135 4140 4145 4150

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP POST-DEVELOPMENT	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	CHANDRA S. RAMAN, P.E. LICENSE NUMBER: 58740 APEX ENGINEERS, INC. 10175 FORTUNE PARKWAY, UNIT 704. JACKSONVILLE, FLORIDA 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		29
					SR 91	ST. LUCIE OKEECHOBEE INDIAN RIVER	423374-2-22-01		

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

12/26/2024 9:54:24 AM RoshanM
C:\Users\RoshanM\OneDrive - APEX-ENGINEERS\PROJECTS\Turnpike SR 70 to SR 60\423374222201\Drainage\DRMPRD02-Post Development.dgn

APPENDIX B
Datum Conversion

RowID	Input_Geopot_Datum	Output_Geopot_Datum	Input_Lat(DMS)	Input_Lon(DMS)	Input_Orthoht	Output_Orthoht
195.4	NGVD29	NAVD88	N274325.67860	W0805431.10180	59.399	58.153
195.2	NGVD29	NAVD88	N274315.10950	W0805419.41650	62.631	61.381
194	NGVD29	NAVD88	N274231.53180	W0805344.28610	49.800	48.550
190.4	NGVD29	NAVD88	N273950.90250	W0805221.03040	63.389	62.136
189.7	NGVD29	NAVD88	N273930.30490	W0805156.96180	59.101	57.844
188.7	NGVD29	NAVD88	N273838.95950	W0805115.52860	59.990	58.730
188.4	NGVD29	NAVD88	N273828.22670	W0805107.52010	57.999	56.742
187.3	NGVD29	NAVD88	N273740.24380	W0805031.92630	56.699	55.436
185.7	NGVD29	NAVD88	N273629.23510	W0804939.26050	50.899	49.632
184.3	NGVD29	NAVD88	N273529.00510	W0804854.60080	51.299	50.033
184	NGVD29	NAVD88	N273516.52070	W0804845.33070	44.701	43.432
183.6	NGVD29	NAVD88	N273456.69890	W0804830.63110	42.201	40.932
181.9	NGVD29	NAVD88	N273358.34820	W0804725.26580	36.001	34.731
180.8	NGVD29	NAVD88	N273338.58610	W0804623.99630	32.201	30.919
179.5	NGVD29	NAVD88	N273333.86120	W0804502.41930	28.901	27.602
179.1	NGVD29	NAVD88	N273333.81210	W0804440.06230	33.999	32.697
177.2	NGVD29	NAVD88	N273333.82640	W0804246.18390	19.101	17.769
176.4	NGVD29	NAVD88	N273333.85190	W0804202.39270	18.300	16.959
175.2	NGVD29	NAVD88	N273333.81920	W0804046.84600	18.100	16.742
174.1	NGVD29	NAVD88	N273333.80120	W0803946.80800	18.100	16.729
172.9	NGVD29	NAVD88	N273329.93080	W0803844.74050	19.400	18.015
171.8	NGVD29	NAVD88	N273252.35370	W0803747.44090	19.600	18.202
170.8	NGVD29	NAVD88	N273222.76170	W0803705.66260	18.399	16.995
169.8	NGVD29	NAVD88	N273151.29950	W0803622.85780	18.799	17.385
168.9	NGVD29	NAVD88	N273112.19660	W0803548.73530	20.000	18.583
167.2	NGVD29	NAVD88	N273000.71930	W0803448.95970	17.999	16.575
165.7	NGVD29	NAVD88	N272908.66380	W0803348.38910	17.999	16.568
164.7	NGVD29	NAVD88	N272906.52110	W0803248.85180	16.699	15.253
163	NGVD29	NAVD88	N272905.91990	W0803105.31270	24.272	22.802
162.9	NGVD29	NAVD88	N272905.92230	W0803104.40320	12.402	10.932
162.4	NGVD29	NAVD88	N272905.80730	W0803037.54000	15.098	13.625
161.7	NGVD29	NAVD88	N272905.41370	W0802951.27600	17.402	15.919
160.7	NGVD29	NAVD88	N272905.65590	W0802851.68320	26.001	24.508
160.2	NGVD29	NAVD88	N272904.40520	W0802822.48400	15.098	13.606
NSLRWCD43	NGVD29	NAVD88	N272744.17890	W0802605.72480	0.000	-1.493
NSLRWCD44	NGVD29	NAVD88	N272718.05490	W0802546.72060	15.000	13.514
NSLRWCD45	NGVD29	NAVD88	N272652.38420	W0802538.63200	15.699	14.216
NSLRWCD46	NGVD29	NAVD88	N272624.78870	W0802527.89220	15.000	13.517
NSLRWCD47	NGVD29	NAVD88	N272557.97070	W0802505.59940	14.701	13.218
NSLRWCD48	NGVD29	NAVD88	N272532.04460	W0802443.87680	13.901	12.421
NSLRWCD49	NGVD29	NAVD88	N272506.84500	W0802422.69150	10.801	9.324

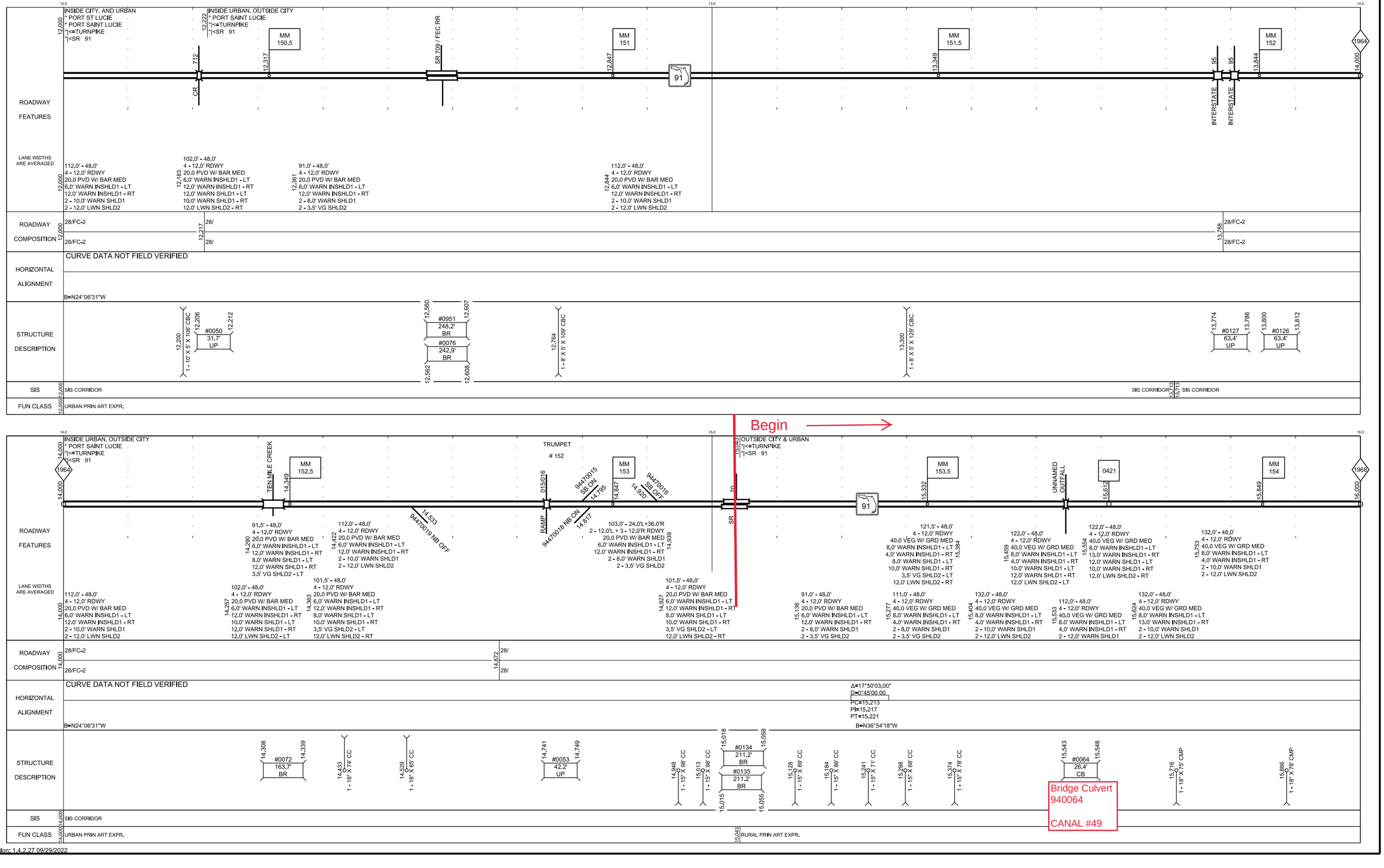
APPENDIX C
Straight Line Diagrams

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	09/06/2022	09/29/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	ST. LUCIE	08	94470000	4 OF 9



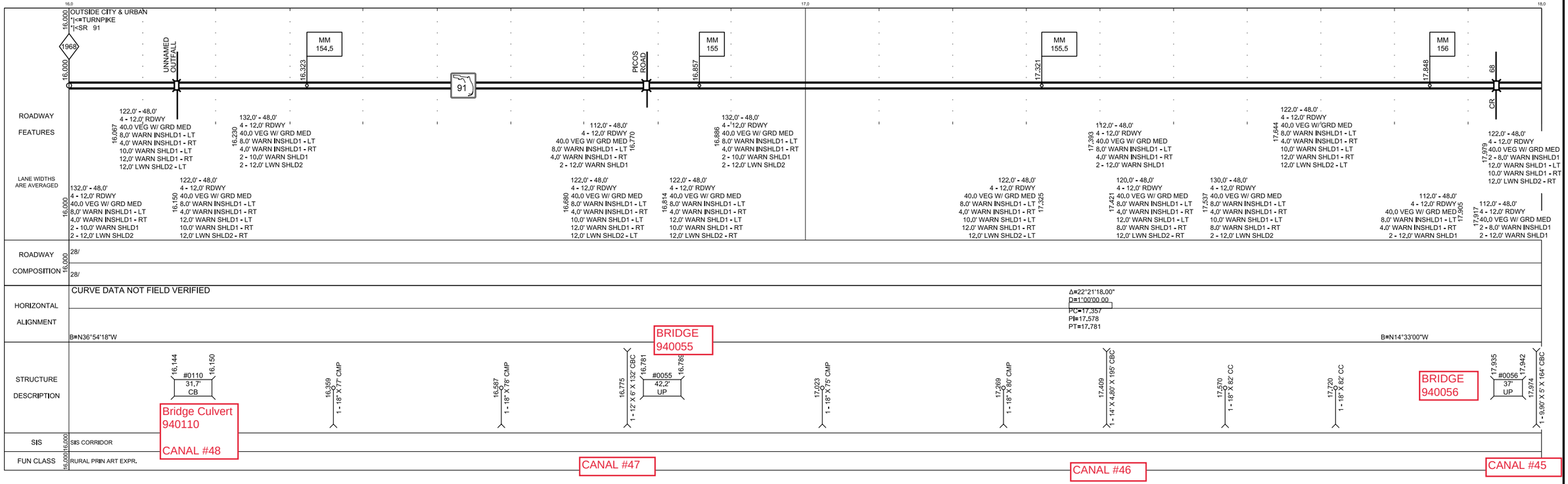
Version: 1.4.2.27 09/29/2022

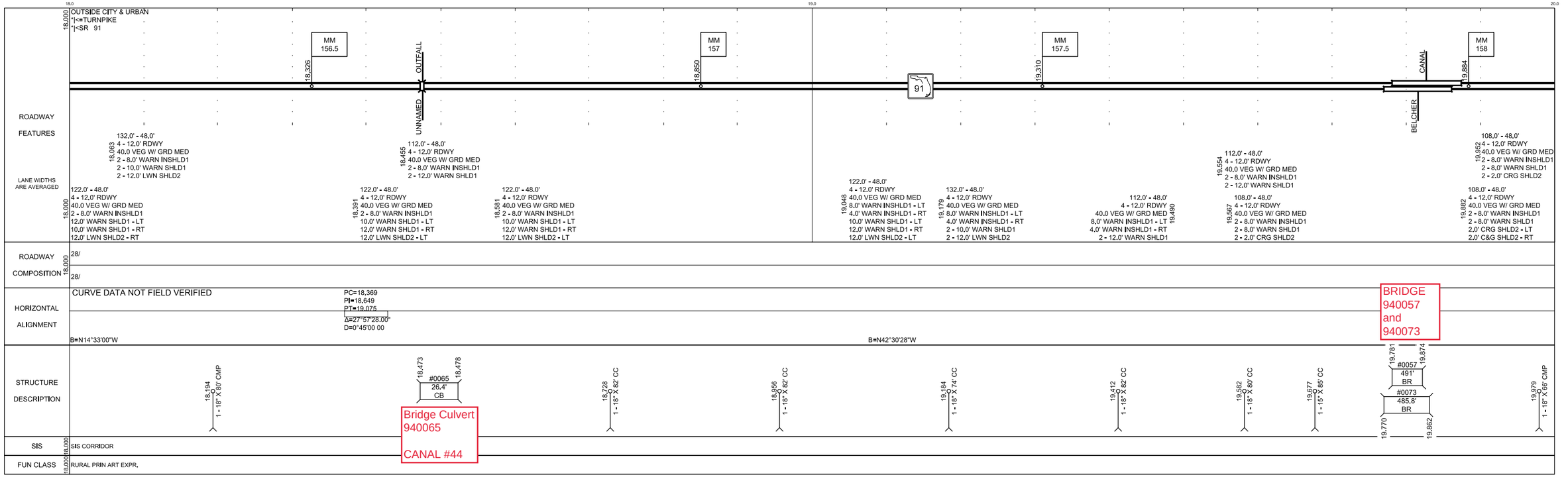
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	09/06/2022	09/29/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	ST. LUCIE	08	94470000	5 OF 9





Version: 1.4.2.27 09/29/2022

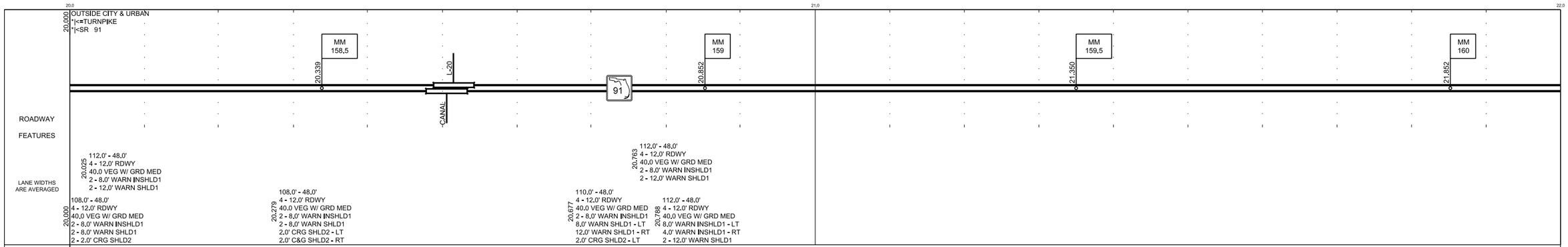
C:\Users\kn85ju\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\94470000\94470000_092922.dgn
PRINTED: 9/29/2022 11:45:55 AM

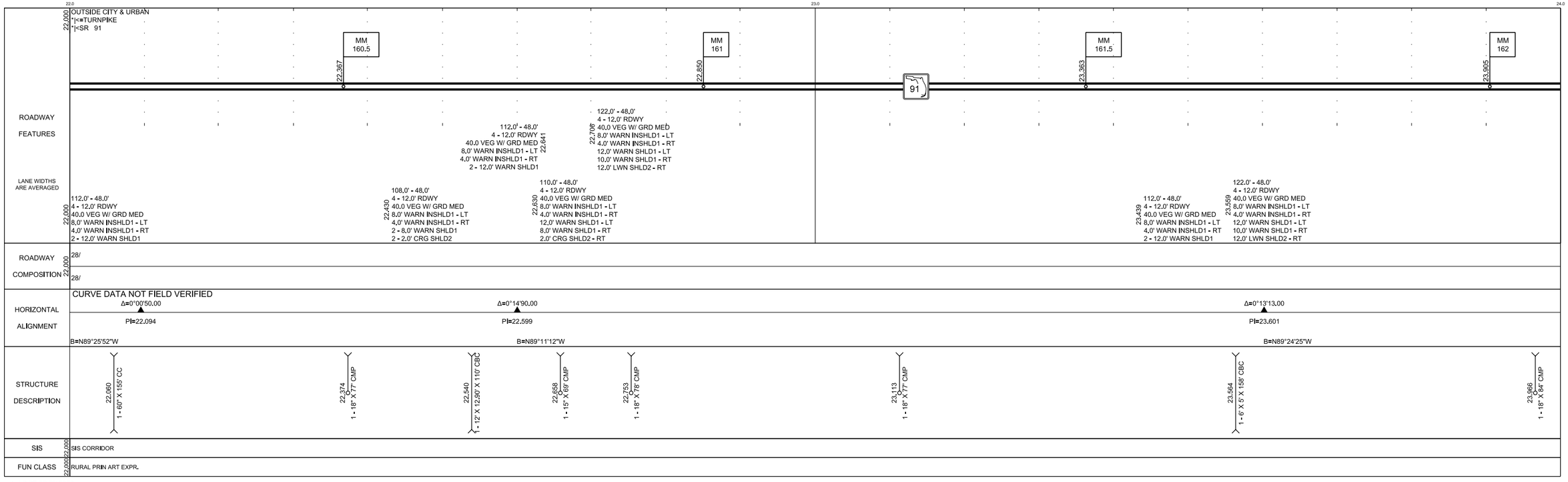
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	09/06/2022	09/29/2022				
BY	Juan Echevarría - AECOM	Juan Echevarría - AECOM				

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 91	ST. LUCIE	08	94470000	6 OF 9





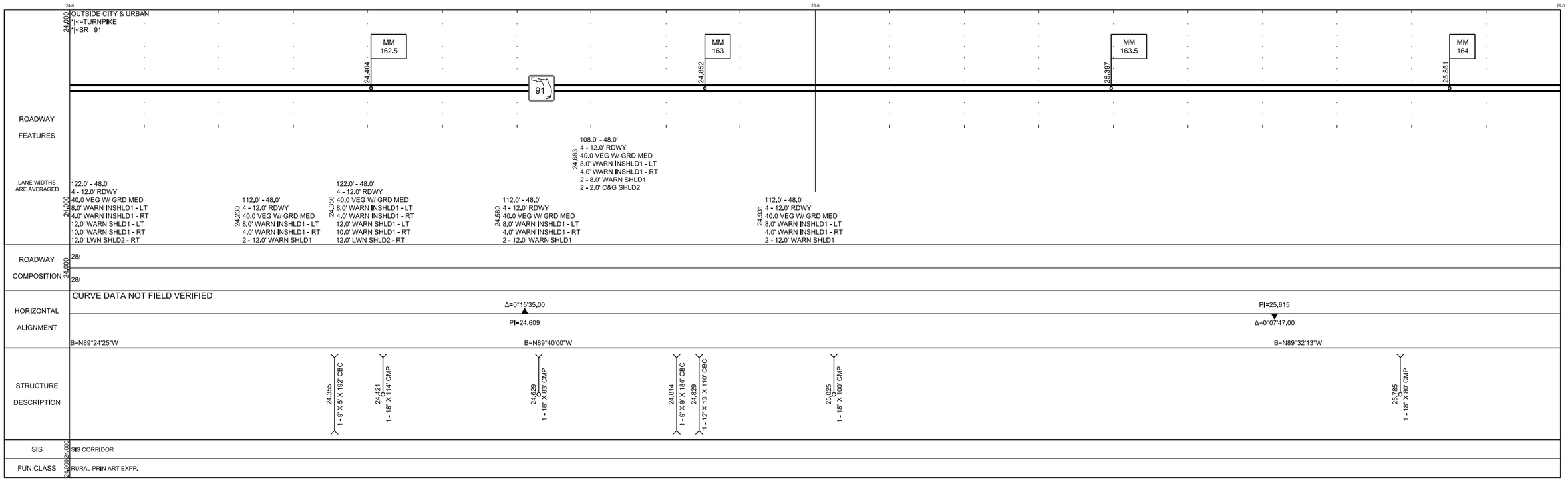
Version: 1.4.2.27 09/29/2022

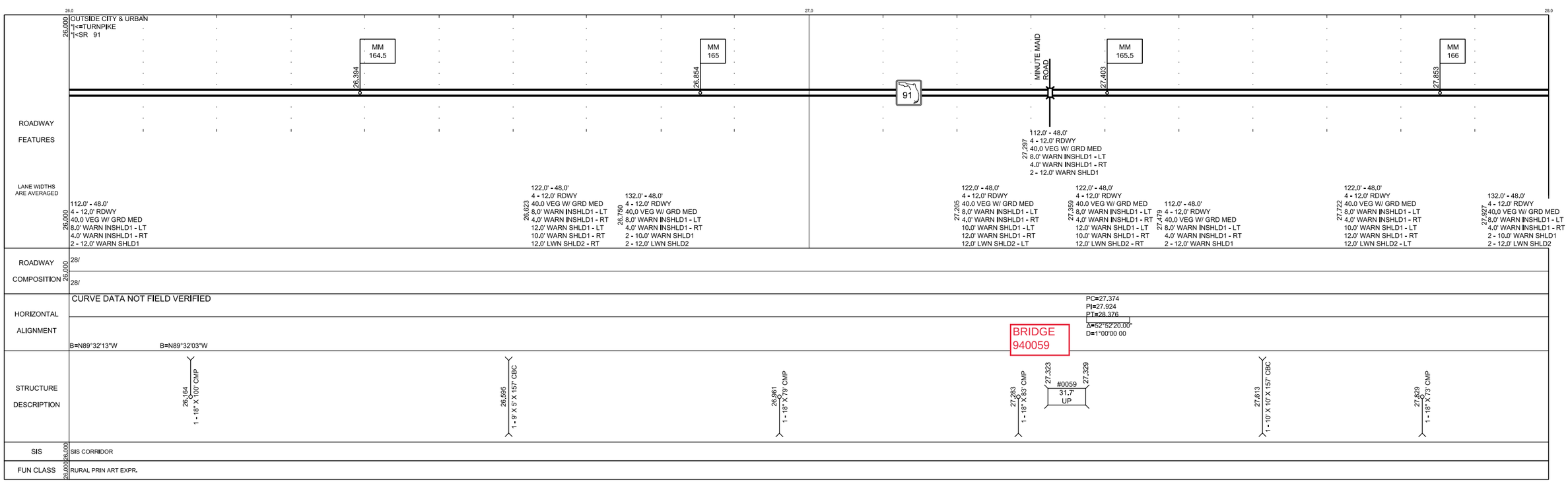
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	09/06/2022	09/29/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	ST. LUCIE	08	94470000	7 OF 9





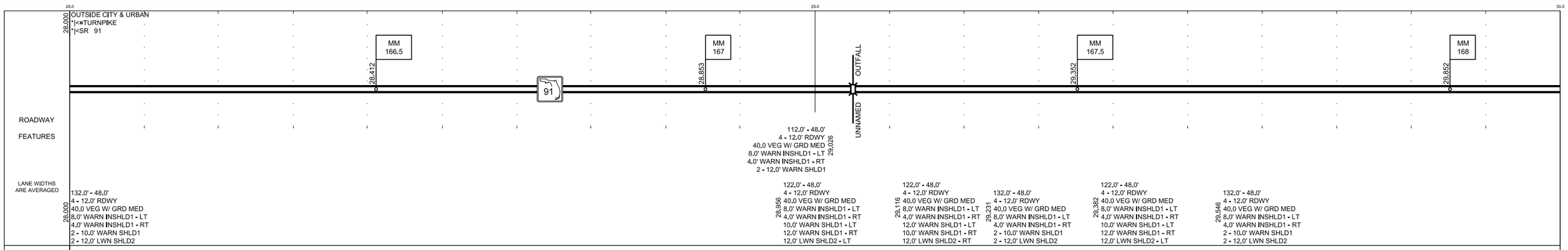
Version: 1.4.2.27 09/29/2022

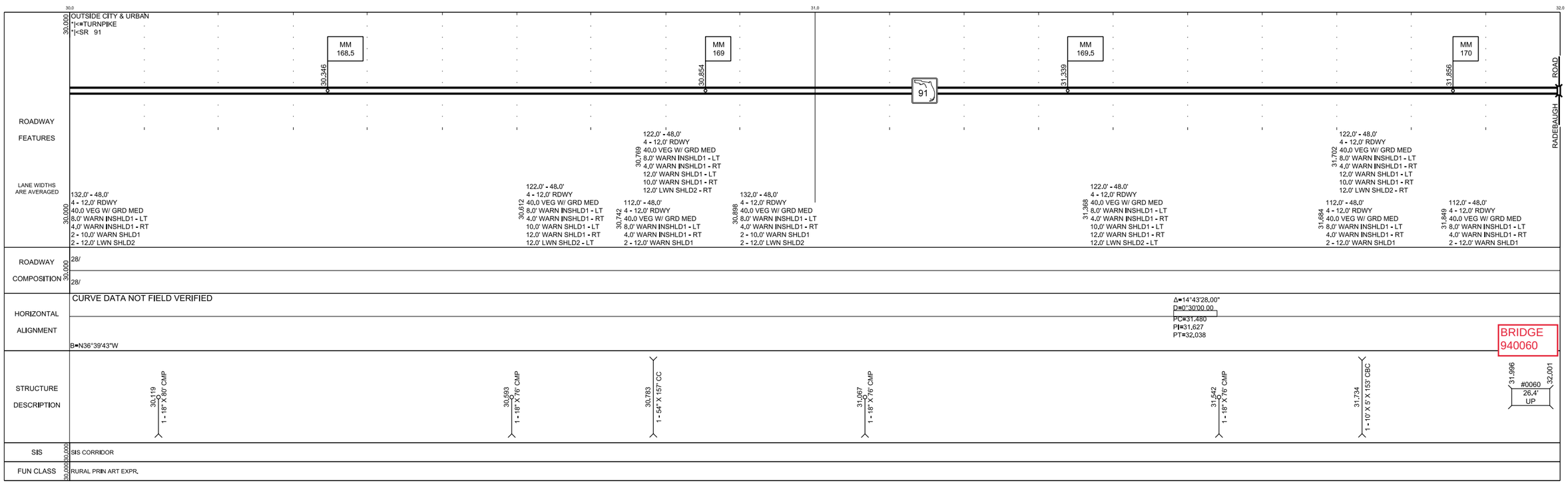
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	09/06/2022	09/29/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	ST. LUCIE	08	94470000	8 OF 9





C:\Users\km85juv\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\94470000\94470000_092922.dgn
PRINTED: 9/29/2022 11:47:31 AM

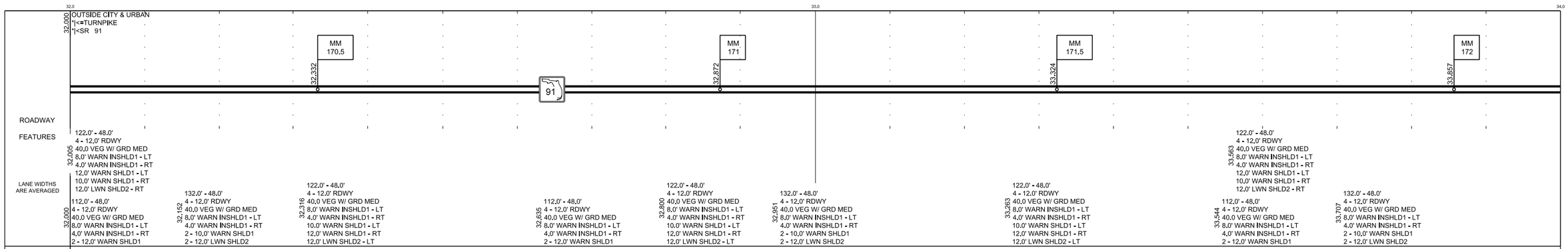
Version: 1.4.2.27 09/29/2022

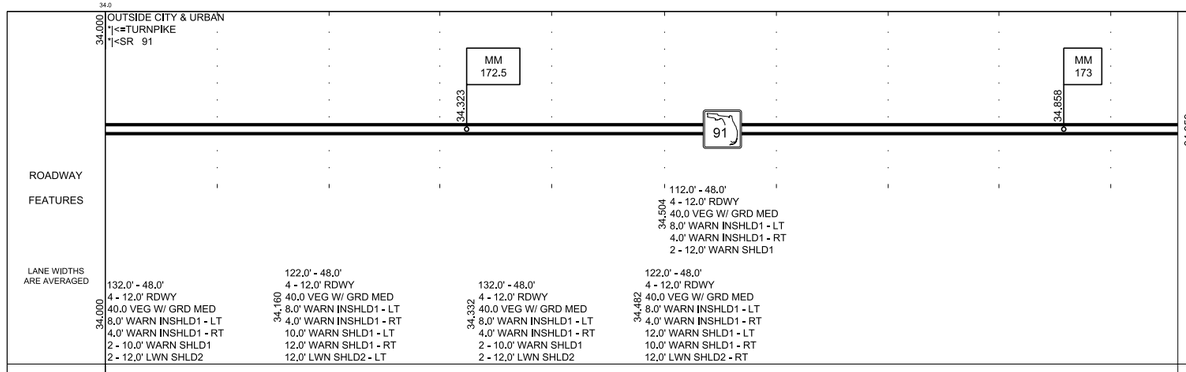
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	09/06/2022	09/29/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	ST. LUCIE	08	94470000	9 OF 9





END MP: 034.959

NET ROADWAY ID LENGTH: 34.959

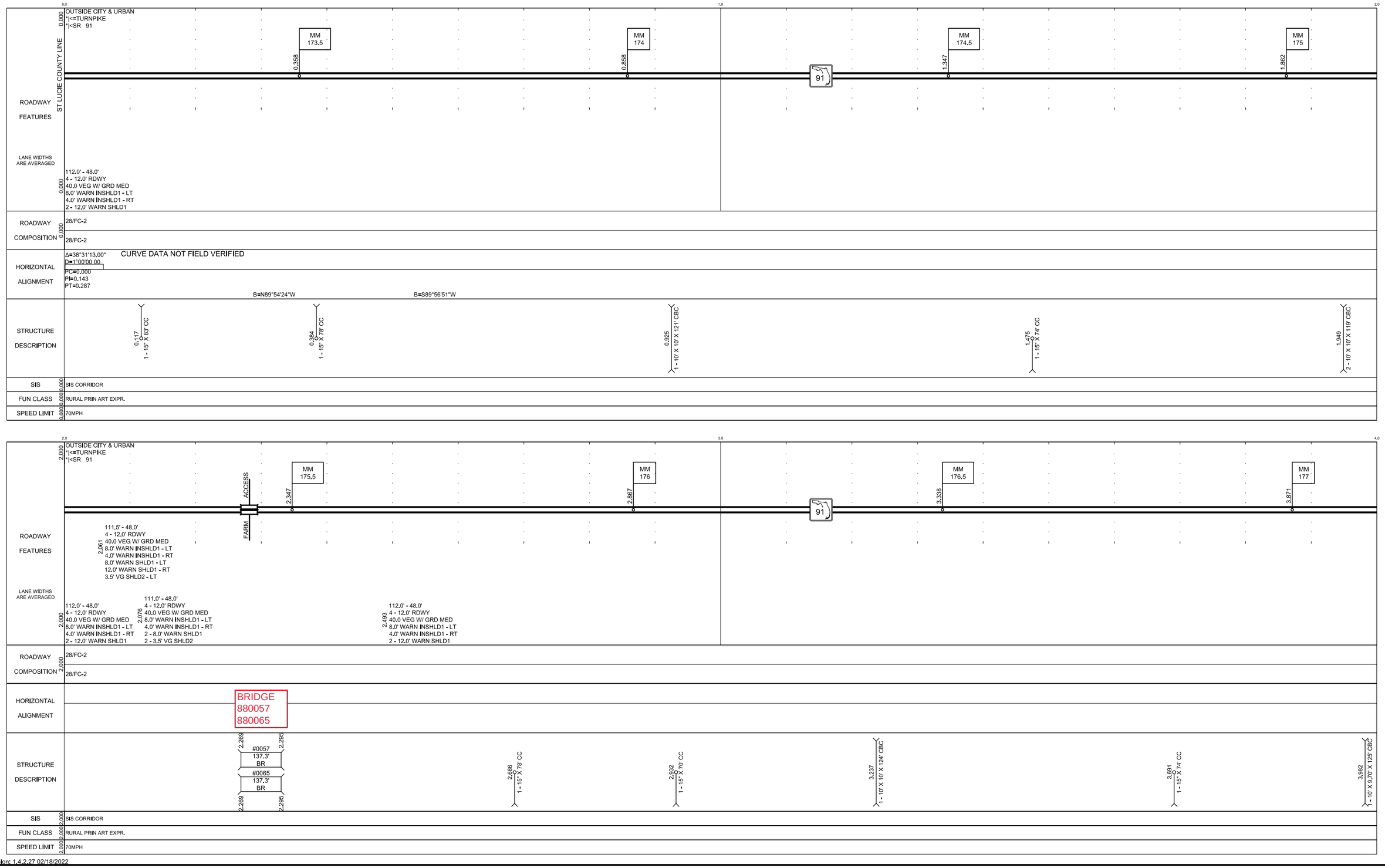
Continue to SLD2

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	01/12/2022	02/01/2022	000.000	017.452	01/12/2022 AECOM	02/18/2022 AECOM
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	INDIAN RIVER	08	88470000	1 OF 4



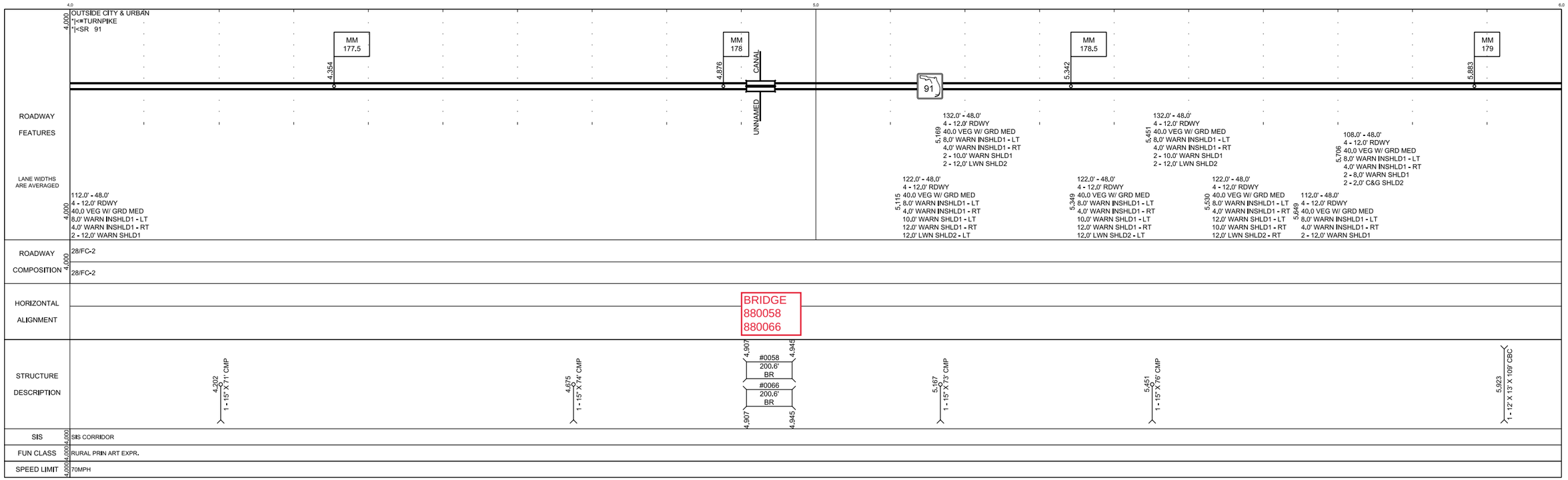
Version: 1.4.2.27 02/18/2022

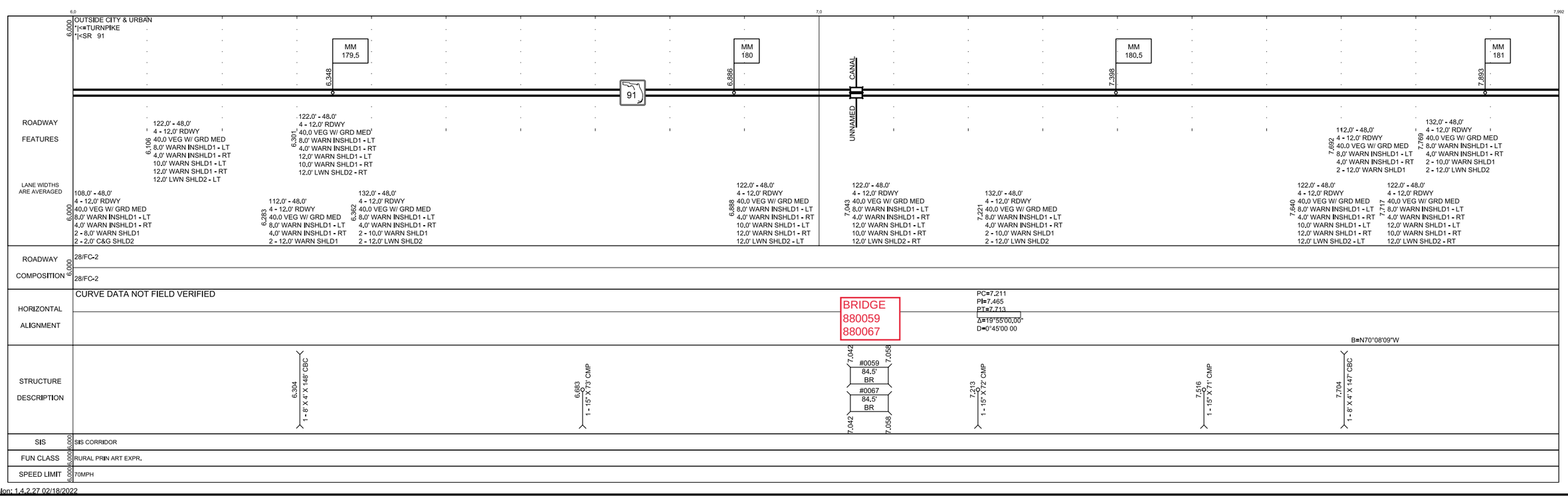
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	01/12/2022	02/01/2022	000.000	017.452	01/12/2022 AECOM	02/18/2022 AECOM
BY	Juan Echevarría - AECOM	Juan Echevarría - AECOM				

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 91	INDIAN RIVER	08	88470000	2 OF 4





Version: 1.4.2.27 02/18/2022

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	01/12/2022	02/01/2022	000.000	017.452	01/12/2022 AECOM	02/18/2022 AECOM
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	INDIAN RIVER	08	88470000	3 OF 4

8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 15.464

ROADWAY FEATURES

7.992

(MP 7.992 TO MP 15.464)
STATIONING EXCEPTION
SEE ROADWAY ID: 91470000
MP 0.000 TO MP 7.472

LANE WIDTHS ARE AVERAGED

ROADWAY COMPOSITION

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

SIS

FUN CLASS

SPEED LIMIT

15.464 16.0

ROADWAY FEATURES

15.464 OUTSIDE CITY & URBAN
*|<=TURNPIKE
*|<SR 91

MM 189

15.925

91

LANE WIDTHS ARE AVERAGED

15.464 112.0' - 48.0'
4 - 12.0' RDWY
40.0 VEG W/ GRD MED
8.0' WARN INSHLD1 - LT
4.0' WARN INSHLD1 - RT
2 - 12.0' WARN SHLD1

15.884 122.0' - 48.0'
4 - 12.0' RDWY
40.0 VEG W/ GRD MED
8.0' WARN INSHLD1 - LT
4.0' WARN INSHLD1 - RT
12.0' WARN SHLD1 - LT
10.0' WARN SHLD1 - RT
12.0' LWN SHLD2 - RT

15.740 132.0' - 48.0'
4 - 12.0' RDWY
40.0 VEG W/ GRD MED
8.0' WARN INSHLD1 - LT
4.0' WARN INSHLD1 - RT
2 - 10.0' WARN SHLD1
2 - 12.0' LWN SHLD2

15.881 122.0' - 48.0'
4 - 12.0' RDWY
40.0 VEG W/ GRD MED
8.0' WARN INSHLD1 - LT
4.0' WARN INSHLD1 - RT
10.0' WARN SHLD1 - LT
12.0' WARN SHLD1 - RT
12.0' LWN SHLD2 - LT

ROADWAY COMPOSITION

15.464 28/FC-2

15.464 28/FC-2

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

B=N33°27'09"W

STRUCTURE DESCRIPTION

15.585
1 - 12' X 12.90' X 108' CBC

15.674
1 - 16' X 12' X 95' CC

15.994
1 - 15' X 83' CMP

SIS

15.464 SIS CORRIDOR

FUN CLASS

15.464 RURAL PRIN ART EXPR.

SPEED LIMIT

15.464 70MPH

Version: 1.4.2.27 02/18/2022

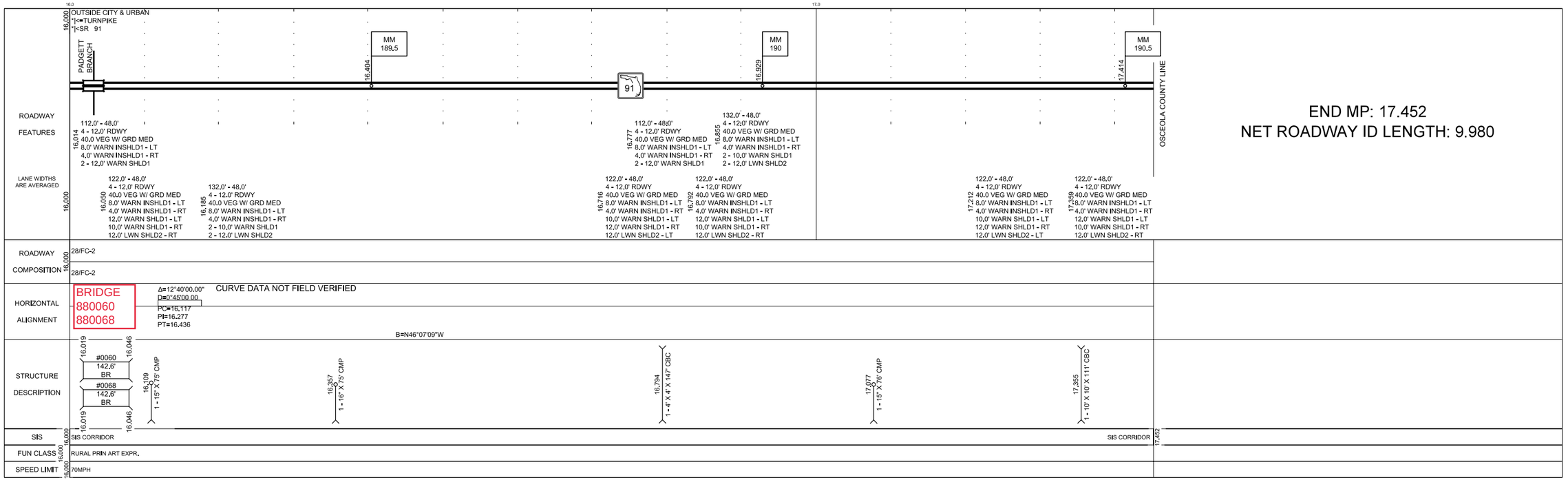
C:\Users\n815ju\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\88470000\88470000_021822.dgn
PRINTED: 2/18/2022 11:22:23 AM

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	01/12/2022	02/01/2022	000.000	017.452	01/12/2022 AECOM	02/18/2022 AECOM
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	INDIAN RIVER	08	88470000	4 OF 4



C:\Users\kn8l5ju\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\88470000\88470000_02l822.dgn
PRINTED: 2/18/2022 11:21:57 AM

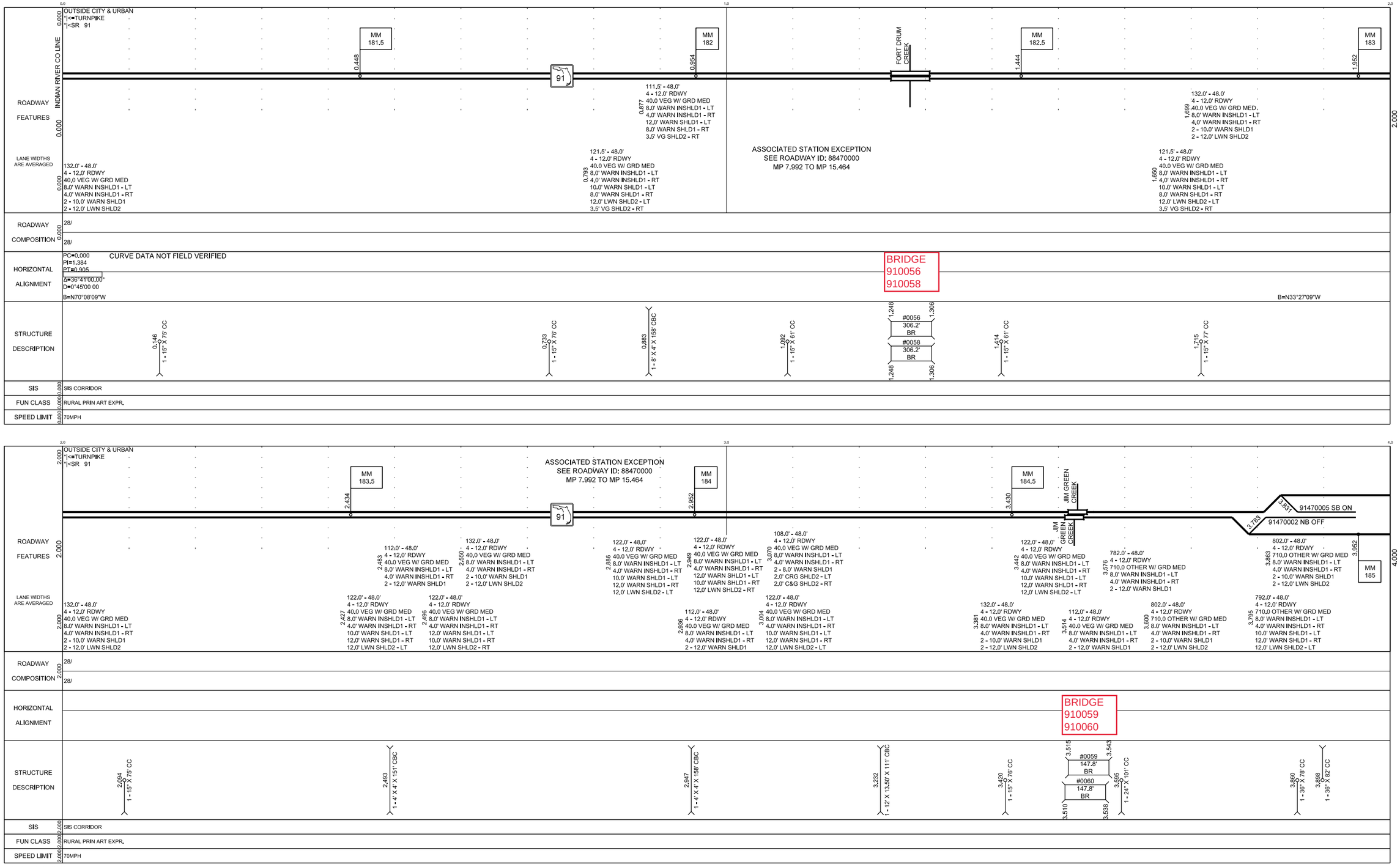
Version: 1.4.2.27 02/18/2022

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	02/07/2022	02/17/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	OKEECHOBEE	08	91470000	1 OF 2



C:\Users\kn815j\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\91470000\91470000_02l722.dgn
PRINTED: 2/17/2022 1:25:04 PM

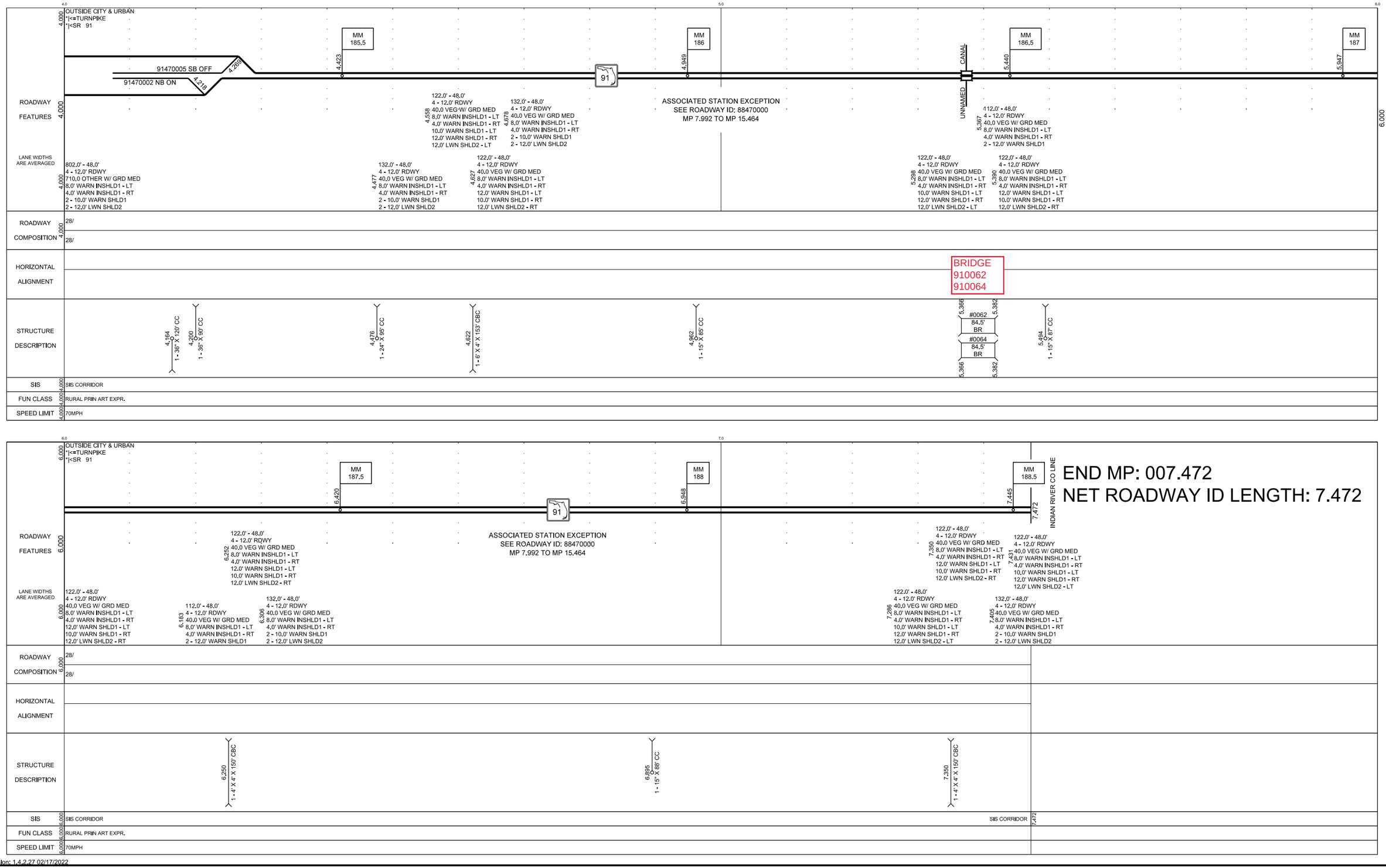
Version: 1.4.2.27 02/17/2022

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	02/07/2022	02/17/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	OKEECHOBEE	08	91470000	2 OF 2



C:\Users\kn8l5ju\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\91470000\91470000_021722.dgn
PRINTED: 2/17/2022 1:25:30 PM

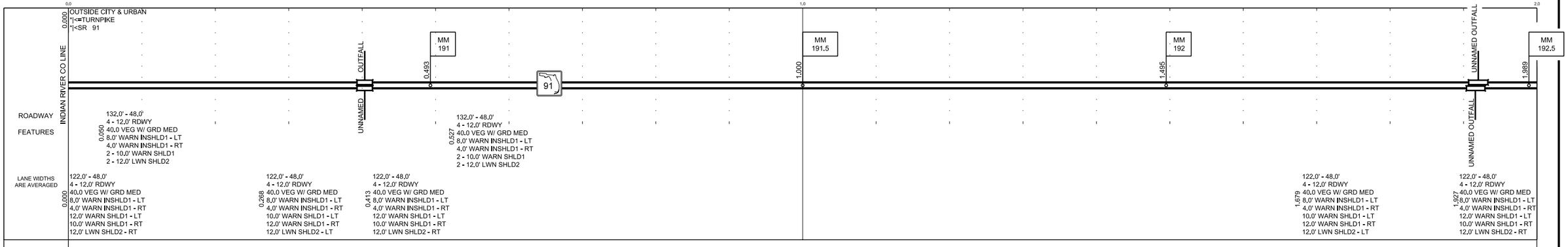
Version: 1.4.2.27 02/17/2022

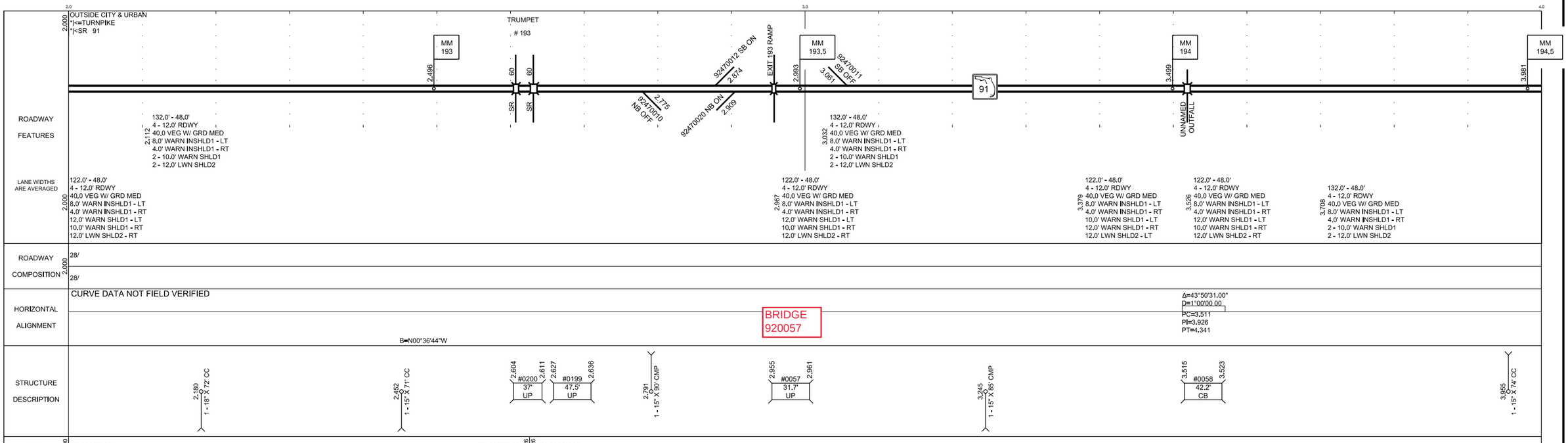
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	07/20/2022	09/23/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	OSCEOLA	08	92470000	1 OF 5





C:\Users\kn815ju\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\92470000\92470000_092322.dgn

PRINTED: 9/23/2022 2:25:32 PM

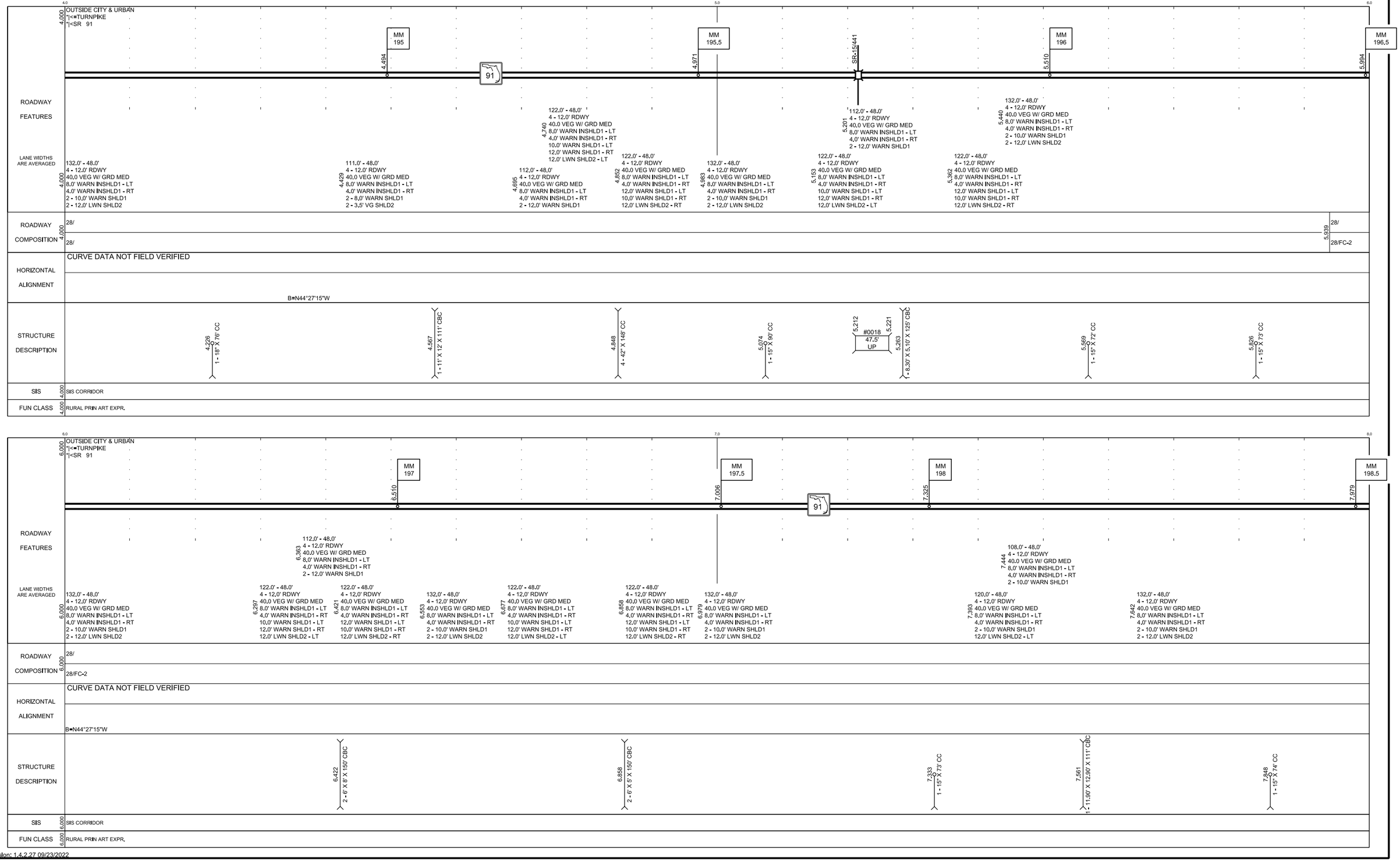
Version: 1.4.2.27 09/23/2022

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	07/20/2022	09/23/2022				
BY	Juan Echevarria - AECOM	Juan Echevarria - AECOM				

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 91	OSCEOLA	08	92470000	2 OF 5



Version: 1.4.2.27 09/23/2022

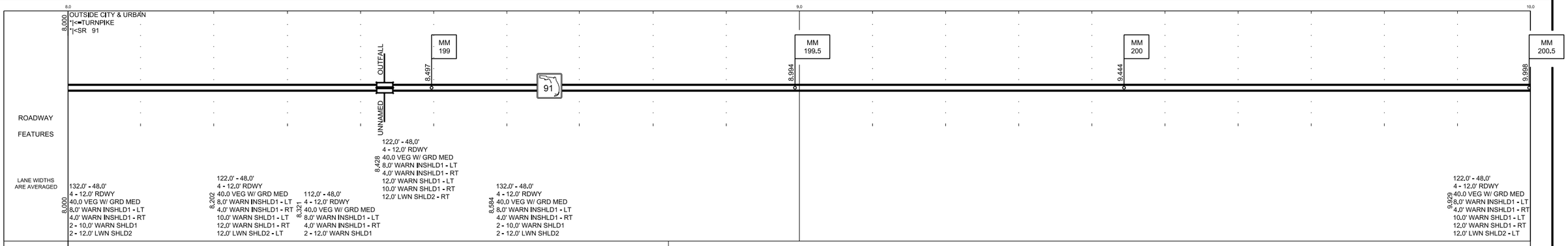
C:\Users\kn815ju\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\92470000\92470000_092322.dgn
PRINTED: 9/23/2022 2:26:01 PM

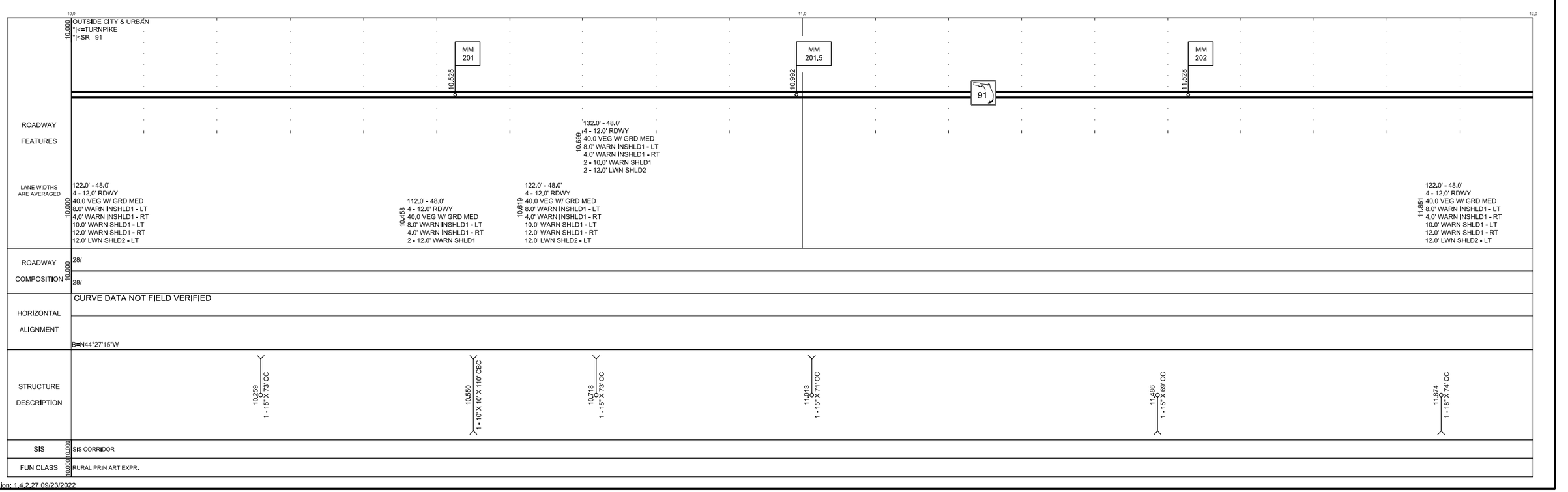
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	07/20/2022	09/23/2022				
BY	Juan Echevarría - AECOM	Juan Echevarría - AECOM				

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 91	OSCEOLA	08	92470000	3 OF 5

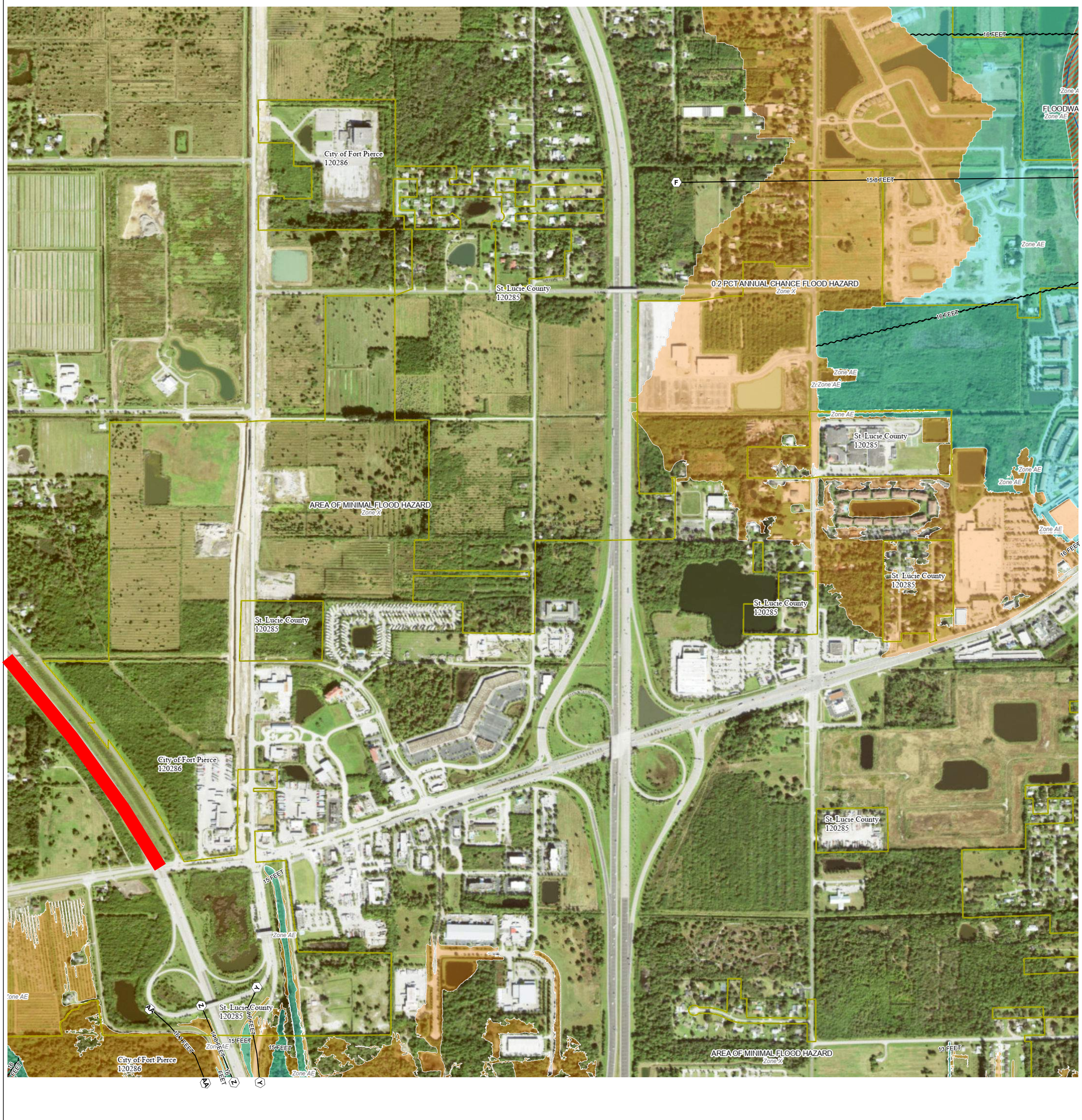




C:\Users\kn815ju\OneDrive - Florida Department of Transportation\Documents\SLDs to be posted\92470000\92470000_092322.dgn
PRINTED: 9/23/2022 2:26:27 PM

Version: 1.4.2.27 09/23/2022

APPENDIX D
FEMA FIRM's



For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://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 website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to 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.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **4/27/2022 4:16 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

0 250 500 1,000 1,500 2,000 Feet

N

0 50 100 200 300 400 Meters

FEMA

National Flood Insurance Program

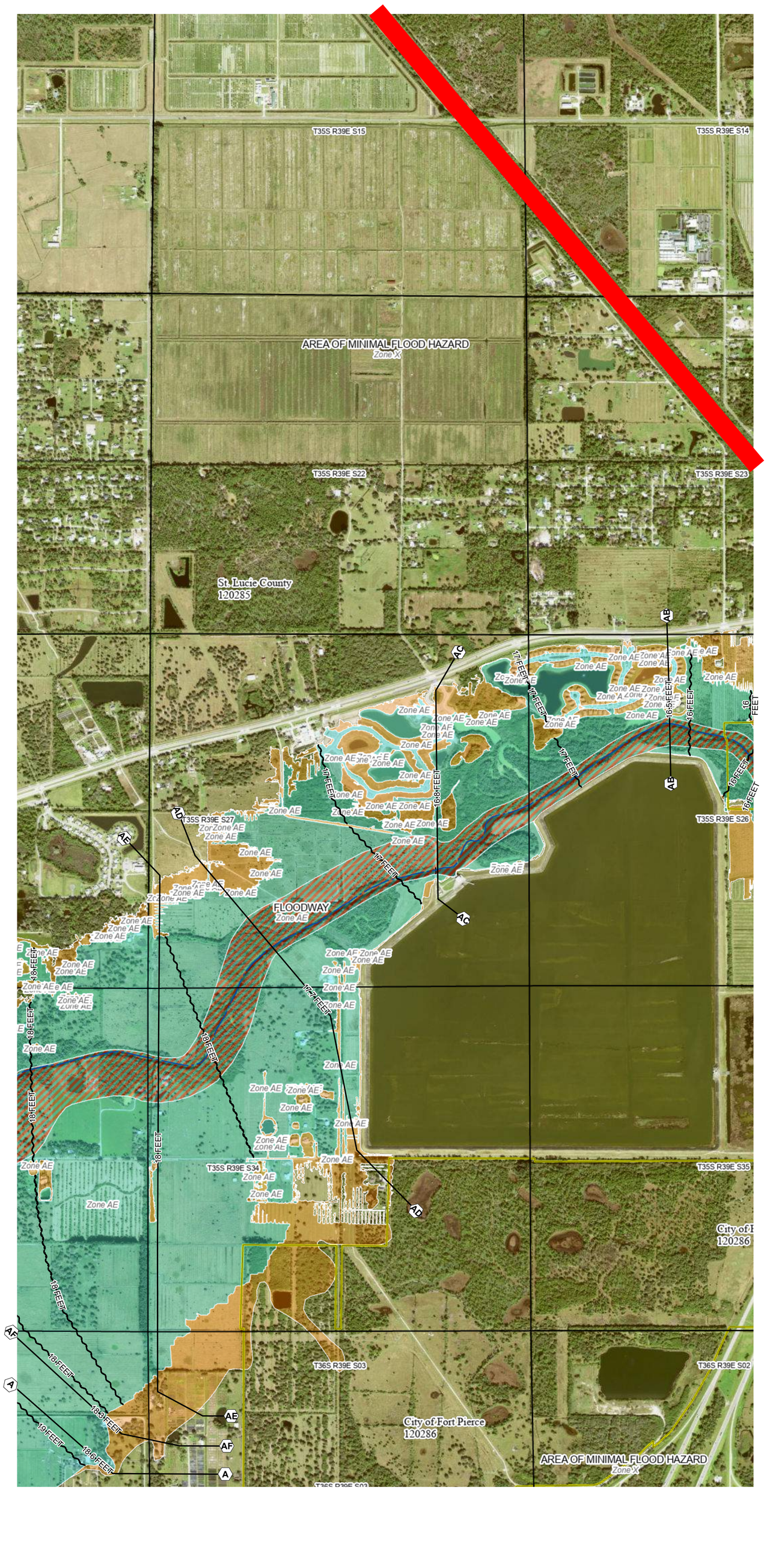
ST. LUCIE COUNTY
CITY OF FORT PIERCE

MAP NUMBER
&
EFFECTIVE DATE

... 1

... 1

FEMA National Flood Insurance Program



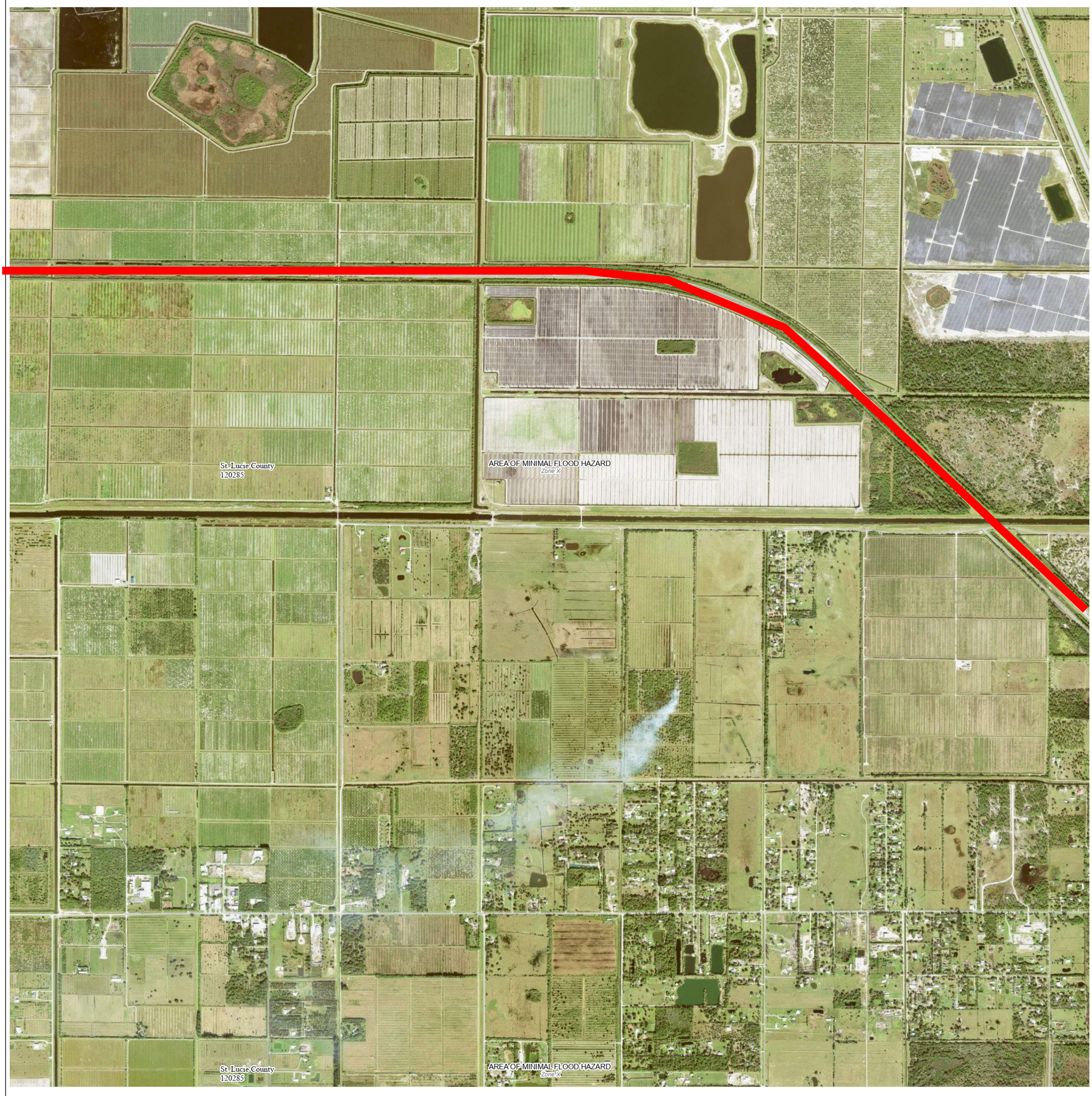
N

0 500 1,000 2,000 3,000 4,000 Feet

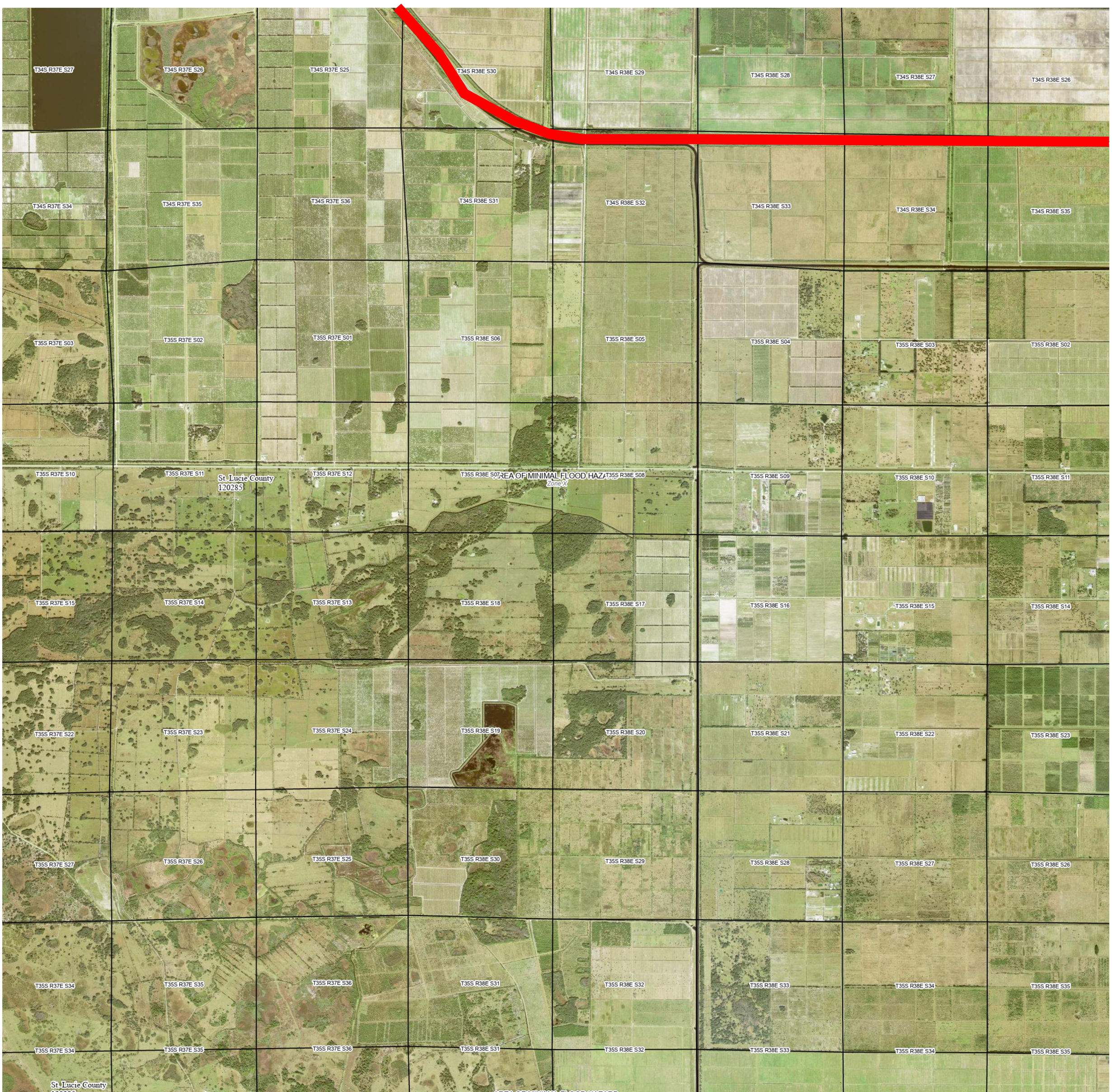
0 105 210 420 630 840 Meters

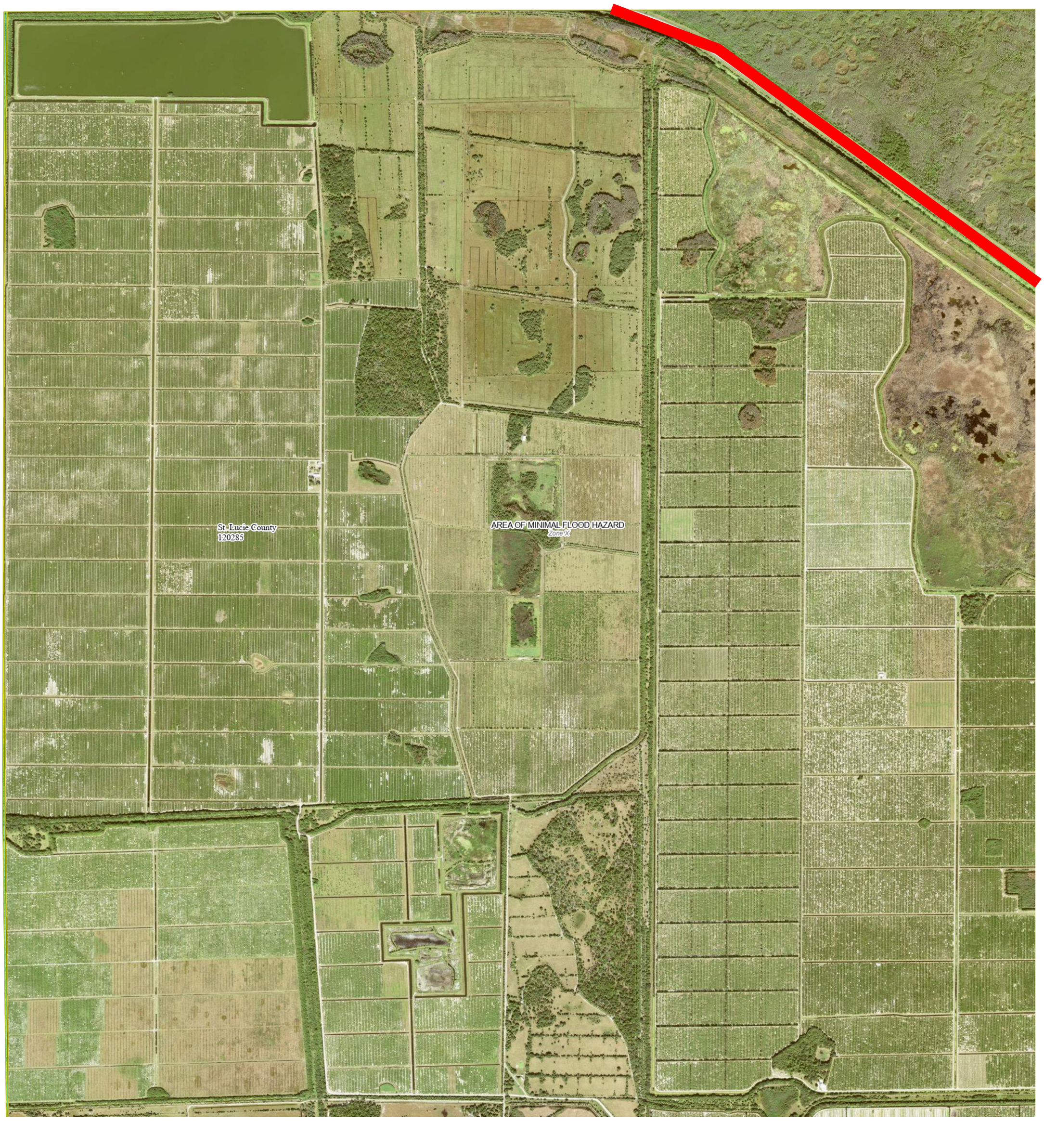
FEMA National Flood Insurance Program

MAP NUMBER
&
EFFECTIVE DATE



FEMA National Flood Insurance Program

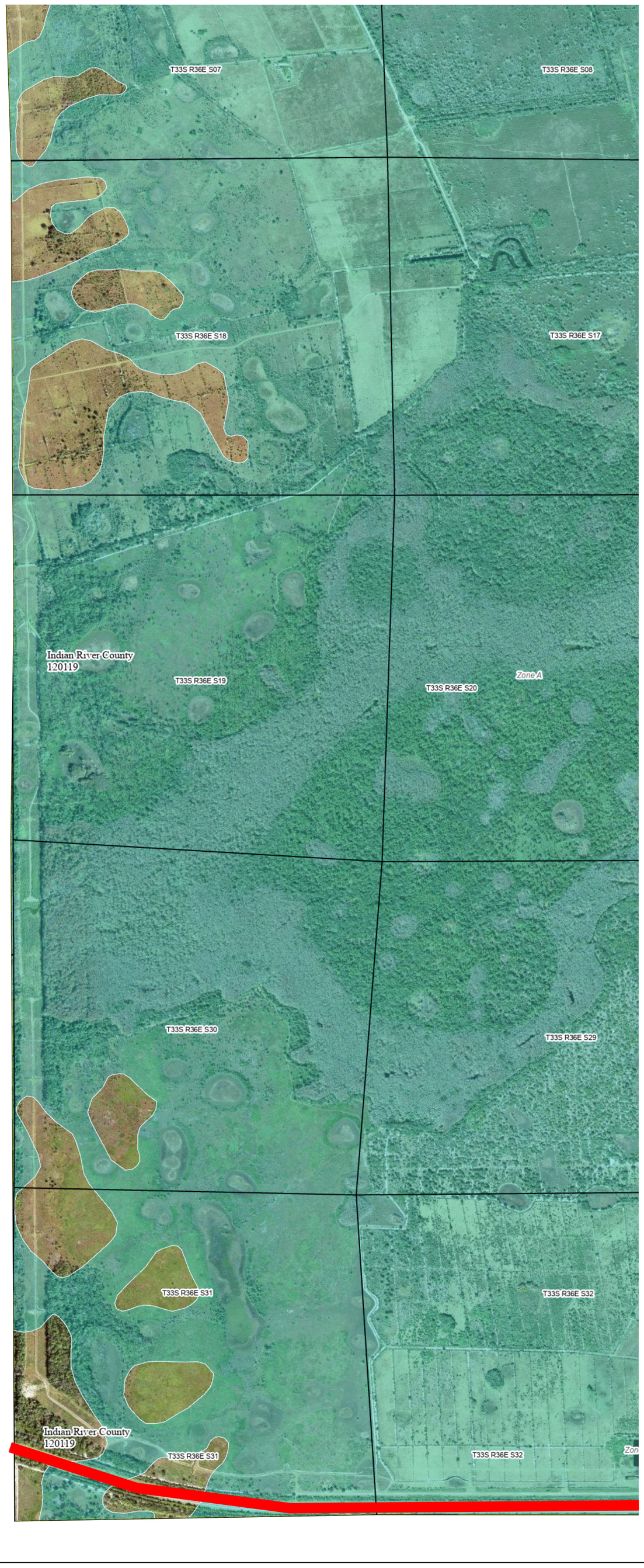


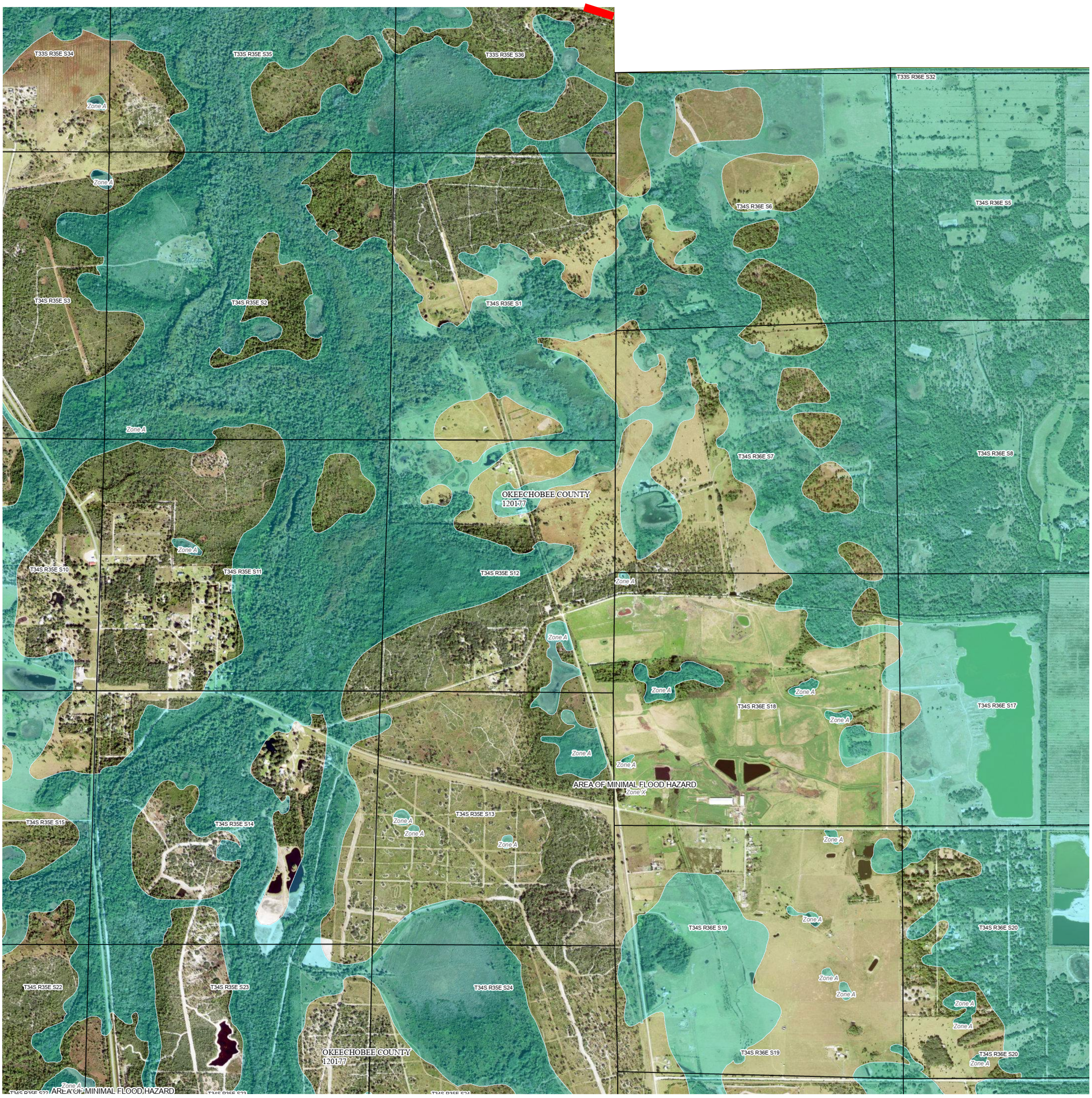


FEMA

National Flood Insurance Program

FEMA National Flood Insurance Program

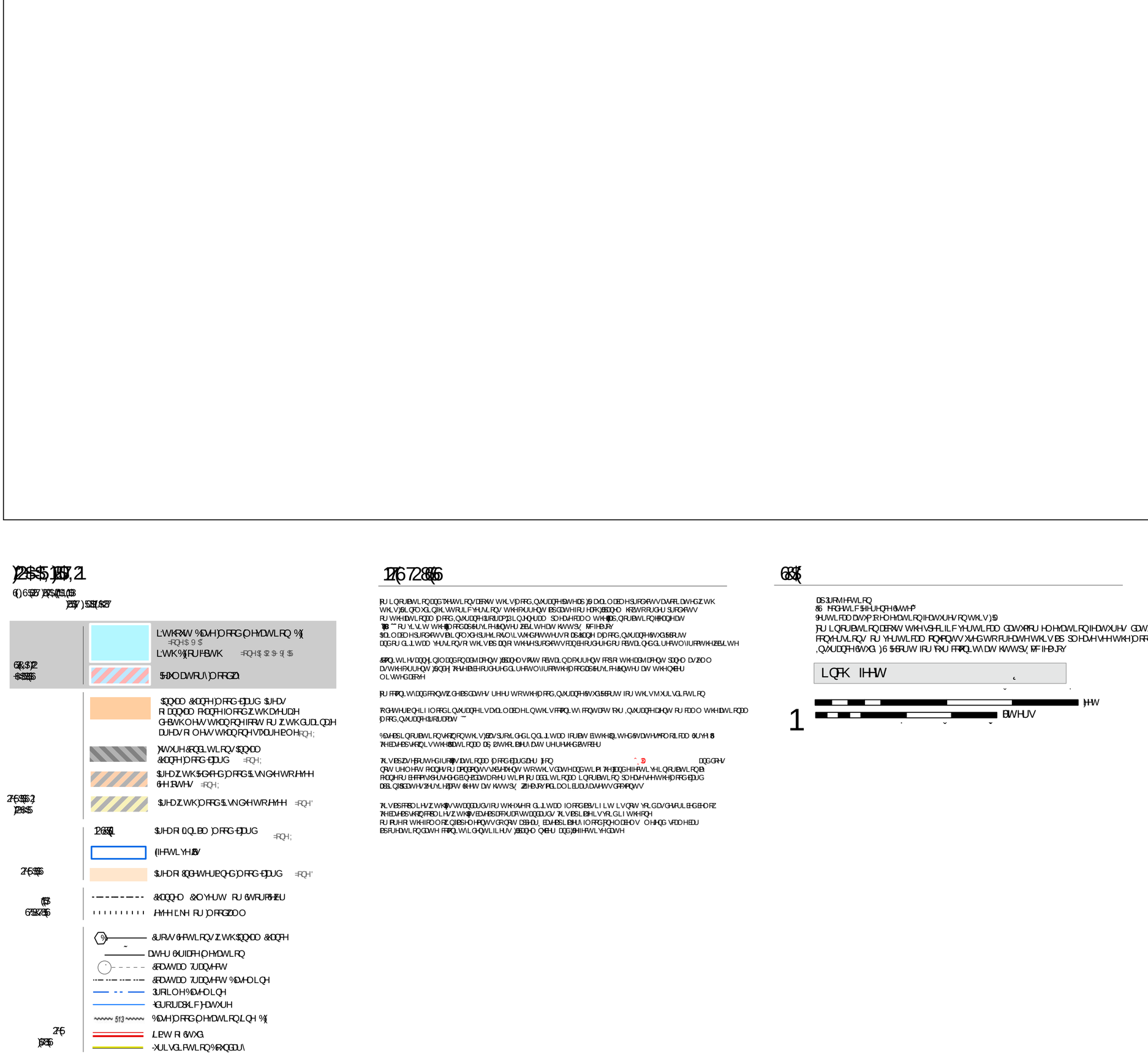

T33S R36E S07
T33S R36E S08
T33S R36E S18
T33S R36E S17
Indian River County
120119
T33S R36E S19
Zone A
T33S R36E S20
T33S R36E S30
T33S R36E S29
T33S R36E S31
T33S R36E S32
Indian River County
120119
T33S R36E S31
T33S R36E S32




AREA OF MINIMAL FLOOD HAZARD
Zone X
Zone A
Zone A
Zone A
Zone A
Zone X


T33S R35E S7
T33S R35E S8
T33S R35E S9
T33S R35E S10
T33S R35E S18
T33S R35E S17
T33S R35E S16
T33S R35E S15
Zone A
OKEECHOBEE COUNTY
120177
T33S R34E S24
T33S R35E S19
T33S R35E S20
T33S R35E S21
T33S R35E S22
Zone A
AREA OF MINIMAL FLOOD HAZARD
Zone X
T33S R34E S25
T33S R35E S30
T33S R35E S29
T33S R35E S28
T33S R35E S27
T33S R34E S36
T33S R35E S31
T33S R35E S32
T33S R35E S33
T33S R35E S34
Zone A
OKEECHOBEE COUNTY
120177
Zone A
AREA OF MINIMAL FLOOD HAZARD


Zone A
T33S R35E S6
T33S R35E S4
T33S R35E S3
Zone A
T33S R35E S2
T33S R35E S1


FEMA
National Flood Insurance Program


AREA OF MINIMAL FLOOD HAZARD
Zone X
OSCEOLA COUNTY
120189
Zone A

APPENDIX E
Soils Data

Map Unit Descriptions (Hydrologic Soil Group 6)

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.

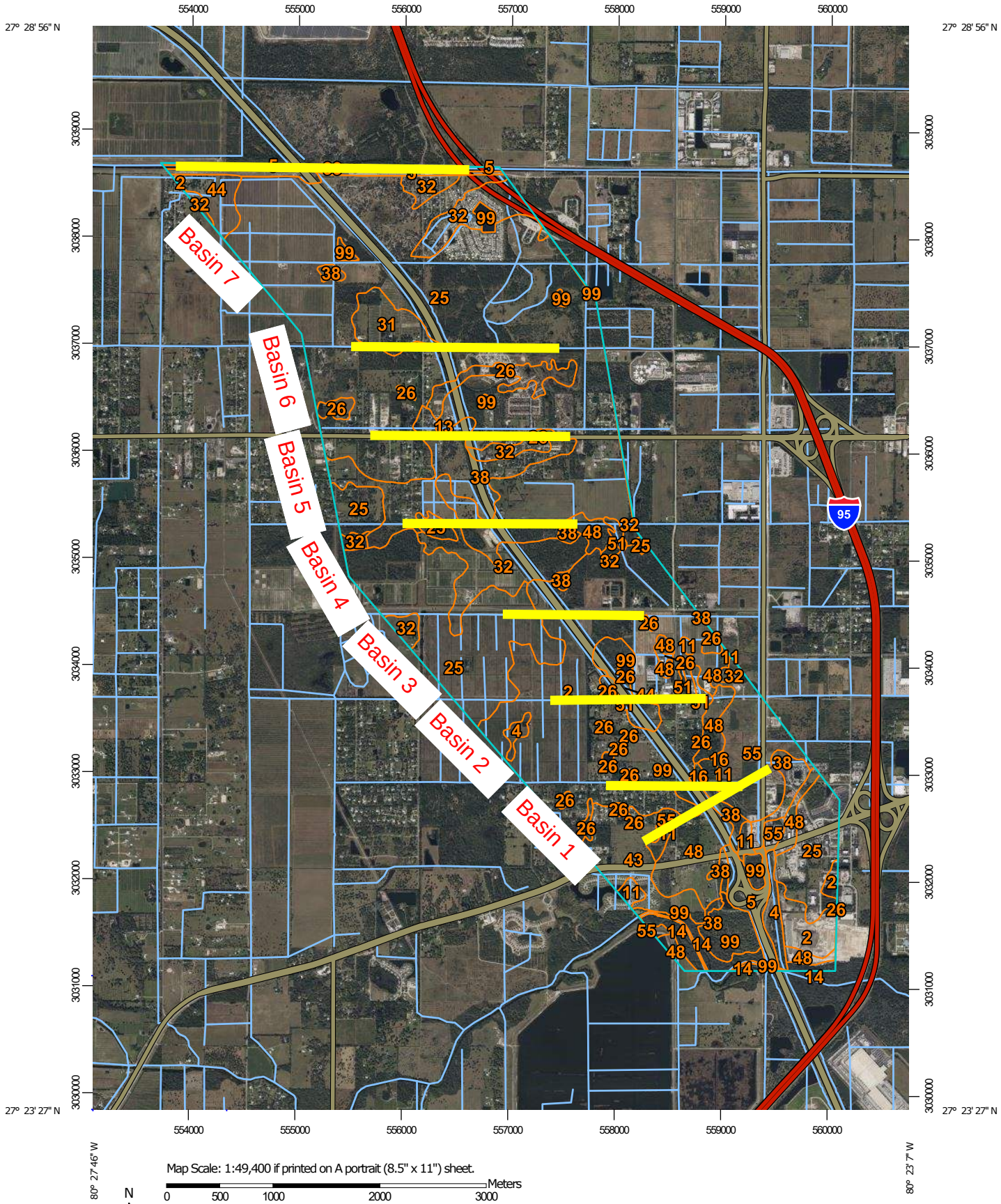
A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes,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

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 1)



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.

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: St. Lucie County, Florida
Survey Area Data: Version 16, Sep 2, 2022

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

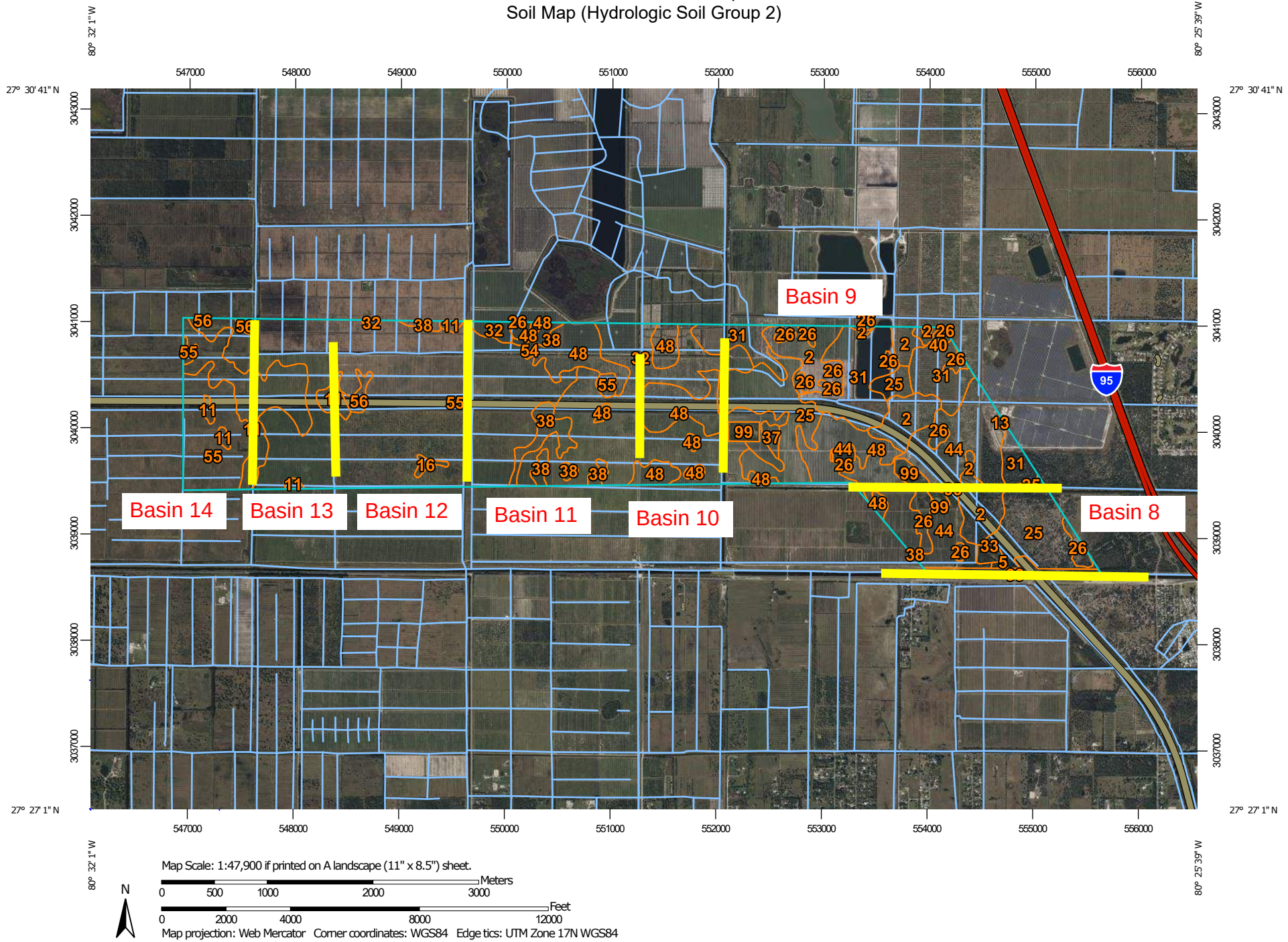
Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 2022

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 (Hydrologic Soil Group 1)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Ankona and Farmton sands	925.9	18.0%
4	Arents, 0 to 5 percent slopes	39.4	0.8%
5	Arents, 45 to 65 percent slopes	100.9	2.0%
11	Chobee loamy sand, frequently ponded, 0 to 1 percent slopes	44.3	0.9%
13	Floridana sand, frequently ponded, 0 to 2 percent slopes	2.4	0.0%
14	Fluvaquents, frequently flooded	64.9	1.3%
16	Hilolo loamy sand, 0 to 2 percent slopes	8.2	0.2%
25	Nettles and Oldsmar sands	2,384.6	46.5%
26	Oldsmar sand, depressional	115.3	2.2%
31	Pepper and EauGallie sands	69.7	1.4%
32	Pineda sand, 0 to 2 percent slopes	293.3	5.7%
38	Riviera fine sand, 0 to 2 percent slopes	295.0	5.7%
43	Susanna and Wauchula sands	129.6	2.5%
44	Tantile and Pomona sands	96.1	1.9%
48	Wabasso sand, 0 to 2 percent slopes	227.6	4.4%
51	Waveland-Lawnwood complex, depressional	18.1	0.4%
55	Winder loamy sand	192.5	3.7%
99	Water	125.2	2.4%
Totals for Area of Interest		**5,133.0**	**100.0%**

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 2)



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.

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: St. Lucie County, Florida
Survey Area Data: Version 16, Sep 2, 2022

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

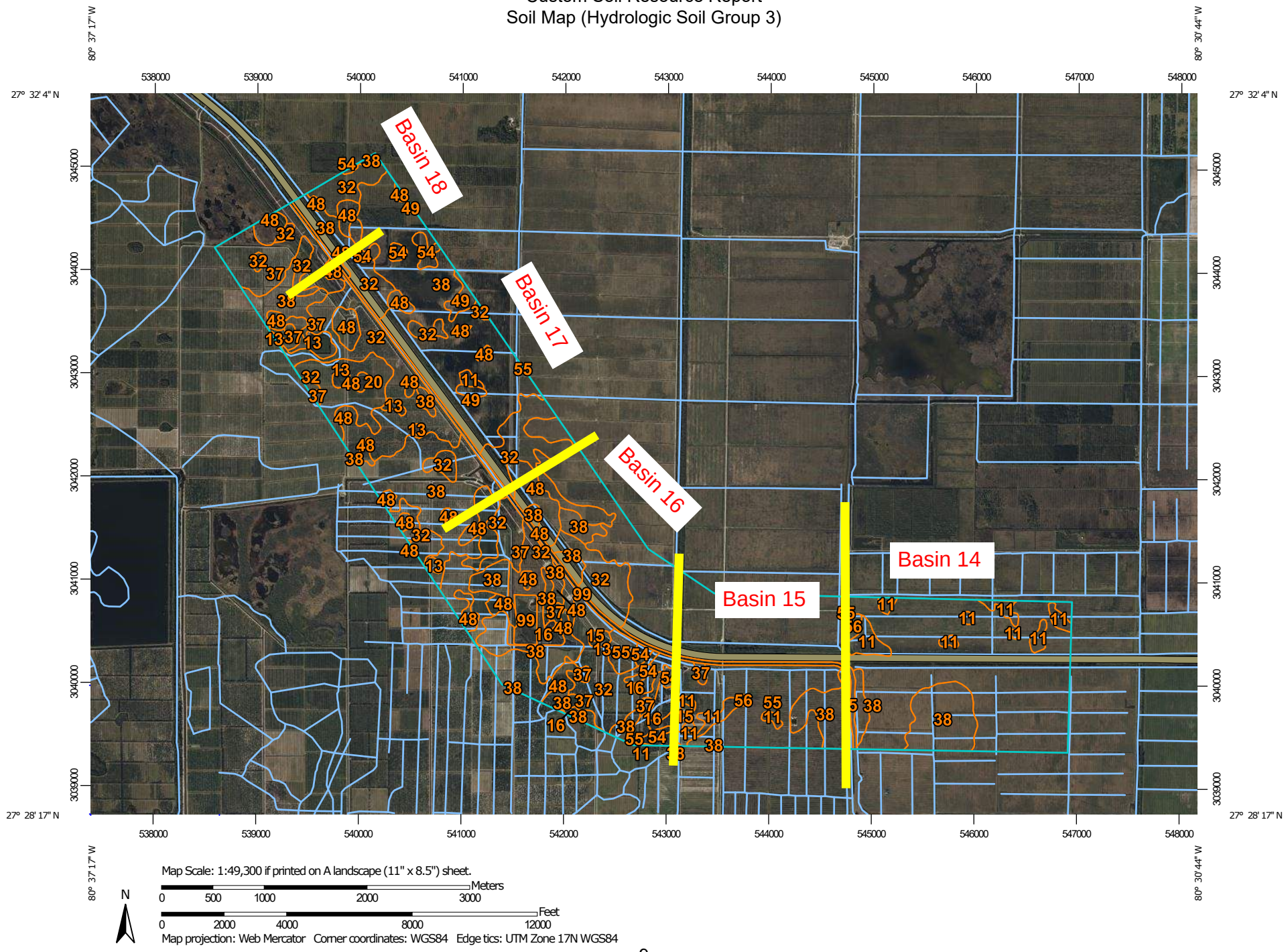
Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 2022

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 (Hydrologic Soil Group 2)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Ankona and Farmton sands	185.4	5.6%
5	Arents, 45 to 65 percent slopes	31.8	1.0%
11	Chobee loamy sand, frequently ponded, 0 to 1 percent slopes	180.3	5.5%
13	Floridana sand, frequently ponded, 0 to 2 percent slopes	1.8	0.1%
16	Hilolo loamy sand, 0 to 2 percent slopes	6.3	0.2%
25	Nettles and Oldsmar sands	276.1	8.4%
26	Oldsmar sand, depressional	85.6	2.6%
31	Pepper and EauGallie sands	261.4	7.9%
32	Pineda sand, 0 to 2 percent slopes	423.9	12.9%
33	Pits	9.9	0.3%
37	Riviera sand, frequently ponded, 0 to 1 percent slopes	12.0	0.4%
38	Riviera fine sand, 0 to 2 percent slopes	70.2	2.1%
40	Samsula muck, frequently ponded, 0 to 1 percent slopes	2.1	0.1%
44	Tantile and Pomona sands	269.9	8.2%
48	Wabasso sand, 0 to 2 percent slopes	323.8	9.8%
54	Winder sand, frequently ponded, 0 to 1 percent slopes	4.6	0.1%
55	Winder loamy sand	1,081.0	32.8%
56	Winder sand, shell substratum	15.9	0.5%
99	Water	55.2	1.7%
Totals for Area of Interest		**3,297.6**	**100.0%**

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 3)



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.

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: St. Lucie County, Florida
Survey Area Data: Version 16, Sep 2, 2022

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

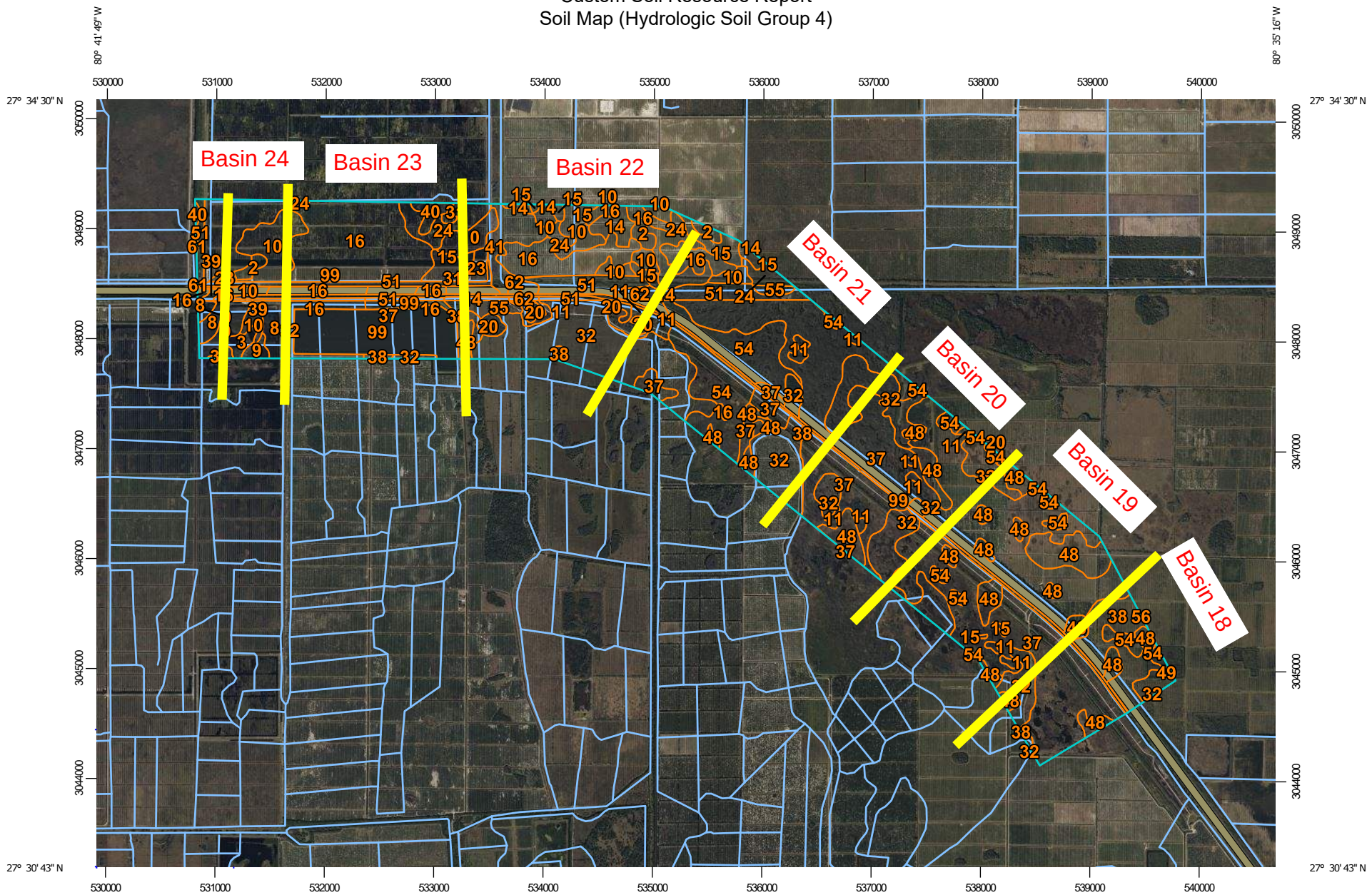
Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 2022

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 (Hydrologic Soil Group 3)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Arents, 45 to 65 percent slopes	8.5	0.2%
11	Chobee loamy sand, frequently ponded, 0 to 1 percent slopes	94.3	2.3%
13	Floridana sand, frequently ponded, 0 to 2 percent slopes	45.6	1.1%
15	Brynwood sand, 0 to 2 percent slopes	8.7	0.2%
16	Hilolo loamy sand, 0 to 2 percent slopes	17.8	0.4%
20	Kaliga muck, frequently ponded, 0 to 1 percent slopes	4.7	0.1%
32	Pineda sand, 0 to 2 percent slopes	796.6	19.3%
37	Riviera sand, frequently ponded, 0 to 1 percent slopes	208.6	5.0%
38	Riviera fine sand, 0 to 2 percent slopes	1,026.8	24.8%
48	Wabasso sand, 0 to 2 percent slopes	353.0	8.5%
49	Wabasso fine sand, gravelly substratum	23.0	0.6%
54	Winder sand, frequently ponded, 0 to 1 percent slopes	50.8	1.2%
55	Winder loamy sand	1,395.9	33.8%
56	Winder sand, shell substratum	9.4	0.2%
99	Water	91.4	2.2%
Totals for Area of Interest		**4,135.3**	**100.0%**

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 4)



Map Scale: 1:49,300 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

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 scales ranging from 1:20,000 to 1:24,000.

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: Indian River County, Florida
Survey Area Data: Version 21, Sep 1, 2022

Soil Survey Area: Okeechobee County, Florida
Survey Area Data: Version 20, Sep 1, 2022

Soil Survey Area: St. Lucie County, Florida
Survey Area Data: Version 16, Sep 2, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 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 (Hydrologic Soil Group 4)

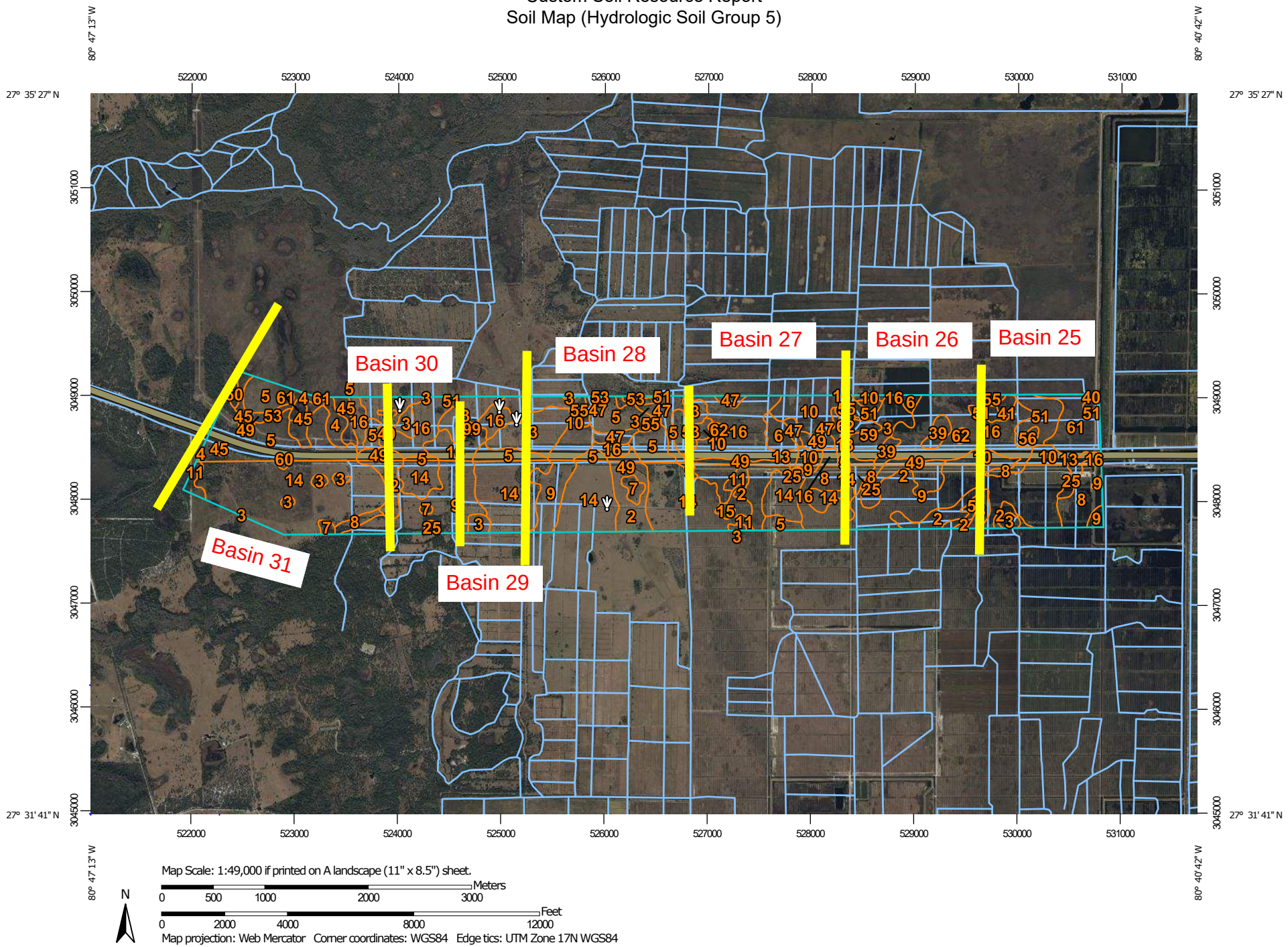
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Chobee loamy fine sand, frequently ponded, 0 to 1 percent slopes	24.0	0.6%
10	Riviera fine sand, 0 to 2 percent slopes	164.4	4.4%
14	Winder fine sand, 0 to 2 percent slopes	48.1	1.3%
15	Manatee loamy fine sand, frequently ponded, 0 to 1 percent slopes	56.6	1.5%
16	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	434.4	11.6%
23	Arents, 0 to 5 percent slopes	19.8	0.5%
24	Floridana sand, frequently ponded, 0 to 2 percent slopes	103.5	2.8%
31	Jupiter fine sand	3.8	0.1%
39	Malabar fine sand	3.2	0.1%
40	Gator muck	13.7	0.4%
41	Canova muck	56.2	1.5%
51	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	103.4	2.8%
55	Floridana mucky fine sand, frequently ponded, 0 to 1 percent slopes	6.6	0.2%
61	Delray muck	0.5	0.0%
62	Chobee mucky loamy fine sand, depressional	14.6	0.4%
99	Water	53.0	1.4%
Subtotals for Soil Survey Area		**1,105.8**	**29.6%**
Totals for Area of Interest		**3,736.1**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Basinger and Placid soils, depressional	11.6	0.3%
5	Valkaria fine sand, 0 to 2 percent slopes	1.2	0.0%
8	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	40.2	1.1%
9	Riviera fine sand, 0 to 2 percent slopes	40.1	1.1%
10	Ft. Drum fine sand	10.0	0.3%
Subtotals for Soil Survey Area		**103.0**	**2.8%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Totals for Area of Interest		**3,736.1**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
11	Chobee loamy sand, frequently ponded, 0 to 1 percent slopes	71.4	1.9%
15	Brynwood sand, 0 to 2 percent slopes	2.5	0.1%
16	Hilolo loamy sand, 0 to 2 percent slopes	2.0	0.1%
20	Kaliga muck, frequently ponded, 0 to 1 percent slopes	14.4	0.4%
32	Pineda sand, 0 to 2 percent slopes	597.1	16.0%
37	Riviera sand, frequently ponded, 0 to 1 percent slopes	1,085.3	29.0%
38	Riviera fine sand, 0 to 2 percent slopes	104.7	2.8%
48	Wabasso sand, 0 to 2 percent slopes	210.8	5.6%
49	Wabasso fine sand, gravelly substratum	1.5	0.0%
54	Winder sand, frequently ponded, 0 to 1 percent slopes	226.4	6.1%
55	Winder loamy sand	17.8	0.5%
56	Winder sand, shell substratum	0.1	0.0%
99	Water	192.8	5.2%
Subtotals for Soil Survey Area		**2,527.0**	**67.6%**
Totals for Area of Interest		**3,736.1**	**100.0%**

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 5)



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 scales ranging from 1:20,000 to 1:24,000.

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: Indian River County, Florida
Survey Area Data: Version 21, Sep 1, 2022

Soil Survey Area: Okeechobee County, Florida
Survey Area Data: Version 20, Sep 1, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

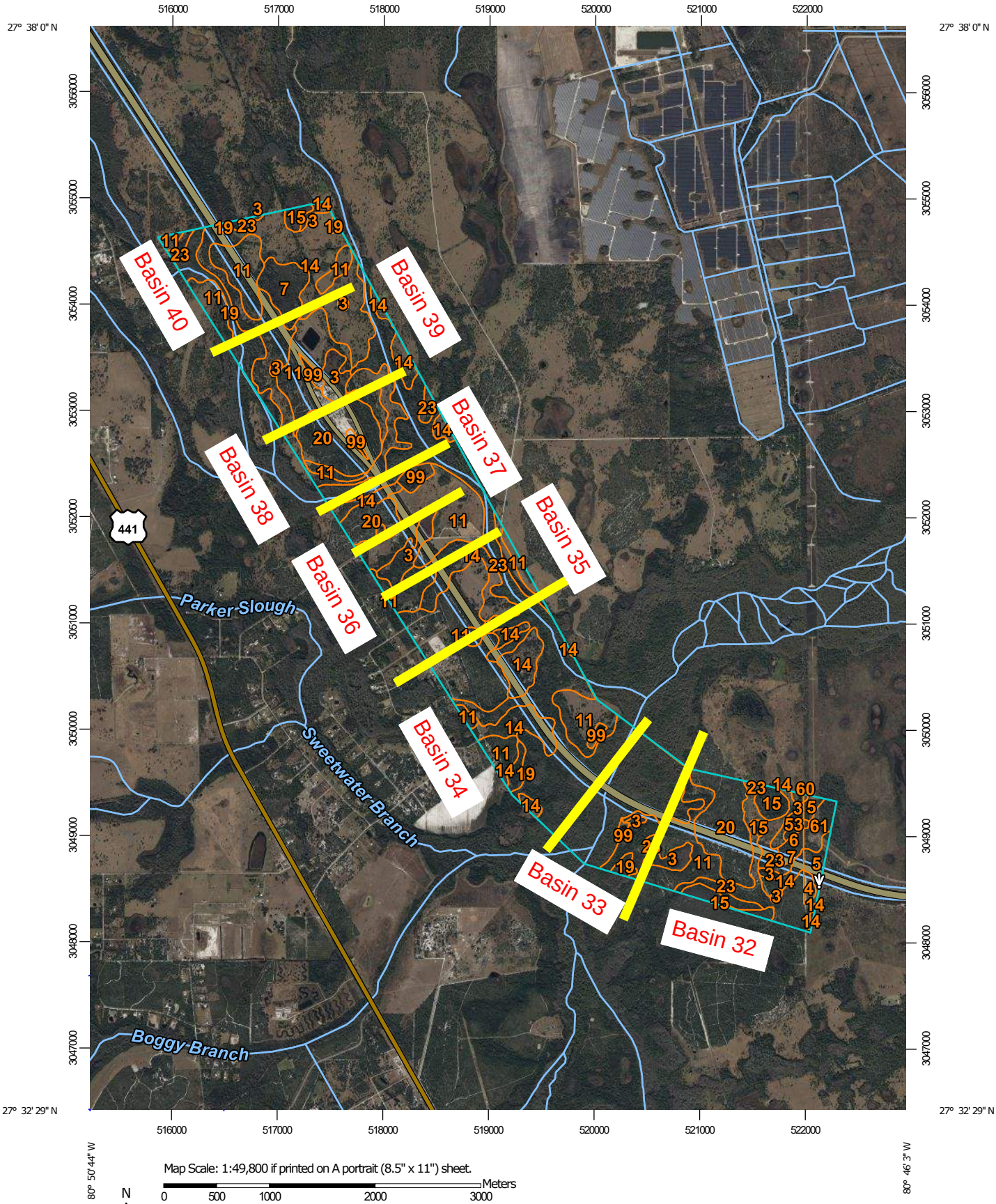
imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Hydrologic Soil Group 5)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	EauGallie fine sand	160.0	5.7%
4	Immokalee fine sand	17.8	0.6%
5	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	270.9	9.7%
6	Oldsmar fine sand	24.1	0.9%
10	Riviera fine sand, 0 to 2 percent slopes	186.7	6.7%
13	Wabasso-Wabasso, wet, fine sand, 0 to 2 percent slopes	17.9	0.6%
16	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	319.9	11.4%
31	Jupiter fine sand	3.0	0.1%
39	Malabar fine sand	21.3	0.8%
40	Gator muck	1.5	0.1%
41	Canova muck	6.1	0.2%
45	Myakka fine sand, frequently ponded, 0 to 1 percent slopes	47.4	1.7%
47	Holopaw fine sand, 0 to 2 percent slopes	56.7	2.0%
49	Pompano fine sand, 0 to 2 percent slopes	82.2	2.9%
51	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	56.4	2.0%
53	Manatee mucky loamy fine sand, depressional	7.1	0.3%
55	Floridana mucky fine sand, frequently ponded, 0 to 1 percent slopes	20.7	0.7%
56	Pineda fine sand, frequently ponded, 0 to 1 percent slopes	7.8	0.3%
59	Lokosee fine sand	10.0	0.4%
60	Pompano fine sand, frequently ponded, 0 to 1 percent slopes	5.7	0.2%
61	Delray muck	63.3	2.3%
62	Chobee mucky loamy fine sand, depressional	12.7	0.5%
99	Water	4.8	0.2%
Subtotals for Soil Survey Area		**1,404.1**	**50.1%**
Totals for Area of Interest		**2,805.1**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Basinger fine sand, 0 to 2 percent slopes	190.6	6.8%
3	Basinger and Placid soils, depressional	28.5	1.0%
5	Valkaria fine sand, 0 to 2 percent slopes	18.3	0.7%
7	Floridana, Riviera, and Placid soils, depressional	16.3	0.6%
8	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	122.3	4.4%
9	Riviera fine sand, 0 to 2 percent slopes	361.0	12.9%
11	Immokalee fine sand, 0 to 2 percent slopes	19.8	0.7%
14	Myakka fine sand, 0 to 2 percent slopes	615.0	21.9%
15	Okeelanta muck, frequently ponded, 0 to 1 percent slopes	4.5	0.2%
25	Wabasso fine sand, 0 to 2 percent slopes	23.9	0.9%
Subtotals for Soil Survey Area		**1,400.2**	**49.9%**
Totals for Area of Interest		**2,805.1**	**100.0%**

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 6)



Map Scale: 1:49,800 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

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 scales ranging from 1:20,000 to 1:24,000.

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: Indian River County, Florida
Survey Area Data: Version 21, Sep 1, 2022

Soil Survey Area: Okeechobee County, Florida
Survey Area Data: Version 20, Sep 1, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

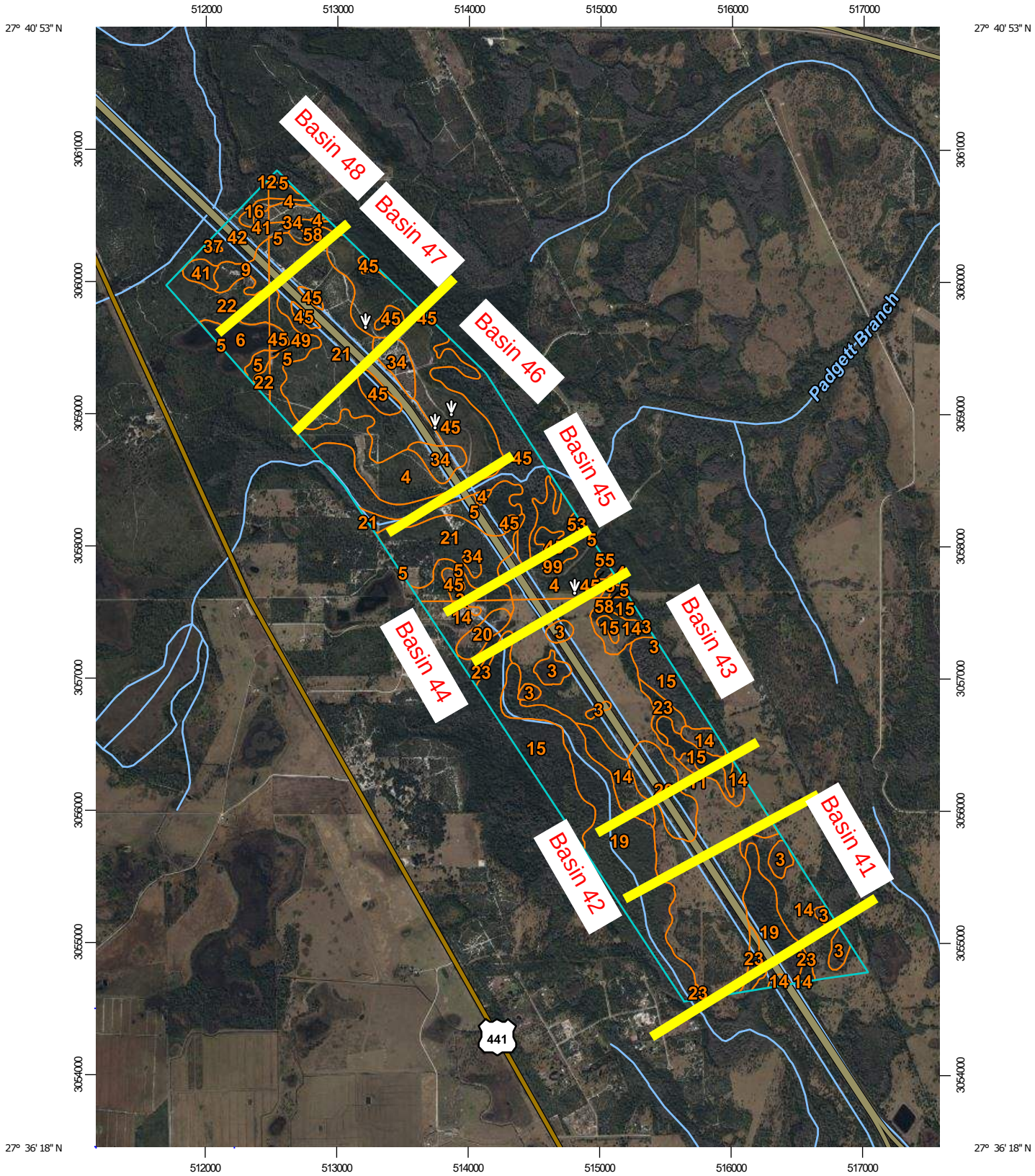
imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Hydrologic Soil Group 6)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Immokalee fine sand	6.9	0.2%
5	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	23.6	0.8%
53	Manatee mucky loamy fine sand, depressional	0.9	0.0%
60	Pompano fine sand, frequently ponded, 0 to 1 percent slopes	0.6	0.0%
61	Delray muck	22.1	0.8%
Subtotals for Soil Survey Area		**54.1**	**1.9%**
Totals for Area of Interest		**2,783.6**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Basinger and Placid soils, depressional	94.4	3.4%
6	Manatee loamy fine sand, frequently ponded, 0 to 1 percent slopes	3.5	0.1%
7	Floridana, Riviera, and Placid soils, depressional	60.1	2.2%
11	Immokalee fine sand, 0 to 2 percent slopes	820.9	29.5%
14	Myakka fine sand, 0 to 2 percent slopes	560.6	20.1%
15	Okeelanta muck, frequently ponded, 0 to 1 percent slopes	50.2	1.8%
19	Floridana, Placid, and Okeelanta soils, frequently flooded	786.6	28.3%
20	Pomello fine sand, 0 to 5 percent slopes	242.5	8.7%
23	St. Johns fine sand	79.8	2.9%
99	Water	30.7	1.1%
Subtotals for Soil Survey Area		**2,729.3**	**98.0%**
Totals for Area of Interest		**2,783.6**	**100.0%**

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 7)



Map Scale: 1:41,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

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 scales ranging from 1:20,000 to 1:24,000.

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: Indian River County, Florida
Survey Area Data: Version 21, Sep 1, 2022

Soil Survey Area: Okeechobee County, Florida
Survey Area Data: Version 20, Sep 1, 2022

Soil Survey Area: Osceola County, Florida
Survey Area Data: Version 20, Sep 1, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 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.

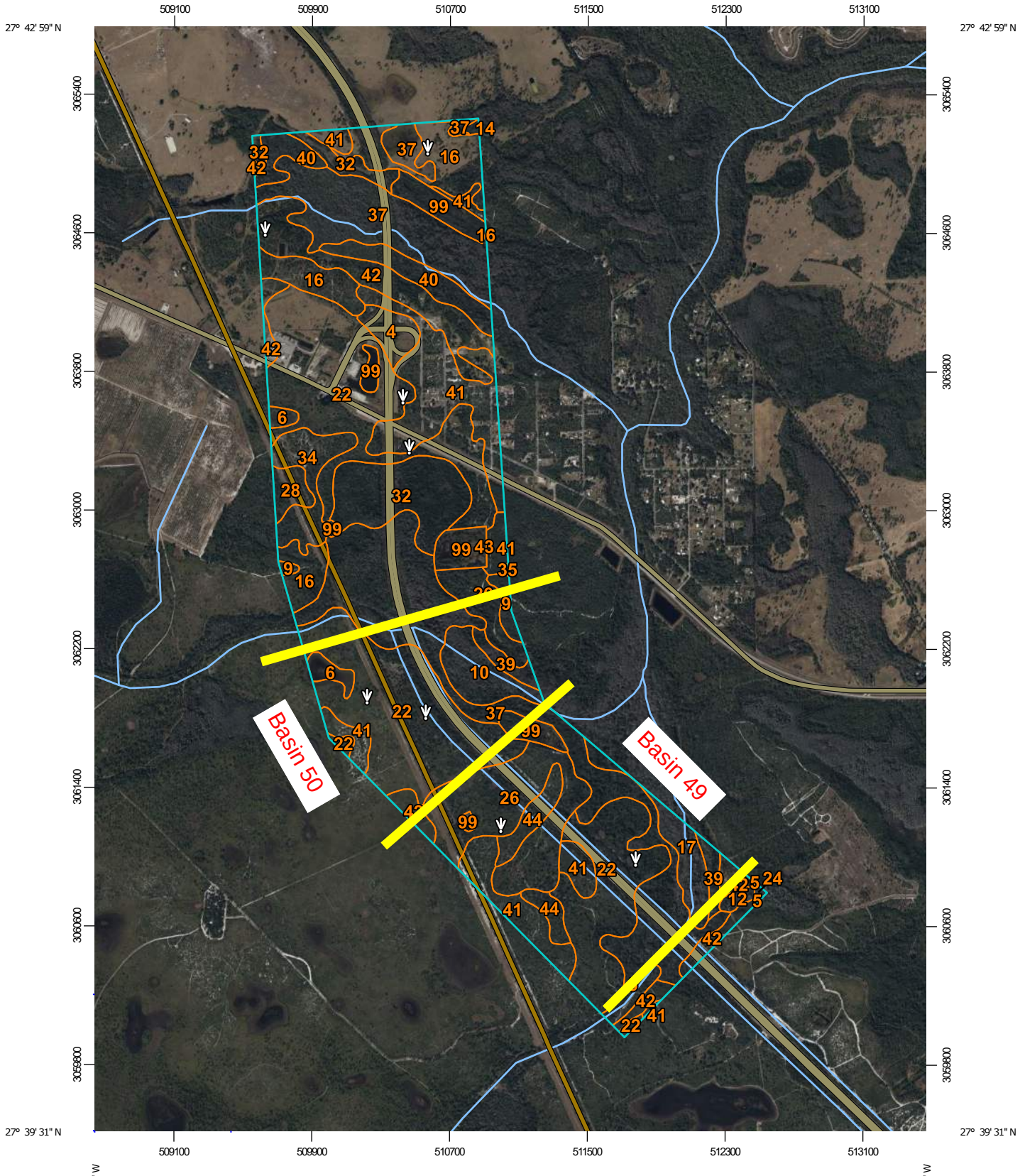
Map Unit Legend (Hydrologic Soil Group 7)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Immokalee fine sand	328.6	14.0%
5	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	114.0	4.9%
21	Pomello sand, 0 to 5 percent slopes	313.1	13.4%
24	Floridana sand, frequently ponded, 0 to 2 percent slopes	2.7	0.1%
34	Satellite fine sand, 0 to 2 percent slopes	55.3	2.4%
45	Myakka fine sand, frequently ponded, 0 to 1 percent slopes	203.0	8.7%
49	Pompano fine sand, 0 to 2 percent slopes	0.8	0.0%
53	Manatee mucky loamy fine sand, depressional	2.8	0.1%
55	Floridana mucky fine sand, frequently ponded, 0 to 1 percent slopes	0.0	0.0%
58	Samsula muck, frequently ponded, 0 to 1 percent slopes	8.2	0.3%
99	Water	2.2	0.1%
Subtotals for Soil Survey Area		**1,030.6**	**44.1%**
Totals for Area of Interest		**2,339.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Basinger and Placid soils, depressional	46.6	2.0%
11	Immokalee fine sand, 0 to 2 percent slopes	418.1	17.9%
14	Myakka fine sand, 0 to 2 percent slopes	183.7	7.9%
15	Okeelanta muck, frequently ponded, 0 to 1 percent slopes	163.2	7.0%
19	Floridana, Placid, and Okeelanta soils, frequently flooded	232.5	9.9%
20	Pomello fine sand, 0 to 5 percent slopes	68.1	2.9%
23	St. Johns fine sand	32.1	1.4%
Subtotals for Soil Survey Area		**1,144.3**	**48.9%**
Totals for Area of Interest		**2,339.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Basinger fine sand, 0 to 2 percent slopes	6.6	0.3%
6	Basinger fine sand, depressional, 0 to 1 percent slopes	28.5	1.2%
9	Cassia fine sand, 0 to 2 percent slopes	22.3	1.0%
12	Floridana fine sand, frequently ponded, 0 to 1 percent slopes	0.1	0.0%
16	Immokalee fine sand, 0 to 2 percent slopes	5.8	0.2%
22	Myakka fine sand, 0 to 2 percent slopes	52.0	2.2%
37	Pompano fine sand, frequently ponded, 0 to 1 percent slopes	1.6	0.1%
41	Satellite sand, 0 to 2 percent slopes	13.0	0.6%
42	Smyrna fine sand, 0 to 2 percent slopes	33.8	1.4%
Subtotals for Soil Survey Area		**163.7**	**7.0%**
Totals for Area of Interest		**2,339.0**	**100.0%**

Custom Soil Resource Report
Soil Map (Hydrologic Soil Group 8)



Map Scale: 1:31,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 450 900 1800 2700

Feet: 0 1500 3000 6000 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

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 1:20,000.

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: Indian River County, Florida
Survey Area Data: Version 21, Sep 1, 2022

Soil Survey Area: Osceola County, Florida
Survey Area Data: Version 20, Sep 1, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jan 18, 2022—Jan 30, 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.

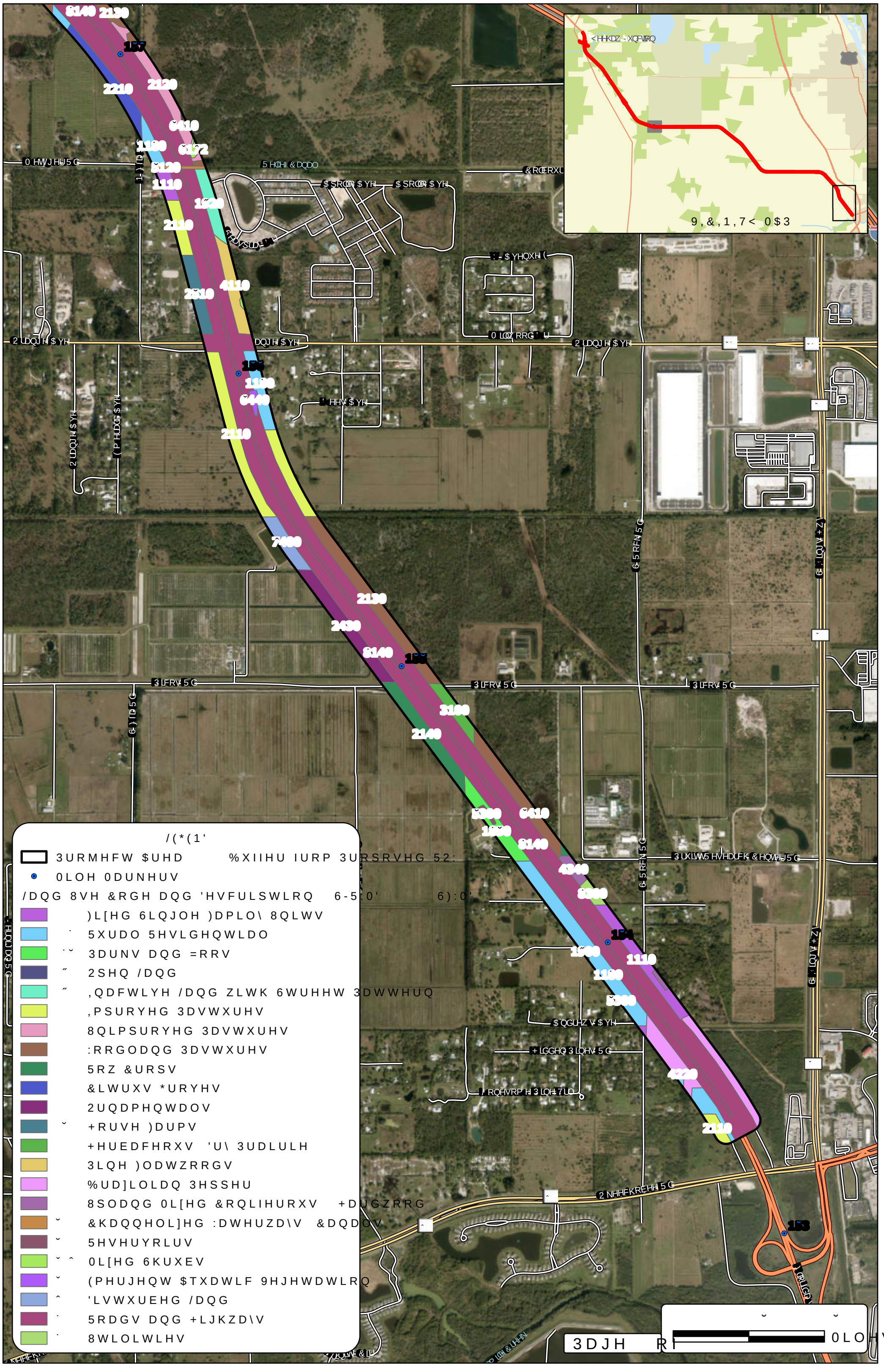
Map Unit Legend (Hydrologic Soil Group 8)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	0.2	0.0%
24	Floridana sand, frequently ponded, 0 to 2 percent slopes	1.0	0.1%
Subtotals for Soil Survey Area		**1.2**	**0.1%**
Totals for Area of Interest		**1,677.3**	**100.0%**

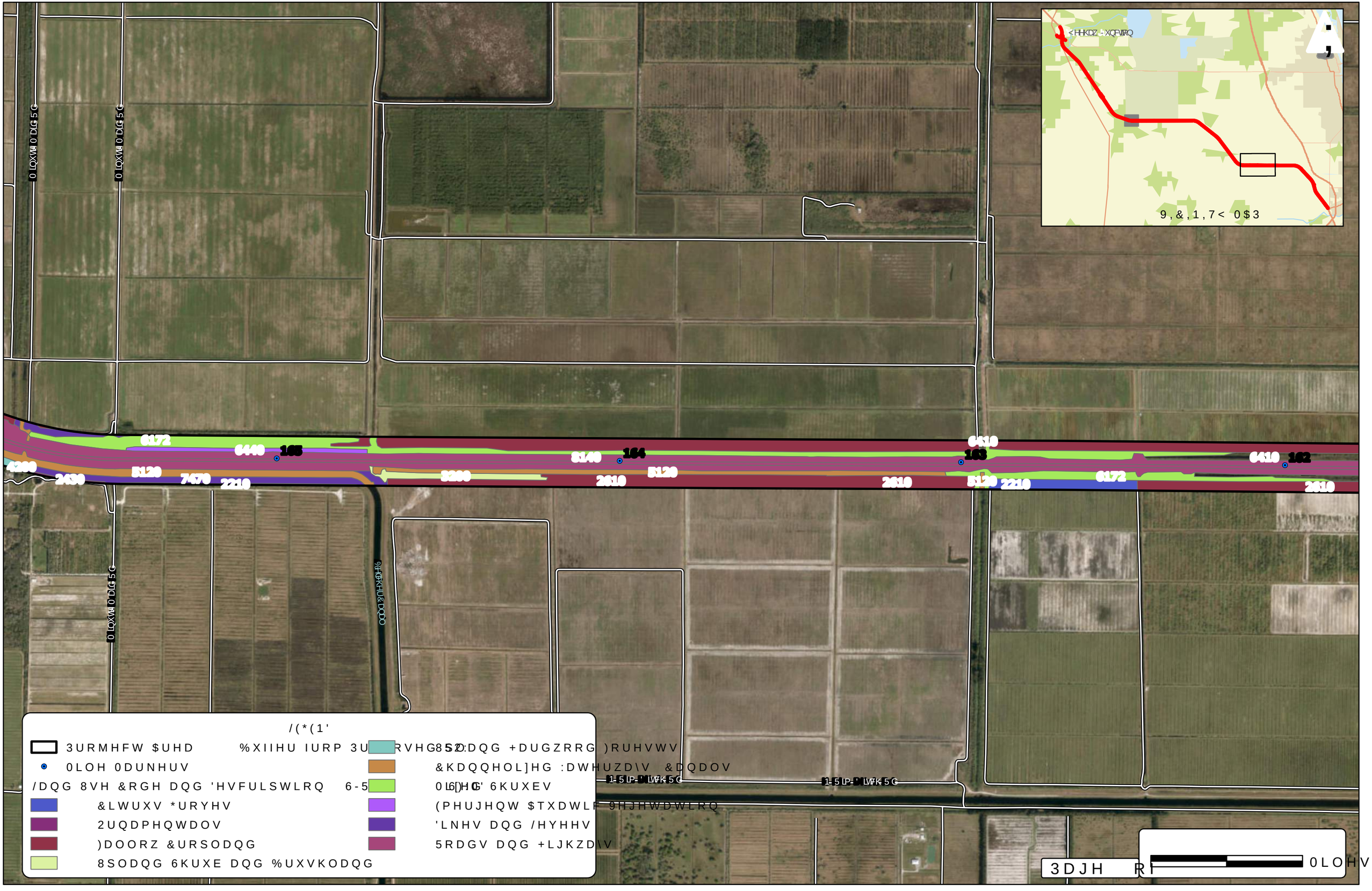
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Arents, 0 to 5 percent slopes	17.5	1.0%
5	Basinger fine sand, 0 to 2 percent slopes	10.2	0.6%
6	Basinger fine sand, depressional, 0 to 1 percent slopes	12.3	0.7%
9	Cassia fine sand, 0 to 2 percent slopes	9.2	0.6%
10	Delray loamy fine sand, depressional	33.4	2.0%
12	Floridana fine sand, frequently ponded, 0 to 1 percent slopes	4.5	0.3%
14	Holopaw fine sand, 0 to 2 percent slopes	1.3	0.1%
16	Immokalee fine sand, 0 to 2 percent slopes	90.0	5.4%
17	Kaliga muck, frequently ponded, 0 to 1 percent slopes	30.5	1.8%
22	Myakka fine sand, 0 to 2 percent slopes	436.7	26.0%
26	Oldsmar fine sand, 0 to 2 percent slopes	132.9	7.9%
28	Paola sand, 0 to 5 percent slopes	12.7	0.8%
32	Placid fine sand, frequently ponded, 0 to 1 percent slopes	88.8	5.3%
34	Pomello fine sand, 0 to 5 percent slopes	38.5	2.3%
35	Pomona fine sand, 0 to 2 percent slopes	0.3	0.0%
37	Pompano fine sand, frequently ponded, 0 to 1 percent slopes	341.9	20.4%
39	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	17.4	1.0%

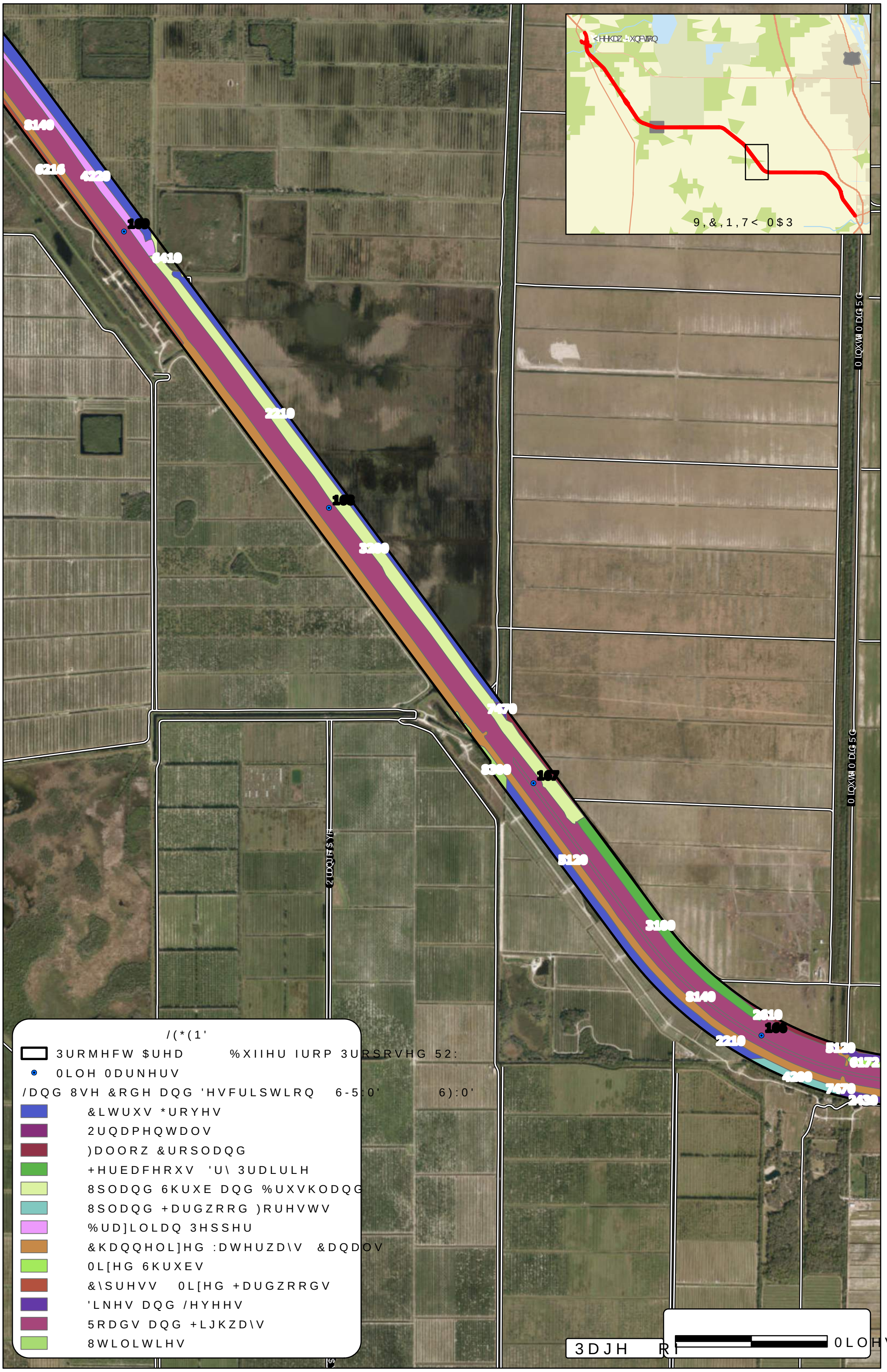
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
40	Samsula muck, frequently ponded, 0 to 1 percent slopes	45.5	2.7%
41	Satellite sand, 0 to 2 percent slopes	156.1	9.3%
42	Smyrna fine sand, 0 to 2 percent slopes	104.1	6.2%
43	St. Lucie fine sand, 0 to 5 percent slopes	9.2	0.5%
44	Tavares fine sand, 0 to 5 percent slopes	26.4	1.6%
99	Water	56.5	3.4%
Subtotals for Soil Survey Area		**1,676.0**	**99.9%**
Totals for Area of Interest		**1,677.3**	**100.0%**

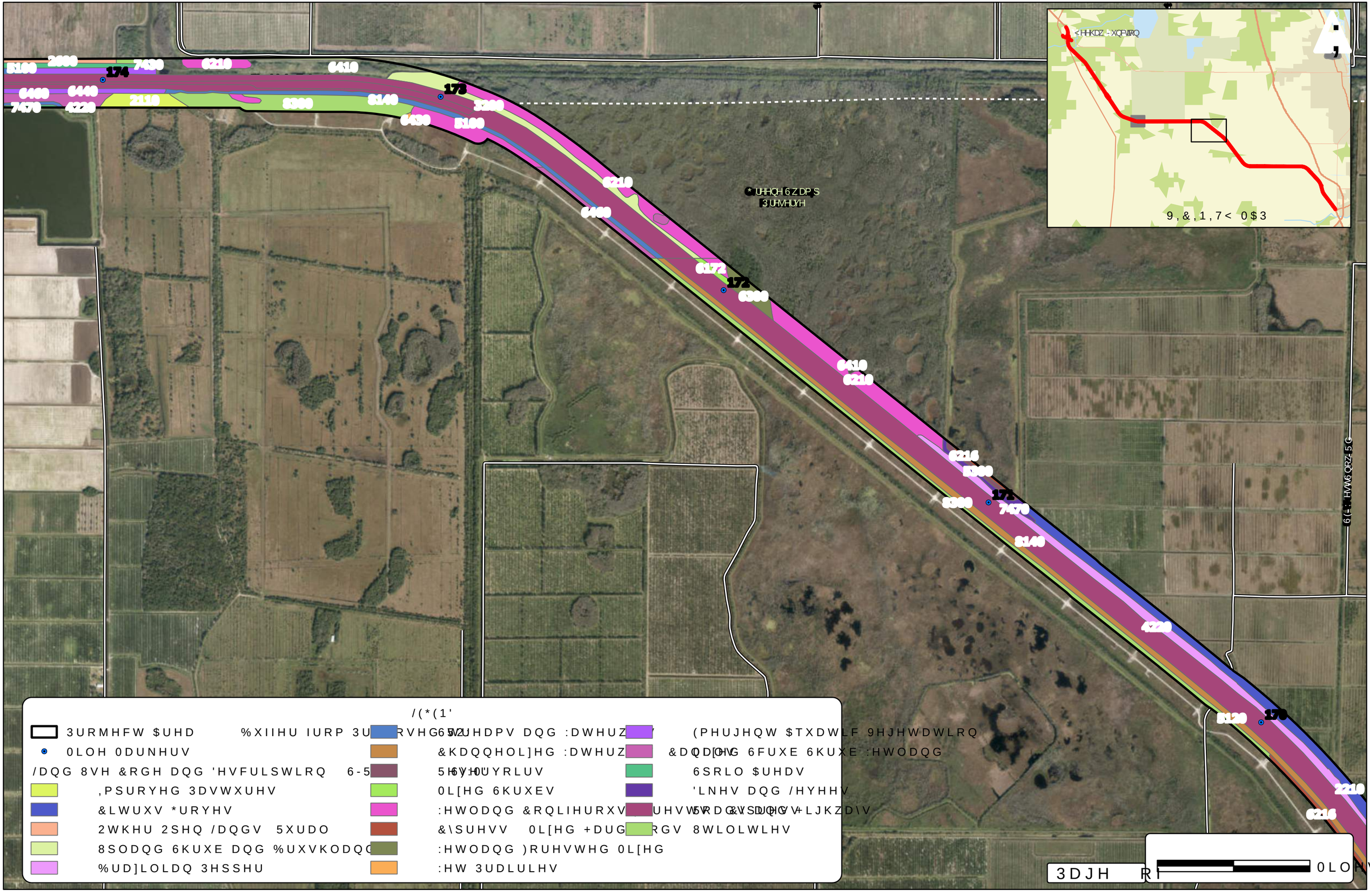
APPENDIX F
Land Use Map


/(*(1'
3URMHFW $UHD
%XIIHU IURP 3URSRVHG 52:
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ
)L[HG 6LQJOH)DPLO\ 8QLWV
5XUDO 5HVLGHQWLDO
3DUNV DQG =RRV
2SHQ /DQG
,QDFWLYH /DQG ZLWK 6WUHHW 3DWWHUQ
,PSURYHG 3DVWXUHV
8QLPSURYHG 3DVWXUHV
:RRGODQG 3DVWXUHV
5RZ &URSV
&LWUXV *URYHV
2UQDPHQWDOV
+RUVH)DUPV
+HUEDFHRXV 'U\ 3UDLULH
3LQH)ODWZRRGV
%UD]LOLDQ 3HSSHU
8SODQG 0L[HG &RQLIHURXV +DUGZRRG
&KDQQHO]HG :HWODQG\V &DQDOV
5HVHUYRLUV
0L[HG 6KUXEV
(PHUJHQW $TXDWLF 9HJHWDWLRQ
'LVWXUEHG /DQG
5RDGV DQG +LJKZD\V
8WLOLWLHV
3DJH RI
0LOHV

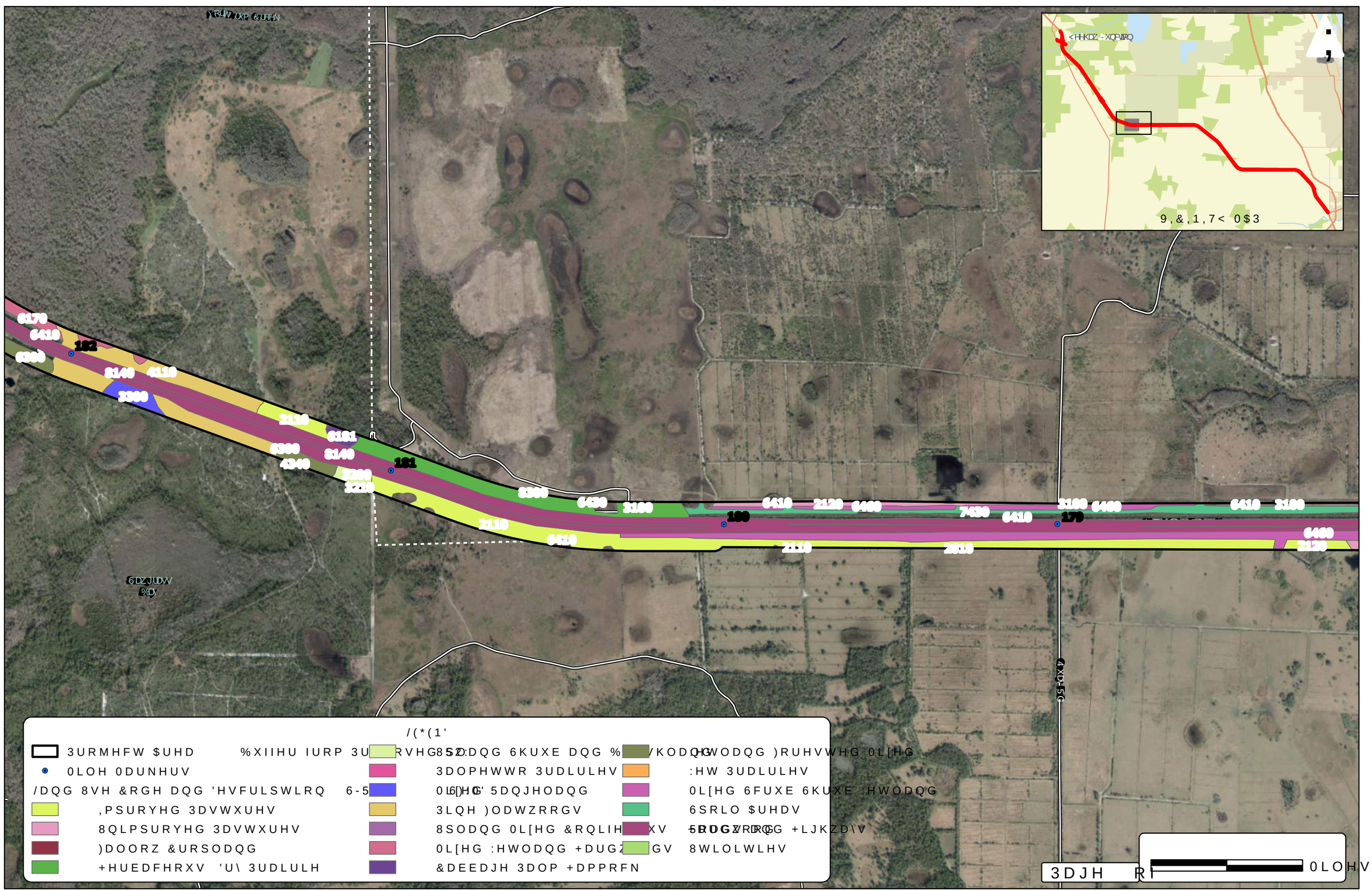
/(*(1'
3URMHFW $UHD
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ
,PSURYHG 3DVWXUHV
8QLPSURYHG 3DVWXUHV
:RRGODQG 3DVWXUHV
5RZ &URSV
&LWUXV *URYHV
%XIIHU IURP 3U RVHG)
0L[HG 5DQJHODQG
&KDQQHOL]HG :HWODQGV &DQDOV
0L[HG 6KUXEV
(PHUJHQW $TXDWLF 9HJHWDWLRQ
5RDGV DQG +LJKZD\V
3DJH RI
0LOHV

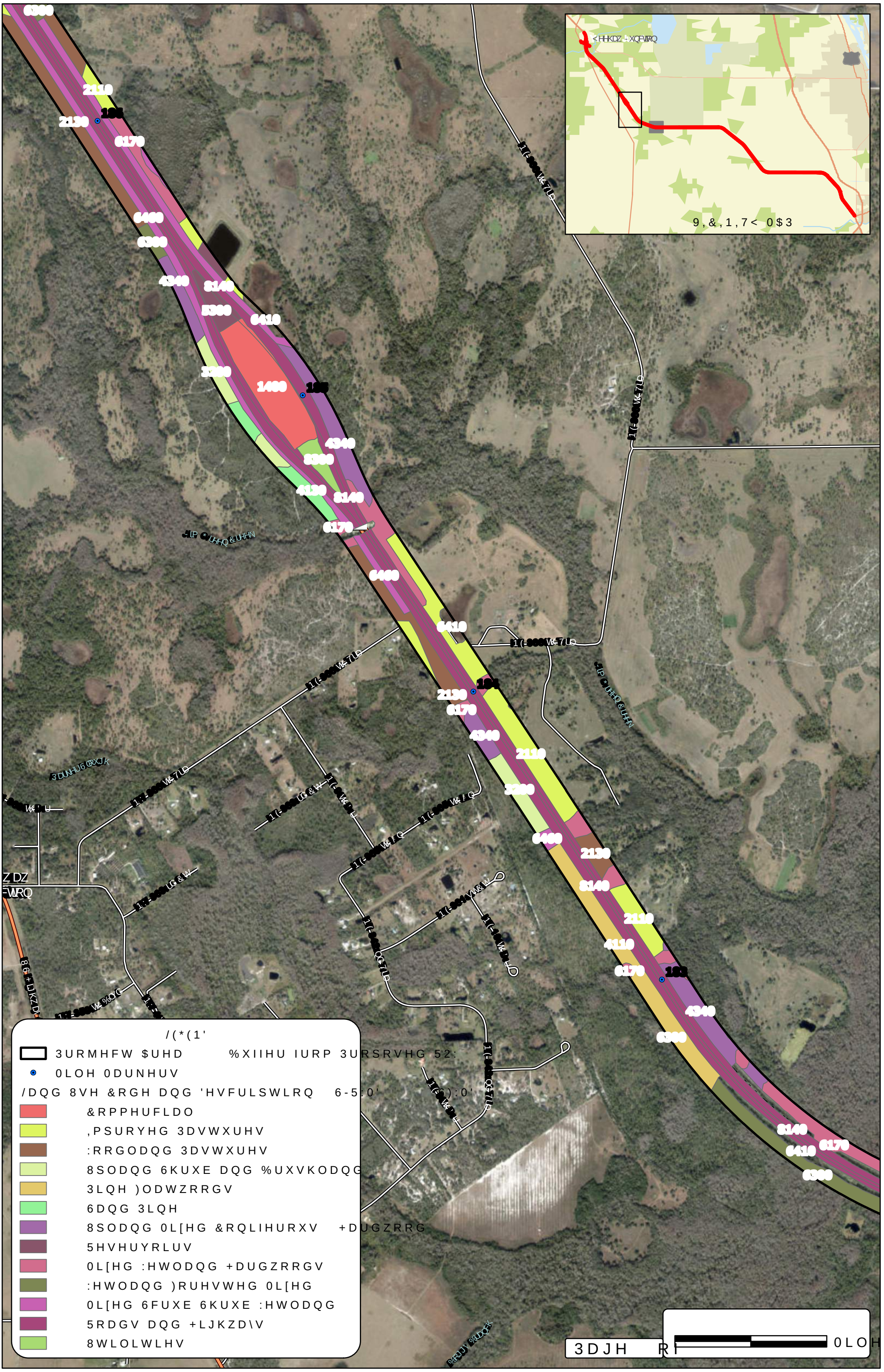

0 LQXW 0 DLG 5 G
0 LQXW 0 DLG 5 G
0 LQXW 0 DLG 5 G
%HDFKHU&DQDO
6172
6440
165
8140
164
8120
7470
2210
2610
6410
163
6410
162
2610
2610
2610
2610
6172
2210
/(*(1'
3URMHFW $UHD
%XIIHU IURP 3U RVHG8 52:DQG +DUGZRRG)RUHVWV
0LOH 0DUNHUV
&KDQQHOL]HG :DWHUZD\V &DQDOV
/DQG 8VH &RGH DQG 'HVFULSWLRQ 6-5 0L6[]HG 6KUXEV
&LWUXV *URYHV (PHUJHQW $TXDWLF 9HJHWDWLRQ
2UQDPHQWDOV 'LNHV DQG /HYHHV
)DOORZ &URSODQG 5RDGV DQG +LJKZD\V
8SODQG 6KUXE DQG %UXVKODQG
3DJH RI
0LOHV

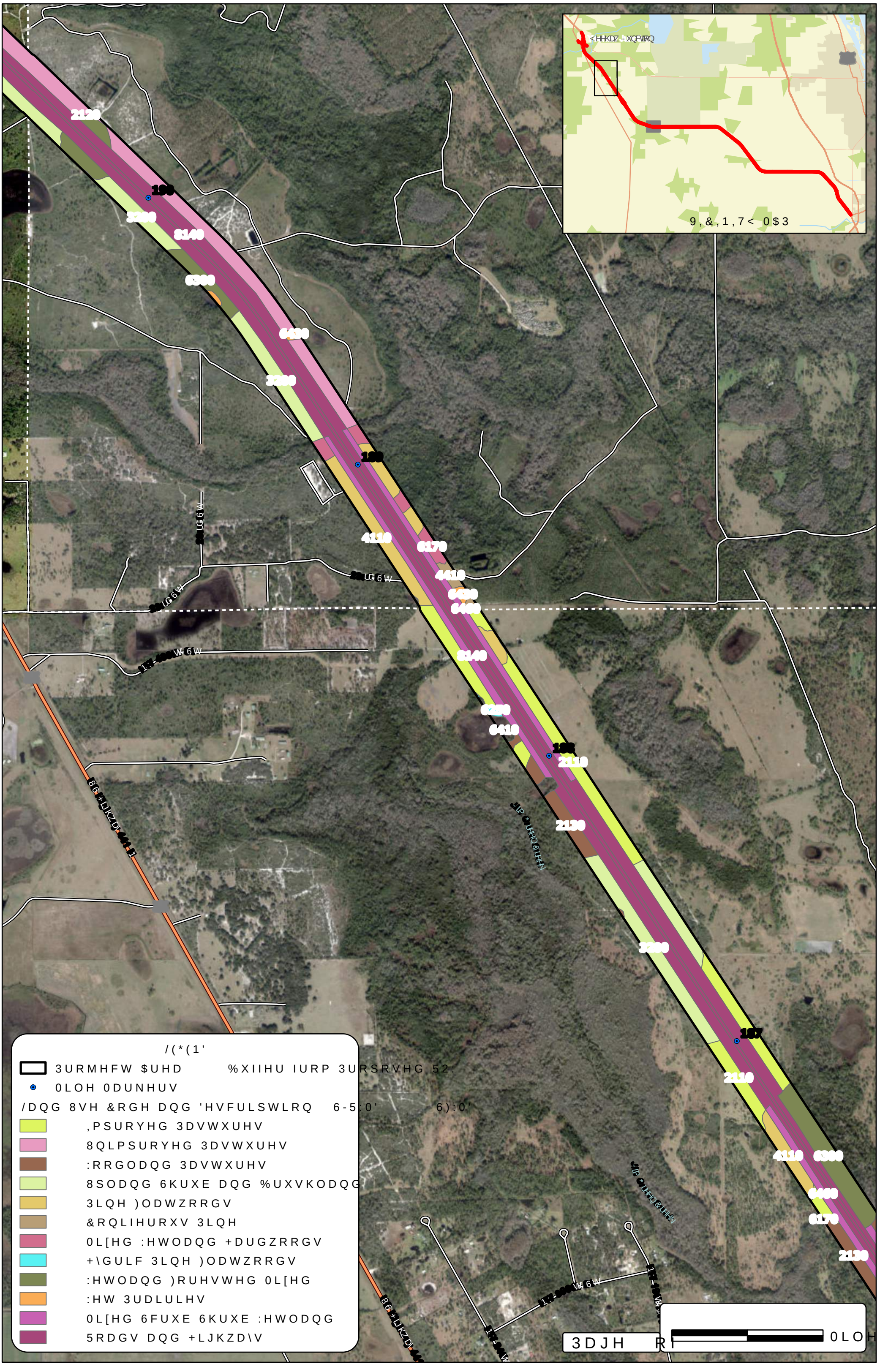

/(*(1'
3URMHFW $UHD %XIIHU IURP 3URSRVHG 52:
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ 6-5:0' 6):0'
&LWUXV *URYHV
2UQDPHQWDOV
)DOORZ &URSODQG
+HUEDFHRXV 'U\ 3UDLULH
8SODQG 6KUXE DQG %UXVKODQG
8SODQG +DUGZRRG)RUHVWV
%UD]LOLDQ 3HSSHU
&KDQQHOL]HG :HWHUZD\V &DQDOV
0L[HG 6KUXEV
&\SUHVV 0L[HG +DUGZRRGV
'LNHV DQG /HYHHV
5RDGV DQG +LJKZD\V
8WLOLWLHV
3DJH R
0LOHV

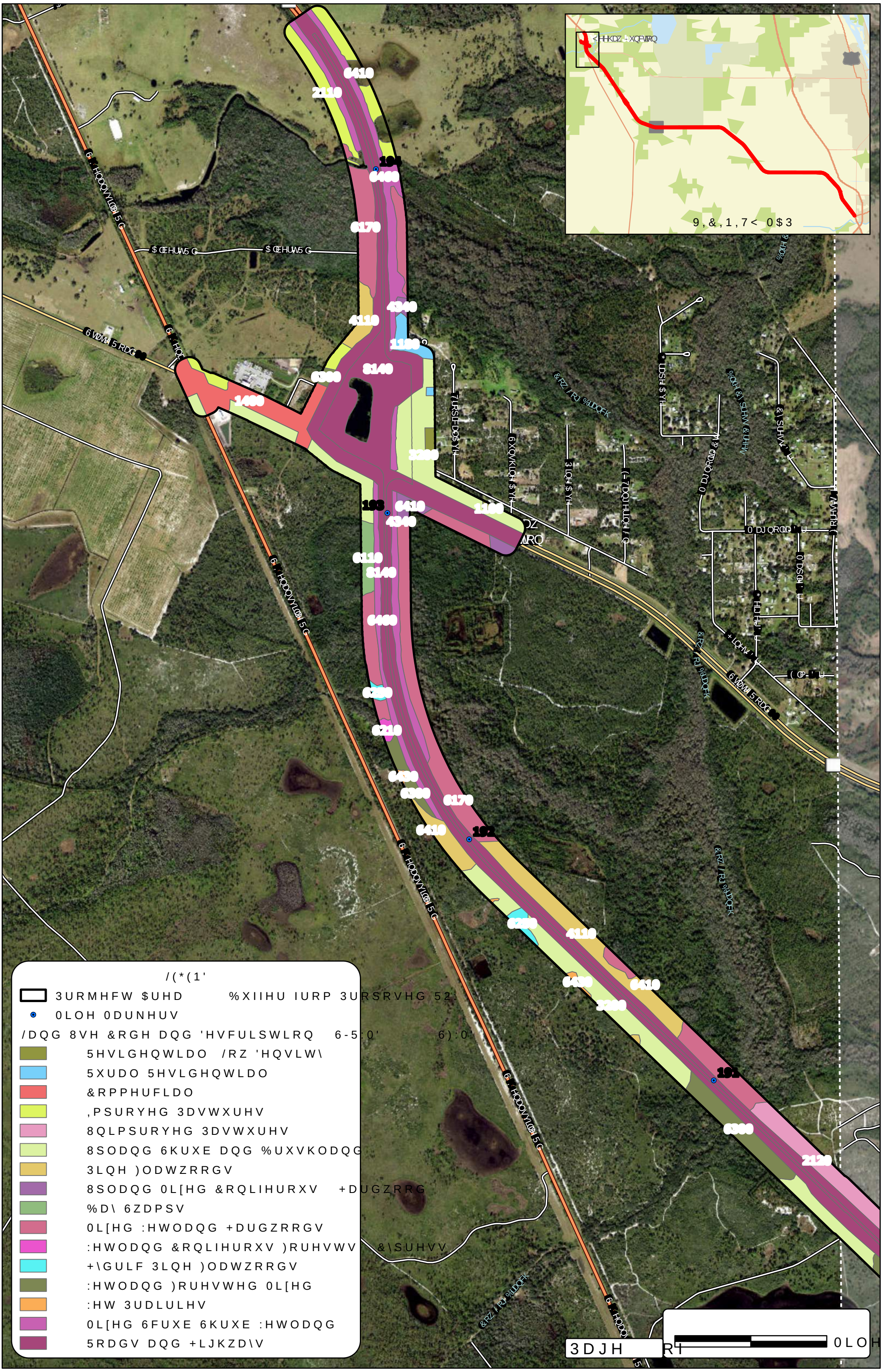

174
173
172
171
170
7490
6210
6410
6440
7470
4220
2110
8360
8140
6430
8100
6460
8360
7470
8140
4220
8120
2210
2216
* UHHQH 6ZDPS
3 UHVHUYH
< HHKDZ - XQPIRQ
9 , & , 1 , 7 < 0 $ 3
/(*(1'
3URMHFW $UHD
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ
,PSURYHG 3DVWXUHV
&LWUXV *URYHV
2WKHU 2SHQ /DQGV 5XUDO
8SODQG 6KUXE DQG %UXVKODQG
%UD]LOLDQ 3HSSHU
%XIIHU IURP 3U
&KDQQHOL]HG :DWHUZ
5LYHUV
0L[HG 6KUXEV
:HWODQG &RQLIHURXV
&\SUHVV 0L[HG +DUG
:HWODQG)RUHVWHG 0L[HG
:HW 3UDLULHV
(PHUJHQW $TXDWLF 9HJHWDWLRQ
6SRLO $UHDV
'LNHV DQG /HYHHV
3DJH RI
0LOHV

6430
6410
6440
7430
5100
177
5140
6400
2210
6410
176
6440
6400
6172
5120
6410
7430
5100
176
2000
7430
5100
5140
6440
6400
4220
7470
2120
2210
9,&,1,7< 0$3
/(*(1'
3URMHFW $UHD
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ
,PSURYHG 3DVWXUHV
8QLPSURYHG 3DVWXUHV
&LWUXV *URYHV
$EDQGRQHG *URYHV
%XIIHU IURP 3U
%UD]LOLDQ 3HSSHU
&KDQQHO]HG :DWHUZD\V
5HVHUYRLUV
0L[HG 6KUXEV
:HW 3UDLULHV
RVHG2SWKHU 2SHQ /DQGV
XUDO(PHUJHQW $TXDWLF 9HJHWDWLRQ
0L[HG 6FUXE 6KUXE :HWODQG
6SRLO $UHDV
5RDGV DQG +LJKZD\V
3DJH RI
0LOHV


6170
6410
182
3300
6140
4510
2110
6161
3300
6140
4340
181
3300
3210
6430
3100
2110
6410
180
6410
2120
6460
7430
6410
179
3100
6460
6410
3100
6460
2120
2110
2610
4XD-5C
6DZJUDV
%D
/(*(1'
3URMHFW $UHD
%XIIHU IURP 3U RVHG 8 52 DQG 6KUXE DQG % /KODQG
)RUHVWHG 0L[HG
0LOH 0DUNHUV
3DOPHWWR 3UDLULHV
:HW 3UDLULHV
/DQG 8VH &RGH DQG 'HVFULSWLRQ 6-5
0L[HG 5DQJHODQG
0L[HG 6FUXE 6KUXE :HWODQG
,PSURYHG 3DVWXUHV
3LQH)ODWZRRGV
6SRLO $UHDV
8QLPSURYHG 3DVWXUHV
8SODQG 0L[HG &RQLIHU
)DOORZ &URSODQG
0L[HG :HWODQG +DUGZRRGV
8WLOLWLHV
+HUEDFHRXV 'U\ 3UDLULH
&DEEDJH 3DOP +DPPRFN
3DJH RI
0LOHV


/(*(1'
3URMHFW $UHD %XIIHU IURP 3URSRVHG 52:
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ 6-5:0' 6):0'
&RPPHUFLDO
,PSURYHG 3DVWXUHV
:RRGODQG 3DVWXUHV
8SODQG 6KUXE DQG %UXVKODQG
3LQH)ODWZRRGV
6DQG 3LQH
8SODQG 0L[HG &RQLIHURXV +DUGZRRG
5HVHUYRLUV
0L[HG :HWODQG +DUGZRRGV
:HWODQG)RUHVWHG 0L[HG
0L[HG 6FUXE 6KUXE :HWODQG
5RDGV DQG +LJKZD\V
8WLOLWLHV
3DJH RI
0LOHV


/(*(1'
3URMHFW $UHD %XIIHU IURP 3URSRVHG 52:
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ 6-5:0' 6):0'
,PSURYHG 3DVWXUHV
8QLPSURYHG 3DVWXUHV
:RRGODQG 3DVWXUHV
8SODQG 6KUXE DQG %UXVKODQG
3LQH)ODWZRRGV
&RQLIHURXV 3LQH
0L[HG :HWODQG +DUGZRRGV
+\GULF 3LQH)ODWZRRGV
:HWODQG)RUHVWHG 0L[HG
:HW 3UDLULHV
0L[HG 6FUXE 6KUXE :HWODQG
5RDGV DQG +LJKZD\V
3DJH RI
0LOHV


/(*(1'
3URMHFW $UHD
%XIIHU IURP 3URSRVHG 52:
0LOH 0DUNHUV
/DQG 8VH &RGH DQG 'HVFULSWLRQ
5HVLGHQWLDO /RZ 'HQVLW\
5XUDO 5HVLGHQWLDO
&RPPHUFLDO
,QGXVWULDO 3DVWXUHV
8QLPSURYHG 3DVWXUHV
8SODQG 6KUXE DQG %UXVKODQG
3LQH)ODWZRRGV
8SODQG 0L[HG &RQLIHURXV +DUGZRRG
%D\ 6ZDPSV
0L[HG :HWODQG +DUGZRRGV
:HWODQG &RQLIHURXV)RUHVWV
&\SUHVV
+\GULF 3LQH)ODWZRRGV
:HWODQG)RUHVWHG 0L[HG
:HW 3UDLULHV
0L[HG 6FUXE 6KUXE :HWODQG
5RDGV DQG +LJKZD\V
3DJH
0LOHV

APPENDIX G
Project Meeting Minutes

SFWMD Pre-Application Meeting Notes
August 15, 2024

1. Attendees

Name	Email
Michael Leo	Michael.Leo@dot.state.fl.us
Chandra Raman	chandra@apexengineersfl.com
Nicolette Lundie	Nicolette.Lundie@dot.state.fl.us
Annemarie Hammond	Annemarie.Hammond@dot.state.fl.us
Erin Yao	Erin.Yao@dot.state.fl.us
Tiffany Crosby	Tiffany.Crosby@dot.state.fl.us
Carlos Rodriguez	Carlos.Rodriguez@metriceng.com
Rax Jung	Rax.Jung@dot.state.fl.us
Paul Carballo	Paul.Carballo@metriceng.com
Beth Beam	Beth.Beam@stantec.com
Kristee Booth	Kristee.Booth@MyFWC.com
Barbara Conmy	BConmy@sfwmd.gov
Shari Tellman	Stellman@sfwmd.gov
Jay Cornelius	Jay.Cornelius@dot.state.fl.us
Jesse Markle	JMarkle@sfwmd.gov
Jennifer Shipley	JShipley@millerlegg.com
Adriana Kirwan	Adriana.Kirwan@dot.state.fl.us
Blake Meinecke	Blake.Meinecke@dot.state.fl.us
Greg Moore	Greg.Moore@dot.state.fl.us
Henry Pinzon	Henry.Pinzon@dot.state.fl.us
Kenneth Quigley	KQuigley@sfwmd.gov
Rob Myers	Rob.Myers@metriceng.com
Mohit Soni	Mohit.Soni@stantec.com
Arifa Sultana	ASultana@sfwmd.gov

2. Meeting Notes

- The meeting's purpose was to present the project to SFWMD and discuss alternative treatment approaches, the existing conservation land, impaired water bodies, and other environmental features that can influence drainage design.
- An overview of the project was presented including the project location and SFWMD's limits within the project corridor. He further explained that this project is in a PD&E study phase.
- Additional details included:
    - There are NSLRWCD canal systems within the project corridor.
    - Water quantity will be based on a 25-year -72-hour design storm event for pre-post development attenuation. All basins within the project location are considered open basins.
    - Water Quality- 2.5 (inch) over new impervious area in areas of reconstruction and widening.
    - Inside shoulders will be widened from 8 feet to 12 feet. Since no pollutant loading is expected from the shoulder pavement, the project is not planning to treat the additional impervious area from the shoulder pavement.
    - The project proposes using existing roadside borrow ditch/canal as potential treatment facilities.
    - Other treatment methods include roadside linear swales and offsite stormwater ponds.

- **C-25 Canal**
    - Use allowable discharge criteria in the Applicant Handbook when discharging into C-25 Canal.
    - A R/W occupancy permit will be required for this project due to the replacement of the C-25 Canal bridge.
    - The bridge replacement will require a minimum vertical clearance of 15 feet from the top of the bank and a horizontal clearance of 20 feet between the faces of the end bents.
    - Assume COE 408 authorization is needed.
    - Per the SFWMD Right-of-Way, no planned improvements are at the C-25 Canal.

- **Conservation Lands**
    - CERP projects and SFWMD-owned conservation lands are located within the project limits.
    - The project needs to distinguish conservation lands from WMD conservation easements. If it is a conservation easement, then a recorded easement should be granted to the District; the SFWMD Board is not receptive to releasing or amending conservation easements. If the project were to impact or encroach on a conservation easement, then a release or amendment to the conservation

easement is needed.

- **Impaired Water Criteria**
  - Per SFWMD, the project is subject to impaired water rules as long as the discharge point is within the basin, which has adopted TMDL and BMAP criteria. This rule applies even if the discharge point is far from the receiving impaired water body.
- **New Rule Application started on June 28, 2024**
  - When the application is made to the District, Section 3.1.2 of the Applicant Handbook Volume-1 will be followed, which has the grandfathering criteria. The project is not subject to this new rule. In that case, the project will be subject to Appendix E of the prior Volume-II, which addresses the impaired water rule, TMDL, BMAP, and water quality and quantity rules.

- **Missing FEMA Floodplain information within SFWMD limits**
  - Floodplain impact – No documented Floodplain information is available within the SFWMD corridor.
  - SFWMD is unaware of any efforts made to coordinate with FEMA through regulation about the missing FEMA map within the SFWMD limits. The SFWMD prefers, at the time of permit application submittal, to follow the latest FEMA flood information available in these areas.

- There are currently no regional stormwater needs or opportunities within the project corridor. However, the project needs to follow up in the future regarding what opportunities are available.
- A single permit submittal for the ROW Occupancy Permit for C-25 bridge replacement is required.
- The project should plan on two separate ERP's for each project. However, when the project is getting closer to the ERP application phase, we will coordinate with both SJRWMD and SFWMD to see if one district can take the lead on the ERP.

***** END OF MEETING*****

Metric Engineering will rely on these notes as the approved record of matters discussed and conclusions reached during this meeting unless you send the author written notice to the contrary within seven calendar days of receipt date of this meeting record.

Turnpike Drainage Access Maintenance Coordination Meeting Notes
July 31, 2024

1. Attendees

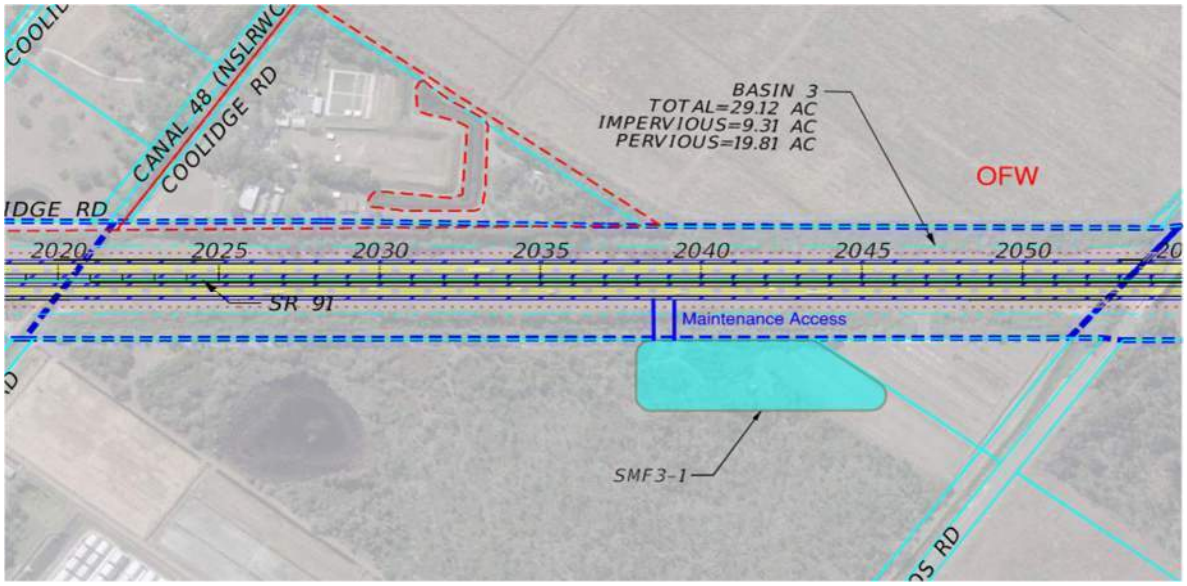
Name	Email
Leo, Michael	Michael.Leo@dot.state.fl.us
Carballo, Paul	Paul.Carballo@metriceng.com
Rodriguez, Carlos	Carlos.Rodriguez@metriceng.com
Yao, Erin	Erin.Yao@dot.state.fl.us
May, Robert	Robert.May@dot.state.fl.us
Raman, Chandra	chandra@apexengineersfl.com
Kirwan, Adriana	Adriana.Kirwan@dot.state.fl.us

2. Meeting Notes

- The purpose of this meeting is to discuss the accessibility and maintainability of offsite treatment ponds.
- Chandra explained that the project will use two alternative treatment methods. The first will utilize an offsite treatment pond, and the second will utilize linear swale treatment within the right-of-way (ROW).
- A previous meeting was held on 4-24-2024 with the Maintenance Department to discuss the swale treatment approach.
- Chandra presented several scenarios for accessing the offsite treatment ponds and their challenges.

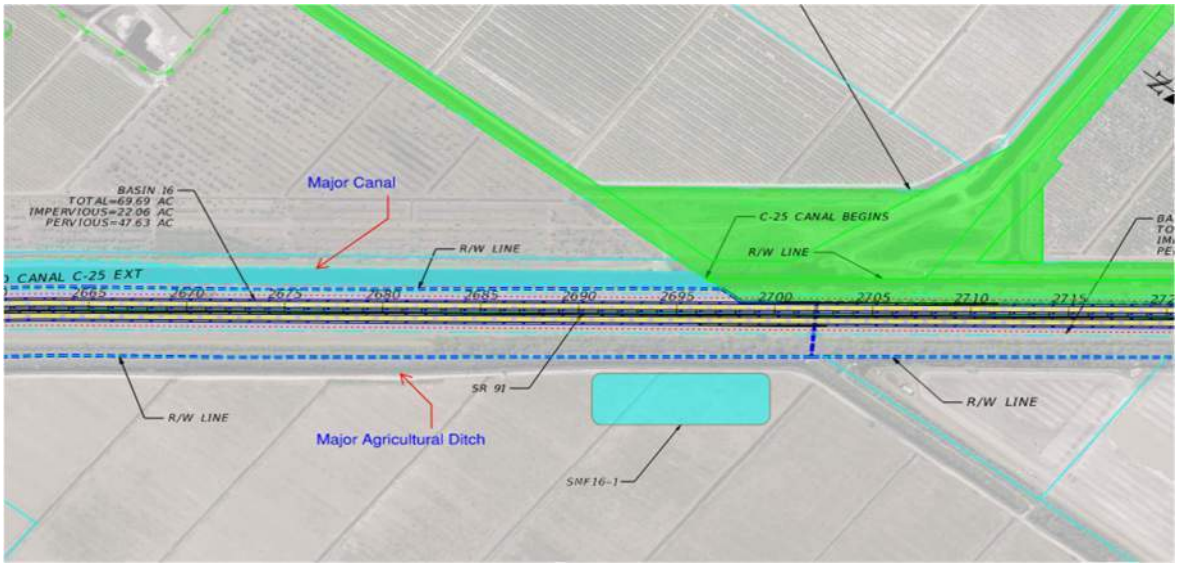
Scenario-1

- The first scenario will include treatment ponds located right next to ROW. Maintenance access to the pond will be done by constructing a berm or ramp and filling in the borrow ditch. (See exhibit below)
- Maintenance does not have any issues with this approach. The only challenge with this scenario is the existing or proposed guardrail, which could prevent access from the roadway.



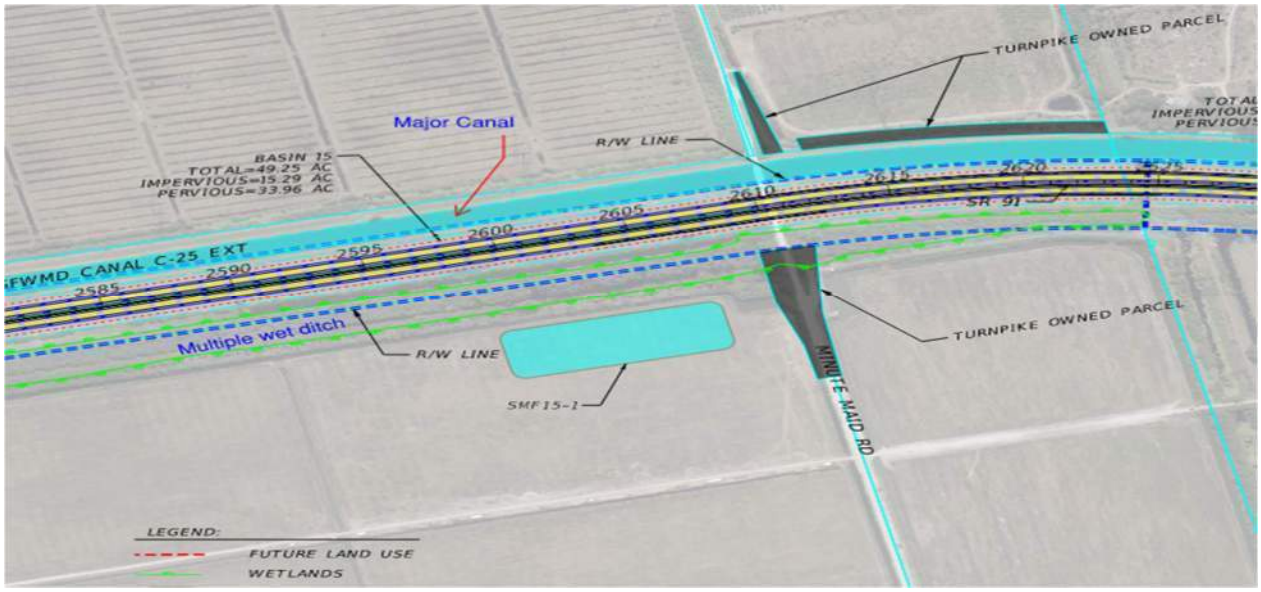
Scenario-2

- In this scenario, there is an existing deep canal on one side of the roadway and a major wet ditch on the other. The proposed pond is located outside of the borrow ditch and agricultural ditch. (See exhibit below)
- One approach to accessing the pond is constructing a drainage siphon under the borrow ditch and agricultural ditch before discharging into the pond. However, the siphon approach is not preferred due to its long-term maintainability issue.
- The more acceptable option is to fill in the borrow ditch and re-route the agricultural ditch around the pond. These are two solutions that we could offer during the PD&E study. However, successfully implementing the re-rerouting agricultural ditch solution will require close coordination with the property owners. Their involvement is crucial for the future maintenance of the re-routed agricultural ditch.
- The long run of guardrail may add access challenges
- If the borrow ditch is not connected to the existing agricultural canal and does not take in offsite runoff, then the proposed pond could be moved closer to the right-of-way line.



Scenaria-3

- Very similar to Scenario 2. Move the ponds closer to the existing roadway right-of-way that might cross the Turnpike. This way, the Pond can be accessed from the adjacent roadway, such as Minute Maid Road. (See exhibit below)
- The challenge will be a larger swath of private wet ditch that needs to be rerouted. The Maintenance Department does not favor leaving private land between the proposed pond and the right-of-way. It is better to move the ponds closer to the right-of-way and reroute the wet agricultural ditches.
- Maintenance prefers to move ponds closer to the R/W and reroute the existing agricultural canals around the Pond. The rerouted agricultural canal will be handed back to the property owner for them to maintain. Turnpike will only purchase the pond areas needed for the project.
- Essentially, we will acquire R/W for the Pond only. We enter into agreements with property owners to reroute the canal outside the Pond R/W and hand it over after the canal rerouting is constructed. Therefore, the property owners will maintain the rerouted canal.



- **Major Canal:** Maintenance is not in favor of re-routing a major canal owned and operated by others. Maintenance would instead realign or cross a minor canal rather than a major canal. Minor or smaller canals can be relocated more easily than major canals.
- Pond locations are preferred to be locked in at the PD&E level for acquisition. The design office prefers that the pond site be located within a single property rather than multiple properties. Taking from one owner is much easier than taking from multiple owners. The purpose of the PSR is to justify the take from the property owner.

Key points and summary of the meeting to provide better maintenance access:

- Move the ponds closer to the ROW
- Re-routing agricultural ditches around the pond if feasible.
- Piping using the siphon approach.
- Acquire all the property we need to access the property.
- Don't want to use someone else's property to access our ponds for Maintenance (no easements)
- Reroute canal on other property. Do not want the rerouted canal in Turnpike Row
- Set pond adjacent to existing corridor without other owners in between

When there is no opportunity to place an offsite pond due to a major canal running on both sides of the roadway, an offsite pond is not a viable solution. Then, swale treatment will be the solution since there are no offsite pond opportunities.

Action Items:

- Chandra to determine and label major and minor canals along the project corridor, by 8-6-2024.
- Chandra to update the drainage maps based on this meeting, by 8-30-2024
- Chandra to identify roads that crosses Turnpike and place the pond sites closer to the road to get maintenance access, by 8-30-2024.

Turnpike Drainage Coordination Meeting Notes
April 19, 2023

1. Attendees

Name	Name
Suman Juluru	Carlos Rodriguez
Fred Gaines	Paul Carballo
Annemarie Hammond	Chandra Raman
Rax Jung	Rubina Kandiah
Adriana Kirwan	
Erin Yao	

2. Meeting Notes

The intent of this meeting was to provide an update on the on-going drainage analysis. The following is a brief summary of the discussion on the on-going drainage analysis.

- It was noted that additional coordination meetings with South Florida Water Management District and St. Johns River Management District are needed.
    - The Department noted that once we have the preferred alternative we can schedule the coordination meetings.
- It was noted that on-site drainage linear systems are typically not recommended during the PD&E Study. Unless it is constrained on both sides of the roadway for pond sites.
- **Meeting Resolution**: On-going coordination with Turnpike right-of-way will continue to determine if there is a need to change the analysis for the non-constrained areas. Within constrained areas of the project the scoped approach of one onsite and one offsite pond will remain. Regarding the non-constrained areas, it was noted that even though an onsite option works, it may be preferrable to provide 2 offsite pond locations.
    - This will allow the Department to acquire land before the land is developed and costs more in the future.
    - The Department will coordinate with right-of-way to determine if two offsite pond options will be necessary for this study.
- The Department noted that there are locations along the project that the turnpike has currently acquired.
    - Near the Fort Drum Service Plaza they currently own a pond on the west side
    - A wedged parcel near Mile Marker 173
    - **Action Item**: The department will coordinate with the Turnpike Right of Way department to provide the limits for these special parcels.
- It was noted that the team will only need to treat the new impervious pavement for this project. Attenuation will be provided for both existing and new impervious areas.
- The Florida Forever (BOT) areas will be considered for pond locations.
- Pond sizing will be based on a six lanes typical section.

- Roadway right-of-way lines will be verified against the Departments GIS map and existing as-built plans.
- Direct discharge into impaired water bodies will be evaluated during study and the definition of direct discharge will be clarified with the Water Management District.
- It was noted that Grove Land Reservoir will be developed between mile posts 159 and 165.
    - Potential impacts and benefits of this project will be documented in the PSR.
    - The Metric Team will coordinate with the Department for additional information.
- SHWT elevation for offsite/onsite ponds will be based on USDA Soil Survey. Coordination will continue if the SHWT from USDA Soil Survey is not realistic.

***** END OF MEETING*****

Metric Engineering will rely on these notes as the approved record of matters discussed and conclusions reached during this meeting unless you send the author written notice to the contrary within seven calendar days of receipt date of this meeting record.

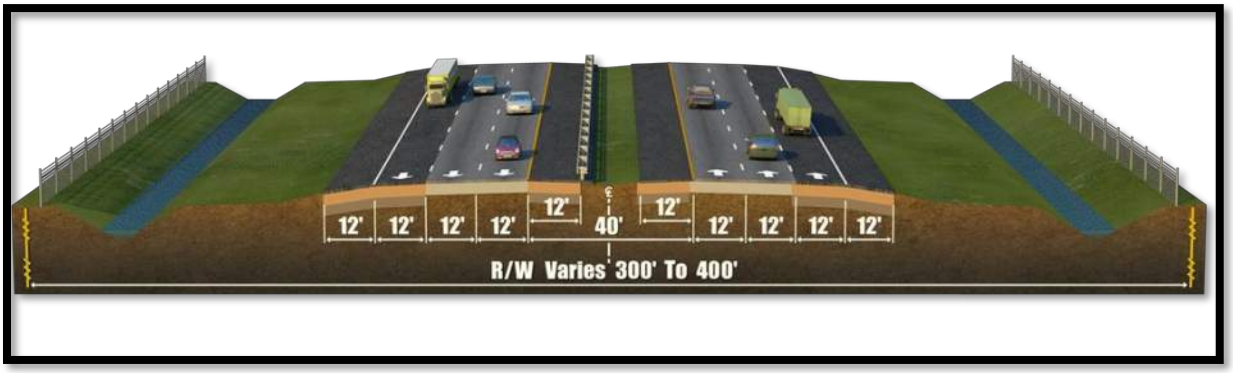
Turnpike Drainage Coordination Meeting Notes
March 27, 2024

1. Attendees

Name	Email
Leo, Michael	Michael.Leo@dot.state.fl.us
Paul Carballo	Paul.Carballo@metriceng.com
Pinzon, Henry	Henry.Pinzon@dot.state.fl.us
Chandra Raman	chandra@apexengineersfl.com
Rafael Zamarripa	rafael.zamarripa@apexengineersfl.com
Rob Myers	Rob.Myers@metriceng.com
Carlos Rodriguez	Carlos.Rodriguez@metriceng.com
Jung, Rax	Rax.Jung@dot.state.fl.us
Yao, Erin	Erin.Yao@dot.state.fl.us
Kirwan, Adriana	Adriana.Kirwan@dot.state.fl.us

2. Meeting Notes

The intent of this meeting was to provide an update on the ongoing drainage evaluation based on the approved Alternative-3 Typical Section.

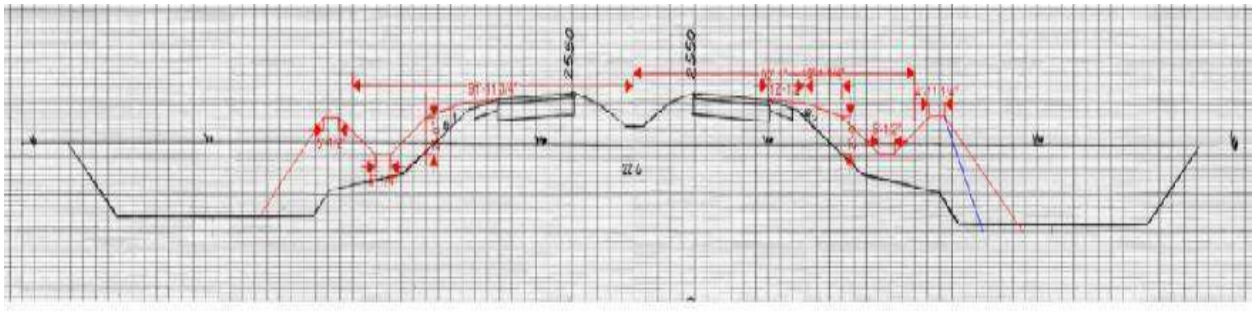


The following is a summary of the discussion on the ongoing drainage analysis.

Chandra provided a brief overview of the project, including the location and limits of the project.

- Mr. Rob Myers clarified that the State of Florida has acquired some Florida Forever Lands, which are now conservation easements.
- When both sides of the roadway are constrained with conservation easements or other environmentally sensitive features, offsite ponds are not feasible and roadside swales become a viable alternative.

- Construction of the roadside swales will impact current borrow ditches, which are not permitted. The existing roadside ditches are shallow, with rooted vegetation at some places and deep standing water at others.
- Based on the existing as-built plans, the existing roadside ditches are within the Turnpike ROW. This needs to be verified with the ROW Department.
- It was discussed that existing roadside ditches can be partially filled, providing it does not impact offsite runoff that is currently being collected. This approach, which could result in storage loss, needs to be coordinated with the Water Management District.
- Roadside ditches that are not connected to the existing cross drains and are not collecting offsite runoff (closed-off ditch) can be converted into treatment and attenuation facilities (wet detention or dry retention-based groundwater elevations). This approach minimizes any rework and takes advantage of the existing ditch within the ROW. FTE advised placing a note in the PSR that states: "Review alternatives to utilize existing ditch and not use double ditch where possible providing this approach will not impact offsite runoff ."
- The Team expects a low risk for utilizing the existing borrow ditch as a potential treatment system and not impacting offsite runoff. This is considering there are agricultural ditches that route the offsite runoff away from the FTE ditch.



- The proposed linear treatment/attenuation swale, as shown in the above exhibit, is feasible option.
- APEX's role is to diligently follow FDM for berm width and berm front slope requirements. This approach will need to be verified with the Maintenance Department. The inside shoulder in the median is exempt from water quality and attenuation.
- Median drainage will discharge directly into the existing roadside borrow ditch.
- Ms. Erin Yao, mentioned the median widening is likely exempt from WMD permitting. The team will verify when we present our concept to the WMD and confirm if they agree.
- Mr. Michael Leo suggested over excavating the existing borrow ditch up to the right-of-way line in order to utilize the material for fill. This could potentially save money on construction costs.
- FTE was instructed to follow the initial scope for ponds inside the ROW. The PSR will include the size and location (siting) of the proposed ponds.
- Fort Drum Plaza will provide treatment and attenuation within the infield ponds and one offsite pond. FTE will verify the feasibility of this approach with the defender of Fort Drum Plaza.

Action Items:

- Metric to confirm offsite runoff entering Turnpike ROW
- Metric to confirm ownership of existing ditches.
- A pre-app meeting with SJRWMD is required to get their input on our drainage recommendations.
- Mike will schedule meetings to include the following:
    - EMO (Henry and Rax)
    - Drainage (Adriana and Erin)
    - Permitting (Fred Gaines)
    - Maintenance (Bob May)
    - Construction (Joe Chinelly)
    - Defender of Ft. Drum Plaza (TBD-Mike Leo to Check with Justin)

***** END OF MEETING*****

Metric Engineering will rely on these notes as the approved record of matters discussed and conclusions reached during this meeting unless you send the author written notice to the contrary within seven calendar days of receipt date of this meeting record.

Florida's Turnpike (SR 91) Widening

From north of SR 70 to north of SR 60

MP 152-193 | Project Development & Environment (PD&E)
Study FPID Number: 423374-2-22-01 EDTM Number: 14425

North St Lucie River Water Control District (NSLRWCD) Coordination Meeting Notes
March 22, 2023

1. Attendees

Name	Name
Suman Juluru (FTE)	Carlos Rodriguez (Metric)
Fred Gaines (FTE)	Chandra Raman (APEX)
Annemarie Hammond (FTE)	Paul Carballo (Metric)
Adriana Kirwan (FTE)	Jessica Bloomfield (Metric)
Philip Stein (AECOM)	Lailee DeLay (Metric)
Erin Yao (FTE)	Kaitlin Chokshi (Metric)
Patrick Helms AECOM)	
James Condon-AECOM	

2. Meeting Notes

The following provides a brief summary of the meeting:

- The intent of this meeting was to coordinate with NSLRWCD and provide a brief overview of the PD&E Study and its preliminary findings regarding the existing culverts.
- A presentation to the team included a brief overview of the project including project background, existing and future typical sections, potential culvert impacts regarding proposed typical sections and questions for the water control district. The following items are from the discussion on the presentation slides:
    - Canal 43 Crossing
        - It was noted there is no crossing listed on the FDOT Straight line diagram and that there is a possibility that the canal runs parallel to the turnpike and connects to Canal 44 which is the NSLRWCD emergency relief canal. The team noted that research is on-going and will further analyze this canal.
    - It was noted that the canals located north of NSLRWCD (L 19 and L 20) are within the Fort Pierce Farms Water Control District are privately owned canals.
    - An additional water control district was presented to the team. This district is located to the west of Fort Pierce Farms Water Control District and is called the Capron Trails Community Development District.
        - There is a bridge over the existing canal that crosses under the Turnpike.
        - The contact for this water control district is Peter May (Peter.May@aecom.com)

Field Code Changed

- Mr. Helms noted that the Generalized Canal Elevations map shows the elevations for the wet and dry season elevations. The peak stages will need to be calculated and more information will be provided as coordination continues.
- It was noted that St Lucie's Stormwater Masterplan is from the early 90's and is currently in the process of being updated including a new ICPR model is being developed. Mrs. Celine Bounds noted that there is a resurfacing project of SR 60 that is on-going. The resurfacing limits are from SR 60 and Turnpike overpass to the east.
- Floodplain Compensation
  - Previous projects within the NSLRWCD has approved applicants to perform floodplain compensation within the canal right of way but since the canals are usually not enough right of way the applicant is usually required to provide additional right of way to compensate for the sufficient floodplain compensation.
    - Stable Chase, a development north of SR 70, is an example of additional right of way is required for the floodplain compensation
- Design and Permitting
  - It was noted that NSLRWCD allows for roadway projects to utilize pre versus the post discharge instead of 2 inches per acre per day. This is used for roadway projects since they are usually constrained by right of way.
  - Assume culvert tailwater to flowing full
  - No tidal flow at the location of the project
  - The project areas are excluded from B-MAP process
  - NSLRWCD indicated that they don't have any water needs and joint use pond needs that could be provided by the project as part of the Environmental Look Around aspect.
- **Action Item**: NSLRWCD to provide the latest Generalized Canal Elevations Map and R/W Maps for the canals in their water control district.

***** END OF MEETING*****

Metric Engineering will rely on these notes as the approved record of matters discussed and conclusions reached during this meeting unless you send the author written notice to the contrary within seven calendar days of receipt date of this meeting record.

Turnpike Drainage Coordination Meeting Notes
July 23, 2024

1. Attendees

Name	Email
Michael Leo	Michael.Leo@dot.state.fl.us
Fred Gaines	Fred.Gaines@dot.state.fl.us
Chandra Raman	chandra@apexengineersfl.com
Nicolette Lundie	Nicolette.Lundie@dot.state.fl.us
Annemarie Hammond	Annemarie.Hammond@dot.state.fl.us
Erin Yao	Erin.Yao@dot.state.fl.us
Tiffany Crosby	Tiffany.Crosby@dot.state.fl.us
Carlos Rodriguez	Carlos.Rodriguez@metriceng.com
Rax Jung	Rax.Jung@dot.state.fl.us
Paul Carballo	Paul.Carballo@metriceng.com
Adriana Kirwan	Adriana.Kirwan@dot.state.fl.us

2. Meeting Notes

- The purpose of the meeting is to coordinate with Turnpike Environmental and Drainage staff prior to the pre-application meeting with SJRWMD.
- Chandra presented the project location and SJRWMD's limits within the project corridor. He also explained the SJRWMD Water Quality and Quantity requirements.
- Water quality in the FTE corridor has historically been provided for **net new pavement**, which is in agreement with local regulatory agencies.
- The treatment approach for this project is to provide roadside linear swale treatment or offsite stormwater ponds.
- The design approach will be presented to SJRWMD. The goal is to identify the **required ROW for treatment facilities**.
- We do not anticipate **offsite runoff** into the FTE system. This is not conclusive, but it is the general observation at the PD&E level.
- We will bring to SJRWMD's attention that the **inside shoulder pavement does not need water quality treatment** since the shoulder pavement will not generate pollutant loading. This will be confirmed with WMD.
- Based on the meeting with the Maintenance Department (April 24th, 2024), the roadside linear treatment swale design approach is not favored due to potential maintenance issues, prolonged standing water, and vegetation growth.
- The other preferred treatment method is to provide offsite ponds. Stormwater ponds are not allowed in conservation land currently owned by state agencies.

- When conservation land is on both sides of the roadway, ponds are not allowed on either side. The only other stormwater treatment option in this situation is roadside linear swales.
- Offsite ponds will be located where feasible, and roadside swale treatment will be provided where offsite ponds are not viable.
- The existing borrow ditch was constructed to provide fill materials for the initial roadway construction. It is not constructed to provide water quality treatment or attenuation.
- Chandra will verify if the existing borrow ditch can be used to provide water quality and attenuation using the **applicable WMD rules**. The borrow ditch is currently connected with the adjacent agricultural ditch. Keeping Turnpike **runoff separate from the farm ditch** can be difficult and costly. Control structures, drainage pipes, and berms might be required to separate the FTE borrow ditch from the agricultural ditch. This creative treatment option should be based on the applicable rules and should be accepted by the Maintenance Department due to the long-term maintenance need.
- In areas with conservation land on both sides of the roadway, **hardship can be claimed**, and both roadside linear treatment swales and existing borrow ditches can be used for treatment and attenuation.
- It was clarified that Conservation Land or Florida Forever Land that is not yet owned by state agencies is not Conservation Land; therefore, stormwater ponds can be placed on it. FDOT or the Turnpike can purchase ROW for future pond sites.
- Turnpike had great success using conservation land for future stormwater treatment facilities that State Agencies have not yet purchased or owned. Existing conservation land can be used after pre-treatment to attenuate, especially when we are not going to flood others.
- APEX will identify in the drainage map exhibit state-owned conservation land and designated Florida Forever Land that state agencies do not own.
- Hardship cannot be applied in areas with designated Florida Forever Land not yet purchased or owned by state agencies.
- Pond maintenance access from the Turnpike is required. The maintenance access ramp could impact existing agricultural ditches at some locations. This issue needs to be verified and avoided if possible.
- APEX will coordinate a meeting with the Maintenance Department to get their input on pond maintenance access and viability of the pond locations.
- Floodplain Zone A traverses the project corridor within SJRWMD. Floodplain impact is anticipated.
- Since this is a PD&E phase, flood elevation and impacts will be **identified during the design phase**.
- The purpose of this PD&E study is to identify ROW and cost associate ROW for offsite ponds.
- APEX to identify Regional Stormwater Opportunities from the Stormwater harvesting Tool on the SJRWMD website.

Action Items:

- Michael Leo to set up a meeting with the Maintenance Department on 7-31-2024 to get their input on pond locations and the impact of the maintenance access ramp placement on the existing agricultural or WMD-owned ditch system.
- Chandra to update the Drainage Map by labeling Conservation Land owned by state agencies and those not owned by state agencies by 8-15-2024.
- Chandra to check the Stormwater Harvesting Tool on the WMD website to identify potential regional stormwater management facilities by 7-31-2024.
- Chandra to verify if the existing borrow ditch can be used as a treatment facility by 8-15-2024.

***** END OF MEETING*****

Metric Engineering will rely on these notes as the approved record of matters discussed and conclusions reached during this meeting unless you send the author written notice to the contrary within seven calendar days of receipt date of this meeting record.

SJRWMD Pre-Application Meeting Notes
October 3rd, 2024

1. Attendees

Name	Email
Greg Moore	Greg.Moore@dot.state.fl.us
Fred Gaines	Fred.Gaines@dot.state.fl.us
Chandra Raman	chandra@apexengineersfl.com
Nicolette Lundie	Nicolette.Lundie@dot.state.fl.us
Annemarie Hammond	Annemarie.Hammond@dot.state.fl.us
Erin Yao	Erin.Yao@dot.state.fl.us
Blake Meinecke	Blake.Meinecke@dot.state.fl.us
Jennings Perry	pjenning@sjrwmd.com
Paul Carballo	Paul.Carballo@metriceng.com
Adriana Kirwan	Adriana.Kirwan@dot.state.fl.us

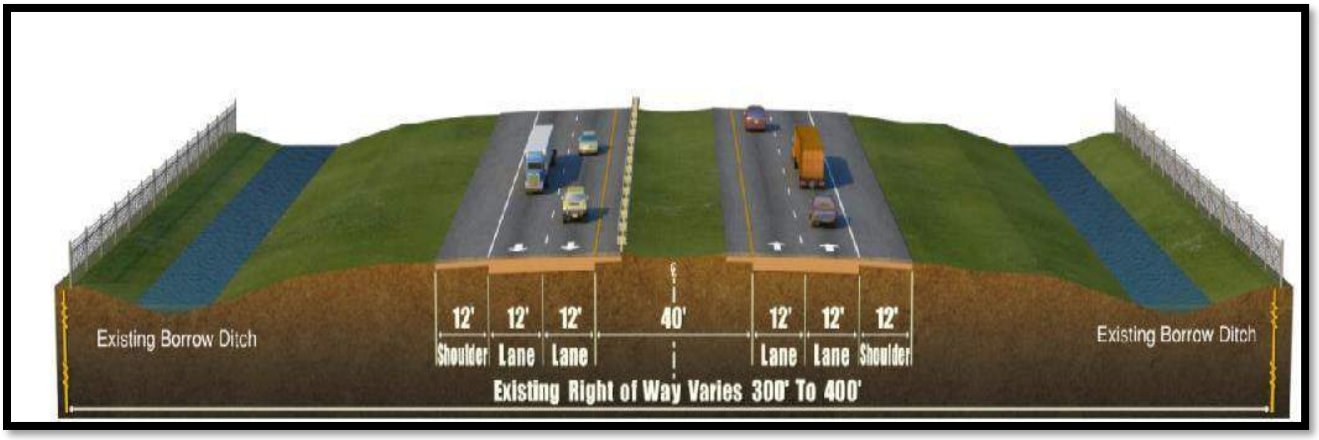
2. Meeting Notes

The meeting's purpose was to present the project to SJRWMD, discuss alternative treatment approaches, the existing conservation easements, and the other environmental features that can influence drainage design.

An overview of the project, including its location and SJRWMD's limits within the project corridor, was presented. It was explained that this project is in a PD&E study phase.

Additional details included:

- The existing 4-lane roadway will be widened to 6 lanes.
- Typical sections: Existing Condition



- Typical Section: Proposed Condition

- There are borrow ditches along the entire project corridor. Some of them are dry, and some of them are wet ditches.
- Water quality—2.5 inches over new impervious areas in locations of reconstruction and widening. However, due to commingling runoff, SJRWMD prefers treating all impervious areas if possible.
- Water quantity will be based on a 25-year-72-hour design storm event for pre- and post-development attenuation. All basins within the project location are considered open basins.
- Inside shoulders will be widened from 8 feet to 12 feet. Since no pollutant loading is expected from the shoulder pavement, the project is not planning to treat the additional impervious area from the shoulder pavement.
- The project proposes using existing roadside borrow ditch/canal as potential treatment facilities.
- Other treatment methods include roadside linear swales and offsite stormwater ponds.
- Runoff from the reconstructed bridges will be captured and treated in the treatment facilities.
- Compensation treatment will be utilized if the project gets into hardship. This approach will be evaluated during the design phase.
- The project includes one interchange at Yeehaw Junction, SR 60. The existing interchange will be removed and reconstructed with a new partial cloverleaf interchange. Additional right-of-way acquisition will be required to accommodate the new interchange.
- When the existing borrow ditch is converted into a linear wet detention facility, the placement of control structures should not short-circuit the pond.

Permitting:

- There are no existing Water Management District Permits along the corridor except Fort Drum Toll Plaza and SR 60 Interchange.

- No permit application will be made in the next few years.
- This project will follow the old stormwater rule. The project will be Grandfathered to meet old criteria.
- The project is not subject to the new rule, which started on June 28, 2024.

Environmental Look Around:

- SFWMD and SJRWMD are negotiating a plan to treat water from SFWMD before discharging it to the Upper St. Johns River Basin. The project in work is Evans Grove. Additional information can be obtained from Mark Van Hayden with SJRWMD.

Conservation Land:

- There are conservation lands along the project corridor owned by various agencies.
- Stormwater Management facilities (offsite ponds) will not be placed on conservation land.

Floodplain:

- The majority of the project is within FEMA 100-year floodplain Zone A.
- In addition to FEMA criteria, the project needs to evaluate the SJRWMD rules in Applicant Handbook Volume II, chapters 3.3.2 and 3.3.4 (special basin criteria) to determine the floodplain impact and compensation requirement.
- The project is in the Upper St. Johns Hydraulic Basin and needs to follow the basin criteria, chapter 13.1.

Action Items:

- Fred Gains to coordinate with Mark Wan Hayden (SJRWMD) regarding the Evans Grove project between SFWMD and SJRWMD. Evans Grove project could become a regional stormwater facility.
- Chandra to review and determine additional information on the SJRWMD floodplain elevation determination, impact and compensation criteria.

***** END OF MEETING*****

Metric Engineering will rely on these notes as the approved record of matters discussed and conclusions reached during this meeting unless you send the author written notice to the contrary within seven calendar days of receipt date of this meeting record.

APPENDIX H
Correspondence

William Davis

From: Carlos Rodriguez
Sent: Friday, August 16, 2024 2:31 PM
To: Chandra Raman
Cc: Paul Carballo; William Davis; Jessica Bloomfield; Lailee DeLay
Subject: FW: 423374-2 Florida Turnpike (SR 91) Widening from SR 70 to SR 60 | Drainage Flooding Issues

Follow Up Flag: Follow up
Flag Status: Flagged

See below. Thanks!

From: May, Robert <Robert.May@dot.state.fl.us>
Sent: Friday, August 16, 2024 12:06 PM
To: chandra@apexengineersfl.com; Carlos Rodriguez <Carlos.Rodriguez@metriceng.com>
Cc: Leo, Michael <Michael.Leo@dot.state.fl.us>; Yao, Erin <Erin.Yao@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>
Subject: FW: 423374-2 Florida Turnpike (SR 91) Widening from SR 70 to SR 60 | Drainage Flooding Issues

All,

Please see the information below received from our Asset Maintenance Contractor for this portion of the mainline.

Please let us know if you need additional information.

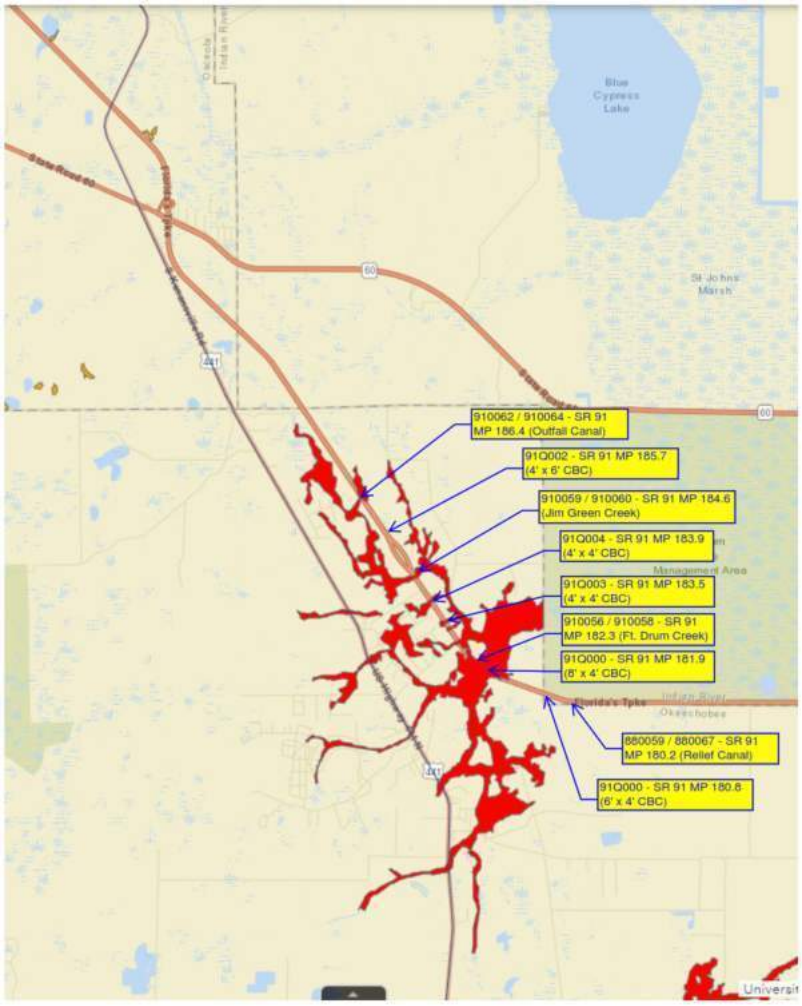
Bob

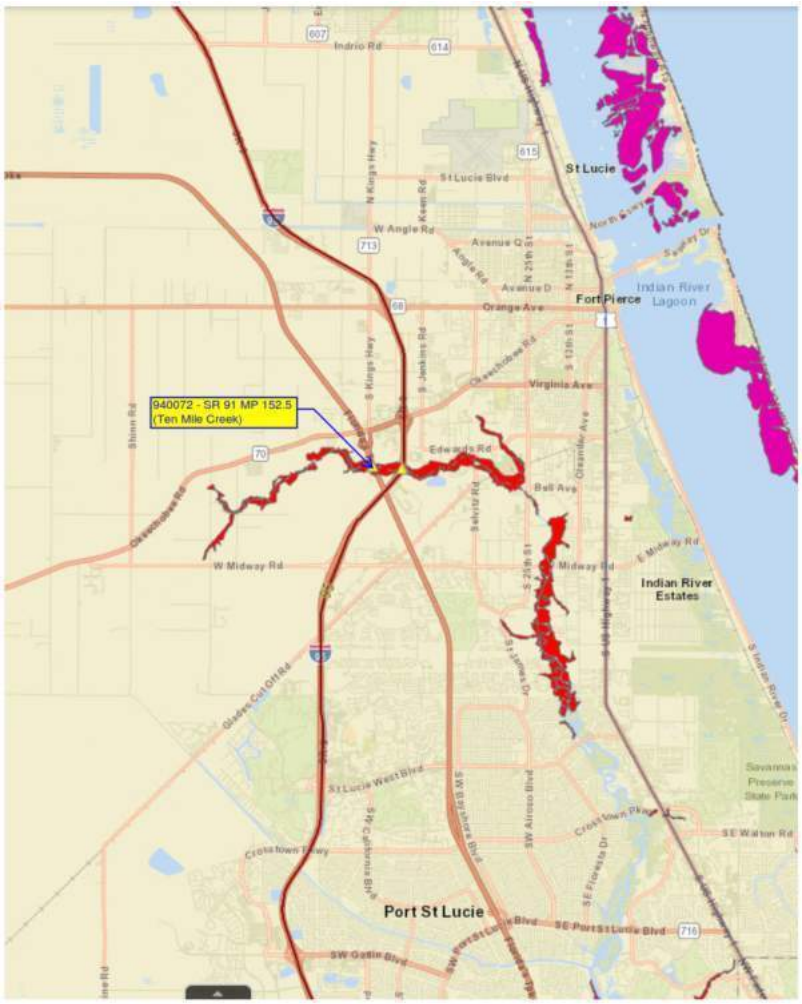
Robert C. May
Plans Review & Special Projects Manager – Jacobs
Traffic Engineering and Maintenance General Consultant to Florida's Turnpike
Physical Address: Mile Post 263, Florida's Turnpike – Operations Building 5317, Ocoee, FL 34761
US Mail: P.O. Box 613069, Ocoee, FL 34761
Phone: 407-264-3473
Cell: 407-466-3636

From: Amilcar R Giron Pineda <Amilcar_Giron@royjorgensen.com>
Sent: Friday, August 16, 2024 10:21 AM
To: Miranda, Javier <Javier.Miranda@dot.state.fl.us>
Cc: Norberto, Cardenas <Norberto_Cardenas@royjorgensen.com>; Elyann Morales Tardi <Elyann_Tardi@royjorgensen.com>; JEisenhardt <james_eisenhardt@royjorgensen.com>; May, Robert <Robert.May@dot.state.fl.us>
Subject: RE: 423374-2 Florida Turnpike (SR 91) Widening from SR 70 to SR 60 | Drainage Flooding Issues

Good morning Javier,

We have no records of flooding events between SR 70 and SR 60. However, there is a layer on GIS that contains flood monitoring for various waterways. Please see attached email with the information shared by Aran Lessar.





Regards,

Amilcar Giron | Jorgensen Contract Services
Project Manager
p. 772.871.1020/772.419-8086
m. 954.541.1257
f. 772.380.4558
a. 5501 Orange Ave
Fort Pierce, FL 34947
e. Amilcar_Giron@royjorgensen.com

From: Miranda, Javier <Javier.Miranda@dot.state.fl.us>
Sent: Wednesday, August 14, 2024 12:05 PM
To: Amilcar R Giron Pineda <Amilcar_Giron@royjorgensen.com>
Cc: Norberto Cardenas <Norberto_Cardenas@royjorgensen.com>; Elyann Morales Tardi <Elyann_Tardi@royjorgensen.com>; James F Eisenhardt <james_eisenhardt@royjorgensen.com>; May, Robert <Robert.May@dot.state.fl.us>
Subject: FW: 423374-2 Florida Turnpike (SR 91) Widening from SR 70 to SR 60 | Drainage Flooding Issues

Amilcar,

Please review the email below and advise. Thank you.

Regards,
Javier Miranda

Zone 2 Roadway Maintenance Project Manager - Jacobs/Castillo
Traffic Engineering and Maintenance General Consultant to Florida's Turnpike
Physical Address:
MP 145, Turnpike Operations
Port St. Lucie, FL 34984
Office: 772-873-6535
Fax: 772-871-7634
Mobile: 561-504-8477

From: May, Robert <Robert.May@dot.state.fl.us>
Sent: Wednesday, August 14, 2024 12:04 PM
To: Miranda, Javier <Javier.Miranda@dot.state.fl.us>
Subject: FW: 423374-2 Florida Turnpike (SR 91) Widening from SR 70 to SR 60 | Drainage Flooding Issues

Javier,

Before I respond, I wanted to reach out to you for your input.

Thanks,

Bob

Robert C. May
Plans Review & Special Projects Manager – Jacobs
Traffic Engineering and Maintenance General Consultant to Florida's Turnpike
Physical Address: Mile Post 263, Florida's Turnpike – Operations Building 5317, Ocoee, FL 34761
US Mail: P.O. Box 613069, Ocoee, FL 34761
Phone: 407-264-3473
Cell: 407-466-3636

From: Chandra Raman <chandra@apexengineersfl.com>
Sent: Wednesday, August 14, 2024 11:15 AM
To: May, Robert <Robert.May@dot.state.fl.us>
Cc: Carlos Rodriguez <Carlos.Rodriguez@metriceng.com>
Subject: FW: 423374-2 Florida Turnpike (SR 91) Widening from SR 70 to SR 60 | Drainage Flooding Issues

Good morning Bob,

Are you aware of any flooding issues along FTE from just north of SR 70 to SR 60? We had several meetings with you in the past about this PD&E study, but we can't recall discussing the flooding issues.

Below is the project location map. Thank You!

CHANDRA RAMAN, P.E.
President | Project Manager

APEX ENGINEERS

FDOT CERTIFIED: DBE/SBE

10175 Fortune Parkway, Unit 704
Jacksonville, FL 32256
www.apexengineersfl.com
Office: (904)-367-2199 | Cell (561)-713-8977

From: Carlos Rodriguez <Carlos.Rodriguez@metriceng.com>
Sent: Tuesday, August 6, 2024 6:21 PM
To: Leo, Michael <Michael.Leo@dot.state.fl.us>; Yao, Erin <Erin.Yao@dot.state.fl.us>; May, Robert <Robert.May@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>
Cc: Paul Carballo <Paul.Carballo@metriceng.com>; Chandra Raman <chandra@apexengineersfl.com>
Subject: 423374-2 Florida Turnpike (SR 91) Widening from SR 70 to SR 60 | Drainage Access Maintenance Notes

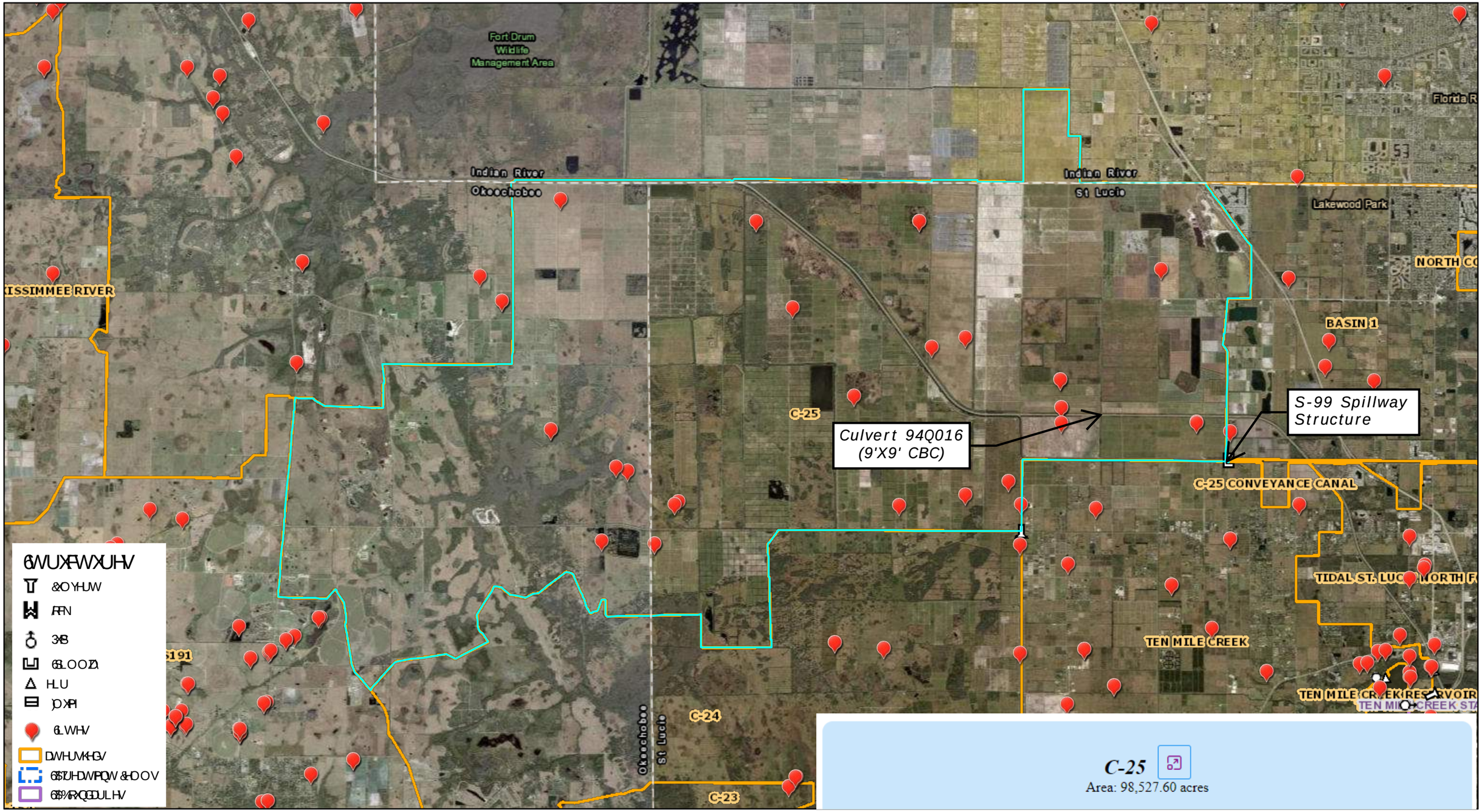
Good afternoon team, thank you for attending the drainage access maintenance coordination meeting. I have attached the DRAFT meeting notes for your review. We are requesting that comments on these Draft Notes be sent to me by COB Tuesday, August 13th.

Thank you!

Carlos Rodriguez, P.E.
cell: 305-968-2546

metric

Attention: The information contained in this E-mail message is privileged and confidential information intended only for the use of the individual(s) named above. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copy of this communication is strictly prohibited. If you have received this communication in error, please contact the sender by reply E-mail and destroy all copies of the original message. Thank you.



sfwmd.gov

6RXWKGDUGDWHU DQDJHPHQW\VWULFW
XQGXEHW 3DPEDUK GDUGD
ZUBRY

&%DLQ$JHD

DOHV

LORPHWHUV

DS3URGHGRQDWH

,QIR
7KLV BS LV D FRQBVXDO RU SDDQL QI WRO RQD\ 7H6RWK GDUGDWHU
DQGHQW L'WULRW GHV QRW JOUDQWH RU BH DQ UHJUHQWDWLRQ
UHDUGL QIWKHLQRUBWLRQRQDL QHGHUHLQ ,W LV QRW VHOI HHPWLQQIRU EL QQL QI
DQGGHV QRW DIHFW WKHLQWHUHVWV RU SHUVRQV RJ SURHUWLHV LQFOXGLQQ
SUHQV RJ IXVUH ULJW RJ XH R UHDO SURHUW\ DQG LV HBW IURPSEDLF
UHFUGV' GL VFORVUH DQG FRQGLWLDQ XQGU 6FHW RQ D)DRUGD
6VDSXWH

HESS9XLOGHU RUSJR5

From: Norberto Mercado Miranda
To: Kirwan, Adriana
Subject: MP 163 Culvert 94Q016 Analysis
Date: Wednesday, February 14, 2024 11:27:02 AM
Attachments: image001.png
RE MP 163.msg
S-99 Spillway Location within Basin C-25.pdf
HY8Report Velocity Method Flows.pdf
HY8Report S-99 Flows.pdf

Adriana,

The following is a summary of home office analysis for 9' by 9' Box Culvert 94Q016 at MP 163. I've attached HY-8 analysis, exhibit showing location of culvert within C-25 watershed and Email with FTE maintenance for your reference.

Culvert 94Q016 is a 9'x9' concrete box culvert located within Turnpike MP 163. This culvert is part of the SFWMD Basin C-25 Watershed. The C-25 basin is approximately 98,527 acres. Culvert 94Q016 flows from North to South into the Belcher Canal (C-25) making its way east to Spillway Structure S-99. Upstream area of the culvert is agricultural land that uses detention canals and pumps to send water to reservoirs for irrigation. This land is owned by Sunshine Farms Treasure Coast LLC (Permit No. 56-0004-P-02). The Florida Turnpike divides the farm into two separate stormwater management (SWM) systems: one in the north and another in the south. These systems will function independently.

Elevations used in the analysis reference the North American Vertical Datum of 1988 (NAVD88). Where necessary, elevations that reference the National Geodetic Vertical Datum of 1929 (NGVD29) were converted to NAVD88. The datum conversion is as follows: NAVD 88 = NGVD 29 – 1.457 ft

Turnpike Maintenance was contacted to see if there's any history of flooding and/or roadway overtopping in Florida's Turnpike near MP 163, and they are not aware of any flooding in this area (see attached email).

Summary of information obtained from Original As-builts (1962):

- Overall Drainage Area: 2,266 AC
- Record High Water elev. @ upstream: 27.5 NGVD 29 (26.04 NAVD 88)
- Anticipated High water elev. @ upstream: 23.6 NGVD 29 (22.14 NAVD 88)
- Canal existing water elev.: 20.0 NGVD 29 (18.54 NAVD 88)

Summary of information obtained from 2018 LiDAR (NAVD 88 datum):

- SR 91 Low edge of pavement (EOP) elevation: 28.50 NAVD 88
- Approximate berm elevation between SR 91 and upstream land: 23 NAVD 88

Summary of information obtained from FPID 437170-1-52-02 - Culvert Rehabilitation As-Built (2017):

- Exist. 9'x9' CBC Length: 184.10 ft
- Upstream Invert: 10.74 NAVD 88
- Downstream Invert: 10.55 NAVD 88
- Channel downstream elevation
- Straight Headwall Inlet configuration @ upstream

Summary of information obtained from Structural Inspection Reports and Comprehensive Inventory

Data Report(CIDR):

- Water depth inside CBC: 8.7 ft (1/25/2023).
- Water depth inside CBC: 11.2 ft (07/27/2016).
- Water depth inside CBC: 10.7 Ft (3/05/2015).
- Water depth inside CBC: 6.6 ft (2/26/2009).
- Heavy vegetation in channel partially obstructing flow through the culvert.
- Sediment buildup within the Cell.
- Culvert has a history of damage in the downstream and upstream wingwalls.
- No mention of scour issues.

Hydrology Methodology:

- Typical Hydrology methodology for cross drains from FDOT Drainage Manual were not utilized due to the following reasons:
    1. Rational Method can't be used as the Drainage Area upstream of 9'X9' CBC exceeds 600 acres (as shown in original 1962 as built).
    2. Frequency analysis of observed flow gage data is not available at the location.
    3. Site falls under the Undefined region of the USGS Regression equation. Region 4 hydrology was still calculated due to site being in proximity of that region, but yielded flows are that unrealistic in comparison to flows measured at downstream Spillway Structure S-99 obtained from SFWMD DBHydroInsights website.
    4. Upstream agricultural land has the ability to control flows and stages via interconnected detention ditches and pumps that sends water to the land water reservoir.
- Hydrology scenarios evaluated use max flow measured in the past 6 months of 722 cfs at S-99 and the other scenario is the Velocity method which estimates flows assuming a low velocity of 2 ft/s using the Q=AV method for a 9'X9' CBC. The design guide recommends a velocity of 6 ft/s, but a low velocity of 2 ft/s was chosen due to recurring sedimentation issues and flat slope at the culvert (~0.1%).

Chosen TW source:

- Culvert Downstream channel connects into canal C-25 which is controlled by SFWMD S-99 Spillway structure near Turnpike. Design HW stage 20 NGVD 29 (18.54 NAVD 88) at S-99 which is used as Tailwater conditions for the culvert. This is also the elevation of the canal water at the culvert location per the 1962 as built. Water depth measured inside culvert shows that water levels are at or near the downstream soffit (19.55 NAVD 88) of the 9'X9' CBC. Provided photos also show this.

Assumption:

- Based on Culvert 94Q016 meeting on Feb 1. 3 ft of silt will be assumed for Culvert calculations.

Design Storm Frequency:

- 50 yr. frequency for Mainline Interstate per Table 4.1 of the 2024 Drainage Manual.

Summary of Headwater stages and flows:

Summary of headwater & flows @ Culvert 94Q016 (9'X9') CBC						
Hydrology Scenario	**Total Flow Discharge (cfs)**	**Culvert Discharge No Silt (cfs)**	**Culvert Discharge with Silt (cfs)**	**No Silt HW Stage (ft)**	**With Silt HW Stage (ft)**	**HW Δ**
S-99 Max Flow	722.18	224.44	137.21	18.80	18.80	0
Velocity Method (2 fps)	200*	62.46	37.75	18.56**	18.56**	0

Note: * 50-year flow. **50-year Headwater stage

Results show that when you reduce the box culvert size from 9 ft by 9 ft (No silt scenario) to a 9 ft by 6 ft (with silt scenario), the hydraulic capacity of the culvert decreases. However, since the tailwater condition is submerged, the flow is primarily controlled by the tailwater level. The culvert is outlet

control (meaning that the water level downstream is higher than the critical depth of the CBC barrel), the tailwater level dictates the flow rate through the culvert. Culvert reduced capacity due to silt is offset by the high tailwater level resulting in consistent headwater elevations.

Norberto Mercado-Miranda, PE
Drainage Project Engineer
Direct (407) 547-3091 **Email** nmercadomiranda@hntb.com

HNTB CORPORATION
Colonial Town Park
200 Colonial Center Pkwy, Suite 140
Lake Mary, FL 32746 | www.hntb.com

100+ YEARS OF INFRASTRUCTURE SOLUTIONS

Twitter | LinkedIn | Facebook | Instagram

William Davis

From: Lailee DeLay
Sent: Friday, August 9, 2024 2:16 PM
To: William Davis
Subject: FW: 423374-2 Culvert 94Q016 (MP 163)
Attachments: MP 163 Culvert 94Q016 Analysis

Follow Up Flag: Follow up
Flag Status: Flagged

FYI – not sure if it is useful. Did you get this email?

Lailee DeLay, P.E.
Drainage Engineer

904.465.1244

metric

www.metriceng.com

From: Chandra Raman <chandra@apexengineersfl.com>
Sent: Thursday, April 25, 2024 12:19 PM
To: Carlos Rodriguez <Carlos.Rodriguez@metriceng.com>
Cc: Paul Carballo <Paul.Carballo@metriceng.com>; Lailee DeLay <Lailee.DeLay@metriceng.com>
Subject: FW: 423374-2 Culvert 94Q016 (MP 163)

Hi Carlos,

See the email below from Adriana with Turnpike. Please include the information in the LHR.

Thank You!

CHANDRA RAMAN, P.E.
President | Project Manager

APEX ENGINEERS

FDOT CERTIFIED: DBE/SBE
10175 Fortune Parkway, Unit 704
Jacksonville, FL 32256
www.apexengineersfl.com
Office: (904)-367-2199 | Cell (561)-713-8977

From: Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>
Sent: Thursday, April 25, 2024 12:16 PM
To: Chandra Raman <chandra@apexengineersfl.com>
Cc: Yao, Erin <Erin.Yao@dot.state.fl.us>
Subject: 423374-2 Culvert 94Q016 (MP 163)

Chandra,

I wanted to bring to your attention an issue with an existing culvert and it's reoccurring siltation issue. The culvert 94Q016 at MP 163 is constantly getting desilted by our maintenance contractor. HNTB home office did an analysis regarding the effects of the siltation on the culvert to see if the desilting could be pushed out to a later date. Attached is an email with the assumptions and finding from the home office analysis.

I think it would be beneficial to document this in the LHR so that when the future design project for this area comes around, we can have the design team look at it closer and address maintenance's concerns.

Thank you,

Adriana M. Kirwan, P.E.
Drainage Engineer

HNTB CORPORATION
General Consultant to Florida's Turnpike Enterprise
Florida's Turnpike Milepost 263, Building 5315, Ocoee, FL 34761
Tel (407) 264-3080 | **Mobile** (407) 698-6544

Attention: The information contained in this E-mail message is privileged and confidential information intended only for the use of the individual(s) named above. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copy of this communication is strictly prohibited. If you have received this communication in error, please contact the sender by reply E-mail and destroy all copies of the original message. Thank you.