POND SITING REPORT

Florida Department of Transportation

District 4

I-95 (S.R. 9) Project Development and Environment (PD&E) Study

Miami-Dade/Broward County Line to north of Griffin Road

Broward County, Florida

Financial Management Number: 439170-1-22-02

ETDM Number: 14500

Date: March 2026

DRAFT

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

PROFESSIONAL ENGINEER CERTIFICATION

POND SITING REPORT

Project: I-95 (S.R. 9) Project Development and Environment (PD&E) Study

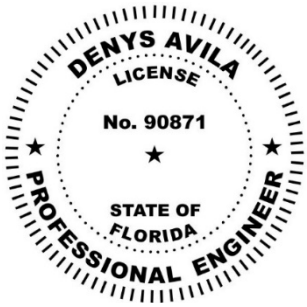
ETDM Number: 14500

Financial Project ID: 439170-1-22-02

Federal Aid Project Number: D421 105 B

This pond siting report contains engineering information that fulfills the purpose and need for the I-95 (S.R. 9) Project Development & Environment Study from the Miami-Dade/Broward County Line to north of Griffin Road in Broward County, Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Scalar Consulting Group, LLC, and that I have prepared or approved the evaluation, findings, opinions, conclusions or technical advice for this project.



This item has been digitally signed and sealed by **Denys Avila** 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.

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I. PROJECT INTRODUCTION

This Pond Siting Report has been completed to support the Project Development and Environment (PD&E) Study prepared for the future improvements of I-95 (S.R. 9) from Miami-Dade/Broward County Line to North of Griffin Road. This report will discuss, analyze, and identify the stormwater management plan for the proposed corridor improvements based on cultural resources such as historic structures and archeological assessment, environmental impacts including wetlands, upland habitat and protected species involvement, hazardous and/or potential contamination, and economic factors including right of way acquisition costs. This report will evaluate and make recommendations for proposed stormwater management facilities to provide adequate treatment and attenuation for the proposed improvements.

I-95 is the primary north-south interstate facility that links numerous major cities along the Atlantic coast and is one of the most important transportation systems in southeast Florida. Within the study limits, it is functionally classified as an Urban Principal Arterial Interstate and has a posted speed limit of 65 mph. This segment consists of eight general use lanes (four in each direction), and managed lanes that vary between four (two in each direction) and two lanes (one in each direction). The access management classification for the I-95 study corridor is Class 1. There is a total of six existing interchanges within the study limits; however, only three interchanges in the northern section are proposed for improvements as part of this project (Sheridan Street, Stirling Road, and Griffin Road). The cross streets at the interchanges are all six lane divided facilities with varying functional classifications. Sheridan Street is classified as an Urban Principal Arterial Other to the west of the I-95 interchange, and to the east it is classified as an Urban Minor Arterial. Stirling Road is classified as an Urban Minor Arterial. Griffin Road is classified as an Urban Principal Arterial Other. Two (2) alternatives are being proposed for each interchange, except at Griffin Road where there is only one alternative. For Sheridan Street, a modified diamond and a modified diamond with a median flyover off ramp alternative are proposed. For Stirling Road, a modified diamond and Diverging Diamond Interchange (DDI) alternative are proposed. At Griffin Road, a modified diamond alternative is proposed.

1.1 PROJECT LOCATION AND DATUM

This project is within Broward County, Florida, in Sections 28 & 33 in Township 50S and Range 42E, and in Sections 4, 8, 9, 17, 20, 21 and 28 in Township 51S and Range 42E. A project Location Map is provided in Figure 1 and USGS Quadrangle Maps are shown in Appendix A. The vertical datum for the proposed improvements refers to the North American Vertical Datum (NAVD), 1988 and is expressed in feet. The latitude/longitude of the datum shift point was taken as the approximate centroid of the project limits (See Appendix A).

The study area is located within the South Florida Water Management District C-10 Basin and Coral Reef Basin and traverses WBID 3282 (Southeast Coastal, C10 Canal) and WBID 3277E (Southeast Coastal, Dania Cutoff Canal).

Note: The vertical datum for the proposed improvements refers to the North American Vertical Datum (NAVD), 1988 and is expressed in feet. The conversion from NAVD 1988 to National Geodetic Vertical Datum (NGVD), 1929, is:

NGVD29 – 1.608= NAVD88



Figure 1: Project Location Map

1.2 REPORT PURPOSE

The purpose of this report is to evaluate the need for stormwater management and to recommend potential locations for stormwater management. The recommended locations will then be analyzed and evaluated for cultural resources such as historic structures and archeological assessment, environmental impacts including wetlands, upland habitat and protected species involvement, hazardous and/or potential contamination, and economic factors including right of way acquisition costs.

1.3 PROJECT PURPOSE & NEED

Purpose:

The purpose of the study is to improve traffic operations at the existing interchanges, cross streets, and managed lanes, address existing and future traffic demand, and enhance safety along S.R. 9/I-95 from Miami-Dade/Broward County Line to north of Griffin Road in Broward County, Florida. The project will also address social demands, economic development, and other modes of travel.

Need:

Between 2024 and 2050, traffic demand along the I-95 corridor in Broward County is projected to increase steadily at 0.5% annually, with AADT rising from a range of 213,000–267,000 vehicles to an estimated 303,000–333,000 vehicles. Operational analyses reveal existing and future deficiencies at multiple interchanges—particularly Sheridan Street, Stirling Road, and Griffin Road—with several locations already operating at or below Level of Service E. Safety concerns are pronounced, with 4,764 crashes recorded over five years, including a high rate of rear-end collisions, attributed to congestion. The corridor ranks high on the MPO's severity index, signaling urgent need for safety improvements. The project addresses evacuation route performance and supports anticipated population and employment growth and enhances multimodal connectivity. Proposed improvements will alleviate congestion, improve safety, support freight and express transit, and fill pedestrian and bicycle infrastructure gaps identified in the Broward MPO Complete Streets Master Plan.

1.4 EXISTING FACILITY AND PROPOSED IMPROVEMENTS.

1.4.1 EXISTING FACILITY

The existing I-95 typical consists primarily of 8 General Purpose Lanes (4 in each direction), the 2 outermost lanes being 12-foot wide and the 2 inner lanes 11-foot wide. Both directions include an 11-foot managed lane and a 3-foot buffer area with pavement markings separating the managed lanes from the general use lanes. The shoulders are 12-foot wide with 10-foot paved shoulders for the outer shoulders. The northbound and southbound arterials are separated by a center barrier wall. From station 257+82.86 to station 547+10.50 the typical includes an additional 11-foot managed lane in each direction.

There are 6 full interchanges within the project limits which include: Hallandale Beach Blvd., Pembroke Road, Hollywood Blvd., Sheridan Street, Stirling Road and Griffin Road. Details can be found in Table 1.

Table 1: Summary of Interchanges

Road Name	Interchange Type	Lane Configuration
Hallandale Beach Blvd. – S.R. 858	Diamond	6 Lane East of I-95 4 Lanes West of I-95
Pembroke Rd. – S.R. 824	Diamond	4 Lane East of I-95 6 Lanes West of I-95
Hollywood Blvd. – S.R. 820	Diamond	4 Lane East of I-95 6 Lanes West of I-95
Sheridan St. – S.R. 822	Diamond	6 Lane East of I-95 6 Lanes West of I-95
Stirling Rd. – S.R. 848	Diamond	6 Lane East of I-95 6 Lanes West of I-95
Griffin Rd. – S.R. 818	Diamond	6 Lane East of I-95 6 Lanes West of I-95

1.4.2 PROPOSED IMPROVEMENTS

The proposed corridor consists of two 11-foot managed lanes in each direction, 4 to 5 general use lanes in each direction with lane widths of 11 to 12 feet, 2-to-9-foot buffer area with pavement markings and managed lane markers separating the general use lanes, one to two 12-foot auxiliary lanes at select locations, a 2.5-foot wide center barrier wall and barrier walls at either side of the corridor.

From Ives Dairy Road to Hallandale Beach Boulevard, the PD&E with FPID 436903-1-22-02 proposes relocating the Pembroke Road Southbound On-Ramp via a ramp/bridge with one 15-foot lane with 6-foot shoulders. This PD&E will use the same ramp/bridge to accommodate both the southbound managed lanes egress and Pembroke Road Southbound On-Ramp. The ramp diverges to either the Ives Dairy Southbound Exit or I-95 Southbound Mainline. The 15-foot buffer between northbound and southbound arterials will be removed and one 12-foot lane will be reduced to an 11-foot lane to add a new 11-foot managed lane in the southbound direction.

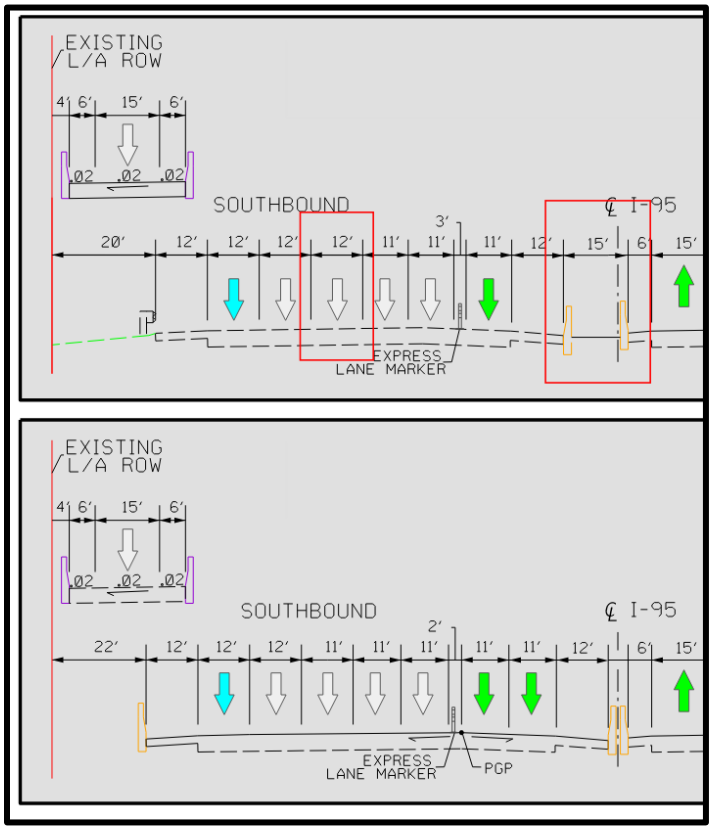


Figure 2: Improvements between Ives Dairy to Hallandale Beach Blvd.

From Hallandale Beach Boulevard to Pembroke Road, the proposed typical will have one 15-foot lane ramp/bridge with 6-foot shoulders for the Hallandale Northbound Exit. This bridge crosses over the local ramp from Pembroke Rd. to Hallandale Beach Blvd. running parallel to the mainline. In the southbound direction the Pembroke ingress ramp/bridge will be widened to accommodate for the Egress managed lanes. This will result in a two lane 12-foot

ramp/bridge with 10-foot shoulders on either side. The bridge widening will be 17 feet. The northbound direction will have a 6-foot widening to increase the inside shoulder from 6 to 12 feet.

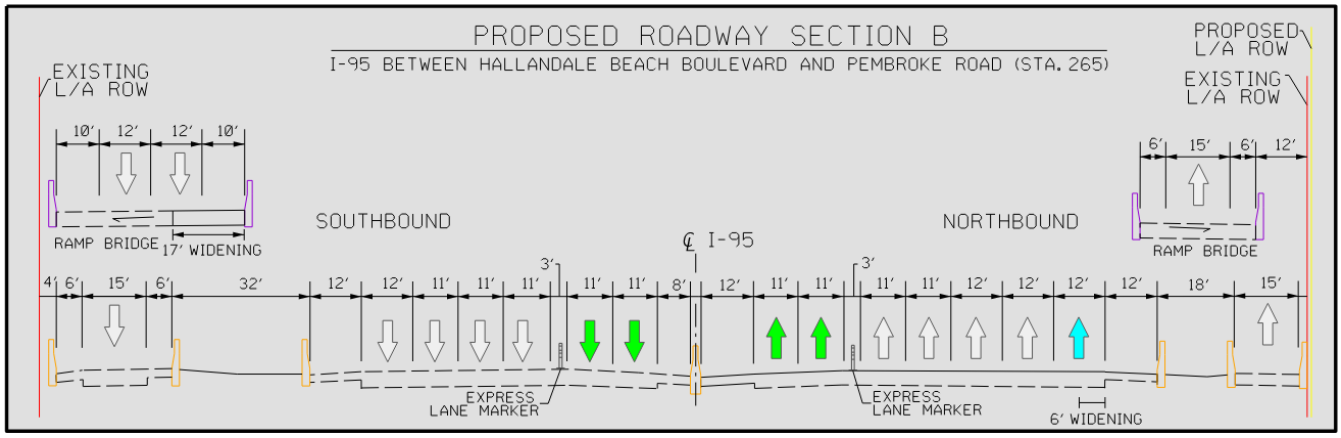


Figure 3: Improvements between Hallandale Beach Blvd. and Pembroke Rd.

From Pembroke Road to Hollywood Boulevard the northbound managed lane buffer will be reduced from 16 feet to 3 feet and to increase the inside shoulder from 12 to 25 feet. From Hollywood Boulevard to Sheridan Street, in the Northbound Direction a center ramp/bridge is proposed for the egress of managed lanes diverging onto the Sheridan Street Exit or I-95 Southbound Mainline. The ramp will start at Johnston Street, cross over the northbound mainline and diverge south of Taft Street. The inside shoulders will be increased from 7 feet to 10 feet and the outside shoulders reduced from 12 feet to 10 feet. In the southbound direction the inside shoulder will be increased from 7 to 9 feet, the outside shoulder will be reduced from 14 feet to 12 feet, and a 12-foot auxiliary lane will be added to have two 12-foot lanes for the southbound Hollywood Boulevard exit.

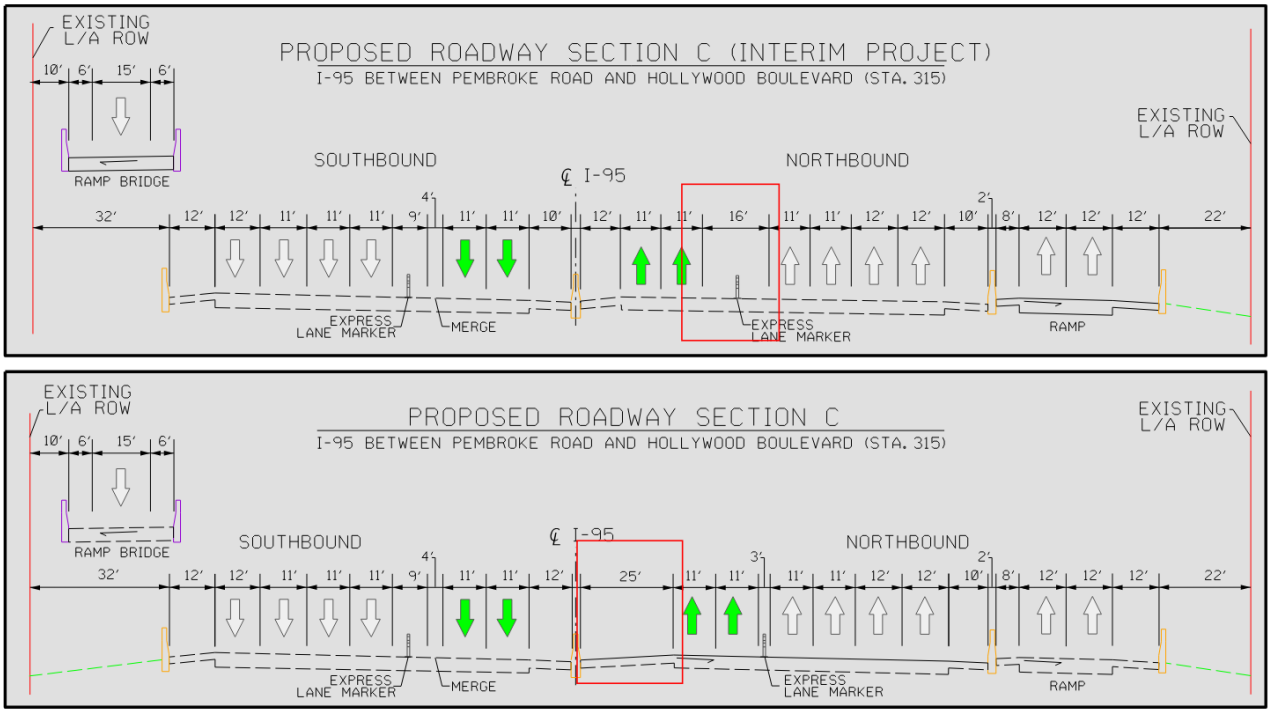


Figure 4: Improvements between Pembroke Rd. and Hollywood Blvd.

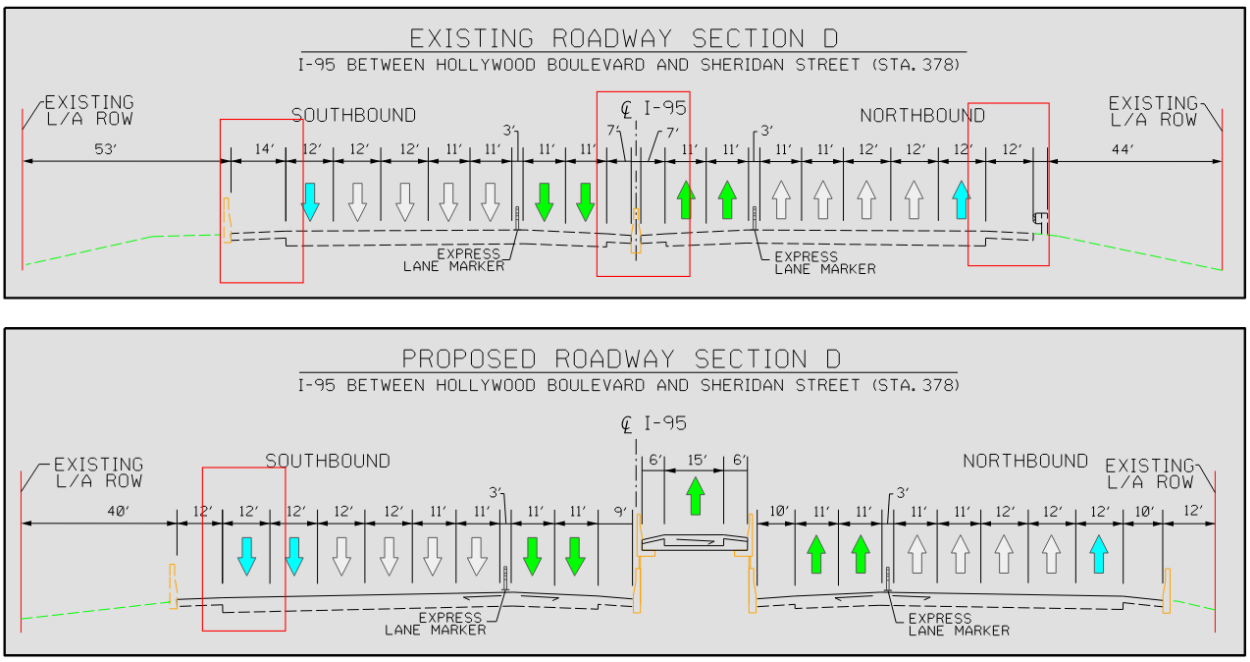


Figure 5: Improvements between Hollywood Blvd. and Sheridan St.

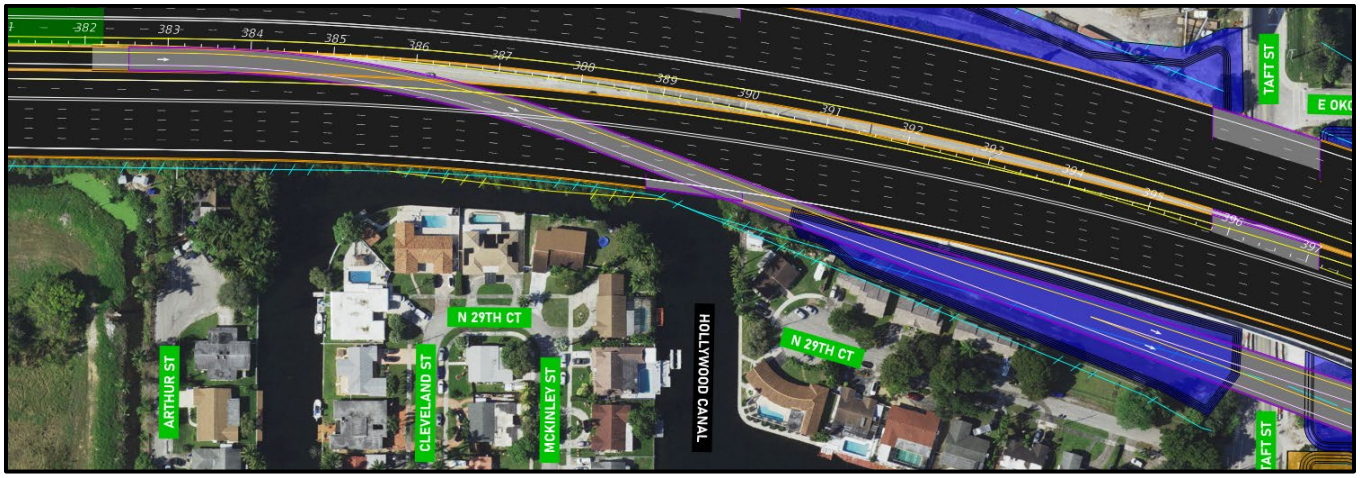


Figure 6: Northbound Managed Lanes Egress Bridge

From Sheridan Road to Griffin Road I-95 will be widened 12 feet to add one 12-foot general purpose lane on both directions. Between Griffin Road and I-595 the northbound direction will have a 12-foot widening for a new 12-foot general purpose lane. The outside shoulder will be reduced from 12 to 10 feet. In the southbound direction the mainline will have 6 feet of widening, to add a general-purpose lane. All general-purpose lanes will be reduced from 12 to 11 feet. The inside shoulder of the I-595 ramp into I-95 will be reduced from 9 to 6 feet.

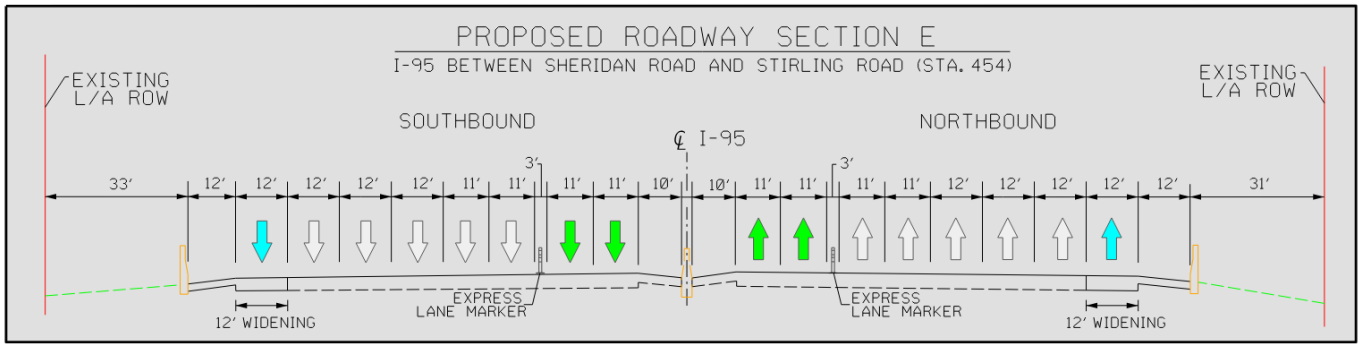


Figure 7: Improvements between Sheridan Rd. and Griffin Rd.

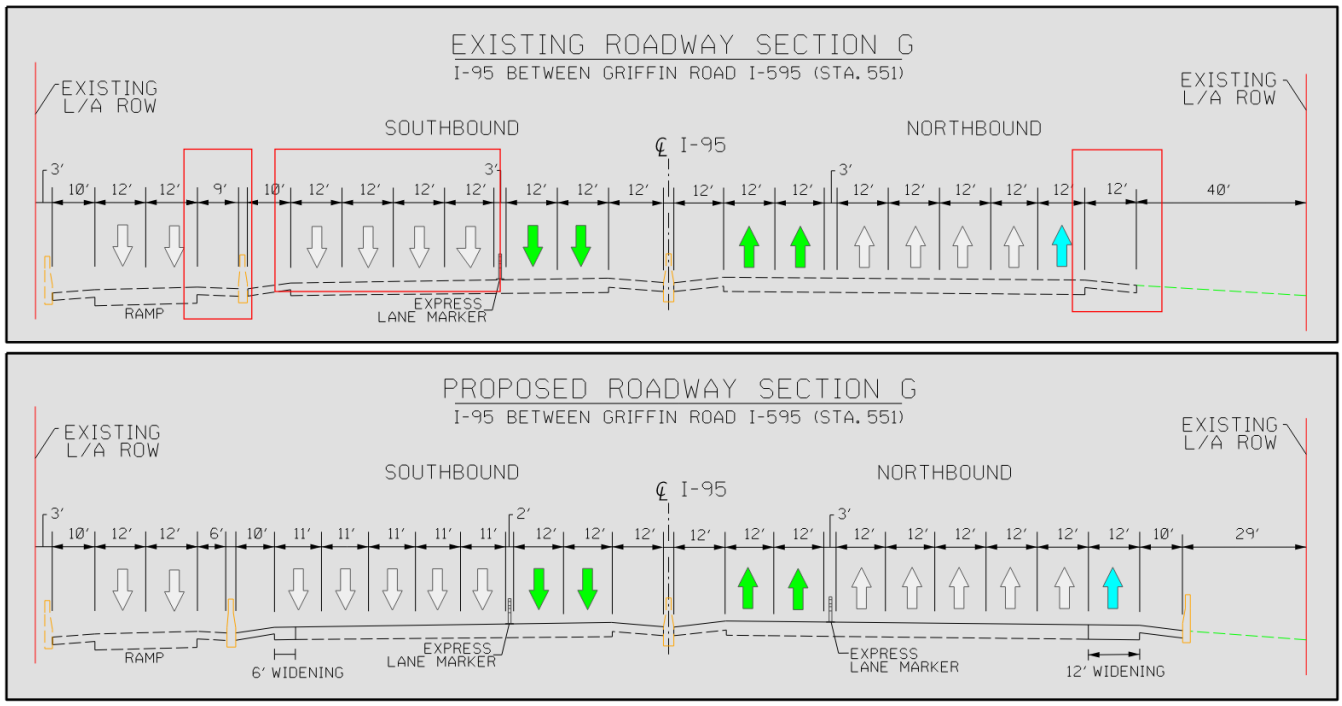


Figure 8: Improvements between Griffin Rd. and I-595

The proposed Typical Sections can be seen in **Appendix B.**

II. RESOURCE DATA

2.1 RAINFALL DATA

Rainfall distribution data was sourced from **1)** SFWMD Rainfall maps and **2)** NOAA Atlas 14. A summary of rainfall amounts in inches can be seen below and backup documentation in Appendix A.

Table 2: Rainfall Data

SOURCE	RETURN PERIOD (YEARS)	DURATION (HOURS)	RAINFALL (INCHES)
SFWMD	25	72	14.5
SFWMD	100	72	17.0
NOAA	10	24	8.9

2.2 SOIL DATA

The Soil Survey of Broward County, Florida, published by the USDA NRCS has been generated for the project limits. According to the soil survey there are 15 different soil types encountered along the project limits and are classified as Hydrological Soil Group (HSG) A, A/D and B soils. For soil assigned dual HSG, the first letter is for drained areas and the second is for un-drained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

- Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sand or gravel and have a high rate of water transmission.

- Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep or deep, moderately drained or well drained soils and have moderate runoff potential.

- Group D soils have high runoff potential when thoroughly wet and have slow infiltration rates.

The Soil Survey report was sourced from the USDA Web Soil Survey application and can be seen in Appendix H.

2.3 OTHER RESOURCES

The following resources were also utilized to complete this report:

- FDOT Drainage Design Guide
- FDOT Drainage Manual
- FDOT Project Development and Environment Manual
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate
- Map (FIRM)
- SFWMD DBHydro
- SFWMD ERP Applicant's Handbook I/II
- USGS Quadrangle Maps (Broward)

III. EXISTING CONDITIONS

3.1 EXISTING DRAINAGE

Existing drainage divides, basins, outfall information, and stormwater management facilities were taken from two main sources

1) Broward County I-95 PD&E (FPID: 436903-1) for Basins 1-5 and

2) I-95 3C PD&E /Design-Build Projects for Systems 9-13 (FPID 409354-2)



Figure 9: I-95 3C Project Map

Basin 1: This drainage basin encompasses I-95 between station limits 171+00 and 247+38. The basin extends from south of the Miami Dade/Broward County Line to the Hallandale Beach Blvd. interchange. Stormwater flows from the general-purpose lanes and shoulder into roadside swales and french drains located along the outside of I-95 and outfalls to the C-9/ Snake Creek Canal. The managed lanes and shoulder flow into the barrier wall inlets along the barrier walls. The swales are designed with a bottom elevation of 2.5 feet (NAVD) and a control elevation of 3.5 feet NAVD 88. Existing conditions have dry retention roadside swales provide water quality treatment and stormwater attenuation with ditch block weirs. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed, proposes new dry retention swales and pond alternatives to treat/attenuate the additional runoff proposed as part of that study. Basin 1 is located between the SFWMD C-9 East and North Biscayne Bay Basins. SFWMD permits 06-02942-P and 88-00053-S are within the basin's limits.

Basin 2: This drainage basin encompasses I-95 between station limits 247+38 and 287+92 between Hallandale Beach Blvd. and Pembroke Rd. Stormwater flows from the general-purpose lanes and shoulder

into roadside swales and french drains located along the outside of I-95 and outfalls to the C-10 Canal. The managed lanes and shoulder flow into the barrier wall inlets along the barrier walls. Dry retention roadside swales provide water quality treatment and stormwater attenuation with ditch block weirs. This basin discharges into Chaves Lake. Excess stormwater runoff from Chaves Lake overflows to the C-10 Canal through a pump station located on the west side of the I-95. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed, proposes new dry retention swales and pond alternatives to treat/attenuate the additional runoff proposed as part of that study. Basin 2 is located between the SFWMD C-9 East and North Biscayne Bay Basins. SFWMD permits 06-02942-P and 88-00053-S are within the basin's limits.

Basin 3: This drainage basin encompasses I-95 between station limits 287+92 and 342+06 between Pembroke Rd. and Hollywood Blvd. Stormwater flows from the general-purpose lanes and shoulder into roadside swales and french drains located along the outside of I-95 and outfalls to the C-10 canal. The managed lanes and shoulder flow into the barrier wall inlets along the barrier walls. Roadside swales provide partial water quality treatment and stormwater attenuation using ditch block weirs. The rest of the storage for treatment and attenuation is discharged to Basin 4 and ultimately discharged to the C-10 Canal. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed, proposes new dry retention swales and pond alternatives to treat/attenuate the additional runoff proposed as part of that study. Basin 3 is located within the SFWMD C-10 Basin. SFWMD permits 06-01465-S, 88-00053-S and 06-105283-P are within the basin's limits.

Basin 4: This drainage basin encompasses I-95 between station limits 342+06 and 369+41 between Hollywood Blvd. and Johnson St. Stormwater flows from the general-purpose lanes and shoulder into roadside swales located along both sides of the I-95 and Hollywood Blvd. interchange infield areas. The managed lanes and shoulder flow into the barrier wall inlets along the barrier walls. These roadside swales and interchange infield areas provide water quality treatment and stormwater attenuation with ditch block weirs. Excess stormwater runoff discharge into the C-10 Canal. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed, proposes new dry retention swales and pond alternatives to treat/attenuate the additional runoff proposed as part of that study. Basin 4 is located within the SFWMD C-10 Basin. SFWMD permits 06-01465-S, 88-00053-S and 06-105283-P are within the basin's limits.

Basin 5: This drainage basin encompasses I-95 between station limits 369+41 and 389+20 (between Johnson St. and the C-10 Canal). The managed lanes and shoulder flow into roadside swales and ponds located along both sides of the road and outfalls into the C-10 Canal. The managed lanes and shoulder flow into the barrier wall inlets along the barrier walls. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed, proposes new dry retention swales and the Sunset Golf Course Pond to

treat/attenuate the additional runoff proposed as part of that study. This is the last basin of the Broward County I-95 PD&E (FPID: 436903-1) study that is an extension of this PD&E Study. Basin 5 is located within the SFWMD C-10 Basin. SFWMD permits 06-01465-S and 06-105283-P are within the basin's limits.

System 9: This drainage basin encompasses I-95 between station limits 389+20 to 425+00 between C-10 Canal and Sheridan Street. Stormwater is collected by barrier wall inlets or directly sheet flows into roadside swales and ponds located along both sides of the road and outfall to the C-10 via existing ditch blocks. Existing Swale 9-1, 9-2, 9-3 and 9-4 currently provide the treatment/attenuation for the basin. These existing swales have a design bottom elevation of 1.0' NAVD and a discharge elevation of 2.0' NAVD. The Phase 3C design-build project (FPID 409354-2) re-graded these swales to provide the required storage as part of those improvements. System 9 is located within the SFWMD C-10 Basin. SFWMD permits 06-01465-S, 06-105306-P and 06-102237-P are within the basin's limits.

System 10: This drainage basin encompasses I-95 between station limits 425+00 to 451+80 between Sheridan Street and the C-10 Spur Canal. Stormwater is collected by barrier wall inlets or directly sheet flows into roadside swales 10-1 and 10-2 along both sides of the road and outfall to the C-10 Spur Canal via existing ditch blocks. These swales have a ditch bottom elevation of 1.5' NAVD and a discharge elevation of 2.6' NAVD. System 10 is located within the SFWMD C-10 Basin. SFWMD permits 06-01465-S, 06-105306-P and 06-105283-P are within the basin's limits.

System 11: This drainage basin encompasses I-95 between station limits 451+80 to 479+32 between the C-10 Spur Canal and Stirling Road. Stormwater is collected by barrier wall inlets or directly sheet flows into roadside swales 11E and 11W along both sides of the road and outfall to the C-10 Spur Canal via existing ditch blocks. These swales have a ditch bottom elevation of 1.5' NAVD and a discharge elevation of 2.6' NAVD. System 11 is located within the SFWMD C-10 Basin. SFWMD permits 06-102237-P, and 06-105306-P are within the basin's limits.

System 12: This drainage basin encompasses I-95 between station limits 479+32 to 533+23 between Stirling Rd. and Griffin Rd. Stormwater along mainline I-95 is collected by barrier wall inlets or directly sheet flows into roadside swales 12E and 12W. These swales have a ditch bottom elevation of 1.5' NAVD and a discharge elevation of 2.0' NAVD. Stormwater at the Griffin Road interchange is collected by two small treatment ponds (Pond 12SW on the Southwest Quadrant and Pond 12SE on the Northeast Quadrant). Stormwater is conveyed through Swale 12W and into Swale 12E through a 36" cross- drain pipe. A concrete weir controls the outfall of stormwater from Swale 12E through a 66" pipe that eventually outfalls into the C-10 Canal. System 12 is located within the SFWMD C-10 Basin. SFWMD permits 06-01465-S, 06-105306-P, 06-102237-P and 06-01768-S are within the basin's limits.

System 13: This drainage basin encompasses I-95 between station limits 533+23 to 604+54 between Griffin Rd. to I-595. Stormwater is collected by barrier wall inlets or sheet flows into roadside ponds (13A-1 through 13A-10) and outfalls to the Dania Cut-Off Canal. These ponds have a bottom elevation of that range from 0.92' to 1.42' NAVD. System 13 is located within the SFWMD Coral Reef Basin. SFWMD permits 06-01465-S, 06-01768-S and 06-102234-P are within the basin's limits.

Griffin Road East: This is an offsite drainage basin that encompasses Griffin Road east of I-95. Stormwater is collected by curb inlets and conveyed through a series of pipes east to an existing dry pond under the Griffin Road bridge over the Dania Cut-off Canal. This pond outfalls to the Dania Cut-Off Canal. The pond has a bottom elevation of about 1.50' NAVD. SFWMD General Permit 82-09 covers the basin's limits.

3.2 FLOODPLAINS

The project is located within Federal Emergency Management Agency (FEMA) Insurance Rate Maps (FIRMs) 12011C0558J, 12011C0566J, 12011C0568J and 12011C0731J. The project limits lie within flood zones AH, AE, and X.

The definitions according to FEMA are listed below:

- Zone AH*: "Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones."*

- Zone AE: "*The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones."*

- Zone B and X (Shaded): "*Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile."*

3.3 CROSS DRAINS

Existing cross drain locations were determined based on existing construction plans, the Straight-Line Diagram (Appendix A) and existing survey information. Cross Drains are described in Table 3 below.

Table 3: Cross Drains

Cross Drain No.	Station	Size	Approx. Length (ft)	Description
CD-1	215+77	18”	100	MBI to west ditch
CD-2	228+76	30”	200	MBI to side ditches
CD-3	266+84	30”	229	MBI to side ditches
CD-4	302+65	30”	246	Inlets connected to east ditch
CD-5	304+75	24”	116	MBI to east ditch
CD-6	312+85	24”	130	MBI to east ditch
CD-7	319+88	24”	250	MBI to side ditches
CD-8	325+34	24”	235	MBI to side ditches
CD-9	355+93	24” - 30”	158	MBI to west ditch
CD-10	382+45	24”	120	MBI to west ditch
CD-11	391+96	18”	114	MBI to east ditch
CD-12	407+90	30”	106	MBI to west ditch
CD-13	441+78	36”	112	MBI to east ditch
CD-14	457+76	18”	122	MBI to east ditch
CD-15	463+75	18”	119	MBI to west ditch
CD-16	490+76	18”	130	MBI to east ditch
CD-17	498+66	36”	245	MBI to side ditches
CD-18	499+75	36”	245	Cross Drain
CD-19	500+76	18”	122	MBI to east ditch
CD-20	507+36	18”	233	MBI to side ditches
CD-21	510+16	18”	123	MBI to east ditch
CD-22	512+96	15”	120	MBI to west ditch
CD-23	515+76	18”	129	MBI to east ditch
CD-24	520+76	24”	128	MBI to west ditch
CD-25	544+26	24”	234	MBI to east ditch (Skewed)
CD-26	546+31	24”	213	MBI to east ditch

MBI: Median Barrier Inlet

3.4 EXISTING PERMITS

Within the project corridor there are several permits involved. The following are the permits pertaining to the project:

- ERP No. 06-00526-S, Design Center of the Americas / BICC Drainage Interconnect
- ERP No. 06-01465-S, I-95 Express Lanes Phase 3C (FPID 409354-2)
- ERP No. 06-01826-S, S R 822 (Sheridan Street) From CSX Rr Bridge to N 26th
- ERP No. 06-02366-P-05, Tanger Retail Center
- ERP No. 06-02371-P, Sportsman's Park Outdoor World
- ERP No. 06-02942-P, C S X / I-95 Ditch Paving - Hollywood Blvd to Pembroke Rd
- ERP No. 06-03640-P, I-95 Bridges Over The C-10 And C-10 Spur Canals
- ERP No. 108019-P, Broward County Aviation Department Mangrove Trimming
- ERP No. 88-00053-S, S.R.-9/I-95 Express Lanes

3.5 REGULATORY AGENCIES

The study area falls in the SFWMD C-10, and Coral Reef Basins within the jurisdiction of SFWMD and outside the limits of any local water control districts jurisdiction. Figure 10 shows the SFWMD drainage basins C-10, and Coral Reef Basins and Figure 11 shows the Broward County Drainage Districts Map.

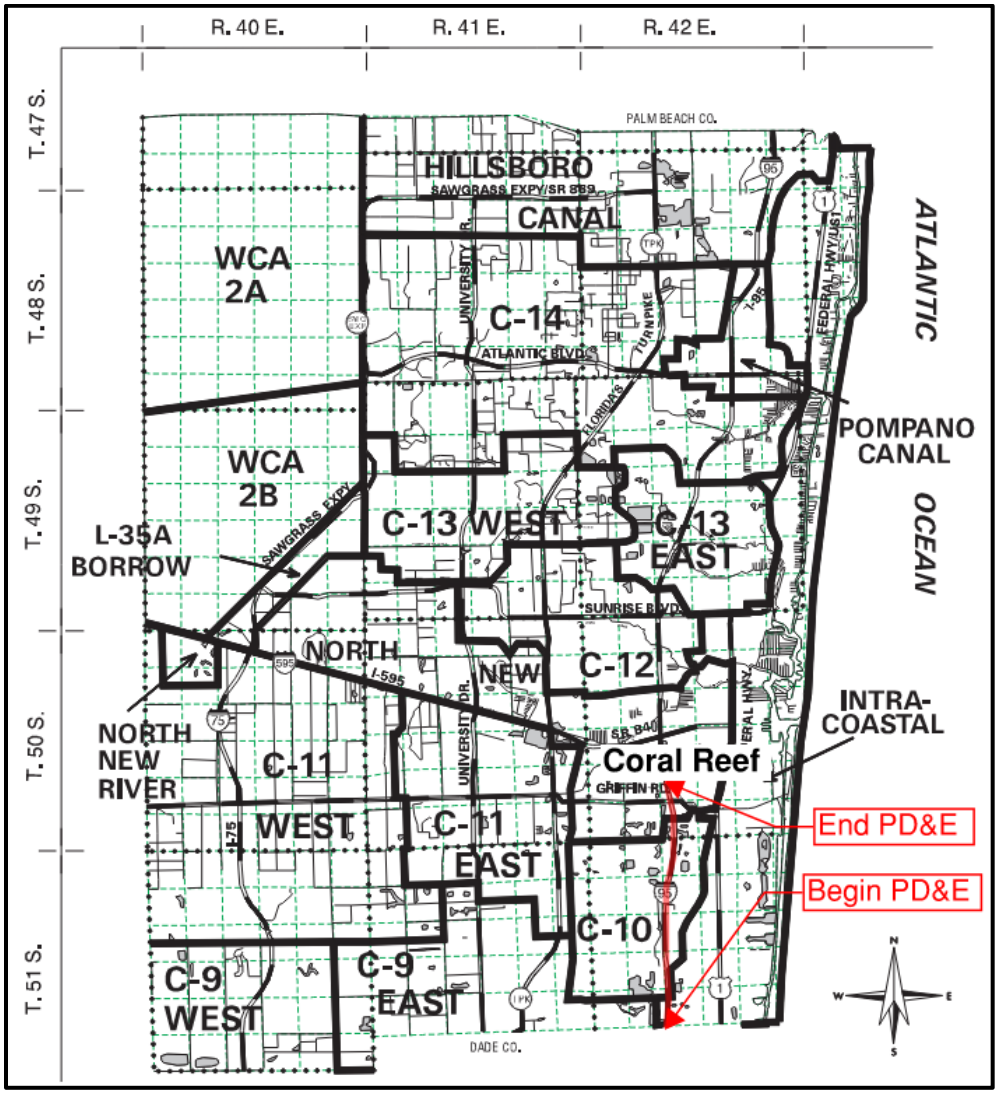


Figure 10: SFWMD Basin Map

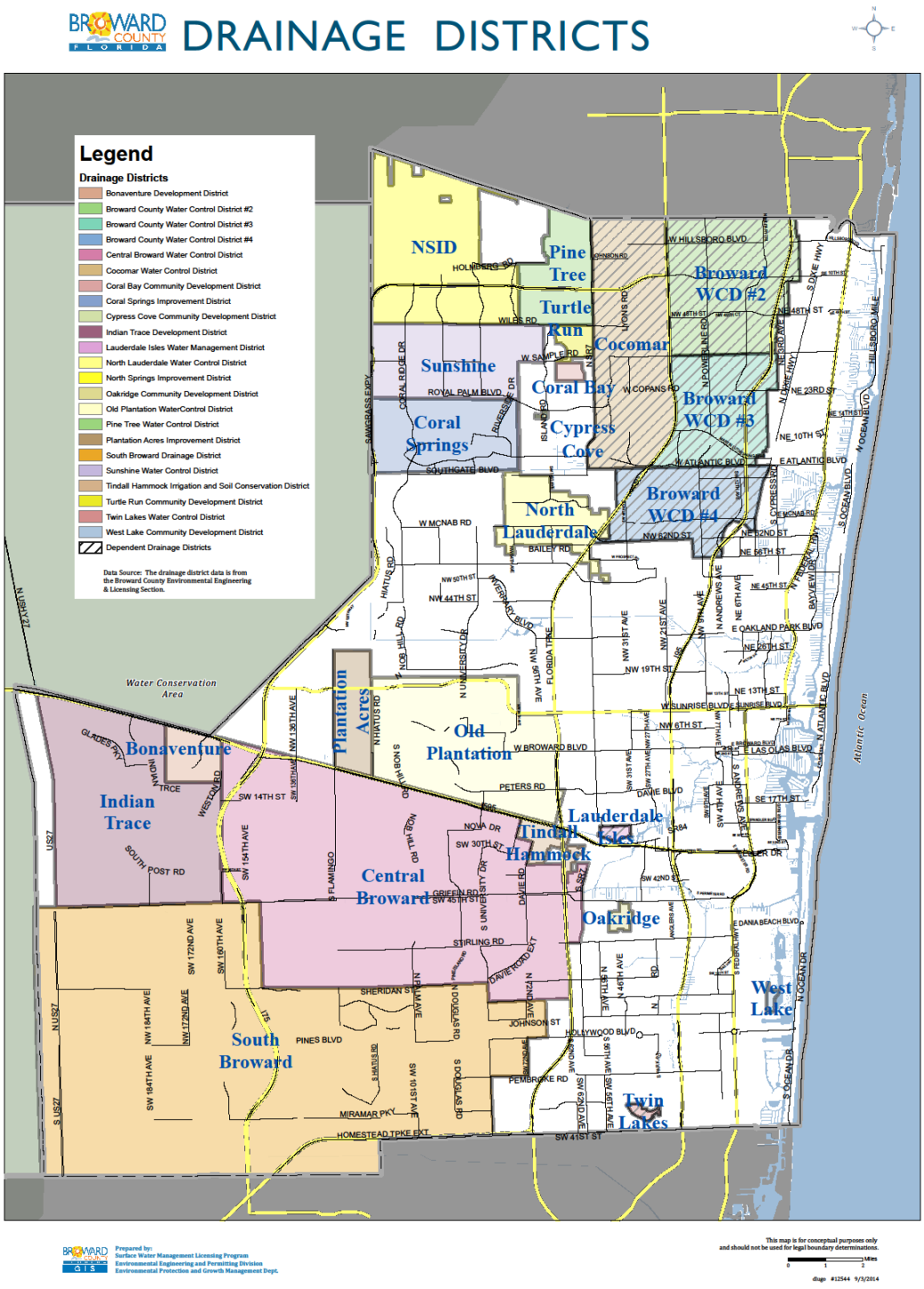


Figure 11: Broward County Drainage Districts

3.6 LAND USE

The project land use is primarily commerce and low medium residential. No future land use change is anticipated within the project corridor. Figure 12 shows the Broward County Land Use Plan.

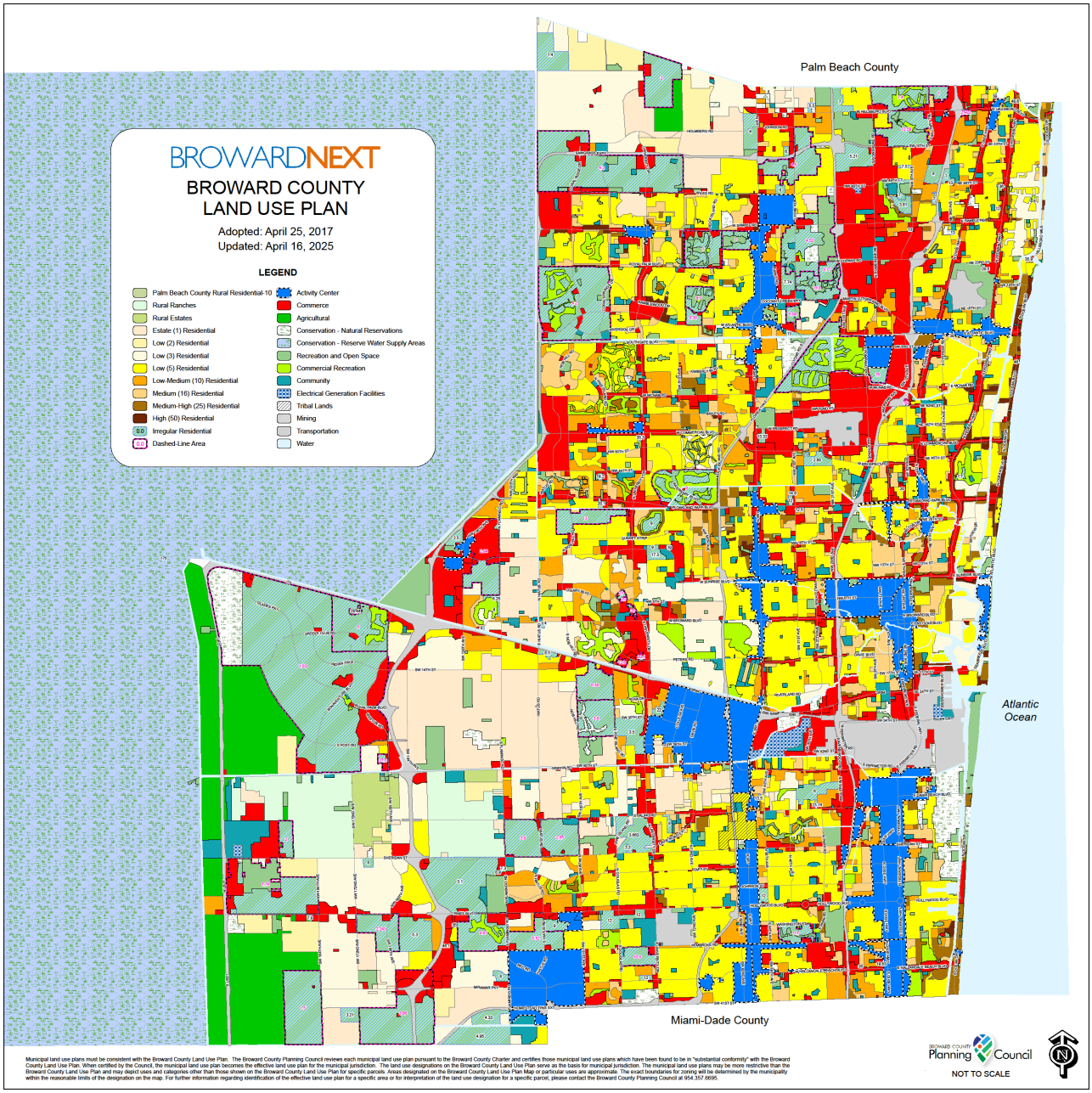


Figure 12: Broward County Land Use Plan

3.7 GEOTECHNICAL CHARACTERISTICS

3.7.1 SOIL PROPERTIES

Based on the U.S. Department of Agriculture (USDA) web soil survey there are 15 different soil types encountered along the project limits and are classified as Hydrological Soil Group (HSG) A, A/D and B soils. The predominant HSG is determined to Group A. Udorthents (shaped) and Urban Lands, are the predominant soils in the corridor, and are classified as well drained soils. Based on the Geotechnical Engineering Report for Bridge Widening for the I-95 Express Lanes project (FPID Nos.: 422796-1 & 422796-2), the environmental classification of the corridor is considered slightly aggressive. The Soil Properties Map is included in the Custom Soil Resource Report in Appendix H, along with excerpts from the geotechnical report referenced.

Depth to groundwater based on geotechnical investigation, generally ranged from about 3 to 12 feet below existing grade for each boring location The Seasonal High Water elevation has been determined to be 0.50 feet NAVD88 for this study for Systems 9 through 13 based on existing ERP permits and Broward County Water Table Map. Figure 13 shows the Broward County Water Table Map. Appendix J shows the Seasonal High Water Table Technical Memo.

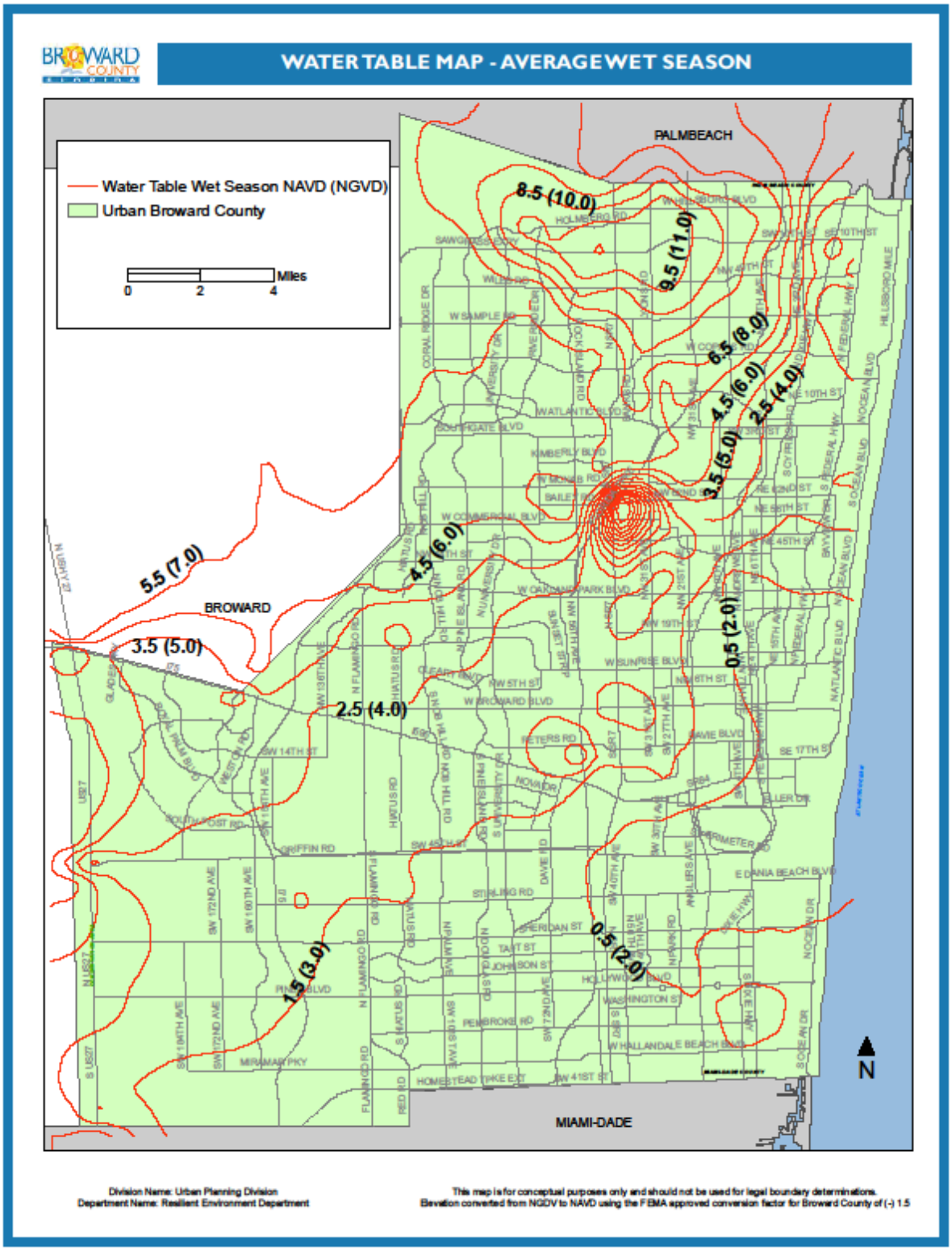


Figure 13: Broward County Water Table Map

3.7.2 WELLFIELD PROTECTION AREAS

The project is outside the limits of any wellfield protection area. Therefore, no wellfield protection measures are required. The near wellfield areas are located east of the project corridor between Hallandale Beach Boulevard and Pembroke Road. Figure 14 shows the Broward County Wellfield Map.

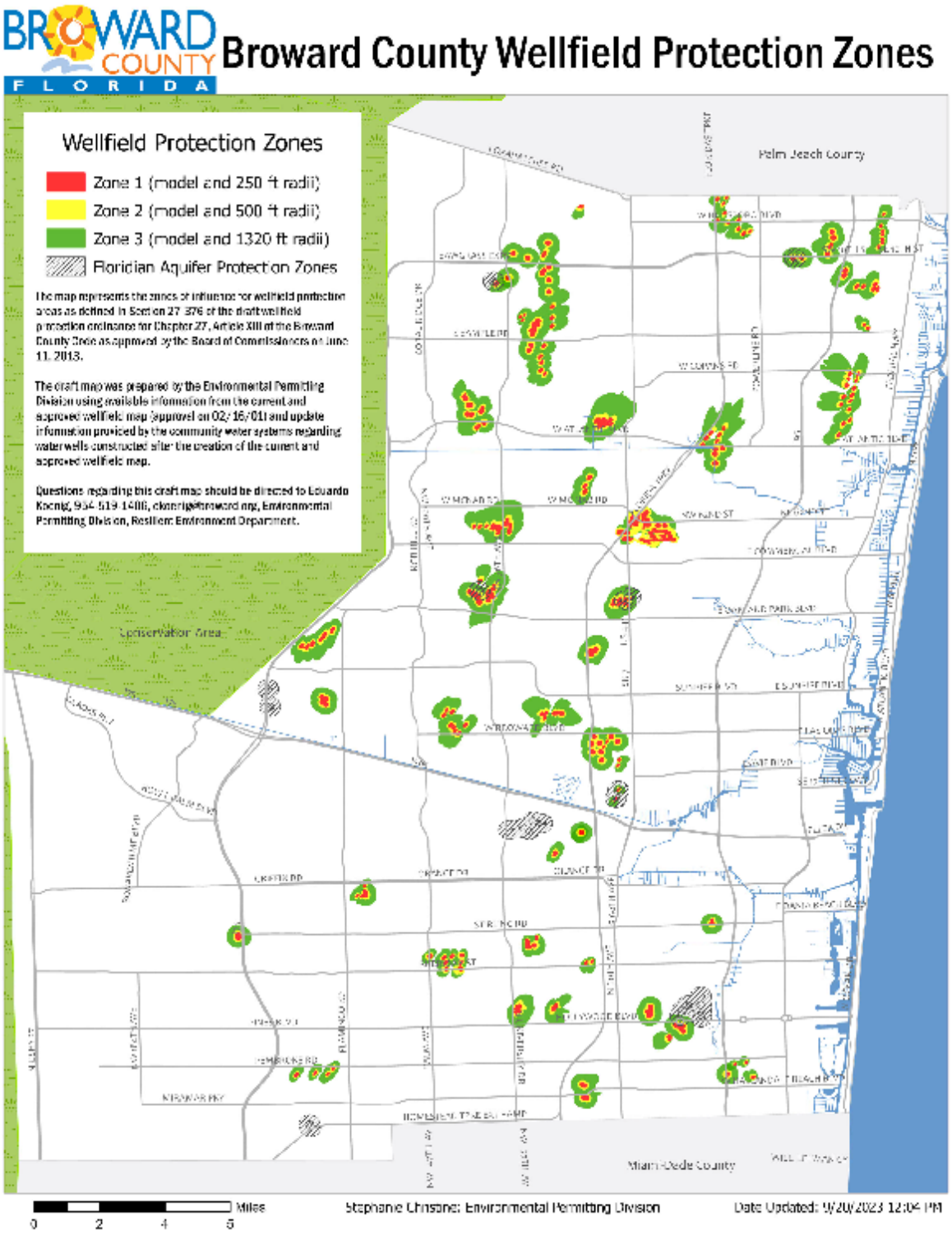


Figure 14: Broward County Wellfields

3.8 ENVIRONMENTAL

3.8.1 CONTAMINATION

A Level 1 Contamination Screening Evaluation Report (CSER) was prepared using the FDOT PD&E Manual, Part 2, Chapter 20, and standard contamination screening evaluation practices such as: reviewing regulatory agency records, site reconnaissance, literature review and when necessary, personal interviews of knowledgeable parties within the limits of the project.

Potentially contaminated sites were identified and reviewed for potential impacts to the project. Of these, three were ranked “High”, 22 were ranked “Medium”, 11 were ranked “Low”, and two were ranked "No" for potential contamination concerns. See **Figures 7-10** for the locations of these sites. For sites assigned a risk rating of “Medium” or “High”, a Level II Assessment is recommended if construction activities are proposed in the site vicinity. These sites have been determined to have known contaminants, which may impact the proposed project. A soil and groundwater sampling plan should be developed for each site, as applicable. Based on the findings of a future review and Level II Assessment, design engineers may be required to avoid areas of concern or include special provisions with the plans to require that construction activities performed in areas of concern be conducted or supervised by a contamination assessment and remediation contractor specified by FDOT.

Additional information may become available or site-specific conditions may change from the time this report was prepared and should be considered prior to acquiring right of way and/or proceeding with roadway construction.

Dewatering is anticipated; therefore, a dewatering permit will be required from FDEP/SFWMD. The dewatering plan will need to consider the radius of the influence of any dewatering activity on nearby contamination plumes to avoid potential contamination plume exacerbation. The status of the sites should be updated accordingly at each future design phase. All permits will be obtained in accordance with Federal, State, and local laws and regulations and coordination with the District Contamination Impact Coordinator (DCIC). If dewatering activities are proposed within 500 feet of a contaminated site, an FDOT Contamination Assessment Remediation (CAR) Contractor will assist in the preparation of the dewatering permit application and assist in the permit process. Future Roadway Design plans should include a general note listing any area of dewatering concerns with applicable stationing. See *Part 2, Chapter 20 Contamination, paragraph 22.2.5.2 Dewatering During Construction* for further details. Additionally, *see Part 1, Chapter 12, Environmental Permits, and Part 2, Chapter 11, Water Quality Impact Evaluation,* for guidance on NPDES permitting. For more information about contamination, please refer to the CSER.

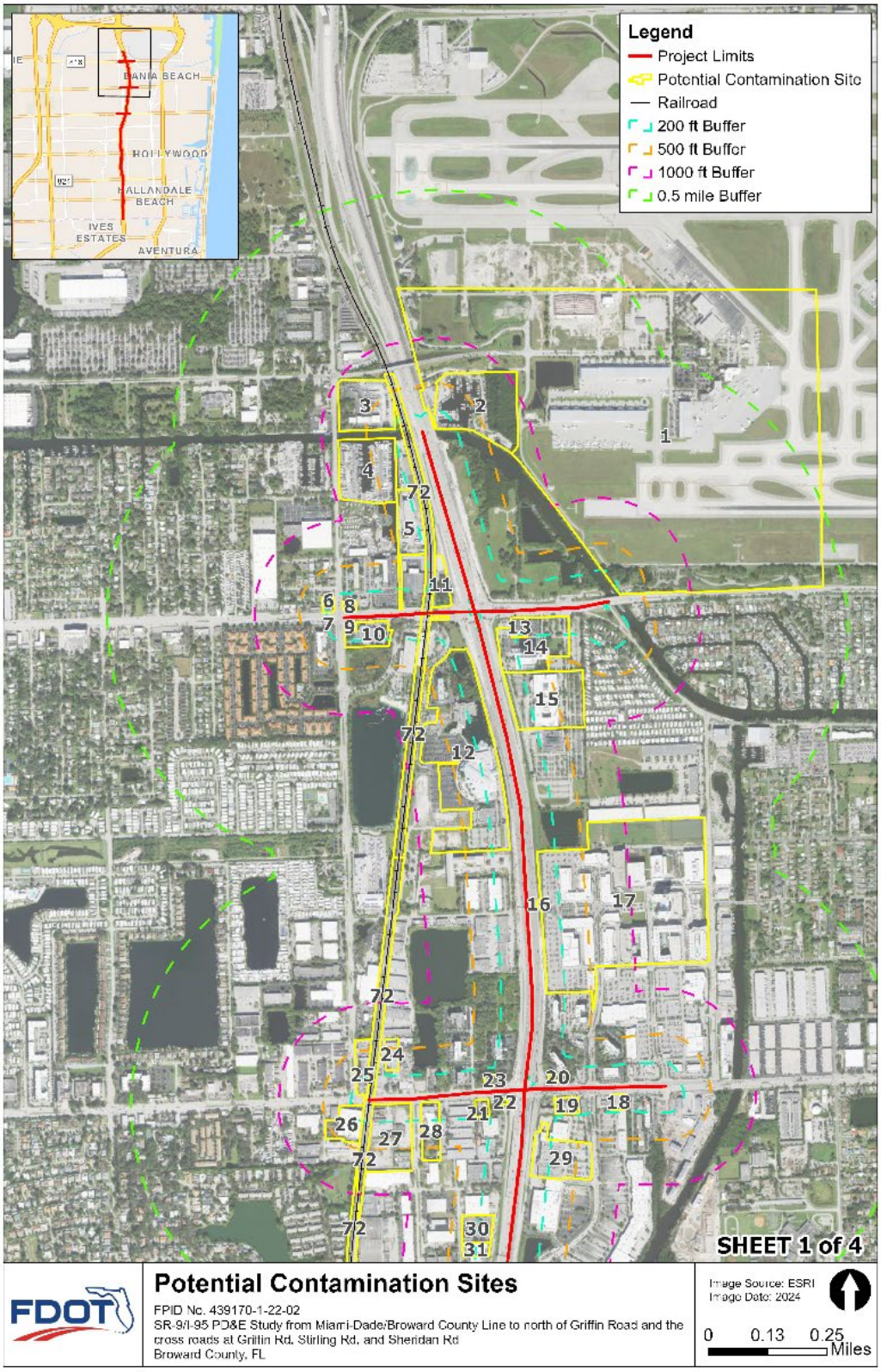


Figure 15: Broward County Contaminated Sites Map (1 of 4)

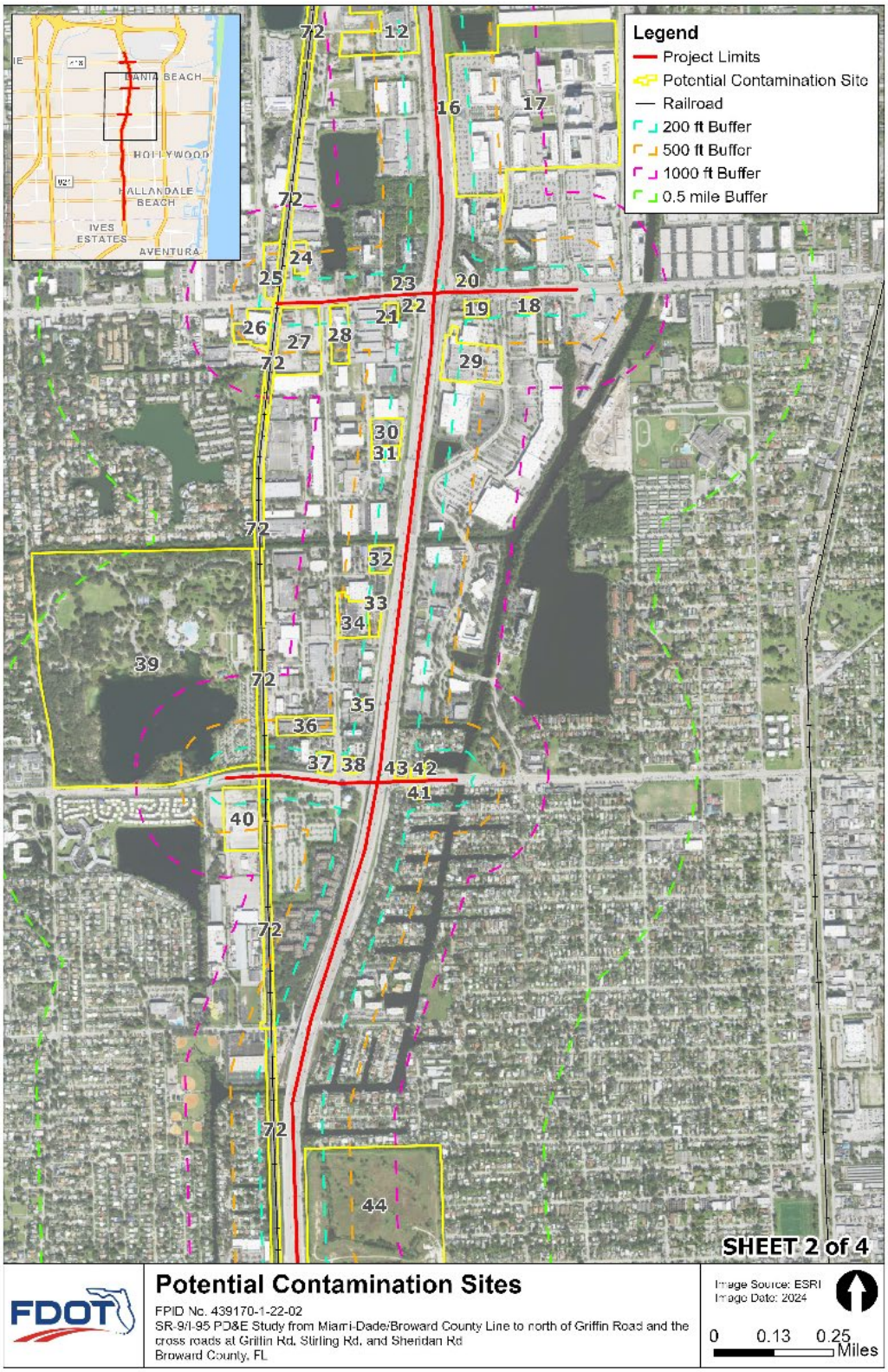


Figure 16: Broward County Contaminated Sites Map (2 of 4)

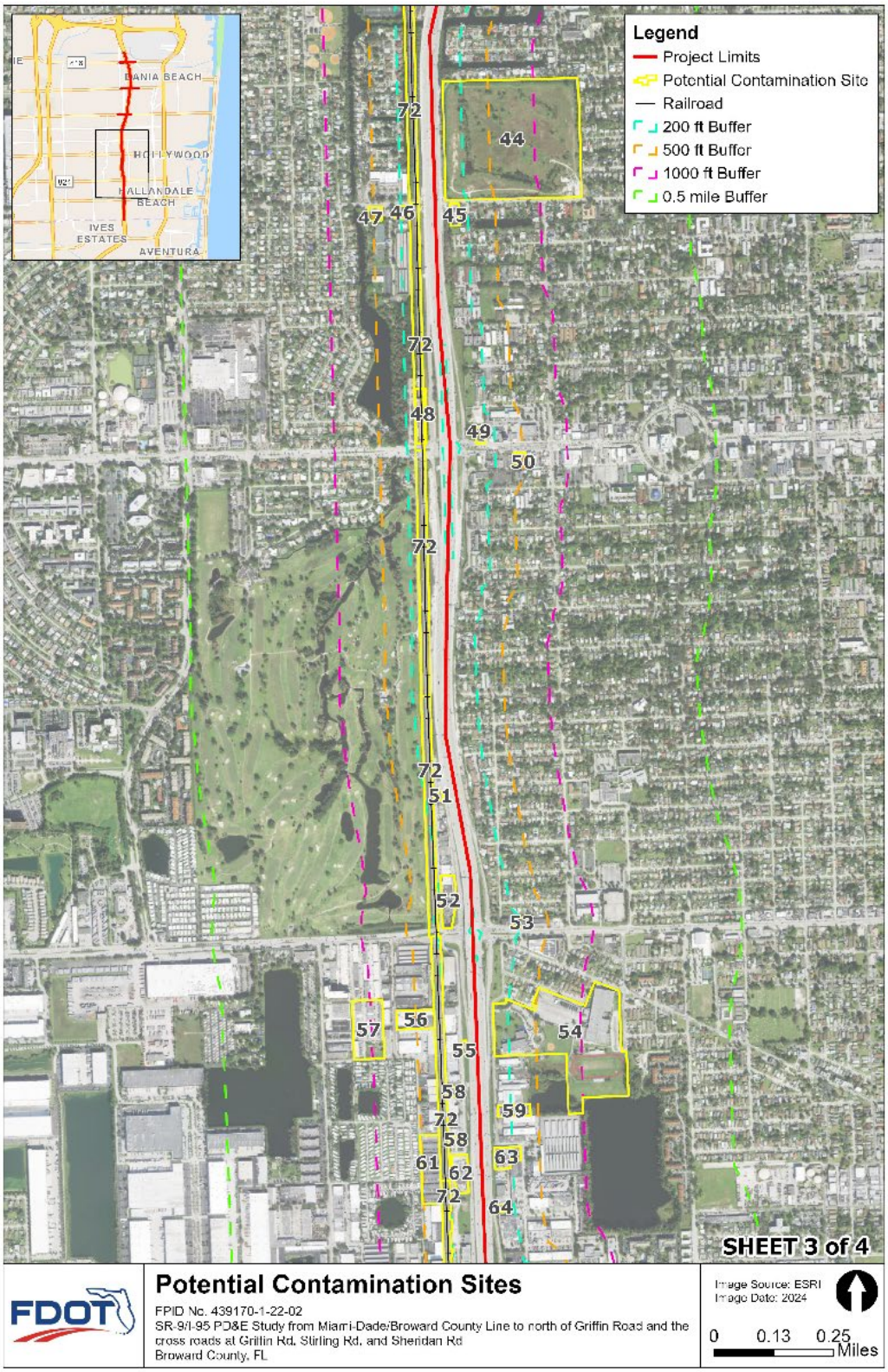


Figure 17: Broward County Contaminated Sites Map (3 of 4)

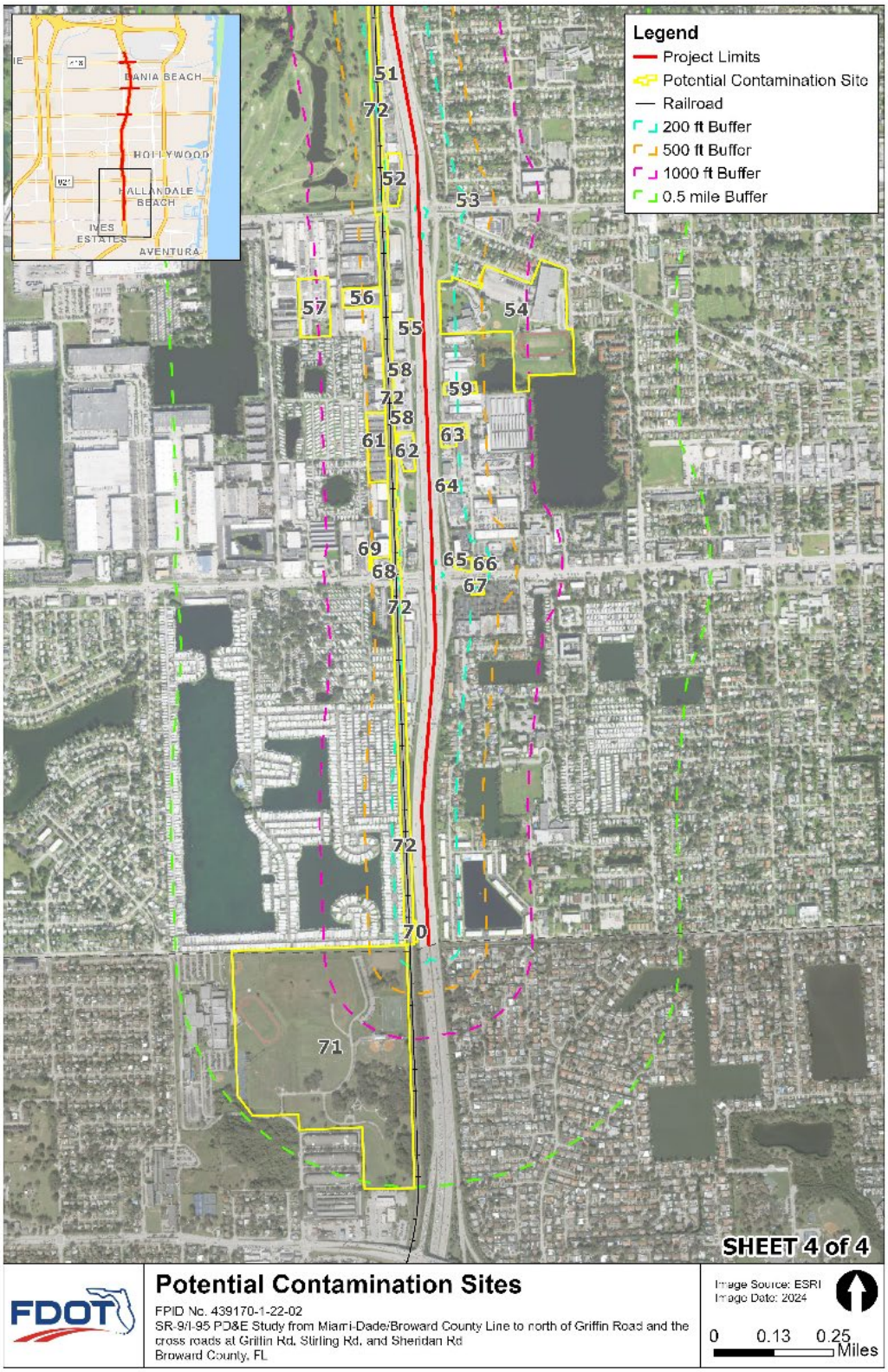


Figure 18: Broward County Contaminated Sites Map (4 of 4)

3.8.2 WETLAND

In accordance with the FDOT PD&E Manual, Chapter 9 (July 1, 2024), Executive Order 11990, Protection of Wetlands as well as applicable federal and state regulatory requirements (Section 404 of the Clean Water Act and Chapter 373, Florida Statute, respectively) a wetland and other surface waters (OSW) evaluation was conducted for this project. The objectives of this evaluation were to identify existing wetlands and OSW's, evaluate potential impacts to them, and assess the function and value of wetlands potentially impacted by the project. Additional ROW is being acquired primarily for drainage purposes/ponds. Pedestrian transect surveys have been performed to confirm identified wetland and/or OSW areas. National Wetland Inventory Maps are included in **Appendix A.**

3.8.3 HISTORICAL, ARCHEOLOGICAL AND ENDANGERED SPECIES

There are few historical, archaeological and environmental areas located within the project limits. A copy of the Broward County Historical, Archaeological and Environmental Area Maps is included in **Appendix A.** Additionally, per the CRAS report dated February 4, 2026, none of the selected pond alternatives have an adverse effect on listed resources, eligible, or potentially eligible for listing in the NRHP and no additional investigation within the APE or ASA is necessary.

IV. PROPOSED DRAINAGE

4.1 DESIGN CRITERIA

4.1.1 WATER QUALITY CRITERIA

SFWMD Criteria: The SFWMD requires that all projects meet state surface water quality standards as set forth in Chapters 62-4 and 62-302, Florida Administrative Code (FAC). Effective June 28, 2024, Chapter 62-330, FAC and ERP AH Vols. I & II were amended to include new water quality performance standards and supporting calculations specified in Section 8.0, Criteria for Evaluation, and Section 9.0, Stormwater Quality Treatment Evaluations, ERP AH Vol. I, respectively.

According to the SFWMD Environmental Resource Permit Information Manual, Volume 1, 2024, this study is anticipated to meet the performance standards listed below:

- Projects containing impaired waters.
    - 80% reduction in average annual loading of phosphorus (TP) & 80% reduction in average annual loading of nitrogen (TN).
    - A reduction such that the post-development condition average annual loading of nutrients does not exceed the predevelopment condition nutrient loading.

Table 4 contains the list of basins within the study limits, its associated WBID and the nutrient removal efficiencies that are anticipated for this study basin our preliminary investigation. The percentage increase in nutrient loading when comparing the Pre. Vs. Post Development loading is typically less than the percentage removal listed above for a fully developed corridor. This means the greater nutrient loading removal percentages listed above and in Table 3 are taken as the greatest.

Table 4: Nutrient Removal Criteria

Drainage Basin	HUC12	WBID	Impaired	Nutrient Removal Criteria	Nutrient Removal Criteria	Remarks
				TN (%)	TP (%)	
System 9	030902061205	3282	Bacteria	80	80	
System 10		3282	Bacteria	80	80	
System 11		3282	Bacteria	80	80	
System 12		3282	Bacteria	80	80	
System 13	030902061800	3277E	Bacteria	80	80	
Griffin East		3277E	Bacteria	80	80	No net increase in impervious

Note: The studies limits of this PD&E overlaps with a separate PD&E (FPID: 436903-1) which extends from South of Hallandale Beach Boulevard to North of Hollywood Boulevard within Basins 1 through 5. That PD&E was completed under the previous stormwater quality criteria that were in place prior to the June 28, 2024 amendment. That criterion is volumetric water quality and requires the following:

- Wet detention treatment is calculated as the greatest between the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness.
- Dry detention requirements are calculated as 75 percent of the computed amount for wet detention.

This PD&E study does not anticipate any major changes to the Pond Siting Report and stormwater facility alternatives developed as part of the abutting PD&E.

4.1.2 WATER QUANTITY CRITERIA

The SFWMD Basis of Review also addresses stormwater quantity (peak discharge) and requires that off-site discharge rates and volumes do not adversely impact off-site areas. Typically, this means that post development peak discharge rate must be equal or less than the pre-development discharge rate. The design storm for determination of allowable off-site discharge is a 3-day duration storm with a 25-year return frequency, unless a different frequency is specified on previous permits. The 25-year, 3-day rainfall amount at the project location is 14.5 inches, see **Figure 11.**

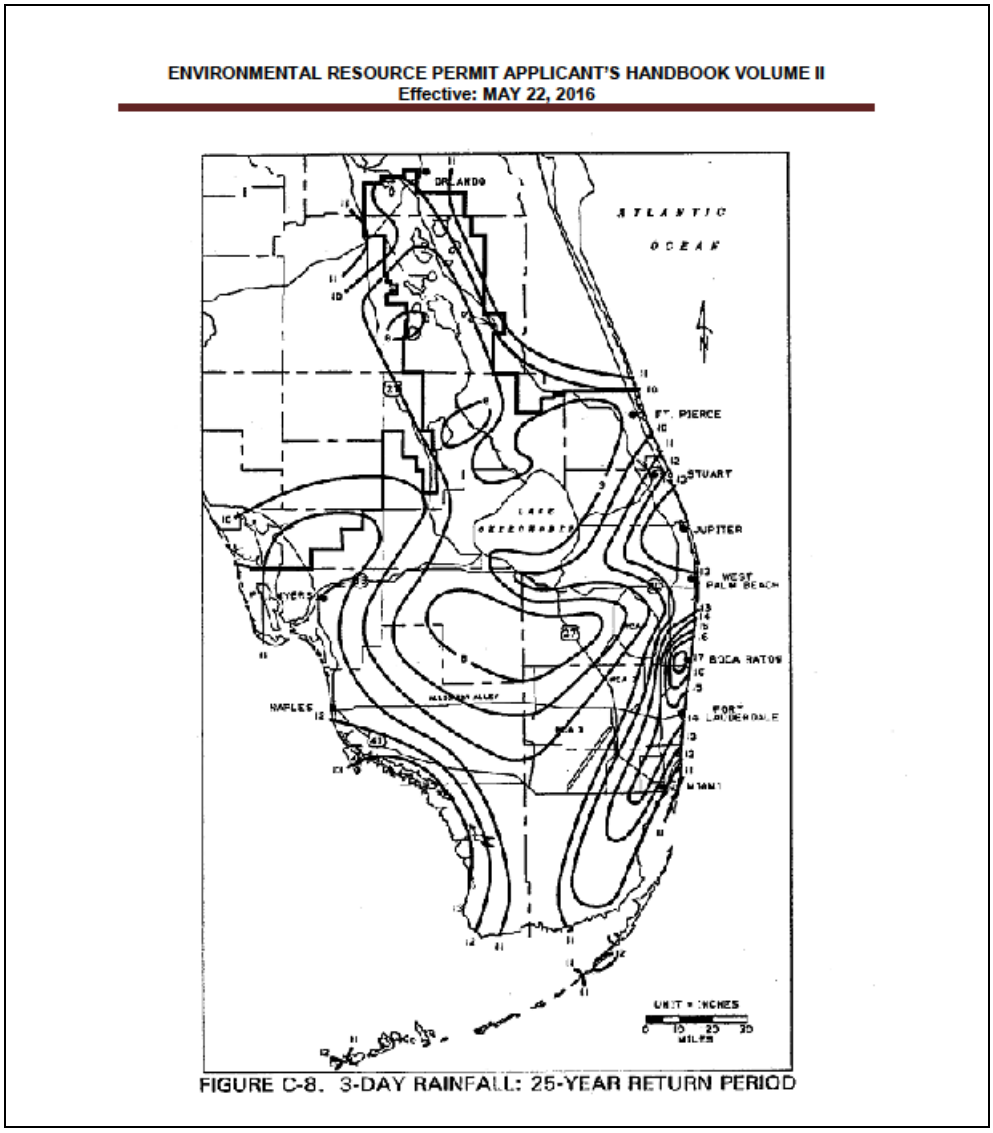


Figure 19: SFWMD 25 Year, 3-Day Rainfall Map

A-18

A-165

4.1.3 REQUIRED PERMITS

The agencies with stormwater permitting jurisdiction over the proposed study area include:

- SFWMD - General Environmental Resource Permit (ERP)
- United States Army Corps of Engineers – Dredge and fill permit is required for proposed work in, under or above surface waters or wetlands, as associated with the bridge widening work at the C-10 Spur, C-10 (Hollywood Canal) and Dania Cut-off Canal.

Note: The permits required listed above are for documentation purposes only and will be secured during the design phases.

4.2 REQUIRED STORAGE FOR WATER QUALITY TREATMENT AND WATER QUANTITY ATTENUATION

The latest permits covering this PD&E's segment of I-95 were issued by SFWMD between 2021 and 2022 as part of a segmented widening project known as I-95 Express Lanes Phase 3C (FPID 409354-2). Those permits approved the widening of I-95 for the purpose of converting the existing High Occupancy Vehicle (HOV) lanes to managed toll lanes.

Segment 1A: Segment 1A extends from south of Hollywood Boulevard to the SFWMD C-10 Spur Canal, in Broward County. **SFWMD Permit No. 06-105283-P.**

Segment 1B: Segment 1B extends from the SFWMD C-10 Spur Canal to the Dania Cut Off Canal, in Broward County. **SFWMD Permit No. 06-102234-P.**

Segment 2A: Segment 2A extends from the Dania Cut Off Canal to S.R.-84, in Broward County. **SFWMD Permit No. 06-102234-P.**

As previously stated, this project pond siting analysis will concentrate on the limits from where the southern abutting PD&E (FPID: 436903-1) ends (C-10 Canal) and includes Systems 9 through 13. As part of the Phase 3C (FPID 409354-2) improvements, existing swales were reshaped along I-95 to provide additional storage for the additional impervious area resulting from the project. Water quality was provided across all basins based on the previous water quality standards discussed in Section 4.1. Water quantity (discharge rates) will be based on the previous permits established pre-development discharge rate. One thing to note is that the I-95 Phase 3C project (FPID 409354-2) did not set a pre-development discharge rate for Systems 9 and 10 and only did a volumetric analysis.

This study is anticipated to have varying impacts to the existing permitted I-95 swales, regardless of which alternative is recommended (excluding no-build alternative). The proposed "build" improvements will add additional impervious areas, while also reducing the capacity of existing roadside swales and/or dry retention ponds. Due to the constrained right of way conditions within this segment of I-95, additional stormwater quantity/quality storage is needed outside of the right of way.

Water quality requirements for this study are based on the nutrient removal efficiencies (discussed in Section 4.1) required for each basin. Because the I-95 corridor has historically been designed/permitted using a volumetric water quality approach, this report utilized the volumetric approach to estimate the post development water quality. This served as an accurate estimate and ensured that the required volumes were

not underestimated if only nutrient removal efficiencies were used for pond/swale sizing. Additionally, the water treatment volume calculation of 2.5 inches over the impervious area is a conservative estimate when comparing the dry retention nutrient removal efficiencies outlined in the SFWMD Applicant's Handbook, Appendix O. Dry retention nutrient removal efficiencies between 1.5 and 2.0 inches over the Directly Connected Impervious Area provide more than 80% removal efficiencies (See Appendix E). Once the pond sites were sized, a nutrient removal analysis using BMPTrains was completed to validate that each basin met the required nutrient removal efficiencies. Water quantity volume was estimated by calculating the difference in runoff volume between the post-developed conditions and the pre-developed conditions using the NRCS equation for runoff. The 25-year, 3-Day rainfall depth is used to estimate the required attenuation volume.

The combined needs for both stormwater quality and quantity determined that additional parcels are needed to meet the stormwater management criteria for the project. Detailed analysis has been provided in Appendix E.

4.3 STORMWATER MANAGEMENT FOR ALTERNATIVES AND POND SITING

The proposed drainage system will focus on Systems 9 through 13 as they are the basins with the largest impact due to the proposed corridor improvements. Basins 1 through 5 are covered under a separate PD&E as previously discussed. The existing and proposed drainage basins were delineated based on the most recent project that modified the corridor, which is I-95 Phase 3C (FPID 409354-2). The proposed drainage maps from I-95 Phase 3C (FPID 409354-2) were used as pre-development drainage maps. The proposed drainage maps were established by modifying the pre-development (Phase 3C) maps to account for the interchange and mainline alternations.

The proposed drainage systems are based on the alternative deemed the worst-case scenario for added impervious and impacts to existing facilities. Based on our review of each of the alternatives (Diamond vs. Diverging Diamond Interchange), the traditional diamond interchange was deemed to have the largest increase to both impervious area and to the reduction in capacity of existing systems. Each stormwater management site proposed outside the right-of-way considered three alternatives and evaluated them with a matrix on the PD&E Study Pond Siting Report. **Appendix C** includes conceptual drainage maps for each basin within the study limits.

The proposed corridor improvements widen the I-95 Corridor and encroaches on most of the existing roadside treatment ponds. This report looked at innovative ideas (walled treatment ponds) to provide the required storage within the right of way, but due to limited availability of open space within right of way,

new offsite ponds were presented as solutions to the stormwater needs of the project. A summary of the proposed stormwater facilities being considered as part of this PD&E can be found below.

Basin 1: This drainage basin encompasses I-95 between station limits 172+00 and 247+38. The basin extends from south limits of the Miami Dade/Broward County Line to the Hallandale Beach Boulevard interchange. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed proposes new dry retention swales and pond alternatives to treat/attenuate the additional runoff proposed as part of that study. No changes to this basin are being proposed as part of this study.

Basin 2: This drainage basin encompasses I-95 between station limits 247+38 and 287+92 between Hallandale Beach Blvd. and Pembroke Rd. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed proposes new dry retention swales and pond alternatives to treat/attenuate the additional runoff proposed as part of that study. No changes to this basin are being proposed as part of this study.

Basin 3: This drainage basin encompasses I-95 between station limits 287+92 and 341+98 between Pembroke Rd. and Hollywood Blvd. The Broward County I-95 PD&E (FPID: 436903-1) study recently completed proposes new dry retention swales and pond alternatives to treat/attenuate the additional runoff proposed as part of that study. No changes to this basin are being proposed as part of this study.

Basin 4: This drainage basin encompasses I-95 between station limits 341+98 and 369+46, between Hollywood Boulevard and Johnson Street. The basin is subdivided into 4A-L, 4B-L, 4C-L & 4D-L on the west side, and 4A-R & 4B-R at east of I-95. Runoff from this segment of I-95 sheet flows into the remaining roadside swales located along both sides of I-95 identified as S-L6, S-R12, S-R13, S-R14 and S-R15. Among those, S-R13 is in two (2) new parcels. This system consists of dry swales with a bottom elevation of 1.5 feet NAVD 88 and a weir control elevation raised to 3.5 feet NAVD 88. These modified roadside swales provide water quality treatment and stormwater attenuation using ditch block weirs. The excess stormwater runoff will be discharged to the stormwater pond within the Sunset Golf Course on the east side of the I-95 corridor and ultimately discharged into the C-10 Canal just north of Johnson Street. This basin is located within the SFWMD's C-10 Basin. The proposed improvements clip a small corner of swale S-L6 and S-R15. The impacts are not sufficient to warrant a re-evaluation of this basin and can be mitigated through regrading (as demonstrated in the calculations in **Appendix E**) during the design stages.

Basin 5: This drainage basin encompasses I-95 between Johnson Street and approximately 800 feet to the North, where the northbound widening is ending. The basin is subdivided into 5AL basin on the west side and 5AR on the east side. This study will add additional impervious areas to this basin in the various fly-over alternatives. The stormwater runoff from the basin is being routed to a new proposed retention Pond

located in the adjacent Sunset Golf Course. As part of the adjacent PD&E Study (FPID 436903-1), 4.6 Ac.-Ft. of storage is included in the Sunset Golf Course Pond.

System 9: This drainage basin encompasses I-95 between station limits 389+20 to 425+00 between C-10 Canal and Sheridan Street. This basin is sub-divided into 9AL & 9BL on the west side, 9AR & 9BR on the east side, 9AC & BC centered on the corridor. Sub-Basins 9OFF is offsite from the I-95 Corridor and encompasses Sheridan Street within the vicinity of the interchange. The overall improvement proposed will reduce the storage capacity of existing Swale 9-1, 9-2, 9-3 and 9-4. These existing swales have a design bottom elevation of 1.5' NAVD. Swales 9-1, 9-2, and 9-3 are proposed to be re-graded to maximize the post-development storage capacity. Pond 9-7 is a new pond with four alternatives; Alternatives 1-3 are adjacent to the west side of I-95, Alternative 4 is west of the SFRC Railroad. Alternative 4 has a unique constraint as the outfall pipe would need to cross under the SFRC tracks with a minimum clearance of 5.5' from the base of the rail. The minimum clearance required along with a larger pipe to hydraulically convey the stormwater to the Alt. 4 pond site, means the invert of the pipe will be significantly lower than the pond bottom, requiring a bubble up structure.

System 10: This drainage basin encompasses I-95 between station limits 425+00 to 451+80 between Sheridan Street and the C-10 Spur Canal. This basin is sub-divided into 10AL on the west side, 10AR on the east side, 10AC centered on the corridor. The proposed improvements encroach on the existing swales, while also adding additional impervious areas. To minimize impacts outside the ROW, this study proposes the use of retaining walls on the outside of each swale to maximize the storage volume to the extent possible. Modified Swale 10-1 and 10-2 have a design bottom elevation of 1.5' NAVD and a control elevation of 4.0' NAVD. If during the design phase of this PD&E, impacts due to wall design, maintenance access and/or proposed widening cause a slight deficit in storage, french drain is suitable and recommended in conjunction with the modified swale approach. Offsite pond alternatives are also being proposed as an alternate solution, as per coordination with the department.

System 11: This drainage basin encompasses I-95 between station limits 451+80 to 479+32 between the C-10 Spur Canal and Stirling Road. This basin is sub-divided into 11B-95W on the west side, 11B-95E on the east side, 11B-95C centered on the corridor. The proposed improvements encroach on the existing swales, while also adding additional impervious areas. To minimize impacts outside the ROW, this study proposes the use of retaining walls on the outside of each swale to maximize the storage volume to the extent possible. Modified Swale 11E and 11W have a design bottom elevation of 1.5' NAVD and a control elevation of 4.0' NAVD. If during the design phase of this PD&E, impacts due to wall design, maintenance access and/or proposed widening cause a slight deficit in storage, french drain is suitable and recommended

in conjunction with the modified swale approach. Offsite pond alternatives are also being proposed as an alternate solution, as per coordination with the department.

System 12: This drainage basin encompasses I-95 between station limits 479+32 to 533+23 between Stirling Rd. and Griffin Rd. This basin is sub-divided into 12B-95 for the mainline I-95 Basin that directly outfalls into Swale 12E/W. Sub-basins 12B-SW, SE, & NW are interchange quadrants that outfall to separate systems. The proposed improvements encroach on the existing swales significantly, while also adding additional impervious areas. The use of retaining walls on the outside of each swale to maximize the storage volume is possible, but ROW is still needed as the improvements do not leave sufficient room for swales in the post development condition. Modified Swale 12E and 12W have a design bottom elevation of 1.5' NAVD and a control elevation of 4.0' NAVD. Both swales will require expansion outside of the ROW to provide the required storage capacity. If during the design phase of this PD&E, impacts due to wall design, maintenance access and/or proposed widening cause a slight deficit in storage, the ROW take can be altered to provide additional storage. Offsite pond alternatives are also being proposed as an alternate solution, as per coordination with the department.

System 13: This drainage basin encompasses I-95 between station limits 533+23 to 604+54 between Griffin Rd. to I-595. This basin is sub-divided into 13A (south of the Dania Cut-Off Canal) and 13B (North of the Dania Cut-Off Canal). Stormwater is collected by barrier wall inlets or sheet flows into roadside ponds (13A-1 through 13A-10) and outfalls to the Dania Cut-Off Canal. The proposed improvements have low to medium impacts to existing ponds 13A-1 and 13A-2 for Basin 13A and low impacts to 13B-7 for Basin 13B. The minor impacts to existing swales and ponds and required storage can be mitigated through regrading of existing swales and ponds with no impacts outside of the ROW anticipated.

Griffin Road East: This is an offsite drainage basin that encompasses Griffin Road east of I-95. The proposed interchange improvements as part of the diamond alternative are anticipated to create a net decrease in impervious area in the post development condition, but a new proposed U-turn Lane will impact the existing dry retention pond adjacent to the Griffin Road bridge over the Dania Cut-off canal. Based on preliminary grading of the pond, the stormwater needs of this basin are anticipated to be largely satisfied by this modified dry retention pond. The pond grading will be split in the post-development condition with a cross drain under the U-turn Lane that will equalize both areas. The pond will have a bottom elevation of 1.50' NAVD and a control elevation of 5.0' NAVD. Approximately 280 feet of 24" french drain will be needed to supplement the existing pond to achieve the required nutrient removal.

4.4 RECOMMENDED DRAINAGE SYSTEM

Based on the available information collected as part of this study (see Section VII), only the hydraulically and environmentally feasible alternative pond sites were considered as part of the pond selection process. Alternative pond sites are analyzed and evaluated for the following parameters:

- Drainage Considerations (Hydrologic and hydraulic factors): existing ground elevation, soil types, Seasonal High-Water Table (SHWT) established by the SHWT Technical Memo, stormwater conveyance feasibility, and existing basin outfalls
- Environmental resources: include wetlands/other surface waters and threatened or endangered species*
- Floodplain compensation potential
- Utility conflict potential
- Estimated right-of-way costs
- Impacts on cultural resources and Section 4(f)*
- Hazardous materials and contamination*
- Zoning/Land Use
- Public Wellfields within the limits
- Construction, ease of maintenance and general aesthetics.

*Please note that the information for items is provided under separate covers as part of this study.

System 9: This drainage basin encompasses I-95 between station limits 389+20 to 425+00 between C-10 Canal and Sheridan Street. Four alternatives were selected for Pond 9-7. Alternatives 1-3 are adjacent to the west side of I-95, Alternative 4 is west of the SFRC Railroad. Based on our Pond Siting Matrix it is recommended that Pond 9-7 Alt. 3 be used as the preferred alternative. Alt. 3 scored similar to the other three alternatives, but had a slightly better score for right-of-way costs, Utility Impacts, Zoning and Land Use. The most distinguishing factor is that when factoring in impacts from each pond alternative, Alt. 3 is located on parcels that are already being impacted by the northbound off-ramp improvements at Sheridan.

System 10: This drainage basin encompasses I-95 between station limits 425+00 to 451+80 between Sheridan Street and the C-10 Spur Canal. This study proposes the use of retaining walls on the outside of each swale to maximize the storage volume to the extent possible as Alternative 1, with Alternatives 2 & 3 being offsite ponds. Based on our Pond Siting Matrix it is recommended that Alt. 1 be used as the preferred alternative. Alt. 1 scored less than the offsite alternatives when it came to maintenance and aesthetic considerations, but significantly better on R/W costs and Public Opinion as the improvements are within the FDOT R/W.

System 11: This drainage basin encompasses I-95 between station limits 451+80 to 479+32 between the C-10 Spur Canal and Stirling Road. This study proposes the use of retaining walls on the outside of each swale to maximize the storage volume to the extent possible as Alternative 1, with Alternatives 2 & 3 being offsite ponds. Based on our Pond Siting Matrix it is recommended that Alt. 1 be used as the preferred alternative. Alt. 1 scored less than the offsite alternatives when it came to maintenance and aesthetic considerations, but significantly better on R/W costs and Public Opinion as the improvements are within the FDOT R/W.

System 12: This drainage basin encompasses I-95 between station limits 479+32 to 533+23 between Stirling Rd. and Griffin Rd. This study proposes the use of retaining walls on the outside of each swale to maximize the storage volume to the extent possible as Alternative 1, with Alternatives 2 & 3 being offsite ponds. Initially, the recommended alternative for System 12 was the offsite pond directly adjacent to the southbound Stirling Road off-ramp (Alternative 2) based on the overall score. Alt. 2 had a slightly better score for right-of-way costs, Utility Impacts, Zoning and Land Use. Alt. 2 is also located adjacent to I-95, making it a better offsite alternative for ease of access for a drainage outfall and routine maintenance. However, the City of Dania Beach did not support the offsite pond alternatives because of the potential for loss of ad valorem revenue and interest from other developers for the same property Ponds 2 and 3 are being proposed on. Based on a revised matrix that puts more weight on Public Opinion and loss of ad valorem under the Other category, the preferred alternative has ultimately changed to Alternative 1 (swales with walls).

V. FLOODPLAIN COMPENSATION

The project corridor lies within Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) panel numbers 12011C0558J, 12011C0566J, 12011C0568J and12011C0731J in Broward County. The project is located within the 100-year floodplain, within flood zones AE, AH, and X. Zone AE designates flood hazard areas inundated by 100-year flood; Zone AH designates shallow flooding areas where average depths are between 1 and 3 feet for the 100-year flood; and Zone X designates flood hazard areas outside the 100-year flood zone but within the 500-year flood zone. In accordance with Executive Order 11988 "Floodplain Management", USDOT Order 5650.2, "Floodplain Management Protection", and Federal-Aid Policy Guide 23 CFR 650A, floodplains must be protected. The intent of these regulations is to avoid or minimize highway encroachments within the base floodplains, and to avoid supporting land use development incompatible with floodplain values. The project limits encroach into areas of the 100-year base floodplain of Basin 5 and Systems 9, 10, 11, 12 and 13. Preliminary flood encroachment is estimated using existing roadway cross sections and Digital Terrain Models. Table 5 and Table 6 shows estimated required floodplain compensation and preliminary compensation values calculated with the cross sections.

Table 5: Summary of Floodplain Encroachment & Compensation (Diamond)

Diamond Alternative	Total Cut (ac-ft)	Total Fill (ac-ft)	Net (ac-ft)
Basin 5	2.00	1.40	0.60
System 9	9.44	9.07	0.37
System 10	3.21	0.52	2.69
System 11	6.01	0.81	5.2
System 12	9.63	8.37	1.26
System 13	8.61	0.85	7.76
TOTAL	**38.90**	**21.02**	**17.88**

Table 6: Summary of Floodplain Encroachment & Compensation (DDI)

DDI Alternative	Total Cut (ac-ft)	Total Fill (ac-ft)	Net (ac-ft)
Basin 5	2.00	1.33	0.67
System 9	9.44	7.39	2.05
System 10	3.23	0.34	2.85
System 11	6.01	0.73	5.28
System 12	9.63	6.31	3.32
System 13	9.00	0.28	8.72
TOTAL	**39.31**	**16.38**	**22.90**

The recommended drainage systems described in Chapters 4.4 will compensate for the loss of floodplain storage. Detailed analysis of floodplain encroachment and corresponding compensation measures will be conducted during the later study phases and will be documented as part of the Location Hydraulics Report.

VI. CONCLUSIONS

The various interchange and fly-over ramp alternatives being considered are currently going through a preferred selection process and will be finalized as the study progresses. Per our analysis, the diamond interchange alternatives have greater impacts to existing facilities, while also having less potential for storage capacity within the proposed road footprint. Nonetheless, both alternatives have similar overall drainage requirements. Once a preferred alternative is selected for each interchange, the Pond Siting Report will be finalized with the final preferred approach to stormwater within the corridor. The project is subdivided into ten basins, each with its own sub-basin areas and stormwater requirements. The proposed drainage system will focus on Systems 9 through 13 as they are the basins with the largest impact due to the proposed corridor improvements. Basins 1 through 5 are covered under a separate PD&E as previously discussed.

The proposed drainage systems are based on the alternative deemed the worst-case scenario for added impervious and impacts to existing facilities. Based on our review of each of the alternatives (Diamond vs. Diverging Diamond Interchange), the traditional diamond interchange was deemed to have the largest increase to both impervious area and to the reduction in capacity of existing systems. Each stormwater management site proposed outside the right-of-way considered three alternatives and evaluated them with a matrix on the PD&E Study Pond Siting Report. This report looked at innovative ideas (walled treatment ponds) to provide the required storage within the right of way, but due to limited availability of open space within right of way, new offsite ponds were presented as solutions to the stormwater needs of the project.

Pond alternatives were graded based on a variety of factors like right of way costs, land use, drainage considerations, FEMA flood zone, contamination, utilities, wellfield location, aesthetics, construction, and maintenance. The preferred pond alternative selected for System 9 was Alt. 3, Alt. 1 for System 10, 11 and Alt. 1 for System 12.

The estimated total project area for the limits of this study is 372.09 acres. The estimated storage needed for the proposed improvements mainly centered on Systems 9 through 13 requires a volume of 35.14 ac-ft to provide the estimated water quality/attenuation volume per SFWMD regulatory criteria. 46.55 ac-ft of total storage is estimated to be provided within a combination of offsite (10.96 ac-ft) and onsite (35.83 ac-ft) stormwater treatment swales and ponds (refer to Tables 7 & 8). A Nutrient loading analysis was completed to determine the requirements of the amended stormwater quality criteria for nutrient reduction. Per our preliminary analysis, nutrient reduction targets can be met with the use of dry retention treatment swales and ponds and french drain. Appendix E contains the backup calculations for our analysis.

Please note that the recommendations were based on pond sizes and locations determined from preliminary data calculations, reasonable engineering judgment, and assumptions. Stormwater management sizes and configurations may change during final design as more detailed information on SHWT, soil conditions, hydrologic data, and final roadway profile become available.

Table 7: Summary of Required/Provided Storage Volume

Basin	Total Area (Ac.)	Required Storage (Ac-Ft)	Storage Provided (Ac-Ft) Within R/W	Storage Provided (Ac-Ft) Outside R/W	Total Storage Provided (Ac-Ft)
System 9	36.83	9.80	6.66	3.20	9.87
System 10	20.80	3.54	3.93	0	3.93
System 11	18.25	3.46	4.90	0	4.90
System 12	46.60	8.98	3.16	7.75	10.91
System 13	59.06	7.02	15.88	0	15.88
Griffin Road East	6.28	0.61	1.07	0	1.07
Overall	**372.09**	**35.14**	**35.83**	**10.96**	**46.55**

Table 8: Summary of Nutrient Analysis

Basin	Total N Load Removed (Kg/Yr)	Total P Load Removed (Kg/Yr)	Percent N Reduction (%)	Percent P Reduction (%)	Percent N & P Reduction Req. (N/P)
System 9	186.23	25.77	94%	94%	80/80
System 10	101.42	14.04	90%	90%	80/80
System 11	96.13	13.30	94%	94%	80/80
System 12	239.61	33.16	91%	91%	80/80
System 13	251.83	34.85	95%	96%	80/80
Griffin Road East	26.83	3.71	90%	90%	80/80

VII. REFERENCES

The design team collected and reviewed data from the following sources:

- FDOT Drainage Manual, January 2025.
- FDOT Drainage Design Guide, January 2024.
- FDOT Straight Line Diagram, 86070000 (2019), 86070901 (2016), 86070902 (2016), 86015000 (2022), 86230000 (2021), 86016000 (2018)
- Natural Resources Conservation Service (NRCS) Soil Survey of Broward County.
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Broward County (12011C0558J, 12011C0566J, 12011C0568J, 12011C0731J & 12086C0131M).
- FDOT 409354-2-52-01, 422796-1-52-01 As-builts.
- National Oceanic Atmospheric Administration LIDAR data.
- US Army Corps of Engineers
- FDOT Project Development and Environment Manual
- SFWMD DBHydro
- SFWMD ERP Applicant's Handbook II
- USGS Quadrangle Maps

Appendix A
Figures and Data

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
OnDemand Topo

7.5-MINUTE TOPO QUADRANGLE
FLORIDA - CUSTOM EXTENT
7.5-MINUTE TOPO



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: UNIVERSAL TRANSVERSE MERCATOR, ZONE 17R

Data is provided by The National Map (TNM), is the best available at the time of map generation, and includes data content from supporting themes of Elevation, Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover, and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC) Metadata for additional source data information.

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands. Temporal changes may have occurred since these data were collected and some data may no longer represent actual surface conditions.

Learn About The National Map: https://nationalmap.gov

MN
GN
7°18'
130 MILS
0°22'
7 MILS
UTM GRID AND 2025 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
NJ
Grid Zone Designation
17R

SCALE 1:24 000
1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

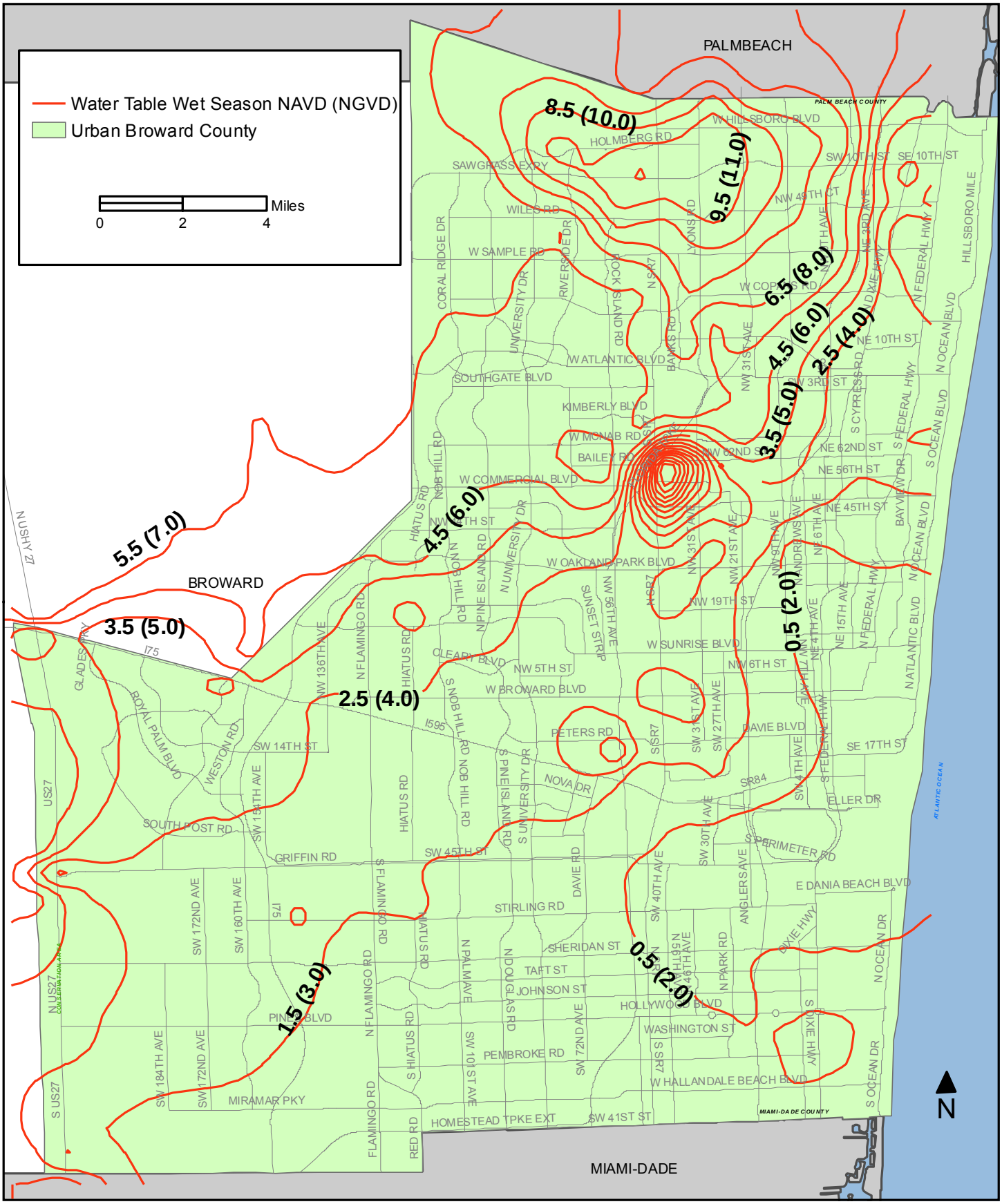
CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
CONTOUR SMOOTHNESS = Medium

FLORIDA
QUADRANGLE LOCATION
Fort Lauderdale South
Port Everglades
North Miami
North Miami OE E
ADJOINING QUADRANGLES

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

7.5-MINUTE TOPO, FL
2025

WATER TABLE MAP - AVERAGE WET SEASON



Division Name: Urban Planning Division
Department Name: Resilient Environment Department

This map is for conceptual purposes only and should not be used for legal boundary determinations.
Elevation converted from NGDV to NAVD using the FEMA approved conversion factor for Broward County of (-) 1.5

BROWARDNEXT

BROWARD COUNTY LAND USE PLAN

Adopted: April 25, 2017
Updated: March 6, 2025

LEGEND

- Palm Beach County Rural Residential-10
- Rural Ranches
- Rural Estates
- Estate (1) Residential
- Low (2) Residential
- Low (3) Residential
- Low (5) Residential
- Low-Medium (10) Residential
- Medium (16) Residential
- Medium-High (25) Residential
- High (50) Residential
- Irregular Residential
- Dashed-Line Area
- Activity Center
- Commerce
- Agricultural
- Conservation - Natural Reservations
- Conservation - Reserve Water Supply Areas
- Recreation and Open Space
- Commercial Recreation
- Community
- Electrical Generation Facilities
- Tribal Lands
- Mining
- Transportation
- Water

Palm Beach County

Atlantic Ocean

Miami-Dade County

BROWARD COUNTY Planning Council

NOT TO SCALE

Municipal land use plans must be consistent with the Broward County Land Use Plan. The Broward County Planning Council reviews each municipal land use plan pursuant to the Broward County Charter and certifies those municipal land use plans which have been found to be in "substantial conformity" with the Broward County Land Use Plan. When certified by the Council, the municipal land use plan becomes the effective land use plan for the municipal jurisdiction. The land use designations on the Broward County Land Use Plan serve as the basis for municipal jurisdiction. The municipal land use plans may be more restrictive than the Broward County Land Use Plan and may depict uses and categories other than those shown on the Broward County Land Use Plan for specific parcels. Areas designated on the Broward County Land Use Plan Map or particular uses are approximate. The exact boundaries for zoning will be determined by the municipality within the reasonable limits of the designation on the map. For further information regarding identification of the effective land use plan for a specific area or for interpretation of the land use designation for a specific parcel, please contact the Broward County Planning Council at 954.357.6695.

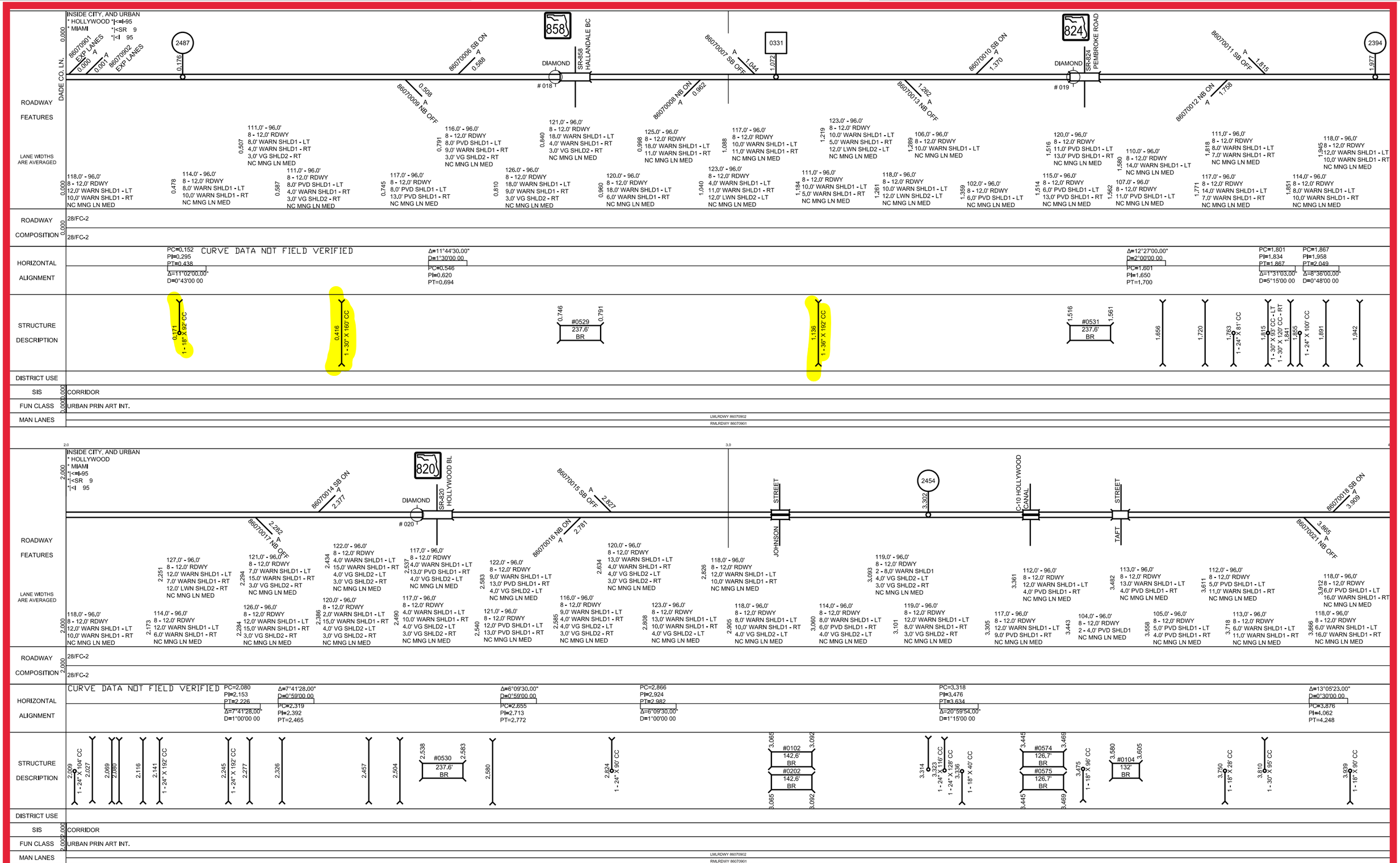
	5 YR INV	SLD REV
DATE	09/30/2019	10/07/2019
BY	CTS	CTS

BMP	EMP	INV	SLD REV
000.000	008.105	03/25/2021	03/25/2021 CTS

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	I 95	SR 9	BROWARD	04	86070000	1 OF 7



Version: 1.4.2.27 03/25/2021

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DATE	09/30/2019	10/07/2019
BY	CTS	CTS

BMP	EMP	INV	SLD REV
000.000	008.105	03/25/2021	03/25/2021 CTS

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

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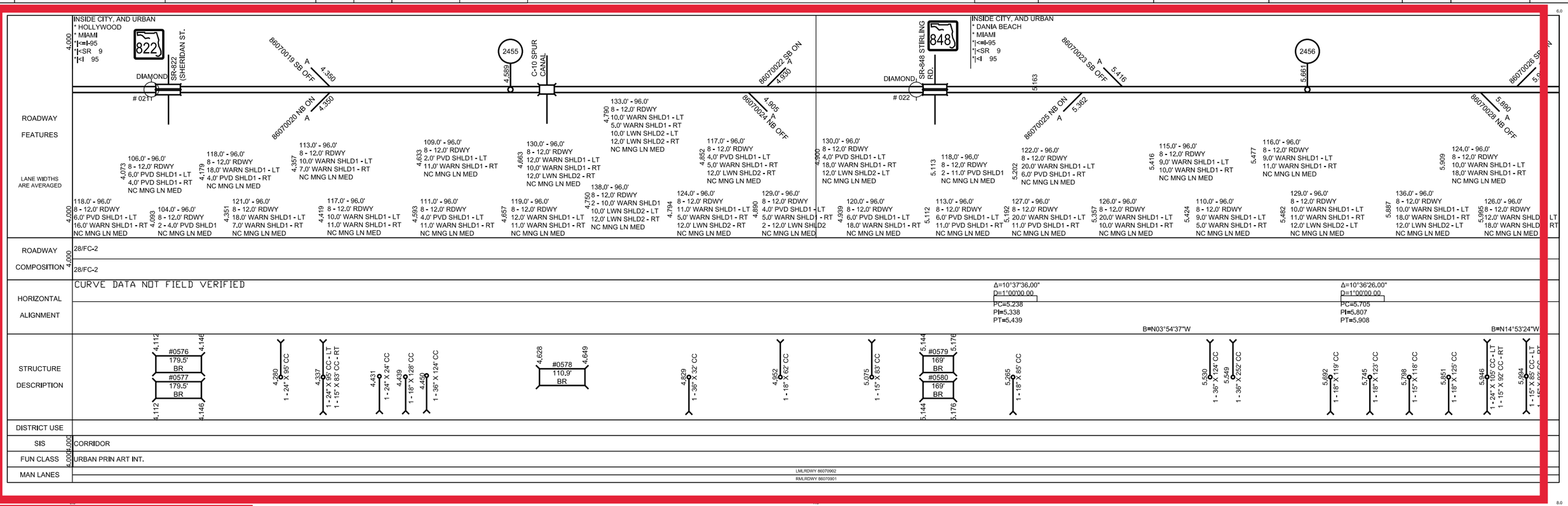

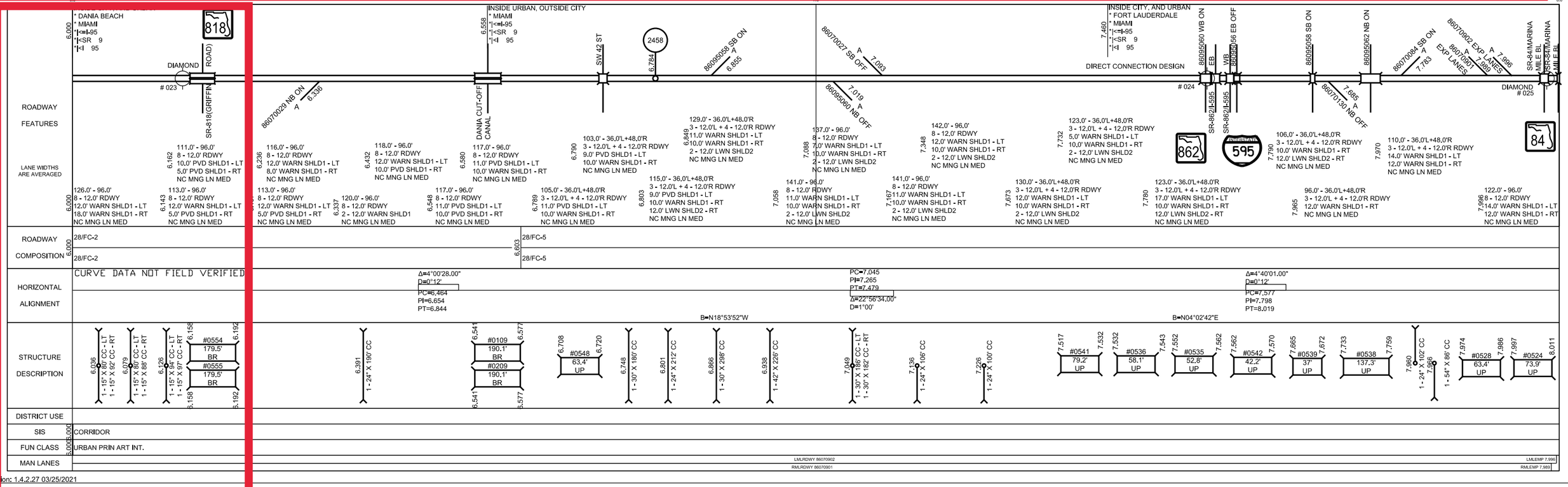

Version: 1.4.2.27 03/25/2021

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DATE	11/08/2016	02/22/2017
BY	FTE	FTE

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000.179	006.776	08/06/2019 FDOT-D4	08/06/2019 FDOT-D4
000.000	007.989	11/08/2016 FTE	02/21/2017 FTE

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
07	I 95	SR 9	BROWARD	04	86070901	1 OF 2

ROADWAY FEATURES

INSIDE CITY, AND URBAN
* HOLLYWOOD
* MIAMI
*I<=I-95/SR-9 EXPRESS N
*I<SR 9
*I<I 95

ONE WAY
(0.000 TO 7.989)

DADE/BROWARD CO LINE 0.000

1487 at 0.179

BLVD / HALLANDALE at 0.348

RD/SR-824 / PEMBROKE at 0.969

824

1394 at 1.977

LANE WIDTHS ARE AVERAGED

0.000: 24.0' - 12.0'
1 - 12.0' RDWY
12.0' WARN SHLD1 - LT
FLEX POSTS MLSP

0.348: 17.0' - 12.0'
1 - 12.0' RDWY
5.0' WARN SHLD1 - LT
FLEX POSTS MLSP

0.969: 27.0' - 22.0'
2 - 11.0' RDWY
5.0' WARN SHLD1 - LT
FLEX POSTS MLSP

1.780: 32.0' - 22.0'
2 - 11.0' RDWY
10.0' WARN SHLD1 - LT
FLEX POSTS MLSP

ROADWAY COMPOSITION

0.000: 28/

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

0.744 #0529 264' BR 0.794

1.519 #0531 242.9' BR 1.565

DISTRICT USE

SIS

0.000: MANAGED/EXPRESS/REVERSIBLE

FUN CLASS

0.000: URBAN PRIN ART INT.

2.0 3.0 4.0

ROADWAY FEATURES

INSIDE CITY, AND URBAN
* HOLLYWOOD
* MIAMI
*I<=I-95/SR-9 EXPRESS N
*I<SR 9
*I<I 95

ONE WAY
(0.000 TO 7.989)

BLV / SR-820/HOLLYWOOD at 2.000

820

ST / JOHNSON at 3.000

1454 at 3.300

C-10 / CANAL at 3.447

ST / TAFT at 3.577

LANE WIDTHS ARE AVERAGED

2.000: 32.0' - 22.0'
2 - 11.0' RDWY
10.0' WARN SHLD1 - LT
FLEX POSTS MLSP

2.276: 28.0' - 22.0'
2 - 11.0' RDWY
6.0' WARN SHLD1 - LT
FLEX POSTS MLSP

ROADWAY COMPOSITION

2.000: 28/

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

2.541 #0530 242.9' BR 2.587

3.069 #0202 147.8' BR 3.097

3.447 #0575 121.4' BR 3.470

3.577 #0104 126.7' BR 3.601

DISTRICT USE

SIS

2.000: MANAGED/EXPRESS/REVERSIBLE

FUN CLASS

2.000: URBAN PRIN ART INT.

Versi

	5 YR INV	SLD REV
DATE	11/08/2016	02/22/2017
BY	FTE	FTE

BMP	EMP	INV	SLD REV
000,000	007,989	12/03/2019 FDOT-D4	12/03/2019 FDOT-D4-CO
005,655	006,776	09/25/2019 FDOT-D4	09/25/2019 FDOT-D4
000,179	006,776	08/06/2019 FDOT-D4	08/06/2019 FDOT-D4

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:
07	I 95	SR 9	BROWARD	04	86070901	2 OF 2

ROADWAY FEATURES

4.000: INSIDE CITY, AND URBAN
* HOLLYWOOD
* MIAMI
*|<=I-95/SR-9 EXPRESS N
*|<SR 9
*|<I 95

SHERIDAN ST

1455 @ 4.583

C-10 SPUR CANAL

ONE WAY
(0,000 TO 7,989)

5.163: INSIDE CITY, AND URBAN
* DANIA BEACH
* MIAMI
*|<=I-95/SR-9 EXPRESS N
*|<SR 9
*|<I 95

STERLING RD

LANE WIDTHS ARE AVERAGED

4.000	28.0' - 22.0' 2 - 11.0' RDWY 6.0' WARN SHLD1 - LT FLEX POSTS MLSP
4.342	32.0' - 22.0' 2 - 11.0' RDWY 10.0' WARN SHLD1 - LT FLEX POSTS MLSP
4.757	28.0' - 22.0' 2 - 11.0' RDWY 6.0' WARN SHLD1 - LT FLEX POSTS MLSP
4.868	18.0' - 12.0' 1 - 12.0' RDWY 6.0' WARN SHLD1 - LT FLEX POSTS MLSP
5.435	23.0' - 12.0' 1 - 12.0' RDWY 11.0' WARN SHLD1 - LT FLEX POSTS MLSP
5.800	18.0' - 12.0' 1 - 12.0' RDWY 6.0' WARN SHLD1 - LT FLEX POSTS MLSP

ROADWAY COMPOSITION

4.000: 28/

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

4.114	#0577 21.1' BR	4.118
4.632	#0578 100.3' BR	4.651
5.144	#0580 179.5' BR	5.178

DISTRICT USE

SIS

4.000: MANAGED/EXPRESS/REVERSIBLE

FUN CLASS

4.000: URBAN PRIN ART INT.

6.000: INSIDE CITY, AND URBAN
* DANIA BEACH
* MIAMI
*|<=I-95/SR-9 EXPRESS N
*|<SR 9
*|<I 95

GRIFFIN RD

6.558: INSIDE URBAN, OUTSIDE CITY
* MIAMI
*|<=I-95/SR-9 EXPRESS N
*|<SR 9
*|<I 95

DANIA CUT OFF CANAL

SW 42 ST

ONE WAY
(0,000 TO 7,989)

7.460: INSIDE CITY, AND URBAN
* FORT LAUDERDALE
* MIAMI
*|<=I-95/SR-9 EXPRESS N
*|<SR 9
*|<I 95

EB I-595/SR-862

86095060 NB I-95 TO EB I-595/SR-862/WEB

86095056 SB I-95 TO EB I-595/SR-862

86095038 WB I-595 TO NB I-95

86095062 EB I-595 TO SB I-95

EB SR-84/SW 24 ST

END OF SECTION

LANE WIDTHS ARE AVERAGED

6.000	18.0' - 12.0' 1 - 12.0' RDWY 6.0' WARN SHLD1 - LT FLEX POSTS MLSP
6.309	22.0' - 12.0' 1 - 12.0' RDWY 10.0' WARN SHLD1 - LT FLEX POSTS MLSP

ROADWAY COMPOSITION

6.000: 28/

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

6.166	#0555 179.5' BR	6.200
6.551	#0209 195.4' BR	6.588
6.719	#0548 37' BR	6.726
7.526	#0536 73.9' UP	7.540
7.540	#0541 21.1' UP	7.544
7.544	#0535 52.8' UP	7.554
7.554	#0542 68.6' UP	7.567
7.656	#0539 37' UP	7.663
7.742	#0538 68.6' UP	7.755
7.971	#0528 63.4' UP	7.983

DISTRICT USE

SIS

6.000: MANAGED/EXPRESS/REVERSIBLE

7.989: MANAGED/EXPRESS/REVERSIBLE

FUN CLASS

6.000: URBAN PRIN ART INT.

END MP: 007.989 NET ROADWAY ID LENGTH: 7.989

Version: 1.4.2.27 12/03/2019

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DATE	11/08/2016	02/22/2017
BY	FTE	FTE

BMP	EMP	INV	SLD REV
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017.418	025.412	11/08/2016 FTE	02/21/2017 FTE

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

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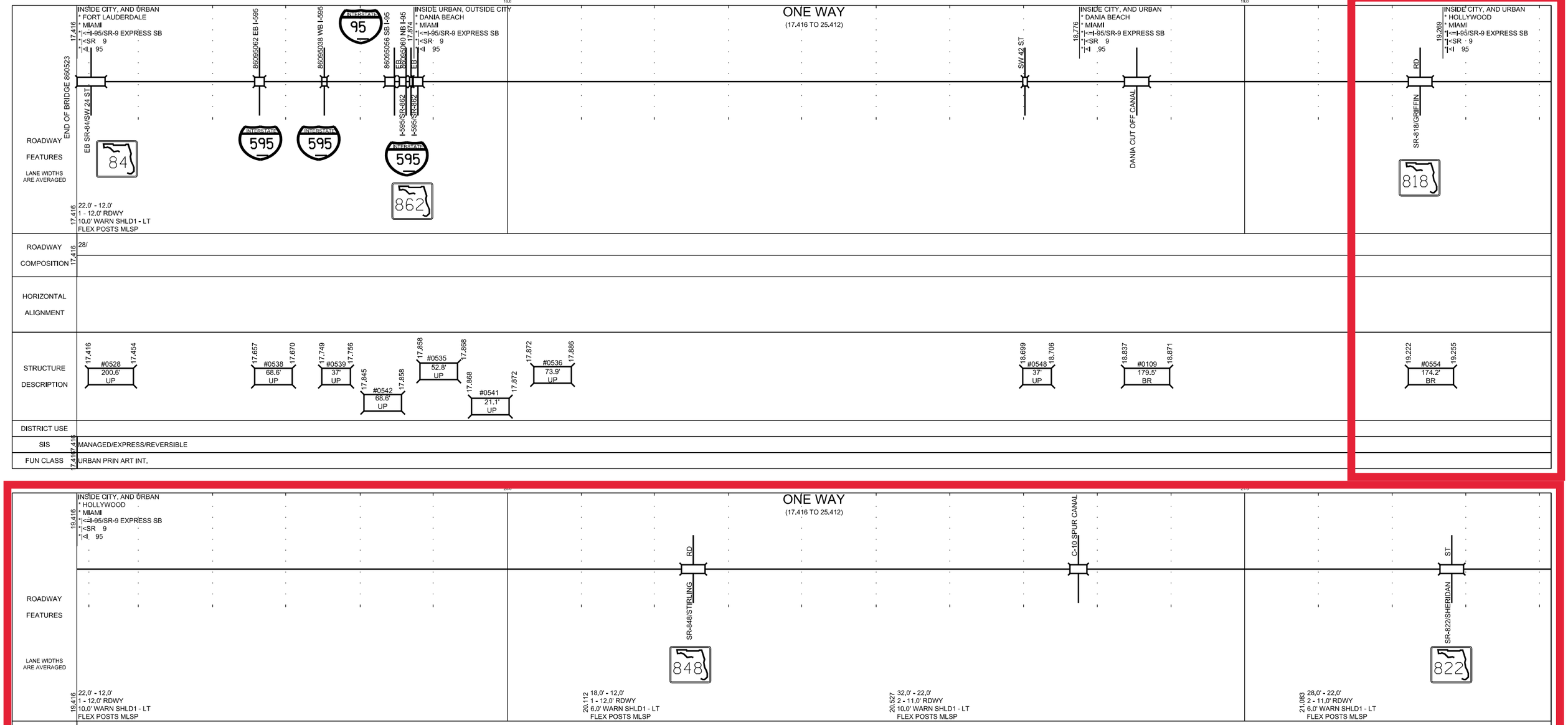

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DATE	11/08/2016	02/22/2017
BY	FTE	FTE

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017.418	025.412	11/08/2016 FTE	02/21/2017 FTE

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
07	I 95	SR 9	BROWARD	04	86070902	2 OF 2

ROADWAY FEATURES

21.416 INSIDE CITY, AND URBAN
* HOLLYWOOD
* MIAMI
*|<=I-95/SR-9 EXPRESS SB
*|<SR 9
*|<I 95

ONE WAY
(17.416 TO 25.412)

ST TAFT — CANAL C-10 — ST JOHNSON — BLD SR-820/HOLLYWOOD — 820

LANE WIDTHS ARE AVERAGED

21.416 28.0' - 22.0'
2 - 11.0' RDWY
6.0' WARN SHLD1 - LT
FLEX POSTS MLSP

23.132 32.0' - 22.0'
2 - 11.0' RDWY
10.0' WARN SHLD1 - LT
FLEX POSTS MLSP

ROADWAY COMPOSITION

21.416 28/

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

21.806 #0104 142.6' BR 21.833
21.944 #0574 142.6' BR 21.971
22.321 #0102 147.8' BR 22.349
22.825 #0530 31.7' BR 22.831

DISTRICT USE

SIS

21.416 MANAGED/EXPRESS/REVERSIBLE

FUN CLASS

21.416 URBAN PRIN ART INT.

24.0 25.0

ROADWAY FEATURES

23.416 INSIDE CITY, AND URBAN
* HOLLYWOOD
* MIAMI
*|<=I-95/SR-9 EXPRESS SB
*|<SR 9
*|<I 95

824 RD/SR-824 — PEMBROKE

ONE WAY
(17.416 TO 25.412)

24.432 INSIDE CITY, AND URBAN
* MIAMI
*|<=I-95/SR-9 EXPRESS SB
*|<SR 9
*|<I 95

HALLANDALE BCH BLVD

DADE/BROWARD CO LINE

LANE WIDTHS ARE AVERAGED

23.416 32.0' - 22.0'
2 - 11.0' RDWY
10.0' WARN SHLD1 - LT
FLEX POSTS MLSP

23.761 29.0' - 22.0'
2 - 11.0' RDWY
7.0' WARN SHLD1 - LT
FLEX POSTS MLSP

24.462 23.0' - 12.0'
1 - 12.0' RDWY
11.0' WARN SHLD1 - LT
FLEX POSTS MLSP

ROADWAY COMPOSITION

23.416 28/

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

23.854 #0531 242.9' BR 23.900
24.624 #0529 242.9' BR 24.670

DISTRICT USE

SIS

23.416 MANAGED/EXPRESS/REVERSIBLE — MANAGED/EXPRESS/REVERSIBLE 25.412

FUN CLASS

23.416 URBAN PRIN ART INT.

END MP: 025.412 NET ROADWAY ID LENGTH: 7.996

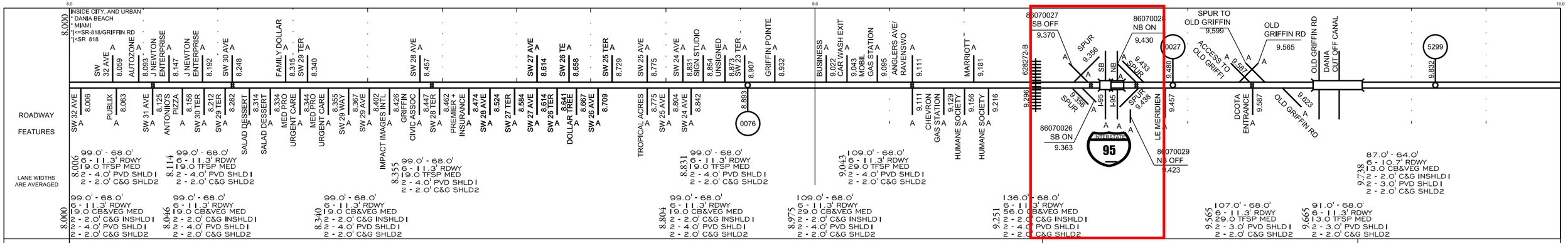
Version: 1.4.2.27 12/03/2019

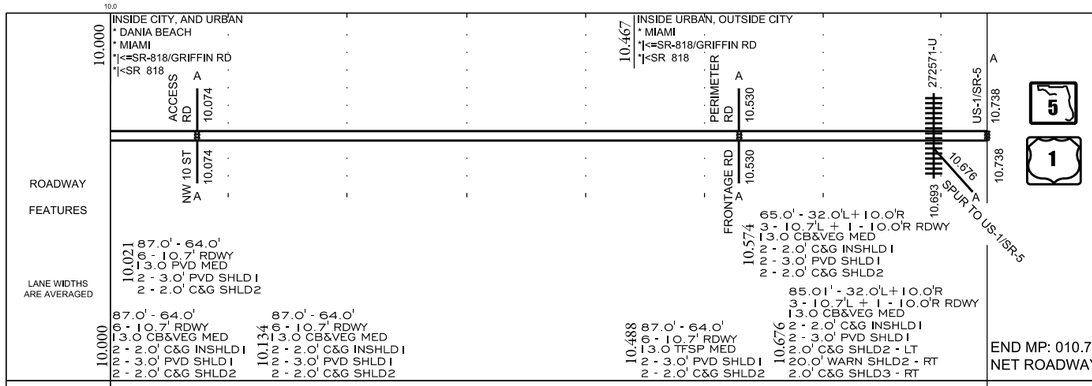
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	03/14/2022	04/12/2022				
BY	CALTRAN	CALTRAN				

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:
12		SR 818	BROWARD	04	86015000	3 OF 3





END MP: 010.738
NET ROADWAY ID LENGTH: 10.343

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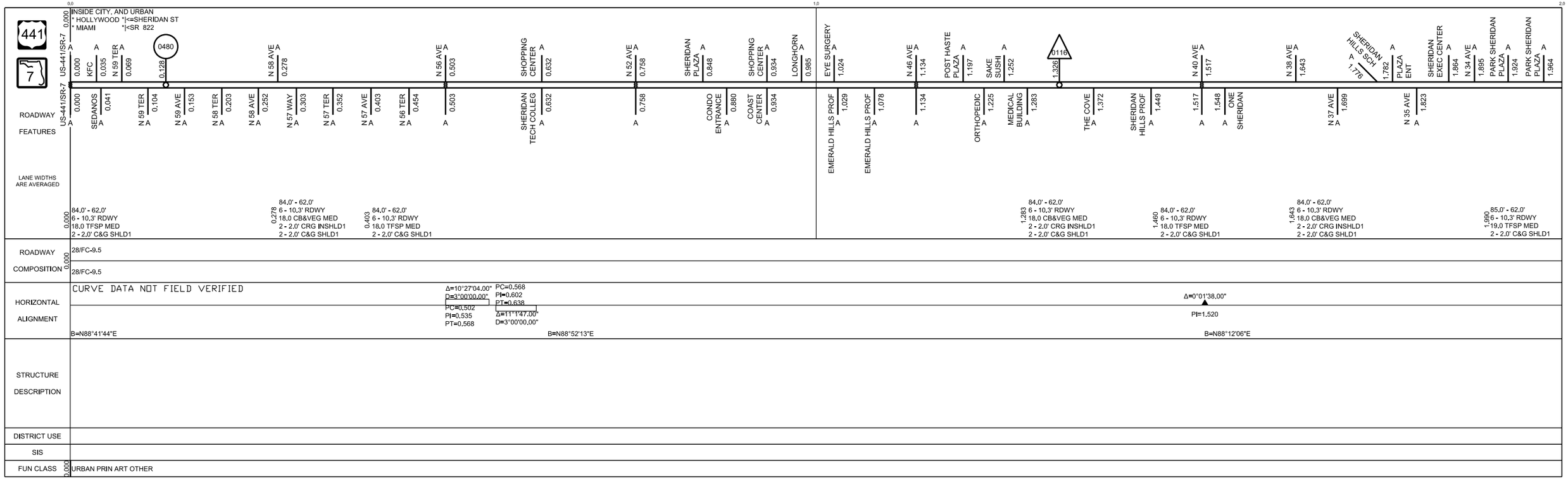
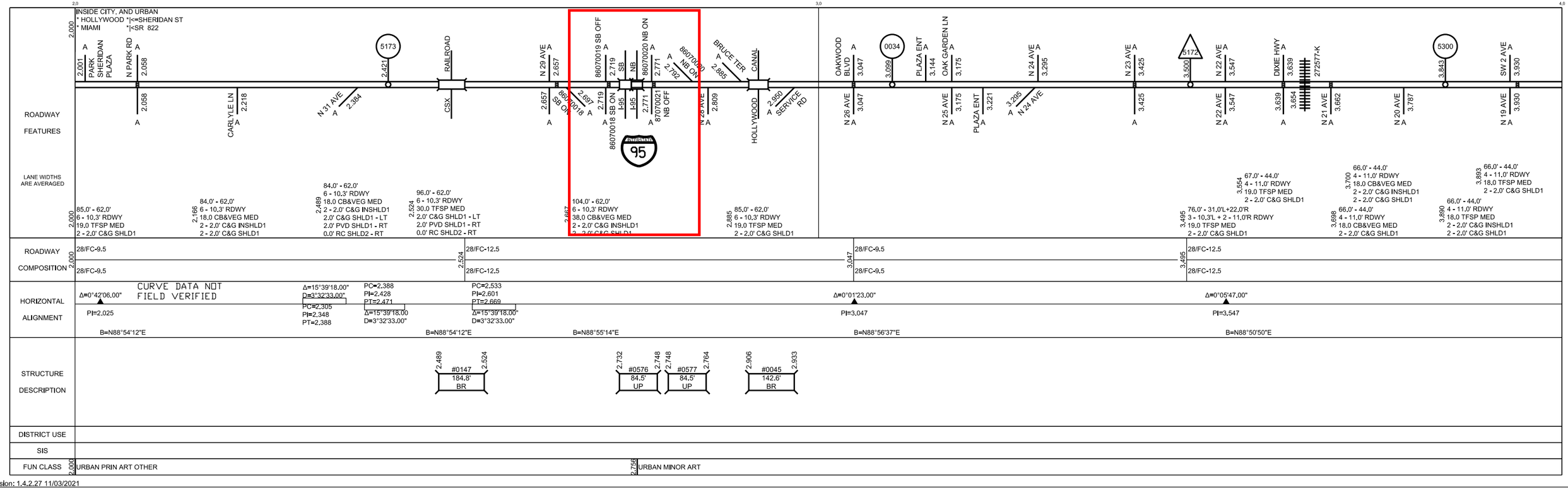
DATE	06/07/2021	06/21/2021	003.492	004.050	10/26/2021 CTS	11/03/2021 CTS
BY	AECOM	AECOM				

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 822	BROWARD	04	86230000	1 OF 2





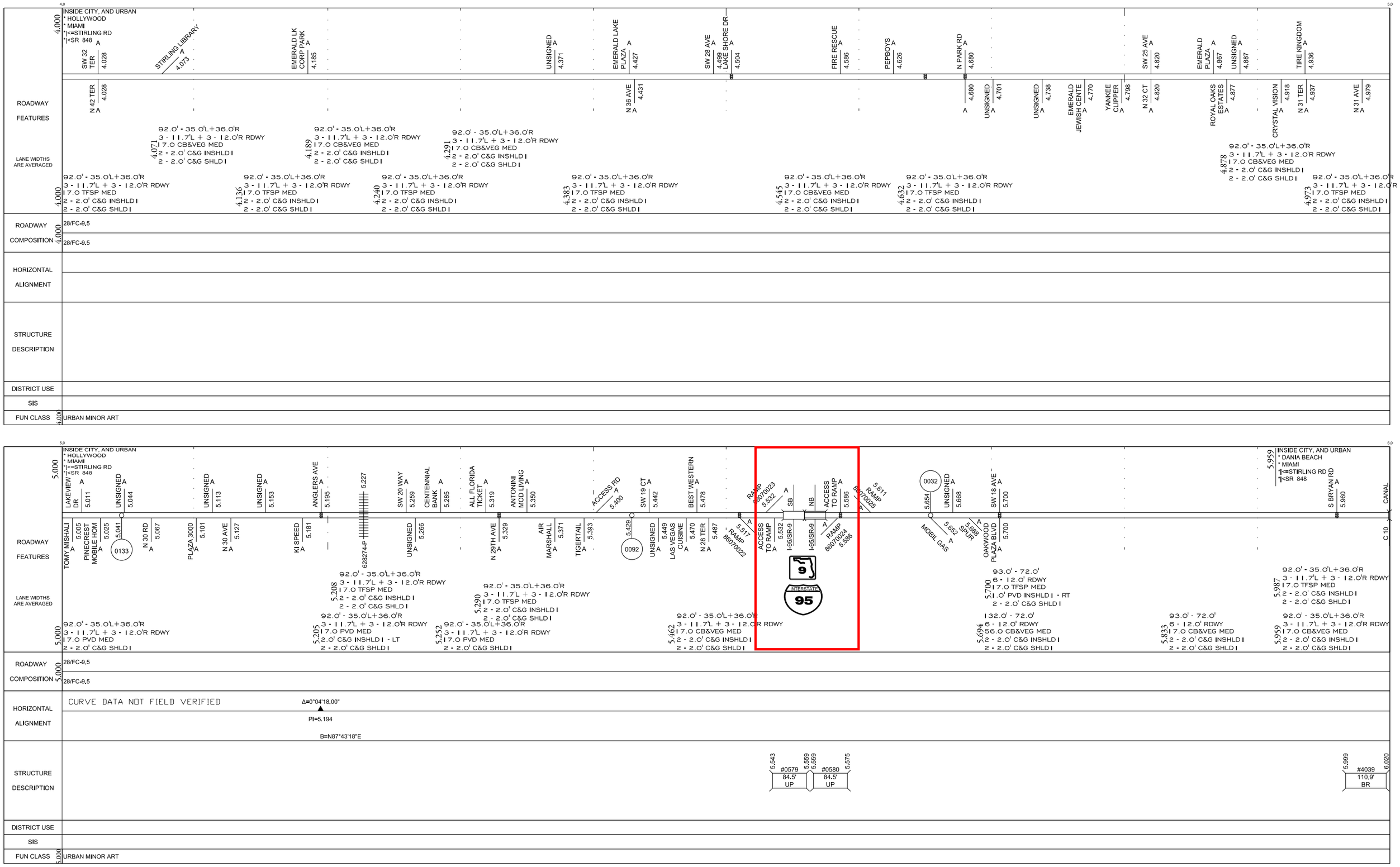
Version: 1.4.2.27 11/03/2021

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	06/06/2018	07/18/2018				
BY	CALTRAN	CALTRAN				

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 848	BROWARD	04	86016000	3 OF 4



- Commemorative Marks
- Applications of Geodesy

Search

Single Point Conversion | Multipoint Conversion | Web services | Downloads | Tutorial & FAQs | About NCAT

Convert/Transform from:

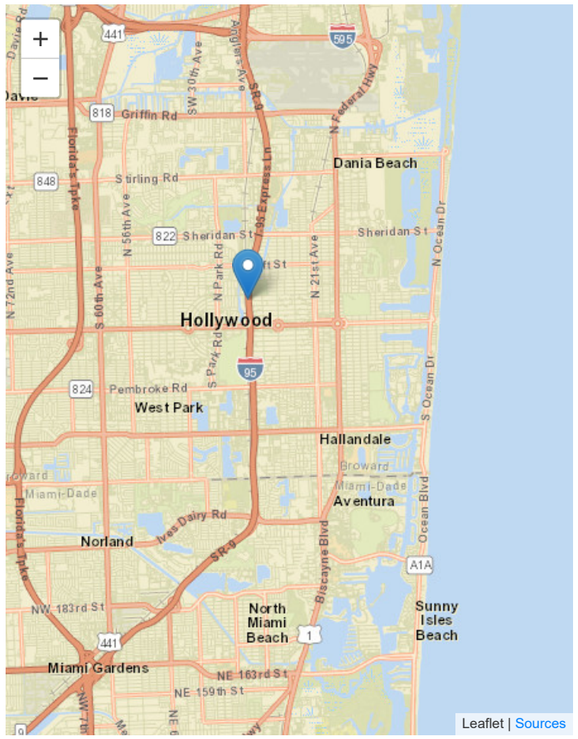
- ☐ Horizontal
- ◉ Horizontal+height
- ☐ XYZ

Select the type of horizontal coordinate:

- ◉ Geodetic lat-long
- ☐ SPC
- ☐ UTM
- ☐ USNG

Select a height

- ☐ Ellipsoidal
- ◉ Orthometric



Enter lat-lon in decimal degrees

Lat 26.0174518292

Lon -80.1675796509

or degrees-minutes-seconds

Lat N 26-01-02.82659

Lon W 080-10-03.28674

or drag map marker to a location of interest

Input reference frame (historically called 'horizontal datum') NAD83(2011)

Output reference frame (historically called 'horizontal datum') NAD83(2011)

Don't see a reference frame in the list?
Click here *to learn more.*

Orthometric Height 0.000

Units of height US Survey Feet

Input geopotential datum (historically called 'vertical datum') NGVD29

Output geopotential datum (historically called 'vertical datum') NAVD88

SPC zone Auto Pick (default zor

Submit

Click blue bar(s) to expand/collapse

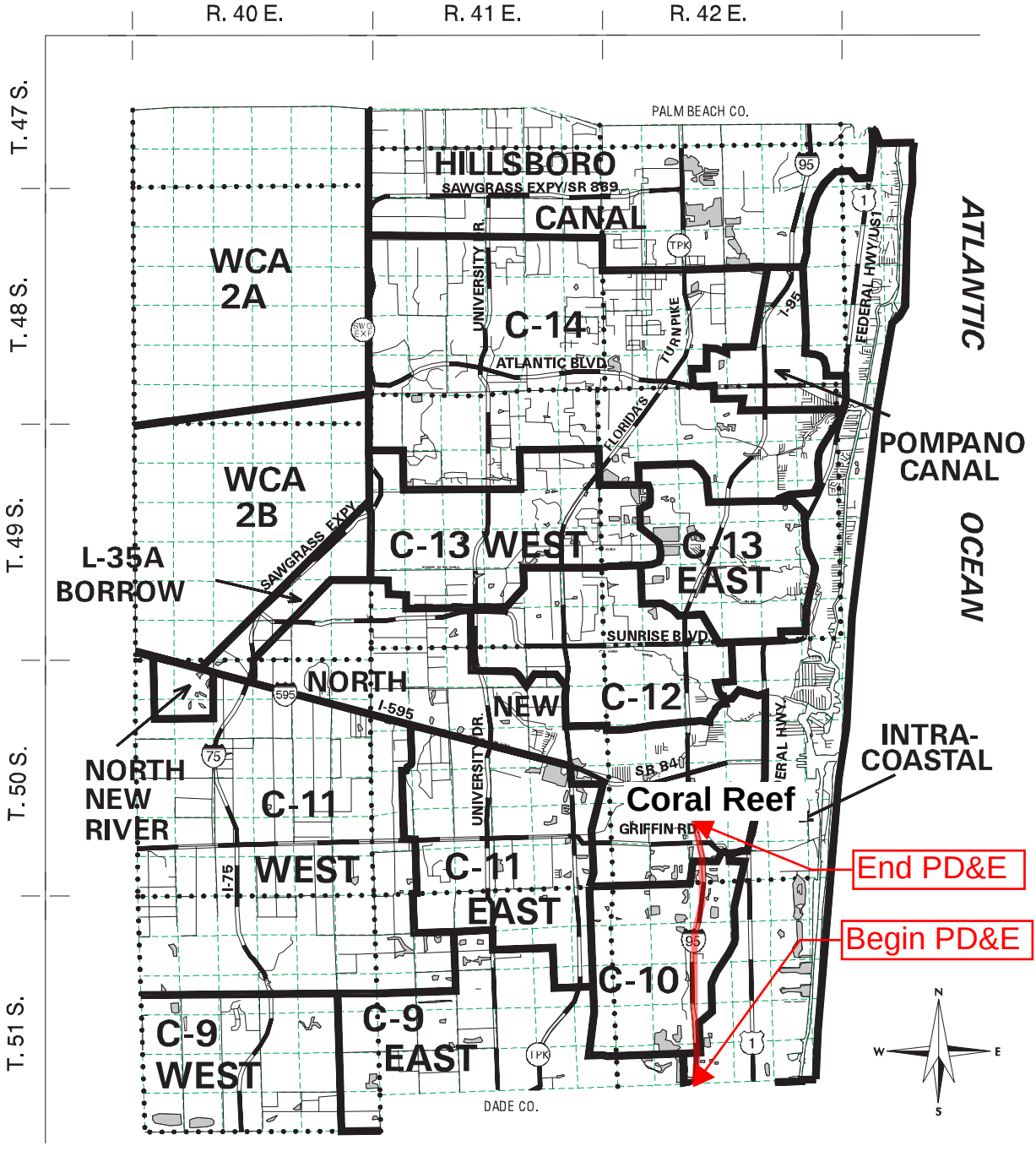
Transformed Coordinate

Input Coordinate		Output Coordinate		Total Change + Uncertainty	
Latitude	N26° 01′ 02.82659″ N260102.82659 26.0174518292	Latitude	N26° 01′ 02.82659″ N260102.82659 26.0174518292	Latitude	0.00000″ ±0.000000″ (0.000 m ±0.0000 m)*
Longitude	E279° 49′ 56.71326″ W0801003.28674 -80.1675796509	Longitude	E279° 49′ 56.71326″ W0801003.28674 -80.1675796509	Longitude	0.00000″ ±0.000000″ (0.000 m ±0.0000 m)*
Ellipsoid Height (usft)	Not given	Ellipsoid Height (usft)	Not given	Ellipsoid Height	Not given
Orthometric Height (usft)	0.000	Orthometric Height (usft)	-1.608	Orthometric Height	-1.608 usft ±0.033 usft
Reference Frame	NAD83(2011)	Reference Frame	NAD83(2011)		
Geopotential Datum	NGVD29	Geopotential Datum	NAVD88		

*Approximate value to aid interpretation and not an actual distance. See TM NOS NGS 82 for more details.

Converted Coordinate

Customize Export

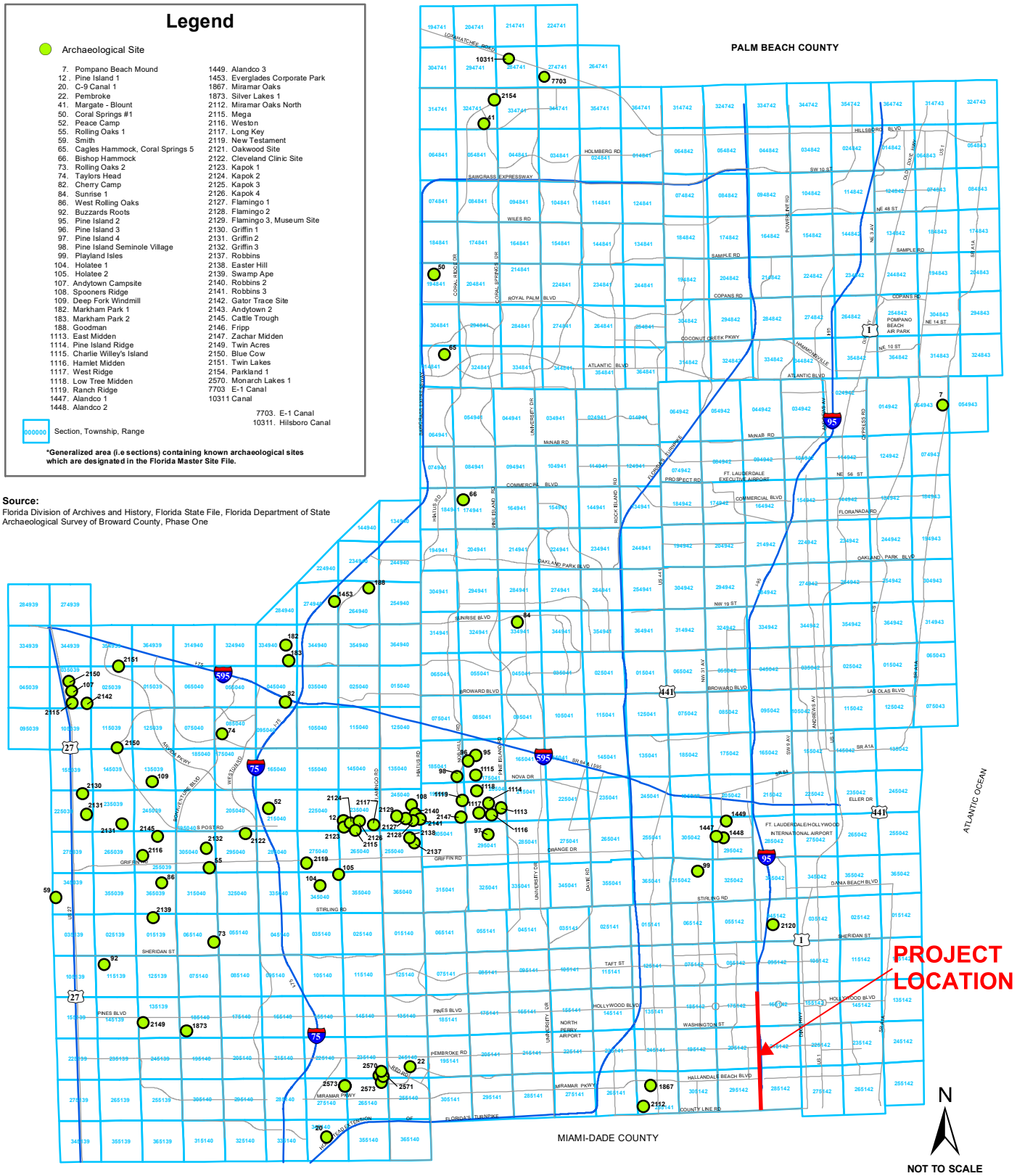


DRAINAGE BASINS for EASTERN BROWARD COUNTY, FL.

Figure B-1

BROWARD COUNTY LAND USE PLAN

Cultural Resource Map Series/Local Areas of Particular Concern- Archaeological Sites



Source:
Florida Division of Archives and History, Florida State File, Florida Department of State
Archaeological Survey of Broward County, Phase One

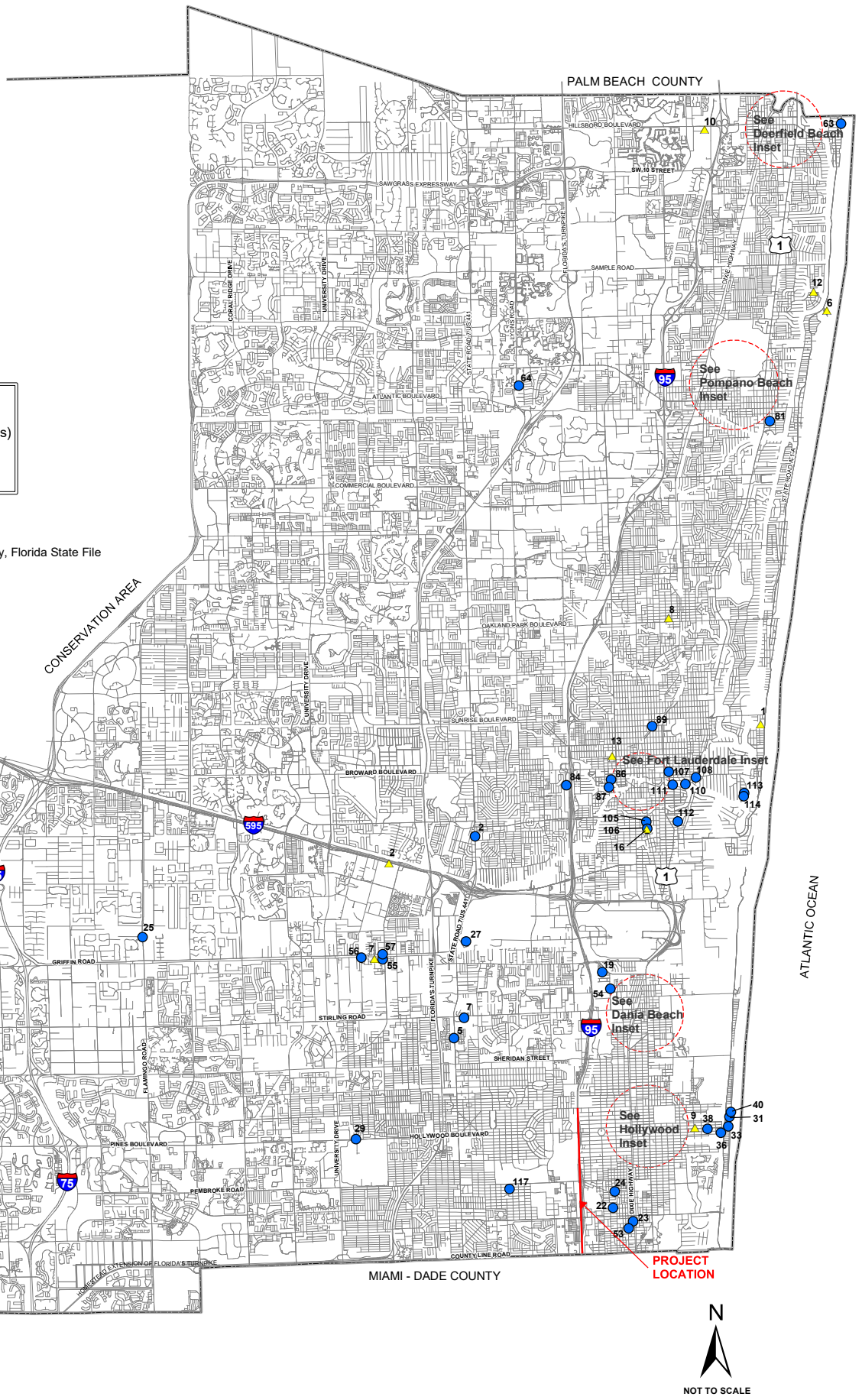
This is a generalized map. This map should not be used to determine parcel boundaries or limits of depicted items. Please contact the Broward County Planning Council office regarding questions pertaining to parcel boundaries or limits.

BROWARD COUNTY LAND USE PLAN

CULTURAL RESOURCES / LOCAL AREAS OF PARTICULAR CONCERN: HISTORIC SITES

	Historic Resource
Map #	Name
1	Deerfield Beach Pioneer House (Kester Cottage)
2	Dixie Water Plant
3	Sailboat Bend Historic District
4	Old Fort Lauderdale High School Site
5	Seminole Indian Reservation
6	Great Southern Hotel
7	John M. and Gilda Bryan House
8	Hollywood Art and Culture Center (Johnson-Foster Funeral Home)
9	Hollywood Publishing Company/Hemmingway Restaurant
10	Ingram Arcade
11	Young Circle
12	Hollywood Woman's Club
13	Original Dania Methodist Church
14	A. C. Frost House
15	Martin C. Frost House
16	Dania Bank Building
17	Woodlawn Cemetery
18	Westlawn Memorial Cemetery
19	Ocean Waterway Mobile Home Park Office Building
20	Dania Beach Hotel
22	Old Hallandale Schoolhouse
23	J. W. Moffitt House
24	Hallandale Cemetery
25	Floyd L. Wray House/Wray Everglades Museum
27	Old Electrical Plant
29	North Perry Airport
30	Dunham's Grocery
31	Coral House
32	Golf View Hotel/Hutchinson Apartments
33	Hollywood Beach Hotel
34	Flora Apartments
35	Hollywood Temple Methodist Church
36	707 Van Buren Street
37	1329 Polk Street
38	Little White House
39	Floyd Wray Residence
40	Circle Villa Apartments
41	Avon Apartments
42	Lornell Apartments
43	1555 Hollywood Boulevard
44	1345 Hollywood Boulevard
45	Ollie H. Gore Residence
46	Dania Historical Society and Museum
47	Hotel Poinciana
48	29 South Federal Highway
49	118 Southwest 1 Avenue
50	124 Southwest 1 Avenue
51	La Normandie Restaurant
52	A. E. Anderson Residence
53	Frank Curci Residence
54	John Bryan House Site
55	Davie Community Church
56	Viele House
57	1911 Hotel
58	Deerfield Furniture Store
59	Waldron House/Kraeer Funeral Home
60	Valdama Howard House
61	Memorial Cemetery
62	Deerfield Beach First Baptist Church and Parsonage
63	Vina S. Gould House
64	Coconut Creek Windmill
65	George Foster Chapel/First United Methodist Church
66	Captain Campbell House
67	Shiver House
68	J. D. Blount House
69	George Blount House
70	Wallace Robinson House
71	W. H. McNab House
72	Dr. McClellan House and Office
73	McClellan Drugs
74	Pompano Mercantile Company
75	Bank Of Pompano
76	Pompano City Pump House and Fire Department
77	Pompano Beach Historical Society Museum
78	Bevill House
79	B. F. Bailey House
80	Frank Austin House
81	Pompano Beach Cemetery
82	Horace Robinson House
83	Giddens-Kimball House
84	Seaboard Airline Railroad Station
85	Brown Home
86	Fire Station No. 8
87	Southwest 11 Avenue Bridge
88	Commodore Brook House
89	Progresso Plaza
90	Retail Stores/Apartments
91	Tom M. Bryan Building
92	Tibbets
93	Colonial Hotel
94	Woman's Club
95	Reed Bryan House
96	Weidling Building
97	Tom M. Bryan House
98	Philemon Bryan House
99	King-Cromartie House
100	Shepherd Hotel
101	Maxwell Arcade
102	Coca-Cola Bottling Plant
103	South Side School
104	Fire Station No. 2
105	Frank Croissant House
106	Croissant Park Administration Building
107	Himmarshee Court
108	Sheppard Estate
109	John W. Needham House
110	Tom Bryan Home
111	E. N. Sperry House
112	Evergreen Cemetery
113	Tom Stilwell House
114	W. G. Bosworth House
116	Robert McNab House
117	Bowles-Strachan House

	National Register of Historic Places
Map #	Name
1	Bonnet House/Bartlett Estate
2	Lock #1, North New River Canal
3	New River Inn
4	Sample-McDougald House
5	Stranahan House
6	Hillsboro Inlet Light Station
7	Davie Elementary School
8	Oakland Park Elementary School
9	Joseph Wesley Young House
10	Seaboard Coast Line Railway Station
11	Deerfield Beach Elementary School
12	Cap's Place Island Restaurant
13	Old Dillard High School
14	Old Deerfield School
15	James D. and Alice Butler House
16	Sam Gilliam House



Legend

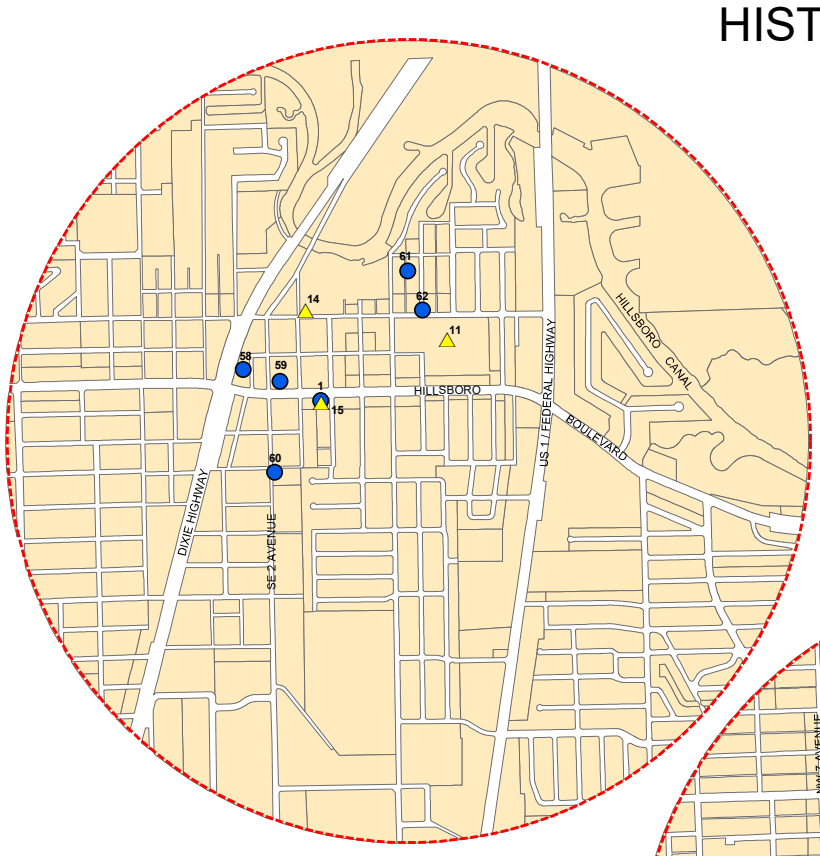
- Historic Resource (National Register of Historic Places)
- Historic Resource

Source:
National Register of Historic Places
Florida Department of State, Florida Division of Archives and History, Florida State File
Broward County Historical Commission
City of Fort Lauderdale

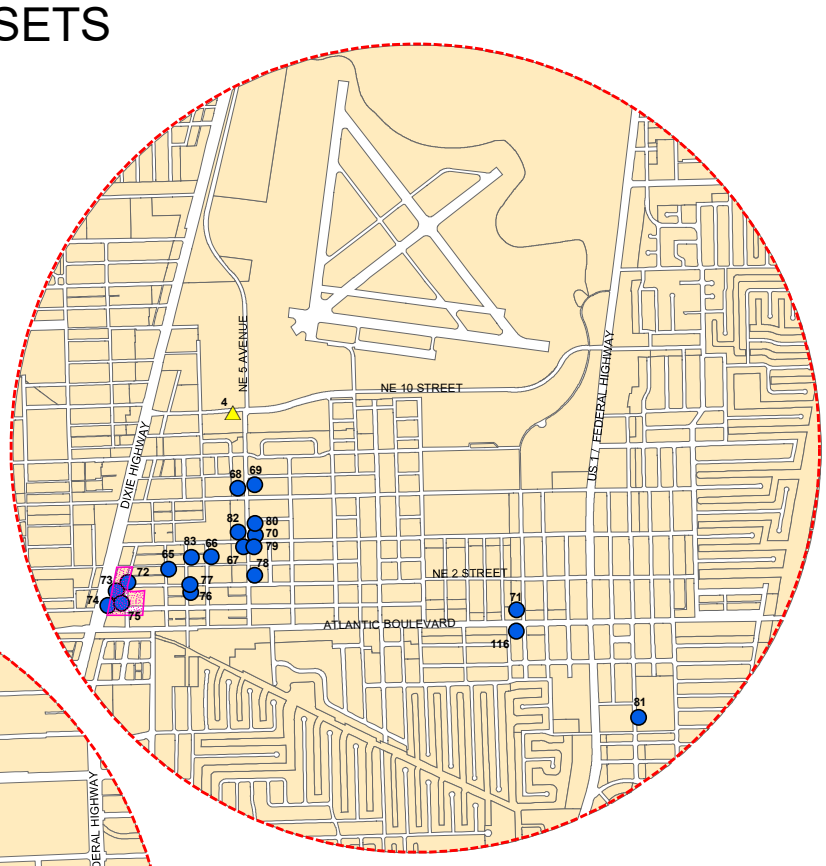
This is a generalized map. This map should not be used to determine parcel boundaries or limits of depicted items. Please contact the Broward County Planning Council office regarding questions pertaining to parcel boundaries or limits.

BROWARD COUNTY LAND USE PLAN

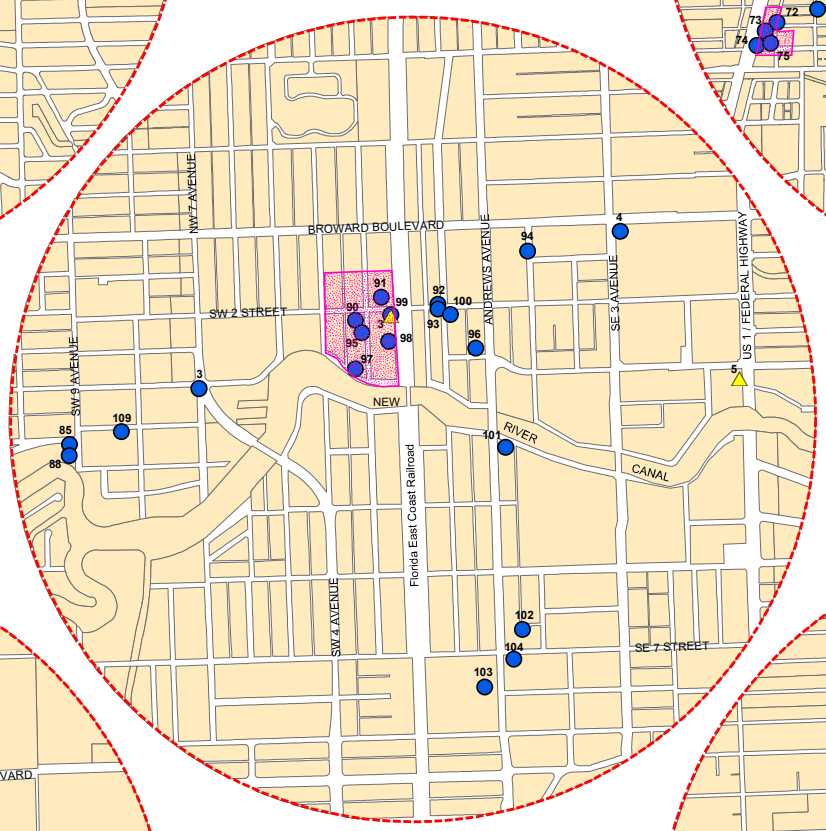
CULTURAL RESOURCE / LOCAL AREAS OF PARTICULAR CONCERN: HISTORIC SITES MAP INSETS



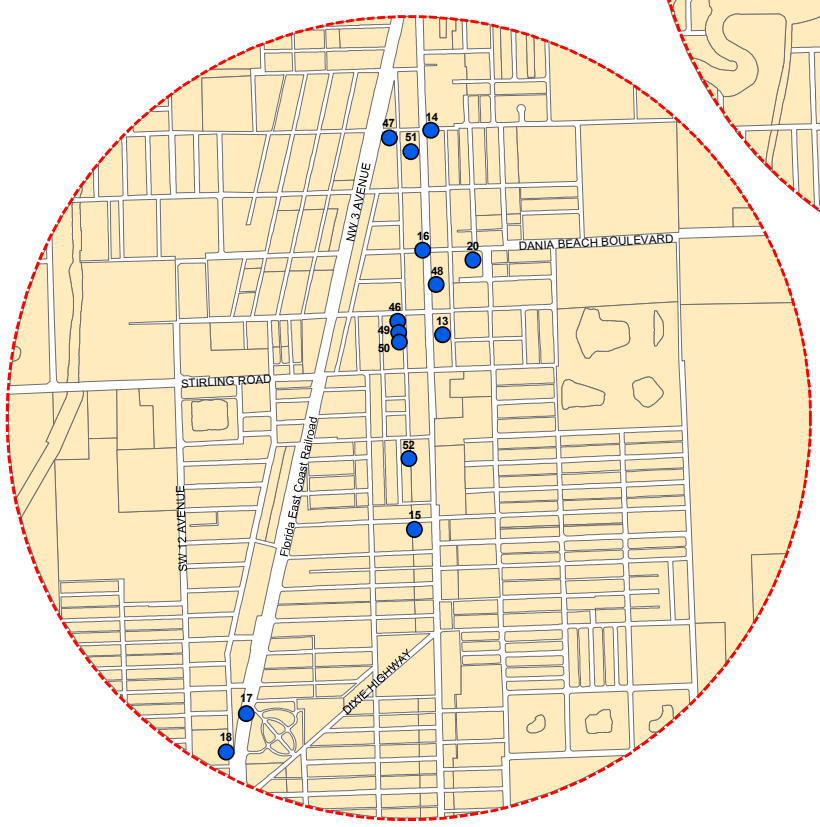
DEERFIELD BEACH



POMPANO BEACH



FORT LAUDERDALE



DANIA BEACH



HOLLYWOOD

Legend

- Historic Resource (National Register of Historic Places)
- Historic Resource
- Historic District

Source:

National Register of Historic Places
Florida Department of State, Florida Division of Archives and History, Florida State File
Broward County Historical Commission
City of Fort Lauderdale

N

NOT TO SCALE

This is a generalized map. This map should not be used to determine parcel boundaries or limits of depicted items.
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Proposed to be deleted

BROWARD COUNTY LAND USE PLAN

CULTURAL RESOURCES / LOCAL AREAS OF PARTICULAR CONCERN: CULTURAL FACILITIES

NO. NAME

ARTS PARK
1 ArtsPark & Amphitheater at Young Circle
2 Central Broward Regional Park & ArtsPark
3 Miramar Cultural Center & ArtsPark
4 River of Grass ArtsPark

CULTURAL CENTER
5 Coral Springs Center for the Arts
6 David Posnack Jewish Community Center
7 Donnith Fletcher Art & Cultural Center
8 Hallandale Beach Cultural Community Center
9 Historic West Side School
10 Hollywood Beach Culture & Community Center
11 Pembroke Pines Historical Library
12 Pompano Beach Amphitheater
13 Ruth E. Cohan Art Gallery/Soref Jewish Community Cent
14 Stonewall Library & Archives
15 Sunrise Civic Center
16 The Township Aquatic Center
17 Third Avenue Art District

MUSEUM
18 Acetylene Building
19 Art & Culture Center of Hollywood
20 Bienes Museum of the Modern Book
21 Bonnet House Museum & Gardens
22 Broward County Historical Commission
23 Coral Springs Museum of Art
24 Ely Educational Museum
25 Flamingo Gardens
26 Fort Lauderdale Antique Car Museum
27 Fort Lauderdale Fire & Safety Museum
28 Hoch Heritage Center
29 IGFA Fishing Hall of Fame & Museum
30 International Swimming Hall of Fame
31 King Cromartie House
32 Museum of Art/Fort Lauderdale/Nova Southeastern Univ
33 Museum of Coral Springs History
34 Museum of Discovery & Science & IMAX 3D Theater
35 My Jewish Discovery Place Museum
36 Old Fort Lauderdale Village & Museum
37 Philemon Nathaniel Bryan House
38 Plantation Historical Museum
39 Replica 1899 Schoolhouse
40 Schacknow Museum of Fine Arts
41 Seminole Okalee Indian Village & Museum
42 Tradewinds McLean Farmhouse
43 Viele House
44 Walsh/Osterhoudt House
45 Wray Family Estate
46 Young At Art Children's Museum

NATIONAL REGISTER OF HISTORIC PLACES
47 Alfred and Olive Thorpe Lustron House (2007)
48 Bonnet House Museum & Gardens (1984)
49 Bryan Building (1997)
50 Cap's Place (1990)
51 Croissant Park Administration Building (2001)
52 Davie School Historical Museum (1988)
53 Deerfield Beach Elementary School (1990)
54 Dr. Willard Van Orsdel King House (2006)
55 Hammerstein House (2005)
56 Hillsboro Inlet Light Station (1974)
57 Hollywood Boulevard Historic Business District (1999)
58 Hollywood Garden Club (2005)
59 Hollywood Woman's Club (1995)
60 James D. and Alice Butler House (1995)
61 Joseph Wesley Young House (1989)
62 Link Trainer Building (1998)
63 Lock No. 1, North New River Canal (1978)
64 New River Inn (1972)
65 Nyberg-Swanson House (1999)
66 Oakland Park Elementary School (1988)
67 Old Deerfield School (1999)
68 Old Dillard High School (1991)
69 Old Seaboard Air Line Railway Station (1990)
70 S.S. Copenhagen Shipwreck (2001)
71 Sam Gilliam House (2001)
72 Sample-McDougald House (1984)
73 South Side School (2006)
74 St. Anthony School (1997)
75 Stranahan House (1973)
76 Williams House aka Gilda's Club (2005)

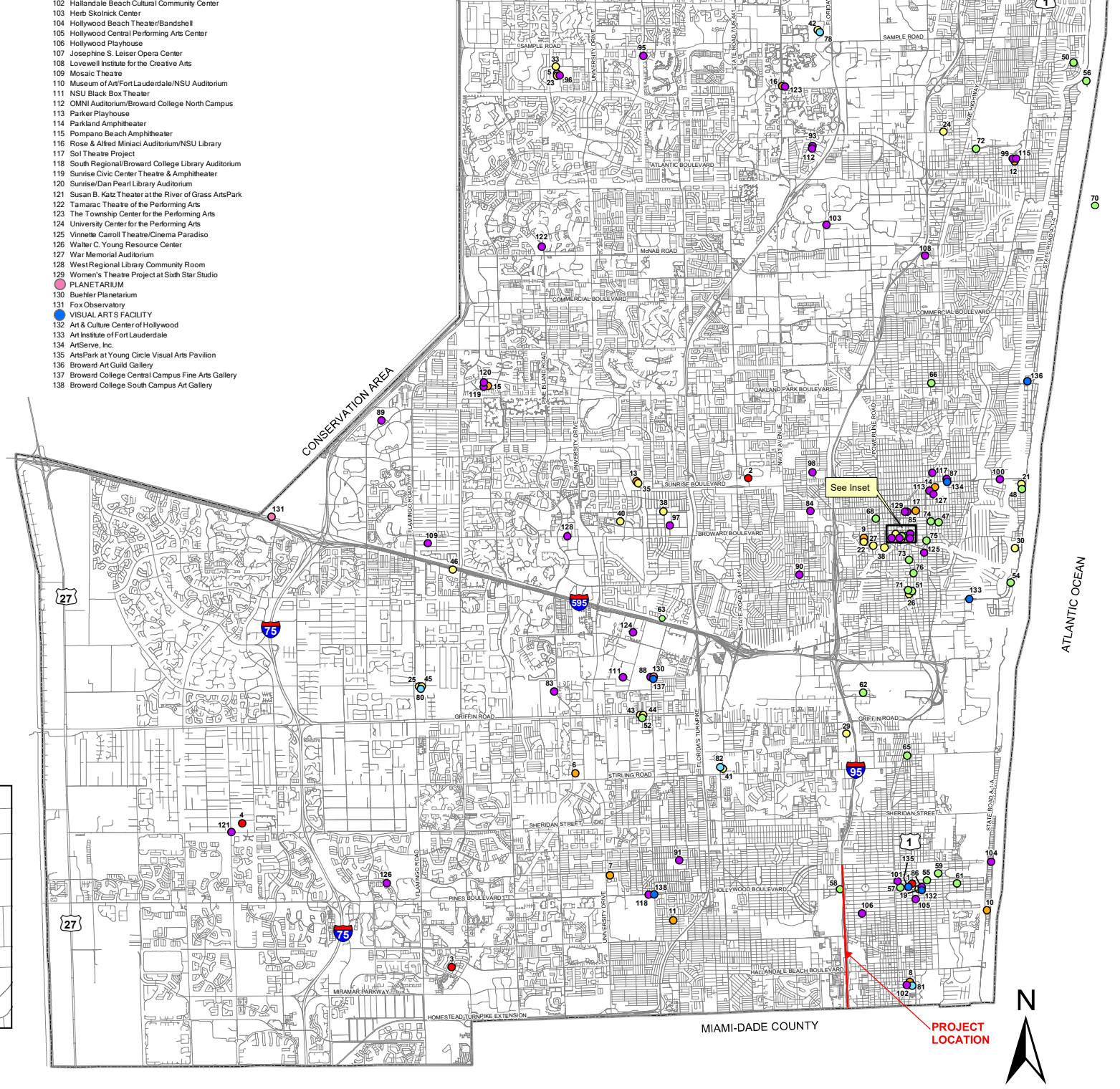
OTHER
77 Broward Cultural Division & Cultural Information Center
78 Butterfly World
79 Deerfield Beach Arboretum aka Tree Zoo
80 Flamingo Gardens
81 Hallandale Beach Cannon Site, World War II Memorial
82 Seminole Okalee Indian Village & Museum
0 PERFORMING ARTS FACILITY
83 Actors Community Theatre
84 African American Research Library & Cultural Center

NO. NAME

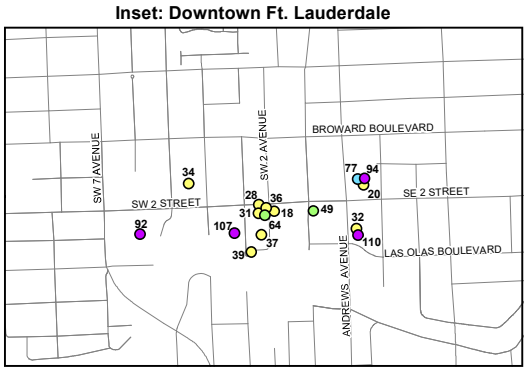
PERFORMING ARTS FACILITY
83 Actors Community Theatre
84 African American Research Library & Cultural Center
85 Andrews Living Arts
86 Art & Culture Center of Hollywood
87 ArtServe, Inc.
88 Bailey Concert Hall
89 Bank Atlantic Center
90 Bienes Center for the Arts at St. Thomas Aquinas High S
91 Boulevard Heights Community Center & Amphitheater
92 Broward Center for the Performing Arts
93 Broward College North Campus Library/Auditorium
94 Broward County Main Library/Auditorium
95 Broward Stage Door's Theatre
96 Coral Springs Center for the Arts
97 Deicke Auditorium
98 Dillard Center for the Performing Arts
99 Emma Lou Olson Civic Center
100 Fort Lauderdale Children's Theatre/The Studio
101 Fred Lippman Multi-Purpose Center
102 Hallandale Beach Cultural Community Center
103 Herb Skolnick Center
104 Hollywood Beach Theater/Bandshell
105 Hollywood Central Performing Arts Center
106 Hollywood Playhouse
107 Josephine S. Leiser Opera Center
108 Lovewell Institute for the Creative Arts
109 Mosaic Theatre
110 Museum of Art/Fort Lauderdale/NSU Auditorium
111 NSU Black Box Theater
112 OMNI Auditorium/Broward College North Campus
113 Parker Playhouse
114 Parkland Amphitheater
115 Pompano Beach Amphitheater
116 Rose & Alfred Miniaci Auditorium/NSU Library
117 Sol Theatre Project
118 South Regional/Broward College Library Auditorium
119 Sunrise Civic Center Theatre & Amphitheater
120 Sunrise/Dan Pearl Library Auditorium
121 Susan B. Katz Theater at the River of Grass ArtsPark
122 Tamarac Theatre of the Performing Arts
123 The Township Center for the Performing Arts
124 University Center for the Performing Arts
125 Vinnette Carroll Theatre/Cinema Paradiso
126 Walter C. Young Resource Center
127 War Memorial Auditorium
128 West Regional Library Community Room
129 Women's Theatre Project at Sixth Star Studio

PLANETARIUM
130 Buehler Planetarium
131 Fox Observatory

VISUAL ARTS FACILITY
132 Art & Culture Center of Hollywood
133 Art Institute of Fort Lauderdale
134 ArtServe, Inc.
135 ArtsPark at Young Circle Visual Arts Pavilion
136 Broward Art Guild Gallery
137 Broward College Central Campus Fine Arts Gallery
138 Broward College South Campus Art Gallery



Inset: Downtown Ft. Lauderdale



Source:
Broward County Cultural Division
II.C. Cultural Resources/Local Areas of Particular Concern - Cultural Facilities (October 25, 2011)

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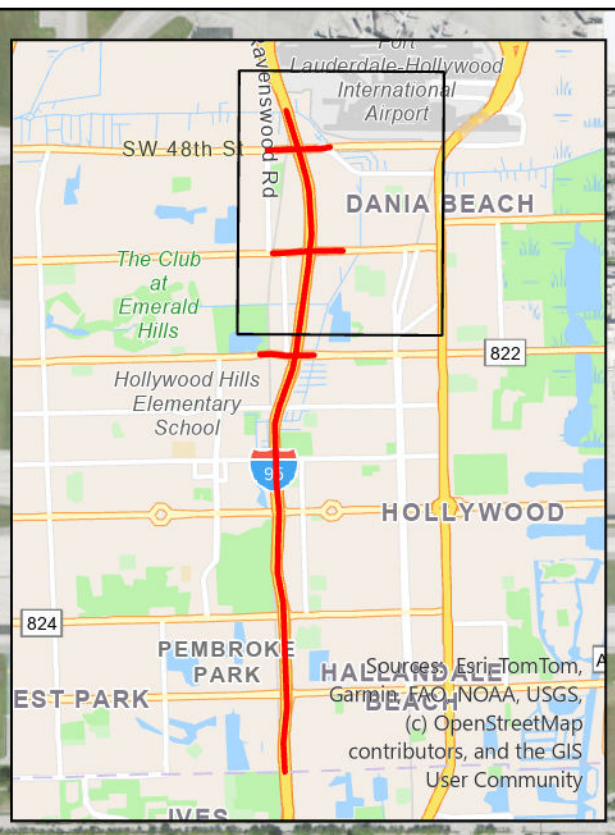
NOT TO SCALE



Legend

- Project Limits
- 500 ft Buffer

SFWMD Land Use and Cover Description (2023)

- Commercial and Services
- Industrial
- Institutional
- Nurseries and Vineyards
- Open Land
- Recreational
- Reservoirs
- Residential, High Density (Six Or More Dwelling Units Per Acre)
- Residential, Medium Density (Two-Five Dwelling Units Per Acre)
- Streams and Waterways
- Transportation
- Upland Hardwood Forests
- Vegetated Non-Forested Wetlands
- Wetland Hardwood Forests

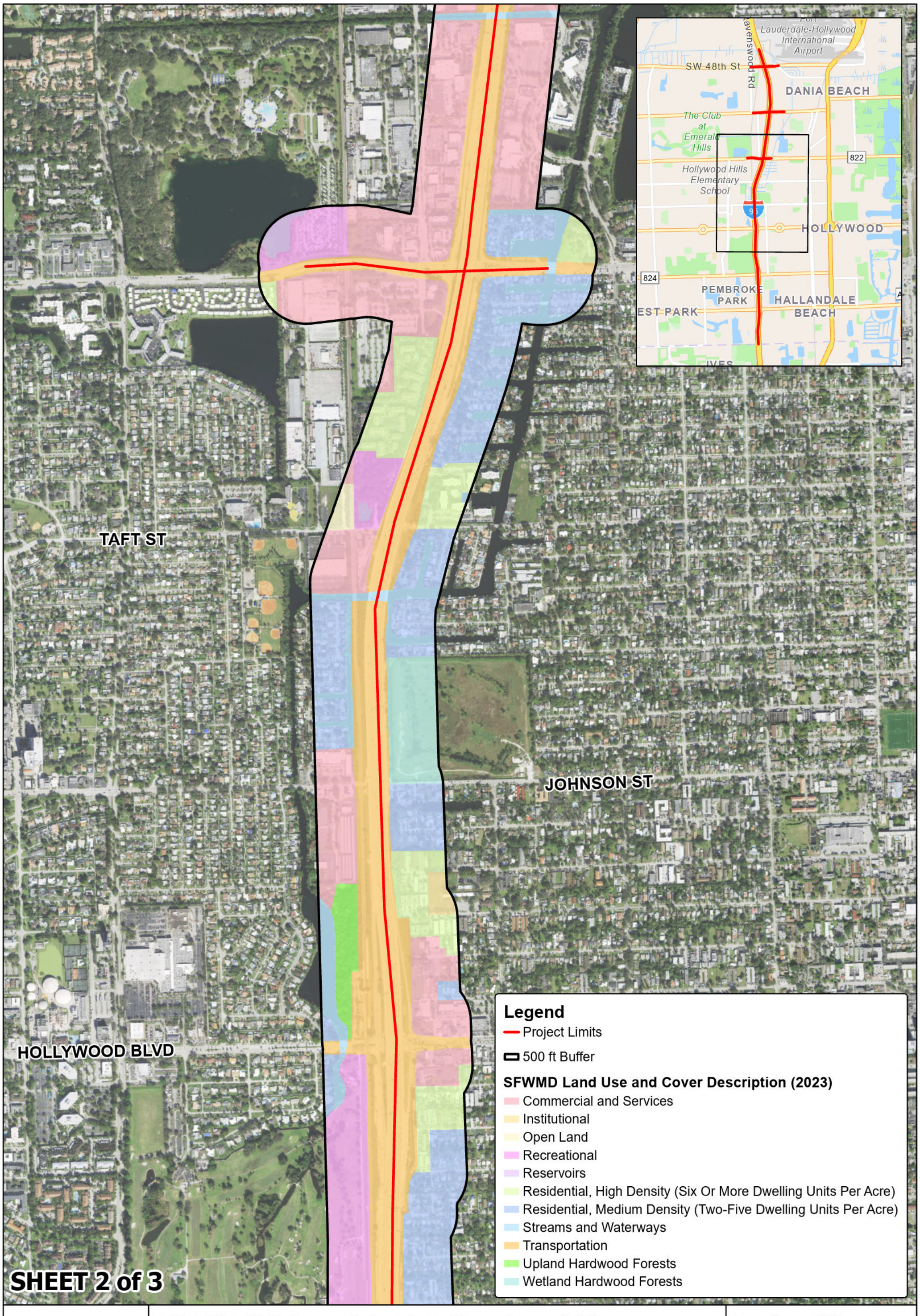
SHEET 3 of 3

FLUCFCS Level 2: Existing Land Use

FPID No. 439170-1-22-02
SR-9/I-95 PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road and the cross roads at Griffin Rd, Stirling Rd, and Sheridan Rd
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 500 1,000 US Feet

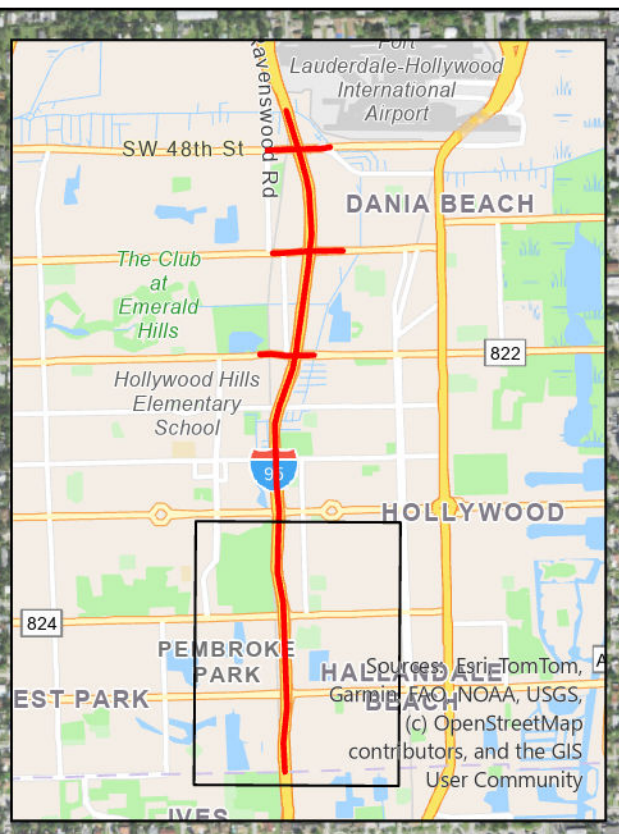


FLUCFCS Level 2: Existing Land Use

FPID No. 439170-1-22-02
SR-9/I-95 PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road and the cross roads at Griffin Rd, Stirling Rd, and Sheridan Rd
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 500 1,000
US Feet



PEMBROKE RD

HALLANDALE BEACH BLVD

SHEET 1 of 3

Legend

- Project Limits
- 500 ft Buffer

SFWMD Land Use and Cover Description (2023)

- Commercial and Services
- Institutional
- Recreational
- Reservoirs
- Residential, High Density (Six Or More Dwelling Units Per Acre)
- Residential, Medium Density (Two-Five Dwelling Units Per Acre)
- Streams and Waterways
- Transportation

FLUCFCS Level 2: Existing Land Use

FPID No. 439170-1-22-02
SR-9/I-95 PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road and the cross roads at Griffin Rd, Stirling Rd, and Sheridan Rd
Broward County, FL

Image Source: ESRI
Image Date: 2024

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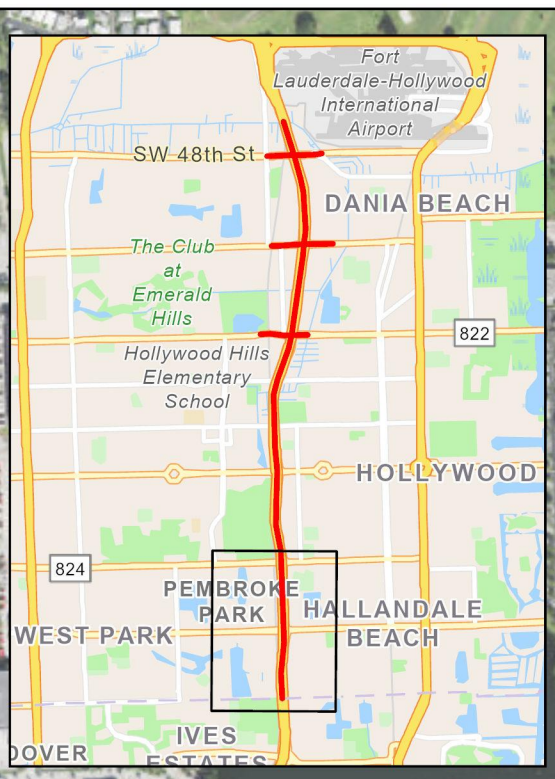
US Feet



Legend

- Project Limits
- 500 ft Buffer

NWI (2024) Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake

SHEET 1 of 4

National Wetland Inventory

FPID No. 439170-1-22-02
SR-9/I-95 PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road and the cross roads at Griffin Rd, Stirling Rd, and Sheridan Rd
Broward County, FL

Image Source: ESRI
Image Date: 2024

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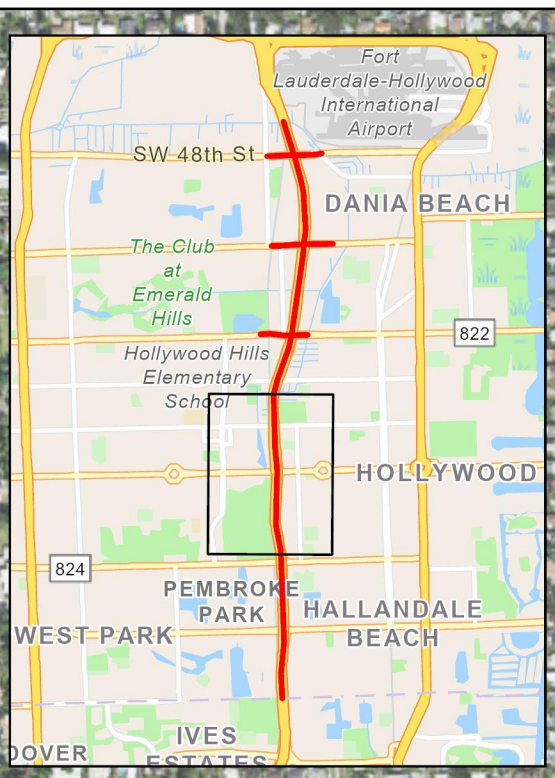

Legend

- Project Limits
- 500 ft Buffer

NWI (2024) Wetland Type

- Estuarine and Marine Deepwater
- Freshwater Pond
- Riverine

SHEET 2 of 4

National Wetland Inventory

FPID No. 439170-1-22-02
SR-9/I-95 PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road and the cross roads at Griffin Rd, Stirling Rd, and Sheridan Rd
Broward County, FL

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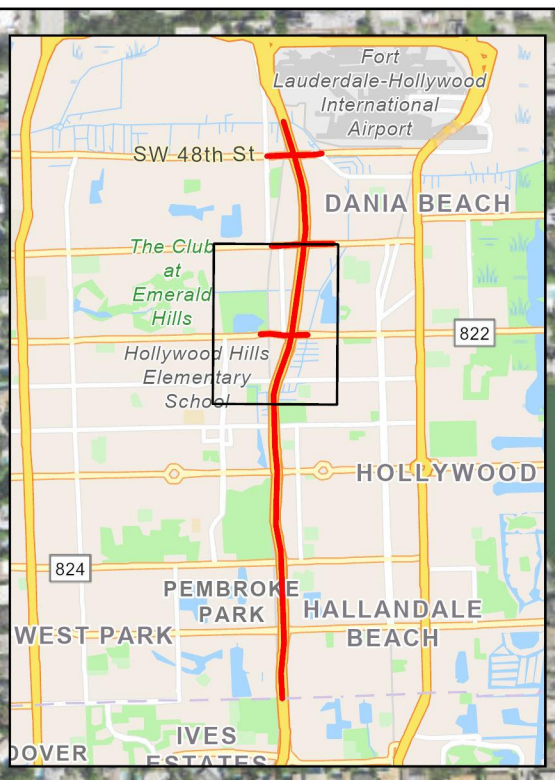

Legend

- Project Limits
- 500 ft Buffer

NWI (2024) Wetland Type

- Estuarine and Marine Deepwater
- Freshwater Pond
- Lake
- Riverine

SHEET 3 of 4

National Wetland Inventory

FPID No. 439170-1-22-02
SR-9/I-95 PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road and the cross roads at Griffin Rd, Stirling Rd, and Sheridan Rd
Broward County, FL

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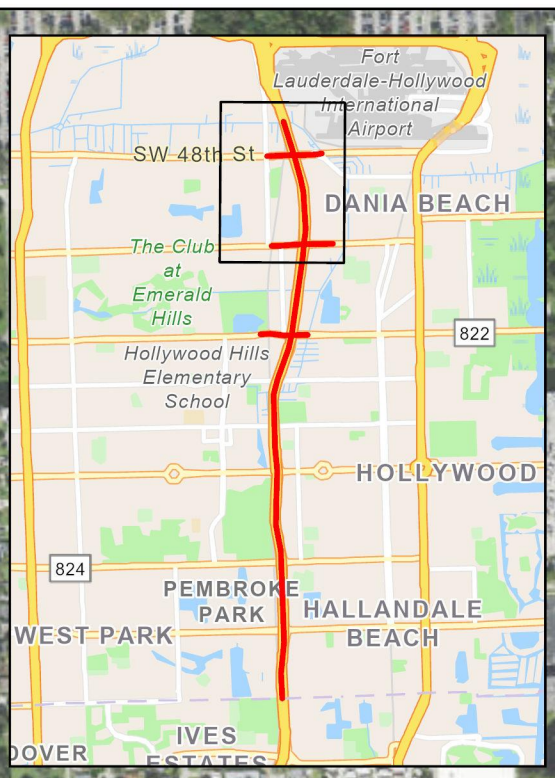

Legend

- Project Limits
- 500 ft Buffer

NWI (2024) Wetland Type

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

SHEET 4 of 4

National Wetland Inventory

FPID No. 439170-1-22-02
SR-9/I-95 PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road and the cross roads at Griffin Rd, Stirling Rd, and Sheridan Rd
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 350 700 US Feet

NOAA Atlas 14, Volume 9, Version 2
Location name: Hollywood, Florida, USA*
Latitude: 26.0116°, Longitude: -80.1665°
Elevation: 28 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.552** (0.441-0.693)	**0.640** (0.511-0.805)	**0.785** (0.625-0.991)	**0.907** (0.717-1.15)	**1.08** (0.824-1.41)	**1.21** (0.905-1.60)	**1.34** (0.972-1.83)	**1.48** (1.03-2.07)	**1.66** (1.11-2.40)	**1.80** (1.18-2.64)
10-min	**0.808** (0.645-1.02)	**0.937** (0.748-1.18)	**1.15** (0.915-1.45)	**1.33** (1.05-1.68)	**1.58** (1.21-2.06)	**1.77** (1.32-2.35)	**1.96** (1.42-2.68)	**2.16** (1.51-3.03)	**2.43** (1.63-3.51)	**2.63** (1.72-3.86)
15-min	**0.985** (0.787-1.24)	**1.14** (0.912-1.44)	**1.40** (1.12-1.77)	**1.62** (1.28-2.05)	**1.92** (1.47-2.52)	**2.16** (1.62-2.87)	**2.39** (1.74-3.26)	**2.64** (1.84-3.70)	**2.96** (1.99-4.28)	**3.21** (2.10-4.71)
30-min	**1.57** (1.26-1.97)	**1.83** (1.46-2.30)	**2.26** (1.80-2.86)	**2.62** (2.08-3.33)	**3.13** (2.40-4.10)	**3.52** (2.64-4.68)	**3.92** (2.84-5.34)	**4.32** (3.01-6.06)	**4.86** (3.26-7.02)	**5.28** (3.45-7.75)
60-min	**2.15** (1.72-2.70)	**2.48** (1.98-3.12)	**3.06** (2.43-3.86)	**3.57** (2.83-4.53)	**4.33** (3.34-5.74)	**4.96** (3.74-6.65)	**5.62** (4.10-7.73)	**6.34** (4.43-8.95)	**7.33** (4.94-10.7)	**8.13** (5.32-11.9)
2-hr	**2.73** (2.20-3.41)	**3.13** (2.51-3.91)	**3.86** (3.08-4.83)	**4.52** (3.60-5.69)	**5.54** (4.32-7.33)	**6.40** (4.86-8.56)	**7.34** (5.39-10.1)	**8.35** (5.89-11.8)	**9.80** (6.66-14.2)	**11.0** (7.24-16.0)
3-hr	**3.05** (2.46-3.80)	**3.48** (2.80-4.34)	**4.30** (3.45-5.37)	**5.08** (4.06-6.37)	**6.31** (4.96-8.37)	**7.38** (5.64-9.88)	**8.55** (6.32-11.7)	**9.85** (7.00-13.9)	**11.7** (8.03-17.0)	**13.3** (8.80-19.3)
6-hr	**3.56** (2.88-4.40)	**4.11** (3.33-5.08)	**5.16** (4.17-6.41)	**6.19** (4.97-7.71)	**7.81** (6.19-10.3)	**9.24** (7.11-12.3)	**10.8** (8.05-14.8)	**12.6** (8.99-17.6)	**15.1** (10.4-21.8)	**17.2** (11.5-24.9)
12-hr	**4.02** (3.27-4.93)	**4.79** (3.90-5.88)	**6.21** (5.04-7.65)	**7.54** (6.08-9.33)	**9.58** (7.60-12.5)	**11.3** (8.75-15.0)	**13.2** (9.89-17.9)	**15.3** (11.0-21.3)	**18.3** (12.7-26.1)	**20.7** (13.9-29.8)
24-hr	**4.53** (3.72-5.53)	**5.53** (4.53-6.75)	**7.31** (5.97-8.95)	**8.92** (7.24-11.0)	**11.3** (9.02-14.7)	**13.4** (10.4-17.5)	**15.5** (11.7-20.8)	**17.9** (12.9-24.6)	**21.2** (14.8-30.0)	**23.9** (16.2-34.0)
2-day	**5.26** (4.34-6.38)	**6.37** (5.24-7.72)	**8.33** (6.84-10.1)	**10.1** (8.26-12.3)	**12.8** (10.2-16.4)	**15.0** (11.7-19.5)	**17.4** (13.1-23.1)	**19.9** (14.5-27.3)	**23.6** (16.5-33.1)	**26.5** (18.1-37.6)
3-day	**5.88** (4.86-7.09)	**6.96** (5.75-8.40)	**8.90** (7.33-10.8)	**10.7** (8.75-13.0)	**13.4** (10.7-17.1)	**15.6** (12.3-20.2)	**18.1** (13.7-24.0)	**20.7** (15.2-28.2)	**24.5** (17.3-34.3)	**27.5** (18.9-38.9)
4-day	**6.43** (5.33-7.73)	**7.46** (6.18-8.99)	**9.35** (7.72-11.3)	**11.1** (9.11-13.5)	**13.7** (11.1-17.6)	**16.0** (12.6-20.7)	**18.5** (14.1-24.4)	**21.1** (15.5-28.7)	**24.9** (17.6-34.8)	**28.0** (19.3-39.5)
7-day	**7.85** (6.54-9.39)	**8.80** (7.32-10.5)	**10.6** (8.76-12.7)	**12.2** (10.1-14.7)	**14.8** (12.0-18.8)	**17.0** (13.5-21.8)	**19.4** (14.9-25.5)	**22.0** (16.3-29.8)	**25.9** (18.4-35.9)	**29.0** (20.0-40.6)
10-day	**9.03** (7.54-10.8)	**10.0** (8.37-12.0)	**11.9** (9.86-14.2)	**13.6** (11.2-16.3)	**16.2** (13.1-20.4)	**18.4** (14.6-23.5)	**20.8** (16.0-27.2)	**23.4** (17.4-31.5)	**27.2** (19.5-37.7)	**30.3** (21.1-42.3)
20-day	**12.1** (10.2-14.3)	**13.6** (11.4-16.1)	**16.1** (13.5-19.2)	**18.3** (15.3-21.9)	**21.5** (17.4-26.6)	**24.0** (19.0-30.1)	**26.6** (20.5-34.2)	**29.3** (21.7-38.8)	**33.0** (23.7-45.0)	**35.9** (25.1-49.7)
30-day	**14.6** (12.3-17.2)	**16.6** (13.9-19.5)	**19.8** (16.6-23.4)	**22.4** (18.7-26.6)	**26.0** (21.1-31.8)	**28.7** (22.8-35.7)	**31.5** (24.3-40.2)	**34.2** (25.4-44.9)	**37.8** (27.1-51.2)	**40.5** (28.5-55.9)
45-day	**17.7** (15.0-20.8)	**20.2** (17.1-23.8)	**24.2** (20.4-28.5)	**27.3** (22.9-32.3)	**31.4** (25.4-38.0)	**34.3** (27.3-42.3)	**37.1** (28.7-47.0)	**39.8** (29.6-51.9)	**43.1** (31.0-57.9)	**45.5** (32.1-62.5)
60-day	**20.4** (17.3-23.9)	**23.3** (19.8-27.3)	**27.8** (23.5-32.7)	**31.2** (26.2-36.9)	**35.6** (28.8-42.9)	**38.7** (30.8-47.4)	**41.5** (32.1-52.2)	**44.1** (32.8-57.1)	**47.1** (33.9-62.8)	**49.0** (34.7-67.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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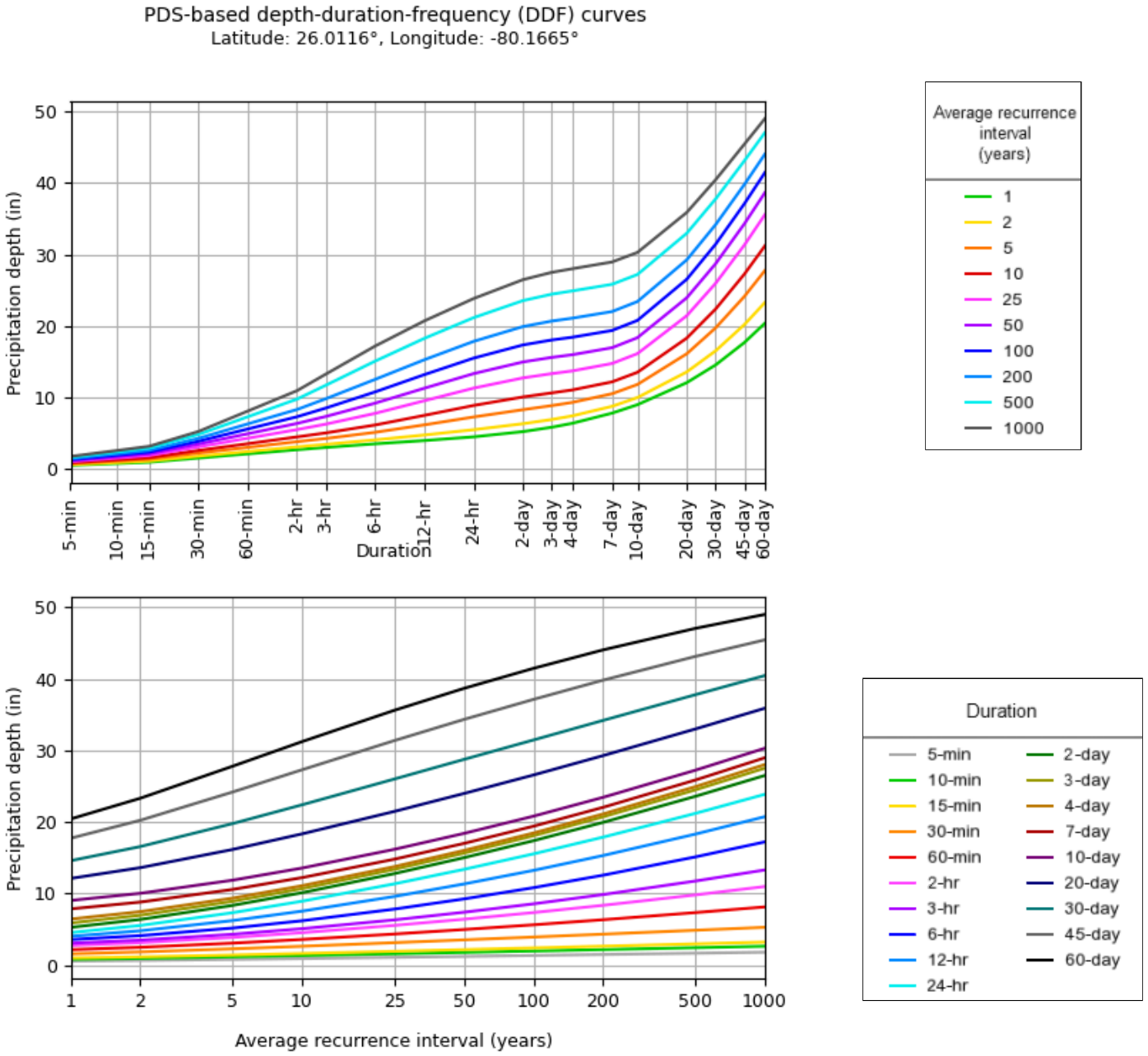
PF graphical



NOAA Atlas 14, Volume 9, Version 2

Created (GMT): Tue Apr 15 15:05:56 2025

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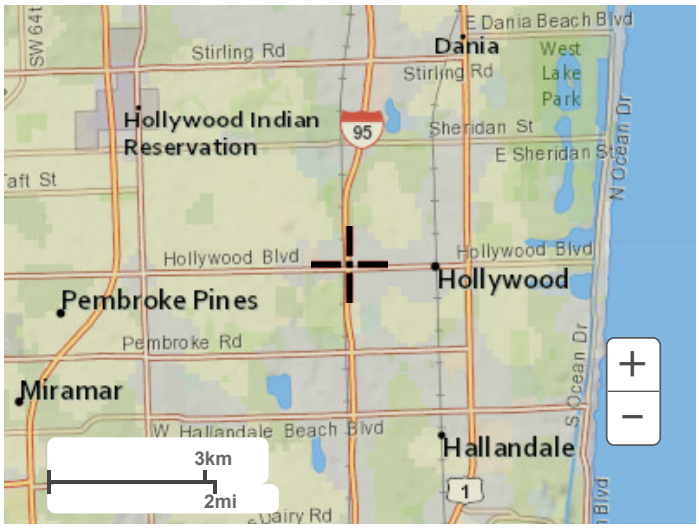
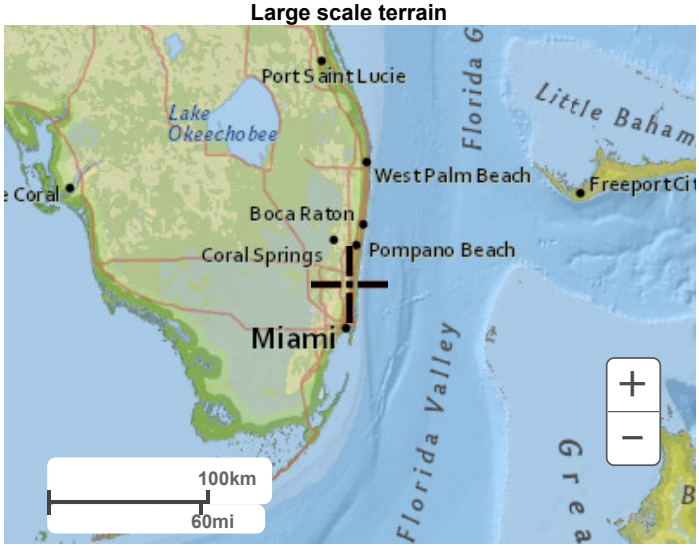
Maps & aerials

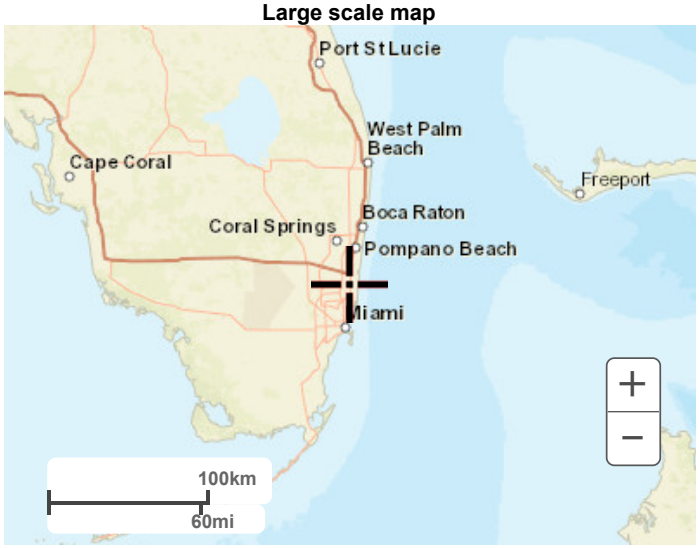
Small scale terrain



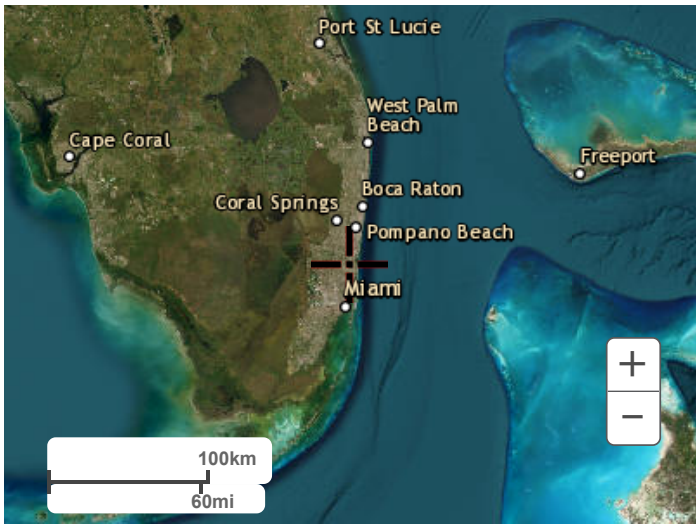
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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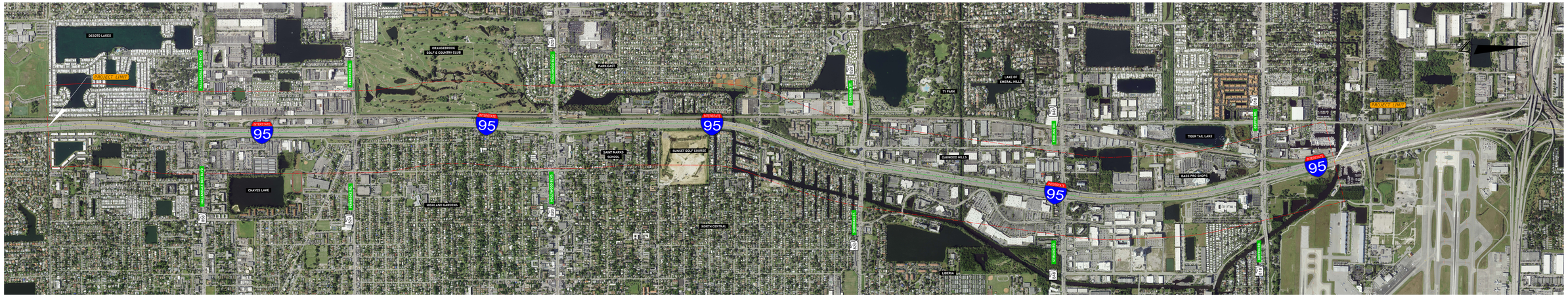
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NW 6083RD ST
NW 6087TH ST
NW 6091ST ST
NW 6095TH ST
NW 6099TH ST
NW 6103RD ST
NW 6107TH ST
NW 6111TH ST
NW 6115TH ST
NW 6119TH ST
NW 6123RD ST
NW 6127TH ST
NW 6131ST ST
NW 6135TH ST
NW 6139TH ST
NW 6143RD ST
NW 6147TH ST
NW 6151ST ST
NW 6155TH ST
NW 6159TH ST
NW 6163RD ST
NW 6167TH ST
NW 6171ST ST
NW 6175TH ST
NW 6179TH ST
NW 6183RD ST
NW 6187TH ST
NW 6191ST ST
NW 6195TH ST
NW 6199TH ST
NW 6203RD ST
NW 6207TH ST
NW 6211TH ST
NW 6215TH ST
NW 6219TH ST
NW 6223RD ST
NW 6227TH ST
NW 6231ST ST
NW 6235TH ST
NW 6239TH ST
NW 6243RD ST
NW 6247TH ST
NW 6251ST ST
NW 6255TH ST
NW 6259TH ST
NW 6263RD ST
NW 6267TH ST
NW 6271ST ST
NW 6275TH ST
NW 6279TH ST
NW 6283RD ST
NW 6287TH ST
NW 6291ST ST
NW 6295TH ST
NW 6299TH ST
NW 6303RD ST
NW 6307TH ST
NW 6311TH ST
NW 6315TH ST
NW 6319TH ST
NW 6323RD ST
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NW 6379TH ST
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NW 6431ST ST
NW 6

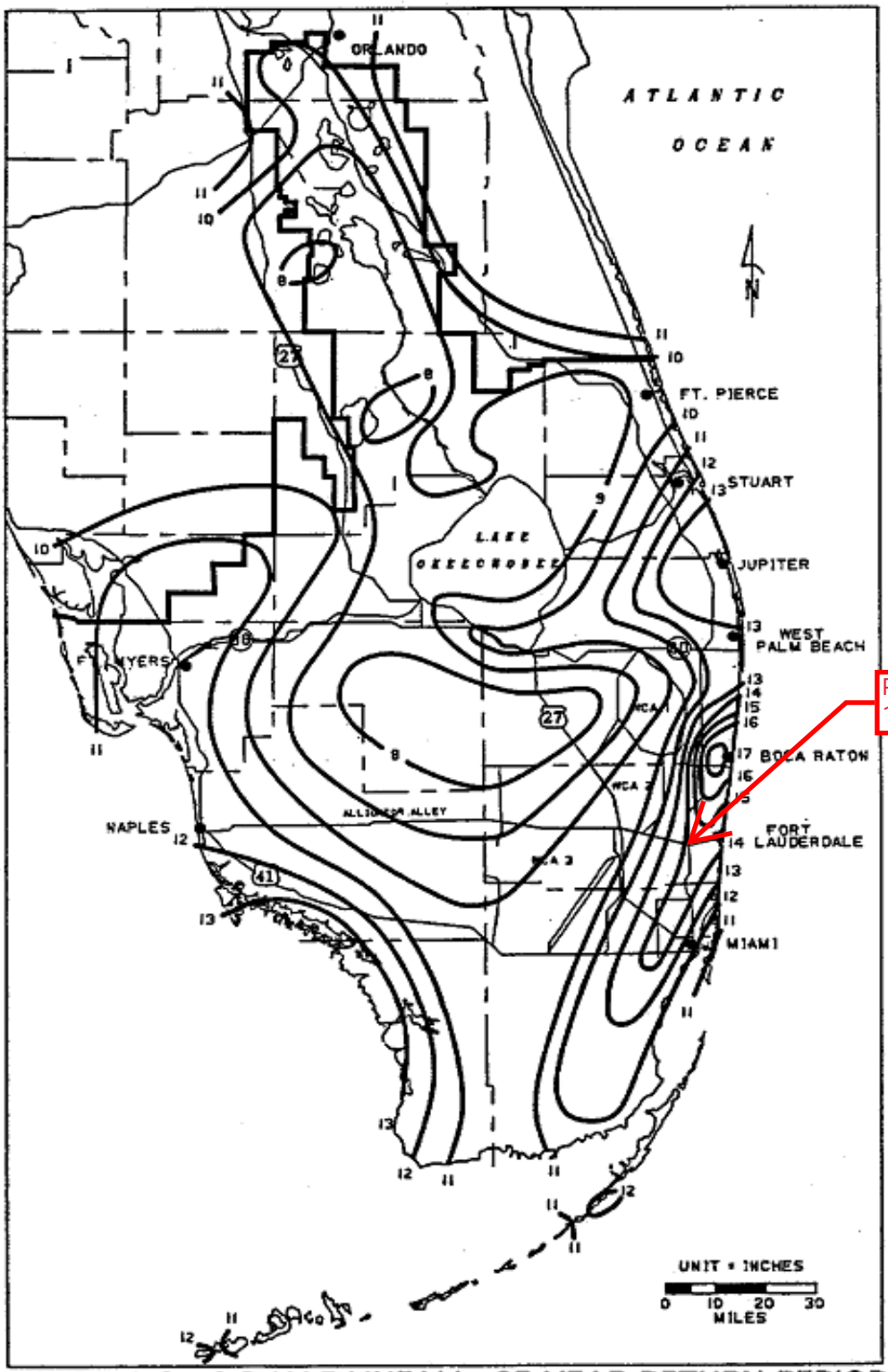


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

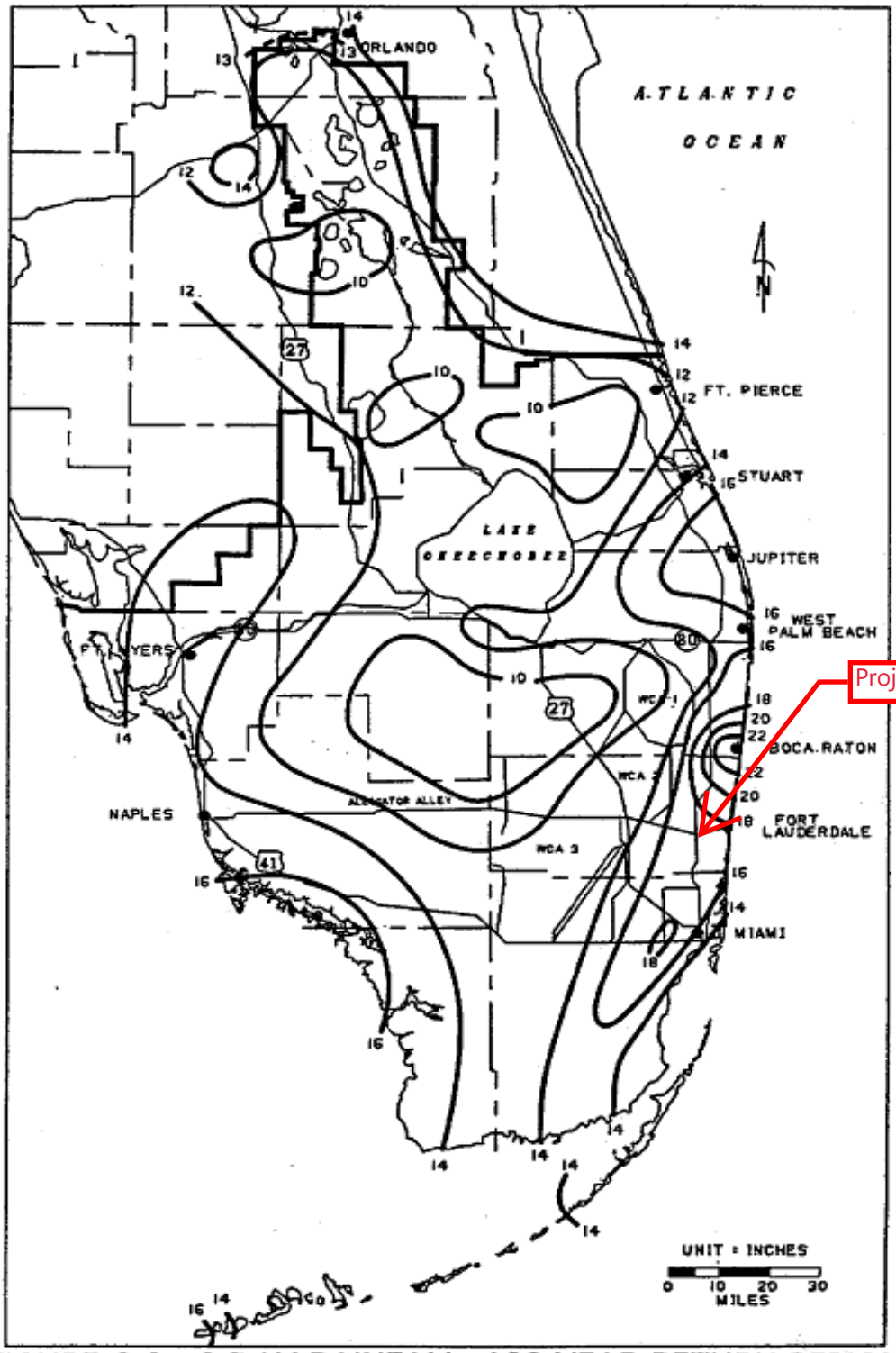
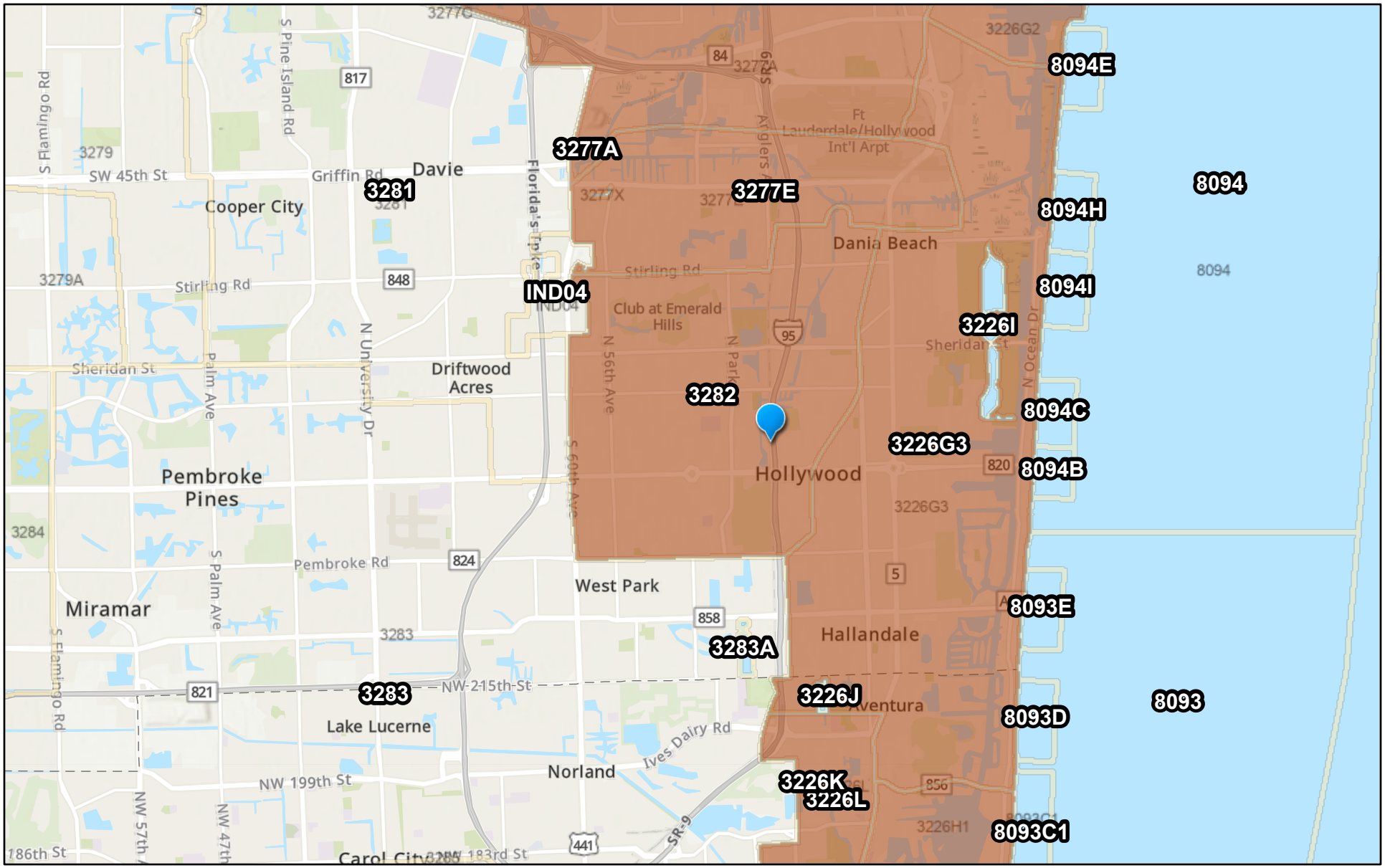


FIGURE C-9. 3-DAY RAINFALL: 100-YEAR RETURN PERIOD

WBIDs



November 15, 2022

Waterbody IDs (WBIDs) Verified List WBIDs

Group 4

1:121,216

0 0.75 1.5 3 mi

0 1.5 3 6 km

FDEP, DEAR, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA,

Map created by Map Direct, powered by ESRI.

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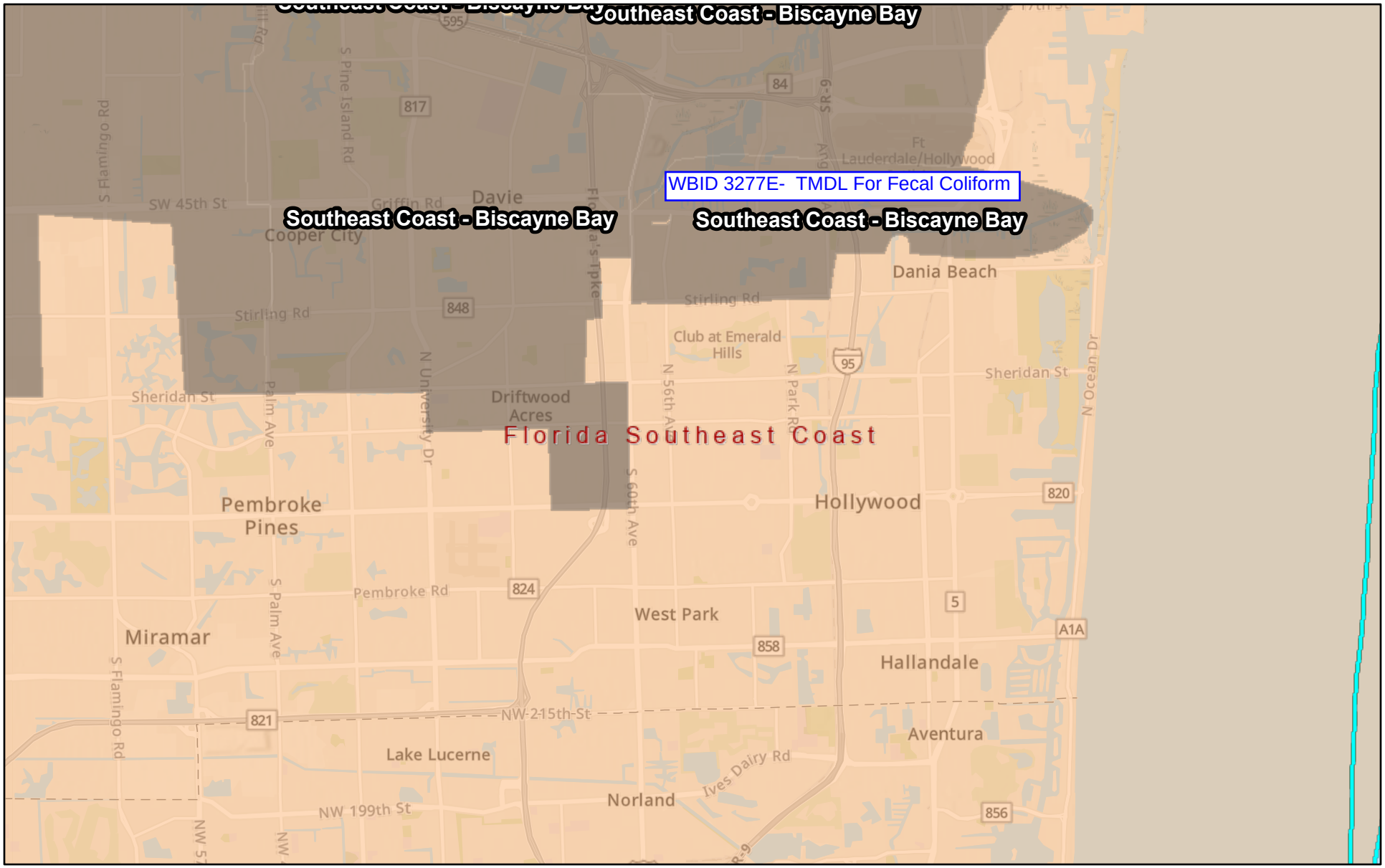
TMDLs



November 15, 2022

TMDL Basin Groups

Group 4

Florida TMDLs

TMDLs Adopted

TMDL Development Priority HUC Basins

1:121,216

0 0.75 1.5 3 mi

0 1.5 3 6 km

FDEP, DEAR, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA,

Map created by Map Direct, powered by ESRI.

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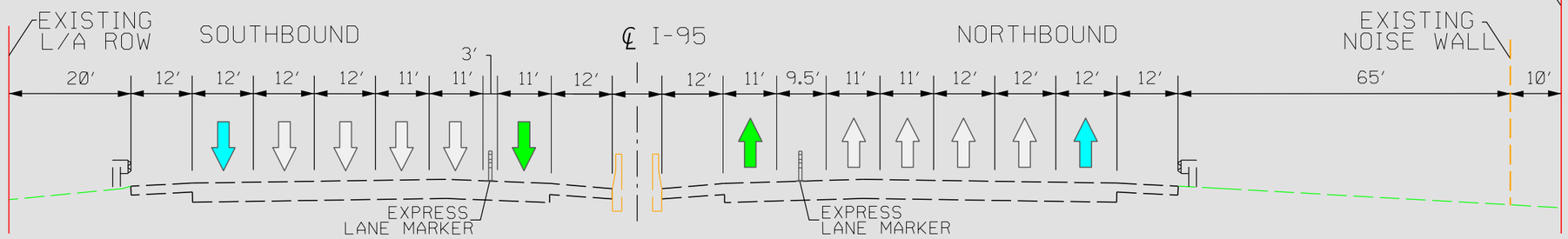
Appendix B
Typical Sections

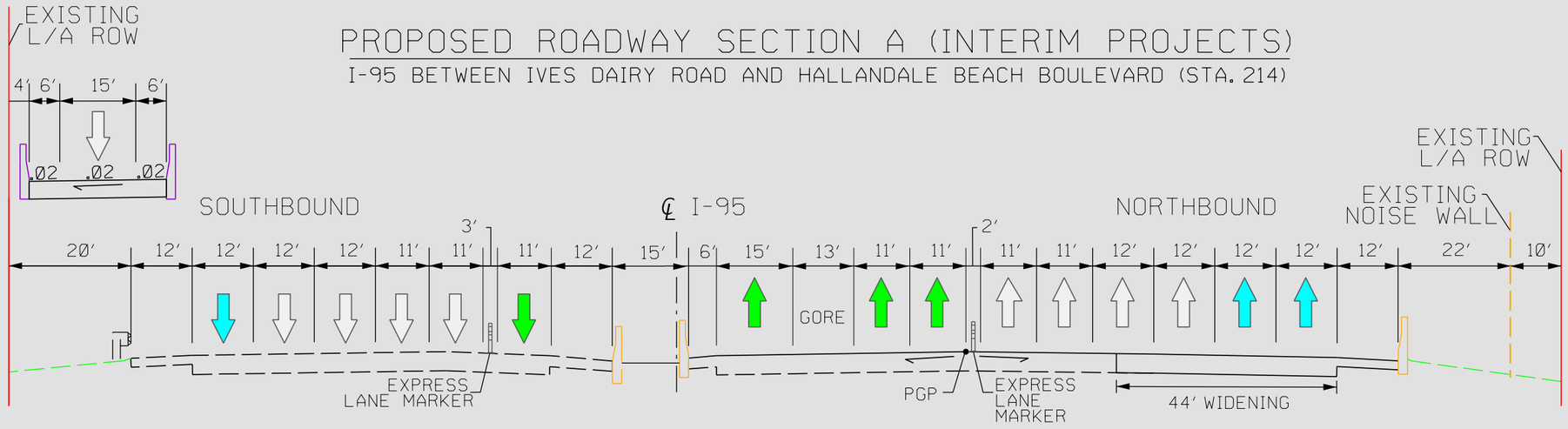
EXISTING ROADWAY SECTION A

I-95 BETWEEN IVES DAIRY ROAD AND HALLANDALE BEACH BOULEVARD (STA. 214)



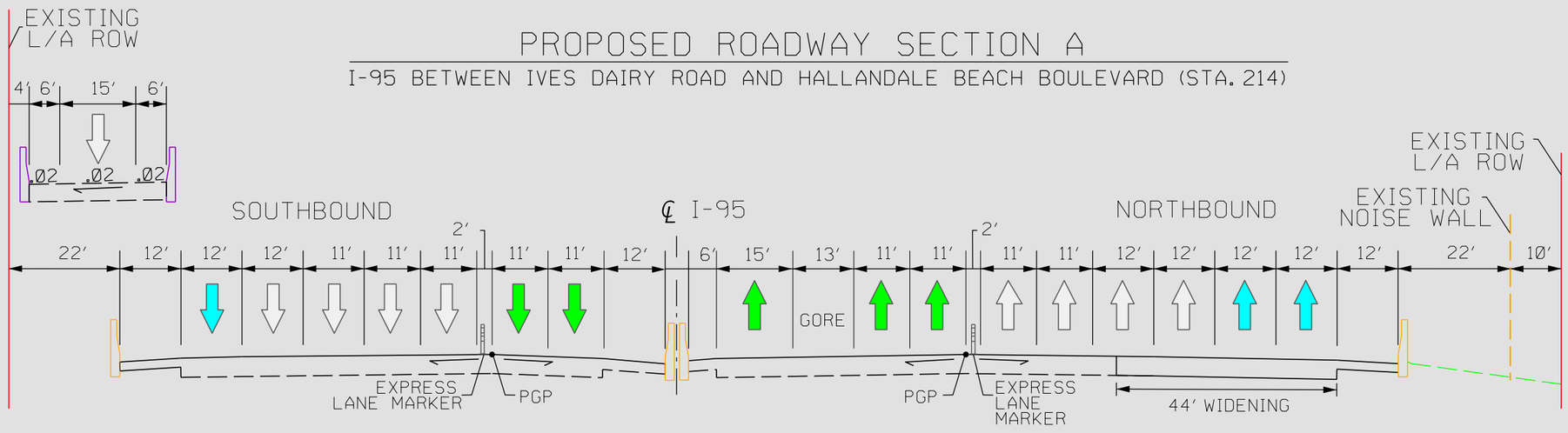
PROPOSED ROADWAY SECTION A (INTERIM PROJECTS)

I-95 BETWEEN IVES DAIRY ROAD AND HALLANDALE BEACH BOULEVARD (STA. 214)



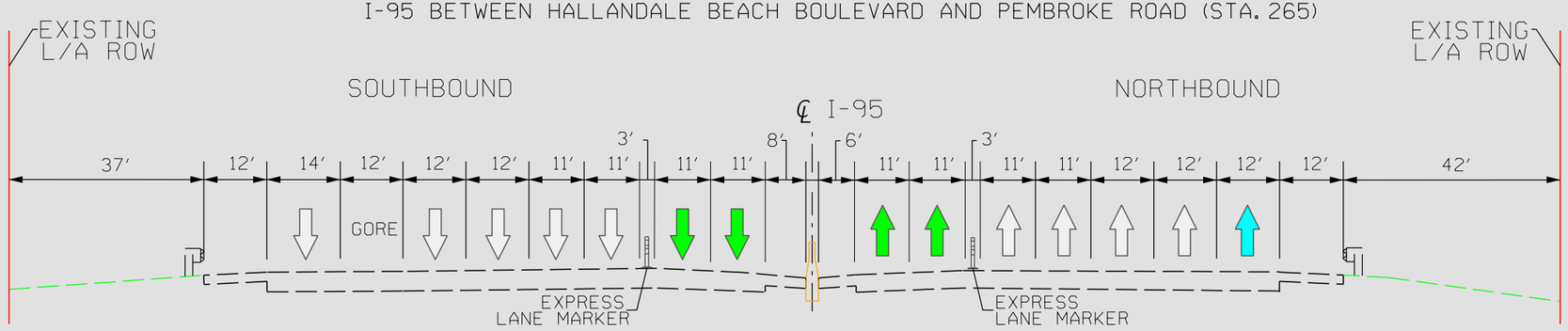
PROPOSED ROADWAY SECTION A

I-95 BETWEEN IVES DAIRY ROAD AND HALLANDALE BEACH BOULEVARD (STA. 214)



EXISTING ROADWAY SECTION B

I-95 BETWEEN HALLANDALE BEACH BOULEVARD AND PEMBROKE ROAD (STA. 265)



PROPOSED ROADWAY SECTION B (INTERIM PROJECT)

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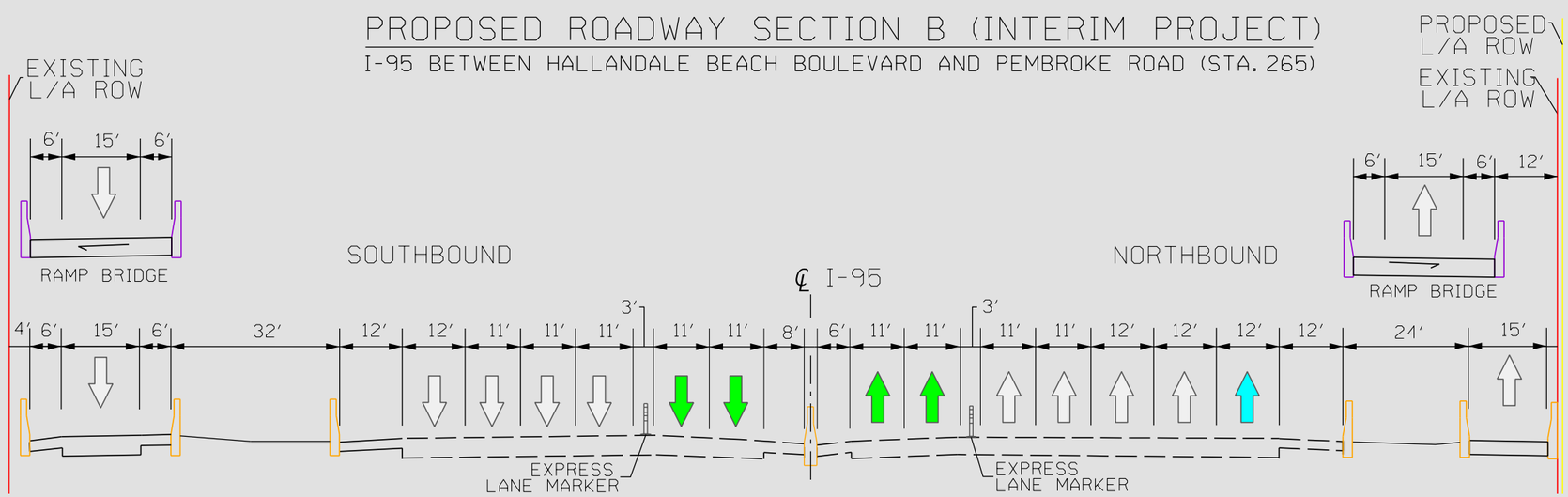
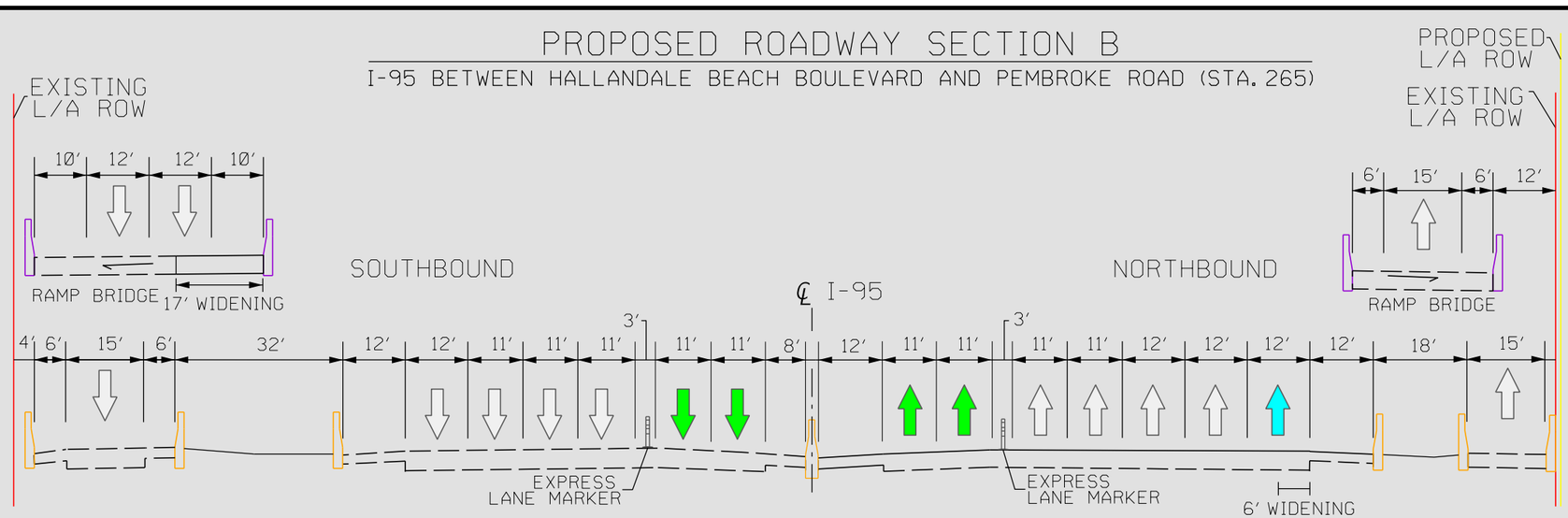


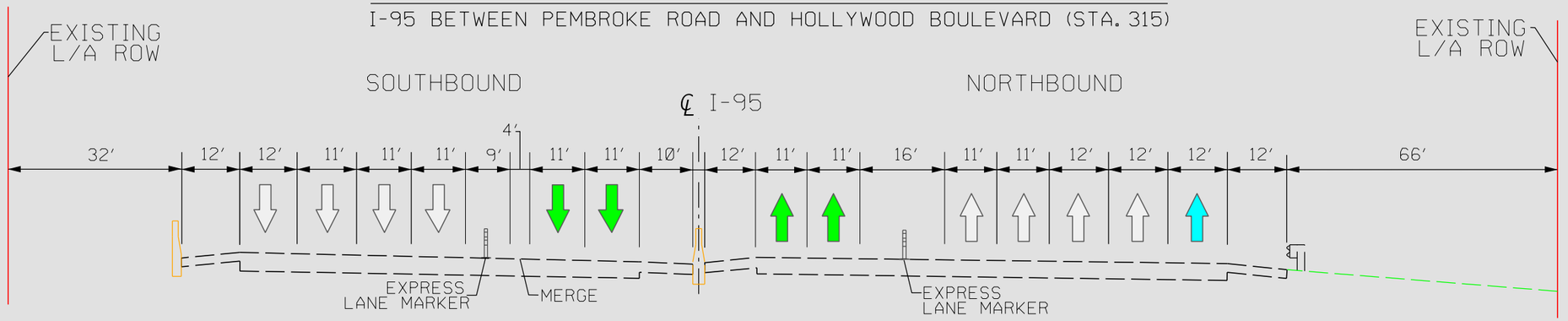
PROPOSED ROADWAY SECTION B

I-95 BETWEEN HALLANDALE BEACH BOULEVARD AND PEMBROKE ROAD (STA. 265)



EXISTING ROADWAY SECTION C

I-95 BETWEEN PEMBROKE ROAD AND HOLLYWOOD BOULEVARD (STA. 315)



PROPOSED ROADWAY SECTION C (INTERIM PROJECT)

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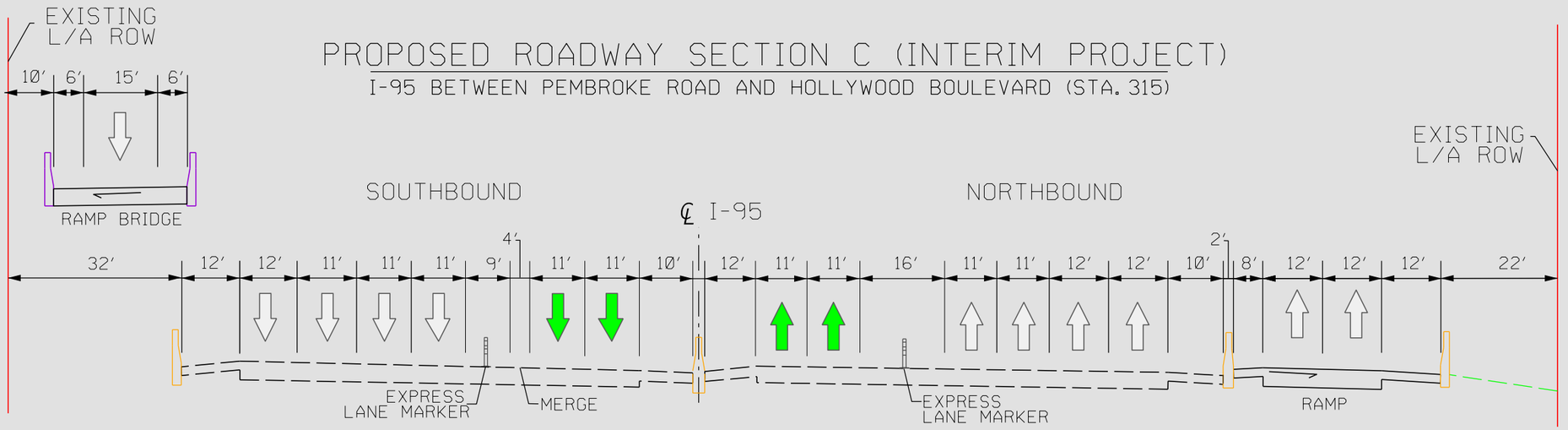
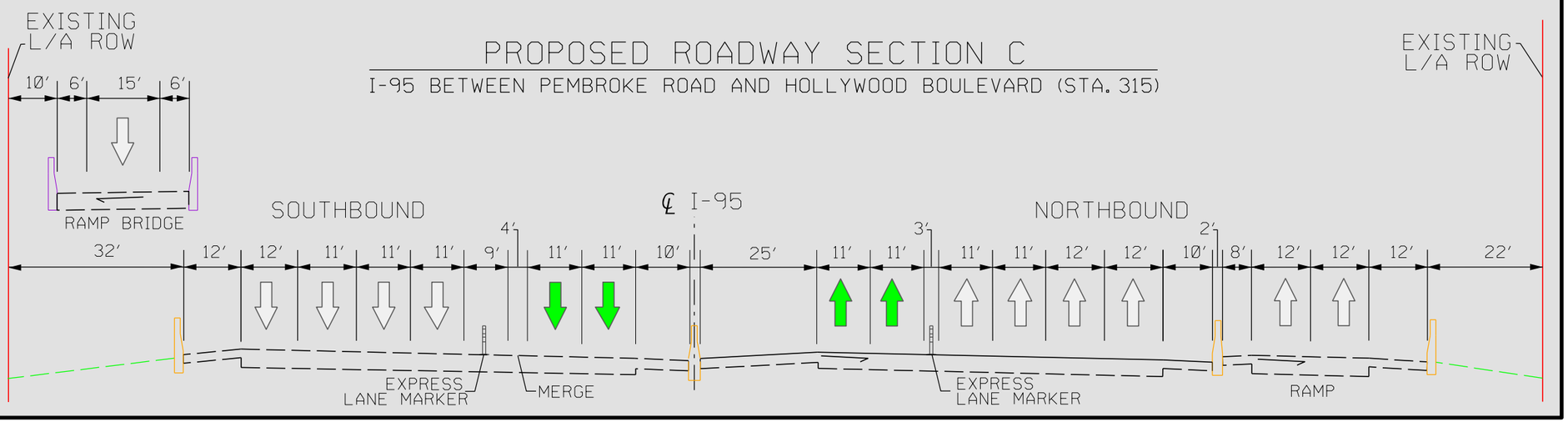


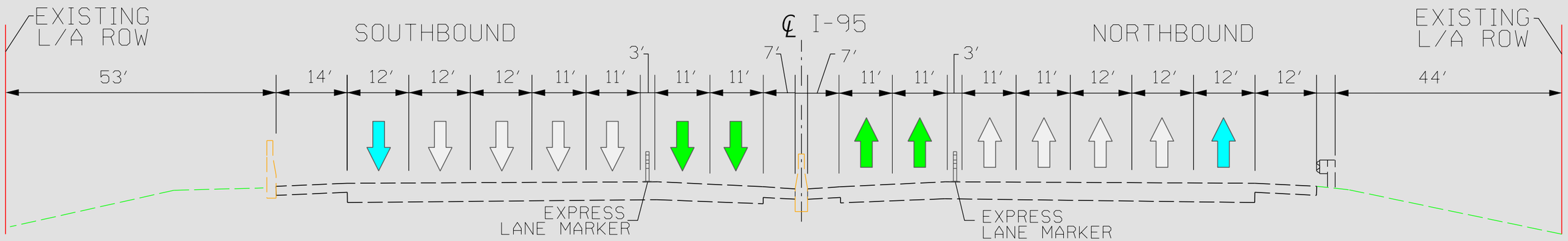
PROPOSED ROADWAY SECTION C

I-95 BETWEEN PEMBROKE ROAD AND HOLLYWOOD BOULEVARD (STA. 315)



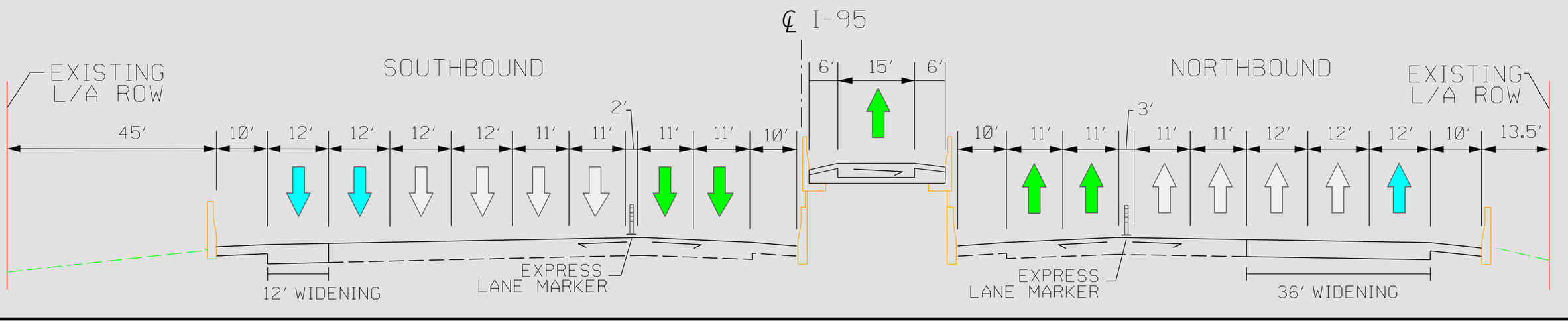
EXISTING ROADWAY SECTION D

I-95 BETWEEN HOLLYWOOD BOULEVARD AND SHERIDAN STREET (STA. 378)



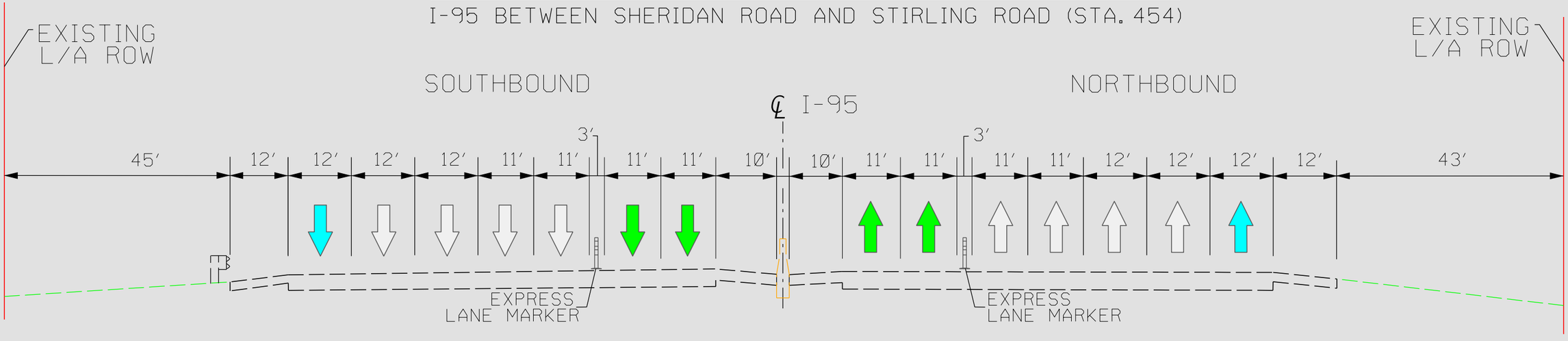
PROPOSED ROADWAY SECTION D

I-95 BETWEEN HOLLYWOOD BOULEVARD AND SHERIDAN STREET (STA. 378)



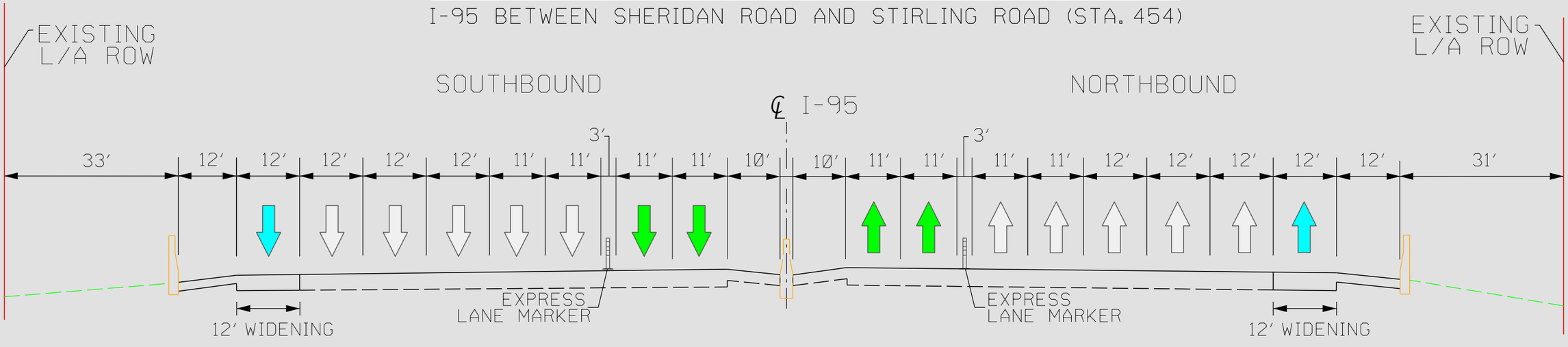
EXISTING ROADWAY SECTION E

I-95 BETWEEN SHERIDAN ROAD AND STIRLING ROAD (STA. 454)



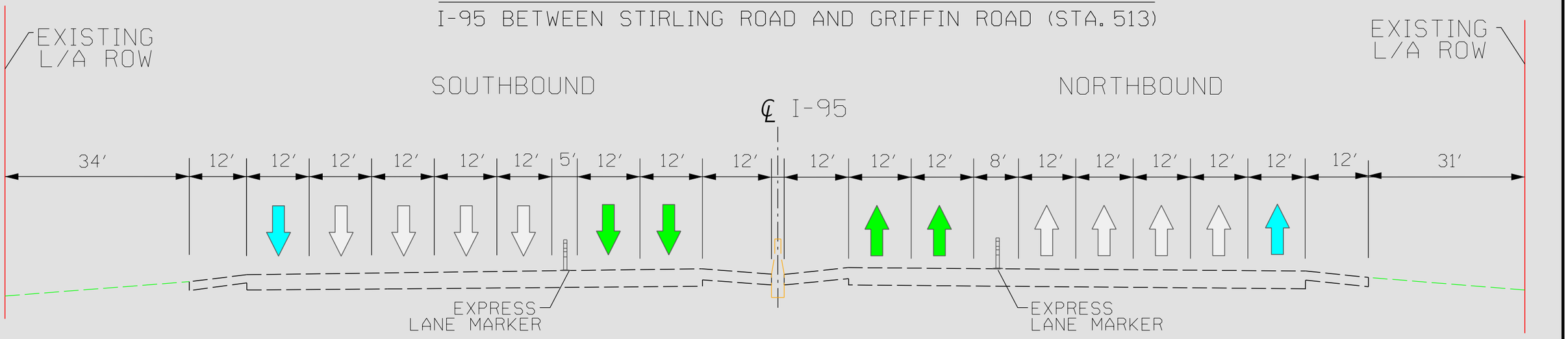
PROPOSED ROADWAY SECTION E

I-95 BETWEEN SHERIDAN ROAD AND STIRLING ROAD (STA. 454)



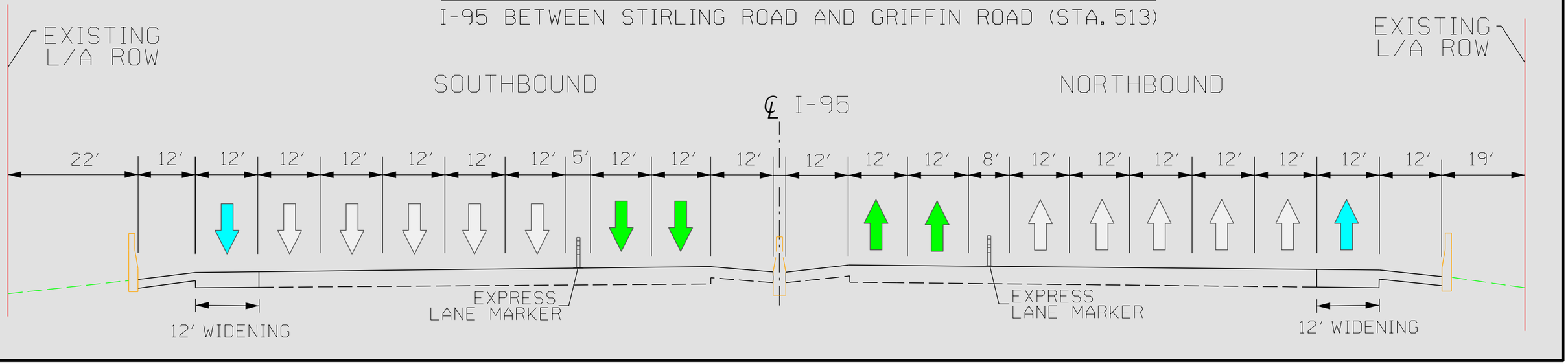
EXISTING ROADWAY SECTION F

I-95 BETWEEN STIRLING ROAD AND GRIFFIN ROAD (STA. 513)



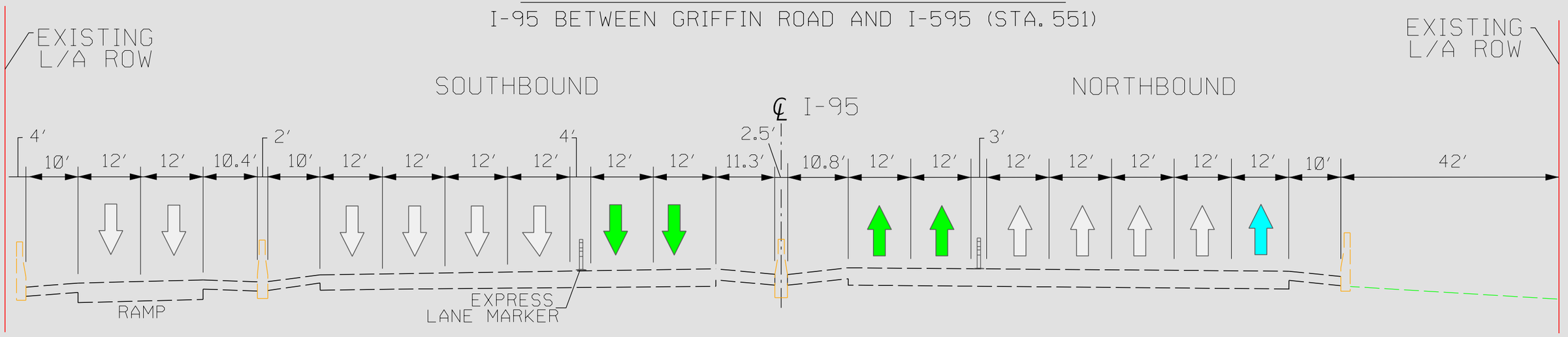
PROPOSED ROADWAY SECTION F

I-95 BETWEEN STIRLING ROAD AND GRIFFIN ROAD (STA. 513)



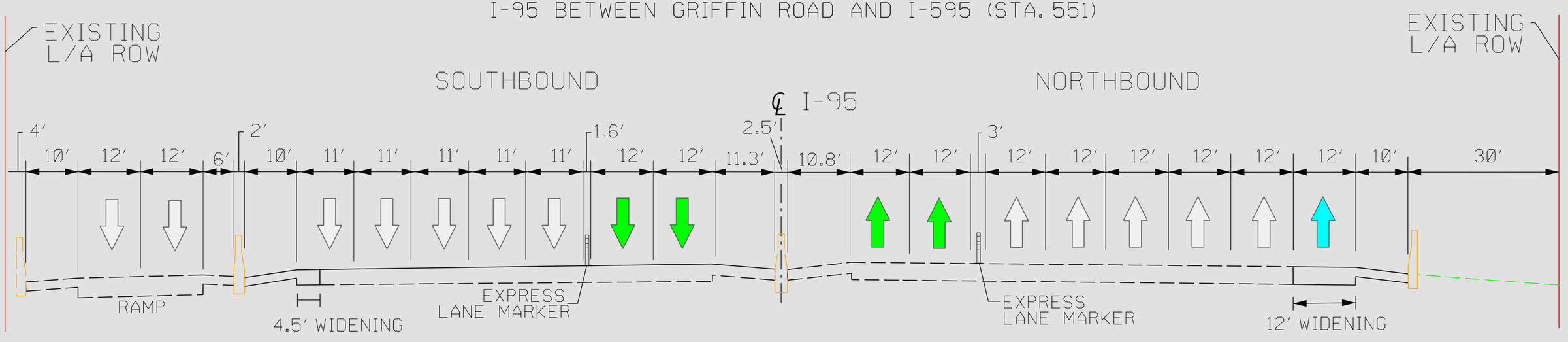
EXISTING ROADWAY SECTION G

I-95 BETWEEN GRIFFIN ROAD AND I-595 (STA. 551)

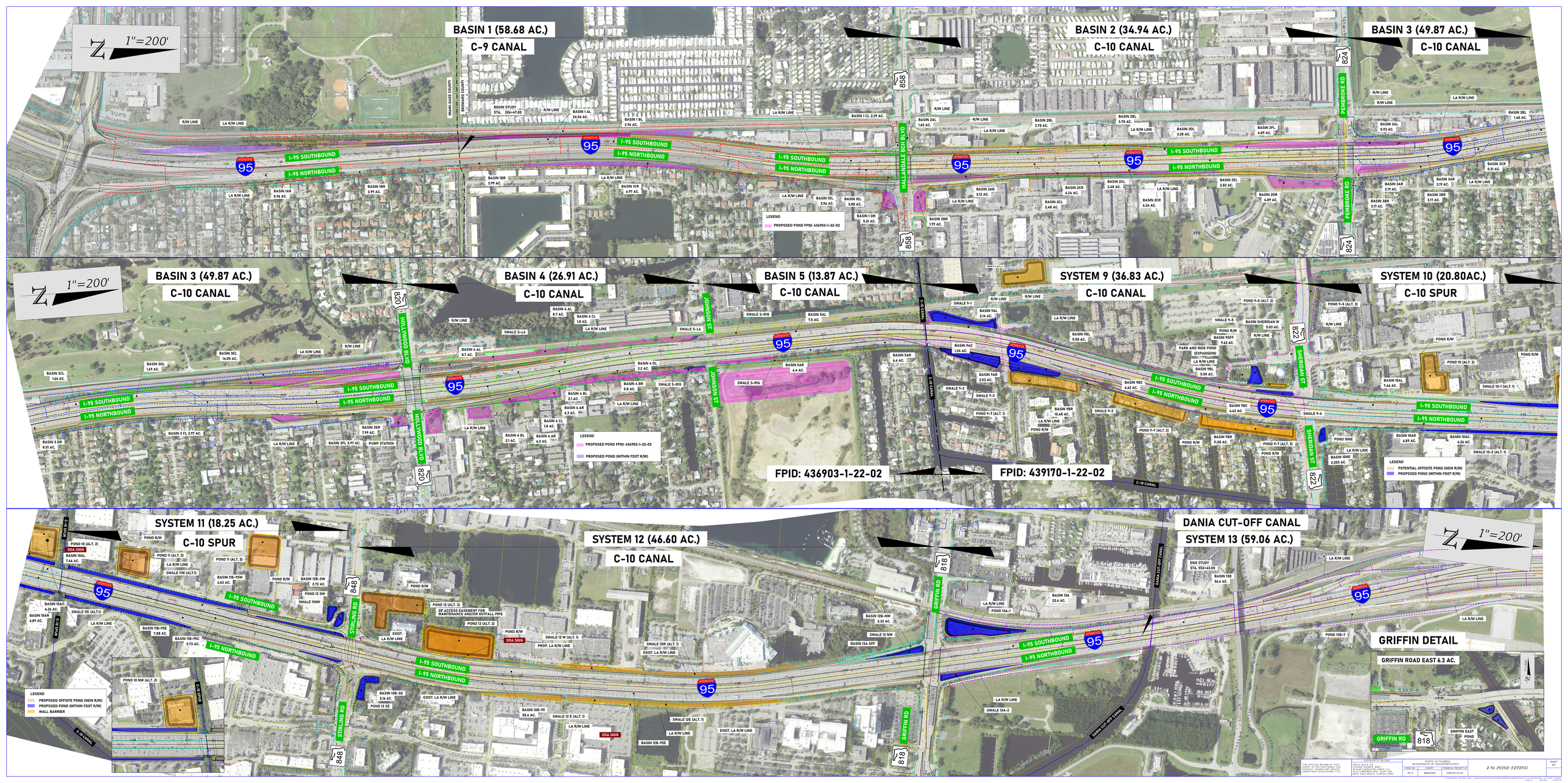


PROPOSED ROADWAY SECTION G

I-95 BETWEEN GRIFFIN ROAD AND I-595 (STA. 551)



Appendix C
Drainage Maps


1"=200'
BASIN 1 (58.68 AC.)
C-9 CANAL
BASIN 2 (34.94 AC.)
C-10 CANAL
BASIN 3 (49.87 AC.)
C-10 CANAL
BASIN 3 (49.87 AC.)
C-10 CANAL
BASIN 4 (26.91 AC.)
C-10 CANAL
BASIN 5 (13.87 AC.)
C-10 CANAL
SYSTEM 9 (36.83 AC.)
C-10 CANAL
SYSTEM 10 (20.80AC.)
C-10 SPUR
SYSTEM 11 (18.25 AC.)
C-10 SPUR
SYSTEM 12 (46.60 AC.)
C-10 CANAL
DANIA CUT-OFF CANAL
SYSTEM 13 (59.06 AC.)
GRIFFIN DETAIL
GRIFFIN ROAD EAST 6.3 AC.
I-95 SOUTHBOUND
I-95 NORTHBOUND
HALLANDALE BCH BLVD
PEMBROKE RD
HOLLYWOOD BLVD
JOHNSON ST
SHERIDAN ST
STIRLING RD
GRIFFIN RD
FPID: 436903-1-22-02
FPID: 439170-1-22-02
LEGEND
PROPOSED POND FPID: 436903-1-22-02
PROPOSED POND (WITHIN FDOT R/W)
POTENTIAL OFFSITE POND (NEW R/W)
WALL BARRIER
I-95 POND SITING



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

DENYS AVILA, P.E.
LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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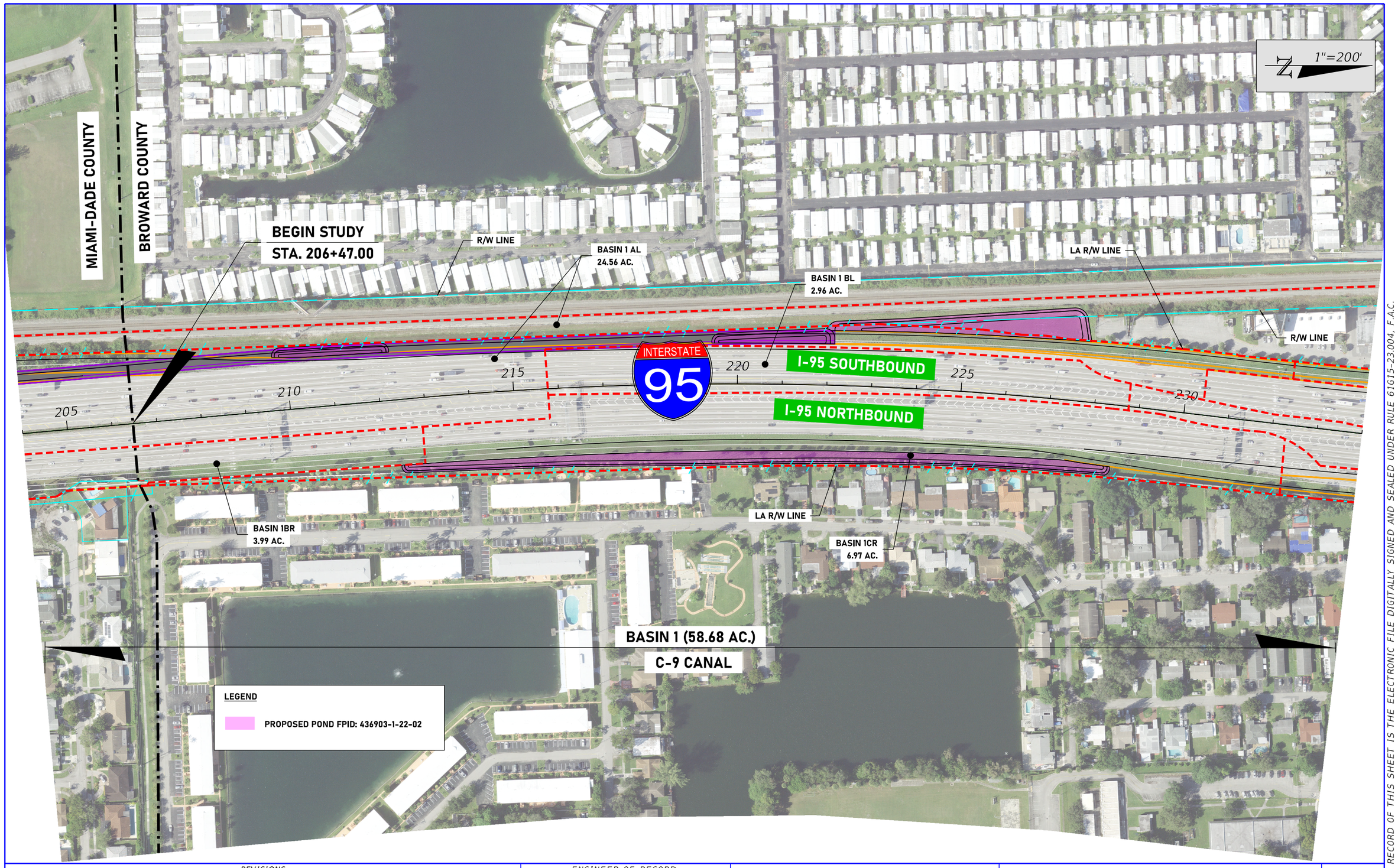

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ENGINEER OF RECORD

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LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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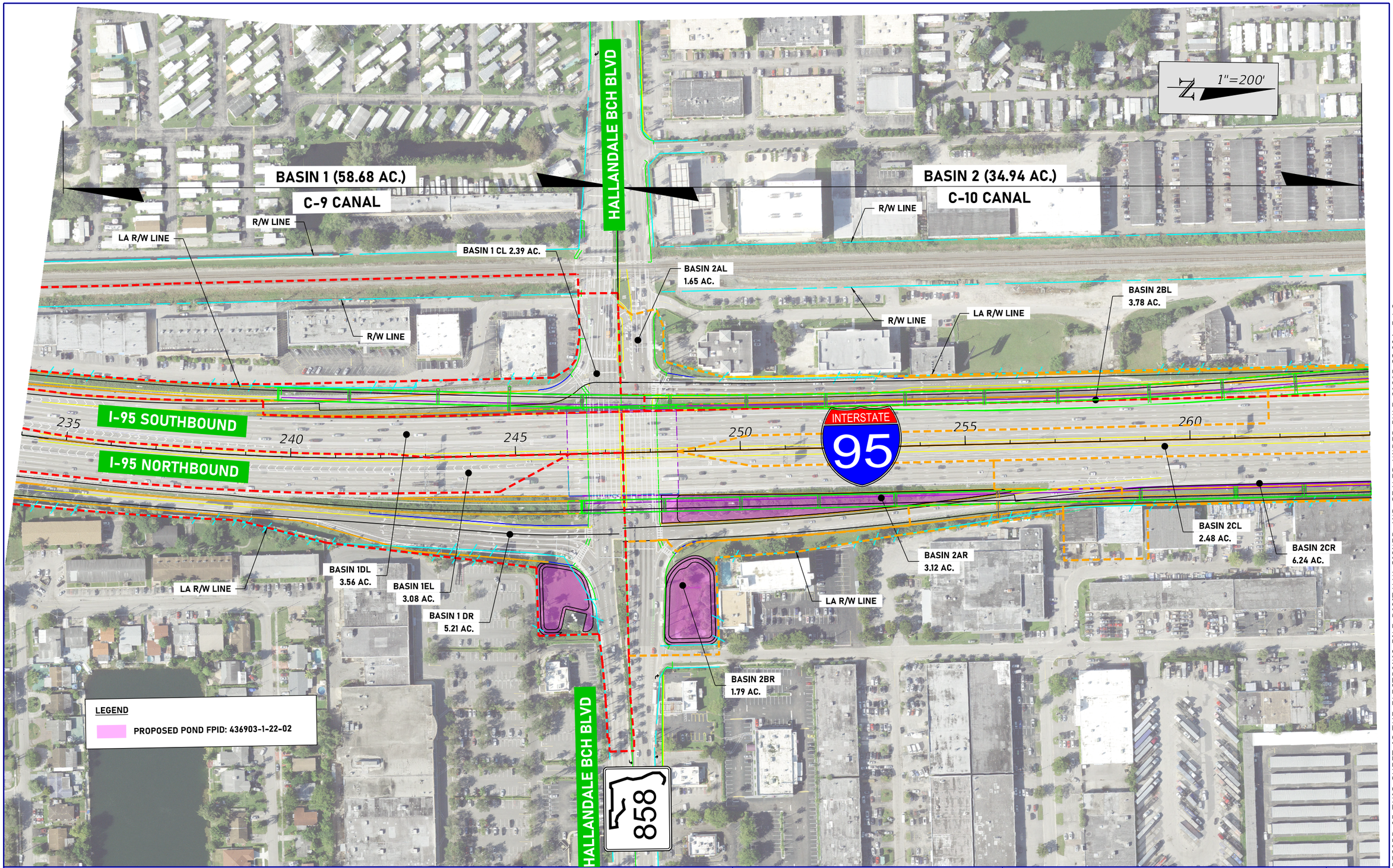

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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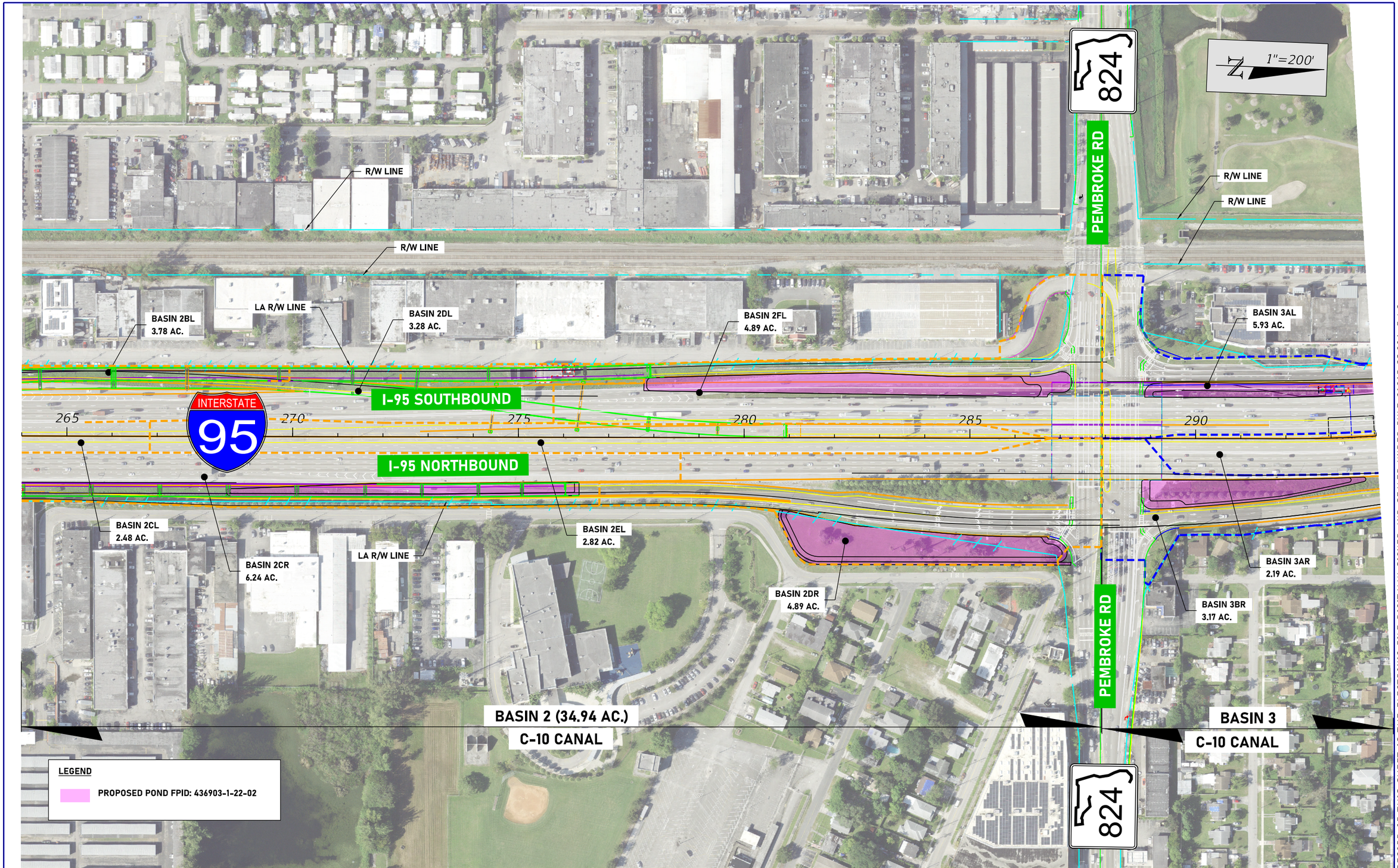

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

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WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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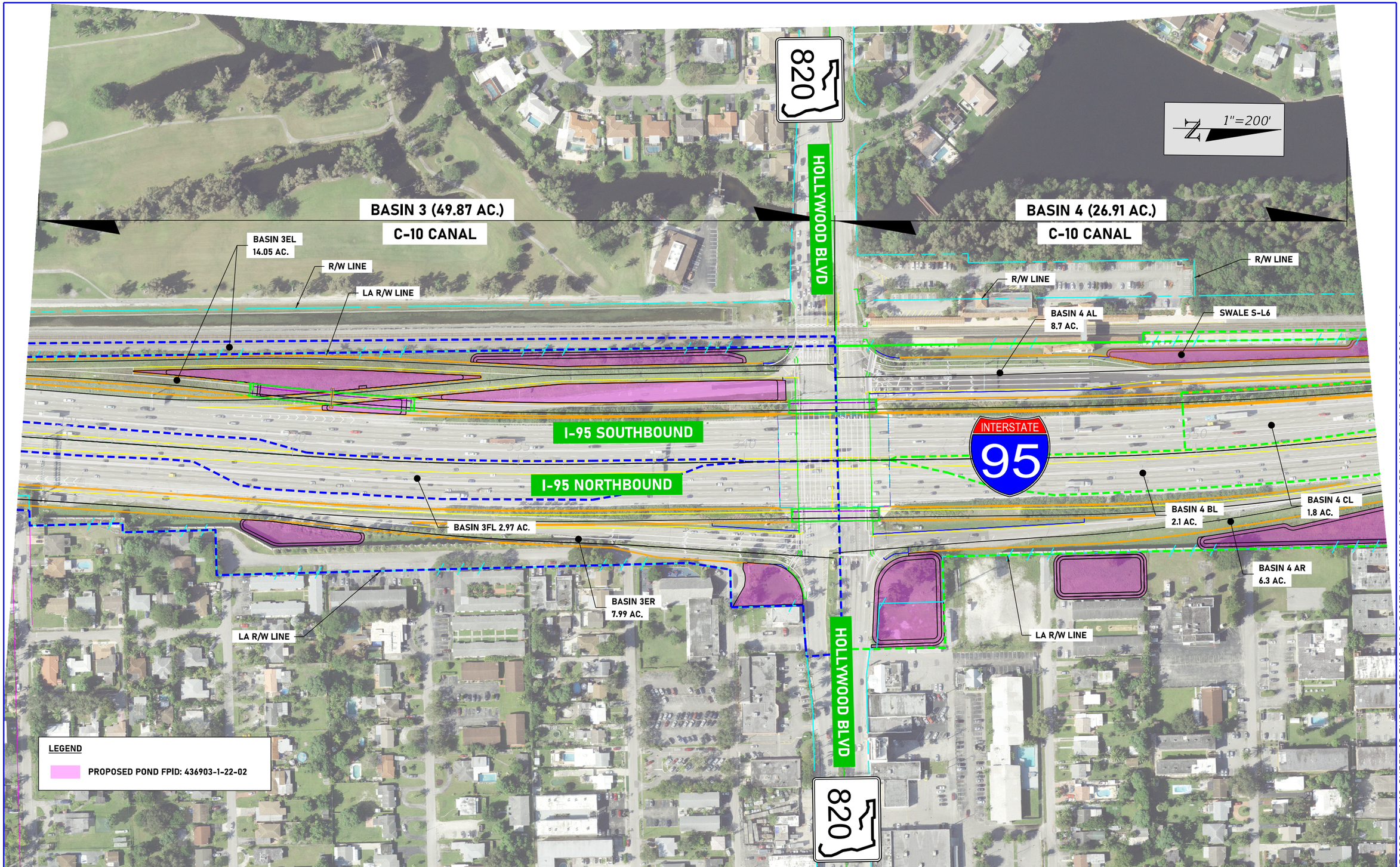

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	DENYS AVILA, P.E. LICENSE NUMBER: 90871 SCALAR CONSULTING GROUP, LLC 5713 CORPORATE WAY, SUITE 200 WEST PALM BEACH, FLORIDA 33407	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	POST-DEVELOPMENT DRAINAGE MAP	
					SR 9	BROWARD	439170-1-22-02		

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C-10 CANAL

1"=200'

BASIN 4 (26.91 AC.)

C-10 CANAL

BASIN 5 (13.87 AC.)

C-10 CANAL

JOHNSON ST

LA R/W LINE

R/W LINE

BASIN 4 AL
8.7 AC.

SWALE S-L6

SWALE S-R18

BASIN 5AL
7.5 AC.

355

360

365

370

375

INTERSTATE
95

380

BASIN 4 CL
1.8 AC.

BASIN 4 DL
2.2 AC.

BASIN 4 BL
2.1 AC.

BASIN 4 BR
5.8 AC.

SWALE S-R15

JOHNSON ST

BASIN 5AR
6.4 AC.

SWALE S-R16

BASIN 4 AR
6.3 AC.

LA R/W LINE

LEGEND

- PROPOSED POND FPID: 436903-1-22-02
- PROPOSED POND (WITHIN FDOT R/W)
- POTENTIAL OFFSITE POND (NEW R/W)

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

DENYS AVILA, P.E.
LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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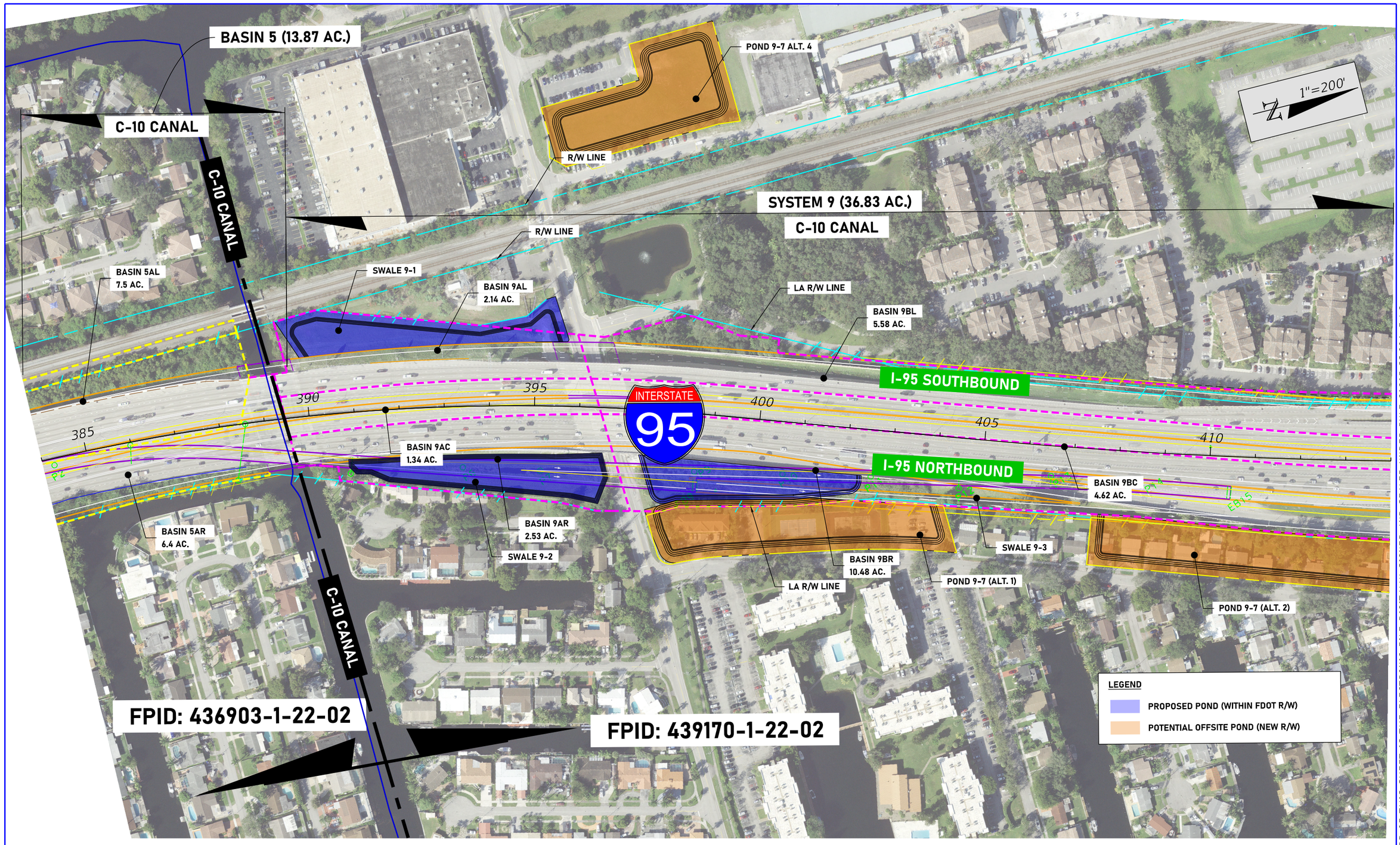

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

DENYS AVILA, P.E.
LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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

P:\FL23013.00 I-95 PD&E Study - Broward\43917012202\Drainage\DRMPRD_PlanBasinsProp11x17_01.dgn : CL - PLAN 7 [SHEET]
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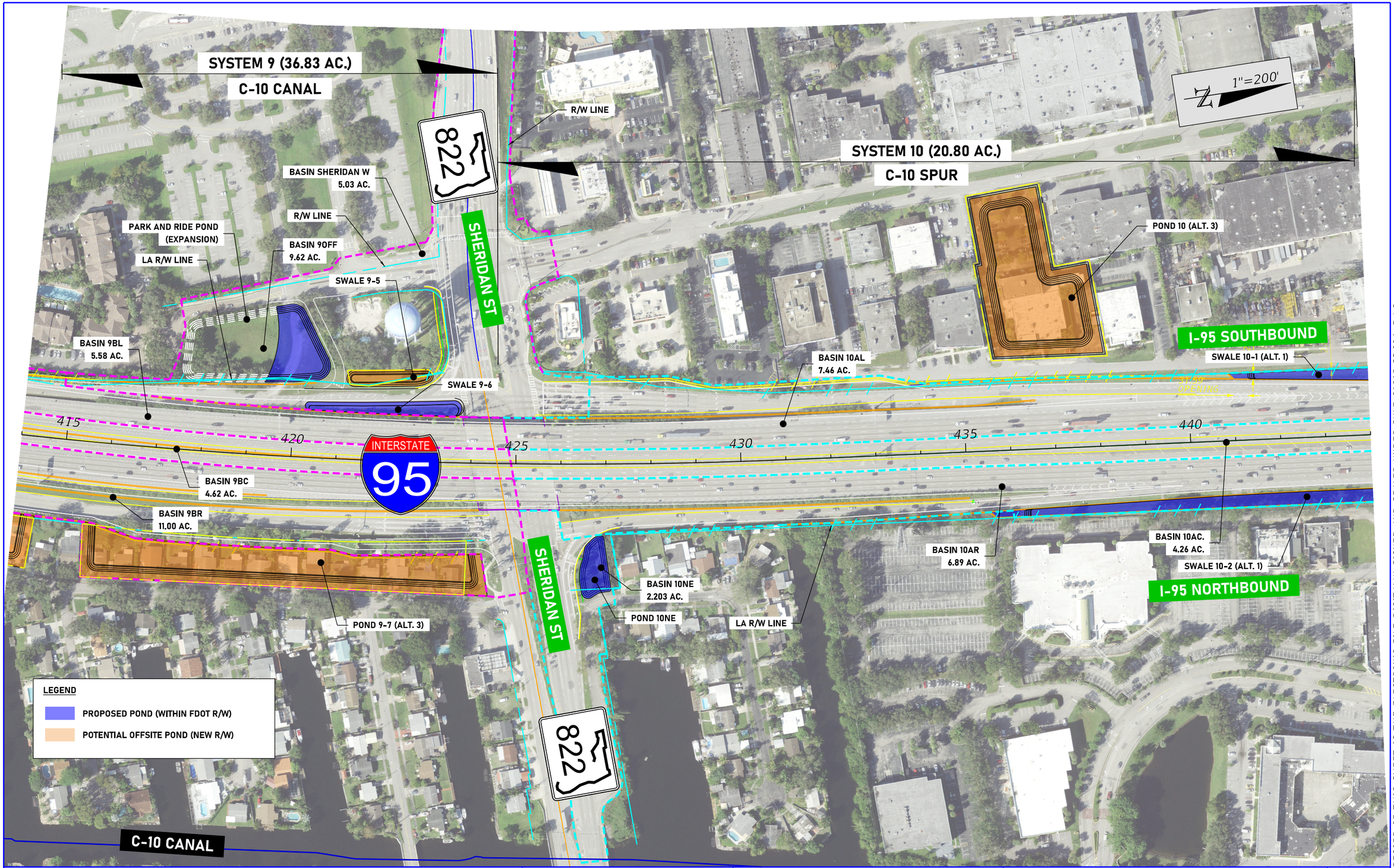

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEVELOPMENT DRAINAGE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	DENYS AVILA, P.E. LICENSE NUMBER: 90871 SCALAR CONSULTING GROUP, LLC 5713 CORPORATE WAY, SUITE 200 WEST PALM BEACH, FLORIDA 33407	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 9	BROWARD	439170-1-22-02		

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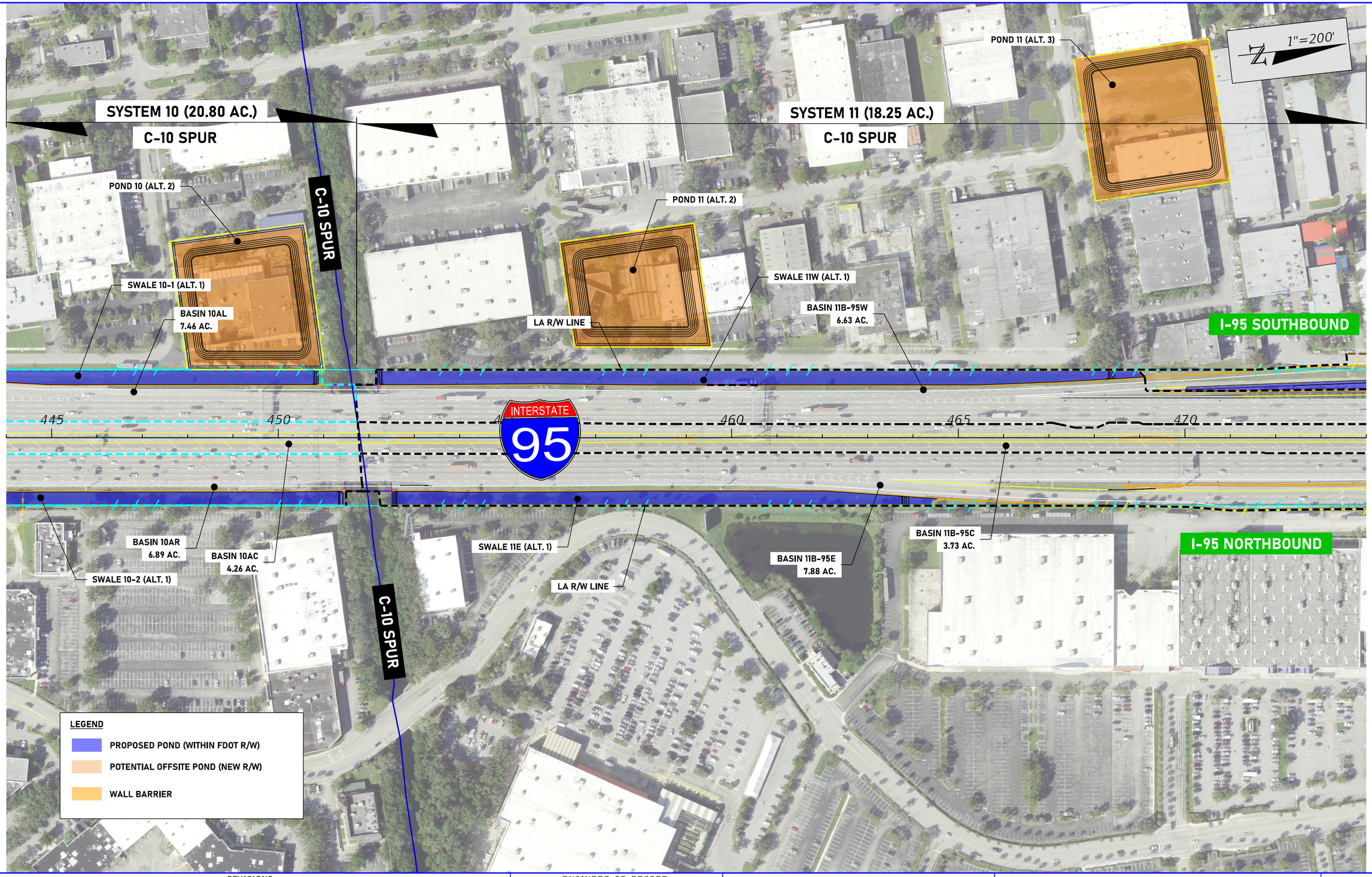

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

DENYS AVILA, P.E.
LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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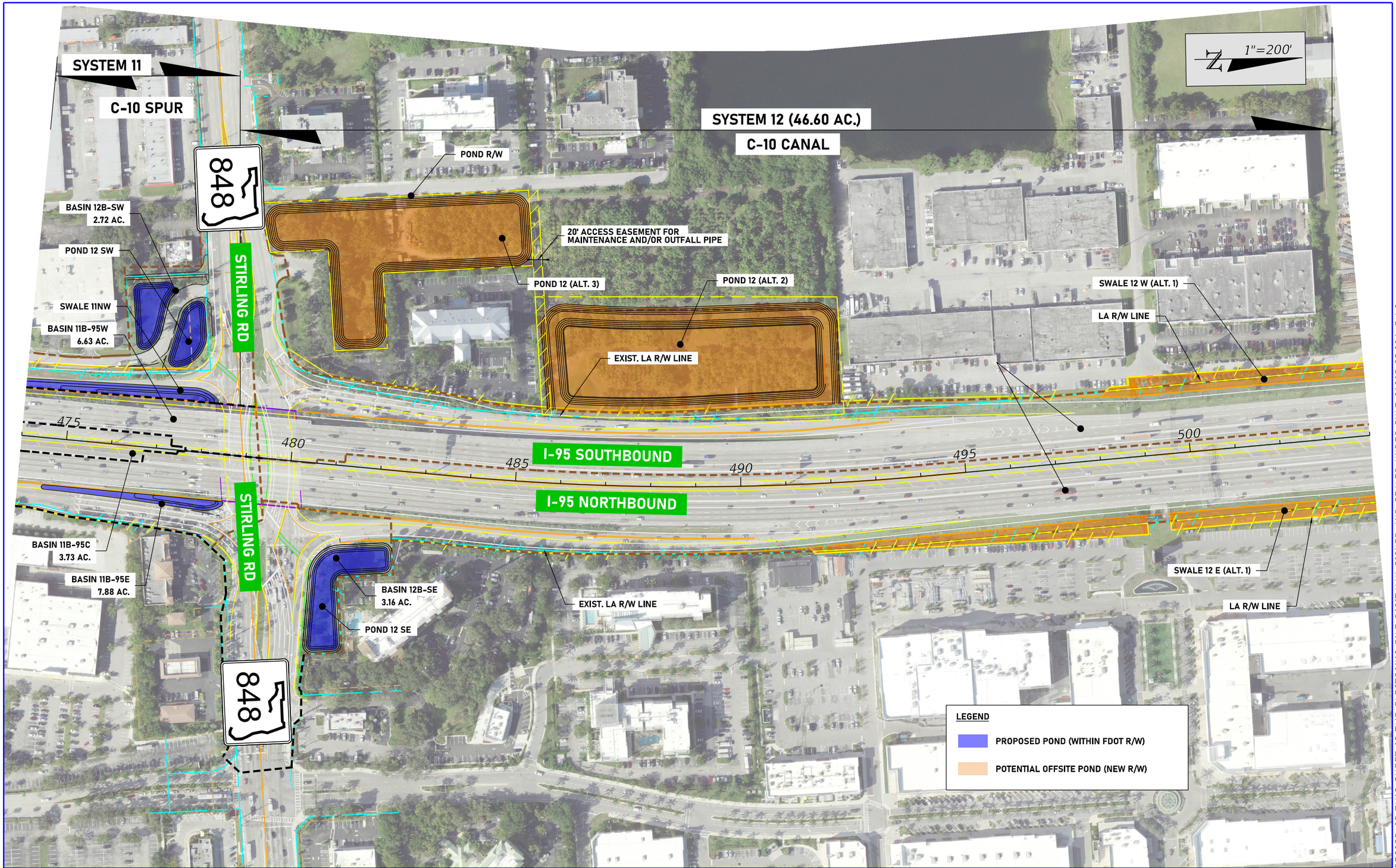

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

DENYS AVILA, P.E.
LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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1"=200'

SYSTEM 12 (46.60 AC.)

C-10 CANAL

818

GRIFFIN RD

BASIN 12B-NW
2.32 AC.

SWALE 12 NW

BASIN 13A OFF

SWALE 12W (ALT. 1)

LA R/W LINE

505 510 515 520 525 530

INTERSTATE 95

SWALE 12E (ALT. 1)

EXIST. LA R/W LINE

LA R/W LINE

BASIN 12B-95
38.4 AC.

SWALE 13A-2

GRIFFIN RD

818

LEGEND

PROPOSED POND (WITHIN FDOT R/W)

POTENTIAL OFFSITE POND (NEW R/W)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

DENYS AVILA, P.E.
LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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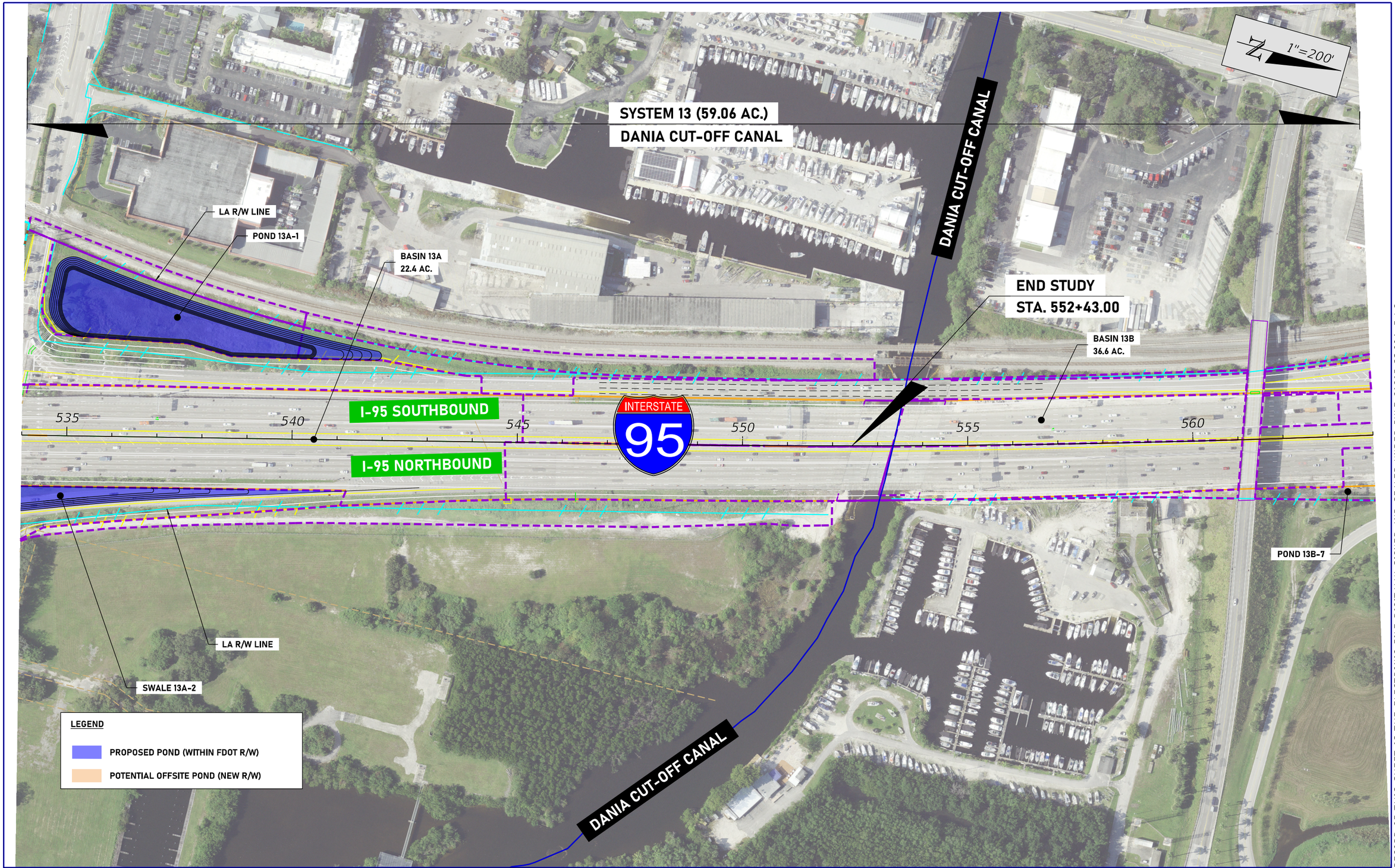

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEVELOPMENT DRAINAGE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	DENYS AVILA, P.E. LICENSE NUMBER: 90871 SCALAR CONSULTING GROUP, LLC 5713 CORPORATE WAY, SUITE 200 WEST PALM BEACH, FLORIDA 33407	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 9	BROWARD	439170-1-22-02		

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

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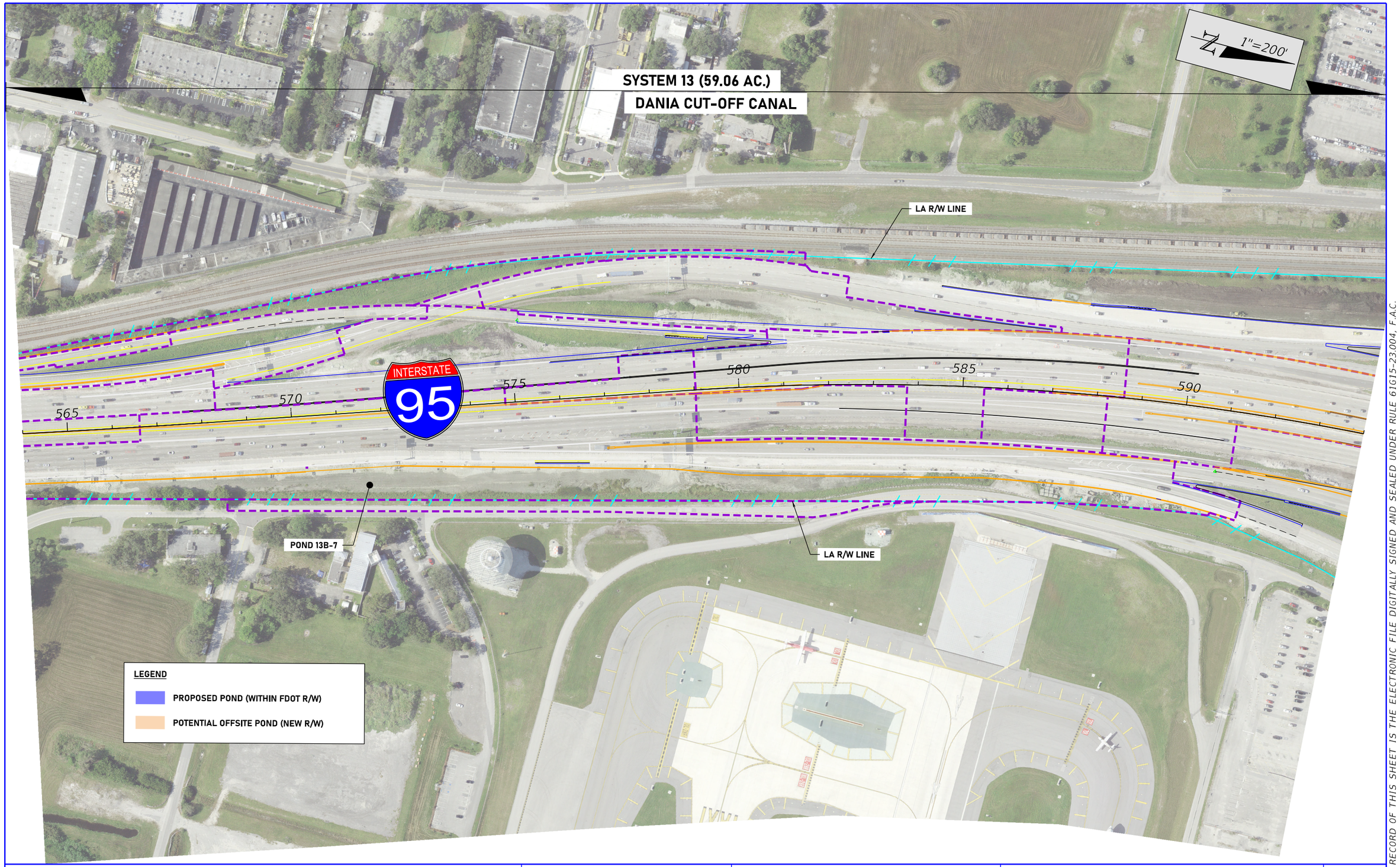

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEVELOPMENT DRAINAGE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	DENYS AVILA, P.E. LICENSE NUMBER: 90871 SCALAR CONSULTING GROUP, LLC 5713 CORPORATE WAY, SUITE 200 WEST PALM BEACH, FLORIDA 33407	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 9	BROWARD	439170-1-22-02		

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

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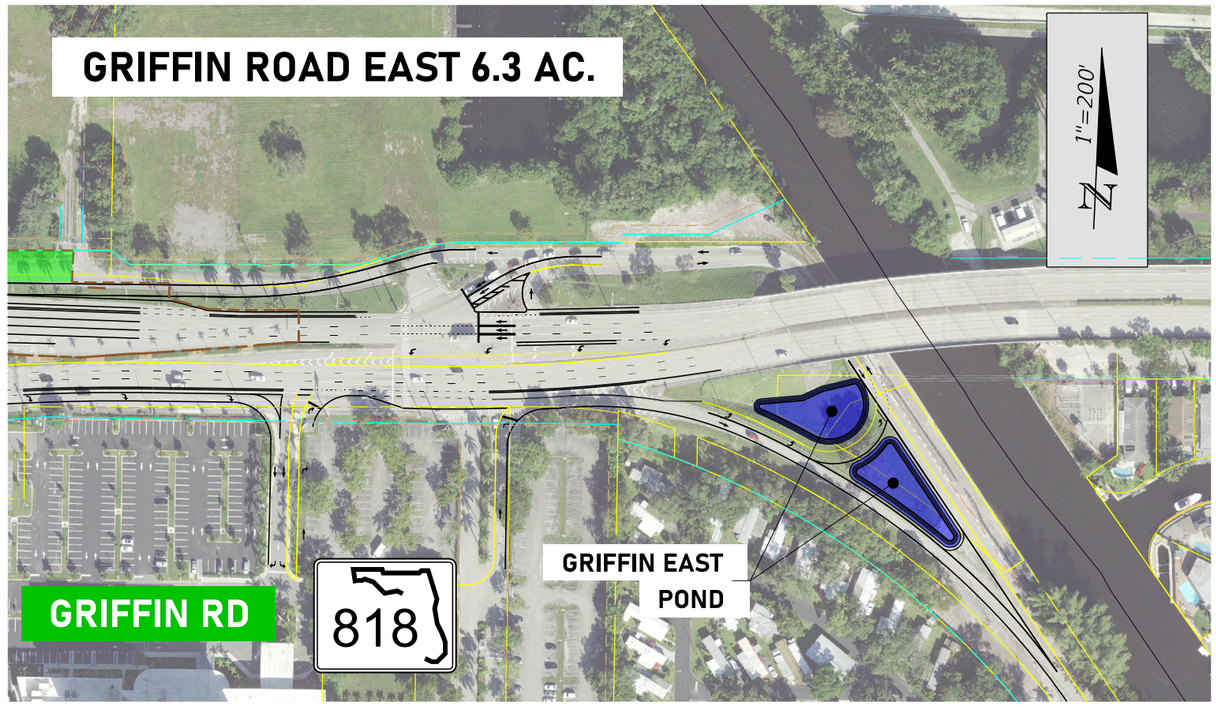

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

DENYS AVILA, P.E.
LICENSE NUMBER: 90871
SCALAR CONSULTING GROUP, LLC
5713 CORPORATE WAY, SUITE 200
WEST PALM BEACH, FLORIDA 33407

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	439170-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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

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Appendix D
Existing Data

Basin 1-5
PD&E Data

IVES ESTATES PARK

BASIN 1

C-9 CANAL

PROJECT LIMIT

SWALE S-L1A

BASIN 1AL
24.56 AC.

BASIN 1AL_OFF
13.66 AC.

R/W LINE

SWALE S-L1B

LA R/W LINE

S1-01 S1-02 S1-03 S1-04 S1-05 S1-06 S1-07 S1-08 S1-09 S1-10 S1-11 S1-12 S1-13 S1-14 S1-15 S1-16 S1-17 S1-19 S1-20 S1-21 S1-22 S1-23 S1-24 S1-25 S1-26 S1-27 S1-28 S1-29 S1-30 S1-31 S1-32 S1-33 S1-34 S1-35 S1-36 S1-37 S1-38 S1-39 S1-40 S1-41 S1-42 S1-43 S1-44 S1-45 S1-46 S1-47 S1-49 S1-50 S1-51 S1-52 S1-53

170 175 180 185 190 195

INTERSTATE 95

I-95 SOUTHBOUND

I-95 NORTHBOUND

IVES DAIRY RD

NE 206TH ST

NE 210TH ST

BASIN 1AR
5.96 AC.

SWALE S-R1A

SWALE S-R1A-1

FD1_1R

FD1_2R

MATCHLINE "A" (SEE SHEET 2)

0 50 200
Feet

LEGEND

BASIN 1 BOUNDARY

SX-XX PROPOSED STRUCTURE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	436903-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 1

IVES ESTATES PARK

BASIN 1

C-9 CANAL

SWALE S-L1D

SWALE S-L1C

BASIN 1BL
2.96 AC.

BASIN 1AL_OFF
13.66 AC.

R/W LINE

BASIN 1AL
24.56 AC.

S1-56 S1-57 S1-60 S1-64 S1-63 S1-66 S1-70 S1-71 S1-73 S1-74 S1-76 S1-80 S1-79 S1-82

LA R/W LINE

I-95 SOUTHBOUND

I-95 NORTHBOUND

INTERSTATE 95

200 205 210 215 220

N 5° 12' 56" W

S1-54 S1-55 S1-59 S1-58 S1-61 S1-62 S1-65 S1-67 S1-68 S1-69 S1-72 S1-75 S1-77 S1-78 S1-81

LA R/W LINE

BASIN 1CR
6.97 AC.

SWALE S-R1

BASIN 1BR
3.99 AC.

MIAMI DADE COUNTY

BROWARD COUNTY

SW 8TH ST

SW 11TH ST

FD1_3R

MATCHLINE "A" (SEE SHEET 1)

MATCHLINE "B" (SEE SHEET 3)

0 50 200
Feet

LEGEND

BASIN 1 BOUNDARY

SX-XX PROPOSED STRUCTURE

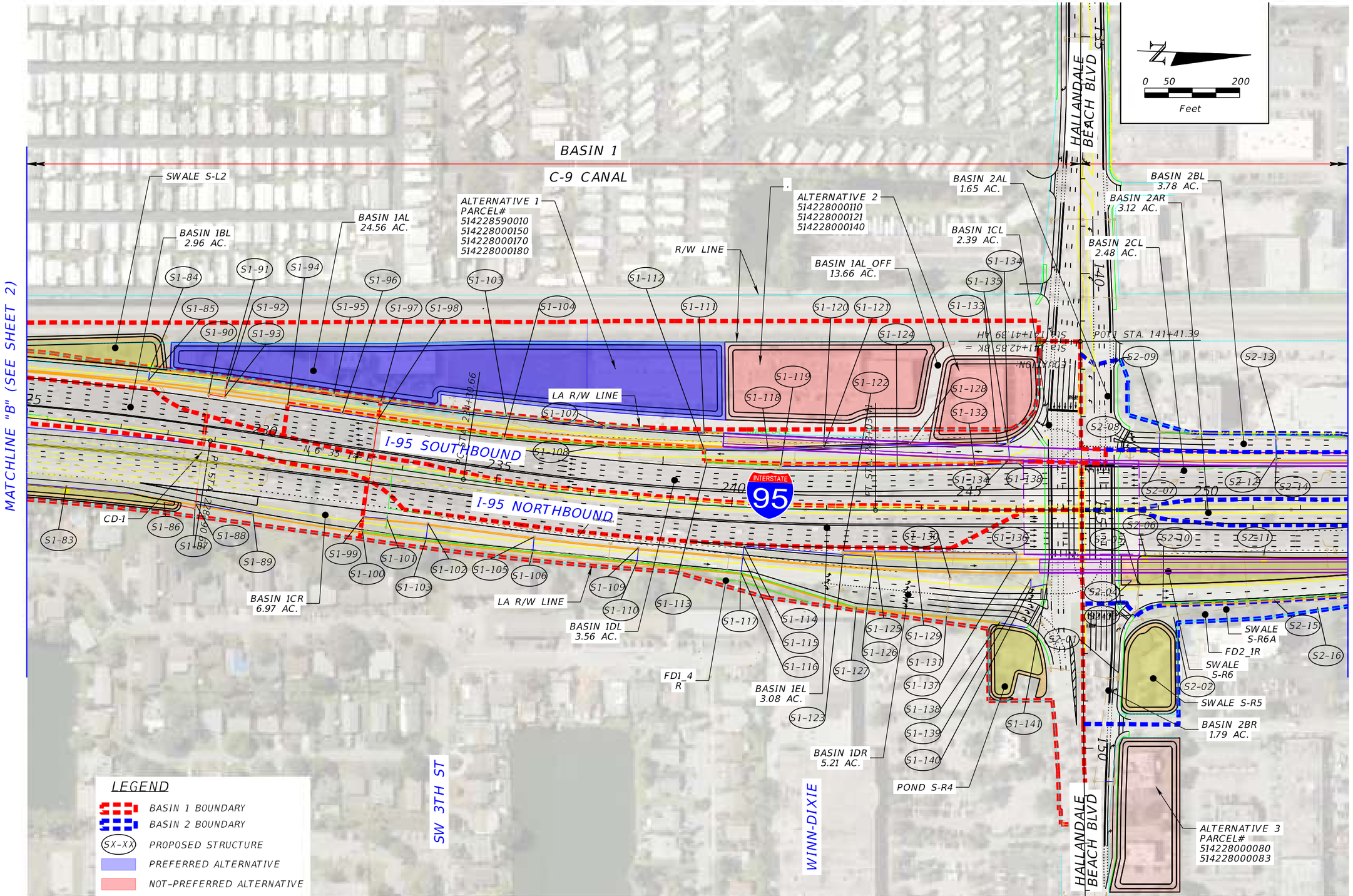
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	436903-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 2



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	436903-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 3

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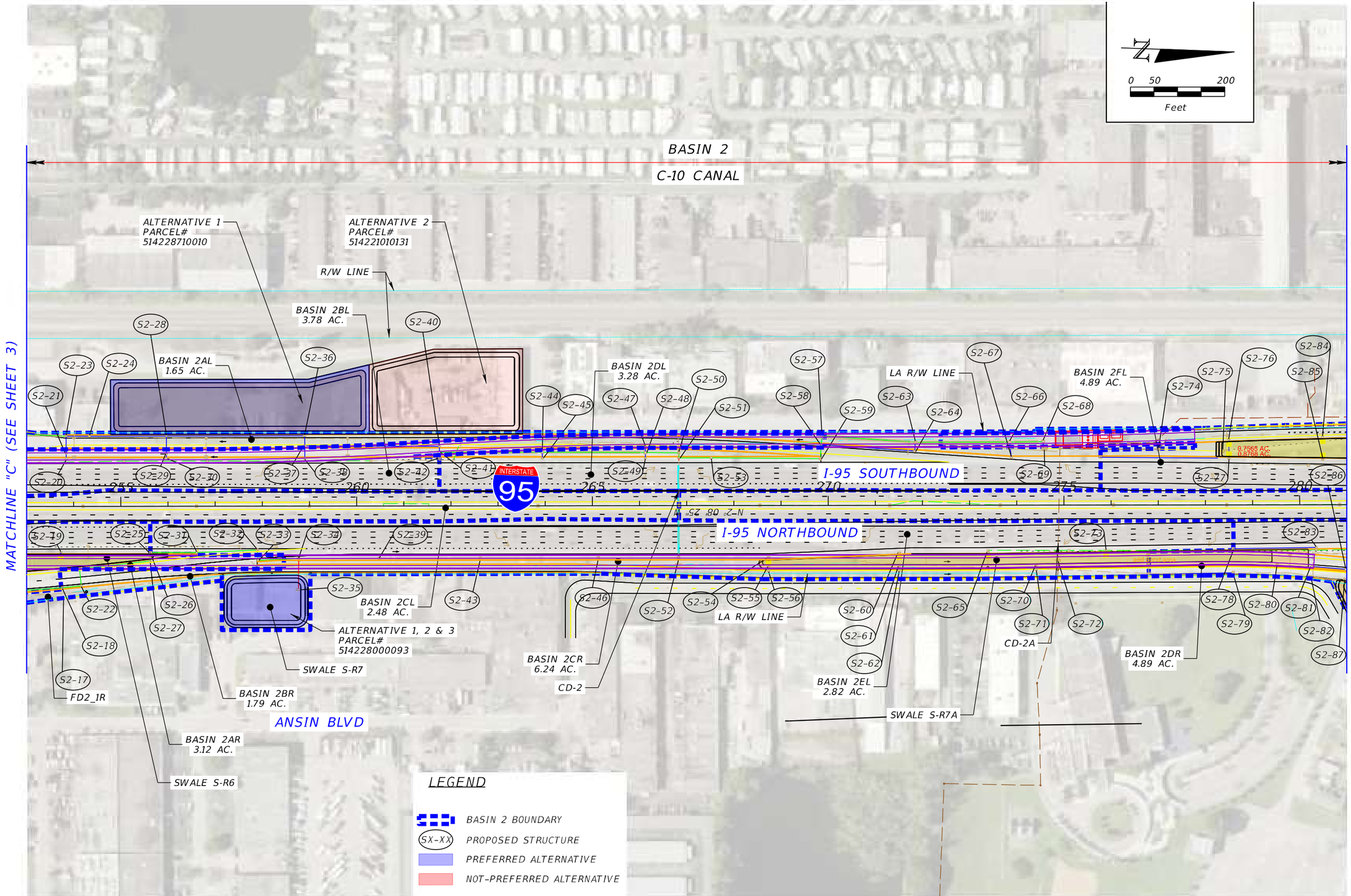

REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEVELOPMENT DRAINAGE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
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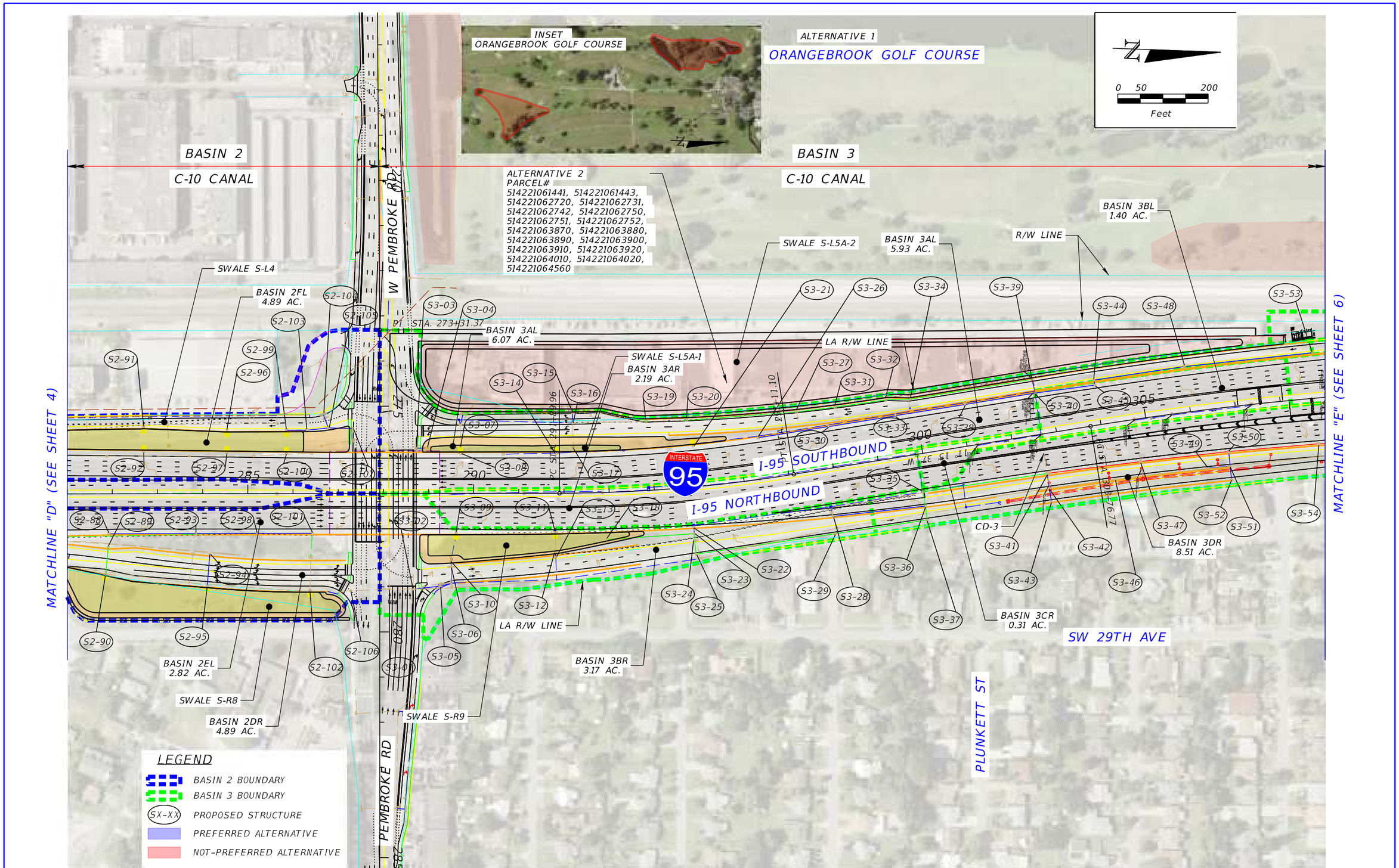

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	436903-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 5

ISHAIKH 1/3/2025 3:06:55 PM DRMPRD05 PW:\

ORANGEBROOK GOLF COURSE

BASIN 3

C-10 CANAL

0 50 200
Feet

MATCHLINE "E" (SEE SHEET 5)

MATCHLINE "F" (SEE SHEET 7)

SWALE S-L5C

SWALE S-L5E

SWALE S-L5A-2

SWALE S-L5B

BASIN 3CL
1.66 AC.

BASIN 3DL
1.69 AC.

BASIN 3EL_OFF
2.38 AC.

BASIN 3EL
14.05 AC.

BASIN 3FL
2.97 AC.

R/W LINE

LA R/W LINE

S3-55 S3-56 S3-57 S3-58 S3-59 S3-60 S3-61 S3-62 S3-63 S3-64 S3-65 S3-66 S3-67 S3-68 S3-69 S3-70 S3-71 S3-72 S3-73 S3-74 S3-75 S3-76 S3-77 S3-78 S3-79 S3-80 S3-89 S3-90 S3-91 S3-92 S3-93 S3-94 S3-95 S3-96 S3-97 S3-98 S3-99 S3-100 S3-101 S3-102 S3-103 S3-104 S3-105 S3-106 S3-107 S3-108 S3-109 S3-110 S3-111 S3-112 S3-113 S3-114 S3-115 S3-116 S3-117 S3-118 S3-119 S3-120 S3-03

310 315 320 325 330 335

INTERSTATE 95

I-95 NORTHBOUND

I-95 SOUTHBOUND

N 73° 14' 00" E

CD-4

CD-5

BASIN 3DR
8.51 AC.

BASIN 3ER
7.99 AC.

SWALE S-R10

SW 29TH AVE

MONROE ST

LEGEND

- BASIN 3 BOUNDARY
- SX-XX PROPOSED STRUCTURE
- PREFERRED ALTERNATIVE
- NOT-PREFERRED ALTERNATIVE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	436903-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 6

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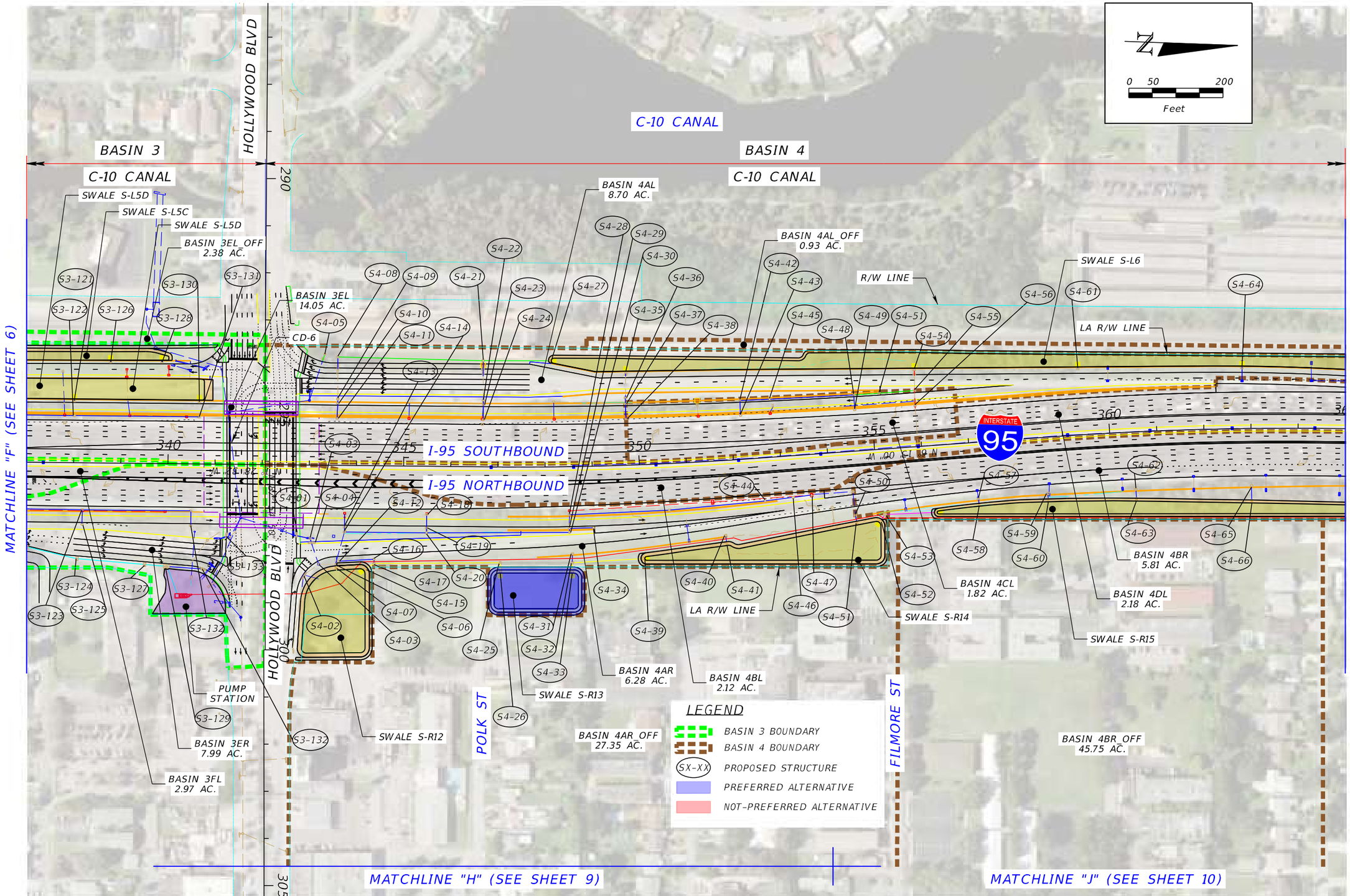

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	436903-1-22-02

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 7

C-10 CANAL

C-10 CANAL

0 50 200
Feet

BASIN 4

BASIN 5

C-10 CANAL

C-10 CANAL

SWALE S-L6

BASIN 4AL
8.70 AC.

S4-70

BASIN 4AL_OFF
0.93 AC.

S5-02

BASIN 5AL_OFF
1.06 AC.

S5-06

PROJECT LIMIT

R/W LINE

BASIN 5AL
7.91 AC.

S4-69

S4-72

S5-03

S5-07

S5-08

LA R/W LINE

I-95 SOUTHBOUND

370

375

380

385

390

N 1° 32' 30" W

INTERSTATE 95

I-95 NORTHBOUND

S5-05

STA. 382+08.71

S4-67

S4-68

S4-71

S4-73

BASIN 4BR
5.81 AC.

LA R/W LINE

S5-10

BASIN 5AR
6.36 AC.

SWALE
S-R15

S5-01

S5-04

S5-09

JOHNSON ST

SWALE
S-R16

POND
S-R17

ALTERNATIVE 2
PARCEL#
514209000200

CLEVELAND ST

BASIN 4CR_OFF
32.16 AC.

SUNSET GOLF COURSE

FLOOD COMPENSATION SITE
12.76 AC

LEGEND

- BASIN 4 BOUNDARY
- BASIN 5 BOUNDARY
- SX-XX PROPOSED STRUCTURE
- PREFERRED ALTERNATIVE
- NOT-PREFERRED ALTERNATIVE

MATCHLINE "G" (SEE SHEET 7)

MATCHLINE "K" (SEE SHEET 10)

REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEVELOPMENT DRAINAGE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				SR 9	BROWARD	436903-1-22-02		8

TABLE 1. WATER QUALITY/QUANTITY SUMMARY

Basin Area Calculation							Water Quality Calculation Summary	Water Quantity Calculation Summary	Required Storage For Stormwater Management	Storage Calculation Summary					Remarks
Project Basin		Station		Side	Total Area	Impervious Area	Water Quality Treatment Req'd	Net Runoff Increase (Post-Pre)		Available Storage within Exist. R/W (Ac.ft.)	Available Storage in FD (Ac.Ft.)	Additional Storage Needed outside Exist. R/W (Ac.ft.)	Additional Storage Provided outside Exist. R/W (Ac.ft.)	Surplus Storage (Ac.ft.)	Remarks
No.	Name	From	To	LT/RT	(Ac.)	(Ac.)	(Ac.ft.)	(Ac.ft.)	(Ac.ft.)						
1	Basin 1AL	172+00	236+00	LT	24.56	20.49	4.27	2.05	4.27	2.35	0.00	-1.92	5.91		Swale S-L2 & Swale S-L3 (Parcel 514228000170 & 514118000180)
2	Basin 1BL	217+50	228+80	LT	2.96	2.96	0.62	0.50	0.62	0.13	0.00	-0.48	0.00		Swale S-L1B
3	Basin 1CL	237+50	247+38	LT	2.39	1.92	0.40	0.52	0.52	0.08	0.00	-0.44	0.00		Swale S-L1C
4	Basin 1DL	236+00	247+38	LT	3.56	3.56	0.74	1.35	1.35	0.19	0.00	-1.16	0.00		Swale S-L1D
5	Basin 1EL	228+80	245+20	LT	3.08	3.08	0.64	0.18	0.64	0.16	0.00	-0.48	0.00		Swale S-L1E
6	Basin 1AR	177+50	192+00	RT	5.96	4.68	0.98	3.88	3.88	3.42	0.62	0.16	0.00		Swale S-R1A, Swale S-R1A-1, FD1_1R & FD1_2R
7	Basin 1BR	192+00	205+20	RT	3.99	3.34	0.70	0.95	0.95	1.36	0.23	0.63	0.00		Swale S-R1, FD1_3R
8	Basin 1CR	177+50	192+00	RT	6.97	5.39	1.12	-1.30	1.12	0.00	0.00	-1.12	0.00		
9	Basin 1DR	177+50	192+00	RT	5.21	4.04	0.84	0.47	0.84	0.48	0.08	-0.28	0.00		Pond S-R4, FD1_4R
From beginning of the project to Hallandale Beach Blvd. (Basin 1)									**14.19**	**8.16**	**0.92**	**-5.11**	**5.91**	**0.80**	

TABLE 1. WATER QUALITY/QUANTITY SUMMARY (CONTINUED)

Basin Area Calculation							Water Quality Calculation Summary	Water Quantity Calculation Summary	Required Storage For Stormwater Management	Storage Calculation Summary					Remarks
Project Basin		Station		Side	Total Area	Impervious Area	Water Quality Treatment Req'd	Net Runoff Increase (Post-Pre)		Available Storage within Exist. R/W (Ac.ft.)	Available Storage in FD (Ac.Ft.)	Additional Storage Needed outside Exist. R/W (Ac.ft.)	Additional Storage Provided outside Exist. R/W (Ac.ft.)	Surplus Storage (Ac.ft.)	Remarks
No.	Name	From	To	LT/RT	(Ac.)	(Ac.)	(Ac.ft.)	(Ac.ft.)	(Ac.ft.)						
1	Basin 2AL	247+38	262+00	LT	1.65	1.36	0.28	-0.55	0.28	0.00	0.00	0.28	2.75		Pond S-L5, (Parcels 514228710010, 514221010131, 514228640010, 514228740010 & 514228000102)
2	Basin 2BL	247+38	262+00	LT	3.78	3.78	0.79	1.45	1.45	0.00	0.00	1.45	0.00		
3	Basin 2CL	248+60	266+80	LT	2.48	2.48	0.52	0.01	0.52	0.00	0.00	0.52	0.00		
4	Basin 2DL	262+00	274+80	LT	3.28	2.74	0.57	0.55	0.57	0.00	0.00	0.57	0.00		
5	Basin 2EL	266+80	286+80	LT	2.82	2.82	0.59	0.00	0.59	1.51	0.00	-0.92	0.00		Swale S-R7A
6	Basin 2FL	274+80	288+00	LT	4.89	3.51	0.73	-0.04	0.73	0.84	0.00	-0.11	0.00		Swale S-L4
7	Basin 2AR	247+38	257+00	RT	3.12	2.87	0.60	0.89	0.89	1.35	0.00	-0.47	0.00		Swale S-R6
8	Basin 2BR	247+38	257+60	RT	1.79	0.73	0.15	-0.14	0.15	0.63	0.00	-0.48	0.00		Swale S-R5, FD2_1R
9	Basin 2CR	254+20	275+00	RT	6.24	5.73	1.19	2.20	2.20	0.00	0.00	2.20	0.59		Swale S-R7 (Parcel #514228000092 & 514228000093)
10	Basin 2DR	273+30	288+00	RT	4.89	3.14	0.65	-0.42	0.65	1.72	0.00	-1.07	0.00		Swale S-R8
From Hallandale Beach Blvd. to Pembroke Road. (Basin 2)									**8.02**	**6.05**	**0.00**	**1.97**	**3.34**	**1.37**	

TABLE 1. WATER QUALITY/QUANTITY SUMMARY (CONTINUED)

Basin Area Calculation							Water Quality Calculation Summary	Water Quantity Calculation Summary	Required Storage For Stormwater Management	Storage Calculation Summary					Remarks
Project Basin		Station		Side	Total Area	Impervious Area	Water Quality Treatment Req'd	Net Runoff Increase (Post-Pre)		Available Storage within Exist. R/W (Ac.ft.)	Available Storage in FD (Ac.Ft.)	Additional Storage Needed outside Exist. R/W (Ac.ft.)	Additional Storage Provided outside Exist. R/W (Ac.ft.)	Surplus Storage (Ac.ft.)	Remarks
No.	Name	From	To	LT/RT	(Ac.)	(Ac.)	(Ac.ft.)	(Ac.ft.)	(Ac.ft.)						
1	Basin 3AL	288+00	302+60	LT	5.93	5.08	1.06	0.47	1.06	0.41	0.00	0.65	0.80		Parcels 514221064500, 514221064590 & 514221064591
2	Basin 3BL	302+60	308+10	LT	1.40	1.40	0.29	-0.45	0.29	0.00	0.00	0.29	0.00		
3	Basin 3CL	308+10	315+00	LT	1.66	1.66	0.35	-0.11	0.35	0.74	0.00	-0.39	0.00		
4	Basin 3DL	315+00	322+00	LT	1.69	1.69	0.35	0.00	0.35	0.00	0.00	0.35	0.00		
5	Basin 3EL	310+00	342+00	LT	14.05	11.84	2.47	7.90	7.90	2.37	0.00	5.53	0.00		
6	Basin 3FL	322+00	340+00	LT	2.97	2.97	0.62	0.00	0.62	0.00	0.00	0.62	0.00		
7	Basin 3AR	289+00	300+00	RT	2.19	2.19	0.46	0.00	0.46	0.00	0.00	0.46	0.00		
8	Basin 3BR	288+00	298+80	RT	3.17	1.92	0.40	0.35	0.40	0.54	0.00	-0.14	0.00		
9	Basin 3CR	300+00	302+60	RT	0.31	0.31	0.06	0.00	0.06	0.00	0.00	0.06	0.00		
10	Basin 3DR	299+60	324+00	RT	8.51	7.76	1.62	1.46	1.62	0.00	0.00	1.62	0.00		
11	Basin 3ER	324+00	342+00	RT	7.99	5.54	1.15	1.58	1.58	0.34	0.00	1.24	0.00		
From Pembroke Road to Hollywood Blvd. (Basin 3)									**14.69**	**4.40**	**0.00**	**10.29**	**0.80**	**-9.49**	Provide in Sunset Golf Course

TABLE 1. WATER QUALITY/QUANTITY SUMMARY (CONTINUED)

Basin Area Calculation							Water Quality Calculation Summary	Water Quantity Calculation Summary	Required Storage For Stormwater Management	Storage Calculation Summary					Remarks
Project Basin		Station		Side	Total Area	Impervious Area	Water Quality Treatment Req'd	Net Runoff Increase (Post-Pre)		Available Storage within Exist. R/W (Ac.ft.)	Available Storage in FD (Ac.Ft.)	Additional Storage Needed outside Exist. R/W (Ac.ft.)	Additional Storage Provided outside Exist. R/W (Ac.ft.)	Surplus Storage (Ac.ft.)	Remarks
No.	Name	From	To	LT/RT	(Ac.)	(Ac.)	(Ac.ft.)	(Ac.ft.)	(Ac.ft.)						
1	Basin 4AL	342+00	369+50	LT	8.70	6.43	1.34	0.28	1.34	2.76	0.00	-1.42	0.00		Swale S-L6
2	Basin 4BL	343+00	355+90	LT	2.12	2.12	0.44	0.00	0.44	0.00	0.00	0.44	0.00		
3	Basin 4CL	349+80	356+80	LT	1.82	1.82	0.38	0.45	0.45	0.00	0.00	0.45	0.00		
4	Basin 4DL	355+90	369+50	LT	2.18	2.18	0.45	0.12	0.45	0.00	0.00	0.45	0.00		
5	Basin 4AR	342+00	355+00	LT	6.28	3.68	0.77	1.36	1.36	1.73	0.00	-0.36	0.56		Swale S-R12, Swale S-R14 & Swale S-R13 (Parcel No. 514216026520 & 51426026530),
6	Basin 4BR	354+60	369+50	LT	5.81	3.88	0.81	0.35	0.81	1.62	0.00	-0.81	0.00		Swale S-R15
From Hollywood Blvd. to Johnson Street (Basin 4)									**4.86**	**6.10**	**0.00**	**-1.25**	**0.56**	**1.81**	

TABLE 1. WATER QUALITY/QUANTITY SUMMARY (CONTINUED)

Basin Area Calculation							Water Quality Calculation Summary	Water Quantity Calculation Summary	Required Storage For Stormwater Management	Storage Calculation Summary					Remarks
Project Basin		Station		Side	Total Area	Impervious Area	Water Quality Treatment Req'd	Net Runoff Increase (Post-Pre)		Available Storage within Exist. R/W (Ac.ft.)	Available Storage in FD (Ac.Ft.)	Additional Storage Needed outside Exist. R/W (Ac.ft.)	Additional Storage Provided outside Exist. R/W (Ac.ft.)	Surplus Storage (Ac.ft.)	Remarks
No.	Name	From	To	LT/RT	(Ac.)	(Ac.)	(Ac.ft.)	(Ac.ft.)	(Ac.ft.)						
1	Basin 5AR	369+50	390+50	LT	6.36	4.66	0.97	0.07	0.97	0.34	0.00	0.63	9.62		
From Johnson Street to end of the project (Basin 5)									**0.97**	**0.34**	**0.00**	**0.63**	**9.62**	**9.00**	

BASIN No.	WATER MANAGEMENT FACILITIES					CONTROL /BOTTOM EL		TREATMENT AND ATTENUATION EL		STORAGE	REMARKS
	DESCRIPTION	From Sta.	To Sta.	Side	TREATMENT METHOD	Elev. (ft.)	Area (Ac.)	Elev (ft.)	Area (Ac.)	Volume (Ac-ft)	Minimum Berm EL
1	Swale S-L1A	176+20	191+00	LT	Dry Detention	2	0.98	4.2	1.15	2.35	6.00
	Swale S-L1B	193+90	197+20	LT	Dry Detention	2	0.04	4.2	0.08	0.13	6.00
	Swale S-L1C	209+80	212+50	LT	Dry Detention	2	0.02	4.2	0.05	0.08	6.50
	Swale S-L1D	219+50	222+30	LT	Dry Detention	2	0.06	4.2	0.11	0.19	5.00
	Swale S-L2	222+00	227+80	LT	Dry Detention	2	0.28	4.2	0.38	0.72	6.50
	Swale S-L1E	239+70	242+00	LT	Dry Detention	2	0.05	4.2	0.09	0.16	6.00
	Pond S-L3	224+90	239+80	LT	Dry Detention	2	2.23	4.2	2.49	5.19	5.50
	Swale S-R1A	171+00	175+80	RT	Dry Detention	2	1.08	4.2	1.26	2.58	8.00
	Swale S-R1A-1	171+00	175+80	RT	Dry Detention	2	0.33	4.2	0.43	0.84	8.00
	Swale S-R1	212+10	228+50	RT	Dry Detention	2	0.55	4.2	0.68	1.36	6.00
	Pond S-R4	245+20	246+80	RT	Dry Detention	2	0.18	4.2	0.26	0.48	5.50
									Σ Dry Detention =	*14.07*	
	TOTAL AVAILABLE STORAGE BASIN 1 = 14.07 AC-FT										
2	Swale S-L4	278+10	286+20	LT	Dry Detention	1.5	0.28	4	0.39	0.84	9.00
	Pond S-L5	254+90	260+20	LT	Dry Detention	1.5	1.00	4	1.20	2.75	9.00
	Swale S-R5	248+20	249+60	RT	Dry Detention	1.5	0.18	4	0.32	0.63	5.50
	Swale S-R6	248+20	255+80	RT	Dry Detention	1.5	0.47	4	0.61	1.35	5.50
	Swale S-R7	257+20	259+00	RT	Dry Detention	1.5	0.19	4	0.28	0.59	6.00
	Swale S-R7A	268+50	280+20	RT	Dry Detention	1.5	0.53	4	0.68	1.51	5.00
	Swale S-R8	280+10	285+10	RT	Dry Detention	1.5	0.61	4	0.77	1.72	7.00
									Σ Dry Detention =	*9.39*	
	TOTAL AVAILABLE STORAGE BASIN 1 = 9.39 AC-FT										
3	Swale S-L5A-1	289+90	295+80	LT	Dry Detention	1.5	0.17	3.5	0.24	0.41	7.50
	Swale S-L5A-2	314+30	321+70	LT	Dry Detention	1.5	0.30	3.5	0.44	0.74	4.50
	Swale S-L5B	326+20	334+20	LT	Dry Detention	1.5	0.35	3.5	0.45	0.80	5.00
	Swale S-L5C	333+80	340+10	LT	Dry Detention	1.5	0.18	3.5	0.25	0.43	5.00
	Swale S-L5D	332+30	340+90	LT	Dry Detention	1.5	0.47	3.5	0.58	1.05	5.00
	Swale S-L5E	330+40	332+40	LT	Dry Detention	1.5	0.03	3.5	0.06	0.09	5.00
	Swale S-R9	288+90	293+80	RT	Dry Detention	1.5	0.23	3.5	0.31	0.54	7.50
	Swale S-R10	329+00	331+80	RT	Dry Detention	1.5	0.14	3.5	0.20	0.34	4.50
									Σ Dry Detention =	*4.40*	
	TOTAL AVAILABLE STORAGE BASIN 1 = 4.40 AC-FT										
4	Swale S-L6	348+00	369+00	LT	Dry Detention	1.5	1.29	3.5	1.47	2.76	4.50
	Swale S-R12	342+90	346+30	RT	Dry Detention	1.5	0.29	3.5	0.43	0.72	6.00
	Swale S-R13	346+70	348+90	RT	Dry Detention	1.5	0.24	3.5	0.32	0.56	5.00
	Swale S-R14	350+00	355+10	RT	Dry Detention	1.5	0.45	3.5	0.56	1.01	5.50
	Swale S-R15	346+10	369+00	LT	Dry Detention	1.5	0.74	3.5	0.88	1.62	4.50
									Σ Dry Detention =	*6.66*	
	TOTAL AVAILABLE STORAGE BASIN 1 = 6.66 AC-FT										
5	Swale S-R16	370+10	375+05	RT	Dry Detention	1.5	0.14	3.5	0.20	0.34	5.00
	Pond S-R17	370+00	382+05	RT	Dry Detention	1.5	4.56	3.5	5.06	9.62	6.00
									Σ Dry Detention =	*9.97*	
	TOTAL AVAILABLE STORAGE BASIN 1 = 9.97 AC-FT										

indicates outside r/w

System 9
Existing Data

1" = 300'

SYSTEM 6
PERMIT 88-00053-S

SYSTEM 7
PERMIT 88-00053-S

SYSTEM 8
PERMIT 88-00050-S

SYSTEM 9
PERMIT 88-00050-S

MATCH LINE (STA. 359+46.45)

MATCH LINE (STA. 397+19.17)

JOHNSON ST.

STA. 381+80.50

C-10 CANAL

TAFT ST.

SB SR 9 (I-95)

NB SR 9 (I-95)

R/W LINE

SWALE 6-4

SWALE 9-1

SWALE 9-2

ADDITIONAL IMP. AREA A6-10 = 0.004 AC

ADDITIONAL IMP. AREA A7-1 = 0.002 AC

ADDITIONAL IMP. AREA A7-3 = 0.007 AC

ADDITIONAL IMP. AREA A7-4 = 0.003 AC

ADDITIONAL IMP. AREA A6-9 = 0.009 AC

ADDITIONAL IMP. AREA A7-2 = 0.002 AC

ADDITIONAL IMP. AREA A8-1 = 0.016 AC

ADDITIONAL IMP. AREA A8-2 = 0.078 AC

ADDITIONAL IMP. AREA A9-1 = 0.092 AC

ADDITIONAL IMP. AREA A9-2 = 0.013 AC

ADDITIONAL IMP. AREA A9-3 = 0.031 AC

ADDITIONAL IMP. AREA

PROP. POND/SWALE

EXIST. POND/SWALE

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND ASSISTANCE TO THE CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DAVID R. VERLANDER, P.E.
P.E. LICENSE NUMBER 81420
GAI CONSULTANTS, INC.
618 E. SOUTH STREET - SUITE 700
ORLANDO, FL 32801
CERTIFICATE OF AUTHORIZATION 9951

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	409354-2-52-01

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 3

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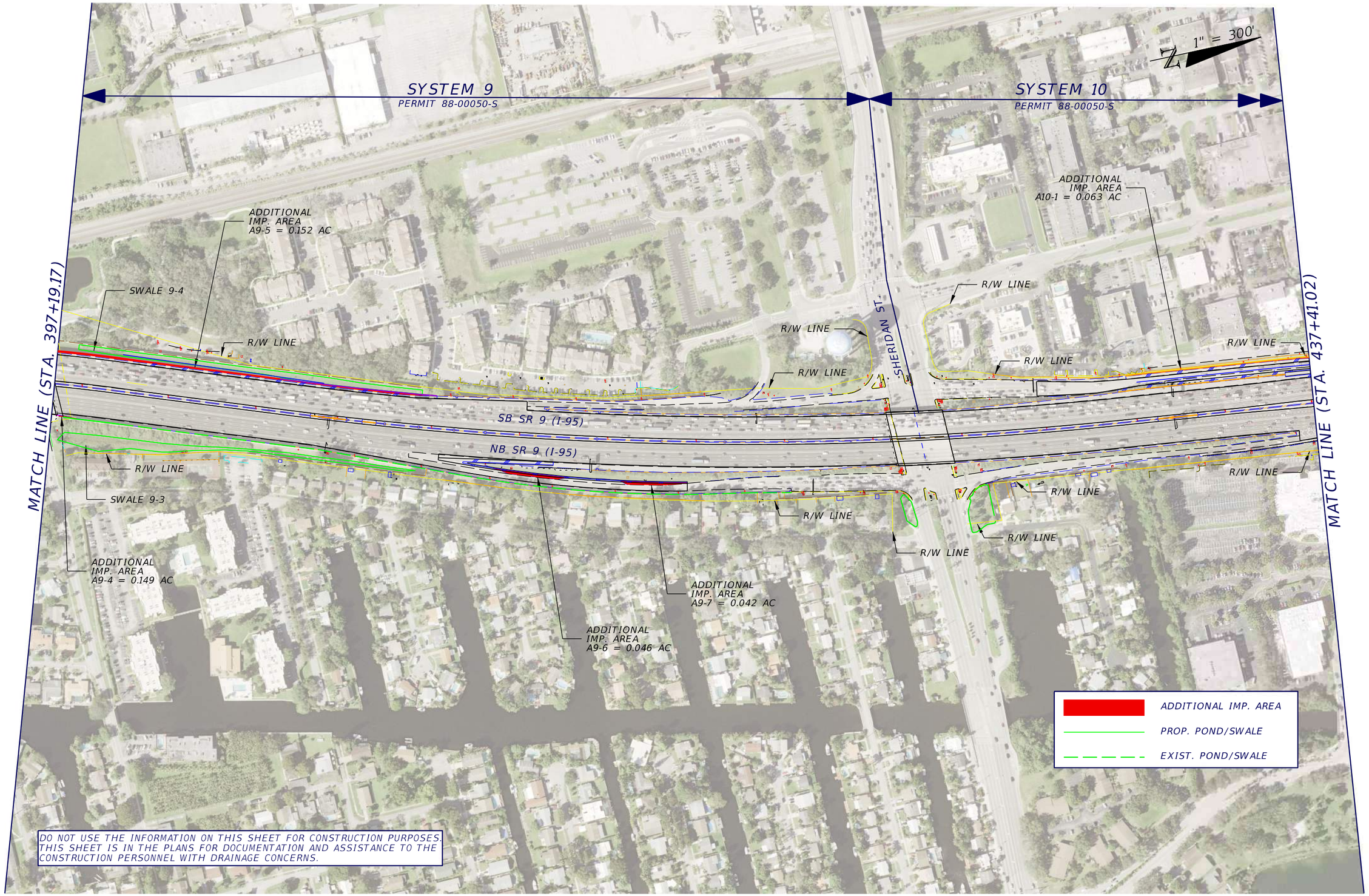

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	409354-2-52-01

POST-DEVELOPMENT DRAINAGE MAP

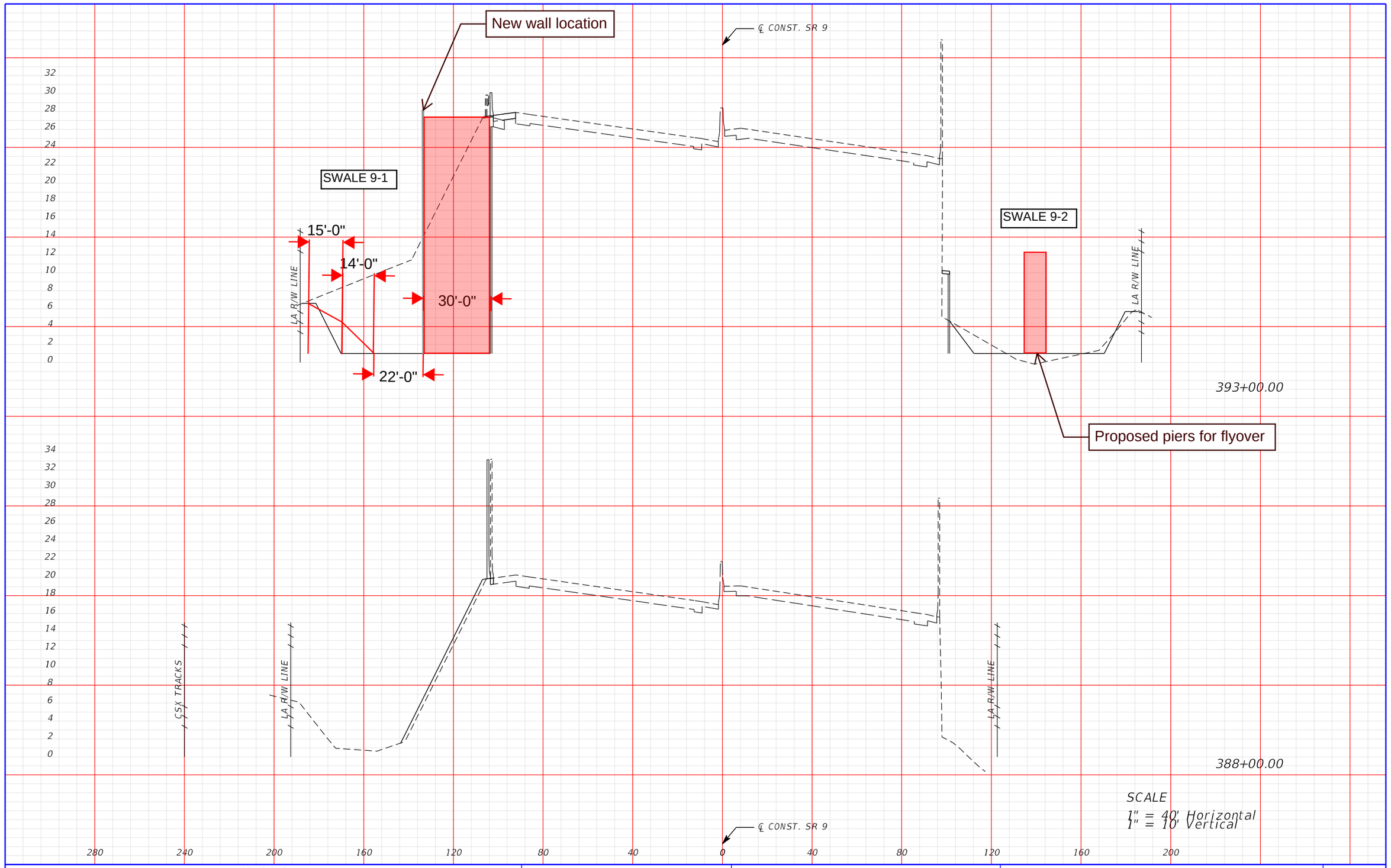
SHEET NO. 4

SYSTEM 9											
C-10 Canal to Sheridan Street											
Permit 88-00050-S											
Station	Side	Ditch Fill Area (SF)	Ditch Excavation Area (SF)	Ditch Fill Volume * (CY)	Ditch Excavation Volume * (CY)	Station	Side	Ditch Fill Area (SF)	Ditch Excavation Area (SF)	Ditch Fill Volume * (CY)	Ditch Excavation Volume * (CY)
390+00.00	LT	0.00	**112.51**			390+00.00	RT	0.00	0.00		
391+00.00	LT	0.00	**103.93**	0.000	400.815	391+00.00	RT	0.00	**4.30**	0.000	7.963
392+00.00	LT	0.00	**86.03**	0.000	351.778	392+50.00	RT	0.00	**24.56**	0.000	80.167
393+00.00	LT	0.00	**67.61**	0.000	284.519	393+00.00	RT	0.00	**16.24**	0.000	37.778
394+00.00	LT	0.00	**62.50**	0.000	240.944	394+00.00	RT	0.00	**38.73**	0.000	101.796
395+00.00	LT	0.00	**43.83**	0.000	196.907	395+00.00	RT	0.00	**50.07**	0.000	164.444
396+00.00	LT	0.00	0.00	0.000	81.167	396+00.00	RT	0.00	0.00	0.000	92.722
397+00.00	LT	0.00	**3.39**	0.000	6.278	397+00.00	RT	0.00	0.00	0.000	0.000
398+00.00	LT	0.00	**7.20**	0.000	19.611	398+00.00	RT	0.00	**82.05**	0.000	151.944
399+00.00	LT	0.00	**14.59**	0.000	40.352	399+00.00	RT	0.00	**52.28**	0.000	248.759
400+00.00	LT	0.00	**22.88**	0.000	69.389	400+00.00	RT	0.00	**34.33**	0.000	160.389
401+00.00	LT	0.00	**21.24**	0.000	81.704	401+00.00	RT	**6.67**	**30.87**	12.352	120.741
402+00.00	LT	0.00	**20.38**	0.000	77.074	402+00.00	RT	0.00	**27.25**	12.352	107.630
403+00.00	LT	0.00	**20.38**	0.000	75.481	403+00.00	RT	0.00	**23.55**	0.000	94.074
404+00.00	LT	0.00	**20.24**	0.000	75.222	404+00.00	RT	0.00	**18.96**	0.000	78.722
405+00.00	LT	0.00	**19.75**	0.000	74.056	405+00.00	RT	0.00	**16.08**	0.000	64.889
406+00.00	LT	0.00	**3.08**	0.000	42.278	406+00.00	RT	0.00	**17.81**	0.000	62.759
407+00.00	LT	0.00	**1.25**	0.000	8.019	407+00.00	RT	0.00	**16.83**	0.000	64.148
408+00.00	LT	0.00	**3.13**	0.000	8.111	408+00.00	RT	0.00	**14.55**	0.000	58.111
409+00.00	LT	**6.04**	**0.48**	11.185	6.685	409+00.00	RT	0.00	0.00	0.000	26.944
410+00.00	LT	0.00	0.00	11.185	0.889	410+00.00	RT	0.00	0.00	0.000	0.000
411+00.00	LT	0.00	0.00	0.000	0.000	411+00.00	RT	0.00	0.00	0.000	0.000
412+00.00	LT	0.00	0.00	0.000	0.000	412+00.00	RT	0.00	0.00	0.000	0.000
413+00.00	LT	0.00	0.00	0.000	0.000	413+00.00	RT	0.00	0.00	0.000	0.000
414+00.00	LT	0.00	0.00	0.000	0.000	414+00.00	RT	0.00	0.00	0.000	0.000
415+00.00	LT	0.00	0.00	0.000	0.000	415+00.00	RT	0.00	0.00	0.000	0.000
416+00.00	LT	0.00	0.00	0.000	0.000	416+00.00	RT	0.00	0.00	0.000	0.000
417+00.00	LT	0.00	0.00	0.000	0.000	417+00.00	RT	0.00	0.00	0.000	0.000

SYSTEM 9											
C-10 Canal to Sheridan Street											
Permit 88-00050-S											
Station	**Side**	**Ditch Fill Area (SF)**	**Ditch Excavation Area (SF)**	**Ditch Fill Volume * (CY)**	**Ditch Excavation Volume * (CY)**	**Station**	**Side**	**Ditch Fill Area (SF)**	**Ditch Excavation Area (SF)**	**Ditch Fill Volume * (CY)**	**Ditch Excavation Volume * (CY)**
418+00.00	LT	0.00	0.00	0.000	0.000	418+00.00	RT	0.00	0.00	0.000	0.000
419+00.00	LT	0.00	0.00	0.000	0.000	419+00.00	RT	0.00	0.00	0.000	0.000
420+00.00	LT	0.00	0.00	0.000	0.000	420+00.00	RT	0.00	0.00	0.000	0.000
421+00.00	LT	0.00	0.00	0.000	0.000	421+00.00	RT	0.00	0.00	0.000	0.000
422+00.00	LT	0.00	0.00	0.000	0.000	422+00.00	RT	0.00	0.00	0.000	0.000
423+00.00	LT	0.00	0.00	0.000	0.000	423+00.00	RT	0.00	0.00	0.000	0.000
			Sub-Total (CY) =	**22.370**	**2141.278**				**Sub-Total (CY) =**	**24.704**	**1723.981**
			Sub-Total (Ac-ft) =	**0.014**	**1.327**				**Sub-Total (Ac-ft) =**	**0.015**	**1.069**

System 9 Totals: **Fill Total (Ac-ft): 0.029** **Excavation Total (Ac-ft): 2.396**

* Volumes calculated for ditch stations above are based on a ditch bottom elevation of 1.0-ft NAVD to a control elevation of 2.0-ft NAVD (information based on existing permit).



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON, P.E.
P.E. LICENSE NUMBER 61898
RS&H, INC.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

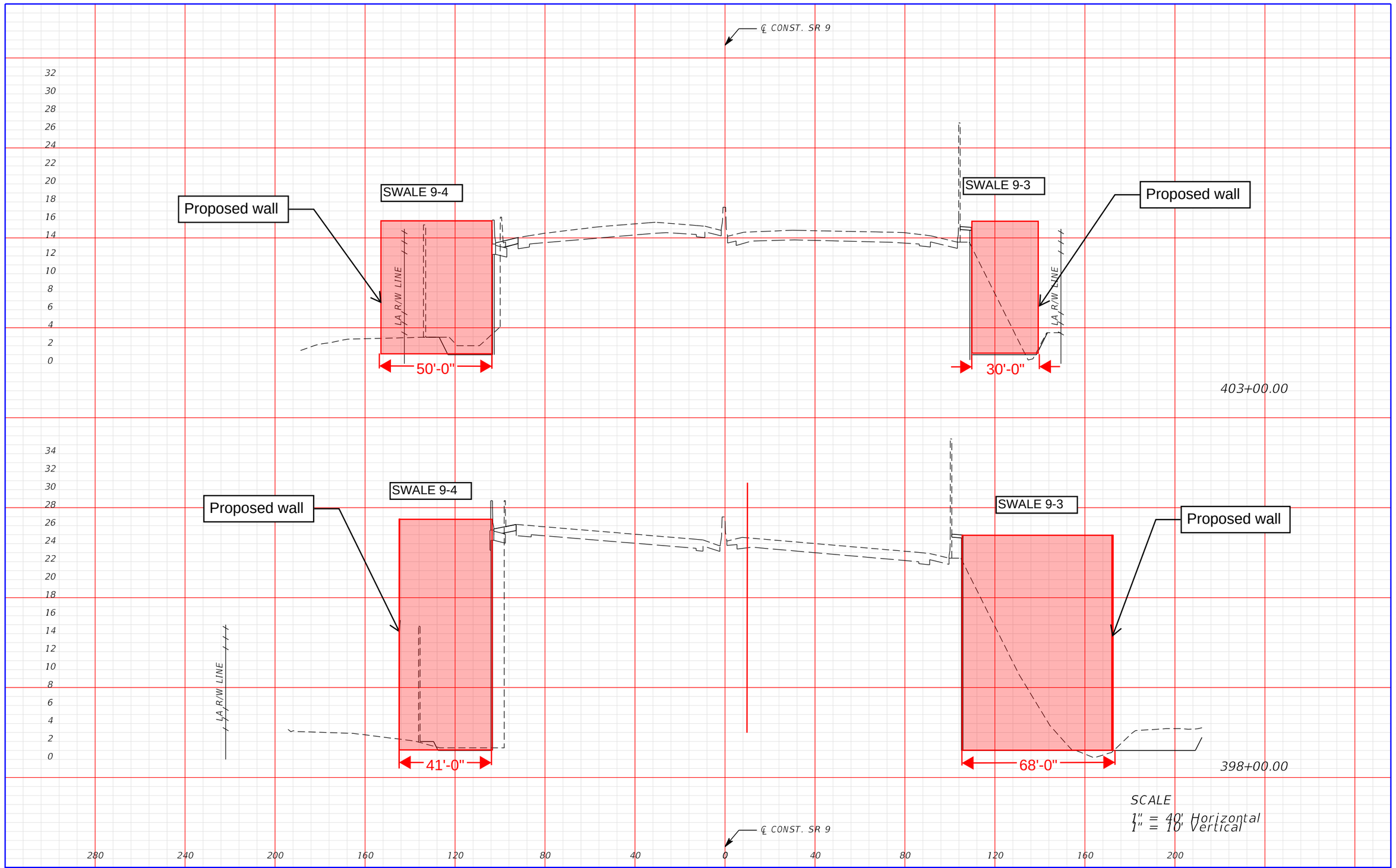
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-8

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



SCALE
1" = 40' Horizontal
1" = 10' Vertical

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

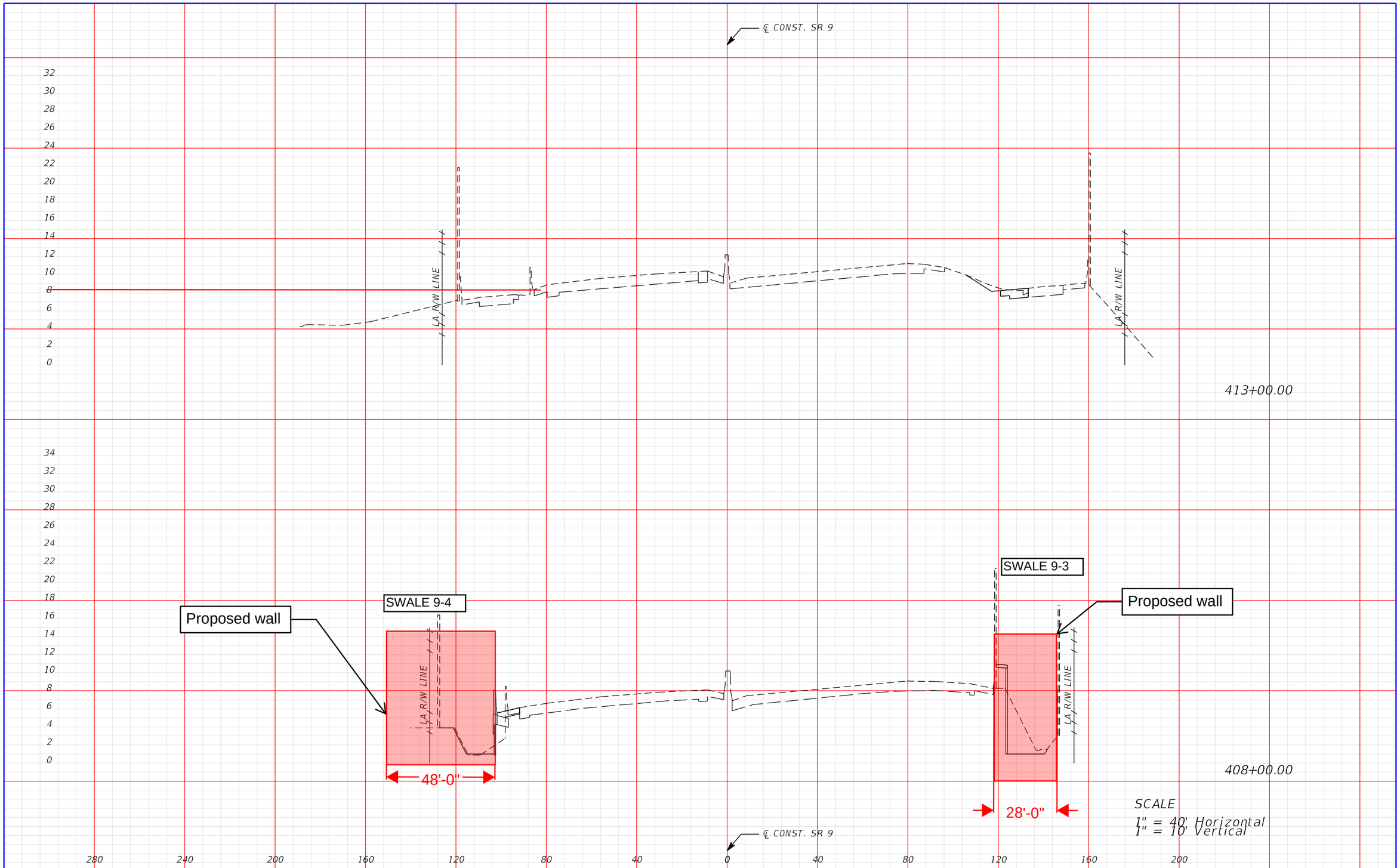
CHRISTIAN B. JACKSON, P.E.
P.E. LICENSE NUMBER 61898
RS&H, INC.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-9



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON, P.E.
P.E. LICENSE NUMBER 61898
RS&H, INC.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-10

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

Table 2: Project Area Breakdown and Land Use Summary

PRE-DEVELOPMENT				
System	Impervious Area (ac)		Pervious Area (ac)	Total Area (ac)
	Roadway / Sidewalk, etc.	Wet Storage		
System 6	43.72	0.00	18.15	61.86
System 7	6.19	0.00	2.35	8.54
System 8	3.73	0.00	1.54	5.27
System 9	21.07	0.00	8.02	29.10
System 10	16.88	0.00	3.21	20.09

POST-DEVELOPMENT				
System	Impervious Area (ac)		Pervious Area (ac)	Total Area (ac)
	Roadway / Sidewalk, etc.	Wet Storage		
System 6	45.71	0.00	16.16	61.86
System 7	6.20	0.00	2.34	8.54
System 8	3.82	0.00	1.45	5.27
System 9	21.60	0.00	7.50	29.10
System 10	17.01	0.00	3.07	20.09

Table 3: Water Quality Summary

POST-DEVELOPMENT			
System	Water Quality Required (ac·ft)	Water Quality Provided (ac·ft)	Surplus Water Quality Provided (ac·ft)
System 6	0.311	2.621	2.310
System 7	0.011	0.076	0.065
System 8	0.077	0.248	0.171
System 9	0.427	0.868	0.441
System 10	0.115	0.472	0.357

DRAINAGE SYSTEM 9 CALCULATIONS

FIGURE 9.1 - SYSTEM 9

DITCH LEFT:

STATION	EXISTING DITCH AREA (SF)	PROPOSED DITCH AREA (SF)	EXISTING DITCH VOLUME (CY)	PROPOSED DITCH VOLUME (CY)
445+00.00	26.6	10.8		
450+00.00	30.6	70.9	530	756
		TOTAL =	530	756

DITCH RIGHT:

STATION	EXISTING DITCH AREA (SF)	PROPOSED DITCH AREA (SF)	EXISTING DITCH VOLUME (CY)	PROPOSED DITCH VOLUME (CY)
435+00.00	9.9	19.0		
440+00.00	12.0	23.1	203	390
445+00.00	39.6	37.7	478	563
450+00.00	50.2	52.0	831	831
		TOTAL =	1512	1783

NET VOLUME PROVIDED (PROPOSED DITCH VOLUME) - (EXISTING DITCH VOLUME) = 498 CY

= 0.309 Ac-Ft

NET VOLUME NEEDED PER ADD'L IMPERVIOUS AREA OVER 2.5 in = 0.189 Ac-Ft

1.207 Ac Add'l Impev
2.5" Runoff Treatment
75% Dry Retention

CONCLUSION: VOLUME PROVIDED FOR ADDITIONAL IMPERVIOUS AREA IS SUFFICIENT TO TREAT AND STORE THE ADDITIONAL IMPERVIOUS AREA REQUIREMENTS OVER THE FIRST 2.5 INCHES OF RUNOFF

*The stations listed above represent only the areas where volumetric storage has been disturbed

DRAINAGE SYSTEM 10 CALCULATIONS

FIGURE 10.1 - SYSTEM 10

DITCH RIGHT:

STATION	EXISTING DITCH AREA (SF)	PROPOSED DITCH AREA (SF)	EXISTING DITCH VOLUME (CY)	PROPOSED DITCH VOLUME (CY)
455+00.00	14.3	27.0		
460+00.00	13.6	29.8	258	526
		TOTAL =	258	526

DITCH LEFT:

STATION	EXISTING DITCH AREA (SF)	PROPOSED DITCH AREA (SF)	EXISTING DITCH VOLUME (CY)	PROPOSED DITCH VOLUME (CY)
455+00.00	39.8	71.9		
460+00.00	2.1	63.6	388	1255
465+00.00	11.6	60.8	127	1152
		TOTAL =	515	2406

NET VOLUME PROVIDED (PROPOSED DITCH VOLUME) - (EXISTING DITCH VOLUME) = 2159 CY

= 1.338 Ac-Ft

NET VOLUME NEEDED PER ADD'L IMPERVIOUS AREA OVER 2.5 in = 0.039 Ac-Ft

0.248 Ac Add'l Imperv
2.5" Runoff Treatment
75% Dry Retention

CONCLUSION: VOLUME PROVIDED FOR ADDITIONAL IMPERVIOUS AREA IS SUFFICIENT TO TREAT AND STORE THE ADDITIONAL IMPERVIOUS AREA REQUIREMENTS OVER THE FIRST 2.5 INCHES OF RUNOFF

*The stations listed above represent only the areas where volumetric storage has been disturbed

DRAINAGE SYSTEM 11 CALCULATIONS

FIGURE 11.1 - SYSTEM 11

DITCH RIGHT:

STATION	EXISTING DITCH AREA (SF)	PROPOSED DITCH AREA (SF)	EXISTING DITCH VOLUME (CY)	PROPOSED DITCH VOLUME (CY)
500+00.00	13.6	51.5		
505+00.00	0.0	25.5	126	713
510+00.00	4.2	27.7	39	493
515+00.00	0.0	19.3	39	895
		TOTAL =	204	2101

NET VOLUME PROVIDED (PROPOSED DITCH VOLUME) - (EXISTING DITCH VOLUME) = 1897 CY

= 1.176 Ac-Ft

NET VOLUME NEEDED PER ADD'L IMPERVIOUS AREA OVER 2.5 in = 0.072 Ac-Ft

0.461 Ac Add'l Imperv
2.5" Runoff Treatment
75% Dry Retention

CONCLUSION: VOLUME PROVIDED FOR ADDITIONAL IMPERVIOUS AREA IS SUFFICIENT TO TREAT AND STORE THE ADDITIONAL IMPERVIOUS AREA REQUIREMENTS OVER THE FIRST 2.5 INCHES OF RUNOFF

*The stations listed above represent the areas only where volumetric storage has been disturbed

FLOOD

PROJECT PARK & RIDE @ SHERIDAN JT. PROJECT NO. 3511.100
SUBJECT DETENTION & TREATMENT VOLUMES DESIGNED BY JMG DATE OCT '91
CHECKED BY DATE
SHEET NO. 3 OF 3

DETENTION BASIN *

STAGE VS. STORAGE :

STAGE	AREA (SF)	STORAGE (AC-FT)
3	15 310.	Ø
4	17970.	0.388
5	20130	0.825
6	22 290.	1.312

* NO WATER TREATMENT, ONLY ATTENUATION IN DETENTION BASIN!

STATE PROJ. NO.	SHEET NO.
86070-3495	14

STA. 8+30 ℄ CONST. N. 29TH AVE.
BEGIN CONSTRUCTION CONN. TO EXIST. PAVT.

STA. 63+64.66, 8' LT. ℄ ACCESS RD.
STA. 122+00, 16.51' LT. ℄ RAMP 'E'
END CONST. CONN. TO EXIST. SHLD.

P.C. STA. 120+67.32 ℄ RAMP 'E'
STA. 64+97.83 END ℄ ACCESS RD.

STA. 123+37.51, 16' LT. ℄ RAMP 'E'
STA. 62+33.77, 16' LT. ℄ ACCESS RD.

EQUATION:
STA. 10+56.96 BK. =
STA. 10+56.24 AH.

MATCH LINE STA. 11+60

NOTE:
1. FOR DETAILED BASELINE GEOMETRICS AND CURVE DATA SEE SHEET NO. 9
2. FOR DETAIL ON TYPE 'B' FENCE SEE INDEX NO. 452.

ADD./REVISED SUBMITTAL
SEP 22 1992

ADD./REVISED SUBMITTAL
SEP 22 1992

EXHIBIT 5

FINAL APPROVED
OCT 15 1992
WPB

06-01607-5

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

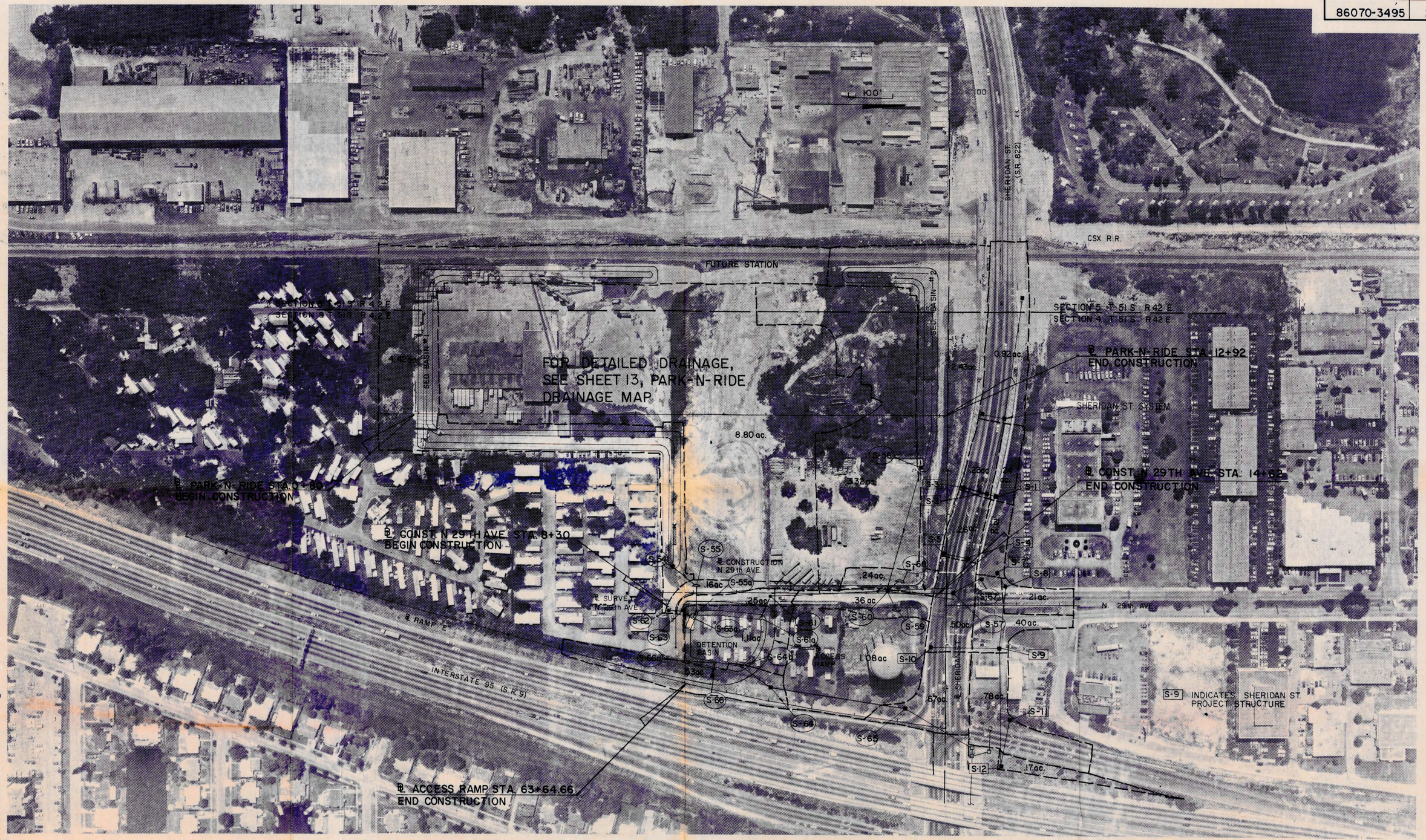
P29A.DGN 08-SEP-92

	NAME	DATE		NAME	DATE
DESIGNED BY	AVERY	10-91	DRAWN BY	NGUYEN	10-91
CHECKED BY	MADDEN	10-91	CHECKED BY	McBRAYER	10-91
SUPERVISED BY: H. MADDEN					

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY: H. MADDEN
DATE: 12-17-91

PLAN N. 29TH AVE. 8+30 - 11+60 & ACCESS ROAD 60+00 - 63+64.66

STATE PROJ. NO.	SHEET NO.
86070-3495	2



REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	D. GILE	10/91	DRAWN BY	E. HODGES	10/91
CHECKED BY	MARDEN	10/91	CHECKED BY	GILE	10/91
SUPERVISED BY					

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY

DATE

ORIGINAL SUBMITTAL

AUG 03 1992

DRAINAGE MAP

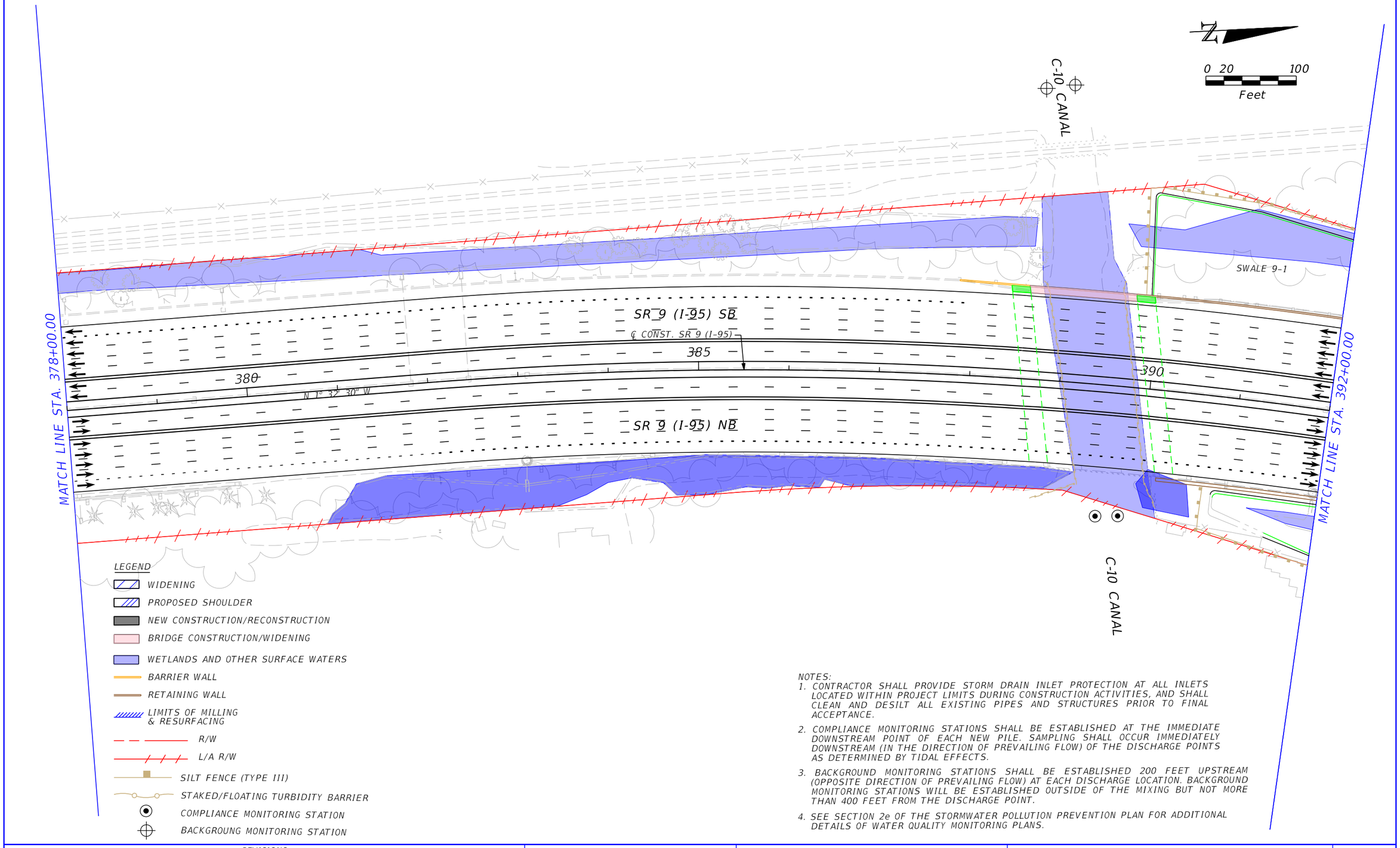
SOUTHERN RESOURCE MAPPING CORP.
ORMOND BEACH, FLORIDA

FINAL APPROVED
OCT 15 1992
WPB

11-26-91

08-01607-5

EXHIBIT 2



LEGEND

- WIDENING
- PROPOSED SHOULDER
- NEW CONSTRUCTION/RECONSTRUCTION
- BRIDGE CONSTRUCTION/WIDENING
- WETLANDS AND OTHER SURFACE WATERS
- BARRIER WALL
- RETAINING WALL
- LIMITS OF MILLING & RESURFACING
- R/W
- L/A R/W
- SILT FENCE (TYPE III)
- STAKED/FLOATING TURBIDITY BARRIER
- COMPLIANCE MONITORING STATION
- BACKGROUNG MONITORING STATION

NOTES:

1. CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.
2. COMPLIANCE MONITORING STATIONS SHALL BE ESTABLISHED AT THE IMMEDIATE DOWNSTREAM POINT OF EACH NEW PILE. SAMPLING SHALL OCCUR IMMEDIATELY DOWNSTREAM (IN THE DIRECTION OF PREVAILING FLOW) OF THE DISCHARGE POINTS AS DETERMINED BY TIDAL EFFECTS.
3. BACKGROUND MONITORING STATIONS SHALL BE ESTABLISHED 200 FEET UPSTREAM (OPPOSITE DIRECTION OF PREVAILING FLOW) AT EACH DISCHARGE LOCATION. BACKGROUND MONITORING STATIONS WILL BE ESTABLISHED OUTSIDE OF THE MIXING BUT NOT MORE THAN 400 FEET FROM THE DISCHARGE POINT.
4. SEE SECTION 2e OF THE STORMWATER POLLUTION PREVENTION PLAN FOR ADDITIONAL DETAILS OF WATER QUALITY MONITORING PLANS.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-7

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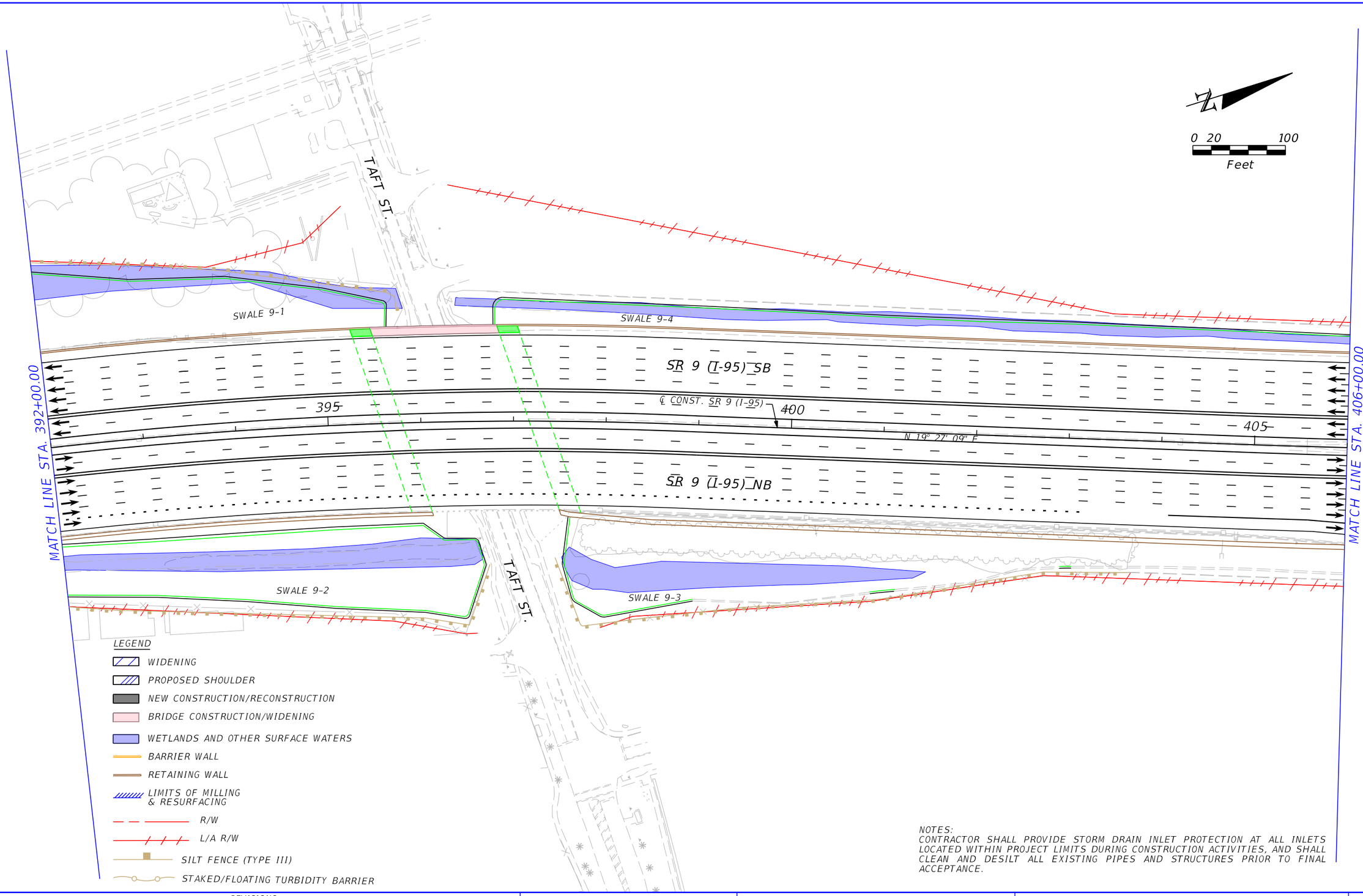

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DATE	DESCRIPTION	DATE	DESCRIPTION

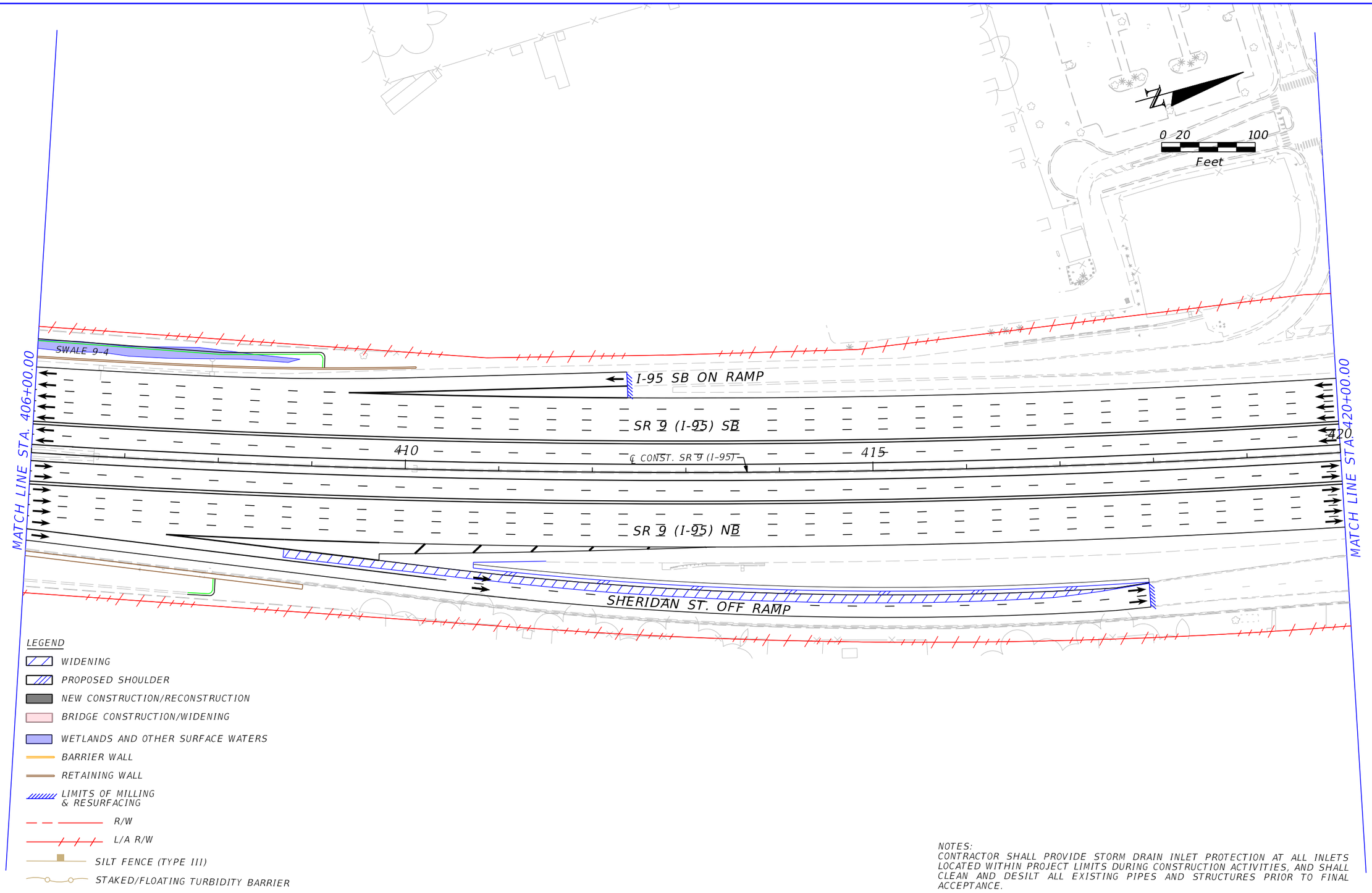
CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-8



LEGEND

- WIDENING
- PROPOSED SHOULDER
- NEW CONSTRUCTION/RECONSTRUCTION
- BRIDGE CONSTRUCTION/WIDENING
- WETLANDS AND OTHER SURFACE WATERS
- BARRIER WALL
- RETAINING WALL
- LIMITS OF MILLING & RESURFACING
- R/W
- L/A R/W
- SILT FENCE (TYPE III)
- STAKED/FLOATING TURBIDITY BARRIER

NOTES:
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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO.
R-9

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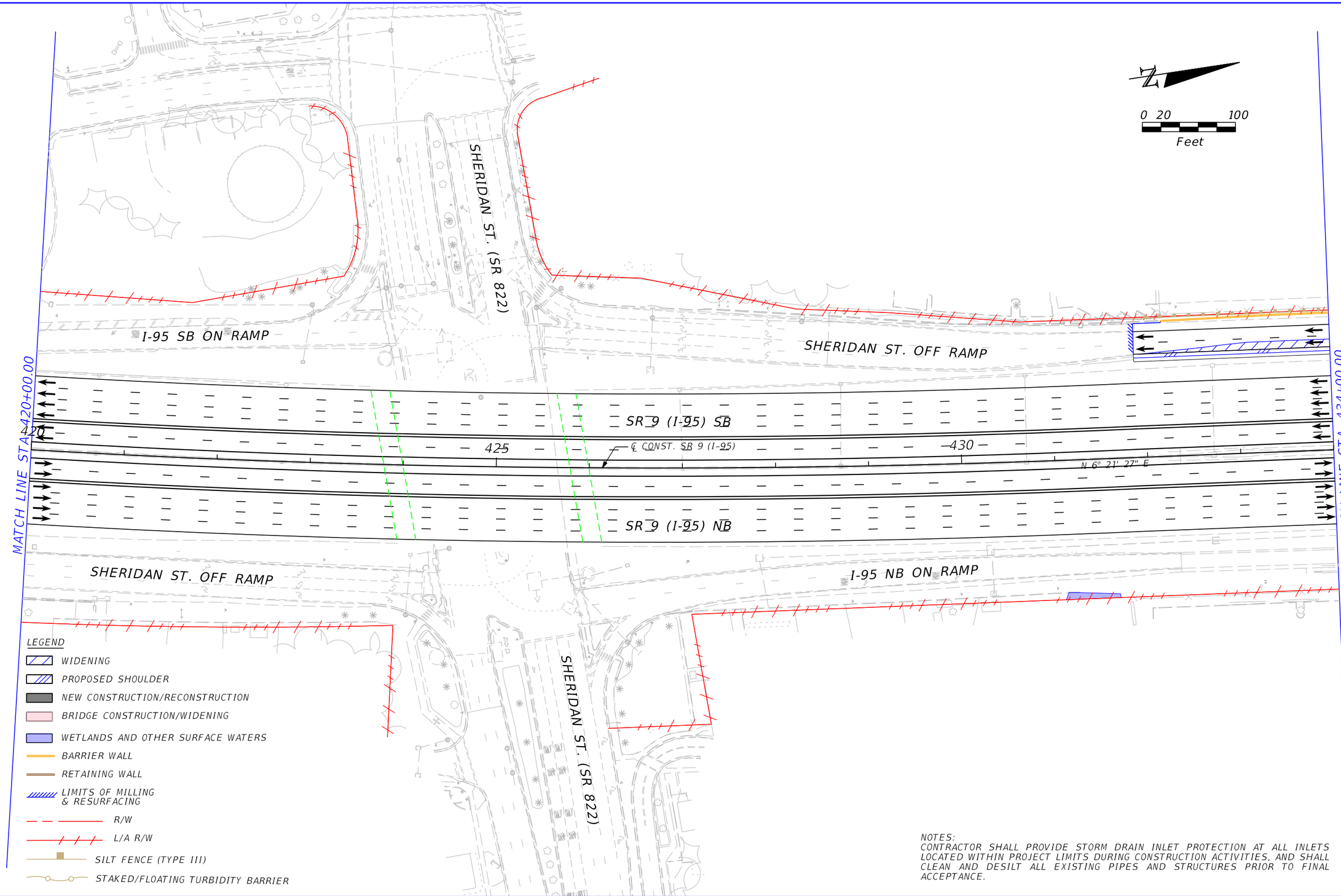

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-10

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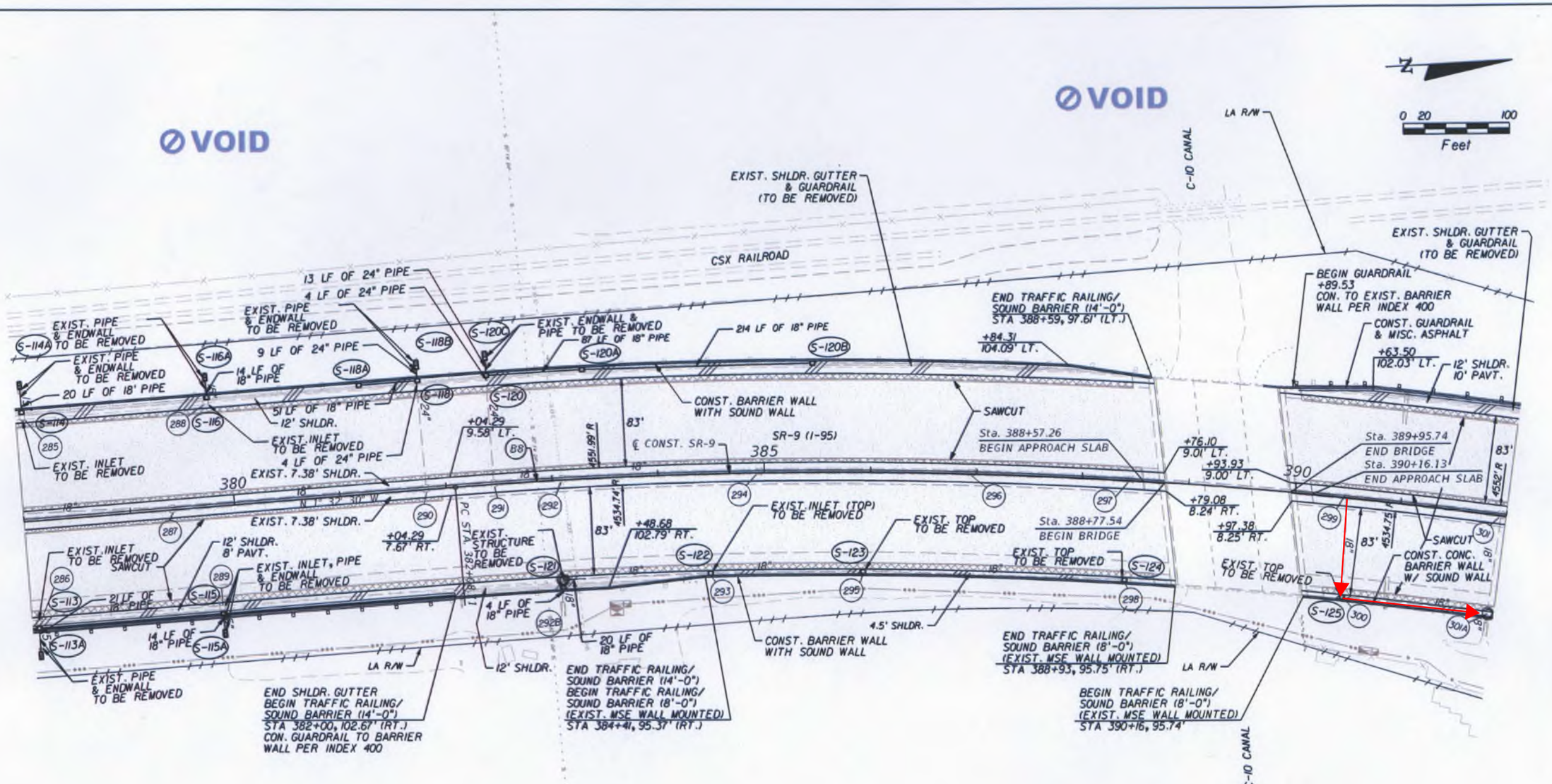

LEGEND:

- WIDENING
- MILL & RESURFACE
- PROPOSED SHOULDER

RELEASED FOR CONSTRUCTION

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DATE	DESCRIPTION	DATE	DESCRIPTION

C. BRIAN FULLER, P.E. # 49524
METRIC ENGINEERING, INC.
615 CRESCENT EXECUTIVE CT
SUITE 524
LAKE MARY, FLORIDA 32746
TEL. (407) 644-1898
FAX. (407) 644-1921
CERTIFICATE OF AUTHORIZATION 2294
● ENGINEERS ● PLANNERS ● SURVEYORS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 54

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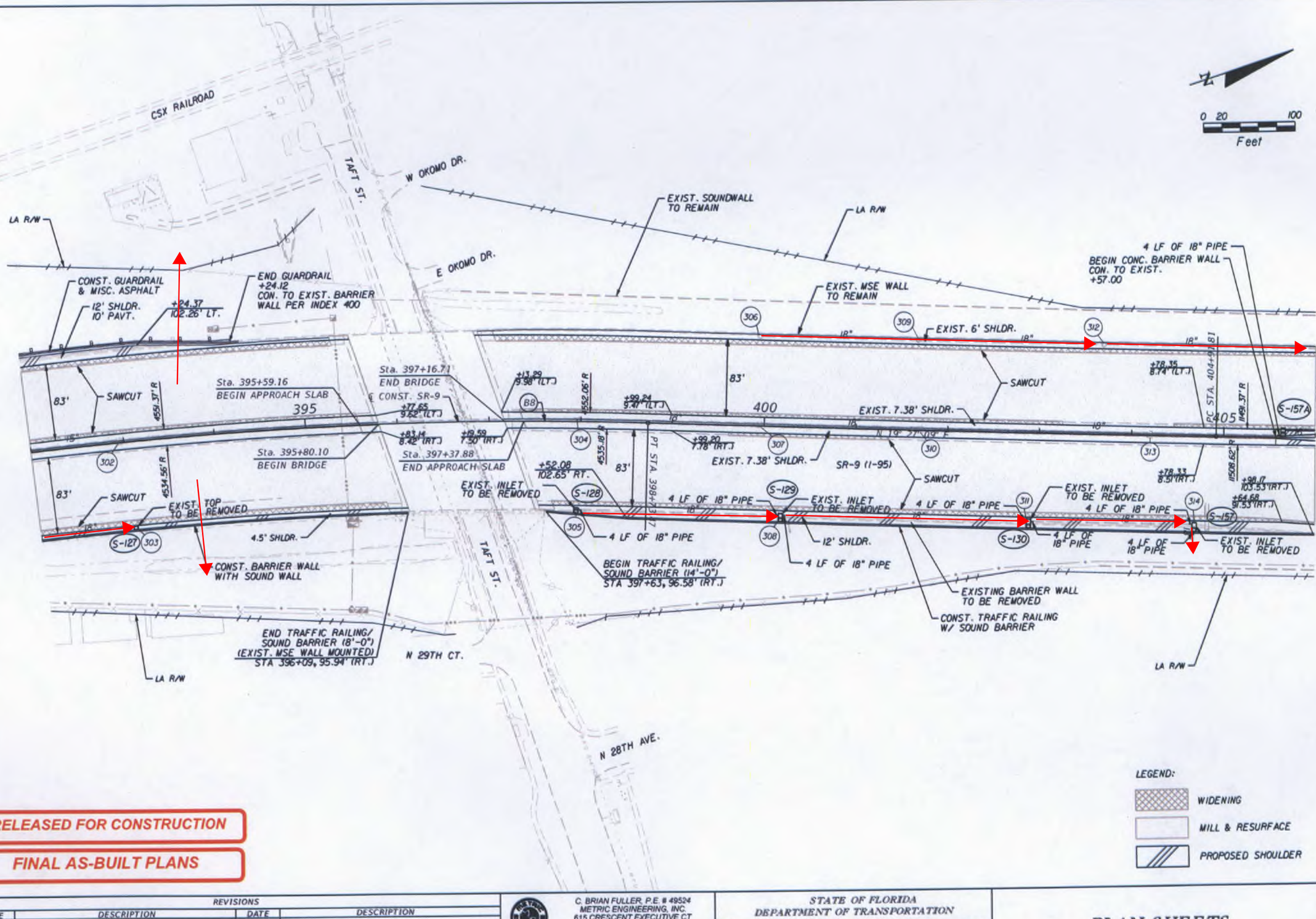

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FINAL AS-BUILT PLANS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

C. BRIAN FULLER, P.E. # 49524
METRIC ENGINEERING, INC.
615 CRESCENT EXECUTIVE CT
SUITE 524
LAKE MARY, FLORIDA 32746
TEL. (407) 644-1898
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 55

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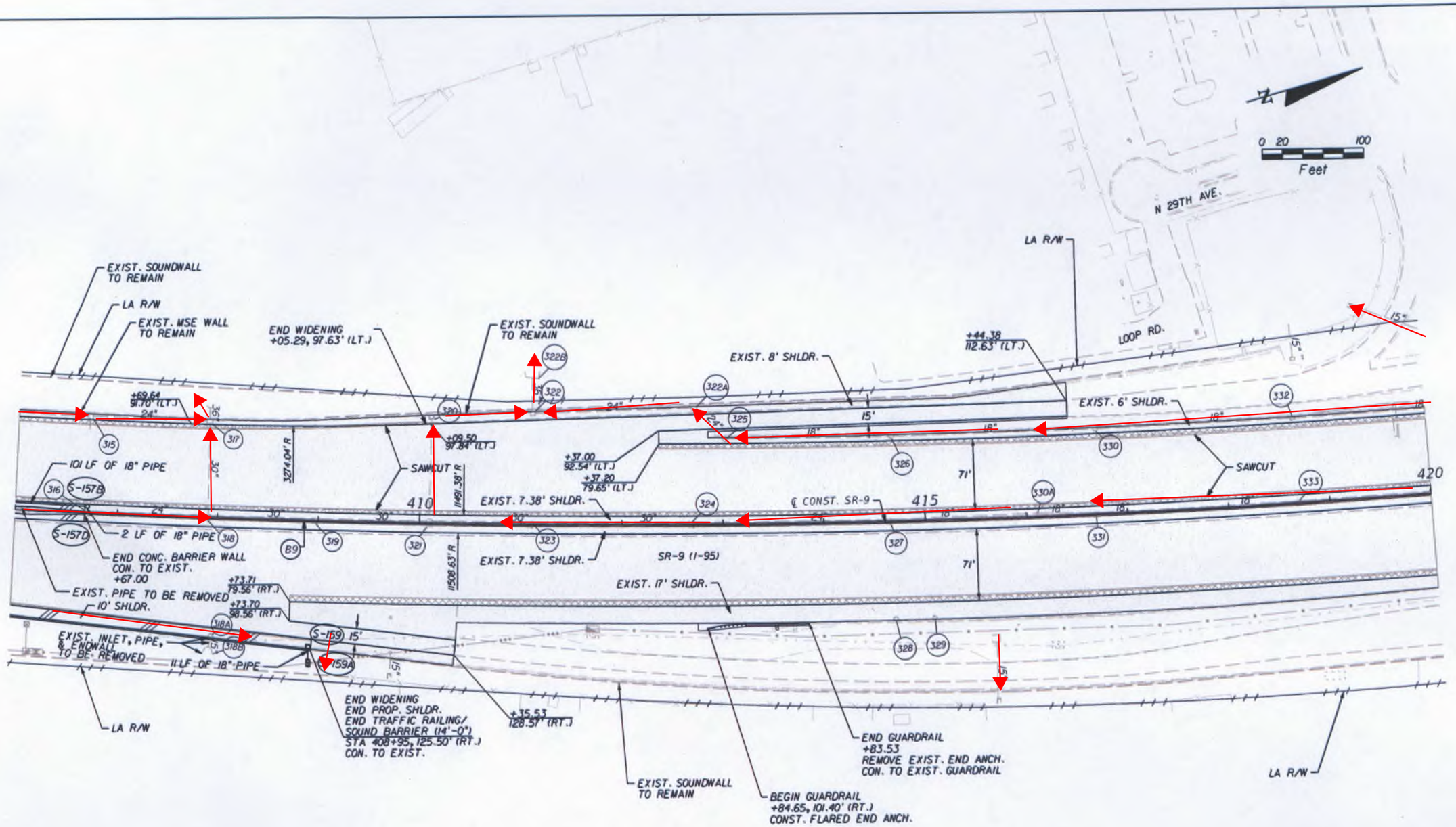
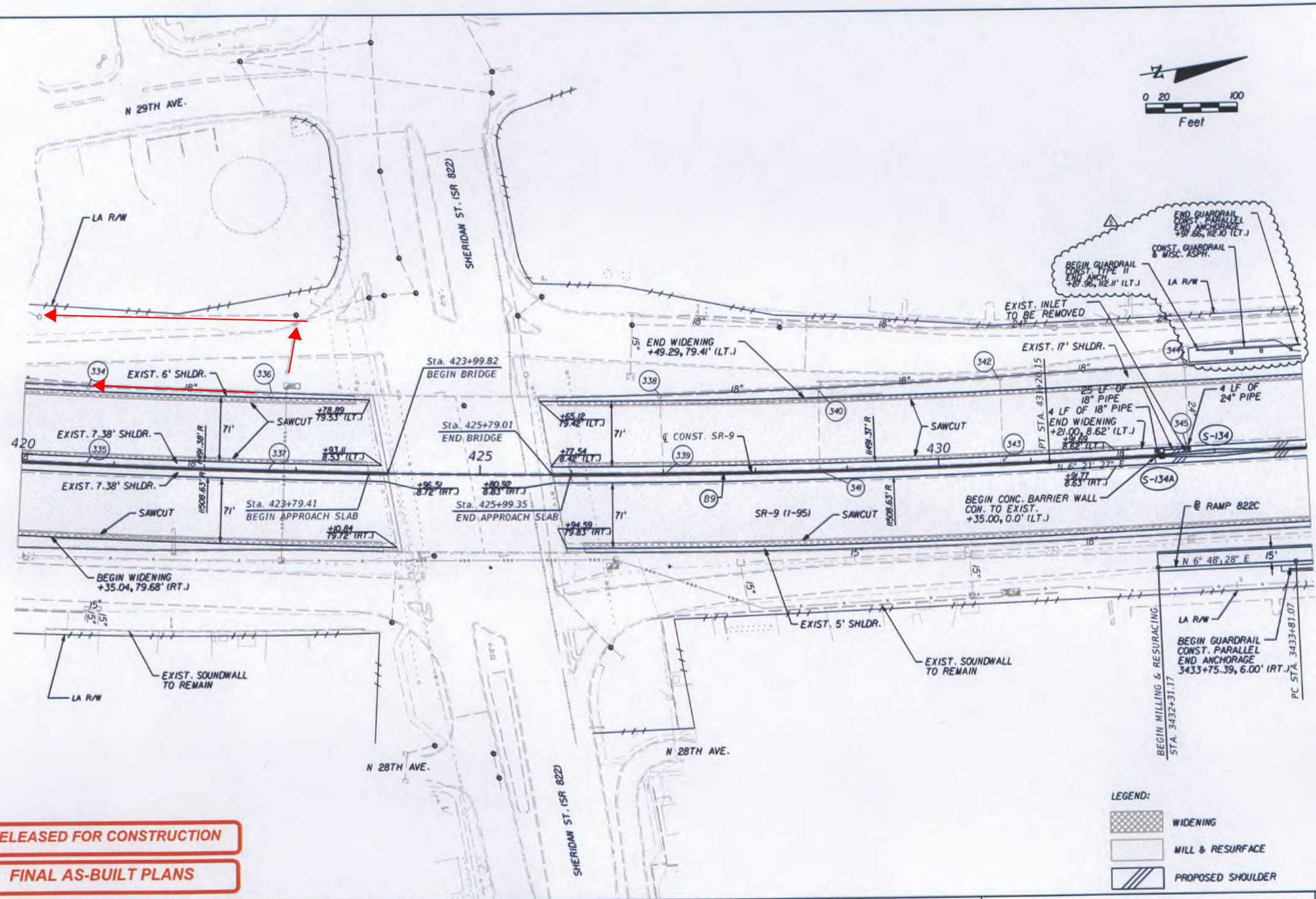

N
0 20 100
Feet
N 29TH AVE.
LA R/W
LOOP RD.
EXIST. SOUNDWALL TO REMAIN
LA R/W
EXIST. MSE WALL TO REMAIN
END WIDENING +05.29, 97.63' (LT.)
EXIST. SOUNDWALL TO REMAIN
EXIST. 8' SHLDR.
+44.38 112.63' (LT.)
EXIST. 6' SHLDR.
+69.64 91.70' (LT.)
+09.50 97.84' (LT.)
+37.00 92.54' (LT.)
+37.20 79.65' (LT.)
101 LF OF 18" PIPE
SAWCUT
SAWCUT
410
415
420
EXIST. 7.38' SHLDR.
℄ CONST. SR-9
EXIST. 7.38' SHLDR.
SR-9 (I-95)
EXIST. 17' SHLDR.
2 LF OF 18" PIPE
END CONC. BARRIER WALL CON. TO EXIST. +67.00
EXIST. PIPE TO BE REMOVED
10' SHLDR.
+73.71 79.56' (RT.)
+73.70 98.56' (RT.)
EXIST. INLET, PIPE, & ENDWALL TO BE REMOVED
11 LF OF 18" PIPE
END WIDENING
END PROP. SHLDR.
END TRAFFIC RAILING/ SOUND BARRIER (14'-0") STA 408+95, 125.50' (RT.) CON. TO EXIST.
+35.53 128.51' (RT.)
END GUARDRAIL +83.53 REMOVE EXIST. END ANCH. CON. TO EXIST. GUARDRAIL
EXIST. SOUNDWALL TO REMAIN
BEGIN GUARDRAIL +84.65, 101.40' (RT.) CONST. FLARED END ANCH.
LA R/W
LA R/W
S-157B
S-157D
S-159
B9
315
316
317
318
318A
318B
319
321
322
322A
322B
323
324
325
326
327
328
329
330
330A
331
332
333
3274.04' R
11491.38' R
11508.63' R
71'
71'
71'
15'
15'
15'
15'
30'
30'
30



RELEASED FOR CONSTRUCTION

FINAL AS-BUILT PLANS

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
10/9/13	6 ADDED GUARDRAIL AT SS 95-53		

C. BRIAN FULLER, P.E. # 49524
METRIC ENGINEERING, INC.
615 CRESCENT EXECUTIVE CT
SUITE 524
LAKE MARY, FLORIDA 32746
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● ENGINEERS ● PLANNERS ● SURVEYORS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 57

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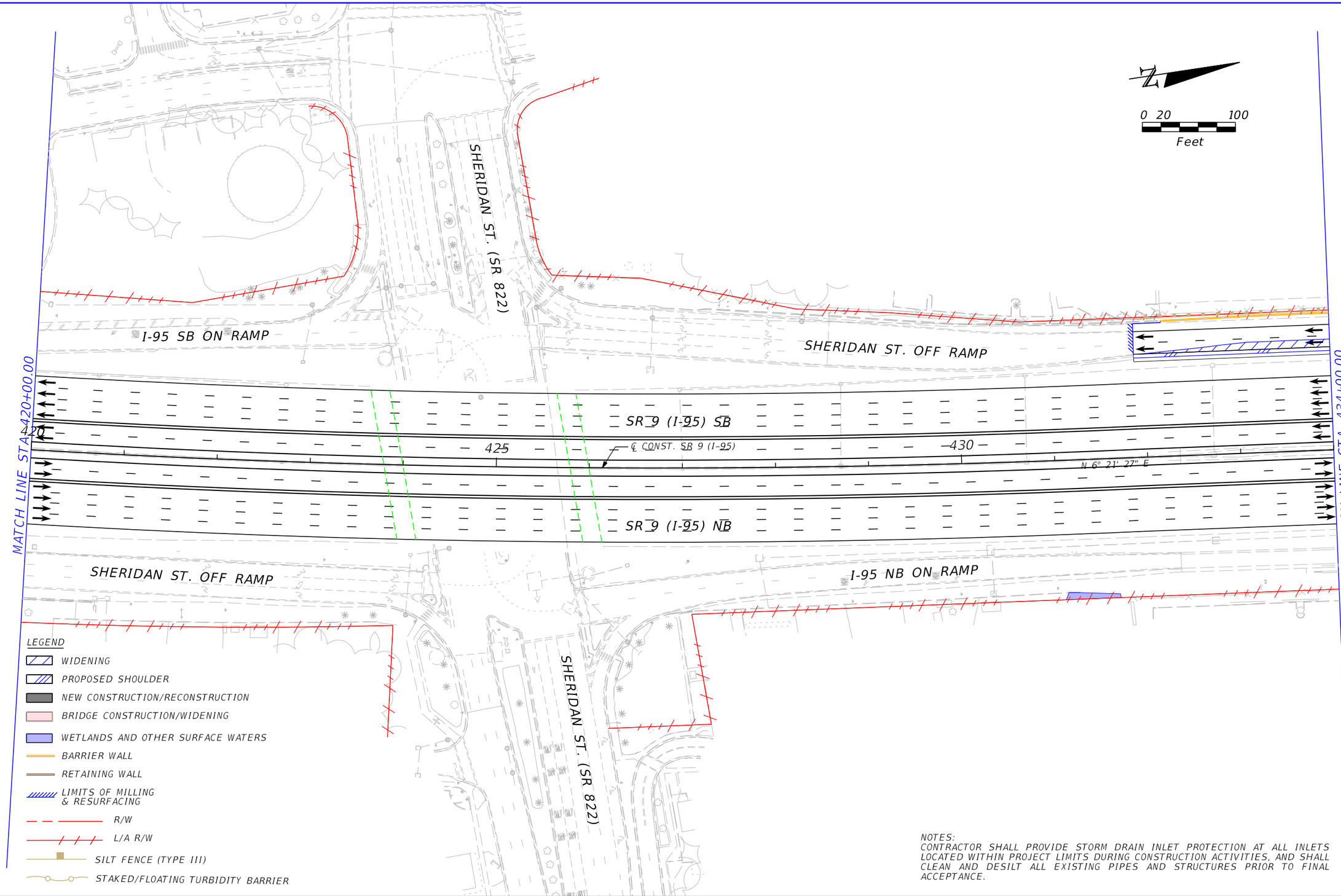
System 10
Existing Data



NOTES:
CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-10

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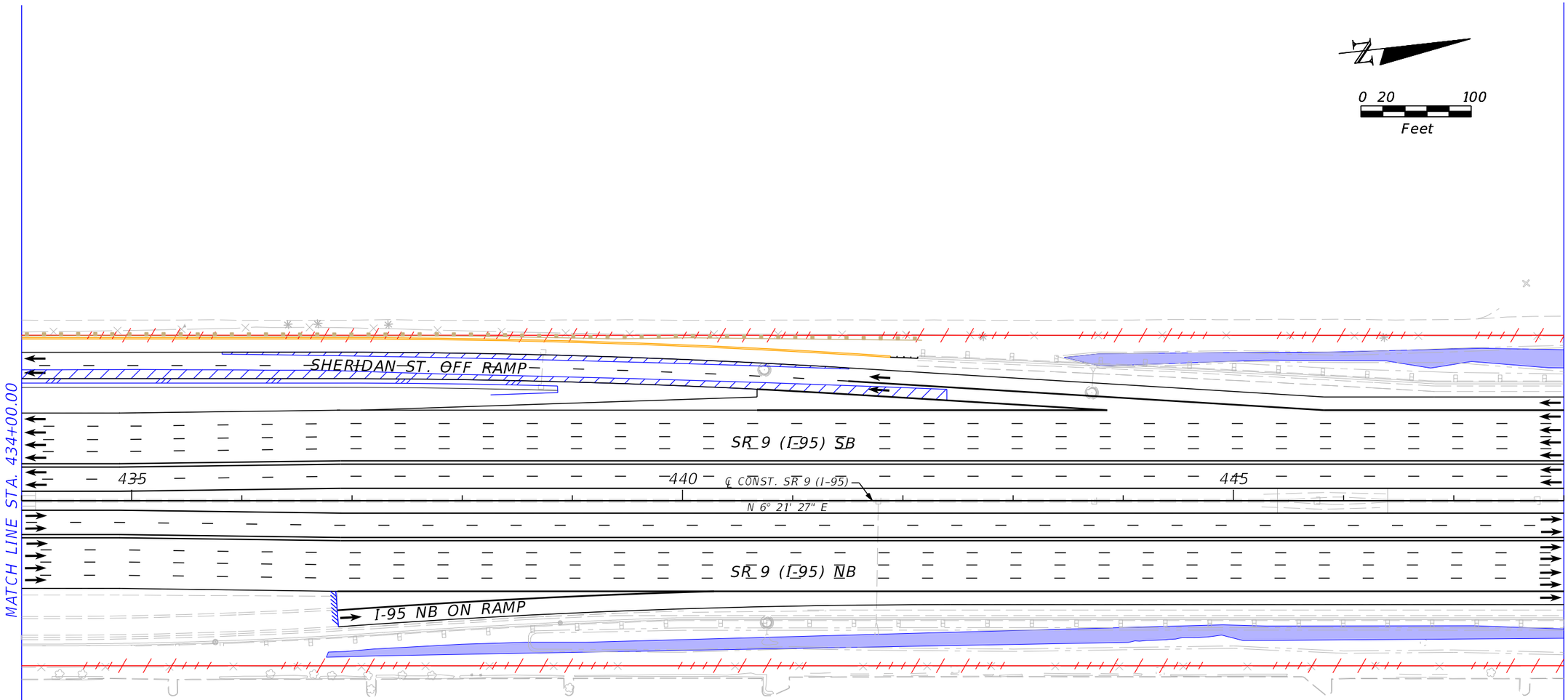

LEGEND

- WIDENING
- PROPOSED SHOULDER
- NEW CONSTRUCTION/RECONSTRUCTION
- BRIDGE CONSTRUCTION/WIDENING
- WETLANDS AND OTHER SURFACE WATERS
- BARRIER WALL
- RETAINING WALL
- LIMITS OF MILLING & RESURFACING
- R/W
- L/A R/W
- SILT FENCE (TYPE III)
- STAKED/FLOATING TURBIDITY BARRIER

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO.
R-11

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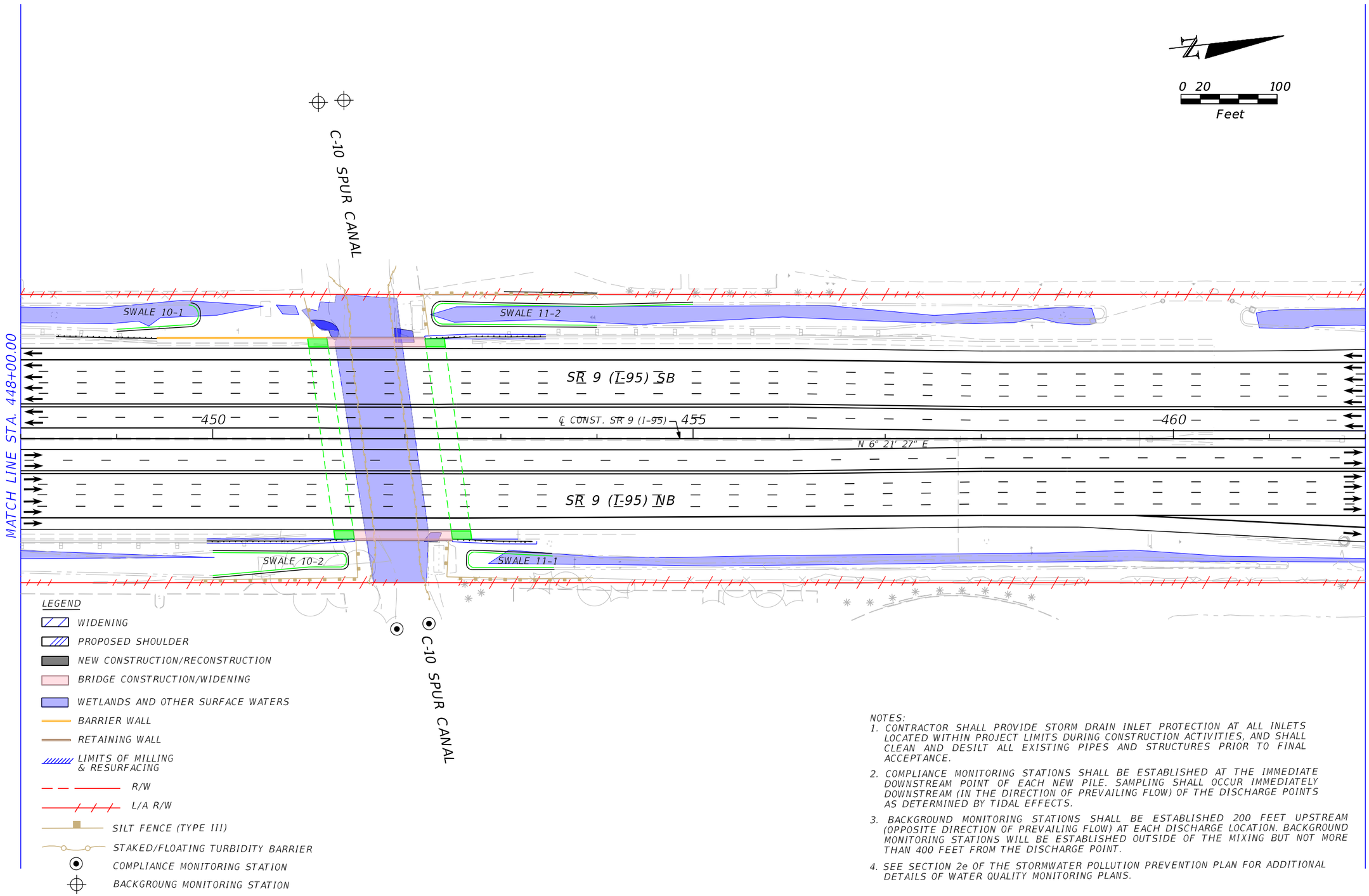

NOTES:

1. CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.
2. COMPLIANCE MONITORING STATIONS SHALL BE ESTABLISHED AT THE IMMEDIATE DOWNSTREAM POINT OF EACH NEW PILE. SAMPLING SHALL OCCUR IMMEDIATELY DOWNSTREAM (IN THE DIRECTION OF PREVAILING FLOW) OF THE DISCHARGE POINTS AS DETERMINED BY TIDAL EFFECTS.
3. BACKGROUND MONITORING STATIONS SHALL BE ESTABLISHED 200 FEET UPSTREAM (OPPOSITE DIRECTION OF PREVAILING FLOW) AT EACH DISCHARGE LOCATION. BACKGROUND MONITORING STATIONS WILL BE ESTABLISHED OUTSIDE OF THE MIXING BUT NOT MORE THAN 400 FEET FROM THE DISCHARGE POINT.
4. SEE SECTION 2e OF THE STORMWATER POLLUTION PREVENTION PLAN FOR ADDITIONAL DETAILS OF WATER QUALITY MONITORING PLANS.

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REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

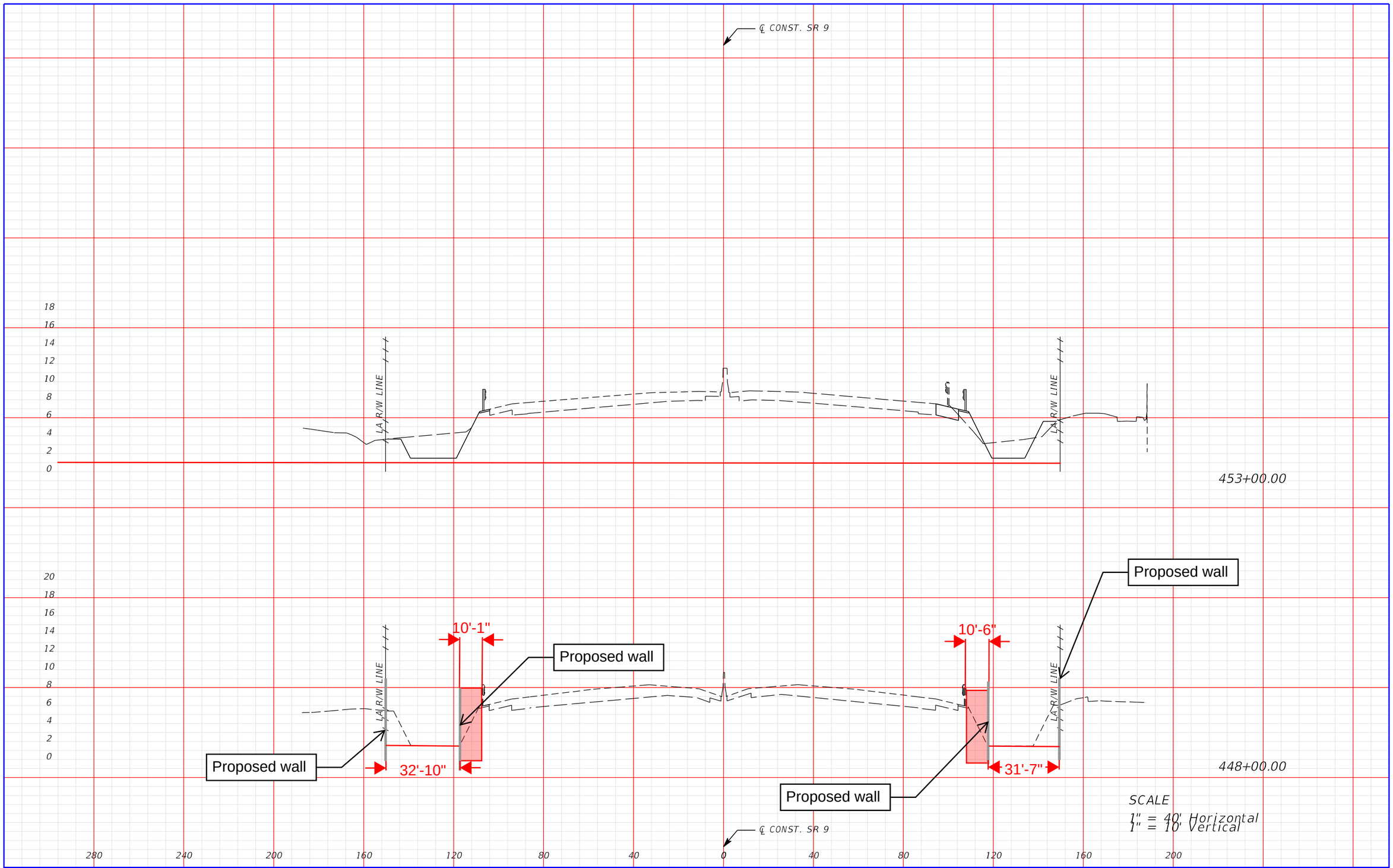
ROADWAY PLAN

SHEET NO. R-12

SYSTEM 10															
Sheridan Street to C-10 Canal Spur															
Permit 88-00050-S															
Station	Side	Ditch Fill Area (SF) Exaggerated	Ditch Fill Area (SF)	Ditch Excavation Area (SF) Exaggerated	Ditch Excavation Area (SF)	Ditch Fill Volume * (CY)	Ditch Excavation Volume * (CY)	Station	Side	Fill Area (SF) Exagge	Ditch Fill Area (SF)	Ditch Excavation Area (SF) Exaggerated	Ditch Excavation Area (SF)	Ditch Fill Volume * (CY)	Ditch Excavation Volume * (CY)
424+00.00	LT	0	0.00	0.00	0.00			424+00.00	RT	0	0.00	0.00	0.00		
425+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	425+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
426+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	426+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
427+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	427+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
428+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	428+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
429+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	429+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
430+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	430+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
431+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	431+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
432+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	432+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
433+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	433+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
434+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	434+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
435+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	435+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
436+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	436+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
437+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	437+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
438+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	438+00.00	RT	0	0.00	0.00	0.00	0.000	0.000
439+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	439+00.00	RT	2.91	0.73	19.67	4.92	1.347	9.106
440+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	440+00.00	RT	0	0.00	33.29	8.32	1.347	24.519
441+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	441+00.00	RT	0.89	0.22	55.96	13.99	0.412	41.319
442+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	442+00.00	RT	0	0.00	42.92	10.73	0.412	45.778
443+00.00	LT	0	0.00	0.00	0.00	0.000	0.000	443+00.00	RT	0	0.00	10.70	2.68	0.000	24.824
444+00.00	LT	0	0.00	70.38	17.60	0.000	32.583	444+00.00	RT	0	0.00	13.70	3.43	0.000	11.296
445+00.00	LT	0	0.00	51.30	12.83	0.000	56.333	445+00.00	RT	0	0.00	18.57	4.64	0.000	14.940
446+00.00	LT	0	0.00	84.65	21.16	0.000	62.940	446+00.00	RT	0	0.00	31.31	7.83	0.000	23.093
447+00.00	LT	4.50	1.13	23.36	5.84	2.083	50.006	447+00.00	RT	0	0.00	5.25	1.31	0.000	16.926
448+00.00	LT	1.24	0.31	42.68	10.67	2.657	30.575	448+00.00	RT	0	0.00	1.94	0.49	0.000	3.329
449+00.00	LT	4.33	1.08	46.62	11.66	2.579	41.343	449+00.00	RT	0	0.00	84.02	21.01	0.000	39.796
450+00.00	LT	0.00	0.00	102.86	25.72	2.005	69.204	450+00.00	RT	1.53	0.38	36.70	9.18	0.708	55.889
451+00.00	LT	0.00	0.00	0.00	0.00	0.000	47.621	451+00.00	RT	0	0.00	93.40	23.35	0.708	60.231
					Sub-Total (CY) =	**9.324**	**390.605**						**Sub-Total (CY) =**	**4.935**	**371.046**
					Sub-Total (Ac-ft) =	**0.006**	**0.242**						**Sub-Total (Ac-ft) =**	**0.003**	**0.230**

System 10 Totals: **Fill Total (Ac-ft): 0.009** **Excavation Total (Ac-ft): 0.472**

* Volumes calculated for ditch stations above are based on a ditch bottom elevation of 1.5-ft NAVD to a control elevation of 2.6-ft NAVD (information based on existing permit).



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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P.E. LICENSE NUMBER 61898
RS&H, INC.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-14

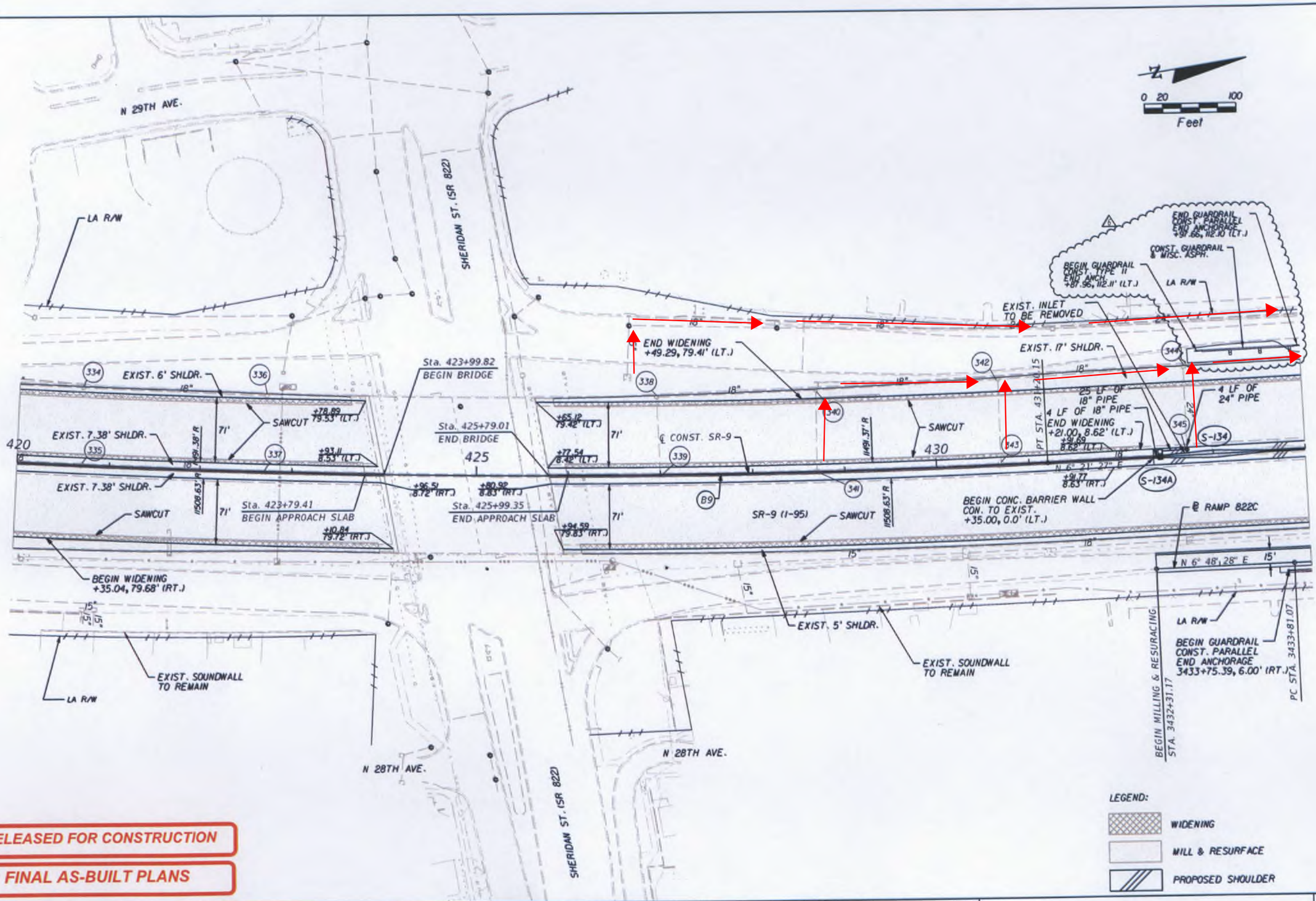
Table 2: Project Area Breakdown and Land Use Summary

PRE-DEVELOPMENT				
System	Impervious Area (ac)		Pervious Area (ac)	Total Area (ac)
	Roadway / Sidewalk, etc.	Wet Storage		
System 6	43.72	0.00	18.15	61.86
System 7	6.19	0.00	2.35	8.54
System 8	3.73	0.00	1.54	5.27
System 9	21.07	0.00	8.02	29.10
System 10	16.88	0.00	3.21	20.09

POST-DEVELOPMENT				
System	Impervious Area (ac)		Pervious Area (ac)	Total Area (ac)
	Roadway / Sidewalk, etc.	Wet Storage		
System 6	45.71	0.00	16.16	61.86
System 7	6.20	0.00	2.34	8.54
System 8	3.82	0.00	1.45	5.27
System 9	21.60	0.00	7.50	29.10
System 10	17.01	0.00	3.07	20.09

Table 3: Water Quality Summary

POST-DEVELOPMENT			
System	Water Quality Required (ac·ft)	Water Quality Provided (ac·ft)	Surplus Water Quality Provided (ac·ft)
System 6	0.311	2.621	2.310
System 7	0.011	0.076	0.065
System 8	0.077	0.248	0.171
System 9	0.427	0.868	0.441
System 10	0.115	0.472	0.357



RELEASED FOR CONSTRUCTION

FINAL AS-BUILT PLANS

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
10/9/13	6 ADDED GUARDRAIL AT SS 95-53		

C. BRIAN FULLER, P.E. # 49524
METRIC ENGINEERING, INC.
615 CRESCENT EXECUTIVE CT
SUITE 524
LAKE MARY, FLORIDA 32746
TEL. (407) 644-1898
FAX. (407) 644-1921
CERTIFICATE OF AUTHORIZATION 2294

● ENGINEERS
● PLANNERS
● SURVEYORS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 57

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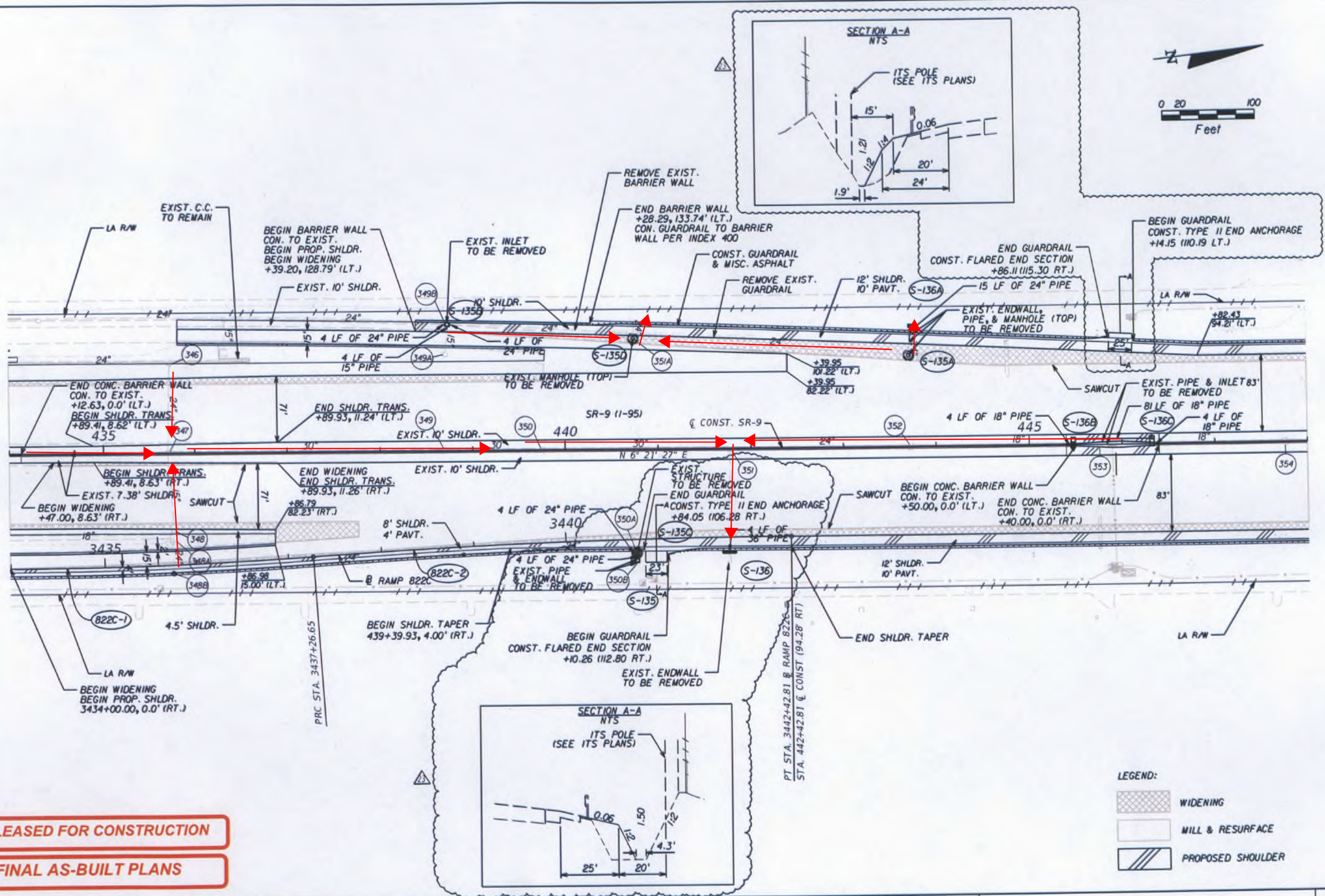

RELEASED FOR CONSTRUCTION

FINAL AS-BUILT PLANS

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
12/18/15	13 ITS ACCESS AS-BUILT		

C. BRIAN FULLER, P.E. # 49524
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LAKE MARY, FLORIDA 32746
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 58

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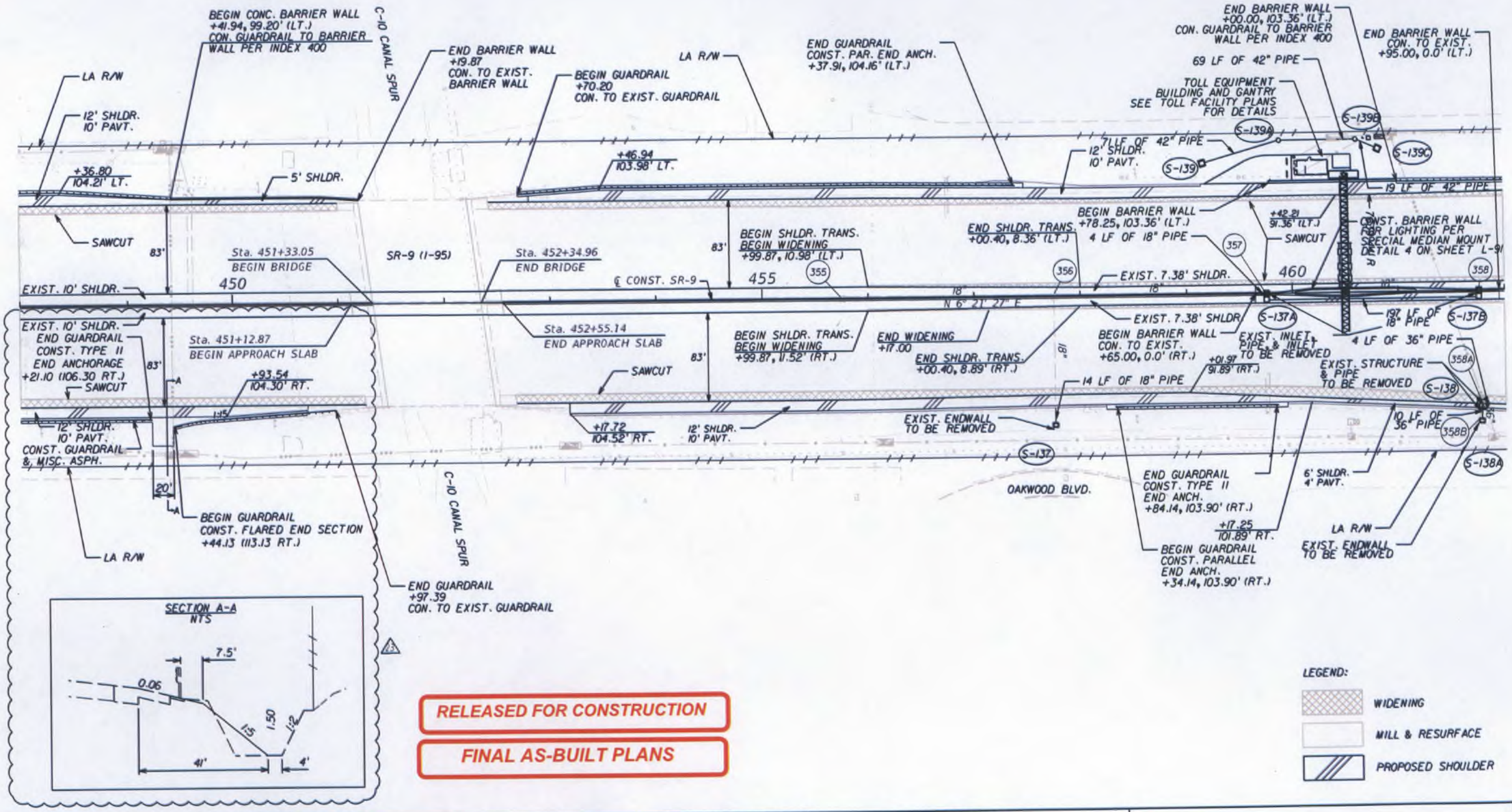
NOTE: NO RUMBLE STRIPS WITHIN TOLL PLAZA SHLDR. PAVT. LIMITS

0 20 100
Feet



RELEASED FOR CONSTRUCTION

FINAL AS-BUILT PLANS

LEGEND:

- WIDENING
- MILL & RESURFACE
- PROPOSED SHOULDER

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REVISIONS			
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12/18/15	13 ITS ACCESS AS-BUILT		

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 59

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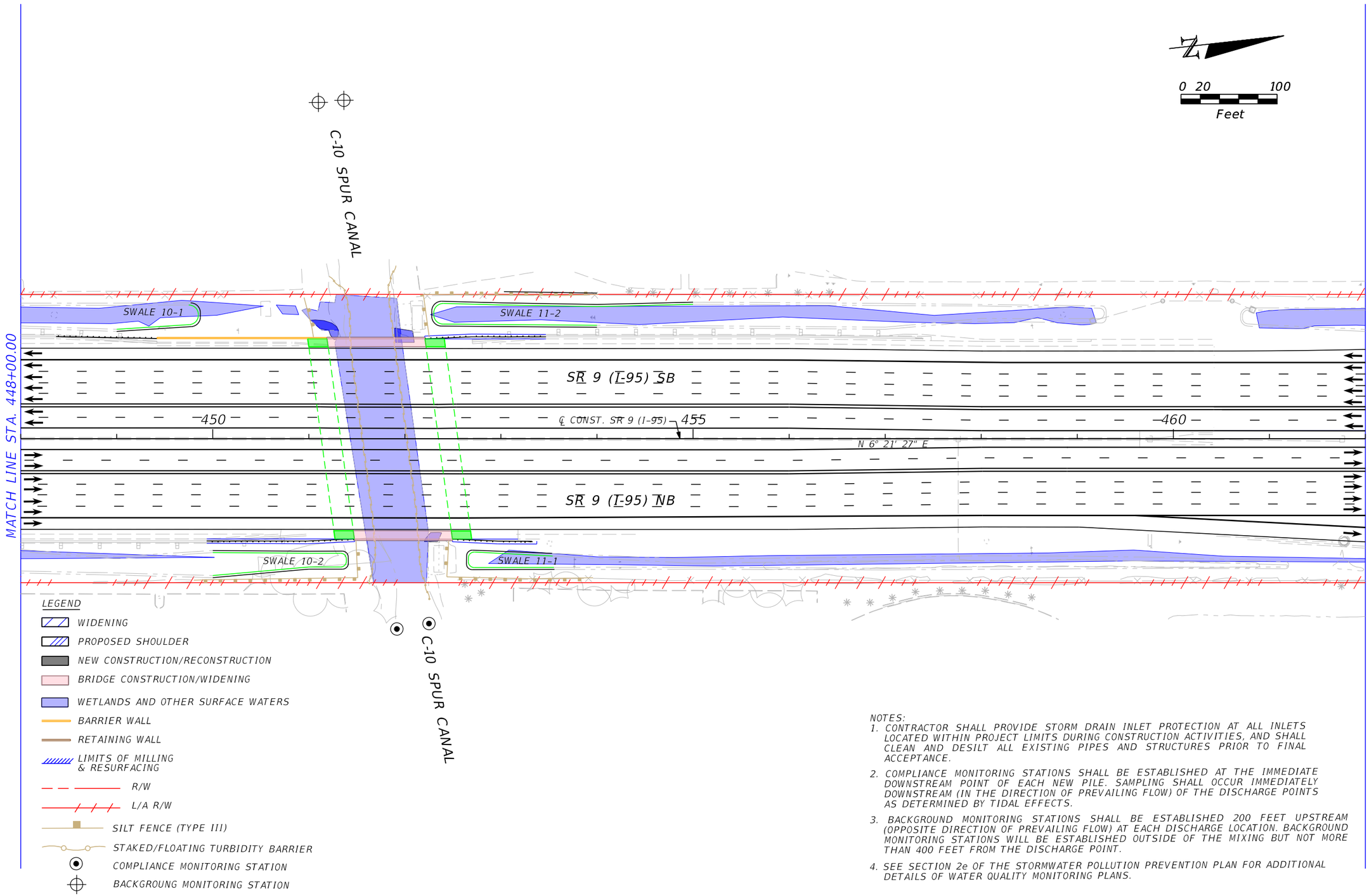
System 11
Existing Data



NOTES:

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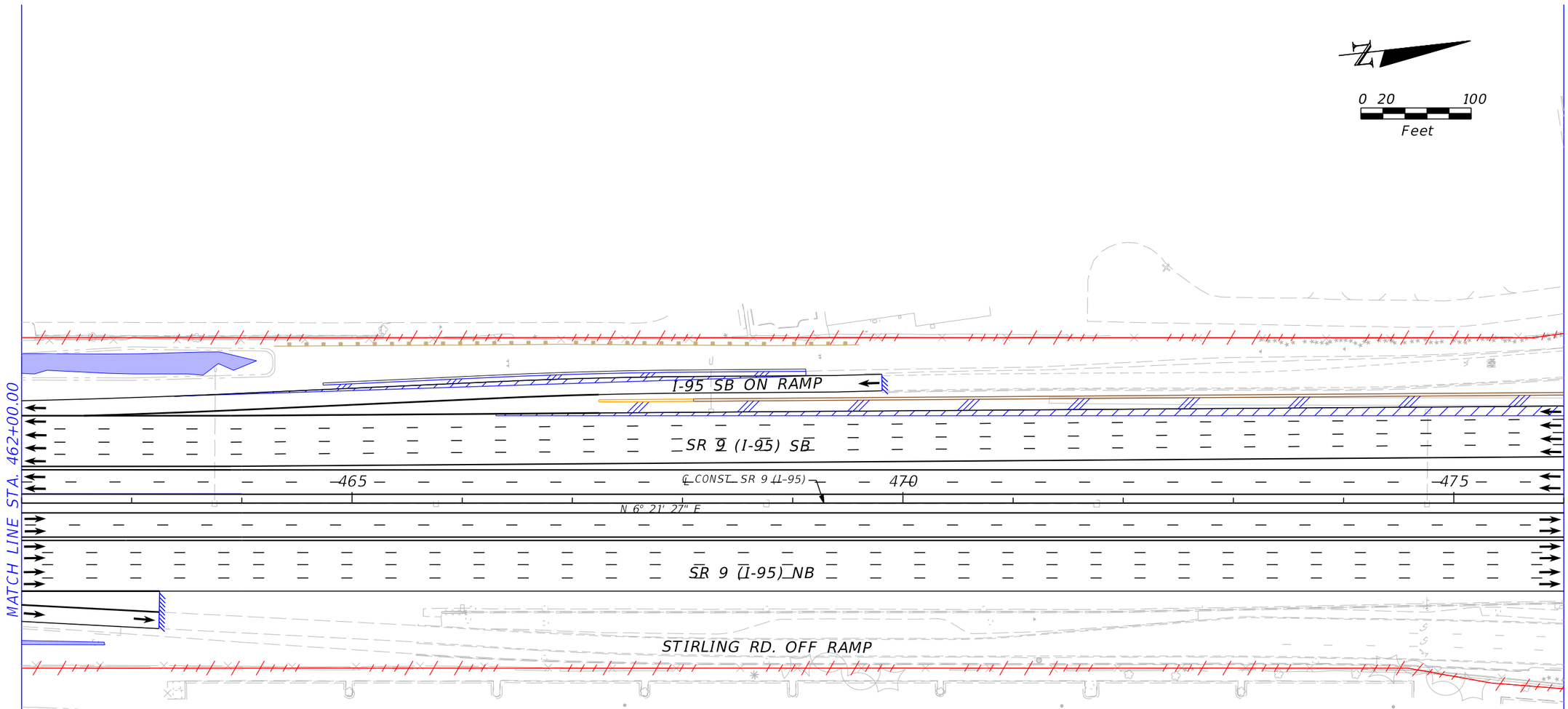
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-12



LEGEND

- WIDENING
- PROPOSED SHOULDER
- NEW CONSTRUCTION/RECONSTRUCTION
- BRIDGE CONSTRUCTION/WIDENING
- WETLANDS AND OTHER SURFACE WATERS
- BARRIER WALL
- RETAINING WALL
- LIMITS OF MILLING & RESURFACING
- R/W
- L/A R/W
- SILT FENCE (TYPE III)
- STAKED/FLOATING TURBIDITY BARRIER

NOTES:
CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO.
R-13

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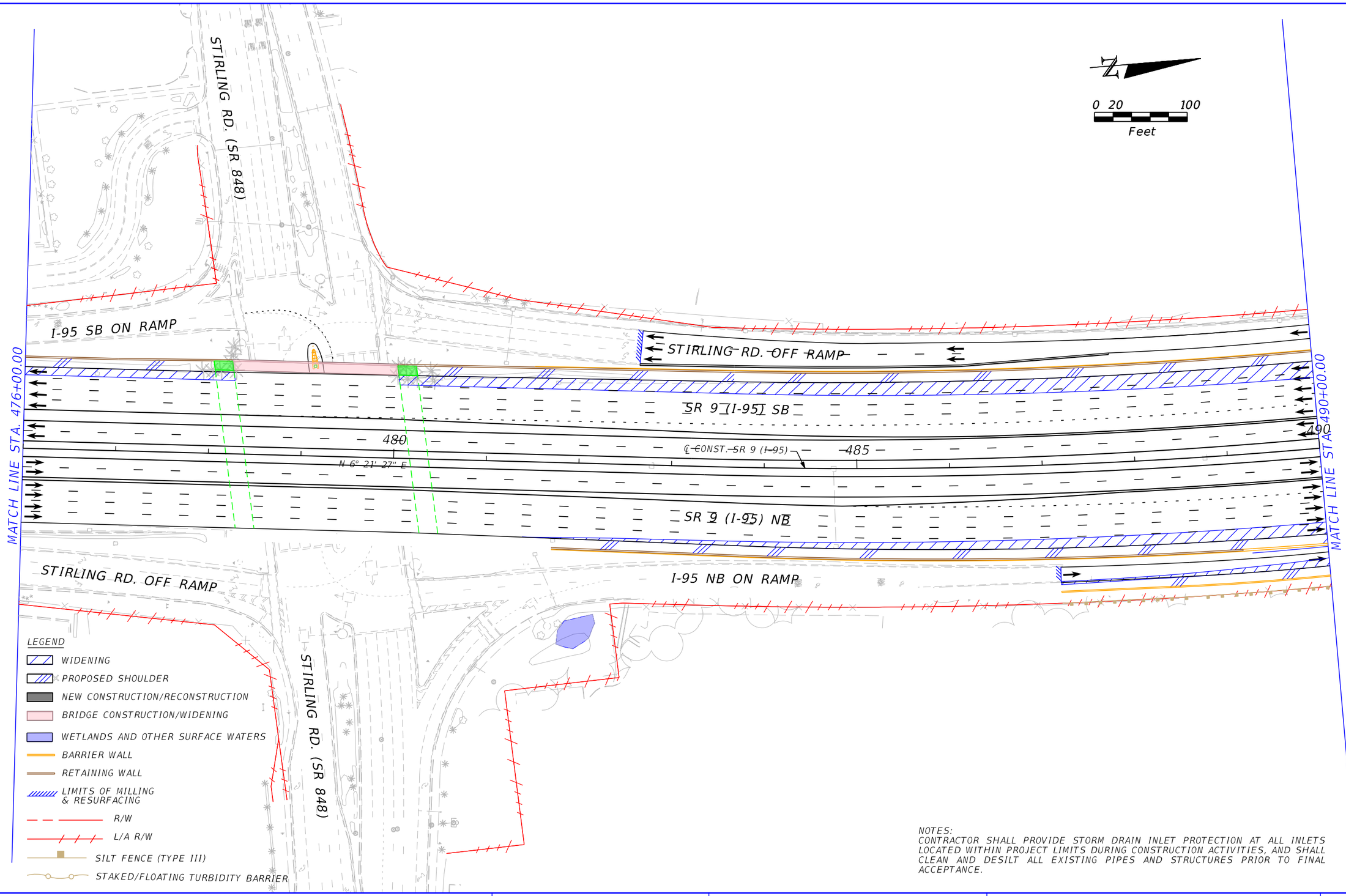

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-14

Prepared by:	HS	Date:	3/16/2021
Checked by:	CF	Date:	3/16/2021
Approved by:	WR	Date:	3/16/2021

I-95 PHASE 3C DRAINAGE CALCULATIONS

POST-DEVELOPMENT LAND-USE - SEGMENT 1B

DRAINAGE SYSTEM: 11 & 12 **SHGWT EL. (ft-NAVD):** 0.50

SYSTEM	BASIN	TIME OF CONC. tc (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)
11	11B-95	10	18.84	18.68	15.14	0.00	3.53	0.17	0.11	0.00	0.06
	11B-C10	10	0.12	0.12	0.04	0.08	0.00	0.00	0.00	0.00	0.00
	BASIN 11 TOTALS		**18.96**	**18.80**	**15.19**	**0.08**	**3.53**	**0.17**	**0.11**	**0.00**	**0.06**
12	12B-95	10	37.39	37.39	32.48	0.00	4.91	0.00	0.00	0.00	0.00
	12B-SW	10	2.42	2.42	1.39	0.00	1.03	0.00	0.00	0.00	0.00
	BASIN 12 TOTALS		**39.81**	**39.81**	**33.86**	**0.00**	**5.94**	**0.00**	**0.00**	**0.00**	**0.00**
12E	12B-SE	10	1.67	1.67	1.00	0.00	0.67	0.00	0.00	0.00	0.00
	BASIN 12E TOTALS		**1.67**	**1.67**	**1.00**	**0.00**	**0.67**	**0.00**	**0.00**	**0.00**	**0.00**
SEGMENT 1B TOTALS*			**60.44**	**60.27**	**50.05**	**0.08**	**10.15**	**0.17**	**0.11**	**0.00**	**0.06**

**Note: This land-use table is associated with Permit No. 88-00050-S. Basin 13A is associated under a different permit.*

Prepared by:	CF	Date:	2/15/2021
Checked by:	WR	Date:	2/15/2021
Approved by:	LR	Date:	2/15/2021

I-95 PHASE 3C DRAINAGE CALCULATIONS

POST-DEVELOPMENT WATER QUALITY CALCULATIONS

PERMIT No. 88-00050-S											
SYSTEM	SHGWT EL. (FT-NAVD)	PRE-DEVELOPMENT			POST-DEVELOPMENT			Add'l Impervious Area [1] (ac.)	WQ REQUIREMENTS	DRY DETENTION [2]	VOLUME PROVIDED
		Total Onsite Area (ac.)	Pervious Area (ac.)	Impervious Area (ac.)	Total Onsite Area (ac.)	Pervious Area (ac.)	Impervious Area (ac.)		2.5" Over Additional Impervious Area (ac-ft)	75% Dry Detention Volume (ac-ft)	Net Storage Volume Provided [3]
BASIN 11	0.50	18.53	3.51	14.92	18.80	3.53	15.19	0.266	0.055	0.042	0.254
BASIN 12	0.50	41.33	9.75	31.58	41.48	6.62	34.86	3.281	0.683	0.513	0.401
SEGMENT 1B TOTALS*:		59.86	13.27	46.50	60.27	10.15	50.05	3.55	0.739	0.554	0.655

NOTES:

Existing Systems 11 and 12 were permitted via Cut & Fill and are part of a network of drainage systems (Systems 9-12 from Permit No. 88-00050-S) that discharge to the C-10 Spur Canal. The existing conditions show that the existing swales do not provide the sufficient water quality required due to the complexity of it's interconnectivity on off-site drainage runoff and minimal storage capacity in the corridor. This analysis was conducted to show that the proposed conditions will not only meet the water quality requirements for the additional impervious area, but also compensate for some of the deficiency in the Systems. The Conceptual Permit had accounted for a small deficiency in the water quality provided for the additional impervious area (-0.016 Ac-ft). This is also consistent with the existing Drainage Report previously approved by SFWMD in September 2009 under 85-00070-S.

[1] Add'l Impervious Area - Difference between Post-Development and Pre-Development Impervious Areas.

[2] Dry Detention - Per SFWMD guidelines, utilizing dry detention facilities credits the permittee to a reduced 75% water quality requirement.

[3] Net Storage Volume Provided - Difference between Post-Development WQ Volume and Pre-Development WQ Volume. *(See Stage Storage Calculations)*

**Note: This calculation table is associated with Permit No. 88-00050-S. Basin 13A is associated under a different permit.*

Prepared by:	CF	Date:	10/21/2020
Checked by:	WR	Date:	10/21/2020
Approved by:	LR	Date:	10/21/2020

I-95 3C CALCULATIONS

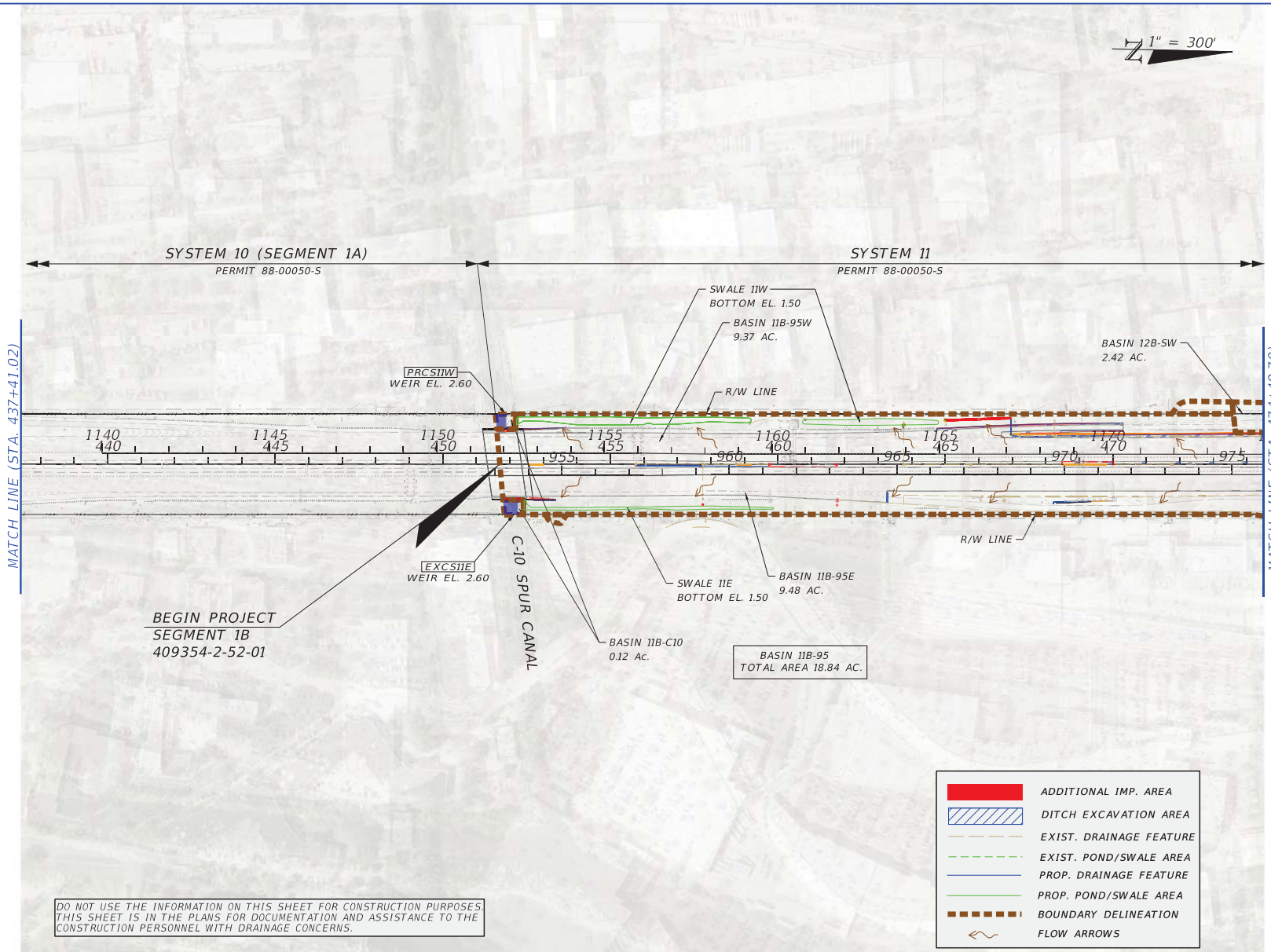
STAGE-STORAGE CALCULATION
POST-DEVELOPMENT

SWALE 11E

Elev.	Area (Ac)	Incr. Vol. (Ac-Ft)	Treatment Volume (Ac-Ft)	Remark
1.50	**0.139**	0.000	0.000	
2.00	**0.192**	0.083	0.083	
2.50	**0.261**	0.113	0.196	
2.60	0.279	0.027	0.223	Exist. Weir Elevation (ExCS11E)
3.00	**0.347**	0.125	0.348	
3.50	**0.430**	0.194	0.543	
4.00	**0.535**	0.241	0.784	
4.50	0.639	0.293	1.077	
5.00	0.744	0.346	1.423	
5.04	0.752	0.030	1.453	Overflow EL. Into R/W (1:30)
5.26	0.799	0.171	1.624	Warning Stage - Ramp
5.50	0.849	0.198	1.821	
6.00	0.954	0.451	2.272	

SWALE 11W

Elev.	Area (Ac)	Incr. Vol. (Ac-Ft)	Treatment Volume (Ac-Ft)	Remark
1.50	**0.448**	0.000	0.000	
2.00	**0.517**	0.241	0.241	
2.50	**0.585**	0.275	0.517	
2.60	0.599	0.059	0.576	Exist. Weir Elevation (PrCS11W)
3.00	**0.655**	0.251	0.827	
3.50	**0.737**	0.348	1.175	
3.85	0.804	0.270	1.444	Overflow EL. Into R/W (1:195)
4.00	**0.832**	0.123	1.567	
4.50	0.927	0.440	2.007	
5.00	1.022	0.487	2.494	
5.50	1.117	0.535	3.029	
6.00	1.212	0.582	3.611	



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

LUIS A. RODRIGUEZ, P.E.
P.E. LICENSE NUMBER 63983
BCC ENGINEERING, INC.
6401 SW 87th AVE, SUITE 200
MIAMI, FLORIDA 33173
CERTIFICATE OF AUTHORIZATION NO. 7184

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 5

mramirez 3/16/2021 10:46:21 AM c:\bms\bcc-pw-01\misael ramirez\d0139039\DRMPRD01_1B_POST 11-12.dgn

℄ CONST. SR 9

24
22
20
18
16
14
12
10
8
6
4
2
0

LA R/W LINE

LA R/W LINE

483+00.00

22
20
18
16
14
12
10
8
6
4
2
0

LA R/W LINE

Swale 11NW

23'-0"

LA R/W LINE

478+00.00

SCALE
1" = 40' Horizontal
1" = 10' Vertical

280 240 200 160 120 80 40 0 40 80 120 160 200

℄ CONST. SR 9

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

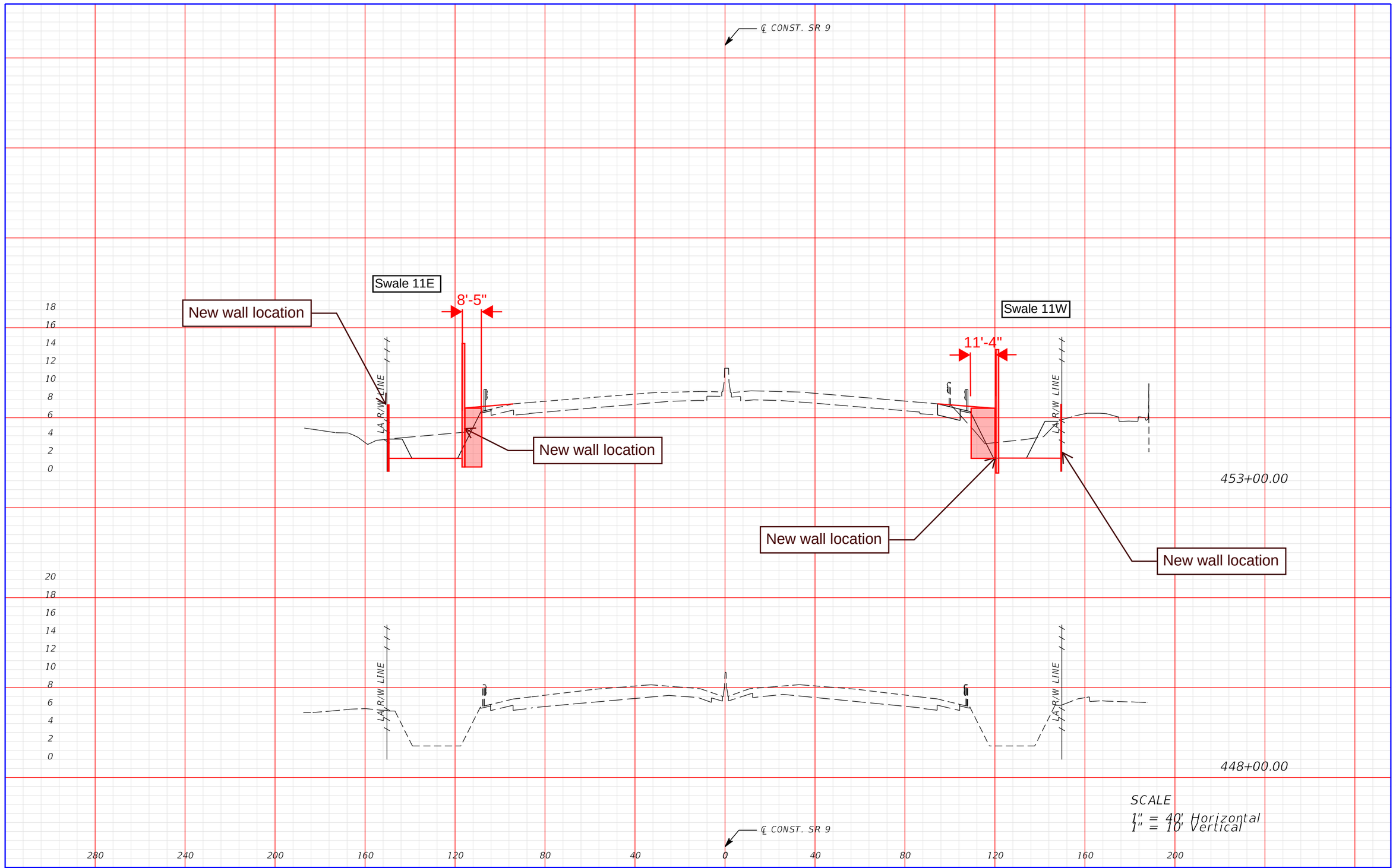
CHRISTIAN B. JACKSON, P.E.
P.E. LICENSE NUMBER 61898
RS&H, INC.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-17



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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-14

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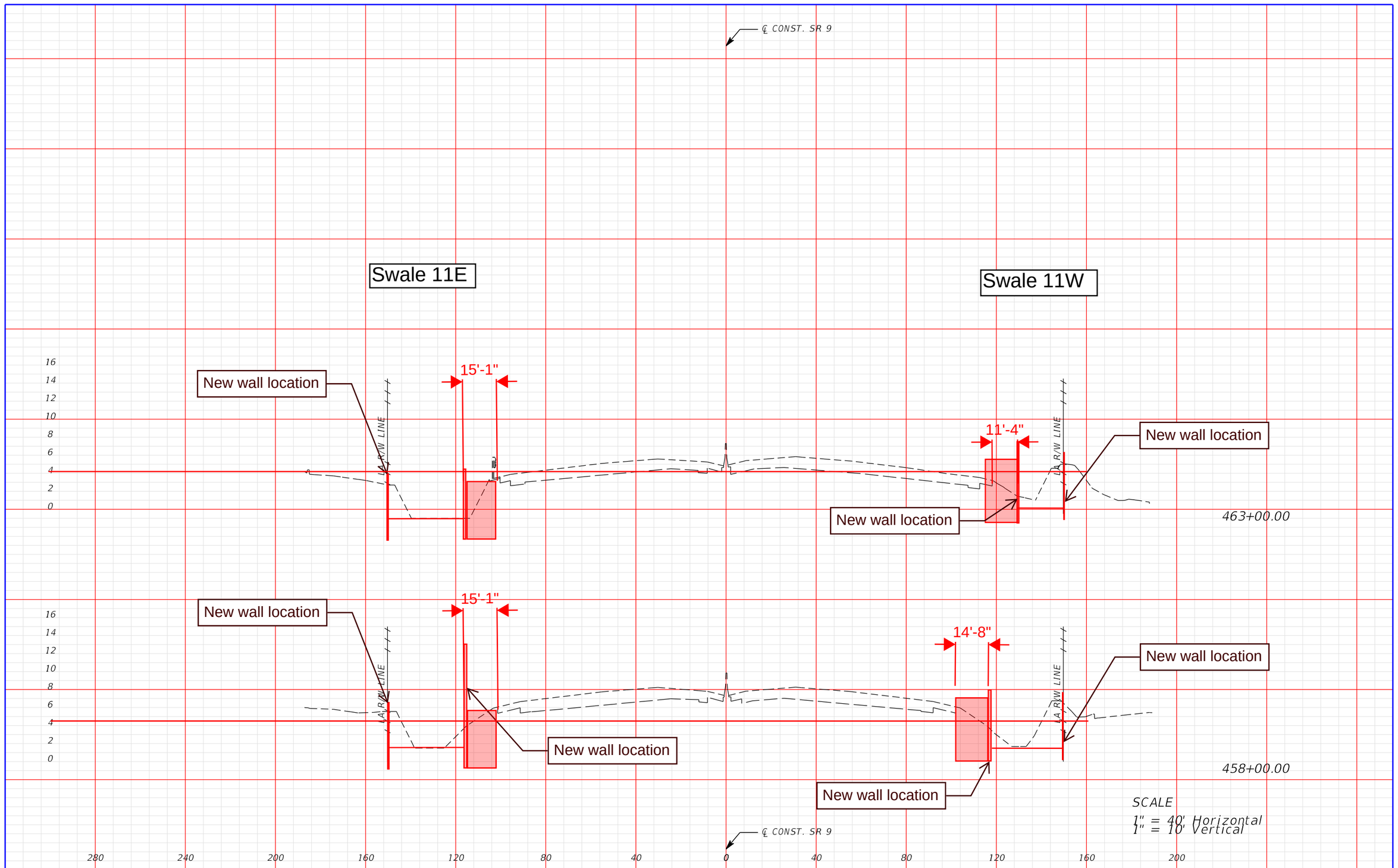

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-15

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System 12
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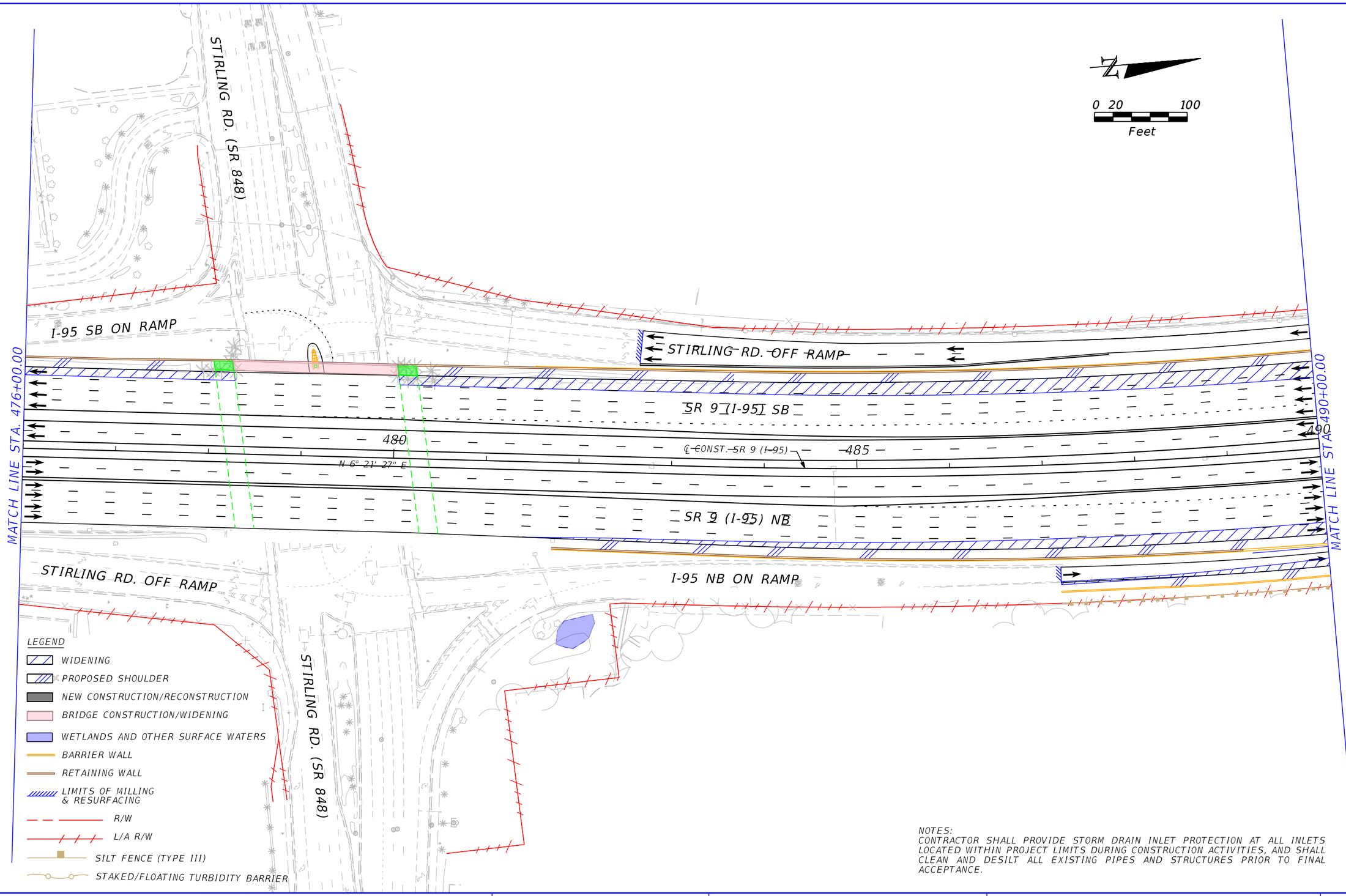

NOTES:
CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.

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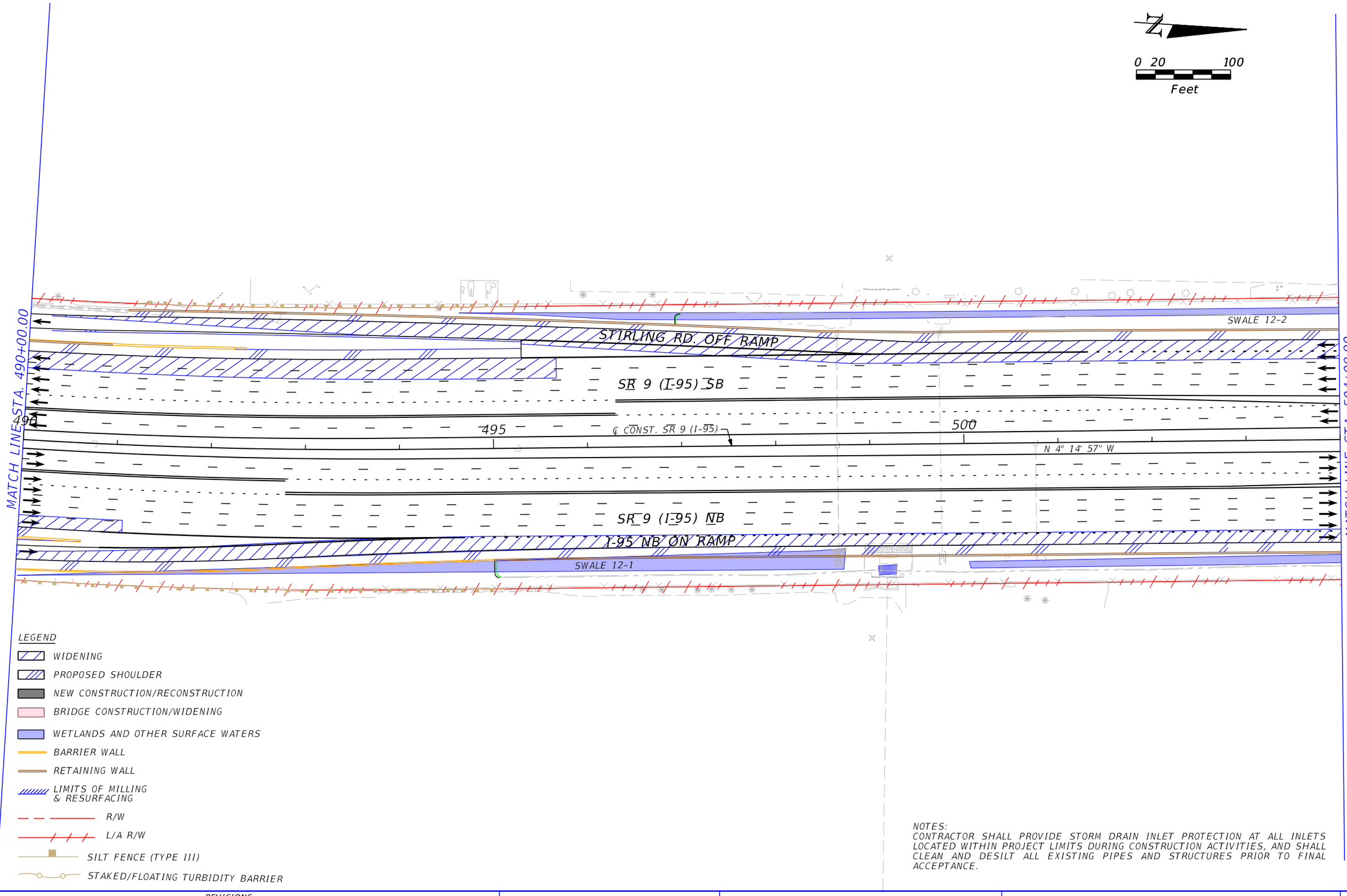
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-14



LEGEND

- WIDENING
- PROPOSED SHOULDER
- NEW CONSTRUCTION/RECONSTRUCTION
- BRIDGE CONSTRUCTION/WIDENING
- WETLANDS AND OTHER SURFACE WATERS
- BARRIER WALL
- RETAINING WALL
- LIMITS OF MILLING & RESURFACING
- R/W
- L/A R/W
- SILT FENCE (TYPE III)
- STAKED/FLOATING TURBIDITY BARRIER

NOTES:
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DEPARTMENT OF TRANSPORTATION

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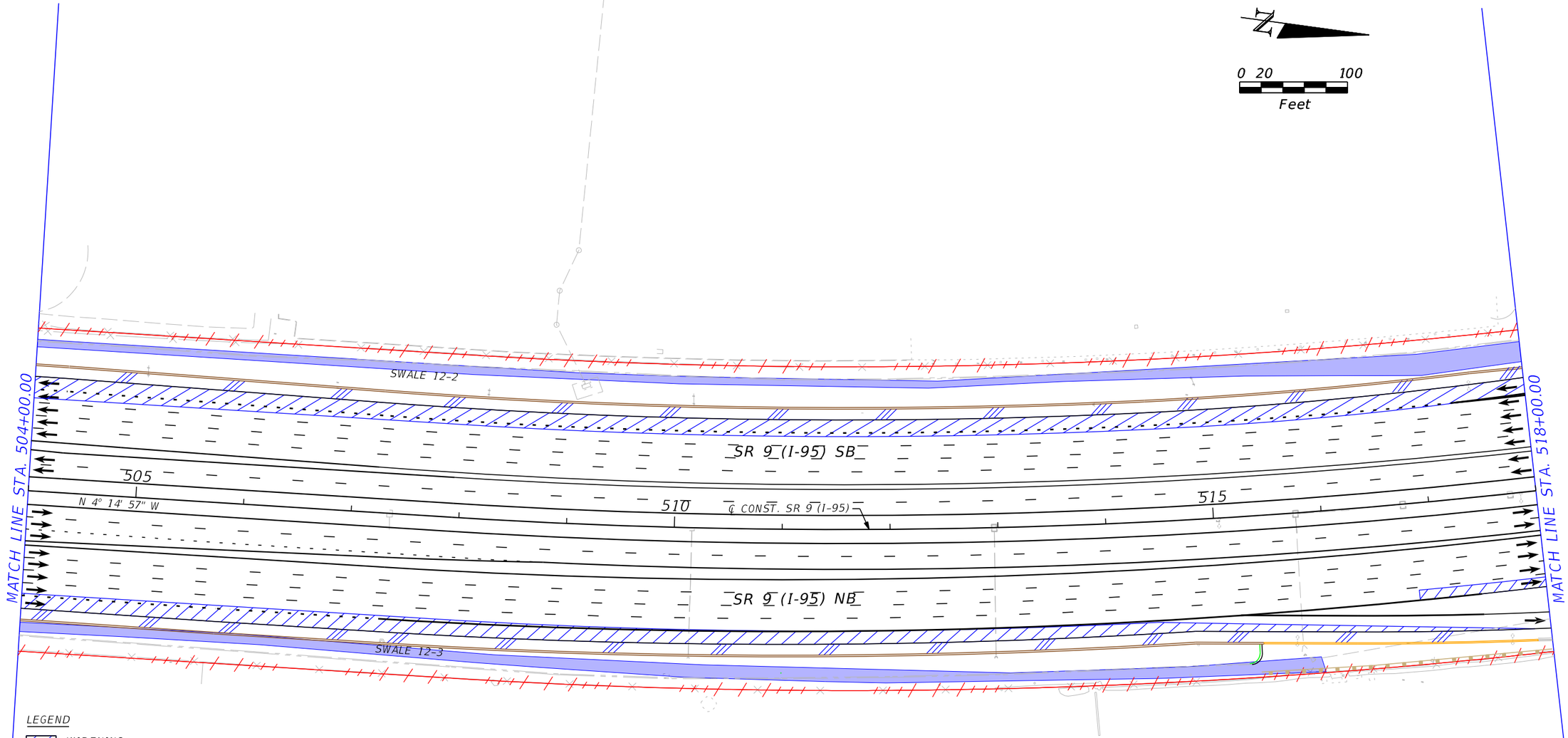
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO.
R-15



LEGEND

- WIDENING
- PROPOSED SHOULDER
- NEW CONSTRUCTION/RECONSTRUCTION
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- WETLANDS AND OTHER SURFACE WATERS
- BARRIER WALL
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NOTES:
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO.
R-16

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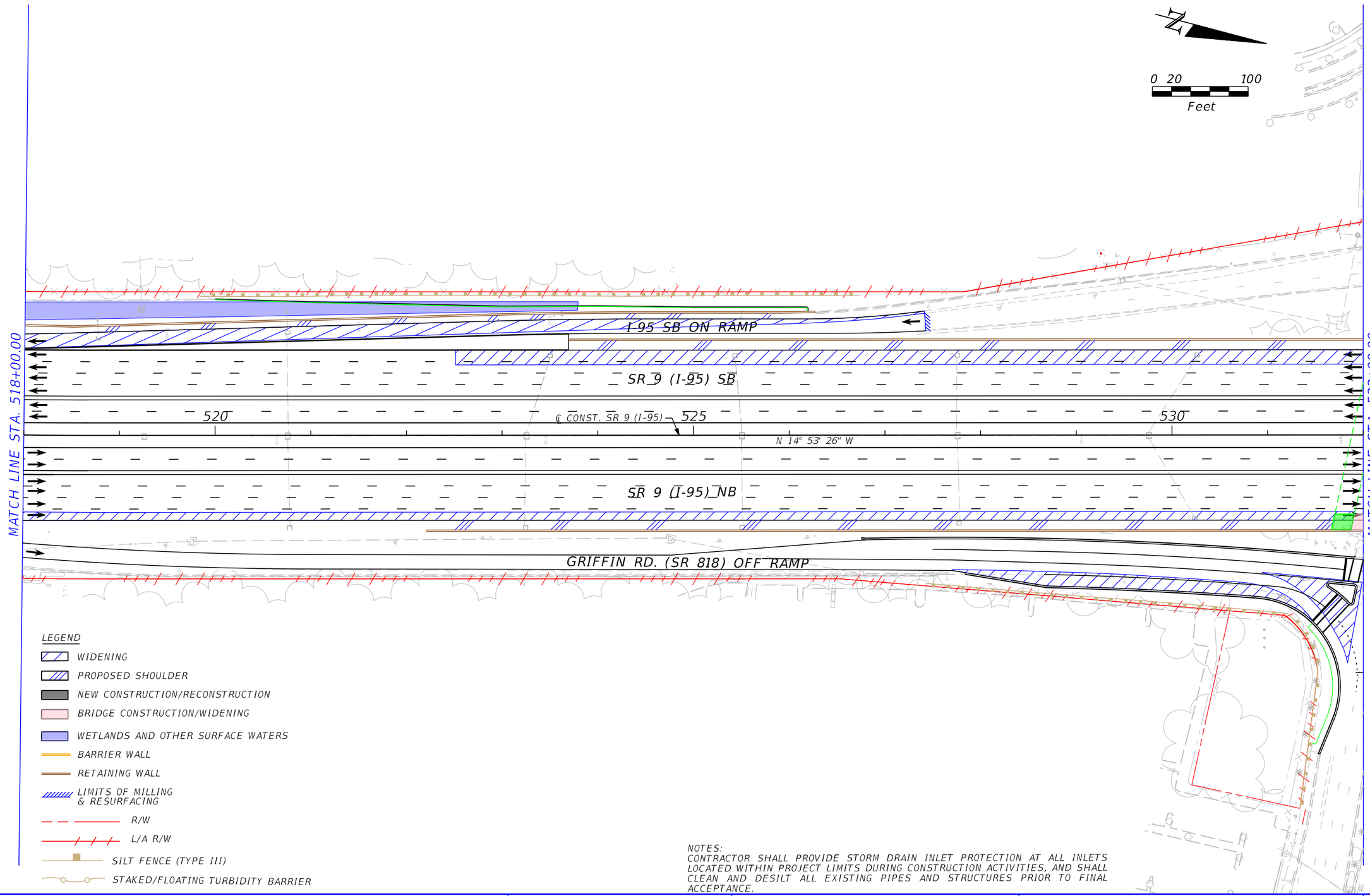

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO.
R-17

Prepared by:	HS	Date:	3/16/2021
Checked by:	CF	Date:	3/16/2021
Approved by:	WR	Date:	3/16/2021

I-95 PHASE 3C DRAINAGE CALCULATIONS

POST-DEVELOPMENT LAND-USE - SEGMENT 1B

DRAINAGE SYSTEM: 11 & 12 **SHGWT EL. (ft-NAVD):** 0.50

SYSTEM	BASIN	TIME OF CONC. tc (min.)	TOTAL AREA (Ac.)	TOTAL ONSITE AREA (Ac.)	ONSITE IMPERVIOUS AREA (Ac.)	ONSITE WATER SURFACE AREA (Ac.)	ONSITE PERVIOUS AREA (Ac.)	TOTAL OFFSITE AREA (Ac.)	OFFSITE IMPERVIOUS AREA (Ac.)	OFFSITE WATER SURFACE AREA (Ac.)	OFFSITE PERVIOUS AREA (Ac.)
11	11B-95	10	18.84	18.68	15.14	0.00	3.53	0.17	0.11	0.00	0.06
	11B-C10	10	0.12	0.12	0.04	0.08	0.00	0.00	0.00	0.00	0.00
	BASIN 11 TOTALS		**18.96**	**18.80**	**15.19**	**0.08**	**3.53**	**0.17**	**0.11**	**0.00**	**0.06**
12	12B-95	10	37.39	37.39	32.48	0.00	4.91	0.00	0.00	0.00	0.00
	12B-SW	10	2.42	2.42	1.39	0.00	1.03	0.00	0.00	0.00	0.00
	BASIN 12 TOTALS		**39.81**	**39.81**	**33.86**	**0.00**	**5.94**	**0.00**	**0.00**	**0.00**	**0.00**
12E	12B-SE	10	1.67	1.67	1.00	0.00	0.67	0.00	0.00	0.00	0.00
	BASIN 12E TOTALS		**1.67**	**1.67**	**1.00**	**0.00**	**0.67**	**0.00**	**0.00**	**0.00**	**0.00**
SEGMENT 1B TOTALS*			**60.44**	**60.27**	**50.05**	**0.08**	**10.15**	**0.17**	**0.11**	**0.00**	**0.06**

**Note: This land-use table is associated with Permit No. 88-00050-S. Basin 13A is associated under a different permit.*

Prepared by:	CF	Date:	2/15/2021
Checked by:	WR	Date:	2/15/2021
Approved by:	LR	Date:	2/15/2021

I-95 PHASE 3C DRAINAGE CALCULATIONS

POST-DEVELOPMENT WATER QUALITY CALCULATIONS

PERMIT No. 88-00050-S											
SYSTEM	SHGWT EL. (FT-NAVD)	PRE-DEVELOPMENT			POST-DEVELOPMENT			Add'l Impervious Area [1] (ac.)	WQ REQUIREMENTS	DRY DETENTION [2]	VOLUME PROVIDED
		Total Onsite Area (ac.)	Pervious Area (ac.)	Impervious Area (ac.)	Total Onsite Area (ac.)	Pervious Area (ac.)	Impervious Area (ac.)		2.5" Over Additional Impervious Area (ac-ft)	75% Dry Detention Volume (ac-ft)	Net Storage Volume Provided [3]
BASIN 11	0.50	18.53	3.51	14.92	18.80	3.53	15.19	0.266	0.055	0.042	0.254
BASIN 12	0.50	41.33	9.75	31.58	41.48	6.62	34.86	3.281	0.683	0.513	0.401
SEGMENT 1B TOTALS*:		59.86	13.27	46.50	60.27	10.15	50.05	3.55	0.739	0.554	0.655

NOTES:

Existing Systems 11 and 12 were permitted via Cut & Fill and are part of a network of drainage systems (Systems 9-12 from Permit No. 88-00050-S) that discharge to the C-10 Spur Canal. The existing conditions show that the existing swales do not provide the sufficient water quality required due to the complexity of it's interconnectivity on off-site drainage runoff and minimal storage capacity in the corridor. This analysis was conducted to show that the proposed conditions will not only meet the water quality requirements for the additional impervious area, but also compensate for some of the deficiency in the Systems. The Conceptual Permit had accounted for a small deficiency in the water quality provided for the additional impervious area (-0.016 Ac-ft). This is also consistent with the existing Drainage Report previously approved by SFWMD in September 2009 under 85-00070-S.

[1] Add'l Impervious Area - Difference between Post-Development and Pre-Development Impervious Areas.

[2] Dry Detention - Per SFWMD guidelines, utilizing dry detention facilities credits the permittee to a reduced 75% water quality requirement.

[3] Net Storage Volume Provided - Difference between Post-Development WQ Volume and Pre-Development WQ Volume. *(See Stage Storage Calculations)*

**Note: This calculation table is associated with Permit No. 88-00050-S. Basin 13A is associated under a different permit.*

Prepared by:	CF	Date:	3/16/2021
Checked by:	WR	Date:	3/16/2021
Approved by:	LR	Date:	3/16/2021

I-95 3C CALCULATIONS

STAGE-STORAGE CALCULATION
POST-DEVELOPMENT

POND 12SW (06-102237-P, ESTIMATED)

Elev.	Area (Ac)	Incr. Vol. (Ac-Ft)	Treatment Volume (Ac-Ft)	Remark
2.50	**0.200**	0.000	0.000	Area from 06-102237-P SFWMD ERP
3.00	0.218	0.104	0.104	Estimated using 1:4 slope
4.00	0.255	0.236	0.340	Estimated using 1:4 slope
5.00	0.295	0.275	0.615	Estimated using 1:4 slope
6.00	0.338	0.316	0.932	Estimated using 1:4 slope

POND 12SE (06-102237-P)

Elev.	Area (Ac)	Incr. Vol. (Ac-Ft)	Treatment Volume (Ac-Ft)	Remark
3.50	**0.087**	0.000	0.000	
4.00	**0.123**	0.053	0.053	
4.50	**0.140**	0.066	0.118	
5.00	**0.159**	0.075	0.193	
5.50	**0.178**	0.084	0.277	
5.70	**0.185**	0.036	0.313	Exist. Weir Elevation (Ex12SE)
6.00	**0.197**	0.057	0.371	
6.50	**0.218**	0.104	0.474	
7.00	**0.241**	0.115	0.589	
7.50	**0.276**	0.129	0.718	
8.00	**0.328**	0.151	0.869	

Prepared by:	CF	Date:	10/21/2020
Checked by:	WR	Date:	10/21/2020
Approved by:	LR	Date:	10/21/2020

I-95 3C CALCULATIONS

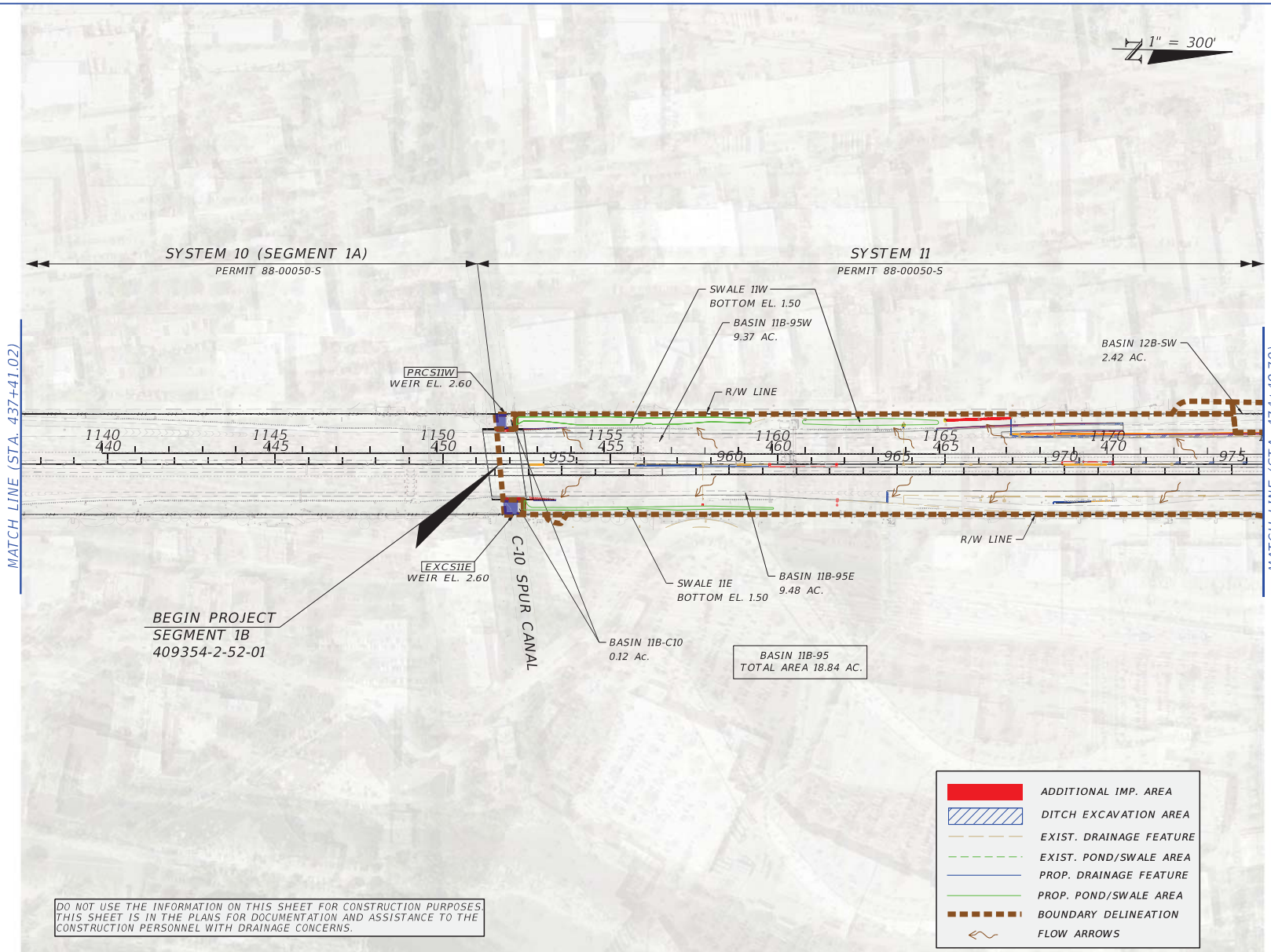
STAGE-STORAGE CALCULATION
POST-DEVELOPMENT

SWALE 12E

Elev.	Area (Ac)	Incr. Vol. (Ac-Ft)	Treatment Volume (Ac-Ft)	Remark
1.50	**0.877**	0.000	0.000	
1.95	0.942	0.409	0.409	Exist. Weir Elevation (ExCS12E)
2.00	**0.950**	0.047	0.457	
2.50	**1.010**	0.490	0.946	
3.00	**1.075**	0.521	1.468	
3.45	1.132	0.497	1.964	Overflow EL. Into R/W (1:60)
3.50	**1.139**	0.057	2.021	
4.00	**1.206**	0.586	2.607	
4.20	1.226	0.243	2.850	Overflow EL. Into R/W (1:133.3)
4.50	1.273	0.375	3.225	
5.00	1.341	0.653	3.879	
5.50	1.408	0.687	4.566	
6.00	1.475	0.721	5.287	

SWALE 12W

Elev.	Area (Ac)	Incr. Vol. (Ac-Ft)	Treatment Volume (Ac-Ft)	Remark
1.50	**0.645**	0.000	0.000	
1.95	0.733	0.310	0.310	Exist. Weir Elevation (PrCS12E)
2.00	**0.743**	0.037	0.347	
2.33	0.812	0.257	0.604	Overflow EL. Into R/W (1:53)
2.50	**0.848**	0.141	0.745	
2.77	0.903	0.236	0.981	Overflow EL. Into Offsite (10' Width)
3.00	**0.950**	0.449	1.194	
3.50	**1.047**	0.499	1.693	
4.00	**1.145**	0.548	2.241	
4.50	1.243	0.597	2.839	
5.00	1.342	0.646	3.485	Warning Stage - Sag
5.50	1.440	0.695	4.180	
6.00	1.538	0.744	4.924	



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SR 9	BROWARD	409354-2-52-01

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 5

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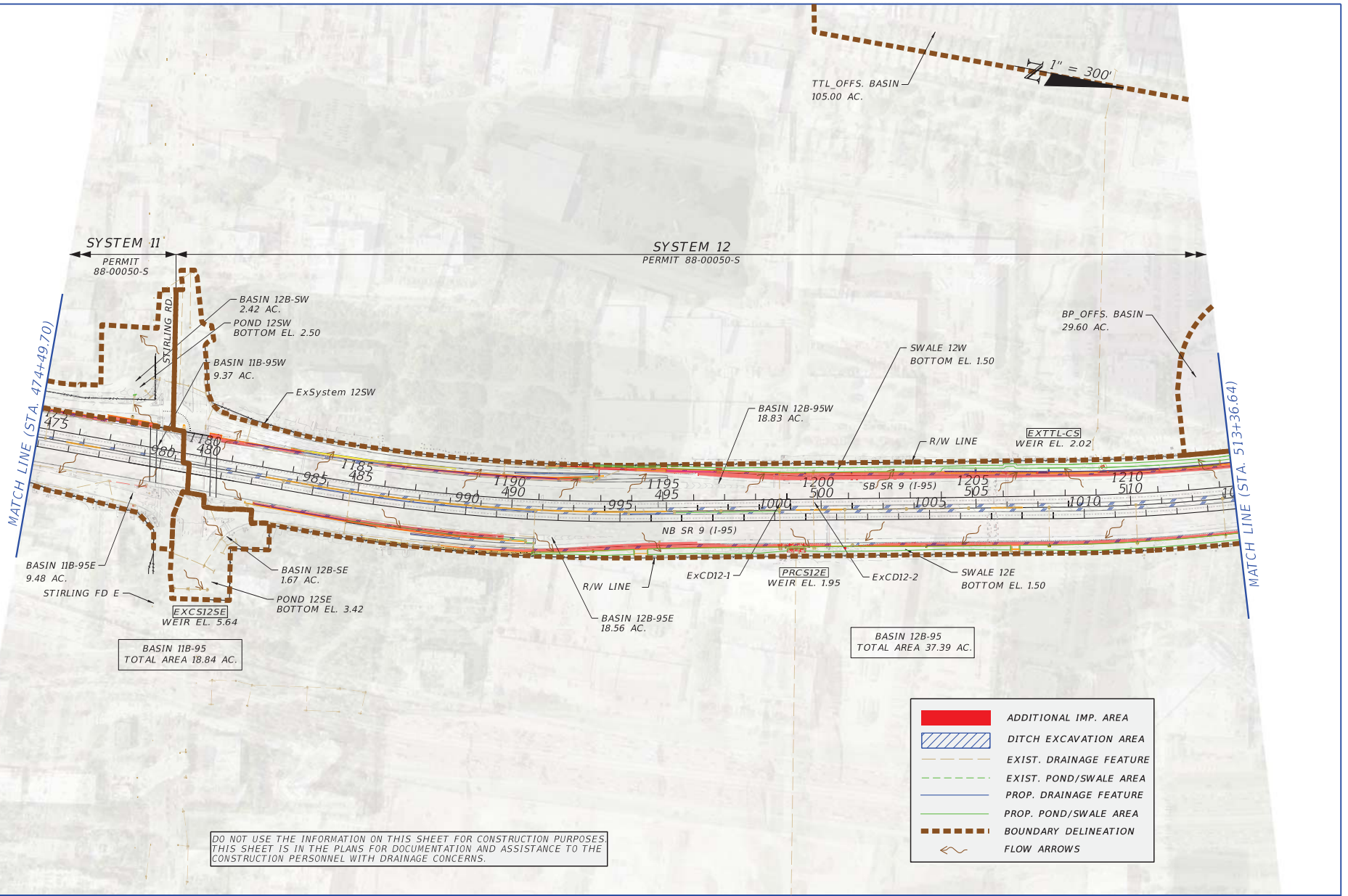

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POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 6

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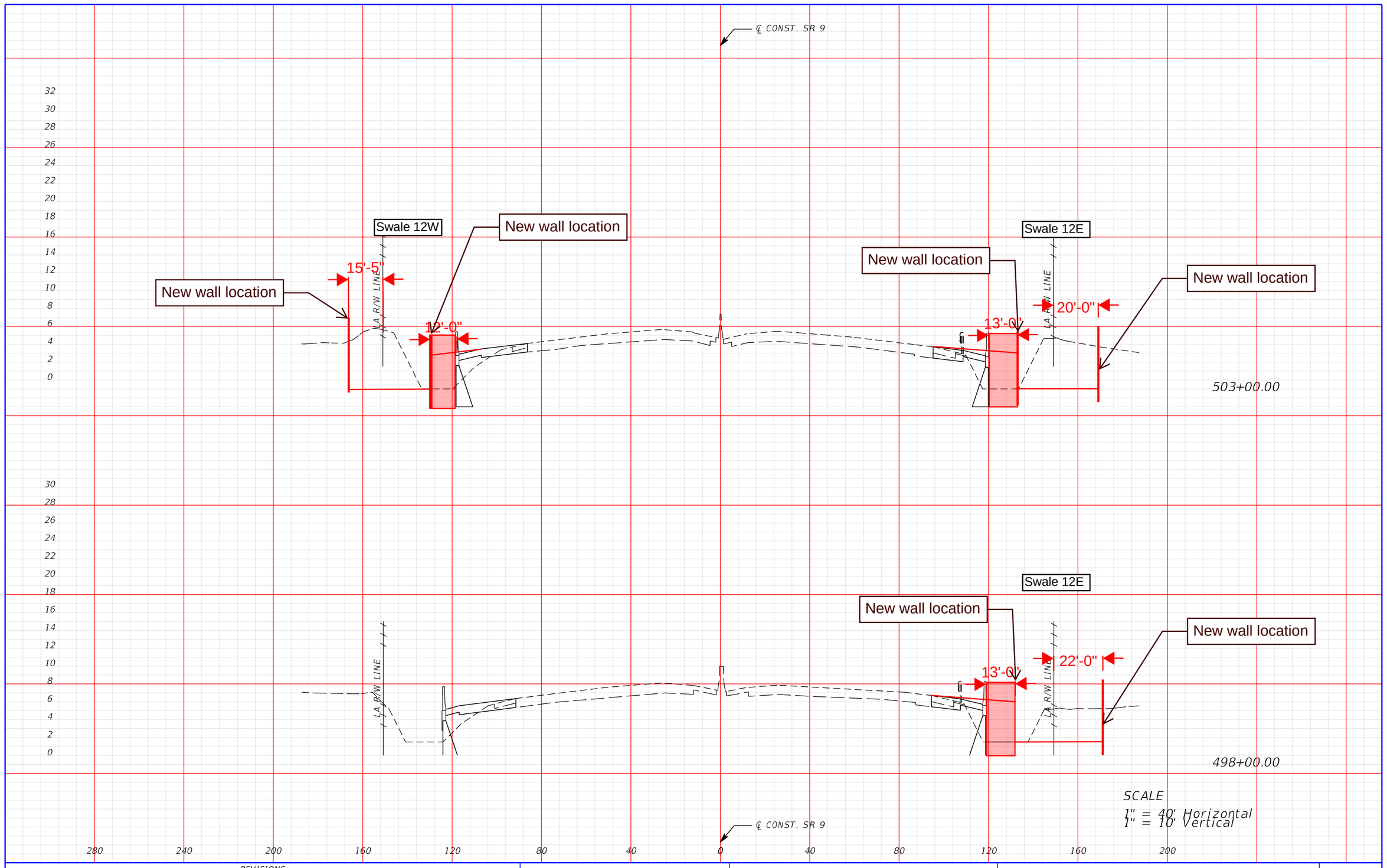

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON, P.E.
P.E. LICENSE NUMBER 61898
RS&H, INC.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

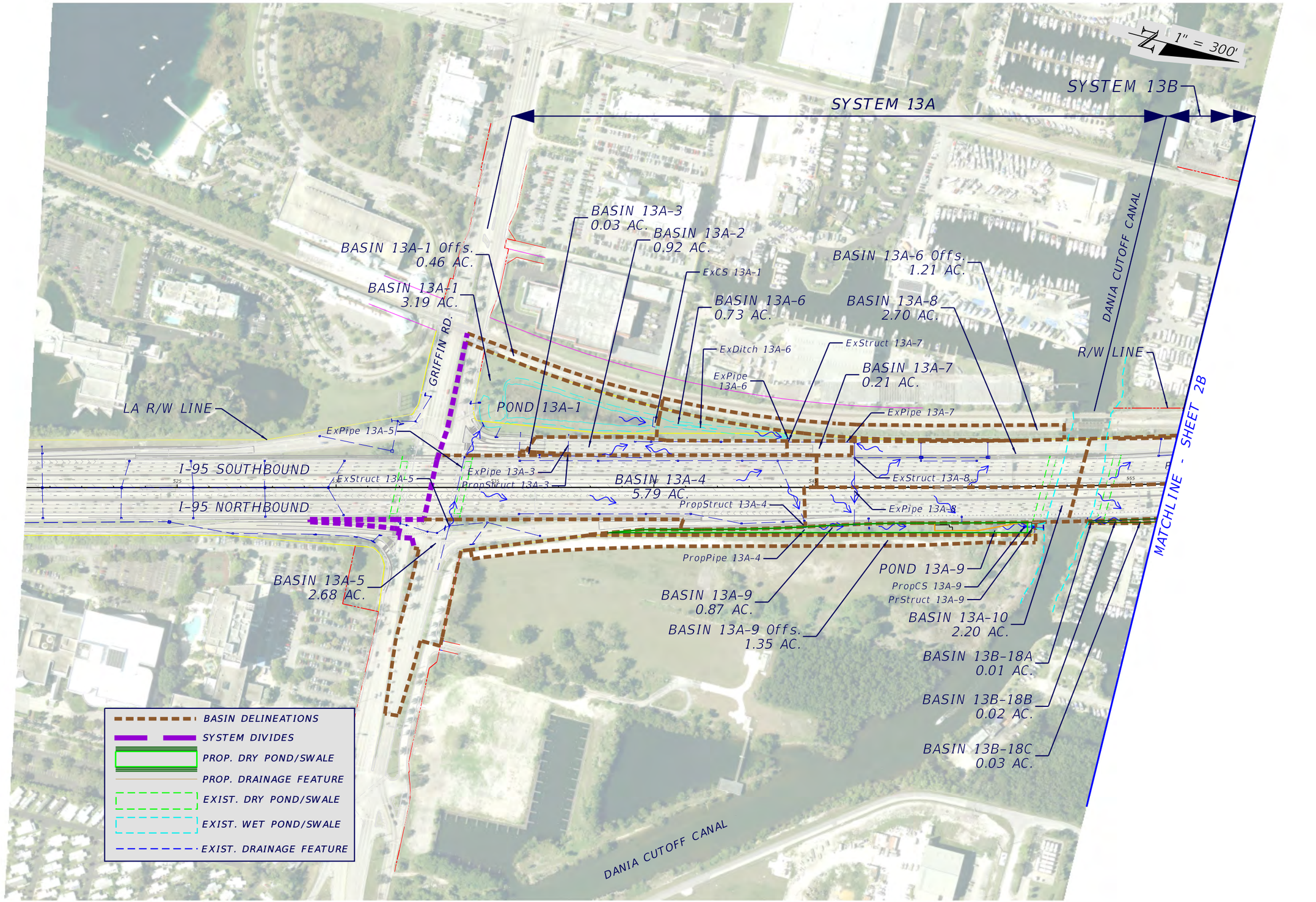
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

CROSS SECTIONS

SHEET NO.
XS-19

System 13
Existing Data



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

95 EXPRESS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	409354-2-52-01

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 1B

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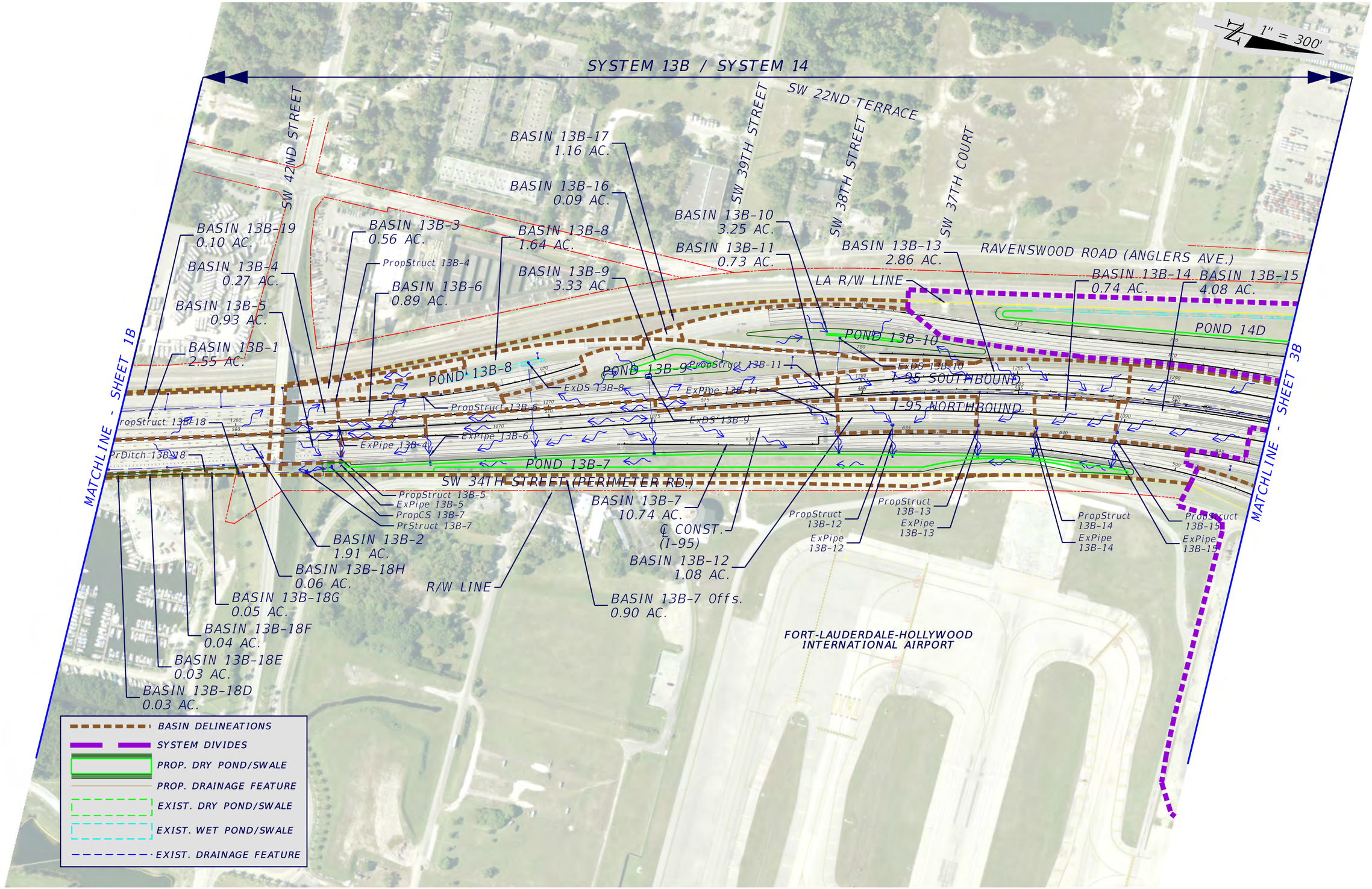

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

95 EXPRESS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	409354-2-52-01

POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 2B

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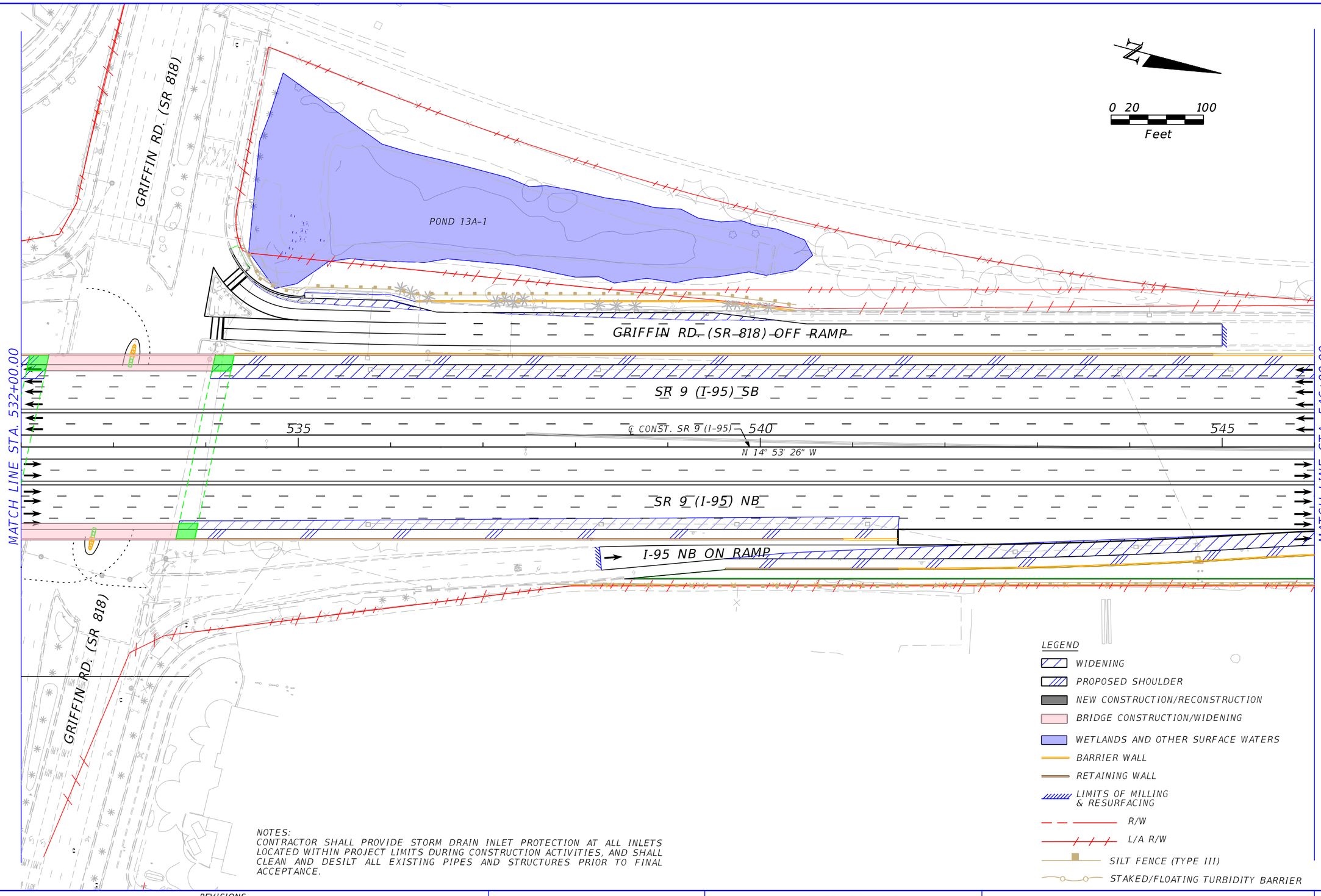
11. PROJECT SUMMARY TABLES

Table 3 – Project Area Breakdown and Land Use Summary

PRE-DEVELOPMENT					
System	Sub-system	Impervious Area (ac)		Pervious Area (ac)	Total Area (ac)
		Roadway / Sidewalk, etc.	Wet Storage		
System 13	System 13A	14.71	0.01	7.72	22.44
	System 13B	24.43	0.00	12.19	36.62
System 14	--	66.39	2.71	55.48	124.57
System 15	--	26.98	1.13	4.97	33.08
Basin 8	Basin 8E & 8G	30.95	0.48	38.96	70.39
Basin 9	--	6.54	2.11	0.00	8.65
Basin 10	--	65.33	8.29	44.83	118.45
TOTAL		**235.33**	**14.73**	**164.15**	**414.20**

POST-DEVELOPMENT					
System	Sub-system	Impervious Area (ac)		Pervious Area (ac)	Total Area (ac)
		Roadway / Sidewalk, etc.	Wet Storage		
System 13	System 13A	15.55	0.00	6.79	22.34
	System 13B	28.44	0.00	9.64	38.08
System 14	--	62.41	2.71	58.48	123.60
System 15	--	28.36	1.13	4.38	33.87
Basin 8	Basin 8E & 8G	32.88	0.48	36.98	70.34
Basin 9	--	9.43	0.00	0.00	9.43
Basin 10	--	73.96	6.14	39.00	119.10
TOTAL		**251.03**	**10.46**	**155.27**	**416.76**



NOTES:
CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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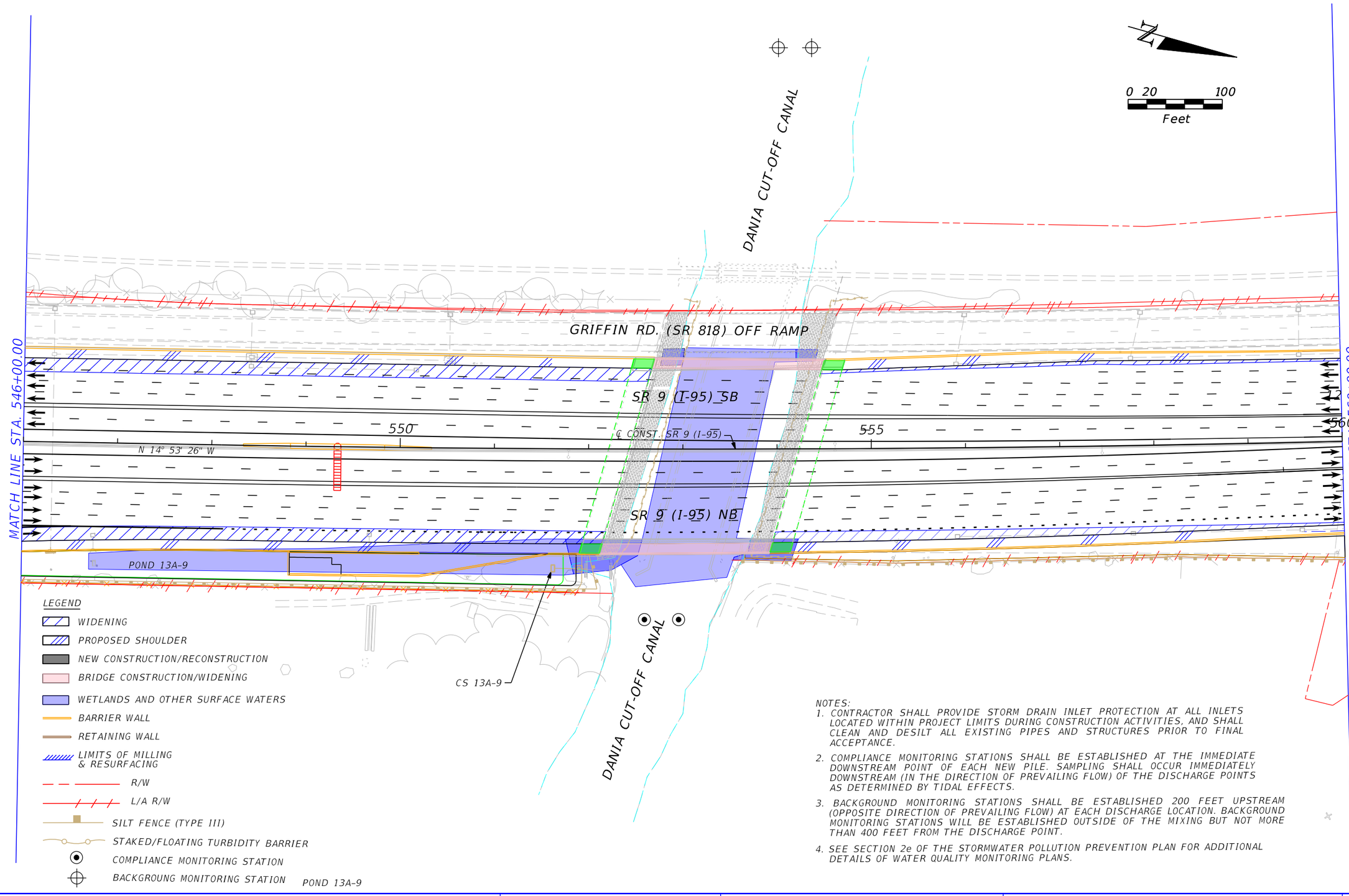
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-18

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



NOTES:

1. CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.
2. COMPLIANCE MONITORING STATIONS SHALL BE ESTABLISHED AT THE IMMEDIATE DOWNSTREAM POINT OF EACH NEW PILE. SAMPLING SHALL OCCUR IMMEDIATELY DOWNSTREAM (IN THE DIRECTION OF PREVAILING FLOW) OF THE DISCHARGE POINTS AS DETERMINED BY TIDAL EFFECTS.
3. BACKGROUND MONITORING STATIONS SHALL BE ESTABLISHED 200 FEET UPSTREAM (OPPOSITE DIRECTION OF PREVAILING FLOW) AT EACH DISCHARGE LOCATION. BACKGROUND MONITORING STATIONS WILL BE ESTABLISHED OUTSIDE OF THE MIXING BUT NOT MORE THAN 400 FEET FROM THE DISCHARGE POINT.
4. SEE SECTION 2e OF THE STORMWATER POLLUTION PREVENTION PLAN FOR ADDITIONAL DETAILS OF WATER QUALITY MONITORING PLANS.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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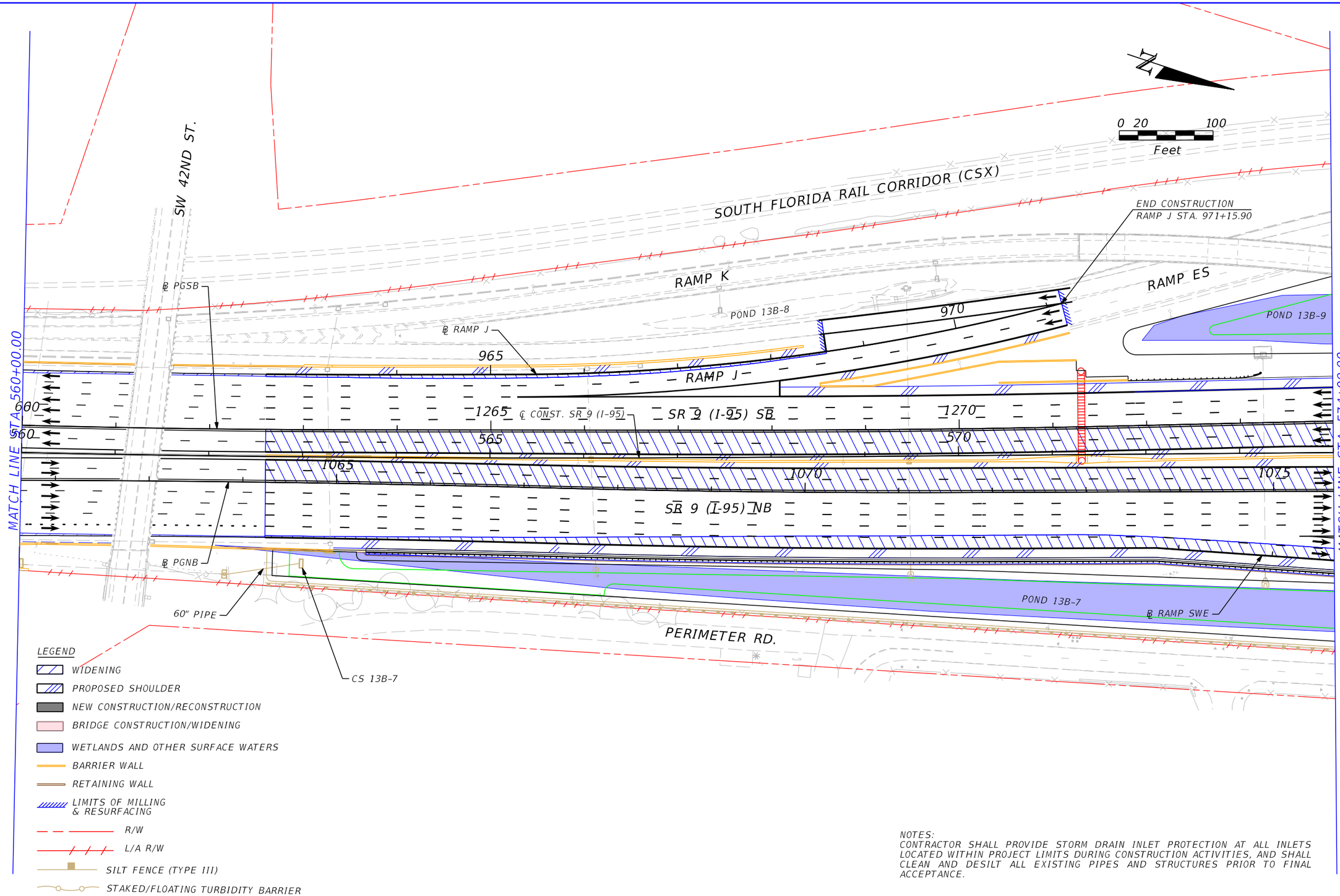
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-19

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



NOTES:
CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
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RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
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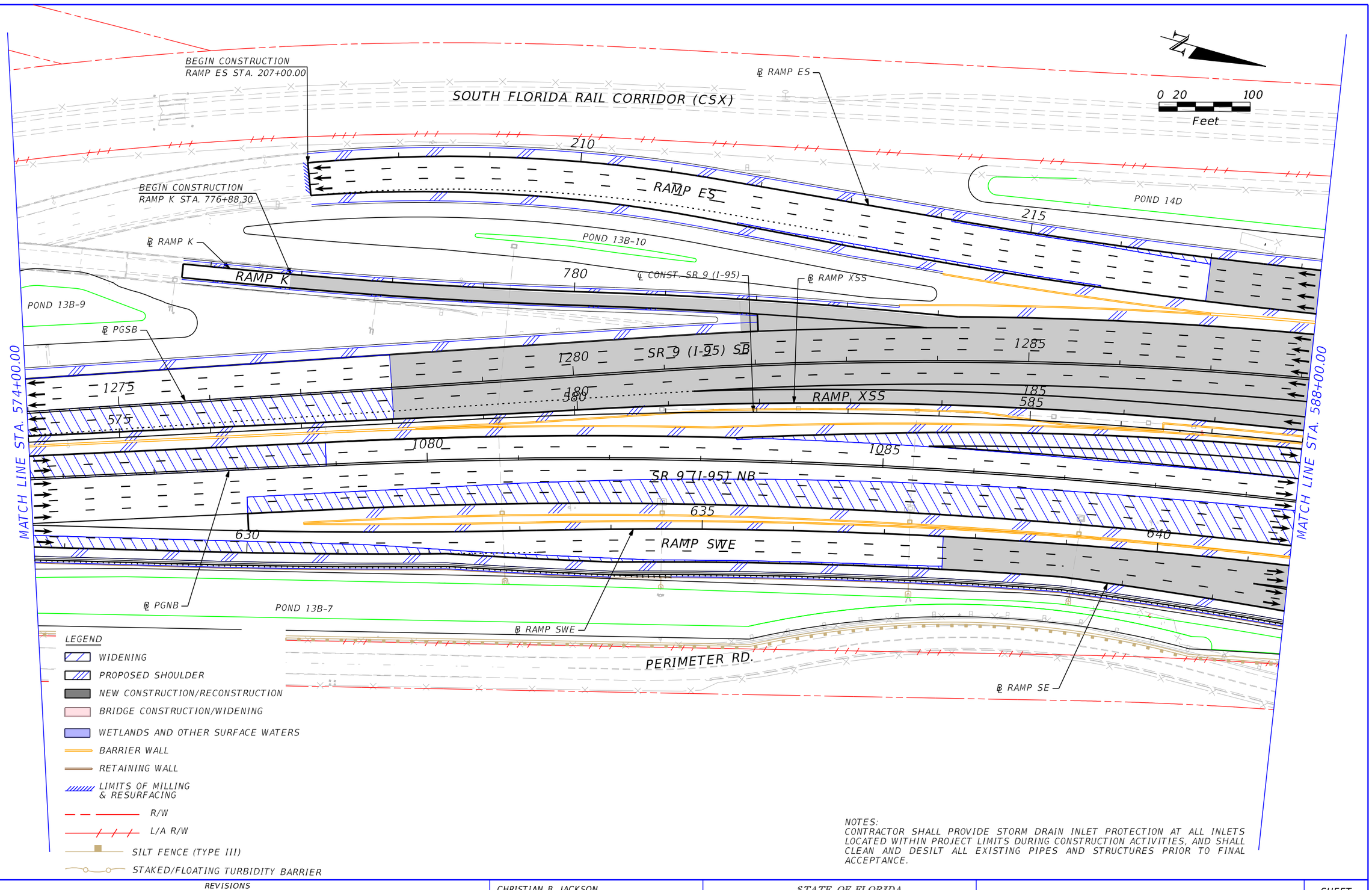
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-20

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



NOTES:
CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO. R-21

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

SOUTH FLORIDA RAIL CORRIDOR (CSX)

POND 14D

℄ RAMP ES

END CONSTRUCTION
RAMP ES STA. 227+20.01

℄ RAMP WS

RAMP ES

0 20 100
Feet

RAMP WS

POND 14C

℄ RAMP XSS

℄ PGSB

225

220

810

815

820

END CONSTRUCTION
RAMP WS STA. 820+20.82

℄ RAMP XS

SR 9 (I-95) SB

1290

1295

1300

190

590

RAMP XSS

690

195

595

695

700

RAMP XS

RAMP XSN

1095

℄ RAMP XSN

1100

1090

SR 9 (I-95) NB

645

MATCH LINE STA. 588+00.00

MATCH LINE STA. 602+00.00

℄ CONST. SR 9 (I-95)

℄ PGNB

RAMP SE

590

℄ RAMP SW

RAMP SW

END CONSTRUCTION
RAMP SW STA. 918+69.73

595

℄ RAMP SE

PERIMETER RD.

END CONSTRUCTION
RAMP SE STA. 597+92.08

LEGEND

- WIDENING
- PROPOSED SHOULDER
- NEW CONSTRUCTION/RECONSTRUCTION
- BRIDGE CONSTRUCTION/WIDENING
- WETLANDS AND OTHER SURFACE WATERS
- BARRIER WALL
- RETAINING WALL
- LIMITS OF MILLING & RESURFACING
- R/W
- L/A R/W
- SILT FENCE (TYPE
- STAKED/FLOATIN

NOTES:
CONTRACTOR SHALL PROVIDE STORM DRAIN INLET PROTECTION AT ALL INLETS LOCATED WITHIN PROJECT LIMITS DURING CONSTRUCTION ACTIVITIES, AND SHALL CLEAN AND DESILT ALL EXISTING PIPES AND STRUCTURES PRIOR TO FINAL ACCEPTANCE.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTIAN B. JACKSON
P.E. LICENSE NUMBER 61898
RS&H, Inc.
3125 W. COMMERCIAL BLVD., SUITE 130
FORT LAUDERDALE, FL 33309-3451
CERTIFICATE OF AUTHORIZATION 5620

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD	409354-2-52-01

ROADWAY PLAN

SHEET NO.
R-22

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

I-95 CDC DRAINAGE CALCULATIONS
WATER QUALITY

Drainage System: ***13A***

SYSTEM	SHGWT EL. (ft-NAVD)	TOTAL ONSITE AREA (Ac.) *[POST-DEV.]*	ONSITE IMPERVIOUS AREA (Ac.) *[POST-DEV.]*	ONSITE PERVIOUS AREA (Ac.) *[POST-DEV.]*	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	[1]WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY-DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET-DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET-RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	[2]TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
13A	0.42	19.32	14.83	4.49	1.61	3.09	**3.09**	0.21	0.00	1.42	0.00	**3.12**	**0.03**

[1]Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.
[2]Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

POND 13A-1			POND 13A-9		
TYPE:	DRY RETENTION / DETENTION		TYPE:	DRY DETENTION	
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
0.92	0.56	--	1.42	0.480	--
1.00	0.57	0.05	2.00	0.482	0.28
2.00	0.72	0.69	3.00	0.484	0.76
3.00	0.87	1.49	4.00	0.486	1.25
4.00	1.02	2.43	5.00	0.489	1.73
5.00	1.18	3.53	6.00	0.511	2.23
6.00	1.45	4.85			

BASIN 13A : POND 13A-1 DRY RETENTION TOTALS	STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME	MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT	PROVIDED WATER QUALITY TREATMENT	
	TYPE:	DRY RETENTION					
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)
	0.92	0.56	0.00	DRY RETENTION	DRY RETENTION	EXIST.	
	1.00	0.57	0.05	**1.54**	**3.07**	**2.92**	**1.42**
	2.00	0.72	0.69				
	3.00	0.87	1.49				
	4.00	1.02	2.43				
	5.00	1.18	3.53				
	6.00	1.45	4.85				

BASIN 13A: DRY DETENTION TOTALS	STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME	MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT	PROVIDED WATER QUALITY TREATMENT		
	TYPE:	DRY DETENTION						
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)
	1.42	0.48	0.00	DRY DETENTION	DRY DETENTION	PROP.		
	2.00	0.48	0.28					
	2.92	1.34	1.12					
	3.00	1.35	1.23					
	4.00	1.51	2.66	0.18	1.80	1.85	0.21	0.03
	5.00	1.67	4.24					
	6.00	1.96	6.06					

I-95 CDC DRAINAGE CALCULATIONS
WATER QUALITY

Drainage System: ***13B***

SYSTEM	SHGWT EL. (ft-NAVD)	TOTAL ONSITE AREA (Ac.) *[POST-DEV.]*	ONSITE IMPERVIOUS AREA (Ac.) *[POST-DEV.]*	ONSITE PERVIOUS AREA (Ac.) *[POST-DEV.]*	1" OVER TOTAL ONSITE AREA (Ac-ft)	2.5" OVER IMPERVIOUS AREA (Ac-ft)	[1]WATER QUALITY TREATMENT REQUIRED (Ac-ft)	DRY-DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	WET-DETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	DRY- / WET-RETENTION TREATMENT VOLUME PROVIDED (Ac-ft)	FRENCH DRAIN TREATMENT VOLUME PROVIDED (Ac-ft)	[2]TOTAL TREATMENT VOLUME PROVIDED (Ac-ft)	SURPLUS TREATMENT VOLUME PROVIDED (Ac-ft)
B13B-9	0.42	3.42	1.81	1.61	0.29	0.38	**0.38**	0.00	0.00	1.59	0.00	**3.18**	**2.80**
B13B-10	0.42	3.25	1.70	1.55	0.27	0.35	**0.35**	0.00	0.00	0.92	0.00	**1.85**	**1.49**
REST OF 13B	0.42	30.51	24.36	6.15	2.54	5.08	**5.08**	3.87	0.00	0.00	0.00	**5.16**	**0.09**
13B TOTAL	0.42	37.18	27.87	9.31	3.10	5.81	**5.81**	3.87	0.00	2.51	0.00	**10.19**	**4.38**

[1]Greater of 1" over Total Onsite Area and 2.5" over Onsite Impervious Area; Volume based on wet detention requirements.

[2]Sum of all treatment provided; Retention and Dry Detention volumes divided by 0.50 and 0.75, respectively to account for 50% and 25% credits.

POND 13B-7			POND 13B-9			POND 13B-10		
TYPE:	DRY DETENTION		TYPE:	DRY RETENTION		TYPE:	DRY RETENTION	
STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)
1.42	1.57	--	1.42	0.18	--	2.00	0.04	--
2.00	1.72	0.96	2.00	0.23	0.12	3.00	0.14	0.09
3.00	1.99	2.81	3.00	0.30	0.38	4.00	0.26	0.29
4.00	2.25	4.93	4.00	0.37	0.72	5.00	0.40	0.62
5.00	2.51	7.31	5.00	0.46	1.13	6.00	0.54	1.09
6.00	2.78	9.95	6.00	0.54	1.63			

	STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME	MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT	PROVIDED WATER QUALITY TREATMENT		
	TYPE:	DRY RETENTION						
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)
BASIN 13B-9	1.42	0.18	0.00	DRY RETENTION	DRY RETENTION	EXIST.		
	2.00	0.23	0.12	**0.19**	**2.27**	**5.92**	**1.59**	**2.80**
	3.00	0.30	0.38					
	4.00	0.37	0.72					
	5.00	0.46	1.13					
	6.00	0.54	1.63					

	STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME	MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT	PROVIDED WATER QUALITY TREATMENT		
	TYPE:	DRY RETENTION						
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)
BASIN 13B-10	2.00	0.04	0.00	DRY RETENTION	DRY RETENTION	EXIST.		
	3.00	0.14	0.09	**0.18**	**3.66**	**5.92**	**0.92**	**1.49**
	4.00	0.26	0.29					
	5.00	0.40	0.62					

	STAGE-AREA RELATIONSHIP			REQUIRED WATER QUALITY TREATMENT VOLUME	MINIMUM WEIR ELEVATION FOR FULL WATER QUALITY TREATMENT	PROVIDED WATER QUALITY TREATMENT		
	TYPE:	DRY DETENTION						
	STAGE (ft-NAVD)	AREA (Ac.)	VOLUME (Ac-ft)	VOLUME (Ac-ft)	ELEVATION (ft-NAVD)	WEIR ELEVATION (ft-NAVD)	VOLUME PROVIDED (Ac-ft)	SURPLUS VOLUME (Ac-ft)
REST OF BASIN 13B	1.42	1.57	0.00	DRY DETENTION	DRY DETENTION	PROP.		
	2.00	1.72	0.96	**3.81**	**3.47**	**3.50**	**3.87**	**0.09**
	3.00	1.99	2.81					
	4.00	2.25	4.93					
	5.00	2.51	7.31					
	6.00	2.78	9.95					

Griffin Road
Existing Data

STATE PROJ. NO.	SHEET NO.
86070-3488	2

EXHIBIT 2

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

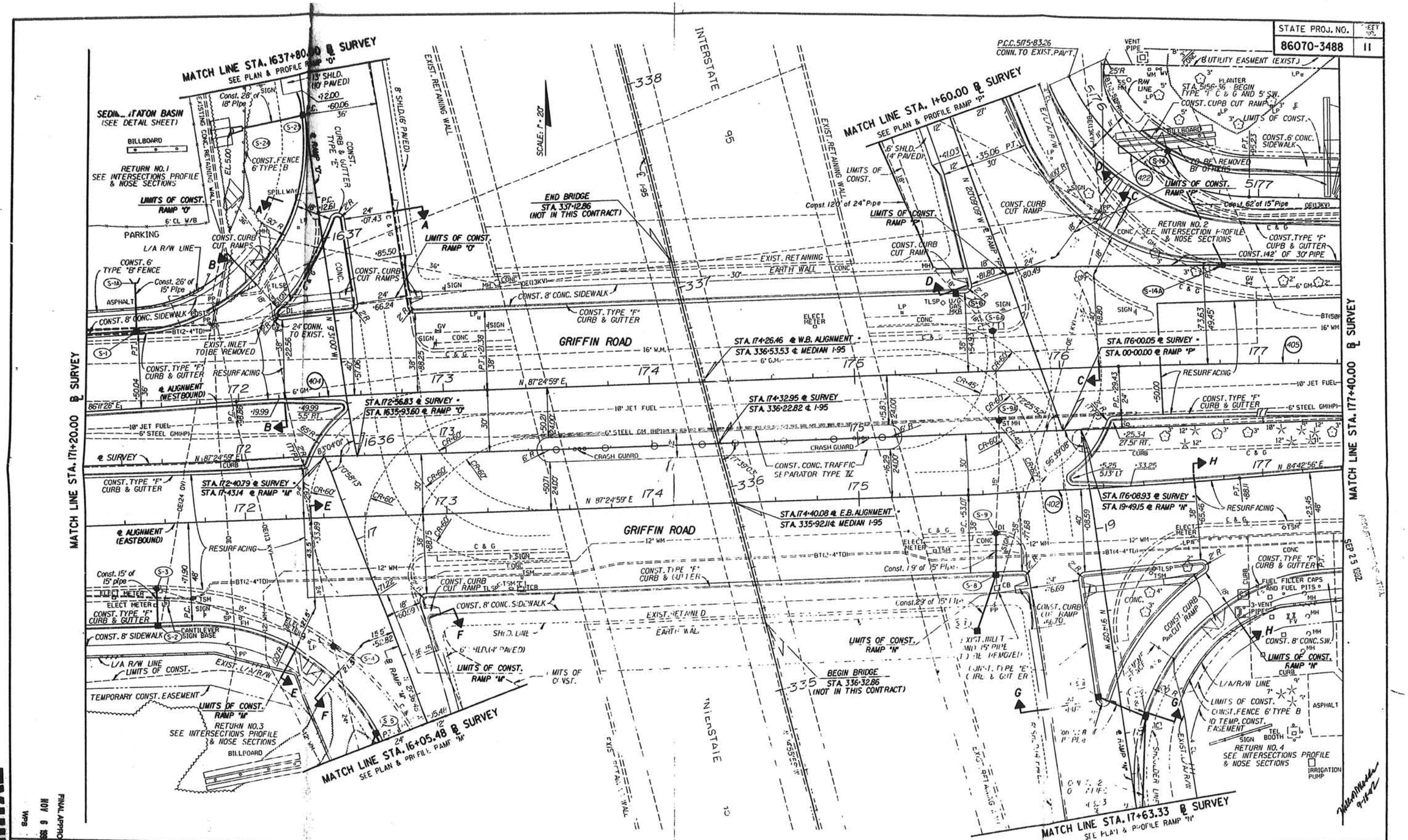
	NAME	DATE		NAME	DATE
DESIGNED BY	LUGENBEEL	12/88	DRAWN BY	D.NGUYEN	1/89
CHECKED BY	E. WAGNER	1/89	CHECKED BY	E. WAGNER	1/89
SUPERVISED BY					

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY

DATE

DRAINAGE MAP GRIFFIN ROAD


STATE PROJ. NO.
86070-3488
SHEET NO.
11
MATCH LINE STA. 1637+80.00 ℄ SURVEY
SEE PLAN & PROFILE RAMP "O"
MATCH LINE STA. 1+60.00 ℄ SURVEY
SEE PLAN & PROFILE RAMP "P"
MATCH LINE STA. 171+20.00 ℄ SURVEY
MATCH LINE STA. 177+40.00 ℄ SURVEY
MATCH LINE STA. 16+05.48 ℄ SURVEY
SEE PLAN & PROFILE RAMP "M"
MATCH LINE STA. 17+63.33 ℄ SURVEY
SEE PLAN & PROFILE RAMP "N"
INTERSTATE 95
GRIFFIN ROAD
END BRIDGE
STA. 337+12.86
(NOT IN THIS CONTRACT)
BEGIN BRIDGE
STA. 336+32.86
(NOT IN THIS CONTRACT)
STA. 174+26.46 ℄ W.B. ALIGNMENT
STA. 336+53.53 ℄ MEDIAN I-95
STA. 174+32.95 ℄ SURVEY
STA. 336+22.82 ℄ I-95
STA. 174+40.08 ℄ E.B. ALIGNMENT
STA. 335+92.11 ℄ MEDIAN I-95
STA. 172+56.83 ℄ SURVEY
STA. 1635+93.60 ℄ RAMP "O"
STA. 172+40.79 ℄ SURVEY
STA. 17+43.14 ℄ RAMP "M"
STA. 176+00.05 ℄ SURVEY
STA. 00+00.00 ℄ RAMP "P"
STA. 176+08.93 ℄ SURVEY
STA. 19+49.15 ℄ RAMP "N"
SEDIMENTATION BASIN
(SEE DETAIL SHEET)
RETURN NO. 1
SEE INTERSECTIONS PROFILE & NOSE SECTIONS
RETURN NO. 2
SEE INTERSECTION PROFILE & NOSE SECTIONS
RETURN NO. 3
SEE INTERSECTIONS PROFILE & NOSE SECTIONS
RETURN NO. 4
SEE INTERSECTIONS PROFILE & NOSE SECTIONS
LIMITS OF CONST. RAMP "O"
LIMITS OF CONST. RAMP "P"
LIMITS OF CONST. RAMP "M"
LIMITS OF CONST. RAMP "N"
CONST. 8' CONC. SIDEWALK
CONST. TYPE "F" CURB & GUTTER
CONST. CURB CUT RAMPS
CONST. CONC. TRAFFIC SEPARATOR TYPE IV
CRASH GUARD
RESURFACING
EXIST. RETAINING WALL
EXIST. RETAINING EARTH WALL
PARKING
BILLBOARD
TEMPORARY CONST. EASEMENT
SCALE: 1" = 20'
SEP 25 1992
FINAL APPROVED
NOV 6 1992
WPB
EXHIBIT 8
C6-01768-S
GRIFFIN2.DGN 31-JAN-92
PLAN GRIFFIN ROAD
STA. 171+20.00 - STA. 177+40.00

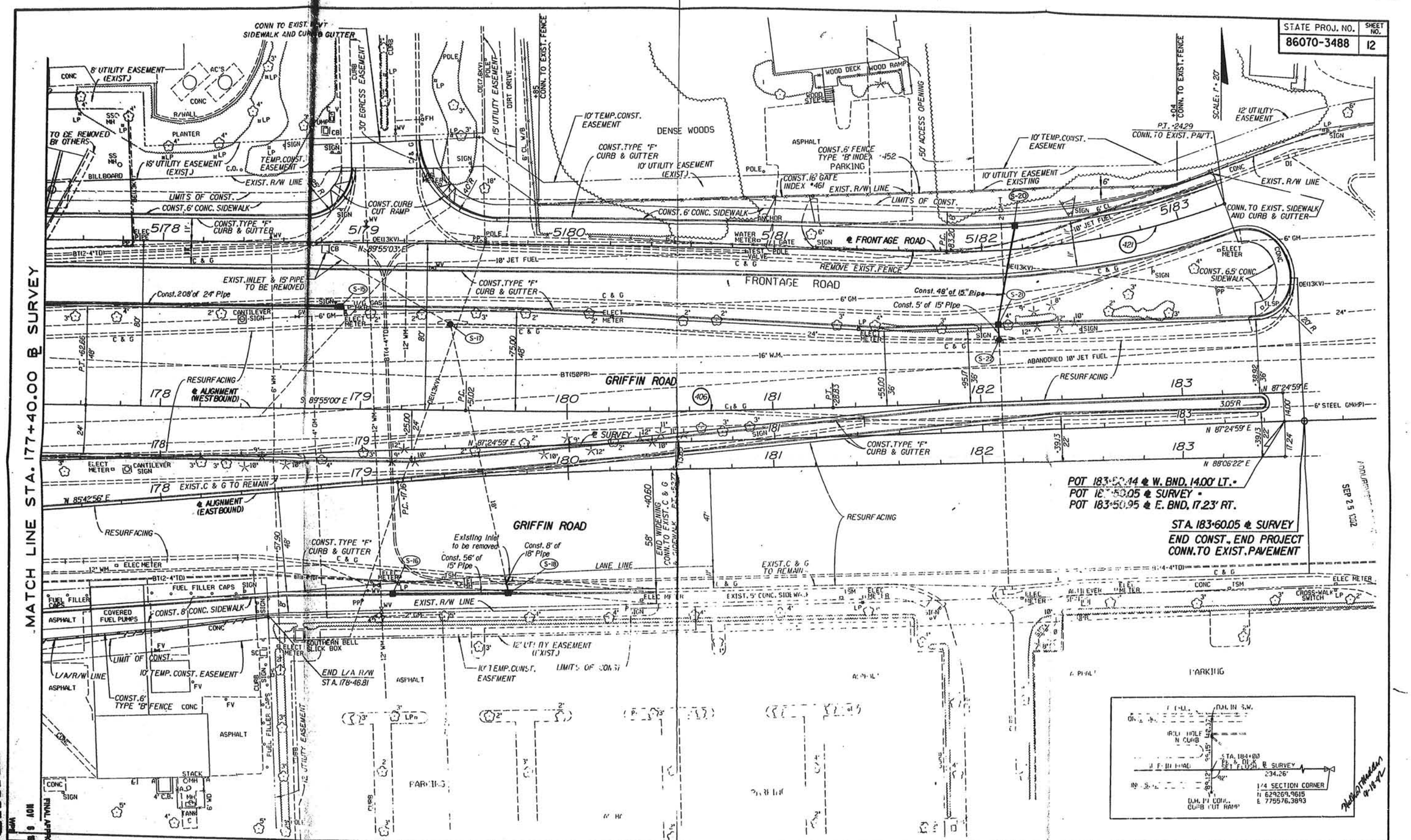

STATE PROJ. NO. 86070-3488
SHEET NO. 12
MATCH LINE STA. 177+40.00 ℄ SURVEY
FRONTAGE ROAD
GRIFFIN ROAD
DENSE WOODS
PARKING
℄ FRONTAGE ROAD
℄ SURVEY
℄ ALIGNMENT (WESTBOUND)
℄ ALIGNMENT (EASTBOUND)
POT 183+50.44 ℄ W. BND. 14.00' LT.
POT 183+50.05 ℄ SURVEY
POT 183+50.95 ℄ E. BND. 17.23' RT.
STA. 183+60.05 ℄ SURVEY
END CONST., END PROJECT
CONN. TO EXIST. PAVEMENT
END L/A R/W
STA. 178+48.81
1/4 SECTION CORNER
N 629269.9615
E 775576.3893
SEP 25 1992
PLAN GRIFFIN ROAD
STA. 177+40.00 - STA. 183+60.05
GRIFFIN3.DGN 31-JAN-92

EXHIBIT 9

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA
SUBDISTRICT

3301 GUN CLUB ROAD
P.O. BOX 3858
WEST PALM BEACH, FLORIDA 33402

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WARREN G. STRAHM
SUBDISTRICT MANAGER

December 16, 1981

Broward County Engineering
Division
c/o Mid South Engineering
Company
233 Commercial Boulevard
Lauderdale-by-the-Sea, FL 33308

D&F - Broward County
Stormwater System/
Griffin Road from
S.R. 7/U.S. 441 to
U.S. 1, Dania

Dear Sirs:

Enclosed is Permit Number DF 06-30905-6E, dated Dec. 16, 1981, to construct a dredge and fill project issued pursuant to Section 403.087, Florida Statutes.

Should you object to this permit, including any and all of the conditions contained therein, you may file an appropriate petition for administrative hearing. This petition must be filed within fourteen (14) days of the receipt of this letter. Further, the petition must conform to the requirements of Section 28-5.201, Florida Administrative Code, (see reverse side of this letter). The petition must be filed with the Office of General Counsel, Department of Environmental Regulation, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32301.

If no petition is filed within the prescribed time, you will be deemed to have accepted this permit and waived your right to request an administrative hearing on this matter.

Acceptance of the permit constitutes notice and agreement that the Department will periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement action for violation of the conditions and requirements thereof.

Sincerely,

Roy M. Duke, Jr., P.E.
Subdistrict Manager
RMD:rwj
Enclosure

cc: Broward County Environmental Quality Control Board
Florida Game & Fresh Water Fish Comm.
Florida Marine Patrol, Miami
U.S. Army Corps of Engineers, Miami

DER Form 17-1.122(66)

SP82-09

5

RULES OF THE ADMINISTRATION COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

PART II
FORMAL PROCEEDINGS

28-5.201 Initiation of Formal Proceedings.

(1) Initiation of formal proceedings shall be made by petition to the agency responsible for rendering final agency action. The term petition as used herein includes any application or other document which expresses a request for formal proceedings. Each petition should be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double-spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners, and an explanation of how his/her substantial interests will be affected by the agency determination;

(c) A statement of when and how petitioner received notice of the agency decision or intent to render a decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief;

(f) A demand for relief to which the petitioner deems himself entitled; and

(g) Other information which the petitioner contends is material.

****

A petition may be denied if the petitioner does not state adequately a material factual allegation, such as a substantial interest in the agency determination, or if the petition is untimely. (Section 28-5.201 (3) (a), FAC)

GP82-09

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA
SUBDISTRICT

3301 GUN CLUB ROAD
P.O. BOX 3858
WEST PALM BEACH, FLORIDA 33402

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WARREN G. STRAHM
SUBDISTRICT MANAGER

APPLICANT:

Broward County Engineering Division
c/o Mid South Engineering Company
233 Commercial Boulevard
Lauderdale-by-the-Sea, FL 33308

PERMIT/CERTIFICATION
NO. DF 06-30905-6E

COUNTY: Broward

PROJECT: Stormwater System/Griffin Road from S.R. 7/U.S. 441, to U.S. 1, Dania

This permit is issued under the provisions of Chapter 253 and 403, Florida Statutes, and Chapter 17-4, Florida Administrative Code. The above named applicant, hereinafter called Permittee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications attached hereto and made a part hereof and specifically described as follows:

To construct a stormwater drainage/retention system for an expanded Griffin Road (6 lane) from SR 7 /US 441 to U.S. 1, Dania, as per the stamped attached drawings. The system includes curb and gutter design with swale retention areas, 3,834 linear feet of seepage trenches, pollutant retardent structures and outfalls to the Florence Canal (48" R.C.P.), Tiger Tail Lake (42" R.C.P.), Dania Cutoff Canal (36" R.C.P.), canals connected to the Dania Cutoff Canal (Three: 42" R.C.P.; 30" R.C.P.; 84" R.C.P.) and the airport drainage canals (two: 48" R.C.P.; 36" R.C.P.). The project also includes filling a portion of the airport drainage canal and the construction of a 102" culvert connecting the airport drainage ditchto the Dania Cutoff Canal. This connection would include the excavation of a terminal retention canal with weir control prior to discharge to the Dania Cutoff Canal.

Subject to General Conditions 1 through 13 and Specific Conditions 1 and 2.

GP82-09

7 10

DER FORM 17-1.122(53) 1/4 (1/80)

PERMIT NO.: DF 06-30905-6E
APPLICANT: Broward County Engineering Division

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions:, and as such are binding upon the permittee and enforceable pursuant to the authority of Section 403.161(1), Florida Statutes. Permittee is hereby placed on notice that the department will review this permit periodically and may initiate court action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations indicated in the attached drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit shall constitute grounds for revocation and enforcement action by the department.

3. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information: (a) a description of and cause of non-compliance; and (b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

4. As provided in subsection 403.087(6), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

5. This permit is required to be posted in a conspicuous location at the work site or source during the entire period of construction or operation.

6. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.111, F.S.

7. In the case of an operation permit, permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

8. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant, or aquatic life or property and penalities therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, except where specifically authorized by an order from the department granting a variance or exception from department rules or state statutes.

9. This permit is not transferable. Upon sale or legal transfer of the property or facility covered by this permit, the permittee shall notify the department within thirty (30) days. The new owner must apply for a permit transfer within thirty (30) days. The permittee shall be liable for any non-compliance of the permitted source until the transferee applies for and receives a transfer of permit.

10. The permittee, by acceptance of this permit, specifically agrees to allow access to permitted source at reasonable times by department personnel presenting credentials for the purposes of inspection and testing to determine compliance with this permit and department rules.

11. This permit does not indicate a waiver of or approval of any other department permit that may be required for other aspects of the total project.

12. This permit conveys no title to land or water, nor constitutes state recognition or acknowledgement of title, and does not constitute authority for the reclamation of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

13. This permit also constitutes:

[ ] Determination of Best Available Control Technology (BACT)
[ ] Determination of Prevention of Significant Deterioration (PSD)
[X] Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)

GP82-09

PERMIT NO.: DF 06-30905-6E
APPLICANT: Broward County Engineering Division

SPECIFIC CONDITIONS:

1. Written notification shall be provided to the DER South Florida Subdistrict Office in West Palm Beach a minimum of forty-eight (48) hours prior to commencement of construction and a maximum of forty-eight (48) hours after completion of construction.

2. Turbidity curtains shall be utilized during all dredging/filling authorized by this permit.

Expiration Date: December 16, 1984

Issued this 16th day of December, 1987.

_____ Pages Attached.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Roy M Duke Jr
Signature
Roy M. Duke, Jr., P.E.
Subdistrict Manager

RW
pw

GP82-09

DER FORM 17-1 122(63) 4/4 (1/80)

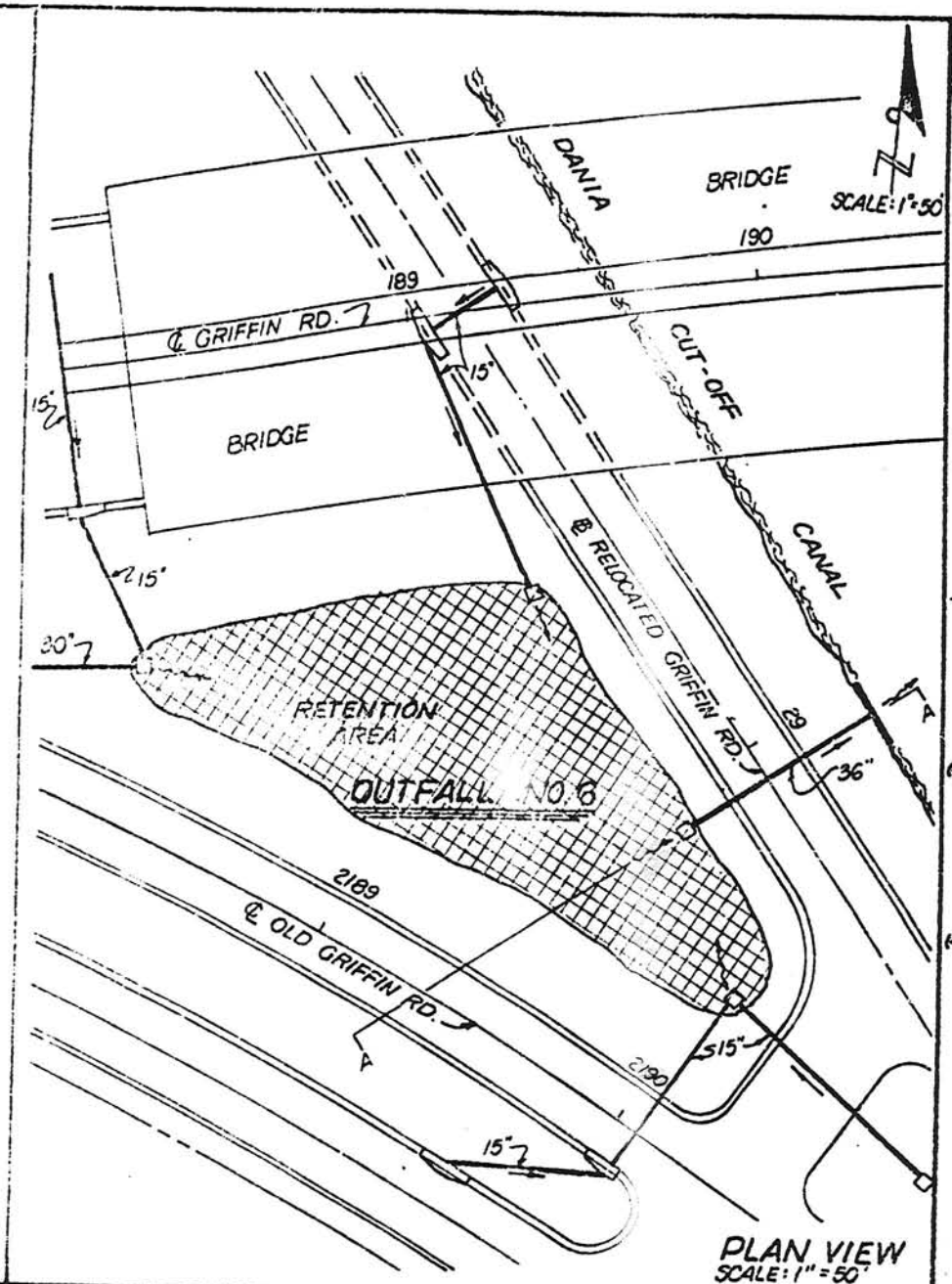
89

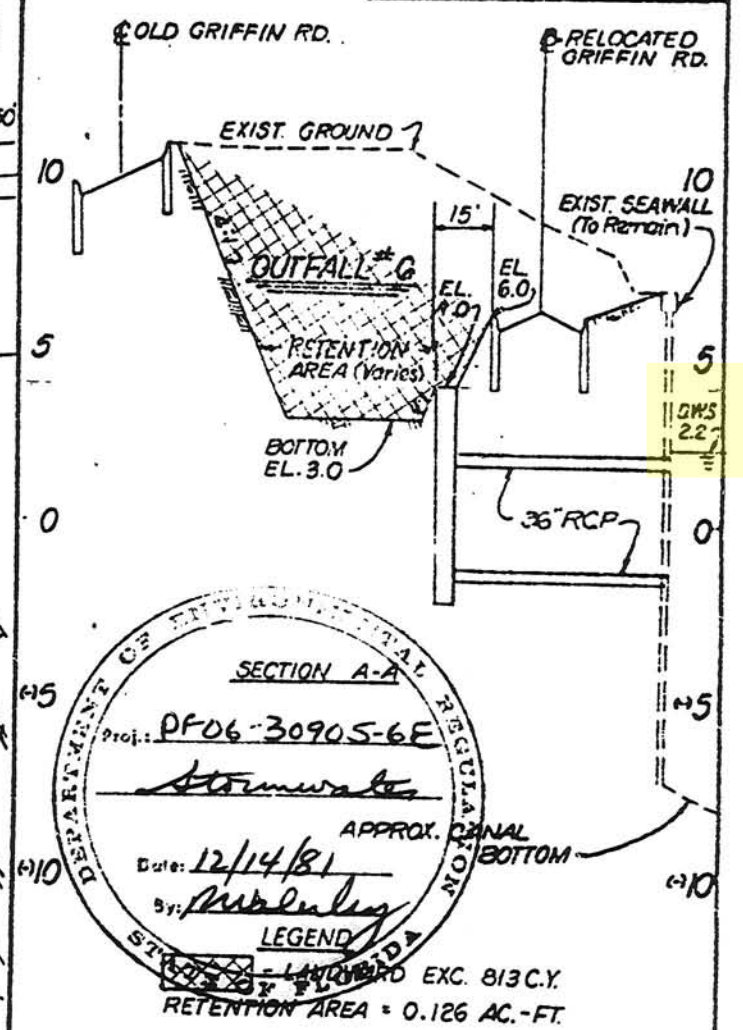
PERMIT NO.:
APPLICANT:

SPECIFIC CONDITIONS:

GP 82-09

SHEET NO. 11 OF 11





Appendix E
Drainage Calculations

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

PRE-DEVELOPMENT LAND-USE

HSG:	A			SHWT (FT., NAVD)			0.50		IMPERVIOUS CN		98	PERVIOUS CN	49	
BASIN	Time of Conc. t_c (min.)	TOTAL AREA (Ac.)	IMPERVIOUS AREA (Ac.)	PERVIOUS AREA (Ac.)	LOW GROUND ELEV. (ft-NAVD) *	AVERAGE DEPTH TO SHGWT (ft)	SOIL STORAGE (in)	COMPOSITE SITE SOIL STORAGE, S (in)	COMPOSITE CURVE NUMBER	OUTFALL	25Yr-3Day TOTAL RAINFALL, P (in)	TOTAL RUNOFF, Q (in)	TOTAL RUNOFF VOLUME (Ac-Ft)	Remarks
1AL	10	24.56	20.49	4.07	8.20	7.7	8.18	1.36	90	C-9	14.50	12.99	26.59	Exist. Land Use from I-95 PD&E (436903-1)
1BL	10	2.96	2.960	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.58	
1CL	10	2.39	1.920	0.47	8.20	7.7	8.18	1.61	88		14.50	12.73	2.54	
1DL	10	3.56	3.560	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	4.30	
1EL	10	3.08	3.080	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.72	
1AR	10	5.96	4.680	1.28	8.20	7.7	8.18	1.76	87		14.50	12.59	6.25	
1BR	10	3.99	3.340	0.65	8.20	7.7	8.18	1.33	90		14.50	13.01	4.33	
1CR	10	6.97	4.040	2.93	8.20	7.7	8.18	3.44	77		14.50	11.06	6.42	
1DR	10	5.21	5.210	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	6.30	
Basin 1 Totals		**58.68**	**49.28**	**9.40**	**8.20**	**7.70**	**8.18**	**1.31**	**90**			**120.38**	**64.02**	
2AL	10	1.65	1.36	0.29	8.20	7.7	8.18	1.44	89	C-10	14.50	12.91	1.77	Exist. Land Use from I-95 PD&E (436903-1)
2BL	10	3.78	3.78	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	4.57	
2CL	10	2.48	2.48	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.00	
2DL	10	3.28	2.74	0.54	8.20	7.7	8.18	1.35	90		14.50	13.00	3.55	
2EL	10	2.82	2.82	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.41	
2FL	10	4.89	3.51	1.38	8.20	7.7	8.18	2.31	84		14.50	12.06	4.91	
2AR	10	3.12	2.87	0.25	8.20	7.7	8.18	0.66	94		14.50	13.74	3.57	
2BR	10	1.79	0.73	1.06	8.20	7.7	8.18	4.84	69		14.50	9.96	1.49	
2CR	10	6.24	5.73	0.51	8.20	7.7	8.18	0.67	94		14.50	13.73	7.14	
2DR	10	4.89	3.14	1.75	8.20	7.7	8.18	2.93	80		14.50	11.50	4.68	
Basin 2 Totals		**34.94**	**29.16**	**5.78**	**8.20**	**7.70**	**8.18**	**1.35**	**90**			**130.39**	**38.09**	
3AL	10	5.93	5.08	0.85	8.20	7.7	8.18	1.17	91	C-10	14.50	13.18	6.51	Exist. Land Use from I-95 PD&E (436903-1)
3BL	10	1.40	1.40	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	1.69	
3CL	10	1.66	1.66	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.01	
3DL	10	1.69	1.69	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.04	
3EL	10	14.05	11.84	2.21	8.20	7.7	8.18	1.29	90		14.50	13.06	15.29	
3FL	10	2.97	2.97	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.59	
3AR	10	2.19	2.19	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.65	
3BR	10	3.17	1.92	1.25	8.20	7.7	8.18	3.23	79		14.50	11.24	2.97	
3CR	10	0.31	0.31	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	0.37	
3DR	10	8.51	8.51	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	10.28	
3ER	10	7.99	7.99	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	9.65	
Basin 3 Totals		**49.87**	**45.56**	**4.31**	**8.20**	**7.70**	**8.18**	**0.71**	**94**			**153.48**	**57.06**	
4AL	10	8.7	6.43	2.27	8.20	7.7	8.18	2.13	85	C-10	14.50	12.22	8.86	Exist. Land Use from I-95 PD&E (436903-1)
4BL	10	2.1	2.12	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.56	
4CL	10	1.8	1.82	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.20	
4DL	10	2.2	2.18	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.63	
4AR	10	6.3	3.68	2.60	8.20	7.7	8.18	3.39	78		14.50	11.10	5.81	
4BR	10	5.8	3.88	1.93	8.20	7.7	8.18	2.72	82		14.50	11.68	5.66	
Basin 4 Totals		**26.91**	**20.11**	**6.80**	**8.20**	**7.70**	**8.18**	**2.07**	**86**			**78.50**	**27.72**	
5AR	10	6.4	4.66	1.70	8.20	7.7	8.18	2.19	85	C-10	14.50	12.17	6.45	Exist. Land Use from I-95 PD&E (436903-1)
5AL	10	7.5	4.53	2.98	8.20	7.7	8.18	3.25	79	C-10	14.50	11.22	7.02	
Basin 5 Totals		**13.87**	**9.19**	**4.68**	**8.20**	**7.70**	**8.18**	**2.76**	**81**			**23.39**	**13.47**	
9AL	10	2.54	1.17	1.37	8.20	7.7	8.18	4.40	72	C-10	14.50	10.29	2.18	
9AR	10	2.47	1.16	1.31	8.20	7.7	8.18	4.33	72	C-10	14.50	10.35	2.13	
9AC	10	0.98	0.98	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	1.18	
9BL	10	6.03	4.31	1.73	8.20	7.7	8.18	2.34	84		14.50	12.03	6.05	
9BR	10	9.50	5.96	3.54	8.20	7.7	8.18	3.05	80		14.50	11.39	9.02	
9BC	10	3.93	3.93	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	4.75	
9OFF	10	9.62	6.54	3.08	8.20	7.7	8.18	2.62	82		14.50	11.77	9.44	
System 9		**35.07**	**24.06**	**11.02**	**8.20**	**7.70**	**8.18**	**2.57**	**83**			**84.83**	**34.74**	
10AL	10	7.13	5.49	1.64	8.00	7.5	8.18	1.88	87	C-10 SPUR	14.50	12.46	7.41	

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report												Project # 439170-1-22-02
PRE-DEVELOPMENT LAND-USE													
HSG:	A			SHWT (FT., NAVD)			0.50		IMPERVIOUS CN		98	PERVIOUS CN	49	
10AR	10	7.736	4.41	3.32	8.00	7.5	8.18	3.51	77	C-10 SPUR	14.50	11.00	7.09	
10AC	10	4.258	4.258	0.00	8.00	7.5	8.18	0.00	98		14.50	14.50	5.15	
10NE	10	2.203	1.561	0.64	8.00	7.5	8.18	2.38	84		14.50	11.99	2.20	
System 10		21.33	15.72	5.61	8.00	7.50	8.18	2.15	85			49.94	21.84	
11B-95W	10	6.74	4.81	1.93	8.00	7.5	8.18	2.34	84	C-10 SPUR	14.50	12.03	6.75	
11B-95E	10	7.975	6.06	1.92	8.00	7.5	8.18	1.96	86		14.50	12.38	8.23	
11B-95C	10	3.726	3.73	0.00	8.00	7.5	8.18	0.00	98		14.50	14.50	4.50	
11B-C10	10	0.062	0.062	0.00	8.00	7.5	8.18	0.00	100		14.50	14.50	0.08	
System 11		18.50	14.66	3.84	8.00	7.50	8.18	1.70	88			53.41	19.56	
12B-95	10	37.1	32.48	4.65	8.00	7.5	8.18	1.02	92	C-10 SPUR	14.50	13.34	41.27	
12B-SW	10	2.67	1.58	1.09	8.00	7.5	8.18	3.34	78		14.50	11.14	2.48	
12B-SE	10	3.03	2.20	0.83	8.00	7.5	8.18	2.24	85		14.50	12.12	3.06	
12B-NW	10	2.46	1.50	0.97	8.00	7.5	8.18	3.21	79		14.50	11.25	2.31	
System 12		45.29	37.76	7.53	8.00	7.50	8.18	1.36	90			47.86	49.12	
13A	10	22.4	14.71	7.73	8.00	7.5	8.18	2.82	81	DANIA CUTOFF	14.50	11.59	21.68	
13B	10	36.6	24.43	12.19	8.00	7.5	8.18	2.72	82		14.50	11.68	35.63	
System 13		59.06	39.14	19.92	8.00	7.50	8.18	2.76	81			23.27	57.31	
Griffin Road East		6.3	4.78	1.50	8.00	8.5	8.18	1.95	86	DANIA CUTOFF	14.50	12.39	6.49	
Project Total		369.81	289.41	80.39		7.70	8.18	1.78	87			765.47	382.95	

Existing Soil Storage		Soil Capacity (S) =	$\frac{1000}{CN} - 10$
Pervious area:	**80.39**		
Soil storage	**8.18**	Direct Runoff (Q) =	$\frac{(P - 0.2S)^2}{(P + 0.8S)}$
Composite soil storage (in)	**1.78**		
Total Soil Storage (Ac-Ft)	**54.80**	Total Runoff (R_t) =	A*Q/12

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

POST-DEVELOPMENT LAND-USE

HSG:	A			SHWT (FT., NAVD)			0.50		IMPERVIOUS CN		98	PERVIOUS CN	49	
BASIN	Time of Conc. t_c (min.)	TOTAL AREA (Ac.)	IMPERVIOUS AREA (Ac.)	PERVIOUS AREA (Ac.)	LOW GROUND ELEV. (ft-NAVD)	AVERAGE DEPTH TO SHGWT (ft)	SOIL STORAGE (in)	COMPOSITE SITE SOIL STORAGE, S (in)	CURVE NUMBER	OUTFALL	25Yr-3Day TOTAL RAINFALL, P (in)	TOTAL RUNOFF, Q (in)	TOTAL RUNOFF VOLUME (Ac-Ft)	Remarks
1AL	10	24.56	20.49	4.07	8.20	7.7	8.18	1.36	90		14.50	12.99	26.59	
1BL	10	2.96	2.960	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.58	
1CL	10	2.39	1.920	0.47	8.20	7.7	8.18	1.61	88		14.50	12.73	2.54	
1DL	10	3.56	3.560	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	4.30	
1EL	10	3.08	3.080	0.00	8.20	7.7	8.18	0.00	98	C-9	14.50	14.50	3.72	No change in land use from I-95 PD&E (436903-1)
1AR	10	5.96	4.680	1.28	8.20	7.7	8.18	1.76	87		14.50	12.59	6.25	
1BR	10	3.99	3.340	0.65	8.20	7.7	8.18	1.33	90		14.50	13.01	4.33	
1CR	10	6.97	4.040	2.93	8.20	7.7	8.18	3.44	77		14.50	11.06	6.42	
1DR	10	5.21	5.210	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	6.30	
Basin 1 Totals		58.68	49.28	9.40	8.20	7.70	8.18	1.31	90			120.38	64.02	
2AL	10	1.65	1.36	0.29	8.20	7.7	8.18	1.44	89		14.50	12.91	1.77	
2BL	10	3.78	3.78	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	4.57	
2CL	10	2.48	2.48	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.00	
2DL	10	3.28	2.74	0.54	8.20	7.7	8.18	1.35	90		14.50	13.00	3.55	
2EL	10	2.82	2.82	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	3.41	
2FL	10	4.89	3.51	1.38	8.20	7.7	8.18	2.31	84	C-10	14.50	12.06	4.91	No change in land use from I-95 PD&E (436903-1)
2AR	10	3.12	2.87	0.25	8.20	7.7	8.18	0.66	94		14.50	13.74	3.57	
2BR	10	1.79	0.73	1.06	8.20	7.7	8.18	4.84	69		14.50	9.96	1.49	
2CR	10	6.24	5.73	0.51	8.20	7.7	8.18	0.67	94		14.50	13.73	7.14	
2DR	10	4.89	3.14	1.75	8.20	7.7	8.18	2.93	80		14.50	11.50	4.68	
Basin 2 Totals		34.94	29.16	5.78	8.20	7.70	8.18	1.35	90			130.39	38.09	
3AL	10	5.93	5.08	0.85	8.20	7.7	8.18	1.17	91		14.50	13.18	6.51	
3BL	10	1.40	1.40	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	1.69	
3CL	10	1.66	1.66	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.01	
3DL	10	1.69	1.69	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.04	
3EL	10	14.05	11.84	2.21	8.20	7.7	8.18	1.29	90		14.50	13.06	15.29	
3FL	10	2.97	2.97	0.00	8.20	7.7	8.18	0.00	98	C-10	14.50	14.50	3.59	No change in land use from I-95 PD&E (436903-1)
3AR	10	2.19	2.19	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.65	
3BR	10	3.17	1.92	1.25	8.20	7.7	8.18	3.23	79		14.50	11.24	2.97	
3CR	10	0.31	0.31	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	0.37	
3DR	10	8.51	8.51	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	10.28	
3ER	10	7.99	7.99	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	9.65	
Basin 3 Totals		49.87	45.56	4.31	8.20	7.70	8.18	0.71	94			153.48	57.06	
4AL	10	8.7	6.47	2.23	8.20	7.7	8.18	2.09	85		14.50	12.26	8.89	+0.043 Impervious
4BL	10	2.1	2.12	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.56	
4CL	10	1.8	1.82	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	2.20	
4DL	10	2.2	2.18	0.00	8.20	7.7	8.18	0.00	98	C-10	14.50	14.50	2.63	
4AR	10	6.3	3.68	2.60	8.20	7.7	8.18	3.39	78		14.50	11.10	5.81	
4BR	10	5.8	4.01	1.80	8.20	7.7	8.18	2.53	83		14.50	11.85	5.74	+0.133 Impervious
Basin 4 Totals		26.91	20.29	6.62	8.20	7.70	8.18	2.01	86			78.71	27.83	
5AR	10	6.4	6.01	0.35	8.20	7.7	8.18	0.45	95	C-10	14.50	13.98	7.41	+1.354 Impervious
5AL	10	7.5	5.09	2.42	8.20	7.7	8.18	2.64	82		14.50	11.76	7.36	+0.560 Impervious
Basin 5 Totals		13.87	11.10	2.77	8.20	7.70	8.18	1.63	88			25.73	14.77	
9AL	10	2.14	1.69	0.45	8.20	7.7	8.18	1.74	88	C-10	14.50	12.61	2.25	
9AR	10	2.53	1.75	0.78	8.20	7.7	8.18	2.53	83		14.50	11.85	2.50	
9AC	10	1.34	1.34	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	1.62	
9BL	10	5.58	5.20	0.38	8.20	7.7	8.18	0.55	95		14.50	13.86	6.44	
9BR	10	11.00	8.98	2.02	8.20	7.7	8.18	1.50	89		14.50	12.84	11.77	
9BC	10	4.62	4.62	0.00	8.20	7.7	8.18	0.00	98		14.50	14.50	5.58	

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POST-DEVELOPMENT LAND-USE														
HSG:	A			SHWT (FT., NAVD)			0.50		IMPERVIOUS CN		98	PERVIOUS CN	49	
9OFF	10	9.62	6.85	2.77	8.20	7.7	8.18	2.36	84		14.50	12.01	9.63	
System 9		36.83	30.42	6.40	8.20	7.70	8.18	1.42	89			92.17	39.79	
10AL	10	7.46	6.25	1.20	8.00	7.5	8.18	1.32	90	C-10 SPUR	14.50	13.03	8.09	
10AR	10	6.89	5.36	1.52	8.00	7.5	8.18	1.81	87		14.50	12.54	7.19	
10AC	10	4.26	4.250	0.01	8.00	7.5	8.18	0.02	98		14.50	14.48	5.14	
10NE	10	2.203	1.604	0.60	8.00	7.5	8.18	2.22	85		14.50	12.13	2.23	
System 10		20.80	17.47	3.33	8.00	7.50	8.18	1.31	90			52.18	22.65	
11B-95W	10	6.63	5.41	1.22	8.00	7.5	8.18	1.51	89		14.50	12.83	7.09	
11B-95E	10	7.88	6.98	0.90	8.00	7.5	8.18	0.94	92	C-10 SPUR	14.50	13.43	8.82	
11B-95C	10	3.73	3.734	0.00	8.00	7.5	8.18	0.00	98		14.50	14.50	4.51	
11B-C10	10	0.00	0.00	0.00	8.00	7.5	8.18	0.00	100		14.50	0.00	0.00	
System 11		18.25	16.12	2.13	8.00	7.50	8.18	0.95	92			40.77	20.43	
12B-95	10	38.4	35.95	2.45	8.00	7.5	8.18	0.52	95		14.50	13.89	44.45	
12B-SW	10	2.72	1.14	1.58	8.00	7.5	8.18	4.75	70	C-10 SPUR	14.50	10.03	2.27	
12B-SE	10	3.16	2.04	1.12	8.00	7.5	8.18	2.90	81		14.50	11.52	3.03	
12B-NW	10	2.32	1.43	0.89	8.00	7.5	8.18	3.14	79		14.50	11.31	2.19	
System 12		46.60	40.56	6.04	8.00	7.50	8.18	1.06	91.65			46.76	51.95	
13A	10	22.4	15.21	7.23	8.00	7.5	8.18	2.64	82	DANIA CUTOFF	14.50	11.76	21.98	
13B	10	36.6	25.10	11.52	8.00	7.5	8.18	2.57	83		14.50	11.81	36.05	
System 13		59.06	40.31	18.75	8.00	7.50	8.18	2.60	82			23.57	58.03	
Griffin Road East		6.3	4.61	1.67	8.00	8.5	8.18	2.18	85	DANIA CUTOFF	14.50	12.18	6.38	
Project Total		372.09	304.88	63.88		7.70	8.18	1.40	89			776.33	401.00	

Proposed Soil Storage		Soil Capacity (S) =	$\frac{1000}{CN} - 10$
Pervious area:	**63.88**		
Soil storage	**8.18**	Direct Runoff (Q) =	$\frac{(P - 0.2S)^2}{(P + 0.8S)}$
Composite soil storage (in)	**1.40**		
Total Soil Storage (Ac-Ft)	**43.55**	Total Runoff (R_t) =	A*Q/12

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report															Project # 439170-1-22-02
BMPTRAINS NUTRIENT ANALYSIS																
Basin	EXISTING TOTAL AREA (Ac.)	PROPOSED TOTAL AREA (Ac.)	EXISTING DCIA %*	PROPOSED DCIA %*	Non-DCIA CN	Total Pre N Load (Kg/Yr)	Total Pre P Load (Kg/Yr)	Total Post N Load (Kg/Yr)	Total Post P Load (Kg/Yr)	Total N Reduction Req. (%)	Total P Reduction Req. (%)	Total N Load Removed (Kg/Yr)	Total P Load Removed (Kg/Yr)	Total N Surface Discharge (Kg/Yr)	TotaL P Surface Discharge (Kg/Yr)	Percent N Reduction	Percent P Reduction
System 9	35.07	36.83	69%	83%	49	158.51	21.938	198.294	27.444	20%	20%	186.23	25.770	12.070	1.670	94%	94%
System 10	21.33	20.80	74%	84%		102.92	14.245	113.286	15.679	9%	9%	101.42	14.040	11.860	1.640	90%	90%
System 11	18.50	18.25	79%	88%		94.99	13.147	102.804	14.228	8%	8%	96.13	13.300	6.680	0.920	94%	94%
System 12	45.29	46.60	83%	87%		243.84	33.748	262.503	36.330	7%	7%	239.61	33.160	22.890	3.170	91%	91%
System 13	59.06	59.06	66%	68%		255.94	35.422	263.275	36.437	3%	3%	251.83	34.850	11.440	1.580	96%	96%
Griffin Road East	6.28	6.28	76%	73%		31.08	4.301	29.921	4.141	0%	0%	26.83	3.710	3.090	0.430	90%	90%
Project Totals	369.81	372.09				887.28	122.80	970.08	134.26			902.05	124.83	68.03	9.41	93%	93%

* All impervious areas are assumed to be a directly connected impervious areas for a typical urban closed drainage system. Non-DCIA is considered pervious open space.

I-95 PD&E DRAINAGE CALCULATIONS

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

WATER QUALITY/QUANTITY CALCULATIONS

					WATER QUALITY				WATER QUANTITY			REQUIRED STORAGE
Basin	PROPOSED TOTAL AREA (Ac.)	PROPOSED IMPERVIOUS AREA (Ac.)	EXISTING IMPERVIOUS AREA (Ac.)	CHANGE IN IMPERVIOUS AREA (Ac.)	1" OVER BASIN (Ac-FT)	2.5" OVER IMP. (Ac-FT)	2.5" OVER INCREASE IN IMP. (Ac-FT)	REQ. WATER QUALITY (Ac-FT) (75% Dry)	PRE- RUNOFF VOLUME (Ac-Ft)	POST- RUNOFF VOLUME (Ac-Ft)	NET RUNOFF INCREASE (Ac-Ft)	(Ac-Ft)
1AL	24.56	20.49	20.49	0.00				0.000	26.589	26.589	0.00	0.00
1BL	2.96	2.96	2.96	0.00				0.000	3.577	3.577	0.00	0.00
1CL	2.39	1.92	1.92	0.00				0.000	2.536	2.536	0.00	0.00
1DL	3.56	3.56	3.56	0.00				0.000	4.302	4.302	0.00	0.00
1EL	3.08	3.08	3.08	0.00				0.000	3.722	3.722	0.00	0.00
1AR	5.96	4.68	4.68	0.00				0.000	6.251	6.251	0.00	0.00
1BR	3.99	3.34	3.34	0.00				0.000	4.327	4.327	0.00	0.00
1CR	6.97	4.04	4.04	0.00				0.000	6.423	6.423	0.00	0.00
1DR	5.21	5.21	5.21	0.00				0.000	6.295	6.295	0.00	0.00
Basin 1 Totals	**58.68**	**49.28**	**49.28**	**0.00**				**0.00**	**64.02**	**64.02**	**0.00**	**0.00**
2AL	1.65	1.36	1.36	0.00				0.000	1.775	1.775	0.00	0.00
2BL	3.78	3.78	3.78	0.00				0.000	4.568	4.568	0.00	0.00
2CL	2.48	2.48	2.48	0.00				0.000	2.997	2.997	0.00	0.00
2DL	3.28	2.74	2.74	0.00				0.000	3.553	3.553	0.00	0.00
2EL	2.82	2.82	2.82	0.00				0.000	3.408	3.408	0.00	0.00
2FL	4.89	3.51	3.51	0.00				0.000	4.913	4.913	0.00	0.00
2AR	3.12	2.87	2.87	0.00				0.000	3.573	3.573	0.00	0.00
2BR	1.79	0.73	0.73	0.00				0.000	1.486	1.486	0.00	0.00
2CR	6.24	5.73	5.73	0.00				0.000	7.138	7.138	0.00	0.00
2DR	4.89	3.14	3.14	0.00				0.000	4.685	4.685	0.00	0.00
Basin 2 Totals	**34.94**	**29.16**	**29.16**	**0.00**				**0.00**	**38.09**	**38.09**	**0.00**	**0.00**
3AL	5.93	5.08	5.08	0.00				0.000	6.514	6.514	0.00	0.00
3BL	1.40	1.40	1.40	0.00				0.000	1.692	1.692	0.00	0.00
3CL	1.66	1.66	1.66	0.00				0.000	2.006	2.006	0.00	0.00
3DL	1.69	1.69	1.69	0.00				0.000	2.042	2.042	0.00	0.00
3EL	14.05	11.84	11.84	0.00				0.000	15.294	15.294	0.00	0.00
3FL	2.97	2.97	2.97	0.00				0.000	3.589	3.589	0.00	0.00
3AR	2.19	2.19	2.19	0.00				0.000	2.646	2.646	0.00	0.00
3BR	3.17	1.92	1.92	0.00				0.000	2.969	2.969	0.00	0.00
3CR	0.31	0.31	0.31	0.00				0.000	0.375	0.375	0.00	0.00
3DR	8.51	8.51	8.51	0.00				0.000	10.283	10.283	0.00	0.00
3ER	7.99	7.99	7.99	0.00				0.000	9.655	9.655	0.00	0.00
Basin 3 Totals	**49.87**	**45.56**	**45.56**	**0.00**				**0.00**	**57.06**	**57.06**	**0.00**	**0.00**
4AL	8.70	6.47	6.43	0.04			0.009	0.007	8.859	8.887	0.03	0.03
4BL	2.12	2.12	2.12	0.00				0.000	2.562	2.562	0.00	0.00
4CL	1.82	1.82	1.82	0.00				0.000	2.199	2.199	0.00	0.00
4DL	2.18	2.18	2.18	0.00				0.000	2.634	2.634	0.00	0.00

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report											Project # 439170-1-22-02
WATER QUALITY/QUANTITY CALCULATIONS												
					WATER QUALITY				WATER QUANTITY			REQUIRED STORAGE
Basin	PROPOSED TOTAL AREA (Ac.)	PROPOSED IMPERVIOUS AREA (Ac.)	EXISTING IMPERVIOUS AREA (Ac.)	CHANGE IN IMPERVIOUS AREA (Ac.)	1" OVER BASIN (Ac-FT)	2.5" OVER IMP. (Ac-FT)	2.5" OVER INCREASE IN IMP. (Ac-FT)	REQ. WATER QUALITY (Ac-FT) (75% Dry)	PRE- RUNOFF VOLUME (Ac-Ft)	POST- RUNOFF VOLUME (Ac-Ft)	NET RUNOFF INCREASE (Ac-Ft)	(Ac-Ft)
4AR	6.28	3.68	3.68	0.00				0.000	5.810	5.810	0.00	0.00
4BR	5.81	4.01	3.88	0.13			0.028	0.021	5.656	5.738	0.08	0.10
Basin 4 Totals	**26.91**	**20.29**	**20.11**	**0.18**			**0.037**	**0.03**	**27.72**	**27.83**	**0.11**	**0.14**
5AR	6.36	6.01	4.66	1.35			0.282	0.212	6.450	7.409	0.96	1.17
5AL	7.51	5.09	4.53	0.56			0.118	0.088	7.020	7.357	0.34	0.42
Basin 5 Totals	**13.87**	**11.10**	**9.19**	**1.92**			**0.40**	**0.30**	**13.47**	**14.77**	**1.30**	**1.60**
9AL	2.14	1.69	1.17	0.51	0.178	0.351		0.263	2.178	2.248	0.07	0.33
9AR	2.53	1.75	1.16	0.58	0.211	0.364		0.273	2.131	2.496	0.37	0.64
9AC	1.34	1.34	0.98	0.36	0.112	0.279		0.210	1.183	1.621	0.44	0.65
9BL	5.58	5.20	4.31	0.89	0.465	1.084		0.813	6.048	6.442	0.39	1.21
9BR	11.00	8.98	5.96	3.02	0.917	1.870		1.403	9.017	11.770	2.75	4.16
9BC	4.62	4.62	3.93	0.69	0.385	0.963		0.722	4.750	5.584	0.83	1.56
9OFF	9.62	6.85	6.54	0.31	0.802	1.427		1.070	9.438	9.629	0.19	1.26
System 9 Totals	**36.83**	**30.42**	**24.06**	**6.37**				**4.75**	**34.74**	**39.79**	**5.05**	**9.80**
10AL	7.46	6.25	5.49	0.76	0.621	1.302		0.977	7.407	8.094	0.69	1.66
10AR	6.89	5.36	4.41	0.95	0.574	1.117		0.838	7.090	7.193	0.10	0.94
10AC	4.26	4.25	4.26	-0.01	0.355	0.885		0.664	5.145	5.139	-0.01	0.66
10NE	2.20	1.60	1.56	0.04	0.184	0.334		0.251	2.201	2.228	0.03	0.28
System 10 Totals	**20.80**	**17.47**	**15.72**	**1.75**				**2.73**	**21.84**	**22.65**	**0.81**	**3.54**
11B-95W	6.63	5.41	4.81	0.60	0.553	1.127		0.845	6.752	7.093	0.34	1.19
11B-95E	7.88	6.98	6.06	0.92	0.657	1.454		1.091	8.230	8.825	0.60	1.69
11B-95C	3.73	3.73	3.73	0.01	0.311	0.778		0.583	4.502	4.511	0.01	0.59
11B-C-10	0.00	0.00	0.06	-0.06	0.000	0.000		0.000	0.000	0.000	0.00	0.00
System 11 Totals	**18.25**	**16.12**	**14.66**	**1.46**				**2.52**	**19.48**	**20.43**	**0.95**	**3.46**
12B-95	38.40	35.95	32.48	3.47	3.200	7.490		5.617	41.274	44.454	3.18	8.80
12B-SW	2.72	1.14	1.58	-0.44	0.000	0.000		0.000	2.479	2.274	-0.21	-0.21
12B-SE	3.16	2.04	2.20	-0.16	0.263	0.425		0.319	3.061	3.034	-0.03	0.29
12B-NW	2.32	1.43	1.50	-0.07	0.193	0.298		0.223	2.310	2.187	-0.12	0.10
System 12 Totals	**46.60**	**40.56**	**37.76**	**2.80**				**6.16**	**49.12**	**51.95**	**2.82**	**8.98**
13A	22.44	15.21	14.71	0.50	1.870	3.169		2.377	21.678	21.983	0.30	2.68
13B	36.62	25.10	24.43	0.67	3.052	5.229		3.922	35.634	36.046	0.41	4.33
System 13 Totals	**59.06**	**40.31**	**39.14**	**1.17**				**6.30**	**57.31**	**58.03**	**0.72**	**7.02**
Griffin Road East	**6.28**	**4.61**	**4.78**	**-0.17**	**0.52**	**0.96**		**0.72**	**6.49**	**6.38**	**-0.11**	**0.61**
Project Total	**372.09**	**304.88**	**289.41**	**15.47**			**0.44**	**23.51**	**389.37**	**401.00**	**11.64**	**35.14**

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

WATER STORAGE SUMMARY

Basin	PROPOSED TOTAL AREA (Ac.)	REQUIRED STORAGE (Ac-FT)	STORAGE PROVIDED (Ac-FT) WITHIN ROW	STORAGE PROVIDED (Ac-FT) OUTSIDE ROW	TOTAL STORAGE PROVIDED (Ac-FT)	TYPE	REMARKS
1AL	24.56	0.00					
1BL	2.96	0.00					
1CL	2.39	0.00					
1DL	3.56	0.00					
1EL	3.08	0.00					
1AR	5.96	0.00					
1BR	3.99	0.00					
1CR	6.97	0.00					
1DR	5.21	0.00					
Basin 1 Totals	**58.68**	**0.00**					**Refer to I-95 PD&E (436903-1)**
2AL	1.65	0.00					
2BL	3.78	0.00					
2CL	2.48	0.00					
2DL	3.28	0.00					
2EL	2.82	0.00					
2FL	4.89	0.00					
2AR	3.12	0.00					
2BR	1.79	0.00					
2CR	6.24	0.00					
2DR	4.89	0.00					
Basin 2 Totals	**34.94**	**0.00**					**Refer to I-95 PD&E (436903-1)**
3AL	5.93	0.00					
3BL	1.40	0.00					
3CL	1.66	0.00					
3DL	1.69	0.00					
3EL	14.05	0.00					
3FL	2.97	0.00					
3AR	2.19	0.00					
3BR	3.17	0.00					
3CR	0.31	0.00					
3DR	8.51	0.00					
3ER	7.99	0.00					
Basin 3 Totals	**49.87**	**0.00**					**Refer to I-95 PD&E (FPID 436903-1)**
4AL	8.70	0.03	0.07				**Reshape Swale S-L6**

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

WATER STORAGE SUMMARY

Basin	PROPOSED TOTAL AREA (Ac.)	REQUIRED STORAGE (Ac-FT)	STORAGE PROVIDED (Ac-FT) WITHIN ROW	STORAGE PROVIDED (Ac-FT) OUTSIDE ROW	TOTAL STORAGE PROVIDED (Ac-FT)	TYPE	REMARKS
4BL	2.12	0.00					
4CL	1.82	0.00					
4DL	2.18	0.00					
4AR	6.28	0.00					
4BR	5.81	0.10	0.16				Reshape Swale S-R15
Basin 4 Totals	**26.91**	**0.14**	**0.23**				
5AR	6.36	1.17					
5AL	7.51	0.42					
Basin 5 Totals	**13.87**	**1.60**	**0.00**	**0.00**	**0.00**		**4.6 Ac.-Ft. of storage included in Sunset Golf Course Pond (FPID 436903-1)**
9AL	2.14	0.33	1.55		1.55	**Dry Retention**	**Post Swale 9-1**
9AR	2.53	0.64	1.58		1.58	**Dry Retention**	**Post Swale 9-2**
9AC	1.34	0.65			0.00		
9BL	5.58	1.21	1.25		1.25	**Dry Retention**	**Post Swale 9-3, New Swale 9-6**
9BR	11.00	4.16		3.08	3.08	**Dry Retention**	**New Pond 9-7 (Alt. 3)**
9BC	4.62	1.56			0.00		
9OFF	9.62	1.26	2.28	0.13	2.41	**Dry Retention**	**New Swale 9-5 , Park and Ride Pond**
System 9 Totals	**36.83**	**9.80**	**6.66**	**3.20**	**9.87**		
10AL	7.46	1.66	1.480		1.48	**Dry Retention**	**Post Swale 10-1**
10AR	6.89	0.94	2.229		2.23	**Dry Retention**	**Post Swale 10-2**
10AC	4.26	0.66			0.00		**Post Swale 10-1 & 2**
10NE	2.20	0.28	0.220		0.22	**Dry Retention**	**Pond 10NE**
System 10 Totals	**20.80**	**3.54**	**3.93**	**0.00**	**3.93**		
11B-95W	6.63	1.19	3.017		3.02	**Dry Retention**	**Post Swale 11W, 11NW**
11B-95E	7.88	1.69	1.886		1.89	**Dry Retention**	**Post Swale 11E, 11NE**
11B-95C	3.73	0.59				**Dry Retention**	**Post Swale 11E&W**
11B-C-10	0.00	0.00					
System 11 Totals	**18.25**	**3.46**	**4.90**	**0.00**	**4.90**		
12B-95	38.40	8.80		7.75	7.75	**Dry Retention**	**Pond 12 (Alt. 1)**
12B-SW	2.72	-0.21	0.907		0.91	**Dry Retention**	**Post Swale 12SW**
12B-SE	3.16	0.29	1.179		1.18	**Dry Retention**	**Post Swale 12SE**
12B-NW	2.32	0.10	1.072		1.07	**Dry Retention**	**New Swale 12NW Griffin**
System 12 Totals	**46.60**	**8.98**	**3.16**	**7.75**	**10.91**		

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

WATER STORAGE SUMMARY

Basin	PROPOSED TOTAL AREA (Ac.)	REQUIRED STORAGE (Ac-FT)	STORAGE PROVIDED (Ac-FT) WITHIN ROW	STORAGE PROVIDED (Ac-FT) OUTSIDE ROW	TOTAL STORAGE PROVIDED (Ac-FT)	TYPE	REMARKS
13A	22.44	2.68	6.076		6.08	**Dry Retention**	**Reshape Pond 13A-1, New 13A-2 Swale**
13B	36.62	4.33	9.80		9.80	**Dry Retention**	**Reshape Pond 13B-7**
System 13 Totals	**59.06**	**7.02**	**15.88**	**0.00**	**15.88**		
Griffin Road East	**6.28**	**0.61**	**1.07**	**0.00**	**1.07**	**Dry Retention**	**Reshape Existing Pond Adjacent Dania Cut-Off Canal**
Project Total	**372.09**	**35.14**	**35.83**	**10.96**	**46.55**		

POND SIZING CALCULATIONS - SYSTEM 9

Project: I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report — Designer: DA
FDOT FPID 439170-01-22-02 — 2/9/2026
County: Broward

Pond Sizing:
Required Treatment Volume (TV)
Selection Criteria:

Permitting Agency	**SFWMD**
Stormwater Mgmt.	**Dry Retention**
Online / Offline	**Online**
OFW	**No**
Open/Closed Basin	**Open**
Total Proposed Imper. Area	**23.63**
Total Basin Area	**26.69** ac.

System 9-A & B Only

Dry Retention	**1 in.**	x Total Basin Area =	2.224 ac-ft
	2.50 in.	x Impervious Area =	4.923 ac-ft

Treatment V_{req} = Largest of Trt. Volume =	4.92	ac-ft
OFW (50% additional TV) =	0.00	ac-ft
Required Treatment Volume (75% Dry Retention)) =	3.69	ac-ft

Low Edge of Pavement within the Basin is: **5.0**

Required Attenuation Volume (AV)
Impervious Percentage: **88.5%** See Pre and Post Basin Data

Total Runoff (ac-ft)	SFWMD (25yr/72hr)
P=	14.5
Qpre =	25.25
Qpost =	29.94
Δ Q =	4.69

AV_{req} = Largest ΔQ Volume =	4.69	ac-ft
Existing Pond Volume: Existing within the R/W **(System 9-A & B Only)**	4.38	ac-ft
Required Pond Volume: (Treatment + largest Attenuation) - Existing Volume =	4.00	ac-ft

Pond 1
Pond Stage / Storage Calculations: Soil Type = Myakka Fine Sand — Soil HSG = A/D

Soil depth to water table =	4.50			
Maintenance Area Width =	15.00	@ 1:15	Avg. Exist. Ground Elev. (ft) =	5.00
Pond Tie-In Width =	0.00	@ 1:4	Normal Water Elevation (ft) =	0.50
Maximum Storage Depth (**SD**) =	23.50	with 1.0 ft freeboard	Minimum EOP Elevation (ft) = (At Furthest EOP from Pond)	25.00

Hydraulic Grade Line (HGL) check:

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance to Furthest EOP from Pond =	1050.0	ft
Estimated Energy Losses =	1.05	ft
HGL Clearance =	1.15	ft
Maximum Allow. Storm Sewer Tailwater El. =	22.80	ft — Use junction losses

ELEVATION (ft, NAVD)	DESCRIPTION	AREA (ac)	DIMENSIONS Length (ft)	DIMENSIONS Width (ft)	STORAGE (ac ft)
5.50	Pond R/W	1.32	614.0	94.0	**NA**
5.00	Back of Maintenance Berm	1.32	614.0	94.0	**NA**
5.00	Front of Maintenance Berm	1.32	614.0	94.0	**NA**
4.00	Provided Treatment + Atten. Volume	1.26	610.0	90.0	**2.953**
4.00	Req'd Treatment + Attenuation Volume	1.26	610.0	90.0	**2.953**
4.00	Top of Treatment Vol.	1.26	610.0	90.0	**2.953**
1.50	Pond Bottom	1.10	600.0	80.0	**0.000**
0.50	Season High Water Level	0.00	0.0	0.0	0.00

Req'd Treat. Vol. (ac-ft) =	**N/A**	Prov'd. Treat. Vol. (ac-ft) =	**N/A**
Req'd Treat. + Atten. Vol. (ac-ft) =	**4.00**	Prov'd. Treat. + Atten. Vol. (ac-ft) =	**2.95**
Req'd Treat. + Atten. Stage (ft) =	**4.00**	Prov'd. Treat. + Atten. Stage (ft) =	**4.00**

Mean Depth = Pond Volume/ pond area at control elevation = **2.34** ft

Use a 15% Safety Factor (SF):

			Length (ft)	Width (ft)
Required Pond R/W =	**1.52**	**ac**	**0.00**	**0.00**

POND SIZING CALCULATIONS - SYSTEM 10

Project: I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report — Designer: DA
FDOT FPID: 439170-01-22-02 — 2/9/2026
County: Broward

Pond Sizing:

Required Treatment Volume (TV)

Selection Criteria:

Permitting Agency	**SFWMD**
Stormwater Mgmt.	**Dry Retention**
Online / Offline	**Online**
OFW	**No**
Open/Closed Basin	**Open**
Total Proposed Imper. Area	**17.47**
Total Basin Area	**20.80** ac.

Dry Retention	**1 in.**	x Total Basin Area =	1.734 ac-ft
	2.50 in.	x Impervious Area =	3.639 ac-ft

Treatment V_{req} = Largest of Trt. Volume =	3.64	ac-ft
OFW (50% additional TV) =	0.00	ac-ft
Required Treatment Volume (75% Dry Retention)) =	2.73	ac-ft

Low Edge of Pavement within the Basin is: **6.0**

Required Attenuation Volume (AV)

Impervious Percentage: **84.0%** See Pre and Post Basin Data

Total Runoff (ac-ft)	SFWMD (25yr/72hr)
P=	14.5
Qpre =	21.84
Qpost =	22.65
Δ Q =	0.81

AV_{req} = Largest ΔQ Volume = 0.81 ac-ft

Existing Pond Volume: Existing within the R/W — 0.00 ac-ft

Required Pond Volume: (Treatment + largest Attenuation) - Existing Volume = 3.54 ac-ft

Pond 1

Pond Stage / Storage Calculations: Soil Type = Myakka Fine Sand — Soil HSG = A/D

Soil depth to water table = 5.00

Maintenance Area Width =	15.00	@ 1:15	Avg. Exist. Ground Elev. (ft) =	5.50
Pond Tie-In Width =	1.50	@ 1:4	Normal Water Elevation (ft) =	0.50
Maximum Storage Depth (**SD**) =	21.50	with 1.0 ft freeboard	Minimum EOP Elevation (ft) = (At Furthest EOP from Pond)	23.00

Hydraulic Grade Line (HGL) check:

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance to Furthest EOP from Pond =	1600.0	ft
Estimated Energy Losses =	1.6	ft
HGL Clearance =	1.15	ft
Maximum Allow. Storm Sewer Tailwater El. =	20.25	ft — Use junction losses

ELEVATION (ft, NAVD)	DESCRIPTION	AREA (ac)	DIMENSIONS Length (ft)	DIMENSIONS Width (ft)	STORAGE (ac ft)
5.50	Pond R/W	1.31	239.0	239.0	**NA**
7.00	Back of Maintenance Berm	1.25	233.0	233.0	**NA**
6.00	Front of Maintenance Berm	1.09	218.0	218.0	**NA**
5.00	Provided Treatment + Atten. Volume	1.05	214.0	214.0	**3.447**
5.00	Req'd Treatment + Attenuation Volume	1.05	214.0	214.0	**3.447**
5.00	Top of Treatment Vol.	1.05	214.0	214.0	**3.447**
1.50	Pond Bottom	0.92	200.0	200.0	**0.000**
0.50	Season High Water Level	0.00	0.0	0.0	0.00

Req'd Treat. Vol. (ac-ft) =	**2.73**	Prov'd. Treat. Vol. (ac-ft) =	**3.45**
Req'd Treat. + Atten. Vol. (ac-ft) =	**3.54**	Prov'd. Treat. + Atten. Vol. (ac-ft) =	**3.45**
Req'd Treat. + Atten. Stage (ft) =	**5.00**	Prov'd. Treat. + Atten. Stage (ft) =	**5.00**

Mean Depth = Pond Volume/ pond area at control elevation = **3.28** ft

Use a 15% Safety Factor (SF):

		Length (ft)	Width (ft)
Required Pond R/W =	**1.51** ac	**0.00**	**0.00**

POND SIZING CALCULATIONS - SYSTEM 11

Project: I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report — Designer: DA
FDOT FPID: 439170-01-22-02 — 2/9/2026
County: Broward

Pond Sizing:

Required Treatment Volume (TV)

Selection Criteria:

Permitting Agency	**SFWMD**
Stormwater Mgmt.	**Dry Retention**
Online / Offline	**Online**
OFW	**No**
Open/Closed Basin	**Open**
Total Proposed Imper. Area	**16.12**
Total Basin Area	**18.25** ac.

Dry Retention	**1 in.**	x Total Basin Area =	1.521 ac-ft
	2.50 in.	x Impervious Area =	3.359 ac-ft

Treatment V_{req} = Largest of Trt. Volume =	3.36	ac-ft
OFW (50% additional TV) =	0.00	ac-ft
Required Treatment Volume (75% Dry Retention)) =	2.52	ac-ft

Low Edge of Pavement within the Basin is: **6.0**

Required Attenuation Volume (AV)

Impervious Percentage: **88.4%** See Pre and Post Basin Data

Total Runoff (ac-ft)	SFWMD (25yr/72hr)
P=	14.5
Qpre =	19.56
Qpost =	20.43
Δ Q =	0.87

AV_{req} = Largest ΔQ Volume = 0.87 ac-ft

Existing Pond Volume: Existing within the R/W — 0.00 ac-ft

Required Pond Volume: (Treatment + largest Attenuation) - Existing Volume = 3.39 ac-ft

Pond 1

Pond Stage / Storage Calculations: Soil Type = Myakka Fine Sand — Soil HSG = A/D

Soil depth to water table = 5.50

Maintenance Area Width =	15.00	@ 1:15	Avg. Exist. Ground Elev. (ft) =	6.00
Pond Tie-In Width =	2.00	@ 1:4	Normal Water Elevation (ft) =	0.50
Maximum Storage Depth (**SD**) =	18.50	with 1.0 ft freeboard	Minimum EOP Elevation (ft) = (At Furthest EOP from Pond)	20.00

Hydraulic Grade Line (HGL) check:

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance to Furthest EOP from Pond =	1925.0	ft
Estimated Energy Losses =	1.925	ft
HGL Clearance =	1.15	ft
Maximum Allow. Storm Sewer Tailwater El. =	16.93	ft — Use junction losses

ELEVATION (ft, NAVD)	DESCRIPTION	AREA (ac)	DIMENSIONS Length (ft)	DIMENSIONS Width (ft)	STORAGE (ac ft)
6.00	Pond R/W	1.38	245.0	245.0	**NA**
8.00	Back of Maintenance Berm	1.29	237.0	237.0	**NA**
7.00	Front of Maintenance Berm	1.13	222.0	222.0	**NA**
6.00	Provided Treatment + Atten. Volume	1.09	218.0	218.0	**4.521**
6.00	Req'd Treatment + Attenuation Volume	1.09	218.0	218.0	**4.521**
4.50	Top of Treatment Vol.	1.03	212.0	212.0	**2.925**
1.50	Pond Bottom	0.92	200.0	200.0	**0.000**
0.50	Season High Water Level	0.00	0.0	0.0	0.00

Req'd Treat. Vol. (ac-ft) =	**2.52**	Prov'd. Treat. Vol. (ac-ft) =	**2.93**
Req'd Treat. + Atten. Vol. (ac-ft) =	**3.39**	Prov'd. Treat. + Atten. Vol. (ac-ft) =	**4.52**
Req'd Treat. + Atten. Stage (ft) =	**6.00**	Prov'd. Treat. + Atten. Stage (ft) =	**6.00**

Mean Depth = Pond Volume/ pond area at control elevation = **4.14** ft

Use a 15% Safety Factor (SF):

		Length (ft)	Width (ft)
Required Pond R/W =	**1.58** ac	**0.00**	**0.00**

POND SIZING CALCULATIONS - SYSTEM 12

Project: I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report — Designer: DA
FDOT FPID: 439170-01-22-02 — 2/9/2026
County: Broward

Pond Sizing:

Required Treatment Volume (TV)

Selection Criteria:

Permitting Agency	**SFWMD**
Stormwater Mgmt.	**Dry Retention**
Online / Offline	**Online**
OFW	**No**
Open/Closed Basin	**Open**
Total Proposed Imper. Area	**40.56**
Total Basin Area	**46.60** ac.

Dry Retention	**1 in.**	x Total Basin Area =	3.883	ac-ft
	2.50 in.	x Impervious Area =	8.450	ac-ft

Treatment V_{req} = Largest of Trt. Volume =	8.45	ac-ft
OFW (50% additional TV) =	0.00	ac-ft
Required Treatment Volume (75% Dry Retention)) =	6.34	ac-ft

Low Edge of Pavement within the Basin is: **6.0**

Required Attenuation Volume (AV)

Impervious Percentage: **87.0%** See Pre and Post Basin Data

Total Runoff (ac-ft)	SFWMD (25yr/72hr)
P=	14.5
Qpre =	49.12
Qpost =	51.95
Δ Q =	2.82

AV_{req} = Largest ΔQ Volume =	2.82	ac-ft
Existing Pond Volume: Existing within the R/W	3.16	ac-ft
Required Pond Volume: (Treatment + largest Attenuation) - Existing Volume =	6.00	ac-ft

Pond 1

Pond Stage / Storage Calculations: Soil Type = Myakka Fine Sand — Soil HSG = A/D

Soil depth to water table = 2.50

Maintenance Area Width =	15.00	@ 1:15	Avg. Exist. Ground Elev. (ft) =	3.00
Pond Tie-In Width =	4.00	@ 1:4	Normal Water Elevation (ft) =	0.50
Maximum Storage Depth (**SD**) =	28.50	with 1.0 ft freeboard	Minimum EOP Elevation (ft) = (At Furthest EOP from Pond)	30.00

Hydraulic Grade Line (HGL) check:

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance to Furthest EOP from Pond =	1500.0	ft
Estimated Energy Losses =	1.5	ft
HGL Clearance =	1.15	ft
Maximum Allow. Storm Sewer Tailwater El. =	27.35	ft — Use junction losses

ELEVATION (ft, NAVD)	DESCRIPTION	AREA (ac)	DIMENSIONS Length (ft)	DIMENSIONS Width (ft)	STORAGE (ac ft)
3.00	Pond R/W	2.74	599.0	199.0	**NA**
7.00	Back of Maintenance Berm	2.45	583.0	183.0	**NA**
6.00	Front of Maintenance Berm	2.19	568.0	168.0	**NA**
5.00	Provided Treatment + Atten. Volume	2.12	564.0	164.0	**7.030**
5.00	Req'd Treatment + Attenuation Volume	2.12	564.0	164.0	**7.030**
5.00	Top of Treatment Vol.	2.12	564.0	164.0	**7.030**
1.50	Pond Bottom	1.89	550.0	150.0	**0.000**
0.50	Season High Water Level	0.00	0.0	0.0	0.00

Req'd Treat. Vol. (ac-ft) =	**6.34**	Prov'd. Treat. Vol. (ac-ft) =	**7.03**
Req'd Treat. + Atten. Vol. (ac-ft) =	**6.00**	Prov'd. Treat. + Atten. Vol. (ac-ft) =	**7.03**
Req'd Treat. + Atten. Stage (ft) =	**5.00**	Prov'd. Treat. + Atten. Stage (ft) =	**5.00**

Mean Depth = Pond Volume/ pond area at control elevation = **3.31** ft

Use a 15% Safety Factor (SF):

		Length (ft)	Width (ft)
Required Pond R/W =	**3.15** ac	**0.00**	**0.00**

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

System 10 Stage-Storage Calculations

System: 9 — **Pre-Development**

Swale 9-1

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.00	0.370		0.0000	0.0000	Existing storage based on Phase 3C As-built grading.
		0.3825			
2.00	0.395		0.3825	0.3825	
		0.4075			
3.00	0.420		0.7900	0.7900	Control Stage: 2.0
		0.4325			Control Volume: 0.38
4.00	0.445		1.2225	1.2225	Overflow Stage: 6.0
		0.4575			Overflow Volume: 2.16
5.00	0.470		1.6800	1.6800	
		0.4825			
6.00	0.495		2.1625	2.1625	

Swale 9-2

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.00	0.686				Existing storage based on Phase 3C As-built grading.
		0.7134			
2.00	0.741		0.7134	0.7134	
		0.7689			
3.00	0.797		1.4823	1.4823	Control Stage: 2.0
		0.8249			Control Volume: 0.71
4.00	0.853		2.3072	2.3072	Overflow Stage: 6.0
		0.8809			Overflow Volume: 4.13
5.00	0.909		3.1881	3.1881	
		0.9374			
6.00	0.966		4.1255	4.1255	

Swale 9-3

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.00	0.460				Existing storage based on Phase 3C As-built grading.
		0.4875			
2.00	0.515		0.4875	0.4875	
		0.5425			
3.00	0.570		1.0300	1.0300	Control Stage: 2.0
					Control Volume: 0.49
					Overflow Stage: 3.0
					Overflow Volume: 1.03

System: 9 — **Post-Development**

Swale 9-1

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.563		0.0000	0.0000	Swale regraded to mitigate widening impacts
		0.2900			
2.00	0.597		0.2900	0.2900	
		0.6140			
3.00	0.631		0.9040	0.9040	Control Stage: 4.0
		0.6480			Control Volume: 1.55
4.00	0.665		1.5520	1.5520	Overflow Stage: 6.0
		0.6820			Overflow Volume: 3.07
5.00	0.699		2.2340	2.2340	
		0.8387			
6.00	0.978		3.0727	3.0727	

Swale 9-2

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.700		0.0000	0.0000	Minor impacts anticipated from bridge pier.
		0.3650			
2.00	0.760		0.3650	0.3650	
		0.7900			
3.00	0.820		1.1550	1.1550	Control Stage: 3.5
		0.8500			Control Volume: 1.58
4.00	0.880		2.0050	2.0050	Overflow Stage: 6.0
		0.9100			Overflow Volume: 3.88
5.00	0.940		2.9150	2.9150	
		0.9685			
6.00	0.997		3.8835	3.8835	

Swale 9-3

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.673				Swale regraded at the southeast corner of Taft St.
		0.3440			
2.00	0.703		0.3440	0.3440	
		0.7295			
3.00	0.756		1.0734	1.0734	Control Stage: 3.0
		0.7832			Control Volume: 1.07
4.00	0.810		1.8566	1.8566	Overflow Stage: 4.0
					Overflow Volume: 1.86

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System 10 Stage-Storage Calculations

System: 9 — **Pre-Development**

Swale 9-4

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.00	0.400				Existing storage based on Phase 3C As-built grading.
		0.4150			
2.00	0.430		0.4150	0.4150	
		0.4450			
3.00	0.460		0.8600	0.8600	Control Stage: 2.0
					Control Volume: 0.42
					Overflow Stage: 3.0
					Overflow Volume: 0.86

Swale 9-5

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

NOT USED

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

System: 9 — **Post-Development**

Swale 9-4

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.000				Swale regraded at the southwest corner of Taft St.
		0.0000			
2.00	0.000		0.0000	0.0000	
		0.0000			
3.00	0.000		0.0000	0.0000	Control Stage: 3.0
		0.0000			Control Volume: 0.00
4.00	0.000		0.0000	0.0000	Overflow Stage: 4.0
					Overflow Volume: 0.00

Swale 9-5

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.061				New Pond at the Southwest corner of Sheridan Street
		0.0345			
2.00	0.077		0.0345	0.0345	
		0.0950			
3.00	0.113		0.1294	0.1294	Control Stage: 3.0
		0.1314			Control Volume: 0.13
4.00	0.150		0.2608	0.2608	Overflow Stage: 4.0
					Overflow Volume: 0.26

NOT USED

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

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System 10 Stage-Storage Calculations

System: 9	Pre-Development	System: 9	Post-Development

Swale 9-6

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

Swale 9-6

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.140				
		0.1750			
2.50	0.210		0.1750	0.1750	
		0.1100			
3.00	0.230		0.2850	0.2850	Control Stage: 2.5
					Control Volume: 0.18
					Overflow Stage: 3.0
					Overflow Volume: 0.29

Pond 9-7 (Alt.1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

Pond 9-7 (Alt.1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.075				Northeast corner of Taft Street
		0.5510			
2.00	1.129		0.5510	0.5510	
		1.1827			
3.00	1.236		1.7337	1.7337	Control Stage: 4.0
		1.2897			Control Volume: 3.02
4.00	1.343		3.0234	3.0234	Overflow Stage: 5.0
		1.3959			Overflow Volume: 4.42
5.00	1.449		4.4193	4.4193	

Pond 9-7 (Alt.2)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

Pond 9-7 (Alt.2)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.247				Centered between Taft Street and Sheridan Street
		0.6331			
2.00	1.285		0.6331	0.6331	
		1.3232			
3.00	1.361		1.9562	1.9562	Control Stage: 4.0
		1.4001			Control Volume: 3.36
4.00	1.439		3.3563	3.3563	Overflow Stage: 5.0
		1.4781			Overflow Volume: 4.83
5.00	1.517		4.8344	4.8344	

Pond 9-7 (Alt.3)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

Pond 9-7 (Alt.3)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.110				Southeast corner of Sheridan Street
		0.5675			
2.00	1.160		0.5675	0.5675	
		1.2060			
3.00	1.252		1.7735	1.7735	Control Stage: 4.0
		1.3020			Control Volume: 3.08
4.00	1.352		3.0755	3.0755	Overflow Stage: 5.0
		1.4020			Overflow Volume: 4.48
5.00	1.452		4.4775	4.4775	

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System 10 Stage-Storage Calculations

System: 9 — **Pre-Development**

Pond 9-7 (Alt.4)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
					Control Stage: 0.0
					Control Volume: 0.00
					Overflow Stage: 0.0
					Overflow Volume: 0.00

Park & Ride Pond

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.40	0.363				Existing detention pond east side of Park and Ride
		0.4268			
2.50	0.413		0.4268	0.4268	
		0.4376			
3.20	0.438		0.8643	0.8643	Control Stage: 3.2
		0.1349			Control Volume: 0.86
3.50	0.462		0.9993	0.9993	Overflow Stage: 5.5
		0.4869			Overflow Volume: 2.00
4.50	0.512		1.4862	1.4862	
		0.5117			
5.50	0.512		1.9979	1.9979	

System: 9 — **Post-Development**

Pond 9-7 (Alt.4)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.850				West of the SFRC
		0.4362			
2.00	0.895		0.4362	0.4362	
		0.9406			
3.00	0.986		1.3768	1.3768	Control Stage: 5.0
		1.0332			Control Volume: 3.54
4.00	1.080		2.4100	2.4100	Overflow Stage: 6.0
		1.1293			Overflow Volume: 4.77
5.00	1.179		3.5393	3.5393	
		1.2277			
6.00	1.277		4.7670	4.7670	
		1.4958			
7.00	1.715		6.2628	6.2628	

Park & Ride Pond

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.40	0.757				Modified pond east side of Park and Ride
		0.8714			
2.50	0.828		0.8714	0.8714	
		0.9011			
3.20	0.901		1.7725	1.7725	Control Stage: 3.7
		0.2813			Control Volume: 2.28
3.50	0.975		2.0538	2.0538	Overflow Stage: 5.5
		1.0112			Overflow Volume: 4.15
4.50	1.048		3.0650	3.0650	
		1.0846			
5.50	1.121		4.1496	4.1496	

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System 10 Stage-Storage Calculations

System: 10 — **Pre-Development**

Swale 10-1 (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.263				
		0.1451			
2.00	0.318		0.1451	0.1451	
		0.1727			
2.50	0.373		0.3178	0.3178	Control Stage: 2.6
		0.0376			Control Volume: 0.36
2.60	0.378		0.3554	0.3554	
		0.3629			
3.50	0.428			0.7182	Overflow Stage: 3.50
					Overflow Volume: 0.72

Swale 10-2 (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.508				
		0.2679			
2.00	0.563		0.2679	0.2679	
		0.2955			
2.50	0.618		0.5634	0.5634	Control Stage: 2.6
		0.0621			Control Volume: 0.58
2.60	0.624		0.6255	0.6255	
		0.2595			
3.00	0.674		0.8850	0.8850	Overflow Stage: 5.5
		0.3506			Overflow Volume: 3.00
3.50	0.729		1.2356	1.2356	
		0.2647			
3.85	0.784		1.5003	1.5003	
		0.1217			
4.00	0.839		1.6220	1.6220	
		0.4332			
4.50	0.894		2.0552	2.0552	
		0.4608			
5.00	0.949		2.5160	2.5160	
		0.4883			
5.50	1.004			3.0043	

Pond 10NE

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.110				
		0.1250			
2.50	0.140		0.1250	0.1250	
		0.1550			
3.50	0.170		0.2800	0.2800	Control Stage: 3.50
		0.1850			Control Volume: 0.28
4.50	0.200		0.4650	0.4650	
					Overflow Stage: 4.5
					Overflow Volume: 0.47

System: 10 — **Post-Development**

Swale 10-1 (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.589			0.0000	
		0.2945			
2.00	0.589		0.2945	0.2945	
		0.5909			
3.00	0.593		0.8854	0.8854	Control Stage: 4
		0.5949			Control Volume: 1.48
4.00	0.597		1.4803	1.4803	
		0.5989			
5.00	0.601		2.0792	2.0792	Overflow Stage: 6
		0.6029			Overflow Volume: 2.68
6.00	0.605		2.6821	2.6821	

Swale 10-2 (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.887				
		0.4438			
2.00	0.889		0.4438	0.4438	
		0.8906			
3.00	0.893		1.3344	1.3344	Control Stage: 4
		0.8946			Control Volume: 2.23
4.00	0.897		2.2290	2.2290	
		0.8986			
5.00	0.901		3.1276	3.1276	Overflow Stage: 6
		0.9026			Overflow Volume: 4.03
6.00	0.905		4.0302	4.0302	

Pond 10 (ALT.2)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	1.119				
		0.5693			
2.00	1.159		0.5693	0.5693	
		1.1994			
3.00	1.240		1.7686	1.7686	Control Stage: 4.5
		1.2823			Control Volume: 3.73
4.00	1.324		3.0509	3.0509	
		1.3675			
5.00	1.411		4.4184	4.4184	Overflow Stage: 6.00
		1.4551			Overflow Volume: 5.87
6.00	1.499		5.8734	5.8734	
		2.5445			
7.50	1.893		8.4179	8.4179	

Pond 10 (ALT.3)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.841				
		0.4312			
2.00	0.884		0.4312	0.4312	
		0.9266			
3.00	0.970		1.3578	1.3578	Control Stage: 5.00
		1.0138			Control Volume: 3.47
4.00	1.058		2.3716	2.3716	
		1.1034			
5.00	1.149		3.4749	3.4749	Overflow Stage: 7.5
		1.1952			Overflow Volume: 6.58
6.00	1.242		4.6701	4.6701	
		1.2596			
7.00	1.278		5.9297	5.9297	
		0.6477			
7.50	1.313		6.5774	6.5774	

Pond 10NE

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.080				
		0.0950			
2.50	0.110		0.0950	0.0950	
		0.1250			
3.50	0.140		0.2200	0.2200	Control Stage: 3.50
		0.1550			Control Volume: 0.22
4.50	0.170		0.3750	0.3750	
					Overflow Stage: 4.5
					Overflow Volume: 0.38

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System 11 Stage-Storage Calculations

System: 11 — **Pre-Development**

Swale 11E (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.139				
		0.0828			
2.00	0.192		0.0828	0.0828	
		0.1133			
2.50	0.261		0.1960	0.1960	Control Stage: 2.6
		0.0270			Control Volume: 0.223
2.60	0.279		0.2230	0.2230	
		0.1252			
3.00	0.347		0.3482	0.3482	Overflow Stage: 5.04
		0.1943			Overflow Volume: 1.453
3.50	0.430		0.5425	0.5425	
		0.2413			
4.00	0.535		0.7837	0.7837	
		0.2935			
4.50	0.639		1.0772	1.0772	
		0.3458			
5.00	0.744		1.4230	1.4230	
		0.0299			
5.04	0.752		1.4529	1.4529	
		0.0155			
5.06	0.799		1.4684	1.4684	
		0.3626			
5.50	0.849		1.8309	1.8309	
		0.4508			
6.00	0.954		2.2817	2.2817	

Swale 11W (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.448				
		0.2413			
2.00	0.517		0.2413	0.2413	
		0.2755			
2.50	0.585		0.5168	0.5168	Control Stage: 2.6
		0.0592			Control Volume: 0.576
2.60	0.599		0.5760	0.5760	
		0.2508			
3.00	0.655		0.8268	0.8268	Overflow Stage: 3.85
		0.3480			Overflow Volume: 1.44
3.50	0.737		1.1748	1.1748	
		0.2697			
3.85	0.804		1.4444	1.4444	
		0.1227			
4.00	0.832		1.5671	1.5671	
		0.4398			
4.50	0.927		2.0069	2.0069	
		0.4873			
5.00	1.022		2.4941	2.4941	
		0.5348			
5.50	1.117		3.0289	3.0289	
		0.5823			
6.00	1.212		3.6111	3.6111	

System: 11 — **Post-Development**

Swale 11E (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.735		0.0000	0.0000	
		0.3677			
2.00	0.735		0.3677	0.3677	
		0.3677			
2.50	0.735		0.7354	0.7354	Control Stage: 4
		0.3677			Control Volume: 1.84
3.00	0.735		1.1031	1.1031	1
		0.3677			
3.50	0.735		1.4708	1.4708	Overflow Stage: 5
		0.3677			Overflow Volume: 2.57
4.00	0.735		1.8385	1.8385	
		0.3677			
4.50	0.735		2.2062	2.2062	
		0.3677			
5.00	0.735		2.5739	2.5739	
		0.3677			
5.50	0.735		2.9416	2.9416	
		0.3677			
6.00	0.735		3.3093	3.3093	

Swale 11W (Alt. 1)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	1.108		0.0000	0.0000	
		0.5540			
2.00	1.108		0.5540	0.5540	
		0.5540			
2.50	1.108		1.1080	1.1080	Control Stage: 4
		0.5540			Control Volume: 2.77
3.00	1.108		1.6620	1.6620	
		0.5540			
3.50	1.108		2.2160	2.2160	Overflow Stage: 5
		0.5540			Overflow Volume: 3.88
4.00	1.108		2.7700	2.7700	
		0.5540			
4.50	1.108		3.3240	3.3240	
		0.5540			
5.00	1.108		3.8780	3.8780	
		0.5540			
5.50	1.108		4.4320	4.4320	
		0.5540			
6.00	1.108		4.9860	4.9860	

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System 11 Stage-Storage Calculations

System: 11	Pre-Development		System: 11	Post-Development

Swale 11NW

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
3.00	0.060				
		0.0825			
4.00	0.105		0.0825	0.0825	
		0.1641			
5.00	0.223		0.2466	0.2466	Control Stage: 5
		0.2989			Control Volume: 0.25
6.00	0.374		0.5454	0.5454	
					Overflow Stage: 6
					Overflow Volume: 0.55

Swale 11NE

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
5.00	0.035				
		0.0474			
6.00	0.060		0.0474	0.0474	
		0.1031			
7.00	0.147		0.1505	0.1505	Control Stage: 6
					Control Volume: 0.05
					Overflow Stage: 7
					Overflow Volume: 0.15

Pond 11 (Alt. 2)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac Ft)	Remarks
1.50	0.795				
		0.4059			
2.00	0.829		0.4059	0.4059	
		0.8644			
3.00	0.900		1.2702	1.2702	Control Stage: 6
		0.9369			Control Volume: 4.31
4.00	0.974		2.2071	2.2071	
		1.0117			
5.00	1.049		3.2187	3.2187	Overflow Stage: 7.00
		1.0881			Overflow Volume: 5.47
6.00	1.127		4.3068	4.3068	
		1.1669			
7.00	1.207		5.4737	5.4737	

Pond 11 (Alt. 3)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.346				
		0.6841			
2.00	1.390		0.6841	0.6841	
		1.4350			
3.00	1.480		2.1191	2.1191	
		1.5256			Control Stage: 4.5
4.00	1.572		3.6447	3.6447	Control Volume: 4.45
		1.6186			
5.00	1.666		5.2632	5.2632	
		1.7138			Overflow Stage: 7.00
6.00	1.762		6.9770	6.9770	Overflow Volume: 8.95
		1.9731			
7.00	2.184		8.9501	8.9501	

Project Name:	I-95 (SR 9) Project Development and Environment (PD&E) Study | Pond Siting Report	Project # 439170-1-22-02

System 12 Stage-Storage Calculations

System: 12 — **Pre-Development**

Swale 12E

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.877				
		0.4093			
1.95	0.942		0.4093	0.4093	
		0.0519			
2.00	1.132		0.4611	0.4611	Control Stage: 3.45
		0.5355			Control Volume: 1.96
2.50	1.010		0.9966	0.9966	
		0.5213			
3.00	1.075		1.5179	1.5179	Overflow Stage: 4.2
		0.4966			Overflow Volume: 2.85
3.45	1.132		2.0145	2.0145	
		0.0568			
3.50	1.139		2.0712	2.0712	
		0.5863			
4.00	1.206		2.6575	2.6575	
		0.2432			
4.20	1.226		2.9007	2.9007	
		0.3749			
4.50	1.273		3.2755	3.2755	
		0.6535			
5.00	1.341		3.9290	3.9290	
		0.6873			
5.50	1.408		4.6163	4.6163	
		0.7208			
6.00	1.475		5.3370	5.3370	

Swale 12W

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.645				
		0.3101			
1.95	0.733		0.3101	0.3101	
		0.0369			
2.00	0.743		0.3470	0.3470	Control Stage: 2.33
		0.2566			Control Volume: 0.60
2.33	0.812		0.6035	0.6035	
		0.1411			
2.50	0.848		0.7446	0.7446	Overflow Stage: 2.77
		0.2364			Overflow Volume: 0.98
2.77	0.903		0.9810	0.9810	
		0.2131			
3.00	0.950		1.1941	1.1941	
		0.4993			
3.50	1.047		1.6934	1.6934	
		0.5480			
4.00	1.145		2.2414	2.2414	
		0.5970			
4.50	1.243		2.8384	2.8384	
		0.6463			
5.00	1.342		2.7100	3.4846	
		0.6955			
5.50	1.440		3.4055	4.1801	
		0.7445			
6.00	1.538		4.1500	4.9246	

System: 12 — **Post-Development**

Swale 12E

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.880		0.0000		
		0.9398			
2.00	1.880		0.9398	0.9398	
		1.8795			
3.00	1.880		2.8193	2.8193	Control Stage: 4
		1.8795			Control Volume: 4.70
4.00	1.880		4.6988	4.6988	
		1.8795			
5.00	1.880		6.5783	6.5783	Overflow Stage: 6
		1.8795			Overflow Volume: 8.46
6.00	1.880		8.4578	8.4578	

Swale 12W

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.221		0.0000		
		0.6103			
2.00	1.221		0.6103	0.6103	
		1.2206			
3.00	1.221		1.8309	1.8309	Control Stage: 4
		1.2206			Control Volume: 3.05
4.00	1.221		3.0515	3.0515	
		1.2206			
5.00	1.221		4.2721	4.2721	Overflow Stage: 5
		1.2206			Overflow Volume: 4.27
6.00	1.221		5.4927	5.4927	

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System 12 Stage-Storage Calculations		
System: 12	Pre-Development	

Pond 12SE

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
3.50	0.087				
		0.0525			
4.00	0.123		0.0525	0.0525	
		0.0658			
4.50	0.140		0.1183	0.0525	Control Stage: 5.7
		0.0748			Control Volume: 0.313
5.00	0.159		0.1930	0.1273	
		0.0843			
5.50	0.178		0.2773	0.2115	Overflow Stage: 8
		0.0363			Overflow Volume: 0.80
5.70	0.185		0.3136	0.2478	
		0.0573			
6.00	0.197		0.3709	0.3051	
		0.1038			
6.50	0.218		0.4746	0.4089	
		0.1148			
7.00	0.241		0.5894	0.5236	
		0.1293			
7.50	0.276		0.7186	0.6529	
		0.1510			
8.00	0.328		0.8696	0.8039	

Pond 12SW

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
2.00	0.209				
		0.2388			
3.00	0.269		0.2388	0.2388	
		0.3009			
4.00	0.333		0.5397	0.5397	Control Stage: 5
		0.3673			Control Volume: 0.91
5.00	0.402		0.9070	0.9070	
		0.4361			
6.00	0.471		1.3431	1.3431	Overflow Stage: 6
					Overflow Volume: 1.34

System: 12	Post-Development

Pond 12SE

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
3.50	0.293				
		0.3259			
4.50	0.359		0.3259	0.3259	
		0.3927			
5.50	0.427		0.7186	0.7186	Control Stage: 6.5
		0.4607			Control Volume: 1.18
6.50	0.495		1.1793	1.1793	
		0.5287			
7.50	0.563		1.7080	1.7080	Overflow Stage: 8.5
		0.5967			Overflow Volume: 2.30
8.50	0.631		2.3047	2.3047	

Pond 12SW

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
2.00	0.209				
		0.2388			
3.00	0.269		0.2388	0.2388	
		0.3009			
4.00	0.333		0.5397	0.5397	Control Stage: 5
		0.3673			Control Volume: 0.91
5.00	0.402		0.9070	0.9070	
		0.4361			
6.00	0.471		1.3431	1.3431	Overflow Stage: 6
					Overflow Volume: 1.34

Pond 12 (ALT. 2)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.903				
		0.9675			
2.00	1.967		0.9675	0.9675	
		2.0321			
3.00	2.097		2.9996	2.9996	Control Stage: 5
		2.1644			Control Volume: 7.46
4.00	2.232		5.1640	5.1640	
		2.2989			
5.00	2.366		7.4628	7.4628	Overflow Stage: 6
		2.4345			Overflow Volume: 9.90
6.00	2.503		9.8973	9.8973	

Pond 12 (ALT. 3)

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	1.600				
		0.8369			
2.00	1.748		0.8369	0.8369	
		1.8225			
3.00	1.898		2.6594	2.6594	Control Stage: 5
		1.9725			Control Volume: 6.76
4.00	2.048		4.6319	4.6319	
		2.1245			
5.00	2.202		6.7564	6.7564	Overflow Stage: 6
		2.2790			Overflow Volume: 9.04
6.00	2.357		9.0354	9.0354	

Swale 12NW Griffin

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
2.00	0.114				
		0.1344			
3.00	0.154		0.1344	0.1344	
		0.1744			
4.00	0.194		0.3088	0.3088	Control Stage: 7.00
		0.2144			Control Volume: 1.07
5.00	0.234		0.5232	0.5232	
		0.2544			
6.00	0.274		0.7776	0.7776	Overflow Stage: 8
		0.2944			Overflow Volume: 0.78
7.00	0.314		1.0720	1.0720	
		0.3344			
8.00	0.354			1.4064	

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System 13 Stage-Storage Calculations

System: 13	Pre-Development	System: 13	Post-Development

Pond 13A-1

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
0.92	0.560				
		0.0452			
1.00	0.570		0.0452	0.0452	
		0.6450			
2.00	0.720		0.6902	0.6902	Control Stage: 5.99
		0.7950			Control Volume: 4.83
3.00	0.870		1.4852	1.4852	
		0.9450			
4.00	1.020		2.4302	2.4302	Overflow Stage: 6.5
		1.1000			
5.00	1.180		3.5302	3.5302	
		1.3150			
6.00	1.450		4.8452	4.8452	

Pond 13A-1

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.900				
		0.4650			
2.00	0.960		0.4650	0.4650	
		0.9900			
3.00	1.020		1.4550	1.4550	Control Stage: 6.0
		1.0500			Control Volume: 4.81
4.00	1.080		2.5050	2.5050	
		1.1100			
5.00	1.140		3.6150	3.6150	Overflow Stage: 7
		1.1916			
6.00	1.243		4.8066	4.8066	
		1.2947			
7.00	1.346		6.1012	6.1012	

Swale 13A-2

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.177				
		0.3030			
3.00	0.227		0.3030	0.3030	
		0.2562			
4.00	0.285		0.5592	0.5592	Control Stage: 6
		0.3203			Control Volume: 1.27
5.00	0.355		0.8795	0.8795	
		0.3903			
6.00	0.425		1.2698	1.2698	Overflow Stage: 7
		0.4603			
7.00	0.495		1.7301	1.7301	

Pond 13B-7

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.42	1.570				
		0.9541			
2.00	1.720		0.9541	0.9541	
		1.8550			
3.00	1.990		2.8091	2.8091	Control Stage: 4
		2.1200			Control Volume: 4.93
4.00	2.250		4.9291	4.9291	
		2.3800			
5.00	2.510		7.3091	7.3091	6
		2.6450			
6.00	2.780		9.9541	9.9541	

Pond 13B-7

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.42	1.913				
		1.1663			
2.00	2.109		1.1663	1.1663	
		2.2074			
3.00	2.306		3.3737	3.3737	Control Stage: 4.5
		2.4040			Control Volume: 7.08
4.00	2.502		5.7777	5.7777	
		2.6006			
5.00	2.699		8.3783	8.3783	Overflow Stage: 6
		2.7972			
6.00	2.896		11.1755	11.1755	

Pond 13B-9

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.42	0.180				
		0.1189			
2.00	0.230		0.1189	0.1189	
		0.2650			
3.00	0.300		0.3839	0.3839	Control Stage: 6.26
		0.3350			Control Volume: 1.63
4.00	0.370		0.7189	0.7189	
		0.4150			
5.00	0.460		1.1339	1.1339	Overflow Stage: 7.5
		0.5000			
6.00	0.540		1.6339	1.6339	

Pond 13B-9

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.42	0.180				
		0.1189			
2.00	0.230		0.1189	0.1189	
		0.2650			
3.00	0.300		0.3839	0.3839	Control Stage: 6
		0.3350			Control Volume: 1.63
4.00	0.370		0.7189	0.7189	
		0.4150			
5.00	0.460		1.1339	1.1339	Overflow Stage: 7.5
		0.5000			
6.00	0.540		1.6339	1.6339	

Pond 13B-10

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
2.00	0.040			0.0000	
		0.0900			
3.00	0.140		0.0900	0.0900	
		0.2000			
4.00	0.260		0.2900	0.2900	Control Stage: 6.46
		0.3300			Control Volume: 1.09
5.00	0.400		0.6200	0.6200	
		0.4700			
6.00	0.540		1.0900	1.0900	Overflow Stage: 8

Pond 13B-10

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
2.00	0.040				
		0.0900			
3.00	0.140		0.0900	0.0900	
		0.2000			
4.00	0.260		0.2900	0.2900	Control Stage: 6
		0.3300			Control Volume: 1.09
5.00	0.400		0.6200	0.6200	
		0.4700			
6.00	0.540		1.0900	1.0900	Overflow Stage: 8

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Griffin East Stage-Storage Calculations

Stage-Storage Calculations

System: GRIFFIN EAST — **Pre-Development**

Griffin East Pond

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.143				
		0.0713			
2.00	0.143		0.0713	0.0713	
		0.1425			
3.00	0.143		0.2138	0.2138	Control Stage: 2.5
		0.1425			Control Volume: 0.14
4.00	0.143		0.3563	0.3563	
					Overflow Stage: 4.0000
					Overflow Volume: 0.36

Stage-Storage Calculations

System: GRIFFIN EAST — **Post-Development**

Griffin East Pond

Elev.	Stage Area (Ac)	Incremental Volume (Ac-Ft)	Water Quality Cumulative Volume (Ac-Ft)	Cumulative Volume (Ac-Ft)	Remarks
1.50	0.245		0.0000		
		0.1266			
2.00	0.261		0.1266	0.1266	
		0.2789			
3.00	0.296		0.4055	0.4055	Control Stage: 5
		0.3139			Control Volume: 1.07
4.00	0.331		0.7194	0.7194	
		0.3489			
5.00	0.366		1.0683	1.0683	Overflow Stage: 6
		0.3837			Overflow Volume: 1.07
6.00	0.401		1.4520	1.4520	

Complete Report (not including cost) Ver 4.3.5

Project: I-95 PD_E
Date: 12/8/2025 10:52:09 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	System 9	System 10	System 11	System 12	System 13	Griffin East
Rainfall Zone	Florida Zone 5	Florida Zone 5	Florida Zone 5	Florida Zone 5	Florida Zone 5	Florida Zone 5
Annual Mean Rainfall	62.00	62.00	62.00	62.00	62.00	62.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	35.07	21.33	18.50	45.29	59.06	6.28
Rational Coefficient (0-1)	0.57	0.61	0.64	0.68	0.54	0.62
Non DCIA Curve Number	49.00	49.00	49.00	49.00	49.00	49.00
DCIA Percent (0-100)	69.00	74.00	79.00	83.00	66.00	76.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	102.846	66.780	61.632	158.211	166.059	20.162
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	158.512	102.924	94.991	243.843	255.938	31.075
Phosphorus Loading (kg/yr)	21.938	14.245	13.147	33.748	35.422	4.301

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values

Area (acres)	36.83	20.80	18.25	46.60	59.06	6.28
Rational Coefficient (0-1)	0.68	0.68	0.71	0.71	0.56	0.60
Non DCIA Curve Number	49.00	49.00	49.00	49.00	49.00	49.00
DCIA Percent (0-100)	83.00	84.00	87.00	87.00	68.00	73.00
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	128.658	73.503	66.702	170.318	170.819	19.413
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	198.294	113.286	102.804	262.503	263.275	29.921
Phosphorus Loading (kg/yr)	27.444	15.679	14.228	36.330	36.437	4.141

Catchment Number: 1 Name: System 9

Project: I-95 PD_E
Date: 12/8/2025

Retention Design

Retention Depth (in)	3.223
Retention Volume (ac-ft)	9.890

Watershed Characteristics

Catchment Area (acres)	36.83
Contributing Area (acres)	36.830
Non-DCIA Curve Number	49.00
DCIA Percent	83.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	62.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	94

Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	94

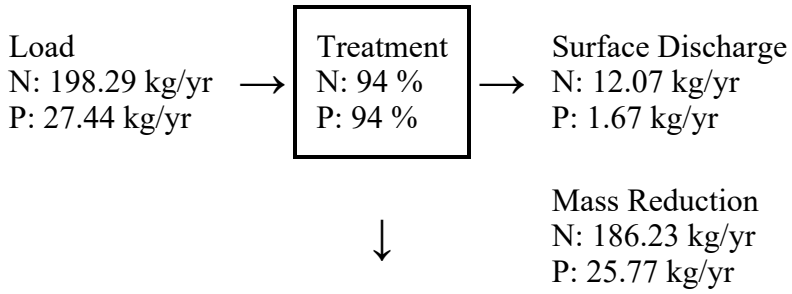
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

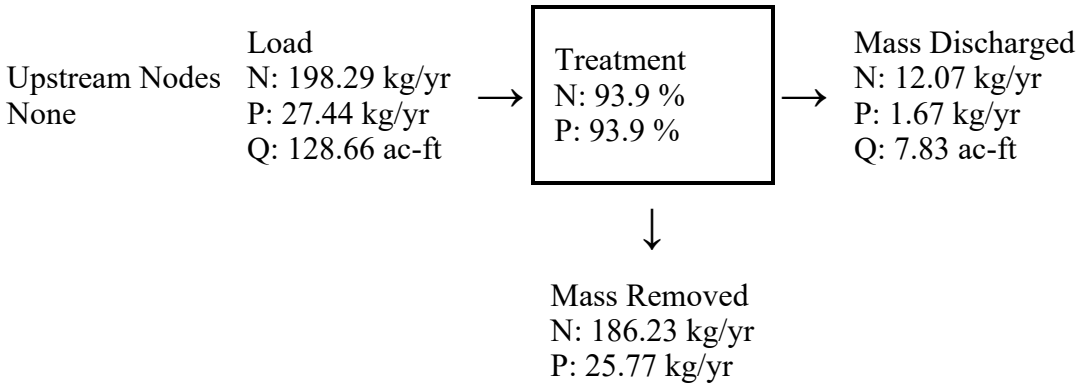
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	186.226
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	25.774
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Catchment Number: 2 Name: System 10

Project: I-95 PD_E
Date: 12/8/2025

Retention Design

Retention Depth (in)	2.394
Retention Volume (ac-ft)	4.150

Watershed Characteristics

Catchment Area (acres)	20.80
Contributing Area (acres)	20.800
Non-DCIA Curve Number	49.00
DCIA Percent	84.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	62.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	90
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	90

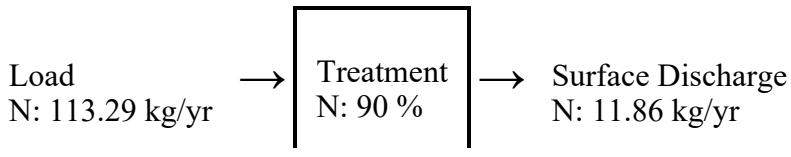
Media Mix Information

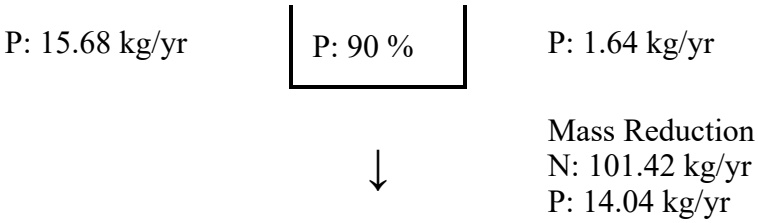
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

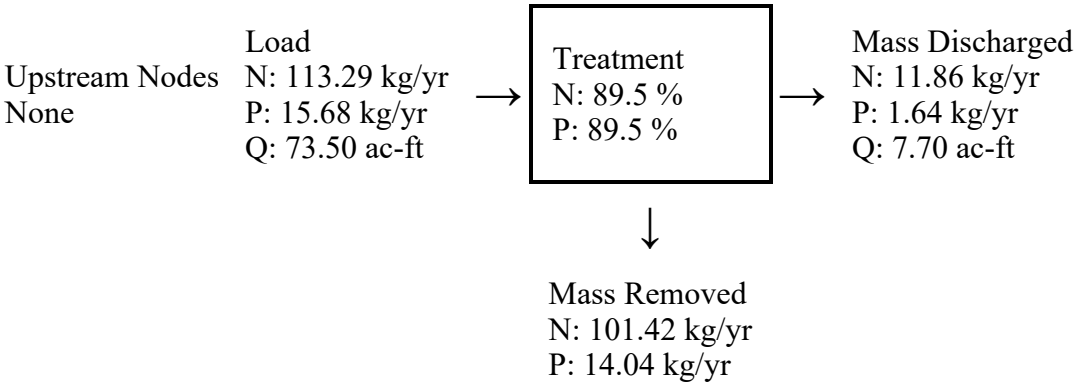
Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	101.423
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	14.037
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)





Load Diagram for Retention (As Used In Routing)



Catchment Number: 3 Name: System 11

Project: I-95 PD_E
Date: 12/8/2025

Retention Design

Retention Depth (in)	3.222
Retention Volume (ac-ft)	4.900

Watershed Characteristics

Catchment Area (acres)	18.25
Contributing Area (acres)	18.250
Non-DCIA Curve Number	49.00
DCIA Percent	87.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	62.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	94
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	94

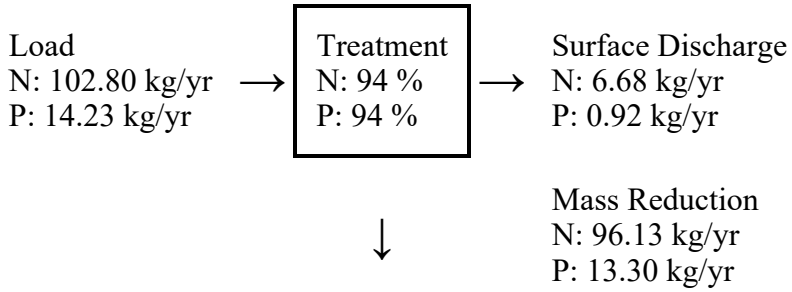
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

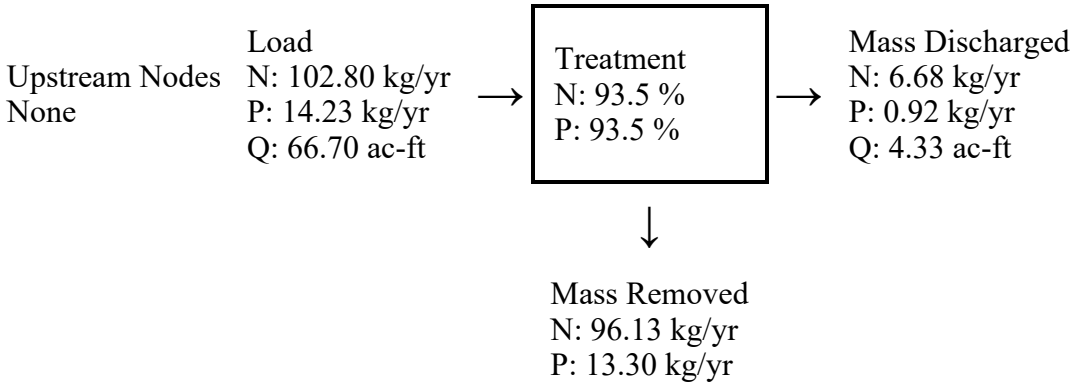
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	96.126
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	13.304
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Catchment Number: 4 Name: System 12

Project: I-95 PD_E

Date: 12/8/2025

Retention Design

Retention Depth (in)	2.735
Retention Volume (ac-ft)	10.621

Watershed Characteristics

Catchment Area (acres)	46.60
Contributing Area (acres)	46.600
Non-DCIA Curve Number	49.00
DCIA Percent	87.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	62.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	91
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	91

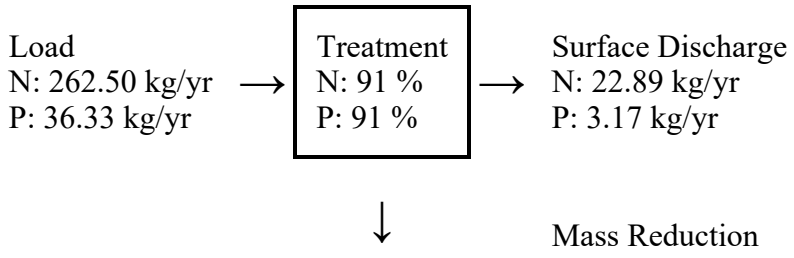
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

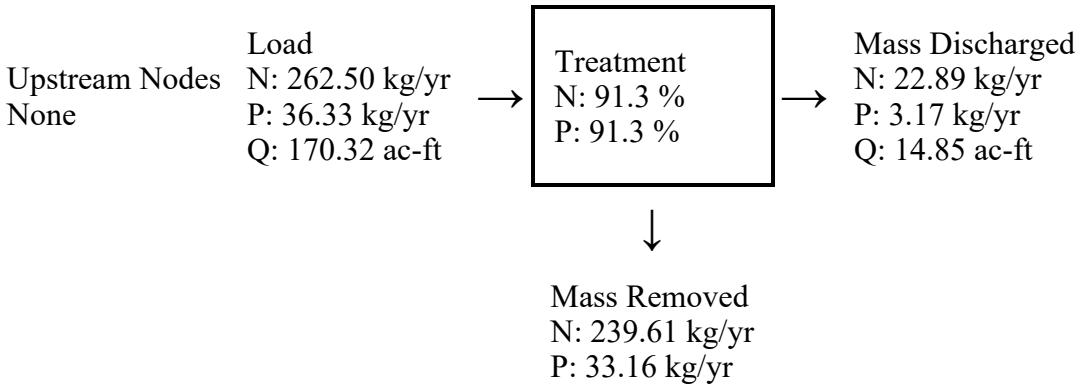
Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	239.615
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	33.163
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



N: 239.61 kg/yr
P: 33.16 kg/yr

Load Diagram for Retention (As Used In Routing)



Catchment Number: 5 Name: System 13

Project: I-95 PD_E
Date: 12/8/2025

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Retention

Retention Depth (in)	3.227
Retention Volume (ac-ft)	15.880

BMP in Series Number: 2
BMP Type: Swale

Swale Top Width for Flood Conditions - **W** (ft)	15.000
Swale Bottom Width - **B** (ft)	13.000
Swale Length - **L** (ft)	1,000.000
Average Impervious Length (ft)	1,000.000
Average Impervious Width (ft)	270.000
Average Pervious Width (ft)	15.000
Swale Slope (foot drop/foot length) - **S**	0.050
Mannings N	0.022
Soil Infiltration Rate (in/hr)	2.000
Side Slope of Swale horizontal/vertical - **Z**	2.000
Average Height of Swale Block - **H**	0.000
Length of Berm Upstream of Crest - $\mathbf{L_b}$	0.000

Runoff Area (acres)	6.543
Number of Swale Blocks	

BMP in Series Number: 3
BMP Type: None

BMP in Series Number: 4
BMP Type: None

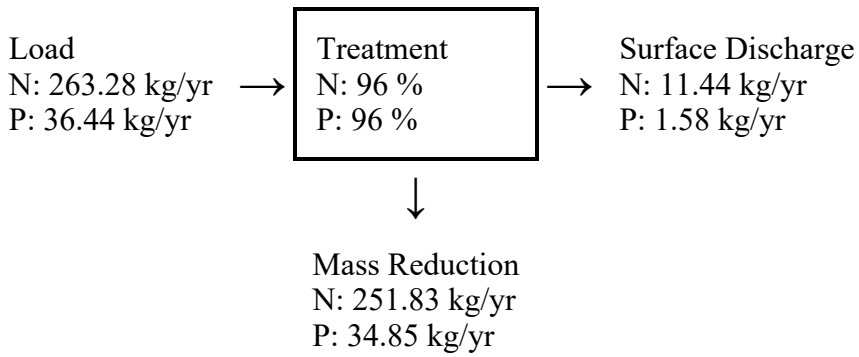
Watershed Characteristics

Catchment Area (acres)	59.06
Contributing Area (acres)	59.060
Non-DCIA Curve Number	49.00
DCIA Percent	68.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	62.00

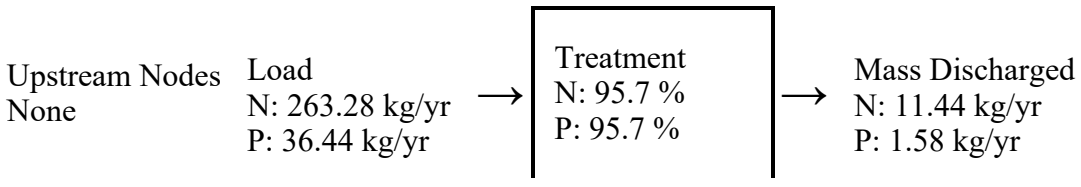
Surface Water Discharge

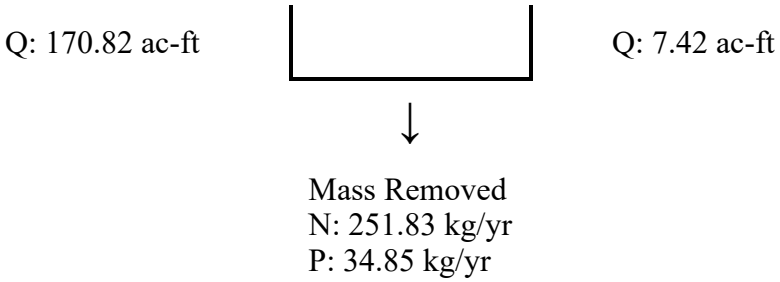
Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	96
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	96

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)





Catchment Number: 6 Name: Griffin East

Project: I-95 PD_E
Date: 12/8/2025

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Exfiltration

Pipe Span (in)	24.0
Pipe Rise (in)	24.0
Pipe Length (ft)	280.0
Trench Width (ft)	5.0
Trench Depth (ft)	6.0
Trench Length (ft)	280.0
Aggregate Void %	0.25
Storage Volume (Ac-ft)	0.06
Retention Depth (in over CA)	0.121

BMP in Series Number: 2
BMP Type: Retention

Retention Depth (in)	2.045
Retention Volume (ac-ft)	1.070

BMP in Series Number: 3
BMP Type: None

BMP in Series Number: 4
BMP Type: None

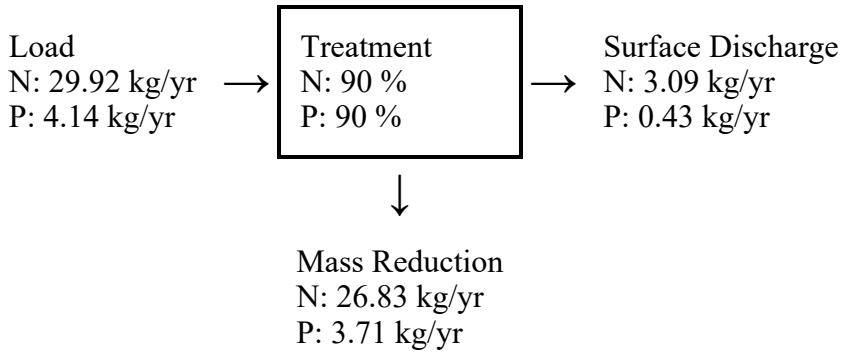
Watershed Characteristics

Catchment Area (acres)	6.28
Contributing Area (acres)	6.280
Non-DCIA Curve Number	49.00
DCIA Percent	73.00
Rainfall Zone	Florida Zone 5
Rainfall (in)	62.00

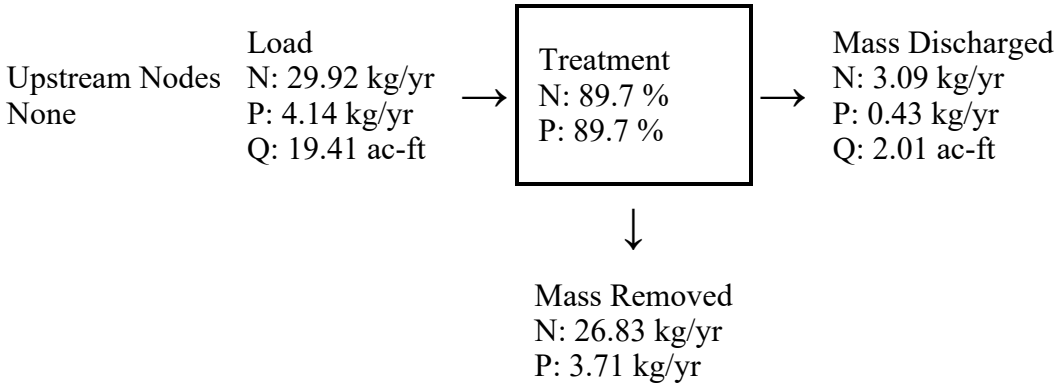
Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	90
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	90

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: I-95 PD_E

Analysis Type: Specified Removal Efficiency

Date:12/8/2025

BMP Types:

Catchment 1 - (System 9) Retention	**Routing Summary**
Catchment 2 - (System 10) Retention	Catchment 1 Routed to Outlet
Catchment 3 - (System 11) Retention	Catchment 2 Routed to Outlet
Catchment 4 - (System 12) Retention	Catchment 3 Routed to Outlet
Catchment 5 - (System 13) Multiple BMP	Catchment 4 Routed to Outlet
	Catchment 5 Routed to Outlet
Catchment 6 - (Griffin East) Multiple BMP	Catchment 6 Routed to Outlet

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**
Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge		
Total N pre load	887.28 kg/yr	
Total N post load	970.08 kg/yr	
Target N load reduction	80 %	
Target N discharge load	194.02 kg/yr	
Percent N load reduction	93 %	
Provided N discharge load	68.03 kg/yr	150.02 lb/yr
Provided N load removed	902.05 kg/yr	1989.02 lb/yr

Phosphorus

Surface Water Discharge		
Total P pre load	122.8 kg/yr	
Total P post load	134.26 kg/yr	
Target P load reduction	80 %	
Target P discharge load	26.852 kg/yr	
Percent P load reduction	93 %	
Provided P discharge load	9.416 kg/yr	20.76 lb/yr
Provided P load removed	124.844 kg/yr	275.28 lb/yr

Appendix M

Rainfall Criteria

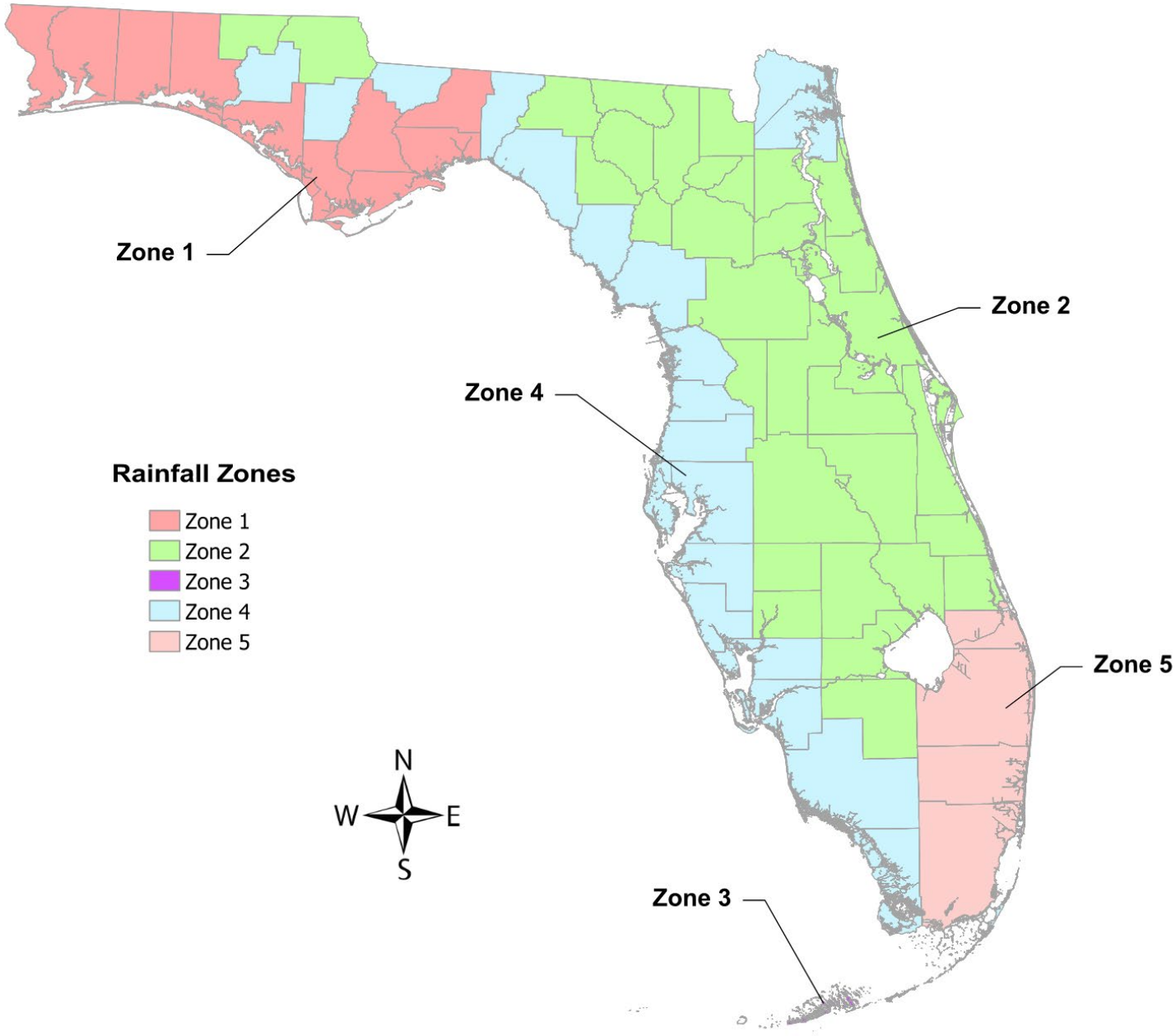
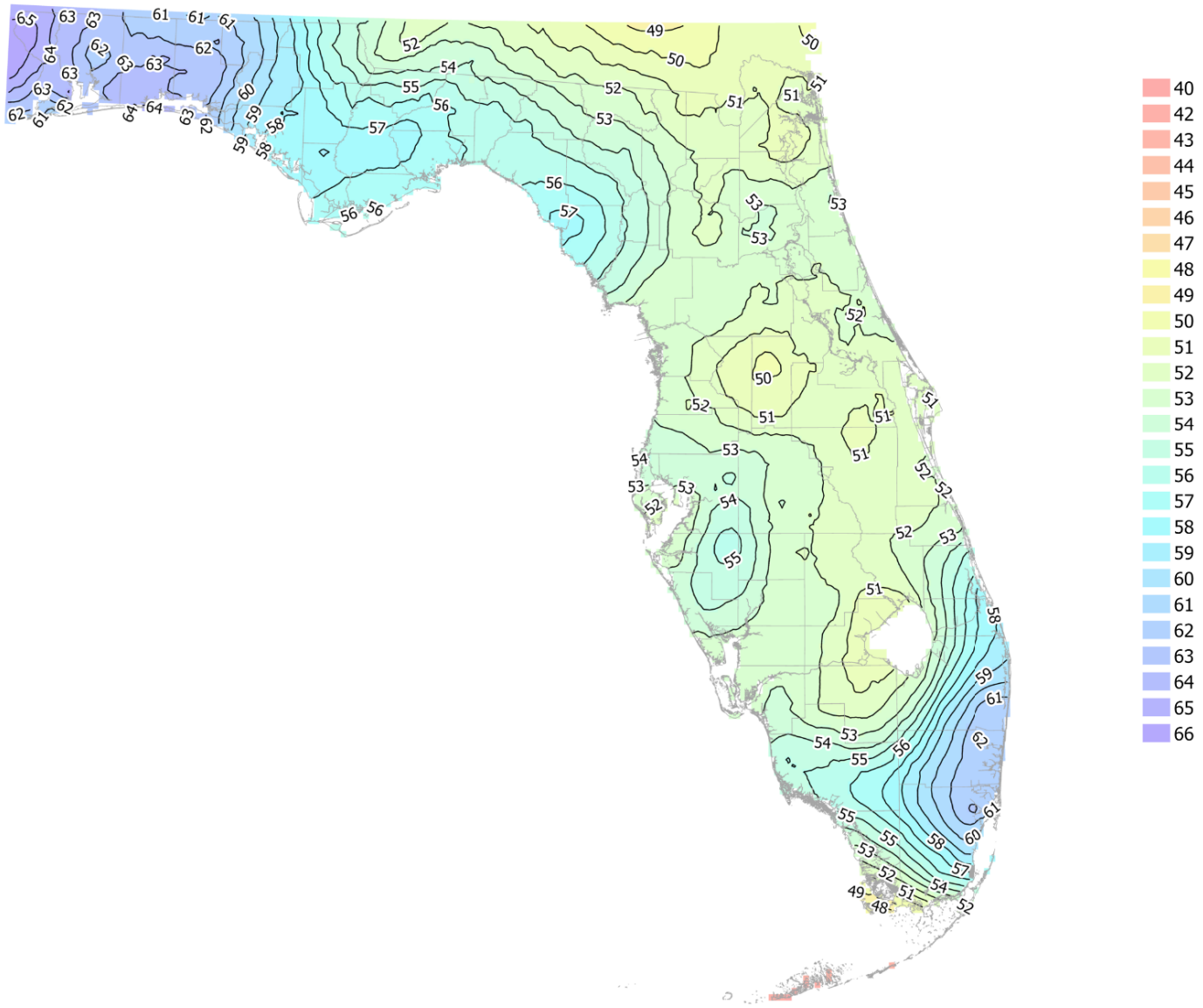


Figure 1: Designated Meteorological Regions (Zones) in Florida

Figure 2: Average Annual Rainfall Isopleth Map for Florida



9.2.2 Calculating Predevelopment and Post-development Stormwater Nutrient Loading

a. To calculate the predevelopment and post development loadings before treatment of the annual mass loadings for TN and TP, multiply the predevelopment annual runoff volume (derived in Section 9.2.1) by the land use specific runoff characterization data (event mean concentrations or EMCs) for TN and TP. Applicants must use the most up-to-date verified EMC values, where available and incorporated by reference pursuant to rule 62.330.301(4), for their project region. Applicants also must comply with the applicable special basin or geographic area criteria in rule 62-330.301(1)(k), F.A.C., including any EMC values specified in the applicable Applicant's Handbook Volume II. EMC Values are listed in Table 9.2 for different types of land use categories. EMC values for the land uses must consider cover, soils, and topography and be representative of the latest assigned Florida Land Use and Cover Classification System (FLUCCS) code.

Table 9.2 Standardized Statewide Stormwater Nutrient EMC Values

Land Use Category	Total N (mg/l)	Total P (mg/l)
Low Density Residential	1.65	0.270
Single Family	1.77	0.327
Multi-Family	1.84	0.520
Low Intensity Commercial	0.93	0.19
High Intensity Commercial	2.40	0.345
Light Industrial	1.20	0.260
Highway	1.25	0.173
Dry Prairie	2.025	0.184
Marl Prairie	0.684	0.012
Mesic Flatwoods	1.087	0.043
Ruderal/Upland Pine	1.694	0.162
Scrubby Flatwoods	1.155	0.027
Upland Hardwood	1.042	0.346
Upland Mixed Forest	0.606	1.166
Wet Flatwoods	1.213	0.021
Wet Prairie	1.095	0.015
Xeric Scrub	1.596	0.156
Rangeland/parkland	1.150	0.055
General Agricultural	2.29	0.381
Pasture	3.03	0.593
Citrus	2.11	0.180
Row Crops	2.50	0.577

b. At the time of the application, an applicant may propose to use TN and TP EMC values accepted by the Agency which denote EMC values derived from regional or local government studies. Any study conducted must be submitted with the permit application for the Agency records. If EMC values from a study are to be used, data collected must follow quality assurance provisions outlined in chapter 62-160, F.A.C., and include:
   - Data collected at a representative variety of rainfall depths;
   - Minimum of 10 rainfall events;
   - Minimum of one year of data with seasonal variation;
   - Use of autosamplers to allow for runoff to be sampled for the duration of the rainfall event;
   - Volume or time weighted composite samples;

Non DCIA CN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	95.1	96.1	96.0	95.4	94.5	93.3	91.9	90.4	88.7	86.9	85.1	83.3	81.5	79.7	77.8	76.1	74.4	72.7	71.1	69.5
35	92.3	94.2	94.5	94.2	93.4	92.4	91.1	89.7	88.2	86.5	84.8	83.0	81.2	79.5	77.7	76.0	74.3	72.6	71.1	69.5
40	89.3	92.0	92.8	92.8	92.2	91.3	90.2	88.9	87.5	85.9	84.3	82.6	80.9	79.2	77.5	75.8	74.2	72.6	71.0	69.5
45	86.5	89.8	90.9	91.2	90.9	90.1	89.2	88.0	86.7	85.3	83.8	82.2	80.6	78.9	77.3	75.7	74.1	72.5	71.0	69.5
50	83.8	87.5	88.9	89.5	89.3	88.8	88.0	87.0	85.8	84.5	83.1	81.7	80.2	78.6	77.0	75.5	73.9	72.4	71.0	69.5
55	81.2	85.1	86.8	87.5	87.5	87.2	86.6	85.8	84.8	83.7	82.4	81.1	79.7	78.2	76.7	75.3	73.8	72.3	70.9	69.5
60	78.6	82.7	84.6	85.4	85.6	85.5	85.1	84.5	83.7	82.7	81.6	80.4	79.1	77.8	76.4	75.0	73.6	72.2	70.9	69.5
65	76.4	80.3	82.2	83.1	83.6	83.7	83.5	83.1	82.4	81.6	80.7	79.6	78.5	77.2	76.0	74.7	73.4	72.1	70.8	69.5
70	74.3	77.7	79.7	80.8	81.5	81.7	81.7	81.4	80.9	80.3	79.5	78.7	77.7	76.6	75.4	74.3	73.1	71.9	70.7	69.5
75	72.4	75.4	77.3	78.5	79.2	79.6	79.7	79.6	79.3	78.8	78.2	77.5	76.7	75.8	74.8	73.8	72.7	71.7	70.6	69.5
80	70.8	73.3	75.1	76.2	76.9	77.4	77.6	77.6	77.4	77.1	76.7	76.2	75.5	74.8	74.0	73.2	72.3	71.4	70.5	69.5
85	69.8	71.6	72.9	73.9	74.6	75.0	75.3	75.4	75.4	75.2	75.0	74.6	74.1	73.6	73.0	72.4	71.7	71.0	70.3	69.5
90	69.2	70.3	71.1	71.8	72.3	72.6	72.9	73.0	73.1	73.1	72.9	72.7	72.5	72.2	71.8	71.4	71.0	70.5	70.0	69.5
95	68.9	69.3	69.7	70.0	70.2	70.4	70.5	70.6	70.7	70.7	70.7	70.7	70.6	70.5	70.4	70.3	70.1	69.9	69.7	69.5
98	69.4	69.5	69.6	69.6	69.7	69.7	69.8	69.8	69.8	69.8	69.8	69.8	69.8	69.8	69.7	69.7	69.7	69.6	69.6	69.5

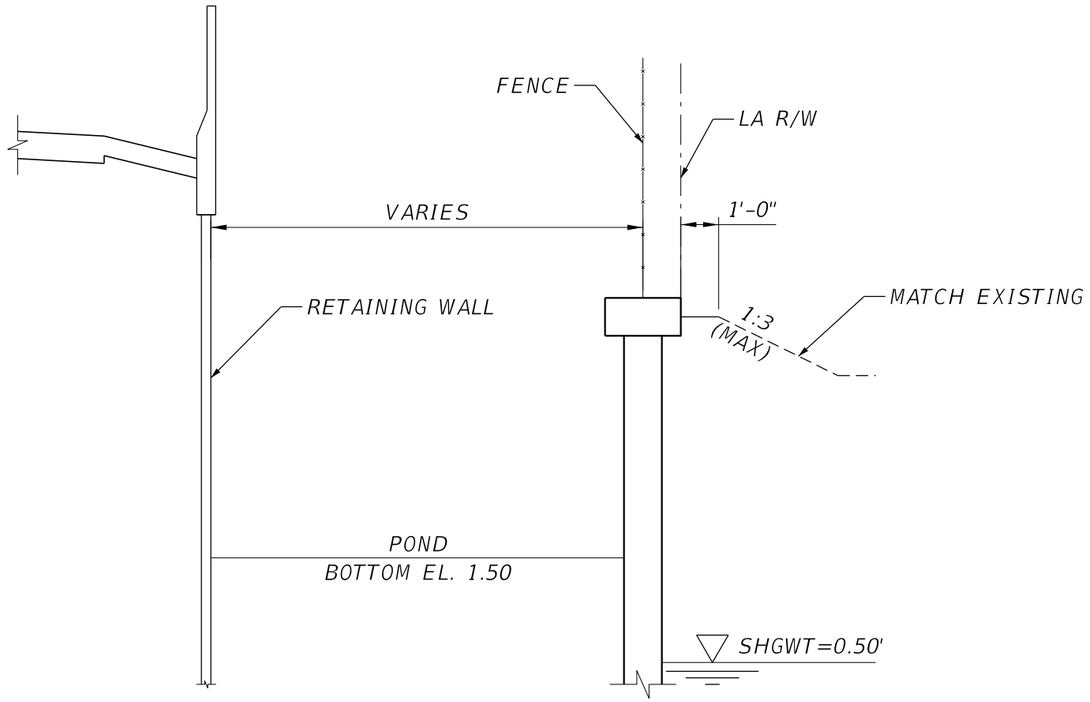
Mean Annual Mass Removal Efficiencies for 1.50-inches of Retention for Zone 5 by Percent DCIA

Non DCIA CN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	96.3	97.1	97.0	96.5	95.9	95.0	93.9	92.8	91.5	90.2	88.7	87.2	85.7	84.1	82.6	81.1	79.5	78.0	76.5	75.1
35	93.9	95.4	95.6	95.4	95.0	94.2	93.2	92.2	91.0	89.7	88.3	86.9	85.4	83.9	82.4	81.0	79.5	78.0	76.5	75.1
40	91.3	93.5	94.1	94.2	93.9	93.3	92.4	91.5	90.4	89.2	87.9	86.5	85.1	83.7	82.3	80.8	79.4	77.9	76.5	75.1
45	88.8	91.5	92.5	92.8	92.7	92.2	91.5	90.6	89.6	88.6	87.4	86.1	84.8	83.4	82.0	80.6	79.2	77.8	76.4	75.1
50	86.4	89.6	90.8	91.3	91.4	91.0	90.4	89.7	88.8	87.9	86.8	85.6	84.4	83.1	81.8	80.4	79.1	77.7	76.4	75.1
55	84.2	87.5	89.0	89.7	89.8	89.6	89.2	88.6	87.9	87.1	86.1	85.0	83.9	82.7	81.5	80.2	78.9	77.6	76.3	75.1
60	81.9	85.4	87.1	87.9	88.2	88.1	87.9	87.4	86.9	86.2	85.3	84.4	83.3	82.2	81.1	79.9	78.7	77.5	76.3	75.1
65	80.0	83.4	85.1	86.0	86.4	86.5	86.4	86.1	85.7	85.1	84.4	83.6	82.7	81.7	80.7	79.6	78.5	77.4	76.2	75.1
70	78.3	81.3	83.0	84.0	84.5	84.8	84.8	84.7	84.4	83.9	83.4	82.7	81.9	81.1	80.2	79.3	78.2	77.2	76.1	75.1
75	76.6	79.3	80.9	81.9	82.6	83.0	83.1	83.1	82.9	82.6	82.2	81.6	81.0	80.4	79.6	78.8	77.9	77.0	76.0	75.1
80	75.3	77.4	78.9	79.9	80.6	81.1	81.3	81.4	81.3	81.1	80.8	80.4	80.0	79.5	78.9	78.2	77.5	76.7	75.9	75.1
85	74.4	76.0	77.2	78.0	78.7	79.1	79.4	79.5	79.5	79.5	79.3	79.1	78.8	78.4	78.0	77.5	76.9	76.3	75.7	75.1
90	73.9	74.9	75.7	76.3	76.8	77.1	77.4	77.6	77.7	77.7	77.7	77.6	77.4	77.2	76.9	76.6	76.3	75.9	75.5	75.1
95	74.0	74.4	74.7	75.0	75.2	75.4	75.6	75.7	75.8	75.9	75.9	75.9	75.9	75.8	75.7	75.6	75.5	75.4	75.2	75.1
98	74.8	74.9	75.0	75.0	75.1	75.1	75.1	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.2	75.1	75.1	75.1

Non DCIA CN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.2	97.7	97.7	97.4	96.8	96.2	95.4	94.4	93.5	92.4	91.2	90.0	88.7	87.4	86.1	84.8	83.4	82.1	80.8	79.4
35	95.1	96.3	96.6	96.4	96.0	95.5	94.7	93.9	93.0	91.9	90.8	89.7	88.5	87.2	85.9	84.6	83.3	82.0	80.7	79.4
40	92.9	94.7	95.2	95.2	95.0	94.6	94.0	93.2	92.4	91.4	90.4	89.3	88.2	87.0	85.7	84.5	83.2	82.0	80.7	79.4
45	90.7	93.0	93.7	94.0	94.0	93.7	93.2	92.5	91.7	90.9	89.9	88.9	87.8	86.7	85.5	84.3	83.1	81.9	80.7	79.4
50	88.5	91.2	92.2	92.7	92.8	92.6	92.2	91.7	91.0	90.2	89.4	88.4	87.4	86.4	85.3	84.1	83.0	81.8	80.6	79.4
55	86.5	89.4	90.7	91.3	91.5	91.5	91.2	90.7	90.2	89.5	88.7	87.9	87.0	86.0	85.0	83.9	82.8	81.7	80.6	79.4
60	84.6	87.5	89.0	89.8	90.2	90.2	90.0	89.6	89.2	88.6	88.0	87.3	86.4	85.6	84.6	83.6	82.6	81.6	80.5	79.4
65	82.9	85.8	87.4	88.3	88.6	88.7	88.7	88.5	88.1	87.7	87.2	86.6	85.8	85.1	84.2	83.3	82.4	81.4	80.5	79.4
70	81.4	84.1	85.6	86.5	87.0	87.2	87.2	87.2	87.0	86.6	86.2	85.7	85.1	84.5	83.7	83.0	82.1	81.3	80.4	79.4
75	80.2	82.4	83.8	84.7	85.2	85.6	85.8	85.8	85.7	85.5	85.2	84.8	84.3	83.8	83.2	82.5	81.8	81.1	80.3	79.4
80	78.9	80.8	82.0	82.9	83.5	84.0	84.2	84.3	84.3	84.2	84.0	83.7	83.4	83.0	82.5	82.0	81.4	80.8	80.1	79.4
85	78.1	79.5	80.5	81.3	81.9	82.3	82.6	82.8	82.8	82.8	82.7	82.5	82.3	82.1	81.7	81.4	81.0	80.5	80.0	79.4
90	77.8	78.6	79.3	79.9	80.4	80.7	80.9	81.1	81.2	81.3	81.3	81.2	81.1	81.0	80.9	80.6	80.4	80.1	79.8	79.4
95	78.0	78.4	78.7	78.9	79.1	79.3	79.5	79.6	79.7	79.8	79.9	79.9	79.9	79.9	79.9	79.8	79.8	79.7	79.6	79.4
98	79.0	79.0	79.1	79.2	79.2	79.3	79.3	79.4	79.4	79.4	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.4

Mean Annual Mass Removal Efficiencies for 2.00-inches of Retention for Zone 5 by Percent DCIA

Non DCIA CN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.8	98.3	98.3	98.0	97.5	97.0	96.4	95.6	94.8	93.9	93.0	92.0	91.0	89.9	88.7	87.6	86.4	85.2	84.0	82.9
35	96.2	97.1	97.3	97.1	96.8	96.3	95.8	95.1	94.4	93.6	92.7	91.7	90.7	89.7	88.6	87.4	86.3	85.2	84.0	82.9
40	94.3	95.7	96.1	96.1	95.9	95.6	95.2	94.5	93.8	93.1	92.3	91.4	90.4	89.4	88.4	87.3	86.2	85.1	84.0	82.9
45	92.3	94.2	94.8	95.0	94.9	94.8	94.4	93.9	93.3	92.6	91.8	91.0	90.1	89.2	88.2	87.1	86.1	85.0	83.9	82.9
50	90.3	92.5	93.4	93.8	93.9	93.8	93.6	93.1	92.6	92.0	91.3	90.5	89.7	88.8	87.9	87.0	86.0	84.9	83.9	82.9
55	88.4	90.9	92.0	92.6	92.8	92.8	92.6	92.3	91.8	91.3	90.7	90.0	89.3	88.5	87.6	86.7	85.8	84.8	83.9	82.9
60	86.8	89.3	90.6	91.3	91.6	91.7	91.6	91.3	91.0	90.6	90.0	89.4	88.8	88.1	87.3	86.5	85.6	84.7	83.8	82.9
65	85.3	87.7	89.1	90.0	90.4	90.5	90.5	90.3	90.0	89.7	89.3	88.8	88.2	87.6	86.9	86.2	85.4	84.6	83.7	82.9
70	83.9	86.3	87.7	88.5	88.9	89.2	89.2	89.1	89.0	88.8	88.4	88.0	87.6	87.1	86.5	85.8	85.1	84.4	83.7	82.9
75	82.9	84.9	86.2	87.0	87.4	87.7	87.9	87.9	87.9	87.7	87.5	87.2	86.9	86.4	86.0	85.4	84.8	84.2	83.6	82.9
80	81.9	83.5	84.6	85.4	85.9	86.3	86.5	86.7	86.7	86.6	86.5	86.3	86.1	85.7	85.4	84.9	84.5	84.0	83.4	82.9
85	81.1	82.3	83.3	84.0	84.5	84.9	85.1	85.3	85.4	85.4	85.4	85.3	85.1	84.9	84.7	84.4	84.1	83.7	83.3	82.9
90	80.9	81.7	82.3	82.8	83.2	83.5	83.8	84.0	84.1	84.2	84.2	84.2	84.1	84.0	83.9	83.8	83.6	83.4	83.1	82.9
95	81.3	81.6	81.9	82.1	82.3	82.5	82.6	82.8	82.9	83.0	83.0	83.1	83.1	83.1	83.1	83.1	83.1	83.0	82.9	82.9
98	82.3	82.3	82.4	82.5	82.5	82.6	82.6	82.7	82.7	82.7	82.8	82.8	82.8	82.8	82.9	82.9	82.9	82.9	82.9	82.9



TYPICAL SECTION

N.T.S

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			MISCELLANEOUS DETAILS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	DENYS AVILA, P.E. LICENSE NUMBER: 90871 SCALAR CONSULTING GROUP INC. 5713 CORPORATE WAY, SUITE 200 WEST PALM BEACH, FLORIDA 33407	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR9/I95	BROWARD	439170-1-22-02		

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

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Appendix F
Pond Siting Evaluation

Project Name:			SR-9/I-95 PD&E from Miami-Dade/Broward County Line to N. of Griffin Rd.								
Date:	2/9/2026		Completed by:	Denys A.							
Project #:	439170-1-22-02		Checked by:	David B.							
POND SITING EVALUATION MATRIX			BASIN 9								

POND 9-7

#	Factor	Weight of Factor	Comments	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Comments
				1-10		1-10		1-10		1-10		
			Alternative Number (Pond ID)	1		2		3		4		
			Brief Description of Alternative	NW Corner of Taft Street & NB I-95		Adjacent to East side of I-95		SW Corner of Sheridan St. & I-95		Taft Street, west of the SFRC Railroad		
		1-10	Parcel Numbers	514209AM0010		514209160980		514209170030		514208160020		
				514209AM0020		514209160990		514209170040				
				514209AM0030		514209161000		514209170050				
				514209AM0040		514209161010		514209170060				
				514209AM0050		514209161020		514209170630				
				514209AM0060		514209161030		514209170640				
				514209000080		514209161040		514209170650				
				514209AJ0010		514209161050		514209170660				
						514209161060		514209170670				
						514209161070		514209170680				
						514209161080		514209170690				
						514209161090						
						514209161100						
						514209161110						
			Total Parcels	8		14		11		1		
			Parcel Size (Acres)	1.83		1.79		1.91		3.79		
1	**Zoning**	5	Broward County Zoning Maps	3	15	5	25	5	25	7	35	Alt. 1- Low/Medium Residential, Alt. 4 Commerce, Alt. 5 Activity Center
2	**Land Use**	5	SFWMD Land Use Maps	4	20	5	25	5	25	7	35	Alt. 3 Residential High Density, Alt. 4/5 Commercial & Services
3	**Right of Way Costs**	10	Total Cost of Pond ROW, TCE, Easements	5	50	3	30	6	60	7	70	Alt. 1 Multiple Owners, Alt. 3 - 1 Parcel Owned by City of Hollywood, Alt. 4 One Owner, Alt.5 Owned by FDOT
4	**Drainage Considerations**	8	Location with respect to outfall location, canals, SHGWT	8	64	6	48	7	56	4	32	Alt. 4 & 5 farthest away. Alt. 4 requires railroad crossing
5	**Flood Zones**	5	Potential for Floodplain Comp.	8	40	8	40	8	40	8	40	Alt. 1-4 Flood Zone AE (EL. 6.0), Alt. 5 Flood Zone AE (EL. 7.0)
6	**Contamination/Hazardous Materials**	5	Per CSER	10	50	10	50	6	30	6	30	Alt. 3, 4, 5 are adjacent to Medium Risk site
7	**Utilities**	5	Based on As-built Plans	8	40	8	40	8	40	7	35	No major utility impacts for Alt 1-3. Alt. 4 potential impacts along Taft St.
8	**Public Opinion/Residency Concerns**	8		3	24	4	32	4	32	8	64	Alt. 1 contains HOA recreational courts & parking, Alt. 2-3 contains residential housing
9	**Threatened/Endangered Species**	5		9	45	9	45	9	45	9	45	Urban corridor, minimal involvement
10	**Wetlands and Other Surface Waters**	2	Lakes, Canals, Existing Ditches	8	16	10	20	10	20	10	20	Alt 1 - 0.4 acres of surface waters impacted
11	**Section 4(f)**	5		10	50	10	50	10	50	10	50	No involvement
12	**Cultural Resources**	5		10	50	10	50	10	50	10	50	No adverse effect per CRAS
13	**Public Wellfield**	4		10	40	10	40	10	40	10	40	No involvement
14	**Construction**	8	Construction Constraints	8	64	8	64	8	64	3	24	Similar layout for Alt. 1-3. Alt. 4 pipe under SFRC Railroad
15	**Maintenance**	6	Ease of Access and Maintenance	8	48	8	48	8	48	6	36	All will have access from public road, Alt. 4 pipe under SFRC Railroad
16	**Aesthetics**	5		6	30	6	30	6	30	6	30	Similar layout for all alternatives
17	**Other**	2		0	0	0	0	0	0	0	0	
			Score	**646**		**637**		**655**		**636**		
			Ranking	**2**		**3**		**1**		**4**		

Note: Scores range from 1-10. 1 is least desirable, 10 is most desirable.

Project Name:	SR-9/I-95 PD&E from Miami-Dade/Broward County Line to N. of Griffin Rd.		
Date:	2/9/2026	**Completed by:**	Denys A.
Project #:	439170-1-22-02	**Checked by:**	David B.
POND SITING EVALUATION MATRIX		**SYSTEM 10**	

POND 10

#	Factor	Weight of Factor	Comments	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Comments
				1-10		**1-10**		**1-10**		
			Alternative Number (Pond ID)	**1**		**2**		**3**		
			Brief Description of Alternative	Existt. Swales East/West Sides of I-95		Southern Offsite Parcel		Northern Offsite Parcel		
		1-10	Parcel Numbers			514204040164 514204040160		514204040102 514204040104 514204040114 514204040112		
			Total Parcels	0.00		2		4		
			Parcel Size (Acres)	0.00		2.70		2.52		
1	**Zoning**	5	Broward County Zoning Maps	10	50	5	25	5	25	Alt. 2 & 3 Commerce
2	**Land Use**	5	SFWMD Land Use Maps	10	50	5	25	5	25	Alt. 2 & 3 Commercial & Services
3	**Right of Way Costs**	10	Total Cost of Pond ROW, TCE, Easements	10	100	5	50	4	40	Alt. 1 within FDOT R/W
4	**Drainage Considerations**	10	Location with respect to outfall location, canals, SHGWT	10	100	8	80	8	80	Alt. 1 adjacent to I-95 Corridor
5	**Flood Zones**	5	Potential for Floodplain Comp.	3	15	10	50	10	50	Alt. 2 & 3 AE/AH (EL. 6.0-7.0)
6	**Contamination/Hazardous Materials**	5	Per CSER	10	50	10	50	9	45	Alt 3 is within documented active handler of controlled substances but no concern at this time
7	**Utilities**	5	Based on As-built Plans	8	40	5	25	5	25	Alt. 1 are existing swales
8	**Public Opinion/Residency Concerns**	8		10	80	5	40	5	40	Alt. 1 are existing swales
9	**Threatened/Endangered Species**	5		9	45	9	45	9	45	Urban corridor, minimal involvement
10	**Wetlands and Other Surface Waters**	2	Lakes, Canals, Existing Ditches	10	20	10	20	10	20	No involvement
11	**Section 4(f)**	5		10	50	10	50	10	50	No involvement
12	**Cultural Resources**	5		10	50	10	50	10	50	No adverse effect per CRAS
13	**Public Wellfield**	4		10	40	10	40	10	40	No involvement
14	**Construction**	8	Construction Constraints	7	56	7	56	7	56	Alt. 1 requires walls to be contructed at the R/W w/ TCE's
15	**Maintenance**	6	Ease of Access and Maintenance	5	30	10	60	10	60	Alt.1 reduced access due to walls on either end. One entry/exit point
16	**Aesthetics**	5		6	30	8	40	8	40	Alt.1 will have walls adjacent to R/W
17	**Other**	2		0	0	0	0	0	0	
			Score	**806**		**706**		**691**		
			Ranking	**1**		**2**		**3**		

Note: Scores range from 1-10. 1 is least desirable, 10 is most desirable.

Project Name:	SR-9/I-95 PD&E from Miami-Dade/Broward County Line to N. of Griffin Rd.		
Date:	2/9/2026	**Completed by:**	Denys A.
Project #:	439170-1-22-02	**Checked by:**	David B.
POND SITING EVALUATION MATRIX		**SYSTEM 11**	

POND 11

#	Factor	Weight of Factor	Comments	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Comments
				1-10		**1-10**		**1-10**		
			Alternative Number (Pond ID)	**1**		**2**		**3**		
			Brief Description of Alternative	East/West Sides of I-95		Southern Offsite Parcel		Northern Offsite Parcel		
		1-10	Parcel Numbers			514204070040 514204070030 514204070022		514204040082		
			Total Parcels	0.00		3		1		
			Parcel Size (Acres)	0.00		1.75		1.12		
1	**Zoning**	5	Broward County Zoning Maps	10	50	5	25	5	25	Alt. 2 & 3 Commerce
2	**Land Use**	5	SFWMD Land Use Maps	10	50	5	25	5	25	Alt. 2 & 3 Commercial & Services
3	**Right of Way Costs**	10	Total Cost of Pond ROW, TCE, Easements	10	100	4	40	5	50	Alt. 1 within FDOT R/W
4	**Drainage Considerations**	10	Location with respect to outfall location, canals, SHGWT	10	100	7	70	5	50	Alt. 1 adjacent to I-95 Corridor
5	**Flood Zones**	5	Potential for Floodplain Comp.	3	15	8	40	8	40	Alt. 2 & 3 Adjacent to AE/AH (EL. 6.0)
6	**Contamination/Hazardous Materials**	5	Per CSER	10	50	10	50	8	40	
7	**Utilities**	5	Based on As-built Plans	8	40	5	25	5	25	Alt. 1 are existing swales
8	**Public Opinion/Residency Concerns**	8		10	80	5	40	5	40	Alt. 1 are existing swales
9	**Threatened/Endangered Species**	5		9	45	9	45	9	45	Urban corridor, minimal involvement
10	**Wetlands and Other Surface Waters**	2	Lakes, Canals, Existing Ditches	10	20	10	20	10	20	No involvement
11	**Section 4(f)**	5		10	50	10	50	10	50	No involvement
	Cultural Resources	5		10	50	10	50	10	50	No adverse effect per CRAS
12	**Public Wellfield**	4		10	40	10	40	10	40	No involvement
13	**Construction**	8	Construction Constraints	7	56	7	56	7	56	Alt. 1 requires walls to be contructed at the R/W w/ TCE's
14	**Maintenance**	6	Ease of Access and Maintenance	5	30	10	60	10	60	Alt.1 reduced access due to walls on either end. One entry/exit point
15	**Aesthetics**	5		6	30	8	40	8	40	Alt.1 will have walls adjacent to R/W
16	**Other**	2		0	0	0	0	0	0	
			Score	**806**		**676**		**656**		
			Ranking	**1**		**2**		**3**		

Note: Scores range from 1-10. 1 is least desirable, 10 is most desirable.

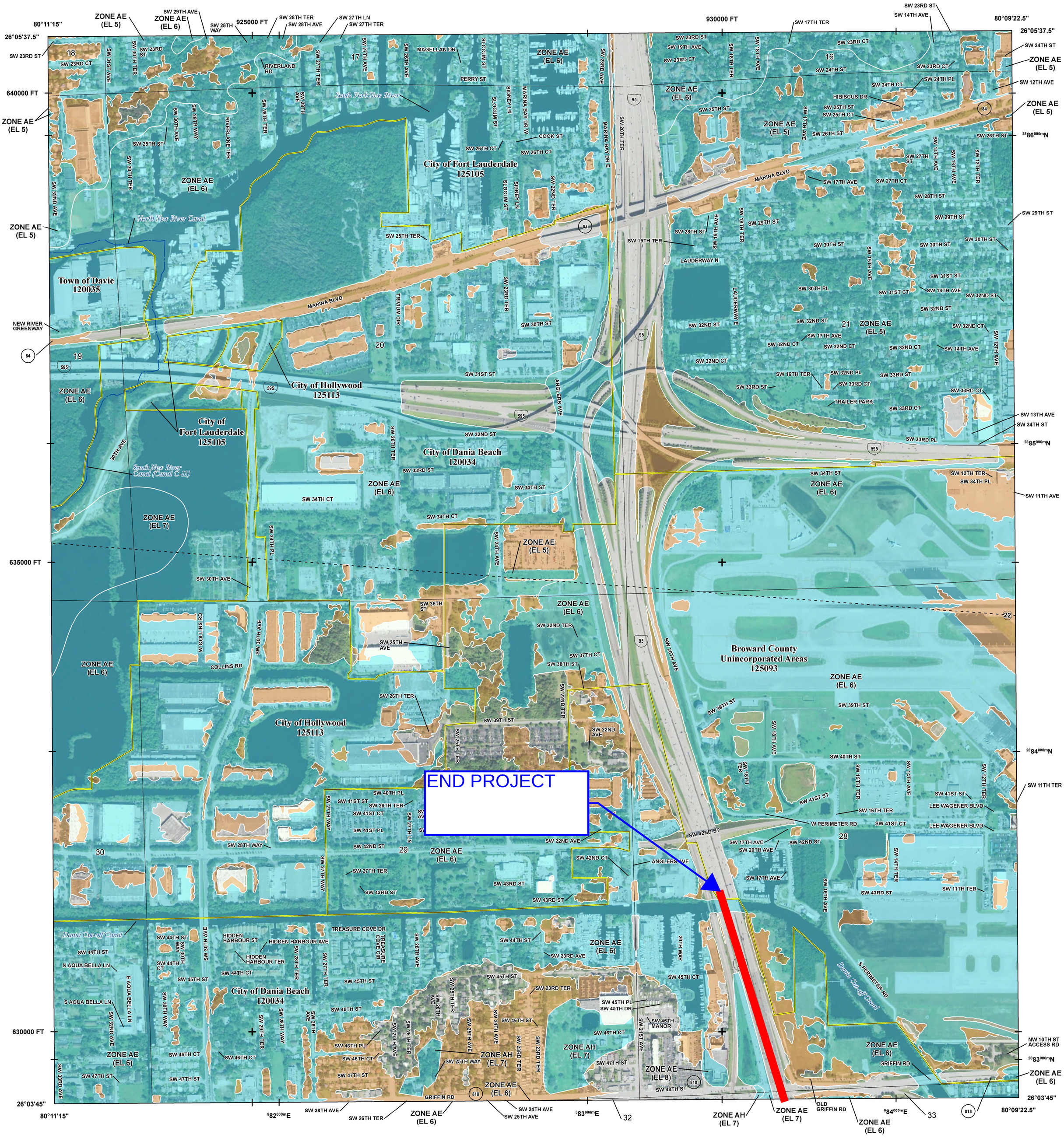
Project Name:	SR-9/I-95 PD&E from Miami-Dade/Broward County Line to N. of Griffin Rd.		
Date:	3/4/2026	**Completed by:**	Denys A.
Project #:	439170-1-22-02	**Checked by:**	David B.
POND SITING EVALUATION MATRIX		**SYSTEM 12**	

POND 12

#	Factor	Weight of Factor	Comments	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score	Comments
				1-10		**1-10**		**1-10**		
			Alternative Number (Pond ID)	**1**		**2**		**3**		
			Brief Description of Alternative	East/West Sides of I-95		Northern Offsite Parcel		Southern Offsite Parcel		
		1-10	Parcel Numbers	504233590010 504233380020 504233490011 504233580010		504233000360		504233000381 504233000390 504233000400		
			Total Parcels	4		1		3		
			Parcel Size (Acres)	0.83		3.72		2.53		
1	**Zoning**	5	Broward County Zoning Maps	5	25	5	25	5	25	Alt. 1, 2 & 3 Commerce
2	**Land Use**	5	SFWMD Land Use Maps	6	30	8	40	8	40	Alt. 2 & 3 Nursery, Alt. 1 Commercial
3	**Right of Way Costs**	10	Total Cost of Pond ROW, TCE, Easements	8	80	7	70	6	60	Alt. 1 smallest R/W take, Alt. 2 one parcel impact only
4	**Drainage Considerations**	10	Location with respect to outfall location, canals, SHGWT	10	100	8	80	5	50	Alt. 1 & 2 adjacent to I-95 Corridor, Alt. 3 requires drain. Easement
5	**Flood Zones**	5	Potential for Floodplain Comp.	7	35	8	40	8	40	Alt. 2 & 3 Adjacent to AE (EL. 7.0)
6	**Contamination/Hazardous Materials**	5	Per CSER	2	10	10	50	9	45	
7	**Utilities**	5	Based on As-built Plans	5	25	8	40	8	40	Alt. 1 has potential to impact frontage Utilities
8	**Public Opinion/Residency Concerns**	10		10	100	4	40	4	40	
9	**Threatened/Endangered Species**	5		9	45	9	45	9	45	Urban corridor, minimal involvement
10	**Wetlands and Other Surface Waters**	2	Lakes, Canals, Existing Ditches	9	18	10	20	10	20	
11	**Section 4(f)**	5		10	50	10	50	10	50	No involvement
12	**Cultural Resources**	5		10	50	10	50	10	50	No adverse effect per CRAS
13	**Public Wellfield**	4		10	40	10	40	10	40	No involvement
14	**Construction**	8	Construction Constraints	6	48	8	64	8	64	Alt. 1 requires walls to be contructed at the R/W w/ TCE's
15	**Maintenance**	6	Ease of Access and Maintenance	5	30	8	48	7	42	Alt.1 reduced access due to walls on either end. One entry/exit point
16	**Aesthetics**	5		6	30	8	40	8	40	Alt.1 will have walls adjacent to R/W
17	**Other**	10		8	80	2	20	2	20	Impacts to ad valorem revenue to the City
			Score	**796**		**762**		**711**		
			Ranking	**1**		**2**		**3**		

Note: Scores range from 1-10. 1 is least desirable, 10 is most desirable.

Appendix G
FEMA FIRM Maps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930000 FT
80°09'22.5"
640000 FT
635000 FT
630000 FT
26°03'45"
ZONE AE (EL 5)
ZONE AE (EL 6)
ZONE AE (EL 7)
ZONE AH (EL 7)
ZONE AE (EL 8)
City of Fort Lauderdale 125105
City of Hollywood 125113
Town of Davie 120035
City of Dania Beach 120034
Broward County Unincorporated Areas 125093
South Fork New River
North New River Canal
South New River Canal (Canal C-11)
Dania Cut-off Canal
MARINA BLVD
SW 23RD ST
SW 24TH ST
SW 25TH ST
SW 26TH ST
SW 27TH ST
SW 28TH ST
SW 29TH ST
SW 30TH ST
SW 31ST ST
SW 32ND ST
SW 33RD ST
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SW 39TH ST
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SW 41ST ST
SW 42ND ST
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SW 44TH ST
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SW 46TH ST
SW 47TH ST
SW 17TH AVE
SW 19TH AVE
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SW 28TH AVE
SW 30TH AVE
SW 31ST AVE
SW 32ND AVE
SW 12TH AVE
SW 13TH AVE
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SW 16TH AVE
SW 18TH AVE
SW 19TH AVE
SW 20TH AVE
SW 21ST AVE
SW 22ND TER
SW 23RD TER
SW 25TH TER
SW 26TH TER
SW 27TH TER
SW 28TH TER
SW 30TH TER
SW 31ST AVE
SW 12TH TER
SW 13TH TER
SW 14TH TER
SW 15TH TER
SW 16TH TER
SW 18TH TER
SW 19TH TER
SW 20TH TER
SW 23RD CT
SW 24TH CT
SW 25TH CT
SW 26TH CT
SW 27TH CT
SW 28TH CT
SW 30TH CT
SW 31ST CT
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SW 47TH CT
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SW 30TH PL
SW 31ST CT
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SW 45TH PL
SW 45TH DR
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SW 34TH PL
SW 41ST ST
SW 42ND ST
SW 43RD ST
SW 46TH PL
SW 47TH ST
SW 48TH ST
SW 36TH ST
SW 37TH CT
SW 38TH ST
SW 39TH ST
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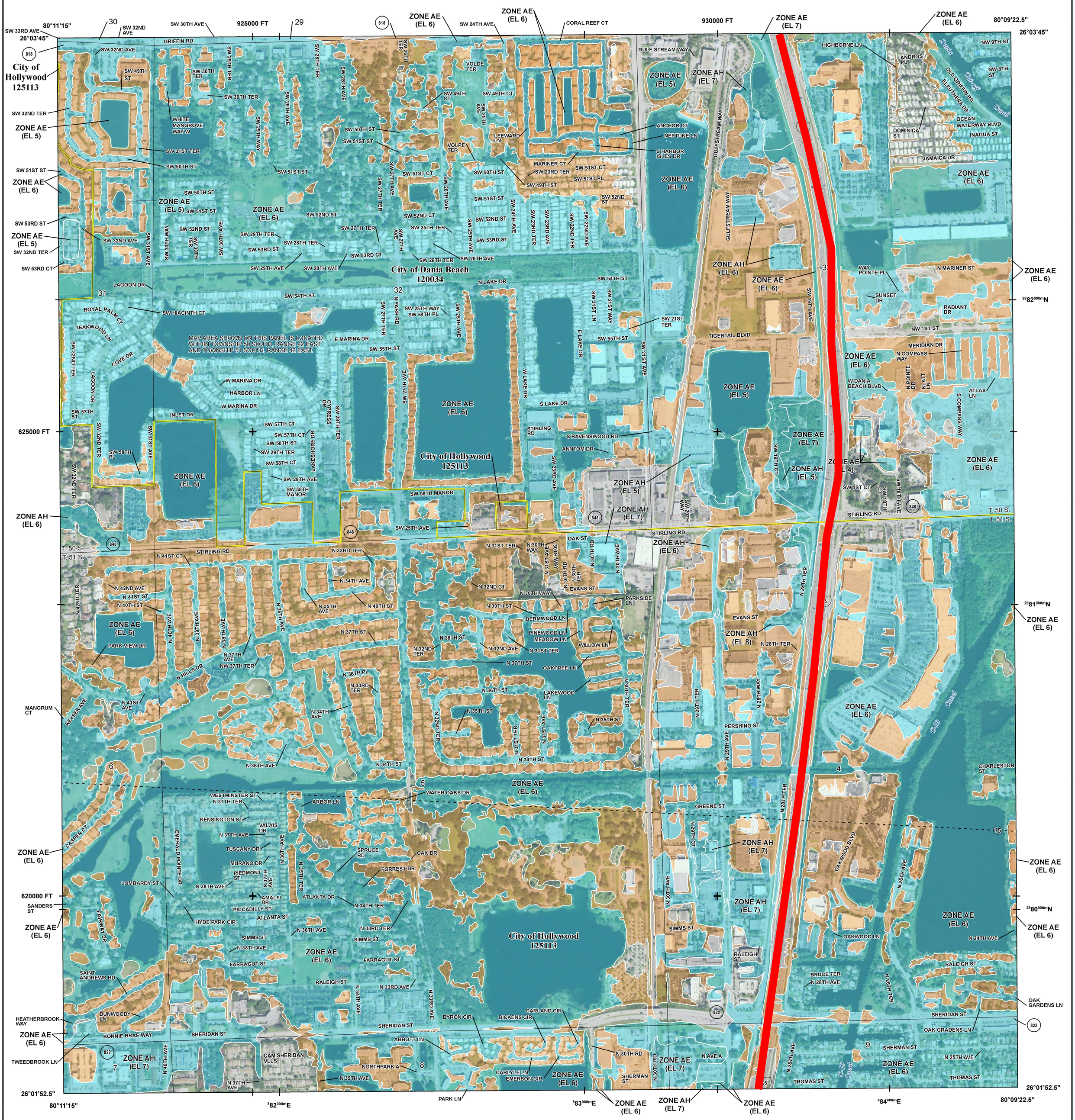

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

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SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A,V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- E 18.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 — Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

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SCALE

N

Map Projection:
State Plane Transverse Mercator, Florida East Zone 0901H; North American Datum 1983 HARN; Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

BROWARD COUNTY, FLORIDA
and Incorporated Areas

PANEL 566 OF 751

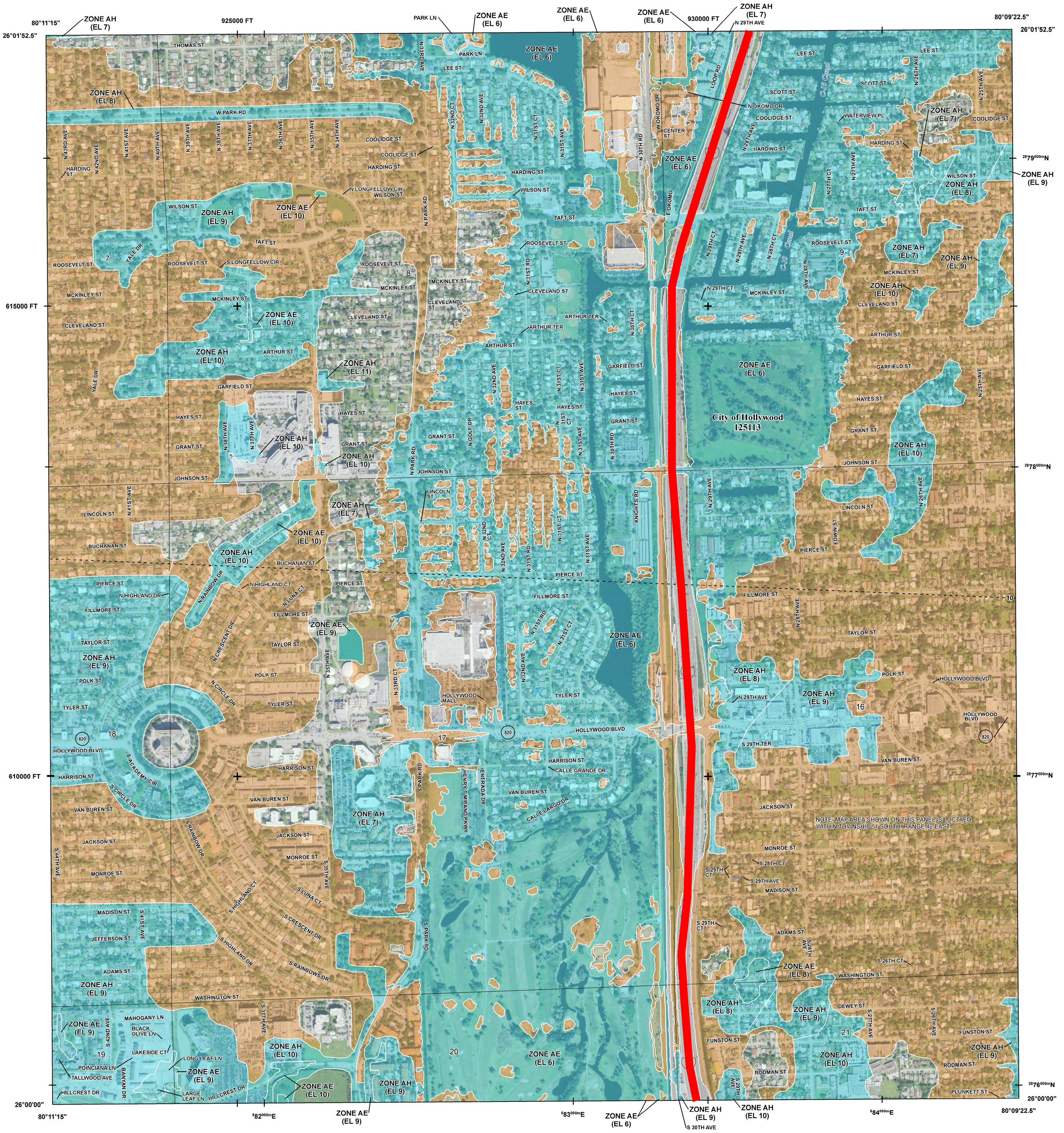
Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
DANIA BEACH, CITY OF	120034	0566	J
HOLLYWOOD, CITY OF	125113	0566	J

VERSION NUMBER
2.6.3.5

MAP NUMBER
12011C0566J

MAP REVISED
JULY 31, 2024



FLOOD HAZARD INFORMATION

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SCALE

N

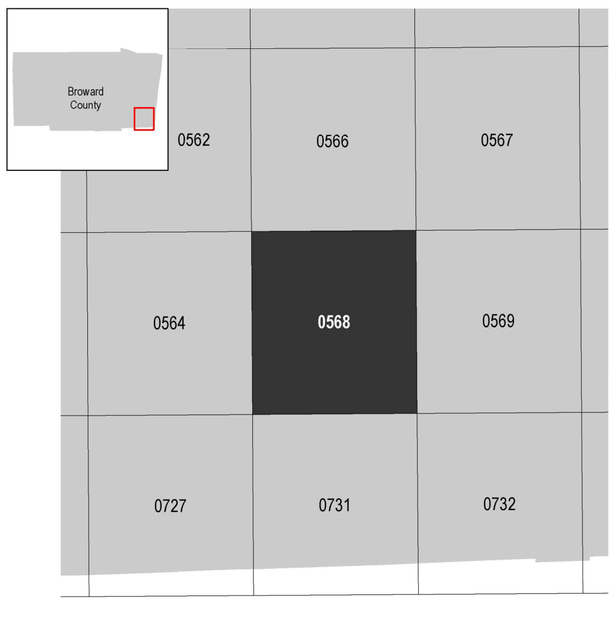
Map Projection:
State Plane Transverse Mercator, Florida East Zone 0901H; North American Datum 1983 HARN; Western Hemisphere; Vertical Datum: NAVD 88

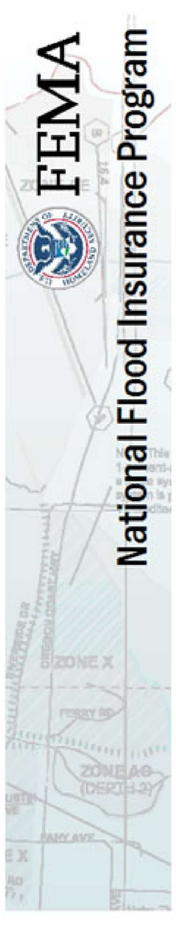
1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR





NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

BROWARD COUNTY, FLORIDA
and Incorporated Areas

PANEL 568 OF 751

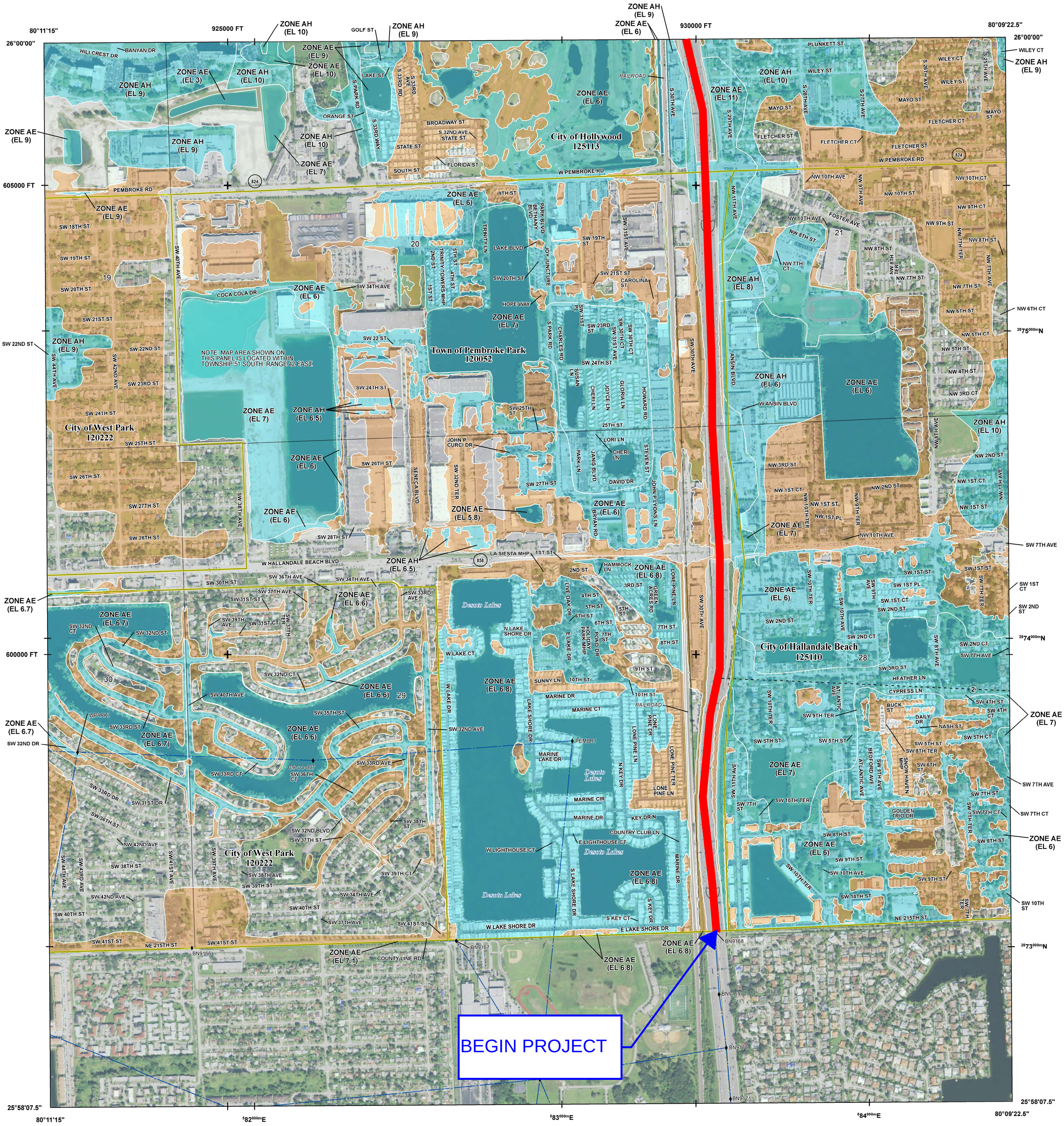
Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
HOLLYWOOD, CITY OF	125113	0568	J

VERSION NUMBER
2.6.3.5

MAP NUMBER
12011C0568J

MAP REVISED
JULY 31, 2024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930000 FT
80°09'22.5"
26°00'00"
605000 FT
600000 FT
25°58'07.5"
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Town of Pembroke Park 120052
City of West Park 120222
City of Hallandale Beach 125110
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NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 51 SOUTH, RANGE 42 EAST.
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$^{28}73^{000m}$N

25°58'07.5" 25°58'07.5"

80°11'15" $^{5}82^{000m}$E $^{5}83^{000m}$E $^{5}84^{000m}$E 80°09'22.5"

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 51 SOUTH, RANGE 42 EAST

Miami-Dade County Unincorporated Areas 120635

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31 32 33 77 95

FLOOD HAZARD INFORMATION

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- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
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- Levee, Dike, or Floodwall

OTHER FEATURES
- E 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
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SCALE

N

Map Projection:
State Plane Transverse Mercator, Florida East Zone 0901; North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

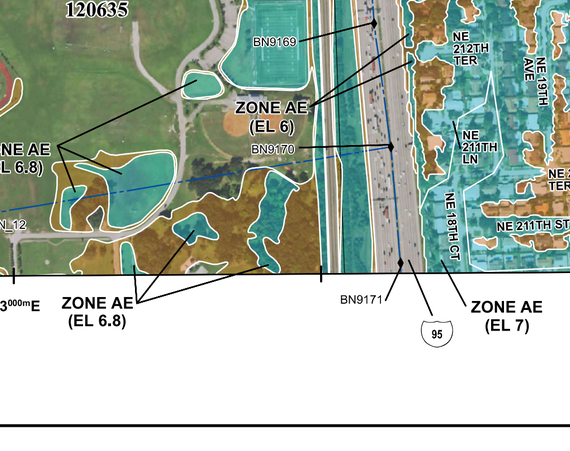
1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR





FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

MIAMI-DADE COUNTY, FLORIDA
and Incorporated Areas

PANEL 131 OF 1031

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
MIAMI-DADE COUNTY	120635	0131	M

REVISED PRELIMINARY 8/8/2024

VERSION NUMBER
2.6.3.5

MAP NUMBER
12086C0131M

MAP REVISED

Appendix H
Geotechnical Information

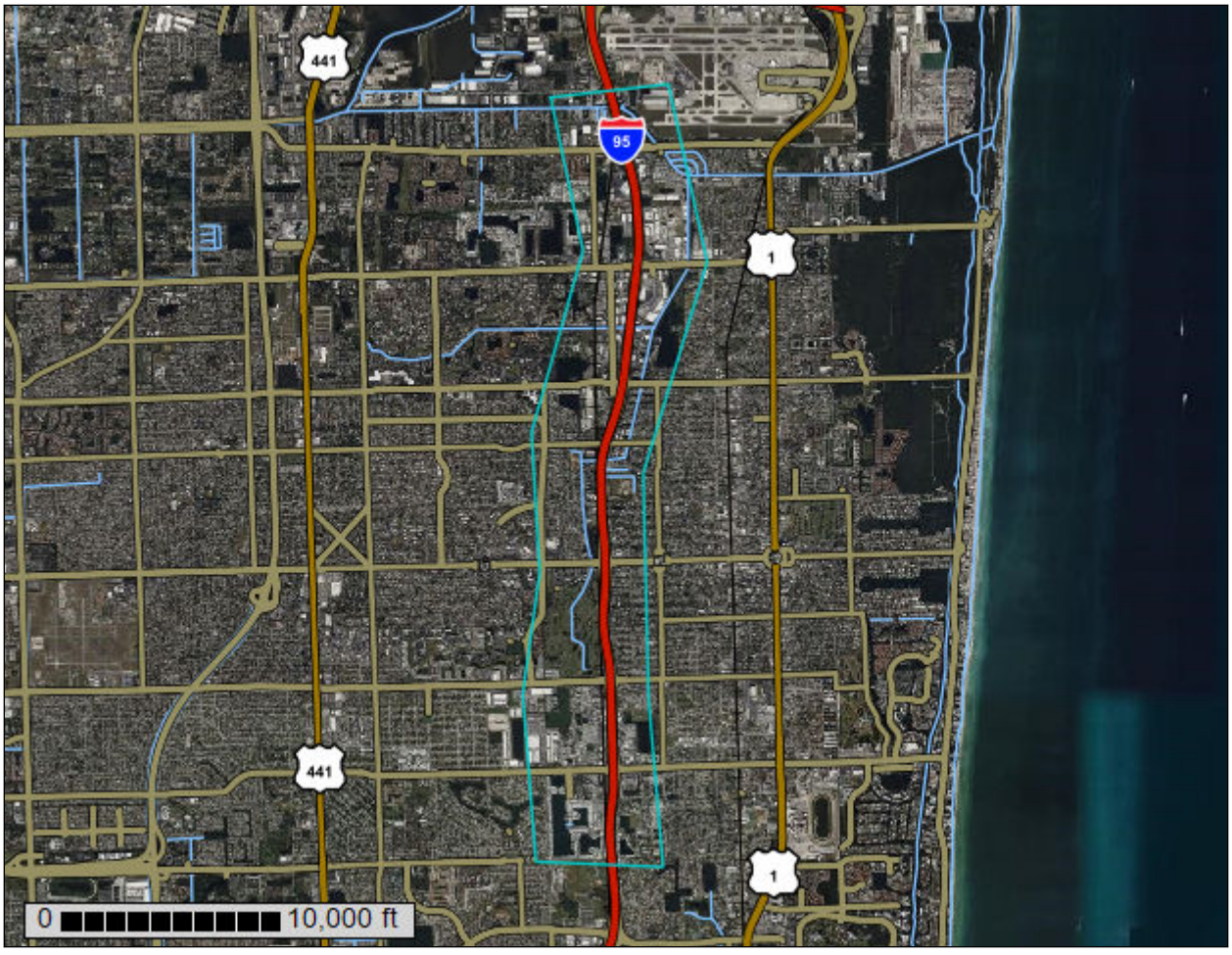
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Broward County, Florida, East Part; and Miami-Dade County Area, Florida



April 24, 2025

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

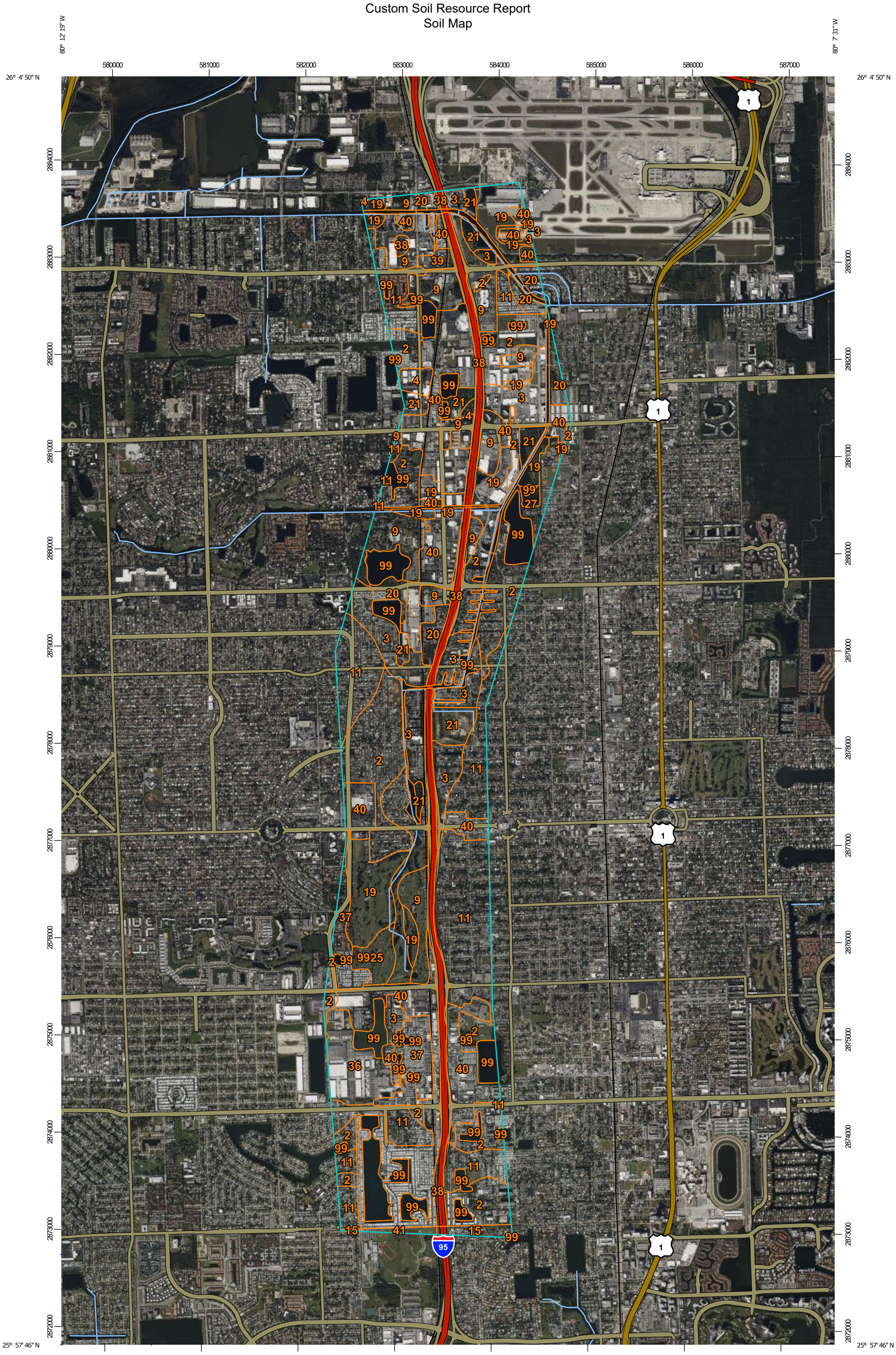
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 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: Broward County, Florida, East Part
Survey Area Data: Version 20, Aug 20, 2024

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 16, Aug 20, 2024

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: Dec 3, 2021—Jan 30, 2022

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

MAP LEGEND

MAP INFORMATION

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Arents-Urban land complex	698.8	15.6%
3	Arents, organic substratum-Urban land complex	437.2	9.8%
4	Basinger fine sand, 0 to 2 percent slopes	26.1	0.6%
9	Dade fine sand	402.0	9.0%
11	Dade-Urban land complex	653.5	14.6%
19	Margate fine sand, occasionally ponded, 0 to 1 percent slopes	302.1	6.8%
20	Matlacha, limestone substratum-Urban land complex	105.4	2.4%
21	Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes	128.5	2.9%
25	Pennsuco silty clay loam	42.7	1.0%
27	Plantation, ponded-Matlacha-Urban land complex, 0 to 2 percent slopes	7.8	0.2%
36	Udorthents	110.9	2.5%
37	Udorthents, marly substratum-Urban land complex	110.7	2.5%
38	Udorthents, shaped	222.9	5.0%
39	Udorthents-Urban land complex	16.0	0.4%
40	Urban land, 0 to 2 percent slopes	778.6	17.4%
99	Water	391.2	8.8%
Subtotals for Soil Survey Area		**4,434.4**	**99.3%**
Totals for Area of Interest		**4,466.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
15	Urban land, 0 to 2 percent slopes	21.8	0.5%
41	Dade fine sand-Urban land complex, 0 to 2 percent slopes	10.6	0.2%
99	Water	0.0	0.0%
Subtotals for Soil Survey Area		**32.4**	**0.7%**
Totals for Area of Interest		**4,466.9**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

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

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

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

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

Broward County, Florida, East Part

2—Arents-Urban land complex

Map Unit Setting

National map unit symbol: 1hn8f
Elevation: 0 to 210 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 55 percent
Urban land: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

A - 0 to 4 inches: cobbly sand
C1 - 4 to 9 inches: cobbly sand
C2 - 9 to 32 inches: sand
2C - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A/D
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Arents, organic substratum

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Udorthents, marly substratum

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

3—Arents, organic substratum-Urban land complex

Map Unit Setting

National map unit symbol: 1hn8g
Elevation: 0 to 30 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents, organic substratum and similar soils: 55 percent

Urban land: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents, Organic Substratum

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy dredge spoils over organic material over sandy marine deposits

Typical profile

A - 0 to 12 inches: gravelly sand
C - 12 to 38 inches: sand
Oa - 38 to 52 inches: muck
2C - 52 to 72 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

4—Basinger fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2svym
Elevation: 0 to 100 feet
Mean annual precipitation: 42 to 63 inches
Mean annual air temperature: 68 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Basinger

Setting

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

Typical profile

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

Properties and qualities

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

Interpretive groups

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

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

Minor Components

Myakka

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

Immokalee

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

Placid

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

Pompano

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

Felda

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

Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R155XY080FL - Sandy over Loamy Freshwater Isolated Marshes and Swamps
Other vegetative classification: Slough (R155XY011FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

Anclote

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

9—Dade fine sand

Map Unit Setting

National map unit symbol: 1hn8n
Elevation: 0 to 30 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Dade and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dade

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits over soft limestone

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 27 inches: fine sand
Bh - 27 to 35 inches: fine sand
Cr - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Forage suitability group: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Minor Components

Duette

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G156AC121FL)
Hydric soil rating: No

Basinger

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Hydric soil rating: Yes

Immokalee, limestone substratum

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Hydric soil rating: No

Margate

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

11—Dade-Urban land complex

Map Unit Setting

National map unit symbol: 1hn8q
Elevation: -20 to 30 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Dade and similar soils: 55 percent
Urban land: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dade

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits over soft limestone

Typical profile

A - 0 to 8 inches: gravelly sand
E - 8 to 27 inches: fine sand
Bh - 27 to 35 inches: fine sand
Cr - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained

Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: R155XY180FL - Sandy Scrub on Rises, Ridges, and Knolls of Mesic Uplands
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Immokalee, limestone substratum

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Basinger

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave

Ecological site: F155XY120FL - Sandy Flatwoods and Hammocks
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Margate

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

19—Margate fine sand, occasionally ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2sm5l
Elevation: 0 to 30 feet
Mean annual precipitation: 55 to 70 inches
Mean annual air temperature: 72 to 81 degrees F
Frost-free period: 360 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Margate

Setting

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

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 16 inches: fine sand
Bw - 16 to 28 inches: fine sand
C - 28 to 32 inches: very gravelly fine sand
2R - 32 to 42 inches: bedrock

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Minor Components

Basinger

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

Matlacha

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: No

Plantation

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave

Ecological site: R156AY320FL - Subtropical Freshwater Non-Forested Wetlands of Miami Ridge/ Atlantic Coastal Strip
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

20—Matlacha, limestone substratum-Urban land complex

Map Unit Setting

National map unit symbol: 1hn90
Elevation: 0 to 30 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Matlacha, limestone substratum, and similar soils: 50 percent
Urban land: 45 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Matlacha, Limestone Substratum

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy mine spoil or earthy fill over limestone

Typical profile

C - 0 to 23 inches: gravelly fine sand
2Ab - 23 to 27 inches: fine sand
2Eb - 27 to 48 inches: fine sand
3R - 48 to 52 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0

Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Margate

Percent of map unit: 5 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

21—Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzwc
Elevation: 0 to 40 feet
Mean annual precipitation: 48 to 56 inches

Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 350 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Okeelanta, Drained

Setting

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

Typical profile

Oa - 0 to 31 inches: muck
Cg - 31 to 65 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 14.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Ecological site: R156BY020FL - Histisol Isolated Marshes and Swamps
Forage suitability group: Organic soils in depressions and on flood plains (G156AC645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Minor Components

Sanibel

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: R156BY021FL - Mineral Isolated Marshes and Swamps

Other vegetative classification: Organic soils in depressions and on flood plains (G155XB645FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R156BY021FL - Mineral Isolated Marshes and Swamps
Other vegetative classification: Freshwater Marshes and Ponds (R156BY010FL), Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Basinger

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: F156BY040FL - Sandy Pine Flatwoods and Hammocks
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

25—Pennsuco silty clay loam

Map Unit Setting

National map unit symbol: 1hn95
Elevation: 10 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Pennsuco, drained, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pennsuco, Drained

Setting

Landform: Marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy marine deposits over limestone

Typical profile

A - 0 to 5 inches: silty clay loam
Bg - 5 to 38 inches: silt loam
2C - 38 to 53 inches: fine sand
2Cr - 53 to 80 inches: weathered bedrock

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 40 to 72 inches to paralithic bedrock
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very high (about 14.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Forage suitability group: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Minor Components

Pennsuco, tidal

Percent of map unit: 2 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Perrine

Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Perrine variant

Percent of map unit: 1 percent
Landform: Tidal marshes on marine terraces

Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

27—Plantation, ponded-Matlacha-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2y9j0
Elevation: 0 to 20 feet
Mean annual precipitation: 46 to 70 inches
Mean annual air temperature: 77 to 81 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Plantation and similar soils: 32 percent
Matlacha, limestone substratum, and similar soils: 28 percent
Urban land: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plantation

Setting

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

Typical profile

Oa - 0 to 10 inches: muck
A - 10 to 16 inches: fine sand
Cg - 16 to 33 inches: fine sandy loam
2R - 33 to 43 inches: bedrock

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Ecological site: R156AY320FL - Subtropical Freshwater Non-Forested Wetlands of Miami Ridge/ Atlantic Coastal Strip
Forage suitability group: Organic soils in depressions and on flood plains (G156AC645FL)
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Description of Matlacha, Limestone Substratum

Setting

Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Sandy mine spoil or earthy fill over sandy marine deposits over limestone

Typical profile

^C - 0 to 23 inches: gravelly fine sand
2Ab - 23 to 28 inches: fine sand
2Eb - 28 to 44 inches: fine sand
2C - 44 to 48 inches: fine sandy loam
3R - 48 to 58 inches: bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 36 to 80 inches to lithic bedrock
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 4 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Forage suitability group not assigned (G155XB999FL)

Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Shark valley

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, convex
Ecological site: R156AY220FL - Subtropical Freshwater Non-Forested Glades Marshes and Slough Wetlands of Everglades
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Hallandale

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Margate

Percent of map unit: 4 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip

Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Cooper town
Percent of map unit: 1 percent
Landform: Marshes on marine terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip, talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, convex
Ecological site: R156AY220FL - Subtropical Freshwater Non-Forested Glades Marshes and Slough Wetlands of Everglades
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

36—Udorthents

Map Unit Setting
National map unit symbol: 1hn9j
Elevation: 0 to 70 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile
C - 0 to 57 inches: cobbly sand

Properties and qualities
Slope: 2 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R156AY310FL - Subtropical Tidal Saline Wetlands of Miami Ridge/ Atlantic Coastal Strip
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

37—Udorthents, marly substratum-Urban land complex

Map Unit Setting
National map unit symbol: 1hn9k
Elevation: 0 to 20 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, marly substratum, and similar soils: 55 percent
Urban land: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Marly Substratum

Setting
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile
C - 0 to 32 inches: gravelly sand
2C - 32 to 60 inches: marly silt loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained

Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

38—Udorthents, shaped

Map Unit Setting

National map unit symbol: 1hn9l
Elevation: 0 to 50 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Udorthents, Shaped

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

C1 - 0 to 30 inches: gravelly sand
C2 - 30 to 50 inches: sand
2R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 0 to 45 percent
Depth to restrictive feature: 40 to 72 inches to paralithic bedrock
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 10 percent
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

39—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 1hn9m
Elevation: 0 to 30 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 55 percent
Urban land: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

C1 - 0 to 30 inches: gravelly sand
C2 - 30 to 50 inches: sand
2R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 40 to 72 inches to paralithic bedrock
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Forage suitability group: Forage suitability group not assigned (G156AC999FL)

Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting
Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups
Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Arents
Percent of map unit: 5 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

40—Urban land, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: 2x9fc
Elevation: 0 to 200 feet
Mean annual precipitation: 40 to 68 inches
Mean annual air temperature: 68 to 79 degrees F
Frost-free period: 345 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Hills on marine terraces, ridges on marine terraces, knolls on marine terraces, rises on marine terraces, flatwoods on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser, rise, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

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

Minor Components

Matlacha

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: No

St. augustine

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: No

Paola

Percent of map unit: 1 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Adamsville

Percent of map unit: 1 percent
Landform: Rises on marine terraces, knolls on marine terraces
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex

Across-slope shape: Linear
Other vegetative classification: Upland Hardwood Hammock (R155XY008FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Eaugallie

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Immokalee

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G155XB141FL), South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Myakka

Percent of map unit: 1 percent
Landform: Drainageways on flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Pomello

Percent of map unit: 1 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Hydric soil rating: No

Apopka

Percent of map unit: 1 percent
Landform: Hills on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Longleaf Pine-Turkey Oak Hills (R155XY002FL), Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Brynwood

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Cypress lake

Percent of map unit: 1 percent
Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Convex, linear
Across-slope shape: Linear, concave
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy over loamy soils on flats of hydric or mesic lowlands (G155XB241FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

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

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Miami-Dade County Area, Florida

15—Urban land, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2z9t5
Elevation: 0 to 30 feet
Mean annual precipitation: 55 to 70 inches
Mean annual air temperature: 68 to 81 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Hills on marine terraces, ridges on marine terraces, knolls on marine terraces, rises on marine terraces, flatwoods on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope, riser, rise, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: F156AY390FL - Subtropical Scrub of Miami Ridge / Atlantic Coastal Strip, F156AY380FL - Subtropical Hardwood Hammocks of Miami Ridge / Atlantic Coastal Strip, F156AY360FL - Subtropical Moist Hammocks of Miami Ridge / Atlantic Coastal Strip, R156AY310FL - Subtropical Tidal Saline Wetlands of Miami Ridge/ Atlantic Coastal Strip, R156AY370FL - Subtropical Coastal Zones of Miami Ridge / Atlantic Coastal Strip, R156AY320FL - Subtropical Freshwater Non-Forested Wetlands of Miami Ridge/ Atlantic Coastal Strip, F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip, F156AY330FL - Subtropical Freshwater Cypress Swamps of Miami Ridge / Atlantic Coastal Strip, F156AY350FL - Subtropical Forested Rocklands of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Naranja

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear

Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Sunny isles

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: No

Margate

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Hallandale

Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: South Florida Flatwoods (R155XY003FL), Sandy soils on flats of mesic or hydric lowlands (G155XB141FL)
Hydric soil rating: Yes

Dade

Percent of map unit: 3 percent
Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F156AY390FL - Subtropical Scrub of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

41—Dade fine sand-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2z9sm
Elevation: 0 to 30 feet
Mean annual precipitation: 42 to 70 inches
Mean annual air temperature: 77 to 81 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Dade and similar soils: 50 percent
Urban land: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dade

Setting

Landform: Ridges on marine terraces
Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits over oolithic limestone

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 24 inches: fine sand
Bh - 24 to 27 inches: fine sand
2R - 27 to 37 inches: bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 50 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Ecological site: F156AY390FL - Subtropical Scrub of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)
Hydric soil rating: No

Description of Urban Land

Setting
Landform: Flats on islands
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Interpretive groups
Land capability classification (irrigated): None specified
Ecological site: F156AY390FL - Subtropical Scrub of Miami Ridge / Atlantic Coastal Strip
Forage suitability group: Forage suitability group not assigned (G155XB999FL)
Other vegetative classification: Forage suitability group not assigned (G155XB999FL)
Hydric soil rating: Unranked

Minor Components

Doral
Percent of map unit: 3 percent
Landform: Rises on flatwoods on marine terraces
Landform position (three-dimensional): Tread, rise, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F156AY390FL - Subtropical Scrub of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Naranja
Percent of map unit: 3 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Margate
Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear

Across-slope shape: Concave
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Grande oaks

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: F156AY340FL - Subtropical Pine Flatwoods and Palmetto Prairie of Miami Ridge / Atlantic Coastal Strip
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Hydric soil rating: Yes

99—Water

Map Unit Composition

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

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Ecological site: R156AY500FL - Subaqueous Haline Estuarine Habitats of MLRA 156A
Forage suitability group: Forage suitability group not assigned (G156AC999FL)
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

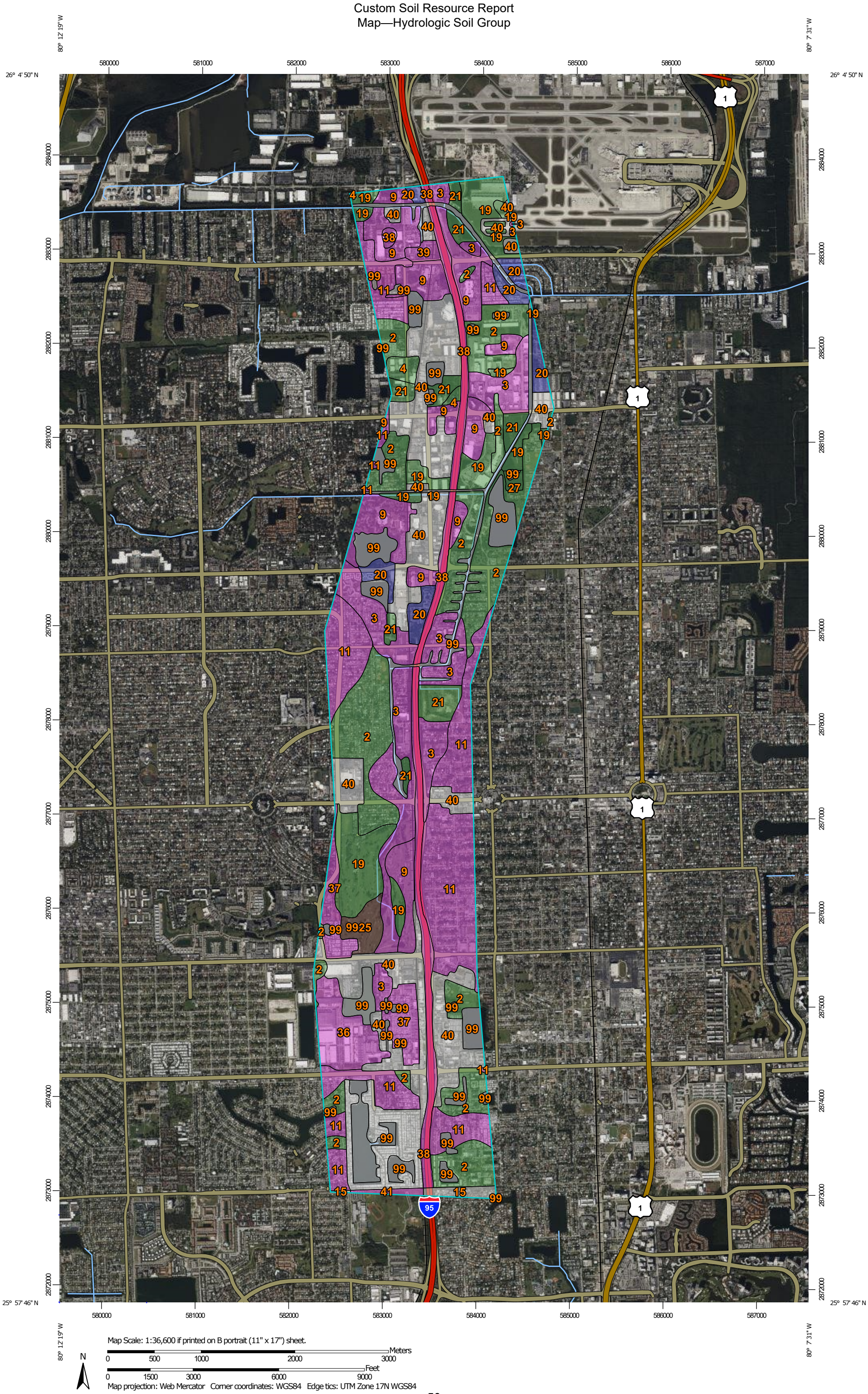
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.



Map Scale: 1:36,600 if printed on B portrait (11" x 17") sheet.

N

Meters: 0 500 1000 2000 3000

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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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: Broward County, Florida, East Part
Survey Area Data: Version 20, Aug 20, 2024

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 16, Aug 20, 2024

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: Dec 3, 2021—Jan 30, 2022

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

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

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Arents-Urban land complex	A/D	698.8	15.6%
3	Arents, organic substratum-Urban land complex	A	437.2	9.8%
4	Basinger fine sand, 0 to 2 percent slopes	A/D	26.1	0.6%
9	Dade fine sand	A	402.0	9.0%
11	Dade-Urban land complex	A	653.5	14.6%
19	Margate fine sand, occasionally ponded, 0 to 1 percent slopes	A/D	302.1	6.8%
20	Matlacha, limestone substratum-Urban land complex	B	105.4	2.4%
21	Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes	A/D	128.5	2.9%
25	Pennsuco silty clay loam	B/D	42.7	1.0%
27	Plantation, ponded-Matlacha-Urban land complex, 0 to 2 percent slopes	A/D	7.8	0.2%
36	Udorthents	A	110.9	2.5%
37	Udorthents, marly substratum-Urban land complex	A	110.7	2.5%
38	Udorthents, shaped	A	222.9	5.0%
39	Udorthents-Urban land complex	A	16.0	0.4%
40	Urban land, 0 to 2 percent slopes		778.6	17.4%
99	Water		391.2	8.8%
Subtotals for Soil Survey Area			**4,434.4**	**99.3%**
Totals for Area of Interest			**4,466.9**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
15	Urban land, 0 to 2 percent slopes		21.8	0.5%
41	Dade fine sand-Urban land complex, 0 to 2 percent slopes	A	10.6	0.2%
99	Water		0.0	0.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Subtotals for Soil Survey Area			**32.4**	**0.7%**
Totals for Area of Interest			**4,466.9**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

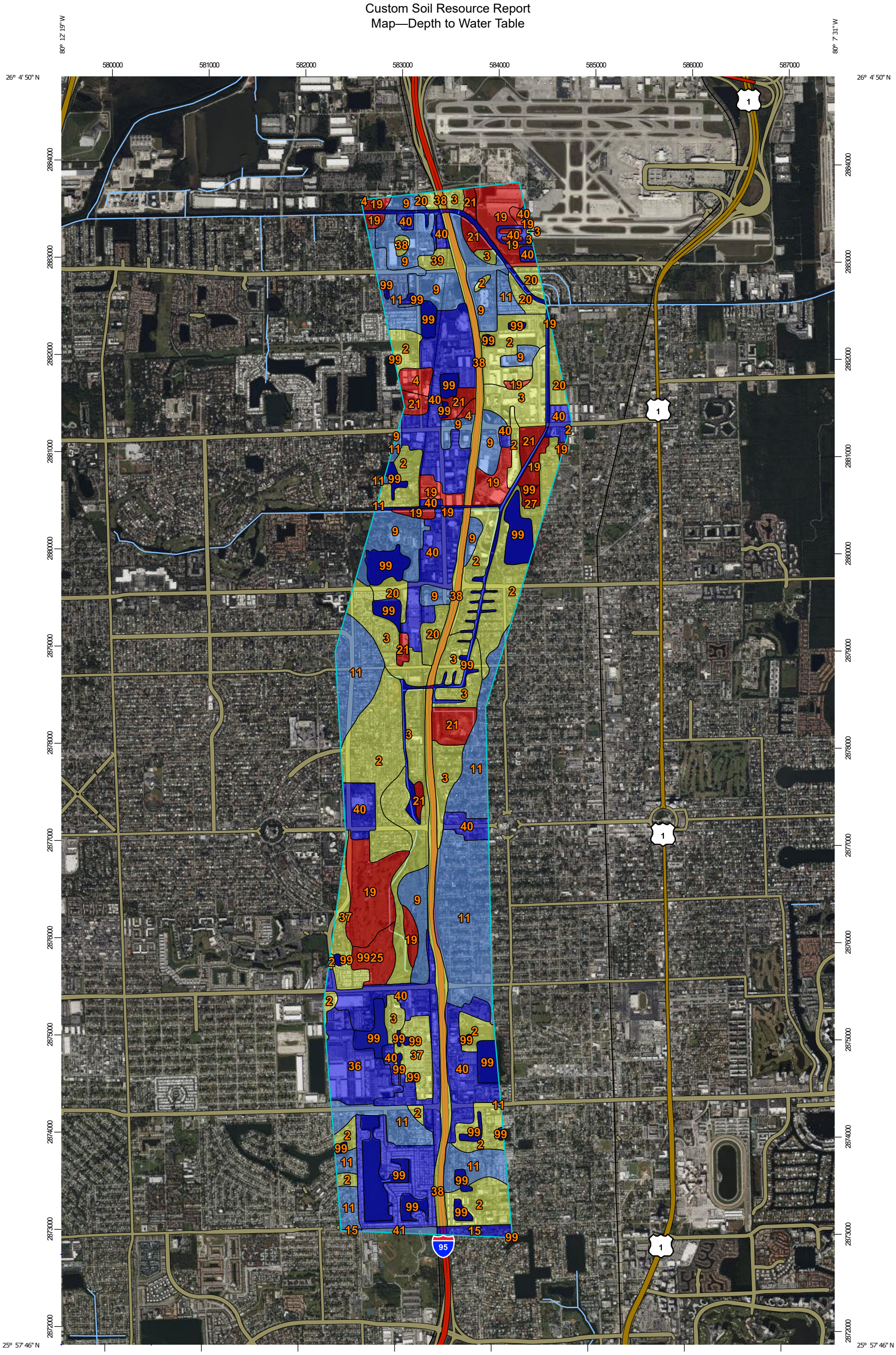
Water Features

Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.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80° 7' 31" W
26° 4' 50" N
25° 57' 46" N
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Map Scale: 1:36,600 if printed on B portrait (11" x 17") sheet.
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Meters
0 500 1000 2000 3000
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 Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

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.

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 20, Aug 20, 2024

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 16, Aug 20, 2024

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: Dec 3, 2021—Jan 30, 2022

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

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

Table—Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
2	Arents-Urban land complex	59	698.8	15.6%
3	Arents, organic substratum-Urban land complex	76	437.2	9.8%
4	Basinger fine sand, 0 to 2 percent slopes	15	26.1	0.6%
9	Dade fine sand	168	402.0	9.0%
11	Dade-Urban land complex	168	653.5	14.6%
19	Margate fine sand, occasionally ponded, 0 to 1 percent slopes	15	302.1	6.8%
20	Matlacha, limestone substratum-Urban land complex	76	105.4	2.4%
21	Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes	0	128.5	2.9%
25	Pennsuco silty clay loam	15	42.7	1.0%
27	Plantation, ponded-Matlacha-Urban land complex, 0 to 2 percent slopes	0	7.8	0.2%
36	Udorthents	>200	110.9	2.5%
37	Udorthents, marly substratum-Urban land complex	92	110.7	2.5%
38	Udorthents, shaped	92	222.9	5.0%
39	Udorthents-Urban land complex	92	16.0	0.4%
40	Urban land, 0 to 2 percent slopes	>200	778.6	17.4%
99	Water	>200	391.2	8.8%
Subtotals for Soil Survey Area			**4,434.4**	**99.3%**
Totals for Area of Interest			**4,466.9**	**100.0%**

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
15	Urban land, 0 to 2 percent slopes	>200	21.8	0.5%
41	Dade fine sand-Urban land complex, 0 to 2 percent slopes	168	10.6	0.2%
99	Water	>200	0.0	0.0%

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
Subtotals for Soil Survey Area			**32.4**	**0.7%**
Totals for Area of Interest			**4,466.9**	**100.0%**

Rating Options—Depth to Water Table

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

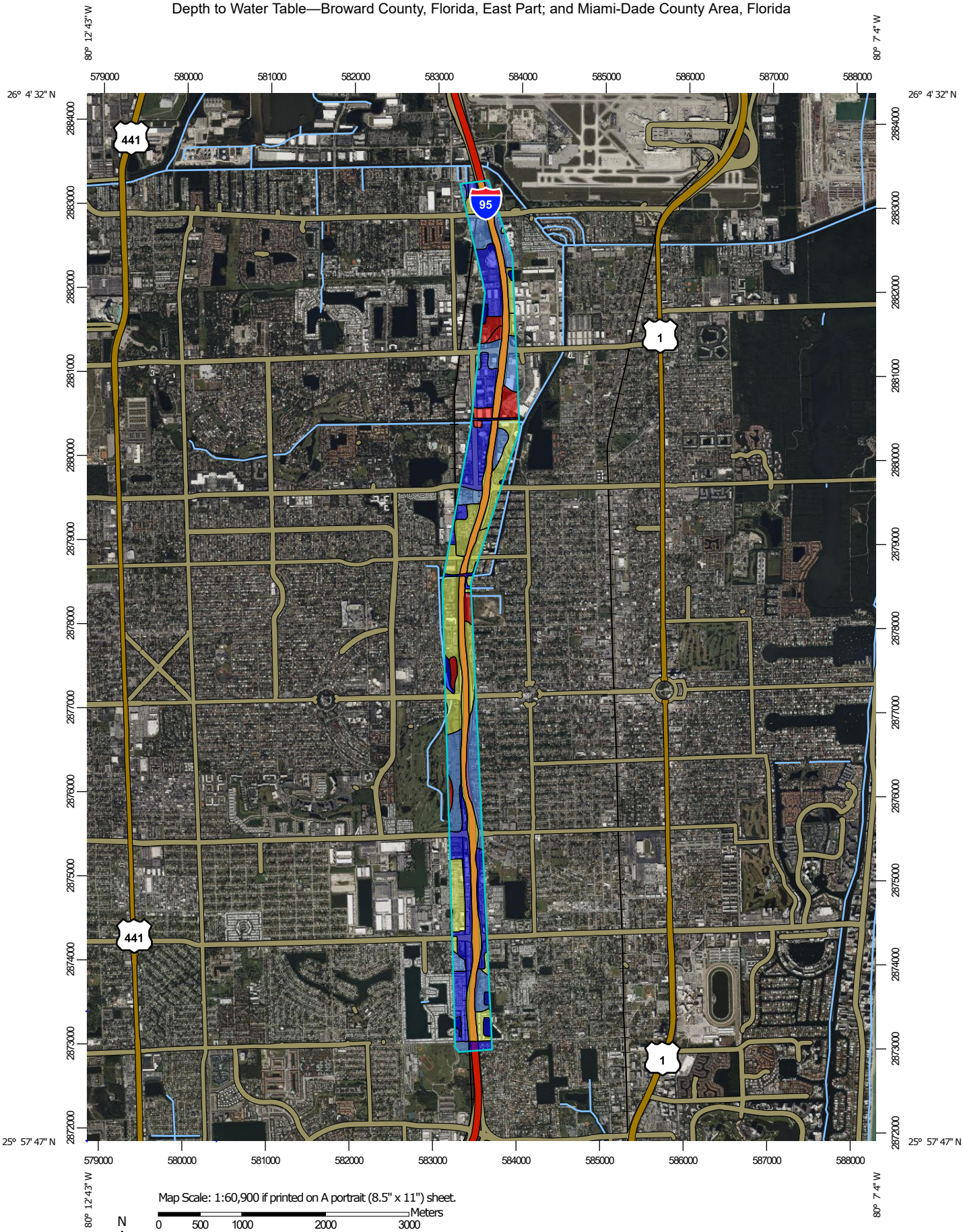
Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Depth to Water Table—Broward County, Florida, East Part; and Miami-Dade County Area, Florida



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

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: Broward County, Florida, East Part
Survey Area Data: Version 18, Sep 1, 2022

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 14, Sep 1, 2022

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

Date(s) aerial images were photographed: Dec 3, 2021—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.

Depth to Water Table

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
2	Arents-Urban land complex	59	69.0	6.5%
3	Arents, organic substratum-Urban land complex	76	128.7	12.1%
4	Basinger fine sand, 0 to 2 percent slopes	15	4.9	0.5%
9	Dade fine sand	168	147.9	13.9%
11	Dade-Urban land complex	168	70.8	6.7%
19	Margate fine sand, occasionally ponded, 0 to 1 percent slopes	15	31.9	3.0%
20	Matlacha, limestone substratum-Urban land complex	76	25.5	2.4%
21	Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes	0	27.4	2.6%
37	Udorthents, marly substratum-Urban land complex	92	34.2	3.2%
38	Udorthents, shaped	92	208.4	19.6%
39	Udorthents-Urban land complex	92	10.5	1.0%
40	Urban land, 0 to 2 percent slopes	>200	262.6	24.7%
99	Water	>200	30.5	2.9%
Subtotals for Soil Survey Area			**1,052.4**	**98.9%**
Totals for Area of Interest			**1,064.6**	**100.0%**

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
15	Urban land, 0 to 2 percent slopes	>200	7.5	0.7%
41	Dade fine sand-Urban land complex, 0 to 2 percent slopes	168	4.5	0.4%
Subtotals for Soil Survey Area			**12.1**	**1.1%**
Totals for Area of Interest			**1,064.6**	**100.0%**

Description

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

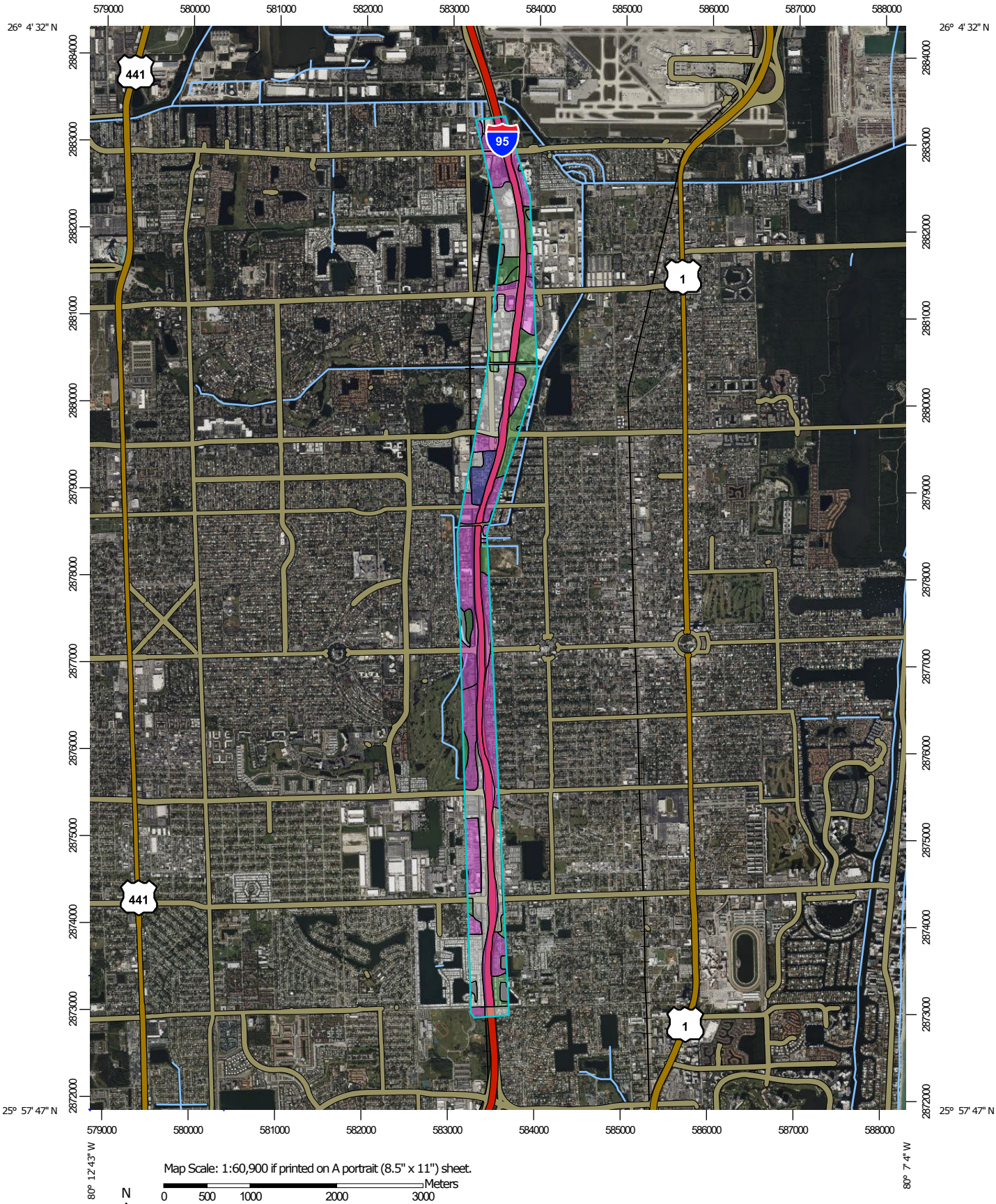
Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Hydrologic Soil Group—Broward County, Florida, East Part; and Miami-Dade County Area, Florida



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Arents-Urban land complex	A/D	69.0	6.5%
3	Arents, organic substratum-Urban land complex	A	128.7	12.1%
4	Basinger fine sand, 0 to 2 percent slopes	A/D	4.9	0.5%
9	Dade fine sand	A	147.9	13.9%
11	Dade-Urban land complex	A	70.8	6.7%
19	Margate fine sand, occasionally ponded, 0 to 1 percent slopes	A/D	31.9	3.0%
20	Matlacha, limestone substratum-Urban land complex	B	25.5	2.4%
21	Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes	A/D	27.4	2.6%
37	Udorthents, marly substratum-Urban land complex	A	34.2	3.2%
38	Udorthents, shaped	A	208.4	19.6%
39	Udorthents-Urban land complex	A	10.5	1.0%
40	Urban land, 0 to 2 percent slopes		262.6	24.7%
99	Water		30.5	2.9%
Subtotals for Soil Survey Area			**1,052.4**	**98.9%**
Totals for Area of Interest			**1,064.6**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
15	Urban land, 0 to 2 percent slopes		7.5	0.7%
41	Dade fine sand-Urban land complex, 0 to 2 percent slopes	A	4.5	0.4%
Subtotals for Soil Survey Area			**12.1**	**1.1%**
Totals for Area of Interest			**1,064.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

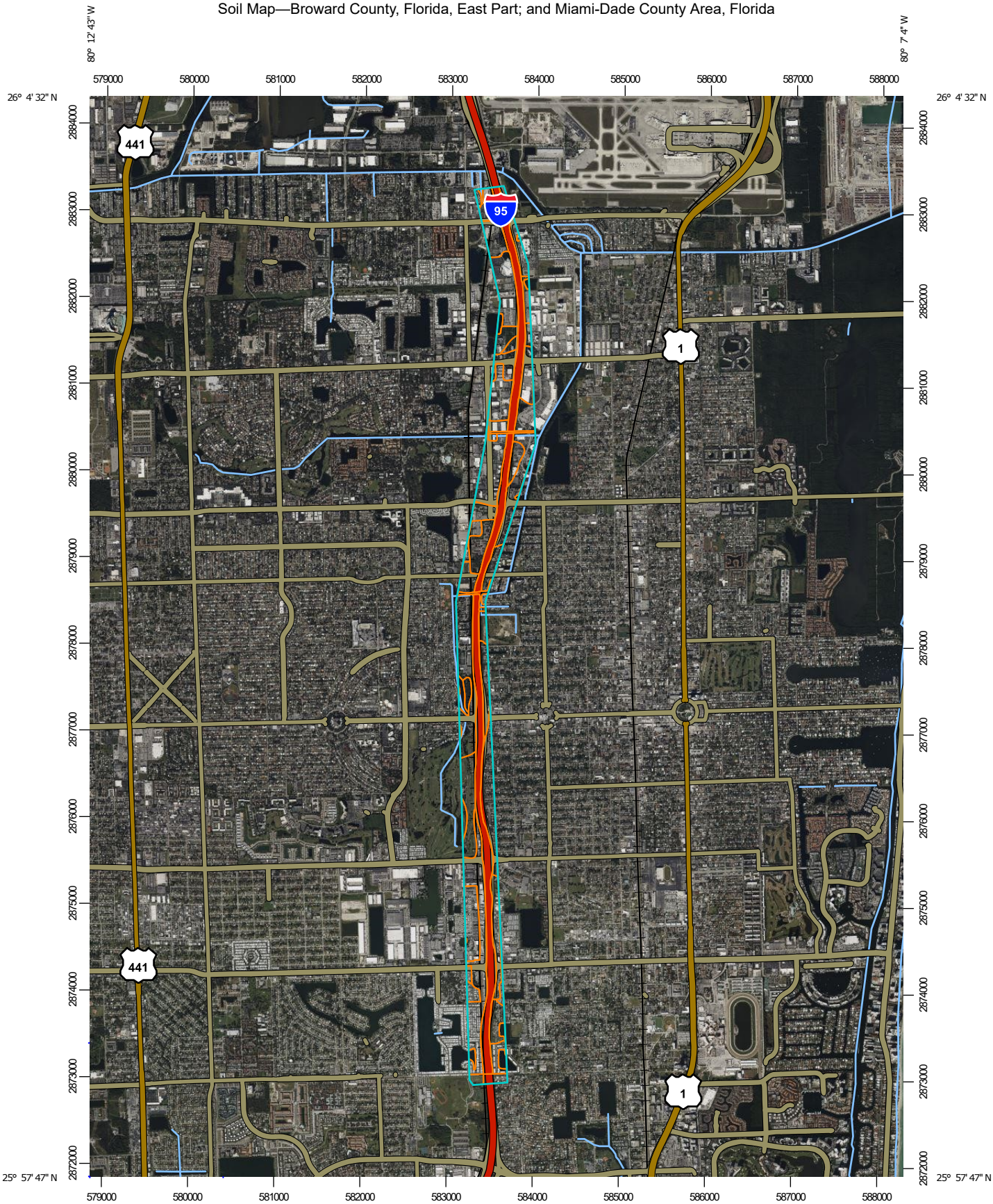
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Map Scale: 1:60,900 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

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

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
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11	Dade-Urban land complex	70.8	6.7%
19	Margate fine sand, occasionally ponded, 0 to 1 percent slopes	31.9	3.0%
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Subtotals for Soil Survey Area		**12.1**	**1.1%**
Totals for Area of Interest		**1,064.6**	**100.0%**

tierra
SOUTH FLORIDA
GEOTECHNICAL ENGINEERING / MATERIAL TESTING / INSPECTION SERVICES

Revised August 23, 2012
March 29, 2012

Metric Engineering, Inc.
615 Crescent Executive Court, Suite 524
Lake Mary, Florida 32746

Attention: Dale W. Cody, P.E.
Senior Vice President

Subject: **Geotechnical Engineering Report for Bridge Widening and Associated Walls**
Project: I-95 Express Lanes in Broward and Miami-Dade Counties
(Design-Build)
FPID Nos.: 422796-1-52-01 & 422796-2-52-01
TSF Project No: 7111-11-297

Dear Dale:

Tierra South Florida, Inc. (TSF) has completed a geotechnical study for the proposed bridge widening and associated walls at bridge approaches in subject project. The study was performed in general accordance with FDOT procedures. The results of our geotechnical study and subsequent geotechnical recommendations are presented in this report.

If you have any questions or comments regarding this report, please contact our office at your earliest convenience.

Sincerely,

TIERRA SOUTH FLORIDA, INC.

Raj Krishnasamy, P.E.
Principal Engineer/President
FL Registration No. 53567

N. Manoharan, Ph.D.
Senior Specialist

Table of Contents

1.0 PROJECT DESCRIPTION AND SCOPE OF SERVICES 1
2.0 REVIEW OF USDA SOIL SURVEY INFORMATION 2
3.0 FIELD EXPLORATION 2
4.0 SUBSURFACE CONDITIONS 2
5.0 GROUNDWATER CONDITIONS 3
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7.3 Pile Installation 4
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APPENDIX – A: Vicinity Map
USDA Soil Survey Map
Report of Core Boring Sheet
Laboratory Test Results

APPENDIX – B: Pile Data Tables
Axial Capacity Analysis Results

APPENDIX – C: Soil Parameters for FB-Pier Analysis
L-Pile Analysis Results for minimum Tip Elevations

APPENDIX – D: MSE Wall Analysis Results

1.0 PROJECT DESCRIPTION AND SCOPE OF SERVICES

The project involves construction of express lanes in SR-9/I-95 in Broward and Miami-Dade Counties, Florida. The project involves also widening of the following bridges and construction of associated walls:

- I-95 over Snake Creek Canal (Miami-Dade)
- I-95 over Hallandale Beach Boulevard (Broward)
- I-95 over Pembroke Road (Broward)
- I-95 over Hollywood Boulevard (Broward)
- I-95 over Stirling Road (Broward)

The purpose of this supplemental study is to provide geotechnical input to the design team to assist in the preparation of construction plans for the proposed bridge. The following services were provided:

1. Reviewed readily available published topographic and soils information. This information was obtained from the soil survey maps of Broward and Miami-Dade Counties published by the United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS), and USGS Maps.

2. Performed a geotechnical study which included a total of 18 SPT borings to about 85 feet deep and 20 SPT borings to 40 feet deep.

3. Visually classified and stratified the samples in the laboratory using the Unified Soil Classification System (USCS).

4. Performed pile capacity analyses.

5. Performed external stability, global stability and settlement analyses for the proposed MSE walls.

6. Provided soil parameters for sheet pile wall design

7. Prepared this Geotechnical Services Report for bridges and associated walls.

These Geotechnical Services were performed in general accordance with FDOT Standards "Soils and Foundations Manual".

2.0 REVIEW OF USDA SOIL SURVEY INFORMATION

Based on a review of the Broward and Miami-Dade County Soil Survey Maps by United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), it appears that the bridge vicinities are mapped as follows:

Miami-Dade County:

- **Urban land**

Broward County:

- **Arents, organic substratum-Urban land complex**
- **Dade fine sand**
- **Udorthents, shaped**
- **Urban land**

Site Vicinity Map and USDA soil survey map are presented in Appendix A of this report.

3.0 FIELD EXPLORATION

Subsurface conditions at the bridge and associated MSE walls at bridge approaches were explored by a total of 18 SPT borings to about 85 feet deep and 20 SPT borings to 40 feet deep. Approximate locations of the borings are presented on Report of core borings in Appendix A. The borings were located in the field by TSF personnel using a hand-held GPS system. The SPT borings were drilled using CME-45 and CME-55 drill rigs and mud rotary procedures. The soil samples were returned to our laboratory for classification by a geotechnical engineer. Representative soil samples collected from the borings were classified and stratified in general accordance with the US Soil Classification System.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions encountered in the borings primarily consisted of sandy soils (sand and silty sand) and limestone. Report of core borings are presented in Appendix A.

A Geotechnical engineer bases soil stratification on a visual review of the recovered samples, laboratory testing, and interpretation of the field boring logs. The boring stratification lines represent the approximate boundaries between soil types of significantly different engineering properties; however, the actual transition may be gradual. In some cases, small variations in properties not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The boring profiles represent the conditions at the particular boring location and variations do occur and should be expected among the borings.

5.0 GROUNDWATER CONDITIONS

Depth to groundwater level was measured at the boring locations following termination of drilling. Depth to groundwater table generally ranged about 3 to 12 feet below existing grades. The groundwater table measured at each boring location is presented on the boring profiles in Appendix A.

Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences (i.e. existing canals, swales, drainage ponds, under drains and areas of covered soils like, paved parking lots and sidewalks). Fluctuation should be anticipated. We recommend that the contractor determine the actual groundwater levels at the time of construction to determine groundwater impact on his construction procedure.

6.0 ENVIRONMENTAL CLASSIFICATIONS

Based on geotechnical data the environmental classification for bridges are as follows:

Bridge Location	Environmental Classification	
	Substructure	Superstructure
Snake Creek Canal	Moderately Aggressive (Resistivity 1600 ohm-cm)	Slightly Aggressive
Hallandale Beach Blvd.	Slightly Aggressive	Slightly Aggressive
Pembroke Road	Slightly Aggressive	Slightly Aggressive
Hollywood Blvd.	Slightly Aggressive	Slightly Aggressive
Stirling Road	Slightly Aggressive	Slightly Aggressive

7.0 ENGINEERING EVALUATIONS AND RECOMMENDATIONS

7.1 Driven Pile Axial Capacity

We understand that 18-inch pre-stressed precast square concrete piles will be used to support the bridge widening at Snake Creek Canal and steel H-piles (18x135) will be used for bridge widening at other locations. Axial capacity analyses were performed for 18-inch PPSC piles and H-piles as required in the project using the program FB-DEEP. The results are presented in Appendix B.

The results indicate that capacities are generated relatively uniformly as the pile penetrates the substrata. When piles penetrate into very dense sand or rock layers, refusal may be achieved and reach the design capacities at penetrations different than those indicated from the analyses.

Required Bearing Resistance is defined as (Factored Design Load + Net Scour + Downdrag)/Φ. A resistance factor of Φ=0.75 may be used assuming that all piles will be dynamically monitored (PDA testing).

No reduction of the individual pile capacities will be required if piles are spaced center-to-center at 3 times their width or greater.

Intermediate Bents of the bridge over Snake Creek canal will be located in the canal. Based on the information provided to us the canal bottom elevation is approximately -15 feet and estimated scour elevation (500 year) is about -22 feet. Estimated total scour resistance at the intermediate bents ranged about 9 to 28 tons and the details are included in Appendix B.

7.2 Pile Lateral Load Analysis

We understand that FB-Pier analysis will be performed for the bridges. Soil parameters that can be used in the FB-Pier analysis are included in Appendix C. L-Pile analysis was performed for typical bent/pier loading conditions to evaluate minimum pile elevations and the results are included in Appendix C.

7.3 Pile Installation

Pile installation should be carried out in accordance with the Florida Department of Transportation Standard Specifications, Section 455. The FDOT Standard Specifications,

7.4 MSE Walls at Bridge Approaches

In general, the existing subsurface soils encountered in the borings performed are suitable for supporting the proposed MSE wall construction after proper subgrade preparation. Site preparation should consist of normal clearing and grubbing followed by compaction of subgrade soils.

External Stability:

External stability analyses for MSE walls were conducted using the FDOT LRFD computer program. Analysis was based on the assumption of discontinuous reinforcement (metal strip reinforcement). The soil parameters considered for the external stability analyses of MSE walls are given below.

SOIL TYPE	APPROXIMATE SOIL UNIT WEIGHT (pcf)		SOIL ANGLE OF FRICTION (Degrees)	COHESION (psf)
	γ_{SAT}	γ_{SUB}		
Reinforced soil and random backfill	105	42.6	30	0
Foundation soil	110	47.6	30	0

Analysis was performed for walls with and without sloping backfill at the top. A summary of the external stability results (reinforcement length and factored bearing resistance) is given in Appendix D. It is our understanding that the internal wall stability analyses will be performed by others (proprietary wall companies).

Global Stability (overall Stability):

Global stability analysis of MSE walls were performed using the computer program ReSSA (3.0) for the following conditions:

- A 26 feet high wall with flat surface at the top
- A 16 feet high wall with a sloping backfill at the top.

The analysis was performed using Bishop method to compute the factor of safety against deep-seated circular failure. Traffic surcharge load of 250 psf was applied at the top. The overall stability was found to be adequate and the results are presented in the Appendix D.

Estimated Settlement:

Settlement analysis for the MSE walls was performed using the computer program FoSSA (2.0). This program is for calculation of stresses and settlement under uniformly loaded rectangle areas. Elastic constant (Young's modulus) of soil layers were selected in general as suggested in AASHTO Specifications. The results are presented in the Appendix D. Since the subsoils encountered are typically sandy soils and limestone, we anticipate that most of the estimated settlement will occur during construction. We recommend all MSE Walls be designed to accommodate the following settlements.

MSE WALL NO.	LONG TERM * SETTLEMENT (inch)	SHORT TERM ** SETTLEMENT (inch)	DIFFERENTIAL SETTLEMENT	
			Longitudinal (%)	Transverse (inch)
All walls	0.3	3.3	Less than 0.5%	N/A

* Long term settlement is measured from the end of wall fill placement.
** Short term settlement occurs during construction.

7.5 Soil Parameters for Sheet Pile Wall Design

We understand that permanent sheet pile walls will be required at Hallandale Beach Boulevard interchange. Soil parameters that may be used in the design are given below.

Soil Parameters for Sheet Pile Wall SPW-1 at I-95 over Hallandale Beach Boulevard

ELEVATION (feet)	BORINGS USED	SOIL DESCRIPTION (Depth 0 – 40ft)	AVERAGE SPT N-VALUE (Automatic Hammer)	AVERAGE SPT N-VALUE (Safety Hammer)	APPROXIMATE SOIL UNIT WEIGHT (PCF)		SOIL ANGLE OF FRICTION (DEGREES)	COHESION (PSF)	WALL FRICTION ANGLE (DEGREES)
					γ SAT	γ SUB			
Retained soil (bottom of articulated block wall and above)	-	Embankment fill	-	-	115	52.6	30	0	17
Below bottom of articulated block wall	WHA-4/ BH-2	SP/ML/ Limestone	15/22	19/27	110	47.6	32	0	17

Soil Parameters for Sheet Pile Wall SPW-2 at I-95 over Hallandale Beach Boulevard

ELEVATION (feet)	BORINGS USED	SOIL DESCRIPTION (Depth 0 – 40ft)	AVERAGE SPT N-VALUE (Automatic Hammer)	AVERAGE SPT N-VALUE (Safety Hammer)	APPROXIMATE SOIL UNIT WEIGHT (PCF)		SOIL ANGLE OF FRICTION (DEGREES)	COHESION (PSF)	WALL FRICTION ANGLE (DEGREES)
					γ SAT	γ SUB			
Retained soil (bottom of articulated block wall and above)	-	Embankment fill	-	-	115	52.6	30	0	17
Below bottom of articulated block wall	WHA-3/ BH-4	SP/ML/ Limestone	10/25	12/31	110	47.6	32	0	17

Notes: 1. Walls may be considered unsupported above the bottom of articulated block wall ignoring any passive resistance from embankment fill in front of the wall.
2. Slope of retained soil should be included in wall analysis.

8.0 REPORT LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions, or recommendations made by others based on this data.

The scope of the investigation was intended to evaluate soil conditions within the influence zone of the foundations. The analysis and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the condition encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the proposed structure.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

Appendix I
Excerpts From Environmental Documents

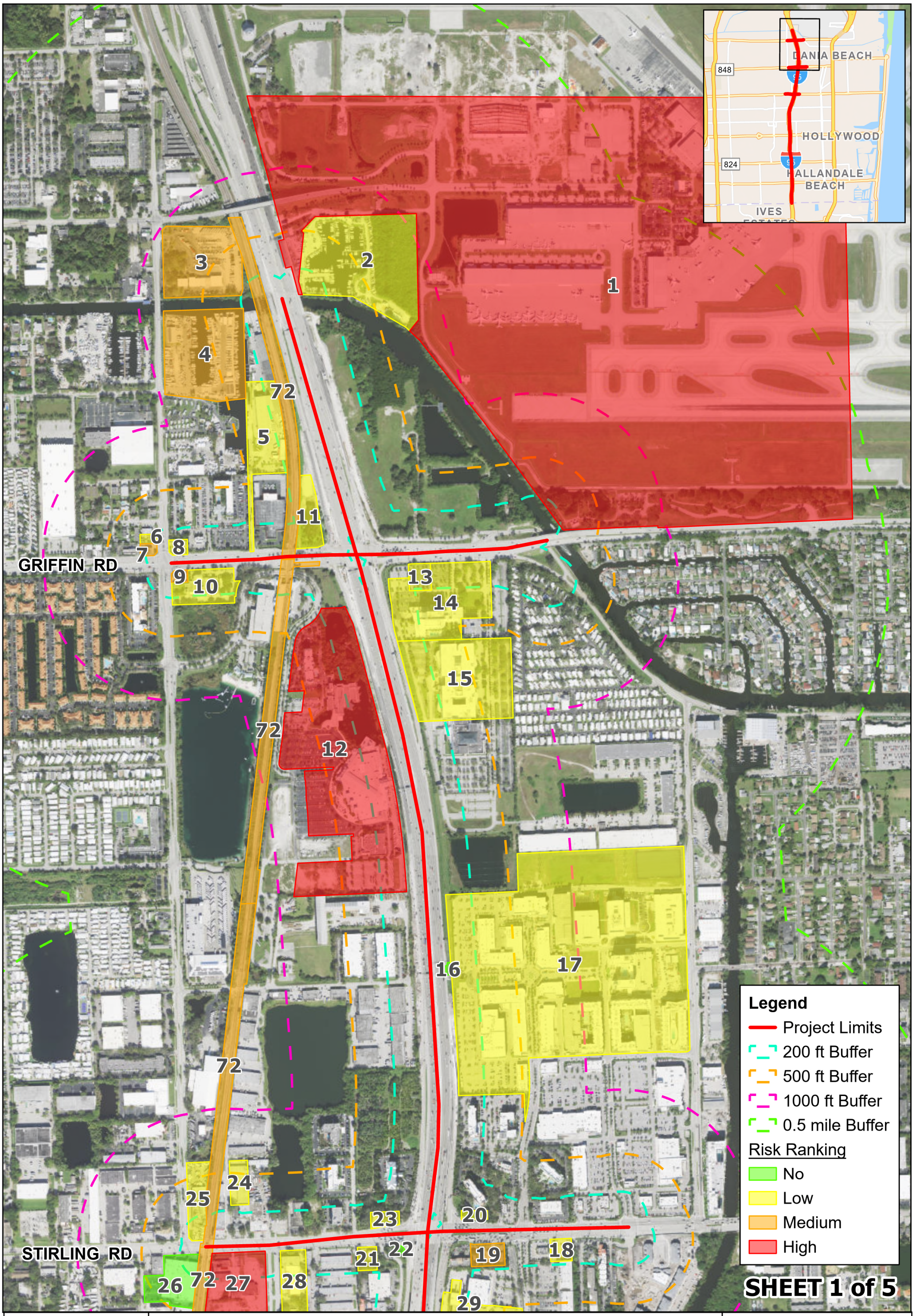

Figure 6: Ranked Contamination Sites

FPID No. 439170-1-22-02
I-95 (S.R. 9) PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 0.07 0.15 Miles

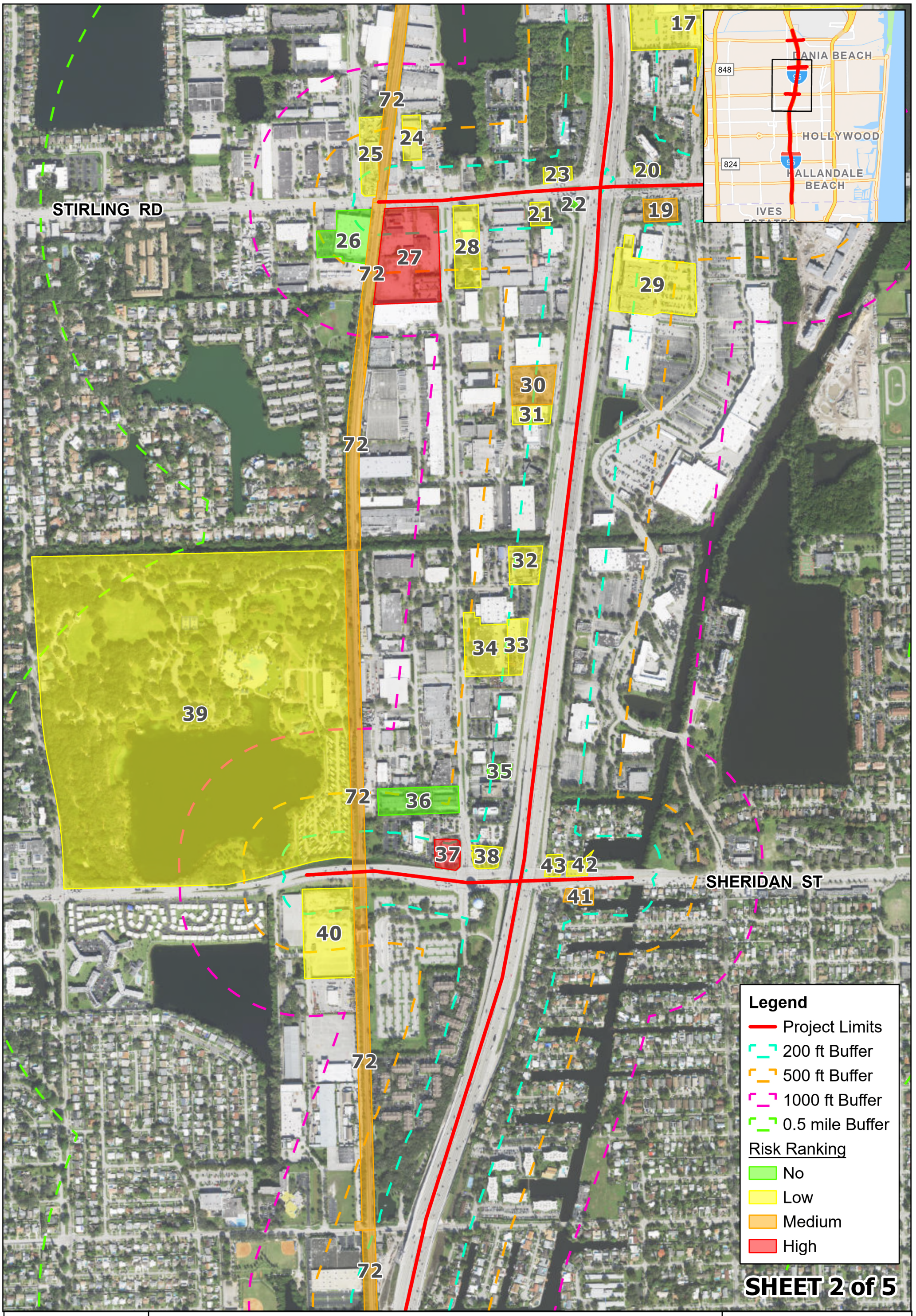

Figure 6: Ranked Contamination Sites

FPID No. 439170-1-22-02
I-95 (S.R. 9) PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 0.07 0.15 Miles



Figure 6: Ranked Contamination Sites

FPID No. 439170-1-22-02
I-95 (S.R. 9) PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 0.07 0.15 Miles

HOLLYWOOD BLVD

PEMBROKE RD

72
48
49
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57
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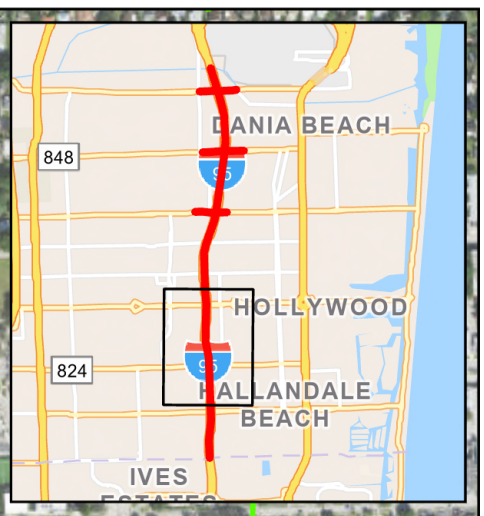
64



Legend

- Project Limits
- 200 ft Buffer
- 500 ft Buffer
- 1000 ft Buffer
- 0.5 mile Buffer

Risk Ranking

- No
- Low
- Medium
- High

SHEET 4 of 5

Figure 6: Ranked Contamination Sites

FPID No. 439170-1-22-02
I-95 (S.R. 9) PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 0.07 0.15 Miles

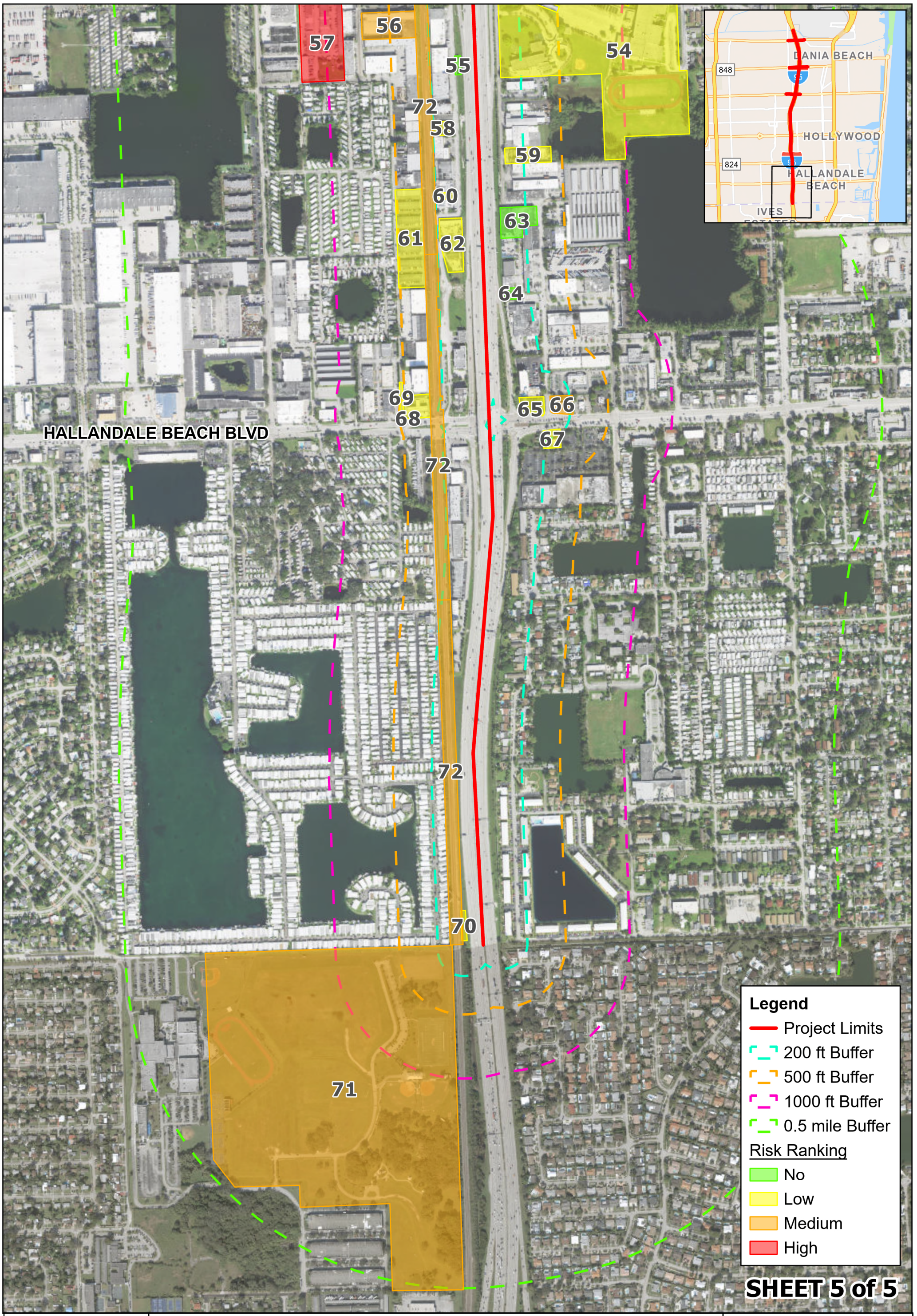


Figure 6: Ranked Contamination Sites

FPID No. 439170-1-22-02
I-95 (S.R. 9) PD&E Study from Miami-Dade/Broward County Line to north of Griffin Road
Broward County, FL

Image Source: ESRI
Image Date: 2024

0 0.07 0.15 Miles

TABLE 3: POTENTIAL CONTAMINATION SITES

Facility Location Number	Facility Name	Facility Address/ Location	Facility ID	Facility Type	Discharge/ Report Date	Contamination Soil/GW	Parcel Distance to ROW (feet)	Remediation Status	Risk Rating
1	Fort Lauderdale-Hollywood International Airport (FLL)	1410-1470 Lee Wagener Blvd, Unincorporated	8622507, SQG_12204, SQG_1103, FLD984239764, FLD982155244, 8628476, FLR000002907, SQG_5474, FLD984171652, 8732767 / 8622390, FLD981868789, 8622383 / 8732765, FLD984184523, FLD984248922, 9100276, 9813940, 9100730, 9819298, FL0000283168, 8625876, 8733095, 8628153, 8501745, 8501579	UST, SQG, AST, LUST, LAST, Emergency Response Spill Site	1989, 1990, 1995, 1997 (2), 1999, 2001, 2011, 2012, 2019, 2022, 2024	Both – Soil/GW	0	Various	High
2	Lauderdale Small Boat Club	1740 SW 42nd St, Fort Lauderdale	FLR000232371	VSQG	2019	None	15	None	Low
3	Nextran Truck Centers (formerly, 4300 Ravenswood LLC, Environmental Waste Systems, State Paving Corporation)	4300 Ravenswood Rd, Dania Beach	8622379	UST, LUST	1987	Soil only	170	Ongoing	Medium
4	Nautical Ventures Marine Center (formerly, Bonnie's Ravenswood Marina)	4470 Ravenswood Rd, Fort Lauderdale	FLR000055442, 8733225, ERIC_10226	AST, CESQG, CERCLA Superfund Site	1998	Both – Soil/GW	200	No Further Action	Medium
5	HCB Test & Yacht Center (formerly, Thunderboat Marina)	2051 Griffin Rd, Fort Lauderdale	8502700, FL0000999789	CESQG, LUST	2005	None	0	Cleanup Not Required	Low
6	S And H Auto Care and Sales Inc	4741 Ravenswood Rd, Fort Lauderdale	SQG_5565	VSQG	None	None	120	None	Low

Facility Location Number	Facility Name	Facility Address/ Location	Facility ID	Facility Type	Discharge/ Report Date	Contamination Soil/GW	Parcel Distance to ROW (feet)	Remediation Status	Risk Rating
7	Giant #134 DBA Mobil (formerly, Citgo – Farmers #101, Phillips 66-Farmers #1)	2109 Griffin Rd, Fort Lauderdale	8944565	UST, LUST	2003	Both – Soil/GW	130	No Further Action	Medium
8	Dunkin' Donuts LLC (formerly, Gulf Station)	2091 Griffin Rd, Fort Lauderdale	9806500	UST, LUST	2004	Both – Soil/GW	0	No Further Action	Low
9	Chevron - 2080 Griffin Holdings LLC (formerly, Amoco Griffin Mini Mart, Olympic Minimart)	2080 Griffin Rd, Fort Lauderdale	8943751	UST, LUST	1992	Both – Soil/GW	0	SRCO	Medium
10	Humane Society of Broward County (formerly, Lightning Marine Inc)	2070 Griffin Rd, Fort Lauderdale	FL0000997254, SQG_8348, 8731740	VSQG, UST	None	None	0	None	Low
11	FDOT Stormwater Retention Area (formerly, Studiale Property)	1901 Griffin Rd / I-95 SB Exit Ramp and Griffin Rd, Dania Beach	9200241, 9809061	UST, Emergency Response Spill Site	None / 2006	N/A / Both – Soil/GW	0	None / SRCO	Low
12	Courtyard by Marriott, International Game Fish Association, and Bass Pro Outdoor World, Divers Direct (formerly, Holiday Divers) (all formerly Lindsley Lumber, Tigertail Quarries, Inc.)	200, 300, 400 Gulf Stream Way, 1940 Griffin Road, 1905 Tigertail Blvd, Dania Beach	ERIC_6252, COM_54408, 9046724, 9046329, 9047475, FLD982127417, SQG_11001, FLR000049734, 9700336	LUST, UST, CERCLA Superfund Site, SQG	1960s	Both – Soil/GW	0	Case closure due to redevelopment and reports of no further actionable contamination	High
13	Le Meridien Parking lot (Northwest) (formerly, Texaco Station #24-021-1312)	1895, 1801 Griffin Rd, Dania Beach	8502017, FLD984173047	UST, LUST, SQG	2004	GW only	0	SRCO	Low
14	Le Meridien Dania Beach at Fort Lauderdale Airport (formerly, Wyndham, Sheraton)	1825 Griffin Rd, Dania Beach	9700959	AST, UST	None	None	0	None	Low
15	Design Center of the Americas	1855 Griffin Rd, Dania Beach	9100136	UST	None	None	0	None	Low
16	FDOT Right-of-Way	I-95 NB & Griffin Rd, Dania Beach	9808385	Emergency Response Spill Site	2004	Both – Soil/GW	0	SRCO	No

Facility Location Number	Facility Name	Facility Address/ Location	Facility ID	Facility Type	Discharge/ Report Date	Contamination Soil/GW	Parcel Distance to ROW (feet)	Remediation Status	Risk Rating
17	Dania Pointe (formerly, Boomers!, Malibu Grand Prix/Arcade Gaming)	101 Bryan Rd (formerly, 1801 NW 1st Street), Dania Beach	8839733, BF060801000	AST, UST, LUST, Brownfield Area	1993	Both – Soil/GW	0	SRCO, Brownfield Area	Low
18	Taco Bell (formerly, Atlantis the Water Kingdom)	2700 Stirling Rd, Hollywood	8732109	UST, LUST, AST	1988	Both – Soil/GW	0	No Further Action	Low
19	Mobil Station-Oakwood (formerly, Exxon Co USA #45379)	2780 Stirling Rd, Hollywood	FLD984196105, 8622441	UST, LUST, CESQG	1991	Soil	0	No Further Action	Medium
20	FDOT Right-of-Way (formerly Chevron #47265 – Shannehan's)	1881 Stirling Rd, Dania Beach	8502619	UST, LUST	1989	Both – soil/GW	0	No Further Action	Low
21	Las Vegas Cuban Cuisine (formerly, Shell Oil Company)	2810 (formerly, 2800) Stirling Rd, Hollywood	FLD984185751, 8502161	SQG, UST, LUST	1988	Both – soil/GW	0	SRCR	Low
22	FDOT Right-of-Way	I-95 & Stirling Rd SB, Hollywood	9820116	Emergency Response Spill Site	2004	Both – soil/GW	0	No Further Action	No
23	FDOT Right-of-Way (formerly, Texaco #240210911)	1904 Stirling Rd, Dania Beach	FLD 984172825, 8501586	SQG, UST, LUST	1988	Both – soil/GW	0	None	Low
24	Aarons Window Treatments Inc and SiteSurv USA (formerly, Pro Quality Collision, JKL Transmission Parts Inc, Quality Aircraft & Engines Inc)	185 SW 20th Way Ste S4, Dania Beach	FLD 982101602	CESQG	None	None	250	None	Low
25	Flooring King and Boat and RV Storage (formerly, Trust No. Bm-1)	5950 Ravenswood Rd, Fort Lauderdale	8628175	UST, LUST	1991	Both – soil/GW	0	No Further Action	Low
26	K1 Speed (formerly, Stirling Rd. Concrete Batch Plant)	2950 (formerly, 2920) Stirling Rd, Hollywood	8627780, AIR_0110018	AST	None	None	0	None	No
27	Stirling Logistics Center (formerly, Gold Coast Crane Inc, Liquid Carbonic Corporation, Praxair Distribution, Inc.)	2910 Stirling Rd; 4450 N 29th Ave, Hollywood	FLD045464377, ERIC_10245, 8841174, SQG_10911, 8622411	CESQG, CERCLA Superfund Site, VSQG, AST, UST	1979	GW Only	0	CERCLA Low Priority, yearly groundwater monitoring	High

Facility Location Number	Facility Name	Facility Address/ Location	Facility ID	Facility Type	Discharge/ Report Date	Contamination Soil/GW	Parcel Distance to ROW (feet)	Remediation Status	Risk Rating
28	QC Laboratories Inc, QC Metallurgical Inc, (formerly, Certified Aircraft Parts)	2870 Stirling Rd, Hollywood	FLR000110551, FLD982103467, ERIC_10221, SQG_9745	CESQG, VSQG	1999	Both – soil/GW	0	SRCO Without Controls	Low
29	BJs Wholesale Club #109	4000 Oakwood Blvd, Hollywood	9816453, FLR000142299, SQG_10321	SQG	None	None	0	None	Low
30	Carvana Hollywood (formerly, Scozak Realty Inc., Penn Dutch Meats)	3950 N 28th Ter, Hollywood	9046686	LUST	1999	GW only	50	NREQ	Medium
31	Toyota Nationwide Lift Trucks, Inc. (formerly, Nationwide Lift Trucks Inc)	3900 N 28th Ter, Hollywood	8942718, SQG_7012	AST, UST, LUST, SQG	1993	Unknown	50	No Further Action	Low
32	High Performance Motors (formerly, Shimons Cars)	2801 Greene St, Hollywood	FLR000226027	CESQG	None	None	0	None	Low
33	Durante Equipment LLC (formerly, CVS Regional Office #64)	3300 N 28th Ter, Hollywood	8627593	AST, UST	None	None	50	None	Low
34	United Parcel Service	3101 N 29th Ave, Hollywood	8625855	UST, LUST, AST	1994	Both – soil/GW	150	SRCO	Low
35	National Hollywood Funeral Home & Crematorium (formerly, Graphplex Signs, Himedics Inc.)	2830 N 28th Ter, Hollywood	FLD981754112, AIR_0112789	CESQG	None	None	50	None	No
36	Hollywood 95 Office Center (formerly, Lab)	2700 N 29th Ave Ste 301, Hollywood	FL0000962985	SQG	None	None	400	None	No
37	Shell-First Coast Energy #1819 (formerly, Sun Tattler Newspaper)	2600 N 29th Ave, Hollywood	FLD004126470, 8627708	SQG, UST, LUST	2003	GW only	0	Fieldwork for groundwater sampling is scheduled for January 2025	High
38	McDonald's (formerly, Shell-Lucys)	2851 Sheridan St, Hollywood	8501783	UST, LUST	1987	Unknown	0	SRCR	Low
39	Topeekeegee Yugnee Park	3300 N Park Road, Hollywood	8841545	UST	None	None	0	None	Low

Facility Location Number	Facility Name	Facility Address/ Location	Facility ID	Facility Type	Discharge/ Report Date	Contamination Soil/GW	Parcel Distance to ROW (feet)	Remediation Status	Risk Rating
40	Yellow Green Farmer's Market Parking Lot (formerly, Cemex - Hollywood Ready-Mix, Rinker Material Corp/Hwd)	3080 S Sheridan St, Hollywood	8622330, SQG_6070, AIR_0110010	AST, UST, VSQG, LUST	1988	Soil	0	No Further Action	Low
41	Chevron (formerly, The Six Hearts Corp)	2730 Sheridan St, Hollywood	8502641	LUST	1987, 2010	Both – soil/GW	0	SRCO	Medium
42	FDOT Right-of-Way (formerly, Mobile Service Station #02-A25)	2729 Sheridan St, Hollywood	8502135	UST, LUST	1988, 1993	GW only	0	No Further Action	Low
43	FDOT Right-of-Way (formerly, Exxon #5355-STEVES)	2801 Sheridan St, Hollywood	8502129	UST, LUST	1993	Soil only	0	No Further Action	Low
44	Vacant (formerly, Sunset Golf Course)	2727 Johnson St, Hollywood	FLR10TJ71	Golf Course	2006	Both – soil/GW	0	No Further Action with Controls	High
45	Hollywood Tires (formerly, Michel Auto Repairs Inc)	2922 Johnson St, Hollywood	SQG_130394	VSQG	None	None	0	None	Low
46	Sunshine Chevron #30 (formerly, Sunset Automotive, Shell Service Station)	3000 Johnson St, Hollywood	8502723	UST, LUST	1990	Both – soil/GW	0	SRCO	Medium
47	Vacant (formerly, Marathon/Sunshine #165)	3034 Johnson St, Hollywood	8502207	UST, LUST	1989	Soil	400	NAM	Medium
48	Tri-Rail Hollywood Train Station	3001 Hollywood Blvd, Hollywood	N/A	Emergency Response Spill Site, Railroad	2022	Soil	0	NREQ – Cleanup Not Required	Medium
49	FDOT Right-of-Way (formerly, Mobil-Hollywood Blvd, Chevron USA, Inc)	2911 Hollywood Blvd, Hollywood	8502126	UST, LUST	1988, 1995	Both – soil/GW	0	Unknown	Medium
50	U-Haul Neighborhood Dealer (formerly, Davo Auto Center)	2828 Hollywood Blvd, Hollywood	8502583	UST, LUST	1989	GW	400	NAM	Medium
51	National Disaster Solutions (formerly, Microfilm Depot, Inc.)	1213 S 30th Ave, Hollywood	FLR000002998, SQG_9439	CESQG	None	None	0	None	No

Facility Location Number	Facility Name	Facility Address/ Location	Facility ID	Facility Type	Discharge/ Report Date	Contamination Soil/GW	Parcel Distance to ROW (feet)	Remediation Status	Risk Rating
52	Hollywood Woodwork Inc (formerly, Texaco-Pembroke Royal)	2951 Pembroke Rd, 1551 S 30th Ave, Hollywood	FLD982093874, 8625884	SQG, UST, AST, LUST	1992	None	0	No Further Action	Low
53	Kosher Motors (formerly, Stevens Auto Service Center)	2829 Pembroke Rd, Hollywood	9500022	UST, LUST	1984	Both – soil/GW	0	SRCO	Low
54	James Lanier Education Center, Hallandale High School (formerly, South Area Alternative Education Center, Hallandale Beach Dump)	1050 NW 7th Ave; 720 NW 9th Ave, Hallandale Beach	9100221, 9047348	UST, LUST	2007 / 1987	Both – soil/GW	30	SRCO / NREQ	Low
55	Hallandale Beach City I-95 Pump Station	2001 SW 30th Ave, Hallandale Beach	9809512	AST	None	None	0	None	No
56	Pembroke Park Recycling and Transfer (formerly, ECO Waste Transfer and Recycling, LLC)	1899 SW 31st Ave, Hallandale Beach	55464, 105719	Solid Waste Site	None	None	300	None	Medium
57	Vacant (formerly, Petroleum Products Corp)	3130 SW 19th St, Hallandale Beach	ERIC_3796, 8732818	CERCLA Superfund Site, UST	1960s	Both – soil/GW	870	CERCLA Superfund Site, Ongoing	High
58	Surraca Studio (formerly, Custom Craft, Edtick, Inc.)	2260 SW 30th Ave, Hallandale Beach	FL0000016436	CESQG	None	None	45	None	Low
59	Counter Tops of Broward (formerly, Gallo Marble Enterprises, Inc.)	500 Ansin Blvd, Hallandale Beach	8627989	LUST	1991	GW only	55	SRCO	Low
60	Fineline Marine Interiors (formerly, Butch Stores Automotive Inc)	2530 SW 30th Ave, Hallandale Beach	FL0000016436	SQG	None	None	40	None	Low
61	1800 Warehouse (formerly, 95 Warehouse LTD)	2401 SW 31st Ave, Pembroke Park	8942651	LUST	1988	Both – soil/GW	300	SRCO	Low
62	Dr's Toy Store, Travertine Mart (formerly, Messingschlager Properties, Bobb's Pianos & Organs)	2514 SW 30th Ave, Hallandale Beach	9401806	LUST	1994	Both – soil/GW	0	SRCO	Low

Facility Location Number	Facility Name	Facility Address/ Location	Facility ID	Facility Type	Discharge/ Report Date	Contamination Soil/GW	Parcel Distance to ROW (feet)	Remediation Status	Risk Rating
63	Imperial Stone Corp (formerly, Sungraf Inc)	325 W Ansin Blvd, Hallandale Beach	FLD982160947, AIR_0112101	SQG	None	None	0	None	No
64	Integrity Marine Engineering (formerly, B&W Recycling, Pflueger Marine Taxidermy Inc)	301 W Ansin Blvd, Hallandale Beach	FLD984167080	CESQG	None	None	0	None	No
65	FDOT Stormwater Retention Area (formerly, Texaco #021-313-FISK'S)	1090 W Hallandale Beach Blvd, Hallandale Beach	8501967	UST, LUST	1988	Unknown	0	Cleanup Not Required	Low
66	Exxon #4-4893 (formerly, SF Service LLC)	1080 W Hallandale Beach Blvd, Hallandale Beach	8502695	UST, LUST	1987	Both – soil/GW	55	SRCR	Medium
67	Wendy's (formerly, Mobil #03 A8, FDOT Property)	1091 W Hallandale Beach Blvd, Hallandale Beach	8502027	UST, LUST	1988	GW only	190	No Further Action	Low
68	Racetrac #491(formerly, Chevron, Capital Bank)	3031 W Hallandale Beach Blvd / NW 31st Ave & Hallandale Beach Blvd, Pembroke Park	9602003, 9101088	UST, LUST	1989, 2008	Both – soil/GW	255	SRCO / SRCO	Low
69	FDOT Right-of-Way	East and West Sides of SW 31st Ave, Pembroke Park	9803721	Emergency Response Spill Site	2001	Both – soil/GW	470	SRCO	Low
70	FDOT Right-of-Way	SB I-95 N of Exit 16, Hallandale Beach	9816414	Emergency Response Spill Site	2018	Both – soil/GW	0	SRCO	Low
71	Ives Estates Park (formerly, City of North Miami Beach Ojus Landfill)	20735 NE 16th Ave @ NE 214th St, North Miami Beach	57134, SW-01179	Solid Waste Site	1938-1977	Both – soil/GW	90	Ongoing groundwater monitoring for ammonia and methane	Medium
72	Tri-Rail Mainline Corridor	N/A	N/A	Railroad	None	N/A	0	None	Medium

-Parcel Distance to ROW is defined as the distance from existing ROW to the parcel on which a source of potential for contamination involvement with the project has been identified
-Data Derived from FDEP OCULUS database, FDEP Map Direct application, the EDR report, and field review results.

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), District 4, is conducting a Project Development and Environment (PD&E) Study that proposes to improve traffic operations at the existing interchanges, cross streets, and managed lanes, address existing and future traffic demand, and enhance safety along the corridor from the Miami-Dade/Broward County Line to north of Griffin Road in Broward County, Florida. The total project length is approximately 6.6 miles. Improvements to the bicycle and pedestrian accommodations along the cross streets will be considered as part of the project. The study was conducted to meet the requirements of the National Environmental Policy Act (NEPA) and other related federal and state laws, rules, and regulations.

This Natural Resources Evaluation (NRE) is being prepared as part of this PD&E Study. This report reviews the possible impacts to wetland systems, Essential Fish Habitat (EFH), and federally and state-protected species. The identification of measures to avoid, minimize, and mitigate any potential impacts is also discussed. A summary of the analysis of potential project impacts for the proposed project is presented below.

PROTECTED SPECIES AND HABITATS

Based on evaluation of collected data and field reviews, the federal and state listed species discussed in **Table ES1** and **Table ES2** were observed or were determined to have the potential to occur within or adjacent to the project area. An effect determination was made for each of these federal and state listed species based on an analysis of the potential impacts of the proposed project on each species.

TABLE ES1: FEDERALLY LISTED SPECIES IMPACT DETERMINATIONS

Project Effect Determination	Federally Listed Species
No Effect	**BIRDS**
	Everglade snail kite (*Rostrhamus sociabilis plumbeus*)
	REPTILES
	American crocodile (*Crocodylus acutus)*
May Affect, Not Likely to Adversely Affect	**BIRDS**
	Wood stork (*Mycteria americana*)
	MAMMALS
	West Indian manatee (*Trichechus manatus latirostris*)
	Florida bonneted bat (*Eumops floridanus*)
	REPTILES
	Eastern indigo snake (*Drymarchon corais couperi*)

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TABLE ES2: STATE LISTED SPECIES IMPACT DETERMINATIONS

Project Effect Determination	State Listed Species
No Effect Anticipated	**BIRDS**
	Least tern (*Sternula antillarum*)
No Adverse Effect Anticipated	**REPTILES**
	Gopher tortoise (*Gopherus polyphemus*)
	BIRDS
	Florida burrowing owl (*Athene cunicularia floridana*)

WETLANDS AND SURFACE WATERS

Wetlands have very little coverage in the study area, while surface waters in the study area are limited to roadside drainage canals and stormwater ponds. Roadside swales and stormwater ponds are located within or adjacent to the I-95 right-of-way (ROW) as part of the existing surface water management system. Three canals (Hollywood/C-10 Canal, C-10 Spur Canal, and Dania Cut-Off Canal) are located within the proposed improvements.

No impacts to jurisdictional wetlands are anticipated. The proposed project is anticipated to impact 1.28 acres other surface waters (OSWs), including 0.15 acres of impacts to roadside swales, 0.91 acres of impacts to stormwater ponds, and 0.21 acres of impacts to named canals.

ESSENTIAL FISH HABITAT

Impacts to EFH from the project include 0.03 acres to the unconsolidated bottom substrate of the Dania Cut-Off Canal. These impacts are from the proposed widening of the roadway and bridge over the Dania Cut-Off Canal, increasing the bridge span by approximately 12 feet from the existing northbound deck, resulting in additional coverage of open surface waters and associated in-water work. An EFH assessment is included as part of this NRE. With avoidance and minimization measures, best management practices (BMPs), adverse effects to EFH are expected to be "**minimal**".

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Appendix J
Seasonal High Water Table

Seasonal High-Water Table (SHWT) Technical Memo

Project Development and Environment (PD&E) Studies

SR-9/I-95 from Miami-Dade/Broward County Line to North of Griffin Road

FDOT District 4 - Broward County

Financial Project ID No. 439170-1-22-02

Federal Aid Project No.: D421 105 B

An estimated Seasonal High-Water Table (SHWT) was established for the subject project based on the following reference material:

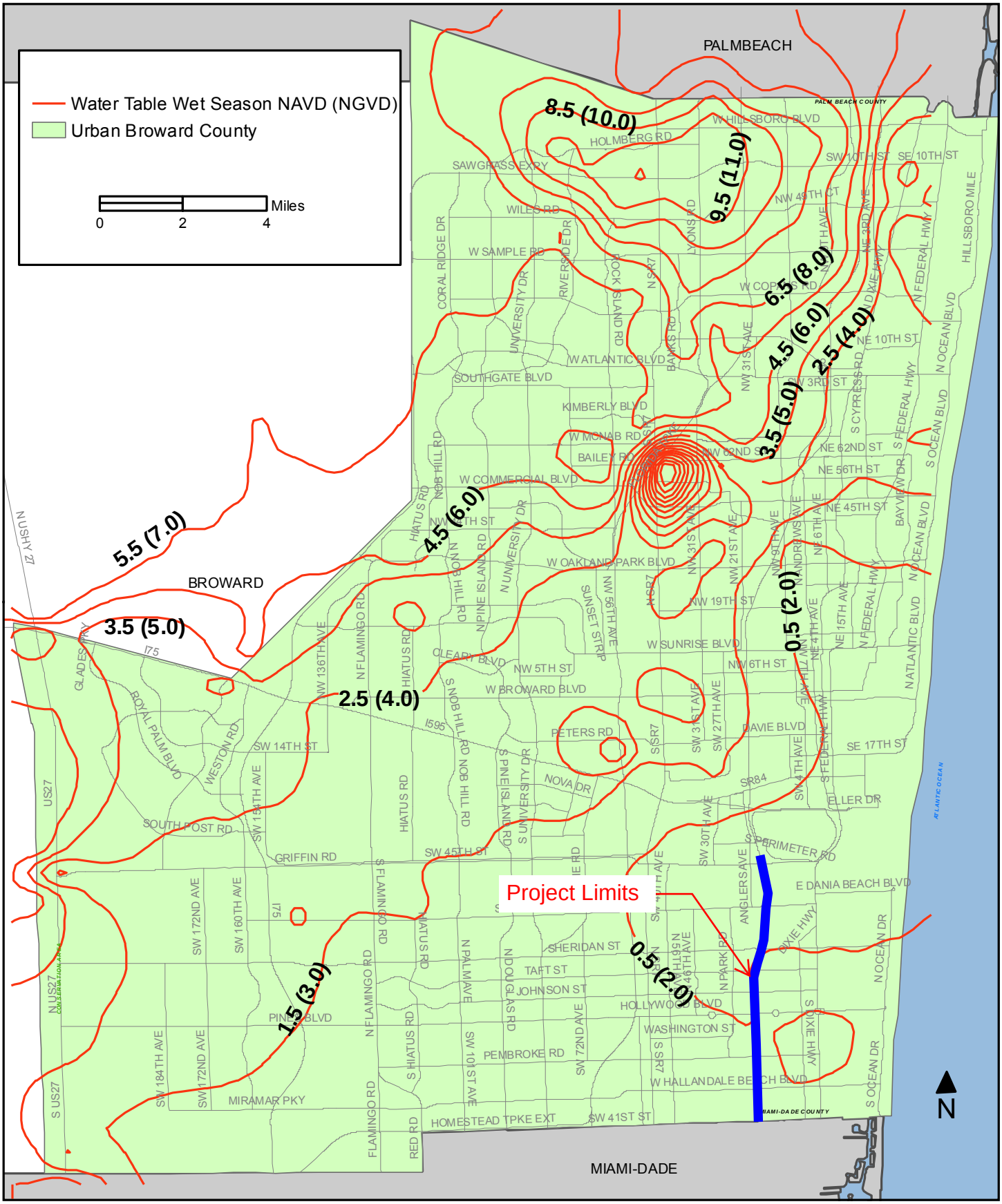
1. Broward County Average Wet Season Water Table Map: The SHWT is 0.5' NAVD (2.0' NGVD) within the project limits.
2. FDOT Projects with SFWMD Environmental Resource Permits (ERP):

SFWMD Permit #	Description	SHWT (NAVD)	Source
06-02942-P	I-95 Pump Station	0.50'	C-10 Canal
06-105283-P	I-95 Express Lanes Phase 3C (Segment 1A)	0.50'	C-10/Spur Canal
06-105306-P	I-95 Express Lanes Phase 3C (Segment 1B)	0.50'	C-10/Spur Canal
06-102237-9	I-95 Stirling Rd Widening Improvements	0.50'	Broward Maps
06-102234-P	I-95 Express Lanes Phase 3C (Segments 1B & 2A)	0.42'	Dania Cutoff Canal

Recommendation:

Based on the information gathered from the Broward County Water Table Map and the various FDOT projects with ERP Permits, the recommended SHWT is **0.5 Ft. NAVD (2.0 Ft. NGVD)**. Backup documentation that supports the data presented above is attached to this memo.

WATER TABLE MAP - AVERAGE WET SEASON



Division Name: Urban Planning Division
Department Name: Resilient Environment Department

This map is for conceptual purposes only and should not be used for legal boundary determinations.
Elevation converted from NGDV to NAVD using the FEMA approved conversion factor for Broward County of (-) 1.5

SPECIAL CONDITIONS

1. DISCHARGE FACILITIES:

STRUCTURE NO. 1:

1-53760 GPM WITH PUMP ON AT ELEV. 3' NGVD AND WITH PUMP OFF AT ELEV. 2' NGVD.

RECEIVING BODY : C-10 CANAL

CONTROL ELEV : 2 FEET NGVD. /2 FEET NGVD DRY SEASON.

STRUCTURE NO. 2:

1-17920 GPM ' NGVD.

RECEIVING BODY : C-10 CANAL

CONTROL ELEV : 2 FEET NGVD. /2 FEET NGVD DRY SEASON.

2. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

3. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

4. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

5. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

6. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF FDOT, HALLANDALE BEACH AND PEMBROKE PARK.

7. ALL SPECIAL CONDITIONS, EXHIBITS AND TEXT OF STAFF REPORTS PREVIOUSLY STIPULATED BY PERMIT NUMBER 06-02942-P REMAIN IN EFFECT UNLESS OTHERWISE REVISED AND SHALL APPLY TO THIS MODIFICATION.

8. SILT SCREENS, HAY BALES AND/OR OTHER SUCH SEDIMENT CONTROL MEASURES AND TURBIDITY BARRIERS AND/OR OTHER TURBIDITY CONTROL MEASURES SHALL BE UTILIZED DURING CONSTRUCTION AS INDICATED IN THE CONSTRUCTION PLANS.

9. PRIOR TO CONSTRUCTION, THE PERMITTEE(S) SHALL PROVIDE THE DISTRICT WITH A COPY OF THE EXECUTED JOINT PARTICIPATION AGREEMENT.

10. PRIOR TO CONSTRUCTION, THE PERMITTEE(S) SHALL PROVIDE THE DISTRICT WITH A COPY OF THE EASEMENT DEED AUTHORIZING THE FACILITIES TO BE CONSTRUCTED ON THE PROPERTY OF HALLANDALE BEACH HIGH SCHOOL.

11. EXHIBIT NUMBER 3 AND EXHIBITS 8 THROUGH 55 DEPICT PLAN AND PROFILE VIEWS OF THE PROPOSED BACKBONE CONVEYANCE FACILITIES. THESE EXHIBITS ARE LOCATED IN THE PERMIT FILE AND ARE INCORPORATED HEREIN BY REFERENCE.

12. EXHIBIT 67 DEPICTS THE AREAS WHERE THE MAINTENANCE DREDGING OF THE C-10 CANAL WILL BE DONE. THIS EXHIBIT IS LOCATED IN THE PERMIT FILE AND IS INCORPORATED BY

For System 13, the existing dry detention and retention ponds will be expanded to the maximum extent possible in order to provide water quality treatment and water quantity discharge attenuation in accordance with SFWMD criteria.
The proposed stormwater plan will not only enhance water quality treatment within this section of the I-95 corridor but will also provide sufficient storage capacity to attenuate the 25-year – 72-hour and 100-year – 24-hour design storm events and maintain or reduce pre-development discharges to offsite waterbodies.

4.2 Background

Various regulatory agencies were contacted to identify readily available data for the segment of the I-95 corridor within System 13. This data, in addition to the topographic survey, was used to develop base maps and assist in establishing the pre-development and post-development hydrologic and hydraulic conditions. The data collection process includes obtaining information regarding existing drainage features within the I-95 corridor and the adjacent areas from survey, record drawings, and/or SFWMD permits. The agencies contacted and the information obtained is summarized below:

Florida Department of Transportation (FDOT)

FDOT existing plans, as-builts, and available drainage reports were obtained and used to establish existing drainage conditions within this segment of I-95. The data collected from FDOT includes the following plans/record drawings:

- State Project No.: 86095-3453, Year – 1984
- State Project No.: 86070-3460, Year – 1988
- State Project No.: 86070-3488, Year – 1991
- Financial Project No.: 409127-1-52-01, Year – 2004

South Florida Water Management District (SFWMD)

Existing SFWMD permits were obtained and used to establish existing drainage conditions within this section of the I-95 corridor. Data collected from SFWMD includes:

- Permit No. 06-01768-S (Application No. 920811-9)

4.3 Seasonal High Groundwater Table and Tailwater Elevations

The Seasonal High Groundwater Table (SHGWT) elevation and static tailwater elevation for the Dania Cutoff Canal assumed for the analysis, modeling, and design associated with this study is 0.42-ft NAVD. This assumption is in accordance with previous permitting documentation and designs.

Project:	**SR 848/Stirling Rd. & SR 9/I-95 Interim Improvements**	Calc. by:	JV
	From East of N 29th Ave. to West of SW 18th Ave./Oakwood Blvd.	Chkd. by:	CR
FPID #:	**439170-2-52-01**	Date:	Oct. 2019
Location:	**I-95/Stirling Rd. Interchange - SB Off-Ramp**		

SFWMD Water Quality Control
French Drain (FD) Length Determination

SFWMD FD Length Formula :

$L_{REQUIRED} = V_{REQUIRED} / (K*((2*H_2*Du-Du^2 + 2*H_2*Ds) + (1.30E-4)*W*Du))$

Pond treatment volume deficit to be compensated by French drain= 0.0954 ac.-inch

*** Weir Elev.	2.0	ft-NAVD
SHGWT Elev.	0.5	ft-NAVD
Top Elev.	4.5	ft-NAVD
Bot. Elev.	-1.0	ft-NAVD
K	1.10E-04	cfs/ft^2-ft
W	4.0	ft.
Du	1.5	ft.
Ds	1.5	ft.
H2	1.5	ft.
Vrequired	0.0954	ac-inch
L FD required	61	ft.
L FD provided	119	ft.

From PSI Geotechnical Report:
Nearest-by percolation test: W4

W4/P1: K_{10}= 1.10E-04 cfs/ft^2-ft

*** System Control Weir (ditch-block) is located at I-95 Easterly Swale (Swale 12-1) between Stirling Rd. & Griffin Rd.
I-95 System 12 (Basin 12) Weir Control Elevation= 2.0'-NAVD

provide the runoff volume generated by the 25 year-3 day storm event. The summary of results can be found in Table 1.

2.4.4 Seasonal High Groundwater Table and Tailwater Elevations

The Seasonal High Groundwater Table (SHGWT) elevation and static tailwater elevation for the C-10 and C-10 Spur Canal are 0.50 NAVD. This assumption is in accordance with previous permitting documentation and designs.

3.0 Drainage Systems

3.1 System 6

This drainage system extends from Pembroke Road to Johnson Street. The existing system consists of interconnected roadside dry detention ponds along the east and west sides of I-95, ultimately discharging to the C-10 Canal via an outfall structure in the southwest quadrant of I-95 and Hollywood Boulevard. Refer to Appendix B for the Drainage Basin Maps. The improvements within System 6 result in 1.99 acres of additional impervious area. To accommodate the additional runoff volume, plus the storage filled due to widening, these existing dry detention ponds were expanded to the maximum extent possible to provided water quality and water quantity required. French drains were also required between Pembroke Road and Hollywood Boulevard to help meet these requirements. This resulted in the need to model the pre-development and post-development conditions to compare the stages in each swale along with the discharge rate into the C-10 Canal. The result is that the post-development discharge rate in the C-10 Canal is less than the pre-development discharge rate and the stages in all the swales have either decreased or remained the same. It is important to note that the pre-development model shows that many of the existing swales exceed the warning stage. The post-development model shows that this project is providing a net benefit by lowering these elevations. Refer to Section 4.0 for the complete summary of maximum stages and discharge rates. Refer to Appendix C and D respectively for the System 6 pre and post development ICPR routing analysis. Refer to Appendix E for System 6 stage-storage calculations and Table 1 for the summary table. System 6 includes 10 proposed and existing swales. Below is a list of each swale with its corresponding control structure and weir elevation, further depiction can be found on the nodal diagrams and existing plans within Appendix C and D:

- Swales 6-0, 6-1, 6-1-2, and 6-2:
    - Control Structure CS 6-2, Weir EL = 2.5’ (NAVD88)

discharge in accordance with SFWMD criteria. System 11 works in conjunction with System 12 in providing the water quality and water quantity required.

4.2 Background

Various regulatory agencies were contacted to identify readily available data for the segment of the I-95 corridor within System 11. This data, in addition to the topographic survey, was used to develop base maps and assist in establishing the pre-development and post-development hydrologic and hydraulic conditions. The data collection process includes obtaining information regarding existing drainage features within the I-95 corridor and the adjacent areas from survey, record drawings, and/or SFWMD permits. The agencies contacted and the information obtained is summarized below:

Florida Department of Transportation (FDOT)

FDOT existing plans, as-builts, and available drainage reports were obtained and used to establish existing drainage conditions within this segment of I-95. The data collected from FDOT includes the following plans/record drawings:

- State Project No.: 86070-3460, Year – 1988
- Financial Project No.: 422796-1-52-01 and 422796-2-52-01, Year – 2011

South Florida Water Management District (SFWMD)

Existing SFWMD permits were obtained and used to establish existing drainage conditions within this section of the I-95 corridor. Data collected from SFWMD includes:

- Permit No. 06-01768-S (Application No. 170525-8)

4.3 Seasonal High Groundwater Table and Tailwater Elevations

The Seasonal High Groundwater Table (SHGWT) elevation and static tailwater elevation for the C-10 Spur Canal assumed for the analysis, modeling, and design associated with this study is 0.50-ft NAVD. This assumption is in accordance with previous permitting documentation and designs.

4.4 Floodplain

The study limits include areas within FEMA floodplain designation AE. Zone AE designates flood hazard areas inundated by 100-year flood. For specific information about the Flood Insurance Rate maps (FIRMs) see FIRM 12011C0556H and FEMA Floodplain Map included in **Appendix B** of this report. Within the limits of System 11, the Zone AE 100-year flood elevation is 7 ft. NAVD.

Appendix K
Correspondence & Existing Permit Excerpts

Meeting Minutes

Project:	FPID No. 439170-1-22-02 I-95 (SR 9) PD&E Study from Miami-Dade/Broward County Line to n. of Griffin Road
Subject:	Hallandale Beach Drainage Meeting
Date and time:	August 21, 2024, 10:00 AM
Meeting place:	Online Teams Meeting
Minutes by:	Scalar Consulting Group Inc.

Attendees:

Ronald Wallace – FDOT; ronald.wallace@dot.state.fl.us
James Poole – FDOT; james.poole@dot.state.fl.us
Jacob Ryan – FDOT; Jacob.Ryan@dot.state.fl.us
Ruben Rodriguez – FDOT; ruben.rodriguez@dot.state.fl.us
Jean Cariany – FDOT; jean.cariany@dot.state.fl.us
Rudy Gotmare – Scalar Consulting Group; agotmare@scalarinc.net
John Scarlatos – Scalar Consulting Group; jscarlatos@scalarinc.net
David Boyer – Scalar Consulting Group; dboyer@scalarinc.net
David Bennett – Scalar Consulting Group; dbennett@scalarinc.net
Jeffrey Odoms – City of Hallandale Beach; JOdoms@Hallandalebeachfl.gov
Vanessa Leroy – City of Hallandale Beach; vleroy@hallandalebeachfl.gov
Jeffrey Towne – City of Hallandale Beach; Jtowne@hallandalebeachfl.gov

Notes:

The meeting was held to discuss Chaves Lake and run-off, and contamination concerns related to the I-95 PD&E Study. Key points discussed are provided below.

- The meeting opened with a general discussion regarding the hydraulic and environmental aspects of I-95 and Lake Chaves. This included:
    - Lake Chaves outfalls via pumping to a FDOT pump station on the west side of I-95 then north to a concrete lined ditch which flows north to the C-11 canal.
    - Currently, I-95 does not contribute runoff to Lake Chaves, therefore, does not impact the lake.
    - FDOT had no relevant data regarding TMDL's since I-95 does not discharge to Lake Chaves.
- The City's concern over the potential impacts of the 1-95 project to Chaves Lake is due to the City's desire for capacity within the lake for future flooding relief, public use, water quality, etc.
- The city requested drainage data from FDOT. The current design is being performed by BCC. The BCC contact is Carlos Alcantara, calcantara@bcceng.com, 954-298-2246. Additional contacts are Juan H. Vázquez, PE, R J Behar & Company, jvazquez@rjbehar.com, 954-680-7771 and Patrick Leung, Stantec, Patrick.leung@stantec.com, 954-481-2812 x227.

Meeting Minutes
Drainage Pond Siting Alternatives
I-95 (SR 9) Project Development and Environment (PD&E) Study
Miami-Dade/Broward County Line to North of Griffin Road
Broward County, Florida
FPID No. 439170-1-22-01
August 18, 2025
Time: 4:00 pm to 5:00 pm

LOCATION:
FDOT D4 Office 3400 W. Commercial Blvd. Ft. Lauderdale, FL 33309
Virtual Attendees (Microsoft Teams)

Attendees:
Leslie Wetherell - FDOT Project Manager
Ruben Rodriguez – FDOT Drainage Designer
Jean Cariany – FDOT Drainage Designer
Ronald Wallace - FDOT Assistant Project Manager
Aniruddha Gotmare – SCALAR Project Manager
John Scarlatos – SCALAR Deputy Project Manager
David Boyer – SCALAR Drainage Engineer
Denys Avila - SCALAR Drainage Engineer of Record
Lucas Chaparro - SCALAR Drainage Engineer Intern

Purpose: The purpose of this meeting was to present the pond sites alternatives developed for the PD&E.

Discussion items:

a. Scalar described the limits of each basin and the proposed ponds for each basin.
    a. Basin 1, 2, 3, 4, 5 are part of the FPID: 436903-1-22-02 PD&E.
    b. System 9: from C-10 Canal to Sheridan Street. I-95 mainline 3 pond alternatives (Pond 9-7) with full take for R/W. Alternative 2 is preferred since those properties are already affected by the diamond interchange widening.
    c. Sheridan Basin has 3 pond alternatives (Pond 9-5) (two with right of way acquisition) to provide treatment/attenuation for the Sheridan Flyover.
        1. Alternative 2 is within the Tri-Rail Park & Ride parcel, which is owned by FDOT.
        2. Alternative 2 & 3 both will require MSE walls to be built along the approaches over the railroad and allow for a linear pond to be graded.

d. System 10: from Sheridan Street to C-10 Spur. Alternative 1 consists of roadside ditches graded up to a gravity and/or cantilever retaining wall along the right of way (This is the preferred alternative). Alternatives 2 & 3 are new ponds requiring full right-of-way acquisitions.
    1. Maintenance is of concern with a dry detention swale with walls on both sides. Maintenance access will need to be provided through an opening in the wall.
e. System 11: from C-10 Spur to Stirling Road. Equivalent layout to system 10.
f. System 12: from Stirling Road to Griffin Road. Alternative 1 consists of roadside ditches graded up to a gravity wall and/or cantilever retaining wall requiring a linear take across multiple parcels. Alternative 2 is a partial take of a palm tree nursery parcel. Alternative 3 full take of palm tree nursery parcels.
    1. Maintenance is of concern with a dry detention swale with walls on both sides. Maintenance access will need to be provided through an opening in the wall.
    2. Alternative 1 & 2 both have ODA signs that could be impacted and will be identified on roll plots.
g. System 13: From Griffin Road to I-595. New ponds within the right of way and regrading of the existing ponds. No R/W is required for this basin

Action items:

a. SCALAR to confirm ponds from PD&E FPID: 436903-1-22-02 and request updated files.
b. **System 9:** SCALAR to evaluate whether eliminating auxiliary lanes could potentially remove the need for right-of-way acquisition east of I-95. If the roadway design is determined to be constructible within the existing right-of-way, SCALAR will reevaluate the parcels to be affected.
c. **System 10, 11 & 12:** SCALAR and FDOT to coordinate with maintenance agencies to determine if access to roadside ditches between walls is adequate. SCALAR to develop maintenance access exhibit and typical section for drainage ditches with walls on both sides.
d. **System 10:** Evaluate the feasibility of utilizing proposed swales along Sheridan Street for mainline I-95 stormwater management, if the Sheridan Flyover alternative is disregarded.

Meeting Minutes

Project:	FPID No. 439170-1-22-02 I-95 (SR 9) PD&E Study from Miami-Dade/Broward County Line to n. of Griffin Road
Subject:	Hallandale Beach Drainage Meeting
Date and time:	August 21, 2024, 10:00 AM
Meeting place:	Online Teams Meeting
Minutes by:	Scalar Consulting Group Inc.

Attendees:

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James Poole – FDOT; james.poole@dot.state.fl.us
Jacob Ryan – FDOT; Jacob.Ryan@dot.state.fl.us
Ruben Rodriguez – FDOT; ruben.rodriguez@dot.state.fl.us
Jean Cariany – FDOT; jean.cariany@dot.state.fl.us
Rudy Gotmare – Scalar Consulting Group; agotmare@scalarinc.net
John Scarlatos – Scalar Consulting Group; jscarlatos@scalarinc.net
David Boyer – Scalar Consulting Group; dboyer@scalarinc.net
David Bennett – Scalar Consulting Group; dbennett@scalarinc.net
Jeffrey Odoms – City of Hallandale Beach; JOdoms@Hallandalebeachfl.gov
Vanessa Leroy – City of Hallandale Beach; vleroy@hallandalebeachfl.gov
Jeffrey Towne – City of Hallandale Beach; Jtowne@hallandalebeachfl.gov

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February 17, 2026

Via Email: Leslie.wetherell@dot.state.fl.us

Florida Department of Transportation
Attn: Leslie Wetherell, P.E., Project Manager
3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

Re: I-95 PD&E Study – Project Advisory Group (PAG) Meeting #3

Dear Leslie:

Thank you for bringing your consultant, Scalar, to City Hall on February 5, 2026, to meet with staff and stakeholders from the City of Hollywood, the Town of Pembroke Park, Port Everglades, and the City of Dania Beach to discuss FDOT's proposed Interstate 95 interchange improvements during the third and final Project Advisory Group (PAG) meeting.

As discussed, the project limits span multiple interchanges from the south county line to Griffin Road. The February 5th meeting primarily focused on the three interchanges located within Dania Beach: Sheridan Street, Stirling Road, and Griffin Road.

At this stage of the project, Dania Beach staff have the following comments and concerns:

Sheridan Street
Staff have no comments or concerns regarding the proposed improvements at the Sheridan Street intersection.

Stirling Road
The proposed improvements include FDOT's acquisition of the CF & Hill Family Ltd. property (ID: 504233000360), located on the northwest side of the intersection, for drainage purposes. The City is concerned about the removal of this future development parcel from the tax base. There has been investor interest in developing this site, and if acquired by FDOT, the property would be removed from the City's tax rolls, creating an inequitable fiscal impact on the City of Dania Beach.

Griffin Road
I-95 Access
The City strongly supports the proposed northbound access ramp to I-95 utilizing the former hotel access road. Currently, motorists perceive a visual connection from Old Griffin Road to I-95 and often assume this access exists. Formalizing this connection would reduce driver confusion and improve traffic flow, particularly when Tri-Rail train activity causes signal interruptions.

Traffic Control
(DCOTA). The City has requested clarification as to whether this signal was originally warranted and installed as part of the Development of Regional Impact (DRI) approval for DCOTA. Staff are concerned that eliminating the signal could negatively affect safe traffic operations given existing volumes, turning movements, and conflict points.

Traffic Congestion and Operations
Existing queue lengths entering Old Griffin Road and DCOTA within the dedicated right-turn lane are significant and may worsen without signal control and with reduced turn lane dimensions. In the proposed design, limited queue storage for vehicles entering Old Griffin Road eastbound may result in congestion and restricted maneuverability.

The turnaround movement on Old Griffin Road is also expected to experience increased congestion as traffic patterns shift. Requiring all vehicles exiting the two DCOTA driveways to travel east will concentrate traffic volumes along constrained roadway segments that already experience queuing from the traffic signal eastward under the bridge.

Additional traffic may further impact the Old Griffin Road/Bryan Road intersection, which has seen a substantial increase in trips following development of Dania Pointe, a project that is not yet fully built out. A future signal is anticipated at this location. The developer has been asked by the City to resubmit a traffic analysis for your consideration.

Access Management and Property Impacts
To date, no outreach has been conducted with DCOTA stakeholders. Their legal representative was not aware of FDOT's proposal. Following the PAG meeting, the city provided them with project information and your contact details. Removal of the traffic signal may limit future build-out potential of the DCOTA property and could conflict with prior DRI approvals, depending on access and circulation requirements. Broward County expressed strong support for maintaining the current traffic signal design concept.

Drainage
The City has requested confirmation as to whether drainage and seawall improvements beneath the Old Griffin Road bridge are included in the project design. Significant flooding currently occurs during the rainy season, creating unsafe travel conditions.

Planning and Long-Term Considerations
The proposed modifications may affect future redevelopment opportunities, access planning, and long-term circulation patterns along the Griffin Road corridor and, to some extent, Stirling Road.

We understand FDOT's next steps include:
- Hybrid Public Hearing: April–June
- Broward MPO Coordination: Meetings currently being scheduled
- Design Approval: Targeted for October–December

FDOT also indicated plans to conduct individual follow-up meetings with stakeholder agencies, including two meetings with the City of Dania Beach staff and the Mayor.

The City respectfully requests that FDOT re-evaluate the proposed improvements considering the concerns outlined above. Please let us know if additional clarification or information from the City would be helpful as the project advances.

Sincerely,

Eleanor Noreana
Director, Community Development

cc: Ana M. Garcia, ICMA-CM, City Manager
Candido Sosa-Cruz, ICMA-CM, Deputy City Manager
Fernando J. Rodriguez, Public Services Director
Sean Schutten, City Engineer

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE PERMIT NO. 06-01465-S
DATE ISSUED:August 2, 2017

PERMITTEE: FLORIDA DEPARTMENT OF TRANSPORTATION
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

PROJECT DESCRIPTION: Conceptual approval of a stormwater management system serving an 8.6 mile highway widening project known as I-95 Express Lanes Phase 3C.

PROJECT LOCATION: BROWARD COUNTY, SEC 8,9,16,17,19,20,21,28,29,33 TWP 50S RGE 42E
SEC 4,8,9,16,17 TWP 51S RGE 42E

PERMIT DURATION: See Special Condition No:1.

This is to notify you of the District's agency action for Permit Application No. 170525-8, dated May 25, 2017. This action is taken pursuant to the provisions of Chapter 373, Part IV, Florida Statues (F.S).

Based on the information provided, District rules have been adhered to and an Environmental Resource Permit is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120, Florida Statutes, administrative hearing.
2. the attached 18 General Conditions (See Pages : 2 - 4 of 8),
3. the attached 10 Special Conditions (See Pages : 5 - 7 of 8),
4. the attached General Conditions for Authorizations for Use of Sovereign Submerged Lands (See Pages : 8 - 8 of 8) and
5. the attached 6 Exhibit(s)

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights," we will assume that you concur with the District's action.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY THAT this written notice has been mailed or electronically transmitted to the Permittee (and the persons listed in the attached distribution list) this 2nd day of August, 2017, in accordance with Section 120.60(3), F.S. Notice was also electronically posted on this date through a link on the home page of the District's website (my.sfwmd.gov/ePermitting).

BY:_____
Ricardo A. Valera, P.E.
Bureau Chief - Environmental Resource
Regulation Division

GENERAL CONDITIONS

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, Florida Administrative Code (F.A.C.). Any deviations that are not so authorized shall subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the "State of Florida Erosion and Sediment Control Designer and Reviewer Manual" (Florida Department of Environmental Protection and Florida Department of Transportation June 2007), and the "Florida Stormwater Erosion and Sedimentation Control Inspector's Manual" (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice" indicating the expected start and completion dates. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.

6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
   a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex- "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit"[Form 62-330.310(3)]; or
   b. For all other activities- "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
   c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

7. If the final operation and maintenance entity is a third party:
   a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Applicant's Handbook Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
   b. Within 30 days of submittal of the as- built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that

GENERAL CONDITIONS

require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

9. This permit does not:
a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
b. Convey to the permittee or create in the permittee any interest in real property;
c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the Agency in writing:
a. Immediately if any previously submitted information is discovered to be inaccurate; and
b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification shall be provided in accordance with Section 872.05, F.S.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other

GENERAL CONDITIONS

uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

SPECIAL CONDITIONS

1. The conceptual phase of this permit shall expire on July 28, 2037.

2. Operation and maintenance of the stormwater management system shall be the responsibility of FLORIDA DEPARTMENT OF TRANSPORTATION.

3. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

4. The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

   a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injuries to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

   b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

   c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

   d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the animal(s) have moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the animal(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

   e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com.

   f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 ft. by 4 ft. which reads Caution: Manatee Area must be posted. A second sign measuring at least 81/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to FWC at ImperiledSpecies@myFWC.com.

5. Manatee exclusion devices (such as grating) shall be installed and maintained over any existing or proposed pipes or culverts greater than 8 inches, but smaller than 8 feet in diameter that are submerged or partially submerged and reasonably accessible to manatees. If horizontal or vertical bars are used, no more than 8 inch gaps on center shall be allowed. Grates or valves shall be in place at the accessible

SPECIAL CONDITIONS

end(s) during all phases of the construction process and as a final design element to restrict manatee access.

6. 1. For the I-595 bridge crossing over the FPL Cooling Pond Canal:

No pile driving work shall be performed between November 15 and March 31, to reduce the possibility of injuring or killing a manatee during construction.

2. During pile-driving activities for concrete piles 12 inches in diameter or larger, the following measures shall be followed:

a. At least one observer shall be onsite and dedicated to the task of watching for manatees during the pile driving. Observers must have prior on-the-job experience as a dedicated manatee observer, observing for manatees during similar in-water work and shall perform no other duties that may interfere with their ability to observe for protected marine species. All pile-driving activity shall be confined to daylight hours. If pile driving is to occur between November 15 and March 31, the observer(s) must be approved by the FWC at least two weeks prior to construction commencement. FWC approval of observers shall be specific to this project and must occur as per FWC guidelines outlined at the following website: http://www.myfwc.com/wildlifehabitats/managed/manatee/watch-program/.

b. The pile driving activities will use a ramp-up measure. At the start of pile driving, hammers would initially be operated at low levels, then gradually increase to minimum necessary power required for pile installation. Monitoring for protected marine species will occur for 30 minutes prior to pile driving, during pile driving, and for 30 minutes after pile driving ends.

c. If the activities appear to harass or injure a protected marine species, then work shall cease immediately and not resume until after consultation with the Florida Fish and Wildlife Conservation Commission (FWC) at ImperiledSpecies@myfwc.com or 850-922-4330. Any additional conservation measures deemed necessary by FWC must be implemented to minimize the risks to protected species.

3. For the use of barges during work on the C-10 Canal, Dania Cutoff Canal bridge crossings, and also for in-water activity associated with the South Fork of the New River Canal bridge crossing:

At least one dedicated observer shall be present during bridge construction related activity in the water and shall perform no other duties that may interfere with their ability to observe for protected marine species. Observer(s) must have prior on-the-job experience observing during previous work where the activities were similar in nature to this project. Movement of a work barge or other associated vessels shall be minimized to the greatest extent possible at night.

7. A monitoring program shall be implemented in accordance with Exhibit No. 5.2. The monitoring program shall extend for a period of 5 years with annual reports submitted to District staff. At the end of the first monitoring period the mitigation area shall contain an 80% survival of planted vegetation. The 80% survival rate shall be maintained throughout the remainder of the monitoring program, with replanting as necessary. If native wetland, transitional, and upland species do not achieve an 80% coverage within the initial two years of the monitoring program, native species shall be planted in accordance with the maintenance program. At the end of the 5 year monitoring program the entire mitigation area shall contain an 80% survival of planted vegetation and an 80% coverage of desirable obligate and facultative wetland species.

SPECIAL CONDITIONS

8. Upon submittal of an application for construction approval involving wetland impacts or proposed restoration, the permittee shall submit a work schedule, subject to District staff review and approval, specifying completion dates for each restoration, monitoring and maintenance task.

9. No work shall occur within the District's right-of-way until all necessary right-of-way occupancy permits are obtained authorizing the proposed work in the District's right-of-way.

10. The following are exhibits to this permit:

Exhibit No. 1 Location Map
Exhibit No. 2 Summary Tables
Exhibit No. 3 Pre & Post Drainage Basin Maps
Exhibit No. 4 Roadway Plans
Exhibit No. 5 Environmental Documents
Exhibit No. 6 Sovereign Submerged Lands Sketch

GENERAL CONDITIONS FOR AUTHORIZATIONS FOR USE OF SOVEREIGN SUBMERGED LANDS

Project No. 170525-8

Chapter 18-21.004(7), F.A.C., provides that all authorizations granted by rule or in writing under Rule 18-21.005, F.A.C., except those for aquaculture activities and geophysical testing, shall be subject to the general conditions as set forth in paragraphs (a) through (i) below. The general conditions shall be part of all authorizations under this chapter, shall be binding upon the grantee, and shall be enforceable under Chapter 253 or Chapter 258, Part II, F.S.

Chapter 18-21.004(7), F.A.C., General Conditions for Authorizations:
(a) Authorizations are valid only for the specified activity or use. Any unauthorized deviation from the specified activity or use and the conditions for undertaking that activity or use shall constitute a violation. Violation of the authorization shall result in suspension or revocation of the grantee's use of the sovereignty submerged land unless cured to the satisfaction of the Board.

(b) Authorizations convey no title to sovereignty submerged land or water column, nor do they constitute recognition or acknowledgment of any other person's title to such land or water.

(c) Authorizations may be modified, suspended or revoked in accordance with their terms or the remedies provided in Sections 253.04 and 258.46, F.S., or Chapter 18-14, F.A.C.

(d) Structures or activities shall be constructed and used to avoid or minimize adverse impacts to sovereignty submerged lands and resources.

(e) Construction, use, or operation of the structure or activity shall not adversely affect any species which is endangered, threatened or of special concern, as listed in Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C.

(f) Structures or activities shall not unreasonably interfere with riparian rights. When a court of competent jurisdiction determines that riparian rights have been unlawfully affected, the structure or activity shall be modified in accordance with the court's decision.

(g) Structures or activities shall not create a navigational hazard.

(h) Structures shall be maintained in a functional condition and shall be repaired or removed if they become dilapidated to such an extent that they are no longer functional. This shall not be construed to prohibit the repair or replacement subject to the provisions of Rule 18-21.005, F.A.C., within one year, of a structure damaged in a discrete event such as a storm, flood, accident, or fire.

(i) Structures or activities shall be constructed, operated, and maintained solely for water dependent purposes, or for non-water dependent activities authorized under paragraph 18-21.004(1)(g), F.A.C., or any other applicable law.

NOTICE OF RIGHTS

As required by Sections 120.569 and 120.60(3), Fla. Stat., the following is notice of the opportunities which may be available for administrative hearing or judicial review when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Not all of the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (SFWMD or District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Fla. Stat. Persons seeking a hearing on a SFWMD decision which affects or may affect their substantial interests shall file a petition for hearing with the Office of the District Clerk of the SFWMD, in accordance with the filing instructions set forth herein, within 21 days of receipt of written notice of the decision, unless one of the following shorter time periods apply: (1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Fla. Stat.; or (2) within 14 days of service of an Administrative Order pursuant to Section 373.119(1), Fla. Stat. "Receipt of written notice of agency decision" means receipt of written notice through mail, electronic mail, or posting that the SFWMD has or intends to take final agency action, or publication of notice that the SFWMD has or intends to take final agency action. Any person who receives written notice of a SFWMD decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

If the District takes final agency action which materially differs from the noticed intended agency decision, persons who may be substantially affected shall, unless otherwise provided by law, have an additional Rule 28-106.111, Fla. Admin. Code, point of entry.

Any person to whom an emergency order is directed pursuant to Section 373.119(2), Fla. Stat., shall comply therewith immediately, but on petition to the board shall be afforded a hearing as soon as possible.

A person may file a request for an extension of time for filing a petition. The SFWMD may, for good cause, grant the request. Requests for extension of time must be filed with the SFWMD prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and that the SFWMD and any other parties agree to or oppose the extension. A timely request for an extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

FILING INSTRUCTIONS

A petition for administrative hearing must be filed with the Office of the District Clerk of the SFWMD. Filings with the Office of the District Clerk may be made by mail, hand-delivery, or e-mail. Filings by facsimile will not be accepted. A petition for administrative hearing or other document is deemed filed upon receipt during normal business hours by the Office of the District Clerk at SFWMD headquarters in West Palm Beach, Florida. The District's normal business hours are 8:00 a.m. – 5:00 p.m., excluding weekends and District holidays. Any document received by the Office of the District Clerk after 5:00 p.m. shall be deemed filed as of 8:00 a.m. on the next regular business day. Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the District Clerk, 3301 Gun Club Road, West Palm Beach, Florida 33406.

- Filings by hand-delivery must be delivered to the Office of the District Clerk. Delivery of a petition to the SFWMD's security desk does not constitute filing. It will be necessary to request that the SFWMD's security officer contact the Office of the District Clerk. An employee of the SFWMD's Clerk's office will receive and file the petition.
- Filings by e-mail must be transmitted to the Office of the District Clerk at clerk@sfwmd.gov. The filing date for a document transmitted by electronic mail shall be the date the Office of the District Clerk receives the complete document. A party who files a document by e-mail shall (1) represent that the original physically signed document will be retained by that party for the duration of the proceeding and of any subsequent appeal or subsequent proceeding in that cause and that the party shall produce it upon the request of other parties; and (2) be responsible for any delay, disruption, or interruption of the electronic signals and accepts the full risk that the document may not be properly filed.

INITIATION OF AN ADMINISTRATIVE HEARING

Pursuant to Sections 120.54(5)(b)4. and 120.569(2)(c), Fla. Stat., and Rules 28-106.201 and 28-106.301, Fla. Admin. Code, initiation of an administrative hearing shall be made by written petition to the SFWMD in legible form and on 8 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, SFWMD file number or any other SFWMD identification number, if known.
2. The name, address, any email address, any facsimile number, and telephone number of the petitioner and petitioner's representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the SFWMD's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the SFWMD's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the SFWMD's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the SFWMD to take with respect to the SFWMD's proposed action.

MEDIATION

The procedures for pursuing mediation are set forth in Section 120.573, Fla. Stat., and Rules 28-106.111 and 28-106.401–.405, Fla. Admin. Code. The SFWMD is not proposing mediation for this agency action under Section 120.573, Fla. Stat., at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Section 120.68, Fla. Stat., and in accordance with Florida Rule of Appellate Procedure 9.110, a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal with the Office of the District Clerk of the SFWMD in accordance with the filing instructions set forth herein within 30 days of rendition of the order to be reviewed, and by filing a copy of the notice with the clerk of the appropriate district court of appeal.

Last Date For Agency Action: September 23, 2017

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: I-95 Express Lanes Phase 3c

Permit No.: 06-01465-S

Application No.: 170525-8

Application Type: Environmental Resource (Conceptual Approval Modification)

Location: Broward County, S8,9,16,17,19,20,21,28,29,33/T50S/R42E
S4,8,9,16,17/T51S/R42E

Permittee : Florida Department Of Transportation

Operating Entity : Florida Department Of Transportation

Project Area: 15.70 acres

Permit Area: 416.76 acres

Project Land Use: Roadway

Drainage Basin: NORTH NEW RIVER
Drainage Basin: C-10
Drainage Basin: C-12

Receiving Body: See Exhibit 2 - Table 5

Special Drainage District: NA

Total Acres Wetland Onsite: 6.66
Total Acres Impacted Onsite : 6.66
Conservation Easement To District : No
Sovereign Submerged Lands: Yes **Type:** Letter Of Consent

PROJECT SUMMARY:

This Environmental Resource Permit Modification authorizes the conceptual approval of a stormwater management system serving an 8.6 mile highway widening project known as I-95 Express Lanes Phase 3C.

This project is for the widening of I-95 from south of Stirling Road to Broward Boulevard in Broward County for the purpose of converting the existing High Occupancy Vehicle (HOV) lanes to Express Toll Lanes and to provide an additional Express Toll Lane in each direction. A total of 15.47 acres of new impervious area is proposed. Additionally, a stretch of I-595 will be widened to accomodate the required auxiliary lanes that connect the I-95 and I-595 Express Lane systems (see Exhibit Nos. 1, 3 & 4).

The project extends through the C-10, North New River and C-12 Basins and through the Cities of Hollywood, Dania Beach and Fort Lauderdale.

The stormwater management system will consist of catch basins, storm sewer pipes, existing infield wet & dry ponds, expansion of existing roadside dry ponds (swales) and the construction of new dry detention ponds discharging to various canals (see Exhibit No. 2 - Table 5).

Issuance of this permit constitutes certification of compliance with state water quality standards in accordance with Rule 62-330.062 Florida Administrative Code (F.A.C.).

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

Refer to Exhibit 1 for a Location Map and Exhibit No. 3 for Drainage Basin Maps.

The site is an existing stretch of Interstate-95 from south of Stirling Road to Broward Boulevard in Broward County, Florida.

For information on the wetlands and surface waters within the project, please refer to the Wetlands and Surface Waters section of this staff report.

LAND USE:

See Exhibit No. 2 - Table 3

WATER QUANTITY :

Discharge Rate :

The engineer-of-record has submitted an analysis which demonstrates that the post-development peak discharge rate for the 25-year 3-day design storm event will not exceed the existing condition (see Exhibit No. 2 - Table 5).

WATER QUALITY :

The project provides the required water quality treatment volume based on one inch over the basin area (see Exhibit No. 2 - Table 4).

In addition to the required water quality treatment volume, the applicant provided site specific pollutant loading calculations to demonstrate that the storm water management system reduces the post development loading of pollutants (specifically nutrients) to levels less than the loadings generated under the pre-development condition. The pollutant loading calculations are based upon the removal characteristics associated with the system.

The project also includes implementation of an Erosion Control Plan (Exhibit No. 4) as additional reasonable assurance of compliance with water quality criteria during construction and operation.

WETLANDS:

Wetlands And Other Surface Waters:

The project area contains wetlands and surface waters totaling 19.20 acres. Please see Exhibit No. 5.0 for wetland locations. The wetlands along the I-95 corridor consist of degraded mangrove fringes, dominated by exotic species, and are located within the Dania Cut-Off Canal, the C-10 and C-10 Spur Canals, and the South Fork of the New River Canal. There are three different types of wetlands along the I-595 corridor and these include white mangrove dominated wetlands, mudflats and forested wetlands with a mix of freshwater species and white and red mangroves. Additional wetland descriptions are located in the July 2017 environmental considerations report in the epermitting file.

The project will result in permanent impacts to 6.66 acres of wetlands and 1.05 acres of other surface

waters as described in the table below, and temporary impacts to 2.42 acres of wetlands. Exhibit No. 5.1 identifies the locations of wetlands and surface waters that will be impacted. Due to the limited space within the right-of-way, staff determined that additional reduction and elimination of direct impacts was not practicable.

Secondary impacts to mangrove wetlands within the C-10 Spur Canal and Dania Cut-Off Canal were assessed within 25 feet from the edge of the proposed bridge widening for a total of 0.04 acre. No secondary impacts in the C-10 Canal and South Fork of the New River canal are anticipated.

A series of stormwater ponds will be constructed below the I-595 bridge which will separate the north portion of the forested wetland area from the south portion. However, no secondary impacts are anticipated. The hydrology will be maintained, via the continuation of freshwater discharge from an adjacent ditch, the tidal influence from the South Fork of the New River Canal and equalizer pipes located in each pond. In addition, the water quality of the discharge into the wetland area will be significantly improved as it is currently discharged with no treatment. Finally, the ponds will still provide access to wildlife and will continue to provide a source of foraging for wading birds.

Mitigation Plan:

Wetland Impacts:

To mitigate for the wetland impacts within the canals along the I-95 corridor, the applicant will use mitigation functional units generated from the West Lake Park Mitigation Project and the wetland impacts along the I-595 bridge will be offset with the use of functional units from the Pond Apple Slough Mitigaton Area. Applications No. 170725-13 and 170725-15 are being issued concurrently to authorize the modification of Permits No. 06-05891-P and 06-07122-P to deduct 0.025 and 1.84 functional units, respectively, proposed as wetland mitigation. The amount of mitigation was determined by using the Uniform Mitigation Assessment Method in Chapter 62-345, F.A.C. The final scores can be found in the permit file.

The proposed mitigation is located within the same basin as the impacts; therefore, pursuant to Section 10.2.8 of Volume I, the project will not result in unacceptable cumulative impacts to the New River Basin.

Other Surface Waters Impacts:

The benthic surveys conducted by the applicant indicate that some discontinuous, patchy oyster beds were observed in the South Fork of the New River Canal, under the east bound lane of the I-595 bridge as well as south of the bridge and in the C-10 and C-10 Spur Canals. A majority of the observed oyster patches consisted of remnant shells and the total acreage of fill in the South Fork of the New River Canal is 0.06 acre and less than 0.01 acre in the C-10 and C-10 Spur Canals. No other benthic resources were observed within the overall project's proposed area of work in other surface waters. Therefore, mitigation is not required for work in other surface waters associated with this project. The benthic surveys can be found in the permit file.

Temporary Wetland Impacts:

The project includes temporary impacts to 2.10 acres of forested wetlands and 0.32 acre of mudflats along the I-595 bridge. Temporary access roads will be constructed for the duration of the project and will be removed upon completion. The wetland areas will be restored to their original condition as described in the restoration plan shown in Exhibit No. 5.2. An additional 0.79 acre of forested wetland areas will be impacted by the temporary road construction and then restored. However, these areas will be shaded after the bridge widening and mitigation units from the Pond Apple Slough Mitigation Area will be used to offset the shading impacts.

Monitoring/Maintenance:

Since 2.10 acres of forested wetland areas will be restored upon completion of the project, monitoring will be conducted by the permittee for five years or until District staff determines that restoration success has been achieved. The 0.32 acre of restored mudflats will not require monitoring as no vegetation will be planted. Exhibit No. 5.2 describes the monitoring methodology, locations, and maintenance activities. Monitoring will include vegetative cover, hydrologic conditions and success of the restoration, as well as wildlife usage and recommendations for maintenance work. Success criteria are found in the special conditions and Exhibit No. 5.2. A work schedule for monitoring shall be submitted at the time of the application for construction and annual reports shall be submitted to the District in accordance with that work schedule. After success is achieved, maintenance will be conducted in perpetuity by the permittee.

Wetland Inventory:

The temporary impacts to 2.10 acres of forested wetland areas and 0.32 acre of non-vegetated wetland areas are not shown in the table below since they will be restored directly following the completion of the bridge construction activities.

Wetland Inventory :

CONSTRUCTION NEW -I-95 Express Lanes Phase 3C

Site Id	Site Type	Pre-Development				Post-Development						
		Pre Flucs	AA Type	Acreage (Acres)	Current Wo Pres	With Project	Time Lag (Yrs)	Risk Factor	Pres. Adj. Factor	Post Fluccs	Adj Delta	Functional Gain / Loss
A	ON	612	Direct	3.11							.000	.000
B	ON	650	Direct	2.76							.000	.000
C	ON	630	Direct	.79							.000	.000
D	ON	510	Direct	1.05							.000	.000
			Total:	7.71								.00

Fluccs Code	Description
510	Streams And Waterways
612	Mangrove Swamps
630	Wetland Forested Mixed
650	Non-Vegetated

Fish And Wildlife Issues:

The wetlands or surface waters to be impacted provide habitat for wetland-dependent species including the West Indian manatee (Trichechus manatus). Correspondence from the Florida Fish and Wildlife Conservation Commission recommends that the permittee follow the Standard Manatee Construction Conditions for In-Water Work, as well as provide manatee exclusion devices on any existing or proposed pipes or culverts greater than 8 inches but less than 8 feet in diameter that are submerged or partially submerged and reasonably accessible to manatees. Additionally, no pile driving work shall be performed between November 15 and March 31 in the FPL Cooling Pond Canal and an observer will be required during pile-driving activities for concrete piles 12 inches in diameter or larger. An observer will also be

required while using barges on the C-10 Canal and Dania Cut-Off Canal bridge crossings, and during in-water activities associated with the South Fork of the New River Canal Bridge crossing. Special conditions are included to address these recommendations.

This permit does not relieve the applicant from complying with all applicable rules and any other agencies' requirements if, in the future, endangered/threatened species or species of special concern are discovered on the site.

SOVEREIGNTY SUBMERGED LANDS:

The existing bridge is located on sovereignty submerged lands- lands owned by the State of Florida and Easement No. 26451(3335-06) was granted to the applicant by the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida on January 26, 2014.

The project also requires the temporary use of sovereignty submerged lands adjacent to the existing easement to provide additional space for waterborne access and staging of equipment and materials during the bridge construction. Therefore, it also requires authorization from the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), pursuant to Article X, Section 11 of the Florida Constitution, and Section 253.77, F.S. For this project, the District is delegated the authority to review and take final action on behalf of the Board of Trustees, pursuant to Rule 18-21.0051(2), F.A.C.

The District has determined that the activity qualifies for a Letter of Consent, as long as the work performed is located within the boundaries as described and is consistent with the conditions herein. The sketch depicting the location of the temporary area is included as Exhibit No. 6.0.

RELATED CONCERNS:

Water Use Permit Status:

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

CERP:

The proposed project is not located within or adjacent to a Comprehensive Everglades Restoration Project component.

Right-Of-Way Permit Status:

District Right-of-Way Permit Application No. 17-0526-2M is under review for the Dania Cut-Off Canal I-95 crossing. Right-of-Way Permits will also be required for the I-95 crossing over the C-10 and C-10 Spur Canals and the applicant is in the process of submitting the applications. The Right-of-Way permits will be required before the modification for the construction phase of this project is issued.

Historical/Archeological Resources:

The District has received correspondence from the Florida Department of State, Division of Historical Resources indicating that no significant archaeological or historical resources are recorded in the project area and the project is therefore unlikely to have an effect upon any such properties.

This permit does not release the permittee from compliance with any other agencies' requirements in the event that historical and/or archaeological resources are found on the site.

DEO/CZM Consistency Review:

The issuance of this permit constitutes a finding of consistency with the Florida Coastal Management Program.

Third Party Interest:

No third party has contacted the District with concerns about this application.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF REVIEW:

DIVISION APPROVAL:

NATURAL RESOURCE MANAGEMENT:

Barbara J. Conmy

DATE: 02 Aug 2017

SURFACE WATER MANAGEMENT:



Carlos A. de Rojas, P.E.

DATE: 02-Aug-2017

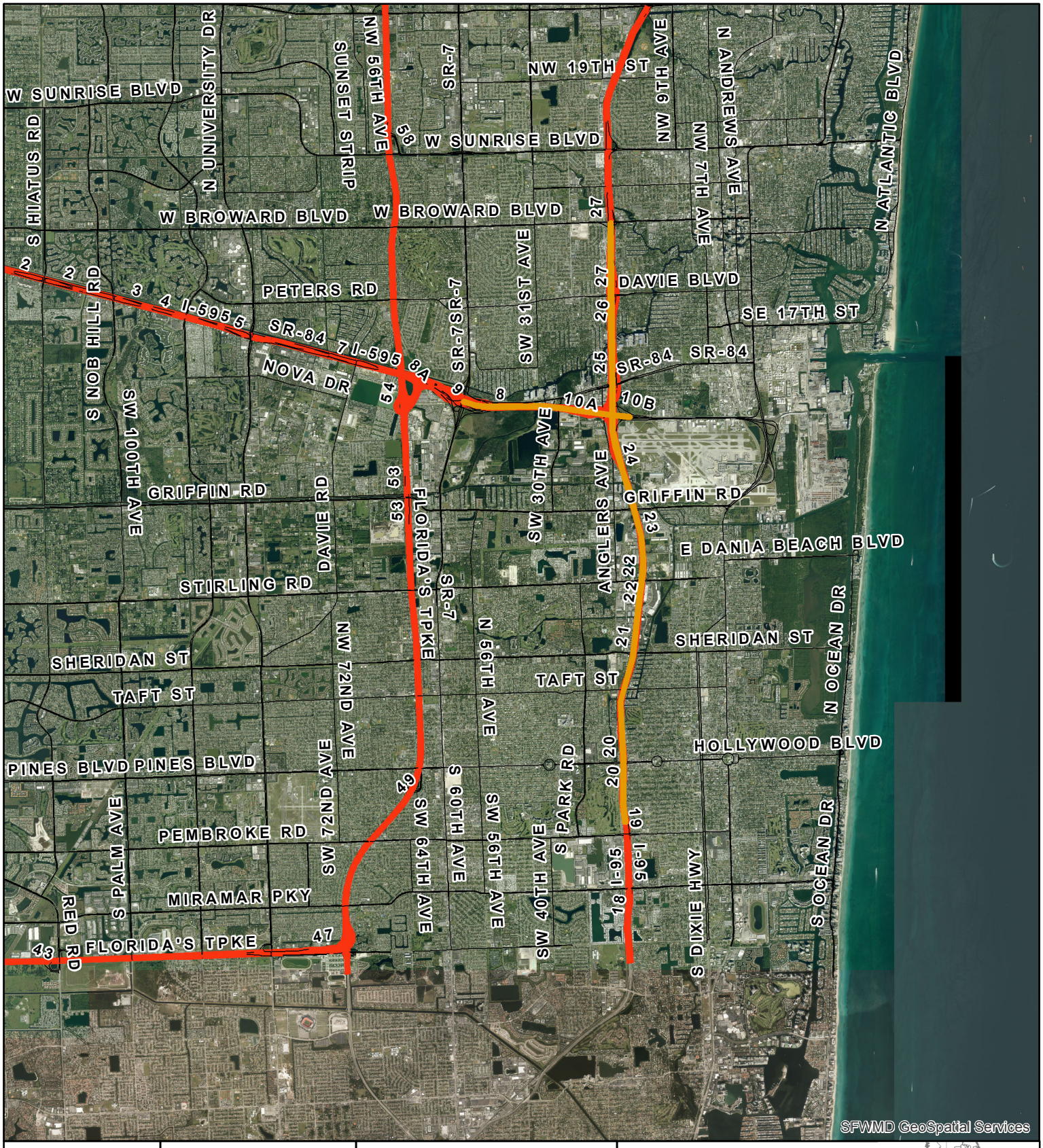

Exhibit No: 1	Exhibit Created On: 2017-06-06	BROWARD COUNTY, FL

REGULATION DIVISION

Project Name: I-95 EXPRESS LANES PHASE 3C

sfwmd.gov

0 1.5 3 Miles

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Application

Permit No: 06-01465-S

Application Number: 170525-8

Created by IT GEOSPATIAL SERVICES

South Florida Water Management District

South Florida Water Management District
Individual Environmental Resource Permit No. 06-105283-P
Date Issued: August 19, 2021

Permittee: Florida Department of Transportation
District 4
3400 W Commercial Blvd
Fort Lauderdale, FL 33309

Project: I-95 Express Lanes Phase 3C (Segment 1A)

Application No. 210423-5999

Location: Broward County, See Exhibit 1

Your application for an Individual Environmental Resource Permit is approved. This action is taken based on Chapter 373, Part IV, of Florida Statutes (F.S.) and the rules in Chapter 62-330, Florida Administrative Code (F.A.C.). Unless otherwise stated, this permit constitutes certification of compliance with state water quality standards under section 401 of the Clean Water Act, 33 U.S.C. 1341, and a finding of consistency with the Florida Coastal Management Program. Please read this entire agency action thoroughly and understand its contents.

This permit is subject to:

- Not receiving a filed request for a Chapter 120, F.S., administrative hearing.
- The attached General Conditions for Environmental Resource Permits.
- The attached Special Conditions.
- All referenced Exhibits.

All documents are available online through the District's ePermitting site at www.sfwmd.gov/ePermitting.

If you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights", we will assume that you concur with the District's action.

The District does not publish notices of action. If you wish to limit the time within which a person may request an administrative hearing regarding this action, you are encouraged to publish, at your own expense, a notice of agency action in the legal advertisement section of a newspaper of general circulation in the county or counties where the activity will occur. Legal requirements and instructions for publishing a notice of agency action, as well as a noticing format that can be used, are available upon request. If you publish a notice of agency action, please send a copy of the affidavit of publication provided by the newspaper to the District's West Palm Beach office for retention in this file.

If you have any questions regarding your permit or need any other information, please call us at 1-800-432-2045 or email epermits@sfwmd.gov.

Gary R. Priest, P.E.
Engineering Section Administrator, Environmental Resource Bureau

South Florida Water Management District
Individual Environmental Resource Permit No. 06-105283-P

Date Issued: August 19, 2021	**Expiration Date:** August 19, 2026
Project Name:	I-95 Express Lanes Phase 3C (Segment 1A)
Permittee:	Florida Department of Transportation District 4 3400 W Commercial Blvd Fort Lauderdale, FL 33309
Operating Entity:	Florida Department of Transportation District 4 3400 W Commercial Blvd Fort Lauderdale, FL 33309
Location:	Broward County
Permit Acres:	124.86 acres
Project Land Use:	Transportation
Special Drainage District:	N/A
Water Body Classification:	CLASS III
FDEP Water Body ID:	3277A
Wetland and Surface Water Impacts:	0.05 acres
Conservation Easement to District:	No
Sovereign Submerged Lands:	No

Project Summary
This Environmental Resource Permit authorizes Construction and Operation of a stormwater management (SWM) system serving 124.86 acres of transportation improvements known as I-95 Express Lanes Phase 3C (Segment 1A). The proposed project consists of roadway widening and improvements with exfiltration and roadside swale expansion. Refer to Exhibit Nos. 2.0 and 2.1 for SWM plans and calculations, respectively.

Issuance of this permit constitutes certification of compliance with state water quality standards in accordance with Rule 62-330.062, F.A.C..

Site Description
The project site consists of Segment 1A in Phase 3C of the I-95 Express Lane Expansion project. Segment 1A extends from south of the SFWMD C-10 Spur Canal to the project beginning station (STA 300+00.00), in Broward County. Refer to Exhibit No. 1.0 for a location map.

For information on wetland and surface water impacts, please see the Wetlands and Other Surface Water section of this permit.

Background
Conceptual Permit No. 06-01465-S, Application No. 170525-8 was issued on August 2, 2017 which included widening of I-95 from south of Stirling Road to Broward Blvd. in Broward County for the purpose of converting the existing High Occupancy Vehicle (HOV) lanes to Express Toll Lanes.

Ownership, Operation and Maintenance
Perpetual operation and maintenance of the SWM system is the responsibility of Florida Department of Transportation. Upon conveyance or division of ownership or control of the property or the system, the permittee must notify the Agency in writing within 30 days, and the new owner must request transfer of the permit.

Engineering Evaluation:

Land Use
Refer to the Engineering Evaluation Table for the project's land use breakdown.

Water Quality
Water quality treatment is provided in an exfiltration system (System 6) and expanded dry detention swales (Systems 7 through 10). The project provides 18.43 acre-feet of required water quality treatment volume based on 2.5 inches over the controlled basin areas. The stormwater management system complies with Section 4.2.1 of the Environmental Resource Permit Applicant’s Handbook Volume II.

The project includes implementation of an Erosion Control Plan as additional reasonable assurance of compliance with water quality criteria during construction and operation.

Discharge
The project discharge has been reduced based on a pre-vs-post analysis for System 6 and within the allowable limit for systems 7 through 10. All discharge is via existing authorized structures with outfall to the C-10 Canal.

Road Design
As found in the Water Quantity Data Table, minimum road center line elevations have been set at or above the calculated design storm flood elevation.

Perimeter Berm
As found in the Water Quantity Data Table, minimum perimeter elevations have been set at or above the calculated design storm flood elevation.

Flood Plain
The permittee submitted calculations demonstrating that the proposed project is consistent with cut and fill requirements included in Conceptual ERP 06-01465-S.

Certification, Operation, and Maintenance
Pursuant to Chapter 62-330.310, F.A.C., Individual Permits will not be converted from the construction phase to the operation phase until construction completion certification of the project is submitted to and accepted by the District. This includes compliance with all permit conditions, except for any long term maintenance and monitoring requirements. It is suggested that the permittee retain the services of an appropriate professional registered in the State of Florida for periodic observation of construction of the project.

For projects permitted with an operating entity that is different from the permittee, it should be noted that until the construction completion certification is accepted by the District and the permit is transferred to an acceptable operating entity pursuant to Sections 12.1-12.3 of the Applicant's Handbook Volume I and Section 62-330.310, F.A.C., the permittee is liable for operation and maintenance in compliance with the terms and conditions of this permit.

In accordance with Section 373.416(2), F.S., unless revoked or abandoned, all SWM systems and works permitted under Part IV of Chapter 373, F.S., must be operated and maintained in perpetuity.

The efficiency of SWM systems, dams, impoundments, and most other project components will decrease over time without periodic maintenance. The operation and maintenance entity must perform periodic inspections to identify if there are any deficiencies in structural integrity, degradation due to insufficient maintenance, or improper operation of projects that may endanger public health, safety, or welfare, or the water resources. If deficiencies are found, the operation and maintenance entity is responsible for correcting the deficiencies in a timely manner to prevent compromises to flood protection and water quality. See Section 12.4 of the Applicant's Handbook Volume I for Minimum Operation and Maintenance Standards.

Engineering Evaluation Tables:

Land Use

Basin	Land Type	Area (ac)	% of Total Basin
System 6	Impervious	45.71	73.89
	Pervious	16.15	26.11
	Total:	61.86	100%
System 7 - 10	Impervious	48.63	77.19
	Pervious	14.37	22.81
	Total:	63.00	100%

Water Quality

Basin	Treatment Type	Treatment System	Volume Required (ac-ft)	Volume Provided (ac-ft)	Length Required (ft)	Length Provided (ft)	Area (ac)	Overflow Elevation (ft NAVD88)
System 6	Treatment	DRY DETENTION AND EXFILTRATION	14.62	14.62	1590.00	1590.00	16.15	2.50
Systems 7 - 10	Treatment	DRY DETENTION	3.81	3.81	N/A	N/A	14.37	2.50

Water Quantity

Basin	Elevation Type	Storm Event (Yr/Day)	Precipitation Depth (in)	Peak Stage (ft NAVD88)	Min. EL (ft NAVD88)	Peak Discharge Rate (cfs)	Allowable Discharge Rate (cfs)
System 6	Perimeter Berm/ Discharge	25YR3D	14.50	6.10	6.12	8.31	8.60
	Road Crown	10YR1D	8.50	6.10	7.87	N/A	N/A
Systems 7 - 10	Perimeter Berm/ Discharge	25YR3D	14.50	3.32	4.00	48.90	49.41
	Road Crown	10YR1D	8.50	3.32	6.15	N/A	N/A

Environmental Evaluation:

Wetlands and Other Surface Waters
The project site contains 0.73 acre of mangrove wetlands within the C-10 Spur Canal and C-10 Canal, and 1.16 of other surface waters. This phase of construction will result in 0.03 acre of wetland impacts due to shading, and 0.02 acre of work over other surface waters, as described in the Environmental Data Tables. Exhibit 3.0 identifies the locations of the wetlands and other surface waters being impacted.

Wetland and other surface waters impacts were addressed in the conceptual approval under Application No. 170525-8. To mitigate for the mangrove impacts, the applicant used mitigation functional units generated from the West Lake Park Mitigation Project. Application No. 170725-13 was issued concurrently with the conceptual approval to authorize the modification of Permit No. 06-05891-P to deduct the necessary functional units proposed as wetland mitigation.

Fish, Wildlife, and Listed Species
The wetlands or surface waters to be impacted provide habitat for wetland-dependent species including the West Indian manatee (Trichechus manatus). Correspondence from the Florida Fish and Wildlife Conservation Commission, received with the conceptual authorization under Application No. 170525-8, recommends that the permittee follow the Standard Manatee Construction Conditions for In-Water Work, as well as provide manatee exclusion devices on any existing or proposed pipes or culverts greater than 8 inches but less than 8 feet in diameter that are submerged or partially submerged and reasonably accessible to manatees. Special conditions are included to address these recommendations.

This permit does not relieve the applicant from complying with all applicable rules and any other agencies' requirements if, in the future, endangered/threatened species or species of special concern are discovered on the site.

Environmental Evaluation Tables:
Summary

Wetlands and Other Surface Waters:	0.05	acres
Direct Impacts:	0.05	acres
Secondary impacts:	0	acres
Net UMAM Functional Loss/ Gain:	0	units
Total Onsite Mitigation Area:	0	acres
Total Offsite Mitigation Area:	0	acres
Mitigation Provided in Permit No.:	06-05891-P	

Phase 3C - Segment 1A

Activities in Wetlands or Other Surface Waters, Not Including Mitigation at a Bank

ID	Acres	Action	Community Description	Current Score	With Project Score	UMAM Loss
1O	0.01	Works in Surface Waters	Ditches and Canals			0.000
3O	0.01	Works in Surface Waters	Ditches and Canals			0.000
9M	0.01	Direct Impact	Mangrove Fringe			0.000
10M	0.01	Direct Impact	Mangrove Fringe			0.000
8M	0.01	Direct Impact	Mangrove Fringe			0.000
Total:	**0.05**					**0.000**

Related Concerns:

Water Use Permit Status
The applicant has indicated that irrigation is not required for this project.

The applicant has indicated that dewatering is anticipated for portions of the project. A dewatering permit will be required prior to proceeding with the work within the portions of the project that will require dewatering, in accordance with the Special Conditions.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

Historical/ Archeological Resources
The District has received correspondence from the Florida Department of State, Division of Historical Resources indicating that no significant archaeological or historical resources are recorded in the project area and the project is therefore unlikely to have an effect upon any such properties.

This permit does not release the permittee from complying with any other agencies requirements in the event that historical and/or archaeological resources are found on the site.

General Conditions for Individual Environmental Resource Permits, 62-330.350, F.A.C.

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation, June 2007), and the Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice," (October 1, 2013), (http://www.flrules.org/Gateway/reference.asp?No=Ref-02505), incorporated by reference herein, indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C., and shall be submitted electronically or by mail to the Agency. However, for activities involving more than one acre of construction that also require a NPDES stormwater construction general permit, submittal of the Notice of Intent to Use Generic Permit for Stormwater Discharge from Large and Small Construction Activities, DEP Form 62-621.300(4)(b), shall also serve as notice of commencement of construction under this chapter and, in such a case, submittal of Form 62-330.350(1) is not required.

5. Unless the permit is transferred under rule 62-330.340, F.A.C., or transferred to an operating entity under rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms, and conditions of the permit for the life of the project or activity.

6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
   a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex- "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit"[Form 62-330.310(3)]; or
   b. For all other activities- "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
   c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

7. If the final operation and maintenance entity is a third party:
   a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as-built certification, whichever comes first, the permittee shall submit, as

applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.4 of Volume I) as filed with the Florida Department of State, Division of Corporations, and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
b. Within 30 days of submittal of the as-built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation and Maintenance Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

9. This permit does not:
   a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
   b. Convey to the permittee or create in the permittee any interest in real property;
   c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
   d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the Agency in writing:
    a. Immediately if any previously submitted information is discovered to be inaccurate; and
    b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, stone tools, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section (DHR), at (850)245-6333, as well as the appropriate permitting agency office. Project activities shall not resume without verbal or written authorization from

the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and the proper authorities notified in accordance with section 872.05, F.S. For project activities subject to prior consultation with the DHR and as an alternative to the above requirements, the permittee may follow procedures for unanticipated discoveries as set forth within a cultural resources assessment survey determined complete and sufficient by DHR and included as a specific permit condition herein.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

Special Conditions for Individual Environmental Resource Permits, 62-330.350, F.A.C.

1. The construction authorization for this permit shall expire on the date shown on page 2.

2. Operation and maintenance of the stormwater management system shall be the responsibility of the Florida Department of Transportation District 4. The permittee shall notify the Agency in writing within 30 days of any conveyance or division of ownership or control of the property of the system, and the new owner must request transfer of the permit in accordance with Rule 62-330.340, F.A.C.

3. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

4. Prior to any future construction, the permittee shall apply for and receive an Individual ERP. As part of the permit application, the applicant for that phase shall provide documentation verifying that the proposed construction is consistent with the design of the master stormwater management system, including the land use and site grading assumptions.

5. Prior to initiating construction activities associated with this Environmental Resource Permit (ERP), the permittee is required to hold a pre-construction meeting with field representatives, consultants, contractors, District Environmental Resource Bureau (ERB) staff, and any other local government entities as necessary. The purpose of the pre-construction meeting is to discuss construction methods, sequencing, best management practices, identify work areas, staking and roping of preserves where applicable, and to facilitate coordination and assistance amongst relevant parties. To schedule a pre-construction meeting, please contact ERB staff from the West Palm Beach Office at (561) 686-8800 or via e-mail at: pre-con@sfwmd.gov. When sending a request for a pre-construction meeting, please include the application number, permit number, and contact name and phone number.

6. This permit does not authorize the permittee to cause any adverse impact to or “take” of state listed species and other regulated species of fish and wildlife. Compliance with state laws regulating the take of fish and wildlife is the responsibility of the owner or applicant associated with this project. Please refer to Chapter 68A-27 of the Florida Administrative Code for definitions of “take” and a list of fish and wildlife species. If listed species are observed onsite, FWC staff are available to provide decision support information or assist in obtaining the appropriate FWC permits. Most marine endangered and threatened species are statutorily protected and a “take” permit cannot be issued. Requests for further information or review can be sent to: FWCConservationPlanningServices@MyFWC.com.

7. Prior to commencement of construction, a Consumptive Use permit for dewatering shall be obtained or demonstration that the work qualifies for the permit by rule under Rule 40E-2.061, F.A.C. shall be provided.

8. STANDARD MANATEE CONDITIONS FOR IN-WATER WORK (2011)
   The permittee shall comply with the following conditions intended to protect manatees from direct project effects:
   a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The

permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads Caution: Boaters must be posted. A second sign measuring at least 8" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to the email address listed above.

9. Manatee exclusion devices (such as grating or valves) shall be installed and maintained over any existing or proposed pipes or culverts greater than 8 inches, but smaller than 8 feet in diameter that are submerged or partially submerged and reasonably accessible to manatees. If horizontal or vertical bars are used, no more than 8 inch gaps on center shall be allowed. Grates or valves shall be in place at the accessible end(s) during all phases of the construction process and as a final design element to restrict manatee access.

Project Work Schedule for Permit No. 06-105283-P

The following activities are requirements of this Permit and shall be completed in accordance with the Project Work Schedule below. Please refer to General Conditions, Special Conditions and/or Specific Conditions for more information. Any deviation from these time frames will require prior approval from the District's Environmental Resources Bureau and may require a minor modification to this permit. Such requests must be made in writing and shall include: (1) reason for the change, (2) proposed start/finish and/or completion dates, and (3) progress report on the status of the project.

Condition No.	Date Added	Description (Application Number)	Due Date	Date Satisfied
GC 4	08/19/2021	Construction Commencement Notice	Prior to Construction	
GC 6	08/19/2021	Submit Certification	30 Days After Construction Completion	
GC 7	08/19/2021	Submit Operation Transfer Request	Within 30 days of Certification	
SC 5	08/19/2021	Pre-Construction Meeting	Prior to Construction	
SC 7	08/19/2021	Obtain a Water Use Permit for Dewatering	Prior to Construction	

GC = General Condition

SC = Special Condition

Distribution List

Brian Voelker, E Sciences, Inc

Audubon of Florida

City of Pembroke Pines

Div of Recreation and Park - District 5

US Army Corps of Engineers - Permit Section

Broward County

City Of Fort Lauderdale

Exhibits

The following exhibits to this permit are incorporated by reference. The exhibits can be viewed by clicking on the links below or by visiting the District's ePermitting website at http://my.sfwmd.gov/ePermitting and searching under this application number 210423-5999 .

Exhibit No. 1.0 Location Map

Exhibit No. 2.0 SWM Plans

Exhibit No. 2.1 Calculations

Exhibit No. 3.0 Wetland and OSW Map

NOTICE OF RIGHTS

As required by Chapter 120, Florida Statutes, the following provides notice of the opportunities which may be available for administrative hearing pursuant to Sections 120.569 and 120.57, Florida Statutes, or judicial review pursuant to Section 120.68, Florida Statutes, when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Some of the legal proceedings detailed below may not be applicable or appropriate for your situation. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Florida Statutes. Persons seeking a hearing on a District decision which affects or may affect their substantial interests shall file a petition for hearing in accordance with the filing instructions set forth herein within 21 days of receipt of written notice of the decision unless one of the following shorter time periods apply: (1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Florida Statutes; or (2) within 14 days of service of an Administrative Order pursuant to Section 373.119(1), Florida Statutes. "Receipt of written notice of agency decision" means receipt of written notice through mail, electronic mail, posting, or publication that the District has taken or intends to take final agency action. Any person who receives written notice of a District decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

If the District takes final agency action that materially differs from the noticed intended agency decision, persons who may be substantially affected shall, unless otherwise provided by law, have an additional point of entry pursuant to Rule 28-106.111, Florida Administrative Code.

Any person to whom an emergency order is directed pursuant to Section 373.119(2), Florida Statutes, shall comply therewith immediately, but on petition to the board shall be afforded a hearing as soon as possible.

A person may file a request for an extension of time for filing a petition. The District may grant the request for good cause. Requests for extension of time must be filed with the District prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and whether the District and any other parties agree to or oppose the extension. A timely request for an extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

FILING INSTRUCTIONS

A petition for administrative hearing must be filed with the Office of the District Clerk. Filings with the Office of the District Clerk may be made by mail, hand-delivery, or e-mail. Filings by facsimile will not be accepted. A petition for administrative hearing or other document is deemed filed upon receipt during normal business hours by the Office of the District Clerk at the District's headquarters in West Palm Beach, Florida. The District's normal business hours are 8:00 a.m. – 5:00 p.m., excluding weekends and District holidays. Any document received by the Office of the District Clerk after 5:00 p.m. shall be deemed filed as of 8:00 a.m. on the next regular business day.

Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the District Clerk, 3301 Gun Club Road, West Palm Beach, Florida 33406.
- Filings by hand-delivery must be delivered to the Office of the District Clerk. Delivery of a petition to the District's security desk does not constitute filing. It will be necessary to request that the District's security officer contact the Office of the District Clerk. An employee of the District's Clerk's office will receive and process the petition.
- Filings by e-mail must be transmitted to the Office of the District Clerk at clerk@sfwmd.gov. The filing date for a document transmitted by electronic mail shall be the date the Office of the District Clerk receives the complete document.

INITIATION OF ADMINISTRATIVE HEARING

Pursuant to Sections 120.54(5)(b)4. and 120.569(2)(c), Florida Statutes, and Rules 28-106.201 and 28-106.301, Florida Administrative Code, initiation of an administrative hearing shall be made by written petition to the District in legible form and on 8 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, District file number or any other District identification number, if known.
2. The name, address, any email address, any facsimile number, and telephone number of the petitioner, petitioner's attorney or qualified representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the District's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the District's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the District's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the District to take with respect to the District's proposed action.

MEDIATION

The procedures for pursuing mediation are set forth in Section 120.573, Florida Statutes, and Rules 28-106.111 and 28-106.401–.405, Florida Administrative Code. The District is not proposing mediation for this agency action under Section 120.573, Florida Statutes, at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Section 120.68, Florida Statutes, and in accordance with Florida Rule of Appellate Procedure 9.110, a party who is adversely affected by final District action may seek judicial review of the District's final decision by filing a notice of appeal with the Office of the District Clerk in accordance with the filing instructions set forth herein within 30 days of rendition of the order to be reviewed, and by filing a copy of the notice with the appropriate district court of appeals via the Florida Courts E-Filing Portal.

South Florida Water Management District
Individual Environmental Resource Permit No. 06-105306-P
Date Issued: July 29, 2021

Permittee: Florida Department Of Transportation District 4
3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

Project: I-95 Express Lanes Phase 3C (Segment 1B)

Application No. 210415-5929

Location: Broward County, See Exhibit 1

Your application for an Individual Environmental Resource Permit is approved. This action is taken based on Chapter 373, Part IV, of Florida Statutes (F.S.) and the rules in Chapter 62-330, Florida Administrative Code (F.A.C.). Unless otherwise stated, this permit constitutes certification of compliance with state water quality standards under section 401 of the Clean Water Act, 33 U.S.C. 1341, and a finding of consistency with the Florida Coastal Management Program. Please read this entire agency action thoroughly and understand its contents.

This permit is subject to:

- Not receiving a filed request for a Chapter 120, F.S., administrative hearing.
- The attached General Conditions for Environmental Resource Permits.
- The attached Special Conditions.
- All referenced Exhibits.

All documents are available online through the District's ePermitting site at www.sfwmd.gov/ePermitting.

If you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights", we will assume that you concur with the District's action.

The District does not publish notices of action. If you wish to limit the time within which a person may request an administrative hearing regarding this action, you are encouraged to publish, at your own expense, a notice of agency action in the legal advertisement section of a newspaper of general circulation in the county or counties where the activity will occur. Legal requirements and instructions for publishing a notice of agency action, as well as a noticing format that can be used, are available upon request. If you publish a notice of agency action, please send a copy of the affidavit of publication provided by the newspaper to the District's West Palm Beach office for retention in this file.

If you have any questions regarding your permit or need any other information, please call us at 1-800-432-2045 or email epermits@sfwmd.gov.

Gary R. Priest, P.E.
Engineering Section Administrator, Environmental Resource Bureau

South Florida Water Management District
Individual Environmental Resource Permit No. 06-105306-P

Date Issued: July 29, 2021	**Expiration Date:** July 29, 2026
Project Name:	I-95 Express Lanes Phase 3C (Segment 1B)
Permittee:	Florida Department Of Transportation District 4 3400 West Commercial Boulevard Fort Lauderdale, FL 33309
Operating Entity:	Florida Department Of Transportation District 4 3400 West Commercial Boulevard Fort Lauderdale, FL 33309
Location:	Broward County
Permit Acres:	58.94 acres
Project Land Use:	Transportation
Special Drainage District:	N/A
Water Body Classification:	CLASS III
FDEP Water Body ID:	3277A
Conservation Easement to District:	No
Sovereign Submerged Lands:	No

Project Summary
This Environmental Resource Permit authorizes Construction and Operation of a stormwater management (SWM) system serving 58.77 acres of transportation improvements known as I-95 Express Lanes Phase 3c (Segment 1b). The project consists of roadway improvements, widening, and roadside swale expansion.

Issuance of this permit constitutes certification of compliance with state water quality standards in accordance with Rule 62-330.062, F.A.C.

Site Description
The site consists of Segment 1B of Phase 3C of the I-95 Express Lane Expansion Project. Segment 1B extends from the C-10 Spur Canal Road to the Dania Cutoff Canal.

Background
Conceptual Permit No. 06-01465-S, Application No. 170525-8 was issued on August 2, 2017 which included widening of I-95 from south of Stirling Road to Broward Blvd. in Broward County for the purpose of converting the existing High Occupancy Vehicle (HOV) lanes to Express Toll Lanes.

For information on wetland and surface water impacts, please see the Wetlands and Other Surface Water section of this permit.

Ownership, Operation and Maintenance
Perpetual operation and maintenance of the SWM system will be the responsibility of the Florida

Department Of Transportation District 4. Upon conveyance or division of ownership or control of the property or the system, the permittee must notify the Agency in writing within 30 days, and the new owner must request transfer of the permit.

Engineering Evaluation:

Land Use
Refer to the Engineering Evaluation Table for the project's land use breakdown.

Water Quality
The project provides 0.65 ac-ft of water quality treatment based on 2.5-inches over 3.55 acres of additional impervious area. The stormwater management system complies with Section 4.2.1 of the Environmental Resource Permit Applicant’s Handbook Volume II.

The project includes implementation of a Turbidity and Erosion Control Plan, (Exhibit No. 2.0.1), as additional reasonable assurance of compliance with water quality criteria during construction and operation.

Discharge
As found in the attached Exhibit No. 2.1, the project discharge is within the allowable limit based on a pre- vs. post-development analysis.

Road Design
As found in Water Quantity Data Table, minimum road center line elevations have been set at or above the calculated design storm flood elevation.

Perimeter Berm
As found in Water Quantity Data Table, minimum perimeter elevations have been set at or above the calculated design storm flood elevation.

Flood Plain
The permittee submitted calculations demonstrating that the proposed project is consistent with cut and fill requirements included in Conceptual ERP 06-01465-S.

Certification, Operation, and Maintenance
Pursuant to Chapter 62-330.310, F.A.C., Individual Permits will not be converted from the construction phase to the operation phase until construction completion certification of the project is submitted to and accepted by the District. This includes compliance with all permit conditions, except for any long term maintenance and monitoring requirements. It is suggested that the permittee retain the services of an appropriate professional registered in the State of Florida for periodic observation of construction of the project.

For projects permitted with an operating entity that is different from the permittee, it should be noted that until the construction completion certification is accepted by the District and the permit is transferred to an acceptable operating entity pursuant to Sections 12.1-12.3 of the Applicant's Handbook Volume I and Section 62-330.310, F.A.C., the permittee is liable for operation and maintenance in compliance with the terms and conditions of this permit.

In accordance with Section 373.416(2), F.S., unless revoked or abandoned, all SWM systems and works permitted under Part IV of Chapter 373, F.S., must be operated and maintained in perpetuity.

The efficiency of SWM systems, dams, impoundments, and most other project components will decrease over time without periodic maintenance. The operation and maintenance entity must perform periodic inspections to identify if there are any deficiencies in structural integrity, degradation due to insufficient maintenance, or improper operation of projects that may endanger public health, safety, or welfare, or the water resources. If deficiencies are found, the operation and maintenance entity is responsible for correcting the deficiencies in a timely manner to prevent

compromises to flood protection and water quality. See Section 12.4 of the Applicant's Handbook Volume I for Minimum Operation and Maintenance Standards.

Engineering Evaluation Tables:
Land Use

Basin	Land Type	Area (ac)	% of Total Basin
Basin 11	Impervious	15.29	80.64
	Pervious	3.60	18.99
	Lake	0.08	0.42
	Total:	18.97	100%
Basin 11 (Off-Site)	Impervious	0.11	64.71
	Pervious	0.06	35.29
	Total:	0.17	100%
Basin 12	Impervious	33.86	85.08
	Pervious	5.94	14.92
	Total:	39.80	100%

Water Quality

Basin	Treatment Type	Treatment System	Volume Required (ac-ft)	Volume Provided (ac-ft)
Basin 11	Treatment	DRY DETENTION	0.04	0.25
Basin 12	Treatment	DRY DETENTION	0.51	0.40

Water Quantity

Basin	Elevation Type	Storm Event (Yr/Day)	Precipitation Depth (in)	Peak Stage (ft NAVD88)	Min. EL (ft NAVD88)
Basin 11	Perimeter Berm/ Discharge	25YR3D	14.50	3.80	5.26
	Road Crown	10YR1D	8.50	3.22	5.26
Basin 12	Perimeter Berm/ Discharge	25YR3D	14.50	4.03	5.00
	Road Crown	10YR1D	8.50	3.11	5.00

Environmental Evaluation:

Wetlands and Other Surface Waters
There are no wetlands or other surface waters located within the project site or affected by this project.

Related Concerns:

Water Use Permit Status
The applicant has indicated that a Water Use permit for landscape irrigation water will not be required for the construction of this project.

The applicant has indicated that dewatering is anticipated for portions of the project. A dewatering permit will be required prior to proceeding with the work within the portions of the project that will require dewatering, in accordance with the Special Conditions.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

Historical/ Archeological Resources
No information has been received that indicates the presence of archaeological or historical resources on the project site or indicating that the project will have any effect upon significant historic properties listed, or eligible for listing in the National Register of Historic Places.

This permit does not release the permittee from complying with any other agencies requirements in the event that historical and/or archaeological resources are found on the site.

General Conditions for Individual Environmental Resource Permits, 62-330.350, F.A.C.

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation, June 2007), and the Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice," (October 1, 2013), (http://www.flrules.org/Gateway/reference.asp?No=Ref-02505), incorporated by reference herein, indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C., and shall be submitted electronically or by mail to the Agency. However, for activities involving more than one acre of construction that also require a NPDES stormwater construction general permit, submittal of the Notice of Intent to Use Generic Permit for Stormwater Discharge from Large and Small Construction Activities, DEP Form 62-621.300(4)(b), shall also serve as notice of commencement of construction under this chapter and, in such a case, submittal of Form 62-330.350(1) is not required.

5. Unless the permit is transferred under rule 62-330.340, F.A.C., or transferred to an operating entity under rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms, and conditions of the permit for the life of the project or activity.

6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
   a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex- "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit"[Form 62-330.310(3)]; or
   b. For all other activities- "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
   c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

7. If the final operation and maintenance entity is a third party:
   a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as-built certification, whichever comes first, the permittee shall submit, as

applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.4 of Volume I) as filed with the Florida Department of State, Division of Corporations, and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
b. Within 30 days of submittal of the as-built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation and Maintenance Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

9. This permit does not:
   a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
   b. Convey to the permittee or create in the permittee any interest in real property;
   c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
   d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the Agency in writing:
    a. Immediately if any previously submitted information is discovered to be inaccurate; and
    b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, stone tools, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section (DHR), at (850)245-6333, as well as the appropriate permitting agency office. Project activities shall not resume without verbal or written authorization from

the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and the proper authorities notified in accordance with section 872.05, F.S. For project activities subject to prior consultation with the DHR and as an alternative to the above requirements, the permittee may follow procedures for unanticipated discoveries as set forth within a cultural resources assessment survey determined complete and sufficient by DHR and included as a specific permit condition herein.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

Special Conditions for Individual Environmental Resource Permits, 62-330.350, F.A.C.

1. The construction authorization for this permit shall expire on the date shown on page 2.

2. Operation and maintenance of the stormwater management system shall be the responsibility of the Florida Department Of Transportation District 4. The permittee shall notify the Agency in writing within 30 days of any conveyance or division of ownership or control of the property of the system, and the new owner must request transfer of the permit in accordance with Rule 62-330.340, F.A.C.

3. Prior to any future construction, the permittee shall apply for and receive an Individual ERP. As part of the permit application, the applicant for that phase shall provide documentation verifying that the proposed construction is consistent with the design of the master stormwater management system, including the land use and site grading assumptions.

4. Prior to initiating construction activities associated with this Environmental Resource Permit (ERP), the permittee is required to hold a pre-construction meeting with field representatives, consultants, contractors, District Environmental Resource Bureau (ERB) staff, and any other local government entities as necessary. The purpose of the pre-construction meeting is to discuss construction methods, sequencing, best management practices, identify work areas, staking and roping of preserves where applicable, and to facilitate coordination and assistance amongst relevant parties. To schedule a pre-construction meeting, please contact ERB staff from the West Palm Beach Office at (561) 686-8800 or via e-mail at: pre-con@sfwmd.gov. When sending a request for a pre-construction meeting, please include the application number, permit number, and contact name and phone number.

5. This permit does not authorize the permittee to cause any adverse impact to or “take” of state listed species and other regulated species of fish and wildlife. Compliance with state laws regulating the take of fish and wildlife is the responsibility of the owner or applicant associated with this project. Please refer to Chapter 68A-27 of the Florida Administrative Code for definitions of “take” and a list of fish and wildlife species. If listed species are observed onsite, FWC staff are available to provide decision support information or assist in obtaining the appropriate FWC permits. Most marine endangered and threatened species are statutorily protected and a “take” permit cannot be issued. Requests for further information or review can be sent to: FWCConservationPlanningServices@MyFWC.com.

6. Prior to commencement of construction, a Consumptive Use permit for dewatering shall be obtained or demonstration that the work qualifies for the permit by rule under Rule 40E-2.061, F.A.C. shall be provided.

Project Work Schedule for Permit No. 06-105306-P

The following activities are requirements of this Permit and shall be completed in accordance with the Project Work Schedule below. Please refer to General Conditions, Special Conditions and/or Specific Conditions for more information. Any deviation from these time frames will require prior approval from the District's Environmental Resources Bureau and may require a minor modification to this permit. Such requests must be made in writing and shall include: (1) reason for the change, (2) proposed start/finish and/or completion dates, and (3) progress report on the status of the project.

Condition No.	Date Added	Description (Application Number)	Due Date	Date Satisfied
GC 4	07/29/2021	Construction Commencement Notice	Prior to Construction	
GC 6	07/29/2021	Submit Certification	30 Days After Construction Completion	
GC 7	07/29/2021	Submit Operation Transfer Request	Within 30 days of Certification	
SC 6	07/29/2021	Obtain a Water Use Permit for Dewatering	Prior to Construction	
SC 7	07/29/2021	Pre-Construction Meeting	Prior to Construction	

GC = General Condition

SC = Special Condition

Distribution List

Brian Voelker, E Sciences, Inc

Audubon of Florida

City of Pembroke Pines

Div of Recreation and Park - District 5

US Army Corps of Engineers - Permit Section

Broward County

City Of Fort Lauderdale

Exhibits

The following exhibits to this permit are incorporated by reference. The exhibits can be viewed by clicking on the links below or by visiting the District's ePermitting website at http://my.sfwmd.gov/ePermitting and searching under this application number 210415-5929 .

Exhibit No. 1.0 Location Map

Exhibit No. 2.0 SWM Plans

Exhibit No. 2.01 SWPPP

Exhibit No. 2.1 Calculations

NOTICE OF RIGHTS

As required by Chapter 120, Florida Statutes, the following provides notice of the opportunities which may be available for administrative hearing pursuant to Sections 120.569 and 120.57, Florida Statutes, or judicial review pursuant to Section 120.68, Florida Statutes, when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Some of the legal proceedings detailed below may not be applicable or appropriate for your situation. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Florida Statutes. Persons seeking a hearing on a District decision which affects or may affect their substantial interests shall file a petition for hearing in accordance with the filing instructions set forth herein within 21 days of receipt of written notice of the decision unless one of the following shorter time periods apply: (1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Florida Statutes; or (2) within 14 days of service of an Administrative Order pursuant to Section 373.119(1), Florida Statutes. "Receipt of written notice of agency decision" means receipt of written notice through mail, electronic mail, posting, or publication that the District has taken or intends to take final agency action. Any person who receives written notice of a District decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

If the District takes final agency action that materially differs from the noticed intended agency decision, persons who may be substantially affected shall, unless otherwise provided by law, have an additional point of entry pursuant to Rule 28-106.111, Florida Administrative Code.

Any person to whom an emergency order is directed pursuant to Section 373.119(2), Florida Statutes, shall comply therewith immediately, but on petition to the board shall be afforded a hearing as soon as possible.

A person may file a request for an extension of time for filing a petition. The District may grant the request for good cause. Requests for extension of time must be filed with the District prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and whether the District and any other parties agree to or oppose the extension. A timely request for an extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

FILING INSTRUCTIONS

A petition for administrative hearing must be filed with the Office of the District Clerk. Filings with the Office of the District Clerk may be made by mail, hand-delivery, or e-mail. Filings by facsimile will not be accepted. A petition for administrative hearing or other document is deemed filed upon receipt during normal business hours by the Office of the District Clerk at the District's headquarters in West Palm Beach, Florida. The District's normal business hours are 8:00 a.m. – 5:00 p.m., excluding weekends and District holidays. Any document received by the Office of the District Clerk after 5:00 p.m. shall be deemed filed as of 8:00 a.m. on the next regular business day.

Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the District Clerk, 3301 Gun Club Road, West Palm Beach, Florida 33406.
- Filings by hand-delivery must be delivered to the Office of the District Clerk. Delivery of a petition to the District's security desk does not constitute filing. It will be necessary to request that the District's security officer contact the Office of the District Clerk. An employee of the District's Clerk's office will receive and process the petition.
- Filings by e-mail must be transmitted to the Office of the District Clerk at clerk@sfwmd.gov. The filing date for a document transmitted by electronic mail shall be the date the Office of the District Clerk receives the complete document.

INITIATION OF ADMINISTRATIVE HEARING

Pursuant to Sections 120.54(5)(b)4. and 120.569(2)(c), Florida Statutes, and Rules 28-106.201 and 28-106.301, Florida Administrative Code, initiation of an administrative hearing shall be made by written petition to the District in legible form and on 8 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, District file number or any other District identification number, if known.
2. The name, address, any email address, any facsimile number, and telephone number of the petitioner, petitioner's attorney or qualified representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the District's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the District's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the District's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the District to take with respect to the District's proposed action.

MEDIATION

The procedures for pursuing mediation are set forth in Section 120.573, Florida Statutes, and Rules 28-106.111 and 28-106.401–.405, Florida Administrative Code. The District is not proposing mediation for this agency action under Section 120.573, Florida Statutes, at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Section 120.68, Florida Statutes, and in accordance with Florida Rule of Appellate Procedure 9.110, a party who is adversely affected by final District action may seek judicial review of the District's final decision by filing a notice of appeal with the Office of the District Clerk in accordance with the filing instructions set forth herein within 30 days of rendition of the order to be reviewed, and by filing a copy of the notice with the appropriate district court of appeals via the Florida Courts E-Filing Portal.

WATER QUALITY IMPACT EVALUATION CHECKLIST

PART 1: PROJECT INFORMATION

Project Name:	I-95 (S.R. 9) PD&E Study
County:	Broward
FM Number:	439170-1-22-02
Federal Aid Project No:	
Brief Project Description:	I-95 (S.R. 9) PD&E Study from the Miami-Dade/Broward County Line to north of Griffin Road

PART 2: DETERMINATION OF WQIE SCOPE

Does project discharge to surface or groundwater? ☑ Yes ☐ No

Does project alter the drainage system? ☑ Yes ☐ No

Is the project located within a permitted MS4? ☑ Yes ☐ No
Name: Broward County MS4 #FLS000016-004

If the answers to the questions above are no, complete the applicable sections of Part 3 and 4, and then check Box A in Part 5.

PART 3: PROJECT BASIN AND RECEIVING WATER CHARACTERISTICS

Surface Water
Receiving water names: C-10 & Coral Reef Basin

Water Management District: SFWMD

Coordination meeting date: ____/____/_____
Attach meeting minutes/notes to the checklist.

Water Control District Name(s) (list all that apply):

Groundwater
Sole Source Aquifer (SSA)? ☑ Yes ☐ No Name Biscayne Aquifer
If yes, complete Part 5, D and the EPA Region 4 Sole Source Aquifer Project Review Form

Other Aquifer? ☐ Yes ☐ No Name_____

Springs vents? ☐ Yes ☐ No Name_____

Well head protection area? ☐ Yes ☐ No Name_____

Figure 11-2 Water Quality Impact Evaluation

Groundwater recharge? ☐ Yes ☑ No Name_____

Notify District Drainage Engineer if karst conditions are expected or if a higher level of treatment may be needed due to a project being located within a WBID verified as Impaired in accordance with Chapter 62-303, F.A.C.

Date of notification: ____/____/_____

PART 4: WATER QUALITY CRITERIA

List all WBIDs and all parameters for which a WBID has been verified impaired, or has a TMDL in **Table 1**. This information should be updated during each re-evaluation as required.

Note: If BMAP or RAP has been identified in **Table 1**, **Table 2** must also be completed. *Attach notes or minutes from all coordination meetings identified in* **Table 2**.

EST recommendations confirmed with agencies? ☐ Yes ☑ No

BMAP Stakeholders contacted? ☐ Yes ☑ No

TMDL program contacted? ☐ Yes ☑ No

RAP Stakeholders contacted? ☐ Yes ☑ No

Regional water quality projects identified through coordination or the WATERSS process? ☐ Yes ☑ No

If yes, describe:

Potential direct effects associated with project construction and/or operation identified? ☐ Yes ☑ No

If yes, describe:

Discuss any other relevant information related to water quality including Regulatory Agency Water Quality Requirements.

Figure 11-2 Water Quality Impact Evaluation (Page 2 of 5)

PART 5: WQIE DOCUMENTATION

☐ A. No involvement with water quality
☐ B. No water quality regulatory requirements apply.
☑ C. Water quality regulatory requirements apply to this project (provide Evaluator's information below). Water quality and stormwater issues will be mitigated through compliance with the design requirements of authorized regulatory agencies.
☑ D. EPA Ground/Drinking Water Branch review required. ☐ Yes ☑ No
Concurrence received? ☐ Yes ☐ No
If Yes, Date of EPA Concurrence: ___/___/____ (Attach the concurrence letter)

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

Evaluator Name (print): Denys Avila	
Title: Drainage Engineer	
Signature: *Denys*	Date: 12/15/25

Figure 11-2 Water Quality Impact Evaluation (Page 3 of 5)

Table 1: Water Quality Criteria

Receiving Waterbody Name (list all that apply)	FDEP Group Number / Name	WBID(s) Numbers	Classification (I,II,III,IIIL,IV,V)	Special Designations*	NNC limits**	Verified Impaired (Y/N)	TMDL (Y/N)	Pollutants of concern	BMAP, RA Plan or SSAC
C-10	4	3282				Y	N	Bacteria	No
Dania Cutoff Canal	4	3277E				Y	Y	Bacteria	No

*** ONRW, OFW, Aquatic Preserve, Wild and Scenic River, Special Water, SWIM Area, Local Comp Plan, MS4 Area, Other**
**** Lakes, Spring vents, Streams, Estuaries**
Note: If BMAP or RAP has been identified in Table 1, Table 2 must also be completed.

Figure 11-2 Water Quality Impact Evaluation (Page 4 of 5)

Table 2: Regulatory Agencies/Stakeholders Contacted

Receiving Water Name (list all that apply)	Agency's Contact and Title	Date Contacted	Follow-up Required (Y/N)	Comments

Figure 11-2 Water Quality Impact Evaluation (Page 5 of 5)