CONCEPTUAL DRAINAGE REPORT

Florida Department of Transportation

District Four
3400 W Commercial Blvd
Fort Lauderdale, FL 33309

Interstate 95 from SW 10th Street to Hillsboro Boulevard

Financial Management Number 436964-1-22-01
ETDM Number 14244

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016, and executed by FHWA and FDOT.

October 2019

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1 Project Summary

1.1 Project Description and Location

The Florida Department of Transportation (FDOT) District Four is conducting a Project Development and Environment (PD&E) Study, in accordance with the National Environmental Policy Act (NEPA), to assess potential operational and safety improvements along 3.1 miles of Interstate 95 (I-95), from just south of the SW 10 Street interchange [Mile Post (MP) 22.0] to just north of the Hillsboro Boulevard (Blvd) interchange (MP 25.10), in Broward County, Florida.

The project extends along I-95 from just south of SW 10 Street to just north of Hillsboro Boulevard and along both SW 10 Street from just west of Military Trail east to SW Natura Boulevard and along Hillsboro Boulevard from Goolsby Boulevard east to SW Natura Boulevard. The entire project lies within the city of Deerfield Beach. I-95 is part of the Strategic Intermodal System and the National Highway System which is Florida's high priority network of transportation facilities important to the state's economy, mobility and defense.

This study evaluates alternatives for improvements to the I-95 partial cloverleaf interchanges at SW 10 Street and Hillsboro Boulevard and along I-95 from just south of the SW 10 Street interchange to just north of the Hillsboro Boulevard interchange. SW 10 Street provides a direct connection between I-95 and the Sawgrass Expressway. The study also evaluates improvements along both SW 10 Street and Hillsboro Boulevard near I-95.

This study evaluates alternatives to modify the existing merge and diverge ramp areas at the SW 10 Street and Hillsboro Boulevard interchanges, considers the replacement of the existing SW 10 Street bridge over I-95 and providing a grade separation at the existing at-grade railroad crossing at Hillsboro Boulevard.

The construction of express lanes on I-95 within the project area is also analyzed as part of this project.

The project study area is shown in **Figure 1-1**.

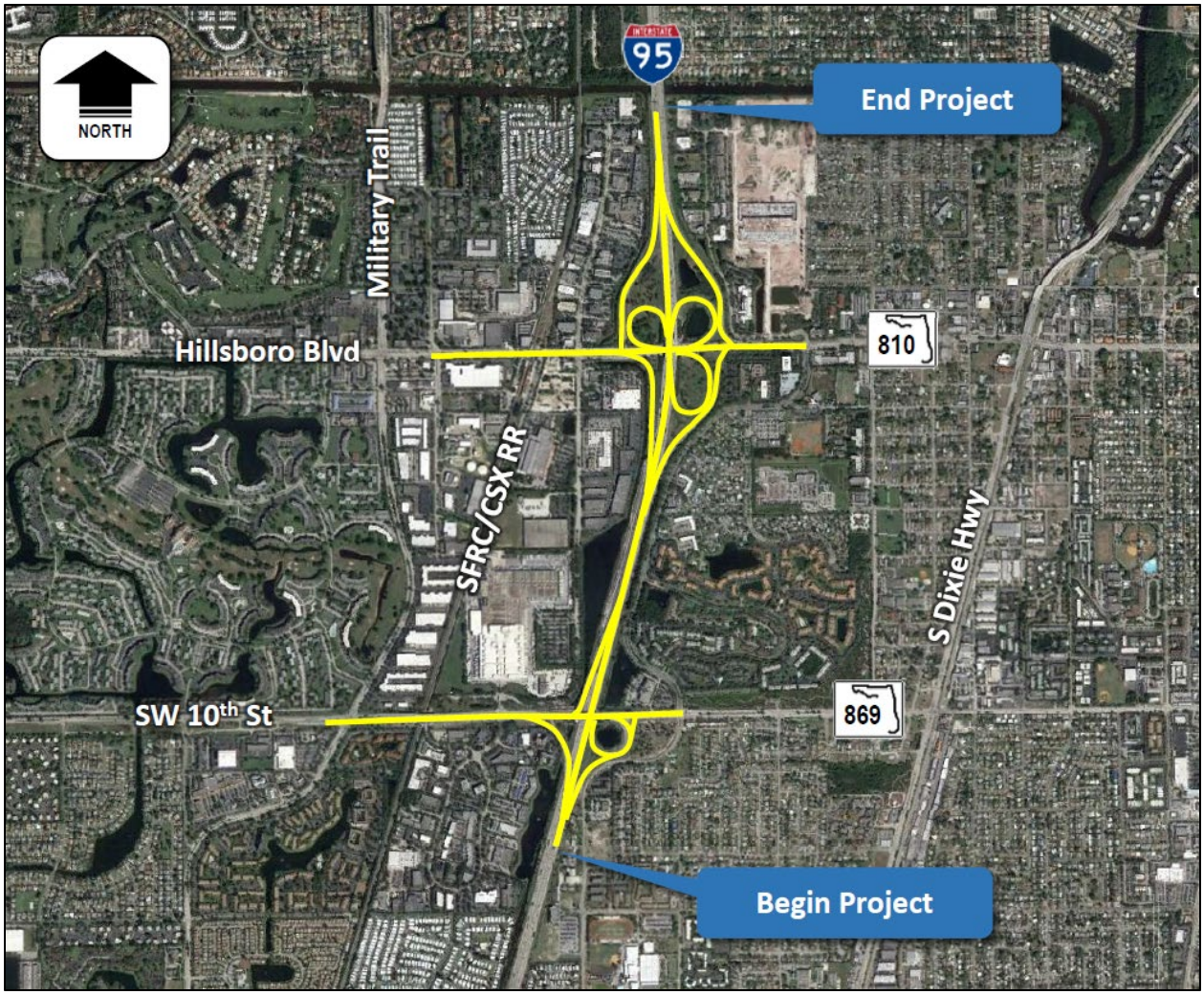


Figure 1-1 Project Study Area

1.2 Purpose and Need

The purpose of this project is to eliminate existing operational and safety deficiencies along I-95 between and including the interchanges at SW 10th Street and Hillsboro Boulevard, and also on SW 10th Street and Hillsboro Boulevard in the vicinity of I-95. The primary need for the project is based on capacity/operational and safety issues, with secondary considerations for the needs of evacuation and emergency services, transportation demand, system linkage, modal interrelationships, and social demands and economic development.

1.2.1 Capacity/Operational Deficiencies

FDOT has identified the need to improve traffic operations along I-95 between the SW 10 Street and Hillsboro Boulevard interchanges, especially at existing merge and

diverge ramps that are the sources of traffic turbulence and collisions. The mainline directional volumes range from 4,400 to 5,850 vehicles per hour (vph) with ramp volumes from 800 to 1,250 vph at SW 10 Street and 400 to 1,000 vph at Hillsboro Boulevard.

Operational analyses along I-95 indicate that all freeway segments in the study area operate at Level of Service (LOS) D or better except for the following:

- The diverge segment at I-95 southbound (SB) off-ramp to SW 10th Street EB and WB during the AM and PM peak periods;
- The I-95 mainline segment between I-95 SB on-ramp from SW 10th Street eastbound (EB) and westbound (WB) and I-95 SB off-ramp to Sample Road EB and WB during the PM peak period;
- The I-95 mainline between I-95 SB On-Ramp from Palmetto Park Boulevard EB and I-95 SB Off-Ramp to Hillsboro Boulevard EB and WB during the AM peak period;
- The merge at I-95 SB on-ramp from Hillsboro Boulevard WB during AM and PM peak periods; and
- The diverge segment at I-95 northbound (NB) off-ramp to Hillsboro Boulevard EB during the AM peak period.

These conditions are existing concerns and are projected to worsen in the future if no action is taken. Year 2040 traffic projections show the mainline directional volumes ranging from 6,000 to 7,300 vph. Year 2040 peak hour directional volumes on I-95 Express are forecasted to range an additional 1,300 to 2,550 vph within the I-95 corridor. Operational analyses under the "No Action" option in year 2040 reflects implementation of two major programmed improvements: 1) I-95 Express Phase 3 (two express travel lanes in each direction), and 2) I-95 Ramp Metering. All of the mainline freeway segments in the study area would operate at a deficient LOS (E or F) during one or both peak periods with the exception that the merge segment for I-95 SB On-Ramp from WB Hillsboro Boulevard would operate at LOS D during the PM peak hour.

1.2.2 Safety

A need exists to resolve safety issues within the project limits along I-95 as well as SW 10 Street and Hillsboro Boulevard. Crash analyses for the years 2008 through 2012 reveal that the I-95 segment within the Hillsboro Boulevard interchange area is classified as a high crash segment for four of the five study years. It should also

be noted that the existing interchanges are closely located together and have short weave distances. Crash rates along SW 10 Street in the vicinity of I-95 exceed the statewide average for similar facilities for all five study years, but the segment along Hillsboro Boulevard in the vicinity of I-95 does not. Field observations indicate that the number of crashes along the Hillsboro Boulevard project segment may be influenced by queues extending from the railroad crossing into this area.

1.2.3 Evacuation and Emergency Services

The South Florida region has been identified by the National Oceanic and Atmospheric Administration (NOAA) as an area with a high degree of vulnerability to hurricanes and the Florida Division of Emergency Management has designated specific evacuation routes through the region. Both SW 10th Street and Hillsboro Boulevard are designated as emergency evacuation routes from I-95 to SR 5/US-1 and A1A. I-95 is designated as an emergency evacuation route throughout Broward County. A need exists to enhance capacity and traffic circulation along evacuation routes to improve evacuation and enhance emergency response.

1.2.4 Transportation Demand

A need exists to improve capacity and safety while meeting transportation demand and maintaining consistency with other transportation plans and projects, such as the Broward County Interchange Master Plan (IMP) and I-95 Express Lanes Phase III Project. The project is included in the FDOT Work Program with PE is scheduled for fiscal years 2017 and 2018. The Broward County MPO 2035 Long Range Transportation Plan (LRTP) included improvements to all I-95 interchanges in Broward County under Illustrative Roadway Projects. Illustrative projects are those that cannot be included in the cost feasible plan due to financial constraints but could be included in a future approved Transportation Improvement Program.

1.2.5 System Linkage

A need exists to ensure that I-95 continues to meet the minimum requirements of a component of the state's Strategic Intermodal System (SIS) and the National Highway System (NHS), as well as provides access connectivity to other major arterials such as I-595 and Florida's Turnpike Intermodal System (SIS) and the National Highway System (NHS), as well as provides access and connectivity to other major arterials such as I-595 and Florida's Turnpike.

1.2.6 Modal Interrelationships

There exists a need for capacity improvements along the I-95 project corridor to enhance the mobility of public transit and goods by alleviating current and future congestion along the corridor and on the surrounding freight and transit networks. Reduced congestion will serve to maintain and improve viable access to the major transportation facilities and businesses of the area.

Increased mobility to public transit operations are needed and will benefit as a result of this project. Although no designated Broward County Transit (BCT) Routes are provided within the SW 10th Street interchange area, Hillsboro Boulevard is serviced by BCT Route #48, which provides a connection from SR 7 to Deerfield Beach including a direct connection to the Deerfield Tri-Rail Station located just west of the Hillsboro interchange.

1.2.7 Social Demands and Economic Development

Social and economic demands on the I-95 corridor will continue to increase as population and employment increase. The Broward County MPO 2035 LRTP predicted that the population would grow from 1.7 million in 2005 to 2.3 million by 2035, an increase of 29 percent. Jobs were predicted to increase from 0.7 to 1 million during the same time period, an increase of 37 percent. A need exists for the proposed improvements to support the predicted social and economic travel.

1.3 Description of Preferred Alternative

This project and the recommended improvements were closely coordinated with the SW 10 Street Connector PD&E Study Project (FM 439891-1) which is studying the feasibility of connecting the existing Sawgrass Expressway with the proposed connector lanes along SW 10 Street. An Alternatives Analysis Memorandum documenting the development and screening of various alternatives including No-Build, Partial Build and Build concepts was submitted to FDOT District 4 on June 29, 2018 and is included in Appendix I of the Systems Interchange Modification Report (SIMR) prepared for this PD&E Study.

The preferred alternative for the I-95 corridor is Build Alternative 2. Build Alternative 2 proposes to add one tolled express lane in each direction in the median along I-95 while maintaining the existing access points south of the SW 10 Street interchange and north of the Hillsboro Boulevard interchange. The existing number of general-purpose lanes throughout the I-95 corridor will be maintained and the express lanes

will be separated from the general-purpose lanes with tubular markers and a 4-ft wide buffer. A Collector-Distributer (CD) road and braided ramps are proposed on the east side of I-95 for the NB traffic and a separate CD road on the west side of I-95 is proposed for the SB traffic.

The preferred alternative for SW 10 Street is the modified north alignment alternative. This alternative provides three 11-ft lanes with 7-ft buffered bike lanes and 6-ft sidewalks in each direction for the SW 10 Street local traffic. Additionally, two 12-ft elevated connector lanes are provided in each direction with direct connect ramps to/from the I-95 express lanes providing regional connectivity to the express lanes network. A WB ingress ramp is proposed west of the Newport Center Drive intersection that provides access from the SW 10 Street WB local lanes to the connector lanes. In the EB direction along the connector lanes an egress ramp departs from the connector lanes west of the Military Trail intersection braiding over the EB SW 10 Street local lanes connecting along the outside. The egress ramp allows access to the Newport Center and to ramps to NB and SB I-95.

On SW 10 Street at the NB and SB legs of the East Newport Center Drive intersection triple right turn lanes and no left turn or through lanes are provided. In addition, dual left turn lanes and exclusive right turn lanes are provided for the EB and WB movements at this intersection. This configuration allows improved operations and mitigates congestion for the intersection, the interchange ramp intersections and along SW 10 Street.

A roundabout is provided at the intersection of West and East Newport Center Drive to improve left turn movements at the Newport Center. A loop ramp is provided along SW 12 Avenue that connects directly to the SW 10 Street connector lanes to improve operations of the East Newport Center Drive intersection with SW 10 Street by allowing WB traffic making a right turn to bypass the signal.

The NB exit ramp terminal will be widened to accommodate triple left and triple right turn lanes. The intersection at Natura Boulevard is expanded to accommodate double left and single right turn lanes on all intersection approaches.

Alternatives 1 and 2 along Hillsboro Boulevard which evaluated a depressed profile under the South Florida Rail Corridor (SFRC) and a grade separation over the railroad tracks were considered non-viable due to significant impacts to property access, right of way, utilities, and major temporary traffic control impacts for both the railroad tracks and Hillsboro Boulevard. Therefore, the proposed improvements along

Hillsboro Boulevard are limited to the ramp terminals. The improvements include an additional left turn movement for the NB egress ramp terminal while maintaining the dual right turn movement which resulted in the elimination of the NB off-ramp loop to WB Hillsboro Boulevard. In addition, the NB on-ramp from WB Hillsboro Blvd was realigned to be within the proximity of I-95. Moreover, a new configuration was proposed for the WB to NB on-ramp and the WB to SB on-ramp to minimize the weaving maneuvers within the interchange area. Additionally, a new bridge is proposed to be constructed on the west side of the I-95 mainline, due to the existing vertical clearance above Hillsboro Boulevard.

The analysis presented in this Conceptual Drainage Report was based on the alternative developed in February 2019. During the design phase, the analysis should be further refined to incorporate any changes to the proposed alternative and typical sections.

2 Data Collection

The following sources were used to evaluate the project:

- Florida Department of Transportation (FDOT) Drainage Manual (January 2017)
- FDOT Drainage Design Guide (January 2017)
- FDOT PD&E Manual, Part 2, Chapter 11 – Water Quality and Water Quantity (June 2017)
- South Florida Water Management District (SFWMD) Environmental Resource Permit (ERP) Applicant's Handbook Volume II (May 2016)
- SFWMD Permit Documents and Permitted Plans
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM)
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey
- NOAA LiDAR Contours
- Microstation survey files from I-95 Express Lanes 3A2 Design-Build project
- Straight Line Diagrams (**Appendix F**)

3 Design Criteria

3.1 Water Quality

SFWMD ERP Applicant's Handbook Volume II Part IV identifies that proposed projects meet the following criteria:

- For wet detention ponds, treatment shall be provided for 2.5-inches times the new impervious area via compensatory treatment due to the limited space available (per November 2018 coordination meeting).
- For dry detention ponds, treatment shall be provided equal to 75% of the amounts computed for wet detention.

3.2 Water Quantity

SFWMD ERP Applicant's Handbook Volume II Part III identifies that proposed projects meet the following criteria:

- Offsite discharge rate is limited to rates not causing adverse impacts to existing offsite properties and
    - Historic discharge rates; or
    - Rates determined in previous Agency permit actions; or
    - Rates specified in District criteria
- A design storm event of 25-years, 72-hours shall be used in computing offsite discharge rates.

3.3 FDOT Pond Design

FDOT Drainage Manual section 5.4.4.2 establishes criteria for detention and retention pond. The proposed ponds were designed based on these criteria. For dry ponds, the pond bottom was selected as 1-foot above the seasonal high water table. For wet ponds, the control elevation was selected at the seasonal high water table.

3.4 Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) were used to evaluate the 100-year floodplain encroachment. The project area is located within four FEMA FIRM panels: 12011C0159H, 12011C0167H, 12011C0178H, 12011C0186H (effective August 2014). A letter of map revision determination updated FEMA FIRM panel 12011C0186H (effective March 2017). The floodplain encroachments are within the zones AE and AH with Base Flood Elevations

(BFE) ranging from 12 to 16 feet (NAVD 88). Refer to the I-95 SW 10th Street PD&E Study Locations Hydraulic Report for further information.

4 Existing Conditions

4.1 Drainage Patterns

4.1.1 Basin 1

SR 869 (SW 10th Street), west of the railroad tracks, outfalls to the Broward County Water Control District (BCWCD)#2 C-2 canal. East of Military Trail along SW 10th Street, runoff is collected via a closed storm drain system. West of Military Trail to the project's western limits along SW 10th Street, runoff sheet flows into adjacent swales. There are no SFWMD permitted facilities that provide water quality treatment or attenuation.

4.1.2 Basin 2

SR 869, east of the railroad tracks and west of I-95, outfalls to the BCWCD#2 C-1 canal. Runoff is collected via a closed storm drain system. There are no SFWMD permitted facilities that provide water quality treatment or attenuation.

4.1.3 Basin 3

SR 810 (Hillsboro Boulevard), west of railroad tracks outfalls to BCWCD#2 C-2 canal. Runoff is collected via a closed storm drain system. There are no SFWMD permitted facilities that provide water quality treatment or attenuation.

4.1.4 Basin 4

SR 810, east of railroad tracks and west of I-95, outfalls to BCWCD#2 C-1 canal. Runoff is collected via a closed storm drain system. There are no SFWMD permitted facilities that provide water quality treatment or attenuation.

4.1.5 Basin 25

I-95, from north of Sample Road to SW 10th Street, outfalls to the BCWCD#2 C-1 canal. Runoff is collected via a closed storm drain systems and ditches. Prior to the I-95 Express Lanes, there was one wet pond located in the southeast quadrant of the I-95 and SW 10th Street Interchange, referred to as Borrow Lake. The I-95 Express Lanes project within I-95 SW 10th Street PD&E Study did not widen within this section and no water quality treatment or attenuation facilities were constructed.

4.1.6 Basin 26

I-95, from SW 10th Street to Hillsboro Boulevard, outfalls to the BCWCD#2 C-1 canal. Runoff is collected via a closed storm drain system and ditches. I-95 and SW 10th

Street Operational Improvements project (FPID 430932-1-52-01) added an auxiliary lane adjacent to the southbound lanes and constructed a linear pond that provided water quality treatment and attenuation. I-95 Express Lanes project (FPID 433108-6-52-01 and 433109-4-52-01) added a 10 foot shoulder and noise wall on the east side of I-95 along with constructing linear ponds on the eastern side (ditch 26-3 and 26-3A) to provide water quality treatment and attenuation.

4.1.7 Basin 27

I-95, from Hillsboro Boulevard to the Hillsboro canal, outfalls to the BCWCD #2 C-1 canal. Runoff is collected via a closed storm drain system or sheet flows into ditches adjacent to I-95, eventually discharging to BCWCD #2 C-1 canal. Prior to the I-95 Express Lane project, there were no SFWMD permitted facilities providing water quality treatment or attenuation. The four infield detention ponds were built as part of FDOT Project 86070-3474 and collect runoff from I-95 and portions of Hillsboro Boulevard. For the I-95 Express Lane project, proposed linear ditches 27-1 and 27-41 and proposed ponds 27-2 and 27-6 were constructed and modified, respectively, to provide the required water quality treatment and attenuation.

4.1.8 Newport Center (offsite)

The Newport Center is located south of SW 10th Street and adjacent to the BCWCD#2 C-1 canal. A master plan was permitted, with special conditions identifying that each parcel will provide water quality treatment prior to discharge to the Newport Center Lake.

4.1.9 Cross Drains

There are 13 cross drains within the project limits along SW 10th Street, Hillsboro Boulevard and I-95. Refer to **Table 3-1** for a summary of the existing cross drains.

Table 4-1 Summary of Cross Drains

Cross Drain	Station (CL I-95)	Description
CD - 1	1333+50	1 - 36" RCP
CD - 2	1346+13	1 - 18" RCP
CD - 3	1352+15	1 - 72" RCP
CD - 4	1360+00	3 - 66" RCP*
CD - 5	1368+14	1 - 18" RCP
CD - 6	1383+16	2 - 66" RCP
CD - 7	1396+34	1 - 18" RCP
CD - 8	1406+13	1 - 36" RCP
CD - 9	1410+37	2 - 8' x 8' box culvert*
CD - 10	1422+14	1 - 18" RCP
CD - 11	1428+13	1 - 18" RCP
CD - 12	1434+13	1 - 72" RCP
CD - 13	1441+14	1 - 18" RCP

* BCWCD#2 control structures

4.1.10 History of Flooding

There has been no documented history of flooding in the project area based on correspondence with FDOT Broward Operations Center, SFWMD and the BCWCD#2.

4.2 Environmental Characteristics

The project is located within the Hillsboro and El Rio Canals waterbody (Waterbody ID# 3226F5). The project is not within a verified impaired waterbody. At the time of final design, a review of the impaired water bodies should be performed.

In separate documents, a Cultural Resource Assessment Survey (CRAS), a Wetland Evaluation and Biological Assessment Report (WEBAR) and a Contamination Screening Evaluation Report (CSER) were prepared during this PD&E study. Information regarding historical and archeological impacts from this project can be found in the CRAS. Information regarding wetland and species impacts from this project can be found in the WEBAR. Information regarding known and/or potential contamination sites near this project can be found in the CSER.

4.3 Land Uses

This project lies within the City of Deerfield Beach. West of I-95 within the project limits, the dominant land uses are industrial and commercial, including a Publix distribution center and several hotels at the interchanges. Additional land uses west of I-95 include City of Deerfield government offices located west of the CSX railroad and south of Hillsboro Boulevard, and a residential development southwest of SW 10th Street and the railroad. East of I-95 and south of Hillsboro Boulevard, land use is mainly single and multi-family residential with a mixture of commercial development at the interchanges. East of I-95 and north of Hillsboro Boulevard, land use is mainly commercial along I-95 and Hillsboro Boulevard. Set behind the commercial development is the former Deerfield Country Club Golf Course.

4.4 Soil Types

A soil survey report from United States Department of Agriculture (USDA) was reviewed for the project area. According to the report, there are 10 soil types around the project area. The depth to water table varied between 0.0 to more than 80 inches. A summary of the USDA soil survey report is found in **Table 3-2**.

Table 4-2 Summary of USDA NRCS Soil Survey Report

USDA Soil No.	USDA Soil Name	Depth to Water Table (feet)	Hydrologic Soil Group
15	Immokalee fine sand, 0 to 2 percent slopes	0.5 - 1.5	B/D
17	Immokalee-Urban land complex	0.5 - 1.5	B/D
19	Margate fine sand, occasionally ponded 0 to 1 percent slopes	0.0 - 1.5	A/D
23	Paola-Urban land complex	> 6.7	A
28	Pomello fine sand, 0 to 2 percent slopes	1.5 - 3.5	A
29	Pomello fine sand, 0 to 2 percent slopes	0.25 - 1.5	A/D
33	Sanibel muck	0.0	A/D
34	St. Lucie fine sand, 0 to 2 percent slopes	> 6.7	A
36	Udorthents	> 6.7	A
38	Udorthents, shaped	2.0 - 4.0	A

4.5 Permits

Permitting coordination is anticipated with the following agencies:

- SFWMD
- Broward County Environmental Protection and Growth Management Department/BCWCD#2

This project will directly impact the BCWCD#2 C-1 canal that BCWCD#2 maintains and operates. Impacts to one control structure (SW 10th Street) will need to be coordinated. Coordination minutes between both agencies can found in **Appendix E**.

Existing SFWMD permits were obtained and reviewed within the project area. Permits reviewed can be found in **Table 3-3**.

Table 4-3 Summary of Applicable SFWMD Permits

ERP #	Application No.	Year	Project Description
88-00040	04297-1	1988	I-95 and SW 10th St (New Interchange)
	140919-16	2014	I-95 and SW 10th St Operational Improvements
	150507-14	2015	I-95 and SW 10th St Operational Improvements (Minor Modification)
06-01465	160620-2	2016	I-95 Express Lanes Phase 3B (Conceptual Permit)
	161013-5	2016	I-95 Express Lanes Phase 3B (Minor Modification)
	171117-5	2017	I-95 Express Lanes Phase 3B (Minor Modification)
	180222-16	2018	I-95 Express Phase 3B-1 Segment 1
	180531-3	2018	I-95 Express Phase 3B-1 Segment 2
06-00426	09291-C	1982	Newport Center Master Plan

4.6 Project Datum

The vertical datum for this project and in this report is the North American Vertical Datum of 1988 (NAVD 88). Elevations can be converted from NAVD 88 to the National Geodetic Vertical Datum of 1929 (NGVD 29) by adding a conversion factor of 1.57 feet (NAVD 88 + 1.57 feet = NGVD 29).

5 Proposed Conditions

With the exception of SW 10th Street west of the railroad tracks towards west of Military Trail, the project will to discharge to the BCWCD#2 C-1 canal. Along SW 10th Street, Hillsboro Boulevard, and portions of I-95, the discharge will be through a closed storm drain system. The remain portions of I-95 will sheet flow and discharge directly into the BCWCD#2 C-1 canal. Proposed wet and dry stormwater management facilities will provide the required attenuation and water quality treatment per the SFWMD (2016) and FDOT (2017) standards (refer to **Chapter 2** for references). The majority of the stormwater improvements from the I-95 Express Lanes project will be removed. Project calculations reflect the water quality treatment removals. Because of the limiting right of way around the I-95 and SW 10th Street interchange, compensatory water quality treatment at the I-95 and SW 10th Street interchange is proposed. Proposed floodplain compensation sites will provide floodplain storage due to floodplain encroachment. Existing patterns will be maintained in the proposed condition. Summary of the required and provided water quality treatment and attenuation volumes are provided in **Tables 4-1** and **4-2**.

Table 5-1 Summary of Water Quality Treatment

Basin	Treatment Required (ac-ft)	Treatment Provided (ac-ft)	Net Treatment* (ac-ft)	Treatment Type
2	0.55	1.41	0.86	Dry Detention
25	1.83	0.40	-1.43	Dry Detention
26	3.71	3.75	0.04	Wet Detention
27	0.56	6.88	6.32	Wet Detention
Newport	0.01	0.00	-0.01	Wet Detention
Total	**6.67**	**12.44**	**5.77**	
*Net treatment (+) surplus (-) deficit				

Table 5-2 Summary of Attenuation

Basin	Attenuation Required (ac-ft)	Attenuation Provided (ac-ft)	Net Attenuation* (ac-ft)
2	0.75	1.09	0.34
25	2.46	0.66	-1.80
26	4.83	4.52	-0.31
27	6.99**	10.75	3.76
Newport	0.01	0.00	-0.01
Total	**15.04**	**17.02**	**1.98**
*Net attenuation (+) surplus (-) deficit **Attenuation includes replacing approximately 5 acre-ft due to existing pond shifting to new location			

A safety factor of 5% was applied to pond sizes (**Appendix B**). Typically, 10% to 20% safety factor is applied in the PD&E study. During pond sizing, the provided water quality treatment and attenuation volume was maximized to allow flexibility (providing a project total of 29.46 ac-ft). Comparing to the required water quality treatment and attenuation volume project total (21.71 ac-ft), this is a 35% more than what is required thus providing an additional safety factor.

The analysis presented in this Conceptual Drainage Report was based on the alternative developed in February 2019. During the design phase, the analysis should be further refined to incorporate any changes to the proposed alternative and typical sections.

5.1 Stormwater Ponds

5.1.1 Basin 1

There are no proposed ponds within this basin. The additional impervious area will be accommodated by the adjacent SW 10th Street Connector project (FPID 439891-1-22-02). In order to accommodate a theoretical pond, the outfall pipe would travel west towards the BCWCD#2 C-2 canal and need to go through the adjacent project. After coordination, it was preferred not to have separate outfall pipes for both projects. Refer to **Appendix E** for correspondence. If the adjacent project does not move forward, then a new proposed pond not covered in this report will be necessary; location and size of this new proposed pond will be determined in the design phase.

5.1.2 Basin 2

Pond 2-1 is located north of SW 10th Street, east of the railroad tracks. Runoff will be collected through a closed storm drain system from SW 10th Street lanes. Seasonal high water table was estimated based on Broward County Water Table map (**Appendix A**) at 6.50 feet (NAVD88). Because the pond is within the Broward County groundwater well zone, Pond 2-1 will be a dry detention pond. Pond 2-1 is approximately 1.85 acres and will outfall through a new drainage pipe to the BCWCD#2 C-1 canal. The size of the outfall pipe will be determined during design. Refer to **Appendix B** for conceptual pond calculations.

5.1.3 Basin 3

No roadway work is proposed within this basin. No water quality treatment or attenuation is required.

5.1.4 Basin 4

No roadway work is proposed within this basin. No water quality treatment or attenuation is required.

5.1.5 Basin 25

Pond 25-2 is located on the southeast quadrant of the I-95 and SW 10th Street interchange. Runoff will be collected through a closed storm drain system along the I-95 northbound lanes. The seasonal high water table was based on the I-95 Express Lanes drainage report at elevation 7.60 feet (NAVD88). Pond 25-2 will be a dry detention pond and have an approximate size of 0.76 acres. Pond 25-2 will outfall to BCWCD#2 C-1 canal through an existing 60-inch pipe. During the design phase, the outfall pipe will be evaluated to determine if the outfall pipe is sized appropriately. Refer to **Appendix B** for conceptual pond calculations.

5.1.6 Basin 26

Pond 26-5 is located on the southeast quadrant of the I-95 and Hillsboro Boulevard interchange. Runoff will be collected through a closed storm drain system along the I-95 northbound lanes. The seasonal high water table was based on the I-95 Express Lanes drainage report at elevation 3.43 feet (NAVD88). Thus, Pond 26-5 will be a wet detention pond and have an approximate size of 2.95 acres. Pond 26-5 will outfall to FPC 26-1 through an existing 24-inch pipe. During the design phase, the outfall pipe will be evaluated to determine if the outfall pipe is sized appropriately. Refer to **Appendix B** for conceptual pond calculations.

5.1.7 Basin 27

There are two proposed ponds within the right of way. With the relocation of the northbound ramp from westbound Hillsboro Boulevard, Pond 27-3 is expanded. Runoff will be collected through a closed storm drain system from the I-95 northbound lanes and treated and attenuated in Pond 27-3 while Pond 27-5 will collect runoff through a closed storm drain system from the I-95 southbound lanes. For both ponds, the seasonal high water table was based on the I-95 Express Lanes drainage report at elevation 3.43 feet (NAVD88). Pond 27-3 will remain a wet detention pond and have an approximate size of 4.52 acres. Pond 27-3 will outfall to existing Pond 27-6 through three existing 30-inch pipes. Pond 27-5 will be a wet detention pond and have an approximate size of 3.92 acres. Pond 27-5 will outfall to existing ditch and under the southbound I-95 ramp through an existing 36-inch pipe.

During the design phase, both outfall pipes will be evaluated to determine if the outfall pipes are sized appropriately. Refer to **Appendix B** for conceptual pond calculations.

5.1.8 Newport Center (offsite)

There is a net gain of impervious area due to the proposed roundabout, requiring water quality treatment and attenuation. However, there are no proposed ponds due to the office complex and limited right of way. Compensatory water quality treatment and attenuation will occur within Basin 27.

5.2 Floodplain Compensation Sites

There are two floodplain compensation sites within the project. The net floodplain encroachment volume will be offset by the excavation of floodplain compensation sites and SMFs within the existing right of way on a cup-for-cup evaluation approach. The City of Deerfield Beach parcel adjacent to the project is no longer available nor required. Refer to the I-95 SW 10th Street PD&E Study Locations Hydraulic Report for further information regarding floodplain impacts and compensation.

5.2.1 FPC 26-1

FPC 26-1 is located in the southeast quadrant of the I-95 and Hillsboro Boulevard interchange. The seasonal high water table was based on the I-95 Express Lanes drainage report at elevation 3.43 feet (NAVD88). Per the FEMA FIRMs, the 100-year floodplain is at elevation 11 feet (NAVD88). FPC 26-1 is 4.46 acres and would provide 24.00 acre-feet of floodplain compensation. FPC 26-1 will connect to the BCWCD#2 C-1 canal via a 36-inch cross drain under I-95.

5.2.2 FPC 27-1

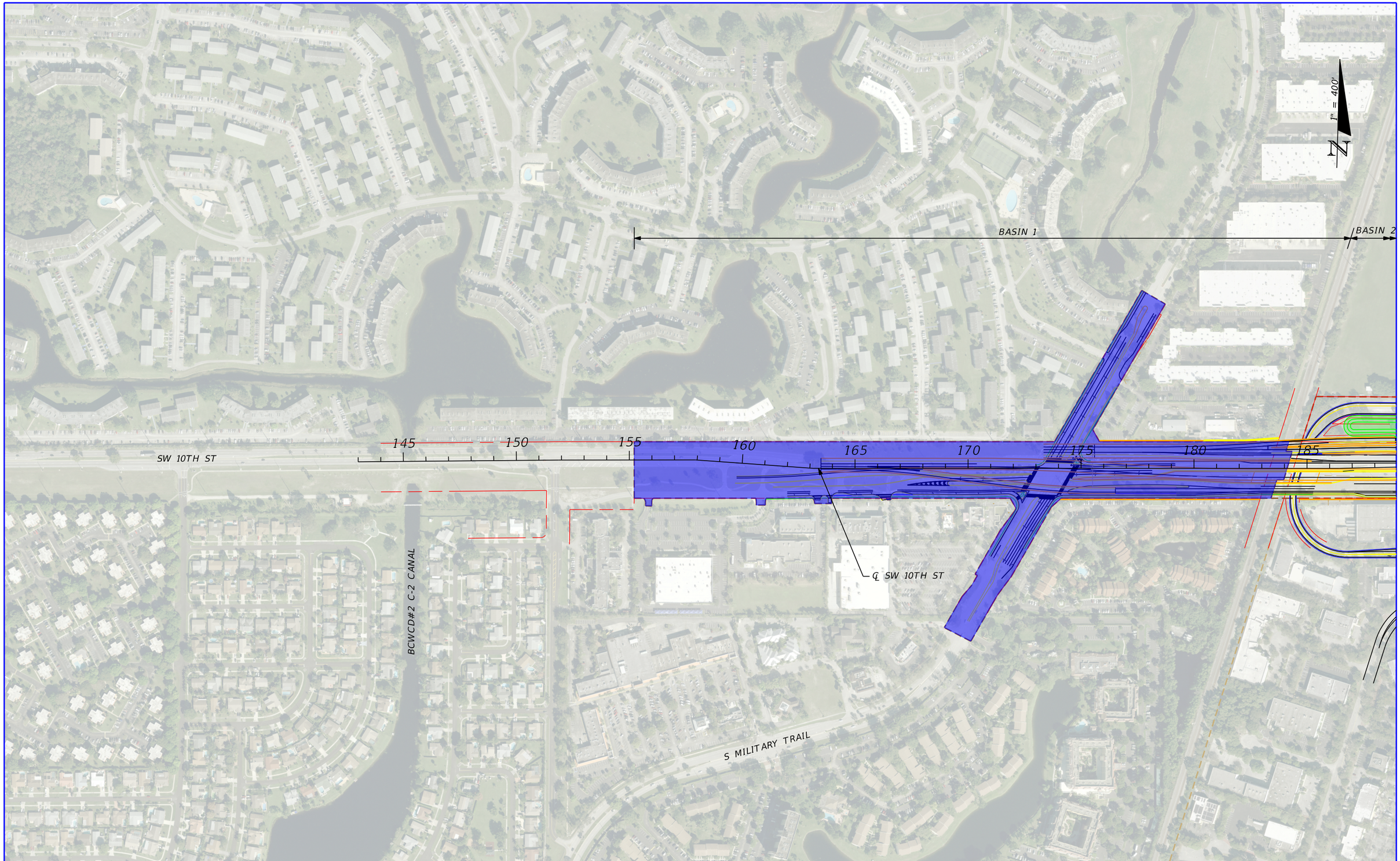
FPC 27-1 is located in the northwest quadrant of the I-95 and Hillsboro Boulevard interchange. The seasonal high water table was based on the I-95 Express Lanes drainage report at elevation 3.43 feet (NAVD88). Per the FEMA FIRMs, the 100-year floodplain is at elevation 11 feet (NAVD88). FPC 27-1 is 0.57 acres and would provide 2.44 acre-feet of floodplain compensation. FPC 27-1 will connect to the BCWCD#2 C-1 canal via a ditch and a 36-inch cross drain under the southbound exit ramp of I-95.

5.3 Cross Drains

Due to the roadway widening, existing cross drains will be extended. CD-4 contains a canal control structure owned and managed by BCWCD#2. Coordination for relocation of the control structure and boat ramp access will be determined in the design phase. Location and size for all other cross drains will be determined in the design phase.

APPENDIX A:

Exhibits



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

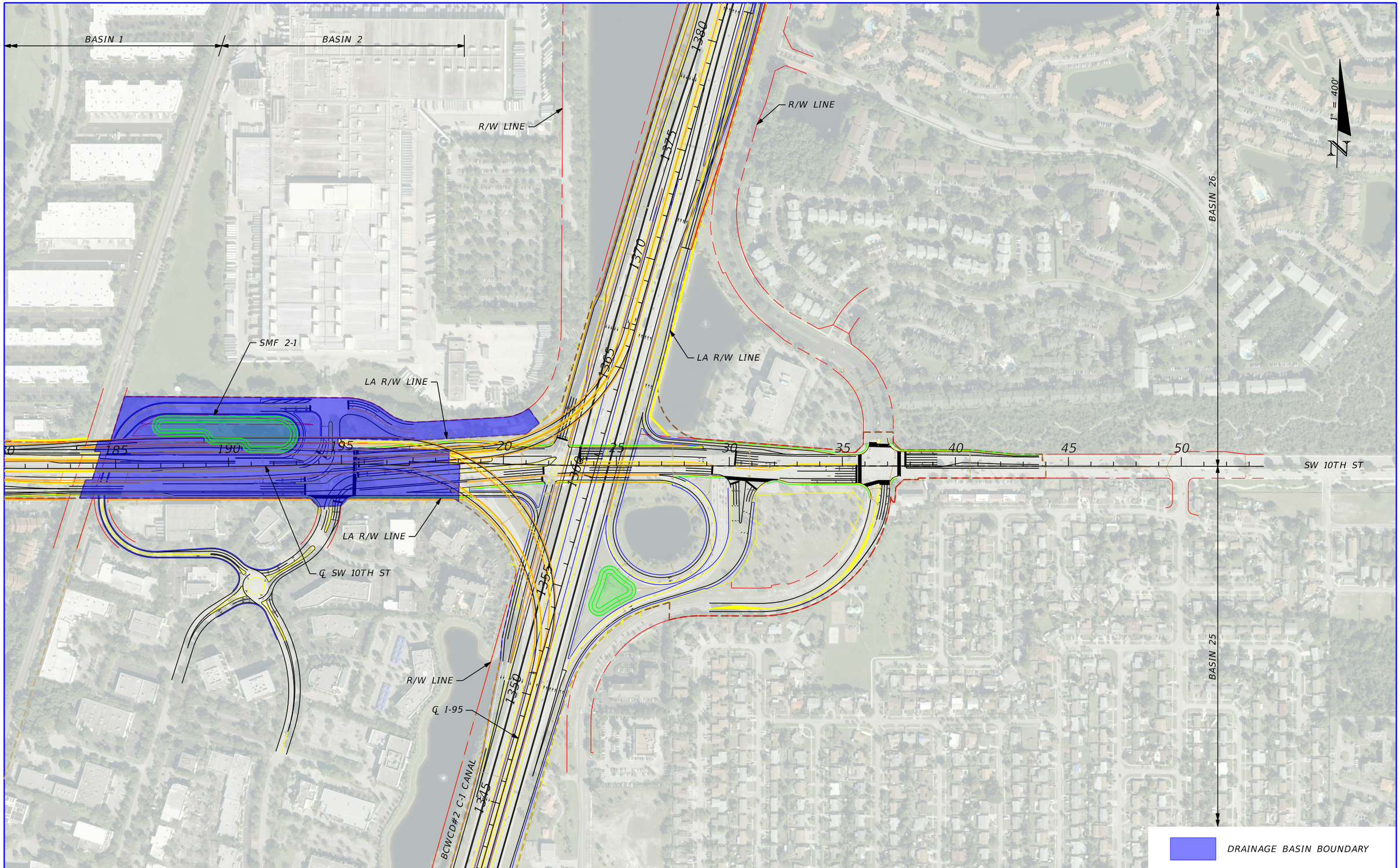
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9 SR 810 SR 869	BROWARD	436964-1-22-01

BASIN 1

SHEET NO.
A-1

\\tmaw00\pmwork\jobs\65674\CADD\43696415201\drainage\DRMPRD11.DGN



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

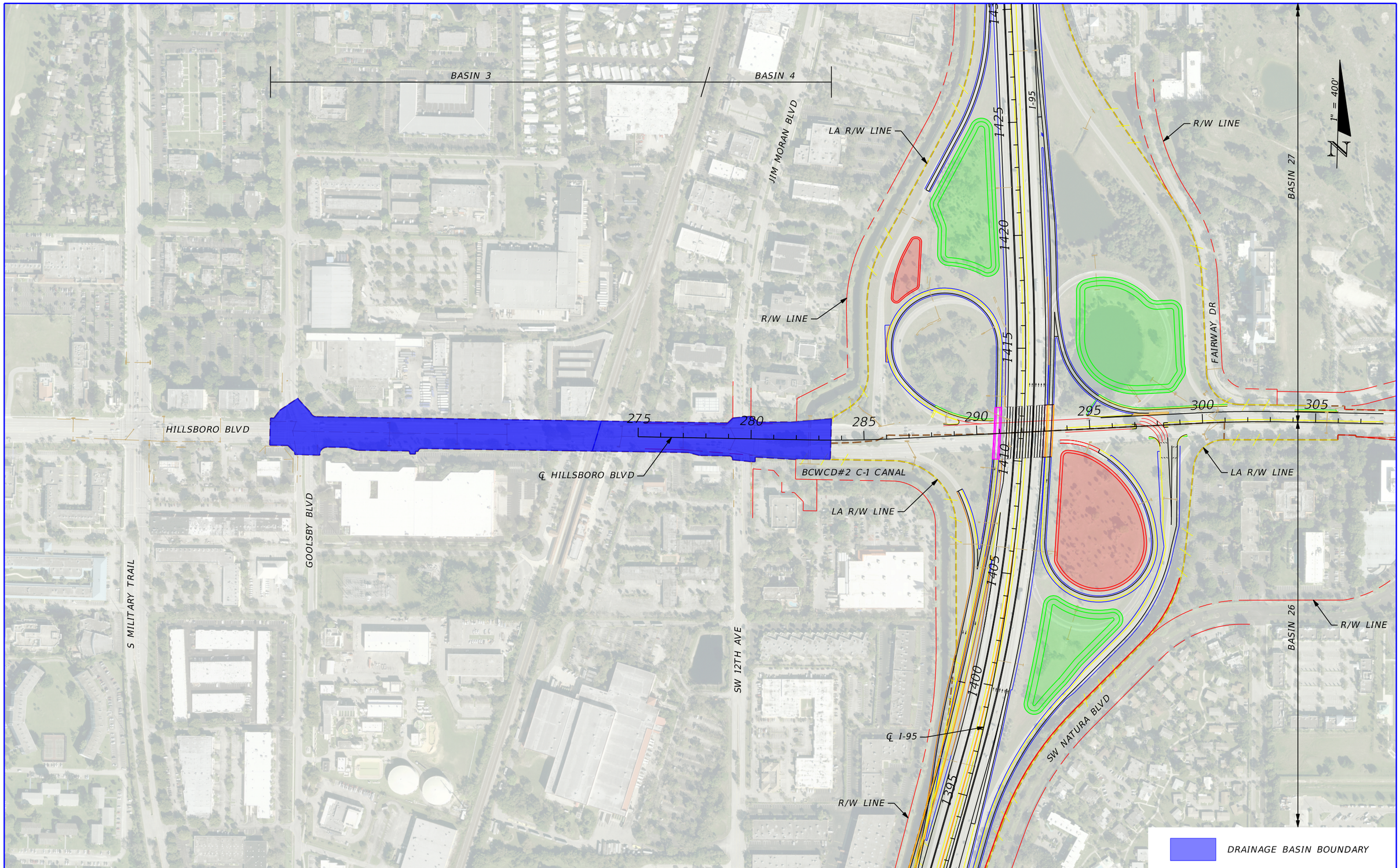
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9 SR 810 SR 869	BROWARD	436964-1-22-01

BASIN 2

SHEET NO.
A-2

\\tmaw00\pmwork\jobs\65674\CADD\43696415201\drainage\DRMPRD12.DGN



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

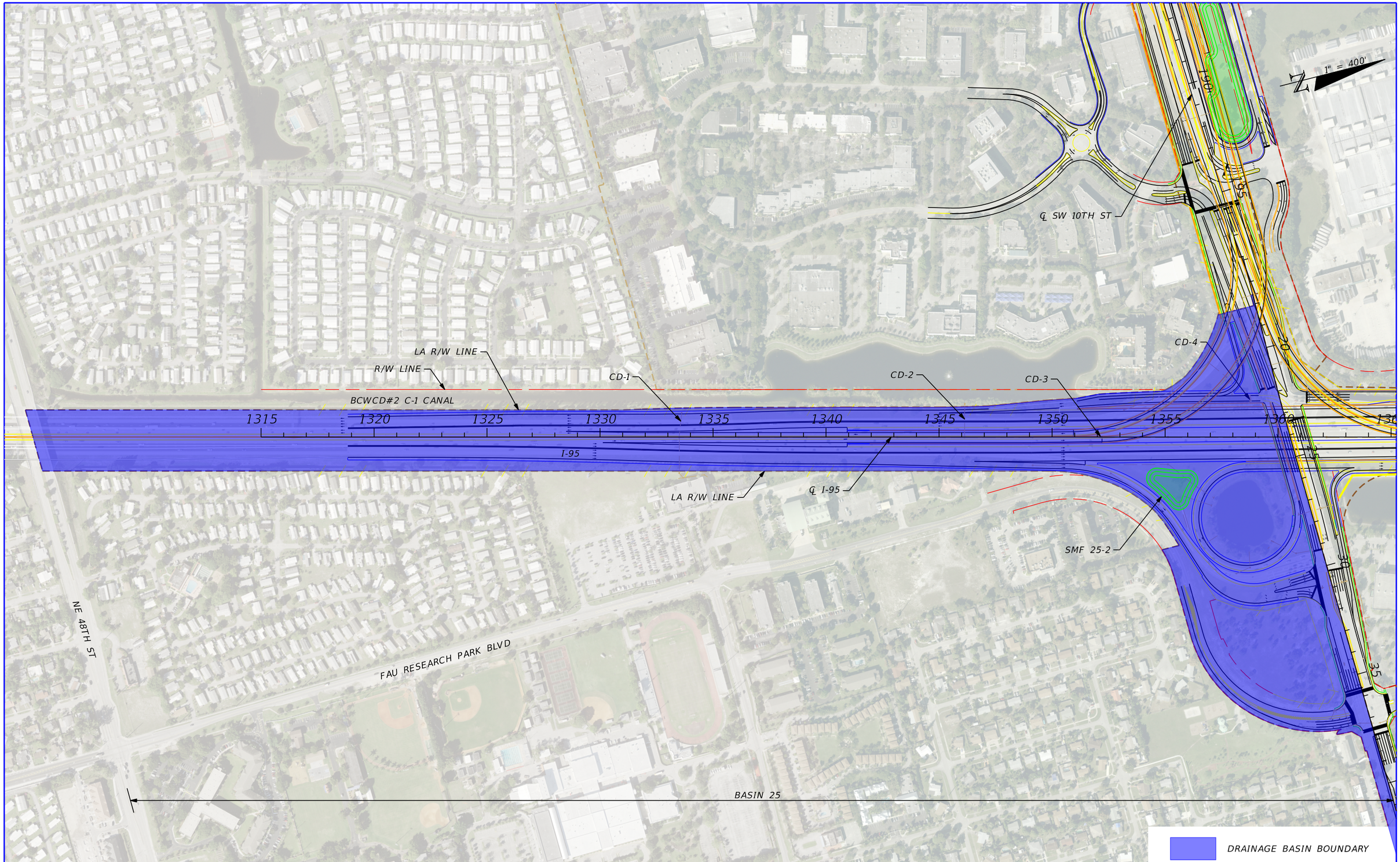
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9 SR 810 SR 869	BROWARD	436964-1-22-01

BASIN 3 & 4

SHEET NO.
A-3

\\tmaw00\pmwork\jobs\65674\CADD\43696415201\drainage\DRMPRD16.DGN



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

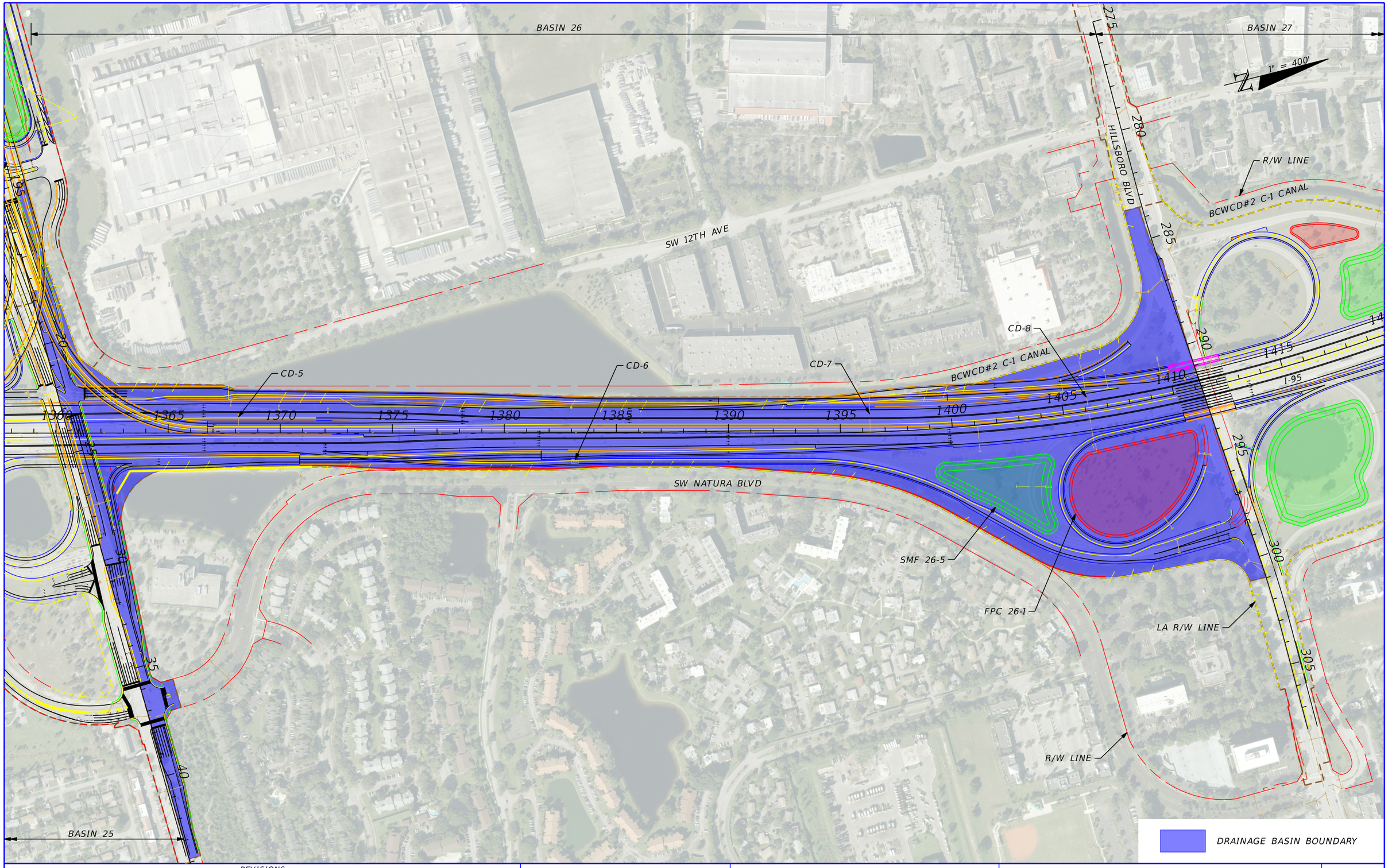
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9 SR 810 SR 869	BROWARD	436964-1-22-01

BASIN 25

SHEET NO.
A-4

\\tmaw00\pmwork\jobs\65674\CADD\43696415201\drainage\DRMPRD13.DGN



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

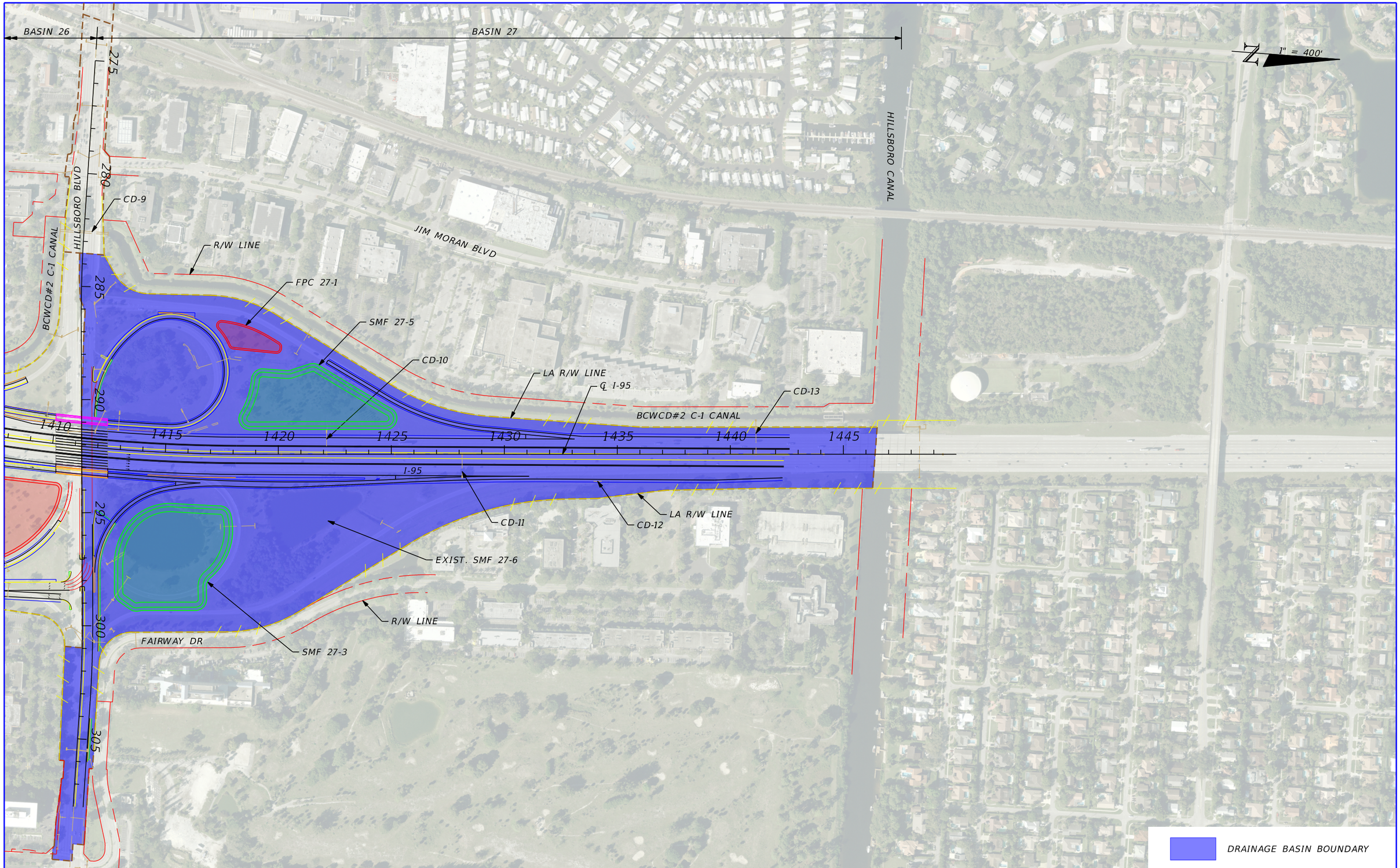
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9 SR 810 SR 869	BROWARD	436964-1-22-01

BASIN 26

SHEET NO.
A-5

\\tmaw00\pmwork\jobs\65674\CADD\43696415201\drainage\DRMPRD14.DGN



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

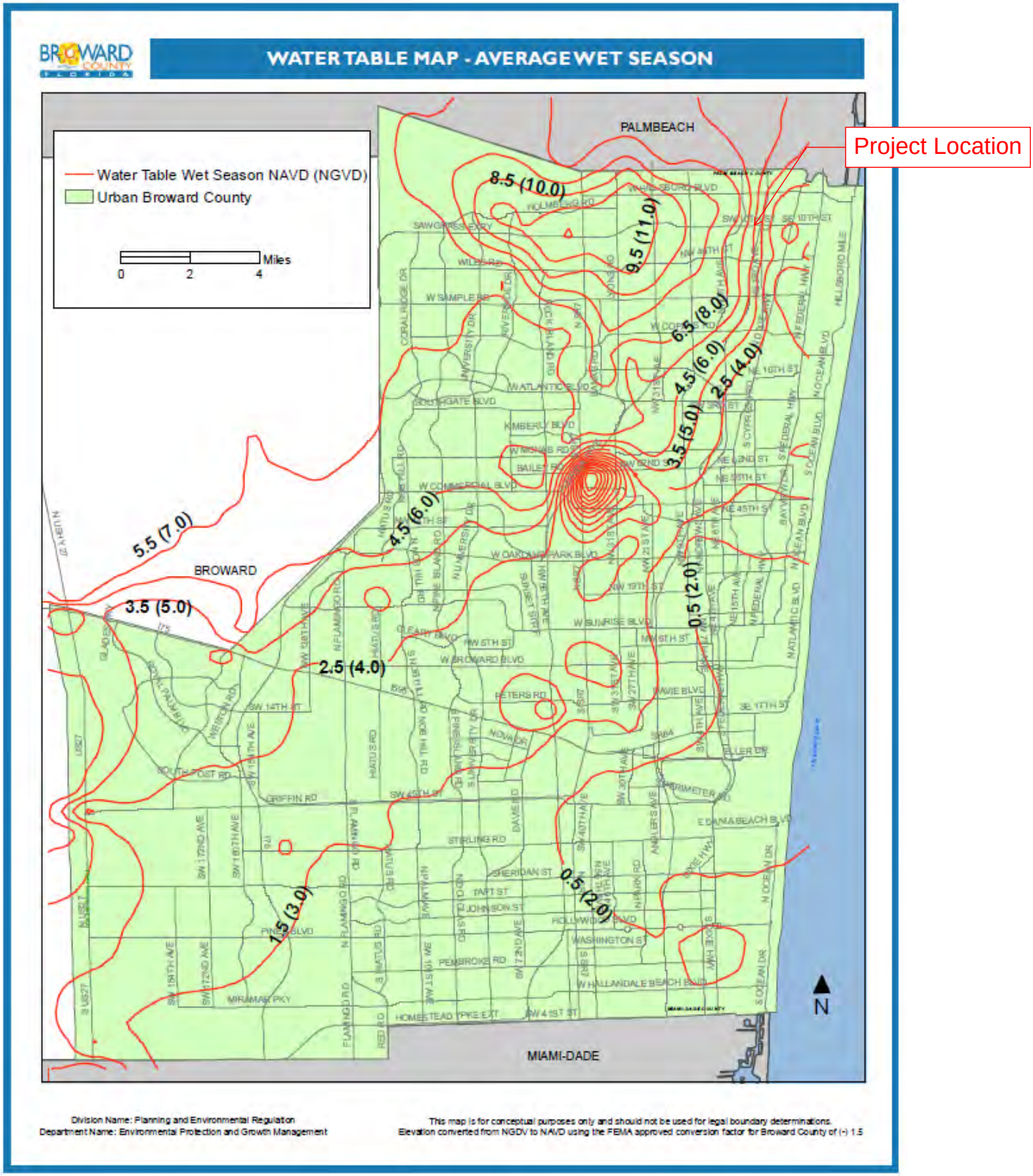
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9 SR 810 SR 869	BROWARD	436964-1-22-01

BASIN 27

SHEET NO.
A-6

\\tmaw00\pmwork\jobs\65674\CADD\43696415201\drainage\DRMPRD15.DGN

B-17: Draft Broward County Water Table Map (Wet Season)



APPENDIX B:

Conceptual Pond Calculations

HNTB

By:	BTM	7/16/2019				*FPID:*	436964-1-22-02
Checked By:	CK	7/17/2019	*Updated By:*	BTM	7/23/2019	*Job No.:*	65674
Back-Checked By:	BTM	7/22/2019	*Verified By:*	CK	7/24/2019	*Office No.:*	82

Basin	Total Post Area (ac)	Total Post Impervious (ac)	Existing Impervious (ac)	New Impervious (ac)	1" total (ac-ft)	2.5" Total Impervious (ac-ft)	2.5" New Impervious (ac-ft)	75% reduction if dry
2	15.64	10.79	7.25	3.55	1.30	2.25	0.74	0.55
25	58.24	39.13	27.39	11.74	4.85	8.15	2.45	1.83
26	65.49	44.23	26.42	17.81	5.46	9.21	3.71	
27	62.69	25.15	22.48	2.67	5.22	5.24	0.56	
Newport	0.46	0.26	0.20	0.05	0.04	0.05	0.01	

Assumptions

1. Basins 2 and 25 water quality treatment is based on dry detention. This assumes SFWMD would allow new impervious instead of total post impervious requirements based on I-95 express lanes project.
2. Basins 26, 27 and Newport is based on wet detention. This assumes SFWMD would allow new impervious instead of total post impervious requirements based on I-95 express lanes project.

HNTB

By:	BTM	7/16/2019				*FPID:*	436964-1-22-02
Checked By:	CK	7/17/2019	*Updated By:*	BTM	7/23/2019	*Job No.:*	65674
Back-Checked By:	BTM	7/22/2019	*Verified By:*	CK	7/24/2019	*Office No.:*	82

SMF:	2-1
BASIN:	2

Basin Type:	OPEN		SMF Location:	190+90
LT Basin Begin STA:	184+20		RT Basin Begin STA:	183+40
LT Basin End STA:	21+55		RT Basin End STA:	21+55

WEIGHTED CN CALCULATIONS

EXISTING

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		7.25	98	710
Pervious (Open Space: Poor Condition)	B	8.39	79	663
Water		0.00	100	0
	SUBTOTAL	15.64		**1373**
			TOTAL WEIGHTED CN =	**87.8**

PROPOSED

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		10.79	98	1057
Pervious (Open Space: Poor Condition)	B	4.85	79	383
Water		0.00	100	0
	SUBTOTAL	15.64		**1440**
			TOTAL WEIGHTED CN =	**92.1**

ESTIMATE OF PEAK ATTENUATION VOLUME P 17.00 in Based on 25-year/72-hour SFWMD Storm Event

	PRE	POST
Pot. Abstraction, S (in)	1.39	0.86
Runoff Depth, Q (in)	15.44	16.01
Runoff Volume, ac-ft	20.12	20.87
Attenuation Volume, ac-ft		**0.75**

HNTB

By:	BTM	7/16/2019				*FPID:*	436964-1-22-02
Checked By:	CK	7/17/2019	*Updated By:*	BTM	7/23/2019	*Job No.:*	65674
Back-Checked By:	BTM	7/22/2019	*Verified By:*	CK	7/24/2019	*Office No.:*	82

SMF:	25-2
BASIN:	25

Basin Type:	OPEN		SMF Location:	1355+00
LT Basin Begin STA:	1304+91		RT Basin Begin STA:	1304+91
LT Basin End STA:	1358+92		RT Basin End STA:	1365+98

WEIGHTED CN CALCULATIONS

EXISTING

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		27.39	98	2684
Pervious (Open Space: Poor Condition)	B	29.23	79	2310
Water		1.61	100	161
	SUBTOTAL	58.24		**5155**
			TOTAL WEIGHTED CN =	**88.5**

PROPOSED

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		39.13	98	3835
Pervious (Open Space: Poor Condition)	B	17.53	79	1385
Water		1.57	100	157
	SUBTOTAL	58.24		**5377**
			TOTAL WEIGHTED CN =	**92.3**

ESTIMATE OF PEAK ATTENUATION VOLUME P 17.00 in Based on 25-year/72-hour SFWMD Storm Event

	PRE	POST
Pot. Abstraction, S (in)	1.30	0.83
Runoff Depth, Q (in)	15.54	16.04
Runoff Volume, ac-ft	75.40	77.85
Attenuation Volume, ac-ft		**2.46**

HNTB							
	By:	BTM	7/16/2019			FPID:	436964-1-22-02
	Checked By:	CK	7/17/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF:	26-5
BASIN:	26

Basin Type:	OPEN		SMF Location:	1402+00
LT Basin Begin STA:	1358+88		RT Basin Begin STA:	1365+94
LT Basin End STA:	1411+29		RT Basin End STA:	1412+07

WEIGHTED CN CALCULATIONS

EXISTING

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		26.42	98	2589
Pervious (Open Space: Poor Condition)	B	38.24	79	3021
Water		0.83	100	83
	SUBTOTAL	65.49		**5693**
			TOTAL WEIGHTED CN =	**86.9**

PROPOSED

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		44.23	98	4335
Pervious (Open Space: Poor Condition)	B	15.76	79	1245
Water		5.49	100	549
	SUBTOTAL	65.49		**6129**
			TOTAL WEIGHTED CN =	**93.6**

ESTIMATE OF PEAK ATTENUATION VOLUME P 17.00 in Based on 25-year/72-hour SFWMD Storm Event

	PRE	POST
Pot. Abstraction, S (in)	1.50	0.68
Runoff Depth, Q (in)	15.32	16.21
Runoff Volume, ac-ft	83.60	88.44
Attenuation Volume, ac-ft		**4.83**

HNTB							
	By:	BTM	7/16/2019			FPID:	436964-1-22-02
	Checked By:	CK	7/17/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF:	27-3 and 27-5
BASIN:	27

Basin Type:	OPEN		SMF Location:	1415+00 and 1422+00
LT Basin Begin STA:	1410+27		RT Basin Begin STA:	1411+37
LT Basin End STA:	1446+50		RT Basin End STA:	1446+29

WEIGHTED CN CALCULATIONS

EXISTING

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		22.48	98	2203
Pervious (Open Space: Poor Condition)	B	36.22	79	2862
Water		3.98	100	398
	SUBTOTAL	62.69		**5463**
			TOTAL WEIGHTED CN =	**87.1**

PROPOSED

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		25.15	98	2465
Pervious (Open Space: Poor Condition)	B	27.57	79	2178
Water		9.97	100	997
	SUBTOTAL	62.69		**5640**
			TOTAL WEIGHTED CN =	**90.0**

ESTIMATE OF PEAK ATTENUATION VOLUME P 17.00 in Based on 25-year/72-hour SFWMD Storm Event

	PRE	POST
Pot. Abstraction, S (in)	1.47	1.12
Runoff Depth, Q (in)	15.35	15.73
Runoff Volume, ac-ft	80.19	82.18
Attenuation Volume, ac-ft		**1.99**

HNTB							
	By:	BTM	7/16/2019			FPID:	436964-1-22-02
	Checked By:	CK	7/17/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF:	N/A
BASIN:	Newport Offsite

Basin Type:	OPEN		SMF Location:	N/A
LT Basin Begin STA:	1332+50		RT Basin Begin STA:	N/A
LT Basin End STA:	1357+41		RT Basin End STA:	N/A

WEIGHTED CN CALCULATIONS

EXISTING

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		0.20	98	20
Pervious (Open Space: Poor Condition)	B	0.26	79	20
Commercial and Business Areas		112.22	95	10661
	SUBTOTAL	112.68		**10701**
			TOTAL WEIGHTED CN =	**95.0**

PROPOSED

LAND USE	SOILS	AREA (AC)	CN	PRODUCT
Impervious		0.26	98	25
Pervious (Open Space: Poor Condition)	B	0.20	79	16
Commercial and Business Areas		112.22	95	10661
	SUBTOTAL	112.68		**10702**
			TOTAL WEIGHTED CN =	**95.0**

ESTIMATE OF PEAK ATTENUATION VOLUME P 17.00 in Based on 25-year/72-hour SFWMD Storm Event

	PRE	POST
Pot. Abstraction, S (in)	0.53	0.53
Runoff Depth, Q (in)	16.38	16.38
Runoff Volume, ac-ft	153.82	153.83
Attenuation Volume, ac-ft		**0.01**

HNTB							
	By:	BTM	4/11/2018			FPID:	436964-1-22-01
	Checked By:	CK	7/15/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF-2-1 (DRY)

SMF:	2-1

POND DESIGN

SHW EL.:	6.50	ft **[BC Water Table Map]**
Treatment System:	DRY	
EL along RR and local road:	12.5	ft
Maint. Berm Width:	15.00	ft
Freeboard:	1.00	ft
Pond Side Slope (1:X):	4	
Maint. Berm Slope (1:X):	15	
Tie-Down Slope (1:X):	4	
LEOP EL:	11.2	ft
Distance to LEOP:	80	ft
Clearance to LEOP:	1.1	ft
Safety Factor:	5	%

	Stage (ft)	Inc. Depth (ft)	Total Depth (ft)	Area (ac)	Inc. Volume (ac-ft)	Total Volume (ac-ft)
Pond Bottom (Dry Pond)	7.50			0.85	0.00	0.00
Treatment Vol. EL. (Weir EL.)	9.00	1.50	1.50	1.03	1.41	1.41
Detention Vol. EL.	10.00	1.00	2.50	1.15	1.09	2.50
Bottom of Maintenance Berm (Freeboard)	11.00	1.00	3.50	1.28	1.22	3.72
Top of Maintenance Berm	12.00	1.00	4.50	1.76	1.52	
Tie Down (To Existing Ground EL.)				1.76		
			Toal Pond Area (With 5% Safety Factor):	**1.85**		

HNTB							
	By:	BTM	4/11/2018			FPID:	436964-1-22-01
	Checked By:	CK	7/15/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF-25-2 (DRY)

SMF:	25-2

POND DESIGN

SHW EL.:	7.60	ft **[I-95 Phase 3B-1]**
Treatment System:	DRY	
EL along S side:	15.7	ft
EL along NW side:	15.2	ft
EL along NE side:	16.5	ft
Maint. Berm Width:	15.00	ft
Freeboard:	1.00	ft
Pond Side Slope (1:X):	4	
Maint. Berm Slope (1:X):	15	
Tie-Down Slope (1:X):	4	
LEOP EL:	14.5	ft
Distance to LEOP:	800	ft
Clearance to LEOP:	1.7	ft
Safety Factor:	5	%

	Stage (ft)	Inc. Depth (ft)	Total Depth (ft)	Area (ac)	Inc. Volume (ac-ft)	Total Volume (ac-ft)
Pond Bottom (Dry Pond)	8.60			0.24	0.00	0.00
Treatment Vol. EL. (Weir EL.)	10.10	1.50	1.50	0.30	0.40	0.40
Detention Vol. EL.	12.00	1.90	3.40	0.39	0.66	1.06
Bottom of Maintenance Berm (Freeboard)	13.00	1.00	4.40	0.44	0.42	1.48
Top of Maintenance Berm	14.00	1.00	5.40	0.65	0.54	
Tie Down (To Existing Ground EL.)				0.73		
Toal Pond Area (With 5% Safety Factor):				**0.76**		

HNTB							
	By:	BTM	4/11/2018			FPID:	436964-1-22-01
	Checked By:	CK	7/15/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF-26-5 (WET)

SMF:	26-5

POND DESIGN

SHW EL.:	3.50	ft **[I-95 Phase 3B-1]**
Treatment System:	WET	
EL along S side:	15.0	ft
EL along NW side:	27.0	ft
EL along NE side:	11.5	ft
Maint. Berm Width:	15.00	ft
Freeboard:	1.00	ft
Pond Side Slope (1:X):	4	
Maint. Berm Slope (1:X):	15	
Tie-Down Slope (1:X):	4	
LEOP EL:	12.2	ft
Distance to LEOP:	1700	ft
Clearance to LEOP:	2.0	ft
Safety Factor:	5	%

	Stage (ft)	Inc. Depth (ft)	Total Depth (ft)	Area (ac)	Inc. Volume (ac-ft)	Total Volume (ac-ft)
SHW EL. (Wet Pond)	3.50			1.35	0.00	0.00
Treatment Vol. EL. (Weir EL.)	6.00	2.50	2.50	1.65	3.75	3.75
Detention Vol. EL.	8.50	2.50	5.00	1.96	4.52	8.27
Bottom of Maintenance Berm (Freeboard)	9.50	1.00	6.00	2.09	2.03	10.29
Top of Maintenance Berm	10.50	1.00	7.00	2.60	2.34	
Tie Down (To Existing Ground EL.)				2.81		
Toal Pond Area (With 5% Safety Factor):				**2.95**		

HNTB							
	By:	BTM	4/11/2018			FPID:	436964-1-22-01
	Checked By:	CK	7/15/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF-27-3 (WET)

SMF:	27-3

POND DESIGN

SHW EL.:	3.50	ft **[I-95 Phase 3B-1]**
Treatment System:	WET	
EL along W side:	25.5	ft
EL along S side:	12.0	ft
EL along E side:	11.6	ft
EL along N side:	10.3	ft
Maint. Berm Width:	15.00	ft
Freeboard:	1.00	ft
Pond Side Slope (1:X):	4	
Maint. Berm Slope (1:X):	15	
Tie-Down Slope (1:X):	4	
LEOP EL:	10.2	ft
Distance to LEOP:	2810	ft
Clearance to LEOP:	1.4	ft
Safety Factor:	5	%

	Stage (ft)	Inc. Depth (ft)	Total Depth (ft)	Area (ac)	Inc. Volume (ac-ft)	Total Volume (ac-ft)
SHW EL. (Wet Pond)	3.50			3.01	0.00	0.00
Treatment Vol. EL. (Weir EL.)	5.00	1.50	1.50	3.21	4.67	4.67
Detention Vol. EL.	6.00	1.00	2.50	3.34	3.27	7.94
Bottom of Maintenance Berm (Freeboard)	7.00	1.00	3.50	3.48	3.41	11.35
Top of Maintenance Berm	8.00	1.00	4.50	4.01	3.74	
Tie Down (To Existing Ground EL.)				4.30		
Toal Pond Area (With 5% Safety Factor):				**4.52**		

HNTB							
	By:	BTM	4/11/2018			FPID:	436964-1-22-01
	Checked By:	CK	7/15/2019	Updated By:	BTM 7/23/2019	Job No.:	65674
	Back-Checked By:	BTM	7/22/2019	Verified By:	CK 7/24/2019	Office No.:	82

SMF-27-5 (WET)

SMF:	27-5

POND DESIGN

SHW EL.:	3.50	ft **[I-95 Phase 3B-1]**
Treatment System:	WET	
EL along W side:	11.5	ft
EL along S side:	19.0	ft
EL along E side:	12.0	ft
Maint. Berm Width:	15.00	ft
Freeboard:	1.00	ft
Pond Side Slope (1:X):	4	
Maint. Berm Slope (1:X):	15	
Tie-Down Slope (1:X):	4	
LEOP EL:	11.5	ft
Distance to LEOP:	2100	ft
Clearance to LEOP:	1.9	ft
Safety Factor:	5	%

	Stage (ft)	Inc. Depth (ft)	Total Depth (ft)	Area (ac)	Inc. Volume (ac-ft)	Total Volume (ac-ft)
SHW EL. (Wet Pond)	3.50			2.14	0.00	0.00
Treatment Vol. EL. (Weir EL.)	4.50	1.00	1.00	2.28	2.21	2.21
Detention Vol. EL.	7.50	3.00	4.00	2.70	7.48	9.69
Bottom of Maintenance Berm (Freeboard)	8.50	1.00	5.00	2.85	2.78	12.47
Top of Maintenance Berm	9.50	1.00	6.00	3.42	3.13	
Tie Down (To Existing Ground EL.)				3.74		
Toal Pond Area (With 5% Safety Factor):				**3.92**		

APPENDIX C:

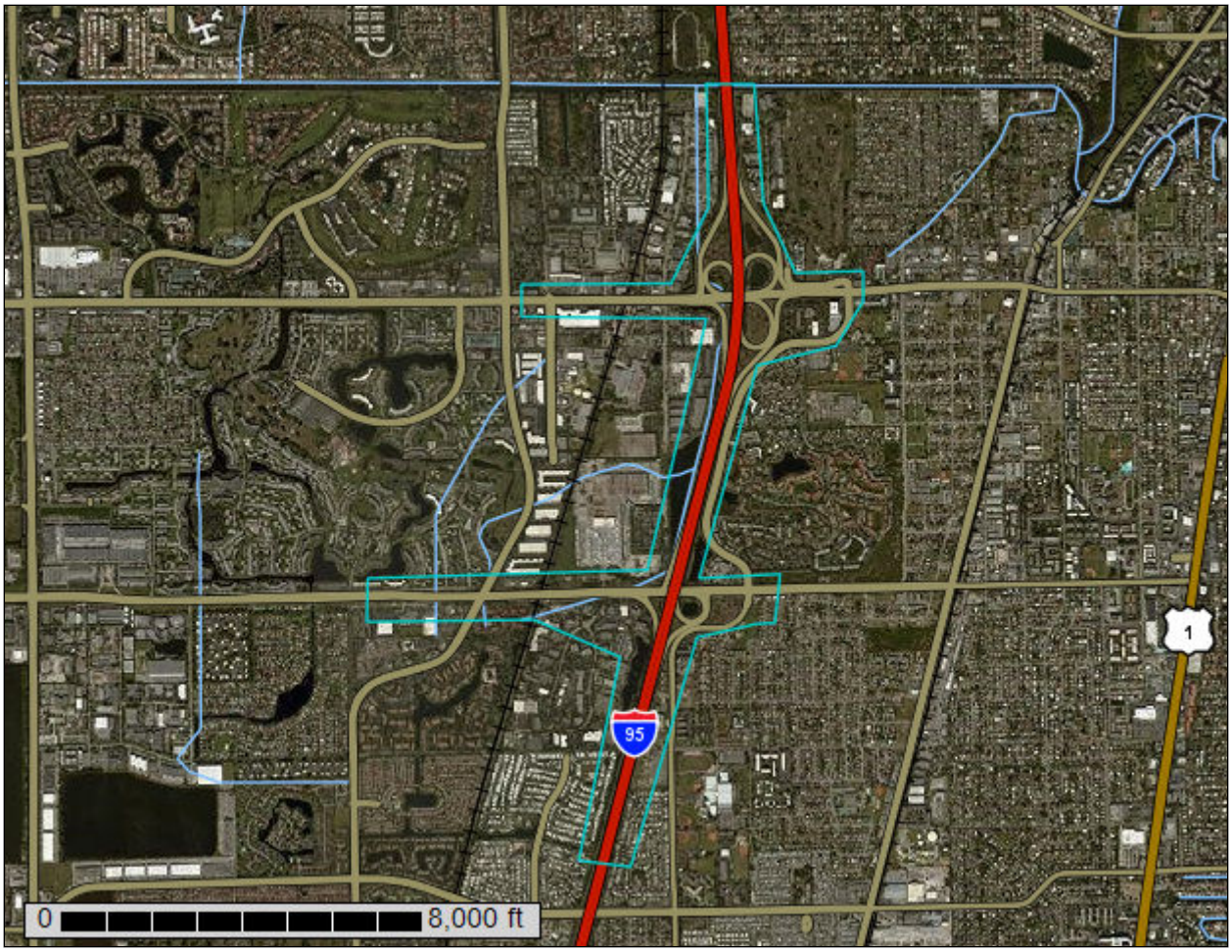
USDA Soil Report

United States Department of Agriculture

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 Palm Beach County Area, Florida



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.

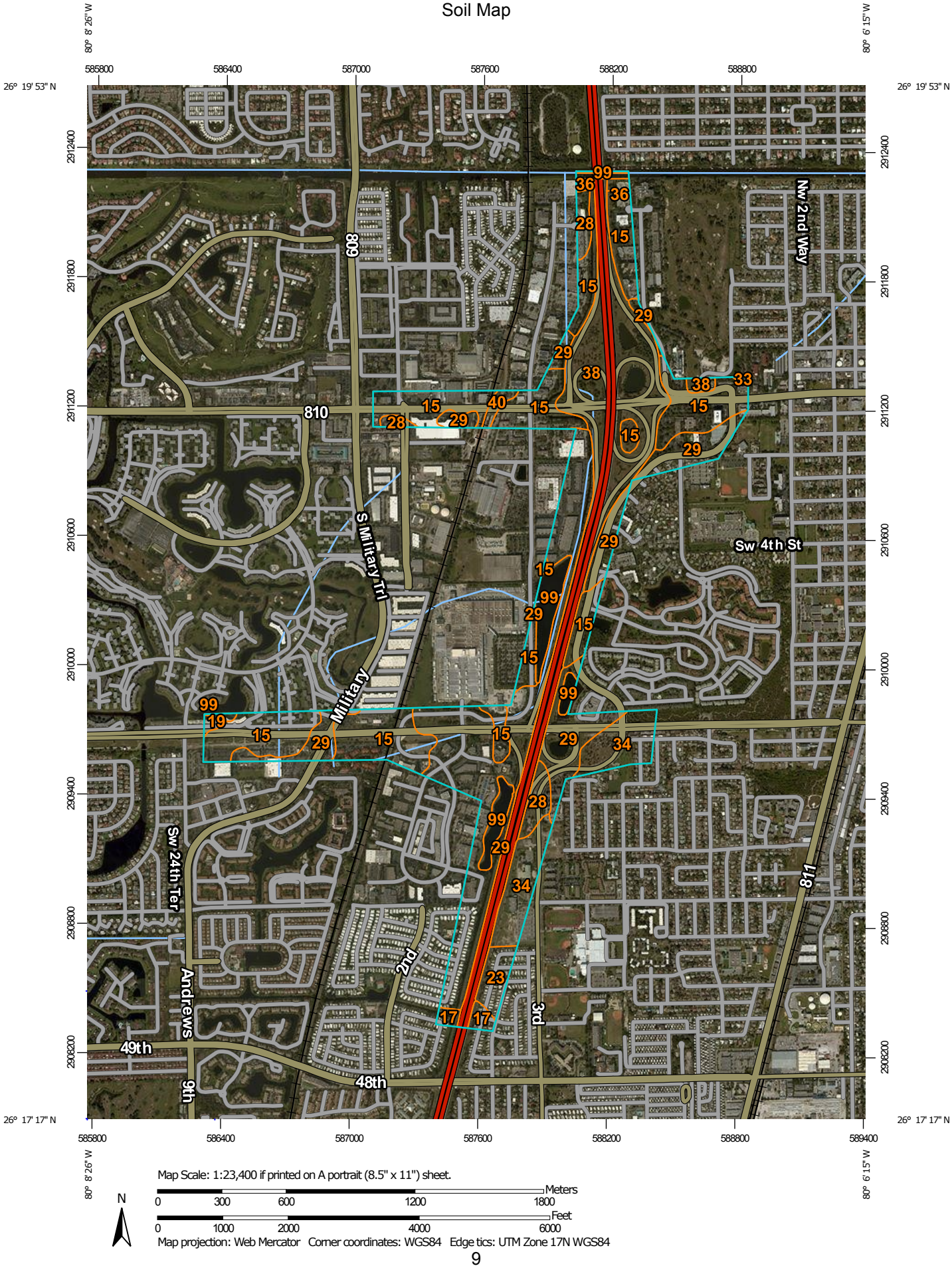
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 Scale: 1:23,400 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 300 600 1200 1800

Feet: 0 1000 2000 4000 6000

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

Soil Survey Area: Broward County, Florida, East Part
Survey Area Data: Version 14, Sep 17, 2018

Soil Survey Area: Palm Beach County Area, Florida
Survey Area Data: Version 14, Sep 17, 2018

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 17, 2014—Feb 11, 2015

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
15	Immokalee fine sand, 0 to 2 percent slopes	146.7	28.1%
17	Immokalee-Urban land complex	4.9	0.9%
19	Margate fine sand, occasionally ponded, 0 to 1 percent slopes	2.0	0.4%
23	Paola-Urban land complex	9.2	1.8%
28	Pomello fine sand, 0 to 2 percent slopes	13.4	2.6%
29	Pompano fine sand, 0 to 2 percent slopes	158.2	30.4%
33	Sanibel muck	0.4	0.1%
34	St. Lucie fine sand, 0 to 2 percent slopes	37.3	7.2%
36	Udorthents	2.5	0.5%
38	Udorthents, shaped	122.0	23.4%
40	Urban land, 0 to 2 percent slopes	2.7	0.5%
99	Water	21.5	4.1%
Subtotals for Soil Survey Area		**520.8**	**99.9%**
Totals for Area of Interest		**521.3**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
99	Water	0.5	0.1%
Subtotals for Soil Survey Area		**0.5**	**0.1%**
Totals for Area of Interest		**521.3**	**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

15—Immokalee fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2s3lk
Elevation: 0 to 130 feet
Mean annual precipitation: 44 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

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

Description of Immokalee

Setting

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

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
BC - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

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

Minor Components

Basinger

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Pomello

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: Sand Pine Scrub (R155XY001FL)
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Wabasso

Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Margate

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Placid

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces, depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

17—Immokalee-Urban land complex

Map Unit Setting

National map unit symbol: 1hn8x
Elevation: 10 to 100 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

Immokalee and similar soils: 45 percent
Urban land: 45 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Immokalee

Setting

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

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 35 inches: fine sand
Bh - 35 to 54 inches: fine sand
BC - 54 to 72 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

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

Forage suitability group: 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

Minor Components

Hallandale

Percent of map unit: 3 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Basinger

Percent of map unit: 3 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Margate

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Pompano

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
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: 60 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
Natural 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 in profile: 4 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Forage suitability group: 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
Other vegetative classification: Slough (R155XY011FL)
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
Hydric soil rating: No

Plantation
Percent of map unit: 5 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

23—Paola-Urban land complex

Map Unit Setting
National map unit symbol: 1hn93
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
Paola 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 Paola

Setting
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile
A - 0 to 4 inches: fine sand
E - 4 to 25 inches: fine sand
B/C - 25 to 80 inches: fine sand

Properties and qualities
Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Forage suitability group: 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

Minor Components

St. lucie

Percent of map unit: 3 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Pomello

Percent of map unit: 2 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

28—Pomello fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw1

Elevation: 0 to 110 feet
Mean annual precipitation: 42 to 60 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

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

Description of Pomello

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Sandy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 42 inches: fine sand
Bh - 42 to 54 inches: fine sand
B/C - 54 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: Sand Pine Scrub (R155XY001FL)
Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G155XB131FL)
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Minor Components

Duette

Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces

Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Immokalee

Percent of map unit: 5 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Jonathan

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread, rise
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Tavares

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces, hills on marine terraces, flatwoods on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope, interfluve, tread, rise
Down-slope shape: Linear, convex
Across-slope shape: Convex, linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL), Longleaf Pine-Turkey Oak Hills (R155XY002FL)
Hydric soil rating: No

29—Pompano fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzw3
Elevation: 0 to 100 feet
Mean annual precipitation: 44 to 65 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

Pompano and similar soils: 80 percent
Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pompano

Setting

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

Typical profile

A - 0 to 4 inches: fine sand
C - 4 to 80 inches: fine sand

Properties and qualities

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

Interpretive groups

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

Minor Components

Anclote

Percent of map unit: 4 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, convex
Across-slope shape: Concave, linear
Other vegetative classification: Freshwater Marshes and Ponds (R155XY010FL)
Hydric soil rating: Yes

Valkaria

Percent of map unit: 4 percent
Landform: Drainageways on flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear, concave

Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Malabar
Percent of map unit: 4 percent
Landform: — error in exists on —
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: Slough (R155XY011FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

Immokalee
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
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Myakka
Percent of map unit: 3 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)
Hydric soil rating: No

Riviera
Percent of map unit: 2 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: Slough (R155XY011FL)
Other vegetative classification: Slough (R155XY011FL)
Hydric soil rating: Yes

33—Sanibel muck

Map Unit Setting
National map unit symbol: 1hn9f
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

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

Description of Sanibel, Drained

Setting

Landform: Marshes on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Thin organic material over sandy marine deposits

Typical profile

Oa - 0 to 9 inches: muck
A - 9 to 10 inches: fine sand
C - 10 to 60 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural 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
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Forage suitability group: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Minor Components

Margate

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Dania

Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Dip

Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Lauderhill

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Plantation

Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Okeelanta

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

34—St. Lucie fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tzwr
Elevation: 0 to 130 feet
Mean annual precipitation: 46 to 68 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

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

Description of St. Lucie

Setting

Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Convex, linear
Across-slope shape: Linear

Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
C - 4 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on ridges and dunes of xeric uplands (G155XB111FL)
Hydric soil rating: No

Minor Components

Pomello

Percent of map unit: 5 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: Sand Pine Scrub (R155XY001FL)
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

Immokalee

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
Other vegetative classification: South Florida Flatwoods (R155XY003FL)
Hydric soil rating: No

Paola

Percent of map unit: 2 percent
Landform: Ridges on marine terraces, knolls on marine terraces
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Side slope, interfluve, riser
Down-slope shape: Linear, convex

Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
Hydric soil rating: No

36—Udorthents

Map Unit Setting

National map unit symbol: 1hn9j
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
Natural 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
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.3 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)
Hydric soil rating: No

38—Udorthents, shaped

Map Unit Setting

National map unit symbol: 1hn9l
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
Natural 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
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: 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)
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
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): Backslope, summit
Landform position (three-dimensional): Interfluve, side slope, riser, rise, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: No parent material

Typical profile

M - 0 to 6 inches: cemented material
^C - 6 to 36 inches: paragravelly sand
2Ab - 36 to 46 inches: paragravelly fine sand
2Cb - 46 to 80 inches: paragravelly fine sand

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

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
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): Side slope, interfluve, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
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): Side slope, interfluve, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sand Pine Scrub (R155XY001FL)
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)
Hydric soil rating: No

Boca

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)
Hydric soil rating: Yes

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)
Hydric soil rating: No

Hallandale

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)
Hydric soil rating: Yes

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: 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)
Hydric soil rating: No

Apopka

Percent of map unit: 1 percent
Landform: Hills on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Backslope, summit
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)
Hydric soil rating: No

99—Water

Map Unit Composition

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

Palm Beach County Area, Florida

99—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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APPENDIX D:

Permit Documents

documentation will be the proximity to sources of contaminants, drawdown impacts, and dewatering effluent discharge location(s).

- SFWMD Right-of-Way Occupancy Permit Modification is required for proposed work or improvements within the SFWMD Hillsboro Canal right-of-way. The existing Right-of-Way Occupancy Permit that will be modified is NGP MOD 6049 for encroachment of roadway/bridges along the Hillsboro Canal.

- **United States Army Corps of Engineers (USACE):** Due to unavoidable wetland, surface water, and/or foraging habitat impacts associated with the proposed roadway widening and required swale and pond expansions, a USACE Section 404 Dredge and Fill Permit will be required. This permit has been submitted and is currently under review. In addition, per SFWMD, a USACE Section 408 Approval is not required for the Hillsboro Canal.

- **United States Coast Guard (USCG)** The Coast Guard approves the location and plans of bridges and causeways and imposes any necessary conditions relating to the construction, maintenance, and operation of these bridges in the interest of public navigation. A bridge permit is the written approval of the location and plans of the bridge or causeway to be constructed or modified across a navigable waterway of the United States. Any individual, partnership, corporation, local, state, or federal legislative body, agency, or authority planning to construct or modify a bridge or causeway across a navigable waterway of the U.S. must apply for a Coast Guard bridge permit in accordance with 33 CFR 115.50. A USCG permit has been issued (Permit No. 3-17-7) and modifications are not anticipated as a result of the alignment shift since the vertical / horizontal clearances are not expected to change.

- **Broward County Environmental Protection and Growth Management Department (BCEPGMD):** The project improvements are located within the boundaries of Broward County Water Control District #3 and #4. However, since the State of Florida is exempt from local permitting requirements for projects on the State Highway System (SHS), the regulations of SFWMD and USACE will govern the stormwater and natural resources criteria for the project. Coordination with BCEPGMD during the design-build process will ensure that the proposed improvements address any major design concerns.

5.0 DRAINAGE SYSTEM 25

5.1 Overview

The I-95 Express Phase 3B-1 project begins with System 25 which is defined as the segment of the I-95 corridor from Sample Road extending north to SW 10th Street. The system is located within the SFWMD Pompano Canal Drainage Basin. Refer to **Appendix H** for the SFWMD Drainage Basin Map. The total basin area is approximately 80.51 acres. This drainage basin falls within the limits of two design build projects:

- The I-95 Express Lanes Phase 3A-2: This project is under construction. The ERP package was submitted by Parsons Brinckerhoff|WSP and approved by SFWMD on December 1, 2016 (Permit No. 06-01465-S). Based on the approved ERP, System 25 is defined as the segment of the I-95 corridor from Sample Road (Station 2641+00) extending north to just south of SW 10th Street (Station 2711+20). The total basin drainage area within the project limits for System 25 is approximately 47.30 acres, 30.94 impervious acres and 16.36 pervious acres. The stormwater

runoff will be collected and conveyed via closed storm drain system to the proposed SMFs for water quality treatment and attenuation. Drainage basins are depicted in **Appendices F and G**.

- The I-95 Express Lanes Phase 3B-1, Segment 1 project: System 25 within the project limits extends along I-95 from south of SW 10th Street (Station 2711+20) to SW 10th Street (Station 2750+92). The total basin drainage area within the project limits for System 25 is approximately 33.21 acres, consisting of 16.60 impervious acres, 14.65 pervious acres and 1.96 acres of water surface area.

For System 25, the roadway work will consist of milling and resurfacing only. The existing drainage features will not be impacted and therefore shall remain as is.

5.2 Seasonal High Groundwater Table and Tailwater Elevations

The SHGWT elevation and static tailwater elevation for the C-1 Canal used for the analysis, modeling, and design associated with the Conceptual Permit ERP No. 06-01465-S is 3.92 feet NAVD88. This assumption is in accordance with previous permitting documentation and designs. Based on field investigation and discussions with the Broward County Water Management District, the SHGWT was revised to 7.60 feet NAVD88. Refer to **Appendix C** for correspondence and validation of this SHGWT.

5.3 Floodplain

The study limits include areas within FEMA floodplain designations AE and AH. Zones AE and AH designates areas inundated by the 100-year floodplain. For specific information, see FIRM 12011C0186H and FEMA Floodplain Map included in **Appendix D** of this report. The Zone AE 100-year flood elevation identified is 13.00 feet NAVD88. The Zone AH 100-year flood elevation identified is 15.00 feet NAVD88. This limiting flood elevation applies to System 25.

5.4 Pre-Development Conditions Stormwater Management System

5.4.1 General Pre-Development Drainage Conditions

The existing drainage facilities within this section of the corridor include dry detention ponds and swales/ditches with discharge to the Broward County C-1 Canal without treatment being provided. The runoff from southbound lanes between NW 48th Street and SW 10th Street discharges directly to the C-1 Canal without the use of control structures. Runoff from the median is collected by barrier wall inlets and conveyed via existing pipes to the roadside swales along the corridor. Runoff from the northbound lanes is collected by the existing inlet and pipe system and discharges to the C-1 Canal without any prior treatment. Refer to **Appendix F** for the Pre-Development Drainage Maps.

5.4.2 Modeling Results

The flood routing results for all simulated design storm events are summarized in the Drainage System Summary Tables included in **Appendix I**. lCPR model results are also included in **Appendix I**.

5.5 Post-Development Conditions Stormwater Management System

5.5.1 General Post-Development Drainage Conditions

The project improvements within the limits of System 25 include milling and resurfacing. No additional impervious area is proposed within this system and existing drainage patterns will remain unchanged. Therefore, water quality treatment discharge attenuation prior to outfall into the C-1 Canal is not required. Refer to **Appendix I** for water quality treatment summary and supplemental water quality calculations.

The total post-development basin drainage area within the project limits for System 25 remains unchanged from pre-development conditions. Basin 25 consists of 33.21 acres, consisting of 16.60 impervious acres, 14.65 pervious acres and 1.96 acres of water surface area. Refer to **Appendix G** for the Post-Development Drainage Maps.

5.5.2 Post-Development Revisions to Conceptual Drainage Design

Modifications are required to the SMFs that were proposed in the Phase 3A-2 conceptual drainage report because of the revised project scope and limits. The Phase 3B-1 limits were revised to include approximately 4,350 feet north of NE 48th Street to SW 10th Street which had been eliminated from Phase 3A-2. In addition, the conceptual drainage report considered roadway improvements for the ultimate condition which includes converting the existing HOV lanes to Managed Lanes and widening. The Phase 3B-1 within Basin 25 includes only milling and resurfacing the existing lanes with no additional impervious area. The proposed design changes are noted below:

- Pond 25-4, Pond 25-5, Pond 25-6, Pond 25-7 and Swale 25-4 as shown in the Phase 3A conceptual ERP were eliminated because of the revised project limits. These areas will remain in existing conditions.

5.5.3 Summary of Results

The portion of System 25 that falls within the Phase 3B-1 project limits will remain as is in proposed conditions. Proposed roadway work includes milling and resurfacing without impacts to the existing drainage features. No additional impervious area will be added within the limits of System 25. Therefore, water quality and water quantity permit criteria is not required.

6.0 DRAINAGE SYSTEM 26

6.1 Overview

System 26 is defined as the segment of the I-95 corridor from north of SW 10th Street to the Hillsboro Boulevard Interchange. The existing system consists of multiple linear dry detention swales along the east side of I-95 and dry detention ponds within the infield areas south of Hillsboro Boulevard. The system ultimately discharges to the C-1 Canal via several existing outfall structures. The system is located within the Hillsboro Drainage Basin. Refer to **Appendix H** for the SFWMD Drainage Basin Map. System 26 serves a total onsite area of 57.06 acres, 27.02 acres of which is impervious area and 30.04 acres of which is pervious area.

For System 26, the existing dry detention swales along southbound I-95 were recently modified to accommodate widening of the corridor as part of the SR 9/I-95 Interchange Operational Improvement Project at SW 10th Street, ERP No. 88-00040-S. The project improvements within the limits of System 26 include milling and resurfacing the existing lanes of I-95 with the addition of approximately 3,000 feet of a 10-foot wide shoulder. This equates to 0.69 acres of additional impervious area. Two new roadside retention swales on the east side of northbound I-95 (from Station 2752+90 to approximately Station 3022+17) will be used to provide water quality treatment and water quantity discharge attenuation in accordance with SFWMD criteria. In addition, these new swales will be constructed to provide proposed ground elevation for the construction of the 22-foot tall ground mounted Noise Wall No.1.

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 SFWMD 25-year/72-hour and FDOT 100-year/24-hour design storm events and maintain or reduce pre-development discharges to offsite waterbodies.

6.2 Seasonal High Groundwater Table and Tailwater Elevations

The SHGWT was determined to be at El. 3.43 feet NAVD (5.00 feet NGVD) based on previous permits documentation and as-built plans. The Average Wet Season Water Table Map provided by the Broward County Office of Environmental Services Water Management Division was also considered.

Tailwater elevation is based on the Broward County Water Management Division data provided and confirmed on the SFWMD Permit 88-00040—S, Application No. 150507-14 (2014) Drainage Report, the control water elevation of the C-1 Canal is 8.00 feet NGVD (6.43 feet NAVD).

6.3 Floodplain

The study limits include areas within FEMA floodplain Zone AE adjacent to I-95 corridor. Zone AE designates flood hazard areas inundated by the 100-year flood. For specific information about the Flood Insurance Rate Maps (FIRMs) see FIRM 12011C0186 H and 12011C0178 H included in **Appendix D** of this report. The Zone AE 100-year flood elevation identified between 11 and 13 feet NAVD. This limiting flood elevation applies to System 26.

6.4 Pre-Development Conditions Stormwater Management System

6.4.1 General Pre-Development Drainage Conditions

System 26 is located within the SFWMD Hillsboro Canal Basin. Refer to **Appendix H** for the SFWMD Drainage Basin Map. Within the southwestern section of the system along SW 10th Street, the existing storm water management consists of conventional storm drains used to convey runoff toward a linear dry detention swale prior to discharging to the C-1 Canal without providing any water quality treatment.

Along the southbound section of I-95 within System 26, runoff from the bridge portion of the SW 10th Street off-ramp and the southbound I-95 ramp entrance is conveyed via scuppers and sheet flow to a linear dry detention swale. An existing control structure provides treatment prior to directly discharging to the C-1 Canal via a 15-inch pipe. Stormwater from the bridge approach to the SW 10th Street off-ramp, the gore area and a portion of southbound I-95 is conveyed to an existing linear dry detention swale via

gutter inlets and concrete flumes. An existing control structure provides treatment prior to discharge to the C-1 Canal via a 15-inch pipe. The remaining portion of southbound I-95 prior to the Hillsboro Boulevard on-ramp conveys stormwater through a combination of gutter inlets and concrete flumes to an existing dry detention swale. A wall along the western border separates the existing swale from the C-1 Canal. Two existing concrete ditch blocks with V-notch bleeders provide treatment and control attenuation prior to discharge into the C-1 Canal.

Runoff from the northbound lanes sheet flows into a roadside swale east of the road and discharges into the C-1 Canal via an existing double 66-inch cross drain approximately 2,260 feet north of SW 10th Street. Based on the as-built plans for Project 86070-3474 (1988), there is a ditch block located before the east end of the cross drain. However, there are no permitted water treatment facilities in this specific section. Based on a field review, no ditch block was found within the swale. Therefore, discharge into the canal appears to occur without providing any water quality treatment. The double 66-inch cross drain also connects the off-site storm sewer system along Natura Boulevard to the C-1 Canal. Runoff from the inside lanes is collected by barrier wall inlets and discharged through median drains along the system.

South of the Hillsboro Boulevard Interchange, runoff from the main corridor and from the ramps is conveyed using a conventional storm drainage system and discharged into two interconnected dry detention ponds in the east infield area and into a third dry pond located between the mainline and the southbound on-ramp from Hillsboro Boulevard. Referenced as-built plans show a ditch block within the dry pond located at the southeast section of the Hillsboro Boulevard Interchange. However, within this section of the system, no permitted control structure was found. There are no SFWMD permits available in the segment of the I-95 corridor within System 26, and no control is currently visible within any infield area of the interchange.

All three ponds ultimately discharge into the C-1 Canal via an existing 48-inch pipe. No permitted allowable discharge has been found except for the SFWMD Permit 88-00040—S, Application No. 150507-14 (2014) where the peak discharge provided includes only the sub-basin corresponding to the southbound of the corridor and the southbound off-ramp to SW 10th Street. Therefore, for System 26, the pre-development model will be utilized to establish the pre-development peak discharge rates.

Refer to **Appendix F** for the Pre-Development Drainage Maps.

6.4.2 Modeling Results

The flood routing results for all simulated design storm events are summarized in the Drainage System Summary Tables included in **Appendix J**. AdICPR model results are also included in **Appendix J**.

6.5 Post-Development Conditions Stormwater Management System

6.5.1 General Post-Development Drainage Conditions

The total post development basin drainage area for System 26 is approximately 57.06 acres, 27.02 impervious acres and 30.04 pervious acres. Refer to **Appendix G** for the Post-Development Drainage Maps.

The proposed roadway work within System 26 consists of milling and resurfacing of existing I-95 lanes with the addition of approximately 3,000 feet of 10-foot shoulder and the construction of a proposed noise wall adjacent to the right-of-way on the east side of I-95. Two new roadside retention swales along the east side of northbound I-95 (Ditch 26-3 and Ditch 26-3A) will be constructed with the purpose of providing the berm elevation as shown in the conceptual permit to accommodate the installation of the 22-foot tall ground mounted Noise Wall No.1. These new swales will also be utilized to provide water quality treatment and water quantity discharge attenuation in accordance with SFWMD criteria but are not intended to accommodate ultimate conditions.

The existing stormwater management system along southbound I-95 was recently modified as part of the I-95 Operational Improvements at SW 10th Street Interchange project (FPID 430932-1-52-01) ERP No. 88-00040-S and will remain unchanged in Post-Development conditions.

The existing interconnections between ponds and swales will remain the same as pre-development conditions with additions and modifications to enhance conveyance and equalization. The swales will provide stormwater collection and conveyance, water quality treatment and discharge attenuation prior to outfall into the C-1 Canal. The proposed SMFs will provide water quality treatment volume and limit the peak discharge rate into the C-1 Canal to the pre-development peak discharge rate.

Please refer to the Post-Development Land-Use Table included in **Appendix J** for curve number calculations and area breakdowns.

6.5.2 Post-Development Revisions to Conceptual Drainage Design

Modifications are required to the SMFs that were proposed in the conceptual drainage report due to several factors described below:

- The existing conceptual ERP (ERP No. 06-01465-S) includes the construction of the storm water management system for the ultimate condition which involves the conversion of existing HOV lanes to HOT lanes and widening to accommodate one additional HOT lane in each direction. The scope of the current Phase 3B-1 for Basin 26 only includes milling and resurfacing along existing I-95 lanes with the addition of approximately 3,000 feet of 10-foot shoulder and the construction of a proposed noise wall adjacent to the right-of-way on the east side of I-95. Therefore, only two roadside retention swales on the east side along northbound I-95 (from Station 2752+90 to approximate Station 3022+17) will be used to provide water quality treatment and water quantity discharge attenuation in accordance with SFWMD criteria.
- Within the limits of System 26, a separate FDOT project along southbound I-95 is under construction. This project, referred to as the I-95 Operational Improvements at SW 10th Street Interchange project (FPID 430932-1-52-01), involved the widening of the southbound lanes of I-95 and the southbound off-ramp to SW 10th Street. These improvements were permitted under ERP No. 88-00040-S. During the permitting phase of the 3B conceptual drainage design, these improvements were reflected in the Post-Development conditions. These improvements have since been constructed following the approval of the conceptual ERP. The proposed design changes are noted below:

- Updated pre-development conditions to account for the recently constructed SMFs and control structures that resulted from the completion of the I-95 Operational Improvements at SW 10th Street Interchange project.
- Renamed the following SMFs to reflect that these are now existing conditions:
  - PrDitch 26-1 to ExDitch 26-1
  - PrDitch 26-2 to ExDitch 26-2
  - PrDitch 26-4 to ExDitch 26-4
- PrDitch 26-3 located along northbound I-95 was renamed and reconfigured into Ditch 26-3 and Ditch 26-3A due to impacts from the proposed noise wall construction.

6.6 Summary of Results

The proposed System 26 SMFs concept meets SFWMD water quality and water quantity permit criteria. The main drainage and permitting issues, conclusions, and/or recommendations are summarized as follows:

- The proposed drainage design for System 26 meets both the water quality and water quantity requirements set by the SFWMD. System 26 will provide 9.56 acre-feet of water quality treatment volume within the dry detention ponds and swales. The required water quality treatment volume for System 26 is 6.33 acre-feet. Therefore, a surplus of 3.23 acre-feet of water quality treatment volume is provided within the proposed stormwater management system.
- ICPR flood routing results indicate that pre- versus post-development peak discharge criteria is met with the proposed stormwater management facilities.

  The pre-development peak discharge rate from System 26 into the C-1 Canal for the 25-year/72-hour design storm event is 276.44 cfs and the post-development peak discharge rate from System 26 is 247.03 cfs. Therefore, the total 25-year/72-hour pre-development discharge is reduced by 29.41 cfs.
- The proposed SMFs will contain the SFWMD 25-year/72-hour design storm event without overtopping the berms.

7.0 DRAINAGE SYSTEM 27

7.1 Overview

System 27 is defined as the segment of the I-95 corridor from Hillsboro Boulevard to the Hillsboro Canal. The existing system consists of linear dry detention swales along the east side of I-95 and dry and wet detention ponds within the infield areas north of Hillsboro Boulevard. The system ultimately discharges to the C-1 Canal via several existing outfall structures. The system is located within the Hillsboro Drainage Basin. Refer to **Appendix H** for the SFWMD Drainage Basin Map. System 27 serves a proposed total onsite area of 59.96 acres, 21.58 acres of which is paved impervious area, 4.50 acres of which is water surface area, and 33.89 acres of which is pervious area.

For System 27, the existing dry detention swales on the west side will be modified to accommodate the new widening of the corridor and complemented with new roadside swales on the east side 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 SFWMD 25-year/72-hour and FDOT 100-year/24-hour design storm events and maintain or reduce pre-development discharges to offsite waterbodies.

7.2 Seasonal High Groundwater Table and Tailwater Elevations

The SHGWT was determined to be at El. 3.43 feet NAVD (5.00 feet NGVD) based on previous permits documentation and as-built plans as well as on the Average Wet Season Water Table Map provided by the Broward County Office of Environmental Services Water Management Division.

The tailwater elevation is based on the Broward County Water Management Division data provided and confirmed on the SFWMD Permit 88-00040—S, Application No. 150507-14 (2014) Drainage Report, the control water elevation of the C-1 Canal is 8.00 feet NGVD (6.43 feet NAVD).

7.3 Floodplain

The study limits include areas within FEMA floodplain Zone AE adjacent to I-95 corridor. Zone AE designates flood hazard areas inundated by the 100-year flood. For specific information about the Flood Insurance Rate maps (FIRMs) see 12011C0178 H included in **Appendix D** of this report. The Zone AE 100-year flood elevation identified between 12.0 and 13.0 feet NAVD. This limiting flood elevation applies to System 27.

7.4 Pre-Development Conditions Stormwater Management System

7.4.1 General Pre-Development Drainage Conditions

System 27 is located within the SFWMD Hillsboro Canal Basin. Refer to **Appendix H** for the SFWMD Drainage Basin Map. Based on As-built Plans for Project 86070-3474, in the area north of Hillsboro Boulevard Interchange, and within the infield areas, there are four detention ponds that collect stormwater runoff from the interchange section. Plans show that two of the ponds located within the northwest quadrant of the interchange are dry ponds and interconnected with a 36-inch equalizer pipe with a ditch block located upstream of the connecting pipe. Plans also show a second ditch block near the I-95 mainline. However, no ditch blocks were found during field inspections or by examination of aerials of the project area. Discharge into the C-1 Canal from the ponds within this quadrant occurs via a 42-inch concrete pipe that crosses the southbound off-ramp from I-95. Due to the lack of control structures/ditch blocks, it appears no water quality treatment is provided within the ponds.

The remaining two ponds are interconnected wet ponds located within the infield areas in the northeast quadrant of the interchange. The northern pond has a ditch block shown on the as-built plan, but, similar to the west side ponds, the ditch block could not be found during field visits. Furthermore, aerials and topographic information do not show a consistent retention area adjacent to this structure, nor has a permitted water quality volume been documented. The second wet pond is connected to a swale/ditch to the east, adjacent to corridor mainline. Runoff from this ditch ultimately discharges into the C-1 Canal via a 72-inch cross drain located approximately 830 feet south of the Hillsboro Canal. South of this pond, as-built show an existing 54-inch pipe; however, based on further research of additional documentation, review of aerials and field inspection, the pipe does not appear to be connected to the pond, or conveying

runoff from any offsite area. Runoff from Hillsboro Boulevard, east of I-95, appears to flow eastward and is not interconnected with the I-95 corridor drainage system.

As-built plans show a ditch block located at the east end of the 72-inch cross drain, where field inspection only found an eroded ditch that currently conveys runoff into the cross drain and into the C-1 Canal.

The runoff from within the median of I-95 south of Hillsboro appears to be conveyed via a series of barrier wall inlets and 18-inch pipes and subsequently is discharged into the C-1 Canal without any water quality treatment.

From the southbound lanes, north of the southbound I-95 off-ramp to Hillsboro Boulevard, runoff sheet flows to the west area and discharges directly into the C-1 Canal also without any apparent water quality treatment.

No SFWMD permit was found within the limits of this system. No permitted allowable discharge to the C-1 Canal has been found. Therefore, for System 27, the pre-development model will be utilized to establish the pre-development peak discharge rates. Refer to **Appendix F** for the Pre-Development Drainage Maps.

7.4.2 Modeling Results

The flood routing results for all simulated design storm events are summarized in the Drainage System Summary Tables included in **Appendix K**. AdlCPR model results are also included in **Appendix K**.

7.5 Post-Development Conditions Stormwater Management System

7.5.1 General Post-Development Drainage Conditions

The proposed System 27 extends along I-95 from Station 3027+38 (Hillsboro Blvd) to Station 3062+60 (Hillsboro Canal). System 27 falls within the limits of Segment 1 (from Station 3027+38 to Station 3034+00) and Segment 2 (from Station 3034+00 to Station 3062+60). The Segment 1 portion of the roadway construction consists of milling and resurfacing with no additional impervious area. Segment 2 will include the widening of I-95.

The total post development basin drainage area for System 27, including Segment 2 roadway improvements, is approximately 59.96 acres. This consists of 21.58 impervious acres, 4.50 acres of onsite surface water and 33.89 pervious acres. Refer to **Appendix G** for the Post-Development Drainage Maps.

The proposed SMFs have been designed to include the roadway improvements for Segment 1 and Segment 2. The stormwater runoff will be collected and conveyed by an existing and proposed closed storm drain system to the proposed SMFs for water quality treatment and attenuation. The proposed SMFs will consist of dry detention, dry retention and wet detention ponds. The control structures will consist of raised inlets with V-notch and orifice bleeders with piped outfalls to the C-1 Canal. The existing interconnections between ponds and swales will mimic that of pre-development conditions. The swales will provide stormwater collection and conveyance, water quality treatment and discharge attenuation prior to outfall into the C-1 Canal. The required treatment volume is 5.84 acre-feet and the provided treatment volume is 32.44 acre-feet.

Runoff from the inside lanes of I-95 will be collected via barrier wall inlets and discharged into median drains along the system. West of the corridor, runoff from the outside lanes will sheet flow to the west areas in some portions, and be collected with barrier wall inlets where retaining wall is proposed, and conveyed to ultimately discharge into the C-1 Canal. The boundary condition tailwater elevation for this system will be the same tailwater elevation used in the pre-development condition.

Please refer to the Post-Development Land-Use Table included in **Appendix K** for curve number calculations and area breakdowns.

7.5.2 Post-Development Revisions to Conceptual Drainage Design

Modifications are required to the stormwater management facilities that were proposed in the conceptual drainage report due to impacts from the roadway design. Phase 3B-1 is split into Segment 1 and Segment 2 at Station 3034+00. This split occurs within System 27. The Segment 1 portion of the roadway construction consists of milling and resurfacing with no additional impervious area. Segment 2 will include the widening of I-95. For design purposes, the SMFs reflected in System 27 for Segment 1 will be modeled to account for the additional impervious area in Segment 2. The proposed design changes are noted below:

- Reconfigured PrDitch 27-1 along southbound off-ramp to Hillsboro Boulevard due to roadway design changes.
- Reconfigured PrPond 27-6 adjacent to northbound I-95 and northbound on-ramp to preserve existing landscape features.
- Reconfigured PrDitch 27-41 along northbound on-ramp from Hillsboro Boulevard due to roadway design changes.

7.6 Summary of Results

The proposed System 27 SMFs concept meets SFWMD water quality and water quantity permit criteria. The main drainage and permitting issues, conclusions, and/or recommendations are summarized as follows:

- The drainage design for System 27 meets both the water quality and water quantity requirements set by the SFWMD. System 27 will provide 32.44 acre-feet of water quality treatment volume within the dry/wet detention ponds and roadside ditches. The required water quality treatment volume for System 27 is 5.84 acre-feet. Therefore, a surplus of 26.60 acre-feet of water quality treatment volume is provided within the proposed stormwater management system.

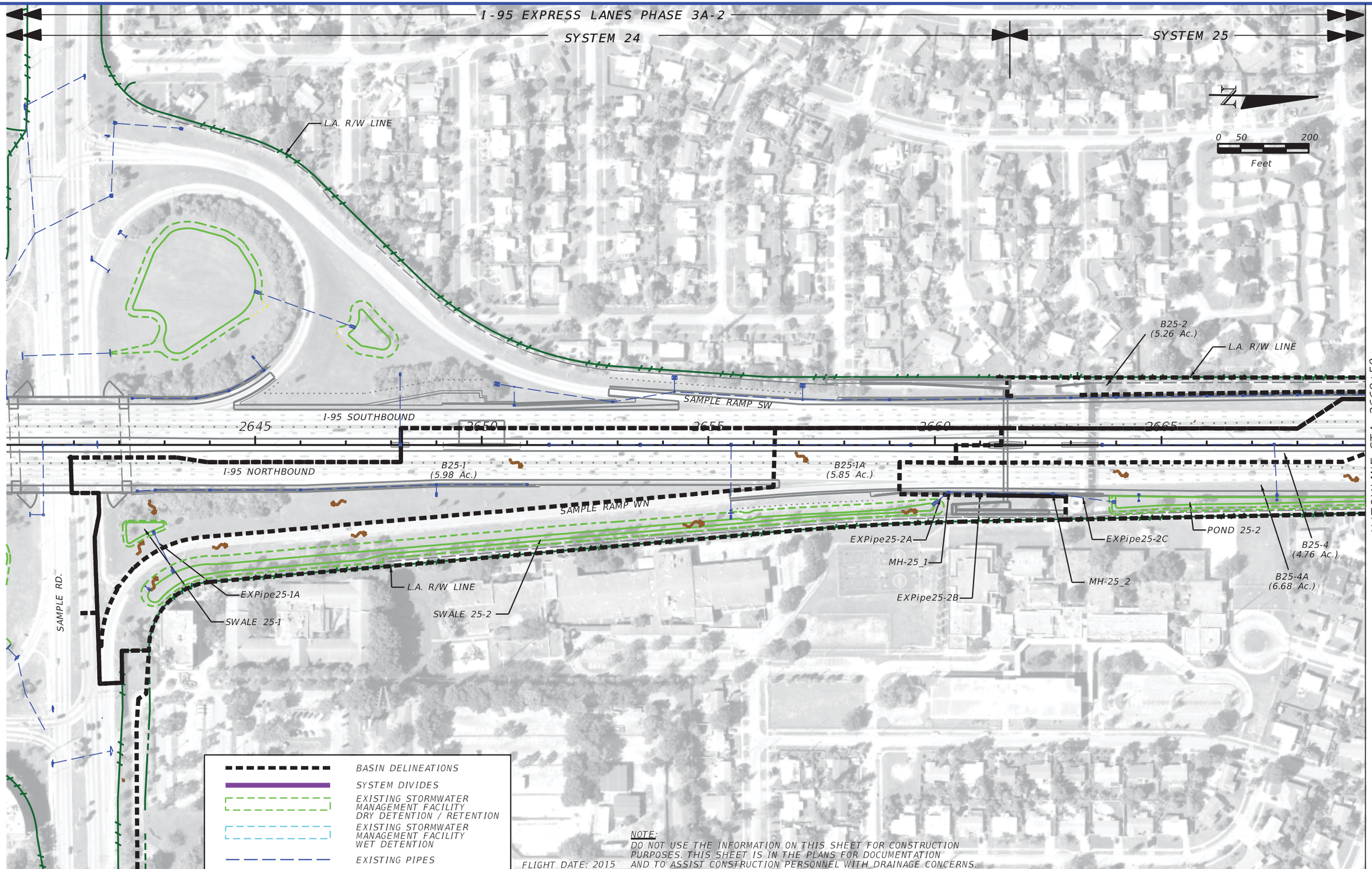
- ICPR flood routing results indicate that pre- versus post-development peak discharge criteria is met with the proposed stormwater management facilities.

  The pre-development peak discharge rate from System 27 into the C-1 Canal for the 25-year/72-hour design storm event is 223.95 cfs and the post-development peak discharge rate from System 27 is 118.45 cfs. Therefore, the total 25-year/72-hour pre-development discharge is reduced by 105.50 cfs.

- The proposed SMFs will contain the SFWMD 25-year/72-hour design storm event without overtopping the berms.

Appendix F

Pre-Development Drainage Maps



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

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX F-1		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

EXHIBIT 1

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

PRE-DEVELOPMENT DRAINAGE MAP (1)

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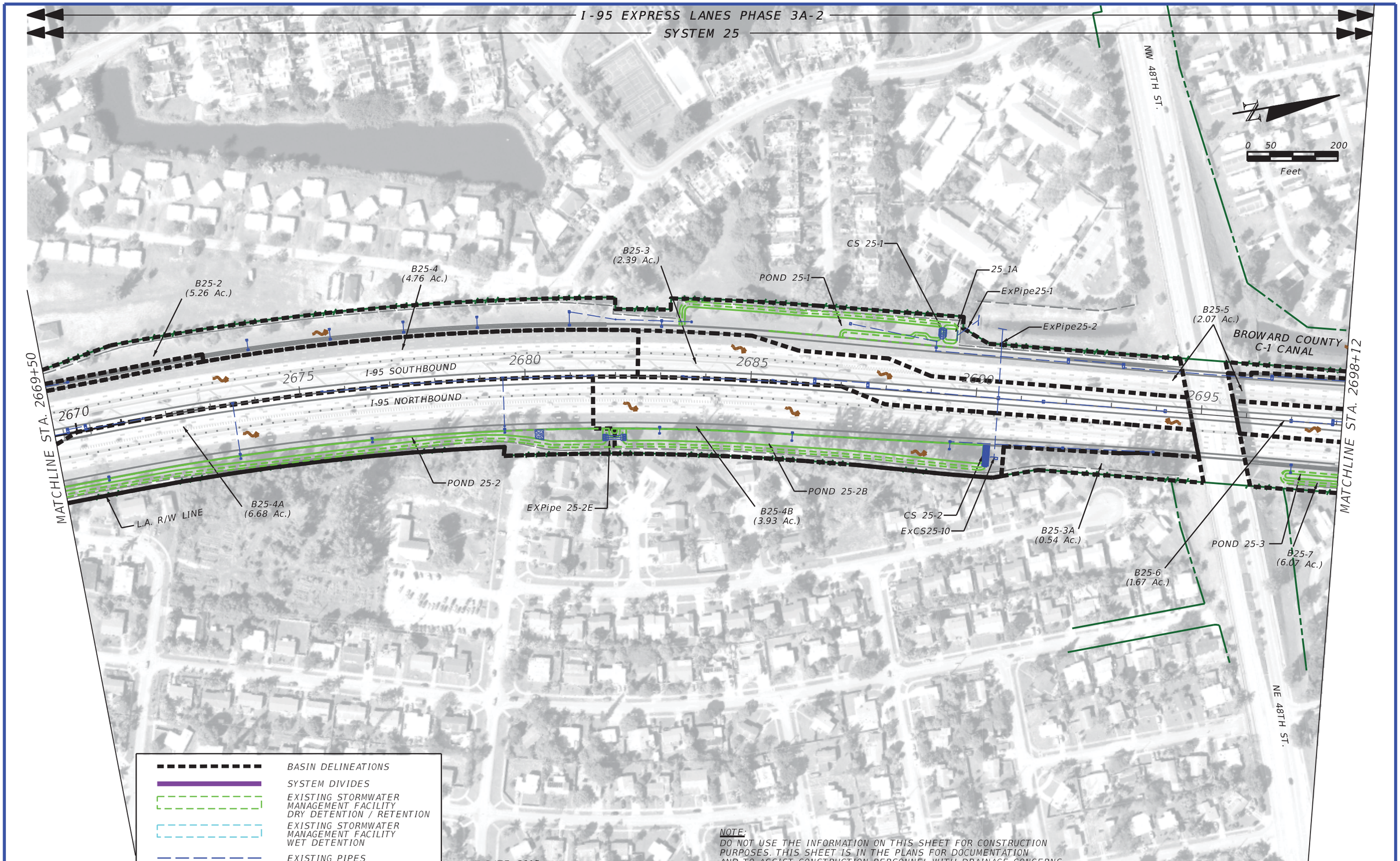

NOTE:
DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX F-2		

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EXHIBIT 1

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

PRE-DEVELOPMENT DRAINAGE MAP (2)

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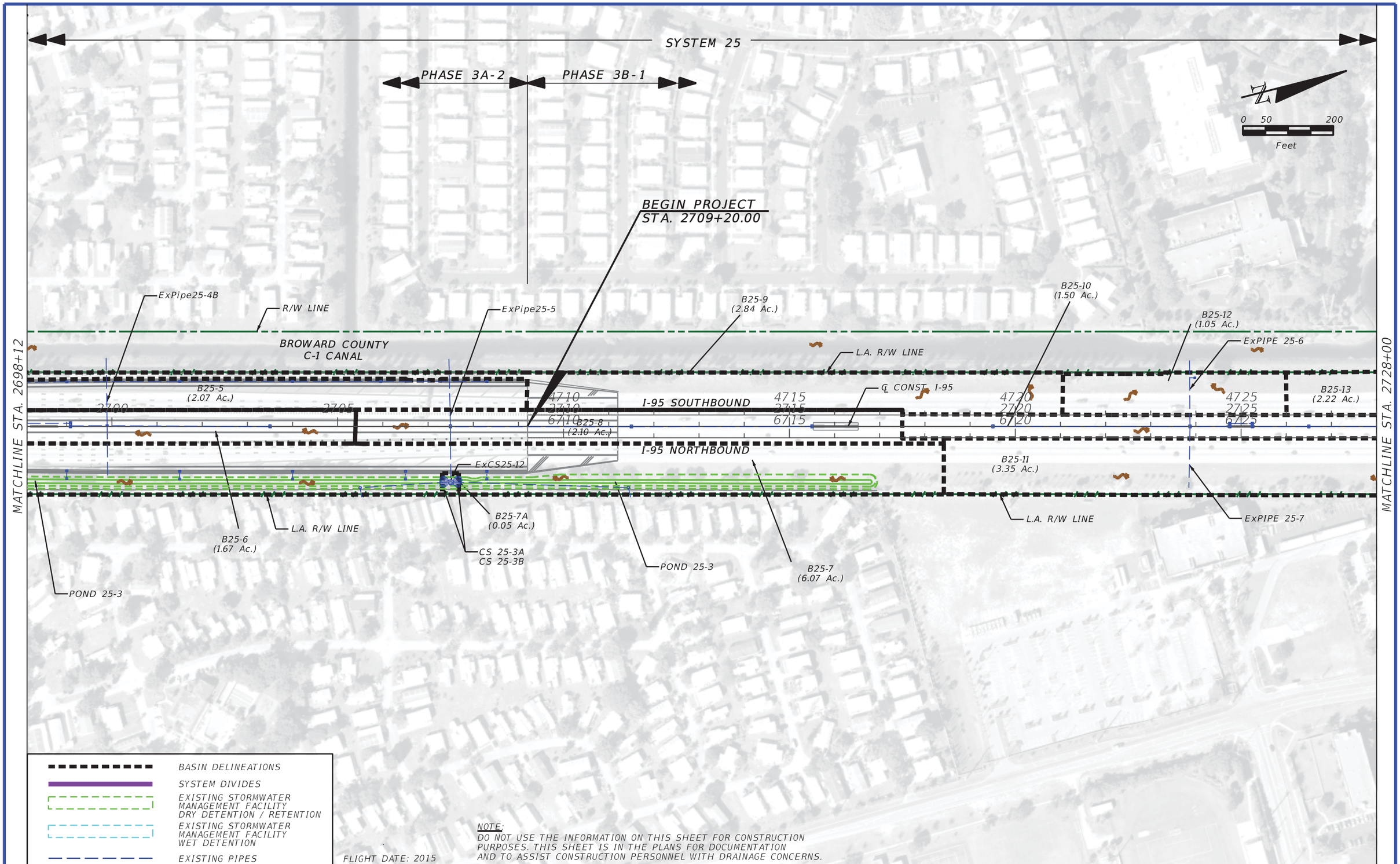

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX F-3		

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

PRE-DEVELOPMENT DRAINAGE MAP (3)

SHEET NO.

EXHIBIT 1

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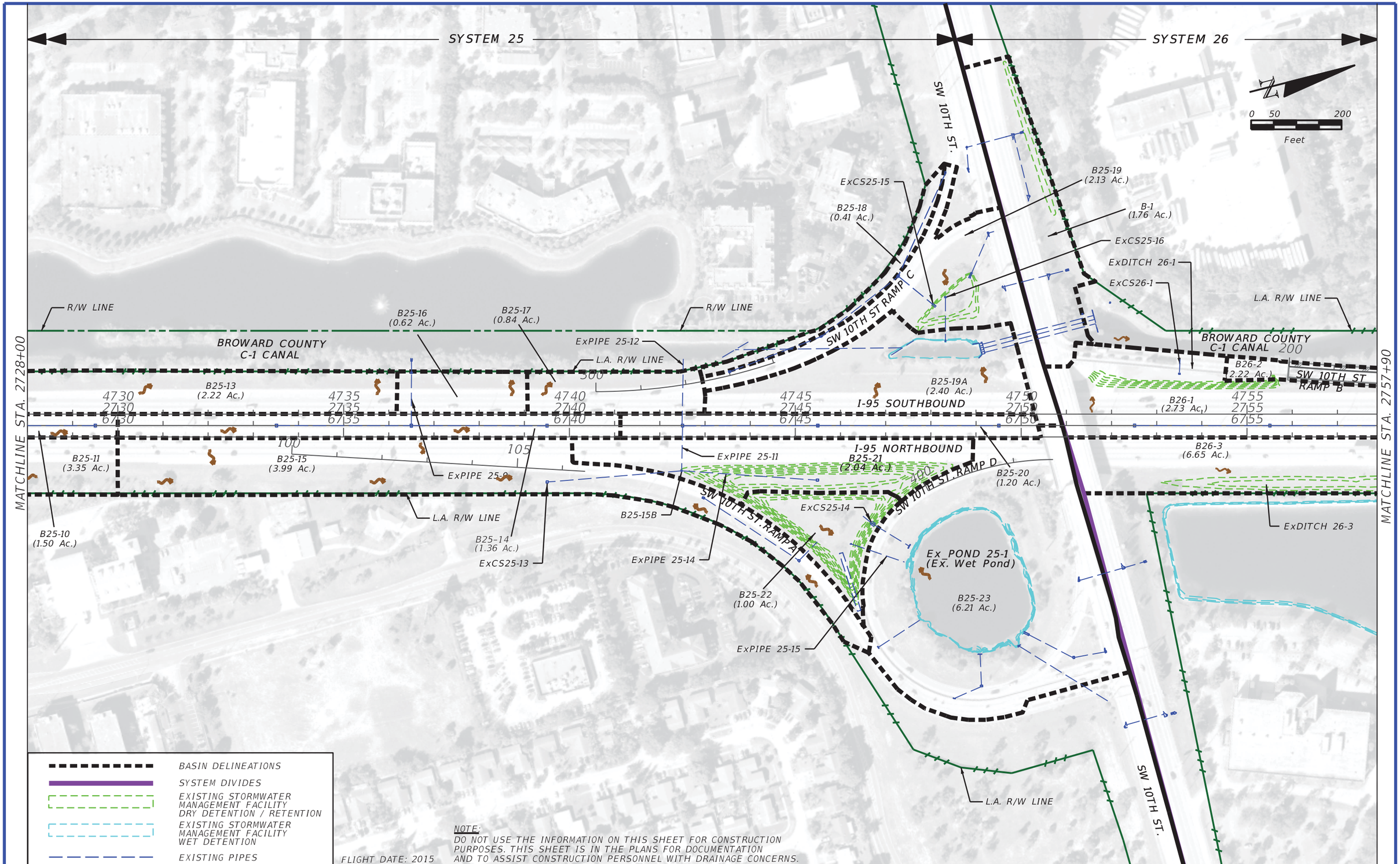

FLIGHT DATE: 2015

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

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX F-4		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

EXHIBIT 1

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

PRE-DEVELOPMENT DRAINAGE MAP (4)

SHEET NO.
D-15 4

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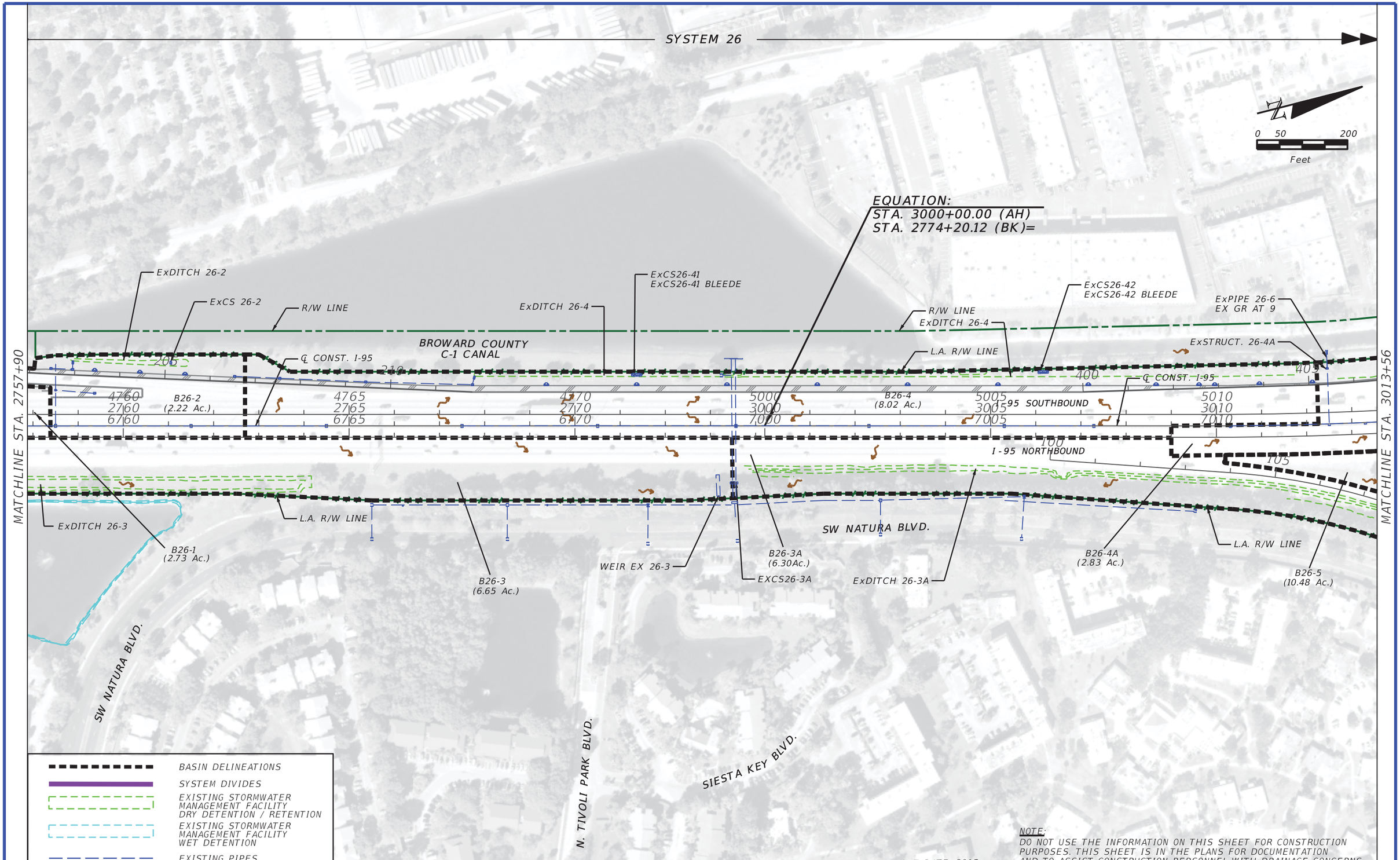

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX F-5		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

PRE-DEVELOPMENT DRAINAGE MAP (5)

SHEET NO.
D-16 5

EXHIBIT 1

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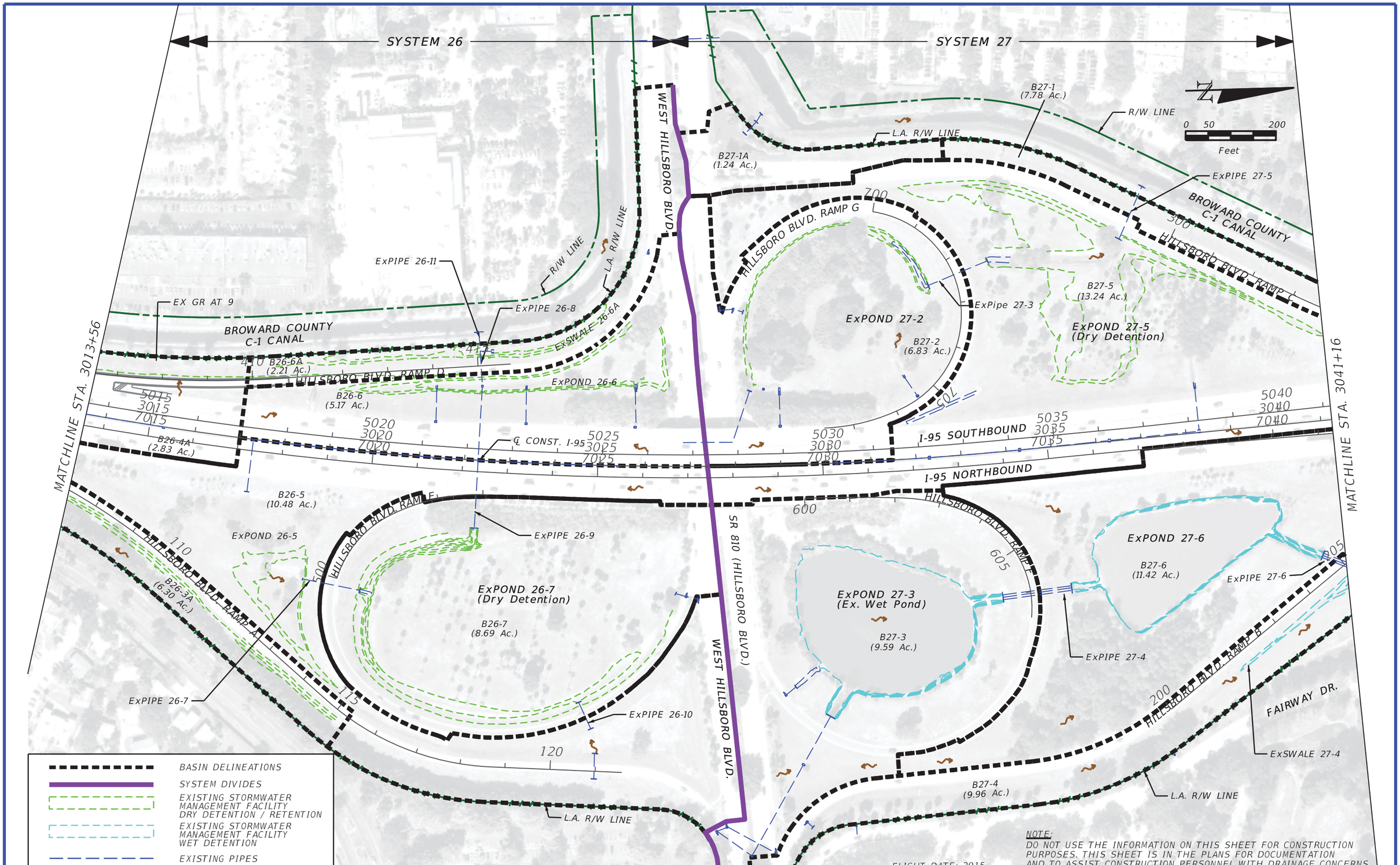

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX F-6		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

PRE-DEVELOPMENT DRAINAGE MAP (6)

SHEET NO.
D-17 6

EXHIBIT 1

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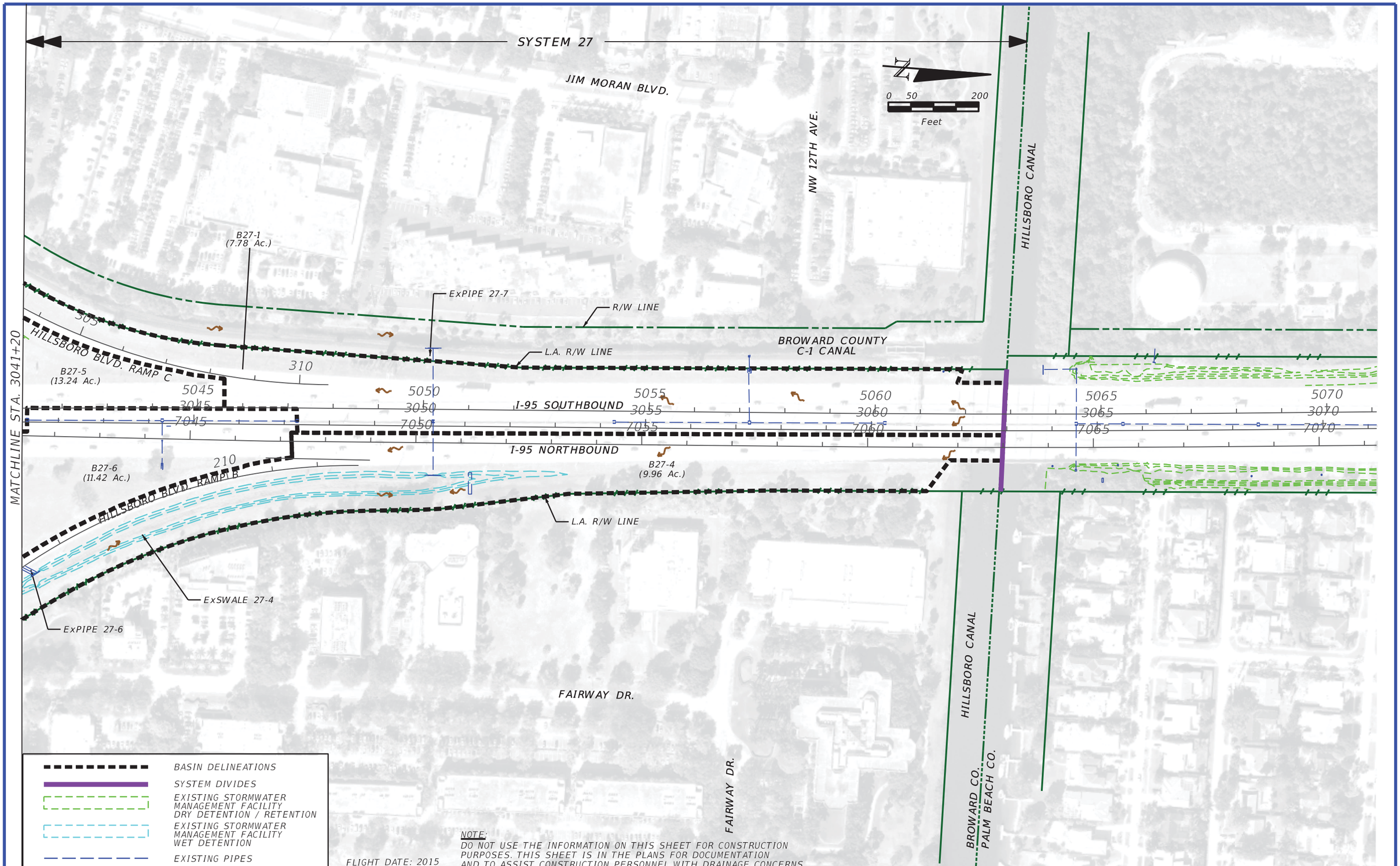

NOTE:
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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX F-7		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

PRE-DEVELOPMENT DRAINAGE MAP (7)

SHEET NO.
D-18
7

EXHIBIT 1

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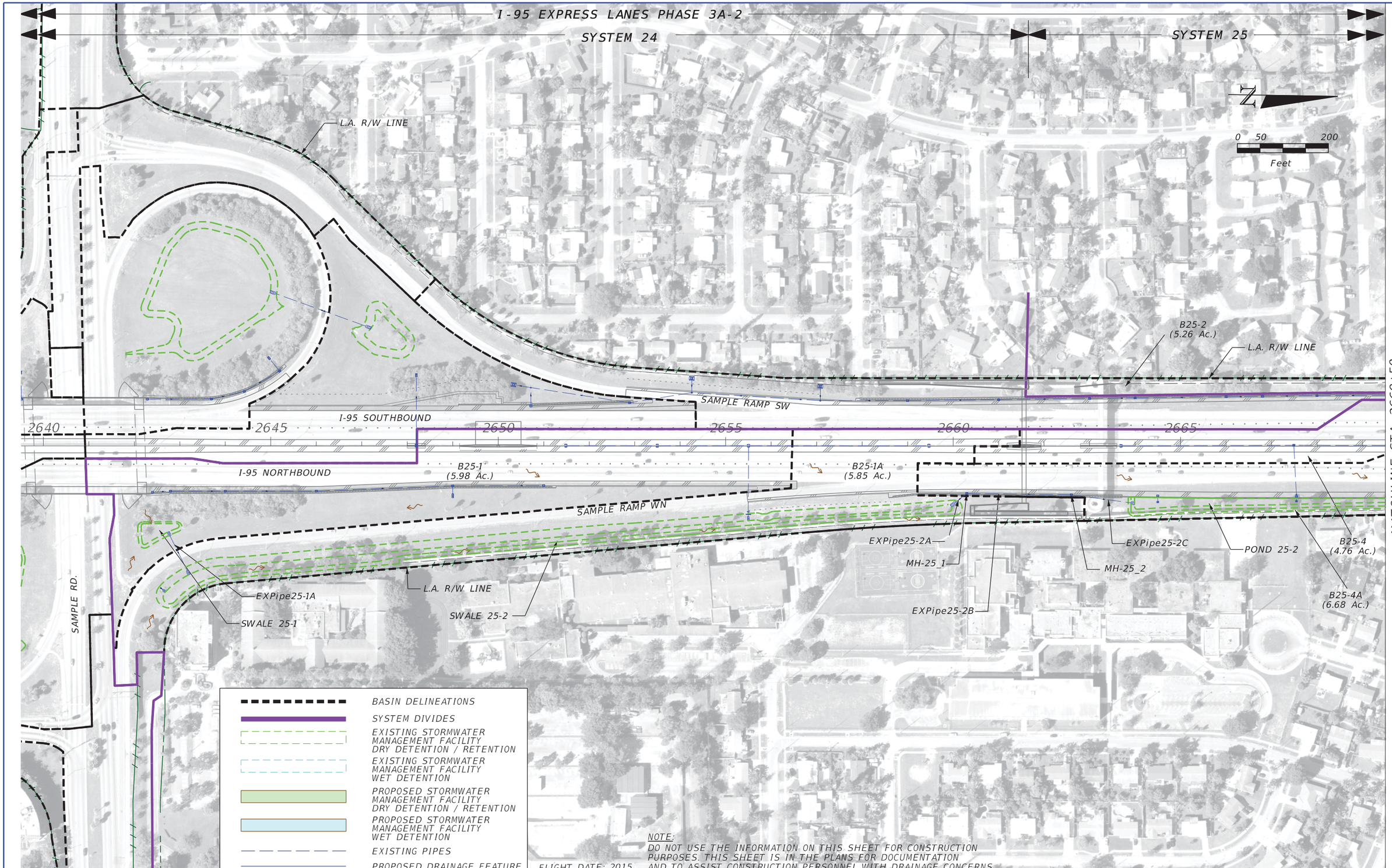
Appendix G

Post-Development Drainage Maps



FLIGHT DATE: 2015

NOTE:
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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX G-1		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

EXHIBIT 1

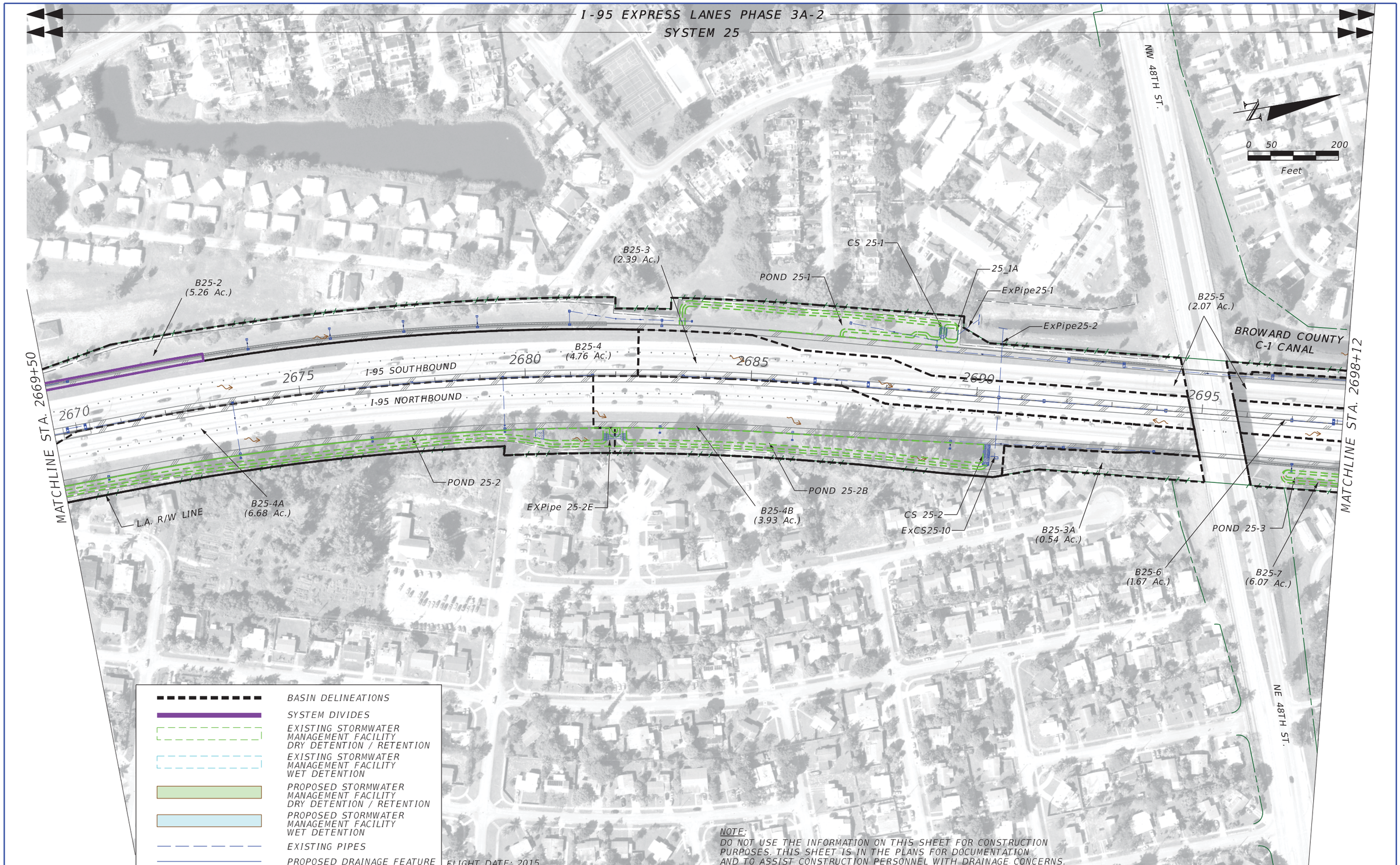
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

POST-DEVELOPMENT DRAINAGE MAP (1)

SHEET NO.
D-20 1

I-95 EXPRESS LANES PHASE 3A-2
SYSTEM 25



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX G-2		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

POST-DEVELOPMENT DRAINAGE MAP (2)

SHEET NO.
D-21
2

EXHIBIT 9

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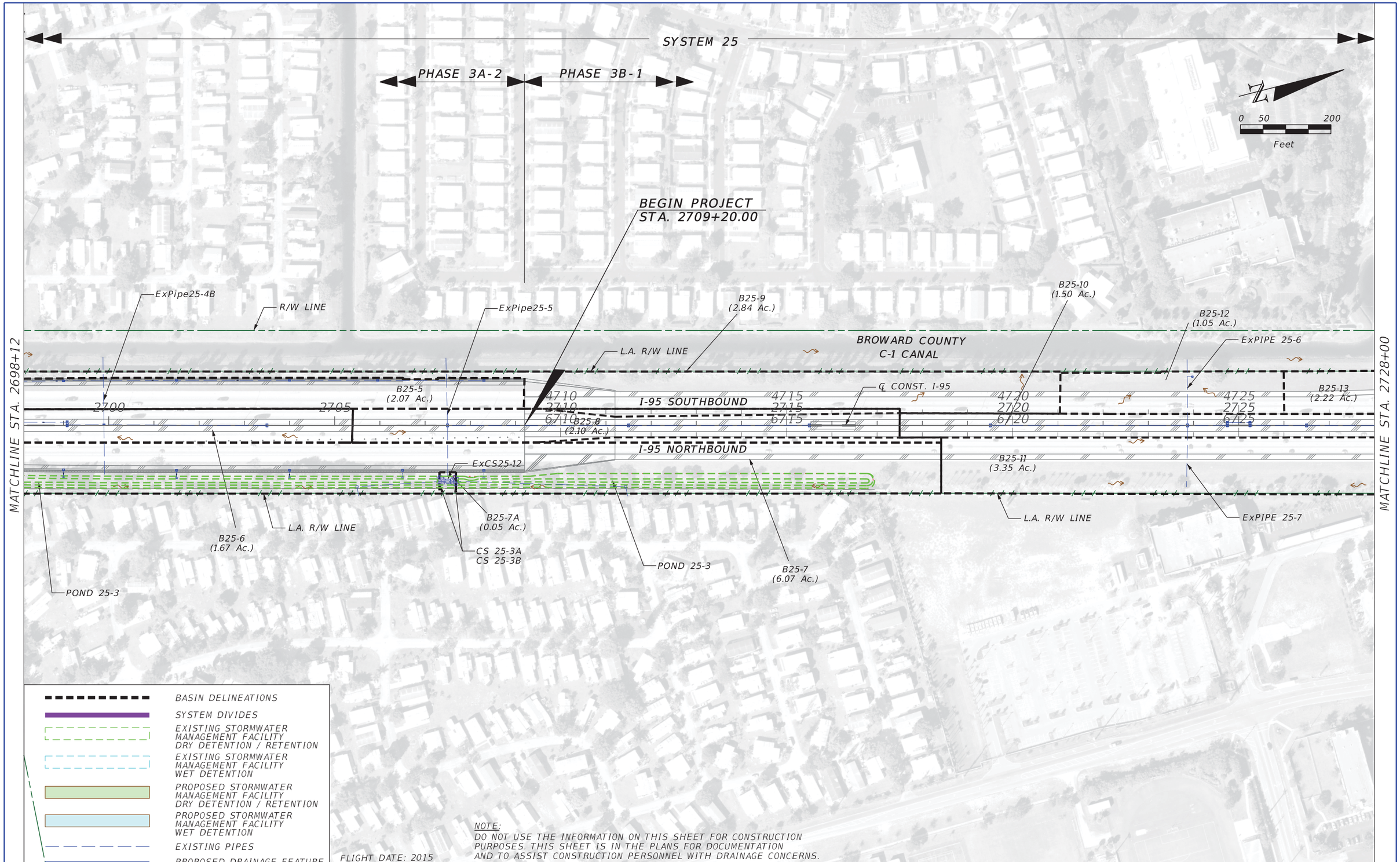

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX G-3		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

EXHIBIT 1

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

POST-DEVELOPMENT DRAINAGE MAP (3)

SHEET NO.
D-22 3

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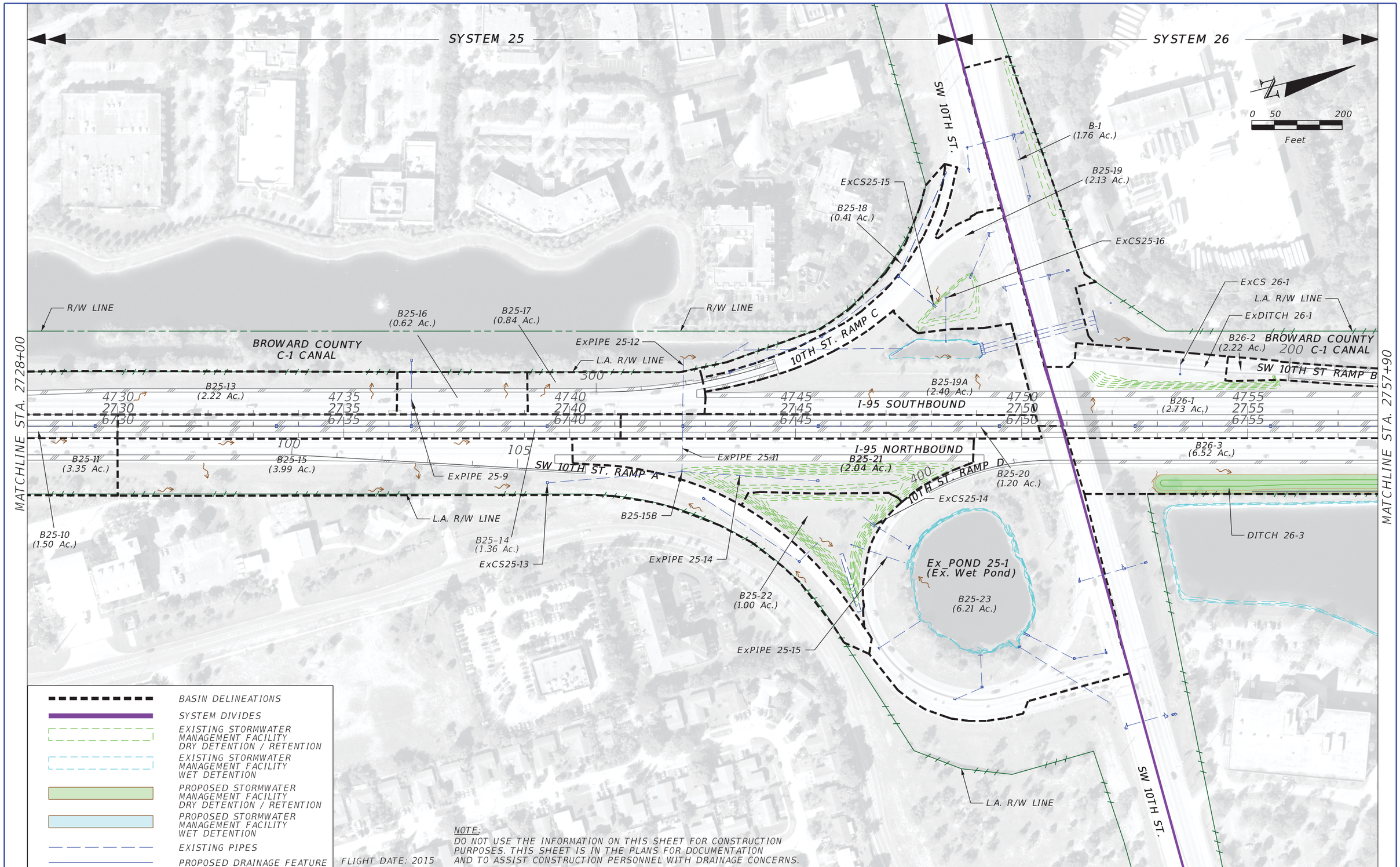

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX G-4		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

EXHIBIT 1

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

POST-DEVELOPMENT DRAINAGE MAP (4)

SHEET NO.
D-23 4

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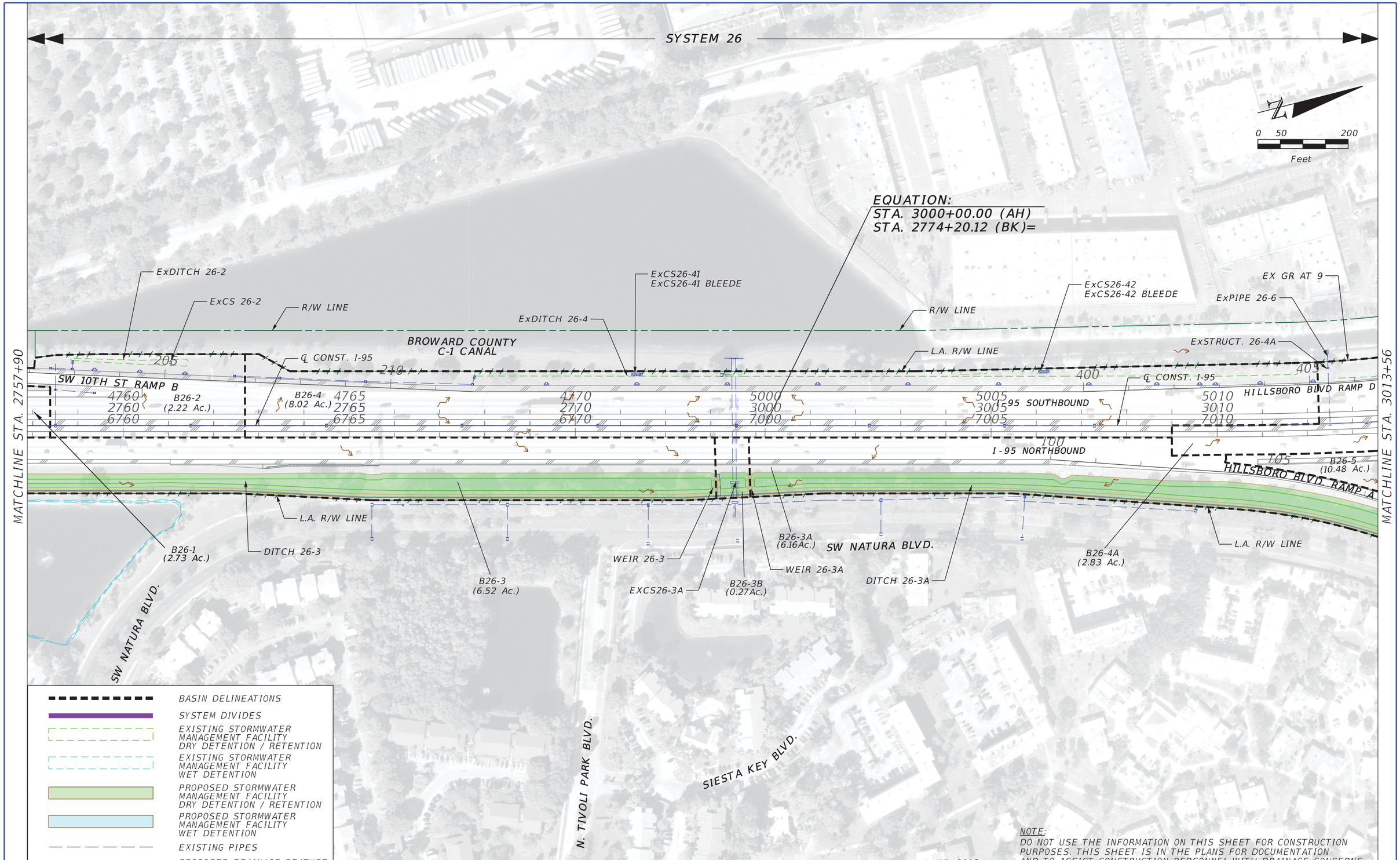

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX G-5		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

POST-DEVELOPMENT DRAINAGE MAP (5)

SHEET NO.
D-24 5

EXHIBIT 1

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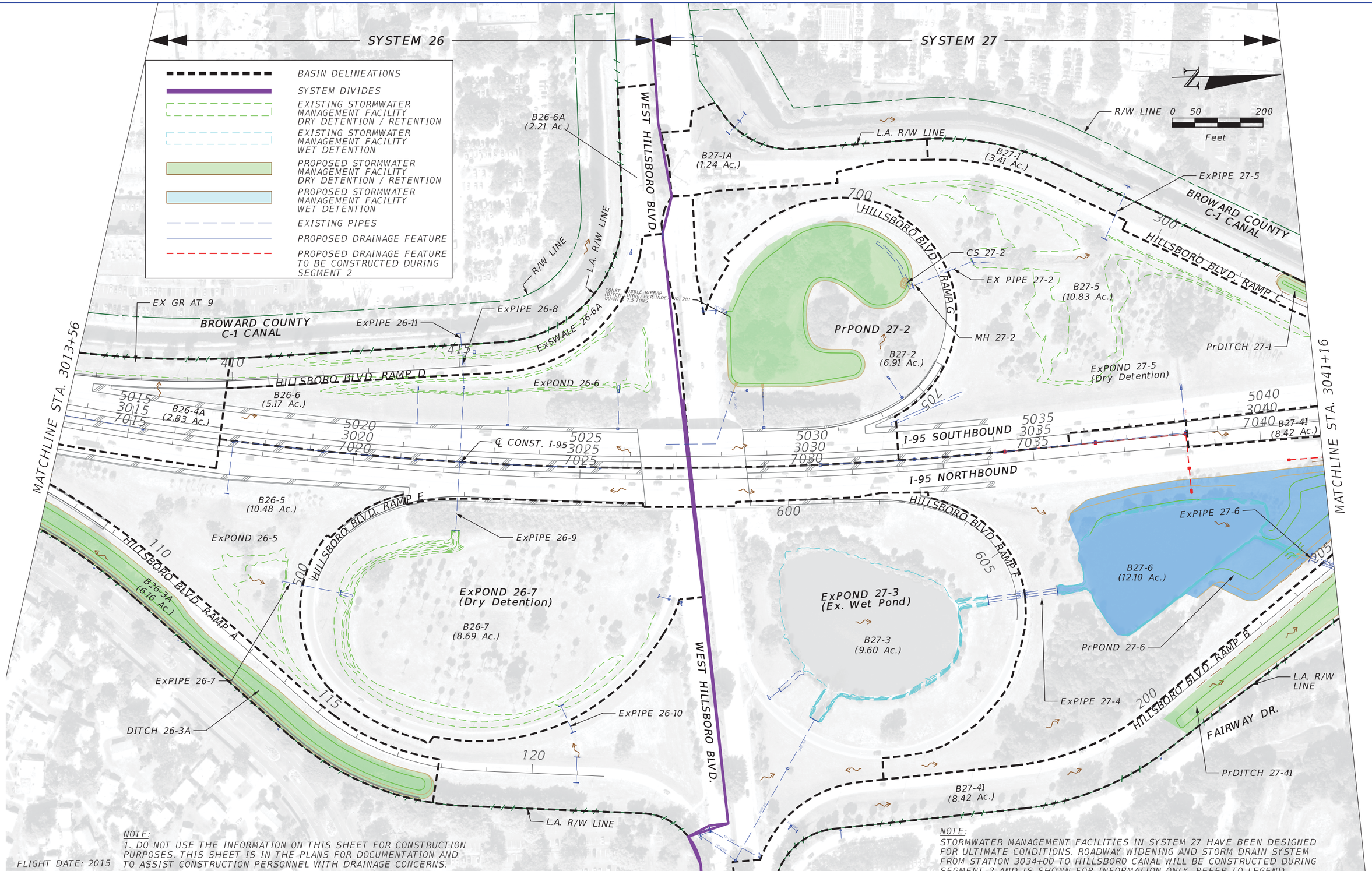

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FLIGHT DATE: 2015

NOTE:
STORMWATER MANAGEMENT FACILITIES IN SYSTEM 27 HAVE BEEN DESIGNED FOR ULTIMATE CONDITIONS. ROADWAY WIDENING AND STORM DRAIN SYSTEM FROM STATION 3034+00 TO HILLSBORO CANAL WILL BE CONSTRUCTED DURING SEGMENT 2 AND IS SHOWN FOR INFORMATION ONLY. REFER TO LEGEND.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX G-6		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

POST-DEVELOPMENT DRAINAGE MAP (6)

SHEET NO.
D-25 6

EXHIBIT 1

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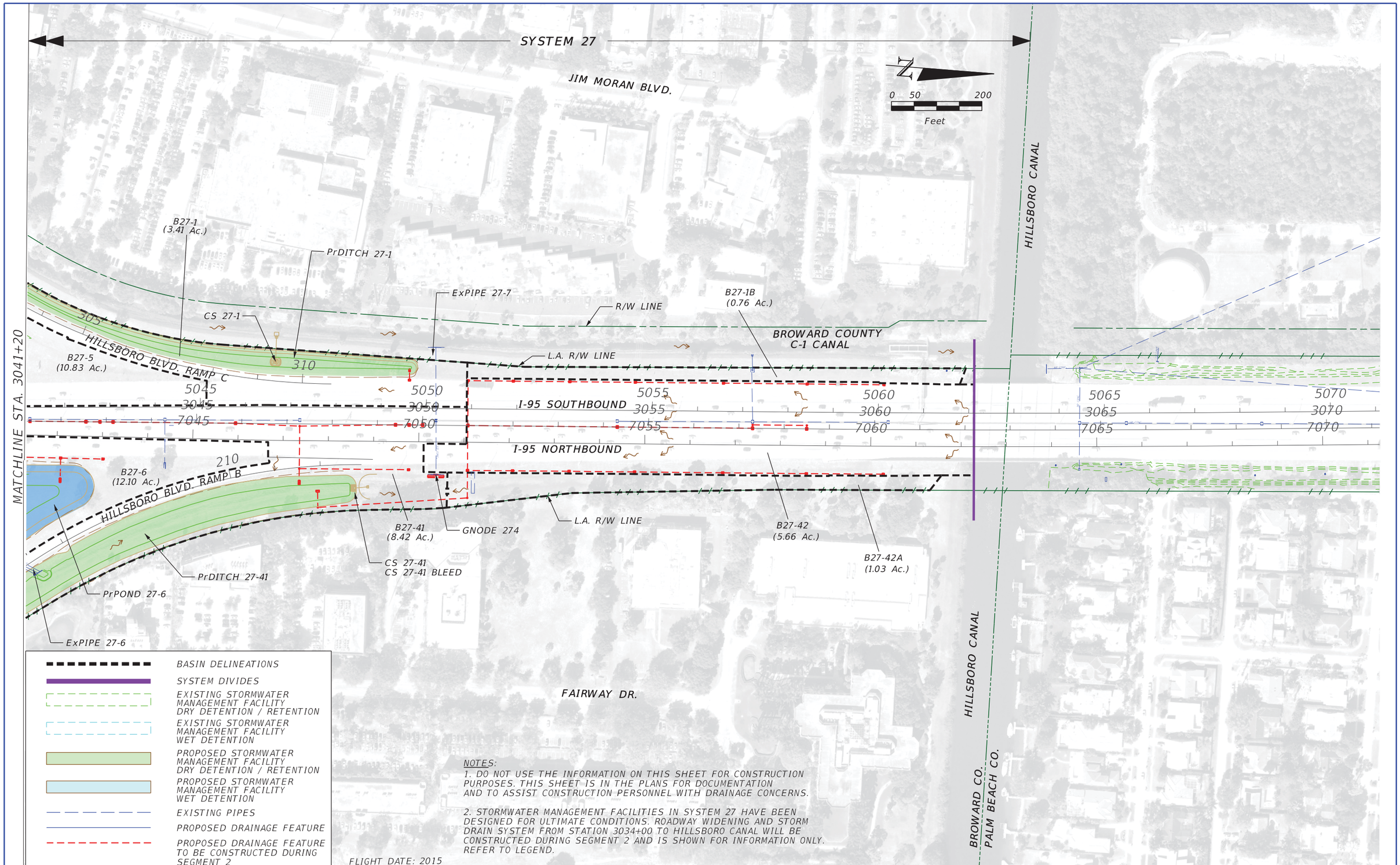

NOTES:

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FLIGHT DATE: 2015

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
	APPENDIX G-7		

WSP USA INC.
7650 CORPORATE CENTER DRIVE
SUITE 300
MIAMI, FL 33126
305-261-4785
CERT OF AUTH NO. 01462
MARY C. MIDDLEBROOKS, P.E. NO. 67960

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD PALM BEACH	433108-6-52-01 433109-4-52-01

POST-DEVELOPMENT DRAINAGE MAP (7)

SHEET NO.

D-26 7

EXHIBIT 1

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Excerpt from ERP# 06-00426 Newport Center

LIMITING CONDITIONS

1. THE PERMITTEE SHALL PROSECUTE THE WORK AUTHORIZED IN A MANNER SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATERS.

2. WATER QUALITY DATA FOR THE WATER DISCHARGED FROM THE PERMITTEE'S PROPERTY OR INTO SURFACE WATERS OF THE STATE SHALL BE SUBMITTED TO THE DISTRICT AS REQUIRED. PARAMETERS TO BE MONITORED MAY INCLUDE THOSE LISTED IN CHAPTER 17-3. IF WATER QUALITY DATA IS REQUIRED, THE PERMITTEE SHALL PROVIDE DATA AS REQUIRED, ON VOLUMES OF WATER DISCHARGED, INCLUDING TOTAL VOLUME DISCHARGED DURING THE DAYS OF SAMPLING AND TOTAL MONTHLY DISCHARGES FROM THE PROPERTY OR INTO SURFACE WATERS OF THE STATE.

3. THE PERMITTEE SHALL COMPLY WITH ALL APPLICABLE LOCAL SUBDIVISION REGULATIONS AND OTHER LOCAL REQUIREMENTS. IN ADDITION THE PERMITTEE SHALL OBTAIN ALL NECESSARY FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY CONSTRUCTION OR ALTERATION OF WORKS AUTHORIZED BY THIS PERMIT.

4. THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE UNTIL A FLORIDA REGISTERED PROFESSIONAL ENGINEER CERTIFIES THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE DISTRICT. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL SUBMIT THE CERTIFICATION AND NOTIFY THE DISTRICT THAT THE FACILITIES ARE READY FOR INSPECTION AND APPROVAL. UPON APPROVAL OF THE COMPLETED SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL REQUEST TRANSFER OF THE PERMIT TO THE RESPONSIBLE ENTITY APPROVED BY THE DISTRICT.

5. ALL ROADS SHALL BE SET AT OR ABOVE ELEVATIONS REQUIRED BY THE APPLICABLE LOCAL GOVERNMENT FLOOD CRITERIA.

6. ALL BUILDING FLOORS SHALL BE SET AT OR ABOVE ELEVATIONS ACCEPTABLE TO THE APPLICABLE LOCAL GOVERNMENT.

7. OFF-SITE DISCHARGES DURING CONSTRUCTION AND DEVELOPMENT SHALL BE MADE ONLY THROUGH THE FACILITIES AUTHORIZED BY THIS PERMIT. NO ROADWAY OR BUILDING CONSTRUCTION SHALL COMMENCE ON-SITE UNTIL COMPLETION OF THE PERMITTED DISCHARGE STRUCTURE AND DETENTION AREAS. WATER DISCHARGED FROM THE PROJECT SHALL BE THROUGH STRUCTURES HAVING A MECHANISM SUITABLE FOR REGULATING UPSTREAM WATER STAGES. STAGES MAY BE SUBJECT TO OPERATING SCHEDULES SATISFACTORY TO THE DISTRICT.

8. NO CONSTRUCTION AUTHORIZED HEREIN SHALL COMMENCE UNTIL A RESPONSIBLE ENTITY ACCEPTABLE TO THE DISTRICT HAS BEEN ESTABLISHED AND HAS AGREED TO OPERATE AND MAINTAIN THE SYSTEM. THE ENTITY MUST BE PROVIDED WITH SUFFICIENT OWNERSHIP SO THAT IT HAS CONTROL OVER ALL WATER MANAGEMENT FACILITIES AUTHORIZED HEREIN. UPON RECEIPT OF WRITTEN EVIDENCE OF THE SATISFACTION OF THIS CONDITION, THE DISTRICT WILL ISSUE AN AUTHORIZATION TO COMMENCE CONSTRUCTION.

9. THE PERMIT DOES NOT CONVEY TO THE PERMITTEE ANY PROPERTY RIGHT NOR ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4, FAC.

10. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, OPERATION, MAINTENANCE OR USE OF ANY FACILITY AUTHORIZED BY THE PERMIT.

11. THIS PERMIT IS ISSUED BASED ON THE APPLICANT'S SUBMITTED INFORMATION WHICH REASONABLY DEMONSTRATES THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS WILL NOT BE CAUSED BY THE COMPLETED PERMIT ACTIVITY. IT IS ALSO THE RESPONSIBILITY OF THE PERMITTEE TO INSURE THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS DO NOT OCCUR DURING CONSTRUCTION.

12. PRIOR TO DEWATERING, PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL. INFORMATION SHALL INCLUDE AS A MINIMUM: PUMP SIZES, LOCATIONS AND HOURS OF OPERATION FOR EACH PUMP. IF OFF-SITE DISCHARGE IS PROPOSED, OR OFF-SITE ADVERSE IMPACTS ARE EVIDENT, AN INDIVIDUAL WATER USE PERMIT MAY BE REQUIRED. THE PERMITTEE IS CAUTIONED THAT SEVERAL MONTHS MAY BE REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION.

MICROFILMED

App# 08286-A
06-00426-04-S

SPECIAL CONDITIONS

1. MINIMUM BUILDING FLOOR ELEVATION 15.34 FEET NGVD.

2. MINIMUM ROAD CROWN ELEVATION 14.0 FEET NGVD.

3. DISCHARGE FACILITIES:

   DESCRIPTION 1-54" DIAMETER RCP AND 1-48" DIAMETER RCP CULVERT

   CONTROL ELEVATION 10.0' NGVD (BROWARD COUNTY CANAL C-1)

   RECEIVING WATER BROWARD COUNTY CANAL C-1

4. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED TO THE RECEIVING WATER.

5. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF A PROPERTY OWNER'S ASSOCIATION.

6. EACH LOT SHALL HAVE AT LEAST 20 PERCENT OF THE LAND DEDICATED TO PERVIOUS AREAS.

7. THE FIRST TWO INCHES OF RUNOFF SHALL BE REQUIRED TO BE RETAINED ON EACH INDIVIDUAL SITE PRIOR TO DISCHARGE.

8. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION OR SHOALING PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

9. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

10. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY MONITORING BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

11. LAKE SIDE SLOPES SHALL BE 4:1 (HORIZONTAL:VERTICAL) TO A DEPTH OF TWO FEET BELOW THE CONTROL ELEVATION. SIDE SLOPES SHALL BE NURTURED OR PLANTED FROM 2 FEET BELOW TO 1 FOOT ABOVE CONTROL ELEVATION TO INSURE VEGETATIVE GROWTH.

12. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF FUTURE PHASES, PAVING, GRADING, AND DRAINAGE PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.

#06-00426-04-S

MICROFILMED

IANNED

NOTES RE. CONSTRUCTION ACTIVITIES AND PHASING

1. INSTALL FLOATING TURBIDITY CURTAINS ACROSS EXISTING CANAL C-1 TO THE SOUTH AND NORTH OF THE PROPOSED WORK AREA PER PLANS.

2. CONSTRUCT TEMPORARY EARTHEN BERMS (5' WIDE TOPS) ACROSS EXISTING CANAL C-1 TO THE SOUTH AND NORTH OF THE PROPOSED WORK AREA PER PLANS.

3. CONSTRUCT TEMPORARY STABILIZED EARTHEN BERM (15' WIDE TOP) ACROSS EXISTING NEWPORT CENTER LAKE PER PLANS.

4. DEWATER WORK AREA "B" BY PUMPING INTO WORK AREA "A".

5. CONSTRUCT LAKE/CANAL EARTH WORK IMPROVEMENTS WITHIN WORK AREA "B".

6. RESTORE/REPAIR DAMAGE TO EXISTING HEADWALL AND OUTFALL STRUCTURES DISCHARGING FROM NEWPORT CENTER TO LAKE AREA.

7. INSTALL PLANTS ON UPLAND MITIGATION PLANTING AREA AND PROVIDE FOR TEMPORARY IRRIGATION, AS REQUIRED FOR PLANT'S VITALITY.

8. SOD SOUTH AND WEST SIDE OF LAKE (IN WORK AREA "B") FROM EDGE OF EXISTING ASPHALT WALK TO ELEV. +8.00' AND SEED/MULCH FROM ELEV. +8.00' TO LAKE WATER'S EDGE.

9. SEED/MULCH ALL DISTURBED AREAS ALONG EAST SIDE OF LAKE WITHIN WORK AREA "B".

10. DEWATER WORK AREA "A" BY PUMPING INTO COMPLETED WORK AREA "B".

11. CONSTRUCT LAKE/CANAL EARTH WORK IMPROVEMENTS WITHIN WORK AREA "A".

12. AFTER EARTH WORK IMPROVEMENTS ARE COMPLETED REMOVE TEMPORARY STABILIZED EARTH BERM BETWEEN WORK AREAS "A" AND "B".

13. REMOVE TEMPORARY EARTHEN BERMS (5' WIDE TOPS) ACROSS EXISTING CANAL C-1 TO THE SOUTH AND NORTH OF THE WORK AREAS AND ALLOW WATER LEVELS TO STABILIZE WITHIN NEW LAKE AREA.

14. SOD NORTH AND WEST SIDE OF LAKE (IN WORK AREA "A") FROM EDGE OF EXISTING ASPHALT WALK TO LAKE WATER'S EDGE.

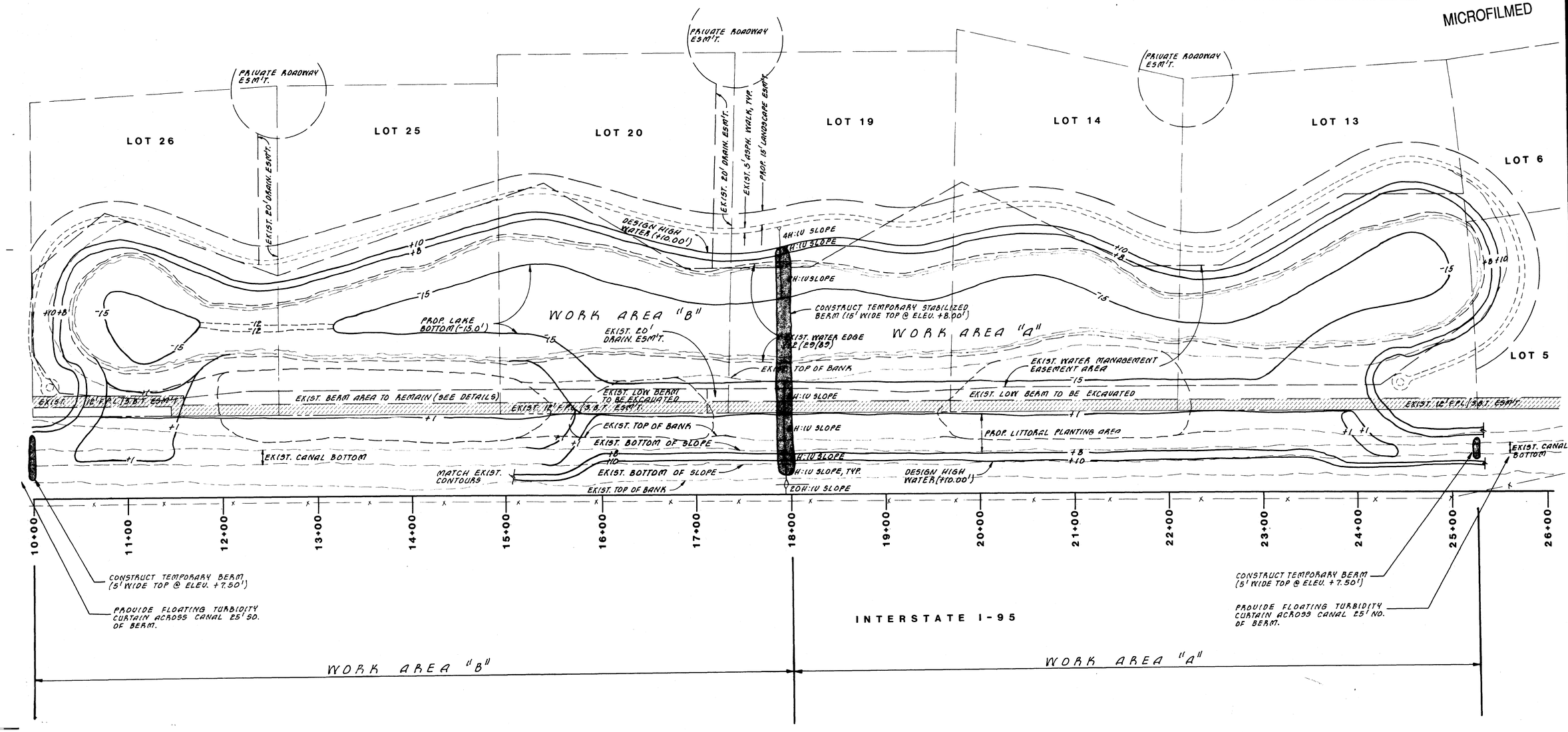
15. SOD SOUTH AND WEST SIDE OF LAKE (IN WORK AREA "B") FROM ELEV. +8.0' TO LAKE WATER'S EDGE.

16. SEED/MULCH ALL DISTURBED AREAS ALONG EAST SIDE OF LAKE WITHIN WORK AREA "A".

17. INSTALL CANAL LITTORAL ZONE PLANTINGS.

18. FLOATING TURBIDITY CURTAINS TO REMAIN IN PLACE AFTER CONSTRUCTION IS COMPLETED UNTIL TURBIDITY LEVELS IN WORK AREA IS LESS THAN 20 NTU'S ABOVE AMBIENT TURBIDITY LEVELS IN ADJACENT OFFSITE CANAL AREAS.

MICROFILMED



NO.	DATE	REVISION

meco
MOTCHKAVITZ ENGINEERING COMPANY
Engineering • Hydrology • Planning • Science
2323 SO. BR. 7/STE. 118 BOCA RATON, FL. 33428
407-483-9114

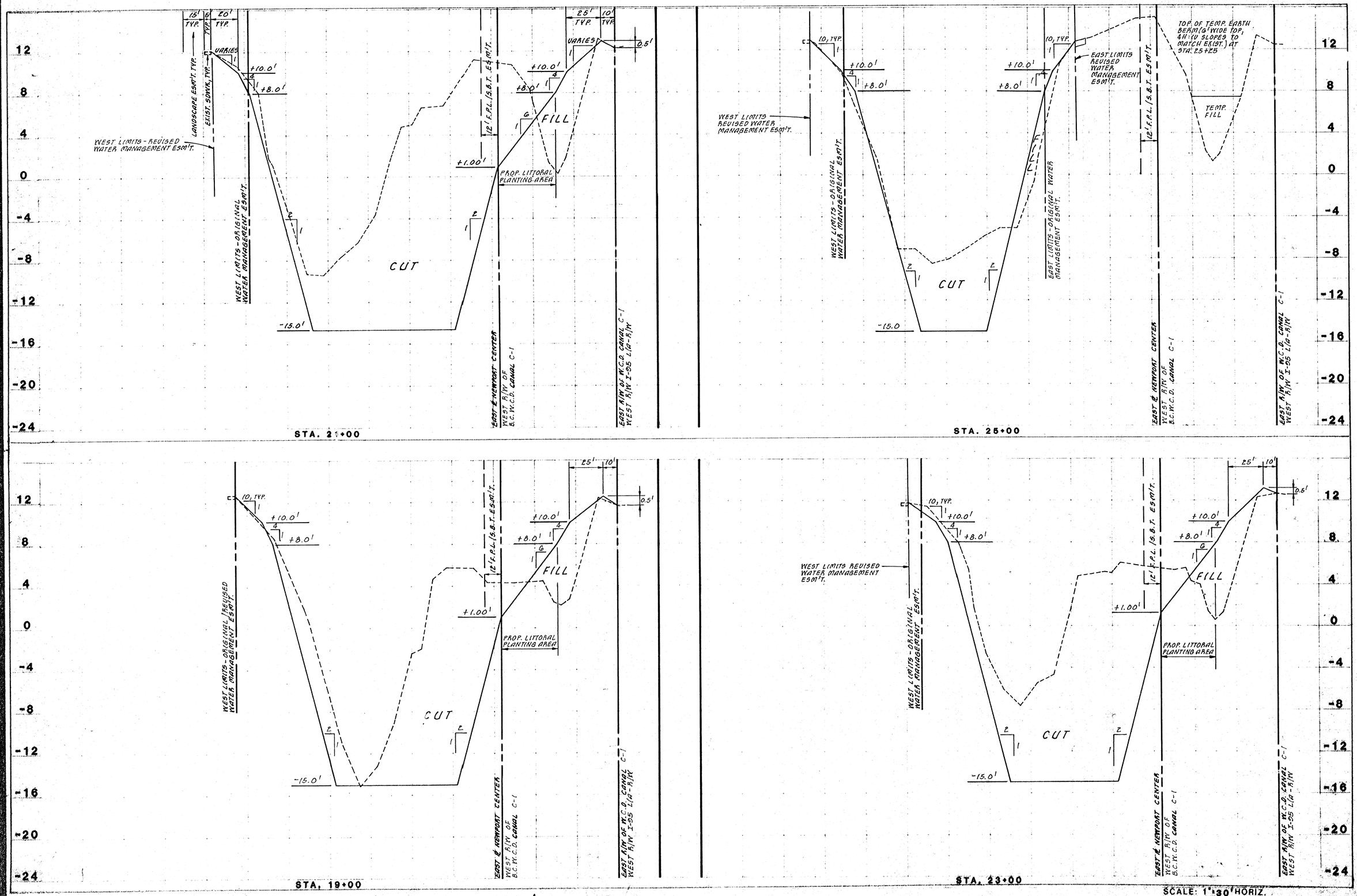
NEWPORT CENTER LAKE IMPROVEMENTS
CONSTRUCTION PHASING PLAN
DEERFIELD BEACH, BROWARD CO., FL.

CERTIFICATION
JUN 13 1990

DRAWN BY:	AM
CHECKED BY:	RJM
APPROVED BY:	RJM
DATE:	1/90
PROJECT NO:	NCLE-1

SCALE: 1"=50'

9 OF 10



SCALE: 1"=30' HORIZ.
1"=4' VERT.

MICROFILMED

NO.	DATE	REVISION
1	6/18/90	FIELD CONDITIONS/NOTES RE. FOOT L/A-R/W

meco
MOTCHKAVITZ ENGINEERING COMPANY
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22763 SO. SR. 7/STE. 118 BOCA RATON, FL. 33428
407-486-0114

NEWPORT CENTER LAKE IMPROVEMENTS
CROSS-SECTION
DEERFIELD BEACH, BROWARD CO., FL.

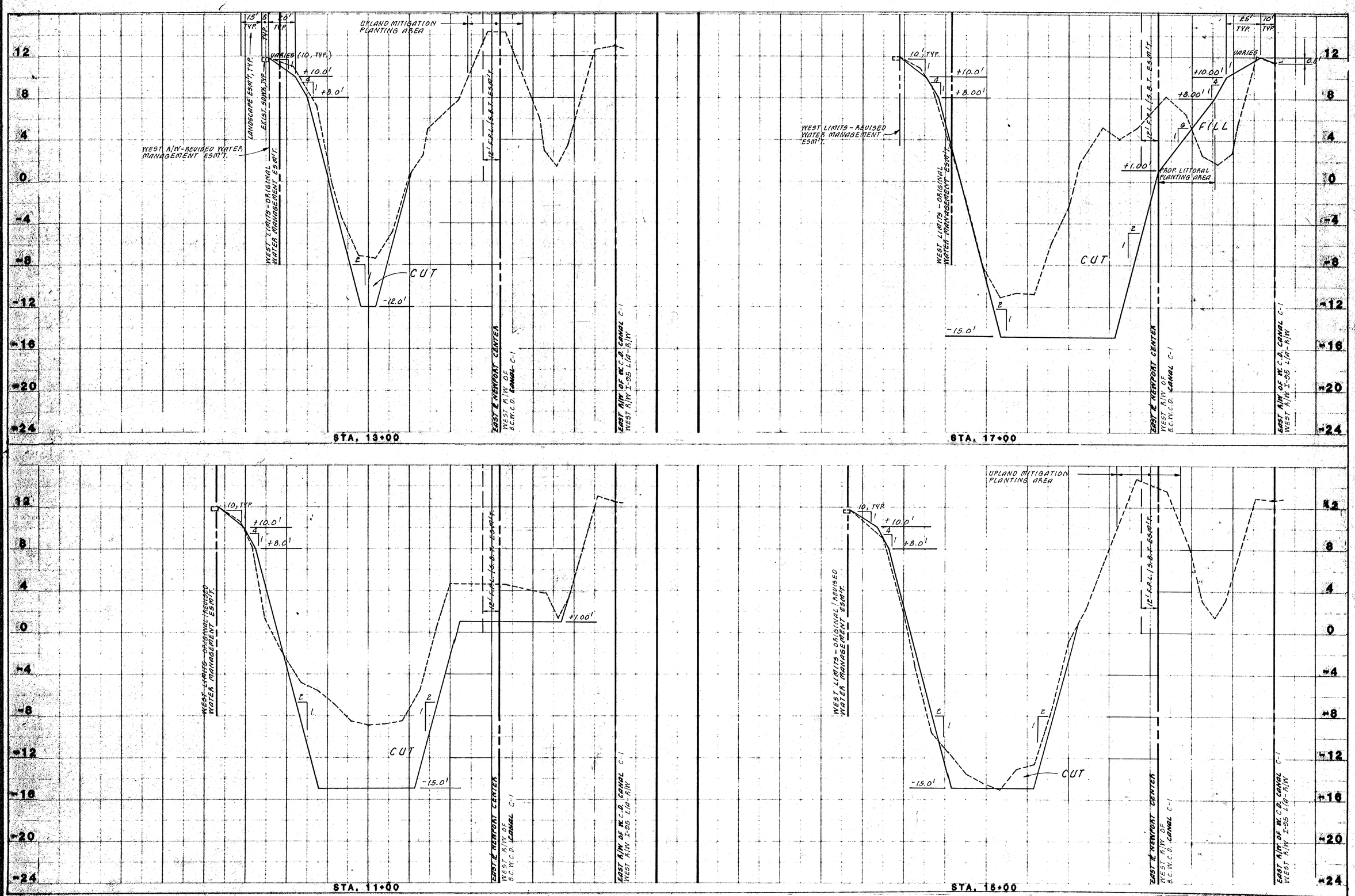
CERTIFICATION
JUN 15 1990

DRAWN BY: AM
CHECKED BY: RJM
APPROVED BY: RJM
DATE: 1/90
PROJECT NO: NCLE-

SCALE SHOWN

8 OF 10
06-00426-5
D-30

MICROFILMED



SCALE: 1"=30' HORIZ.
1"=4' VERT.

meco
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Engineering • Hydrology • Planning • Science
22783 SO. SR. 7/STE. 118 BOCA RATON, FL. 33428
407-488-0114

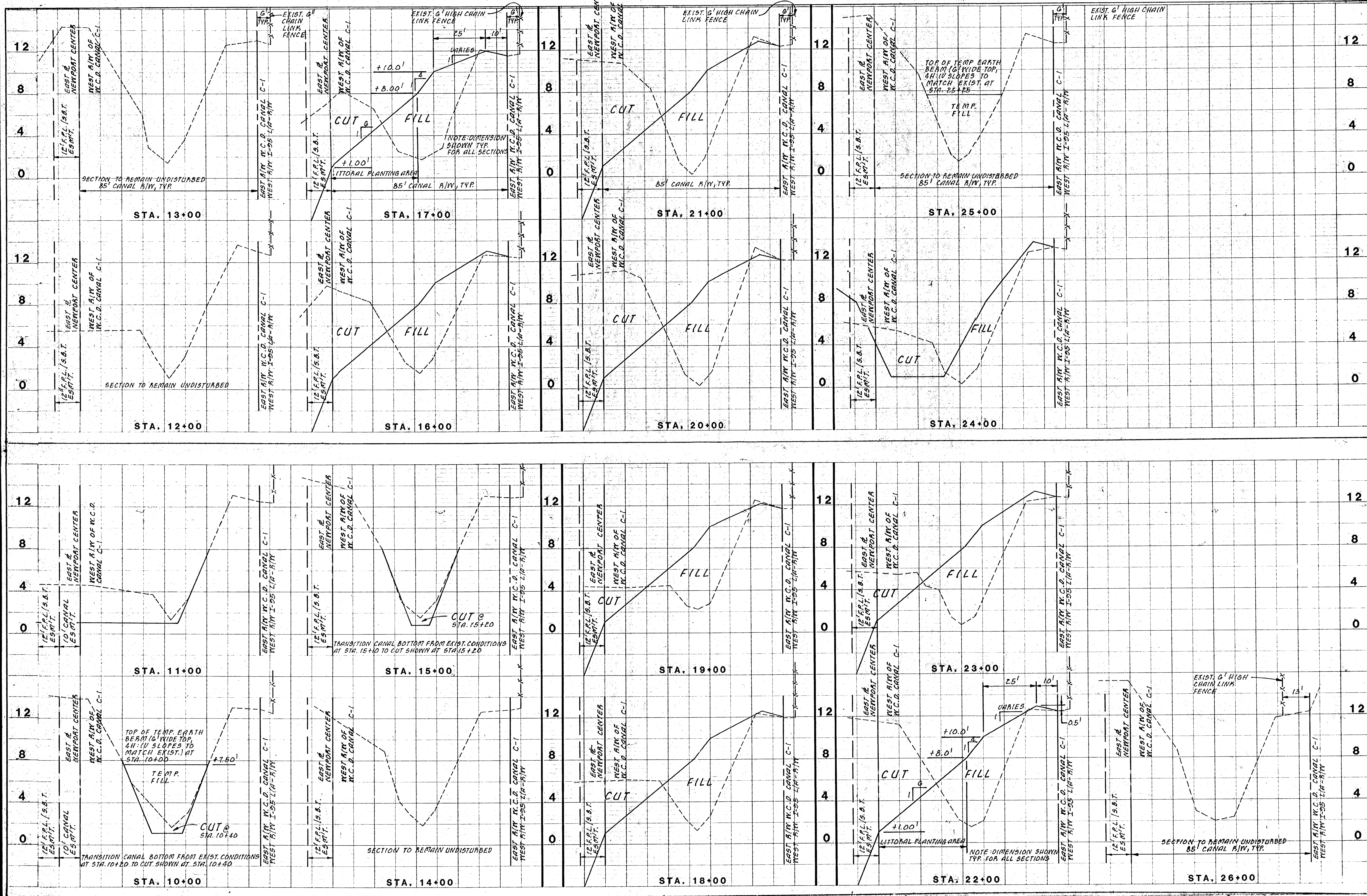
NEWPORT CENTER LAKE IMPROVEMENTS
CROSS-SECTION

CERTIFICATION
JUN 15 1990

DRAWN BY:	AM
CHECKED BY:	RJM
APPROVED BY:	RJM
DATE:	1/90
PROJECT NO:	NCLE-1

SCALE: SHOWN

7 OF 10
06-00426-5



SCALE: 1"=20' HORIZ.
1"=4' VERT.

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22783 SO. SR. 7/STE. 118 BOCA RATON, FL. 33428
407-488-0114

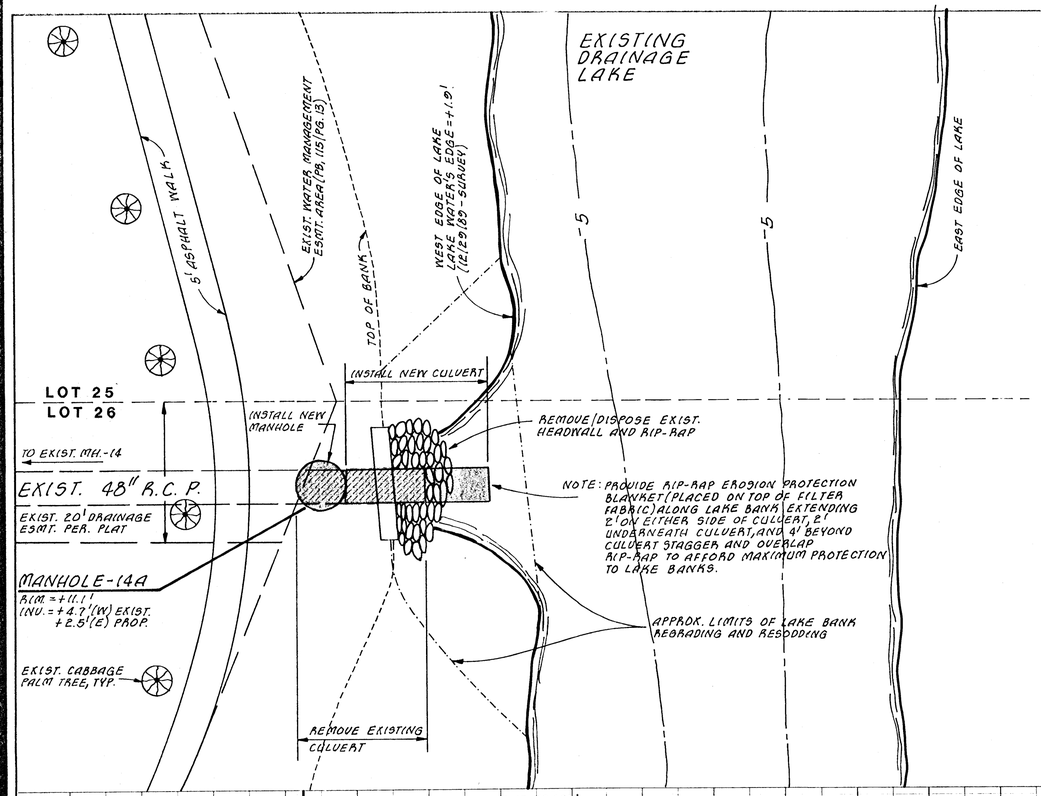
NEWPORT CENTER LAKE IMPROVEMENTS

CROSS-SECTIONS
BROWARD COUNTY W.C.D. CANAL C-1
DEERFIELD BEACH BROWARD CO., FL.

CERTIFICATION
JUN 15 1990

DRAWN BY:	AM
CHECKED BY:	RJM
APPROVED BY:	RJM
DATE:	1/90
PROJECT NO:	NCLE-1

SCALE
SHOWN



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CALL TOLL FREE
1-800-432-4770
U. N. C. L. E. UNDERGROUND UTILITIES NOTIFICATION CENTER

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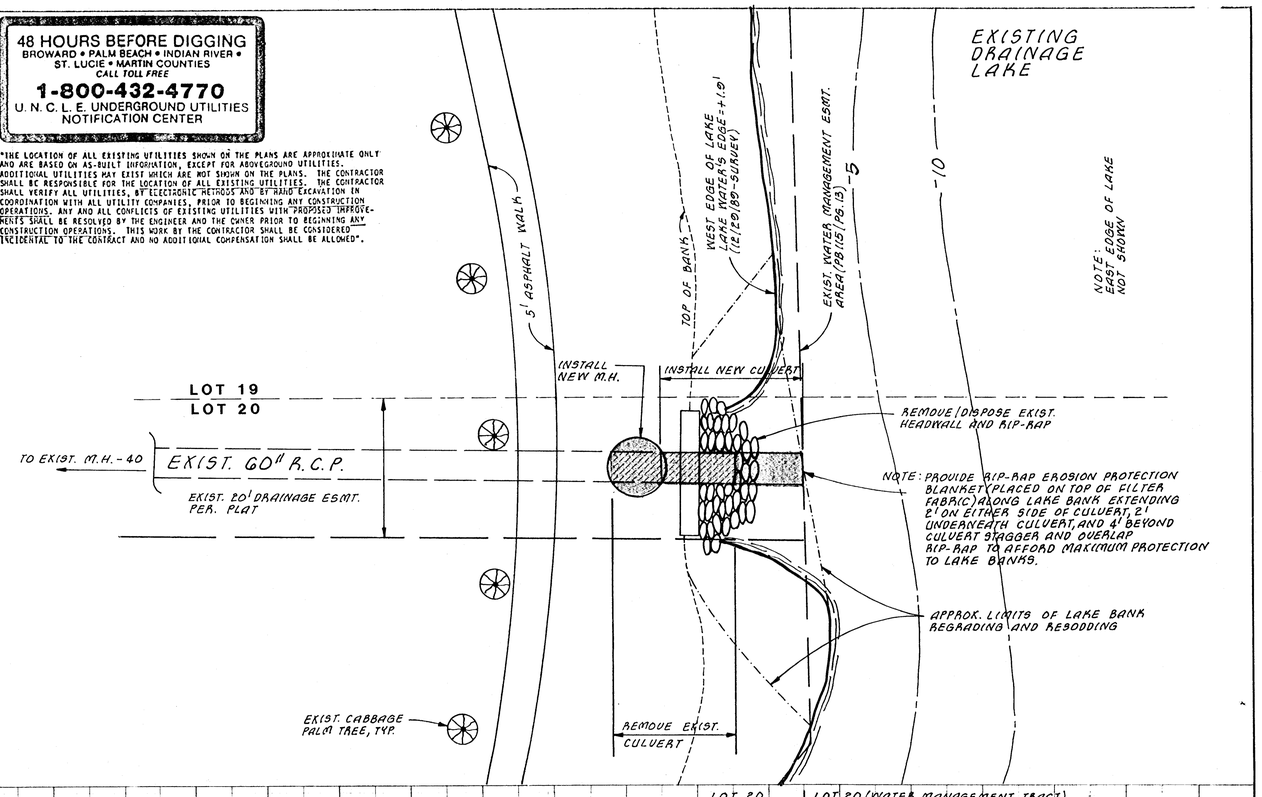
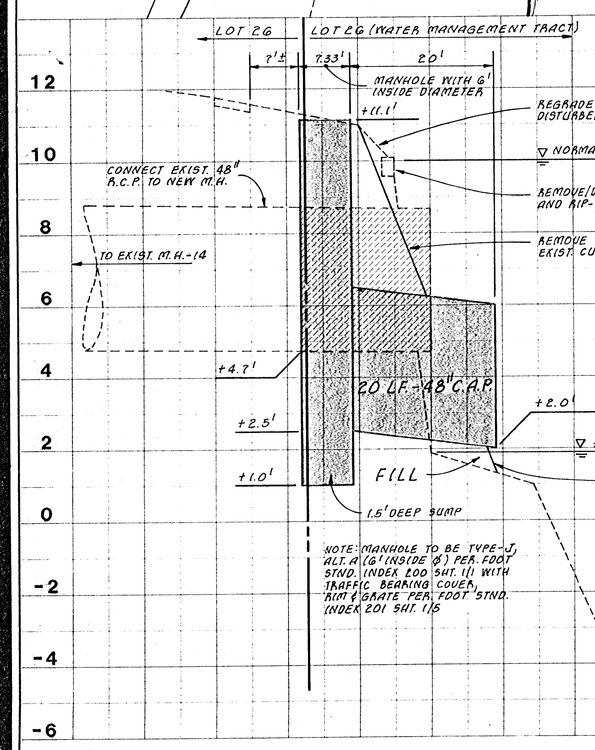
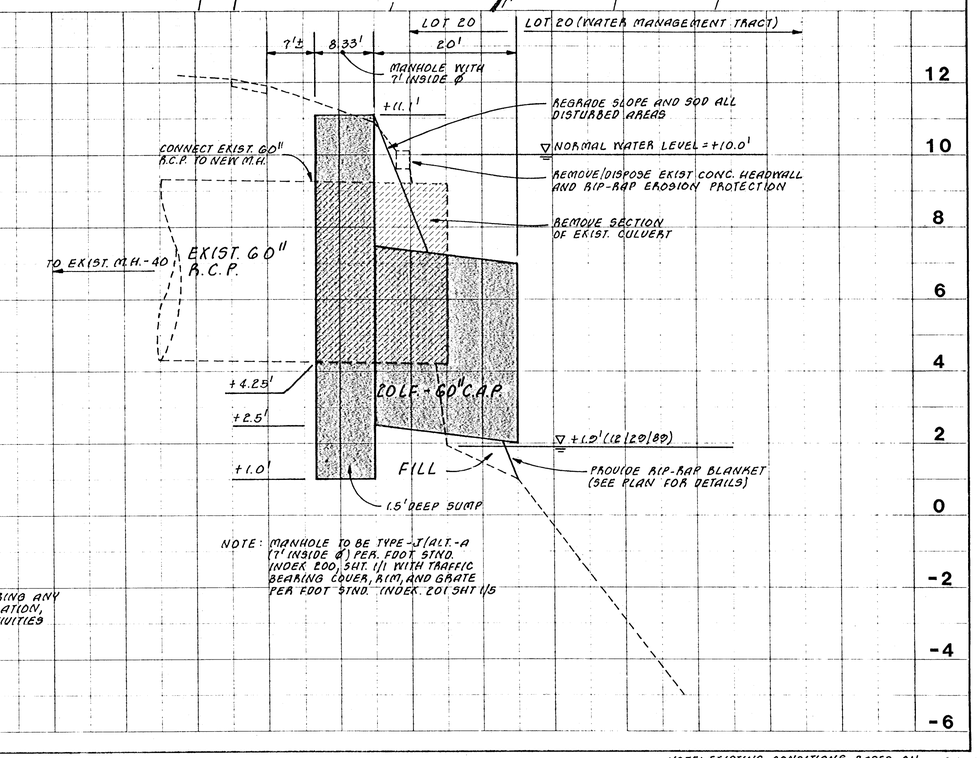




NOTE: CONTRACTOR RESPONSIBLE FOR RESTORING ANY DAMAGES TO LANDSCAPE, LIGHTING, IRRIGATION, PAVING, ETC. CAUSED BY CONSTRUCTION ACTIVITIES



NOTE: EXISTING CONDITIONS BASED ON AS-BUILT SURVEY BY AVIRAM-HALL & ASSOC. DATED 12/29/89, REV. 4/12/90.

MICROFILMED

NO.	DATE	REVISION

meco
MOTCHKAVITZ ENGINEERING COMPANY
Engineering • Hydrology • Science
22783 SO. SR.7/SUITE 118, BOCA RATON, FL.33428
TEL.- (407)-488-0114

HEADWALL MAINTENANCE
MASTER DRAINAGE SYSTEM OUTFALL
LOTS 20 & 26
NEWPORT CENTER
DEERFIELD BEACH, BROWARD, CO., FL.

CERTIFICATION
JUN 15 1990

DRAWN BY:	AM
CHECKED BY:	RJM
APPROVED BY:	RJM
DATE:	5/90
PROJECT NO:	NPC-3

SCALE: 1"=20'

APPENDIX E:

Correspondence

RECORD OF TELEPHONE CALL

HNTB

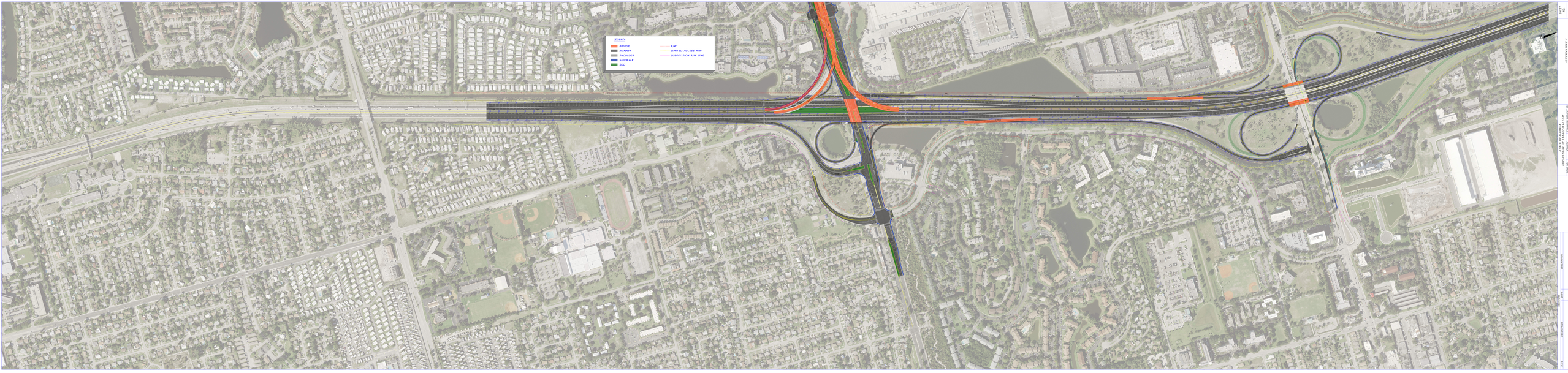
Job #	65674	**Date**	October 9, 2018
Call From	Brian McCarthy, Hong Ting (Sam) Chiu	**Of**	HNTB Corporation
Call To	Carl Archie, Johana Narvaez	**Of**	Broward County Water Control District #2
By	Brian McCarthy		

Subject Discussed

This telephone call with Broward County Water Control District (BCWCD) #2 was to discuss the potential impacts to the BCWCD #2 C-1 canal from the Florida Department of Transportation (FDOT) SR-9 (I-95) SW 10th St to Hillsboro Blvd PD&E Study. Figures were emailed in advanced of the telephone call to facilitate discussion and are attached to this record.

- Brian provided a general overview of the project. Along I-95, the project extends from south of SW 10th St to north of Hillsboro Blvd and includes capacity and safety improvements. Along SW 10th St, the project extends from east of FAU Research Park Blvd to west of Military Trail and proposes elevated express lanes to connect I-95 and the Turnpike.
- Brian asked about how the BCWCD #2 C-1 canal functions. Carl stated in the 1970s, Broward County and FDOT entered into an agreement where FDOT owns the property and Broward County maintains the C-1 canal. The canal acts as conveyance to the Hillsboro Canal and prevents saltwater intrusion into the wellfields west of I-95. Along the C-1 canal and within the project limits, there are 3 control structures that step down in elevation. The SW 10th St structure provides impoundment and storage and is maintained at a higher elevation. Vertical gates allow BCWCD #2 the ability to adjust the water elevation as needed. Access is gained by a boat ramp at SW 10th St. The Hillsboro Blvd structure also has vertical gates to adjust the water elevation and is accessed by a boat ramp at Hillsboro Blvd. The final structure is a weir with no adjustable gates at the Hillsboro Canal.
- Sam asked what the degree of accuracy is required to show no rise within the C-1 canal. Carl stated that should be discussed with the City of Deerfield's Floodplain Manager.
- Brian mentioned that there would be a proposed pond within the wellfield's zone of influence along SW 10th St. Johana stated that no wet ponds are permitted within the wellfield's zone of influence. If a dry pond is proposed, then 1 foot above the seasonal high water table is sufficient.

This is our understanding of the topics discussed.



SHEET NO.

ALTERNATIVE 2
EXPRESS ABBEY CONNECT

DATE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
ROAD NO. | COUNTY | FINANCIAL PROJECT ID
SR 9 | BROWARD | 2447
SECTION | SHEET | TOTAL SHEETS

REVISIONS

DATE | DESCRIPTION | DATE | DESCRIPTION

LA R/W
R/W
I-95
2695
2700
2705
2710
2715
2720
LA R/W
NE 48th St
FAU Research Park Blvd
1" = 200'

Figure 1

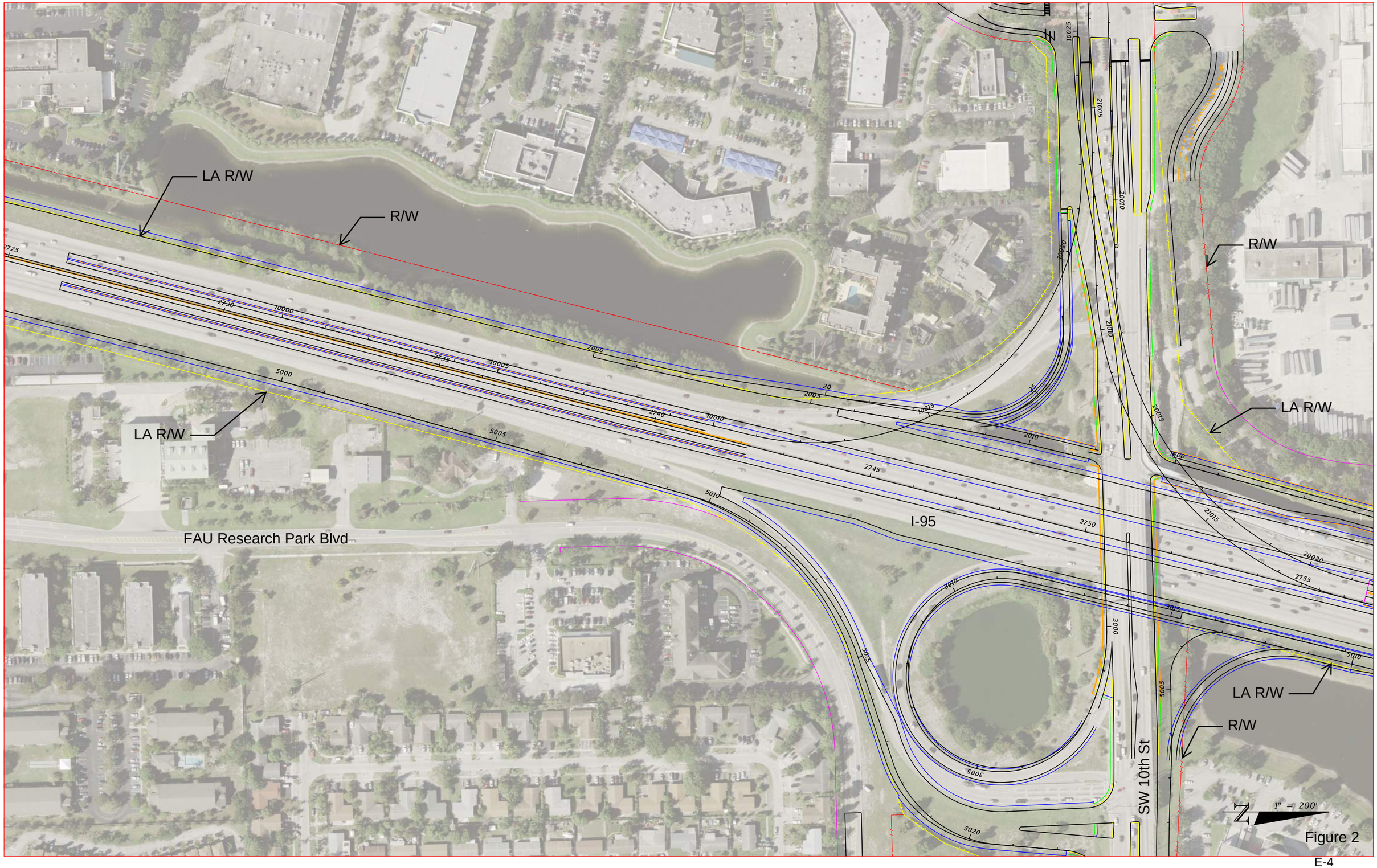

LA R/W
R/W
LA R/W
FAU Research Park Blvd
I-95
R/W
LA R/W
LA R/W
R/W
SW 10th St
1" = 200'

Figure 2

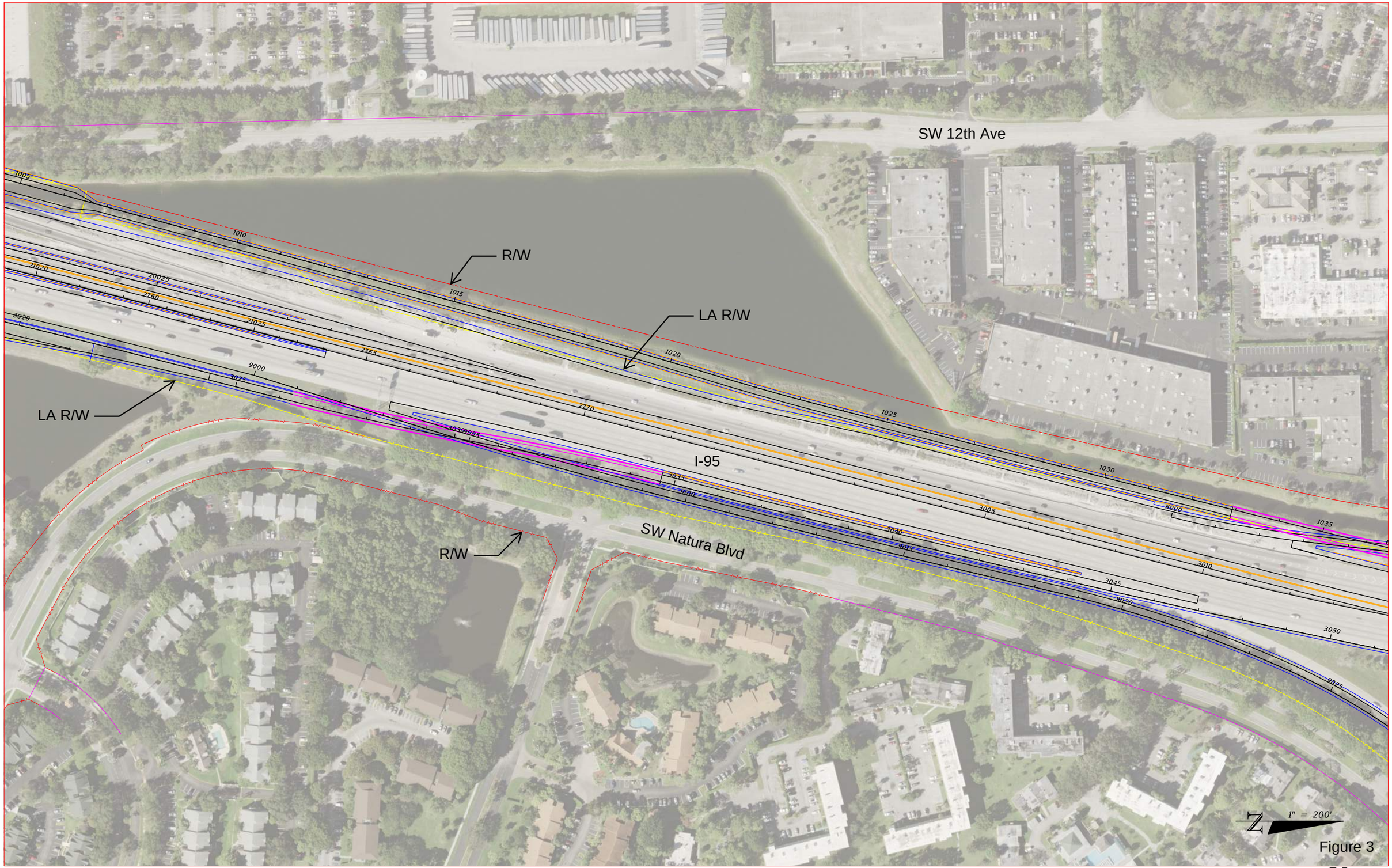


Figure 3

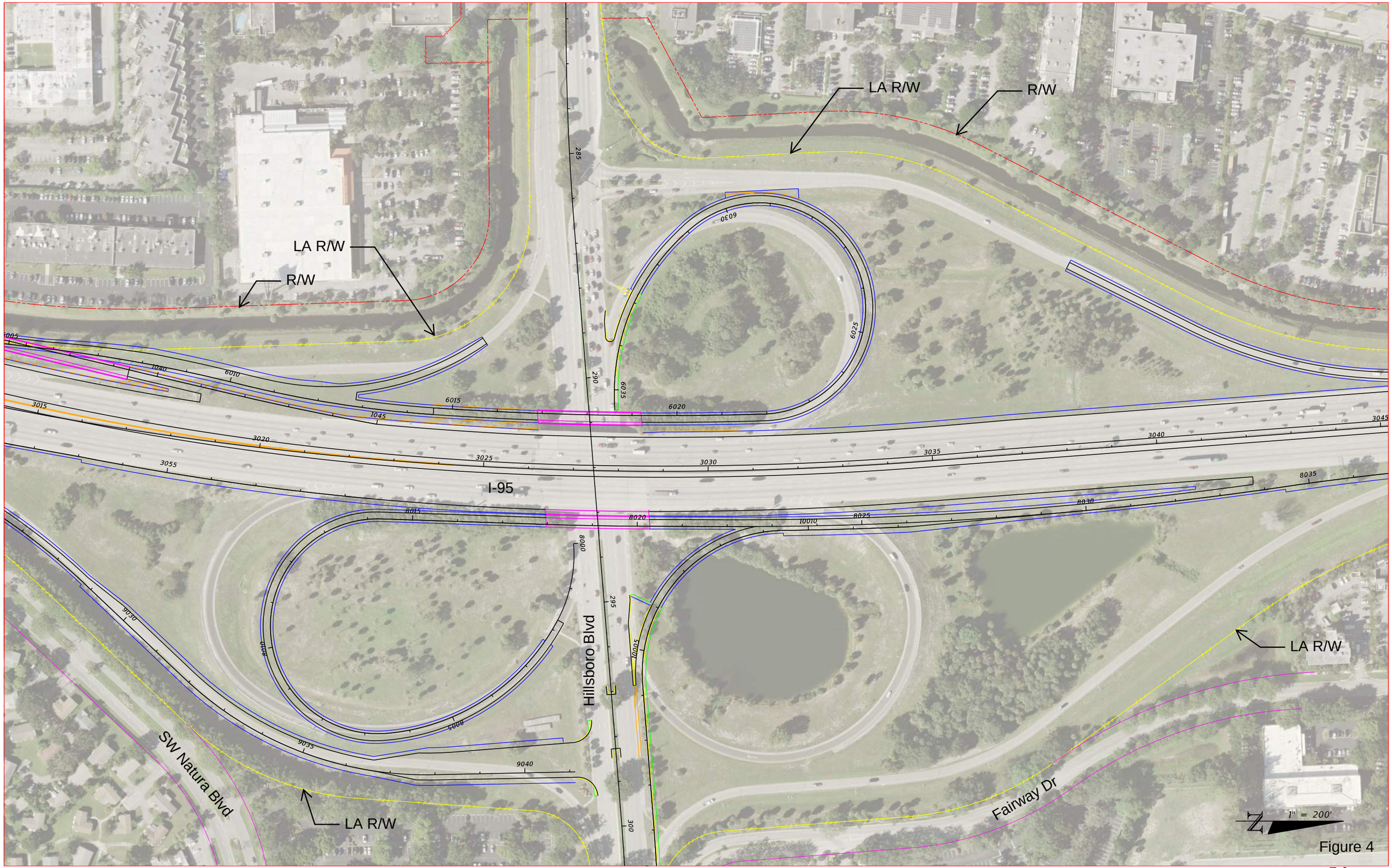

LA R/W
R/W
LA R/W
R/W
I-95
Hillsboro Blvd
SW Natura Blvd
Fairway Dr
LA R/W
LA R/W
1" = 200'

Figure 4

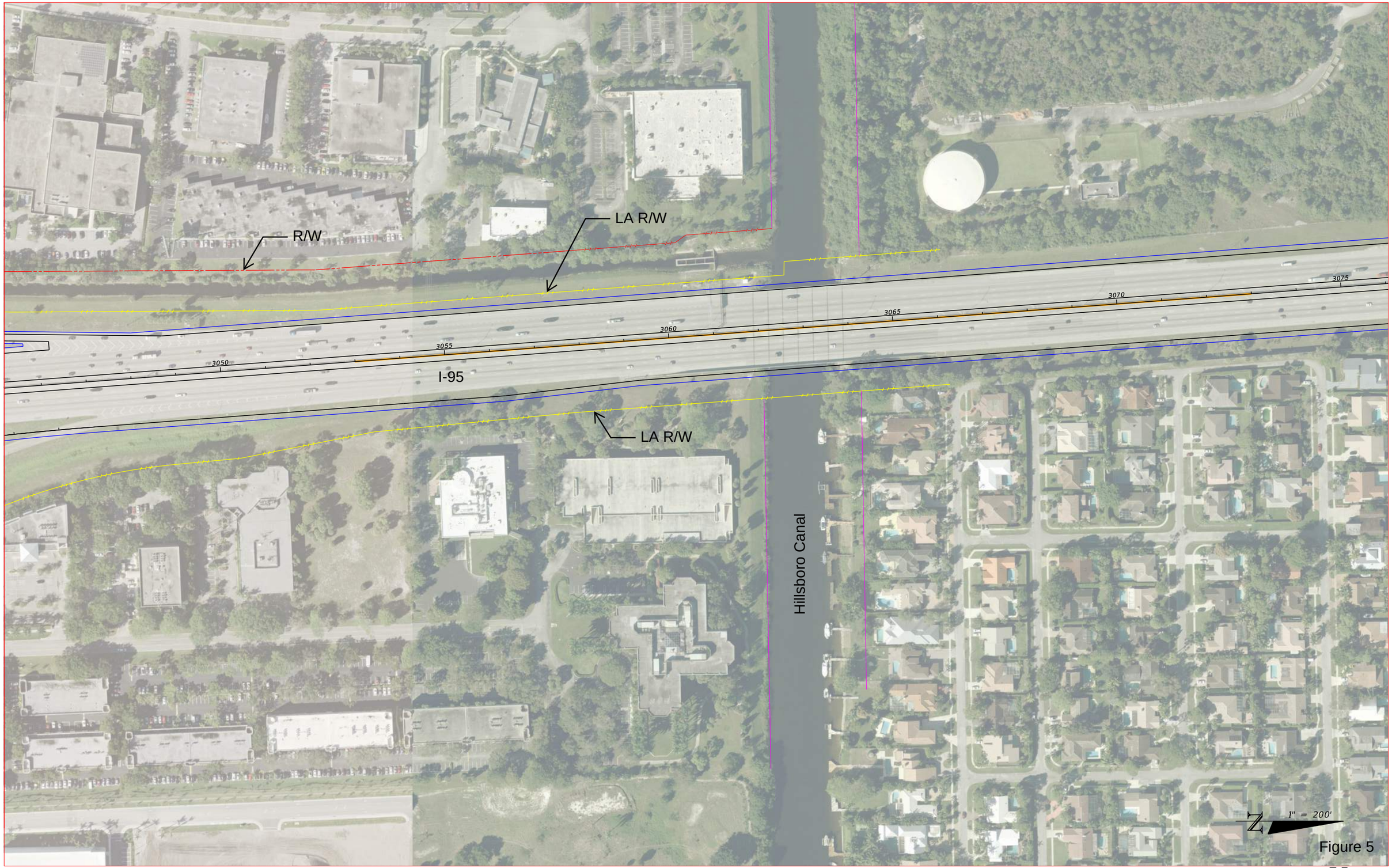

R/W
LA R/W
3050
3055
3060
3065
3070
3075
I-95
LA R/W
Hillsboro Canal
1" = 200'

Figure 5

HNTB Corporation
The HNTB Companies
Infrastructure Solution

201 N. Franklin Street
Suite 1200
Tampa, FL 33602

Telephone (813) 402-4150
www.hntb.com

Project Name
I-95 from south of SW 10th St to north of Hillsboro Blvd
FPID 436964-1

Date of Meeting
October 15, 2018
October 16, 2018 (follow-up)

HNTB Project #
65674

Location
Teleconference
850-414-4972 Code 490513

Purpose of Meeting
Pond Siting Meeting #3

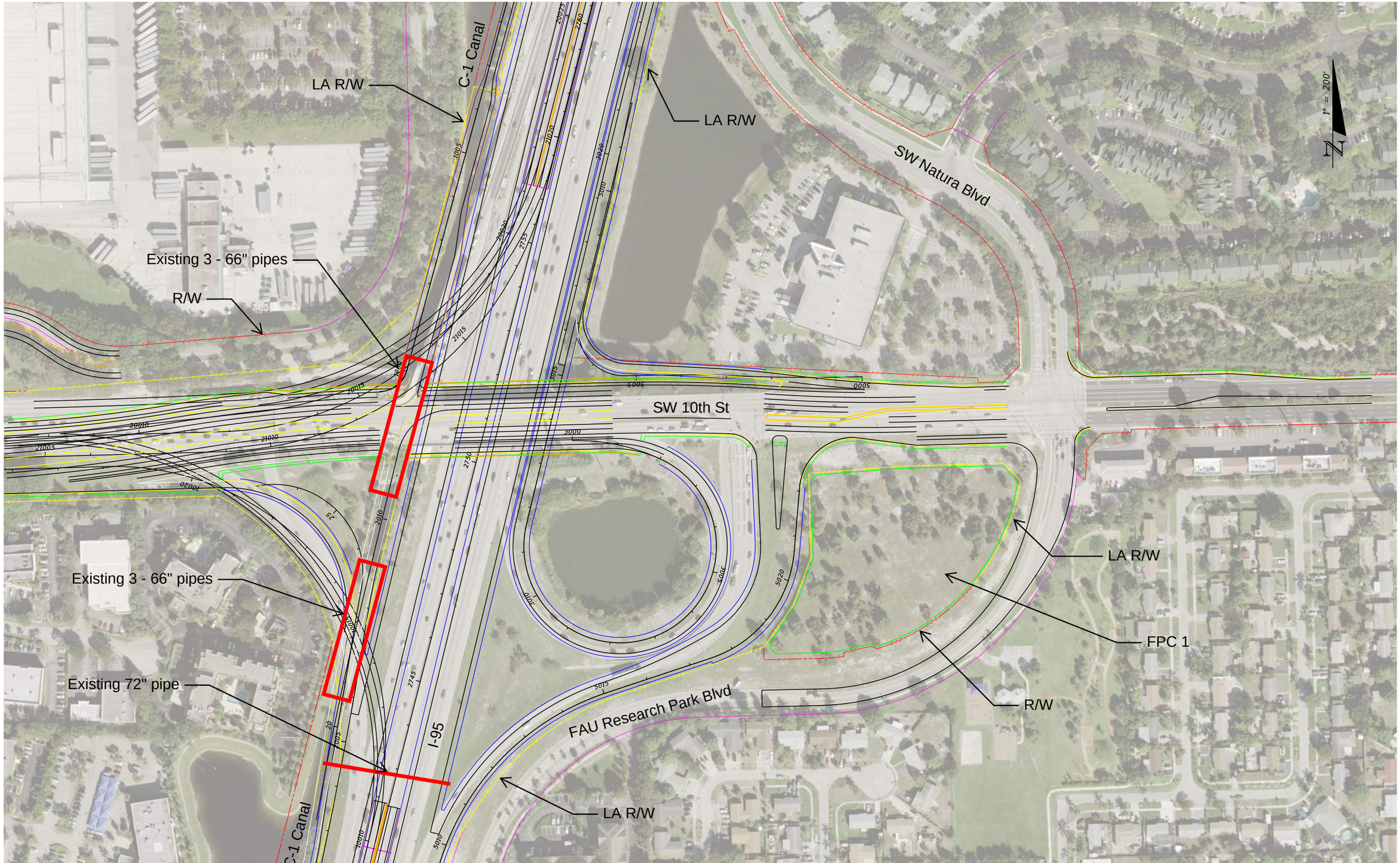
Time
3:00 pm – 4:30 pm

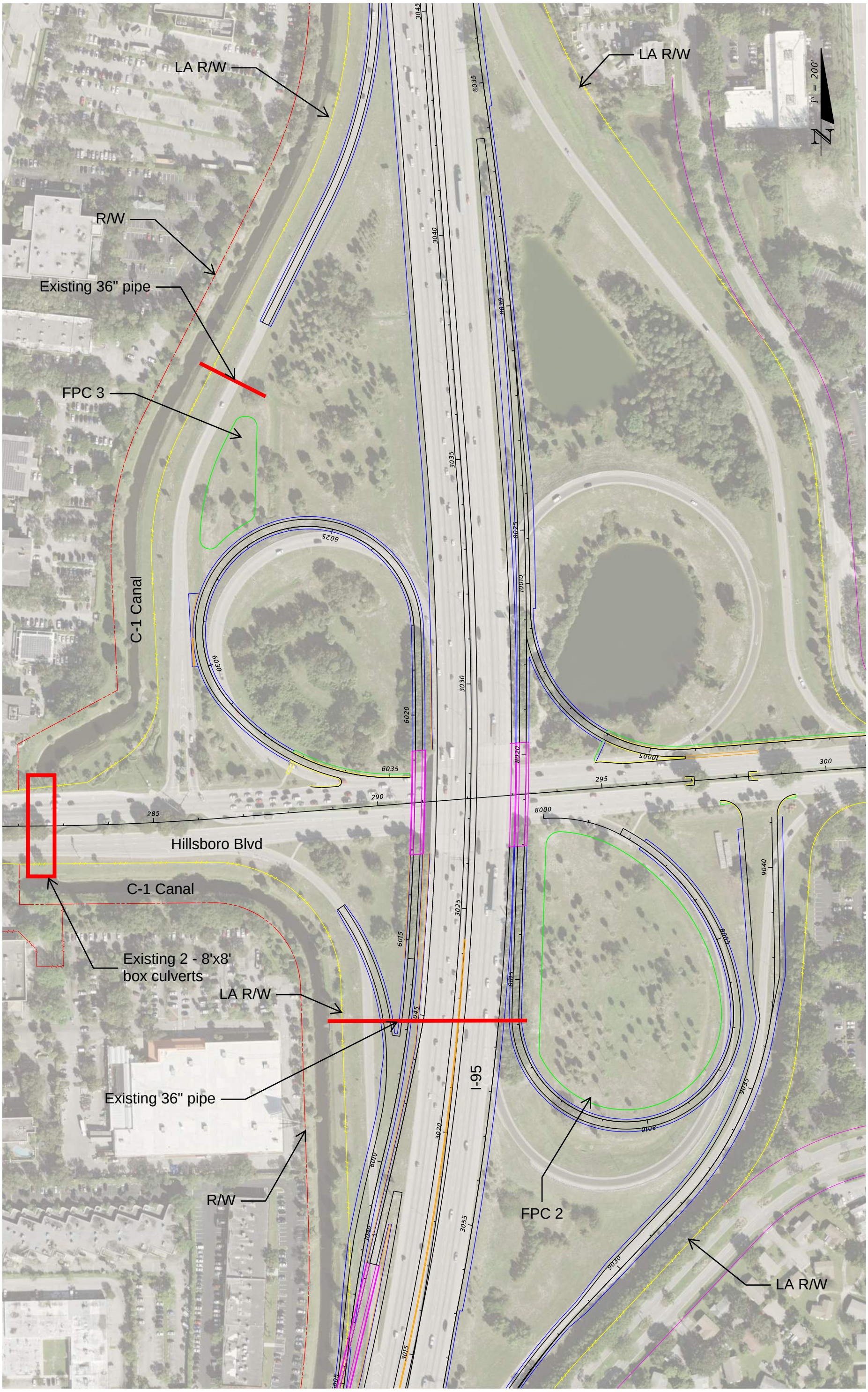
Participants
FDOT D4
RS&H
Vilma Croft (HNTB)
Brian McCarthy (HNTB)
Sam Chiu (HNTB)

MEETING MINUTES

The following relates to HNTB's portion of the SW 10th St connector project.

- Off-site right-of-way needs
  - Brian told FDOT that the calculations from the floodplain impacts indicate that the project will need an offsite parcel. The only vacant parcel available within the floodplain and large enough to accommodate the necessary impacts was at the southeast corner of the I-95 and SW 10th St.
    - According the Broward County Property Appraiser's website, the parcel is owned by the City of Deerfield.
    - FDOT believed that FDOT previously owned the parcel or had the right to deny any development by the City.
    - Further review by FDOT was required.
- SW 10th St at Military Trail
  - Brian asked Chris Jackson (RS&H) if their drainage calculations include HNTB's portion that discharge to the BCWCD#2 C-2 canal. Chris said from the high point at the railroad tracks west, RS&H has accounted for the HNTB impacts.
- Follow-up phone conversation (October 16)
  - After the teleconference on October 15, a discussion took place with FDOT leadership regarding the parcel's ownership. The parcel was originally owned FDOT, but loaned to FAU and that any potential project would also provide an opportunity for public use. No project was developed, and the parcel was returned to FDOT. At some point, FDOT gave the parcel to the City of Deerfield without the rights to develop it. However, sometime this year, the FDOT D4 Secretary granted the City of Deerfield the right to develop it. This parcel is no longer available for FPC use.


LA R/W
C-1 Canal
LA R/W
SW Natura Blvd
1" = 200'
N
Existing 3 - 66" pipes
R/W
SW 10th St
Existing 3 - 66" pipes
Existing 72" pipe
I-95
FAU Research Park Blvd
LA R/W
C-1 Canal
LA R/W
FPC 1
R/W


LA R/W
LA R/W
1" = 200'
R/W
Existing 36" pipe
FPC 3
C-1 Canal
Hillsboro Blvd
C-1 Canal
Existing 2 - 8'x8'
box culverts
LA R/W
Existing 36" pipe
R/W
I-95
FPC 2
LA R/W

http://bcweb-adapters.bcpa.net/bcpawebmap_ex/bcpawebmap.aspx

BCPA Web Map

Search By Folio | Search By Name | Search By Address | Help | About

Marty Kiar Broward County Property Appraiser Florida

Status: Identify

Layer List

- [ ] Highways
- [x] Major Roads
- [ ] Twn-Rng-Sec
- [ ] City Limits
- [ ] Zip Codes
- [ ] CRA Boundaries
- [ ] FEMA Flood Zones
- [ ] Census Tracts
- [ ] City Zoning Codes
- [ ] County Land Use
- [ ] Comm Appraisal Districts
- [ ] Resid Appraisal Districts
- [ ] Subdiv. Number
- [ ] Subdiv. Name
- [x] Street
- [x] Parcels
- [ ] Map Number

Aerials 2018

No Sales

Select Description

Important Disclaimer

Parcel Information

Folio Number:	484212530010
Owner:	CITY OF DEERFIELD BEACH MANAGEMENT & BUDGET DIRECTOR
Situs Address:	1045 SW 11 WAY DEERFIELD BEACH FL 33441
Legal:	DEERFIELD BEACH FAU-PLAT 2 178-29B PAR A
Millage Code:	1112
Use Code:	80
Land Value:	$ 980,690
Building Value:	0
Other Value:	0
Total Value:	$ 980,690
SOH Capped Value:	$ 980,690
Homestead Exempt. Amt:	$ 0
WVD Exempt. Amt:	$ 0
Other Exempt. Amt:	$ 0
Taxable Value:	$ 980,690
Sale Date 1:	05/16/2005
Sale Price 1:	$ 0
Deed Type 1:	QC*
Sale Date 2:	

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Suite 1200
Tampa, FL 33602

Telephone (813) 402-4150
www.hntb.com

Project Name
I-95 from south of SW 10th St to north of Hillsboro Blvd
FPID 436964-1

Date of Meeting
November 14, 2018

HNTB Project #
65674

Location
Teleconference
855-797-9485 Code 740-384-270

Purpose of Meeting
SFWMD Coordination Meeting

Time
9:00 am – 9:30 am

Participants
Kenson Coupet (SFWMD)
Carlos De Rojas (SFWMD)
Vilma Croft (HNTB)
Brian McCarthy (HNTB)
Sam Chiu (HNTB)

MEETING MINUTES

1. Brian McCarthy (HNTB) provided a general project description of the project. Along I-95, the project extends from south of SW 10th St to north of Hillsboro Blvd and includes capacity and safety improvements. Along SW 10th St, the project extends from east of FAU Research Park Blvd to west of Military Trail and proposes elevated express lanes to connect I-95 and the Turnpike.
2. Brian stated that all roadway improvements, west of the railroad tracks along SW 10th St, flow to the Broward County Water Control District #2 (BCWCD#2) C-2 canal. The adjacent FDOT project (SW 10th St Connector; FPID 439891-1) will accommodate the treatment and attenuation needs in their project. Carlos De Rojas (SFWMD) asked if the connector project will be constructed first or concurrently to ours. Sam Chiu (HNTB) stated that since both projects are still in the Project Development & Environment Phase, the construction schedule has been not determined. HNTB will inform FDOT of the need that the this project will need to have the stormwater improvements from the connector project built before or concurrently to ours.
3. Carlos asked if FDOT plans on submitting a conceptual permit for this project. Sam stated that FDOT typically obtains an individual permit for each project; however, FDOT will determine the permitting approach/type at a later date.
4. Brian asked if SFWMD was aware of any known flooding issues. Carlos wasn't aware of any flooding issues but that we should verify with FDOT and Broward County. Sam added that Broward County wasn't aware of any flooding issues from the previous coordination call.
5. Kenson Coupet (SFWMD) asked if FDOT will have acquired all offsite parcels prior to submitting a permit application. Sam stated that according to FDOT's typical right-of-way acquisition schedule, FDOT generally does not acquired all the necessary parcels by the time of permitting, given the State is an entity having the power of eminent domain and condemnation authority. If there are changes due to right-of-way acquisition after the permit issuance, FDOT typically would apply for a permit modification. Carlos stated a special condition could be added to the permit if the offsite parcels weren't acquired by permit issuance.
6. Brian asked if SFWMD would allow the majority of treatment for the project to occur in the Hillsboro Blvd interchange since there was limited space available in the SW 10th St interchange. Also, Brian mentioned the plan was to pursue compensatory treatment for the new impervious area along the areas of I-95 that

wasn't being treated. Carlos mentioned it would be okay, but to maximize the treatment as much as possible in the SW 10th St interchange. Also, Carlos emphasized that if pursuing compensatory treatment, to ensure that the impervious area hasn't already been treated in another project.

From:	Torres, Margie
To:	Brian McCarthy
Cc:	Williams, Darlene; Taylor, Zachary; Leiva, Ivette
Subject:	FW: [FPID 436964-1] I-95 from SW 10th St to Hillsboro Blvd - Drainage Concerns - S.R. 17842
Date:	Thursday, January 10, 2019 3:38:53 PM
Attachments:	image001.png image004.png FPID 436964-1 Project Limits .pdf

---

I have not received any drainage or flooding issues on I-95, from S.W. 10th St. to Palm Beach County line.

Lets write a new story

Margarita Torres
Public Service Coordinator
State of Florida Department of Transportation
Margarita.torres@dot.state.fl.us
(954) 776-4300 x 7670
(954) 958-7670
Fax: (954) 958-7660
5548 N.W. 9th Avenue
Fort Lauderdale, Fl. 33309

How am I doing? Please contact my Maint. Mgr/Field Operations, Zachary Taylor at Zachary.taylor@dot.state.fl.us with any feedback or comments

---

From: Williams, Darlene
Sent: Thursday, January 10, 2019 2:22 PM
To: Brian McCarthy <btmccarthy@HNTB.com>; Torres, Margie <Margarita.Torres@dot.state.fl.us>
Cc: Taylor, Zachary <Zachary.Taylor@dot.state.fl.us>; Leiva, Ivette <Ivette.Leiva@dot.state.fl.us>
Subject: RE: [FPID 436964-1] I-95 from SW 10th St to Hillsboro Blvd - Drainage Concerns - S.R. 17842

Brian, It's very rare that we get reports of drainage issues on any of the expressways. Sometimes we

get reports of debris clogging the drains, but not actual reports of flooding.

I could not find any reports of flooding or drainage issues on I-95, either direction, from S.W. 10th St., to the PB County Line. No erosion reports either.

Margie, can you let him know if you have received any such reports? Thanks--dar

---

From: Brian McCarthy [mailto:btmccarthy@HNTB.com]
Sent: Thursday, January 10, 2019 11:16 AM
To: Williams, Darlene <Darlene.Williams@dot.state.fl.us>
Subject: [FPID 436964-1] I-95 from SW 10th St to Hillsboro Blvd - Drainage Concerns

EXTERNAL SENDER: Use caution with links and attachments.

Hi Darlene,

It was a pleasure talking to you on the phone this morning.

Our company is working on a PD&E Study along I-95, SW 10th St and Hillsboro Blvd. Attached is a figure to show the project limits (the project ends at Hillsboro Canal/County Line).

I was wondering if there has been any history of flooding, erosion problems or other drainage issues in our project area that you might be aware of.

Thanks for your help!
Brian

Brian McCarthy, PE
Stormwater Engineer
Drainage
Tel (813) 498-5160 **Email** btmccarthy@hntb.com

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201 N. Franklin Street, Suite, 1200 | Tampa, FL 33602 | hntb.com

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Brian McCarthy

From: Jackson, Chris <Chris.Jackson@rsandh.com>
Sent: Friday, July 19, 2019 3:06 PM
To: Brian McCarthy
Subject: RE: FPID 436964-1 I-95 and SW10th Drainage Areas

Hey Brian,
Yes, I confirm your email below. The SW 10th Street project is indeed designed to fully accommodate all contributing roadway drainage east of the railroad tracks.

Thanks,
Chris

Chris Jackson, PE, LEED AP
Vice President, Transportation-Infrastructure
O 954-236-7375 | O 678-528-7236 | M 954-205-0288
chris.jackson@rsandh.com
rsandh.com | Facebook | Twitter | LinkedIn | Blog

Stay up-to-date with our latest news and insights.

RS&H

From: Brian McCarthy [mailto:btmccarthy@HNTB.com]
Sent: Friday, July 19, 2019 2:47 PM
To: Jackson, Chris <Chris.Jackson@rsandh.com>
Subject: FPID 436964-1 I-95 and SW10th Drainage Areas

Hi Chris,

Thanks for speaking with me.

I'm writing our PSR and wanted to document our coordination.

Along SW 10th Street, between Newport Center and Military Trail, the railroad tracks is assumed to be the highpoint separating 2 basins. The west basin (basin 1) would flow towards the BCWCD#2 C-2 canal and the east (basin 2) towards the BCWCD#2 C-1 canal.

Rather than having an outfall pipe to the C-2 canal from HNTB's project go through RS&H's project, it was agreed that RS&H would size their proposed pond to include the additional impervious area from HNTB's basin 1 (see attached figure).

Please let me know if you have any questions.

Thanks,
Brian

Brian McCarthy, PE
Stormwater Engineer
Drainage
Tel (813) 498-5160 **Email** btmccarthy@hntb.com

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201 N. Franklin Street, Suite, 1200 | Tampa, FL 33602 | hntb.com

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APPENDIX F:

STRAIGHT LINE DIAGRAMS

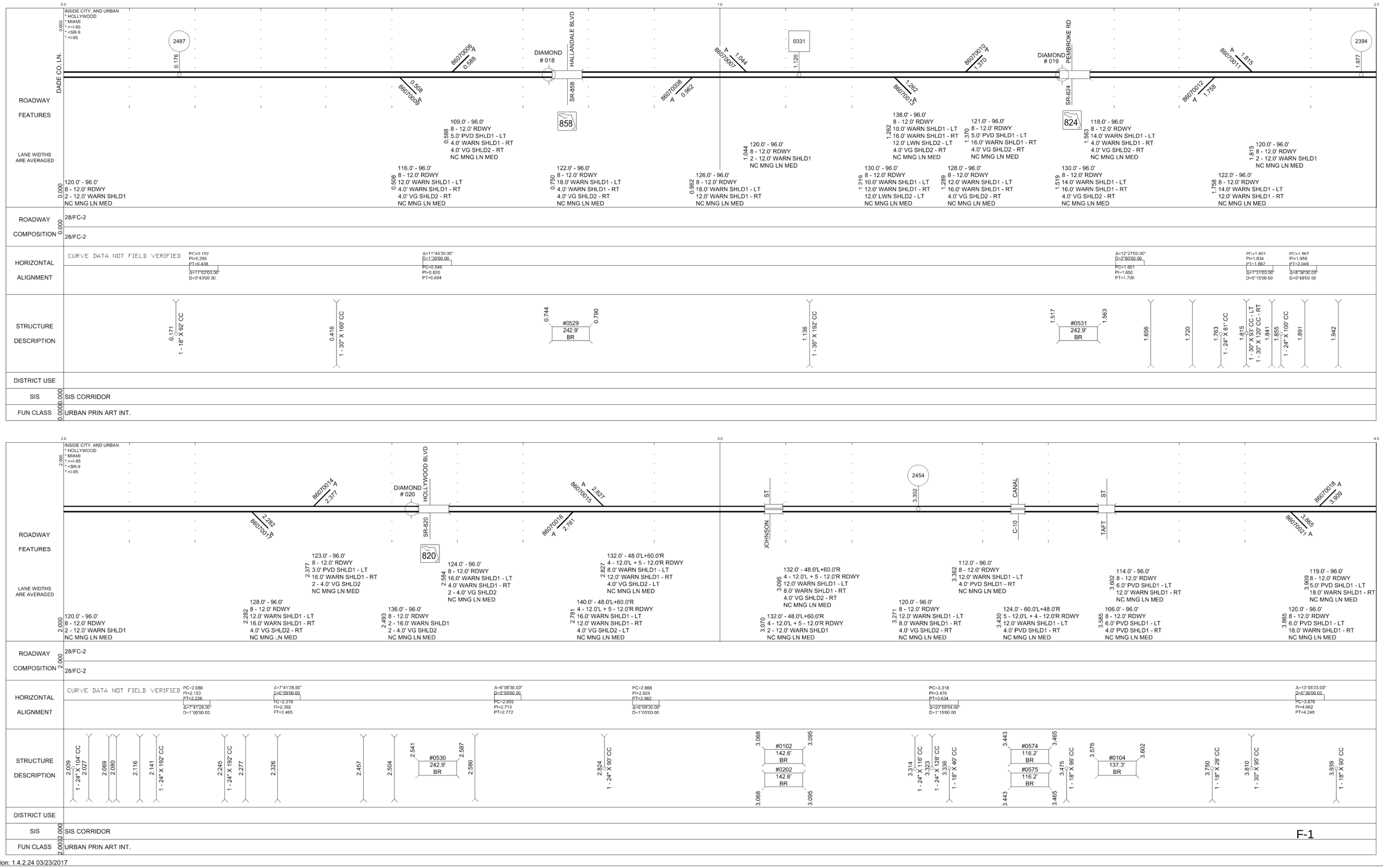
	5 YR INV	SLD REV
DATE	10/03/2014	10/17/2014
BY	CTS	CTS

BMP	EMP	INV	SLD REV
000.000	008.105	03/06/2017 FTE	03/23/2017 FTE
010.578	010.578	09/30/2016 FDOT-D4	09/30/2016 FDOT-D4
013.892	015.284	08/02/2016 DQE 2016 P1	08/02/2016 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



F-1

Version: 1.4.2.24 03/23/2017

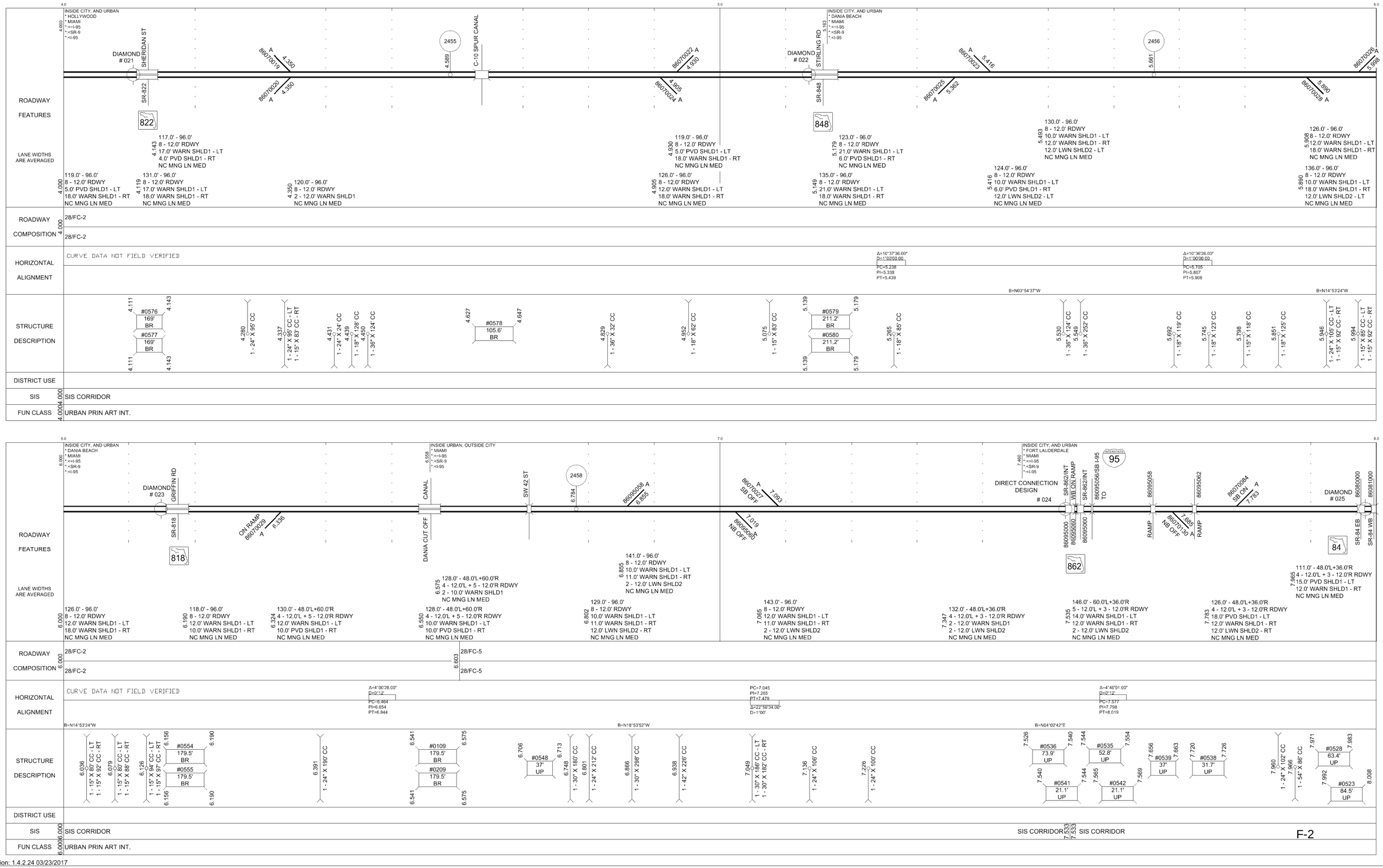
	5 YR INV	SLD REV
DATE	10/03/2014	10/17/2014
BY	CTS	CTS

BMP	EMP	INV	SLD REV
000.000	008.105	03/06/2017 FTE	03/23/2017 FTE
010.578	010.578	09/30/2016 FDOT-D4	09/30/2016 FDOT-D4
013.892	015.284	08/02/2016 DQE 2016 P1	08/02/2016 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	2 OF 7



F-2

Version: 1.4.2.24 03/23/2017

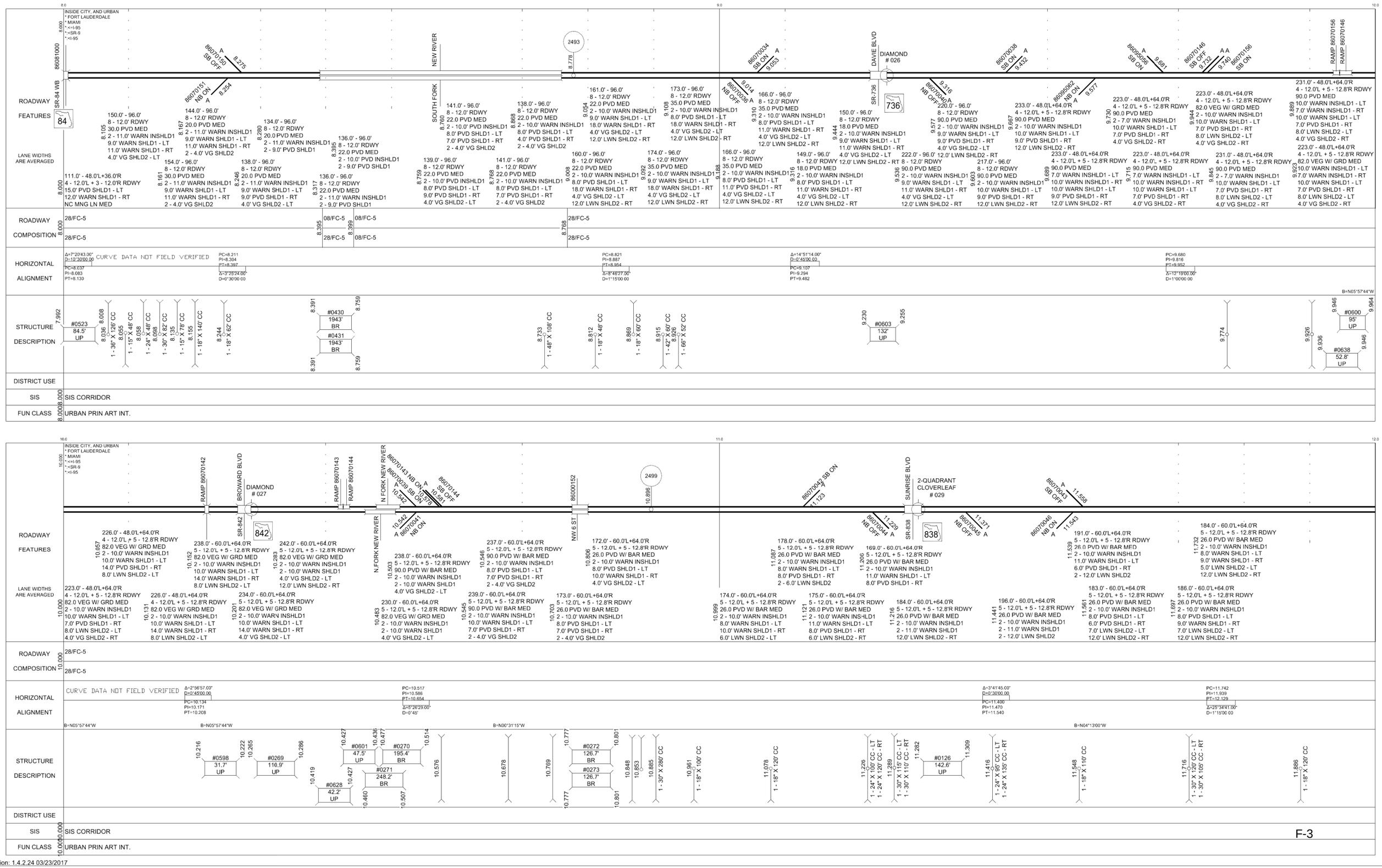
	5 YR INV	SLD REV
DATE	10/03/2014	10/17/2014
BY	CTS	CTS

BMP	EMP	INV	SLD REV
000.000	008.105	03/06/2017 FTE	03/23/2017 FTE
010.578	010.578	09/30/2016 FDOT-D4	09/30/2016 FDOT-D4
013.892	015.284	08/02/2016 DQE 2016 P1	08/02/2016 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	3 OF 7



F-3

Version: 1.4.2.24 03/23/2017

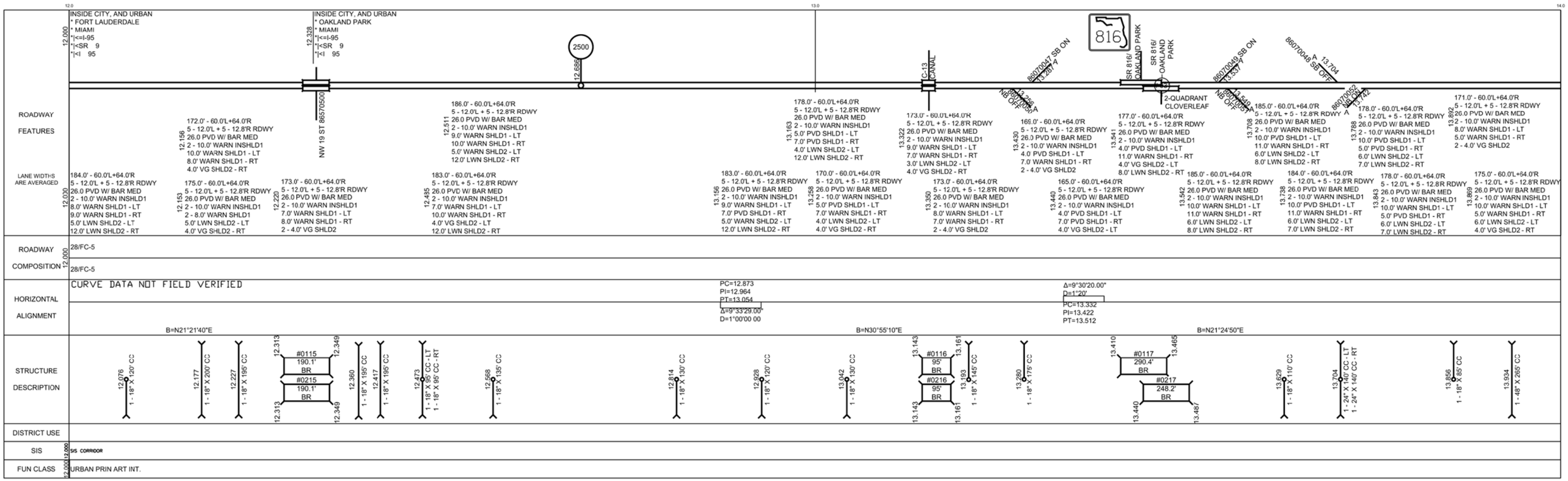
	5 YR INV	SLD REV
DATE	10/03/2014	10/17/2014
BY	CTS	CTS

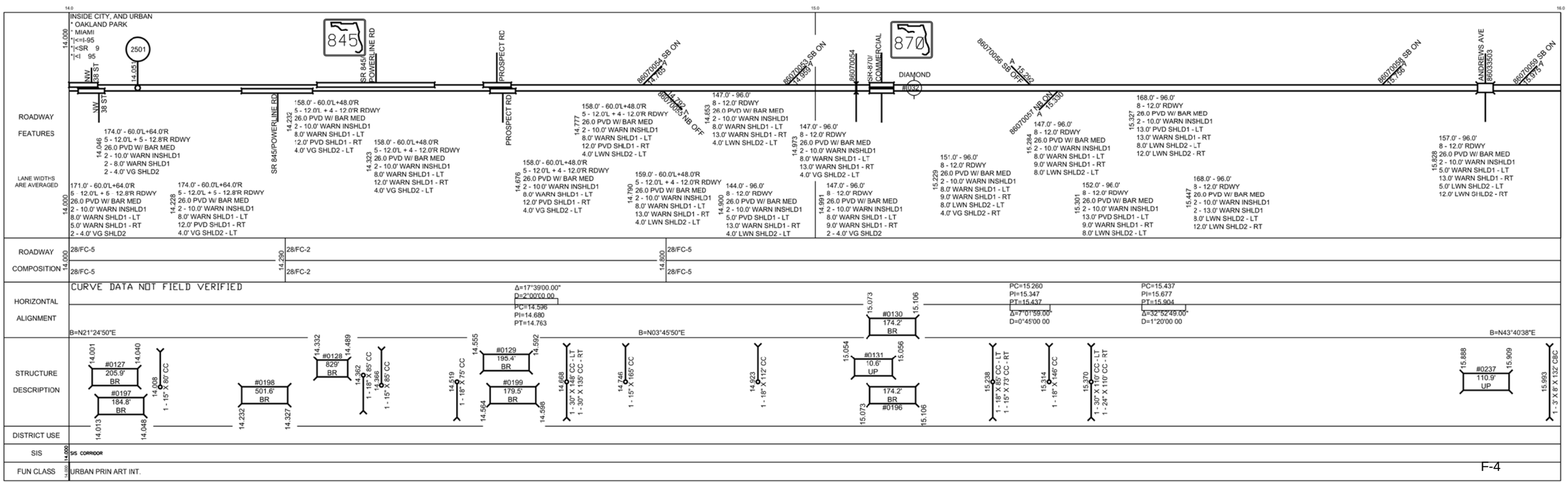
BMP	EMP	INV	SLD REV
013.892	15.284	08/02/2016 DQE	08/02/2016 CTS
005.163	006.558	08/25/2015 FDOT-D4	08/25/2015 FDOT-D4
020.508	024.272	06/25/2015 FDOT-D4	06/25/2015 FDOT-D4

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:
02	I 95	SR 9	BROWARD	04	86070000	4 OF 7





	5 YR INV	SLD REV
DATE	10/03/2014	10/17/2014
BY	CTS	CTS

BMP	EMP	INV	SLD REV
0.000	025.334	FFC-121/124	03/04/2015 FDOT-D4
020.500	025.334	12/16/2014 FDOT-D4	12/16/2014 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:
02	I 95	SR 9	BROWARD	04	86070000	5 OF 7

16.0 17.0 18.0

ROADWAY FEATURES

16.000 INSIDE CITY, AND URBAN
* OAKLAND PARK
* MIAMI
*I<=I-95
*I<SR 9
*I<I 95

PARK AND RIDE RAMP CYPRESS CREEK RD — 2-QUADRANT CLOVERLEAF # 033 — 86070061SB ON A 16.351 — 86070060 A SB OFF 16.570 — 16.798 — C-14 — MCNAB RD — 2503 17.46

86070062 A NB OFF 16.050 — PARK AND RIDE RAMP — CYPRESS CREEK RD — 86070063 A NB OFF 16.454 — 86070064 NB ON A 16.711 — CANAL — MCNAB RD

16.012 163.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
2 – 13.0' WARN SHLD1
3.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

16.155 147.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
5.0' WARN SHLD1 – RT
3.0' LWN SHLD2 – LT
4.0' VG SHLD2 – RT

16.365 134.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
5.0' PVD SHLD1 – RT
3.0' LWN SHLD2 – LT
4.0' VG SHLD2 – RT

16.451 157.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
12.0' WARN SHLD1 – LT
13.0' WARN SHLD1 – RT
3.0' LWN SHLD2 – LT
7.0' LWN SHLD2 – RT

16.731 145.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
10.0' WARN SHLD1 – LT
13.0' PVD SHLD1 – RT

16.835 146.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' WARN SHLD1 – LT
13.0' WARN SHLD1 – RT
4.0' VG SHLD2 – LT

17.092 169.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
10.0' WARN SHLD1 – LT
13.0' WARN SHLD1 – RT
2 – 12.0' LWN SHLD2

LANE WIDTHS ARE AVERAGED

16.000 157.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
5.0' WARN SHLD1 – LT
13.0' WARN SHLD1 – RT
5.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

16.050 151.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
8.0' PVD SHLD1 – RT
3.0' LWN SHLD2 – LT
5.0' LWN SHLD2 – RT

16.160 142.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' WARN SHLD1 – LT
5.0' WARN SHLD1 – RT
2 – 4.0' VG SHLD2

16.334 142.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' WARN SHLD1 – LT
5.0' PVD SHLD1 – RT
2 – 4.0' VG SHLD2

16.384 146.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
12.0' WARN SHLD1 – LT
5.0' PVD SHLD1 – RT
3.0' LWN SHLD2 – LT
4.0' VG SHLD2 – RT

16.576 152.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
10.0' PVD SHLD1 – LT
13.0' WARN SHLD1 – RT
7.0' LWN SHLD2 – RT

16.709 145.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
10.0' PVD SHLD1 – LT
13.0' PVD SHLD1 – RT

16.769 146.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' WARN SHLD1 – LT
13.0' PVD SHLD1 – RT
4.0' VG SHLD2 – LT

17.088 158.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' WARN SHLD1 – LT
13.0' WARN SHLD1 – RT
4.0' VG SHLD2 – LT
12.0' LWN SHLD2 – RT

17.150 181.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
10.0' WARN SHLD1 – LT
13.0' WARN SHLD1 – RT
2 – 12.0' LWN SHLD2

17.838 184.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
2 – 13.0' WARN SHLD1
2 – 12.0' LWN SHLD2

17.951 172.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
6.0' PVD SHLD1 – RT
12.0' LWN SHLD2 – LT
7.0' LWN SHLD2 – RT

ROADWAY COMPOSITION

16.000 28/FC-5

16.000 28/FC-5

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

Δ=44°30'47.00"
D=1°30'00 00
PC=16.646
PI=16.943
PT=17.209

B=N43°40'38"E

B=N00°50'09"W

STRUCTURE DESCRIPTION

16.202 1 – 18" X 38' CC – LT
1 – 18" X 38' CC – RT

16.247 #0239 264' BR 16.297

16.276 #0240 322.1' BR 16.337

16.590 1 – 18" X 44' CC – RT

16.675 1 – 18" X 56' CC

16.808 1 – 18" X 38' CC

16.787 #0243 258.7' BR 16.836
16.787 #0244 258.7' BR 16.836

16.901 #0241 301' BR 16.958
16.910 #0242 290.4' BR 16.965

17.092 1 – 18" X 66' CC

17.243 1 – 18" X 56' CC

17.385 1 – 18" X 50' CC

17.527 1 – 18" X 50' CC

17.698 1 – 18" X 50' CC

17.868 1 – 18" X 50' CC

DISTRICT USE

SIS

16.000 SIS CORRIDOR

FUN CLASS

16.000 URBAN PRIN ART INT.

18.0 19.0 20.0

ROADWAY FEATURES

18.000 INSIDE CITY, AND URBAN
* POMPANO BEACH
* MIAMI
*I<=I-95
*I<SR 9
*I<I 95

RACE TRACK ROAD — 86070065 NB ON A 18.086 — 86070066 SB OFF A 18.303 — 814 — BLVD — 2-QUADRANT CLOVERLEAF # 036 — 86070069 SB OFF A 18.546 — HAMMONDVILLE RD — RAILROAD — NW 15 ST — 2504 19.548

86070067 A NB OFF 18.102 — 86070068 NB ON A 18.286 — SR-814/ATLANTIC — 86070070 NB ON A 18.546 — HAMMONDVILLE RD — F.E.C.

18.040 160.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
6.0' PVD SHLD1 – RT
12.0' LWN SHLD2 – LT
7.0' LWN SHLD2 – RT

18.339 147.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
9.0' WARN SHLD1 – LT
8.0' PVD SHLD1 – RT
2 – 4.0' VG SHLD2

18.536 156.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
5.0' PVD SHLD1 – LT
13.0' WARN SHLD1 – RT
4.0' VG SHLD2 – LT
12.0' LWN SHLD2 – RT

18.640 154.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
5.0' PVD SHLD1 – LT
11.0' WARN SHLD1 – RT
4.0' VG SHLD2 – LT
12.0' LWN SHLD2 – RT

18.716 179.0' – 48.0'L+60.0'R
4 – 12.0'L + 5 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
10.0' WARN SHLD1 – LT
11.0' WARN SHLD1 – RT
2 – 12.0' LWN SHLD2

19.103 159.0' – 48.0'L+60.0'R
4 – 12.0'L + 5 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
8.0' WARN SHLD1 – LT
9.0' WARN SHLD1 – RT
2 – 4.0' VG SHLD2

19.266 169.0' – 120.0'
10 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
8.0' WARN SHLD1 – LT
7.0' WARN SHLD1 – RT
2 – 4.0' VG SHLD2

19.435 168.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
8.0' WARN SHLD1 – LT
10.0' WARN SHLD1 – RT
4.0' VG SHLD2 – LT
12.0' LWN SHLD2 – RT

19.938 164.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
9.0' WARN SHLD1 – LT
5.0' PVD SHLD1 – RT
4.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

19.962 164.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
2 – 5.0' PVD SHLD1
8.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

LANE WIDTHS ARE AVERAGED

18.000 172.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
6.0' PVD SHLD1 – RT
12.0' LWN SHLD2 – LT
7.0' LWN SHLD2 – RT

18.105 179.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
20.0' WARN SHLD1 – RT
2 – 12.0' LWN SHLD2

18.289 159.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
8.0' PVD SHLD1 – RT
12.0' LWN SHLD2 – LT
4.0' VG SHLD2 – RT

18.464 160.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
9.0' WARN SHLD1 – LT
13.0' WARN SHLD1 – RT
4.0' VG SHLD2 – LT
12.0' LWN SHLD2 – RT

18.542 140.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
5.0' PVD SHLD1 – LT
9.0' PVD SHLD1 – RT
4.0' VG SHLD2 – LT

18.666 167.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
10.0' WARN SHLD1 – LT
11.0' WARN SHLD1 – RT
2 – 12.0' LWN SHLD2

19.061 169.0' – 48.0'L+60.0'R
4 – 12.0'L + 5 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
9.0' WARN SHLD1 – LT
12.0' LWN SHLD2 – LT
4.0' VG SHLD2 – RT

19.259 171.0' – 120.0'
10 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
8.0' WARN SHLD1 – LT
9.0' WARN SHLD1 – RT
2 – 4.0' VG SHLD2

19.407 157.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
8.0' WARN SHLD1 – LT
7.0' WARN SHLD1 – RT
2 – 4.0' VG SHLD2

19.450 169.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
9.0' WARN SHLD1 – LT
10.0' WARN SHLD1 – RT
4.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

19.646 173.0' – 60.0'L+48.0'R
5 – 12.0'L + 4 – 12.0'R RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
14.0' WARN SHLD1 – RT
4.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

19.949 152.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
2 – 5.0' PVD SHLD1
8.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

ROADWAY COMPOSITION

18.000 28/FC-5

28/FC-5

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

PC=19.893
PI=20.062
PT=20.217

Δ=38°28'34.00"
D=2°15'00 00

B=N00°50'09"W

STRUCTURE DESCRIPTION

18.038 #0233 110.9' UP 18.059

18.209 1 – 18" X 38' – RT

18.370 1 – 15" X 38' CC

18.371 #0231 211.2' BR 18.411
18.371 #0232 211.2' BR 18.411

18.497 1 – 18" X 58' CC

18.567 #0235 174.2' BR 18.600
18.560 #0236 147.8' BR 18.588

18.721 1 – 18" X 54' CC

18.872 1 – 60" X 128' CC

19.043 1 – 18" X 38' CC

19.239 #0118 142.6' BR 19.266
19.239 #0218 142.6' BR 19.266

19.289 1 – 15" X 38' CC – LT
1 – 18" X 38' CC – RT

19.353 #0119 174.2' BR 19.386
19.353 #0219 174.2' BR 19.386

19.497 1 – 18" X 56' CC

19.649 1 – 18" X 58' CC

19.762 1 – 18" X 54' CC

19.848 1 – 72" X 156'

DISTRICT USE

SIS

18.000 SIS CORRIDOR

FUN CLASS

18.000 URBAN PRIN ART INT.

Version: 1.4.2.24 02/24/2015

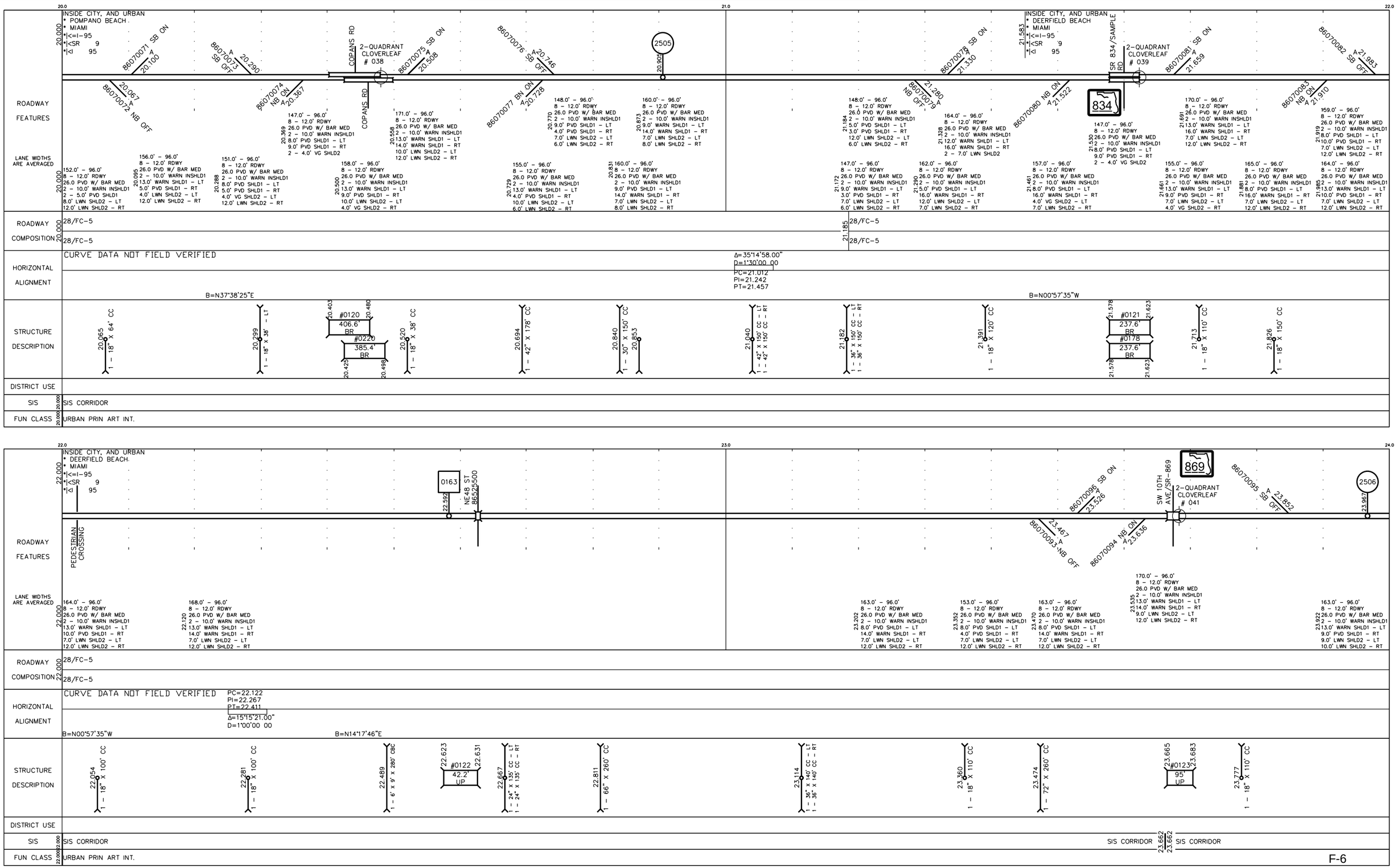
	5 YR INV	SLD REV
DATE	10/03/2014	10/17/2014
BY	CTS	CTS

BMP	EMP	INV	SLD REV
020.508	024.272	06/25/2015 FDOT-D4	06/25/2015 FDOT-D4
0.000	025.334	FFC-121/124	03/04/2015 FDOT-D4
020.500	025.334	12/16/2014 fdot-d4	12/16/2014 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:
02	I 95	SR 9	BROWARD	04	86070000	6 OF 7



Version: 1.4.2.24 02/24/2015

	5 YR INV	SLD REV
DATE	10/03/2014	10/17/2014
BY	CTS	CTS

BMP	EMP	INV	SLD REV
020.508	024.272	06/25/2015 FDOT-D4	06/25/2015 FDOT-D4
0.000	025.334	FFC-121/124	03/04/2015 FDOT-D4
020.500	025.334	12/16/2014 fdot-d4	12/16/2014 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:
02	I 95	SR 9	BROWARD	04	86070000	7 OF 7

24.0 — 25.0

ROADWAY FEATURES

24.000 INSIDE CITY, AND URBAN
* DEERFIELD BEACH.
* MIAMI
*I<=I-95
*I<SR 9
*I<I 95

86070087 SB ON A 24.400

86070086 NB ON A 24.272

86070088 NB ON A 24.517

2-QUADRANT CLOVERLEAF # 042

SR810 HILLSBORO BLVD

810

86070089 SB ON A 24.711

86070090 NB OFF A 24.732

86070091 SB OFF A 24.850

86070092 NB ON A 25.013

HILLSBORO CANAL

25.334 END OF BR 0125/0195

25.334 END OF SECTION

24.192 151.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' PVD SHLD1 – LT
6.0' PVD SHLD1 – RT
4.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

24.337 167.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
12.0' WARN SHLD1 – LT
14.0' WARN SHLD1 – RT
7.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

24.518 143.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' PVD SHLD1 – LT
10.0' PVD SHLD1 – RT
4.0' VG SHLD2 – LT

24.733 160.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
12.0' WARN SHLD1 – LT
14.0' WARN SHLD1 – RT
12.0' LWN SHLD2 – LT

LANE WIDTHS ARE AVERAGED

24.000 163.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' WARN SHLD1 – LT
9.0' PVD SHLD1 – RT
9.0' LWN SHLD2 – LT
10.0' LWN SHLD2 – RT

24.124 152.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' PVD SHLD1 – LT
9.0' PVD SHLD1 – RT
4.0' LWN SHLD2 – LT
10.0' LWN SHLD2 – RT

24.310 159.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' PVD SHLD1 – LT
14.0' WARN SHLD1 – RT
4.0' LWN SHLD2 – LT
12.0' LWN SHLD2 – RT

24.503 159.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
7.0' PVD SHLD1 – LT
14.0' WARN SHLD1 – RT
4.0' VG SHLD2 – LT
12.0' LWN SHLD2 – RT

24.710 156.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
12.0' WARN SHLD1 – LT
10.0' PVD SHLD1 – RT
12.0' LWN SHLD2 – LT

24.862 161.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' PVD SHLD1 – LT
14.0' WARN SHLD1 – RT
12.0' LWN SHLD2 – LT

25.017 168.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' PVD SHLD1 – LT
9.0' PVD SHLD1 – RT
2 – 12.0' LWN SHLD2

25.254 163.0' – 96.0'
8 – 12.0' RDWY
26.0 PVD W/ BAR MED
2 – 10.0' WARN INSHLD1
13.0' PVD SHLD1 – LT
16.0' PVD SHLD1 – RT
12.0' LWN SHLD2 – LT

END MP: 025.334
NET ROADWAY ID LENGTH: 25.334

ROADWAY COMPOSITION

24.000 28/FC-5
28/FC-5

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED
Δ=18°37'54.00"
D=0°45'
PC=24.262
PI=24.500
PT=24.733

B=N14°17'46"E

B=N24°20'08"W

STRUCTURE DESCRIPTION

24.061 2 – 66" X 260' CC

24.270 1 – 18" X 120' CC

24.402 1 – 18" X 110' CC

24.619 #0124 227' BR 24.662
24.619 #0194 227' BR 24.662

24.800 1 – 18" X 95' CC

24.914 1 – 18" X 95' CC

25.027 1 – 72" X 260' CC

25.160 1 – 18" X 110' CC

25.319 #0125 79.2' BR 25.334
25.319 #0195 79.2' BR 25.334

DISTRICT USE

SIS

24.000 SIS CORRIDOR

SIS CORRIDOR 25.334

FUN CLASS

24.000 URBAN PRIN ART INT.

Version: 1.4.2.24 02/24/2015

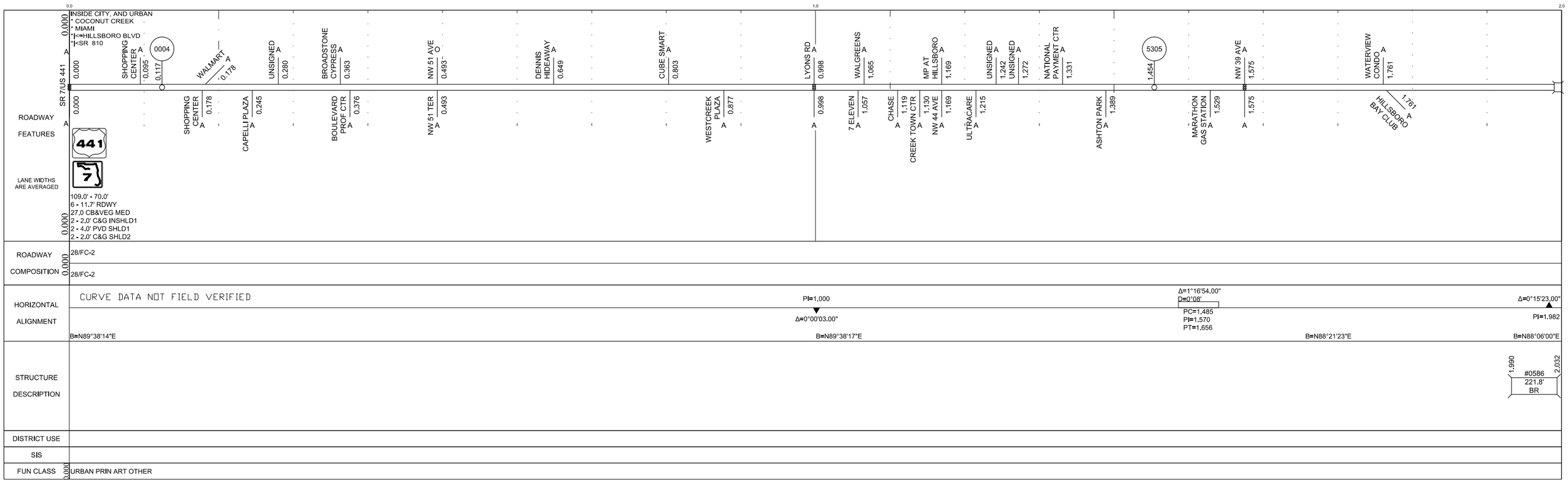
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	01/30/2018	03/06/2018	0.000	4.000	05/07/18 CALTRAN	06/04/18 CALTRAN
BY	CALTRAN	CALTRAN				

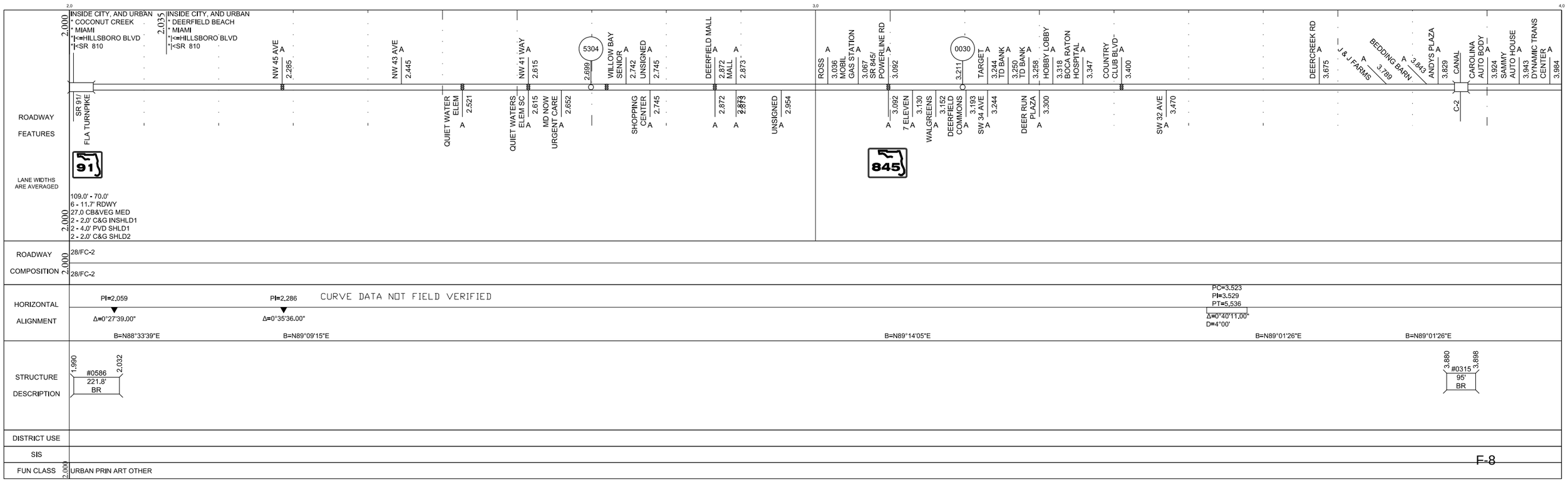
FLORIDA DEPARTMENT OF TRANSPORTATION

FDOT

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 810	BROWARD	04	86120000	1 OF 2





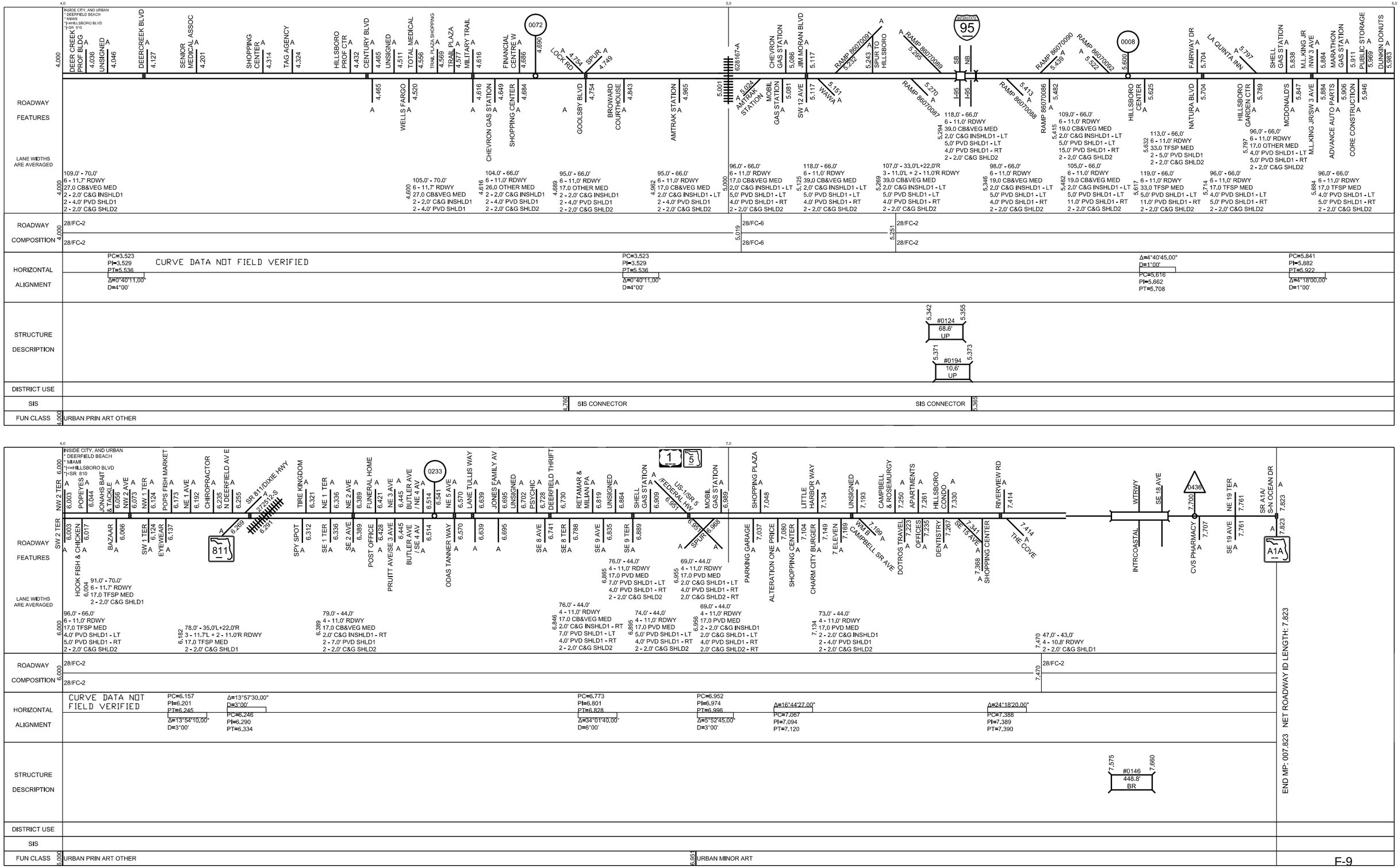
	5 YR INV	SLD REV
DATE	01/30/2018	03/06/2018
BY	CALTRAN	CALTRAN

BMP	EMP	INV	SLD REV
004.635	006.955	07/31/2018 FRA	08/24/2018 FRA
006.525	006.541	08/21/2018 FDOT D4	08/21/2018 FDOT-D4
000.000	007.823	06/12/2018 CALTRAN	06/12/2018 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 810	BROWARD	04	86120000	2 OF 2



Version: 1.4.2.27 08/23/2018

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	10/19/2018	11/13/2018				
BY	CTS Engineering	CTS Engineering				

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 869	BROWARD	04	86012000	1 OF 3

845

0.0

0.000 INSIDE CITY, AND URBAN
* DEERFIELD BEACH
* MIAMI
*|<=SW 10 ST
*|<SR 869

SR-845/ POWERLINE RD 0.000

3012 0.291

QUIET WATERS BUSINES A 0.379

ROADWAY FEATURES

SR-845/POWERLINE RD 0.000 A

PUBLIC STORAGE 0.162 A

PUBLIC STORAGE 0.310 A

0.369
102.0' - 48.0'
4 - 12.0' RDWY
30.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
2 - 5.0' PVD SHLD1
2.0' C&G SHLD2 - LT
12.0' LWN SHLD2 - RT

0.427
96.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
2 - 5.0' PVD SHLD1
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

LANE WIDTHS ARE AVERAGED

0.000
141.0' - 72.0'
6 - 12.0' RDWY
30.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
10.0' PVD SHLD1 - LT
5.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

0.098
135.0' - 72.0'
6 - 12.0' RDWY
30.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
4.0' PVD SHLD1 - LT
5.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

0.178
123.0' - 36.0'L+24.0'R
3 - 12.0'L + 2 - 12.0'R RDWY
30.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
4.0' PVD SHLD1 - LT
5.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

0.237
131.0' - 36.0'L+24.0'R
3 - 12.0'L + 2 - 12.0'R RDWY
30.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
4.0' PVD SHLD1 - LT
13.0' WARN SHLD1 - RT
2 - 12.0' LWN SHLD2

0.300
119.0' - 48.0'
4 - 12.0' RDWY
30.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
4.0' PVD SHLD1 - LT
13.0' WARN SHLD1 - RT
2 - 12.0' LWN SHLD2

0.365
111.0' - 48.0'
4 - 12.0' RDWY
30.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
4.0' PVD SHLD1 - LT
5.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

0.411
90.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
2 - 5.0' PVD SHLD1
2.0' C&G SHLD2 - LT
12.0' LWN SHLD2 - RT

0.452
86.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
2 - 5.0' PVD SHLD1
8.0' LWN SHLD2 - LT
2.0' C&G SHLD2 - RT

ROADWAY COMPOSITION

0.000
28/FC-9.5
28/FC-9.5

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

PC=0.054
PI=0.149
PT=0.244
Δ=5°01'32.00"
D=0°30'

Δ=5°01'32.00"
D=0°30'
PC=0.244
PI=0.340
PT=0.435

STRUCTURE DESCRIPTION

0.187 1 - 2" X 80'

0.377 2 - 4" X 80'
0.378 1 - 4" X 80'

DISTRICT USE

SIS

0.000 SIS CORRIDOR

FUN CLASS

0.000 URBAN PRIN ART OTHER

1.0

0.500
INSIDE CITY, AND URBAN
* DEERFIELD BEACH
* MIAMI
*|<=SW 10 ST
*|<SR 869

ROADWAY FEATURES

A 0.502 SW 30 AVE

0.509
95.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
4.0' PVD SHLD1 - RT
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

SW 28 AVE 0.698 A

LANE WIDTHS ARE AVERAGED

0.500
86.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
2 - 5.0' PVD SHLD1
8.0' LWN SHLD2 - LT
2.0' C&G SHLD2 - RT

0.626
102.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
11.0' PVD SHLD1 - RT
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

0.706
95.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
4.0' PVD SHLD1 - RT
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

0.956
105.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
14.0' PVD SHLD1 - RT
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

ROADWAY COMPOSITION

0.500
28/FC-9.5
28/FC-9.5

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

0.566 2 - 4" X 80'
0.567 1 - 4" X 80'

0.756 2 - 4" X 80'
0.757 1 - 4" X 80'

0.945 2 - 4" X 80'
0.946 1 - 4" X 80'

DISTRICT USE

SIS

0.500 SIS CORRIDOR

FUN CLASS

0.500 URBAN PRIN ART OTHER

Version: 1.4.2.27 11/13/2018

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	10/19/2018	11/13/2018				
BY	CTS Engineering	CTS Engineering				

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 869	BROWARD	04	86012000	2 OF 3

1.0

ROADWAY FEATURES

1.000 INSIDE CITY, AND URBAN
* DEERFIELD BEACH
* MIAMI
*|<=SW 10 ST
*|<SR 869

SW 24 AVE 1.010 A

1.016 113.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
22.0' WARN SHLD1 - RT
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

FRONTAGE ROAD 1.155 A

1.189 A FRONTAGE ROAD

FRONTAGE ROAD 1.251 A

PALM TRAILS PLAZA A 1.293

1.305 115.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
11.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

MILITARY TRAIL A 1.426

A 1.426

1.458 98.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
29.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
3.0' PVD SHLD1 - RT
2 - 2.0' C&G SHLD2

LANE WIDTHS ARE AVERAGED

1.000 105.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
14.0' PVD SHLD1 - RT
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

1.068 101.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
10.0' PVD SHLD1 - RT
8.0' LWN SHLD2 - LT
12.0' LWN SHLD2 - RT

1.134 105.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - RT
10.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

1.256 100.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
2 - 5.0' PVD SHLD1
2 - 12.0' LWN SHLD2

1.303 106.0' - 48.0'
4 - 12.0' RDWY
18.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
11.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

1.316 126.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
29.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
11.0' PVD SHLD1 - RT
2 - 12.0' LWN SHLD2

1.440 108.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
29.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
3.0' PVD SHLD1 - RT
12.0' LWN SHLD2 - LT
2.0' C&G SHLD2 - RT

ROADWAY COMPOSITION

1.000 28/FC-9.5

28/FC-9.5

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

PC=1.107
PI=1.138
PT=1.168
Δ=4°53'42.00"
D=1°30'

STRUCTURE DESCRIPTION

1.135 2 - 4" X 80'

1.136 1 - 4" X 80'

1.305 1 - 4" X 50' - LT
1 - 4" X 40' - RT

1.306 2 - 2" X 50' - LT
2 - 2" X 40' - RT

DISTRICT USE

SIS 1.000 SIS CORRIDOR

FUN CLASS 1.000 URBAN PRIN ART OTHER

2.0

ROADWAY FEATURES

1.500 INSIDE CITY, AND URBAN
* DEERFIELD BEACH
* MIAMI
*|<=SW 10 ST
*|<SR 869

RR SCL SW 12 AVE

3015 1.801

SW 12 AVE A 1.824

E NEWPORT CENTER DR A 1.824

1.599 79.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
10.0 PVD W/ BAR MED
2 - 6.0' PVD INSHLD1
2 - 5.0' PVD SHLD1
2.0' C&G SHLD2 - LT
0.0' RC SHLD2 - RT

1.662 85.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
10.0 PVD W/ GRD MED
2 - 6.0' PVD INSHLD1
2 - 4.0' PVD SHLD1
0.0' RC SHLD2 - LT
2.0' C&G SHLD2 - RT

1.685 87.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
10.0 PVD MED
2 - 6.0' PVD INSHLD1
2 - 4.0' PVD SHLD1
2 - 2.0' C&G SHLD2

1.837 87.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
18.0 CB&VEG MED
2 - 6.0' PVD INSHLD1
2 - 2.0' C&G SHLD1

86070096 SB ON A 1.922

SPUR A 1.955

1.979 88.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
19.0 TFSP MED
2 - 2.0' PVD INSHLD1
2 - 2.0' C&G SHLD1

LANE WIDTHS ARE AVERAGED

1.500 98.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
29.0 CB&VEG MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
3.0' PVD SHLD1 - RT
2 - 2.0' C&G SHLD2

1.551 98.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
29.0 CB&VEG W/ GRD MED
2 - 2.0' C&G INSHLD1
5.0' PVD SHLD1 - LT
3.0' PVD SHLD1 - RT
2 - 2.0' C&G SHLD2

1.594 98.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
29.0 CB&VEG W/ GRD MED
2 - 2.0' C&G INSHLD1
2 - 5.0' PVD SHLD1
2.0' C&G SHLD2 - LT
0.0' RC SHLD2 - RT

1.602 76.0' - 24.0'L+33.0'R
2 - 12.0'L + 3 - 11.0'R RDWY
10.0 PVD W/ BAR MED
2 - 6.0' PVD INSHLD1
4.0' PVD SHLD1 - LT
5.0' PVD SHLD1 - RT
2 - 0.0' RC SHLD2

1.661 85.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
10.0 PVD W/ BAR MED
2 - 6.0' PVD INSHLD1
2 - 4.0' PVD SHLD1
0.0' RC SHLD2 - LT
2.0' C&G SHLD2 - RT

1.663 87.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
10.0 PVD W/ GRD MED
2 - 6.0' PVD INSHLD1
2 - 4.0' PVD SHLD1
2 - 2.0' C&G SHLD2

1.692 95.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
18.0 CB&VEG MED
2 - 6.0' PVD INSHLD1
2 - 4.0' PVD SHLD1
2 - 2.0' C&G SHLD2

1.834 91.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
18.0 CB&VEG MED
2 - 6.0' PVD INSHLD1
4.0' PVD SHLD1 - LT
2.0' C&G SHLD1 - RT
2.0' C&G SHLD2 - LT

1.901 100.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
18.0 CB&VEG MED
2 - 6.0' PVD INSHLD1
2.0' C&G SHLD1 - LT
13.0' WARN SHLD1 - RT
2.0' C&G SHLD2 - RT

1.966 101.0' - 32.0'L+33.0'R
3 - 10.7'L + 3 - 11.0'R RDWY
19.0 TFSP MED
2 - 2.0' PVD INSHLD1
2.0' C&G SHLD1 - LT
13.0' WARN SHLD1 - RT
2.0' C&G SHLD2 - RT

1.989 77.0' - 32.0'L+22.0'R
3 - 10.7'L + 2 - 11.0'R RDWY
19.0 TFSP MED
2 - 2.0' PVD INSHLD1
2 - 2.0' C&G SHLD1

ROADWAY COMPOSITION

1.500 28/FC-9.5

28/FC-9.5

1.823 28/FC-2

28/FC-2

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED

PC=1.688
PI=1.698
PT=1.708
Δ=2°03'07.00"
D=1°55'

PC=1.814
PI=1.832
PT=1.849
Δ=3°30'22.00"
D=1°55'

STRUCTURE DESCRIPTION

1.603 1.653
#0553
264' BR
#0557
264' BR
1.603 1.653

DISTRICT USE

SIS 1.500 SIS CORRIDOR

FUN CLASS 1.500 URBAN PRIN ART OTHER

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	10/19/2018	11/13/2018				
BY	CTS Engineering	CTS Engineering				

FLORIDA DEPARTMENT OF TRANSPORTATION FDOT

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
12		SR 869	BROWARD	04	86012000	3 OF 3

ROADWAY FEATURES LANE WIDTHS ARE AVERAGED	2.0 2.000 INSIDE CITY, AND URBAN * DEERFIELD BEACH * MIAMI *I<=SW 10 ST *I<SR 869 SPUR 2.012 A 86070095 SB OFF 2.016 A 9 I-95/SR 86070094 NB ON 2.118 A ACCESS TO RAMP 2.150 A 2.030 75.0' - 32.0'L+22.0'R 3 - 10.7'L + 2 - 11.0'R RDWY 17.0 CB&VEG MED 2 - 2.0' C&G INSHLD1 2 - 2.0' C&G SHLD1 2.000 77.0' - 32.0'L+22.0'R 3 - 10.7'L + 2 - 11.0'R RDWY 19.0 TFSP MED 2 - 2.0' PVD INSHLD1 2 - 2.0' C&G SHLD1 2.103 85.0' - 32.0'L+22.0'R 3 - 10.7'L + 2 - 11.0'R RDWY 17.0 CB&VEG MED 2 - 2.0' C&G INSHLD1 2.0' C&G SHLD1 - LT 10.0' WARN SHLD1 - RT 2.0' C&G SHLD2 - RT
ROADWAY COMPOSITION	2.000 28/FC-2 28/FC-2
HORIZONTAL ALIGNMENT	
STRUCTURE DESCRIPTION	2.023 #0123 258.7' BR 2.072
DISTRICT USE	
SIS	2.000 SIS CORRIDOR SIS CORRIDOR 2.061
FUN CLASS	2.000 URBAN PRIN ART OTHER

ACTIVE OFF THE SHS
(MP 2.152 TO MP 2.540)

ROADWAY FEATURES LANE WIDTHS ARE AVERAGED	ACTIVE OFF THE SHS (MP 2.152 TO MP 2.540)	END MP: 002.540 NET ROADWAY ID LENGTH: 2.152
ROADWAY COMPOSITION		
HORIZONTAL ALIGNMENT		
STRUCTURE DESCRIPTION		
DISTRICT USE		
SIS		
FUN CLASS		