Florida Department of Transportation

US 301 (SR 35) PD&E Study

CR 470 E to State Road 44 in Sumter County, FL

Pond Siting Report

FDOT Office
District Five

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

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US 301 Project Development and Environment Study
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The Pond Siting Report includes a summary of data collection efforts and design analysis of pond sites for the US 301 PD&E Study from CR 470 to SR 44. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of civil 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.

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Executive Summary

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) study for an approximate 8.0 mile portion of US 301 between CR 470 East and SR 44 in Sumter County. The proposed improvements consist of widening US 301 from two (2) to four (4) lanes. The project is located within the Withlacoochee River South watershed (Walled Sink, Outlet River, Shady Brook and Little Jones Creek sub-basins).

The purpose of this Draft Pond Siting Report is to discuss, analyze, and identify the stormwater management plan for the proposed roadway improvements based on environmental, hydrology and hydraulics, and economic factors. Stormwater management for water quality treatment and runoff attenuation will be provided using dry detention and wet detention ponds. The design of the drainage and stormwater facilities will comply with the standards set forth by the FDOT Drainage Manual and the Southwest Florida Water Management District (SWFWMD) Environmental Resource Permit (ERP) manual.

Alternative pond sites have been identified along the project limits. The analysis estimates right-of-way needs using a volumetric analysis, which accounts for water quality treatment and water quantity for runoff attenuation. The total pond cost estimate found in this report is a budget tool used by the Department to estimate total acquisition costs associated with each pond site and to budget the appropriate funds for acquisition.

Please note that the volumetric analysis of the pond sites is performed with preliminary data, reasonable engineering judgment, and assumptions. Pond sites and configurations may change during final design as more detailed information on SHWT, Wetland hydrologic information, and final roadway profile become available. Please refer to **Table 1** for a **Summary of Recommended Stormwater & Floodplain Compensation Pond Sites**.

Table 1 – Summary of Recommended Stormwater & Floodplain Compensation Pond Sites

Basin	Preferred Pond Alternative	Pond Access Easement Area (ac)	Pond Right-of-Way Area (ac)	Total Required Right-of-Way Area (ac)	Hazardous Materials & Contamination Potential	Cost ($)
1	Pond 1B	0.00	1.02	1.02	None	$447,514
2	Pond 2A	0.00	1.93	1.93	None	$437,896
3	Pond 3B	0.26	2.48	2.74	None	$790,044
4	Pond 4B	0.00	2.16	2.16	Medium	$415,756
5/19	Pond 19A	0.76	7.17	7.93	High	$906,468
13	Pond 13C	0.00	3.18	3.18	Low	$485,211
14	Pond 14C	0.30	2.10	2.40	None	$420,340
15	Pond 15B	0.00	1.60	1.60	None	$291,528
16	Pond 16A	0.00	1.27	1.27	None	$270,236
17	Pond 17B	0.61	5.36	5.97	Medium	$893,200
20	Pond 20C	0.00	1.88	1.88	None	$271,527
21	Pond 21A	0.00	3.40	3.40	None	$348,252
22	Pond 22C	0.00	2.91	2.91	None	$400,766
23	Pond 23A-1 & 23A-2	0.00	3.58	3.58	None	$772,765
---	FPC 1	0.00	0.56	0.56	None	$113,314
---	FPC 4	0.00	2.25	2.25	None	$328,937
---	FPC 5	0.00	5.17	5.17	None	$565,703
---	FPC 6	0.00	0.56	0.56	None	$107,581
---	FPC 7	0.00	1.26	1.26	None	$206,826
			Totals:	**51.36**		**$8,473,864**

Note: A stormwater pond is not anticipated for Basin 18, located between stations 612+93 and 640+78, due to the minor roadway improvements. Preferred stormwater pond alternatives and floodplain compensation pond sites are listed for the preferred roadway alignment alternative (Alternative 2).

1.0 Project Description

FDOT is conducting a Project Development and Environment (PD&E) study for an approximately 8.0 mile portion of US 301 between CR 470 East and SR 44 in Sumter County. Within these limits, US 301 (SR 35) travels through the cities of Coleman and Wildwood. While mostly a north-south route, US 301 travels in an east-west direction through the City of Coleman where it has the local road name Warm Springs Avenue. The Florida's Turnpike (SR 91) crosses US 301 with an interchange to the south of the northern project limit, and I-75 runs parallel to the study corridor on the west of US 301 through Sumter County.

The PD&E study will analyze design alternatives that widen US 301; improve the US 301 interchange at Florida's Turnpike; and consider a new corridor for US 301 south of the City of Coleman. The improvements will seek to provide additional capacity for future traffic growth. US 301 is projected to carry more than 14,000 vehicles per day by 2022 and increase to more than 24,000 per day by 2042. Based on existing 2014 conditions analysis, US 301 carried up to 9,600 vehicles per day on a 2-lane segment south of the Turnpike operating with a Level of Service of D.

Within the project limits, US 301 begins as a two-lane undivided roadway at CR 470 East with turn lanes at some intersections; makes a sharp 90° turn through the City of Coleman (Warm Springs Avenue/Commercial Street) and then curves to the north at CR 468. It then continues north as an undivided roadway until it reaches the Florida's Turnpike interchange where a median is added. North of the interchange the roadway is a four-lane divided, rural typical section facility. It has a short urban curb and gutter section approaching SR 44.

The purpose of this project is to increase the capacity of US 301, to respond to future travel demand from the intersection of CR 470 East, north through the City of Coleman, to SR 44 in the City of Wildwood. The project will also improve safety and provide multi-modal facilities for pedestrian and bicyclists, and evaluate improvements to the US 301 interchange with the Florida's Turnpike.

This study will evaluate all viable alternatives to widen US 301 on the existing project corridor as well as a potential realignment for US 301 from near CR 525 to CR 468 to minimize potential environmental impacts to the City of Coleman. **Figure 1-1** shows the study corridor and potential realignment (truck route) area.

Figure 1-1 | Project Location Map



1.1 Roadway Study Segments

The study corridor has been broken down into six general roadway segments based on changes in roadway characteristics and adjacent land uses. These segments, shown on **Figure 1-2**, will be referred to as follows:

Segment 1 – South of CR 470 East to Shady Brook Drive

Segment 1 extends north from south of CR 470 E (MP 14.53) to Shady Brook Drive (MP 14.83), and is approximately 0.3 miles in length. It includes open drainage to roadside swales and consists of a three-lane typical section including one travel lane in each direction and a center left turn lane. This segment of the corridor is classified as a Rural Principal Arterial Other and has an existing speed limit of 50 mph. Shady Brook Resort and Golf Club is a significant use adjacent to this segment.

Segment 2 – Shady Brook Drive to CR 525 East

Segment 2 extends north from Shady Brook Drive (MP 14.83) to CR 525 E (MP 16.991), including the Shady Brook Bridge, and is approximately 2.2 miles in length. The segment includes open drainage to roadside swales and is a two-lane rural typical section. It has a posted speed of 55 mph and is classified as a Rural Principal Arterial Other. Shady Brook Park is a significant land use located along the segment.

Segment 3 – CR 525 East to Stokes Street

Segment 3 extends from CR 525 East (MP 16.991) to Stokes Street (MP 18.706) and is classified as a Rural Principal Arterial Other with posted speeds ranging between 35 and 45 mph. It is approximately 1.7 miles in length and is a two lane rural roadway. It follows Warm Springs Avenue as it runs east-west through the City of Coleman. There are numerous homes and businesses with relatively small setbacks from the roadway along this segment. Most of the segment has a sidewalk on one side of the roadway.

Segment 4 – Stokes Street to Florida's Turnpike

Segment 4 extends east from Stokes Street (MP 18.706) to Florida's Turnpike (MP 21.663) and is approximately 3.0 miles in length. It consists of two 12-foot travel lanes (one in each direction) and a five foot paved shoulder on either side of the roadway. This segment also includes open drainage to roadside swales and is classified as a Rural Principal Arterial Other with posted speeds of 55 mph between Stokes Street and the northbound entrance to Florida's Turnpike (SR 91), where it reduces to 45 mph. The existing and future land use context of the corridor is mostly auto oriented development. The segment is influenced by the CR 468 curve and the development that is occurring near the CR 468 intersection at the Village of Fenney.

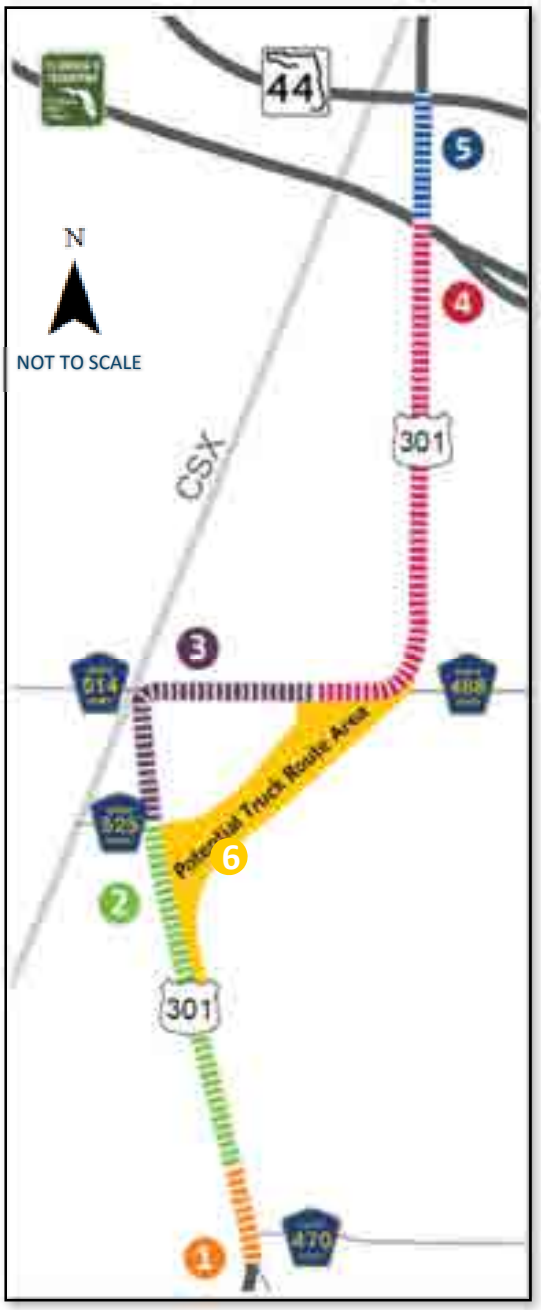
Segment 5 – North of Florida's Turnpike to SR 44

Segment 5 extends north from Florida's Turnpike (MP 21.663) to just south of SR 44 (MP 22.395) and is approximately 0.7 miles in length. It is classified as an Urban Principal Arterial with posted speeds ranging between 40 and 45 mph. In contrast to Segments 1 through 4, Segment 5 is already predominantly a four-lane divided roadway. The northern portion of the segment (north of Spring Lake Road) has a closed drainage system with an outside curb and gutter. South of Spring Lake Road the segment includes open drainage to roadside swales. This segment of the roadway is within the City of Wildwood and approximately half of the segment has adjacent urban development.

Segment 6 – Truck Route/ US 301 Realignment

The truck route will require a new roadway alignment (approximately 1.5 miles) and construction over current non-roadway property linking CR 525 East to CR 468. While the area for the route is currently largely undeveloped, both ends of this segment have impending development that is currently in the permitting process. The Villages Industrial Park (formerly Wade Industrial Park) and Monarch Ranch are planned for the CR 525 East area while the CR 468 area will be home to the Village of Fenney.

Figure 1-2 | US 301 Existing Roadway Segments



1.2 Recommended Typical Sections

As a result of the typical section evaluation, three (3) typical sections as shown in **Figures 1-3, 1-4** and **1-5** were carried forward to the segment analysis.

A 45 mph urban typical section with four travel lanes separated by a 28-foot raised median with five foot sidewalks and seven foot buffered shoulders on each side is under consideration for Segment 3 of this project. **Figure 1-3** illustrates the proposed urban typical section.

A 45 mph urban typical section with four travel lanes separated by a 28-foot raised median seven foot buffered shoulders and six foot sidewalks on each side is under consideration for Segment 5 of this project. **Figure 1-4** illustrates the proposed urban typical section.

A 55 mph suburban typical section with four travel lanes separated by a 22-foot raised median with four foot paved inside shoulders, seven foot buffered shoulder, and five foot sidewalks on each side is under consideration for Segments 1, 2, 4, and 6 of this project. **Figure 1-5** illustrates the proposed suburban typical section.

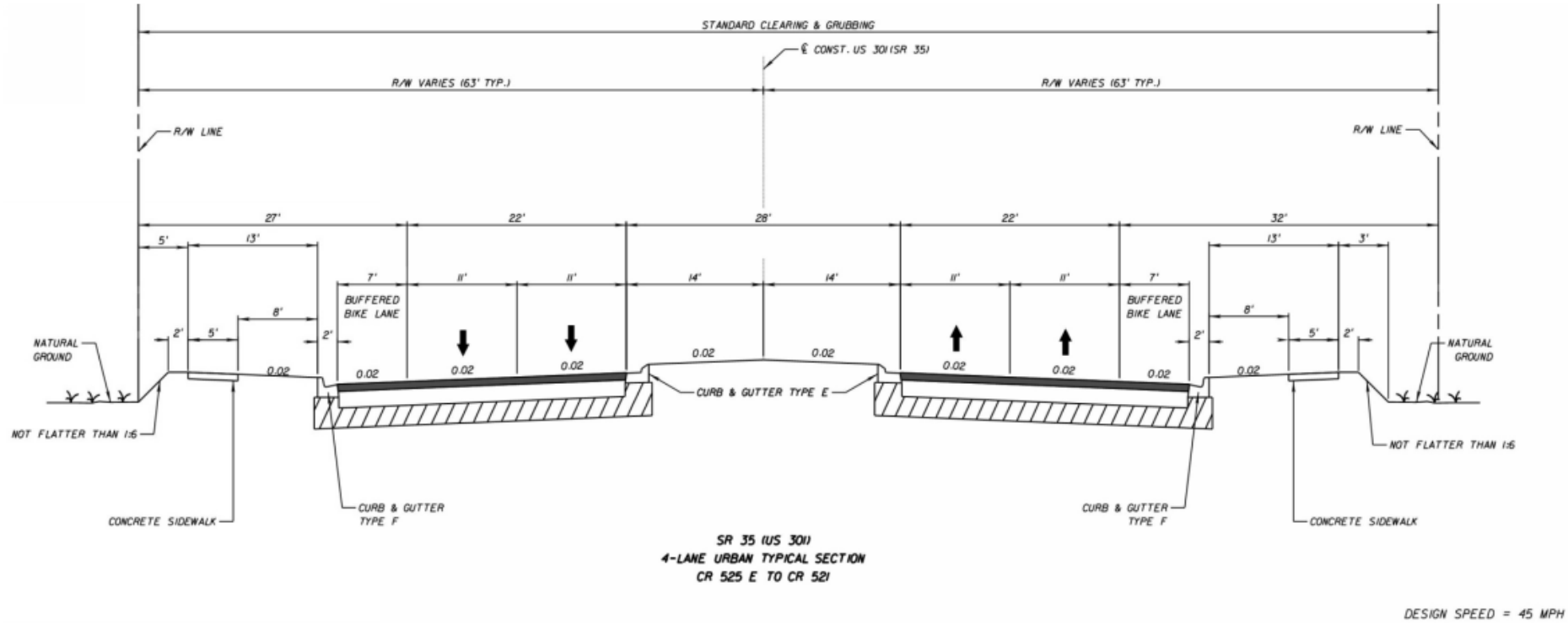


Figure 1-3 | Recommended Urban Typical Section – Coleman

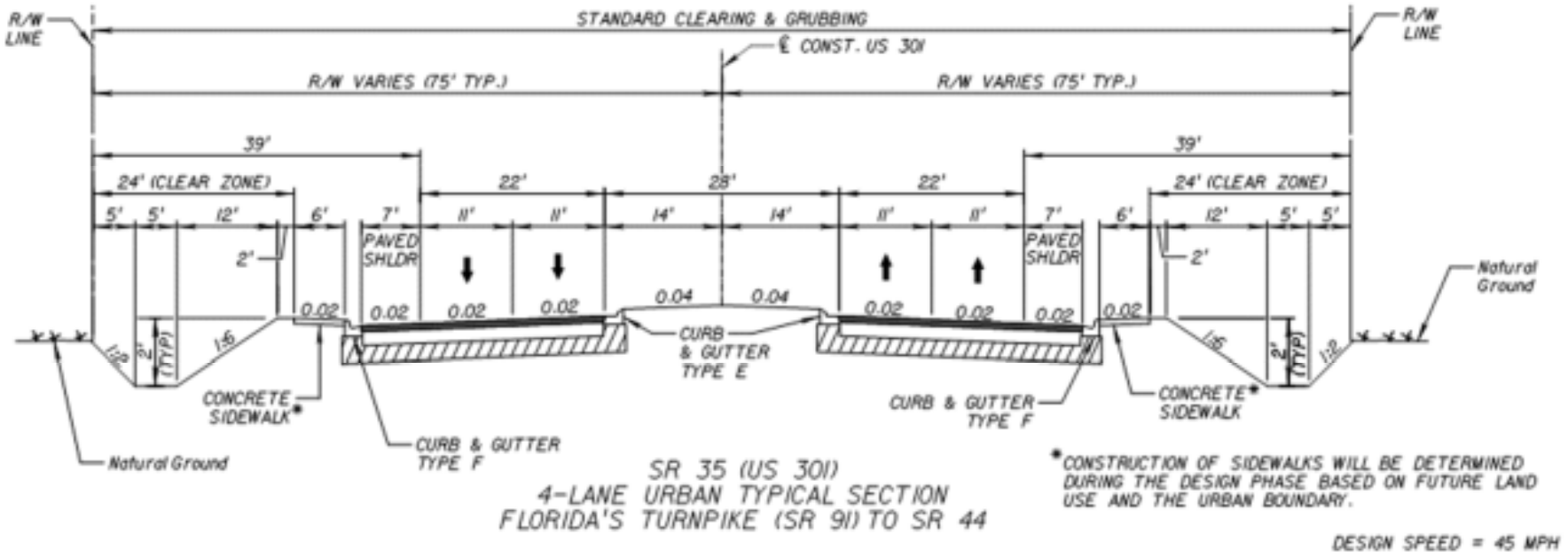


Figure 1-4 | Recommended Urban Typical Section – Segment 5

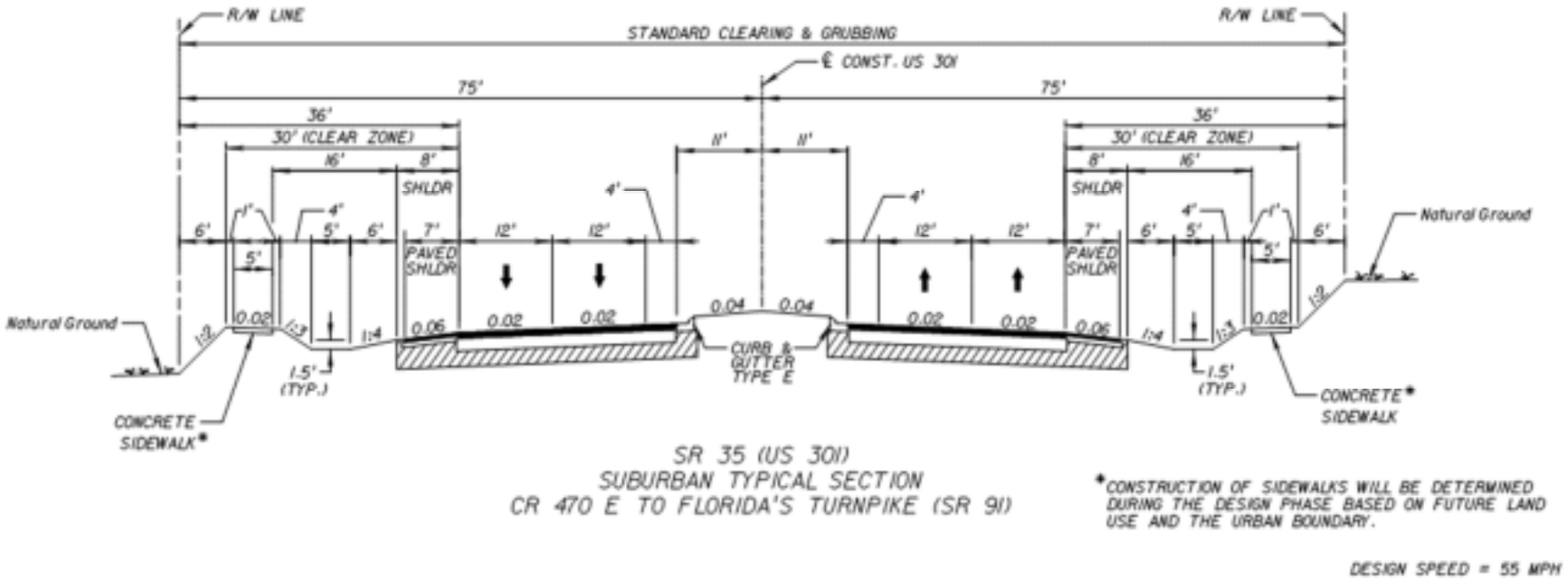


Figure 1-5 | Recommended Suburban Typical Section

2.0 Design Criteria

The design of the stormwater management facilities for the project is governed by the rules set forth by the SWFWMD and FDOT. Water treatment and attenuation requirements will comply with the guidelines as defined in Chapter 62-330 of the Florida Administrative Code (F.A.C) and the SWFWMD Environmental Resource Permit Applicant's Handbook (Volume II).

Wet detention and dry retention ponds will provide for water quality improvements as well as water quantity attenuation for the project runoff. The stormwater ponds are designed and sized for the most conservative typical section for each segment. Please refer to the sections below for the water quality, water quantity, and detention pond facilities configuration criterion used for the project.

2.1 SWFWMD Criteria

- **Water Quality**:
  - Wet Detention Ponds: Treatment will be provided for one inch (1") over the Directly Connected Impervious Areas (DCIA) for alterations to existing public roadway projects.
    - An outfall control structure shall be designed to drawdown the system's treatment volume in no less than 120 hours (5 days) with no more than one half the total volume being discharged within the first 60 hours (2.5 days). Only that volume which drains below the overflow elevation within 36 hours may be counted as part of the volume required for water quantity storage.
  - Dry Retention Ponds: Treatment will be provided for one-half inch (0.5") over DCIA for alterations to existing public roadway projects.
    - The entire treatment volume is to be infiltrated within 72 hours after a storm event.

  The project traverses five (5) Waterbody IDs (WBID): 1344 Little Jones Creek, 1351 Lake Panasoffkee Drain, 1351C Lake Panasoffkee Drain, 1356 Shady Brook, and 1359D Walled Sink Drain, none of which are impaired according to the current FDEP 303(d) list of impaired water bodies. Therefore, a pre versus post pollutant loading analysis is not required. In addition, Shady Brook is considered an Outstanding Florida Water (OFW). Direct discharges to this waterbody will require an additional 50% water quality treatment.

- **Water Quantity**:
  - For a project or portion of a project located within an open drainage basin, the allowable discharge is:
    - Historic discharge, which is the peak rate at which runoff leaves the parcel of land by gravity under existing site conditions, or the legally allowable discharge at the time of permit application; or
    - Amounts determined in previous District permit actions relevant to the project.

  Offsite discharges and peak stages for the existing and proposed conditions shall be computed using the SWFWMD's 25-year/24-hour rainfall maps and the Natural Resources Conservation Service (NRCS) Type II Florida Modified 24-hour rainfall distribution with and antecedent moisture condition II.

- For a project or portion of a project located within a closed drainage basin, the required retention volume shall be:
  - The post development runoff volume less the pre-development runoff volume

The runoff volume is computed using the SWFWMD's 100-year/24-hour rainfall map and the NRCS type II Florida Modified 24-hour rainfall distribution with and antecedent moisture condition II. The total post development volume leaving the site shall be no more than the total pre-development volume leaving the site for the design 100-year storm. The rate of runoff leaving the site shall not cause adverse offsite impacts. Maintenance of pre-development offsite low flow may be required in hydrologically sensitive areas.

- **Detention/Retention Pond Configuration**:
  - Littoral Zone – Manmade wet detention systems shall include a minimum of 35 percent littoral zone, concentrated at the outfall and shall be no deeper than 3.5 feet below the design overflow elevation.
  - Width - The proposed ponds shall have a 100 feet minimum width for linear areas in excess of 200 feet length. Area and width requirements will be waived for projects to be operated by single owner entities, or entities with full time maintenance staffs (i.e. FDOT).
  - Depth – The detention facility shall not be excavated to a depth that breaches the aquitard such that it would allow for lesser quality water to pass, either way, between the two systems. In those geographical areas of the district where there is not an aquitard present, the depth of the pond shall not be excavated to within two feet of the underlying limestone which is part of a drinking water aquifer.
  - Side Slopes – All retention and detention facilities should have stabilized side slopes no steeper than 1V:4H out to a depth of two feet below the control elevation, unless for purposes of public safety, side slopes designed or permitted steeper than 1V:4H will require a six foot chain link fence or other protection sufficient to prevent accidental incursion into the retention or detention area.
  - For wet detention systems, the bottom elevation of the pond must be at least one foot below the control elevation.
  - Maintenance Access – Perimeter maintenance and operation easements, with a minimum width of 20 feet and slopes no steeper than 1V:4H, should be provided landward of the control elevation water line. Widths less than 20 feet are allowed when it can be demonstrated that equipment can enter and preform the necessary maintenance for the system.
  - Karst Areas: Portions of the project are located within a Sensitive Karst Area (SKA), therefore, stormwater management ponds shall not be excavated through a confining layer as it would allow polluted water to drain into the Florida Aquifer. If no confining layer is present, the stormwater management ponds should not be excavated to within two (2) feet of the underlying limestone layer. Geotechnical analysis will be required for the ponds which should look for sinkhole indicators (i.e. 100% loss of circulations).

2.2 FDOT Criteria

- **Water Quality**: That which is specified in Section 2.1.

- **Water Quantity**: Critical Duration as defined by Rule 14-86 F.A.C.
  - Open Basins
    - Ponds shall be sizes such that the post development discharge rate does not exceed the pre-development discharge rate for the critical duration (1-hour through 3-day) storm.
  - Closed Basins
    - Ponds shall be sizes such that the post development discharge rate (or volume) does not exceed the pre-development discharge rate (or volume) for the critical duration (1-hour through 10-day) storm.

- **Detention/Retention Pond Configuration**:
  - Maintenance Berm: Provide a minimum 20 feet of horizontal clearance between the top edge of the control elevation and the right-of-way line. Provide at least 15 feet adjacent to the pond at a slope of 1:8 or flatter. Create the inside edge of the maintenance berm to have a minimum radius of 30 feet and be a minimum of one foot above the maximum design stage elevation.
  - Freeboard: Provide at least one foot of clearance between the maximum design stage of the pond and the inside edge of the berm. For linear treatment swales, the minimum freeboard is 0.5 foot.
  - Side Slopes: Provide a slope of 1V:4H or flatter. Install fences around ponds only when a documented maintenance need for restricted access has been demonstrated (Section 5.4.4.2 from the FDOT Drainage Manual) or when pond side slopes above the normal water level are steeper than 1V:4H and are unavoidable. A design variation is required to install fences around stormwater management facilities.
  - Permanent (Normal) Pool Depth: For facilities designed to be wet, provide a minimum permanent pool depth of six feet to minimize aquatic growth.

3.0 Data Collection

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

- FDOT Drainage Design Guidelines, January 2017
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Nos. 12119C0143D, 1211C0139D, 12119C0137D, 12119C0141D, 12119C0133D, 12119C0131D for Sumter County, Effective Date 9/27/2013
- United States Geological Survey (USGS) Quadrangle Maps
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soils Survey of Sumter County, Florida, 1990
- FDOT Straight Line Diagrams (SLD's) of road inventory for US 301 (SR 35)
- Field Reconnaissance (February 2016)
- Flooding Evaluation Technical Memorandum, ICON Consultant Group, Inc. (December 21, 2016)

4.0 Existing Drainage Conditions

4.1 Topography & Hydrologic Features

The topography of the project area is relatively flat, however roadway elevations on US 301 range between 72 feet and 52 feet NAVD 88. Please refer to the **USGS Quadrangle Map**, **Figure 3** in **Appendix A**. The project area traverses five (5) WBIDs: 1344 – Little Jones Creek, 1351 – Lake Panasoffkee Drain, 1351C – Lake Panasoffkee Drain, 1356 – Shady Brook, and 1359D – Walled Sink Ditch. Please refer to the **WBID Map**, **Figure 7** in **Appendix A**. There are fourteen (14) existing cross drains and one (1) bridge within the project limits allowing for conveyance of offsite and onsite runoff to flow beneath US 301 toward Lake Panasoffkee and the Withlacoochee River. The size and geometry of all cross drains and bridges have been verified from the FDOT SLD's, 1-foot LiDAR contours, existing plans, as well as during field reconnaissance. Please refer to **Table 2** for a **Summary of Existing Cross Drains and Bridges**.

Table 2 – Summary Existing Cross Drains and Bridges

Structure No.	FDOT Milepost	Station	Description	Remarks
CD-01	14.601	-	Double 7' x 6' CBC	
CD-02	15.282	132+36	Single 24" RCP	
Bridge-1	15.621 - 15.643	150+18 – 151+12	116.2' Bridge	Shady Brook
CD-03	16.355	190+21	Single 24" RCP	
CD-04	16.577	201+95	Double 24" RCP	
CD-05	17.203	10026+41	Single 15" RCP	
CD-06	17.375	10035+49	Single 24" RCP	
CD-07	18.481	10092+84	Single 24" RCP	
CD-08	18.990	10118+73	Single 30" RCP	
CD-09	19.334	10138+20	Single 2' x 2' CBC	
CD-10	19.533	409+80	Single 30" RCP	
CD-11	20.457	540+60	Single 36" RCP	
CD-12	20.907	564+49	Single 36" RCP	
CD-13	21.529	-	Double 8' x 5' CBC	
CD-14	21.971	-	Single 9' x 3' CBC	

4.2 Soils Data and Geotechnical Investigations

The soil survey of Sumter County, Florida (dated 1990) published by the USDA NRCS has been reviewed within the project vicinity. USDA Soil Survey Geographic database (SSURGO) data was also obtained from SWFWMD to create a soils map for the project limits using GIS ArcMap. SSURGO data was compared to the soil survey by USDA NRCS and found no deviation. The soil survey map for the project vicinity is illustrated in **Figures 4A** and **4B** of **Appendix A**.

The soils encountered along the project limits are mostly Hydrologic Soil Group (HSG) A, A/D, B/D, C/D and D. Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sand or gravel and have a high rate of water transmission. Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission. If a soil is assigned to a dual HSG, the first letter is for drained areas and the second is for un-drained areas. Only the soils that in their natural condition are in group D are assigned to dual classes. According to the Soil Survey, there are 41 different soil types located along the project limits. **Table 3 – USDA NRCS Soil Survey Information: Sumter County** summarizes and lists the soil types and relevant information. The ground water depth varies from +2' to greater than 6' along the project.

Table 3 – USDA NRCS Soil Survey Information: Sumter County

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
4	Candler Sand, 0 to 5 Percent Slopes	>6.0	---	A	0-8	SP, SP-SM	A-3
					8-50	SP, SP-SM	A-3
					50-80	SP-SM	A-3, A-2-4
6	Kendrick Fine Sand, 0 to 5 Percent Slopes	>6.0	---	A	0-33	SP-SM, SM	A-3, A-2-4
					33-68	SC, SM-SC	A-2-6, A-2-4
					68-80	SC	A-2-6, A-6
8	Lake Fine Sand, 0 to 5 Percent Slopes	>6.0	---	A	0-80	SP-SM	A-3, A-2-4
9	Paisley Fine Sand, Bouldery Subsurface	0.5-1.5	Jun-Nov	B/D	0-16	SP-SM, SM	A-2-4, A-3
					16-25	SC	A-6, A-7
					25-80	CH, CL	A-7
10	Sparr Fine Sand, 0 to 5 Percent Slopes	1.5-3.5	Jul-Oct	A/D	0-9	SP-SM, SM	A-3, A-2-4
					9-45	SP-SM, SM	A-3, A-2-4
					45-51	SM-SC, SC, SM	A-2-4
					51-80	SC, SM-SC	A-2, A-4, A-6, A-7
11	Millhopper Sand, 0 to 5 Percent Slopes	3.5-6.0	Aug-Oct	A	0-50	SP-SM, SM	A-3, A-2-4
					50-80	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6
13	Tavares Fine Sand, 0 to 5 Percent Slopes	3.5-6.0	Jun-Dec	A	0-8	SP, SP-SM	A-3
					8-80	SP, SP-SM	A-3
15	Adamsville Fine Sand, Bouldery Subsurface	2.0-3.5	Jun-Nov	A	0-5	SP-SM	A-3, A-2-4
					5-80	SP-SM, SP	A-3, A-2-4

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
17	Sumterville-Mabel-Tavares Association, Bouldery Subsurface, 0 to 5 Percent Slopes	1.5-3.0	Jul-Oct	C/D	0-7	SP-SM, SM	A-3, A-2-4
					7-25	SP-SM, SM	A-3, A-2-4
					25-80	CL, CH	A-2-6, A-4, A-6
21	EauGallie Fine Sand, Bouldery Subsurface	0.5-1.5	Jun-Oct	A/D	0-8	SP	A-3
					8-25	SP	A-3
					25-36	SP-SM, SM	A-3, A-2-4
					36-57	SP, SP-SM	A-3, A-2-4
					57-80	SM, SM-SC, SC	A-2-4, A-2-6
22	Smyrna-Smyrna, Wet, Fine Sand, 0 to 2 Percent Slopes	0.5-1.5	Jul-Oct	A/D	0-15	SP, SP-SM	A-3, A-2-4
					15-28	SM, SP-SM	A-3, A-2-4
					28-80	SP, SP-SM	A-3
23	Ona Fine Sand	0.5-1.5	Jun-Nov	B/D	0-9	SP-SM, SP	A-3
					9-20	SP-SM, SM	A-3, A-2-4
					20-80	SP-SM, SP	A-3
24	Basinger Fine Sand	0-1.0	Jun-Feb	A/D	0-8	SP	A-3
					8-27	SP, SP-SM	A-3, A-2-4
					27-45	SP, SP-SM	A-3, A-2-4
					45-80	SP, SP-SM	A-3, A-2-4
25	Kanapaha Sand, Bouldery Subsurface	0.5-1.5	Jul-Sep	A/D	0-3	SP-SM	A-3, A-2-4
					3-55	SP-SM	A-3, A-2-4
					55-80	SC, SM-SC	A-2-4, A-4, A-6
26	Wabasso Fine Sand, Bouldery Subsurface	0-1.0	Jun-Oct	B/D	0-4	SP-SM	A-3, A-2-4
					4-15	SP-SM	A-3, A-2-4
					15-21	SP-SM, SM	A-2-4, A-3
					21-60	SC, CL, CH	A-7, A-6, A-2-6, A-2-7
					60-80	SM-SC, SC, SM	A-6, A-4, A-2-4, A-2-6
27	Sumterville Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes	1.5-3.0	Jul-Oct	C/D	0-9	SP-SM, SM	A-3, A-2-4
					9-29	SP-SM, SM	A-3, A-2-4
					29-80	CL, CH	A-7
29	Nittaw Muck, Frequently Flooded	0-1.0	Jun-Nov	C/D	0-5	PT	---
					5-12	SP-SM, SM	A-3, A-2-4
					12-65	CH, CL	A-7
					65-80	SP, SP-SM, SM, SM-SC	A-3, A-2-4
30	Placid Fine Sand, Depressional	0-1.0	Jun-Mar	A/D	0-16	SP, SP-SM, SM	A-3, A-2-4
					16-80	SP, SP-SM, SM	A-3, A-2-4
32	Pompano Fine Sand	0-1.0	Jun-Nov	A/D	0-80	SP, SP-SM	A-3, A-2-4

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
33	Sparr Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes	1.5-3.5	Jul-Oct	A/D	0-8	SP-SM	A-3, A-2-4
					8-46	SP-SM	A-3, A-2-4
					46-58	SM, SC, SM-SC	A-2-4
					58-80	SC, SM-SC	A-2-4, A-2-6, A-2, A-6
34	Tarrytown Sandy Clay Loam, Bouldery Subsurface	1.0-2.0	Jul-Sep	C/D	0-7	SM	A-2-4
					7-14	SC, CH, CL	A-4, A-6, A-7
					14-50	SC, CL, SM-SC, CL-ML	A-4
					50-80	SP-SM, SP	A-3, A-2-4
36	Floridana Mucky Fine Sand, Depressional	0-1.0	Jun-Feb	C/D	0-12	SP-SM, SM	A-3, A-2-4
					12-25	SP, SP-SM	A-3
					25-80	SM-SC, SC	A-2-4, A-2-6
37	Astatula Fine Sand, 0 to 8 Percent Slopes	>6.0	---	A	0-5	SP, SP-SM	A-3
					5-80	SP, SP-SM	A-3
39	Mabel Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes	1.5-3.0	Jul-Sep	D	0-16	SP-SM, SP, SM	A-2-4, A-3
					16-24	SC, CL, CH	A-6, A-7, A-2
					24-30	CH, MH	A-7
					30-80	SC, CS, CL	A-6, A-7
40	Millhopper Sand, Bouldery Subsurface, 0 to 5 Percent Slopes	3.5-6.0	Aug-Oct	A	0-7	SP-SM	A-3, A-2-4
					7-45	SP-SM	A-3, A-2-4
					45-80	SM, SM-SC, SC	A-2-4, A-4, A-2-6, A-6
42	Adamsville Fine Sand	2.0-3.5	Jun-Nov	A	0-8	SP-SM	A-3, A-2-4
					8-80	SP-SM, SP	A-3, A-2-4
43	Basinger Fine Sand, Depressional, 0 to 1 Percent Slopes	0-1.0	Jun-Feb	A/D	0-6	SP	A-3
					6-15	SP, SP-SM	A-3, A-2-4
					15-30	SP, SP-SM	A-3, A-2-4
					30-80	SP, SP-SM	A-3, A-2-4
44	Oldsmar Fine Sand, Bouldery Subsurface	0.5-1.5	Jun-Oct	A/D	0-31	SP, SP-SM	A-3
					31-48	SP-SM, SM	A-2-4, A-3
					48-80	SM-SC, SC	A-2, A-4, A-6, A-7
45	Electra Fine Sand, Bouldery Subsurface	2.0-3.5	Jul-Oct	A	0-3	SP, SP-SM	A-3
					3-35	SP, SP-SM	A-3
					35-40	SP-SM, SM	A-3, A-2-4
					40-46	SP, SP-SM	A-3
					46-80	SC, SM-SC	A-2, A-4, A-6
46	Ft. Green Fine Sand, Bouldery Subsurface	0.5-1.5	Jun-Jan	C/D	0-28	SP-SM, SM	A-3, A-2-4
					28-38	SC, SM-SC, SM	A-2-6, A-6, A-2-4, A-4
					38-58	SC	A-2-6, A-6, A-4, A-7-6
					58-80	SC, SM-SC, SM	A-2-6, A-6, A-2-4, A-4

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
47	Okeelanta Muck, Frequently Flooded	0-1.0	Jan-Dec	A/D	0-19	PT	A-8
					19-80	SP, SP-SM, SM	A-3, A-2-4
49	Terra Ceia Muck, 0 to 1 Percent Slopes, Frequently Flooded	0-0.5	Jan-Dec	A/D	0-80	PT	A-8
50	Immokalee Sand	0.5-1.5	Jun-Nov	B/D	0-5	SP, SP-SM	A-3
					5-34	SP, SP-SM	A-3
					34-46	SP-SM, SM	A-3, A-2-4
					46-80	SP, SP-SM	A-3
51	Pits-Dumps Complex	---	---	---	---	---	---
53	Tavares Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes	3.5-6.0	Jun-Dec	A	0-7	SP, SP-SM	A-3
					7-80	SP, SP-SM	A-3
54	Monteocha Fine Sand, Depressional	+2-0	Jun-Feb	D	0-11	SP-SM, SM	A-3, A-2-4
					11-65	SP, SP-SM, SM	A-3, A-2-4
					65-80	SM, SM-SC, SC	A-2-4, A-2-6
55	Pomello Fine Sand, 0 to 5 Percent Slopes	2.0-3.5	Jul-Nov	A	0-40	SP, SP-SM	A-3
					40-56	SP-SM, SM	A-3, A-2-4
					56-80	SP, SP-SM	A-3
56	Wabasso Fine Sand, Depressional	+1-1.0	Jun-Feb	C/D	0-17	SP-SM, SM	A-3, A-2-4
					17-33	SM	A-2-4
					33-60	SM, SM-SC, SC	A-2-4, A-2-6, A-6, A-4
					60-80	SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-4
58	Paisley Fine Sand, Depressional	0-1.0	Jun-Feb	C/D	0-13	SP-SM	A-2-4, A-3
					13-80	CH, CL	A-7
62	Urban Land	---	---	---	---	---	---
65	Candler Sand, Bouldery Subsurface, 0 to 5 Percent Slopes	>6.0	---	A	0-3	SP, SP-SM	A-3
					3-65	SP, SP-SM	A-3
					65-80	SP-SM	A-3, A-2-4

Seasonal High Ground water table: Depth is referenced below existing grade, except where indicated as "+".

Portions of the project are located within a Sensitive Karst Area (SKA), therefore, stormwater management ponds shall not be excavated through a confining layer as it would allow polluted water to drain into the Florida Aquifer. If no confining layer is present, the stormwater management ponds should not be excavated to within two (2) feet of the underlying limestone layer. Geotechnical analysis will be required for the ponds which should look for sinkhole indicators (i.e. 100% loss of circulations). Please refer to **Figure 8 – Karst Map** in **Appendix 1** and to the pond descriptions in **Section 5.3 Stormwater Pond Evaluation** to determine which ponds are located within the SKA.

4.2.1 Contamination Screening

A total of 74 preliminary pond alternative locations (and 19 associated easements) were investigated for sites that may present the potential for finding petroleum contamination or hazardous materials and therefore may impact the proposed improvements for this project. Of the pond sites investigated, the following risk rankings have been applied: Three (3) "High" ranking sites (Ponds 1C, 12C/23C, and 19A), ten (10) "Medium" ranking sites (Ponds 4B, 5A, 5B, 5C, 7C, 8A, 8B, 8C, 8D and 17B), fifteen (15) "Low" ranking sites (Ponds 2B, 3A, 3B, 4A, 4C, 9A, 9C, 12A, 12B, 13B, 13C, 14A, 14B, 23A, and 23B), and the remaining forty-six (46) sites ranked "No" for potential contamination concerns.

The sites, business operations and/or facilities identified, to date, and the risk rankings given to them are preliminary. It should be understood that these risk rankings may change pending receipt of information which indicates a discharge occurred on-site or in nearby surrounding areas. Variables that may change the risk ranking include a facility's non-compliance to environmental regulations, new discharges to the soil or groundwater, and modifications to current permits. Should any of these variables change, additional assessment of the facilities should be conducted.

For any sites with a risk ranking of "Medium" or "High", Level II field screening should be conducted if it is determined during the project's design that its construction activities could be within their vicinity. Please refer to **Appendix H - Contamination Screening Evaluation Report** for further information.

4.3 Environmental Characteristics

4.3.1 Land Use Data

The project corridor is a mixture of residential, commercial, agricultural, pasture, upland forest and wetlands. Please see **Figures 5A** and **5B** for the **Land Use Map** in **Appendix A**. The widening of US 301 from north of CR 470 to SR 44 does not alter the existing or future land uses in the area.

4.3.2 Cultural Features

Cultural features preserve and enhance the cultural nature of a community and include parks, schools, churches and other religious institutions. Also included are historic sites, archaeologically significant sites and neighborhood gathering places. Community services include facilities that provide necessary services such as fire stations, police stations, public and private schools, hospitals, cemeteries, public buildings, and civic facilities. As a result of the cultural resource assessment survey of the proposed pond locations, five newly recorded archeological sites were recorded within five of the pond sites and the boundaries of one previously recorded site were expanded within one pond site. Please refer to **Appendix F - Cultural Resource Assessment Survey Addendum** for further information.

4.3.3 Natural and Biological Features

The proposed project has potential to involve several State and/or Federally listed protected wildlife species. These species and their anticipated involvement are identified in the Wildlife and Habitat Report located in **Appendix G – Natural Resources Evaluation Report**.

The project corridor was evaluated for the presence of potentially-occurring species. It was determined that four protected species could potentially occur within the project area, the gopher tortoise, the Florida burrowing owl, the wood stork and the Southeastern American Kestrel. The likelihood of each species occurring within the project corridor was evaluated based on historic ranges, literature review, aerial photography interpretation to identify suitable habitat, and field investigations.

The identification of wetlands has been investigated and is included within the **Natural Resources Evaluation Report** located in **Appendix G**. It is likely that this project will impact wetlands regulated by the State and Federal Governments. Pond alternative recommendations will be based on avoidance of wetland impacts whenever possible.

4.4 Floodplains/Floodways

According to the Federal Emergency Management Agency (FEMA) the relevant Flood Insurance Rate Map (FIRM) panel numbers are 12119C0231D, 12119C0143D, 12119C0139D, 12119C0137D, 12119C0141D, 12119C0133D and 12119C0131D for Polk County, dated September 27, 2013. According to the FEMA FIRMs, much of the project is within Zone X of the 100-year floodplain, which are determined to be outside the 0.2% annual chance of flooding. However, portions of the project will impact small pockets of the 100-year floodplain which lie within Zone A. These areas are associated with small depressional areas or wetlands and have a 1% probability of flooding every year, and where predicted flood water elevations have not been established. There are no federally regulated floodways within the project limits. Please refer to **Figure 6**, **Appendix A** for the **FEMA FIRM Map**.

4.4.1 Flooding History and Maintenance Concern

The City of Coleman was contacted to discuss any flooding history and maintenance concerns. During a site visit, Inwood staff met with the Mayor of Coleman (Milton Hill) and the President of the Coleman City Council (Richard Huff) to discuss flooding issues on Florida Avenue between Commercial Street and Mulberry Street, north of US 301. Storm water flows from a highpoint in the topography to the east, along Florida Avenue and collects in both the roadway and the open portion of the adjacent parcel, covering this entire area. Mr. Hill and Mr. Huff also reported flood waters rising high enough to enter some surrounding buildings and seeping into a nearby septic tank. Mr. Hill and Mr. Huff said flooding has reached US 301 during times of heavy rain, overtopping the road and flowing into a storm sewer system installed on the south side of the road. Mr. Hill and Mr. Huff then identified this storm sewer infrastructure installed by FDOT at the intersection of Commercial Street and Warm Springs Avenue (US 301) which consisted of one DBI and two grate inlets. This system outfalls into a ditch along the East side of the nearby CSX railway which flows south. These locations are shown in **Figure 4-1**.

For further discussions about mitigation alternatives to alleviate this flooding concern, please refer to the Location Hydraulics Report prepared for this study, which discusses the Preliminary Flooding Evaluation Report prepared by ICON Consulting Group (December 2016).



Figure 4-1 | Reported Flooding Location Map

4.5 Existing Drainage Permits

There are currently, three (3) SWFWMD permits which cover portions of US 301 within the project limits. The section below briefly describes the permitted condition, the impacts to the permit associated with the proposed improvements and the action necessary to mitigate for the impacts.

4.5.1 Permit No. 22044.001

This permit involves the milling and resurfacing of US 301 from CR 468 to SR 91. No formal water quality treatment or water quantity attenuation was provided for US 301 with this permit. The proposed roadway improvements to US 301 will not impact this permit.

4.5.2 Permit No. 16854.000

This permit involves the US 301 bridge replacement over Shady Brook. No formal water quality treatment or water quantity attenuation was provided for US 301 with this permit. The proposed roadway improvements to US 301 will not impact this permit.

4.5.3 Permit No. 32972.016

This permit involves the construction of the Wildwood Springs residential development of the Village of Fenney. Stormwater treatment ponds for the residential development have been approved with this permit. These ponds provide a joint use opportunity, further discussed in **Section 5.4 – Environmental Look Arounds (ELAs)**. The proposed roadway improvements to US 301 will not impact this permit.

4.6 Existing Drainage Basins

4.6.1 Basin 1

Basin 1 begins 681 feet south of station 100+00 and continues north to a high point in that roadway at station 117+45. Stormwater runoff from US 301 between the beginning of the basin and CD-01, 273 feet south of station 100+00, is collected in roadside swales and conveyed north to CD-01 where it then flows west. Stormwater runoff from the west side of US 301 between CD-01 and station 117+45, sheet flows off the roadway, across the adjacent golf course and into nearby wetlands. Stormwater runoff from the east side of US 301 between CD-01 and station 117+45 is collected in roadside swales and conveyed south to CD-01. This basin is considered an open basin.

4.6.2 Basin 2

Basin 2 begins at a high point in the roadway at station 117+45 and continues north to the bridge over Shady Brook at station 150+69. Stormwater runoff from US 301 is collected in roadside swales and conveyed north to station 126+05 on the west side of the roadway and station 129+05 on the east side of the roadway where it then sheet flows into the adjacent wetlands. Stormwater runoff from the remainder of the basin sheets flows directly into the adjacent wetlands. A 24" RCP cross drain (CD-02) at station 132+36 allows stormwater runoff to flow west underneath US 301 and into the adjacent wetlands associated with Shady Brook. This basin is considered an open basin.

4.6.3 Basin 3

Basin 3 begins at the bridge over Shady Brook at station 150+69 and continues north to a high point in the roadway at station 179+19. Stormwater runoff from US 301 is collected in roadside swales and conveyed south from station 173+46 on the west side of the roadway and station 172+46 on the east side of the roadway where it then sheet flows into the adjacent wetlands associated with Shady Brook. Roadway stormwater runoff between station 173+46 and station 176+86 on the west side of the roadway and station 172+46 and station 177+06 on the east side of the roadway, sheet flows off the roadway into adjacent depressional areas where it infiltrates into the ground. Stormwater runoff from the remainder of the basin is collected in roadside swales and conveyed south to the same adjacent depressional areas. The majority of this basin is considered an open basin, however the portion between stations 172+46 and 179+19 would be consider closed.

4.6.4 Basin 4

Basin 4 begins at a high point in the roadway at station 179+19 and continues north to station 196+64, the point at which offsite runoff divides between CD-03 and CD-04. Stormwater runoff from US 301 is collected in roadside swales and conveyed north to CD-03 at station 190+21, where it is discharged west towards a series of ditches that eventually outfall to an existing series of wetlands. Stormwater runoff from the remainder of the basin sheet flows off the roadway and flows overland to CD-03. This basin is considered an open basin.

4.6.5 Basin 5

Basin 5 begins at station 196+64, the point at which offsite runoff divides between CD-03 and CD-04 and continues north to the intersection of US 301 and County Road 525 East at station 222+61. Stormwater runoff on the west side of the roadway is collected in roadside swales and conveyed to CD-04 at station 201+95 where it discharges west to an adjacent wetland. Between station 196+64 and station 204+86 on the east side of the roadway, stormwater runoff is collected in roadside swales and conveyed to CD-04. Stormwater runoff from the east side of the roadway in the remainder of the basin sheet flows off of the roadway into adjacent depressional areas where it infiltrates into the ground. Both the adjacent wetland and these depressional areas do not have an outfall, therefore, this basin is considered a closed basin.

4.6.6 Basin 6

Basin 6 begins at the intersection of US 301 and County Road 525 East at station 10014+12 and continues north to the intersection of US 301 and Anderson Road at station 10031+24, a high point in the roadway. Stormwater runoff on the east side of the roadway is collected in roadside swales and conveyed to CD-05 at station 10026+41 where it discharges east to an adjacent wetland. Between station 10014+12 and station 10022+22 on the west side of the roadway, stormwater runoff sheet flows off of the roadway into an adjacent wetland. When this wetland reaches its maximum retaining volume, it backflows north through roadside swales to CD-05. Stormwater runoff from the west side of the roadway in the remainder of the basin is collected in roadside swales and conveyed south to CD-05. This wetland has a pop-over elevation of 56.00 ft to the east leading to a series of ditches and wetlands which eventually drain to Shady Brook, therefore, this is considered an open basin.

4.6.7 Basin 7

Basin 7 begins at the intersection of US 301 and Anderson Road at station 10031+24, a high point in the roadway, and continues north to another high point in the roadway at station 10042+34. Stormwater runoff from both sides of the roadway is collected in roadside swales and conveyed to CD-06 at station 10035+49 where it discharges east to an adjacent wetland. This wetland drains to the southeast through a series of ditches and wetlands which eventually drain to Shady Brook, therefore, this is considered an open basin.

4.6.8 Basin 8

Basin 8 begins at a high point in the roadway at station 10042+34 and continues north to the intersection of US 301 and Warm Springs Avenue at station 10052+38. The basin then continues east from the intersection to a high point in the roadway at station 10062+09. Stormwater runoff from the east side of the roadway between station 10042+34 and the intersection of US 301 and Clark Avenue at station 10048+99 sheet flows across the roadway

into an adjacent depressional area to the west. This depressional area has a pop-over elevation of 61.00 ft to the northwest leading to a ditch alongside the CSX Railway. Stormwater runoff from the west side of the roadway between station 10042+34 and station 10051+39 sheet flows off of the roadway to the same depressional area to the west. Between the intersection of US 301 and Clark Avenue at station 10048+99 and station 10053+55, stormwater runoff from the east side of the roadway is collected through a storm sewer system consisting of curb and gutter, grate inlets and a ditch bottom inlet that discharges west along Warm Springs Avenue into the same ditch along the CSX Railway. Stormwater runoff from the remainder of the basin sheet flows west along the roadway into the storm sewer system inlets at the intersection of US 301 and Warm Springs Avenue.

Flooding has been reported in this basin. Storm water flows from a highpoint in the topography to the east, along Florida Avenue (north of US 301) and collects in both the roadway and the open portion of the adjacent parcel, between Commercial Street and Mulberry Street. Flooding has reportedly reached US 301 during times of heavy rain, has flowed overtop of it and into the storm sewer system. For further information, please refer to **Section 4.4.1**. This is considered an open basin.

4.6.9 Basin 9

Basin 9 begins at a high point in the roadway at station 10062+09 and continues east to another high point in the roadway at station 10077+36. Stormwater runoff from both sides of the roadway sheet flows along and across the roadway into adjacent wetlands to the south. These wetlands drain to the south through pop-over elevations of 56.00 and 57.00 ft to a series of ditches and wetlands which eventually drain to Shady Brook, therefore, this is considered an open basin.

4.6.10 Basin 10

Basin 10 begins at a high point in the roadway at station 10077+36 and continues east to the intersection of US 301 (Warm Springs Avenue) and Stokes Street at station 10105+04, another high point in the roadway. Stormwater runoff from both sides of the roadway is collected in roadside swales and conveyed to CD-07 at station 10092+84, which discharges south to the adjacent wetland. Roadway swales on the north side of the roadway discharge to CD-07 through a ditch bottom inlet on the upstream end. The adjacent wetland does not have an outfall, therefore, this basin is considered a closed basin.

4.6.11 Basin 11

Basin 11 begins at the intersection of US 301 (Warm Springs Avenue) and Stokes Street at station 10105+04, a high point in the roadway and continues east, then northeast to another high point in the roadway at station 10124+41, the point at which runoff divides between CD-08 and CD-09. Stormwater runoff from both sides of the roadway is collected in roadside swales and conveyed to CD-08 at station 10118+73, which discharges south to the adjacent wetland. The adjacent wetland does not have an outfall, therefore, this basin is considered a closed basin.

4.6.12 Basin 12

Basin 12 begins at a high point in the roadway at station 10124+41, the point at which runoff divides between CD-08 and CD-09, and continues northeast, then north to station 10143+90, the point at which offsite runoff divides

between CD-09 and CD-10. Stormwater runoff from both sides of the roadway is collected in roadside swales and conveyed to CD-09 at station 10138+20, which discharges west to the adjacent depressional area where it infiltrates into the ground. The adjacent depressional area does not have an outfall, therefore, this basin is considered a closed basin.

4.6.13 Basin 13

Basin 13 begins at station 401+79 and continues north to a high point in the roadway at station 502+54. Stormwater runoff from the east side of the roadway is collected in roadside swales and conveyed to CD-10 at station 409+80, which discharges west to the adjacent depressional area where it infiltrates into the ground. Between station 401+79 and station 414+00 on the west side of the roadway, stormwater runoff is collected in roadside swales and conveyed to CD-10. Between station 414+00 and station 502+54 on the west side of the roadway, stormwater runoff sheet flows off of the roadway into the adjacent depressional area where it infiltrates into the ground. The adjacent depressional areas do not have an outfall, therefore, this basin is considered a closed basin.

4.6.14 Basin 14

Basin 14 begins at a high point in the roadway at station 502+54 and continues north to another high point in the roadway at station 542+19 just north of CD-11. Stormwater runoff from both sides of the roadway is collected in roadside swales and conveyed to CD-11 at station 540+60. CD-11 acts as an equalizer between the two wetlands on each side of US 301. These wetlands do not have an outfall, therefore, this basin is considered a closed basin.

4.6.15 Basin 15

Basin 15 begins at a high point in the roadway at station 542+19 and continues north to another high point in the roadway at station 578+35. Stormwater runoff from both sides of the roadway is collected in roadside swales and conveyed to CD-12 at station 564+49, which discharges east to an adjacent wetland. This wetland outfalls to the east at a pop-over elevation of 57.00 ft to a series of existing wetlands and ditches, therefore, this basin is considered an open basin.

4.6.16 Basin 16

Basin 16 begins at a high point in the roadway at station 578+35 and continues north to CD-13, 49 feet north of station 596+90. Stormwater runoff from the east side of US 301 is collected in roadside swales and conveyed to CD-13 which discharges west to a series of existing interconnected wetlands. Stormwater runoff from the west side of the roadway is collected in roadside swales and conveyed north to station 588+69, where it then sheet flows into an adjacent wetland. This wetland discharges to the northwest at a pop-over elevation of 58.00 ft to the same series of existing wetlands. Stormwater runoff from the west side of the roadway for the remainder of the basin is collected in roadside swales and conveyed to CD-13. This is considered an open basin.

4.6.17 Basin 17

Basin 17 begins at CD-13, 49 feet north of station 596+90, and continues 1604 feet north to the end of the project's roadway improvements. Basin 17 also includes all lanes of Florida's Turnpike (including the on and off ramps) between Turnpike station 1016+05 and station 1053+25. Stormwater runoff from both sides of US 301 between

CD-13 and the intersection of US 301 and Florida's Turnpike, 789 feet north of station 596+90, is collected in roadside swales and conveyed to CD-13, which discharges west to a series of existing interconnected wetlands. Stormwater runoff from the southbound lanes of Florida's Turnpike sheet flow to the south off of the roadway to the adjacent wetlands. Stormwater runoff collected in the depressional areas between the southbound roadway and ramps (between stations 1029+00 and 1040+50 and stations 1041+40 and 1052+00) is discharged south through cross drains beneath the on and off ramps to the adjacent wetlands.

Stormwater runoff from the northbound lanes of Florida's Turnpike between stations 1016+05 and 1027+00 sheet flows to the north off of the roadway into an adjacent wetland. Stormwater runoff collected in the depressional area between the northbound lanes and the northbound on ramp (between stations 1027+00 and 1040+80) flows to the north off of the roadway and is conveyed through a cross drain beneath the on ramp to the roadside swales along the west side of US 301 where it is discharged to CD-14, 2380 feet north of station 596+90. Stormwater runoff from the northbound lanes of Florida's Turnpike between stations 1040+80 and 1053+25, the northbound off ramp and the east side of US 301 between 789 and 1029 feet north of station 596+90 sheet flows off of the roadway where it is conveyed through a cross drain beneath the off ramp into an adjacent wetland. Stormwater water runoff from the west side of US 301 between 789 and 1604 feet north of station 596+90 is collected in roadside swales and conveyed north to CD-14. Stormwater runoff from the east side of US 301 for the remainder of the basin is collected in grate inlets, ditch bottom inlets and roadside swales and conveyed to CD-14. This is considered an open basin.

4.6.18 Basin 18

Basin 18 begins 1604 feet north of station 596+90 and ends at the intersection of US 301 and State Road 44, 4388 feet north of station 596+90. Stormwater runoff from the east side of US 301 between the start of the basin and the intersection of US 301 and Spring Lake Road, 3469 feet north of station 596+90 is collected in grate inlets, ditch bottom inlets and roadside swales and conveyed to CD-14, 2380 feet north of station 596+60, which discharges west under US 301 to a series of ditches and existing wetlands. Stormwater water runoff from the west side of US 301 between the start of the basin and the intersection of US 301 and Spring Lake Road is collected in roadside swales and conveyed to CD-14. Stormwater runoff from the remainder of the basin is collected in curb inlets and conveyed south where it is discharged to an adjacent wetland. This is considered an open basin.

4.6.19 Basin 19

Basin 19 begins at the intersection of US 301 and County Road 525 East at Truck Route station 300+00 and ends at station 320+68. This basin consists of the proposed roadway for the Truck Route Alternative. Stormwater runoff in this basin collects in existing depressional areas and wetlands, which are connected through a series of ditches and other wetlands eventually draining to Shady Brook, therefore, this is considered an open basin.

4.6.20 Basin 20

Basin 20 begins at Truck Route station 320+68 and ends at station 340+35. This basin consists of the proposed roadway for the Truck Route Alternative. Stormwater runoff in this basin collects in existing depressional areas and wetlands, which are connected through a series of ditches and other wetlands eventually draining to Shady Brook, therefore, this is considered an open basin.

4.6.21 Basin 21

Basin 21 begins at Truck Route station 340+35 and ends at station 372+74. This basin consists of the proposed roadway for the Truck Route Alternative. Stormwater runoff in this basin collects in existing depressional areas and wetlands, which are connected through a series of ditches and other wetlands eventually draining to Shady Brook, therefore, this is considered an open basin.

4.6.22 Basin 22

Basin 22 begins at Truck Route station 372+74 and ends at station 385+47. This basin consists of the proposed roadway for the Truck Route Alternative. Stormwater runoff in this basin collects in existing depressional areas and wetlands, which do not have an outfall therefore, this is considered a closed basin.

4.6.23 Basin 23

Basin 23 begins at Truck Route station 385+47 and ends at Stokes Street at station 401+79. This basin consists of the proposed roadway for the Truck Route Alternative. Stormwater runoff in this basin collects in existing depressional areas and wetlands, which do not have an outfall therefore, this is considered a closed basin.

5.0 Proposed Drainage Conditions

The stormwater runoff from the project limits will be collected and conveyed in roadside ditches to the proposed offsite dry retention and wet detention ponds. The ponds will discharge at or near the same cross drains that carry the roadway runoff in the existing condition. The proposed ponds have been sized to achieve the required water quality treatment and water quantity attenuation.

5.1 Proposed Ponds

There are currently twenty-three (23) drainage basins within the project limits. Three (3) pond alternatives for each basin have been analyzed, with the exception of Basin 18, where the proposed roadway improvements are minor, consisting of safety related improvements and therefore, stormwater pond alternatives have not been considered. The ponds were sized on the assumption that offsite runoff would be drained through the pond site alternative toward its historical path. Also, for contingency purposes, the ponds were upsized by twenty percent (20%). In Segments 1, 2, 4, and 6 the ponds were sized to accommodate four (4) 12-foot travel lanes, 4-foot inside shoulders and 7-foot buffered shoulders, and 6-foot sidewalks on each side of the roadway, as specified in the Suburban Typical Section. In Segment 3 of the project, the ponds were sized to accommodate four (4) 11-foot travel lanes, 7-foot buffered shoulders and 5-foot sidewalks on each side of the roadway, as specified in the Urban Typical Section. Ponds sized for Basin 17 also include accommodation for the proposed widening of Florida's Turnpike; this includes four (4) 12-foot travel lanes and 12-foot inside and 10-foot outside shoulders for both northbound and southbound roadways. Segment 5 of the project is anticipated to have minor safety related roadway improvements; therefore, no pond alternatives have been analyzed for this segment.

The onsite roadway basin areas draining to the ponds were determined to be the areas within the proposed right-of-way limits. The limits of the proposed basins begin and end at the same locations as the existing condition with the exception of Basins 11, 12 and 13, where the limits were adjusted slightly to have a common station between the left and right side of the roadway. The location of the outfall in the proposed condition is the same as the existing condition. Please refer to the Basin Maps in **Appendix B** for the pond locations.

The ponds have been properly sized to accommodate the increased attenuation volume due to the proposed increase in impervious area within the basin. **Table 4 – Summary of Proposed Drainage Basins** provides a summary of the proposed basin limits.

Table 4 – Summary of Proposed Drainage Basins

Basin Name	Segment Number	Alignment Alternative	From Station	To Station
Basin 1	1	1 & 2	97+26*	117+45
Basin 2	2	1 & 2	117+45	150+69
Basin 3	2	1 & 2	150+69	179+19
Basin 4	2	1 & 2	179+19	196+64
Basin 5	2	1 & 2	196+64	222+61
Basin 6	3	1	10014+12	10031+24
Basin 7	3	1	10031+24	10042+34
Basin 8	3	1	10042+34	10062+09

Basin Name	Segment Number	Alignment Alternative	From Station	To Station
Basin 9	3	1	10062+09	10077+36
Basin 10	3	1	10077+36	10105+04
Basin 11	4	1	10105+04	10124+41
Basin 12	4	1	10124+41	10143+90
Basin 13	4	1 & 2	401+79	502+54
Basin 14	4	1 & 2	502+54	542+19
Basin 15	4	1 & 2	542+19	578+35
Basin 16	4	1 & 2	578+35	597+39*
Basin 17	4	1 & 2	597+39*	612+93*
Basin 18	5	1 & 2	612+93*	640+78*
Basin 19	6	2	300+00	320+68
Basin 20	6	2	320+68	340+35
Basin 21	6	2	340+35	372+74
Basin 22	6	2	372+74	385+47
Basin 23	6	2	385+47	401+79
*Approximate station value extrapolated from beginning or end of station chain.				

5.2 Methodology of Pond Determination

The pond sizing analysis assumes that all ponds will be designed using wet detention and dry retention pond design criteria. The report focuses on the preliminary estimate of required pond volumes necessary for each roadway drainage basin. A 20% upsize in the required pond right-of-way area has been applied for all the ponds to account for preliminary parameters such as the estimated seasonal high water elevations, ground elevations and potential natural contouring of the ponds. The following parameters were considered in the sizing of potential pond sites:

- Hydrologic and hydraulic factors such as existing ground elevations, soil types, estimated seasonal high water (ESHW), stormwater conveyance feasibility, allowable hydraulics grade line (HGL);
- Environmental resource impacts including wetlands and threatened or endangered species;
- Floodplain Impacts;
- Major utility conflict potential;
- Parcel descriptions and land usage;
- Impacts to cultural resources

The possibility of dry linear swales within the right of way for Segments 1, 2, 4, and 6 should be further explored during the design phase of the project. Dry linear swales should be viable as long as sufficient separation between the ESHW table and the bottom of the linear swale is maintained to allow for proper recovery of the volume to meet SWFWMD and FDOT guidelines. In addition, linear swales may be viable in areas where the Hydrologic Soil Group (HSG) is Type A. Another consideration for linear swales includes investigating if offsite runoff can hydraulically commingle with onsite runoff of if a bypass offsite system is required. For right of way estimates and funding purposes, this report focuses on the conservative assumption that offsite ponds will be required.

5.3 Stormwater Pond Evaluation

5.3.1 Basin 1

Basin 1 is located between 681 feet south of station 100+00 and station 117+45 within the Withlacoochee River South watershed. Basin 1 is considered an open basin because the surrounding area drains to CD-1, 273 feet south of station 100+00, and continues to drain west to the wetlands surrounding Shady Brook. This basin is located within WBID 1359D and WBID 1351C which are not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 1. Two (2) of the alternatives are offsite wet detention ponds and one (1) is an offsite dry retention pond. All the pond site alternatives in this basin are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 1B.

5.3.1.1 Pond 1A

Pond 1A will serve as the treatment and attenuation pond for Basin 1. Pond 1A is located east of US 301 at approximately station 103+40 (RT.). This pond site sits within one (1) parcel (J12-009). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 1A consists of Millhopper (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 3.5 to 6.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 66.00 feet NAVD. With the data compiled it was determined that Pond 1A will be a wet pond with the normal water/control elevation set at elevation 62.50 feet. Preliminary pond sizing calculations indicate that this pond requires 1.27 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-01.

5.3.1.2 Pond 1B

Pond 1B will serve as the treatment and attenuation pond for Basin 1. Pond 1B is located east of US 301 at approximately station 109+21 (RT.). This pond site sits within one (1) parcel (J12-009). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 1B consists of Candler (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be greater than 6.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 66.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 1B was estimated to be at approximately 59.30 feet NAVD. With the data compiled it was determined that Pond 1B will be a dry pond with the pond bottom set at elevation 62.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.02 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-01.

5.3.1.3 Pond 1C

Pond 1C will serve as the treatment and attenuation pond for Basin 1. Pond 1C is located west of US 301 at approximately station 110+01 (LT.). This pond site sits within one (1) parcel (J12-006). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 1C consists of Sumterville (HSG

C/D) and Oldsmar (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.0 feet and 0.5 to 1.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 1C will be a wet pond with the normal water/control elevation set at elevation 62.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.59 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-01.

5.3.2 Basin 2

Basin 2 is located between stations 117+45 and 150+69 within the Withlacoochee River South watershed. Basin 2 is considered an open basin because the surrounding area drains to the wetlands surrounding Shady Brook. This basin is located within WBID 1351C and WBID 1356 which are not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 2. All the pond site alternatives in this basin are within the SKA. All of the alternatives are offsite wet detention ponds. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 2A.

5.3.2.1 Pond 2A

Pond 2A will serve as the treatment and attenuation pond for Basin 2. Pond 2A is located west of US 301 at approximately station 145+14 (LT.). This pond site sits within one (1) parcel (J12-019). The pond site has no impacts to wetlands and has impacts approximately 0.27 acres to the floodplain. According to Sumter County Soil Survey, Pond 2A consists of Paisley (HSG B/D) and Terra Ceia (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet and 0.0 to 0.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 54.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 2A was estimated to be at approximately 50.60 feet NAVD. With the data compiled it was determined that Pond 2A will be a wet pond with the normal water/control elevation set at elevation 48.00 feet. Pond 2A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.93 acres of area for treatment and attenuation. This pond will have a direct discharge to Shady Brook which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required.

5.3.2.2 Pond 2B

Pond 2B will serve as the treatment and attenuation pond for Basin 2. Pond 2B is located east of US 301 at approximately station 144+43 (RT.). This pond site sits within one (1) parcel (J12-013). The pond site has approximately 0.32 acres of impacts to wetlands and no impacts to the floodplain. According to Sumter County Soil Survey, Pond 2B consists of Paisley (HSG B/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 55.00 feet NAVD. With the data compiled it was determined that Pond 2B will be a wet pond with the normal water/control elevation set at elevation 49.00 feet. Pond 2B will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 3.20

acres of area for treatment and attenuation. This pond will have a direct discharge to Shady Brook which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required.

5.3.2.3 Pond 2C

Pond 2C will serve as the treatment and attenuation pond for Basin 2. Pond 2C is located west of US 301 at approximately station 139+53 (LT.). This pond site sits within one (1) parcel (J12-022). The pond site has approximately 1.52 acres of impacts to wetlands and no impacts to the floodplain. According to Sumter County Soil Survey, Pond 2C consists of Paisley (HSG B/D), Terra Ceia (HSG A/D) and Oldsmar (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet, 0.0 to 0.5 feet and 0.5 to 1.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 48.00 feet NAVD. With the data compiled it was determined that Pond 2C will be a wet pond with the normal water/control elevation set at elevation 44.00 feet. Pond 2C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 2.65 acres of area for treatment and attenuation and a 0.31 acre access easement (total of 2.96 acres). This pond will have a direct discharge to Shady Brook which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required.

5.3.3 Basin 3

Basin 3 is located between stations 150+69 and 179+19 within the Withlacoochee River South watershed. Basin 3 is considered an open basin because the surrounding area drains to the wetlands surrounding Shady Brook. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 3. All the alternatives are offsite wet detention ponds. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 3B.

5.3.3.1 Pond 3A

Pond 3A will serve as the treatment and attenuation pond for Basin 3. Pond 3A is located west of US 301 at approximately station 155+96 (LT.). This pond site sits within three (3) parcels (J01-027, J01-024 and J01-068). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 3A consists of Sumterville (HSG C/D) and Millhopper (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.0 feet and 3.5 to 6.0 feet below existing ground respectively. This pond site is not located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 3A will be a wet pond with the normal water/control elevation set at elevation 48.25 feet. Pond 3A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 3.47 acres of area for treatment and attenuation. This pond will discharge to the US 301 right-of-way where it will be conveyed to Shady Brook, which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required.

5.3.3.2 Pond 3B

Pond 3B will serve as the treatment and attenuation pond for Basin 3. Pond 3B is located east of US 301 at approximately station 152+97 (RT.). This pond site sits within one (1) parcel (J01-067). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 3B consists of Paisley (HSG B/D), Sumterville (HSG C/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet, 1.5 to 3.0 feet and 1.5 to 3.5 feet below existing ground respectively. This pond site is located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 53.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 3B was estimated to be at approximately 47.60 feet NAVD. With the data compiled it was determined that Pond 3B will be a wet pond with the normal water/control elevation set at elevation 47.50 feet. Preliminary pond sizing calculations indicate that this pond requires 2.48 acres of area for treatment and attenuation and a 0.26 acre access easement (total of 2.74 acres). This pond will discharge to the US 301 right-of-way where it will be conveyed to Shady Brook, which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required.

5.3.3.3 Pond 3C

Pond 3C will serve as the treatment and attenuation pond for Basin 3. Pond 3C is located east of US 301 at approximately station 152+69 (RT.). This pond site sits within one (1) parcel (J12-004). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 3C consists of Paisley (HSG B/D), Sumterville (HSG C/D) and Oldsmar (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet, 1.5 to 3.0 feet and 0.5 to 1.5 feet below existing ground respectively. This pond site is located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 55.00 feet NAVD. With the data compiled it was determined that Pond 3C will be a wet pond with the normal water/control elevation set at elevation 48.00 feet. Pond 3C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 2.33 acres of area for treatment and attenuation. This pond will discharge to the US 301 right-of-way where it will be conveyed to Shady Brook, which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required.

5.3.4 Basin 4

Basin 4 is located between stations 179+19 and 196+64 within the Withlacoochee River South watershed. Basin 4 is considered an open basin because the surrounding area drains to CD-03 and continues to drain west to a series of ditches that eventually outfall to an existing series of wetlands. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 4. All of the alternatives are offsite wet detention ponds. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 4B.

5.3.4.1 Pond 4A

Pond 4A will serve as the treatment and attenuation pond for Basin 4. Pond 4A is located east of US 301 at approximately station 185+02 (RT.). This pond site sits within one (1) parcel (J01-011). The pond site has no

impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 4A consists of Adamsville (HSG A), Ona (HSG B/D) and Tavares (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet, 0.5 to 1.5 feet and 3.5 to 6.0 feet below existing ground respectively. This pond site is not located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 4A will be a wet pond with the normal water/control elevation set at elevation 55.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.21 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-03.

5.3.4.2 Pond 4B

Pond 4B will serve as the treatment and attenuation pond for Basin 4. Pond 4B is located east of US 301 at approximately station 190+65 (RT.). This pond site sits within two (2) parcels (J01-006 and J01-011). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 4B consists of Adamsville (HSG A) and Ona (HSG B/D) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet and 0.5 to 1.5 feet below existing ground respectively. This pond site is located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 4B was estimated to be at approximately 52.90 feet NAVD. With the data compiled it was determined that Pond 4B will be a wet pond with the normal water/control elevation set at elevation 55.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.16 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-03.

5.3.4.3 Pond 4C

Pond 4C will serve as the treatment and attenuation pond for Basin 4. Pond 4C is located west of US 301 at approximately station 184+65 (LT.). This pond site sits within two (2) parcels (J01-008 and J01-029). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 4C consists of Adamsville (HSG A) and Tavares (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet and 3.5 to 6.0 feet below existing ground respectively. This pond site is not located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 4C will be a wet pond with the normal water/control elevation set at elevation 54.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.19 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-03.

5.3.5 Basin 5

Basin 5 is located between stations 196+64 and 222+61 within the Withlacoochee River South watershed. Basin 5 is considered a closed basin because the surrounding area drains to CD-04 where it discharges to an adjacent wetland that does not have an outfall. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. There are three (3) alternatives being considered for Basin 5. All of the alternatives are offsite wet detention ponds. The particulars of the alternatives are discussed in the following

sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 5B.

5.3.5.1 Pond 5A

Pond 5A will serve as the treatment and attenuation pond for Basin 5. Pond 5A is located east of US 301 at approximately station 205+83 (RT.). This pond site sits within one (1) parcel (F36-054). The pond site impacts approximately 0.28 acres to wetlands and approximately 0.72 acres to the floodplain. This pond site is located within the SKA. According to Sumter County Soil Survey, Pond 5A consists of Adamsville (HSG A), Basinger (HSG A/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet, 0.0 to 1.0 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 59.00 feet NAVD. With the data compiled it was determined that Pond 5A will be a wet pond with the normal water/control elevation set at elevation 55.50 feet. Preliminary pond sizing calculations indicate that this pond requires 5.21 acres of area for treatment and attenuation and a 0.25 acre access easement (total of 5.46 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-04.

5.3.5.2 Pond 5B

Pond 5B will serve as the treatment and attenuation pond for Basin 5. Pond 5B is located east of US 301 at approximately station 220+00 (RT.). This pond site sits within one (1) parcel (J01-003). The pond site has no impacts to wetlands and approximately 0.69 acres of impacts to the floodplain. According to Sumter County Soil Survey, Pond 5B consists of Adamsville (HSG A) and Basinger (HSG A/D). The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet and 0.0 to 1.0 feet below existing ground respectively. This pond site is located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 5B will be a wet pond with the normal water/control elevation set at elevation 54.25 feet. Preliminary pond sizing calculations indicate that this pond requires 3.09 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-04.

5.3.5.3 Pond 5C

Pond 5C will serve as the treatment and attenuation pond for Basin 5. Pond 5C is located west of US 301 at approximately station 197+56 (LT.). This pond site sits within one (1) parcel (J01-031). The pond site impacts approximately 0.33 acres to wetlands and approximately 0.56 acres to the floodplain. According to Sumter County Soil Survey, Pond 5C consists of Adamsville (HSG A) and Basinger (HSG A/D). The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet and 0.0 to 1.0 feet below existing ground respectively. This pond site is not located within the SKA. According to LIDAR data obtained for this pond site, the existing ground is at approximately 55.00 feet NAVD. With the data compiled it was determined that Pond 5C will be a wet pond with the normal water/control elevation set at elevation 54.00 feet. Preliminary pond sizing calculations indicate that this pond requires 5.58 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-04.

5.3.6 Basin 6

Basin 6 is located between stations 10014+12 and 10031+24 within the Withlacoochee River South watershed. Basin 6 is considered an open basin because the surrounding area drains to CD-05 where it discharges to an adjacent wetland that outfalls across a pop-over elevation to a series of ditches and wetlands that eventually drain to Shady Brook. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. There are three (3) alternatives being considered for Basin 6. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 6B.

5.3.6.1 Pond 6A

Pond 6A will serve as the treatment and attenuation pond for Basin 6. Pond 6A is located east of US 301 at approximately station 10018+22 (RT.). This pond site sits within one (1) parcel (F36-062). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 6A consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 6A will be a wet pond with the normal water/control elevation set at elevation 56.50 feet. Preliminary pond sizing calculations indicate that this pond requires 2.30 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-05.

5.3.6.2 Pond 6B

Pond 6B will serve as the treatment and attenuation pond for Basin 6. Pond 6B is located east of US 301 at approximately station 10023+15 (RT.). This pond site sits within one (1) parcel (F36-062). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 6B consists of Paisley (HSG A), Basinger (HSG A/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet, 0.0 to 1.0 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 6B will be a wet pond with the normal water/control elevation set at elevation 56.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.29 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-05.

5.3.6.3 Pond 6C

Pond 6C will serve as the treatment and attenuation pond for Basin 6. Pond 6C is located east of US 301 at approximately station 10018+01 (RT.). This pond site sits within one (1) parcel (F36-062). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 6C consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 6C will be a wet pond with the normal water/control elevation set at elevation 55.50 feet. Preliminary pond sizing calculations indicate that this pond

requires 2.01 acres of area for treatment and attenuation and a 0.54 acre access easement (total of 2.55 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-05.

5.3.7 Basin 7

Basin 7 is located between stations 10031+24 and 10042+34 within the Withlacoochee River South watershed. Basin 7 is considered an open basin because the surrounding area drains to CD-06 where it discharges to an adjacent wetland that outfalls across a pop-over elevation to a series of ditches and wetlands that eventually drain to Shady Brook. This basin is located within WBID 1356 and WBID 1351 which are not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. There are three (3) alternatives being considered for Basin 7. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 7B.

5.3.7.1 Pond 7A

Pond 7A will serve as the treatment and attenuation pond for Basin 7. Pond 7A is located east of US 301 at approximately station 10036+82 (RT.). This pond site sits within two (2) parcels (F36-041 and F36-098). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 7A consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 7A will be a wet pond with the normal water/control elevation set at elevation 58.00 feet. Pond 7A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 2.37 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-06.

5.3.7.2 Pond 7B

Pond 7B will serve as the treatment and attenuation pond for Basin 7. Pond 7B is located east of US 301 at approximately station 10031+13 (RT.). This pond site sits within one (1) parcel (F36-042). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 7B consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 59.00 feet NAVD. With the data compiled it was determined that Pond 7B will be a wet pond with the normal water/control elevation set at elevation 57.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.24 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-06.

5.3.7.3 Pond 7C

Pond 7C will serve as the treatment and attenuation pond for Basin 7. Pond 7C is located west of US 301 at approximately station 10036+80 (LT.). This pond site sits within one (1) parcel (F35-001). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 7C consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing

ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 61.00 feet NAVD. With the data compiled it was determined that Pond 7C will be a wet pond with the normal water/control elevation set at elevation 58.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.83 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-06.

5.3.8 Basin 8

Basin 8 is located between stations 10042+34 and 10062+09 within the Withlacoochee River South watershed. Basin 8 is considered an open basin because the surrounding area drains to an adjacent depressional area that outfalls across a pop-over elevation to a ditch along the CSX Railway. This basin is located within WBID 1344 and WBID 1351 which are not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. There are four (4) alternatives being considered for Basin 8. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 8A.

5.3.8.1 Pond 8A

Pond 8A will serve as the treatment and attenuation pond for Basin 8. Pond 8A is located west of US 301 at approximately station 10047+28 (LT.). This pond site sits within two (2) parcels (F35C005 and F35C015). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 8A consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 61.00 feet NAVD. With the data compiled it was determined that Pond 8A will be a wet pond with the normal water/control elevation set at elevation 59.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.43 acres of area for treatment and attenuation. This pond will outfall to the ditch along the CSX Railway.

5.3.8.2 Pond 8B

Pond 8B will serve as the treatment and attenuation pond for Basin 8. Pond 8B is located west of US 301 at approximately station 10043+86 (LT.). This pond site sits within two (2) parcels (F35C009 and F35C013). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 8B consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 60.00 feet NAVD. With the data compiled it was determined that Pond 8B will be a wet pond with the normal water/control elevation set at elevation 58.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.16 acres of area for treatment and attenuation. This pond will outfall to the ditch along the CSX Railway.

5.3.8.3 Pond 8C

Pond 8C will serve as the treatment and attenuation pond for Basin 8. Pond 8C is located west of US 301 at approximately station 10045+23 (LT.). This pond site sits within three (3) parcels (F35C006, F35C008, and F35C017). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey,

Pond 8C consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 60.00 feet NAVD. With the data compiled it was determined that Pond 8C will be a wet pond with the normal water/control elevation set at elevation 58.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.14 acres of area for treatment and attenuation. This pond will outfall to the ditch along the CSX Railway.

5.3.8.4 Pond 8D

Pond 8D will serve as the treatment and attenuation pond for Basin 8, in addition to providing relief for flooding that has been reported in this basin. This alternative also provides an option for regional stormwater opportunities to meet the Environmental Look Around (ELA) directive from FDOT. Storm water flows from a highpoint in the topography to the east, along Florida Avenue (north of US 301) and collects in both the roadway and the open portion of the adjacent parcel, between Commercial Street and Mulberry Street. Flooding has reportedly reached US 301 during times of heavy rain, overtopping the road and flowing into the storm sewer system. For further information, please refer to **Section 4.4.1**. The method for calculating flooding relief is described as follows: The total area generating the flooding was delineated based on one-foot LIDAR contours and an amount of total runoff generated was calculated based on this area. This additional runoff was added to the required pre vs. post attenuation volume for Basin 8 of US 301 and Pond 8D was sized accordingly.

Pond 8D is located west of US 301 at approximately station 10045+23 (LT.). This pond site sits within seven (7) parcels (F35C004, F35C005, F35C006, F35C007, F35C008, F35C015 and F35C017). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 8D consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 61.00 feet NAVD. With the data compiled it was determined that Pond 8D will be a wet pond with the normal water/control elevation set at elevation 58.00 feet. Preliminary pond sizing calculations indicate that this pond requires 4.19 acres of area for treatment and attenuation. This pond will outfall to the ditch along the CSX Railway.

5.3.9 Basin 9

Basin 9 is located between stations 10062+09 and 10077+36 within the Withlacoochee River South watershed. Basin 9 is considered an open basin because the surrounding area drains south to a series of ditches and wetlands that eventually drain to Shady Brook. This basin is located within WBID 1344 and WBID 1356 which are not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. Two (2) of the alternatives are offsite wet detention ponds and one (1) is an offsite dry retention pond. All of the pond site alternatives are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 9B.

5.3.9.1 Pond 9A

Pond 9A will serve as the treatment and attenuation pond for Basin 9. Pond 9A is located south of US 301 at approximately station 10070+47 (RT.). This pond site sits within one (1) parcel (F36-016). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 9A consists of Tavares (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 3.5 to 6.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 9A will be a wet pond with the normal water/control elevation set at elevation 60.50 feet. Preliminary pond sizing calculations indicate that this pond requires 1.39 acres of area for treatment and attenuation and a 0.29 acre access easement (total of 1.68 acres). This pond will outfall to the adjacent series of wetlands and ditches.

5.3.9.2 Pond 9B

Pond 9B will serve as the treatment and attenuation pond for Basin 9. Pond 9B is located south of US 301 at approximately station 10065+15 (RT.). This pond site sits within one (1) parcel (F36-075). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 9B consists of Tavares (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 3.5 to 6.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 61.00 feet NAVD. With the data compiled it was determined that Pond 9B will be a dry pond with the pond bottom set at elevation 59.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.37 acres of area for treatment and attenuation and a 0.65 acre access easement (total of 2.02 acres). This pond will outfall to the adjacent series of wetlands and ditches.

5.3.9.3 Pond 9C

Pond 9C will serve as the treatment and attenuation pond for Basin 9. Pond 9C is located south of US 301 at approximately station 10068+38 (RT.). This pond site sits within one (1) parcel (F36-018). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 9C consists of Tavares (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 3.5 to 6.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 9C will be a wet pond with the normal water/control elevation set at elevation 60.50 feet. Preliminary pond sizing calculations indicate that this pond requires 1.21 acres of area for treatment and attenuation and a 0.22 acre access easement (total of 1.43 acres). This pond will outfall to the adjacent series of wetlands and ditches.

5.3.10 Basin 10

Basin 10 is located between stations 10077+36 and 10105+04 within the Withlacoochee River South watershed. Basin 10 is considered a closed basin because the surrounding area drains to CD-07 where it discharges to an adjacent wetland that does not have an outfall. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. There are three (3) alternatives being considered for Basin 10. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the

alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 10B.

5.3.10.1 Pond 10A

Pond 10A will serve as the treatment and attenuation pond for Basin 10. Pond 10A is located 630 feet south of US 301 at approximately station 10095+00 (RT.). This pond site sits within one (1) parcel (F36-083). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 10A consists of Tarrytown (HSG C/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 10A will be a wet pond with the normal water/control elevation set at elevation 56.50 feet. Preliminary pond sizing calculations indicate that this pond requires 2.19 acres of area for treatment and attenuation and a 1.18 acre access easement (total of 3.37 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-07.

5.3.10.2 Pond 10B

Pond 10B will serve as the treatment and attenuation pond for Basin 10. Pond 10B is located south of US 301 at approximately station 10089+00 (RT.). This pond site sits within one (1) parcel (F36-003). The pond site has no impacts to wetlands however does impact 0.14 acres of the floodplain. According to Sumter County Soil Survey, Pond 10B consists of Tarrytown (HSG C/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 59.00 feet NAVD. With the data compiled it was determined that Pond 10B will be a wet pond with the normal water/control elevation set at elevation 56.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.96 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-07.

5.3.10.3 Pond 10C

Pond 10C will serve as the treatment and attenuation pond for Basin 10. Pond 10C is located 965 feet south of US 301 at approximately station 10086+50 (RT.). This pond site sits within one (1) parcel (F36-002). The pond site has no impacts to wetlands or floodplain. According to Sumter County Soil Survey, Pond 10C consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 10C will be a wet pond with the normal water/control elevation set at elevation 55.50 feet. Preliminary pond sizing calculations indicate that this pond requires 2.25 acres of area for treatment and attenuation and a 1.04 acre access easement (total of 3.29 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-07.

5.3.11 Basin 11

Basin 11 is located between stations 10105+04 and 10124+41 within the Withlacoochee River South watershed. Basin 11 is considered a closed basin because the surrounding area drains to CD-08 where it discharges to an adjacent wetland that does not have an outfall. This basin is located within WBID 1344 and WBID 1356 which are

not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. There are three (3) alternatives being considered for Basin 11. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 11B.

5.3.11.1Pond 11A

Pond 11A will serve as the treatment and attenuation pond for Basin 11. Pond 11A is located north of US 301 at approximately station 10116+00 (LT.). This pond site sits within one (1) parcel (G30-029). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 11A consists of EauGallie (HSG A/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 65.00 feet NAVD. With the data compiled it was determined that Pond 11A will be a wet pond with the normal water/control elevation set at elevation 61.00 feet. Pond11A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.84 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-08.

5.3.11.2Pond 11B

Pond 11B will serve as the treatment and attenuation pond for Basin 11. Pond 11B is located south of US 301 at approximately station 10117+00 (RT.). This pond site sits within one (1) parcel (G31-027). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 11B consists of Sumterville (HSG C/D), and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.0 feet, and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 60.00 feet NAVD. With the data compiled it was determined that Pond 11B will be a wet pond with the normal water/control elevation set at elevation 58.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.78 acres of area for treatment and attenuation and a 0.19 acre access easement (total of 1.97 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-08.

5.3.11.3Pond 11C

Pond 11C will serve as the treatment and attenuation pond for Basin 11. Pond 11C is located south of US 301 at approximately station 10117+00 (RT.). This pond site sits within one (1) parcel (G31-040). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 11C consists of Sumterville (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 65.00 feet NAVD. With the data compiled it was determined that Pond 11C will be a wet pond with the normal water/control elevation set at elevation 59.75 feet. Pond 11C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.70 acres of area for treatment and

attenuation and a 0.43 acre access easement (total of 2.13 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-08.

5.3.12 Basin 12

Basin 12 is located between stations 10124+41 and 10143+90 within the Withlacoochee River South watershed. Basin 12 is considered a closed basin because the surrounding area drains to CD-09 where it discharges to an adjacent depressional area that does not have an outfall. This basin is located within WBID 1344 and WBID 1356 which are not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. This basin is exclusive for the alternative alignment through the City of Coleman. There are three (3) alternatives being considered for Basin 12. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 12B.

5.3.12.1Pond 12A

Pond 12A will serve as the treatment and attenuation pond for Basin 12. Pond 12A is located southeast of US 301 at approximately station 10131+00 (RT.). This pond site sits within one (1) parcel (G30-030). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 12A consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 12A will be a wet pond with the normal water/control elevation set at elevation 61.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.73 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-09.

5.3.12.2Pond 12B

Pond 12B will serve as the treatment and attenuation pond for Basin 12. Pond 12B is located southeast of US 301 at approximately station 10132+00 (RT.). This pond site sits within one (1) parcel (G30-036). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 12B consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 12B will be a wet pond with the normal water/control elevation set at elevation 61.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.48 acres of area for treatment and attenuation and a 0.30 acre access easement (total of 1.76 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-09.

5.3.12.3Pond 12C

Pond 12C will serve as the treatment and attenuation pond for Basin 12. Pond 12C is located west of US 301 at approximately station 10140+00 (LT.). This pond site sits within one (1) parcel (G30-022). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 12C consists of Adamsville (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet below

existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 12C will be a wet pond with the normal water/control elevation set at elevation 60.75 feet. Preliminary pond sizing calculations indicate that this pond requires 1.44 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-09.

5.3.13 Basin 13

Basin 13 is located between stations 401+79 and 502+54 within the Withlacoochee River South watershed. Basin 13 is considered a closed basin because the surrounding area drains to CD-10 where it discharges to an adjacent depressional area that does not have an outfall. This basin is located within WBID 1344 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 13. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 13C.

5.3.13.1Pond 13A

Pond 13A will serve as the treatment and attenuation pond for Basin 13. Pond 13A is located west of US 301 at approximately station 414+00 (LT.). This pond site sits within one (1) parcel (G30-013). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 13A consists of Adamsville (HSG A), Ft. Green (HSG C/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet, 0.5 to 1.5 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 62.00 feet NAVD. With the data compiled it was determined that Pond 13A will be a wet pond with the normal water/control elevation set at elevation 60.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.19 acres of area for treatment and attenuation and a 0.54 acre access easement (total of 2.73 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-10.

5.3.13.2Pond 13B

Pond 13B will serve as the treatment and attenuation pond for Basin 13. Pond 13B is located east of US 301 at approximately station 410+00 (RT.). This pond site sits within three (3) parcel (G30-006, G30-009 and G30-050). The pond site impacts approximately 1.58 acres to wetlands and approximately 1.57 acres to the floodplain. According to Sumter County Soil Survey, Pond 13B consists of Pits-Dumps (HSG N/a) soils. The pond site chosen is an existing borrow pit with a normal surface water elevation estimated to be at elevation 54.00 feet. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 13B will be a wet pond with the normal water/control elevation set equivalent to the borrow pit surface water elevation at elevation 54.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.35 acres of area for treatment and attenuation and a 0.54 acre access easement (total of 2.89 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-10. The existing borrow pit is approximately 80 to 100 feet deep and will need to be filled to an elevation above the

Floridan Aquifer. Additional investigation will need to be performed on this pond to determine if it is a cost-effective alternative should this site become the preferred site.

5.3.13.3 Pond 13C

Pond 13C will serve as the treatment and attenuation pond for Basin 13. Pond 13C is located east of US 301 at approximately station 405+00 (RT.). This pond site sits within one (1) parcel (G30-009). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 13C consists of Pits-Dumps (HSG N/a) soils. The soil survey does not define the seasonal high water depth in these soils; the seasonal high water depth is estimated to be 3.0 to 6.0 feet below existing ground, based on the surrounding soil types and normal water elevations of nearby borrow pits. According to LIDAR data obtained for this pond site, the existing ground is at approximately 62.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 13C was estimated to be at approximately 60.40 feet NAVD. With the data compiled it was determined that Pond 13C will be a wet pond with the normal water/control elevation set at elevation 59.50 feet. Preliminary pond sizing calculations indicate that this pond requires 3.18 acres of area for treatment and attenuation. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-10.

5.3.14 Basin 14

Basin 14 is located between stations 502+54 and 542+19 within the Withlacoochee River South watershed. Basin 14 is considered a closed basin because the surrounding area drains to CD-11 where it discharges to adjacent wetlands that do not have an outfall. This basin is located within WBID 1344 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 14. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 14C.

5.3.14.1 Pond 14A

Pond 14A will serve as the treatment and attenuation pond for Basin 14. Pond 14A is located west of US 301 at approximately station 536+21 (LT.). This pond site sits within one (1) parcel (G19-010). The pond site has no impacts to wetlands and impacts approximately 0.14 acres to the floodplain. According to Sumter County Soil Survey, Pond 14A consists of Wabasso (HSG B/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 14A will be a wet pond with the normal water/control elevation set at elevation 56.00 feet, approximated by the water elevation of the nearby wetlands. Preliminary pond sizing calculations indicate that this pond requires 2.20 acres of area for treatment. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-11.

5.3.14.2 Pond 14B

Pond 14B will serve as the treatment and attenuation pond for Basin 14. Pond 14B is located west of US 301 at approximately station 541+01 (LT.). This pond site sits within one (1) parcel (G19-003). The pond site has no

impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 14B consists of Wabasso (HSG B/D) and Ft. Green (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.0 to 1.0 feet and 0.5 to 1.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 59.00 feet NAVD. With the data compiled it was determined that Pond 14B will be a wet pond with the normal water/control elevation set at elevation 56.00 feet, approximated by the water elevation of the nearby wetlands. Pond 14B will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.67 acres of area for treatment. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-11.

5.3.14.3Pond 14C

Pond 14C will serve as the treatment and attenuation pond for Basin 14. Pond 14C is located east of US 301 at approximately station 535+37 (RT.). This pond site sits within one (1) parcel (G19-001). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 14C consists of Manteocha (HSG A/D) and Ft. Green (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 feet and 0.5 to 1.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 61.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 14C was estimated to be at approximately 54.70 feet NAVD. With the data compiled it was determined that Pond 14C will be a wet pond with the normal water/control elevation set at elevation 56.50 feet, approximated by the water elevation of the nearby wetlands. Preliminary pond sizing calculations indicate that this pond requires 2.10 acres of area for treatment and a 0.30 acre access easement (total of 2.40 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-11.

5.3.15 Basin 15

Basin 15 is located between stations 542+19 and 578+35 within the Withlacoochee River South watershed. Basin 15 is considered an open basin because the surrounding area drains to CD-12 where it discharges to adjacent wetlands that discharge across a pop-over elevation to a series of ditches and wetlands. This basin is located within WBID 1344 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 15. All of the alternatives are offsite wet detention ponds and are outside of the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 15B.

5.3.15.1Pond 15A

Pond 15A will serve as the treatment and attenuation pond for Basin 15. Pond 15A is located west of US 301 at approximately station 568+24 (LT.). This pond site sits within one (1) parcel (G19-002). The pond site has no impacts to wetlands and impacts approximately 0.07 acres to the floodplain. According to Sumter County Soil Survey, Pond 15A consists of EauGallie (HSG A/D) and Okeelanta (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet and 0.0 to 1.0 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 60.00 feet NAVD. With the data compiled it was determined that Pond 15A will be a wet pond with the normal water/control elevation

set at elevation 56.00 feet, approximated by the water elevation of the nearby wetlands. Pond 15A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.75 acres of area for treatment. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-12.

5.3.15.2Pond 15B

Pond 15B will serve as the treatment and attenuation pond for Basin 15. Pond 15B is located west of US 301 at approximately station 556+96 (LT.). This pond site sits within one (1) parcel (G19-002). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 15B consists of Ft. Green (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 62.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 15B was estimated to be at approximately 61.90 feet NAVD. With the data compiled it was determined that Pond 15B will be a wet pond with the normal water/control elevation set at elevation 56.00 feet, approximated by the water elevation of the nearby wetlands. Pond 15B will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.60 acres of area for treatment. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-12.

5.3.15.3Pond 15C

Pond 15C will serve as the treatment and attenuation pond for Basin 15. Pond 15C is located east of US 301 at approximately station 567+39 (RT.). This pond site sits within one (1) parcel (G19-001). The pond site has no impacts to wetlands and impacts approximately 0.02 acres to the floodplain. According to Sumter County Soil Survey, Pond 15C consists of EauGallie (HSG A/D), Ft. Green (HSG C/D) and Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet, 0.5 to 1.5 feet and 1.0 to 2.0 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 60.00 feet NAVD. With the data compiled it was determined that Pond 15C will be a wet pond with the normal water/control elevation set at elevation 56.00 feet, approximated by the water elevation of the nearby wetlands. Pond 15C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.61 acres of area for treatment. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-12.

5.3.16 Basin 16

Basin 16 is located between station 578+35 and CD-13, 49 feet north of station 596+90 within the Withlacoochee River South watershed. Basin 16 is considered an open basin because the surrounding area drains to CD-13 where it discharges west to a series of existing interconnected wetlands. This basin is located within WBID 1344 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 16. All of the alternatives are offsite wet detention ponds and are outside of the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 16A.

5.3.16.1Pond 16A

Pond 16A will serve as the treatment and attenuation pond for Basin 16. Pond 16A is located east of US 301 at approximately station 594+17 (RT.). This pond site sits within one (1) parcel (G18-008). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 16A consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 16A was estimated to be at approximately 54.00 feet NAVD. With the data compiled it was determined that Pond 16A will be a wet pond with the normal water/control elevation set at elevation 54.00 feet, approximated by the water elevation of the nearby wetlands. Preliminary pond sizing calculations indicate that this pond requires 1.27 acres of area for treatment. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-13.

5.3.16.2Pond 16B

Pond 16B will serve as the treatment and attenuation pond for Basin 16. Pond 16B is located west of US 301 at approximately station 590+18 (LT.). This pond site sits within one (1) parcel (G18-052). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 16B consists of EauGallie (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 16B will be a wet pond with the normal water/control elevation set at elevation 54.00 feet, approximated by the water elevation of the nearby wetlands. Pond 16B will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.72 acres of area for treatment and a 0.15 acre access easement (total of 1.87 acres). This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-13.

5.3.16.3Pond 16C

Pond 16C will serve as the treatment and attenuation pond for Basin 16. Pond 16C is located east of US 301 at approximately station 589+28 (RT.). This pond site sits within one (1) parcel (G18-008). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 16C consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that Pond 16C will be a wet pond with the normal water/control elevation set at elevation 54.00 feet, approximated by the water elevation of the nearby wetlands. Pond 16C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.48 acres of area for treatment. This pond will outfall to the US 301 right-of-way where it will be conveyed to CD-13.

5.3.17 Basin 17

Basin 17 is located between CD-13, 49 feet north of station 596+90, and the end of the project's roadway improvements, 1604 feet north of station 596+90 within the Withlacoochee River South watershed. Basin 17 also includes all lanes of Florida's Turnpike (including the on and off ramps) between Turnpike station 1016+05 and

station 1053+25. Basin 17 is considered an open basin because the surrounding area drains to a series of existing interconnected wetlands. This basin is located within WBID 1344 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 17. All of the alternatives are offsite wet detention ponds and are outside of the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 17B.

5.3.17.1Pond 17A

Pond 17A will serve as the treatment and attenuation pond for Basin 17. Pond 17A is located west of US 301 and south of Florida's Turnpike at approximately station 1034+65 (RT.). This pond site sits within one (1) parcel (G18-015). The pond site has no impacts to wetlands and impacts approximately 2.06 acres to the floodplain. According to Sumter County Soil Survey, Pond 17A consists of Paisley (HSG B/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 17A will be a wet pond with the normal water/control elevation set at elevation 54.00 feet, approximated by the water elevation of the nearby wetlands. Pond 17A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 4.08 acres of area for treatment. This pond will outfall to the surrounding series of interconnected wetlands.

5.3.17.2Pond 17B

Pond 17B will serve as the treatment and attenuation pond for Basin 17. Pond 17B is located east of US 301 and north of Florida's Turnpike at approximately station 1035+25 (LT.). This pond site sits within one (1) parcel (G18-008). The pond site has approximately 0.47 acres of impacts to wetlands and approximately 2.60 acres to the floodplain. According to Sumter County Soil Survey, Pond 17B consists of EauGallie (HSG A/D) and Wabasso (HSG B/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet and 0.0 to 1.0 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 17B was estimated to be at approximately 55.90 feet NAVD. With the data compiled it was determined that Pond 17B will be a wet pond with the normal water/control elevation set at elevation 54.50 feet, approximated by the water elevation of the nearby wetlands. Pond 17B will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 5.36 acres of area for treatment and a 0.61 acre access easement (total of 5.97 acres). This pond will outfall to the surrounding wetlands.

5.3.17.3Pond 17C

Pond 17C will serve as the treatment and attenuation pond for Basin 17. Pond 17C is located west of US 301 and south of Florida's Turnpike at approximately station 1028+02 (RT.). This pond site sits within one (1) parcel (G18-015). The pond site has no impacts to wetlands and approximately 5.11 acres of impacts to the floodplain. According to Sumter County Soil Survey, Pond 17C consists of Paisley (HSG B/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it

was determined that Pond 17C will be a wet pond with the normal water/control elevation set at elevation 54.00 feet, approximated by the water elevation of the nearby wetlands. Pond 17C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 5.95 acres of area for treatment and a 0.46 acre access easement (total of 6.41 acres). This pond will outfall to the surrounding series of interconnected wetlands.

5.3.18 Basin 18

Basin 18 is located between 1604 feet north of station 596+90 and 4388 feet north of station 596+90 within the Withlacoochee River South watershed. Basin 18 is considered an open basin because the surrounding area drains to CD-14 where it continues to drain west to a series of existing interconnected wetlands. This basin is located within WBID 1344 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are no alternatives being considered for this basin because the proposed roadway improvements for Basin 18 consist of minor safety related improvements.

5.3.19 Basin 19

Basin 19 is located between stations 300+00 and 320+68 along the Truck Route Alternative alignment within the Withlacoochee River South watershed. Basin 19 is considered an open basin because the surrounding area drains to a series of ditches and wetlands that eventually drain to Shady Brook. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 19. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. Because of the interface between the beginning of the truck route alternative (Basin 19) and Basin 5, five potential pond combinations have been evaluated. These combinations are 19A, 19B & 5B, 19B & 5C, 19C & 5B, and 19C & 5C. Pond 19A can serve as the treatment and attenuation pond for a combination of Basin 5 and Basin 19, while Ponds 19B and 19C can only treat Basin 19. These two ponds must be evaluated in conjunction with Ponds 5B and 5C in order to accurately account the treatment and attenuation needs for both basins. The preferred alternative for this basin is Pond 19A.

5.3.19.1Pond 19A

Pond 19A will serve as the treatment and attenuation pond for a combination of Basin 5 and Basin 19. Pond 19A is located east of US 301 and south of the Truck Route Alternative at approximately station 308+00 (RT.). This pond site sits within one (1) parcel (F36-054). The pond site impacts approximately 0.28 acres to wetlands and approximately 0.72 acres to the floodplain. According to Sumter County Soil Survey, Pond 19A consists of Adamsville (HSG A), Basinger (HSG A/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet, 0.0 to 1.0 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 58.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 19A was estimated to be at approximately 56.00 feet NAVD. With the data compiled it was determined that Pond 19A will be a wet pond with the normal water/control elevation set at elevation 55.00 feet. Pond 19A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond

requires 7.17 acres of area for treatment and attenuation and two access easements totaling 0.76 acres (total of 7.93 acres). This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-15.

5.3.19.2Pond 19B

Pond 19B will serve as the treatment and attenuation pond for Basin 19. Pond 19B is located east of US 301 and south of the Truck Route Alternative at approximately station 305+00 (RT.). This pond site sits within one (1) parcel (F36-054). The pond site has no impacts to wetlands and approximately 0.61 acres of impacts to the floodplain. According to Sumter County Soil Survey, Pond 19B consists of Paisley (HSG B/D) and Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet and 1.0 to 2.0 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 19B will be a wet pond with the normal water/control elevation set at elevation 55.25 feet. Preliminary pond sizing calculations indicate that this pond requires 5.26 acres of area for treatment and attenuation. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-15.

5.3.19.3Pond 19C

Pond 19C will serve as the treatment and attenuation pond for Basin 19. Pond 19C is located east of US 301 and north of the Truck Route Alternative at approximately station 310+00 (LT.). This pond site sits within one (1) parcel (F36-062). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 19C consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 19C will be a wet pond with the normal water/control elevation set at elevation 55.25 feet. Preliminary pond sizing calculations indicate that this pond requires 5.33 acres of area for treatment and attenuation and a 0.27 acre access easement (total of 5.60 acres). This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-15.

5.3.20 Basin 20

Basin 20 is located between stations 320+68 and 340+35 along the Truck Route Alternative alignment within the Withlacoochee River South watershed. Basin 20 is considered an open basin because the surrounding area drains to a series of ditches and wetlands that eventually drain to Shady Brook. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 20. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 20C.

5.3.20.1Pond 20A

Pond 20A will serve as the treatment and attenuation pond for Basin 20. Pond 20A is located south of US 301 and north of the Truck Route Alternative at approximately station 332+00 (LT.). This pond site sits within one (1) parcel

(F36-059). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 20A consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 20A will be a wet pond with the normal water/control elevation set at elevation 55.50 feet. Preliminary pond sizing calculations indicate that this pond requires 1.93 acres of area for treatment and attenuation and a 0.28 acre access easement (total of 2.21 acres). This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-16.

5.3.20.2 Pond 20B

Pond 20B will serve as the treatment and attenuation pond for Basin 20. Pond 20B is located south of US 301 and north of the Truck Route Alternative at approximately station 335+00 (LT.). This pond site sits within one (1) parcel (F36-009). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 20B consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 56.00 feet NAVD. With the data compiled it was determined that Pond 20B will be a wet pond with the normal water/control elevation set at elevation 54.50 feet. Preliminary pond sizing calculations indicate that this pond requires 1.93 acres of area for treatment and attenuation. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-16.

5.3.20.3 Pond 20C

Pond 20C will serve as the treatment and attenuation pond for Basin 20. Pond 20C is located south of US 301 and north of the Truck Route Alternative at approximately station 320+00 (LT.). This pond site sits within one (1) parcel (F36-059). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 20C consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 20C was estimated to be at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 20C will be a wet pond with the normal water/control elevation set at elevation 55.50 feet. Pond 20C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.88 acres of area for treatment and attenuation. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-16.

5.3.21 Basin 21

Basin 21 is located between stations 340+35 and 372+74 along the Truck Route Alternative alignment within the Withlacoochee River South watershed. Basin 21 is considered an open basin because the surrounding area drains to a series of ditches and wetlands that eventually drain to Shady Brook. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 21. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and

parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 21A.

5.3.21.1 Pond 21A

Pond 21A will serve as the treatment and attenuation pond for Basin 21. Pond 21A is located south of US 301 and north of the Truck Route Alternative at approximately station 350+00 (RT.). This pond site sits within one (1) parcel (F36-001). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 21A consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 21A was estimated to be at approximately 56.30 feet NAVD. With the data compiled it was determined that Pond 21A will be a wet pond with the normal water/control elevation set at elevation 55.80 feet. Preliminary pond sizing calculations indicate that this pond requires 3.40 acres of area for treatment and attenuation. This pond will outfall through a spreader swale and into an adjacent ditch.

5.3.21.2 Pond 21B

Pond 21B will serve as the treatment and attenuation pond for Basin 21. Pond 21B is located south of US 301 and north of the Truck Route Alternative at approximately station 347+00 (LT.). This pond site sits within one (1) parcel (F36-009). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 21B consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 21B will be a wet pond with the normal water/control elevation set at elevation 55.50 feet. Preliminary pond sizing calculations indicate that this pond requires 3.42 acres of area for treatment and attenuation. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-17.

5.3.21.3 Pond 21C

Pond 21C will serve as the treatment and attenuation pond for Basin 21. Pond 21C is located south of US 301 and north of the Truck Route Alternative at approximately station 350+00 (RT.). This pond site sits within one (1) parcel (F36-009). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 21C consists of Tarrytown (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that Pond 21C will be a wet pond with the normal water/control elevation set at elevation 55.50 feet. Preliminary pond sizing calculations indicate that this pond requires 3.68 acres of area for treatment and attenuation and a 0.28 acre access easement (total of 3.96 acres). This pond will outfall through a spreader swale and into an adjacent ditch.

5.3.22 Basin 22

Basin 2 is located between stations 372+74 and 385+47 along the Truck Route Alternative alignment within the Withlacoochee River South watershed. Basin 22 is considered a closed basin because the surrounding area does not have an outfall. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are three (3) alternatives being considered for Basin 22. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 22C.

5.3.22.1 Pond 22A

Pond 22A will serve as the treatment and attenuation pond for Basin 22. Pond 22A is located south of US 301 and north of the Truck Route Alternative at approximately station 372+00 (RT.). This pond site sits within two (2) parcels (G31-040 and G31-020). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 22A consists of Sumterville (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 65.00 feet NAVD. With the data compiled it was determined that Pond 22A will be a wet pond with the normal water/control elevation set at elevation 59.00 feet. Pond 22A will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 2.77 acres of area for treatment and attenuation. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-19.

5.3.22.2 Pond 22B

Pond 22B will serve as the treatment and attenuation pond for Basin 22. Pond 22B is located south of US 301 and north of the Truck Route Alternative at approximately station 375+00 (LT.). This pond site sits within one (1) parcel (G31-027). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 21B consists of Floridana (HSG C/D) and Sumterville (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.0 to 1.0 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 60.00 feet NAVD. With the data compiled it was determined that Pond 22B will be a wet pond with the normal water/control elevation set at elevation 56.00 feet. Pond 22B will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 3.18 acres of area for treatment and attenuation. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-19.

5.3.22.3 Pond 22C

Pond 22C will serve as the treatment and attenuation pond for Basin 22. Pond 22C is located south of US 301 and north of the Truck Route Alternative at approximately station 372+00 (LT.). This pond site sits within one (1) parcel (G31-040). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 21C consists of Sumterville (HSG C/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in both of these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. A geotechnical analysis was performed

on the preferred pond sites and the seasonal high water table elevation of Pond 22C was estimated to be at approximately 62.30 feet NAVD. With the data compiled it was determined that Pond 22C will be a wet pond with the normal water/control elevation set at elevation 59.00 feet. Pond 22C will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 2.91 acres of area for treatment and attenuation. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-19.

5.3.23 Basin 23

Basin 23 is located between stations 385+47 and 401+79 along the Truck Route Alternative alignment within the Withlacoochee River South watershed. Basin 23 is considered a closed basin because the surrounding area does not have an outfall. This basin is located within WBID 1356 which is not impaired for nutrients; therefore, a pollutant loading analysis is not required for this basin. There are four (4) total ponds sited within this basin however, three (3) of the alternatives are being considered to be utilized alongside Pond 23A-2, in order to achieve the necessary amount of storage. All of the alternatives are offsite wet detention ponds and are within the SKA. The particulars of the alternatives are discussed in the following sections. All calculations and parameters for each alternative are located in **Appendix C – Pond Design Calculations**. The preferred alternative for this basin is Pond 23A-1 and Pond 23A-2.

5.3.23.1 Pond 23A-1

Pond 23A-1 in conjunction with Pond 23A-2 will serve as the treatment and attenuation pond for Basin 23. Pond 23A-1 is located south of US 301 and north of the Truck Route Alternative at approximately station 385+00 (LT.). This pond site sits within two (2) parcels (G30-033 & G30-031). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 23A-1 consists of EauGallie (HSG A/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond site, the existing ground is at approximately 65.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 23A-1 was estimated to be at approximately 62.50 feet NAVD. With the data compiled it was determined that Pond 23A-1 will be a wet pond with the normal water/control elevation set at elevation 60.00 feet. Pond 23A-1 will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 1.28 acres of area and along with Pond 23A-2 (2.30 acres) will provide the required treatment and attenuation volume (total of 3.58 acres). This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-20.

5.3.23.2 Pond 23A-2

Pond 23A-2 in conjunction with either Pond 23A-1, Pond 23B, or Pond 23C will serve as the treatment and attenuation pond for Basin 23. Pond 23A-2 is located north of US 301 and north of the Truck Route Alternative at approximately station 386+00 (LT.). This pond site sits within one (1) parcel (G30-030). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 23A-2 consists of EauGallie (HSG A/D) and Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet and 1.5 to 3.5 feet below existing ground respectively. According to LIDAR data obtained for this pond

site, the existing ground is at approximately 65.00 feet NAVD. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of Pond 23A-2 was estimated to be at approximately 62.50 feet NAVD. With the data compiled it was determined that Pond 23A-2 will be a wet pond with the normal water/control elevation set at elevation 60.00 feet. Pond 23A-2 will require the installation of an impermeable liner. Preliminary pond sizing calculations indicate that this pond requires 2.30 acres of area and along with Pond 23A-1, Pond 23B, or Pond 23C will provide the required treatment and attenuation volume. This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-20.

5.3.23.3 Pond 23B

Pond 23B in conjunction with Pond 23A-2 will serve as the treatment and attenuation pond for Basin 23. Pond 23B is located east of US 301 and east of the Truck Route Alternative at approximately station 393+00 (RT.). This pond site sits within one (1) parcel (G30-036). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 23B consists of Sparr (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.5 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 63.50 feet NAVD. With the data compiled it was determined that Pond 23B will be a wet pond with the normal water/control elevation set at elevation 60.00 feet. Preliminary pond sizing calculations indicate that this pond requires 1.80 acres of area (0.23 acres for an easement and 1.57 acres for the pond site) and along with Pond 23A-2 (2.30 acres) will provide the required treatment and attenuation volume (total of 3.87 acres). This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-09.

5.3.23.4 Pond 23C

Pond 23C in conjunction with Pond 23A-2 will serve as the treatment and attenuation pond for Basin 23. Pond 23C is located west of US 301 and west of the Truck Route Alternative at approximately station 401+00 (LT.). This pond site sits within one (1) parcel (G30-022). The pond site has no impacts to wetlands or to the floodplain. According to Sumter County Soil Survey, Pond 23C consists of Adamsville (HSG A) soils. The soil survey defines the seasonal high water depth in these soils to be 2.0 to 3.5 feet below existing ground. According to LIDAR data obtained for this pond site, the existing ground is at approximately 64.00 feet NAVD. With the data compiled it was determined that Pond 23C will be a wet pond with the normal water/control elevation set at elevation 60.50 feet. Preliminary pond sizing calculations indicate that this pond requires 1.44 acres of area and along with Pond 23A-2 (2.30 acres) will provide the required treatment and attenuation volume (total of 3.74 acres). This pond will outfall to the Truck Route Alternative right-of-way where it will be conveyed to a proposed cross drain CD-09.

5.3.24 Floodplain Compensation

There are six (6) floodplain compensation sites within the project limits. All of the alternatives are offsite scraped down areas outside of the 100-year floodplain. The particulars of the floodplain compensation sites are discussed in the following sections. All calculations and parameters for each alternative are located in the Location Hydraulics Report.

5.3.24.1 Floodplain Compensation Site 1

Floodplain Compensation Site 1 (FPC-1) is a scraped down area west of US 301 between station 199+77 and station 201+66 and is directly adjacent to the 100-year floodplain boundary. This site is located within one parcel (J01-031). This site partially compensates for roadway impacts to the 100-year floodplain within Basin 5, which totals approximately 0.30 ac-ft of floodplain volume. It is anticipated that there will be no wetland impacts associated with this site. According to Sumter County Soil Survey, Pond FPC-1 consists of Basinger (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.0 to 1.0 feet below existing ground at SHWT Elev. 53.00. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of FPC-1 was estimated to be at approximately 53.00 feet NAVD. This site is outside of the SKA. It was estimated that the 100-year floodplain elevation through this area is at elevation 54.50. According to LIDAR data obtained for this floodplain compensation site, the existing ground is at approximately 54.00 feet NAVD. With the data compiled it was determined that FPC-1 will be a 0.56 acre site which will be scraped down one foot below the existing ground to provide the appropriate compensating volume (0.40 ac-ft).

5.3.24.2 Floodplain Compensation Site 3

Floodplain Compensation Site 3 (FPC-3) is a scraped down area east of US 301 between station 10024+40 and station 10026+39 and is directly adjacent to the 100-year floodplain boundary. This site is located within one parcel (F36-062). This site compensates for roadway impacts to the 100-year floodplain within Basin 6, which totals approximately 0.37 ac-ft of floodplain volume. It is anticipated that there will be no wetland impacts associated with this site. According to the Sumter County Soil Survey, FPC-3 consists of Basinger fine sand (HSG A/D) and Sparr fine sand (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.0 to 1.0 feet and 1.5 to 3.5 feet below existing ground respectively, at SHWT Elev. 55.00. This site is within the SKA. It was estimated that the 100-year floodplain elevation through this area is at elevation 56.00. According to LIDAR data obtained for this floodplain compensation site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that FPC-3 will be a 0.61 acre site which will be scraped down three feet below the existing ground to provide the appropriate compensating volume (0.40 ac-ft).

5.3.24.3 Floodplain Compensation Site 4

Floodplain Compensation Site 4 (FPC-4) is a scraped down area east of US 301 between station 535+67 and station 541+23 and is directly adjacent to the 100-year floodplain boundary. This site is located within one parcel (G19-001). This site compensates for roadway impacts to the 100-year floodplain within Basin 14, which totals approximately 2.69 ac-ft of floodplain volume. It is anticipated that there will be 0.28 acres of wetland impacts associated with this site. According to the Sumter County Soil Survey, FPC-4 consists of Ft. Green fine sand (HSG C/D) and Monteocha fine sand (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 0.5 to 1.5 feet below and +2.0 feet above existing ground respectively, at SHWT Elev. 56.50. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of FPC-4 was estimated to be at approximately 57.40 feet NAVD. This site is within the SKA. It was estimated that the 100-year floodplain elevation through this area is at elevation 58.00. According to LIDAR data obtained for this floodplain compensation site, the existing ground is at approximately 61.00 feet NAVD. With the data compiled it was determined that FPC-4 will be a 2.25 acre site which will be scraped down five feet below the

existing ground to provide the appropriate compensating volume (2.72 ac-ft). FPC-4 will require the installation of an impermeable liner.

5.3.24.4 Floodplain Compensation Site 5

Floodplain Compensation Site 5 (FPC-5) is a scraped down area east of US 301 between station 567+39 and station 574+51 and is directly adjacent to the 100-year floodplain boundary. This site is located within one parcel (G19-001). This site compensates for roadway impacts to the 100-year floodplain within Basin 15, which totals approximately 4.52 ac-ft of floodplain volume. It is anticipated that there will be 0.51 acres of wetland impacts associated with this site. According to the Sumter County Soil Survey, FPC-5 consists of Tarrytown sandy clay loam (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground at SHWT Elev. 56.00. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of FPC-5 was estimated to be at approximately 55.60 feet NAVD. This site is outside of the SKA. It was estimated that the 100-year floodplain elevation through this area is at elevation 57.00. According to LIDAR data obtained for this floodplain compensation site, the existing ground is at approximately 60.00 feet NAVD. With the data compiled it was determined that FPC-5 will be a 5.17 acre site which will be scraped down four feet below the existing ground to provide the appropriate compensating volume (4.57 ac-ft).

5.3.24.5 Floodplain Compensation Site 6

Floodplain Compensation Site 6 (FPC-6) is a scraped down area east of US 301 between station 583+00 and station 584+00 and is directly adjacent to the 100-year floodplain boundary. This site is located within one parcel (G18-008). This site compensates for roadway impacts to the 100-year floodplain within Basin 16, which totals approximately 0.87 ac-ft of floodplain volume. It is anticipated that there will be no wetland impacts associated with this site. According to the Sumter County Soil Survey, FPC-6 consists of Tarrytown sandy clay loam (HSG C/D) and Monteocha fine sand (HSG A/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 and +2.0 feet below existing ground respectively, at SHWT Elev. 54.00. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of FPC-6 was estimated to be at approximately 54.00 feet NAVD. This site is outside of the SKA. It was estimated that the 100-year floodplain elevation through this area is at elevation 56.00. According to LIDAR data obtained for this floodplain compensation site, the existing ground is at approximately 57.00 feet NAVD. With the data compiled it was determined that FPC-6 will be a 0.56 acre site which will be scraped down three feet below the existing ground to provide the appropriate compensating volume (0.89 ac-ft).

5.3.24.6 Floodplain Compensation Site 7

Floodplain Compensation Site 7 (FPC-7) is a scraped down area east of US 301 between station 591+92 and station 594+17 and is directly adjacent to the 100-year floodplain boundary. This site is located within one parcel (G18-008). This site compensates for roadway impacts to the 100-year floodplain within Basins 16 and 17, which totals approximately 1.79 ac-ft of floodplain volume. It is also anticipated that there will be no wetland impacts associated with this site. According to the Sumter County Soil Survey, FPC-7 consists of Tarrytown sandy clay loam (HSG C/D) soils. The soil survey defines the seasonal high water depth in these soils to be 1.0 to 2.0 feet below existing ground at SHWT Elev. 54.00. A geotechnical analysis was performed on the preferred pond sites and the seasonal high water table elevation of FPC-1 was estimated to be at approximately 53.80 feet NAVD. This site is

outside of the SKA. It was estimated that the 100-year floodplain elevation through this area is at elevation 56.00. According to LIDAR data obtained for this floodplain compensation site, the existing ground is at approximately 58.00 feet NAVD. With the data compiled it was determined that FPC-7 will be a 1.26 acre site which will be scraped down four feet below the existing ground to provide the appropriate compensating volume (2.03 ac-ft).

5.4 Environmental Look Arounds (ELAs)

Environmental Look Arounds (ELAs) provide a unique opportunity to team up with regional stakeholders to explore watershed wide stormwater needs and alternative permitting approaches for the project. Areas of potential cooperation are documented in this report for future follow up as the design moves forward.

The City of Coleman was contacted to discuss any flooding history and maintenance concerns. During a site visit, Inwood staff met with the Mayor of Coleman (Milton Hill) and the President of the Coleman City Council (Richard Huff) to discuss flooding issues on Florida Avenue between Commercial Street and Mulberry Street, north of US 301. The proximity of the flooding to US 301 provides an excellent joint use opportunity. For further information, please refer to **Section 4.4.1** and **Section 5.3.8.4**.

The permitted residential and commercial development Wildwood Springs lies southeast of the intersection of US 301 and State Road 468. The proximity of the planned development to US 301, and the potential impact of the Truck Route Alternative, provide another joint use opportunity. Ponds B-50 and B-55A shown in the drainage calculations of Permit 32972.016 could be reshaped and resized to accommodate stormwater runoff from US 301. For further information, please refer to Permit 32972.016 in **Appendix E – Existing Permits**.

The Villages is in the process of obtaining a Conceptual Permit from SWFWMD (ERP No. 42998.000). The permit covers a large area that includes the parcel east of US 301 and south of Florida's Turnpike. The Conceptual Permit seeks to establish pre-development conditions for future development plans on the site. At this time, no development plans by The Villages have been submitted to the City.

Development along the corridor is beginning to occur on a larger scale between CR 468 and the Florida's Turnpike. Much of it is in the early approval phases and some properties have received permits for mass grading of sites. These locations present opportunities for joint use ponds and they can continue to be coordinated during the local development review process and the US 301 design process. With the PD&E and the PSR we have identified areas that could be stand alone or joint use pond sites and we have made efforts to clear them. The rate of development in the area will continue to result in the pond sites and opportunities evolving. Potential and preferred pond sites have been established and the US 301 project is in the process of obtaining approvals with these established sites. The approval with pond sites that are part of mass grading allows for the opportunity for joint use to be fully explored while also still allowing for other sites to be considered.

6.0 Total Pond Cost Estimate

The total pond cost estimate for each alternative site includes construction costs of the stormwater facility, any costs associated with mitigation of wetland impacts, and preliminary right of way cost estimates which include any administrative costs and legal fees. The preliminary right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond site and to budget the appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT used appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

7.0 Conclusions and Recommendations

Potential ponds have been sized and located along the project limits for this PD&E study. The analysis estimates right-of-way needs using a volumetric analysis, which accounts for water quality treatment and water quantity for runoff attenuation. Please note that the estimated right-of-way areas for the ponds were based on pond sizes determined from preliminary data calculations, reasonable engineering judgment, and assumptions. Pond sizes and configurations may change during final design as more detailed information on SHWT, wetland normal pool elevation, final roadway profile design, etc. become available. Please refer to **Table 5** for **Recommended Stormwater Pond Sizes**.

Table 5 – Recommended Stormwater Pond Sizes

Basin	Pond Name	From Station	To Station	Type (Dry/Wet)	Req'd Treatment + Attenuation (ac-ft)	Provided Treatment + Attenuation (ac-ft)	Pond Right-of-Way Area Including Access (ac)
1	1B	97+26*	117+45	Dry	0.88	1.07	1.02
2	2A	117+45	150+69	Wet	2.76	3.73	1.93
3	3B	150+69	179+19	Wet	3.35	4.32	2.74
4	4B	179+19	196+64	Wet	1.75	1.90	2.16
5/19	19A	196+64	222+61	Wet	7.65	9.14	7.93
		300+00	320+68				
13	13C	401+79	502+54	Wet	5.36	5.50	3.18
14	14C	502+54	542+19	Wet	1.83	3.74	2.40
15	15B	542+19	578+35	Wet	1.32	3.15	1.60
16	16A	578+35	597+39*	Wet	1.02	1.16	1.27
17	17B	597+39*	612+93*	Wet	3.78	6.66	5.97
20	20C	320+68	340+35	Wet	1.22	1.26	1.88
21	21A	340+35	372+74	Wet	2.18	2.20	3.40
22	22C	372+74	385+47	Wet	5.18	5.40	2.91
23	23A-1 & 23A-2	385+47	401+79	Wet	5.27	5.74	3.58
				Total	**43.55**	**54.97**	**41.97**

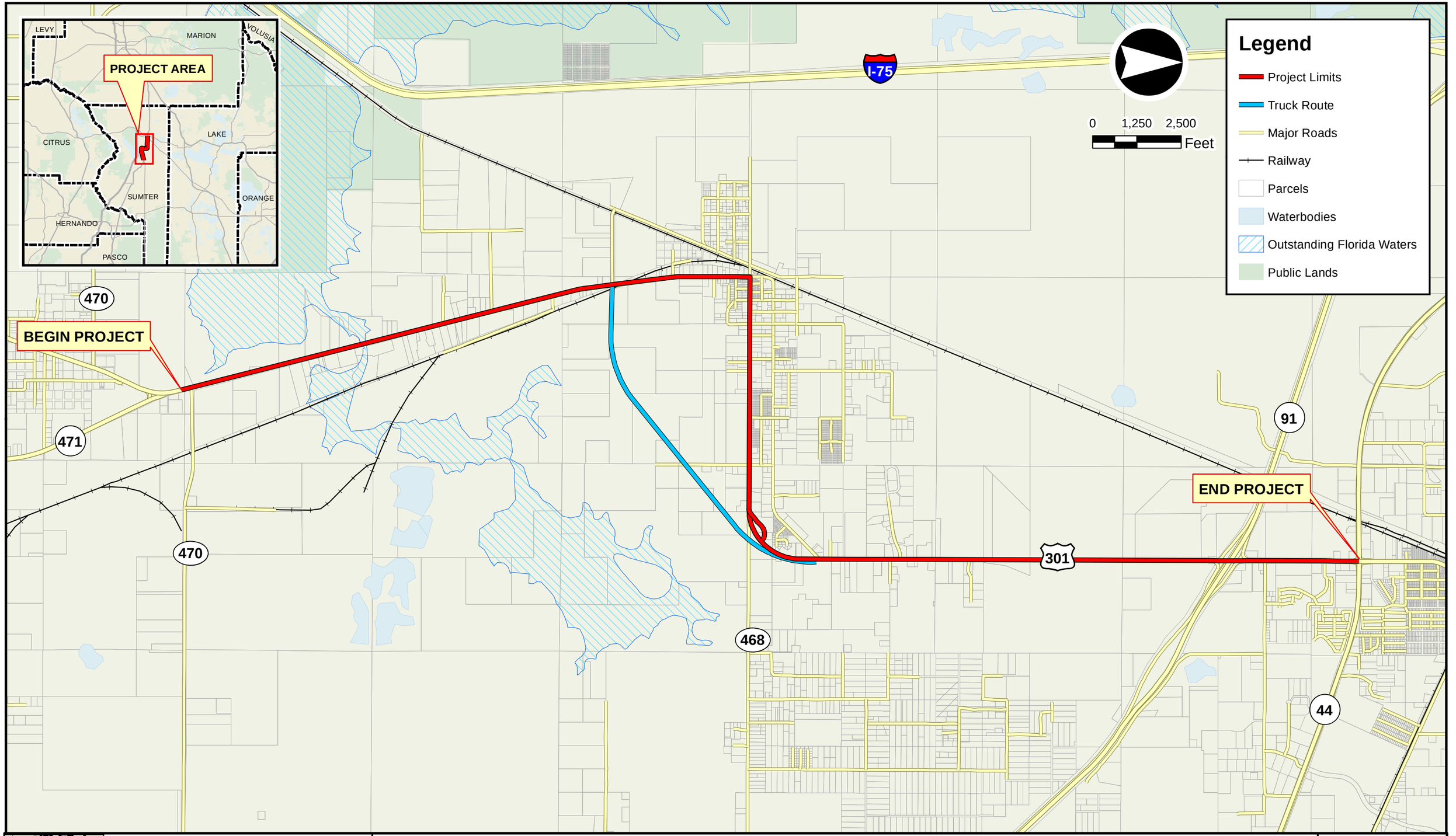
*Approximate station value extrapolated from beginning or end of station chain.

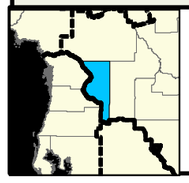
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APPENDIX A

Exhibits

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Florida Department of Transportation

District 5

SR 35/US 301 PD&E STUDY

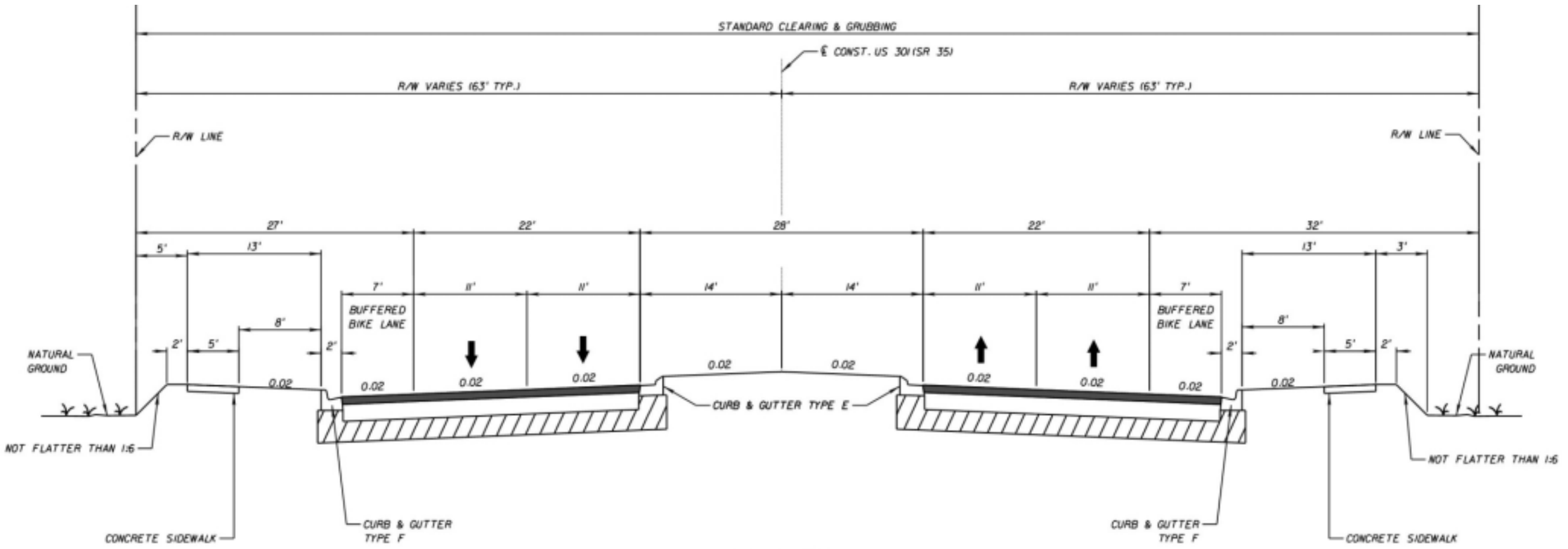
From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

PROJECT LOCATION MAP

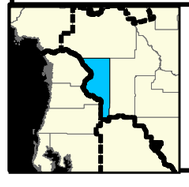
Figure

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SR 35 (US 301)
4-LANE URBAN TYPICAL SECTION
CR 525 E TO CR 521

DESIGN SPEED = 45 MPH



Florida Department of Transportation

District 5

SR 35/US 301 PD&E STUDY

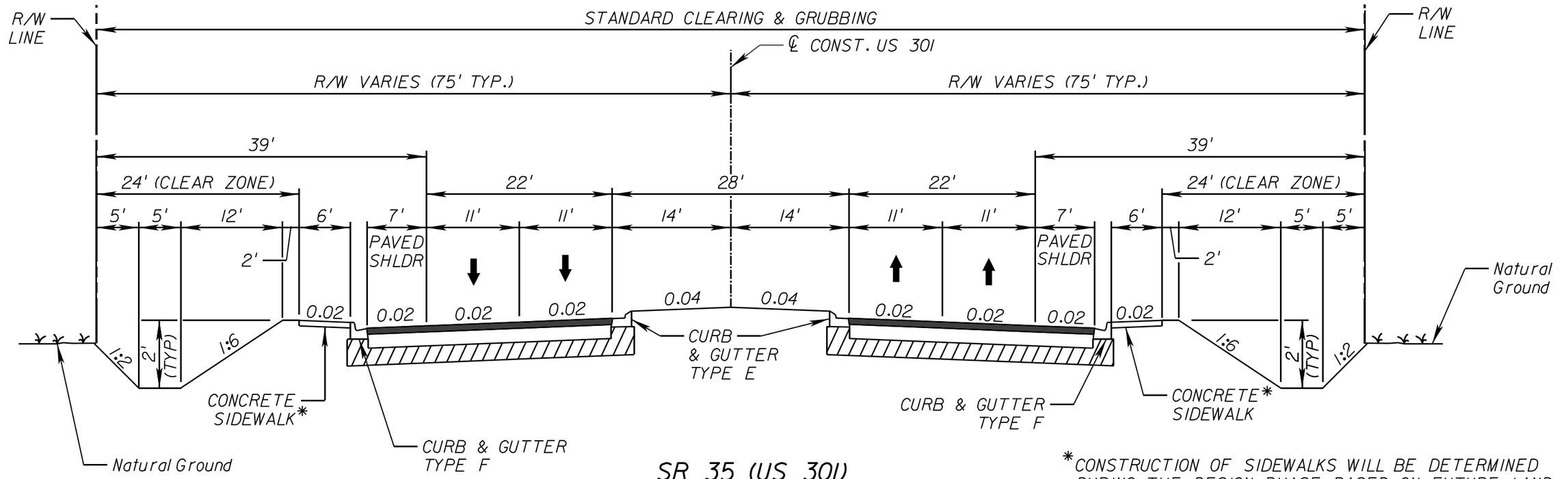
From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

TYPICAL SECTION

Figure

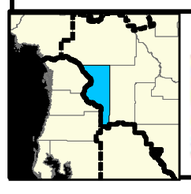
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SR 35 (US 301)
4-LANE URBAN TYPICAL SECTION
FLORIDA'S TURNPIKE (SR 91) TO SR 44

*CONSTRUCTION OF SIDEWALKS WILL BE DETERMINED DURING THE DESIGN PHASE BASED ON FUTURE LAND USE AND THE URBAN BOUNDARY.

DESIGN SPEED = 45 MPH

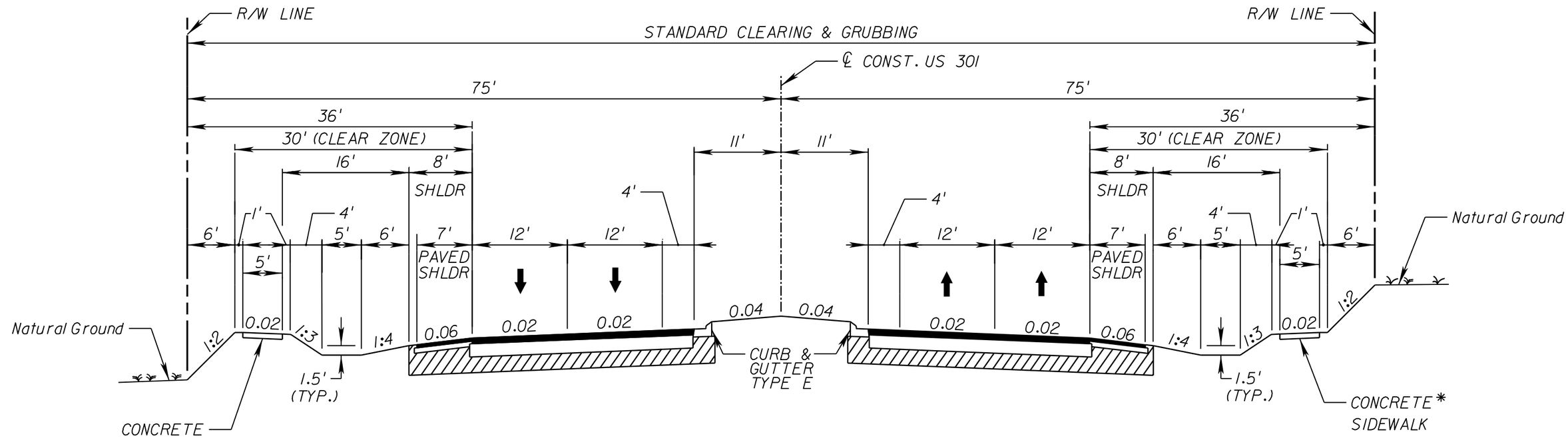


Florida Department of Transportation
District 5

SR 35/US 301 PD&E STUDY
From CR 470 E to SR 44
Sumter County, Florida
Financial Project ID: 430132-1-22-01

TYPICAL SECTION

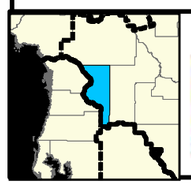
Figure
2B



SR 35 (US 301)
SUBURBAN TYPICAL SECTION
CR 470 E TO FLORIDA'S TURNPIKE (SR 91)

*CONSTRUCTION OF SIDEWALKS WILL BE DETERMINED DURING THE DESIGN PHASE BASED ON FUTURE LAND USE AND THE URBAN BOUNDARY.

DESIGN SPEED = 55 MPH

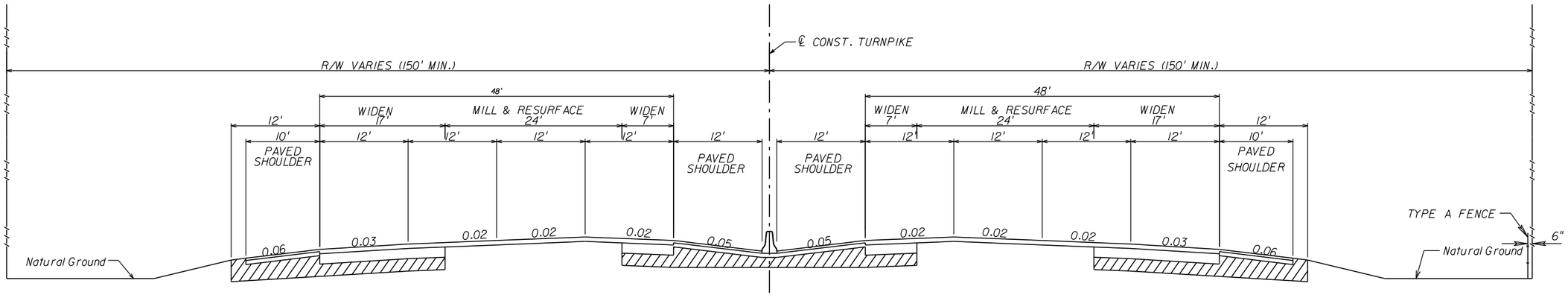


Florida Department of Transportation
District 5

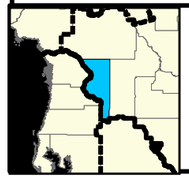
SR 35/US 301 PD&E STUDY
From CR 470 E to SR 44
Sumter County, Florida
Financial Project ID: 430132-1-22-01

TYPICAL SECTION

Figure 2C



TYPICAL SECTION ALTERNATIVE 4
FLORIDA'S TURNPIKE

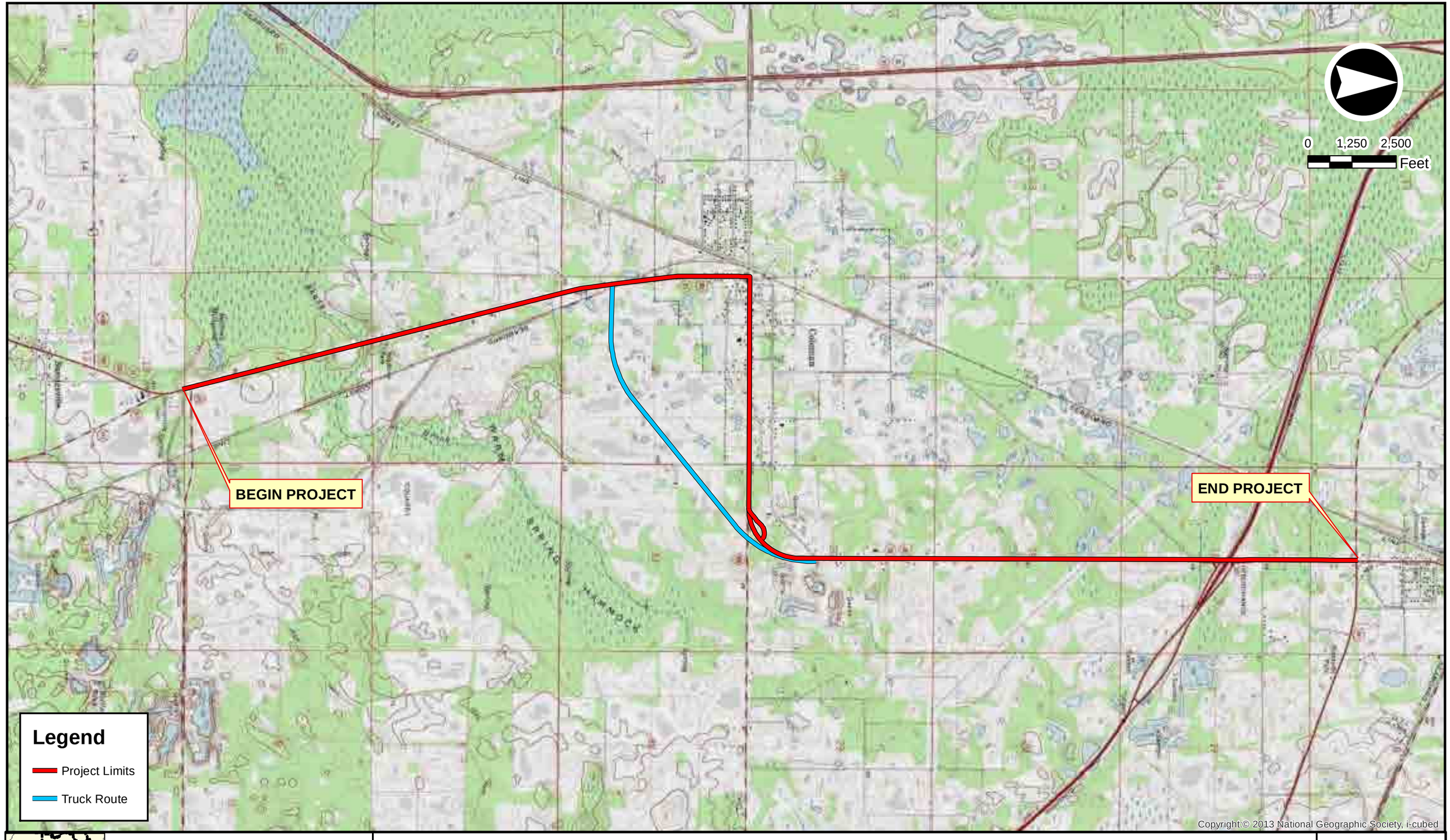


Florida Department of Transportation
District 5

SR 35/US 301 PD&E STUDY
From CR 470 E to SR 44
Sumter County, Florida
Financial Project ID: 430132-1-22-01

TYPICAL SECTION

Figure 2D



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District 5

SR 35/US 301 PD&E STUDY

From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

USGS QUADRANGLE MAP

Figure

3

Soil Descriptions

4: Candler Sand, 0 to 5 Percent Slopes

6: Kendrick Fine Sand, 0 to 5 Percent Slopes

8: Lake Fine Sand, 0 to 5 Percent Slopes

9: Paisley Fine Sand, Bouldery Subsurface

10: Sparr Fine Sand, 0 to 5 Percent Slopes

11: Milhopper Sand, 0 to 5 Percent Slopes

13: Tavares Fine Sand, 0 to 5 Percent Slopes

15: Adamsville Fine Sand, Bouldery Subsurface

17: Sumterville-Mabel-Tavares Association, Bouldery Subsurface, 0 to 5 Percent Slopes

21: EauGallie Fine Sand, Bouldery Subsurface

22: Smyrna-Smyrna Fine Sand, 0 to 2 Percent Slopes

23: Ona Fine Sand

24: Basinger Fine Sand

25: Kanapaha Sand, Bouldery Subsurface

26: Wabasso Fine Sand, Bouldery Subsurface

27: Sumterville Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes

29: Nittaw Muck, Frequently Flooded

30: Placid Fine Sand, Depressional

32: Pompano Fine Sand

33: Sparr Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes

34: Tarrytown Sandy Clay Loam, Bouldery Subsurface

36: Floridana Mucky Fine Sand, Depressional

37: Astatula Fine Sand, 0 to 8 Percent Slopes

39: Mabel Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes

40: Millhopper Sand, Bouldery Subsurface, 0 to 5 Percent Slopes

42: Adamsville Fine Sand

43: Basinger Fine Sand, Depressional, 0 to 1 Percent Slopes

44: Oldsmar Fine Sand, Bouldery Subsurface

45: Electra Fine Sand, Bouldery Subsurface

46: Ft. Green Fine Sand, Bouldery Subsurface

47: Okeelanta Muck, Frequently Flooded

49: Terra Ceia Muck, 0 to 1 Percent Slopes, Frequently Flooded

50: Immokalee Sand

51: Pits-Dumps Complex

53: Tavares Fine Sand, Bouldery Subsurface, 0 to 5 Percent Slopes

54: Monteocha Fine Sand, Depressional

55: Pomello Fine Sand, 0 to 5 Percent Slopes

56: Wabasso Fine Sand, Depressional

58: Paisley Fine Sand, Depressional

62: Urban Land

65: Candler Sand, Bouldery Subsurface, 0 to 5 Percent Slopes

99: Water

Soil Rating

- A
- A/D
- B/D
- C/D
- D
- Water
- Urban Land, Pits-Dumps Complex

Legend

- Project Limits
- Truck Route
- Major Roads
- Railway
- Parcels

0 1,250 2,500 Feet

BEGIN PROJECT

I-75

470

301

471

470

468

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbu

Florida Department of Transportation

District 5

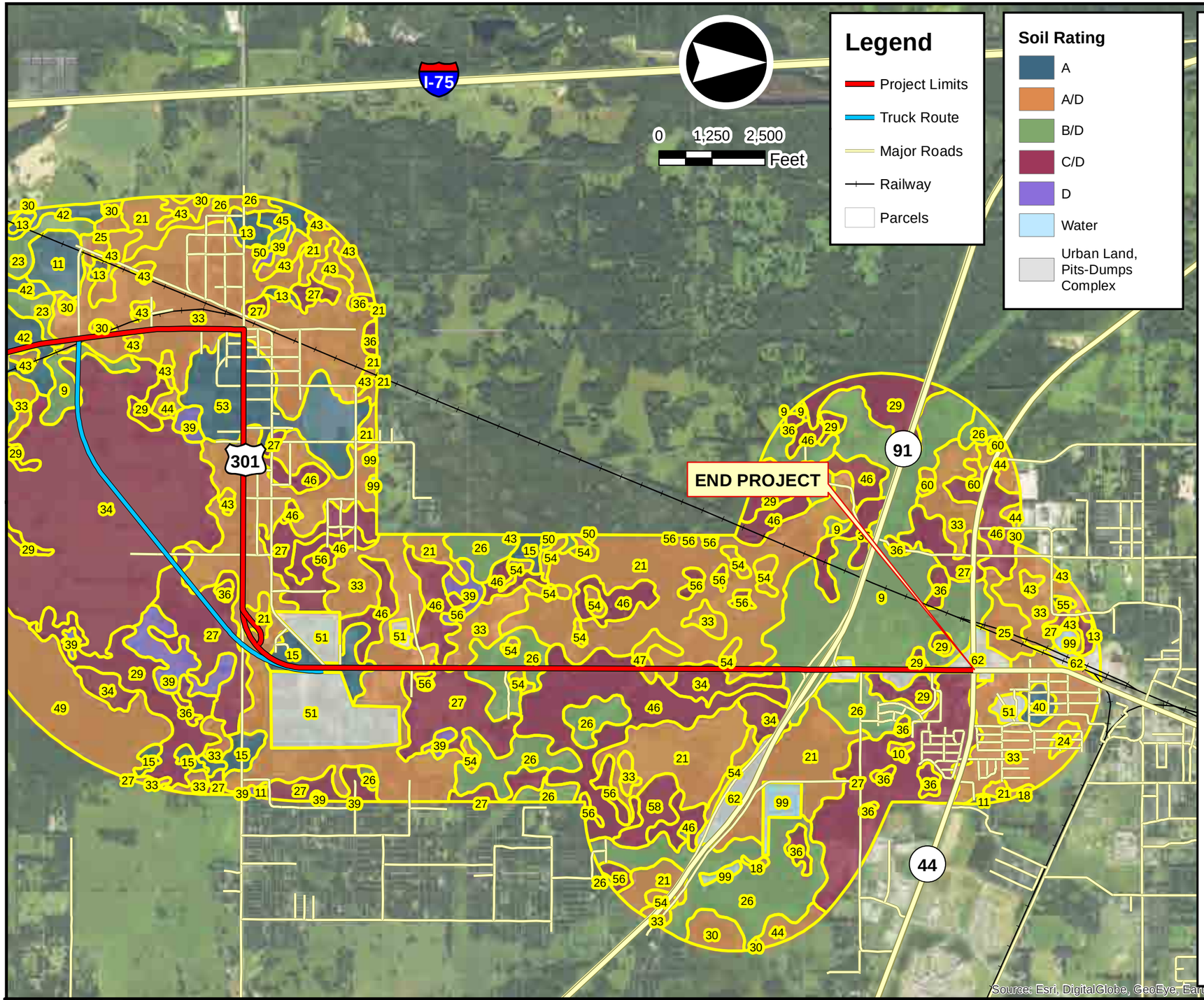
SR 35/US 301 PD&E STUDY

From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

NRCS SOILS MAP

Figure 4A



Legend

- Project Limits
- Truck Route
- Major Roads
- Railway
- Parcels

Soil Rating

- A
- A/D
- B/D
- C/D
- D
- Water
- Urban Land, Pits-Dumps Complex

Soil Descriptions

4: Candler Sand, 0 to 5 Percent Slopes

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11: Milhopper Sand, 0 to 5 Percent Slopes

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15: Adamsville Fine Sand, Bouldery Subsurface

17: Sumterville-Mabel-Tavares Association, Bouldery Subsurface, 0 to 5 Percent Slopes

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54: Monteocha Fine Sand, Depressional

55: Pomello Fine Sand, 0 to 5 Percent Slopes

56: Wabasso Fine Sand, Depressional

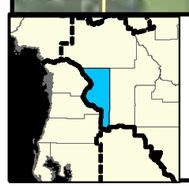
58: Paisley Fine Sand, Depressional

62: Urban Land

65: Candler Sand, Bouldery Subsurface, 0 to 5 Percent Slopes

99: Water

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus



Florida Department of Transportation

District 5

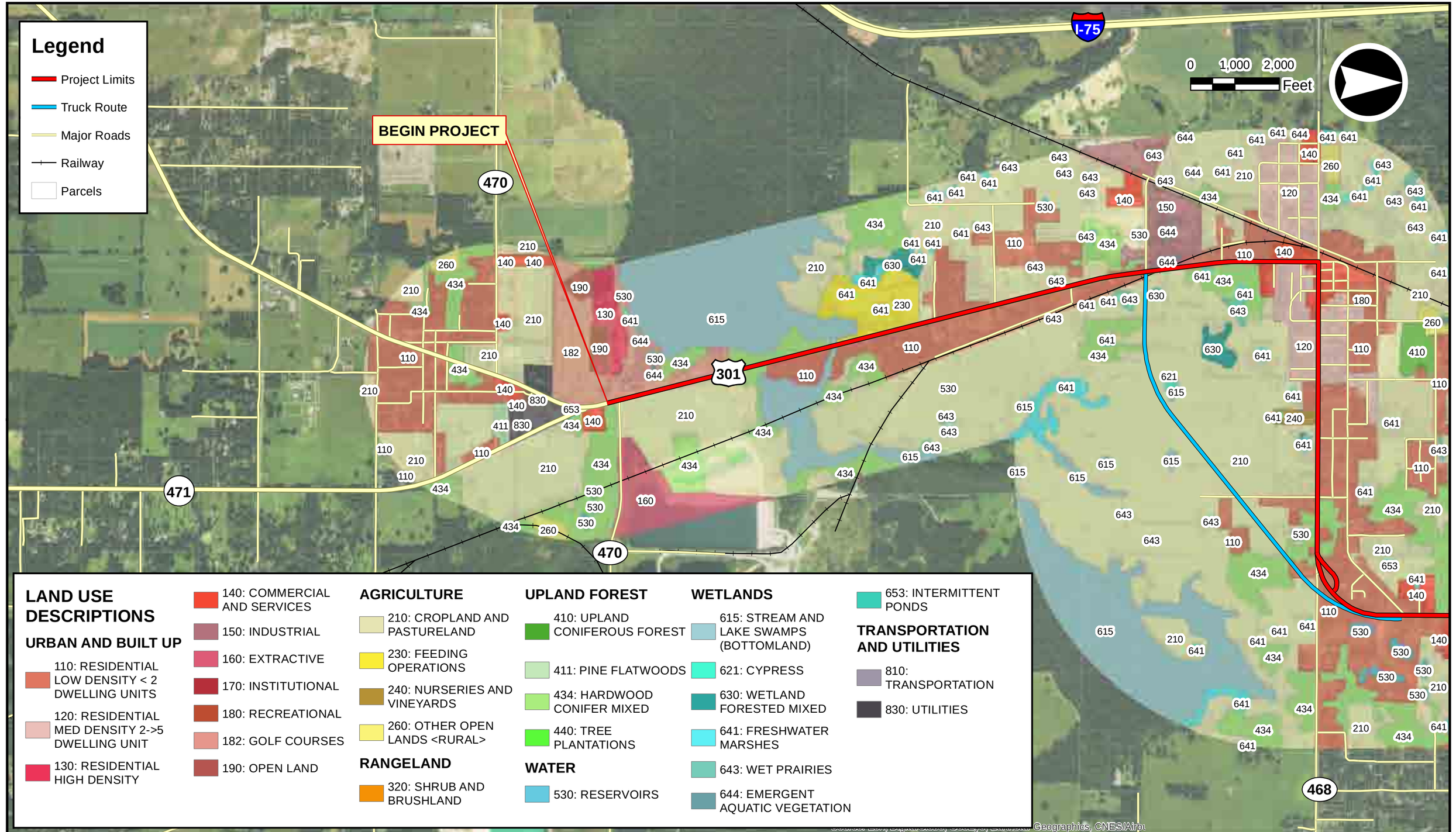
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From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

NRCS SOILS MAP

Figure 4B



Florida Department of Transportation

District 5

SR 35/US 301 PD&E STUDY

From CR 470 E to SR 44
Sumter County, Florida

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LAND USE MAP

Figure 5A

LAND USE DESCRIPTIONS

URBAN AND BUILT UP

- 110: RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS
- 120: RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT
- 130: RESIDENTIAL HIGH DENSITY
- 140: COMMERCIAL AND SERVICES
- 150: INDUSTRIAL
- 160: EXTRACTIVE
- 170: INSTITUTIONAL
- 180: RECREATIONAL
- 182: GOLF COURSES
- 190: OPEN LAND

AGRICULTURE

- 210: CROPLAND AND PASTURELAND
- 230: FEEDING OPERATIONS
- 240: NURSERIES AND VINEYARDS
- 260: OTHER OPEN LANDS <RURAL>

RANGELAND

- 320: SHRUB AND BRUSHLAND

UPLAND FOREST

- 410: UPLAND CONIFEROUS FOREST
- 411: PINE FLATWOODS
- 434: HARDWOOD CONIFER MIXED
- 440: TREE PLANTATIONS

WATER

- 530: RESERVOIRS

WETLANDS

- 615: STREAM AND LAKE SWAMPS (BOTTOMLAND)
- 621: CYPRESS
- 630: WETLAND FORESTED MIXED
- 641: FRESHWATER MARSHES
- 643: WET PRAIRIES
- 644: EMERGENT AQUATIC VEGETATION
- 653: INTERMITTENT PONDS

TRANSPORTATION AND UTILITIES

- 810: TRANSPORTATION
- 830: UTILITIES

Legend

- Project Limits
- Truck Route
- Major Roads
- Railway
- Parcels

0 1,000 2,000 Feet

END PROJECT

91 44 301 468

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbt

Florida Department of Transportation

District 5

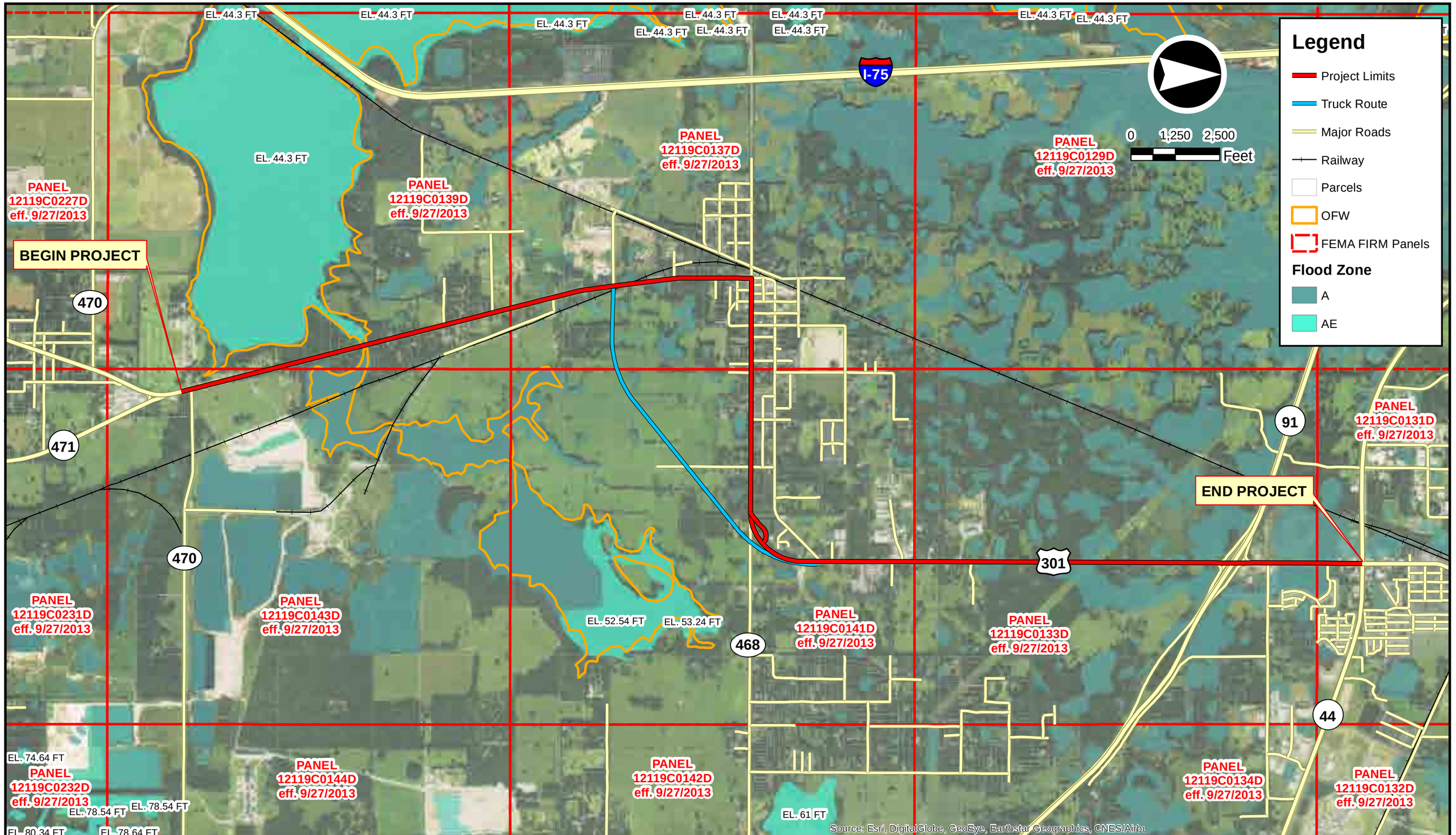
SR 35/US 301 PD&E STUDY

From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

LAND USE MAP

Figure 5B



Florida Department of Transportation

District 5

SR 35/US 301 PD&E STUDY

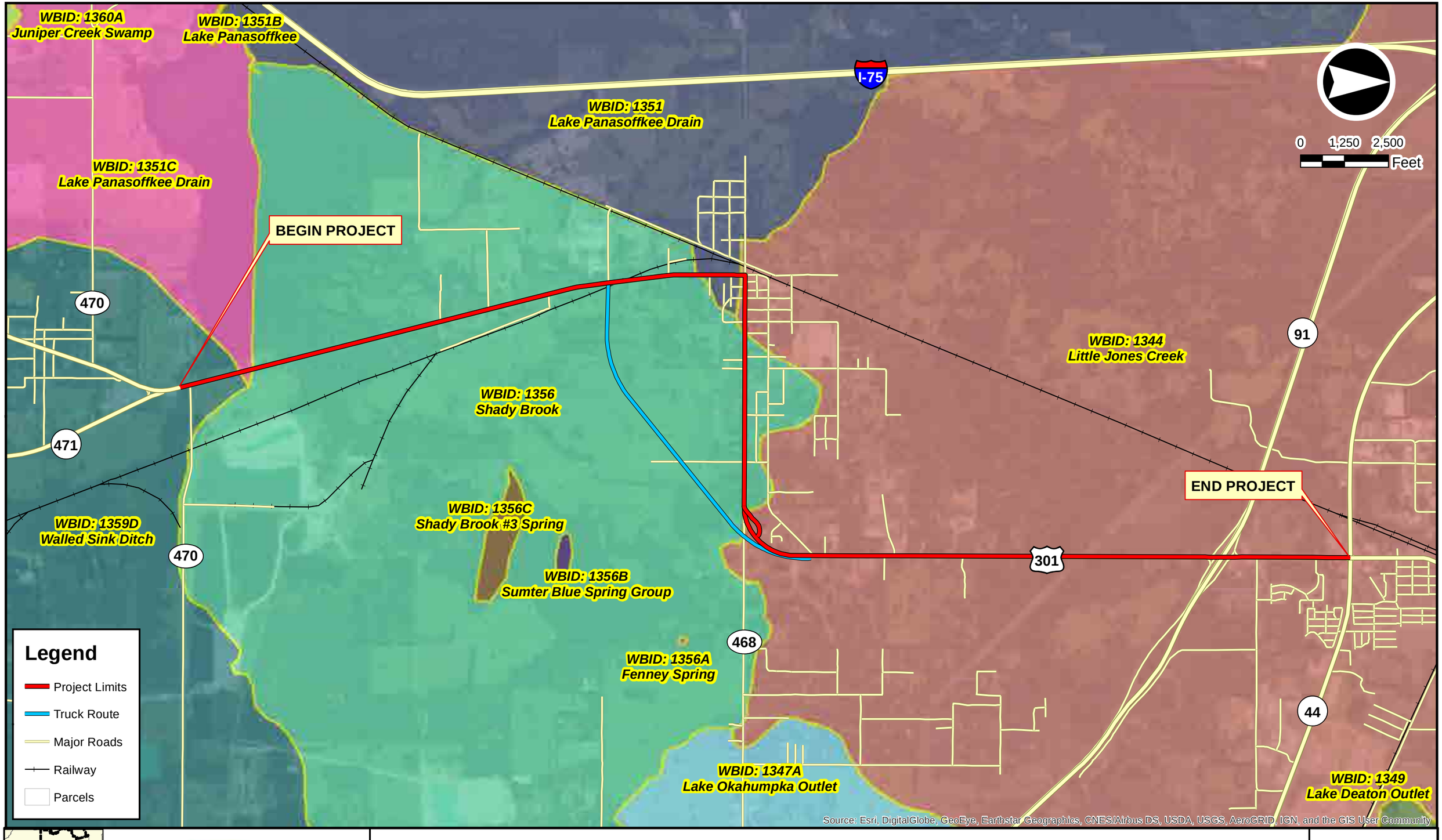
From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

FEMA FLOODPLAINS MAP

Figure

6

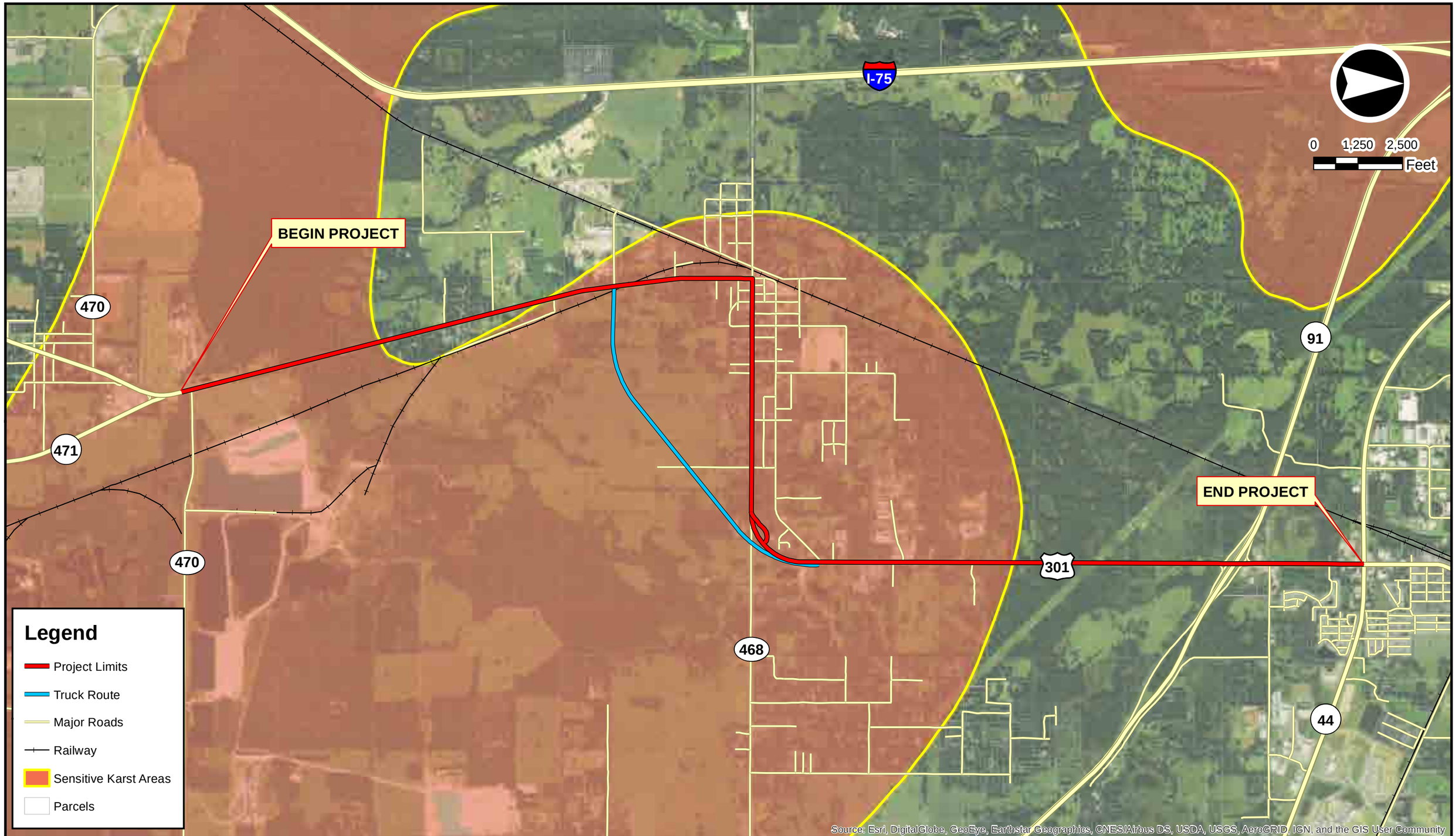


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District 5

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WBID MAP

Figure
7



Florida Department of Transportation

District 5

SR 35/US 301 PD&E STUDY

From CR 470 E to SR 44
Sumter County, Florida

Financial Project ID: 430132-1-22-01

KARST MAP

Figure 8

APPENDIX B

Basin Maps

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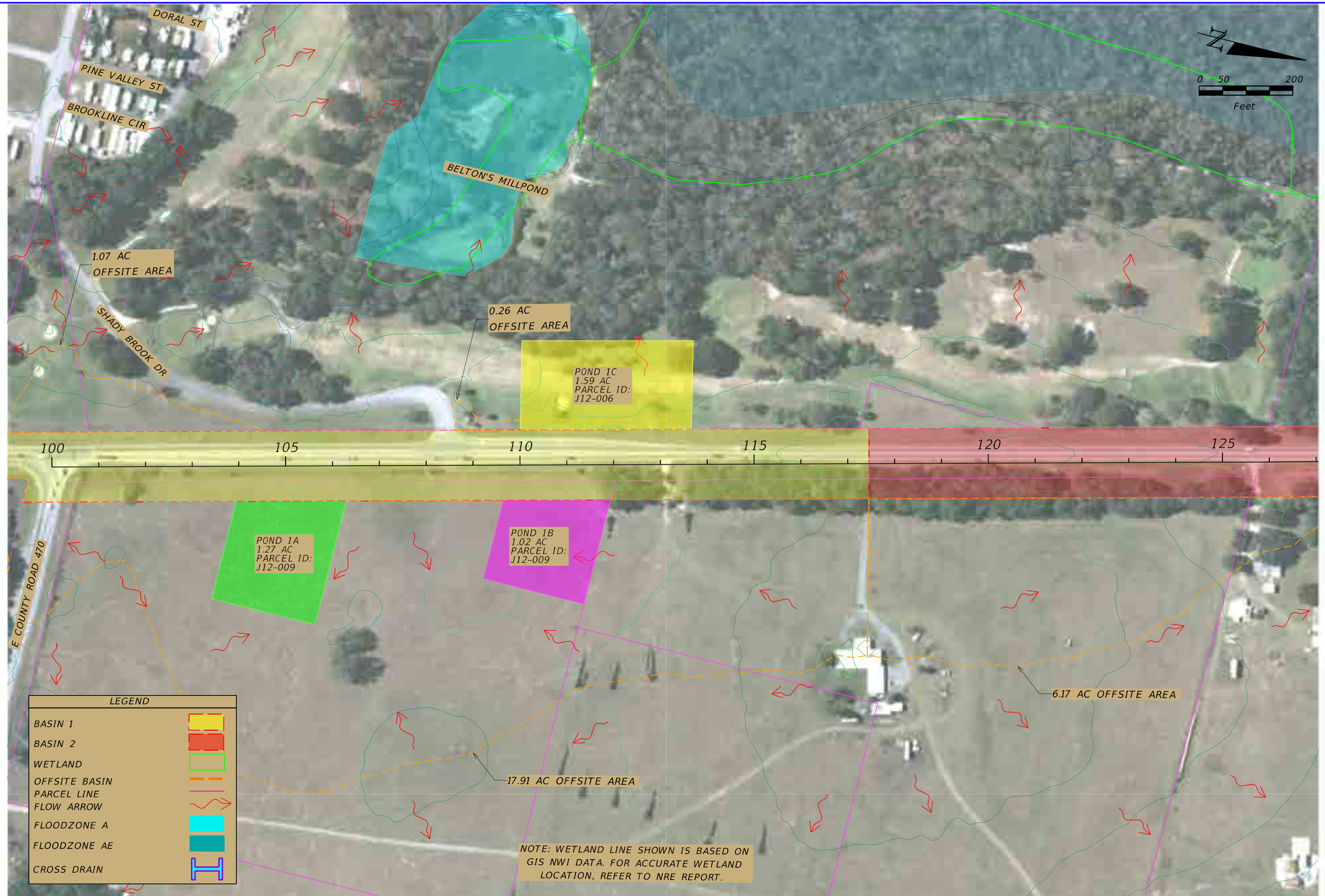
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BASIN MAPS

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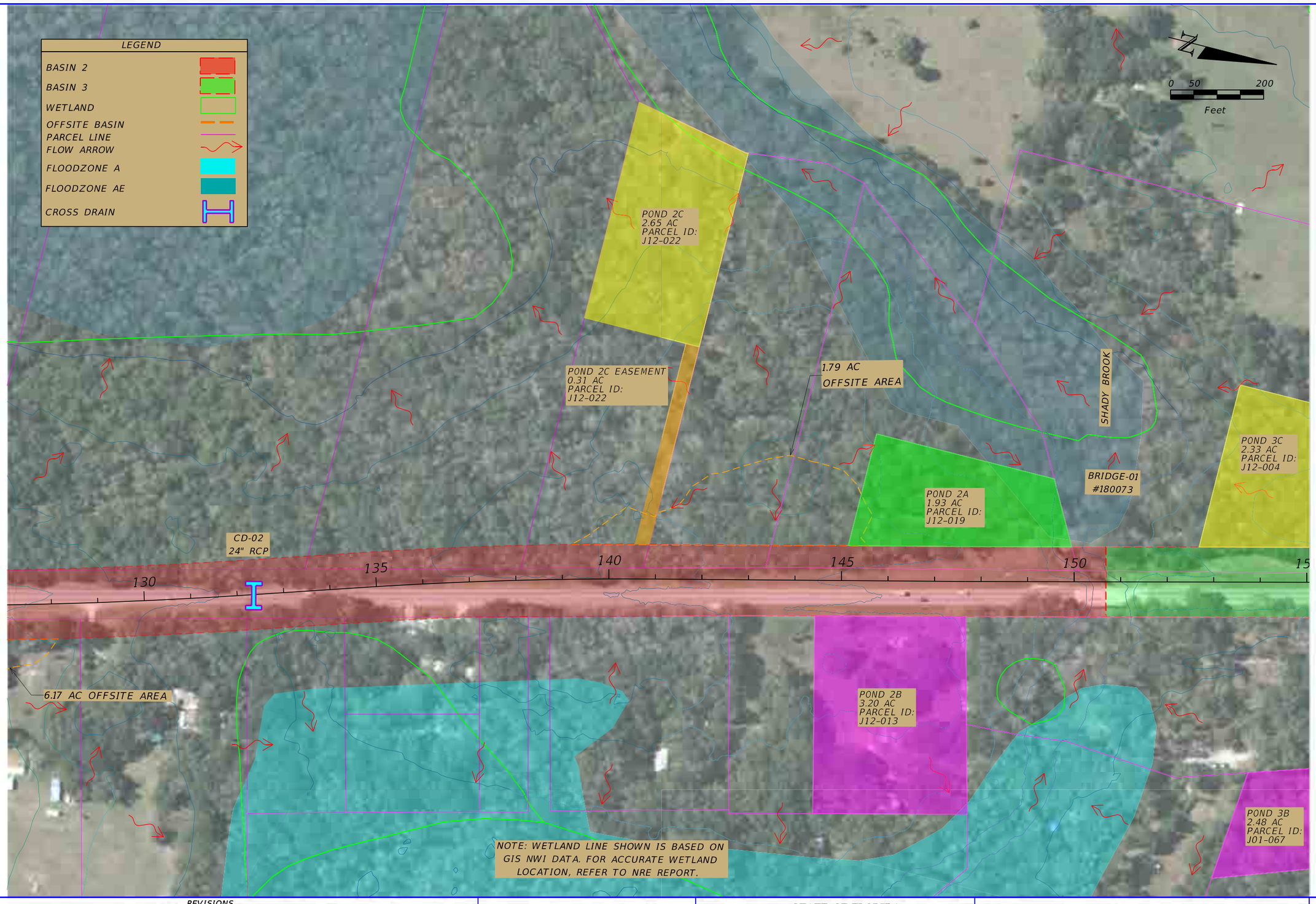
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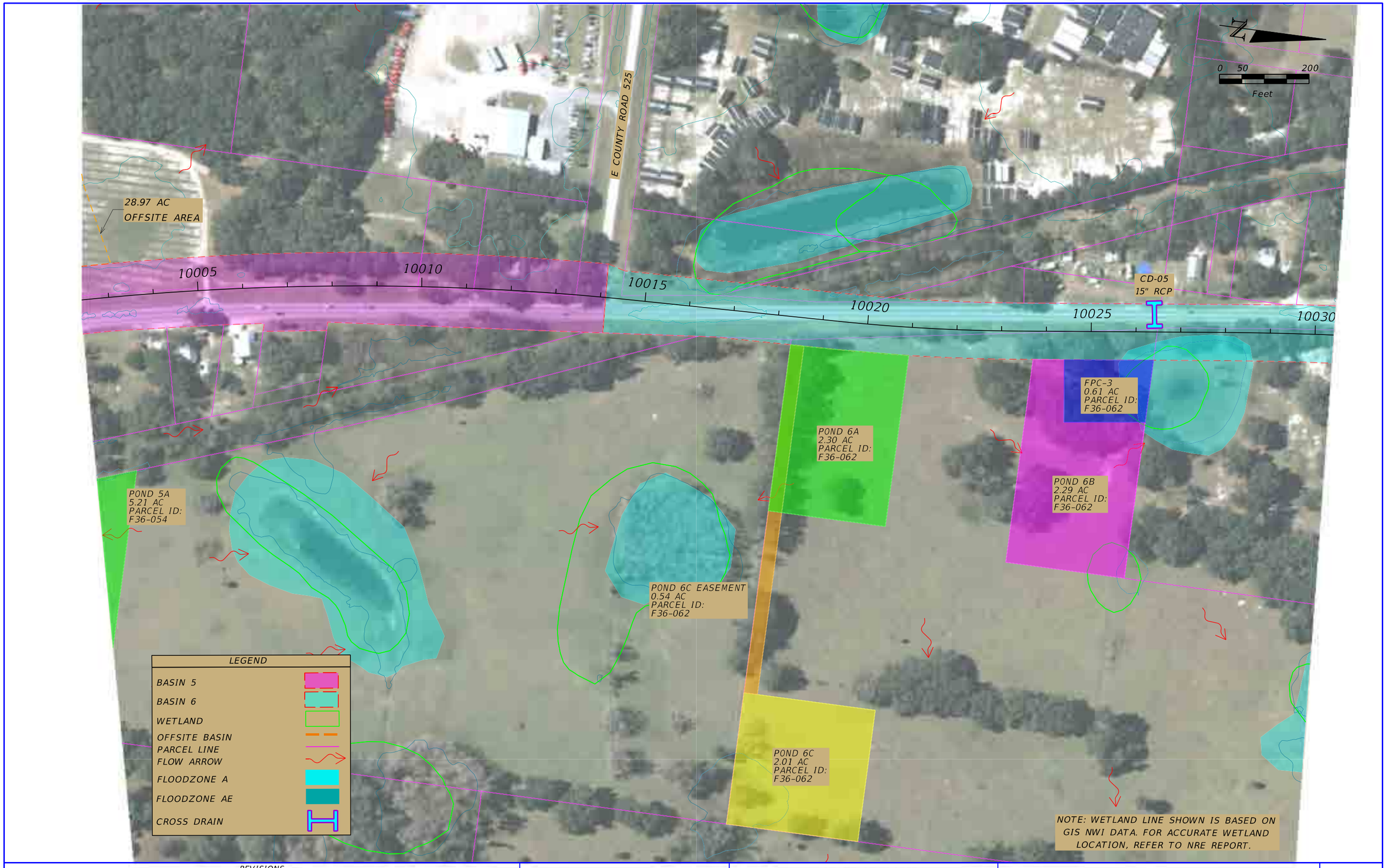
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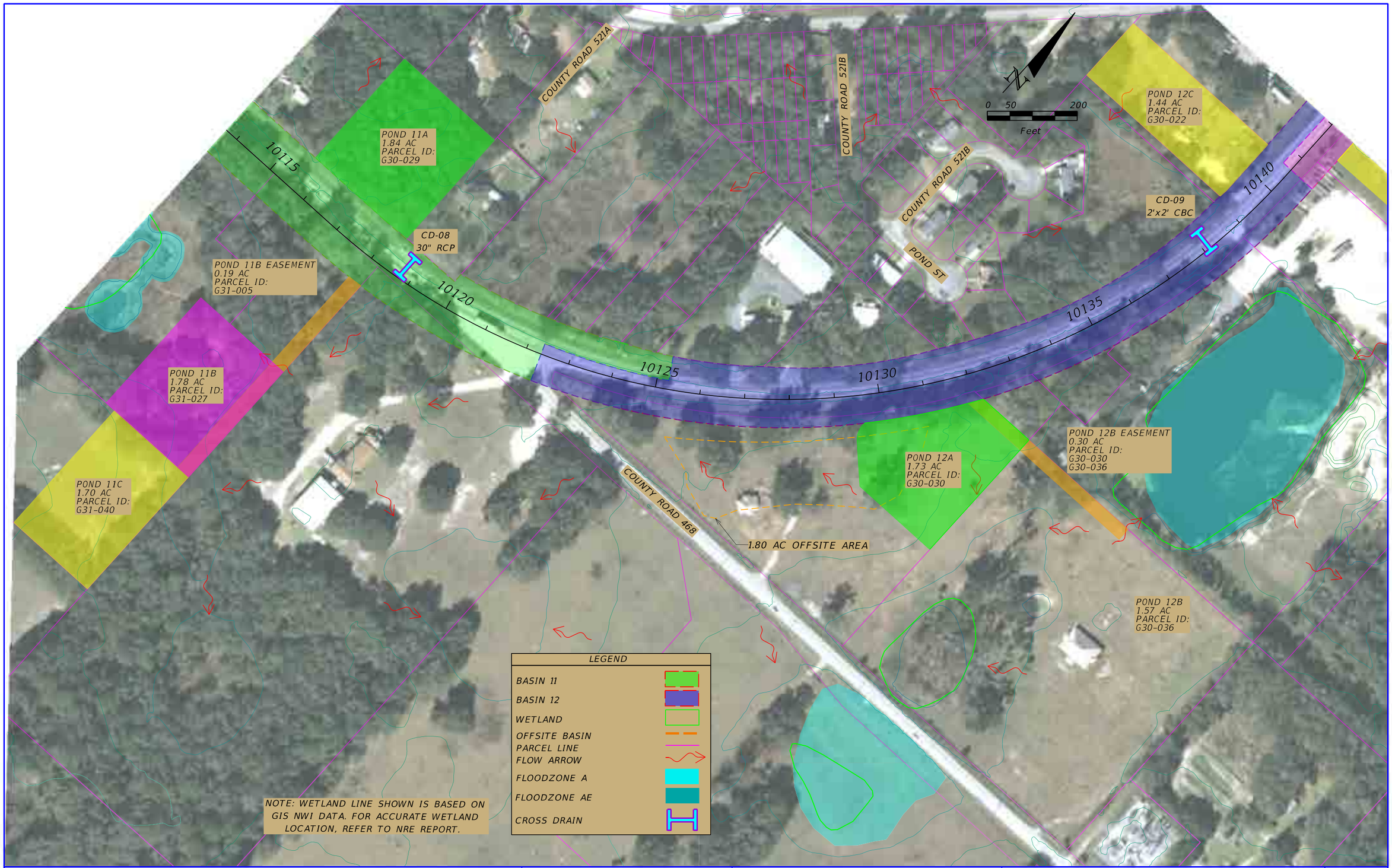
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BASIN MAPS

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BASIN MAPS

SHEET NO. 10

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COUNTY ROAD 521

CD-10
30" RCP

POND 13A EASEMENT
0.54 AC
PARCEL ID:
G30-013

N

0 50 200
Feet

NE 37TH PL

10145 10150 10155 500 505 510

POND 13C
4.16 AC
PARCEL ID:
G30-009

COUNTY ROAD 521

NE 37TH RD

3.34 AC
OFFSITE AREA

POND 13B EASEMENT
0.57 AC
PARCEL ID:
G30-009

POND 13B
2.35 AC
PARCEL ID:
G30-006
G30-009
G30-050

LEGEND

- BASIN 12
- BASIN 13
- BASIN 14
- WETLAND
- OFFSITE BASIN
- PARCEL LINE
- FLOW ARROW
- FLOODZONE A
- FLOODZONE AE
- CROSS DRAIN

NOTE: WETLAND LINE SHOWN IS BASED ON GIS NWI DATA. FOR ACCURATE WETLAND LOCATION, REFER TO NRE REPORT.

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BASIN MAPS

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POND 13A
2.19 AC
PARCEL ID:
G31-013

2.40 AC
OFFSITE AREA

POND 13A EASEMENT
0.54 AC
PARCEL ID:
G31-013

COUNTY ROAD 521

CD-10
30" RCP

10145 10150 10155 500

POND 13C
4.16 AC
PARCEL ID:
G30-009

3.34 AC
OFFSITE AREA

POND 13B EASEMENT
0.57 AC
PARCEL ID:
G30-009

COUNTY ROAD 521

LEGEND

- BASIN 13
- BASIN 14
- WETLAND
- OFFSITE BASIN
- PARCEL LINE
- FLOW ARROW
- FLOODZONE A
- FLOODZONE AE
- CROSS DRAIN

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N
0 50 200
Feet

N
0 50 200
Feet

505 510

NE 37TH PL

NE 37TH RD

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BASIN MAPS

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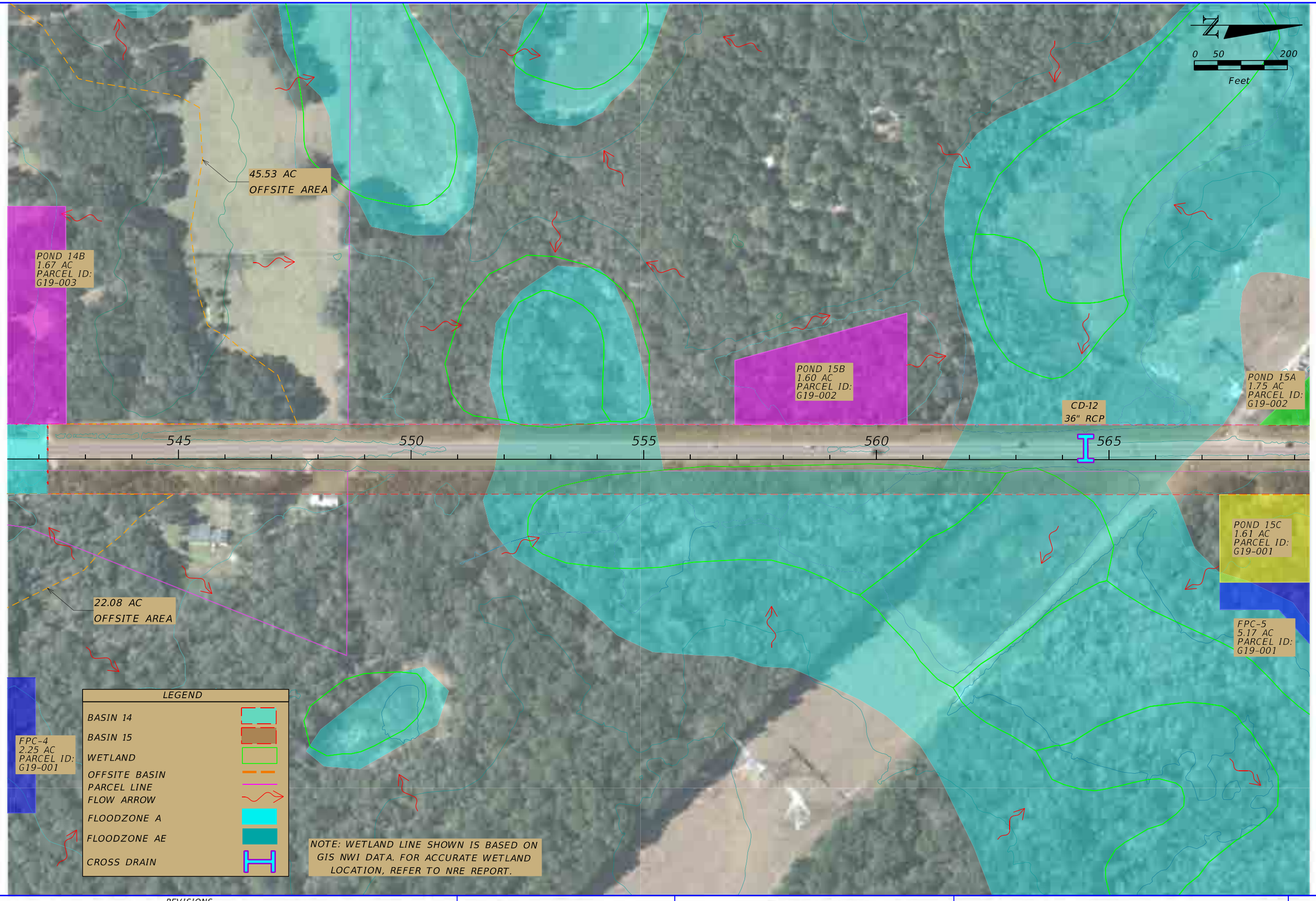
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BASIN MAPS

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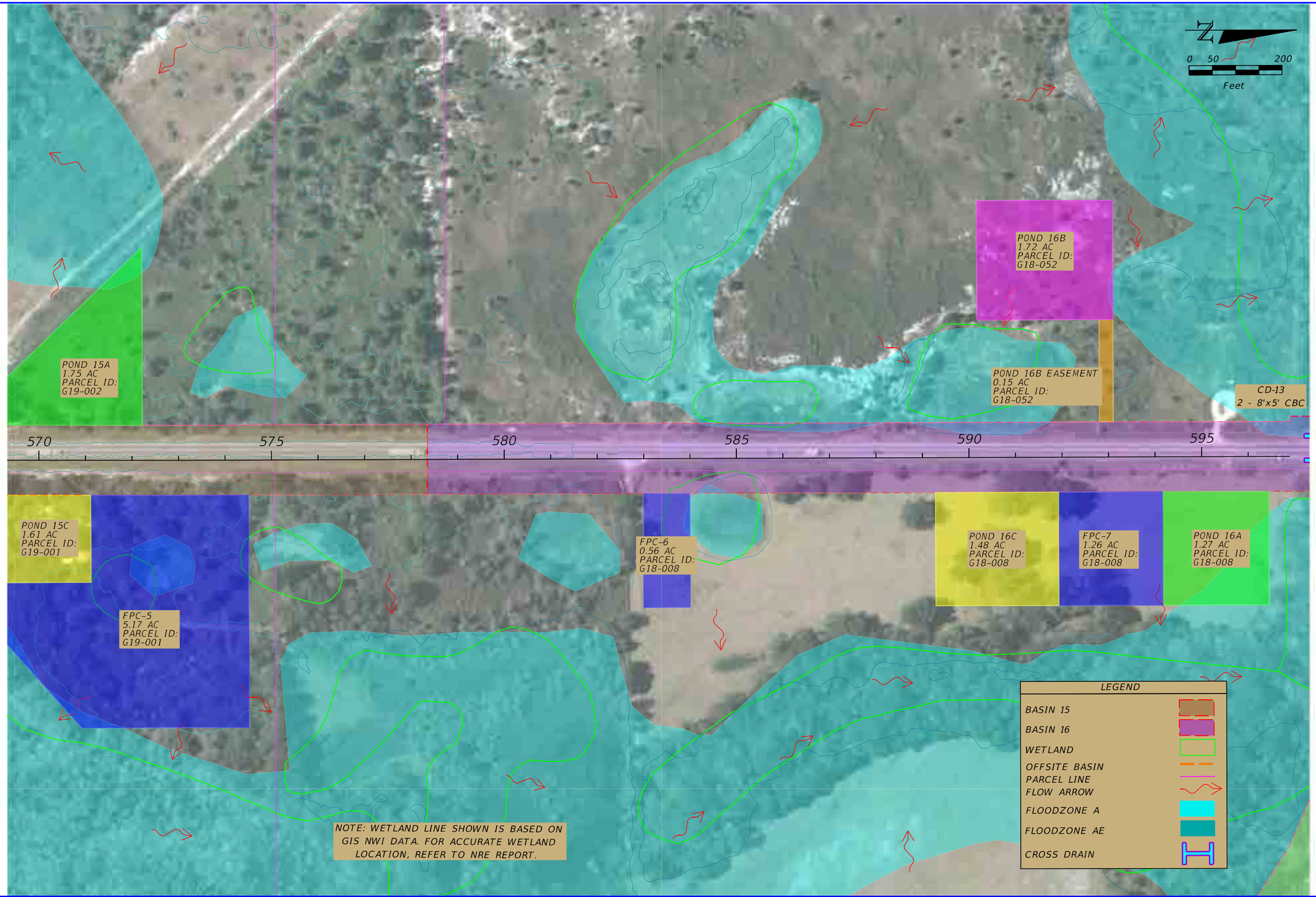
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BASIN MAPS

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BASIN MAPS

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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 16

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 17

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 18

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 19

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 20

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 21

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 22



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DATE	DESCRIPTION	DATE	DESCRIPTION

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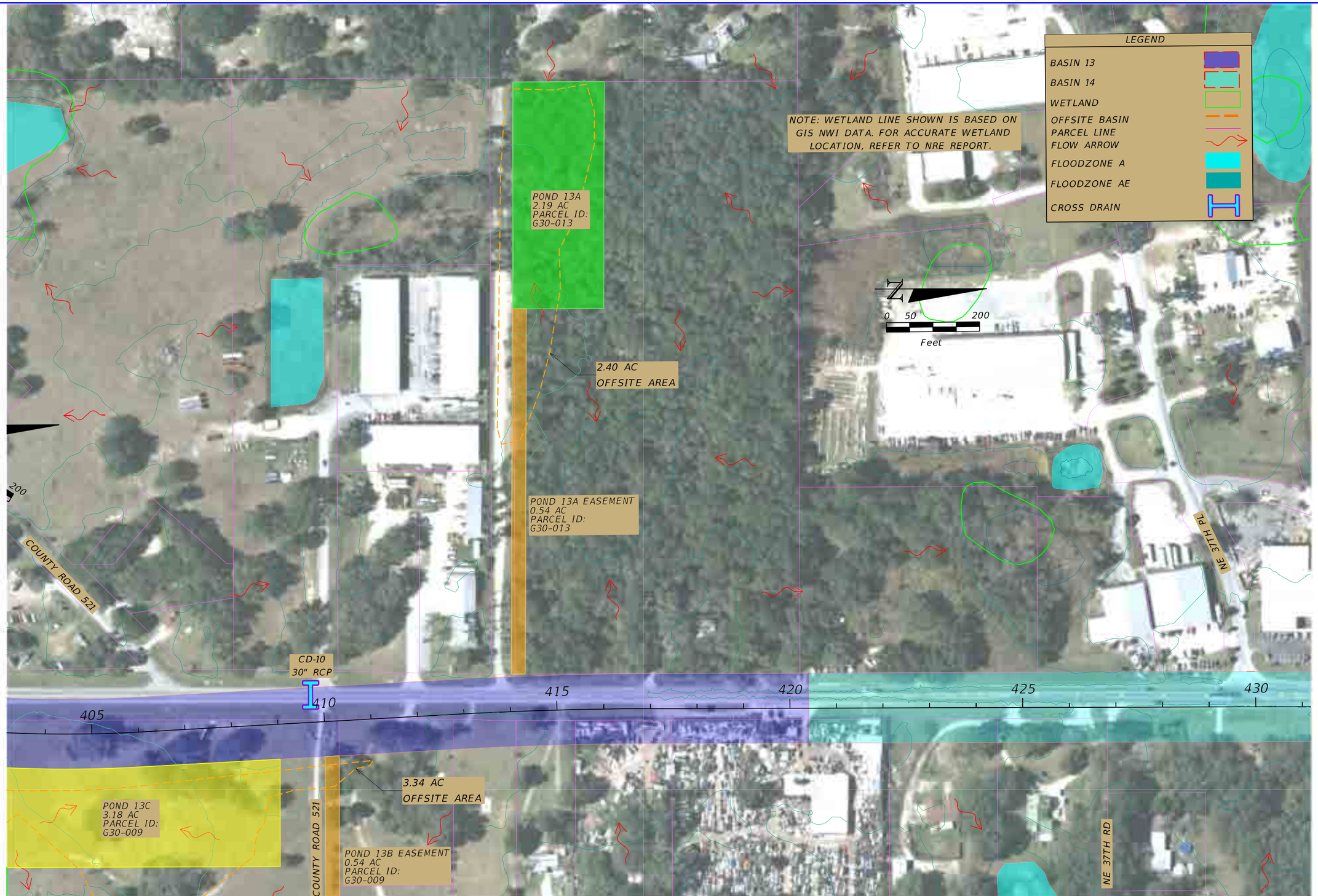
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 23

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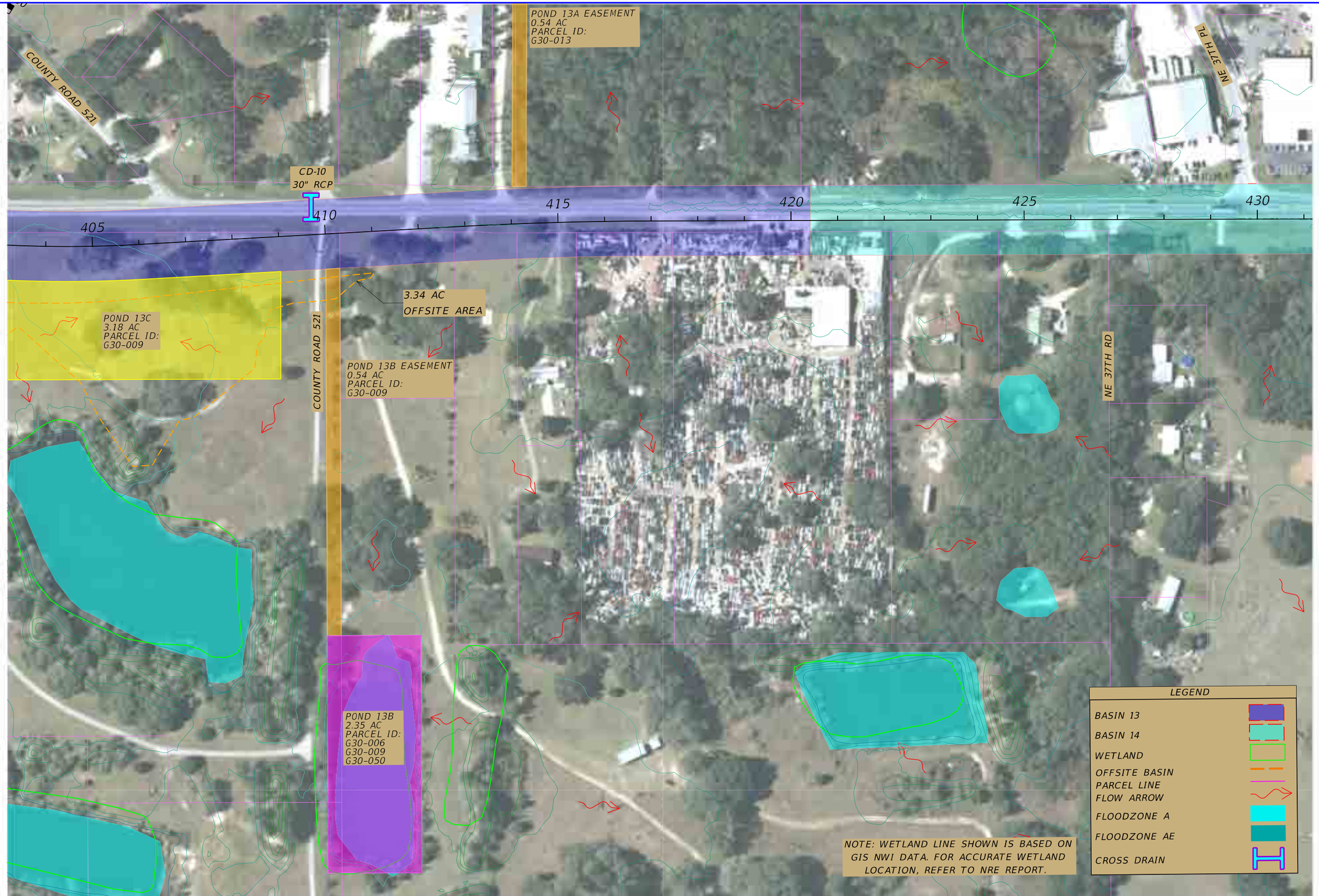
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 24

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	SUMTER	430132-1-22-01

BASIN MAPS

SHEET NO. 25

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APPENDIX C

Pond Design Calculations

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Made by: CND
Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1A**

Station Limits: From: 097+26 To: 117+45 Roadway Length = 2019 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.23 ac
Pervious Area*: 7.04 ac
Total Roadway Area *: 9.26 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.06 ac

Total Area:
Impervious Area: **2.23 ac**
Pervious Area: **8.10 ac**
Total Area: **10.33 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.32 ac	31.7
Impervious areas; Streets & roads	D	98	1.90 ac	186.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.30 ac	11.5
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.14 ac	90.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.97 ac	37.7
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.51 ac	201.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.36 ac	40.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.77 ac	59.1
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.06 ac	41.4
		Total:	10.33 ac	700.6

CN = Total CN*Area / Total Area = **67.9**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.74 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**3.80 in**	**3.40 in**	**4.64 in**	**14.30 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1A**

Station Limits: From: 097+26 To: 117+45 Roadway Length = 2019 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.29 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.97 ac	*Areas measured in Microstation
Total Roadway Area *:	9.26 ac	

Pond Area:

Pervious Pond Area :	0.67 ac	
Water Surface Area:	0.39 ac	Wet Pond
Total Pond Area:	1.06 ac	

Total Area:

Impervious Area:	**4.29 ac**
Pervious Area:	**5.64 ac**
Water Surface Area:	**0.39 ac**
Total Area:	**10.33 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.87 ac	183.0
Impervious areas; Streets & roads	D	98	2.42 ac	237.5
Proposed Roadway Pervious	A	39	2.16 ac	84.4
Proposed Roadway Pervious	D	80	2.81 ac	224.7
Proposed Pond Pervious	A	39	0.67 ac	26.0
Proposed Ponds (Water Surface)	A	100	0.39 ac	39.4
		Total:	10.33 ac	795.0

CN = Total CN*Area / Total Area = **77.0**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.99 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.82 in**	**4.37 in**	**5.73 in**	**15.83 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.36 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.36 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.27 ac-ft	2.92 ac-ft	3.99 ac-ft	12.30 ac-ft
Q_{post} =	4.15 ac-ft	3.76 ac-ft	4.93 ac-ft	13.62 ac-ft
ΔQ =	**0.87 ac-ft**	**0.84 ac-ft**	**0.94 ac-ft**	**1.32 ac-ft**

Attenuation V_{req} = 0.94 ac-ft

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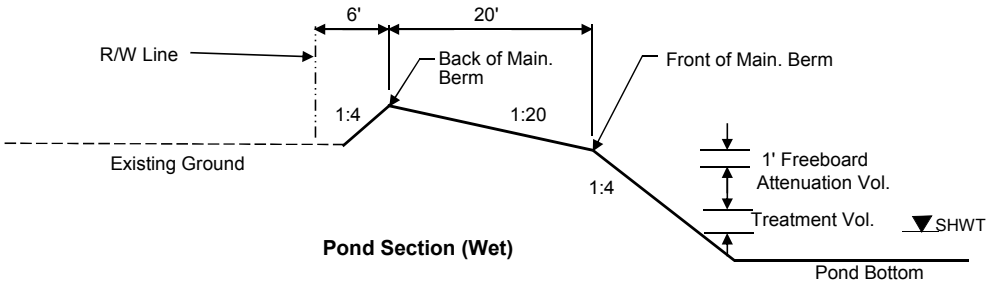
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	66.00
Pond Tie-In Width =	6.0 ft	@ 1:4	Normal Water Elevation =	62.50
Maximum Storage Depth (**SD**) =	3.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	67.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	825 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	65.18 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
66.00	Pond R/W	1.06 ac	215.0 ft	215.0 ft	
67.50	Back of Main. Berm	0.95 ac	203.0 ft	203.0 ft	2.78 ac-ft
67.00		0.77 ac	183.0 ft	183.0 ft	2.35 ac-ft
66.50	Front of Main. Berm	0.61 ac	163.0 ft	163.0 ft	2.01 ac-ft
65.50	Provided Treat.Vol.+Att.Vol	0.55 ac	155.0 ft	155.0 ft	1.42 ac-ft
65.29	Req'd Treat.Vol+Att. Vol	0.54 ac	153.3 ft	153.3 ft	1.30 ac-ft
65.09	Estimated Storm Sewer TW	0.53 ac	151.7 ft	151.7 ft	1.19 ac-ft
63.36	Top of Treatment Vol.	0.44 ac	137.9 ft	137.9 ft	0.36 ac-ft
62.50	Normal Water Level	0.39 ac	131.0 ft	131.0 ft	0.00 ac-ft
60.50		0.30 ac	115.0 ft	115.0 ft	
58.00	Pond Bottom	0.21 ac	95.0 ft	95.0 ft	

Required Treatment+Attenuation Vol.= 1.30 ac-ft
Required Treatment+Attenuation Stage= 65.29 ft

Provided Treatment+Attenuation Vol.= 1.42 ac-ft
Provided Treatment+Attenuation Stage= 65.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.19 ac-ft
Estimated Storm Sewer TW EL.= 65.09 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.27 ac

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DATE: December 5, 2017
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1B**

Station Limits: From: 097+26 To: 117+45

Roadway Length = 2019 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.23 ac
Pervious Area*: 7.04 ac
Total Roadway Area *: 9.26 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 0.85 ac

Total Area:

Impervious Area: **2.23 ac**
Pervious Area: **7.89 ac**
Total Area: **10.11 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.32 ac	31.7
Impervious areas; Streets & roads	D	98	1.90 ac	186.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.30 ac	11.5
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.14 ac	90.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.97 ac	37.7
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.51 ac	201.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.36 ac	40.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.77 ac	59.1
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.85 ac	33.1
		Total:	10.11 ac	692.3

CN = Total CN*Area / Total Area = **68.5**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = 1000/CN - 10 = **4.61 in** — Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $(P - 0.2S)^2 / (P + 0.8S)$ — Runoff (Q) =	**3.87 in**	**3.46 in**	**4.71 in**	**14.41 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1B**

Station Limits: From: 097+26 To: 117+45 Roadway Length = 2019 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.29 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.97 ac	*Areas measured in Microstation
Total Roadway Area *:	9.26 ac	

Pond Area:

Pervious Pond Area :	0.85 ac	Dry Pond
Water Surface Area:	0.00 ac	
Total Pond Area:	0.85 ac	

Total Area:

Impervious Area:	**4.29 ac**
Pervious Area:	**5.82 ac**
Water Surface Area:	**0.00 ac**
Total Area:	**10.11 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.87 ac	183.0
Impervious areas; Streets & roads	D	98	2.42 ac	237.5
Proposed Roadway Pervious	A	39	2.16 ac	84.4
Proposed Roadway Pervious	D	80	2.81 ac	224.7
Proposed Pond Pervious	A	39	0.85 ac	33.1
Proposed Ponds (Water Surface)	A	100	0.00 ac	0.0
		Total:	10.11 ac	762.7

CN = Total CN*Area / Total Area = **75.4**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.26 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.64 in**	**4.19 in**	**5.55 in**	**15.58 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Dry Retention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Dry Retention	**0.50 in**	x DCIA =	0.18 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.18 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.26 ac-ft	2.91 ac-ft	3.97 ac-ft	12.14 ac-ft
Q_{post} =	3.91 ac-ft	3.54 ac-ft	4.67 ac-ft	13.13 ac-ft
ΔQ =	**0.65 ac-ft**	**0.62 ac-ft**	**0.70 ac-ft**	**0.99 ac-ft**

Attenuation V_{req} = 0.70 ac-ft

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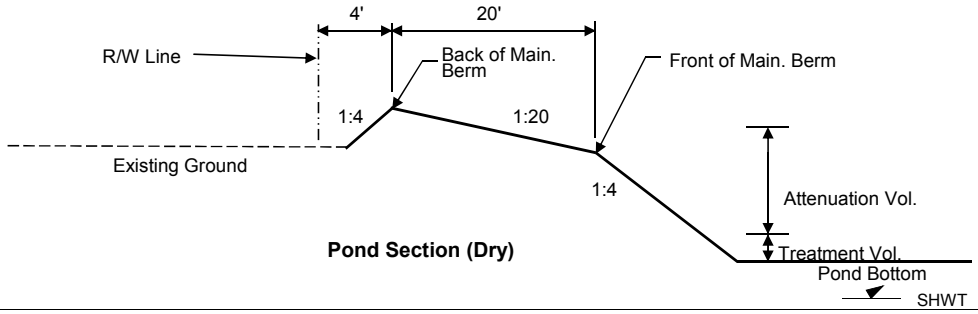
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	66.00
Pond Tie-In Width =	4.0 ft	@ 1:4	Seasonal High Water Elevation =	60.00
Maximum Storage Depth (**SD**) =	5.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	67.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1400 ft	
Estimated Energy Losses =	1.4 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	64.60 ft	



Pond Section (Dry)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
66.00	Pond R/W	0.85 ac	185.0 ft	200.0 ft	
67.00	Back of Main. Berm	0.78 ac	177.0 ft	192.0 ft	2.16 ac-ft
66.50		0.62 ac	157.0 ft	172.0 ft	1.81 ac-ft
66.00	Front of Main. Berm	0.48 ac	137.0 ft	152.0 ft	1.53 ac-ft
65.00	Provided Treat.Vol.+Att.Vol	0.43 ac	129.0 ft	144.0 ft	1.07 ac-ft
64.53	Req'd Treat.Vol+Att. Vol	0.40 ac	125.2 ft	140.2 ft	0.88 ac-ft
64.35	Estimated Storm Sewer TW	0.39 ac	123.8 ft	138.8 ft	0.80 ac-ft
62.60	Top of Treatment Vol.	0.31 ac	109.8 ft	124.8 ft	0.18 ac-ft
62.00	Pond Bottom	0.29 ac	105.0 ft	120.0 ft	0.00 ac-ft

Required Treatment+Attenuation Vol.= 0.88 ac-ft
Required Treatment+Attenuation Stage= 64.53 ft

Provided Treatment+Attenuation Vol.= 1.07 ac-ft
Provided Treatment+Attenuation Stage= 65.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.80 ac-ft
Estimated Storm Sewer TW EL.= 64.35 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.02 ac

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Made by: CND
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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1C**

Station Limits: From: 097+26 To: 117+45

Roadway Length = 2019 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *:	2.23 ac
Pervious Area*:	7.04 ac
Total Roadway Area *:	9.26 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.32 ac

Total Area:

Impervious Area:	**2.23 ac**
Pervious Area:	**8.36 ac**
Total Area:	**10.59 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.32 ac	31.7
Impervious areas; Streets & roads	D	98	1.90 ac	186.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.30 ac	11.5
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.14 ac	90.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.97 ac	37.7
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.51 ac	201.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.36 ac	40.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.77 ac	59.1
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.32 ac	105.8
		Total:	10.59 ac	765.0

CN = Total CN*Area / Total Area = **72.3**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.29 in**	**3.86 in**	**5.17 in**	**15.06 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.84 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Made by: CND
Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1C**

Station Limits: From: 026+22 To: 046+41 Roadway Length = 2019 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.29 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.97 ac	*Areas measured in Microstation
Total Roadway Area *:	9.26 ac	

Pond Area:

Pervious Pond Area :	0.77 ac	
Water Surface Area:	0.55 ac	Wet Pond
Total Pond Area:	1.32 ac	

Total Area:

Impervious Area:	**4.29 ac**
Pervious Area:	**5.74 ac**
Water Surface Area:	**0.55 ac**
Total Area:	**10.59 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.87 ac	183.0
Impervious areas; Streets & roads	D	98	2.42 ac	237.5
Proposed Roadway Pervious	A	39	2.16 ac	84.4
Proposed Roadway Pervious	D	80	2.81 ac	224.7
Proposed Pond Pervious	D	80	0.77 ac	61.7
Proposed Ponds (Water Surface)	D	100	0.55 ac	55.1
		Total:	10.59 ac	846.4

CN = Total CN*Area / Total Area = **80.0**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.51 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.15 in**	**4.69 in**	**6.09 in**	**16.29 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.36 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.36 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.78 ac-ft	3.40 ac-ft	4.56 ac-ft	13.29 ac-ft
Q_{post} =	4.55 ac-ft	4.14 ac-ft	5.37 ac-ft	14.37 ac-ft
ΔQ =	**0.76 ac-ft**	**0.73 ac-ft**	**0.81 ac-ft**	**1.08 ac-ft**

Attenuation V_{req} = 0.81 ac-ft

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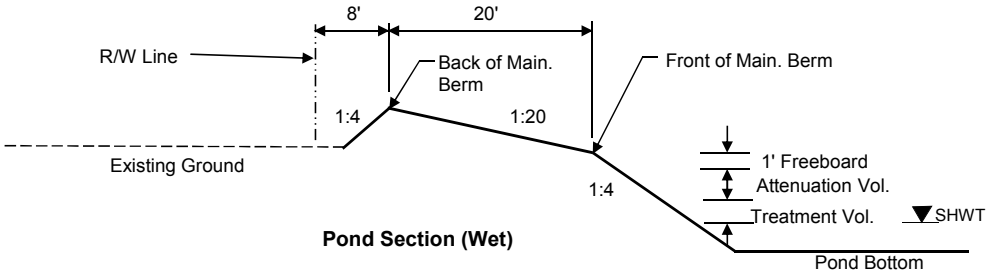
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **1**
POND NAME : **1C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	64.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	62.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	67.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1300 ft	
Estimated Energy Losses =	1.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	64.70 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.32 ac	320.0 ft	180.0 ft	
66.00	Back of Main. Berm	1.14 ac	304.0 ft	164.0 ft	2.90 ac-ft
65.50		0.94 ac	284.0 ft	144.0 ft	2.38 ac-ft
65.00	Front of Main. Berm	0.75 ac	264.0 ft	124.0 ft	1.95 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	0.68 ac	256.0 ft	116.0 ft	1.23 ac-ft
63.91	Req'd Treat.Vol+Att. Vol	0.68 ac	255.3 ft	115.3 ft	1.17 ac-ft
63.79	Estimated Storm Sewer TW	0.67 ac	254.3 ft	114.3 ft	1.09 ac-ft
62.63	Top of Treatment Vol.	0.59 ac	245.0 ft	105.0 ft	0.36 ac-ft
62.00	Normal Water Level	0.55 ac	240.0 ft	100.0 ft	0.00 ac-ft
60.00		0.43 ac	224.0 ft	84.0 ft	
58.00	Pond Bottom	0.32 ac	208.0 ft	68.0 ft	

Required Treatment+Attenuation Vol.= 1.17 ac-ft
Required Treatment+Attenuation Stage= 63.91 ft

Provided Treatment+Attenuation Vol.= 1.23 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.09 ac-ft
Estimated Storm Sewer TW EL.= 63.79 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.59 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2A**

Station Limits: From: 117+45 To: 150+69 Roadway Length = 3324 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.59 ac
Pervious Area*: 12.66 ac
Total Roadway Area *: 15.25 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.61 ac

Total Area:

Impervious Area: **2.59 ac**
Pervious Area: **14.28 ac**
Total Area: **16.86 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.93 ac	90.7
Impervious areas; Streets & roads	D	98	1.66 ac	162.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	2.65 ac	103.4
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.53 ac	122.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.30 ac	23.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.62 ac	48.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	6.57 ac	505.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.61 ac	124.1
		Total:	16.86 ac	1181.0

CN = Total CN*Area / Total Area = **70.0**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = 1000/CN - 10 = **4.28 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.04 in**	**3.62 in**	**4.90 in**	**14.68 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2A**

Station Limits: From: 117+45 To: 150+69 Roadway Length = 3324 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.06 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	8.19 ac	*Areas measured in Microstation
Total Roadway Area *:	15.25 ac	

Pond Area:

Pervious Pond Area :	0.83 ac	
Water Surface Area:	0.79 ac	Wet Pond
Total Pond Area:	1.61 ac	

Total Area:

Impervious Area:	**7.06 ac**
Pervious Area:	**9.01 ac**
Water Surface Area:	**0.79 ac**
Total Area:	**16.86 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.58 ac	253.1
Impervious areas; Streets & roads	D	98	4.48 ac	439.1
Proposed Roadway Pervious	A	39	2.99 ac	116.7
Proposed Roadway Pervious	D	80	5.19 ac	415.4
Proposed Pond Pervious	D	80	0.83 ac	66.1
Proposed Ponds (Water Surface)	D	100	0.79 ac	78.6
		Total:	16.86 ac	1369.0

CN = Total CN*Area / Total Area = **81.2**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.32 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.29 in**	**4.83 in**	**6.24 in**	**16.48 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/Yes**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.59 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.59 ac-ft

OFW Requirement, add 0.5 inches more TV= 0.88 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	5.68 ac-ft	5.09 ac-ft	6.89 ac-ft	20.63 ac-ft
Q_{post} =	7.44 ac-ft	6.78 ac-ft	8.77 ac-ft	23.15 ac-ft
ΔQ =	**1.76 ac-ft**	**1.69 ac-ft**	**1.88 ac-ft**	**2.52 ac-ft**

Attenuation V_{req} = 1.88 ac-ft

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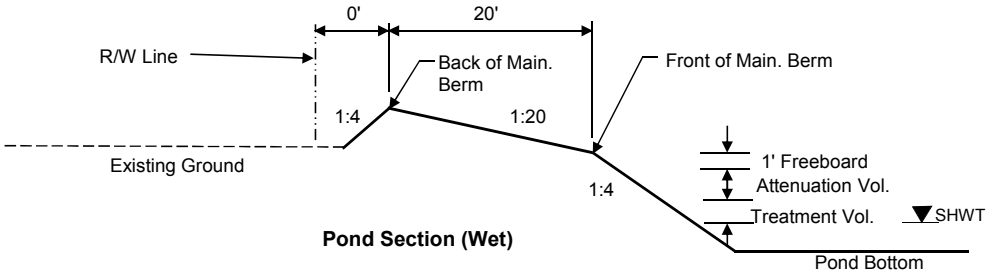
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	54.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	48.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	52.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	100 ft	
Estimated Energy Losses =	0.1 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	50.90 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
54.00	Pond R/W	1.61 ac	265.0 ft	265.0 ft	
54.00	Back of Main. Berm	1.61 ac	265.0 ft	265.0 ft	6.25 ac-ft
53.50		1.38 ac	245.0 ft	245.0 ft	5.50 ac-ft
53.00	Front of Main. Berm	1.16 ac	225.0 ft	225.0 ft	4.87 ac-ft
52.00	Provided Treat.Vol.+Att.Vol	1.08 ac	217.0 ft	217.0 ft	3.73 ac-ft
51.08	Req'd Treat.Vol+Att. Vol	1.01 ac	209.6 ft	209.6 ft	2.76 ac-ft
50.89	Estimated Storm Sewer TW	0.99 ac	208.1 ft	208.1 ft	2.57 ac-ft
49.07	Top of Treatment Vol.	0.86 ac	193.6 ft	193.6 ft	0.88 ac-ft
48.00	Normal Water Level	0.79 ac	185.0 ft	185.0 ft	0.00 ac-ft
46.00		0.66 ac	169.0 ft	169.0 ft	
44.00	Pond Bottom	0.54 ac	153.0 ft	153.0 ft	

Required Treatment+Attenuation Vol.= 2.76 ac-ft
Required Treatment+Attenuation Stage= 51.08 ft

Provided Treatment+Attenuation Vol.= 3.73 ac-ft
Provided Treatment+Attenuation Stage= 52.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.57 ac-ft
Estimated Storm Sewer TW EL.= 50.89 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.93 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2B**

Station Limits: From: 117+45 To: 150+69 Roadway Length = 3324 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.59 ac
Pervious Area*: 12.66 ac
Total Roadway Area *: 15.25 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.66 ac

Total Area:
Impervious Area: **2.59 ac**
Pervious Area: **15.33 ac**
Total Area: **17.91 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.93 ac	90.7
Impervious areas; Streets & roads	D	98	1.66 ac	162.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	2.65 ac	103.4
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.53 ac	122.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.30 ac	23.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.62 ac	48.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	6.57 ac	505.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.66 ac	205.2
		Total:	17.91 ac	1262.1

CN = Total CN*Area / Total Area = **70.5**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.19 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.09 in**	**3.67 in**	**4.95 in**	**14.75 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2B**

Station Limits: From: 117+45 To: 150+69 Roadway Length = 3324 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.06 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	8.19 ac	*Areas measured in Microstation
Total Roadway Area *:	15.25 ac	

Pond Area:

Pervious Pond Area :	1.11 ac	
Water Surface Area:	1.56 ac	Wet Pond
Total Pond Area:	2.66 ac	

Total Area:

Impervious Area:	**7.06 ac**
Pervious Area:	**9.29 ac**
Water Surface Area:	**1.56 ac**
Total Area:	**17.91 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.58 ac	253.1
Impervious areas; Streets & roads	D	98	4.48 ac	439.1
Proposed Roadway Pervious	A	39	2.99 ac	116.7
Proposed Roadway Pervious	D	80	5.19 ac	415.4
Proposed Pond Pervious	D	80	1.11 ac	88.4
Proposed Ponds (Water Surface)	D	100	1.56 ac	155.9
		Total:	17.91 ac	1468.7

CN = Total CN*Area / Total Area = **82.0**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.20 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.38 in**	**4.91 in**	**6.33 in**	**16.60 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/Yes**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.59 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.59 ac-ft

OFW Requirement, add 0.5 inches more TV= 0.88 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	6.10 ac-ft	5.47 ac-ft	7.39 ac-ft	22.02 ac-ft
Q_{post} =	8.04 ac-ft	7.34 ac-ft	9.46 ac-ft	24.78 ac-ft
ΔQ =	**1.94 ac-ft**	**1.86 ac-ft**	**2.07 ac-ft**	**2.75 ac-ft**

Attenuation V_{req} = 2.07 ac-ft

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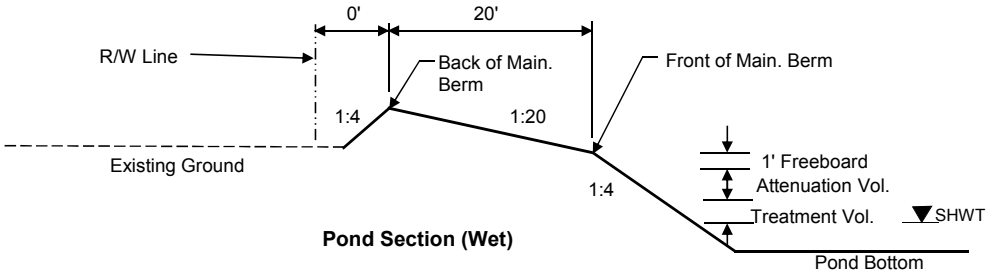
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	55.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	49.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	52.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	300 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	50.70 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
55.00	Pond R/W	2.66 ac	355.0 ft	327.0 ft	
55.00	Back of Main. Berm	2.66 ac	355.0 ft	327.0 ft	11.45 ac-ft
54.50		2.36 ac	335.0 ft	307.0 ft	10.20 ac-ft
54.00	Front of Main. Berm	2.08 ac	315.0 ft	287.0 ft	9.09 ac-ft
53.00	Provided Treat.Vol.+Att.Vol	1.97 ac	307.0 ft	279.0 ft	7.05 ac-ft
50.79	Req'd Treat.Vol+Att. Vol	1.74 ac	289.3 ft	261.3 ft	2.95 ac-ft
50.68	Estimated Storm Sewer TW	1.72 ac	288.4 ft	260.4 ft	2.75 ac-ft
49.56	Top of Treatment Vol.	1.61 ac	279.4 ft	251.4 ft	0.88 ac-ft
49.00	Normal Water Level	1.56 ac	275.0 ft	247.0 ft	0.00 ac-ft
47.00		1.37 ac	259.0 ft	231.0 ft	
45.00	Pond Bottom	1.20 ac	243.0 ft	215.0 ft	

Required Treatment+Attenuation Vol.= 2.95 ac-ft
Required Treatment+Attenuation Stage= 50.79 ft

Provided Treatment+Attenuation Vol.= 7.05 ac-ft
Provided Treatment+Attenuation Stage= 53.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.75 ac-ft
Estimated Storm Sewer TW EL.= 50.68 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.20 ac

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2C**

Station Limits: From: 117+45 To: 150+69 Roadway Length = 3324 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.59 ac
Pervious Area*: 12.66 ac
Total Roadway Area *: 15.25 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.21 ac

Total Area:
Impervious Area: **2.59 ac**
Pervious Area: **14.88 ac**
Total Area: **17.46 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.93 ac	90.7
Impervious areas; Streets & roads	D	98	1.66 ac	162.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	2.65 ac	103.4
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.53 ac	122.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.30 ac	23.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.62 ac	48.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	6.57 ac	505.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.21 ac	170.3
		Total:	17.46 ac	1227.1

CN = Total CN*Area / Total Area = **70.3**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.23 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.07 in**	**3.65 in**	**4.93 in**	**14.72 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2C**

Station Limits: From: 117+45 To: 150+69 Roadway Length = 3324 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.06 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	8.19 ac	*Areas measured in Microstation
Total Roadway Area *:	15.25 ac	

Pond Area:

Pervious Pond Area :	0.84 ac	
Water Surface Area:	1.37 ac	Wet Pond
Total Pond Area:	2.21 ac	

Total Area:

Impervious Area:	**7.06 ac**
Pervious Area:	**9.03 ac**
Water Surface Area:	**1.37 ac**
Total Area:	**17.46 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.58 ac	253.1
Impervious areas; Streets & roads	D	98	4.48 ac	439.1
Proposed Roadway Pervious	A	39	2.99 ac	116.7
Proposed Roadway Pervious	D	80	5.19 ac	415.4
Proposed Pond Pervious	D	80	0.84 ac	67.3
Proposed Ponds (Water Surface)	D	100	1.37 ac	137.0
		Total:	17.46 ac	1428.6

CN = Total CN*Area / Total Area = **81.8**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.37 in**	**4.90 in**	**6.31 in**	**16.57 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.22 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/Yes**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.59 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.59 ac-ft

OFW Requirement, add 0.5 inches more TV= 0.88 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	5.92 ac-ft	5.31 ac-ft	7.17 ac-ft	21.42 ac-ft
Q_{post} =	7.81 ac-ft	7.12 ac-ft	9.19 ac-ft	24.11 ac-ft
ΔQ =	**1.89 ac-ft**	**1.82 ac-ft**	**2.01 ac-ft**	**2.69 ac-ft**

Attenuation V_{req} = 2.01 ac-ft

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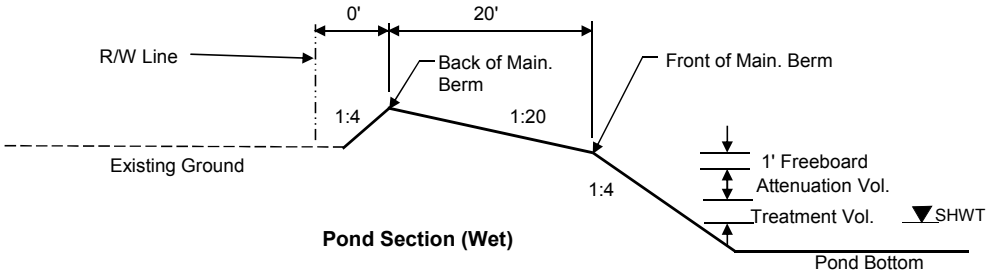
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **2**
POND NAME : **2C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	48.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	44.00	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	52.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1550 ft	
Estimated Energy Losses =	1.6 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	49.45 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
48.00	Pond R/W	2.21 ac	247.0 ft	390.0 ft	
48.00	Back of Main. Berm	2.21 ac	247.0 ft	390.0 ft	6.48 ac-ft
47.50		1.93 ac	227.0 ft	370.0 ft	5.45 ac-ft
47.00	Front of Main. Berm	1.66 ac	207.0 ft	350.0 ft	4.55 ac-ft
46.00	Provided Treat.Vol.+Att.Vol	1.56 ac	199.0 ft	342.0 ft	2.93 ac-ft
45.98	Req'd Treat.Vol+Att. Vol	1.56 ac	198.8 ft	341.8 ft	2.90 ac-ft
45.85	Estimated Storm Sewer TW	1.55 ac	197.8 ft	340.8 ft	2.70 ac-ft
44.63	Top of Treatment Vol.	1.43 ac	188.0 ft	331.0 ft	0.88 ac-ft
44.00	Normal Water Level	1.37 ac	183.0 ft	326.0 ft	0.00 ac-ft
42.00		1.19 ac	167.0 ft	310.0 ft	
40.00	Pond Bottom	1.02 ac	151.0 ft	294.0 ft	

Required Treatment+Attenuation Vol.= 2.90 ac-ft
Required Treatment+Attenuation Stage= 45.98 ft

Provided Treatment+Attenuation Vol.= 2.93 ac-ft
Provided Treatment+Attenuation Stage= 46.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.70 ac-ft
Estimated Storm Sewer TW EL.= 45.85 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.65 ac

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DATE: December 5, 2017
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3A**

Station Limits: From: 150+69 To: 179+19

Roadway Length = 2850 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.19 ac
Pervious Area*: 10.89 ac
Total Roadway Area *: 13.08 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.90 ac

Total Area:
Impervious Area: **2.19 ac**
Pervious Area: **13.79 ac**
Total Area: **15.98 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.69 ac	165.6
Impervious areas; Streets & roads	D	98	0.50 ac	49.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.67 ac	30.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.60 ac	62.5
Woods-grass combination (orchard or tree farm); Good condition	A	32	6.42 ac	205.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	2.19 ac	173.2
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.90 ac	237.4
		Total:	15.98 ac	924.5

CN = Total CN*Area / Total Area = **57.9**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **7.28 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**2.74 in**	**2.40 in**	**3.46 in**	**12.40 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3A**

Station Limits: From: 150+69 To: 179+19 Roadway Length = 2850 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	6.06 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	7.03 ac	*Areas measured in Microstation
Total Roadway Area *:	13.08 ac	

Pond Area:

Pervious Pond Area :	1.31 ac	
Water Surface Area:	1.59 ac	Wet Pond
Total Pond Area:	2.90 ac	

Total Area:

Impervious Area:	**6.06 ac**
Pervious Area:	**8.33 ac**
Water Surface Area:	**1.59 ac**
Total Area:	**15.98 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	4.89 ac	479.5
Impervious areas; Streets & roads	D	98	1.17 ac	114.2
Proposed Roadway Pervious	A	39	5.67 ac	221.3
Proposed Roadway Pervious	D	80	1.35 ac	108.1
Proposed Pond Pervious	D	80	1.31 ac	104.6
Proposed Ponds (Water Surface)	D	100	1.59 ac	158.8
		Total:	15.98 ac	1186.5

CN = Total CN*Area / Total Area = **74.3**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.47 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.51 in**	**4.07 in**	**5.41 in**	**15.39 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/Yes**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.50 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.50 ac-ft

OFW Requirement, add 0.5 inches more TV= 0.76 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.65 ac-ft	3.19 ac-ft	4.61 ac-ft	16.51 ac-ft
Q_{post} =	6.00 ac-ft	5.42 ac-ft	7.20 ac-ft	20.49 ac-ft
ΔQ =	**2.36 ac-ft**	**2.23 ac-ft**	**2.59 ac-ft**	**3.99 ac-ft**

Attenuation V_{req} = 2.59 ac-ft

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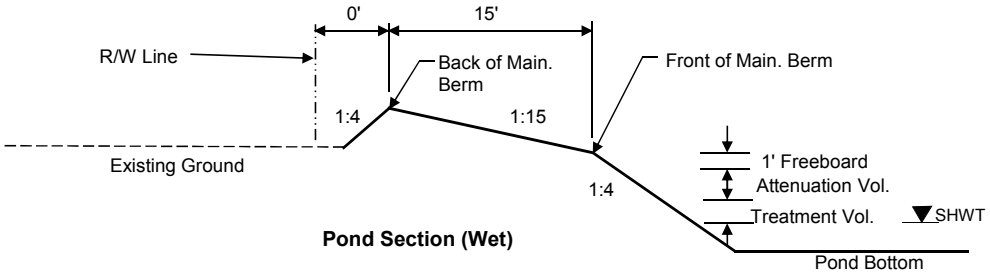
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3A**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	57.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	48.25	*
Maximum Storage Depth (**SD**) =	6.75 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	52.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	450 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	50.55 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	2.90 ac	372.0 ft	339.0 ft	
57.00	Back of Main. Berm	2.90 ac	372.0 ft	339.0 ft	18.21 ac-ft
56.50		2.66 ac	357.0 ft	324.0 ft	16.82 ac-ft
56.00	Front of Main. Berm	2.43 ac	342.0 ft	309.0 ft	15.55 ac-ft
55.00	Provided Treat.Vol.+Att.Vol	2.31 ac	334.0 ft	301.0 ft	13.15 ac-ft
50.23	Req'd Treat.Vol+Att. Vol	1.79 ac	295.8 ft	262.8 ft	3.34 ac-ft
50.04	Estimated Storm Sewer TW	1.77 ac	294.3 ft	261.3 ft	2.99 ac-ft
48.72	Top of Treatment Vol.	1.63 ac	283.8 ft	250.8 ft	0.76 ac-ft
48.25	Normal Water Level	1.59 ac	280.0 ft	247.0 ft	0.00 ac-ft
46.25		1.40 ac	264.0 ft	231.0 ft	
46.00	Pond Bottom	1.38 ac	262.0 ft	229.0 ft	

Required Treatment+Attenuation Vol.= 3.34 ac-ft
Required Treatment+Attenuation Stage= 50.23 ft

Provided Treatment+Attenuation Vol.= 13.15 ac-ft
Provided Treatment+Attenuation Stage= 55.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.99 ac-ft
Estimated Storm Sewer TW EL.= 50.04 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.47 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3B**

Station Limits: From: 150+69 To: 179+19 Roadway Length = 2850 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.19 ac
Pervious Area*: 10.89 ac
Total Roadway Area *: 13.08 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.07 ac

Total Area:
Impervious Area: **2.19 ac**
Pervious Area: **12.96 ac**
Total Area: **15.15 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.69 ac	165.6
Impervious areas; Streets & roads	D	98	0.50 ac	49.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.67 ac	30.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.60 ac	62.5
Woods-grass combination (orchard or tree farm); Good condition	A	32	6.42 ac	205.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	2.19 ac	173.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.07 ac	159.1
		Total:	15.15 ac	846.2

CN = Total CN*Area / Total Area = **55.9**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **7.90 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**2.53 in**	**2.20 in**	**3.23 in**	**11.98 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3B**

Station Limits: From: 150+69 To: 179+19 Roadway Length = 2850 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	6.06 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	7.03 ac	*Areas measured in Microstation
Total Roadway Area *:	13.08 ac	

Pond Area:

Pervious Pond Area :	1.00 ac	
Water Surface Area:	1.06 ac	Wet Pond
Total Pond Area:	2.07 ac	

Total Area:

Impervious Area:	**6.06 ac**
Pervious Area:	**8.03 ac**
Water Surface Area:	**1.06 ac**
Total Area:	**15.15 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	4.89 ac	479.5
Impervious areas; Streets & roads	D	98	1.17 ac	114.2
Proposed Roadway Pervious	A	39	5.67 ac	221.3
Proposed Roadway Pervious	D	80	1.35 ac	108.1
Proposed Pond Pervious	D	80	1.00 ac	80.1
Proposed Ponds (Water Surface)	D	100	1.06 ac	106.5
		Total:	15.15 ac	1109.7

CN = Total CN*Area / Total Area = **73.2**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.65 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.40 in**	**3.96 in**	**5.28 in**	**15.23 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/Yes**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.50 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.50 ac-ft

OFW Requirement, add 0.5 inches more TV= 0.76 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.20 ac-ft	2.78 ac-ft	4.08 ac-ft	15.13 ac-ft
Q_{post} =	5.55 ac-ft	5.00 ac-ft	6.67 ac-ft	19.22 ac-ft
ΔQ =	**2.35 ac-ft**	**2.22 ac-ft**	**2.59 ac-ft**	**4.09 ac-ft**

Attenuation V_{req} = 2.59 ac-ft

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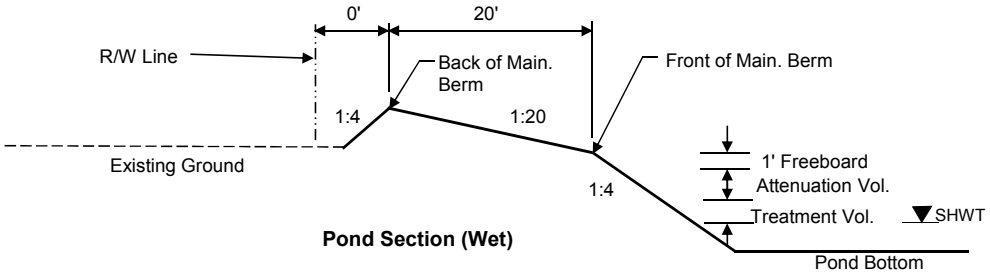
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	53.00
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	47.50
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	52.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	950 ft	
Estimated Energy Losses =	1.0 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	50.05 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
53.00	Pond R/W	2.07 ac	450.0 ft	200.0 ft	
53.00	Back of Main. Berm	2.07 ac	450.0 ft	200.0 ft	7.57 ac-ft
52.50		1.78 ac	430.0 ft	180.0 ft	6.60 ac-ft
52.00	Front of Main. Berm	1.51 ac	410.0 ft	160.0 ft	5.78 ac-ft
51.00	Provided Treat.Vol.+Att.Vol	1.40 ac	402.0 ft	152.0 ft	4.32 ac-ft
50.30	Req'd Treat.Vol+Att. Vol	1.33 ac	396.4 ft	146.4 ft	3.35 ac-ft
50.02	Estimated Storm Sewer TW	1.30 ac	394.1 ft	144.1 ft	2.98 ac-ft
48.19	Top of Treatment Vol.	1.13 ac	379.5 ft	129.5 ft	0.76 ac-ft
47.50	Normal Water Level	1.06 ac	374.0 ft	124.0 ft	0.00 ac-ft
45.50		0.89 ac	358.0 ft	108.0 ft	
43.00	Pond Bottom	0.68 ac	338.0 ft	88.0 ft	

Required Treatment+Attenuation Vol.= 3.35 ac-ft
Required Treatment+Attenuation Stage= 50.30 ft

Provided Treatment+Attenuation Vol.= 4.32 ac-ft
Provided Treatment+Attenuation Stage= 51.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.98 ac-ft
Estimated Storm Sewer TW EL.= 50.02 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.48 ac

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3C**

Station Limits: From: 150+69 To: 179+19

Roadway Length = 2850 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.20 ac
Pervious Area*: 10.88 ac
Total Roadway Area *: 13.08 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.95 ac

Total Area:
Impervious Area: **2.20 ac**
Pervious Area: **12.83 ac**
Total Area: **15.02 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.69 ac	165.5
Impervious areas; Streets & roads	D	98	0.51 ac	49.7
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.67 ac	30.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.60 ac	62.3
Woods-grass combination (orchard or tree farm); Good condition	A	32	6.42 ac	205.5
Woods-grass combination (orchard or tree farm); Good condition	D	79	2.19 ac	173.1
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.95 ac	149.8
		Total:	15.02 ac	836.8

CN = Total CN*Area / Total Area = **55.7**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **7.95 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**2.52 in**	**2.19 in**	**3.21 in**	**11.95 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3C**

Station Limits: From: 150+69 To: 179+19 Roadway Length = 2850 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	6.06 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	7.02 ac	*Areas measured in Microstation
Total Roadway Area *:	13.08 ac	

Pond Area:

Pervious Pond Area :	1.00 ac	
Water Surface Area:	0.95 ac	Wet Pond
Total Pond Area:	1.95 ac	

Total Area:

Impervious Area:	**6.06 ac**
Pervious Area:	**8.02 ac**
Water Surface Area:	**0.95 ac**
Total Area:	**15.02 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	4.89 ac	479.5
Impervious areas; Streets & roads	D	98	1.17 ac	114.2
Proposed Roadway Pervious	A	39	5.67 ac	221.1
Proposed Roadway Pervious	D	80	1.35 ac	108.0
Proposed Pond Pervious	D	80	1.00 ac	80.0
Proposed Ponds (Water Surface)	D	100	0.95 ac	94.5
		Total:	15.02 ac	1097.3

CN = Total CN*Area / Total Area = **73.0**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.69 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.37 in**	**3.94 in**	**5.26 in**	**15.19 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/Yes**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.50 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.50 ac-ft

OFW Requirement, add 0.5 inches more TV= 0.76 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.15 ac-ft	2.74 ac-ft	4.02 ac-ft	14.96 ac-ft
Q_{post} =	5.48 ac-ft	4.93 ac-ft	6.59 ac-ft	19.02 ac-ft
ΔQ =	**2.32 ac-ft**	**2.19 ac-ft**	**2.56 ac-ft**	**4.06 ac-ft**

Attenuation V_{req} = 2.56 ac-ft

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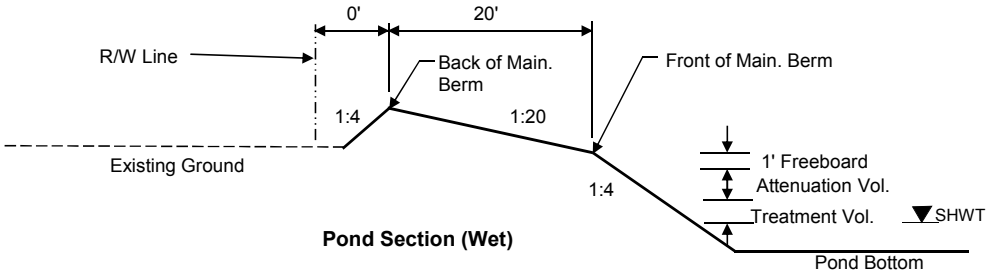
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **3**
POND NAME : **3C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	55.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	48.00	*
Maximum Storage Depth (**SD**) =	5.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	52.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	200 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	50.80 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
55.00	Pond R/W	1.95 ac	307.0 ft	276.0 ft	
55.00	Back of Main. Berm	1.95 ac	307.0 ft	276.0 ft	8.87 ac-ft
54.50		1.69 ac	287.0 ft	256.0 ft	7.96 ac-ft
54.00	Front of Main. Berm	1.45 ac	267.0 ft	236.0 ft	7.18 ac-ft
53.00	Provided Treat.Vol.+Att.Vol	1.36 ac	259.0 ft	228.0 ft	5.75 ac-ft
51.11	Req'd Treat.Vol+Att. Vol	1.19 ac	243.9 ft	212.9 ft	3.32 ac-ft
50.80	Estimated Storm Sewer TW	1.17 ac	241.4 ft	210.4 ft	2.95 ac-ft
48.78	Top of Treatment Vol.	1.00 ac	225.2 ft	194.2 ft	0.76 ac-ft
48.00	Normal Water Level	0.95 ac	219.0 ft	188.0 ft	0.00 ac-ft
46.00		0.80 ac	203.0 ft	172.0 ft	
45.00	Pond Bottom	0.73 ac	195.0 ft	164.0 ft	

Required Treatment+Attenuation Vol.= 3.32 ac-ft
Required Treatment+Attenuation Stage= 51.11 ft

Provided Treatment+Attenuation Vol.= 5.75 ac-ft
Provided Treatment+Attenuation Stage= 53.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.95 ac-ft
Estimated Storm Sewer TW EL.= 50.80 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.33 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4A**

Station Limits: From: 179+19 To: 196+64 Roadway Length = 1744 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.43 ac
Pervious Area*: 6.58 ac
Total Roadway Area *: 8.01 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.84 ac

Total Area:
Impervious Area: **1.43 ac**
Pervious Area: **8.41 ac**
Total Area: **9.85 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.09 ac	107.1
Impervious areas; Streets & roads	D	98	0.34 ac	33.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.26 ac	12.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.93 ac	75.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.66 ac	133.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	2.73 ac	87.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.84 ac	71.7
		Total:	9.85 ac	519.6

CN = Total CN*Area / Total Area = **52.8**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **8.95 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**2.22 in**	**1.92 in**	**2.87 in**	**11.32 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4A**

Station Limits: From: 179+19 To: 196+64 Roadway Length = 1744 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.71 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.30 ac	*Areas measured in Microstation
Total Roadway Area *:	8.01 ac	

Pond Area:

Pervious Pond Area :	0.82 ac	
Water Surface Area:	1.02 ac	Wet Pond
Total Pond Area:	1.84 ac	

Total Area:

Impervious Area:	**3.71 ac**
Pervious Area:	**5.12 ac**
Water Surface Area:	**1.02 ac**
Total Area:	**9.85 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.76 ac	270.3
Impervious areas; Streets & roads	D	98	0.95 ac	93.0
Proposed Roadway Pervious	A	39	3.20 ac	124.9
Proposed Roadway Pervious	D	80	1.10 ac	88.1
Proposed Pond Pervious	A	39	0.82 ac	31.8
Proposed Ponds (Water Surface)	A	100	1.02 ac	102.2
		Total:	9.85 ac	710.3

CN = Total CN*Area / Total Area = **72.1**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.27 in**	**3.84 in**	**5.15 in**	**15.04 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.87 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.31 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.31 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.82 ac-ft	1.57 ac-ft	2.36 ac-ft	9.29 ac-ft
Q_{post} =	3.51 ac-ft	3.15 ac-ft	4.23 ac-ft	12.34 ac-ft
ΔQ =	**1.68 ac-ft**	**1.58 ac-ft**	**1.87 ac-ft**	**3.05 ac-ft**

Attenuation V_{req} = 1.87 ac-ft

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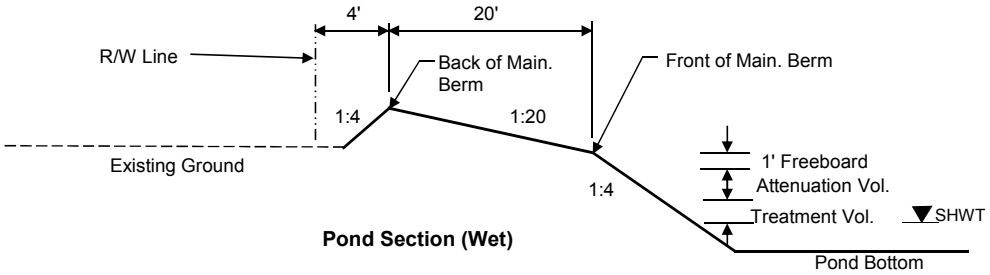
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	55.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	150 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.85 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.84 ac	283.0 ft	283.0 ft	
59.00	Back of Main. Berm	1.74 ac	275.0 ft	275.0 ft	4.93 ac-ft
58.50		1.49 ac	255.0 ft	255.0 ft	4.12 ac-ft
58.00	Front of Main. Berm	1.27 ac	235.0 ft	235.0 ft	3.43 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.18 ac	227.0 ft	227.0 ft	2.21 ac-ft
56.98	Req'd Treat.Vol+Att. Vol	1.18 ac	226.8 ft	226.8 ft	2.18 ac-ft
56.73	Estimated Storm Sewer TW	1.16 ac	224.8 ft	224.8 ft	1.89 ac-ft
55.30	Top of Treatment Vol.	1.05 ac	213.4 ft	213.4 ft	0.31 ac-ft
55.00	Normal Water Level	1.02 ac	211.0 ft	211.0 ft	0.00 ac-ft
53.00		0.87 ac	195.0 ft	195.0 ft	
48.00	Pond Bottom	0.55 ac	155.0 ft	155.0 ft	

Required Treatment+Attenuation Vol.= 2.18 ac-ft
Required Treatment+Attenuation Stage= 56.98 ft

Provided Treatment+Attenuation Vol.= 2.21 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.89 ac-ft
Estimated Storm Sewer TW EL.= 56.73 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.21 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4B**

Station Limits: From: 179+19 To: 196+64 Roadway Length = 1744 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.43 ac
Pervious Area*: 6.58 ac
Total Roadway Area *: 8.01 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.80 ac

Total Area:
Impervious Area: **1.43 ac**
Pervious Area: **8.37 ac**
Total Area: **9.81 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.09 ac	107.1
Impervious areas; Streets & roads	D	98	0.34 ac	33.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.26 ac	12.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.93 ac	75.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.66 ac	133.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	2.73 ac	87.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.80 ac	143.8
		Total:	9.81 ac	591.7

CN = Total CN*Area / Total Area = **60.3**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **6.57 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**3.00 in**	**2.64 in**	**3.75 in**	**12.89 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4B**

Station Limits: From: 179+19 To: 196+64 Roadway Length = 1744 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.71 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.30 ac	*Areas measured in Microstation
Total Roadway Area *:	8.01 ac	

Pond Area:

Pervious Pond Area :	0.93 ac	
Water Surface Area:	0.87 ac	Wet Pond
Total Pond Area:	1.80 ac	

Total Area:

Impervious Area:	**3.71 ac**
Pervious Area:	**5.23 ac**
Water Surface Area:	**0.87 ac**
Total Area:	**9.81 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.76 ac	270.3
Impervious areas; Streets & roads	D	98	0.95 ac	93.0
Proposed Roadway Pervious	A	39	3.20 ac	124.9
Proposed Roadway Pervious	D	80	1.10 ac	88.1
Proposed Pond Pervious	D	80	0.93 ac	74.3
Proposed Ponds (Water Surface)	D	100	0.87 ac	86.8
		Total:	9.81 ac	737.4

CN = Total CN*Area / Total Area = **75.2**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.30 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) =	**4.61 in**	**4.17 in**	**5.52 in**	**15.54 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.31 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.31 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	2.45 ac-ft	2.15 ac-ft	3.07 ac-ft	10.54 ac-ft
Q_{post} =	3.77 ac-ft	3.41 ac-ft	4.51 ac-ft	12.70 ac-ft
ΔQ =	**1.32 ac-ft**	**1.25 ac-ft**	**1.44 ac-ft**	**2.17 ac-ft**

Attenuation V_{req} = 1.44 ac-ft

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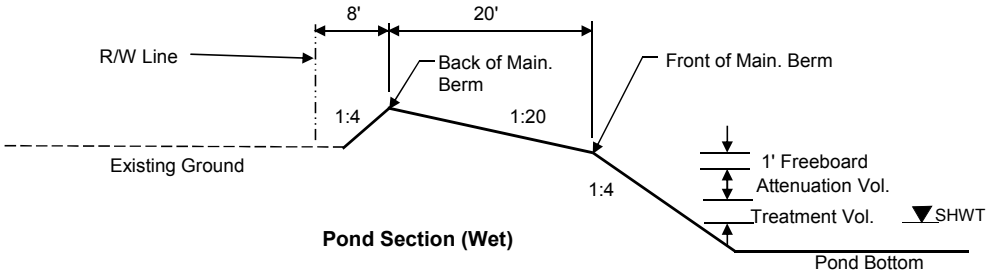
DATE: December 5, 2017
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	250 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.75 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	1.80 ac	206.0 ft	380.0 ft	
59.00	Back of Main. Berm	1.59 ac	190.0 ft	364.0 ft	4.32 ac-ft
58.50		1.34 ac	170.0 ft	344.0 ft	3.59 ac-ft
58.00	Front of Main. Berm	1.12 ac	150.0 ft	324.0 ft	2.98 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.03 ac	142.0 ft	316.0 ft	1.90 ac-ft
56.86	Req'd Treat.Vol+Att. Vol	1.02 ac	140.9 ft	314.9 ft	1.75 ac-ft
56.67	Estimated Storm Sewer TW	1.00 ac	139.4 ft	313.4 ft	1.56 ac-ft
55.35	Top of Treatment Vol.	0.90 ac	128.8 ft	302.8 ft	0.31 ac-ft
55.00	Normal Water Level	0.87 ac	126.0 ft	300.0 ft	0.00 ac-ft
53.00		0.72 ac	110.0 ft	284.0 ft	
50.00	Pond Bottom	0.51 ac	86.0 ft	260.0 ft	

Required Treatment+Attenuation Vol.= 1.75 ac-ft
Required Treatment+Attenuation Stage= 56.86 ft

Provided Treatment+Attenuation Vol.= 1.90 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.56 ac-ft
Estimated Storm Sewer TW EL.= 56.67 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.16 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4C**

Station Limits: From: 179+19 To: 196+64 Roadway Length = 1744 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.43 ac
Pervious Area*: 6.58 ac
Total Roadway Area *: 8.01 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.83 ac

Total Area:
Impervious Area: **1.43 ac**
Pervious Area: **8.40 ac**
Total Area: **9.84 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.09 ac	107.1
Impervious areas; Streets & roads	D	98	0.34 ac	33.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.26 ac	12.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.93 ac	75.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.66 ac	133.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	2.73 ac	87.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.83 ac	54.8
		Total:	9.84 ac	502.7

CN = Total CN*Area / Total Area = **51.1**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**2.06 in**	**1.77 in**	**2.69 in**	**10.95 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **9.57 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4C**

Station Limits: From: 179+19 To: 196+64 Roadway Length = 1744 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.71 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.30 ac	*Areas measured in Microstation
Total Roadway Area *:	8.01 ac	

Pond Area:

Pervious Pond Area :	0.96 ac	
Water Surface Area:	0.86 ac	Wet Pond
Total Pond Area:	1.83 ac	

Total Area:

Impervious Area:	**3.71 ac**
Pervious Area:	**5.26 ac**
Water Surface Area:	**0.86 ac**
Total Area:	**9.84 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.76 ac	270.3
Impervious areas; Streets & roads	D	98	0.95 ac	93.0
Proposed Roadway Pervious	A	39	3.20 ac	124.9
Proposed Roadway Pervious	D	80	1.10 ac	88.1
Proposed Pond Pervious	A	39	0.96 ac	37.5
Proposed Ponds (Water Surface)	A	100	0.86 ac	86.4
		Total:	9.84 ac	700.2

CN = Total CN*Area / Total Area = **71.2**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.05 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.17 in**	**3.74 in**	**5.04 in**	**14.88 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.31 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.31 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.69 ac-ft	1.45 ac-ft	2.20 ac-ft	8.98 ac-ft
Q_{post} =	3.42 ac-ft	3.07 ac-ft	4.13 ac-ft	12.20 ac-ft
ΔQ =	**1.73 ac-ft**	**1.62 ac-ft**	**1.93 ac-ft**	**3.22 ac-ft**

Attenuation V_{req} = 1.93 ac-ft

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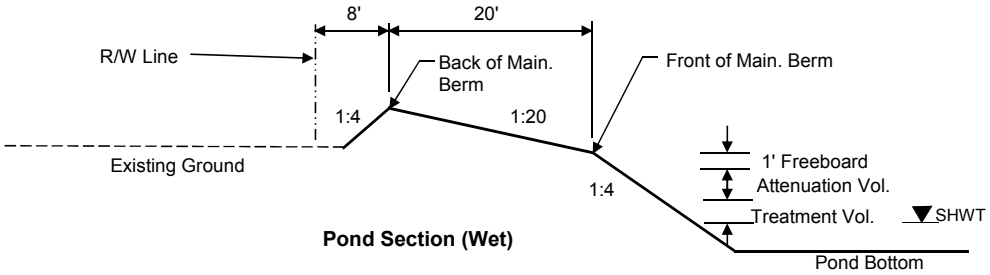
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **4**
POND NAME : **4C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	54.00
Maximum Storage Depth (**SD**) =	3.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	400 ft	
Estimated Energy Losses =	0.4 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.60 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	1.83 ac	282.0 ft	282.0 ft	
59.00	Back of Main. Berm	1.62 ac	266.0 ft	266.0 ft	5.47 ac-ft
58.50		1.39 ac	246.0 ft	246.0 ft	4.71 ac-ft
58.00	Front of Main. Berm	1.17 ac	226.0 ft	226.0 ft	4.07 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.09 ac	218.0 ft	218.0 ft	2.93 ac-ft
56.35	Req'd Treat.Vol+Att. Vol	1.04 ac	212.8 ft	212.8 ft	2.24 ac-ft
56.05	Estimated Storm Sewer TW	1.02 ac	210.4 ft	210.4 ft	1.93 ac-ft
54.35	Top of Treatment Vol.	0.89 ac	196.8 ft	196.8 ft	0.31 ac-ft
54.00	Normal Water Level	0.86 ac	194.0 ft	194.0 ft	0.00 ac-ft
52.00		0.73 ac	178.0 ft	178.0 ft	
49.00	Pond Bottom	0.54 ac	154.0 ft	154.0 ft	

Required Treatment+Attenuation Vol.= 2.24 ac-ft
Required Treatment+Attenuation Stage= 56.35 ft

Provided Treatment+Attenuation Vol.= 2.93 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.93 ac-ft
Estimated Storm Sewer TW EL.= 56.05 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.19 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5A**

Station Limits: From: 196+64 To: 222+61 Roadway Length = 2598 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.13 ac
Pervious Area*: 9.92 ac
Total Roadway Area *: 12.04 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 4.34 ac

Total Area:
Impervious Area: **2.13 ac**
Pervious Area: **14.26 ac**
Total Area: **16.39 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.23 ac	120.6
Impervious areas; Streets & roads	D	98	0.90 ac	87.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.20 ac	9.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.59 ac	22.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.72 ac	57.6
Woods-grass combination (orchard or tree farm); Good condition	A	32	4.59 ac	146.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.54 ac	42.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.05 ac	1.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.72 ac	209.4
Existing Lakes (Water surface)	D	100	0.07 ac	7.1
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.44 ac	44.2
Woods-grass combination (orchard or tree farm); Good condition	A	32	4.34 ac	139.0
		Total:	16.39 ac	888.9

CN = Total CN*Area / Total Area = **54.2**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**2.37 in**	**2.05 in**	**3.04 in**	**11.64 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **8.44 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5A**

Station Limits: From: 196+64 To: 222+61 Roadway Length = 2598 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.52 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	6.52 ac	*Areas measured in Microstation
Total Roadway Area *:	12.04 ac	

Pond Area:

Pervious Pond Area :	1.64 ac	
Water Surface Area:	2.70 ac	Wet Pond
Total Pond Area:	4.34 ac	

Total Area:

Impervious Area:	**5.52 ac**
Pervious Area:	**8.17 ac**
Water Surface Area:	**2.70 ac**
Total Area:	**16.39 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.26 ac	319.4
Impervious areas; Streets & roads	D	98	2.26 ac	221.7
Proposed Roadway Pervious	A	39	3.85 ac	150.2
Proposed Roadway Pervious	D	80	2.67 ac	213.8
Proposed Pond Pervious	A	39	1.64 ac	64.1
Proposed Ponds (Water Surface)	A	100	2.70 ac	270.1
		Total:	16.39 ac	1239.1

CN = Total CN*Area / Total Area = **75.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.22 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.66 in**	**4.22 in**	**5.57 in**	**15.61 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.46 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.46 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.24 ac-ft	2.80 ac-ft	4.16 ac-ft	15.90 ac-ft
Q_{post} =	6.37 ac-ft	5.76 ac-ft	7.60 ac-ft	21.32 ac-ft
ΔQ =	**3.13 ac-ft**	**2.95 ac-ft**	**3.45 ac-ft**	**5.42 ac-ft**

Attenuation V_{req} = 5.42 ac-ft

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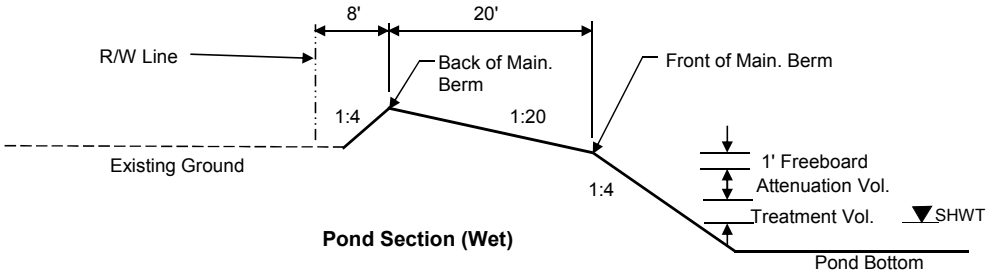
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	59.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.50
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1250 ft	
Estimated Energy Losses =	1.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	56.75 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
59.00	Pond R/W	4.34 ac	435.0 ft	435.0 ft	
61.00	Back of Main. Berm	4.03 ac	419.0 ft	419.0 ft	17.16 ac-ft
60.50		3.65 ac	399.0 ft	399.0 ft	15.23 ac-ft
60.00	Front of Main. Berm	3.30 ac	379.0 ft	379.0 ft	13.50 ac-ft
59.00	Provided Treat.Vol.+Att.Vol	3.16 ac	371.0 ft	371.0 ft	10.26 ac-ft
57.58	Req'd Treat.Vol+Att. Vol	2.97 ac	359.6 ft	359.6 ft	5.88 ac-ft
56.73	Estimated Storm Sewer TW	2.86 ac	352.8 ft	352.8 ft	3.41 ac-ft
55.67	Top of Treatment Vol.	2.72 ac	344.4 ft	344.4 ft	0.46 ac-ft
55.50	Normal Water Level	2.70 ac	343.0 ft	343.0 ft	0.00 ac-ft
53.50		2.45 ac	327.0 ft	327.0 ft	
50.00	Pond Bottom	2.05 ac	299.0 ft	299.0 ft	

Required Treatment+Attenuation Vol.= 5.88 ac-ft
Required Treatment+Attenuation Stage= 57.58 ft

Provided Treatment+Attenuation Vol.= 10.26 ac-ft
Provided Treatment+Attenuation Stage= 59.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 3.41 ac-ft
Estimated Storm Sewer TW EL.= 56.73 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.21 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5B**

Station Limits: From: 196+64 To: 222+61

Roadway Length = 2598 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.13 ac
Pervious Area*: 9.91 ac
Total Roadway Area *: 12.04 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.57 ac

Total Area:

Impervious Area: **2.13 ac**
Pervious Area: **12.48 ac**
Total Area: **14.61 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.23 ac	120.5
Impervious areas; Streets & roads	D	98	0.90 ac	88.2
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.20 ac	9.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.60 ac	23.4
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.71 ac	56.8
Woods-grass combination (orchard or tree farm); Good condition	A	32	4.58 ac	146.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.53 ac	41.9
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.02 ac	0.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.76 ac	212.5
Existing Lakes (Water surface)	D	100	0.07 ac	7.0
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.44 ac	44.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	2.57 ac	82.4
		Total:	14.61 ac	833.1

CN = Total CN*Area / Total Area = **57.0**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = 1000/CN - 10 = **7.54 in**				
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $(P - 0.2S)^2 / (P + 0.8S)$				
Runoff (Q) =	**2.65 in**	**2.31 in**	**3.36 in**	**12.22 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5B**

Station Limits: From: 196+64 To: 222+61 Roadway Length = 2598 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.52 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	6.52 ac	*Areas measured in Microstation
Total Roadway Area *:	12.04 ac	

Pond Area:

Pervious Pond Area :	1.06 ac	
Water Surface Area:	1.51 ac	Wet Pond
Total Pond Area:	2.57 ac	

Total Area:

Impervious Area:	**5.52 ac**
Pervious Area:	**7.58 ac**
Water Surface Area:	**1.51 ac**
Total Area:	**14.61 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.26 ac	319.4
Impervious areas; Streets & roads	D	98	2.26 ac	221.7
Proposed Roadway Pervious	A	39	3.85 ac	150.1
Proposed Roadway Pervious	D	80	2.67 ac	213.7
Proposed Pond Pervious	A	39	1.06 ac	41.4
Proposed Ponds (Water Surface)	A	100	1.51 ac	151.3
		Total:	14.61 ac	1097.4

CN = Total CN*Area / Total Area = **75.1**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.32 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.60 in**	**4.16 in**	**5.51 in**	**15.53 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.46 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.46 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.23 ac-ft	2.82 ac-ft	4.10 ac-ft	14.88 ac-ft
Q_{post} =	5.61 ac-ft	5.07 ac-ft	6.71 ac-ft	18.91 ac-ft
ΔQ =	**2.38 ac-ft**	**2.25 ac-ft**	**2.61 ac-ft**	**4.03 ac-ft**

Attenuation V_{req} = 4.03 ac-ft

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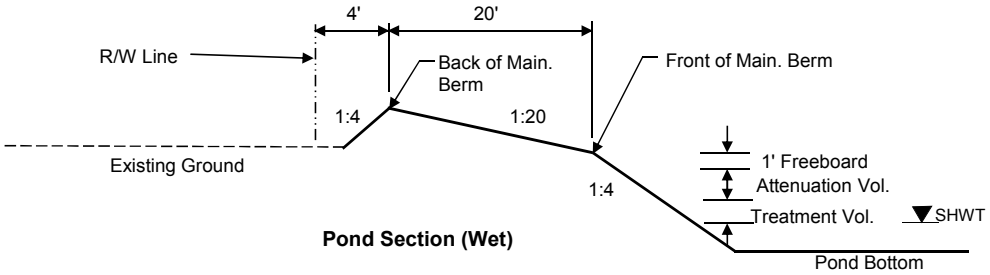
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	54.25
Maximum Storage Depth (**SD**) =	2.75 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	60 ft	
Estimated Energy Losses =	0.1 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.94 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	2.57 ac	356.0 ft	315.0 ft	
59.00	Back of Main. Berm	2.45 ac	348.0 ft	307.0 ft	8.54 ac-ft
58.50		2.16 ac	328.0 ft	287.0 ft	7.39 ac-ft
58.00	Front of Main. Berm	1.89 ac	308.0 ft	267.0 ft	6.38 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.78 ac	300.0 ft	259.0 ft	4.53 ac-ft
56.98	Req'd Treat.Vol+Att. Vol	1.78 ac	299.8 ft	258.8 ft	4.49 ac-ft
55.95	Estimated Storm Sewer TW	1.68 ac	291.6 ft	250.6 ft	2.71 ac-ft
54.55	Top of Treatment Vol.	1.54 ac	280.4 ft	239.4 ft	0.46 ac-ft
54.25	Normal Water Level	1.51 ac	278.0 ft	237.0 ft	0.00 ac-ft
52.25		1.33 ac	262.0 ft	221.0 ft	
49.00	Pond Bottom	1.06 ac	236.0 ft	195.0 ft	

Required Treatment+Attenuation Vol.= 4.49 ac-ft
Required Treatment+Attenuation Stage= 56.98 ft

Provided Treatment+Attenuation Vol.= 4.53 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.71 ac-ft
Estimated Storm Sewer TW EL.= 55.95 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.09 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5C**

Station Limits: From: 196+64 To: 222+61 Roadway Length = 2598 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.13 ac
Pervious Area*: 9.91 ac
Total Roadway Area *: 12.04 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 4.65 ac

Total Area:
Impervious Area: **2.13 ac**
Pervious Area: **14.56 ac**
Total Area: **16.69 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.23 ac	120.5
Impervious areas; Streets & roads	D	98	0.90 ac	88.2
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.20 ac	9.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.60 ac	23.4
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.71 ac	56.8
Woods-grass combination (orchard or tree farm); Good condition	A	32	4.58 ac	146.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.53 ac	41.9
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.02 ac	0.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.76 ac	212.5
Existing Lakes (Water surface)	D	100	0.07 ac	7.0
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.44 ac	44.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	4.65 ac	148.8
		Total:	16.69 ac	899.5

CN = Total CN*Area / Total Area = **53.9**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**2.34 in**	**2.02 in**	**3.00 in**	**11.57 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **8.55 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5C**

Station Limits: From: 196+64 To: 222+61 Roadway Length = 2598 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.52 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	6.52 ac	*Areas measured in Microstation
Total Roadway Area *:	12.04 ac	

Pond Area:

Pervious Pond Area :	1.64 ac	
Water Surface Area:	3.01 ac	Wet Pond
Total Pond Area:	4.65 ac	

Total Area:

Impervious Area:	**5.52 ac**
Pervious Area:	**8.16 ac**
Water Surface Area:	**3.01 ac**
Total Area:	**16.69 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.26 ac	319.4
Impervious areas; Streets & roads	D	98	2.26 ac	221.7
Proposed Roadway Pervious	A	39	3.85 ac	150.1
Proposed Roadway Pervious	D	80	2.67 ac	213.7
Proposed Pond Pervious	A	39	1.64 ac	64.0
Proposed Ponds (Water Surface)	A	100	3.01 ac	300.8
		Total:	16.69 ac	1269.6

CN = Total CN*Area / Total Area = **76.1**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.14 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.71 in**	**4.27 in**	**5.62 in**	**15.69 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.46 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.46 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.25 ac-ft	2.81 ac-ft	4.18 ac-ft	16.09 ac-ft
Q_{post} =	6.56 ac-ft	5.93 ac-ft	7.82 ac-ft	21.81 ac-ft
ΔQ =	**3.31 ac-ft**	**3.12 ac-ft**	**3.64 ac-ft**	**5.73 ac-ft**

Attenuation V_{req} = 5.73 ac-ft

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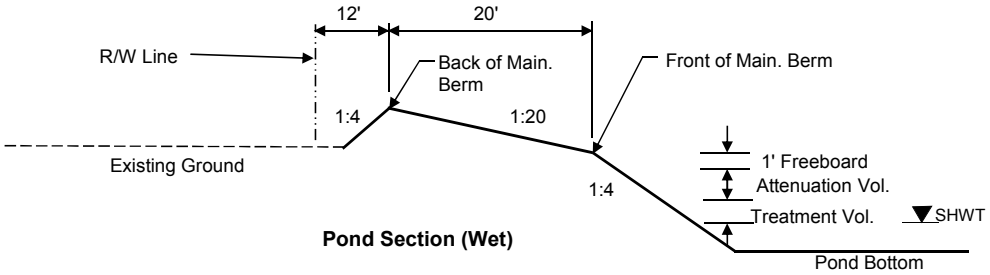
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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **5**
POND NAME : **5C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	55.00
Pond Tie-In Width =	12.0 ft	@ 1:4	Normal Water Elevation =	54.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	250 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.75 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
55.00	Pond R/W	4.65 ac	450.0 ft	450.0 ft	
58.00	Back of Main. Berm	4.17 ac	426.0 ft	426.0 ft	13.43 ac-ft
57.50		3.78 ac	406.0 ft	406.0 ft	11.44 ac-ft
57.00	Front of Main. Berm	3.42 ac	386.0 ft	386.0 ft	9.64 ac-ft
56.00	Provided Treat.Vol.+Att.Vol	3.28 ac	378.0 ft	378.0 ft	6.29 ac-ft
55.97	Req'd Treat.Vol+Att. Vol	3.28 ac	377.8 ft	377.8 ft	6.19 ac-ft
55.16	Estimated Storm Sewer TW	3.16 ac	371.3 ft	371.3 ft	3.58 ac-ft
54.15	Top of Treatment Vol.	3.03 ac	363.2 ft	363.2 ft	0.46 ac-ft
54.00	Normal Water Level	3.01 ac	362.0 ft	362.0 ft	0.00 ac-ft
52.00		2.75 ac	346.0 ft	346.0 ft	
49.00	Pond Bottom	2.38 ac	322.0 ft	322.0 ft	

Required Treatment+Attenuation Vol.= 6.19 ac-ft
Required Treatment+Attenuation Stage= 55.97 ft

Provided Treatment+Attenuation Vol.= 6.29 ac-ft
Provided Treatment+Attenuation Stage= 56.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 3.58 ac-ft
Estimated Storm Sewer TW EL.= 55.16 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.58 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6A**

Station Limits: From: 10014+12 To: 10031+24 Roadway Length = 1712 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.21 ac
Pervious Area*: 3.81 ac
Total Roadway Area *: 5.01 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.92 ac

Total Area:
Impervious Area: **1.21 ac**
Pervious Area: **5.72 ac**
Total Area: **6.93 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.21 ac	118.3
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.11 ac	8.7
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.04 ac	3.0
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.26 ac	18.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	3.31 ac	261.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.04 ac	2.9
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.06 ac	5.6
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.92 ac	153.2
		Total:	6.93 ac	572.1

CN = Total CN*Area / Total Area = **82.6**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.45 in**	**4.98 in**	**6.40 in**	**16.68 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.11 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6A**

Station Limits: From: 10014+12 To: 10031+24 Roadway Length = 1712 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.46 ac
Pervious Roadway Area:	1.56 ac
Total Roadway Area *:	5.01 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.90 ac	
Water Surface Area:	1.02 ac	Wet Pond
Total Pond Area:	1.92 ac	

Total Area:

Impervious Area:	**3.46 ac**
Pervious Area:	**2.45 ac**
Water Surface Area:	**1.02 ac**
Total Area:	**6.93 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	3.46 ac	338.9
Proposed Roadway Pervious	D	80	1.56 ac	124.4
Proposed Pond Pervious	D	80	0.90 ac	71.7
Proposed Ponds (Water Surface)	D	100	1.02 ac	101.8
		Total:	6.93 ac	636.9

CN = Total CN*Area / Total Area = **91.9**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.88 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.54 in**	**6.05 in**	**7.53 in**	**17.98 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.29 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.29 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.15 ac-ft	2.88 ac-ft	3.70 ac-ft	9.63 ac-ft
Q_{post} =	3.78 ac-ft	3.49 ac-ft	4.35 ac-ft	10.38 ac-ft
ΔQ =	**0.63 ac-ft**	**0.62 ac-ft**	**0.65 ac-ft**	**0.75 ac-ft**

Attenuation V_{req} = 0.75 ac-ft

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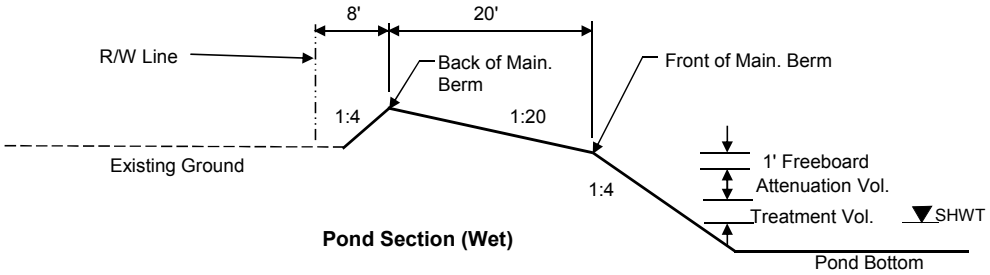
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	56.50
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	58.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	600 ft	
Estimated Energy Losses =	0.6 ft	
HGL Clearance =	0.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.40 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.92 ac	235.0 ft	355.0 ft	
60.00	Back of Main. Berm	1.70 ac	219.0 ft	339.0 ft	4.27 ac-ft
59.50		1.46 ac	199.0 ft	319.0 ft	3.48 ac-ft
59.00	Front of Main. Berm	1.23 ac	179.0 ft	299.0 ft	2.81 ac-ft
58.00	Provided Treat.Vol.+Att.Vol	1.14 ac	171.0 ft	291.0 ft	1.62 ac-ft
57.48	Req'd Treat.Vol+Att. Vol	1.10 ac	166.8 ft	286.8 ft	1.04 ac-ft
57.35	Estimated Storm Sewer TW	1.09 ac	165.8 ft	285.8 ft	0.90 ac-ft
56.78	Top of Treatment Vol.	1.04 ac	161.2 ft	281.2 ft	0.29 ac-ft
56.50	Normal Water Level	1.02 ac	159.0 ft	279.0 ft	0.00 ac-ft
54.50		0.86 ac	143.0 ft	263.0 ft	
50.00	Pond Bottom	0.56 ac	107.0 ft	227.0 ft	

Required Treatment+Attenuation Vol.= 1.04 ac-ft
Required Treatment+Attenuation Stage= 57.48 ft

Provided Treatment+Attenuation Vol.= 1.62 ac-ft
Provided Treatment+Attenuation Stage= 58.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.90 ac-ft
Estimated Storm Sewer TW EL.= 57.35 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.30 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6B**

Station Limits: From: 10014+12 To: 10031+24 Roadway Length = 1712 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.21 ac
Pervious Area*: 3.81 ac
Total Roadway Area *: 5.01 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.91 ac

Total Area:

Impervious Area: **1.21 ac**
Pervious Area: **5.72 ac**
Total Area: **6.92 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.21 ac	118.3
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.11 ac	8.7
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.04 ac	3.0
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.26 ac	18.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	3.31 ac	261.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.04 ac	2.9
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.06 ac	5.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.91 ac	147.1
		Total:	6.92 ac	565.9

CN = Total CN*Area / Total Area = **81.7**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.36 in**	**4.89 in**	**6.31 in**	**16.56 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.23 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Made by: CND
Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6B**

Station Limits: From: 10014+12 To: 10031+24 Roadway Length = 1712 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.46 ac
Pervious Roadway Area:	1.56 ac
Total Roadway Area *:	5.01 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.77 ac	
Water Surface Area:	1.14 ac	Wet Pond
Total Pond Area:	1.91 ac	

Total Area:

Impervious Area:	**3.46 ac**
Pervious Area:	**2.33 ac**
Water Surface Area:	**1.14 ac**
Total Area:	**6.92 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	3.46 ac	338.9
Proposed Roadway Pervious	D	80	1.56 ac	124.4
Proposed Pond Pervious	D	80	0.77 ac	61.7
Proposed Ponds (Water Surface)	D	100	1.14 ac	113.8
		Total:	6.92 ac	638.8

CN = Total CN*Area / Total Area = **92.3**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.58 in**	**6.09 in**	**7.57 in**	**18.03 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.84 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.29 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.29 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.09 ac-ft	2.82 ac-ft	3.64 ac-ft	9.55 ac-ft
Q_{post} =	3.80 ac-ft	3.51 ac-ft	4.37 ac-ft	10.40 ac-ft
ΔQ =	**0.71 ac-ft**	**0.69 ac-ft**	**0.73 ac-ft**	**0.85 ac-ft**

Attenuation V_{req} = 0.85 ac-ft

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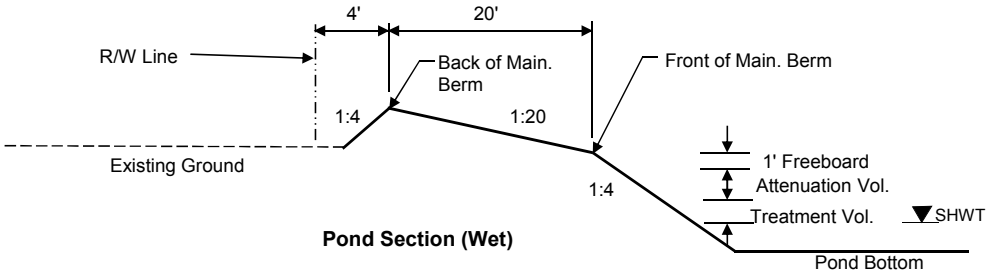
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	56.00
Maximum Storage Depth (**SD**) =	1.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	58.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	100 ft	
Estimated Energy Losses =	0.1 ft	
HGL Clearance =	0.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.90 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.91 ac	235.0 ft	354.0 ft	
59.00	Back of Main. Berm	1.80 ac	227.0 ft	346.0 ft	4.01 ac-ft
58.50		1.55 ac	207.0 ft	326.0 ft	3.17 ac-ft
58.00	Front of Main. Berm	1.31 ac	187.0 ft	306.0 ft	2.45 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.22 ac	179.0 ft	298.0 ft	1.18 ac-ft
56.97	Req'd Treat.Vol+Att. Vol	1.22 ac	178.8 ft	297.8 ft	1.14 ac-ft
56.84	Estimated Storm Sewer TW	1.21 ac	177.7 ft	296.7 ft	0.98 ac-ft
56.25	Top of Treatment Vol.	1.16 ac	173.0 ft	292.0 ft	0.29 ac-ft
56.00	Normal Water Level	1.14 ac	171.0 ft	290.0 ft	0.00 ac-ft
54.00		0.97 ac	155.0 ft	274.0 ft	
50.00	Pond Bottom	0.68 ac	123.0 ft	242.0 ft	

Required Treatment+Attenuation Vol.= 1.14 ac-ft
Required Treatment+Attenuation Stage= 56.97 ft

Provided Treatment+Attenuation Vol.= 1.18 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.98 ac-ft
Estimated Storm Sewer TW EL.= 56.84 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.29 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6C**

Station Limits: From: 10014+12 To: 10031+24 Roadway Length = 1712 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.21 ac
Pervious Area*: 3.81 ac
Total Roadway Area *: 5.01 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.67 ac

Total Area:

Impervious Area: **1.21 ac**
Pervious Area: **5.48 ac**
Total Area: **6.69 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.21 ac	118.3
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.11 ac	8.7
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	0.04 ac	3.0
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.26 ac	18.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	3.31 ac	261.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.04 ac	2.9
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.06 ac	5.6
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.67 ac	133.9
		Total:	6.69 ac	552.8

CN = Total CN*Area / Total Area = **82.7**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.46 in**	**4.99 in**	**6.42 in**	**16.70 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.10 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6C**

Station Limits: From: 10014+12 To: 10031+24 Roadway Length = 1712 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.46 ac
Pervious Roadway Area:	1.56 ac
Total Roadway Area *:	5.01 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.81 ac	
Water Surface Area:	0.86 ac	Wet Pond
Total Pond Area:	1.67 ac	

Total Area:

Impervious Area:	**3.46 ac**
Pervious Area:	**2.36 ac**
Water Surface Area:	**0.86 ac**
Total Area:	**6.69 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	3.46 ac	338.9
Proposed Roadway Pervious	D	80	1.56 ac	124.4
Proposed Pond Pervious	D	80	0.81 ac	64.8
Proposed Ponds (Water Surface)	D	100	0.86 ac	86.4
		Total:	6.69 ac	614.4

CN = Total CN*Area / Total Area = **91.9**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.54 in**	**6.04 in**	**7.53 in**	**17.98 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.88 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.29 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.29 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.04 ac-ft	2.78 ac-ft	3.58 ac-ft	9.30 ac-ft
Q_{post} =	3.64 ac-ft	3.37 ac-ft	4.19 ac-ft	10.02 ac-ft
ΔQ =	**0.60 ac-ft**	**0.59 ac-ft**	**0.62 ac-ft**	**0.72 ac-ft**

Attenuation V_{req} = 0.72 ac-ft

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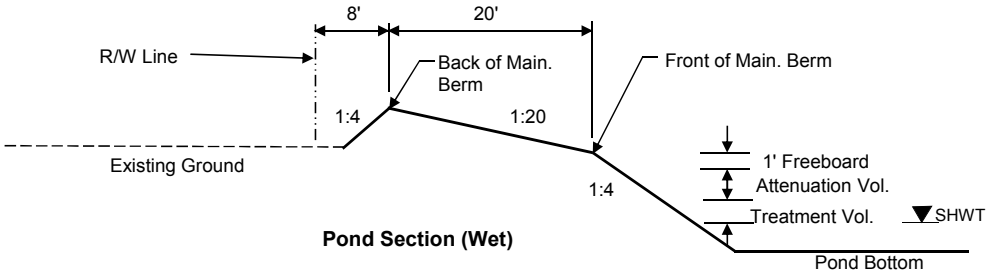
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **6**
POND NAME : **6C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.50
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	58.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1500 ft	
Estimated Energy Losses =	1.5 ft	
HGL Clearance =	0.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	56.50 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	1.67 ac	270.0 ft	270.0 ft	
59.00	Back of Main. Berm	1.48 ac	254.0 ft	254.0 ft	3.66 ac-ft
58.50		1.26 ac	234.0 ft	234.0 ft	2.97 ac-ft
58.00	Front of Main. Berm	1.05 ac	214.0 ft	214.0 ft	2.39 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	0.97 ac	206.0 ft	206.0 ft	1.38 ac-ft
56.61	Req'd Treat.Vol+Att. Vol	0.94 ac	202.9 ft	202.9 ft	1.00 ac-ft
56.50	Estimated Storm Sewer TW	0.94 ac	202.0 ft	202.0 ft	0.90 ac-ft
55.83	Top of Treatment Vol.	0.89 ac	196.6 ft	196.6 ft	0.29 ac-ft
55.50	Normal Water Level	0.86 ac	194.0 ft	194.0 ft	0.00 ac-ft
53.50		0.73 ac	178.0 ft	178.0 ft	
50.00	Pond Bottom	0.52 ac	150.0 ft	150.0 ft	

Required Treatment+Attenuation Vol.= 1.00 ac-ft
Required Treatment+Attenuation Stage= 56.61 ft

Provided Treatment+Attenuation Vol.= 1.38 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.87 ac-ft
Estimated Storm Sewer TW EL.= 56.50 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.01 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7A**

Station Limits: From: 10031+24 To: 10042+34 Roadway Length = 1110 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.72 ac
Pervious Area*: 2.49 ac
Total Roadway Area *: 3.21 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.98 ac

Total Area:
Impervious Area: **0.72 ac**
Pervious Area: **4.47 ac**
Total Area: **5.19 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.72 ac	70.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.56 ac	45.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.07 ac	5.8
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.86 ac	143.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.98 ac	152.2
		Total:	5.19 ac	417.5

CN = Total CN*Area / Total Area = **80.5**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.21 in**	**4.75 in**	**6.15 in**	**16.37 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.42 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7A**

Station Limits: From: 10031+24 To: 10042+34 Roadway Length = 1110 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	2.24 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	0.97 ac	*Areas measured in Microstation
Total Roadway Area *:	3.21 ac	

Pond Area:

Pervious Pond Area :	0.83 ac	
Water Surface Area:	1.15 ac	Wet Pond
Total Pond Area:	1.98 ac	

Total Area:

Impervious Area:	**2.24 ac**
Pervious Area:	**1.80 ac**
Water Surface Area:	**1.15 ac**
Total Area:	**5.19 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.24 ac	219.8
Proposed Roadway Pervious	D	80	0.97 ac	77.5
Proposed Pond Pervious	D	80	0.83 ac	66.5
Proposed Ponds (Water Surface)	D	100	1.15 ac	114.6
		Total:	5.19 ac	478.3

CN = Total CN*Area / Total Area = **92.2**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.57 in**	**6.08 in**	**7.56 in**	**18.02 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.85 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.19 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.19 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	2.25 ac-ft	2.05 ac-ft	2.66 ac-ft	7.08 ac-ft
Q_{post} =	2.84 ac-ft	2.63 ac-ft	3.27 ac-ft	7.79 ac-ft
ΔQ =	**0.59 ac-ft**	**0.57 ac-ft**	**0.61 ac-ft**	**0.71 ac-ft**

Attenuation V_{req} = 0.61 ac-ft

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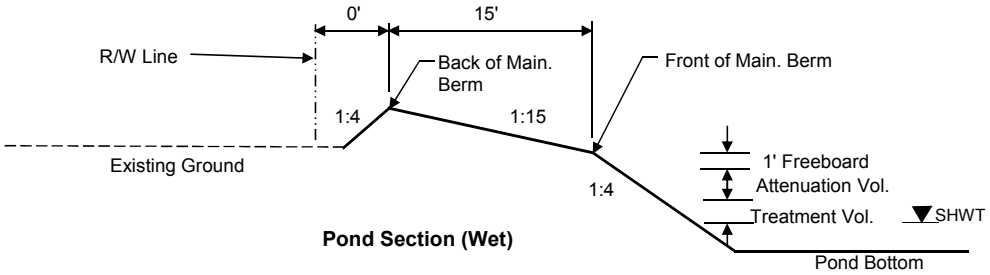
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7A**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	64.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	58.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	185 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	58.82 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.98 ac	300.0 ft	287.0 ft	
64.00	Back of Main. Berm	1.98 ac	300.0 ft	287.0 ft	8.63 ac-ft
63.50		1.78 ac	285.0 ft	272.0 ft	7.69 ac-ft
63.00	Front of Main. Berm	1.59 ac	270.0 ft	257.0 ft	6.85 ac-ft
62.00	Provided Treat.Vol.+Att.Vol	1.50 ac	262.0 ft	249.0 ft	5.29 ac-ft
58.68	Req'd Treat.Vol+Att. Vol	1.20 ac	235.4 ft	222.4 ft	0.80 ac-ft
58.65	Estimated Storm Sewer TW	1.20 ac	235.2 ft	222.2 ft	0.76 ac-ft
58.17	Top of Treatment Vol.	1.16 ac	231.3 ft	218.3 ft	0.19 ac-ft
58.00	Normal Water Level	1.15 ac	230.0 ft	217.0 ft	0.00 ac-ft
56.00		0.99 ac	214.0 ft	201.0 ft	
54.00	Pond Bottom	0.84 ac	198.0 ft	185.0 ft	

Required Treatment+Attenuation Vol.= 0.80 ac-ft
Required Treatment+Attenuation Stage= 58.68 ft

Provided Treatment+Attenuation Vol.= 5.29 ac-ft
Provided Treatment+Attenuation Stage= 62.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.76 ac-ft
Estimated Storm Sewer TW EL.= 58.65 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.37 ac

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7B**

Station Limits: From: 10031+24 To: 10042+34 Roadway Length = 1110 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.72 ac
Pervious Area*: 2.49 ac
Total Roadway Area *: 3.21 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.03 ac

Total Area:
Impervious Area: **0.72 ac**
Pervious Area: **3.52 ac**
Total Area: **4.24 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.72 ac	70.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.56 ac	45.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.07 ac	5.8
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.86 ac	143.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.03 ac	79.5
		Total:	4.24 ac	344.9

CN = Total CN*Area / Total Area = **81.3**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.31 in**				
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$				
Runoff (Q) =	**5.30 in**	**4.83 in**	**6.25 in**	**16.49 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7B**

Station Limits: From: 10031+24 To: 10042+34 Roadway Length = 1110 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	2.24 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	0.97 ac	*Areas measured in Microstation
Total Roadway Area *:	3.21 ac	

Pond Area:

Pervious Pond Area :	0.62 ac	
Water Surface Area:	0.41 ac	Wet Pond
Total Pond Area:	1.03 ac	

Total Area:

Impervious Area:	**2.24 ac**
Pervious Area:	**1.59 ac**
Water Surface Area:	**0.41 ac**
Total Area:	**4.24 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.24 ac	219.8
Proposed Roadway Pervious	D	80	0.97 ac	77.5
Proposed Pond Pervious	D	80	0.62 ac	50.0
Proposed Ponds (Water Surface)	D	100	0.41 ac	40.8
		Total:	4.24 ac	388.1

CN = Total CN*Area / Total Area = **91.4**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.94 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.48 in**	**5.99 in**	**7.47 in**	**17.92 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.19 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.19 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.88 ac-ft	1.71 ac-ft	2.21 ac-ft	5.83 ac-ft
Q_{post} =	2.29 ac-ft	2.12 ac-ft	2.64 ac-ft	6.34 ac-ft
ΔQ =	**0.42 ac-ft**	**0.41 ac-ft**	**0.43 ac-ft**	**0.51 ac-ft**

Attenuation V_{req} = 0.43 ac-ft

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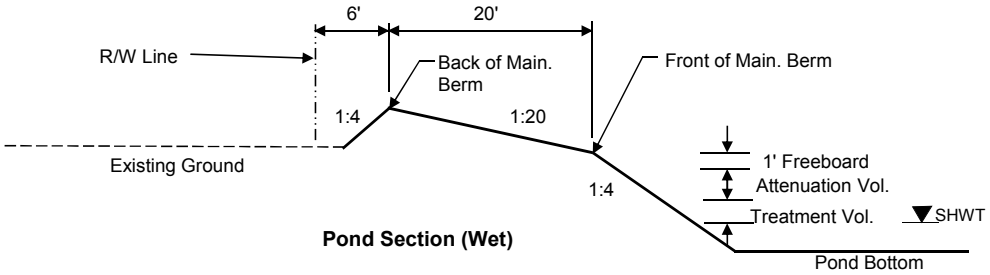
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	59.00
Pond Tie-In Width =	6.0 ft	@ 1:4	Normal Water Elevation =	57.00
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	375 ft	
Estimated Energy Losses =	0.4 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	58.63 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
59.00	Pond R/W	1.03 ac	150.0 ft	300.0 ft	
60.50	Back of Main. Berm	0.91 ac	138.0 ft	288.0 ft	1.94 ac-ft
60.00		0.73 ac	118.0 ft	268.0 ft	1.53 ac-ft
59.50	Front of Main. Berm	0.56 ac	98.0 ft	248.0 ft	1.21 ac-ft
58.50	Provided Treat.Vol.+Att.Vol	0.50 ac	90.0 ft	240.0 ft	0.68 ac-ft
58.39	Req'd Treat.Vol+Att. Vol	0.49 ac	89.1 ft	239.1 ft	0.62 ac-ft
58.34	Estimated Storm Sewer TW	0.49 ac	88.7 ft	238.7 ft	0.60 ac-ft
57.45	Top of Treatment Vol.	0.43 ac	81.6 ft	231.6 ft	0.19 ac-ft
57.00	Normal Water Level	0.41 ac	78.0 ft	228.0 ft	0.00 ac-ft
55.00		0.30 ac	62.0 ft	212.0 ft	
50.00	Pond Bottom	0.09 ac	22.0 ft	172.0 ft	

Required Treatment+Attenuation Vol.= 0.62 ac-ft
Required Treatment+Attenuation Stage= 58.39 ft

Provided Treatment+Attenuation Vol.= 0.68 ac-ft
Provided Treatment+Attenuation Stage= 58.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.60 ac-ft
Estimated Storm Sewer TW EL.= 58.34 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.24 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7C**

Station Limits: From: 10031+24 To: 10042+34 Roadway Length = 1110 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.72 ac
Pervious Area*: 2.49 ac
Total Roadway Area *: 3.21 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.52 ac

Total Area:
Impervious Area: **0.72 ac**
Pervious Area: **4.01 ac**
Total Area: **4.73 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.72 ac	70.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.56 ac	45.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.07 ac	5.8
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.86 ac	143.0
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.52 ac	120.2
		Total:	4.73 ac	385.5

CN = Total CN*Area / Total Area = **81.5**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.28 in**				
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$				
Runoff (Q) =	**5.33 in**	**4.86 in**	**6.27 in**	**16.52 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7C**

Station Limits: From: 10031+24 To: 10042+34 Roadway Length = 1110 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	2.24 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	0.97 ac	*Areas measured in Microstation
Total Roadway Area *:	3.21 ac	

Pond Area:

Pervious Pond Area :	0.59 ac	
Water Surface Area:	0.93 ac	Wet Pond
Total Pond Area:	1.52 ac	

Total Area:

Impervious Area:	**2.24 ac**
Pervious Area:	**1.56 ac**
Water Surface Area:	**0.93 ac**
Total Area:	**4.73 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.24 ac	219.8
Proposed Roadway Pervious	D	80	0.97 ac	77.5
Proposed Pond Pervious	D	80	0.59 ac	47.2
Proposed Ponds (Water Surface)	D	100	0.93 ac	93.2
		Total:	4.73 ac	437.6

CN = Total CN*Area / Total Area = **92.5**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.60 in**	**6.11 in**	**7.59 in**	**18.06 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.81 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.19 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.19 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	2.10 ac-ft	1.92 ac-ft	2.47 ac-ft	6.51 ac-ft
Q_{post} =	2.60 ac-ft	2.41 ac-ft	3.00 ac-ft	7.12 ac-ft
ΔQ =	**0.50 ac-ft**	**0.49 ac-ft**	**0.52 ac-ft**	**0.61 ac-ft**

Attenuation V_{req} = 0.52 ac-ft

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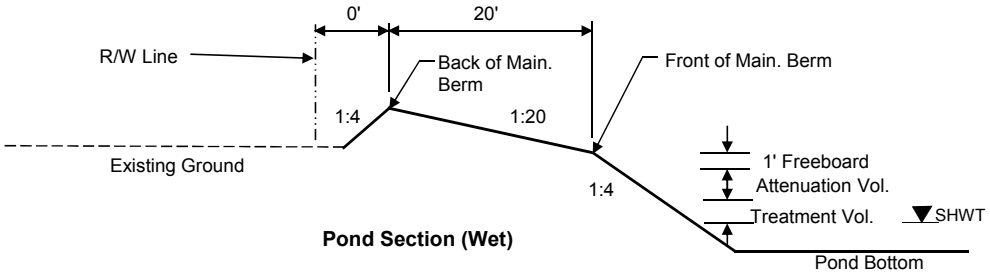
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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **7**
POND NAME : **7C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	61.00
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	58.00
Maximum Storage Depth (**SD**) =	1.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	150 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	58.85 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
61.00	Pond R/W	1.52 ac	262.0 ft	253.0 ft	
61.00	Back of Main. Berm	1.52 ac	262.0 ft	253.0 ft	3.32 ac-ft
60.50		1.29 ac	242.0 ft	233.0 ft	2.61 ac-ft
60.00	Front of Main. Berm	1.09 ac	222.0 ft	213.0 ft	2.02 ac-ft
59.00	Provided Treat.Vol.+Att.Vol	1.01 ac	214.0 ft	205.0 ft	0.97 ac-ft
58.74	Req'd Treat.Vol+Att. Vol	0.99 ac	211.9 ft	202.9 ft	0.71 ac-ft
58.71	Estimated Storm Sewer TW	0.98 ac	211.7 ft	202.7 ft	0.68 ac-ft
58.20	Top of Treatment Vol.	0.95 ac	207.6 ft	198.6 ft	0.19 ac-ft
58.00	Normal Water Level	0.93 ac	206.0 ft	197.0 ft	0.00 ac-ft
56.00		0.79 ac	190.0 ft	181.0 ft	
51.00	Pond Bottom	0.49 ac	150.0 ft	141.0 ft	

Required Treatment+Attenuation Vol.= 0.71 ac-ft
Required Treatment+Attenuation Stage= 58.74 ft

Provided Treatment+Attenuation Vol.= 0.97 ac-ft
Provided Treatment+Attenuation Stage= 59.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.68 ac-ft
Estimated Storm Sewer TW EL.= 58.71 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.83 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8A**

Station Limits: From: 10042+34 To: 10062+09

Roadway Length = 1975 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.87 ac
Pervious Area*: 5.66 ac
Total Roadway Area *: 7.53 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.19 ac

Total Area:

Impervious Area: **1.87 ac**
Pervious Area: **6.86 ac**
Total Area: **8.73 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.70 ac	68.6
Impervious areas; Streets & roads	D	98	1.17 ac	114.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.07 ac	2.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.42 ac	33.6
Commercial & business (85% impervious)	A	89	0.00 ac	0.2
Commercial & business (85% impervious)	D	95	1.01 ac	96.0
Residential Areas (1/4 acre, 38% Impervious)	A	61	1.48 ac	90.3
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.59 ac	27.1
Residential Areas (2.0 acre, 12% Impervious)	D	82	1.68 ac	137.8
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.41 ac	29.9
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.19 ac	91.9
		Total:	8.73 ac	692.8

CN = Total CN*Area / Total Area = **79.4**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.60 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.09 in**	**4.63 in**	**6.02 in**	**16.20 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8A**

Station Limits: From: 10042+34 To: 10062+09 Roadway Length = 1975 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.99 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	3.54 ac	*Areas measured in Microstation
Total Roadway Area *:	7.53 ac	

Pond Area:

Pervious Pond Area :	0.69 ac	
Water Surface Area:	0.50 ac	Wet Pond
Total Pond Area:	1.19 ac	

Total Area:

Impervious Area:	**3.99 ac**
Pervious Area:	**4.24 ac**
Water Surface Area:	**0.50 ac**
Total Area:	**8.73 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.72 ac	168.3
Impervious areas; Streets & roads	D	98	2.27 ac	222.5
Proposed Roadway Pervious	A	39	1.53 ac	59.5
Proposed Roadway Pervious	D	80	2.02 ac	161.4
Proposed Pond Pervious	D	80	0.69 ac	55.4
Proposed Ponds (Water Surface)	D	100	0.50 ac	50.1
		Total:	8.73 ac	717.4

CN = Total CN*Area / Total Area = **82.2**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.16 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.41 in**	**4.94 in**	**6.36 in**	**16.63 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.33 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.33 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.70 ac-ft	3.37 ac-ft	4.38 ac-ft	11.78 ac-ft
Q_{post} =	3.93 ac-ft	3.59 ac-ft	4.63 ac-ft	12.09 ac-ft
ΔQ =	**0.23 ac-ft**	**0.23 ac-ft**	**0.25 ac-ft**	**0.31 ac-ft**

Attenuation V_{req} = 0.25 ac-ft

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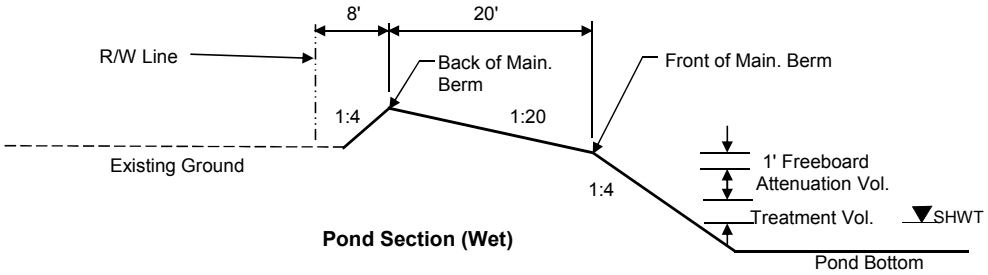
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	61.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	59.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	63.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	425 ft	
Estimated Energy Losses =	0.4 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.58 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
61.00	Pond R/W	1.19 ac	243.0 ft	214.0 ft	
63.00	Back of Main. Berm	1.03 ac	227.0 ft	198.0 ft	2.62 ac-ft
62.50		0.85 ac	207.0 ft	178.0 ft	2.15 ac-ft
62.00	Front of Main. Berm	0.68 ac	187.0 ft	158.0 ft	1.77 ac-ft
61.00	Provided Treat.Vol.+Att.Vol	0.62 ac	179.0 ft	150.0 ft	1.12 ac-ft
60.09	Req'd Treat.Vol+Att. Vol	0.56 ac	171.7 ft	142.7 ft	0.58 ac-ft
60.05	Estimated Storm Sewer TW	0.56 ac	171.4 ft	142.4 ft	0.56 ac-ft
59.63	Top of Treatment Vol.	0.54 ac	168.0 ft	139.0 ft	0.33 ac-ft
59.00	Normal Water Level	0.50 ac	163.0 ft	134.0 ft	0.00 ac-ft
57.00		0.40 ac	147.0 ft	118.0 ft	
55.00	Pond Bottom	0.31 ac	131.0 ft	102.0 ft	

Required Treatment+Attenuation Vol.= 0.58 ac-ft
Required Treatment+Attenuation Stage= 60.09 ft

Provided Treatment+Attenuation Vol.= 1.12 ac-ft
Provided Treatment+Attenuation Stage= 61.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.56 ac-ft
Estimated Storm Sewer TW EL.= 60.05 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.43 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8B**

Station Limits: From: 10042+34 To: 10062+09

Roadway Length = 1975 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.05 ac
Pervious Area*: 3.88 ac
Total Roadway Area *: 5.93 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 0.96 ac

Total Area:

Impervious Area: **2.05 ac**
Pervious Area: **4.85 ac**
Total Area: **6.90 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.92 ac	90.1
Impervious areas; Streets & roads	D	98	1.13 ac	110.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.93 ac	36.3
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.03 ac	2.5
Commercial & business (85% impervious)	A	89	0.50 ac	44.8
Commercial & business (85% impervious)	D	95	0.28 ac	26.7
Residential Areas (1/4 acre, 38% Impervious)	A	61	0.08 ac	4.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.06 ac	2.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	1.96 ac	160.6
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.04 ac	2.6
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.96 ac	79.1
		Total:	6.90 ac	561.2

CN = Total CN*Area / Total Area = **81.4**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.29 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.32 in**	**4.85 in**	**6.26 in**	**16.51 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8B**

Station Limits: From: 10042+34 To: 10062+09 Roadway Length = 1975 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.99 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	1.94 ac	*Areas measured in Microstation
Total Roadway Area *:	5.93 ac	

Pond Area:

Pervious Pond Area :	0.69 ac	
Water Surface Area:	0.28 ac	Wet Pond
Total Pond Area:	0.96 ac	

Total Area:

Impervious Area:	**3.99 ac**
Pervious Area:	**2.63 ac**
Water Surface Area:	**0.28 ac**
Total Area:	**6.90 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.72 ac	168.3
Impervious areas; Streets & roads	D	98	2.27 ac	222.5
Proposed Roadway Pervious	A	39	0.84 ac	32.6
Proposed Roadway Pervious	D	80	1.11 ac	88.5
Proposed Pond Pervious	D	80	0.69 ac	54.9
Proposed Ponds (Water Surface)	D	100	0.28 ac	27.8
		Total:	6.90 ac	594.7

CN = Total CN*Area / Total Area = **86.2**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.60 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.88 in**	**5.39 in**	**6.85 in**	**17.21 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.33 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.33 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.05 ac-ft	2.79 ac-ft	3.60 ac-ft	9.49 ac-ft
Q_{post} =	3.38 ac-ft	3.10 ac-ft	3.93 ac-ft	9.89 ac-ft
ΔQ =	**0.32 ac-ft**	**0.31 ac-ft**	**0.34 ac-ft**	**0.41 ac-ft**

Attenuation V_{req} = 0.34 ac-ft

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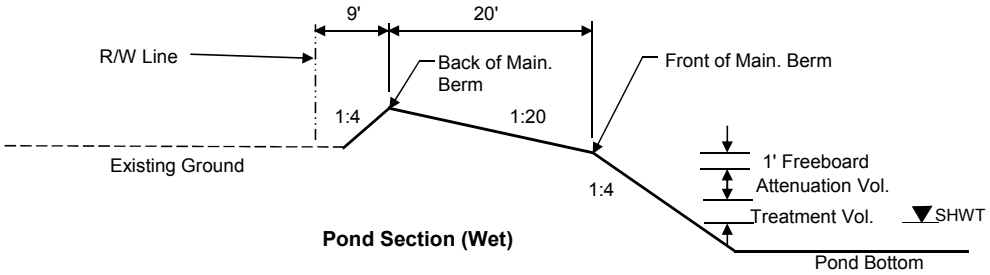
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	60.00
Pond Tie-In Width =	9.0 ft	@ 1:4	Normal Water Elevation =	58.00
Maximum Storage Depth (**SD**) =	2.25 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	63.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	800 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.20 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
60.00	Pond R/W	0.96 ac	300.0 ft	140.0 ft	
62.25	Back of Main. Berm	0.79 ac	282.0 ft	122.0 ft	1.81 ac-ft
61.75		0.61 ac	262.0 ft	102.0 ft	1.46 ac-ft
61.25	Front of Main. Berm	0.46 ac	242.0 ft	82.0 ft	1.19 ac-ft
60.25	Provided Treat.Vol.+Att.Vol	0.40 ac	234.0 ft	74.0 ft	0.76 ac-ft
60.03	Req'd Treat.Vol+Att. Vol	0.39 ac	232.2 ft	72.2 ft	0.67 ac-ft
59.97	Estimated Storm Sewer TW	0.38 ac	231.8 ft	71.8 ft	0.65 ac-ft
59.09	Top of Treatment Vol.	0.33 ac	224.7 ft	64.7 ft	0.33 ac-ft
58.00	Normal Water Level	0.28 ac	216.0 ft	56.0 ft	0.00 ac-ft
56.00		0.18 ac	200.0 ft	40.0 ft	
55.00	Pond Bottom	0.14 ac	192.0 ft	32.0 ft	

Required Treatment+Attenuation Vol.= 0.67 ac-ft
Required Treatment+Attenuation Stage= 60.03 ft

Provided Treatment+Attenuation Vol.= 0.76 ac-ft
Provided Treatment+Attenuation Stage= 60.25 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.65 ac-ft
Estimated Storm Sewer TW EL.= 59.97 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.16 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8C**

Station Limits: From: 10042+34 To: 10062+09

Roadway Length = 1975 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.05 ac
Pervious Area*: 3.88 ac
Total Roadway Area *: 5.93 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 0.95 ac

Total Area:

Impervious Area: **2.05 ac**
Pervious Area: **4.83 ac**
Total Area: **6.88 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.92 ac	90.1
Impervious areas; Streets & roads	D	98	1.13 ac	110.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.93 ac	36.3
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.03 ac	2.5
Commercial & business (85% impervious)	A	89	0.50 ac	44.8
Commercial & business (85% impervious)	D	95	0.28 ac	26.7
Residential Areas (1/4 acre, 38% Impervious)	A	61	0.08 ac	4.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.06 ac	2.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	1.96 ac	160.6
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.04 ac	2.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.95 ac	76.0
		Total:	6.88 ac	558.2

CN = Total CN*Area / Total Area = **81.1**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.33 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.28 in**	**4.82 in**	**6.23 in**	**16.46 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8C**

Station Limits: From: 10042+34 To: 10062+09 Roadway Length = 1975 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.99 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	1.94 ac	*Areas measured in Microstation
Total Roadway Area *:	5.93 ac	

Pond Area:

Pervious Pond Area :	0.61 ac	
Water Surface Area:	0.34 ac	Wet Pond
Total Pond Area:	0.95 ac	

Total Area:

Impervious Area:	**3.99 ac**
Pervious Area:	**2.55 ac**
Water Surface Area:	**0.34 ac**
Total Area:	**6.88 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.72 ac	168.3
Impervious areas; Streets & roads	D	98	2.27 ac	222.5
Proposed Roadway Pervious	A	39	0.84 ac	32.6
Proposed Roadway Pervious	D	80	1.11 ac	88.5
Proposed Pond Pervious	D	80	0.61 ac	48.5
Proposed Ponds (Water Surface)	D	100	0.34 ac	34.4
		Total:	6.88 ac	595.0

CN = Total CN*Area / Total Area = **86.4**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.90 in**	**5.42 in**	**6.87 in**	**17.24 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.57 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.33 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.33 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.03 ac-ft	2.76 ac-ft	3.57 ac-ft	9.44 ac-ft
Q_{post} =	3.38 ac-ft	3.11 ac-ft	3.94 ac-ft	9.89 ac-ft
ΔQ =	**0.35 ac-ft**	**0.34 ac-ft**	**0.37 ac-ft**	**0.44 ac-ft**

Attenuation V_{req} = 0.37 ac-ft

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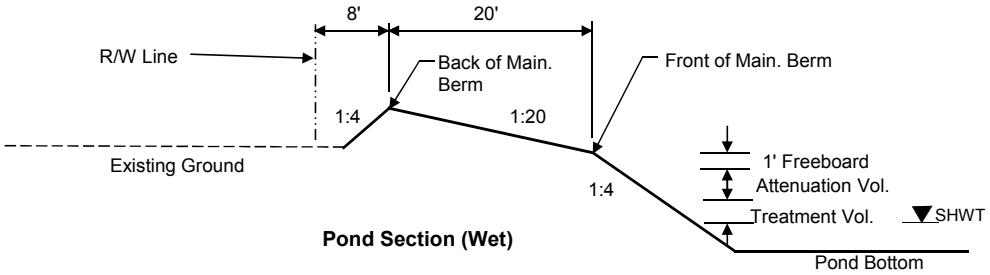
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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	60.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	58.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	63.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	675 ft	
Estimated Energy Losses =	0.7 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.33 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
60.00	Pond R/W	0.95 ac	180.0 ft	230.0 ft	
62.00	Back of Main. Berm	0.81 ac	164.0 ft	214.0 ft	1.91 ac-ft
61.50		0.64 ac	144.0 ft	194.0 ft	1.54 ac-ft
61.00	Front of Main. Berm	0.50 ac	124.0 ft	174.0 ft	1.26 ac-ft
60.00	Provided Treat.Vol.+Att.Vol	0.44 ac	116.0 ft	166.0 ft	0.79 ac-ft
59.80	Req'd Treat.Vol+Att. Vol	0.43 ac	114.4 ft	164.4 ft	0.70 ac-ft
59.75	Estimated Storm Sewer TW	0.43 ac	114.0 ft	164.0 ft	0.68 ac-ft
58.90	Top of Treatment Vol.	0.39 ac	107.2 ft	157.2 ft	0.33 ac-ft
58.00	Normal Water Level	0.34 ac	100.0 ft	150.0 ft	0.00 ac-ft
56.00		0.26 ac	84.0 ft	134.0 ft	
53.00	Pond Bottom	0.15 ac	60.0 ft	110.0 ft	

Required Treatment+Attenuation Vol.= 0.70 ac-ft
Required Treatment+Attenuation Stage= 59.80 ft

Provided Treatment+Attenuation Vol.= 0.79 ac-ft
Provided Treatment+Attenuation Stage= 60.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.68 ac-ft
Estimated Storm Sewer TW EL.= 59.75 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.14 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8D**

Station Limits: From: 10042+34 To: 10062+09 Roadway Length = 1975 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.05 ac
Pervious Area*: 3.88 ac
Total Roadway Area *: 5.93 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 3.49 ac

Total Area:

Impervious Area: **2.05 ac**
Pervious Area: **7.37 ac**
Total Area: **9.42 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.92 ac	90.1
Impervious areas; Streets & roads	D	98	1.13 ac	110.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.93 ac	36.3
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.03 ac	2.5
Commercial & business (85% impervious)	A	89	0.50 ac	44.8
Commercial & business (85% impervious)	D	95	0.28 ac	26.7
Residential Areas (1/4 acre, 38% Impervious)	A	61	0.08 ac	4.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.06 ac	2.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	1.96 ac	160.6
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.04 ac	2.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	3.49 ac	268.8
		Total:	9.42 ac	751.0

CN = Total CN*Area / Total Area = **79.7**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.12 in**	**4.66 in**	**6.06 in**	**16.25 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.55 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8D**

Offsite Area:

Impervious Area: **1.58 ac**
Pervious Area: **10.98 ac**
Total Area: **12.56 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.28 ac	27.3
Impervious areas; Streets & roads	A	98	1.30 ac	127.1
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.54 ac	123.2
Commercial & business (85% impervious)	A	89	0.70 ac	62.6
Commercial & business (85% impervious)	D	95	2.84 ac	269.7
Industrial (72% Impervious)	D	93	1.65 ac	153.1
Residential Areas (1/4 acre, 38% Impervious)	A	61	1.32 ac	80.3
Residential Areas (1/4 acre, 38% Impervious)	D	87	0.57 ac	49.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.82 ac	37.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.54 ac	118.9
		Total:	12.56 ac	1049.9

CN = Total CN*Area / Total Area = **83.6**

Runoff:

			SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) =	$\frac{1000}{CN} - 10 =$	**1.96 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	$\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**5.57 in**	**5.09 in**	**6.53 in**	**16.83 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8D**

Station Limits: From: 10042+34 To: 10062+09 Roadway Length = 1975 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.99 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	1.94 ac	*Areas measured in Microstation
Total Roadway Area *:	5.93 ac	

Pond Area:

Pervious Pond Area :	1.75 ac	
Water Surface Area:	1.74 ac	Wet Pond
Total Pond Area:	3.49 ac	

Total Area:

Impervious Area:	**3.99 ac**
Pervious Area:	**3.70 ac**
Water Surface Area:	**1.74 ac**
Total Area:	**9.42 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.72 ac	168.3
Impervious areas; Streets & roads	D	98	2.27 ac	222.5
Proposed Roadway Pervious	A	39	0.84 ac	32.6
Proposed Roadway Pervious	D	80	1.11 ac	88.5
Proposed Pond Pervious	D	80	1.75 ac	140.4
Proposed Ponds (Water Surface)	D	100	1.74 ac	173.7
		Total:	9.42 ac	826.1

CN = Total CN*Area / Total Area = **87.7**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.04 in**	**5.55 in**	**7.02 in**	**17.41 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.41 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8D**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.33 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.33 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.02 ac-ft	3.66 ac-ft	4.76 ac-ft	12.76 ac-ft
Q_{post} =	4.74 ac-ft	4.36 ac-ft	5.51 ac-ft	13.67 ac-ft
$Q_{offsite}$ =	5.83 ac-ft	5.33 ac-ft	6.83 ac-ft	17.62 ac-ft
$\Delta Q + Q_{offsite}$ =	**6.55 ac-ft**	**6.03 ac-ft**	**7.58 ac-ft**	**18.53 ac-ft**

Attenuation V_{req} = 7.58 ac-ft

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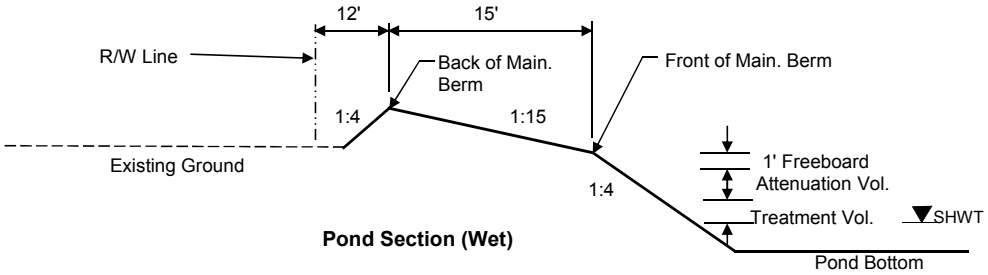
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **8**
POND NAME : **8D**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	61.00
Pond Tie-In Width =	12.0 ft	@ 1:4	Normal Water Elevation =	58.00
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	63.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	275 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.73 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
61.00	Pond R/W	3.49 ac	685.0 ft	222.0 ft	
64.00	Back of Main. Berm	3.00 ac	661.0 ft	198.0 ft	13.14 ac-ft
63.50		2.71 ac	646.0 ft	183.0 ft	11.71 ac-ft
63.00	Front of Main. Berm	2.43 ac	631.0 ft	168.0 ft	10.43 ac-ft
62.00	Provided Treat.Vol.+Att.Vol	2.29 ac	623.0 ft	160.0 ft	8.05 ac-ft
61.95	Req'd Treat.Vol+Att. Vol	2.28 ac	622.6 ft	159.6 ft	7.92 ac-ft
61.25	Estimated Storm Sewer TW	2.18 ac	617.0 ft	154.0 ft	6.37 ac-ft
58.19	Top of Treatment Vol.	1.76 ac	592.5 ft	129.5 ft	0.33 ac-ft
58.00	Normal Water Level	1.74 ac	591.0 ft	128.0 ft	0.00 ac-ft
56.00		1.48 ac	575.0 ft	112.0 ft	
55.00	Pond Bottom	1.35 ac	567.0 ft	104.0 ft	

Required Treatment+Attenuation Vol.= 7.92 ac-ft
Required Treatment+Attenuation Stage= 61.95 ft

Provided Treatment+Attenuation Vol.= 8.05 ac-ft
Provided Treatment+Attenuation Stage= 62.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.37 ac-ft
Estimated Storm Sewer TW EL.= 61.25 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 4.19 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9A**

Station Limits: From: 10062+09 To: 10077+36

Roadway Length = 1527 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.00 ac
Pervious Area*: 3.42 ac
Total Roadway Area *: 4.42 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.16 ac

Total Area:

Impervious Area: **1.00 ac**
Pervious Area: **4.58 ac**
Total Area: **5.58 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.89 ac	87.1
Impervious areas; Streets & roads	D	98	0.11 ac	10.7
Residential Areas (1/4 acre, 38% Impervious)	A	61	0.70 ac	42.5
Residential Areas (1/2 acre, 25% Impervious)	A	54	0.29 ac	15.8
Residential Areas (2.0 acre, 12% Impervious)	A	46	2.23 ac	102.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.20 ac	16.4
Woods-grass combination (orchard or tree farm); Good condition	A	32	1.16 ac	37.0
		Total:	5.58 ac	312.2

CN = Total CN*Area / Total Area = **56.0**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **7.86 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**2.55 in**	**2.22 in**	**3.25 in**	**12.01 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9A**

Station Limits: From: 10062+09 To: 10077+36 Roadway Length = 1527 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.08 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	1.34 ac	*Areas measured in Microstation
Total Roadway Area *:	4.42 ac	

Pond Area:

Pervious Pond Area :	0.86 ac	
Water Surface Area:	0.30 ac	Wet Pond
Total Pond Area:	1.16 ac	

Total Area:

Impervious Area:	**3.08 ac**
Pervious Area:	**2.20 ac**
Water Surface Area:	**0.30 ac**
Total Area:	**5.58 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.75 ac	269.8
Impervious areas; Streets & roads	D	98	0.33 ac	32.4
Proposed Roadway Pervious	A	39	1.19 ac	46.5
Proposed Roadway Pervious	D	80	0.14 ac	11.5
Proposed Pond Pervious	A	39	0.86 ac	33.6
Proposed Ponds (Water Surface)	A	100	0.30 ac	29.5
		Total:	5.58 ac	423.3

CN = Total CN*Area / Total Area = **75.9**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.70 in**	**4.25 in**	**5.60 in**	**15.66 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.17 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.26 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.26 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.18 ac-ft	1.03 ac-ft	1.51 ac-ft	5.58 ac-ft
Q_{post} =	2.18 ac-ft	1.97 ac-ft	2.60 ac-ft	7.28 ac-ft
ΔQ =	**1.00 ac-ft**	**0.94 ac-ft**	**1.10 ac-ft**	**1.70 ac-ft**

Attenuation V_{req} = 1.10 ac-ft

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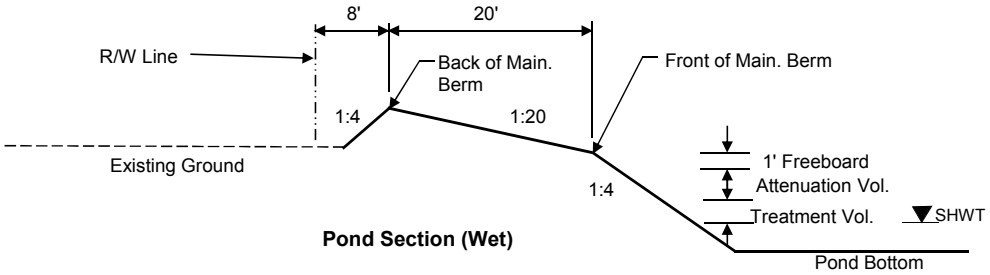
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	64.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	60.50
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	66.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	675 ft	
Estimated Energy Losses =	0.7 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	64.33 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.16 ac	140.0 ft	360.0 ft	
66.00	Back of Main. Berm	0.98 ac	124.0 ft	344.0 ft	2.76 ac-ft
65.50		0.77 ac	104.0 ft	324.0 ft	2.32 ac-ft
65.00	Front of Main. Berm	0.59 ac	84.0 ft	304.0 ft	1.98 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	0.52 ac	76.0 ft	296.0 ft	1.42 ac-ft
63.87	Req'd Treat.Vol+Att. Vol	0.51 ac	75.0 ft	295.0 ft	1.35 ac-ft
63.56	Estimated Storm Sewer TW	0.49 ac	72.5 ft	292.5 ft	1.20 ac-ft
61.30	Top of Treatment Vol.	0.34 ac	54.4 ft	274.4 ft	0.26 ac-ft
60.50	Normal Water Level	0.30 ac	48.0 ft	268.0 ft	0.00 ac-ft
58.50		0.19 ac	32.0 ft	252.0 ft	
55.00	Pond Bottom	0.02 ac	4.0 ft	224.0 ft	

Required Treatment+Attenuation Vol.= 1.35 ac-ft
Required Treatment+Attenuation Stage= 63.87 ft

Provided Treatment+Attenuation Vol.= 1.42 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.20 ac-ft
Estimated Storm Sewer TW EL.= 63.56 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.39 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9B**

Station Limits: From: 10062+09 To: 10077+36

Roadway Length = 1527 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.00 ac
Pervious Area*: 3.42 ac
Total Roadway Area *: 4.42 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.14 ac

Total Area:

Impervious Area: **1.00 ac**
Pervious Area: **4.56 ac**
Total Area: **5.56 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.89 ac	87.1
Impervious areas; Streets & roads	D	98	0.11 ac	10.7
Residential Areas (1/4 acre, 38% Impervious)	A	61	0.70 ac	42.5
Residential Areas (1/2 acre, 25% Impervious)	A	54	0.29 ac	15.8
Residential Areas (2.0 acre, 12% Impervious)	A	46	2.23 ac	102.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.20 ac	16.4
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	1.14 ac	44.5
		Total:	5.56 ac	319.7

CN = Total CN*Area / Total Area = **57.5**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **7.39 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**2.70 in**	**2.36 in**	**3.42 in**	**12.32 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9B**

Station Limits: From: 10062+09 To: 10077+36 Roadway Length = 1527 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.08 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	1.34 ac	*Areas measured in Microstation
Total Roadway Area *:	4.42 ac	

Pond Area:

Pervious Pond Area :	1.14 ac	Dry Pond
Water Surface Area:	0.00 ac	
Total Pond Area:	1.14 ac	

Total Area:

Impervious Area:	**3.08 ac**
Pervious Area:	**2.48 ac**
Water Surface Area:	**0.00 ac**
Total Area:	**5.56 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.75 ac	269.8
Impervious areas; Streets & roads	D	98	0.33 ac	32.4
Proposed Roadway Pervious	A	39	1.19 ac	46.5
Proposed Roadway Pervious	D	80	0.14 ac	11.5
Proposed Pond Pervious	A	39	1.14 ac	44.5
Proposed Ponds (Water Surface)	A	100	0.00 ac	0.0
		Total:	5.56 ac	404.7

CN = Total CN*Area / Total Area = **72.8**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.74 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.34 in**	**3.91 in**	**5.23 in**	**15.15 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Dry Retention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Dry Retention	**0.50 in**	x DCIA =	0.13 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.13 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.25 ac-ft	1.09 ac-ft	1.58 ac-ft	5.71 ac-ft
Q_{post} =	2.01 ac-ft	1.81 ac-ft	2.42 ac-ft	7.02 ac-ft
ΔQ =	**0.76 ac-ft**	**0.72 ac-ft**	**0.84 ac-ft**	**1.31 ac-ft**

Attenuation V_{req} = 0.84 ac-ft

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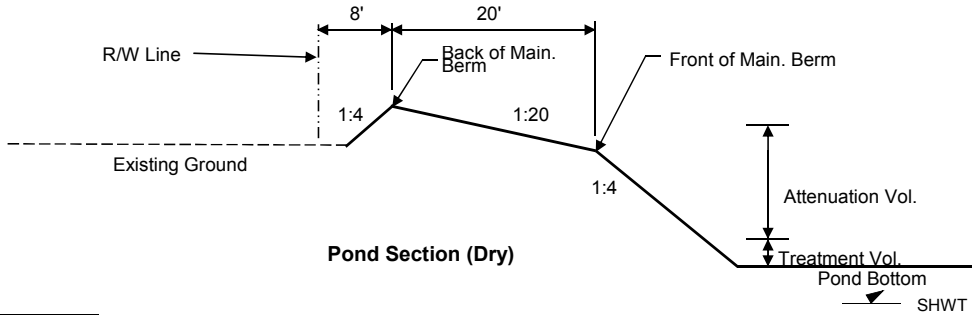
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	61.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Seasonal High Water Elevation =	56.25
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	66.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1850 ft	
Estimated Energy Losses =	1.9 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	63.15 ft	



Pond Section (Dry)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
61.00	Pond R/W	1.14 ac	223.0 ft	223.0 ft	
63.00	Back of Main. Berm	0.98 ac	207.0 ft	207.0 ft	2.47 ac-ft
62.50		0.80 ac	187.0 ft	187.0 ft	2.03 ac-ft
62.00	Front of Main. Berm	0.64 ac	167.0 ft	167.0 ft	1.66 ac-ft
61.00	Provided Treat.Vol.+Att.Vol	0.58 ac	159.0 ft	159.0 ft	1.05 ac-ft
60.87	Req'd Treat.Vol+Att. Vol	0.57 ac	158.0 ft	158.0 ft	0.97 ac-ft
60.65	Estimated Storm Sewer TW	0.56 ac	156.2 ft	156.2 ft	0.85 ac-ft
59.28	Top of Treatment Vol.	0.48 ac	145.2 ft	145.2 ft	0.13 ac-ft
59.00	Pond Bottom	0.47 ac	143.0 ft	143.0 ft	0.00 ac-ft

Required Treatment+Attenuation Vol.= 0.97 ac-ft
Required Treatment+Attenuation Stage= 60.87 ft

Provided Treatment+Attenuation Vol.= 1.05 ac-ft
Provided Treatment+Attenuation Stage= 61.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.85 ac-ft
Estimated Storm Sewer TW EL.= 60.65 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.37 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9C**

Station Limits: From: 10062+09 To: 10077+36

Roadway Length = 1527 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.00 ac
Pervious Area*: 3.42 ac
Total Roadway Area *: 4.42 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.01 ac

Total Area:

Impervious Area: **1.00 ac**
Pervious Area: **4.43 ac**
Total Area: **5.43 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.89 ac	87.1
Impervious areas; Streets & roads	D	98	0.11 ac	10.7
Residential Areas (1/4 acre, 38% Impervious)	A	61	0.70 ac	42.5
Residential Areas (1/2 acre, 25% Impervious)	A	54	0.29 ac	15.8
Residential Areas (2.0 acre, 12% Impervious)	A	46	2.23 ac	102.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.20 ac	16.4
Woods-grass combination (orchard or tree farm); Good condition	A	32	1.01 ac	32.4
		Total:	5.43 ac	307.5

CN = Total CN*Area / Total Area = **56.6**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **7.66 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**2.61 in**	**2.28 in**	**3.32 in**	**12.14 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9C**

Station Limits: From: 10062+09 To: 10077+36

Roadway Length = 1527 ft
R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.08 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	1.34 ac	*Areas measured in Microstation
Total Roadway Area *:	4.42 ac	

Pond Area:

Pervious Pond Area :	0.69 ac	
Water Surface Area:	0.32 ac	Wet Pond
Total Pond Area:	1.01 ac	

Total Area:

Impervious Area:	**3.08 ac**
Pervious Area:	**2.03 ac**
Water Surface Area:	**0.32 ac**
Total Area:	**5.43 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.75 ac	269.8
Impervious areas; Streets & roads	D	98	0.33 ac	32.4
Proposed Roadway Pervious	A	39	1.19 ac	46.5
Proposed Roadway Pervious	D	80	0.14 ac	11.5
Proposed Pond Pervious	A	39	0.69 ac	27.0
Proposed Ponds (Water Surface)	A	100	0.32 ac	31.9
		Total:	5.43 ac	419.1

CN = Total CN*Area / Total Area = **77.2**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.84 in**	**4.38 in**	**5.76 in**	**15.86 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.96 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.26 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.26 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.18 ac-ft	1.03 ac-ft	1.50 ac-ft	5.50 ac-ft
Q_{post} =	2.19 ac-ft	1.98 ac-ft	2.60 ac-ft	7.18 ac-ft
ΔQ =	**1.01 ac-ft**	**0.95 ac-ft**	**1.10 ac-ft**	**1.68 ac-ft**

Attenuation V_{req} = 1.10 ac-ft

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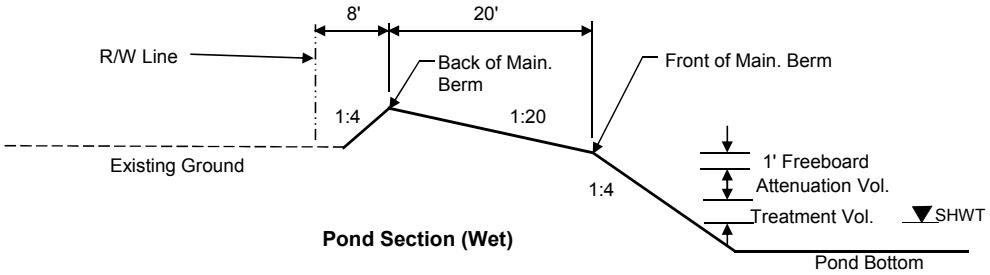
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **9**
POND NAME : **9C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	64.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	60.50
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	66.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	675 ft	
Estimated Energy Losses =	0.7 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	64.33 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.01 ac	215.0 ft	205.0 ft	
66.00	Back of Main. Berm	0.86 ac	199.0 ft	189.0 ft	2.64 ac-ft
65.50		0.69 ac	179.0 ft	169.0 ft	2.25 ac-ft
65.00	Front of Main. Berm	0.54 ac	159.0 ft	149.0 ft	1.94 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	0.49 ac	151.0 ft	141.0 ft	1.41 ac-ft
63.89	Req'd Treat.Vol+Att. Vol	0.48 ac	150.1 ft	140.1 ft	1.36 ac-ft
63.59	Estimated Storm Sewer TW	0.47 ac	147.7 ft	137.7 ft	1.21 ac-ft
61.28	Top of Treatment Vol.	0.35 ac	129.2 ft	119.2 ft	0.26 ac-ft
60.50	Normal Water Level	0.32 ac	123.0 ft	113.0 ft	0.00 ac-ft
58.50		0.24 ac	107.0 ft	97.0 ft	
54.00	Pond Bottom	0.10 ac	71.0 ft	61.0 ft	

Required Treatment+Attenuation Vol.= 1.36 ac-ft
Required Treatment+Attenuation Stage= 63.89 ft

Provided Treatment+Attenuation Vol.= 1.41 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.21 ac-ft
Estimated Storm Sewer TW EL.= 63.59 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.21 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10A**

Station Limits: From: 10077+36 To: 10105+04

Roadway Length = 2768 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.73 ac
Pervious Area*: 6.27 ac
Total Roadway Area *: 8.00 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.83 ac

Total Area:

Impervious Area: **1.73 ac**
Pervious Area: **8.10 ac**
Total Area: **9.83 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.73 ac	169.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.02 ac	1.0
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.54 ac	208.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	3.71 ac	293.1
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.83 ac	146.0
		Total:	9.83 ac	817.8

CN = Total CN*Area / Total Area = **83.2**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.53 in**	**5.05 in**	**6.48 in**	**16.78 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.01 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10A**

Station Limits: From: 10077+36 To: 10105+04 Roadway Length = 2768 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.59 ac
Pervious Roadway Area:	2.41 ac
Total Roadway Area *:	8.00 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.85 ac	
Water Surface Area:	0.97 ac	Wet Pond
Total Pond Area:	1.83 ac	

Total Area:

Impervious Area:	**5.59 ac**
Pervious Area:	**3.26 ac**
Water Surface Area:	**0.97 ac**
Total Area:	**9.83 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.59 ac	547.9
Proposed Roadway Pervious	D	80	2.41 ac	192.9
Proposed Pond Pervious	D	80	0.85 ac	68.3
Proposed Ponds (Water Surface)	D	100	0.97 ac	97.2
		Total:	9.83 ac	906.1

CN = Total CN*Area / Total Area = **92.2**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.84 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.57 in**	**6.08 in**	**7.57 in**	**18.02 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.47 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.47 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.53 ac-ft	4.14 ac-ft	5.31 ac-ft	13.74 ac-ft
Q_{post} =	5.38 ac-ft	4.98 ac-ft	6.19 ac-ft	14.76 ac-ft
ΔQ =	**0.86 ac-ft**	**0.84 ac-ft**	**0.89 ac-ft**	**1.02 ac-ft**

Attenuation V_{req} = 1.02 ac-ft

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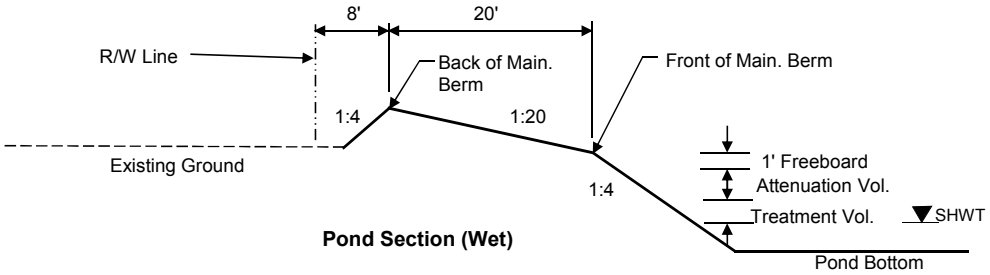
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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	56.50
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1150 ft	
Estimated Energy Losses =	1.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.85 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.83 ac	300.0 ft	265.0 ft	
60.00	Back of Main. Berm	1.62 ac	284.0 ft	249.0 ft	4.07 ac-ft
59.50		1.39 ac	264.0 ft	229.0 ft	3.32 ac-ft
59.00	Front of Main. Berm	1.17 ac	244.0 ft	209.0 ft	2.68 ac-ft
58.00	Provided Treat.Vol.+Att.Vol	1.09 ac	236.0 ft	201.0 ft	1.55 ac-ft
57.94	Req'd Treat.Vol+Att. Vol	1.08 ac	235.5 ft	200.5 ft	1.48 ac-ft
57.78	Estimated Storm Sewer TW	1.07 ac	234.2 ft	199.2 ft	1.31 ac-ft
56.97	Top of Treatment Vol.	1.01 ac	227.8 ft	192.8 ft	0.47 ac-ft
56.50	Normal Water Level	0.97 ac	224.0 ft	189.0 ft	0.00 ac-ft
54.50		0.83 ac	208.0 ft	173.0 ft	
50.00	Pond Bottom	0.54 ac	172.0 ft	137.0 ft	

Required Treatment+Attenuation Vol.= 1.48 ac-ft
Required Treatment+Attenuation Stage= 57.94 ft

Provided Treatment+Attenuation Vol.= 1.55 ac-ft
Provided Treatment+Attenuation Stage= 58.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.31 ac-ft
Estimated Storm Sewer TW EL.= 57.78 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.19 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10B**

Station Limits: From: 10077+36 To: 10105+04 Roadway Length = 2768 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.73 ac
Pervious Area*: 6.27 ac
Total Roadway Area *: 8.00 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.64 ac

Total Area:
Impervious Area: **1.73 ac**
Pervious Area: **7.91 ac**
Total Area: **9.64 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.73 ac	169.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.02 ac	1.0
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.54 ac	208.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	3.71 ac	293.1
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.64 ac	129.3
		Total:	9.64 ac	801.1

CN = Total CN*Area / Total Area = **83.1**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.52 in**	**5.04 in**	**6.47 in**	**16.76 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.03 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10B**

Station Limits: From: 10077+36 To: 10105+04 Roadway Length = 2768 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.59 ac
Pervious Roadway Area:	2.41 ac
Total Roadway Area *:	8.00 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.91 ac	
Water Surface Area:	0.72 ac	Wet Pond
Total Pond Area:	1.64 ac	

Total Area:

Impervious Area:	**5.59 ac**
Pervious Area:	**3.32 ac**
Water Surface Area:	**0.72 ac**
Total Area:	**9.64 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.59 ac	547.9
Proposed Roadway Pervious	D	80	2.41 ac	192.9
Proposed Pond Pervious	D	80	0.91 ac	73.1
Proposed Ponds (Water Surface)	D	100	0.72 ac	72.4
		Total:	9.64 ac	886.1

CN = Total CN*Area / Total Area = **91.9**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.54 in**	**6.05 in**	**7.53 in**	**17.99 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.88 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.47 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.47 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.43 ac-ft	4.05 ac-ft	5.20 ac-ft	13.46 ac-ft
Q_{post} =	5.25 ac-ft	4.86 ac-ft	6.05 ac-ft	14.45 ac-ft
ΔQ =	**0.82 ac-ft**	**0.81 ac-ft**	**0.85 ac-ft**	**0.98 ac-ft**

Attenuation V_{req} = 0.98 ac-ft

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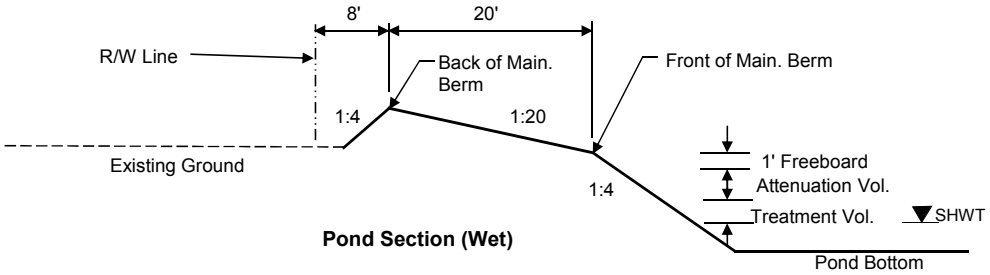
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	59.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	56.00
Maximum Storage Depth (**SD**) =	3.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	800 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	58.20 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
59.00	Pond R/W	1.64 ac	310.0 ft	230.0 ft	
61.00	Back of Main. Berm	1.44 ac	294.0 ft	214.0 ft	4.70 ac-ft
60.50		1.22 ac	274.0 ft	194.0 ft	4.04 ac-ft
60.00	Front of Main. Berm	1.01 ac	254.0 ft	174.0 ft	3.48 ac-ft
59.00	Provided Treat.Vol.+Att.Vol	0.94 ac	246.0 ft	166.0 ft	2.49 ac-ft
57.84	Req'd Treat.Vol+Att. Vol	0.85 ac	236.7 ft	156.7 ft	1.45 ac-ft
57.63	Estimated Storm Sewer TW	0.84 ac	235.0 ft	155.0 ft	1.27 ac-ft
56.63	Top of Treatment Vol.	0.77 ac	227.0 ft	147.0 ft	0.47 ac-ft
56.00	Normal Water Level	0.72 ac	222.0 ft	142.0 ft	0.00 ac-ft
54.00		0.60 ac	206.0 ft	126.0 ft	
50.00	Pond Bottom	0.38 ac	174.0 ft	94.0 ft	

Required Treatment+Attenuation Vol.= 1.45 ac-ft
Required Treatment+Attenuation Stage= 57.84 ft

Provided Treatment+Attenuation Vol.= 2.49 ac-ft
Provided Treatment+Attenuation Stage= 59.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.27 ac-ft
Estimated Storm Sewer TW EL.= 57.63 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.96 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10C**

Station Limits: From: 10077+36 To: 10105+04

Roadway Length = 2768 ft
R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.73 ac
Pervious Area*: 6.27 ac
Total Roadway Area *: 8.00 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.87 ac

Total Area:

Impervious Area: **1.73 ac**
Pervious Area: **8.14 ac**
Total Area: **9.87 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.73 ac	169.4
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.02 ac	1.0
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.54 ac	208.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	3.71 ac	293.1
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.87 ac	149.7
		Total:	9.87 ac	821.6

CN = Total CN*Area / Total Area = **83.2**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.02 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.53 in**	**5.05 in**	**6.48 in**	**16.78 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10C**

Station Limits: From: 10077+36 To: 10105+04 Roadway Length = 2768 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.59 ac
Pervious Roadway Area:	2.41 ac
Total Roadway Area *:	8.00 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.94 ac	
Water Surface Area:	0.94 ac	Wet Pond
Total Pond Area:	1.87 ac	

Total Area:

Impervious Area:	**5.59 ac**
Pervious Area:	**3.35 ac**
Water Surface Area:	**0.94 ac**
Total Area:	**9.87 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.59 ac	547.9
Proposed Roadway Pervious	D	80	2.41 ac	192.9
Proposed Pond Pervious	D	80	0.94 ac	74.8
Proposed Ponds (Water Surface)	D	100	0.94 ac	93.7
		Total:	9.87 ac	909.2

CN = Total CN*Area / Total Area = **92.1**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.86 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.56 in**	**6.07 in**	**7.55 in**	**18.01 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.47 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.47 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.55 ac-ft	4.16 ac-ft	5.33 ac-ft	13.80 ac-ft
Q_{post} =	5.40 ac-ft	4.99 ac-ft	6.21 ac-ft	14.81 ac-ft
ΔQ =	**0.85 ac-ft**	**0.83 ac-ft**	**0.88 ac-ft**	**1.01 ac-ft**

Attenuation V_{req} = 1.01 ac-ft

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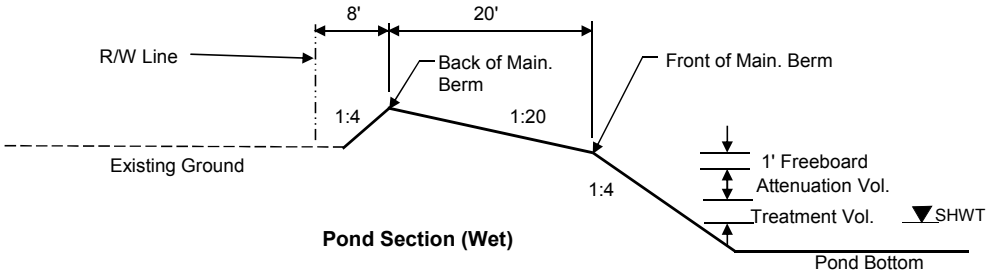
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **10**
POND NAME : **10C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.50
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1500 ft	
Estimated Energy Losses =	1.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.50 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	1.87 ac	416.0 ft	196.0 ft	
59.00	Back of Main. Berm	1.65 ac	400.0 ft	180.0 ft	4.02 ac-ft
58.50		1.40 ac	380.0 ft	160.0 ft	3.26 ac-ft
58.00	Front of Main. Berm	1.16 ac	360.0 ft	140.0 ft	2.62 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.07 ac	352.0 ft	132.0 ft	1.50 ac-ft
56.98	Req'd Treat.Vol+Att. Vol	1.06 ac	351.8 ft	131.8 ft	1.48 ac-ft
56.81	Estimated Storm Sewer TW	1.05 ac	350.5 ft	130.5 ft	1.30 ac-ft
55.99	Top of Treatment Vol.	0.98 ac	343.9 ft	123.9 ft	0.47 ac-ft
55.50	Normal Water Level	0.94 ac	340.0 ft	120.0 ft	0.00 ac-ft
53.50		0.77 ac	324.0 ft	104.0 ft	
50.00	Pond Bottom	0.52 ac	296.0 ft	76.0 ft	

Required Treatment+Attenuation Vol.= 1.48 ac-ft
Required Treatment+Attenuation Stage= 56.98 ft

Provided Treatment+Attenuation Vol.= 1.50 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.30 ac-ft
Estimated Storm Sewer TW EL.= 56.81 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.25 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11A**

Station Limits: From: 10105+04 To: 10124+41 Roadway Length = 1937 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.75 ac
Pervious Area*: 6.55 ac
Total Roadway Area *: 8.31 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.53 ac

Total Area:

Impervious Area: **1.75 ac**
Pervious Area: **8.08 ac**
Total Area: **9.84 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.75 ac	171.9
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.22 ac	18.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.37 ac	108.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	4.96 ac	381.9
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.53 ac	117.9
		Total:	9.84 ac	798.3

CN = Total CN*Area / Total Area = **81.1**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.29 in**	**4.82 in**	**6.23 in**	**16.47 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.33 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11A**

Station Limits: From: 10105+04 To: 10124+41 Roadway Length = 1937 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.12 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.19 ac	*Areas measured in Microstation
Total Roadway Area *:	8.31 ac	

Pond Area:

Pervious Pond Area :	0.67 ac	
Water Surface Area:	0.87 ac	Wet Pond
Total Pond Area:	1.53 ac	

Total Area:

Impervious Area:	**4.12 ac**
Pervious Area:	**4.86 ac**
Water Surface Area:	**0.87 ac**
Total Area:	**9.84 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.12 ac	403.4
Proposed Roadway Pervious	D	80	4.19 ac	335.2
Proposed Pond Pervious	D	80	0.67 ac	53.2
Proposed Ponds (Water Surface)	D	100	0.87 ac	86.6
		Total:	9.84 ac	878.5

CN = Total CN*Area / Total Area = **89.3**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.23 in**	**5.74 in**	**7.21 in**	**17.63 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.20 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.34 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.34 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.34 ac-ft	3.95 ac-ft	5.11 ac-ft	13.50 ac-ft
Q_{post} =	5.11 ac-ft	4.71 ac-ft	5.91 ac-ft	14.46 ac-ft
ΔQ =	**0.77 ac-ft**	**0.76 ac-ft**	**0.80 ac-ft**	**0.95 ac-ft**

Attenuation V_{req} = 0.95 ac-ft

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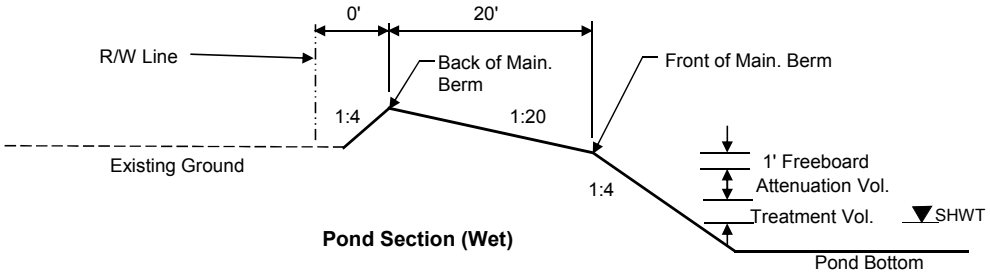
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	65.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	61.00	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	470 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.53 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
65.00	Pond R/W	1.53 ac	248.0 ft	269.0 ft	
65.00	Back of Main. Berm	1.53 ac	248.0 ft	269.0 ft	4.25 ac-ft
64.50		1.30 ac	228.0 ft	249.0 ft	3.54 ac-ft
64.00	Front of Main. Berm	1.09 ac	208.0 ft	229.0 ft	2.94 ac-ft
63.00	Provided Treat.Vol.+Att.Vol	1.01 ac	200.0 ft	221.0 ft	1.88 ac-ft
62.42	Req'd Treat.Vol+Att. Vol	0.97 ac	195.4 ft	216.4 ft	1.30 ac-ft
62.21	Estimated Storm Sewer TW	0.95 ac	193.7 ft	214.7 ft	1.10 ac-ft
61.39	Top of Treatment Vol.	0.89 ac	187.1 ft	208.1 ft	0.34 ac-ft
61.00	Normal Water Level	0.87 ac	184.0 ft	205.0 ft	0.00 ac-ft
59.00		0.73 ac	168.0 ft	189.0 ft	
55.00	Pond Bottom	0.49 ac	136.0 ft	157.0 ft	

Required Treatment+Attenuation Vol.= 1.30 ac-ft
Required Treatment+Attenuation Stage= 62.42 ft

Provided Treatment+Attenuation Vol.= 1.88 ac-ft
Provided Treatment+Attenuation Stage= 63.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.10 ac-ft
Estimated Storm Sewer TW EL.= 62.21 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.84 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11B**

Station Limits: From: 10105+04 To: 10124+41 Roadway Length = 1937 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.75 ac
Pervious Area*: 6.55 ac
Total Roadway Area *: 8.31 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.48 ac

Total Area:

Impervious Area: **1.75 ac**
Pervious Area: **8.03 ac**
Total Area: **9.79 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.75 ac	171.9
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.22 ac	18.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.37 ac	108.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	4.96 ac	381.9
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.48 ac	114.0
		Total:	9.79 ac	794.4

CN = Total CN*Area / Total Area = **81.2**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.29 in**	**4.82 in**	**6.23 in**	**16.47 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.32 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11B**

Station Limits: From: 10105+04 To: 10124+41 Roadway Length = 1937 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.12 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.19 ac	*Areas measured in Microstation
Total Roadway Area *:	8.31 ac	

Pond Area:

Pervious Pond Area :	0.79 ac	
Water Surface Area:	0.70 ac	Wet Pond
Total Pond Area:	1.48 ac	

Total Area:

Impervious Area:	**4.12 ac**
Pervious Area:	**4.98 ac**
Water Surface Area:	**0.70 ac**
Total Area:	**9.79 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.12 ac	403.4
Proposed Roadway Pervious	D	80	4.19 ac	335.2
Proposed Pond Pervious	D	80	0.79 ac	62.9
Proposed Ponds (Water Surface)	D	100	0.70 ac	69.5
		Total:	9.79 ac	871.0

CN = Total CN*Area / Total Area = **89.0**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.20 in**	**5.71 in**	**7.18 in**	**17.59 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.24 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.34 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.34 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.31 ac-ft	3.93 ac-ft	5.09 ac-ft	13.44 ac-ft
Q_{post} =	5.05 ac-ft	4.66 ac-ft	5.85 ac-ft	14.35 ac-ft
ΔQ =	**0.74 ac-ft**	**0.72 ac-ft**	**0.77 ac-ft**	**0.91 ac-ft**

Attenuation V_{req} = 0.91 ac-ft

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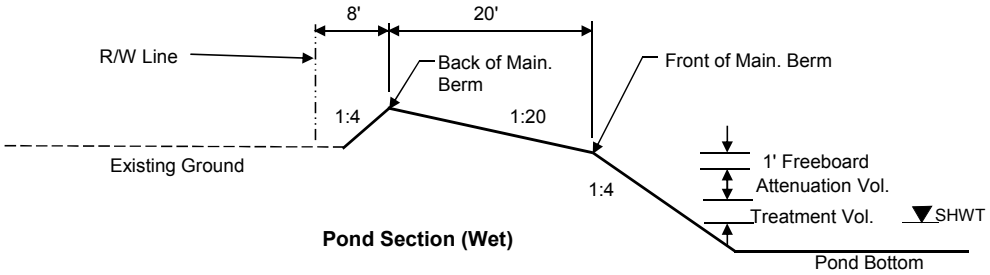
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	60.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	58.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	150 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.85 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
60.00	Pond R/W	1.48 ac	254.0 ft	254.0 ft	
62.00	Back of Main. Berm	1.30 ac	238.0 ft	238.0 ft	3.49 ac-ft
61.50		1.09 ac	218.0 ft	218.0 ft	2.89 ac-ft
61.00	Front of Main. Berm	0.90 ac	198.0 ft	198.0 ft	2.39 ac-ft
60.00	Provided Treat.Vol.+Att.Vol	0.83 ac	190.0 ft	190.0 ft	1.52 ac-ft
59.67	Req'd Treat.Vol+Att. Vol	0.81 ac	187.4 ft	187.4 ft	1.25 ac-ft
59.43	Estimated Storm Sewer TW	0.79 ac	185.4 ft	185.4 ft	1.06 ac-ft
58.48	Top of Treatment Vol.	0.73 ac	177.8 ft	177.8 ft	0.34 ac-ft
58.00	Normal Water Level	0.70 ac	174.0 ft	174.0 ft	0.00 ac-ft
56.00		0.57 ac	158.0 ft	158.0 ft	
55.00	Pond Bottom	0.52 ac	150.0 ft	150.0 ft	

Required Treatment+Attenuation Vol.= 1.26 ac-ft
Required Treatment+Attenuation Stage= 59.67 ft

Provided Treatment+Attenuation Vol.= 1.52 ac-ft
Provided Treatment+Attenuation Stage= 60.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.06 ac-ft
Estimated Storm Sewer TW EL.= 59.43 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.78 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11C**

Station Limits: From: 10105+04 To: 10124+41 Roadway Length = 1937 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.75 ac
Pervious Area*: 6.55 ac
Total Roadway Area *: 8.31 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.41 ac

Total Area:

Impervious Area: **1.75 ac**
Pervious Area: **7.97 ac**
Total Area: **9.72 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.75 ac	171.9
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.22 ac	18.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.37 ac	108.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	4.96 ac	381.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.41 ac	111.6
		Total:	9.72 ac	792.0

CN = Total CN*Area / Total Area = **81.5**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.33 in**	**4.86 in**	**6.27 in**	**16.52 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.27 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11C**

Station Limits: From: 10105+04 To: 10124+41 Roadway Length = 1937 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.12 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.19 ac	*Areas measured in Microstation
Total Roadway Area *:	8.31 ac	

Pond Area:

Pervious Pond Area :	0.66 ac	
Water Surface Area:	0.75 ac	Wet Pond
Total Pond Area:	1.41 ac	

Total Area:

Impervious Area:	**4.12 ac**
Pervious Area:	**4.85 ac**
Water Surface Area:	**0.75 ac**
Total Area:	**9.72 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.12 ac	403.4
Proposed Roadway Pervious	D	80	4.19 ac	335.2
Proposed Pond Pervious	D	80	0.66 ac	52.9
Proposed Ponds (Water Surface)	D	100	0.75 ac	75.2
		Total:	9.72 ac	866.8

CN = Total CN*Area / Total Area = **89.2**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.22 in**	**5.73 in**	**7.20 in**	**17.62 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.21 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.34 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.34 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.31 ac-ft	3.94 ac-ft	5.08 ac-ft	13.38 ac-ft
Q_{post} =	5.04 ac-ft	4.64 ac-ft	5.83 ac-ft	14.27 ac-ft
ΔQ =	**0.72 ac-ft**	**0.70 ac-ft**	**0.75 ac-ft**	**0.89 ac-ft**

Attenuation V_{req} = 0.89 ac-ft

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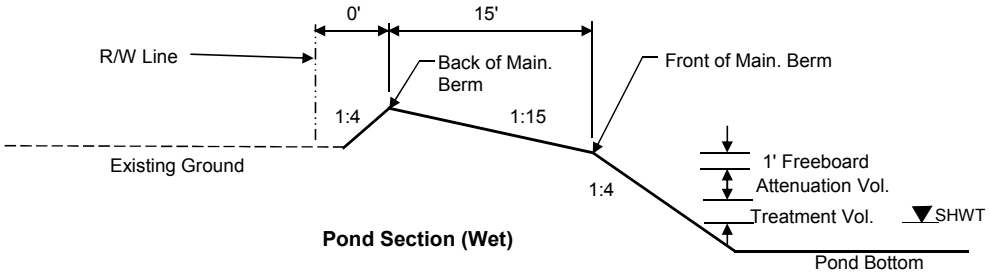
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **11**
POND NAME : **11C**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	65.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	59.75	*
Maximum Storage Depth (**SD**) =	3.25 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

*Pond Liner Required

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1750 ft	
Estimated Energy Losses =	1.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.25 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
65.00	Pond R/W	1.41 ac	324.0 ft	190.0 ft	
65.00	Back of Main. Berm	1.41 ac	324.0 ft	190.0 ft	5.14 ac-ft
64.50		1.24 ac	309.0 ft	175.0 ft	4.47 ac-ft
64.00	Front of Main. Berm	1.08 ac	294.0 ft	160.0 ft	3.89 ac-ft
63.00	Provided Treat.Vol.+Att.Vol	1.00 ac	286.0 ft	152.0 ft	2.84 ac-ft
61.27	Req'd Treat.Vol+Att. Vol	0.86 ac	272.2 ft	138.2 ft	1.23 ac-ft
61.06	Estimated Storm Sewer TW	0.85 ac	270.5 ft	136.5 ft	1.05 ac-ft
60.19	Top of Treatment Vol.	0.78 ac	263.5 ft	129.5 ft	0.34 ac-ft
59.75	Normal Water Elevation	0.75 ac	260.0 ft	126.0 ft	0.00 ac-ft
57.75		0.62 ac	244.0 ft	110.0 ft	
55.00	Pond Bottom	0.45 ac	222.0 ft	88.0 ft	

Required Treatment+Attenuation Vol.= 1.23 ac-ft
Required Treatment+Attenuation Stage= 61.27 ft

Provided Treatment+Attenuation Vol.= 2.84 ac-ft
Provided Treatment+Attenuation Stage= 63.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.05 ac-ft
Estimated Storm Sewer TW EL.= 61.06 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.70 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12A**

Station Limits: From: 10124+41 To: 10143+90

Roadway Length = 1949 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.96 ac
Pervious Area*: 6.83 ac
Total Roadway Area *: 8.79 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.44 ac

Total Area:

Impervious Area: **1.96 ac**
Pervious Area: **8.27 ac**
Total Area: **10.22 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.02 ac	100.1
Impervious areas; Streets & roads	D	98	0.94 ac	91.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.87 ac	33.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.28 ac	22.2
Woods-grass combination (orchard or tree farm); Good condition	A	32	0.47 ac	14.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	2.57 ac	203.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	2.17 ac	65.1
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.48 ac	36.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.44 ac	115.1
		Total:	10.22 ac	682.7

CN = Total CN*Area / Total Area = **66.8**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**3.69 in**	**3.28 in**	**4.51 in**	**14.11 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.98 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12A**

Station Limits: From: 10124+41 To: 10143+90 Roadway Length = 1949 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.14 ac
Pervious Roadway Area:	4.64 ac
Total Roadway Area *:	8.79 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.71 ac	
Water Surface Area:	0.73 ac	Wet Pond
Total Pond Area:	1.44 ac	

Total Area:

Impervious Area:	**4.14 ac**
Pervious Area:	**5.35 ac**
Water Surface Area:	**0.73 ac**
Total Area:	**10.22 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.40 ac	235.4
Impervious areas; Streets & roads	D	98	1.74 ac	170.5
Proposed Roadway Pervious	A	39	2.69 ac	105.0
Proposed Roadway Pervious	D	80	1.95 ac	156.1
Proposed Pond Pervious	A	39	0.71 ac	27.7
Proposed Ponds (Water Surface)	A	100	0.73 ac	72.9
		Total:	10.22 ac	767.6

CN = Total CN*Area / Total Area = **75.1**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.60 in**	**4.16 in**	**5.50 in**	**15.53 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.32 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.35 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.35 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.14 ac-ft	2.80 ac-ft	3.85 ac-ft	12.02 ac-ft
Q_{post} =	3.92 ac-ft	3.54 ac-ft	4.69 ac-ft	13.23 ac-ft
ΔQ =	**0.78 ac-ft**	**0.74 ac-ft**	**0.84 ac-ft**	**1.21 ac-ft**

Attenuation V_{req} = 1.21 ac-ft

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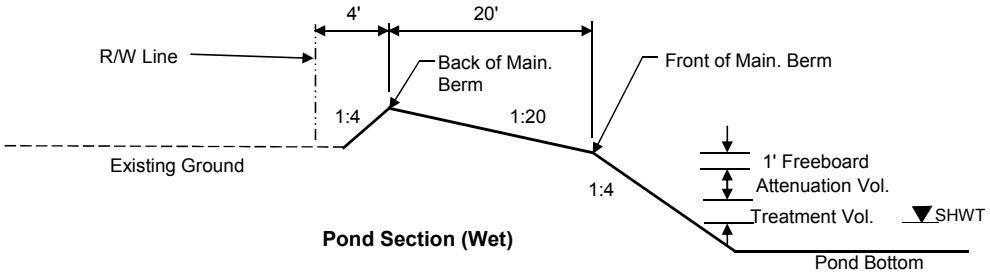
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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	64.00
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	61.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	500 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	0.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	63.50 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.44 ac	260.0 ft	241.0 ft	
65.00	Back of Main. Berm	1.35 ac	252.0 ft	233.0 ft	3.64 ac-ft
64.50		1.13 ac	232.0 ft	213.0 ft	3.02 ac-ft
64.00	Front of Main. Berm	0.94 ac	212.0 ft	193.0 ft	2.50 ac-ft
63.00	Provided Treat.Vol.+Att.Vol	0.87 ac	204.0 ft	185.0 ft	1.60 ac-ft
62.95	Req'd Treat.Vol+Att. Vol	0.86 ac	203.6 ft	184.6 ft	1.55 ac-ft
62.40	Estimated Storm Sewer TW	0.82 ac	199.2 ft	180.2 ft	1.09 ac-ft
61.47	Top of Treatment Vol.	0.76 ac	191.8 ft	172.8 ft	0.35 ac-ft
61.00	Normal Water Level	0.73 ac	188.0 ft	169.0 ft	0.00 ac-ft
59.00		0.60 ac	172.0 ft	153.0 ft	
54.00	Pond Bottom	0.34 ac	132.0 ft	113.0 ft	

Required Treatment+Attenuation Vol.= 1.55 ac-ft
Required Treatment+Attenuation Stage= 62.95 ft

Provided Treatment+Attenuation Vol.= 1.60 ac-ft
Provided Treatment+Attenuation Stage= 63.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.09 ac-ft
Estimated Storm Sewer TW EL.= 62.40 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.73 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12B**

Station Limits: From: 10124+41 To: 10143+90

Roadway Length = 1949 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.96 ac
Pervious Area*: 6.83 ac
Total Roadway Area *: 8.79 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.24 ac

Total Area:
Impervious Area: **1.96 ac**
Pervious Area: **8.06 ac**
Total Area: **10.02 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.02 ac	100.1
Impervious areas; Streets & roads	D	98	0.94 ac	91.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.87 ac	33.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.28 ac	22.2
Woods-grass combination (orchard or tree farm); Good condition	A	32	0.47 ac	14.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	2.57 ac	203.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	2.17 ac	65.1
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.48 ac	36.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.24 ac	98.9
		Total:	10.02 ac	666.5

CN = Total CN*Area / Total Area = **66.5**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**3.66 in**	**3.26 in**	**4.48 in**	**14.06 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **5.04 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12B**

Station Limits: From: 10124+41 To: 10143+90 Roadway Length = 1949 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.14 ac
Pervious Roadway Area:	4.64 ac
Total Roadway Area *:	8.79 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.71 ac	
Water Surface Area:	0.53 ac	Wet Pond
Total Pond Area:	1.24 ac	

Total Area:

Impervious Area:	**4.14 ac**
Pervious Area:	**5.35 ac**
Water Surface Area:	**0.53 ac**
Total Area:	**10.02 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.40 ac	235.4
Impervious areas; Streets & roads	D	98	1.74 ac	170.5
Proposed Roadway Pervious	A	39	2.69 ac	105.0
Proposed Roadway Pervious	D	80	1.95 ac	156.1
Proposed Pond Pervious	A	39	0.71 ac	27.5
Proposed Ponds (Water Surface)	A	100	0.53 ac	53.0
		Total:	10.02 ac	747.6

CN = Total CN*Area / Total Area = **74.6**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.55 in**	**4.11 in**	**5.45 in**	**15.45 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.41 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.35 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.35 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.05 ac-ft	2.72 ac-ft	3.74 ac-ft	11.74 ac-ft
Q_{post} =	3.80 ac-ft	3.43 ac-ft	4.55 ac-ft	12.90 ac-ft
ΔQ =	**0.74 ac-ft**	**0.71 ac-ft**	**0.81 ac-ft**	**1.16 ac-ft**

Attenuation V_{req} = 1.16 ac-ft

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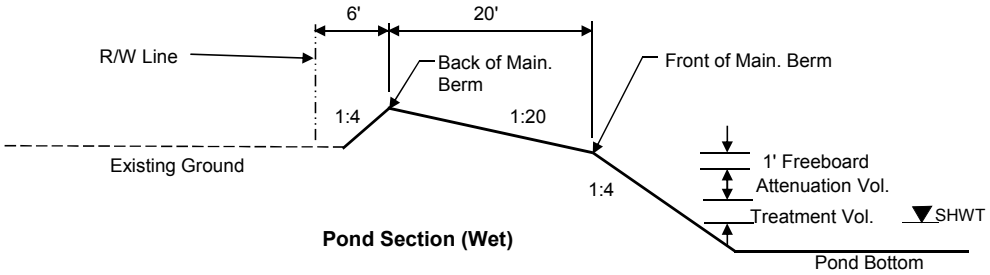
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	64.00
Pond Tie-In Width =	6.0 ft	@ 1:4	Normal Water Elevation =	61.00
Maximum Storage Depth (**SD**) =	2.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	1.0 ft	
HGL Clearance =	0.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	63.00 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.24 ac	232.0 ft	232.0 ft	
65.50	Back of Main. Berm	1.11 ac	220.0 ft	220.0 ft	3.15 ac-ft
65.00		0.92 ac	200.0 ft	200.0 ft	2.65 ac-ft
64.50	Front of Main. Berm	0.74 ac	180.0 ft	180.0 ft	2.23 ac-ft
63.50	Provided Treat.Vol.+Att.Vol	0.68 ac	172.0 ft	172.0 ft	1.51 ac-ft
63.48	Req'd Treat.Vol+Att. Vol	0.68 ac	171.8 ft	171.8 ft	1.50 ac-ft
62.80	Estimated Storm Sewer TW	0.64 ac	166.4 ft	166.4 ft	1.05 ac-ft
61.63	Top of Treatment Vol.	0.57 ac	157.0 ft	157.0 ft	0.35 ac-ft
61.00	Normal Water Level	0.53 ac	152.0 ft	152.0 ft	0.00 ac-ft
59.00		0.42 ac	136.0 ft	136.0 ft	
54.00	Pond Bottom	0.21 ac	96.0 ft	96.0 ft	

Required Treatment+Attenuation Vol.= 1.51 ac-ft
Required Treatment+Attenuation Stage= 63.48 ft

Provided Treatment+Attenuation Vol.= 1.51 ac-ft
Provided Treatment+Attenuation Stage= 63.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.05 ac-ft
Estimated Storm Sewer TW EL.= 62.80 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.48 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12C**

Station Limits: From: 10124+41 To: 10143+90 Roadway Length = 1949 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.96 ac
Pervious Area*: 6.83 ac
Total Roadway Area *: 8.79 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.20 ac

Total Area:
Impervious Area: **1.96 ac**
Pervious Area: **8.03 ac**
Total Area: **9.99 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.02 ac	100.1
Impervious areas; Streets & roads	D	98	0.94 ac	91.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.87 ac	33.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.28 ac	22.2
Woods-grass combination (orchard or tree farm); Good condition	A	32	0.47 ac	14.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	2.57 ac	203.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	2.17 ac	65.1
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.48 ac	36.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.20 ac	96.3
		Total:	9.99 ac	664.0

CN = Total CN*Area / Total Area = **66.5**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**3.65 in**	**3.25 in**	**4.48 in**	**14.05 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **5.05 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12C**

Station Limits: From: 10124+41 To: 10143+90 Roadway Length = 1949 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.14 ac
Pervious Roadway Area:	4.64 ac
Total Roadway Area *:	8.79 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.71 ac	
Water Surface Area:	0.50 ac	Wet Pond
Total Pond Area:	1.20 ac	

Total Area:

Impervious Area:	**4.14 ac**
Pervious Area:	**5.35 ac**
Water Surface Area:	**0.50 ac**
Total Area:	**9.99 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.40 ac	235.4
Impervious areas; Streets & roads	D	98	1.74 ac	170.5
Proposed Roadway Pervious	A	39	2.69 ac	105.0
Proposed Roadway Pervious	D	80	1.95 ac	156.1
Proposed Pond Pervious	A	39	0.71 ac	27.6
Proposed Ponds (Water Surface)	A	100	0.50 ac	49.6
		Total:	9.99 ac	744.2

CN = Total CN*Area / Total Area = **74.5**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.54 in**	**4.10 in**	**5.44 in**	**15.43 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **3.42 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.35 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.35 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.04 ac-ft	2.71 ac-ft	3.73 ac-ft	11.70 ac-ft
Q_{post} =	3.78 ac-ft	3.41 ac-ft	4.52 ac-ft	12.85 ac-ft
ΔQ =	**0.74 ac-ft**	**0.70 ac-ft**	**0.80 ac-ft**	**1.15 ac-ft**

Attenuation V_{req} = 1.15 ac-ft

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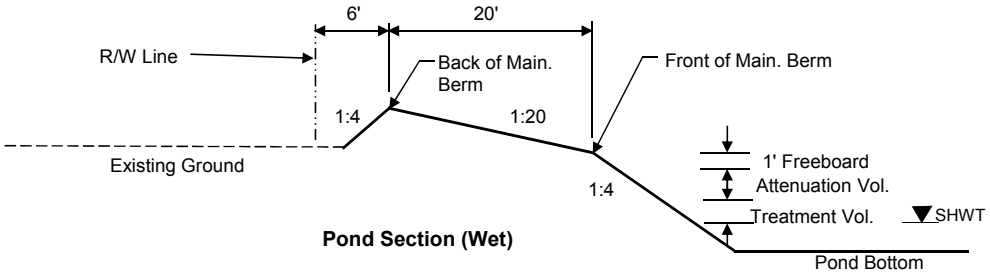
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **12**
POND NAME : **12C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	64.00
Pond Tie-In Width =	6.0 ft	@ 1:4	Normal Water Elevation =	60.75
Maximum Storage Depth (**SD**) =	2.75 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	420 ft	
Estimated Energy Losses =	0.4 ft	
HGL Clearance =	0.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	63.58 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.20 ac	229.0 ft	229.0 ft	
65.50	Back of Main. Berm	1.08 ac	217.0 ft	217.0 ft	3.17 ac-ft
65.00		0.89 ac	197.0 ft	197.0 ft	2.68 ac-ft
64.50	Front of Main. Berm	0.72 ac	177.0 ft	177.0 ft	2.28 ac-ft
63.50	Provided Treat.Vol.+Att.Vol	0.66 ac	169.0 ft	169.0 ft	1.58 ac-ft
63.36	Req'd Treat.Vol+Att. Vol	0.65 ac	167.9 ft	167.9 ft	1.49 ac-ft
62.65	Estimated Storm Sewer TW	0.60 ac	162.2 ft	162.2 ft	1.05 ac-ft
61.43	Top of Treatment Vol.	0.53 ac	152.4 ft	152.4 ft	0.35 ac-ft
60.75	Normal Water Level	0.50 ac	147.0 ft	147.0 ft	0.00 ac-ft
58.75		0.39 ac	131.0 ft	131.0 ft	
54.00	Pond Bottom	0.20 ac	93.0 ft	93.0 ft	

Required Treatment+Attenuation Vol.= 1.49 ac-ft
Required Treatment+Attenuation Stage= 63.36 ft

Provided Treatment+Attenuation Vol.= 1.58 ac-ft
Provided Treatment+Attenuation Stage= 63.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.05 ac-ft
Estimated Storm Sewer TW EL.= 62.65 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.44 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13A**

Station Limits: From: 401+79 To: 502+54

Roadway Length = 1626 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.28 ac
Pervious Area*: 6.67 ac
Total Roadway Area *: 7.95 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.82 ac

Total Area:
Impervious Area: **1.28 ac**
Pervious Area: **8.49 ac**
Total Area: **9.77 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.10 ac	107.8
Impervious areas; Streets & roads	D	98	0.18 ac	17.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.42 ac	16.3
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.20 ac	16.2
Industrial (72% Impervious)	A	81	0.57 ac	46.5
Industrial (72% Impervious)	D	93	1.24 ac	115.1
Woods-grass combination (orchard or tree farm); Good condition	A	32	3.30 ac	105.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.54 ac	42.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.25 ac	7.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.14 ac	10.7
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.82 ac	140.3
		Total:	9.77 ac	626.4

CN = Total CN*Area / Total Area = **64.1**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **5.60 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**3.40 in**	**3.01 in**	**4.20 in**	**13.62 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13A**

Offsite Area:

Impervious Area: **0.16 ac**
Pervious Area: **0.61 ac**
Total Area: **0.77 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.15 ac	14.7
Impervious areas; Streets & roads	D	98	0.01 ac	0.9
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.44 ac	13.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.17 ac	13.3
		Total:	0.77 ac	42.1

CN = Total CN*Area / Total Area = **54.5**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **8.35 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**2.40 in**	**2.08 in**	**3.07 in**	**11.70 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13A**

Station Limits: From: 401+79 To: 502+54 Roadway Length = 1626 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *: 3.11 ac
Pervious Roadway Area: 4.83 ac
Total Roadway Area *: 7.95 ac

Additional 15% added to account for turn lanes, median openings, etc.
*Areas measured in Microstation

Pond Area:

Pervious Pond Area : 0.96 ac
Water Surface Area: 0.87 ac Wet Pond
Total Pond Area: 1.82 ac

Total Area:

Impervious Area: **3.11 ac**
Pervious Area: **5.79 ac**
Water Surface Area: **0.87 ac**
Total Area: **9.77 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.71 ac	265.6
Impervious areas; Streets & roads	D	98	0.40 ac	39.4
Proposed Roadway Pervious	A	39	4.21 ac	164.1
Proposed Roadway Pervious	D	80	0.62 ac	50.0
Proposed Pond Pervious	D	80	0.96 ac	76.5
Proposed Ponds (Water Surface)	D	100	0.87 ac	86.5
		Total:	9.77 ac	682.2

CN = Total CN*Area / Total Area = **69.8**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.32 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.02 in**	**3.60 in**	**4.88 in**	**14.65 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.26 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.26 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	2.77 ac-ft	2.45 ac-ft	3.42 ac-ft	11.09 ac-ft
Q_{post} =	3.27 ac-ft	2.93 ac-ft	3.97 ac-ft	11.92 ac-ft
$Q_{offsite}$ =	0.15 ac-ft	0.13 ac-ft	0.20 ac-ft	0.75 ac-ft
$\Delta Q + Q_{offsite}$ =	**0.66 ac-ft**	**0.61 ac-ft**	**0.75 ac-ft**	**1.59 ac-ft**

Attenuation V_{req} = 1.59 ac-ft

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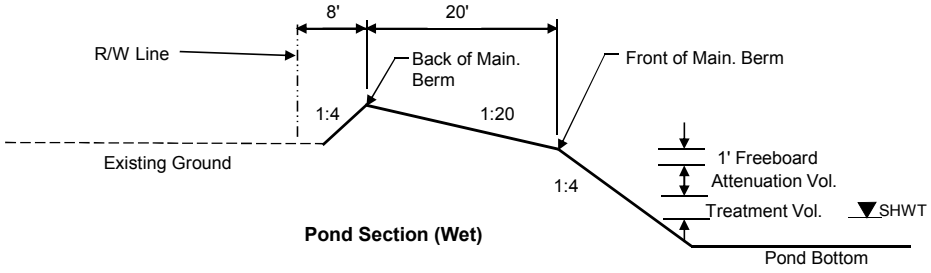
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	62.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	60.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1275 ft	
Estimated Energy Losses =	1.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.73 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
62.00	Pond R/W	1.82 ac	405.0 ft	196.0 ft	
64.00	Back of Main. Berm	1.61 ac	389.0 ft	180.0 ft	4.34 ac-ft
63.50		1.36 ac	369.0 ft	160.0 ft	3.60 ac-ft
63.00	Front of Main. Berm	1.12 ac	349.0 ft	140.0 ft	2.98 ac-ft
62.00	Provided Treat.Vol.+Att.Vol	1.03 ac	341.0 ft	132.0 ft	1.90 ac-ft
61.95	Req'd Treat.Vol+Att. Vol	1.03 ac	340.6 ft	131.6 ft	1.85 ac-ft
60.96	Estimated Storm Sewer TW	0.94 ac	332.7 ft	123.7 ft	0.87 ac-ft
60.30	Top of Treatment Vol.	0.89 ac	327.4 ft	118.4 ft	0.26 ac-ft
60.00	Normal Water Level	0.87 ac	325.0 ft	116.0 ft	0.00 ac-ft
58.00		0.71 ac	309.0 ft	100.0 ft	
55.00	Pond Bottom	0.50 ac	285.0 ft	76.0 ft	

Required Treatment+Attenuation Vol.= 1.85 ac-ft
Required Treatment+Attenuation Stage= 61.95 ft

Provided Treatment+Attenuation Vol.= 1.90 ac-ft
Provided Treatment+Attenuation Stage= 62.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.87 ac-ft
Estimated Storm Sewer TW EL.= 60.96 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.19 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13B**

Station Limits: From: 401+79 To: 502+54 Roadway Length = 1626 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.28 ac
Pervious Area*: 6.67 ac
Total Roadway Area *: 7.95 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.96 ac

Total Area:
Impervious Area: **1.28 ac**
Pervious Area: **8.63 ac**
Total Area: **9.91 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.10 ac	107.8
Impervious areas; Streets & roads	D	98	0.18 ac	17.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.42 ac	16.3
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.20 ac	16.2
Industrial (72% Impervious)	A	81	0.57 ac	46.5
Industrial (72% Impervious)	D	93	1.24 ac	115.1
Woods-grass combination (orchard or tree farm); Good condition	A	32	3.30 ac	105.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.54 ac	42.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.25 ac	7.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.14 ac	10.7
Depressional areas & existing storage	D	90	1.96 ac	176.4
		Total:	9.91 ac	662.5

CN = Total CN*Area / Total Area = **66.9**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.95 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**3.70 in**	**3.29 in**	**4.52 in**	**14.12 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13B**

Station Limits: From: 401+79 To: 502+54 Roadway Length = 1626 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.11 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.83 ac	*Areas measured in Microstation
Total Roadway Area *:	7.95 ac	

Pond Area:

Pervious Pond Area :	1.19 ac	
Water Surface Area:	0.77 ac	Wet Pond
Total Pond Area:	1.96 ac	

Total Area:

Impervious Area:	**3.11 ac**
Pervious Area:	**6.03 ac**
Water Surface Area:	**0.77 ac**
Total Area:	**9.91 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.71 ac	265.6
Impervious areas; Streets & roads	D	98	0.40 ac	39.4
Proposed Roadway Pervious	A	39	4.21 ac	164.1
Proposed Roadway Pervious	D	80	0.62 ac	50.0
Proposed Pond Pervious	D	80	1.19 ac	95.6
Proposed Ponds (Water Surface)	D	100	0.77 ac	76.5
		Total:	9.91 ac	691.2

CN = Total CN*Area / Total Area = **69.8**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.01 in**	**3.60 in**	**4.87 in**	**14.64 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.33 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Made by: CND
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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.26 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.26 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.05 ac-ft	2.72 ac-ft	3.74 ac-ft	11.66 ac-ft
Q_{post} =	3.31 ac-ft	2.97 ac-ft	4.02 ac-ft	12.08 ac-ft
ΔQ =	**0.26 ac-ft**	**0.25 ac-ft**	**0.29 ac-ft**	**0.42 ac-ft**

Attenuation V_{req} = 0.42 ac-ft

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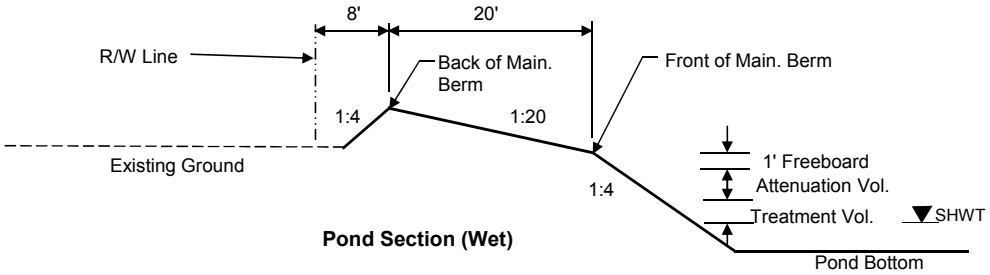
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	54.00
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	950 ft	
Estimated Energy Losses =	1.0 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.05 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.96 ac	447.0 ft	191.0 ft	
60.00	Back of Main. Berm	1.73 ac	431.0 ft	175.0 ft	6.41 ac-ft
59.50		1.46 ac	411.0 ft	155.0 ft	5.61 ac-ft
59.00	Front of Main. Berm	1.21 ac	391.0 ft	135.0 ft	4.94 ac-ft
58.00	Provided Treat.Vol.+Att.Vol	1.12 ac	383.0 ft	127.0 ft	3.76 ac-ft
54.85	Req'd Treat.Vol+Att. Vol	0.84 ac	357.8 ft	101.8 ft	0.68 ac-ft
54.64	Estimated Storm Sewer TW	0.82 ac	356.1 ft	100.1 ft	0.51 ac-ft
54.33	Top of Treatment Vol.	0.79 ac	353.6 ft	97.6 ft	0.26 ac-ft
54.00	Normal Water Level	0.77 ac	351.0 ft	95.0 ft	0.00 ac-ft
52.00		0.61 ac	335.0 ft	79.0 ft	
48.00	Pond Bottom	0.61 ac	335.0 ft	79.0 ft	

Required Treatment+Attenuation Vol.= 0.68 ac-ft
Required Treatment+Attenuation Stage= 54.85 ft

Provided Treatment+Attenuation Vol.= 3.76 ac-ft
Provided Treatment+Attenuation Stage= 58.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.51 ac-ft
Estimated Storm Sewer TW EL.= 54.64 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.35 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13C**

Station Limits: From: 401+79 To: 502+54 Roadway Length = 1926 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.28 ac
Pervious Area*: 6.67 ac
Total Roadway Area *: 7.95 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.65 ac

Total Area:
Impervious Area: **1.28 ac**
Pervious Area: **9.32 ac**
Total Area: **10.60 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.10 ac	107.8
Impervious areas; Streets & roads	D	98	0.18 ac	17.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.42 ac	16.3
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.20 ac	16.2
Industrial (72% Impervious)	A	81	0.57 ac	46.5
Industrial (72% Impervious)	D	93	1.24 ac	115.1
Woods-grass combination (orchard or tree farm); Good condition	A	32	3.30 ac	105.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.54 ac	42.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.25 ac	7.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.14 ac	10.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	2.65 ac	209.7
		Total:	10.60 ac	695.7

CN = Total CN*Area / Total Area = **65.6**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = 1000/CN - 10 = **5.24 in** — Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $(P - 0.2S)^2 / (P + 0.8S)$ — Runoff (Q) =	**3.56 in**	**3.17 in**	**4.38 in**	**13.90 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13C**

Offsite Area:

Impervious Area: **0.02 ac**
Pervious Area: **3.08 ac**
Total Area: **3.11 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.01 ac	1.3
Impervious areas; Streets & roads	D	98	0.01 ac	1.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.30 ac	11.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.26 ac	20.8
Woods-grass combination (orchard or tree farm); Good condition	A	32	1.00 ac	31.8
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.53 ac	120.7
		Total:	3.11 ac	187.4

CN = Total CN*Area / Total Area = **60.3**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **6.58 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**2.99 in**	**2.63 in**	**3.75 in**	**12.89 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13C**

Station Limits: From: 401+79 To: 502+54 Roadway Length = 1926 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	3.69 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.26 ac	*Areas measured in Microstation
Total Roadway Area *:	7.95 ac	

Pond Area:

Pervious Pond Area :	1.10 ac	
Water Surface Area:	1.56 ac	Wet Pond
Total Pond Area:	2.65 ac	

Total Area:

Impervious Area:	**3.69 ac**
Pervious Area:	**5.36 ac**
Water Surface Area:	**1.56 ac**
Total Area:	**10.60 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.71 ac	265.6
Impervious areas; Streets & roads	D	98	0.98 ac	95.7
Proposed Roadway Pervious	A	39	3.13 ac	122.1
Proposed Roadway Pervious	D	80	1.13 ac	90.3
Proposed Pond Pervious	D	80	1.10 ac	87.8
Proposed Ponds (Water Surface)	D	100	1.56 ac	155.7
		Total:	10.60 ac	817.1

CN = Total CN*Area / Total Area = **77.1**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**4.83 in**	**4.38 in**	**5.75 in**	**15.85 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **2.97 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.31 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.31 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.15 ac-ft	2.80 ac-ft	3.87 ac-ft	12.28 ac-ft
Q_{post} =	4.26 ac-ft	3.86 ac-ft	5.07 ac-ft	14.00 ac-ft
$Q_{offsite}$ =	0.78 ac-ft	0.68 ac-ft	0.97 ac-ft	3.34 ac-ft
$\Delta Q + Q_{offsite}$ =	**1.89 ac-ft**	**1.75 ac-ft**	**2.18 ac-ft**	**5.06 ac-ft**

Attenuation V_{req} = 5.06 ac-ft

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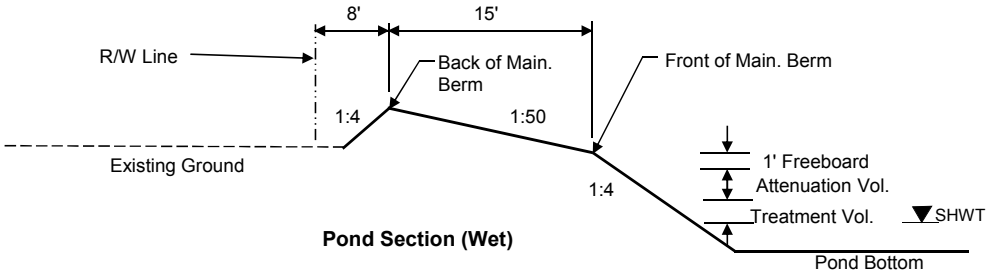
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **13**
POND NAME : **13C**

Maintenance Area Width =	15.0 ft	@ 1:50	Existing Ground Elevation =	62.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	59.50
Maximum Storage Depth (**SD**) =	3.20 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	400 ft	
Estimated Energy Losses =	0.4 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.60 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
62.00	Pond R/W	2.65 ac	340.0 ft	340.0 ft	
64.00	Back of Main. Berm	2.41 ac	324.0 ft	324.0 ft	8.09 ac-ft
63.85		2.19 ac	309.0 ft	309.0 ft	7.75 ac-ft
63.70	Front of Main. Berm	1.98 ac	294.0 ft	294.0 ft	7.44 ac-ft
62.70	Provided Treat.Vol.+Att.Vol	1.88 ac	286.0 ft	286.0 ft	5.50 ac-ft
62.63	Req'd Treat.Vol+Att. Vol	1.87 ac	285.4 ft	285.4 ft	5.36 ac-ft
60.77	Estimated Storm Sewer TW	1.68 ac	270.6 ft	270.6 ft	2.06 ac-ft
59.70	Top of Treatment Vol.	1.58 ac	262.0 ft	262.0 ft	0.31 ac-ft
59.50	Normal Water Level	1.56 ac	260.4 ft	260.4 ft	0.00 ac-ft
57.50		1.37 ac	244.4 ft	244.4 ft	
53.00	Pond Bottom	1.00 ac	208.4 ft	208.4 ft	

Required Treatment+Attenuation Vol.= 5.36 ac-ft
Required Treatment+Attenuation Stage= 62.63 ft

Provided Treatment+Attenuation Vol.= 5.50 ac-ft
Provided Treatment+Attenuation Stage= 62.70 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.06 ac-ft
Estimated Storm Sewer TW EL.= 60.77 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.18 ac

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14A**

Station Limits: From: 502+54 To: 542+19 Roadway Length = 3964 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 3.44 ac
Pervious Area*: 14.77 ac
Total Roadway Area *: 18.20 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.83 ac

Total Area:
Impervious Area: **3.44 ac**
Pervious Area: **16.60 ac**
Total Area: **20.04 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	3.44 ac	336.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	6.55 ac	523.6
Commercial & business (85% impervious)	D	95	0.26 ac	24.8
Industrial (72% Impervious)	D	93	0.37 ac	34.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.99 ac	244.9
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.72 ac	52.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.98 ac	156.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.21 ac	93.5
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.69 ac	68.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.83 ac	144.9
			Total: 20.04 ac	1680.9

CN = Total CN*Area / Total Area = **83.9**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.60 in**	**5.13 in**	**6.56 in**	**16.87 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.92 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14A**

Station Limits: From: 502+54 To: 542+19 Roadway Length = 3964 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	8.43 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	9.78 ac	*Areas measured in Microstation
Total Roadway Area *:	18.20 ac	

Pond Area:

Pervious Pond Area :	1.03 ac	
Water Surface Area:	0.81 ac	Wet Pond
Total Pond Area:	1.83 ac	

Total Area:

Impervious Area:	**8.43 ac**
Pervious Area:	**10.81 ac**
Water Surface Area:	**0.81 ac**
Total Area:	**20.04 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	8.43 ac	825.7
Proposed Roadway Pervious	D	80	9.78 ac	782.3
Proposed Pond Pervious	D	80	1.03 ac	82.3
Proposed Ponds (Water Surface)	D	100	0.81 ac	80.6
		Total:	20.04 ac	1770.8

CN = Total CN*Area / Total Area = **88.4**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.32 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.12 in**	**5.64 in**	**7.10 in**	**17.51 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.70 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.70 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	9.36 ac-ft	8.56 ac-ft	10.96 ac-ft	28.18 ac-ft
Q_{post} =	10.23 ac-ft	9.41 ac-ft	11.86 ac-ft	29.23 ac-ft
ΔQ =	**0.87 ac-ft**	**0.85 ac-ft**	**0.90 ac-ft**	**1.06 ac-ft**

Attenuation V_{req} = 1.06 ac-ft

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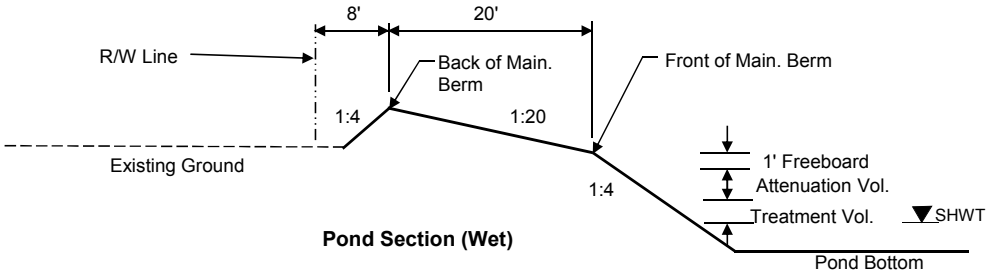
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	56.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	200 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	58.80 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.83 ac	470.0 ft	170.0 ft	
60.00	Back of Main. Berm	1.61 ac	454.0 ft	154.0 ft	4.17 ac-ft
59.50		1.34 ac	434.0 ft	134.0 ft	3.44 ac-ft
59.00	Front of Main. Berm	1.08 ac	414.0 ft	114.0 ft	2.83 ac-ft
58.00	Provided Treat.Vol.+Att.Vol	0.99 ac	406.0 ft	106.0 ft	1.79 ac-ft
57.97	Req'd Treat.Vol+Att. Vol	0.99 ac	405.8 ft	105.8 ft	1.76 ac-ft
57.75	Estimated Storm Sewer TW	0.96 ac	404.0 ft	104.0 ft	1.55 ac-ft
56.83	Top of Treatment Vol.	0.88 ac	396.6 ft	96.6 ft	0.70 ac-ft
56.00	Normal Water Level	0.81 ac	390.0 ft	90.0 ft	0.00 ac-ft
54.00		0.64 ac	374.0 ft	74.0 ft	
52.00	Pond Bottom	0.48 ac	358.0 ft	58.0 ft	

Required Treatment+Attenuation Vol.= 1.76 ac-ft
Required Treatment+Attenuation Stage= 57.97 ft

Provided Treatment+Attenuation Vol.= 1.79 ac-ft
Provided Treatment+Attenuation Stage= 58.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.55 ac-ft
Estimated Storm Sewer TW EL.= 57.75 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.20 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14B**

Station Limits: From: 502+54 To: 542+19 Roadway Length = 3964 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 3.44 ac
Pervious Area*: 14.77 ac
Total Roadway Area *: 18.20 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.39 ac

Total Area:
Impervious Area: **3.44 ac**
Pervious Area: **16.16 ac**
Total Area: **19.59 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	3.44 ac	336.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	6.55 ac	523.6
Commercial & business (85% impervious)	D	95	0.26 ac	24.8
Industrial (72% Impervious)	D	93	0.37 ac	34.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.99 ac	244.9
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.72 ac	52.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.98 ac	156.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.21 ac	93.5
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.69 ac	68.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.39 ac	109.6
			Total: 19.59 ac	1645.6

CN = Total CN*Area / Total Area = **84.0**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.62 in**	**5.14 in**	**6.58 in**	**16.89 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.91 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Made by: CND
Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14B**

Station Limits: From: 502+54 To: 542+19 Roadway Length = 3964 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	8.43 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	9.78 ac	*Areas measured in Microstation
Total Roadway Area *:	18.20 ac	

Pond Area:

Pervious Pond Area :	0.92 ac	
Water Surface Area:	0.46 ac	Wet Pond
Total Pond Area:	1.39 ac	

Total Area:

Impervious Area:	**8.43 ac**
Pervious Area:	**10.70 ac**
Water Surface Area:	**0.46 ac**
Total Area:	**19.59 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	8.43 ac	825.7
Proposed Roadway Pervious	D	80	9.78 ac	782.3
Proposed Pond Pervious	D	80	0.92 ac	73.9
Proposed Ponds (Water Surface)	D	100	0.46 ac	46.5
		Total:	19.59 ac	1728.3

CN = Total CN*Area / Total Area = **88.2**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.34 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.11 in**	**5.62 in**	**7.08 in**	**17.49 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.70 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.70 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	9.17 ac-ft	8.39 ac-ft	10.74 ac-ft	27.58 ac-ft
Q_{post} =	9.97 ac-ft	9.17 ac-ft	11.56 ac-ft	28.55 ac-ft
ΔQ =	**0.80 ac-ft**	**0.78 ac-ft**	**0.83 ac-ft**	**0.97 ac-ft**

Attenuation V_{req} = 0.97 ac-ft

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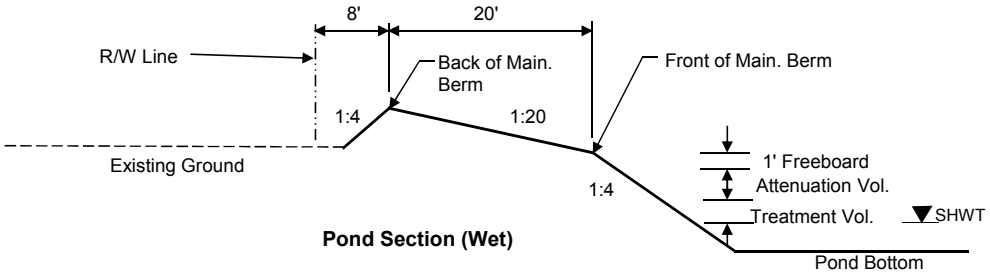
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	59.00	
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	56.00	*
Maximum Storage Depth (**SD**) =	3.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	300 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	58.70 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
59.00	Pond R/W	1.39 ac	390.0 ft	155.0 ft	
61.00	Back of Main. Berm	1.19 ac	374.0 ft	139.0 ft	3.42 ac-ft
60.50		0.97 ac	354.0 ft	119.0 ft	2.88 ac-ft
60.00	Front of Main. Berm	0.76 ac	334.0 ft	99.0 ft	2.45 ac-ft
59.00	Provided Treat.Vol.+Att.Vol	0.68 ac	326.0 ft	91.0 ft	1.72 ac-ft
58.93	Req'd Treat.Vol+Att. Vol	0.68 ac	325.4 ft	90.4 ft	1.67 ac-ft
58.65	Estimated Storm Sewer TW	0.65 ac	323.2 ft	88.2 ft	1.48 ac-ft
57.37	Top of Treatment Vol.	0.56 ac	313.0 ft	78.0 ft	0.70 ac-ft
56.00	Normal Water Level	0.46 ac	302.0 ft	67.0 ft	0.00 ac-ft
54.00		0.33 ac	286.0 ft	51.0 ft	
52.00	Pond Bottom	0.22 ac	270.0 ft	35.0 ft	

Required Treatment+Attenuation Vol.= 1.67 ac-ft
Required Treatment+Attenuation Stage= 58.93 ft

Provided Treatment+Attenuation Vol.= 1.72 ac-ft
Provided Treatment+Attenuation Stage= 59.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.48 ac-ft
Estimated Storm Sewer TW EL.= 58.65 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.67 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14C**

Station Limits: From: 502+54 To: 542+19 Roadway Length = 3964 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 3.44 ac
Pervious Area*: 14.77 ac
Total Roadway Area *: 18.20 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.75 ac

Total Area:
Impervious Area: **3.44 ac**
Pervious Area: **16.52 ac**
Total Area: **19.96 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	3.44 ac	336.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	6.55 ac	523.6
Commercial & business (85% impervious)	D	95	0.26 ac	24.8
Industrial (72% Impervious)	D	93	0.37 ac	34.7
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.99 ac	244.9
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.72 ac	52.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.98 ac	156.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.21 ac	93.5
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.69 ac	68.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.75 ac	135.0
			Total: 19.96 ac	1671.0

CN = Total CN*Area / Total Area = **83.7**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.58 in**	**5.11 in**	**6.54 in**	**16.85 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.94 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14C**

Station Limits: From: 502+54 To: 542+19 Roadway Length = 3964 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	8.43 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	9.78 ac	*Areas measured in Microstation
Total Roadway Area *:	18.20 ac	

Pond Area:

Pervious Pond Area :	0.83 ac	
Water Surface Area:	0.93 ac	Wet Pond
Total Pond Area:	1.75 ac	

Total Area:

Impervious Area:	**8.43 ac**
Pervious Area:	**10.60 ac**
Water Surface Area:	**0.93 ac**
Total Area:	**19.96 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	8.43 ac	825.7
Proposed Roadway Pervious	D	80	9.78 ac	782.3
Proposed Pond Pervious	D	80	0.83 ac	66.0
Proposed Ponds (Water Surface)	D	100	0.93 ac	92.8
		Total:	19.96 ac	1766.8

CN = Total CN*Area / Total Area = **88.5**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.14 in**	**5.65 in**	**7.12 in**	**17.53 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.30 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.70 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.70 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	9.29 ac-ft	8.50 ac-ft	10.88 ac-ft	28.03 ac-ft
Q_{post} =	10.21 ac-ft	9.40 ac-ft	11.84 ac-ft	29.15 ac-ft
ΔQ =	**0.93 ac-ft**	**0.91 ac-ft**	**0.96 ac-ft**	**1.13 ac-ft**

Attenuation V_{req} = 1.13 ac-ft

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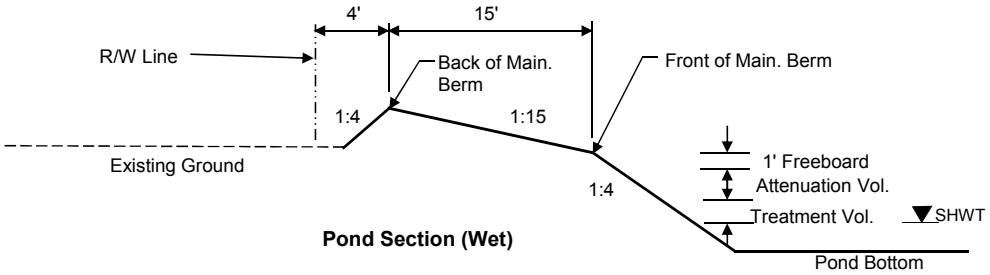
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **14**
POND NAME : **14C**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	61.00
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	56.50
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	60.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	875 ft	
Estimated Energy Losses =	0.9 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	58.13 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
61.00	Pond R/W	1.75 ac	325.0 ft	235.0 ft	
62.00	Back of Main. Berm	1.65 ac	317.0 ft	227.0 ft	6.48 ac-ft
61.50		1.47 ac	302.0 ft	212.0 ft	5.70 ac-ft
61.00	Front of Main. Berm	1.30 ac	287.0 ft	197.0 ft	5.01 ac-ft
60.00	Provided Treat.Vol.+Att.Vol	1.21 ac	279.0 ft	189.0 ft	3.74 ac-ft
58.33	Req'd Treat.Vol+Att. Vol	1.07 ac	265.6 ft	175.6 ft	1.83 ac-ft
58.13	Estimated Storm Sewer TW	1.05 ac	264.0 ft	174.0 ft	1.61 ac-ft
57.23	Top of Treatment Vol.	0.98 ac	256.8 ft	166.8 ft	0.70 ac-ft
56.50	Normal Water Level	0.93 ac	251.0 ft	161.0 ft	0.00 ac-ft
54.50		0.78 ac	235.0 ft	145.0 ft	
52.00	Pond Bottom	0.62 ac	215.0 ft	125.0 ft	

Required Treatment+Attenuation Vol.= 1.83 ac-ft
Required Treatment+Attenuation Stage= 58.33 ft

Provided Treatment+Attenuation Vol.= 3.74 ac-ft
Provided Treatment+Attenuation Stage= 60.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.61 ac-ft
Estimated Storm Sewer TW EL.= 58.13 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.10 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15A**

Station Limits: From: 542+19 To: 578+35 Roadway Length = 3617 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.69 ac
Pervious Area*: 13.89 ac
Total Roadway Area *: 16.58 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.46 ac

Total Area:
Impervious Area: **2.69 ac**
Pervious Area: **15.35 ac**
Total Area: **18.04 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.69 ac	263.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	5.46 ac	436.8
Residential Areas (1/2 acre, 25% Impervious)	D	85	0.31 ac	25.9
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.37 ac	27.1
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	5.02 ac	386.3
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	2.74 ac	273.6
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.46 ac	106.4
		Total:	18.04 ac	1519.9

CN = Total CN*Area / Total Area = **84.3**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.87 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.65 in**	**5.17 in**	**6.61 in**	**16.93 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15A**

Station Limits: From: 542+19 To: 578+35 Roadway Length = 3617 ft R/W Width = 148 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.69 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	8.89 ac	*Areas measured in Microstation
Total Roadway Area *:	16.58 ac	

Pond Area:

Pervious Pond Area :	0.71 ac	
Water Surface Area:	0.74 ac	Wet Pond
Total Pond Area:	1.46 ac	

Total Area:

Impervious Area:	**7.69 ac**
Pervious Area:	**9.61 ac**
Water Surface Area:	**0.74 ac**
Total Area:	**18.04 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.69 ac	753.3
Proposed Roadway Pervious	D	80	8.89 ac	711.5
Proposed Pond Pervious	D	80	0.71 ac	57.1
Proposed Ponds (Water Surface)	D	100	0.74 ac	74.4
		Total:	18.04 ac	1596.3

CN = Total CN*Area / Total Area = **88.5**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.30 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.14 in**	**5.65 in**	**7.12 in**	**17.52 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.64 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.64 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	8.49 ac-ft	7.77 ac-ft	9.93 ac-ft	25.45 ac-ft
Q_{post} =	9.23 ac-ft	8.49 ac-ft	10.70 ac-ft	26.34 ac-ft
ΔQ =	**0.74 ac-ft**	**0.72 ac-ft**	**0.77 ac-ft**	**0.90 ac-ft**

Attenuation V_{req} = 0.77 ac-ft

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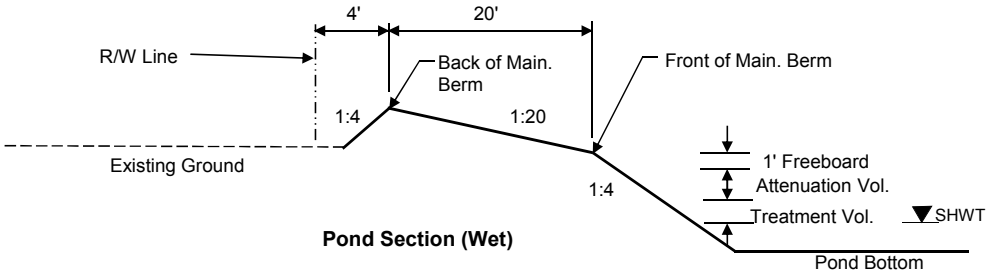
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	60.00	
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	56.00	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	550 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.73 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
59.00	Pond R/W	1.46 ac	252.0 ft	252.0 ft	
60.00	Back of Main. Berm	1.37 ac	244.0 ft	244.0 ft	3.71 ac-ft
59.50		1.15 ac	224.0 ft	224.0 ft	3.08 ac-ft
59.00	Front of Main. Berm	0.96 ac	204.0 ft	204.0 ft	2.55 ac-ft
58.00	Provided Treat.Vol.+Att.Vol	0.88 ac	196.0 ft	196.0 ft	1.63 ac-ft
57.75	Req'd Treat.Vol+Att. Vol	0.86 ac	194.0 ft	194.0 ft	1.41 ac-ft
57.70	Estimated Storm Sewer TW	0.86 ac	193.6 ft	193.6 ft	1.36 ac-ft
56.83	Top of Treatment Vol.	0.80 ac	186.6 ft	186.6 ft	0.64 ac-ft
56.00	Normal Water Level	0.74 ac	180.0 ft	180.0 ft	0.00 ac-ft
54.00		0.62 ac	164.0 ft	164.0 ft	
49.00	Pond Bottom	0.35 ac	124.0 ft	124.0 ft	

Required Treatment+Attenuation Vol.= 1.41 ac-ft
Required Treatment+Attenuation Stage= 57.75 ft

Provided Treatment+Attenuation Vol.= 1.63 ac-ft
Provided Treatment+Attenuation Stage= 58.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.36 ac-ft
Estimated Storm Sewer TW EL.= 57.70 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.75 ac

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15B**

Station Limits: From: 542+19 To: 578+35 Roadway Length = 3617 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.69 ac
Pervious Area*: 13.89 ac
Total Roadway Area *: 16.58 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.34 ac

Total Area:
Impervious Area: **2.69 ac**
Pervious Area: **15.22 ac**
Total Area: **17.92 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.69 ac	263.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	5.46 ac	436.8
Residential Areas (1/2 acre, 25% Impervious)	D	85	0.31 ac	25.9
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.37 ac	27.1
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	5.02 ac	386.3
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	2.74 ac	273.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.34 ac	102.9
		Total:	17.92 ac	1516.3

CN = Total CN*Area / Total Area = **84.6**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.82 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.69 in**	**5.21 in**	**6.65 in**	**16.98 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15B**

Station Limits: From: 542+19 To: 578+35 Roadway Length = 3617 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.69 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	8.89 ac	*Areas measured in Microstation
Total Roadway Area *:	16.58 ac	

Pond Area:

Pervious Pond Area :	0.69 ac	
Water Surface Area:	0.64 ac	Wet Pond
Total Pond Area:	1.34 ac	

Total Area:

Impervious Area:	**7.69 ac**
Pervious Area:	**9.59 ac**
Water Surface Area:	**0.64 ac**
Total Area:	**17.92 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.69 ac	753.3
Proposed Roadway Pervious	D	80	8.89 ac	711.5
Proposed Pond Pervious	D	80	0.69 ac	55.4
Proposed Ponds (Water Surface)	D	100	0.64 ac	64.3
		Total:	17.92 ac	1584.5

CN = Total CN*Area / Total Area = **88.4**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.31 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.13 in**	**5.64 in**	**7.11 in**	**17.52 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.64 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.64 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	8.49 ac-ft	7.78 ac-ft	9.93 ac-ft	25.35 ac-ft
Q_{post} =	9.15 ac-ft	8.43 ac-ft	10.62 ac-ft	26.15 ac-ft
ΔQ =	**0.66 ac-ft**	**0.65 ac-ft**	**0.68 ac-ft**	**0.80 ac-ft**

Attenuation V_{req} = 0.68 ac-ft

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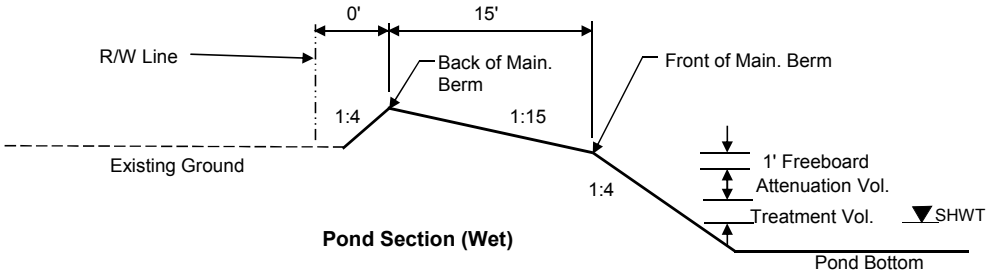
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15B**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	62.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	56.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	325 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.84 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
62.00	Pond R/W	1.34 ac	318.0 ft	183.0 ft	
62.00	Back of Main. Berm	1.34 ac	318.0 ft	183.0 ft	5.31 ac-ft
61.50		1.17 ac	303.0 ft	168.0 ft	4.68 ac-ft
61.00	Front of Main. Berm	1.01 ac	288.0 ft	153.0 ft	4.14 ac-ft
60.00	Provided Treat.Vol.+Att.Vol	0.93 ac	280.0 ft	145.0 ft	3.15 ac-ft
57.87	Req'd Treat.Vol+Att. Vol	0.77 ac	263.0 ft	128.0 ft	1.32 ac-ft
57.83	Estimated Storm Sewer TW	0.77 ac	262.6 ft	127.6 ft	1.29 ac-ft
56.95	Top of Treatment Vol.	0.71 ac	255.6 ft	120.6 ft	0.64 ac-ft
56.00	Normal Water Level	0.64 ac	248.0 ft	113.0 ft	0.00 ac-ft
54.00		0.52 ac	232.0 ft	97.0 ft	
51.00	Pond Bottom	0.35 ac	208.0 ft	73.0 ft	

Required Treatment+Attenuation Vol.= 1.32 ac-ft
Required Treatment+Attenuation Stage= 57.87 ft

Provided Treatment+Attenuation Vol.= 3.15 ac-ft
Provided Treatment+Attenuation Stage= 60.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.29 ac-ft
Estimated Storm Sewer TW EL.= 57.83 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.60 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15C**

Station Limits: From: 542+19 To: 578+35 Roadway Length = 3617 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.69 ac
Pervious Area*: 13.89 ac
Total Roadway Area *: 16.58 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.34 ac

Total Area:
Impervious Area: **2.69 ac**
Pervious Area: **15.23 ac**
Total Area: **17.92 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.69 ac	263.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	5.46 ac	436.8
Residential Areas (1/2 acre, 25% Impervious)	D	85	0.31 ac	25.9
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.37 ac	27.1
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	5.02 ac	386.3
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	2.74 ac	273.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.34 ac	103.5
		Total:	17.92 ac	1516.9

CN = Total CN*Area / Total Area = **84.6**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.82 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.69 in**	**5.21 in**	**6.65 in**	**16.98 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15C**

Station Limits: From: 542+19 To: 578+35 Roadway Length = 3617 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.69 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	8.89 ac	*Areas measured in Microstation
Total Roadway Area *:	16.58 ac	

Pond Area:

Pervious Pond Area :	0.64 ac	
Water Surface Area:	0.70 ac	Wet Pond
Total Pond Area:	1.34 ac	

Total Area:

Impervious Area:	**7.69 ac**
Pervious Area:	**9.53 ac**
Water Surface Area:	**0.70 ac**
Total Area:	**17.92 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.69 ac	753.3
Proposed Roadway Pervious	D	80	8.89 ac	711.5
Proposed Pond Pervious	D	80	0.64 ac	51.2
Proposed Ponds (Water Surface)	D	100	0.70 ac	70.3
		Total:	17.92 ac	1586.3

CN = Total CN*Area / Total Area = **88.5**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.14 in**	**5.65 in**	**7.12 in**	**17.53 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.30 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.64 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.64 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	8.50 ac-ft	7.78 ac-ft	9.94 ac-ft	25.37 ac-ft
Q_{post} =	9.17 ac-ft	8.44 ac-ft	10.63 ac-ft	26.18 ac-ft
ΔQ =	**0.67 ac-ft**	**0.66 ac-ft**	**0.70 ac-ft**	**0.81 ac-ft**

Attenuation V_{req} = 0.70 ac-ft

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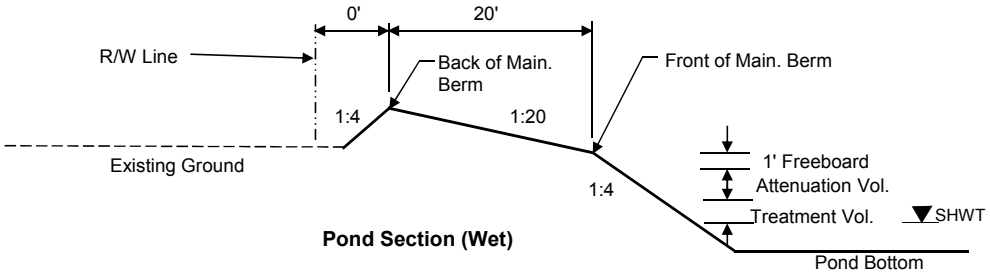
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **15**
POND NAME : **15C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	60.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	56.00	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	600 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.70 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
60.00	Pond R/W	1.34 ac	313.0 ft	187.0 ft	
60.00	Back of Main. Berm	1.34 ac	313.0 ft	187.0 ft	3.56 ac-ft
59.50		1.12 ac	293.0 ft	167.0 ft	2.95 ac-ft
59.00	Front of Main. Berm	0.92 ac	273.0 ft	147.0 ft	2.44 ac-ft
58.00	Provided Treat.Vol.+Att.Vol	0.85 ac	265.0 ft	139.0 ft	1.55 ac-ft
57.75	Req'd Treat.Vol+Att. Vol	0.83 ac	263.0 ft	137.0 ft	1.34 ac-ft
57.70	Estimated Storm Sewer TW	0.82 ac	262.6 ft	136.6 ft	1.30 ac-ft
56.87	Top of Treatment Vol.	0.76 ac	256.0 ft	130.0 ft	0.64 ac-ft
56.00	Normal Water Level	0.70 ac	249.0 ft	123.0 ft	0.00 ac-ft
54.00		0.57 ac	233.0 ft	107.0 ft	
49.00	Pond Bottom	0.30 ac	193.0 ft	67.0 ft	

Required Treatment+Attenuation Vol.= 1.34 ac-ft
Required Treatment+Attenuation Stage= 57.75 ft

Provided Treatment+Attenuation Vol.= 1.55 ac-ft
Provided Treatment+Attenuation Stage= 58.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.30 ac-ft
Estimated Storm Sewer TW EL.= 57.70 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.61 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16A**

Station Limits: From: 578+35 To: 597+39 Roadway Length = 1903 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.42 ac
Pervious Area*: 7.32 ac
Total Roadway Area *: 8.73 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.06 ac

Total Area:
Impervious Area: **1.42 ac**
Pervious Area: **8.38 ac**
Total Area: **9.79 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.42 ac	138.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.47 ac	197.8
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.80 ac	223.8
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.58 ac	115.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.04 ac	3.2
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.42 ac	42.3
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.06 ac	77.4
		Total:	9.79 ac	798.9

CN = Total CN*Area / Total Area = **81.6**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.26 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.34 in**	**4.87 in**	**6.28 in**	**16.53 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16A**

Station Limits: From: 578+35 To: 597+39 Roadway Length = 1903 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.04 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.69 ac	*Areas measured in Microstation
Total Roadway Area *:	8.73 ac	

Pond Area:

Pervious Pond Area :	0.54 ac	
Water Surface Area:	0.52 ac	Wet Pond
Total Pond Area:	1.06 ac	

Total Area:

Impervious Area:	**4.04 ac**
Pervious Area:	**5.23 ac**
Water Surface Area:	**0.52 ac**
Total Area:	**9.79 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.04 ac	396.4
Proposed Roadway Pervious	D	80	4.69 ac	375.2
Proposed Pond Pervious	D	80	0.54 ac	43.0
Proposed Ponds (Water Surface)	D	100	0.52 ac	52.3
		Total:	9.79 ac	866.8

CN = Total CN*Area / Total Area = **88.5**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.30 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.14 in**	**5.65 in**	**7.12 in**	**17.52 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.34 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.34 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.36 ac-ft	3.97 ac-ft	5.13 ac-ft	13.49 ac-ft
Q_{post} =	5.01 ac-ft	4.61 ac-ft	5.81 ac-ft	14.30 ac-ft
ΔQ =	**0.65 ac-ft**	**0.64 ac-ft**	**0.68 ac-ft**	**0.81 ac-ft**

Attenuation V_{req} = 0.68 ac-ft

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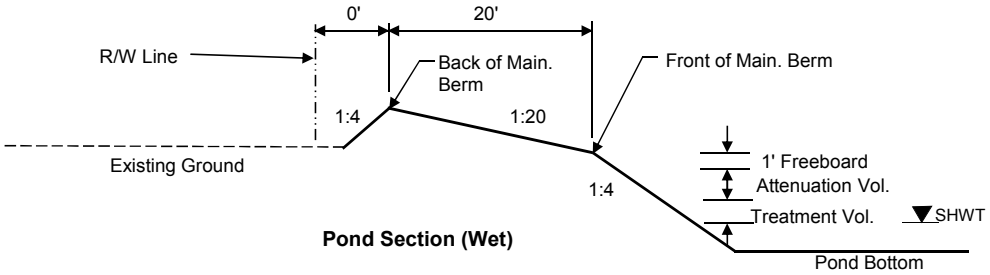
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	54.00
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	57.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	225 ft	
Estimated Energy Losses =	0.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	55.78 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.06 ac	220.0 ft	210.0 ft	
58.00	Back of Main. Berm	1.06 ac	220.0 ft	210.0 ft	2.71 ac-ft
57.50		0.87 ac	200.0 ft	190.0 ft	2.23 ac-ft
57.00	Front of Main. Berm	0.70 ac	180.0 ft	170.0 ft	1.84 ac-ft
56.00	Provided Treat.Vol.+Att.Vol	0.64 ac	172.0 ft	162.0 ft	1.16 ac-ft
55.78	Req'd Treat.Vol+Att. Vol	0.63 ac	170.2 ft	160.2 ft	1.02 ac-ft
55.71	Estimated Storm Sewer TW	0.62 ac	169.7 ft	159.7 ft	0.98 ac-ft
54.62	Top of Treatment Vol.	0.56 ac	161.0 ft	151.0 ft	0.34 ac-ft
54.00	Normal Water Level	0.52 ac	156.0 ft	146.0 ft	0.00 ac-ft
52.00		0.42 ac	140.0 ft	130.0 ft	
48.00	Pond Bottom	0.24 ac	108.0 ft	98.0 ft	

Required Treatment+Attenuation Vol.= 1.02 ac-ft
Required Treatment+Attenuation Stage= 55.78 ft

Provided Treatment+Attenuation Vol.= 1.16 ac-ft
Provided Treatment+Attenuation Stage= 56.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.98 ac-ft
Estimated Storm Sewer TW EL.= 55.71 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.27 ac

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16B**

Station Limits: From: 578+35 To: 597+39 Roadway Length = 1903 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.42 ac
Pervious Area*: 7.32 ac
Total Roadway Area *: 8.73 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.43 ac

Total Area:
Impervious Area: **1.42 ac**
Pervious Area: **8.75 ac**
Total Area: **10.17 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.42 ac	138.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.47 ac	197.8
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.80 ac	223.8
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.58 ac	115.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.04 ac	3.2
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.42 ac	42.3
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.43 ac	104.6
		Total:	10.17 ac	826.1

CN = Total CN*Area / Total Area = **81.3**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.31 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.30 in**	**4.83 in**	**6.25 in**	**16.49 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16B**

Station Limits: From: 578+35 To: 597+39 Roadway Length = 1903 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.04 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.69 ac	*Areas measured in Microstation
Total Roadway Area *:	8.73 ac	

Pond Area:

Pervious Pond Area :	0.64 ac	
Water Surface Area:	0.79 ac	Wet Pond
Total Pond Area:	1.43 ac	

Total Area:

Impervious Area:	**4.04 ac**
Pervious Area:	**5.33 ac**
Water Surface Area:	**0.79 ac**
Total Area:	**10.17 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.04 ac	396.4
Proposed Roadway Pervious	D	80	4.69 ac	375.2
Proposed Pond Pervious	D	80	0.64 ac	51.2
Proposed Ponds (Water Surface)	D	100	0.79 ac	79.2
		Total:	10.17 ac	902.0

CN = Total CN*Area / Total Area = **88.7**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.16 in**	**5.68 in**	**7.14 in**	**17.55 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.27 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.34 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.34 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.49 ac-ft	4.09 ac-ft	5.29 ac-ft	13.97 ac-ft
Q_{post} =	5.22 ac-ft	4.81 ac-ft	6.05 ac-ft	14.87 ac-ft
ΔQ =	**0.73 ac-ft**	**0.71 ac-ft**	**0.76 ac-ft**	**0.90 ac-ft**

Attenuation V_{req} = 0.76 ac-ft

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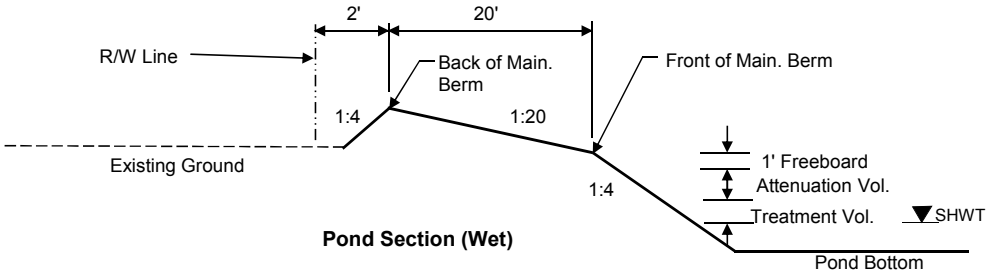
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00	
Pond Tie-In Width =	2.0 ft	@ 1:4	Normal Water Elevation =	54.00	*
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	57.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	700 ft	
Estimated Energy Losses =	0.7 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	55.30 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	1.43 ac	260.0 ft	240.0 ft	
57.50	Back of Main. Berm	1.39 ac	256.0 ft	236.0 ft	3.38 ac-ft
57.00		1.17 ac	236.0 ft	216.0 ft	2.74 ac-ft
56.50	Front of Main. Berm	0.97 ac	216.0 ft	196.0 ft	2.20 ac-ft
55.50	Provided Treat.Vol.+Att.Vol	0.90 ac	208.0 ft	188.0 ft	1.27 ac-ft
55.31	Req'd Treat.Vol+Att. Vol	0.88 ac	206.5 ft	186.5 ft	1.10 ac-ft
55.26	Estimated Storm Sewer TW	0.88 ac	206.1 ft	186.1 ft	1.05 ac-ft
54.42	Top of Treatment Vol.	0.82 ac	199.4 ft	179.4 ft	0.34 ac-ft
54.00	Normal Water Level	0.79 ac	196.0 ft	176.0 ft	0.00 ac-ft
52.00		0.66 ac	180.0 ft	160.0 ft	
48.00	Pond Bottom	0.43 ac	148.0 ft	128.0 ft	

Required Treatment+Attenuation Vol.= 1.10 ac-ft
Required Treatment+Attenuation Stage= 55.31 ft

Provided Treatment+Attenuation Vol.= 1.27 ac-ft
Provided Treatment+Attenuation Stage= 55.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.05 ac-ft
Estimated Storm Sewer TW EL.= 55.26 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.72 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16C**

Station Limits: From: 578+35 To: 597+39 Roadway Length = 1903 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 1.42 ac
Pervious Area*: 7.32 ac
Total Roadway Area *: 8.73 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.23 ac

Total Area:
Impervious Area: **1.42 ac**
Pervious Area: **8.55 ac**
Total Area: **9.96 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	1.42 ac	138.9
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.47 ac	197.8
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.80 ac	223.8
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.58 ac	115.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.04 ac	3.2
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.42 ac	42.3
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.23 ac	98.3
		Total:	9.96 ac	819.8

CN = Total CN*Area / Total Area = **82.3**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.42 in**	**4.95 in**	**6.37 in**	**16.64 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.15 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16C**

Station Limits: From: 578+35 To: 597+39 Roadway Length = 1903 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.04 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	4.69 ac	*Areas measured in Microstation
Total Roadway Area *:	8.73 ac	

Pond Area:

Pervious Pond Area :	0.51 ac	
Water Surface Area:	0.72 ac	Wet Pond
Total Pond Area:	1.23 ac	

Total Area:

Impervious Area:	**4.04 ac**
Pervious Area:	**5.20 ac**
Water Surface Area:	**0.72 ac**
Total Area:	**9.96 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.04 ac	396.4
Proposed Roadway Pervious	D	80	4.69 ac	375.2
Proposed Pond Pervious	D	80	0.51 ac	40.8
Proposed Ponds (Water Surface)	D	100	0.72 ac	72.0
		Total:	9.96 ac	884.3

CN = Total CN*Area / Total Area = **88.8**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.17 in**	**5.68 in**	**7.15 in**	**17.56 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.27 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.34 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.34 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.50 ac-ft	4.11 ac-ft	5.29 ac-ft	13.82 ac-ft
Q_{post} =	5.12 ac-ft	4.72 ac-ft	5.93 ac-ft	14.58 ac-ft
ΔQ =	**0.62 ac-ft**	**0.61 ac-ft**	**0.65 ac-ft**	**0.76 ac-ft**

Attenuation V_{req} = 0.65 ac-ft

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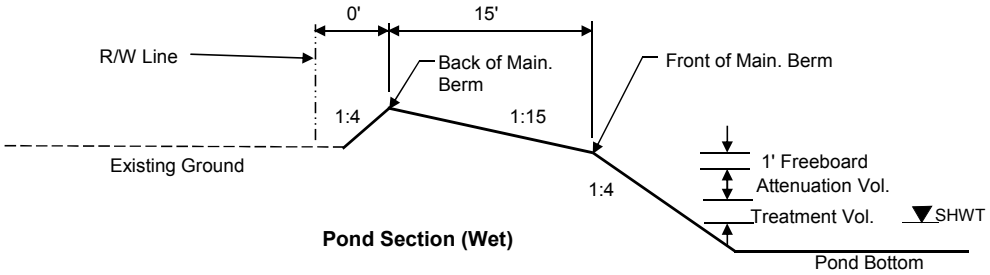
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **16**
POND NAME : **16C**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	58.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	54.00	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	57.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	700 ft	
Estimated Energy Losses =	0.7 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	55.30 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	1.23 ac	255.0 ft	210.0 ft	
58.00	Back of Main. Berm	1.23 ac	255.0 ft	210.0 ft	3.55 ac-ft
57.50		1.07 ac	240.0 ft	195.0 ft	2.98 ac-ft
57.00	Front of Main. Berm	0.93 ac	225.0 ft	180.0 ft	2.47 ac-ft
56.00	Provided Treat.Vol.+Att.Vol	0.86 ac	217.0 ft	172.0 ft	1.58 ac-ft
55.29	Req'd Treat.Vol+Att. Vol	0.81 ac	211.3 ft	166.3 ft	0.98 ac-ft
55.24	Estimated Storm Sewer TW	0.80 ac	210.9 ft	165.9 ft	0.94 ac-ft
54.46	Top of Treatment Vol.	0.75 ac	204.7 ft	159.7 ft	0.34 ac-ft
54.00	Normal Water Level	0.72 ac	201.0 ft	156.0 ft	0.00 ac-ft
52.00		0.59 ac	185.0 ft	140.0 ft	
48.00	Pond Bottom	0.38 ac	153.0 ft	108.0 ft	

Required Treatment+Attenuation Vol.= 0.98 ac-ft
Required Treatment+Attenuation Stage= 55.29 ft

Provided Treatment+Attenuation Vol.= 1.58 ac-ft
Provided Treatment+Attenuation Stage= 56.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.94 ac-ft
Estimated Storm Sewer TW EL.= 55.24 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.48 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17A**

Station Limits: From: 597+39 To: 612+93 Roadway Length = 1555 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 13.75 ac
Pervious Area*: 25.28 ac
Total Roadway Area *: 39.03 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 3.40 ac

Total Area:
Impervious Area: **13.75 ac**
Pervious Area: **28.68 ac**
Total Area: **42.42 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	13.75 ac	1347.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	12.90 ac	1031.7
Commercial & business (85% impervious)	D	95	0.44 ac	42.1
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.78 ac	130.2
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.37 ac	29.3
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	9.19 ac	707.4
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.60 ac	60.0
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	3.40 ac	248.0
		Total:	42.42 ac	3595.7

CN = Total CN*Area / Total Area = **84.8**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.70 in**	**5.23 in**	**6.67 in**	**17.00 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.80 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17A**

Station Limits: From: 597+39 To: 612+93 Roadway Length = 1555 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	22.16 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	16.87 ac	*Areas measured in Microstation
Total Roadway Area *:	39.03 ac	

Pond Area:

Pervious Pond Area :	1.20 ac	
Water Surface Area:	2.20 ac	Wet Pond
Total Pond Area:	3.40 ac	

Total Area:

Impervious Area:	**22.16 ac**
Pervious Area:	**18.06 ac**
Water Surface Area:	**2.20 ac**
Total Area:	**42.42 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	22.16 ac	2171.6
Proposed Roadway Pervious	D	80	16.87 ac	1349.3
Proposed Pond Pervious	D	80	1.20 ac	95.7
Proposed Ponds (Water Surface)	D	100	2.20 ac	220.1
		Total:	42.42 ac	3836.7

CN = Total CN*Area / Total Area = **90.4**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.06 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.37 in**	**5.87 in**	**7.35 in**	**17.79 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA = 1.85 ac-ft (Directly Connected Impervious Area)

Treatment V_{req} = 1.85 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	20.16 ac-ft	18.47 ac-ft	23.57 ac-ft	60.10 ac-ft
Q_{post} =	22.50 ac-ft	20.77 ac-ft	25.99 ac-ft	62.88 ac-ft
ΔQ =	**2.34 ac-ft**	**2.29 ac-ft**	**2.42 ac-ft**	**2.78 ac-ft**

Attenuation V_{req} = 2.42 ac-ft

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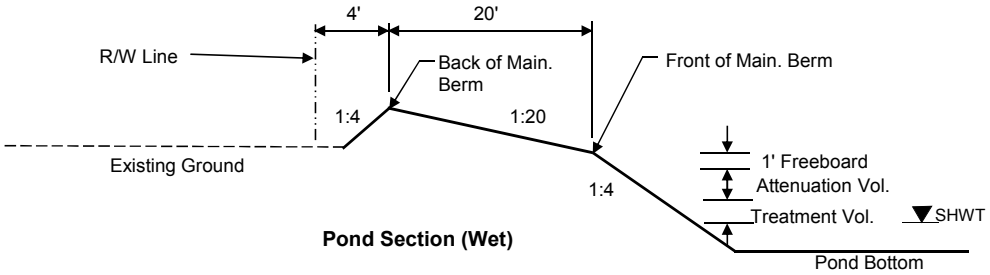
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00	
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	54.00	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	58.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1200 ft	
Estimated Energy Losses =	1.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	55.80 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	3.40 ac	500.0 ft	296.0 ft	
58.00	Back of Main. Berm	3.25 ac	492.0 ft	288.0 ft	10.07 ac-ft
57.50		2.90 ac	472.0 ft	268.0 ft	8.53 ac-ft
57.00	Front of Main. Berm	2.57 ac	452.0 ft	248.0 ft	7.16 ac-ft
56.00	Provided Treat.Vol.+Att.Vol	2.45 ac	444.0 ft	240.0 ft	4.65 ac-ft
55.84	Req'd Treat.Vol+Att. Vol	2.43 ac	442.7 ft	238.7 ft	4.26 ac-ft
55.79	Estimated Storm Sewer TW	2.42 ac	442.3 ft	238.3 ft	4.14 ac-ft
54.82	Top of Treatment Vol.	2.30 ac	434.6 ft	230.6 ft	1.85 ac-ft
54.00	Normal Water Level	2.20 ac	428.0 ft	224.0 ft	0.00 ac-ft
52.00		1.97 ac	412.0 ft	208.0 ft	
45.00	Pond Bottom	1.24 ac	356.0 ft	152.0 ft	

Required Treatment+Attenuation Vol.= 4.26 ac-ft
Required Treatment+Attenuation Stage= 55.84 ft

Provided Treatment+Attenuation Vol.= 4.65 ac-ft
Provided Treatment+Attenuation Stage= 56.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 4.14 ac-ft
Estimated Storm Sewer TW EL.= 55.79 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 4.08 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17B**

Station Limits: From: 597+39 To: 612+93 Roadway Length = 1555 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 13.75 ac
Pervious Area*: 25.28 ac
Total Roadway Area *: 39.03 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 4.46 ac

Total Area:
Impervious Area: **13.75 ac**
Pervious Area: **29.74 ac**
Total Area: **43.49 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	13.75 ac	1347.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	12.90 ac	1031.7
Commercial & business (85% impervious)	D	95	0.44 ac	42.1
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.78 ac	130.2
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.37 ac	29.3
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	9.19 ac	707.4
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.60 ac	60.0
Depressional areas & existing storage	D	90	4.46 ac	401.7
		Total:	43.49 ac	3749.3

CN = Total CN*Area / Total Area = **86.2**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.60 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.87 in**	**5.39 in**	**6.84 in**	**17.21 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17B**

Station Limits: From: 597+39 To: 612+93 Roadway Length = 1555 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	22.16 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	16.87 ac	*Areas measured in Microstation
Total Roadway Area *:	39.03 ac	

Pond Area:

Pervious Pond Area :	1.28 ac	
Water Surface Area:	3.19 ac	Wet Pond
Total Pond Area:	4.46 ac	

Total Area:

Impervious Area:	**22.16 ac**
Pervious Area:	**18.14 ac**
Water Surface Area:	**3.19 ac**
Total Area:	**43.49 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	22.16 ac	2171.6
Proposed Roadway Pervious	D	80	16.87 ac	1349.3
Proposed Pond Pervious	D	80	1.28 ac	102.0
Proposed Ponds (Water Surface)	D	100	3.19 ac	318.7
		Total:	43.49 ac	3941.6

CN = Total CN*Area / Total Area = **90.6**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	**6.39 in**	**5.90 in**	**7.37 in**	**17.81 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.03 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	1.85 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 1.85 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	21.28 ac-ft	19.53 ac-ft	24.80 ac-ft	62.36 ac-ft
Q_{post} =	23.15 ac-ft	21.37 ac-ft	26.73 ac-ft	64.56 ac-ft
ΔQ =	**1.87 ac-ft**	**1.84 ac-ft**	**1.93 ac-ft**	**2.20 ac-ft**

Attenuation V_{req} = 1.93 ac-ft

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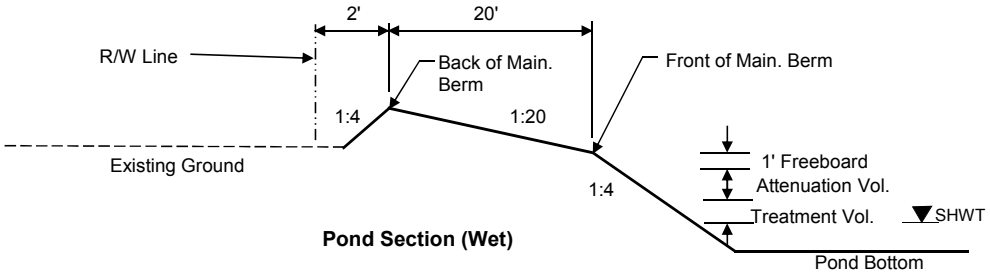
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00	
Pond Tie-In Width =	2.0 ft	@ 1:4	Normal Water Elevation =	54.50	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	58.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1350 ft	
Estimated Energy Losses =	1.4 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	55.65 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	4.46 ac	480.0 ft	405.0 ft	
58.50	Back of Main. Berm	4.38 ac	476.0 ft	401.0 ft	14.19 ac-ft
58.00		3.99 ac	456.0 ft	381.0 ft	12.10 ac-ft
57.50	Front of Main. Berm	3.61 ac	436.0 ft	361.0 ft	10.20 ac-ft
56.50	Provided Treat.Vol.+Att.Vol	3.47 ac	428.0 ft	353.0 ft	6.66 ac-ft
55.66	Req'd Treat.Vol+Att. Vol	3.35 ac	421.3 ft	346.3 ft	3.78 ac-ft
55.63	Estimated Storm Sewer TW	3.34 ac	421.0 ft	346.0 ft	3.68 ac-ft
55.07	Top of Treatment Vol.	3.27 ac	416.6 ft	341.6 ft	1.85 ac-ft
54.50	Normal Water Level	3.19 ac	412.0 ft	337.0 ft	0.00 ac-ft
52.50		2.92 ac	396.0 ft	321.0 ft	
45.00	Pond Bottom	2.01 ac	336.0 ft	261.0 ft	

Required Treatment+Attenuation Vol.= 3.78 ac-ft
Required Treatment+Attenuation Stage= 55.66 ft

Provided Treatment+Attenuation Vol.= 6.66 ac-ft
Provided Treatment+Attenuation Stage= 56.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 3.68 ac-ft
Estimated Storm Sewer TW EL.= 55.63 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.36 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17C**

Station Limits: From: 597+39 To: 612+93 Roadway Length = 1555 ft R/W Width = 126 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 13.75 ac
Pervious Area*: 25.28 ac
Total Roadway Area *: 39.03 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 4.96 ac

Total Area:
Impervious Area: **13.75 ac**
Pervious Area: **30.24 ac**
Total Area: **43.98 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	13.75 ac	1347.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	12.90 ac	1031.7
Commercial & business (85% impervious)	D	95	0.44 ac	42.1
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	1.78 ac	130.2
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.37 ac	29.3
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	9.19 ac	707.4
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.60 ac	60.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	4.96 ac	381.8
		Total:	43.98 ac	3729.5

CN = Total CN*Area / Total Area = **84.8**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.71 in**	**5.23 in**	**6.67 in**	**17.01 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.79 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17C**

Station Limits: From: 597+39 To: 612+93 Roadway Length = 1555 ft R/W Width = 126 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	22.16 ac	Additional 15% added to account for turn lanes, median openings, etc.
Pervious Roadway Area:	16.87 ac	*Areas measured in Microstation
Total Roadway Area *:	39.03 ac	

Pond Area:

Pervious Pond Area :	1.27 ac	
Water Surface Area:	3.69 ac	Wet Pond
Total Pond Area:	4.96 ac	

Total Area:

Impervious Area:	**22.16 ac**
Pervious Area:	**18.14 ac**
Water Surface Area:	**3.69 ac**
Total Area:	**43.98 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	22.16 ac	2171.6
Proposed Roadway Pervious	D	80	16.87 ac	1349.3
Proposed Pond Pervious	D	80	1.27 ac	101.8
Proposed Ponds (Water Surface)	D	100	3.69 ac	368.6
		Total:	43.98 ac	3991.3

CN = Total CN*Area / Total Area = **90.7**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.02 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.40 in**	**5.91 in**	**7.39 in**	**17.83 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA = 1.85 ac-ft (Directly Connected Impervious Area)

Treatment V_{req} = 1.85 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	20.92 ac-ft	19.17 ac-ft	24.45 ac-ft	62.33 ac-ft
Q_{post} =	23.46 ac-ft	21.66 ac-ft	27.08 ac-ft	65.35 ac-ft
ΔQ =	**2.54 ac-ft**	**2.49 ac-ft**	**2.63 ac-ft**	**3.02 ac-ft**

Attenuation V_{req} = 2.63 ac-ft

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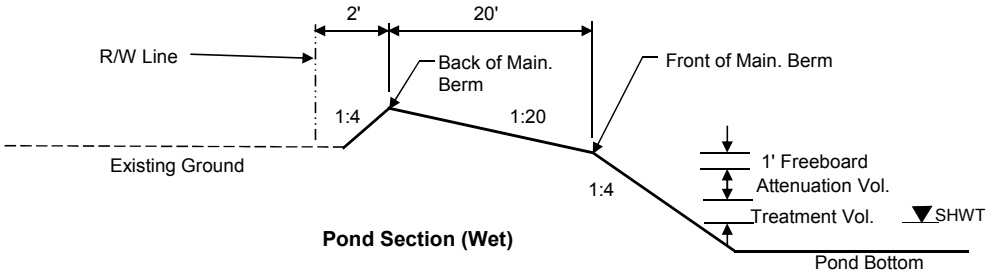
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **17**
POND NAME : **17C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00	
Pond Tie-In Width =	2.0 ft	@ 1:4	Normal Water Elevation =	54.00	*
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	58.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1850 ft	
Estimated Energy Losses =	1.9 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	55.15 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	4.96 ac	480.0 ft	450.0 ft	
57.50	Back of Main. Berm	4.87 ac	476.0 ft	446.0 ft	14.15 ac-ft
57.00		4.46 ac	456.0 ft	426.0 ft	11.82 ac-ft
56.50	Front of Main. Berm	4.06 ac	436.0 ft	406.0 ft	9.69 ac-ft
55.50	Provided Treat.Vol.+Att.Vol	3.91 ac	428.0 ft	398.0 ft	5.70 ac-ft
55.19	Req'd Treat.Vol+Att. Vol	3.86 ac	425.5 ft	395.5 ft	4.47 ac-ft
55.15	Estimated Storm Sewer TW	3.86 ac	425.2 ft	395.2 ft	4.34 ac-ft
54.50	Top of Treatment Vol.	3.76 ac	420.0 ft	390.0 ft	1.85 ac-ft
54.00	Normal Water Level	3.69 ac	416.0 ft	386.0 ft	0.00 ac-ft
52.00		3.40 ac	400.0 ft	370.0 ft	
45.00	Pond Bottom	2.48 ac	344.0 ft	314.0 ft	

Required Treatment+Attenuation Vol.= 4.47 ac-ft
Required Treatment+Attenuation Stage= 55.19 ft

Provided Treatment+Attenuation Vol.= 5.70 ac-ft
Provided Treatment+Attenuation Stage= 55.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 4.34 ac-ft
Estimated Storm Sewer TW EL.= 55.15 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.95 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19A**

Station Limits: From: 300+00 To: 320+68

Roadway Length = 4666 ft
R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 2.13 ac
Pervious Area*: 16.74 ac
Total Roadway Area *: 18.87 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 5.97 ac

Total Area:
Impervious Area: **2.13 ac**
Pervious Area: **22.71 ac**
Total Area: **24.84 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.23 ac	120.6
Impervious areas; Streets & roads	D	98	0.90 ac	87.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	0.20 ac	9.2
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	A	39	0.59 ac	22.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	6.99 ac	558.8
Woods-grass combination (orchard or tree farm); Good condition	A	32	4.59 ac	146.7
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.59 ac	46.6
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	0.05 ac	1.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.86 ac	220.1
Existing Lakes (Water surface)	D	100	0.07 ac	7.1
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.82 ac	81.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	5.97 ac	471.7
		Total:	24.84 ac	1774.8

CN = Total CN*Area / Total Area = **71.4**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.00 in**				
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	**4.20 in**	**3.77 in**	**5.07 in**	**14.92 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19A**

Station Limits: From: 300+00 To: 320+68 Roadway Length = 4666 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	13.20 ac
Pervious Roadway Area:	11.09 ac
Total Roadway Area *:	24.28 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.57 ac	
Water Surface Area:	4.40 ac	Wet Pond
Total Pond Area:	5.97 ac	

Total Area:

Impervious Area:	**13.20 ac**
Pervious Area:	**12.65 ac**
Water Surface Area:	**4.40 ac**
Total Area:	**30.25 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	13.20 ac	1293.2
Proposed Roadway Pervious	D	80	7.24 ac	579.0
Proposed Roadway Pervious	A	39	3.85 ac	150.2
Proposed Pond Pervious	D	80	1.57 ac	125.4
Proposed Ponds (Water Surface)	D	100	4.40 ac	440.4
		Total:	30.25 ac	2588.1

CN = Total CN*Area / Total Area = **85.5**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.69 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.79 in**	**5.31 in**	**6.76 in**	**17.11 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA = 1.10 ac-ft (Directly Connected Impervious Area)

Treatment V_{req} = 1.10 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	8.69 ac-ft	7.81 ac-ft	10.49 ac-ft	30.89 ac-ft
Q_{post} =	14.61 ac-ft	13.40 ac-ft	17.05 ac-ft	43.14 ac-ft
ΔQ =	**5.92 ac-ft**	**5.59 ac-ft**	**6.55 ac-ft**	**12.25 ac-ft**

Attenuation V_{req} = 6.55 ac-ft

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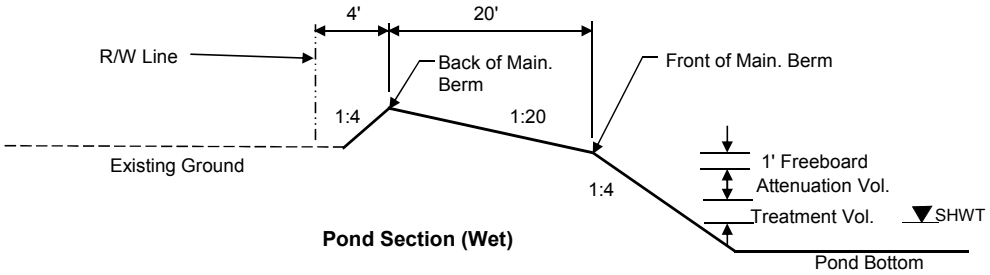
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	58.00	
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	55.00	*
Maximum Storage Depth (**SD**) =	2.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	3000 ft	
Estimated Energy Losses =	1.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	56.50 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
58.00	Pond R/W	5.97 ac	510.0 ft	510.0 ft	
59.00	Back of Main. Berm	5.79 ac	502.0 ft	502.0 ft	19.29 ac-ft
58.50		5.33 ac	482.0 ft	482.0 ft	16.51 ac-ft
58.00	Front of Main. Berm	4.90 ac	462.0 ft	462.0 ft	13.96 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	4.73 ac	454.0 ft	454.0 ft	9.14 ac-ft
56.69	Req'd Treat.Vol+Att. Vol	4.68 ac	451.5 ft	451.5 ft	7.65 ac-ft
56.48	Estimated Storm Sewer TW	4.65 ac	449.8 ft	449.8 ft	6.69 ac-ft
55.25	Top of Treatment Vol.	4.44 ac	440.0 ft	440.0 ft	1.10 ac-ft
55.00	Normal Water Level	4.40 ac	438.0 ft	438.0 ft	0.00 ac-ft
53.00		4.09 ac	422.0 ft	422.0 ft	
51.00	Pond Bottom	3.78 ac	406.0 ft	406.0 ft	

Required Treatment+Attenuation Vol.= 7.65 ac-ft
Required Treatment+Attenuation Stage= 56.69 ft

Provided Treatment+Attenuation Vol.= 9.14 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.69 ac-ft
Estimated Storm Sewer TW EL.= 56.48 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 7.17 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19B**

Station Limits: From: 300+00 To: 320+68 Roadway Length = 2068 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 6.83 ac
Total Roadway Area *: 6.83 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 4.38 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **11.21 ac**
Total Area: **11.21 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	6.27 ac	501.2
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.05 ac	4.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.14 ac	10.7
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.37 ac	37.4
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	4.38 ac	350.7
		Total:	11.21 ac	904.1

CN = Total CN*Area / Total Area = **80.6**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.23 in**	**4.76 in**	**6.17 in**	**16.39 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.40 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19B**

Station Limits: From: 300+00 To: 320+68 Roadway Length = 2068 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.68 ac
Pervious Roadway Area:	4.57 ac
Total Roadway Area *:	12.24 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.43 ac	
Water Surface Area:	2.96 ac	Wet Pond
Total Pond Area:	4.38 ac	

Total Area:

Impervious Area:	**7.68 ac**
Pervious Area:	**5.99 ac**
Water Surface Area:	**2.96 ac**
Total Area:	**16.62 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.68 ac	752.2
Proposed Roadway Pervious	D	80	4.57 ac	365.2
Proposed Pond Pervious	D	80	1.43 ac	114.0
Proposed Ponds (Water Surface)	D	100	2.96 ac	295.9
		Total:	16.62 ac	1527.2

CN = Total CN*Area / Total Area = **91.9**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.53 in**	**6.04 in**	**7.52 in**	**17.98 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.88 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.64 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.64 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.89 ac-ft	4.45 ac-ft	5.77 ac-ft	15.32 ac-ft
Q_{post} =	9.05 ac-ft	8.37 ac-ft	10.42 ac-ft	24.91 ac-ft
ΔQ =	**4.16 ac-ft**	**3.92 ac-ft**	**4.66 ac-ft**	**9.59 ac-ft**

Attenuation V_{req} = 4.66 ac-ft

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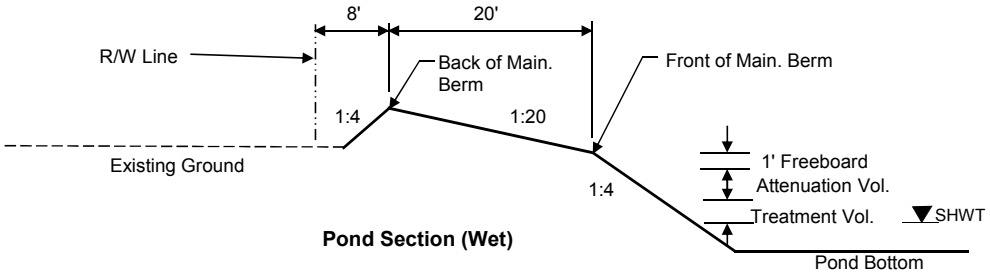
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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.25
Maximum Storage Depth (**SD**) =	1.75 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1250 ft	
Estimated Energy Losses =	1.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	56.75 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	4.38 ac	437.0 ft	437.0 ft	
59.00	Back of Main. Berm	4.07 ac	421.0 ft	421.0 ft	12.35 ac-ft
58.50		3.69 ac	401.0 ft	401.0 ft	10.41 ac-ft
58.00	Front of Main. Berm	3.33 ac	381.0 ft	381.0 ft	8.65 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	3.19 ac	373.0 ft	373.0 ft	5.38 ac-ft
56.97	Req'd Treat.Vol+Att. Vol	3.19 ac	372.8 ft	372.8 ft	5.30 ac-ft
56.74	Estimated Storm Sewer TW	3.16 ac	370.9 ft	370.9 ft	4.56 ac-ft
55.47	Top of Treatment Vol.	2.99 ac	360.7 ft	360.7 ft	0.64 ac-ft
55.25	Normal Water Level	2.96 ac	359.0 ft	359.0 ft	0.00 ac-ft
53.25		2.70 ac	343.0 ft	343.0 ft	
51.00	Pond Bottom	2.42 ac	325.0 ft	325.0 ft	

Required Treatment+Attenuation Vol.= 5.30 ac-ft
Required Treatment+Attenuation Stage= 56.97 ft

Provided Treatment+Attenuation Vol.= 5.38 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 4.56 ac-ft
Estimated Storm Sewer TW EL.= 56.74 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.26 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19C**

Station Limits: From: 300+00 To: 320+68 Roadway Length = 2068 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 6.83 ac
Total Roadway Area *: 6.83 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 4.44 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **11.27 ac**
Total Area: **11.27 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	6.27 ac	501.2
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.05 ac	4.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.14 ac	10.7
WETLANDS, Cypress & Bay Heads, Areas of Periodic Inundation.	D	100	0.37 ac	37.4
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	4.44 ac	355.6
		Total:	11.27 ac	908.9

CN = Total CN*Area / Total Area = **80.6**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.40 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.23 in**	**4.76 in**	**6.17 in**	**16.39 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19C**

Station Limits: From: 300+00 To: 320+68 Roadway Length = 2068 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	7.68 ac
Pervious Roadway Area:	4.57 ac
Total Roadway Area *:	12.24 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.44 ac	
Water Surface Area:	3.01 ac	Wet Pond
Total Pond Area:	4.44 ac	

Total Area:

Impervious Area:	**7.68 ac**
Pervious Area:	**6.00 ac**
Water Surface Area:	**3.01 ac**
Total Area:	**16.68 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.68 ac	752.2
Proposed Roadway Pervious	D	80	4.57 ac	365.2
Proposed Pond Pervious	D	80	1.44 ac	114.9
Proposed Ponds (Water Surface)	D	100	3.01 ac	300.8
		Total:	16.68 ac	1533.1

CN = Total CN*Area / Total Area = **91.9**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.54 in**	**6.04 in**	**7.53 in**	**17.98 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.88 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.64 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.64 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.91 ac-ft	4.47 ac-ft	5.80 ac-ft	15.40 ac-ft
Q_{post} =	9.09 ac-ft	8.40 ac-ft	10.46 ac-ft	25.00 ac-ft
ΔQ =	**4.17 ac-ft**	**3.93 ac-ft**	**4.67 ac-ft**	**9.60 ac-ft**

Attenuation V_{req} = 4.67 ac-ft

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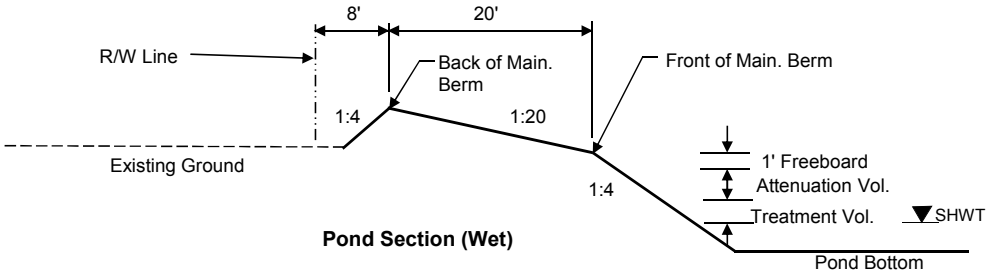
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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **19**
POND NAME : **19C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.25
Maximum Storage Depth (**SD**) =	1.75 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	2500 ft	
Estimated Energy Losses =	1.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	56.75 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	4.44 ac	440.0 ft	440.0 ft	
59.00	Back of Main. Berm	4.13 ac	424.0 ft	424.0 ft	12.54 ac-ft
58.50		3.75 ac	404.0 ft	404.0 ft	10.57 ac-ft
58.00	Front of Main. Berm	3.39 ac	384.0 ft	384.0 ft	8.79 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	3.25 ac	376.0 ft	376.0 ft	5.47 ac-ft
56.95	Req'd Treat.Vol+Att. Vol	3.24 ac	375.6 ft	375.6 ft	5.31 ac-ft
56.72	Estimated Storm Sewer TW	3.21 ac	373.7 ft	373.7 ft	4.56 ac-ft
55.46	Top of Treatment Vol.	3.04 ac	363.7 ft	363.7 ft	0.64 ac-ft
55.25	Normal Water Level	3.01 ac	362.0 ft	362.0 ft	0.00 ac-ft
53.25		2.75 ac	346.0 ft	346.0 ft	
51.00	Pond Bottom	2.47 ac	328.0 ft	328.0 ft	

Required Treatment+Attenuation Vol.= 5.31 ac-ft
Required Treatment+Attenuation Stage= 56.95 ft

Provided Treatment+Attenuation Vol.= 5.47 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 4.56 ac-ft
Estimated Storm Sewer TW EL.= 56.72 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.33 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20A**

Station Limits: From: 320+68 To: 340+35 Roadway Length = 1967 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 6.77 ac
Total Roadway Area *: 6.77 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.61 ac

Total Area:

Impervious Area: **0.00 ac**
Pervious Area: **8.39 ac**
Total Area: **8.39 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	6.77 ac	541.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.61 ac	129.0
		Total:	8.39 ac	670.9

CN = Total CN*Area / Total Area = **80.0**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.50 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.16 in**	**4.69 in**	**6.10 in**	**16.30 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20A**

Station Limits: From: 320+68 To: 340+35 Roadway Length = 1967 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.01 ac
Pervious Roadway Area:	2.76 ac
Total Roadway Area *:	6.77 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.79 ac	
Water Surface Area:	0.82 ac	Wet Pond
Total Pond Area:	1.61 ac	

Total Area:

Impervious Area:	**4.01 ac**
Pervious Area:	**3.55 ac**
Water Surface Area:	**0.82 ac**
Total Area:	**8.39 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.01 ac	393.4
Proposed Roadway Pervious	D	80	2.76 ac	220.8
Proposed Pond Pervious	D	80	0.79 ac	63.4
Proposed Ponds (Water Surface)	D	100	0.82 ac	82.0
		Total:	8.39 ac	759.5

CN = Total CN*Area / Total Area = **90.6**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.38 in**	**5.89 in**	**7.37 in**	**17.81 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.04 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.33 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.33 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.60 ac-ft	3.28 ac-ft	4.26 ac-ft	11.39 ac-ft
Q_{post} =	4.46 ac-ft	4.12 ac-ft	5.15 ac-ft	12.44 ac-ft
ΔQ =	**0.85 ac-ft**	**0.83 ac-ft**	**0.89 ac-ft**	**1.05 ac-ft**

Attenuation V_{req} = 0.89 ac-ft

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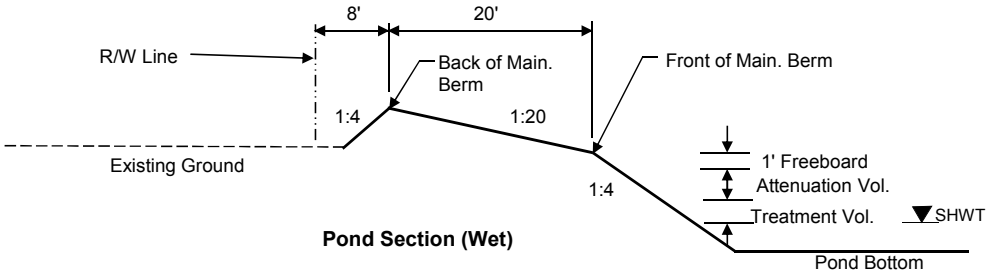
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00	
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.50	*
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00	

** Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1100 ft	
Estimated Energy Losses =	1.1 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	56.90 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	1.61 ac	265.0 ft	265.0 ft	
59.00	Back of Main. Berm	1.42 ac	249.0 ft	249.0 ft	3.49 ac-ft
58.50		1.20 ac	229.0 ft	229.0 ft	2.83 ac-ft
58.00	Front of Main. Berm	1.00 ac	209.0 ft	209.0 ft	2.28 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	0.93 ac	201.0 ft	201.0 ft	1.31 ac-ft
56.90	Req'd Treat.Vol+Att. Vol	0.92 ac	200.2 ft	200.2 ft	1.22 ac-ft
56.85	Estimated Storm Sewer TW	0.92 ac	199.8 ft	199.8 ft	1.17 ac-ft
55.90	Top of Treatment Vol.	0.85 ac	192.2 ft	192.2 ft	0.33 ac-ft
55.50	Normal Water Level	0.82 ac	189.0 ft	189.0 ft	0.00 ac-ft
53.50		0.69 ac	173.0 ft	173.0 ft	
51.00	Pond Bottom	0.54 ac	153.0 ft	153.0 ft	

Required Treatment+Attenuation Vol.= 1.22 ac-ft
Required Treatment+Attenuation Stage= 56.90 ft

Provided Treatment+Attenuation Vol.= 1.31 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.17 ac-ft
Estimated Storm Sewer TW EL.= 56.85 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.93 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20B**

Station Limits: From: 320+68 To: 340+35 Roadway Length = 1967 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 6.77 ac
Total Roadway Area *: 6.77 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.61 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **8.39 ac**
Total Area: **8.39 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	6.77 ac	541.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.61 ac	129.0
		Total:	8.39 ac	670.9

CN = Total CN*Area / Total Area = **80.0**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.50 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.16 in**	**4.69 in**	**6.10 in**	**16.30 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20B**

Station Limits: From: 320+68 To: 340+35 Roadway Length = 1967 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.01 ac
Pervious Roadway Area:	2.76 ac
Total Roadway Area *:	6.77 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.79 ac	
Water Surface Area:	0.82 ac	Wet Pond
Total Pond Area:	1.61 ac	

Total Area:

Impervious Area:	**4.01 ac**
Pervious Area:	**3.55 ac**
Water Surface Area:	**0.82 ac**
Total Area:	**8.39 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.01 ac	393.4
Proposed Roadway Pervious	D	80	2.76 ac	220.8
Proposed Pond Pervious	D	80	0.79 ac	63.4
Proposed Ponds (Water Surface)	D	100	0.82 ac	82.0
		Total:	8.39 ac	759.5

CN = Total CN*Area / Total Area = **90.6**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.38 in**	**5.89 in**	**7.37 in**	**17.81 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.04 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.33 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.33 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.60 ac-ft	3.28 ac-ft	4.26 ac-ft	11.39 ac-ft
Q_{post} =	4.46 ac-ft	4.12 ac-ft	5.15 ac-ft	12.44 ac-ft
ΔQ =	**0.85 ac-ft**	**0.83 ac-ft**	**0.89 ac-ft**	**1.05 ac-ft**

Attenuation V_{req} = 0.89 ac-ft

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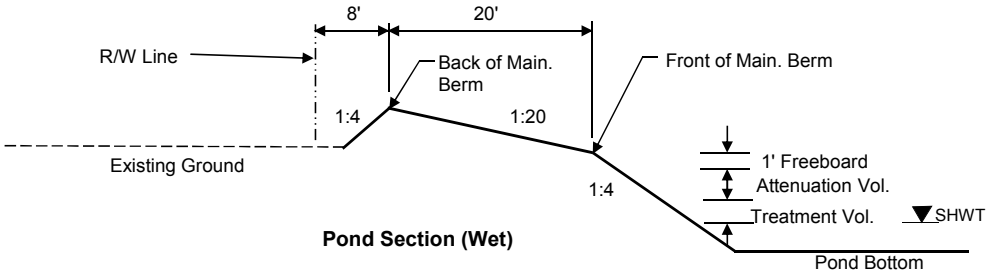
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	56.00	
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	54.50	*
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00	

** Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	750 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.25 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
56.00	Pond R/W	1.61 ac	265.0 ft	265.0 ft	
58.00	Back of Main. Berm	1.42 ac	249.0 ft	249.0 ft	3.49 ac-ft
57.50		1.20 ac	229.0 ft	229.0 ft	2.83 ac-ft
57.00	Front of Main. Berm	1.00 ac	209.0 ft	209.0 ft	2.28 ac-ft
56.00	Provided Treat.Vol.+Att.Vol	0.93 ac	201.0 ft	201.0 ft	1.31 ac-ft
55.90	Req'd Treat.Vol+Att. Vol	0.92 ac	200.2 ft	200.2 ft	1.22 ac-ft
55.85	Estimated Storm Sewer TW	0.92 ac	199.8 ft	199.8 ft	1.17 ac-ft
54.90	Top of Treatment Vol.	0.85 ac	192.2 ft	192.2 ft	0.33 ac-ft
54.50	Normal Water Level	0.82 ac	189.0 ft	189.0 ft	0.00 ac-ft
52.50		0.69 ac	173.0 ft	173.0 ft	
51.00	Pond Bottom	0.60 ac	161.0 ft	161.0 ft	

Required Treatment+Attenuation Vol.= 1.22 ac-ft
Required Treatment+Attenuation Stage= 55.90 ft

Provided Treatment+Attenuation Vol.= 1.31 ac-ft
Provided Treatment+Attenuation Stage= 56.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.17 ac-ft
Estimated Storm Sewer TW EL.= 55.85 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.93 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20C**

Station Limits: From: 320+68 To: 340+35 Roadway Length = 1967 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 6.77 ac
Total Roadway Area *: 6.77 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 1.57 ac

Total Area:

Impervious Area: **0.00 ac**
Pervious Area: **8.34 ac**
Total Area: **8.34 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	6.77 ac	541.9
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	1.57 ac	125.6
		Total:	8.34 ac	667.5

CN = Total CN*Area / Total Area = **80.0**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.50 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.16 in**	**4.69 in**	**6.10 in**	**16.30 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20C**

Station Limits: From: 320+68 To: 340+35 Roadway Length = 1967 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	4.01 ac
Pervious Roadway Area:	2.76 ac
Total Roadway Area *:	6.77 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.78 ac	
Water Surface Area:	0.79 ac	Wet Pond
Total Pond Area:	1.57 ac	

Total Area:

Impervious Area:	**4.01 ac**
Pervious Area:	**3.54 ac**
Water Surface Area:	**0.79 ac**
Total Area:	**8.34 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.01 ac	393.4
Proposed Roadway Pervious	D	80	2.76 ac	220.8
Proposed Pond Pervious	D	80	0.78 ac	62.7
Proposed Ponds (Water Surface)	D	100	0.79 ac	78.7
		Total:	8.34 ac	755.5

CN = Total CN*Area / Total Area = **90.5**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.38 in**	**5.89 in**	**7.36 in**	**17.80 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **1.04 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.33 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.33 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	3.59 ac-ft	3.26 ac-ft	4.24 ac-ft	11.33 ac-ft
Q_{post} =	4.43 ac-ft	4.09 ac-ft	5.12 ac-ft	12.38 ac-ft
ΔQ =	**0.85 ac-ft**	**0.83 ac-ft**	**0.88 ac-ft**	**1.05 ac-ft**

Attenuation V_{req} = 0.88 ac-ft

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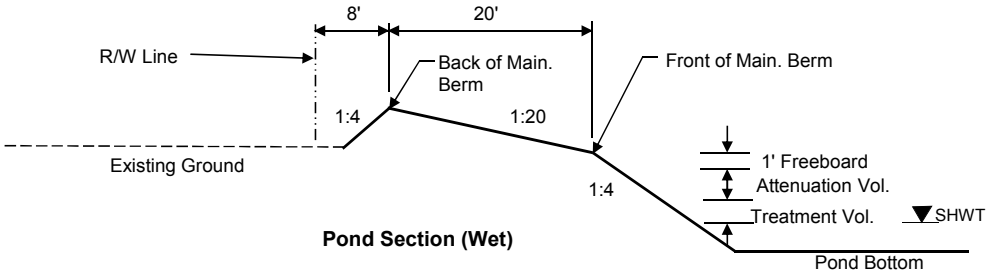
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **20**
POND NAME : **20C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00	
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.50	*
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00	

** Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	500 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.50 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	1.57 ac	240.0 ft	285.0 ft	
59.00	Back of Main. Berm	1.38 ac	224.0 ft	269.0 ft	3.36 ac-ft
58.50		1.17 ac	204.0 ft	249.0 ft	2.73 ac-ft
58.00	Front of Main. Berm	0.97 ac	184.0 ft	229.0 ft	2.19 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	0.89 ac	176.0 ft	221.0 ft	1.26 ac-ft
56.96	Req'd Treat.Vol+Att. Vol	0.89 ac	175.7 ft	220.7 ft	1.22 ac-ft
56.90	Estimated Storm Sewer TW	0.89 ac	175.2 ft	220.2 ft	1.17 ac-ft
55.92	Top of Treatment Vol.	0.82 ac	167.4 ft	212.4 ft	0.34 ac-ft
55.50	Normal Water Level	0.79 ac	164.0 ft	209.0 ft	0.00 ac-ft
53.50		0.66 ac	148.0 ft	193.0 ft	
51.00	Pond Bottom	0.51 ac	128.0 ft	173.0 ft	

Required Treatment+Attenuation Vol.= 1.22 ac-ft
Required Treatment+Attenuation Stage= 56.96 ft

Provided Treatment+Attenuation Vol.= 1.26 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.16 ac-ft
Estimated Storm Sewer TW EL.= 56.90 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.88 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21A**

Station Limits: From: 340+35 To: 372+74 Roadway Length = 3238 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 11.23 ac
Total Roadway Area *: 11.23 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.83 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **14.06 ac**
Total Area: **14.06 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.08 ac	7.6
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.00 ac	0.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	11.15 ac	892.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.00 ac	0.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.83 ac	226.6
		Total:	14.06 ac	1126.6

CN = Total CN*Area / Total Area = **80.1**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.48 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.17 in**	**4.71 in**	**6.11 in**	**16.31 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21A**

Station Limits: From: 340+35 To: 372+74 Roadway Length = 3238 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	6.97 ac
Pervious Roadway Area:	4.26 ac
Total Roadway Area *:	11.23 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.06 ac	
Water Surface Area:	1.77 ac	Wet Pond
Total Pond Area:	2.83 ac	

Total Area:

Impervious Area:	**6.97 ac**
Pervious Area:	**5.32 ac**
Water Surface Area:	**1.77 ac**
Total Area:	**14.06 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	6.97 ac	683.3
Proposed Roadway Pervious	D	80	4.26 ac	340.8
Proposed Pond Pervious	D	80	1.06 ac	85.0
Proposed Ponds (Water Surface)	D	100	1.77 ac	177.0
		Total:	14.06 ac	1286.0

CN = Total CN*Area / Total Area = **91.4**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.48 in**	**5.99 in**	**7.47 in**	**17.92 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.94 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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Made by: CND
Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.58 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.58 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	6.06 ac-ft	5.51 ac-ft	7.16 ac-ft	19.12 ac-ft
Q_{post} =	7.60 ac-ft	7.02 ac-ft	8.76 ac-ft	21.00 ac-ft
ΔQ =	**1.54 ac-ft**	**1.51 ac-ft**	**1.60 ac-ft**	**1.88 ac-ft**

Attenuation V_{req} = 1.60 ac-ft

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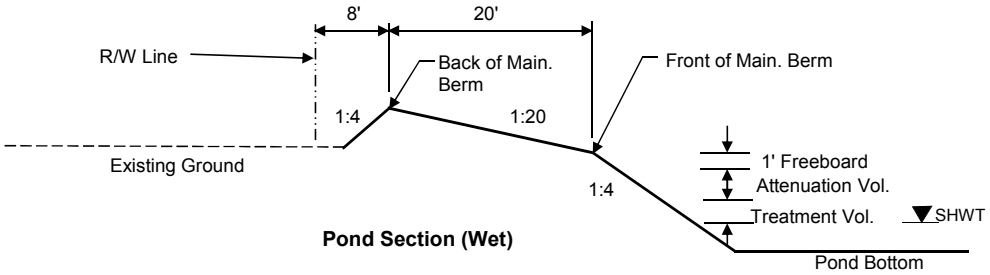
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.80
Maximum Storage Depth (**SD**) =	1.20 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	900 ft	
Estimated Energy Losses =	0.9 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.10 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	2.83 ac	351.3 ft	351.3 ft	
59.00	Back of Main. Berm	2.58 ac	335.3 ft	335.3 ft	6.43 ac-ft
58.50		2.28 ac	315.3 ft	315.3 ft	5.22 ac-ft
58.00	Front of Main. Berm	2.00 ac	295.3 ft	295.3 ft	4.15 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.89 ac	287.3 ft	287.3 ft	2.20 ac-ft
56.99	Req'd Treat.Vol+Att. Vol	1.89 ac	287.2 ft	287.2 ft	2.18 ac-ft
56.95	Estimated Storm Sewer TW	1.89 ac	286.8 ft	286.8 ft	2.09 ac-ft
56.13	Top of Treatment Vol.	1.80 ac	280.3 ft	280.3 ft	0.58 ac-ft
55.80	Normal Water Level	1.77 ac	277.7 ft	277.7 ft	0.00 ac-ft
53.80		1.57 ac	261.7 ft	261.7 ft	
51.00	Pond Bottom	1.31 ac	239.3 ft	239.3 ft	

Required Treatment+Attenuation Vol.= 2.18 ac-ft
Required Treatment+Attenuation Stage= 56.99 ft

Provided Treatment+Attenuation Vol.= 2.20 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.09 ac-ft
Estimated Storm Sewer TW EL.= 56.95 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.40 ac

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21b**

Station Limits: From: 340+35 To: 372+74 Roadway Length = 3238 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 11.23 ac
Total Roadway Area *: 11.23 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.85 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **14.08 ac**
Total Area: **14.08 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.08 ac	7.6
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.00 ac	0.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	11.15 ac	892.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.00 ac	0.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	2.85 ac	227.9
		Total:	14.08 ac	1127.9

CN = Total CN*Area / Total Area = **80.1**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.48 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.17 in**	**4.71 in**	**6.11 in**	**16.31 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21b**

Station Limits: From: 340+35 To: 372+74 Roadway Length = 3238 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	6.97 ac
Pervious Roadway Area:	4.26 ac
Total Roadway Area *:	11.23 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.10 ac	
Water Surface Area:	1.75 ac	Wet Pond
Total Pond Area:	2.85 ac	

Total Area:

Impervious Area:	**6.97 ac**
Pervious Area:	**5.36 ac**
Water Surface Area:	**1.75 ac**
Total Area:	**14.08 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	6.97 ac	683.3
Proposed Roadway Pervious	D	80	4.26 ac	340.8
Proposed Pond Pervious	D	80	1.10 ac	87.7
Proposed Ponds (Water Surface)	D	100	1.75 ac	175.3
		Total:	14.08 ac	1287.1

CN = Total CN*Area / Total Area = **91.4**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.48 in**	**5.99 in**	**7.47 in**	**17.92 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.94 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21b**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.58 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.58 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	6.07 ac-ft	5.52 ac-ft	7.17 ac-ft	19.14 ac-ft
Q_{post} =	7.60 ac-ft	7.02 ac-ft	8.76 ac-ft	21.02 ac-ft
ΔQ =	**1.54 ac-ft**	**1.50 ac-ft**	**1.60 ac-ft**	**1.88 ac-ft**

Attenuation V_{req} = 1.60 ac-ft

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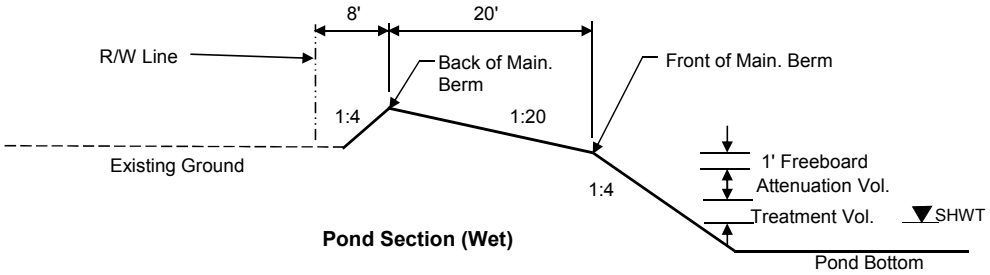
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21b**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.50
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	600 ft	
Estimated Energy Losses =	0.6 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	57.40 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	2.85 ac	352.3 ft	352.3 ft	
59.00	Back of Main. Berm	2.60 ac	336.3 ft	336.3 ft	7.01 ac-ft
58.50		2.30 ac	316.3 ft	316.3 ft	5.79 ac-ft
58.00	Front of Main. Berm	2.02 ac	296.3 ft	296.3 ft	4.71 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	1.91 ac	288.3 ft	288.3 ft	2.75 ac-ft
56.70	Req'd Treat.Vol+Att. Vol	1.88 ac	285.9 ft	285.9 ft	2.18 ac-ft
56.65	Estimated Storm Sewer TW	1.87 ac	285.5 ft	285.5 ft	2.08 ac-ft
55.83	Top of Treatment Vol.	1.79 ac	278.9 ft	278.9 ft	0.58 ac-ft
55.50	Normal Water Level	1.75 ac	276.3 ft	276.3 ft	0.00 ac-ft
53.50		1.56 ac	260.3 ft	260.3 ft	
51.00	Pond Bottom	1.33 ac	240.3 ft	240.3 ft	

Required Treatment+Attenuation Vol.= 2.18 ac-ft
Required Treatment+Attenuation Stage= 56.70 ft

Provided Treatment+Attenuation Vol.= 2.75 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.08 ac-ft
Estimated Storm Sewer TW EL.= 56.65 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.42 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21C**

Station Limits: From: 340+35 To: 372+74 Roadway Length = 3238 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 11.23 ac
Total Roadway Area *: 11.23 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 3.07 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **14.30 ac**
Total Area: **14.30 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.08 ac	7.6
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.00 ac	0.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	11.15 ac	892.3
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.00 ac	0.0
Pasture, grassland or range; Good condition (> 75% ground cover or lightly grazed)	D	80	3.07 ac	245.6
		Total:	14.30 ac	1145.6

CN = Total CN*Area / Total Area = **80.1**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.48 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.17 in**	**4.71 in**	**6.11 in**	**16.31 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21C**

Station Limits: From: 340+35 To: 372+74 Roadway Length = 3238 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	6.97 ac
Pervious Roadway Area:	4.26 ac
Total Roadway Area *:	11.23 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.24 ac	
Water Surface Area:	1.83 ac	Wet Pond
Total Pond Area:	3.07 ac	

Total Area:

Impervious Area:	**6.97 ac**
Pervious Area:	**5.50 ac**
Water Surface Area:	**1.83 ac**
Total Area:	**14.30 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	6.97 ac	683.3
Proposed Roadway Pervious	D	80	4.26 ac	340.8
Proposed Pond Pervious	D	80	1.24 ac	99.0
Proposed Ponds (Water Surface)	D	100	1.83 ac	183.3
		Total:	14.30 ac	1306.4

CN = Total CN*Area / Total Area = **91.3**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.95 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.47 in**	**5.98 in**	**7.46 in**	**17.91 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**No/No**
Open/Closed Basin	**Open**

Wet Detention	**1.00 in**	x DCIA =	0.58 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.58 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	6.16 ac-ft	5.61 ac-ft	7.28 ac-ft	19.44 ac-ft
Q_{post} =	7.71 ac-ft	7.12 ac-ft	8.89 ac-ft	21.34 ac-ft
ΔQ =	**1.55 ac-ft**	**1.52 ac-ft**	**1.61 ac-ft**	**1.90 ac-ft**

Attenuation V_{req} = 1.61 ac-ft

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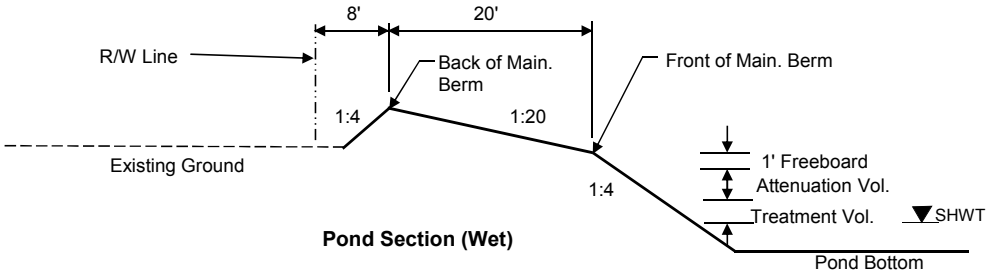
DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **21**
POND NAME : **21C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	55.50
Maximum Storage Depth (**SD**) =	1.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1100 ft	
Estimated Energy Losses =	1.1 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	56.90 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	3.07 ac	250.0 ft	535.0 ft	
59.00	Back of Main. Berm	2.79 ac	234.0 ft	519.0 ft	7.41 ac-ft
58.50		2.45 ac	214.0 ft	499.0 ft	6.10 ac-ft
58.00	Front of Main. Berm	2.13 ac	194.0 ft	479.0 ft	4.96 ac-ft
57.00	Provided Treat.Vol.+Att.Vol	2.01 ac	186.0 ft	471.0 ft	2.88 ac-ft
56.65	Req'd Treat.Vol+Att. Vol	1.97 ac	183.2 ft	468.2 ft	2.19 ac-ft
56.61	Estimated Storm Sewer TW	1.96 ac	182.8 ft	467.8 ft	2.10 ac-ft
55.81	Top of Treatment Vol.	1.87 ac	176.5 ft	461.5 ft	0.58 ac-ft
55.50	Normal Water Level	1.83 ac	174.0 ft	459.0 ft	0.00 ac-ft
53.50		1.61 ac	158.0 ft	443.0 ft	
51.00	Pond Bottom	1.34 ac	138.0 ft	423.0 ft	

Required Treatment+Attenuation Vol.= 2.19 ac-ft
Required Treatment+Attenuation Stage= 56.65 ft

Provided Treatment+Attenuation Vol.= 2.88 ac-ft
Provided Treatment+Attenuation Stage= 57.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.10 ac-ft
Estimated Storm Sewer TW EL.= 56.61 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.68 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22A**

Station Limits: From: 372+74 To: 385+47 Roadway Length = 1273 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 1.76 ac
Total Roadway Area *: 1.76 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.31 ac

Total Area:

Impervious Area: **0.00 ac**
Pervious Area: **4.07 ac**
Total Area: **4.07 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.76 ac	141.1
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.00 ac	0.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.31 ac	184.6
		Total:	4.07 ac	325.7

CN = Total CN*Area / Total Area = **80.0**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.16 in**	**4.69 in**	**6.10 in**	**16.30 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.50 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22A**

Station Limits: From: 372+74 To: 385+47 Roadway Length = 1273 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	2.87 ac
Pervious Roadway Area:	1.84 ac
Total Roadway Area *:	4.71 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.02 ac	
Water Surface Area:	1.29 ac	Wet Pond
Total Pond Area:	2.31 ac	

Total Area:

Impervious Area:	**2.87 ac**
Pervious Area:	**2.86 ac**
Water Surface Area:	**1.29 ac**
Total Area:	**7.01 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.87 ac	281.0
Proposed Roadway Pervious	D	80	1.84 ac	147.3
Proposed Pond Pervious	D	80	1.02 ac	81.4
Proposed Ponds (Water Surface)	D	100	1.29 ac	128.9
		Total:	7.01 ac	638.6

CN = Total CN*Area / Total Area = **91.0**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	**6.44 in**	**5.94 in**	**7.42 in**	**17.87 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.99 in**

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Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.24 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.24 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.75 ac-ft	1.59 ac-ft	2.07 ac-ft	5.53 ac-ft
Q_{post} =	3.76 ac-ft	3.47 ac-ft	4.34 ac-ft	10.44 ac-ft
ΔQ =	**2.01 ac-ft**	**1.88 ac-ft**	**2.27 ac-ft**	**4.92 ac-ft**

Attenuation V_{req} = 4.92 ac-ft

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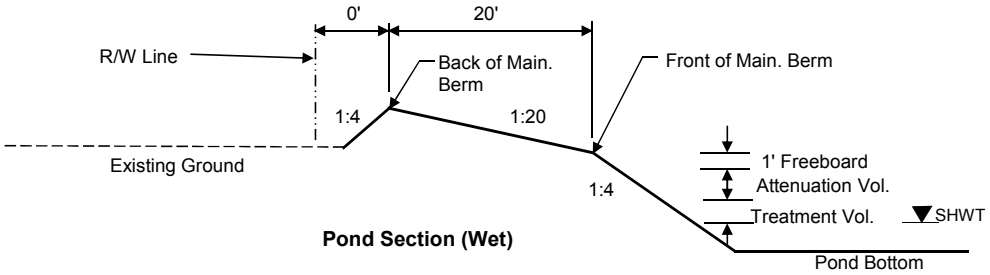
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	65.00	
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	59.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1250 ft	
Estimated Energy Losses =	1.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.75 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
65.00	Pond R/W	2.31 ac	317.0 ft	317.0 ft	
65.00	Back of Main. Berm	2.31 ac	317.0 ft	317.0 ft	9.66 ac-ft
64.50		2.03 ac	297.0 ft	297.0 ft	8.57 ac-ft
64.00	Front of Main. Berm	1.76 ac	277.0 ft	277.0 ft	7.63 ac-ft
63.00	Provided Treat.Vol.+Att.Vol	1.66 ac	269.0 ft	269.0 ft	5.90 ac-ft
62.55	Req'd Treat.Vol+Att. Vol	1.62 ac	265.4 ft	265.4 ft	5.15 ac-ft
60.56	Estimated Storm Sewer TW	1.43 ac	249.5 ft	249.5 ft	2.12 ac-ft
59.19	Top of Treatment Vol.	1.31 ac	238.5 ft	238.5 ft	0.24 ac-ft
59.00	Normal Water Level	1.29 ac	237.0 ft	237.0 ft	0.00 ac-ft
57.00		1.12 ac	221.0 ft	221.0 ft	
55.00	Pond Bottom	0.96 ac	205.0 ft	205.0 ft	

Required Treatment+Attenuation Vol.= 5.15 ac-ft
Required Treatment+Attenuation Stage= 62.55 ft

Provided Treatment+Attenuation Vol.= 5.90 ac-ft
Provided Treatment+Attenuation Stage= 63.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.12 ac-ft
Estimated Storm Sewer TW EL.= 60.56 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.77 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22B**

Station Limits: From: 372+74 To: 385+47 Roadway Length = 1273 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 1.76 ac
Total Roadway Area *: 1.76 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.65 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **4.41 ac**
Total Area: **4.41 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.76 ac	141.1
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.00 ac	0.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.00 ac	0.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	2.65 ac	204.0
		Total:	4.41 ac	345.2

CN = Total CN*Area / Total Area = **78.2**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.79 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**4.95 in**	**4.50 in**	**5.88 in**	**16.02 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22B**

Station Limits: From: 372+74 To: 385+47 Roadway Length = 1273 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	2.87 ac
Pervious Roadway Area:	1.84 ac
Total Roadway Area *:	4.71 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	0.95 ac	
Water Surface Area:	1.70 ac	Wet Pond
Total Pond Area:	2.65 ac	

Total Area:

Impervious Area:	**2.87 ac**
Pervious Area:	**2.80 ac**
Water Surface Area:	**1.70 ac**
Total Area:	**7.36 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.87 ac	281.0
Proposed Roadway Pervious	D	80	1.84 ac	147.3
Proposed Pond Pervious	D	80	0.95 ac	76.4
Proposed Ponds (Water Surface)	D	100	1.70 ac	169.5
		Total:	7.36 ac	674.1

CN = Total CN*Area / Total Area = **91.6**

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**6.50 in**	**6.01 in**	**7.49 in**	**17.95 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.91 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.24 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.24 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.82 ac-ft	1.65 ac-ft	2.16 ac-ft	5.89 ac-ft
Q_{post} =	3.99 ac-ft	3.69 ac-ft	4.59 ac-ft	11.00 ac-ft
ΔQ =	**2.17 ac-ft**	**2.03 ac-ft**	**2.43 ac-ft**	**5.11 ac-ft**

Attenuation V_{req} = 5.11 ac-ft

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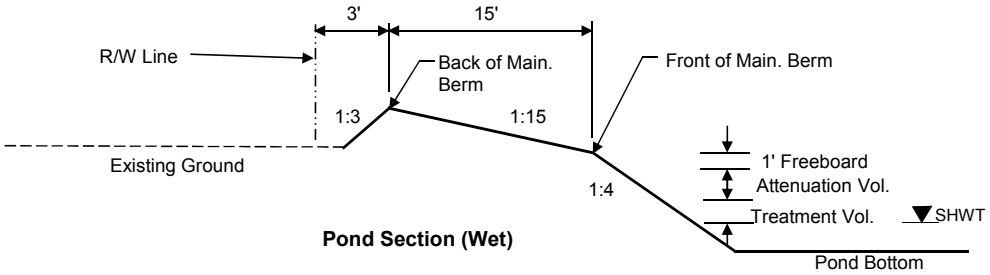
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22B**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	60.00	
Pond Tie-In Width =	3.0 ft	@ 1:3	Normal Water Elevation =	56.00	*
Maximum Storage Depth (**SD**) =	3.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	1.0 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.00 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
60.00	Pond R/W	2.65 ac	339.8 ft	339.8 ft	
61.00	Back of Main. Berm	2.56 ac	333.8 ft	333.8 ft	9.96 ac-ft
60.50		2.33 ac	318.8 ft	318.8 ft	8.74 ac-ft
60.00	Front of Main. Berm	2.12 ac	303.8 ft	303.8 ft	7.63 ac-ft
59.00	Provided Treat.Vol.+Att.Vol	2.01 ac	295.8 ft	295.8 ft	5.55 ac-ft
58.90	Req'd Treat.Vol+Att. Vol	2.00 ac	295.0 ft	295.0 ft	5.35 ac-ft
57.29	Estimated Storm Sewer TW	1.83 ac	282.1 ft	282.1 ft	2.27 ac-ft
56.14	Top of Treatment Vol.	1.71 ac	272.9 ft	272.9 ft	0.24 ac-ft
56.00	Normal Water Level	1.70 ac	271.8 ft	271.8 ft	0.00 ac-ft
54.00		1.50 ac	255.8 ft	255.8 ft	
51.00	Pond Bottom	1.23 ac	231.8 ft	231.8 ft	

Required Treatment+Attenuation Vol.= 5.35 ac-ft
Required Treatment+Attenuation Stage= 58.90 ft

Provided Treatment+Attenuation Vol.= 5.55 ac-ft
Provided Treatment+Attenuation Stage= 59.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.27 ac-ft
Estimated Storm Sewer TW EL.= 57.29 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.18 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22C**

Station Limits: From: 372+74 To: 385+47 Roadway Length = 1273 ft R/W Width = 150 ft

EXISTING CONDITION

Roadway Area:

Impervious Area *: 0.00 ac
Pervious Area*: 1.76 ac
Total Roadway Area *: 1.76 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.42 ac

Total Area:
Impervious Area: **0.00 ac**
Pervious Area: **4.19 ac**
Total Area: **4.19 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.76 ac	141.1
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.00 ac	0.0
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	2.42 ac	194.0
		Total:	4.19 ac	335.1

CN = Total CN*Area / Total Area = **80.0**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**5.16 in**	**4.69 in**	**6.10 in**	**16.30 in**

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.50 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22C**

Station Limits: From: 372+74 To: 385+47 Roadway Length = 1273 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	2.87 ac
Pervious Roadway Area:	1.84 ac
Total Roadway Area *:	4.71 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.05 ac	
Water Surface Area:	1.38 ac	Wet Pond
Total Pond Area:	2.42 ac	

Total Area:

Impervious Area:	**2.87 ac**
Pervious Area:	**2.89 ac**
Water Surface Area:	**1.38 ac**
Total Area:	**7.13 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.87 ac	281.0
Proposed Roadway Pervious	D	80	1.84 ac	147.3
Proposed Pond Pervious	D	80	1.05 ac	83.8
Proposed Ponds (Water Surface)	D	100	1.38 ac	137.7
		Total:	7.13 ac	649.8

CN = Total CN*Area / Total Area = **91.1**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **0.98 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**6.44 in**	**5.95 in**	**7.43 in**	**17.88 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.24 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.24 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	1.80 ac-ft	1.64 ac-ft	2.13 ac-ft	5.69 ac-ft
Q_{post} =	3.83 ac-ft	3.54 ac-ft	4.42 ac-ft	10.63 ac-ft
ΔQ =	**2.03 ac-ft**	**1.90 ac-ft**	**2.29 ac-ft**	**4.94 ac-ft**

Attenuation V_{req} = 4.94 ac-ft

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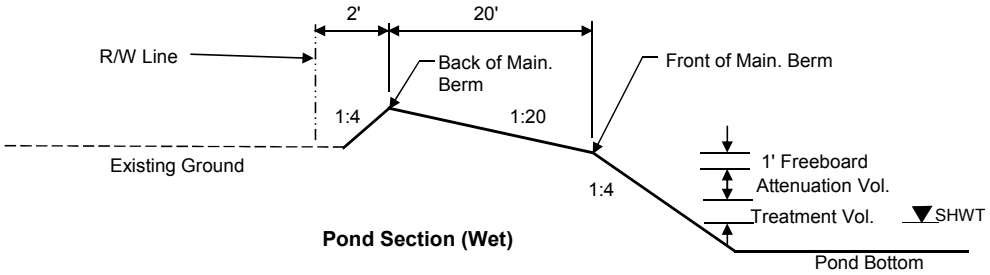
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **22**
POND NAME : **22C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	64.00	
Pond Tie-In Width =	2.0 ft	@ 1:4	Normal Water Elevation =	59.00	*
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1150 ft	
Estimated Energy Losses =	1.2 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.85 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	2.42 ac	335.3 ft	315.0 ft	
64.50	Back of Main. Berm	2.37 ac	331.3 ft	311.0 ft	9.26 ac-ft
64.00		2.08 ac	311.3 ft	291.0 ft	8.15 ac-ft
63.50	Front of Main. Berm	1.81 ac	291.3 ft	271.0 ft	7.18 ac-ft
62.50	Provided Treat.Vol.+Att.Vol	1.71 ac	283.3 ft	263.0 ft	5.40 ac-ft
62.37	Req'd Treat.Vol+Att. Vol	1.70 ac	282.3 ft	262.0 ft	5.18 ac-ft
60.48	Estimated Storm Sewer TW	1.51 ac	267.1 ft	246.8 ft	2.14 ac-ft
59.17	Top of Treatment Vol.	1.39 ac	256.7 ft	236.4 ft	0.24 ac-ft
59.00	Normal Water Level	1.38 ac	255.3 ft	235.0 ft	0.00 ac-ft
57.00		1.20 ac	239.3 ft	219.0 ft	
54.00	Pond Bottom	0.96 ac	215.3 ft	195.0 ft	

Required Treatment+Attenuation Vol.= 5.18 ac-ft
Required Treatment+Attenuation Stage= 62.37 ft

Provided Treatment+Attenuation Vol.= 5.40 ac-ft
Provided Treatment+Attenuation Stage= 62.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.14 ac-ft
Estimated Storm Sewer TW EL.= 60.48 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.91 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23A**

Station Limits: From: 385+47 To: 401+79

Roadway Length = 1632 ft
R/W Width = 150 ft

EXISTING CONDITION - 23A (US 301 Mainline)

Roadway Area:

Impervious Area *: 1.89 ac
Pervious Area*: 8.27 ac
Total Roadway Area *: 10.16 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 2.98 ac

Total Area:

Impervious Area: **1.89 ac**
Pervious Area: **11.26 ac**
Total Area: **13.15 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.95 ac	93.5
Impervious areas; Streets & roads	D	98	0.94 ac	91.8
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.87 ac	33.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.18 ac	14.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	0.48 ac	15.4
Woods-grass combination (orchard or tree farm); Good condition	D	79	4.07 ac	321.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.97 ac	59.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.71 ac	54.6
Woods-grass combination (orchard or tree farm); Good condition	D	79	1.07 ac	84.3
		Total:	11.23 ac	768.1

CN = Total CN*Area / Total Area = **68.4**

Denotes Pond Area

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **4.62 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	**3.86 in**	**3.45 in**	**4.71 in**	**14.39 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23A**

Station Limits: From: 385+47 To: 401+79 Roadway Length = 1632 ft R/W Width = 150 ft

EXISTING CONDITION - 23B (468 Plus Intersection Connection)

Roadway Area:

Impervious Area *: 0.94 ac
Pervious Area*: 2.66 ac
Total Roadway Area *: 3.61 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 0.00 ac

Total Area:

Impervious Area: **0.94 ac**
Pervious Area: **2.66 ac**
Total Area: **3.61 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.94 ac	92.2
Impervious areas; Streets & roads	D	98	0.00 ac	0.0
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.02 ac	1.6
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.00 ac	0.0
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.60 ac	43.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.09 ac	7.3
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.95 ac	150.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.00 ac	0.0
		Total:	3.61 ac	295.2

CN = Total CN*Area / Total Area = **81.9**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.21 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**3.86 in**	**3.45 in**	**4.71 in**	**14.39 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23A**

Station Limits: From: 385+47 To: 401+79 Roadway Length = 1632 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.62 ac
Pervious Roadway Area:	6.23 ac
Total Roadway Area *:	11.85 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	1.89 ac	
Water Surface Area:	1.09 ac	Wet Pond
Total Pond Area:	2.98 ac	

Total Area:

Impervious Area:	**5.62 ac**
Pervious Area:	**8.12 ac**
Water Surface Area:	**1.09 ac**
Total Area:	**14.83 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.62 ac	550.9
Proposed Roadway Pervious	D	80	4.07 ac	325.5
Proposed Roadway Pervious	A	39	2.16 ac	84.2
Proposed Pond Pervious	D	80	1.89 ac	151.5
Proposed Ponds (Water Surface)	D	100	1.09 ac	109.1
		Total:	14.83 ac	1221.2

CN = Total CN*Area / Total Area = **82.3**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.15 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.42 in**	**4.95 in**	**6.37 in**	**16.65 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23A**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.47 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.47 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.23 ac-ft	3.78 ac-ft	5.16 ac-ft	15.77 ac-ft
Q_{post} =	6.70 ac-ft	6.12 ac-ft	7.88 ac-ft	20.58 ac-ft
ΔQ =	**2.47 ac-ft**	**2.34 ac-ft**	**2.72 ac-ft**	**4.81 ac-ft**

Attenuation V_{req} = 4.81 ac-ft

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23A**

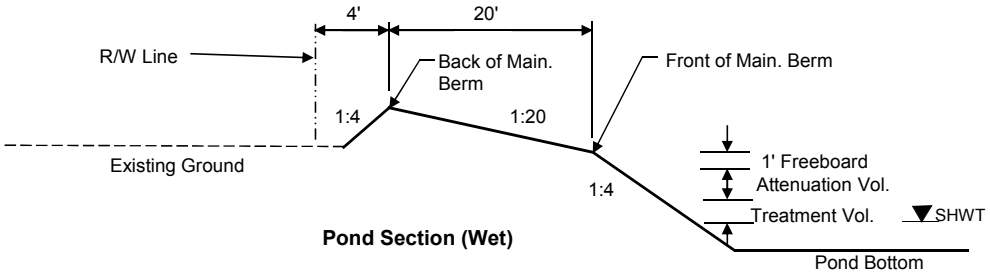
POND 23 A-1

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	65.00	
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	60.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1050 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.48 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
65.00	Pond R/W	1.07 ac	310.0 ft	150.0 ft	
66.00	Back of Main. Berm	0.98 ac	302.0 ft	142.0 ft	3.12 ac-ft
65.50		0.79 ac	282.0 ft	122.0 ft	2.67 ac-ft
65.00	Front of Main. Berm	0.61 ac	262.0 ft	102.0 ft	2.32 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	0.55 ac	254.0 ft	94.0 ft	1.73 ac-ft
63.73	Req'd Treat.Vol+Att. Vol	0.53 ac	251.8 ft	91.8 ft	1.58 ac-ft
62.16	Estimated Storm Sewer TW	0.44 ac	239.3 ft	79.3 ft	0.81 ac-ft
61.34	Top of Treatment Vol.	0.39 ac	232.7 ft	72.7 ft	0.47 ac-ft
60.00	Normal Water Level	0.32 ac	222.0 ft	62.0 ft	0.00 ac-ft
58.00		0.22 ac	206.0 ft	46.0 ft	
55.00	Pond Bottom	0.09 ac	182.0 ft	22.0 ft	

Required Treatment+Attenuation Vol.= 5.27 ac-ft
Required Treatment+Attenuation Stage= 63.73 ft

Provided Treatment+Attenuation Vol.= 1.73 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.81 ac-ft
Estimated Storm Sewer TW EL.= 62.16 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.28 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23A**

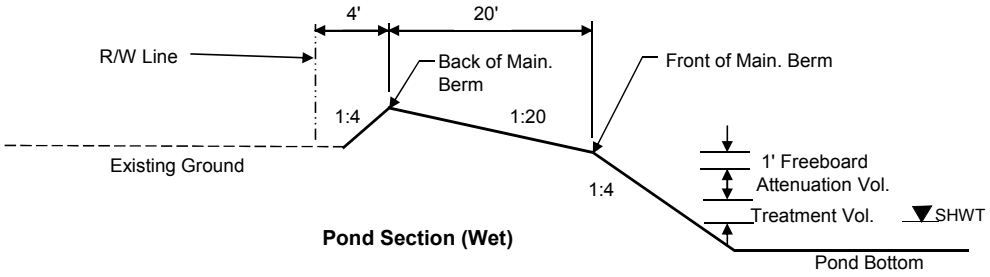
POND 23 A-2

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	65.00	
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	60.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1050 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.48 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
65.00	Pond R/W	1.92 ac	348.0 ft	240.0 ft	
66.00	Back of Main. Berm	1.81 ac	340.0 ft	232.0 ft	6.80 ac-ft
65.50		1.56 ac	320.0 ft	212.0 ft	5.96 ac-ft
65.00	Front of Main. Berm	1.32 ac	300.0 ft	192.0 ft	5.24 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	1.23 ac	292.0 ft	184.0 ft	4.02 ac-ft
63.73	Req'd Treat.Vol+Att. Vol	1.21 ac	289.8 ft	181.8 ft	3.70 ac-ft
62.16	Estimated Storm Sewer TW	1.08 ac	277.3 ft	169.3 ft	2.00 ac-ft
60.55	Top of Treatment Vol.	0.95 ac	264.4 ft	156.4 ft	0.47 ac-ft
60.00	Normal Water Level	0.77 ac	222.0 ft	152.0 ft	0.00 ac-ft
58.00		0.64 ac	206.0 ft	136.0 ft	
55.00	Pond Bottom	0.47 ac	182.0 ft	112.0 ft	

Required Treatment+Attenuation Vol.= 5.27 ac-ft
Required Treatment+Attenuation Stage= 63.73 ft

Provided Treatment+Attenuation Vol.= 4.02 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.81 ac-ft
Estimated Storm Sewer TW EL.= 62.16 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.30 ac

Required Treatment+Attenuation Vol.= 5.27 ac-ft
Required Treatment+Attenuation Stage= 63.73 ft

Total Provided Treatment+Attenuation Vol.= 5.74 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.81 ac-ft
Estimated Storm Sewer TW EL.= 62.16 ft

HGL requirements met

TOTAL PROPOSED POND R/W (Pond 23A-1 + Pond 23A-2) = 3.58 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23B**

Station Limits: From: 385+47 To: 401+79

Roadway Length = 1632 ft
R/W Width = 150 ft

EXISTING CONDITION - 23A (US 301 Mainline)

Roadway Area:

Impervious Area *: 1.89 ac
Pervious Area*: 8.27 ac
Total Roadway Area *: 10.16 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 3.23 ac

Total Area:

Impervious Area: **1.89 ac**
Pervious Area: **11.50 ac**
Total Area: **13.39 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.95 ac	93.5
Impervious areas; Streets & roads	D	98	0.94 ac	91.8
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.87 ac	33.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.18 ac	14.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	0.48 ac	15.4
Woods-grass combination (orchard or tree farm); Good condition	D	79	4.07 ac	321.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.97 ac	59.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.71 ac	54.6
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	1.31 ac	104.9
		Total:	11.47 ac	788.6

CN = Total CN*Area / Total Area = **68.7**

Denotes Pond Area

Runoff:

			SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) =	$\frac{1000}{CN} - 10 =$	**4.55 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) =	$\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**3.90 in**	**3.49 in**	**4.75 in**	**14.45 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23B**

Station Limits: From: 385+47 To: 401+79 Roadway Length = 1632 ft R/W Width = 150 ft

EXISTING CONDITION - 23B (468 Plus Intersection Connection)

Roadway Area:

Impervious Area *: 0.94 ac
Pervious Area*: 2.66 ac
Total Roadway Area *: 3.61 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 0.00 ac

Total Area:
Impervious Area: **0.94 ac**
Pervious Area: **2.66 ac**
Total Area: **3.61 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.94 ac	92.2
Impervious areas; Streets & roads	D	98	0.00 ac	0.0
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.02 ac	1.6
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.00 ac	0.0
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.60 ac	43.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.09 ac	7.3
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.95 ac	150.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.00 ac	0.0
		Total:	3.61 ac	295.2

CN = Total CN*Area / Total Area = **81.9**

Denotes Pond Area

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.21 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**3.90 in**	**3.49 in**	**4.75 in**	**14.45 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23B**

Station Limits: From: 385+47 To: 401+79 Roadway Length = 1632 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.62 ac
Pervious Roadway Area:	6.23 ac
Total Roadway Area *:	11.85 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	2.49 ac	
Water Surface Area:	0.74 ac	Wet Pond
Total Pond Area:	3.23 ac	

Total Area:

Impervious Area:	**5.62 ac**
Pervious Area:	**8.72 ac**
Water Surface Area:	**0.74 ac**
Total Area:	**15.08 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.62 ac	550.9
Proposed Roadway Pervious	D	80	4.07 ac	325.5
Proposed Roadway Pervious	A	39	2.16 ac	84.2
Proposed Pond Pervious	D	80	2.49 ac	199.2
Proposed Ponds (Water Surface)	D	100	0.74 ac	73.8
		Total:	15.08 ac	1233.6

CN = Total CN*Area / Total Area = **81.8**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.22 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$	Runoff (Q) =	**5.37 in**	**4.90 in**	**6.31 in**	**16.57 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23B**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.47 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.47 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.35 ac-ft	3.89 ac-ft	5.30 ac-ft	16.13 ac-ft
Q_{post} =	6.74 ac-ft	6.15 ac-ft	7.93 ac-ft	20.82 ac-ft
ΔQ =	**2.39 ac-ft**	**2.26 ac-ft**	**2.64 ac-ft**	**4.69 ac-ft**

Attenuation V_{req} = 4.69 ac-ft

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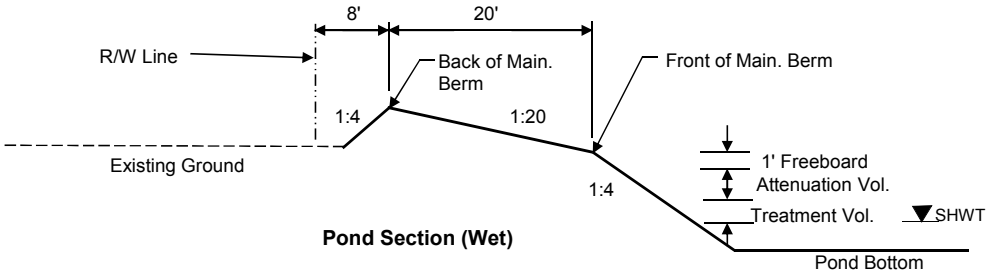
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23B**

POND 23 B

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	63.50
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	60.00
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1100 ft	
Estimated Energy Losses =	1.1 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	61.90 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
63.50	Pond R/W	1.31 ac	172.0 ft	332.0 ft	
65.50	Back of Main. Berm	1.13 ac	156.0 ft	316.0 ft	3.57 ac-ft
65.00		0.92 ac	136.0 ft	296.0 ft	3.06 ac-ft
64.50	Front of Main. Berm	0.73 ac	116.0 ft	276.0 ft	2.65 ac-ft
63.50	Provided Treat.Vol.+Att.Vol	0.66 ac	108.0 ft	268.0 ft	1.93 ac-ft
63.47	Req'd Treat.Vol+Att. Vol	0.66 ac	107.7 ft	267.7 ft	1.91 ac-ft
61.89	Estimated Storm Sewer TW	0.56 ac	95.1 ft	255.1 ft	0.94 ac-ft
61.00	Top of Treatment Vol.	0.50 ac	88.0 ft	248.0 ft	0.47 ac-ft
60.00	Normal Water Level	0.44 ac	80.0 ft	240.0 ft	0.00 ac-ft
58.00		0.33 ac	64.0 ft	224.0 ft	
55.00	Pond Bottom	0.18 ac	40.0 ft	200.0 ft	

Required Treatment+Attenuation Vol.= 5.16 ac-ft
Required Treatment+Attenuation Stage= 63.47 ft

Provided Treatment+Attenuation Vol.= 1.93 ac-ft
Provided Treatment+Attenuation Stage= 63.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.73 ac-ft
Estimated Storm Sewer TW EL.= 61.89 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.57 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23B**

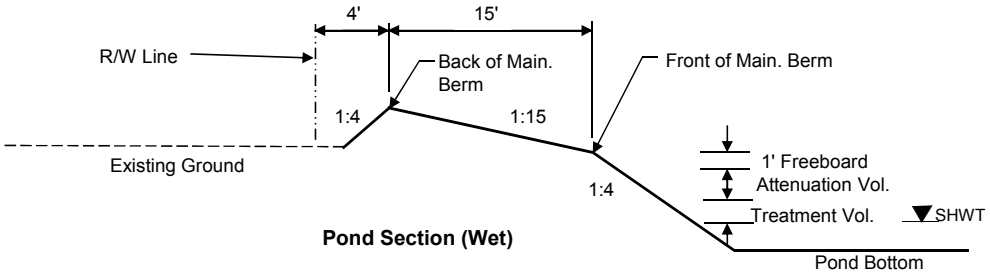
POND 23 A-2

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	65.00	
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	60.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1050 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.48 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
65.00	Pond R/W	1.92 ac	348.0 ft	240.0 ft	
66.00	Back of Main. Berm	1.81 ac	340.0 ft	232.0 ft	5.96 ac-ft
65.50		1.62 ac	325.0 ft	217.0 ft	5.10 ac-ft
65.00	Front of Main. Berm	1.44 ac	310.0 ft	202.0 ft	4.34 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	1.34 ac	302.0 ft	194.0 ft	3.29 ac-ft
63.96	Req'd Treat.Vol+Att. Vol	1.34 ac	301.7 ft	193.7 ft	3.24 ac-ft
62.38	Estimated Storm Sewer TW	1.20 ac	289.0 ft	181.0 ft	1.78 ac-ft
60.69	Top of Treatment Vol.	1.06 ac	275.5 ft	167.5 ft	0.47 ac-ft
60.00	Normal Water Level	0.30 ac	80.0 ft	162.0 ft	0.00 ac-ft
58.00		0.21 ac	64.0 ft	146.0 ft	
55.00	Pond Bottom	0.11 ac	40.0 ft	122.0 ft	

Required Treatment+Attenuation Vol.= 5.16 ac-ft
Required Treatment+Attenuation Stage= 63.96 ft

Provided Treatment+Attenuation Vol.= 3.29 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.73 ac-ft
Estimated Storm Sewer TW EL.= 62.38 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.30 ac

Required Treatment+Attenuation Vol.= 5.16 ac-ft
Required Treatment+Attenuation Stage= 63.96 ft

Total Provided Treatment+Attenuation Vol.= 5.22 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.73 ac-ft
Estimated Storm Sewer TW EL.= 62.38 ft HGL requirements met

TOTAL PROPOSED POND R/W (Pond 23B + Pond 23A-2) = 3.87 ac

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(407) 971-8955 (fax)

Made by: CND
Checked by:

DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23C**

Station Limits: From: 385+47 To: 401+79

Roadway Length = 1632 ft
R/W Width = 150 ft

EXISTING CONDITION - 23A (US 301 Mainline)

Roadway Area:

Impervious Area *: 1.89 ac
Pervious Area*: 8.27 ac
Total Roadway Area *: 10.16 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 3.12 ac

Total Area:

Impervious Area: **1.89 ac**
Pervious Area: **11.39 ac**
Total Area: **13.28 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.95 ac	93.5
Impervious areas; Streets & roads	D	98	0.94 ac	91.8
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	A	39	0.87 ac	33.7
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.18 ac	14.0
Woods-grass combination (orchard or tree farm); Good condition	A	32	0.48 ac	15.4
Woods-grass combination (orchard or tree farm); Good condition	D	79	4.07 ac	321.5
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	A	30	1.97 ac	59.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.71 ac	54.6
Commercial & business (85% impervious)	A	89	1.20 ac	106.7
		Total:	11.36 ac	790.4

CN = Total CN*Area / Total Area = **69.6**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = 1000/CN - 10 = **4.37 in** — Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $(P - 0.2S)^2 / (P + 0.8S)$ — Runoff (Q) =	**3.99 in**	**3.57 in**	**4.85 in**	**14.60 in**

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DATE: December 5, 2017
Job Number: HDR-001-01

PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23C**

Station Limits: From: 385+47 To: 401+79 Roadway Length = 1632 ft R/W Width = 150 ft

EXISTING CONDITION - 23B (468 Plus Intersection Connection)

Roadway Area:

Impervious Area *: 0.94 ac
Pervious Area*: 2.66 ac
Total Roadway Area *: 3.61 ac

*Areas measured in Microstation

Pond Area: Pervious Pond Area = 0.00 ac

Total Area:

Impervious Area: **0.94 ac**
Pervious Area: **2.66 ac**
Total Area: **3.61 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.94 ac	92.2
Impervious areas; Streets & roads	D	98	0.00 ac	0.0
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.02 ac	1.6
Residential Areas (2.0 acre, 12% Impervious)	D	82	0.00 ac	0.0
Brush-weed-grass mixture; Good condition (> 75% ground cover)	D	73	0.60 ac	43.9
Woods-grass combination (orchard or tree farm); Good condition	D	79	0.09 ac	7.3
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	1.95 ac	150.2
Woods; Good condition (Woods are protected from grazing and covered with forest litter and brush)	D	77	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries, etc.) Good condition (grass cover > 75%)	D	80	0.00 ac	0.0
		Total:	3.61 ac	295.2

CN = Total CN*Area / Total Area = **81.9**

Denotes Pond Area

Runoff:

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ = **2.21 in** — Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ — Runoff (Q) =	**3.99 in**	**3.57 in**	**4.85 in**	**14.60 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23C**

Station Limits: From: 385+47 To: 401+79 Roadway Length = 1632 ft R/W Width = 150 ft

PROPOSED CONDITION

Roadway Area:

Impervious Roadway Area *:	5.62 ac
Pervious Roadway Area:	6.23 ac
Total Roadway Area *:	11.85 ac

*Areas measured in Microstation

Pond Area:

Pervious Pond Area :	2.46 ac	
Water Surface Area:	0.65 ac	Wet Pond
Total Pond Area:	3.12 ac	

Total Area:

Impervious Area:	**5.62 ac**
Pervious Area:	**8.69 ac**
Water Surface Area:	**0.65 ac**
Total Area:	**14.97 ac**

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.62 ac	550.9
Proposed Roadway Pervious	D	80	4.07 ac	325.5
Proposed Roadway Pervious	A	39	2.16 ac	84.2
Proposed Pond Pervious	D	80	2.46 ac	197.0
Proposed Ponds (Water Surface)	D	100	0.65 ac	65.3
		Total:	14.97 ac	1222.9

CN = Total CN*Area / Total Area = **81.7**

Runoff:

		SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Soil Capacity (S) = $\frac{1000}{CN} - 10$ =	**2.24 in**	Precipitation (P) =	7.50 in	7.00 in	8.50 in	19.00 in
Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$		Runoff (Q) =	**5.35 in**	**4.88 in**	**6.30 in**	**16.56 in**

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23C**

PROPOSED CONDITION

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	**SWFWMD**
StormW.Mgmt.	**Wet Detention**
Online/Offline	**Online**
Impaired/OFW	**Yes/No**
Open/Closed Basin	**Closed**

Wet Detention	**1.00 in**	x DCIA =	0.47 ac-ft
		(Directly Connected Impervious Area)	

Treatment V_{req} = 0.47 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD 25yr/24hr	Storm Sewer 10yr/24hr	FDOT Open 25yr/24hr	FDOT Closed 100yr/240hr
Q_{pre} =	4.42 ac-ft	3.95 ac-ft	5.36 ac-ft	16.16 ac-ft
Q_{post} =	6.68 ac-ft	6.09 ac-ft	7.86 ac-ft	20.65 ac-ft
ΔQ =	**2.26 ac-ft**	**2.14 ac-ft**	**2.50 ac-ft**	**4.49 ac-ft**

Attenuation V_{req} = 4.49 ac-ft

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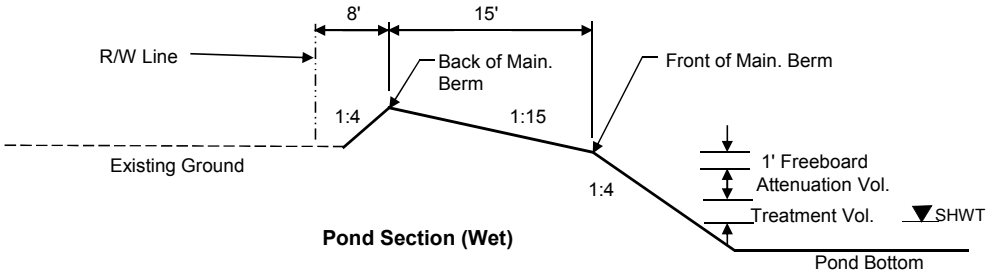
PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23C**

POND 23 C

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	64.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	60.50
Maximum Storage Depth (**SD**) =	3.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	450 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.55 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
64.00	Pond R/W	1.20 ac	150.0 ft	348.0 ft	
66.00	Back of Main. Berm	1.02 ac	134.0 ft	332.0 ft	3.43 ac-ft
65.50		0.87 ac	119.0 ft	317.0 ft	2.95 ac-ft
65.00	Front of Main. Berm	0.72 ac	104.0 ft	302.0 ft	2.56 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	0.65 ac	96.0 ft	294.0 ft	1.86 ac-ft
63.96	Req'd Treat.Vol+Att. Vol	0.65 ac	95.7 ft	293.7 ft	1.83 ac-ft
62.38	Estimated Storm Sewer TW	0.54 ac	83.0 ft	281.0 ft	0.89 ac-ft
61.54	Top of Treatment Vol.	0.48 ac	76.3 ft	274.3 ft	0.47 ac-ft
60.50	Normal Water Level	0.42 ac	68.0 ft	266.0 ft	0.00 ac-ft
58.50		0.30 ac	52.0 ft	250.0 ft	
55.00	Pond Bottom	0.12 ac	24.0 ft	222.0 ft	

Required Treatment+Attenuation Vol.= 4.96 ac-ft
Required Treatment+Attenuation Stage= 63.96 ft

Provided Treatment+Attenuation Vol.= 1.86 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.61 ac-ft
Estimated Storm Sewer TW EL.= 62.38 ft

HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.44 ac

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PROJECT : **SR 35/US 301 PD&E Study From CR 470 W to SR 44**
BASIN NAME : **23**
POND NAME : **23C**

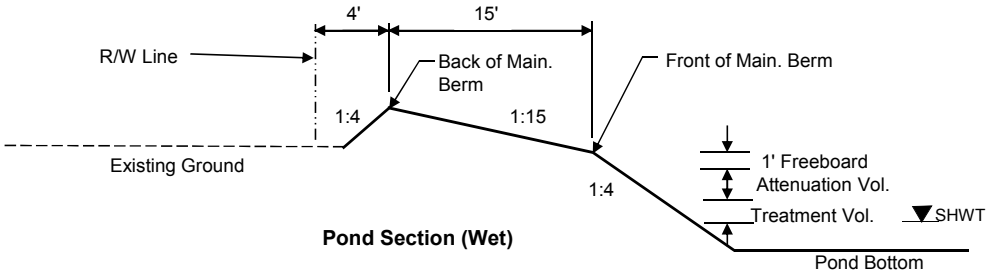
POND 23 A-2

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	65.00	
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	60.00	*
Maximum Storage Depth (**SD**) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	64.00	

**Pond Liner Required*

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1050 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Allowable Storm Sewer Tailwater EL =	62.48 ft	



Pond Section (Wet)

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
65.00	Pond R/W	1.92 ac	348.0 ft	240.0 ft	
66.00	Back of Main. Berm	1.81 ac	340.0 ft	232.0 ft	5.81 ac-ft
65.50		1.62 ac	325.0 ft	217.0 ft	4.95 ac-ft
65.00	Front of Main. Berm	1.44 ac	310.0 ft	202.0 ft	4.19 ac-ft
64.00	Provided Treat.Vol.+Att.Vol	1.34 ac	302.0 ft	194.0 ft	3.17 ac-ft
63.96	Req'd Treat.Vol+Att. Vol	1.34 ac	301.7 ft	193.7 ft	3.13 ac-ft
62.38	Estimated Storm Sewer TW	1.20 ac	289.0 ft	181.0 ft	1.71 ac-ft
60.73	Top of Treatment Vol.	1.06 ac	275.8 ft	167.8 ft	0.47 ac-ft
60.00	Normal Water Level	0.24 ac	64.0 ft	162.0 ft	0.00 ac-ft
58.00		0.16 ac	48.0 ft	146.0 ft	
55.00	Pond Bottom	0.07 ac	24.0 ft	122.0 ft	

Required Treatment+Attenuation Vol.= 4.96 ac-ft
Required Treatment+Attenuation Stage= 63.96 ft

Provided Treatment+Attenuation Vol.= 3.17 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.61 ac-ft
Estimated Storm Sewer TW EL.= 62.38 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.30 ac

Required Treatment+Attenuation Vol.= 4.96 ac-ft
Required Treatment+Attenuation Stage= 63.96 ft

Total Provided Treatment+Attenuation Vol.= 5.03 ac-ft
Provided Treatment+Attenuation Stage= 64.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.61 ac-ft
Estimated Storm Sewer TW EL.= 62.38 ft HGL requirements met

TOTAL PROPOSED POND R/W (Pond 23C + Pond 23A-2) = 3.74 ac

APPENDIX D

Alternatives Evaluation Matrix

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US 301 PD&E - From CR 470 W to SR 44

BASIN 1 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
1A	Station 103+40 (RT.) Parcel No. J12-009	66.00	Millhopper (A)	62.50	67.00	825	65.50	3.00	62.50	N	CD-01	10.33	1.30	0.00	1.27	1.27
1B	Station 109+21 (RT.) Parcel No. J12-009	66.00	Candler (A)	59.30	67.00	1400	65.00	3.00	62.00	N	CD-01	10.11	0.88	0.00	1.02	1.02
1C	Station 110+01 (LT.) Parcel No. J12-006	64.00	Sumterville (C/D) & Oldsmar (A)	62.00	67.00	1300	64.00	2.00	62.00	N	CD-01	10.59	1.17	0.00	1.59	1.59

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
1A	0	0	0.00	X	High	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	21.40	$571,443	2
1B	0	0	0.00	X	High	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	21.40	$447,514	1
1C	0	0	0.00	X	High	0	Low	Florida Burrowing Owl, Gopher Tortoise	High	N	Golf Course	Golf Course	175.62	$1,809,708	3

Note:

The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 2 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
2A	Station 145+14 (LT.) Parcel No. J12-019	54.00	Paisley (B/D) & Terra Ceia (A/D)	50.60	52.00	100	52.00	4.00	48.00	Y	Shady Brook	16.86	2.76	0.00	1.93	1.93
2B	Station 144+43 (RT.) Parcel No. J12-013	55.00	Paisley (B/D)	53.50	52.00	300	53.00	4.00	49.00	Y	Shady Brook	17.91	2.95	0.00	3.20	3.20
2C	Station 139+53 (LT.) Parcel No. J12-022	48.00	Paisley (B/D), Terra Ceia (A/D) & Oldsmar (A)	46.50	52.00	1550	46.00	2.00	44.00	Y	Shady Brook	17.46	2.90	0.31	2.65	2.96

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
2A	0	0.27	0.27	AE	Low	0	Low	None	None	N	Hardwood Conifer Mixed	Agricultural Resource	7.32	$437,896	1
2B	0	0	0.00	X	Low	0.32	High	Florida Burrowing Owl, Gopher Tortoise	Low	N	Low Density Residential	Agricultural Resource	4.98	$721,605	2
2C	0	0	0.00	X	High	1.52	High	None	None	N	Stream & Lake Swamps	Agricultural Resource	5.71	$700,469	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 3 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
3A	Station 155+96 (LT.) Parcel No. J01-027, J01-024, J01-068	57.00	Sumterville (C/D) & MIllhopper (A)	52.00	52.00	450	55.00	6.75	48.25	Y	Shady Brook	15.98	3.34	0.00	3.47	3.47
3B	Station 152+97 (RT.) Parcel No. J01-067	53.00	Sumterville (C/D), Paisley (B/D) & Sparr (A/D)	47.60	52.00	950	51.00	3.50	47.50	N	Shady Brook	15.15	3.35	0.26	2.48	2.74
3C	Station 152+69 (RT.) Parcel No. J12-004	55.00	Sumterville (C/D), Paisley (B/D) & Oldsmar (A/D)	52.00	52.00	200	53.00	5.00	48.00	Y	Shady Brook	15.02	3.32	0.00	2.33	2.33

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
3A	0	0	0.00	X	Moderate	0	High	Florida Burrowing Owl, Gopher Tortoise	Low	N	Feeding Operations	Agricultural Resource	4.06	$934,436	3
3B	0	0	0.00	X	Low	0	Low	None	Low	N	Hardwood Conifer Mixed	Agricultural Resource	13.42	$790,044	1*
3C	0	0	0.00	X	High	0	Low	None	None	N	Stream & Lake Swamps	Agricultural Resource	14.51	$492,066	2

Note:

The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

* Although the total cost of Pond 3C is less than Pond 3B, due to the presence of artifact scatter within Pond 3C identified in the Cultural Resource Assessment Survey and the additional work associated with excavating and documenting the site, the preferred alternative fo this basin is Pond 3B.

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BASIN 4 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
4A	Station 185+02 (RT.) Parcel No. J01-011	58.00	Adamsville (A), Ona (B/D) & Tavares (A)	55.00	59.00	150	57.00	2.00	55.00	N	CD-03	9.85	2.18	0.00	2.21	2.21
4B	Station 190+65 (RT.) Parcel No. J01-006 & J01-011	57.00	Adamsville (A) & Ona (B/D)	52.90	59.00	250	57.00	2.00	55.00	N	CD-03	9.81	1.75	0.00	2.16	2.16
4C	Station 184+65 (LT.) Parcel No. J01-008 & J01-029	57.00	Adamsville (A) & Tavares (A)	54.00	59.00	400	57.00	3.00	54.00	N	CD-03	9.84	2.24	0.00	2.19	2.19

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
4A	0	0	0.00	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	Low	N	Low Density Residential	Agricultural Resource	11.16	$432,144	2
4B	0	0	0.00	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	Medium	N	Low Density Residential	Agricultural Resource	11.38	$415,756	1
4C	0	0	0.00	X	Low	0	Low	None	Low	N	Cropland & Pasture	Agricultural Resource	2.59	$565,455	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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BASIN 5 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
5A	Station 205+83 (RT.) Parcel No. F36-054	59.00	Adamsville (A), Basinger (A/D) & Sparr (A/D)	56.00	59.00	1250	59.00	3.50	55.50	N	CD-04	16.39	5.88	0.25	5.21	5.46
5B	Station 199+66 (RT.) Parcel No. J01-003	58.00	Adamsville (A) & Basinger (A/D)	54.50	59.00	60	57.00	2.75	54.25	N	CD-04	14.61	4.49	0.00	3.09	3.09
5C	Station 197+56 (LT.) Parcel No. J01-031	55.00	Adamsville (A) & Basinger (A/D)	54.00	59.00	250	56.00	2.00	54.00	N	CD-04	16.69	6.19	0.00	5.58	5.58

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs
5A	0	0.72	0.72	A	Low	0.28	High	Florida Sandhill Crane, Florida Burrowing Owl, Gopher tortoise	Medium	N	Cropland & Pasture	Agricultural Resource	33.71	$1,032,209
5B	0	0.69	0.69	A	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	Medium	N	Low Density Residential	Agricultural Resource	6.70	$594,062
5C	0	0.56	0.56	A	Low	0.33	Low	Florida Burrowing Owl, Gopher Tortoise	Medium	N	Cropland & Pasture	Agricultural Resource	13.91	$656,983

Note:

The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

See Basin 19 for Pond Rankings

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US 301 PD&E - From CR 470 W to SR 44

BASIN 6 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
6A	Station 10018+22 (RT.) Parcel No. F36-062	58.00	Sparr (A/D)	56.50	58.00	600	58.00	1.50	56.50	N	CD-05	6.93	1.04	0.00	2.30	2.30
6B	Station 10023+15 (RT.) Parcel No. F36-062	58.00	Paisley (A), Basinger (A/D) & Sparr (A/D)	56.00	58.00	100	57.00	1.00	56.00	N	CD-05	6.92	1.14	0.00	2.29	2.29
6C	Station 10018+01 (RT.) Parcel No. F36-062	57.00	Tarrytown (C/D)	55.50	58.00	1500	57.00	1.50	55.50	N	CD-05	6.69	1.00	0.54	2.01	2.55

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
6A	0	0	0.00	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	31.29	$374,368	2
6B	0	0	0.00	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	31.29	$292,752	1
6C	0	0	0.00	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	31.29	$517,140	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

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BASIN 7 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
7A	Station 10036+82 (RT.) Parcel No. F36-041 & F36-098	64.00	Sparr (A/D)	60.50	60.00	185	62.00	4.00	58.00	Y	CD-06	5.19	0.80	0.00	2.37	2.37
7B	Station 10031+13 (RT.) Parcel No. F36-042	59.00	Sparr (A/D)	57.00	60.00	375	58.50	1.50	57.00	N	CD-06	4.24	0.62	0.00	1.24	1.24
7C	Station 10036+80 (LT.) Parcel No. F35-001	61.00	Sparr (A/D)	58.00	60.00	150	59.00	1.00	58.00	N	CD-06	4.73	0.71	0.00	1.83	1.83

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
7A	0	0	0.00	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Hardwood Conifer Mixed	Municipality	6.80	$430,895	3
7B	0	0	0.00	X	Low	0	Low	None	None	N	Hardwood Conifer Mixed	Municipality	22.12	$236,289	1
7C	0	0	0.00	X	Low	0	High	Gopher Tortoise	Medium	N	Low Density Residential	Municipality	1.83	$368,301	2

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

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BASIN 8 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
8A	Station 10047+28 (LT.) Parcel No. F35C005 & F35C015	61.00	Sparr (A/D)	59.00	63.00	425	61.00	2.00	59.00	N	CSX Railway Ditch	8.73	0.58	0.00	1.43	1.43
8B	Station 10043+86 (LT.) Parcel No. F35C009 & F35C013	60.00	Sparr (A/D)	58.00	63.00	800	60.25	2.25	58.00	N	CSX Railway Ditch	6.90	0.67	0.00	1.16	1.16
8C	Station 10045+23 (LT.) Parcel No. F35C006, F35C008 & F35C017	60.00	Sparr (A/D)	58.00	63.00	675	60.00	2.00	58.00	N	CSX Railway Ditch	6.88	0.70	0.00	1.14	1.14
8D	Station 10045+23 (LT.) Parcel No. F35C004, F35C005, F35C006, F35C007, F35C008, F35C015, & F35C017	61.00	Sparr (A/D)	58.00	63.00	275	62.00	4.00	58.00	N	CSX Railway Ditch	9.42	7.92	0.00	4.19	4.19

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
8A	0	0	0.00	X	Moderate	0	Low	None	Medium	N	Commercial & Services	Municipality	1.95	$331,551	1
8B	0	0	0.00	X	Moderate	0	Low	None	Medium	N	Commercial & Services	Municipality	2.13	$802,424	2
8C	0	0	0.00	X	Moderate	0	Low	None	Medium	N	Commercial & Services	Municipality	1.14	$1,092,998	3
8D	0	0	0.00	X	Moderate	0	Low	None	Medium	N	Commercial & Services	Municipality	4.52	$1,680,962	4

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

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BASIN 9 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control / Bottom Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
9A	Station 10070+47 (RT.) Parcel No. F36-016	64.00	Tavares (A)	60.50	66.00	675	64.00	3.50	60.50	N	Adjacent Wetlands	5.58	1.35	0.29	1.39	1.68
9B	Station 10065+15 (RT.) Parcel No. F36-075	61.00	Tavares (A)	56.25	66.00	1850	61.00	2.00	59.00	N	Adjacent Wetlands	5.56	0.97	0.65	1.37	2.02
9C	Station 10068+38 (RT.) Parcel No. F36-018	64.00	Tavares (A)	60.50	66.00	675	64.00	3.50	60.50	N	Adjacent Wetlands	5.43	1.36	0.22	1.21	1.43

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
9A	0	0	0.00	X	Moderate	0	High	Southeastern American Kestral	Low	N	Medium Density Residential	Municipality	5.72	$432,950	2
9B	0	0	0.00	X	Moderate	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Municipality	17.71	$357,387	1
9C	0	0	0.00	X	Moderate	0	High	Southeastern American Kestral	Low	N	Medium Density Residential	Municipality	3.10	$437,439	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

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BASIN 10 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
10A	Station 10087+78 (RT.) Parcel No. F36-083	58.00	Tarrytown (C/D) & Sparr (A/D)	56.50	60.00	1150	58.00	1.50	56.50	N	CD-07	9.83	1.48	1.18	2.19	3.37
10B	Station 10087+78 (RT.) Parcel No. F36-003	59.00	Tarrytown (C/D) & Sparr (A/D)	56.00	60.00	800	59.00	3.00	56.00	N	CD-07	9.64	1.45	0.00	1.96	1.96
10C	Station 10085+05 (RT.) Parcel No. F36-002	57.00	Tarrytown (C/D)	55.50	60.00	1500	57.00	1.50	55.50	N	CD-07	9.87	1.48	1.04	2.25	3.29

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
10A	0.00	0.00	0.00	A	Low	0	Low	None	None	N	Cropland & Pasture	Municipality	12.88	$527,121	3
10B	0.00	0.14	0.14	X	Low	0	Low	None	None	N	Cropland & Pasture	Municipality	24.81	$323,723	1
10C	0.00	0.00	0.00	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Rural Residential	35.32	$523,609	2

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

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BASIN 11 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
11A	Station 10116+00 (LT.) Parcel No. G30-029	65.00	EauGallie (A/D) & Sparr (A/D)	63.00	64.00	470	63.00	2.00	61.00	Y	CD-08	9.84	1.30	0.00	1.84	1.84
11B	Station 10117+00 (RT.) Parcel No. G31-027	60.00	Sumterville (C/D) & Sparr (A/D)	58.00	64.00	150	60.00	2.00	58.00	N	CD-08	9.79	1.26	0.19	1.78	1.97
11C	Station 10117+00 (RT.) Parcel No. G31-040	65.00	Sumterville (C/D)	62.00	64.00	1750	63.00	3.25	59.75	Y	CD-08	9.72	1.23	0.43	1.70	2.13

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
11A	0.00	0	0.00	X	Low	0.00	Low	None	None	N	Hardwood Conifer Mixed	Rural Residential	1.84	$421,553	2
11B	0.00	0	0.00	X	Low	0.00	Low	None	None	N	Hardwood Conifer Mixed	Agricultural Resource	9.54	$386,400	1
11C	0.00	0	0.00	X	Moderate	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	23.01	$450,167	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 12 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
12A	Station 10131+00 (RT.) Parcel No. G30-030	64.00	Sparr (A/D)	61.00	64.00	500	63.00	2.00	61.00	N	CD-09	10.22	1.55	0.00	1.73	1.73
12B	Station 10132+00 (RT.) Parcel No. G30-036	64.00	Sparr (A/D)	61.00	64.00	1000	63.50	2.50	61.00	N	CD-09	10.02	1.51	0.30	1.48	1.78
12C	Station 10140+00 (LT.) Parcel No. G30-022	64.00	Adamsville (A)	61.00	64.00	420	63.50	2.75	60.75	N	CD-09	9.99	1.49	0.00	1.44	1.44

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
12A	0.00	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	Low	N	Low Density Residential	Municipality	6.46	$517,963	2
12B	0.00	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	Low	N	Low Density Residential	Municipality	9.57	$462,688	1
12C	0.00	0	0.00	X	Moderate	0.00	Low	None	High	N	Low Density Residential	Municipality	1.44	$900,724	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 13 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
13A	Station 414+00 (LT.) Parcel No. G30-013	62.00	Adamsville (A), Ft. Green (C/D) & Sparr (A/D)	60.00	64.00	1275	62.00	2.00	60.00	N	CD - 10	9.77	1.85	0.54	2.19	2.73
13B	Station 410+00 (RT.) Parcel No. G30-006, G30-009 & G30-050	58.00	Pits (Not Defined)	54.00	64.00	950	58.00	4.00	54.00	N	CD - 10	9.91	0.68	0.54	2.35	2.89
13C	Station 405+00 (RT.) Parcel No. G30-009	62.00	Pits (Not Defined)	60.40	64.00	400	62.70	3.20	59.50	N	CD - 10	10.60	5.36	0.00	3.18	3.18

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
13A	0	0	0	X	Moderate	0	Low	None	None	N	Hardwood Conifer Mixed	Rural Residential	17.97	$617,193	2
13B	0	1.57	1.57	A	Low	1.58	Low	None	Low	N	Resevoir	Rural Residential	90.45	$1,345,749	3
13C	0	0	0	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	Low	N	Low Density Residential	Rural Residential	39.95	$485,211	1

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 14 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
14A	Station 536+21 (LT.) Parcel No. G19-010	58.00	Wabasso (B/D)	56.00	60.00	200	58.00	2.00	56.00	N	CD - 11	20.04	1.76	0.00	2.20	2.20
14B	Station 541+01 (LT.) Parcel No. G19-003	59.00	Wabasso (B/D) & Ft. Green (C/D)	57.00	60.00	300	59.00	3.00	56.00	Y	CD - 11	19.59	1.67	0.00	1.67	1.67
14C	Station 535+37 (RT.) Parcel No. G19-001	61.00	Manteocha (A/D) & Ft. Green (C/D)	54.70	60.00	875	60.00	3.50	56.50	N	CD - 11	19.96	1.83	0.30	2.10	2.40

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
14A	0	0.14	0.14	A	Moderate	0	High	Southeastern American Kestral, Florida Burrowing Owl, Gopher Tortoise	Low	N	Cropland & Pasture	Municipality	14.88	$468,433	2
14B	0	0	0	X	Moderate	0	High	Southeastern American Kestral, Florida Burrowing Owl, Gopher Tortoise	Low	N	Hardwood Conifer Mixed	Municipality	45.42	$654,969	3
14C	0	0	0	X	Low	0	High	Southeastern American Kestral, Florida Burrowing Owl, Gopher Tortoise	None	N	Hardwood Conifer Mixed	Municipality	233.17	$420,340	1

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 15 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
15A	Station 568+24 (LT.) Parcel No. G19-002	60.00	EauGallie (A/D) & Okeelanta (A/D)	58.50	59.00	550	58.00	2.00	56.00	Y	CD - 12	18.04	1.41	0.00	1.75	1.75
15B	Station 556+96 (LT.) Parcel No. G19-002	62.00	Ft. Green (C/D)	61.90	59.00	325	60.00	4.00	56.00	Y	CD - 12	17.92	1.32	0.00	1.60	1.60
15C	Station 567+39 (RT.) Parcel No. G19-001	60.00	EauGallie (A/D), Ft. Green (C/D) & Tarrytown (C/D)	58.00	59.00	600	58.00	2.00	56.00	Y	CD - 12	17.92	1.34	0.00	1.61	1.61

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
15A	0	0.07	0.07	A	Low	0	Low	None	None	N	Shrub & Brushland	Municipality	157.48	$355,667	3
15B	0	0	0	X	Low	0	Low	None	None	N	Hardwood Conifer Mixed	Municipality	157.48	$291,528	1
15C	0	0.02	0.02	A	Low	0	Low	None	None	N	Shrub & Brushland	Municipality	233.17	$309,805	2

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 16 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
16A	Station 594+17 (RT.) Parcel No. G18-008	58.00	Tarrytown (C/D)	54.00	57.00	225	56.00	2.00	54.00	N	CD - 13	9.79	1.02	0.00	1.27	1.27
16B	Station 590+18 (LT.) Parcel No. G18-052	57.00	EauGallie (A/D)	55.50	57.00	700	55.50	1.50	54.00	Y	CD - 13	10.17	1.10	0.15	1.72	1.87
16C	Station 589+28 (RT.) Parcel No. G18-008	58.00	Tarrytown (C/D)	56.00	57.00	700	56.00	2.00	54.00	Y	CD - 13	9.96	0.98	0.00	1.48	1.48

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
16A	0	0	0	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Municipality	107.57	$270,236	1
16B	0	0	0	X	Low	0	High	Gopher Tortoise	None	N	Shrub & Brushland	Municipality	54.08	$607,609	3
16C	0	0	0	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Municipality	107.57	$380,164	2

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 17 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
17A	Station1034+65 (RT.) Parcel No. G18-015	57.00	Paisley (B/D)	55.50	58.00	1200	56.00	2.00	54.00	Y	Adjacent Wetlands	42.42	4.26	0.00	4.08	4.08
17B	Station 1035+25 (LT.) Parcel No. G18-008	58.00	EauGallie (A/D) & Wabasso (B/D)	55.90	58.00	1350	56.50	2.00	54.50	Y	Adjacent Wetlands	43.49	3.78	0.61	5.36	5.97
17C	Station 1028+02 (RT.) Parcel No.G18-015	57.00	Paisley (B/D)	55.50	58.00	1850	55.50	1.50	54.00	Y	Adjacent Wetlands	43.98	4.47	0.46	5.95	6.41

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
17A	0	2.06	2.06	A	Low	0	Low	None	None	N	Cropland & Pasture	Municipality	15.08	$1,639,438	2
17B	0	2.6	2.6	A	Low	0.47	High	Florida Burrowing Owl, Gopher Tortoise	Medium	N	Cropland & Pasture	Municipality	75.41	$893,200	1
17C	0	5.11	5.11	A	Low	0	Low	None	None	N	Cropland & Pasture / Hardwood Conifer Mixed	Municipality	15.08	$1,840,795	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 19 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
19A	Station 311+00 (RT.) Parcel No. F36-054	58.00	Adamsville (A), Basinger (A/D) & Sparr (A/D)	56.00	59.00	3000	57.00	2.00	55.00	Y	CD- 15	30.25	7.65	0.76	7.17	7.93
19B	Station 305+00 (RT.) Parcel No. F36-054	57.00	Paisley (B/D) & Tarrytown (C/D)	55.25	59.00	1250	57.00	1.75	55.25	N	CD- 15	16.62	5.30	0.00	5.26	5.26
19C	Station 311+00 (LT.) Parcel No. F36-062	57.00	Tarrytown (C/D)	55.25	59.00	2500	57.00	1.75	55.25	N	CD- 15	16.68	5.31	0.27	5.33	5.60

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs
19A	0	0.72	0.72	A	Low	0.28	High	Florida Sandhill Crane, Florida Burrowing Owl, Gopher Tortoise	High	N	Cropland & Pasture	Agricultural Resource	33.71	$906,468
19B	0	0.61	0.61	A	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Wet Prairie	Agricultural Resource	33.71	$859,445
19C	0	0	0	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	31.29	$723,030

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

Alternatives	Total Pond Costs	Rankings
19A	$906,468	1
19B & 5B	$1,453,507	4
19B & 5C	$1,516,428	5
19C& 5B	$1,317,092	2
19C & 5C	$1,380,013	3

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US 301 PD&E - From CR 470 W to SR 44

BASIN 20 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
20A	Station 332+00 (LT.) Parcel No. F36-059	57.00	Tarrytown (C/D)	55.50	59.00	1100	57.00	1.50	55.50	N	CD-16	8.39	1.22	0.28	1.93	2.21
20B	Station 335+00 (LT.) Parcel No. F36-009	56.00	Tarrytown (C/D)	54.50	59.00	750	56.00	1.50	54.50	N	CD-16	8.39	1.22	0.00	1.93	1.93
20C	Station 320+00 (LT.) Parcel No. F36-059	57.00	Tarrytown (C/D)	57.00	59.00	500	57.00	1.50	55.50	Y	CD-16	8.34	1.22	0.00	1.88	1.88

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
20A	0	0	0	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Municipality	110.00	$420,346	3
20B	0	0	0	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Municipality	60	$314,216	2
20C	0	0	0	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Rural Residential	110.00	$271,527	1

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

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US 301 PD&E - From CR 470 W to SR 44

BASIN 21 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
21A	Station 350+00 (RT.) Parcel No. F36-001	57.00	Tarrytown (C/D)	56.30	59.00	900	57.00	1.20	55.80	N	Adjacent Ditch	14.06	2.18	0.00	3.40	3.40
21B	Station 347+00 (LT.) Parcel No. F36-009	57.00	Tarrytown (C/D)	55.50	59.00	600	57.00	1.50	55.50	N	CD-17	14.08	2.18	0.00	3.42	3.42
21C	Station 348+50 (RT.) Parcel No. F36-009	57.00	Tarrytown (C/D)	55.50	59.00	1100	57.00	1.50	55.50	N	Adjacent Ditch	14.30	2.19	0.28	3.68	3.96

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
21A	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Rural Residential	10.00	$348,252	1
21B	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Rural Residential	60.00	$360,295	2
21C	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	60.00	$484,645	3

Note:

The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

Inwood Consulting Engineers, Inc.

3000 Dovera Drive, Suite 200, Oviedo FL32765
(407)971-8850 - (407) 971-8955 (fax)

US 301 PD&E - From CR 470 W to SR 44

BASIN 22 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
22A	Station 372+00 (RT.) Parcel No's G31-020 & G31-040	65.00	Sumterville (C/D)	61.50	64.00	1250	63.00	4.00	59.00	Y	CD-19	7.01	5.15	0.00	2.77	2.77
22B	Station 375+00 (LT.) Parcel No. G31-027	60.00	Floridana (C/D) & Sumterville (C/D)	58.00	64.00	1000	59.00	3.00	56.00	Y	CD-19	7.36	5.35	0.00	3.18	3.18
22C	Station 372+00 (LT.) Parcel No. G31-040	64.00	Sumterville (C/D), Sparr (A/D)	62.30	64.00	1150	62.50	3.50	59.00	Y	CD-19	7.13	5.18	0.00	2.91	2.91

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
22A	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	15.00 & 16.57	$463,963	2
22B	0	0	0.00	X	Low	0.00	Low	None	None	N	Hardwood Conifer Mixed	Agricultural Resource	7.71	$548,209	3
22C	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	16.57	$400,766	1

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

Inwood Consulting Engineers, Inc.

3000 Dovera Drive, Suite 200, Oviedo FL32765
(407)971-8850 - (407) 971-8955 (fax)

US 301 PD&E - From CR 470 W to SR 44

BASIN 23 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
23A-1	Station 385+00 (LT.) Parcel No.'s G30-033 & G30-031	65.00	EauGallie (A/D), Sparr (A/D)	62.50	64.00	1050	64.00	4.00	60.00	Y	CD-20	14.83	5.27	0.00	1.28	1.28
23A-2	Station 385+00 (LT.) Parcel No. G30-030	65.00	EauGallie (A/D), Sparr (A/D)	62.50	64.00	1050	64.00	4.00	60.00	Y	CD-20			0.00	2.30	2.30
23B	Station 393+00 (RT.) Parcel No.'s G30-036	63.50	Sparr (A/D)	60.00	64.00	1100	63.50	3.50	60.00	N	CD-09	15.08	5.16	0.23	1.57	1.80
23C	Station 401+00 (LT.) Parcel No. G30-022	64.00	Adamsville (A)	60.50	64.00	450	64.00	3.50	60.50	N	CD-09	14.97	4.96	0.00	1.44	1.44

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs
23A-1	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Low Density Residential	Rural Residential	2.00 & 0.64	$331,591
23A-2	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Low Density Residential	Municipality	7.00	$441,173
23B	0	0	0.00	X	Low	0.00	High	Florida Burrowing Owl, Gopher Tortoise	Low	N	Low Density Residential	Municipality	7.00 & 9.50	$525,952
23C	0	0	0.00	X	Moderate	0.00	Low	None	High	N	Low Density Residential	Municipality	1.44	$916,704

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

Alternatives	Total Pond Costs	Rankings
23A-1 & 23A-2	$772,765	1
23B & 23A-2	$967,126	2
23C & 23A-2	$1,357,877	3

Inwood Consulting Engineers, Inc.

3000 Dovera Drive, Suite 200, Oviedo FL32765
(407)971-8850 - (407) 971-8955 (fax)

US 301 PD&E - From CR 470 W to SR 44

FLOODPLAIN COMPENSATION POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable $DHW_{25yr/24hr}$ (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Pond Control / Bottom Elevation (ft)	Impermeable Liner Required (Y/N)	Outfall Location	Roadway Drainage Area (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
FPC 1	Station 199+77 (LT.) Parcel No. J01-031	54.00	Basinger (A/D)	53.00	N/A	N/A	N/A	N/A	53.00	N	Adjacent Wetlands	N/A	N/A	0.00	0.56	0.56
FPC 3	Station 10026+39 (RT.) Parcel No. F36-062	58.00	Basinger (A/D) & Sparr (A/D)	55.00	N/A	N/A	N/A	N/A	55.00	N	Adjacent Wetlands	N/A	N/A	0.00	0.61	0.61
FPC 4	Station 535+67 (RT.) Parcel No. G19-001	61.00	Ft. Green (C/D) & Manteocha (A/D)	57.40	N/A	N/A	N/A	N/A	56.50	Y	Adjacent Wetlands	N/A	N/A	0.00	2.25	2.25
FPC 5	Station 567+39 (RT.) Parcel No. G19-001	60.00	Tarrytown (C/D)	55.60	N/A	N/A	N/A	N/A	56.00	N	Adjacent Wetlands	N/A	N/A	0.00	5.17	5.17
FPC 6	Station 583+00 (RT.) Parcel No. G18-008	57.00	Tarrytown (C/D) & Manteocha (A/D)	54.00	N/A	N/A	N/A	N/A	54.00	N	Adjacent Wetlands	N/A	N/A	0.00	0.56	0.56
FPC 7	Station 591+92 (RT.) Parcel No. G18-008	58.00	Tarrytown (C/D)	53.80	N/A	N/A	N/A	N/A	54.00	N	Adjacent Wetlands	N/A	N/A	0.00	1.26	1.26

IMPACT & COST ANALYSIS

Alternatives	Roadway Floodplain Impacts (ac-ft)	Pond Floodplain Impacts (ac-ft)	Total Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Environmental Impact Risk	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Parcel Area (ac)	Total Pond Costs	Rankings
FPC 1	0	0	0	X	Moderate	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Agricultural Resource	13.91	$113,314	1
FPC 3	0	0	0	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Hardwood Conifer Mixed	Agricultural Resource	31.29	$109,559	1
FPC 4	0	0	0	X	Low	0.28	High	Southeastern American Kestral. Florida Burrowing Owl, Gopher Tortoise	None	N	Hardwood Conifer Mixed	Municipality	233.17	$328,937	1
FPC 5	0	0	0	X	Low	0.51	Low	None	None	N	Shrub & Brushland	Municipality	233.17	$565,703	1
FPC 6	0	0	0	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Municipality	107.57	$107,581	1
FPC 7	0	0	0	X	Low	0	High	Florida Burrowing Owl, Gopher Tortoise	None	N	Cropland & Pasture	Municipality	107.57	$206,826	1

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. A geotechnical analysis was preformed on the preferred pond sites to determine the approximate seasonal high water table elevation.

APPENDIX E

Existing Permits

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Permit 22044.001

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Southwest Florida Water Management District

2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
SUNCOM 628-4150 TDD only 1-800-231-6103 (FL only)
On the Internet at: WaterMatters.org

An Equal Opportunity Employer

Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)
SUNCOM 578-2070

Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)
SUNCOM 572-6200

Venice Service Office
115 Corporation Way
Venice, Florida 34292-3524
(941) 486-1212 or
1-800-320-3503 (FL only)
SUNCOM 526-6900

Lecanto Service Office
3600 West Sovereign Path
Suite 226
Lecanto, Florida 34461-8070
(352) 527-8131
SUNCOM 667-3271

Ronnie E. Duncan
Chair, Pinellas
Thomas G. Dabney, II
Vice Chair, Sarasota
Janet D. Kovach
Secretary, Hillsborough
Watson L. Haynes, II
Treasurer, Pinellas
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Manatee
Monroe "Al" Coogler
Citrus
Maggie N. Dominguez
Hillsborough
Pamela L. Fentress
Highlands
Ronald C. Johnson
Polk
Heidi E. McCree
Hillsborough
John K. Rooks, III
Pasco

E. D. "Sonny" Vergara
Executive Director
Gene A. Heath
Assistant Executive Director
William S. Blakely
General Counsel

July 11, 2001

Tadd Kasbeer, P.E.
FDOT
719 S Woodland Boulevard
DeLand, FL 32720

Subject: **Notice of Final Agency Action - Approval**
Environmental Resource Noticed General Construction

Project Name:	FDOT- SR 35 from CR 468 to SR 91 (FM - 118010)
Permit No:	47022044.001
County:	Sumter
Sec/Twp/Rge:	18-19, 30/19S/23E
Expiration Date:	July 11, 2006

Dear Mr. Kasbeer:

The District acknowledges your intent to use a Noticed General Construction Permit for the project referenced above. Plans and information received will be kept on file in the Brooksville Service Office in support of this determination. The proposed construction must be completed before the expiration date indicated above.

The proposed construction is subject to general conditions of Rule 40D-400.215, Florida Administrative Code (F.A.C.) (Exhibit A, copy enclosed) and the specific conditions of Rule 40D-400.447(1)(a), F.A.C. Deviations from these conditions may subject you to enforcement action and possible penalties. You are responsible for conducting construction in a manner which satisfies all criteria.

Final approval is contingent upon no objection to the District's action being received by the District within the time frames described below.

You or any person whose substantial interests are affected by the District's action regarding a permit may request an administrative hearing in accordance with Sections 120.569 and 120.57, F.S., and Chapter 28-106, F.A.C., of the Uniform Rules of Procedure. *A request for hearing must: (1) explain how the substantial interests of each person requesting the hearing will be affected by the District's action, or proposed action, (2) state all material facts disputed by the person requesting the hearing or state that there are no disputed facts, and (3) otherwise comply with Chapter 28-106, F.A.C.* Copies of Sections 28-106.201 and 28-106.301, F.A.C. are enclosed for your reference. A request for hearing must be filed with (received by) the Agency Clerk of the District at the District's Brooksville address within 21 days of receipt of this notice. Receipt is deemed to be the fifth day after the date on which this notice is deposited in the United States mail. Failure to file a request for hearing within this time period shall constitute a waiver of any right you or such person may have to request a hearing under Sections 120.569 and 120.57, F.S. Mediation pursuant to Section 120.573, F.S., to settle an administrative dispute regarding the District's action in this matter is not available prior to the filing of a request for hearing.

Enclosed is a "Noticing Packet" that provides information regarding District Rule 40D-1.1010, F.A.C., which addresses the notification of persons whose substantial interests may be affected by the District's action in this matter. The packet contains guidelines on how to provide notice of the District's action, and a notice that you may use.

If you have questions, please contact C. Clay Black, P.E., at the Brooksville Service Office, extension 4325.

Sincerely,

A. Paul Desmarais, P.E., Director
Brooksville Regulation Department

APD:CCB:dkh
Enclosures: Rule 40D-400.447(1)(a), F.A.C.
Exhibit A
Noticing Packet (42.00-039)
Sections 28-106.201 and 28-106.301, F.A.C.
cc: File of Record 47022044.001
USACOE

PROFESSIONAL CERTIFICATION*
FOR THE ENGINEERING EVALUATION REPORT

MSSW/ERP Permit Number:	47022044.001
Date Application Received:	June 5, 2001
Permittee's Name:	FDOT
Address:	719 S Woodland Boulevard DeLand, FL 32720
Project Name:	FDOT- SR 35 from CR 468 to SR 91 (FM - 118010)
Project Description:	Road Project
Project Size:	29.42 Acres
Activity:	Construction
Section(s)/Township/Range:	18-19, 30/19S/23E

I HEREBY CERTIFY that the engineering features described in the referenced application to construct and/or operate a surface water management system associated with the indicated project have been evaluated regarding provision of reasonable assurance of compliance with Part IV, Chapter 373, Florida Statutes, and Chapters 40D-4, 40D-40 or 40D-400, Florida Administrative Code (F.A.C.), as applicable. I have not evaluated and do not make any certifications as to other aspects of the proposal.

7/10/01 (Seal)

C. Clay Black, FL P.E. #40879
Brooksville Regulation Department
Southwest Florida Water Management District

* When required by Section 61G15-26.001(1), F.A.C., a professional engineer's seal, signature and date (i.e., "Professional Certification") means that the work indicated has been conducted under the responsible supervision, direction or control of a person licensed by the State to practice engineering, who by authority of their license is required to have some specialized knowledge of engineering. Professional Certification is not a guaranty or warranty of fitness or suitability, either explicit or implied.

40D-400.447 General Permit to the Florida Department of Transportation, Counties and Municipalities for Minor Activities Within Existing Rights-of-Way or Easements.

(1) A general permit is hereby granted to the Florida Department of Transportation, Counties and Municipalities to conduct the activities described below:

(a) The extension of existing culverts and crossing approaches to accommodate widening of the roadway where excavation or deposition of material shall not exceed 1000 cubic yards in wetlands and other surface waters and the area from which material is excavated or to which material is deposited shall not exceed a total of 0.25 acres at any one location (project site). The 1000 cubic yardage limitation shall be separately applied to excavation and deposition of material.

(b) Relocation, recontouring, widening, or reconstruction of existing highway drainage ditches through uplands provided the floor elevation of the ditch is not deepened below the original design elevation and provided that the work does not cause a change in the hydrology of any wetlands which are connected to or which are adjacent to the ditch.

(c) Culvert placement, replacement and maintenance associated with existing roadways, in streams with an average discharge of less than 10 cubic feet per second at the culvert location or streams draining less than 10 square miles, provided that construction does not cause scour in the downstream waters or increase the velocity of the water downstream, does not reduce existing flood conveyance of the stream for the 100 year flood flow and does not reduce existing flood storage within the 10 year flood plain. The material excavated or deposited as fill shall not exceed 1000 cubic yards in wetlands and other surface waters. The cross sectional area of the culvert shall not be reduced unless the reduced cross section provides for an equal or greater discharge capability. In the case of a culvert installed as a wildlife crossing, the cross sectional area shall not be reduced.

(d) Construction of temporary bypass lanes and stream channel diversions necessary to complete projects detailed in paragraph (c) above, provided the area used for the temporary bypass lanes and temporary diversion is restored to its previous contours and elevations.

(e) Channel clearing and shaping, not to exceed a combined total of 0.5 acres of dredging and filling in wetlands and other surface waters, to facilitate maximum hydraulic efficiency of structures authorized by paragraph (c) above, where the spoil material is used on an upland portion of the project or is deposited on a self-contained, upland spoil site. Escape of spoil material or return water from the spoil deposition area into wetlands or other surface waters is prohibited.

(f) Repair of existing concrete bridge pilings by the construction of pile jackets, provided that the permanent outer form is composed of inert materials and the quantity of material shall not exceed 300 cubic yards of dredging or 300 cubic yards of filling per project. Although the bottom sediments within the forms may be removed by jetting or pumping, and may not be recoverable, proper turbidity control measures shall be employed as necessary to prevent violations of state water quality standards.

(2) This general permit shall be subject to the following specific conditions:

(a) The permittee shall use erosion and sediment control best management practices, including turbidity curtains or similar devices, in strict adherence to these practices as described in Chapter 6, The Florida Land Development Manual: A Guide to Sound Land and Water Management (Florida Department of Environmental Regulation, 1988) incorporated by reference to prevent violation of state water quality standards.

(b) Immediately following completion of slope construction, the fill areas and any disturbed banks of wetlands or other surface waters shall be stabilized with vegetation or riprap to prevent erosion. Temporary erosion controls for all exposed soils within wetlands and other surface waters shall be completed within seven calendar days of the most recent construction activity. Prevention of erosion of exposed earth into wetlands and other surface waters is a construction priority and completed slopes shall not remain unstabilized while other construction continues.

(c) In addition to complying with the notice provisions of section 40D-400.211, F.A.C., at least 90 days prior to commencement of construction, the permittee shall provide written notification to the appropriate District office of the date the permitted construction activities are planned to begin and within 90 days following completion of construction the permittee shall provide written notification to the District of the date construction activities are completed.

(d) The permittee shall limit stream channel relocation to streams which have an average annual discharge of 10 cubic feet per second or less. The length of relocated channels or those significantly altered shall be limited to 200 feet per stream. A stream channel shall be altered only when such a measure will reduce the long term adverse water quality impacts and will maintain or restore the stream's natural hydraulic capability.

(e) This general permit shall not apply to ditch construction in Class I or Class II surface waters, Outstanding National Resource Waters or waters designated as Outstanding Florida Waters.

(3) This general permit does not authorize the construction of additional traffic lanes. Systems which require additional traffic lanes must first obtain a general or individual environmental resource permit under chapters 40D-4 or 40D-40, F.A.C., as applicable, before the start of construction.

Specific Authority 373.044, 373.113, 373.118, F.S., Law Implemented 373.413, 373.416, 373.426, F.S. History--New: 10-3-95.

Permit 16854.000

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Southwest Florida Water Management District

2379 Broad Street • Brooksville, Florida 34609-6899 • 1-800-423-1476 (Florida Only) or (352) 796-7211 • SUNCOM 628-4150 • T.D.D. Number Only (Florida Only): 1-800-231-6103

7601 Highway 301 North, Tampa, Florida 33637-6759, 1-800-836-0797 or (813) 985-7481, SUNCOM 578-2070

170 Century Boulevard, Bartow, Florida 33830-7700, 1-800-492-7862 or (941) 534-1448, SUNCOM 572-6200

115 Corporation Way, Venice, Florida 34292-3524, 1-800-320-3503 or (941) 486-1212, SUNCOM 526-6900

2303 Highway 44 West, Inverness, Florida 34453-3809, (352) 637-1360

Executive Director

September 16, 1997

Roy G. Hurndl, Jr., Chairman, St. Petersburg
Joe L. Davis, Jr., Vice Chairman, Wauchula
Curtis L. Law, Secretary, Land O' Lakes
Sally Thompson, Treasurer, Tampa
James L. Allen, Bushnell
Ramon F. Campo, Brandon
Rebecca M. Egar, Sarasota
John P. Hallee, IV, Bradenton
Ronald C. Johnson, Lake Wales
James E. Marlin, St. Petersburg
Virginia S. Roe, Tampa

E. D. "Sonny" Vergara, Executive Director
Edward B. Helvenston, General Counsel

James Bassett
Florida Department of Transportation
719 S Woodland Boulevard
Deland, FL 32720

Subject: Environmental Resource Noticed General Permit
Project Name: FDOT - Shady Brook Bridge Replacement, SR 35 (WPI 5118381; SPN 18010-3528)
Permit No: [redacted]
County: Sumter
Expiration Date: June 18, 2002

Dear Mr. Bassett:

The District acknowledges your intent to use a Noticed General Permit for the project referenced above. Plans and information received will be kept on file in the Brooksville Service Office in support of this determination. The proposed construction must be completed before the expiration date indicated above.

The proposed construction is subject to general conditions of Rule 40D-400.215, Florida Administrative Code (F.A.C.), and the specific conditions of Rule 40D-400.443(1)(a), F.A.C. (copies enclosed). Deviations from these conditions may subject you to enforcement action and possible penalties. You are responsible for conducting construction in a manner which satisfies all criteria.

The following statements describe procedures established by Florida law, should you or any other person disagree with the District's decision regarding this permit. State law and District rules provide that any person who is substantially affected by the District's Final Agency Action concerning a permit may object to the permit by petitioning for an Administrative Hearing in accordance with Section 120.569, Florida Statutes (F.S.), and Part V of Chapter 40D-1, F.A.C.

A request for hearing must be filed with (received by) the Agency Clerk of the District within 14 days after the date of receipt of this notice.

Excellence Through Quality Service

3

Failure to file a request for hearing within the 14-day period constitutes a waiver of the right such person has to request a hearing under Section 120.569, F.S. When the actual date of receipt of this notice cannot be determined, receipt is deemed to be the fifth day after the date on which the letter is postmarked.

If you have questions, please contact Charlotte F. Booth at the Brooksville Service Office, extension 4376.

Sincerely,

A. Paul [illegible], P.E., Director
Brooksville Regulation Department

APD:CFB:mjs
Enc.: Rule 40D-400.215
Rule 40D-400.463(1)(a)
cc: [illegible]
USACOE
Paulette Fiske, P.E., WBQ Design & Engineering, Inc.

40D-[illegible]215 General Conditions for All Noticed G[illegible]ral Permits.

(1) The terms, conditions, requirements, limitations, and restrictions set forth in this section are binding upon the permittee for all noticed general permits in this chapter. These conditions are enforceable under part IV of Chapter 373, F.S.

(2) The general permit is valid only for the specific activity indicated. Any deviation from the specified activity and the conditions for undertaking that activity shall constitute a violation of the permit. A violation of the permit is a violation of part IV of Chapter 373, F.S., and may result in suspension or revocation of the permittee's right to conduct such activity under the general permit. The District may also begin legal proceedings seeking penalties or other remedies as provided by law for any violation of these conditions.

(3) This general permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any construction, alteration, operation, maintenance, removal or abandonment authorized by this permit.

(4) This general permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the general permit and this chapter.

(5) This general permit does not relieve the permittee from liability and penalties when the permitted activity causes harm or injury to human health or welfare; animal, plant or aquatic life; or property. It does not allow the permittee to cause pollution in contravention of Florida Statutes and District rules.

(6) The permittee is hereby advised that Section 253.77, F.S., states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

(7) The authorization to conduct activities pursuant to the noticed general permit may be modified, suspended or revoked in accordance with Chapter 120, and Section 373.429, F.S.

(8) This permit shall not be transferred to a third party except pursuant to section 40D-4.351, F.A.C. The permittee transferring the general permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to sale, conveyance, or other transfer of ownership or control of the permitted system or the real property at which the permitted system is located.

(9) Upon reasonable notice to the permittee, District staff with proper identification shall have permission to enter, inspect, sample and test the permitted system to insure conformity with the plans and specifications approved by the permit.

(10) The permittee shall maintain any permitted system in accordance with the plans submitted and authorized by this permit.

(11) A permittee's right to conduct a specific activity under this noticed general permit is authorized for a duration of five years.

(12) Construction, alteration, operation, maintenance, removal and abandonment approved by this general permit shall be conducted in a manner which does not cause violations of state water quality standards, including any antidegradation provisions of sections 62-4.242(1)(a) and (b), 62-4.242(2) and (3), and 62-302.300, F.A.C., and any special standards for Outstanding Florida Waters and Outstanding National Resource Waters. The permittee shall implement best management practices for erosion, turbidity, and other pollution control to prevent violation of state water quality standards. Temporary erosion control measures such as sodding, mulching, and seeding shall be implemented and shall be maintained on all erodible ground areas prior to and during construction. Permanent erosion control measures such as sodding and planting of wetland species shall be completed within seven days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into wetlands or surface waters exists due to the permitted activity. Turbidity barriers shall remain in place and shall be maintained in a functional condition at all locations until construction is completed, soils are stabilized and vegetation has been established. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

(13) The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the general permit.

(14) The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

10/95

40D-400.443 General Permit to t[redacted]Florida Department of Transportation, C[redacted]ies and Municipalities for Minor Bridge [redacted]lteration, Replacement, Maintenance and Operation.

(1) A general permit is hereby granted to the Florida Department of Transportation, Counties and Municipalities to conduct the activities described below:

(a) The replacement or modification of bridges and approaches where the combined total of dredging and filling, both temporary and permanent, in wetlands and other surface waters does not exceed 0.5 acre.

(b) Channel clearing and shaping, not to exceed a combined total of 0.5 acres of dredging and filling in wetlands and other surface waters, to facilitate maximum hydraulic efficiency of the structures detailed in paragraph (a) above, where the spoil material is used on an upland portion of the project or is deposited on a self-contained, upland spoil site. Escape of spoil material or return water from the spoil deposition area into wetlands or other surface waters is prohibited.

(2) This general permit shall be subject to the following specific conditions:

(a) in addition to compliance with the notice provisions of section 40D-400.211, F.A.C., within 90 days following completion of construction, the permittee will notify by letter the appropriate District office of the date construction activities were completed;

(b) no dredging of access or work channels are authorized by this general permit;

(c) temporary fill roads shall not be constructed waterward of mean high water or ordinary high water;

(d) all fill placed in wetlands other than all on which a bridge or approach described in paragraph (1)(a) is constructed, shall be regraded to the original wetland elevations and these filled wetland areas revegetated with native wetland species endemic to adjoining, undisturbed wetlands, within seven days of completion of construction. Within "Clear Zones" as described in Chapter Three, Roadside Design Manual, American Association of State Highway and Transportation Officials, dated October 1988, revegetation shall be with native herbaceous species endemic to adjoining undisturbed wetlands. These wetland areas shall be maintained and planted as necessary, to ensure that satisfactory revegetation occurs. For the purposes of this general permit, "satisfactory revegetation" means that the herbaceous wetlands, and forested wetlands within clear zones that are disturbed by fill shall have achieved not less than 33 percent cover of planted or naturally reestablished herbaceous wetland species within 18 months of completion of construction, and the forested wetlands other than the forested wetlands in clear zones that are disturbed by fill shall achieve a survival rate of not less than 400 wetland trees per acre within 18 months of completion of construction, and a maintenance plan must be developed and implemented to ensure the survival of the planted or naturally reestablishing wetland species. Within the revegetated wetland areas, non-native vegetation must be controlled such that it does not constitute more than 10 percent of the area cover in any stratum at any time for the five-year period following the initial planting or restoration of the site;

(e) hydraulic openings of bridges constructed under paragraph (1)(a) above shall be sufficient to prevent downstream scour, increased downstream water velocities, and increased backwater elevation on the property of others;

(f) minimum horizontal and vertical navigational clearances on bridges over navigable waters of the United States shall be established in accordance with procedures outlined in the U.S. Coast Guard Bridge Administration Manual, COMDTINST M16590.5, May 7, 1982;

(g) horizontal and vertical clearances for replacement bridge structures shall meet or exceed those of the bridge being replaced;

(h) temporary erosion controls for all exposed soils within wetlands and other surface waters shall be completed within seven calendar days of the most recent construction activity;

(i) the fill areas and the banks of the water body shall be stabilized with vegetation or riprap within seven days following completion of slope construction. This stabilization is considered a construction priority and completed fill slopes in wetlands and other surface waters shall not remain unstabilized while other construction continues;

(j) this general permit does not authorize the use of dredged material for roadway construction;

(k) the permittee shall use erosion and sediment control best management practices, including turbidity curtains or similar devices, in strict adherence to these practices as described in Chapter 6, the Florida Land Development Manual: A Guide to Sound Land and Water Management (Florida Department of Environmental Regulation, 1988) incorporated by reference to prevent violations of state water quality standards;

(l) this general permit authorizes dredging and filling for the replacement or modification of a bridge and approaches for a specific crossing of a wetland or other surface water. Any connecting road expansion or alteration associated with such replacement or modification must be authorized by a separate general or individual permit under chapter 40D-4 or 40D-40, or 40D-400, F.A.C., as applicable, before the start of construction; and

(m) this general permit does not authorize replacement or modification of bridges or approaches which involve the construction of additional traffic lanes.

Permit 32972.016

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Southwest Florida Water Management District
2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
SUNCOM 628-4150 TDD only 1-800-231-6103 (FL only)
On the Internet at: WaterMatters.org

An Equal Opportunity Employer

Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)

Sarasota Service Office
6750 Fruitville Road
Sarasota, Florida 34240-9711
(941) 377-3722 or
1-800-320-3503 (FL only)

Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

May 31, 2016

Wildwood Springs, LLC
Attn: Dean Barberree
5850 T.G. Lee Boulevard, Suite 200
Orlando, FL 32822

RP Fenney, LLC.
Attn: Dean Barberree
5850 T.G. Lee Boulevard, Suite 200
Orlando, FL 32822

Subject: **Notice of Intended Agency Action - Approval**
ERP Individual Construction Major Modification

Project Name:	Wildwood Springs West Mass Grading
App ID/Permit No:	728419 / 43032972.016
County:	SUMTER
Sec/Twp/Rge:	S30/T19S/R23E, S31/T19S/R23E

Dear Permittee(s):

The Southwest Florida Water Management District (District) has completed its review of the application for Environmental Resource Permit modification. Based upon a review of the information you have submitted, the District hereby gives notice of its intended approval of the application.

The File of Record associated with this application can be viewed at http://www18.swfwmd.state.fl.us/erp/erp/search/ERPSearch.aspx and is also available for inspection Monday through Friday, except for District holidays, from 8:00 a.m. through 5:00 p.m. at the District's Tampa Service Office, 7601 U.S. Highway 301 North, Tampa, Florida 33637.

If you have any questions or concerns regarding the application or any other information, please contact the Environmental Resource Permit Bureau in the Tampa Service Office.

Sincerely,

Michelle K. Hopkins, P.E.
Bureau Chief
Environmental Resource Permit Bureau
Regulation Division

cc: Wesley Barraw, P.E., Farner, Barley & Associates, Inc.

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App ID/Permit No:	728419 / 43032972.016
County:	SUMTER
Sec/Twp/Rge:	S30/T19S/R23E, S31/T19S/R23E

Dear Permittee(s):

The Southwest Florida Water Management District (District) is in receipt of your application for the Environmental Resource Permit modification. Based upon a review of the information you submitted, the application is approved. Please refer to the attached Notice of Rights to determine any legal rights you may have concerning the District's agency action on the permit application described in this letter.

If approved construction plans are part of the permit, construction must be in accordance with these plans. These drawings are available for viewing or downloading through the District's Application and Permit Search Tools located at www.WaterMatters.org/permits.

The District's action in this matter only becomes closed to future legal challenges from members of the public if such persons have been properly notified of the District's action and no person objects to the District's action within the prescribed period of time following the notification. The District does not publish notices of agency action. If you wish to limit the time within which a person who does not receive actual written notice from the District may request an administrative hearing regarding this action, you are strongly encouraged to publish, at your own expense, a notice of agency action in the legal advertisement section of a newspaper of general circulation in the county or counties where the activity will occur. Publishing notice of agency action will close the window for filing a petition for hearing. Legal requirements and instructions for publishing notices of agency action, as well as a noticing form that can be used, are available from the District's website at www.WaterMatters.org/permits/noticing. If you publish notice of agency action, a copy of the affidavit of publication provided by the newspaper should be sent to the District's Tampa Service Office for retention in this permit's File of Record.

If you have any questions or concerns regarding your permit or any other information, please contact the Environmental Resource Permit Bureau in the Tampa Service Office.

Sincerely,

Michelle K. Hopkins, P.E.
Bureau Chief
Environmental Resource Permit Bureau
Regulation Division

Enclosures: Approved Permit w/Conditions Attached
As-Built Certification and Request for Conversion to Operation Phase
Notice of Authorization to Commence Construction
Notice of Rights

cc: Wesley Barraw, P.E., Farner, Barley & Associates, Inc.

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE

INDIVIDUAL CONSTRUCTION MAJOR MODIFICATION
PERMIT NO. 43032972.016

EXPIRATION DATE: **May 31, 2021** **PERMIT ISSUE DATE:** **May 31, 2016**

This permit is issued under the provisions of Chapter 373, Florida Statutes, (F.S.), and the Rules contained in Chapter 62-330, Florida Administrative Code, (F.A.C.). The permit authorizes the Permittee to proceed with the construction of a surface water management system in accordance with the information outlined herein and shown by the application, approved drawings, plans, specifications, and other documents, attached hereto and kept on file at the Southwest Florida Water Management District (District). Unless otherwise stated by permit specific condition, permit issuance constitutes certification of compliance with state water quality standards under Section 401 of the Clean Water Act, 33 U.S.C. 1341. All construction, operation and maintenance of the surface water management system authorized by this permit shall occur in compliance with Florida Statutes and Administrative Code and the conditions of this permit.

PROJECT NAME:	Wildwood Springs West Mass Grading
GRANTED TO:	Wildwood Springs, LLC Attn: Dean Barberree 5850 T.G. Lee Boulevard, Suite 200 Orlando, FL 32822
OTHER PERMITTEES:	RP Fenney, LLC. Attn: Dean Barberree 5850 T.G. Lee Boulevard, Suite 200 Orlando, FL 32822

ABSTRACT: This permit is for the modification of a stormwater management system authorized under Environmental Resource Permit (ERP) No. 43032972.002 for the construction of a 240.93-acre mass grading project to serve future residential and commercial development. Revision .002 authorized mass grading activities and the construction of 39 on line retention ponds. Ponds B-50, B-55, B-55A, B-39, B-36, B-37, B-40, B-40A, B-40B, and B-30 and mass grading activities for the western portion of the site will be constructed under this new modification. Water quality treatment will be provided via on-line retention. Pond B-50 is a stand-alone pond. Ponds B-55 and B-55A are interconnected. Both systems will store all runoff from the entire 100-year, 24-hour storm event without discharging. The remaining pond systems discharge to Shady Brook, which is an Outstanding Florida Water (OFW). These systems provide treatment for 1.5 times the volume normally required. These systems also attenuate the 25-year, 24-hour post-development peak discharge rate to the peak discharge rate for the pre-development conditions. The project is located on County Road 466A, east of Highway 301, in Sumter County.

OP. & MAIN. ENTITY:	Wildwood Springs, LLC
OTHER OP. & MAIN. ENTITY:	RP Fenney, LLC.
COUNTY:	SUMTER
SEC/TWP/RGE:	S30/T19S/R23E, S31/T19S/R23E

TOTAL ACRES OWNED OR UNDER CONTROL:	1049.00
PROJECT SIZE:	240.93 Acres
LAND USE:	Residential
DATE APPLICATION FILED:	May 03, 2016
AMENDED DATE:	N/A

I. Water Quantity/Quality

POND No.	Area Acres @ Top of Bank	Treatment Type
B-30	2.97	ON-LINE RETENTION
B-36	6.44	ON-LINE RETENTION
B-37	2.15	ON-LINE RETENTION
B-39	6.18	ON-LINE RETENTION
B-40	3.60	ON-LINE RETENTION
B-40A	0.88	ON-LINE RETENTION
B-40B	0.77	ON-LINE RETENTION
B-50	4.01	ON-LINE RETENTION
B-55A	2.22	ON-LINE RETENTION
B-55	4.22	ON-LINE RETENTION
	Total: **33.44**	

Water Quality/Quantity Comment: Ponds B-50, B-55, and B-55A will be lined and percolation will occur laterally above the liner elevations. These facilities have been designed to accommodate all runoff from the 100-year, 24-hour storm event without discharging. The remaining seven ponds function as traditional dry retention. In addition to providing treatment volume for discharge to an OFW (Shady Brook), they attenuate the 25-year, 24-hour post-development peak discharge rate to the pre-development peak discharge rate.
The plans reflect the North American Vertical Datum of 1988 (NAVD 88).
A mixing zone is not required.
A variance is not required.

II. 100-Year Floodplain

Encroachment (Acre-Feet of fill)	Compensation (Acre-Feet of excavation)	Compensation Type	Encroachment Result* (feet)
0.00	0.00	No Encroachment	N/A

Floodplain Comment: All floodplain encroachment and calculations were provided with permit authorization 43032972.002 to demonstrate no adverse impacts in the form of elevated flood stages will occur as a result of the proposed activities for the Wildwood Springs development.

*Depth of change in flood stage (level) over existing receiving water stage resulting from floodplain encroachment caused by a project that claims Minimal Impact type of compensation.

III. Environmental Considerations

No wetlands or other surface waters exist within the project area.

Specific Conditions

1. If the ownership of the project area covered by the subject permit is divided, with someone other than the Permittee becoming the owner of part of the project area, this permit may be terminated, unless the terms of the permit are modified by the District or the permit is transferred pursuant to Rule 40D-1.6105, F.A.C. In such situations, each land owner shall obtain a permit (which may be a modification of this permit) for the land owned by that person. This condition shall not apply to the division and sale of lots or units in residential subdivisions or condominiums.

2. The Permittee shall retain the design professional registered or licensed in Florida, to conduct on-site observations of construction and assist with the as-built certification requirements of this project. The Permittee shall inform the District in writing of the name, address and phone number of the design professional so employed. This information shall be submitted prior to construction.

3. For these retention systems, the water quality treatment volume shall draw down within 72 hours after a rainfall event. If it fails to do so on a regular basis, this situation shall be deemed to be a violation of this permit.

4. This Permit Modification No. 43032972.016 amends the previously issued Permit No. 43032972.002 and adds conditions. All other original permit conditions remain in effect.

5. If limestone bedrock is encountered during construction of the stormwater management system, the District must be notified and construction in the affected area shall cease.

6. The Permittee shall notify the District of any sinkhole development in the stormwater management system within 48 hours of discovery and must submit a detailed sinkhole evaluation and repair plan for approval by the District within 30 days of discovery.

7. The Permitted Plan Set for this project includes the set received by the District on May 31, 2016.

8. The operation and maintenance entity shall provide for the inspection of the permitted project after conversion of the permit to the operation and maintenance phase. For systems utilizing retention or wet detention, the inspections shall be performed five (5) years after operation is authorized and every five (5) years thereafter.

   The operation and maintenance entity must maintain a record of each inspection, including the date of inspection, the name and contact information of the inspector, whether the system was functioning as designed and permitted, and make such record available upon request of the District.

   Within 30 days of any failure of a stormwater management system or deviation from the permit, an inspection report shall be submitted using Form 62-330.311(1), “Operation and Maintenance Inspection Certification” describing the remedial actions taken to resolve the failure or deviation.

9. District staff must be notified in advance of any proposed construction dewatering. If the dewatering activity is likely to result in offsite discharge or sediment transport into wetlands or surface waters, a written dewatering plan must either have been submitted and approved with the permit application or submitted to the District as a permit prior to the dewatering event as a permit modification. A water use permit may be required prior to any use exceeding the thresholds in

Chapter 40D-2, F.A.C.

10. Off-site discharges during construction and development shall be made only through the facilities authorized by this permit. Water discharged from the project shall be through structures having a mechanism suitable for regulating upstream stages. Stages may be subject to operating schedules satisfactory to the District.

11. The permittee shall complete construction of all aspects of the stormwater management system, including wetland compensation (grading, mulching, planting), water quality treatment features, and discharge control facilities prior to beneficial occupancy or use of the development being served by this system.

12. The following shall be properly abandoned and/or removed in accordance with the applicable regulations:

    a. Any existing wells in the path of construction shall be properly plugged and abandoned by a licensed well contractor.

    b. Any existing septic tanks on site shall be abandoned at the beginning of construction.

    c. Any existing fuel storage tanks and fuel pumps shall be removed at the beginning of construction.

13. All stormwater management systems shall be operated to conserve water in order to maintain environmental quality and resource protection; to increase the efficiency of transport, application and use; to decrease waste; to minimize unnatural runoff from the property and to minimize dewatering of offsite property.

14. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the occupation of the site or operation of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of that phase or portion of the system to a local government or other responsible entity.

15. This permit is valid only for the specific processes, operations and designs indicated on the approved drawings or exhibits submitted in support of the permit application. Any substantial deviation from the approved drawings, exhibits, specifications or permit conditions, including construction within the total land area but outside the approved project area(s), may constitute grounds for revocation or enforcement action by the District, unless a modification has been applied for and approved. Examples of substantial deviations include excavation of ponds, ditches or sump areas deeper than shown on the approved plans.

GENERAL CONDITIONS

1. The general conditions attached hereto as Exhibit "A" are hereby incorporated into this permit by reference and the Permittee shall comply with them.

Michelle K. Hopkins, P.E.

Authorized Signature

EXHIBIT A

GENERAL CONDITIONS:

1 The following general conditions are binding on all individual permits issued under this chapter, except where the conditions are not applicable to the authorized activity, or where the conditions must be modified to accommodate, project-specific conditions.

a. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C., or the permit may be revoked and the permittee may be subject to enforcement action.

b. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

c. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation June 2007)*, and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008)*, which are both incorporated by reference in subparagraph 62-330.050(8)(b)5, F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

d. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice,"[effective date], incorporated by reference herein (<http://www.flrules.org/Gateway/reference.asp?No=Ref-02505>), indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

e. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.

f. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:

1. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex - "Construction Completion and Inspection Certification for Activities Associated with a Private Single-Family Dwelling Unit" [Form 62-330.310(3)]; or

2. For all other activities - "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].

3. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

g. If the final operation and maintenance entity is a third party:

1. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction

needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.

2. Within 30 days of submittal of the as- built certification, the permittee shall submit “Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity” [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

h. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

i. This permit does not:

1. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;

2. Convey to the permittee or create in the permittee any interest in real property;

3. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or

4. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

j. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

k. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

l. The permittee shall notify the Agency in writing:

1. Immediately if any previously submitted information is discovered to be inaccurate; and

2. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

m. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

n. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification

shall be provided in accordance with Section 872.05, F.S. (2012).

o. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

p. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

q. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

r. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

2. In addition to those general conditions in subsection (1) above, the Agency shall impose any additional project-specific special conditions necessary to assure the permitted activities will not be harmful to the water resources, as set forth in Rules 62-330.301 and 62-330.302, F.A.C., Volumes I and II, as applicable, and the rules incorporated by reference in this chapter.

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

NOTICE OF
AUTHORIZATION
TO COMMENCE CONSTRUCTION

Wildwood Springs West Mass Grading
PROJECT NAME

Residential
PROJECT TYPE

SUMTER
COUNTY

S30/T19S/R23E, S31/T19S/R23E
SEC(S)/TWP(S)/RGE(S)

Wildwood Springs, LLC
PERMITTEE See permit for additional permittees

APPLICATION ID/PERMIT NO: 728419 / 43032972.016
DATE ISSUED: May 31, 2016

Michelle K. Hopkins, P.E.
Issuing Authority

THIS NOTICE SHOULD BE CONSPICUOUSLY DISPLAYED AT THE SITE OF THE WORK

Notice of Rights

ADMINISTRATIVE HEARING

1. You or any person whose substantial interests are or may be affected by the District's intended or proposed action may request an administrative hearing on that action by filing a written petition in accordance with Sections 120.569 and 120.57, Florida Statutes (F.S.), Uniform Rules of Procedure Chapter 28-106, Florida Administrative Code (F.A.C.) and District Rule 40D-1.1010, F.A.C. Unless otherwise provided by law, a petition for administrative hearing must be filed with (received by) the District within 21 days of receipt of written notice of agency action. "Written notice" means either actual written notice, or newspaper publication of notice, that the District has taken or intends to take agency action. "Receipt of written notice" is deemed to be the fifth day after the date on which actual notice is deposited in the United States mail, if notice is mailed to you, or the date that actual notice is issued, if sent to you by electronic mail or delivered to you, or the date that notice is published in a newspaper, for those persons to whom the District does not provide actual notice.

2. Pursuant to Subsection 373.427(2)(c), F.S., for notices of intended or proposed agency action on a consolidated application for an environmental resource permit and use of state-owned submerged lands concurrently reviewed by the District, a petition for administrative hearing must be filed with (received by) the District within 14 days of receipt of written notice.

3. Pursuant to Rule 62-532.430, F.A.C., for notices of intent to deny a well construction permit, a petition for administrative hearing must be filed with (received by) the District within 30 days of receipt of written notice of intent to deny.

4. Any person who receives written notice of an agency decision and who fails to file a written request for a hearing within 21 days of receipt or other period as required by law waives the right to request a hearing on such matters.

5. Mediation pursuant to Section 120.573, F.S., to settle an administrative dispute regarding District intended or proposed action is not available prior to the filing of a petition for hearing.

6. A request or petition for administrative hearing must comply with the requirements set forth in Chapter 28-106, F.A.C. A request or petition for a hearing must: (1) explain how the substantial interests of each person requesting the hearing will be affected by the District's intended action or proposed action, (2) state all material facts disputed by the person requesting the hearing or state that there are no material facts in dispute, and (3) otherwise comply with Rules 28-106.201 and 28-106.301, F.A.C. Chapter 28-106, F.A.C. can be viewed at www.flrules.org or at the District's website at www.WaterMatters.org/permits/rules.

7. A petition for administrative hearing is deemed filed upon receipt of the complete petition by the District Agency Clerk at the District's Tampa Service Office during normal business hours, which are 8:00 a.m. to 5:00 p.m., Monday through Friday, excluding District holidays. Filings with the District Agency Clerk may be made by mail, hand-delivery or facsimile transfer (fax). The District does not accept petitions for administrative hearing by electronic mail. Mailed filings must be addressed to, and hand-delivered filings must be delivered to, the Agency Clerk, Southwest Florida Water Management District, 7601 Highway 301 North,Tampa,FL 33637-6759. Faxed filings must be transmitted to the District Agency Clerk at (813) 367-9776. Any petition not received during normal business hours shall be filed as of 8:00 a.m. on the next business day. The District's acceptance of faxed petitions for filing is subject to certain conditions set forth in the District's Statement of Agency Organization and Operation, available for viewing at www.WaterMatters.org/about.

JUDICIAL REVIEW

1. Pursuant to Sections 120.60(3) and 120.68, F.S., a party who is adversely affected by District action may seek judicial review of the District's action. Judicial review shall be sought in the Fifth District Court of Appeal or in the appellate district where a party resides or as otherwise provided by law.

2. All proceedings shall be instituted by filing an original notice of appeal with the District Agency Clerk within 30 days after the rendition of the order being appealed, and a copy of the notice of appeal, accompanied by any filing fees prescribed by law, with the clerk of the court, in accordance with Rules 9. 110 and 9.190 of the Florida Rules of Appellate Procedure (Fla. R. App. P.). Pursuant to Fla. R. App. P. 9.020(h), an order is rendered when a signed written order is filed with the clerk of the lower tribunal.

SCOPE OF PROJECT

SUMMARY

This report contains drainage basin calculations for the Wildwood Springs West Mass Grade project. The site is approximately 240-acres. Site design consists of master grading and construction of the surface storm water management system. All wetlands and wildlife areas have been located on the site and are described in detail in the report by Breedlove, Dennis, and Associates from ERP no. 43032972.002. All geotechnical data associated with this project can be found in the reports prepared by Andreyev Engineering,Inc. from ERP no. 43032972.002

RUNOFF CURVE NUMBERS

Soil Conservation Service (SCS) runoff Curve Numbers (CN), were developed considering soil types and land use. The soil type for this project is largely composed of Spam sand. The existing land cover is primarily open space. The post-developed curve numbers are based on the proposed land uses within each drainage basin and take into account any directly connected impervious areas (DCIA).

I. RAINFALL INTENSITY ANALYSIS

The 25year/24-hour rainfall intensity amount of 7.5 inches was interpolated from the 24-hour/25-year return period map Figure D-9, and the100-year / 24-hour rainfall intensity amount of 10.5-inches, which was interpolated from the 24-hour / 100-year return period map Figure D-7 in the SWFWMD Environmental Resource Permitting Information Manual, was used in design.

II. DESIGN CRITERIA

The project is located in Sumter County. Portions of the site are located in FEMA designated flood zones A & AE as shown on FIRM panels 12119C0141D and 12119C0142D.

The project is located within hydrologically open drainage basin. Consistent with SWFWMD Chapter 40D-4, F.A.C. water quantity and water quality requirements were used as the design basis for the storm water management system.

In the post developed conditions only dry retention ponds are utilized. The dry retention ponds hold and recover the water quality volume in 72 hours.

Runoff volumes in this stormwater management plan use the procedure outlined in the United States Department of Agriculture Soil Conservation Services – Urban Hydrology for Small Watersheds – SCS Technical Release 55 and the stormwater modeling program (A.D.I.C.P.R.).

III. PRE DEVELOPMENT HYDROLOGY

The pre-development is based off of ERP no. 43032972.002

IV. POST DEVELOPMENT HYDROLOGY

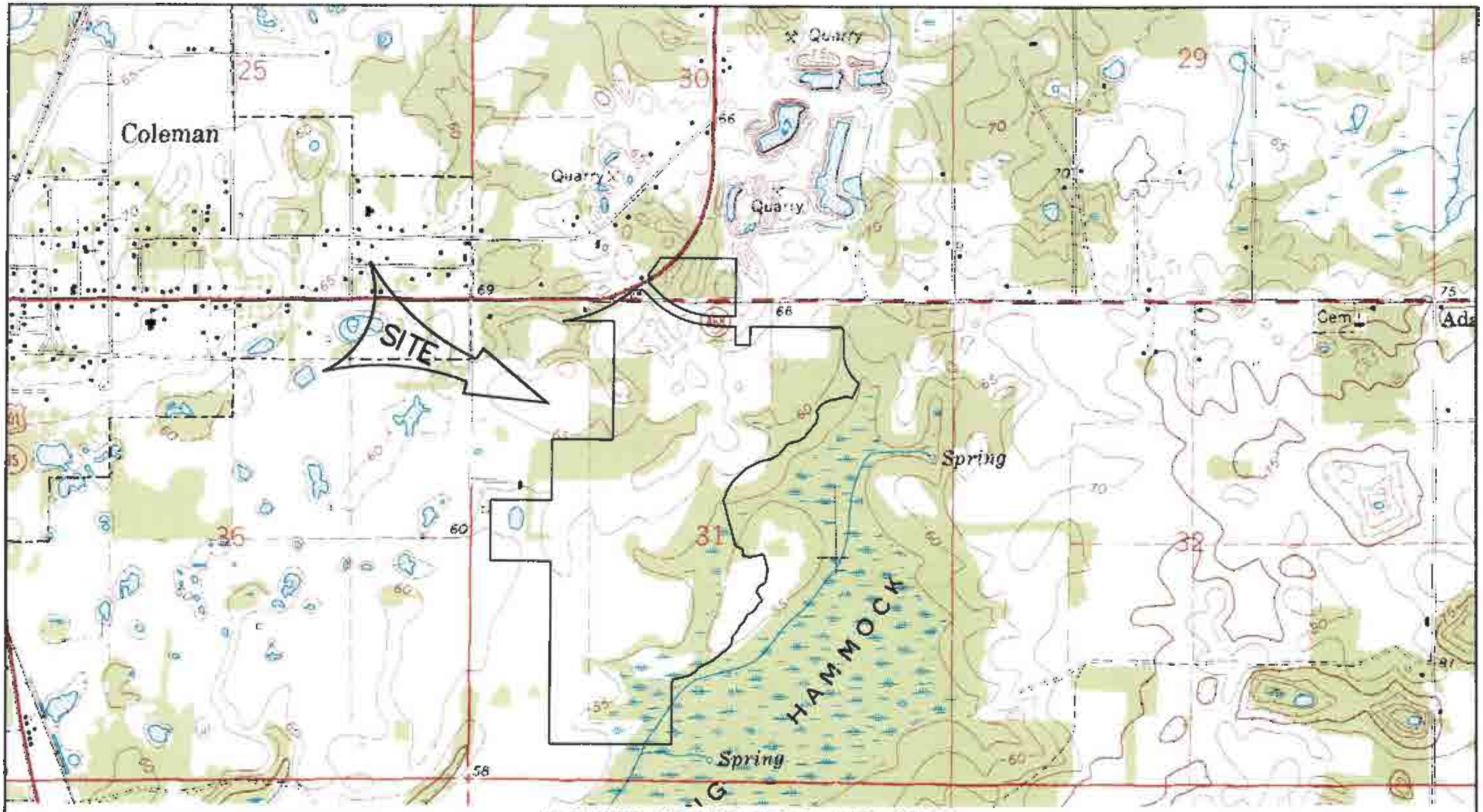
Reference the post drainage basin map and node schematics for location and illustration of the basins.

The post developed condition will use dry retention. The dry retention ponds will provide water quality treatment and water quantity attenuation insuring that the post-developed 25-year/24hour discharge rates are less than the pre-developed rates. With discharge being to Lake Shady Brook, and additional 50% water quality treatment volume has been provided. The wet retention ponds are designed to hold the 100 year/24 hour runoff volume on-site.

This application will revise ponds B-30, B-36, B-37, B-39, B-40, B-50, and B-55 from ERP no. 43032972.002 and create new ponds B-40A, B-40B, and B-55A.

The pre-post analysis done for ERP no. 43032972.002 is still valid with the addition of two areas that were not included. Basin B-38 was not included in the previous submittal since this basin nor storage volume was affected. With this submittal the basin area will be change (a decrease in area), but the storage volume will remain the same. The analysis indicates that this area pops off to the west in the pre development and will still pop off in the post (see tab 20). The other area is pre developed basin B-160 which is near post developed pond B-55 (see tab 19 for pre basin illustration). Subsequent to ERP no. 43032972.002 is was found that this off-site portion of pre basin B-160 drainage was being blocked due to proposed grading. The pre-development analysis showed that depression staged up over 60.0, so an inlet was proposed to pick this drainage up at elevation 59.0 in the post condition. The inlet and pipe are sized to handle the flow coming off-site to insure that the post flood stage on the off-site area would never stage above 59.0 which is below the pre-developed flood stage (see tab 19 for calculations).

As documented in the LOMR dated March, 30 2009, zone AE designations were established for Shady Brook 1 (north of spring run) and Shady Brook 2 (south of spring). From that LOMR Shady Brook 1 has a 100-year/24-hour flood elevation of 53.09 NAVD and Shady Brook 2 was established at 52.39 NAVD. All construction activities take place above both elevations and so there is no floodplain encroachment on-site.



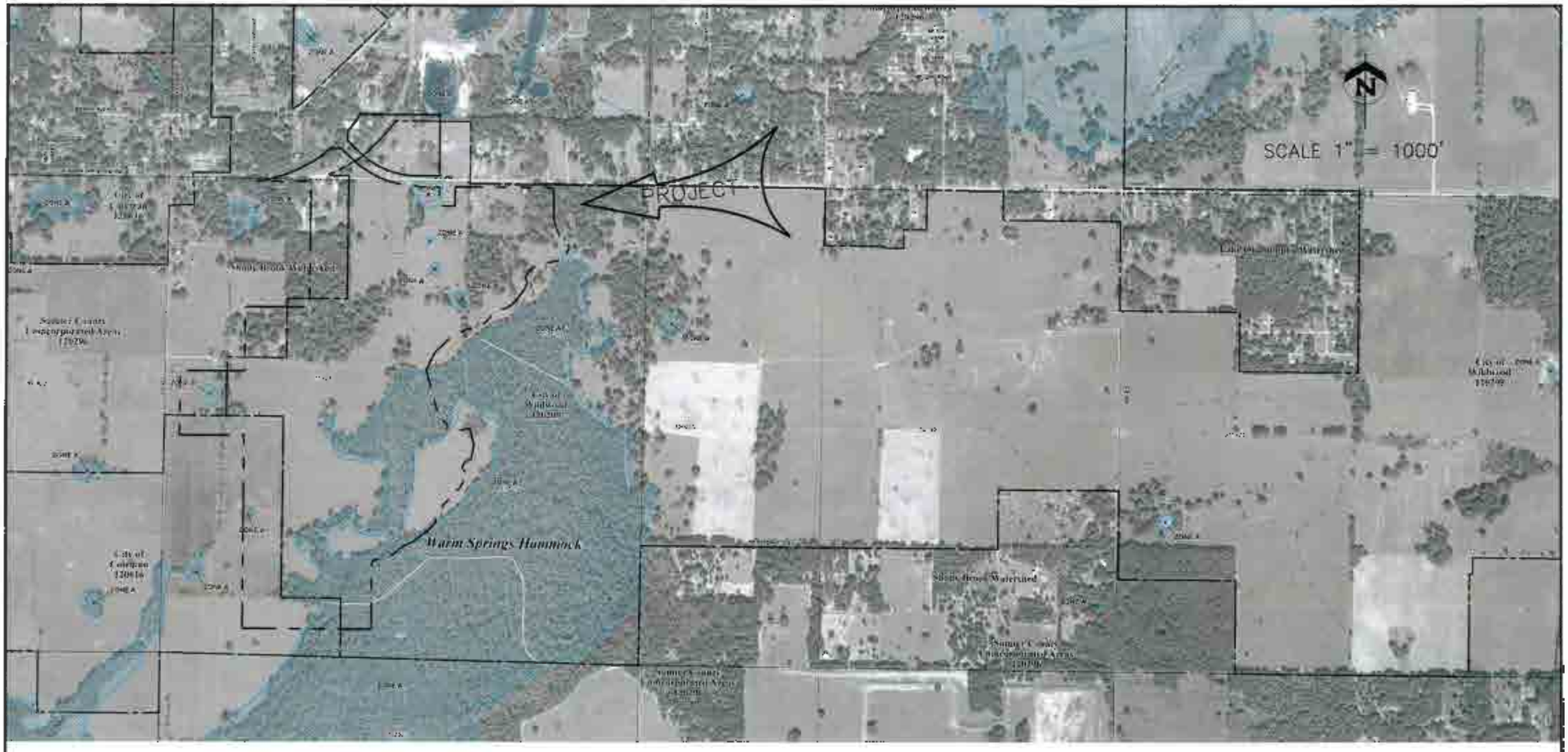
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▲ ENGINEERS
▲ SURVEYORS
▲ PLANNERS
4450 NE 53rd Road · Wildwood, Florida 34785 · (352) 748-3126

SCALE 1" = 1000'

WILDWOOD SPRINGS WEST MASS GRADE

U.S.G.S. QUAD MAP

SECTIONS 31
TOWNSHIP 19 S.
RANGE 23 E.

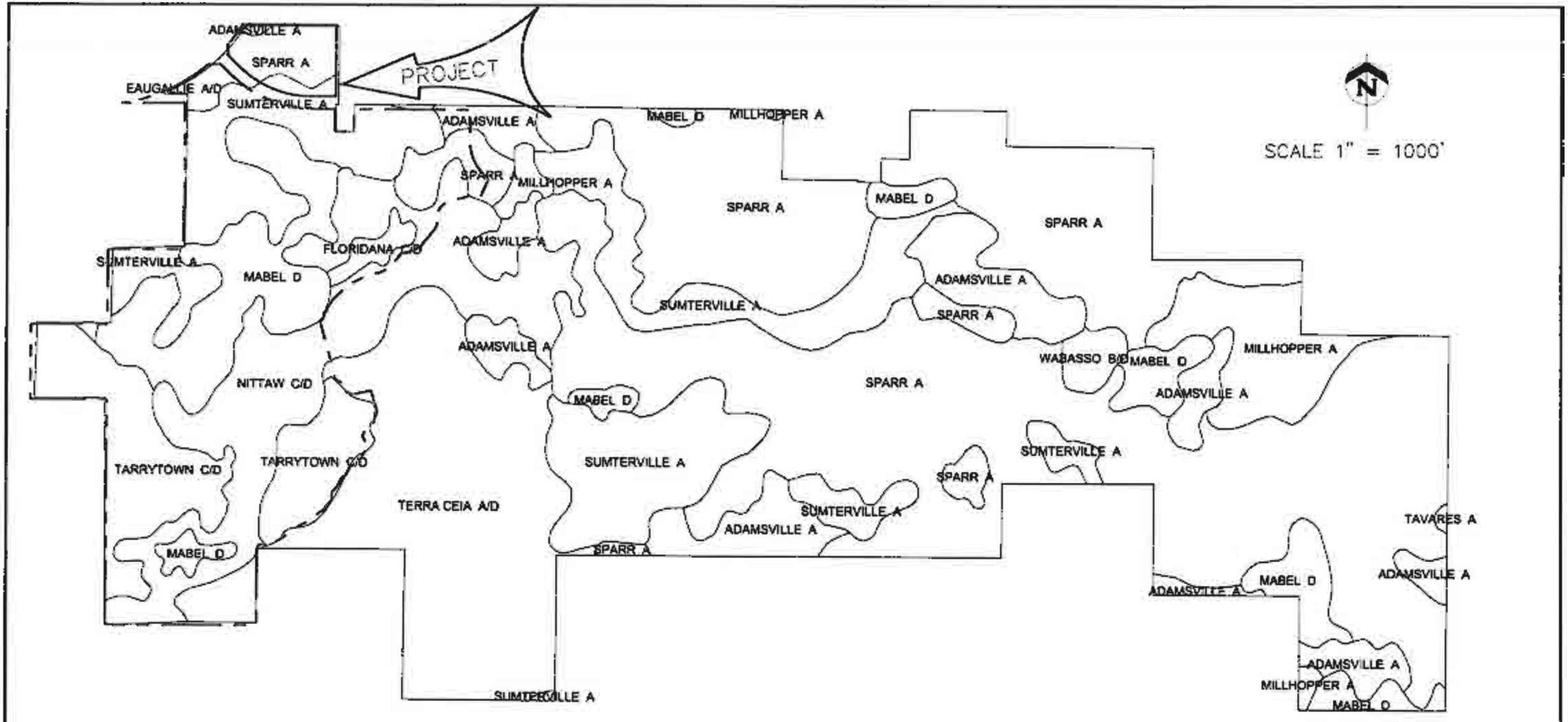


WILDWOOD SPRINGS WEST MASS GRADE

FEMA MAP

SECTION 31
TOWNSHIP 19 S.
RANGE 23 E.

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WILDWOOD SPRINGS
WEST MASS GRADE
SCS SOILS MAP
SECTION 31
TOWNSHIP 19 S.
RANGE 23 E.

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WILDWOOD SPRINGS

POND SUMMARY

	BASIN / POND / / SUMP NO.	POND T.O.B. ELEV (FT)	POND 100YR-24HR STAGE ELEV. (FT)	POND T.O.L./DLW ELEV. (FT)	POND BTM ELEV. (FT)
Dry Retention	B-30	58.00	57.41	N/A	55.00
Dry Retention	B-36	58.00	57.26	N/A	55.00
Dry Retention	B-37	58.00	57.60	N/A	55.00
Dry Retention	B-39	58.00	57.21	N/A	55.00
Dry Retention	B-40	58.00	56.93	N/A	55.00
Dry Retention	B-40A	58.00	56.30	N/A	55.00
Dry Retention	B-40B	58.00	56.54	N/A	55.00
Wet Retention	B-50	63.00	62.21	58.00	52.00
Wet Retention	B-55	60.00	58.36	55.00	49.00
Wet Retention	B-55A	60.00	58.48	55.00	49.00

WILDWOOD SPRINGS
PERMITTED RETENTION AREA AND ASSOCIATED PROJECT NAME

"All ponds orginally permitted under 43032972.002"

PROJECT NAME	PONDS TO BE TIED TO PERMIT	PERMIT NO.
WWS - Fenney Path Phase I	B-23, 26, 28, 29, 39A	43032972.004
WWS - Unit 1	B-24, 25, 27	43032972.003
WWS - Bougainvilla Villas	NONE	43032972.009
WWS - Sand Pine Villas	B-2*	43032972.006
WWS - Village of Spanish Moss FPC & NRC	NONE	43032972.007
WWS - Fenney Village Recreation Center	NONE	43032972.005
WWS Fenney Path Phase II	B-19, 22	
WWS - Unit 2	NONE	
WWS - Longleaf Villas	NONE	
WWS - West Mass Grade	B-30, 35, 37, 40, 40A, 40B, 50, 55, 59A	

B-55A
DRAINAGE BASIN
POST DEVELOPED
CURVE NUMBER CALCULATIONS

Total Area:	10.37	**AC**
Total DCIA Area:	**8.15**	**AC**
Percent (%) DCIA of Area:	**78.57%**	
Total Weighted CN Area:	**2.22**	**AC**
Weigthed Curve Number:	**74.00**	

Land Use Description	Area		% DCIA	% Impervious	% Pervious
Type "C" soil - Residential (Undeveloped)	0.00	AC	35%	30%	35%
Type "C" soil - Commercial (Undeveloped)	8.15	AC	80%	0%	20%
Type "C" soil - Road 120' R/W (C.R. 466A)	0.00	AC	46%	0%	54%
Type "C" soil - Open Space	0.59	AC	0%	0%	100%
Retention Pond	1.62	AC	100%	0%	0%
TOTAL AREA ------->	**10.37**	**AC**			

	% LAND USED	DCIA AREA (AC)	C.N.	
Type "C" soil - Residential (Undeveloped)	35%	0.00	98	
Type "C" soil - Commercial (Undeveloped)	80%	6.52	98	
Type "C" soil - Road 120' R/W (C.R. 466A)	46%	0.00	98	
Retention Pond	100%	1.62	98	**Percent (%) DCIA of Area = 78.57%**
TOTAL --->		**8.15**		

WEIGHTED C.N

	% LAND USED	AREA (AC)	% AREA	C.N.	%XC.N.
Type "C" soil - Residential (Undeveloped)	30%	0.00	0.0%	98	0.00
Type "C" soil - Residential (Undeveloped)	35%	0.00	0.0%	74	0.00
Type "C" soil - Commercial (Undeveloped)	20%	1.63	73.4%	74	54.29
Type "C" soil - Road 120' R/W (C.R. 466A)	54%	0.00	0.0%	74	0.00
Type "C" soil - Open Space	100%	0.59	26.6%	74	19.71
TOTAL ----------->		**2.22**	**100%**		**74.00**

B-55A
WET RETENTION POND
POST - DEVELOPED
AREA & STAGE-STORAGE VOLUME

Stage (ft)	Area (ac)	Stor. Vol. (ac-ft)	
49.00	1.46	0.23	BTM
50.00	1.49	1.71	
51.00	1.51	3.23	
52.00	1.54	4.75	
53.00	1.57	3.19	
54.00	1.60	1.61	
55.00	1.62	0.00	DLW
56.00	1.74	1.68	
57.00	1.86	3.48	
58.00	1.98	5.40	
59.00	2.10	7.43	
60.00	2.22	9.59	TOB

Stage-Storage Volume @ T.O.B. 60.00 = 9.59 ac-ft

B-50

DRAINAGE BASIN

POST DEVELOPED

CURVE NUMBER CALCULATIONS

Total Area:	18.26	**AC**
Total DCIA Area:	**8.31**	**AC**
Percent (%) DCIA of Area:	**45.49%**	
Total Weighted CN Area:	**9.95**	**AC**
Weighted Curve Number:	**80.99**	

Land Use Description	Area		% DCIA	% Impervious	% Pervious
Type "C" soil - Residential (Undeveloped)	9.67	AC	35%	30%	35%
Type "C" soil - Commercial (Undeveloped)	2.59	AC	80%	0%	20%
Type "C" soil - Road 120' R/W (C.R. 468)	0.00	AC	46%	0%	54%
Type "C" soil - Open Space	3.15	AC	0%	0%	100%
Retention Pond	2.85	AC	100%	0%	0%
TOTAL AREA --------->	**18.26**	**AC**			

	% LAND USED	DCIA AREA (AC)	C.N.	
Type "C" soil - Residential (Undeveloped)	35%	3.38	98	
Type "C" soil - Commercial (Undeveloped)	80%	2.07	98	
Type "C" soil - Road 120' R/W (C.R. 468A)	46%	0.00	98	
Retention Pond	100%	2.85	98	Percent (%) DCIA
TOTAL --->		**8.31**		**of Area = 45.49%**

WEIGHTED C.N.

	% LAND USED	AREA (AC)	% AREA	C.N.	%XC.N.
Type "C" soil - Residential (Undeveloped)	30%	2.90	29.1%	98	28.50
Type "C" soil - Residential (Undeveloped)	35%	3.38	34.0%	74	25.16
Type "C" soil - Commercial (Undeveloped)	20%	0.52	5.2%	74	3.85
Type "C" soil - Road 120' R/W (C.R. 468A)	54%	0.00	0.0%	74	0.00
Type "C" soil - Open Space	100%	3.15	31.6%	74	23.42
**TOTAL ----------> **		**9.95**	**100%**		**80.99**

B-50
100YR, 24HR
STORM RUNOFF CALCULATIONS

Total Runoff Volume =	**14.01**	**ac-ft**
Rainfall Intensity =	**10.50**	**inches**
Total DCIA Area =	**8.31**	**AC**
Total Weighted CN Area:	**9.95**	**AC**
Weigthed Curve Number:	**80.99**	

DCIA Runoff Volume In Acre-Feet

V = 8.31 x 10.50 1/12 inches/ft

V = 7.27 acre-feet

Based on SCS Runoff Curve Number Method

Runoff in Inches

$$S = \frac{1{,}000}{80.99} - 10 \qquad S = 2.35$$

$$Q = \frac{(10.50 - 0.2 \times 2.35)^2}{10.50 + 0.8 \times 2.35}$$

Q = 8.13 inches

Runoff Volume in Acre-feet

V = 9.95 x 8.13 1/12 inches/ft

V = 6.74 acre-feet

DCIA Runoff Volume =	7.27	acre-feet
Runoff Volume =	6.74	acre-feet
Total Runoff Volume ac-ft =	**14.01**	**acre-feet**

B-50

WET RETENTION POND

POST - DEVELOPED

AREA & STAGE-STORAGE VOLUME

Stage (ft)	Area (ac)	Stor. Vol. (ac-ft)	
52.00	1.57	13.20	BTM
53.00	1.78	11.38	
54.00	2.00	9.60	
55.00	2.21	7.86	
56.00	2.42	6.17	
57.00	2.64	4.74	
58.00	2.86	0.00	DLW
59.00	3.07	2.96	
60.00	3.30	6.15	
61.00	3.53	9.56	
62.00	3.77	13.21	
63.00	4.01	17.10	TOB

Stage-Storage Volume @ T.O.B.	**63.00**	=	**17.10**	**ac-ft**
100YR, 24HR	**Storm Runoff Vol.**	=	**14.01**	**ac-ft**
100YR, 24HR	**Flood Stage Elev.**	=	**62.21**	**ft**

C.R. 468

PROJECT BOUNDARY

PERMITTED DRAINAGE SOUTHWEST FLOW

SCALE IN FEET

FARNER BARLEY AND ASSOCIATES, INC.

ENGINEERS
SURVEYORS
PLANNERS

WILDWOOD SPRINGS
MASS GRADING

AERIAL PHOTOGRAPH

Wesley D. Barnes, State of Florida, Professional Engineer, License No. 72105. This item has been electronically signed and sealed by Wesley D. Barnes, P.E. on May 01, 2018 using a SHA-1 authentication code.
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SHT 2 OF 10



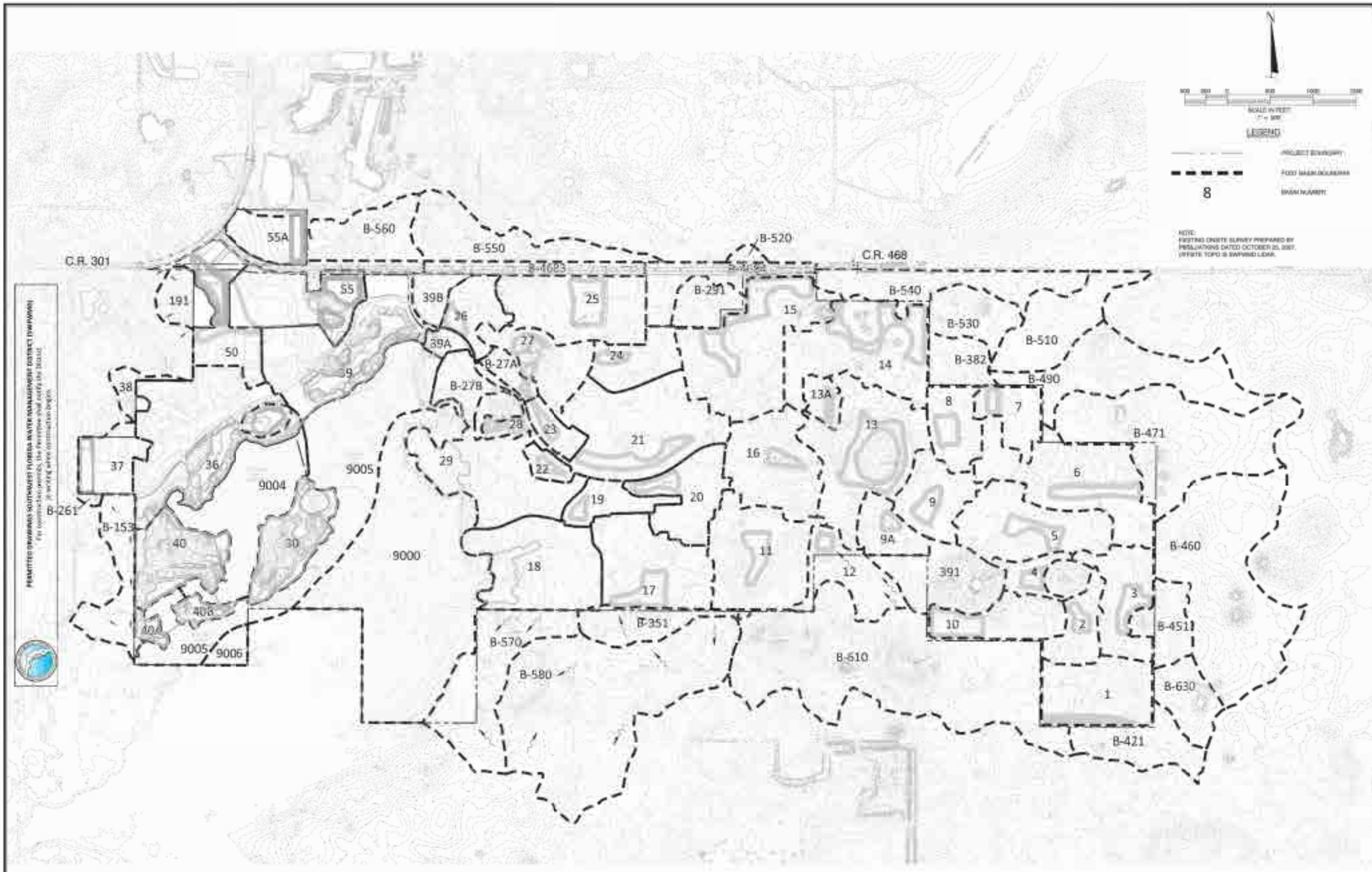
FARNER BARLEY AND ASSOCIATES, INC.
▲ ENGINEERS ▲ SURVEYORS ▲ PLANNERS
Certificate of Authorization Number: 4709
4402 N.E. 83rd Road ◇ Wildwood, Florida 34785 ◇ (352) 748-3126

WILDWOOD SPRINGS
MASS GRADING
MASTER PLAN

DATE 4/30/19
Designed by TAG
Drawn by RLG
CAD (DWG) 19-WS-MASTER
Job No. 7584/19/001

SHEET 3 OF 10

S:\SUMTER\WILDWOOD SPRINGS\01 MASS GRADING\WILDWOOD SPRINGS WEST MASS GRADING\CIVIL\CONSTRUCTION\03 rev MASTER.dwg, 04/30/2019 11:



PERMITTED DRAWINGS SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)
Per Rule 62-330.340, F.A.C., the Permittee shall notify the District in writing of the anticipated date of initiation of the surface water management system at least 48 hours prior to commencement of construction activities. Please reference the Permit Number when submitting your notification. It is suggested that you notify the District in writing when construction begins.

Wesley D. Bonar, State of Florida, Professional Engineer, License No. 71728. This item has been electronically signed and sealed by Wesley D. Bonar, P.E. on May 21, 2018 using a SHA-1 authentication code.
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Certificate of Authorization Number: 4709
4400 N.E. 83rd Road ◇ Wildwood, Florida 34785 ◇ (352) 748-3126

WILDWOOD SPRINGS
MASS GRADING
POST DEVELOPMENT PLAN

DATE 4/27/18
DESIGNED BY TW
DRAWN BY
CHECKED BY
COST CENTER 04-NS-5100
JOB NO. 7548.08.0001

SHEET 4 OF 10

S:\SUMTER\WILDWOOD SPRINGS\(1) MASS GRADING\WILDWOOD SPRINGS WEST MASS GRADING\CIVIL\CONSTRUCTION\Fin ex PCSI dwg 04-26-18 1:1

KEY MAP

LEGEND

- EXISTING STORM PIPE (S.D.)
- PROPOSED STORM PIPE (S.D.)
- PROJECT BOUNDARY
- EXISTING CONTOUR
- PROPOSED CONTOUR
- S.D. STORM DRAIN PIPE (SHALL BE FDOT APPROVED)
- T.O.E. TOP OF SLOPE
- D.L.W. DESIGN LOW WATER
- BOT BOTTOM

B-55A

B-560

55A

B-50

B-55

B-39

191

35

EXISTING STORM PIPES AND STRUCTURES TO BE REMOVED

STACK BLOCK RETAINING WALL TO BE REMOVED

10' BUFFER (TYP.)

PERMITTED GRADING SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)
Construction permits, the Permittee shall notify the District
in writing when construction begins

REVISIONS
BY
DATE
REVISED PER SWFWMD COMMENTS

FARNER BARLEY AND ASSOCIATES, INC.
ENGINEERS
SURVEYORS
PLANNERS

WILDWOOD SPRINGS
MASS GRADING
GRADING PLAN

DATE
DESIGN BY
DRAWN BY
FILE NAME
JOB NO.

Wesley D. Garner, State of Florida, Professional Engineer, License No. 72778. This item has been electronically signed and sealed by Wesley D. Garner, P.E. on March 2019 using a SHA-1 authentication code. Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies.

SHT 5 OF 10

APPENDIX F

Cultural Resources Assessment Survey Addendum

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Florida Department of Transportation

US 301 (SR 35) PD&E Study
Cultural Resource Assessment Survey Addendum: Proposed Ponds and Floodplain Compensation Areas

FDOT Office
District Five

Authors
SEARCH

Date of Publication
December 2017

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

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2.0 Florida Master Site File Review 4
3.0 Survey Methodology 4
3.1 Archaeological Field Methods 4
3.2 Architectural Field Methods 6
4.0 Survey Results 10
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Attachment 3: FMSF Survey Log

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1.0 Executive Summary and Project Description

This technical memorandum details the results of a Cultural Resource Assessment Survey (CRAS) of 21 proposed pond and floodplain compensation areas, five drainage easements, and portions of a new truck route alignment and a new roundabout associated with proposed improvements to US 301. In addition, supplemental shovel testing was conducted at previously documented site 8SM00932 per a request from the Seminole Tribe of Florida. The project area currently under study is located on both sides of a 7.7-mile (12.39-kilometer) section of US 301 (State Road [SR] 35) in Sumter County, Florida (**Figure 1-1**). This technical memorandum serves as an addendum to the 2017 SEARCH report titled *Cultural Resource Assessment Survey of US 301 (SR 35) from CR 470 West to SR 44, Sumter County, Florida* (Florida Master Site File [FMSF] Survey No. 24186). The discussions of regional prehistory and history, environment, historic map and aerial review, research design, and laboratory methods provided in the previous report apply to the current CRAS and are not repeated in this technical memorandum.

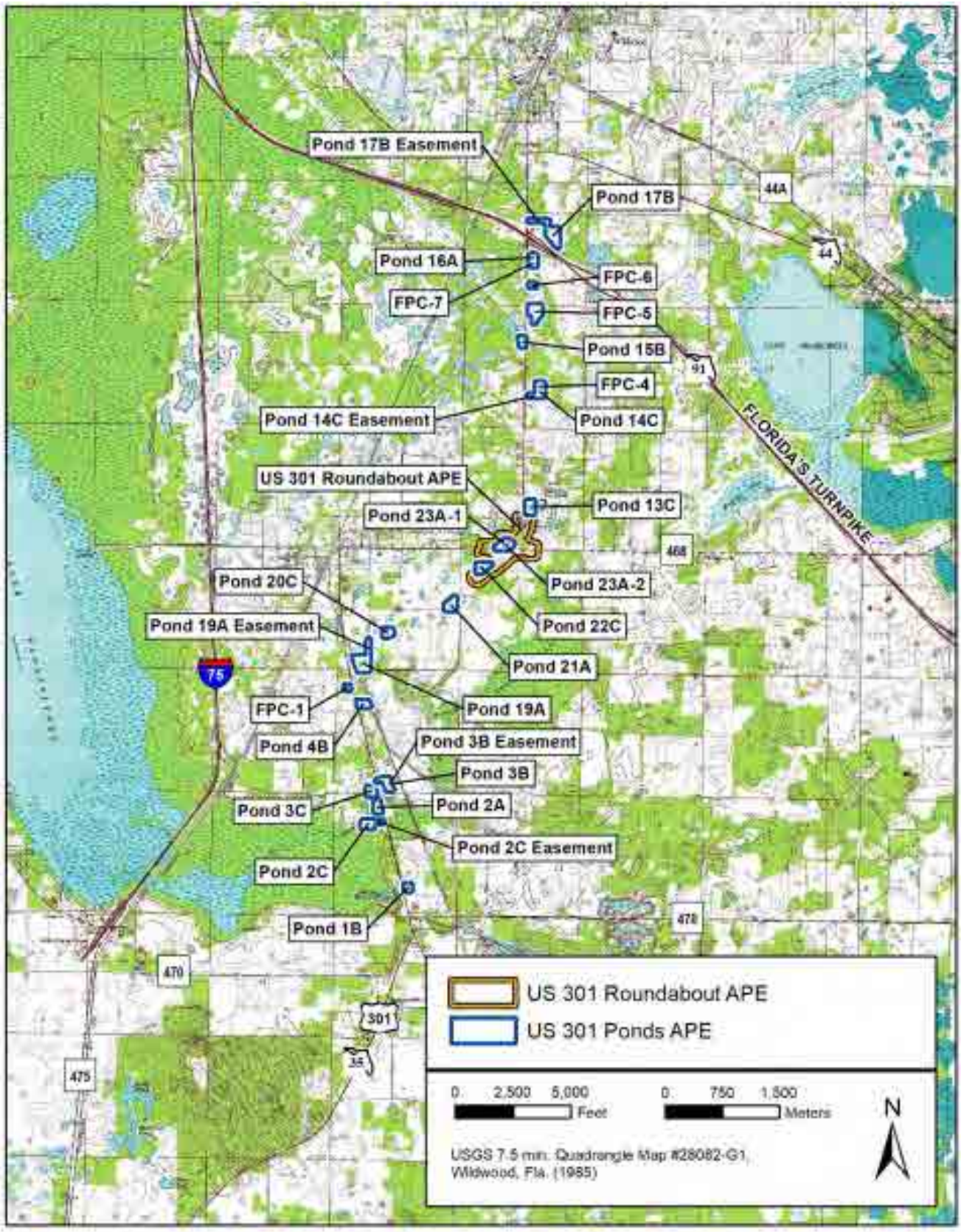
The project Area of Potential Effect (APE) was developed to consider any visual, audible, and atmospheric effects that the project may have on historic properties. The APE defined for this project includes the footprints for the proposed ponds and drainage easements, plus a 100-foot (30-meter) buffer of each. The APE also includes the proposed right-of-way for a previously inaccessible portion of the truck route and proposed roundabout, plus a 330-foot (100-meter) buffer (**Figure 1-2**). Archaeological survey covered the pond footprints and proposed road right-of-way. Architectural survey considered the entire APE. The total project APE measures approximately 246 acres.

The purpose of the survey was to locate, identify, and bound any archaeological resources, historic structures, and potential districts within the project's APE and to assess their potential for listing in the National Register of Historic Places (NRHP). This study was conducted to comply with Chapter 267 of the Florida Statutes and Rule Chapter 1A-46, Florida Administrative Code. All work was performed in accordance with Part 2, Chapter 8 of the Florida Department of Transportation's (FDOT) Project Development & Environment (PD&E) Manual (revised June 2017), as well as the Florida Division of Historical Resources' (FDHR) recommendations for such projects, as stipulated in the FDHR's *Cultural Resource Management Standards & Operations Manual, Module Three: Guidelines for Use by Historic Preservation Professionals*. The Principal Investigator for this project meets the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-42). This study also complies with Public Law 113-287 (Title 54 U.S.C.), which incorporates the provisions of the National Historic Preservation Act (NHPA) of 1966, as amended, and the Archeological and Historic Preservation Act of 1979, as amended. The study also complies with the regulations for implementing NHPA Section 106 found in 36 CFR Part 800 (*Protection of Historic Properties*).

FIGURE 1-1 | Project Location Map.



FIGURE 1-2 | Project APE.



2.0 Florida Master Site File Review

A review of the FMSF database (updated July 2017) indicates several of the ponds within the current project area have been at least partially surveyed for cultural resources as part of previous studies (Table 2-1). However, only four received comprehensive coverage for architectural and archaeological resources. Three of these ponds (Ponds 20C, 23A-1, and 23A-2) were surveyed during SEARCH's survey of the US 301 mainline roadway (FMSF Survey No. 24186). Pond FPC-6 was previously surveyed as part of the Sabal Trail project conducted by Cardno in 2015 (FMSF Survey No. 21991).

Table 2-1. Previous Surveys and Cultural Resources within the US 301 Ponds APE.

Pond	Previous Surveys	Resources
1B	n/a	8SM00933
2A	5213	n/a
3B	24186	n/a
3B Easement	24186	n/a
3C	5213	n/a
4B	24186	n/a
FPC-1	18329	n/a
20C	24186 (completely)	n/a
22C	24186	n/a
23A-2	24186 (completely) 13900	n/a
23A-1	24186 (completely)	n/a
15B	21431	n/a
FPC-5	21991	n/a
FPC-6	21991 (completely)	n/a
16A	5213	n/a
17B	18329	n/a
17B Easement	9309	n/a
SR 35 Roundabout	24186	n/a
Truck Route	24186	n/a

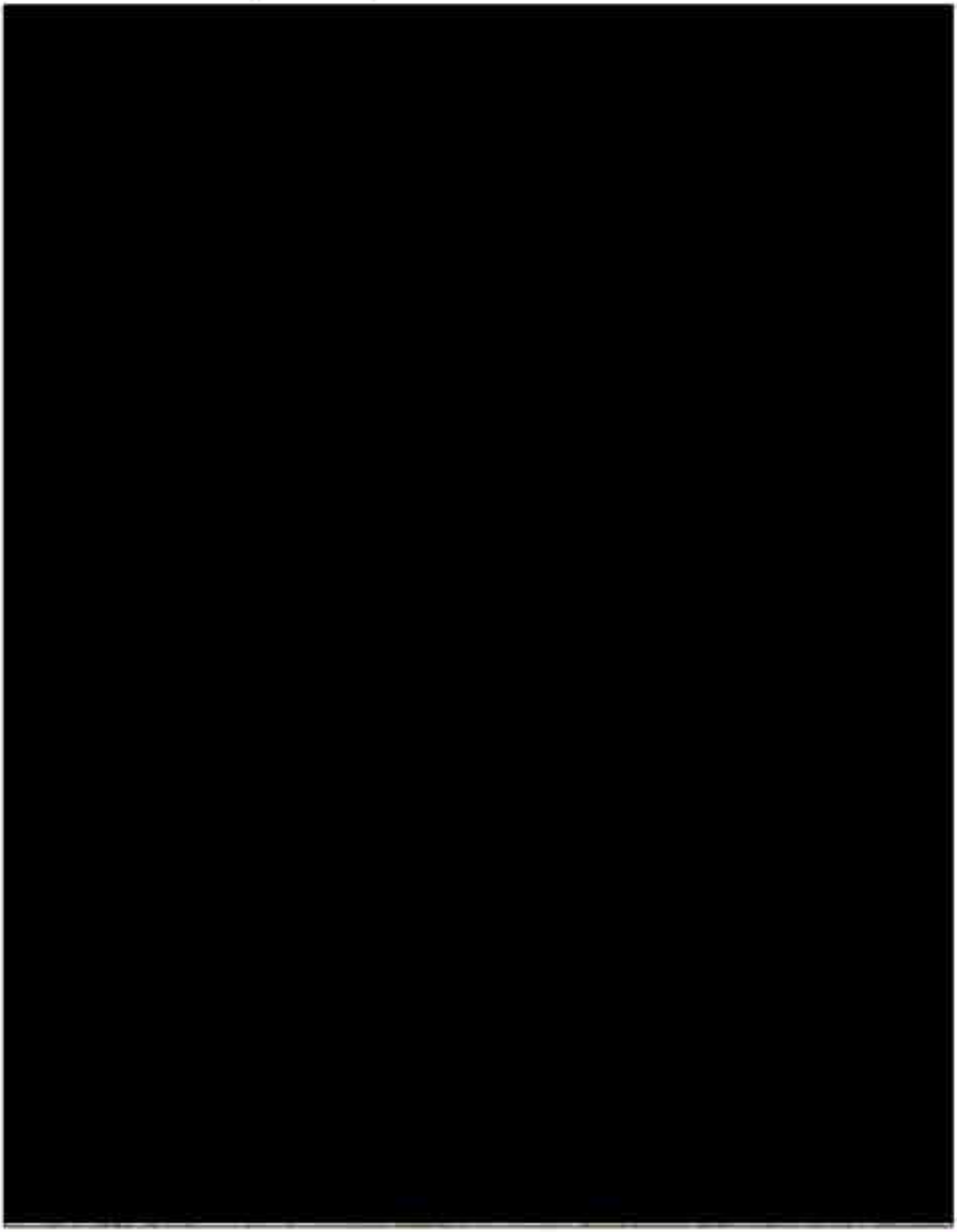
Previous surveys have recorded one archaeological site within one pond footprint (**Figure 2-1**; see **Table 2-1**). The eastern edge of the Shady Brook archaeological site (8SM00933) runs along the western boundary of Pond 1B. This site was recorded during the 2017 survey of US 301 conducted by SEARCH, for which the current report serves as an addendum (FMSF Survey No. 24186). This site is an extensive prehistoric scatter from the St. Johns and Pasco periods, which may represent a significant prehistoric habitation site. The site also limited evidence for nineteenth- and twentieth-century use. The State Historic Preservation Officer (SHPO) has determined that 8SM00933 is eligible for the NRHP. No other previously recorded resources are located within the US 301 Ponds APE.

3.0 Survey Methodology

3.1 Archaeological Field Methods

The pond and roadway locations were visually examined via pedestrian survey for the presence of exposed artifacts and aboveground features (e.g., structural remains and prehistoric mounds). The Phase I field survey consisted of subsurface shovel testing within the proposed pond, drainage, and roadway footprints at varying intervals according to the potential for containing buried archaeological sites. Shovel tests were judgmentally placed to achieve coverage within each pond and roadway area. The FDHR manual specifies that non-systematic testing (i.e., judgmental testing) is appropriate in "geographically restricted areas such as proposed pond sites" (FDHR 2002:17-18). A positive shovel test triggered archaeological site delineation with excavation at reduced intervals (12.5 meters [41 feet]). Shovel testing continued until two negative tests were excavated in the cardinal directions within the project limits.

FIGURE 2-1 | Previously Recorded Resources in the US 301 Ponds APE.



Shovel tests measuring approximately 50 centimeters (20 inches) in diameter were excavated to a minimum depth of 100 centimeters below surface (cmbs) (39 inches), unless prevented by groundwater inundation or impenetrable zones, such as rubble/fill, limestone, or clay. Excavated soil was screened through 6.4-millimeters (1/4-inch) mesh hardware cloth. The location of each shovel test was marked on aerial photographs of the project area. Global Positioning System (GPS) coordinates were taken for each shovel test with handheld units that used the Wide Area Augmentation System (WAAS). The cultural content, stratigraphy, and environmental setting of each shovel test were recorded in field notebooks. The Field Specimen (FS) Log with artifact analysis is provided in **Attachment 1**, and the FMSF Resource Form is provided in **Attachment 2**. A FMSF Survey Log sheet is included in **Attachment 3**.

In addition to information regarding previously recorded archaeological sites, soil drainage characteristics were examined in order to develop testing strategies (**Figures 3-1** to **3-3**). Soils within the APE range from well drained to excessively drained.

The potential for archaeological sites to be present within the pond and drainage easement footprints and roadway areas was evaluated based on an examination of environmental variables (i.e., soil drainage, relative elevation, nearness to water or wetland resources), as well as the results of previously conducted surveys. The potential for encountering archaeological deposits varied across the ponds APE. Due to the close proximity to Lake Panasoffkee and associated wetlands, ponds in the southern portion of the project area were determined to have a high probability for archaeological resources. Ponds in the northern half of the project area are more distant from significant hydrological features and were determined to have a low to moderate potential for archaeological sites.

3.2 Architectural Field Methods

In addition to a search of the FMSF for any previously recorded historic structures within the APE, older US Geological Survey (USGS) quadrangle maps were reviewed for structures that were constructed prior to 1973. A pedestrian survey was completed throughout the APE. No architectural resources were identified within the APE.

FIGURE 3-1 | Soil Drainage, Map 1 of 3.

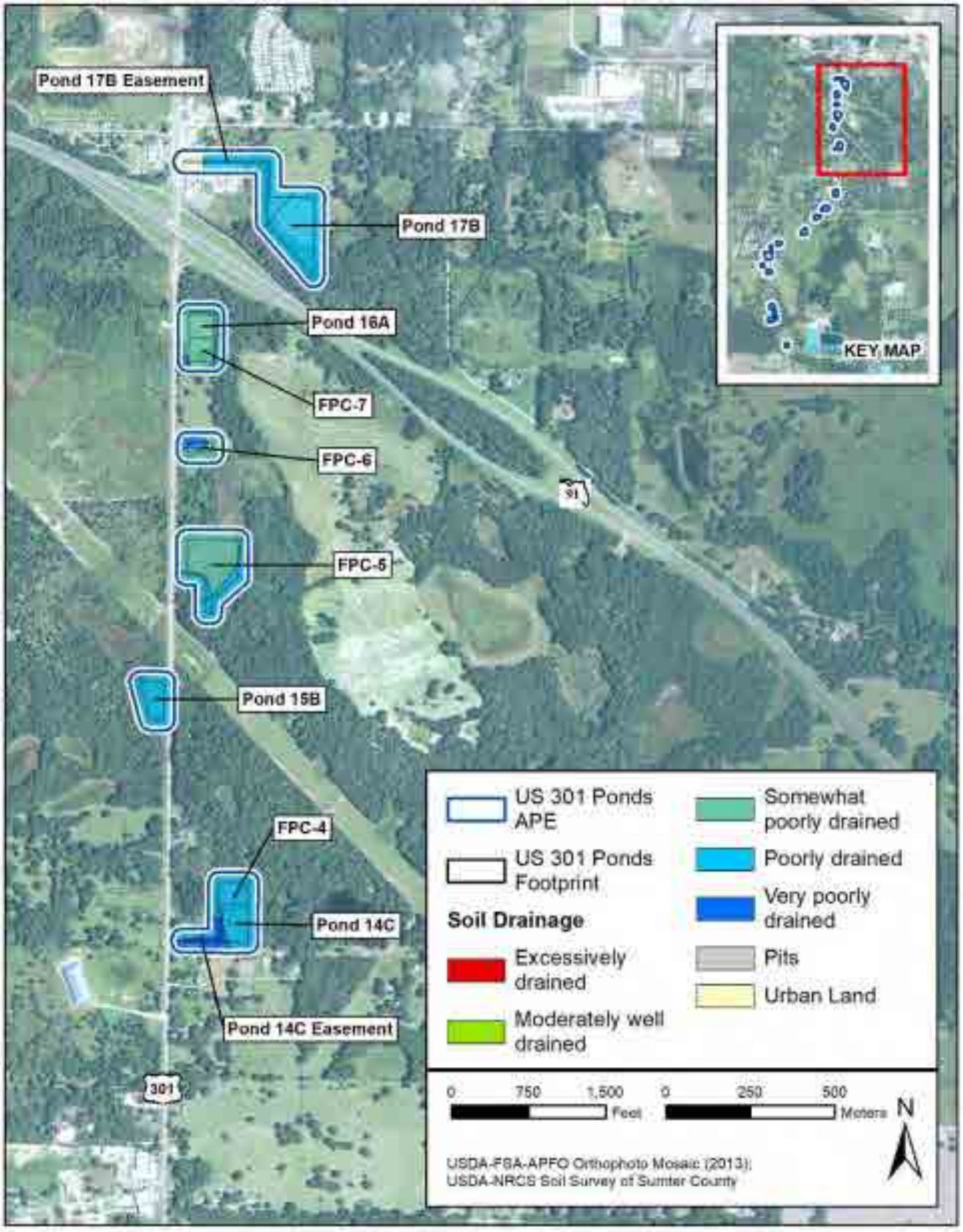


FIGURE 3-2 | Soil Drainage, Map 2 of 3.

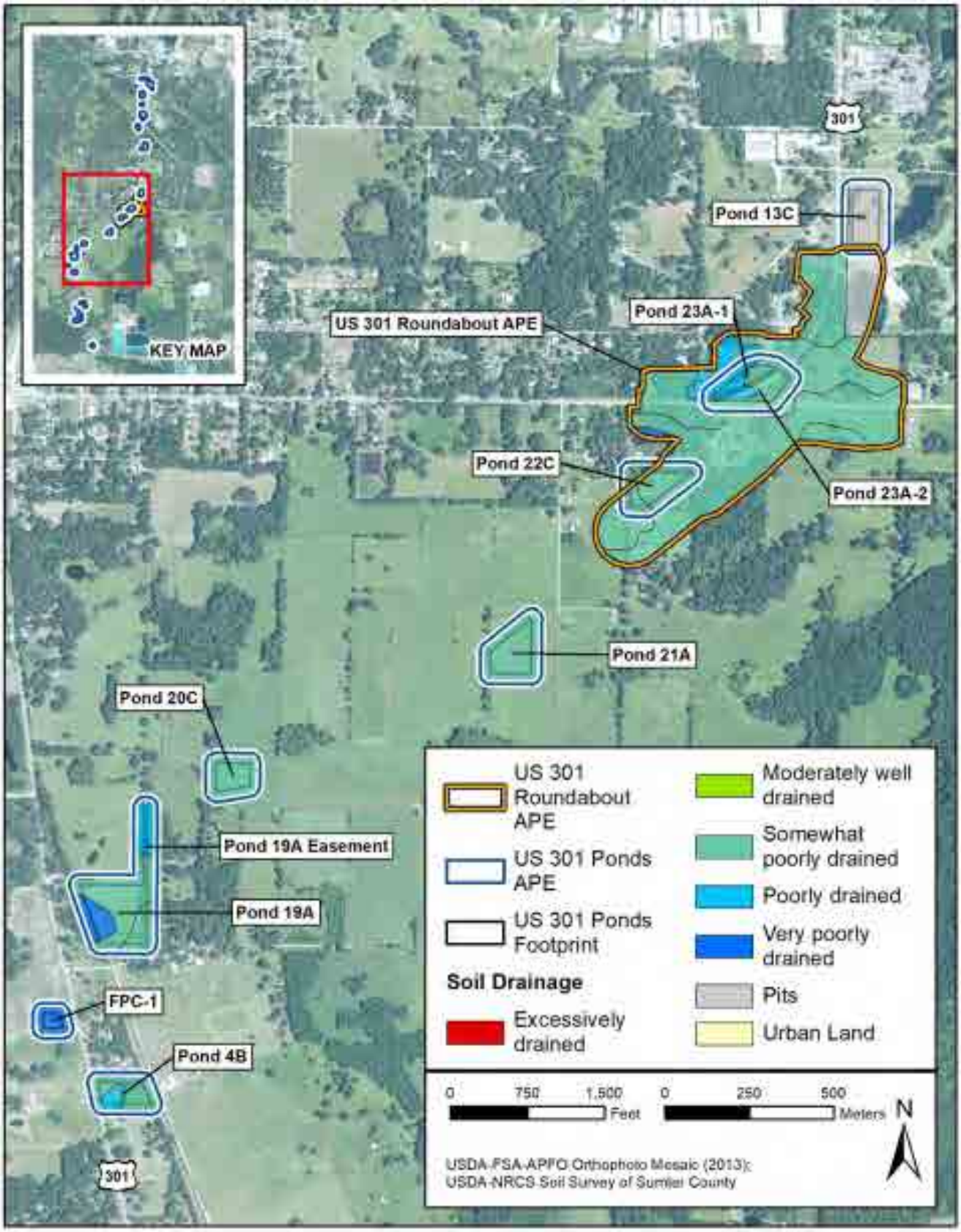
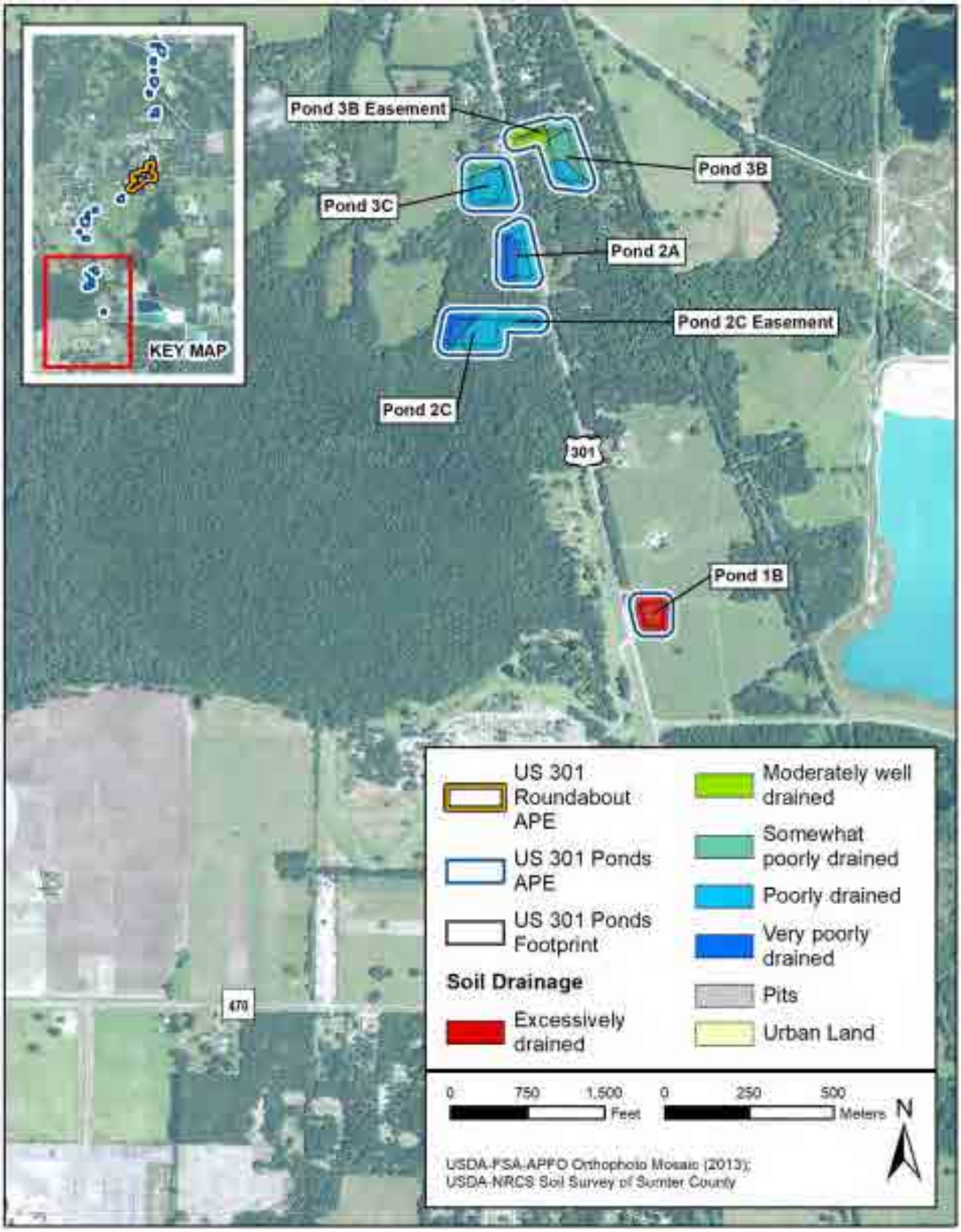


FIGURE 3-3 | Soil Drainage, Map 3 of 3.



4.0 Survey Results

4.1 Archaeology Results

A total of 246 shovel tests (STs) were excavated within the US 301 Ponds APE. Some of these shovel tests were previously completed by SEARCH (2017; FMSF Survey No. 24186) in six of the current proposed pond footprints (Ponds 4B, 19A, 20C, 22C, 23A-1, and 23A-2). Seven shovel tests were dug within the proposed US 301 Truck Route in a previously inaccessible portion of the truck route right-of-way (SEARCH 2017; FMSF Survey No. 24186). A total of 36 shovel tests were excavated in the area of the proposed roundabout at the intersection of US 301 and SR 35; 26 of these were excavated during SEARCH's US 301 mainline survey (FMSF Survey No. 24186). Eight shovel tests were excavated to further delineate 8SM00932 along US 301. The fieldwork results of the US 301 Ponds APE survey are summarized in **Table 4-1** and shown in **Figures 4-1** to **4-5**.



Table 4-1. Summary of Archaeological Fieldwork Results from the US 301 Ponds APE.

[redacted]

Representative views of the project area are presented in **Figure 4-6**. The archaeological survey resulted in the identification of five newly recorded archaeological sites (8SM01022-8MR01025 and 8SM01100) and three archaeological occurrences (AOs) (AOs 5-7), as well as an update to the 8SM00933 site boundaries (see **Figures 4-1 to 4-5**). No archaeological material was identified within the previously inaccessible portion of the US 301 Truck Route (SEARCH 2017; FMSF Survey No. 24186), the roundabout, or the additional delineation testing at 8SM00932.

The archaeological sites and occurrences encountered within the US 301 Ponds APE are discussed in the following section.

FIGURE 4-1 | Results of archaeological testing in the US 301 Pond APE, Map 1 of 5.

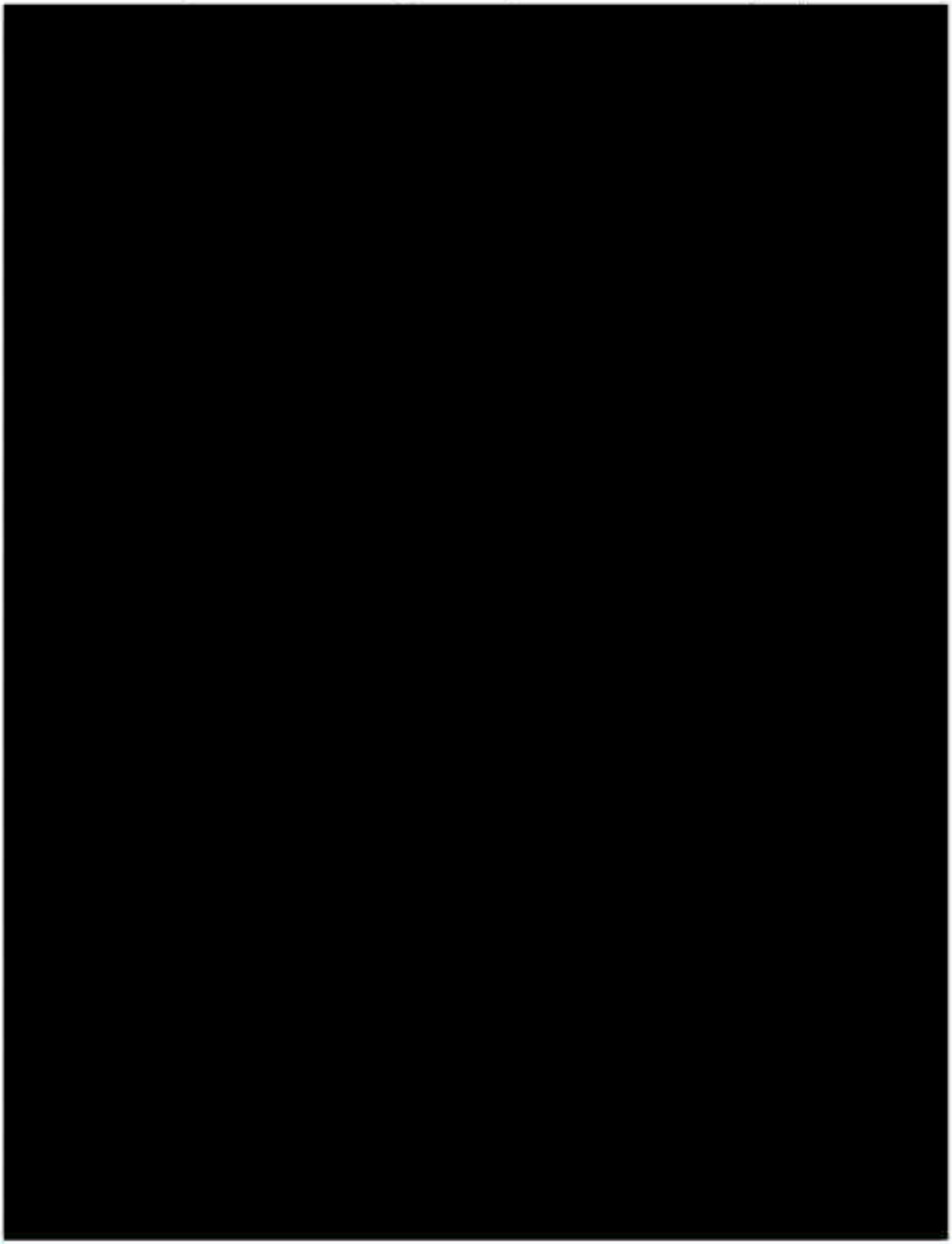


FIGURE 4-2 | Results of archaeological testing in the US 301 Pond APE, Map 2 of 5.

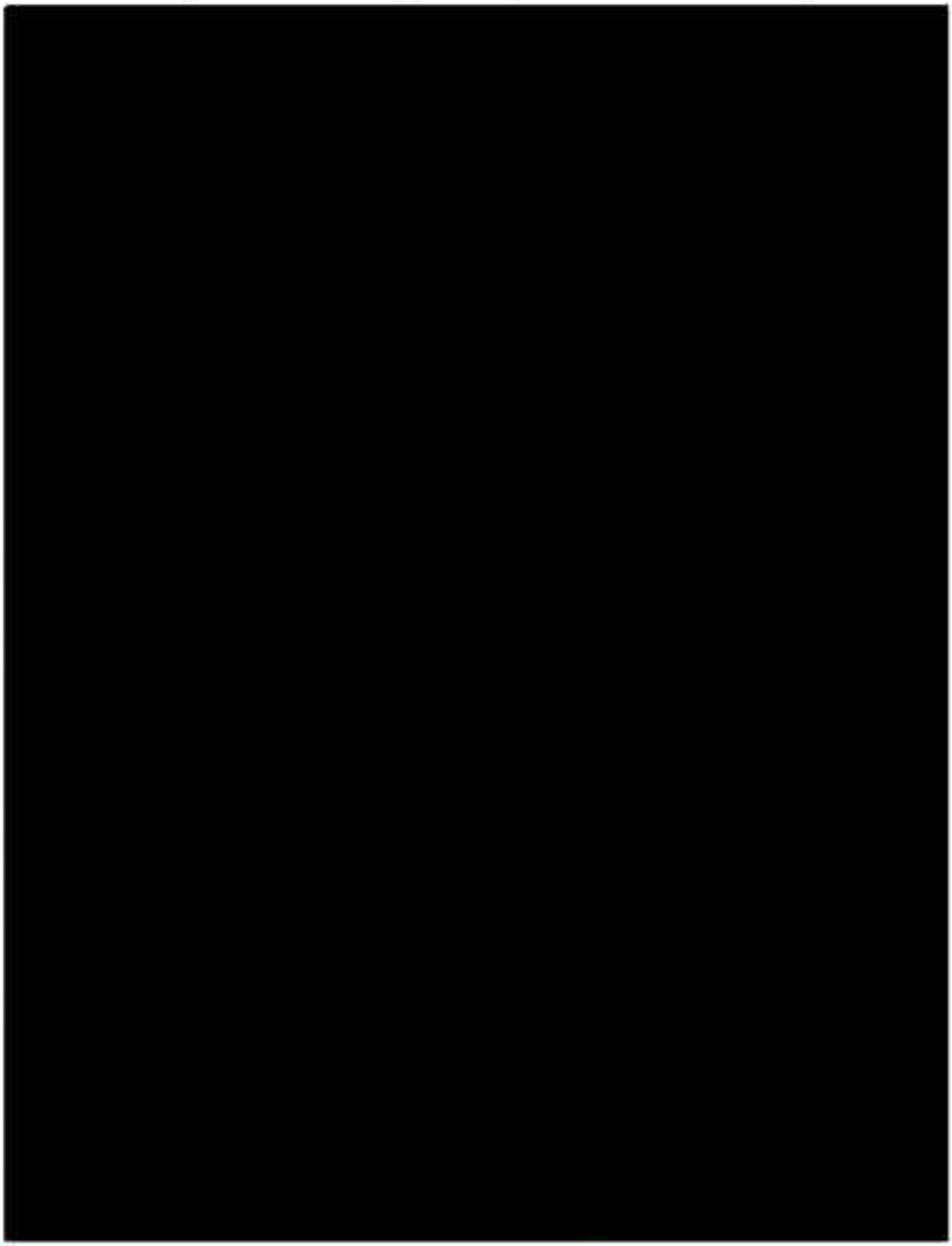


FIGURE 4-3 | Results of archaeological testing in the US 301 Pond APE, Map 3 of 5. Note: new shovel tests south of Pond 22C represent additional testing in previously inaccessible pasture.

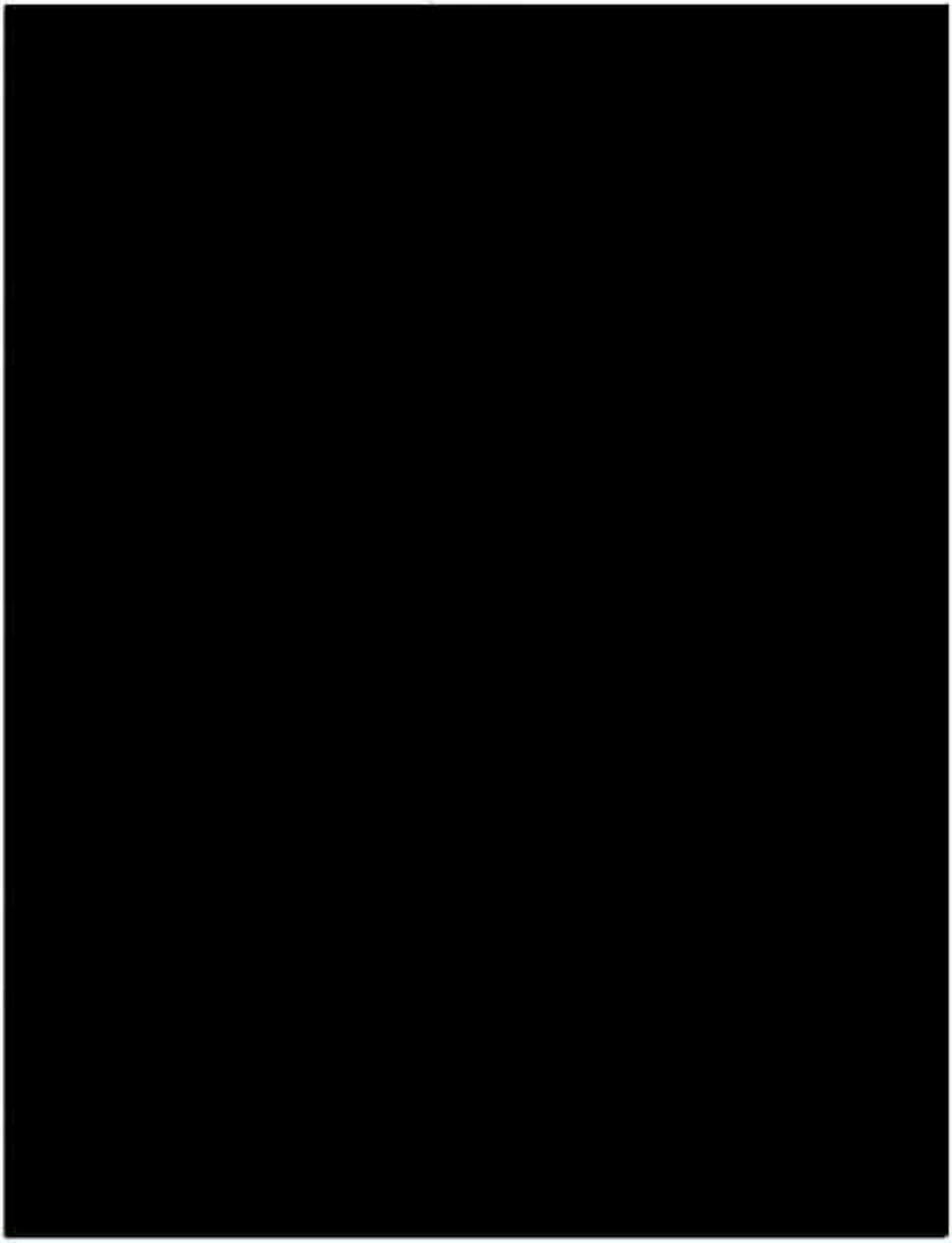


FIGURE 4-4 | Results of archaeological testing in the US 301 Pond APE, Map 4 of 5.

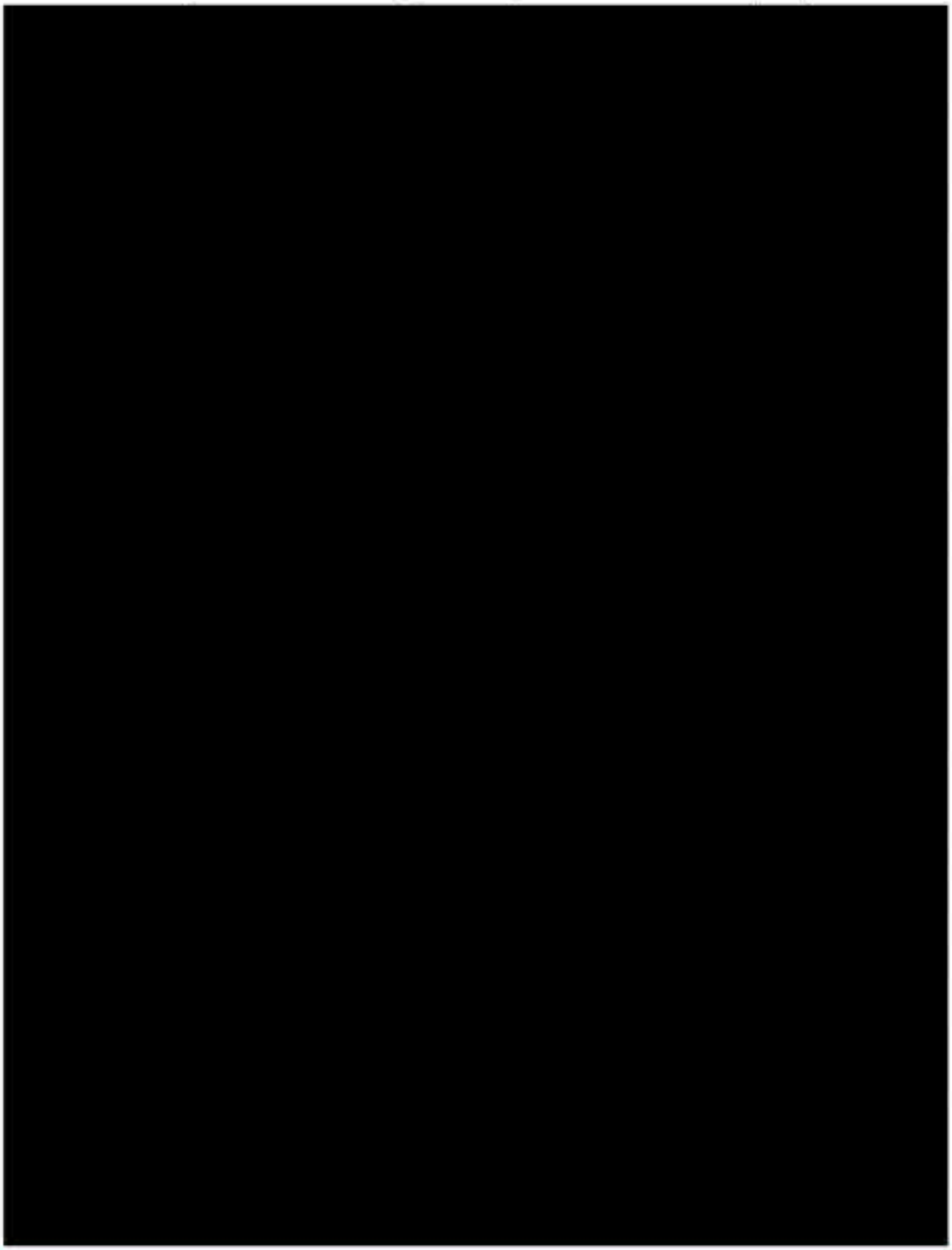


FIGURE 4-5 | Results of archaeological testing in the US 301 Pond APE, Map 5 of 5.

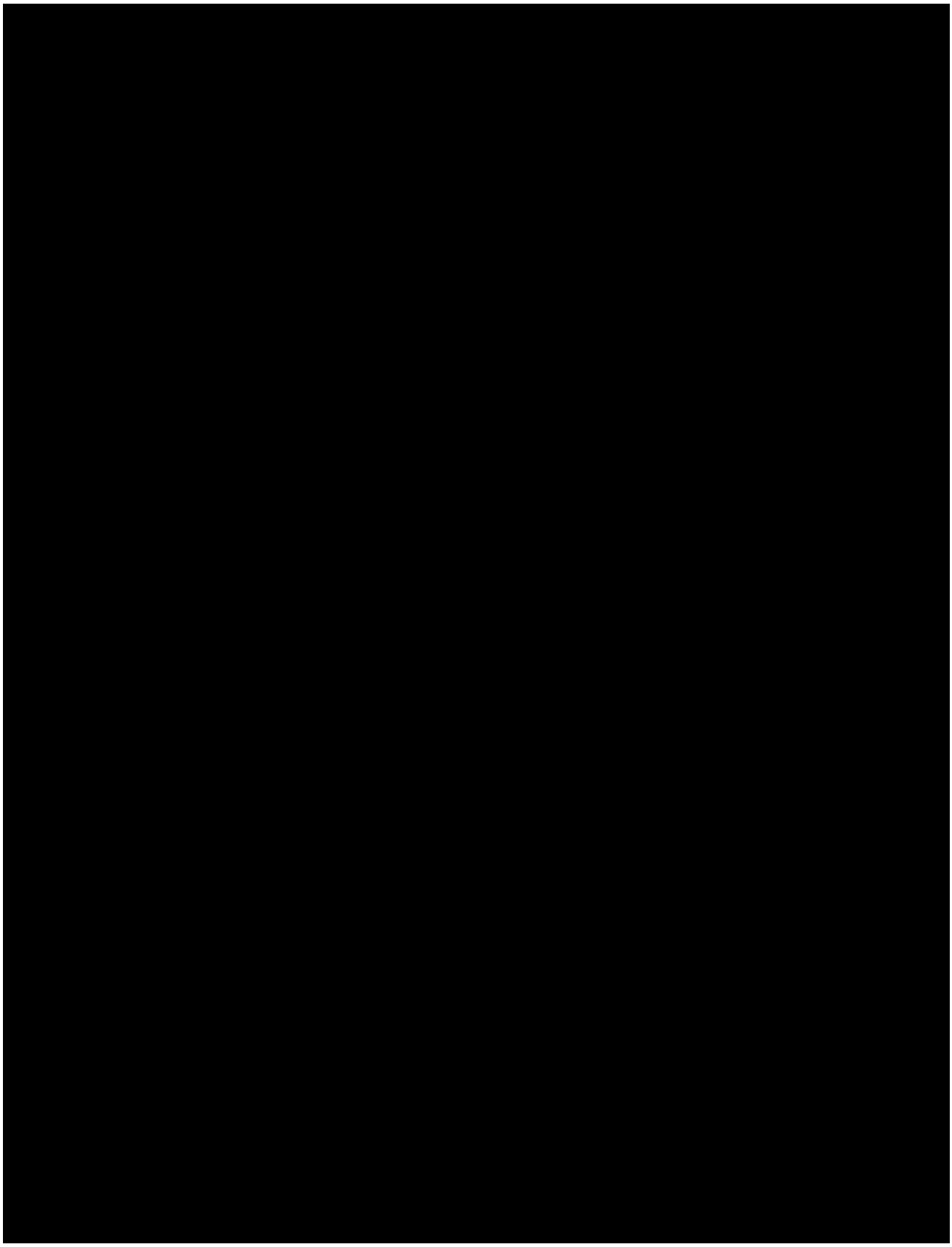


FIGURE 4-6 | Overview photographs of US 301 Ponds APE. Top left: West end of Pond 23A-2, view east. Top right: East end of Pond 23A-1, view east. Center left: Pond 19A Easement, view east. Center right: Overview of Pond 3C, view west. Bottom left: Overview of Pond 22 C, view north. Bottom right: Overview of roundabout, view west.



4.1.1 8SM00933, Shady Brook Site

Location: Township 20 South, Range 22 East, Section 12

Setting: Cleared agricultural field

Vegetation: Cleared field, grass

Soils: Excessively drained Oldsmar, Sumterville, and Paisley fine sand

Methods: Shovel testing at 25-meter (82-foot) intervals

Site Type: Prehistoric lithic scatter with a small nineteenth- and twentieth-century historic component

Site Size: 28.2 additional acres

Cultural Remains: Prehistoric chert flakes (n=9), prehistoric, heat-treated chert flakes (n=92), prehistoric silicified coral flakes (n=3), prehistoric silicified coral, heat-treated flakes (n=5), heat-treated chert projectile point fragment (n=1), historic whiteware fragment (n=1)

Chronology: St. Johns and Pasco prehistoric; Nineteenth- and twentieth-century American

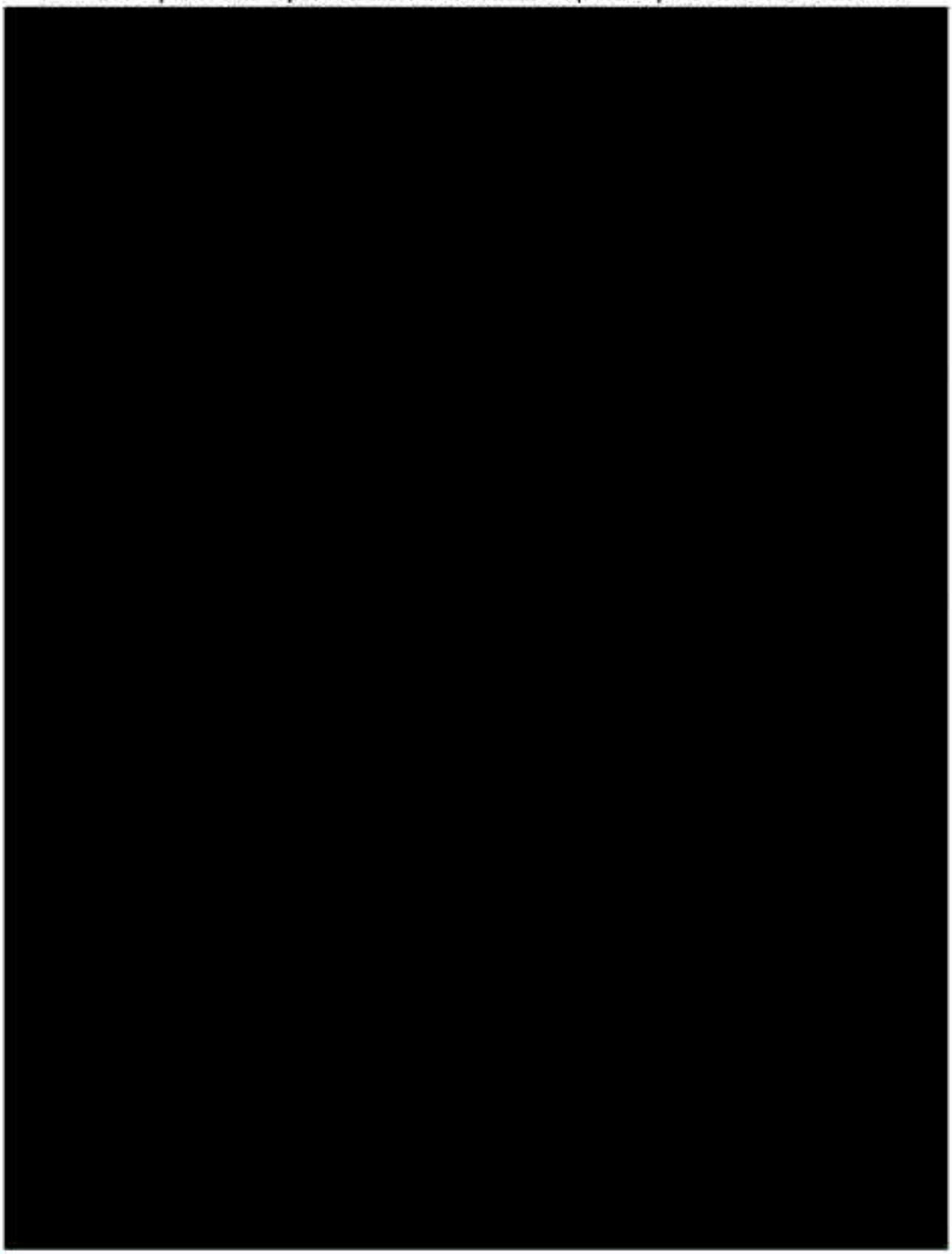
Discussion: The Shady Brook archaeological site (8SM00933) was originally recorded by SEARCH earlier in 2017 as part of the US 301 PD&E Study for which this report serves as an addendum (FMSF Survey No. 24186). The site was evaluated as eligible for the NRHP by the SHPO in July 2017. Additional positive shovel tests associated with 8SM00933 were excavated as part of the current study within [redacted].

FIGURE 4-7 | Overview of expanded 8SM00933, view south.



The original site boundaries extend along the east and west sides of US 301 and encompass a total of 22.9 acres. A large portion of the site is located within an existing golf course and agricultural fields; [redacted] archaeological deposits. All nine shovel tests excavated within the pond boundaries were positive for cultural material (**Figure 4-8**). Typical soil profiles consisted of gray sand from 0-30 cmbs (0-12 inches), yellowish brown sand from 30-40 cmbs (12-16 inches), and very pale brown sand from 40-100 cmbs (16-39 inches). Although cultural material was collected from all three strata, the majority of artifacts came from Stratum I (n=44) and

FIGURE 4-8 | Location of positive shovel tests in the expanded portion of site 8SM00933.



Stratum II (n=52). An additional 15 artifacts were recovered from Stratum III. All but one of the artifacts collected in the current excavation of 8SM00933 were prehistoric. The only historic artifact collected was a single fragment of whiteware ceramic.

Interpretation and Evaluation: The one historic artifact collected during the excavation of 8SM00933 is a fragment of whiteware ceramic, which was widely produced and utilized from the mid-nineteenth century into the present day. This artifact was recovered from ST 4, [redacted]. No other historic material was recorded in the surrounding shovel tests.

The majority of material collected from 8SM00933 was prehistoric lithic debitage, including tertiary flakes and one unidentified partial projectile point (see **Attachment 1**). The majority of this was composed of coastal plain chert (93 percent), but eight flakes were composed of silicified coral. Nearly all (n=104) of the 110 lithic or coral artifacts were broken or fractured and exhibited no evidence of cortex, consistent with late stage tool manufacture or tool maintenance. No prehistoric ceramics or complete tools were found during testing. The original US 301 PD&E study interpreted 8SM00933 as a seasonal campsite due to the lack of features and the density of prehistoric material. Given the similarity between the original survey and the current testing in [redacted] this assessment is still applicable.

The original survey noted that the greatest density of artifacts was located in the vicinity of Beltons Millpond and wetlands associated with Lake Panasoffkee; these resources are located approximately 170 meters [redacted]. Artifact density drops as distance from these two hydrological features increases. This observation is generally applicable to the newly recorded portion of 8SM00933 [redacted], although artifact recovery within the pond site was still significant. As no negative shovel tests were excavated within the Pond [redacted], it is likely that additional archaeological deposits exist outside the expanded boundaries of 8SM00933. No features have yet been noted within the boundaries of 8SM00933; however, the moderate to high artifact density and good physical integrity in most portions of the site, [redacted] indicate features are likely. Based on investigations of other parts of the site, the SHPO has evaluated 8SM00933 as eligible for the NRHP, and it is the opinion of SEARCH that the portion of the site found to extend [redacted]e. Further consultation with the SHPO and the Tribes will be necessary to determine the appropriate management of the site with regard to potential project-related impacts.

4.1.2 8SM01022, Shady Brook Lithic Scatter

Location: Township 20 South, Range 22 East, Section 12

Setting: Wooded area with low wetland along western boundary

Vegetation: Oaks, sabal palms, pines, saw palmetto

Soils: Poorly drained Paisley fine sand

Methods: Shovel testing at 12.5-meter (41-foot) and 25-meter (82-foot) intervals

Site Type: Prehistoric lithic scatter with a small nineteenth-century historic component

Site Size: 2.28 acres

Cultural Remains: Chert flakes (n=286), silicified coral flakes (n=6), prehistoric chert shatter (n=7), prehistoric ceramic (n=1), historic ceramics (n=11), bottle/container glass (n=8), animal bone (n=4), shell (n=1)

Chronology: Woodland through Mississippian periods; nineteenth-century American; unknown aboriginal

Discussion: 8SM01022 (**Figure 4-9**) is a newly documented prehistoric and historic archaeological site [redacted]. Vegetation in the site area includes a canopy of tall mature oak and pine trees and a sub-canopy consisting of sabal palms and crepe myrtle (**Figure 4-10**).

Subsurface tests were excavated at 12.5- and 25-meter intervals to ascertain the nature and extent of the site. The resulting 23 positive shovel tests defined the site boundaries to be approximately 225 meters by 75 meters (738 feet by 246 feet). Some variation in soil profiles was noted across the site, but in general, soils exhibited three strata: a grayish brown sand from 0 to 40 cmbs (15.7 inches; Stratum I), pale brown sand from 40 to 70 cmbs (15.7 to 27.6 inches; Stratum II), and white or gray sand from 70 to 100 cmbs (39 inches; Stratum III). The historic artifacts were recovered from the upper stratum in two positive shovel tests (STs 40 and 43) located in the eastern portion of the site. Prehistoric artifacts were recovered across the entire site from all three strata.

Interpretation and Evaluation: Shady Brook Lithic Scatter (8SM01022) is a multicomponent prehistoric and historic artifact scatter consisting of a moderate-density aboriginal artifact scatter and a light density scatter of glass and historic ceramics. In addition, a small amount of faunal material (n=4) was recovered. The prehistoric artifact assemblage is dominated by tertiary debitage derived from locally available coastal plain chert (n=262). A few flakes (n=6) are composed of silicified coral (see **Attachment 1**). Thermal alteration was noted on 64 percent of the lithic artifacts. Four flakes exhibited modified margins, suggesting they were utilized as tools. A single potsherd was recovered from 8SM01022, a Pasco Plain body fragment. This pottery fragment was the only temporally diagnostic prehistoric artifact recovered, suggesting a cultural affinity with Late Woodland Weeden Island related groups and possibly later Mississippian period cultures in the region. The predominance of tertiary flakes and expediently fashioned flake tools is consistent with activities related to late stage tool production and tool maintenance associated with hunting or other resource procurement activities. Such sites represent intermittent occupations, possibly occurring repeatedly as part of a seasonal migration.

Historic artifacts were isolated to the eastern part of the site and consisted of annular decorated whiteware (n=1), edge decorated whiteware (n=1), undecorated whiteware (n=6), hotelware (n=1), and glass bottle fragments (n=5). A single oyster shell was recovered from the same provenience as the historic items. Temporally diagnostic historic artifacts suggest that the historic component dates from the early to middle nineteenth century into the twentieth century. Annular decorated and edge decorated whiteware were common in the early to middle nineteenth century, while hotelware has been manufactured since 1870 and its use ranges into the 1920s. Glass bottle fragments were either clear or soda green in color; although clear bottle glass is ubiquitous to all historic time periods, soda green bottle glass was almost exclusively manufactured in the twentieth and twenty-first centuries. Historic topographic maps (USGS 1895) and county maps (Florida State Road Department 1936) do not show any historic structures in the vicinity of the site which might have served as a source for this historic material.

FIGURE 4-9 | Location of positive shovel tests in 8SM01022.

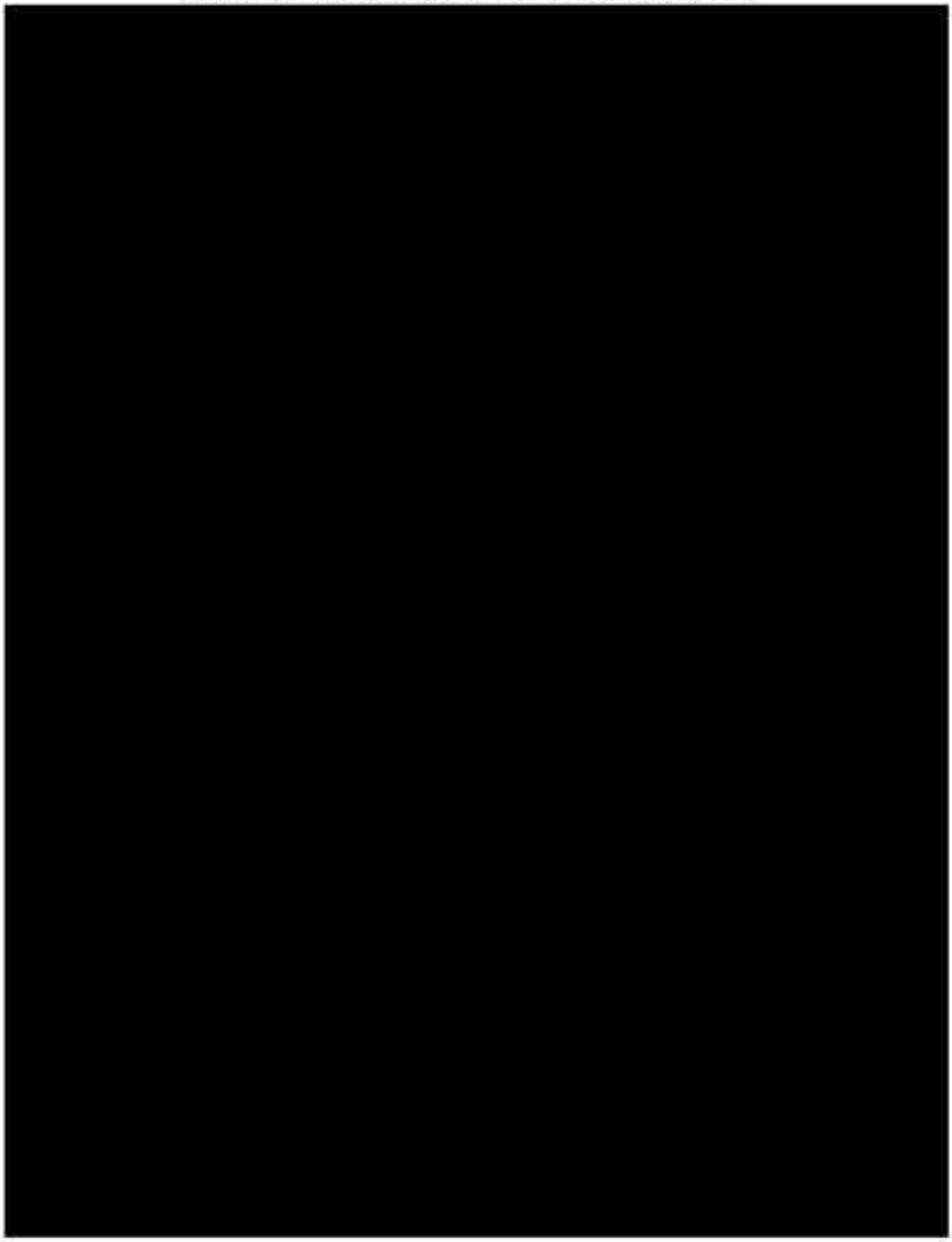


FIGURE 4-10 | Overview of site 8MS01022, view west.



The Shady Brook Lithic Scatter is a moderately dense artifact scatter with evidence for prehistoric and historic occupation. Soils appear relatively undisturbed, with a discrete nineteenth- and twentieth-century deposit located in the eastern portion of the site. This historic component is confined to the upper soil stratum and is underlain by older prehistoric deposits, implying that stratification exists on the site. Boundaries for the site were constrained by the limits of the pond footprint, and it is likely that the site extends farther to the north. No features were identified; however, based on the density of artifacts, good physical integrity, and the limitations of shovel testing, it is possible that archaeological features and other intact cultural deposits exist within the boundaries of 8SM01022. Given the potential for significant cultural deposits and the inability to make a definitive evaluation of the site at the survey level of investigation, it is the opinion of SEARCH that there is insufficient information to determine whether 8SM01022 is eligible for the NRHP. Unit excavation (Phase II site assessment) is recommended to determine the eligibility of 8SM01022.

[redacted]

4.1.3 8SM01023, Shady Brook Hammock Site

Location: Township 20 South, Range 22 East, Sections 1 and 12

Setting: Oak hammock on west side of US 301

Vegetation: Oaks, sabal palms, pines, saw palmetto

Soils: Poorly drained Paisley and Oldsmar fine sands, and somewhat poorly drained Sumterville fine sand

Methods: Shovel testing at 12.5-meter (41-foot) and 25-meter (82-foot) intervals

Site Type: Prehistoric lithic and ceramic scatter

Site Size: 2.33 acres

Cultural Remains: Prehistoric chert tertiary flakes (n=160), prehistoric silicified coral flakes (n=4), modified chert flakes (n=2), projectile point fragment (n=1), Hernando projectile point (n=1), bifaces fragment (n=1), prehistoric check-stamped ceramic (n=2), prehistoric complicated stamped ceramic (n=4), prehistoric ceramic with indeterminate decoration (n=1), plain prehistoric ceramic (n=4), St. Johns Check stamped ceramic (n=1)

Chronology: Archaic to Mississippian

Discussion: 8SM01023 is a newly documented prehistoric archaeological site [redacted]. The site lies in an area of poorly drained soil located approximately 30 meters (98 feet) west of US 301. Vegetation in the site area includes a canopy of tall mature oak and pine trees and a sub-canopy consisting of sabal palms and crepe myrtle (**Figure 4-11**). Shady Brook is located approximately 50 meters south of the site.

FIGURE 4-11 | Overview of site 8SM01023, view north.

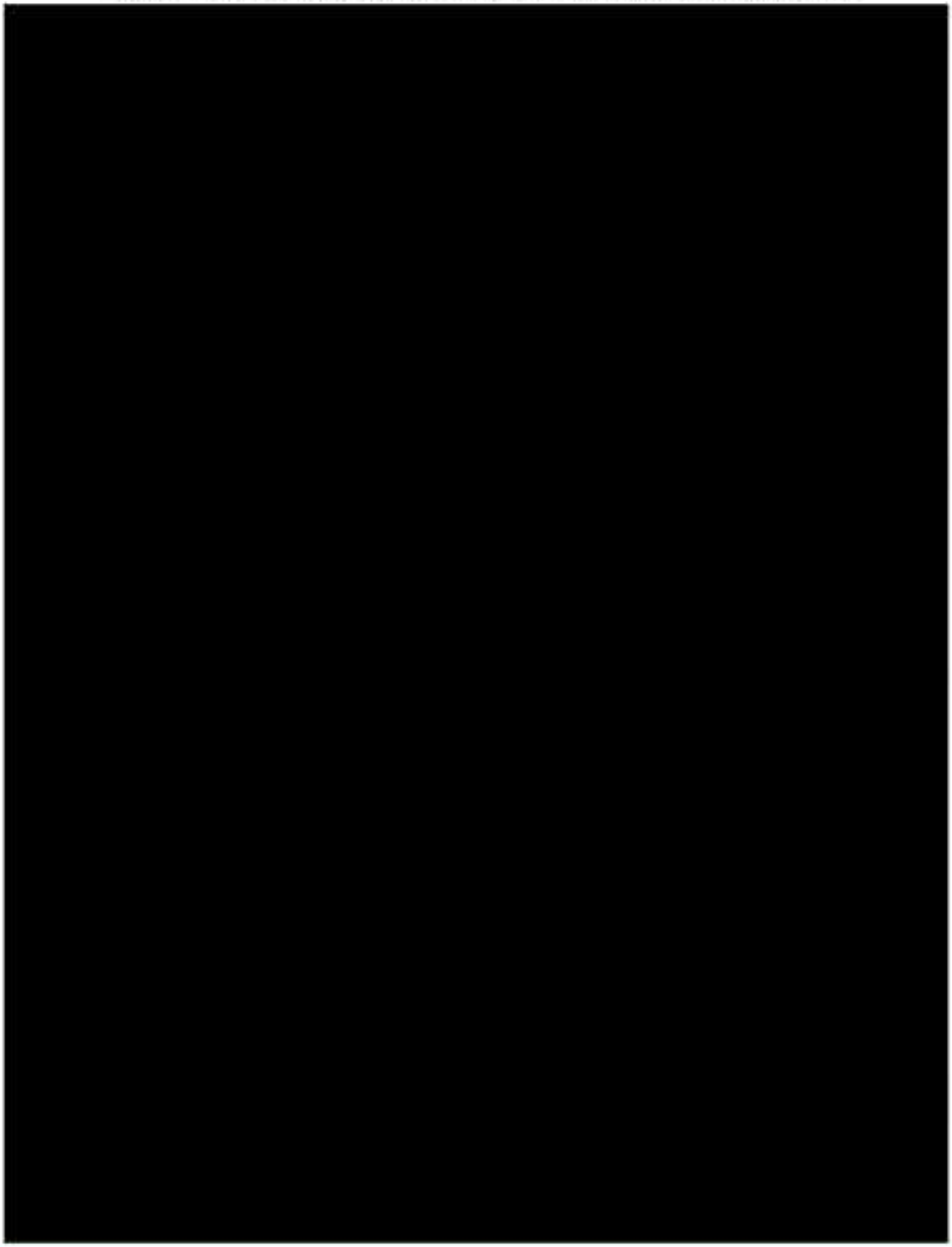


Subsurface tests were excavated at 12.5- and 25-meter intervals to ascertain the nature and extent of the site. The resulting 19 positive shovel tests defined the site boundaries to be 96 meters by 97 meters (315 feet by 318 feet) (**Figure 4-12**). The soil profiles observed in the positive shovel tests exhibited three strata: gray sand from 0 to 20 cmbs (8 inches; Stratum I), very pale brown sand from 20 to 90 cmbs (36 inches; Stratum II), and white sand from 90 to 100 cmbs (39 inches; Stratum III). Artifacts came from all strata, but the largest concentration of artifacts was recovered from Stratum II. [redacted] Except for one negative shovel test located in spodic soils, all of the shovel tests excavated within the pond footprint were positive for cultural material. [redacted] total of 181 prehistoric artifacts were recovered from the Shady Brook Hammock site, of which the majority (n=169) was lithic debitage or tools. The remaining 12 artifacts were fragments of prehistoric ceramics.

Interpretation and Evaluation: The Shady Brook Hammock site (8SM01023) is a moderately dense prehistoric artifact scatter. Artifacts are primarily tools or byproducts of tool production (i.e., flakes, projectile points, tools), but the assemblage also contains 12 fragments of prehistoric ceramics, including one St. Johns Check Stamped sherd (see **Attachment 1**). This ceramic type is typically associated with the Late Woodland St. Johns Period. Other diagnostic material includes a Hernando projectile point, which is typically associated with the Early and Middle Archaic periods. One other partial projectile point fragment was collected, although the tool did not have adequate diagnostic features to identify. Other tools include two edge-modified flakes and one unidentified biface fragment. Both projectile points showed evidence of heat treatment, along with 43 percent (n=71) of the flakes. The majority of flakes are comprised of locally available chert or silicified coral.

Artifact density appeared greatest in shovel tests in the southeast corner of the site, with the highest concentration of material in ST 125 (n=50). The number of artifacts recovered from surrounding shovel tests was generally more than 10, while shovel tests located along the northern and western edges of the site typically contained five or fewer artifacts. In terms of vertical distribution, the greatest density of artifacts was

FIGURE 4-12 | Location of positive shovel tests in 8SM01023 and 8SM01100.



collected from Stratum II (approximately 30 to 70 cmbs [11.8 to 27.6 inches]). No evidence of features (e.g., hearths, trash pits, post molds), midden, or other intact cultural deposits were detected.

Assemblages indicative of late stage tool production and tool maintenance, such as found at the Shady Brook Hammock site, are typically associated with hunting or other resource procurement activities. While the predominance of lithic debitage may point to short-term use related to specifically targeted resource extraction, the presence of pottery, complete tools, flake tools, and a biface fragment suggests a wider variety of activities, possibly related to more prolonged occupation, such as a seasonal habitation area. Although features or other intact deposits were not encountered, the density of cultural material and reasonably good physical integrity at the site suggests such deposits may be present, but not detectable at the survey level of investigation.

As such, insufficient information is available to determine if 8SM01023 is eligible for the NRHP. Additional work is recommended to determine the presence of features or other deposits capable of producing significant information about the site within the pond footprint.

[redacted]

4.1.4 8SM01024, Tolson Lithic Scatter

Location: Township 19 South, Range 23 East, Section 31

Setting: At the edge of a cleared pasture, bounded to the south by mature trees

Vegetation: Young pines, grass

Soils: Somewhat poorly drained Sparr fine sand

Methods: Shovel testing at 12.5-meter (41-foot) and 25-meter (82-foot) intervals; two positive shovel tests

Site Type: Prehistoric lithic scatter

Site Size: 0.14 acres

Cultural Remains: Prehistoric chert tertiary flakes, heat treated (n=5); prehistoric chert tertiary flakes, untreated (n=1)

Chronology: Unknown prehistoric

Discussion: The Tolson Lithic Scatter (8SM01024) is a newly recorded prehistoric archaeological site located in [redacted] The site is situated in somewhat poorly drained Sparr sands at the southern edge of an active livestock pasture and bounded to the south by a forested section of young pine trees (**Figure 4-13**). Three small natural ponds are located approximately 100 meters north of the site.

FIGURE 4-13 | Overview of site 8SM01024, view south.



for prehistoric archaeological resources based on soil drainage, the level of subsurface disturbance noted in aerial photographs, and the proximity of freshwater resources. Subsurface tests were excavated at 25-meter intervals, resulting in two positive shovel tests (**Figure 4-14**). Subsurface tests were excavated at 12.5-meter intervals in cardinal directions from the initial positive shovel test to ascertain the nature and extent of the site. Final site boundaries measure approximately 33 meters by 15 meters (108 feet by 49 feet). Soil strata in the positive shovel tests consisted of three strata: dark grayish brown or gray sand from 0 to 30 cmbs (0 to 11.8 inches; Stratum I), pale brown or light gray sand from 30 to 80 cmbs (11.8 to 31.5 inches; Stratum II), and white sand from 80 to more than 100 cmbs (31.5 to more than 39.3 inches; Stratum III). All but one artifact was recovered from Stratum III; one artifact was recovered in Stratum II between 30 and 40 cmbs (11.8 and 15.7 inches) (see **Attachment 1**).

Interpretation and Evaluation: The Tolson Lithic Scatter (8SM01024) artifact assemblage consists of six prehistoric chert flakes, of which all but one were recovered from at least 80 cmbs (31.5 inches). Subsurface disturbance within the site appears to be minimal, as evidenced by the consistent soil profile found throughout the site. Prehistoric lithic flakes are temporally non-diagnostic, and the site cannot be assigned to a particular prehistoric time period. The Tolson Lithic Scatter represents an ephemeral occupation, likely related to hunting or prehistoric resource procurement. No evidence of features was noted during excavation, and the site is unlikely to provide additional information.

Given the unremarkable nature of the assemblage, the lack of diagnostic material, and the low potential to yield additional information regarding the prehistoric occupation of Florida, the Tolson Lithic Scatter archaeological site (8SM01024) is recommended ineligible for the NRHP. No further work is recommended.

4.1.5 8SM01025, Main Street Lithic Site

Location: Township 19 South, Range 23 East, Section 30

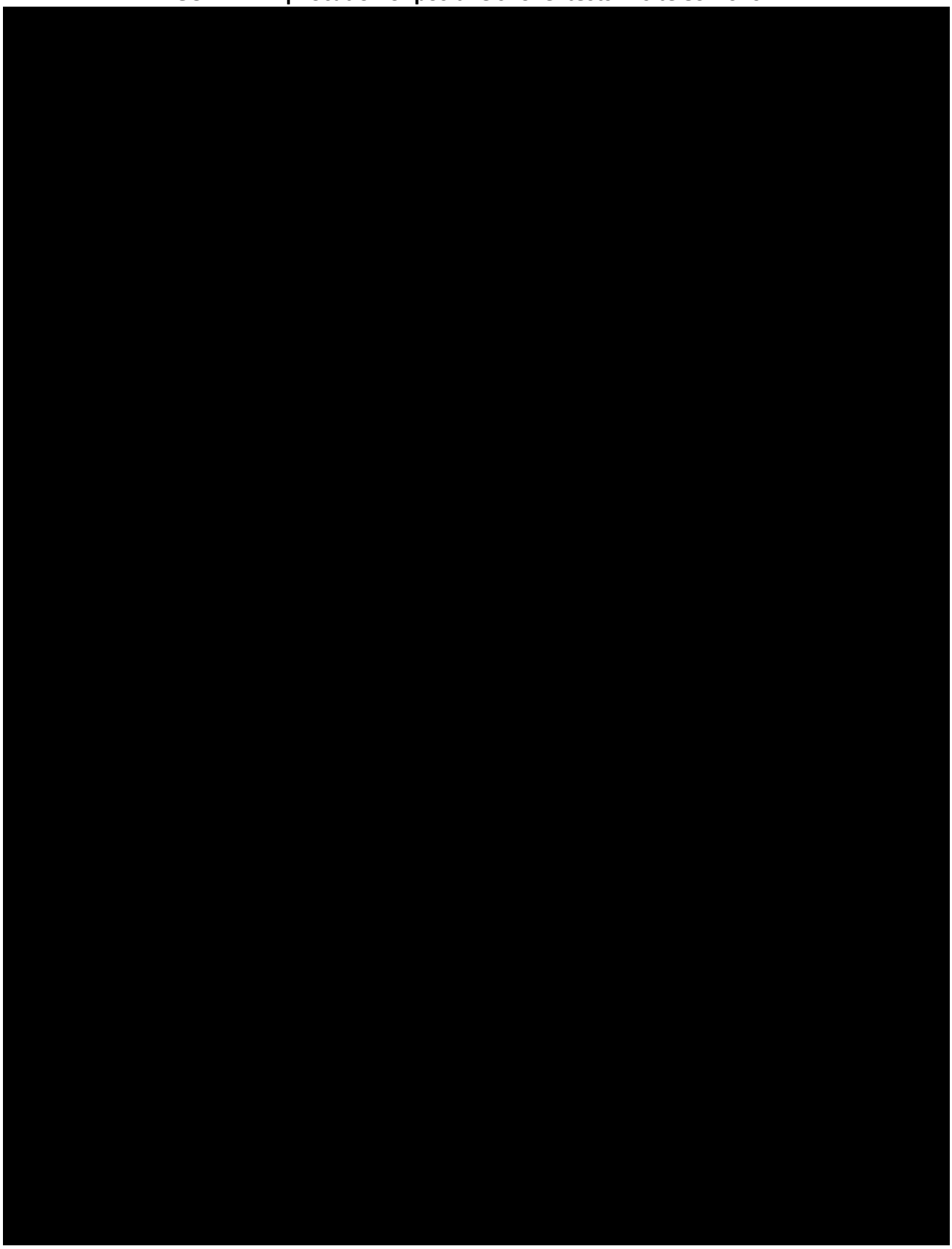
Setting: Cleared field, some mature trees to the west and north

Vegetation: Grass

Soils: Pits-Dump Complex

Methods: Shovel testing at 12.5-meter (41-foot) and 25-meter (82-foot) intervals

FIGURE 4-14 | Location of positive shovel tests in site 8SM01024.



Site Type: Low density, prehistoric lithic scatter

Site Size: 0.04 acres

Cultural Remains: Coastal plain chert flake (n=1), coastal plain chert flake, heat-treated (n=2).

Chronology: Prehistoric

FIGURE 4-15 | Overview of site 8SM01025, view north.

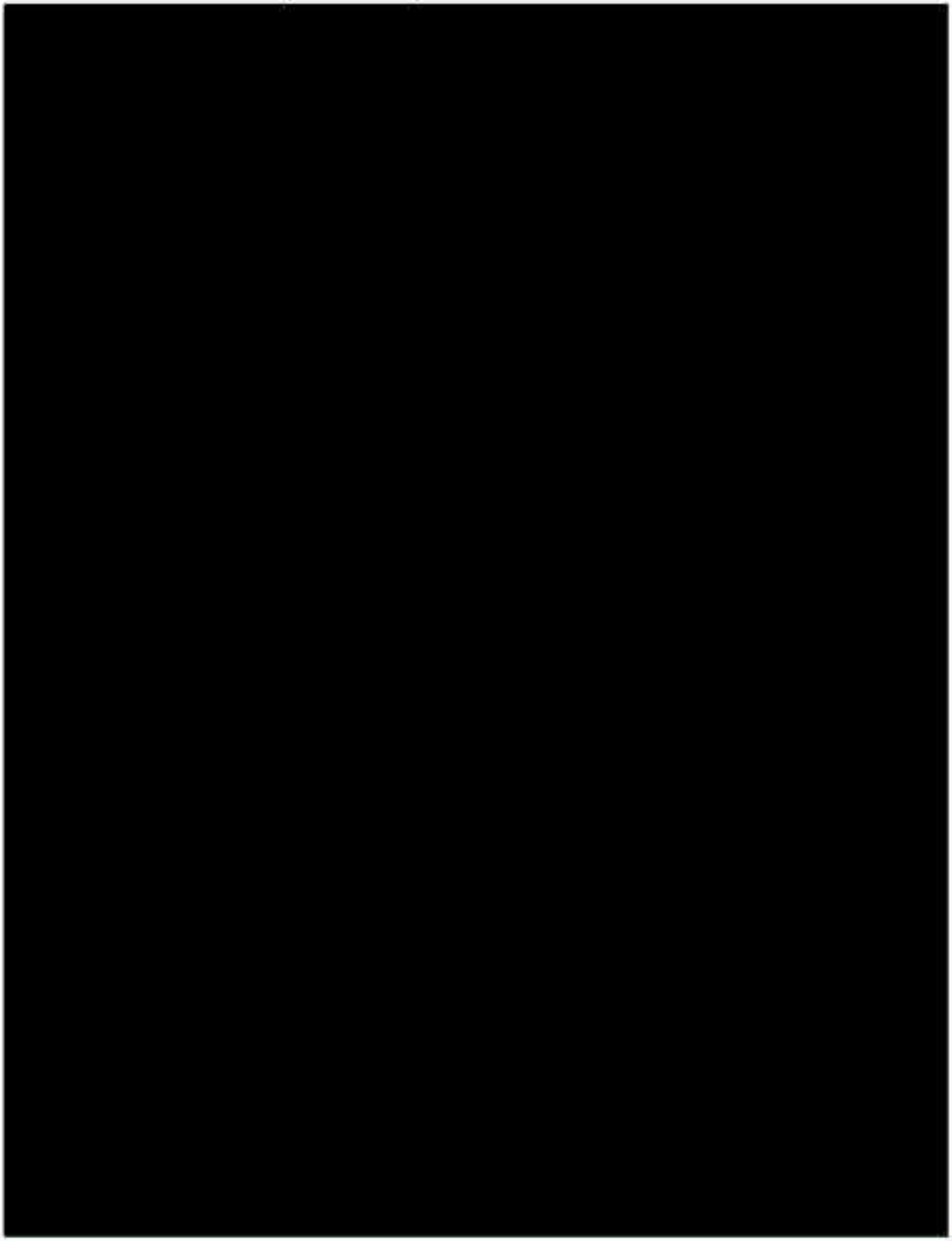


Discussion: The Main Street Lithic Site (8SM01025) is a newly recorded prehistoric archaeological site [redacted] (**Figure 4-15**). The site was identified based on three positive shovel tests located in the eastern portion of the pond footprint. While the site boundary includes negative shovel tests, the positive tests recovered similar material on the same landform spaced 40 meters apart. Thus, the site boundary was drawn to include all three positive shovel tests representing one diffuse lithic scatter. The site measures approximately 112 meters by 12 meters (367 feet by 39 feet) and is situated in a cleared field and bounded to the east by an access road (**Figure 4-16**). Soils consisted of Pits-Dumps complex soils.

[redacted] judged to have moderate probability for intact archaeological deposits based on the level of soil drainage and the proximity to freshwater resources. Shovel tests were excavated at 50-meter intervals; positive shovel tests were bracketed in the four cardinal directions at 12.5- and 25-meter intervals (unless prevented by the pond footprint boundaries) to determine the horizontal extent of the deposits. Soil stratigraphy in positive shovel tests consisted of large limestone chunks from 0-50 cmbs (0-20 inches), dark grayish brown sandy clay from 50-90 cmbs (20-35 inches), and very dark brown clay from 90-100 cmbs (35-39 inches). Artifacts were typically recovered between 40-60 cmbs (15.7-23.6 inches) and consisted of one partial projectile point and three coastal plain chert flakes (see **Attachment 1**).

Interpretation and Evaluation: Artifacts collected from the Main Street Lithic site consisted of three Coastal Plain chert flakes and one Coastal Plain chert contracting stem projectile point/knife (PPK); two of the flakes and the PPK showed evidence of heat treatment. The PPK is missing portions of the base, shoulder, and distal end. The point has characteristics similar to a Hillsborough type point, which is diagnostic of the Middle to Late Archaic periods. The flakes are temporally non-diagnostic; however, they are indicative of particular activities likely related to tool maintenance. Based on the low density of prehistoric lithic artifacts, it is likely that this site represents brief intermittent use of the area by prehistoric peoples, possibly for hunting or other resource extraction.

FIGURE 4-16 | Location of positive shovel tests in site 8SM01025.



Site 8SM01025 is a low-density scatter of prehistoric artifacts with no evidence of features or other intact deposits likely to produce significant information regarding prehistoric occupation or use of the area. In addition, low-density lithic scatters are an extremely common type found throughout Florida and the greater United States, which further diminishes the information potential of this site. Based on this assessment, it is the opinion of SEARCH that 8SM001025 is ineligible for the NRHP. No further work is recommended.

4.1.6 8SM01100, US 301 Lithic Scatter Site 2

Location: Township 20 South, Range 22 East, Section 1

Setting: Dense mature vegetation, topography sloping towards the center of the pond footprint

Vegetation: Palmettos, pine, and oaks

Soils: Sumterville fine sand, somewhat poorly drained

Methods: Shovel testing at 12.5-meter (41-foot) and 25-meter (82-foot) intervals; three positive shovel tests

Site Type: Low density, prehistoric lithic scatter

Site Size: 0.24 acres

Cultural Remains: Coastal plain chert flake (n=4)

Chronology: Prehistoric, unspecified

Discussion: The US 301 Lithic Scatter 2 archaeological site (8SM01100) is a newly recorded prehistoric lithic scatter [redacted] The site was identified based on three positive shovel tests that were excavated at the northern end of the pond footprint (see **Figure 4-12**). Vegetation in this portion of the pond consisted of pine trees and other mature growth (**Figure 4-17**).

FIGURE 4-17 | Overview of site 8SM01100, view north.



[redacted] assessed with high probability for intact archaeological deposits, and shovel tests were excavated at 25-meter intervals; positive shovel tests were bracketed in each cardinal direction at 12.5- and 25-meter intervals. The soil profile in positive shovel tests consisted of a thin layer of dark gray sand to 10 cmbs (3.9 inches; Stratum I), and light brown or gray fine sand to 100 cmbs (39.3 inches; Stratum II). In one shovel test, a third stratum of strong brown loamy sand was encountered from 80 to 100 cmbs (31.5 to 39.3 inches; Stratum III). All artifacts were recovered from Stratum II.

Interpretation and Evaluation: All four artifacts collected from the US 301 Lithic Scatter 2 were prehistoric lithic flakes derived from Coastal Plain chert (see **Attachment 1**). No temporally non-diagnostic artifacts were recovered, and, therefore, the site cannot be assigned to a particular prehistoric period. Based on the low density of artifacts, it is likely that this site represents brief intermittent use of the area by prehistoric peoples, possibly for hunting or other resource extraction.

Site 8SM01100 is a low-density scatter of prehistoric artifacts with no evidence for features or other intact deposits likely to produce significant evidence regarding prehistoric occupation or use of the area. The site is an extremely common type found throughout Florida and the greater United States. Based on this assessment, 8SM01100 holds little research potential and is recommended ineligible for the NRHP. No further work is recommended.

4.1.7 Archaeological Occurrence 5 (AO 5)

AO 5 consists of two chert tertiary flakes recovered from one shovel test excavated in the southwest corner of [redacted] (see **Figure 4-1**). The area of these recoveries is a poorly drained oak hammock with large live oaks and sabal palms comprising the canopy and sub-canopy (**Figure 4-18**). The nearest water source is Shady Brook, located approximately 115 meters (375 feet) north of AO 5. The soil profile observed in the positive shovel test exhibited three strata: a dark gray sand from 0 to 4 cmbs (0 to 2 inches; Stratum I), gray sand from 4 to 30 cmbs (2 to 12 inches; Stratum II), and mottled dark gray and strong brown clay from 30 to 45 cmbs (12 to 39 inches; Stratum III). The flakes were produced from Coastal Plain chert and were recovered between 5 and 15 cmbs within Stratum II. Delineation shovel testing at 12.5-meter intervals and thorough surface examination failed to produce additional artifacts. The pond's boundary to the south and west prevented further delineation testing beyond 12.5 meters from the positive shovel test. This isolated resource is considered not eligible for NRHP inclusion, and no further archaeological work or considerations are warranted.

FIGURE 4-18 | Overview of the AO 5 location, view west.



4.1.8 Archaeological Occurrence 6 (AO 6)

AO 6 consists of one chert tertiary flake recovered from a single shovel test excavated in the northwest corner of [redacted] (see **Figure 4-5**). The area of recovery is an open field consisting of various grasses and scattered oak trees (**Figure 4-19**). The nearest water source is Lake Okahumpka, approximately 3 kilometers to the southeast [redacted] The soil profiles observed in the positive shovel test exhibited five strata: dark grayish brown sand from 0 to 30 cmbs (0 to 12 inches; Stratum I), grayish brown sand from 30 to 70 cmbs (12 to 28 inches; Stratum II), very dark brown spodic from 70 to 80 cmbs (28 to 31 inches; Stratum III), dark yellowish brown sandy clay

from 80 to 90 cmbs (31 to 35 inches; Stratum IV), and gray clay from 90 to 100 cmbs (35 to 39 inches; Stratum V). The flake was produced from coastal plain chert and was recovered between 40 and 60 cmbs within Stratum II. Delineation shovel tests excavated at 12.5- and 25-meter (41- and 82-foot) intervals in cardinal directions within [redacted] failed to produce any additional artifacts. Due to the project boundary, delineation shovel tests were placed only 12.5 meters to the west and north. This isolated resource is considered not eligible for NRHP inclusion, and no further archaeological work or considerations are warranted.

FIGURE 4-19 | Overview of the AO 6 location, view south.



4.1.9 Archaeological Occurrence 7 (AO 7)

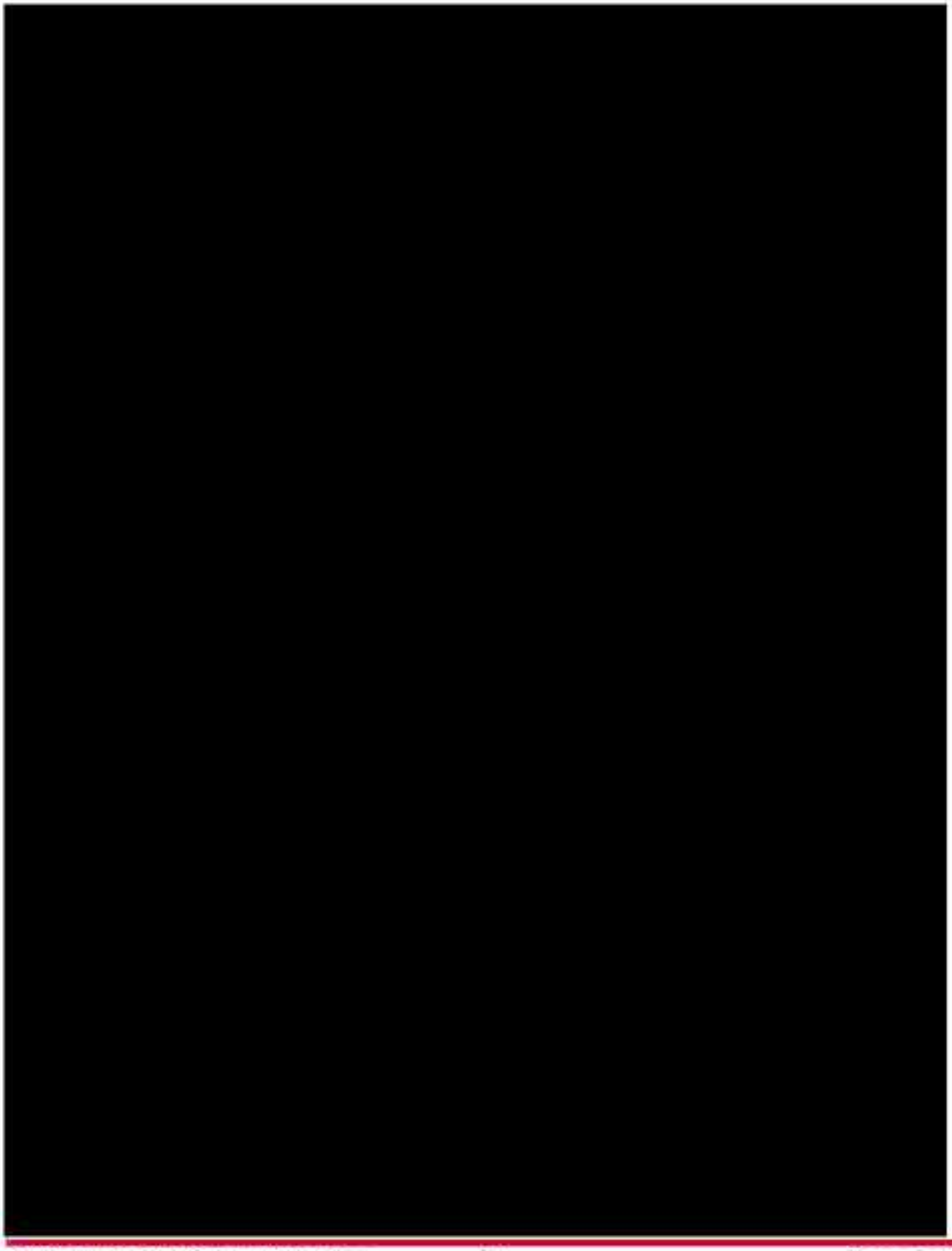
AO 7 consists of a single liquor bottle identified on the ground surface in the northwest corner of [redacted], where the landform slopes down toward Shady Brook (see **Figure 4-9**). Embossed labeling and maker's mark on the liquor bottle date it between 1933 and 1965. Subsurface testing in the immediate vicinity of the surface find failed to produce additional cultural material. This isolated surface artifact is considered not eligible for NRHP inclusion, and no further archaeological work or considerations are warranted.

4.1.10 Additional Testing at 8SM00932

Subsequent to their review of the 2017 roadway CRAS, the Seminole Tribe of Florida requested additional delineation testing at 8SM00932. During the roadway CRAS, the western site boundary was defined as the US 301 roadway, while the northern, southern, and eastern boundaries were delineated by negative shovel tests. Per the request from the Seminole Tribe of Florida, SEARCH revisited 8SM00932 to better define the western site boundary. A pedestrian survey was completed, and eight additional shovel tests were excavated within the project right-of-way to the west of 8SM00932.

Consultation with Sunshine 811 utility locators identified all areas of the project area that contained buried utilities. Coordination with the utility locators found that it was not possible to dig additional shovel tests between the east edge of the roadway and the original line of positive shovel tests (**Figure 4-20**). Instead, field archaeologists walked the length of the right-of-way's east side, noting and photographing the level of disturbance by development. No buried utilities were present on the west side of US 301, and this allowed eight shovel tests to be excavated within the project right-of-way. Just to the west of the road, four shovel tests were excavated within a ditch, and four more were placed on the edge of a peach grove. None of these shovel tests

FIGURE 4-20 | Additional testing at 8SM00932.



yielded any cultural material. A representative soil profile displayed dark gray sand from 0-30 cmbs (0-12 inches), and dark light gray sand from 30-100 cmbs (12-39 inches). **Figure 4-21** provides a representative view of the current conditions and environment immediately to the west of 8SM00932. No additional evidence of 8SM00932 was identified west of the current site boundaries, and SEARCH recommends that the original site boundaries remain unchanged.

FIGURE 4-21 | Overview of peach grove immediately west of 8SM00932, view north.



4.2 Architectural Results

No architectural resources were identified within the US 301 Ponds APE. No further architectural survey is recommended.

5.0 Conclusions

This technical memorandum details the results of a CRAS of 21 proposed pond and floodplain compensation areas, five drainage easements, and portions of a new truck route alignment and a new roundabout associated with proposed improvements to US 301. In addition, supplemental shovel testing was conducted at previously documented site 8SM00932. The project area currently under study is located on both sides of a 7.7-mile (12.39-kilometer) section of US 301 (SR 35) which passes through the City of Coleman. This technical memorandum serves as an addendum to the 2017 SEARCH report titled *Cultural Resource Assessment Survey of US 301 (SR 35) from CR 470 West to SR 44, Sumter County, Florida* (FMSF Survey No. 24186).

A total of 246 shovel tests were excavated within the US 301 Ponds APE. Some of these shovel tests were previously completed by SEARCH (2017; FMSF Survey No. 24186) in six of the current proposed pond footprints (Ponds 4B, 19A, 20C, 22C, 23A-1, and 23A-2). As a result, five newly recorded archaeological sites (8SM01022-8SM01025 and 8SM01100) were recorded, and the boundaries of one previously recorded site (8SM00933) were expanded. In addition, three archaeological occurrences (AOs 5-7) were recorded. Archaeological sites 8SM01024, 8SM01025, and 8SM01100 are low-density scatters and/or exhibit disturbed stratigraphy, indicating a lack of integrity. These sites are recommended ineligible for the NRHP. Archaeological occurrences are, by definition, ineligible for consideration on the NRHP. No further archaeological survey is recommended for sites 8SM01024, 8SM01025, 8SM01100, or AOs 5-7.

Newly recorded resource 8SM01022 is a moderate-density prehistoric archaeological site with relatively intact soils. [redacted] No features were identified; however, based on the density of artifacts, good physical integrity, and the limitations of shovel testing, it is possible that archaeological features and other intact cultural deposits exist within the boundaries of 8SM01022. Given the potential for significant cultural deposits and the inability to

make a definitive evaluation of the site at the survey level of investigation, it is the opinion of SEARCH that there is insufficient information to determine whether 8SM01022 is eligible for the NRHP. [redacted]

Newly recorded resource 8SM01023 (the Shady Brook Hammock site) [redacted] and is a moderately dense artifact scatter dating to the Early to Middle Archaic and St Johns periods. Although features or other intact deposits were not encountered, the density of cultural material and reasonably good physical integrity at the site suggests such deposits may be present, but not detectable at the survey level of investigation. As such, insufficient information is available to determine if 8SM01023 is eligible for the NRHP. Additional work is recommended to confirm the absence of features and other deposits capable of producing significant information about the site within the pond footprint. [redacted]

The present survey expanded previously documented site 8SM00933 [redacted]. Here the site exists as a moderate-density lithic scatter within relatively undisturbed soils. Based on investigations of other parts of the site during the US 301 and CR 470 roadway projects, SHPO has evaluated 8SM00933 as eligible for the NRHP, and it is the opinion of SEARCH that the portion of the site found to extend into the [redacted]t has the research potential capable of contributing to the site's significance. Further consultation with the SHPO and the Tribes will be necessary to determine the appropriate management of the site in regards to potential highway construction impacts.

No architectural resources were identified within the US 301 Ponds APE. No further architectural survey is recommended.

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Cardno

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SEARCH

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ATTACHMENT 1.

FIELD SPECIMEN LOG

ATTACHMENT 2.

FMSF RESOURCE FORMS

ATTACHMENT 3.

FMSF SURVEY LOG

Ent D (FMSF only) _____

Survey Log Sheet

Florida Master Site File
Version 4.1 1/07

Survey # (FMSF only) _____

Consult *Guide to the Survey Log Sheet* for detailed instructions.

Identification and Bibliographic Information

Survey Project (name and project phase) US 301 (SR 35) PD&E Study Cultural Resource Assessment Survey Addendum: Proposed Ponds and Floodplain Compensation Areas

Report Title (exactly as on title page) US 301 (SR 35) PD&E Study Cultural Resource Assessment Survey Addendum: Proposed Ponds and Floodplain Compensation Areas

Report Authors (as on title page, last names first) 1. RabbySmith, Steve 2. Foster, Michael 3. Fish, Jessica 4. Chamblee, Elizabeth

Publication Date (year) 2017 **Total Number of Pages in Report** (count text, figures, tables, not site forms) 37

Publication Information (Give series, number in series, publisher and city. For article or chapter, cite page numbers. Use the style of *American Antiquity*.)
on file at SEARCH, Newberry. SEARCH Project No. 3895-14124T, FM No. 430132-1-22-01.

Supervisors of Fieldwork (even if same as author) Names Chambless, Elizabeth

Affiliation of Fieldworkers: Organization Southeastern Archaeological Research City Pensacola

Key Words/Phrases (Don't use county name, or common words like *archaeology, structure, survey, architecture, etc.*)
1. ponds 3. SR931 5. _____ 7. _____
2. US 301 4. _____ 6. _____ 8. _____

Survey Sponsors (corporation, government unit, organization or person directly funding fieldwork)
Name _____ Organization Florida Dept of Transportation - District 5
Address/Phone/E-mail Deland, Florida

Recorder of Log Sheet Fish, Jessica **Date Log Sheet Completed** 11-15-2017

Is this survey or project a continuation of a previous project? ☐ No ☒ Yes: **Previous survey #'s (FMSF only)** 24186

Mapping

Counties (List each one in which field survey was done; attach additional sheet if necessary)
1. Sumter 3. _____ 5. _____
2. _____ 4. _____ 6. _____

USGS 1:24,000 Map Names/Year of Latest Revision (attach additional sheet if necessary)
1. Name WILDWOOD Year 1985 4. Name _____ Year _____
2. Name _____ Year _____ 5. Name _____ Year _____
3. Name _____ Year _____ 6. Name _____ Year _____

Description of Survey Area

Dates for Fieldwork: Start _____ End _____ **Total Area Surveyed** (fill in one) _____ hectares 246 acres
Number of Distinct Tracts or Areas Surveyed 26
If Corridor (fill in one for each) **Width:** _____ meters _____ feet **Length:** _____ kilometers _____ miles

Survey Log Sheet

Survey # _____

Research and Field Methods

Types of Survey (check all that apply): ☒ archaeological ☒ architectural ☐ historical/archival ☐ underwater ☐ damage assessment ☐ monitoring report ☐ other (describe): _____

Scope/Intensity/Procedures: Excavation of shovel tests at 25-, 50-, and 100-meter intervals depending on probability.

Preliminary Methods (check as many as apply to the project as a whole)

- ☐ Florida Archives (Gray Building)
- ☐ Florida Photo Archives (Gray Building)
- ☒ Site File property search
- ☒ Site File survey search
- ☐ Library research - *local public*
- ☐ Library special collection - *academic*
- ☐ Public Lands Survey (maps at DEP)
- ☐ local informant(s)
- ☒ local property or tax records
- ☐ newspaper files
- ☐ literature search
- ☐ Sanborn insurance maps
- ☒ other historic maps
- ☒ soils maps or data
- ☐ windshield survey
- ☒ aerial photography
- ☐ other (describe): _____

Archaeological Methods (check as many as apply to the project as a whole)

☐ Check here if **NO** archaeological methods were used.

- ☐ surface collection, controlled
- ☐ surface collection, uncontrolled
- ☒ shovel test-1/4" screen
- ☐ shovel test-1/8" screen
- ☐ shovel test 1/16" screen
- ☐ shovel test-unscreened
- ☐ shovel test-other screen size
- ☐ water screen
- ☐ posthole tests
- ☐ auger tests
- ☐ coring
- ☐ test excavation (at least 1x2 m)
- ☐ block excavation (at least 2x2 m)
- ☐ soil resistivity
- ☐ magnetometer
- ☐ side scan sonar
- ☒ pedestrian survey
- ☐ unknown
- ☐ other (describe): _____

Historical/Architectural Methods (check as many as apply to the project as a whole)

☒ Check here if **NO** historical/architectural methods were used.

- ☐ building permits
- ☐ commercial permits
- ☐ interior documentation
- ☐ demolition permits
- ☐ exposed ground inspected
- ☐ local property records
- ☐ neighbor interview
- ☐ occupant interview
- ☐ occupation permits
- ☐ subdivision maps
- ☐ tax records
- ☐ unknown
- ☐ other (describe): _____

Survey Results (cultural resources recorded)

Site Significance Evaluated? ☒ Yes ☐ No

Count of Previously Recorded Sites: 1 Count of Newly Recorded Sites: 5

Previously Recorded Site #'s with Site File Update Forms (List site #'s without "8". Attach additional pages if necessary.) SM00933

Newly Recorded Site #'s (Are all originals and not updates? List site #'s without "8". Attach additional pages if necessary.) SM01022-01025, SM01100

Site Forms Used: ☐ Site File Paper Form ☒ Site File Electronic Recording Form

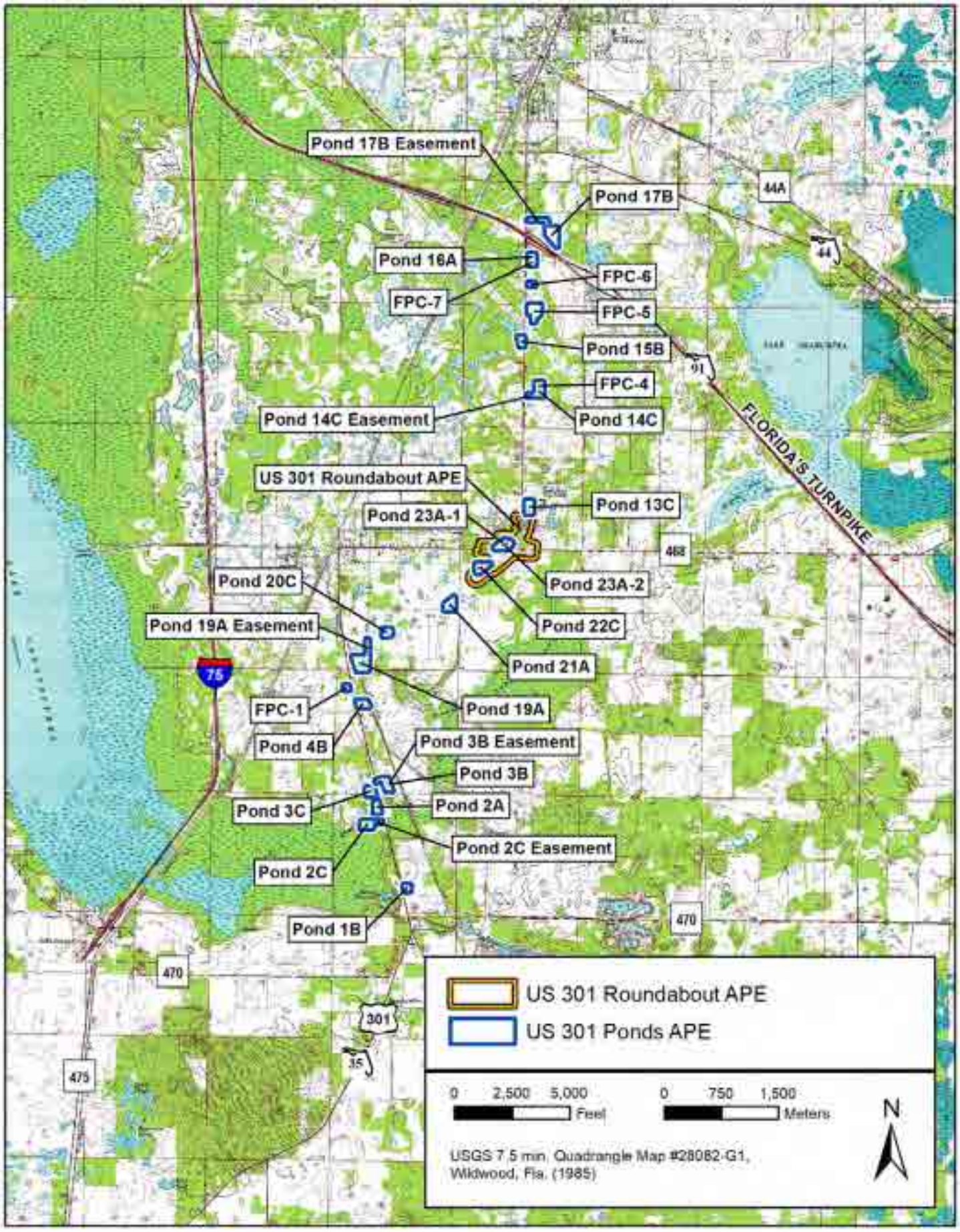
*****REQUIRED: ATTACH PLOT OF SURVEY AREA ON PHOTOCOPY OF USGS 1:24,000 MAP(S)*****

SHPO USE ONLY **SHPO USE ONLY** **SHPO USE ONLY**

Origin of Report: ☐ 872 ☐ CARL ☐ DW ☐ 1A32 # _____ ☐ Academic ☐ Contract ☐ Avocational
☐ Grant Project # _____ ☐ Compliance Review: CRAT # _____

Type of Document: ☐ Archaeological Survey ☐ Historical/Architectural Survey ☐ Marine Survey ☐ Cult Towns CRAS ☐ Monitoring Report
☐ Overview ☐ Excavation Report ☐ Multi-Site Excavation Report ☐ Structure Detailed Report ☐ Library, Hist. or Archival Doc
☐ MPS ☐ MRA ☐ TS ☐ Other: _____

Document Destination: _____ Portability: _____


Pond 17B Easement
Pond 17B
Pond 16A
FPC-6
FPC-7
FPC-5
Pond 15B
FPC-4
Pond 14C Easement
Pond 14C
US 301 Roundabout APE
Pond 13C
Pond 23A-1
Pond 23A-2
Pond 20C
Pond 22C
Pond 19A Easement
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FPC-1
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Pond 1B
44A
44
91
FLORIDA'S TURNPIKE
468
75
470
470
301
35
475
US 301 Roundabout APE
US 301 Ponds APE
0 2,500 5,000 Feet
0 750 1,500 Meters
N
USGS 7.5 min. Quadrangle Map #28082-G1,
Wildwood, Fla. (1985)

APPENDIX G

Natural Resources Evaluation Report

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US 301 (SR 35) PD&E Study

Natural Resources Evaluation

FDOT Office
District Five

Authors
E Sciences, Inc.

Date of Publication
December 2017

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

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1.0 Executive Summary

FDOT is conducting a Project Development and Environment (PD&E) study for an approximately 8.0 mile portion of US 301 between CR 470 East and SR 44 in Sumter County. US 301 (SR 35) travels through the cities of Coleman and Wildwood within these limits. While mostly a north-south route, US 301 travels in an east-west direction through the City of Coleman where it has the local road name Warm Springs Avenue.

The PD&E study is analyzing design alternatives that widen US 301 to provide additional capacity for future traffic growth. US 301 is projected to carry more than 14,000 vehicles per day by 2022 and increase to more than 24,000 per day by 2042. Based on existing 2014 conditions analysis, US 301 carried up to 9,600 vehicles per day on a 2-lane segment south of the Turnpike operating with a Level of Service of D.

A Natural Resource Evaluation has been prepared in accordance with Part 2, Chapters 9, Wetlands and Other Surface Waters and Chapter 16 Protected Species and Habitats of the FDOT's PD&E Manual (FDOT, June 2017). The purpose of this Natural Resource Evaluation (NRE) is to identify, wetlands, surface waters, protected species and habitats that exist within the study corridor and to address potential impacts to these protected species.

Wetland (7.02 acres) and surface water (0.09) impacts totaling approximately 7.11 acres are associated with the recommended alternative along the US 301 corridor. Impacts are needed for the construction of roadway widening and drainage improvements. All build alternatives were evaluated for wetland and surface water impacts, which can be found in the Alternatives section of the PER.

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137 Florida Statutes (F.S.) to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.s. 1344. Under Section 373.4137 F.S., mitigation of FDOT wetland impacts will be implemented by the Southwest Florida Water Management District (SWFWMD) where the impacts occur. The SWFWMD will then provide wetland mitigation for specific FDOT project impacts through a corresponding mitigation project within the overall approved regional mitigation plan. FDOT will provide funding to the SWFWMD for implementation of such mitigation projects. If the SWFWMD is unable to provide mitigation services, credits from an approved mitigation bank will be purchased by the FDOT to satisfy all mitigation needs for the project.

The project site was evaluated during numerous site surveys in November 2016, December 2016, and July 2017, for the PD&E alternative analysis to address the occurrence, or potential occurrence, of wildlife and plant species listed as threatened, endangered, species of special concern (protected species), or otherwise protected, according to methodology outlined by the United States Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC), and/or Florida Natural Areas Inventory (FNAI). Wildlife species identification was accomplished mainly through visual observation, but tracks and aural indicators were also noted. The FNAI, USFWS, and FWC databases were consulted regarding current state and federally-listed wildlife species, species of special concern and eagle nests that are known or have the potential to occur within certain habitats found in the region. An effects determination of "not likely to adversely affect" was made for the wood stork and eastern indigo snake and "no effect" for the scrub jay, snail kite, bald eagle and the red cockaded woodpecker.

To date, coordination completed with the USFWS to comply with Section 7 of the Endangered Species Act (ESA) has occurred through the Efficient Transportation Decision Making (ETDM) process. Additional coordination with the USFWS, as well as USACE and FWC will occur throughout the PD&E process.

2.0 Project Overview

FDOT is conducting a Project Development and Environment (PD&E) study for an approximately 8.0 mile portion of US 301 between CR 470 East and SR 44 in Sumter County (**Figure 1**). Within these limits, US 301 (SR 35) travels through the cities of Coleman and Wildwood. While mostly a north-south route, US 301 travels in an east-west direction through the City of Coleman where it has the local road name Warm Springs Avenue. The Florida's Turnpike (SR 91) crosses US 301 with an interchange to the south of the northern project limit, and I-75 runs parallel to the study corridor on the west of US 301 through Sumter County.

The PD&E study analyzed design alternatives that widen US 301; improve the US 301 interchange at Florida's Turnpike; and considered a new corridor for US 301 south of the City of Coleman. The improvements will seek to provide additional capacity for future traffic growth. US 301 is projected to carry more than 14,000 vehicles per day by 2022 and increase to more than 24,000 per day by 2042. Based on existing 2014 conditions analysis, US 301 carried up to 9,600 vehicles per day on a 2-lane segment south of the Turnpike operating with a Level of Service of D.

Within the project limits, US 301 begins as a two-lane undivided roadway at CR 470 East with turn lanes at some intersections; makes a sharp 90° turn through the City of Coleman (Warm Springs Avenue/Commercial Street) and then curves to the north at CR 468. It then continues north as an undivided roadway until it reaches the Florida's Turnpike interchange where a median is added. North of the interchange the roadway is a four-lane divided, rural typical section facility. It has a short urban curb and gutter section approaching SR 44.

The purpose of this project is to increase the capacity of US 301, to respond to future travel demand from the intersection of CR 470 East, north through the City of Coleman, to SR 44 in the City of Wildwood. The project will also improve safety and provide multi-modal facilities for pedestrian and bicyclists, and evaluate improvements to the US 301 interchange with the Florida's Turnpike.

This study evaluated viable alternatives to widen US 301 on the existing project corridor as well as a potential realignment for US 301 from near CR 525 East to CR 468 to minimize potential environmental impacts to the City of Coleman.

Figure 1 | Project Location Map



2.1 Roadway Study Segments

The existing roadway has been divided into five segments as depicted on **Figure 2**. A sixth segment includes the alternative for new alignment for a truck route to reduce traffic in the City of Coleman.

Segment 1 – South of CR 470 East to Shady Brook Drive

Segment 1 extends north from south of CR 470 E (MP 14.53) to Shady Brook Drive (MP 14.83), and is approximately 0.3 miles in length. It includes open drainage to roadside swales and consists of a three-lane typical section including one travel lane in each direction and a center left turn lane. This segment of the corridor is classified as a Rural Principal Arterial Other and has an existing speed limit of 50 mph. Shady Brook Resort and Golf Club is a significant use adjacent to this segment.

Segment 2 – Shady Brook Drive to CR 525 East

Segment 2 extends north from Shady Brook Drive (MP 14.83) to CR 525 East (MP 16.991), including the Shady Brook Bridge, and is approximately 2.2 miles in length. The segment includes open drainage to roadside swales and is a two-lane rural typical section. It has a posted speed of 55 mph and is classified as a Rural Principal Arterial Other. Shady Brook Park is a significant land use located along the segment.

Segment 3 – CR 525 East to Stokes Street

Segment 3 extends from CR 525 East (MP 16.991) to Stokes Street (MP 18.706) and is classified as a Rural Principal Arterial Other with posted speeds ranging between 35 and 45 mph. It is approximately 1.7 miles in length and is a two lane rural roadway. It follows Warm Springs Avenue as it runs east-west through the City of Coleman. There are numerous homes and businesses with relatively small setbacks from the roadway along this segment. Most of the segment has a sidewalk on one side of the roadway.

Segment 4 – Stokes Street to Florida's Turnpike

Segment 4 extends east from Stokes Street (MP 18.706) then north to Florida's Turnpike (MP 21.663) and is approximately 3.0 miles in length. It consists of two 12-foot travel lanes (one in each direction) and a five foot paved shoulder on either side of the roadway. This segment also includes open drainage to roadside swales and is classified as a Rural Principal Arterial Other with posted speeds of 55 mph between Stokes Street and the northbound entrance to Florida's Turnpike (SR 91), where it reduces to 45 mph. The existing and future land use context of the corridor is mostly auto oriented development. The segment is influenced by the CR 468 curve and the development that is occurring near the CR 468 intersection at the Village of Fenney.

Segment 5 – North of Florida's Turnpike to SR 44

Segment 5 extends north from Florida's Turnpike (MP 21.663) to just south of SR 44 (MP 22.395) and is approximately 0.7 miles in length. It is classified as an Urban Principal Arterial with posted speeds ranging between 40 and 45 mph. In contrast to Segments 1 through 4, Segment 5 is already predominantly a four-lane divided roadway. The northern portion of the segment (north of Spring Lake Road) has a closed drainage system with an outside curb and gutter. South of Spring Lake Road the segment includes open drainage to roadside swales. This

segment of the roadway is within the City of Wildwood and approximately half of the segment has adjacent urban development.

Segment 6 – Truck Route/US 301 Realignment

The realignment will require a new roadway alignment (approximately 1.5 miles) and construction over current non-roadway property linking CR 525 East to CR 468. While the area for the route is currently largely undeveloped, both ends of this segment have impending development that is currently in the permitting process. The Villages Industrial Park (formerly Wade Industrial) and Monarch Ranch are planned for the CR 525 East area while the CR 468 area will be home to the Village of Fenney. The following is a description of the three alternatives for Segment 6 that are evaluated as part of the US 301 PD&E. The recommended corridor through this area has minimal wetland and surface water impacts, and impacts less suitable habitat for kestrels and gopher tortoises. The corridor also provides a minimum 55 mph design speed meeting driving and access management criteria.

Figure 2 | US 301 (SR 35) Existing Roadway Segments



2.2 Methods

The jurisdictional extent of wetland and other surface water systems within the study corridor was approximated through the review of aerial photography, National Wetland Inventory (NWI) data, U.S. Geological Survey Topographic Maps (**Figure 3**), Soils Maps (**Figure 4**), Land Use Maps (**Figure 5**), and ground-truthing activities. The wetland limits were identified in general accordance with the United States Army Corps of Engineers' (USACE) Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (November 2010) and the state of Florida's Delineation of the Landward Extent of Wetlands and Surface Waters (Chapter 62-340, Florida Administrative Code). In the event wetland boundaries differed between the two methods, the more landward extent was used to define that particular wetland system's boundary.

Each system observed was classified using the Southwest Florida Water Management District (SWFWMD) Florida Land Use, Cover Classification System (FLUCCS, FDOT, 1999) and further categorized using the Classification of Wetlands and Deepwater Habitats of the United States, (Cowardin, et. al., 1979) as adopted by the USFWS and the NWI. Photographic documentation was used to capture the current condition of each wetland system and Uniform Mitigation Assessment Method (UMAM, Chapter 62-345 F.A.C.) was used to quantify each system's condition.

A literature review was conducted to identify those species classified by USFWS and FWC as being endangered, threatened or species of special concern (collectively recognized as "protected species") within the project corridor. In addition to the literature review, species lists were obtained from the USFWS and FWC via the ETDM web site.

Field reconnaissance to assess the potential occurrence of protected species within the study corridor was conducted in November and December 2016. Wildlife observations were conducted by a team of two environmental scientists through recognition of tracts, scat, calls and other visual observations. The purpose of the reconnaissance was to evaluate the existing lands for the presence of flora and fauna listed by USFWS as endangered and/or threatened, and those listed by the FWC as endangered, threatened, or species of special concern. The available habitat, habitat preferences, or critical habitat, if applicable, for these species, as well as others not expressly protected but managed through state or federal laws; such as black bear and bald eagle, were also evaluated throughout the study corridor. Representative photographs of the field findings are found in **Appendix A.**

Mitigation for the estimated wetland impacts was determined using the UMAM, which is a standard procedure for assessing the functions provided by wetlands and other surface waters, the amount that those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset that loss. The UMAM worksheets for the estimated wetland impacts can be found in **Appendix B**.

2.3 Soils

Table 1 contains the soils found within the US 301 study corridor according to the Natural Resources Conservation Service (NRCS) Soil Survey of Sumter County. Soil characteristics listed in the table include depth to water table, soil permeability, hydric rating and hydrologic group. Hydric rating will be identified as "Yes" if any component or inclusion of the soil type is considered hydric and does not define the mapped area as being hydric. The Hydrologic Groups are based upon infiltration rates and runoff potential due to precipitation. Group A indicates very high infiltration rate. Group B indicates a moderate infiltration rate. Group C indicates a slow infiltration rate. Group D indicates a very slow infiltration rate. Soils with two hydrologic group classifications reflect different runoff potential in a drained and undrained condition.

Table 1 | US 301 (SR 35) Soils

Soil Number	Soil Name	Depth to Water Table (inches)	Permeability	Hydric Rating	Hydrologic Group
4	Candler sand	80	Rapid	No	A
9	Paisley fine sand Bouldery subsurface	10	Rapid	Yes	D
11	Millhopper sand	40	Rapid	No	A
13	Tavares fine sand	40	Very Rapid	No	A
15	Adamsville fine sand Bouldery subsurface	20	Rapid	Yes	C
17	Sumterville-Mabel-Tavares	18	Rapid	No	C/A
21	EauGallie fine sand Bouldery subsurface	10	Rapid	Yes	B/D
23	Ona fine sand	10	Rapid	Yes	B/D
26	Wabasso fine sand Bouldery subsurface	10	Rapid	Yes	B/D
27	Sumterville fine sand	18	Rapid	No	C
29	Nittaw muck	0	Rapid	Yes	D
30	Placid fine sand	0	Rapid	Yes	D
33	Sparr fine sand Bouldery	20	Rapid	No	C
34	Tarrytown sandy clay loam Bouldery	12	Moderate	No	C
36	Floridana mucky fine sand	0	Rapid	Yes	D
37	Astatula fine sand	80	Very Rapid	No	A
39	Mabel fine sand Bouldery	20	Rapid	Yes	C
40	Millhopper sand Bouldery	40	Rapid	No	A
42	Adamsville fine sand	20	Rapid	Yes	C
43	Basinger fine sand	0	Rapid	Yes	D

Soil Number	Soil Name	Depth to Water Table (inches)	Permeability	Hydric Rating	Hydrologic Group
44	Oldsmar fine sand Bouldery	10	Rapid	Yes	B/D
46	Ft. Green fine sand Bouldery	10	Rapid	Yes	D
47	Okeelanta muck	0	Rapid	Yes	D
49	Terra Ceia muck	0	Moderate	Yes	D
51	Pits-Dumps Complex	N/A	N/A	Yes	-
53	Tavares fine sand - bouldery	40	Very Rapid	No	A
54	Monteocha fine sand	10	Rapid	Yes	D
56	Wabasso fine sand	0	Rapid	Yes	D
62	Urban land	N/A	N/A	No	-
65	Candler sand Bouldery	80	Rapid	No	A

2.4 Land Use

The following land uses are located within the US 301 study area. **(Figure 5)** Each system observed was classified using the SWFWMDs Florida Land Use, Cover Classification System (FLUCCS, FDOT, 1999) and further categorized using the Classification of Wetlands and Deepwater Habitats of the United States, (Cowardin, et. al., 1979) as adopted by the USFWS and the NWI. The total area of each land use type within the corridor width is shown within **Table 2**.

Table 2 | Summary of Land Use

FLUCCS Code	Land Use Type	Total Acreage in Corridor	Percentage of Corridor
100-130	Residential	28.83	21.57
140-150	Commercial and Services/Industrial	2.27	1.70
180	Recreational	5.14	3.85
190	Open Land	0.80	0.60
210	Cropland and Pastureland	56.55	42.32
230	Feeding Operations	2.69	2.01
320	Shrub and Brushland	5.28	3.95
434	Hardwood Conifer Mixed	15.61	11.68
615	Stream and Lake Swamps	3.47	2.60
641	Freshwater Marshes	0.38	0.28
643	Wet Prairies	0.09	0.07
810	Transportation	11.11	8.32
830	Utilities	1.41	1.06

Residential (FLUCCS No. 100 – 130)

Residential land uses in the corridor range from low density farmsteads to high density small lot subdivisions. Some of the low density residential lots contain the native canopy of oaks and pine, while higher density developments lack native vegetative structure. Wildlife utilization is low for all residential uses, limited to foraging opportunities.

Commercial and Services/Industrial (FLUCCS No. 140 - 150)

These high intensity land uses are dedicated to the manufacturing and distribution of goods and services. Native vegetation has been replaced with large buildings, parking lots and storage areas. Native land forms have been modified to facilitate development. Wildlife utilization is low for these land use types due to high human activity.

Recreational (FLUCCS No. 180)

Land uses where recreation is or could be occurring. Recreational areas within the corridor include a golf course near the southern end of the corridor and Shady Brook Park. Wildlife utilization is low due to human use.

Open Land (FLUCCS No. 190)

This category included undeveloped lands within urban areas and inactive land. Several cleared parcels are located along the corridor that have not been developed or where older structures have been removed. These parcels lack native vegetation and therefore have a low likelihood for wildlife utilization. Sandhill cranes and kestrel may use these areas for foraging.

Cropland and Pastureland (FLUCCS No. 210)

Land managed for the cultivation of row and field crops. Cropland within the corridor consists of a peach farm and hay fields. Wildlife utilization is moderate allowing for foraging and movement, but typically lacks native vegetative structure needed for many animals' life cycles.

Feeding Operations (FLUCCS No. 230)

Land used for livestock production. Most pasturelands within the corridor contain cattle in relatively low densities. Wildlife utilization on these lands is moderate. Sandhill cranes and kestrels were observed in several pastures in the corridor.

Shrub and Brushland (FLUCCS No.320)

This category includes saw palmettos, gallberry, wax myrtles, and other shrubs and brush, but lacks a canopy of trees. Areas of shrub and brushland within the corridor include areas previously cleared for development and left unattended. Wildlife utilization is moderate in this habitat due to the lack of native canopy species and maintenance activities such as routine mowing.

Hardwood Conifer Mixed (FLUCCS No. 434)

This forested community consists of areas in which neither upland conifers nor hardwoods achieve a crown canopy dominance. Wildlife utilization is high within this habitat unless it has been modified for residential use or cattle grazing.

Stream and Lake Swamps (FLUCCS No. 615)

This community, often referred to as Bottomlands, is usually found on river, creek and lake floodplain or overflow areas. This forested habitat will contain a large variety of predominantly hardwood species. Wildlife utilization is high including foraging, denning and movement, and access to surrounding habitats.

Freshwater Marshes (FLUCCS No. 641)

Vegetated non-forested wetlands typically comprised of non-woody species and include marshes and seasonally flooded areas. Freshwater marshes within the corridor are typically small areas connected to larger systems via ditches and swales across pasturelands or along roadsides. Wildlife utilization is moderate, providing foraging and nesting opportunities for several species of wading birds.

Wet Prairies (FLUCCS No. 643)

This classification is composed of grassy vegetation on hydric soils and is usually distinguished from marshes by having less water and shorter herbage. Wet prairies within the corridor are typically small areas connected to

larger systems via ditches and swales across pasturelands or along roadsides. Wildlife utilization is moderate, providing foraging and nesting opportunities for several species of wading birds.

Transportation (FLUCCS No. 810)

Transportation facilities are used for the movement of people and goods. Transportation facilities within the corridor include paved and unpaved roads and railroads. Wildlife utilization within these areas is low.

Utilities (FLUCCS No. 830)

Utilities usually include power generating facilities and water treatment plants and include related facilities such as transmission lines and aeration fields for sewage treatment sites. Major utilities with the corridor include overhead electrical lines and underground gas lines south of the intersection with the Florida Turnpike. Wildlife utilization within these areas is low.

2.5 Pond Site Descriptions

This section describes the current recommended alternative stormwater pond sites evaluated for the US 301 study and are depicted on **Figure 6.** Surveys for state and federal protected species, coordination with the appropriate agencies and permitting, if required, will be conducted prior to the commencement of construction, within each of the pond sites.

Pond Site 1B

This pond site is located approximately 900 feet north of the intersection of CR 470 and US 301 on the east side of US 301. The site is composed entirely of improved pasture, with the dominant vegetation being bahiagrass. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 2A

This pond site is located approximately 1 mile north of the intersection of CR 470 and US 301, just north of Shady Brook on the west side of US 301. This pond site is primarily non-wetland mixed hardwood dominated by a canopy of live oak, American Elm (*Ulmus americana*), cabbage palms and mixed citrus trees (*Citrus* spp.). Sub canopy and ground cover was composed of Boston fern (*Nephrolepis exaltata*), greenbrier (*Smilax* spp.) and dead leaf litter. There were no hydrologic indicators observed within the pond site. No protected plant or animal species and no suitable protected species habitat were observed in the pond site during the field review.

Pond Site 3B

Pond site 3B is located approximately 1 mile north of the intersection of CR 470 and US 301, on the east side of US 301 and to the east of the Shady Brook Park. The canopy is composed of silver maples (*Acer saccharinum*), live oak, water oak (*Quercus nigra*) and cabbage palms. Greenbrier and canopy tree saplings dominated the herbaceous ground cover. No listed plant or animal species and no suitable listed species habitat were observed in the pond site during the field review. Additionally, no wetlands were identified on site.

Pond Site 4B

This pond site is located north of NE 16th Avenue on the east side of US 301. The western portion of the site consists of improved pasture dominated by bahiagrass and the eastern portion of the site has a canopy of live oak, laurel oak (*Quercus hemisphaerica*), and southern magnolia (*Magnolia grandiflora*). No wetland habitats were identified within the pond site. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 9A

This pond site is located south of the intersection of Sherman Street and US 301. It contains low density residential buildings and portions of Messners Salvage Yard. Live oak and cabbage palms dominate the canopy and crowfoot grass and greenbrier dominate the ground cover. No wetlands were observed on site. No protected plant species were observed within the pond site. However, two American kestrels (*Falco sparverius*) were observed within and in the vicinity of the pond site. The Southeastern American kestrel (*Falco sparverius paulus*) subspecies is listed as threatened by the FWC.

Pond Site 13C

Pond 13C is located just to the east of the intersection of US 301 and CR 521, on the east side of US 301. This pond site is composed entirely of active improved pasture, with the dominant vegetation being bahiagrass. A small isolated less than 0.5-acre depressional area is located within the pond boundaries. During the design and permitting process there will be opportunity to reduce or eliminate impacts, which could reduce the mitigation potentially required by the SWFWMD and USACE for impacts to this wetland. Carolina willow is the dominant vegetation within this wetland. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat was identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by FWC.

Pond Site 14C

Pond 14C is located along the east side of US 301, north of the intersection of US 301 and NE 41st Lane. The pond site consists of a mixed hardwood forest with the canopy being composed of live oak, magnolia and slash pine. Understory and ground cover consists of American beautyberry and greenbrier. No wetlands were observed on site; however a herbaceous wetland system of soft rush (*Juncus effusus*) and arrowhead (*Sagittaria lancifolia*) is adjacent to the west of the pond. No protected plant species were observed during the field review. However, American kestrels were heard in the vicinity of the pond site during the field review. The Southeastern American kestrel subspecies is listed as threatened by the FWC. A survey of the pond site will be conducted prior to construction to determine presence of Southeastern American kestrel. Additionally, suitable habitat has also been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 15B

Pond 15B is located also on the west side of US 301, but just south of the power line easement that crosses US 301. This pond site is a mixed upland hardwood forest with the canopy being composed of live oak, pignut hickory (*Carya glabra*) and cabbage palms. The understory and ground cover are saw palmetto and American beautyberry. There are no wetlands within boundaries of the pond site; however, there is a wet depressional area just north of the pond site that has a canopy of sweetgum and water oak. No protected plant or animal species and no suitable protected species habitat were observed in the pond site during the field review.

Pond Site 16A

This pond site is located just south of the Florida's Turnpike interchange with US 301 and is on the east side of US 301. The pond site consists of improved pasture, with the dominant vegetation being bahiagrass. No wetlands were observed on site. However, a small ditch area is located north of the pond. The surface water appears to connect to a cross drain underneath US 301 via a culvert. No protected plant or animal species were observed within the pond site during the field review. Suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 17B

This pond site is located just north of the Florida's Turnpike interchange with US 301 and is on the east side of US 301. The site consists of improved pasture, with the dominant vegetation being bahiagrass. Wetlands were observed on site and consist of forested areas containing red maple, sweetgum, slash pine, laurel oak (*Quercus laurifolia*) and saw palmetto. No protected plant or animal species were observed within the pond site during the field review. Suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 19A

This pond site is located on the north side of NE 19th Way and approximately 300 feet east of US 301, and is approximately in the same location as Pond Site 5A. The existing habitat is improved pastures that are dominated by bahiagrass. One small wetland was observed on the western portion of the site. The wetland is isolated from other wetlands and surface waters and appears to be less than 0.5 acre in size. During the design and permitting process there will be opportunity to reduce or eliminate impacts, which could reduce the mitigation potentially required by the SWFWMD and USACE for impacts to this wetland. No protected plant species were observed within the pond site during the field review. However, sandhill cranes (*Grus Canadensis pratensis*) were observed foraging within the pasture during the field review. Suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 20C

Pond Site 20C Alt 2 is located approximately 1,900 feet east of the US 301 and CR 525 East intersection. The site is composed entirely of improved pasture, with the dominant vegetation being bahiagrass. No wetlands were observed on site. No protected plant or animal species were observed within the pond site during the field review.

However, suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 21A

Pond Site 21A is located approximately 4,700 feet east of the US 301 and CR 525 East intersection. The site is composed entirely of improved pasture, with the dominant vegetation being bahiagrass. No wetlands were observed on site. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 22C

Pond Site 22C is located 600 feet southwest of the intersection of US 301 and County Road 523, and a portion of this pond site overlaps the boundaries of Pond Site 11C. The site is composed entirely of improved pasture, with the dominant vegetation being bahiagrass. No wetlands were observed on site. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site 23A-1

Pond Site 23A-1 is located immediately north of the US 301 and C-468E intersection. The site is composed of a mix of hardwood species including live oak and laurel oak and the groundcover is dominated by an assemblage of pasture grasses. No wetlands were observed on site. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site FPC1

This pond site is located adjacent to Pond 5C and is a floodplain compensation area. The site consists of improved pasture, with the dominant vegetation being bahiagrass. No wetlands were observed on site. However, a small surface water area is located on lands north of the pond. The surface water appears to connect to roadside swales along US 301 via a culvert and open ditch. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat has been identified that may potentially support the occurrence of the gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site FPC4

Pond FPC4 is located along the east side of US 301, north of the intersection of US 301 and NE 41st Lane and is a floodplain compensation area located adjacent to Pond 14C. The pond site consists of a mixed hardwood forest with the canopy being composed of live oak, magnolia and slash pine. Understory and ground cover consists of American beautyberry and greenbrier. No wetlands were observed on site; however, an herbaceous wetland system of soft rush and arrowhead is adjacent to the west of the pond. No protected plant species were observed during the field review. However, American kestrels were heard in the vicinity of the pond site during the field

review. The Southeastern American kestrel subspecies is listed as threatened by the FWC. Additionally, suitable habitat has also been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site FPC5

This pond side is a floodplain compensation area located across US 301 from Pond 15A, adjacent to Pond 15C and north of the power line easement. The canopy of this mixed upland hardwood community is composed of water oak, sweetgum and pignut hickory. Saw palmetto, grapevine and American beautyberry make up the understory within this habitat. No wetlands were observed on site and no protected plant or animal species were observed on site. Pond site FPC-5 is also located within similar boundaries of this pond and has the same site characteristics and community structure.

Pond Site FPC6

This pond site is a floodplain compensation area located 1,900 feet south of the Florida's Turnpike interchange with US 301 on the east side of US 301. The pond site consists of improved pasture, with the dominant vegetation being bahiagrass. No wetlands were observed on site. No protected plant or animal species were observed within the pond site during the field review. Suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

Pond Site FPC7

This pond site is located between Pond 16A and 16C and is a floodplain compensation area. The site consists of improved pasture, with the dominant vegetation being bahiagrass. No wetlands were observed on site. No protected plant or animal species were observed within the pond site during the field review. However, suitable habitat has been identified that may potentially support the occurrence of gopher tortoise and the Florida burrowing owl, which are both listed as threatened by the FWC.

3.0 Protected Species and Their Habitats

The United States Fish and Wildlife Service (USFWS), through the Endangered Species Act (ESA) and other regulatory instruments, and the Florida Fish and Wildlife Conservation Commission (FWC), through Chapter 68 of the Florida Administrative Code (FAC), regulate activities that may affect protected species. Information regarding the occurrence, or likelihood of occurrence, for any threatened or endangered species was gathered for this project area in order to comply with agency regulations.

The project site was evaluated during numerous site surveys in November and December 2016 for the PD&E alternative analysis to address the occurrence or potential occurrence of wildlife and plant species listed as threatened, endangered, species of special concern, or otherwise protected (protected species), according to methodology outlined by the USFWS, FWC, and/or FNAI. Wildlife species identification was accomplished mainly through visual observation, but tracks and aural indicators were also noted. The FNAI, USFWS, and FWC databases were consulted regarding current state and federally-protected wildlife species, species of special concern and managed species that are known or have the potential to occur within certain habitats found in the region.

A table of protected wildlife species known to occur in representative habitat types similar to that found within the US 301 Project and their potential for occurrence within the project limits is provided in **Table 3** below.

Table 3 | Protected Wildlife and their Potential for Occurrence

Scientific Name	Common Name	Potential for Occurrence	Federal or State Listing	Protection Status
Aphelocoma coerulescens	Florida scrub-jay	No	Both	Threatened
Athene cunicularia	Florida burrowing owl	Moderate	State	Threatened
Drymarchon couperi	Eastern indigo snake	Moderate	Both	Threatened
Egretta caerulea	Little blue heron	Moderate	State	Threatened
Egretta tricolor	Tricolor heron	Moderate	State	Threatened
Falco sparverius	American kestrel	High	State	Threatened
Gopherus polyphemus	Gopher tortoise	High	State	Threatened
Grus Canadensis pratensis	Florida sandhill crane	Moderate	State	Threatened
Haliaeetus leucocephalus	Bald eagle	Low	Federal	Managed*
Lampropeltis extenuate	Short tailed snake	Low	State	Threatened
Leuconotopicus borealis	Red cockaded woodpecker	Low	Both	Endangered
Mycteria americana	Wood stork	Low	Both	Threatened
Pituophis melanoleucus mugitus	Florida pine snake	Low	State	Special Concern
Rostrhamus sociabilis plumbeus	Snail kite	Low	Both	Endangered
Sciurus niger shermani	Sherman's fox squirrel	Low	State	Special Concern
Ursus americanus floridanus	Florida black bear	Low	State	Managed**

*** Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668c**

****Florida's Endangered and Threatened Species Rule, 68A-27, F.A.C**

3.1 Federally Protected Wildlife Species

Florida Scrub-jay – is listed by both the USFWS and FWC as threatened. This small, blue and gray bird is very gregarious in nature. They can be found in low-growing, oak scrub habitat with well drained soils as well as fallow orange groves. They are year-round residents here in Florida but are most likely to be spotted between March and October. No appropriate habitat occurs within the project area and no individuals were noted during field surveys; therefore this project will have no effect on the species.

Snail kite – is listed by both the USFWS and FWC as endangered. This medium-sized raptor is distinguished in the field by its slender, downward curved bill that is adapted to extract its primary prey, the apple snail (*Pomacea paludosa*) from its shell. Their range is restricted to watersheds in the central and southern portion of Florida. Snail kite foraging habitat is limited to sparsely vegetated freshwater marshes and shallow vegetated edges of natural and manmade lakes. The project corridor is approximately 50 miles northwest of the nearest snail kite population and no individuals were noted during field surveys; therefore this project will have no effect on the species.

Eastern indigo snake – is listed by both the USFWS and FWC as threatened. This large, stout-bodied, shiny black snake can reach 8 feet in length and will utilize a wide range of habitats from scrub and sandhills to wetlands throughout Florida. They are known to winter in gopher tortoise burrows. Eastern indigo snakes require large tracts of natural land to survive, typically foraging in more hydric habitats. No Eastern indigo snakes were observed during the field review of the corridor. Less than 25 gopher tortoise burrows were identified within the project area and less than 25 acres of xeric habitat will be impacted by the construction of the roadway and associated pond sites. Prior to construction, any tortoise burrows identified in the construction area will be evacuated. In addition the site contractor will implement the Eastern Indigo Snake Protection Measures found in **Appendix C** prior to construction. Therefore, based on the USFWS' Determination Key, a "not likely to adversely affect" determination is recommended for this species.

Bald eagle - The USFWS has delisted the bald eagle from the list of threatened and endangered species because the bald eagle population has recovered in the lower 48 states, threats to the species have been reduced or eliminated, and reproductive success has significantly increased. The bald eagle will continue to be managed and protected by the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act. In addition, the bald eagle is protected in Florida through F.A.C. 68A-16.002. As of February 2014, the FWC bald eagle nesting database does not indicate any active or inactive bald eagle nests on the project site or within 660 feet of the project site or any pond site. The nearest nest, SU036, occurs approximately 0.5 mile to the east of the project corridor.

Red-cockaded woodpecker - is a small woodpecker distinguished by its barred, black and white back and wings and large white cheek patches. This species is known to occur in open, mature pine woodlands throughout the state. Populations are restricted to areas of old growth pine forest. The red-cockaded woodpecker is listed by the USFWS and FWC as endangered. No documented occurrence of red-cockaded woodpeckers and no habitat for this species occur within the project corridor. Therefore this project will have no effect on this species.

Wood stork – this long-legged wader is a large bodied white bird with black in the wings and tail. Wood storks are listed as threatened under the Endangered Species Act (ESA) and nest in colonies in a variety of inundated forested wetlands such as cypress swamps, sloughs or mangroves. Foraging habitat includes shallow fresh water marshes, ponds, ditches or pastures. The USFWS and the FWC both list the wood stork as threatened. No wood storks were observed during survey days within the project footprint or within the shallow marshes and ponds adjacent to the project area. If applicable, replacement foraging habitat will be provided through the purchase of herbaceous wetland mitigation credits at a mitigation bank within the same core foraging area. Based on the USFWS' Determination Key, a "not likely to adversely affect" determination is recommended for this species, as the project is:

A. At a location greater than 0.47 miles from a colony site and:
B. The project impact to Suitable Foraging Habitat is less than 0.50 acre

Additional mitigation for loss of foraging habitat could be provided through replacement habitat constructed as part of the stormwater management system.

3.2 State Protected Wildlife Species

Wading Birds - as a group, are common to wetlands where they forage for small fish and invertebrates. Species that are expected to frequent wetlands within the corridor include little blue heron and tri-colored heron, which are listed as threatened per the FWC. Review of the FWC Waterbird Colony Locator indicated that there are no known active wading bird colonies near the project corridor. The loss of wading bird foraging habitat in roadside surface waters will be replaced through on-site replacement of habitat in the form of ditches, swales and ponds associated with the stormwater management system.

Florida Burrowing Owl – is a pint sized bird that resides in open, treeless areas where it spends most of its time on the ground. Its sandy brown plumage offers camouflage from predators from its ground-level perch. Throughout the state its distribution is considered localized and spotty. They often inhabit native prairies, golf courses, airports and vacant lots. Burrows are used year-round that are dug on their own, however, they can also utilize gopher tortoise or armadillo burrows. They are listed as threatened by the FWC. No burrowing owls have been observed during the field review, but appropriate habitat exists within the project corridor, therefore the potential occurrence of the burrowing owl is moderate.

American kestrel - is a large falcon, that migrates to Florida during winter months and the Southeastern American Kestrel is a smaller, visually similar falcon that is a full time Florida resident. This species utilizes cavities within older longleaf pine and live and turkey oak trees, many of which have been abandoned by woodpeckers. These kestrels can be seen at the edge of longleaf pine, turkey oak and live oak woodlands, in open land/pastures and along power lines and fence lines hunting for insects, reptiles, and small mammals. The FWC lists this species as threatened. Abundant habitat for kestrels is present along the corridor and kestrels were sighted during field reviews. The FDOT is committed to performing kestrel surveys during the design and permitting phase of the project.

Gopher Tortoise – is a medium sized turtle fully adapted for life on land. The forelimbs are greatly expanded for excavating deep burrows to escape predators, weather or fire. Gopher tortoises are found in dry habitats such as sandhills, xeric oak habitats, and dry pine flatwoods. More than 300 other species of animals have been recorded sharing gopher tortoise burrows. Gopher tortoises are listed by the FWC as threatened and are a candidate species for listing by the USFWS. Seven (7) potentially occupied gopher tortoise burrows were identified within the project corridor. The FDOT will obtain a gopher tortoise permit to relocate any gopher tortoises identified within the project limits, therefore adverse effects to this species are not anticipated.

Florida Sandhill Crane - are tall, long-necked, long-legged birds ranging throughout the Florida peninsula from Okefenokee Swamp to the Everglades. These birds spend much of the year foraging within a variety of habitats including improved pasture, open pine forests, agricultural cropland, and freshwater marshes. In Central Florida, the Florida sandhill crane typically nests in shallow freshwater marshes and forages on agricultural lands. They are listed as threatened by FWC. Sandhill cranes have been observed during field reviews and appropriate habitat exists within the project corridor, therefore the potential occurrence of the sandhill crane is moderate. The 2016 FWC Sandhill Crane Species Guidelines will be implemented throughout the design, permitting and construction phases of this project.

Short tailed snake – is a small slender fossorial snake that can reach a length of 20 inches and has a small head that is indistinct from its body. They generally reside in sandy soils, particularly longleaf and xeric oak sandhills. They are endemic to Florida and are found from the Suwannee River south to Highlands County. The FWC lists this species as threatened. No short tailed snakes have been observed during field review and little to no appropriate habitat exists within the project area. Therefore the potential occurrence of the short tailed snake is low.

Florida pine snake - is a large, stocky tan or rust colored snake with an indistinct pattern of large blotches on a lighter background. This species is known to occur throughout Florida in habitats with relatively open canopies and dry sandy soils, preferring sandhills and pine scrub. Florida pine snakes often coexist with gopher tortoises and pocket gophers. This species is listed by the FWC as a species of special concern. No pine snakes have been observed during field review and little to no appropriate habitat exists within the project area. Therefore the potential occurrence of the pine snake is low.

Sherman's fox squirrel - are large tree squirrels that inhabit areas of high pine sandhills, pine flatwoods, pastures, and other open areas with scattered pines and oaks. They are listed by FWC as a species of special concern. No fox squirrels have been observed during field review and little to no appropriate habitat exists within the project area. Therefore the potential occurrence of the fox squirrel is low.

Florida black bear - is protected in the state of Florida through F.A.C. 68A-4.009. It can be found in heavily wooded terrain; particularly hardwood swamp, cypress swamp, and undisturbed upland forest. The FWC has identified six core and two remnant areas of Florida bear populations: Apalachicola, Big Cypress, Eglin, Ocala, Osceola, St. Johns, Chassahowitzka, and Glades/Highlands, respectively. The proposed project is located outside of the primary and secondary black bear ranges identified by FWC, therefore the potential occurrence of black bear is considered low.

3.3 Protected Plant Species

Habitats within the project corridor consist of maintained upland areas used for maintenance access, wetland ditches, swales and an assemblage of natural (undeveloped) upland and wetland communities. As a result, some habitat exists within the project corridor for protected plants (See **Table 4**). However, during the field reviews, no protected plant species were observed within the project corridor. Areas to be impacted by the roadway and the proposed stormwater ponds will be re-evaluated for the presence of any federally protected plant species during permitting in the design phase of the project. In addition, portions of the study area are located near potential habitat for rare state protected plant species. State law prohibits the take of any protected plant species from public lands, or the private land of another. Land owners are under no state restrictions for the take of state-listed plants on their own land. If such species are discovered during the design phase, the FDOT will coordinate with the Division of Plant Industry to avoid or minimize harm.

Table 4 | Protected Plants and their Potential for Occurrence

Scientific Name	Common Name	Potential for Occurrence	Federal or State Listing	Protection Status
Asplenium erosum	Auricled spleenwort	Low	State	Endangered
Asplenium verecundum	Modest spleenwort	Low	State	Endangered
Centrosema arenicola	Sand butterfly pea	Low	State	Endangered
Dicerandra cornutussima	Longspurred mint	Low	Both	Endangered
Justicia cooleyi	Cooley's water-willow	Low	Both	Endangered
Matelea floridana	Florida spiny-pod	Low	State	Endangered
Pecluma plumula	Plume polypody	Low	State	Endangered
Pecluma ptilodon	Swamp plume polybody	Low	State	Endangered
Peperomia humilis	Terrestrial peperomia	Low	State	Endangered
Pteroglossaspis ecristata	Giant orchid	Low	State	Threatened
Spigella loganioides	Pinkroot	Low	State	Endangered
Trichomanes punctatum spp. Floridanum	Florida filmy fern	Low	Both	Endangered
Triphora craigheadii	Craighead's nodding caps	Low	State	Endangered

4.0 Wetland and Surface Water Features

Wetland communities found within the US 301 corridor study area consists of cypress wetlands, stream and lake swamps, forested mixed wetlands, freshwater marshes, wet prairies, emergent herbaceous wetlands and ditches, which are protected under Executive Order 11990: Protection of Wetlands. The ecosystem structure of the wetland communities and the corresponding wetlands identified within the project corridor are described below and presented in **Figure 6**. Photographs of identified wetland communities can be found in Appendix A.

Within the project corridor the wetland habitat is bordered by agricultural lands, large lot residential, commercial and industrial developments, and pastures. The indications of wildlife utilization include use by avian species including black vulture (*Coragyps atratus*), pileated woodpecker (*Dryocopus pileatus*), sandhill cranes, small and medium-sized mammals including deer (*Odocoileus virginianus*), wild boar (*Sus scrofa*), coyotes (*Canis latrans*), raccoon (*Procyon lotor*) and opossum (*Didelphis virginiana*), and herpetofauna.

The table **(Table 5)** below is a brief depiction of the wetlands and surface waters found within the US 301 corridor, including their FLUCCS code, size and UMAM functional value. The location of each wetland or surface water impacts are depicted on **Figure 6**.

Table 5 | Summary of Wetlands and UMAM Assessment

Wetland ID No.	FLUCCS	NWI Code	Impact (acres)	Impact Delta	Functional Loss
WL-1	615	PFO6	0.87	0.77	0.67
WL-2	615	PFO6	0.47	0.77	0.36
WL-3	630	PFO6	0.45	0.77	0.35
WL-6	615	PFO6	0.22	0.77	0.17
WL-7	615	PFO6	0.50	0.77	0.39
WL-7A	643	PEM1	0.07	0.63	0.04
WL-9	615	PFO6	1.67	0.77	1.29
WL-9A	615	PFO6	0.14	0.77	0.11
WL-11	641	PEM2	0.24	0.63	0.15
WL-12	641	PEM2	0.31	0.63	0.20
WL-13	615	PFO6	0.12	0.77	0.09
WL-14	615	PFO6	0.25	0.77	0.19
WL-21	641	PEM2	0.28	0.63	0.18
WL-22	615	PFO6	0.49	0.77	0.38
WL-23	630	PFO6	0.47	0.77	0.36
WL-25	630	PFO6	0.41	0.77	0.31

Wetland ID No.	FLUCCS	NWI Code	Impact (acres)	Impact Delta	Functional Loss
WL-26	630	PFO6	0.06	0.77	0.04
SW-1	530	L2EM2	0.09	-	-
TOTALS			**7.11**		**5.28**

Wetland 1

Wetland 1 (WL-1) is located at the named creek, Shady Brook, and consists of a large stream and lake swamp associated with the creek. The forested wetland canopy contains red maple, live oak, water hickory, and sweetgum. Groundcover is sparse consisting of saw palmetto, grapevine, and cabbage palm. Soils are sandy and saturated with no standing water.

Surrounding land uses include pastures and agricultural lands to the east and public lands owned by the SWFWMD to the west. Wetland functions include water storage, water conveyance, and vegetative cover for denning and foraging habitat for wetland dependent species.

Wetland 2

Wetland 2 (WL-2) is north of and contiguous to WL-1. The forested wetland canopy contains red maple, live oak, water hickory, and sweetgum. Groundcover is sparse consisting of saw palmetto, grapevine, and cabbage palm. Soils are sandy and saturated but with no standing water.

Surrounding land uses include pastures and agricultural lands to the east and public lands owned by the SWFWMD to the west. Wetland functions include water storage, water conveyance, and vegetative cover for denning and foraging habitat for wetland dependent species.

Wetland 3

Wetland 3 (WL-3) is located approximately 500 feet east of US 301 and CR 525 East intersection. The wetland canopy consists mainly of water tupelo (Nyssa aquatic). Ground cover is very sparse due to grazing by cattle. The wetland is connected to other wetland areas via a small swale that is seasonally inundated. Soils are sandy with no standing water observed during the field review, but staining on trees indicated that standing water is present during the wet season.

The surrounding land use is pasture. Wetland functions include water storage and foraging areas for wetland dependent species.

Wetland 6

Wetland 6 (WL-6) is located on the north side of CR 468, just east of the intersection with US 301. The wetland canopy consists mainly of water tupelo with a very sparse groundcover of pasture grasses. Soils are sandy and no standing water observed during the field visit, but staining on trees indicated that standing water is present during the wet season.

The surrounding land use is pasture. Wetland functions include water storage and foraging areas for wetland dependent species.

Wetland 7

Wetland 7 (WL-7) is located east side of US 301 north of NE 41st Lane. The wetland is a freshwater marsh with scattered red maple and laurel oak along the outer edges and spikerush (*Eleocharis* spp.), chalky blue stem, and pickerelweed (*Pontederia cordata*) in the lower areas of the marsh. The wetland appears to be mowed on a regular basis.

The surrounding land use is pasture. Wetland functions include water storage and foraging areas for wetland dependent species.

Wetland 7A

Wetland 7A (WL-7A) is located on the west side of US 301 across from WL-7. The wetland is a freshwater marsh with scattered red maple and laurel oak along the outer edges and spike rush, chalky blue stem, and pickerelweed in the lower areas of the marsh. The wetland appears to be mowed on a regular basis. Soils are sandy and standing water was observed during the field reviews.

The surrounding land use is pasture. Wetland functions include water storage and foraging areas for wetland dependent species.

Wetland 9

Wetland 9 (WL-9) is located on the east side of US 301 south of the electrical transmission easement. This forested wetland contains a mix of red maple, sweetgum, slash pine, laurel oak, and water hickory. Soils are sandy and saturated but with no standing water.

Surrounding land uses include upland hardwood and conifer forest. Wetland functions include water storage, foraging and denning for wetland dependent species, and water conveyance.

Wetland 9A

Wetland 9A (WL-9A) is located on the west side of US 301 south of the electrical transmission easement. This forested wetland contains a mix of red maple, sweetgum, slash pine, laurel oak, and water hickory. Soils are sandy and saturated but with no standing water.

Surrounding land uses include upland hardwood and conifer forest. Wetland functions include water storage, foraging and denning for wetland dependent species, and water conveyance.

Wetland 11

Wetland 11 (WL-11) is located on the east side of US 301 approximately 500 feet south of the Florida's Turnpike. This isolated freshwater marsh contains pickerelweed, spike rush and Carolina willow along the outer edge of the wetland. The marsh appears to be isolated from other marshes in the immediate vicinity. Soils are sandy and standing water was observed during the field reviews.

Surrounding land uses include pastures. Wetland functions include water storage, foraging areas for wading birds, and stormwater conveyance.

Wetland 12

Wetland 12 (WL-12) is located on the west side of US 301 across from WL-11. This large freshwater marsh contains cattail (*Typha* spp.), Carolina willow, salt bush, pickerelweed, wax myrtle, chalky bluestem, and cabbage palm. Soils are sandy and standing water was observed during the field reviews. The wetland appears to be connected to a larger forested system that drains north towards the Florida Turnpike.

Surrounding land uses include upland shrub and brush lands. Wetland functions include water storage, foraging areas for wading birds, and stormwater conveyance.

Wetland 13

Wetland 13 (WL-13) is located on the east side of US 301 just south of the Florida's Turnpike. This forested area consists of red maple, sweetgum, slash pine, laurel oak and saw palmetto. Soils are sandy and saturated but with no standing water. The wetland is connected to a larger system to the west via a culvert under US 301.

Surrounding land uses include pastures. Wetland functions include water storage, foraging areas for wading birds, and stormwater conveyance.

Wetland 14

Wetland 14 (WL-14) is located on the west side of US 301 just south of Florida Turnpike. The wetland contains both marsh and forested components. The vegetation is consistent with WL-13, however there is a section of the wetland that was previously cleared and has started to regenerate. Soils are sandy and saturated but with no standing water.

Surrounding land use includes upland forests that were cleared but have been left to regenerate. Wetland functions include water storage, foraging areas for wading birds, and stormwater conveyance.

Wetland 21

Wetland 21 (WL-21) is located within Pond 5A. This freshwater marsh is seasonally inundated and heavily grazed by cattle. Vegetation is very limited with various pasture grasses along the perimeter. Soils are sandy and saturated but with no standing water observed during the field review.

Surrounding land use is pastures. Wetland functions include water storage and foraging habitat for wading birds.

Wetland 22

Wetland 22 (WL-22) is located within FPC5. The pond site includes three areas of forested wetlands that extend off-site to the east. The forested wetlands contain a mix of red maple, sweetgum, slash pine, laurel oak, and water hickory. Soils are sandy and saturated but with no standing water.

Surrounding land uses include upland hardwood and conifer forest. Wetland functions include water storage, foraging and denning for wetland dependent species, and water conveyance.

Wetland 23

Wetland 23 (WL-23) is located within Pond 17B. The wetland appears to be connected to wetlands south of the Florida's Turnpike. The pond site is a forested mix of red maple, sweetgum, laurel oak, water hickory and saw palmetto. Soils are sandy and saturated but with no standing water.

Surrounding land use is pastures. Wetland functions include water storage and foraging habitat for wading birds.

Wetland 25

Wetland 25 (WL-25) is located east side of US 301 north of NE 41st Lane. The wetland is a hardwood forest with red maple, sweetgum and laurel oak. Groundcover is sparse consisting of saw palmetto, grapevine, and cabbage palm. Soils are sandy and saturated but with no standing water.

The surrounding land use is pasture. Wetland functions include water storage and foraging areas for wetland dependent species.

Wetland 26

Wetland 26 (WL-26) is located approximately 2,400 feet east of US 301 and CR 525 East intersection. Ground cover is very sparse due to grazing by cattle. The onsite portion of this wetland consists of a swale that is seasonally inundated. Soils are sandy with no standing water observed during the field review, but staining on vegetation indicated that standing water is present during the wet season.

The surrounding land use is pasture. Wetland functions include water storage and foraging areas for wetland dependent species.

Surface Water 1

Surface Water 1 (SW-1) is a small agricultural pond along the west side of US 301 just south of NE 19th Way. Standing water was present during the field review and maintenance trimming/mowing was evident in the pond.

Surrounding land uses include pastures to the south and peach (*Prunus persica*) orchards to the north. Wetland functions include water storage, water conveyance, and foraging habitat for wading birds.

4.1 Assessment of Potential Impacts

Avoidance and Minimization Strategies (Quality Enhancement Strategies)

The avoidance and minimization of wetland impacts during the PD&E phase of the project include the study of multiple widening options within the five segments of existing roadway, three alignment options within the segment of new right-of-way associated with the realignment, and multiple alternatives for each proposed pond site; for which the full alternative analysis can be found in the Alternatives section of the PER.

The recommended alignment for widening of each segment is described as follows:

- Segment 1 will be widened to the right of the existing roadway and will require approximately 3.2 acres of new right of way. No wetland impacts are anticipated in this segment of the corridor.
- Segment 2 will be widened to the left of the existing roadway and will require 26.6 acres of new right of way. Segment 2 will impact 0.5 acres of wetlands associated with Shady Brook. Since Shady Brook crosses the corridor alignment, the impacts are unavoidable for all widening options. However, clearing of wetlands would be required for construction and long-term shading impacts will occur from the bridge.
- Segment 3 will be widened to the left side of the existing roadway and will require 13.8 acres of new right of way. Segment 3 could potentially impact 1.03 acres of wetlands that occur within the existing US 301 right-of-way.
- Segment 4 will be widened to the right side of the existing roadway and will require 34.1 acres of new right of way. Segment 4 could potentially impact 5.52 acres of wetlands that occur within the existing US 301 right-of-way.
- Segment 5 will not require new right of way and will not include new travel lanes. Segment 5 could potentially impact 0.21 acres of wetlands that occur within the existing US 301 right-of-way.

The US 301 realignment will require a new roadway alignment (approximately 1.5 miles) linking CR 525 East to CR 468. While the area for the route is currently largely undeveloped, both ends of this segment have impending development that is currently in the permitting process. The Villages Industrial (formerly Wade Industrial) Park and Monarch Ranch are planned for the CR 525 East area while the CR 468 area will be home to the Village of Fenney.

Wetlands and Surface Waters

Wetland (7.02 acres) and surface water (0.09) impacts totaling approximately 7.11 acres are associated with the recommended alternative along the US 301 corridor **(Table 5)**. However, all of the surface water impacts are upland cut ditches making them non-jurisdictional to the state. Impacts are needed for the construction of roadway widening and drainage improvements. All build alternatives will require impacts to the existing wetlands and surface waters within the project corridor. The proposed wetland impacts are depicted on **Figures 6-1 – 6-10**.

UMAM Assessment

During November and December 2016, wetlands that were proposed for impacts associated with proposed right of way and stormwater pond locations had their associated functional loss quantified utilizing UMAM. The field forms are included under **Appendix B**. The summary of wetland impacts and associated functional loss are shown in **Table 5**.

Secondary and Cumulative Wetland Impacts

Wetland impacts associated with the construction of this project may result in secondary impacts to remaining wetlands within and outside the right of way. Potential secondary wetland impacts will be addressed by the FDOT by creating on-site upland buffers averaging 25 feet in width along the wetland boundary. In those areas where

buffers cannot be provided, mitigation for secondary impacts will be provided in accordance with Section 373.4137 F.S. Secondary impacts will be calculated during the design phase. Cumulative impacts are not anticipated as a result of this project due to the wetland mitigation occurring within the same drainage basin as the proposed wetland impacts.

Essential Fish Habitat

Impacts to Essential Fish Habitat are not anticipated in conjunction with this project. Coordination with the NMFS during the ETDM screening phase indicated that protected species under the purview of the NMFS will not be impacted with this project and that no further consultation related to the Magnuson-Stevens Fishery Conservation and Management Act is necessary.

Habitat Connectivity

Movement of wildlife for feeding, reproduction, and survival is dependent upon the connectivity of large regionally significant ecosystems, patchiness of such ecosystems, and the specific type of habitats available and utilized by various species of wildlife. Habitat reduction and fragmentation at a variety of spatial scales has been widely acknowledged as a primary cause of the decline of many species. Habitat fragmentation generally leads to smaller and more isolated animal populations. Smaller populations are then more vulnerable to local extinction and they are more susceptible to the negative effects of inbreeding and transmission of disease. To reduce the isolation of habitat fragments, many conservation biologists have recommended maintaining landscape "connectivity" and preserving habitat for movement of species between remaining fragments.

Suitable wildlife habitat, connectivity, and wildlife utilization was qualitatively assessed for large, regionally significant ecosystems outside of the corridor. Data provided by Florida Greenways and Trails Council, FNAI, and FWC was reviewed to determine the location of important linkage areas, specific habitat types, and species occurrences. Coordination with regulatory personnel and biologists with specific regional knowledge or professional experience concerning wildlife habitat utilization was maintained throughout the study process to address the issue of habitat connectivity.

Florida Ecological Greenways Network Critical Linkages (University of Florida, 2002) data shows that high priority habitat was not identified within the study corridor. The Chassahowitzka-Annutteliga Hammock-Green Swamp High priority linkage areas occur just west of the study corridor and generally runs along the Withlacoochee River. The closest public lands within the linkage area to the corridor are lands owned by the SWFWMD associated with Lake Panasoffkee. Therefore, no direct impacts to strategic habitat, critical linkages, Florida Forever projects, or public lands are expected as a result of this project.

Shady Brook connects to the Lake Panasoffkee system of wetlands and surface waters. Alternatives for the crossing of this creek will include use of the existing structure for north bound traffic and a new bridge for southbound traffic. A new bridge may include shelves to accommodate the movement of small animal species along the creek and associated wetlands. A final determination and assessment of the inclusion of wildlife shelves will be made during the permitting phase of the project. Based on the FDOT's Wildlife Crossing Guidelines, no other opportunities exist along the project corridor. The corridor does not contain large tracts of public lands and has not been identified as an area of high wildlife utilization.

4.2 Mitigation

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137 F.S. to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.s. 1344.

Surface water impacts which will result from the construction of this project will be mitigated through on-site in-kind replacement. The proposed stormwater treatment and conveyance system will maintain existing surface water function. Temporary functional loss will occur during construction, but no permanent direct, secondary or cumulative impact is anticipated.

Optional mitigation available to the project includes the purchase of mitigation credits from the Lake Louisa and Green Swamp Mitigation Bank, Withlacoochee River Mitigation Bank and the Hammock Lake Mitigation Bank. A final mitigation plan for the project will be developed during the design and permitting phase with input from FDOT, SWFWMD and USACE.

5.0 Coordination

In June 2013, comments from the Environmental Technical Advisory Team (ETAT) were published on the ETDM website. Six ETAT members commented on proposed wetland impacts. The SWFWMD, US Environmental Protection Agency (EPA), and Florida Department of Environmental Protection (FDEP) each applied a minimal degree of effect. The National Marine Fisheries Service (NMFS), USACE and USFWS applied the degree of effect as moderate. Agency comments included the need for wetland delineation, assessment of direct impacts and the assessment of secondary and cumulative impacts and the need to address the potential for increase runoff of stormwater and an increase of pollutants in surface waters and wetlands.

Through the PD&E process, the FDOT has addressed each of these agency issues as documented in this report. Wetland delineation was completed through the established criteria of the USACE and SFWMD, wetland assessments were completed using UMAM, and potential secondary and cumulative impacts were addressed through mitigation within the same drainage basin. The potential of water quality impacts have been addressed through the proposed stormwater management system and will be carried through to construction by following erosion control measures according to FDOT standard methods.

Three resource agencies submitted comments related to wildlife and habitat. The SWFWMD and FWC applied a minimal degree of effect. The USFWS applied a moderate degree of effect. Agency comments included the need for wildlife surveys and coordination during the study phase, implementation of species protection measures during construction, and investigation of opportunities to enhance wildlife connectivity.

The FDOT has addressed each of these agency issues during the study phase. Wildlife surveys were performed by the study team and will be updated during the design and permitting phase to ensure minimal impacts to protected species. A Commitment to perform a species specific survey for the Southeastern American kestrel, burrowing owl and sandhill crane; and a gopher tortoise permit will acquired during design should it be required. Coordination that began through ETDM will be carried through the study phase into design and permitting with the wildlife agencies and appropriate permits obtained during the design and permitting phase. Protection measures for the eastern indigo snake will be implemented during construction to ensure no significant impacts occur to this protected species. Wildlife crossing opportunities were investigated along the corridor, to enhance wildlife movement along the wetlands associated with the creek. No other public lands or natural systems were identified within the corridor that could provide enhanced wildlife movement.

6.0 Conclusions

Wetland impacts which will result from the construction of this project will be mitigated pursuant to Section 373.4137 Florida Statutes (F.S.) to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.s. 1344. Under Section 373.4137 F.S., mitigation of FDOT wetland impacts will be implemented by the SWFWMD where the impacts occur. Wetland (7.02 acres) and surface water (0.09) impacts totaling approximately 7.11 acres are associated with the recommended alternative along the US 301 corridor.

Adverse impacts to individual species or regional populations of federal or state protected species or their habitat are not anticipated as a result of the construction of this project. An effect determination of "not likely to adversely affect" was made for the wood stork and eastern indigo snake and "no effect" for the scrub jay, snail kite, bald eagle and the red cockaded woodpecker. This determination is based on results of the USFWS' determination key, literature review, data research, field surveys and coordination with agency personnel.

Further evaluation of suitable habitat will be necessary for specific species (identified in Section 3.0) during the project design phase. If endangered or threatened species or species of special concern are identified within the construction area during design or construction phases, coordination will be initiated with the appropriate resource agencies to avoid or mitigate impacts. Furthermore, standard protection measures developed by the USFWS to address the protection of the eastern indigo snake will be implemented during the design and construction phase.

FDOT will also implement the following actions during later phases of the project:

1. Use of Best Management Practices for erosion control during construction.
2. Conduct gopher tortoise surveys and permitting during the design phase.
3. Update other wildlife and plant surveys during the design phase.

7.0 Commitments

The following commitments will be added to the environmental document relative to wildlife:

- FDOT will implement the Standard Protection Measures for Eastern indigo snakes.
- During permitting, all potential burrowing owl habitat that could be impacted by the project will be systematically surveyed for the presence of this species. If burrowing owls are located and cannot be avoided, coordination and permitting with the FWC will be performed.
- During permitting, a survey for the Southeastern American kestrel will be performed using the most current survey guidelines and in coordination with the FWC.
- Prior to construction, any potential sandhill crane nesting habitat that will be impacted during the nesting season (January-August) will be surveyed for active nest sites to avoid impacts to this species. If a nest is found, coordination will occur with the FWC.

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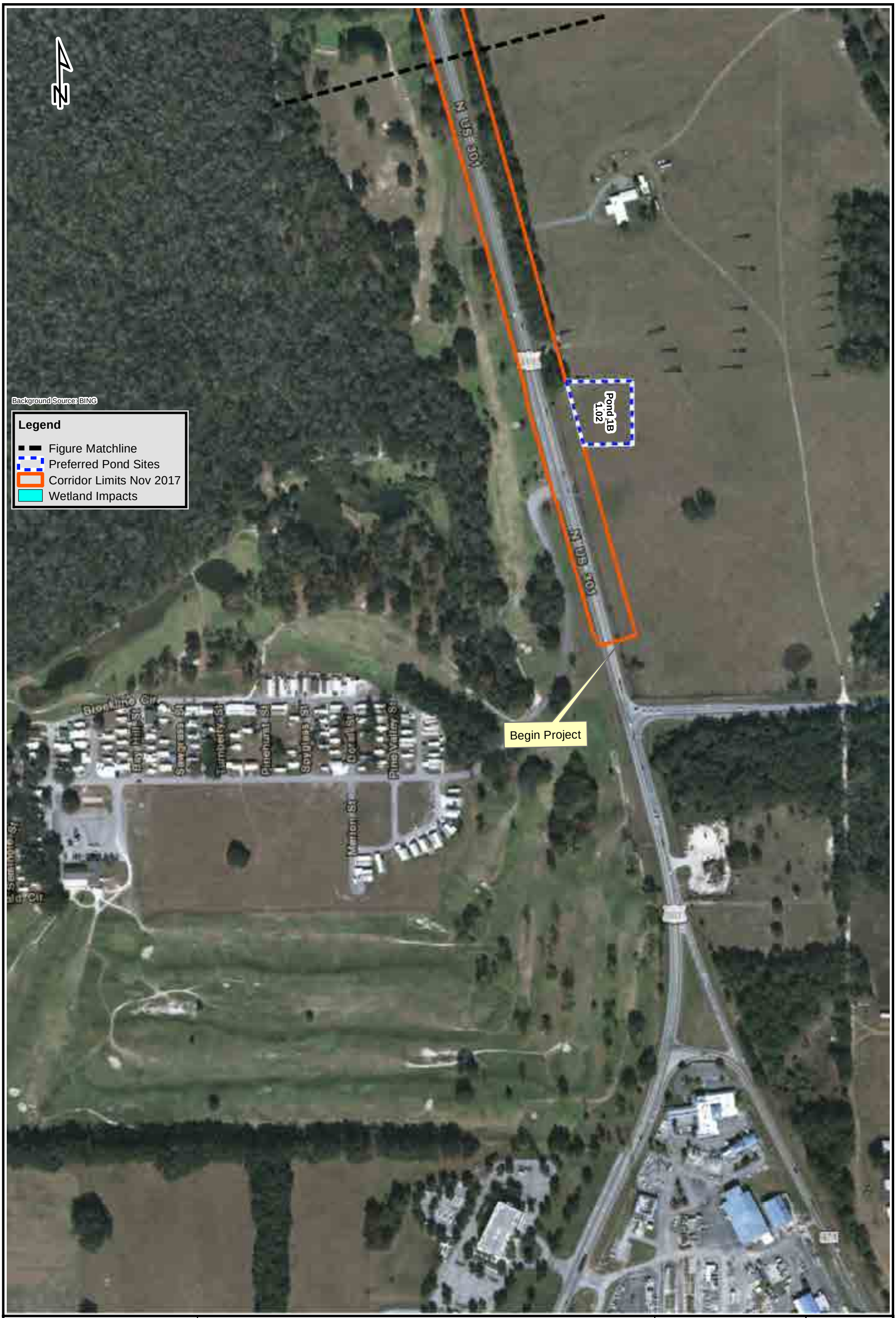
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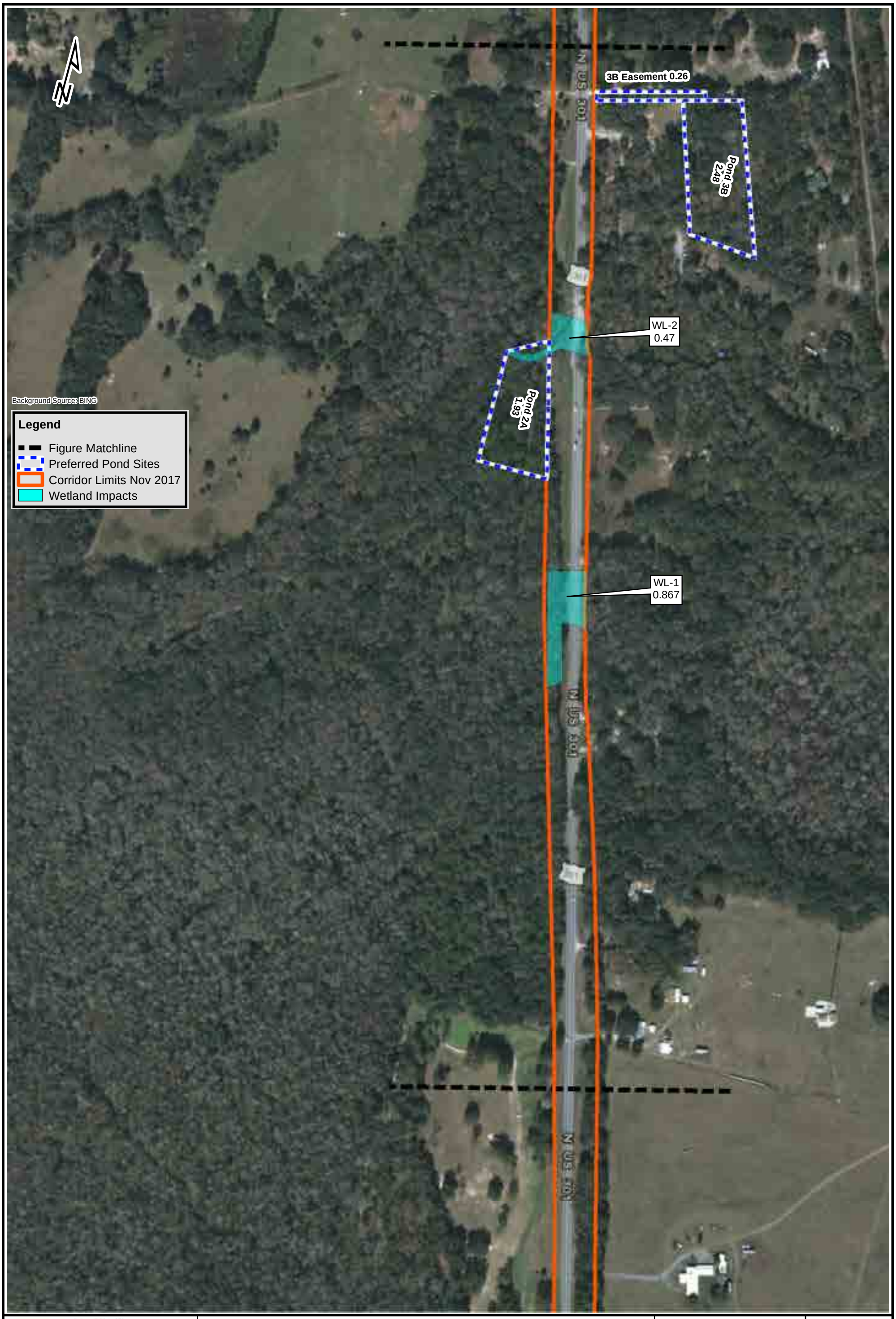
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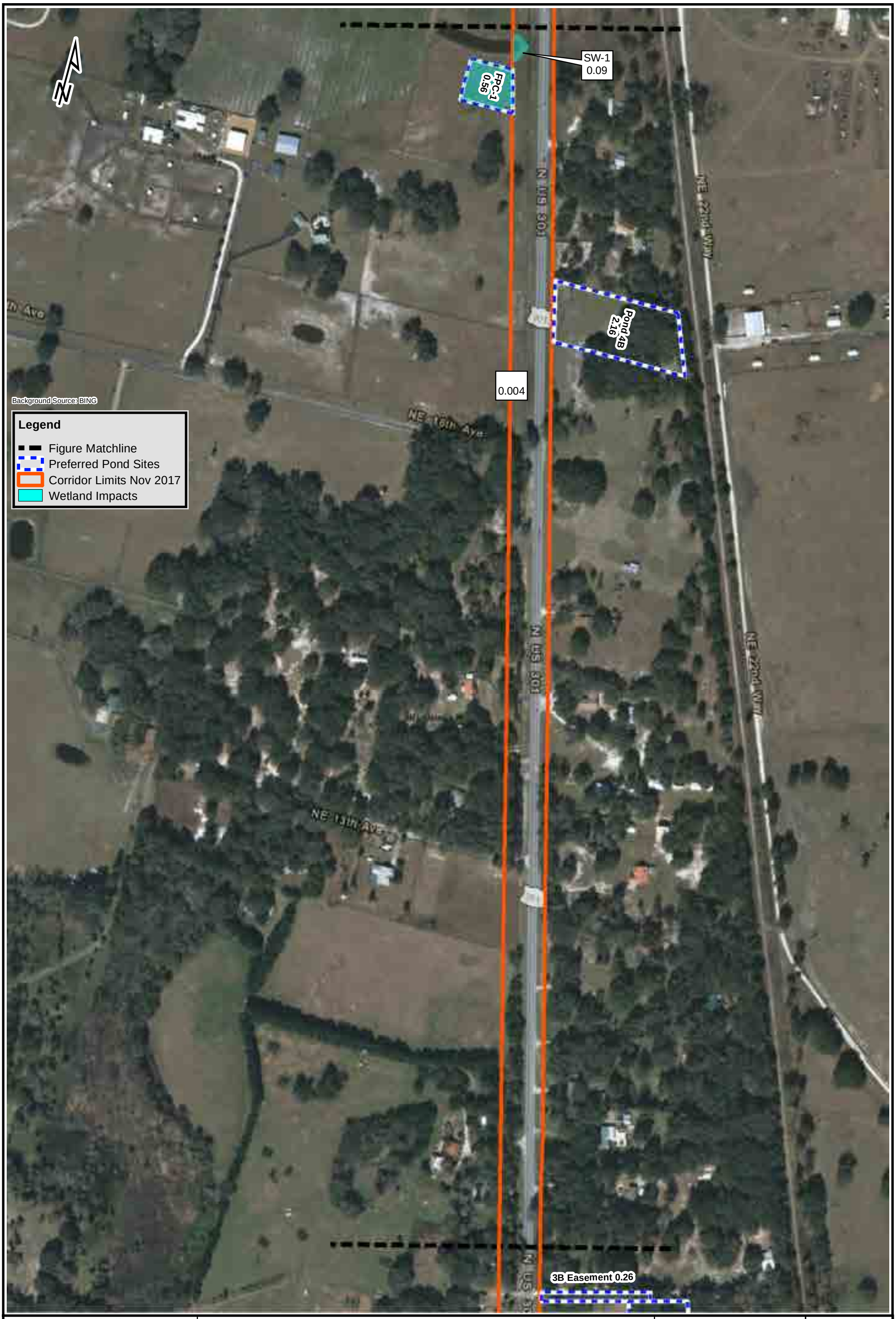
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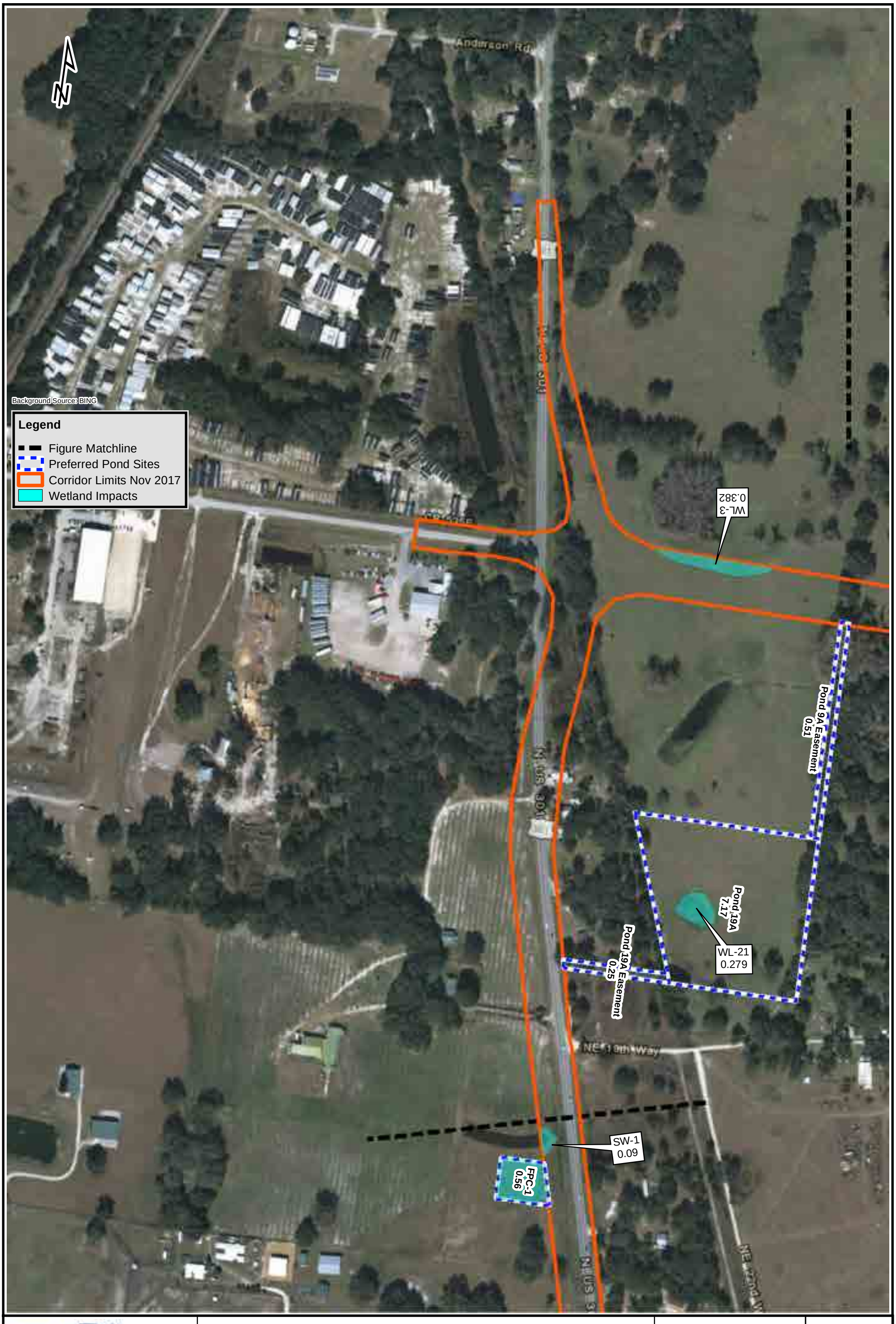
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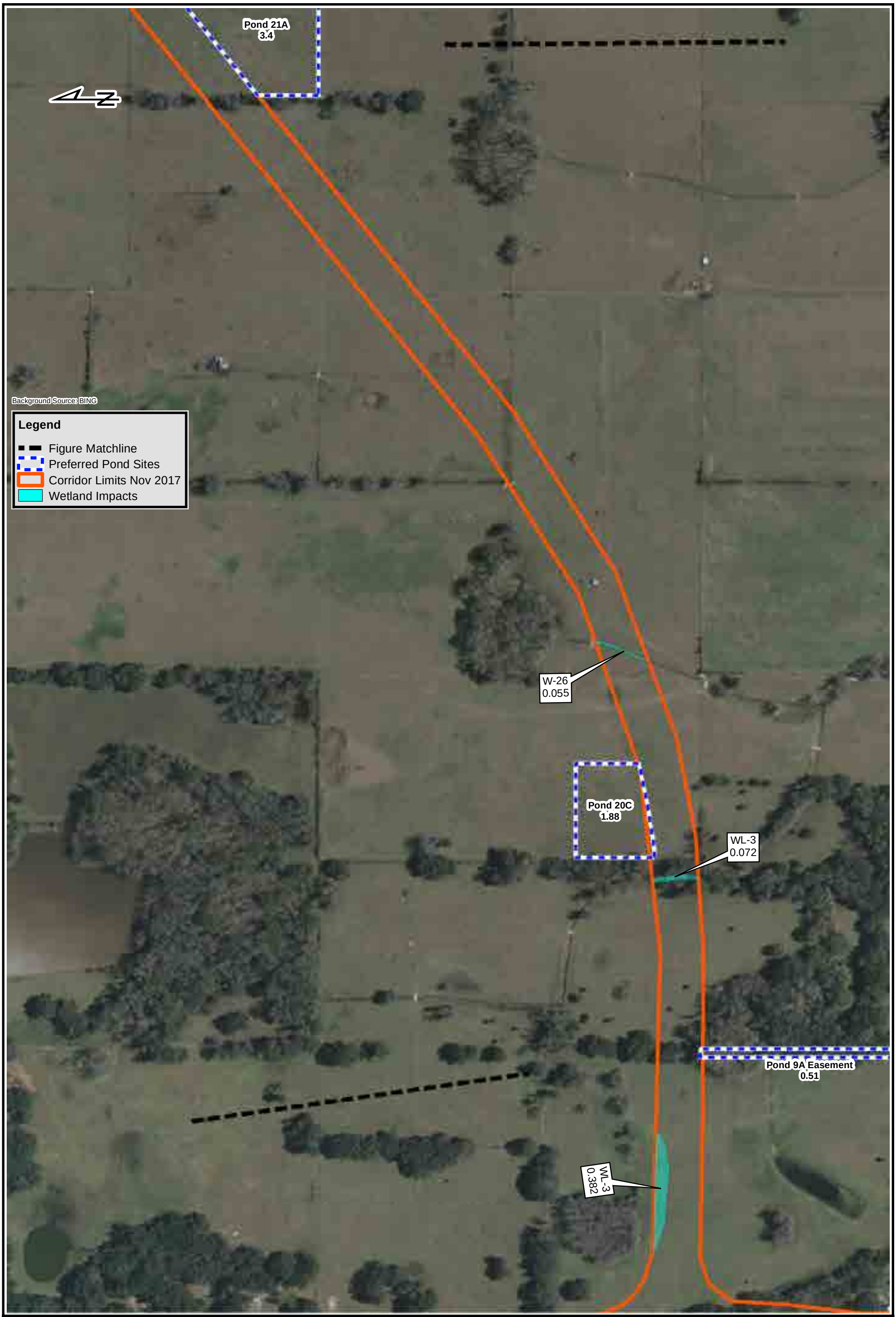
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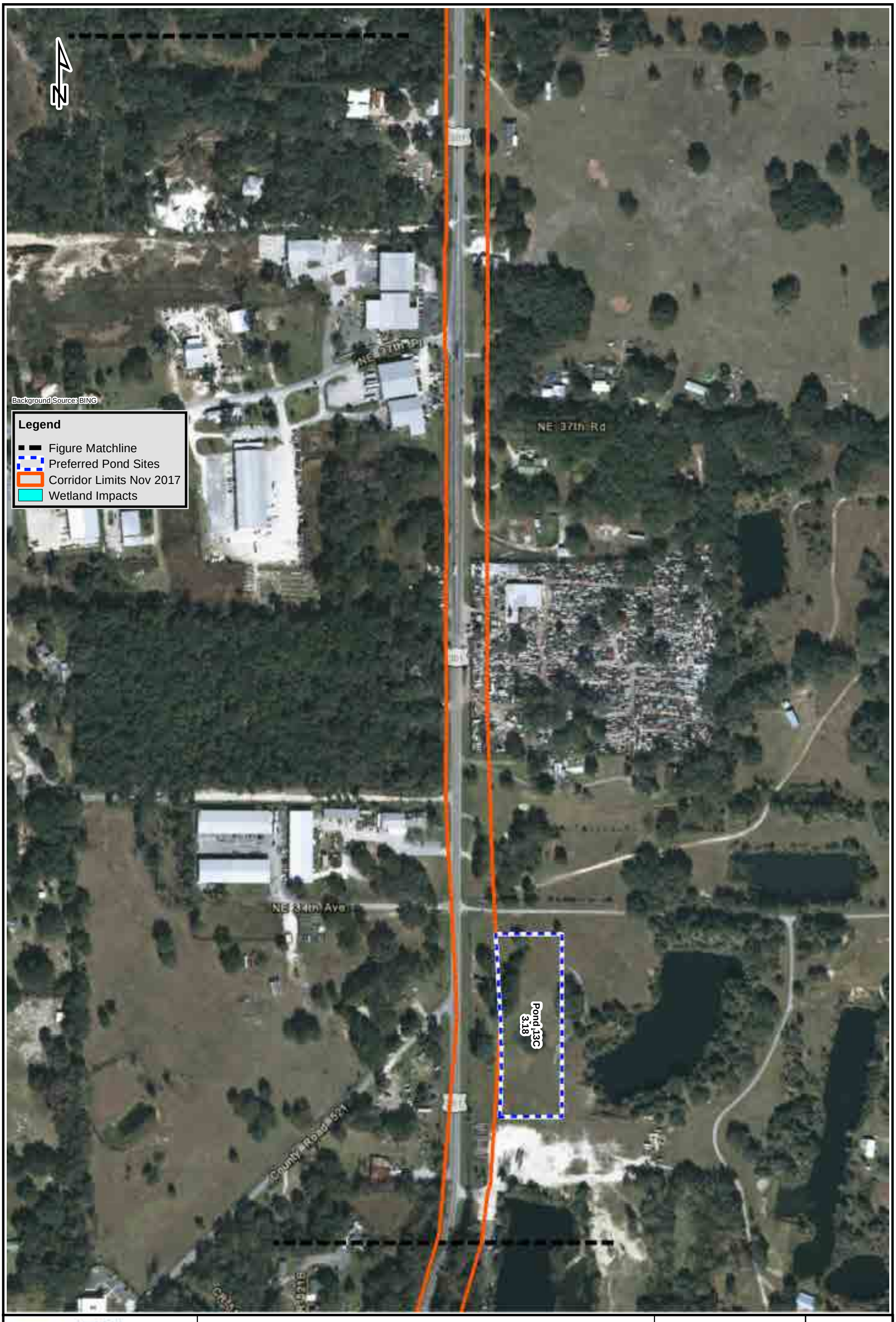
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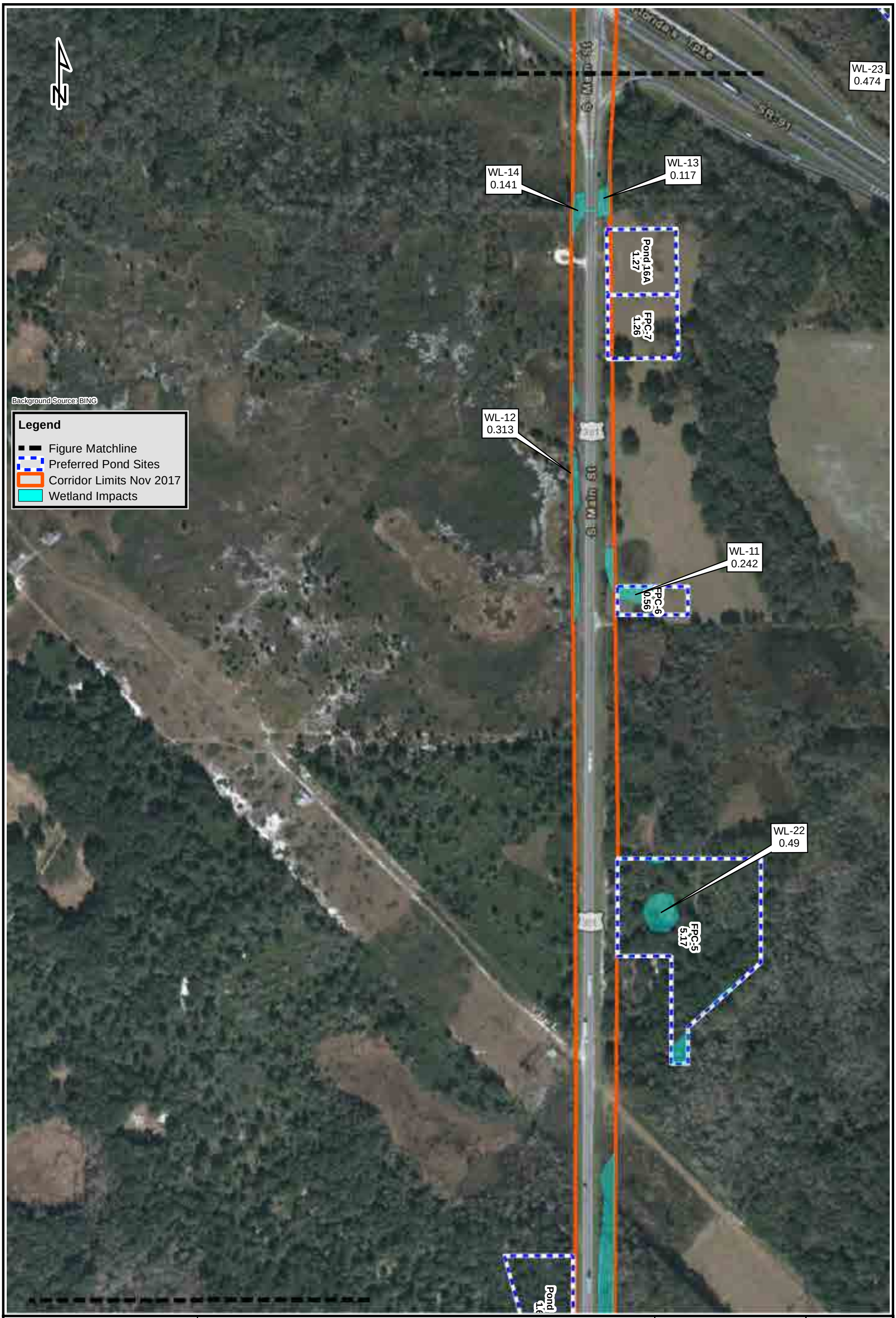
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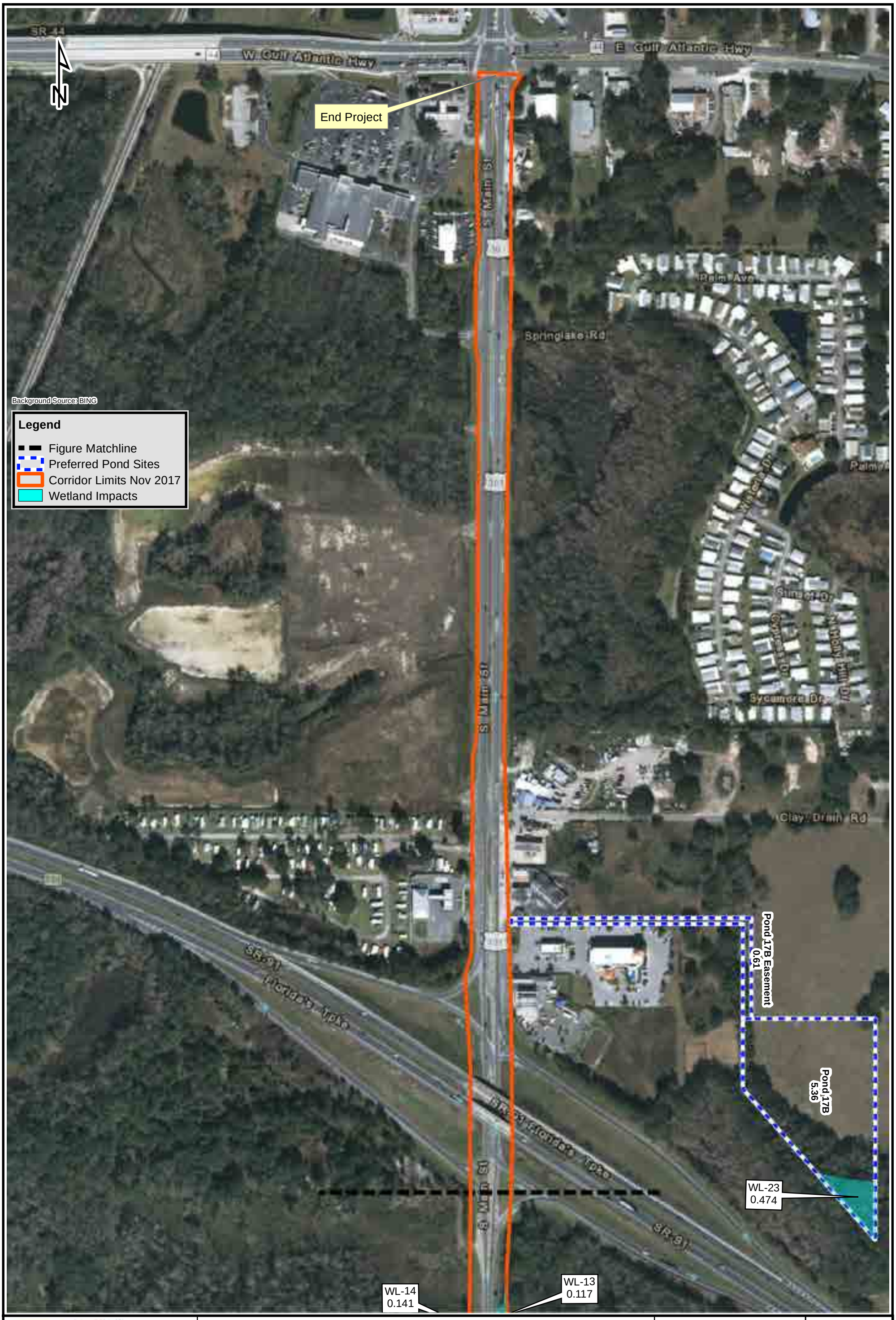
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Note:
Snail Kite and Scrub Jay Consultation Areas cover the entire limits of this map.

Legend

- Figure Matchline

Observed Wildlife Occurrence

- Gopher Tortoise
- Kestrel
- Red-tailed Hawk
- Sandhill Cranes
- White Egret
- Wading Bird Rookery
- Eagle Nesting
- CRESTED CARACARA, CA - US FWC, 2003
- Wildlife_Observations FWC Feb 2015
- Preferred Pond Sites
- Project Study Area

Background Source: BING

Pond 3B Easement
0.26

Pond 3B
2.48

Pond 2A
1.93

Pond 1B
1.02

Begin Project

0 400 800
Feet

FDOT			**US 301 (SR 35) PD&E Study from CR 470 E to SR 44**	Wildlife Occurrence Map	FIGURE 7
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Note:
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Legend

Figure Matchline

Observed Wildlife Occurrence

- Gopher Tortoise
- Kestrel
- Red-tailed Hawk
- Sandhill Cranes
- White Egret
- Wading Bird Rookery
- Eagle Nesting
- CRESTED CARACARA, CA - US FWC, 2003
- Wildlife_Observations FWC Feb 2015
- Preferred Pond Sites
- Project Study Area

Background Source: BING

10C

19B Pond 9A Easement 0.51

Pond 19A 7.17

Pond 19A Easement 0.25

FPC-1 0.56

Pond 4B 2.16

0 400 800 Feet

FDOT		**US 301 (SR 35) PD&E Study from CR 470 E to SR 44**	Wildlife Occurrence Map	FIGURE 7	
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Note:
Snail Kite and Scrub Jay Consultation Areas cover the entire limits of this map.

FPC-4
2.25

Pond 14C
2

Pond 14C Easement
0.3

13C
Pond 13C
3.18

12A

Pond 22C
2.91

10C

Pond 21A
3.4

Legend

- Figure Matchline

Observed Wildlife Occurrence

- Gopher Tortoise
- Kestrel
- Red-tailed Hawk
- Sandhill Cranes
- White Egret
- Wading Bird Rookery
- Eagle Nesting
- CRESTED CARACARA, CA - US FWC, 2003
- Wildlife_Observations FWC Feb 2015
- Preferred Pond Sites
- Project Study Area

Background Source: BING

0 400 800
Feet

FDOT			**US 301 (SR 35) PD&E Study from CR 470 E to SR 44**	Wildlife Occurrence Map	FIGURE 7
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Note:
Snail Kite and Scrub Jay Consultation Areas cover the entire limits of this map.

End Project

Legend

Figure Matchline

Observed Wildlife Occurrence

- Gopher Tortoise
- Kestrel
- Red-tailed Hawk
- Sandhill Cranes
- White Egret
- Wading Bird Rookery
- Eagle Nesting
- CRESTED CARACARA, CA - US FWC, 2003
- Wildlife_Observations FWC Feb 2015
- Preferred Pond Sites
- Project Study Area

Background Source: BING

Pond 17B Easement
0.51

Pond 17B
5.36

Pond 16A
1.27

FPC7
FPC-7
1.26

FPC-6
0.56

FPC-5
5.17

Pond 15B
1.6

FPC-4
2.25

Pond 14C
2

Pond 14C Easement
0.3

0 400 800
Feet

FDOT			**US 301 (SR 35) PD&E Study from CR 470 E to SR 44**	Wildlife Occurrence Map	FIGURE 7
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ATTACHMENTS

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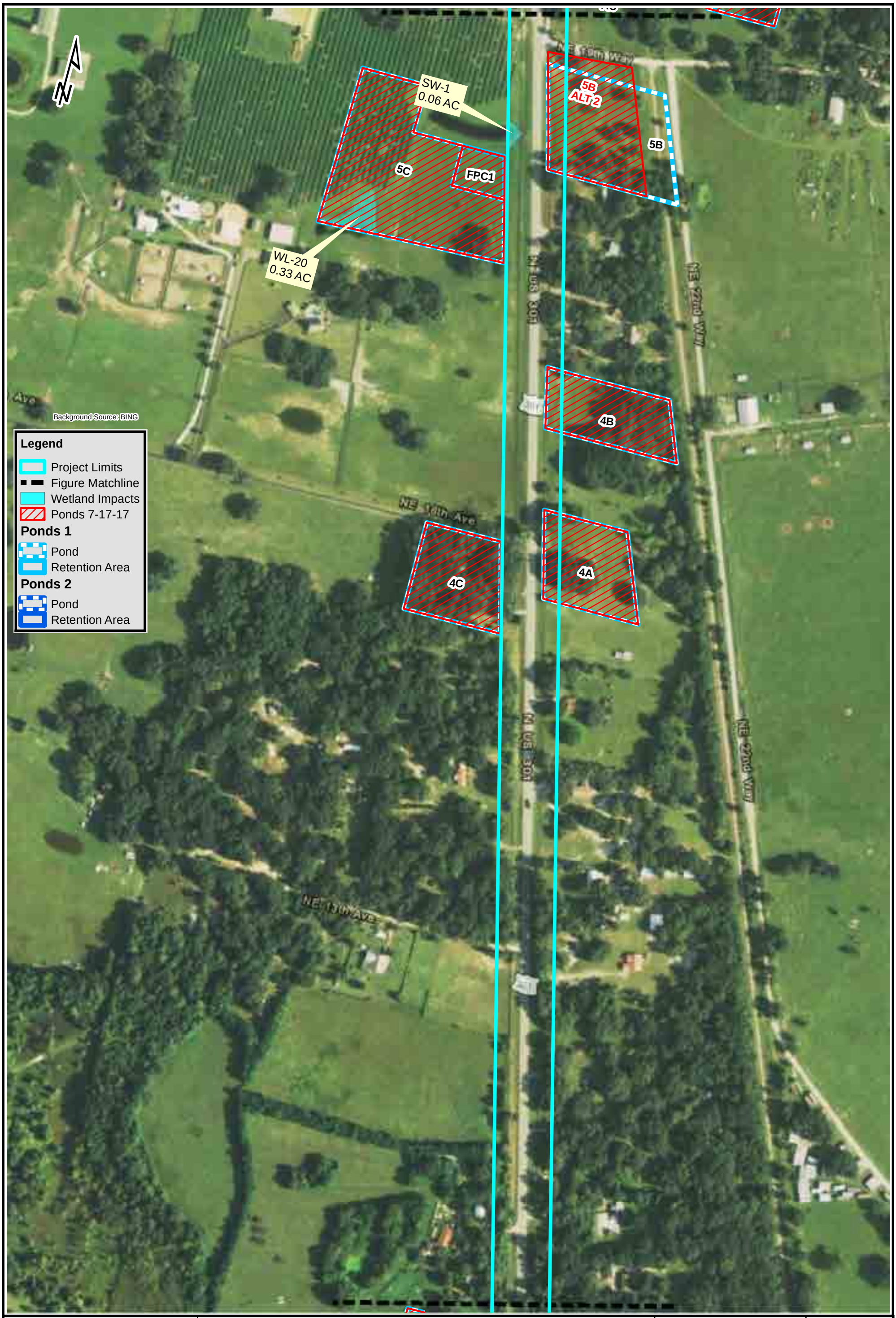
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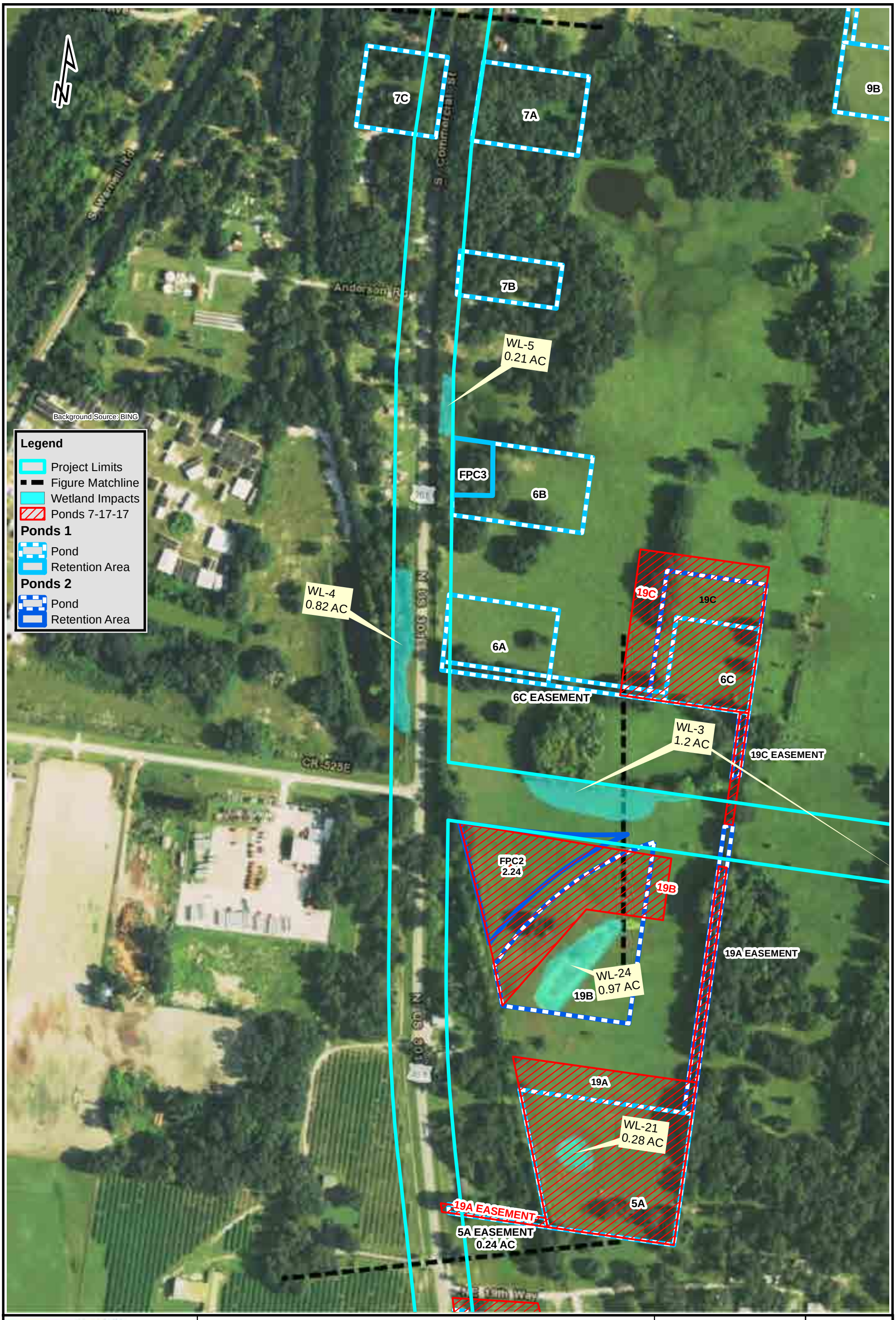


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SW-1
0.06 AC
WL-20
0.33 AC
5C
FPC1
5B
ALT 2
5B
4B
4A
4C
NE 170th Ave
NE 170th Ave
NE 170th Ave

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FDOT			US 301 (SR 35)	Wetland Impact Map	FIGURE 6
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Background Source: BING

Legend

- Project Limits
- Figure Matchline
- Wetland Impacts
- Ponds 7-17-17

Ponds 1

- Pond
- Retention Area

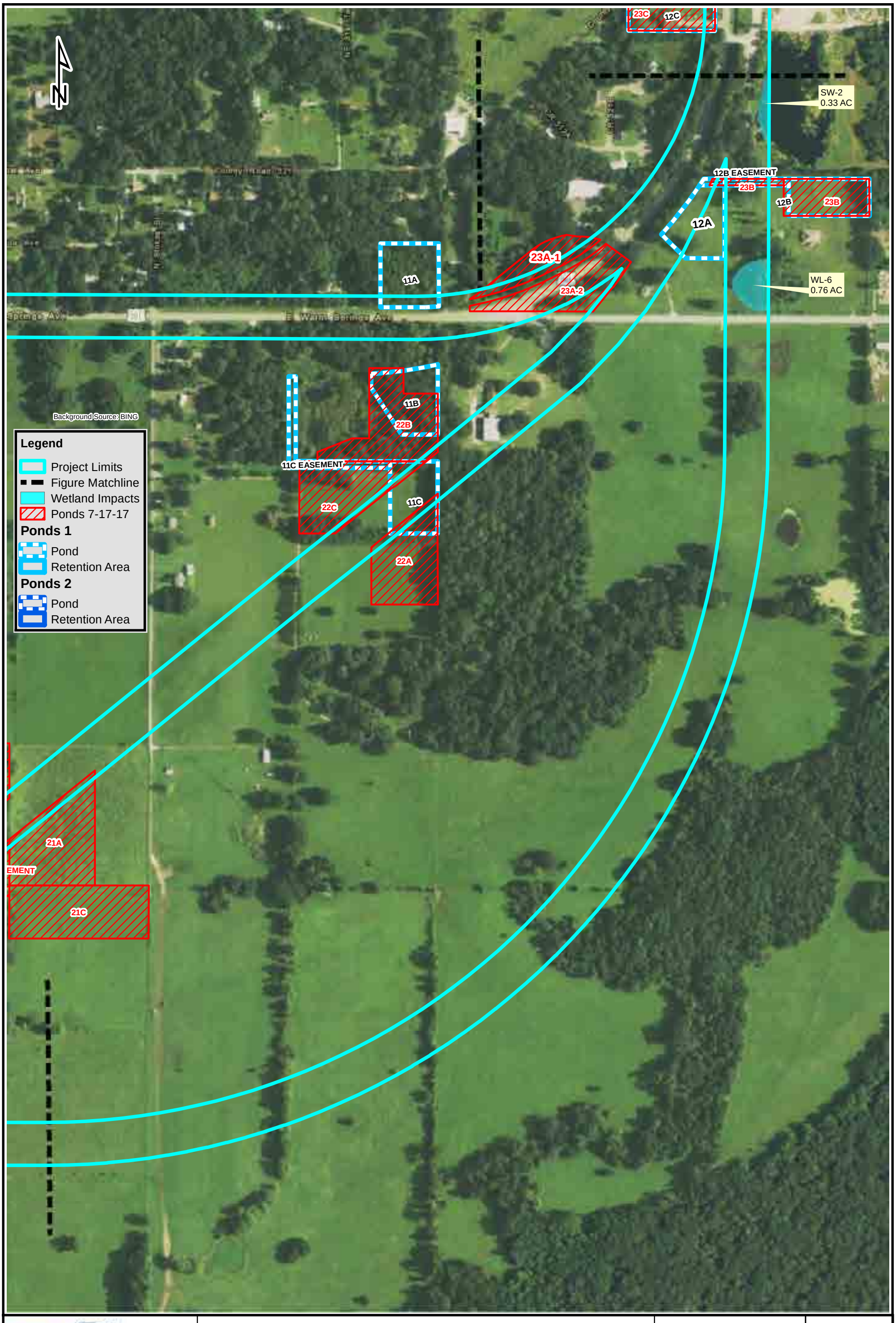
Ponds 2

- Pond
- Retention Area

21A
21C EASEMENT
21B
20B ALT 2
20A EASEMENT
20A ALT 2
WL-26
0.06 AC
20C ALT 2
19C EASEMENT
19A EASEMENT
6C
19C
WL-3
1.2 AC
19B
6C EASEMENT
6B
6A
FPC2
2.24

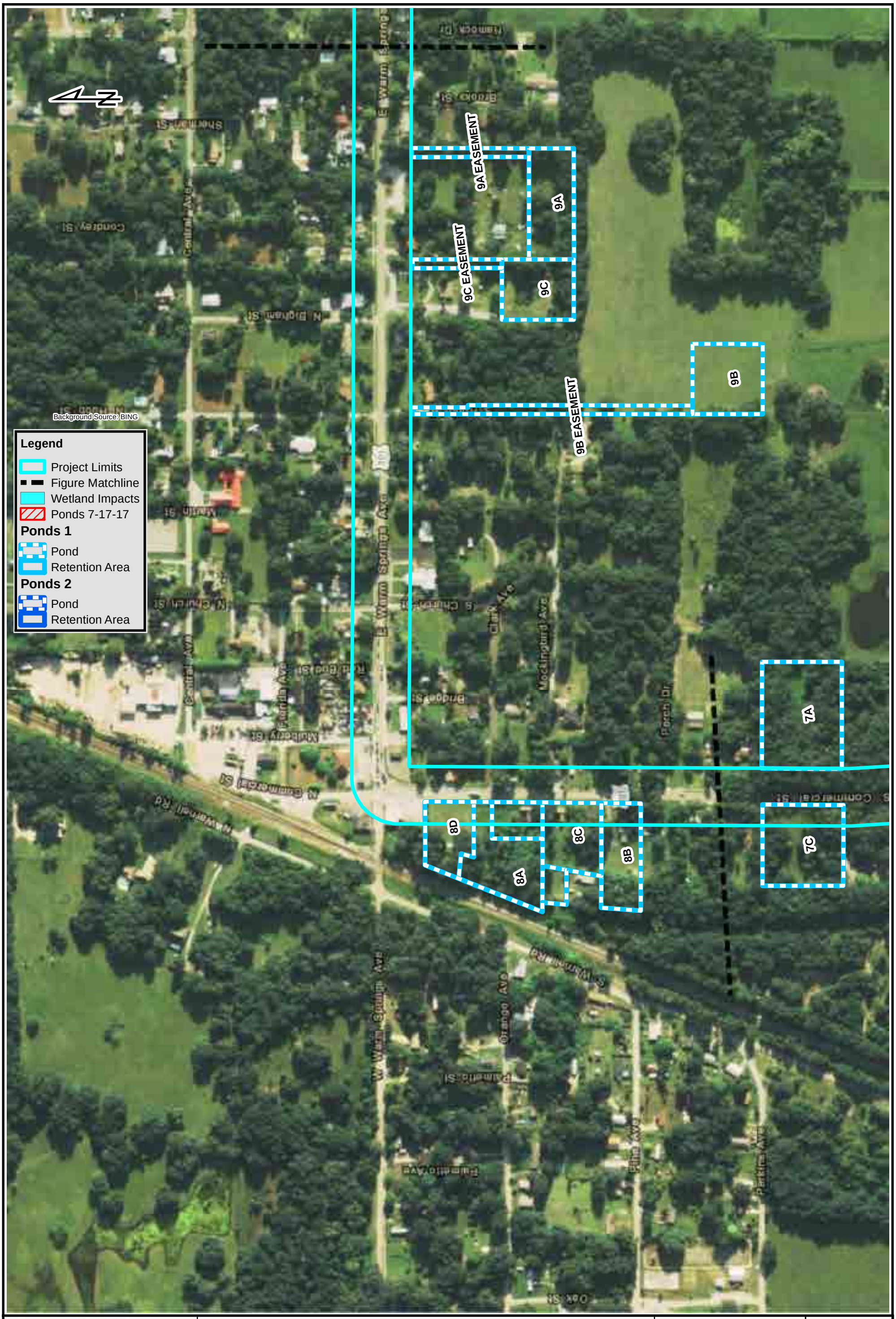
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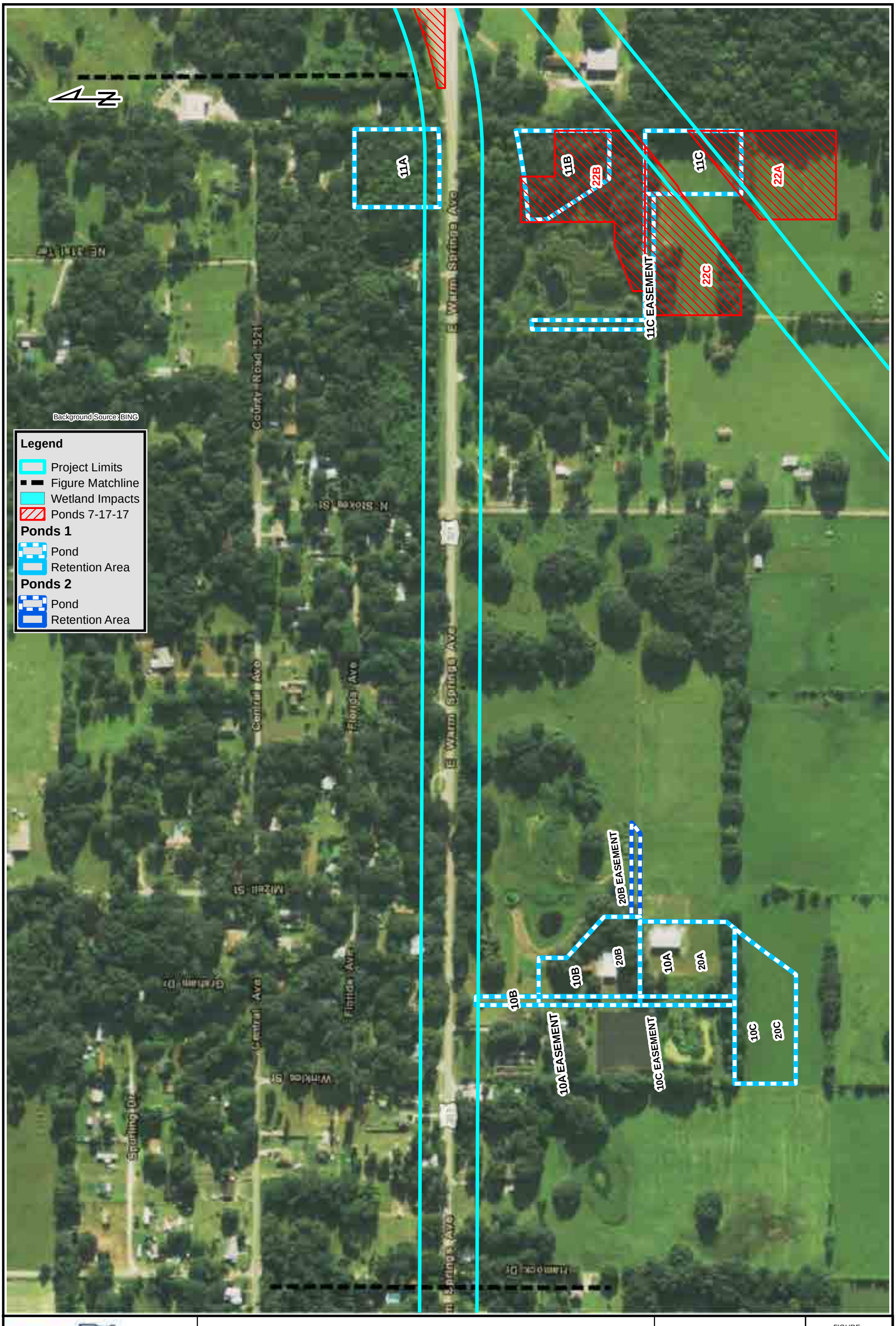
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FDOT	**US 301 (SR 35)**		Wetland Impact Map		FIGURE 6
DRAWN BY: LG	CHECKED BY: PS	PROJECT NUMBER: 1-1849-001	Sumter County, FL	SCALE: 1 "=300 '	DATE: 8/15/2017	Sheet 8 of 12

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Background Source: BING

Legend

- Project Limits
- Figure Matchline
- Wetland Impacts
- Ponds 7-17-17

Ponds 1

- Pond
- Retention Area

Ponds 2

- Pond
- Retention Area

NE 87th Rd

NE 87th Pl

NE 83rd Ave

13A

13A EASEMENT

13B

13B EASEMENT

13B EASEMENT

13C

13C

23C

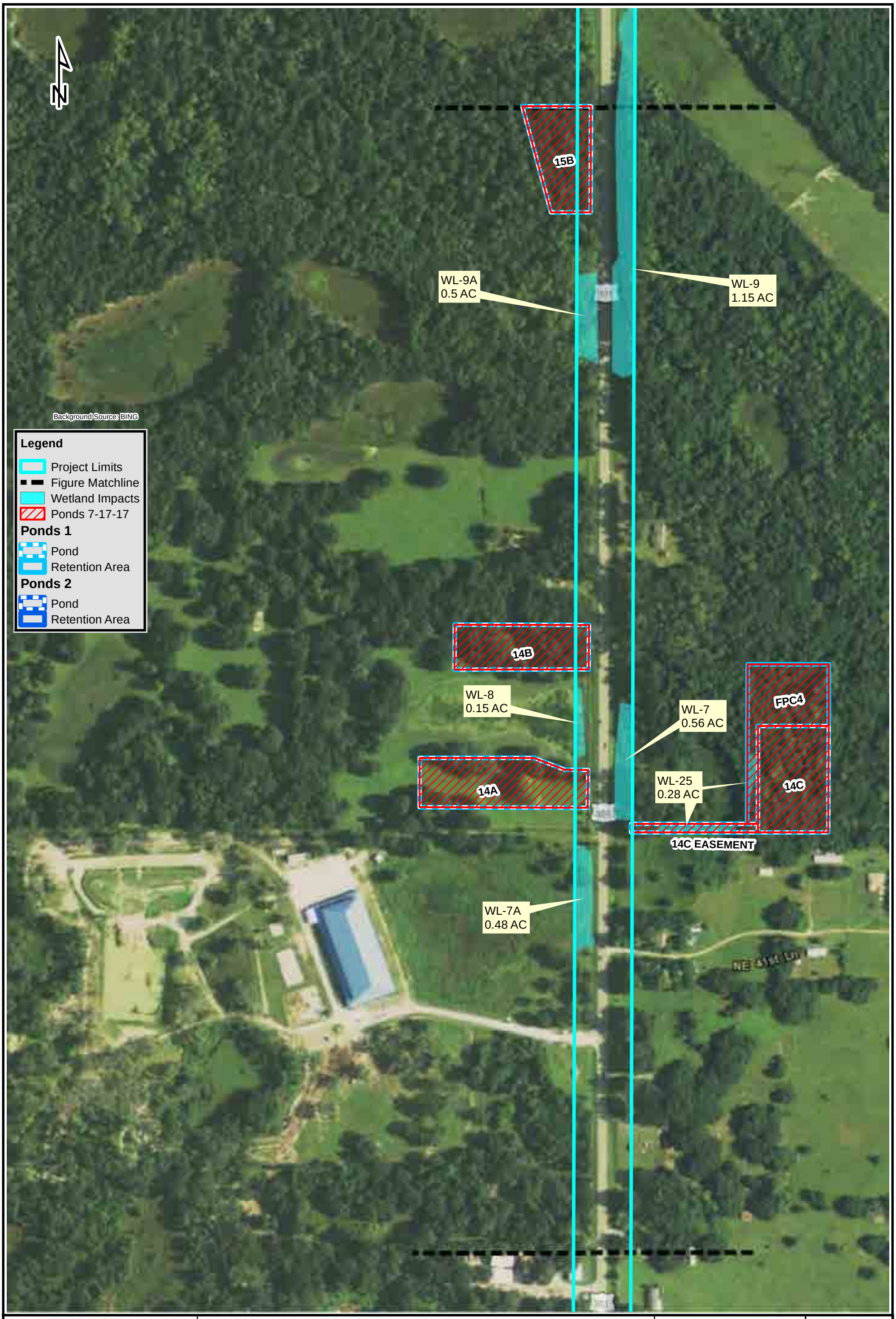
12C

SW-3
1.58 AC

SW-2
0.33 AC

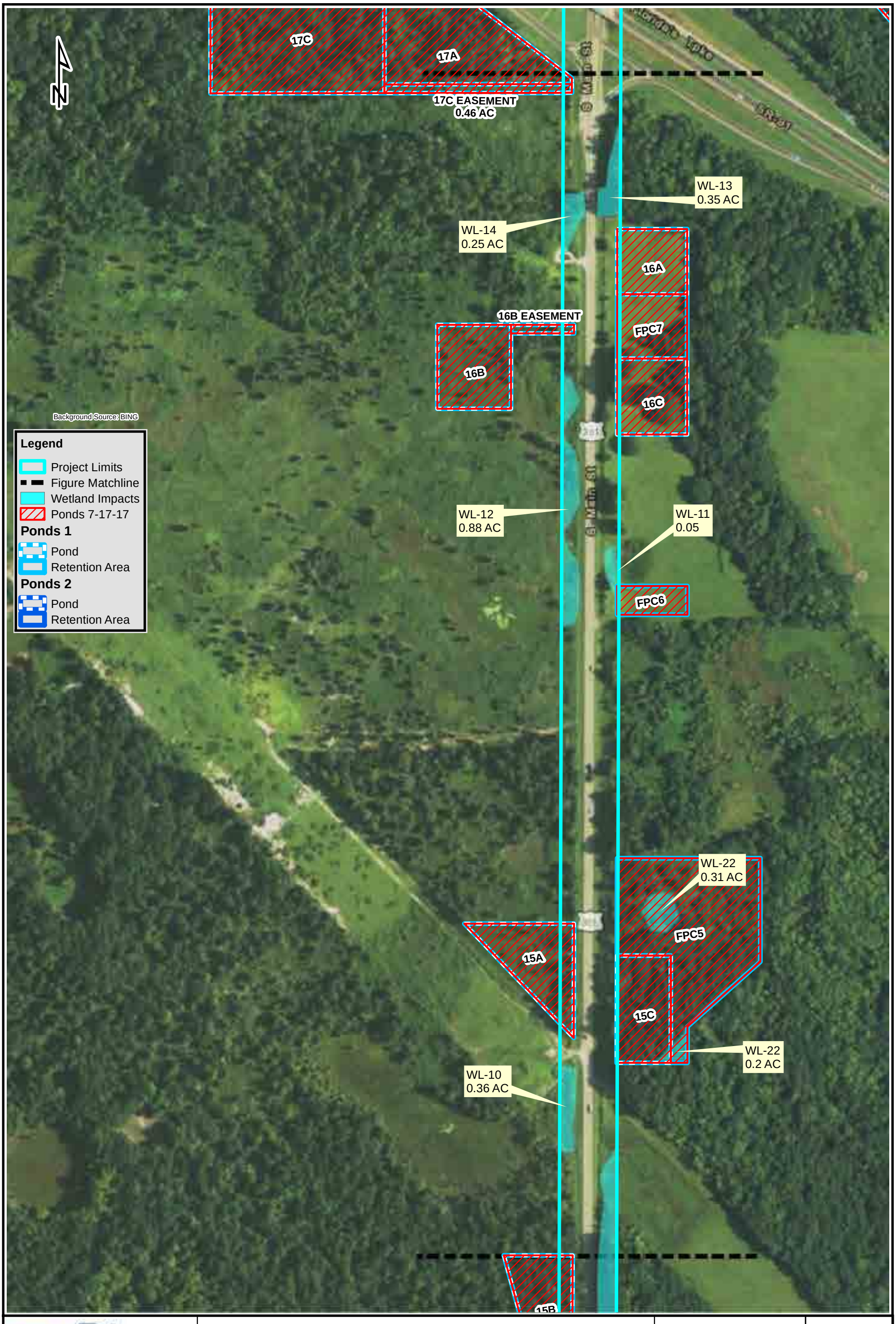
FDOT			US 301 (SR 35)	Wetland Impact Map	FIGURE 6
DRAWN BY: LG	CHECKED BY: PS	PROJECT NUMBER: 1-1849-001	Sumter County, FL	SCALE: 1 "=300 ' / DATE: 8/15/2017	Sheet 9 of 12

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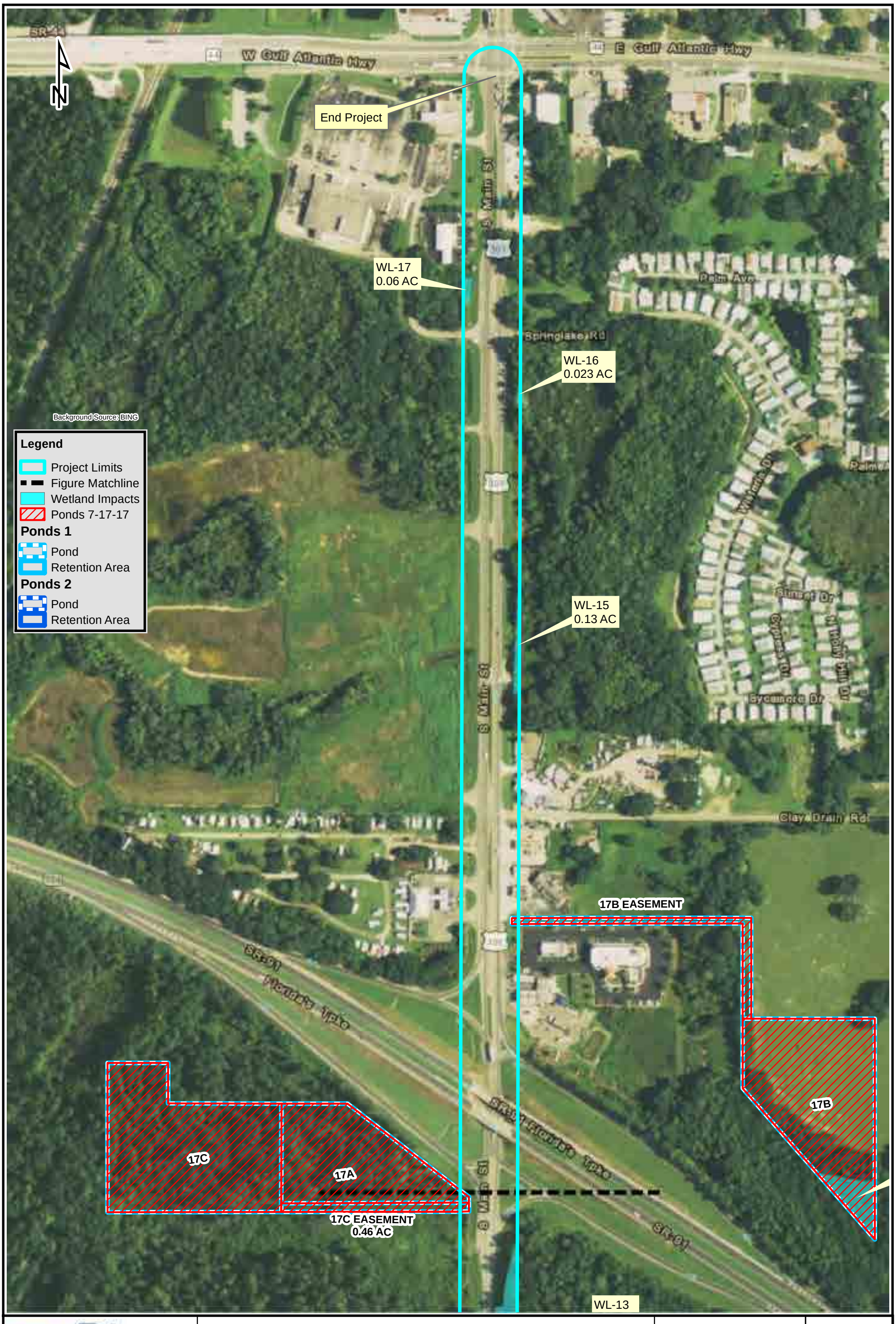
FDOT			**US 301 (SR 35)**	Wetland Impact Map	FIGURE 6
DRAWN BY: LG	CHECKED BY: PS	PROJECT NUMBER: 1-1849-001	Sumter County, FL	SCALE: 1 "=300 '	DATE: 8/15/2017	Sheet 10 of 12

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FDOT			**US 301 (SR 35)**	Wetland Impact Map	FIGURE 6
DRAWN BY: LG	CHECKED BY: PS	PROJECT NUMBER: 1-1849-001	Sumter County, FL	SCALE: 1 "=300 ' / DATE: 8/15/2017	Sheet 11 of 12

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FDOT			**US 301 (SR 35)**	Wetland Impact Map	FIGURE 6
DRAWN BY: LG	CHECKED BY: PS	PROJECT NUMBER: 1-1849-001	Sumter County, FL	SCALE: 1 "=300 '	DATE: 8/15/2017	Sheet 12 of 12

APPENDIX H

Contamination Screening Evaluation Report

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Ponds

The pond site options identified for evaluation are located onsite within the existing ROW, offsite, or along the new potential Truck Route ROW alignment. In November 2016, sixty-five (65) Preliminary Pond Alternative locations and twenty-one (21) associated Easements were received for evaluation. Updates to the Preliminary Ponds and Easements were received in May 2017. The revised pond sites are presented on recent aerial photographs in **Appendix B, Sheet B-8**. The contamination screening evaluation has resulted in the following risk rankings for the revised preliminary pond sites:

Table 2 – Preliminary Ponds Risk Ranking Summary

Pond Name	Pond Size (acres)	Risk Ranking	Comments
		Mainline Ponds	
1A	1.27	NO	Historical Pastureland.
1B	1.02	NO	Historical Pastureland.
1C	1.59	HIGH	Located on the Shady Brook golf course property. Concerns regarding residual herbicides/pesticides and fertilizers.
2A	1.93	NO	Wooded.
2B	3.20	LOW	Residential and partially wooded.
2C + Easement	2.65 + 0.30	NO	Wooded.
3A	3.47	LOW	Residential and partially wooded.
3B + Easement	2.48 + 0.26	LOW	Wooded.
3C	2.33	NO	Wooded.
4A	2.21	LOW	Residential, pasture and partially wooded.
4B	2.16	MEDIUM	Residential, pasture and partially wooded. Concerns regarding herbicides/pesticides and petroleum-based products on the east adjoining former railroad corridor.
4C	2.19	LOW	Residential and wooded.
5A + Easement	5.58 + 0.25	MEDIUM	Residential and partially wooded. Similar footprint as Truck Route Pond 19A, with different Easement. Concerns regarding herbicides/pesticides and petroleum-based products on the west adjoining former railroad corridor.
5B	3.09	MEDIUM	Residence. Concerns regarding herbicides/pesticides and petroleum-based products on the east adjoining former railroad corridor.
5C	5.58	MEDIUM	Row crops and Pastureland.
FPC-1	0.56	NO	Historical Pastureland.
6A	2.30	NO	Historical Pastureland.
6B	2.29	NO	Historical Pastureland and partially wooded.
6C	2.01 + 0.54	NO	Historical Pastureland. Similar footprint as Truck Route Pond 19C, with different Easement.
FPC-3	0.61	NO	Wooded.
7A	2.37	NO	Wooded.
7B	1.24	NO	Wooded.
7C	1.83	MEDIUM	Residential. South adjoining “Shade Tree” auto mechanic.

Table 2 – Preliminary Ponds Risk Ranking Summary

Pond Name	Pond Size (acres)	Risk Ranking	Comments
8A	1.43	MEDIUM	Residential and partially wooded. Concerns regarding herbicides/pesticides and petroleum-based products on the west adjoining railroad corridor and the east adjacent (presumed) historical fuel station. This pond site sits within the footprint of Pond 8D.
8B	1.16	MEDIUM	Residential and partially wooded. Concerns regarding herbicides/pesticides and petroleum-based products on the west adjoining railroad corridor.
8C	1.14	MEDIUM	Residential and partially wooded. Concerns regarding herbicides/pesticides and petroleum-based products on the west adjoining railroad corridor.
8D	4.19	MEDIUM	Vacant, residential and partially wooded. Concerns regarding herbicides/pesticides and petroleum-based products on the west adjoining railroad corridor and the east adjacent (presumed) historical fuel station. This pond site encompasses the footprint of Pond 8A.
9A + Easement	1.39 + 0.29	LOW	Residential property with possible automobile salvage yard.
9B + Easement	1.37 + 0.65	NO	Historical Pastureland.
9C + Easement	1.21 + 0.22	LOW	Coleman City Hall property.
10A + Easement	2.19 + 1.18	NO	Historical Pastureland. West adjoining Plant Nursery and storage.
10B ~~+ Easement~~	1.96 ~~+ 0.15~~	NO	Historical Pastureland. West adjoining Plant Nursery.
10C + Easement	2.25 + 1.04	NO	Historical Pastureland. North adjoining Plant Nursery.
11A	1.84	NO	Wooded.
11B	1.78	NO	Wooded.
11C + Easement	1.70 + 0.43	NO	Historical Pastureland and partially wooded
12A	1.73	LOW	Vacant, Residential, Pastureland. North adjoining former quarry. Similar footprint to Pond 23A.
12B + Easement	1.48 + 0.28	LOW	Vacant, Residential, Pastureland. North adjoining former quarry. Similar footprint to Pond 23B.
12C	1.44	HIGH	Davis Garage auto service/repair. Similar footprint to Pond 23C. Concerns regarding residual impacts from petroleum products and other automotive fluids.
13A + Easement	2.19 + 0.54	NO	Wooded.
13B + Easement	2.35 + 0.54	LOW	Existing pond. Adjoining former quarry.
13C	3.18	LOW	Historical Pastureland. Adjoining former quarry.
14A	2.20	LOW	Historical Pastureland.
14B	1.67	LOW	Pastureland and residence.
14C + Easement	2.10 + 0.30	NO	Wooded.
FPC-4	1.68	NO	Wooded.
15A	1.75	NO	Wooded. South adjoining power easement.
15B	1.60	NO	Wooded.
15C	1.61	NO	Wooded. South adjoining power easement.
FPC-5	5.17	NO	Wooded. South adjoining power easement.
FPC-6	0.56	NO	Historical Pastureland.
16A	1.27	NO	Historical Pastureland.

Table 2 – Preliminary Ponds Risk Ranking Summary

Pond Name	Pond Size (acres)	Risk Ranking	Comments
16B + Easement	1.72 + 0.15	NO	Wooded.
16C	1.48	NO	Historical Pastureland.
FPC-7	1.26	NO	Historical Pastureland.
17A	4.08	NO	Wooded.
17B + Easement	5.36 + 0.61	MEDIUM	Pastureland and partially wooded. The Easement passes by existing fuel stations.
17C + Easement	5.95 + 0.46	NO	Wooded.
18	-	-	N/A
		Truck Route Ponds	
19A + Easement-1 **19A + Easement-2**	7.17 + 0.25 7.17 + 0.51	HIGH	Residential and partially wooded. Similar footprint as Mainline Pond 5A, with different Easement. Concerns regarding herbicides/pesticides and petroleum-based products on the west adjoining railroad corridor.
19B	5.26	NO	Pastureland with existing pond. Concerns regarding herbicides/pesticides and petroleum-based products on the west adjoining railroad corridor.
19C + Easement	5.33 + 0.27	NO	Historical Pastureland. Similar footprint as Mainline Pond 6C, with different Easement.
~~**FPC-2**~~	~~1.48~~	~~HIGH~~	~~Pastureland. West adjoining railroad.~~
20A + Easement	1.93 + 0.28	NO	Historical Pastureland.
20B ~~+ Easement~~	1.93 ~~+ 0.36~~	NO	Historical Pastureland.
20C	1.88	NO	Historical Pastureland.
21A	3.40	NO	Historical Pastureland.
21B	3.42	NO	Historical Pastureland.
21C + Easement	3.68 + 0.28	NO	Historical Pastureland.
22A	2.77	NO	Historical Pastureland.
22B	3.18	NO	Wooded.
22C	2.91	NO	Historical Pastureland.
23A	2.36	LOW	Residential, Pastureland. ROW. Adjacent to former quarry area. Similar footprint to Pond 12A.
23A-1	1.28	NO	Wooded. ROW.
23A-2	2.30	NO	Wooded. ROW.
23B + Easement	1.57 + 0.23	LOW	Vacant, Residential, Pastureland. North adjoining former quarry. Similar footprint to Pond 12B.
23C	1.44	HIGH	Davis Garage auto service/repair. Similar footprint to Pond 12C. Concerns regarding residual impacts from petroleum products and other automotive fluids.
Notes: No named Pond 18, FPC-2 is removed, Easements 10B and 20B are removed			

A total of seventy-four (74) Preliminary Pond Alternatives and nineteen (19) associated Easements were identified for evaluation based on revised files received in May 2017. Tierra completed a review of environmental record databases, historical research, site reconnaissance, and detailed file reviews; which may present the potential for finding petroleum contamination or hazardous materials and therefore may impact the proposed improvements for this project. Of the pond alternatives investigated, the following risk rankings have been applied: **three (3) "High" ranking pond sites, ten (10) "Medium" ranking pond sites, fifteen (15) "Low" ranking pond sites, and forty-six (46) pond sites ranked "No"** for potential contamination concerns.

Evaluations

For the sites ranked "No" for potential contamination, no further action is recommended. These sites have been evaluated and determined not to have any potential environmental risk to the study area at this time.

For sites ranked "Low" for potential contamination, no further action is required at this time. These sites/facilities have potential to impact the study area, but based on select variables have been determined to have low risk to the corridor at this time. Variables that may change the risk ranking include a facility's non-compliance to environmental regulations, new discharges to the soil or groundwater, and modifications to current permits. Should any of these variables change, additional assessment of the facilities should be conducted.

For those locations with a risk ranking of "Medium" or "High", that have not been previously assessed, Level 2 field screening should be conducted. These sites have been determined to have potential contaminants, which may impact the project corridor. A soil and groundwater sampling plan should be developed for each site.

The sampling plan should provide sufficient detail as to the number of soil and groundwater samples to be obtained and the specific analytical test to be performed. A site location sketch for each facility showing all proposed boring locations and groundwater monitoring wells should be prepared. Prior to conducting any field screenings the District Contamination Impact Coordinator (DCIC) should be notified.

Regardless of the risk ranking, all ponds sites selected for final design will require Level 2 field screening. The field screening scope of work should include, at a minimum, soil borings to the proposed depth of the pond and soil sampling for total arsenic. Additional sample analyses may be required based on historical land use of the pond site and surrounding properties. The District Contamination Impact Coordinator should be consulted regarding the field screening scope of work for all final pond sites.

This *Executive Summary* provides a brief overview of the environmental contamination concerns associated with the proposed roadway improvement project. The reader should utilize the detailed information presented within this report for specific information regarding any area of particular interest.

NOTE: These 4 pages have been extracted from the combined Draft Level I CSER that includes information for the ponds, mainline and alternatives. The full report should be reviewed in is entirety.

APPENDIX I

Geotechnical Report

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Table 2
Summary of Seasonal High Groundwater Table Estimates for Ponds
US 301 (SR 35) PD&E Study
Sumter County, Florida
FPN: 430132-1-22-01
Tierra Project No: 5511-15-004

Boring Number	Boring Location[1] C/L Construction SR 35		Boring Depth[2]	Ground Surface Elevation NAVD88[1]	Measured GWT		Date Groundwater Table Recorded	USDA Soil Survey		Estimated SHGWT	
	Station (feet)	Offset (feet)	(feet)	(feet)	Depth Below Ground Surface (feet)	Elevation NAVD88 (feet)		Soil Map Unit	SHGWT Depth[3] (feet)	Depth Below Ground Surface (feet)	Elevation NAVD88 (feet)
PB-1B	110+21	175 RT	20.0	65.3	GNA[4]	GNA[4]	11/17/2017	65	0.0-1.0	6.0 [5]	59.3
PB-2A-2	146+56	148 LT	25.0	53.5	GNA[4]	GNA[4]	11/17/2017	9	0.0-1.0	2.0 [5]	51.5
PB-2A-1	148+93	121 LT	20.0	49.6	GNA[4]	GNA[4]	11/02/2017	9/49	0.0-1.0	0.0 [5]	49.6
PB-3B-1	153+54	372 RT	20.0	52.8	GNA[4]	GNA[4]	11/07/2017	17	1.5-6.0	4.0 [5]	48.8
PB-3B-2	156+64	349 RT	20.0	54.4	GNA[4]	GNA[4]	11/07/2017	27	1.5-3.0	8.0 [5]	46.4
PB-4B-1	190+98	473 RT	25.0	58.8	GNA[4]	GNA[4]	11/06/2017	42	2.0-3.5	6.0	52.8
PB-4B-2	193+12	140 RT	20.0	55.9	4.5	51.4	11/06/2017	42	2.0-3.5	3.0	52.9
FPC-1	200+95	173 LT	20.0	54.0	2.5	51.5	10/12/2017	43	+2.0-1.0	1.0	53.0
PB-19A-2	207+66	732 RT	20.0	59.7	GNA[4]	GNA[4]	11/06/2017	42	2.0-3.5	2.0 [5]	57.7
PB-19A-1	211+85	517 RT	20.0	57.7	5.0	52.7	11/06/2017	42	2.0-3.5	3.5	54.2
PB-20C	240+72	164 LT	20.0	57.0	3.5	53.5	10/12/2017	34	1.5-2.5	0.0 [5]	57.0
PB-21A-1	269+35	221 RT	20.0	56.3	3.0	53.3	10/12/2017	34	1.5-2.5	0.0 [5]	56.3
PB-21A-2	272+04	183 RT	20.0	56.3	3.0	53.3	10/12/2017	34	1.5-2.5	0.0 [5]	56.3
PB-22C-2	290+41	273 LT	20.0	62.5	GNA[4]	GNA[4]	10/13/2017	27/33	1.5-3.0	0.0 [5]	62.5
PB-22C-1	293+12	154 LT	20.0	66.0	GNA[4]	GNA[4]	10/13/2017	27	1.5-3.0	4.0 [5]	62.0
PB-23A-1	305+56	393 LT	20.0	64.0	GNA[4]	GNA[4]	11/16/2017	21/33	0.0-1.0/1.5-3.0	0.0 [5]	64.0
PB-23A-2	305+68	188 LT	20.0	64.3	9.0	55.3	10/13/2017	33	1.5-3.0	2.0 [5]	62.3
PB-23A-3	308+03	127 LT	20.0	63.3	9.5	53.8	10/13/2017	33	1.5-3.0	2.0 [5]	61.3
PB-13C-1	325+08	174 RT	20.0	59.3	GNA[4]	GNA[4]	11/01/2017	51	[6]	0.0 [5]	59.3
PB-13C-2	328+67	197 RT	20.0	61.4	GNA[4]	GNA[4]	11/01/2017	51	[6]	0.0 [5]	61.4
PB-14C	377+12	656 RT	20.0	60.7	GNA[4]	GNA[4]	11/16/2017	46	0.0-1.0	6.0 [5]	54.7
FPC-4	378+63	677 RT	20.0	61.4	GNA[4]	GNA[4]	11/16/2017	46	0.0-1.0	4.0 [5]	57.4
PB-15B	398+31	177 LT	35.0	63.9	GNA[4]	GNA[4]	11/16/2017	46	0.0-1.0	2.0 [5]	61.9
FPC-5-2	409+63	314 RT	20.0	61.8	7.0	54.8	11/02/2017	21/34	0.0-1.0/1.5-2.5	6.0	55.8
FPC-5-1	412+21	314 RT	20.0	61.4	GNA[4]	GNA[4]	11/02/2017	34	1.5-2.5	6.0 [5]	55.4
FPC-6	422+28	217 RT	20.0	57.0	GNA[4]	GNA[4]	11/02/2017	34/54	1.5-2.5/+2.0-0.0	3.0	54.0
FPC-7	432+18	157 RT	20.0	57.8	GNA[4]	GNA[4]	11/02/2017	34	1.5-2.5	4.0	53.8
PB-16A	434+74	168 RT	20.0	58.0	GNA[4]	GNA[4]	11/02/2017	34	1.5-2.5	4.0	54.0
PB-17B-2	443+21	1252 RT	20.0	58.0	GNA[4]	GNA[4]	11/01/2017	21	0.0-1.0	2.0 [5]	56.0
PB-17B-1	446+13	1009 RT	25.0	57.7	8.0	49.7	11/01/2017	26	0.0-1.0	2.0 [5]	55.7

[1] Boring locations (station and offset) and ground surface elevations were determined using the Microstation design files provided by HDR.
[2] Depth below existing grades at time of field services.
[3] Seasonal high groundwater table depth reported in the Soil Survey of Sumter County, Florida published by the USDA/NRCS.
[4] GNA: Groundwater not apparent due to introduction of drilling fluid.
[5] Perched seasonal high groundwater table depth estimated based on soil stratigraphy.
[6] Soil Type Dump-Pits Complex. No estimates provided by the USDA NRCS.

APPENDIX J

Correspondence

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Meeting Minutes

3000 Dovera Drive, Suite 200, Oviedo, FL 32765 | P: 407-971-8850 | F: 407-971-8955 | www.inwoodinc.com

DATE: February 23, 2016

TO: Renato Chuw

FROM: Cameron DeWitt

RE: US 301 PD&E Study (FPID: 430132-1-22-01) | Site visit meeting with Milton Hill (Mayor of Coleman, FL) and Richard Huff (President of Coleman City Counsel) regarding flooding issues within City of Coleman

CC: Sean Carrigan; File

11:15 – 11:45 AM

Met with Milton Hill (Mayor of Coleman, FL) and Richard Huff (President of Coleman City Counsel).

Discussed frequent flooding of parcels and road (Florida Avenue) near US 301. Storm water collects at a low point in the topography along Florida Avenue between Commercial Street and Mulberry Street, oftentimes flooding into both of those streets as well. Storm water flows from a highpoint in the topography to the east, along Florida Avenue and collects in both the roadway and the open portion of the adjacent parcel, covering this entire area. They also reported flood waters rising high enough to enter some surrounding buildings and seeping into a nearby septic tank.

Mr. Hill and Mr. Huff said flooding has reached US 301 during times of heavy rain, has flowed overtop of it and into a storm sewer system installed on the south side of the road.

Mr. Hill and Mr. Huff then identified this storm sewer infrastructure installed by FDOT at the intersection of Commercial Street and Warm Springs Road (US 301) which consisted of one DBI and two grate inlets. This system outfalls into a ditch along the East side of the nearby CSX railway which flows south.

Inwood received copies of the FDOT Phase IV plans for this drainage system at the Coleman city office.

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 404164

Date:	2/16/2017
Time:	10:00
Project Name:	FDOT US301 - CR470 E to SR44
District Engineer:	Monte Ritter
District ES:	Kim Dymond
Attendees:	Sean Carrigan, Renato Chuw rchuw@inwoodinc.com

County:	Sumter	**Sec/Twp/Rge:**	7,18,19,30,31/19/23;25,26,35,36/19/22; 1,12,13/20/22
Total Land Acreage:		**Project Acreage:**	>100 <640 acres

Prior On-Site/Off-Site Permit Activity:

- ETDM #13955; Previous Permits 16854.000, 22044.001, 25096.003

Project Overview:

- PD&E for US 301 to widen from 2 lanes to 4 lanes between CR 470 E and SR 44 within existing 200-foot right of way. Project will also include a new section of roadway for a separate truck route south of the City of Coleman. For section between Turnpike and SR 44 will only include minor improvements, such as turn lanes, sidewalks and bike lanes.

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.

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- Watersheds – Withlacoochee River
- 100-year flood levels will need to be established prior to permitting.
- WBIDs 1359D, 1351C, 1356, 1351, and 1344. None of these WBIDs are currently listed as impaired. WBIDs need to be independently verified by the consultant
- Project crosses Shady Brook, an OFW.
- Portions of project may discharge to a closed basin
- Contaminated sites within 200-feet of project per ETDM #13955.
- Karst sensitive area.
- Document/justify SHWE's at pond locations, wetlands, and OSWs.
- Provide documentation to support tailwater conditions for quality and quantity design

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Demonstrate that post development peak discharges from proposed project area will not exceed pre-development peak discharges during a 25-year, 24-hour storm event.
- For projects or portions of projects that discharge to a closed basin, limit the post-development 100-year discharge volume to the pre-development 100-year, 24-hour volume.
- 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).[Refer to Subsections 3.0(a)(b)(c), 3.3, and 3.7 A.H.V.II]
- Provide equivalent compensating storage for all 100-year, 24-hour floodplain impacts if applicable.

- If performing storage modeling in lieu of providing “cup for cup” compensating storage, demonstrate that the project will not increase flood stages during lesser storm events including the 2.33-year, 10-year, 25-year, and 100-year, 24-hour storm events.

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- Presumptive Water Quality Treatment for Alterations to Existing Public Roadway Projects:
  -Refer to Section 4.5 A.H.V.II for Alterations to Existing Public Roadway Projects.
  -Refer to Sections 4.8, 4.8.1 and 4.8.2 A.H.V.II for Compensating Stormwater Treatment, Overtreatment, and Offsite Compensation.
  -All co-mingled existing & new impervious that is proposed to be connected to a treatment pond will require treatment for an area equal to the co-mingled existing & new impervious (times ½” for dry treatment or 1” for wet treatment). This applies whether or not equivalent treatment concepts are used.
  -However, if equivalent treatment concepts are used it is possible to strategically locate the pond(s) so that the minimum treatment requirement may be for an area equivalent to the new impervious area only. That is, co-mingled existing & new impervious that is not connected to a treatment pond may bypass treatment (as per Section 4.5(2), A.H.V.II); as long as the ‘total impervious area’ that is connected to the treatment pond(s) is at least equivalent to the area of new impervious only. The ‘total impervious area’ that is connected to the pond(s) may be composed of co-mingled existing & new impervious.
  -Offsite impervious not required to be treated; but may be useful to be treated when using equivalent treatment concepts.
  -Existing treatment capacity displaced by any road project will require additional compensating volume. Refer to Subsection 4.5(c), A.H.V.II.
- Will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated.
- Provide additional 50% treatment for any direct discharges to OFW. Refer to ERP Applicant’s Handbook Vol. II Subsection 4.1(f).
- Keep ponds as shallow as possible in karst sensitive areas.
- Avoid placing ponds near contamination sites.

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

- Improvements proposed to the Shady Brook Bridge. Need title determination to see if Shady Brook is SSL.

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 entity that owns or controls the property.

Application Type and Fee Required:

- SWERP Individual – Sections A, C, and E of the ERP Application. $3105.75 for an online submittal.
- Consult the fee schedule for different thresholds.

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

- An application for an individual permit to construct or alter a dam, impoundment, reservoir, or appurtenant work, requires that a notice of receipt of the application must be published in a newspaper within the affected area. Provide documentation that such noticing has been accomplished. Note that the published notices of receipt for an ERP can be in accordance with the language provided in Rule 40D-1.603(10), F.A.C.

- The plans and drainage report submitted electronically must include the appropriate information required under Rule 61G15-23.005(3)(d), F.A.C. The following text is acceptable to the Florida Board of Professional Engineers (FBPE) to meet this requirement and must appear where the signature would normally appear:

  [Licensee] State of Florida, Professional Engineer, License No. X
  This item has been electronically signed and sealed by [Licensee, PE] on [DATE] using a SHA-1 authentication code. Printed copies of this document are not considered signed and sealed and the SHA-1 authentication code must be verified on any electronic copies
- Provide soil erosion and sediment control measures for use during construction. Refer to ERP Applicant’s Handbook Vol. 1 Part IV Erosion and Sediment Control.

- If wells and/or a water use permit (WUP) are located on-site, contact District Water Use staff if wells or WUP will be impacted. You may be required to properly abandon/cap/plug wells located on site and/or modify the WUP quantities and/or type of use.
- Demonstrate that excavation of any stormwater ponds does not breach an aquitard (see Subsection 2.1.1, A.H.V.II) such that it would allow for lesser quality water to pass, either way, between the two systems. In those geographical areas of the District where there is not an aquitard present, the depth of the pond(s) shall not be excavated to within two (2) feet of the underlying limestone which is part of a drinking water aquifer. [Refer to Subsection 5.4.1(b), A.H.V.II]
- If lowering of SHWE is proposed, then burden is on Applicant to demonstrate no adverse onsite or offsite impacts as per Subsection 3.6, A.H.V.II. Groundwater drawdown 'radius of influence' computations may be required to demonstrate no adverse onsite or offsite impacts. Please note that new roadside swales or deepening of existing roadside swales may result in lowering of SHWE. Proposed ponds with control elevation less than SHWE may result in adverse lowering of onsite or offsite groundwater.
- Check for contaminants and assure that FDEP clearance is secured, if so found within 1500 feet. If found within 500 feet, the permit cannot be issued until Applicant provides the District with written verification from FDEP demonstrating the proposed system will not result in adverse water quality affects. If found between 500 and 1500 feet, the permit may be issued with a condition that all contaminated site assessment concerns have been addressed with FDEP prior to beginning construction.
- Contact FDEP Petroleum Restoration Program #850-245-8839 regarding potential groundwater contamination issues associated with existing onsite or offsite underground petroleum storage tanks (UST's).
- Federal Supplemental Application Form - to be used with the Joint Application form under SWERP 2 (SWERP 2 has not been approved yet). This form will not be incorporated into rule but will be added to the electronic application. The Corps has requested that we begin using this form now to help them gather the information they need to process their permits. This should be provided during any pre-application meeting that proposed work in, on or over wetlands or surface waters.

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.

Meeting Minutes

3000 Dovera Drive, Suite 200, Oviedo, FL 32765 I P: 407-971-8850 I F: 407-971-8955 I www.inwoodinc.com

DATE: February 16, 2017

TO: **Jazlyn Heywood**

FROM: Sean Carrigan

RE: FPID 430132-1-22-01: US 301 PD&E Study – From CR 470 E to SR 44 (Sumter County)

CC: Freddy Andrade (FDOT), Jeff Arms (HDR), Howard Newman (HDR), Taylor Laurent (HDR), Paul Sebert (E-Sciences)

A meeting was held at the Southwest Florida Water Management District (SWFWMD) office in Brooksville, FL (10:00 am) to discuss the drainage approach for the referenced project. Renato began the meeting by providing a brief overview of the project location and the scope of work. Meeting attendees were:

- Monte Ritter (SWFWMD)
- Kim Dymond (SWFWMD)
- Renato Chuw (Inwood)
- Sean Carrigan (Inwood)

The project consists of widening approximately 8 miles of US 301 between CR 470 E and SR 44, from two lanes to four lanes. However, between Florida's Turnpike and SR 44, only safety improvements (i.e. buffered bike lanes, turn lanes, sidewalks, etc.) are proposed. Additionally, as an alternative to widening US 301 through the City of Coleman, a truck route is being evaluated between CR 525 and CR 468. Below are some of the main topics discussed at the meeting.

Existing Drainage Conditions:

- The project is located within the Withlacoochee River South Watershed and traverses several WBIDs (Little Jones Creek, Lake Panasoffkee Drain, Shady Brook and Walled Sink Drain), none of which are impaired for nutrients.
- Stormwater runoff from the existing roadway is collected in roadside swales and conveyed to several existing cross drains along the corridor. There are 14 existing cross drains and one bridge (over Shady Brook) within the project limits. Shady Brook is considered an Outstanding Florida Waterbody (OFW).
- There are several depressional areas along the project limits that collect roadway stormwater runoff. These areas do not discharge further downstream and are considered land-locked basins.
- FEMA 100-yr floodplain sparsely located throughout the corridor but more concentrated south and north of Florida's Turnpike. Monte explained that in land-locked depressional areas, FEMA does not always designate these depressions as flood zones. However, during design, the consultant is required to maintain the historical basin storage for the 100-yr/24hr storm event within the depressions, regardless of the FEMA designation.

Proposed Drainage Approach:

Renato explained that during this study, three (3) pond site alternatives are being evaluated for each roadway basin and floodplain compensation ponds will be sited to mitigate floodplain impacts.

- Criteria:
  - 1" DCIA (wet detention) or 0.5" DCIA (dry retention) required for water quality treatment.
  - 50% additional water quality volume for ponds discharging to OFW. Monte confirmed that this rule only applies to ponds that discharge directly into the OFW.
  - 25yr/24hr pre vs. post runoff attenuation – open basins.
  - 100yr/24hr pre vs. post runoff attenuation – closed basins.

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- Floodplain compensation approach – cup for cup. Renato asked Monte if it was permissible to provide floodplain compensation within the stormwater ponds. Monte said that is permissible, however it would require hydraulic modeling (mean annual/24hr, 10yr/24hr, 25yr/24hr, and 100yr/24hr events) of the floodplain and stormwater ponds to show no increase in the flood stages in adjacent parcels. Renato mentioned that for this PD&E Study, separate floodplain compensation ponds are identified.
- Renato explained that between Florida's Turnpike and SR 44, only safety improvements (i.e. buffered bike lanes, turn lanes, sidewalks, etc.) are proposed, and therefore, no water quality treatment or water quantity attenuation is being proposed. Monte agreed that this area would be exempt from providing water quality treatment and water quantity attenuation. However, Monte stated that if any of the improvements impact the floodplains, floodplain compensation will still need to be required. Monte and Kym mentioned that there is a permit for the existing development on the SW corner of US 301 and SR 44 where the wetlands and the 100-year floodplain may have been established. Renato agreed and said Inwood would investigate whether the proposed improvements would impact the floodplain and site a floodplain compensation pond if necessary.
- Renato asked Monte if he is aware of any new developments in the area in which there would be a good opportunity to propose a regional stormwater facility. Monte was not aware of any new development other than Wildwood Springs. Monte explained that because some of our basins fall within closed basin criteria, a regional stormwater may not be as beneficial as with open basins.
- Monte stated that the project traverses a karst area so it will be important to maintain shallow ponds because there is potential to create a sinkhole which would discharge contaminated stormwater runoff into the aquifer. Monte also advised against utilizing any existing borrow pits as stormwater treatment ponds because they tend to be very deep, and penetrate the aquifer. Discharging roadway runoff into these locations could also contaminate Florida's drinking water.
- Monte verified that SWFWMD does not have any current watershed models within Sumter County, specifically the area that covers the project corridor. There is watershed model for the portion in Hernando Co, just south of CR 470.

End of Meeting.

US 301 PD&E Study from CR 470 E to SR 44 (Sumter Co.)
Pre-Application Meeting
FPID 430132-1-22-01
February 16, 2017 – 10:00 AM (SWFWMD Brooksville Office)

SIGN-IN SHEET

Name	Signature	Representing	Phone	E-mail
Monte Ritter		SWFWMD	352-796-7211	Monte.Ritter@swfwmd.state.fl.us
Kim Dymond		SWFWMD	352-796-7211	Kim.Dymond@swfwmd.state.fl.us
Melissa Gulvin		SWFWMD	352-796-7211	Melissa.Gulvin@swfwmd.state.fl.us
Jazlyn Heywood		FDOT	386-943-5388	Jazlyn.Heywood@dot.state.fl.us
Jeff Arms		HDR	407-420-4249	Jeff.Arms@hdrinc.com
Renato Chaw		Inwood Consulting Engineers, Inc.	407-971-8850	RChaw@inwoodinc.com
Sean Carrigan		Inwood Consulting Engineers, Inc.	407-971-8850	Scarrigan@inwoodinc.com

Agenda

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www.inwoodinc.com

Project:	**US 301 PD&E Study**	**Date:**	**February 16, 2017**
FPID:	**430132-1-22-01**	**Time:**	**10:00 am**
Description:	**From CR 470 E to SR 44 (Sumter County)**	**Location:**	**SFWMD**
Meeting Title:	**Pre App meeting**		

Project Overview

- PD&E Study by FDOT District 5
- HDR Inc. contracted as prime consultant for the Study. Inwood Consulting Engineers, Inc. contracted as drainage sub-consultants
- Approximately 8 miles of US 301 between CR 470 E to SR 44 will be evaluate for:
  - Widen existing two-lane road to a four-lane road (urban, suburban and rural typical sections are being considered)
  - Safety improvements / multi modal facilities between Florida's Turnpike and SR 44
  - Evaluate interchange improvements at US 301 and Florida's Turnpike
  - Alternative for a realignment (truck route) near CR 525 to CR 468
- Pond Siting Report and Location Hydraulics Report currently in preparation

Existing Drainage

- Withlacoochee River South watershed
- WBIDs (Little Jones Creek, Lake Panasoffkee Drain, Shady Brook and Walled Sink Drain)
  - None impaired for nutrients
- Shady Brook is an OFW
- Majority of drainage conveyance is through roadside ditches/overland flow and cross drains under US 301
- From Spring Lake Road to SR 44 – closed drainage systems (curb and gutter, inlets and pipes)
- Major drainage conveyance – Shady Brook
- Several depressional (land-locked) areas exist throughout project
- FEMA 100-yr floodplain sparsely located throughout corridor but more concentrated south and north of Florida's Turnpike
- Flooding issue within the City of Coleman, near Commercial St. and Mulberry St.

Proposed Drainage

- Study currently evaluating potential stormwater pond site alternatives and floodplain compensation ponds
- Drainage/Permitting criteria
  - 1" DCIA (wet detention) or 0.5" DCIA (dry retention) water quality treatment
  - 50% additional water quality – OFW (direct discharge?)
  - 25yr/24hr pre vs. post runoff volume attenuation – open basins

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- 100yr/24hr for closed basins (pre vs. post and total retention)
- Minor roadway safety improvements (trail, sidewalk, shoulders, turn lanes)
  - Criteria for water quality?
  - Exempt?
- Floodplain compensation approach (cup for cup)

- Existing Permits – Wildwood Springs
- Regional stormwater opportunities

Environmental

- Minimal wetland impacts

From: Hickson, Ferrell <Ferrell.Hickson@dot.state.fl.us>
Sent: Tuesday, March 07, 2017 9:46 AM
To: Renato Chuw; Snyder, Karen; Andrade Sr, Freddy; Heywood, Jazlyn
Cc: Arms, Jeff; Laurent, Taylor; Sean Carrigan
Subject: RE: FPID 430132-1-22; US 301 (SR 35) PD&E (Sumter Co.), from CR 470 to SR 44, WQIE notification - Karst Areas

Noted. Because of the Karst nature of the area, we recommend increasing the number of borings per selected pond site, and if no borings were planned, we recommend adding them. We also recommend extending the borings to limestone as we are investigating some solutions with BAM that would enable the ponds to recover.

FERRELL

Ferrell L. Hickson, Jr. P.E.
District Drainage Design Engineer, District Five
Florida Department of Transportation
719 South Woodland Boulevard, Ms 2-553
DeLand, FL 32720

From: Renato Chuw [mailto:rchuw@inwoodinc.com]
Sent: Monday, March 06, 2017 6:15 PM
To: Hickson, Ferrell; Snyder, Karen; Andrade Sr, Freddy; Heywood, Jazlyn
Cc: Arms, Jeff; Laurent, Taylor; Sean Carrigan
Subject: FPID 430132-1-22; US 301 (SR 35) PD&E (Sumter Co.), from CR 470 to SR 44, WQIE notification - Karst Areas

Hi Ferrell,

We are working with HDR on the PD&E Study of US 301 from CR 470 E to SR 44 in Sumter County. We are in the process of filling out the Water Quality Impact Evaluation Checklist (WQIE) as required per Chapter 20 of the FDOT PD&E Manual.

One of the disclaimers of the checklist is to notify the District Drainage Engineer if Karst conditions are expected. Most of the US 301 corridor within the study limits are in karst area and we have also verified this with SWFWMD. A graphic of the karst boundaries are shown in the graphic below.

My purpose of this email is to serve as official notification of the karst condition and documentation for the WQIE checklist.

Should you have any questions, please let me know.

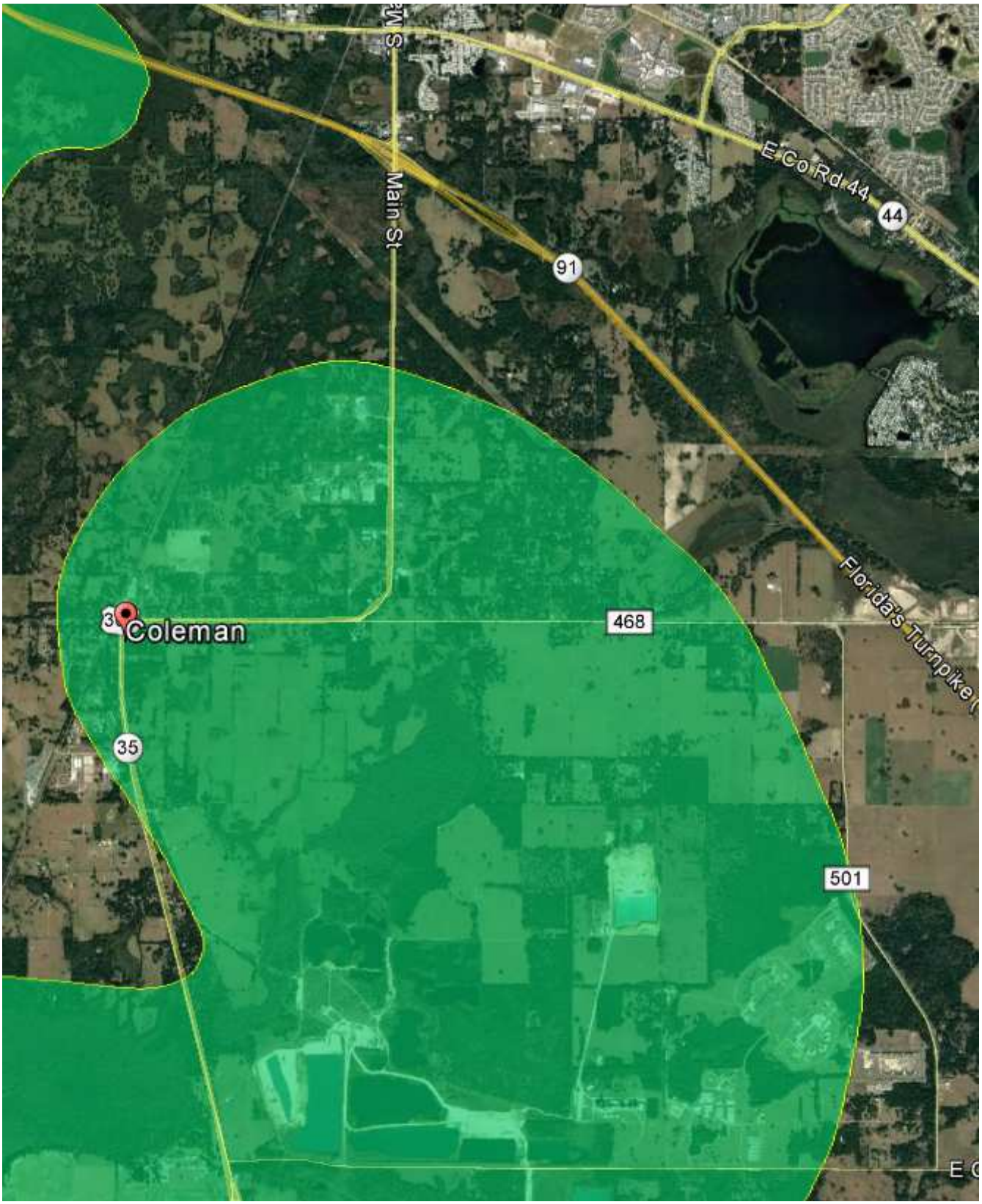
Regards,

Renato

Groundwater recharge? ☐ Yes ☐ No Name_____

Notify District Drainage Engineer if karst conditions are expected or if a higher level of treatment may be needed due to a project being located within a WBID verified as Impaired in accordance with Chapter 62-303, FAC.

Date of notification:


E Co Rd 44
44
91
Main St
Coleman
468
35
501
Florida's Turnpike

Renato E. Chuw, P.E.
Associate Principal - Senior Drainage Engineer

INWOOD CONSULTING ENGINEERS
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