POND SITING REPORT

I-95 (SR 9) WIDENING FROM I-295 TO BAYMEADOWS ROAD (SR 152)

Duval County, FL
FPID: 435577-1-22-01

Prepared for:

Florida Department of Transportation
District 2
1109 South Marion Avenue
Lake City, FL 32025

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March 2021

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am a registered professional engineer in the State of Florida practicing engineering with The Balmoral Group and that I have supervised the preparation of and approve the analysis, findings, opinions, conclusions and technical advice hereby reported for:

PROJECT: I-95 (SR 9) FROM I-295 TO BAYMEADOWS ROAD (SR 152)
Pond Siting Report
Financial Project ID: 435577-1-22-01
Duval County, Florida

The engineering work represented by this document was performed through the following duly authorized engineering business:

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This report provides the results of the preliminary analysis of the existing drainage conditions and the analysis required for the estimation of stormwater pond sizes for the proposed improvements and their potential locations for cost comparison purposes for the Pond Siting Report for the Project Development and Environmental Study for I-95 (SR 9) FROM I-295 TO BAYMEADOWS ROAD (SR 152). The results in this report are based on assumptions from existing permits and best available desktop data; no site-specific investigations were performed for this analysis. It is recommended that additional site specific analysis be performed to finalize the report or prior to purchasing any recommended sites. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of hydrologic analysis and hydraulic engineering as applied through professional judgment and experience.

Any engineering analysis, documents, conclusions or recommendations relied upon from other professional sources or provided with responsibility by the client are referenced accordingly in the following report.

FLORIDA REGISTERED ENGINEER:
Jennifer A. Nunn, State of Florida, Professional Engineer, License No. 70709
This item has been electronically signed and sealed by:

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

EXECUTIVE SUMMARY

The Balmoral Group has subcontracted with HDR Engineering, Inc. to provide Project Development and Environmental (PD&E) drainage design services for the Florida Department of Transportation (FDOT) District Two for the widening and reconstruction of 3.8 miles of limited access highway along I-95 (SR 9) from I-295 to Baymeadows Road (SR 152), in Duval County, in order to provide capacity improvements with two additional general use lanes in each direction. There are also proposed improvements at the US 1 (Phillips Highway), SR 115 (Southside Boulevard), and SR 152 (Baymeadows Road) interchanges, which include operation improvements and ramp reconfiguration. The project limits are approximately from MP 5.7 to MP 9.5 along I-95.

The objective of this report is to provide preliminary stormwater facility options for cost comparison purposes to manage the runoff from the proposed I-95 ultimate 10-lane capacity improvements. There are four (4) major basins along I-95 (Basin B through E) that outfall to Julington Creek and an additional basin at Baymeadows Road that outfalls to Pottsburg Creek. The I-95 widening and interchange improvements for the basin at Baymeadows Road that discharges to Pottsburg Creek is included within the analysis of an adjacent project under FPID 432259-2 and is compensated within Pond F-G. Therefore, there are a total of four (4) major proposed basins for pond sizing purposes.

Required pond sizes for each basin were calculated by evaluating runoff volume using the NRCS CN method, calculating treatment volume requirements, and reviewing floodplain impacts. Treatment and Attenuation volumes, and any volumes associated with impacts to existing ponds, were combined for the total pond volume. Separate floodplain compensation ponds were evaluated at locations where there were floodplain impacts. The total volume is combined with landscaping, pond geometry, side slopes, freeboard, and maintenance berm assumptions to produce an estimated total required pond size. Pond size estimates include a 10% increase in area to account for landscaping aesthetics and tie-ins to the existing ground. Since this is a rough analysis for pond sizing capacity, recovery calculations for orifice sizing and permanent pool calculations are not included in the pond sizing considerations.

A pollutant loading analysis was not required for basins within the Julington Creek watershed to meet the Lower St Johns River Basin's Basin Management Action Plan (BMAP) criteria. Refer to **Appendix F** for SJRWMD Pre-Application Meeting Minutes.

Design considerations for each pond site location included a desktop review of the best available data, which included hydraulic data, hydrology (land use cover, soil types, seasonal high water elevations, etc.), contamination sites, wetland limits, wildlife sitings, archaeological or historical sites, and conservation areas. No site-specific investigations have been performed or used in this analysis, this includes field survey, geotechnical testing, wetland delineation, threatened and endangered species observations, archaeological or cultural resources investigations, or contamination screenings. The analyses in this report are based on best available GIS data, permit research, and field review. The total pond cost consists of right-of-way (R/W) acquisition (provided by FDOT) and estimated construction cost. The following table provides a summary of the results of the analysis.

POND SUMMARY MATRIX

Pond Site	Recommended Rank	Wetland Impacts (ac)	Wildlife Habitat Impacts	Contamination Risk	Floodplain Impact	Impact to Historical or Archaeological Resources	Pond Construction Cost	Pond R/W Costs	Mitigation Costs	Total Pond Cost
B-1	#1	1.61	Low	Low	None	Low	$1,365,700	$0	$212,850	$1,578,550
C-1	#1	0.00	Low	Low	None	Low	$2,102,900	$0	$0	$2,102,900
D-1	#3	0.88	Low	Low	None	Low	$675,600	$68,723	$232,650	$976,973
D-3	#2	0.98	Low	Low	None	Low	$687,500	$60,914	$259,050	$1,007,464
D-4	#4	0.05	Low	Medium	None	Low	$718,500	$931,602	$6,600	$1,656,702
E-1	#2	0.00	Low	Low	None	Low	$565,700	$557,186	$0	$1,122,886
E-2	#3	0.83	Low	Low	None	Low	$292,200	$44,156	$219,450	$555,806
D-E	#1	1.69	Low	Low	None	Low	$939,000	$81,518	$445,500	$1,466,018

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1. Introduction

The Balmoral Group has subcontracted with HDR Engineering, Inc. to provide Project Development and Environmental (PD&E) drainage design services for the Florida Department of Transportation (FDOT) District Two for the widening and reconstruction of 3.8 miles of limited access highway along I-95 (SR 9) from I-295 to Baymeadows Road (SR 152), in Duval County, in order to provide capacity improvements with two additional general use lanes in each direction. There are also proposed improvements at the US 1 (Phillips Highway), SR 115 (Southside Boulevard), and SR 152 (Baymeadows Road) interchanges, which include operation improvements and ramp reconfiguration. The project limits are approximately from MP 5.7 to MP 9.5 along I-95. **Figure 1** in **Appendix A** shows the project location.

The project consists of widening the existing six-lane facility to a ten-lane typical section, with proposed widening to the outside. Improvements also include auxiliary lane widening, interchange modifications, and ramp widening in several locations.

The purpose of this draft pond siting report is to document the preliminary analysis used to evaluate impacts to existing stormwater management facilities and to determine the size and potential locations for proposed stormwater management facilities as a result of the construction of the additional I-95 general use lanes. A minimum of two (2) off-site locations were selected for each drainage basin that required additional right-of-way (R/W) acquisition for the pond site. Only one (1) pond site was selected for drainage basins for which the location of the site is within FDOT R/W, and thereby, would not require R/W acquisition.

2. Available Data Collection

This initial drainage evaluation is based on several data sources. The report is based on the vertical datum NAVD88. Data sources based in NGVD29 are converted to NAVD88. The conversion from NGVD29 to NAVD88 is -1.17 using the U.S. Army Corps of Engineers Corpscon Version 6 software (i.e. 10.00 ft NGVD = 8.83 ft NAVD).

Elevation information was obtained through NOAA and utilizes LiDAR flown in 2007 from the Florida Division of Emergency Management for Duval County. The elevation data was in the form of a 3-foot Digital Elevation Model (DEM). This DEM was used to quantify floodplain impacts, estimate low edge of pavement, and verify SHGWT estimates. Other than these roadway improvements, it does not appear that any other significant development has occurred along the corridor from review of historic aerials in Google Earth. No topographic survey was available for the project limits, and no field survey was collected for this phase.

A field visit was performed on April 6, 2017 to review the existing floodplain areas and existing interchange ponds. Another field visit was performed on July 11, 2017 to review the potential proposed pond sites.

The existing I-95 corridor was constructed and permitted in multiple phases over the last several decades. Interchange modifications at I-295 and JTB are more recent than the mainline widening, which

was permitted in April 1995. Construction is still ongoing for the improvements along I-295. **Table 1** shows the major existing permits within the project corridor. The analysis in this report utilizes the best available information.

TABLE 1 - EXISTING SJRWMD PERMITS FOR EXISTING I-95 MAINLINE

Permit #	Name	Year (Plans)	Status	Datum
18228-3	Widening of I-95 from 4 to 6 lanes	1995	Constructed	Feet, NGVD
18092-2	State Road No. 9A/I-295/I-95 Interchange	1997	Constructed	Meters, NGVD

The Master Stormwater Management Plan (MSMP), completed by CDM Smith in 2009 and updated in 2013 for the City of Jacksonville, was obtained and provided a reliable source for the floodplain information. This information has been approved by the Federal Emergency Management Agency (FEMA) and has been adopted into the Flood Insurance Study (FIS) for Duval County, dated 2013.

3. Existing Conditions

3.1 Land Use

The existing land use along the I-95 corridor is predominantly undeveloped wetlands and forested areas along the west side of I-95 from I-295 to south of Baymeadows Road. A commercial/industrial area stretches along the east side of I-95 from the Southside Road ramps to Baymeadows Road. The general topography of the project area is a low-lying, flat area with raised roadway embankments and several bridges; elevations range from 2 feet to 48 feet based on the 2007 LiDAR. **Figure 2** in **Appendix A** shows the existing land use within the I-95 ROW.

3.2 Soils

United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) soil characteristics were used to identify the soil types within and adjacent to the project limits. These are shown in **Figure 3** in **Appendix A**. Project soils include hydrologic soil groups: A, A/D, B/D, and C/D.

3.2.1 Dual Hydrologic Groups

If a soil is assigned to a dual hydrologic group (i.e. A/D, B/D), the first letter is for the drained areas and the second is for the undrained areas. To identify whether the area was in a drained or undrained condition, seasonal high groundwater table (SHGWT) information was collected from the existing permit information and plotted along the corridor. Areas where the SHGWT was within two-feet of the existing ground were assumed to be an undrained condition and were classified as a D soils group. This undrained case applied to all dual soil classifications outside the right-of-way, and the drained classification was used for curve number calculations for the extents of the project area located within the right-of-way. See Section 3.2.2 for further explanation.

3.2.2 Urban Land Hydrologic Group

Most of the project corridor is classified as Urban Land, which does not have a hydrologic soil group classification according to the USDA NRCS.

The existing I-95 project corridor has some areas with ditch and pipe collection systems which drain to stormwater facilities with positive outfalls. These portions are mainly near the interchanges where the roadway has been elevated and graded to drain. The majority of the mainline from US 1 to JTB is not currently treated and nearly follows existing grade.

The plotted SHGWT information was compared to the existing ground elevation, and the adjacent hydrologic soil group and classification was assigned. The minimum clearance between the roadway and SHGWT is 2.3 feet, so all urban land along the I-95 mainline was considered to be in a drained condition. This assessment from historical documents was confirmed from field visits when evaluating the seasonal high water levels at the existing cross drains along the corridor. As shown in **Plate 1**, the SHWL is lower than the I-95 mainline. These road R/W areas are shown as either "Unassigned A or C" on **Figure 3**. See **Figure 3** for hydrologic soil groups designated using the described methodology.

PLATE 1 – FIELD REVIEW OF NORMAL WATER LEVEL (NWL) AT THE 10'X3' CBC CROSS DRAIN AT STA 778+00 IN BASIN B (4/6/2017)

3.3 Floodplains

FEMA has approved floodplain limits for Duval County as shown in **Figure 4** in **Appendix A** for the overall project. The project is located mainly within Zone X (areas outside the 100-year flood zone), but has portions of Zone A (areas within the 100-year floodplain) and Zone AE (areas within the 100-year floodplain with an established base flood elevation) within the project limits. Julington Creek, Sweetwater Creek, and Pottsburg Creek are regulated floodways that are located within I-95 right-of-way limits. The anticipated I-95 Widening Project footprint does not encroach within the floodway limits as defined by FEMA. Therefore, it is anticipated that

FEMA No-Rise Certifications will not be required in a future phase of the I-95 Expressway Project for all three creeks.

SJRWMD requires floodplain compensation within locations that have a contributing basin to the floodplain of at least five square miles. In addition, floodplain impacts are quantified using the 10-year storm event. Refer to Pre-Application Meeting Minutes provided in **Appendix F**.

Following FDEP waterbody identification (WBID) boundaries, there were four identified locations along the project corridor where the 2013 FEMA-mapped floodplains encroach into the I-95 right-of-way limits. The floodplains west of the I-95 and US-1 interchange and along Julington Creek south of US-1 will require that floodplain compensation be provided for these impacts.

Floodplain impact volumes were estimated by taking the greater impact of either (1) the approximated limit of construction distance using the existing roadway's edge of pavement elevation from the DEM with assumed typical sections as approved by the design team or (2) the estimated clear zone offset from the proposed edge of pavement. However, the impact estimate is always limited to the existing or proposed right-of-way line. In each case, the volume is estimated using a "glass wall" at the estimated impact boundary. The typical sections used for the floodplain impact volume estimates are provided in **Appendix B**.

In order to estimate the SHGWT for floodplain impacts, the SHGWT shown in roadway cross sections from the existing permitted plans was reviewed along with the stain lines at the culverts and normal water levels for surface waters within the floodplain areas observed during the field review. For the purposes of the floodplain volume, the existing ground elevation was used over the SHGWT for a more conservative estimate. The floodplain impact areas were estimated using an ArcGIS Cut/Fill tool, which calculated the impact based on the volumetric difference between the 100-year floodplain and the existing DEM ground elevation. The 10-year floodplain was plotted on the existing DEM in order to quantify fill. For both Zone AE floodplains and Zone A floodplains, the 10-year elevation was sourced from the Master Stormwater Management Plan, developed by CDM Smith, dated 2013. An excerpt is provided in **Appendix E.** A summary of the floodplain impact volume is shown in **Table 2**.

The following lists locations of FEMA floodplains within the I-95 right-of-way basins that were not included within the floodplain impact analysis:

1. Floodplains located in basins that are less than 5 square miles
2. Bridge locations. These impacts are to be evaluated in a future phase.
3. Floodplains above existing roads where profiles are not changing (e.g. Philips Hwy)
4. Locations where FEMA floodplain impacts are associated with a cross drain and not fill from proposed development. These impacts are to be evaluated in a future phase.

TABLE 2 – FLOODPLAIN IMPACTS

Area ID	Basin	Permit	Lowest DEM Elevation within Floodplain (feet, NAVD)	Estimated SHGWT, from Field Visit (feet, NAVD)	10-Year Flood Elevation (feet, NAVD)	MSMP Node Name (CDM Study, 2013)	Floodplain Impact Volume (ac-ft)
300	B	18228-3	9.90	11.53*	10.6	JU30200AP	0.020
400	C		13.79	Did not field review	15.4	JU30040S	0.040
401	C		14.38		16.1	JU30050S	0.255
402	C		13.34	16.25	16.7	JU30120	0.362

*Estimated SHGWT from the north box culvert within floodplain area.

Refer to **Figures B-1 – B-3** in **Appendix B** for the floodplain impact locations.

3.4 Watersheds

There are no Outstanding Florida Waterways associated with the project area. The I-95 mainline includes area within Julington Creek, Sweetwater Creek, and Pottsburg Creek watersheds, which are located within the Lower St. Johns River Basin. Based on the results of the 2017 Study List Assessment for Group 2 for the Lower St. Johns River by Florida Department of Environmental Protection (dated April 26, 2017), none of the watersheds are impaired for nutrients, however, the Lower St. Johns River is.

TABLE 3 - IMPAIRED WATERS

Waterbody	WBID	Parameter of Concern	Action
Sweetwater Creek	2350	None	None
Julington Creek	2351	Iron & Metals	TMDL in place (Fecal Coliform, 2009)
Pottsburg Creek	2265C	None	
Lower St Johns River Basin	N/A	Nutrients	TMDL in place (Nutrients, 2008) BMAP in place (Nutrients, 2008)

During the Pre-Application Meeting with SJRWMD, it was determined that the project's location within Julington Creek is located within an area that has a high base flow, providing sufficient mixing and dilution. Thus, nutrient analysis will not be required within Julington Creek. The project area located within Pottsburg Creek is evaluated under *the Pond Siting Report for I-95 Widening from Baymeadows Road (SR 152) to JTB (SR 202)* under FPID 432259-2, under a different cover. Refer to **Appendix F** for meeting minutes.

3.5 Existing Ponds

As identified in **Section 2** of this report, there are several permitted stormwater management facilities within the project corridor. Some ponds provide treatment and attenuation and some

provide attenuation only. The majority of the ponds are located in the infield areas of the existing interchanges, and there is one offsite pond located behind the existing Nissan dealership. **Table 4** summarizes the existing ponds with respect to existing treatment capacity. **Figure B-9** in **Appendix B** shows the location of the existing ponds.

TABLE 4 - EXISTING PONDS TREATMENT CAPACITY

Pond	PSR Basin ID	Watershed	Treatment Required (ac-ft)	Treatment Provided (ac-ft)
Offsite North Pond (Nissan Dealership)[1]	D	Julington Creek	5.56	5.80
North Pond/South Pond (US 1 Infield Area)[2]	C	Julington Creek	0.00	0.00

[1] The I-95 Offsite North Pond (Nissan Dealership pond), under Permit 18228-3, provides treatment for an area of equal size to the proposed pavement additions of the I-95 widening.
[2] The infield area provides attenuation for Julington Creek basin under Permit 18228-3 for the I-95 widening to a 6-lane condition.

4. Existing Drainage Basins

Basin and pond names match their originally permitted names as much as possible. The I-95 project corridor was built and modified segmentally under multiple projects resulting in a disjointed naming system. The pre-development basins have been grouped to form four (4) major basins along I-95 (Basin B through E) within Julington Creek watershed, and one (1) basin (Basin Baymeadows) within the Pottsburg Creek watershed. The I-95 Widening and Baymeadows Road Interchange improvements are included within the analysis of an adjacent Pond Siting Report for *I-95 Widening from Baymeadows Road (SR 152) to JTB (SR 202)* (FPID 432259-2) under a different cover. Therefore, there are a total of four (4) major proposed basins for pond sizing purposes.

The existing drainage basins are primarily contained within the right of way. The basins are analysed from south to north beginning just north of the I-295 interchange. The existing basins are summarized in **Table 5**.

The Pre-development CN shown in **Table 5** was calculated using ArcGIS Tools, which utilizes a look up table and shapefiles for land use and soil characteristics to determine a weighted CN over the basin. A look up table was created using the land uses and curve numbers from the USDA NRCS Urban Hydrology for Small Watersheds TR-55 (June 1986). An existing land use shapefile was created based on 2016 aerial imagery. The NRCS soil shapefile was updated to reflect the dual hydrologic soil group and urban land hydrologic soil group assumptions.

The pre-development CN shapefiles and lookup table are provided in **Appendix B**.

TABLE 5 - EXISTING BASIN SUMMARY

Basin ID	Area (acres)	Station Limits	Existing Ponds	Discharge Location	Watershed	Existing Treatment Criteria	Existing CN
B	44.43	766+50 to 807+80	N/A	10'x3' Cross drain at Station 778+00 and 4'x3' cross drain at Station 795+00	Julington Creek	None within Basin B, compensatory treatment provided in Basin D	73.6
C	123.36	807+80 to 888+30	I-95 & US 1 Infield ponds (attenuation only)	3-8'x4' Cross drain at Station 832+00, 2-10'x4' Cross drain at Station 857+50, and 3-30" Cross drain at Station 867+00	Julington Creek	None within Basin C, compensatory treatment provided in Basin D	68.3
D	21.95	888+30 to 920+20	I-95 Offsite Pond (Nissan Dealership Pond)	8'x4' Cross drain at Station 913+20	Julington Creek	Compensatory; 2.5" over impervious area	72.3
E	12.04	920+20 to 937+70	N/A	Double 30" Cross drain at Station 928+80	Julington Creek	None within Basin E, compensatory treatment provided in Basin D	73.2

5. Proposed Stormwater Management

5.1 Basis of Evaluation

An alternative comparison analysis has been performed which consists of a description of each Stormwater Management Facility (SMF) location along with an analysis of the following parameters for each site. Note analysis of these parameters is based on a desktop review of the best available data. Any data used in the review of that parameter is listed, and where available, a date is provided. Field analysis of these parameters for all proposed sites will be required as design progresses.

Maintainability: Adequate area needed for regular cleaning, sediment removal, mowing and other required maintenance. This was evaluated based on the proximity of the site to existing right-of-way.

Hazardous Materials: Pertains to the presence of hazardous materials or petroleum contamination on or near the site location. A *Preliminary Evaluation Contamination Screening Memorandum* was provided in 2019 for proposed pond sites, which is provided in **Appendix F**. Additionally, the following datasets were used: FDEP Cleanup Sites, Petroleum Contamination Monitoring (PCTS) Discharges, State Funded Cleanup Sites (2014), FDEP Waste Cleanup Inactive Sites (2016), FDEP Waste Cleanup Open Sites (2016), and FDEP brownfield sites (2016).

Geotechnical Information: Addresses the underlying soil conditions within the pond footprint. Site specific exploration has not been performed for pond options. The following datasets were used for desktop analysis of the pond sites: NRCS Soils (2017), Florida Geologic Survey wells, Florida Geologic Survey swallets, and FDEP Florida Subsidence Incident Reports.

Utilities: Addresses impacts to existing apparent utilities and known future utilities at each alternative location. Utilities were identified during field visits and documented within **Appendix D**. Additionally, the following dataset was used: Antenna Structures (2017).

Environmental Impacts: Pertains to impacts to floodplain and wetland areas, and to habitats for threatened, endangered or significant wildlife species. A *Pond Site Natural Resource Analysis (NRE) Memorandum* reviewed pond site options for wetland, surface water, and protected species and habitat impacts. The NRE Memorandum is provided in **Appendix F**.

Cultural Resources: Addresses impacts to prehistoric/historic archaeological or historic structures for each site. Risk ratings and analysis descriptions are provided in the *Desktop Analysis of Proposed Drainage Locations Technical Memorandum*, performed by SEARCH. Refer to **Appendix F**.

Permitability: Addresses impacts to permitting efforts to local, state, and federal agencies. The following datasets were used to evaluate anticipated permitting efforts: Airports (2013), DEP Outstanding Florida Waters, Florida TMDLs (2020), and Verified Impaired WBIDs (2020).

Ownership: Addresses the impacts to property owner(s). The following dataset was used: Duval County Property Appraiser (2019).

Economics: Costs associated with right-of-way acquisition, pond construction costs, and wetland mitigation. See **Appendix C** for associated costs estimates.

5.2 Pond Sizing Criteria

Required pond sizes for each basin were calculated by evaluating the runoff volume using the NRCS CN method and calculating treatment volume requirements. These volumes were added together and combined with landscaping and maintenance berm assumptions to result in the total stormwater management facility (SMF) required pond size.

Per the SJRWMD Pre-Application meeting minutes, floodplain compensation must be provided in a separate floodplain compensation (FPC) pond site. Potential floodplain impact locations were reviewed to determine if an additional FPC pond site would be required within each basin.

5.2.1 Attenuation Criteria

Per Section 5.2.2 of the *2020 FDOT Drainage Manual*, the design must comply with state, Water Management District, and – when delegated by the state – local government stormwater management programs.

Per Section 3.2.1(b) of the *2013 SJRWMD Permit Information Manual*, the post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year frequency, 24-hour duration storm.

Per Section 5.2.1 of the *2020 FDOT Drainage Manual*, the design must comply with the water quality, rate, and quantity requirements of *Section 334.044(15), F.S., Chapter 14-86, F.A.C.,* Rules of the Department of Transportation only in closed basins or areas subject to historical flooding.

Therefore, the SJRWMD 25-year, 24-hour storm event will be used to establish the attenuation criteria for the propose ponds. No other design storms are required since all basins within the project have positive outfall. The SCS volume method is used for calculating the attenuation volume for the 25-year, 24-hour event with a rainfall of 9.3-inches.

5.2.2 Treatment Criteria

All proposed offsite ponds are proposed to be wet detention. The required treatment volume is the first 1.0 inch of runoff across the entire basin or 2.5-inches of runoff from the impervious area, whichever is greater *(2013 SJRWMD Permit Information Manual Section 8.2)*.

For the purposes of pond sizing estimates, the required treatment volume is calculated as 2.5-inches over the net additional impervious area. Since this is a rough analysis for pond sizing capacity, recovery calculations for orifice sizing and permanent pool calculations were not included in the pond sizing considerations.

5.2.3 Floodplain Compensation Criteria

According to SJRWMD, floodplains must not be altered so as to adversely impact the off-site storage and conveyance capabilities of the water resource, and it is presumed a system will meet this criterion if there is no net reduction in flood storage within a 10- year floodplain. This criterion is only applicable to floodplain locations where the contributing drainage area is five square miles *(2013 SJRWMD Permit Information Manual Section 3.3)*.

A Pre-Application meeting was held with SJRWMD to confirm floodplain impact criteria. Since no floodplain criteria has been confirmed with the City of Jacksonville, the agency responsible for FEMA floodplain management, the pond sizing calculations include the 10-year floodplain compensation volume (cup for cup) for floodplains downstream of a 5 square mile basin. Refer to **Appendix F** for the SJRWMD Pre-Application Meeting minutes.

5.2.4 Pond Geometry Criteria

Pond sizing estimates are based on providing sufficient storage capacity above the estimated normal water level within an allowable storage height. The average pond area is estimated by dividing the required volume for the pond site by the allowable storage height of the pond site. The pond size is expanded at 1:4 side slopes and includes one-foot of freeboard and a 20-foot maintenance berm. An additional 10% increase in pond size accounts for landscaping and tie-in to natural ground. In keeping with the Highway Beautification Policy, the pond aesthetics design approach should be developed early in order to include it in the determination of pond right-of-way acquisition needs. *(2021 FDOT Drainage Manual Section 5.4.4.2)*.

5.2.5 Nutrient Removal Criteria

Julington Creek and Pottsburg Creek watersheds are not identified as impaired for nutrients (i.e. nitrogen or phosphorus) on the FDEP State-wide Comprehensive Verified List of Impaired Waterways (August 2020). However, the project is within the Lower St. Johns River Main Stem basin that has an adopted Surface Water Basin Management Action Plan (BMAP) for total nitrogen, total phosphorus, and fecal coliform, with an associated Total Maximum Daily Load (TMDL) Report for nutrient reduction.

During the SJRWMD Pre-Application meeting, it was understood that the Julington Creek has a high base flow, thus provides sufficient mixing and dilution within the watershed before reaching the St. Johns River Main Stem. Therefore, nutrient-loading calculations are not required within the Julington Creek watershed. The project area located within the Pottsburg Creek watershed is included in the PSR analysis for *I-95 Widening from Baymeadows Road (SR 152) to JTB (SR 202)* under a different cover.

5.3 Proposed Stormwater Facility Alternatives

Proposed drainage patterns will remain largely unchanged. It is assumed that any median swale systems that are to be paved over will be replaced with storm drain systems.

5.3.1 Basin B

An existing undeveloped parcel currently owned by FDOT has been identified within Basin B. Detailed stage-storage contours within the parcel demonstrate that this existing parcel will meet the proposed design criteria.

Basin B includes a total area of 44.43 acres and extends from Station 766+50 to Station 807+80 (Baseline Survey SR 9 (I-95)). Existing runoff currently drains to two existing cross drains, Station 778+00 (10'x3' box culvert) and Station 795+00 (4'x 3' box culvert), which convey runoff west to Julington Creek.

The entire existing roadway basin is untreated. A pond located behind parcel 148634-0300, approximately 800 feet northeast of the east R/W line at Station 910+00, was permitted in 1995 to provide compensatory treatment for impervious area from commercial sites equal to the proposed pavement additions of the I-95 widening from four to six lanes under ERP Application No. 18228-3, Offsite North Pond (Nissan Dealership Pond). Refer to **Appendix E** for details and **Figure B-9** in **Appendix B** for the pond location.

Basin B will have a net increase of 4.63 acres of impervious area, resulting in a required treatment volume of 0.96 ac-ft. Together the roadway improvements and pond site result in 2.86 ac-ft of runoff volume. Additionally, the roadway improvements impact two existing attenuation ponds located within the I-295 and I-95 interchange, Ponds 100 and 103. The estimated impacts were quantified by utilizing a GIS cut-fill tool at the permitted design high water elevation within the anticipated limits of construction which resulted in 0.27 ac-ft of additional volume to be accommodated within Basin B. This results in a total volume of 4.09 ac-ft to be accommodated within the pond site.

The required floodplain compensation volume is 0.02 ac-ft. It is recommended to utilize ditch grading along the western side of the roadway to provide floodplain compensation.

The preliminary results indicate that Pond Site B-1 will provide sufficient treatment and attenuation volume for the I-95 widening improvements for Basin B within the developed pond contours. These results will need to be confirmed during final design with complete survey and seasonal high water information. See **Appendix B** for calculations. Refer to **Figure 5** within **Appendix A** for the location of the potential pond site.

Pond Site B-1 is located just to the east of where the northbound I-95 on-ramp from where eastbound I-295 ties into the I-95 mainline. The site will utilize the entire area of undeveloped parcels, 156448-0100 and 156449-0100, owned by "STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION". The total combined parcel area is 3.7 acres. Detailed stage-area contours were created to evaluate the maximum provided volume within the FDOT property. The normal water elevation (NWL) was set to 10.8 ft-NAVD, which matches the adjacent stormwater pond. The pond site was sized to have a berm elevation below the low edge of pavement for I-95 mainline and ramps. The proposed pond site is assumed to take both parcels

owned by FDOT. It assumed the entire combined parcel area would be incorporated into the I-95 right-of-way. The site is not located within the 100-year FEMA floodplain.

The proposed pond site is located along I-95. No drainage easement is required for access and conveyance. The site is not located within the 100-year FEMA floodplain. The site contains an existing conveyance ditch from the Avenues Walk Regional Development outfall pond (ERP Application No. 91736-9) to the 10'x3' box culvert under I-95. Refer to **Appendix E** for the Regional Development Drainage Map. There are no apparent utilities on this undeveloped site. As an overhead lighting structure exists between the northbound I-95 on-ramp and Site B-1, appropriate measures should be taken in final design to avoid any drainage conflicts with this structure. See **Appendix D** for a picture of this pond site.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basin B to Pond Site B-1, a compensatory basin was delineated utilizing existing drainage infrastructure as much as possible. Pond B-1 will provide treatment and attenuation for all impervious area within the northbound I-95 lanes between Stations 784+00 to 807+80 as well as southbound lanes within a superelevated condition to flow to the median between Stations 784+00 to 795+00, which will route slightly more impervious area to the pond site than the net increase in impervious area for the entire basin. The delineated basin for this pond option is for conceptual planning and cost estimating purposes only; proposed basins should be further evaluated in design.

The soils encountered at this site include Evergreen-Wesconnett Complex (HSG A/D) and Pamlico Muck (HSG A/D). Both of these soils are very poorly drained and have typical high water tables between existing grade and 2 feet above existing grade according to the Duval County Soil Survey. The estimated SHGWT at this location is 10.83 feet, based on a review of geotechnical borings from existing I-95 plans and permitted NWL of adjacent commercial ponds.

The site is classified as pine flatwoods land use according to SJRWMD. Wetland mitigation is anticipated if Pond Site B-1 is utilized; approximately 1.61 acres of the potential pond site is within wetlands as identified by the Pond Siting NRE Memorandum in **Appendix F**. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

There is a low risk of contamination at the pond site, as determined by the Contamination Screening Memorandum provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

It should be noted that it is assumed that the existing conveyance ditch from the Avenues Walk Regional Development outfall pond (ERP Application No. 91736-9) can be diverted (by

piping) around the proposed pond to the 10'x3' box culvert under I-95. The preliminary results indicate that Site B-1 will provide sufficient treatment and attenuation volumes within the estimated pond design depth and footprint. If this site is chosen, these results will need to be confirmed during final design with complete survey and seasonal high water information.

This pond site has an estimated total cost of **$1,578,500**. The estimated cost reflects the construction of the pond site and estimated mitigation costs only since this pond option is located within existing FDOT property. The construction costs are for comparison purposes only and include estimates for earthwork, sodding, clearing & grubbing, sediment barrier (silt fence), and storm sewer systems associated with this specific pond option.

The construction cost estimate includes accommodations to the Avenues Walk Regional Development Site Outfall by extending the 36" outfall pipe to the box culvert to which it currently discharges by routing around the proposed pond site. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of pond option and will be included in the cost of the roadway. Please see **Appendix C** for supporting documentation.

5.3.2 Basin C

The infield areas within the interchange of I-95 and US 1 (Phillips Hwy.) will be utilized for wet detention stormwater facilities within Basin C. Detailed stage-area contours were developed within the infield areas to determine the capacity volume within the infield. At this phase, it was assumed that the vertical profiles of the interchange ramps and mainline will mimic the existing ramp profiles. Due to the infield areas being designed as wet detention facilities, the canal hazard criteria was evaluated but was determined to not be applicable for any of the infield areas (i.e. flush shoulders for any ramp did not exceed 1,000-feet before guardrail was already applied to the roadway design).

Basin C includes a total area of 123.36 acres and extends from Station 807+80 to Station 888+30 (Baseline Survey SR 9 (I-95)). Existing runoff currently drains to three existing cross drains at Station 832+00 (triple 8'x4' box culvert at Tire Creek), Station 857+50 (double 10'x 4' box culvert), and Station 567+00 (triple 30-inch pipe), all of which convey runoff west to Julington Creek.

The entire existing roadway basin is untreated. A pond located behind parcel 148634-0300, approximately 800 feet northeast of the east R/W line at Station 910+00, was permitted in 1995 to provide compensatory treatment for impervious area from commercial sites equal to the proposed pavement additions of the I-95 widening from four to six lanes under ERP Application No. 18228-3, Offsite North Pond (Nissan Dealership Pond). Refer to **Appendix E** for details and **Figure B-9** in **Appendix B** for the pond location.

Basin C will have a net increase of 12.00 acres of impervious area, resulting in a required treatment volume of 2.50 ac-ft. It is anticipated that the infield ponds will provide treatment

and attenuation for all impervious area associated with the interchange and US 1 (Philips Highway).

Together the roadway improvements and infield pond sites result in 8.92 ac-ft of runoff volume. Additionally, the roadway improvements impact two existing attenuation ponds located within the US-1 and I-95 interchange, North Pond and South Pond (ERP 18228-3, I-95 Widening from 4-lane to 6-lane). Since the interchange is to be realigned, it is anticipated the full permitted attenuation volume is to be accommodated within the proposed infield ponds. The permitted attenuation volume was quantified by evaluating the permitted storage provided by the design high water elevation within the ponds, resulting in 2.08 ac-ft. Refer to **Appendix B** for calculations and **Appendix E** for excerpts of the supporting permit data. This results in a total volume of 13.50 ac-ft to be accommodated within the infield pond sites.

The western side of the US-1 and I-95 interchange include floodplains that are downstream of a 5 square mile basin, thus floodplain impacts are required to be evaluated. The total floodplain compensation volume for the interchange configuration anticipated footprint is 0.657 ac-ft. Refer to **Appendix B** for limits and summary of the GIS cut-fill results. One of the infield areas was evaluated to be a floodplain compensation pond, therefore an offsite option was not required.

The preliminary results indicate that the infield areas provide sufficient treatment and attenuation, as well as floodplain compensation volumes for the I-95 widening improvements for Basin C within the infield contours. These results will need to be confirmed during final design with complete survey and seasonal high water information.

Pond C-1 is the infield area for the proposed I-95 and US 1 interchange realignment provides approximately 10.30 acres available for stormwater ponds. Detailed contours for the interchange infield ponds were developed to estimate the provided storage within each infield area. Infield ponds were graded such that the tie-in side slopes were 1:6 within the clear zone along flush shoulders and 1:3 behind locations of guardrail. The infield ponds were comprised of a 20-ft berm with a maximum slope of 1:20 and side slopes of 1:4 to the bottom of the pond. The site is not located within the 100-year FEMA floodplain.

The eastern side of the interchange, which is the location of the existing attenuation ponds, will continue to discharge at the I-95 R/W to flow north to Tire Creek, which ultimately outfalls to Julington Creek. These infield areas are identified as C-1A, C-1B, and C-1C. The NWL is assumed to match the existing control structure design, and all three ponds will provide treatment and attenuation to US-1 and I-95. The western side of the interchange estimated NWL is based on historical boring data, aerial imagery, and DEM elevations. The western infield areas are identified as C-1D and C-1E. Since these western infield areas are located adjacent to the floodplains that have anticipated impacts, one infield area, C-1E, was utilized as the floodplain compensation pond, while the other, C-1D, will provide treatment and attenuation for the I-95 and US-1 interchange. In total the four treatment and attenuation ponds (C-1A through C-1D) provide an estimated 21.90 ac-ft of storage volume, which is 8.40 ac-ft more than the anticipated required volume. The FPC pond, C-1E, provides 0.82 ac-ft of

volume at the floodplain stage, which is in excess of 0.16 ac-ft than required. Therefore the infield ponds are anticipated to provide sufficient storage capacity and an off-site pond option was not evaluated.

Since the proposed pond site is located within I-95 R/W, no drainage easement is required for access and conveyance. The infield sites are not located within the 100-year FEMA floodplain. There are overhead utilities/utility poles within the southeast infield area that may need to be relocated in final design if these sites are used. An unknown underground utility marker was also noted within the southeast infield area during the field visit. The southwest infield site has an underground AT&T utility on the south side along US 1, a TECO gas transmission line, and overhead utilities/utility poles. See **Appendix D** for pictures of these pond sites.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basin C to the Infield Pond Sites, a compensatory basin was delineated utilizing existing drainage infrastructure as much as possible. The pond sites will provide treatment and attenuation for all impervious area within the interchange ramps and the entire I-95 mainline from Station 815+00 to 835+00, which will route slightly more impervious area to the pond site than the net increase in impervious area for the entire basin. The delineated basin for this pond option is for conceptual planning and cost estimating purposes only; proposed basins should be further evaluated in design.

The soils encountered at the infield sites are considered Urban Land which does not have a hydrologic soil group classification according to the USDA NRCS. As previously stated, the Urban Land classification within the project area is considered to be in a drained condition.

Wetland mitigation is not anticipated as approximately zero acres of wetlands have been identified in the infield areas per the Pond Siting NRE Memorandum in **Appendix F**. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

There is a low risk of contamination at the pond site, as determined by the Contamination Screening Memorandum provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

Utilizing all five interchange areas as ponds results in an estimated total cost of **$2,102,900**. The estimated cost reflects the construction of the pond site only since the interchange areas are located within the R/W and are not anticipated to have any wetland mitigation costs.

The construction costs are for comparison purposes only, and they include estimates for earthwork, sodding, clearing & grubbing, sediment barrier (silt fence), and storm sewer

systems associated with this specific pond option. It was assumed that equalizer pipes connecting sites C-1A through C-1C will be placed under the ramps, and the eastern infield areas will not be hydraulically connected to the western infield areas. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of the pond option and will be included in the cost of the roadway. Please see **Appendix C** for supporting documentation.

5.3.3 Basin D

Three potential offsite wet detention pond sites, Pond D-1, D-3, and D-4, have been identified within Basin D. Pond Site D-1 is located in an undeveloped area along the west side of I-95. Pond Site D-3 is located east of an existing FDOT treatment pond. Pond Site D-4 is located in an undeveloped area behind an industrial building and downstream of a wastewater facility effluent discharge location. Preliminary calculations demonstrate that each site will meet the proposed design criteria.

Basin D includes a total area of 21.95 acres and extends from Station 888+30 to Station 920+20 (Baseline Survey SR 9 (I-95)). Existing runoff currently drains to an existing 8'x 4' box culvert located at Station 913+20, which conveys runoff to the west to Pottsburg Creek.

The entire existing roadway basin is untreated. A pond located behind parcel 148634-0300, approximately 800 feet northeast of the east R/W line at Station 910+00, was permitted in 1995 to provide compensatory treatment for impervious area from commercial sites equal to the proposed pavement additions of the I-95 widening from four to six lanes under ERP Application No. 18228-3, Offsite North Pond (Nissan Dealership Pond). Refer to **Appendix E** for details and **Figure B-9** in **Appendix B** for the pond location.

Basin D will have a net increase of 3.85 acres of impervious area, resulting in a required treatment volume of 0.80 ac-ft. The required attenuation volume includes the pond site, therefore the roadway improvements and pond option result in 1.97 to 2.01 ac-ft of runoff volume depending upon the pond size. It is assumed that there will be no impacts to the existing FDOT treatment pond (ERP 18228-3, I-95 Widening from 4-lane to 6-lane) for any of these pond options.

Additionally, improvements along Southside Blvd. (SR 115) will have a net increase of 0.87 acres in impervious area. Pond Options for Basin D will provide compensatory treatment and additional attenuation to accommodate the Southside Blvd. proposed improvements. Southside improvements result in a total required treatment volume of 0.18 ac-ft and a net runoff volume of 0.50 ac-ft. This results in a total volume for the Basin D pond options of 3.45 to 3.49 ac-ft to be accommodated within the pond options.

There are no floodplain impacts associated with the proposed I-95 improvements within Basin D, Southside Blvd, or the Basin D pond options.

The required pond area per option was determined using an estimated pond design depth, 1-foot of freeboard, a 20-foot maintenance berm, and an additional 10% for landscaping. It is

assumed that an additional 12-feet of excavation below the design depth will be used for the pond permanent pool for cost estimate purposes. See **Appendix B** for calculations. Refer to **Figures 9** and **10** within **Appendix A** for the location of the potential pond sites.

The preliminary results indicate that Pond Sites D-1, D-3, and D-4 provide sufficient treatment and attenuation volumes for the I-95 widening improvements for Basin D within the estimated pond design depth and footprint. These results will need to be confirmed during final design with complete survey and seasonal high water information.

Pond Site D-1 is located just west of I-95. The site requires a partial take of parcel 152690-0010, owned by Neoverde St Johns LLC, and is designated as a conservation easement. The parcel is undeveloped. The potential take has been delineated as 1.70 acres of the parcel. Since the proposed pond site is adjacent to I-95 mainline, a drainage easement is not required for access and conveyance. The site is not located within the 100-year FEMA floodplain.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basin D to Pond Site D-1, a compensatory basin was delineated utilizing existing drainage infrastructure as much as possible. Pond D-1 will provide compensatory treatment and attenuation for Basin D. The compensatory sub-basin collects runoff from the southbound travel lanes and median between Stations 888+30 to 913+00 and only the median from Station 913+00 to 920+20. The compensatory sub-basin is sized to route a total impervious area that is slightly greater than the net increase in impervious area for the entire Basin D. It is anticipated that this would require the use of a jack and bore pipe under I-95 to connect to an existing median ditch inlet to reroute runoff away from the cross drain. The delineated basin for this pond option is for conceptual planning and cost estimating purposes only; proposed sub-basins should be further evaluated in design.

The soils encountered at this site include Leon Fine Sand (HSG A/D) and Pamlico Muck (HSG A/D). Leon Fine Sand is poorly drained with the high water table approximately 0.5 to 1.5 feet below ground according to the Duval County Soil Survey. Pamlico Muck is very poorly drained with the high water table approximately 0 to 2 feet above ground according to the Duval County Soil Survey. The estimated SHGWT at this location is 19.8 feet, based on the design SHGWT of the existing I-95 offsite (Nissan Dealership) wet detention pond and review of the associated boring at the 8'x4' box culvert under ERP Permit Application No. 18228-3.

Wetland mitigation is anticipated if Pond Site B-1 is utilized; approximately 0.88 acres of the potential pond site is within wetlands as identified by the Pond Siting NRE Memorandum in **Appendix F**. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

There is a low risk of contamination at the pond site, as determined by the Contamination Screening Memorandum provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

The preliminary results indicate that Site D-1 will provide sufficient treatment and attenuation volumes within the estimated pond design depth and footprint for both the I-95 widening within Basin D and the Southside Boulevard improvements. If this site is chosen, these results will need to be confirmed during final design with complete survey and seasonal high water information.

This pond site has an estimated total cost of **$976,973**. FDOT District 2 Right of Way Department has provided land acquisition estimates for a previous version of this pond site. The fixed verse variable R/W costs was not itemized in the R/W estimates, therefore an equivalent cost per acreage was applied to estimate a new R/W cost. The estimated R/W costs is $68,723 for the proposed Pond D-1, which is for the parcel only and does not include potential easement improvements. Wetland mitigation costs were estimated to be $232,650 and the construction costs are estimated at $675,600.

The construction costs are for comparison purposes only, and they include estimates for earthwork, sodding, clearing & grubbing, sediment barrier (silt fence), and storm sewer systems associated with this specific pond option. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of the pond option and will be included in the cost of the roadway. Please see **Appendix C** for supporting documentation.

Pond Site D-3 will expand an existing wet detention pond's east border that was permitted to provide compensatory treatment under Permit #18228-3. The existing wet detention pond is located behind parcel 148634-0300, approximately 1,100 feet northeast of the east R/W line at Station 910+00. The expansion requires a partial take of parcel 148635-1010, owned by Katy Moon. The parcel is a permitted conservation easement under SJRWMD ERP 74433-1 for the Belle Rive Subdivision. The total parcel area is 11.15 acres. The potential take has been delineated to take 1.20 acres of the parcel. A drainage easement is not necessary as there is already an easement from the existing wet detention pond to I-95. The site is not located within the 100-year FEMA floodplain. A water line along Western Way was observed during the field visit which will need to be considered when designing the drainage conveyance system from I-95 to the proposed pond site. See **Appendix D** for a picture of this pond site.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basin D to Pond Site D-3, a compensatory basin was delineated utilizing existing drainage infrastructure as much as possible. Pond D-3 will provide compensatory treatment and attenuation for Basin D. The compensatory sub-basin collects runoff from the northbound travel lanes and median between Stations 888+30 to 913+00 and only the median from Station 913+00 to 920+20. The compensatory sub-basin is sized to route a total impervious area that is slightly greater than the net increase in impervious area for the entire Basin D. It is anticipated that this would require the use of a jack and bore pipe under I-95 to connect to an existing median ditch inlet

to reroute runoff away from the cross drain. The delineated basin for this pond option is for conceptual planning and cost estimating purposes only; proposed sub-basins should be further evaluated in design.

The soils encountered at this site are considered Urban Land which does not have a hydrologic soil group classification according to the USDA NRCS. As previously stated, the Urban Land classification within the project area is considered to be in a drained condition. The estimated SHGWT at this location is 19.8 feet, based on the design SHGWT of the existing I-95 offsite (Nissan Dealership) wet detention pond and review of the associated boring at the 8'x4' box culvert under ERP Permit Application No. 18228-3.

The site is classified as upland mixed hardwood forests land use according to SJRWMD. Wetland mitigation is anticipated if Pond Site D-3 is utilized; approximately 0.98 acres of the potential pond site is within wetlands as identified by the National Wetland Inventory. The Pond Siting NRE Memorandum in **Appendix F** estimated wetland quantities for a larger pond site, therefore the wetland impact quantities in the NRE are larger than the current pond size. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

There is a low risk of contamination at the pond site, as determined by the Contamination Screening Memorandum provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

The preliminary results indicate that Site D-3 will provide sufficient treatment and pre/post attenuation within the estimated pond design depth and footprint. If this site or other sites within this basin are chosen, these results will need to be confirmed during final design.

This pond site has an estimated total cost of **$1,007,464**. FDOT District 2 Right of Way Department has provided land acquisition estimates for a previous version of this pond site. The fixed verse variable R/W costs were not itemized in the R/W estimates, therefore an equivalent cost per acreage was applied to estimate a new R/W cost. The estimated R/W costs is $60,914 for the proposed Pond D-3, which is for the parcel only and does not include potential easement improvements. Wetland mitigation costs were estimated to be $259,050 and the construction costs are estimated at $687,500.

The construction costs are for comparison purposes only, and they include estimates for earthwork, sodding, fencing, clearing & grubbing, sediment barrier (silt fence), and storm sewer systems associated with this specific pond option. The construction cost estimate assumes connection to the existing stormwater sewer network that currently flows to the existing Nissan Pond, and does not include an evaluation of the existing stormwater sewer network's capacity to convey the additional flow to the pond. Therefore, the cost estimate

does not include any modifications to the existing storm sewer network. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of the pond option and will be included in the cost of the roadway. Please see **Appendix C** for supporting documentation.

Pond Site D-4 will expand the existing wet detention pond's volume capacity at the northwest border that was permitted to provide compensatory treatment under Permit #18228-3. The existing wet detention pond is located behind parcel 148634-0400, approximately 800 feet northeast of the east R/W line at Station 910+00. The expansion requires a partial take of parcel 148634-0400, owned by "Western Way Jax, Inc", and is designated as light industrial. The parcel is partially developed, but the potential pond site includes the entire undeveloped area of the parcel. The total parcel area is 8.05 acres. The potential take has been delineated as 1.8 acres of the parcel, due to its location and possible functionality as a regional pond option. It is anticipated that a drainage easement would not be necessary since this delineated parcel is adjacent to an existing FDOT pond which can be connected to I-95 via an existing easement from Western Way. The proposed site includes an existing drainage canal that currently serves as the outfall to the adjacent existing FDOT pond. The site contains an outfall ditch for Royal Lakes Wastewater Treatment Facility (WWTF) (FL0026751) which has a permitted design capacity of 3.25 million gallons per day (MGD). The site is not located within the 100-year FEMA floodplain. A water line along Western Way was observed during the field visit, which will need to be considered when designing the drainage conveyance system from I-95 to the proposed pond site.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basin D to Pond Site D-4, a compensatory basin was delineated utilizing existing drainage infrastructure as much as possible. Pond D-4 will provide compensatory treatment and attenuation for Basin D. The compensatory sub-basin collects runoff from the northbound travel lanes and median between Stations 888+30 to 913+00 and only the median from Station 913+00 to 920+20. The compensatory sub-basin is sized to route a total impervious area that is slightly greater than the net increase in impervious area for the entire Basin D. It is anticipated that this would require the use of a jack and bore pipe under I-95 to connect to an existing median ditch inlet to reroute runoff away from the cross drain. The delineated basin for this pond option is for conceptual planning and cost estimating purposes only; proposed sub-basins should be further evaluated in design.

The soils encountered at this site are considered Urban Land, which does not have a hydrologic soil group classification according to the USDA NRCS. As previously stated, the Urban Land classification within the project area is considered to be in a drained condition. The estimated SHGWT at this location is 19.8 feet, based on a the design SHGWT of the existing I-95 offsite (Nissan Dealership) wet detention pond and review of the associated boring at the 8'x4' box culvert under ERP Permit Application No. 18228-3.

The site is classified as mixed wetland hardwoods land use according to SJRWMD. Wetland mitigation is anticipated if Pond Site D-4 is utilized; approximately 0.05 acres of the potential pond site is within wetlands as identified by the National Wetland Inventory. The Pond Siting

NRE Memorandum in **Appendix F** estimated wetland quantities for a larger pond site, therefore the wetland impact quantities in the NRE are larger than the current pond size. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

As previously stated, Pond Site D-4 is just south of Royal Lakes WWTF and is considered to have medium potential for contamination. However, the Contamination Screening Memorandum does not mention the WWTF or risk associated with it. The Contamination Screening Memorandum is provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

It is anticipated that this pond option could function as a regional pond option for the area. The preliminary results indicate that Site D-4 will provide sufficient treatment and attenuation volumes within the estimated pond design depth and footprint. If this site is chosen, these results will need to be confirmed during final design with complete survey and seasonal high water information.

This pond site has an estimated total cost of **$1,656,702**. FDOT District 2 Right of Way Department has provided land acquisition estimates for a previous version of this pond site. The fixed verse variable R/W costs were not itemized in the R/W estimates, therefore an equivalent cost per acreage was applied to estimate a new R/W cost. The estimated R/W costs is $931,602 for the proposed Pond D-4, which is for the parcel only and does not include potential easement improvements. Wetland mitigation costs were estimated to be $6,600 and the construction costs are estimated at $718,500.

The construction costs are for comparison purposes only, and they include estimates for earthwork, sodding, clearing & grubbing, sediment barrier (silt fence), and storm sewer systems associated with this specific pond option. The construction cost estimate assumes connection to the existing stormwater sewer network that currently flows to the existing Nissan Pond and does not include an evaluation of the existing stormwater sewer network's capacity to convey the additional flow to the pond. Therefore, the cost estimate does not include any modifications to the existing storm sewer network. The construction costs do not include estimates for wetland mitigation. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of pond option and will be included in the cost of the roadway. Cost estimates do not include accommodation of the WWTF outfall ditch relocation. Please see **Appendix C** for supporting documentation.

5.3.4 Basin E

Two potential off-site wet detention pond sites, Pond E-1 and E-2, have been identified within Basin E. Basin E extends the length of the I-95 mainline that outfalls to the floodplain south of Freedom Crossing Trail, which is associated with the Julington Creek watershed. Previously,

Basin E extended to Baymeadows Road; however, more detailed review of this area shows that the Baymeadows Road and I-95 interchange outfall to large box culverts under Baymeadows Road that flow north to Pottsburg Creek. This basin has been divided to better mimic existing drainage conditions. The I-95 Widening and Baymeadows Road interchange improvements within the Pottsburg Creek watershed are evaluated within the adjacent *PSR I-95 Widening from Baymeadows Road (SR 152) to JTB (SR 202)* project (FPID 432259-2) under a different cover.

Due to the significant decrease in size of this basin, another pond option was reviewed for this area which accommodates addressing treatment and attenuation for both Basins D and E together. Required pond volumes and cost reduction for this option is further discussed in the **Pond Site D-E** section of this report.

Basin E includes a total area of 12.04 acres and extends from Station 920+20 to Station 937+70 (Baseline Survey SR 9 (I-95)). Existing runoff currently drains to double 30-inch pipes located at Station 928+80, which conveys runoff west to Pottsburg Creek.

The entire existing roadway basin is untreated. A pond located behind parcel 148634-0300, approximately 800 feet northeast of the east R/W line at Station 910+00, was permitted in 1995 to provide compensatory treatment for impervious area from commercial sites equal to the proposed pavement additions of the I-95 widening from four to six lanes under ERP Application No. 18228-3, Offsite North Pond (Nissan Dealership Pond). Refer to **Appendix E** for details and **Figure B-9** in **Appendix B** for the pond location.

Basin E will have a net increase of 1.68 acres of impervious area, resulting in a required treatment volume of 0.35 ac-ft. The required attenuation volume includes the pond site, therefore the roadway improvements and pond option result in 0.97 to 0.98 ac-ft of runoff volume, depending upon the pond size. This results in a total volume of 1.32 to 1.33 ac-ft to be accommodated within the Basin E pond options.

There are no floodplain impacts associated with the proposed I-95 improvements within Basin E or its pond options.

The required pond area per option was determined using an estimated pond design depth, 1-foot of freeboard, a 20-foot maintenance berm, and an additional 10% for landscaping. It is assumed that an additional 12-feet of excavation below the design depth will be used for the pond permanent pool for cost estimate purposes. See **Appendix B** for calculations. Refer to **Figures 11** and **12** within **Appendix A** for the location of the potential pond sites.

The preliminary results indicate that Pond Sites E-1 and E-2 provide sufficient treatment and attenuation volumes for the I-95 widening improvements for Basin E within the estimated pond design depth and footprint. These results will need to be confirmed during final design with complete survey and seasonal high water information.

Pond Site E-1 is located just northwest of where the southbound I-95 on-ramp from Baymeadows Road ties into the I-95 mainline. The site requires a whole take of undeveloped parcels, 152683-0160, owned by Patel Rajesh P. During The Balmoral Group's field review on July 11th, 2017, it was noted that Parcel 152683-0160 was for sale. From Jacksonville's Property Appraiser Site, this parcel was then sold in October of 2017 but is still classified as vacant commercial. The parcel area is approximately 1.15 acres. A drainage easement from I-95 will not be required as the pond site is adjacent to the I-95 R/W. The site is not located within the 100-year FEMA floodplain. Underground utilities observed along Dix Ellis Trail include water, buried fiber optic and electric. See **Appendix D** for a picture of this pond site.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basin E to Pond Site E-1, a compensatory basin was delineated utilizing existing drainage infrastructure as much as possible. Pond E-1 will provide compensatory treatment and attenuation for Basin E. The compensatory sub-basin collects runoff from the southbound travel lanes and median to route a total impervious area that is slightly greater than the net increase in impervious area for the entire Basin E. It is anticipated that this would require the use of a jack and bore pipe under I-95 to connect to an existing median ditch inlet to reroute runoff away from the cross drain. Additionally, it was assumed that a 36-inch trunkline would be able to convey the runoff from the basin to the pond site. The delineated basin and drainage infrastructure for this pond option is for conceptual planning and cost estimating purposes only; proposed sub-basins and pipe sizes should be further evaluated in design.

The soil encountered at this site is mainly Leon Fine Sand (HSG A/D) and Evergreen-Wesconnett Complex (depressional, HSG A/D). These soils are poorly drained and very poorly drained with the typical high water table between 0.5 and 1.5-feet below existing grade and 0 to 2-feet above existing grade, respectively, according to the Duval County Soil Survey. The estimated SHGWT at this location is 16.5 feet, based on permitted NWL of adjacent commercial ponds and elevation of the depression within the pond site.

Wetland mitigation is not anticipated since approximately zero acres of the site are within wetlands as identified by the Pond Siting NRE Memorandum in **Appendix F**. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

There is a low risk of contamination at the pond site, as determined by the Contamination Screening Memorandum provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

This pond site has an estimated total cost of **$1,122,886**. FDOT District 2 Right of Way Department has provided land acquisition estimates for a previous version of this pond site. The fixed verse variable R/W costs were not itemized in the R/W estimates, therefore an

equivalent cost per acreage was applied to estimate a new R/W cost. The estimated R/W costs is $557,186 for the proposed Pond E-1, which is for the parcel only and does not include potential easement improvements. Wetland mitigation costs were estimated to be $0 and the construction costs are estimated at $565,700.

The construction costs are for comparison purposes only, and they include estimates for earthwork, sodding, clearing & grubbing, sediment barrier (silt fence), and storm sewer systems associated with this specific pond option. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of the pond option and will be included in the cost of the roadway. Please see **Appendix C** for supporting documentation.

Pond Site E-2 is located between Dix Ellis Trail and I-95 on undeveloped, forested land. The site requires a partial take of parcel 152690-0010, owned by "Neoverde St Johns LLC", which is designated as a conservation easement. This parcel is south of the Freedom Commerce Center business parks. The estimated proposed area to be acquired is 1.30 acres. Since the proposed pond site is located along I-95, no drainage easement is required for access and conveyance. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities on this site. See **Appendix D** for a picture of this pond site.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basin E to Pond Site E-2, a compensatory basin was delineated utilizing existing drainage infrastructure as much as possible. Pond E-2 will provide compensatory treatment and attenuation for Basin E. The compensatory sub-basin developed anticipates that the double 30-inch cross drain at Station 928+80 may be used to route runoff from the northbound travel lanes to the pond site, with most of the hydraulic routing performed by ditch systems. This allows the contributing basin to collect a total impervious area that is significantly greater than the net increase in impervious area for the entire Basin E. Therefore, it is anticipated that this pond site would not require the use of a jack and bore pipe under I-95. The delineated basin for this pond option is for conceptual planning and cost estimating purposes only; proposed sub-basins should be further evaluated in design.

The soils encountered at this site include Leon Fine Sand (HSG A/D) and Evergreen-Wesconnett Complex (HSG A/D). Leon Fine Sand is poorly drained and has a typical high water table between 0.5 and 1.5 feet below existing grade according to the Duval County Soil Survey. Evergreen-Wesconnett Complex has a high water table between existing grade and 2 feet above existing grade according to the Duval County Soil Survey. The estimated SHGWT at this location is 19.8 feet, based on a review of I-95 offsite (Nissan Dealership) wet detention pond and review of the associated boring at the 8'x4' box culvert under ERP Permit Application No. 18228-3, which is located approximately 980-feet southeast of the proposed pond site.

The site is classified as pine flatwoods and wetland forested mixed land use according to SJRWMD. Wetland mitigation is anticipated if Pond Site E-2 is utilized; approximately 0.83

acres of the potential pond site is within wetlands as identified by the National Wetland Inventory. The Pond Siting NRE Memorandum in **Appendix F** estimated wetland quantities for a larger pond site, therefore the wetland impact quantities in the NRE are larger than the current pond size. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

There is a low risk of contamination at the pond site, as determined by the Contamination Screening Memorandum provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

This pond site has an estimated total cost of **$555,806**. FDOT District 2 Right of Way Department has provided land acquisition estimates for a previous version of this pond site. The fixed verse variable R/W costs were not itemized in the R/W estimates, therefore an equivalent cost per acreage was applied to estimate a new R/W cost. The estimated R/W costs is $44,156 for the proposed Pond E-2, which is for the parcel only and does not include potential easement improvements. Wetland mitigation costs were estimated to be $219,450 and the construction costs are estimated at $292,200.

The construction costs are for comparison purposes only, and they include estimates for earthwork, sodding, clearing & grubbing, sediment barrier (silt fence), and storm sewer systems associated with this specific pond option. It appears the double 30-inch cross drain within the basin only conveys I-95 mainline runoff, thus not requiring jack and bore piping to route runoff to the pond site, which makes this site cost effective in relation to construction costs. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of pond option and will be included in the cost of the roadway. Please see **Appendix C** for supporting documentation.

Pond Site D-E is at the same location as Pond Site E-2, however, it is sized to provide compensatory treatment and attenuation for Basins D, E, and Southside. These three basins have a net increase in impervious area of 6.4 acres, which requires 1.33 ac-ft in treatment volume. The three basins plus the pond site have a net increase of 3.53 ac-ft in runoff volume, resulting in a total required pond volume of 4.86 ac-ft. There are no floodplain impacts within any of these basins. The same assumptions (e.g. NWL) used for Pond Option E-2 were used for Pond Option D-E. The estimated proposed area to be acquired is 2.4 acres. Since the proposed pond site is located along I-95, no drainage easement is required for access and conveyance. The site is not located within the 100-year FEMA floodplain. There are no apparent utilities on this site. See **Appendix D** for a picture of this pond site.

Because it is not hydraulically feasible to convey all the stormwater runoff from Basins D and E to Pond Site D-E, a compensatory basin was delineated utilizing existing drainage

infrastructure as much as possible. Pond D-E will provide compensatory treatment and attenuation for Basins D and E. The compensatory sub-basin developed anticipates that the double 30-inch cross drain at Station 928+80 may be used to route runoff from the northbound travel lanes to the pond site, with most of the hydraulic routing performed by ditch systems. The contributing basin does assume that the median south of the 8'x4' box culvert will be able to be routed to the pond site. This allows the contributing basin to collect a total impervious area that is significantly greater than the net increase in impervious area for the entire basin. Therefore, it is anticipated that this pond site would not require the use of a jack and bore pipe under I-95. The delineated basin for this pond option is for conceptual planning and cost estimating purposes only; proposed sub-basins should be further evaluated in design.

The soils encountered at this site include Leon Fine Sand (HSG A/D) and Evergreen-Wesconnett Complex (HSG A/D). Leon Fine Sand is poorly drained and has a typical high water table between 0.5 and 1.5 feet below existing grade according to the Duval County Soil Survey. Evergreen-Wesconnett Complex has a high water table between existing grade and 2 feet above existing grade according to the Duval County Soil Survey. The estimated SHGWT at this location is 19.8 feet, based on a review of I-95 offsite (Nissan Dealership) wet detention pond and review of the associated boring at the 8'x4' box culvert under ERP Permit Application No. 18228-3, which is located approximately 980-feet southeast of the proposed pond site.

The site is classified as pine flatwoods and wetland forested mixed land use according to SJRWMD. Wetland mitigation is anticipated if Pond Site D-E is utilized; approximately 1.69 acres of the potential pond site is within wetlands as identified by the National Wetland Inventory. The Pond Siting NRE Memorandum in **Appendix F** estimated wetland quantities for a larger pond site, therefore the wetland impact quantities in the NRE are larger than the current pond size. There are no specific wildlife data observed in or adjacent to the pond site. From the NRE memorandum, it is anticipated that there will be no adverse impacts to state or federally listed species or habitats.

There is a low risk of contamination at the pond site, as determined by the Contamination Screening Memorandum provided in **Appendix F**.

There is a low risk of cultural/historic resources located within the pond site, as determined by the Archaeological and Cultural Resource Probability Memorandum provided in **Appendix F**.

This pond site has an estimated total cost of **$1,466,018**. FDOT District 2 Right of Way Department has provided land acquisition estimates for a previous version of this pond site. The fixed verse variable R/W costs were not itemized in the R/W estimates, therefore an equivalent cost per acreage was applied to estimate a new R/W cost. The estimated R/W costs is $81,518 for the proposed Pond D-E, which is for the parcel only and does not include potential easement improvements. Wetland mitigation costs were estimated to be $445,500 and the construction costs are estimated at $939,000.

The construction costs are for comparison purposes only, and they include estimates for earthwork, sodding, clearing & grubbing, sediment barrier (silt fence), and storm sewer systems associated with this specific pond option. It appears the double 30-inch cross drain within the basin only conveys I-95 mainline runoff, thus not requiring jack and bore piping to route runoff to the pond site, which makes this site cost effective in relation to construction costs. It is assumed that any new on-site storm sewer systems within I-95 right-of-way will be equivalent regardless of the pond option and will be included in the cost of the roadway. Please see **Appendix C** for supporting documentation.

6. Conclusion

This memorandum presents the evaluation of potential stormwater facilities to treat and attenuate runoff and provide compensation for any floodplain impacts associated with the I-95 widening to a 10-lane mainline from I-295 to Baymeadows Road (SR 152) with capacity and mobility improvements for the interchanges at Phillips Highway (US-1), Southside Boulevard (SR 115), and Baymeadows Road (SR 152). This report is intended to provide feasible options with preliminary sizing calculations. Further evaluation for right-of-way acquisition should include site-specific information including topographic survey, wetland delineation, geotechnical investigation, review of wildlife habitats, utility survey, and contamination screening. The Pond Siting Analysis should be updated for any data obtained after this submittal. See **Table 6** below for the Recommended Pond Siting Matrix.

TABLE 6 – RECOMMENDED POND SITE MATRIX

Pond Site	Wetland Impacts (ac)	Wildlife Habitat Impacts	Contamination Risk	Floodplain Impact	Impact to Historical or Archaeological Resources	Pond Construction Cost	Pond R/W Costs	Mitigation Costs	Total Pond Cost
B-1	1.61	Low	Low	None	Low	$1,365,700	$0	$212,850	$1,578,550
C-1	0	Low	Low	None	Low	$2,102,900	$0	$0	$2,102,900
D-E	1.69	Low	Low	None	Low	$939,000	$81,518	$445,500	$1,466,018

Pond option D-E was chosen over acquiring two separate pond sites for Basins D and E. The most cost effective pond options within these two basins are all located within the same parcel, the SJRWMD conservation easement. Pond site D-E not only provides a lower capital cost compared to two pond sites, it is anticipated to also have lower maintenance cost to maintain a single pond site. Additionally, this pond site is located at the corner of the conservation easement adjacent to a business park development, as the intent is to minimize impacts to conservation lands.

7. References

Environmental Resource Permitting Handbook Volume II. St Johns River Water Management District. 2013.

State-wide Comprehensive Verified List of Impaired Waterbodies. Florida Department of Environmental Protection. August 2020.

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Flood Map Database. Federal Emergency Management Agency. 2019.

Flood Insurance Study for Duval County. Federal Emergency Management Agency. June 2013.

Pond Siting Report for I-95 Widening from Baymeadows Road (SR 152) to JTB (SR 202). FPID 432259-2. The Balmoral Group. 2021.

Appendix A
Figures

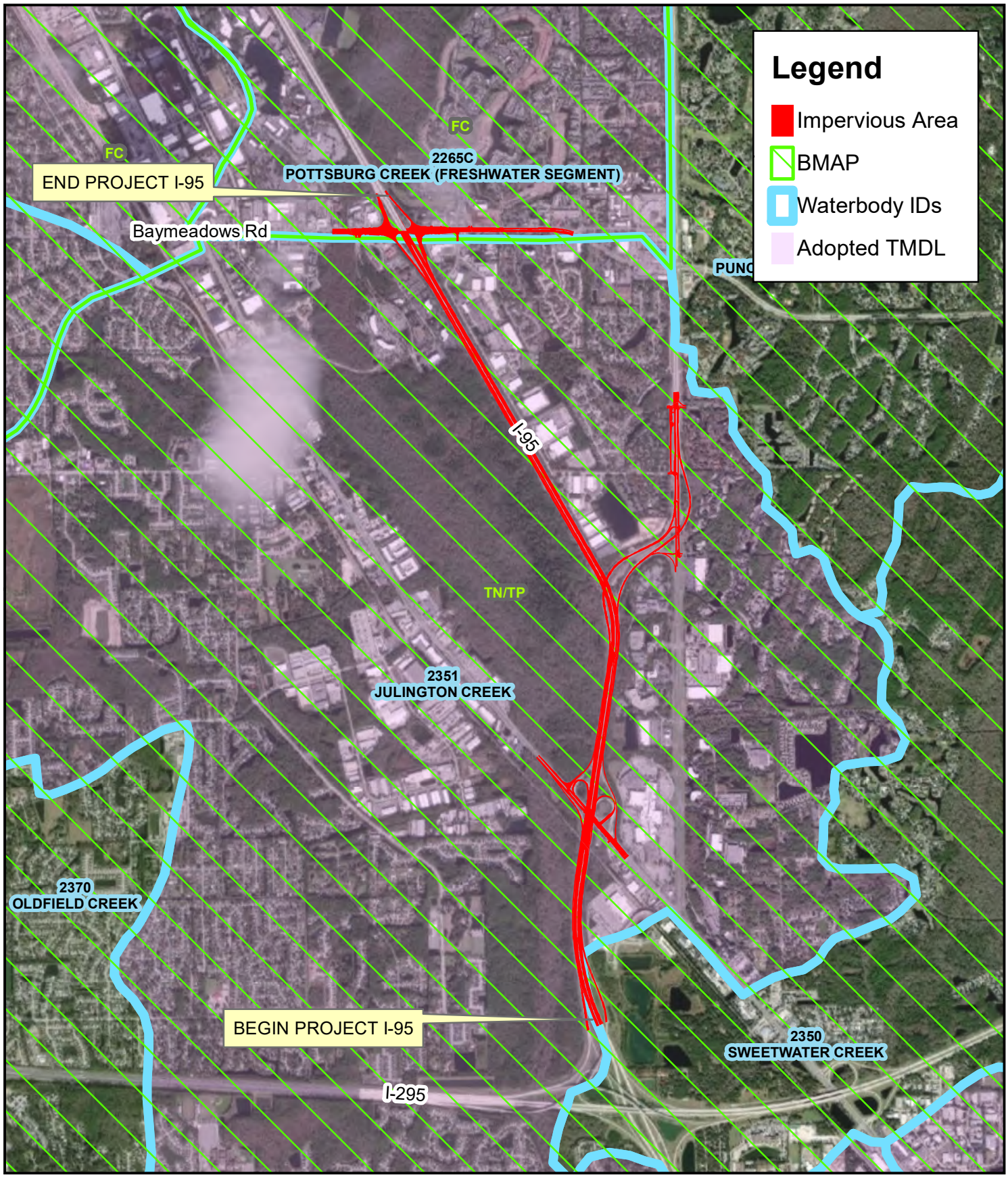

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Figure 1
Project Location

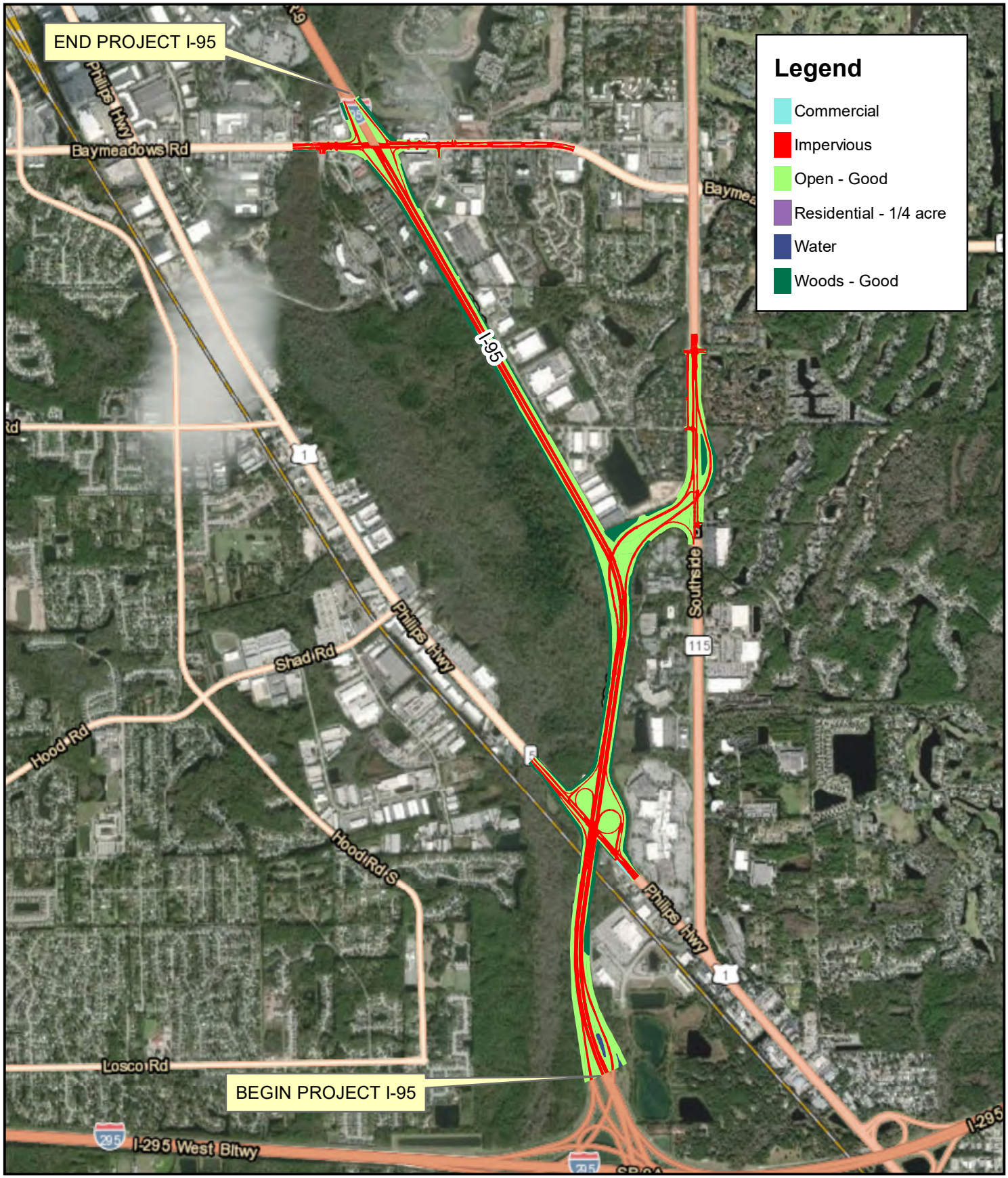
I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID No. 435577-1-22-01
Duval County, FL

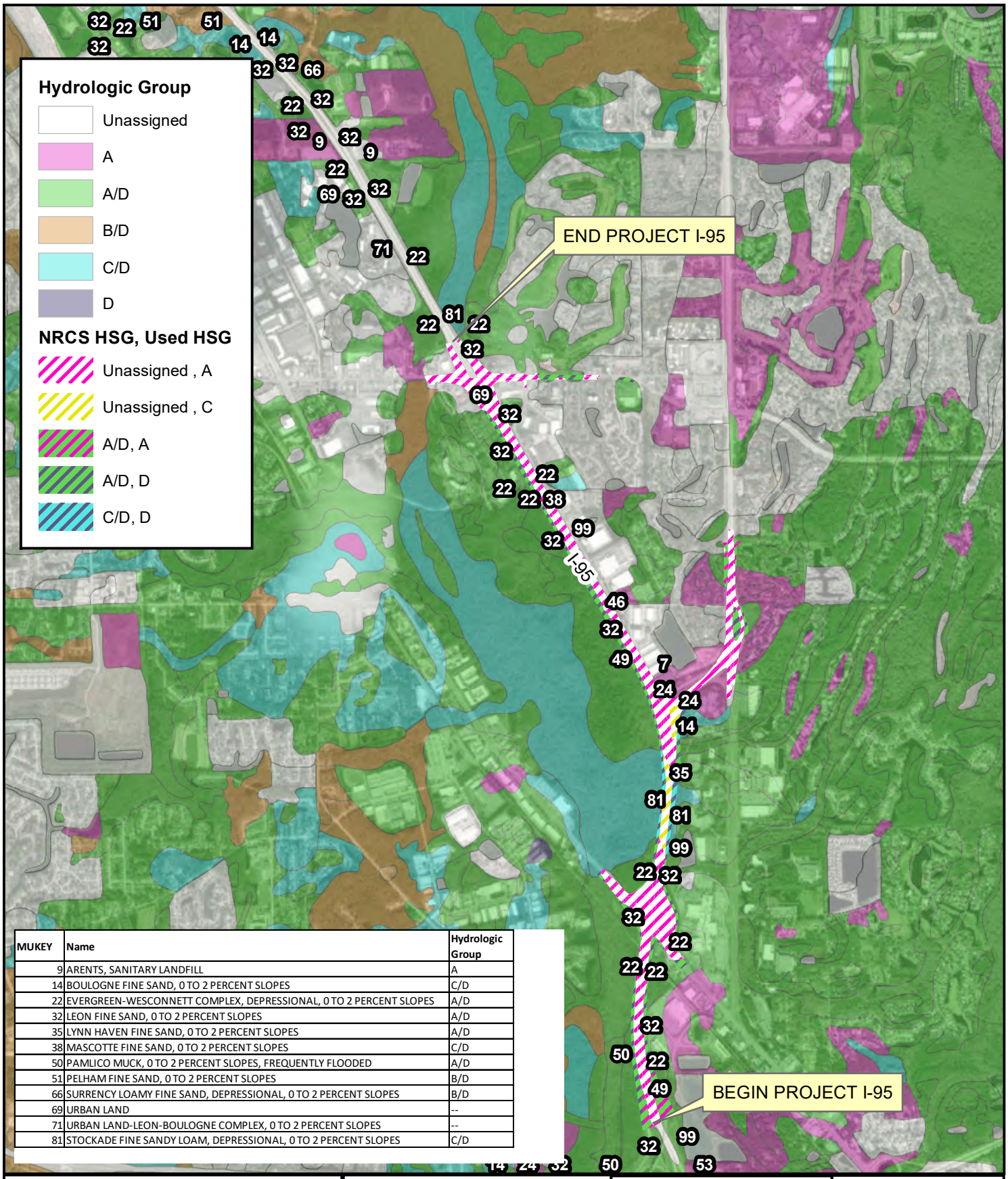
FDOT

N
W E
S

0 0.25 0.5
Miles



The Balmoral Group 165 Lincoln Avenue Winter Park, FL 32789 Phone: (407) 629-2185 www.balmoralgroup.us	Figure 2 Existing Land Use Map I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152) FPID No. 435577-1-22-01 Duval County, FL	FDOT	N W E S 0 0.2 0.4 Miles Appendix A, Page 2 of 14



MUKEY	Name	Hydrologic Group
9	ARENTS, SANITARY LANDFILL	A
14	BOULOGNE FINE SAND, 0 TO 2 PERCENT SLOPES	C/D
22	EVERGREEN-WESCONNETT COMPLEX, DEPRESSIONAL, 0 TO 2 PERCENT SLOPES	A/D
32	LEON FINE SAND, 0 TO 2 PERCENT SLOPES	A/D
35	LYNN HAVEN FINE SAND, 0 TO 2 PERCENT SLOPES	A/D
38	MASCOTTE FINE SAND, 0 TO 2 PERCENT SLOPES	C/D
50	PAMLICO MUCK, 0 TO 2 PERCENT SLOPES, FREQUENTLY FLOODED	A/D
51	PELHAM FINE SAND, 0 TO 2 PERCENT SLOPES	B/D
66	SURRENCY LOAMY FINE SAND, DEPRESSIONAL, 0 TO 2 PERCENT SLOPES	B/D
69	URBAN LAND	--
71	URBAN LAND-LEON-BOULOGNE COMPLEX, 0 TO 2 PERCENT SLOPES	--
81	STOCKADE FINE SANDY LOAM, DEPRESSIONAL, 0 TO 2 PERCENT SLOPES	C/D

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Figure 3
NRCS Soils Map
I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID No. 435577-1-22-01
Duval County, FL

0 0.25 0.5 Miles

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Figure 4
FEMA Floodplains

I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID No. 435577-1-22-01
Duval County, FL

FDOT

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0 1,250 2,500
Feet

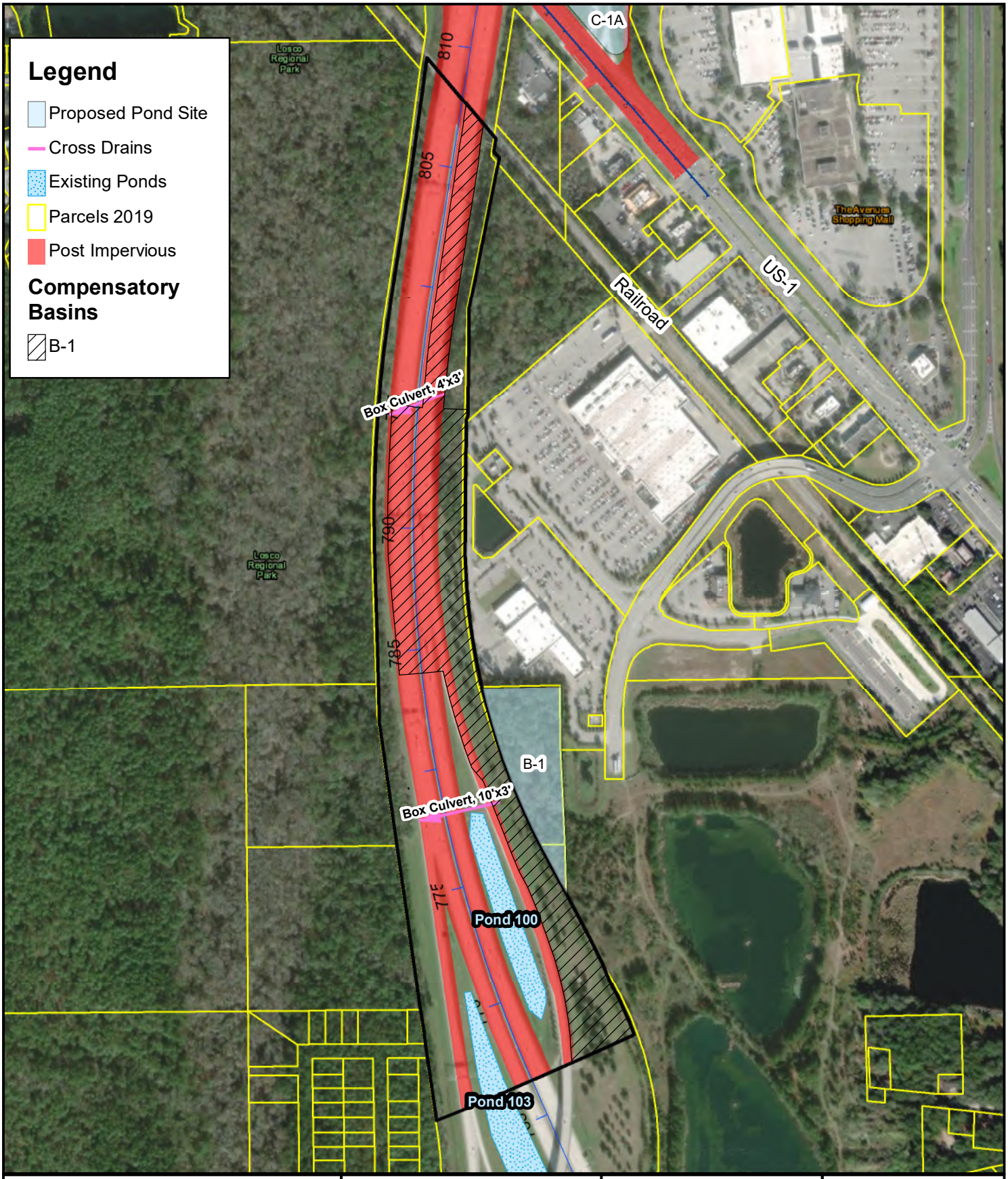

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Figure 5
Basin B Pond Sites

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
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0 0.045 0.09
Miles

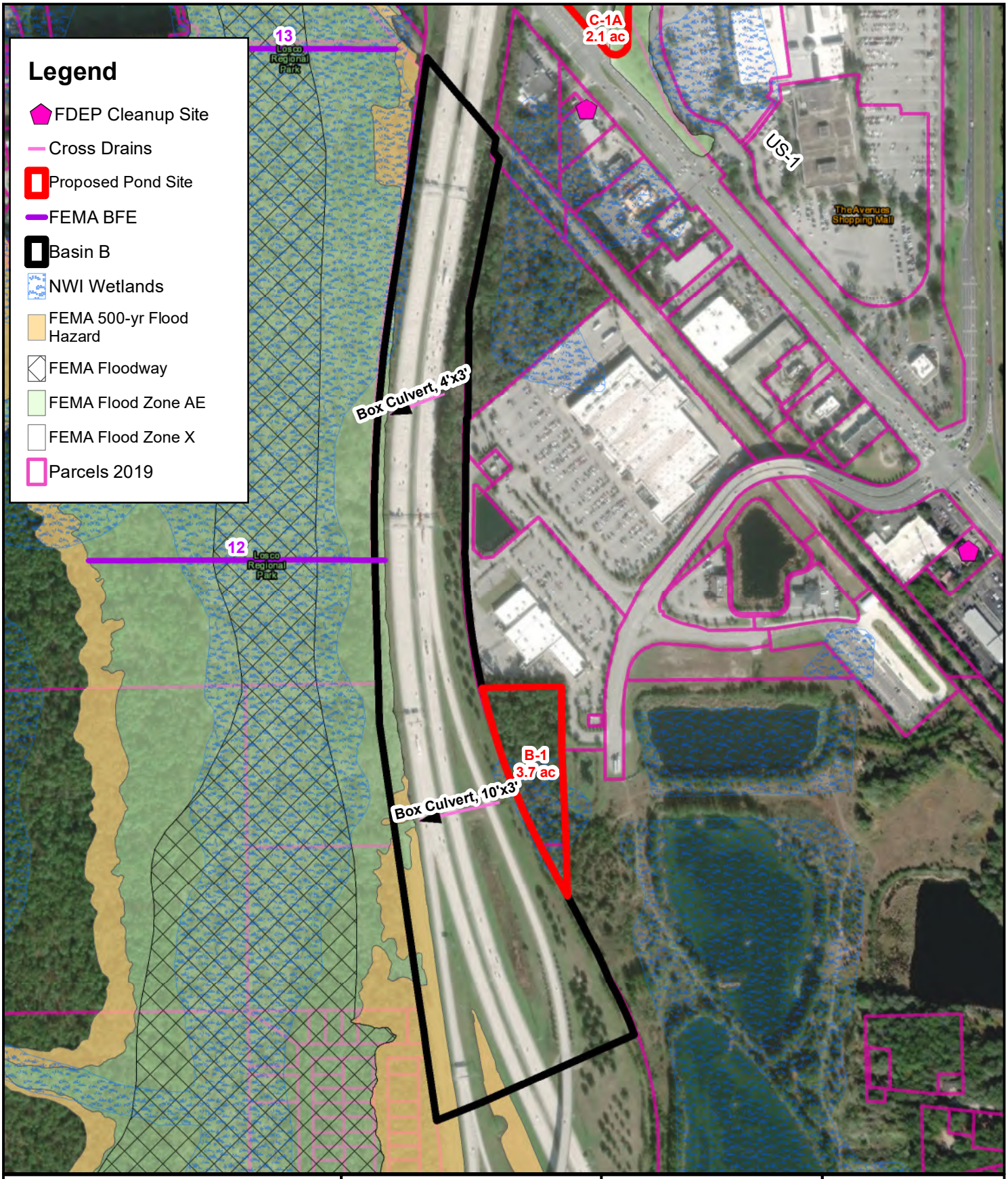

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Figure 6
Basin B Pond Sites - Evaluation

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.045 0.09
Miles

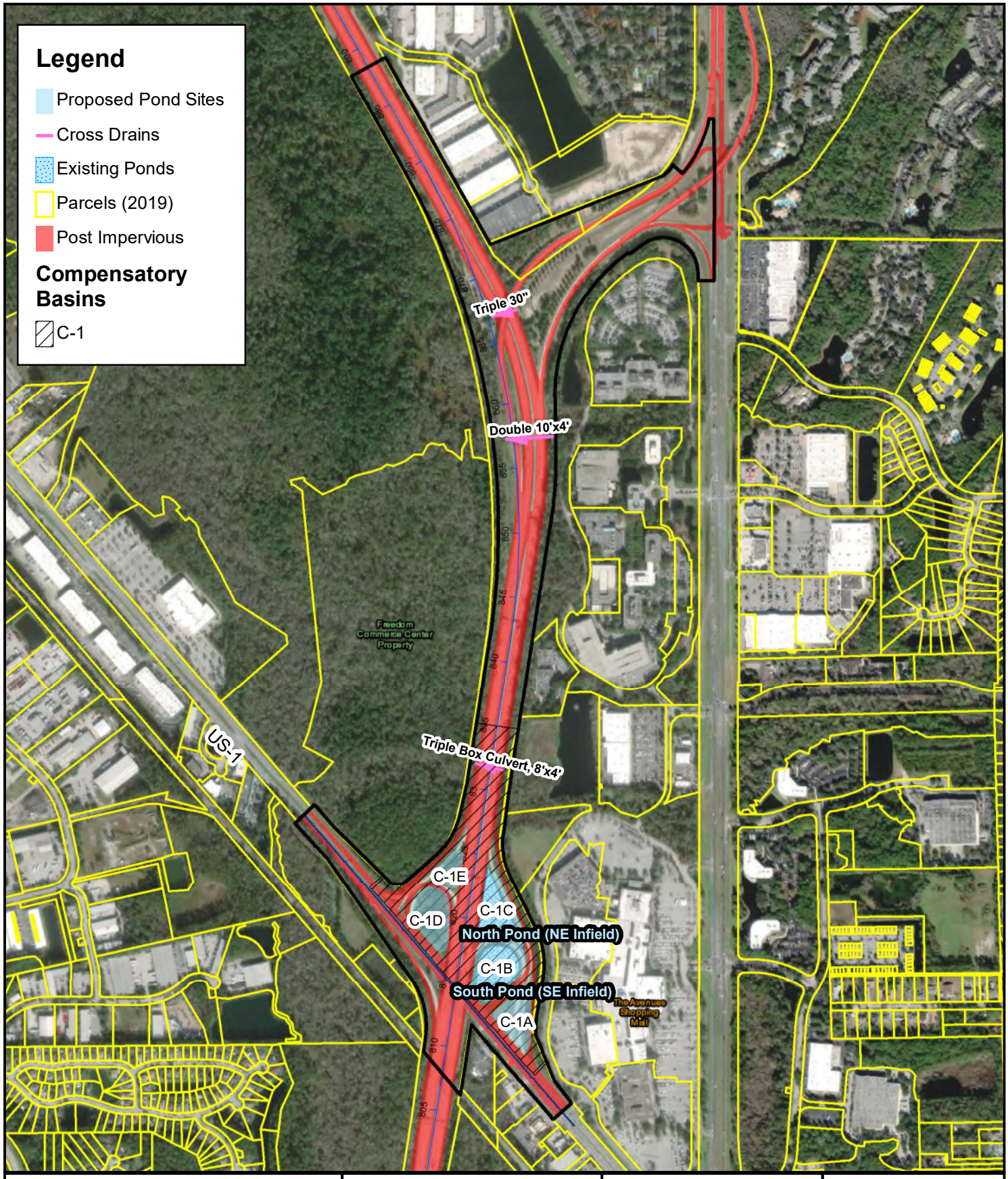

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Figure 7
Basin C Pond Sites

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

0 0.075 0.15
Miles

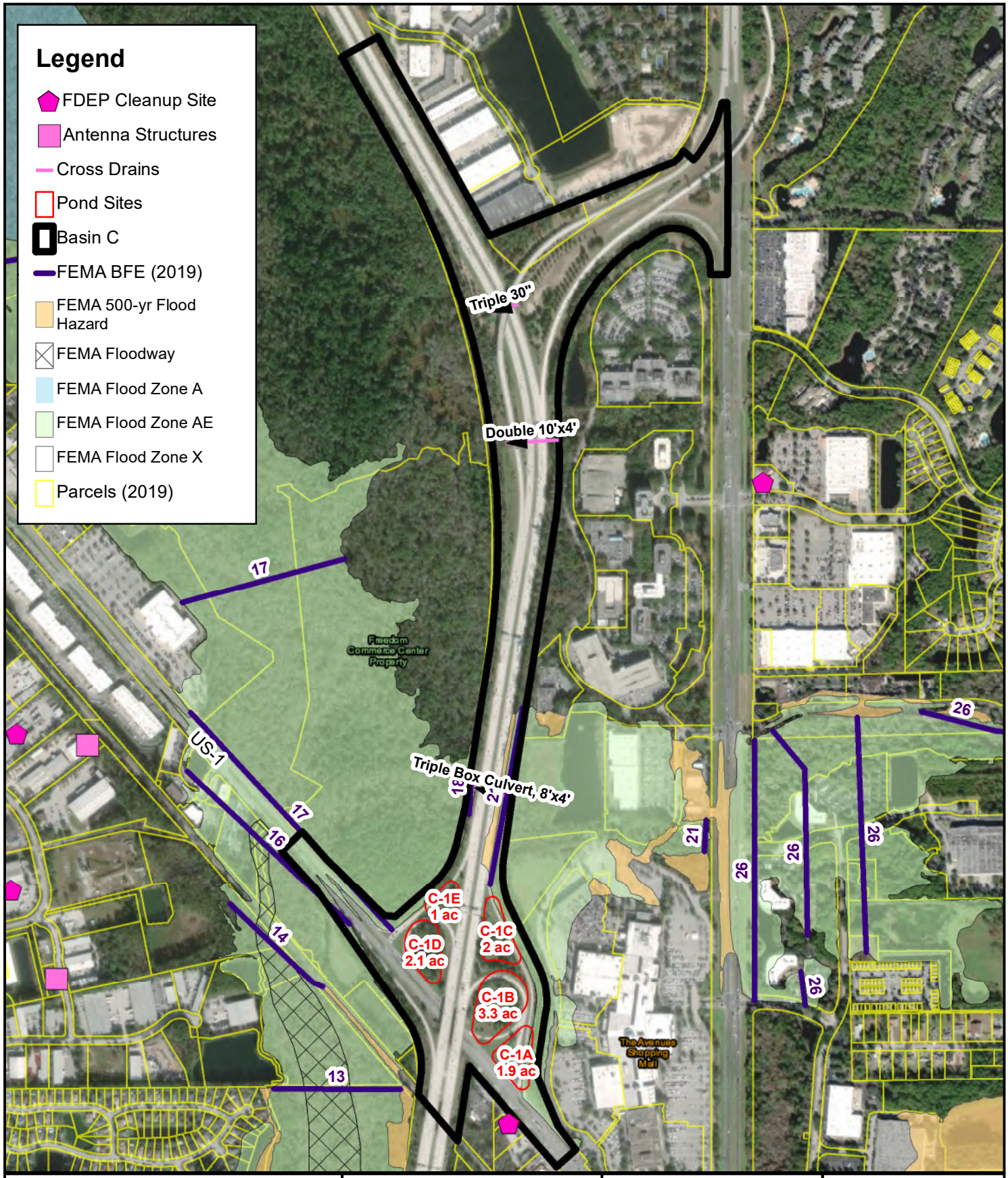

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Figure 8
Basin C Pond Sites - Evaluation

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.075 0.15
Miles

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Figure 9
Basin D Pond Sites

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)

FPID: 435577-1-22-01
Duval County, FL

FDOT

0 0.03 0.06
Miles

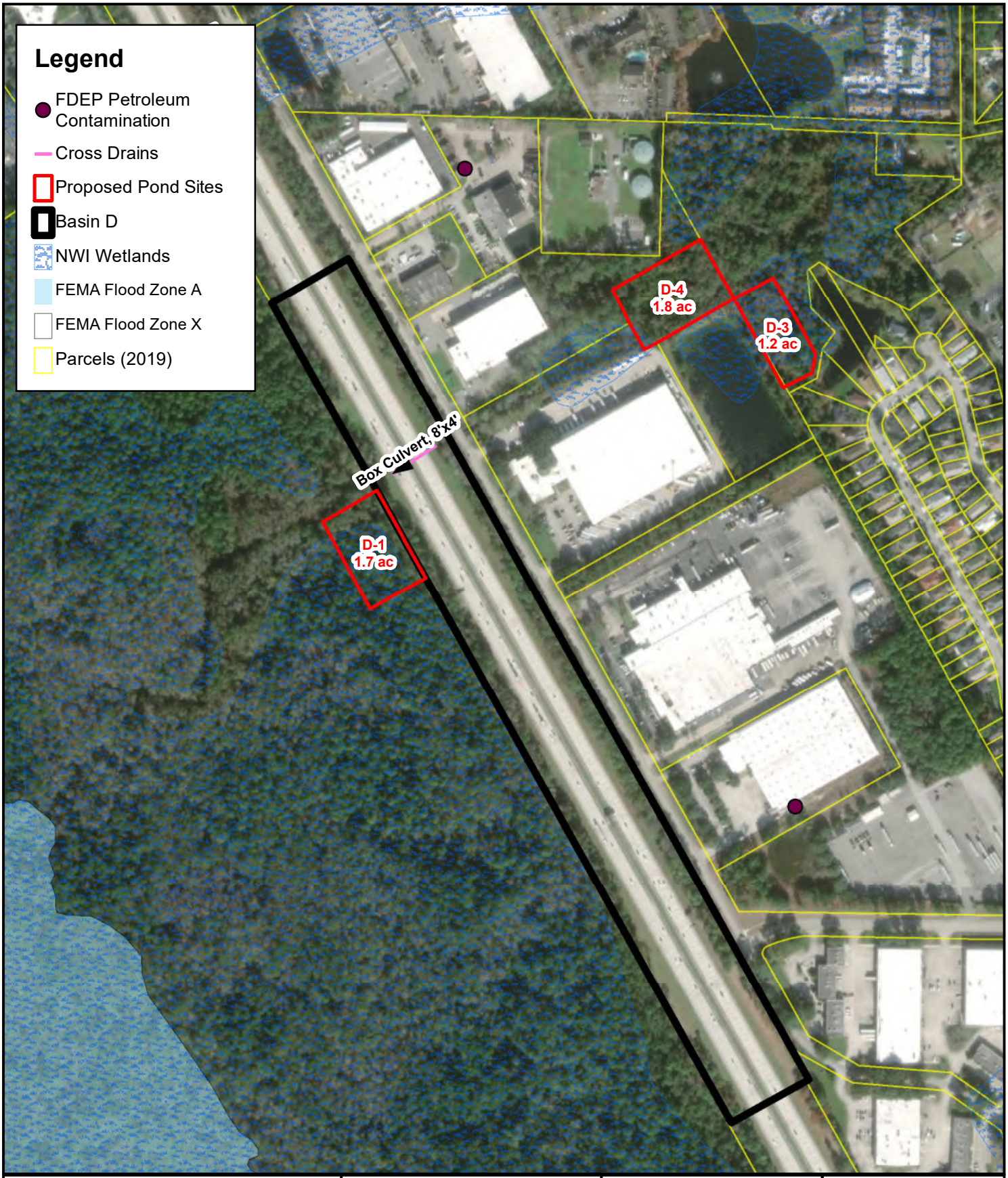

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Figure 10
Basin D Pond Sites - Evaluation

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
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0 0.0375 0.075
Miles

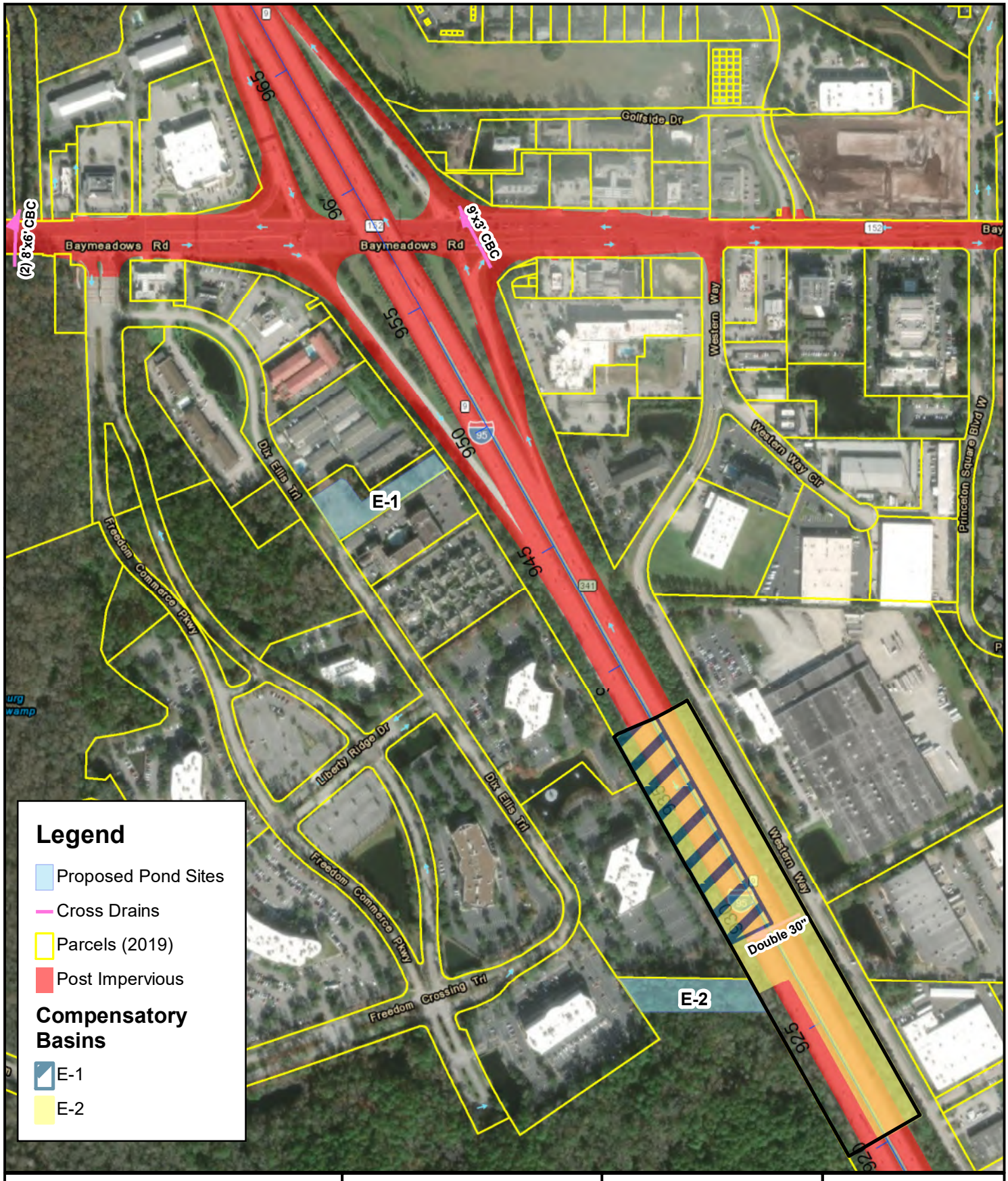

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Figure 11
Basin E Pond Sites

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

0 0.04 0.08
Miles

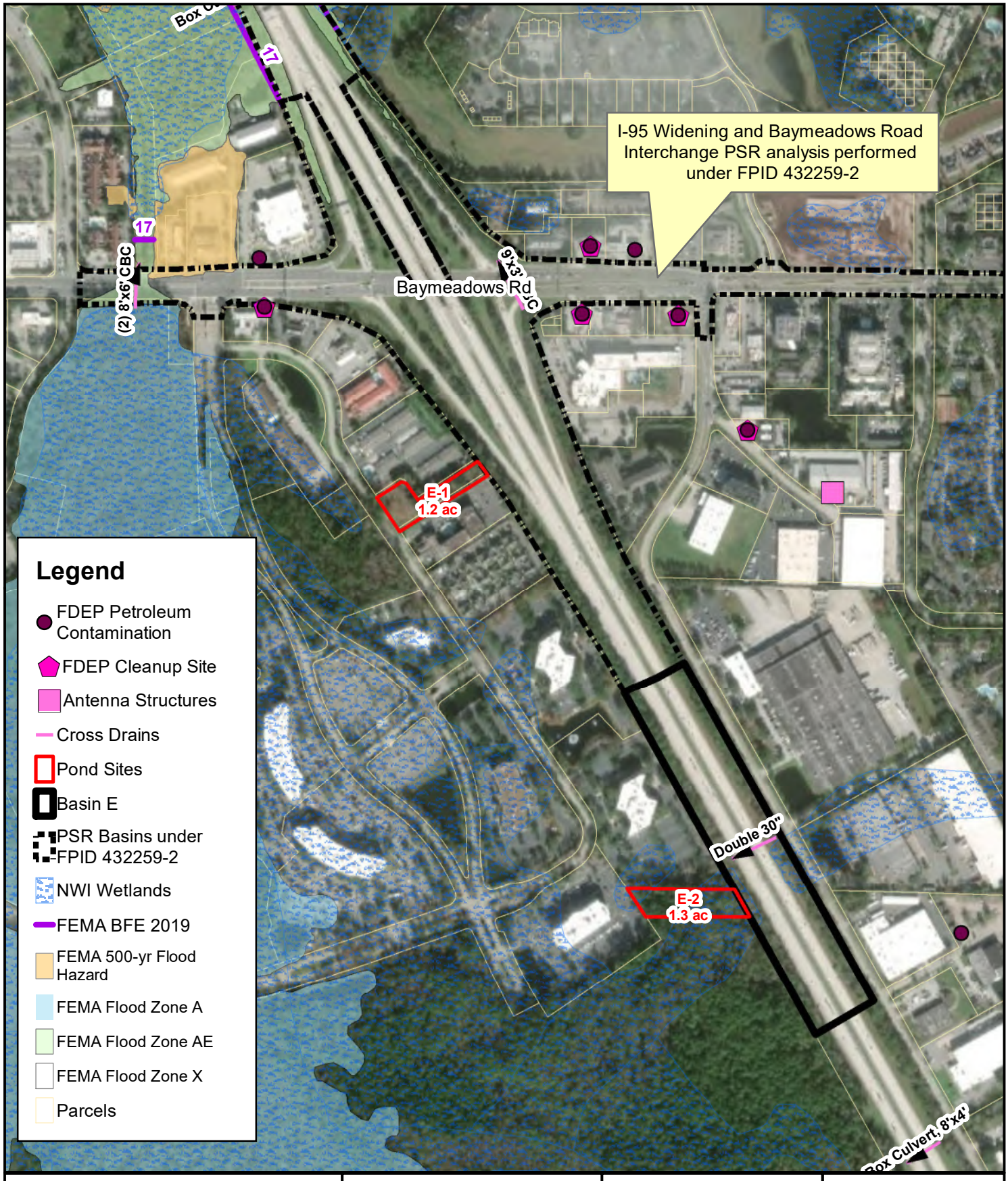

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Figure 12
Basin E Pond Sites - Evaluation

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
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0 0.05 0.1
Miles

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Figure 13
Basin D-E Pond Sites

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)

FPID: 435577-1-22-01
Duval County, FL

0 0.045 0.09
Miles

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Figure 14
Basin D-E Pond Site - Evaluation

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
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0 0.045 0.09
Miles

Appendix B
Pond Calculations

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID: 435577-1-22-01
County: Duval

Pond Options Evaluation Matrix

Pond Site	Proposed Parcel Take (ac)	Wetland Impacts	Estimated Required Mitigation Credits	Wildlife Habitat Impacts	Contamination Risk	Floodplain Impact	Impact to Historical or Archaeological Resources	Pond Construction Cost	Pond R/W Costs	Mitigation Costs	Total Pond Cost	Recommended Rank
B-1	N/A	1.61	1.29	Low	Low	None	Low	$1,365,700	$0	$212,850	$1,578,550	X
C-1	N/A	0.00	0.00	Low	Low	None	Low	$2,102,900	$0	$0	$2,102,900	X
D-1	1.70	0.88	1.41	Low	Low	None	Low	$675,600	$68,723	$232,650	$976,973	
D-3	1.20	0.98	1.57	Low	Low	None	Low	$687,500	$60,914	$259,050	$1,007,464	
D-4	1.80	0.05	0.04	Low	Medium	None	Low	$718,500	$931,602	$6,600	$1,656,702	
E-1	1.15	0.00	0.00	Low	Low	None	Low	$565,700	$557,186	$0	$1,122,886	
E-2	1.30	0.83	1.33	Low	Low	None	Low	$292,200	$44,156	$219,450	$555,806	
D-E	2.40	1.69	2.70	Low	Low	None	Low	$939,000	$81,518	$445,500	$1,466,018	X

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID: 435577-1-22-01
County: Duval

Table 1 - Basin B Pond Sites

	B-1
Basin Type	Open
Receiving Water Body	Julington Creek
Parcel ID(s)	156448-0100, 156449-0100
Total Size of Parcel(s) (ac)	3.70
Proposed Parcel Take (ac)	N/A
Wetland Impacts	1.61 acres Pond Site NRE Memorandum (2019)
Located in Conservation Easement	No
Estimated Required Mitigation Credits	1.29 credits
Wildlife Habitat Impacts	Low Pond Site NRE Memorandum (2019)
Contamination Risk	Low
Floodplain Impact	None
Impact to Historical or Archaeological Resources	Low
Pond Construction Cost	$1,365,700
Pond R/W Costs	$0
Mitigation Costs	$212,850
Total Pond Cost	**$1,578,550**
Easement Required?	No
Site Considerations	Parcels currently owned by FDOT

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID: 435577-1-22-01
County: Duval

Table 2 - Basin C Pond Sites

	C-1
Basin Type	Open
Receiving Water Body	Julington Creek
Parcel ID(s)	N/A
Total Size of Parcel(s) (ac)	N/A
Proposed Parcel Take (ac)	N/A
Wetland Impacts	0 acres Pond Site NRE Memorandum (2019)
Located in Conservation Easement	No
Estimated Required Mitigation Credits	0 credits
Wildlife Habitat Impacts	Low Pond Site NRE Memorandum (2019)
Contamination Risk	Low
Floodplain Impact	None
Impact to Historical or Archaeological Resources	Low
Pond Construction Cost	$2,102,900
Pond R/W Costs	$0
Mitigation Costs	$0
Total Pond Cost	**$2,102,900**
Easement Required?	No
Site Considerations	Infield Area of I-95 & US 1 Interchange

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID: 435577-1-22-01
County: Duval

Table 2 - Basin D and E Pond Sites

	D-1	D-3	D-4	E-1	E-2	D-E
Basin Type	Open	Open	Open	Open	Open	Open
Receiving Water Body	Julington Creek	Julington Creek	Julington Creek	Julington Creek	Julington Creek	Julington Creek
Parcel ID(s)	152690-0010	148635-1010	148634-0400	152683-0160	152690-0010	152690-0010
Total Size of Parcel(s) (ac)	588.65	11.15	8.05	1.15	588.65	588.65
Proposed Parcel Take (ac)	1.70	1.20	1.80	1.15	1.30	2.40
Wetland Impacts	0.88 acres Pond Site NRE Memorandum (2019)	0.98 acres As identified by USFWS National Wetland Inventory (2017)*	0.05 acres As identified by USFWS National Wetland Inventory (2017)*	0 acres Pond Site NRE Memorandum (2019)	0.83 acres As identified by USFWS National Wetland Inventroy (2017)*	1.69 acres As identified by USFWS National Wetland Inventroy (2017)*
Located in Conservation Easement	Yes	Yes	No	No	Yes	Yes
Estimated Required Mitigation Credits	1.41 credits	1.57 credits	0.04 credits	0 credits	1.33 credits	2.7 credits
Wildlife Habitat Impacts	Low Pond Site NRE Memorandum (2019)	Low Pond Site NRE Memorandum (2019)	Low Pond Site NRE Memorandum (2019)	Low Pond Site NRE Memorandum (2019)	Low Pond Site NRE Memorandum (2019)	Low Pond Site NRE Memorandum (2019)
Contamination Risk	Low	Low	Medium Adjacent to WWTP	Low	Low	Low
Floodplain Impact	None	None	None	None	None	None
Impact to Historical or Archaeological Resources	Low	Low	Low	Low	Low	Low
Pond Construction Cost	$675,600	$687,500	$718,500	$565,700	$292,200	$939,000
Pond R/W Costs	$68,723	$60,914	$931,602	$557,186	$44,156	$81,518
Mitigation Costs	$232,650	$259,050	$6,600	$0	$219,450	$445,500
Total Pond Cost	**$976,973**	**$1,007,464**	**$1,656,702**	**$1,122,886**	**$555,806**	**$1,466,018**
Easement Required?	No	No	No	Yes	No	No
Site Considerations			Regional Pond Option	Parcel 152683-0160 for sale as of 7-11-17 field visit.		

*The pond site has decreased in size since the Pond Site NRE was prepared. The estimated wetland impacts in the NRE exceed the pond site size, thus an estimate from the USFWS NWI was used in lieu of the NRE estimate.

Estimating ROW Adjustments:

ROW Source:	FDOT, 4/29/2019	FDOT, 4/29/2019	FDOT, 4/29/2019	FDOT, 4/29/2019	FDOT, 4/29/2019	FDOT, 4/29/2019
ROW Fixed Costs:	unknown	unknown	unknown	unknown	unknown	unknown
ROW acreage (variable) Costs:	unknown	unknown	unknown	unknown	unknown	unknown
Previous Pond Area for Costs:	3.4	2.46	4.43	1.15	4.81	4.81
Total ROW Costs:	$137,445	$124,873	$2,292,776	$557,186	$163,375	$163,375
Equ. ROW per ac Costs:	$40,425	$50,761	$517,557	$484,510	$33,966	$33,966

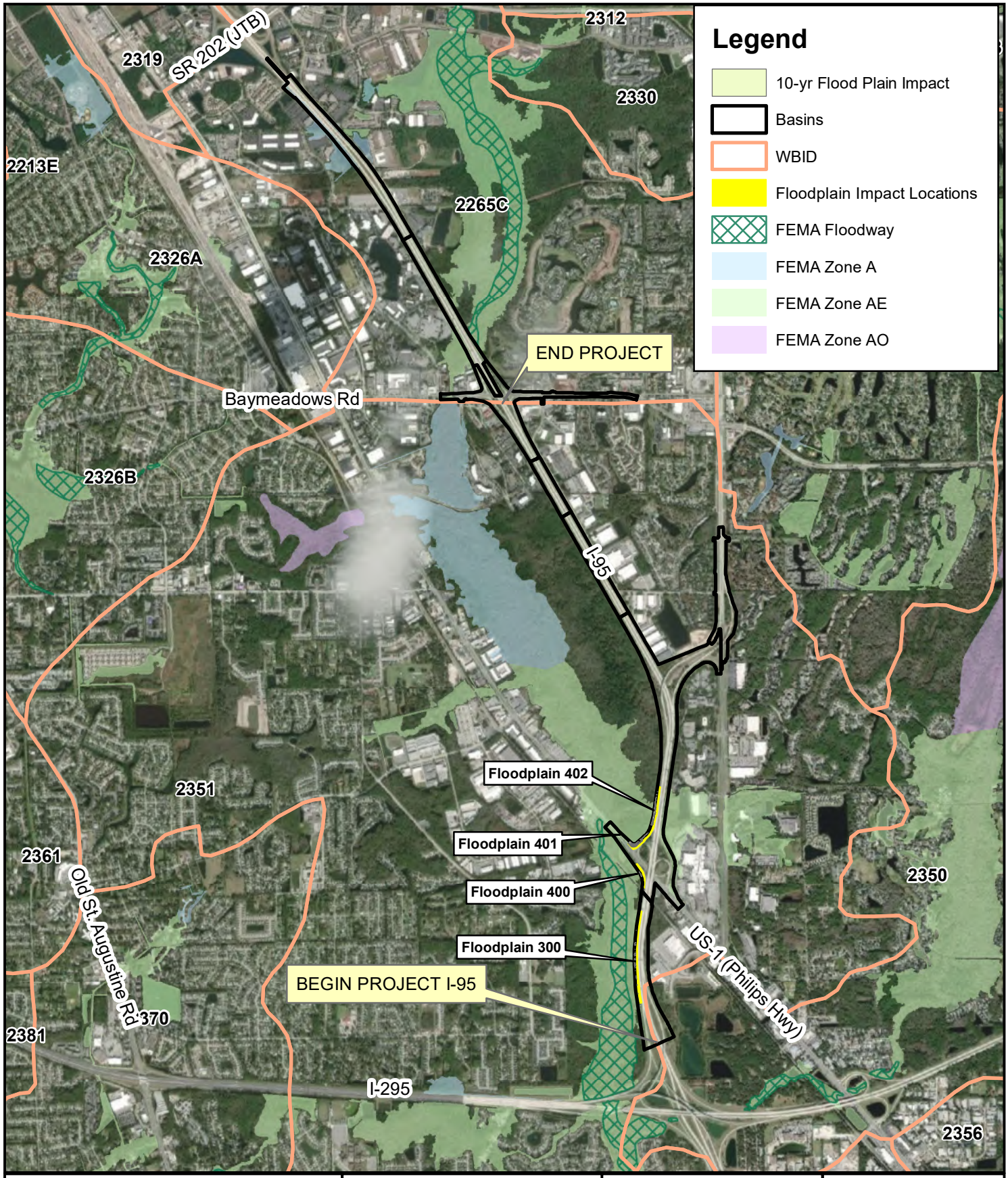

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Figure B-1
Floodplain Impact Shapes

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.3 0.6
Miles

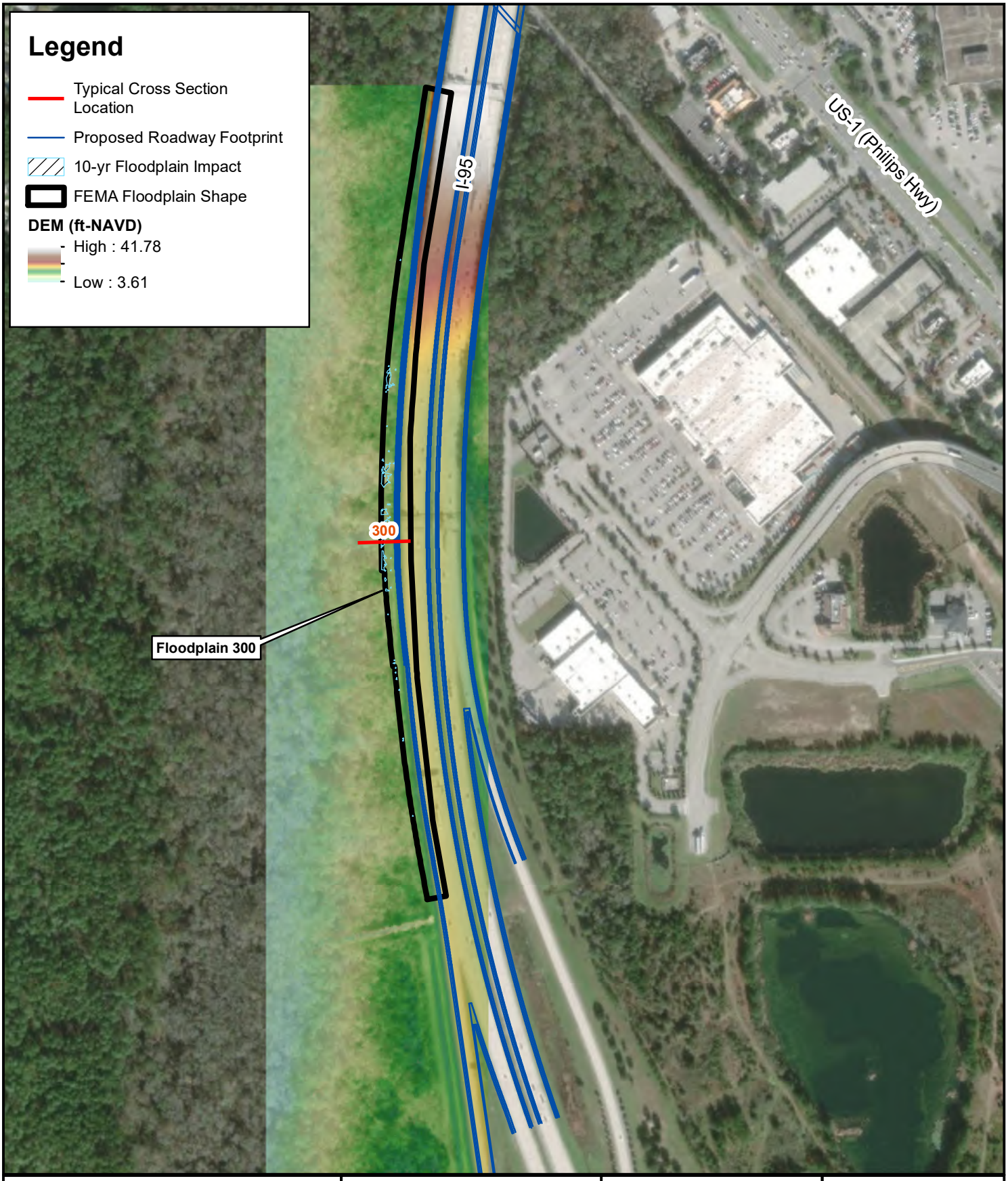

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Figure B-2
Floodplain Impacts Basin B

I-95 (SR 9) Express Lanes
From I-295 to
J. Turner Butler Blvd (SR 202)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S
0 200 400
Feet

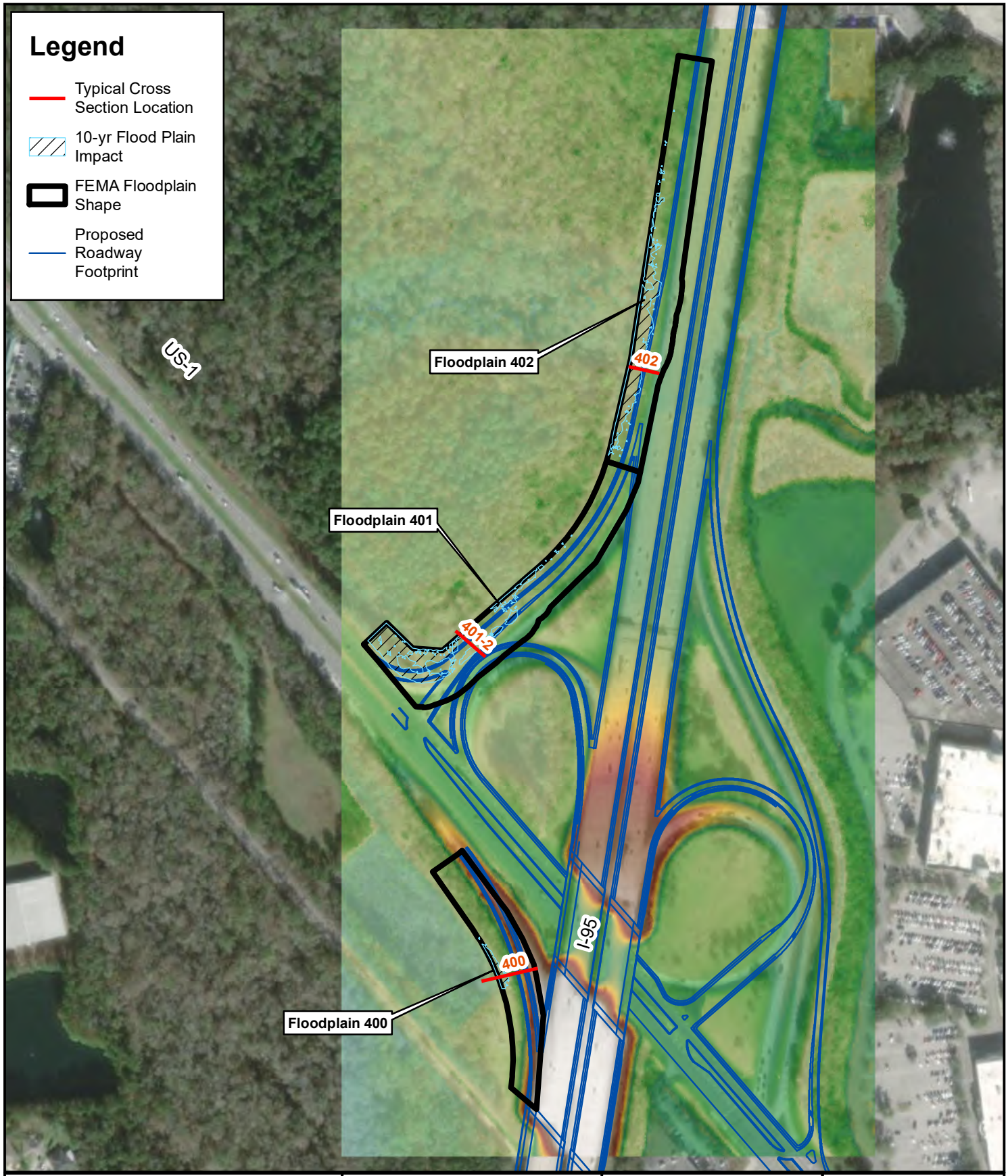

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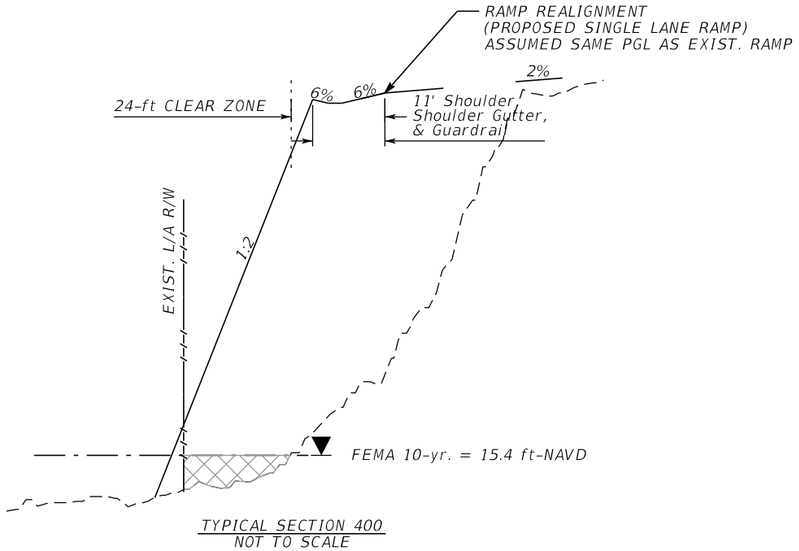
Figure B-3
Floodplain Impacts Basin C

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

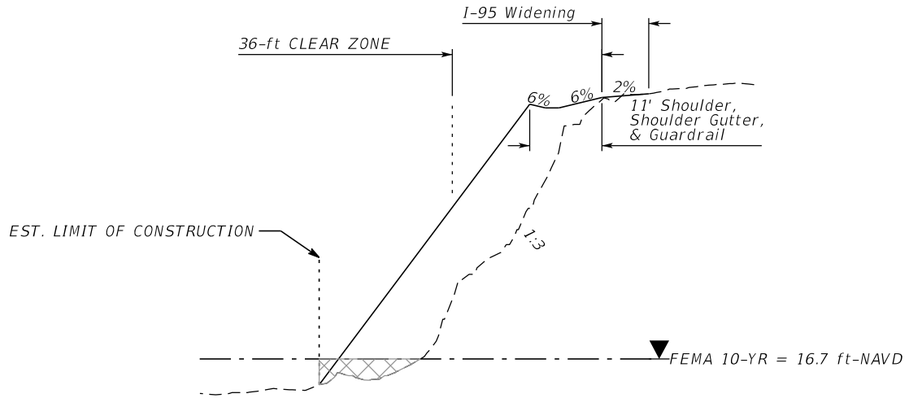
FDOT

N
W E
S

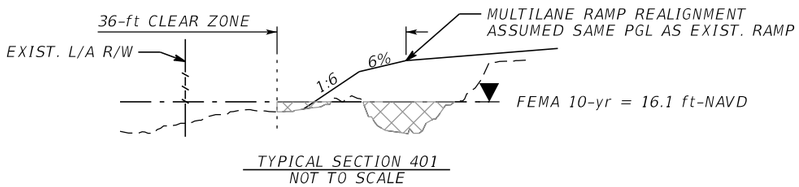
0 170 340
Feet



TYPICAL SECTION 400
NOT TO SCALE



TYPICAL SECTION
FLOODPLAIN 300



TYPICAL SECTION 401
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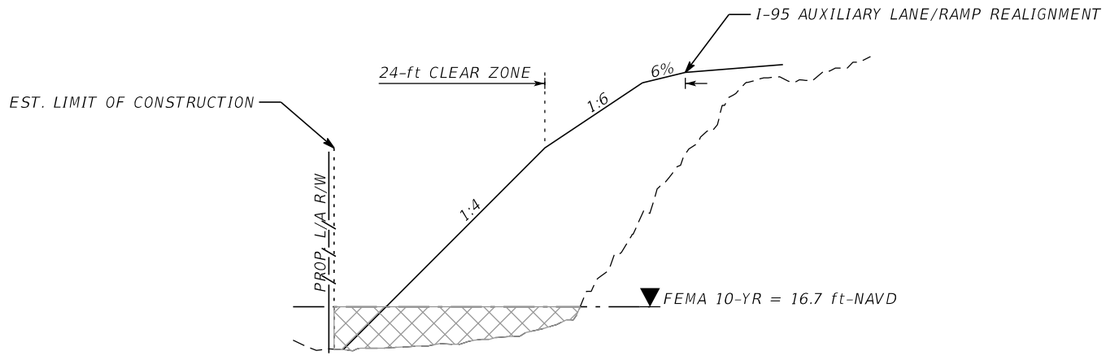

TYPICAL SECTION
FLOODPLAIN 402

FEMA FLOODPLAIN IMPACT EXTENTS

BASIN B AND C FLOODPLAIN IMPACTS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	DUVAL	435577-1-22-01

FLOODPLAIN IMPACT
TYPICAL SECTIONS

SHEET NO.

ALowe 2/19/2021 3:22:32 PM T:\00125.00\435577-1-22-01\drainage\Working\FP_Typicals.dgn

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Figure B-5
Landuse and Soil Type Basin B

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.045 0.09
Miles

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Figure B-6
Landuse and Soil Type Basin C

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.075 0.15
Miles

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Figure B-7
Landuse and Soil Type Basin D

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.05 0.1
Miles

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Figure B-8
Landuse and Soil Type Basin E

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.035 0.07
Miles

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Figure B-9
Existing Ponds

I-95 (SR 9) Express Lanes
From I-295 to
J. Turner Butler Blvd (SR 202)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S
0 0.25 0.5
Miles

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Figure B-10
Basin B Existing Pond Sites

I-95 (SR 9) Widening
From I-295 to
Baymeadows Road (SR 152)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.045 0.09
Miles

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)

FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/8/2021

County: Duval **Reviewer:** JN **Checked:** 3/8/2021

Roadway Contributing Basin Summary

Basin	Location		Total Impervious Area (Existing)	Basin Area	Total Impervious Area[(1)] (Proposed)	Basin Area	Net Impervious Area
	Begin	End	(ac)	(ac)	(ac)	(ac)	(ac)
B (PRE)	766+50	807+80	17.49	44.43	22.12	44.43	**4.63**
B-1 CD (POST)			--	--	14.27	28.31	-3.22
B-1 Pond (POST)			--	--	7.85	16.12	--
C (PRE)	807+80	888+30	43.41	123.36	55.41	123.36	**12.00**
C-1 CD (POST)			--	--	40.61	89.06	-2.80
C-1 Infield Ponds (POST)			--	--	14.80	34.30	--
D (PRE)	888+30	920+20	8.79	21.95	12.64	21.95	**3.85**
D-1 CD (POST)			--	--	6.88	11.67	-1.91
D-1 Pond (POST)			--	--	5.76	10.28	--
D-3 CD (POST)			--	--	6.88	11.67	-1.91
D-3 Pond (POST)			--	--	5.76	10.28	--
D-4 CD (POST)			--	--	6.88	11.67	-1.91
D-4 Pond (POST)			--	--	5.76	10.28	--
E (PRE)	920+20	937+70	5.25	12.04	6.93	12.04	**1.68**
E-1 CD (POST)			--	--	5.05	8.66	-0.20
E-1 Pond (POST)			--	--	1.88	3.38	--
E-2 CD (POST)			--	--	1.42	2.04	-3.83
E-2 Pond (POST)			--	--	5.51	10.00	--
D-E (PRE)	888+30	937+70	14.04	33.99	19.57	33.99	**5.53**
D-E CD (POST)			--	--	9.49	15.90	-4.55
D-E Pond (POST)			--	--	10.08	18.09	--
Southside	--	--	11.91	29.64	12.78	29.64	**0.87**

(1) Includes an additional 5% Impervious to accommodate future design refinement elements (e.g. shoulder gutter)

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Required Treatment Volume Summary

Roadway Basin	Existing Impervious Area (ac)	Proposed Impervious Area (ac)	Net New Impervious (ac)	Required Treatment Volume[(1)] (ac-ft)
B	17.49	22.12	4.63	0.96
C	43.41	55.41	12.00	2.50
D	8.79	12.64	3.85	0.80
E	5.25	6.93	1.68	0.35
Southside	11.91	12.78	0.87	0.18

[(1)] Required Treatment Volume is 2.5-inches over the Net New Impervious Area

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Curve Number Calculations: Roadway Basin and Pond Option

Basin	Land Use	Hydrologic Group	Curve Number	Area (acres)
B-1 Pre	Impervious	--	98	17.49
	Open - Good	A	39	14.30
	Open - Good	D	80	8.30
	Woods - Good	A	30	0.81
	Woods - Good	D	77	2.48
	Water	--	100	1.05
	Pond Area -Woods	D	77	3.70
		Weighted CN/Total Area	**73.6**	**48.13**
B-1 Post	Impervious	--	98	22.12
	Open - Good	A	39	10.95
	Open - Good	D	80	7.18
	Woods - Good	A	30	0.79
	Woods - Good	D	77	2.38
	Water	--	100	1.01
	Pond Area - NWL	--	100	2.08
	Pond Area - Open	D	80	1.62
		Weighted CN/Total Area	**79.3**	**48.13**
Basin	**Land Use**	**Hydrologic Group**	**Curve Number**	**Area (acres)**
C-1 Pre	Impervious	--	98	43.41
	Open - Good	A	39	44.96
	Open - Good	C	74	4.76
	Open - Good	D	80	6.28
	Woods - Good	A	30	6.03
	Woods - Good	C	70	0.39
	Woods - Good	D	77	17.11
	Commercial	A	89	0.26
	Commercial	D	95	0.16
		Weighted CN/Total Area	**68.3**	**123.36**
C-1 Post	Impervious	--	98	55.41
	Open - Good	A	39	33.70
	Open - Good	C	74	3.51
	Open - Good	D	80	3.82
	Woods - Good	A	30	5.18
	Woods - Good	C	70	0.15
	Woods - Good	D	77	15.57
	Commercial	A	89	0.25
	Commercial	D	95	0.16
	Infield NWL	--	100	5.61
		Weighted CN/Total Area	**75.2**	**123.34**

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Curve Number Calculations: Roadway Basin and Pond Option

Basin	Land Use	Hydrologic Group	Curve Number	Area (acres)
D-1 Pre	Impervious	--	98	8.79
	Open - Good	A	39	5.86
	Open - Good	D	80	1.42
	Woods - Good	A	30	1.66
	Woods - Good	D	77	4.21
	Pond Area -Woods	D	77	1.70
	Weighted CN/Total Area		**72.3**	**23.65**
D-1 Post	Impervious	--	98	12.64
	Open - Good	A	39	4.16
	Open - Good	D	80	0.79
	Woods - Good	A	30	1.02
	Woods - Good	D	77	3.34
	Pond NWL	--	100	0.50
	Pond Open	D	80	1.20
	Weighted CN/Total Area		**80.3**	**23.65**
Basin	**Land Use**	**Hydrologic Group**	**Curve Number**	**Area (acres)**
D-3 Pre	Impervious	--	98	8.79
	Open - Good	A	39	5.86
	Open - Good	D	80	1.42
	Woods - Good	A	30	1.66
	Woods - Good	D	77	4.21
	Pond Area -Woods	D	77	1.20
	Weighted CN/Total Area		**72.2**	**23.15**
D-3 Post	Impervious	--	98	12.64
	Open - Good	A	39	4.16
	Open - Good	D	80	0.79
	Woods - Good	A	30	1.02
	Woods - Good	D	77	3.34
	Pond NWL	--	100	0.80
	Pond Open	D	80	0.40
	Weighted CN/Total Area		**80.5**	**23.15**
Basin	**Land Use**	**Hydrologic Group**	**Curve Number**	**Area (acres)**
D-4 Pre	Impervious	--	98	8.79
	Open - Good	A	39	5.86
	Open - Good	D	80	1.42
	Woods - Good	A	30	1.66
	Woods - Good	D	77	4.21
	Pond Area -Woods	D	77	1.80
	Weighted CN/Total Area		**72.3**	**23.75**
D-4 Post	Impervious	--	98	12.64
	Open - Good	A	39	4.16
	Open - Good	D	80	0.79
	Woods - Good	A	30	1.02
	Woods - Good	D	77	3.34
	Pond NWL	--	100	0.70
	Pond Open	D	80	1.10
	Weighted CN/Total Area		**80.4**	**23.75**

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Curve Number Calculations: Roadway Basin and Pond Option

Basin	Land Use	Hydrologic Group	Curve Number	Area (acres)
E-1 Pre	Impervious	--	98	5.25
	Open - Good	A	39	2.95
	Open - Good	D	80	0.04
	Woods - Good	A	30	1.04
	Woods - Good	D	77	2.77
	Pond Area -Woods	D	77	1.20
	Weighted CN/Total Area		**73.2**	**13.24**
E-1 Post	Impervious	--	98	6.93
	Open - Good	A	39	1.92
	Open - Good	D	80	0.57
	Woods - Good	A	30	0.93
	Woods - Good	D	77	1.69
	Pond NWL	--	100	0.50
	Pond Open	D	80	0.70
	Weighted CN/Total Area		**80.3**	**13.24**
Basin	**Land Use**	**Hydrologic Group**	**Curve Number**	**Area (acres)**
E-2 Pre	Impervious	--	98	5.25
	Open - Good	A	39	2.95
	Open - Good	D	80	0.04
	Woods - Good	A	30	1.04
	Woods - Good	D	77	2.77
	Pond Area -Woods	D	77	1.30
	Weighted CN/Total Area		**73.2**	**13.34**
E-2 Post	Impervious	--	98	6.93
	Open - Good	A	39	1.92
	Open - Good	D	80	0.57
	Woods - Good	A	30	0.93
	Woods - Good	D	77	1.69
	Pond NWL	--	100	0.50
	Pond Open	D	80	0.80
	Weighted CN/Total Area		**80.3**	**13.34**

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Curve Number Calculations: Roadway Basin and Pond Option

Basin	Land Use	Hydrologic Group	Curve Number	Area (acres)
D-E Pre	Impervious	--	98	14.04
	Open - Good	A	39	8.81
	Open - Good	D	80	1.46
	Woods - Good	A	30	2.70
	Woods - Good	D	77	6.98
	Pond Area -Woods	D	77	2.40
	Weighted CN/Total Area		**72.5**	**36.39**
D-E Post	Impervious	--	98	19.57
	Open - Good	A	39	6.09
	Open - Good	D	80	1.36
	Woods - Good	A	30	1.94
	Woods - Good	D	77	5.03
	Pond NWL	--	100	1.40
	Pond Open	D	80	1.00
	Weighted CN/Total Area		**80.5**	**36.39**
Basin	**Land Use**	**Hydrologic Group**	**Curve Number**	**Area (acres)**
Southside Pre	Impervious	--	98	11.91
	Open - Good	A	39	12.41
	Open - Good	D	80	1.88
	Woods - Good	A	30	1.33
	Woods - Good	D	77	2.12
	Pond Area -Woods	D	77	0.00
	Weighted CN/Total Area		**67.6**	**29.64**
Southside Post	Impervious	--	98	12.78
	Open - Good	A	39	11.72
	Open - Good	D	80	1.82
	Woods - Good	A	30	1.28
	Woods - Good	D	77	2.05
	Pond NWL	--	100	0.00
	Pond Open	D	80	0.00
	Weighted CN/Total Area		**69.2**	**29.64**

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01
County: Duval

Performed by: ALE
Checked by: JAN
Date: 3/4/2021

Rainfall (25yr/24hr, in) **9.3**

Attenuation Volume Summary for Required Sizing

		Existing			Proposed			Results
Pond Option	**Roadway and Pond Area (ac)**	**Weighted CN**	**Runoff (in)**	**Runoff (ac-ft)**	**Weighted CN**	**Runoff (in)**	**Runoff (ac-ft)**	**Required Attenuation Volume (ac-ft)**
B-1	48.13	73.6	6.05	24.28	79.3	6.77	27.14	2.86
C-1	123.36	68.3	5.39	55.36	75.2	6.25	64.28	8.92
D-1	23.65	72.3	5.89	11.61	80.3	6.89	13.58	1.97
D-3	23.15	72.2	5.88	11.34	80.5	6.92	13.34	2.00
D-4	23.75	72.3	5.89	11.65	80.4	6.90	13.66	2.01
E-1	13.24	73.2	6.00	6.63	80.3	6.89	7.60	0.97
E-2	13.34	73.2	6.00	6.68	80.3	6.89	7.66	0.98
D-E	36.39	72.5	5.91	17.94	80.5	6.92	20.97	3.03
Southside	29.64	67.6	5.30	13.09	69.2	5.50	13.59	0.50

Project: I-95 (SR 9) Express Lanes from I-295 to JTB (SR 202)
FPID: 435577-1-22-01
County: Duval

Performed by: ALE
Checked by: JAN
Date: 3/4/2021

Basin B - Existing Ponds 100, 101, & 102

Basin Summary:

Pond 100 - Dry Detention, Provides Attenuation Only
Pond 101 & 102 - Wet Detention, Provides Treatment & Attenuation

Pond 100: Partial Impacts
Pond 101: Outside Project Limits
Pond 102: Outside Project Limits

Existing Permitted Data

(From Permitted Calculations, ERP 18092-2, December 1992)

Treatment Volume Considerations

		Weir Elev. ft, NGVD	Provided	Required	
EXISTING	Pond 100	N/A			(Partially Impacted)
	Pond 101	10.50	1.50 ac-ft	2.08 ac-ft	(Outside of Project Limits)
	Pond 102	10.50	1.20 ac-ft		(Outside of Project Limits)

0.00 ac-ft Additional treatment volume required to compensate loss in Pond 100

Attenuation Volume Considerations (25y-24h)

		DHW ft, NGVD	DHW ft, NAVD	Volume	
EXISTING	Pond 100	13.44	12.27	1.45 ac-ft	(Partially Impacted)
	Pond 101	12.08	10.91	3.42 ac-ft	(Outside of Project Limits)
	Pond 102	11.88	10.71	2.33 ac-ft	(Outside of Project Limits)

Pond 100 Impacted Volume:

	Stage ft, NGVD	Stage ft, NAVD	Area*	Volume
Pond Bottom	11.50	10.33	0.00 ac	0.00 ac-ft
Pond DHW	13.44	12.27	0.26 ac	0.25 ac-ft

*Estimated Impact Boundary from EOP of 36-ft (I-95 Mainline)

0.25 ac-ft Additional attenuation volume required to compensate loss in Ponds 100

Project: I-95 (SR 9) Express Lanes from I-295 to JTB (SR 202)
FPID: 435577-1-22-01
County: Duval

Performed by: ALE
Checked by: JAN
Date: 3/4/2021

Basin B - Existing Ponds 103 & 104

Basin Summary:

Pond 103 - Dry Detention, Provides Attenuation Only
Pond 104 - Wet Detention, Provides Treatment & Attenuation

Pond 103: Partial Impact
Pond 104: No Impact, Outside of Project Limits

Existing Permitted Data

(From Permitted Calculations, ERP 18092-2, December 1992)

Treatment Volume Considerations

		Weir Elev. ft, NGVD	Provided	Required	
EXISTING	Pond 103	N/A			(Partially Impacted)
	Pond 104	9.90	4.91 ac-ft	4.54 ac-ft	(Outside of Project Limits)

0.00 ac-ft Additional treatment volume required to compensate loss in Pond 103

Attenuation Volume Considerations (25y-24h)

		DHW ft, NGVD	DHW ft, NAVD	Volume	
EXISTING	Pond 103	13.10	11.93	4.96 ac-ft	(Partially Impacted)
	Pond 104	11.78	10.61	15.22 ac-ft	(Outside of Project Limits)

Pond 103 Impacted Volume:

	Stage ft, NGVD	Stage ft, NAVD	Area*	Volume
Pond Bottom	10.00	8.83	0.00 ac	0.00 ac-ft
Pond DHW	13.10	11.93	0.01 ac	0.02 ac-ft

*Estimated Impact Boundary from EOP of 45-ft (off-ramp) & 36-ft (I-95 Mainline)

0.02 ac-ft Additional attenuation volume required to compensate loss in Pond 103

Project: I-95 (SR 9) Express Lanes from I-295 to JTB (SR 202) Performed by: ALE
FPID: 435577-1-22-01 Checked by: JAN
County: Duval Date: 3/4/2021

Basin C - Existing Ponds at US 1 Interchange

Existing North Pond - Northeast Infield

(From ERP 18228-3 ICPR model, dated Feb. 1995)

Stage (ft, NGVD)	Stage (ft, NAVD)	Surface Area (ac)	Incremental Volume (ac-ft)	Available Volume (ac-ft)
22	20.83	2.18	5.23	7.20
19	17.83	1.31	1.13	1.97
18	16.83	0.95	0.85	0.85
17	15.83	0.75	--	0

Existing South Pond - Southeast infield

(From ERP 18228-3 ICPR model, dated Feb. 1995)

Stage (ft, NGVD)	Stage (ft, NAVD)	Surface Area (ac)	Incremental Volume (ac-ft)	Available Volume (ac-ft)
20	18.83	2.80	2.57	3.81
19	17.83	2.33	0.85	1.24
18.5	17.33	1.09	0.38	0.38
18	16.83	0.45	--	0

Treatment Volume Considerations

	Weir Elev. (ft, NGVD)	Weir Elev. (ft, NAVD)	Provided Volume	Required Volume	**Excess Volume**
EXISTING	16.20	15.03	0.00 ac-ft	0.00 ac-ft	**0.00 ac-ft**

These ponds were design to accommodate attenuation for I-95 & US 1 Interchange and do not provide treatment.

Attenuation Volume Considerations

	DHW Elev. (ft, NGVD)	DHW Elev. (ft, NAVD)	Provided Volume
Existing C-1	18.40 FT	17.23 FT	1.30 ac-ft
Existing C-2	18.73 FT	17.56 FT	0.78 ac-ft
		Total	**2.08 ac-ft**

Summary

Existing infield ponds are to be reconfigured with new interchange.
Permitted attenuation will be provided within the new pond configuration at the interchange.

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Project Required Volume Summary

Pond Option	Basin(s)	Attenuation Volume (ac-ft)	Required Treatment Volume (ac-ft)	Compensating Impacts to Existing Ponds (ac-ft)	Total Required Pond Volume (ac-ft)
B-1	B	2.86	0.96	0.27	4.09
C-1	C	8.92	2.50	2.08	13.50
D-1	D, Southside	2.47	0.98	0.00	3.45
D-3	D, Southside	2.50	0.98	0.00	3.48
D-4	D, Southside	2.51	0.98	0.00	3.49
E-1	E	0.97	0.35	0.00	1.32
E-2	E	0.98	0.35	0.00	1.33
D-E	D, E, Southside	3.53	1.33	0.00	4.86

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01
County: Duval

Performed by: ALE
Checked by: JAN
Date: 2/17/2021

Floodplain Impact Compensation Analysis

Pre-Application Meeting (Dec. 2018): Cup for Cup compensation of 10-yr for impacts to FEMA floodplains downstream of a 5 square mile basin.
10-year Stages from City of Jacksonville Master Stormwater Management Plan (Update 2013) by CDM Smith
Calculations between Existing Ground DEM to 10-yr Peak Stage using GIS Cut-Fill tool

Floodplain Impacts

Limit of Construction Estimated Impacts, Fill Volume Only (Volume<0)

Basin	FP_ID	10YR Elev.	Volume (cf)	Volume (ac-ft)	
B	300	10.6	871	0.020	*Recommend to provide ditch grading for FPC along roadway*
C	400	15.4	1,742	0.040	*Floodplain Compensation provided in C-1E*
C	401	16.1	11,108	0.255	*Floodplain Compensation provided in C-1E*
C	402	16.7	15,769	0.362	*Floodplain Compensation provided in C-1E*

Project: I-95 (SR 9) Express Lanes from I-295 to JTB
FPID: 435577-1-22-01
County: Duval

Performed by: ALE
Checked by: JAN
Date: 3/4/2021

Off-Site SMF Pond Option Summary

Basin	Pond Option ID	Comment	Existing Low EOP from DEM (ft-NAVD)	Assumed Proposed Low EOP	Required Low EOP in Design (ft-NAVD)	Pond Opt. Est. SHWL (NWL) (ft-NAVD)	Allowable Design Depth (ft)	Total Project Required Volume (ac-ft)	Pond Area at Outside Edge of 20' Maintenance Berm (assuming 4:1 side slopes and 1-ft of freeboard) (ac)	Approximate Area Required (Additional 10% for Landscaping & Tie-In Sideslopes) (ac)	Proposed Parcel Take (ac)
B-1	Pond B-1	FDOT Property, At outfall location for Avenues Walk Master Plan	14.6	14.6	14.0	10.8	2.2	4.09	--	--	--
C-1	Infield	Infield Ponds at US 1 (Philips Hwy) & I-95	Varies for East and West Infield Areas, Refer to Detailed Infield Pond Calculations					13.50	--	--	--
D-1	Pond D-1	Within a Conservation Easement	28.2	27.7	24.8	19.8	4	3.45	1.6	1.7	1.7
D-3	Pond D-3	Expand Existing FDOT Pond & Belle Rive Subdivision Pond, Partial Take of Subdivision's Conservation Easement	28.2	27.7	25.3	19.8	4.5	3.48	1.1 *	1.2 *	1.2 *
D-4	Pond D-4	Partial Parcel Take at WWTF Effluent Discharge & Offsite Channel	28.2	27.7	24.8	19.8	4	3.49	1.6	1.7	1.8
E-1	Pond E-1	One Pond	25.4	24.9	20.5	16.5	3	1.32	0.9	1.0	1.2
E-2	Pond E-2	Within a Conservation Easement	28	27.5	24.8	19.8	4	1.33	0.8	0.9	1.3
D-E	Pond D-E	Within a Conservation Easement	28	27.5	24.8	19.8	4	4.86	2.0	2.2	2.4

* Calculations only included side slopes and berm along one side of pond due to widening of the existing pond

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Basin B - FDOT Pond Area

Berm Assessment:

Low Edge of Pavement = 14.6 *(NB on-ramp from EB I-295)*
Est. Low Edge of Pavement = 14.6 *(Assumes same PGL as existing, no widening at this location)*

Pond Contours:

Pond B-1

	Stage	Area	Vol.
	14	3.29	--
TOB	14	2.53	7.37
DHW	13	2.39	4.91
TV	12.3	--	3.29
	12	2.24	2.59
	11	2.10	0.42
NWL	10.8	2.08	0.00

Infield Pond Evaluation:

Overall Design Volume Review

Total Volume Required = 4.09 ac-ft
Total Volume Provided at DHW = 4.91 ac-ft *(DHW volume at 1-ft below the Top of Berm)*

Excess Volume = **0.82 ac-ft** *Pond provides sufficient storage*

Treatment Volume Assessment

Required Treatment Volume = 0.96 ac-ft
Provided Treatment Volume = 3.29 ac-ft *(Max. 18-inches over NWL)*

Excess Volume = **2.33 ac-ft** *Pond provides sufficient treatment volume*

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Basin C - Infield Pond Areas

SHGWT Review:

Existing Control Structure for Attenuation Infield Ponds (ERP App. 18228-3)

Control Elev 16.2 ft-NGVD Permitted Dry Detention Infields East of I-95
15.0 ft-NAVD

Boring Info for Infield Ponds (ERP App. 18228-3)

NW Pond	HA-3	16.3 ft-NGVD	NE Pond	HA-2	16.5 ft-NGVD
		15.13 ft-NAVD			15.33 ft-NAVD
SW Pond	HA-4	16 ft-NGVD	SE Pond	HA-1	18.5 ft-NGVD
		14.83 ft-NAVD			17.33 ft-NAVD

Above Exist. Ground (DEM), by approx. 0.5-ft

West Boring SHWT = 14.83 ft-NAVD East Boring SHWT = 15.33 ft-NAVD

Existing ground, DEM & Aerial

Site	Exist. Ground Elev (DEM)	Aerial Appearance
NW Pond	15.0 ft-NAVD	appears dry
SW Pond	14.3 ft-NAVD	appears damp

Site	Exist. Ground Elev (DEM)	Aerial Appearance
NE Pond (at CS)	15.3 ft-NAVD	appears damp
SE Pond	16.8 ft-NAVD	appears dry

Determination of SHWL

West SHWT = **14.3 ft-NAVD** East SHWT = **15.0 ft-NAVD**

Western Ponds - Used Aerial/DEM Elev. *Eastern Ponds - Used Existing CS Control Elev.*

Berm Assessment:

FEMA 100yr =	16.6 ft-NAVD	*FEMA 100yr =*	20.7 ft-NAVD
US 1 LEOP =	18.2 ft-NAVD	*US 1 LEOP =*	20.0 ft-NAVD

West Top of Berm = 18.0 ft-NAVD East Top of Berm = 20.0 ft-NAVD

Berms match US 1 low edge of pavement elevation as to not require PGL change under I-95 Bridge.

Project: I-95 (SR 9) Widening from I-295 to Baymeadows Road (SR 152)
FPID: 435577-1-22-01 **Designer:** AE **Date:** 3/4/2021
County: Duval **Reviewer:** JN **Checked:** 3/4/2021

Basin C - Infield Pond Areas

Infield Pond Contours:

FPC = Floodplain Compensation Pond
SMF = Stormwater Management Facility (Treatment Ponds)

C-1E: NW Infield - FPC Pond

	Stage	Area	Vol
Berm	18	0.62	1.89
	17	0.56	1.30
BFE	16.1	--	0.82
	16	0.50	0.77
	15	0.44	0.30
NWL	14.3	0.40	0.00

C-1D: SW Infield - SMF

	Stage	Area	Vol
Berm	18	1.59	5.27
DHW	17	1.50	3.72
	16	1.41	2.27
TV	15.8	--	2.00
	15	1.32	0.90
NWL	14.3	1.26	0.00

C-1C: NE Infield - SMF

	Stage	Area	Vol
Berm	20	1.40	5.75
DHW	19	1.30	4.40
	18	1.20	3.15
	17	1.10	2.00
TV	16.5	--	1.48
	16	1.00	0.95
NWL	15	0.91	0.00

C-1B: SE1 Infield - SMF

	Stage	Area	Vol
Berm	20	2.68	11.92
DHW	19	2.56	9.30
	18	2.44	6.80
	17	2.32	4.42
TV	16.5	--	3.29
	16	2.21	2.16
NWL	15	2.10	0.00

C-1A: SE2 Infield - SMF

	Stage	Area	Vol
Berm	20	1.40	5.83
DHW	19	1.30	4.48
	18	1.21	3.22
	17	1.12	2.06
TV	16.5	--	1.52
	16	1.03	0.98
NWL	15	0.94	0.00

Infield Pond Evaluation:

Overall Design Volume Review

Total Volume Required =	13.50	ac-ft	
Total Volume Provided at DHW =	21.90	ac-ft	*(Total SMF DHW volume at 1-ft below the Top of Berm)*
Excess Volume =	**8.40**	**ac-ft**	*Infield Ponds provide sufficient storage*

Treatment Volume Assessment

Required Treatment Volume =	2.50	ac-ft	
Provided Treatment Volume =	8.28	ac-ft	*(Max. 18-inches over NWL, SMF ponds only)*
Excess Volume =	**5.78**	**ac-ft**	*Infield Ponds provide sufficient treatment volume*

Floodplain Compensation

Req. Floodplain Comp. Vol. =	0.657	ac-ft	*(Includes Impacts at Floodplains 400, 401, and 402)*
FEMA 10 yr Stage =	16.10	ft-NAVD	*(Western ponds outfall to Floodplain 401)*
Provided Storage =	0.82	ac-ft	*(pond storage between NWL and FEMA BFE, FPC pond only)*
Excess Volume =	**0.16**	**ac-ft**	*Infield Ponds provide sufficient floodplain compensation*

Appendix C
Pond Cost Estimates

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)

POND B-1

Item			Description	Unit	Quantity	Unit Price	Amount
0104	12		Staked Turbidity Barrier	LF	1,193	$ 4.59	$ 5,475.87
0110	1	1	Clearing and Grubbing	AC	3.70	$ 66,576.05	$ 246,331.39
0120	4		Subsoil Excavation	CY	29,701	$ 25.27	$ 750,556.06
0425	1	549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 8,943.00	$ 8,943.00
0425	2	61	Manhole, P-8, <10'	EA	1	$ 4,715.50	$ 4,715.50
0430	175	136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	800	$ 166.93	$ 133,544.00
0430	982	138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 4,293.00	$ 4,293.00
0524	1	2	Concrete Ditch Pavement, 4", Non Reinforced	SY	81	$ 57.35	$ 4,645.35
0530	3	4	Riprap, Ditch Lining	CY	2.5	$ 123.49	$ 308.73
0570	1	2	Performance Turf, Sod	SY	9,196	$ 3.12	$ 28,691.52
						Sub-Total:	$ 1,187,504.41
0101	1		Mobilization (L.S.) - 15%	LS	1	$ 178,125.66	$ 178,125.66
						Grand Total:	$ 1,365,630.07

$ 1,365,700

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Clearing & Grubbing is the entire parcel.

Excavation based off of the total required volume plus the permanent pool volume.

Subsoil Excavation used for ponds options with assumed presence of wetlands. Cost does not include associated mitigation requirements.

Sodding is based off of the remnant parcel + berm area + pond slope to two feet below NWL.

It is assumed all on-site systems along mainline will be equivalent for each option. Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option.

Estimate includes routing the Avenues Walk Regional Development outfall around the pond site and connect directly to the box culvert to which it currently drains.

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)

Eastern Infield Areas: C-1A though C-1C

Item	Description	Unit	Quantity	Unit Price	Amount
0110 1 1	Clearing and Grubbing	AC	7.33	$ 66,576.05	$ 488,002.45
0120 1	Regular Excavation	CY	31,912	$ 10.36	$ 330,605.56
0425 11*	Modify existing structure	EA	1	$ 2,684.62	$ 2,684.62
0430 175 124	Pipe Culvert, Optional Material, Round, 24" S/CD	LF	400	$ 103.78	$ 41,512.00
0430 982 129*	Mitered End Section, Optional Material, Round, 24" CD	EA	4	$ 1,848.70	$ 7,394.80
0570 1 2	Performance Turf, Sod	SY	18,618	$ 3.12	$ 58,086.74
				Sub-Total:	$ 928,286.16
Western Infield Areas: C-1D through C-1E					
0110 1 1	Clearing and Grubbing	AC	3.17	$ 66,576.05	$ 211,159.26
0120 1	Regular Excavation	CY	87,459	$ 10.36	$ 906,073.17
0425 1 549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 8,943.00	$ 8,943.00
0430 175 118	Pipe Culvert, Optional Material, Round, 18" S/CD	LF	400	$ 113.70	
0430 175 124	Pipe Culvert, Optional Material, Round, 24" S/CD	LF	200	$ 103.78	$ 20,756.00
0430 982 125	Mitered End Section, Optional Material, Round, 18" CD	EA	4	$ 1,759.40	
0430 982 129*	Mitered End Section, Optional Material, Round, 24" CD	EA	1	$ 1,848.70	$ 1,848.70
0570 1 2	Performance Turf, Sod	SY	8,272	$ 3.12	$ 25,808.78
				Sub-Total:	$ 1,174,588.90
0101 1	Mobilization (L.S.) - 15%	LS	0	$ 315,431.26	$ -
				Grand Total:	$ 2,102,875.06

$ 2,102,900

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Since the pond sites are located in the infields of the interchange, it was assumed that no additional sediment barrier will be required during construction.

Clearing & Grubbing is the entire infield area.

Excavation based off of the total Provided Volume plus the permanent pool volume.

Sodding is based off of the outside berm area + pond slope to two feet below NWL.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option. It is assumed all on-site systems along mainline will be similar for each option.

Since all three eastern infield ponds will function as one unit for treatment and attenuation, it is estimated that the ponds will have 24" equalizer pipes with only one control structure controlling the entire system.

Pond Site C-1E is a dedicated floodplain compensation area. It is assumed to have a double 18-inch cross drain to connect to the floodplain.

Assumed additional mobilization costs not required for ponds within I-95 right-of-way.

Assume the use of a P-8 manhole for junctions of equalizer pipe along Phillips (US 1) on both east and west side of the I-95 MSE wall.

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)							
POND D-1							
Item			Description	Unit	Quantity	Unit Price	Amount
			General Conditions				
0104	12		Staked Turbidity Barrier	LF	764	$ 4.59	$ 3,506.76
0110	1	1	Clearing and Grubbing	AC	1.70	$ 66,576.05	$ 113,179.29
0120	4		Subsoil Excavation	CY	13,633	$ 25.27	$ 344,497.49
0425	1	549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 8,943.00	$ 8,943.00
0430	175	124	Pipe Culvert, Optional Material, Round, 24" S/CD	LF	150	$ 103.78	$ 15,567.00
0430	185	136*	Pipe Culvert, Optional Material, Round, 36" S/CD, J&B	LF	100	$ 790.32	$ 79,032.00
0430	982	129*	Mitered End Section, Optional Material, Round, 24" CD	EA	1	$ 1,848.70	$ 1,848.70
0430	982	138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 4,293.00	$ 4,293.00
0570	1	2	Performance Turf, Sod	SY	5,324	$ 3.12	$ 16,610.88
						Sub-Total:	$ 587,478.11
0101	1		Mobilization (L.S.) - 15%	LS	1	$ 88,121.72	$ 88,121.72
						Grand Total:	$ 675,599.83
							$ 675,600

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Clearing & Grubbing is the entire parcel and easement area(s).

Excavation based off of the total required volume plus the permanent pool volume.

Subsoil Excavation used for ponds options with assumed presence of wetlands. Cost does not include associated mitigation requirements.

Sodding is based off of the remnant parcel + berm area + pond slope to two feet below NWL.

Estimate includes routing the Avenues Walk Regional Development outfall round the pond site and connect directly to the box culvert to which it currently drains.

Assumed all jack & bore pipes are 36" and are only located within the compensatory treatment basin along I-95.

Assume additional pipe length along easement is a 36" pipe.

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)						
POND D-3						
Item		Description	Unit	Quantity	Unit Price	Amount
		General Conditions				
0104 12		Staked Turbidity Barrier	LF	618	$ 4.59	$ 2,836.62
0110 1	1	Clearing and Grubbing	AC	1.20	$ 66,576.05	$ 79,891.26
0120 4		Subsoil Excavation	CY	15,617	$ 25.27	$ 394,643.27
0425 11*		Modify existing structure	EA	2	$ 2,684.62	$ 5,369.24
0430 175	136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	75	$ 166.93	$ 12,519.75
0430 185	136*	Pipe Culvert, Optional Material, Round, 36" S/CD, J&B	LF	100	$ 790.32	$ 79,032.00
0430 982	138	Mitered End Section, Optional Material, Round, 36" CD	EA	3	$ 4,293.00	$ 12,879.00
0570 1	2	Performance Turf, Sod	SY	3,388	$ 3.12	$ 10,570.56
					Sub-Total:	$ 597,741.70
0101 1		Mobilization (L.S.) - 15%	LS	1	$ 89,661.26	$ 89,661.26
					Grand Total:	$ 687,402.96

$ 687,500

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Clearing & Grubbing is the entire parcel and assumed 0.2 ac for connection along Western Way easement areas.

Excavation based off of the total required volume plus the permanent pool volume.

Subsoil Excavation used for ponds options with assumed presence of wetlands. Cost does not include associated mitigation requirements.

Sodding is based off of the remnant parcel + berm area + pond slope to two feet below NWL.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option. It is assumed all on-site systems along mainline will be similar for each option.

Assumed 36-inch pipe crossing under Western Way (open cut) to connect into the exsiting FDOT pond.

Assume modifying existing manhole for pipe connection to the pond & control structure modification.

Assume additional pipe length along easement is a 36" pipe.

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)

POND D-4

Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 12	Staked Turbidity Barrier	LF	1,154	$ 4.59	$ 5,296.86
0110 1 1	Clearing and Grubbing	AC	1.80	$ 66,576.05	$ 119,836.89
0120 4	Subsoil Excavation	CY	13,697	$ 25.27	$ 346,128.24
0425 11*	Modify existing structure	EA	2	$ 2,684.62	$ 5,369.24
0430 175 136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	75	$ 166.93	$ 12,519.75
0430 175 148*	Pipe Culvert, Optional Material, Round, 48" S/CD	LF	100	$ 187.28	$ 18,728.00
0430 185 136*	Pipe Culvert, Optional Material, Round, 36" S/CD, J&B	LF	100	$ 790.32	$ 79,032.00
0430 982 138	Mitered End Section, Optional Material, Round, 36" CD	EA	3	$ 4,293.00	$ 12,879.00
0430 982 141*	Mitered End Section, Optional Material, Round, 48" CD	EA	2	$ 3,411.21	$ 6,822.42
0570 1 2	Performance Turf, Sod	SY	5,808	$ 3.12	$ 18,120.96
				Sub-Total:	$ 624,733.36
0101 1	Mobilization (L.S.) - 15%	LS	1	$ 93,710.00	$ 93,710.00
				Grand Total:	$ 718,443.37
					$ 718,500

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Clearing & Grubbing is the entire parcel and assumed 0.2 ac for connection along Western Way easement areas.

Excavation based off of the total required volume plus the permanent pool volume.

Subsoil Excavation used for ponds options with assumed presence of wetlands. Cost does not include associated mitigation requirements.

Sodding is based off of the remnant parcel + berm area + pond slope to two feet below NWL.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option. It is assumed all on-site systems along mainline will be similar for each option.

Assumed 36-inch pipe crossing under Western Way to connect into the exsiting FDOT pond.

Assumed 48-inch pipe connection under existing canal between existing FDOT pond and D-4 pond site.

Costs do not include impacts to the existing Royal Lakes WWTF effluent outfall.

Assume additional pipe length along easement is a 36" pipe.

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)							
POND E-1							
Item			Description	Unit	Quantity	Unit Price	Amount
			General Conditions				
0104	10	3	Sediment Barrier (Silt Fence Staked)	LF	1,223	$ 2.11	$ 2,580.53
0110	1	1	Clearing and Grubbing	AC	1.20	$ 66,576.05	$ 79,891.26
0120	1		Regular Excavation	CY	5,840	$ 10.36	$ 60,505.16
0425	1	549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 8,943.00	$ 8,943.00
0430	175	124	Pipe Culvert, Optional Material, Round, 24" S/CD	LF	150	$ 103.78	$ 15,567.00
0430	175	136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	1,300	$ 166.93	$ 217,009.00
0430	185	136*	Pipe Culvert, Optional Material, Round, 36" S/CD, J&B	LF	100	$ 790.32	$ 79,032.00
0430	982	129*	Mitered End Section, Optional Material, Round, 24" CD	EA	1	$ 1,848.70	$ 1,848.70
0430	982	138	Mitered End Section, Optional Material, Round, 36" CD	EA	3	$ 4,293.00	$ 12,879.00
0570	1	2	Performance Turf, Sod	SY	4,356	$ 3.12	$ 13,590.72
						Sub-Total:	$ 491,846.37
0101	1		Mobilization (L.S.) - 15%	LS	1	$ 73,776.96	$ 73,776.96
						Grand Total:	$ 565,623.33

$ 565,700

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Clearing & Grubbing is the entire parcel and easement areas.

Excavation based off of the total required volume plus the permanent pool volume.

Estimate includes routing the Avenues Walk Regional Development outfall round the pond site and connect directly to the box culvert to which it currently drains.

Sodding is based off of the ruminate parcel + berm area + pond slope to two feet below NWL.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option. It is assumed all on-site systems along mainline will be similar for each option.

Assumed all jack & bore pipes are 36" and are only located within the compensatory treatment basin along I-95.

Assumed a 36-inch pipe is used to route runoff from basin area to pond site.

Assume equalizer pipe between pond segments is a 36" pipe

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)

POND E-2

Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 12	Staked Turbidity Barrier	LF	1,104	$ 4.59	$ 5,067.36
0110 1 1	Clearing and Grubbing	AC	1.30	$ 66,576.05	$ 86,548.87
0120 4	Subsoil Excavation	CY	4,727	$ 25.27	$ 119,452.97
0425 1 549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 8,943.00	$ 8,943.00
0430 175 124	Pipe Culvert, Optional Material, Round, 24" S/CD	LF	150	$ 103.78	$ 15,567.00
0430 175 136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	0	$ 166.93	$ -
0430 185 136*	Pipe Culvert, Optional Material, Round, 36" S/CD, J&B	LF	0	$ 790.32	$ -
0430 982 129*	Mitered End Section, Optional Material, Round, 24" CD	EA	1	$ 1,848.70	$ 1,848.70
0570 1 2	Performance Turf, Sod	SY	5,324	$ 3.12	$ 16,610.88
				Sub-Total:	$ 254,038.78
0101 1	Mobilization (L.S.) - 15%	LS	1	$ 38,105.82	$ 38,105.82
				Grand Total:	$ 292,144.60

$ 292,200

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Staked Turbidity Barrier is used for sites located in wetlands

Clearing & Grubbing is the entire parcel and easement areas.

Excavation based off of the total required volume plus the permanent pool volume.

Subsoil Excavation used for ponds options with assumed presence of wetlands. Cost does not include associated mitigation requirements.

Sodding is based off of the ruminate parcel + berm area + pond slope to two feet below NWL.

Estimate includes routing the Avenues Walk Regional Development outfall round the pond site and connect directly to the box culvert to which it currently drains.

Assumed all jack & bore pipes are 36" and are only located within the compensatory treatment basin along I-95.

Assume additional pipe length along easement is a 36" pipe.

Costs do not include evaluation of Western Way outfall ditch capacity.

ENGINEERS OPINION OF PROBABLE COSTS

Estimated Cost for Construction Services

I-95 Express Lanes (FPID: 435577-1-22-01)						
POND D-E						
Item			Description	Unit	Quantity	Unit Price	Amount
			General Conditions				
0104	12		Staked Turbidity Barrier	LF	1,215	$ 4.59	$ 5,576.85
0110	1	1	Clearing and Grubbing	AC	2.40	$ 66,576.05	$ 159,782.52
0120	4		Subsoil Excavation	CY	20,425	$ 25.27	$ 516,134.70
0425	1	549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 8,943.00	$ 8,943.00
0425	11*		Modify Existing Structure	EA	1	$ 2,684.62	$ 2,684.62
0430	175	124	Pipe Culvert, Optional Material, Round, 24" S/CD	LF	150	$ 103.78	$ 15,567.00
0430	175	136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	0	$ 166.93	$ -
0430	185	136*	Pipe Culvert, Optional Material, Round, 36" S/CD, J&B	LF	100	$ 790.32	$ 79,032.00
0430	982	129*	Mitered End Section, Optional Material, Round, 24" CD	EA	1	$ 1,848.70	$ 1,848.70
0430	982	138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 4,293.00	$ 4,293.00
0570	1	2	Performance Turf, Sod	SY	7,260	$ 3.12	$ 22,651.20
						Sub-Total:	$ 816,513.59
0101	1		Mobilization (L.S.) - 15%	LS	1	$ 122,477.04	$ 122,477.04
						Grand Total:	$ 938,990.62
							$ 939,000

Note:

This opinion of costs is based on the best available information and on the opinion of the engineer. The items in the opinion of costs require proposals from other contractors and consultants. Some of the work stated in this opinion of costs requires investigative work that has not been completed . Although every effort has been made to provide a reasonable budget number it should be noted that the actual costs could be significantly more or less that stated in the opinion of costs. This opinion should be used to determine an order of magnitude for the costs . It is recommended that the owner obtain firm quotes from the various contractors in order to obtain a more accurate number. The costs stated in the opinion can also be influenced by market conditions, legal and regulatory conditions which are unforeseen.

Quantity Estimate Notes:

Unit Prices from FDOT Area 05 Moving Average from 1/1/2020 to 12/31/2020, or uses the Statewide 12-Month Average* of the same year.

Sediment Barrier is the net additional fencing required. Measured along the parcel perimeter.

Staked Turbidity Barrier is used for sites located in wetlands

Staked Turbidity Barrier is used for sites located in wetlands

Clearing & Grubbing is the entire parcel and easement areas.

Excavation based off of the total required volume plus the permanent pool volume.

Subsoil Excavation used for ponds options with assumed presence of wetlands. Cost does not include associated mitigation requirements.

Sodding is based off of the ruminate parcel + berm area + pond slope to two feet below NWL.

Estimate includes routing the Avenues Walk Regional Development outfall round the pond site and connect directly to the box culvert to which it currently drains.

Assumed all jack & bore pipes are 36" and are only located within the compensatory treatment basin along I-95.

Assumes Modify Existing Structure to route runoff around the Basin D cross drain.

Assume additional pipe length along easement is a 36" pipe.

Costs do not include evaluation of Western Way outfall ditch capacity.

FLORIDA DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY COST ESTIMATE

FM#:	**435577-1**	**ALTERNATIVE:**	**B1**	**DATE OF ESTIMATE:**	**07/14/17**
CE ID#:	**N/A**	**ALIGNMENT:**	**N/A**	**DISTRICT:**	**Two**
JOB/SEC#:	**72280000**	**LENGTH OF JOB:**	**6.375 Miles**	**COUNTY:**	**72 - DUVAL**
Program Year:	**TBD**	**Design Plans:**	**PDE Aerial (new)**	**STATE ROAD:**	**SR 9**
Estimate Type:	**PD&E**	**Project Type:**	**0237 - ADD MANAGED LANES**	**Actual Costs:**	**None**

PROJECT: **I-95 (SR 9) FROM I-295 (SR 9A) TO SR 202 (JT BUTLER BLV)**

PARCELS:	**FEE**	**Perm. Easmt**	**TCE**	**Lic. Agmt**	**Donation**	**Total Parcels**
Commercial:	0	0	0	0	0	0
Residential:	0	0	0	0	0	0
Vacant:	0	0	0	0	1	1
Total Parcels:	0	0	0	0	1	1

RELOCATEES (EST.)	
Business:	0
Residential:	0
Personal Prop.	0
Special:	0
ODA Signs:	0
Total:	0

SUMMARY OF PHASE TOTALS	
TOTAL PHASE 4B	**$0**
TOTAL PHASE 41	**$0**
TOTAL PHASE 42	**$0**
TOTAL PHASE 43	**$0**
TOTAL PHASE 45	**$0**
TOTAL PHASE 46&48	**$0**
TOTAL ALL PHASES	**$0**

ESTIMATED BY: Gerald W. Springstead II DATE: 07/14/17

REVIEWED BY: Charles Fish DATE: 07/14/17

SUPERSEDES ESTIMATE: DATE: N/A

COMPLETED DATA INPUT DATE: 07/14/17

Remarks: Pond B1 is owned by FDOT and there would be no right of way costs associated with this parcel.

PERSON REQUESTING ESTIMATE: Michael Brock **DATE REQUESTED:** **07/07/17**

PROJECT MANAGER, PHONE EXT: BH/JK **DUE DATE:** **ASAP**

This cost estimate is a consultation service and not an appraisal of market value (per USPAP).

The amount shown is a probable cost to acquire right of way. Accuracy is directly correlated to the completeness of project and market information. The project file contains supporting documentation for this estimate. The cost estimate's confidence rating as listed below is based on the completeness and accuracy of the data utilized and the time allowed to perform the estimate. Signed copies of the estimate are maintained within the project file and are available upon request.

The following indicates the confidence level of this report based on a level between 1 and 5 with 5 representing the highest level of confidence.

CONFIDENCE LEVEL: 2

FLORIDA DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY COST ESTIMATE

FM#:	**435577-1**	**ALTERNATIVE:**	**D1 (New)**	**DATE OF ESTIMATE:**	**04/29/19**
CE ID#:	**N/A**	**ALIGNMENT:**	**N/A**	**DISTRICT:**	**Two**
JOB/SEC#:	**72280000**	**LENGTH OF JOB:**	**6.375 Miles**	**COUNTY:**	**72 - DUVAL**
Program Year:	**TBD**	**Design Plans:**	**PDE Aerial (new)**	**STATE ROAD:**	**SR 9**
Estimate Type:	**PD&E**	**Project Type:**	**0237 - ADD MANAGED LANES**	**Actual Costs:**	**None**

PROJECT: **I-95 (SR 9) FROM I-295 (SR 9A) TO SR 202 (JT BUTLER BLV)**

PARCELS:	FEE	Perm. Easmt	TCE	Lic. Agmt	Donation	Total Parcels
Commercial:	0	0	0	0	0	0
Residential:	0	0	0	0	0	0
Vacant:	1	0	0	0	0	1
Total Parcels:	1	0	0	0	0	1

RELOCATEES (EST.)	
Business:	0
Residential:	0
Personal Prop.	0
Special:	0
ODA Signs:	0
Total:	0

SUMMARY OF PHASE TOTALS	
TOTAL PHASE 4B	
TOTAL PHASE 41	
TOTAL PHASE 42	
TOTAL PHASE 43	
TOTAL PHASE 45	
TOTAL PHASE 46&48	
TOTAL ALL PHASES	**$137,445**

ESTIMATED BY:	Gerald W. Springstead II	DATE:	04/29/19
REVIEWED BY:	Charles Fish	DATE:	04/29/19
SUPERSEDES ESTIMATE:		DATE:	N/A
COMPLETED DATA INPUT DATE:	04/29/19		

Remarks: Pond D1 (former D1 has been voided) contains approximately 3.40 acres. The property is vacant land located in part of The Lower St Johns Mitigation Bank (SJRWMD Permit #127636-2). Utilizing the site for storm water retention is complicated because it is an active land mitigation bank. There are other costs likely associated with acquiring this site, including additional mitigation expenses.

Fixed vs. Variable costs not itemized. Assume the full R/W cost per pond acreage was used to estimate current R/W costs.

PERSON REQUESTING ESTIMATE:	Michael Brock	**DATE REQUESTED:**	**04/17/19**
PROJECT MANAGER, PHONE EXT:	BH/JK	**DUE DATE:**	**ASAP**

This cost estimate is a consultation service and not an appraisal of market value (per USPAP).

The amount shown is a probable cost to acquire right of way. Accuracy is directly correlated to the completeness of project and market information. The project file contains supporting documentation for this estimate. The cost estimate's confidence rating as listed below is based on the completeness and accuracy of the data utilized and the time allowed to perform the estimate. Signed copies of the estimate are maintained within the project file and are available upon request.

The following indicates the confidence level of this report based on a level between 1 and 5 with 5 representing the highest level of confidence.

CONFIDENCE LEVEL: 2

FLORIDA DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY COST ESTIMATE

FM#:	**435577-1**	**ALTERNATIVE:**	**D3**	**DATE OF ESTIMATE:**	**04/29/19**
CE ID#:	**N/A**	**ALIGNMENT:**	**N/A**	**DISTRICT:**	**Two**
JOB/SEC#:	**72280000**	**LENGTH OF JOB:**	**6.375 Miles**	**COUNTY:**	**72 - DUVAL**
Program Year:	**TBD**	**Design Plans:**	**PDE Aerial (new)**	**STATE ROAD:**	**SR 9**
Estimate Type:	**PD&E**	**Project Type:**	**0237 - ADD MANAGED LANES**	**Actual Costs:**	**None**

PROJECT: **I-95 (SR 9) FROM I-295 (SR 9A) TO SR 202 (JT BUTLER BLV)**

PARCELS:	FEE	Perm. Easmt	TCE	Lic. Agmt	Donation	Total Parcels
Commercial:	1	0	0	0	0	1
Residential:	0	0	0	0	0	0
Vacant:	0	0	0	0	0	0
Total Parcels:	1	0	0	0	0	1

RELOCATEES (EST.)	
Business:	0
Residential:	0
Personal Prop.	0
Special:	0
ODA Signs:	0
Total:	0

SUMMARY OF PHASE TOTALS	
TOTAL PHASE 4B	
TOTAL PHASE 41	
TOTAL PHASE 42	
TOTAL PHASE 43	
TOTAL PHASE 45	
TOTAL PHASE 46&48	
TOTAL ALL PHASES	**$124,873**

ESTIMATED BY:	Gerald W. Springstead II	DATE:	04/29/19
REVIEWED BY:	Charles Fish	DATE:	04/29/19
SUPERSEDES ESTIMATE:		DATE:	N/A
COMPLETED DATA INPUT DATE:	04/29/19		

Remarks: Pond D3 has been moved since the previous 7-7-17 pond site analysis. The new pond site contains approximately 2.46 acres from a vacant parcel which is encumbered with a conservation easement with St Johns River Water Management as recorded in ORB 7844/1033 per the Duval County public records. An existing FDOT pond is located adjacent to proposed pond D3.

Fixed vs. Variable costs not itemized. Assume the full R/W cost per pond acreage was used to estimate current R/W costs.

PERSON REQUESTING ESTIMATE:	Michael Brock	**DATE REQUESTED:**	**04/17/19**
PROJECT MANAGER, PHONE EXT:	BH/JK	**DUE DATE:**	**ASAP**

This cost estimate is a consultation service and not an appraisal of market value (per USPAP).

The amount shown is a probable cost to acquire right of way. Accuracy is directly correlated to the completeness of project and market information. The project file contains supporting documentation for this estimate. The cost estimate's confidence rating as listed below is based on the completeness and accuracy of the data utilized and the time allowed to perform the estimate. Signed copies of the estimate are maintained within the project file and are available upon request.

The following indicates the confidence level of this report based on a level between 1 and 5 with 5 representing the highest level of confidence.

CONFIDENCE LEVEL: 2

FLORIDA DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY COST ESTIMATE

FM#:	**435577-1**	**ALTERNATIVE:**	**D4**	**DATE OF ESTIMATE:**	**04/29/19**
CE ID#:	**N/A**	**ALIGNMENT:**	**N/A**	**DISTRICT:**	**Two**
JOB/SEC#:	**72280000**	**LENGTH OF JOB:**	**6.375 Miles**	**COUNTY:**	**72 - DUVAL**
Program Year:	**TBD**	**Design Plans:**	**PDE Aerial (new)**	**STATE ROAD:**	**SR 9**
Estimate Type:	**PD&E**	**Project Type:**	**0237 - ADD MANAGED LANES**	**Actual Costs:**	**None**

PROJECT: **I-95 (SR 9) FROM I-295 (SR 9A) TO SR 202 (JT BUTLER BLV)**

PARCELS:	FEE	Perm. Easmt	TCE	Lic. Agmt	Donation	Total Parcels
Commercial:	1	0	0	0	0	1
Residential:	0	0	0	0	0	0
Vacant:	0	0	0	0	0	0
Total Parcels:	1	0	0	0	0	1

RELOCATEES (EST.)	
Business:	0
Residential:	0
Personal Prop.	0
Special:	0
ODA Signs:	0
Total:	0

SUMMARY OF PHASE TOTALS	
TOTAL PHASE 4B	
TOTAL PHASE 41	
TOTAL PHASE 42	
TOTAL PHASE 43	
TOTAL PHASE 45	
TOTAL PHASE 46&48	
TOTAL ALL PHASES	**$2,292,776**

ESTIMATED BY:	Gerald W. Springstead II	DATE:	04/29/19
REVIEWED BY:	Charles Fish	DATE:	04/29/19
SUPERSEDES ESTIMATE:		DATE:	07/14/17
COMPLETED DATA INPUT DATE:	04/29/19		

Remarks: Since the last estimate, Pond D4 has increase in size from approximately 2.67 to 4.43 acres. The proposed pond site is located on a vacant rear portion of an improved warehouse property. The proposed pond is adjacent to an existing FDOT retention pond.

Fixed vs. Variable costs not itemized. Assume the full R/W cost per pond acreage was used to estimate current R/W costs.

PERSON REQUESTING ESTIMATE:	Michael Brock	**DATE REQUESTED:**	**04/17/19**
PROJECT MANAGER, PHONE EXT:	BH/JK	**DUE DATE:**	**ASAP**

This cost estimate is a consultation service and not an appraisal of market value (per USPAP).

The amount shown is a probable cost to acquire right of way. Accuracy is directly correlated to the completeness of project and market information. The project file contains supporting documentation for this estimate. The cost estimate's confidence rating as listed below is based on the completeness and accuracy of the data utilized and the time allowed to perform the estimate. Signed copies of the estimate are maintained within the project file and are available upon request.

The following indicates the confidence level of this report based on a level between 1 and 5 with 5 representing the highest level of confidence.

CONFIDENCE LEVEL: 2

FLORIDA DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY COST ESTIMATE

FM#:	**435577-1**	**ALTERNATIVE:**	**E1A**	**DATE OF ESTIMATE:**	**04/29/19**
CE ID#:	**N/A**	**ALIGNMENT:**	**N/A**	**DISTRICT:**	**Two**
JOB/SEC#:	**72280000**	**LENGTH OF JOB:**	**6.375 Miles**	**COUNTY:**	**72 - DUVAL**
Program Year:	**TBD**	**Design Plans:**	**PDE Aerial (new)**	**STATE ROAD:**	**SR 9**
Estimate Type:	**PD&E**	**Project Type:**	**0237 - ADD MANAGED LANES**	**Actual Costs:**	**None**

PROJECT: **I-95 (SR 9) FROM I-295 (SR 9A) TO SR 202 (JT BUTLER BLV)**

PARCELS:	**FEE**	**Perm. Easmt**	**TCE**	**Lic. Agmt**	**Donation**	**Total Parcels**
Commercial:	0	0	0	0	0	0
Residential:	0	0	0	0	0	0
Vacant:	1	1	0	0	0	2
Total Parcels:	1	1	0	0	0	2

RELOCATEES (EST.)	
Business:	0
Residential:	0
Personal Prop.	0
Special:	0
ODA Signs:	0
Total:	0

SUMMARY OF PHASE TOTALS	
TOTAL PHASE 4B	
TOTAL PHASE 41	
TOTAL PHASE 42	
TOTAL PHASE 43	
TOTAL PHASE 45	
TOTAL PHASE 46&48	
TOTAL ALL PHASES	**$557,186**

ESTIMATED BY: Gerald W. Springstead II DATE: 04/29/19

REVIEWED BY: Charles Fish DATE: 04/29/19

SUPERSEDES ESTIMATE: DATE: N/A

COMPLETED DATA INPUT DATE: 04/29/19

Remarks: Pond E1A contains approximately 1.15 acres. The pond will require a drainage easement across Dix Ellis Trail to connect with potential pond E1B.

Pond E-1 only includes parcel associated with the E1A and no longer crosses Dix Ellis Trail

PERSON REQUESTING ESTIMATE: Michael Brock **DATE REQUESTED:** **07/07/17**

PROJECT MANAGER, PHONE EXT: BH/JK **DUE DATE:** **ASAP**

This cost estimate is a consultation service and not an appraisal of market value (per USPAP).

The amount shown is a probable cost to acquire right of way. Accuracy is directly correlated to the completeness of project and market information. The project file contains supporting documentation for this estimate. The cost estimate's confidence rating as listed below is based on the completeness and accuracy of the data utilized and the time allowed to perform the estimate. Signed copies of the estimate are maintained within the project file and are available upon request.

The following indicates the confidence level of this report based on a level between 1 and 5 with 5 representing the highest level of confidence.

CONFIDENCE LEVEL: 2

FLORIDA DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY COST ESTIMATE

FM#:	**435577-1**	**ALTERNATIVE:**	**E2**	**DATE OF ESTIMATE:**	**04/29/19**
CE ID#:	**N/A**	**ALIGNMENT:**	**N/A**	**DISTRICT:**	**Two**
JOB/SEC#:	**72280000**	**LENGTH OF JOB:**	**6.375 Miles**	**COUNTY:**	**72 - DUVAL**
Program Year:	**TBD**	**Design Plans:**	**PDE Aerial (new)**	**STATE ROAD:**	**SR 9**
Estimate Type:	**PD&E**	**Project Type:**	**0237 - ADD MANAGED LANES**	**Actual Costs:**	**None**

PROJECT: **I-95 (SR 9) FROM I-295 (SR 9A) TO SR 202 (JT BUTLER BLV)**

PARCELS:	FEE	Perm. Easmt	TCE	Lic. Agmt	Donation	Total Parcels
Commercial:	0	0	0	0	0	0
Residential:	0	0	0	0	0	0
Vacant:	1	0	0	0	0	1
Total Parcels:	1	0	0	0	0	1

RELOCATEES (EST.)	
Business:	0
Residential:	0
Personal Prop.	0
Special:	0
ODA Signs:	0
Total:	0

SUMMARY OF PHASE TOTALS	
TOTAL PHASE 4B	
TOTAL PHASE 41	
TOTAL PHASE 42	
TOTAL PHASE 43	
TOTAL PHASE 45	
TOTAL PHASE 46&48	
TOTAL ALL PHASES	**$163,375**

ESTIMATED BY: Gerald W. Springstead II DATE: 04/29/19

REVIEWED BY: Charles Fish DATE: 04/29/19

SUPERSEDES ESTIMATE: DATE: 07/17/17

COMPLETED DATA INPUT DATE: 04/29/19

Remarks: Pond E2 (FNA E4) contains approximately 4.81 acres (expanded from 2.52 acres). The property is vacant land located in part of The Lower St Johns Mitigation Bank (SJRWMD Permit #127636-2). Utilizing the site for storm water retention is complicated because it is an active land mitigation bank. There are other costs likely associated with acquiring this site, including additional mitigation expenses.

Fixed vs. Variable costs not itemized. Assume the full R/W cost per pond acreage was used to estimate current R/W costs.

This estimate is also used for Pond D-E R/W costs

PERSON REQUESTING ESTIMATE: Michael Brock **DATE REQUESTED:** **04/17/19**

PROJECT MANAGER, PHONE EXT: BH/JK **DUE DATE:** **ASAP**

This cost estimate is a consultation service and not an appraisal of market value (per USPAP).

The amount shown is a probable cost to acquire right of way. Accuracy is directly correlated to the completeness of project and market information. The project file contains supporting documentation for this estimate. The cost estimate's confidence rating as listed below is based on the completeness and accuracy of the data utilized and the time allowed to perform the estimate. Signed copies of the estimate are maintained within the project file and are available upon request.

The following indicates the confidence level of this report based on a level between 1 and 5 with 5 representing the highest level of confidence.

CONFIDENCE LEVEL: 2

Appendix D
Pond Site Photos

Plate 1: Looking east at Pond Site B-1 (Taken 7-11-17)

Plate 2: Looking southwest at Pond Site C-Northeast Infield Area (Taken 7-11-17)

Plate 3: Existing control structure at Pond Site C-Northeast Infield Area (Taken 7-11-17)

Plate 4: Looking north at Pond Site C-Southeast Infield Area (Taken 7-11-17)

Plate 5: Potential Utility Conflicts at Pond Site C-Southeast Infield Area (Taken 7-11-17)

Plate 6: Looking North at Pond Site C-Southwest Infield Area from US 1 (Taken 7-11-17)

Plate 7: Potential Utility Conflicts at Pond Site C-Southwest Infield Area (Taken 7-11-17)

Plate 8: TECO Gas Line at Pond Site C-Southwest Infield Area (Taken 7-11-17)

Plate 9: Petroleum Contamination Sign at Parcel 148632-0100 Driveway (Taken 7-11-17)

Plate 10: Looking northeast at from box culvert under Western Way (Taken 7-11-17).

Plate 11: Looking southeast at Pond Site E-1 (Taken 7-11-17).

Plate 12: Looking southeast at Pond Site E-2 (Taken 7-11-17).

Appendix E
Permit Information

Permit #18228-3: Nissan Pond Modification

18228

DAVID VOLKERT & ASSOCIATES, INC.

CONSULTING ENGINEERS

DESIGN COMPUTATIONS

Designer MAO Date 10/9/97 Sheet No. 1 of 1

Checker PAG Date 10/9/97 Job No. 104906.13

Description I-95 RAMP MODIFICATION

SPN 72280-3423

TREATMENT VOLUME CALCULATIONS

(1) ADDL IMPERVIOUS AREA DUE TO RAMP MODIFICATION = 0.76 Ac

(2) ORIGINAL IMPERVIOUS AREA = 25.93 Ac

(3) REVISED IMPERVIOUS AREA = 26.69 Ac
(25.93 + 0.76 = 26.69)

(4) ORIGINAL TREATMENT VOLUME = 5.40 AC-FT
(25.93 × 2.5/12 = 5.40)

(5) REVISED TREATMENT VOLUME = 5.56 AC-FT
(26.69 × 2.5/12 = 5.56)

(6) TREATMENT VOLUME AVAILABLE IN POND = 5.80 AC-FT

5.56 AC-FT < 5.80 AC-FT

10/13/97

X4-031-0480AGMZ-ERP

POND MODIFICATION

State Road 9 (I-95)
State Project No. 72280-3423

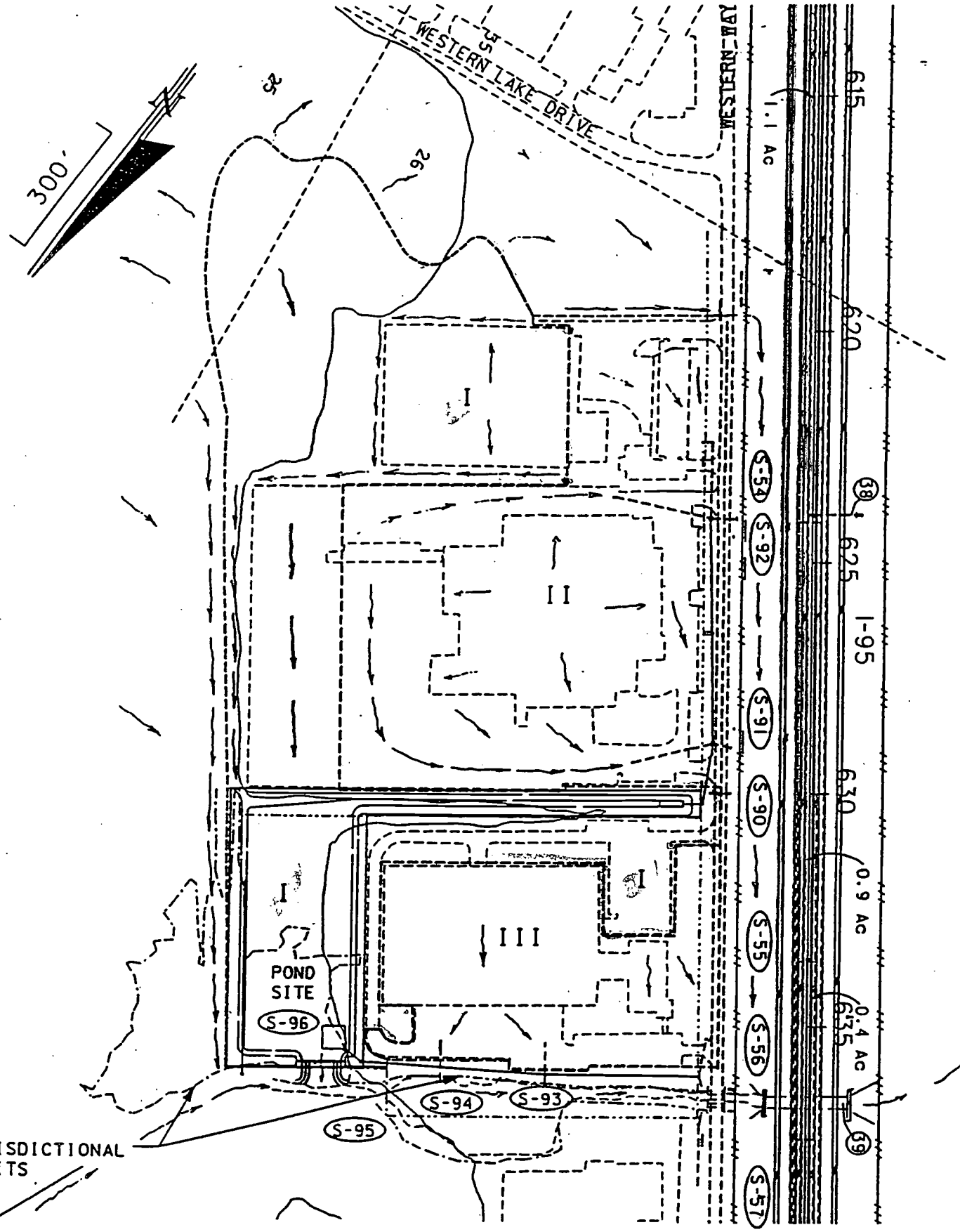
OFF-SITE , NORTH POND

The purpose of this modification is to convert the permitted pond from dry retention with filtration , to wet detention. The reason is to make the pond more functional in water quality treatment and more maintenance free in the long run.

From the "Applicant's Handbook" Chapter 14.10, the control structure should be set at or above the normal on-site ground water elevation. The ground water elevation at the point of discharge at the north end of the proposed pond was observed and documented on two different occasions. The elevation was 19.65 feet on 12-8-94 and at elevation 19.56 feet on 12-15-94, both taken during the survey data gathering for this pond site. There has been no obvious change in normal water elevation since that time. The Normal Water Elevation in the pond will be established at 21.0 feet in order to enhance the jurisdictional wetlands adjacent to the proposed pond.

The Area of runoff being routed through the pond is 43.15 acres. See the proposed drainage plan. The Impervious Area is 25.93 acres, all presently untreated runoff.

RECEIVED
JAN 15 1997
SJRWMD
JACKSONVILLE
18228



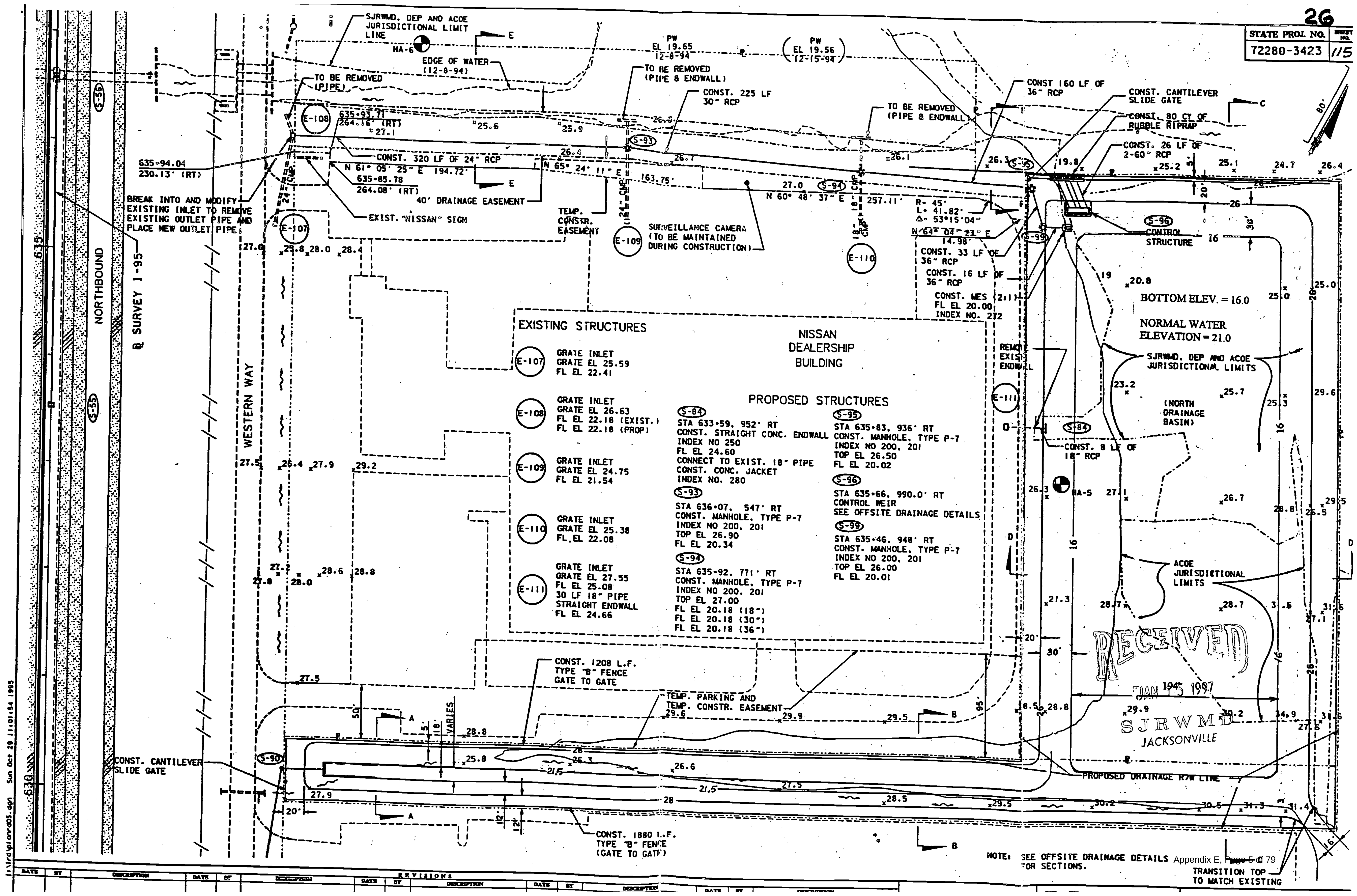
Tue Feb 14 23:28:47 1995

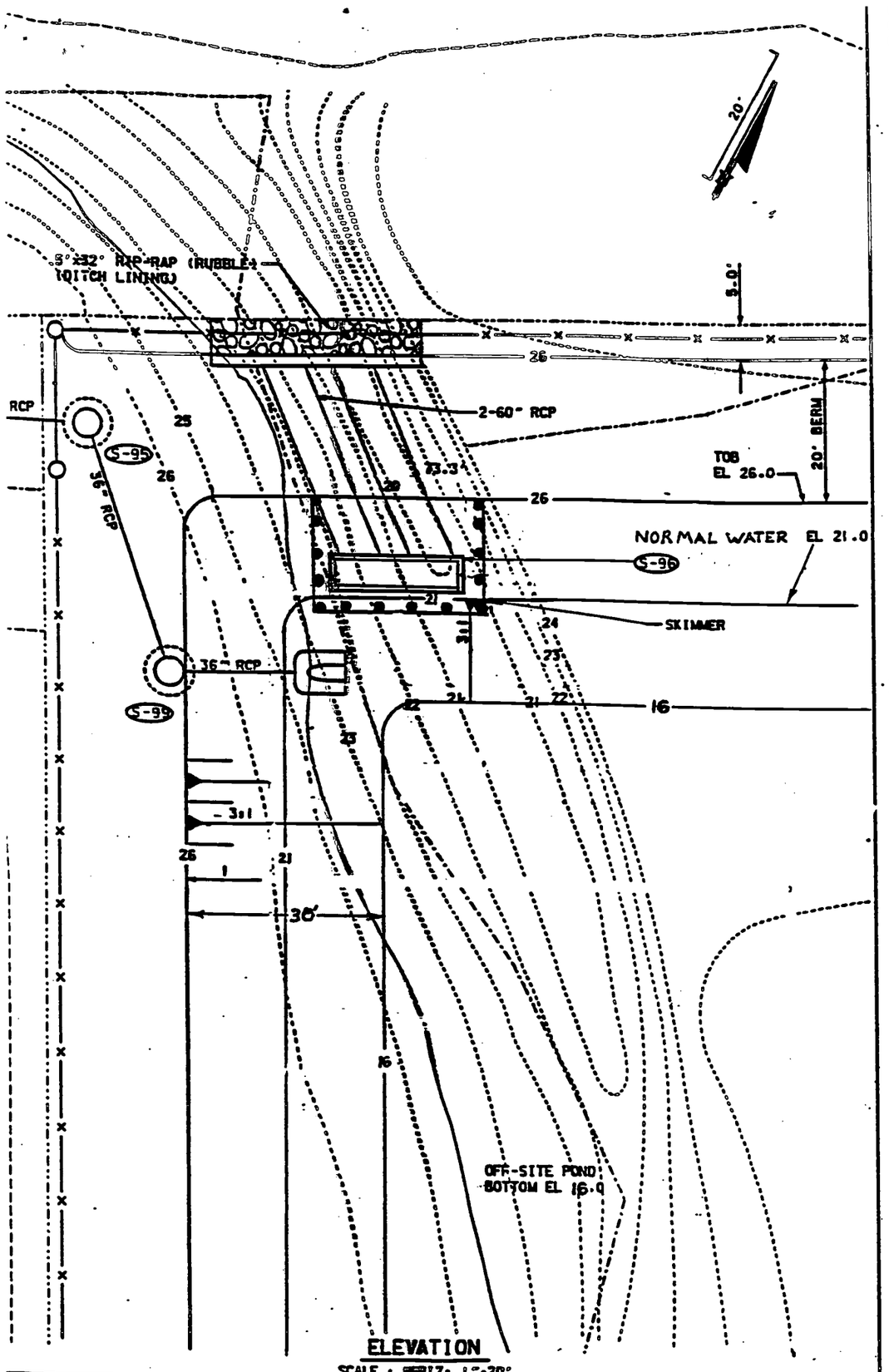
DAVID VOLKERT & ASSOCIATES, INC.
Engineers Architects Planners

I-95 IMPROVEMENTS
DUVAL COUNTY FLORIDA

PROPOSED DRAINAGE PLAN

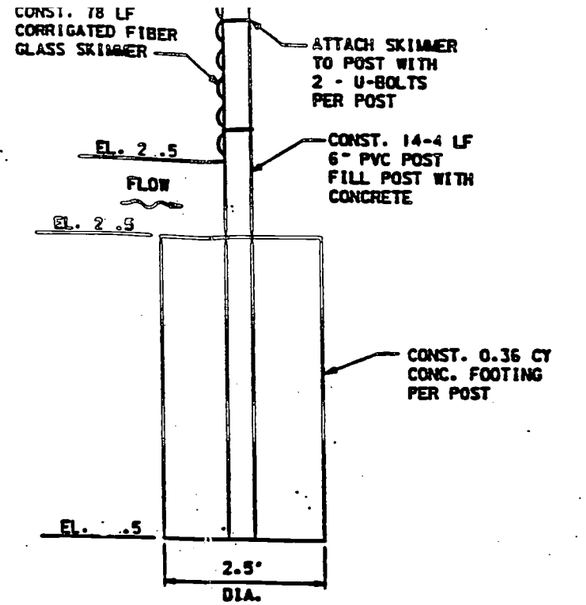
APPLICATION: FDOT
DESCRIPTION:
PROPOSED ROADWAY IMPROVEMENTS
STATE PROJECT NO. 72280-1423
WPI NO. 2142482
FAP NO. IR-95-5(182)331


26
STATE PROJ. NO.
SHEET NO.
72280-3423
115
SJRWMD, DEP AND ACOE JURISDICTIONAL LIMIT LINE
HA-6
EDGE OF WATER (12-8-94)
PW EL 19.65 12-8-94
PW EL 19.56 12-15-94
TO BE REMOVED (PIPE)
TO BE REMOVED (PIPE & ENDWALL)
CONST. 225 LF 30" RCP
TO BE REMOVED (PIPE & ENDWALL)
CONST 160 LF OF 36" RCP
CONST. CANTILEVER SLIDE GATE
CONST. 80 CY OF RUBBLE RIPRAP
CONST. 26 LF OF 2-60" RCP
635+93.71 264.16' (RT)
635+94.04 230.13' (RT)
CONST. 320 LF OF 24" RCP
N 61° 05' 25" E 194.72'
635+85.78 264.08' (RT)
N 65° 24' 11" E 163.75'
N 60° 48' 37" E 257.11'
40' DRAINAGE EASEMENT
BREAK INTO AND MODIFY EXISTING INLET TO REMOVE EXISTING OUTLET PIPE AND PLACE NEW OUTLET PIPE
EXIST. "NISSAN" SIGN
TEMP. CONSTR. EASEMENT
SURVEILLANCE CAMERA (TO BE MAINTAINED DURING CONSTRUCTION)
R= 45' L= 41.82' Δ= 53°15'04"
N 64° 04' 23" E 14.98'
CONST. 33 LF OF 36" RCP
CONST. 16 LF OF 36" RCP
CONST. MES (2:1) FL EL 20.00 INDEX NO. 272
CONTROL STRUCTURE
BOTTOM ELEV. = 16.0
NORMAL WATER ELEVATION = 21.0
SJRWMD, DEP AND ACOE JURISDICTIONAL LIMITS
(NORTH DRAINAGE BASIN)
REMOVE EXIST. ENDWALL
CONST. 8 LF OF 18" RCP
HA-5
ACOE JURISDICTIONAL LIMITS
NORTHBOUND
SURVEY I-95
WESTERN WAY
EXISTING STRUCTURES
E-107 GRATE INLET GRATE EL 25.59 FL EL 22.41
E-108 GRATE INLET GRATE EL 26.63 FL EL 22.18 (EXIST.) FL EL 22.18 (PROP)
E-109 GRATE INLET GRATE EL 24.75 FL EL 21.54
E-110 GRATE INLET GRATE EL 25.38 FL EL 22.08
E-111 GRATE INLET GRATE EL 27.55 FL EL 25.08 30 LF 18" PIPE STRAIGHT ENDWALL FL EL 24.66
NISSAN DEALERSHIP BUILDING
PROPOSED STRUCTURES
S-84 STA 633+59, 952' RT CONST. STRAIGHT CONC. ENDWALL INDEX NO 250 FL EL 24.60 CONNECT TO EXIST. 18" PIPE CONST. CONC. JACKET INDEX NO. 280
S-93 STA 636+07, 547' RT CONST. MANHOLE, TYPE P-7 INDEX NO 200, 201 TOP EL 26.90 FL EL 20.34
S-94 STA 635+92, 771' RT CONST. MANHOLE, TYPE P-7 INDEX NO 200, 201 TOP EL 27.00 FL EL 20.18 (18") FL EL 20.18 (30") FL EL 20.18 (36")
S-95 STA 635+83, 936' RT CONST. MANHOLE, TYPE P-7 INDEX NO 200, 201 TOP EL 26.50 FL EL 20.02
S-96 STA 635+66, 990.0' RT CONTROL WEIR SEE OFFSITE DRAINAGE DETAILS
S-99 STA 635+46, 948' RT CONST. MANHOLE, TYPE P-7 INDEX NO 200, 201 TOP EL 26.00 FL EL 20.01
CONST. 1208 L.F. TYPE "B" FENCE GATE TO GATE
TEMP. PARKING AND TEMP. CONSTR. EASEMENT
CONST. CANTILEVER SLIDE GATE
CONST. 1880 L.F. TYPE "B" FENCE (GATE TO GATE)
PROPOSED DRAINAGE R/W LINE
RECEIVED JAN 15 1997 SJRWMD JACKSONVILLE
NOTE: SEE OFFSITE DRAINAGE DETAILS FOR SECTIONS.
TRANSITION TOP TO MATCH EXISTING
REVISIONS
DATE BY DESCRIPTION



ELEVATION

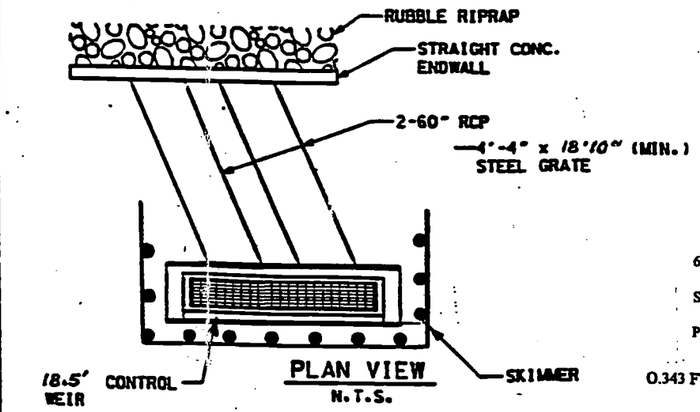
SCALE : HORIZ. 1"=20'



SKIMMER POST DETAIL

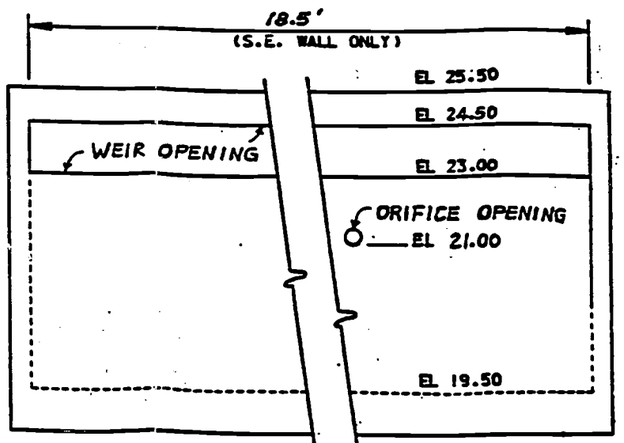
N.T.S.

NOTE: SKIMMER & SKIMMER POST TO BE INCLUDED IN THE COST OF STR. S-96.

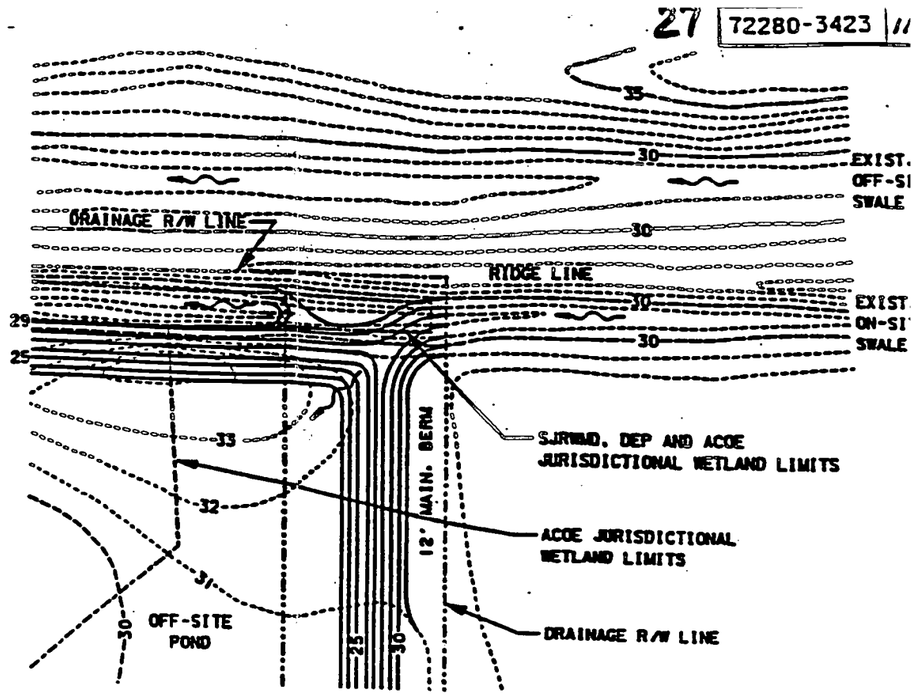


PLAN VIEW

N.T.S.

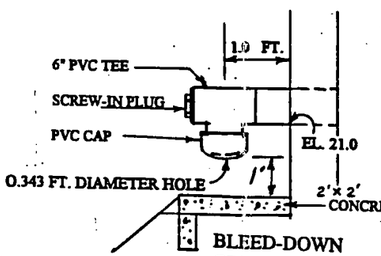


SOUTH ELEVATION



DIRECTIONAL SWALE DETAIL

N.T.S.

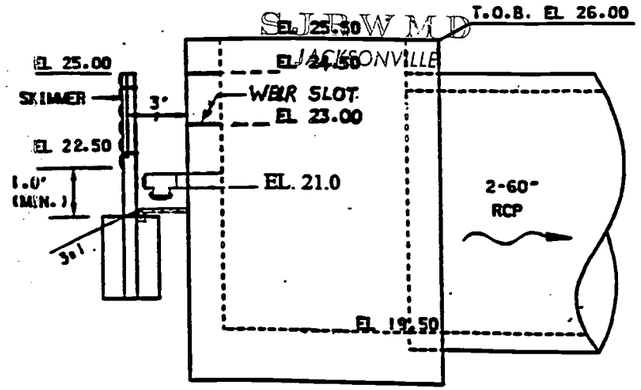


BLEED-DOWN ORIFICE DETAIL

CONTROL STRUCTURE
CONST. DBI TYPE "K"
INDEX NO. 235
GRATE EL. 25.50
WEIR EL. 23.00
INV. EL. 19.50

52 L.F. 60" RCP

CONST. STRAIGHT CONC. ENDWALL INDEX NO.251 (2-60" RCP)
EL. 19.49



EAST ELEVATION

CONTROL STRUCTURE S-96

N.T.S.

AVERAGE END AREA

STAGE	AREA (AC)
16	2.23
17	2.34
18	2.45
19	2.56
20	2.68
21	2.79
22	2.9
23	3.01
24	3.13
25	3.24
26	3.35

Pond stage vs. Volume

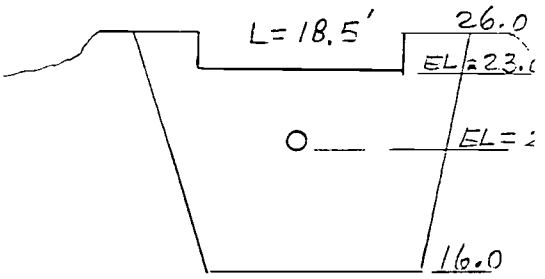
STAGE	STORAGE (AC-FT)
16	0
17	2.2849
18	4.68
19	7.185
20	9.805
21	12.54
22	15.385
23	18.34
24	21.41
25	24.595
26	27.89

Bleed down Elevation → 21

Permanent Pool Volume > 11.1 A.F. @ EL. 21.0

WEIR STRUCTURE

CREST ELEVATION = 23 FEET
WEIR LENGTH = 18.5 FEET
COEFFICIENT = 3



STAGE (FT)	DISCHARGE (CFS)
23	0
24	55.5
25	156.97
26	288.38

PERC RATE = 0 IN/HR

STAGE (FT)	PERCOLATION (CFS)

AVERAGE END AREA

STAGE	AREA (AC)
21	2.79
22	2.9
23	3.01
24	3.13
25	3.24
26	3.35

STAGE	STORAGE (AC-FT)
21	0
22	2.845
23	5.8
24	8.870001
25	12.055
26	15.35

ORIFICE STRUCTURE

NUMBER OF IDENTICAL ORIFICES = 1
INVERT ELEVATION = 21 FEET
DIAMETER = .343 FEET
COEFFICIENT = .6

Orifice Discharge

STAGE (FT)	DISCHARGE (CFS)
21	0
22	.4048023
22.5	.5125986
23	.6013733
23.5	.6786326
24	.7479537
24.5	.8113735
25	.8701836
25.5	.9252632
26	.9772434

PERC RATE = 0 IN/HR

STAGE (FT)	PERCOLATION (CFS)

AVERAGE END AREA

STAGE	AREA (AC)
21	2.79
22	2.9
23	3.01
24	3.13
25	3.24
26	3.35

STAGE	STORAGE (AC-FT)
21	0
22	2.845
23	5.8
24	8.870001
25	12.055
26	15.35

Stage-Storage from Normal Water Elevation

WEIR STRUCTURE

CREST ELEVATION = 23 FEET
WEIR LENGTH = 18.5 FEET
COEFFICIENT = 3

Weir Discharge

STAGE (FT)	DISCHARGE (CFS)
23	0
23.5	19.62221
24	55.5
24.5	101.96
25	156.9777
25.5	219.383
26	288.3864

PERC RATE = 0 IN/HR

STAGE (FT)	PERCOLATION (CFS)

POND MEAN DEPTH Below Normal Water Elevation

**Volume between Pond Bottom (elev. 16.0) and Normal Water Elevation (21.0) = 12.54 ac.ft.

**Area of pond at Normal Water Elevation = 2.79 ac.

MEAN DEPTH : 12.54 ac.ft. / 2.79 ac. = 4.5 ft.

**Maximum Depth = 21.0 - 16.0 = 5.0 ft.

DETERMINE : Time Of Concentration (Tc)

**EXISTING
Distance = 400' overland
Slope = .011 ft./ft.
Flow velocity = 31 fpm
Time of flow = 400' / 31 fpm = 12.9 min.

Distance = 1600' shallow ditch
Slope = .0035 ft./ft.
Flow velocity = 78 fpm
Time of flow = 1600' / 78 fpm = 20.5 min.

Tc = 12.9 min. + 20.5 min. = 33.4 min. * 33.4 min. / 60 min. Per hr. = 0.56 Hrs.

**PROPOSED
Distance = 400' overland
Slope = .011 ft./ft.
Flow velocity = 31 fpm
Time of flow = 400' / 31 fpm = 12.9 min.

Distance = 850' shallow ditch
Slope = .001 ft./ft.
Flow velocity = 69 fpm
Time of flow = 850' / 69 fpm = 12.3 min.

Tc = 12.9 min. + 12.3 min. = 25.2 min. * 25.2 min. / 60 min. Per hr. = 0.42 Hrs.

TIME 14:03:22 DATE 09-26-1996

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**********************************
*                                *
*        For use by the          *
*                                *
*  Fla. Dept. of Transportation  *
*                                *
*             only               *
*                                *
**********************************
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This Program uses the St. Johns Water Management District's dimenionless rainfall distributions, the 24 hour rainfall and the SCS curvelinear unit hydrograph method to compute a runoff hydrograph. The hydrograph is routed through a retention/detention area using the Storage Indication Method.

PROJECT DESCRIPTION :
I95 Widening 72280-1423
Wet detention pond at Nissan dealer
25-yr, 24-hr storm, *NOTE: Discharge shown as perc. is Bleed-down

DRAINAGE AREA = 43.15 ACRES
PRE-DEVELOPMENT CURVE NUMBER = 90.39
PRE-DEVELOPMENT TIME OF CONCENTRATION = .56 HOURS
PRE-DEVELOPMENT SHAPE FACTOR = 484
POST-DEVELOPMENT CURVE NUMBER = 90.43
POST-DEVELOPMENT TIME OF CONCENTRATION = .42 HOURS
POST-DEVELOPMENT SHAPE FACTOR = 484

STAGE (FT)	STORAGE (AC FT)
21.00	0
22.00	2.845
23.00	5.8
24.00	8.87
25.00	12.055
26.00	15.35

STAGE (FT)	DISCHARGE (CFS)
23.00	0.00
24.00	55.50
25.00	156.98
26.00	288.39

STAGE (FT)	PERCOLATION (CFS)
21.00	0.00
22.00	0.50
23.00	0.60
24.00	0.75
25.00	0.87
26.00	1.22

TIME 14:03:29 DATE 09-26-1996

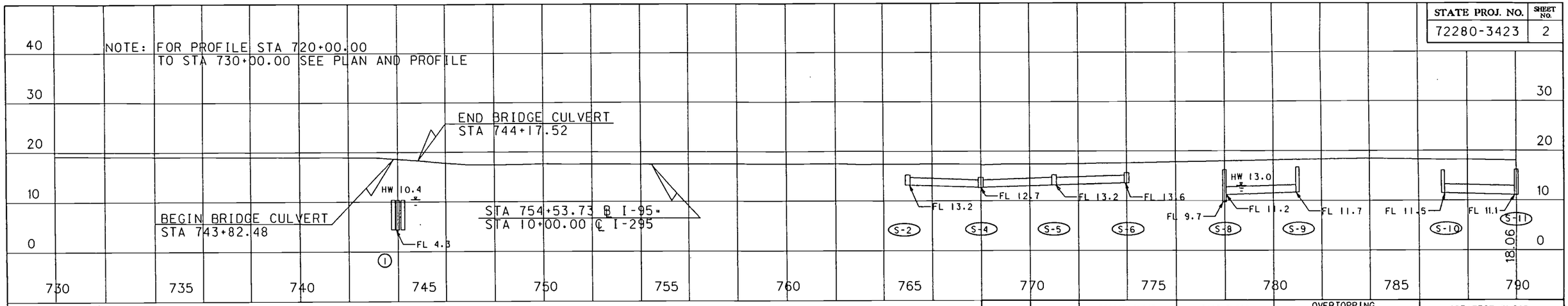
315.00	0.00	0.02	21.04
316.00	0.00	0.02	21.04
317.00	0.00	0.02	21.04
318.00	0.00	0.02	21.04
319.00	0.00	0.02	21.04
320.00	0.00	0.02	21.04
321.00	0.00	0.02	21.04
322.00	0.00	0.02	21.03
323.00	0.00	0.02	21.03
324.00	0.00	0.02	21.03

RESULTS OF ANALYSIS :

PEAK SURFACE DISCHARGE = 78.82 CFS
ALLOWABLE PEAK SURFACE DISCHARGE = 105.82 CFS
SURFACE DISCHARGE VOLUME = 18.6788 AC. FT.
ALLOWABLE SURFACE DISCHARGE VOLUME = 26.9087 AC. FT.
MAXIMUM STAGE = 24.23 FT
STORAGE REQUIRED = 9.6018 AC. FT.

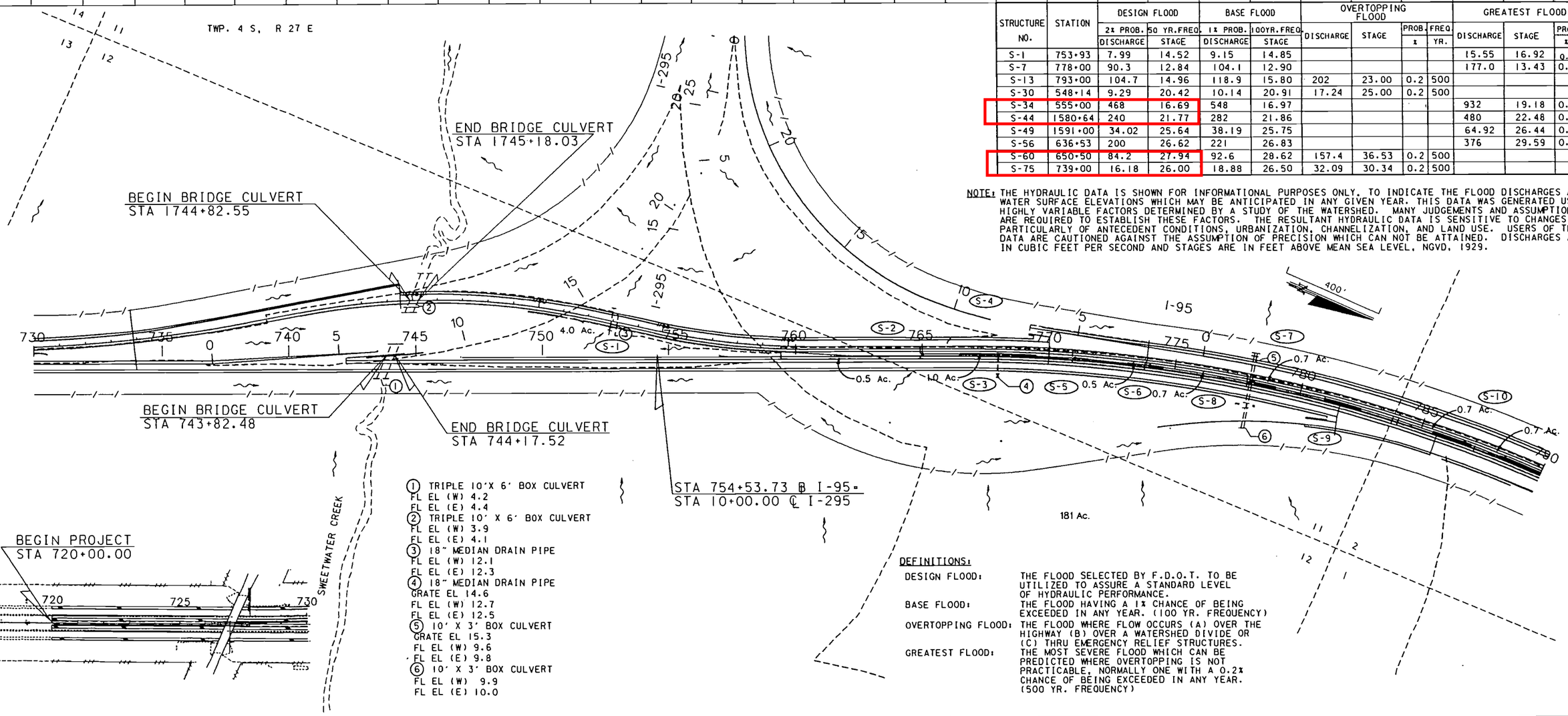
Permit #18228-3: Widening I-95 from 4 to 6 Lanes

STATE PROJ. NO.	SHEET NO.
72280-3423	2



STRUCTURE NO.	STATION	DESIGN FLOOD 2% PROB. DISCHARGE	DESIGN FLOOD 50 YR.FREQ. STAGE	BASE FLOOD 1% PROB. DISCHARGE	BASE FLOOD 100YR.FREQ. STAGE	OVERTOPPING FLOOD DISCHARGE	OVERTOPPING FLOOD STAGE	OVERTOPPING FLOOD PROB. %	OVERTOPPING FLOOD FREQ. YR.	GREATEST FLOOD DISCHARGE	GREATEST FLOOD STAGE	GREATEST FLOOD PROB. %	GREATEST FLOOD FREQ. YR.
S-1	753+93	7.99	14.52	9.15	14.85					15.55	16.92	0.2	500
S-7	778+00	90.3	12.84	104.1	12.90					177.0	13.43	0.2	500
S-13	793+00	104.7	14.96	118.9	15.80	202	23.00	0.2	500				
S-30	548+14	9.29	20.42	10.14	20.91	17.24	25.00	0.2	500				
S-34	555+00	468	16.69	548	16.97					932	19.18	0.2	500
S-44	1580+64	240	21.77	282	21.86					480	22.48	0.2	500
S-49	1591+00	34.02	25.64	38.19	25.75					64.92	26.44	0.2	500
S-56	636+53	200	26.62	221	26.83					376	29.59	0.2	500
S-60	650+50	84.2	27.94	92.6	28.62	157.4	36.53	0.2	500				
S-75	739+00	16.18	26.00	18.88	26.50	32.09	30.34	0.2	500				

NOTE: THE HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. TO INDICATE THE FLOOD DISCHARGES AND WATER SURFACE ELEVATIONS WHICH MAY BE ANTICIPATED IN ANY GIVEN YEAR. THIS DATA WAS GENERATED USING HIGHLY VARIABLE FACTORS DETERMINED BY A STUDY OF THE WATERSHED. MANY JUDGEMENTS AND ASSUMPTIONS ARE REQUIRED TO ESTABLISH THESE FACTORS. THE RESULTANT HYDRAULIC DATA IS SENSITIVE TO CHANGES, PARTICULARLY OF ANTECEDENT CONDITIONS, URBANIZATION, CHANNELIZATION, AND LAND USE. USERS OF THIS DATA ARE CAUTIONED AGAINST THE ASSUMPTION OF PRECISION WHICH CAN NOT BE ATTAINED. DISCHARGES ARE IN CUBIC FEET PER SECOND AND STAGES ARE IN FEET ABOVE MEAN SEA LEVEL, NGVD, 1929.



① TRIPLE 10'X 6' BOX CULVERT
FL EL (W) 4.2
FL EL (E) 4.4
② TRIPLE 10' X 6' BOX CULVERT
FL EL (W) 3.9
FL EL (E) 4.1
③ 18" MEDIAN DRAIN PIPE
FL EL (W) 12.1
FL EL (E) 12.3
④ 18" MEDIAN DRAIN PIPE
GRATE EL 14.6
FL EL (W) 12.7
FL EL (E) 12.5
⑤ 10' X 3' BOX CULVERT
GRATE EL 15.3
FL EL (W) 9.6
FL EL (E) 9.8
⑥ 10' X 3' BOX CULVERT
FL EL (W) 9.9
FL EL (E) 10.0

DEFINITIONS:

DESIGN FLOOD:	THE FLOOD SELECTED BY F.D.O.T. TO BE UTILIZED TO ASSURE A STANDARD LEVEL OF HYDRAULIC PERFORMANCE.
BASE FLOOD:	THE FLOOD HAVING A 1% CHANCE OF BEING EXCEEDED IN ANY YEAR. (100 YR. FREQUENCY)
OVERTOPPING FLOOD:	THE FLOOD WHERE FLOW OCCURS (A) OVER THE HIGHWAY (B) OVER A WATERSHED DIVIDE OR (C) THRU EMERGENCY RELIEF STRUCTURES.
GREATEST FLOOD:	THE MOST SEVERE FLOOD WHICH CAN BE PREDICTED WHERE OVERTOPPING IS NOT PRACTICABLE, NORMALLY ONE WITH A 0.2% CHANCE OF BEING EXCEEDED IN ANY YEAR. (500 YR. FREQUENCY)

j:\rdgrmpr01.dgn Mon Feb 6 23:47:09 1995

REVISIONS

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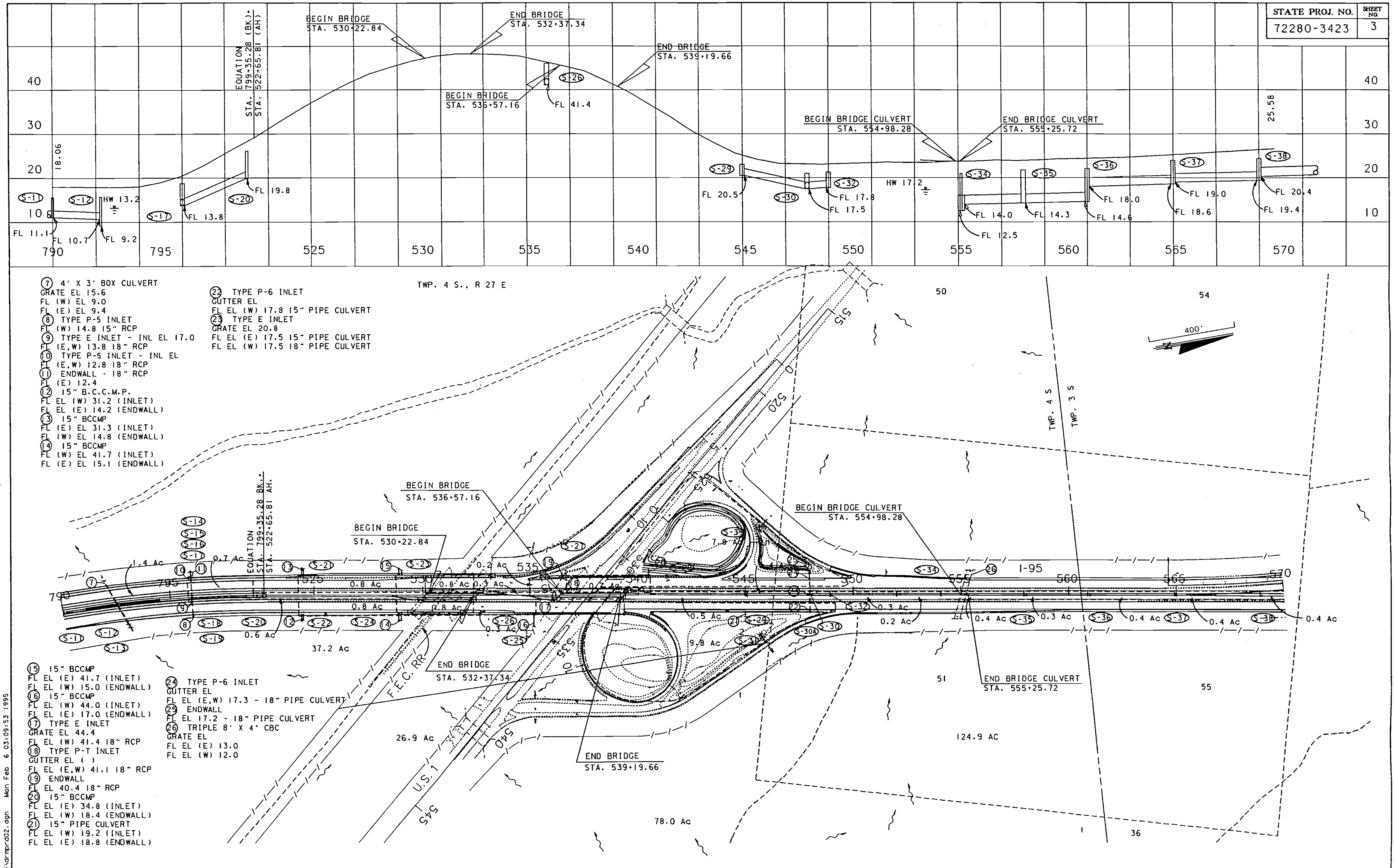
FLORIDA DEPARTMENT OF TRANSPORTATION

VOLKERT

DRAINAGE MAP



STATE PROJ. NO. 72280-3423
SHEET NO. 3
BEGIN BRIDGE STA. 530+22.84
END BRIDGE STA. 532+37.34
END BRIDGE STA. 539+19.66
BEGIN BRIDGE STA. 536+57.16
EQUATION STA. 799+35.28 (BK.) STA. 522+65.81 (AH)
BEGIN BRIDGE CULVERT STA. 554+98.28
END BRIDGE CULVERT STA. 555+25.72
TWP. 4 S., R 27 E
TWP. 4 S
TWP. 3 S
F.E.C. RR
U.S. 1
I-95
400'
7 4' X 3' BOX CULVERT
GRATE EL 15.6
FL (W) EL 9.0
FL (E) EL 9.4
8 TYPE P-5 INLET
FL (W) 14.8 15" RCP
9 TYPE E INLET - INL EL 17.0
FL (E,W) 13.8 18" RCP
10 TYPE P-5 INLET - INL EL
FL (E,W) 12.8 18" RCP
11 ENDWALL - 18" RCP
FL (E) 12.4
12 15" B.C.C.M.P.
FL EL (W) 31.2 (INLET)
FL EL (E) 14.2 (ENDWALL)
13 15" BCCMP
FL (E) EL 31.3 (INLET)
FL (W) EL 14.8 (ENDWALL)
14 15" BCCMP
FL (W) EL 41.7 (INLET)
FL (E) EL 15.1 (ENDWALL)
22 TYPE P-6 INLET
GUTTER EL
FL EL (W) 17.8 15" PIPE CULVERT
23 TYPE E INLET
GRATE EL 20.8
FL EL (E) 17.5 15" PIPE CULVERT
FL EL (W) 17.5 18" PIPE CULVERT
15 15" BCCMP
FL EL (E) 41.7 (INLET)
FL EL (W) 15.0 (ENDWALL)
16 15" BCCMP
FL EL (W) 44.0 (INLET)
FL EL (E) 17.0 (ENDWALL)
17 TYPE E INLET
GRATE EL 44.4
FL EL (W) 41.4 18" RCP
18 TYPE P-T INLET
GUTTER EL ( )
FL EL (E,W) 41.1 18" RCP
19 ENDWALL
FL EL 40.4 18" RCP
20 15" BCCMP
FL EL (E) 34.8 (INLET)
FL EL (W) 18.4 (ENDWALL)
21 15" PIPE CULVERT
FL EL (W) 19.2 (INLET)
FL EL (E) 18.8 (ENDWALL)
24 TYPE P-6 INLET
GUTTER EL
FL EL (E,W) 17.3 - 18" PIPE CULVERT
25 ENDWALL
FL EL 17.2 - 18" PIPE CULVERT
26 TRIPLE 8' X 4' CBC
GRATE EL
FL EL (E) 13.0
FL EL (W) 12.0
37.2 Ac
26.9 Ac
78.0 Ac
124.9 AC

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REVISIONS

FLORIDA DEPARTMENT OF TRANSPORTATION

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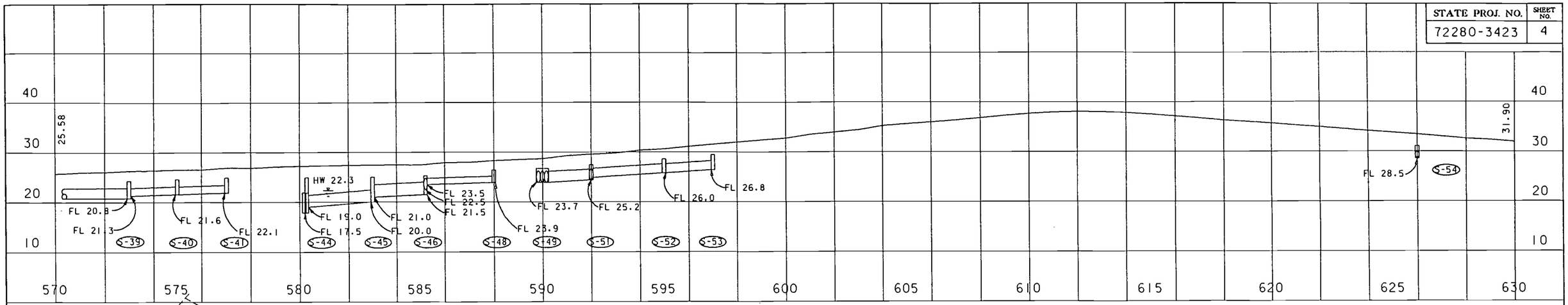
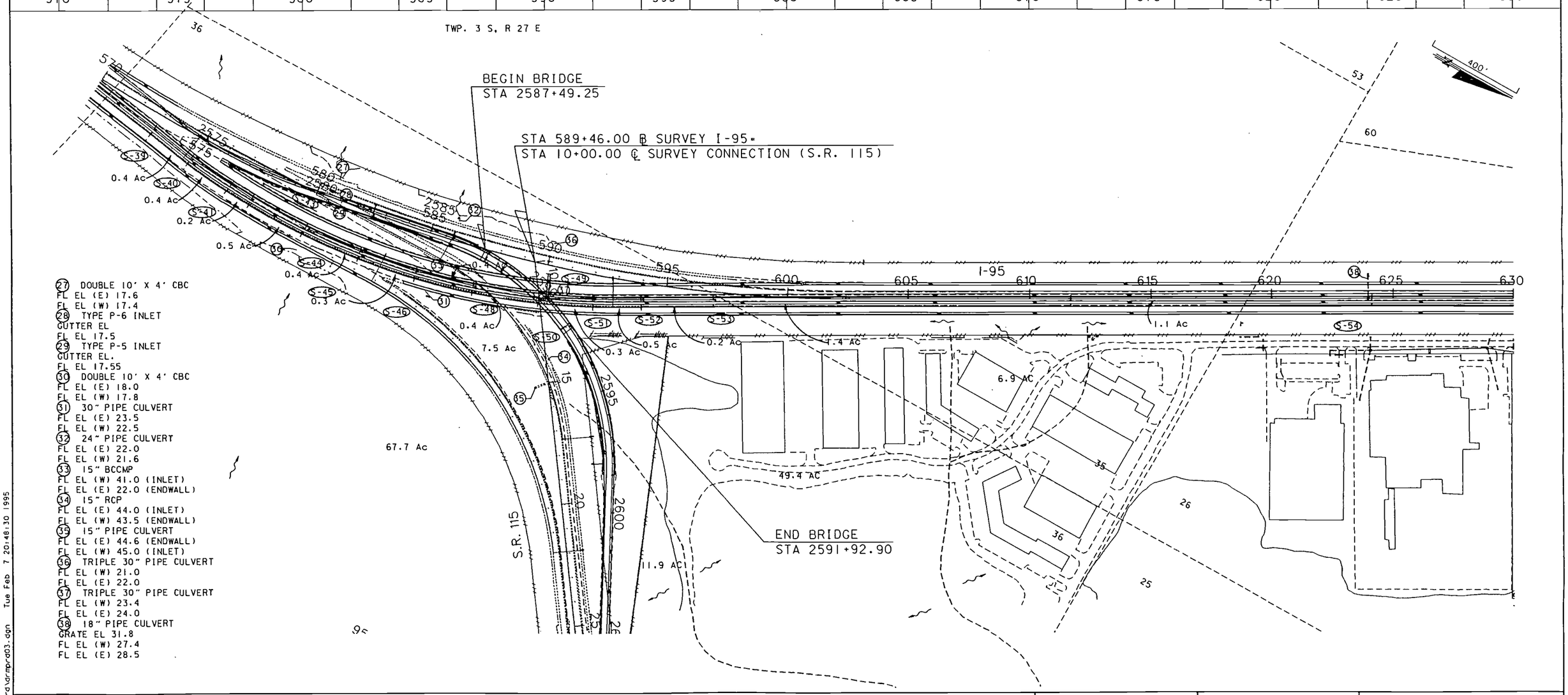
DRAINAGE MAP

j:\lrd\drnprd02.dgn Mon Feb 6 03:09:53 1995

STATE PROJ. NO.	SHEET NO.
72280-3423	4





(27) DOUBLE 10' X 4' CBC
FL EL (E) 17.6
FL EL (W) 17.4
(28) TYPE P-6 INLET
GUTTER EL
FL EL 17.5
(29) TYPE P-5 INLET
GUTTER EL.
FL EL 17.55
(30) DOUBLE 10' X 4' CBC
FL EL (E) 18.0
FL EL (W) 17.8
(31) 30" PIPE CULVERT
FL EL (E) 23.5
FL EL (W) 22.5
(32) 24" PIPE CULVERT
FL EL (E) 22.0
FL EL (W) 21.6
(33) 15" BCCMP
FL EL (W) 41.0 (INLET)
FL EL (E) 22.0 (ENDWALL)
(34) 15" RCP
FL EL (E) 44.0 (INLET)
FL EL (W) 43.5 (ENDWALL)
(35) 15" PIPE CULVERT
FL EL (E) 44.6 (ENDWALL)
FL EL (W) 45.0 (INLET)
(36) TRIPLE 30" PIPE CULVERT
FL EL (W) 21.0
FL EL (E) 22.0
(37) TRIPLE 30" PIPE CULVERT
FL EL (W) 23.4
FL EL (E) 24.0
(38) 18" PIPE CULVERT
GRATE EL 31.8
FL EL (W) 27.4
FL EL (E) 28.5

REVISIONS															
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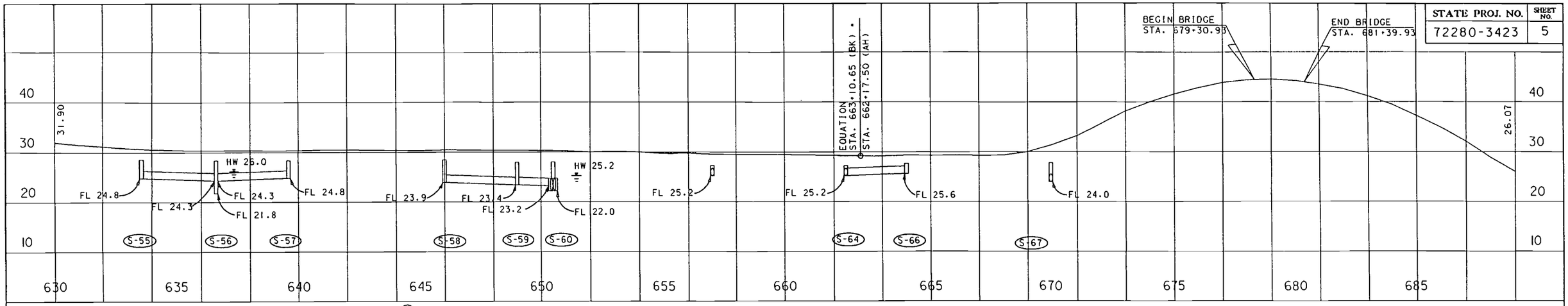
DRAINAGE MAP

j:\lrd\drmprd03.dgn Tue Feb 7 20:48:30 1995

STATE PROJ. NO.	SHEET NO.
72280-3423	5



(39) 8' X 4' CBC
GRATE EL. 26.7
FL EL (W) 21.6
FL EL (E) 22.0

(40) DOUBLE 30" PIPE CULVERT
GRATE EL 27.5
FL EL (W) 22.0
FL EL (E) 22.4

(41) 18" PIPE CULVERT
GRATE EL 27.1
FL EL (E) 25.2
FL EL (W) 25.0

(42) 18" PIPE CULVERT
GRATE EL 27.1
FL EL (E) 25.2
FL EL (W) 25.1

(43) ENDWALL
FL EL 23.2 - 18" RCP

(44) TYPE P-5 INLET
GUTTER EL
FL EL (E) 23.4

(45) TYPE E INLET
GRATE EL 26.6
FL EL (W) 24.0 18" RCP

(46) TYPE P-5 INLET
GUTTER EL
FL EL (E,W) 23.8 18" RCP

(47) ENDWALL
FL EL 23.6 18" RCP

(48) 15" BCCMP
FL EL (W) 36.2 (INLET)
FL EL (E) 22.3 (ENDWALL)

(49) 15" BCCMP
FL EL (W) 22.6 (ENDWALL)
FL EL (E) 36.2 (INLET)

(50) ENDWALL
FL EL 16.2 - 30" RCP

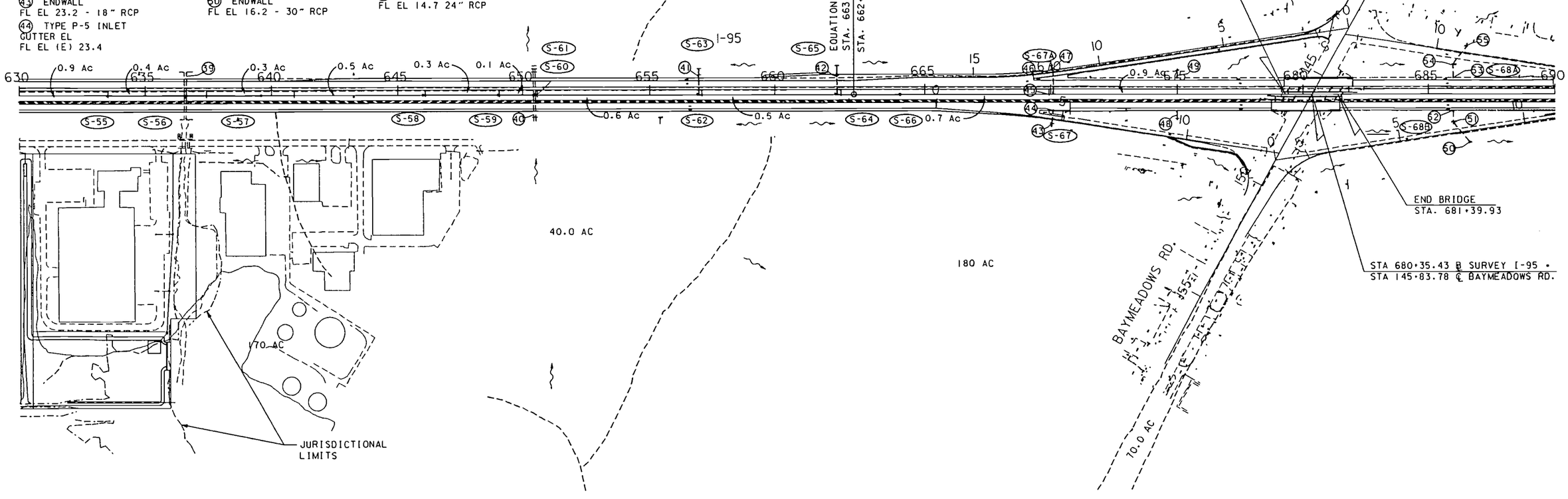
(51) INLET TYPE E
GRATE EL 19.4
FL EL (E) 16.4 30" RCP
FL EL (W) 16.5 15" BCCMP

(52) INLET TYPE P-5
GUTTER EL
FL EL (E) 34.0 15" BCCMP

(53) INLET TYPE P-5
GUTTER EL
FL EL (W) 34.0 15" BCCMP

(54) INLET TYPE E
GRATE EL 17.4
FL EL (E) 14.9 15" BCCMP
FL EL (W) 14.9 24" RCP

(55) ENDWALL
FL EL 14.7 24" RCP



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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

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DRAINAGE MAP

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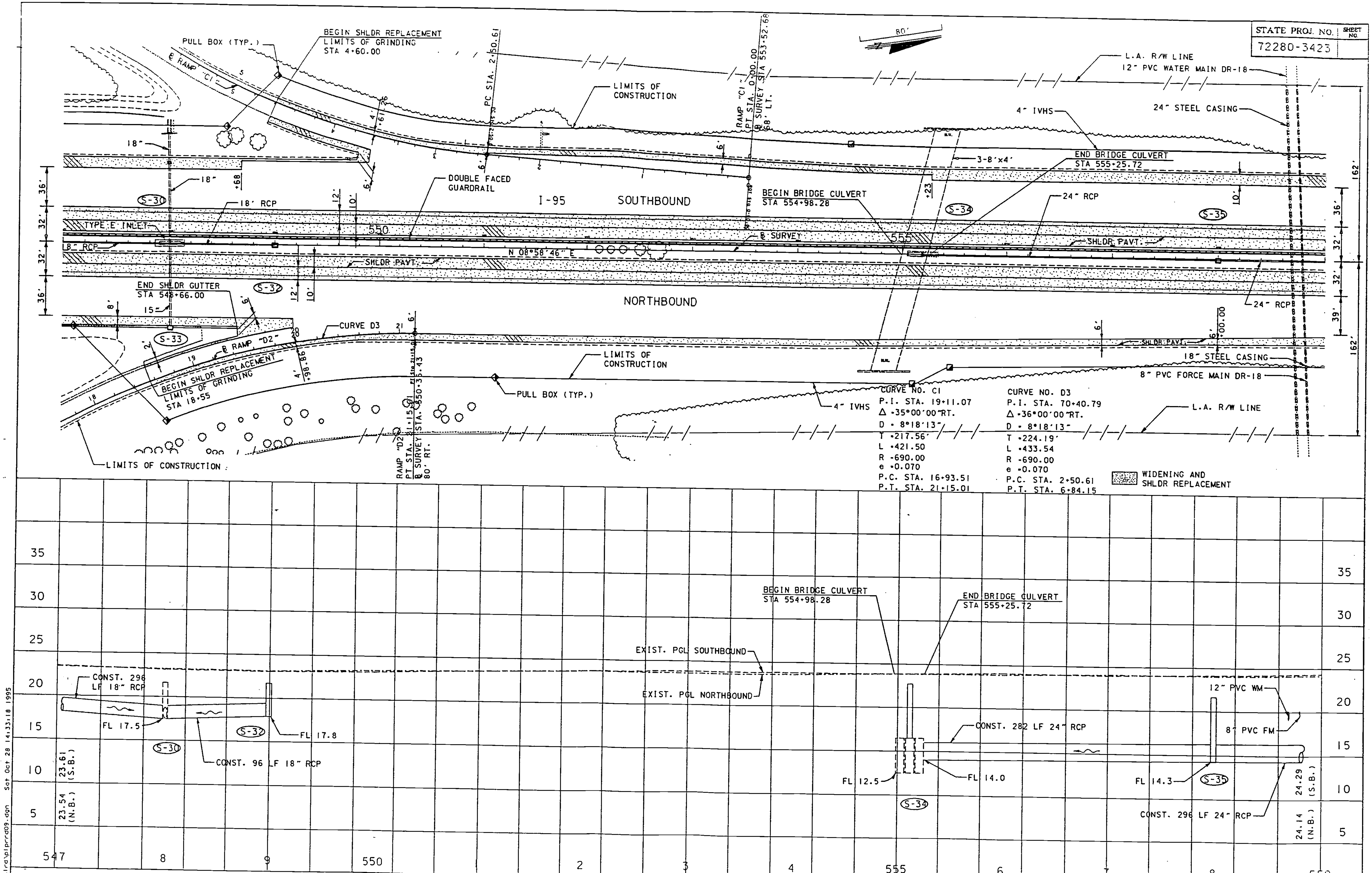
PULL BOX (TYP.)
BEGIN SHLDR REPLACEMENT
LIMITS OF GRINDING
STA 4+60.00
PC STA. 2+50.61
LIMITS OF CONSTRUCTION
RAMP "C1" PT STA. 0+00.00
℄ SURVEY STA 553+52.68
68' LT.
L.A. R/W LINE
12" PVC WATER MAIN DR-18
24" STEEL CASING
4" IVHS
3-8'x4'
END BRIDGE CULVERT
STA 555+25.72
BEGIN BRIDGE CULVERT
STA 554+98.28
24" RCP
DOUBLE FACED GUARDRAIL
I-95
SOUTHBOUND
18" RCP
TYPE E INLET
18" RCP
℄ SURVEY
N 08°58'46" E
SHLDR PAVT.
550
555
NORTHBOUND
END SHLDR GUTTER
STA 548+66.00
15"
S-30
S-32
S-33
S-34
S-35
CURVE D3
℄ RAMP "D2"
BEGIN SHLDR REPLACEMENT
LIMITS OF GRINDING
STA 18+55
18" STEEL CASING
8" PVC FORCE MAIN DR-18
RAMP "D2" PT STA. 21+15.01
℄ SURVEY STA. 550+35.43
80' RT.
LIMITS OF CONSTRUCTION
CURVE NO. C1
P.I. STA. 19+11.07
Δ =35°00'00"RT.
D = 8°18'13"
T =217.56'
L =421.50
R =690.00
e =0.070
P.C. STA. 16+93.51
P.T. STA. 21+15.01
CURVE NO. D3
P.I. STA. 70+40.79
Δ =36°00'00"RT.
D = 8°18'13"
T =224.19'
L =433.54
R =690.00
e =0.070
P.C. STA. 2+50.61
P.T. STA. 6+84.15
WIDENING AND SHLDR REPLACEMENT
36'
32'
32'
36'
39'
162'
162'
CONST. 296 LF 18" RCP
FL 17.5
CONST. 96 LF 18" RCP
FL 17.8
EXIST. PGL SOUTHBOUND
EXIST. PGL NORTHBOUND
BEGIN BRIDGE CULVERT
STA 554+98.28
END BRIDGE CULVERT
STA 555+25.72
CONST. 282 LF 24" RCP
FL 12.5
FL 14.0
FL 14.3
12" PVC WM
8" PVC FM
CONST. 296 LF 24" RCP
23.61 (S.B.)
23.54 (N.B.)
24.29 (S.B.)
24.14 (N.B.)
35
30
25
20
15
10
5
547
8
9
550
2
3
4
555
6
7
8
559

STATE PROJ. NO.	SHEET NO.
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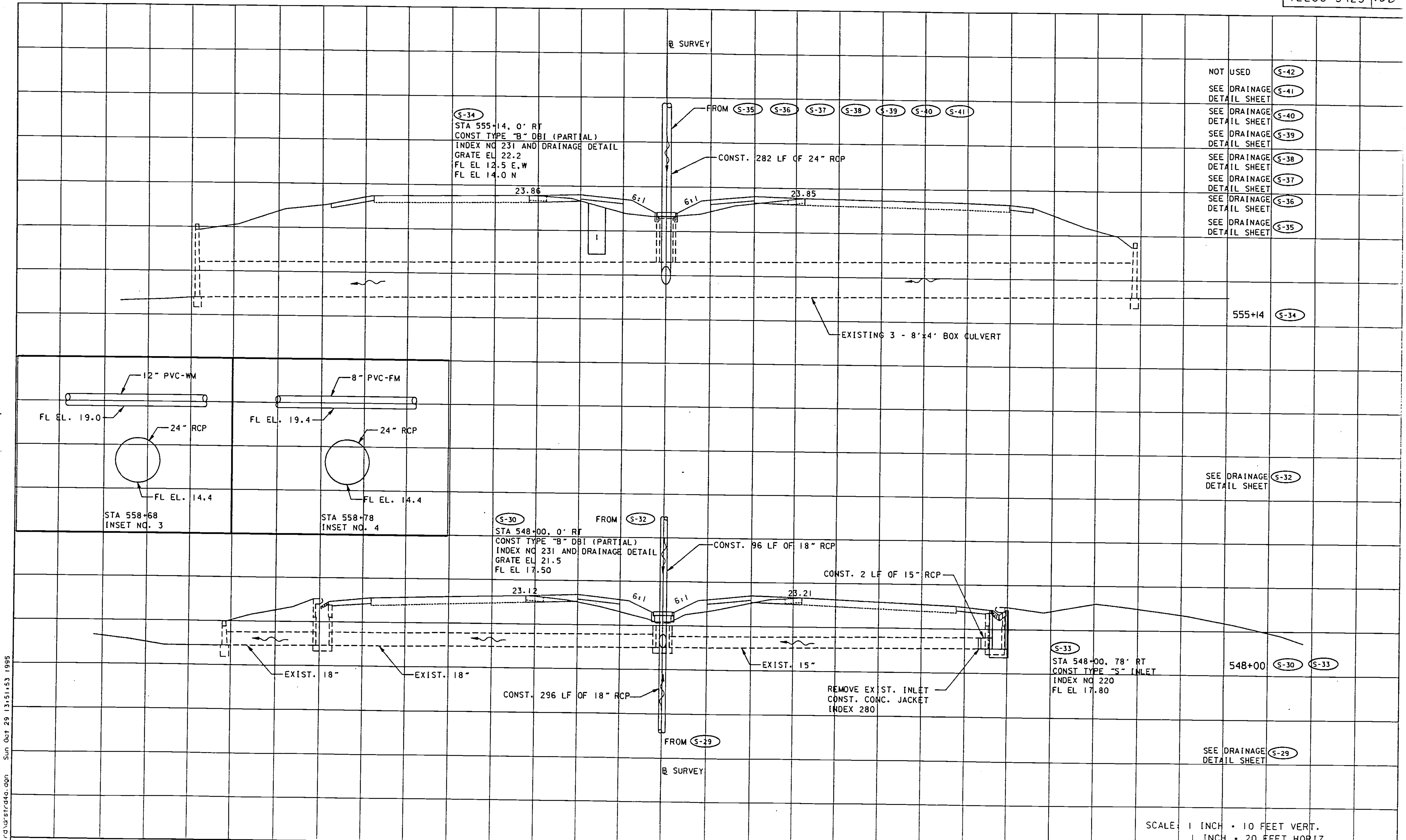
PLAN/PROFILE

STATE PROJ. NO.	SHEET NO.
72280-3423	108



℄ SURVEY
NOT USED (S-42)
SEE DRAINAGE DETAIL SHEET (S-41)
SEE DRAINAGE DETAIL SHEET (S-40)
SEE DRAINAGE DETAIL SHEET (S-39)
SEE DRAINAGE DETAIL SHEET (S-38)
SEE DRAINAGE DETAIL SHEET (S-37)
SEE DRAINAGE DETAIL SHEET (S-36)
SEE DRAINAGE DETAIL SHEET (S-35)
FROM (S-35) (S-36) (S-37) (S-38) (S-39) (S-40) (S-41)
(S-34)
STA 555+14, 0' RT
CONST TYPE "B" DBI (PARTIAL)
INDEX NO 231 AND DRAINAGE DETAIL
GRATE EL 22.2
FL EL 12.5 E,W
FL EL 14.0 N
CONST. 282 LF OF 24" RCP
23.86
6:1
6:1
23.85
555+14 (S-34)
EXISTING 3 - 8'x4' BOX CULVERT
12" PVC-WM
FL EL. 19.0
24" RCP
FL EL. 14.4
STA 558+68
INSET NO. 3
8" PVC-FM
FL EL. 19.4
24" RCP
FL EL. 14.4
STA 558+78
INSET NO. 4
SEE DRAINAGE DETAIL SHEET (S-32)
(S-30)
STA 548+00, 0' RT
CONST TYPE "B" DBI (PARTIAL)
INDEX NO 231 AND DRAINAGE DETAIL
GRATE EL 21.5
FL EL 17.50
FROM (S-32)
CONST. 96 LF OF 18" RCP
CONST. 2 LF OF 15" RCP
23.12
6:1
6:1
23.21
EXIST. 18"
EXIST. 18"
EXIST. 15"
CONST. 296 LF OF 18" RCP
REMOVE EXIST. INLET
CONST. CONC. JACKET
INDEX 280
(S-33)
STA 548+00, 78' RT
CONST TYPE "S" INLET
INDEX NO 220
FL EL 17.80
548+00 (S-30) (S-33)
FROM (S-29)
℄ SURVEY
SEE DRAINAGE DETAIL SHEET (S-29)
SCALE: 1 INCH = 10 FEET VERT.
1 INCH = 20 FEET HORIZ.

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DRAINAGE STRUCTURES

STATE PROJ. NO.	SHEET NO.
72280-3423	109

℄ SURVEY

CONST. 296 LF OF 18" RCP

FROM (S-57)

30.33

6:1

6:1

30.30

SEE DRAINAGE DETAIL SHEET (S-57)
636+53 (S-56)

EXISTING 8'x4' BOX CULVERT

(S-56)
STA 636+53, 0.00' RT.
CONST. TYPE "B" DBI (PARTIAL)
INDEX NO. 231 AND DRAINAGE DETAIL
GRATE EL 28.6
FL EL 21.8 E.W
FL EL 24.3 N.S

CONST. 296 LF OF 18" RCP

FROM (S-55)

SEE DRAINAGE DETAIL SHEET (S-55)

SEE DRAINAGE DETAIL SHEET (S-54)

SEE DRAINAGE DETAIL SHEET (S-53)

SEE DRAINAGE DETAIL SHEET (S-52)

SEE DRAINAGE DETAIL SHEET (S-51)

℄ NORTHBOUND

FROM (S-51) (S-52) (S-53)

CONST. 212 LF OF 24" RCP

29.08

29.00

1591+00 (S-50) (S-49)

3-30" RCP

CONST. 90 LF OF 3-30" RCP's

CONST. 20 LF OF 3-30" RCP's

STA 1591+00, 92.00' LT.
CONST. STRAIGHT ENDWALL
INDEX NO. 250
FL. EL. 22.4

FL 24.3

(S-49)
STA 1591+00, 31.00' LT.
CONST. TYPE "A" INLET w/
"J" BOTTOM (3.5'x24.0')
INDEX NO. 200.230
GRATE EL 27.4
FL EL 23.0

(S-50)
STA 1591+00, 15.00' LT.
CONST. JUNC. BOX
TYPE "J-7" (3.5'x24.0')
INDEX NO. 200
FL EL 23.6 (E)
FL EL 23.1 (W)

NOTE: SEE DRAINAGE DETAIL FOR ADDITIONAL INFORMATION S-49 & S-50

SEE DRAINAGE DETAIL SHEET (S-48)
NOT USED (S-47)

SEE DRAINAGE DETAIL SHEET (S-46)

SEE DRAINAGE DETAIL SHEET (S-45)

FROM (S-45) (S-46) (S-48)

CONST. 222 LF OF 30" RCP

(S-44)
STA 1580+64, 1.00' RT.
CONST. TYPE B INLET
(IN SOUTH 10'x4' CBC)
GRATE EL 25.5

1580+64.00 (S-44)

SEE DRAINAGE DETAIL SHEET (S-43)

24'

26.31

℄ RAMP 'F'

27.15

6:1

6:1

24.45

6:1

27.15

6:1

6:1

27.23

REMOVE EXIST. BOX CULVERT WINGWALLS

CONST 180 LF 2-10'x4' CBC EXTENSION

EXIST. 2-10'x4' CBC

FL 19.0

FL 19.0

FL 17.5

STA 1580+64
EXTEND EXISTING 2-10'X4' BOX CULVERT
INDEX NO. 290
FL EL 17.5

FROM (S-43)

CONST. 246 LF OF 18" RCP

℄ SURVEY

SCALE: 1 INCH = 10 FEET VERT.
1 INCH = 20 FEET HORIZ.

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DRAINAGE STRUCTURES

I. Narrative:

Due to the relocation of the drainage divide between Julington Creek and Pottsburg Creek, the run-off from the north portion of the I-95 project from I-295 to south of J.T.B. Boulevard did not have attenuation of run-off into Pottsburg Creek. The north portion of the project was evaluated for possible areas that could provide attenuation without causing hazardous roadway conditions. The median between Stations 739+00 and 770+00 is an existing expanded area that can be regraded to accommodate the attenuation without infringing on the roadway clear zone.

The existing and proposed drainage pattern in the contained median area flow to inlets S-75 and S-77. Travel time to the discharge point is relatively short and the grassed area has very little time to allow for percolation. Each inlet acts as a submerged orifice or weir which does limit the discharge to a small degree.

Regrading the median area during the construction period to flow north only into structure S-77 resulted in several changes. First, the travel distance is increased from 2300 feet to 3100 feet. The peak run-off is distributed over a greater area and does not reach the outfall point at the same rate as in the existing condition. The longer travel time allows for more percolation, which has not been accounted for in the design of the pre / post attenuation calculations. Secondly, the control structure(s) has been reduced by a factor of two because only one inlet will receive the run-off . Finally, the attenuation of the northern portion of the project can be met in this basin.

The alteration is accomplished by grading the median into a swale-pond, raising the inlet top one foot and placing a 3" bleed-down at the base of the structure. The 25 year design storm will be contained in the swale and the bleed-down pipe will meter the flow. For greater storm events, the inlet will allow the excess run-off to flow through the inlet top. Due to the increased storage area, the greater storms will receive attenuation benefits as well.

A summary is enclosed to show the amount of attenuation for each basin. Calculations to support the design are included in the appendix of this report.

Calculations for the flotation prevention of the North Offsite Pond are also included in the appendix.

II. SUMMARY OF PROPOSED ATTENUATION

SUMMARY OF ROADWAY DISCHARGES FROM THE
25 YEAR / 24 HOUR RAINFALL STORM EVENT:

1.) South Basin:

Existing Peak Discharge: ..... 821.85 cfs
Proposed Peak Discharge: ..... 841.37 cfs

Increased Peak Runoff Rate: ..... 19.52 cfs

Sweetwater Creek:

Increased Peak Runoff Rate: ..... 3.47 cfs

I-95 / US1 Pond: ***(Existing Infield South Attenuation Pond within Basin C)***

Existing Peak Discharge: ..... 22.54 cfs
Proposed Peak Discharge: ..... 4.24 cfs

11.14 cfs from Model Results

Decreased Peak Runoff Rate: ..... 18.30 cfs

Off-Site North Drainage Area Pond: ***(Existing Nissan Pond within Basin D)***

Existing Peak Discharge: ..... 193.85 cfs
Proposed Peak Discharge: ..... 171.65 cfs

Use Peak Flow Rate from Permit Modification (1997)

Decreased Peak Runoff Rate: ..... 22.20 cfs

Summary of Totals for the Julington Creek Basin:

Increased Peak Runoff Rate (19.52 + 3.47 cfs) : ..... 22.99 cfs
Decreased Peak Runoff Rate (18.30 + 22.20 cfs): ..... 40.50 cfs

2.) North Basin:

Existing Peak Discharge: ..... 603.94 cfs
Proposed Peak Discharge: ..... 617.53 cfs

Increased Peak Runoff Rate: ..... 13.59 cfs

Median Swale in North Area: ***(Median Attenuation Swale within Basin G)***

Discharge w/o Attenuation ..... 14.06 cfs
Discharge w/ Attenuation: ..... 0.50 cfs

Summary of Totals for the Pottsberg Creek Basin:

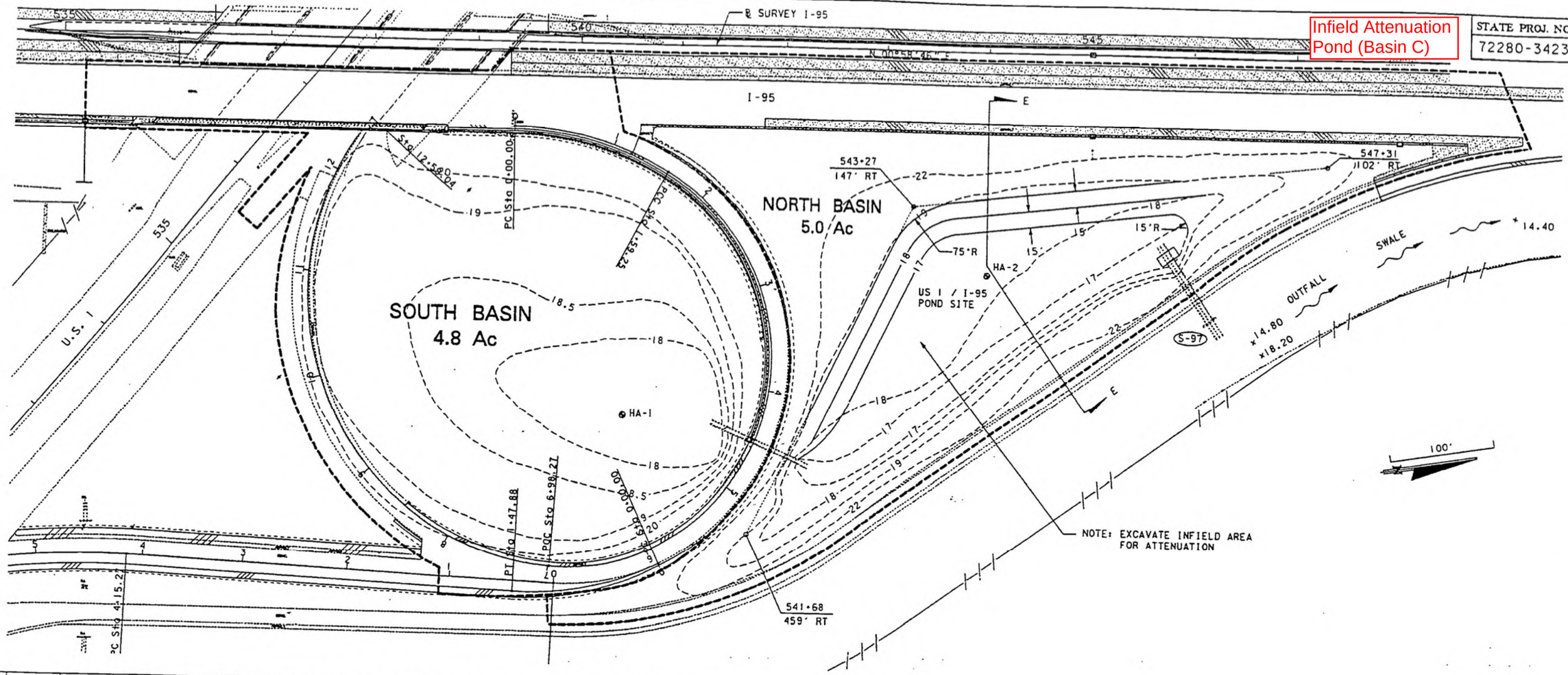
Increased Peak Runoff Rate: ..... 13.59 cfs
Decreased Peak Runoff Rate (14.06 - 0.50 cfs): ..... 13.56 cfs

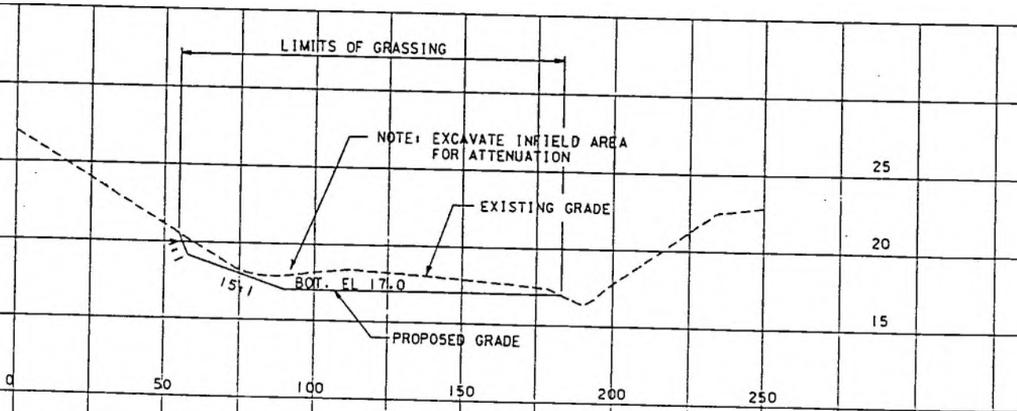
I-95/US 1 POND

PROPOSED CONDITIONS

Infield Attenuation Pond (Basin C)

STATE PROJ. NO.	SHEET NO.
72280-3423	





SECTION E-E

SCALE: 1" = 5' VERT.
1" = 50' HORIZ.

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

FLORIDA DEPARTMENT OF TRANSPORTATION

VOLKERT

DRAINAGE DETAILS

STATE PROJ. NO.	SHEET NO.
72280-3423	

I-95

535

N 08° 58' 46" E

540

℄ SURVEY

2.5' SHLDR PAVT.

3.5' SHLDR GUTTER

2' 6'

Sta 12+52.04

PC Sta 0+00.00

GUARDRAIL

PCC Sta 1+59.25

REMOVE EXIST. CURB & GUTTER

END SHLDR IMPROVEMENT
℄ RAMP D STA 8+50.0 (16.0'LT)

END GUARDRAIL
END ANCHORAGE TYPE II
℄ RAMP D STA 3+50.10

℄ RAMP D

REMOVE EXIST. INLET
REPLACE WITH INLET TYPE S
℄ STA D 4+50 (RT)
FL ELEV 16.9

END SHLDR IMPROVEMENT
℄ RAMP D STA 8+50.0 (0.0'RT)

LIMITS OF GRINDING
(RAMP D)

END SHLDR GUTTER
℄ RAMP D STA 4+47.30

Sta 98

BEGIN SHLDR IMPROVEMENT
℄ RAMP D STA 8+18.77 (16.0'LT)
2' PAVED, 4' UNPAVED

4' SHLDR PAVT.

200' R

300' R

PCC Sta 6+98.27

PT Sta 1+47.88

℄ RAMP D-1

℄ W

CUR W-1

PAVED SHLDR

0 40' 80'

CURVE D1-1
PI Sta 5+17.83
Δ = 16° 17' 58.00" (LT)
D = 8° 00' 00.00"
L = 203.74'
T = 102.56'
R = 716.20'
PC Sta 4+15.27
PT Sta 6+19.01

S 41°01'14" E

US 1 / PHILLIPS HWY.

SBT 2-4" DUCT SYSTEM

O.E

END 10' SHLDR PAVT.
℄ RAMP D-1
STA 5+24.83 (14' RT)

BEGIN 10' SHLDR PAVT.
℄ RAMP D-1
STA 1+28.32 (14' RT)

END ℄ RAMP D-1
STA 6+45.27
STA 540+83.21
℄ SURVEY US 1 / PHILLIPS HWY.

LIMITS OF GRINDING
RAMP D-1

CURVE
D1-1

PT Sta 6+19.01

PC Sta 4+15.2

END 6' SHLDR PAVT.
℄ RAMP D-1
STA 5+57.56 (16' LT)

END ℄ W
STA 1+47.88
℄ RAMP D-1
STA 0+39.75 (10'LT)
END SHLDR TRANSITION

BEGIN ℄ RAMP D-1
STA 0+00.00
℄ RAMP D
STA 6+93.00 (16'LT)

BEGIN ℄ W
STA 0+00.00
℄ RAMP D
STA 5+94.41 (16'LT)
BEGIN SHLDR TRANSITION

LIMITED ACCESS
R/W LINE

WIDENING AND SHLDR REPLACEMENT.

CURVE W-1
PI Sta 0+75.47
Δ = 28° 14' 33" (RT)
D = 19° 05' 55"
L = 147.88'
T = 75.47'
R = 300.00'
PC Sta 0+00.00
PT Sta 1+47.88

J:\rdsplan\rd08.dgn Sat Oct 28 13:50:07 1995

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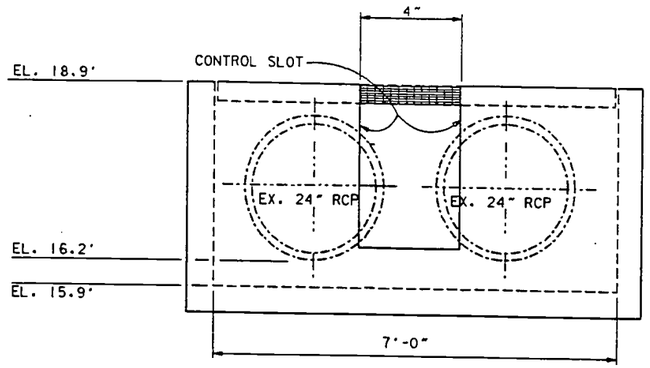
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

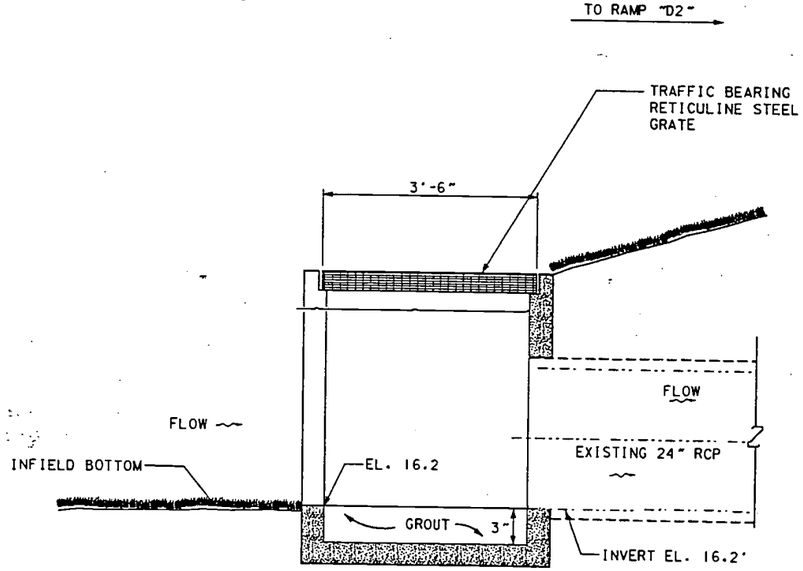
FLORIDA DEPARTMENT OF TRANSPORTATION

VOLKERT

INTERCHANGE LAYOUT
U.S.1 - RAMP D-1



ELEVATION

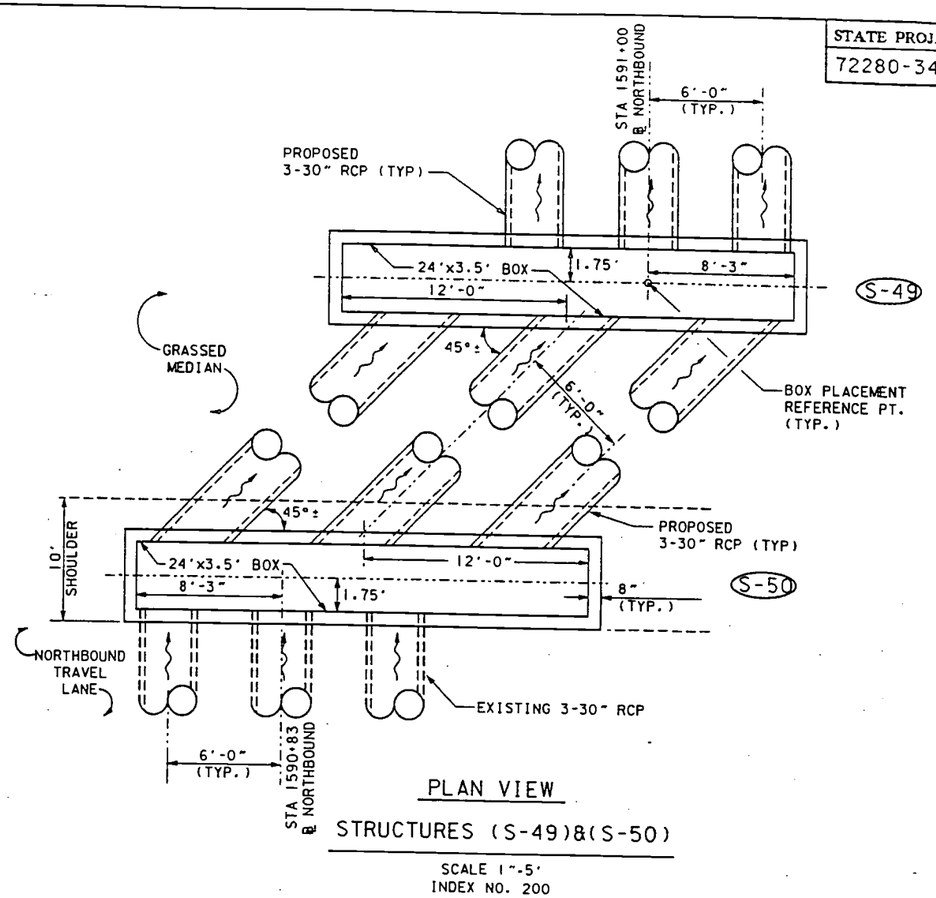


SECTION

STRUCTURE (S-97)

N.T.S.

NOTES
1. FIBERGLASS SKIMMER TO BE INCLUDED IN THE CONTRACT UNIT PRICE OF THE STRUCTURE.
2. STRUCTURE TO BE INLET TYPE "A" INDEX #230 WITH TYPE "J" BOTTOM, INDEX 200



PLAN VIEW

STRUCTURES (S-49)&(S-50)

SCALE 1"=5'
INDEX NO. 200

J:\Vrd\drdtrd02.dgn Mon Oct 23 15:06:11 1995

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

FLORIDA DEPARTMENT OF TRANSPORTATION

VOLKERT

DRAINAGE DETAILS

C:\BRN\95SOUTH.WBS\P95S25.SSS(13 Lines)

INPUT: PROJECT FILE P95S25, RUN ID# 791760967 (7 NODES)

RESULTS: 0 BAD POINTS OUT OF 241 TOTAL, MAX STAGE ERROR 0.0098 FEET

NODAL STAGE SUMMARY

NODE	NODE NAME	NODE TYPE	MIN EL.	AT HR.	MAX EL.	AT HR.	FLOOD
0000	SOUTH BASIN	SUBAREA	20.00	0.00	20.00	0.00	NO
0001	NORTH BASIN	SUBAREA	20.00	0.00	20.00	0.00	NO
0002	SOUTH POND	POND	17.00	0.00	18.73	12.70	NO
0003	NORTH POND	POND	16.20	0.00	18.40	12.80	NO
0004	DITCH	STAGING	14.80	0.00	14.80	0.00	NO
0005	CS NO1	JUNCTION	17.00	0.00	18.54	12.70	NO
0006	CS NO2	JUNCTION	16.20	0.00	17.26	12.80	NO

C:\BRN\95SOUTH.WBS\P95S25.STS(13 Lines)

INPUT: PROJECT FILE P95S25. RUN ID# 791760967 (7 NODES)

RESULTS: 0 BAD POINTS OUT OF 241 TOTAL. MAX STAGE ERROR 0.0098 FEET

NODAL THRUPUT SUMMARY

NODE	NODE NAME	NODE TYPE	CFS IN	AT HR.	CFS OUT	AT HR.	FLOOD
0000	SOUTH BASIN	SUBAREA	26.66	12.10	26.66	12.10	NO
0001	NORTH BASIN	SUBAREA	27.08	12.10	27.08	12.10	NO
0002	SOUTH POND	POND	26.66	12.10	7.59	12.30	NO
0003	NORTH POND	POND	33.68	12.10	11.14	12.80	NO
0004	DITCH	STAGING	11.13	12.80	0.00	0.00	NO
0005	CS NO1	JUNCTION	7.59	12.30	7.59	12.30	NO
0006	CS NO2	JUNCTION	11.13	12.80	11.13	12.80	NO

Q_{post} = 11.14 c.f.s.
25 Yr. - 24 Hr.

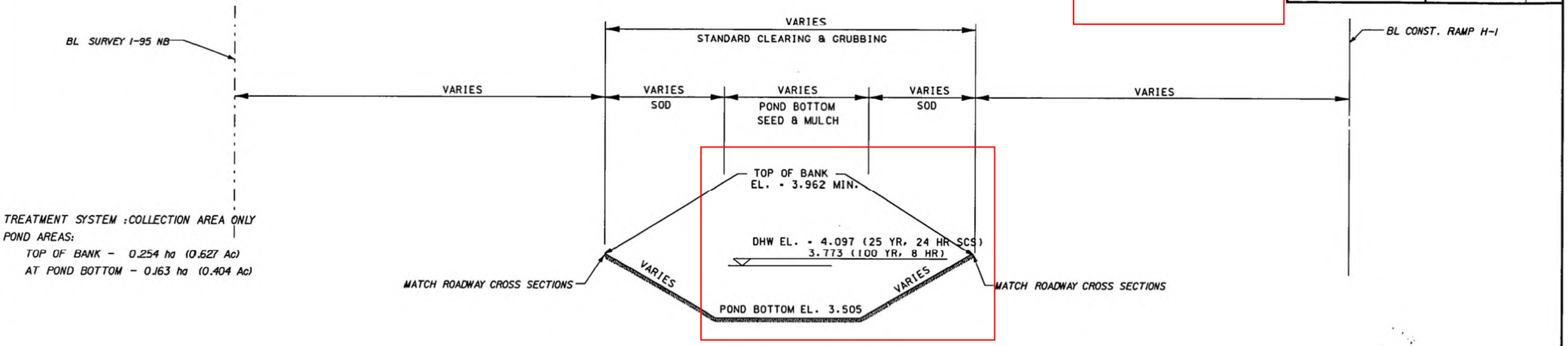
Q_{pre} = 22.54 c.f.s
Q_{post} = 11.14 c.f.s
11.40 c.f.s.

Req. Attenuation < Prop. Attenuation
10.58 c.f.s. < 11.40 c.f.s.
(see pg. 49)

Permit #18092-2: State Road No. 9A/I-295/I-95 Interchange

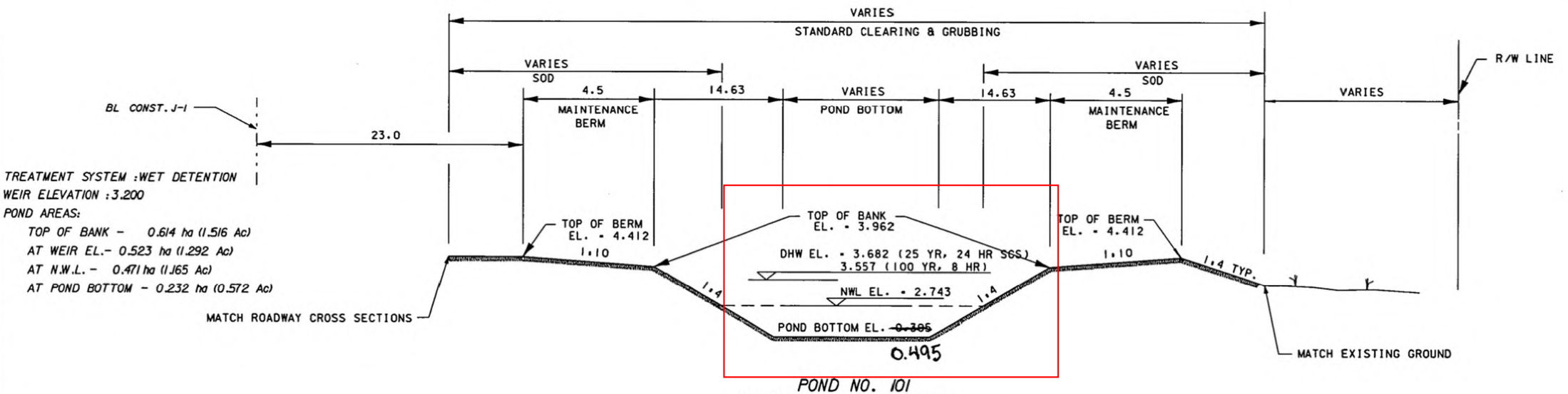
FINANCIAL PROJ. ID.	STATE PROJ. NO.	SHEET NO.
213290-1-52-01	72002-3401	23

(Note: Units are in meters)



POND NO. 100
WATER RETENTION AREA
TYPICAL SECTION
N.T.S.

T.J. Gyorog
5/18/01



POND NO. 101
WATER DETENTION AREA
TYPICAL SECTION
N.T.S.

P:\66044@\DRAINAGE\Typpond01.dgn
16-MAY-2001 19:06

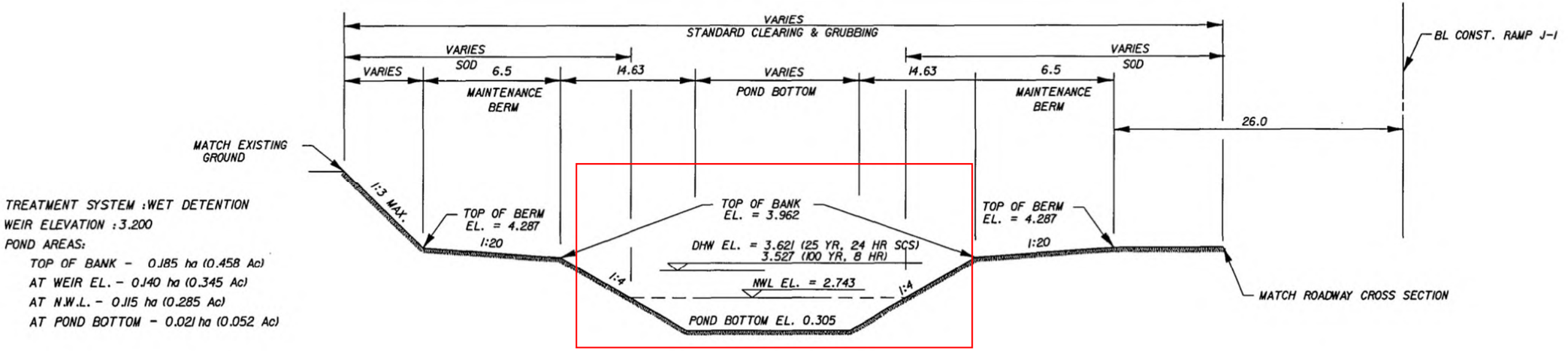
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

PARSONS TRANSPORTATION GROUP
EB 1838 4417 BEACH BLVD. SUITE 400 JACKSONVILLE, FL. 32207

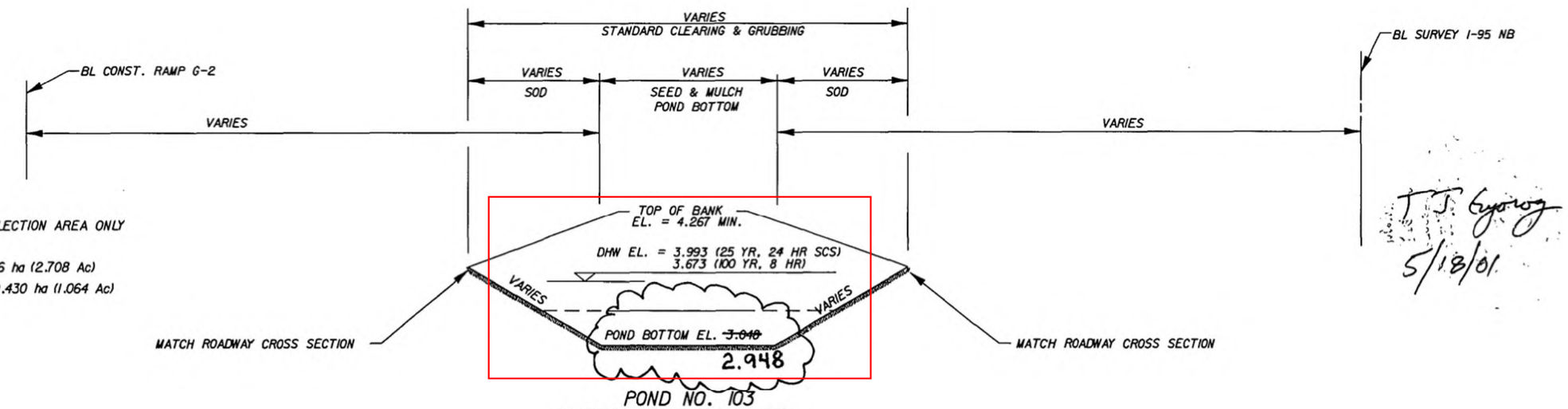
TYPICAL SECTIONS
WATER DETENTION/RETENTION AREAS
I-95/295 INTERCHANGE

FINANCIAL PROJ. ID.	STATE PROJ. NO.	SHEET NO.
213290-1-52-01	72002-3401	24



TREATMENT SYSTEM :WET DETENTION
WEIR ELEVATION :3.200
POND AREAS:
TOP OF BANK - 0.185 ha (0.458 Ac)
AT WEIR EL. - 0.140 ha (0.345 Ac)
AT N.W.L. - 0.115 ha (0.285 Ac)
AT POND BOTTOM - 0.021 ha (0.052 Ac)

POND NO. 102
WATER DETENTION AREA
TYPICAL SECTION
N.T.S.



TREATMENT SYSTEM :COLLECTION AREA ONLY
POND AREAS:
TOP OF BANK - 1.096 ha (2.708 Ac)
AT POND BOTTOM - 0.430 ha (1.064 Ac)

POND NO. 103
WATER RETENTION AREA
TYPICAL SECTION
N.T.S.

T.J. Gyorog
5/18/01

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16-MAY-2001 19:07

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

FLORIDA DEPARTMENT OF TRANSPORTATION

PARSONS TRANSPORTATION GROUP
4417 BEACH BLVD. SUITE 400
JACKSONVILLE, FL. 32207
EB 1838

TYPICAL SECTIONS
WATER DETENTION/RETENTION AREAS
I-95/295 INTERCHANGE

FINANCIAL PROJ. ID.	STATE PROJ. NO.	SHEET NO.
213290-1-52-01	72002-3401	91

1:500

235

CONC.

CONC.

BL SURVEY I-95 NB

CONC.

BE

BE

TOE OF SLOPE

235+94.586
28.684 (RT)

236+04.847
38.103 (RT)

234+60.056
32.782 (RT)

P100B

(WATER COLLECTION AREA)
POND 100
BOTTOM EL = 3.505

(SEE ROADWAY CROSS SECTIONS TO ESTABLISH TOE OF SLOPE)

234+53.222
40.343 (RT)

P100A

235+96.949
52.549 (RT)

S-271

S-264

S-267

S-269

341

CONST. 450 GUTTER DRAIN PIPE

CONST. 900 PIPE

234+57.823
46.946 (RT)

CONST. 450 GUTTER DRAIN PIPE

231+59

S-270

CONST. 450 GUTTER DRAIN PIPE

S-268

232

CONST. 375 PIPE

S-265

S-266

231

N 21°41' 28"W

BL CONST. RAMP H-I

POND BORING LOCATIONS

0 2.5 10
Meters

T.J. Cigoney
5/18/01

P:\66044\DRAINAGE\SHEETS\Pond100.dgn
16-MAY-2001 18:39

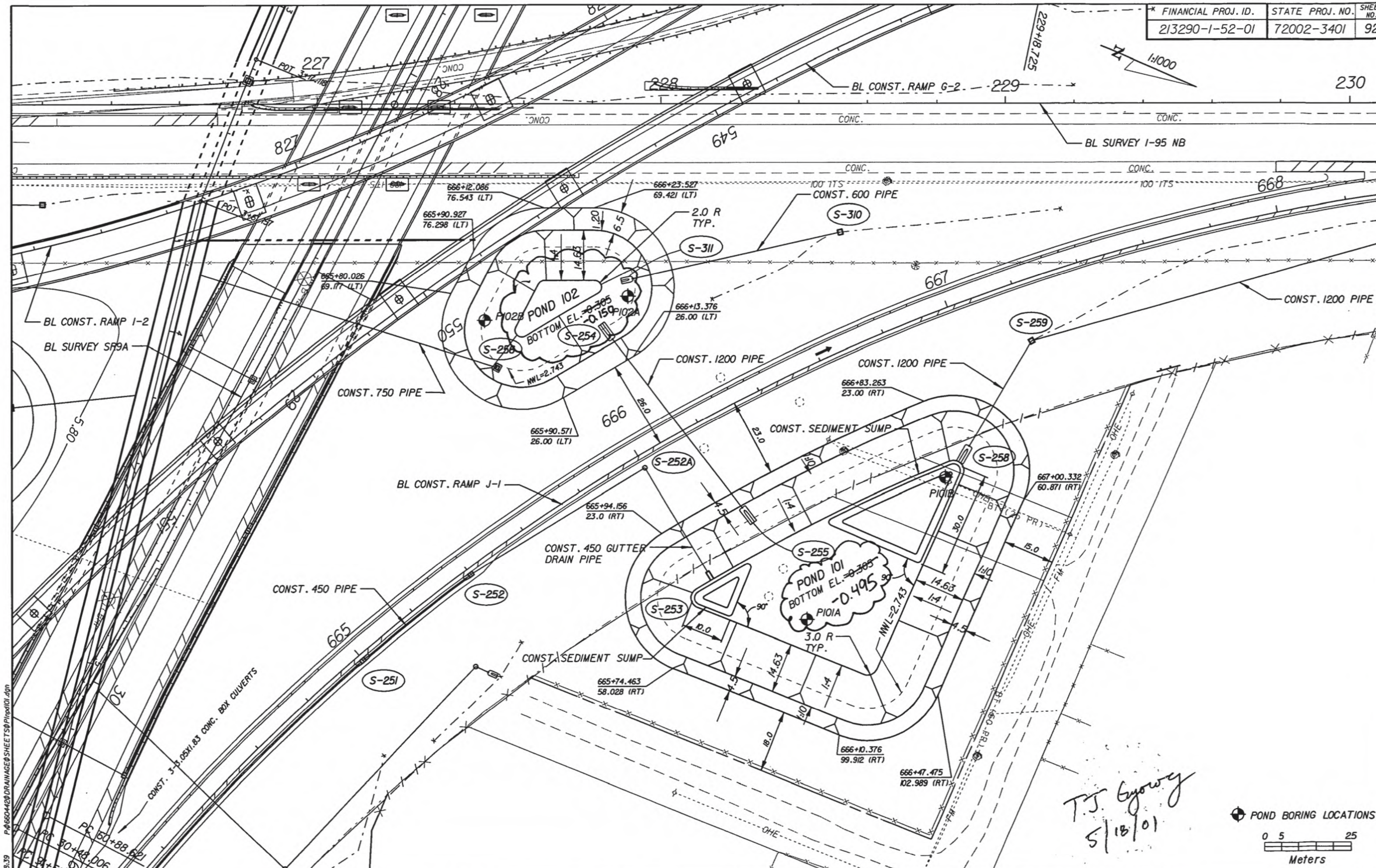
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

PARSONS TRANSPORTATION GROUP
4417 BEACH BLVD. SUITE 400
JACKSONVILLE, FL. 32207
EB 1838

POND No. 100 PLAN

FINANCIAL PROJ. ID.	STATE PROJ. NO.	SHEET NO.
213290-1-52-01	72002-3401	92



1:1000
227
228
229
230
229+18.725
BL CONST. RAMP G-2
BL SURVEY I-95 NB
CONC.
100 ITS
CONST. 600 PIPE
668
667
666
665
666+12.086
76.543 (LT)
666+23.527
69.421 (LT)
665+90.927
76.298 (LT)
2.0 R
TYP.
S-310
S-311
665+80.026
69.177 (LT)
POND 102
BOTTOM EL.=0.305
-0.150
P102A
P102B
S-254
S-258
NWL=2.743
666+13.376
26.00 (LT)
CONST. 1200 PIPE
S-259
BL CONST. RAMP I-2
BL SURVEY SR9A
CONST. 750 PIPE
665+90.571
26.00 (LT)
666+83.263
23.00 (RT)
CONST. SEDIMENT SUMP
S-252A
S-258
667+00.332
60.871 (RT)
P101B
BL CONST. RAMP J-1
665+94.156
23.0 (RT)
CONST. 450 GUTTER
DRAIN PIPE
S-255
POND 101
BOTTOM EL.=0.305
-0.495
P101A
NWL=2.743
CONST. 450 PIPE
S-252
S-253
3.0 R
TYP.
S-251
CONST. SEDIMENT SUMP
665+74.463
58.028 (RT)
CONST. 3-3.05X1.83 CONC. BOX CULVERTS
666+10.376
99.912 (RT)
666+47.475
102.989 (RT)
PC 60+88.621
PC 30+48.006
P:\660442\DRAINAGE\SHEETS\PlnpdI01.dgn
16-MAY-2001 18:39
T.J. Gyory
5/18/01
POND BORING LOCATIONS
0 5 25
Meters

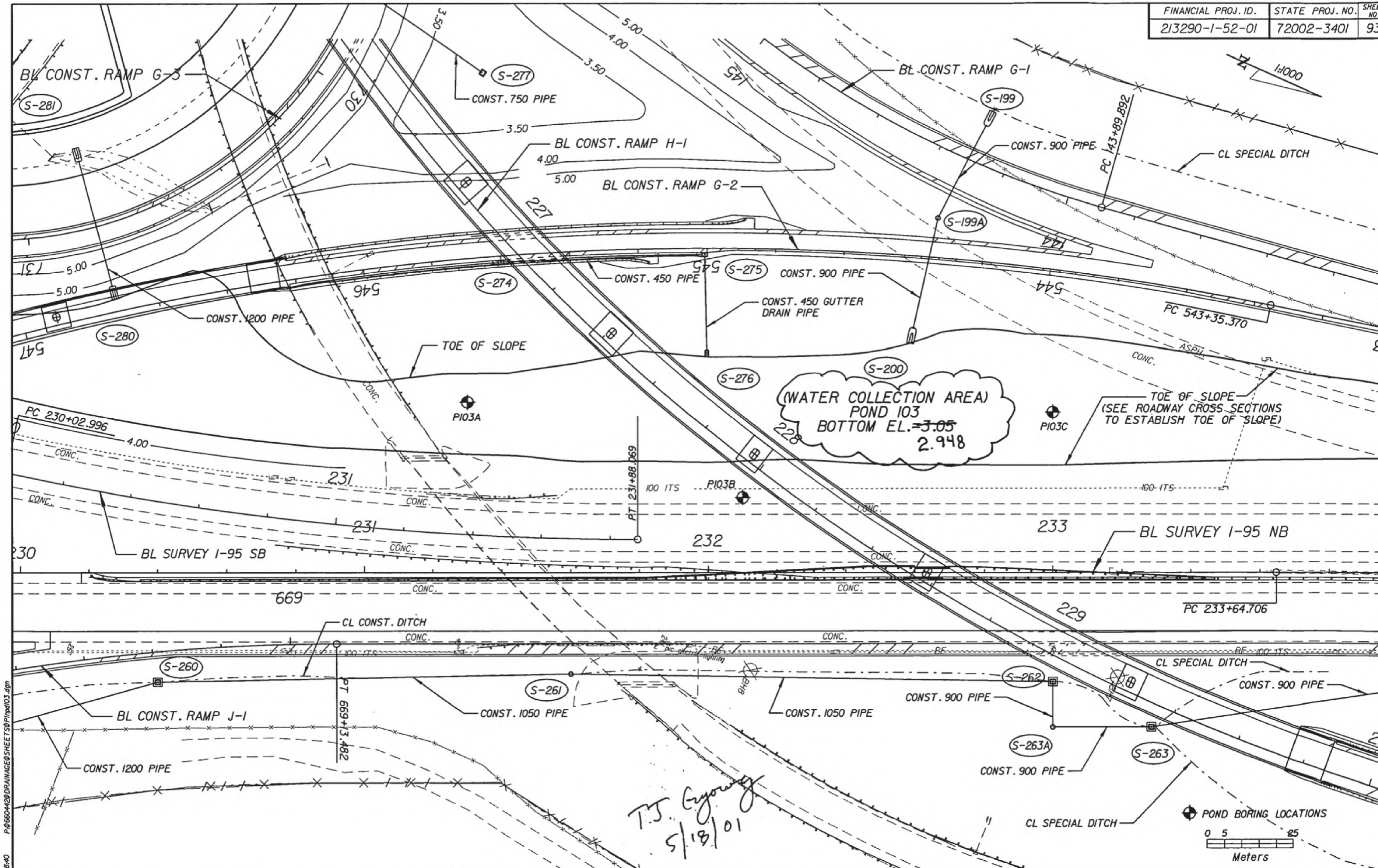
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

PARSONS TRANSPORTATION GROUP
4417 BEACH BLVD. SUITE 400
JACKSONVILLE, FL. 32207
EB 1838

POND Nos. 101 & 102 PLAN

FINANCIAL PROJ. ID.	STATE PROJ. NO.	SHEET NO.
213290-1-52-01	72002-3401	93



BL CONST. RAMP G-3
S-281
S-277
CONST. 750 PIPE
3.50
4.00
5.00
BL CONST. RAMP H-1
BL CONST. RAMP G-2
BL CONST. RAMP G-1
S-199
CONST. 900 PIPE
PC 143+89.892
CL SPECIAL DITCH
1:1000
S-199A
227
CONST. 450 PIPE
S-275
CONST. 900 PIPE
S-274
CONST. 450 GUTTER DRAIN PIPE
CONST. 1200 PIPE
S-280
TOE OF SLOPE
PC 543+35.370
S-276
S-200
(WATER COLLECTION AREA)
POND 103
BOTTOM EL. 3.05
2.948
P103A
P103C
TOE OF SLOPE
(SEE ROADWAY CROSS SECTIONS TO ESTABLISH TOE OF SLOPE)
PC 230+02.996
CONC.
231
PT 231+88.069
100 ITS
P103B
233
232
BL SURVEY I-95 NB
BL SURVEY I-95 SB
230
669
229
PC 233+64.706
CL CONST. DITCH
S-260
S-261
S-262
CL SPECIAL DITCH
CONST. 900 PIPE
CONST. 1050 PIPE
PT 669+13.482
BL CONST. RAMP J-1
CONST. 1200 PIPE
S-263A
S-263
CL SPECIAL DITCH
POND BORING LOCATIONS
0 5 25
Meters
T.J. Egan
5/18/01

P:\6604\20\DRAINAGE\SHEETS\Plnpd103.dgn
16-MAY-2001 18:40

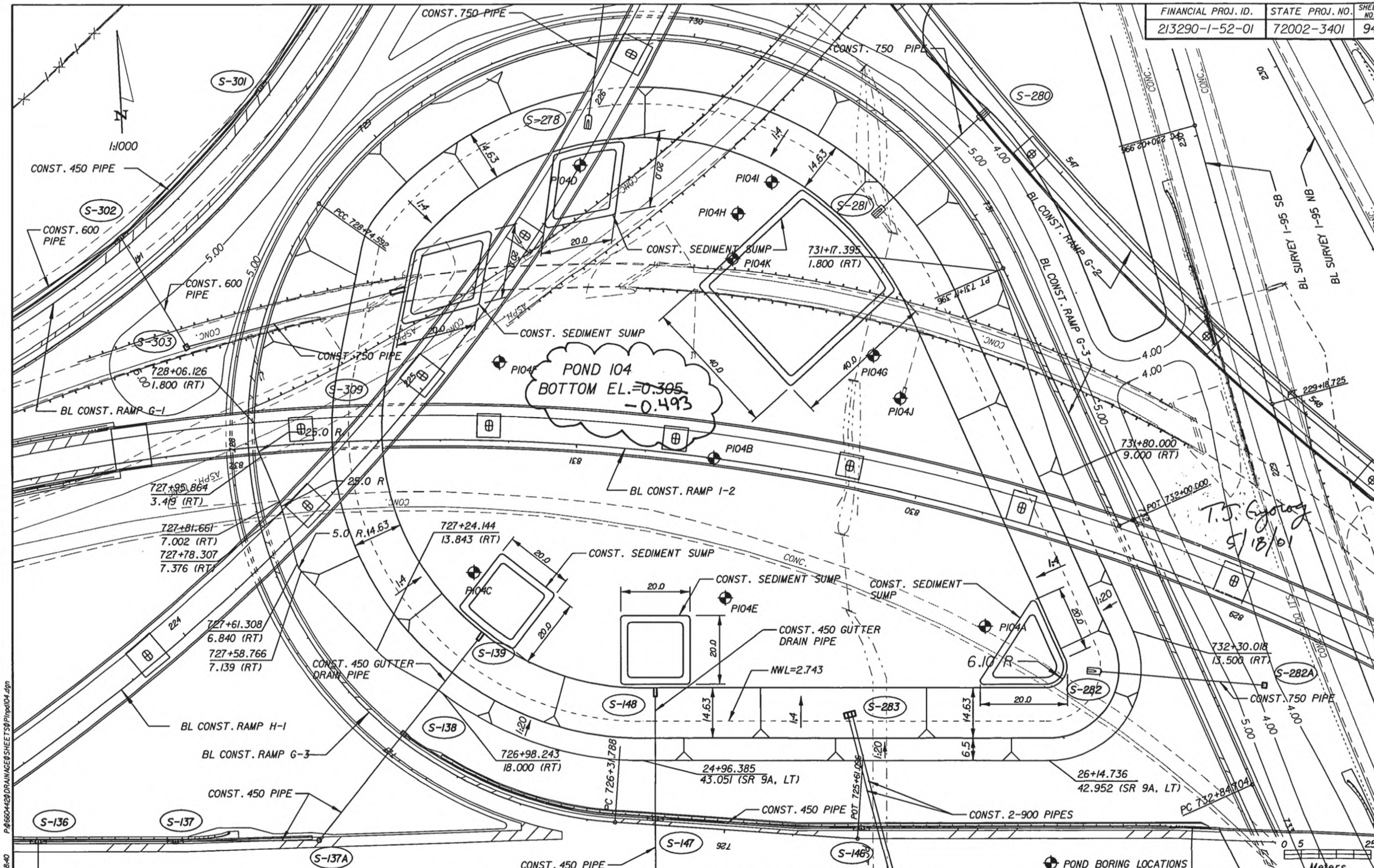
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

PARSONS TRANSPORTATION GROUP
4417 BEACH BLVD. SUITE 400
JACKSONVILLE, FL. 32207
EB 1838

POND No. 103 PLAN

FINANCIAL PROJ. ID.	STATE PROJ. NO.	SHEET NO.
213290-1-52-01	72002-3401	94



1:1000
CONST. 750 PIPE
CONST. 450 PIPE
CONST. 600 PIPE
S-301
S-302
S-303
S-278
S-280
S-281
S-309
S-139
S-148
S-283
S-282
S-282A
S-138
S-136
S-137
S-137A
S-147
S-146
P104D
P104I
P104H
P104K
P104F
P104G
P104J
P104B
P104C
P104E
P104A
CONST. SEDIMENT SUMP
731+17.395
1.800 (RT)
POND 104
BOTTOM EL. 0.305
-0.493
728+06.126
1.800 (RT)
BL CONST. RAMP G-1
BL CONST. RAMP G-2
BL CONST. RAMP G-3
BL CONST. RAMP I-2
BL CONST. RAMP H-1
BL SURVEY I-95 SB
BL SURVEY I-95 NB
731+80.000
9.000 (RT)
727+95.864
3.419 (RT)
727+81.661
7.002 (RT)
727+78.307
7.376 (RT)
727+24.144
13.843 (RT)
727+61.308
6.840 (RT)
727+58.766
7.139 (RT)
CONST. 450 GUTTER DRAIN PIPE
NWL=2.743
732+30.018
13.500 (RT)
726+98.243
18.000 (RT)
24+96.385
43.051 (SR 9A, LT)
26+14.736
42.952 (SR 9A, LT)
CONST. 2-900 PIPES
CONST. 450 PIPE
PC 732+84.704
PC 726+31.788
POT 725+61.036
PCC 728+74.592
PT 731+41.396
POT 732+00.000
PC 229+18.725
6.10 R
25.0 R
5.0 R
T.J. Gyorog
5/18/01
POND BORING LOCATIONS
Meters

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

FLORIDA DEPARTMENT OF TRANSPORTATION

PARSONS TRANSPORTATION GROUP
4417 BEACH BLVD. SUITE 400
JACKSONVILLE, FL. 32207
EB 1838

POND No. 104 PLAN

16-MAY-2001 18:40 P:\6604420\DRAINAGE\SHEETS\Plnpd104.dgn

SR 9A POLLUTION ABATEMENT AND DETENTION POND CALCULATIONS

Drainage Synopsis

SR 9A is a proposed highway which will run from the I-95 / I-295 interchange in south Duval County northeast to the current SJRWMD permitted end (approximately Sta. 507+00) of SR 9A. Runoff from the proposed highway will be treated in combination pollution abatement / detention ponds. The following report outlines the proposed stormwater management system (SMS) for each basin.

The post-development impervious area calculations have been calculated and the ponds have been designed assuming that the SR 9A and SR 9B mainline will have one additional twelve foot wide lane in each direction and that 6.1 acres of impervious area have been added to I-95. The widening discussed in this paragraph is not intended for permitting by this submittal; however, this submittal will serve to establish that the pollution abatement and detention capacity exists in the ponds to improve the roads as mentioned in this paragraph.

Treatment of stormwater runoff will be provided by wet detention ponds in Basins 1000 through 1200 and 1600 through 1800 and by on-line retention in basins 1300 through 1500. The permanent pool volume provided in the proposed wet detention ponds is 50% greater than the minimum required volume; therefore, no littoral zones are proposed for the ponds. On-line Retention Ponds 130 through 150 occur in areas of high fill and will be dry bottom ponds which will recover via percolation. The wet pond normal water levels and dry pond bottom elevations have been set above the peak tailwater elevations of the mean annual storm event. The mean annual storm event peak stages were determined from the SR 9A Cross Drain Culvert Calculations submitted with this report.

The proposed SMS provides peak attenuation during the SCS Type II 25-year, 24-hour storm event (precipitation = 9.5 inches). No basins have impervious areas greater than 50%; therefore, no attenuation calculations have been performed for the mean annual storm event. The SR 9A and SR 9B encroachments into the 100-Year flood plain have been addressed in the Cross Drain Culvert Calculations Report.

Runoff from Basins 1000, 1010, and 1020 is collected in three interconnected ponds. Pond 100 is a dry pond which provides peak attenuation of the Basin 1000 runoff prior to the runoff reaching Pollution Abatement Ponds 101 and 102. Ponds 101 and 102 provide stormwater treatment and peak attenuation for the runoff from Basins 1000, 1010, and 1020. The interconnected ponds outfall into Sweetwater creek adjacent to proposed Pond 102.

Basin 1030 and 1040 runoff is collected in two interconnected ponds. Pond 103 is a dry pond which provides peak attenuation to Basin 1030 runoff prior to the runoff reaching Pollution Abatement Pond 104. Pond 104 provides stormwater treatment and peak attenuation for the runoff from Basins 1030 and 1040. Pond 104 outfalls into Sweetwater Creek.

Runoff from Basin 1050 flows into Wet Detention Pond 105. Pond 105 provides stormwater treatment and peak attenuation for the runoff from Basin 1050. The pond outfalls into an unnamed tributary of Julington Creek which converges with Julington Creek south of I-295.

Runoff from Basin 1060 flows into Wet Detention Pond 106. Pond 106 provides stormwater treatment and peak attenuation for the runoff from Basin 1060. The pond outfalls into Sweetwater creek.

Basins 1070, 1080, and 1090 flow into two interconnected ponds. Ponds 107 and 108 provide stormwater treatment and peak attenuation for the runoff from Basins 1070, 1080, and 1090. Pond 108 outfalls into Sweetwater Creek.

Basin 1100 will collect stormwater runoff from the proposed SR 9A / US 1 interchange and the surrounding area. The pond will treat stormwater runoff from the proposed ramps located on the north side of SR 9A and existing impervious areas which have no stormwater management system along US 1 and the Baywood subdivision. Basin 1100 flows into Wet Detention Pond 110 which outfalls into Sweetwater Creek just upstream of US 1.

Runoff from Basin 1200 flows into Wet Detention Pond 120. Pond 120 provides stormwater treatment and peak attenuation for the runoff from Basin 1200. The pond outfalls into a proposed outfall ditch which discharges near the upstream end of the cross drain at Sta. 221+00.

Basin 1300 runoff flows into Retention Pond 130. Pond 130 provides stormwater treatment and peak attenuation for the runoff from Basin 1300. The pond outfalls into a proposed outfall ditch which discharges to a depressional area east of SR 9A.

Runoff from Basin 1400 flows into Retention Ponds 140R and 140L located within the typical section right-of-way of SR 9A. The ponds provide stormwater treatment and peak attenuation for the runoff from Basin 1400. The ponds are interconnected and outfall into a depressional area located west of SR 9A. The Basin 1500 SMS system is similar to the Basin 1400 SMS.

Basin 1600 runoff will be collected into an existing borrow pit which will be converted to wet detention ponds. The ponds will provide stormwater treatment and peak attenuation for the runoff from Basins 1600 and 1610. Pond 160 is interconnected with Pond 161 which outfalls to a depressional area located west of the proposed pond and south of the proposed culvert at Sta 198+00.

SR 9A POLLUTION ABATEMENT AND DETENTION POND CALCULATIONS

PEAK STAGE AND FLOW SUMMARY TABLE

POND	25-YEAR PRE PEAK FLOW CFS	25-YEAR POST PEAK FLOW CFS	25-YEAR DHW FT NGVD	POND TOP OF BANK FT NGVD
102	47.5	32.3	11.9	13.0
104	97.1	85.2	11.8	13.0
105	60.9	50.8	13.2	14.5
106	13.6	5.0	12.0	14.0
108	23.6	10.5	14.6	16.0
110	25.8	10.0	23.4	24.5
120	65.7	28.0	36.6	38.0
130	65.2	20.7	45.2	46.5
140	15.8	9.8	44.6	46.0
150	14.9	9.3	44.6	46.0
161	27.4	15.1	34.0	35.0
170	19.5	13.8	41.9	42.0
180	11.9	5.0	41.9	42.0

P. Basins 1000-1020 Post-Development Hydrograph and Routing

1. Impervious Area Computation
2. Curve Number Computation
3. Time of Concentration Computation
4. Stage - Storage Table
5. Pollution Abatement Volume and Stage Calculations
6. Permanent Pool Volume Computation
7. Skimmer Blade Design
8. Pond Drawdown Calculations
9. 25-Year, 24-Hour SCS Type 2 Hydrograph Input and Output Summary
10. Node and Reach Input Data
11. Peak Stage and Flow Summary

Basin 1000, 1010, and 1020 Post-development Impervious Area Computation

Basin 1000:

- I95 STA 760+00 → 777+50 = 1750 ($\frac{60+72}{2}$) = 2.7 Ac
- Ramps = 30' (2200) = 1.5 Ac
- Total Impervious Area = **4.2 Ac**

Basin 1010:

- I95 STA 755+00 → 760+00 = 500 (72) = .8 Ac
- Ramps = 1350 (30) = .9 Ac
- Total Impervious Area = **1.7 Ac**

Basin 1020:

- I95 STA 743+50 → 755+00 = 1150 (58) = 1.5 Ac
- SR9A STA 93+00 → 94+00 = 100 (100) = 0.2 Ac
- Ramps = 600 (30) = 0.4 Ac
- Total Impervious Area = **2.1 Ac**

Total Impervious Area Basins 1000, 1010, 1020 = 8.0 Ac

% Impervious = 8.0/25.0 = 32%

SR9A

POST-DEVELOPMENT

CURVE NUMBER COMPUTATION

BASIN: 1000
POND: 100
AREA: 9.8 ACRES

LAND USE	SOIL TYPE	HYDROLOGIC GROUP	CURVE NUMBER	AREA ACRES	PRODUCT CN*A
GOOD OPEN SPACE	16,25	B/D,D	80	5.6	448.0
IMPERVIOUS			98	4.2	411.6
					0.0
					0.0
					0.0
					0.0
					0.0
					859.6

$$\text{COMPOSITE CN} = \frac{859.6}{9.8} = 88$$

BASIN: 1010
POND: 101
AREA: 9.6 ACRES

LAND USE	SOIL TYPE	HYDROLOGIC GROUP	CURVE NUMBER	AREA ACRES	PRODUCT CN*A
GOOD OPEN SPACE	11,24	A	39	7.0	273.0
GOOD OPEN SPACE	16	B/D	80	0.1	8.0
IMPERVIOUS AREA			98	1.7	166.6
POND			100	0.8	80.0
					0.0
					0.0
					0.0
					527.6

$$\text{COMPOSITE CN} = \frac{527.6}{9.6} = 55$$

SR9A

POST-DEVELOPMENT

CURVE NUMBER COMPUTATION

BASIN: 1020
POND: 102
AREA: 5.6 ACRES

LAND USE	SOIL TYPE	HYDROLOGIC GROUP	CURVE NUMBER	AREA ACRES	PRODUCT CN*A
GOOD OPEN SPACE	11,24	A	39	2.8	109.2
GOOD OPEN SPACE	16	B/D	80	0.1	8.0
IMPERVIOUS AREA			98	2.1	205.8
POND			100	0.6	60.0
					0.0
					0.0
					0.0
					383

$$\text{COMPOSITE CN} = \frac{383.0}{5.6} = 68$$

SR9A DRAINAGE

STAGE-STORAGE CALCULATIONS

POND: 100

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
11.5	0.4				0.0
		0.6	1.5	0.9	
13.0	0.8				0.9
		1.3	1.0	1.3	
14.0	1.7				2.2

POND: 101

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
9.0	0.8				0.0
		1.0	4.0	4.0	
13.0	1.2				4.0

POND: 102

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
9.0	0.6				0.0
		0.8	4.0	3.2	
13.0	1.0				3.2

PONDS: 101 & 102

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
9.0	1.4				0.0
		1.8	4.0	7.2	
13.0	2.2				7.2

SR9A

BASINS 1000, 1010, AND 1020

SJRWMD WET DETENTION POND
POLLUTION ABATEMENT VOLUME CALCULATIONS

25.0 ACRES = BASIN AREA

32.0 % = PERCENT IMPERVIOUS AREA

2.5" OF RUNOFF FROM IMPERVIOUS AREA =	1.67 AF
1" OF RUNOFF FROM ENTIRE BASIN =	2.08 AF
REQUIRED POLLUTION ABATEMENT VOLUME =	2.08 AF
POLLUTION ABATEMENT STAGE =	10.36 FT
1/2 POLLUTION VOLUME =	1.04 AF
1/2 POLLUTION ABATEMENT STAGE =	9.71 FT

SR9A

BASINS 1000, 1010, AND 1020

SJRWMD WET DETENTION POND
PERMANENT POOL VOLUME CALCULATIONS

25.0 ACRES = BASIN AREA

32.0 % = PERCENT IMPERVIOUS AREA

RATIONAL RUNOFF COEFFICENT = 0.42

PERM. POOL VOL. = (AREA)(C)(30 IN)(14 D/153 D)(1/12)
= 2.42 AF

NO LITTORAL ZONE PROPOSED; THEREFORE:

PERM. POOL VOL. = (1.5)(PERM. POOL VOL.) = 3.64 AF

VOLUME PROVIDED

POND: 101 & 102

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
1.0	0.4				0.0
		0.9	8.0	7.2	
9.0	1.4				7.2

SR 9A DRAINAGE

POND 102 SKIMMER BLADE DESIGN

THE SKIMMER BLADE WILL BE 6 INCHES ABOVE THE DESIGN HIGH WATER AND 6 INCHES BELOW THE CONTROL STAGE

10.5 = CONTROL STAGE 10.0 = SKIMMER BOTTOM

11.9 = DHW STAGE 12.4 = SKIMMER TOP

32.4 CFS = PEAK DESIGN FLOW

FLOW AROUND SKIMMER IS GOVERENED BY ORIFICE FLOW EQUATION:

Q = C A SQR(2 g H)

H = .1 FT (ALLOWABLE HEADLOSS AROUND SKIMMER)

C = .6 (ORIFICE COEFFICIENT)

21.3 SF = FLOW AREA REQUIRED

SR 9A

BASIN 1000 - WET DETENTION POND DRAWDOWN CALCULATIONS

9.0 = NWL STAGE 1.4 AC = NWL AREA
13.0 = TOP STAGE 2.2 AC = TOP AREA

10.5 = POLLUTION ABATEMENT STAGE
2.32 ACFT = POLLUTION ABATEMENT VOLUME

9.8 = 1/2 POLLUTION ABATEMENT STAGE
1.16 ACFT = 1/2 POLLUTION ABATEMENT VOLUME

0.2 = ELEVATION STEP INCREMENT

3 IN = ORIFICE DIAMETER 1 = NO. OF ORIFICES

ELEV FT	AVG HEAD FT	POND AREA AC	POND AVG AREA AC	INC VOL ACFT	TOTAL VOL ACFT	FLOW CFS	INC TIME HRS	TOTAL TIME HRS
10.5		1.70						0.00
	1.35		1.67	0.50	0.50	0.26	23.17	
10.2		1.64						23.17
	1.1		1.62	0.32	0.83	0.23	16.80	
10.0		1.60						39.97
	0.9		1.58	0.32	1.14	0.21	18.38	
9.8		1.56						58.35
	0.7		1.54	0.31	1.45	0.18	20.79	
9.6		1.52						79.14
	0.5		1.50	0.30	1.75	0.14	25.08	
9.4		1.48						104.22
	0.3		1.46	0.29	2.04	0.10	35.73	
9.2		1.44						139.96
	0.1		1.42	0.28	2.32	0.02	189.35	
9.0		1.40						329.31

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SR9A BASIN 1000 POST-DEVELOPMENT 25YR/24HR
11/30/92

BASIN NAME	1000	1010	1020
NODE NAME	100	101	102
UNIT HYDROGRAPH	UH484	UH484	UH484
PEAKING FACTOR	484.	484.	484.
RAINFALL FILE	SCSII-24	SCSII-24	SCSII-24
RAIN AMOUNT (in)	9.50	9.50	9.50
STORM DURATION (hrs)	24.00	24.00	24.00
AREA (ac)	9.80	9.60	5.60
CURVE NUMBER	88.00	55.00	68.00
DCIA (%)	.00	.00	.00
TC (mins)	10.00	10.00	10.00
LAG TIME (hrs)	.00	.00	.00
BASIN STATUS	ONSITE	ONSITE	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
1000	97.25	12.02	8.03	
1010	50.89	12.02	3.85	
1020	41.97	12.02	5.52	

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SR9A BASIN 1000 POST-DEVELOPMENT 25YR/24HR
11/30/92

CONTROL PARAMETERS

START TIME: .00
END TIME: 24.00

TO TIME (hours)	SIMULATION INC (secs)	PRINT INC (mins)
20.00	150.00	15.00
300.00	150.00	120.00

RUNOFF HYDROGRAPH FILE: DEFAULT
OFFSITE HYDROGRAPH FILE: DEFAULT
BOUNDARY DATABASE FILE: NONE

NOTE:

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SR9A BASIN 1000 POST-DEVELOPMENT 25YR/24HR
11/30/92

NODE NAME	NODE TYPE	INI STAGE (ft)	X-COOR (ft)	Y-COOR (ft)	LENGTH (ft)	STAGE (ft)	AR/TM/STR (ac/hr/af)
100	AREA	11.500	.000	.000	.000	11.500	.400
						13.000	.800
						14.000	1.700
101	AREA	9.000	.000	.000	.000	9.000	.800
						13.000	1.200
102	AREA	9.000	.000	.000	.000	9.000	.600
						13.000	1.000
109A	TIME	4.400	.000	.000	.000	4.400	.000
						4.400	12.000
						11.200	14.000
						11.200	16.000
						8.000	20.000
						8.000	300.000

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SR9A BASIN 1000 POST-DEVELOPMENT 25YR/24HR
11/30/92

>>REACH NAME : 101-102
FROM NODE : 101
TO NODE : 102
REACH TYPE : CULVERT, CIRCULAR w/ ROADWAY
FLOW DIRECTION : POSITIVE AND NEGATIVE FLOWS ALLOWED
TURBO SWITCH : OFF

CULVERT DATA :

SPAN (in):	48.000	RISE (in):	48.000	LENGTH (ft):	239.000
U/S INVERT (ft):	8.000	D/S INVERT (ft):	7.900	MANNING N:	.012
ENTRNC LOSS:	.500	# OF CULVERTS:	1.000		

POSITION A : NOT USED

POSITION B : NOT USED

NOTE:

```
>>REACH NAME       : 100-101
  FROM NODE        : 100
  TO NODE          : 101
  REACH TYPE       : DROP STRUCTURE w/ CIRC. CULVERT
  FLOW DIRECTION   : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH     : OFF

  CULVERT DATA     :
        SPAN (in):  48.000       RISE (in):  48.000     LENGTH (ft):1928.000
   U/S INVERT (ft):   6.500 D/S INVERT (ft):   5.000       MANNING N:    .012
      ENTRNC LOSS:   3.300   # OF CULVERTS:   1.000

  POSITION A       : RECTANGULAR RISER SLOT
    CREST EL. (ft):  11.500  CREST LN. (ft):  19.000    OPENING (ft): 999.000
        WEIR COEF.:   2.600      GATE COEF.:    .600 NUMBER OF ELEM.:   1.000

  POSITION B       : NOT USED

              NOTE:

>>REACH NAME       : 102-109A
  FROM NODE        : 102
  TO NODE          : 109A
  REACH TYPE       : DROP STRUCTURE w/ CIRC. CULVERT
  FLOW DIRECTION   : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH     : OFF

  CULVERT DATA     :
        SPAN (in):  24.000       RISE (in):  24.000     LENGTH (ft): 145.000
   U/S INVERT (ft):   5.500 D/S INVERT (ft):   4.500       MANNING N:    .012
      ENTRNC LOSS:    .500   # OF CULVERTS:   1.000

  POSITION A       : CIRCULAR RISER SLOT
   INVERT EL. (ft):   9.000       SPAN (in):    .250       RISE (in):    .250
        WEIR COEF.:   3.130      GATE COEF.:    .600 NUMBER OF ELEM.:   1.000

  POSITION B       : RECTANGULAR RISER SLOT
    CREST EL. (ft):  10.500  CREST LN. (ft):  10.000    OPENING (ft): 999.000
        WEIR COEF.:   3.130      GATE COEF.:    .600 NUMBER OF ELEM.:   1.000

              NOTE:
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SR9A BASIN 1000 POST-DEVELOPMENT 25YR/24HR
11/30/92

REACH SUMMARY

INDEX	RCHNAME	FRMNODE	TONODE	REACH TYPE
1	101-102	101	102	CULVERT, CIRCULAR w/ ROADWAY
2	100-101	100	101	DROP STRUCTURE w/ CIRC. CULVERT
3	102-109A	102	109A	DROP STRUCTURE w/ CIRC. CULVERT

SR9A BASIN 1000 POST-DEVELOPMENT 25YR/24HR
11/30/92

NODAL MIN/MAX/TIME CONDITIONS REPORT

NODE ID	PARAMETER	MINIMUMS VALUE	MINIMUMS TIME (hr)	MAXIMUMS VALUE	MAXIMUMS TIME (hr)
100	STAGE (ft):	11.50	2.50	13.44	12.25
	VOLUME (af):	.00	2.25	1.45	12.25
	RUNOFF (cfs):	.00	2.25	96.58	12.00
	OFFSITE (cfs):	.00	24.00	.00	24.00
	OTHER (cfs):	.00	24.00	.00	24.00
	OUTFLOW (cfs):	.00	2.50	39.79	12.00
101	STAGE (ft):	9.00	2.50	12.08	12.75
	VOLUME (af):	.27	2.50	3.42	12.75
	RUNOFF (cfs):	.00	9.50	49.04	12.00
	OFFSITE (cfs):	.00	24.00	.00	24.00
	OTHER (cfs):	.00	2.50	39.79	12.00
	OUTFLOW (cfs):	.00	3.00	32.22	12.25
102	STAGE (ft):	9.00	3.00	11.88	13.00
	VOLUME (af):	.01	3.00	2.33	13.00
	RUNOFF (cfs):	.00	6.75	41.09	12.00
	OFFSITE (cfs):	.00	24.00	.00	24.00
	OTHER (cfs):	.00	3.00	32.22	12.25
	OUTFLOW (cfs):	.00	3.00	32.30	12.50
109A	STAGE (ft):	4.40	12.00	11.20	16.00
	VOLUME (af):	.00	3.00	9.05	24.00
	RUNOFF (cfs):	.00	24.00	.00	24.00
	OFFSITE (cfs):	.00	24.00	.00	24.00
	OTHER (cfs):	.00	3.00	32.30	12.50
	OUTFLOW (cfs):	.00	24.00	.00	24.00

Q. Basins 1030-1040 Post-Development Hydrograph and Routing

1. Impervious Area Computation
2. Curve Number Computation
3. Time of Concentration Computation
4. Stage - Storage Table
5. Pollution Abatement Volume and Stage Calculations
6. Permanent Pool Volume Computation
7. Skimmer Blade Design
8. Pond Drawdown Calculations
9. 25-Year, 24-Hour SCS Type 2 Hydrograph Input and Output Summary
10. Node and Reach Input Data
11. Peak Stage and Flow Summary

Basin 1030 & 1040 Postdevelopment Impervious Area Computation

- SR9A sta 74+50 → 80+00 = 550 (100) = 1.3 Ac
- SR9A Sta 80+00 → 90+00 = 1000 (112) = 2.6 Ac
- I95 sta 744+50 → 777+50 = 3300 (58) = 4.4 Ac
- Ramps = 30' (11700) = 8.1 Ac
- Total Impervious Area = 16.4 Ac

% Impervious = 16.4/54.5 = 30.1 %

Basin 1030:

Impervious Area = $\frac{21.8\ Ac}{54.5\ Ac}$ 16.4 Ac = 6.6 Ac

Basin 1040:

Impervious Area = 16.4 − 6.6 = 9.8 Ac

SR9A

POST-DEVELOPMENT

CURVE NUMBER COMPUTATION

BASIN: 1030
POND: 103
AREA: 21.8 ACRES

LAND USE	SOIL TYPE	HYDROLOGIC GROUP	CURVE NUMBER	AREA ACRES	PRODUCT CN*A
GOOD COND. OPEN SPACE	24	A	39	1.0	39.0
GOOD COND. OPEN SPACE	16	B/D	80	14.2	1136.0
IMPERVIOUS AREA			98	6.6	646.8
					0.0
					0.0
					0.0
					0.0
					1821.8

$$\text{COMPOSITE CN} = \frac{1821.8}{21.8} = 84$$

BASIN: 1040
POND: 104
AREA: 32.7 ACRES

LAND USE	SOIL TYPE	HYDROLOGIC GROUP	CURVE NUMBER	AREA ACRES	PRODUCT CN*A
GOOD COND. OPEN SPACE	1	C	74	5.3	392.2
GOOD COND. OPEN SPACE	16	B/D	80	12.5	1000.0
IMPERVIOUS AREA			98	9.8	960.4
POND			100	5.1	510.0
					0.0
					0.0
					0.0
					2862.6

$$\text{COMPOSITE CN} = \frac{2862.6}{32.7} = 88$$

SR9A DRAINAGE

STAGE-STORAGE CALCULATIONS

POND: 103

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
10.0	0.6				0.0
		1.6	4.0	6.4	
14.0	2.6				6.4

POND: 104

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
9.0	5.1				0.0
		5.5	4.0	21.8	
13.0	5.8				21.8

SR9A

BASINS 1030 and 1040

SJRWMD WET DETENTION POND
POLLUTION ABATEMENT VOLUME CALCULATIONS

54.5 ACRES = BASIN AREA

30.1 % = PERCENT IMPERVIOUS AREA

2.5" OF RUNOFF FROM IMPERVIOUS AREA =	3.42	AF
1" OF RUNOFF FROM ENTIRE BASIN =	4.54	AF
REQUIRED POLLUTION ABATEMENT VOLUME =	4.54	AF
POLLUTION ABATEMENT STAGE =	9.88	FT
1/2 POLLUTION VOLUME =	2.27	AF
1/2 POLLUTION ABATEMENT STAGE =	9.44	FT

SR9A

BASINS 1030 and 1040

SJRWMD WET DETENTION POND
PERMANENT POOL VOLUME CALCULATIONS

54.5 ACRES = BASIN AREA

30.1 % = PERCENT IMPERVIOUS AREA

RATIONAL RUNOFF COEFFICENT = 0.41

PERM. POOL VOL. = (AREA)(C)(30 IN)(14 D/153 D)(1/12)
= 5.12 AF

NO LITTORAL ZONE PROPOSED; THEREFORE:

PERM. POOL VOL. = (1.5)(PERM. POOL VOL.) = 7.68 AF

VOLUME PROVIDED

POND: 104

STAGE	AREA (AC)	AVG AREA (AC)	INC DEPTH (FT)	INC VOLUME (ACFT)	TOTAL VOLUME (ACFT)
1.0	3.8				0.0
		4.5	8.0	35.6	
9.0	5.1				35.6

SR 9A DRAINAGE

POND 104 SKIMMER BLADE DESIGN

THE SKIMMER BLADE WILL BE 6 INCHES ABOVE THE DESIGN HIGH WATER AND 6 INCHES BELOW THE CONTROL STAGE

9.9 = CONTROL STAGE 9.4 = SKIMMER BOTTOM

11.8 = DHW STAGE 12.3 = SKIMMER TOP

85 CFS = PEAK DESIGN FLOW

FLOW AROUND SKIMMER IS GOVERENED BY ORIFICE FLOW EQUATION:

$Q = C\ A\ SQR(2\ g\ H)$

H = .1 FT (ALLOWABLE HEADLOSS AROUND SKIMMER)

C = .6 (ORIFICE COEFFICIENT)

55.8 SF = FLOW AREA REQUIRED

SR9A

BASIN 1030 - WET DETENTION POND DRAWDOWN CALCULATIONS

9.0 = NWL STAGE 5.1 AC = NWL AREA
13.0 = TOP STAGE 5.8 AC = TOP AREA

9.9 = POLLUTION ABATEMENT STAGE
4.66 ACFT = POLLUTION ABATEMENT VOLUME

9.45 = 1/2 POLLUTION ABATEMENT STAGE
2.33 ACFT = 1/2 POLLUTION ABATEMENT VOLUME

0.5 FT = RECTANGULAR WEIR WIDTH
0.333 FT = GATE DEPTH

3.13 = WEIR COEFFICIENT 0.6 = ORIFICE COEFFICIENT

ELEV FT	AVG HEAD FT	POND AREA AC	POND AVG AREA AC	INC VOL ACFT	TOTAL VOL ACFT	FLOW CFS	INC TIME HRS	TOTAL TIME HRS
9.90		5.26						0.00
	0.9		5.25	0.26	0.26	0.67	4.71	
9.85		5.25						4.71
	0.8		5.24	0.52	0.79	0.64	9.94	
9.75		5.23						14.65
	0.7		5.22	0.52	1.31	0.59	10.79	
9.65		5.21						25.44
	0.6		5.21	0.52	1.83	0.53	11.93	
9.55		5.20						37.37
	0.5		5.19	0.52	2.35	0.46	13.56	
9.45		5.18						50.93
	0.4		5.17	0.52	2.87	0.39	16.15	
9.35		5.16						67.08
	0.3		5.15	0.52	3.38	0.26	24.24	
9.25		5.14						91.32
	0.2		5.14	0.51	3.89	0.14	44.39	
9.15		5.13						135.71
	0.1		5.12	0.51	4.41	0.05	125.12	
9.05		5.11						260.83
	0.0		5.10	0.26	4.66	0.01	499.20	
9.00		5.10						760.03

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
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SR9A BASIN 1030 POST-DEVELOPMENT 25YR/24HR
8/13/92

BASIN NAME	1030	1040
NODE NAME	103	104
UNIT HYDROGRAPH	UH484	UH484
PEAKING FACTOR	484.	484.
RAINFALL FILE	SCSII-24	SCSII-24
RAIN AMOUNT (in)	9.50	9.50
STORM DURATION (hrs)	24.00	24.00
AREA (ac)	21.80	32.70
CURVE NUMBER	84.00	88.00
DCIA (%)	.00	.00
TC (mins)	10.00	10.00
LAG TIME (hrs)	.00	.00
BASIN STATUS	ONSITE	ONSITE

BASIN	QMX (cfs)	TMX (hrs)	VOL (in)	NOTES
1030	208.52	12.02	7.53	
1040	324.48	12.02	8.03	

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
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SR9A BASIN 1030 POST-DEVELOPMENT 25YR/24HR
11/30/92

CONTROL PARAMETERS

START TIME: .00
END TIME: 24.00

TO TIME (hours)	SIMULATION INC (secs)	PRINT INC (mins)
20.00	150.00	15.00
300.00	150.00	120.00

RUNOFF HYDROGRAPH FILE: DEFAULT
OFFSITE HYDROGRAPH FILE: DEFAULT
BOUNDARY DATABASE FILE: NONE

NOTE:

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
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SR9A BASIN 1030 POST-DEVELOPMENT 25YR/24HR
11/30/92

NODE NAME	NODE TYPE	INI STAGE (ft)	X-COOR (ft)	Y-COOR (ft)	LENGTH (ft)	STAGE (ft)	AR/TM/STR (ac/hr/af)
103	AREA	10.000	.000	.000	.000	10.000	.600
						14.000	2.600
104	AREA	9.000	.000	.000	.000	9.000	5.100
						13.000	5.800
109B	TIME	2.000	.000	.000	.000	2.000	.000
						2.000	10.000
						9.500	14.000
						9.500	16.000
						8.000	20.000
						8.000	300.000

```
        Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
                  Copyright 1989, Streamline Technologies, Inc.

        SR9A   BASIN 1030   POST-DEVELOPMENT   25YR/24HR
        11/30/92

>>REACH NAME       : 103-104
  FROM NODE        : 103
  TO NODE          : 104
  REACH TYPE       : DROP STRUCTURE w/ CIRC. CULVERT
  FLOW DIRECTION   : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH     : OFF

  CULVERT DATA     :
         SPAN (in):  48.000       RISE (in):  48.000     LENGTH (ft): 582.000
   U/S INVERT (ft):   4.000 D/S INVERT (ft):   3.500       MANNING N:    .012
       ENTRNC LOSS:   1.200   # OF CULVERTS:   1.000

  POSITION A       : RECTANGULAR RISER SLOT
    CREST EL. (ft):  10.000  CREST LN. (ft):  19.000    OPENING (ft): 999.000
        WEIR COEF.:   2.600      GATE COEF.:    .600 NUMBER OF ELEM.:   1.000

  POSITION B       : NOT USED

               NOTE:

>>REACH NAME       : 104-109B
  FROM NODE        : 104
  TO NODE          : 109B
  REACH TYPE       : DROP STRUCTURE w/ CIRC. CULVERT
  FLOW DIRECTION   : POSITIVE AND NEGATIVE FLOWS ALLOWED
  TURBO SWITCH     : OFF

  CULVERT DATA     :
         SPAN (in):  42.000       RISE (in):  42.000     LENGTH (ft): 500.000
   U/S INVERT (ft):   3.500 D/S INVERT (ft):   2.000       MANNING N:    .012
       ENTRNC LOSS:    .500   # OF CULVERTS:   1.000

  POSITION A       : RECTANGULAR RISER SLOT
    CREST EL. (ft):   9.000  CREST LN. (ft):    .500    OPENING (ft):    .333
        WEIR COEF.:   3.130      GATE COEF.:    .600 NUMBER OF ELEM.:   1.000

  POSITION B       : RECTANGULAR RISER SLOT
    CREST EL. (ft):   9.900  CREST LN. (ft):  15.000    OPENING (ft): 999.000
        WEIR COEF.:   3.130      GATE COEF.:    .600 NUMBER OF ELEM.:   1.000

               NOTE:
```

Advanced Interconnected Channel & Pond Routing (adICPR Ver 1.40)
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SR9A BASIN 1030 POST-DEVELOPMENT 25YR/24HR
11/30/92

REACH SUMMARY

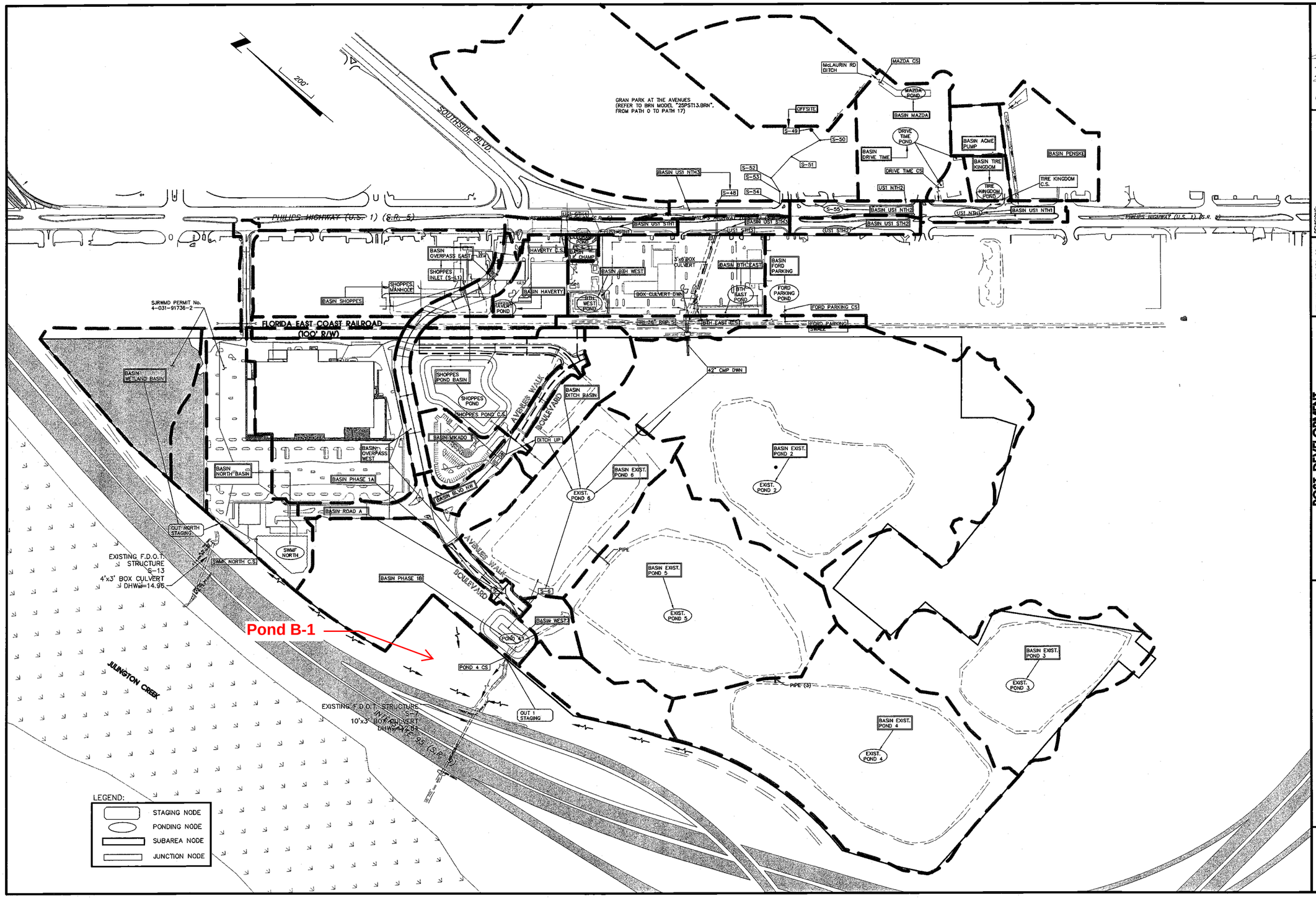
INDEX	RCHNAME	FRMNODE	TONODE	REACH TYPE
1	103-104	103	104	DROP STRUCTURE w/ CIRC. CULVERT
2	104-109B	104	109B	DROP STRUCTURE w/ CIRC. CULVERT

SR9A BASIN 1030 POST-DEVELOPMENT 25YR/24HR
11/30/92

NODAL MIN/MAX/TIME CONDITIONS REPORT

NODE ID	PARAMETER	MINIMUMS VALUE	MINIMUMS TIME (hr)	MAXIMUMS VALUE	MAXIMUMS TIME (hr)
103	STAGE (ft):	10.00	3.25	13.10	12.25
	VOLUME (af):	.00	3.25	4.96	12.25
	RUNOFF (cfs):	.00	3.25	206.64	12.00
	OFFSITE (cfs):	.00	24.00	.00	24.00
	OTHER (cfs):	.00	24.00	.00	24.00
	OUTFLOW (cfs):	.00	3.25	50.83	12.25
104	STAGE (ft):	9.00	2.50	11.78	12.50
	VOLUME (af):	.10	2.25	15.22	12.50
	RUNOFF (cfs):	.00	2.25	322.26	12.00
	OFFSITE (cfs):	.00	24.00	.00	24.00
	OTHER (cfs):	.00	3.25	50.83	12.25
	OUTFLOW (cfs):	.00	2.50	85.23	12.25
109B	STAGE (ft):	2.00	10.00	9.50	16.00
	VOLUME (af):	.00	2.50	28.91	24.00
	RUNOFF (cfs):	.00	24.00	.00	24.00
	OFFSITE (cfs):	.00	24.00	.00	24.00
	OTHER (cfs):	.00	2.50	85.23	12.25
	OUTFLOW (cfs):	.00	24.00	.00	24.00

Permit #91736-9: Avenues Walk Phase 2A



POST DEVELOPMENT
DRAINAGE CALCULATION
REFERENCE MAP

AVENUES WALK – PHASE 2A
FOR KIMCO DEVELOPERS, INC.
JACKSONVILLE, FLORIDA

REVISIONS:

ETM NO. 03-039-06
DRAWN BY: D.G.S.
DESIGNED BY: S.A.W.
CHECKED BY: S.A.W.
DATE: SEPTEMBER, 2007

England·Thims&Miller,Inc.
ENGINEERS - PLANNERS - SURVEYORS - LANDSCAPE ARCHITECTS
14775 OLD ST. AUGUSTINE ROAD JACKSONVILLE, FLORIDA 32258
CERTIFICATE OF AUTHORIZATION NUMBER: 2584
PHONE NUMBER (904) 642-8990 FAX NUMBER (904) 646-9485

DRAWING NO.
5

91736-9

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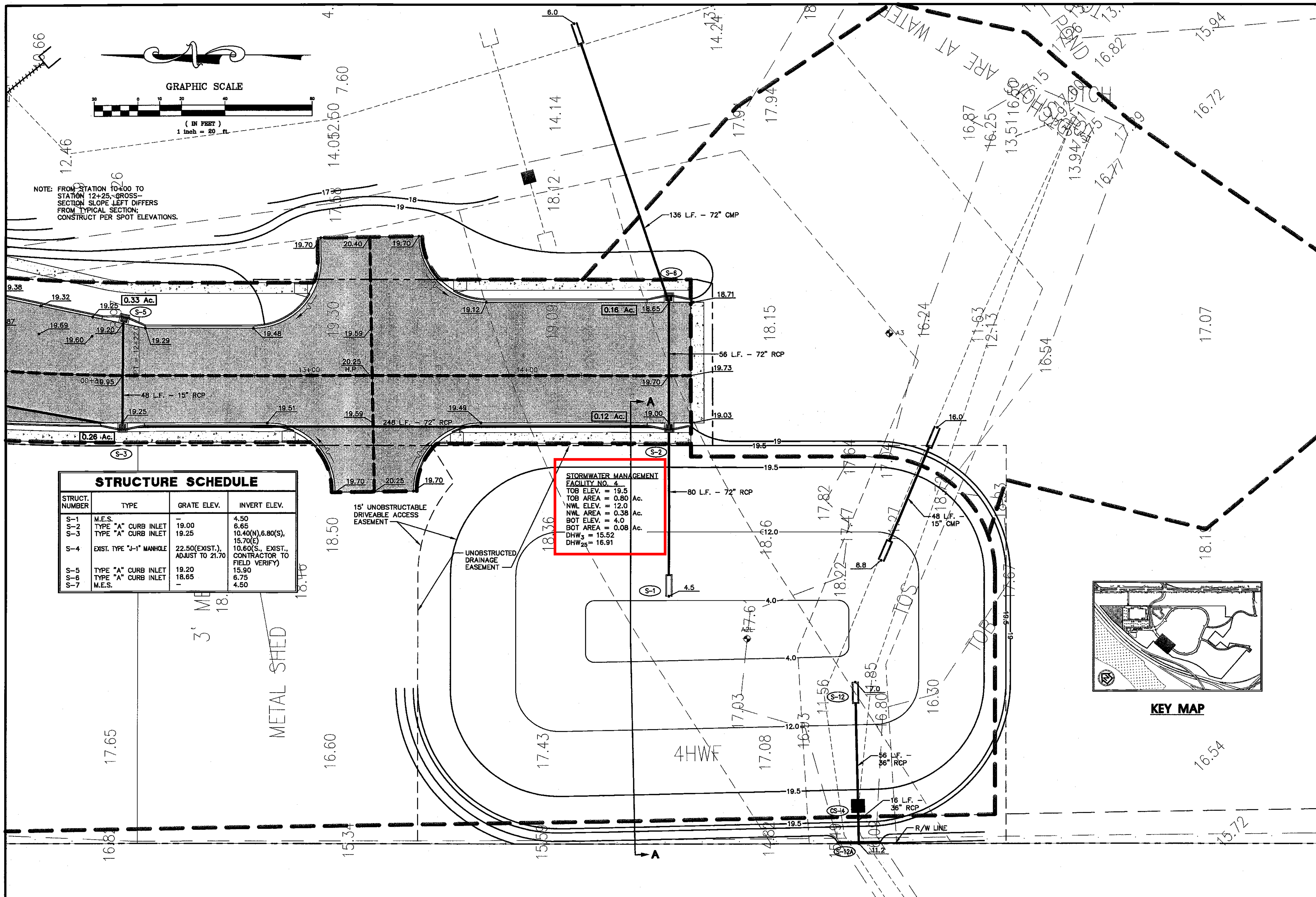

STRUCTURE SCHEDULE

STRUCT. NUMBER	TYPE	GRATE ELEV.	INVERT ELEV.
S-1	M.E.S.	–	4.50
S-2	TYPE "A" CURB INLET	19.00	6.65
S-3	TYPE "A" CURB INLET	19.25	10.40(N),6.80(S), 15.70(E)
S-4	EXIST. TYPE "J-1" MANHOLE	22.50(EXIST.), ADJUST TO 21.70	10.60(S., EXIST., CONTRACTOR TO FIELD VERIFY)
S-5	TYPE "A" CURB INLET	19.20	15.90
S-6	TYPE "A" CURB INLET	18.65	6.75
S-7	M.E.S.	–	4.50

REVISIONS:

ETM NO. 03-039-06
DRAWN BY: D.G.S.
DESIGNED BY: S.A.W.
CHECKED BY: S.A.W.
DATE: SEPTEMBER, 2007

SMF NO. 4 PLAN

AVENUES WALK – PHASE 2A
FOR KIMCO DEVELOPERS, INC.
JACKSONVILLE, FLORIDA

England-Thims & Miller, Inc.
ENGINEERS - PLANNERS - SURVEYORS - LANDSCAPE ARCHITECTS
14775 OLD ST. AUGUSTINE ROAD JACKSONVILLE, FLORIDA 32258
CERTIFICATE OF AUTHORIZATION NUMBER: 2584
PHONE NUMBER (904) 642-8990 FAX NUMBER (904) 646-9485

DRAWING NO.
9A
91736-9

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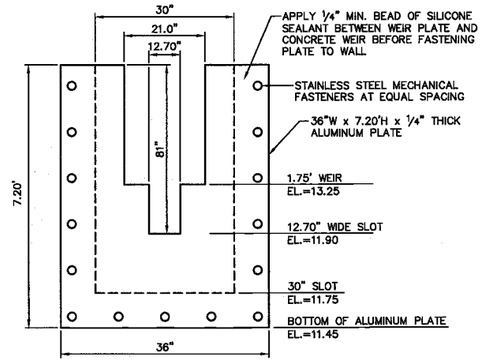
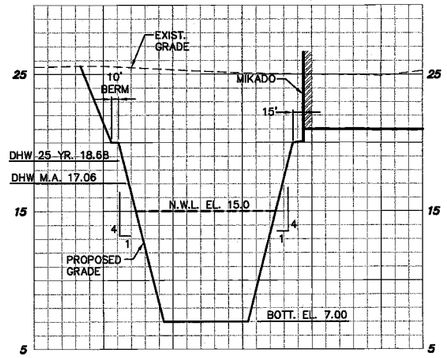


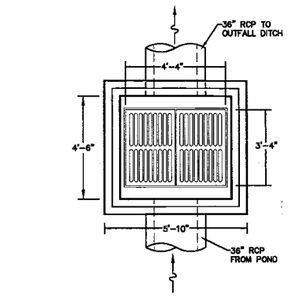
WEIR PLATE DETAIL
SMF No. 4

N.T.S.

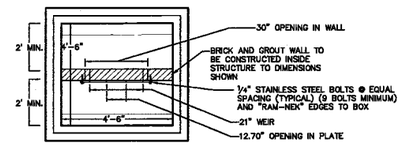


SECTION C-C (SHOPPES POND)

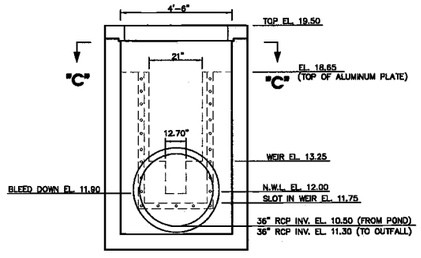
SCALE: 1" = 50' HORIZ.
1" = 5' VERT.



GRATE PLAN



SECTION "C-C"



CONTROL STRUCTURE CS-4 (SMF No. 4)
MODIFIED TYPE E INLET

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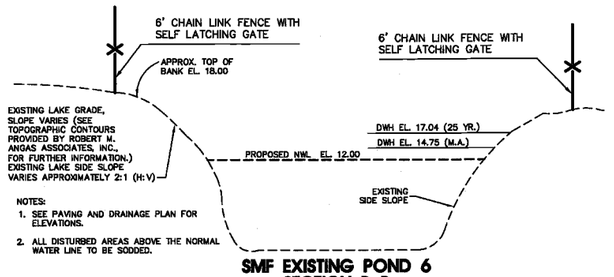
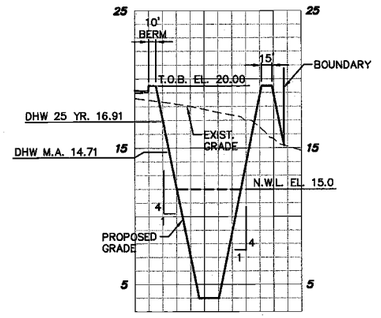


SMF EXISTING POND 6
SECTION B-B

N.T.S.



SECTION A-A (POND 4)

SCALE: 1" = 50' HORIZ.
1" = 5' VERT.

CONTROL STRUCTURE DETAILS

AVENUES WALK - PHASE 2A
FOR KIMCO DEVELOPERS, INC.
JACKSONVILLE, FLORIDA

ETM NO.	03-039-05
DRAWN BY:	D.G.S.
DESIGNED BY:	S.A.W.
CHECKED BY:	S.A.W.
DATE:	SEPTEMBER, 2007

REVISIONS

England-Thims & Miller, Inc.
ENGINEERS - PLANNERS - SURVEYORS - LANDSCAPE ARCHITECTS
14775 OLD ST. AUGUSTINE ROAD JACKSONVILLE, FLORIDA 32258
CERTIFICATE OF AUTHORIZATION NUMBER: 2584
PHONE NUMBER (904) 642-8990 FAX NUMBER (904) 646-9485

DRAWING NO.

10

91736-9

Plotted: May 14, 2008 - 1:55pm By: Kyser

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Path 094 from Node 101 (POND 4 CS DWN) to Node 102 (OUT 1)
^PITCH 6.00

Path 094 ID 480F3B91 Type PIPE		US Std
00	Length..	16.0 Ft
01	Mann N..	0.012
02	Rise....	3.000 Ft
03	Span....	3.000 Ft
04	Inlet	
05	Invert..	11.300 Ft
06	Ent Ke..	0.200
07	Outlet	
08	Invert..	11.200 Ft
09	Ent Ke..	0.200
10		
11	BW Steps	0
12		
13		
14		
15	HW PE/KE NO	
16	TW PE/KE NO	
17	Max HW..	19.500 Ft
18	Max TW..	13.000 Ft

Path 094 Output Data Type PIPE		US Std
00	Input ID 480F3B91	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	21.098 CFS
04	Min In..	-0.093 CFS
05	Max Out.	21.098 CFS
06	Min Out.	-0.093 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

^PITCH 9.00

Path 095 from Node 066 (BASIN NORTH BASIN) to Node 062 (SWMF NORTH)
^PITCH 6.00

Path 095 ID 4664659F Type DIRECT		US Std
00	DIRECT..----------	
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
11		
12		
13		
14		
15	HW PE/KE NO	
16	TW PE/KE YES	
17	Max HW..	20.000 Ft
18	Max TW..	20.000 Ft

Path 095 Output Data Type DIRECT		US Std
00	Input ID 4664659F	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	57.078 CFS
04	Min In..	0.000 CFS
05	Max Out.	57.078 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

^PITCH 9.00

Node 099 Name BASIN WEST	Input# 480F3D7B
Type SUBAREA	US Std
00 Subarea.. 25WST_2A File	Flood El. 18.00 Ft
01 File ID#. 480E4B34	
02 Alt Type. RNF0002	
03 Run Time. 25.000 Hrs	
04 Delta T.. 0.100 Hrs	
05 NumData.. 251 Pts	
06 Storm.... SCS_IIM File	
07 Duration. 24.000 Hrs	
08 Rainfall. 9.500 In	
09 Excess... 8.896 In	
10 Area..... 1.260 Ac	
11 TC....... 0.170 Hrs	
12 TP....... 12.100 Hrs	
13 Peak Flow 7.602 CFS	
14 volume... 0.935 AcFt	
15 Executed. YES	
16	
17 Base Flow 0.00 CFS	Stage TO. Ft
18 x Coord.. 0.00 Ft	Y Coord.. 0.00 Ft

Node 099 Name BASIN WEST	Output Data
Type SUBAREA	US Std
00 Input ID.....	480F3D7B
01 Flood Elevation Reached.....	ND
02 Initial Stage Elevation.....	18.000 Feet
03 Initial Storage.....	0 CF
04 Maximum Stage Reached.....	18.000 Feet
05 Minimum Stage Reached.....	18.000 Feet
06 Maximum Gross Storage.....	0 CF
07 Maximum Detention Storage.....	0 CF
08 Final Stage Elevation.....	18.000 Feet
09 Time of Maximum Stage.....	0.000 Hours
10 Time of Minimum Stage.....	0.000 Hours
11	
12	
13 Peak Nodal Intake.....	7.602 CFS
14 Time of Peak Intake.....	12.100 Hours
15 Peak Nodal Output.....	7.602 CFS
16 Time of Peak Output.....	12.100 Hours
17 Points Out of Tolerance.....	0
18 Maximum Stage Error.....	0.000 Feet

Node 100 Name POND 4 CS UP	Input# 480F3D84
Type JUNCTION	US Std
00 Flood El. 19.500 Ft	
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	
16	
17 Base Flow 0.00 CFS	Stage TO. Ft
18 x Coord.. 0.00 Ft	Y Coord.. 0.00 Ft

Node 100 Name POND 4 CS UP	Output Data
Type JUNCTION	US Std
00 Input ID.....	480F3D84
01 Flood Elevation Reached.....	ND
02 Initial Stage Elevation.....	11.999 Feet
03 Initial Storage.....	0 CF
04 Maximum Stage Reached.....	16.584 Feet
05 Minimum Stage Reached.....	11.999 Feet
06 Maximum Gross Storage.....	0 CF
07 Maximum Detention Storage.....	0 CF
08 Final Stage Elevation.....	14.564 Feet
09 Time of Maximum Stage.....	14.200 Hours
10 Time of Minimum Stage.....	0.000 Hours
11	
12	
13 Peak Nodal Intake.....	21.106 CFS
14 Time of Peak Intake.....	14.200 Hours
15 Peak Nodal Output.....	21.098 CFS
16 Time of Peak Output.....	14.100 Hours
17 Points Out of Tolerance.....	0
18 Maximum Stage Error.....	0.000 Feet

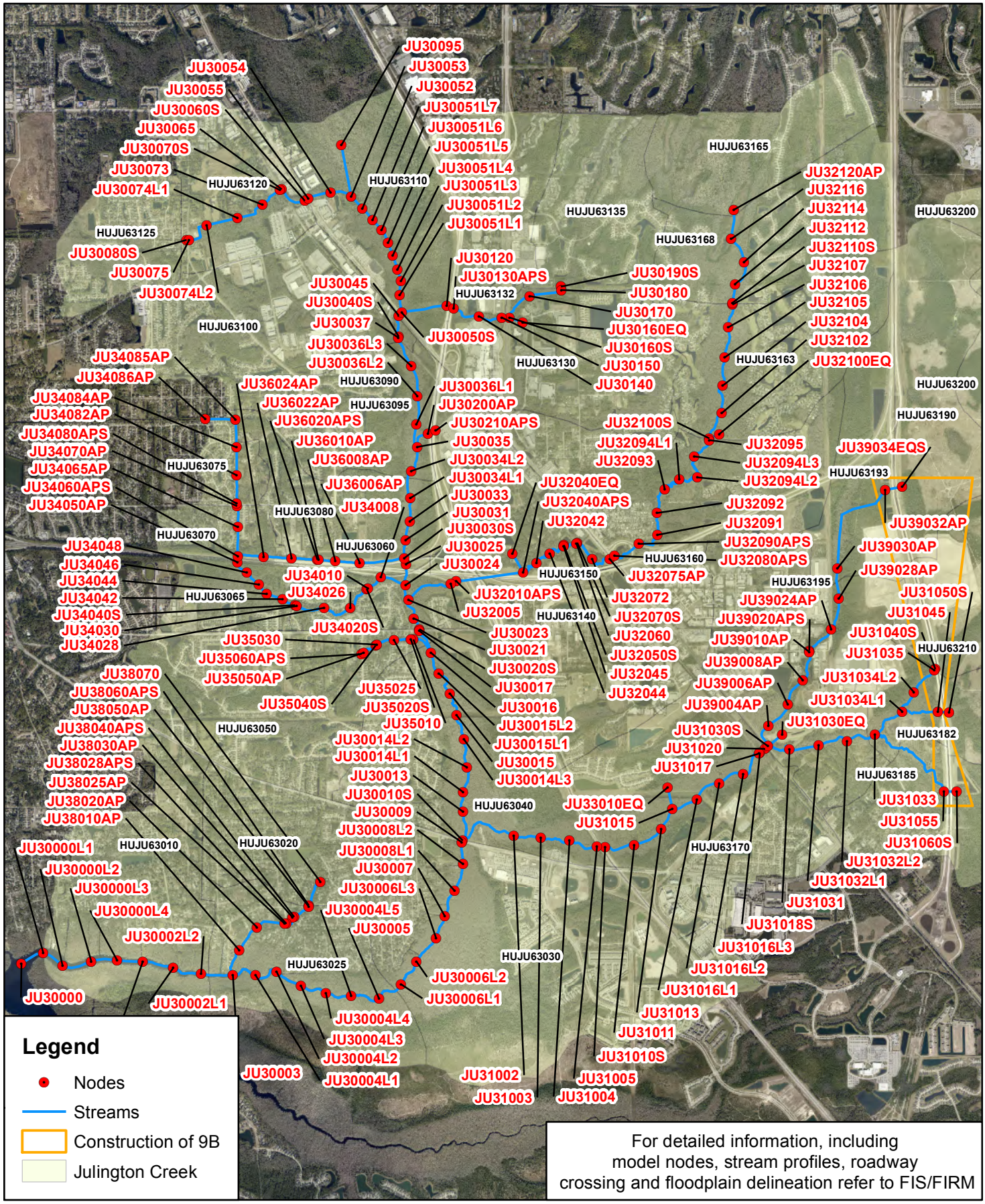
Node 101 Name POND 4 CS DWN	Input# 480F3D8A
Type JUNCTION	US Std
00 Flood El. 19.500 Ft	
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	
16	
17 Base Flow 0.00 CFS	Stage TO. Ft
18 x Coord.. 0.00 Ft	Y Coord.. 0.00 Ft

Node 101 Name POND 4 CS DWN	Output Data
Type JUNCTION	US Std
00 Input ID.....	480F3D8A
01 Flood Elevation Reached.....	ND
02 Initial Stage Elevation.....	11.300 Feet
03 Initial Storage.....	0 CF
04 Maximum Stage Reached.....	12.930 Feet
05 Minimum Stage Reached.....	11.300 Feet
06 Maximum Gross Storage.....	0 CF
07 Maximum Detention Storage.....	0 CF
08 Final Stage Elevation.....	12.166 Feet
09 Time of Maximum Stage.....	12.200 Hours
10 Time of Minimum Stage.....	0.000 Hours
11	
12	
13 Peak Nodal Intake.....	21.098 CFS
14 Time of Peak Intake.....	14.100 Hours
15 Peak Nodal Output.....	21.098 CFS
16 Time of Peak Output.....	14.200 Hours
17 Points Out of Tolerance.....	0
18 Maximum Stage Error.....	0.000 Feet

Node 102 Name OUT 1	Input# 480F3DA6
Type STAGING	US Std
00 Flood El. 13.000 Ft	PE to KE. ND
01	
02 Time..... 12.000 Hrs	Stage El. 12.840 Ft
03 Time..... 30.000 Hrs	Stage El. 10.800 Ft
04 Time..... Hrs	Stage El. Ft
05 Time..... Hrs	Stage El. Ft
06 Time..... Hrs	Stage El. Ft
07 Time..... Hrs	Stage El. Ft
08 Time..... Hrs	Stage El. Ft
09 Time..... Hrs	Stage El. Ft
10 Time..... Hrs	Stage El. Ft
11 Time..... Hrs	Stage El. Ft
12 Time..... Hrs	Stage El. Ft
13	
14	
15	
16	
17 Base Flow CFS	Stage TO. 10.800 Ft
18 x Coord.. 0.00 Ft	Y Coord.. 0.00 Ft

Node 102 Name OUT 1	Output Data
Type STAGING	US Std
00 Input ID.....	480F3DA6
01 Flood Elevation Reached.....	ND
02 Initial Stage Elevation.....	10.800 Feet
03 Initial Storage.....	0 CF
04 Maximum Stage Reached.....	12.840 Feet
05 Minimum Stage Reached.....	10.800 Feet
06 Maximum Gross Storage.....	0 CF
07 Maximum Detention Storage.....	0 CF
08 Final Stage Elevation.....	10.800 Feet
09 Time of Maximum Stage.....	12.000 Hours
10 Time of Minimum Stage.....	0.000 Hours
11	
12	
13 Peak Nodal Intake.....	21.098 CFS
14 Time of Peak Intake.....	14.200 Hours
15 Peak Nodal Output.....	0.093 CFS
16 Time of Peak Output.....	4.700 Hours
17 Points Out of Tolerance.....	0
18 Maximum Stage Error.....	0.000 Feet

CDM Study, 2009



Aerial Source: City of Jacksonville (2012)

CDM Smith

N
W E
S

0 0.5 1 2 Miles

Figure 3.3
Julington Creek Subbasin
2013 Update
Model Update

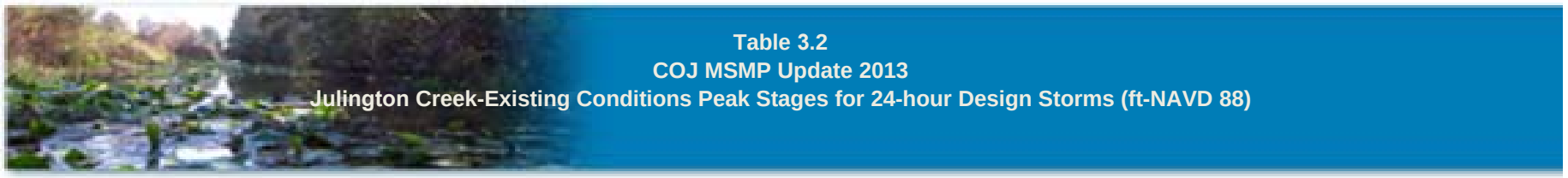


Table 3.2
COJ MSMP Update 2013
Julington Creek-Existing Conditions Peak Stages for 24-hour Design Storms (ft-NAVD 88)

					Mean Annual		5 - year		10 - year		25 - year		50 - year		100 - year	
Junction	Road Name	Type	Road Elevation	Level of Detail	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth
JU30000				S	1.7		1.7		1.7		1.7		1.7		1.7	
JU30010S	OLD ST AUGUSTINE ROAD	ARTERIAL	8.4	S	2.6		3.3		4.1		4.7		5.3		5.8	
JU30013				S	2.7		3.4		4.1		4.8		5.4		5.9	
JU30014L1				S	2.8		3.5		4.2		4.9		5.4		5.9	
JU30014L2				S	3.0		3.6		4.3		4.9		5.5		6.0	
JU30014L3				S	3.1		3.8		4.5		5.1		5.6		6.1	
JU30015				S	3.4		4.0		4.6		5.2		5.7		6.2	
JU30015L1				S	3.7		4.3		4.9		5.4		5.9		6.3	
JU30015L2				S	3.8		4.4		5.0		5.6		6.0		6.5	
JU30016				S	4.1		4.8		5.4		6.0		6.4		6.8	
JU30017				S	5.2		5.9		6.6		7.2		7.7		8.0	
JU30020S	GREENLAND ROAD	ARTERIAL	11.3	S	5.2		6.0		6.7		7.2		7.7		8.1	
JU30021				S	5.4		6.2		6.9		7.5		7.9		8.3	
JU30023				S	5.7		6.5		7.2		7.8		8.2		8.6	
JU30024				S	5.9		6.7		7.4		8.0		8.5		8.8	
JU30025	S I295EXIT N I95 RP	ARTERIAL	19.0	S	6.2		7.0		7.7		8.3		8.7		9.1	
JU30030S	S I95EXIT N I295 RP	ARTERIAL	19.0	S	6.5		7.5		8.5		9.5		10.3		11.0	
JU30031				S	6.7		7.7		8.7		9.6		10.5		11.1	
JU30033				S	6.9		7.9		8.8		9.8		10.6		11.2	
JU30034L1				S	7.2		8.1		9.1		10.0		10.7		11.3	
JU30034L2				S	7.6		8.5		9.4		10.2		10.9		11.5	
JU30035				S	8.0		8.8		9.6		10.4		11.1		11.6	
JU30036L1				S	8.7		9.4		10.1		10.8		11.4		11.9	
JU30036L2				S	9.7		10.2		10.8		11.4		11.9		12.3	
JU30036L3				S	11.2		11.7		12.1		12.6		13.0		13.2	
JU30037				S	12.2		12.7		13.2		13.7		14.1		14.3	
JU30040S				S	14.6		15.1		15.4		15.5		15.7		15.7	
JU30045				S	14.8		15.3		15.6		15.9		16.1		16.2	
JU30050S	PHILLIPS HIGHWAY	ARTERIAL	16.0	S	15.0		15.5		16.1		16.3		16.5		16.6	0.6
JU30051L1				S	15.0		15.6		16.1		16.4		16.5		16.6	
JU30051L2				S	15.1		15.6		16.1		16.4		16.5		16.6	
JU30051L3				S	15.1		15.6		16.1		16.4		16.5		16.6	
JU30051L4				S	15.1		15.6		16.1		16.4		16.5		16.6	
JU30051L5				S	15.1		15.7		16.1		16.4		16.5		16.6	
JU30051L6				S	15.2		15.7		16.1		16.4		16.5		16.6	

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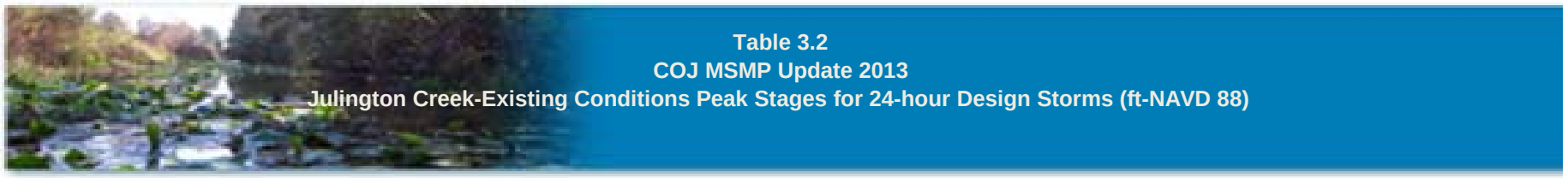

Table 3.2
COJ MSMP Update 2013
Julington Creek-Existing Conditions Peak Stages for 24-hour Design Storms (ft-NAVD 88)

					Mean Annual		5 - year		10 - year		25 - year		50 - year		100 - year	
Junction	Road Name	Type	Road Elevation	Level of Detail	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth
JU30051L7				S	15.2		15.7		16.2		16.4		16.5		16.6	
JU30052				S	15.3		15.8		16.2		16.4		16.5		16.6	
JU30053				S	15.4		15.8		16.2		16.4		16.5		16.6	
JU30054				S	15.4		15.9		16.2		16.5		16.6		16.7	
JU30055				S	16.7		17.3		17.6		17.8		18.0		18.1	
JU30060S	PHILLIPS HIGHWAY	ARTERIAL	23.0	S	17.0		17.9		18.9		19.7		20.3		20.8	
JU30065				S	18.0		18.5		19.1		19.8		20.4		20.8	
JU30070S	HISTORIC KINGS ROAD	LOCAL	25.0	S	18.2		18.7		19.4		20.1		20.6		21.0	
JU30073				S	19.1		19.7		20.2		20.6		21.0		21.3	
JU30074L1				S	19.4		20.0		20.5		20.9		21.2		21.5	
JU30074L2				S	19.6		20.3		20.9		21.3		21.6		21.8	
JU30075				S	20.1		20.8		21.4		21.8		22.0		22.2	
JU30080S	HOOD ROAD	ARTERIAL	23.0	S	20.2		21.1		22.1		22.6		23.1		23.3	0.3
JU30095				S	16.5		16.5		16.5		16.5		16.5		16.5	
JU30120				S	15.2		15.8		16.7		17.1		17.4		17.5	
JU30130APS	I 95 EXPRESSWAY	ARTERIAL	22.0	AP	15.2		16.1		17.6		18.8		19.9		20.7	
JU30135				S	13.1		17.2		17.8		18.8		19.9		20.7	
JU30140				S	16.8		17.2		17.8		18.8		19.9		20.7	
JU30150				S	18.2		18.9		19.6		20.5		21.1		21.4	
JU30160EQ				S	999.9		1000.1		1000.4		1000.7		1000.8		1001.0	
JU30160S	SOUTHSIDE BOULEVARD	ARTERIAL	24.0	S	20.4		22.2		24.4		25.1		25.4		25.5	1.5
JU30170				S	20.7		22.2		24.4		25.1		25.4		25.5	
JU30180				S	22.9		23.2		24.6		25.3		25.7		25.9	
JU30190S	DEERCREEK CLUB ROAD	LOCAL	26.0	S	25.5		26.5		27.0		27.2		27.4		27.5	1.5
JU30200AP				AP	10.5		10.5		10.6		10.7		11.1		11.6	
JU30210APS	I 95 EXPRESSWAY	ARTERIAL	17.0	AP	11.7		12.4		13.0		13.4		13.7		13.9	
JU31002				S	2.6		3.4		4.1		4.8		5.4		5.9	
JU31003				S	2.6		3.5		4.3		5.0		5.5		6.1	
JU31004				S	2.7		3.5		4.4		5.1		5.7		6.2	
JU31005				S	2.7		3.7		4.5		5.3		5.9		6.4	
JU31010S				S	2.7		4.0		5.1		6.3		7.5		8.7	
JU31011				S	2.7		4.1		5.2		6.4		7.5		8.7	
JU31013				S	2.8		4.3		5.3		6.5		7.6		8.7	
JU31015				S	3.4		4.5		5.4		6.5		7.6		8.8	
JU31016L1				S	3.5		4.6		5.5		6.6		7.7		8.8	

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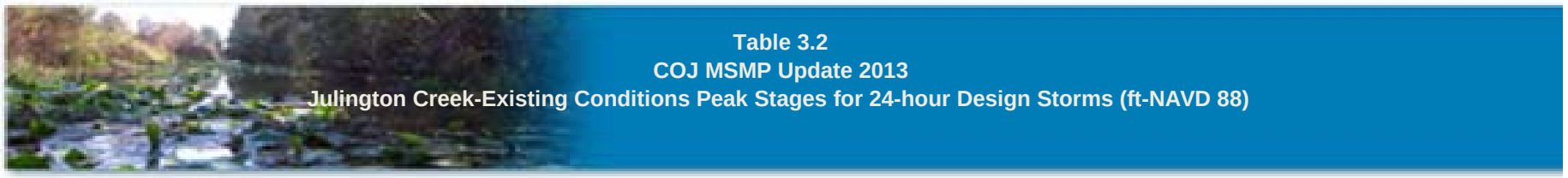

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COJ MSMP Update 2013
Julington Creek-Existing Conditions Peak Stages for 24-hour Design Storms (ft-NAVD 88)

					Mean Annual		5 - year		10 - year		25 - year		50 - year		100 - year	
Junction	Road Name	Type	Road Elevation	Level of Detail	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth	Flood Stage	Flood Depth
JU31016L2				S	4.1		4.8		5.6		6.7		7.7		8.9	
JU31016L3				S	4.6		5.2		5.9		6.9		7.8		8.9	
JU31017				S	5.4		5.9		6.5		7.2		8.0		9.0	
JU31018S				S	6.0		7.2		8.3		9.2		9.7		10.2	
JU31020				S	6.1		7.2		8.3		9.2		9.7		10.3	
JU31030EQ				S	1000.8		1001.3		1001.8		1002.3		1002.7		1003.0	
JU31030S	PHILLIPS HIGHWAY	ARTERIAL	12.0	S	6.2		7.4		8.5		9.7		10.6		11.5	
JU31031				S	9.6		11.3		12.6		13.5		14.0		14.3	
JU31032L1				S	10.1		11.8		13.0		13.8		14.4		14.8	
JU31032L2				S	11.0		12.6		14.0		14.9		15.6		16.1	
JU31033				S	12.1		13.5		14.9		15.8		16.5		17.0	
JU31034L1				S	15.0		15.6		16.2		16.9		17.6		18.1	
JU31034L2				S	15.6		16.4		17.0		17.6		18.1		18.6	
JU31035				S	17.3		18.1		18.8		19.5		19.9		20.4	
JU31040S				S	19.8		20.2		20.5		20.8		21.1		21.3	
JU31045				S	15.2		15.9		16.7		17.0		17.6		18.1	
JU31050S				S	15.2		15.9		16.7		17.0		17.6		18.1	
JU31055				S	16.2		16.7		17.1		17.5		17.7		17.9	
JU31060S				S	17.1		17.2		17.3		17.5		17.7		17.9	
JU32005				S	5.7		6.5		7.2		7.8		8.3		8.6	
JU32010APS	S I295EXIT S I95 RP	ARTERIAL	19.0	AP	5.7		6.5		7.2		7.9		8.4		8.8	
JU32040APS	I 95 EXPRESSWAY	ARTERIAL	25.0	AP	5.8		6.6		7.3		8.3		8.8		9.8	
JU32040EQ				S	999.4		999.5		999.7		999.8		999.8		999.9	
JU32042				S	10.4		11.3		11.6		12.3		12.4		12.5	
JU32044				S	11.0		11.9		12.3		12.9		13.1		13.3	
JU32045				S	12.4		13.0		13.4		13.8		14.0		14.2	
JU32050S				S	12.7		12.9		13.1		13.2		13.4		13.5	
JU32060				S	15.7		16.4		16.8		17.3		17.6		18.0	
JU32070S				S	15.8		16.5		16.9		17.4		17.7		18.0	
JU32072				S	17.7		18.4		18.9		19.3		19.4		19.5	
JU32075AP				AP	17.9		18.6		19.2		19.6		19.8		20.0	
JU32080APS	PHILLIPS HIGHWAY	ARTERIAL	24.0	AP	17.9		18.7		19.2		19.6		19.8		20.0	
JU32090APS	PHIL EXIT S 9A RP	ARTERIAL	26.0	AP	17.9		18.7		19.3		19.7		20.0		20.2	
JU32091				S	19.6		19.9		20.1		20.3		20.5		20.8	
JU32092				S	20.7		21.1		21.3		21.5		21.6		21.7	

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Appendix F
Correspondence

SJRWMD Correspondence & Pre-Application Meeting Minutes

PHONE CONVERSATION

Phone Call: Jeff Reindl, P.E., SJRWMD
Jennifer Nunn, P.E., Balmoral Group

Date: September 27, 2019

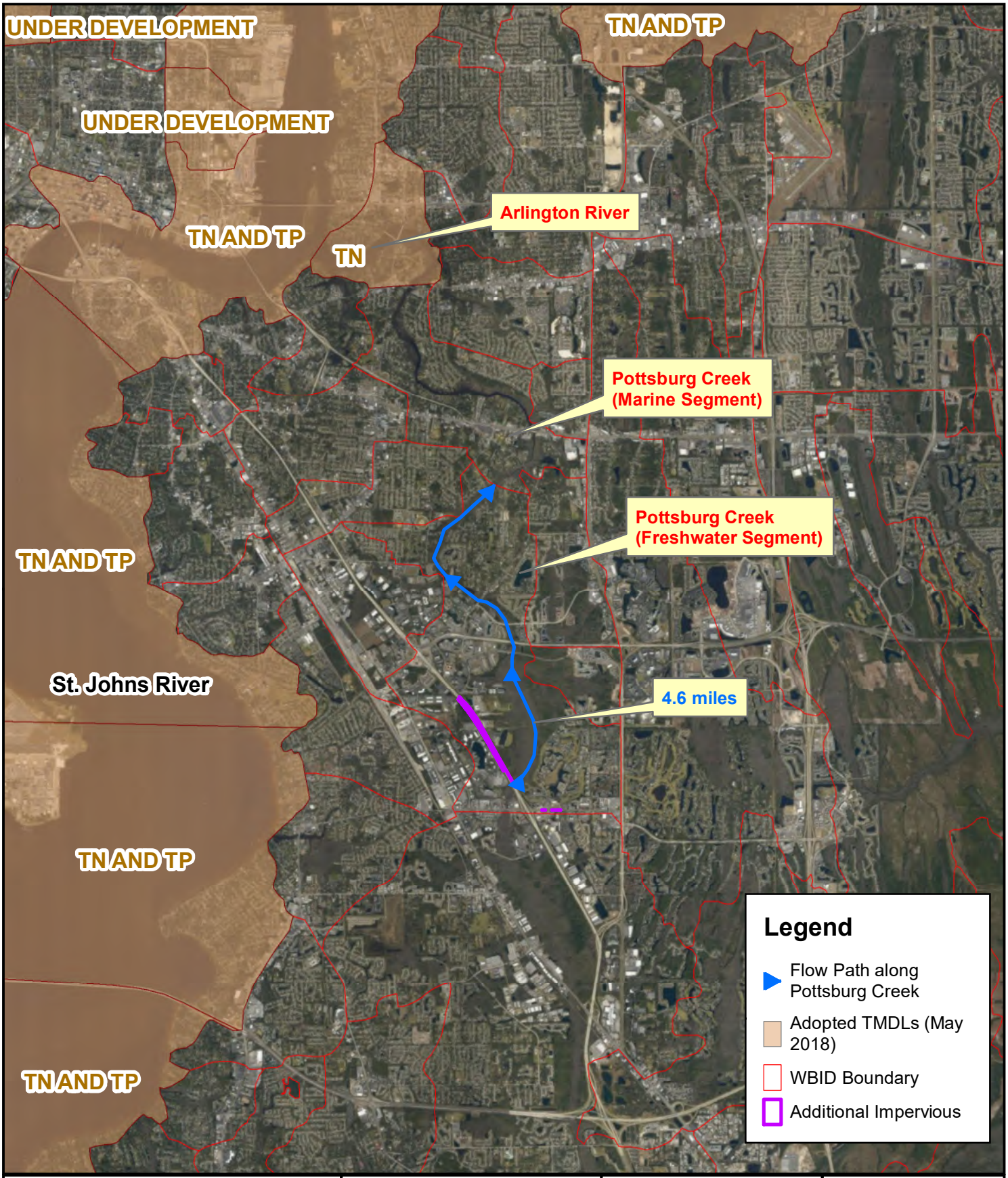
Subject: I-95 PD&E Updated Project Scope

Project Info.: **I-95 PD&E**
FPID No. 435577-1-22-01
Duval County, Florida

The following is a summary of my coordination with Jeff Reindl at SJRWMD to inquiry the use of dry detention swales within the I-95 right-of-way and further coordinate Pottsburg Creek nutrient loading requirements from the Pre-Application Meeting.

In the initial email I described that the I-95 project concept has changed substantially, now limiting the project from Baymeadows Road (SR 152) to JTB (SR 202) and only including an additional auxiliary lane in each direction along I-95 with some minor turn lane improvements along Baymeadows Road (SR 152). I sought confirmation that nutrient removal and dilution/mixing calculations will not be required for the project located in Pottsburg Creek due to the distance between the project limits to the edge of Freshwater Segment WBID boundary is 4.6-miles, and runoff would have to flow through the Marine Segment before reaching the Arlington River segment that is impaired for nutrients. In support of my request, I provided the previous Pre-Application Meeting minutes (12-12-2018), revised project scope location map, and a flow path of Pottsburg Creek from the project location to the impaired segment of Pottsburg Creek (Marine Segment). Additionally, I inquired if dry detention swales may be considered to provide treatment and attenuation for the revised project scope.

Jeff Reindl called my office in response to my e-mail. He confirmed that nutrient removal and dilution/mixing calculations will not be required for the project limits. We discussed dry detention facilities options in detail, concluding that dry detention facilities were not preferred by SJRWMD to provide treatment for this project.



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Certificate of Authorization No. 26123

Figure 2
Pottsburg WBID Flow Path

I-95 (SR 9) Auxiliary Lanes
From Baymeadows Rd. to
J. Turner Butler Blvd (SR 202)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W
E
S
0 0.5 1
Miles

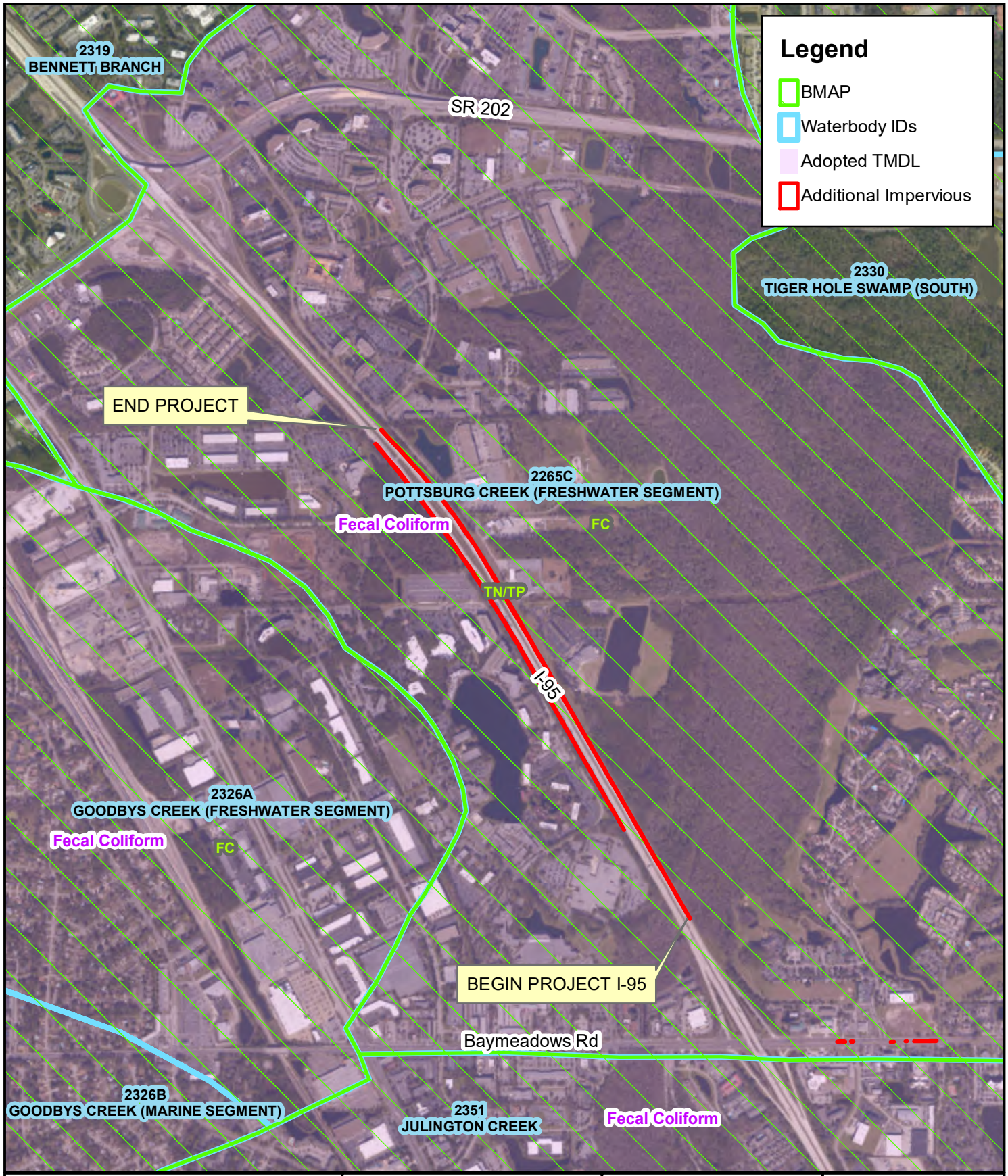

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Figure 1
Project Location

I-95 (SR 9) Auxiliary Lanes
From Baymeadows Rd. to
J. Turner Butler Blvd (SR 202)
FPID: 435577-1-22-01
Duval County, FL

FDOT

N
W E
S

0 0.125 0.25
Miles

MEETING NOTES

SJRWMD Pre-Application Meeting

435577-1-22-01
I-95 (SR 9) from I-295 to J. Turner Butler Blvd (SR 202)
Duval County

Location: Jacksonville Service Center; Date: Tuesday December 12, 2018; Time: 10:00 am

1. **ATTENDEES – See Sign-In Sheet**

2. **Purpose of Discussion**
   a. Kristina reviewed the proposed project improvements and explained the purpose of the pre-application meeting was to confirm design criteria to be used for the pond sizing effort

3. **Existing Stormwater Management Facilities and Permits**
   a. Jennifer reviewed the existing permits within the current roadway right-of-way and project limits.
   b. Four major permits existing ranging from date of issuance from 1995 to 2015
   c. She reviewed the existing permitted facilities for those permits.

4. **Pond Sizing Approach**
   a. Nutrient Analysis – It is understood that the project is within the Lower St. Johns BMAP and crosses four watersheds: Oldfield Creek, Julington Creek, Sweetwater Creek, and Pottsburg Creek; none of which are impaired waterbodies.
      i. Julington Creek - Jeff stated that due to the high base flow within Julington Creek the District understands that sufficient mixing and dilution already exists. Jeff believes that only standard treatment is required for this watershed (although he will confirm this with management). No further calculations (either for nutrient removal or dilution/mixing) would be required.
      ii. Pottsburg Creek – Jeff stated that typically dilution/mixing demonstration is required for improvements within this watershed.
         1. This can be demonstrated by evaluating the total permitted discharge of water quality volume (i.e. discharge rate through the bleeder of a wet pond) to determine if it is less than 10% of the total baseflow within the creek at the point of analysis. The total permitted discharge of water quality includes the discharge from any proposed permitted ponds for the project.
         2. Baseflow is defined as the dry season low water flow. It was mentioned that storm based flows would not suffice as base flow.
         3. Another method of demonstration is to show the total permitted pond permanent pool volume upstream of the point of analysis is less than 10% of the total permanent pool of the natural standing pool of water within the wetland (i.e. Tiger Hole, if that is used as the point of analysis).
         4. It was noted that Pottsburg Creek is not impaired until it reaches the Arlington reach and that further coordination may be done to decide if dilution/mixing would need to be demonstrated, such as an exhibit showing the flow path from project to the impaired section and estimating how much more nutrient loading would result by only providing standard treatment from wet ponds.
   b. Water Quality – Since there is no direct discharge to the impaired waterbodies, only standard treatment criteria will be required
   c. Water Quantity- Pre/Post Discharge for the 25-year/24-hour storm
   d. Floodplain Compensation

i. Cup for cup compensation for the 10-year will be required for impacts to the FEMA floodplain downstream of a 5 square mile basin.
ii. Floodplain compensation will need to be provided separate from the treatment pond and provide the vertical storage between the SHGWT and the 10-year elevation.
iii. Baymeadows Road will act as the basin divide for the 5 square mile basin determination.
iv. The 10-year water elevations from the CDM Master Stormwater model can be used to estimate impacts.

5. Open Discussion

a. Compensatory treatment is allowed and consists of providing treatment for existing and proposed impervious in order to allow some impervious area to direct discharge untreated. Treatment calculations are based on the amount of additional impervious area.
b. In order to provide linear dry retention, it was discussed if ditches could be constructed in fill to meet nutrient removal criteria. Jeff suggested using BAM (Bio-Activated Media) in those instances to ensure criteria is met.
c. Jeff mentioned a retrofit project recently constructed in District 2 on Branan Field Chaffee Road that utilized upflow filters to meet nutrient removal.

6. Action Items

a. Jeff to confirm with management on that dilution/mixing does not need to be demonstrated within Julington Creek
b. Balmoral to research existing information on improvements within Pottsburg and provide Jeff with exhibits/calcs in order to determine if dilution/mixing does need to be demonstrated
c. FDOT to find the plans, calculations, and costs for the project recently retrofitted with upflow filters.

SIGN IN SHEET

SJRWMD Pre-Application Meeting

I-95 (SR 9) FROM I-295 TO J. TURNER BUTLER BLVD (SR 202)

Duval County, FL

FPID: 435577-1-22-01

Date: December 12, 2018; Time: 10:00 AM; Location: SJRWMD Jacksonville Service Center

NAME	AGENCY/FIRM	PHONE NUMBER	EMAIL	INITIALS
Jeff Reindl, P.E.	SJRWMD	904-438-8650	jreindl@sjrwmd.com	
Michael Brock, P.E.	FDOT	386-961-7707	michael.brock@dot.state.fl.us	
Kristina Price, P.E.	HDR	904-598-8961	kristina.price@hdrinc.com	
Gregory Seidel, P.E.	The Balmoral Group	407-629-2185 Ext. 103	gseidel@balmoralgroup.us	
Jennifer Nunn, P.E.	The Balmoral Group	407-629-2185 Ext. 108	jnunn@balmoralgroup.us	

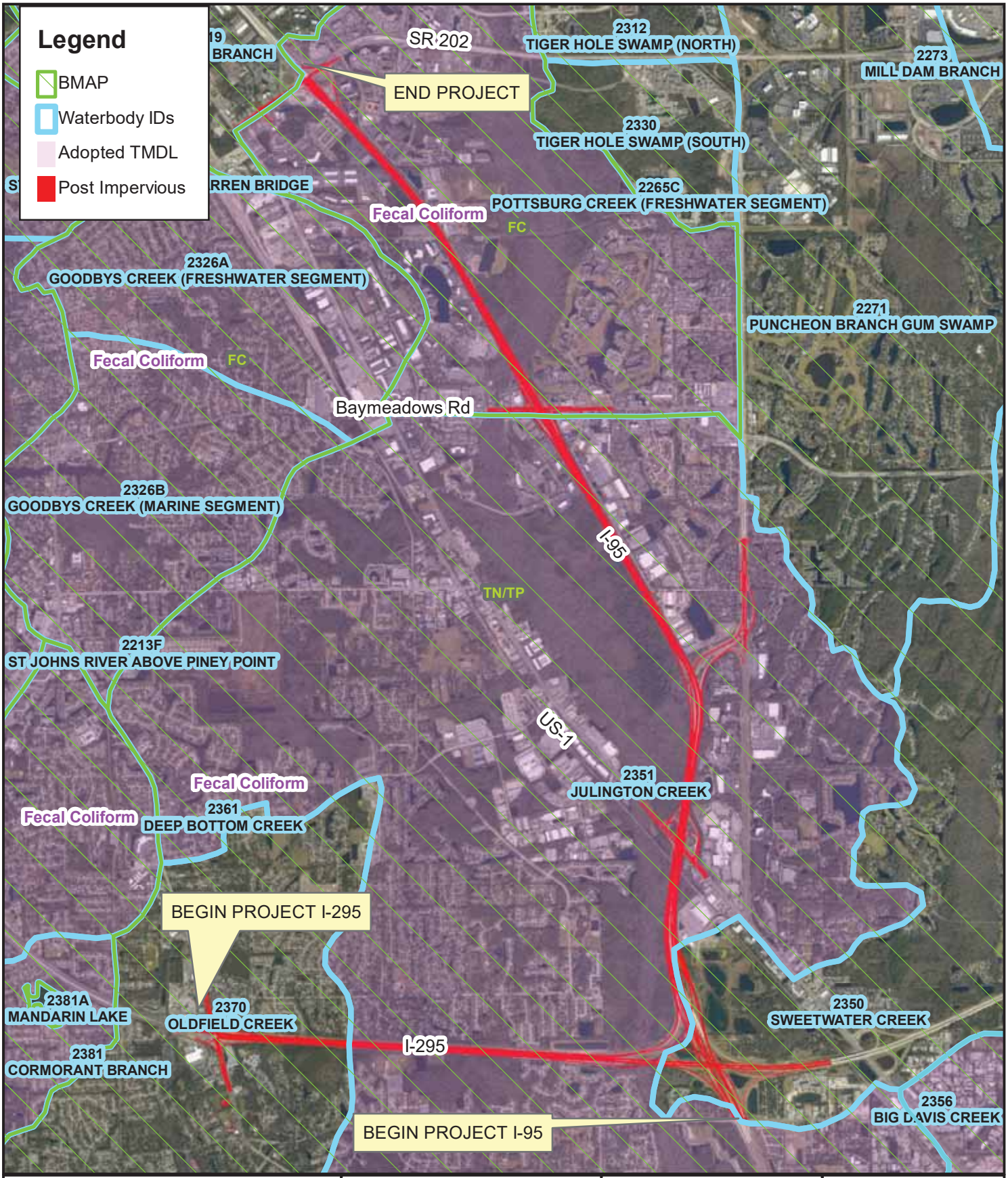

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Figure 1
Project Location

I-95 (SR 9) Express Lanes
From I-295 to
J. Turner Butler Blvd (SR 202)
FPID: 435577-1-22-01
Duval County, FL

FDOT

0 0.325 0.65 Miles

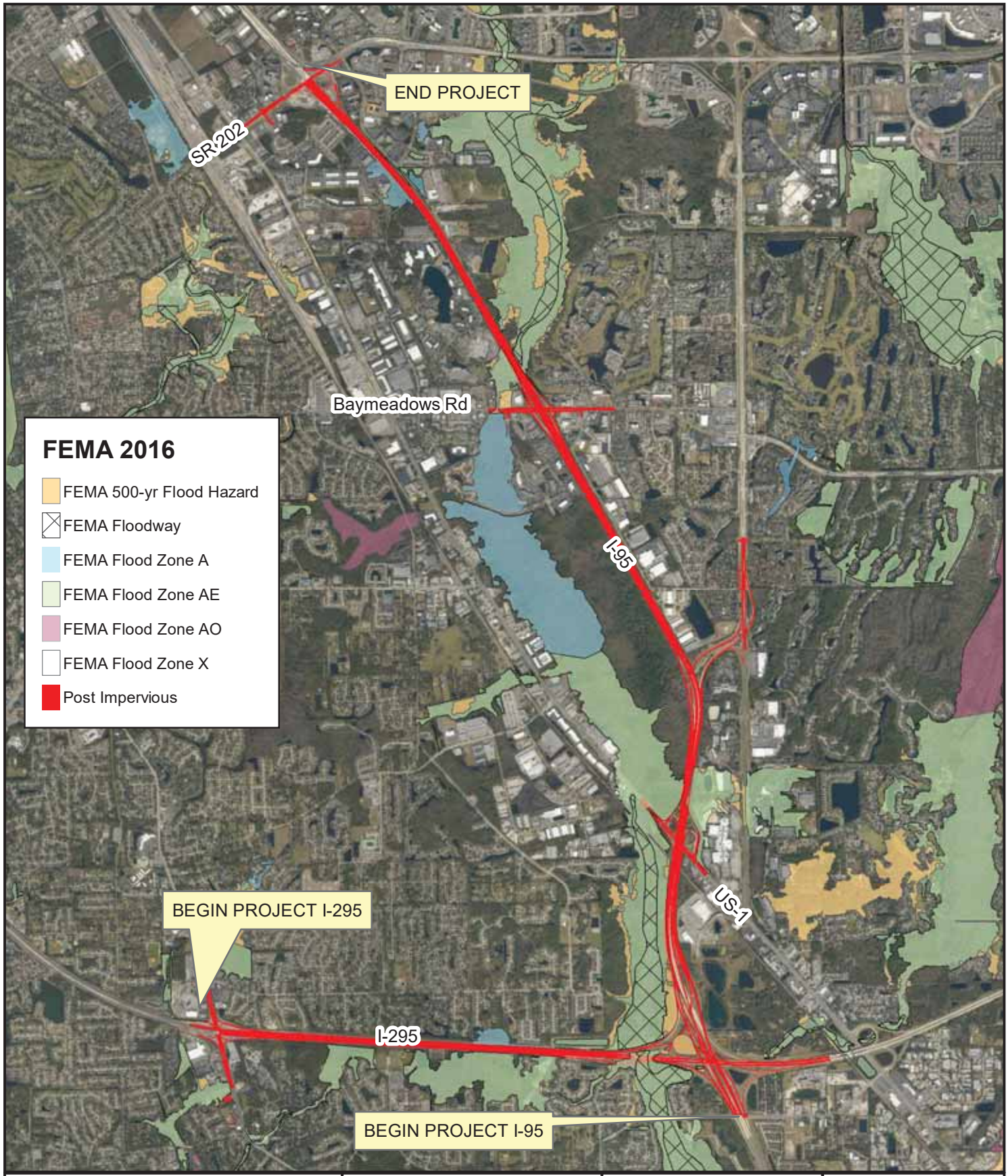

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Figure 4
FEMA Floodplains

I-95 (SR 9) Express Lanes
From I-295 to
J. Turner Butler Blvd (SR 202)
FPID: 435577-1-22-01
Duval County, FL

FDOT

0 0.325 0.65
Miles

Legend

- Existing Permitted SMF

ERP Permit

- 17963-15, I-295
- 18092-2, S.R. 9A
- 18228-3, I-95 (FROM I-295 TO SOUTH OF J.T. BUTLER BLVD.)
- 18228-15, Interstate 95 Interchange with State Road 202 Operational Improvements

North Pond (NE Infield)
South Pond (SE Infield)
US 1 (Philips Hwy)
I-95
Pond 100
Pond 103
Pond 3
I-295
Pond 6 (Pond 105)
Pond 104
Pond 101
Pond 102
Pond 5
Pond 106
Pond 108
Pond 107
City of Jax Old St. Aug. Pond

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Figure B-18
Existing Ponds

I-95 (SR 9) Express Lanes
From I-295 to
J. Turner Butler Blvd (SR 202)
FPID: 435577-1-22-01
Duval County, FL

FDOT

0 0.15 0.3 Miles

Coordination with Environmental Services, Inc.

Jennifer Nunn

Subject: FW: I-95 Pond Site Options

From: Gary Howalt [mailto:ghowalt@ESINC.CC]
Sent: Tuesday, May 7, 2019 4:42 PM
To: Price, Kristina <Kristina.Price@hdrinc.com>
Subject: RE: I-95 Pond Site Options

Hi – Great talking to you too. Most if not all of the purple outlined parcels are going to be in wetlands. The ones north of Baymeadows Road are in Basin 4. The ones south of Baymeadows Road are in Basin 5. You will need about 0.8 mitigation bank credits for each acre of wetland impacts. The ones that are in conservation easements were used as mitigation so you will need double the amount of mitigation for them. Credits in Basin 4 are about $80,000.00 per credit. Basin 5 is about $165,000.00 per credit.

Hope this helps.

ENVIRONMENTAL SERVICES, INC.
Gary K. Howalt, PWS|Principal
7220 Financial Way, Suite 100 | Jacksonville, Florida 32256
904-470-2200 Phone | 904-470-2112 Fax

From: Price, Kristina <Kristina.Price@hdrinc.com>
Sent: Tuesday, May 7, 2019 3:57 PM
To: Gary Howalt <ghowalt@ESINC.CC>
Subject: I-95 Pond Site Options

Gary – it was great talking to you again.

Attached is a KMZ of all pond sites…can you assist me immediately with your professional opinion (if you can)? Do you have any idea of the mitigation ratio that will be required for the ponds in the conservation area and/or weltand areas of Julington and Pottsburg creeks?

Trying to get a feel for mitigation costs to see how non-wetland sites within the basin compare. Drainage folks are not at a point to identify any recommended final site…I am trying to see if there is a way to narrow things down. Otherwise, all I will be able to say is that there will be 5 off-site pond and final will be one of these within the basin, and that would be the basis of the scope/hours.

Kristina M. Price, PE [FL, NC, VA]
Vice President

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Archaeological/Cultural Resource

DESKTOP ANALYSIS OF PROPOSED DRAINAGE LOCATIONS ALONG INTERSTATE 95

FROM INTERSTATE 295 TO STATE ROAD 202 (JT BUTLER BOULEVARD),

DUVAL COUNTY, FLORIDA

DESKTOP ANALYSIS OF PROPOSED DRAINAGE LOCATIONS ALONG INTERSTATE 95 FROM INTERSTATE 295 TO STATE ROAD 202 (JT BUTLER BOULEVARD), DUVAL COUNTY, FLORIDA

CONSULTANT: SEARCH
700 N. 9th Avenue, Pensacola, Florida 32501
PRINCIPAL INVESTIGATOR: Elizabeth J. Chambless, MS, RPA
PROJECT ARCHAEOLOGIST: Michael Foster, MA, RPA

CLIENT: Florida Department of Transportation, District 2
DATE: July 2019
FINANCIAL MANAGEMENT #.: 435577-1

In July 2019, SEARCH completed a desktop analysis of 17 proposed ponds in support of the Interstate 95 (I-95)/State Road (SR) 9 improvements project from I-295 (SR 9A) to SR 202 in Duval County, Florida (**Figure 1**). The present desktop analysis was conducted with the purpose of identifying cultural resource potential and previously recorded historic properties that are listed, or may be eligible for listing, in the National Register of Historic Places (NRHP). For the purposes of this desktop analysis, the study area for each pond was defined as the pond footprint in addition to a 30-meter (100-foot) buffer (**Figure 2**).

The Florida Master Site File (FMSF) database was reviewed for any previous surveys or previously recorded resources. Archaeological site probability was based on soil drainage, distance to water, and prior disturbance. In addition, the Duval County Property Appraiser database, historic maps, and aerial photographs were reviewed to determine if structures constructed prior to 1975 are located in the vicinity of the project study area.

The FMSF database indicates that five previously conducted cultural resource surveys intersect the study area (**Figure 3; Table 1**). Three of these surveys (FMSF Survey Nos. 1002, 4413, and 9766)

Table 1. Previous Cultural Resource Surveys within the I-95 Ponds Study Area.

Pond	Previous Cultural Resource Surveys	Previously Documented Resources
B-1	9766 (previously subjected study area to archaeological survey)	-
C-infield	6140 (clips southern two footprints); 2453 (clips western two footprints)	8DU18995 (southern two footprints)
FPC C-1	2453 (only clips northeast corner of footprint); 6140 (only within 100-foot buffer)	-
FPC C-2	2453 (abuts eastern side of footprint)	-
D-1	4413 (only abuts northwest footprint boundary)	-
D-2	No	-
D-3	4413 (abuts western side of footprint)	-
D-4	4413 (previously subjected study area to archaeological survey)	-
E-1A	No	-
E-1B	No	-
E-2	4413 (only within 100-foot buffer)	-
F-1	2453 (abuts western side of footprint)	-
F-2	No	-
F-3	2453 (clips western side of easement)	-
G-1	1002 (previously subjected study area to archaeological survey)	-
G-2	2453 (clips western side of easement)	-
G-3	2453 (clips western side of easement)	-

Figure 1. Locations of the I-95 Ponds Study Area in Duval County, Florida.

Figure 2. I-95 Ponds Study Area and Ponds Footprint.

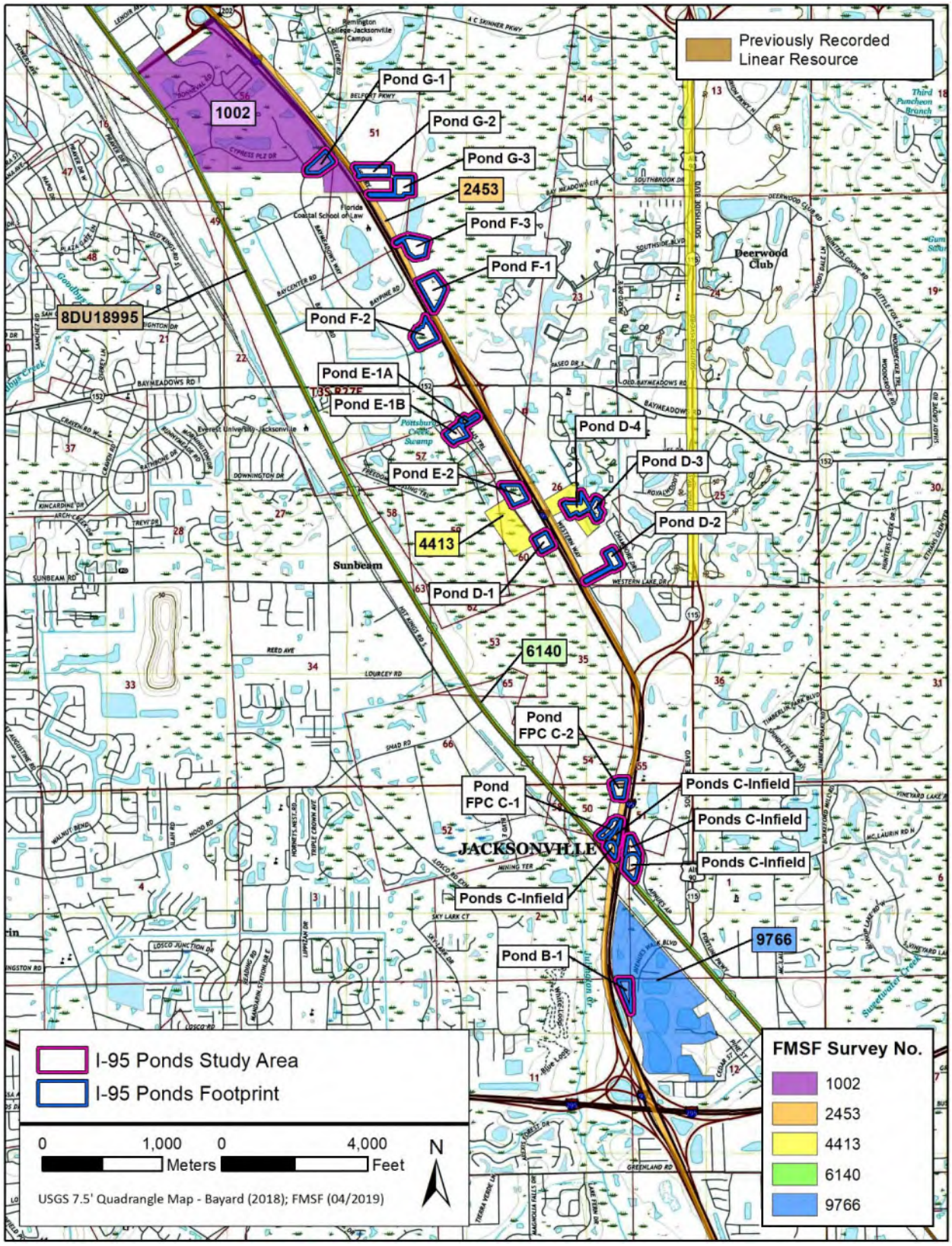

Figure 3. Previous cultural resource surveys and previously recorded resources within the I-95 Ponds Study Area.

previously subjected the entire Pond B-1, D-4, and G-1 locations to archaeological and architectural surveys. FMSF Survey Nos. 2453, 4413, and 6140 intersect small sections of 10 pond study areas (see **Table 1**). Four ponds have not been previously subjected to cultural resource surveys (D-2, E-1A, E-1B, and F-2). Only one resource has been previously documented within the study area. Phillips Highway (8DU18995) is a linear resource that crosses the southwestern end of the C-Infield study area. The State Historic Preservation Officer (SHPO) determined this resource to be not eligible for the NRHP in 2018.

The study area and its immediate surroundings primarily fall within the Mandarin Plain sub-province of the Sea Island physiographic district (Brooks 1981), which is a poorly dissected and drained terrace with flatwoods and river swamps. The majority of the soils in the study area are very poorly drained Maurepas muck; poorly to moderately well drained Leon, Sapelo, and Arents sands; and Urban Land (**Figure 4**). As prehistoric archaeological sites in northeast Florida are most often identified in areas of well drained soils within 200 meters (656.2 feet) of permanent sources of fresh water, the relatively low and wet character of the I-95 Ponds Study Area presents low potential for prehistoric archaeological sites.

The Duval County Property Appraiser's database indicated that there are six parcels within the study area containing unrecorded structures of historic age (i.e., structures with pre-1975 built dates) (**Figure 5**). These parcels are located in Ponds D-4 (three parcels), G-2 (two parcels), and G-3 (one parcel). None of these parcels are located within the pond footprints, but are within the 30-meter (100-foot) buffer. Additionally, a brief review of historic maps (Florida State Road Department [FSRD] 1926; US Geological Survey [USGS] 1952, 1972) and aerial photography (US Department of Agriculture [USDA] 1960) showed little development within the ponds study area, and areas immediately adjacent to the I-95 corridor have seen heavy modification due to roadway, berm, and overpass construction. This review indicates a low potential for historic-period sites within the study area. The cultural resource desktop analysis for the I-95 Ponds Study Area is summarized in **Table 2**.

Table 2. I-95 Ponds Study Area Cultural Resources Matrix.

Pond	Previously Surveyed?	Archaeological Probability	Unrecorded Historic Parcel
B-1	Yes	Low	-
C-infield	Yes	Low	-
FPC C-1	Yes	Low	-
FPC C-2	Yes	Low	-
D-1	Yes	Low	-
D-2	No	Low	-
D-3	Yes	Low	-
D-4	Yes	Low	Three within 100-foot buffer; outside of footprint
E-1A	No	Low	-
E-1B	No	Low	-
E-2	Yes	Low	-
F-1	Yes	Low	-
F-2	No	Low	-
F-3	Yes	Low	-
G-1	Yes	Low	-
G-2	Yes	Low	Two within 100-foot buffer; outside of footprint
G-3	Yes	Low	One within 100-foot buffer; outside of footprint; also overlaps with Pond G-2

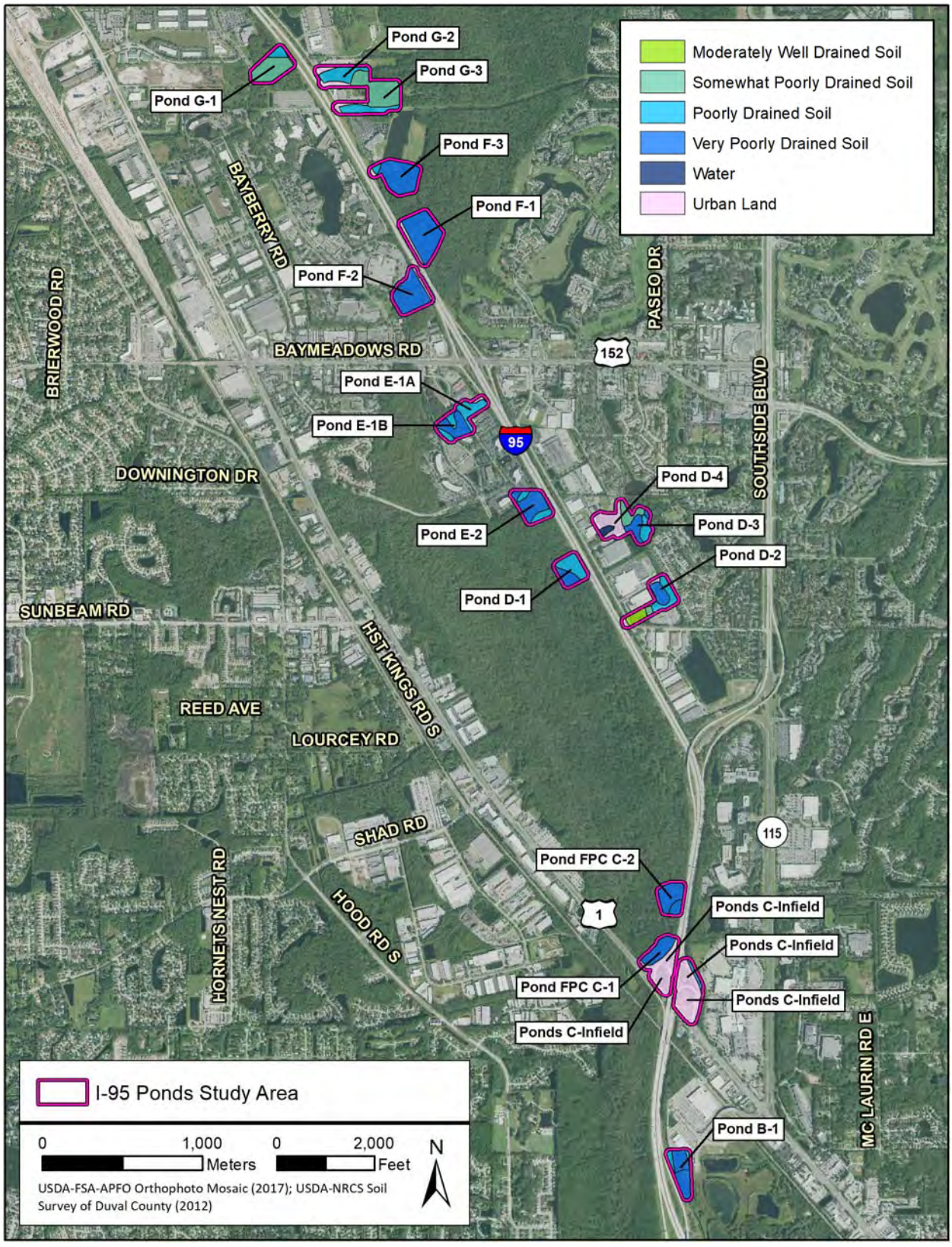

Figure 4. Soil drainage characteristics within the I-95 Ponds Study Area.

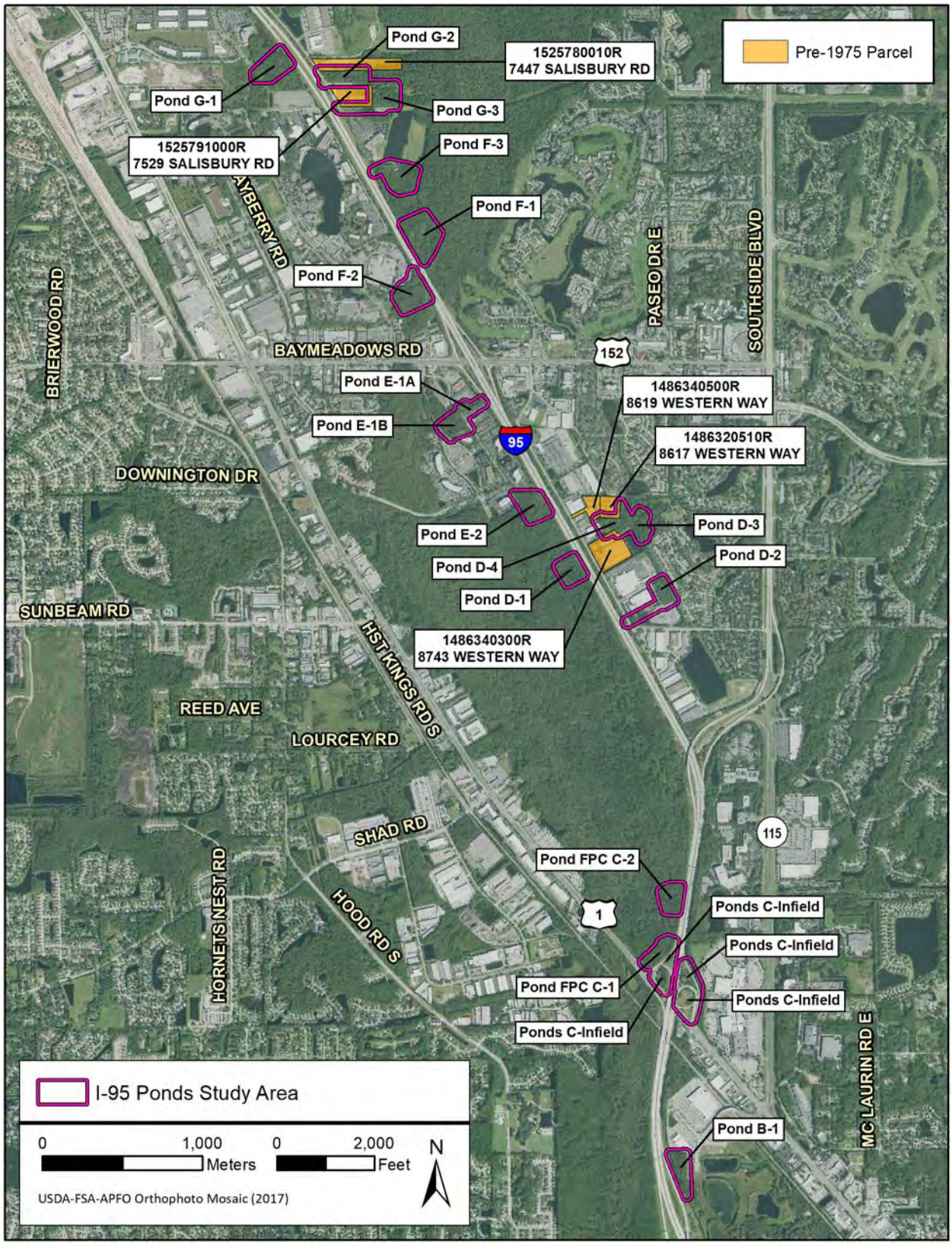

Figure 5. Historic parcels within the I-95 Ponds Study Area.

RECOMMENDATIONS

Once the preferred ponds are selected for the proposed improvements, the project Area of Potential Effects (APE) should be refined and a Phase I cultural resource assessment survey (CRAS) should be conducted. Any historic buildings within the APE should be recorded and evaluated for NRHP eligibility. The pond footprints also should be subjected to subsurface testing according to probability for archaeological resources to determine if any prehistoric or historic archaeological sites are present. Historic structures and archaeological sites identified during survey of the APE should be assessed for their potential eligibility for listing in the NRHP. The results of this evaluation should then be reviewed by the SHPO for concurrence and possible comment.

REFERENCES CITED

Brooks, H. K.
1981 *Guide to the Physiographic Divisions of Florida*. Institute of Food and Agricultural Sciences. Gainesville, FL: University of Florida.

Browning, William
1988 *The Proposed Project Consists of Adding Two Lanes to the Existing Median of I-95 from the St. Johns County Line North to North of Emerson Street in Duval County, Florida.* Florida Master Site File Survey No. 2453. On File at the Florida Division of Historical Resources.

Environmental Services, Inc.
2003 *A Cultural Resource Reconnaissance Survey and Intensive Cultural Resource Assessment Survey of the U.S. 1 Commercial Development Property, Duval County, Florida*. Florida Master Site File Survey No. 9766. On File at the Florida Division of Historical Resources.

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1974 *Report on the Historical and Archaeological Survey of the Belfort Station Site, Jacksonville, Duval County, Florida.* Florida Master Site File Survey No. 1002. On File at the Florida Division of Historical Resources.

SEARCH
1995 *Archaeological Resource Assessment Survey of SR 115/Southside Boulevard and SR 9 Retention Ponds, Duval County, Florida*. Florida Master Site File Survey No. 4413. On File at the Florida Division of Historical Resources.
2000 *CRAS of SR 5 (US 1, Phillips Highway) from SR 9A to SR 126 Duval County*. Florida Master Site File Survey No. 6140. On File at the Florida Division of Historical Resources.

US Department of Agriculture (USDA)
1960 Aerial Photographs of Duval County, FL. Electronic document, http://ufdc.ufl.edu/aerials/map/, accessed July 2, 2019.

US Geological Survey (USGS)
1952 Topographic Map of Bayard, FL. Electronic document, http://ngmdb.usgs.gov/topoview/viewer/, accessed July 2, 2019.
1972 Topographic Map of Bayard, FL. Electronic document, http://ngmdb.usgs.gov//viewer/, accessed July 2, 2019.

Pond Site Natural Resource Analysis

MEMORANDUM

Florida Department of Transportation
District 2 Environmental Management Office

Date: July 31, 2019

To: Michael Brock, PD&E Project Manager

From: Susie Hetrick

Copies To: David Tyler, Terri Newman, Jared Sweat

Project: FM# 435577-1-21-01
I-95(SR9) FROM: I-295(SR9A) TO SR202(JT BUTLER BLVD)

Subject: Pond Site Natural Resource Analysis

Environmental Management Office staff conducted a preliminary desktop and field review of 20 proposed pond locations within the I-95 corridor from I-295 to J. Turner Butler Boulevard in Jacksonville. The proposed pond locations are identified in **Figure 1**.

Wetland Analysis

The proposed pond sites were evaluated for the presence of wetlands, surface waters and floodplains utilizing available GIS data and field observations made during site visits on May 22 and June 5, 2019. The desktop analysis included GIS data compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS); National Wetlands Inventory (NWI); Federal Emergency Management Agency (FEMA); St. Johns River Water Management District (SJRWMD); Florida Natural Areas Inventory (FNAI); and ArcGIS imagery data. In addition, parcel ownership and conservation easement status were determined utilizing data currently available from the City of Jacksonville Property Appraiser. Potential involvement with wetlands, surface waters, floodplains and conservation easements or public conservation lands is summarized for each pond location in **Table 1**.

Potential wetlands within each proposed pond parcel were identified analyzing aerial imagery in conjunction with NWI, NRCS and SJRWMD land cover data and limited ground truthing during site visits. Acreages provided in **Table 1** are estimated for the purpose of comparing relative potential impacts between pond sites. Actual acreages will be quantified during project survey and design.

Estimated wetland mitigation credits provided in **Table 1** are based upon acres of wetlands estimated for each pond location and projected UMAM scores for the subject wetlands. The UMAM scores were projected based upon available SJRWMD permitting records for conservation easements and wetlands within or adjacent to the project area. In addition, mitigation credits for wetlands within recorded conservation easements or public conservation lands are assumed to be double, and are reflected as such in the table.

In addition to potential wetland involvement, 100-year floodplain acreage is estimated for each pond parcel based upon FEMA GIS data. None of the pond parcels falls within a regulatory floodway.

Figure 1. FM 435577-1 I-95 from I-295 to JTB Proposed Pond Locations
Jacksonville, Duval County

0 0.5 1 Miles

N

Table 1. Pond Site Wetlands, Surface Waters, Floodplains and Conservation Status*

Pond Site Alternative	Wetlands (acres)	Surface Waters (acres)	100-year Floodplain (acres)	Conservation Easement	Public Conservation Land	Estimated WL Mitigation Credits
B-1	1.61	0	0	No	No	0.81
C-infield-1	0	0.67	0.02	No	No	0
C-infield-2	0	2.58	0	No	No	0
C-infield-3	0	1.63	0	No	No	0
C-infield-4	0	0	0	No	No	0
FPC C-1	0	0	2.46	No	**Yes**	0
FPC C-2	3.11	0	0.25	No	**Yes**	5.6
D-1	0.88	0	0	**Yes**	No	1.46
D-2	0.38	0.11	0	No	No	0.13
D-3	2.46	0	0	**Yes**	No	1.48
D-4	4.08	0.31	0	No	No	1.22
E-1A	0	0	0	No	No	0
E-1B	3.26	0.27	0	No	No	1.96
E-2	2.62	0	0	**Yes**	No	4.35
F-1	8.55	0	2.44	**Yes**	No	10.82
F-2	4.51	0	4.77	No	No	3.16
F-3	5.28	0	0.49	**Yes**	No	4.96
G-1	4.14	0	0.45	No	No	1.38
G-2	0	0	0	No	No	0
G-3	0	0	0	No	No	0

*Pond site alternatives highlighted in blue are recommended.

Protected Species and Habitat Analysis

The proposed pond sites were evaluated for the presence of state and federally listed plant and animal species and habitats utilizing available GIS data and field observations made during site visits on May 22 and June 5, 2019. The desktop analysis included species and habitat data compiled by the U.S. Fish and Wildlife Service (USFWS); Florida Fish and Wildlife Conservation Commission (FWC); FNAI; and the Institute for Systematic Botany (ISB).

Several state and federally listed plant species are documented to occur within Duval County, however no occurrences are documented for any of the pond site alternative locations. Suitable habitat exists within some of the pond site locations for two federally listed wildlife species – the wood stork and eastern indigo snake. No suitable habitat exists for federally listed plant species.

Furthermore, no federally designated Critical Habitat or Essential Fish Habitat occurs within the pond alternative sites. Suitable habitat does exist for several state listed wildlife and plant species. Detailed analysis and effects determinations for listed species and habitat will be conducted during PD&E for the project. No adverse impacts to state or federally listed species or habitats are anticipated based upon the currently proposed pond site alternatives.

Recommendations

Recommended Pond Site Alternatives for each basin are highlighted in blue in Table 1. Pond Site Alternatives B-1, and C-infield-1 through -4 are owned by FDOT, and other than providing required mitigation for potential wetland impacts on Pond Site B-1, no constraints are identified with regard to impacts to natural resources. Pond sites recommended in each of the remaining basins minimize impacts to conservation lands and wetland mitigation requirements.

Contamination Screening

Preliminary Evaluation Ponds G-1, G-2, and G-3

MEMORANDUM

Florida Department of Transportation
District 2 Environmental Management Office

Date: July 22, 2019

To: Michael Brock, PD&E Project Manager

From: Aja Stoppe, D2 DCIC

Copies To: David Tyler, Terri Newman, Jared Sweat

Project: FM# 435577-1-21-01
I-95(SR9) FROM: I-295(SR9A) TO SR202(JT BUTLER BLVD)

Subject: Preliminary Evaluation Ponds G-1, G-2, and G-3

A desktop contamination screening evaluation of 13 proposed pond locations was conducted for drainage basins along the I-95 corridor from I-295 to JT Butler Boulevard. Pond options G-1, G-2, and G-3 were identified as former city landfill sites. The landfill sites known as the Cypress Plaza Dump and Old Salsibury Dump received municipal solid waste for ~10yrs (1965-1975). The solid waste is still present below the ground surface and reportedly varies in thickness from 1 to 9 feet. A **figure** showing the pond locations overlaying a 1969 aerial is provided for refence. It appears landfilling activities dominated the areas proposed for Ponds G-1 and G-3.

Cost Analysis: Excavation + Disposal of Solid Waste:

A roughly estimated cost to excavate and dispose of the solid waste impacted soils ranges from **$45 to $65 per cubic yard** in-situ volume. The low range in cost is dependent on if the soils mixed in with the solid waste are suitable for use elsewhere on the project, the higher cost relates to full disposal (soil + waste material).

Additional Costs:

There are additional costs involved in constructing ponds within former landfills. Some additional costs to consider include:

1. A work plan for waste removal, pond construction and regulatory clearances from FDEP (NE District).
2. The regulatory agency may require over digging and capping the side walls of the pond with clean fill if waste material borders the pond.
3. Any waste material extending beyond the lower limits of the pond will require removal and clean fill to bring up to grade.

Additional Impacts:

In addition to the solid waste issue, Ponds G-2 and G-3 are adjacent to an FDEP Hazardous Waste Cleanup site. The site is identified as a former electroplating company, Electromate MFG Corp (COM_10694). The site is also listed on EPA's CERCLA Superfund list as Florida Cycle Supply Company (FLD000907006).

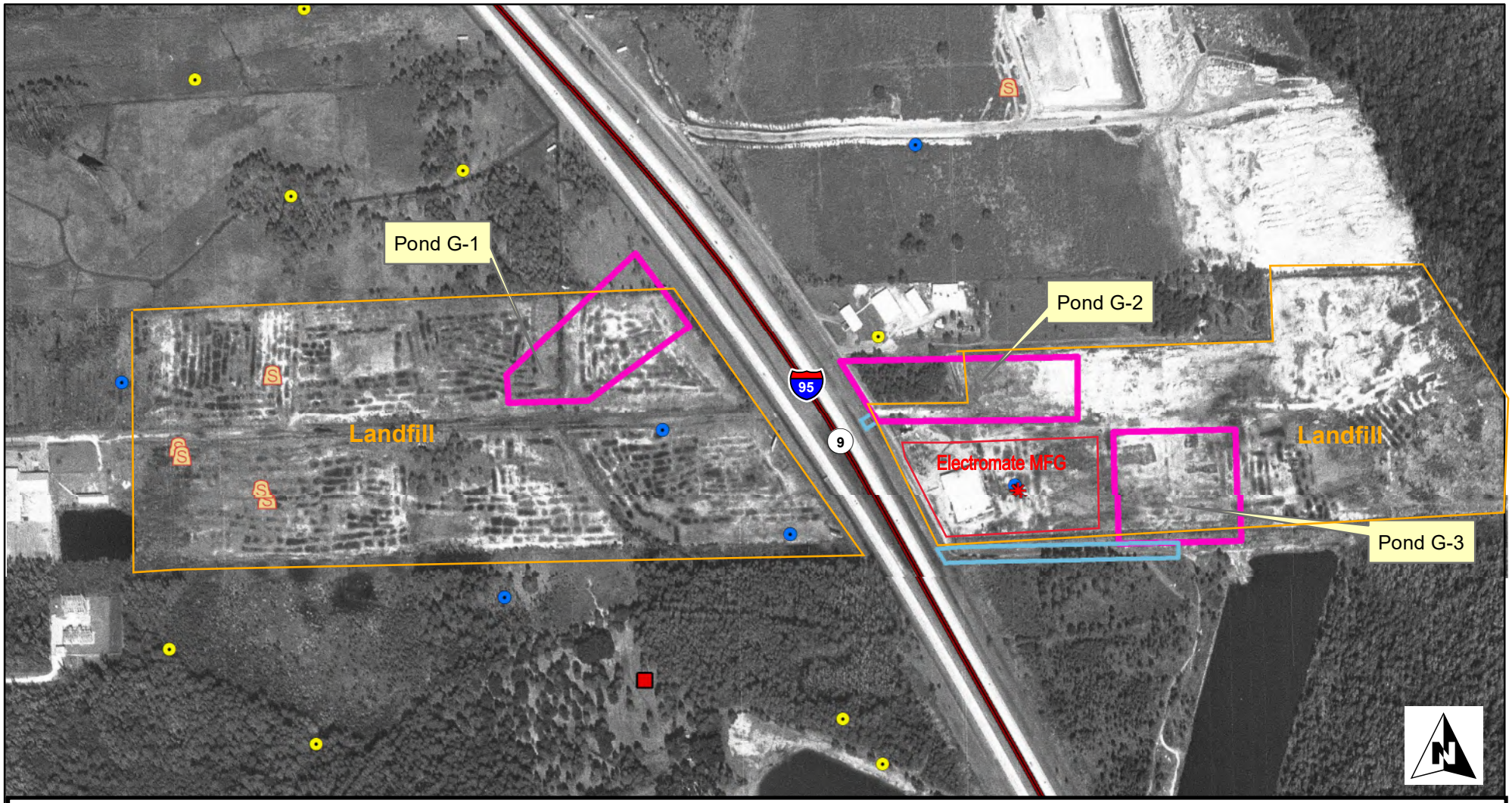
The site is in active remediation for heavy metals and isopropylbenzene impacts to soil and groundwater. The current remediation objective is to achieve Conditional Closure from FDEP by utilizing institutional controls. This approach encapsulates and maintains contamination onsite. Construction of an FDOT stormwater pond on an adjacent property will require coordination with the regulatory agency and must proceed through design and construction in a manner that will not influence the established boundaries of the existing contamination. This may include lining stormwater ponds and counter pumping during construction.

Recommendations:

Ponds G-1, G-2, and G-3 have HIGH potential for impacts to construction. Constructing ponds in areas imbedded with solid waste may add considerable costs to construction. The decision to move forward with any of these three ponds will require further discussion and soil/groundwater assessment to determine the full scope of impact for design, construction and maintenance.

Eliminating these three ponds and evaluating alternative locations is recommended.

FM 435577-1 Contamination Screening of Proposed Pond Locations
Jacksonville, Duval Co, Florida



Legend

- Orphan State Cleanup Sites
- Florida Superfund Waste Cleanup Sites
- Florida ICR
- Institutional Controls Registry
- Institutional Controls Registry Areas
- EPA Superfund Sites
- Haz Waste Large Quantity Generators (LQGS)
- Petroleum Storage Tank Facilities (STCM)
- RCRA Sites (TSDS)
- Solid Waste Facilities
- Waste Cleanup RP_Open
- Wastewater Treatment Facilities (WAFR)

0 375 750 1,500 Feet

1969 AERIAL VIEW - FORMER LANDFILLS