FINAL

Final Preliminary Stormwater Management Facility Report

US 301 (SR 43)

from SR 60 (Adamo Drive) to I-4 (SR 400)

Project Development and Environment Study

FDOT

WPI Segment No. 430050-1

March 2018

Final Preliminary Stormwater Management Facility Report

US 301 (SR 43)

Project Development and Environment Study

From State Road 60 to I-4 (SR 400)
Hillsborough County, Florida

Work Program Number: 430050-1
ETDM Number: 3097

This roadway capacity improvement project involves widening US 301 from the existing four-lane divided arterial roadway to a divided six-lane arterial roadway to accommodate future travel demand in the study area. The study limits extend from the intersection with State Road 60 to south of the I-4/US 301 ramps in Hillsborough County. The total project length is 3.3 miles.

Florida Department of Transportation
District Seven

Prepared By:
AIM Engineering & Surveying, Inc.
Tampa, Florida

March 2018

PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida practicing with **Analytic Engineering, Inc.**, and that I have supervised the preparation of and approved the analysis, findings, opinions, conclusions, and technical advice reported in:

REPORT:	Final Preliminary Stormwater Management Facility Report
PROJECT:	US 301 PD&E Study
LOCATION:	From State Road 60 to Interstate 4 (SR 400) Hillsborough County
WORK PROGRAM NO.:	430050-1
CLIENT:	Florida Department of Transportation – District Seven District Environmental Management Office

The following duly authorized engineering business performed the engineering work represented by this report:

Analytic Engineering, Incorporated
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Tampa, FL 33688
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Florida Certificate of Authorization: 28187

This report includes a summary of data collection efforts, corridor analysis and conceptual design analysis for US 301 from SR 60 to I-4 in Hillsborough County.

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through design standards and criteria set forth by the federal, state, and local regulatory agencies as well as professional judgment and experience.

Alphonse J. Stewart, P.E. Signature:

P.E. No. 38838 Date:

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT), District Seven determined alternative roadway improvements during a Project Development and Environment (PD&E) Study for US 301 (SR 43) in Hillsborough County. The study limits are from SR 60 (Adamo Drive) to south of the I-4 (SR 400)/US 301 ramps, in Hillsborough County, a distance of approximately 3.3 miles. The purpose of the PD&E Study is to document the need for additional capacity within the study corridor and to evaluate the costs and impacts associated with providing this additional capacity. Federal funds are not planned to be used for the project, so it was conducted in accordance with the PD&E Manual, Part 1, Chapter 10, which addresses non-federal projects.

The purpose of this Final Preliminary Stormwater Management Facility Report (PSMFR) is to identify the required area of one hydraulically suitable Stormwater Management Facility (SMF) site per roadway drainage basin that meets both SWFWMD and FDOT design criteria; as well as areas needed to provide any required 100-year floodplain compensation. The objective of the Final PSMFR is to ultimately provide the information required to estimate a preliminary right-of-way cost for the project's stormwater management facilities to be included in the Department of Transportation's Work Program.

This report also documents the preliminary assessment of the basin and drainage characteristics for the project corridor. Preliminary pond sizes were determined for each basin, however pond site alternatives were not located for this study. A full Alternative Stormwater Management Facility Report will be produced during the design phase of the project at a later date, where pond site alternatives will be assessed for each basin.

The proposed roadway project area is divided into nine basins for the conveyance of roadway runoff to SMF's for stormwater treatment and attenuation. The nine SMF basins are labeled 1 through 9. As the project corridor is relatively level with hydrologic group B/D soils and wet ditches during the rainy season, wet detention was assumed for the preliminary pond sizing.

Pond site seasonal high groundwater tables were typically assumed to be one foot below the existing ground. This elevation was typically utilized as the starting elevation for stacking treatment and attenuation depths to estimate the design high water elevation. The 100-year rainfall depth was conservatively utilized for the pond sizing calculations. The hydraulic gradient was calculated to both the critical low edge of pavement location and to the furthest point in the basin from the assumed pond. The pond sites were sized assuming a square equivalent configuration except when noted otherwise. The estimated pond sizes for each basin are summarized in **Table ES-1**.

All elevations sited within this report are based on NAVD 88, and were derived from the one-foot LIDAR generated contour maps of the project area.

Table ES-1: Preliminary Stormwater Management Facility Summary

Basin	From Station	To Station	Treatment Volume Depth (Ft.)	Attenuation Volume Depth (Ft.)	Required SMF Size (Ac.)
1	100+00	113+00	0.46	0.44	1.1
2	113+00	122+00	1.00	0.66	0.5 *
3	122+00	132+00	1.00	1.08	0.6
4	132+00	170+00	0.54	0.63	2.3
5	170+00	181+00	1.50	1.05	0.5
6	181+00	203+00	0.67	0.00	1.3
7	203+00	237+00	1.13	0.00	1.3
8	237+00	248+40	1.50	1.43	0.4 *
9	248+40	262+00	1.00	1.08	0.5 *

* Assuming a linear pond adjacent to the right-of-way

The pond site area requirements for the US 301 project corridor from SR 60 to I-4 have been determined based on preliminary assumptions. The preliminary pond sizes are based on conservative assumptions with an additional 20% added to both the treatment and roadway attenuation volumes calculated to account for unknowns such as turn lanes. The ponds are sized to meet the SWFWMD and FDOT criteria utilizing SWFWMD's 100-year rainfall estimate, and are anticipated to be hydraulically feasible if located within reasonable proximity to the outfall locations. Pond 1 is assumed to be hydraulically distant from the US 301 right-of-way.

The project area resides within four waterbodies as defined by the Florida Department of Environmental Protection (FDEP), WBIDs 1536A, 1536B, 1536F, and 1576. All four waterbodies are listed as impaired, however WBID 1536A is listed as impaired for Fecal Coliform which is not a pollutant of concern for the FDOT. Pollutant loading removal calculations were performed for all basins and the preliminary pond sizes for each basin were checked to ensure that the required permanent pool volumes would fit.

The pond sizes for all basins will need to be reassessed during design when complete survey and geotechnical data will be available to provide refined seasonal high groundwater table and starting tailwater elevations for the sizing calculations, and hydraulic feasibility calculations can be performed based on actual site alternative locations.

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SECTION 1.0 INTRODUCTION

1.1 Project Description

The Florida Department of Transportation (FDOT) conducted a Project Development and Environment (PD&E) study to evaluate the proposed widening of US 301 (SR 43) to six lanes from SR 60 (Adamo Drive) to the southern end of the eastbound I-4 (SR 400) on- and off-ramps in Hillsborough County. The total project length is approximately 3.3 miles, and is illustrated in Figure 1 1. The purpose of this PD&E study is to document the need for additional capacity within the study corridor and to evaluate the costs and impacts associated with providing this additional capacity. Federal funds are not planned to be used for the project, so it was conducted in accordance with the PD&E Manual, Part 1, Chapter 10, which addresses non-federal projects.

The proposed action involves widening US 301 from the existing four-lane divided roadway to a six-lane divided roadway. This improvement is necessary to provide additional capacity to accommodate the future travel demand that will be generated by the projected population and employment growth in eastern Hillsborough County. US 301 is a major north-south roadway that traverses all of Hillsborough County and provides connectivity to many of Florida's major roadways including SR 60, Lee Roy Selmon Expressway and I-4. This roadway is a vital link in the regional transportation network and also serves as an emergency evacuation route.

US 301 is functionally classified as an "Urban Other Principal Arterial" and has a posted speed limit of 50 miles per hour (mph) within the majority of the project limits. The posted speed limit is reduced to 45 mph approaching SR 60 and at the approaching on-ramp to eastbound I-4. Throughout most of the study corridor, US 301 exists as a four-lane divided roadway; however, three through lanes are provided in both the northbound and southbound directions in the vicinity of the intersection with SR 574 (Dr. Martin Luther King, Jr. Boulevard).

The existing right-of-way width ranges from 160 feet to 306 feet; however, a majority of the study corridor has a right-of-way width of 200 feet. Sidewalks as well as roadside ditches, where stormwater runoff is collected, were recently constructed along both the east and west sides of US 301 from SR 574 northward to I-4. Other sections of sidewalks exist intermittently from SR 60 to SR 574.

There are also seven bridges located within the project limits. Two bridges are located over the CSX Railroad's S-Line while two others are located over the CSX Railroad's A-Line and CR 574 (Broadway Avenue). There are also two bridges that cross over the Tampa Bypass Canal and one box culvert that crosses Bruce Creek.

The project corridor is within Sections 1, 12, 13, and 24; Township 29 South; Range 19 East of the Public Land Survey System (PLSS). The project limits are entirely within Hillsborough County.

The vertical datum is NGVD 29 for the "As-Built" plans. Federal Emergency Management Agency (FEMA) floodplain elevations and the Hillsborough County Watershed Models are based on NAVD 88. NAVD 88 = NGVD 29 – 0.866 feet. All elevations sited within this report are based on NAVD 88 and were derived from the one-foot LIDAR generated contour maps of the project area.

Figure 1-1: Project Location Map

The project was evaluated through the FDOT's Efficient Transportation Decision Making (ETDM) process. This project is designated as ETDM project #3097. An ETDM Final *Programming Screen Summary Report* was published on January 9, 2013 containing comments from the Environmental Technical Advisory Team (ETAT) on the project's effects on various natural, physical and social resources.

1.2 Purpose and Need

The purpose of this project is to relieve congestion on this portion of US 301 in unincorporated Hillsborough County. US 301 is a major north-south roadway facility in close proximity to the City of Tampa, which travels from the Sarasota-Bradenton-Venice Metropolitan Statistical Area across the state to the Jacksonville Metropolitan Statistical Area. US 301 serves regional travel and connects residential centers in the Brandon and South Shore area with employment centers along the I-75 corridor. It provides regional connectivity with I-75, the Lee Roy Selmon Crosstown Expressway, and I-4. US 301 has been designated by Hillsborough County Emergency Management as an emergency evacuation route. In addition to increasing capacity, this project will add or enhance the multi-modal facilities in this corridor.

The need for this widening project is based on the congestion and the current failing Level of Service (LOS) of this segment of US 301. Between SR 60 and I-4, I-75 and US 301 are parallel facilities. Like US 301, I-75 between SR 60 and I-4 is operating at a failing LOS according to the 2011 Hillsborough County Level of Service Report; this segment of I-75 ranges from 25-33% over capacity. Addition of capacity on US 301 will help ease congestion for this overburdened roadway.

According to the March 2011 Hillsborough County Automobile Level of Service Report, US 301 between SR 60 and I-4 is currently operating at 102% of capacity. This yields a failing LOS grade of "F". The most recent version of the Tampa Bay Regional Planning Model (TBRPM) uses 2010 base year data, which shows a LOS of C for the SR 60 to I-4 segment of US 301. The TBRPM projects this segment to have a failing LOS by 2035. The 2035 traffic volumes projected by the model show deficiencies and a failing LOS for the US 301 Corridor.

The proposed widening of this US 301 segment will also have positive socio-economic impacts. The Hillsborough County City-County Planning Commission's 2040 Long Range Transportation Plan socio-economic projections (July 2014) contains both population and employment projections. These projections show Hillsborough County's population growing from 1,229,226 to 1,815,964 (a 48% increase) between 2010 and 2040. Employment is projected to grow from 711,400 to 1,112,059 (a 56% increase) between 2010 and 2040, mostly within the urban service area. Based on projected population growth, the existing infrastructure would result in failing levels of service in the future.

Several Strategic Intermodal Systems (SIS) facilities are in close proximity to US 301, including: the Port of Tampa, the Tampa Intercity Greyhound Bus Terminal, and the Port of Manatee. Emerging SIS facilities in the area include: the Tampa Amtrak Station and the Tampa CSX Intermodal Terminal. As this project is constructed and congestion is decreased, travel to intermodal facilities will become faster and easier. Additionally, this improvement is envisioned to include multi-modal improvements, including sidewalks, bicycle lanes, and transit accommodations. Currently, the Hillsborough Area Regional Transit (HART) system does not have buses running on this section of US 301.

Safety within the US 301 corridor is projected to improve with an increase in capacity and a reduction in congestion, thereby decreasing potential conflict with other vehicles. The US 301 corridor between SR 60 and I-4 had 535 crashes from 2008 through 2013. Most occurred at the intersections along the corridor and were the result of rear end collisions. The addition and enhancement of multi-modal facilities will increase pedestrian and bicyclist safety along the corridor.

1.3 Purpose of Report

The purpose of this Final Preliminary Stormwater Management Facility Report (PSMFR) is to identify the required area of one hydraulically suitable Stormwater Management Facility (SMF) site per roadway drainage basin that meets both SWFWMD and FDOT design criteria; as well as areas needed to provide any required 100-year floodplain compensation. The objective of the Final PSMFR is to ultimately provide the information required to estimate a preliminary right-of-way cost for the project's stormwater management facilities to be included in the Department of Transportation's Work Program.

This report also documents the preliminary assessment of the basin and drainage characteristics for the project corridor. Preliminary pond sizes were determined for each basin, however pond site alternatives were not located for this study. A full Alternative Stormwater Management Facility Report will be produced during the design phase of the project at a later date, where pond site alternatives will be assessed for each basin.

1.4 Existing Facility and Proposed Improvements

Within the project limits, US 301 currently has a 4-lane divided rural typical section as shown in **Figure 1-2**. The existing roadway generally has twelve-foot travel lanes, four-foot paved outside shoulders, five-foot sidewalks and a 40-foot grassed median.

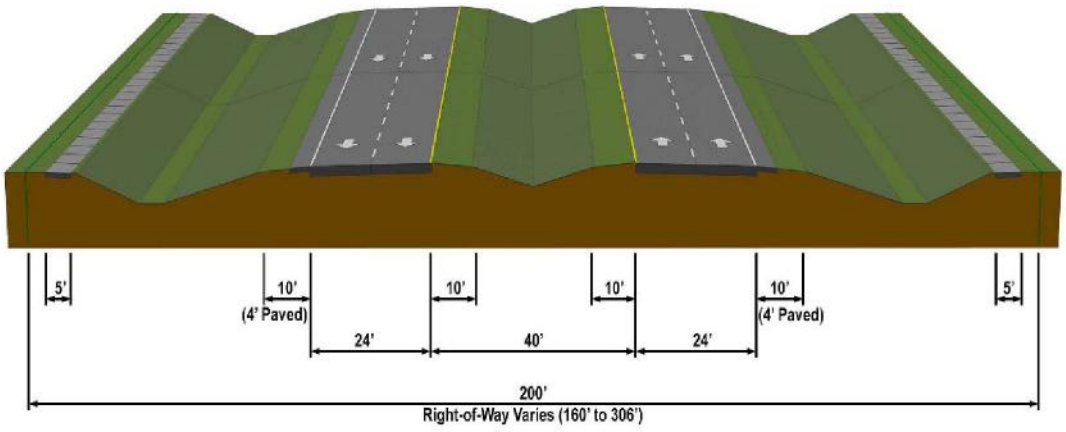


Figure 1-2: Existing Typical Section

The posted speed is 50 miles per hour (mph) within the majority of the project limits. The majority of the existing right-of-way is 200 feet wide but portions vary from 160 to 306 feet wide. Proposed Alternatives 1 and 2 both employ the same typical section. The urban typical section for both alternatives is shown in **Figure 1-3** and the suburban typical section for both alternatives is shown in **Figure 1-4**. **Figures 1-3 and 1-4** also include an overlay of the existing typical section at the

top. Both alternatives include widening to six lanes within the existing right-of-way, as well as providing bicycle and pedestrian facilities. The main difference in the proposed alternatives is that Alternative 2 includes construction of new bridges over the CSX Railroad "S" and "A" lines as opposed to widening of the existing bridges with Alternative 1. A "No-Build" Alternative was also considered during the PD&E study. The proposed project is not funded in FDOT's current 5-year Adopted Work Program for either right-of-way acquisition or construction.

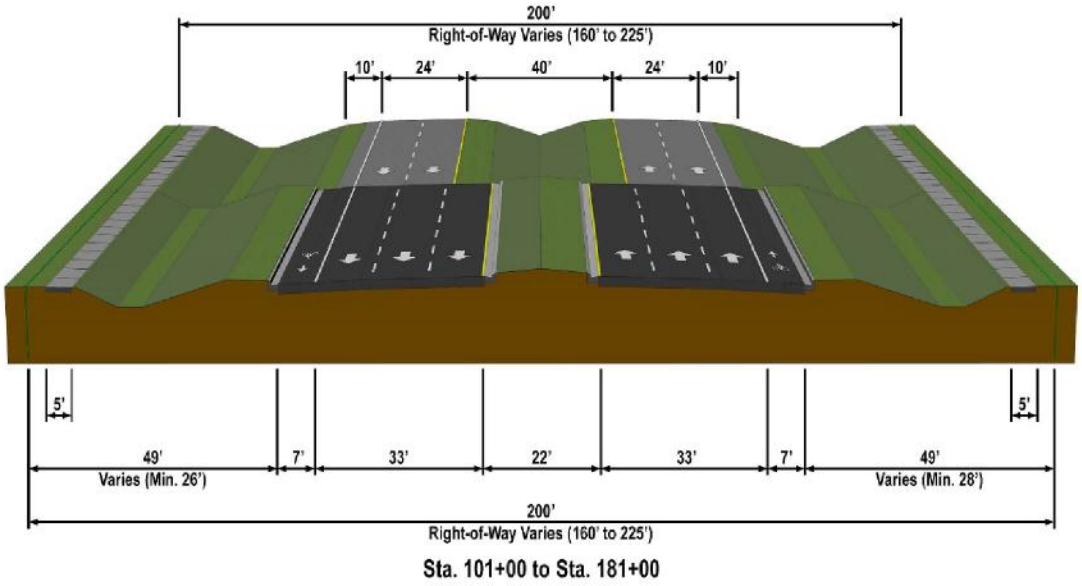


Figure 1-3: Urban Typical Section – Alternatives 1 and 2

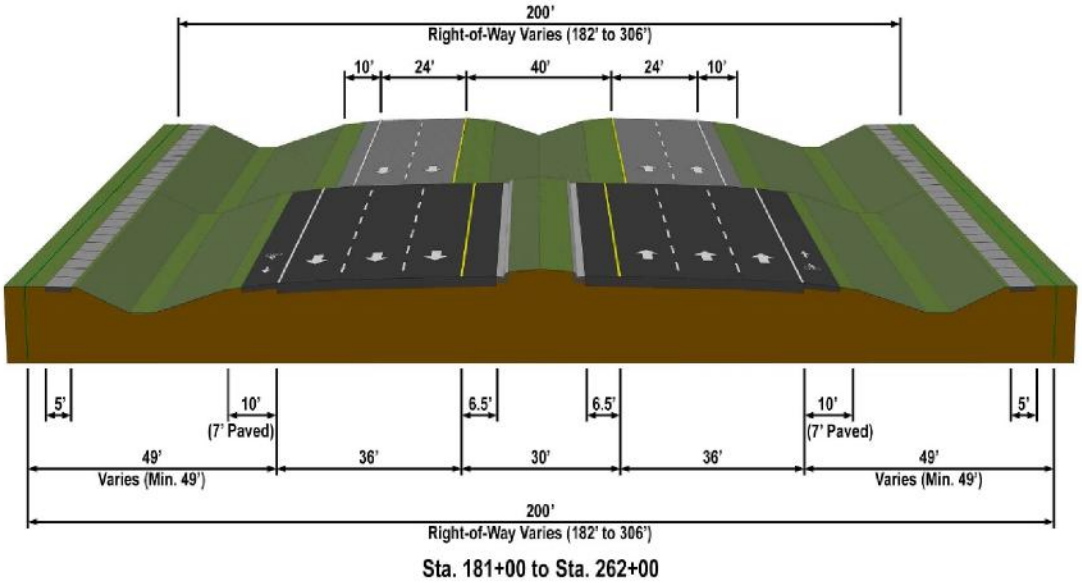


Figure 1-4: Suburban Typical Section – Alternatives 1 and 2

1.5 Site Description

Roadway runoff is collected in roadside ditches which drain either directly to the Tampa Bypass Canal, or indirectly via lateral ditches. The surrounding terrain is fairly level. There is minimal wetland involvement within the project area right-of-way.

Existing US 301 cross drains along the alignment include a double 10'x8' bridge culvert at Bruce Creek, and the Tampa Bypass Canal bridges, which are 675 feet in length. There are four other cross drains, for a total of six (6) cross drains. The cross drains are summarized in **Table 1-1**.

Table 1-1: Cross Drains

Inventory Drain Number	Station	Cross Drain	Bridge Number
S-1A4	105+03	24" RCP	Not Applicable
CD-1	122+09	Bruce Creek Double 10'x8' CBC Bridge Culvert	100574
CD-2	147+11	Double 36" RCP	Not Applicable
CD-3	175+49	2'x2' Culvert extended with 30" RCPs, each side	Not Applicable
CD-4	202+05	Tampa Bypass Canal Two (2) Bridges Northbound and Southbound	North Bound 100103 South Bound 100012
CD-5	248+42	10'x8' CBC	Not Applicable

1.6 Soil Characteristics

The Soil Survey of Hillsborough County, Florida, published by the USDA NRCS (dated 1989) was reviewed for the project corridor. Based on a review of the USDA NRCS Soil Survey, pre-development seasonal high groundwater (SHGWT) levels along the project are anticipated to range from above the natural grade to depths up to 3.5 feet below the natural grade with predominate SHGWT levels on the order of about 0 to 1 foot below natural grades. According to the Soil Survey, the majority of the subsurface conditions along the corridor will consist of sandy soils (A-3/A-2-4) to clayey soils (A-2-6/A-2-7) to a depth of approximately 6 feet. The USDA information indicates that isolated depressional soils associated with wetlands are located within the project limits and that these soil types may contain organic soils/muck (A-8) to depths up to 3 feet below grade.

The soils encountered along the project corridor are predominately in Hydrological Soil Group B/D, C and D. With the high water table, it can be expected that the soils will have low infiltration rates when thoroughly wetted, and have high runoff potential.

The soil survey map for the project vicinity is included as **Figure 1-5**. The USDA Soil Survey Data Summary is included as **Table 1-2**. Soils information is also located in **Appendix C**.

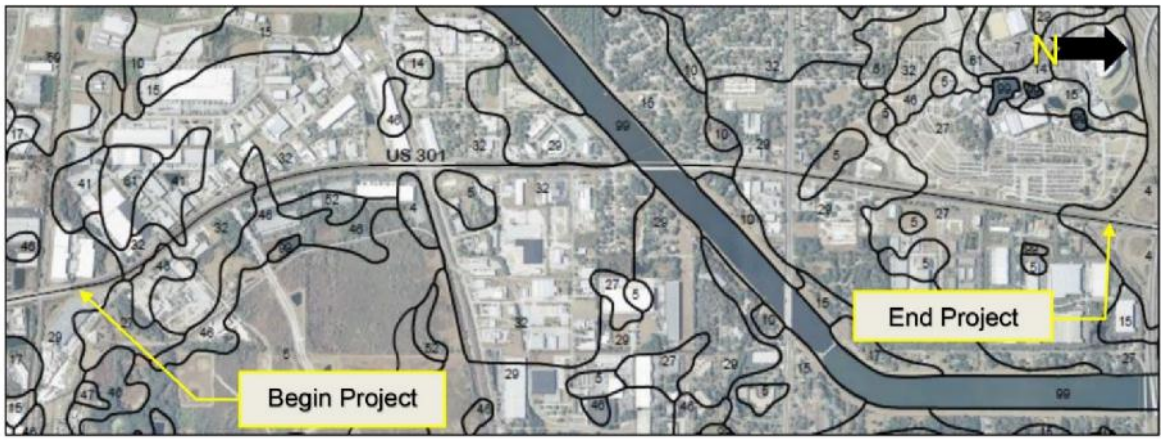


Figure 1-5: Soil Survey Map

SWFWMD's ETDM indicates that the US 301 project corridor lies within a Sensitive Karst Area (SKA) along its entire 3.3-mile length. The area is characterized by a two-aquifer system that includes the Surficial and Floridan aquifers. For proposed stormwater ponds, the ETDM recommends eliminating contaminated sites as potential pond sites; avoiding/minimizing construction activity in proximity to known sinkholes and/or Subsidence Incident Reports along or near the project alignment; and designing and constructing stormwater management facilities to avoid breaching the upper confining unit of the Surficial aquifer.

1.7 Floodplain Information

The latest revision of the Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) for Hillsborough County was adopted in 2013. Portions of the study area exist within the floodplain limits shown on FIRM Community Panels 12057C0378J and 12057C0380J. Excerpts of the panels, in the form of FIRMettes are provided in **Appendix B-3**.

Two locations along the study corridor are contiguous or situated within areas of Zone AE, which have base flood elevations determined from floodplain analyses of the 100-year frequency storm event. The effected floodplains are associated with the Tampa Bypass Canal, a U.S. Army Corps of Engineers project that alleviates major flooding along the Hillsborough River within Hillsborough County and the City of Tampa. It is operated and maintained by the Southwest Florida Water Management District (SWFWMD).

The corridor crosses Tampa Bypass Canal Tributary 2, also known as Bruce Creek, and has a base flood elevation (BFE) of 17.0 NAVD 88 (17.9 NGVD 29) on the downstream west side of US

Table 1-2: USDA Soil Survey Data Summary

SUMMARY OF USDA SOIL SURVEY US 301 PD&E FROM SR 60 to I-4 HILLSBOROUGH COUNTY, FLORIDA FPID 430050-1-22-01								
USDA Map Symbol and Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)	pH	Seasonal High Water Table		Hydrologic Soil Group
		USCS	AASHTO			Depth (feet)	Months	
(4) Arents, nearly level	*	*	*	*	*	*	*	*
(5) Basinger-Holopaw and Samsula soils, depressional	0-7	SP	A-3	6.0 - 20.0	3.6-7.3	+2-1.0	Jan-Dec	D
	7-28	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3			
	28-42	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3			
	42-80	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3			
	0-6	SP, SP-SM	A-3	6.0 - 20.0	5.1-7.3			
	6-52	SP, SP-SM	A-3	6.0 - 20.0	5.1-7.3			
	52-80	SM, SM-SC	A-2-4	0.2 - 2.0	5.1-8.4			
	0-34	PT	A-8	6.0 - 20.0	4.5-5.5			D
	34-80	SP, SP-SM, SM	A-3, A-2-4	6.0 - 20.0	3.6-5.5			
(10) Chobee loamy fine sand	0-16	SP-SM, SM	A-2-4	2.0 - 6.0	6.1-7.3	0-1.0	June-Feb	B/D
	16-49	SC	A-2-6, A-2-7, A-6, A-7	<0.2	7.4-8.4			
	49-80	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-7	0.2 - 6.0	7.4-8.4			
(15) Felda fine sand	0-22	SP, SP-SM	A-3	6.0 - 20.0	5.1-7.8	0-1.0	July-March	B/D
	22-45	SM, SM-SC, SC	A-2-4, A-2-6	0.6 - 6.0	6.1-7.8			
	45-80	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	6.1-8.4			
(27) Malabar fine sand	0-12	SP, SP-SM	A-3	6.0 - 20.0	5.1-8.4	0-1.0	June-Nov	B/D
	12-30	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	5.1-8.4			
	30-50	SP, SP-SM	A-3	6.0 - 20.0	5.1-8.4			
	50-66	SC, SM-SC, SM	A-2, A-4, A-6	<0.2	5.1-8.4			
	66-80	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	5.1-8.4			
(29) Myakka fine sand	0-20	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5	0-1.0	June-Nov	B/D
	20-30	SM, SP-SM	A-3, A-2-4	0.6 - 6.0	3.6-6.5			
	30-80	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5			
(32) Myakka-Urban land complex	0-20	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5	0-1.0	June-Nov	B/D
	20-44	SM, SP-SM	A-3, A-2-4	0.6 - 6.0	3.6-6.5			
	44-80	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5			
(41) Pomello fine sand, 0 to 5 percent slopes	0-43	SP, SP-SM	A-3	>20.0	4.5-6.0	2.0-3.5	July-Nov	C
	43-55	SP-SM, SM	A-3, A-2-4	2.0 - 6.0	4.5-6.0			
	55-80	SP, SP-SM	A-3	6.0 - 20.0	4.5-6.0			
(46) St. Johns fine sand	0-12	SP, SP-SM	A-3	6.0 - 20.0	3.6-5.5	0-1.0	June-April	B/D
	12-29	SP, SP-SM	A-3	6.0 - 20.0	3.6-5.5			
	29-46	SP-SM, SM	A-3, A-2-4	0.2 - 2.0	3.6-5.5			
	46-80	SP, SP-SM	A-3	6.0 - 20.0	3.6-5.5			
(52) Symma fine sand	0-12	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3	0-1.0	July-Oct	B/D
	12-20	SM, SP-SM	A-3, A-2-4	0.6 - 6.0	3.6-7.3			
	20-80	SP, SP-SM	A-3	6.0 - 20.0	4.5-5.5			
(61) Zolfo fine sand	0-3	SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-7.3	2.0-3.5	Jun-Nov	C
	3-60	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	4.5-7.3			
	60-80	SP-SM, SM	A-3, A-2-4	0.6 - 2.0	3.6-6.5			

301 and a BFE of 18.0 NAVD 88 (18.9 NGVD 29) on the upstream east side. The US 301 corridor crosses the Tampa Bypass Canal, also known as Six Mile Creek, with a base flood elevation of 11.0 NAVD 88 (11.9 NGVD 29) at both the upstream and downstream sides of the bridge.

The two impacted floodplains which occur along the existing US 301 alignment are short, transverse encroachments of freshwater or riverine floodplains. The floodplain encroachments will be minimal due to the proposed roadway alignment following the same alignment as the existing roadway and headwaters staying within the channel banks. Floodplain compensation for any freshwater encroachments may be required by SWFWMD. Bruce Creek and the Tampa Bypass Canal are regulated floodways and will require preparation of No-rise Certifications during the design phase.

Since the 100-year floodplain encroachments are minimal, floodplain compensation is not anticipated at this time and is therefore not addressed further in this report.

1.8 Impaired Waterbody Information

The project area resides within four waterbodies as defined by the Florida Department of Environmental Protection (FDEP), WBIDs 1536A, 1536B, 1536F, and 1576. All four waterbodies are listed as impaired, however WBID 1536A is listed as impaired for Fecal Coliform which is not a pollutant of concern for the FDOT. Pollutant loading removal calculations will be required for all pond sites located within WBIDs 1536B, 1536F and 1576.

The pollutant loading removal calculations are to be included in the Southwest Florida Water Management District (SWFWMD) permitting for the project. **Table 1-3** summarizes the waterbody information obtained from the FDEP website's Statewide Comprehensive Verified List of Impaired Waters, and as verified from the sites map data. The supporting information is included in **Appendix A-4**.

Table 1-3: Project Impaired Water Body Basins

WBID	Water Body Name	Basis of Impairment Listing
1536A	South Tampa Canal	• Fecal Coliform
1536B	Six Mile Creek/Tampa Bypass Canal	• Dissolved Oxygen • Nutrients (Chlorophyll a)
1536F	Six Mile Creek/Tampa Bypass Canal	• Dissolved Oxygen • Nutrients (Chlorophyll a)
1576	Mango Drain	• Dissolved Oxygen • Fecal Coliform • Nutrients (Chlorophyll a)

SECTION 2.0 DRAINAGE REFERENCE AND RESOURCE INFORMATION

2.1 Investigations

Initial investigations and data collection were conducted to establish the existing conditions, available information, and historical conditions. Field reviews, contact with FDOT Maintenance, and a preliminary meeting with SWFWMD were all part of the investigation process; the outcomes of which are discussed in the subsections below.

2.1.1 Field Reviews

Field reviews were conducted on several occasions to verify the major basin boundaries and to observe drainage characteristics of the project corridor. The surrounding land uses were observed on the ground, and potential pond site areas were identified to use as a location basis for the hydraulic feasibility calculations and pond sizing.

The existing ditches and swales were observed to be a mix of wet and dry during the wet season depending on their depths and vicinity to outfalls. The water levels at the major outfalls were observed to be noticeably lower than the incoming ditches, therefore water levels in the ditches appear to be a result of the water table and impoundments.

Project area photos and field notes are located in **Appendix A-5**.

2.1.2 Discussion with FDOT Maintenance

During December of 2013 the FDOT Tampa Maintenance Office was contacted to determine if there were any flooding or drainage related maintenance issues within the project limits. No drainage issues were noted. An erosion issue located at the southwest quadrant of the Bruce Creek bridge culvert was noted, however on a subsequent field visit rubble riprap had been placed at the mentioned location. The erosion issue appears to be a result of localized runoff and not the result of a flooding issue.

Refer to **Appendix A-1** for FDOT correspondence and documents provided by the FDOT.

2.1.3 SWFWMD Coordination

On January 22, 2014 a preliminary meeting was held with SWFWMD to discuss the project. The file number given to the project is PA 400766. Notable items discussed were that attenuation of the 25-year, 24-hour design storm event is not required for ponds discharging to the Tampa Bypass Canal, and that they will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project that cannot be physically treated. One such area is the bridges over the Tampa Bypass Canal which are flat and are proposed for widening rather than replacement.

Refer to **Appendix A-2** for SWFWMD correspondence, meeting notes and documents provided by the SWFWMD.

2.1.4 Hillsborough County Coordination

The Stormwater Management Master Plan reports were obtained for both the Hillsborough River and Tampa Bypass Canal basin, and the East Lake basin. As both reports are large, only the covers of the reports and the watershed basin maps for both basins are included for reference in **Appendix A-3**.

2.2 Curve Numbers

The curve number (CN) for all manmade impervious areas (asphalt, concrete and buildings) is 98 regardless of the soil type. For water, the CN is always 100. For the unpaved areas within the project area, a CN of 80 was assumed for the preliminary analysis, which is a conservative assumption that the grass areas of the right-of-way and pond sites are poorly drained hydrologic group D. A CN of 80 was also assumed for the existing pond site areas for conservative estimating purposes, as specific sites were not assessed.

2.3 Rainfall Data

The design storm event for the stormwater management analysis for this project is the Florida Modified 25-year, 24-hour storm event per SWFWMD criteria. However, to be conservative the 100-year rainfall depth of 11 inches was utilized to size the ponds. As the project outfalls to open basins with no volume sensitivity issues, the FDOT will not require Chapter 14-86 rainfall event analysis for this project.

2.4 Resources for Analysis

The most recent applicable publications available were utilized for reference. The following is a list of resources utilized for this study:

1. Southwest Florida Water Management District
    a. Staff Directives
    b. Environmental Resource Permit Applicant's Handbook Volume I
    c. SWFWMD Environmental Resource Permit Applicant's Handbook Volume II
    d. Pre-application Meeting PA 400766
    e. ETDM 3097 dated October 24, 2012
    f. SWFWMD Contour Maps
2. Florida Department of Transportation
    a. Staff Directives
    b. FDOT Drainage Manual
    c. FDOT Stormwater Management Facility Handbook
    d. FDOT Hydrology Handbook
    e. FDOT Design Standards
    f. FDOT Straight Line Diagram of Road Inventory for US 301/SR 43
    g. As-Built Plans SPNs 10010-3502, 10010-3506 and 10010-3509

h. As-Built Plans FPN 428496-1-52-01
i. FDOT D7 Design Preferences and Guidelines
j. FDOT Aerial Map with LIDAR Contours

3. Hillsborough County
   a. Hillsborough County Property Appraiser's Website (GIS parcel lines)
   b. Hillsborough River and Tampa Bypass Canal Stormwater Management Master Plan Update No. 1, Hillsborough County Public Works, August 2011
   c. East Lake Watershed Management Plan Update, Hillsborough County Public Works, January 2007
4. Field and Desktop Analysis
   a. Land Boundary Information System (LABINS) Quadrangle Maps
   b. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, Panel Nos. 12057C0378J and 12507C0380J for Hillsborough County, Florida, dated August 28, 2008
   c. U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Hillsborough County, Florida, 1989
   d. The Florida Department of Environmental Protection website to determine impaired waterbody boundaries and information
   e. Field Reconnaissance (November and December 2013, January and September 2014)

SECTION 3.0 EXISTING CONDITIONS

3.1 Watershed Descriptions

The existing basin boundaries were determined from Hillsborough County Watershed Management Plans, FDOT drainage maps for US 301, LIDAR Contour mapping, and Florida Department of Environmental Protection (FDEP) GIS information.

US 301 south of the Tampa Bypass Canal crossing is within the Hillsborough River/Tampa Bypass Canal watershed. The Tampa Bypass Canal basin generally drains southwesterly towards the Tampa Bypass Canal, however there are lateral ditches within the project limits that cross US 301 in an easterly direction prior to turning south then west back towards the canal. The ultimate outfall is Tampa Bay.

The section of US 301 alignment north of the Tampa Bypass Canal crossing lies within the East Lake Watershed. The East Lake basin generally drains southeasterly and discharges to the Tampa Bypass Canal via several outfalls.

3.2 Topography and Hydrologic Features

The topography of the project area is fairly flat with terrain elevations ranging from 26 to 28 NAVD 88 near SR 60 at the southern end of the project to 21 to 23 NAVD 88 at the northern end of the project near the I-4 ramps. A section of US 301 itself, north of SR 60, has fairly steep grades, with elevations approaching 51 NAVD 88 at each of the two railroad overpass crossings.

The Tampa Bypass Canal is the most significant hydrologic feature within the project corridor. The Tampa Bypass Canal is a U.S. Army Corps of Engineers project that alleviates major flooding along the Hillsborough River within Hillsborough County and the City of Tampa. It is operated and maintained by the Southwest Florida Water Management District (SWFWMD).

3.3 Existing Roadway Drainage Basins

The existing roadway alignment is a four-lane divided rural typical section and most of the stormwater runoff from the travel lanes and outside shoulder sheet flows into roadside ditches, except where there are shoulder gutters and drains along the bridge shoulders. Runoff from the bridges over both CSX railroad line crossings discharges to the roadside ditches as well. The bridges over the Tampa Bypass Canal discharge directly into the canal via scuppers. Most of the grassed medians collect runoff within the medians and discharge via median drains to the roadside ditches. There is some curb and gutter existing along the median on the north side of the bridge at Bruce Creek with a curb inlet that drops into the bridge culvert at that location. There are no existing permitted stormwater management facilities for the US 301 roadway within the project limits.

Roadway high points, larger box culvert crossings, and the canal divide the project corridor into nine roadway drainage basins. It is assumed that the smaller cross drain crossings will be piped under to maintain one basin for that cross drain. Where major cross drain crossings served as a

divide during the preliminary analysis, it is possible that it may be more cost effective to pipe under these crossings as well to reduce pond acquisition costs. The existing roadway drainage basin locations are summarized in **Table 3-1**.

Table 3-1: Existing Roadway Drainage Basins

Basin	From Station	To Station	Description
1	100+00	113+00	SR 60 to bridge high point above CSX crossing
2	113+00	122+00	CSX crossing to 2-10'x8' CBC at Bruce Creek
3	122+00	132+00	CBC to Stannum St./Massaro Blvd. (no side drain)
4	132+00	170+00	Stannum St./Massaro Blvd. to CSX crossing
5	170+00	181+00	CSX to Overpass Rd./21st Ave. (no side drain)
6	181+00	203+00	Overpass Rd./21st Ave. to TBC
7	203+00	237+00	TBC to historic roadside ditch high point
8	237+00	248+00	Historic ditch high point to 10'x8' CD
9	248+00	262+00	CD to Historic ditch high point

3.4 Flooding History and Maintenance Concerns

The FDOT District Seven Tampa Maintenance Yard was contacted concerning any existing flooding problems or maintenance issues along the project corridor. FDOT Maintenance has reported no flooding problems due to inadequately sized cross drains. Maintenance has noted erosion issues that have been repaired. Localized ponding issues were noted within the limits that will be widened, and a sidewalk across from the fairground entrance was noted to go underwater. These issues will be addressed by roadway and drainage engineering during the design phase of the widening project. Refer to **Appendix A-1** for FDOT correspondence.

3.5 Land Use Data

The project corridor is situated in an industrial and heavy commercial area of East Tampa. Several automotive dealerships and repair facilities are located along the corridor. The area includes heavy equipment rental and repair facilities and industrial machine repair. Office, manufacturing, and warehouses are also existing land uses within the project corridor. Land uses also include Veterans Memorial Park and the Florida State Fairgrounds. The ETDM also identified 2 Brownfield locations, 1 Superfund hazardous waste site, 28 petroleum contamination monitoring sites, and 29 storage tank contamination monitoring sites within 500 feet of US 301. Contamination will be assessed for each pond site alternative when a full Alternative Stormwater Management Facility Report is produced during the design phase of the project at a later date.

3.6 Cultural Resources

A separate Cultural Resource Assessment Survey (CRAS) was prepared in conjunction with the undertaking of the PD&E study. Information regarding cultural features can be found within the CRAS. Cultural resources will be assessed for each pond site alternative when a full Alternative Stormwater Management Facility Report is produced during the design phase of the project at a later date.

3.7 Wetland and Biological Features

A separate Final Wetland Evaluation/Biological Assessment Report (WEBAR) was prepared in conjunction with the undertaking of the PD&E study. Information regarding natural and biological features can be found in the Final WEBAR. Wetland and biological features will be assessed for each pond site alternative when a full Alternative Stormwater Management Facility Report is produced during the design phase of the project at a later date.

SECTION 4.0 PROPOSED POND SIZING ANALYSIS

4.1 Stormwater Management Design Approach

The proposed roadway project area is divided into nine SMF basins for the conveyance of roadway runoff to SMFs for stormwater treatment and attenuation. The nine SMF basins are labeled 1 through 9. Any contributing offsite areas will be conveyed through the SMFs to their respective outfalls. Field visits, an evaluation of FDOT As-Built plans, and aerial contour maps were utilized to set basin divides and determine suitable general areas for pond sites. As the project area is in relatively level terrain with primarily B/D soils, wet detention design was assumed for the preliminary pond sizing.

4.2 Design Criteria

The stormwater management design for this project will meet the design criteria set forth in the following manuals:

- FDOT Drainage Manual
- SWFWMD ERP Information Manual

4.2.1 Conveyance

A majority of the proposed roadway will utilize a system of shallow swales, ditch bottom inlets and pipes to convey runoff. The design storm event for the conveyance system of swales and pipes is the 10-year frequency storm event per Section 2.2 of the FDOT Drainage Manual.

Shoulder gutter and storm sewer will be utilized on the bridges over both CSX crossings. There may also be sections of curb and gutter in some median locations. The design storm event for the storm sewer is the 3-year frequency storm per Section 3.3 of the FDOT Drainage Manual. For the gutter spread analysis based on a 50 mph design speed, the spread resulting from a rainfall intensity of four inches per hour will be limited such that eight feet of the adjacent travel lane is kept clear. For shoulder gutter, the spread resulting from a 10-year frequency storm shall not exceed 1’3” outside the gutter in the direction toward the front slope, with the intention of limiting the spread to the face of the guardrail posts.

The bridges over the Tampa Bypass Canal are flat and are being widened rather than replaced, therefore scuppers will be utilized for the bridge deck drainage.

4.2.2 Normal Water Level (NWL) Establishment

The normal water level is the design starting water elevation used when determining stage/storage design computations in a retention or detention area. For wet detention systems it is common practice to set the normal water level or control elevation at the seasonal high groundwater table elevation (SHGWT) of the site. For the purpose of the preliminary pond sizing, the NWL was estimated to be approximately one foot below the existing ground, unless the site is in fill and/or adjacent to a lateral ditch that is drawing down the water table. During the

preliminary analysis phase, seasonal high water elevations estimated by a geotechnical analysis or biological assessment are not available, however they will be considered in the NWL establishment during the design phase.

For wet detention, the control elevation can be set lower than the site's SHGWT if it can be proven that no harmful drawdown affects occur to adjacent wetlands or water features, and that it is set above the SHW of the receiving waterbody. Pond liners can be utilized to prevent the infiltration of base flow from the surrounding groundwater table when using a control elevation lower than the SHGWT. SWFWMD generally allows for a control elevation up to 0.5 feet lower than the SHGWT without having to provide drawdown calculations or pond liners.

4.2.3 Water Quality (Treatment)

The wet detention ponds for this project have been preliminarily sized to treat one inch of runoff from the directly connected impervious area (DCIA). The criteria are per the SWFWMD ERP Applicant's Handbook Volume II, Section 4.1.a.1 requiring treatment of one inch of runoff from the contributing area, and Section 4.5.a.2 defining the contributing area as the DCIA. There are no discharges to Outstanding Florida Waters (OFWs) therefore additional treatment is not required. However, the entire project lies within verified impaired WBIDs and pollutant loading removal will need to be demonstrated for the wet detention ponds via adequately sized permanent pool volumes. Ponds 1 through 3 may not require pollutant loading calculations as the impairment is only being listed as Fecal Coliform for WBID 1536A, however these ponds were still checked for adequate permanent pool volume to ensure an adequate preliminary sizing estimate in case additional impairments are added for WBID 1536A.

4.2.4 Water Quantity (Attenuation)

The SMFs for this project will discharge to open basins. The SMFs will be designed such that the peak discharge rate at the point of assessment is equal to or less than the historic peak discharge rate. During design, the discharge rates will be computed utilizing the SWFWMD 24-hour 25-year rainfall maps and the SCS's Type II Florida Modified 24-hour rainfall distribution with an antecedent moisture condition II. The criteria are per the SWFWMD ERP Applicant's Handbook Volume II, Sections 3.1.a and 3.1.b. However, for this preliminary pond sizing analysis, the attenuation volume required was estimated utilizing the NRCS equation for runoff utilizing the SWFWMD 100-year 24-hour rainfall depth of 11 inches estimated for the project area. Utilizing the 100-year rainfall for preliminary pond sizing is conservative, and ensures the ponds will be large enough to accommodate the 100-year storm event.

4.2.5 Tailwater and Outfall Conditions

The seasonal high water (SHW) for each outfall is typically utilized as the starting tailwater elevation for stormwater modeling. Seasonal high water elevations are typically established for each outfall by assessing soil investigations by the Geotechnical Engineer, field observations, water and stain line elevation measurements, and vegetative indicators as observed by the Biologist. Data requiring survey to establish the SHW elevation was not available for this preliminary analysis. Therefore, SHW estimates were based on an approximation of one foot below the top of bank as seen on the contour maps, or the 100-year FEMA flood elevation,

whichever was lower. For this preliminary assessment, SHGWT estimates were checked against the outfall's SHW estimates to ensure that the site's SHGWT estimate was realistic.

Anticipated receiving waters that stormwater ponds on this project will discharge to include Bruce Creek, ditches running parallel to the two railroad lines, the Tampa Bypass Canal, existing storm drain systems, and existing outfall ditches. During the design and stormwater modeling phase of the project, it is recommended that tailwater elevations be estimated from stage/time data at applicable junctions from the respective HCSWMM Models for the East Lake and Tampa Bypass Canal Watershed Management Plans. Design and maintained regulated stages for the Tampa Bypass Canal can be obtained from the SWFWMD. For ponds not located adjacent to receiving waters, the hydraulic gradient losses in the conveyance to get the pond discharge to the outfall should factor in the tailwater elevations used for modeling the stormwater management facilities.

4.2.6 Critical Duration

Critical duration analysis is not required for this project, as all proposed ponds will discharge to open basins, and none of the outfalls are volume sensitive.

4.2.7 Floodplain Encroachment Volume

The 100-year floodplain for this project is contained within the channel banks for all crossings at US 301. However, during design, proposed pond site alternatives will need to be checked to make sure they are not impacting the 100-year floodplain. It is anticipated that the designer will be able to site ponds that do not impact the 100-year floodplain for this project. If there is an impact, the encroachment volume is defined as the proposed fill between the estimated SHW elevation (if above ground) or the existing ground, and the proposed 100-year peak stage per Chapter 4, Section 4.4 of the ERP Manual.

4.2.8 Offsite Flows

In accordance with Florida Statute 373.413 (6), which gives the Department flexibility on its linear transportation projects with regards to providing stormwater treatment of flows from offsite sources, offsite flows were not evaluated as part of this analysis. During the design phase of the project, it is anticipated that for each basin a determination will be made whether to bypass runoff from the offsite areas or include those areas in the pond routing calculations on a case by case basis. Stormwater pond sizes are expected to be approximately the same whether offsite flows are routed through the ponds or bypassed around them, since water quality treatment will be provided for the roadway only, and including offsite flows in attenuation requirements will impact the sizes of control structures but will not significantly affect pond sizes.

4.3 Preliminary Pond Sizing Calculations

The ultimate proposed typical section was used to calculate the treatment and attenuation requirements for the project. From SR 60 to SR 574 a suburban typical section with a total impervious width of 101 feet within a 200-foot right-of-way was assumed for Basins 1 through 5. From SR 574 a rural typical section with a total impervious width of 107.5 feet within a 200-foot right-of-way was assumed for Basins 6 through 9. Refer to **Figures 1-2** and **1-3** in **Section 1.4** for the proposed typical sections.

An Excel spreadsheet is utilized to perform the preliminary pond sizing calculations. Treatment volume is calculated based on the proposed impervious width, and roadway attenuation is based on the difference in the existing and proposed impervious widths, utilizing the NRCS equation to calculate the runoff. The existing impervious widths utilized for the attenuation calculations did not factor in existing turn lanes, assuming that they would also be required for the proposed condition. This assumption makes the calculations more conservative. An iterative process is utilized to calculate the attenuation requirements for the pond. A square pond is assumed for the calculations, and the treatment depths are iterated until the spreadsheet indicates that the pond size is hydraulically feasible. The hydraulic feasibility determination is based on assuming a site SHGWT as the starting basis for the calculation, the treatment depth and attenuation depths are then added to determine the design high water (DHW) elevation. As actual pond sites are not being assessed for this preliminary analysis, a potential pond location is assumed for the calculations based on site suitability in relation to land use and location to the outfall. The hydraulic gradient is then calculated for the distance from the pond to the pond entrance at the right-of-way line, plus the distance between the estimated pond entrance location and the furthest low edge of pavement location. The hydraulic gradient is also calculated to the furthest end of the basin from the assumed pond location as well. Both hydraulic gradient elevation changes are added to the DHW elevation to determine the hydraulic grade line (HGL) elevation at both of these assessment locations. The HGL is compared to the respective edge of pavement elevations, and spreadsheet deems the result hydraulically feasible if the resulting HGL is one foot or more below the edge of pavement. All elevations were determined from the one-foot contour map which is in NAVD 88. Refer to **Appendix D** for the preliminary pond sizing calculations.

The resulting pond sizes and basin information were then input into the BMP calculations spreadsheet provided by the University of Central Florida to determine the required permanent pool volumes to effectively remove the increased pollutant loading anticipated by the proposed project. The resulting pond sizes were then checked to determine if the required permanent pool volume could be accommodated. Typically, a five-foot deep permanent pool was checked to see if it met the requirements. If it did not, a depth and configuration was determined that did meet the permanent pool volume requirements. Refer to **Appendix E** for the pollutant loading removal calculations.

SECTION 5.0 EVALUATION RESULTS

The estimated pond size requirements are summarized for each basin in **Table 5-1**. The pond sizes assume a square pond except where noted with an asterisk. The following sections discuss the assumptions utilized for sizing the ponds for each basin.

Table 5-1: Preliminary Stormwater Management Facility Summary

Basin	From Station	To Station	Treatment Volume Depth (Ft.)	Attenuation Volume Depth (Ft.)	Required SMF Size (Ac.)
1	100+00	113+00	0.46	0.44	1.1
2	113+00	122+00	1.00	0.66	0.5 *
3	122+00	132+00	1.00	1.08	0.6
4	132+00	170+00	0.54	0.63	2.3
5	170+00	181+00	1.50	1.05	0.5
6	181+00	203+00	0.67	0.00	1.3
7	203+00	237+00	1.13	0.00	1.3
8	237+00	248+40	1.50	1.43	0.4 *
9	248+40	262+00	1.00	1.08	0.5 *

* Assuming a linear pond adjacent to the right-of-way

5.1 Basin 1

Basin 1 begins at the center of the US 301 and SR 60 intersection at Station 100+00 and extends to the high point of the bridge over the CSX rail line at Station 113+00. The existing typical section for the majority of Basin 1 appears to have 10-foot shoulders and curb on both the median and outside. The existing impervious width was assumed at four 12-foot lanes, four 2.25-foot curbs, and two 10-foot shoulders for a total impervious width of 77 feet. The proposed impervious width is 101 feet with six-foot sidewalks adjacent to the roadway. The soils are typically Myakka Fine Sand, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

The Basin 1 frontage is fully developed by industrial and retail (car dealership) buildings with no vacant land, therefore a suitable pond site was assumed to be approximately 2,600 feet piping distance away from the US 301 right-of-way. This pipe distance was factored into the hydraulic gradient calculation. During design, alternatives may be sited closer to US 301, or a shorter pipe route to suitable site locations may be negotiated through property owned by others. Based on the preliminary assumptions, it is estimated that a 1.07-acre pond site is required for Basin 1. The total site area was rounded up to 1.1 acres.

Even though Basin 1 is located in WBID 1536A and is currently impaired for only fecal coliform, which is not a concern for FDOT projects, all the other WBIDs for the project area are impaired for pollutants that are a concern. In case WBID 1536A added impairments of concern between now and design, the pond site capacity to provide the required permanent pool volume of 0.833

ac-ft for pollutant loading removal was evaluated. A five-foot-deep permanent pool has more than sufficient volume to meet the requirement.

5.2 Basin 2

Basin 2 begins at the high point of the bridge over the CSX rail line at Station 113+00 and extends to the double 10'x8' bridge culvert crossing at Bruce Creek at Station 122+00. The existing typical section for the majority of Basin 2 appears to have 10-foot shoulders and curb on both the median and outside. The existing impervious width was assumed at four 12-foot lanes, four 2.25-foot curbs, and two 10-foot shoulders for a total impervious width of 77 feet. The proposed impervious width is 101 feet with six-foot sidewalks adjacent to the roadway. The soils are typically Myakka Fine Sand, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 2 frontage is developed by industrial buildings with minimal open space suitable for a pond site. The pond was sized assuming it was adjacent to the right-of-way. Based on the preliminary assumptions, it is estimated that a 0.51-acre square pond site is required for Basin 2. The total site area was rounded down to 0.5 acres for a linear pond utilizing the right-of-way front slope and a 10-foot berm on the back side.

Even though Basin 2 is located in WBID 1536A and is currently impaired for only fecal coliform, which is not a concern for FDOT projects, all the other WBIDs for the project area are impaired for pollutants that are a concern. In case WBID 1536A added impairments of concern between now and design, the pond site capacity to provide the required permanent pool volume of 0.576 ac-ft for pollutant loading removal was evaluated. A five-foot-deep permanent pool has more than sufficient volume in the square pond size calculated to meet the requirement. However, a rectangular linear pond would need to have a larger control area with a minimum width of 44 feet (if constrained to a length of 400 feet) to meet the requirement.

5.3 Basin 3

Basin 3 begins at the double 10'x8' bridge culvert crossing at Station 122+00 and extends to Strannum Street at Station 132+00. The existing typical section for the majority of Basin 3 appears to have variable width paved shoulders on the outside. The existing impervious width was assumed at four 12-foot lanes and two 5-foot shoulders for a total impervious width of 58 feet. The proposed impervious width is 101 feet with six-foot sidewalks adjacent to the roadway. The soils are typically Myakka Urban Land Complex, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 3 frontage is developed by industrial buildings with minimal open space suitable for a pond site. The pond was sized assuming it was adjacent to the right-of-way. Based on the preliminary assumptions, it is estimated that a 0.57-acre square pond site is required for Basin 3. The total site area was rounded up to 0.6 acres.

Even though Basin 3 is located in WBID 1536A and is currently impaired for only fecal coliform, which is not a concern for FDOT projects, all the other WBIDs for the project area are impaired for pollutants that are a concern. In case WBID 1536A added impairments of concern between

now and design, the pond site capacity to provide the required permanent pool volume of 0.641 ac-ft for pollutant loading removal was evaluated. A five-foot deep permanent pool has more than sufficient volume to meet the requirement.

5.4 Basin 4

Basin 4 begins at Strannum Street at Station 132+00 and extends to the high point of the bridge over the CSX rail line at Station 170+00. The existing typical section for the majority of Basin 4 appears to have variable width paved shoulders on the outside. The existing impervious width was assumed at four 12-foot lanes and two 5-foot shoulders for a total impervious width of 58 feet. The proposed impervious width is 101 feet with six-foot sidewalks adjacent to the roadway. The soils are typically Myakka Urban Land Complex, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 4 frontage is developed by industrial and commercial buildings with some open space and vacant parcels suitable for a pond site. The pond was sized assuming it was adjacent to the right-of-way. Based on the preliminary assumptions, it is estimated that a 2.29-acre square pond site is required for Basin 4. The total site area was rounded up to 2.3 acres. A pipe will be required under the double 36” cross drain or lateral ditch at Station 147+00.

Basin 4 is located within WBID 1536F which is impaired for dissolved oxygen and nutrients. The pond site capacity to provide the required permanent pool volume of 2.436 ac-ft for pollutant loading removal was evaluated. A five-foot deep permanent pool has more than sufficient volume to meet the requirement.

5.5 Basin 5

Basin 5 begins at the high point of the bridge over the CSX rail line at Station 170+00 and extends to Overpass Road/21st Avenue at Station 181+00. The existing typical section for the majority of Basin 5 appears to have variable width paved shoulders on the outside, and shoulder gutter on both sides. The existing impervious width was assumed at four 12-foot lanes, two 3.5-foot width curbs, and two 5-foot shoulders for a total impervious width of 65 feet. The proposed impervious width is 101 feet with six-foot sidewalks adjacent to the roadway. The soils are typically Myakka Urban Land Complex, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 5 frontage is developed by industrial and commercial buildings with some open space and vacant parcels suitable for a pond site. The pond was sized assuming it was adjacent to the right-of-way. Based on the preliminary assumptions, it is estimated that a 0.49-acre square pond site is required for Basin 5. The total site area was rounded up to 0.5 acres.

Basin 5 is located within WBIDs 1536F and 1576 which are impaired for dissolved oxygen, nutrients, and fecal coliform. The pond site capacity to provide the required permanent pool volume of 0.705 ac-ft for pollutant loading removal was evaluated. A five-foot deep permanent pool did not have sufficient volume to meet the requirement due to the small size of the pond. Providing an eight-foot deep permanent pool does provide the sufficient volume for the required pollutant loading removal volume.

5.6 Basin 6

Basin 6 begins at Overpass Road/21st Avenue at Station 181+00 and extends to the center of the bridge crossing over the Tampa Bypass Canal at Station 203+00. The existing typical section for the majority of Basin 6 appears to have variable width paved shoulders on the outside. The existing impervious width was assumed at four 12-foot lanes and two 5-foot shoulders for a total impervious width of 58 feet. The proposed impervious width is 101 feet with six-foot sidewalks adjacent to the roadway. The soils are typically Myakka Urban Land Complex, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 6 frontage is developed by industrial and commercial buildings with minimal open space and vacant parcels suitable for a pond site, therefore a suitable pond site was assumed to be approximately 750 feet piping distance away from the US 301 right-of-way. This pipe distance was factored into the hydraulic gradient calculation. During design, alternatives may be sited closer to US 301. Based on the preliminary assumptions, it is estimated that a 1.25-acre square pond site is required for Basin 6.

Since the runoff from the bridges over the Tampa Bypass Canal drain untreated via scuppers directly into the canal, an equivalent impervious area may be required to be collected into the basin's stormsewer system to be routed to the pond for compensatory treatment. As Basin 6 currently discharges directly to the Tampa Bypass Canal, attenuation is not required for this basin. The pond is sized for stormwater treatment only.

Basin 6 is located within WBIDs 1536F and 1576 which are impaired for dissolved oxygen, nutrients, and fecal coliform. The pond site capacity to provide the required permanent pool volume of 1.477 ac-ft for pollutant loading removal was evaluated. A five-foot deep permanent pool has more than sufficient volume to meet the requirement.

5.7 Basin 7

Basin 7 begins at the center of the bridge crossing over the Tampa Bypass Canal at Station 203+00 and extends to a historic divide at Station 237+00. During design, the end station for Basin 7 could shift based on where the roadway and swale high points are placed. The existing typical section for the majority of Basin 7 appears to have variable width paved shoulders on the outside. The existing impervious width was assumed at four 12-foot lanes and two 5-foot shoulders for a total impervious width of 58 feet. The proposed impervious width is 107.5 feet with five-foot sidewalks adjacent to the right-of-way. The soils are typically Felda and Myakka Fine Sands, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 7 frontage is a mixed use of residential, industrial and commercial buildings with some open space and vacant parcels suitable for a pond site. The Veterans Memorial Park is located on the north side adjacent to the Tampa Bypass Canal, and should be avoided during pond siting. The pond was sized assuming it was adjacent to the right-of-way. Based on the preliminary assumptions, it is estimated that a 1.20-acre square pond site is required for Basin 7.

Since the runoff from the bridges over the Tampa Bypass Canal drain untreated via scuppers directly into the canal, an equivalent impervious area may be required to be collected into the basin's stormsewer system to be routed to the pond for compensatory treatment. As Basin 7 currently discharges directly to the Tampa Bypass Canal, attenuation is not required for this basin. The pond is sized for stormwater treatment only.

Basin 7 is located within WBID 1536F which is impaired for dissolved oxygen and nutrients. The pond site capacity to provide the required permanent pool volume of 2.278 ac-ft for pollutant loading removal was evaluated. A five-foot deep permanent pool has more than sufficient volume to meet the requirement.

5.8 Basin 8

Basin 8 begins at the historic divide at Station 237+00 and extends to the 10'x8' box culvert at Station 248+40. The existing typical section for the majority of Basin 8 appears to have variable width paved shoulders on the outside. The existing impervious width was assumed at four 12-foot lanes and two 5-foot shoulders for a total impervious width of 58 feet. The proposed impervious width is 107.5 feet with five-foot sidewalks adjacent to the right-of-way. The soils are typically Malabar Fine Sand, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 8 frontage is developed by industrial and commercial buildings with some open space and vacant parcels suitable for a pond site. The Florida State Fairgrounds span the frontage on the west side. The pond was sized assuming it was adjacent to the right-of-way. Based on the preliminary assumptions, it is estimated that a 0.54-acre square pond site is required for Basin 8. The total site area was rounded down to 0.4 acres assuming a linear pond utilizing the right-of-way front slope and a 10-foot berm on the back side.

The pond sizing for Basin 8 is based on the assumption that the starting tailwater is one foot below the top of bank of the lateral ditch at the cross drain, which is conservative as the lateral ditch is several feet deep.

Basin 8 is located within WBID 1536B which is impaired for dissolved oxygen and nutrients. The pond site capacity to provide the required permanent pool volume of 0.765 ac-ft for pollutant loading removal was evaluated. An eight-foot-deep permanent pool has sufficient volume to meet the requirement for the linear pond assumed.

5.9 Basin 9

Basin 9 begins at the 10'x8' box culvert at Station 248+40 and extends to a historic divide at Station 262+00, just south of the eastbound I-4 on and off ramps. The existing typical section for the majority of Basin 9 appears to have variable width paved shoulders on the outside. The existing impervious width was assumed at four 12-foot lanes and two 5-foot shoulders for a total impervious width of 58 feet. The proposed impervious width is 107.5 feet with five foot sidewalks adjacent to the right-of-way. The soils are typically Malabar Fine Sand, and a Hydrologic Group D was assumed for the pervious areas for both the roadway and pond site. A wet detention pond was assumed.

Basin 9 frontage is developed by industrial and commercial buildings with some open space suitable for a pond site. The Florida State Fairgrounds span the frontage on the west side. The pond was sized assuming it was adjacent to the right-of-way. Based on the preliminary assumptions, it is estimated that a 0.71-acre square pond site is required for Basin 9. The total site area was rounded down to 0.5 acres assuming a linear pond utilizing the right-of-way front slope and a 10-foot berm on the back side.

The pond sizing for Basin 9 is based on the assumption that the starting tailwater is one foot below the top of bank of the lateral ditch at the cross drain, which is conservative as the lateral ditch is several feet deep.

Basin 9 is located within WBID 1536B which is impaired for dissolved oxygen and nutrients. The pond site capacity to provide the required permanent pool volume of 0.912 ac-ft for pollutant loading removal was evaluated. A five-foot deep permanent pool is sufficient.

SECTION 6.0 CONCLUSION

The pond site area requirements for the US 301 project corridor from SR 60 to I-4 have been determined based on preliminary assumptions for site seasonal high groundwater table elevations and outfall tailwater elevations. All elevations were derived from the one foot LIDAR generated contour maps and the FEMA FIRMettes which are both in NAVD 88.

The preliminary pond sizes are based on conservative assumptions with an additional 20% added to both the treatment and roadway attenuation volumes calculated to account for unknowns such as turn lanes. The ponds are sized to meet the SWFWMD and FDOT criteria utilizing SWFWMD's 100-year rainfall estimate, and are anticipated to be hydraulically feasible if located within reasonable proximity to the outfall locations. Pond 1 was assumed to be hydraulically distant from the US 301 right-of-way.

Pollutant loading removal calculations were performed for all basins and the preliminary pond sizes for each basin were checked to ensure that the required permanent pool volumes would fit.

The pond sizes for all basins will need to be reassessed during design when complete survey and geotechnical data will be available to provide refined seasonal high groundwater table and starting tailwater elevations for the sizing calculations, and hydraulic feasibility calculations can be performed based on actual site alternative locations.

APPENDIX A

Correspondence and Documentation

APPENDIX A-1

FDOT

Telephone Record

Date: December 17, 2013 Time: 10:13 am

Call To: Gerry Ziemak, Permitting Staff
FDOT Tampa Maintenance
Office TAMPA OPERATIONS
2820 Leslie Road, MS 7-1250
Tampa, FL 33619

Telephone No.: 813-612-3209

Call From: Jim Zinner

Telephone No.: 813-480-8708

Project No.: 2012006.00

Project: US 301 PD&E, SR 60 to I-4

Subject: Observed drainage problems along project

Discussion, Agreement and/or Action:

Gerry said he discussed the project with Bob Green in maintenance and no drainage issues have been observed.

There is an erosion issue located at a swale/ditch that drains to the southwest quadrant of the Bruce Creek bridge-culvert. The erosion issue did not appear to be considered a flooding issue from this conversation with Mr. Ziemak.

Analytic field reviews found that rubble riprap has been placed in the mentioned location.

Telephone Record

Date: December 17, 2013 Time: 1:22 pm

Call From: Andrew.Leipski
Tampa Operations Manager
FDOT Tampa Maintenance Office
TAMPA OPERATIONS
2820 Leslie Road, MS 7-1250
Tampa, FL 33619

Telephone No.: 813-612-3209

Call To: Jim Zinner

Project No.: 2012006.00

Project: US 301 PD&E, SR 60 to I-4

Subject: Observed drainage problems along project

Discussion, Agreement and/or Action:

Andrew called and emailed the attached message. We discussed the attached photographs and Andrew mentioned the following.

The note on attachment 301-1 stating “Shoring Right turn lane” is a location where the asphalt is separating.

Attachment 301-2 shows erosion on both the northwest and southwest quadrants of the Bruce Creek bridge culvert.

Attachment 301-4 shows failure at the opening of the RCP side drain. The maintenance department has had to perform mud-jacking approximately between the figure arrow heads due to pavement failure from erosion caused at the pipe end, and construct substantial ditch pavement at the southeast quadrant.

Andrew stated the sidewalk under water noted in attachment 301-6 is caused due to the sidewalk being lower than the roadway.

Notes below by AEI engineer Jim Zinner

Ponding shown on attachments 301-3 and 301-5 appear to be surface and localized ponding, and not necessarily due to cross drain issues.

Concerning attachment 301-4; during the AEI field review a concrete elbow was found just inside the opening to relocate the opening of side drain at the southeast quadrant.

James Zinner < jimzinner@gmail.com>

Issues on US301

2 messages

Leipski, Andrew J < Andrew.Leipski@dot.state.fl.us> Tue, Dec 17, 2013 at 1:27 PM To: "jimzinner@gmail.com" <jimzinner@gmail.com>

Jim,

Hope this helps.

Regards

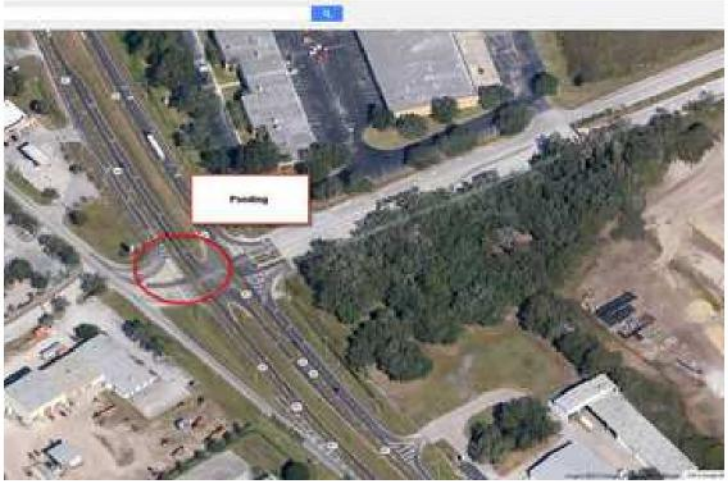
Andrew J. Leipski

Tampa Operations Manager

6 attachments

301-1.png
2657K

301-2.png
2294K



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301-4.png
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2405K

301-6.png
2815K

James Zinner < jimzinner@gmail.com> Tue, Dec 17, 2013 at 2:02 PM
To: Al Stewart <astewart@analytic-engineering.com>

See attached.

[Quoted text hidden]

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Jim Zinner

813-480-8708

6 attachments

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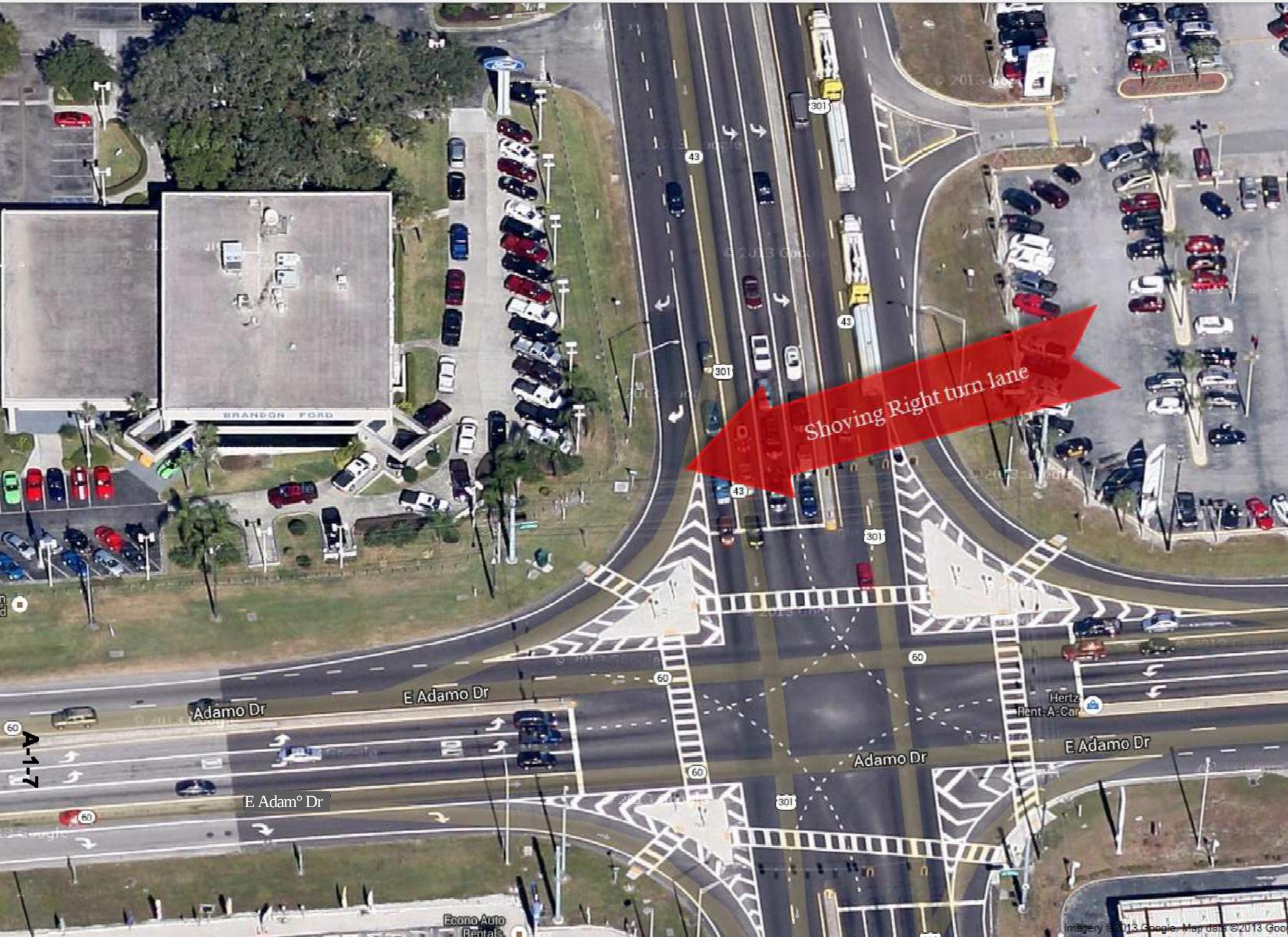
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Econo Auto Rentals
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Imagery ©2013 Google, ?tep data $2013 Goo'

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Pondīng issues
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A-1-11


Sidewalk under water
Laurel Fair Cir
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Garden Ln
Garden Ln
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574

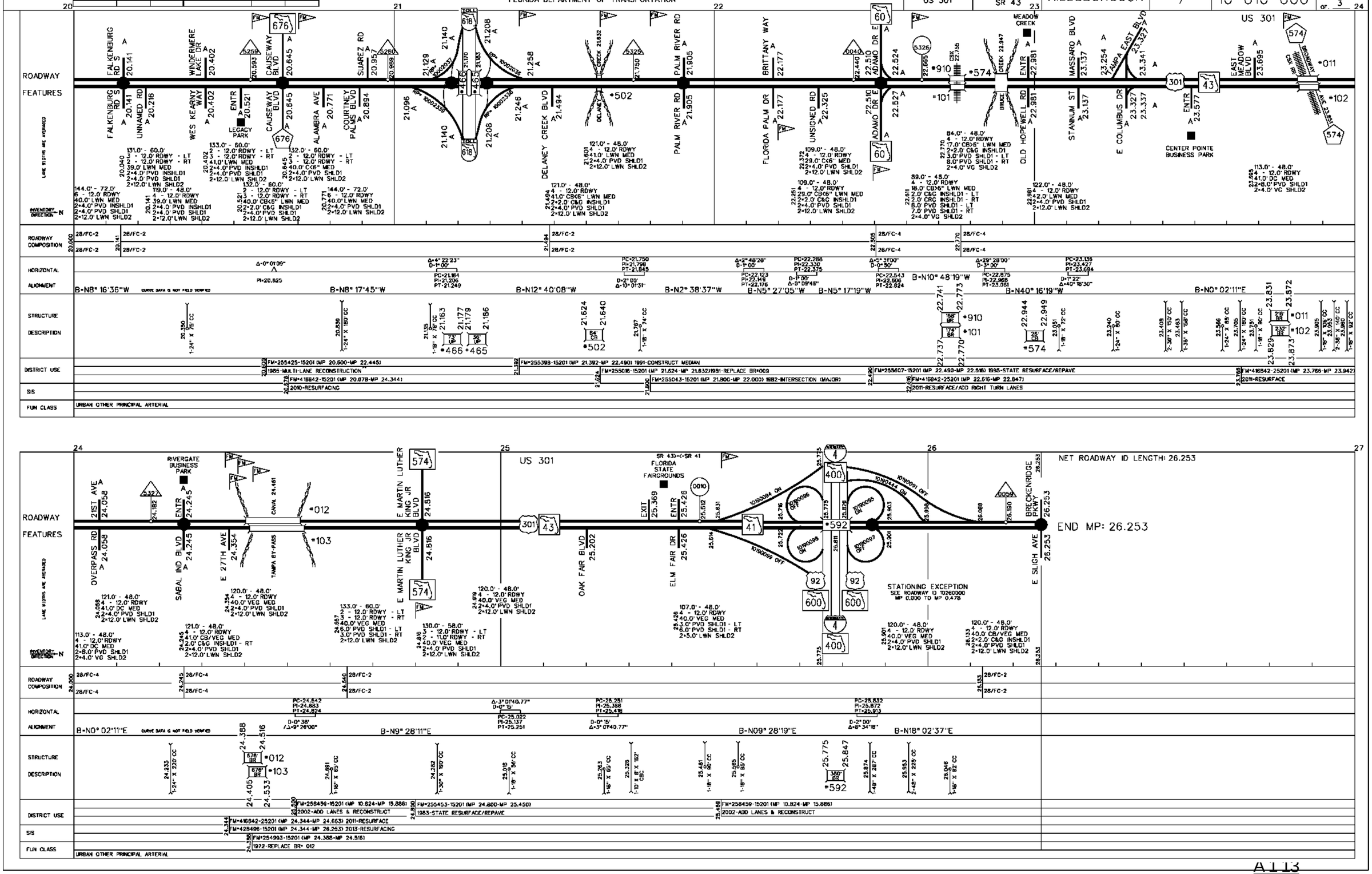
Straight Line Diagrams

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

FLORIDA DEPARTMENT OF TRANSPORTATION

DATE	5 YR INV SLD REV		INTERIM REVISIONS BMP	EMP	INV SLD REV	
DATE	07/07/2009	08/19/2009	24.344	28.253	07/08/2013	08/29/2013
BY	MEV/JW-KA	MEV/RH	CONSTRUCTION ACCEPT		FTE/JW-KA	FTE/KA

INT. or US ROUTE NO	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO. / OF.
US 301	SR 43	HILLSBOROUGH	7	10 010 000	3 / 3

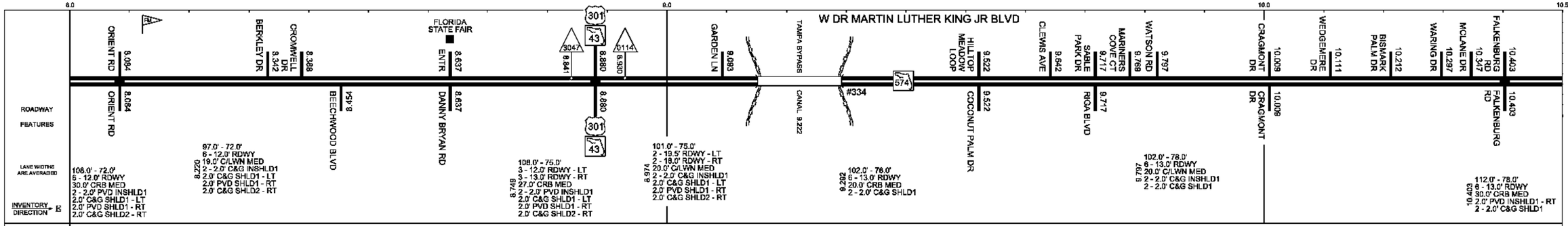


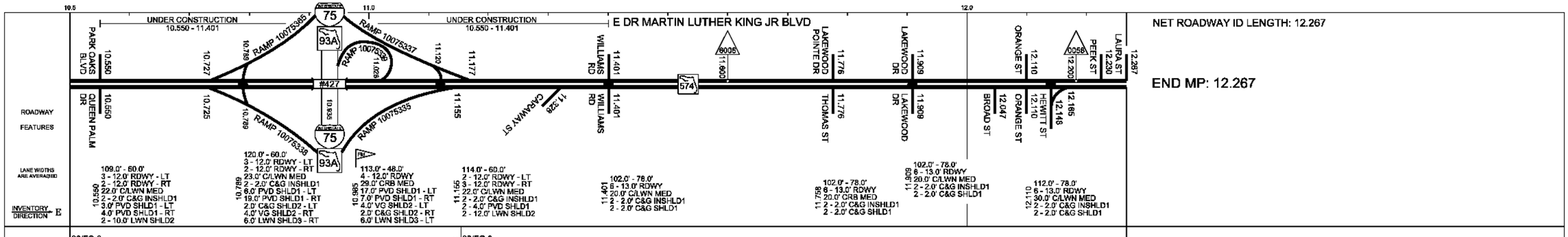
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	06/14/2013	06/27/2013				
BY	FTE/JW-KA	FTE/KA				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 574	HILLSBOROUGH	07	10 340 000	3 OF 3





NET ROADWAY ID LENGTH: 12.267

END MP: 12.267

Version: 1.4.2.6 06/28/2013

Plans Cover Sheets

Previous US 301 and Side Street Projects

STATE JOB NO 10010-3502-31-31
STATE JOB NO.10010-3506-21-31 •

INDEX OF SHEETS

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STATE OF FLORIDA
STATE ROAD DEPARTMENT

PLANS OF PROPOSED

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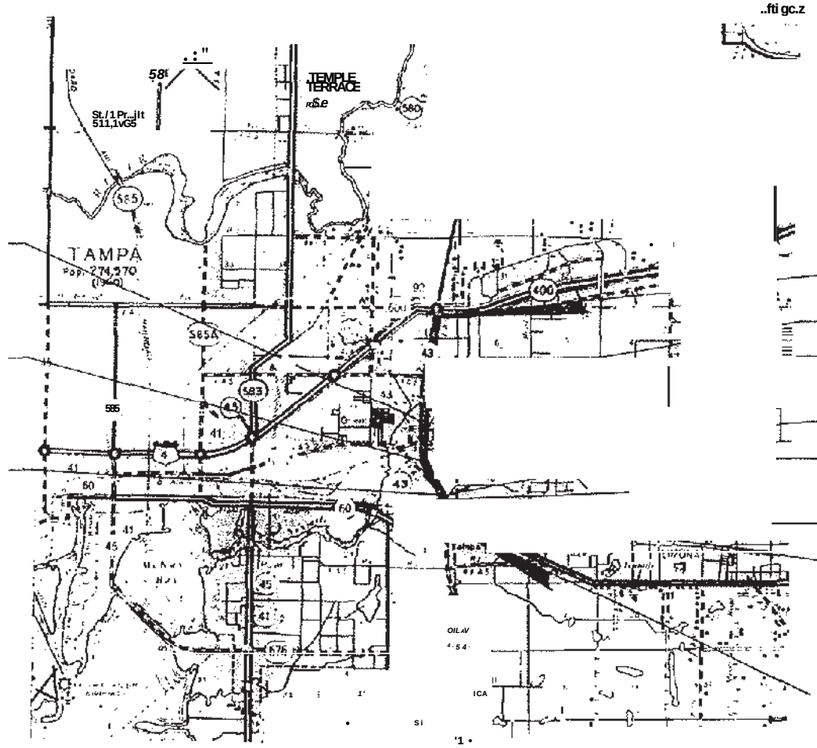
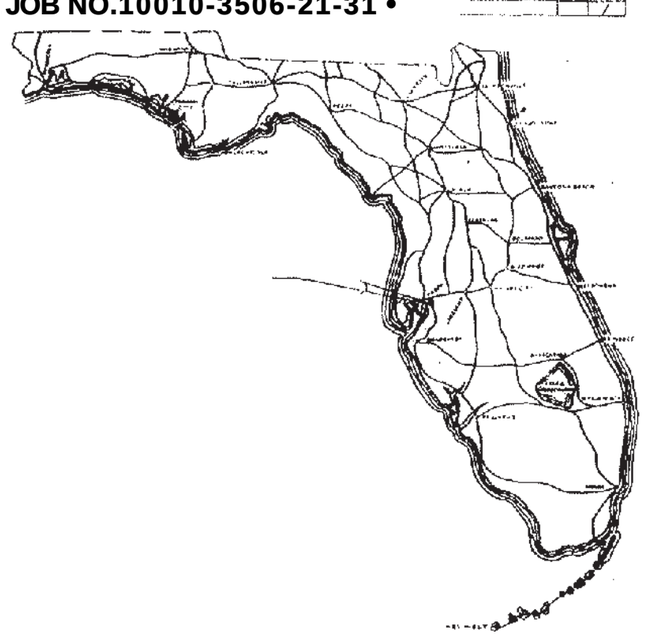
F.A. PROJECT NOS. SG-302(5)aS-302(6)

HILLSBOROUGH COUNTY

STATE ROAD NO. 43





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CONSTRuCTION CONTRACT NO. E7H05

COMPONENTS OF CONTRACT- PLANS SET

ROADWAY PLANS
SIGNING & MARKING PLANS
SIGNAL PLANS
STRUCTURAL PLANS

A DETAILED INDEX APPEARS ON THE
KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION,
DESIGN STANDARDS DATED 2010,
AND STANDARD SPECIFICATIONS FOR ROAD
AND BRIDGE CONSTRUCTION DATED 20i0,
AS AMENDED BY CONTRACT DOCUMENTS.

APPLICABLE DESIGN STANDARDS MODIFICATION: 7-1-2011

For Design Stondord ModIfIcalfon click on
'Design Standards at the following web site:
htto://www.dot.state.11.ustrddesIgn/

REVISIONS

7-1-11 Mods 6A
Nebraska

STATE OF FLO A
DEPA TMENT OF TRANSPO TAT ON

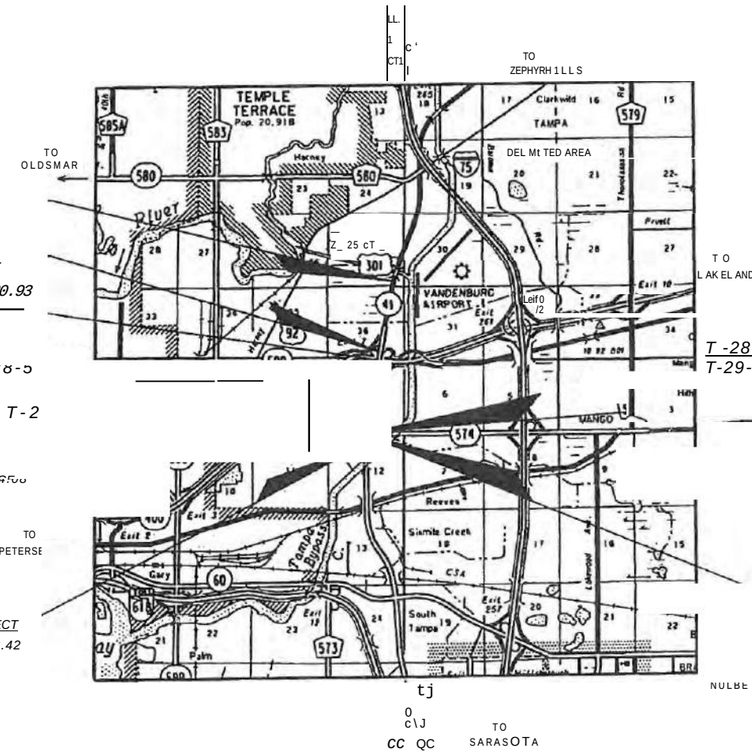
CONTIACT PLANS

FINANCIAL PROJECT ID 428496-1-52-01

HILLSBOROUGH COUNTY (100/0 AND 10260)

SR 41/43 (US 301)

FROM SOUTH OF MARTIN LUTHER KING, JR. BLVD.
TO NORTH OF SLIGH AVE.



END PROJECT
STA. 139+13.91

END BRIDGE
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STATION EQUATION
STA. 273+53.63 BK =
STA. 100+12.75 AH

T-28-S
T-29-S

END EXCEPTION
STA. 221+96.74

BEGIN EXCEPTION
STA. 219+91.58

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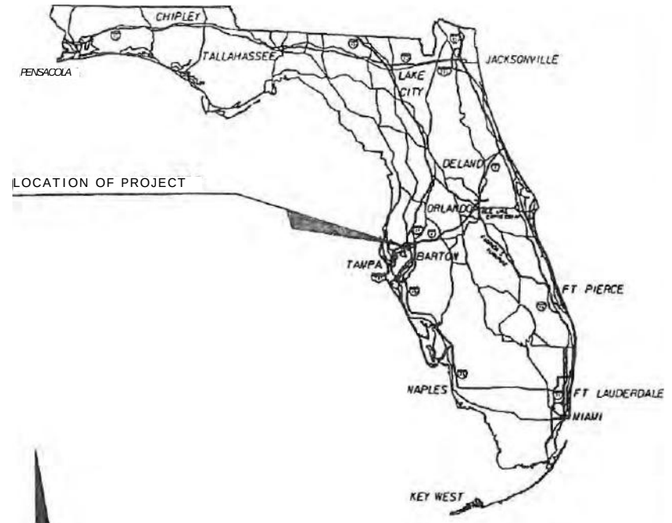
BEGIN PROJECT
STA. 212+53.42

PROJECT LENGTH IS BASED ON OF CONSTRUCTION

LENGTH OF PROJECT	LINEAR FEET	MILES
ROADWAY	9418.48	1.784
BRIDGES	377.73	0.072
NET LENGTH OF PROJECT	9796.21	1.855
EXCEPTIONS	205.16	0.039
GROSS LENGTH OF PROJECT	10001.37	1.894

PROJECT MANAGER: ASHLEY HENZEL, E.I.



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KEY SHEET REVISIONS	
DATE	DESCRIPTION

ROADWAY SHOP DRAWINGS
TO BE SUBMITTED TO:

BRADLEY S. FORAN,
500 W. LEMON STREET. STE. 106
TAMPA. FL 33609
PHONE: (727.1 365-3616

PLANS PREPARED BY:

LIGHTHOUSE ENGINEERING INC.
65 TURNS TONE DRIVE
SAFETY HARBOR, FL 34695
PHONE: (727) 365-36/6 FAX: (727) 683-9848
CONTRACT NO.: E7H05
VENDOR F-208032896-001
CERTIFICATE OF AUTHORIZATION NO. 28576
BRADLEY S. FORM. P.E. NO.: 52634

NOTE: THE SCALE OF THESE PLANS IAA1
HAVE CHANGED DUE TO REPRODUCTION,

pe Engineer
6/19/2012

ROADWAY PLANS
ENGINEER OF RECORD: BRADLEY S. FORAN, P.E.

P.E. NO.: 52634

FISCAL YEAR	SHEET NO.
/2	

FIAAL PLANS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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STATE HIGHWAY

A. PROJECT NO. M-1.812 -(2) Sr ATE PROJECT NO. 10110-3544

HILLS° -OROUGH COUNTY

STA E ROAD NO. 60

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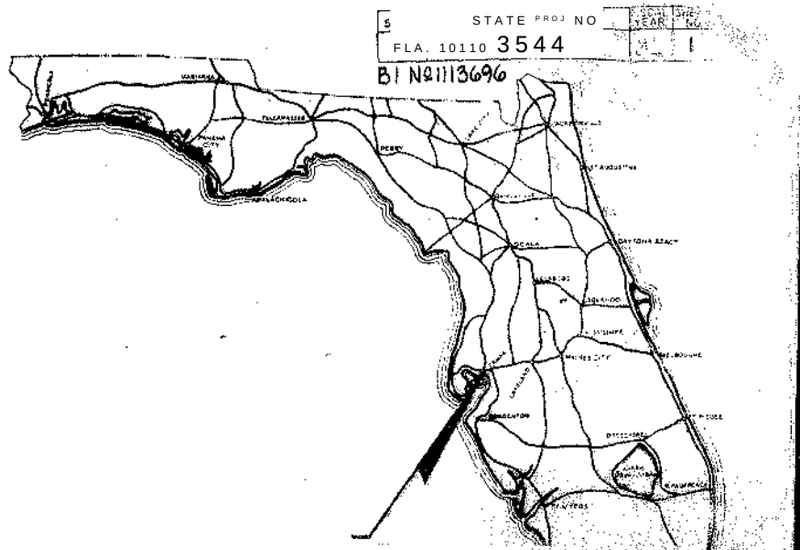
FLA. 10110 3544
B! N21113696



CONTRACTOR: GOLDEN TRIANGLE ASPHALT PAVING CO.
DISTRICT ENGINEER: C. W. MONTS de OCA
RESIDENT ENGINEER: W. N. PENNY
PROJECT ENGINEER: G. ALFONSO
DATE WORK STARTED: 3-22-83 *itc;*
DATE WORK COMPLETED: 2-3-84
DATE WORK CONDITIONALLY ACCEPTED: 2-3-84

,N SET INCLUDES
Y ITEMS (4 SHEETS)
=SIGN DATA (8 SHEETS)

RKING PLANS

THE KEY SHEET OF EACH GROUP OF PLANS
ROADWAY PLANS

ET DESCRIPTION
AP
.L SECTION
RY OF QUANTITIES
SHEETS
GE STRUCTURE SHEETS
MODIFICATION. DETAIL
12836 SINGLE CONC. BOX CULVERT
12837 DOUBLE CONC BOX CULVERT

I (BOOKLET DATED JAN. 196.4 -

AND ABBREVIATIONS
ARD SYMBOLS (3 SHEETS) •
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EMENTARY DETAILS FOR MANHOLES a !NMI 17 5neEra)
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NT CONCRETE ENDWALLS-SINGLE 8 MULTIPLE PIPE
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PAVEMENT a SODDING (2 SHEETS)
CURB a GUTTER •
N STORAGE LANES
IC SEPARATORS
RAIL (6 SHEETS)
ELEVATION (2 SHEETS)
3LE PAVEMENT LAYER THICKNES. FOR STRUCTURAL COURSES
)AD CROSSING (6 SHEETS)
CONCRETE ENDWALLS 'BAFFLES AND GRATE OPTIONAL
TURE REPLACEMENT - RURAL

T° CONCRETE BARRIER wALL

%MAROS (BOOKLET DATED JAN 1982)

)AD GRADE CROSSING TRAFFIC CONTROL DEVICES

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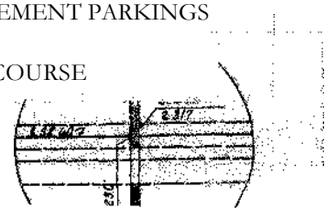

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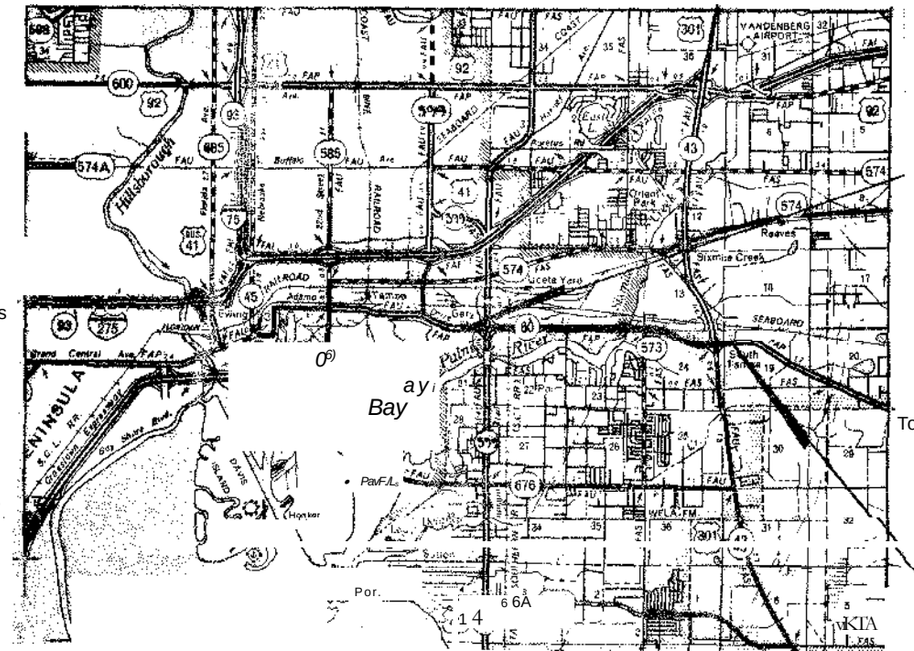
LOCATION OF PROJECT



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ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED 'N SIZE BY REPRODUCTION THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA

COMPONEI S OF CONTRACT PLANS SET

ROADWAY PLANS
SIGNING AND. PAVEMENT MARKING PANS
SIGNALIZATION PLANS

A DETAILED INDEX APPEARS ON THE
KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

GOVERNING STANDARDS AND SPECIFICATIONS.' FLORIDA DEPARTMENT OF TRANSPORTATION, ROALW AY AND TRAFFIC DESIGN STANDARDS DATED JANUARY. 1998. AND STANDARD SPECIFICATIONS FOR ROAD AND BRIXE. CONSTRUCTION DATED 1999.
AS AMENDED BY CONTRACT CGCUMENTS.

REVISIONS

7/26/00	SHEETS 6. 15. 16,	61,	68.	5-3. 5-16.	7-2
8/ 30/00	SHEETS 14. 15. 25.			5-3. S-1.5.	5-16
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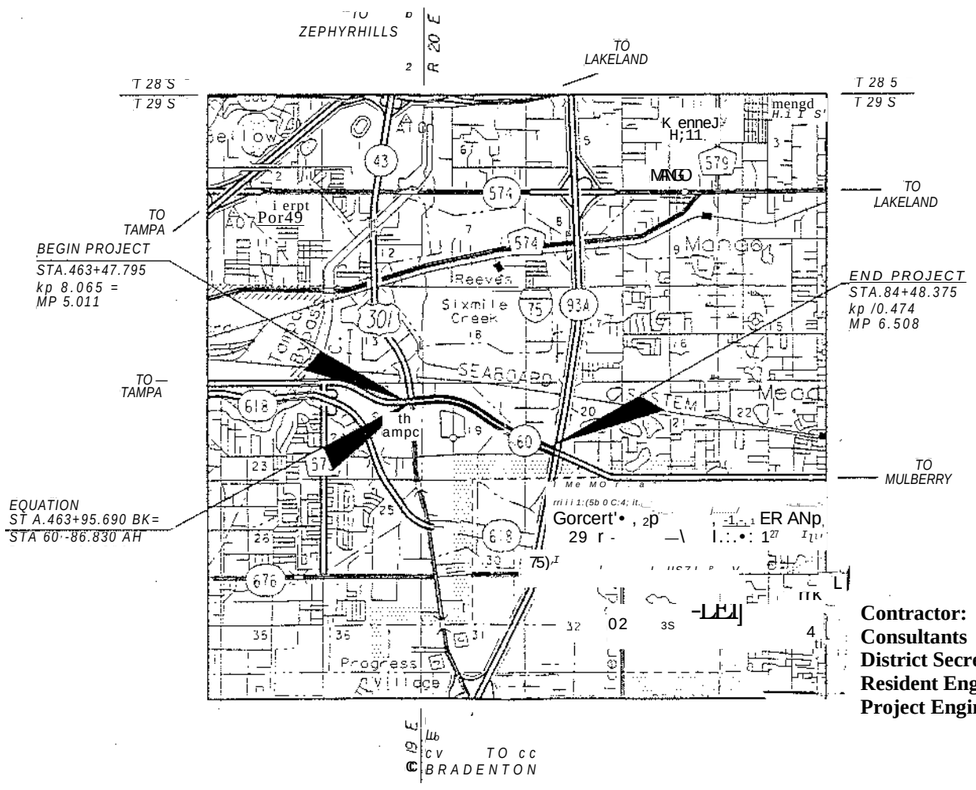
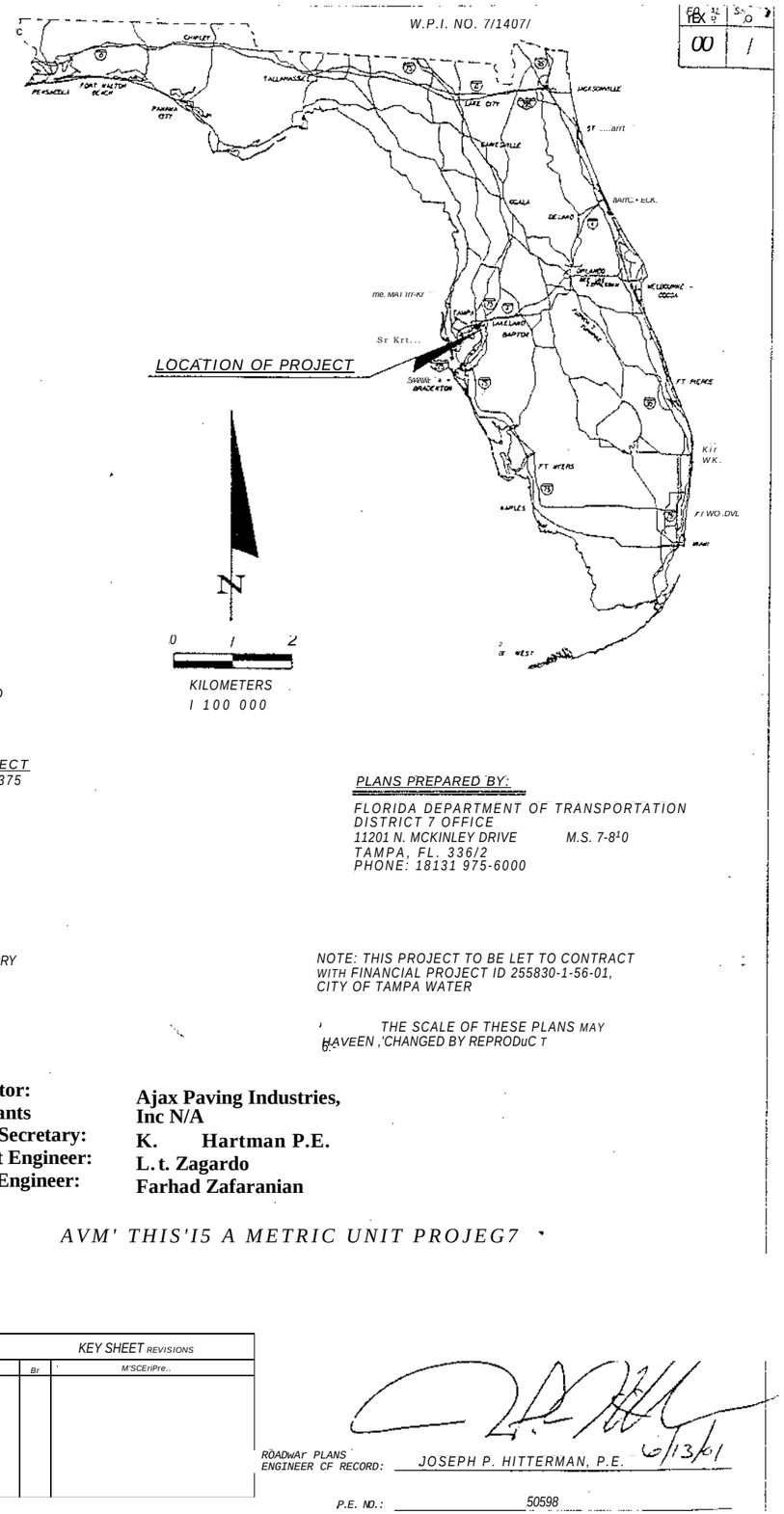
STATE OF FLORIDA
DEPARTMENT OF TRANSPOI?TA TION
FINAL PLANS

FINANCIAL PROJECT ID 255830-1-52-01 STATE PROJECT NO. 10110-3514 (FEDERAL FUNDS) HILLSBOROUGH COUNTY STATE ROAD NO. 60 (ADAMO DRIVE: S.R. 43 (U.S. 30/) TO 1-75)





PLANS PREPARED BY:
FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 7 OFFICE
11201 N. MCKINLEY DRIVE M.S. 7-8[1]0
TAMPA, FL. 336/2
PHONE: 18131 975-6000

NOTE: THIS PROJECT TO BE LET TO CONTRACT WITH FINANCIAL PROJECT ID 255830-1-56-01, CITY OF TAMPA WATER

THE SCALE OF THESE PLANS MAY HAVEEN ,'CHANGED BY REPRODUC T

Contractor:	Ajax Paving Industries, Inc N/A
Consultants	
District Secretary:	K. Hartman P.E.
Resident Engineer:	L. t. Zagardo
Project Engineer:	Farhad Zafaranian

AVM' THIS'I5 A METRIC UNIT PROJEG7

LENGTH OF PROJECT	METERS
ROADWAY	2409 440
BRIDGES	0.000
NET LENGTH OF PROJ.	2409.440
EXCEPTIONS	0.000
GROSS LENGTH OF PROJ.	2409.440

FDOT PROJECT MANAGER : Adam S. Perez. P.E

KEY SHEET REVISIONS

are	Br	M'SCEriPre..

ROADWAr PLANS ENGINEER CF RECORD: JOSEPH P. HITTERMAN, P.E. 6/13/01
P.E. NO.: 50598

.../101102514,/design/keysrd01.dgn 0[6]/13:01 03:53:04 Pi·1

GPPI-Z7111.VT.P

THIS 5 CT PLAN SET :INCLUDES

ROADWAY PLANS
SUMMARY OF PAY ITEMS (SHEETS)
SIGNING AND PAVEMENT MARKING PLANS
SIGNALIZATION. PLANS

STRUCTURE PLANS
WETLAND MITIGATION PLANS (BY GREINER)

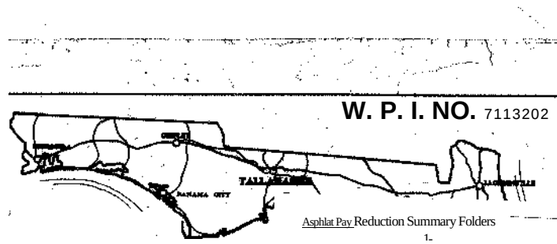
A DETAILED INDEX APPEARS ON THE KEY SHEET., OF EACH, GROUP .OF PLANS

INDEX OF ROADWAY PLANS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY

ATE PROD. NO.10540-3503 (FED l' AL FUNDS)
HILLSILOROUGH COUNTY
STATE 1⁶0AD 57



W. P. I. NO. 7113202

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EWA-2 Plan Quantity Check
EWA-3 Plan Revisions
Multilane Disks (3) & SumMary
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Box4 Box4
Plan Revision Checks Filing PQA-1
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Tally Books
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MOTLoa
Off-Duty_Olicer Box 10
Log_ Striping Log Box10
W S

PROJECT LOCATION

ITEM NO.	25966-1-52-01
CONTRACTOR	HUBBARD CONSTRUCTION COMPANY, INC.
DESIGN CONSULTANT	DSA GROUP, INC.
CEI CONSULTANT ENGINEERS, INC	
DISTRICT SECRETARY	KENNETH A. HARTMANN, P.E.
'ESIDENT ENORTEER	MARTY SANCHEZ, P.E.
'TACT ENGAIEER	DAVID C. ROGER
'S STARTED	JANUARY 1995
WAS COMPLETED	APRIL 22, 1998
	APRIL 27, 1998

ICE RAISER

ROADWAY- PLANS ENGINEER- OF RECORD.

ALAN A. SOROORY, P.E.
DSA GROUP • INC.
2005 PAN .AM CIRCLE
TAMPA; FL. 33607

ROADWAY PLANS PREPARED I

111) 2005 *PAN NA* CIRCLE TAMPA, FLORIDA 33607 9613) 073-9222
ACOMMITMENTTO QUALITY

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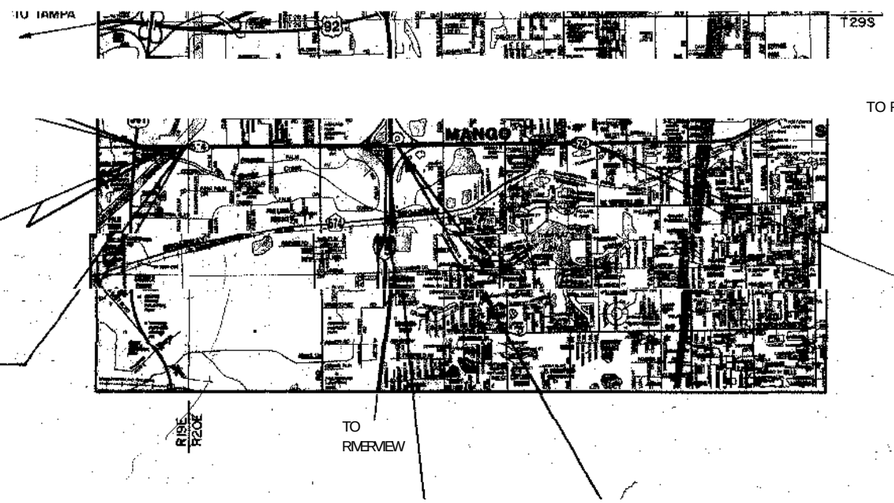
M.P. 8.904

J

END BRIDGE
STA. 1129+38.02 CONSTRUCTION



2933 FT.

END PROJECT

STA. 1122+03,02 CONSTRUCTION

STA. 1304+00.00 Q CONSTRUCTION

NOTE = r/Ps 4=latountir awsr,faciraw PLR t/ 5ET .547- "ty Beier/A u˙we .9"fme CONTRACT WITH STATE PROJECT NUMBER 10340˙3504,10340-6503, 10340˙6506, 10340˙6508, */agio-c5.04,* ***/0510^ 6500 /0540- 6002***

BEGIN EXCEPTION
STA. 1215+01.33 CONSTRUCTION

LENGTH OF PROJECT		
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11t ...	735.0	0.139
LTINGT*1 OF Kat	18,349.71	3.475
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N';' OSS LENCiTH OP PROD,		19,000.0.3.598

F..D.O.T. PROJECT MANAGER IRWIN PRESCOTT, P.E.

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE SEEN REDUCED IN SIZE SY' REPRODUOTION.THIS MUST SE *CON-SIDERED* WHEN OBTMNINO SCALED. DATA. —

NO SPECIFICATIONS. STATE OF FLORIDA, TMENT OF TRANSPORTATIONATARDARD ICATIONS,DATED 1091 AND SUPPLEMENTS TO IF NOTED IN THE SPECIAL. PROVISIONS !THIS PROJECT,

***ROADWAY* IILMD**
mom. Ey. ALAN A. SOROORY, P.E.
DP7E1 11/4494-

Ps. No 41219

THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH **AND ARE GOVERNED BY. THE STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, ROADWAY , AND TRAFFIC DESIGN STANDARDS (BOOKLET DATED JANUARY, 1902)**

REVISIONS

END EXCEPTION
STA.1221+51.62 c. CONSTRUCTION

REVISIONS		
DATE	BY	

W.P.I. NO. 7113201

SET INCLUDES:

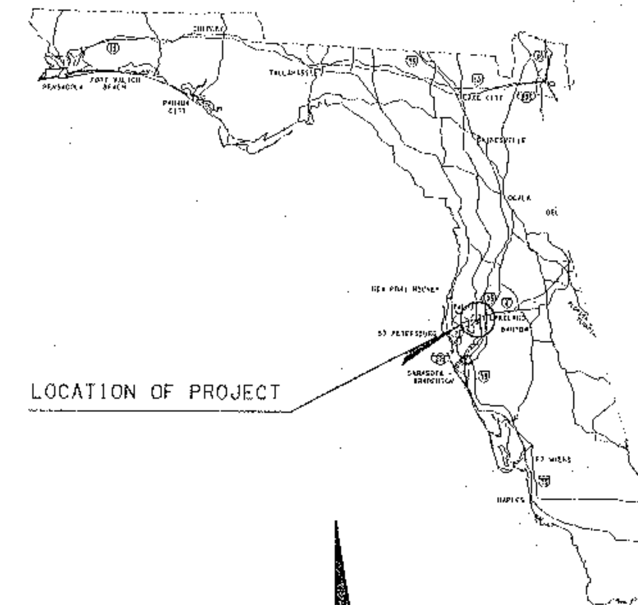
(TEKSHEETS)
PAVEMELING PLANS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

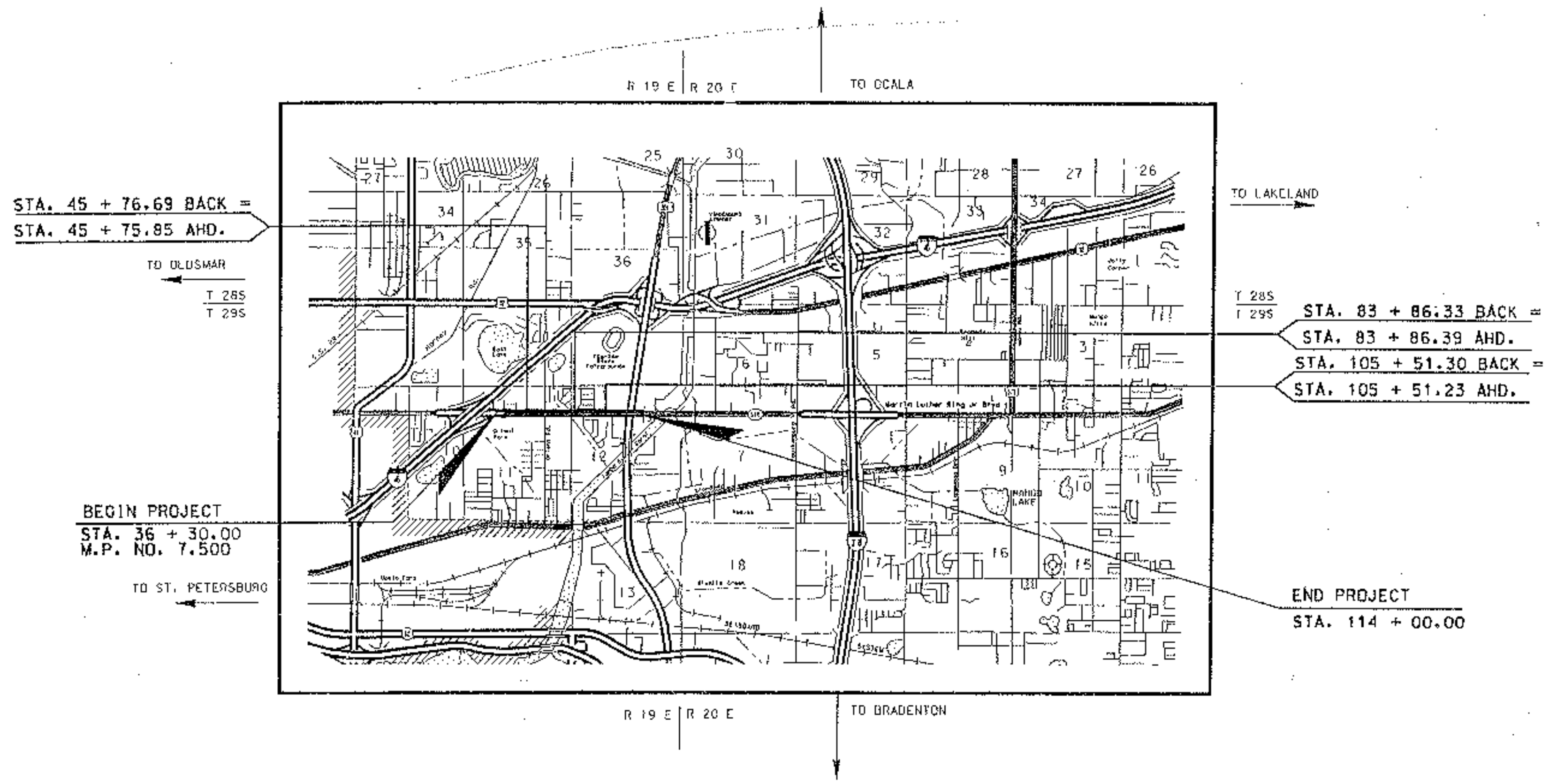
PLANS OF PROPOSED
STATE HIGHWAY

A DETAILED ... OF EAC ... APP'HE KEY SHEET ... MPONENPLANS

STATE PROJECT NO. 10340-3504 (FEDERAL FUNDS)
HILLSBOROUGH COUNTY
STATE ROAD NO. 574



INDE PLANS



1 MILE

PLANS PREPARED BY :

PBSJ

POST, BUCKLEY, SCHUH & JERNIGAN, INC.
CONSULTING ENGINEERS
1560 ORANGE AVENUE
WINTER PARK, FLORIDA, 32789

CONTRACT PLAN SET

NOTE: THIS ROADWAY CONSTRUCTION PLAN SET TO BE LET IN THE SAME CONTRACT WITH STATE PROJECT NOS: 10340-3503, 10340-6503, 10340-6504, 10340-6505, 10340-6506, 10340-6507, 10340-6508.

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

GOVERNING SPECIFICATIONS: STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 1991 AND SUPPLEMENTS THERETO IF NOTED IN THE SPECIAL PROVISIONS FOR THIS PROJECT.

"HDR Engineering, Inc. has made the revisions noted by cloud designation listed below. These revisions do not imply either review of or responsibility for, the adequacy of the original design."

THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH AND ARE GOVERNED BY THE STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, ROADWAY AND TRAFFIC DESIGN STANDARDS (BOOKLET DATED JANUARY, 1992).

REVISIONS

SHEETS 1, 2, 11, 12, 14, 15, 18, 19, 26, 46, 55, 72, 103, 114, 121, 129 (REVISED 11/94)

LENGTH OF PROJECT

	LINEAR FT.	MILES
ROADWAY	7770.85	1.471
BRIDGES	0.00	0.000
NET LENGTH OF PROJ.	7770.85	1.471
EXCEPTIONS	0.00	0.000
GROSS LENGTH OF PROJ.	7770.85	1.471

REVISIONS

DATE	BY	DESCRIPTION
11/94	MEW	ADDED REVISION SHEETS.

FDOT PROJECT MANAGER : CARTER M. REID

ROADWAY PLANS APPROVED BY: SUSAN A. GRATCH
DATE: 3/15/94
P.E. NO.: 40134

13-APR-1994 13:14
/usr2/remote/t6/project/buffalo/bufkey01.dgn

198 pages

APPENDIX A-2

SWFWMD

Pre-Application Meeting Minutes

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES

FILE NUMBER:
PA 400766

Date:	1/22/2014
Time:	10:00
Project Name:	FDOT US 301 PD&E
Attendees:	Richard Alt; Chaz LaRiche; Al Stewart, Analytic Engineering, astewart@analytic-engineering.com Jim Zinner, Brandon Gray

County:	Hillsborough	**Sec/Twp/Rge:**	1, 12, 13, 24/29/19
Total Land Acreage:	90	**Project Acreage:**	90 acres

Prior On-Site/Off-Site Permit Activity:
- Existing 4 lane highway

Project Overview:
- Widen from four to six lanes
- Wetlands/Surface Waters – Yes
- FDOT ETDM 3097

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)
- Provide the limits of jurisdictional wetlands.
- Provide appropriate mitigation using UMAM for impacts, if applicable.
- Demonstrate elimination and reduction of wetland impacts.
- Maintain minimum 15 foot, average 25 foot wetland conservation area setback or address secondary impacts.
- Additional coordination with SWFWMD Land Department will be required for alterations to the bridges over the Bypass Canal since a permit from the District to ACOE will be required

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)
- Existing roadway/intersections.
- Multiple WBID's. – all impaired for nutrients
- Discharging to impaired waters.
- Adjacent to contaminated sites

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)
- Demonstrate that discharges from proposed project area will not cause an adverse impact for a 25-year, 24-hour storm event (if pond does not discharge to an infinite basin (bypass canal)).
- Demonstrate that site will not impede the conveyance of contributing off-site flows.
- Demonstrate that the project will not increase flood stages up- or down-stream of the project area(s).
- Provide equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts if applicable.

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)
- Provide water quality treatment for project area.
- In addition, must provide a net environmental improvement.
- Applicant must demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use.
- Also replace treatment function of existing ditches to be filled.
- Will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)
- N/A

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to the FDOT.
- Provide proof of ownership in the form of a deed or contract for sale.
- Provide appropriate O&M instructions.
- Provide detailed construction surface water management plan.

Application Type and Fee Required:

- SWERP – Sections A, C and E of the ERP Application.
- < 100 acres of project area and < 10 acres of wetland or surface water impacts - $2798.00 Online Submittal

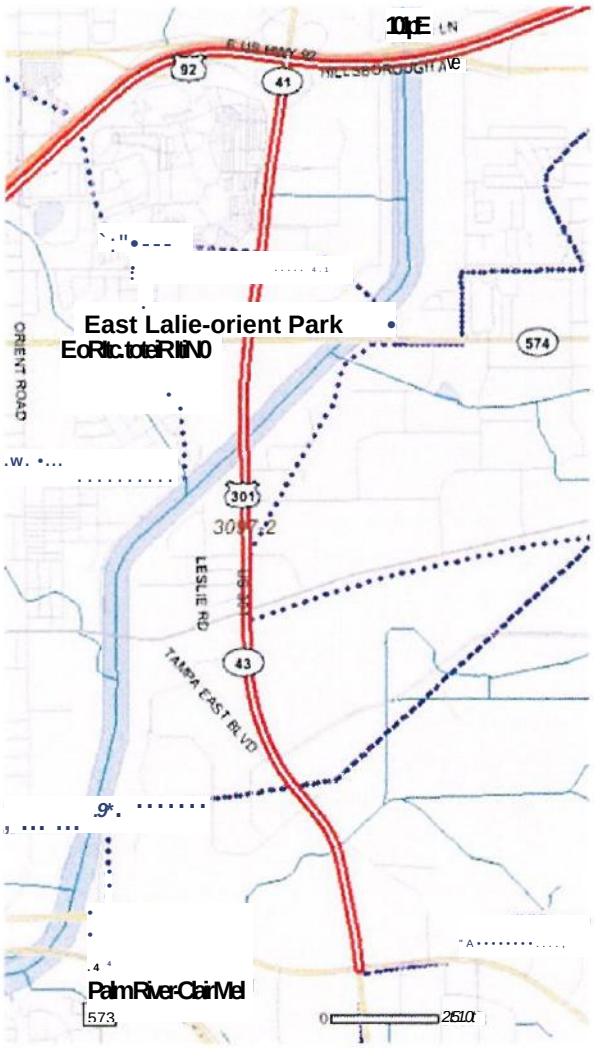
Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

-

Disclaimer: The District ERP pre-application meeting process is a service made available to the public to assist interested parties in preparing for submittal of a permit application. Information shared at pre-application meetings is superseded by the actual permit application submittal. District permit decisions are based upon information submitted during the application process and Rules in effect at the time the application is complete.

ETDM Information

Location Map



Summary

Project Name / Numbers	ETDM Review Screen
US-301 Widening **ETDM #3097 PA #399564**	Planning
Location	**X Programming**
From SR-60 to 1-4 (3.3 miles)	Project Development
County	**Review Period**
Hillsborough	09/14/12 to 10/29/12

Description:
The proposed project will expand US 301 from four to six lanes between SR 60 and 1-4. This improvement is envisioned to include multi-modal improvements, including sidewalks, bicycle lanes, and transit accommodations. The project segment is 3.3 miles long. This project will utilize existing right-of-way (ROW) for mainline improvements, but additional ROW is anticipated for ponds.

Project Status

This project was screened in March 2004 as a Planning Screen, but the limits were from the Lee Roy Selmon Crosstown Expressway to 1-4. Since then, the project has been separate into two separate projects. From the Lee Roy Selmon Crosstown Expressway to SR 60 a PD&E Study was already completed and approved to widen that portion of the corridor to six lanes. Therefore, the new limits to be evaluated in this Programming Screen are from SR 60 to 1-4.

Purpose and Need

The purpose of this project is to relieve congestion on this portion of US 301 in unincorporated Hillsborough County. US 301 is a major north-south roadway facility in close proximity to the City of Tampa, and it travels from the Sarasota-Bradenton-Venice Metropolitan Statistical Area across the state to the Jacksonville Metropolitan Statistical Area. In addition to increasing capacity, this project will add or enhance the multi-modal facilities in this corridor.

The need for this widening project is based on the congestion and the current failing level of service of this segment of US 301.

Roadway Deficiencies

According to the March 2011 Hillsborough County Automobile Level of Service Report, US 301 between State Road 60 and 1-4 is currently operating at 102% of capacity. This yields a failing level of service grade of "F".
The most recent version of the Tampa Bay Regional Planning Model (TBRPM) uses 2010 base year data, which shows a level of service of C for the SR 60 to 1-4 segment of US 301. The TBRPM projects this segment to have a failing LOS by 2035. Table 1 shows the 2010 and projected 2035 traffic volumes from the TBRPM. The 2035 traffic volumes projected for the model show deficiencies and a failing level of service for the US 301 Corridor.

System Linkage

US 301 is a major north-south arterial within the Hillsborough County that serves regional travel and connects residential centers in the Brandon and South Shore area with employment centers along the I75 Corridor. It provides regional connectivity with 1-75, the Lee Roy Selmon Crosstown Expressway, and 1-4.

Relief to Parallel Facilities

Between SR 60 and 1-4,1-75 and US 301 are parallel facilities. Like US 301,1-75 between SR 60 and 1-4 is operating at a failing level of service according to the 2011 Hillsborough County Level of Service Report; in fact, this segment of 1-75 ranges from 25-33% over capacity. Addition of capacity on US 301 will help ease congestion for this overburdened roadway.

Plan Consistency

The Transportation Element of Hillsborough County's Comprehensive Plan lists US 301 from the Manatee County Line to the Pasco County Line as a regulated state roadway, and states that no development orders will be issued that cause the level of service to be exceeded (with the exception of vested

developments). The widening US 301 from SR 60 to 1-4 is not included in the County's Capital Improvement Plan.
In the Florida Department of Transportation's (FDOT) 2012-2017 Five Year Work Program, a PD&E / EMO Study for US 301 between SR 60 and 1-4 is funded in 2013. In the Hillsborough County MPO's 2035 Mobility Vision Plan, the widening of US 301 from four to six lanes between the Crosstown W Ramp and 1-4 is listed as an unfunded need.

US 301 has been identified as a regional roadway by the West Central Florida MPO's Chairs Coordinating Committee (CCC) and included in the Regional Roadway Network. This section of US 301 is not currently a part of Florida's Strategic Intermodal System or the Florida Intrastate Highway System.

Social Demands or Economic Development

The Hillsborough County City-County Planning Commission's 2035 Long Range Transportation Plan Socioeconomic Projections (Nov. 2008) contains both population and employment projections. These projections show Hillsborough County's population growing from 1,173,360 to 1,729,300 (a 47% increase) between 2006 and 2035. Employment is projected to grow from 759,000 to 1,175,920 (a 55% increase) between 2006 and 2035, mostly within the urban service area.

Modal Interrelationships

Several intermodal SIS facilities are in close proximity to US 301, including: the Tampa International Airport, the Port of Tampa, the Tampa Intercity Greyhound Bus Terminal, and the Port of Manatee. (Emerging SIS facilities in the area include: the St. Petersburg / Clearwater International Airport, the Tampa Amtrak Station, and the Tampa CSX Intermodal Terminal.) As this project is constructed and congestion is decreased, travel to intermodal facilities will become faster & easier.

Additionally, this improvement is envisioned to include multi-modal improvements, including sidewalks, bicycle lanes, and transit accommodations. Currently, the Hillsborough Area Regional Transit system does not have buses running on this section of US 301.

Safety

'Safety within the US 301 corridor is projected to increase as roadway congestion is reduced, thereby decreasing potential conflict with other vehicles. The addition and enhancement of multi-modal facilities will increase pedestrian and bicyclist safety along the corridor.
As shown in Table 2, the US 301 corridor between SR 60 and 1-4 had 369 crashes between 2006 and 2010. These crashes were relatively evenly distributed between 2006 and 2010.

Table 3 summarizes the intersections that saw the highest number of crashes between 2006 and 2010, which were: US 301 at SR 574, with 128 crashes and 86 injuries; US 301 at SR 60 with 65 crashes and 32 injuries; and US 301 at Sabal Industrial Park with 25 crashes and 25 injuries.

Table 4 categorizes crashes between 2006 and 2010 by harmful event. The most common harmful event was a rear end crash, with 163 crashes. There were 97 angle crashes, 37 sideswipe crashes, and 17 left turn crashes.

The five-year average safety ratio for years 2006-2010 within the study area indicates that the crash rates are lower than the statewide average with a crash rate of 0.507 for US 301 while the statewide average for a 4-5 lane divided highway with a raised median is 2.45.

Hurricane Evacuation

US 301 has been designated by Hillsborough County Emergency Management as an emergency evacuation route.

Alternatives Under Consideration

There is only one alternative for the proposed project. The total length of the project is approximately 3.3 miles consisting of one (1) segment for planning and evaluation purposes (Segment S-001).

Summary of Public Comments

A Public Involvement Plan will be carried out as part of this study which will include a Public Workshop and a Public Hearing.

Consistency

No information available.

Required District Responses Under ETDM

Purpose and Need Statement

Understood (without comments)

Coastal and Marine

Degree of Effect:	None	**X Minimal**	Moderate	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	**X Permit Required**
	Tech Memo Required	To Be Determined: Further Coordination Required	

Identify Resources and level of importance:

Hillsborough County is listed as a coastal county under the Coastal Zone Management Act.

Comment on effects to resources:

Prior to the issuance of the permit an additional CZM Noticing period will be required for all wetland and surface water impacts associated with the construction. Depending on the type of permit requested the CZM Noticing period is either 10 days (General) or 30 days (Individual) with an additional 5 day mailing timeframe added to each.

Additional Comments:

SWFWMD has assigned a Degree of Effect (DOE) of "Minimal" based upon the routine nature associated with permitting requirements for the proposed construction activity.

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Contaminated Sites

Degree of Effect:	None	Minimal	**X Moderate**	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	Permit Required
	Tech Memo Required	**X To Be Determined: Further Coordination Required**	

Identify Resources and level of importance:

Information regarding proposed off-site stormwater management facilities will not be available until after the subsequent PD&E and design phases of this project. Therefore, the SWFWMD utilized the FDOT's Environmental Screening Tool - EST (supplemented with information from the SWFWMD's Geographic Information System - GIS) for identifying potential contaminated sites that may affect subsequent Environmental Resource Permits (ERPs) for the FDOT. The facilities of concern within 500 feet of this US-301 widening project include (but are not limited to) the following:

Brownfield Locations: Two (2) facilities.
Petroleum Contamination Monitoring Sites: Twenty-eight (28) facilities.
Storage Tank Contamination Monitoring: Twenty-Nine (29) facilities.
National Priority List Sites: One (1) facility.
Superfund Hazardous Waste Site: One (1) facility.
Sensitive Karst Areas: One (1) significant area (details noted below).

Approximate locations of these contaminated sites can be viewed within the EST under the "Contaminated Sites" map and > *Waste* layer. In view of the current / past land uses in the project area, there may be other (unknown) contaminated sites.

Contamination sites (or potential contamination sites) of particular interest to the SWFWMD include the following:

The two (2) Brownfield sites on the east side of US-301 near SR-60 (WRB at Hopewell Road and the Former Wood Preserving Site).
The National Priority (Superfund) Site on the east side of US-301 along Stannum Street (MRI Corporation).
Other current / past commercial & industrial activities near the proposed project.

Both the SWFWMD's GIS and the FDOT's EST clearly show that within the $^1/_2$ mile buffer, this US-301 project lies within a Sensitive Karst Area (SKA) along its entire 3.3 mile length (reference: the FDOT's EST "Contaminated Sites" Map and > *Geology* > *SWFWMD Sensitive Karst Areas* layer).

From the SWFWMD's Geographic Information System (GIS) and the FDOT's Environmental Screening Tool (EST), the project area is characterized by a two-aquifer system that includes the Surficial and Floridan aquifers.

Within a 500 foot buffer of the US-301 widening project, the pollution potential of the intact Surficial Aquifer is high as indicated by DRASTIC weighted indexes of 177 - 186. The Floridan Aquifer is also high as indicated by DRASTIC weighted indexes of 141 - 171.

FAVA Surficial Aquifer System:

For the entire 3.3 mile length of the US-301 widening project, the FAVA is listed as "unknown description" in the FDOT's EST. Graphical locations of the Surficial FAVA can be viewed within the FDOT's EST under the "Contaminated Sites" map and > *Water Resource* > *Surficial Aquifer System Response* layer.

FAVA Floridan Aquifer System:

Classified as "More Vulnerable" within the 500 foot buffer for 94.5 + / - % of the project length, "Vulnerable" for an additional 2.7 + / - %, and "Unknown Description" for the remaining 2.8 + / - %. Graphical locations of the Floridan FAVA can be viewed within the FDOT's EST under the "Contaminated Sites" map and > *Water Resource* > Floridan *Aquifer System Response* layer.

Comment on effects to resources:

If encountered and disturbed during construction, any contaminated site could result in surface and / or groundwater water pollution. While the US-301 footprint may not directly impact contaminated sites, proposed surface water management systems and other project construction activities should avoid these areas.

Additional Comments:

The SWFWMD has assigned a Degree of Effect (DOE) based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For this US-301 widening project, a DOE of "moderate" was assigned to this issue due to the present belief that future ERP permitting is expected to be non-routine for:

Potential pollution sources (particularly petroleum / storage tank contamination).

- The location of the entire 3.3 mile project within a Sensitive Karst Area (SKA).
- The nearby National Priority List (Superfund) Site.
- The two (2) nearby Brownfield sites.
  High DRASTIC scores of the intact Surficial Aquifer and underlying Floridan aquifer.
- FAVA classification of "More Vulnerable" for the overwhelming majority of the area occupied by the Floridan aquifer.

However, the expected permitting effort by FDOT should be straight forward and a normal effort is expected on the part of SWFWMD's regulatory staff. **As noted in FDOT's project description, potential impacts due to Contaminated Sites would generally be limited to areas of new stormwater management ponds located outside of the existing R/W of US-301. The SWFWMD concurs with FDOT's 09/13/12 Advance Notification (AN) package in regard to recommending the following Technical Studies:**

- Contamination Screening Evaluation Report

- **State Environmental Impact Report (SEIR)**

To minimize groundwater and surface water pollution potential, the following actions should be considered by the FDOT:

- Conduct an Environmental Audit at the appropriate level to identify specific facilities of interest and to develop a plan for their proper removal or abandonment **(with particular attention to current & past commercial / industrial areas along the proposed alignment);**
- Coordinate with FDEP & USEPA, and prepare an appropriate Contamination Assessment Report; Avoid known contaminated sites where possible in the selection of the project alignment. If discovered during the recommended soils investigation, contamination should be remediated properly so as to eliminate the potential for ground water contamination;
  If applicable, avoid / minimize all construction activity in proximity to known sinkholes and / or Subsidence Incident Reports along or near the project's alignment;
- Confirm the presence or absence of existing potable supply wells, both public and domestic (refer to the GIS well information below), and identify precisely all potential sources of contamination within the path of construction or in proximity of the proposed surface water management systems;

Thoroughly evaluate potential stormwater treatment pond sites for the presence of contamination and eliminate contaminated sites as potential pond sites;
Design and construct stormwater management facilities to avoid breaching the upper confining unit;

- Temporary drainage & erosion control through areas of potential contamination may be important
considerations for the FDOT and their construction contractor.

Contamination sources such as existing fuel storage tanks, fuel pumps, and septic tanks shall be removed or abandoned properly. In addition, existing wells in the path of construction shall be properly plugged and abandoned by a licensed well contractor — Reference: Rule 40D-4.381(1)(i), Florida Administrative Code, available at http://www.swfwmd.state.fl.us/permits/rules/.

Water use and well construction information is now available in the EST under Contaminated Sites > Permits > SWFWMD Well Construction Permits. Useful information includes the permit number, name of the permittee, well casing diameter(s), street address of the well(s), well driller name and the approximate location(s) by latitude / longitude. **As of October, 2012, the EST indicated three-hundred-sixty-two (362) permits had been issued within the 500 foot buffer of this US-301 widening project.** Similar information can be obtained from the SWFWMD's Permits Map Viewer, Well Construction Permit Search and Water Use Permit Search web sites as follows:
http://www8.swfwmd.state.fl.us/ExternalPermitting/
http://wvvw18.swfwmd.state.fl.us/search/search/wcpsimple.aspx
http://www18.swfwmd.state.fl.us/search/search/searchwupsimple.aspx

Additional information on the Florida Aquifer Vulnerability Assessment (FAVA) can be obtained at the following web addresses:
http://www.dep.state.fl.us/geology/programs/hydrogeology/fava.htm
http://www.dep.state.fl.us/geology/programs/hydrogeology/fava_gis_data.htm
http://www.dep.state.fl.us/swapp/documents/Florida%20Aquifer%20Vulnerability%20Assessment.pdf
http://suwanneeho.ifas.ufl.edu/documents/FAVA_REPORT_MASTER_DOC_3-21-05.pdf

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Floodplains

Degree of Effect:	None	**X Minimal**	Moderate	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	**X Permit Required**
	Tech Memo Required	To Be Determined: Further Coordination Required	

Identify Resources and level of importance:

The following information was obtained from the FDOT's Environmental Screening Tool (EST) and supplemented with information from the SWFWMD's Geographic Information System (GIS):

Digital Flood Insurance Rate Map (DFIRM) areas of interest include the following:

- Zone A: representing less than 1/2 % of US-301 within the 500 foot buffer.
- Zone AE: representing approximately six (6) % of US-301 within the 500 foot buffer.
- Zone X: representing approximately ninety-five (95) % of US-301 within the 500 foot buffer.

Approximate locations of these DFIRM Zones can be viewed within the EST under the "Floodplains" map and *Water Resource > DFIRM Flood Hazard Zones* layer. Graphically, the greatest concentration of floodplains appears near:

The 1-4 interchange within WBID 1536B.

- Near the NW corner of US-301 and Dr. Martin Luther King Jr. Blvd. within WBID 1536F
- The US-301 crossing over the Tampa By-Pass canal within **WBID** 1536F.
- A cross drain ditch / canal just south of Old Hopewell Road.

As of October, 2012, the following DFIRM Panel Numbers for the US-301 widening project (from north to south) can be obtained from the FEMA Map Service Center at:
https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1
Panel # 12057C0380H: Date of issue — 08/28/08 (Hillsborough County)
Panel # 12057C0378H: Date of issue — 08/28/08 (Hillsborough County)

Comment on effects to resources:

Potential impacts for the US-301 widening project will depend upon the required filling, encroachment or alteration of existing (or future) Zone A & AE Floodplains, Historic Basin Storage areas and (if applicable) Floodways.

Additional Comments:

The SWFWMD has assigned a Degree of Effect based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For this US-301 widening project, a DOE of "Minimal" was assigned to this issue due to the present belief that little or no adverse impacts to Floodplains are expected. Future permitting should involve routine interaction with the SWFWMD's regulatory staff.

SWFWMD supported Watershed Management Models are generally based on more recent land cover and topographic information. The SWFWMD recommends that the FDOT utilize data from these flood studies in preference to generalized information on flows and stages. FDOT should coordinate with District Engineering & Watershed Management Section staff in Brooksville regarding the status & data availability of these Watershed Management Models. Ongoing / future SWFWMD

studies (within 1/2 mile of US-301) that may be helpful in the PD&E and design phase include the following:

Project Number: B126
Project Name: WMP Hillsborough County Model Review
Area(s) of Responsibility: Flood Protection / Floodplain Management
Project Status: **Complete**
Project Manager: Ms. Robin Bailey

Project Number: L099
Project Name: WMP - Hillsborough Watershed Model Update
Area(s) of Responsibility: Flood Protection / Floodplain Management
Project Status: **Ongoing**
Project Manager: Ms. Robin Bailey

If available, floodplain information developed through these studies can be viewed through the SWFWMD's "Floodplain Map Viewer" at http://www.swfwmd.state.fl.us/projects/wmp/. **As of October, 2012, no information was available the "Floodplain Map Viewer".** Proposed stormwater management systems by FDOT may necessitate updates to the current or proposed Watershed Management Models.

Filling within any floodplain, floodway or historic basin storage area may decrease stormwater storage which could increase flooding depth and duration. The SWFWMD will require compensation for fill (or other encroachments) into floodplains, floodways and historic basin storage areas up to the 100-year event if such encroachment(s) will adversely affect conveyance, storage, water quality or adjacent lands (Reference: Sections 4.4 and 4.7 of the District's ERP "Basis of Review", available at http://www/.swfwmd.state.fl.us/permits/rules).

The FDOT may reduce the degree of effect for flooding by:
restricting the filling / encroachment into floodplain, floodway and historic basin storage areas to only those areas that are necessary;
constructing stormwater treatment ponds outside floodplain, floodway and historic basin storage areas;
providing equivalent compensation for lost floodplain, floodway and historic basin storage.

The SWFWMD recommends that the FDOT quantify floodplain, floodway and historic impacts based on existing or special basin hydrologic studies. Roadway modification improvements may also affect existing cross drainage / bridge facilities along the entire length of the US-301 widening project. Additional bridge hydraulics reports should be prepared (if applicable) and submitted with the Environmental Resource Permit application. The SWFWMD concurs with FDOT's 09/13/12 Advance Notification (AN) package in regard to recommending the following Technical Studies:

- **Preliminary Engineering Report**
- **Preliminary Stormwater Management Facility Report**

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Historic and Archaeological Sites

Degree of Effect:	None	**X Minimal**	Moderate	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	Permit Required
	Tech Memo Required	**X To Be Determined: Further Coordination Required**	

Identify Resources and level of importance:

SWFWMD's responsibility in the ETDM review process is to identify only those historical and archeological sites located on District owned/controlled lands. From the SWFWMD's Geographic Information System (GIS), the District owns the following lands along this US-301 widening project:

The Tampa Bypass Canal, Sections 2 and 3.

Veterans Memorial Park (managed by Hillsborough County), at the NW quadrant of the US-301 bridges over the Tampa By-Pass Canal.

An approximate (graphical) location of the Tampa Bypass Canal can be viewed within the EST under the "Historic & Archaeological Sites" map and > *Conservation* > *Water Management District Owned Lands* layer. From this same EST map, the following SHPO Survey Areas were noted within the $^1/_4$ mile buffer of US-301 along the Tampa Bypass Canal:

Survey#1869 — Archaeological & Historical Survey of the Tampa Bypass Canal and Associated Structures.

- Survey #243 — An Archaeological Survey of the Tampa Bypass Canal Right-of-Way

In addition, a Historical Private Residence (Site ID HI06547A) is located in the NE quadrant of US-301 and the Tampa By-Pass Canal.

Potential impacts to all historical and archaeological sites shall be considered in evaluation of the application for an environmental resource permit (refer to the "Additional Comments" section below).

Comment on effects to resources:

If historical or archeological artifacts are discovered at any time along the Tampa Bypass Canal, the FDOT shall immediately notify the District and the Florida Department of State Division of Historic Resources; Reference: Rule 40D-4.381(1)(w) F.A.C., available at https://www.flrules.org/gateway/ChapterHome.asp?Chapter=40D-4

Additional Comments:

The SWFWMD has assigned a Degree of Effect (DOE) based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For this US-301 widening project, a DOE of "minimal" was assigned to this issue due to the present belief that little or no adverse impacts to historical or archaeological sites are expected along the Tampa Bypass Canal.

Pursuant to Rule 40D-4.302, F.A.C. (Additional Conditions for Issuance of Permits), applicants must provide reasonable assurance that proposed activities will not be contrary to the public interest, or if such an activity significantly degrades or is within an Outstanding Florida Water, that the activity will be clearly in the public interest. One of the factors considered in this determination is whether the activity will adversely affect or will enhance significant historical and archaeological resources under the provisions of Section 267.061, F.S.

Pursuant to Section 3.2.7.c of the District's ERP "Basis of Review" (available at http://www/permits/rules/), the District will review proposed secondary impacts to historical and archeological resources as part of an ERP application by the FDOT. All reasonable effort should be made to avoid impacts to significant historical and archaeological resources. **The SWFWMD concurs with FDOT's 09/13/12 Advance Notification (AN) package in regard to recommending the following Technical Studies:**

- **Cultural Resource Assessment Survey**

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Infrastructure

Degree of Effect:	None	Minimal	**X Moderate**	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	Permit Required
	Tech Memo Required	**X To Be Determined: Further Coordination Required**	

Identify Resources and level of importance:

From the SWFWMD's Geographic Information System (GIS), the District owns the following lands along this US-301 widening project:

- The Tampa Bypass Canal, Sections 2 and 3.
- Veterans Memorial Park (managed by Hillsborough County), at the NW quadrant of the US-301 bridges over the Tampa By-Pass Canal.

An approximate (graphical) location of the Tampa Bypass Canal can be viewed within the EST under the "Infrastructure" map and > *Conservation* > *Water Management District Owned Lands* layer.

The following information (regarding SWFWMD owned / controlled / cooperative data collection sites) was obtained from the SWFWMD's GIS system, and was analyzed for information within 500 feet of this US-301 widening project:

SITE_ID: 18778
SITE_NAME: TBC 621 DEEP
SITE_TYPE_DESC: Ground Water/Geologic
STATUS_DESC: Inactive
AGENCY: SWFWMD / US Geological Survey
APPROX_LAT: 27 58 15.07
APPROX LONG: 82 21 39.31

SITE_ID: 18785
SITE_NAME: FAIRGROUNDS DEEP
SITE_TYPE_DESC: Ground Water/Geologic
STATUS_DESC: **Active**
AGENCY: SWFWMD / US Geological Survey
APPROX_LAT: 27 59 07.70
APPROX LONG: 82 21 36.90

The SWFWMD has cooperative programs with NGS, FDEP and other local agencies to establish and maintain benchmarks throughout the District. The following Benchmarks are located near this proposed US-301 widening project:

http://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=AG7236
http://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=AG7237
http://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=AG7235
http://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=AG7238
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http://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=DJ8111
http://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=DJ8112

Beginning on 09/04/12, the SWFWMD revised its website to provide benchmark data that is searchable by section, township and range, or by interactive map. The URL for this website is as follows:
http://vvww.swfwmd.state.fl.us/data/surveycontrol/

Comment on effects to resources:

Construction activities related to the project and associated surface water management facilities have the potential to damage the District's data collection stations or to impair their collection functions. Of heightened concern are potential R/W acquisitions and construction easements for the Tampa By-Pass Canal and adjacent Veterans Memorial Park.

Additional Comments:

The SWFWMD has assigned a Degree of Effect based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For the US-301 widening project, a DOE of "Moderate" was assigned to this issue due to the present belief that future ERP permitting is expected to be non-routine for:

- New Right-of-Way and / or construction easements over the Tampa Bypass Canal.
- New Right-of-Way and / or construction easements over the Veterans Memorial Park.

However, the expected permitting effort by FDOT should be straight forward and a normal effort is expected on the part of SWFWMD's Regulatory, Operations and Land Management staff. FDOT should coordinate with the following SWFWMD staff (in Brooksville) to minimize impacts to this regional drainage facility:

- Joseph Quinn, Land Management Manager
- Jeff Hagberg, Field Operations Section Manager
- Ray Mazur, Bureau Chief, Operations & Land Management

Please be advised that the SWFWMD's Operations & Land Management Bureau will need to submit (on behalf of FDOT) the appropriate "Section 408 Review Package" to the U.S. Army Corps of Engineers. FDOT-D7 staff will need to prepare this review package. **For reference, please review the recent (September, 2012) 408 Review Package that was prepared for the FDOT bridges over the Tampa Bypass canal along US-301 (Financial Project # 255793-1-52-01).**

The SWFWMD requests that FDOT avoid disturbing data collection facilities or adjacent survey benchmarks. Coordination with the SWFWMD's Hydrologic Data and Survey Sections in Brooksville will be helpful in protecting these infrastructure components.

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Recreation Areas

Degree of Effect:	None	**X Minimal**	Moderate	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	Permit Required
	Tech Memo Required	**X To Be Determined: Further Coordination Required**	

Identify Resources and level of importance:

SWFWMD's responsibility in the ETDM review process is to identify only those recreation sites located on District owned/controlled lands. From the SWFWMD's Geographic Information System (GIS), the District owns the following lands along this US-301 widening project:

- The Tampa Bypass Canal, Sections 2 and 3.
- Veterans Memorial Park (managed by Hillsborough County), at the NW quadrant of the US-301 bridges over the Tampa By-Pass Canal.

An approximate (graphical) location of the Tampa Bypass Canal can be viewed within the EST under the "Recreation Areas" map and > *Conservation* > *Water Management District Owned Lands* layer. Aerial photography of Veterans Memorial Park can also be accessed in this same EST layer.

Comment on effects to resources:

Alterations to the US-301 bridges over the Tampa Bypass could temporarily impact recreational activities in the adjacent Veterans Memorial Park. Impacts to all recreational areas shall be considered in evaluation of the application for an environmental resource permit (refer to the "Additional Comments" section below).

Additional Comments:

The SWFWMD has assigned a Degree of Effect (DOE) based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For this US-301 widening project, a DOE of "minimal" was assigned to this issue due to the present belief that:

- Short term construction impacts should be temporary in the immediate vicinity of the existing US-301 bridges and Veterans Memorial Park.
  Long term impacts to recreational activities are not expected along this section of US-301.

Pursuant to Rule 40D-4.302, F.A.C. (Additional Conditions for Issuance of Permits), applicants must provide reasonable assurance that proposed activities will not be contrary to the public interest, or if such an activity significantly degrades or is within an Outstanding Florida Water, that the activity will be clearly in the public interest. FDOT must provide reasonable assurance that the project will not be contrary to the public interest considering its effects on fishing or recreational values (Reference: Rule 40D-4.302(1)(a) F.A.C. and Section 3.2.3 of the District's ERP "Basis of Review" available at http://www/permits/rules/).

For the US-301 widening project, design accommodations should be included to eliminate or reduce potential impacts to public lands and recreational areas. FDOT is encouraged to contact the District Land Management Department (in Brooksville) regarding any District-owned or managed lands that may incur actual or potential impacts resulting from this project. If necessary, final design

accommodations should be included to eliminate or reduce potential impacts to public lands and recreational areas.

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Secondary and Cumulative Effects

Degree of Effect:	None	**X Minimal**	Moderate	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	**X Permit Required**
	Tech Memo Required	To Be Determined: Further Coordination Required	

Water Quality and Quantity

Comments on Effects

In the absence of s rmwater treatment & attenuation for new impervious areas, the project has the potential to contribute to water quality & quantity impacts to down-gradient receiving systems.

Recommended avoidance, inimization and mitigation measures:

Compliance with existing pe it requirements, the successful use of erosi and sediment control BMPs, and compliance with applicable TMDL and BMAP requirepe is will help assure that minimum water quality standar are met. Water quantity concerns-will also be addressed during the ERP process. In general, iting or otherwise offsettinsencroachment on the ditches, channels, floodplains and floodwa in the area can reduce,4antity concerns. For groundwater resources, ensure that spillages of p troleum products ,prti'd other chemicals do not occur during construction, and that stormwater trea ent ponds dynot intrude into the limerock or penetrate confining material of the aquifer system, either d· -ctly or by sinkhole formation. Low impact development strategies may help with 'kater, quality treatment as well as water quantity management.

Recommended actions to improve at-risk esourc s:

For surface water resources, reduce ollutant loads to the drainage features in the project area by treating stormwater runoff fro currently untre6d areas, by controlling erosion from the project site, by limiting activiti s in surface water· by protecting surface water from the introduction of oils, greases d fuel spillage from eqipment, and by considering restoration strategies at construction si s. Low impact developmen't\strategies may help to limit secondary and cumulative impacts.

Downstairs Comments" — for SWFWMD staff only (not to be upicaded to the EST)

None

Wetlands

Comments Effects:

The p .posed US-301 widening project has the potential to impact they foot defined wetland buff rs as they relate to the adjacent to the Right Of Way (ROW). The removal of wetland buffers reases the potential for secondary impacts to during and after construction. It is reasonable to

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assume that roadway improvements will result in increased traffic, which without the proper wetland buffer has a higher risk of unanticipated wetland impacts.

Recommends avoidance, minimization and mitigation measures: /Maintaining t 25 foot average wetland buffer can greatly redu9Ithe secondary impacts to the wetlands locate within the project area. If the minimum 16 foot wetland buffer cannot be maintained throu out the project, a buffer planting 006, including shrubbery and other transitional species, n be utilized to discourage these seebndary impacts.

Recommended actions to i • rove at-risk resources No

None additional comments.

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Comments" — for SW

MD staff 7i/y (not to be uploaded to the EST)

Wildlife and Habitat

Comments on Effects:

The uplands located within th9/ 200 foot buffe o the 5,280 foot buffer have the potential to provide habitat to Bald eagle 6, Florida Sandhill -nes and the gopher frogs. Review of the SWFWMD ArcMap GIS incfcates there are no active agles' nests within these defined buffers. However, since the upla d habitats have a potential or bald eagles nest, coordination with FFWCC may be requir9 during the design phase to en re no bald eagles nests have been reported.

Recommended avoidince, minimization and mitigation measureg

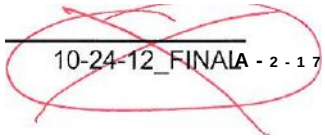
Coordination wit FFWCC during the permitting process may be reOlired.

Recommended ctions to improve at-risk resources:

No additio -I comments.

Downstair Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None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Special Designations

Degree of Effect:	None	**X Minimal**	Moderate	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	Permit Required
	Tech Memo Required	**X To Be Determined: Further Coordination Required**	

Identify Resources and level of importance:

As previously noted in the "Contaminated Sites" section of the EST, the entire 3.3 mile length of this US-301 widening project lies within a Sensitive Karst Area - SKA (reference: the FDOT's EST "Contaminated Sites" Map and > *Geology* > *SWFWMD Sensitive Karst Areas* layer).

Comment on effects to resources:

As this US-301 widening project is located within a Sensitive Karst Area, potential sinkhole development is a concern, especially if FDOT proposes deep stormwater management ponds that could potentially breach a confining unit or encroach into any underlying limestone formation.

Additional Comments:

The SWFWMD has assigned a Degree of Effect (DOE) based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For this US-301 widening project, a DOE of "minimal" was assigned to this issue due to the present belief that little or no adverse impacts to Sensitive Karst Areas are expected. Future permitting should involve routine interaction with the SWFWMD's regulatory staff.

It is recommended that the stormwater facilities be designed as shallow as practical and that geotechnical evaluations of specific pond sites be conducted to determine the potential for sinkhole development and direct entry of runoff to the underlying Intermediate and Floridan Aquifers. **A Drainage or Pond Siting Report, incorporating area-specific geotechnical information on the basin, will be necessary.** Direct discharges to active sinkholes (if applicable) are strongly discouraged due to the potential for groundwater contamination. **The SWFWMD concurs with FDOT's 09/13/12 Advance Notification (AN) package in regard to recommending the following Technical Studies:**

- **Preliminary Engineering Report**
- **Preliminary Stormwater Management Facility Report**

Additional information on the Florida Aquifer Vulnerability Assessment (FAVA) can be obtained at the following web addresses:
http://www.dep.state.fl.us/geology/programs/hydrogeology/fava.htm
http://www.dep.state.fl.us/geology/programs/hydrogeology/fava_gis_data.htm
http://www.dep.state.fl.us/swapp/documents/Florida%20Aquifer°/020Vulnerability%20Assessment.pdf

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Water Quality and Quantity

Degree of Effect:	None	Minimal	**X Moderate**	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	**X Permit Required**
	Tech Memo Required	To Be Determined: Further Coordination Required	

Identify Resources and level of importance:

Water Quality:
The following information was obtained from the FDOT's Environmental Screening Tool (EST) and supplemented with information from the SWFWMD's Geographic Information System (GIS):

The total length of the US-301 widening project equals 3.3 miles within one (1) segment for planning and evaluation purposes. A graphical location of this project can be viewed within the EST. The public EST can be accessed at https://etdmpub.fla-etat.org/est/
The SWFWMD's public GIS can be accessed at http://www.swfwmd.state.fl.us/data/
and http://www8.swfwmd.state.fl.us/GeneralMapViewer/

From north to south, Water Body Identification Numbers (WBIDs) for this US-301 widening project (within the 500 foot buffer) include:

- Sixmile Creek / Tampa Bypass Canal (WBID #1536B) near the intersection of 1-4.
  Sixmile Creek / Tampa Bypass Canal (WBID #1536F) from an area north of East Dr. M. L. King Jr. Blvd. to an area south of Tampa east Blvd.
- Mango Drain (WBID #1576) near Broadway Avenue.
  Unnamed Drain (WBID #1536A) near the intersection of SR-60.
- Delaney Creek (WBID #1605) near the SE quadrant of SR-60. An approximate

(graphical) location of these five (5) WBIDs can be viewed within the EST.

During October, 2012, the following information was obtained from the FDEP regarding Impaired Water Assessments along this US-301 widening project:

Sixmile Creek / Tampa Bypass Canal (WBID #1536B), Group 1 (Tampa Bay), Coastal Hillsborough Bay Tributary Planning Unit, FDEP Southwest Regulatory District:
Selected Assessments for Cycle 2 (as of 05/14/09):

- Not impaired (Assessment Category 2) for Biochemical Oxygen Demand (BOD).
- Not impaired (Assessment Category 2) for Dissolved Oxygen.
  Not impaired (Assessment Category 2) for Fecal Coliform.
  Not impaired (Assessment Category 2) for Nutrients (Chlorophyll-a).
- Insufficient data (Assessment Category 3B) for Nutrients (Historic Chlorophyll-a).

A Total Maximum Daily Load (TMDL) document was not available for this WBID.
No Basin Management Action Plan (BMAP) was available for this WBID.

Sixmile Creek / Tampa Bypass Canal (WBID #1536F), Group 1 (Tampa Bay), Coastal Hillsborough Bay Tributary Planning Unit, FDEP Southwest Regulatory District:
Selected Assessments for Cycle 2 (as of 05/14/09):

- **Verified Impaired (Assessment Category 5) for Dissolved Oxygen.**
  Not impaired (Assessment Category 2) for Fecal Coliform.
- **Verified Impaired (Assessment Category 5) for Nutrients (Chlorophyll-a).**
- Not impaired (Assessment Category 2) for Nutrients (Historic Chlorophyll-a).

A Total Maximum Daily Load (TMDL) document was not available for this WBID.
No Basin Management Action Plan (BMAP) was available for this WBID.

Mango Drain (WBID 1576), Group 1 (Tampa Bay), Coastal Hillsborough Bay Tributary Planning Unit, FDEP Southwest Regulatory District:
Selected Assessments for Cycle 2 (as of 05/14/09):

- **Verified Impaired (Assessment Category 5) for Dissolved Oxygen.**
- Insufficient data (Assessment Category 3B) for Fecal Coliform.
- Not impaired (Assessment Category 2) for Nutrients (Chlorophyll-a).
- Insufficient data (Assessment Category 3B) for Nutrients (Historic Chlorophyll-a).

A Total Maximum Daily Load (TMDL) document was not available for this WBID.
No Basin Management Action Plan (BMAP) was available for this WBID.

Unnamed Drain (WBID #1536A), Group 1 (Tampa Bay), Coastal Hillsborough Bay Tributary Planning Unit, FDEP Southwest Regulatory District:
Selected Assessments for Cycle 2 (as of 05/14/09):

Verified Impaired (Assessment Category 5) for Dissolved Oxygen.

- **Verified Impaired (Assessment Category 5) for Nutrients (Chlorophyll-a).**

Insufficient data (Assessment Category 3B) for Nutrients (Historic Chlorophyll-a). A Total Maximum Daily Load (TMDL) document was not available for this WBID. No Basin Management Action Plan (BMAP) was available for this WBID.

Delaney Creek (WBID #1605), Group 1 (Tampa Bay), Coastal Hillsborough Bay Tributary Planning Unit, FDEP Southwest Regulatory District:
Selected Assessments for Cycle 2 (as of 05/14/09):

- Planning List (Assessment Category 3C) for Biochemical Oxygen Demand (BOD).
- **Verified Impaired (Assessment Category 5) for Dissolved Oxygen.**
- **Verified Impaired (Assessment Category 5) for Fecal Coliform.**
- **Verified Impaired (Assessment Category 5) for Lead.**
- Not impaired (Assessment Category 2) for Nutrients (Chlorophyll-a).
- **Verified Impaired (Assessment Category 5) for Nutrients (Historic Chlorophyll-a).** Two (2) TMLD documents are available at the following FDEP web site:
http://webapps.dep.state.fl.us/DearTmdl/dashboardAction.do?method=tmdlPermitDetailsAction&srcWbid=1605
The first (March, 2005) FINAL document is entitled is entitled *"TMDL for Fecal & Total Coliform in Delaney Creek (WBID 1605)".* **This 1st report is FDEP adopted and EPA approved.**
The second (March, 2005) *EPA established* document is entitled is entitled *"TMDL for Nutrient, Dissolved Oxygen and BOD for Delaney Creek (WBID 1605)".*
A Basin Management Action Plan (BMAP) was available from the following FDEP web site:
http://www.dep.state.fl.us/water/watersheds/b...

Assessment Category information (for the above 5 WBIDs) was obtained from the "Permits" tab of the FDEP's TMDL Tracker, accessible at:
http://webapps.dep.state.fl.us/DearTmdl/dashboardAction.do?method=dashboard#

Assessment Category definitions can be found in Table 7.5 of FDEP's *"2012 Integrated Water Quality Assessment for Florida",* (May, 2012), available at:
http://www.dep.state.fl.us/water/pubs.htm
http://www.dep.state.fl.us/water/docs/2012_integrated_report.pdf
From Table 7.3 of this same report, it should be noted that Cycle 3 rotation assessments are scheduled to be completed as follows:
Group 1 Basins — 06/30/12
Group 2 Basins - 06/30/13
Group 3 Basins — 06/13/14
Group 4 Basins — 06/30/15

Group 5 Basins — 06/30/16

Total Maximum Daily Load (TMDL) information is available from the following FDEP web sites:
http://www.dep.state.fl.us/water/basin411/default.htm
http://www.dep.state.fl.us/water/tmdl/final_tmdl.htm
http://www.dep.state.fl.us/water/tmdl/repost_tmdl.htm
http://www.dep.state.fl.us/water/tmdl/draft_tmdl.htm

Basin Management Action Plan (BMAP) information is available from the following FDEP web site:
http://www.dep.state.fl.us/water/watersheds/bmap.htm

Additional FDEP web links & gateways for impaired waters information (including new listings / delistings) are as follows:
http://www.dep.state.fl.us/water/watersheds/assessment/vdllists.htm
http://www.dep.state.fl.us/water/watersheds/assessment/index.htm
http://www.dep.state.fl.us/water/tmdl/index.htm
http://ca.dep.state.fl.us/mapdirect/?focus=tmdlvi
http://www.dep.state.fl.us/gis/

Water Quantity:

Floodplain issues for the US-301 widening project were addressed in a previous section of this document.

Comment on effects to resources:

Water Quality:
Untreated or under-treated runoff generated by the US-301 widening project could impact the five (5) watersheds (WBIDs) identified in the previous section. As of October, 2012, one (1) of these watersheds (WBID #1536B near 1-4) is not currently classified as "Verified impaired" (Assessment Category 5) by the **FDEP** for nutrient related pollutants. However, this could change in the future as development activities increase within these respective WBIDs. The SWFWMD recommends that FDOT participate as a stakeholder in future TMDL and BMAP activities by the **FDEP.**

Water Quantity:
Potential impacts from the US-301 widening project will depend upon the required filling, encroachment or alteration of existing Zone A & AE Floodplains, Historic Basin Storage areas and (if applicable) Floodways. Un-attenuated or under-attenuated runoff could cause flooding impacts to existing off-site stormwater management systems and drainage conveyance facilities.

Additional Comments:

The SWFWMD has assigned a Degree of Effect based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For the US-301 widening project, a DOE of "Moderate" was assigned to this issue due to the present belief that future **ERP** permitting is expected to be non-routine for:

- Potential impacts to verified impaired waters within four (4) of the five (5) WBIDs noted previously.

However, the expected permitting effort by FDOT should be straight forward and a normal effort is expected on the part of SWFWMD's regulatory staff.

As applicable, the SWFWMD will require that stormwater management systems that discharge directly or indirectly into waters not meeting standards, including impaired waters, provide a net improvement condition in the water body in terms of the pollutants that contribute to the water body's impairment. A higher level of treatment may be necessary (Reference: Section 3.3.1.4 of the District's **ERP** "Basis of Review", available at http://www/permits/rules/). If applicable, reductions in pollutant

loading from stormwater runoff via stormwater treatment facilities or other BMPs will be required to implement future TMDLs and BMAPs should they be finalized and adopted.

If equivalent stormwater quality treatment is to be considered, the FDOT must reasonably demonstrate the following:

- The alternate, contributing areas are hydrologically equivalent to the new and existing, directly-connected impervious watershed areas that would otherwise contribute to the treatment system;
- The pollution source and loading characteristics are reasonably equivalent, and
  The treatment benefits occur in the same receiving waters and in the same general locality as the existing point(s) of discharge from the new project area.

It is recommended that the FDOT consider stormwater quality treatment together with water quality impacts to wetlands and other surface waters when designing the stormwater water management, components of this project. **The SWFWMD concurs with FDOT's 09/13/12 Advance Notification (AN) package in regard to recommending the following Technical Studies:**

- **Preliminary Engineering Report**
- **Water Quality Impact Evaluation**
- **Preliminary Stormwater Management Facility Report**

The US-301 widening project is within the Tampa Bay Watershed of the SWFWMD's Surface Water Improvement and Management (SWIM) program. FDOT should coordinate with the SWFWMD's Surface Water Improvement and Management (SWIM) department in Tampa regarding the appropriate details & data availability. The nearest SWIM projects that may be of interest in the PD&E and design phase of this US-301 widening project include the following:

Project Number: W367
Project Name: Palm River Restoration
Area(s) of Responsibility: Water Quality
Project Status: **Ongoing**
Project Manager: Ms. Stephanie Powers

Project Number: W370
Project Name: Desoto Park Addition Shoreline Restoration
Area(s) of Responsibility: Natural Systems / Water Quality
Project Status: Complete
Project Manager: Ms. Stephanie Powers

Project Number: W243 — East Shore Commerce Park Parcel Stormwater Retrofit
Project Name: Northeast McKay Bay
Area(s) of Responsibility: Natural Systems / Water Quality
Project Status: Complete
Project Manager: Ms. Janie Hagberg

Project Number: W389
Project Name: Hillsborough County - McKay Bay Nature Preserve
Area(s) of Responsibility: Natural Systems
Project Status: Complete
Project Manager: BJ Grant

Project Number: W392
Project Name: Tampa Shoreline Restoration Initiative
Area(s) of Responsibility: Natural Systems
Project Status: Complete
Project Manager: BJ Grant

Specific studies that contain useful water quality and hydrologic information have been done by FDEP, the SWFWMD and the USGS. These reports can be accessed through the District's Library at http://www15.swfwmd.state.fl.us/dbtw-wpd/mywebqbe/librarybasic.htm. Type in the County or water body of interest, click on "Submit query" then click on the pull-down menu in the upper left and select "Record Display — Web."

The following information is provided for the SWFWMD's Minimum Flows and Levels (MFL) Program within 1.0 mile of the US-301 widening project:
Adopted MFLs:
- Tampa Bypass canal

Adopted Guidance Levels:
- Bellows, Lake (East Lake)

MFL reports are available at:
http://www.swfwmd.state.fl.us/projects/mfl/mfl_reports.php
Guidance Level information is available at:
https://www.flrules.org/gateway/ChapterHome.asp?Chapter=40D-8

Filling within any floodplain, floodway or historic basin storage area may decrease stormwater storage which could increase flooding depth and duration. The SWFWMD will require compensation for fill (or other encroachments) into floodplains, floodways and historic basin storage areas up to the 100-year event if such encroachment(s) will adversely affect conveyance, storage, water quality or adjacent lands (Reference: Sections 4.4 and 4.7 of the District's ERP "Basis of Review", available at http://www/.swfwmd.state.fl.us/permits/rules).

The FDOT may reduce the degree of effect for flooding by:
restricting the filling / encroachment into floodplain, floodway and historic basin storage areas to only those areas that are necessary;
- constructing stormwater treatment ponds outside floodplain, floodway and historic basin storage areas;
providing equivalent compensation for lost floodplain, floodway and historic basin storage.

As previous noted in the "Floodplains" section of this document, the SWFWMD recommends that the FDOT quantify floodplain, floodway and historic impacts based on existing, future or special basin hydrologic studies.

Roadway widening improvements may also affect existing cross drainage facilities along the entire length of this US-301 widening project, or require additional cross drains. Additional / updated bridge hydraulics reports should be prepared (if applicable) and submitted with the Environmental Resource Permit application.

Impacts to existing permitted stormwater management systems may decrease performance in terms of flood management and stormwater treatment. Information on Environmental Resource Permits (ERPs), Storm Water Permits, Dredge & Fill Permits and Works of the District Permits is now available in the EST under Water Quality & Quantity > Permits. Useful (but limited) information includes the permit number, a short description of the project, name of the permittee, project acreage and an approximate location of the project (shown graphically). **As of October, 2012, the EST indicated the following permits had been issued within 500 feet of this US-301 widening project:**
SWFWMD Works of the District: Two (2)
SWFWMD Dredge & Fill Permits: One (1)
SWFWMD Environmental Resource Permits: Seventy (70)
SWFWMD Storm Water Management Permits: Eight (8)
Similar information can be obtained from the SWFWMD's Permits Map Viewer and Environmental Resource Permit Search web sites as follows:
http://www8.swfwmd.state.fl.us/ExternalPermitting/

http://www18.swfwmd.state.fl.us/erp/erp/search/ERPSearch.aspx

Previous FDOT, D7 permits that may be of interest to in the future PD&E and design phases of the US-301 widening project are as follows:
Dredge & Fill Permits (1):

- 010895000 - DOT-STATE ROAD 43 DRAINAGE IMPROVEMENTS

Environmental Resource Permits (8):

- 13922.003 - DOT-I-4/50TH STREET TO 1-75 #10190-3409
  13922.002 - DOT-I-4 SEGMENT 1/50TH STREET TO 1-75
- 21017.000 - TAMPA BY PASS CANAUDR MLK JR BLVD SR 574 (STATE OF FLORIDA)
- 16057.000 - DOT-S.R. 60 FROM US 301 #10110-3514
- 10901.000 - DOT-S.R. 43 (U.S. 301) RESURFACING
  29054.001 - HILLS CO VETERANS MEMORIAL PARK EXP (HILLSBOROUGH CO REAL ESTATE DEPT)
- 21015.000 - 6 MILE CREEK/TAMPA BY PASS CANAL (STATE OF FLORIDA)
- 11728.002 - DOT-SR/574 RECONSTRUCTION FROM 1-4-

US301 Storm Water Management Permits (1):

- 007142000 — DOT-US 301 & SR 60

Water quantity concerns must be addressed for the project in accordance with Chapter 4 of the District's ERP "Basis of Review". This includes making provisions to allow runoff from up-gradient areas to be conveyed to down-gradient areas without adversely affecting the stage point or manner of discharge and without degrading water quality (refer to Section 4.8 of the District's "Basis of Review", available at http://www.swfwmd.state.fl.us/permits/rules/).

The District's ERP "Basis of Review" document describes design approaches and criteria that will provide reasonable assurances that the proposed surface water management systems will meet the conditions for issuance of an Environmental Resource Permit (ERP). Parameters frequently over or under estimated include: seasonal high water levels, seasonal high groundwater table elevations, soil vertical & horizontal hydraulic conductivity, depth to the soil confining units, historic basin storage, floodplain storage, conveyance way hydraulic capacity, peak discharge rates and timing, tailwater conditions in the receiving system, total discharged volume, and off-site hydrograph timing impacts. Site-specific design data is preferable to "book values."

The District recommends that the FDOT consider providing a pond siting report that addresses the above referenced design approaches and criteria. For those improvements that may affect existing cross drainage facilities, an updated bridge hydraulics report(s) should be prepared and submitted with the ERP application.

If this project will require the acquisition of new right-of-way areas, the current rule for eminent domain noticing is 40D-1.603(9), FAC and requires the applicant to provide the noticing to the affected property owners. Additionally, any issued permit may include special conditions prohibiting construction until the FDOT provides evidence of ownership and control.

For ETDM #3097, the District has assigned a pre-application file **(PA #399564)** for the purpose of tracking its participation in the ETDM review of this project. File **PA #399564** is maintained at the Tampa Service Office of the SWFWMD. Please refer to this pre-application file whenever contacting District regulatory staff regarding this project.

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Wetlands

Degree of Effect:	None	Minimal	**X Moderate**	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	**X Permit Required**
	Tech Memo Required	To Be Determined: Further Coordination Required	

Identify Resources and level of importance:

US Hwy 301 from SR 60 to 1-4 is a high use roadway surrounded by several industrial parks and buildings. Based upon a query of the Southwest Florida Water Management District (SWFWMD) ArcMap GIS there is approximately 6.90-acres of wetlands and surface waters located within the proposed 200 foot buffer for the roadway project. The majority (6.08-acres) of this acreage is associated with the potential widening of the bridge over the Tampa Bypass Canal. The remaining acreage of wetlands are sections of larger systems located within the vicinity of US-301, in a highly industrial community or are roadside ditches currently being utilized for the conveyance of stormwater runoff.

Comment on effects to resources:

Widening US 301 from 4 lanes to 6 lanes has the potential to impact wetlands and surface waters located within the 200 foot buffer of the proposed route. The main area of impact is the widening of the bridge over the Tampa Bypass Canal. While the Bypass Canal is classified as a surface water and offers a low habitat value to wildlife and wetland species, the bridge will result in shading impacts which will need to be accounted for during the permitting process.

There are several ERP permits with binding wetland lines delineating the wetlands and surface waters located within the defined 200 foot buffer of the proposed project area. The wetland limits as determined by these permits can be utilized during the permitting process if the permits are still valid. However, if the permits have expired then new wetland delineations will be required before or during the permitting process, which can lengthen the amount of time required for the review.

Impacts to the roadway ditches can be classified as temporary if they are going to be shifted during construction activities. However, if the ditches are proposed to be filled and piped, the impact will be considered to be permanent. Both types of impacts will need to be accounted for during the permitting process along with the total acreage located within the project boundaries.

Additional Comments:

The SWFWMD has assigned a Degree of Effect based on the potential need for increased coordination or effort associated with the SWFWMD's proprietary or regulatory interests and obligations. For this project, a DOE of "Moderate" was assigned to this issue due to the fact the vegetated ditch and wetlands will need to be delineated, quantified, and labeled on the construction plans as part of the permit review. However, the expected permitting effort by FDOT should be straight forward and a normal effort is expected on the part of SWFWMD's regulatory staff. Wetland mitigation may be required to offset the potential impacts to the wetlands located within the proposed ROW. In addition, water quality will need to be addressed to offset the impacts to the existing vegetation.

The District will require a delineation of the landward extent of wetland and surface water features by a qualified environmental scientist, pursuant to Chapter 62-340, F.A.C. The District recommends that the FDOT submit a Formal Wetland Determination Petition prior to the ERP application submittal.

The majority of the surface water impacts will have a de minimis impact on fish and wildlife habitat. Therefore, wetland mitigation would not be required. Proposed wetland impacts and the impacts to the creeks will require an analysis utilizing the Uniform Mitigation Assessment Method (UMAM). The proposed US-301 widening project is located within the service area for the Tampa Bay Mitigation Bank and the Hillsborough River Mitigation Bank. Therefore, coordination with these mitigation banks may be needed during the permit application process if the proper type of mitigation credits is available. If not, other mitigation options will need to be assessed.

An Environmental Resource Permit (ERP) will be required for this project. However, the final determination of the type of permit will depend upon the final design configuration. **The SWFWMD concurs with FDOT's 09/13/12 Advance Notification (AN) package in regard to recommending the following Technical Studies:**

- **Wetlands Evaluation and Biological Assessment Report**

For ETDM #3097, the District has assigned a pre-application file **(PA #399564)** for the purpose of tracking its participation in the ETDM review of this project. File **PA #399564** is maintained at the Tampa Service Office of the SWFWMD. Please refer to this pre-application file whenever contacting District regulatory staff regarding this project.

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

Existing ERPs with wetland delineations:

42032846.000- Ferman Foundation Parcels	10/11/2007
44015913.009- Comfort Suites- Tampa Fairgrounds	09/18/2007
40006682.001- Meadow Creek- Pond #3	09/03/1996

Wildlife and Habitat

Degree of Effect:	None	**X Minimal**	Moderate	Substantial
	Enhanced	N/A No Involvement		Potential Dispute

Coordination Document:	No Involvement	PD&E Support Document	**X Permit Required**
	Tech Memo Required	To Be Determined: Further Coordination Required	

Identify Resources and level of importance:

Upland habitat in the project area as a whole is generally disturbed and/or converted for commercial or residential purposes. Within the 200-foot buffer, 83.22% of the area is listed as high impact urban, based upon the 2003 FFWCC Habitat and Land Cover Grid.

As analyzed on September 13, 2012, the buffers fall within the Consultation Area for the Scrub Jay and the Woodstork Core Foraging Area. The site is listed as a USFWS Ecological Service Area for the following Federally Listed Species: Piping Plover, Florida Scrub-Jay, Wood Stork, Red-Cockaded Woodpecker, Eastern Indigo Snake, and the Florida Golden Aster. The uplands located within the 1,320 foot buffer to the 5,280 foot buffer have the potential to provide habitat to Bald eagles, Florida Sandhill Cranes and the gopher frogs.

Comment on effects to resources:

This project has the potential to eliminate the remnants of native upland and wetland habitat known to be used by Listed Species for breeding and foraging.

Additional Comments:

The SWFWMD has assigned a Degree of Effect (DOE) based on the potential need for increased coordination or effort associated with the SWFWMD's regulatory interests and obligations. For this project, a DOE of "Minimal" was assigned to this issue due to the present belief that future ERP permitting is expected to be routine with a required notification to Florida Fish and Wildlife Conservation Commission associated with the wetland impacts. The expected permitting effort by FDOT should be straight forward and a normal effort is expected on the part of SWFWMD's regulatory staff.

Excessive habitat damage can be eliminated by strictly limiting equipment to ROW and staging areas. Turbidity will be addressed in the ERP, and can be eliminated by the use and maintenance of effective control measures that are appropriate to the terrain involved.

The SWFWMD concurs with FDOT's 09/13/12 Advance Notification (AN) package in regard to recommending the following Technical Studies:

- **Wetlands Evaluation and Biological Assessment Report**

For ETDM #3097, the District has assigned a pre-application file **(PA #399564)** for the purpose of tracking its participation in the ETDM review of this project. File **PA #399564** is maintained at the Tampa Service Office of the SWFWMD. Please refer to this pre-application file whenever contacting District regulatory staff regarding this project.

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

None

Federal Consistency Review: NOT REQUIRED FOR THIS PROGRAMMING SCREEN / ETDM REVIEW — NO FEDERAL FUNDS INVOLVED.

Located in Coastal Zone	Consistent	Consistent with Comments	Inconsistent

Comments:

None

"Downstairs Comments" — for SWFWMD staff only (not to be uploaded to the EST)

Per the FDOT's 09/13/12 Advanced Notification (AN) package:

"A consistency review for this project is not required by 15 CFR 930 because no Federal Funds are involved".

"In addition, please review the project's consistency, to the maximum extent feasible, with the approved Comprehensive Plan of the local government to comply with Chapter 163 of the Florida Statutes".

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Project Search new search i

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view on map

Project Name: #3097 - US 301 from SR 60 to 1-4
Phase: Programming Screen
Planning Organization: FDOT District 7
From Location: SR 60
To Location: 1-4
District: District 7
Counties: Hillsborough County
Project Type: Unknown
Submit Comment

Help

Welcome Page

The Welcome Page of the ETDM Public Access Site includes information about the ETDM Process and instructions for finding a project, getting started in using the Site, and how to sign up to receive emails concerning projects of interest. The Welcome Page also includes a Project Search tool for identifying an ETDM project, pull-down menus for accessing Site tools and reports, and links to the Florida

Getting Started

The Efficient Transportation Decision Making (ETDM) Web site makes information available about proposed transportation projects in the ETDM Process. The **Project Information** menu accesses specific information about a project. Information about the ETDM Process can be **found in the ETDM Program Information menu.** For mor information about the site, see options in the **Welco** mer .

About ETDM 1

Florida's ETDM process defines the procedures for planning transportation projects, conducting environmental reviews, and developing and permitting projects. For more information about ETDM , please visit the ETDM Library.

Staying Connected

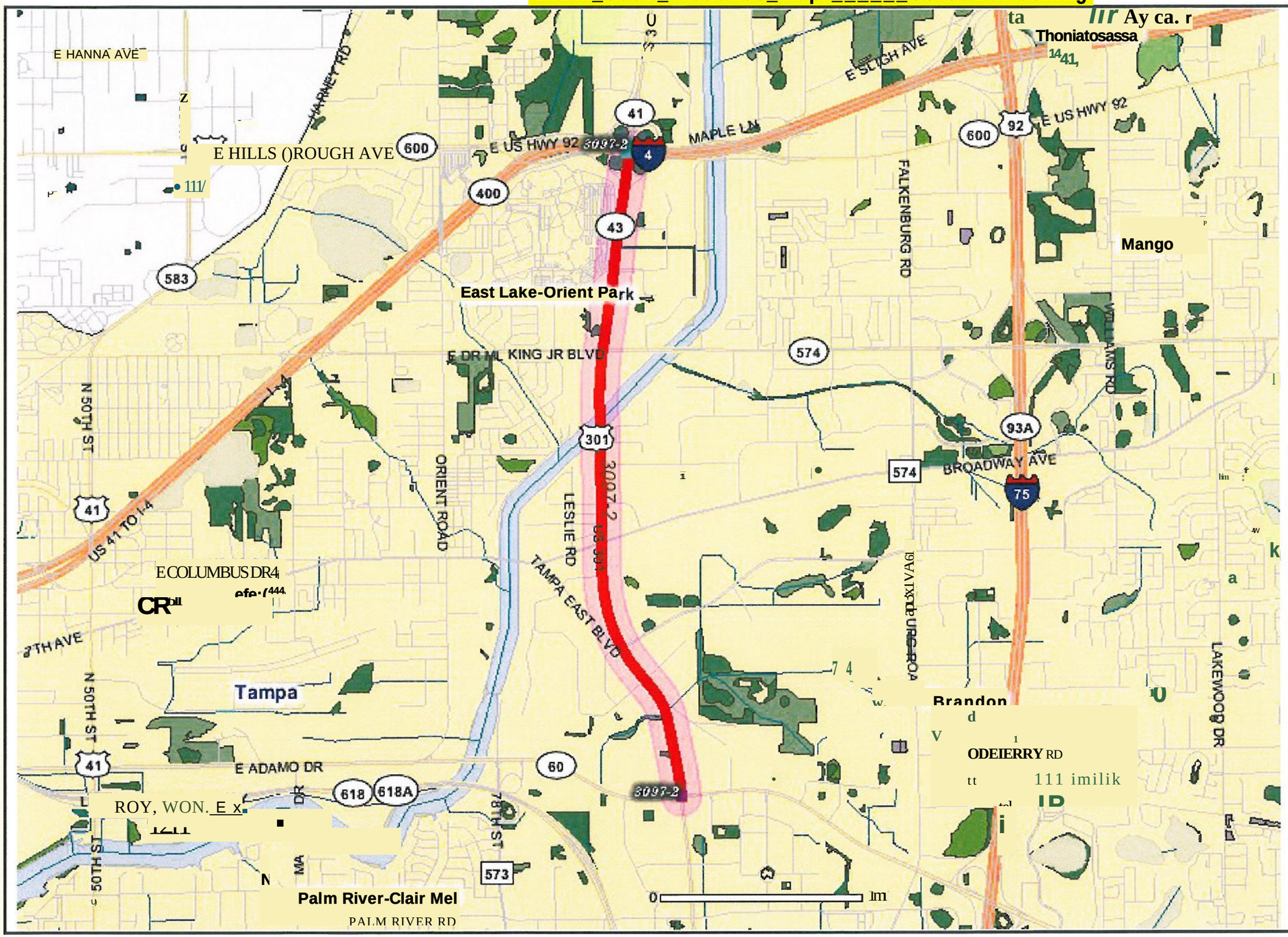
Receive site updates and emails about projects as they move through the ETDM process.

To find a proposed transportation project, use the **Project Search** feature. If you know the ETDM number assigned to the project, select the **Project Number** search option, then enter the project number and press "go." Projects can also be found by typing in the Project Name, Planning Organization, or the County or FDOT District where the project is located.

Site Map | Contacts | Privacy Statement | No)avascript | Get Adobe Acrobat Reader

This Site is maintained by the Florida Department of Transportation Environmental Management Office. For additional information, please e-mail questions or comments to publichelp@fla-etat.org or call 850-414-5334

ETDM_3097_Wetlands_Map _____US-301 Widening



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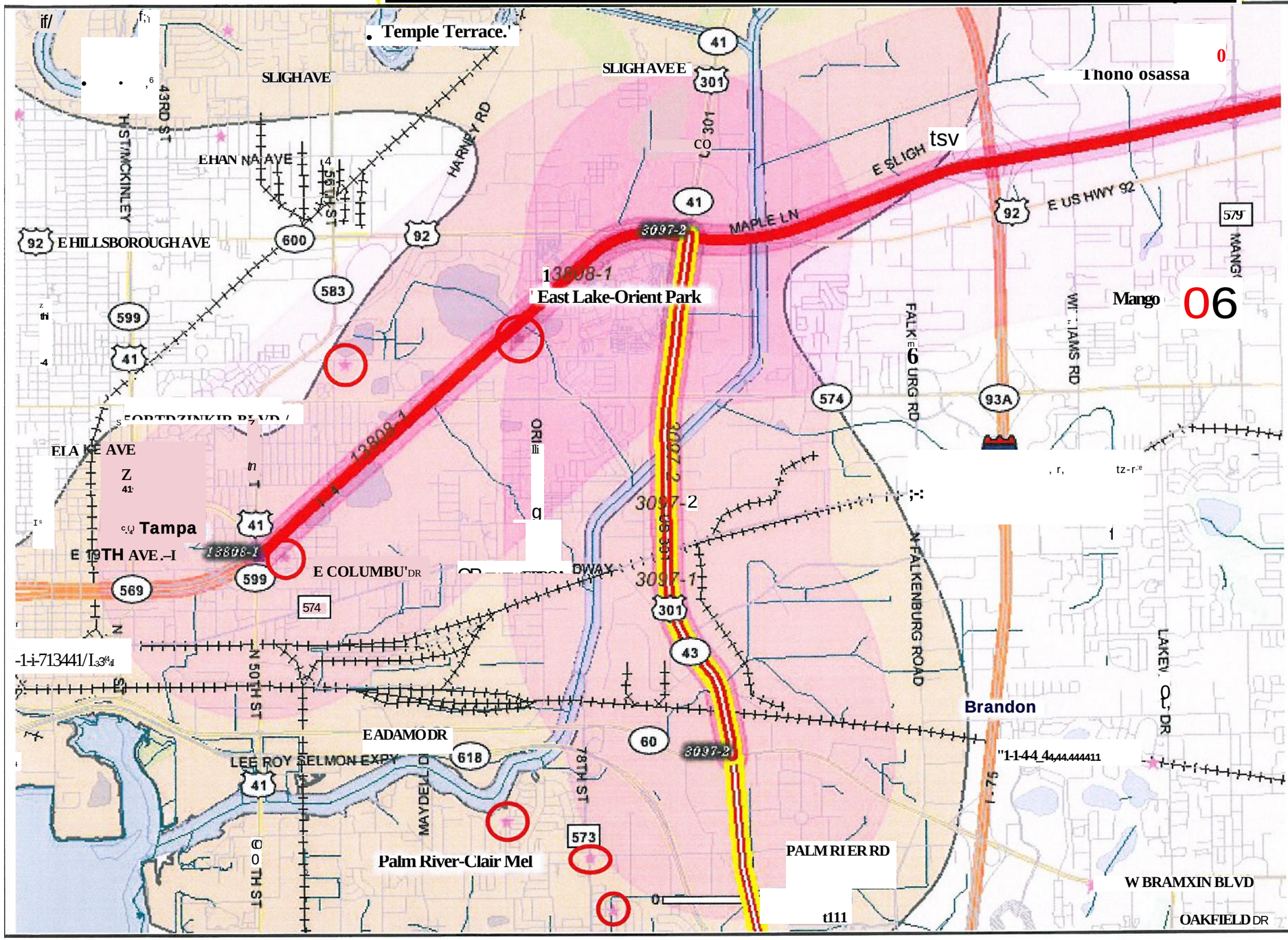

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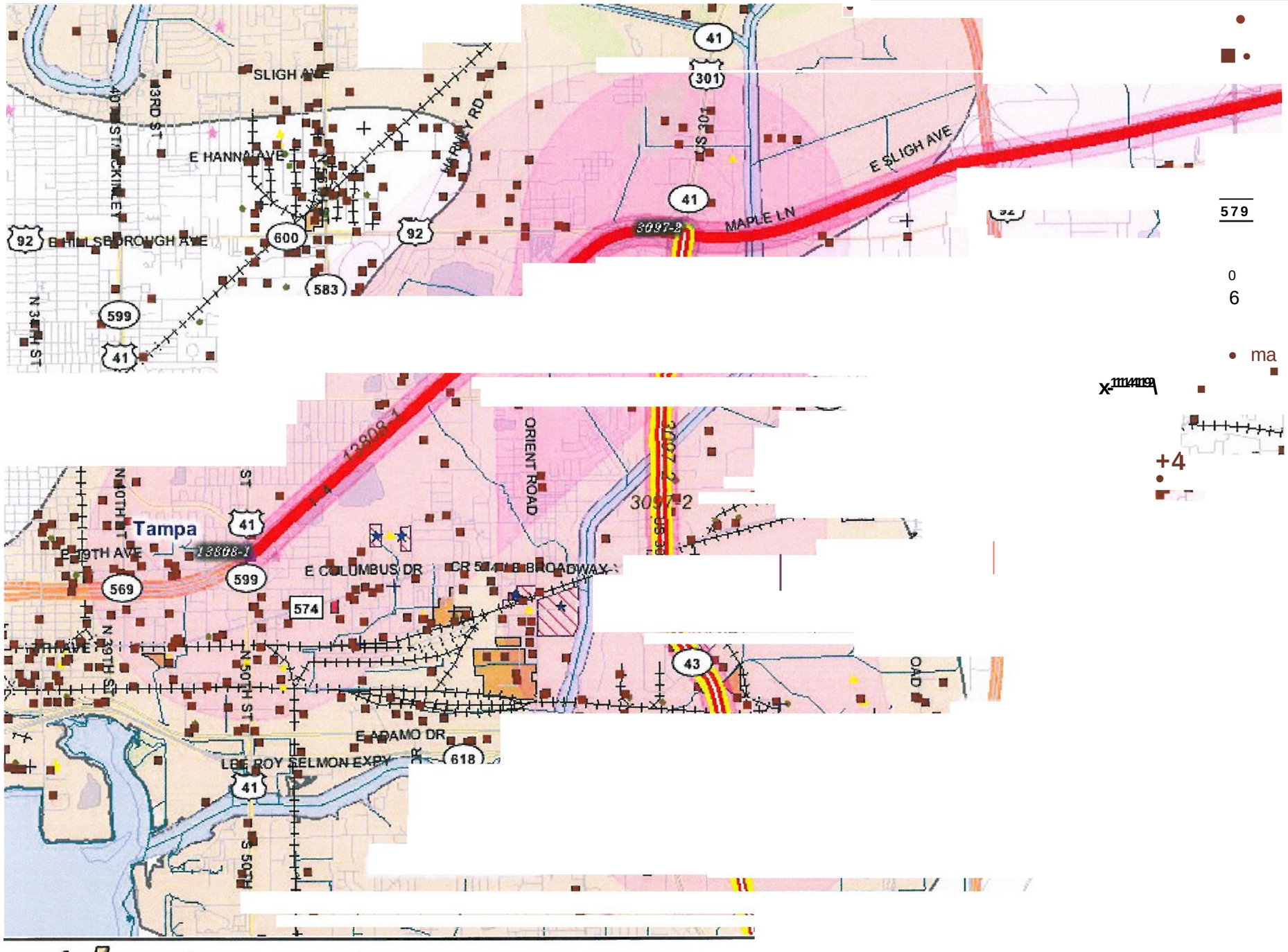

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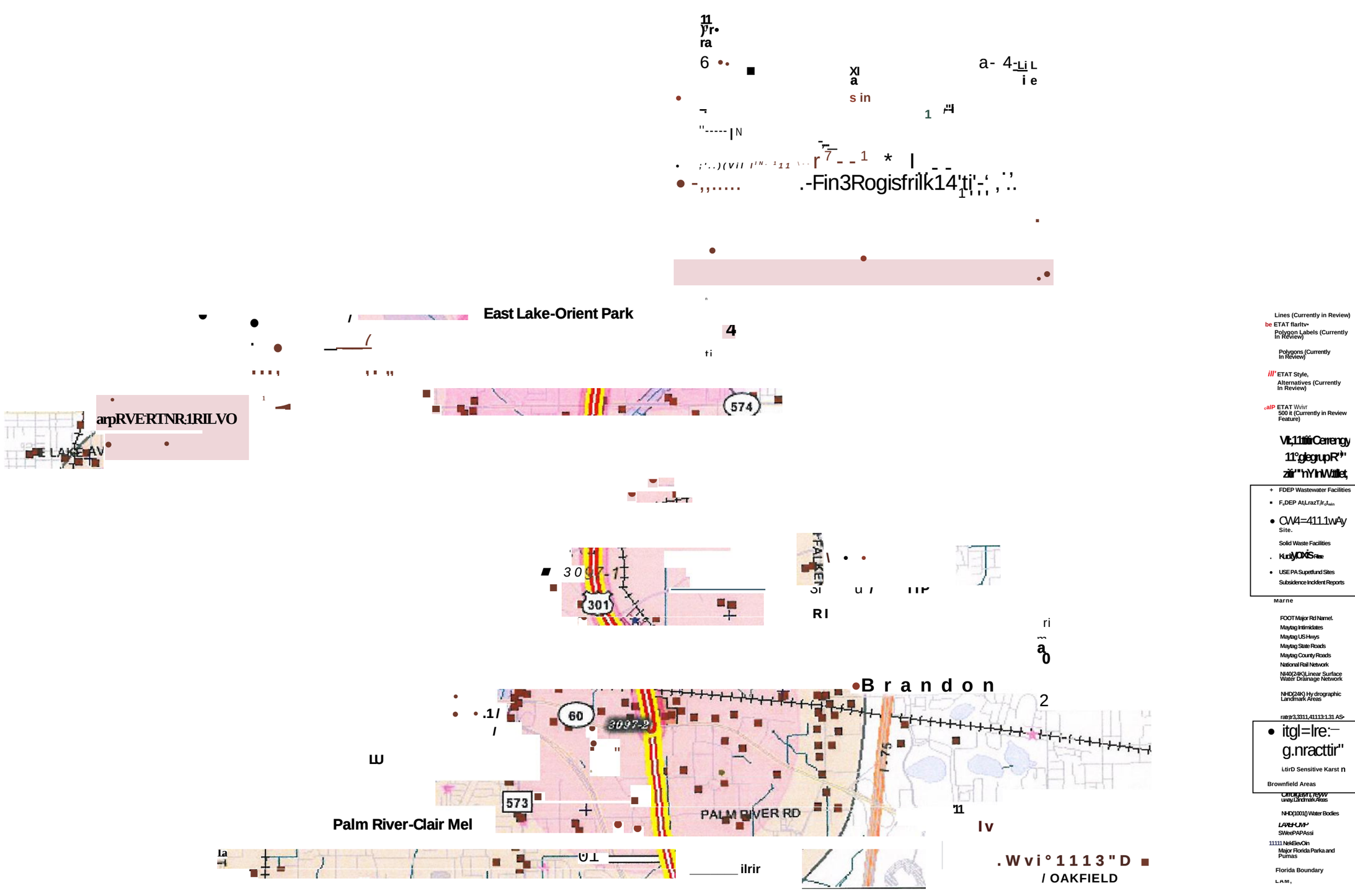
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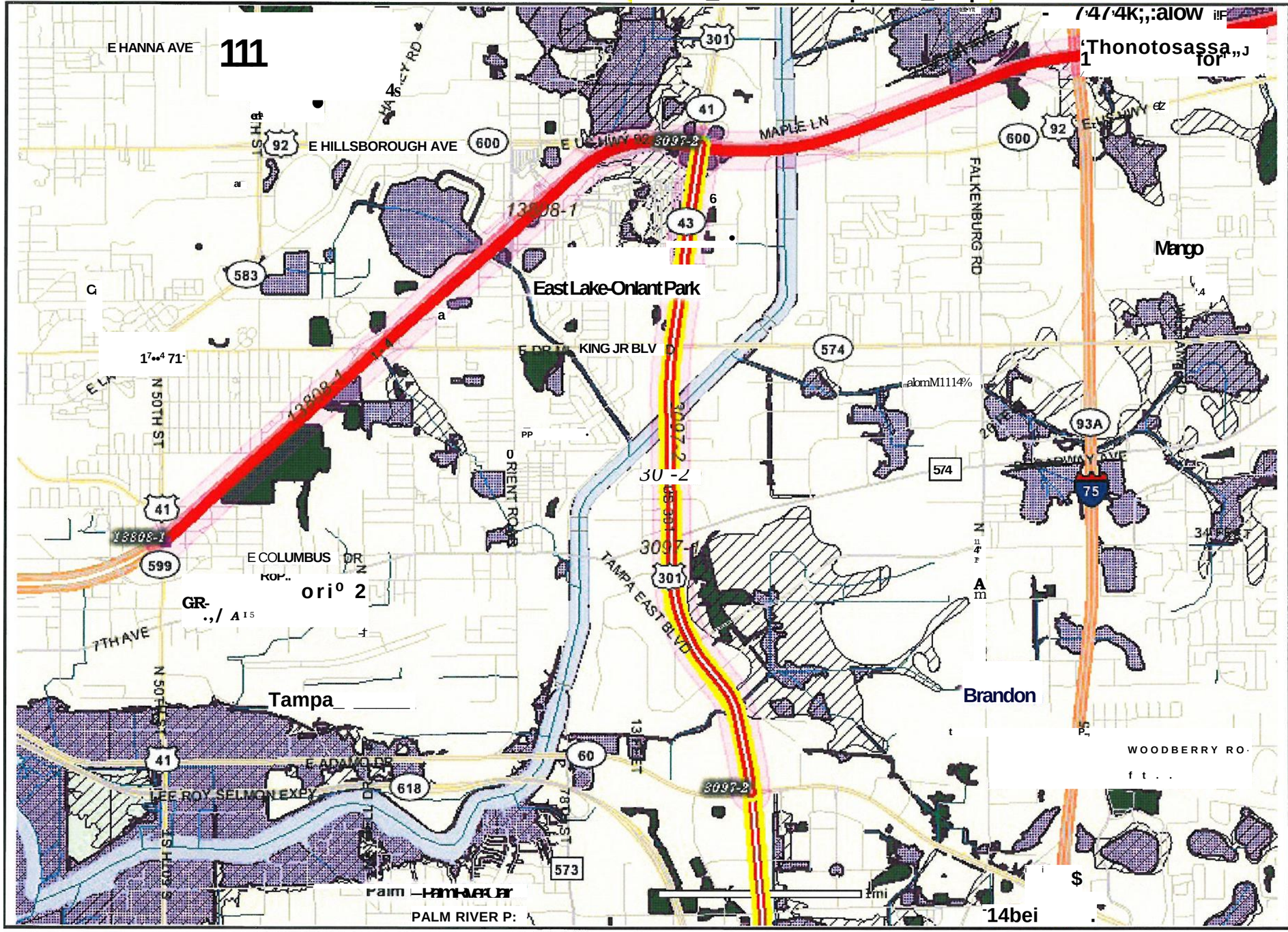
Major Florida Parks and Pumas
Florida Boundary

ETDM_3097 Floodplains_Map



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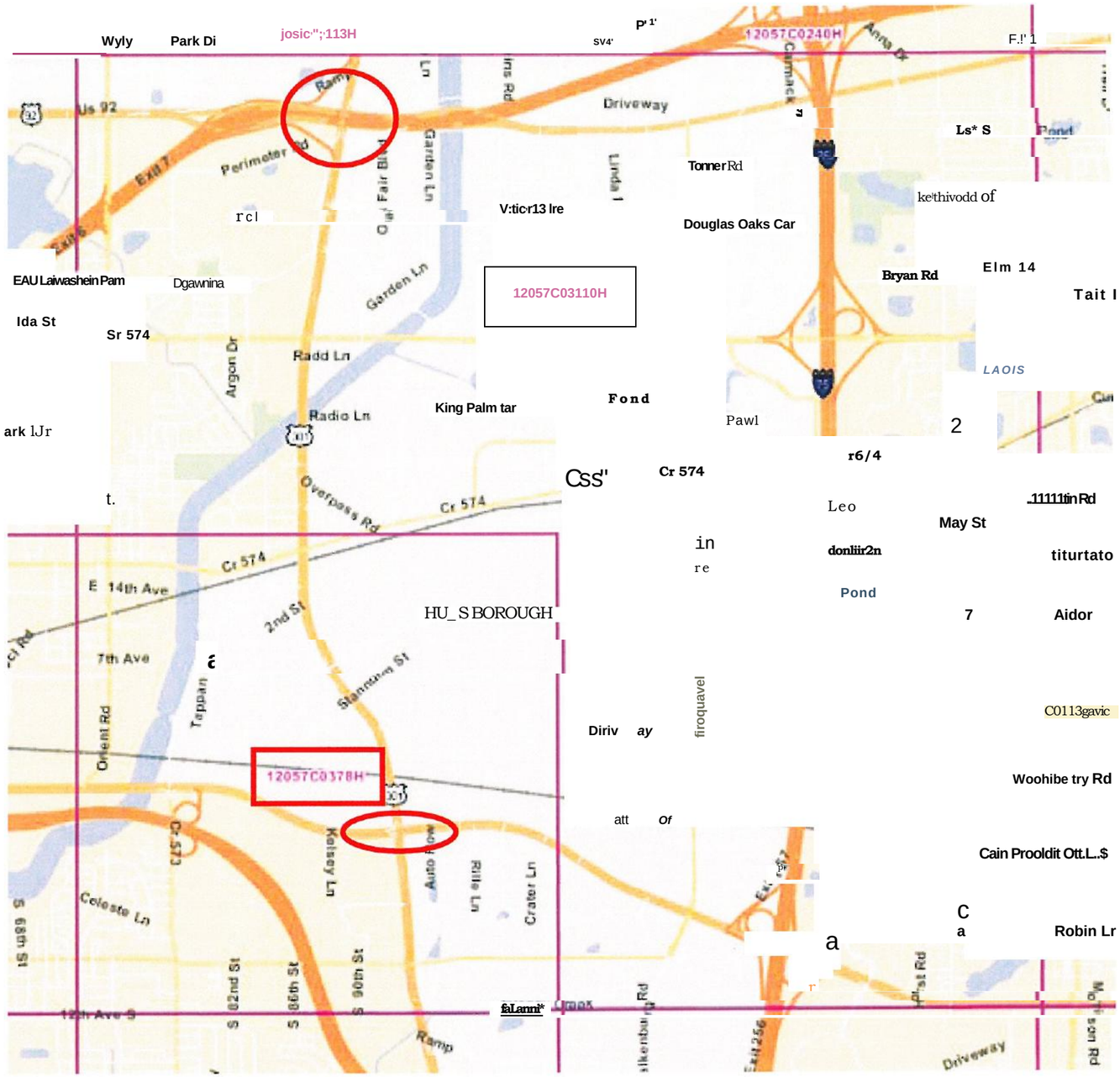

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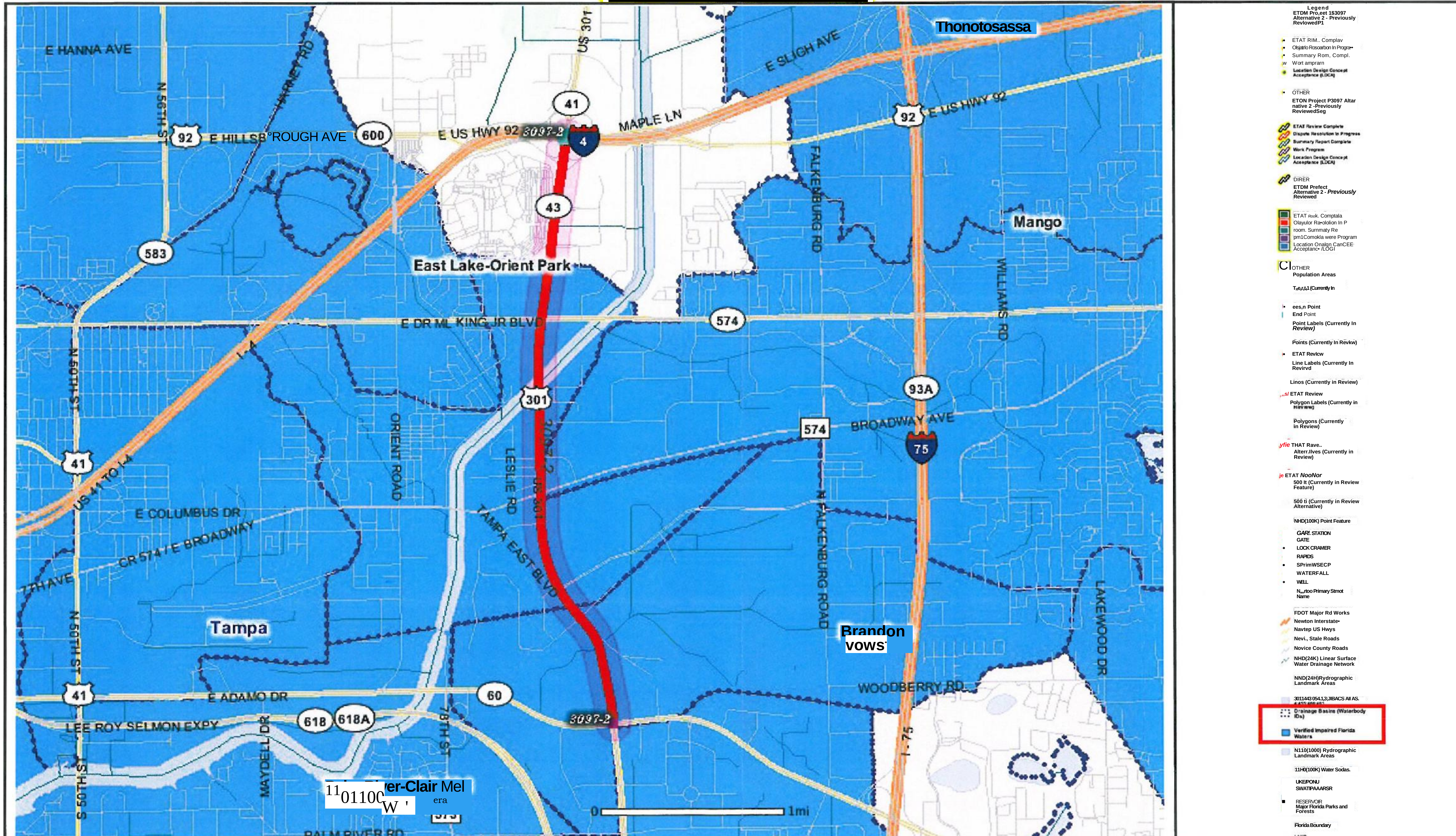
EMA map

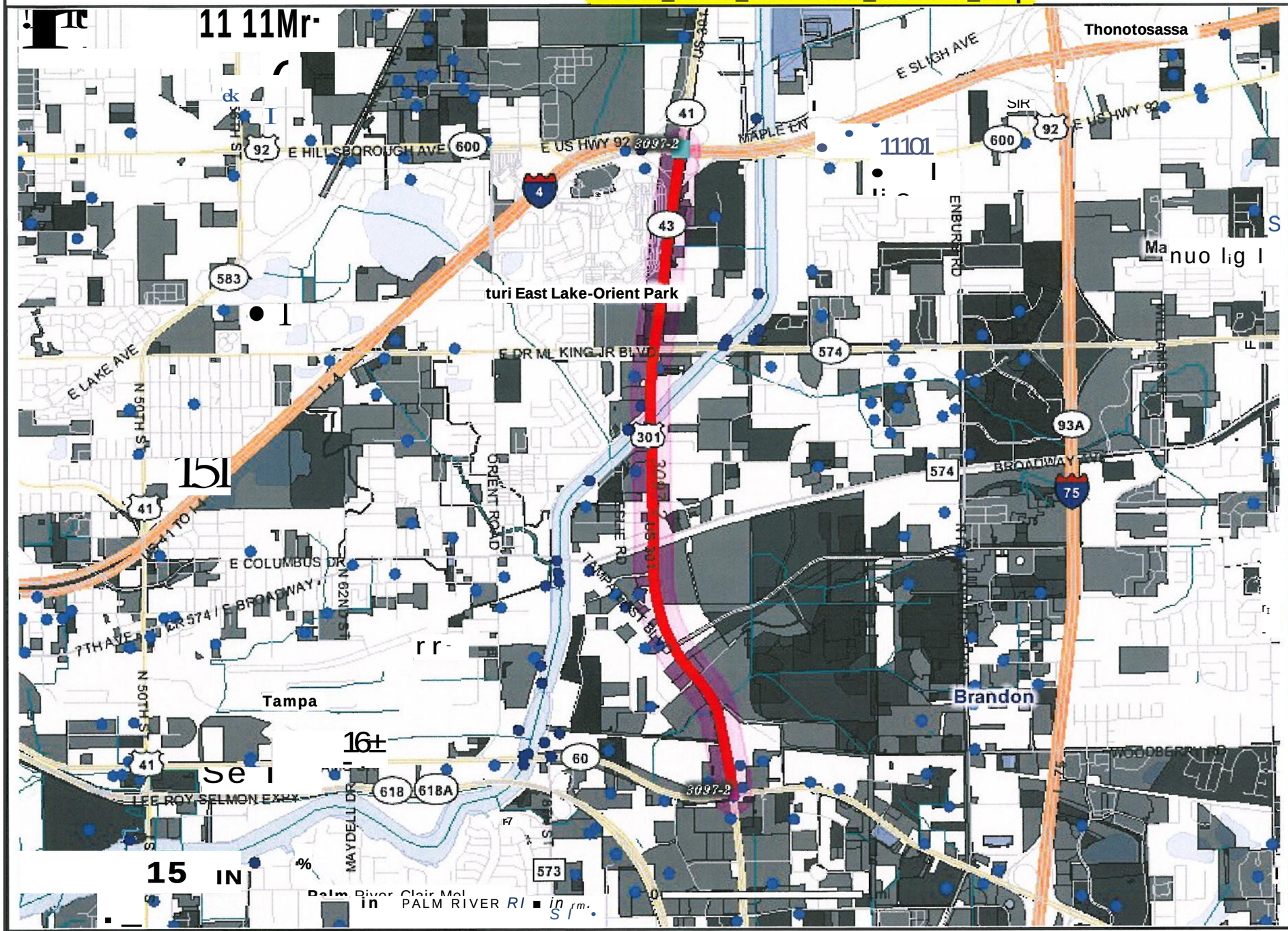
ETDM 3097 WBIDs_Map



Efficient TransportoTian Decision Making

Environment

ETDM_3097_SWFWMD_Permits_Map



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Legend

WMD Boundaries

Boundary

State

Water Management Districts

Water Management Districts

District Counties

District Counties

District County Boundary Lines

District County Boundary Lines

ERP

ERP

Roads

Interstate Highways

Highways

Secondary Roads

Streets

Disclaimer

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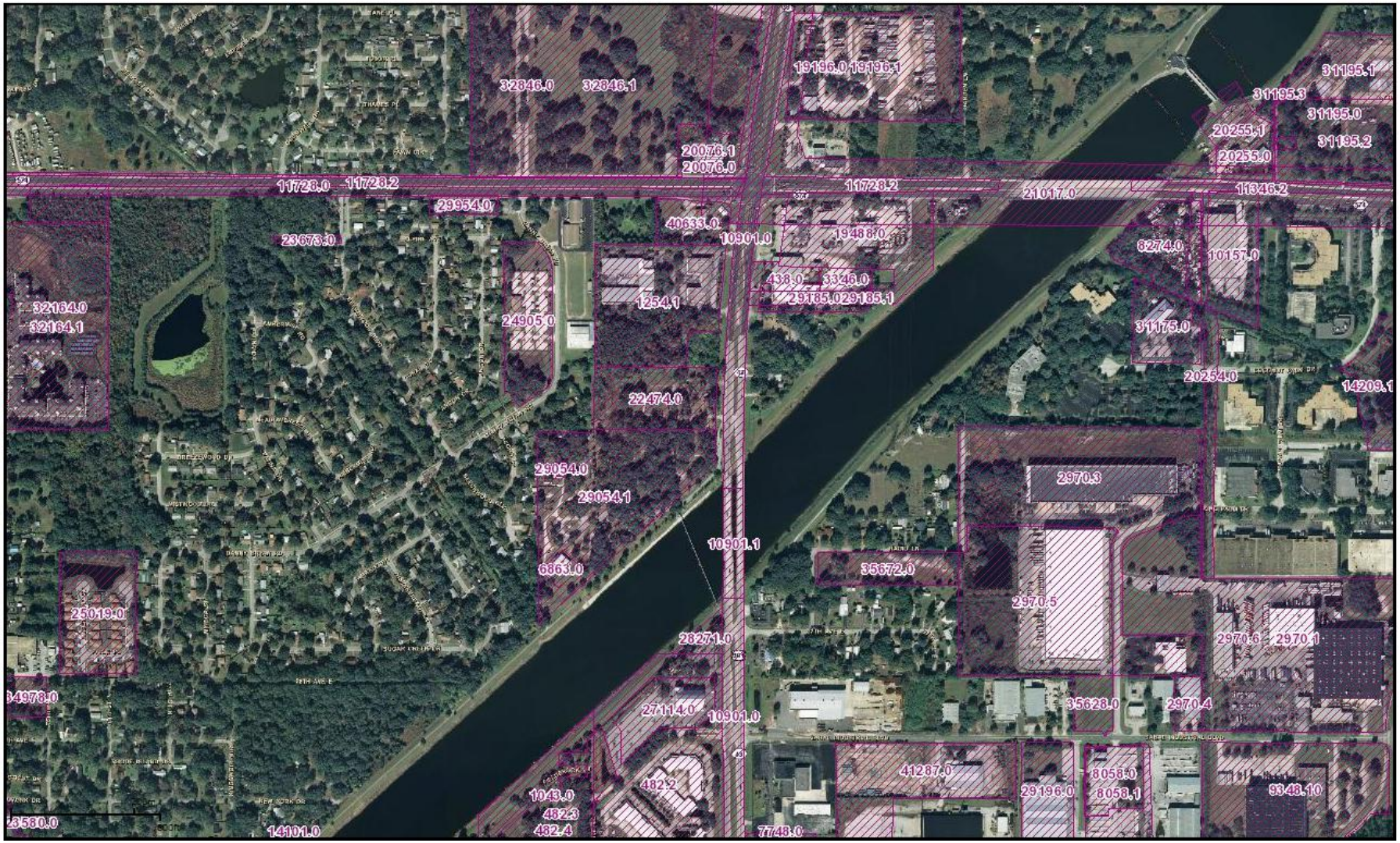
Southwest Florida Water Management District

Map



Legend

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Southwest Florida Water Management District

Map

December 29, 2013

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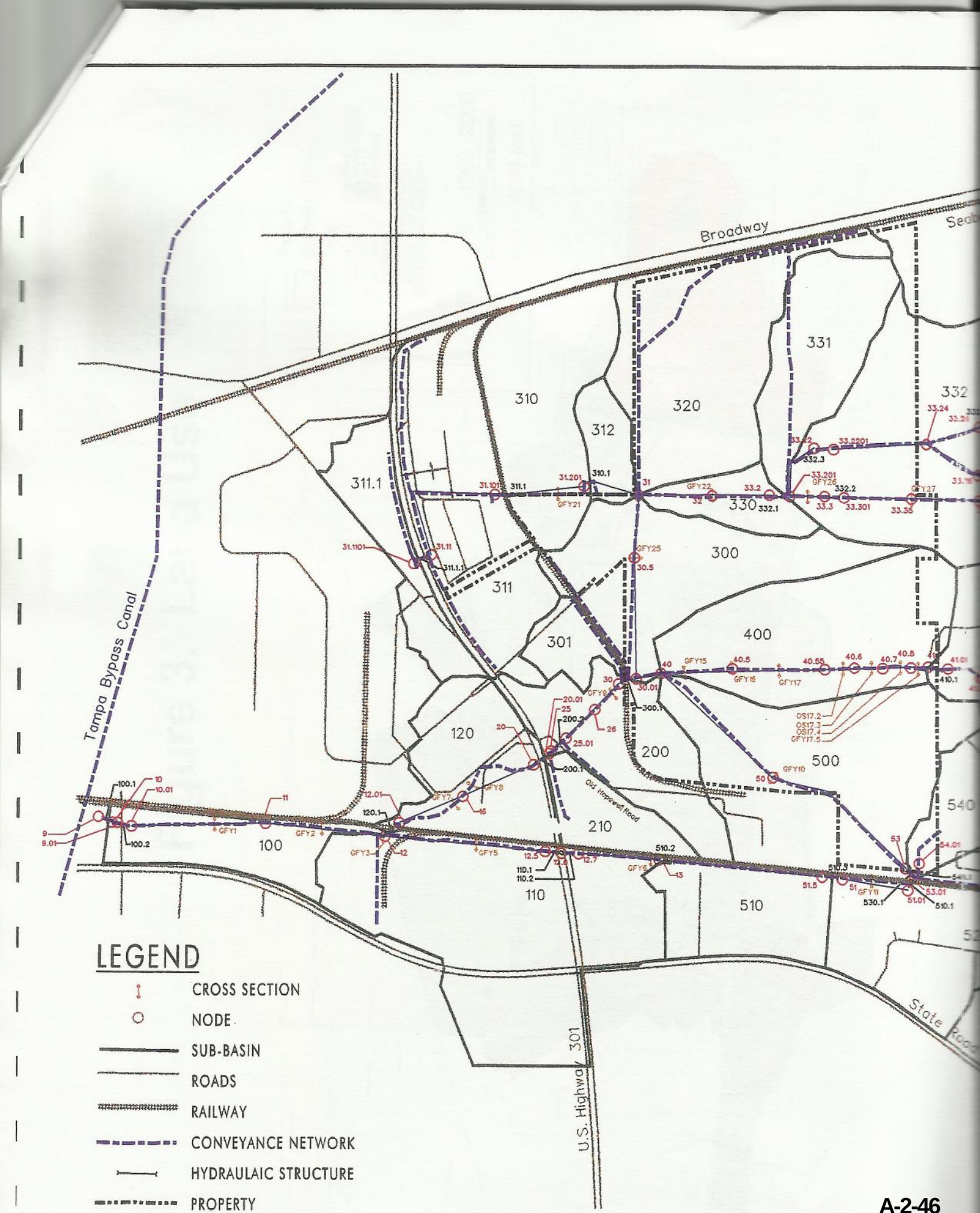
TAMPA BAY WATER
Supplying Water To The Region

TAMPA BAY REGIONAL WATER TREATMENT PLANT

SECTION 18 – TOWNSHIP 29 SOUTH – RANGE 20 EAST

FLOODPLAIN ANALYSIS
UNNAMED EAST-TRIBUTARY TO THE TAMPA BYPASS CANAL
HILLSBOROUGH COUNTY, FLORIDA
JUNE 21, 1999

PARSONS
PARSONS ENGINEERING SCIENCE, INC.
2901 WEST BUSCH BOULEVARD, SUITE 905
TAMPA, FL 33618


Broadway
Tampa Bypass Canal
Old Hopewell Road
U.S. Highway 301
State Road
310
311.1
311
312
320
331
332
330
300
301
400
120
200
210
100
110
500
510
540
LEGEND
CROSS SECTION
NODE
SUB-BASIN
ROADS
RAILWAY
CONVEYANCE NETWORK
HYDRAULAIC STRUCTURE
PROPERTY

SEC I ION 3 HYDROLOGIC AND HYDRAULIC MODEL RESULTS

Data

Tables 12 and 13 identify existing conditions peak flood elevations and discharge, respectively, at points of interest.

Table 12. Peak Flood Elevations.

Location	Peak Flood Elevation (ft. NGVD)	
	4% Annual Chance	1% Annual Chance
Upstream Side of 78th Street	11.4	12.3
Upstream Side of Seaboard Coastline Railroad Bridge	16.0	17.3
Upstream Side of U.S. Highway 301	20.0	21.6
Upstream Side of Old Hopewell Road	21.0	2/6
Upstream Side of Railroad Spur Bridge at the west side of the 436-acre Property	23.5	24.6
West Side of the Plant Site in the South, East-West Channel	24.8	25.0
East Side of the Plant Site in the South, East-West Channel	28.5	29.2
West Side of the Plant Site in the North, East-West Channel	26.3	26.8
East Side of the Plant Site in the North, East-West Channel	30.0	31.0
Southeast End of the Southeast-Northwest Channel, South of the Plant Site	24.5	24.9

Table 13. Peak Discharge.

Location	Peak Discharge (cfs)	
	4% Annual Chance	1% Annual Chance
Upstream of 78th Street	555	800
Upstream of Seaboard Coastline Railroad Bridge	530	760
Upstream of Old Hopewell Road	520	750
East Side of the Plant Site in the South, East-West Channel	320	530
West Side of the Plant Site in the North, East-West Channel	190	280
East Side of the Plant Site in the North, East-West Channel	50	80
Southeast End of the Southeast-Northwest Channel, South of the Plant Site	115	185

Control

The channel between Old Hopewell Road and the Railroad Spur Bridge controls peak one-percent annual chance flood elevations on the west side of the 436-acre site. Sensitivity analyses show that existing, upland floodplain storage east of the 436-acre site does not significantly affect peak one-percent annual chance flood elevations at the Plant site.

Wetland Information

Southwest Florida Water Management District

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National Wetlands Inventory

Estuarine

Lacustrine

Marine

Palustrine

Riverine

Upland

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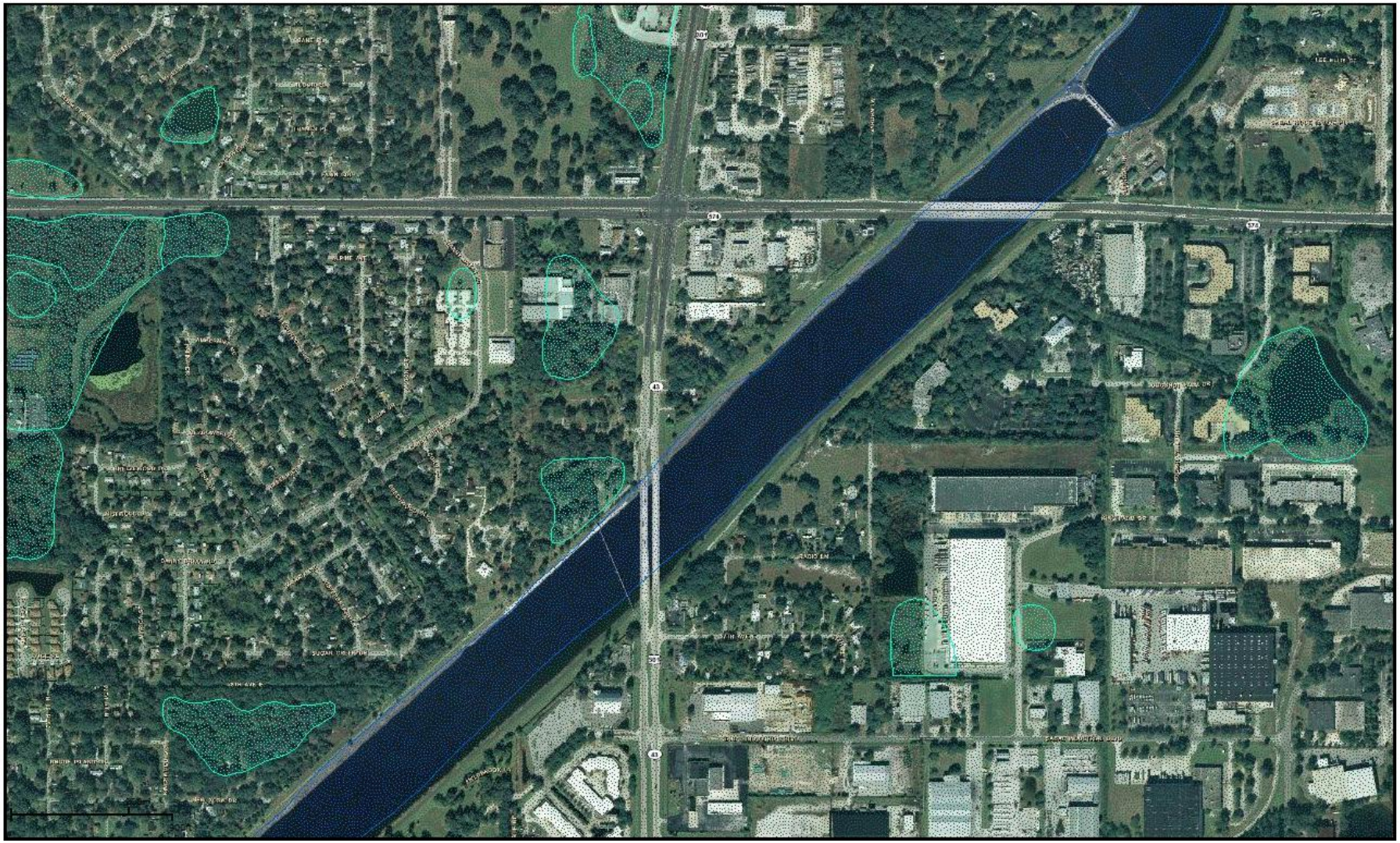

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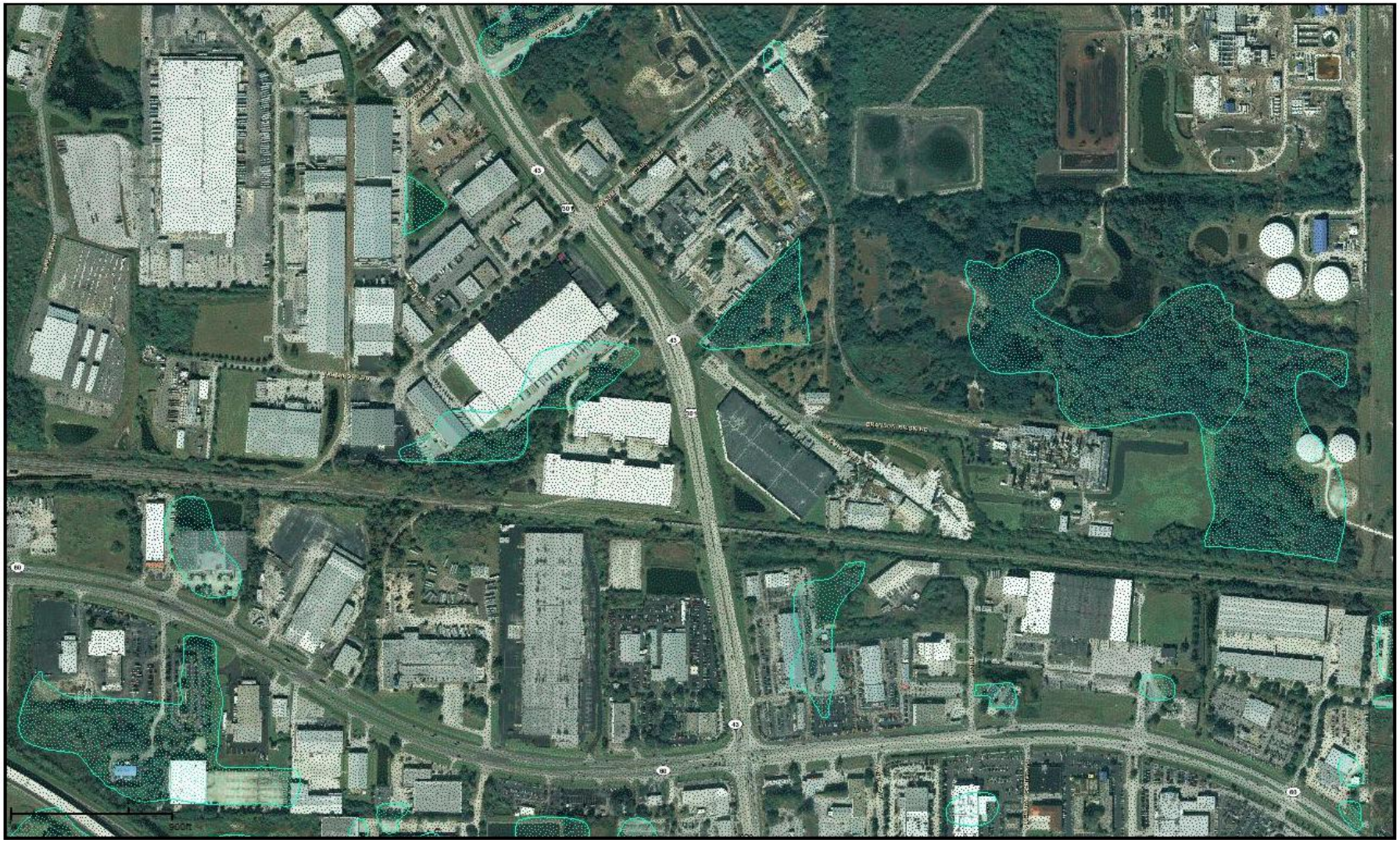

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SWFWMD Aerial Contour Maps

COMPILED BY PHOTOGRAMMETRIC METHODS

BY

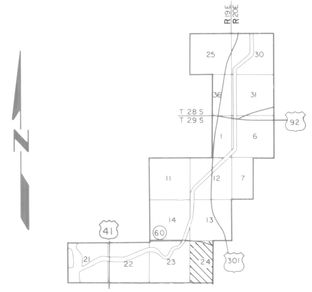
AYRES ASSOCIATES

Photogrammetrists/ Engineers

Madison, Wisconsin

LEGEND

HORIZONTAL CONTROL USC & GS	△ 206 69.12
VERTICAL CONTROL	× 6-11-A 68.13
SECTION CORNERS	8 | 9 / 17 | 16
CONTOURS	20
DEPRESSION CONTOURS	25
SPOT ELEVATION	22.3
TEMPORARY BENCH MARK	× TBM-4 72.49
1927 DATUM	+



KEY MAP

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THE LAND LINE INFORMATION SHOWN HEREON IS COMPILED FROM THE BEST AVAILABLE DATA AND DOES NOT NECESSARILY REPRESENT TRUE LAND LINE LOCATION.

DASHED CONTOURS AND UNDERLINED ELEVATIONS INDICATE STANDARD VERTICAL ACCURACY REDUCED BY TREE COVER.

GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM WEST ZONE. 1983 DATUM

ELEVATIONS BASED ON U.S. C & G.S. DATUM

200 0 200 400 600

SCALE: 1"=200' CONTOUR INTERVAL = 1'

DATE OF PHOTOGRAPHY: DECEMBER 1988

DATE OF MAPPING: FALL 1989

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

TAMPA BY-PASS CANAL

AERIAL PHOTOGRAPHY WITH CONTOURS

A-2-60

SWFWMD PROPERTY
NUMBER 323-13

SHEET NO. 24-29-19

COMPILED BY PHOTOGRAMMETRIC METHODS BY

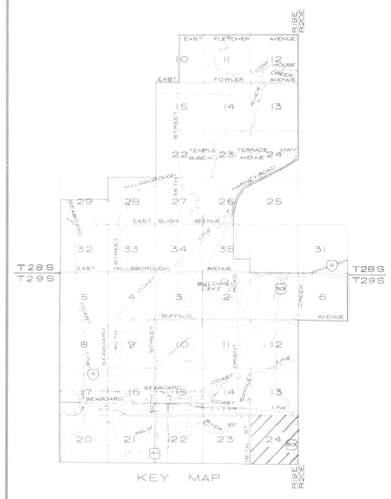
L. ROBERT KIMBALL & ASSOCIATES

CONSULTING ENGINEERS & ARCHITECTS

EBENSBURG, PENNSYLVANIA

LEGEND

HORIZONTAL CONTROL U.S.C.& G.S.	△
FLORIDA STATE DEPT OF TRANSPORTATION	⬡
TRAVERSE STATIONS	FFQ 6 ○
VERTICAL CONTROLS	FFQ-7 97.61 □
SECTION CORNERS	10 | 11 / 15 | 14
CONTOURS	45 / 40
DEPRESSION CONTOURS	50
SPOT ELEVATIONS	50.4



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GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE

ELEVATIONS BASED ON U.S.C.& G.S. DATUM

200 0 200 400 600

SCALE 1" = 200' CONTOUR INTERVAL 1'

DATE OF PHOTOGRAPHY APRIL 20, 1978
DATE OF MAPPING SEPTEMBER 1978

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

HILLSBOROUGH RIVER BASIN

TEMPLE TERRACE A-2-61

AERIAL PHOTOGRAPHY WITH CONTOURS

SWFWMD PROPERTY NO. 15713

SHEET NO. 24-29-19

COMPILED BY PHOTOGRAMMETRIC METHODS

BY

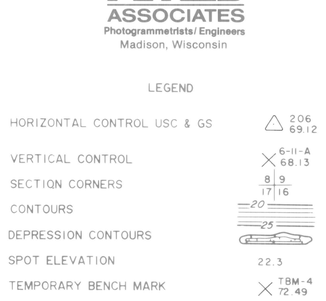
AYRES ASSOCIATES

Photogrammetrists/ Engineers

Madison, Wisconsin

LEGEND

HORIZONTAL CONTROL USC & GS	△ 206 69.12
VERTICAL CONTROL	× 6-11-A 68.13
SECTION CORNERS	8 | 9 / 17 | 16
CONTOURS	20
DEPRESSION CONTOURS	25
SPOT ELEVATION	22.3
TEMPORARY BENCH MARK	× TBM-4 72.49
1927 DATUM	+



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GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM WEST ZONE, 1983 DATUM

ELEVATIONS BASED ON U.S. C & G.S. DATUM

200 0 200 400 600

SCALE: 1"=200' CONTOUR INTERVAL = 1'

DATE OF PHOTOGRAPHY: DECEMBER 1988

DATE OF MAPPING: FALL 1989

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

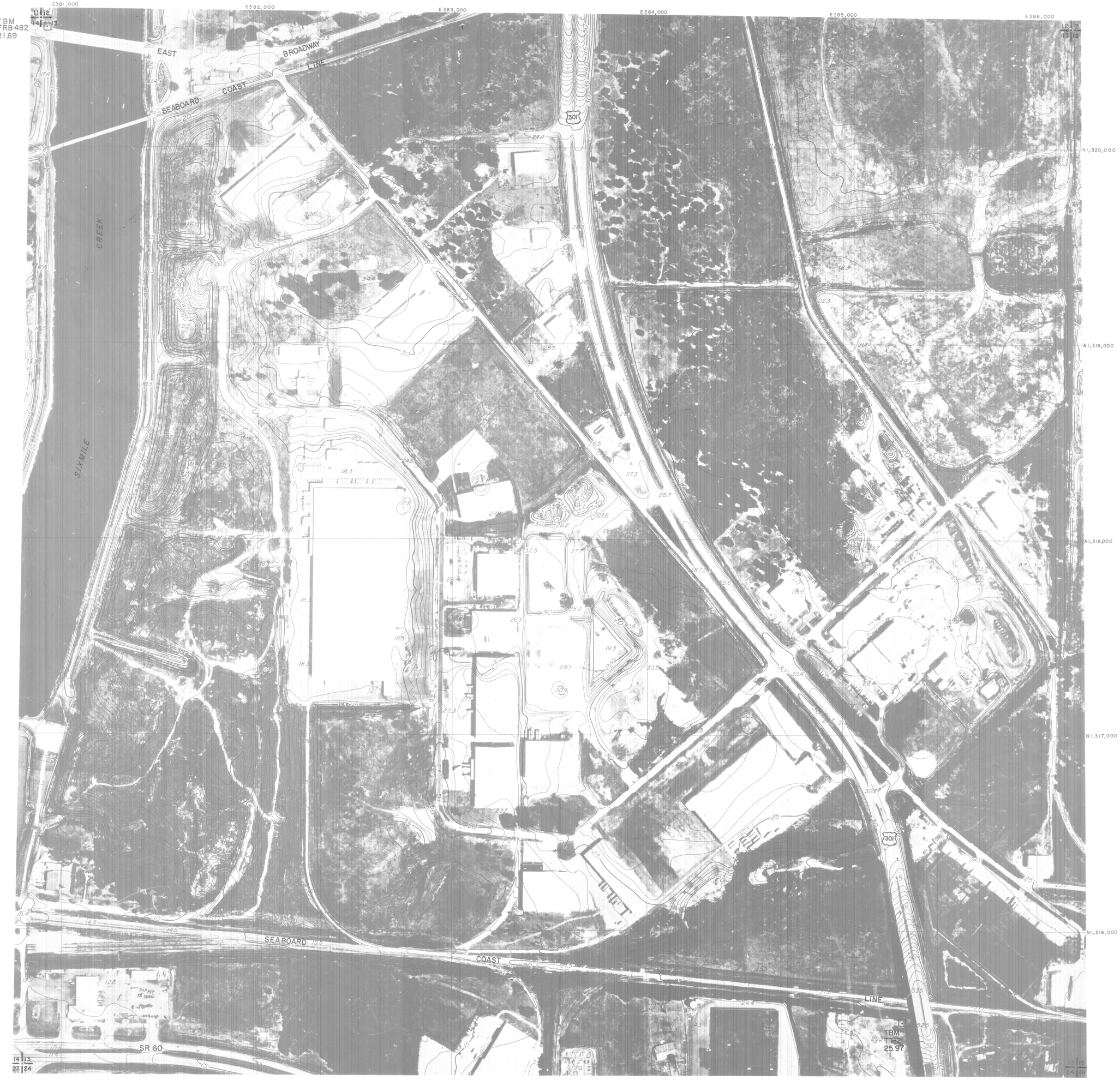
TAMPA BY-PASS CANAL

AERIAL PHOTOGRAPHY WITH CONTOURS

A-2-62

SWFWMD PROPERTY NUMBER 323-13

SHEET NO. 13-29-19



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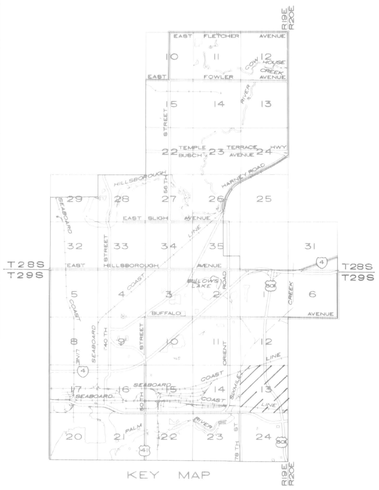
BY
L. ROBERT KIMBALL & ASSOCIATES
CONSULTING ENGINEERS & ARCHITECTS
EBENSBURG, PENNSYLVANIA

LEGEND

HORIZONTAL CONTROL U.S.C.&G.S.	△
FLORIDA STATE DEPT OF TRANSPORTATION	⬡
TRAVERSE STATIONS	FFQ 6 ⊙
VERTICAL CONTROLS	FF4-7 97.61 □
SECTION CORNERS	10 | 11 / 15 | 14
CONTOURS	45 / 40
DEPRESSION CONTOURS	50
SPOT ELEVATIONS	50.4



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GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE

ELEVATIONS BASED ON U.S.C.&G.S. DATUM

N

200 0 200 400 600
SCALE 1" = 200' CONTOUR INTERVAL 1'

DATE OF PHOTOGRAPHY APRIL 20, 1978
DATE OF MAPPING SEPTEMBER 1978

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

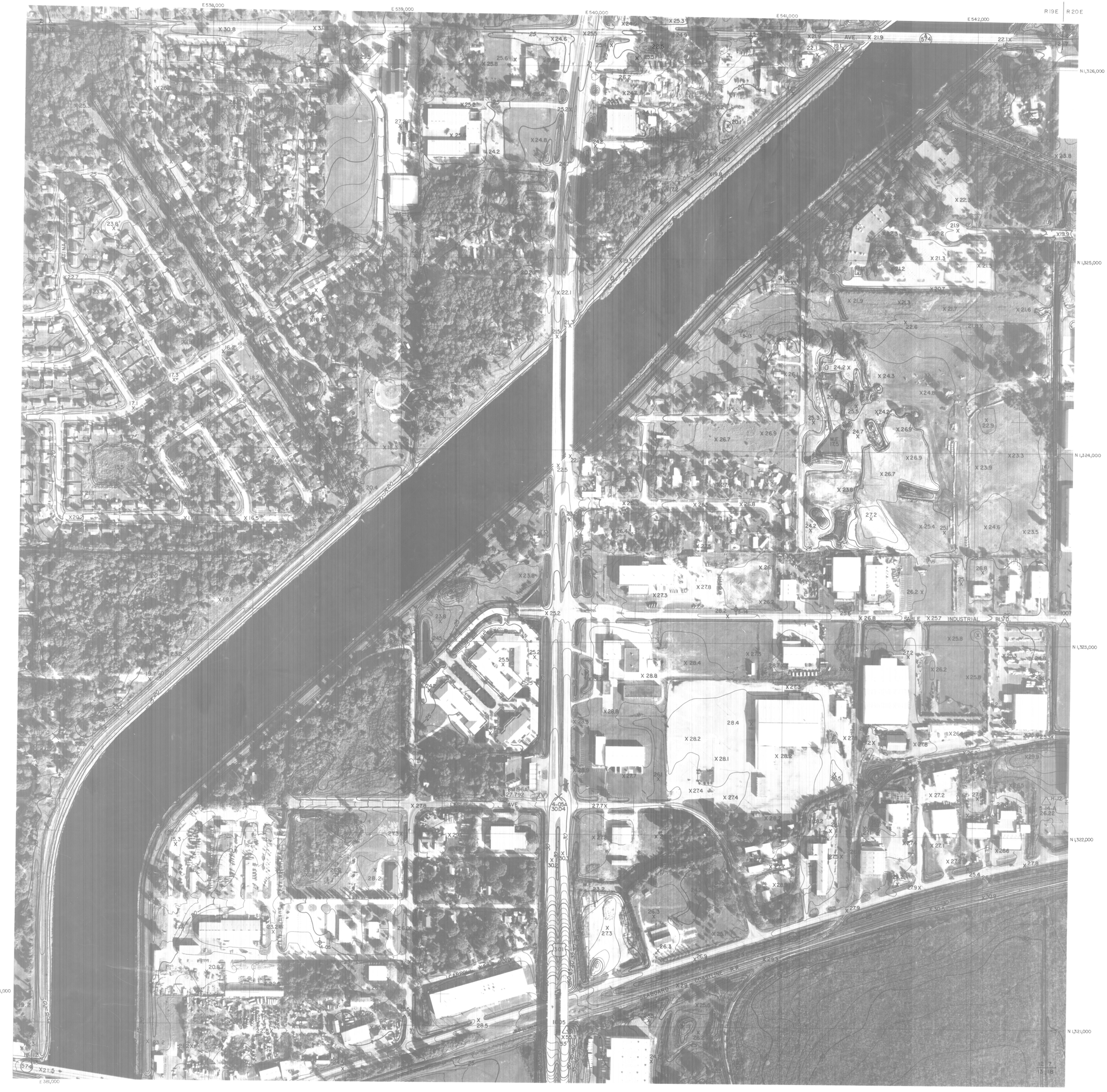
HILLSBOROUGH RIVER BASIN
TEMPLE TERRACE

AERIAL PHOTOGRAPHY WITH CONTOURS

A-2-63

SWFWMD PROPERTY NO. 15713

SHEET NO. 13·29·19



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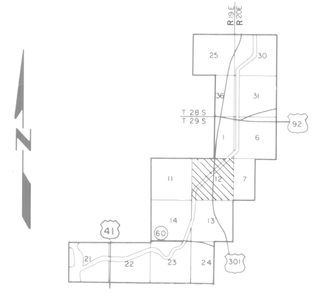
AYRES ASSOCIATES

Photogrammetrists/ Engineers

Madison, Wisconsin

LEGEND

HORIZONTAL CONTROL USC & GS	△ 206 69.12
VERTICAL CONTROL	× 6-11-A 68.13
SECTION CORNERS	8 | 9 / 17 | 16
CONTOURS	20 / 25
DEPRESSION CONTOURS	
SPOT ELEVATION	22.3
TEMPORARY BENCH MARK	× TBM-4 72.49
1927 DATUM	+



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SCALE: 1"=200' CONTOUR INTERVAL = 1'

DATE OF PHOTOGRAPHY: DECEMBER 1988

DATE OF MAPPING: FALL 1989

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

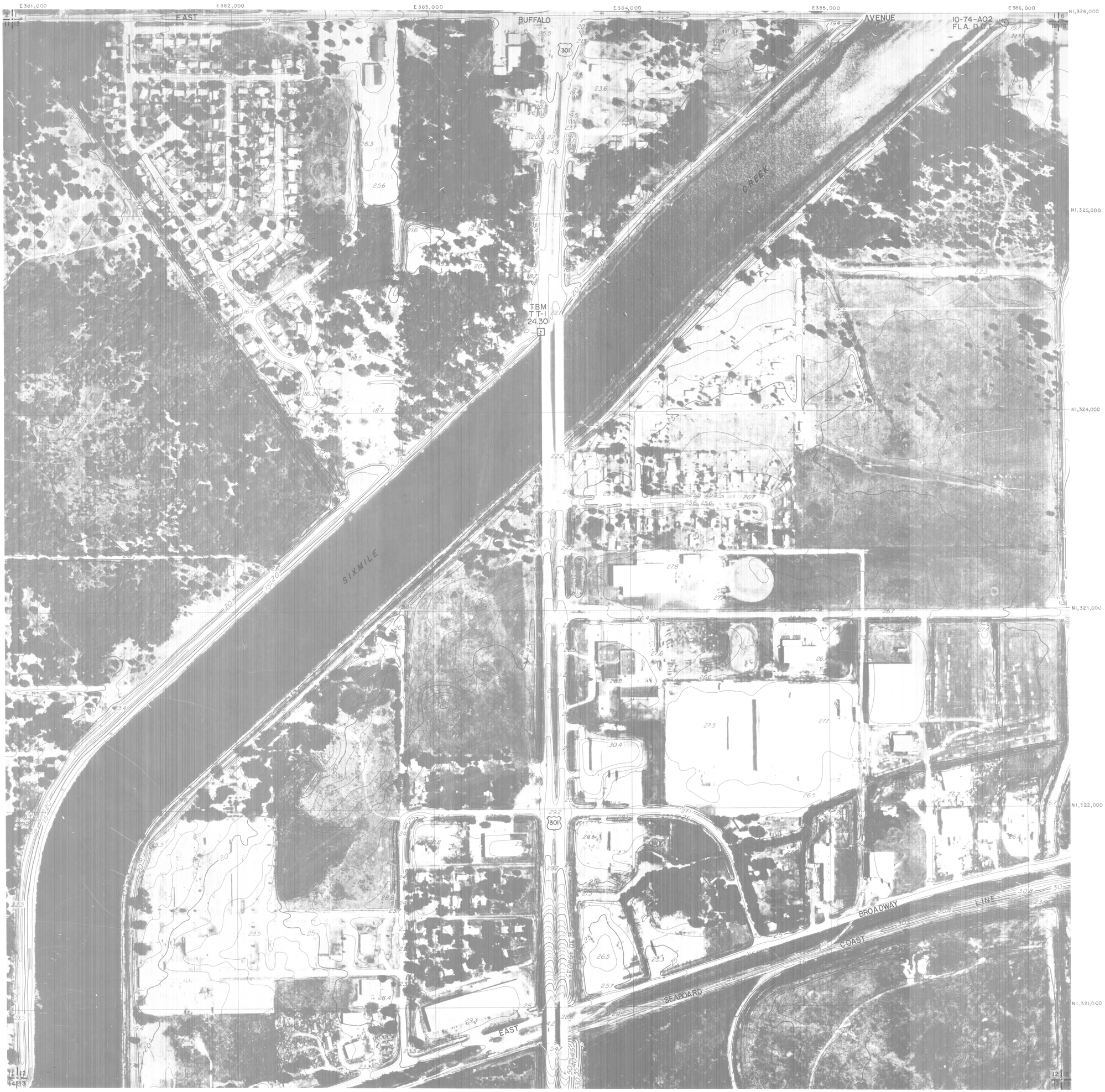
TAMPA BY-PASS CANAL

AERIAL PHOTOGRAPHY WITH CONTOURS

A-2-64

SWFWMD PROPERTY NUMBER 323-13

SHEET NO. 12-29-19



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LEGEND

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FLORIDA STATE DEPT OF TRANSPORTATION	⬡
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VERTICAL CONTROLS	FFQ-7 97.61 ⊡
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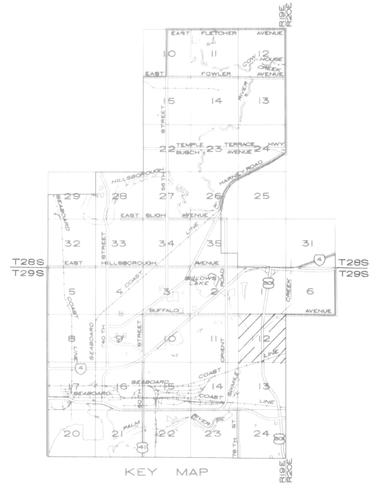

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200 0 200 400 600
SCALE 1" = 200' CONTOUR INTERVAL 1'

DATE OF PHOTOGRAPHY APRIL 20, 1978
DATE OF MAPPING SEPTEMBER 1978

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

HILLSBOROUGH RIVER BASIN
TEMPLE TERRACE

AERIAL PHOTOGRAPHY WITH CONTOURS

SWFWMD PROPERTY NO. 157.13

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SHEET NO. 12·29·19

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Madison, Wisconsin

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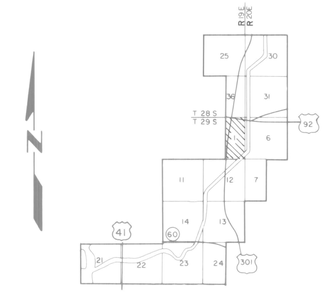
TEMPORARY BENCH MARK	× TBM-4 72.49
1927 DATUM	+



KEY MAP

ACCURACY: IT IS INTENDED THAT THIS MAPPING COMPLY WITH U.S. NATIONAL MAP ACCURACY STANDARDS. HOWEVER, SUCH ACCURACY, OR ANY OTHER LEVEL OF ACCURACY, IS NOT GUARANTEED BY THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT.

THE LAND LINE INFORMATION SHOWN HEREON IS COMPILED FROM THE BEST AVAILABLE DATA AND DOES NOT NECESSARILY REPRESENT TRUE LAND LINE LOCATION.

DASHED CONTOURS AND UNDERLINED ELEVATIONS INDICATE STANDARD VERTICAL ACCURACY REDUCED BY TREE COVER.

GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM WEST ZONE. 1983 DATUM

ELEVATIONS BASED ON U.S. C & G.S. DATUM

200 0 200 400 600

SCALE: 1"=200' CONTOUR INTERVAL = 1'

DATE OF PHOTOGRAPHY: DECEMBER 1988

DATE OF MAPPING: FALL 1989

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

TAMPA BY-PASS CANAL

AERIAL PHOTOGRAPHY WITH CONTOURS

A-2-66

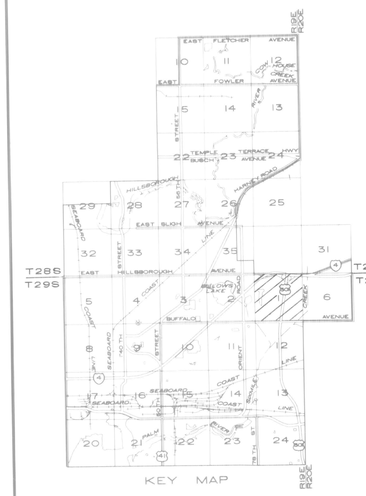
SWFWMD PROPERTY NUMBER 323-13

SHEET NO. I-29-19

COMPILED BY PHOTOGRAMMETRIC METHODS
BY
L. ROBERT KIMBALL & ASSOCIATES
CONSULTING ENGINEERS & ARCHITECTS
EBENSBURG, PENNSYLVANIA

LEGEND

HORIZONTAL CONTROL U.S.C.& G.S.	△
FLORIDA STATE DEPT OF TRANSPORTATION	⬡
TRAVERSE STATIONS	FFQ 6 ○
VERTICAL CONTROLS	FFQ-7 97.61 □
SECTION CORNERS	10 | 11 / 15 | 14
CONTOURS	45 / 40
DEPRESSION CONTOURS	50
SPOT ELEVATIONS	50.4



KEY MAP

NOTE:

ACCURACY: IT IS INTENDED THAT THIS MAPPING COMPLY WITH US NATIONAL MAP ACCURACY STANDARDS. HOWEVER, SUCH ACCURACY, OR ANY OTHER LEVEL OF ACCURACY, IS NOT GUARANTEED BY THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT.

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DASHED CONTOURS AND UNDERLINED ELEVATIONS INDICATE STANDARD VERTICAL ACCURACY REDUCED BY TREE COVER.

GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE

ELEVATIONS BASED ON U.S.C. & G.S. DATUM

200 0 200 400 600
SCALE 1" = 200' CONTOUR INTERVAL 1'

DATE OF PHOTOGRAPHY APRIL 20, 1978
DATE OF MAPPING SEPTEMBER 1978

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

HILLSBOROUGH RIVER BASIN
TEMPLE TERRACE

AERIAL PHOTOGRAPHY WITH CONTOURS

SWFWMD PROPERTY NO. 15713

A-2-67

SHEET NO. 1 · 29 · 19

APPENDIX A-3

Hillsborough County

Hillsborough River and Tampa Bypass Canal

STORMWATER MANAGEMENT MASTER PLAN

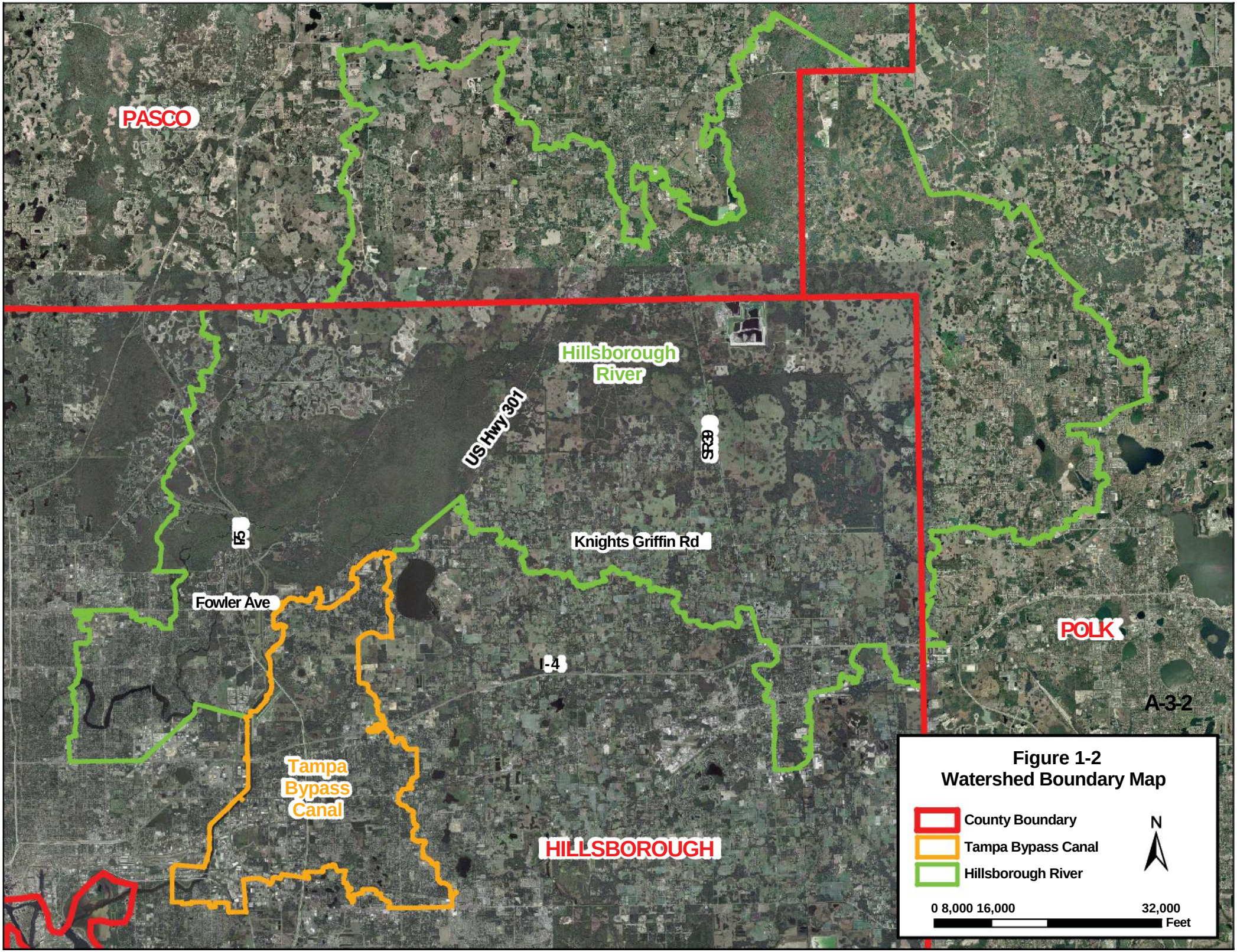
UPDATE NO. 1 (KNOWN CONDITION: DECEMBER 2007)

Hillsborough County
Florida

Prepared By

ATKINS

Tampa, Florida
Original: November 2001
Update 1: August 2011


PASCO
Hillsborough River
US Hwy 301
SR39
Knights Griffin Rd
Fowler Ave
I-4
POLK
A-3-2
Tampa Bypass Canal
HILLSBOROUGH
Figure 1-2
Watershed Boundary Map
County Boundary
Tampa Bypass Canal
Hillsborough River
N
0 8,000 16,000
32,000
Feet

EAST LAKE

WATERSHED MANAGEMENT PLAN UPDATE

(Known Conditions through July 2005)

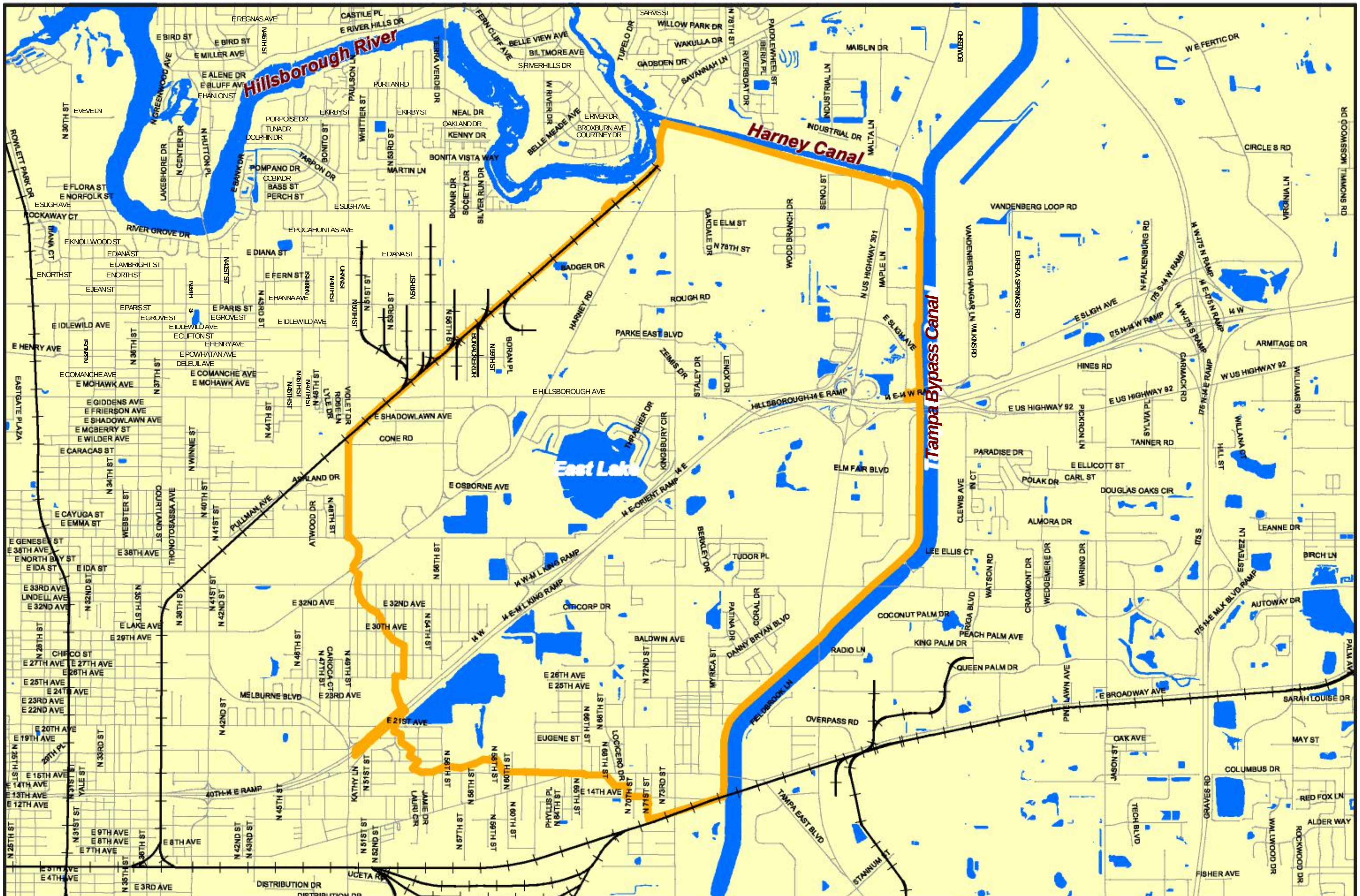
Prepared for:

Stormwater Management Section
Public Works Department, Hillsborough County
601 E. Kennedy Blvd
Tampa, FL 33602

AYRES ASSOCIATES

Engineers/Planners/Scientists
8875 Hidden River Parkway, Suite 200
Tampa, FL 33637
(813) 978-8688, FAX (813) 978-9369

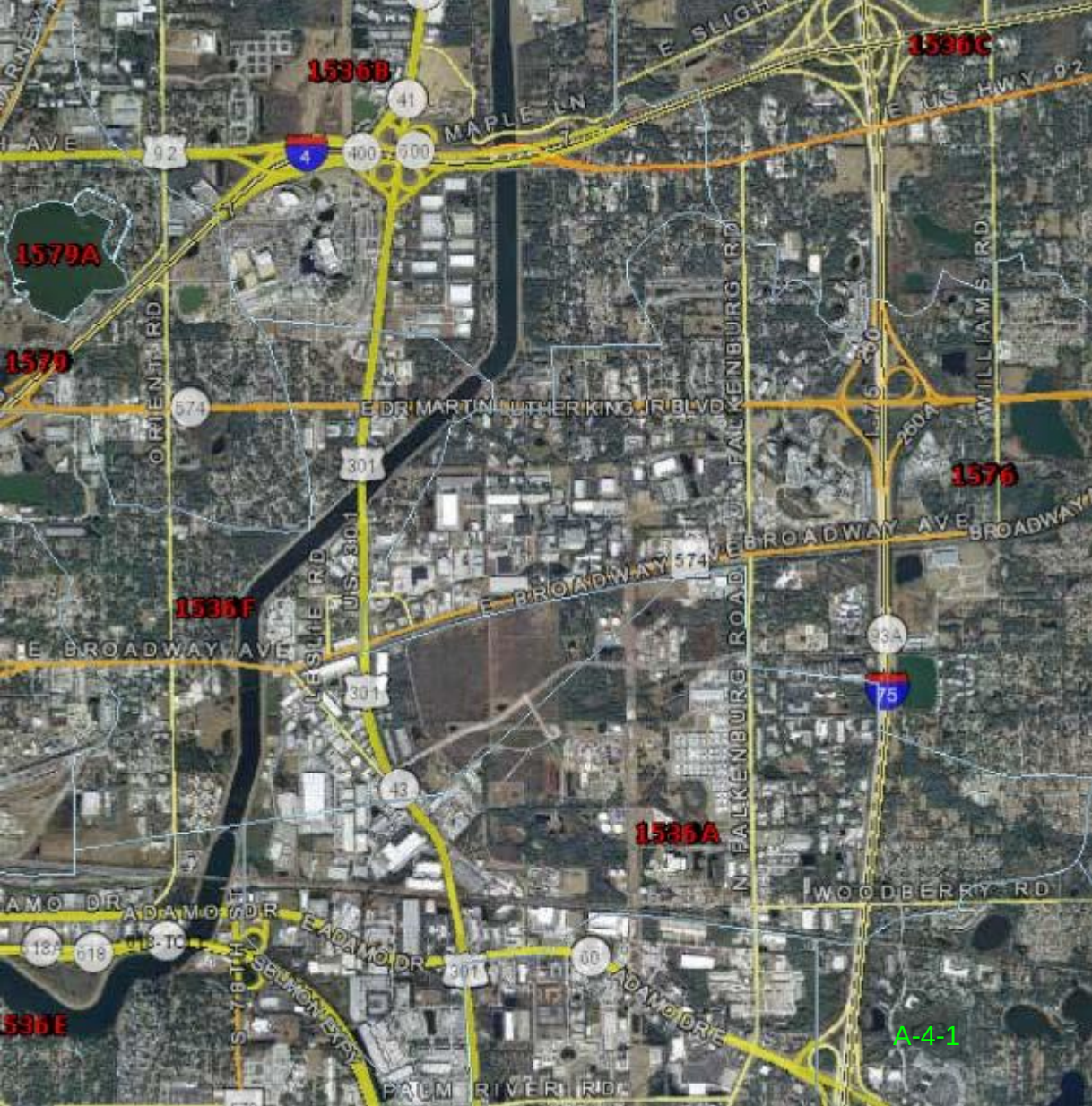
January 2007

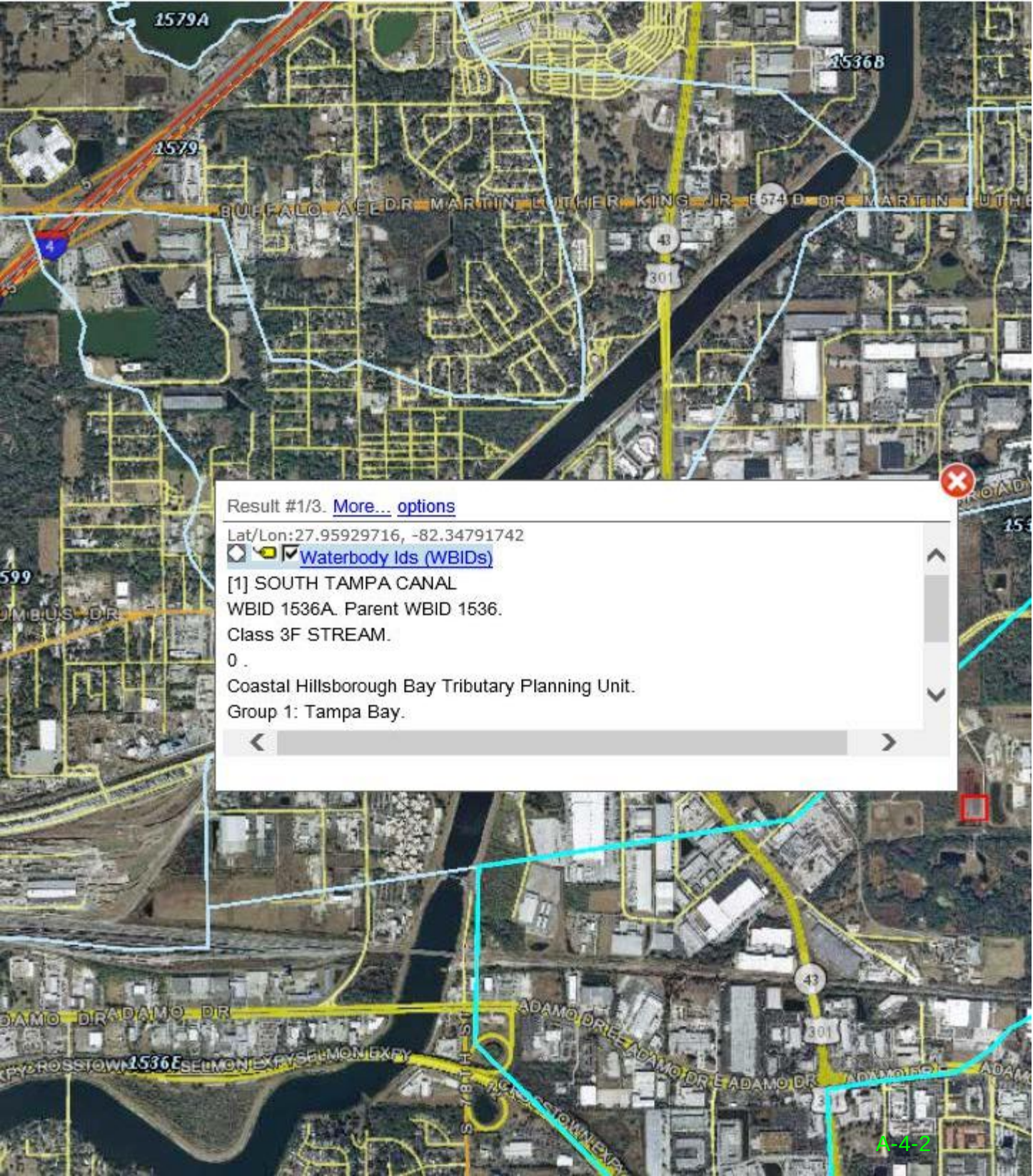


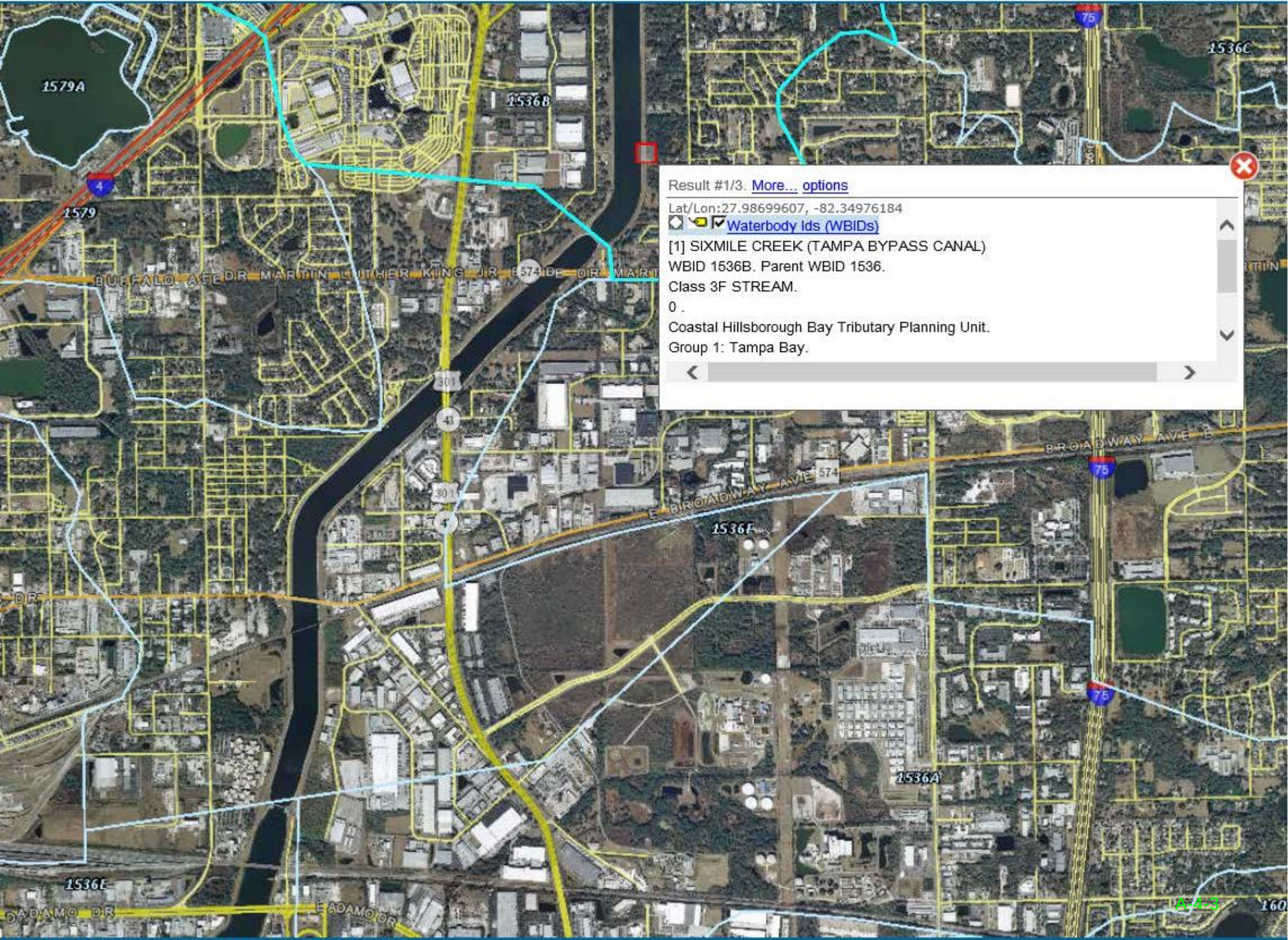
AYRES ASSOCIATES

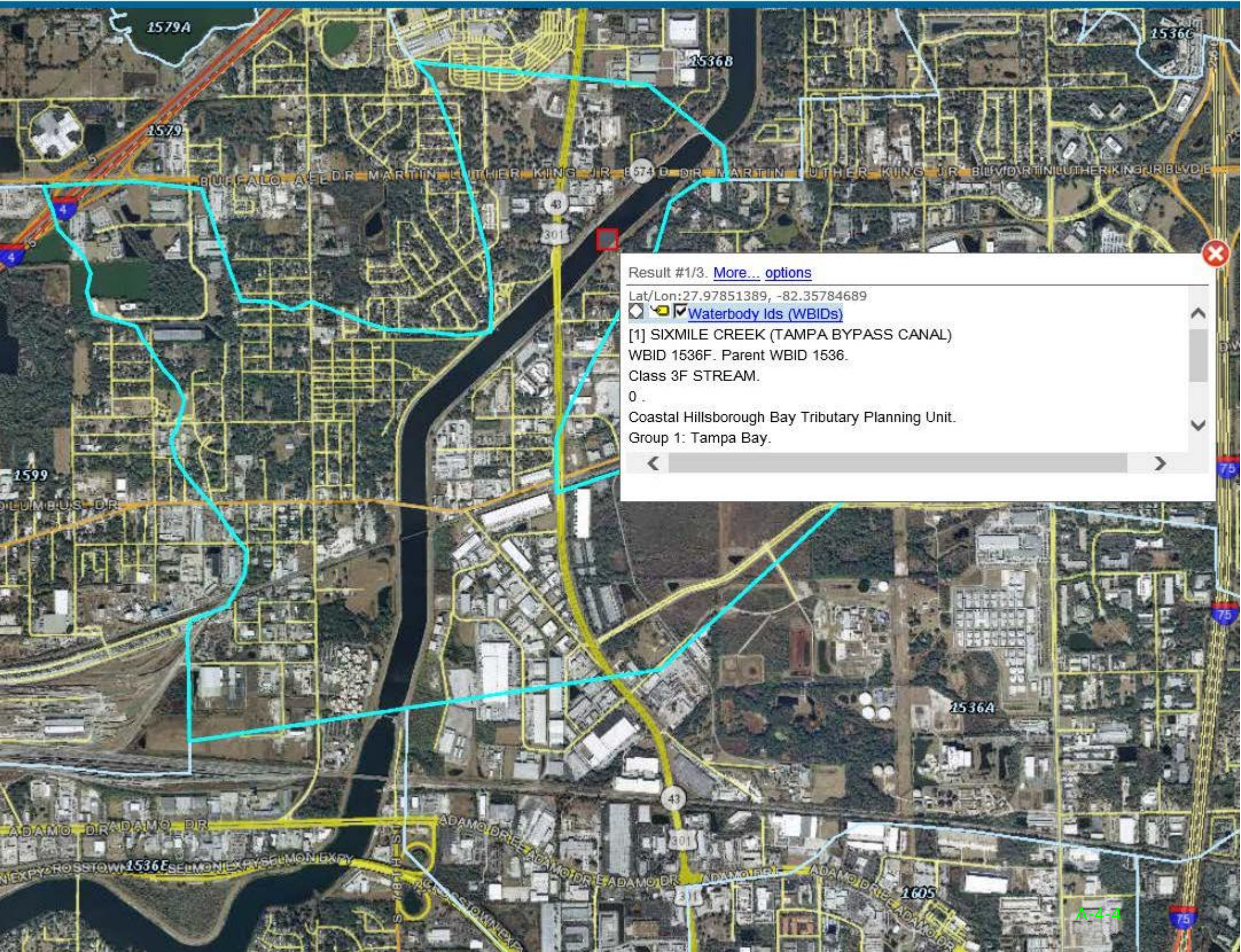
APPENDIX A-4

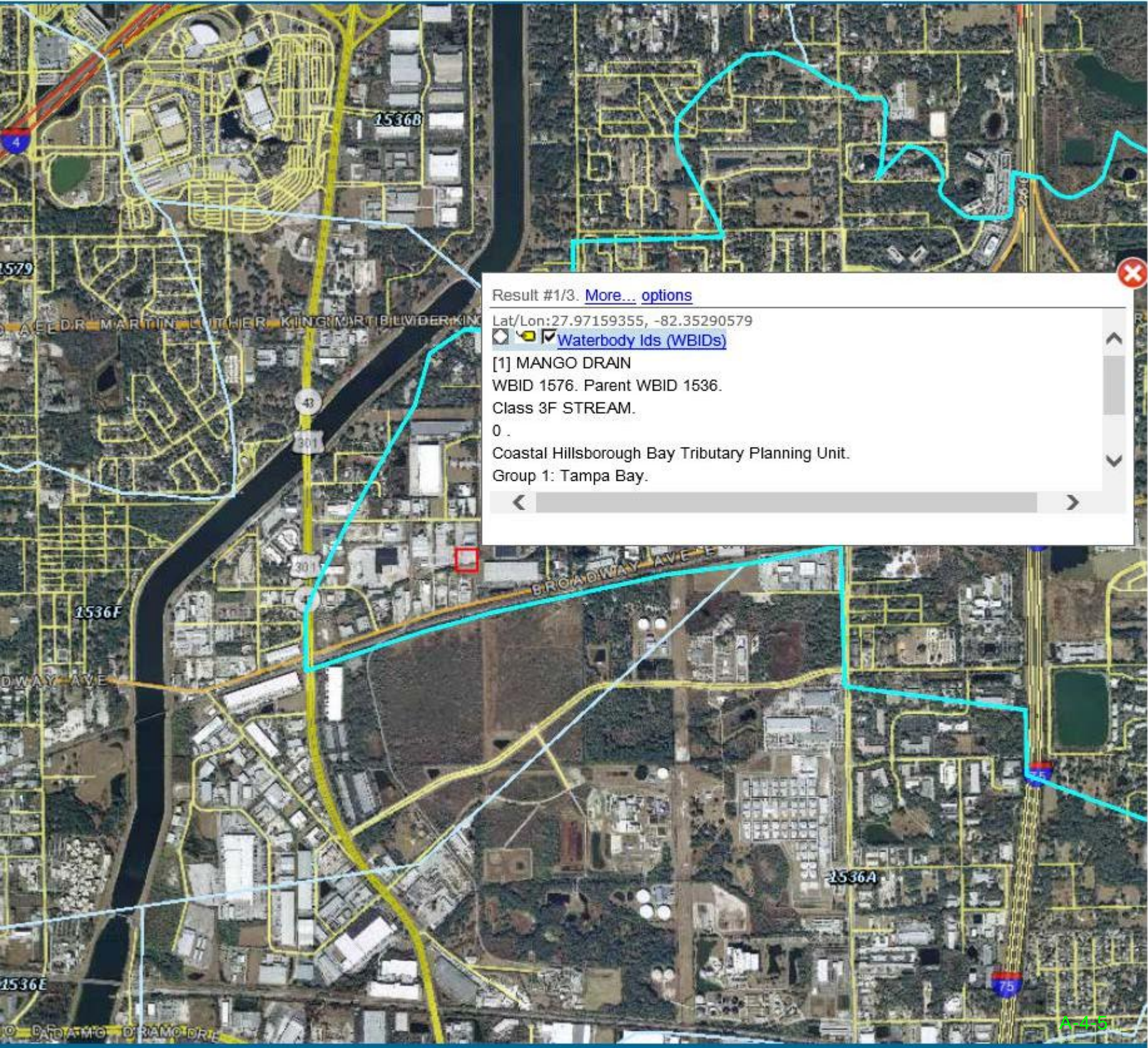
Impaired Waterbodies

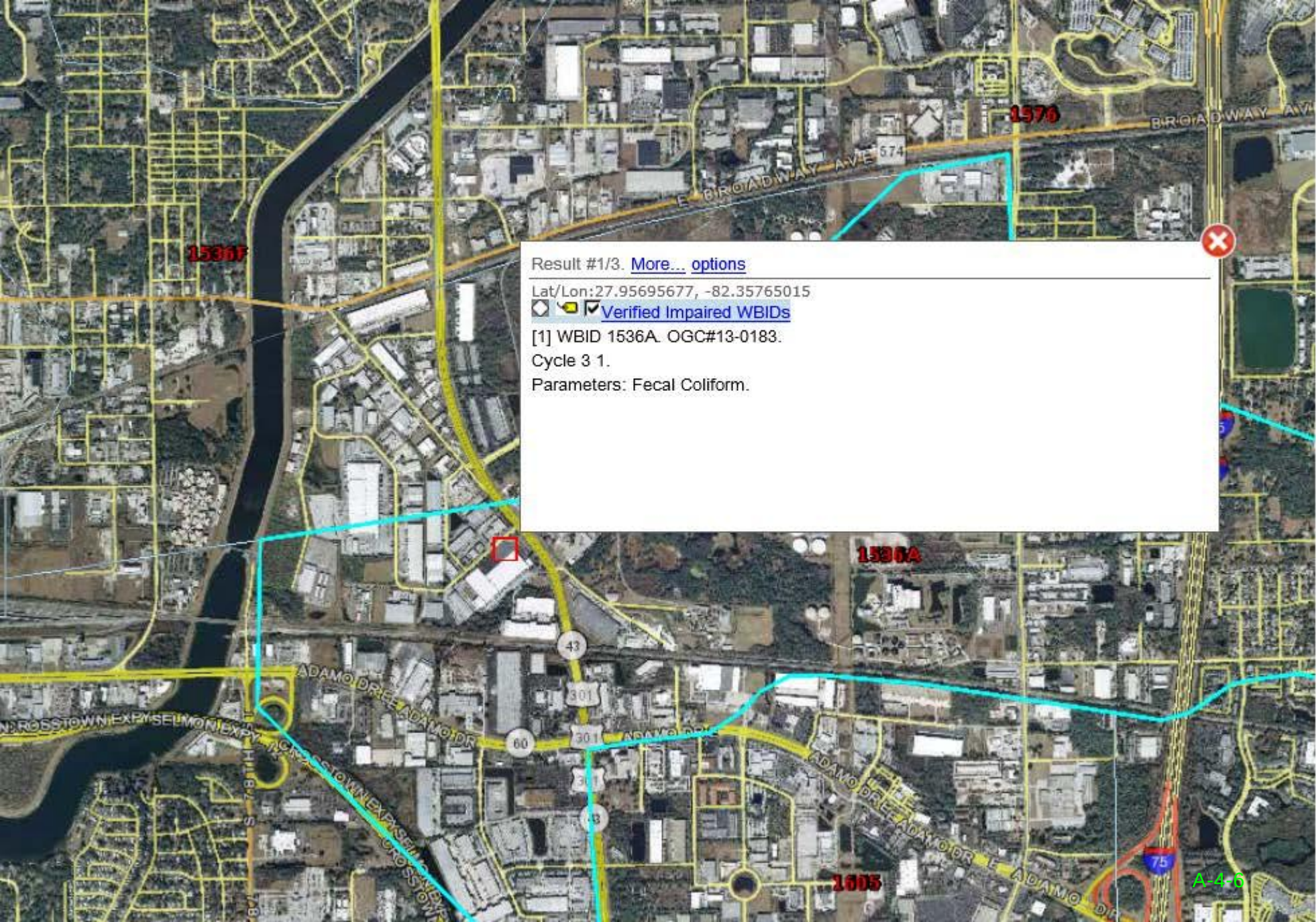

1536B
1536C
1579A
1579
1576
1536F
1536A
1536E
MAPLE LN
E US HWY 92
E SLIGH
ORIENT RD
E DR MARTIN LUTHER KING JR BLVD
FALKENBURG RD
WILLIAMS RD
I-75
BROADWAY AVE
E BROADWAY AVE
LESLIE RD
US 301
N FALKENBURG ROAD
WOODBERRY RD
ADAMO DR
E ADAMO DR
SUNCOAST PKWY
PALM RIVER RD
A-4-1

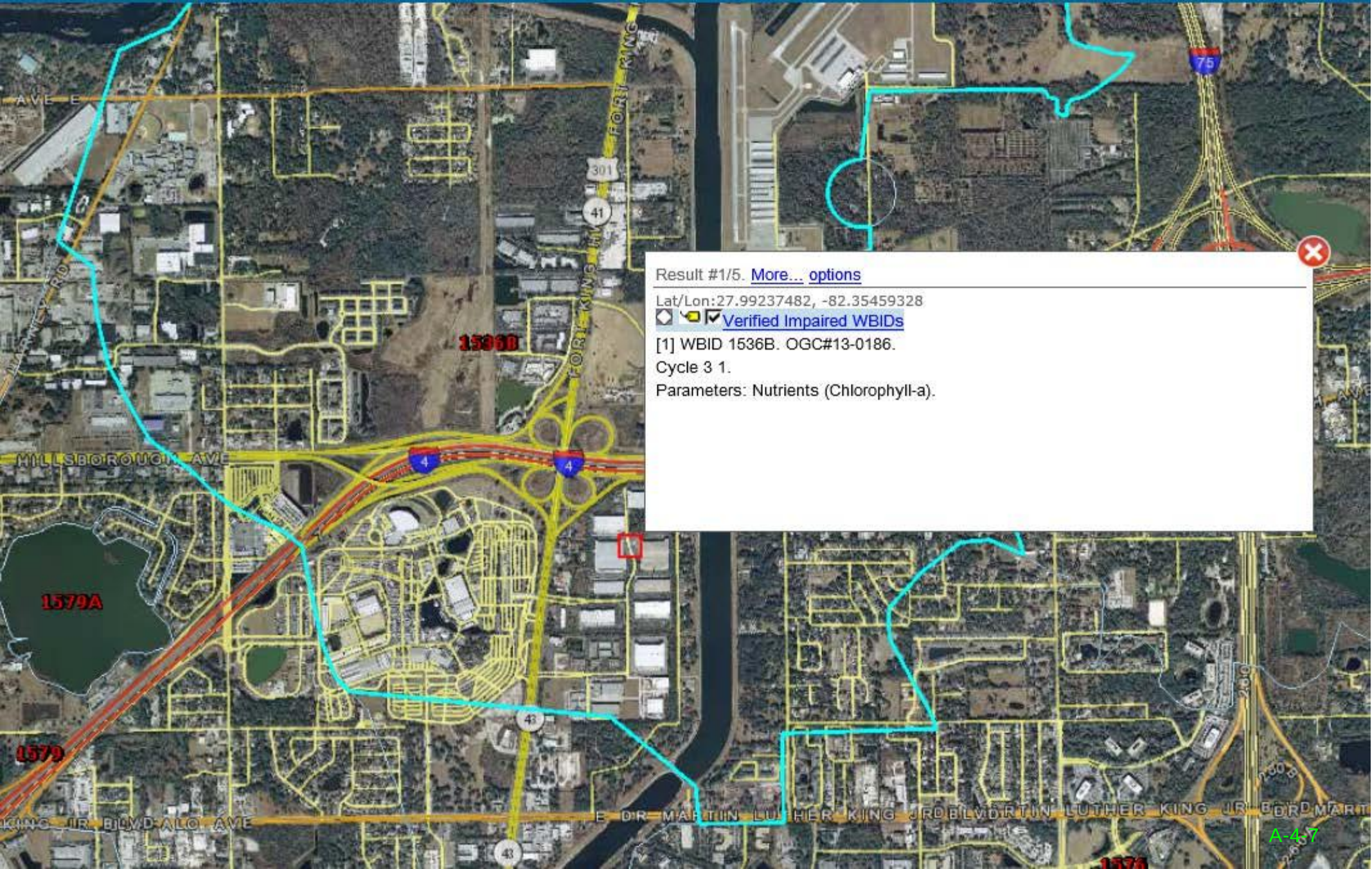

1579A
1579
15368
BUFFALO AVE
MARTIN LUTHER KING JR
574
43
301
Result #1/3. More... options
Lat/Lon:27.95929716, -82.34791742
Waterbody Ids (WBIDs)
[1] SOUTH TAMPA CANAL
WBID 1536A. Parent WBID 1536.
Class 3F STREAM.
0 .
Coastal Hillsborough Bay Tributary Planning Unit.
Group 1: Tampa Bay.
ADAMO DR
ROSSTOWN
1536E
SELMON EXPY
A-4-2

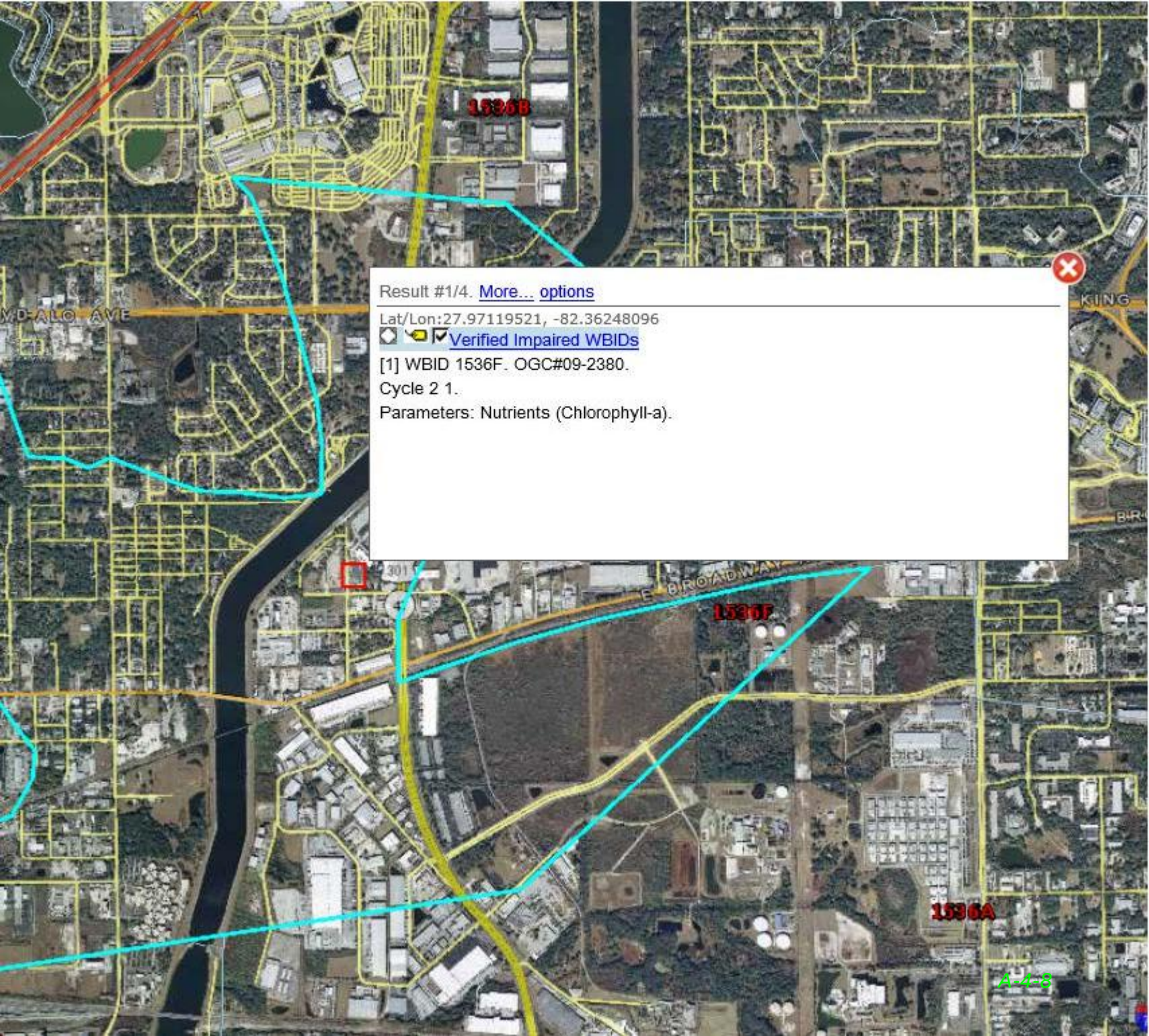

1579A
1536B
1536C
1579
BUFFALO AVE
DR MARTIN LUTHER KING JR
574
E BROADWAY AVE
1536E
1536A
ADAMO DR
Result #1/3. More... options
Lat/Lon:27.98699607, -82.34976184
Waterbody Ids (WBIDs)
[1] SIXMILE CREEK (TAMPA BYPASS CANAL)
WBID 1536B. Parent WBID 1536.
Class 3F STREAM.
0 .
Coastal Hillsborough Bay Tributary Planning Unit.
Group 1: Tampa Bay.
A-4-3
to PDF | Help | Disclaimer | Gateway | Email This Map | Contact Us

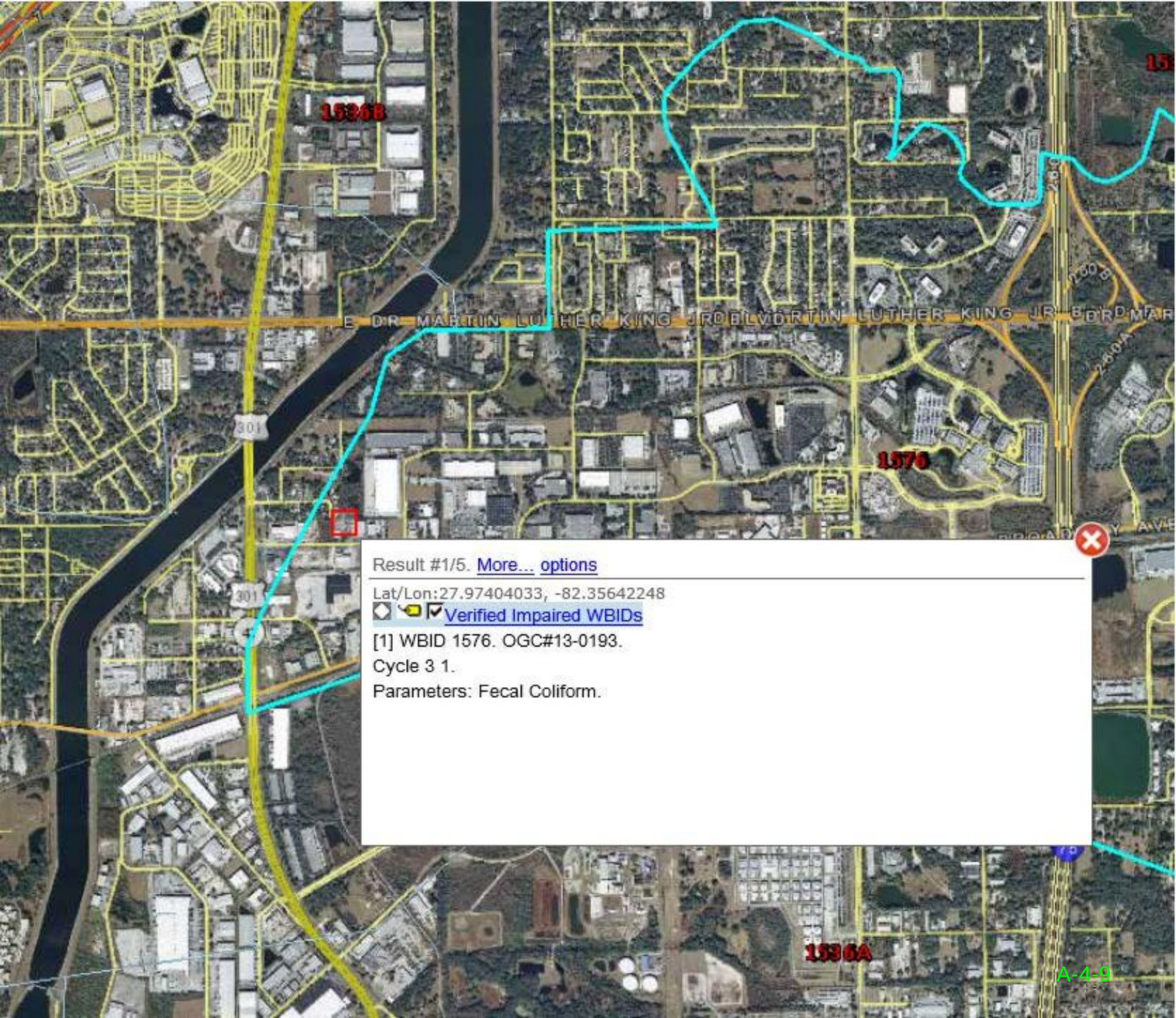

1579A
1536B
1536C
1579
BUFFALO AVE
DR MARTIN LUTHER KING JR BLVD
574
43
301
Result #1/3. More... options
Lat/Lon:27.97851389, -82.35784689
Waterbody Ids (WBIDs)
[1] SIXMILE CREEK (TAMPA BYPASS CANAL)
WBID 1536F. Parent WBID 1536.
Class 3F STREAM.
0 .
Coastal Hillsborough Bay Tributary Planning Unit.
Group 1: Tampa Bay.
1599
COLUMBUS DR
1536A
ADAMO DR
ADAMO DR E
1536E
SELMON EXPY
ROSSTOWN
1605
75
A-4-4


Result #1/3. More... options
Lat/Lon:27.97159355, -82.35290579
Waterbody Ids (WBIDs)
[1] MANGO DRAIN
WBID 1576. Parent WBID 1536.
Class 3F STREAM.
0 .
Coastal Hillsborough Bay Tributary Planning Unit.
Group 1: Tampa Bay.
1536B
1536F
1536A
1536E
BROADWAY AVE
A-4-5


Result #1/3. More... options
Lat/Lon:27.95695677, -82.35765015
Verified Impaired WBIDs
[1] WBID 1536A. OGC#13-0183.
Cycle 3 1.
Parameters: Fecal Coliform.
1576
1536F
1536A
1605
A-4-6
E BROADWAY AVE
ADAMO DR E
ADAMO DR
CROSSTOWN EXPY
SELMON EXPY
43
301
60
75
574


Result #1/5. More... options
Lat/Lon:27.99237482, -82.35459328
Verified Impaired WBIDs
[1] WBID 1536B. OGC#13-0186.
Cycle 3 1.
Parameters: Nutrients (Chlorophyll-a).
1536B
1579A
1579
HILLSBOROUGH AVE
E DR MARTIN LUTHER KING JR BLVD
FORT KING HWY
301
41
4
75
A-4-7


1536B
Result #1/4. More... options
Lat/Lon:27.97119521, -82.36248096
Verified Impaired WBIDs
[1] WBID 1536F. OGC#09-2380.
Cycle 2 1.
Parameters: Nutrients (Chlorophyll-a).
KING
E BROADWAY
1536F
1536A
A-4-8



Result #1/5. More... options

Lat/Lon:27.97404033, -82.35642248

Verified Impaired WBIDs

[1] WBID 1576. OGC#13-0193.

Cycle 3 1.

Parameters: Fecal Coliform.

Comp-Verified-List-2014 [Read-Only] - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Deborah Knighton - Fl

A1 Cycle

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Cycle	Group	OGC Case Numb	Group Name	Planning Unit	County (-ies)	WI310	Water Segment Name	Water-body Type	Water-body Clas:	1998 303(d) Parameters of Concern	Parameters Assessed Using the Impaired Waters Rule (IWR)	Dissolved Oxygen/Biology Pollutant of Concer	DO *i* Nutrient; Biology TN TP BOD Median Values (mg114^2	Concentration of Criterion or Threshold Not PT	Priority for TMDL Development'	Projected Year For TMDL Development	Verified F Assessmei
402	2	4	10-3141	Kissimmee River	Upper Kissimmee Planning Unit	Polk	1532B	Lake Marie	Lake	3F		Nutrients (TSI)		TN = 0.747 (n = 50) TP = 0.02 (n = 45) BOD = No Data	TSI s 40; Color S 40	Medium		2007 (45; C PCU 2008(44;C PCU 2009(44: C PCU
403	1	2	03-2296	Tampa Bay Tnbutaries	Hillsborough River	Hillsborough	1534	Cow House Creek	Stream	1		Dissolved Oxygen	Nutrients (added from comments)		<5.0 mgn	High	2003	
404	1	5	09-1099	Springs Coast	Anclote River / Coastal Pinellas County	Pinellas	1535	Direct Runoff to Gulf (Minnow Creek)	Estuary	3M		Mercury (m fish tissue)			Exceeds DoH threshold(>0.43 m9/152)	High		
405	3	1	13-0183	Tampa Bay	Coastal Hillsborough Bay Tributary	Hillsborough	1536A	Unnamed Drain	Stream	3F		Fecal Coliform			s 400 Counts / 100 nt	Low		7111
406	3	1	13-0184	Tampa Say	Coastal Hillsborough Bay Tributary	Hillsborough	1536B	Sbcmile Creek (Tampa Bypass Canal)	Stream	3F	Biochemical Oxygen Demand	Dissolved Oxygen (BOD)	Biochemical Oxygen Demand	TN = 0.774 (n = 124) TP = 0.122 (n = 125) BOD = 2.3 (n = 63)	25.0 mg/L	Low		49/14
L37	3	1	13-0185	Tampa Bay	Coastal Hillsborough Bay Tributary	Hillsborough	1536B	Sbcmile Creek (Tampa Bypass Canal)	Stream	3F	Dissolved Oxygen	Dissolved Oxygen (BOD)	Biochemical Oxygen Demand	TN = 0.774 (n = 124) TP = 0.122 (n = 125) BOD = 2.3 (n = 63)	a5.0 mg&	Low		49/14
L08	3	1	13-0186	Tampa Bay	Coastal Hillsborough Bay Tributary	Hillsborough	15366	Sbcmile Creek (Tampa Bypass Canal)	Stream	3F	Nutrients	Nutrients (Chlorophyll-a)		TN = 0.774 (n = 124) TP= 0.122 (n= 125) BOD = 2.3 (n = 63)	s20 pg/L	Medium		2005 (22 2006 (17 2007 (21 2008 (40 2009 (26 2010 (20 2011 (27
409	2	1	09-2375	Tampa Bay	Coastal Hillsborough Bay Tributary	Hillsborough	1536C	Tampa Bypass Canal	Stream	3F	Dissolved Oxygen	Dissolved Oxygen	Nutrients. Biochemical Oxygen Demand (added from comments)		<5.0 mg&	Low	A·4·10	

Sheel

AI "'ON d fir SI Cycle

	Cycle Group	OGC Case Numb	Group Name	Planning Unit	County (-ies)	INBID	Water Segment Name	Water-body Type	Water-body Class.[1]	1998 303(d) Parameters of Concern	Parameters Assessed Using the Impaired Waters Rule (IWR)	Dissolved Oxygen/Biology Pollutant of Concer	DO / Nutrient / Biology TN , TP , BOD Median Values (mg/L)[2]	Concentration of Criterion or Threshold Not IV	Priority for TMDL Development[s]	Projected Year For TMDL Development-	Verified Assessmei
412 ... 1		02-1388	Tampa Bay	Coastal Hisborough Bay Trbutary	Hisborough	1536E	Palm River	Estuary	3M		Nutrients (Historic Chlorophyl-a)			Median TN = 1.0 mg/L	Medium	2008	
2	1	09-2377	Tampa Bay	Coastal HMsborough Bay Tributary	Hisborough	1536E	Path River	Estuary	3M	Dissolved Oxygen	Dissolved Oxygen	Nutrients, Biochemical Oxygen Demand (added from comments)		< 4.0Img/L	Low		
413																	
2	1	09-2378	Tampa Bay	Coastal Hisborough Bay Trbutary	Hisborough	1536E	Palm River	Estuary	3M	Nutrients	Nutrients (Chlorophyl-a)			Median TN = 0.84 mgA	Low		
414																	
415 ... 2	1	09-2379	Tampa Bay	Coastal Hisborough Bay Trbutary	Hisborough	1536F	Sbanie Creek	Stream	3F		Dissolved Oxygen	Biochemical Oxygen Demand (added from convnents)		<5.0 mg&	Medium		
2	1	09-2380	Tampa Bay	Coastal Hillsborough Bay Tributary	Hisborough.	1536F	Sticmie Creek	Stream			Nutrients (Chlorophyl-a)			Median TN = 0.87 mg.11	Medium		
$16																	
2	2	09-2320	Tampa Bay Tnbutaries	Hillsborough River	Polk	1537	Lake Nere	Lake	3F		Lead			Pb s e"(1.273[InHj-4.705)	Medium		
417																	
2	2	09-2321	Tampa Bay Tributaries	Hillsborough River	Polk	1537	Lake Wire	Lake	3F		Nutrients (MI)			TSI < 40; Color < 40	Medium		
418																	
419 1	5	09-1044	Springs Coast	Anclote River I Coastal Pinellas County	Pinelas	1538	Curlew Creek Tidal	Estuary	3M	Dissolved Oxygen	Dissolved Oxygen	Nutrients (added from comments)		< 4.0 mg&	High		
1	5	09-1099	Springs Coast	Ancbte River I Coastal Pinellas County	Pinelas	1538	Curlew Creek Tidal	Estuary	3M		Mercury (in fish tissue)			Exceeds DoH threshold (> 0.43 r[11]91.4).....	High		
420																	
1	5	09-1046	Springs Coast	Anclote River / Coastal Pinellas County	Pinellas	1538	Curlew Creek Tidal	Estuary	3M	Nutrients	Nutrients (Chlorophyll-a)			Median TN = 1.65 mgt	High		

A-411

Al f Cycle

6

Cycle	Group	OGC Case Numb ,	Group Name	Planning Unit	County (-ies)	VVBID	Water Segment Name	Water-body Type	Water-body Clasc.	1998 303(d) Parameters of Concern ,	Parameters Assessed Using the **Impaired** Waters Rule (IWR)	Dissolved Oxygen:Biology Pollutant of Concei	**DO** ;Nutrient / **Biology TN , TP , BOO** Median Values (mgIL)[2]	Concentration of Criterion or **Threshold Not** *FT*	Priority for **TMDL Development'**	**Projected Year For** TMOL Development	**Verified Assessmei**
	3	1	**13-0192**	Tampa **Bay**	**Coastal Old Tampa Bay Tributary**	**Pinellas**	**1574A**	**Alligator Lake**	**Lake**	3F	**Nutrients**	Nutrients (TSI)		**TN= 0.753 (n = 118) TP = 0.14 (n = 117) BOD = 3 (n = 54)**	**TSI s 40, Color s 40**	**Medium**		**2005 (52; C 2006 (53; C 2007 (51; C 2008 (51; C 2009 (57; C 2010 (54; C 2011 (51; C**
491																	
492	**2**	1	**09-2442**	**Tampa Bay**	**Coastal Old Tampa Bay Tributary**	**Pinellas**	**1575**	**Mullet Creek Tidal**	**Estuary**	**3M**	**Dissolved Oxygen**	**Dissolved Oxygen**	**Nutrients (added from comments)**		**< 4.0 mgt**	**Low**		
	2	**1**	**09-2444**	**Tampa Bay**	**Coastal Old Tampa Bay Tributary**	**Pinellas**	**1575**	**Mullet Creek Tidal**	**Estuary**	**3M**	**Nutrients**	**Nutrients (Chbrophyll-a)**			Median TN = 0.97 mg/l	**Medium**		
493																	
494	**2**	**1**	**09-2361**	**Tampa Bay**	**Coastal HMsborough Bay Tributary**	**Hillsborough**	**1576**	**Mango Drain**	**Stream**	**3F**		**Dissolved Oxygen**	**Nutrients (added from comments)**		**< 5.0 nig/L**	**Medium**		
495	**3**	**1**	**13-0193**	**Tampa Bay**	**Coastal Hillsborough Bay Tributary .....**	**Hilsborough**	**1576**	**Mango Drain**	Stream	3F		**Fecal Coliform**			**s 400 Counts! 100**	**Low**		**34/8**
496	**3**	1	**13-0194**	**Tampa Bay**	**Coastal Hlsborough Bay Tributary**	**Hillsborough**	**1576**	**Mango Drain**	**Stream**	**3F**		**Nutrients (Chbrophyl-a)**		TN = 1.13 (n = 85) TP = 0.189 (n = 84) BOD = 2.4 (n = 41)	s 20 **pglL**	**Medium**		**2005 (9 2006 (11 2008 (22 2009 (15 2010 (15 2011 (22**
		1	**13-0195**	**Tampa Bay**	**Coastal Old Tampa Bay Tributary**	**Hillsborough**	**1577A**	**Pepper Mound Creek**	**Estuary**	**3M**		Dissolved Oxygen (Nutrients and **BOD)**	Total Nitrogen, Total Phosphorus. Biochemical Oxygen Demand	TN= 1.28 (n = 29) TP = 0.31 (n = 29) BOD = 2.35 (n = 22)	**z 4.0 nigfL**	**Medium**		

1 0 **Sheet1**

READY

APPENDIX A-5

Field Notes and Photos

Typical Project Conditions Photos

The photos shown are a selection of photos take between October 2012 and September 2014. They show the overpasses, typical swales and ditches, cross drains, the Tampa Bypass Canal, and new sidewalk.

Ditch Bottom Inlet

Shoulder Gutter Inlet on Overpass

Swale/Ditch adjacent to Overpass

Shoulder Gutter on Overpass

Shallow Swale

Double 10’x8’ Bridge Culvert at Bruce Creek, Station 121+09

Bruce Creek East Side of US 301

Wet Ditch

Maintained Wet Ditch

New Asphalt

Section of New Sidewalk

Double 36” Cross Drain at Station 147+11

30” Cross Drain at Station 175+49

Bridge Over Tampa Bypass Canal

10’x8’ Box Culvert at Station 248+42

Overpass Embankment West Side of
US 301 South of Broadway Avenue

Overpass Embankment West Side of
US 301 South of RR, North of SR 60

Florida State Fairgrounds Entrance

APPENDIX B

Miscellaneous Maps

APPENDIX B-1

Project Area 1’ Contours

0 50 200
Feet

CSX RAILROAD

DOUBLE 10' X8' CBC

BRANDON FORD

BRANDON FORD

ADAMO DR

US 301

60

BASIN 1

BASIN 2

BASIN 3

STA. 100+00

STA. 113+00

STA. 122+00

HOPEWELL INDUSTRIAL CENTER

OLD HOPEWELL RD

COURTESY TOYOTA SCION

COURTESY TOYOTA SCION

MARATHON

ENTERPRISE RENT-A-CAR

$date$

ANALYTIC ENGINEERING, INCORPORATED
4511 N. Himes Ave., Suite 200
Tampa, Florida 33614
Certificate of Authorization Number 28187
EOR: Alphonse J. Stewart, PE 38838

110

BASELINE & STATIONS CE:XXXX
EXISTING R.O.W.
PROPOSED R.O.W.
MILLING & OVERLAY
PROPOSED PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK
KM TRAFFIC SIGNAL
1///mi PAVEMENT REMOVED

US 301 (SR 43) POSE STUDY

FROM SR 60 (ADAMO DRIVE) TO 1.4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

PROJECT AREA 1 ' CONTOURS

SHEET: 1

0 50 200
Feet

DOUBLE 10'X8' CBC

DOUBLE 36" RCP

BASIN 2

BASIN 3

BASIN 4

STA. 132+00

STA. 82+00

MEADOW CREEK

ACE HARDWARE RETAIL SUPPORT CENTER

MASSARO BLVD

GOODYEAR TRUCKWISE TIRE CENTER

PPG PORTER PAINTS

CASE CONSTRUCTION

KRAUSS BLVD

AIRGAS SOUTH

TAMPA EAST BLVD

US 301

ELEVEN

AUTOMOTIVE & INDUSTRIAL PAINT SUPPLIES

OLD COPPER RD

SIMS CRANE & EQUIPMENT

STANNUM ST

SOUTHERN EQUIPMENT CORP

COLUMBUS DR

CENTER POINT BUSINESS PARK

$date$

ANALYTIC ENGINEERING, INCORPORATED
4511 N. Himes Ave., Suite 200
Tampa, Florida 33614
Certificate of Authorization Number 28187
EOR: Alphonse J. Stewart, PE 38838

110

BASELINE & STATIONS
EXISTING R.O.W.
PROPOSED R.O.W.

txxxxx>4 MILLING & OVERLAY
PROPOSED PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK

TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

FROM SR SO (ADAMO DRIVE) TO I-4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY

WORK PROGRAM SEGMENT NO.430501-1

FDOT

PROJECT AREA f' CONTOURS

SHEET: 2

$date$

ANALYTIC ENGINEERING, INCORPORATED
4511 N. Himes Ave., Suite 200
Tampa, Florida 33614
Certificate of Authorization Number 28187
EOR: Alphonse J. Stewart, PE 38838

110

BASELINE & STATIONS
EXISTING R.O.W.
PROPOSED R.O.W.
MILLING & OVERLAY
PROPOSED PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

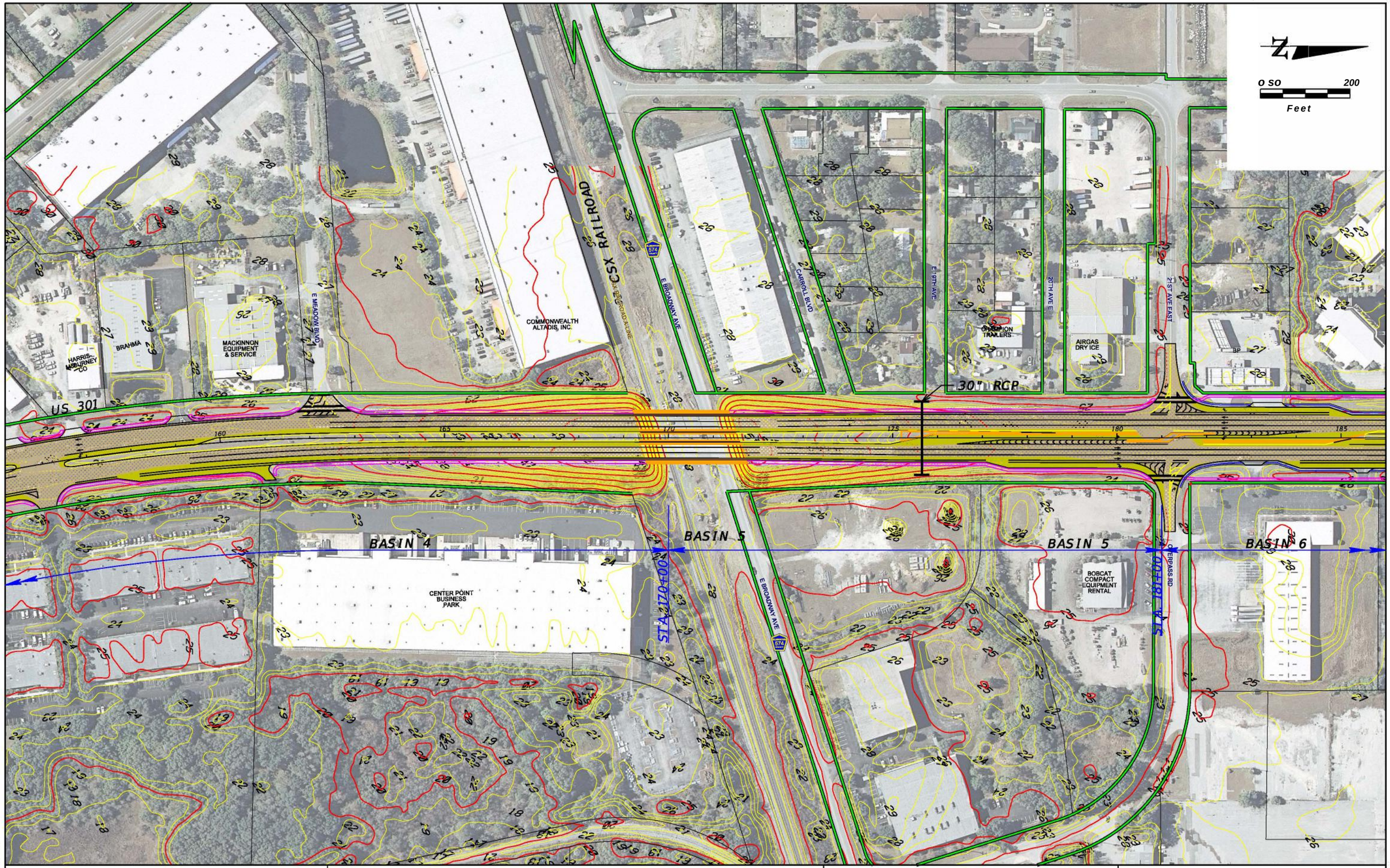
FROM SR 50 (ADAMO DRIVE) TO I-4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

PROJECT AREA f' CONTOURS

SHEET: 3



$date$

ANALYTIC ENGINEERING, INCORPORATED
4511 N. Himes Ave., Suite 200
Tampa, Florida 33614
Certificate of Authorization Number 28187
EOR: Alphonse J. Stewart, PE 38838

110

- BASELINE & STATIONS
- EXISTING R.O.W.
- PROPOSED R.O.W.
- MILLING & OVERLAY
- PROPOSED PAVEMENT
- PROPOSED BRIDGE
- PROPOSED SIDEWALK
- TRAFFIC SIGNAL
- PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

FROM SR 50 (ADAMO DRIVE) TO I-4 (SR 400)

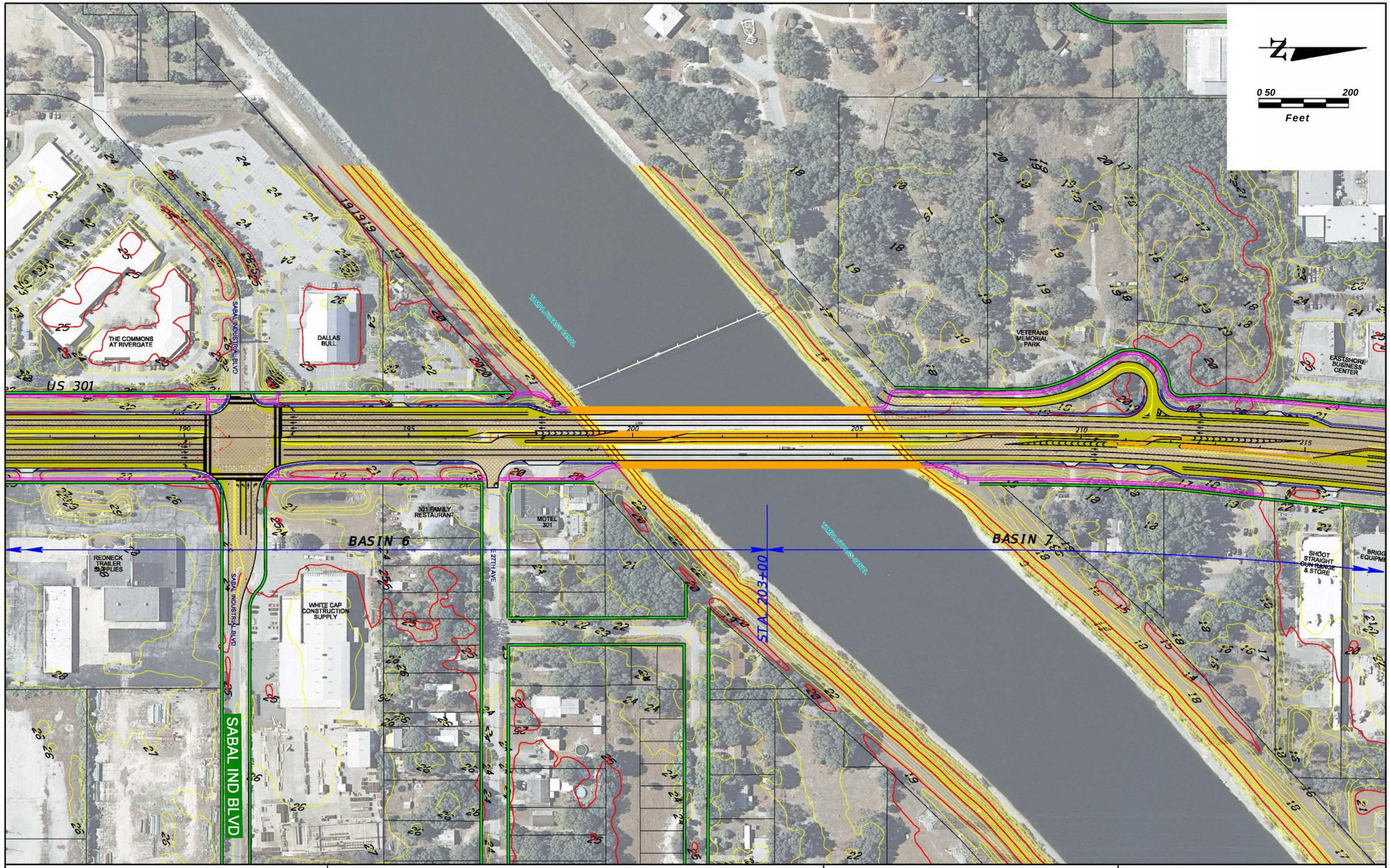
COUNTY: HILLSBOROUGH COUNTY

WORK PROGRAM SEGMENT NO. 430050-1

FDOT

PROJECT AREA f' CONTOURS

SHEET: 4



$date$

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110

- BASELINE & STATIONS
- EXISTING R.O.W.
- PROPOSED R.O.W.
- MILLING & OVERLAY
- PROPOSED PAVEMENT
- PROPOSED BRIDGE
- PROPOSED SIDEWALK
- TRAFFIC SIGNAL
- PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

FROM SR SO (ADAMO DRIVE) TO I-4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY

WORK PROGRAM SEGMENT NO.430050-1

FDOT

PROJECT AREA f' CONTOURS

SHEET: 5

$date$

ANALYTIC ENGINEERING, INCORPORATED
4511 N. Himes Ave., Suite 200
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Certificate of Authorization Number 28187
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110
BASELINE & STATIONS
EXISTING R.O.W.
PROPOSED R.O.W.
txxxxx><! MILLING & OVERLAY
PROPOSED PAVEMENT
8888888888881 PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 30 f (SR 43J PD&.E STUDY

FROM SR SO (ADAMO DR/YE) TD / •4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

PROJECT AREA f' CONTOURS

SHEET: 6

0 50 200
Feet

DRIVEWAY CONNECTIONS TO BE REMOVED

US 301

FLORIDA STATE FAIRGROUNDS

10' X 8' CBC

BASIN 8

BASIN 9

STA 248+40

STA 262+00

COMFORT SUITES

LAQUINTA INN & SUITES

HOLIDAY INN EXPRESS & SUITES

FIVE GUYS

BP

KER'S WINGHOUSE BAR & GRILL

RED ROOF INN

I-4

$date$

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110 BASELINE & STATIONS
EXISTING R.O.W.
PROPOSED R.O.W.
MILLING & OVERLAY
PROPOSED PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

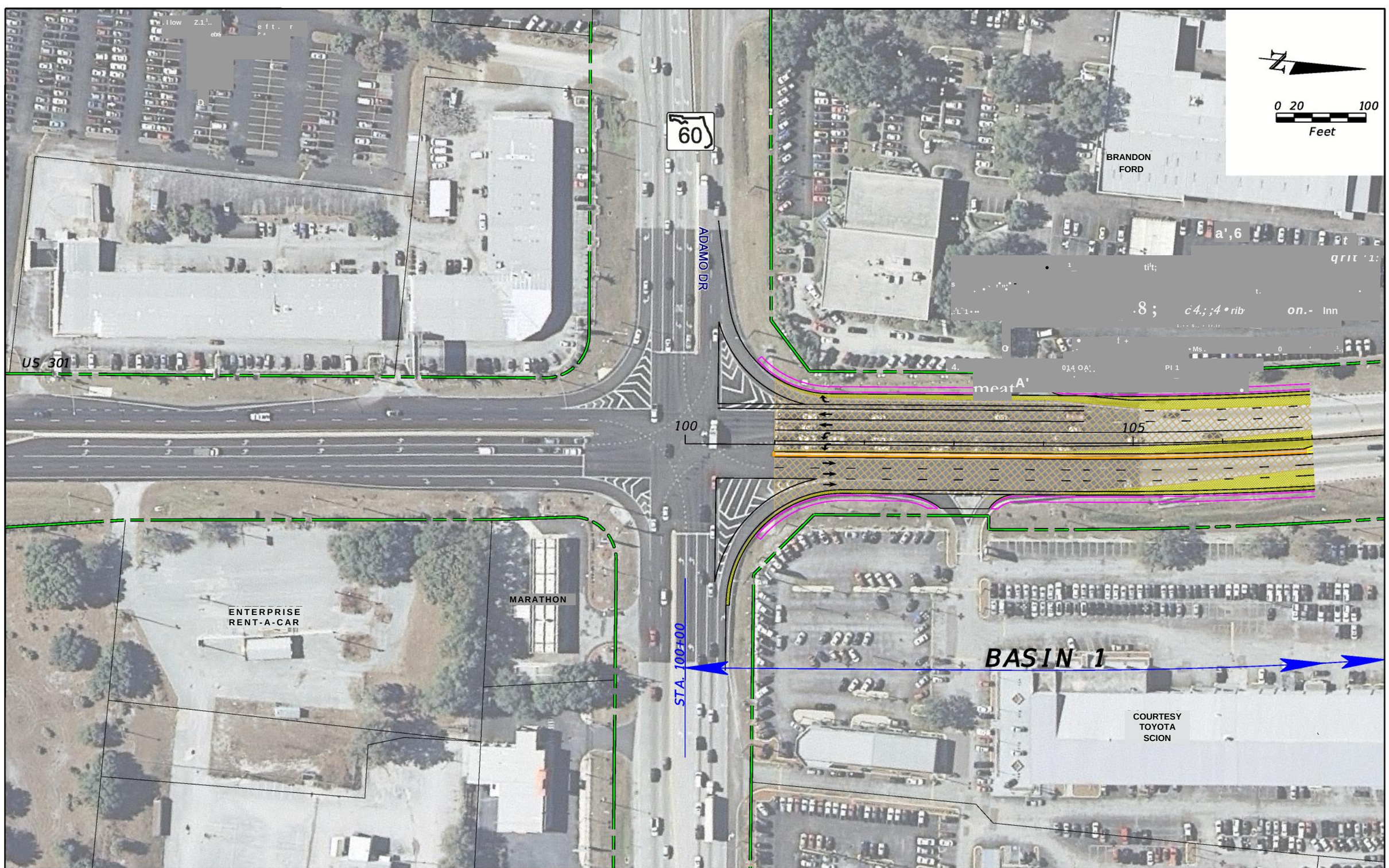
US 301 (SR 43) PD&E STUDY
FROM SR 50 (ADAMO DRIVE) TO I-4 (SR 400)
COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

PROJECT AREA f' CONTOURS

SHEET: 7

APPENDIX B-2

Roadway Drainage Basins



$date$

ANALYTIC ENGINEERING, INCORPORATED
4511 N. Nimes Ave., Suite 200
Tampa, Florida 33614
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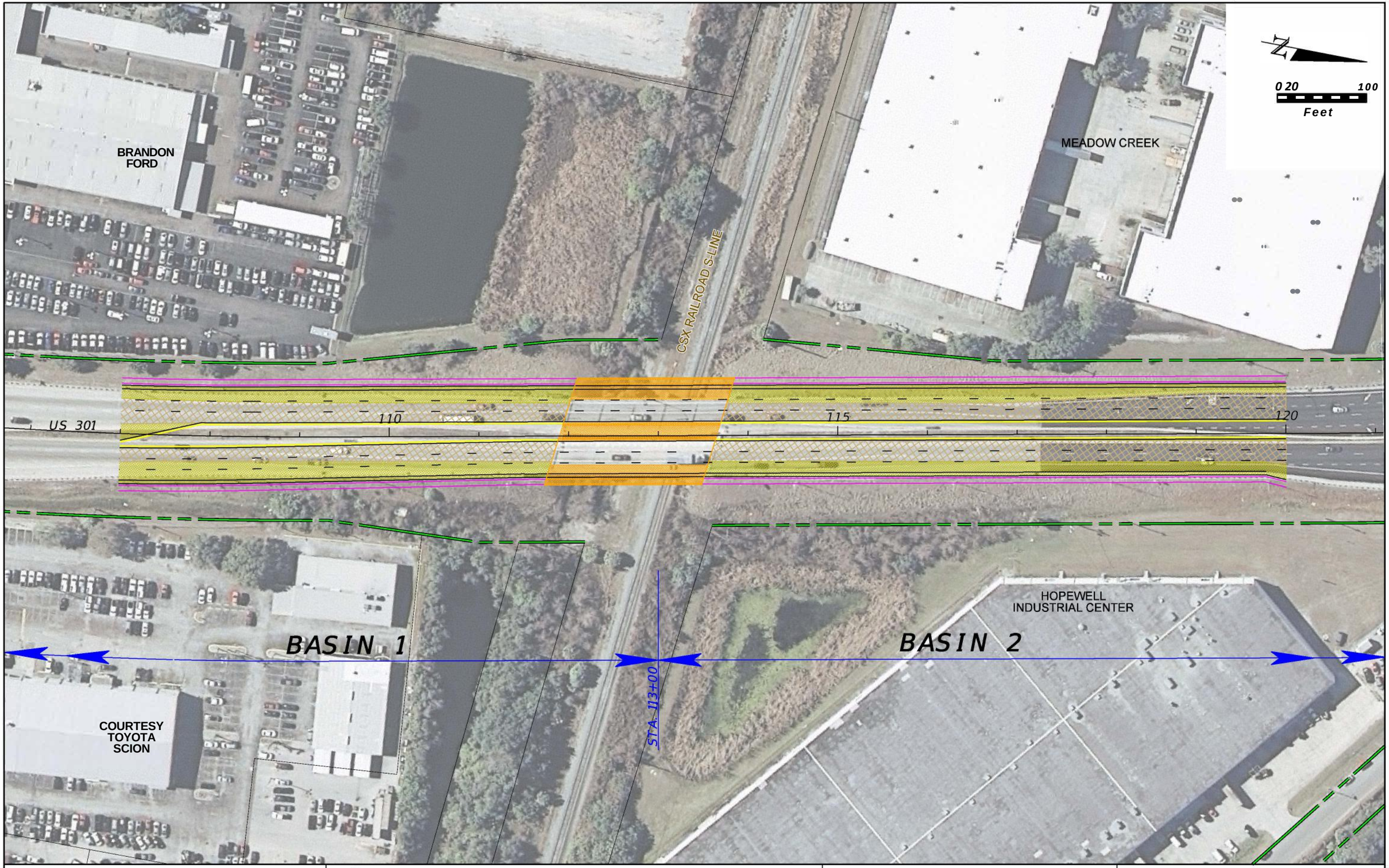
110 BASELINE & STATIONS LEX= MILLING & OVERLAY En TRAFFIC SIGNAL
==== EXISTING R.O.W.
PROPOSED P.O.W.
PROPOSED PAVEMENT VZ/7///1 PAVEMENT REMOVED
PROPOSED BRIDGE
PROPOSED SIDEWALK

US 301 (SR deal FrOBE STUDY
FROM SR 60 (AMMO DRIVE) TO 1.4 (SR 400)
HILLSBOROUGH COUNTY
FDOT

ROADWAY DRAINAGE BASINS

SHEET: 1



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ΑΝΑΛΥΤΙΧ ΕΝΓΙΝΕΕΡΙΝΓ, ΙΝΧΟΡΠΟΡΑΤΕΔ
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Ταμπα, Φλοριδα 33614
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ΕΟΡ: Αλπηονσε Θ. Στεωαρτ, φΕ 38838

110 ΒΑΣΕΛΙΝΕ & ΣΤΑΤΙΟΝΣ
ΕΞΙΣΤΙΝΓ Ρ.Ο.Ω.
ΠΡΟΠΟΣΕΔ Ρ.Ο.Ω.
ΜΙΛΛΙΝΓ & ΟςΕΡΛΑΨ
ΠΡΟΠΟΣΕΔ ΠΑςΕΜΕΝΤ
ΠΡΟΠΟΣΕΔ ΒΡΙΔΓΕ
ΠΡΟΠΟΣΕΔ ΣΙΔΕΩΑΛΚ
TRAFFIC SIGNAL
PAVEMENT REMOVED

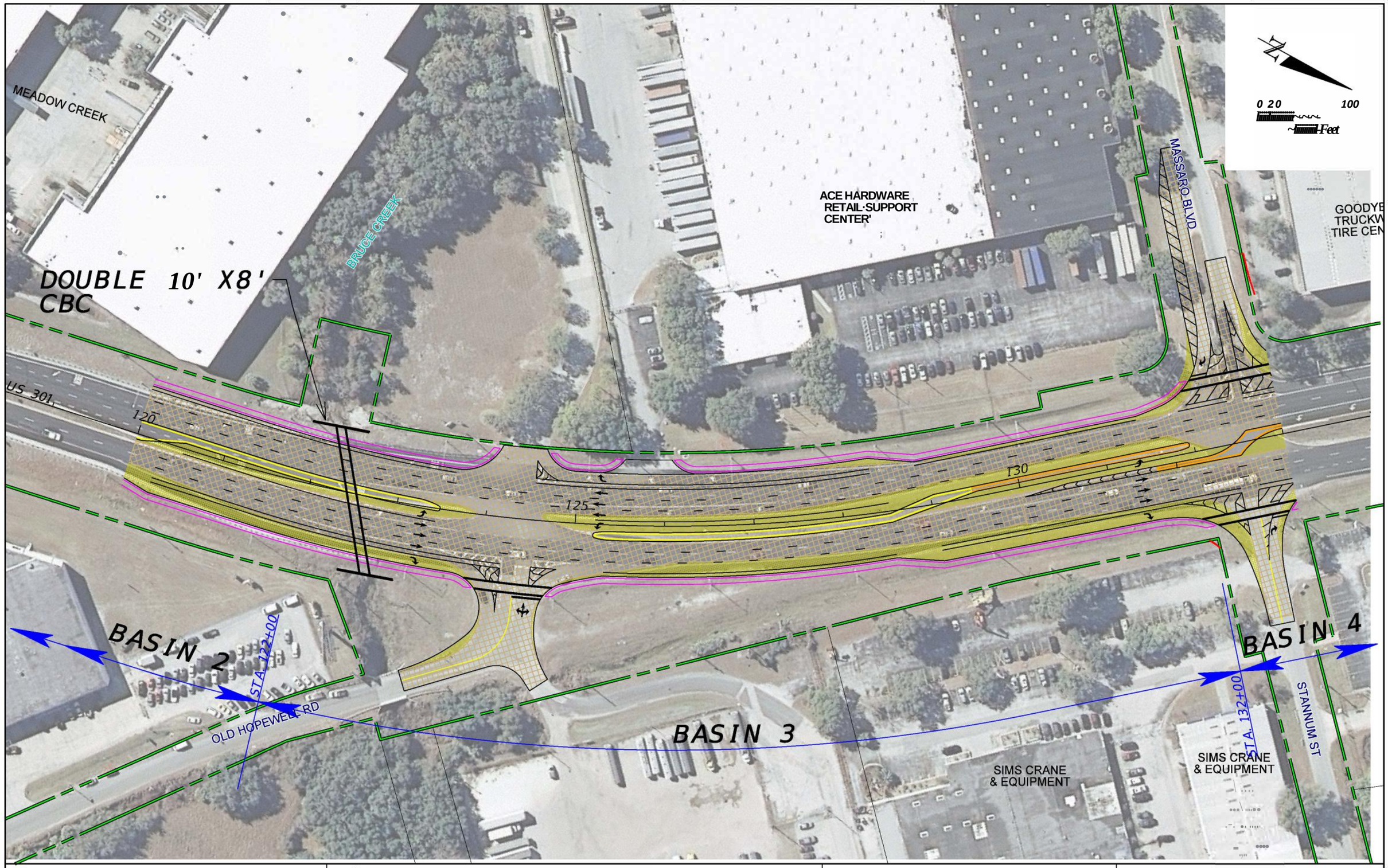
US 301 (SR 43) PD&E STUDY

FROM SR 60 (ADAMO DRIVE) TO SR 674 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS



$date$

ΑΝΑΛΥΤΙΧ ΕΝΓΙΝΕΕΡΙΝΓ, ΙΝΧΟΡΠΟΡΑΤΕΔ
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—— ΠΡΟΠΟΣΕΔ Ρ.Ο.Ω.
(ξξξξξ>< ΜΙΛΛΙΝΓ & ΟςΕΡΛΑΨ
ΠΡΟΠΟΣΕΔ ΠΑςΕΜΕΝΤ
ΩΛ88888888Ι ΠΡΟΠΟΣΕΔ ΒΡΙΔΓΕ
~~~~ ΠΡΟΠΟΣΕΔ ΣΙΔΕΩΑΛΚ
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

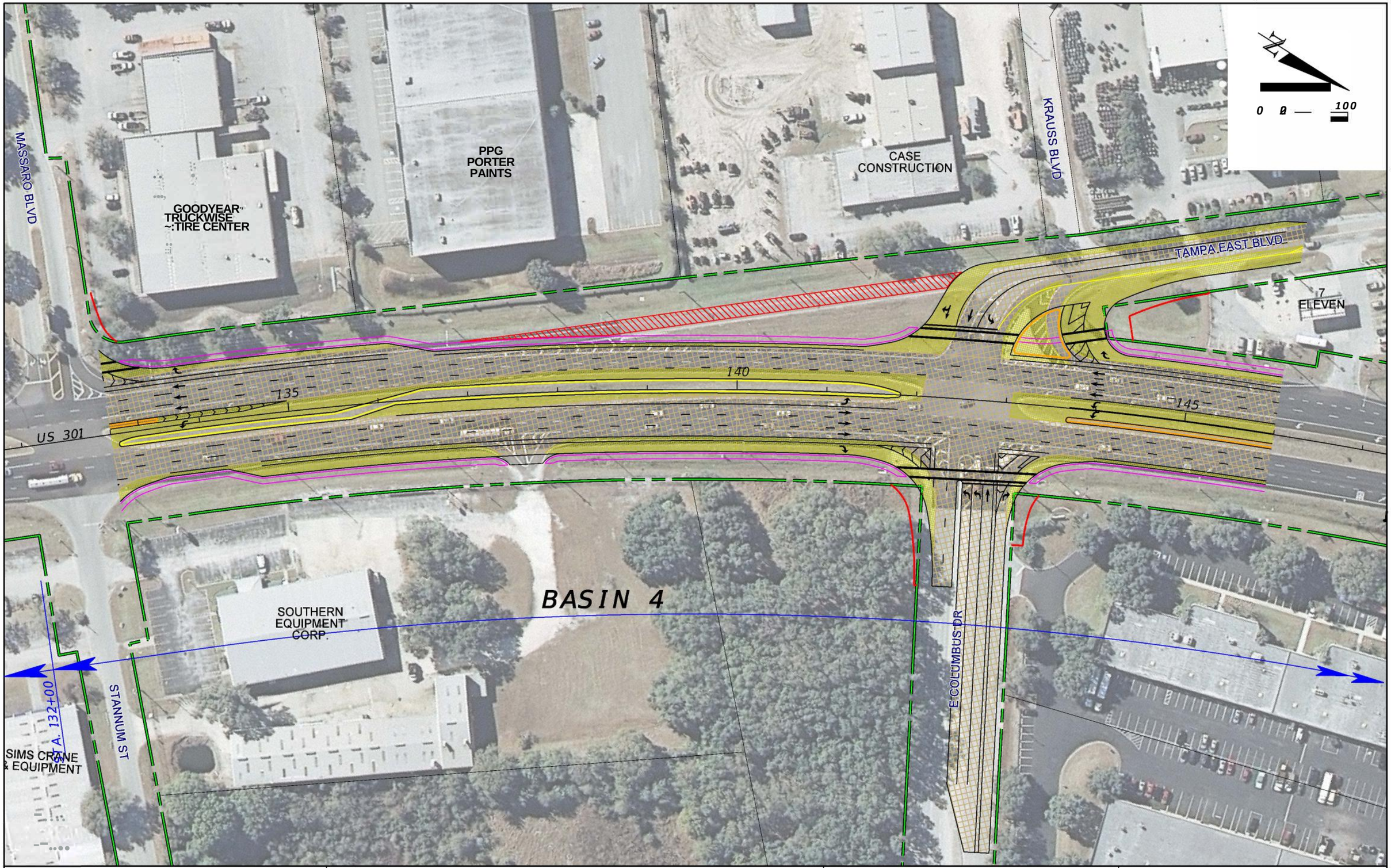
FROM SR 60 (ADAMO DRIVE) TO I-4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

ΣΗΕΕΤ: 3



$dates$

ΑΝΑΛΨΤΙΧ ΕΝΓΙΝΕΕΡΙΝΓ, ΙΝΧΟΡΠΟΡΑΤΕΔ
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ΕΞΙΣΤΙΝΓ Ρ.Ο.Ω.
ΠΡΟΠΟΣΕΔ Ρ.Ο.Ω.
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ΠΡΟΠΟΣΕΔ ΠΑςΕΜΕΝΤ
ΠΡΟΠΟΣΕΔ ΒΡΙΔΓΕ
ΠΡΟΠΟΣΕΔ ΣΙΔΕΩΑΛΚ
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

FROM SR 60 (ADAMO DRIVE) TD /•4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

ΣΗΕΕΤ: 4
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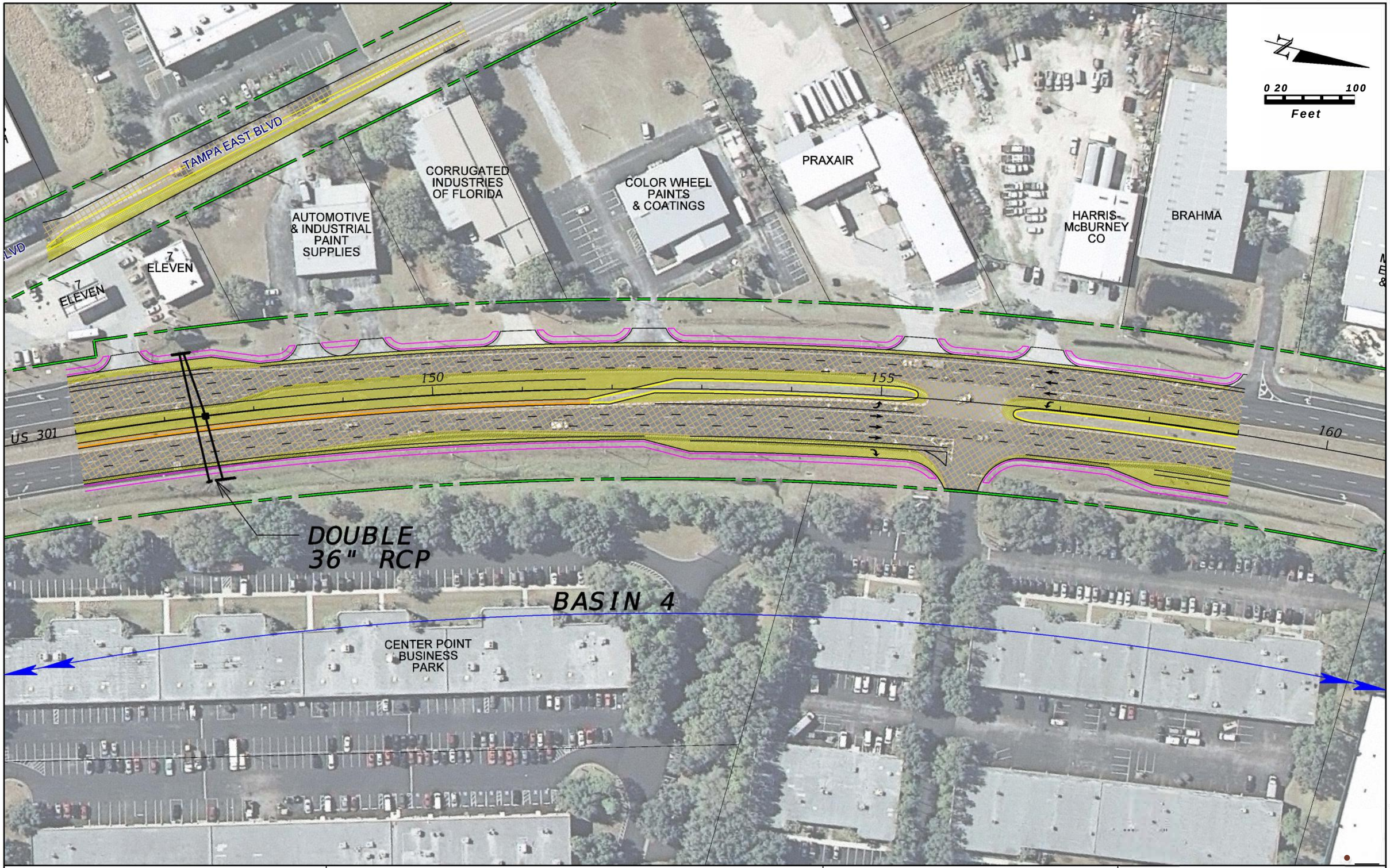


$date$

ANALYTIC ENGINEERING, INCORPORATED
4511 N. Himes Ave., Suite 200
Tampa, Florida 33614
Certificate of Authorization Number 28187
EOR: Alphonse J. Stewart, PE 38838

110
~~-~~ BASELINE & STATIONS
==== EXISTING R.O.W.
---- PROPOSED R.O.W.
(xxxxx><) MILLING & OVERLAY
PROPOSED PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

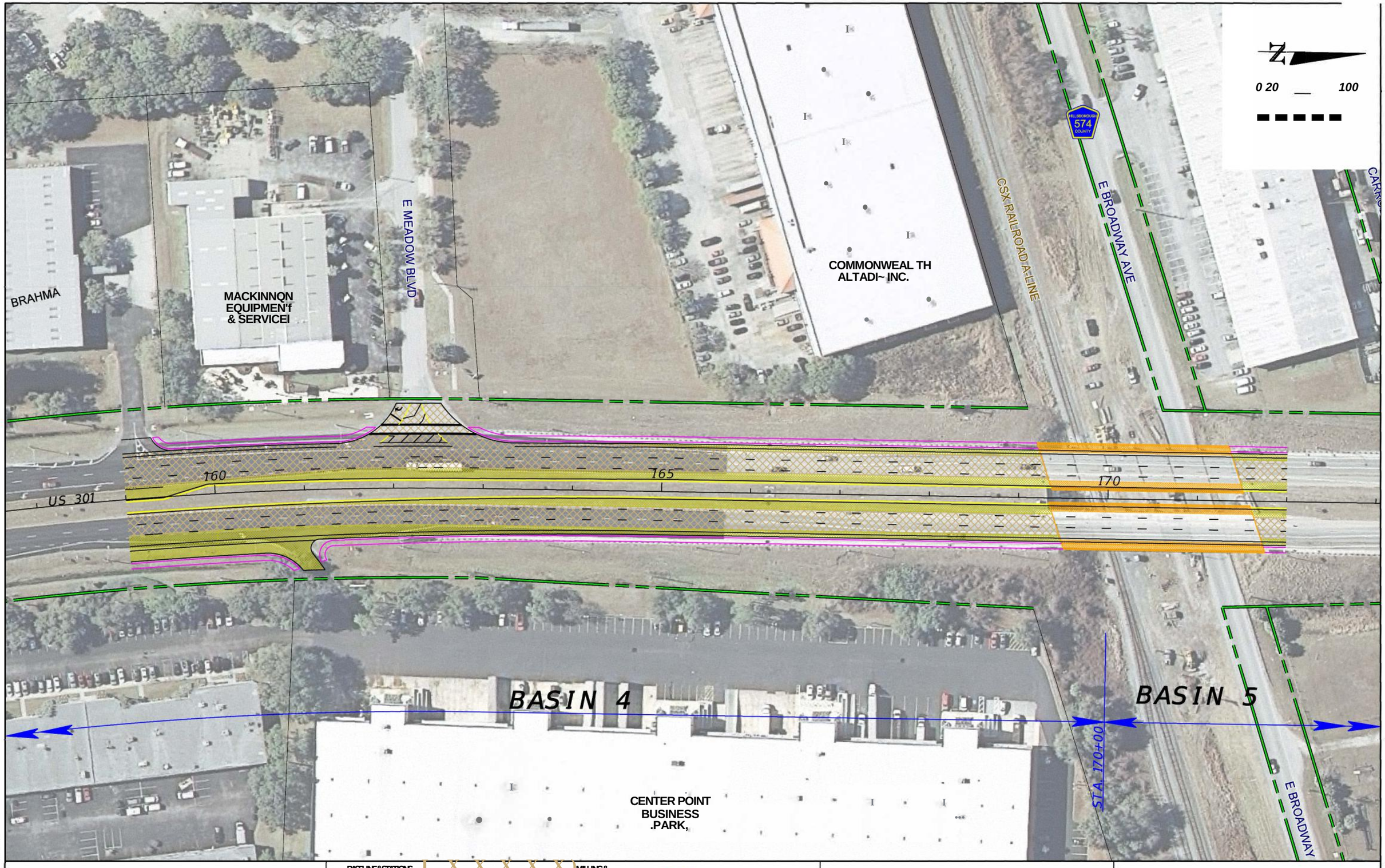
FROM SR 60 (ADAMO DRIVE) TD /•4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

SHEET: 5



$date$

ANALYTIC ENGINEERING, INCORPORATED
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EOR: Alphonse J. Stewart, PE 38838

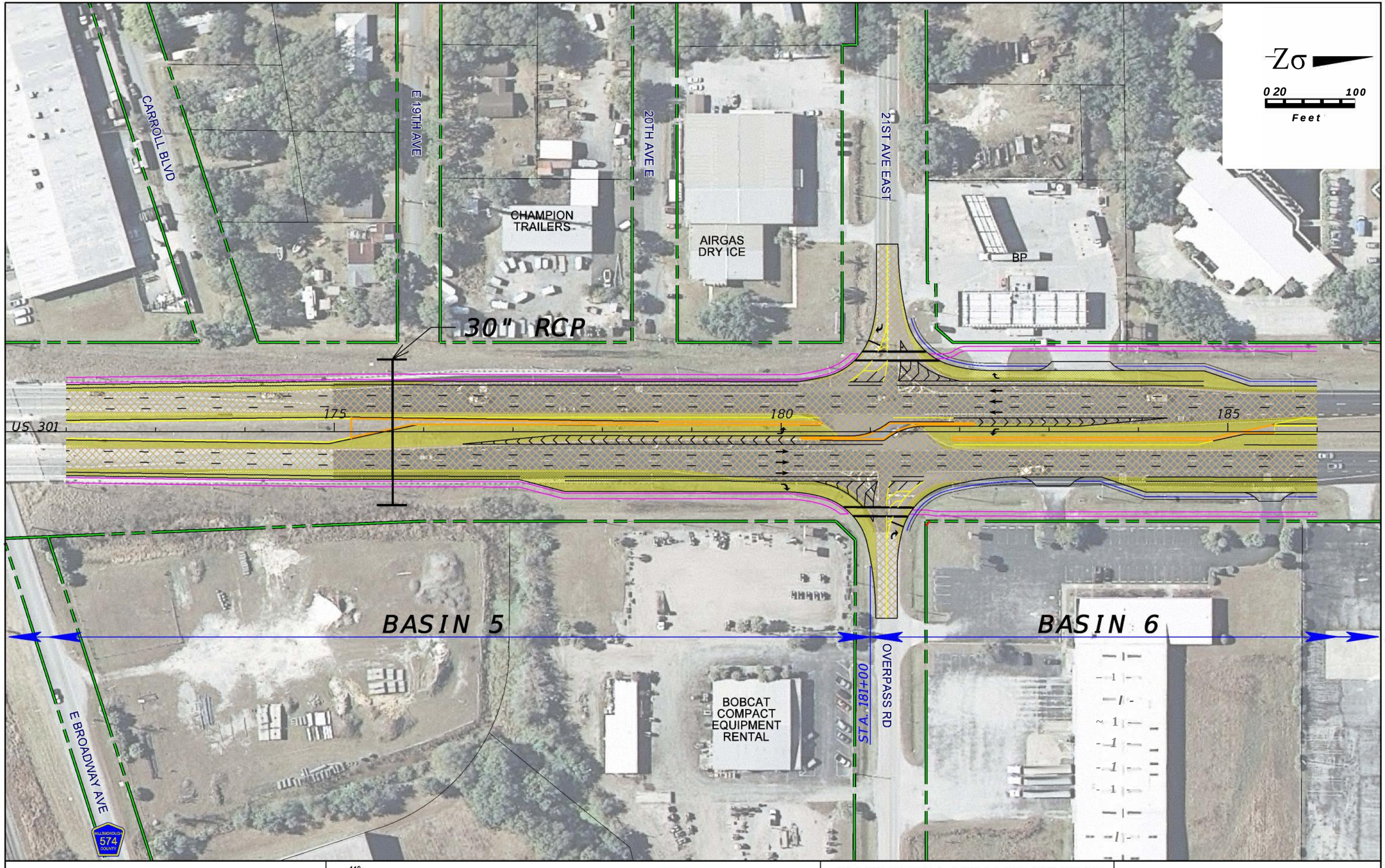
~~~BASELINE&STATIONS
MILLING& OVERLAY110
==== EXISTING R.O.W.
---- PROPOSED R.O.W.
PROPOSED PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 30 f (SR 43) PD&E STUDY FROM SR 60 (ADAMO DRIVE) TO /·4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

ROADWAY DRAINAGE BASINS

SHEET: 6
~~~



ΑΝΑΛΥΤΙΧ ΕΝΓΙΝΕΕΡΙΝΓ, ΙΝΧΟΡΠΟΡΑΤΕΔ
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Ταμπα, Φλοριδα 33614
Χερτιφιχατε οφ Αυτηοριζατιον Νυμβερ 28187
ΕΟΡ: Αλπηονσε Θ. Στεωαρτ, ΠΕ 38838

110
ΒΑΣΕΛΙΝΕ & ΣΤΑΤΙΟΝΣ
ΕΞΙΣΤΙΝΓ Ρ.Ο.Ω.
ΠΡΟΠΟΣΕΔ Ρ.Ο.Ω.
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ΠΡΟΠΟΣΕΔ ΠΑϛΕΜΕΝΤ
ΠΡΟΠΟΣΕΔ ΒΡΙΔΓΕ
ΠΡΟΠΟΣΕΔ ΣΙΔΕΩΑΛΚ
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY
FROM SR 60 (ADAMO DRIVE) TD /•4 (SR 400)
COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1
FDOT

ROADWAY DRAINAGE BASINS
ΣΗΕΕΤ: 7

$date$

THE COMMONS AT RIVERGATE

SABAL INDUSTRIAL BLVD

DALLAS BULL

TAMPA BYPASS CANAL

0 20 40 100
Feet

US 301

190

195

200

REDNECK TRAILER SUPPLIES

BASIN 6

SABAL INDUSTRIAL BLVD

WHITE CAP CONSTRUCTION SUPPLY

301 FAMILY RESTAURANT

E 27TH AVE

MOTEL 301

$date$

110
~~~~ BASELINE & STATIONS
==== EXISTING R.O.W.
---- PROPOSED R.O.W.
(xxxxx><) MILLING & OVERLAY
PROPOSED PAVEMENT
PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

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US 301 (SR 43) PD&E STUDY

FROM SR 60 (ADAMO DRIVE) TD /•4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY

WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

SHEET: 8
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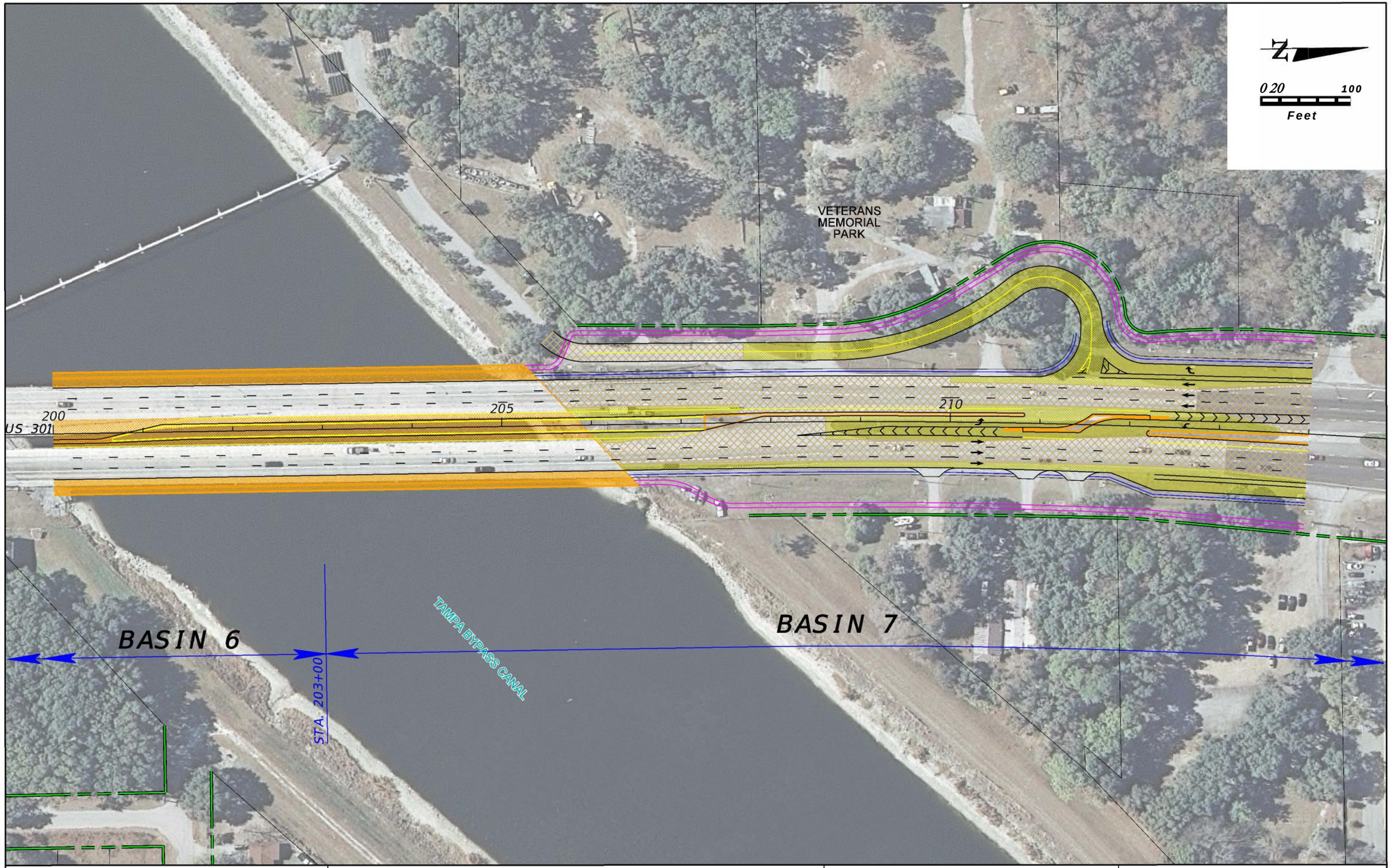

$date$

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4511 N. Himes Ave., Suite 200
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110
.____:_ _ _, BASELINE & STATIONS
==== EXISTING R.O.W.
---- PROPOSED R.O.W.
(XXXXX)α MILLING & OVERLAY
PROPOSED PAVEMENT
8888888888&II PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

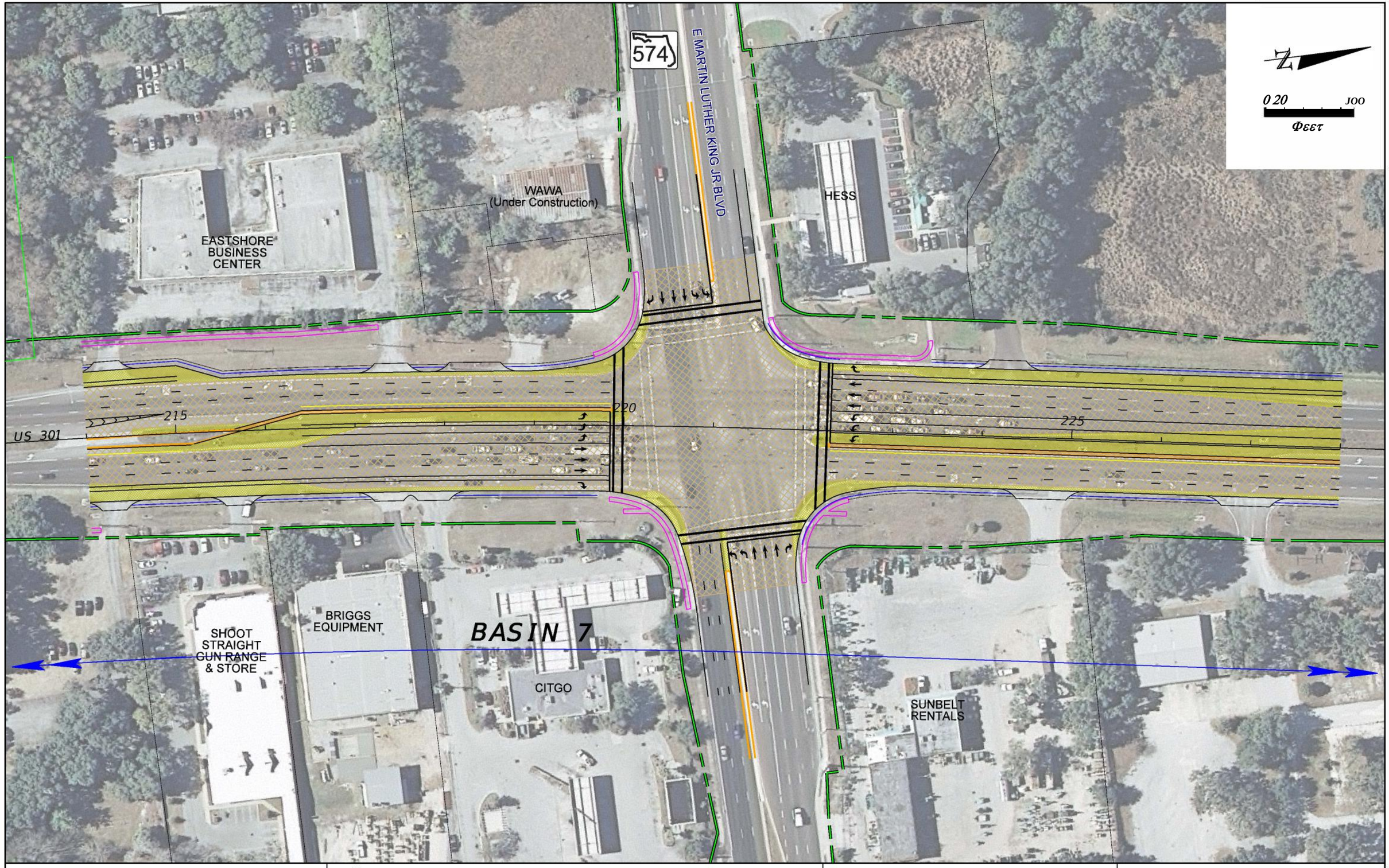
FROM SR 60 (ADAMO DR/YE) TO /•4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

SHEET: 9



$date$

ΑΝΑΛΨΤΙΧ ΕΝΓΙΝΕΕΡΙΝΓ, ΙΝΧΟΡΠΟΡΑΤΕΔ
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==== ΕΞΙΣΤΙΝΓ Ρ.Ο.Ω.
—— ΠΡΟΠΟΣΕΔ Ρ.Ο.Ω.
ΜΙΛΛΙΝΓ & ΟςΕΡΛΑΨ
ΠΡΟΠΟΣΕΔ ΠΑςΕΜΕΝΤ
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ΠΡΟΠΟΣΕΔ ΣΙΔΕΩΑΛΚ
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

FROM SR 60 (ADAMO DRIVE) TD /•4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

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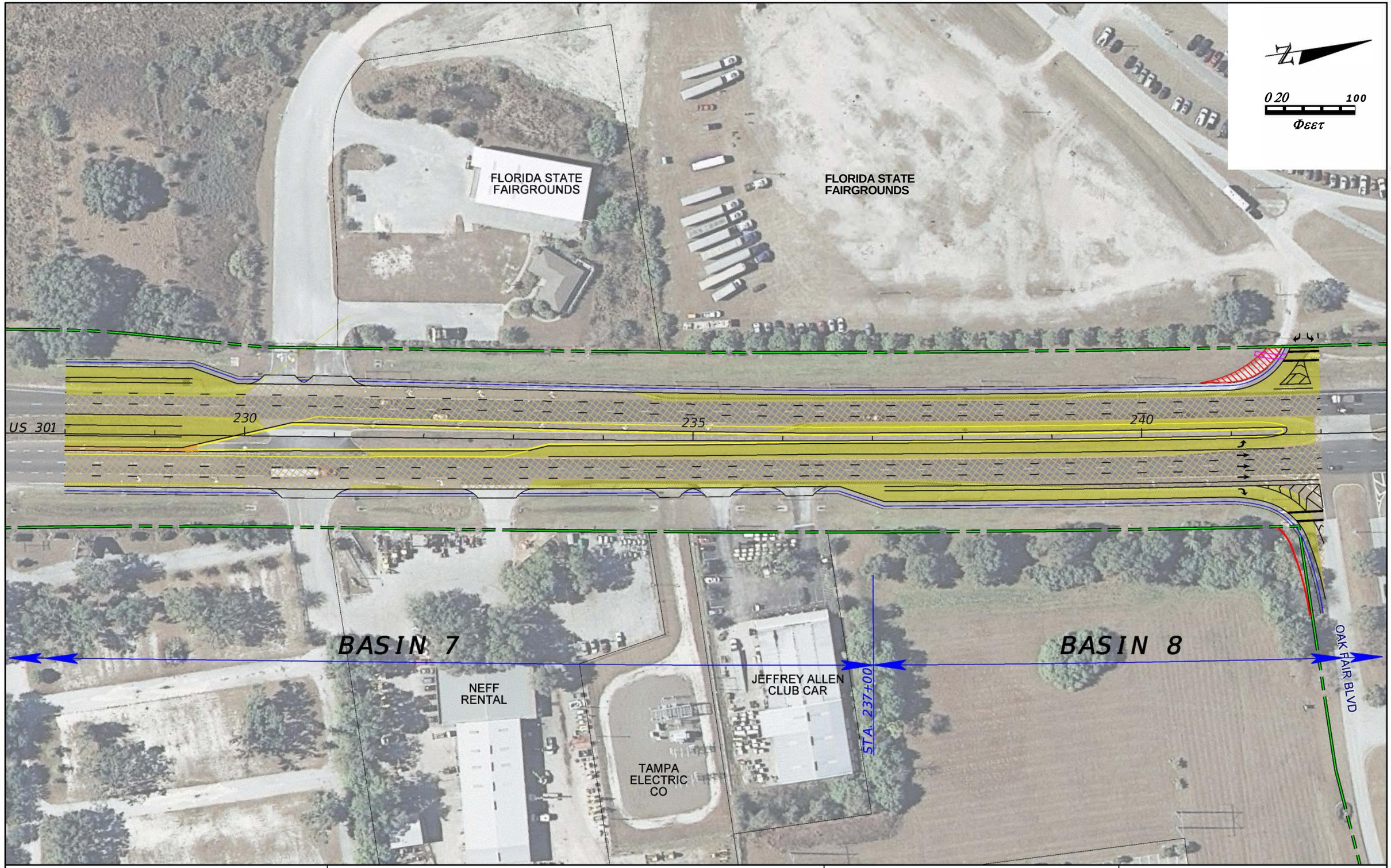

$dates

110
~~~~ BASELINE & STATIONS (XXXXX><i MILLING & OVERLAY
EXISTING R.O.W.
PROPOSED R.O.W.
PROPOSED PAVEMENT
WI888888888I PROPOSED BRIDGE
~~~~ PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

ANALYTIC ENGINEERING, INCORPORATED
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US 30 f (SR 43) PD&E STUDY

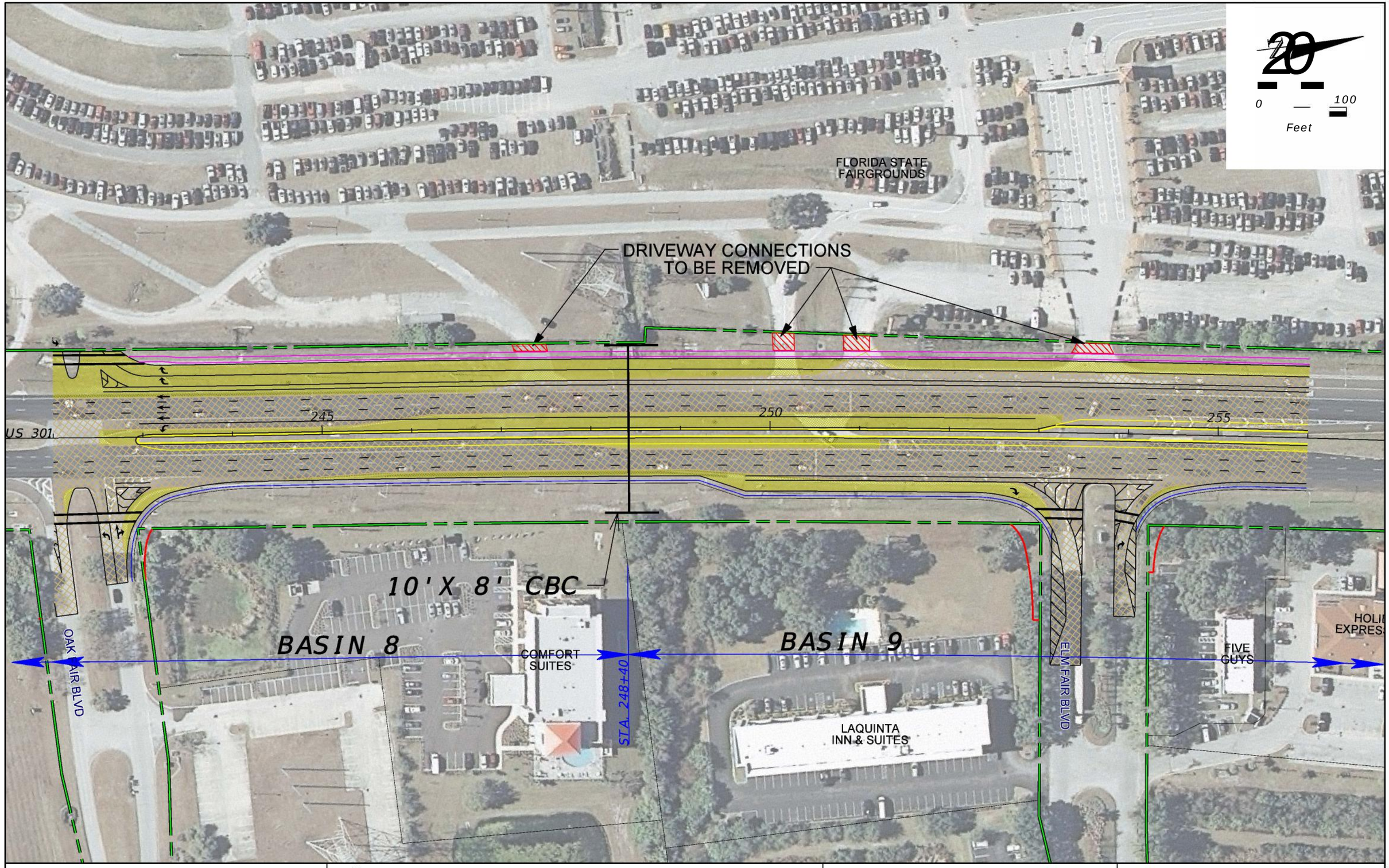
FROM SR 60 (ADAMO DRIVE) TD /•4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

SHEET: 11



$date$

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~~~~ BASELINE & STATIONS
EXISTING R.O.W.
PROPOSED R.O.W.
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PROPOSED PAVEMENT
WI888888881 PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

FROM SR 60 (ADAMO DRIVE) TO I-4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

SHEET: 12
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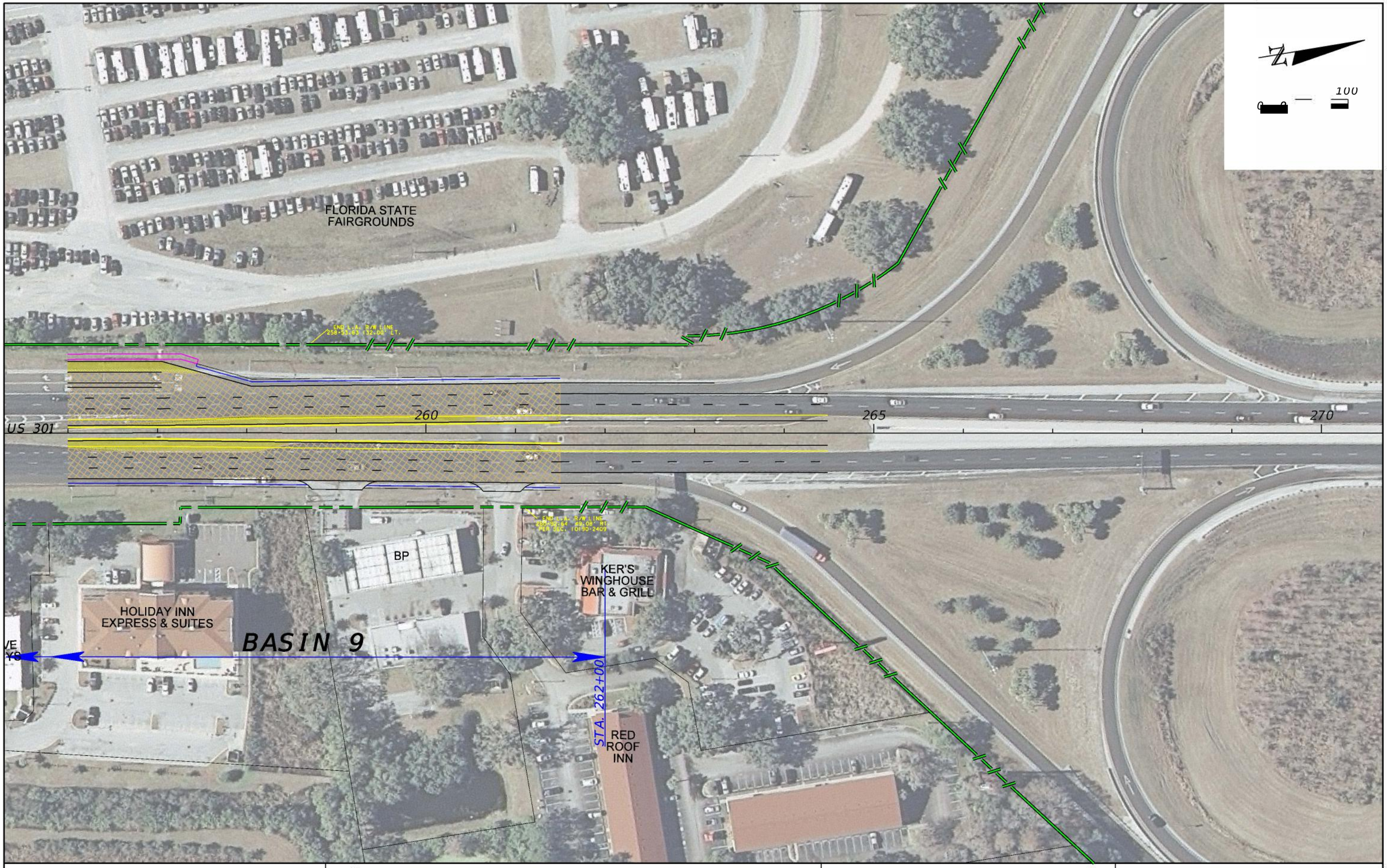

$date$

ANALYTIC ENGINEERING, INCORPORATED
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110
~~~~'BASELINE & STATIONS (xxxxx><) MILLING & OVERLAY
EXISTING R.O.W. PROPOSED PAVEMENT
PROPOSED R.O.W. PROPOSED BRIDGE
PROPOSED SIDEWALK
TRAFFIC SIGNAL
PAVEMENT REMOVED

US 301 (SR 43) PD&E STUDY

FROM SR 60 (ADAMO DRIVE) TO I-4 (SR 400)

COUNTY: HILLSBOROUGH COUNTY
WORK PROGRAM SEGMENT NO. 430050-1

FDOT

ROADWAY DRAINAGE BASINS

SHEET: 13
~~~~

APPENDIX B-3

FIRMettes

onal Flood Insurance Program at 1-800-638-6620.

Hillsborough County
Unincorporated Areas
120112

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

100022

11

Gate S-160

ZONE AE
(EL 19)

Culvert

612010

Tampa Bypass Canal Tributary 2

RAILROAD ROAD

612020

612030

612025

612050

612060

612070

612075

612100

612120

ZONE AE

ZONE AE
(EL 18)

ZONE AE

ZONE X

ZONE X

ZONE X

ZONE A

ZONE A

ZONE AE
(EL 27.1)

MASSARO BL

MASSARO BL

301

STANNUM

RAILROAD ROAD

OLD HOPEWELL RD

78TH ST S

ADAMO DR E

KELSEY LN

CROSSTOWN EXPRESSWAY W

CROSSTOWN E

RIVERGATE DR

SILVER OAK LN

LN

R. 19 E.
R. 20 E.

24

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0378H

FIRM

FLOOD INSURANCE RATE MAP

HILLSBOROUGH COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 378 OF 801

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HILLSBOROUGH COUNTY	120112	0378	H
TAMPA, CITY OF	120114	0378	H

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

MAP NUMBER
12057C0378H

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

onal Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000

FEET

METER

JOINS PANEL 0380 540000 FT

ZONE AE

11

LESLIE RD

BROADWAY AV E

12

RAILROAD ROAD

EAST MEADOW BL

CITY OF TAMPA

HILLSBOROUGH COUNTY

CANAL

MASSARO BL

TAMPA EAST BL

ZONE X

ZONE A

ZONE AE
(EL 21.6)

ZONE A

ZONE X

ZONE A

13

ZONE X

STANNUM ST

301

RAILROAD ROAD

612120

ZONE AE

ZONE AE

ZONE AE
(EL 18)

20

19

612100

18

OLD

ZONE AE

NE AE

Hillsborough County
Unincorporated Areas
120112

MASSARO BL

11

Gate S-160

Hillsboro
Unincorp
1

NFIP

PANEL 0378H

FIRM

FLOOD INSURANCE RATE MAP

HILLSBOROUGH COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 378 OF 801

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HILLSBOROUGH COUNTY	120112	0378	H
TAMPA, CITY OF	120114	0378	H

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

MAP NUMBER
12057C0378H

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

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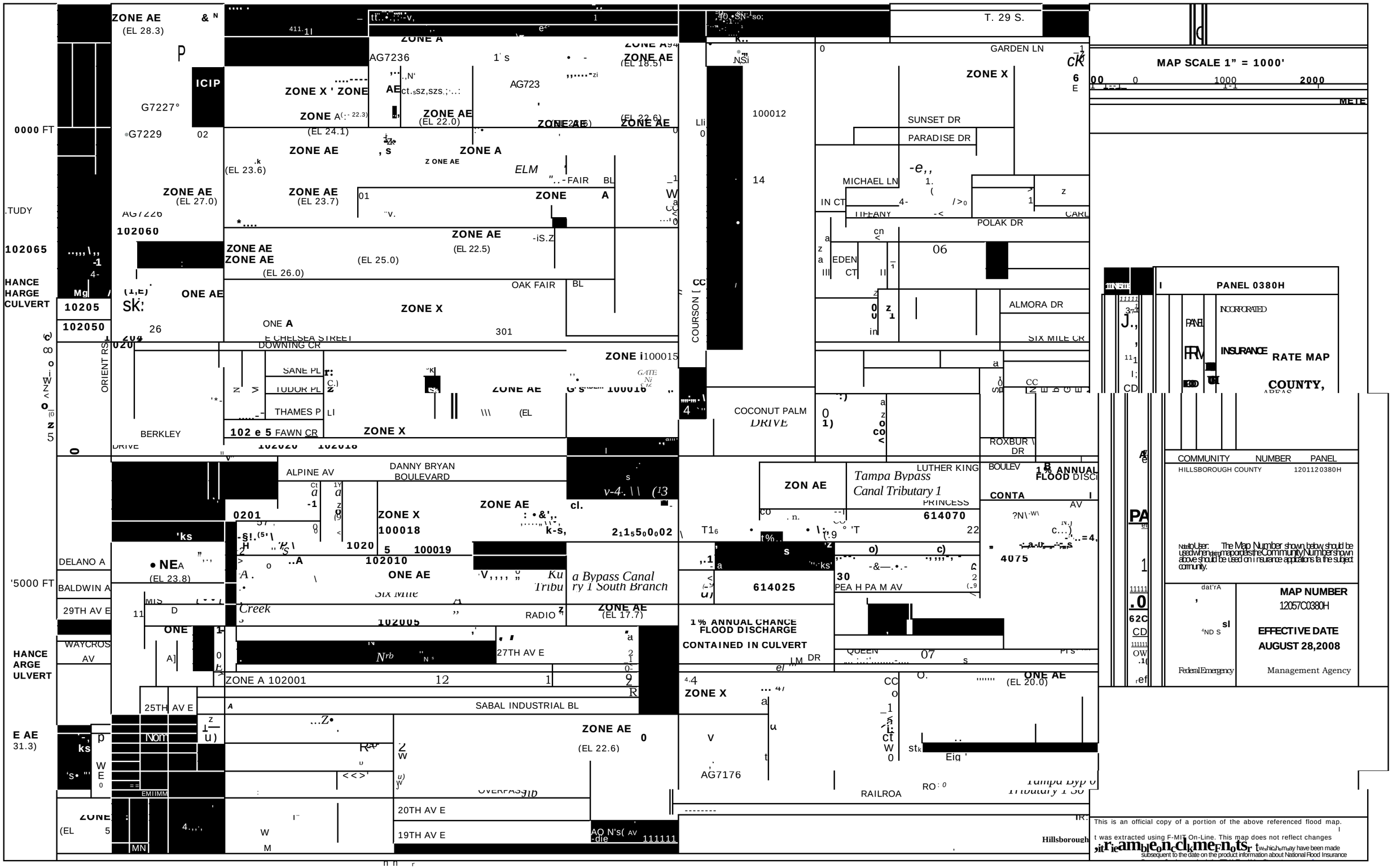
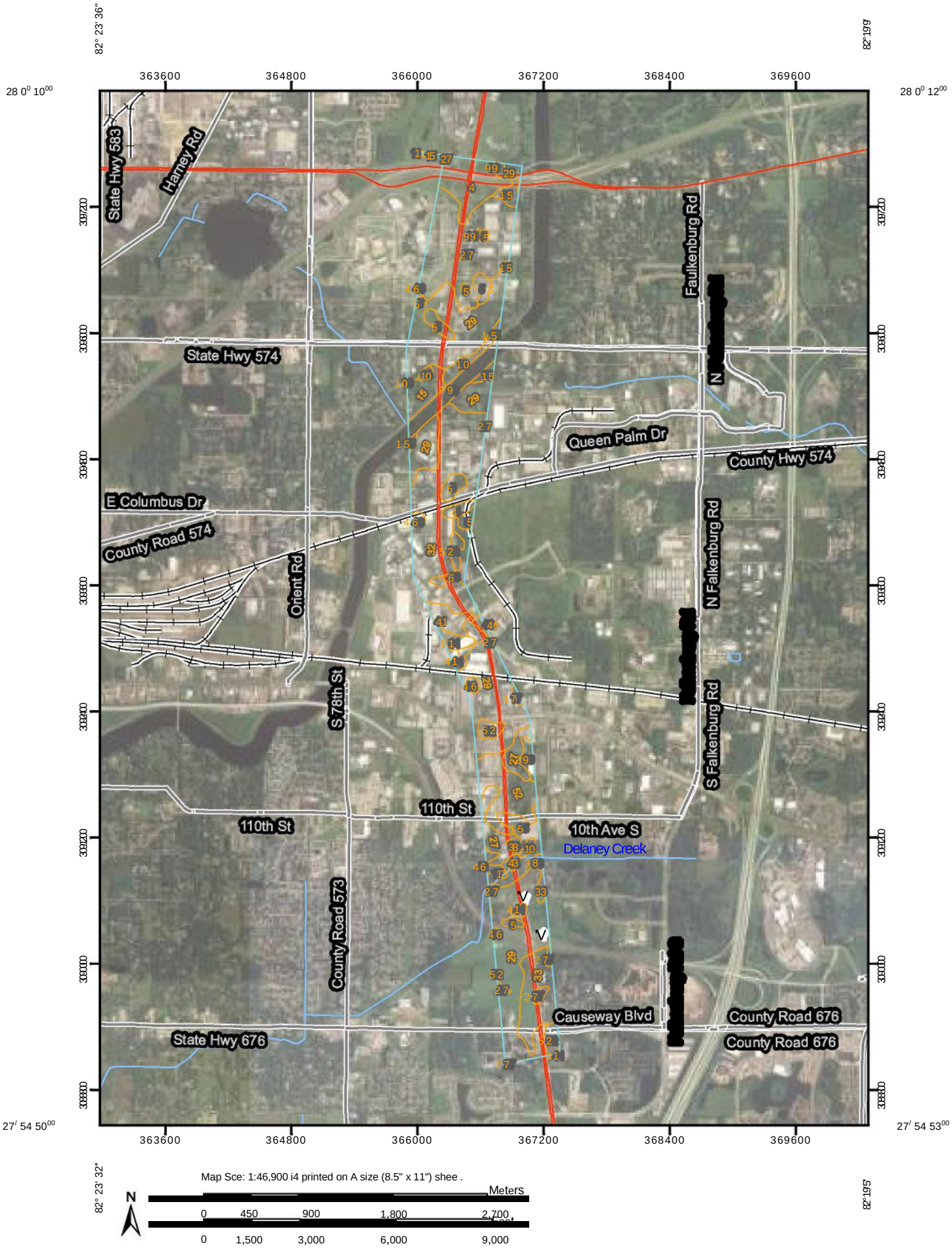

ZONE AE
(EL 28.3)
ZONE A
ZONE X
ZONE AE
(EL 18.5)
ZONE X
ZONE AE
(EL 22.0)
ZONE AE
(EL 24.1)
ZONE AE
ZONE A
ZONE AE
(EL 23.6)
ZONE AE
(EL 27.0)
ZONE AE
(EL 23.7)
ZONE A
ZONE AE
(EL 22.5)
ZONE AE
(EL 25.0)
ZONE AE
(EL 26.0)
ZONE X
ZONE A
ZONE X
ZONE AE
(EL 22.6)
ZONE AE
(EL 17.7)
ZONE AE
(EL 20.0)
ZONE X
1% ANNUAL CHANCE FLOOD DISCHARGE CONTAINED IN CULVERT
ZON AE
Tampa Bypass Canal Tributary 1
Six Mile Creek
Tampa Bypass Canal Tributary 1 South Branch
T. 29 S.
MAP SCALE 1" = 1000'
0 1000 2000
METE
GARDEN LN
SUNSET DR
PARADISE DR
MICHAEL LN
IN CT
TIFFANY CT
POLAK DR
EDEN CT
ALMORA DR
SIX MILE CR
OAK FAIR BL
FAIR BL
ELM
COURSON DR
COCONUT PALM DRIVE
ROXBUR DR
LUTHER KING BOULEV
PRINCESS
CONTA
PEA H PA M AV
QUEEN
LM DR
RAILROA
RO
ALPINE AV
DANNY BRYAN BOULEVARD
DELANO A
BALDWIN A
29TH AV E
WAYCROS AV
27TH AV E
25TH AV E
SABAL INDUSTRIAL BL
20TH AV E
19TH AV E
BERKLEY DRIVE
ORIENT RS
E CHELSEA STREET
DOWNING CR
SANE PL
TUDOR PL
THAMES P LI
102 e 5 FAWN CR
102060
102065
10205
102050
102020
102010
102005
102001
102018
AG7236
AG723
AG7226
AG7176
G7227°
G7229
0000 FT
5000 FT
HANCE HARGE CULVERT
E AE 31.3)
PANEL 0380H
INCORPORATED
INSURANCE RATE MAP
COUNTY,
COMMUNITY NUMBER PANEL
HILLSBOROUGH COUNTY 120112 0380H
MAP NUMBER
12057C0380H
EFFECTIVE DATE
AUGUST 28, 2008
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map.
It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the product information about National Flood Insurance

APPENDIX C

Soils Information


82° 23' 36"
82° 19' 9"
363600
364800
366000
367200
368400
369600
28 0° 10'00"
28 0° 12'00"
State Hwy 583
Harney Rd
Faulkenburg Rd
State Hwy 574
Queen Palm Dr
County Hwy 574
E Columbus Dr
County Road 574
Orient Rd
N Falkenburg Rd
S 78th St
S Falkenburg Rd
110th St
110th St
10th Ave S
Delaney Creek
County Road 573
Causeway Blvd
County Road 676
State Hwy 676
County Road 676
27° 54 50"
27° 54 53"
82° 23' 32"
82° 19' 5"
Map Sce: 1:46,900 i4 printed on A size (8.5" x 11") shee .
N
Meters
0 450 900 1,800 2,700
Feet
0 1,500 3,000 6,000 9,000

MAP LEGEND

Area of Interest (AOI)
Area of Interest (AO1)

Soils
Soil Map Units

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

Special Line Features
Gully
Short Steep Slope
Other

Political Features
Cities

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads

MAP INFORMATION

Map Scale: 1:46,900 if printed on A size (8.5" x 11") sheet.

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 17 N NAD83

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

Soil Survey Area: Hillsborough County, Florida
Survey Area Data: Version 10, Apr 6, 2011

Date(s) aerial images were photographed: 5/21/2007; 8/12/2007; 8/8/2007

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

Map Unit Legend

Hillsborough County, Florida (FL057)			
Map Unit Symbol	**Map Unit Name**	**Acres in A01**	**Percent of A01**
4	Arents, nearly level	65.3	5.0%
5	Basinger, Holopaw, and Samsula soils, depressional	43.0	3.3%
10	Chobee loamy fine sand	19.2	1.5%
11	Chobee muck, depressional	0.0	0.0%
15	Felda fine sand	77.9	5.9%
17	Floridana fine sand	7.3	0.6%
27	Malabar fine sand	215.7	16.4%
29	Myakka fine sand	423.1	32.1%
32	Myakka-Urban land complex	199.6	15.2%
33	Ona fine sand	59.1	4.5%
38	Pinellas fine sand	6.5	0.5%
41	Pomello fine sand, 0 to 5 percent slopes	26.9	2.0%
43	Quartzipsaments, nearly level	3.4	0.3%
46	St. Johns fine sand	30.0	2.3%
52	Smyrna fine sand	90.8	6.9%
61	Zolfo fine sand	10.4	0.8%
99	Water	38.9	3.0%
Totals for Area of Interest		**1,316.9**	**100.0%**

SUMMARY OF USDA SOIL SURVEY
US 301 FROM SR 60 to I-4
HILLSBOROUGH COUNTY, FLORIDA
FPID 430050-1-22-01
TIERRA PROPOSAL NO. 65-12-255

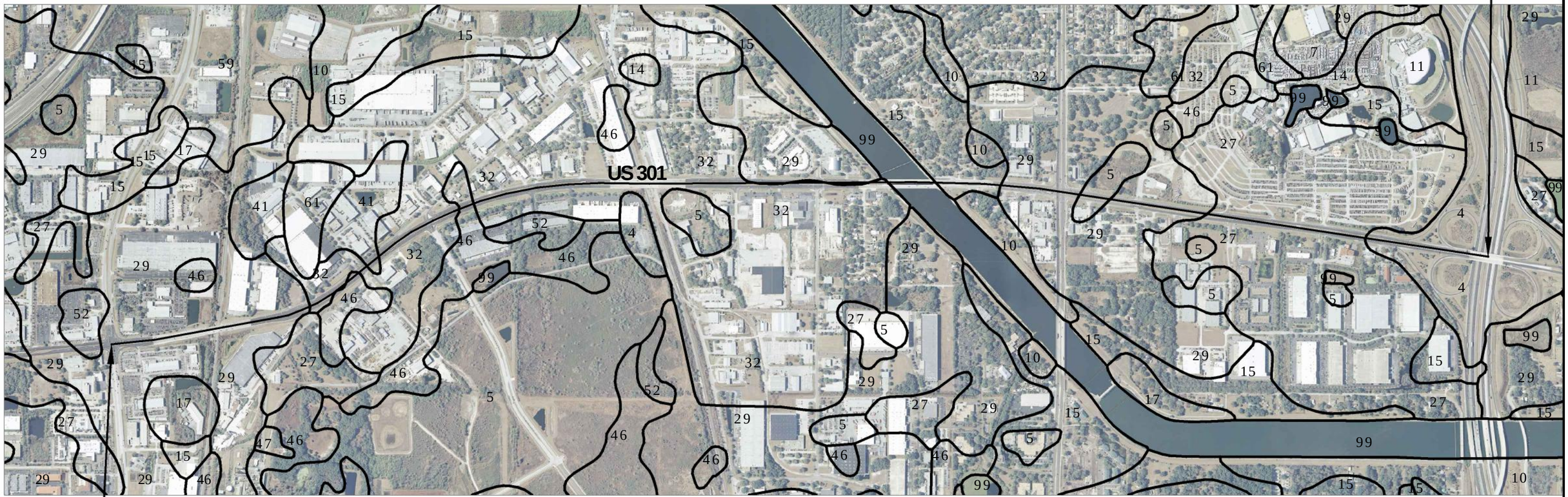
USDA Map Symbol and Soil Name	Depth (in)	Soil Classification		Permeability (in/hr)	pH	Seasonal High Water Table		Risk of Corrosion	
		USCS	AASHTO			Depth (feet)	Months	Uncoated Steel	Concrete
(4) Arents, nearly	*	*	*	*	*	*	*	*	*
(5) Basinger-Holopaw and Samsula soils, depressional	0-7	SP	A-3	6.0 - 20.0	3.6-7.3	+2-1.0	Jan-Dec	High	Moderate
	7-28	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3				
	28-42	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3				
	42-80	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3				
	0-6	SP, SP-SM	A-3	6.0 - 20.0	5.1-7.3				
	6-52	SP, SP-SM	A-3	6.0 - 20.0	5.1-7.3				
	52-80	SM, SM-SC	A-2-4	0.2 - 2.0	5.1-8.4				
	0-34	PT	A-8	6.0 - 20.0	4.5-5.5				
	34-80	SP, SP-SM, SM	A-3, A-2-4	6.0 - 20.0	3.6-5.5			High	High
(10) Chobee loamy fine sand	0-16	SP-SM, SM	A-2-4	2.0 - 6.0	6.1-7.3	0-1.0	June-Feb	Moderate	Low
	16-49	SC	A-2-6, A-2-7, A-6, A-7	<0.2	7.4-8.4				
	49-80	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-7	0.2 - 6.0	7.4-8.4				
(15) Felda fine sand	0-22	SP, SP-SM	A-3	6.0 - 20.0	5.1-7.8	0-1.0	July-March	High	Moderate
	22-45	SM, SM-SC, SC	A-2-4, A-2-6	0.6 - 6.0	6.1-7.8				
	45-80	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	6.1-8.4				
(27) Malabar fine sand	0-12	SP, SP-SM	A-3	6.0 - 20.0	5.1-8.4	0-1.0	June-Nov	High	Low
	12-30	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	5.1-8.4				
	30-50	SP, SP-SM	A-3	6.0 - 20.0	5.1-8.4				
	50-66	SC, SM-SC, SM	A-2, A-4, A-6	<0.2	5.1-8.4				
	66-80	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	5.1-8.4				
(29) Myakka fine sand	0-20	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5	0-1.0	June-Nov	High	High
	20-30	SM, SP-SM	A-3, A-2-4	0.6 - 6.0	3.6-6.5				
	30-80	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5				
(32) Myakka-Urban land complex	0-20	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5	0-1.0	June-Nov	High	High
	20-44	SM, SP-SM	A-3, A-2-4	0.6 - 6.0	3.6-6.5				
	44-80	SP, SP-SM	A-3	6.0 - 20.0	3.6-6.5				
(41) Pomello fine sand, 0 to 5 percent slopes	0-43	SP, SP-SM	A-3	>20.0	4.5-6.0	2.0-3.5	July-Nov	Low	High
	43-55	SP-SM, SM	A-3, A-2-4	2.0 - 6.0	4.5-6.0				
	55-80	SP, SP-SM	A-3	6.0 - 20.0	4.5-6.0				
(46) St. Johns fine sand	0-12	SP, SP-SM	A-3	6.0 - 20.0	3.6-5.5	0-1.0	June-April	High	High
	12-29	SP, SP-SM	A-3	6.0 - 20.0	3.6-5.5				
	29-46	SP-SM, SM	A-3, A-2-4	0.2 - 2.0	3.6-5.5				
	46-80	SP, SP-SM	A-3	6.0 - 20.0	3.6-5.5				
(52) Symrna fine sand	0-12	SP, SP-SM	A-3, A-2-4	6.0 - 20.0	3.6-7.3	0-1.0	July-Oct	High	High
	12-20	SM, SP-SM	A-3, A-2-4	0.6 - 6.0	3.6-7.3				
	20-80	SP, SP-SM	A-3	6.0 - 20.0	4.5-5.5				
(61) Zolfo fine sand	0-3	SP-SM	A-3, A-2-4	6.0 - 20.0	4.5-7.3	2.0-3.5	Jun-Nov	Low	Moderate
	3-60	SP-SM, SM	A-3, A-2-4	6.0 - 20.0	4.5-7.3				
	60-80	SP-SM, SM	A-3, A-2-4	0.6 - 2.0	3.6-6.5				

NRCS SOIL SURVEY

0 1200'

PLAN SCALE

APPROXIMATE END PROJECT



APPROXIMATE BEGIN PROJECT

REFERENCE: USDA SOIL SURVEY OF HILLSBOROUGH COUNTY, FLORIDA

TOWNSHIP: 29 S
RANGE: 19 E
SECTION: 1,12,13 AND 24

DRAWN BY: BJS CHECKED BY: JS	APPROVED BY: JAS DATE: AUGUST 2012	ENGINEER OF RECORD:	TIERRA 7351 Temple Terrace Highway Tampa, Florida 33637 Phone: 813-989-1354 Fax: 813-989-1355 FL Cert. No.: 6486	SCALE: NOTED	PROJECT NUMBER: 65-12-255	GEOTECHNICAL ENGINEERING SERVICES US 301 FROM SR 60 TO I-4 HILLSBOROUGH COUNTY, FLORIDA	SHEET 1

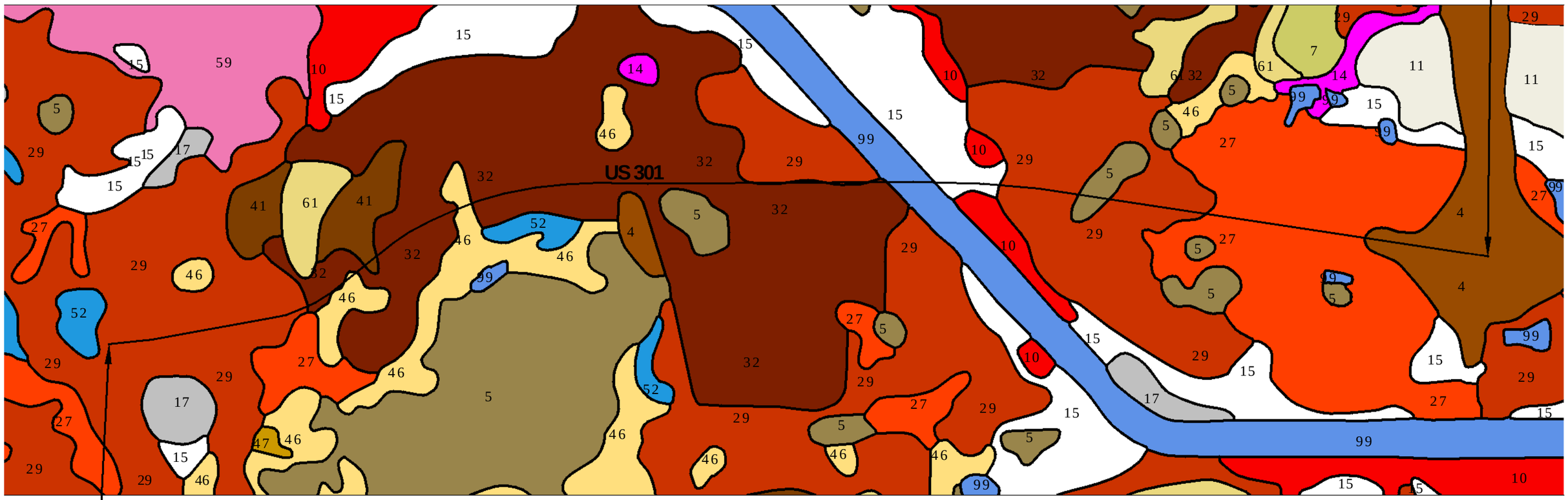
J:\Tampa Proposal\2012 Proposals\65 GEO Proposals\65-12-255_US 301 from SR 60 to I4\Microstation\Roadway\USDA_NRCS.dwg, USDA, 8/28/2012 1:33:30 PM

NRCS SOIL SURVEY

0 1200'

PLAN SCALE

APPROXIMATE END PROJECT



APPROXIMATE BEGIN PROJECT

HILLSBOROUGH COUNTY, FL
MAP UNIT LEGEND

- 4 - Arents, nearly level
- 5 - Basinger, Holopaw, and Samsula soils, depressional
- 10 - Chobee loamy fine sand
- 15 - Felda fine sand
- 27 - Malabar fine sand
- 29 - Myakka fine sand
- 32 - Myakka-Urban land complex
- 41 - Pomello fine sand, 0 to 5 percent slopes
- 46 - St. Johns fine sand
- 52 - Smyrna fine sand
- 61 - Zolfo fine sand
- 99 - Water

DRAWN BY: BJS
CHECKED BY: JS
APPROVED BY: JAS
DATE: AUGUST 2012
ENGINEER OF RECORD:

TIERRA
7351 Temple Terrace Highway
Tampa, Florida 33637
Phone: 813-989-1354 Fax: 813-989-1355
FL Cert. No.: 6486

SCALE: NOTED
PROJECT NUMBER: 65-12-255

GEOTECHNICAL ENGINEERING SERVICES
US 301 FROM SR 60 TO I-4
HILLSBOROUGH COUNTY, FLORIDA

SHEET 2

APPENDIX D

Pond Sizing Calculations

Preliminary Pond Site Sizing Worksheet

Project US 301 from SR 60 to I-4 PD&E Study
Project No. 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	1	Input
Pond #	1	Computed
Begin Basin Station	100+00	
End Basin Station	113+00	
Proposed R/W Width	200 ft.	
Basin Length	1300	
Roadway Basin Area	5.97 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	4	2.25	2	10

Total Existing Impervious Width = 77 ft. Existing Pervious Width = 123 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	11	2	5	4	2.25	0	0	2	7

Total Proposed Impervious Width 99 ft. Proposed Pervious Width = 101 ft.

= **Treatment Volume Calculation**

Required Runoff Depth for Treatment:	no	SWFWMD does not require treatment of pond water surface area
Pond Impervious Requires Treatment?		
Pond Impervious Area:		
Pond Treatment Required:		
Roadway Treatment Required:	1 in.	Wet detention assumed
Add for turnlanes:	N/A ac.	Start with a guess, adjust in an iterate process. Enter N/A if not
Total Treatment Volume Required =	required. 0.00 ac.ft.	
	0.25 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Attenuation Volume Calculation for Roadway	20 %	Conservative contingency for preliminary estimating
	purposes 0.30 ac.ft.	

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 29 - Myakka Fine Sand		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	87				
Composite CN Proposed =	89				
S Existing =	1.50	in.	Q Existing =	9.38	in.
S Proposed =	1.25	in.	Q Prposed =	9.63	in.
			Increase in Q =	0.25	in.

Required Attenuation Volume = 0.13 ac.ft. Increase in Q x Roadway Basin Area / 12
Add for turnlanes: 20 %
Roadway Attenuation Volume Required = 0.15 ac.ft.

Basin #	1
Pond #	1

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area	1.06 ac.	Estimate initially then adjust (iterate)	
Estimated Pond Water Surface Area	0.64 ac.	Estimate initially then adjust (iterate)	
Predominate Soil Type:	B/D	Soil Group 29 - Myakka Fine Sand	
Pervious CN:	80		
Impervious CN Proposed:	100		
Composite CN Existing =	80		
Composite CN Proposed =	92		
S Existing =	2.50 in.	Q Existing =	8.48 in.
S Proposed =	0.86 in.	Q Prposed =	10.03 in.
		Increase in Q =	1.55 in.

Pond Attenuation Volume Required =	0.14 ac.ft.	Increase in Q x Pond Site Area / 12
Total Attenuation Volume Required=	0.29 ac.ft.	Roadway Attenuation + Pond Attenuation Volume Required

Pond Location and Elevation Data

Approximate Pond Inflow Station:	101+00	
Pond Inflow Pipe Length from Roadway:	2600 ft.	
Estimated Site Elevation (Average):	24	One foot contour map
Estimate Site SHGWT Elevation:	23	SCS estimate for Myakka soil

Basin Elevation Data

Lowest Estimated EOP Elevation:	27	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	101+00	
Furthest point from pond:	End 50	Note if at Begin or End of Basin
EOP Elevation at furthest point:	113+00	
Station at furthest point:		

Pond Size Iteration Based on Feasibility

Control Elevation	23	Assumed same as site SHGWT
Iterate Treatment Depth	0.46 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	0.44 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	23.9	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	26.9	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	26.0	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond

Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	167 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	174 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	204 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	214 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	**1.06 ac.**	(L at back of Tie Back)^2/43560

Preliminary Pond Site Sizing Worksheet

Project: US 301 from SR 60 to I-4 PD&E Study
Project No.: 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	2	Input
Pond #	2	Computed
Begin Basin Station	113+00	
End Basin Station	122+00	
Proposed R/W Width	200 ft.	
Basin Length	900	
Roadway Basin Area	4.13 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	4	2.25	2	10

Total Existing Impervious Width = 77 ft. Existing Pervious Width = 123 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	11	2	5	4	2.25	0	0	2	7

Total Proposed Impervious Width = 99 ft. Proposed Pervious Width = 101 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area:	N/A c.ft.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.17 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.20 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 29 - Myakka Fine Sand		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	87				
Composite CN Proposed =	89				
S Existing =	1.50	in.	Q Existing =	9.38	in.
S Proposed =	1.25	in.	Q Prposed =	9.63	in.
			Increase in Q =	0.25	in.

Required Attenuation Volume =	0.09 ac.ft.	Increase in Q x Roadway Basin Area / 12
Add for turnlanes:	20 %	
Roadway Attenuation Volume Required =	0.10 ac.ft.	

Basin #	2
Pond #	2

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area	0.5 ac.	Estimate initially then adjust (iterate)	
Estimated Pond Water Surface Area	0.2 ac.	Estimate initially then adjust (iterate)	
Predominate Soil Type:	B/D	Soil Group 29 - Myakka Fine Sand	
Pervious CN:	80		
Impervious CN Proposed:	100		
Composite CN Existing =	80		
Composite CN Proposed =	88		
S Existing =	2.50 in.	Q Existing =	8.48 in.
S Proposed =	1.36 in.	Q Prposed =	9.52 in.
		Increase in Q =	1.04 in.

Pond Attenuation Volume Required =	0.04 ac.ft.	Increase in Q x Pond Site Area / 12
Total Attenuation Volume Required=	0.15 ac.ft.	Roadway Attenuation + Pond Attenuation Volume Required

Pond Location and Elevation Data

Approximate Pond Inflow Station:	121+00	
Pond Inflow Pipe Length from Roadway:	50 ft.	
Estimated Site Elevation (Average):	23	One foot contour map
Estimate Site SHGWT Elevation:	22	SCS estimate for Myakka soil

Basin Elevation Data

Lowest Estimated EOP Elevation:	28	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	122+00	
Furthest point from pond:	Begin	Note if at Begin or End of Basin
EOP Elevation at furthest point:	50	
Station at furthest point:	113+00	

Pond Size Iteration Based on Feasibility

Control Elevation	22	Assumed same as site SHGWT
Iterate Treatment Depth	1 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	0.66 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	23.7	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	24.3	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	23.8	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond

Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	94 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	108 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	138 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	148 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	**0.50 ac.**	(L at back of Tie Back)^2/43560

Basin #	2
Pond #	2

Site is rectangular:
L = 400 W req = 23 at control elevation
Linear Pond use R/W slope on front
Use 10' berm on back, no tie backs
Top width = 23 + (1.66 x 4 x 2) + 10 = 47 ft (rounded up)
Top length = 400 + (1.66 x 4 x 2) + 20 = 434 ft (rounded up)
Adjusted acreage required = 0.47 ac

Preliminary Pond Site Sizing Worksheet

Project US 301 from SR 60 to I-4 PD&E Study
Project No. 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	3	Input
Pond #	3	Computed
Begin Basin Station	122+00	
End Basin Station	132+00	
Proposed R/W Width	200 ft.	
Basin Length	1000	
Roadway Basin Area	4.59 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	0	0	2	5

Total Existing Impervious Width = 58 ft. Existing Pervious Width = 142 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	11	2	5	4	2.25	0	0	2	7

Total Proposed Impervious Width = 99 ft. Proposed Pervious Width = 101 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area:	N/A c.f.t.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.19 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.23 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 32 - Myakka Urban Land Complex		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	85				
Composite CN Proposed =	89				
S Existing =	1.73	in.	Q Existing =	9.16	in.
S Proposed =	1.25	in.	Q Prposed =	9.63	in.
			Increase in Q =	0.47	in.

Required Attenuation Volume = 0.18 ac.ft. Increase in Q x Roadway Basin Area / 12
Add for turnlanes: 20 %
Roadway Attenuation Volume Required = 0.22 ac.ft.

Basin #	3
Pond #	3

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area	0.56 ac.	Estimate initially then adjust (iterate)	
Estimated Pond Water Surface Area	0.23 ac.	Estimate initially then adjust (iterate)	
Predominate Soil Type:	B/D	Soil Group 29 - Myakka Fine Sand	
Pervious CN:	80		
Impervious CN Proposed:	100		
Composite CN Existing =	80		
Composite CN Proposed =	88		
S Existing =	2.50 in.	Q Existing =	8.48 in.
S Proposed =	1.34 in.	Q Prposed =	9.54 in.
		Increase in Q =	1.06 in.

Pond Attenuation Volume Required =	0.05 ac.ft.	Increase in Q x Pond Site Area / 12
Total Attenuation Volume Required=	0.27 ac.ft.	Roadway Attenuation + Pond Attenuation Volume Required

Pond Location and Elevation Data

Approximate Pond Inflow Station:	124+00	
Pond Inflow Pipe Length from Roadway:	50 ft.	
Estimated Site Elevation (Average):	23	One foot contour map
Estimate Site SHGWT Elevation:	22	SCS estimate for Myakka soil

Basin Elevation Data

Lowest Estimated EOP Elevation:	28	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	122+00	
Furthest point from pond:	End 30	Note if at Begin or End of Basin
EOP Elevation at furthest point:	132+00	
Station at furthest point:		

Pond Size Iteration Based on Feasibility

Control Elevation	22	Assumed same as site SHGWT
Iterate Treatment Depth	1 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	1.08 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	24.1	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	24.8	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	24.3	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond

Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	99 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	116 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	146 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	156 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	**0.56 ac.**	(L at back of Tie Back)^2/43560

Preliminary Pond Site Sizing Worksheet

Project: US 301 from SR 60 to I-4 PD&E Study
Project No.: 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	4	Input
Pond #	4	Computed
Begin Basin Station	132+00	
End Basin Station	170+00	
Proposed R/W Width	200 ft.	
Basin Length	3800	
Roadway Basin Area	17.45 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	0	0	2	5

Total Existing Impervious Width = 58 ft. Existing Pervious Width = 142 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	11	2	5	4	2.25	0	0	2	7

Total Proposed Impervious Width = 99 ft. Proposed Pervious Width = 101 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area:	N/A c.ft.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.72 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.86 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 32 - Myakka Urban Land Complex		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	85				
Composite CN Proposed =	89				
S Existing =	1.73	in.	Q Existing =	9.16	in.
S Proposed =	1.25	in.	Q Prposed =	9.63	in.
			Increase in Q =	0.47	in.

Required Attenuation Volume = 0.69 ac.ft. Increase in Q x Roadway Basin Area / 12
Add for turnlanes: 20 %
Roadway Attenuation Volume Required = 0.82 ac.ft.

Basin #	4	
Pond #	4	

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area (iterate)	2.25	ac.	Estimate initially then adjust
Estimated Pond Water Surface Area (iterate)	1.6	ac.	Estimate initially then adjust
Predominate Soil Type:	B/D	Soil	Group 32 - Myakka-Urban Land
Composite CN Existing =	80		
Composite CN Proposed =	94		
S Existing =	2.50	in.	
S Proposed =	0.61	in.	

Q Existing =	8.48	in.
Q Prposed =	10.30	in.
Increase in Q =	1.82	in.

Pond Attenuation Volume Required =	0.34 ac.ft.	Increase in Q x Pond Site Area / 12
Total Attenuation Volume Required=	1.03 ac.ft.	Roadway Attenuation + Pond Attenuation Volume Required

Pond Location and Elevation Data

Approximate Pond Inflow Station:	163+00	
Pond Inflow Pipe Length from Roadway:	50 ft.	
Estimated Site Elevation (Average):	24	One foot contour map
Estimate Site SHGWT Elevation:	23	SCS estimate for Myakka soil

Basin Elevation Data

Lowest Estimated EOP Elevation:	26.5	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	147+00	
Furthest point from pond:	Begin	Note if at Begin or End of Basin
EOP Elevation at furthest point:	30	
Station at furthest point:	132+00	

Pond Size Iteration Based on Feasibility

Control Elevation	23	Assumed same as site SHGWT
Iterate Treatment Depth	0.54 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	0.63 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	24.2	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	26.7	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	25.5	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond

Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	264 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	273 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	303 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	313 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	2.25 ac.	(L at back of Tie Back)^2/43560

Preliminary Pond Site Sizing Worksheet

Project US 301 from SR 60 to I-4 PD&E Study
Project No. 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	5	Input
Pond #	5	Computed
Begin Basin Station	170+00	
End Basin Station	181+00	
Proposed R/W Width	200 ft.	
Basin Length	1100	
Roadway Basin Area	5.05 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	2	3.5	2	5

Total Existing Impervious Width = 65 ft. Existing Pervious Width = 135 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	11	2	5	4	2.25	0	0	2	7

Total Proposed Impervious Width = 99 ft. Proposed Pervious Width = 101 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area:	N/A c.ft.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.21 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.25 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 32 - Myakka Urban Land Complex		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	86				
Composite CN Proposed =	89				
S Existing =	1.65	in.	Q Existing =	9.24	in.
S Proposed =	1.25	in.	Q Prposed =	9.63	in.
			Increase in Q =	0.39	in.

Required Attenuation Volume = 0.16 ac.ft. Increase in Q x Roadway Basin Area / 12
Add for turnlanes: 20 %
Roadway Attenuation Volume Required = 0.20 ac.ft.

Basin #	5
Pond #	5

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area	0.49 ac.	Estimate initially then adjust (iterate)
Estimated Pond Water Surface Area	0.17 ac.	Estimate initially then adjust (iterate)
Predominate Soil Type:	B/D	Soil Group 5 -Basinger-Holopaw and Samsula depressional (site is in fill)
Pervious CN:	80	
Composite CN Existing =	80	
Composite CN Proposed =	87	
S Existing =	2.50 in.	Q Existing = 8.48 in.
S Proposed =	1.50 in.	Q Prposed = 9.38 in.
		Increase in Q = 0.90 in.

Pond Attenuation Volume Required =	0.04 ac.ft.	Increase in Q x Pond Site Area / 12
Total Attenuation Volume Required=	0.20 ac.ft.	Roadway Attenuation + Pond Attenuation Volume Required

Pond Location and Elevation Data

Approximate Pond Inflow Station:	172+00	
Pond Inflow Pipe Length from Roadway:	50 ft.	
Estimated Site Elevation (Average):	25	One foot contour map
Estimate Site SHGWT Elevation:	22	Adjacent ditches, site is in fill

Basin Elevation Data

Lowest Estimated EOP Elevation:	27	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	181+00	
Furthest point from pond:	End 27	Note if at Begin or End of Basin
EOP Elevation at furthest point:	181+00	
Station at furthest point:		

Pond Size Iteration Based on Feasibility

Control Elevation	22	Assumed same as site SHGWT
Iterate Treatment Depth	1.5 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	1.05 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	24.6	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	25.3	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	25.3	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond		
Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	85 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	106 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	136 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	146 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	**0.49 ac.**	(L at back of Tie Back)^2/43560

Preliminary Pond Site Sizing Worksheet

Project US 301 from SR 60 to I-4 PD&E Study
Project No. 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	6	Input
Pond #	6	Computed
Begin Basin Station	181+00	
End Basin Station	203+00	
Proposed R/W Width	200 ft.	
Basin Length	2200	
Roadway Basin Area	10.10 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	0	0	2	5

Total Existing Impervious Width = 58 ft. Existing Pervious Width = 142 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	12	2	5	2	2.25	2	6.5	2	7

Total Proposed Impervious Width = 113.5 ft. Proposed Pervious Width = 86.5 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area: Pond Treatment Required:	N/A c.ft.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.48 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.57 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$$\frac{S = 1000 - 10}{CN} \qquad \frac{Q = (P-0.2S)^2}{P + 0.8S} \qquad CN\ Pavment = 98 \qquad CN\ Water = 100$$

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 32 - Myakka	Urban Land Complex	
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	85				
Composite CN Proposed =	90				
S Existing =	1.73	in.	Q Existing =	9.16	in.
S Proposed =	1.08	in.	Q Prposed =	9.80	in.
			Increase in Q =	0.64	in.

Required Attenuation Volume = 0.00 ac.ft. Attenuation not required, direct discharge to TBC
Add for turnlanes: 20 %
Roadway Attenuation Volume Required = 0.00 ac.ft.

Basin #	6
Pond #	6

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area (iterate)	1.3 ac.	Estimate initially then adjust		
Estimated Pond Water Surface Area (iterate)	0.86 ac.	Estimate initially then adjust		
Predominate Soil Type:	B/D	Soil	Group 29 - Myakka Fine Sand	
Composite CN Existing =	80			
Composite CN Proposed =	93			
S Existing =	2.50 in.	Q Existing =	8.48	in.
S Proposed =	0.73 in.	Q Prposed =	10.17	in.
		Increase in Q =	1.69	in.

Pond Attenuation Volume Required =	0.00 ac.ft.	Attenuation not required, direct discharge to TBC
Total Attenuation Volume Required=	0.00 ac.ft.	Attenuation not required, direct discharge to TBC

Pond Location and Elevation Data

Approximate Pond Inflow Station:	200+00	
Pond Inflow Pipe Length from Roadway:	750 ft.	
Estimated Site Elevation (Average):	20	One foot contour map
Estimate Site SHGWT Elevation:	19	SCS estimate for Myakka soil

Basin Elevation Data

Lowest Estimated EOP Elevation:	21.5	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	203+00	
Furthest point from pond:	Begin	Note if at Begin or End of Basin
EOP Elevation at furthest point:	27	
Station at furthest point:	181+00	

Pond Size Iteration Based on Feasibility

Control Elevation	19	Assumed same as site SHGWT
Iterate Treatment Depth	0.67 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	0.00 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	19.7	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	21.8	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	20.5	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond		
Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	193 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	198 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	228 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	238 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	**1.30 ac.**	(L at back of Tie Back)^2/43560

Preliminary Pond Site Sizing Worksheet

Project US 301 from SR 60 to I-4 PD&E Study
Project No. 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	7	Input
Pond #	7	Computed
Begin Basin Station	203+00	
End Basin Station	237+00	
Proposed R/W Width	200 ft.	
Basin Length	3400	
Roadway Basin Area	15.61 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	0	0	2	5

Total Existing Impervious Width = 58 ft. Existing Pervious Width = 142 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	12	2	5	2	2.25	2	6.5	2	7

Total Proposed Impervious Width = 113.5 ft. Proposed Pervious Width = 86.5 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area:	N/A c.ft.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.74 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.89 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Groups 15 and 29 - Felda and Myakka Fine Sands		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	85				
Composite CN Proposed =	90				
S Existing =	1.73	in.	Q Existing =	9.16	in.
S Proposed =	1.08	in.	Q Prposed =	9.80	in.
			Increase in Q =	0.64	in.

Required Attenuation Volume = 0.00 ac.ft. Attenuation not required, direct discharge to TBC
Add for turnlanes: 20 %
Roadway Attenuation Volume Required = 0.00 ac.ft.

Basin #	7	
Pond #	7	

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area	1.26 ac.	Estimate initially then adjust (iterate)
Estimated Pond Water Surface Area	0.79 ac.	Estimate initially then adjust (iterate)
Predominate Soil Type:	B/D	Soil Group 15 - Felda Fine Sand
Pervious CN:	80	
Impervious CN Proposed:	100	
Composite CN Existing =	80	
Composite CN Proposed =	93	
S Existing =	2.50 in.	Q Existing = 8.48 in.
S Proposed =	0.81 in.	Q Prposed = 10.09 in.
		Increase in Q = 1.61 in.

Pond Attenuation Volume Required =	0.00 ac.ft.	Attenuation not required, direct discharge to TBC
Total Attenuation Volume Required=	0.00 ac.ft.	Attenuation not required, direct discharge to TBC

Pond Location and Elevation Data

Approximate Pond Inflow Station:	213+50	
Pond Inflow Pipe Length from Roadway:	50 ft.	
Estimated Site Elevation (Average):	19.5	One foot contour map
Estimate Site SHGWT Elevation:	18.5	SCS estimate for Myakka soil

Basin Elevation Data

Lowest Estimated EOP Elevation:	21.5	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	203+00	
Furthest point from pond:	End	Note if at Begin or End of Basin
EOP Elevation at furthest point:	24.5	
Station at furthest point:	237+00	

Pond Size Iteration Based on Feasibility

Control Elevation	18.5	Assumed same as site SHGWT
Iterate Treatment Depth	1.13 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	0.00 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	19.6	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	21.6	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	20.5	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond

Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	185 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	194 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	224 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	234 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	1.26 ac.	(L at back of Tie Back)^2/43560

Preliminary Pond Site Sizing Worksheet

Project: US 301 from SR 60 to I-4 PD&E Study
Project No.: 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	8	Input
Pond #	8	Computed
Begin Basin Station	237+00	
End Basin Station	248+40	
Proposed R/W Width	200 ft.	
Basin Length	1140	
Roadway Basin Area	5.23 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	0	0	2	5

Total Existing Impervious Width = 58 ft. Existing Pervious Width = 142 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	12	2	5	2	2.25	2	6.5	2	7

Total Proposed Impervious Width = 113.5 ft. Proposed Pervious Width = 86.5 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area:	N/A c.ft.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.25 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.30 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 27 - Malabar Fine Sand		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	85				
Composite CN Proposed =	90				
S Existing =	1.73	in.	Q Existing =	9.16	in.
S Proposed =	1.08	in.	Q Prposed =	9.80	in.
			Increase in Q =	0.64	in.

Required Attenuation Volume =	0.28 ac.ft.	Increase in Q x Roadway Basin Area / 12
Add for turnlanes:	20 %	
Roadway Attenuation Volume Required =	0.33 ac.ft.	

Basin #	8
Pond #	8

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area (iterate)	0.56 ac.	Estimate	initially	then	adjust	
Estimated Pond Water Surface Area (iterate)	0.2 ac.	Estimate	initially	then	adjust	
Predominate Soil Type:	B/D	Soil	Group 27 - Malabar Fine Sand			
Composite CN Existing =	80					
Composite CN Proposed =	87					
S Existing =	2.50 in.	Q Existing =	8.48	in.		
S Proposed =	1.48 in.	Q Prposed =	9.41	in.		
		Increase in Q =	0.93	in.		

Pond Attenuation Volume Required =	0.04 ac.ft.	Increase in Q x Pond Site Area / 12
Total Attenuation Volume Required=	0.32 ac.ft.	Roadway Attenuation + Pond Attenuation Volume Required

Pond Location and Elevation Data

Approximate Pond Inflow Station:	248+00	
Pond Inflow Pipe Length from Roadway:	50 ft.	
Estimated Site Elevation (Average):	22	One foot contour map
Estimate Site SHGWT Elevation:	19	Site is in fill, used 1' below TOB at CD

Basin Elevation Data

Lowest Estimated EOP Elevation:	23.5	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	248+40	
Furthest point from pond:	End	Note if at Begin or End of Basin
EOP Elevation at furthest point:	24	
Station at furthest point:	237+00	

Pond Size Iteration Based on Feasibility

Control Elevation	19	Assumed same as site SHGWT
Iterate Treatment Depth	1.5 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	1.43 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	21.9	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	22.8	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	22.0	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond		
Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	93 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	116 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	146 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	156 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	**0.56 ac.**	(L at back of Tie Back)^2/43560

Basin # 8
Pond # 8

Site is rectangular:
W = 70 L req = 124 at control elevation
Linear Pond use R/W slope on front
Use 10' berm on back, no tie backs
Top width = 70 + (1.93 x 4 x 2) + 10 = 96 ft (rounded up)
Top length = 124 + (1.93 x 4 x 2) + 20 = 160 ft (rounded up)
Adjusted acreage required = 0.35 ac

Preliminary Pond Site Sizing Worksheet

Project US 301 from SR 60 to I-4 PD&E Study
Project No. 2012006.00

Computed By: D. Knighton Date: 2/28/2015
Checked By: Date:

Basin Data

Basin #	9	Input
Pond #	9	Computed
Begin Basin Station	248+40	
End Basin Station	262+00	
Proposed R/W Width	200 ft.	
Basin Length	1360	
Roadway Basin Area	6.24 ac.	Proposed R/W width x Basin Length / 43560 sf/ac

Typical Section Data

Existing Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width
	4	12	0	0	0	0	2	5

Total Existing Impervious Width = 58 ft. Existing Pervious Width = 142 ft.

Proposed Impervious:	# lanes	width	# S/W	width	# Curbs	width	# Shldrs	width	# Bike Lns	width
	6	12	2	5	2	2.25	2	6.5	2	7

Total Proposed Impervious Width = 113.5 ft. Proposed Pervious Width = 86.5 ft.

Treatment Volume Calculation

Required Runoff Depth for Treatment:	1 in.	Wet detention assumed
Pond Impervious Requires Treatment?	No	SWFWMD does not require treatment of pond water surface area
Pond Impervious Area:	N/A c.f.t.	Start with a guess, adjust in an iterate process. Enter N/A if not required.
Roadway Treatment Required:	0.30 ac.ft.	Req. runoff d x Basin L x Prop. Imperv. Width / 12 x 43560
Add for turnlanes:	20 %	Conservative contingency for preliminary estimating
Total Treatment Volume Required =	purposes 0.35 ac.ft.	

Attenuation Volume Calculation for Roadway

Use NRCS Equation for runoff to calculate the reqquired attenuation volume:

$S = \frac{1000}{CN} - 10$ $Q = \frac{(P-0.2S)^2}{P+0.8S}$ CN Pavment = 98 CN Water = 100

Rainfall Depth P =	11	in.	SWFWMD 100yr/24hr		
Predominate Soil Type:	B/D		Soil Group 27 - Malabar Fine Sand		
Pervious CN Existing:	80		Ditches are low and wet		
Pervious CN Proposed:	80				
Composite CN Existing =	85				
Composite CN Proposed =	90				
S Existing =	1.73	in.	Q Existing =	9.16	in.
S Proposed =	1.08	in.	Q Prposed =	9.80	in.
			Increase in Q =	0.64	in.

Required Attenuation Volume =	0.33 ac.ft.	Increase in Q x Roadway Basin Area / 12
Add for turnlanes:	20 %	
Roadway Attenuation Volume Required =	0.40 ac.ft.	

Basin #	9
Pond #	9

Atttenuation Volume Calculation for Pond

Estimated Total Pond Site Area	0.75 ac.	Estimate initially then adjust (iterate)		
Estimated Pond Water Surface Area	0.35 ac.	Estimate initially then adjust (iterate)		
Predominate Soil Type:	B/D	Soil Group 27 - Malabar Fine Sand		
Pervious CN:	80			
Impervious CN Proposed:	100			
Composite CN Existing =	80			
Composite CN Proposed =	89			
S Existing =	2.50 in.	Q Existing =	8.48	in.
S Proposed =	1.19 in.	Q Prposed =	9.69	in.
		Increase in Q =	1.21	in.

Pond Attenuation Volume Required =	0.08 ac.ft.	Increase in Q x Pond Site Area / 12
Total Attenuation Volume Required=	0.41 ac.ft.	Roadway Attenuation + Pond Attenuation Volume Required

Pond Location and Elevation Data

Approximate Pond Inflow Station:	251+00	
Pond Inflow Pipe Length from Roadway:	50 ft.	
Estimated Site Elevation (Average):	22	One foot contour map
Estimate Site SHGWT Elevation:	19	Site is in fill, used 1' below TOB at CD

Basin Elevation Data

Lowest Estimated EOP Elevation:	23	Assume Proposed will be no lower than existing Low EOP
Location of Lowest EOP Elevation:	262+00	
Furthest point from pond:	End 23	Note if at Begin or End of Basin
EOP Elevation at furthest point:	262+00	
Station at furthest point:		

Pond Size Iteration Based on Feasibility

Control Elevation	19	Assumed same as site SHGWT
Iterate Treatment Depth	1 ft.	Input Depth Estimates Until Hydraulically Feasible
Attenuation Depth	1.08 ft.	(Attn. Req/(L at Control Elev + Trt. D x Pond Slope)^2)/43560
DHW Elevation in pond =	21.1	Control elev. + Treatment d + Attenuation d
Desired HGL Clearance:	1 ft.	
HGL Gradient Assumed:	0.0008 ft./ft.	
HGL Elev. at furthest point =	22.0	HGL = DHW + distance to furth. pt x HGL Gradient
Feasible?	YES	If HGL at furth. pt is > than EOP el at furth. point - 0.99 ft., YES
HGL Elev. at lowest EOP =	22.0	HGL = DHW + distance to Low EOP x HGL Gradient
Feasible?	YES	If HGL at lwst EOP is > than EOP el at lwst EOP - 0.99 ft., YES

Pond Dimensions and Site Size Required

Calculate for Square Pond

Berm Width:	15 ft.	
Tie Back Width:	5 ft.	
Pond Side Slope:	4 :1	
L at Control Elevation =	124 ft.	(Treatment Vol/ Treatment d x 43560)^0.5
L at inside TOB =	141 ft.	L at Control + 2 x Pond Slope x (Attn. d + Treatm. d)
L at back of Berm =	171 ft.	Assume minimum 1:15 slope to provide 1' of Freeboard
L at back of Tie Back =	181 ft.	L at back of berm + 2 x Tie Back width
Required Pond Site Size =	**0.75 ac.**	(L at back of Tie Back)^2/43560

Basin # 9
Pond # 9

Site is rectangular:
W = 70 L req = 220 at control elevation
Linear Pond use R/W slope on front
Use 10' berm on back, no tie backs
Top width = 70 + (1.08 x 4 x 2) + 10 = 89 ft (rounded up)
Top length = 220 + (1.08 x 4 x 2) + 20 = 249 ft (rounded up)
Adjusted acreage required = 0.51 ac

APPENDIX E

Pollutant Loading Removal Calculations

Stormwater BMP Treatment Trains [BMPTRAINS©]

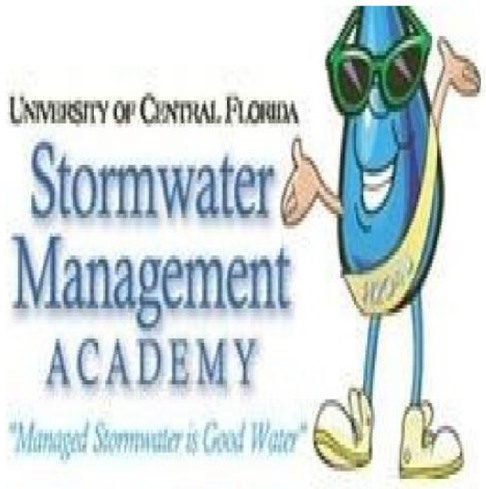
CLICK HERE TO START

INTRODUCTION PAGE

Model requires the use of Excel 2007 or newer

This program is from . compiled management publications and deliberations during a two year review of the stormwater rule in the State of Florida. Input from the members of the Florida Department of Environmental Protection Stormwater Review Technical Advisory Committee and the staff and consultants from the State Water Management Districts is appreciated.

The State Department of Transportation provided guidance and resources to compile this program. The Stormwater Management Academy is responsible for the content of this program.



1) There is a users manual to help navigate this program and it is available at www.stormwater.ucf.edu

2) This spreadsheet is best viewed at 1280 BY 1080 PIXELS screen resolution. If the maximum resolution of your computer screen is lower than 1280 BY 1080 PIXELS you can adjust the view in the Excel VIEW menu by zooming out to value smaller than 100 PERCENT.

3) This spreadsheet has incorporated ERROR MESSAGE WINDOWS. Your analysis is not valid unless ALL ERROR MESSAGE WINDOWS are clear.

4) PRINTING INSTRUCTIONS: Print the page to MICROSOFT OFFICE DOCUMENT IMAGE WRITER (typically the default) or ADOBE PDF, save the page as an image document, then print the document you saved.

5) Click on the button located on the top of this window titled CLICK HERE TO START to begin the analysis.

Disclaimer: These workbooks were created to assist in the analysis of Best Management Practice calculations. All users are responsible for validating the accuracy of the internal calculations. If improvements are noted within this model, please e-mail Marty Wanielista, Ph.D., P.E. at martin.wanielista@ucf.edu with specific information so that revisions can be made.

HELP - HYDROGRAPH AND LEGACY PROGRAMS

SMADA ONLINE

GENERAL SITE INFORMATION: V7.3

GO TO INTRODUCTION PAGE

Blue Numbers = Input data

Red Numbers = Calculated or Carryover

HELP

Select the appropriate Meteorological Zone, input the appropriate Mean Annual Rainfall amount and select the type of analysis

NAME OF PROJECT

US 301 PD&E Pond Siting, SR 60 to I-4

VIEW ZONE MAP

Meteorological Zone (Please use zone map): CLICK ON CELL BELOW TO SELECT — Zone 4

Mean Annual Rainfall (Please use rainfall map): 51.00 Incnes

VIEW MEAN ANNUAL RAINFALL MAP

Type of analysis: CLICK ON CELL BELOW TO SELECT

GO TO WATERSHED CHARACTERISTICS

Treatment efficiency (N, P) (leave empty if net improvement or BMP analysis is used): % %

Select the STORMWATER TREATMENT ANALYSIS Button below to begin analyzing the effectiveness of Best Management Practices.

Model documentation and example problems.

STORMWATER TREATMENT ANALYSIS

There is a user's manual for the BMPTRAINS model. It can be downloaded from www.stormwater.ucf.edu. The results from the example problems shown in the manual however may not reflect current model results due to ongoing updates of the model.

Systems available for analysis:

Retention Basin with option for calculating effluent concentration
Wet Detention
Exfiltration Trench
Pervious Pavement
Stormwater Harvesting
Underdrain Biofiltration
Greenroof
Rainwater Harvesting
Floating Island with Wet Detention
Vegetated Natural Buffer
Vegetated Filter Strip
Swale
Rain Garden
Lined reuse pond
User Defined BMP

RESET IN PUT FOR STORMWATER TREATMENT ANALYSIS

METHODOLOGY FOR CALCULATING REQUIRED TREATMENT EFFICIENCY

METHODOLOGY FOR RETENTION SYSTEMS

METHODOLOGY FOR WET DETENTION SYSTEMS

METHODOLOGY FOR GREENROOF SYSTEMS

METHODOLOGY FOR WATER HARVESTING SYSTEMS

WATERSHED CHARACTERISTICS V7.3

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

SELECT CATCHMENT CONFIGURATION | CLICK ON CELL BELOW TO SELECT CONFIGURATION | **VIEW CATCHMENT CONFIGURATION**

CATCHMENT NO.1 CHARACTERISTICS:

\ If mixed land uses (side calculation)

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Total pre-development catchment area:	5.97	AC	
Total post-development catchment or BMP analysis area:	7.03	AC	
Pre-development Non DCIA CN:	80.00		
Pre-development DCIA percentage:	38.50	%	
Post-development Non DCIA CN:	80.00		
Post-development DCIA percentage:	49.50	%	
Estimated Area of BMP (used for rainfall excess not loadings)	1.06	AC	

Average annual runoff volume:	11.991	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	20.347	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	2.730	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	24.252	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	3.253	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

\ If mixed land uses (side calculation)

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Total pre-development catchment area:	4.13	AC	
Total post-development catchment or BMP analysis area:	4.63	AC	
Pre-development Non DCIA CN:	80.00		
Pre-development DCIA percentage:	38.50	%	
Post-development Non DCIA CN:	80.00		
Post-development DCIA percentage:	49.50	%	
Estimated Area of BMP (used for rainfall excess not loadings)	0.50	AC	

Average annual runoff volume:	8.295	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	14.076	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	1.888	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	16.778	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	2.251	kg/year

CATCHMENT NO.3 CHARACTERISTICS:

\ If mixed land uses (side calculation

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Total pre-development catchment area:	4.59	AC	
Total post-development catchment or BMP analysis area:	5.15	AC	
Pre-development Non DCIA CN:	80.00		
Pre-development DCIA percentage:	29.00	%	
Post-development Non DCIA CN:	80.00		
Post-development DCIA percentage:	49.50	%	
Estimated Area of BMP (used for rainfall excess not loadings)	0.56	AC	

Average annual runoff volume:	9.219	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	13.060	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	1.752	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	18.646	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	2.501	kg/year

CATCHMENT NO.4 CHARACTERISTICS:

\ If mixed land uses (side calculation

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Total pre-development catchment area:	17.45	AC	
Total post-development catchment or BMP analysis area:	19.70	AC	
Pre-development Non DCIA CN:	80.00		
Pre-development DCIA percentage:	29.00	%	
Post-development Non DCIA CN:	80.00		
Post-development DCIA percentage:	49.50	%	
Estimated Area of BMP (used for rainfall excess not loadings)	2.25	AC	

Average annual runoff volume:	35.049	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	49.649	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	6.660	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	70.889	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	9.509	kg/year

WATERSHED CHARACTERISTICS V7.3

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

\ If mixed land uses (side calculation)

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

Total pre-development catchment area:	5.05	AC
Total post-development catchment or BMP analysis area:	5.54	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	32.50	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	49.50	%
Estimated Area of BMP (used for rainfall excess not loadings)	0.49	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Average annual runoff volume:	10.143	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	15.410	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	2.067	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	20.515	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	2.752	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

\ If mixed land uses (side calculation)

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

Total pre-development catchment area:	10.10	AC
Total post-development catchment or BMP analysis area:	11.40	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	29.00	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	56.75	%
Estimated Area of BMP (used for rainfall excess not loadings)	1.30	AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Average annual runoff volume:	22.461	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	28.737	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	3.855	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	45.427	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	6.094	kg/year

CATCHMENT NO.3 CHARACTERISTICS:

\ If mixed land uses (side calculation

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

Total pre-development catchment area:	15.61	AC
Total post-development catchment or BMP analysis area:	16.87	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	29.00	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	56.75	%
Estimated Area of BMP (used for rainfall excess not loadings)	1.26	AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Average annual runoff volume:	34.714	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	44.414	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	5.958	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	70.210	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	9.418	kg/year

CATCHMENT NO.4 CHARACTERISTICS:

\ If mixed land uses (side calculation

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: Total				

Total pre-development catchment area:	5.23	AC
Total post-development catchment or BMP analysis area:	5.58	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	29.00	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	56.75	%
Estimated Area of BMP (used for rainfall excess not loadings)	0.35	AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:		POST:	
EMC(N):		mg/L		mg/L
EMC(P):		mg/L		mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Average annual runoff volume:	11.631	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	14.881	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	1.996	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	23.523	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	3.156	kg/year

WATERSHED CHARACTERISTICS V7.3

GO TO STORMWATER TREATMENT ANALYSIS

Blue Numbers = Input data
Red Numbers = Calculated

HELP - LAND USES/EMC

SELECT CATCHMENT CONFIGURATION

CLICK ON CELL BELOW TO SELECT CONFIGURATION

VIEW CATCHMENT CONFIGURATION

CATCHMENT NO.1 CHARACTERISTICS:

\ If mixed land uses (side calculation)

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs	Total			

Total pre-development catchment area:	6.24	AC
Total post-development catchment or BMP analysis area:	6.75	AC
Pre-development Non DCIA CN:	80.00	
Pre-development DCIA percentage:	29.00	%
Post-development Non DCIA CN:	80.00	
Post-development DCIA percentage:	56.75	%
Estimated Area of BMP (used for rainfall excess not loadings)	0.51	AC

OVERWRITE DEFAULT CONCENTRATIONS USING:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Average annual runoff volume:	13.877	ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**	17.754	kg/year
Pre-development Annual Mass Loading - **Phosphorus:**	2.382	kg/year
Post-development Annual Mass Loading - **Nitrogen:**	28.066	kg/year
Post-development Annual Mass Loading - **Phosphorus:**	3.765	kg/year

CATCHMENT NO.2 CHARACTERISTICS:

\ If mixed land uses (side calculation)

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs	Total			

Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated Area of BMP (used for rainfall excess not loadings)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Average annual runoff volume:		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.3 CHARACTERISTICS:

\ If mixed land uses (side calculation

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs	Total			

Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated Area of BMP (used for rainfall excess not loadings)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

CLICK ON CELL BELOW TO SELECT:

USE DEFAULT CONCENTRATIONS

Average annual runoff volume:		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

CATCHMENT NO.4 CHARACTERISTICS:

\ If mixed land uses (side calculation

CLICK ON CELL BELOW TO SELECT	Land use	Area Acres	non DCIA CN	%DCIA
Pre-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs: CLICK ON CELL BELOW TO SELECT				
Post-development land use: Highway: TN=1.640 TP=0.220				
with default EMCs	Total			

Total pre-development catchment area:		AC
Total post-development catchment or BMP analysis area:		AC
Pre-development Non DCIA CN:		
Pre-development DCIA percentage:		%
Post-development Non DCIA CN:		
Post-development DCIA percentage:		%
Estimated Area of BMP (used for rainfall excess not loadings)		AC

OVERWRITE DEFAULT CONCENTRATIONS:

	PRE:	POST:
EMC(N):	mg/L	mg/L
EMC(P):	mg/L	mg/L

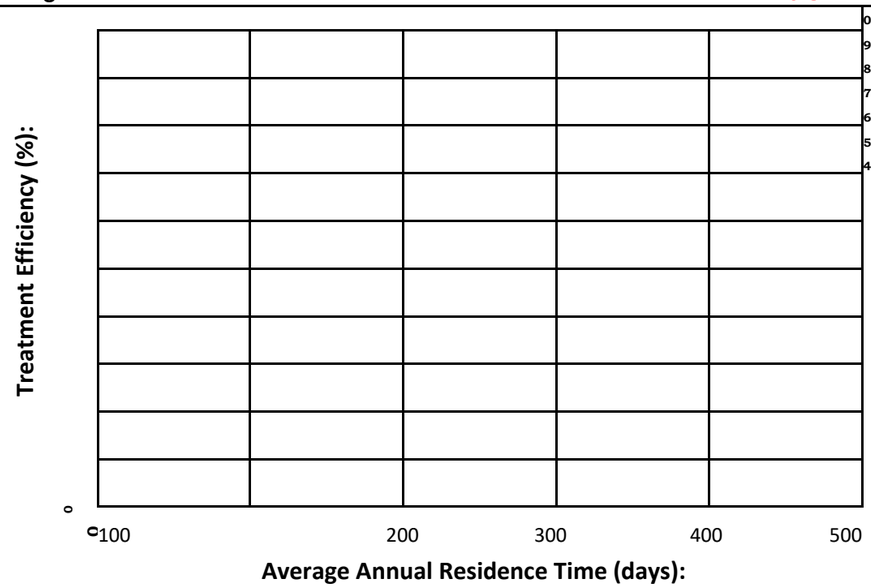
CLICK ON CELL BELOW TO SELECT:

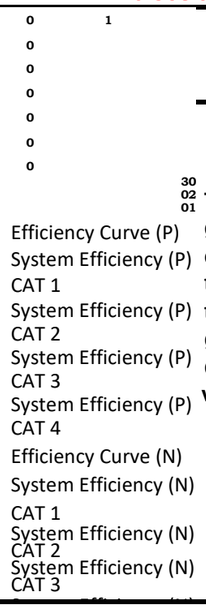
USE DEFAULT CONCENTRATIONS

Average annual runoff volume:		ac-ft/year
Pre-development Annual Mass Loading - **Nitrogen:**		kg/year
Pre-development Annual Mass Loading - **Phosphorus:**		kg/year
Post-development Annual Mass Loading - **Nitrogen:**		kg/year
Post-development Annual Mass Loading - **Phosphorus:**		kg/year

WET DETENTION:

WET DETENTION POND SERVING:	US 301 PD&E Pond Siting, SR 60 to I-4				
	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	5.970	4.130	4.590	17.450	ac
Total post-development catchment area:	5.970	4.130	4.590	17.450	ac
Average annual residence time (between 1 and 500 days):	25.00	25.00	25.00	25.00	days
Littoral Zone or other improvements used?	YES	YES	YES	YES	
Littoral Zone or other improvement efficiency credit:					%
Total **Nitrogen** removal required:	16.102	16.102	29.962	29.962	%
Total **Phosphorus** removal required:	16.102	16.102	29.962	29.962	%
Total **Nitrogen** removal efficiency provided:	37.228	37.228	37.228	37.228	%
Total **Phosphorous** removal efficiency provided:	62.848	62.848	62.848	62.848	%
Is the wet detention sufficient:	YES	YES	YES	YES	
Average annual runoff volume:	11.991	8.295	9.219	35.049	ac-ft/yr
To Achieve the Treatment Efficiency Shown in the Graph Below, the	**Must Hold**				
Following Minimum Pond Permanent Pool Volume:	0.821	0.568	0.631	2.401	ac-ft





NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.

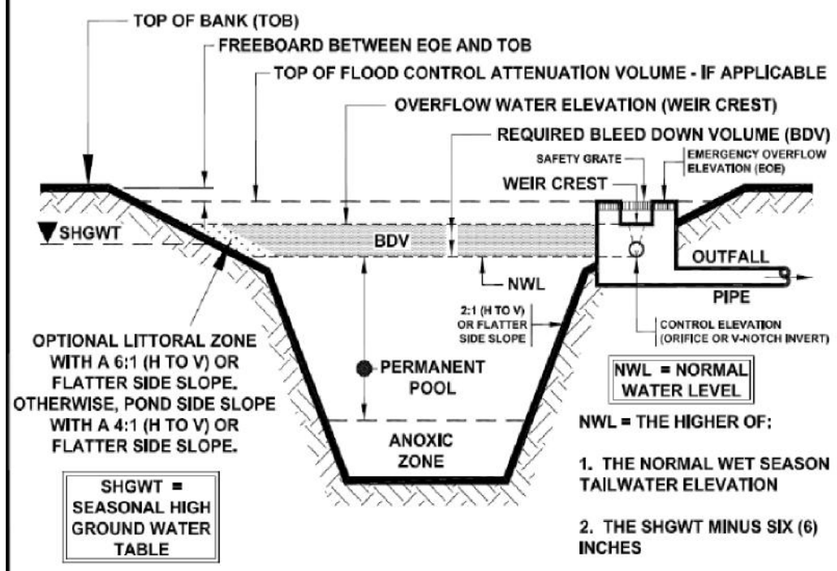
Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen)**:	0.000	0.000	0.000	0.000	%
Remaining treatment efficiency needed (**Phosphorus)**:	0.000	0.000	0.000	0.000	%

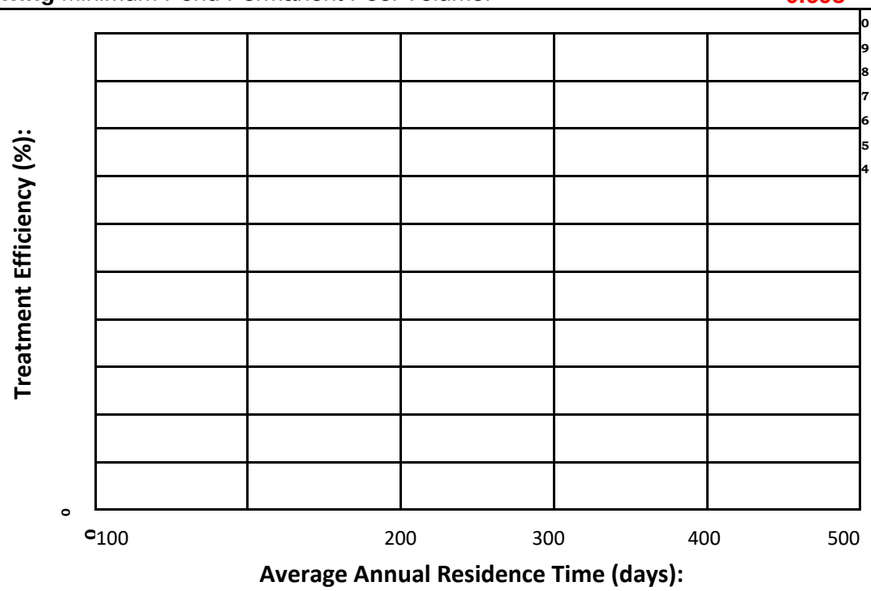


TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

WET DETENTION:

WET DETENTION POND SERVING:	US 301 PD&E Pond Siting, SR 60 to I-4				
	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	5.050	10.100	15.610	5.230	ac
Total post-development catchment area:	5.050	10.100	15.610	5.230	ac
Average annual residence time (between 1 and 500 days):	25.00	25.00	25.00	25.00	days
Littoral Zone or other improvements used?	YES	YES	YES	YES	
Littoral Zone or other improvement efficiency credit:					%
Total **Nitrogen** removal required:	24.884	36.742	36.742	36.742	%
Total **Phosphorus** removal required:	24.884	36.742	36.742	36.742	%
Total **Nitrogen** removal efficiency provided:	37.228	37.228	37.228	37.228	%
Total **Phosphorous** removal efficiency provided:	62.848	62.848	62.848	62.848	%
Is the wet detention sufficient:	YES	YES	YES	YES	
Average annual runoff volume:	10.143	22.461	34.714	11.631	ac-ft/yr
To Achieve the Treatment Efficiency Shown in the Graph Below, the	**Must Hold**				
Following Minimum Pond Permanent Pool Volume:	0.695	1.538	2.378	0.797	ac-ft



0 0 1
9 0
8 0
7 0
6 0
5 0
4 0
30
02
01

Efficiency Curve (P)
System Efficiency (P) CAT 1
System Efficiency (P) CAT 2
System Efficiency (P) CAT 3
System Efficiency (P) CAT 4
Efficiency Curve (N)
System Efficiency (N) CAT 1
System Efficiency (N) CAT 2
System Efficiency (N) CAT 3

NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.

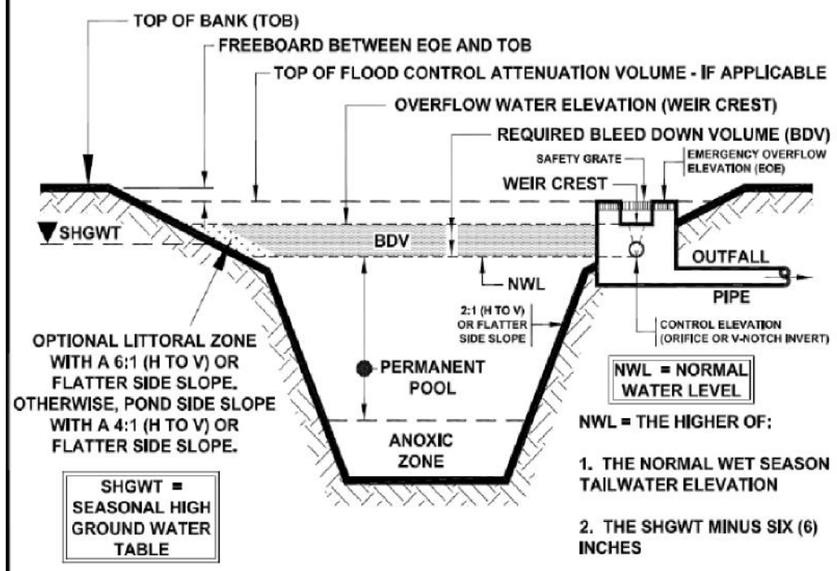
Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen)**:	0.000	0.000	0.000	0.000	%
Remaining treatment efficiency needed (**Phosphorus)**:	0.000	0.000	0.000	0.000	%

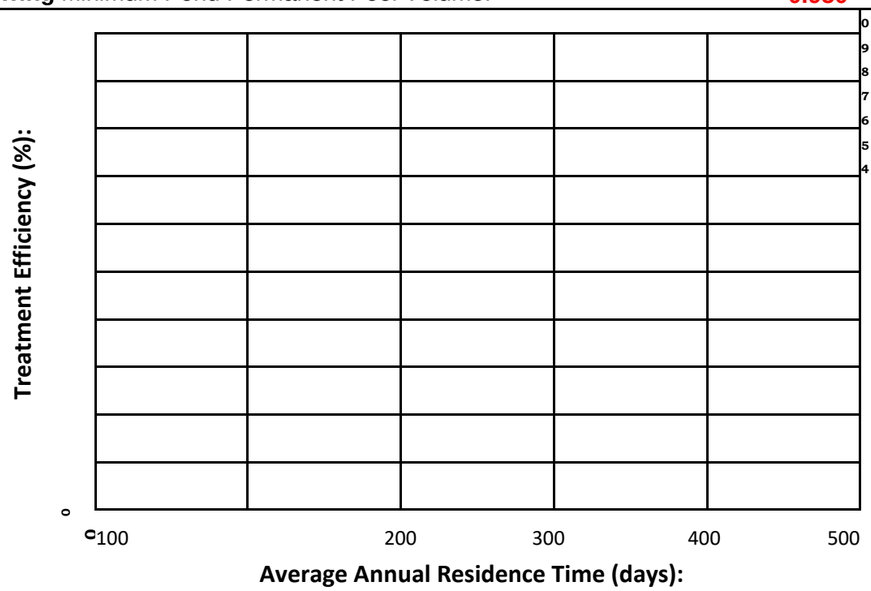


TYPICAL X-SECTION OF A WET DETENTION SYSTEM

Source of Graphic: draft **STORMWATER QUALITY APPLICANT'S HANDBOOK** dated March 2010, by the Department of Environmental Protection, available at: http://www.dep.state.fl.us/water/wetlands/erp/rules/stormwater, March 2010

WET DETENTION:

WET DETENTION POND SERVING:	US 301 PD&E Pond Siting, SR 60 to I-4				
	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Total pre-development catchment area:	6.240	0.000	0.000	0.000	ac
Total post-development catchment area:	6.240	0.000	0.000	0.000	ac
Average annual residence time (between 1 and 500 days):	25.00	25.00	25.00	25.00	days
Littoral Zone or other improvements used?	YES	YES	YES	YES	
Littoral Zone or other improvement efficiency credit:					%
Total **Nitrogen** removal required:	36.742	#DIV/0!	#DIV/0!	#DIV/0!	%
Total **Phosphorus** removal required:	36.742	#DIV/0!	#DIV/0!	#DIV/0!	%
Total **Nitrogen** removal efficiency provided:	37.228	37.228	37.228	37.228	%
Total **Phosphorous** removal efficiency provided:	62.848	62.848	62.848	62.848	%
Is the wet detention sufficient:	YES	#DIV/0!	#DIV/0!	#DIV/0!	
Average annual runoff volume:	13.877				ac-ft/yr
To Achieve the Treatment Efficiency Shown in the Graph Below, the	**Must Hold**				
Following Minimum Pond Permanent Pool Volume:	0.950	#VALUE!	#VALUE!	#VALUE!	ac-ft



0 0 1
9 0
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4 0
30
02
01

Efficiency Curve (P)
System Efficiency (P)
CAT 1
System Efficiency (P)
CAT 2
System Efficiency (P)
CAT 3
System Efficiency (P)
CAT 4
Efficiency Curve (N)
System Efficiency (N)
CAT 1
System Efficiency (N)
CAT 2
System Efficiency (N)
CAT 3

NOTE FOR TREATMENT EFFICIENCY GRAPH:

The purpose of the treatment efficiency graphs is to help illustrate the treatment efficiency of the wet detention system as the function of average annual residence time (and permanent pool volume). The graph illustrates that there is a point of diminished return as the permanent pool volume is substantially increased. The lines are produced from the conditions of catchment one, thus other catchments are shown with the data points.

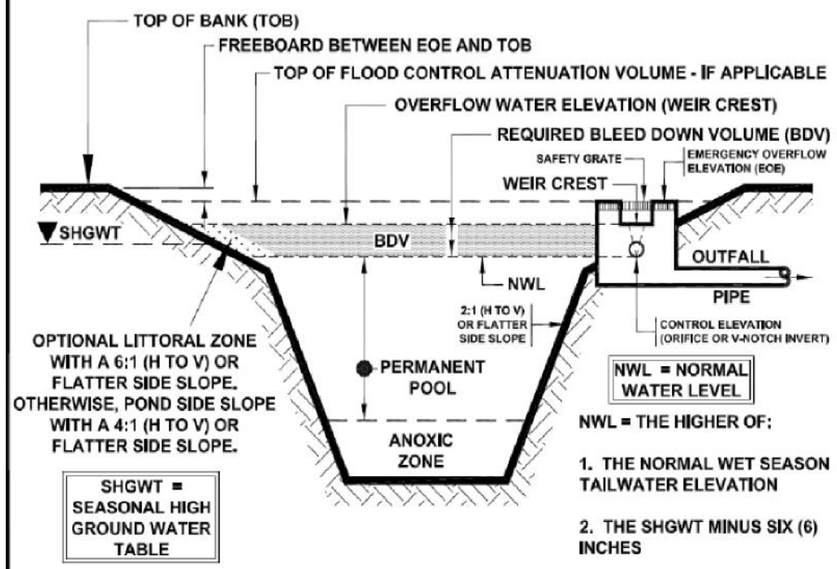
Blue Numbers =	Input data
Red Numbers =	Calculated or Carryover

GO TO STORMWATER TREATMENT ANALYSIS

HELP - EXAMPLE PROBLEM 4

REQUIRED REMAINING TREATMENT EFFICIENCIES OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION. USE FOR SIZING OF TREATMENT SYSTEM IN SERIES WITH WET DETENTION.

	Catchment 1	Catchment 2	Catchment 3	Catchment 4	
Remaining treatment efficiency needed (**Nitrogen)**:	0.000				%
Remaining treatment efficiency needed (**Phosphorus)**:	0.000				%



TYPICAL X-SECTION OF A WET DETENTION SYSTEM

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Permanent Pool Capacity Calculations

Project US 301 from SR 60 to I-4 PD&E Study
Project No. 2012006.00

Computed By: D. Knighton Date: 2/28/2014
Checked By: Date:

Pond #	Minimum Permanent Pool Volume Required (Ac.-Ft.)	Area at Control Elevation (Ac.)	Control Area Dimensions (Ft. x Ft.)		Permanent Pool Depth (Ft.)	Bottom Area Dimensions (Ft. x Ft.)		Area at Bottom (Ac.)	Available Permanent Pool Volume (Ac.-Ft.)	Is Permanent Pool Volume Sufficient?
1	0.821	0.64	167	167	5	127	127	0.37	2.53	Yes
2 *	0.568	0.20	23	400	2.85	0.2	377.2	0.00	0.29	No
2 **	0.568	0.20	44	400	5	4	360	0.03	0.58	Yes
2	0.568	0.20	94	94	5	54	54	0.07	0.67	Yes
3	0.631	0.23	99	99	5	59	59	0.08	0.77	Yes
4	2.401	1.6	264	264	5	224	224	1.15	6.88	Yes
5	0.695	0.17	85	85	5	45	45	0.05	0.54	No
5	0.695	0.17	85	85	8	21	21	0.01	0.72	Yes
6	1.538	0.86	193	193	5	153	153	0.54	3.49	Yes
7	2.378	0.79	185	185	5	145	145	0.48	3.18	Yes
8 *	0.797	0.20	70	124	8	6	60	0.01	0.83	Yes
9 *	0.950	0.35	70	220	5	30	180	0.12	1.18	Yes

Minimum Permanent Pool Volume Required is obtained from the BMP Calculations
Area at Control Elevation is obtained from the Preliminary Pond Sizing Worksheet
First attempt is 5' unless it is for a rectangular pond, then it is the depth to a V bottom if less than 5'
Area at bottom is calculated using a 1:4 slope down from the control elevation
Available Permanent Pool Volume is the sum of area at control and at bottom, divided by 2, multiplied by depth

* Calculated for a rectangular linear pond
** Determined width of linear pond required to meet permanent pool volume requirement