POND SITING REPORT

Florida Department of Transportation

District 5

US 17/92 PD&E Study

Limits of Project: from Ivy Mist Lane to Avenue A

Osceola County, Florida

Financial Management Number: 437200-2-22-01

ETDM Number: 14365

Date: July 2023

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

Florida Department of Transportation

US 17/92 PD&E Study

from Ivy Mist Lane to Avenue A in Osceola County, FL

Pond Siting Report

FDOT Office
District Five

Authors
Vanasse Hangen Brustlin, Inc.

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PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida practicing with VHB, Inc., a corporation, authorized to operate as an engineering business, Certificate of Authorization No. 3932, by the State of Florida, Department of Professional Regulation, Board of Professional Engineers, and that I have reviewed or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

Project:	US 17/92 from Ivy Mist Lane to Avenue A
FIN:	437200-2-22-01
FAP:	
Location:	Osceola County, Florida
Client:	FDOT – District Five

This Pond Siting Report includes a summary of data collection efforts and conceptual drainage analyses prepared for conceptual analyses for the widening of US 17/92. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of stormwater engineering and planning as applied through professional judgment and experience. This document is for planning purposes only and is not to replace any effort required for final design.

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Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
ac-ft	Acre foot
BMAP	Basin Management Action Plan
CARS	Crash Analysis Reporting System
CFX	Central Florida Expressway Authority
CN	Curve Number
CR	County Road
ELA	Environmental Look Around
ERP	Environmental Resource Permit
ETDM	Efficient Transportation Decision Making
FDEM	Florida Division of Emergency Management
FEMA	Federal Emergency Management Agency
FCA	Floodplain Compensation Area
FIRM	Flood Insurance Rate Map
FDOT	Florida Department of Transportation
HSG	Hydrologic Soil Group
LHR	Location Hydraulic Report
LOS	Level of Service
NEEP	Northern Everglades and Estuaries Protection Program
NRCS	Natural Resources Conservation Service
NTCHS	National Technical Committee for Hydric Soils
OFW	Outstanding Florida Waters
PSR	Pond Siting Report
PD&E	Project Development and Environment
PER	Preliminary Engineering Report
PPV	Permanent Pool Volume
PSR	Pond Siting Report
ROW	Right-of-Way
SCS	Soil Conservation Service
SFWMD	South Florida Water Management District
SHGWT	Seasonal High Ground Water Table
SR	State Road
SSA	Sole Source Aquifer

Executive Summary

The Florida Department of Transportation (FDOT) District 5 is conducting a Project Development and Environment (PD&E) Study to evaluate alternatives to widen US 17/92 from the existing two-lane roadway to a four-lane divided roadway from Ivy Mist Lane to Avenue A, a distance of 3.8 miles, in Osceola County.

The proposed road widening intends to increase capacity and improve access management, which is anticipated to reduce congestion and conflict points. This project will also provide pedestrian and bicycle facilities to improve multimodal accommodations throughout the study corridor.

The project is located in Osceola County and within the jurisdiction of the South Florida Water Management District (SFWMD). The project drains to Reedy Creek Swamp and ultimately to Reedy Creek which flows from north to south. Reedy Creek is not an Outstanding Florida Water (OFW).

The corridor is located within the designated Northern Everglades and Estuaries Protection Program (NEEP) Watersheds -Lake Okeechobee Watershed. Lake Okeechobee is not an OFW. Lake Okeechobee is impaired for Total Phosporous and Reedy Creek is part of the Lake's Basin Management Action Plan (BMAP). The proposed widening of US 17/92 project boundaries is also within the Biscayne Aquifer Sole Source Aquifer (SSA) Streamflow and Recharge Source Zones.

The drainage system that serves this segment of US 17/92 is primarily composed of open swales, side drains and cross drains that eventually drain south to the Reedy Creek Swamp, and then to Reedy Creek. Within the project limits, there are two ponds which were permitted and constructed when the existing US 17/92 Bridge over Reedy Creek (Reedy Creek Bridge) was built. The Reedy Creek Bridge discharges directly to Reedy Creek.

Four (4) drainage basins have been identified for the project corridor. Water quality treatment and attenuation requirements for Basins 1 and 2 jointly will be accommodated in three (3) ponds; Pond 1, 2A and 2B. Ponds 1 and 2A will also be joint use ponds with two separate projects: County Road (CR) 532/ Osceola Polk Line Road (CFX 538-235A for pond 2A) and State Road (SR) 538/Poinciana Parkway Extension to CR 532 (CFX 538-235 for pond 1). Basins 3 and 4 will be served by individual Ponds 3 and 4, respectively.

Floodplain impacts associated with the roadway widening will be compensated for in a proposed floodplain compensation pond. Three potential floodplain compensation areas (FCA) were evaluated to compensate for the floodplain impacts and one preferred location (FCA2) was selected.

This report documents the pond sizing requirements to accommodate the proposed widening of US 17/92 for water quality, quantity and floodplain compensation. By complying with regulatory criteria, the implementation of this project will not adversely affect the area adjacent to the corridor and meets the expectations of the stakeholders.

1.0 Introduction

The Florida Department of Transportation (FDOT) District 5 is conducting a Project Development and Environment (PD&E) Study to evaluate alternatives to widen US 17/92 from the existing two-lane roadway to a four-lane divided roadway from Ivy Mist Lane to Avenue A, a distance of 3.8 miles, in Osceola County. A prior Corridor Planning Study of US 17/92 from County Road (CR) 54 (Ronald Reagan Parkway) in Polk County to 1,900 feet west of Poinciana Boulevard at Avenue A in Osceola County was completed in 2018. This project traverses through the unincorporated communities of Poinciana, and Intercession City. **Figure 1** shows the US 17/92 PD&E Study limits (shown in light green) and previous Corridor Planning Study limits (shown in blue), along with the limits of adjacent projects mentioned below.

Two related projects overlap the western end of this PD&E Study:

- The segment of US 17/92 from west of Parker Road in Polk County to Ivy Mist Lane in Osceola County is included in the Central Florida Expressway Authority's (CFX) State Road (SR) 538/ Poinciana Parkway Extension to CR 532 project, which is under design and anticipated to be complete in late 2022 with construction beginning in mid-2023. The SR 538/Poinciana Parkway Extension project will include the widening of US 17/92 within these limits, as well as a proposed diverging diamond interchange with US 17/92 southwest of Ivy Mist Lane as shown in teal (**Figure 1**).
- Adjacent to the western end of the PD&E Study (shown in dark green) is a CFX study evaluating widening CR 532/Osceola Polk Line Road from two to four lanes from Old Lake Wilson Road to US 17/92 (**Figure 1**). This study includes design and is anticipated to begin construction in 2024.

One ongoing project abuts the eastern limits of this PD&E Study. FDOT District 5 is widening US 17/92 from two to four lanes, with limits from 1,900 feet west of Poinciana Boulevard (Avenue A) to CR 535 (Ham Brown Road) in Kissimmee (FPID: 239714-1). This project, shown in purple on **Figure 1**, was already completed at the time of the site visit in December 2022.

1.1 Purpose and Need

The purpose of this project is to provide needed capacity through the design year 2045, enhance regional connectivity, and improve safety conditions along the study corridor. The project is needed to meet future traffic demand, provide satisfactory future traffic operations, improve corridor access management, and improve safety along the corridor.

The following sections describe the need for improvements based on transportation connectivity, future traffic demand, and existing crash data.

1.1.1 Transportation Connectivity

The US 17/92 study corridor is a vital east-west segment in the regional transportation network within western Osceola County and the primary thoroughfare through Intercession City. Regionally, the US 17/92 corridor serves as a major arterial connecting Kissimmee to the north and Polk County to the south. The study corridor will connect to the programmed SR 538/Poinciana Parkway Extension at the western end of the project, which will include an interchange connection to US 17/92 immediately southwest of Ivy Mist Lane. The SR 538/Poinciana Parkway Extension is planned to extend to I-4 in the vicinity of the SR 429 interchange providing enhanced connectivity from US 17/92 to Osceola and Orange Counties. This project would provide a continuous four-lane section between the Poinciana Parkway Extension and Avenue A. The programmed widening of CR 532 from US 17/92 to Lake Wilson Road will complete a continuous four-lane connection to I-4. The corridor is designated an evacuation route by the Florida Division of Emergency Management (FDEM).

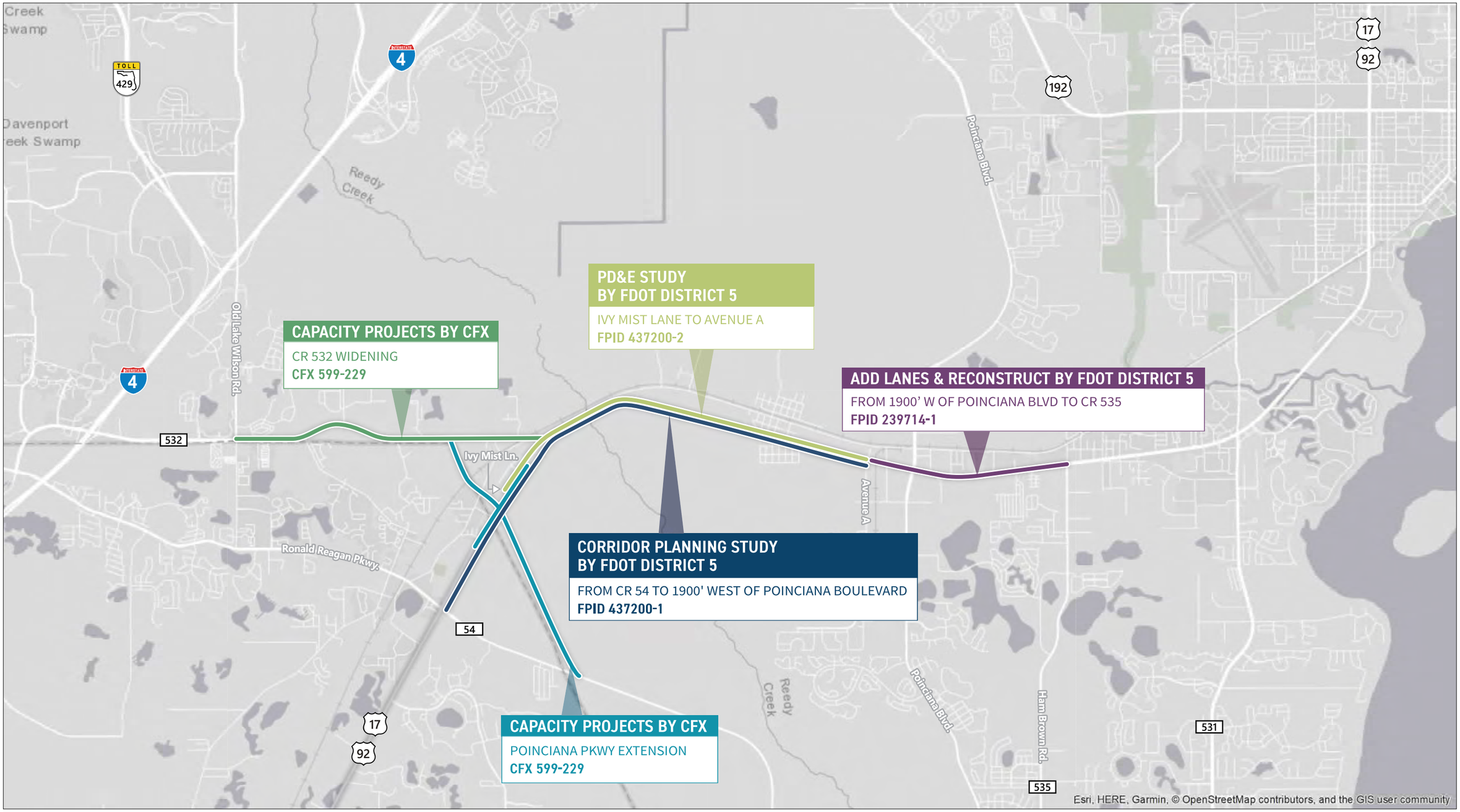

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Figure 1

Location Map
US 17/92 PD&E
FPID # 437200-2

1.1.2 Future Traffic Demand

Future traffic analyses were conducted for the US 17/92 study corridor for three analysis years (2025, 2035, and 2045). Based on the intersection operational analysis, by 2045 most of the study intersections are anticipated to experience very high delays. Specifically, the high delays start from 2025 for the majority of unsignalized intersections and the signalized intersection at US 17/92 and CR 532. Capacity improvements are needed to accommodate future traffic demand and provide satisfactory traffic operations.

Based on the arterial operational analysis, the US 17/92 study corridor is expected to operate at target Level of Service (LOS) D or better through the design year 2045, except for the northbound/eastbound approach south of CR 532, which is expected to fail in the 2035 and 2045 AM peak hour. These results are due to the lack of signalized intersections between CR 532 and Poinciana Boulevard and the existing high posted speed limit. However, the signalized intersection at CR 532 is expected to experience very high approach delays and extensive queueing along US 17/92, which will impact the arterial operations. Additionally, all of the future Annual Average Daily Traffic (AADT) along the study corridor will exceed the Maximum Service Volume of 18,590 for LOS D for a two-lane urbanized arterial starting in opening year 2025.

1.1.3 Safety

Crash data for a five-year period (2014-2018) obtained from FDOT Crash Analysis Reporting System (CARS) found a total of 161 crashes occurred along the study corridor. Of the 161 reported crashes, 91 involved injuries and two resulted in fatalities. The highest portion of crashes were rear-end (62.1%). The crash rates at the Shepherd Lane/Nocatee Street intersection and at the Avenue A intersection were found to be above the statewide crash rate. The crash rate at the CR 532 (Osceola Polk Line Road) intersection was not higher than the statewide crash rate but very close. This project intends to increase capacity and improve access management, which is anticipated to reduce congestion and conflict points. This project will also provide pedestrian and bicycle facilities to improve multimodal accommodations throughout the study corridor.

1.2 Project Alternatives

1.2.1 No-Build Alternative

The No-Build Alternative assumes no improvements such as additional traffic lanes or other improvements will be made within the study area, except for programmed improvements to nearby or adjacent facilities. For this project, the No-Build Alternative includes the ongoing widening of US 17/92 from Avenue A to CR 535 (FPID: 239714-1) to four lanes, the programmed SR 538/Poinciana Parkway Extension, and the CR 532 widening.

The No-Build Alternative serves as the baseline for comparing the Build Alternative and remains a viable option throughout the PD&E study process. Based on programmed improvements, the existing typical section assumed for the No-Build Alternative remains a two-lane undivided rural typical section. At the eastern end of the project at Avenue A, the corridor transitions to a four-lane typical section. For the majority of the study limits, the existing typical section along US 17/92 within the study limits is provided below in **Figure 2**. The existing bridge typical section is provided as **Figure 3**.

Figure 2: Existing Typical Section

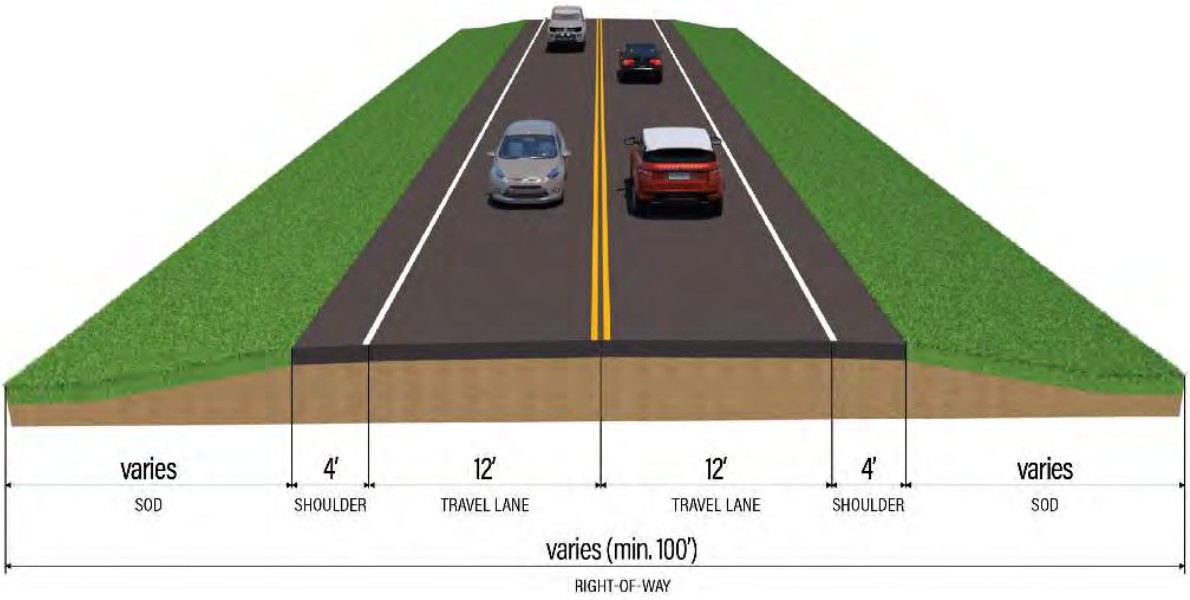
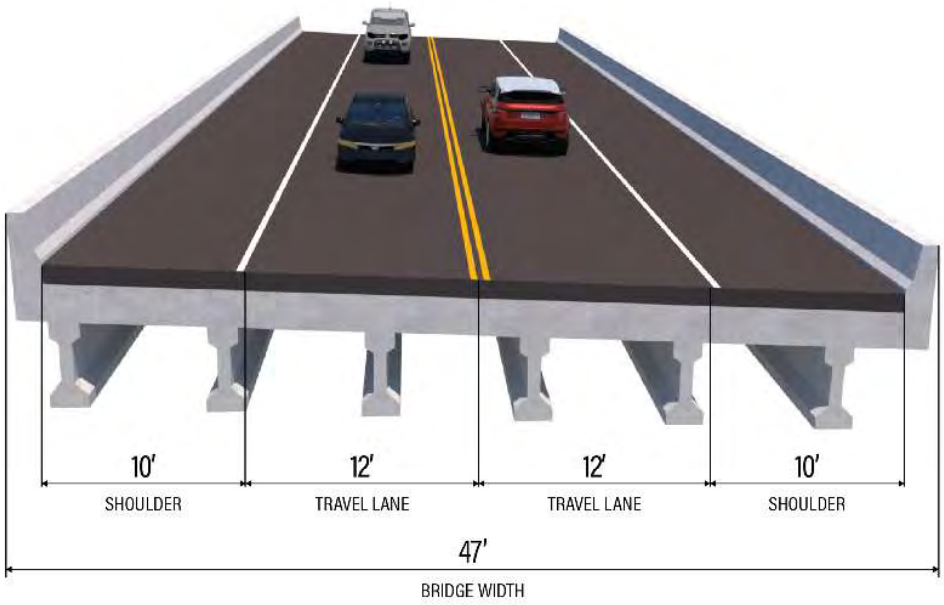


Figure 3: Existing Bridge Typical Section



1.2.2 Alternatives Considered

The Build Alternative widens US 17/92 to four lanes (two lanes per direction) throughout the study limits from Ivy Mist Lane to Avenue A. Due to alignment constraints from adjacent facilities and the existing bridge over Reedy Creek, the Build Alternative applied from Ivy Mist Lane to east of Old Tampa Highway is a best-fit alignment. From east of Old Tampa Highway to Avenue A, the study developed three alignments for alternatives comparison. The recommended alignment maximizes the existing Right-of-Way (ROW) and consists of widening to the south on the west end of the project corridor to align with the Poinciana Parkway Extension proposed improvements, then shifts to the south through the central portion of the project corridor to avoid the existing cemetery, widens to the north through Intercession City to avoid relocations, and aligns with the adjacent widening at the east end of the project corridor. The Preliminary Engineering Report (PER) prepared for the study summarizes the alternatives considered, the related analysis, and selection of the Preferred Alternative. The Preferred Alternative was developed to avoid and minimize environmental effects where feasible. Several stormwater treatment pond alternatives were evaluated, and the Pond Siting Report (PSR) discusses these alternatives and selection of the preferred pond sites.

1.3 Description of Preferred Alternative

The Preferred Alternative widens US 17/92 from Ivy Mist Lane to Avenue A from the existing two-lane rural facility to a four-lane divided facility. The Preferred Alternative includes access management modifications to improve safety. The Preferred Alternative adds continuous multimodal facilities along both sides of the roadway for the entire length of the study corridor, except at the Reedy Creek Bridge due to constraints along the existing bridge (proposed eastbound structure). A pedestrian crossing will be provided at the Osceola Polk Line Road and Old Tampa Highway intersections to provide pedestrians with a crossing over US 17/92 to the shared-use path.

The Preferred Alternative also involves the retention of the existing bridge over Reedy Creek to serve as the eastbound traffic lanes and the addition of a new bridge over Reedy Creek to serve as the westbound traffic lanes. The westbound bridge will have a 12-foot-wide shared use path for the use of pedestrians and bicyclists travelling in both directions. In addition to the widening and multimodal improvements along US 17/92, this project includes intersection improvements at CR 532, Old Tampa Highway, and Avenue A. Five pond site locations have been recommended as part of the Preferred Alternative for a total of 22.74 acres of stormwater ponds.

The typical section for the Preferred Alternative is divided into six segments (shown in **Figure 4**).

Reedy Creek Bridge to Old Tampa Highway

Reedy Creek Bridge

Ivy Mist Lane to Reedy Creek Bridge

Old Tampa Highway to Intercession City

Intercession City

Intercession City to Avenue A

Old Tampa Hwy.

Intercession City

532

Osceola Polk Line Rd.

Ivy Mist Ln.

Old Lake Wilson Rd.

Ronald Reagan Pkwy.

Loughman

54

Loughman Crossing Plaza

92

17

Osceola County
Polk County

Lee Jackson Hwy.

92

17

Poinciana Pkwy.

Ave. A

Ave. B

S. Poinciana Blvd.

92

17

N

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Project Limits

Poinciana Parkway Extension/Interstate 4 (I-4) Connector (in design)

U.S. 17/92 Widening (under construction)

Osceola Polk Line Road Widening (under construction)

FDOT

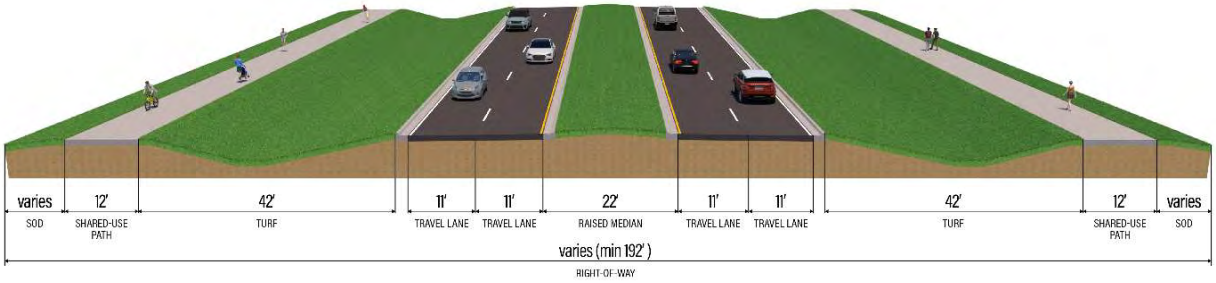
Figure 4

Study Segments
US 17/92 PD&E
FPID # 437200-2

Suburban Typical Section – Segments 1, 4, and 6

An urban roadway typical section with swales is proposed for Segments 1, 4, and 6. The typical section (depicted in **Figure 5**) includes a 22-foot raised median, two 11-foot travel lanes in each direction, and a 12-foot shared use path along both sides of the roadway. The shared use paths are both separated from the roadway by curb and gutter and 42-foot-wide drainage swales. The required ROW for the suburban roadway typical section varies with a minimum of 192 feet.

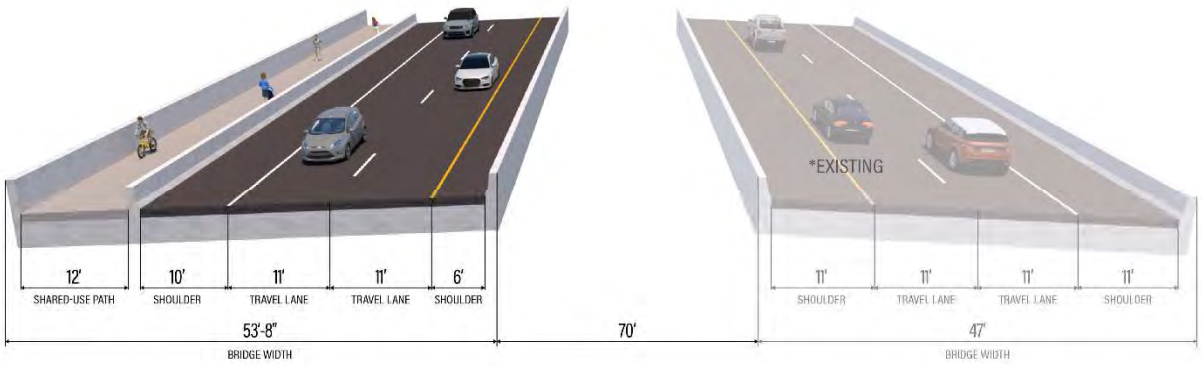
Figure 5: Suburban Typical Section (Segments 1, 4, and 6)



Bridge Typical Section – Segment 2

The typical section for the Reedy Creek Bridge, within Segment 2, includes two bridge structures (**Figure 6**). The existing bridge structure will serve eastbound traffic and a new bridge structure will serve the westbound traffic. The two bridge structures will be separated by a width of 70 feet. The existing eastbound bridge includes 11-foot inside and outside shoulders and two 11-foot travel lanes. The new westbound structure includes a six-foot inside shoulder, a 10-foot outside shoulder, two 11-foot travel lanes, and a 12-foot shared-use path separated from the roadway by a raised concrete barrier. The existing 244 feet ROW accommodates the proposed bridge structure. The existing eastbound bridge is located in a permanent easement on the south side of the FDOT ROW, which allows the new westbound bridge to be located fully within the existing ROW to the north.

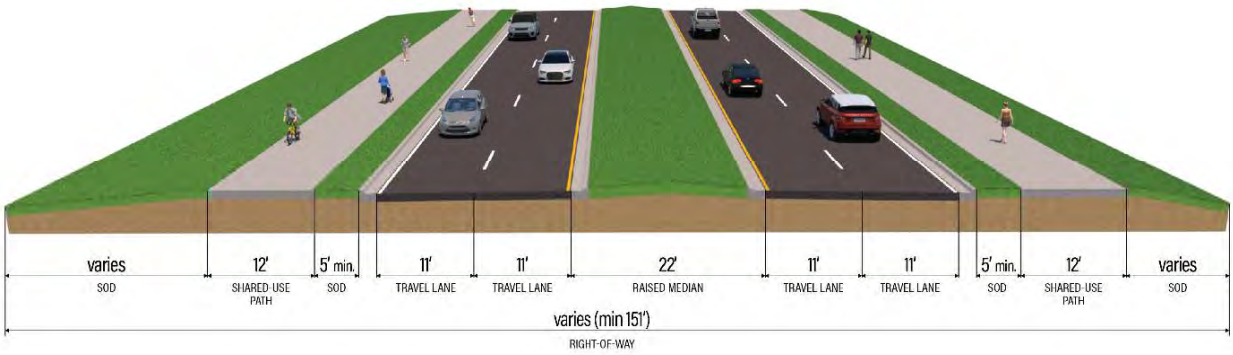
Figure 6: Bridge Typical Section (Segment 2)



Urban Typical Section – Segment 3

An urban typical section, as illustrated in **Figure 7**, is proposed for Segment 3 from the east end of the Reedy Creek Bridge to Old Tampa Highway. This typical section consists of two 11-foot travel lanes in each direction separated by a 22-foot raised median, and a 12-foot shared use path along both sides of the roadway. The shared use path is separated from the roadway by curb and gutter and a buffer varying in width with a minimum of five feet. The total ROW needed for this typical section varies with a minimum of 151 feet.

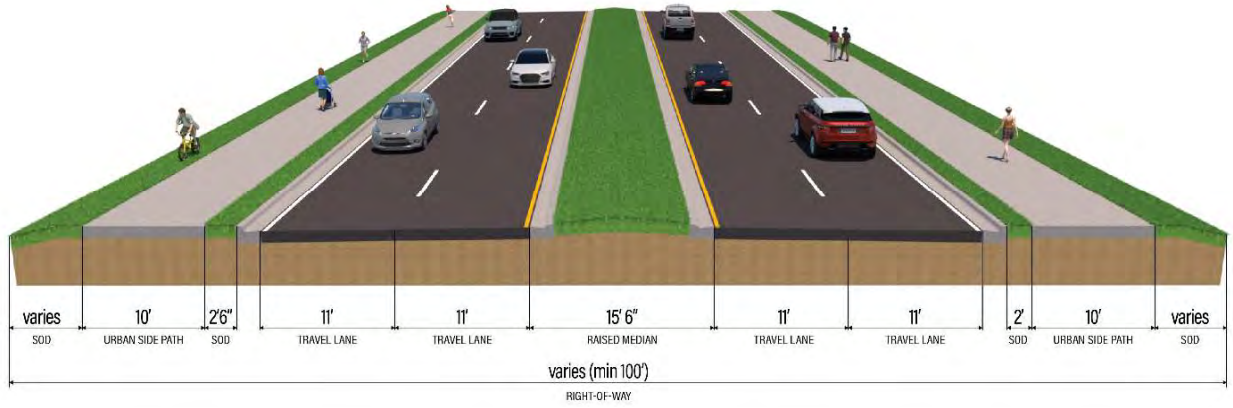
Figure 7: Urban Typical Section (Segment 3)



Urban Typical Section – Segment 5

An urban typical section is proposed for Segment 5 through Intercession City (**Figure 8**). This typical section includes a 15.5-foot raised median, two 11-foot travel lanes in each direction, and a 10-foot urban side path along both sides of the roadway. The urban side path is separated from the roadway by curb and gutter and a buffer with a width of two feet along the south side of the roadway and 2.5 feet along the north side of the roadway. The total ROW needed for this typical section varies with a minimum of 100 feet.

Figure 8: Urban Typical Section (Segment 5)



2.0 Methodology

The design of the stormwater management facilities for the project is regulated by the rules set forth by the South Florida Water Management District (SFWMD) and FDOT. Water quality treatment and water quantity attenuation will comply with the guidelines defined in Chapters 62-330 and the SFWMD Environmental Resource Permit (ERP) Applicant's Handbook, Volume II. Due to the nature of the poorly drained soils within the study area, wet detention ponds are assumed. Stormwater design criteria are listed below:

SFWMD Criteria:

1. Flood Control/Water Quantity:
    a. The 25-year/72-hour design storm will be used in computing pre- and post-development runoff for all basins.

2. Stormwater Quality:
    a. Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater.
        i. The outfall structure shall be designed to drawdown one-half the required treatment volume between 48 and 60 hours.
        ii. The permanent pool shall be sized to provide at least a 21-day residence time based upon average wet season rainfall (rainfall occurring over the wettest four months of an average year; for Central Florida, these are June through September)
        iii. A residence time of 2 weeks is considered to be the minimum duration that ensures adequate opportunity for algal growth.
            - A maximum pond depth of 12 feet and a mean depth (pond volume divided by the pond area at the control elevation) between 2 and 8 feet is required.
        iv. The average length to width ratio of the pond must be at least 2:1.
        v. To minimize ground water contributions which may lower treatment efficiencies, the control elevation shall be set at or above the wet season on-site ground water table elevation.
    b. An additional 50 percent of water quality volume needs to be added for systems discharging to impaired basins.

FDOT Criteria:

1. Pond Configuration:
    a. Side Slopes of 1 (vertical) to 4 (horizontal) or flatter. Conserve established slope vegetation, where possible.
    b. Refer to the Drainage Manual for minimum widths and slopes for maintenance berms (15-feet minimum with a side slope of 1:8 or flatter). For ponds with permanent pools, keep the lowest point of the maintenance berm at least one foot above top of the treatment volume.
    c. Use a radius of 30 feet or larger for the inside edge of the maintenance berm.
    d. Have a benchmark established near or in all ponds to check critical elevations or the pond and outlet control structure.
    e. For wet ponds, provide permanent pool volume based on Water Management District requirements.

f. At least 1.0 foot of freeboard is required above the maximum design stage of the pond below the top of the maintenance berm.

2. Protective Treatment
   a. Use flat slopes when practical.
   b. Only a fence when a documented need for restricted access (steep slopes, hidden hazard, or exposure to children or the elderly) has been demonstrated. A Design Variation is required.

3. Dry Retention
   a. FDOT policy is to design dry retention ponds in accordance with the methodology in the Stormwater Quality Applicant's Handbook (2010).

2.1 Data Collection Sources

This PSR presents information on existing conditions, development/evaluation of options, and engineering details of the proposed improvements. Information sources used in developing this report include the following:

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel for Osceola County:
  - 12097C0045G
  - 12097C0065G
- Flood Insurance Study for Osceola County (2013)
- Soil Conservation Service (SCS) Soil Survey for Osceola County (1979)
- Supplement to the Soil Survey for Osceola County (2011)
- FDOT Drainage Manual (January 2022) and Drainage Design Guide (January 2019)
- SFWMD Environmental Resource Permit Applicant's Handbook, Volume I (December 2020)
- SFWMD Environmental Resource Permit Applicant's Handbook, Volume II (May 2016)
- Lake Okeechobee Basin Management Action Plan, Division of Environmental Assessment and Restoration, Florida Department of Environmental Protection, January 2020
- Site Field Investigations and Reports:
  - Typical Section Package; Prepared by VHB (2022)
  - Efficient Transportation Decision Making (ETDM) Screening; Prepared by FDOT (2018)
- Preliminary Soil Survey Report. US 17 (SR 600) PD&E Study from Ivy Mist Lane to Avenue A, Osceola County Fl. Terracon Consultants, Inc. June 2, 2021.

3.0 Existing Conditions

The study area is in Township 26 South, Range 28 East, Section 03 and 06 and Township 25 South, Range 28 East, Sections 32, 33 and 34. The project area consists of undeveloped forested land and a mixture of residential and commercial development.

The existing road sections were used for the drainage analysis. The existing typical sections are taken from as-built plans for the three following projects:

- Widening and Milling and Resurfacing project along US 17/92 in Polk County from M.P. 9.511 to M.P. 10.256 by Osceola County Expressway Authority, FPID: 432294-1-58-01
- Milling and Resurfacing project along US 17/92 in Osceola County from M.P. 0.000 to M.P. 9.624 by FDOT, State Project No.: 413592-1-52-01
- Widening project along US 17/92 in Osceola County from M.P. 3.988 to M.P. 5.993 by FDOT, FPID: 239714-1-52-01

The existing typical sections found within the study area are illustrated in **Appendix A**. The roadway segment to which each typical section applies is listed below the figure.

3.1 Topography

The area generally flows from north to south draining towards Reedy Creek and the Reedy Creek swamp. The elevation at both ends of the project, intersection of US 17/92 and Avenue A and the intersection of US 17/92 and Ivy Mist Lane, is approximately 75 feet (NAVD 1988) and the road elevation in the vicinity of Reedy Creek is 70 feet (NAVD 1988), as shown in **Figure 9**. Runoff along US 17/92 is collected by roadside swales and ditches.

3.2 Drainage Characteristics

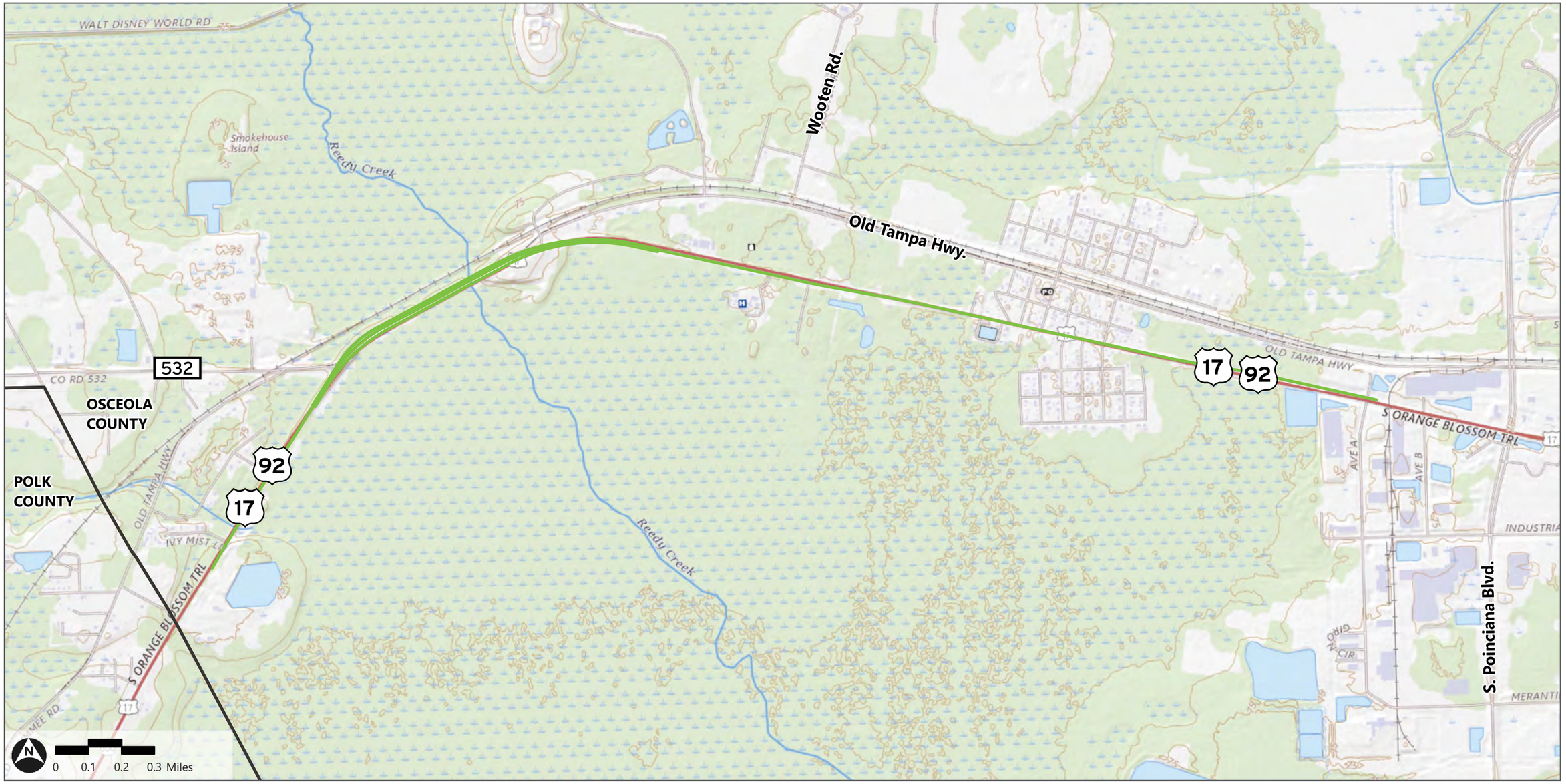
The project site is in the Reedy Creek drainage basin. Reedy Creek flows north to south into Lake Russell and is one of the northernmost water sources for the greater Everglades ecosystem. Reedy Creek, and the limits of this project, are within the jurisdiction of the SFWMD. The project has been divided into four Basins. Basin 1 is located west of Reedy Creek, Basin 2 is located at Reedy Creek, and Basins 3 and 4 are east of Reedy Creek. The basins ROW are the same as the FDOT ROW for the project. Off-site flow adjacent to US 17/92 is routed via existing canals and wetlands, outside the ROW and as described in Section 3.2.2, below. See **Figure 10 A** through **D**, for the drainage map depicting these basins.

Basin 1 begins at Ivy Mist Lane (Approximately STA 1180+00) and ends at Osceola Polk Line Road/CR 532 (Approximately STA 1210+00). The drainage system that serves this segment of US 17/92 is composed of open swales, side drains and cross drains that eventually drain south to the Reedy Creek Swamp, and then to Reedy Creek.

Basin 2 begins at Osceola Polk Line Road/CR 532 (Approximately STA 1210+00) and ends approximately 500 feet west of Old Tampa Highway (Approximately STA 1244+00). The drainage system that serves this segment of US 17/92 is composed of open swales, side drains and cross drains that drain to Reedy Creek. This segment of US 17/92 crosses over Reedy Creek and includes the Reedy Creek Bridge, which discharges directly to Reedy Creek. The Reedy Creek Bridge is parallel to the Old Reedy Creek Bridge, which has been placed out of service but is still in place north of the Reedy Creek Bridge. The drainage system for Basin 2 also includes a dry retention pond which was permitted and constructed when the Reedy Creek Bridge was built. The pond is located on the north side of US 17/92 approximately 900 feet west of Old Tampa Highway (approximately STA 1241+00).

\\vhb.com\gbl\proj\Orlando\63316.11 US 1792 CR54 to Ave A\Graphics\FIGURES\LHR

Imagery source: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed August, 2021.



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Project Alignment

County Boundary

Figure 9

USGS Quadrangle Map
US17/92 from Ivy Mist Lane to Avenue A

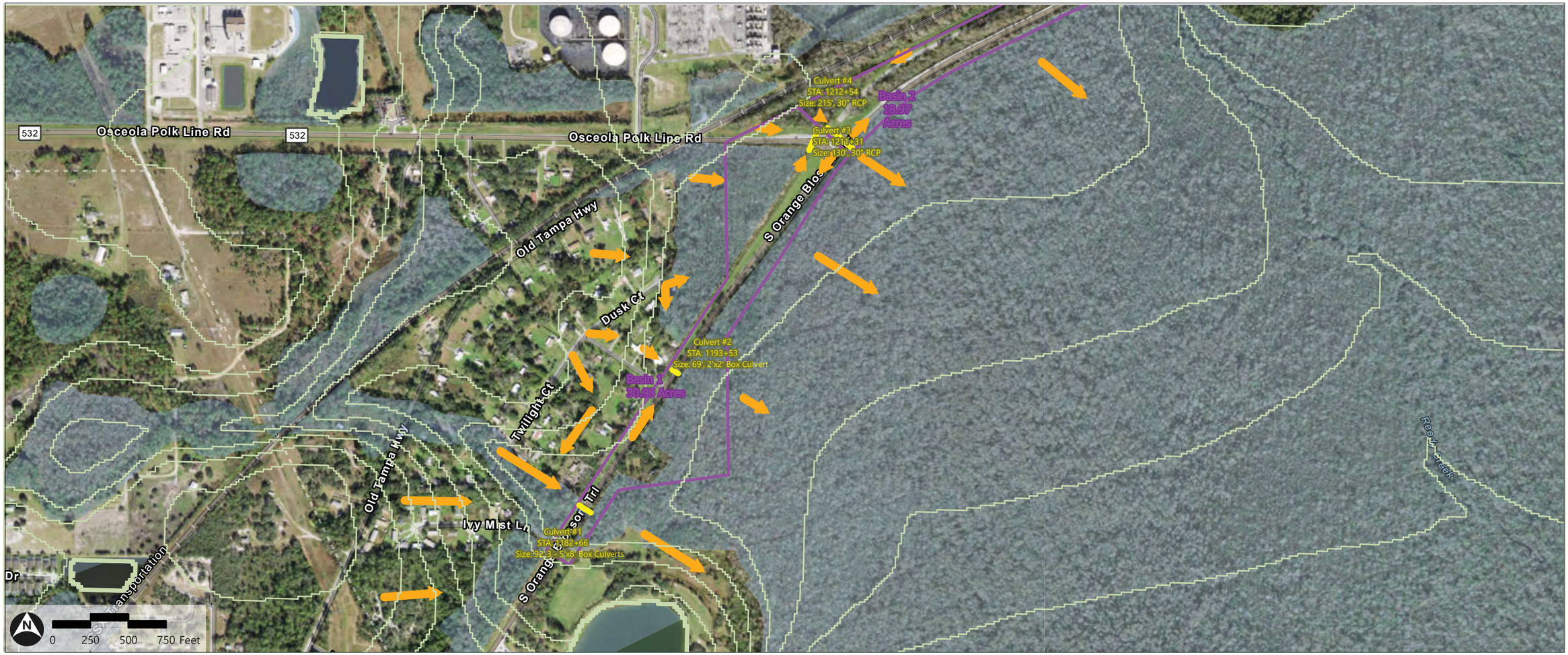
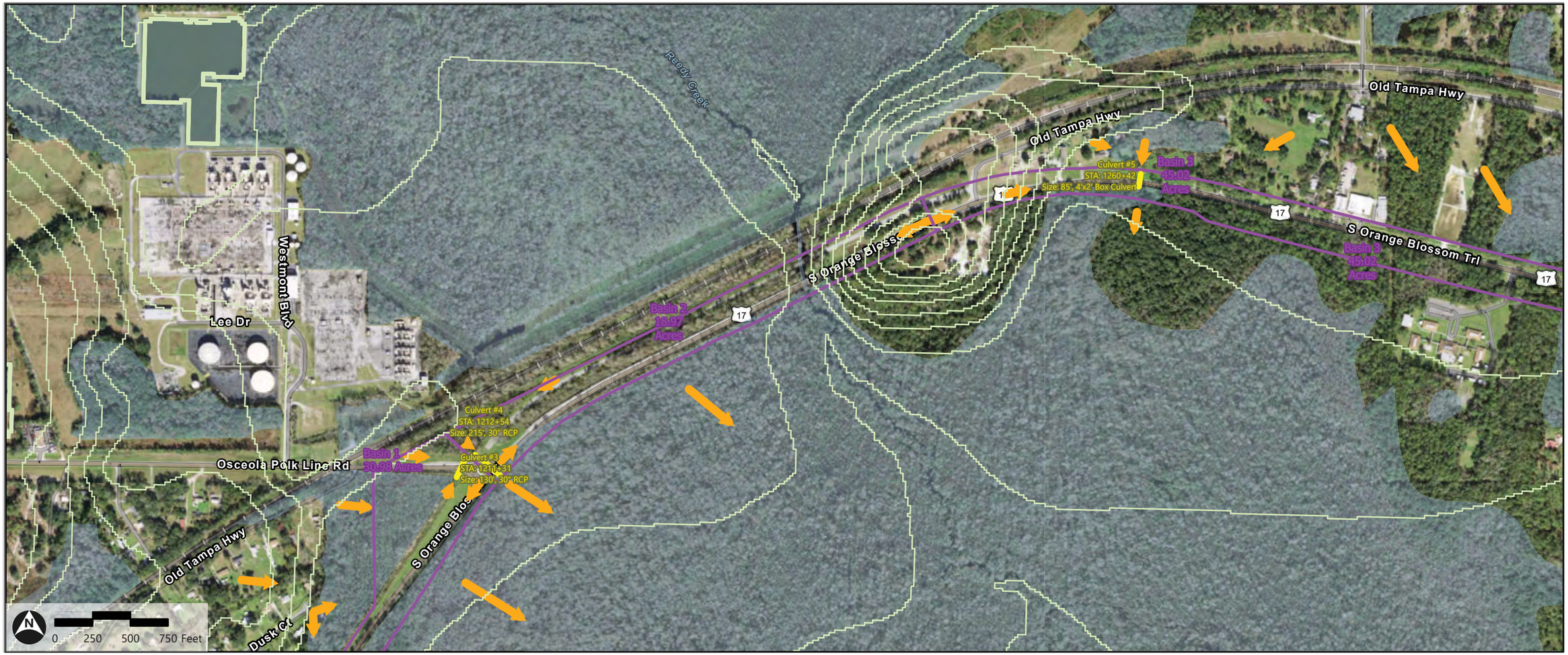


Figure 10A

Basin 1
US17/92 from Ivy Mist Lane to Avenue A



N.T.S.

- Basin Right-of-Way
- Culvert
- Contour 2 ft
- Flow Direction
- Wetland Areas

Figure 10B

Basin 2
US17/92 from Ivy Mist Lane to Avenue A

N.T.S.

- Basin Right-of-Way
- Culvert
- Contour 2 ft
- Flow Direction
- Wetland Areas

Figure 10C

Basin 3
US17/92 from Ivy Mist Lane to Avenue A

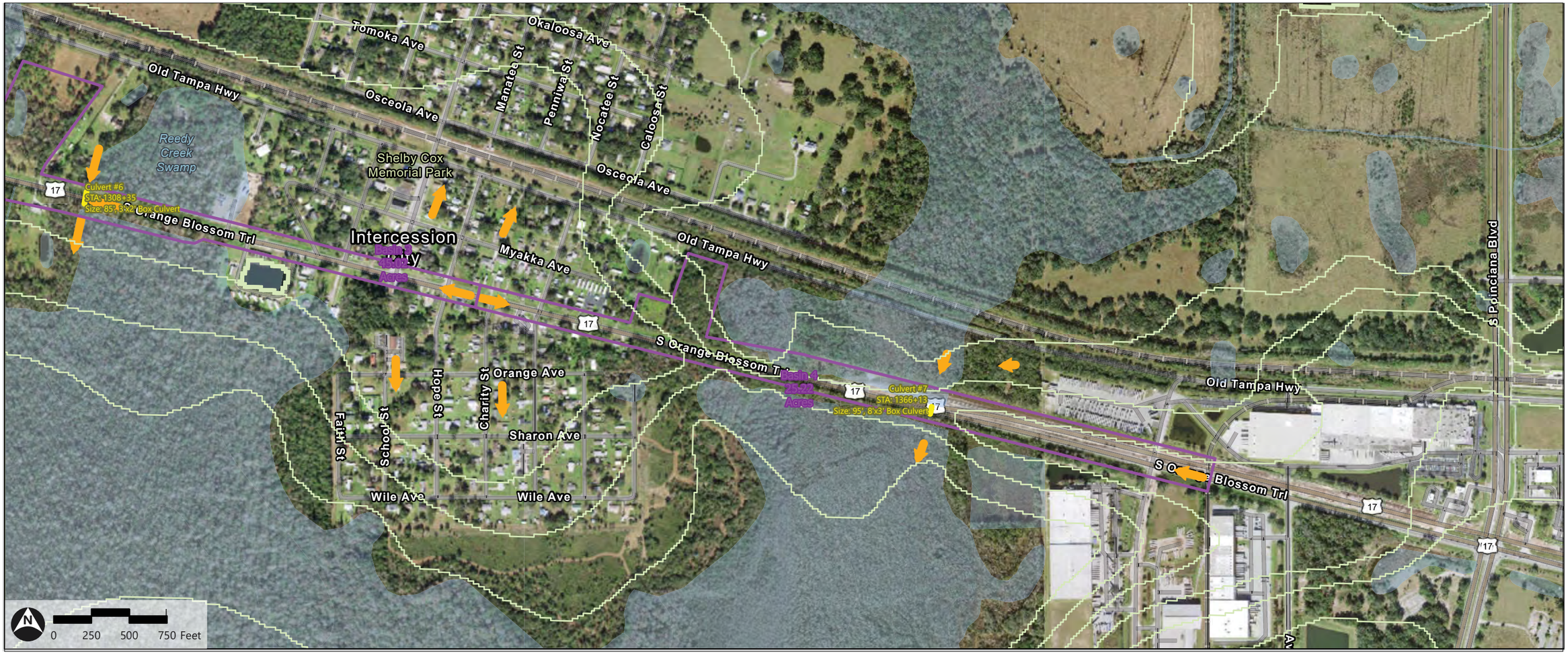


Figure 10D

Basin 4
US17/92 from Ivy Mist Lane to Avenue A

Basin 3 begins approximately 500 feet west of Old Tampa Highway (Approximately STA 1244+00) and ends at Hope Street/Manatee Street (Approximately STA 1333+00) within the Intersession City unincorporated community. The drainage system that serves this segment of US 17/92 is composed of open swales, side drains and cross drains that eventually drain to the Reedy Creek Swamp, and then to Reedy Creek. The drainage system for Basin 3 also includes a wet detention pond which was permitted and constructed when the Reedy Creek Bridge was built. The pond is located on the north side of US 17/92 approximately 900 feet east of Old Tampa Highway (approximately STA 1262+00).

Basin 4 begins at Hope Street/Manatee Street (Approximately STA 1333+00) and ends at Avenue A (Approximately STA 1383+00). The drainage system that serves this segment of US 17/92 is composed of open swales, side drains and cross drains that eventually drain to the Reedy Creek Swamp, and then to Reedy Creek.

3.2.1 Existing Ponds

The existing wet and dry ponds in Basins 2 and 3 are part of the surface water management system to serve the 34.0-acre SR 600 (US 17/92) road widening and bridge over Reedy Creek replacement project in December 1996 (FPID: 239635-1-52-01). The ponds drain to Reedy Creek via Reedy Creek Swamp, and they are part of permit no. 49-00768-S (see **Appendix D** for Previous Permits Information). According to the permit, the dry retention pond does not have a bleeder structure and recovers via percolation. The wet detention pond drains via a combination of a circular orifice and a sharp crested weir. Both ponds provide some excess water quality treatment.

The two ponds were considered as potential pond locations but after further investigation, it was determined that they can't be expanded. The dry pond is located between the existing US 17/92 and the historic US 17/92 bridge (not in service). It is not possible to expand the pond without impacting the National Register of Historic Places (NRHP)-eligible historic bridges. As for the wet pond, there is not enough ROW for expanding the pond since it is bounded by US 17/92 to the south and wetlands on the north, east and west sides.

3.2.2 Offsite Areas

VHB visited the site area in December 2022, to define the drainage patterns and identified potential offsite areas draining to the corridor. Observations made from that site visit include:

- There is a drainage canal in Basin 1 (from approximately STA 1180+00 to STA 1210+00) located at the back of the properties adjacent to the corridor between Ivy Mist Lane and Sundown Drive, that diverts runoff coming from those areas to the existing 3-8'x5' culvert structure that crosses US 17/92. Ultimately, the offsite flows from the culvert to the Reedy Creek Swamp and surrounding wetlands.
- Old Tampa Highway is lower than US 17/92 and in some sections lower than the surrounding wetlands. The CSX Railroad is at a higher elevation than Old Tampa Highway but still at a lower elevation than US 17/92. Any offsite runoff from the Old Tampa Highway and CSX Railroad is routed to wetlands and outside the ROW.
- Adjacent land uses to US 17/92 within Intercession City are very flat. Visual inspection and existing drainage structures along the properties between US 17/92 and Old Tampa Highway indicate that the drainage pattern is to Old Tampa Highway and wetlands to the east and west (north of US 17/92).
- There are numerous wetland areas on the north side of the corridor and pockets of wetlands in between properties in all four basins. Visual observation indicates that these wetlands are

at a lower elevation than the corridor and represent a significant storage area. See **Figure 10A** to **Figure 10D** for drainage pattern and wetland areas.

- The existing ditches along each side of US 17/92 appear to be receiving runoff from only the road. This was confirmed from referenced as-built plans and permits reviewed for the project.
- The existing wet detention pond overflow drains to the south through cross drain 5 (EX-CD-5) at STA 1260+42.

Based on these observations, all offsite runoff from areas adjacent to the project are ultimately draining to the wetlands south of the US 17/92 corridor via the existing cross drains or directly to low-lying areas/wetlands to the north of US 17/92. There are a total of seven culvert structures within the project limits, six of them crossing the US 17/92 corridor. These are briefly discussed in section 3.4 and further analyzed in the separate Location Hydraulic Report (LHR) for this project. Since there is no runoff from offsite areas draining to the ROW, no additional off-site storage is required in the proposed ponds.

3.3 Soils

Thirteen soil types occur within the study area, as listed in **Table 1**, and depicted in **Figure 11**.

Table 1: Soil Types Within the Study Area

Soil ID	Description	Hydric	Hydrologic Soil Group
7	Candler Sand, 0 to 5 percent slopes	N	A
15	Hontoon Muck, frequently ponded, 0 to 1 percent slopes	Y	A/D
16	Immokalee Fine Sand, 0 to 2 percent slopes	N	B/D
22	Myakka Fine Sand, 0 to 2 percent slopes	N	A/D
23	Myakka-Urban land complex	N	A/D
25	Nittaw Muck	Y	C/D
29	Parkwood loamy fine sand, occasionally flooded	Y	A/D
36	Pompano fine sand, 0 to 2 percent slopes	Y	A/D
37	Pompano fine sand, frequently ponded, 0 to 1 percent slopes	Y	D
38	Riviera fine sand, 0 to 2 percent slopes	Y	A/D
39	Riviera fine sand, frequently ponded, 0 to 1 percent slopes	Y	A/D
41	Satellite Sand, 0 to 2 percent slopes	N	A
45	Wabasso fine sand, 0 to 2 percent slopes	N	A/D

The soils within the study area have been mapped by the Natural Resources Conservation Service (NRCS) and classified as hydric or non-hydric. Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions” near the ground surface.

Most of the soil types within the study corridor are poorly drained soils, Hydrologic Soil Group (HSG) A/D, primarily Riviera Fine sand (**Table 2**).

Imagery source: State of Florida, Maxar

N
N.T.S.

Project Alignment

County Boundary

NRCS Soils (Name, Hydrologic Soils Group)

- ADAMSVILLE,A
- BASINGER,A/D
- CANDLER,A
- FLORIDANA,C/D
- HONTOON,A/D
- IMMOKALEE,B/D
- KALIGA,C/D
- MYAKKA,A/D
- NARCOOSSEE,A
- NITTAW,C/D
- ONA,B/D
- PARKWOOD,A/D
- PITS
- PLACID,A/D
- POMPANO,A/D
- RIVIERA,A/D
- SATELLITE,A
- SMYRNA,A/D
- WABASSO,A/D
- WATER
- WAUCHULA,A/D

FDOT

Figure 11

NRCS Soils
US17/92 from Ivy Mist Lane to Avenue A

Table 2: Hydrologic Soil Groups

Hydrological Soil Group (HSG)	Soil Textures
A	Sandy, Loamy Sand, Or Sandy Loam
B	Silt Loam Or Loam
C	Sandy Clay Loam
D	Clay Loam, Silty Clay Loam, Sandy Clay, Silty Clay, Or Clay

- Group A: Soils that have low runoff potential and high infiltration rates even when thoroughly wetted. Consist of deep, well to excessively drained sand or gravel and have a high rate of water transmission.
- Group B: Soils that have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. Moderate rate of transmission.
- Group C: Soils that 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. Low rate of water transmission.
- Group D: Soils that have high runoff potential, very low infiltration rates when thoroughly wetted, and consist mainly of clay soils with a high swelling potential. Soils with a permanent high-water table, claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. Low rate of water transmission.
- HSG B/D indicates that in the drained condition, the soil is in group B, and the undrained condition, the soil is in group D.

See geotechnical report (Preliminary Soil Survey Report, June 2, 2021) for soil characteristics.

3.4 Existing Cross Drains

There are seven existing cross drains, summarized in **Table 3**, six cross US 17/92 within the project corridor and one cross drain that crosses Osceola Polk Line Road, within the project limits. The cross drain culvert sizes were measured and invert elevations shot by the survey crew in September of 2020. Cross drain culverts were visually inspected during the site visit in December of 2022.

Table 3: Existing Cross Drains

Cross Drain	Roadway	Size	Length (ft)
EX-CD-1	US 17/92	3 @ 8-ft X 5-ft Box Culverts	92
EX-CD-2	US 17/92	2-ft x 2-ft Box Culvert	69
EX-CD-3	Osceola Polk Line Road	30” RCP	130
EX-CD-4	US 17/92	30” RCP[1]	215
EX-CD-5	US 17/92	4-ft X 2-ft Box Culvert	85
EX-CD-6	US 17/92	30” RCP	85
EX-CD-7	US 17/92	8-ft X 3-ft Box Culvert	95

[1]*Drainage Map for SR-600, Financial Project ID 437200-1-22-01 shows this cross drain consists of two sections, a 36” section at the upstream side connecting to a 30” section on the downstream side*.

3.5 Floodplains and Floodways

The project corridor falls within FEMA FIRM MAPS No. 12097C0045G and 12097C0065G for Osceola County, Florida dated June 18, 2013 (See **Figure 12**). Portions of the project corridor are in the 100-yr floodplain zone, in designated Zones A and AE, which are respectively defined as having no base flood elevation determined and having a base flood elevation determined. The base flood elevation for this project corridor is 67.0 ft. The old existing Reedy Creek Bridge and the proposed Reedy Creek Bridge fall within the Reedy Creek Floodway. More information is provided in the LHR for this project, under separate cover.

3.6 Environmental Characteristics

Environmental characteristics of the project area have been further evaluated through desktop review of available documentation, coordination with local and state agencies, and field investigations. The findings are consistent with the ETDM Summary Report, previously referenced. More detail on the existing environmental conditions is provided in the PER for this project.

3.7 Stormwater Requirements

Based on SFWMD and FDOT stormwater regulations, water quantity (attenuation) and water quality (treatment) requirements were determined.

3.7.1 Water Quantity

Water quantity requirements are described in Section 2.0. All basins were assumed to be open, with discharge to Reedy Creek as existing. SFWMD discharge criteria involve analysis of the 25-year/72-hour design storm event. The NRCS Method was used to estimate the runoff excess quantities. This method calculates the runoff depth using rainfall data and Curve Number (CN) values. A composite CN value was calculated for the pervious-impervious-pond combination. Curve number calculations are shown in **Appendix B1**. Water quantity calculations are shown in **Appendix B2**.

3.7.2 Water Quality

Water quality requirements are described in Section 2.0. In general, the design intent was to capture all runoff from the proposed improvements associated with roadway widening and treat it. The existing two-lane road was previously permitted and treated. Water quality treatment will be provided for the new impervious area which consists of two additional lanes and any shared use path where applicable. On-line wet detention systems are proposed. Since Lake Okeechobee is impaired for Total Phosporous and Reedy Creek is part of the Lake's Basin Management Action Plan (BMAP), an additional 50% of water quality volume was provided. Nutrient loading calculations will be provided in the final design phase. Water quality calculations are shown in **Appendix B3**.

3.7.3 Special Basin Requirements

The project basins are not subject to Outstanding Florida Waters (OFW) requirements. The project drains to Reedy Creek Swamp and ultimately to Reedy Creek which flows from north to south. Reedy Creek is not an OFW. The corridor is located within the designated Northern Everglades and Estuaries Protection Program (NEEP) Watersheds - Lake Okeechobee Watershed. Lake Okeechobee is not an OFW, therefore, the project and Reedy Creek do not directly discharge to an OFW. The proposed widening of US 17/92 project boundaries is also within the Biscayne Aquifer Sole Source Aquifer (SSA) Streamflow and Recharge Source Zones.

Imagery source: State of Florida, Maxar

N.T.S.

Project Alignment

County Boundary

1% Annual Chance Flood Hazard (FEMA 100yr floodplain)

0.2% Annual Chance Flood Hazard (FEMA 500yr floodplain)

Regulatory Floodway

Figure 12

FEMA Floodplain Map
US17/92 from Ivy Mist Lane to Avenue A

3.7.4 Total Maximum Daily Loads

The project basins are not subject to Total Maximum Daily Loads. Lake Okeechobee is impaired for Total Phosporous and Reedy Creek is part of the Lake's BMAP.

3.8 Soil Conditions

Soils throughout the project are characterized by high water table and relatively low permeability (Tables 1 and 2). See geotechnical report (Preliminary Soil Survey Report, June 2, 2021) for soil conditions.

3.9 Cross Drain and Bridge Structures

There are seven existing cross drains within the project limits which are summarized in **Table 3**. The existing cross drains will need to be extended to accommodate the widening.

Additionally, a new westbound bridge will be constructed parallel to the existing Reedy Creek Bridge. The new bridge will be constructed in the corridor of the Old Reedy Creek Bridge which is north of the existing Reedy Creek Bridge.

3.10 Potential Floodplain Impacts

The corridor will not impact the floodway at the Reedy Creek Bridge location. The proposed corridor will impact the floodplain in some sections of the road between STA 1176+50 and 1385+00, and compensation must be provided. Floodplain Impacts were calculated for the roadway widening based on the base flood elevation of 67 feet (see calculations in **Appendix B5**). Based on the typical sections and the existing roadway profile, the volume of floodplain impacts was estimated, and a floodplain compensation area was estimated. More information is provided in the LHR for this project, under separate cover.

3.11 Environmental Permit Coordination

During the PD&E phase, a SFWMD coordination meeting was conducted (see Section 3.15). Environmental permits and pre-application meetings are anticipated to be coordinated during the design phase.

3.12 Stormwater Alternatives Evaluation

Roadway runoff will be conveyed through curb and gutter. On segments 1, 4 and 6 of the proposed corridor, swales will be used as conveyance ditches to route the runoff to the ponds (See **Appendix F** for Ditch Calculations). Open flumes are proposed in the curb section for connectivity. Segments 3 and 5 are closed systems that will runoff from curb and gutters to inlets and to pipes that will convey to the ponds. Offsite runoff will be managed by the existing cross drains with no impact to the ROW. The conceptual map showing the pond alternatives considered is shown on **Figure 13**. The evaluation of the pond altenatives is discussed in the following sections and summarized in Section 3.12.5. **Appendix E** includes a preliminary cost estimate for the proposed ponds.

3.12.1 Joint Use and Regional Pond Options

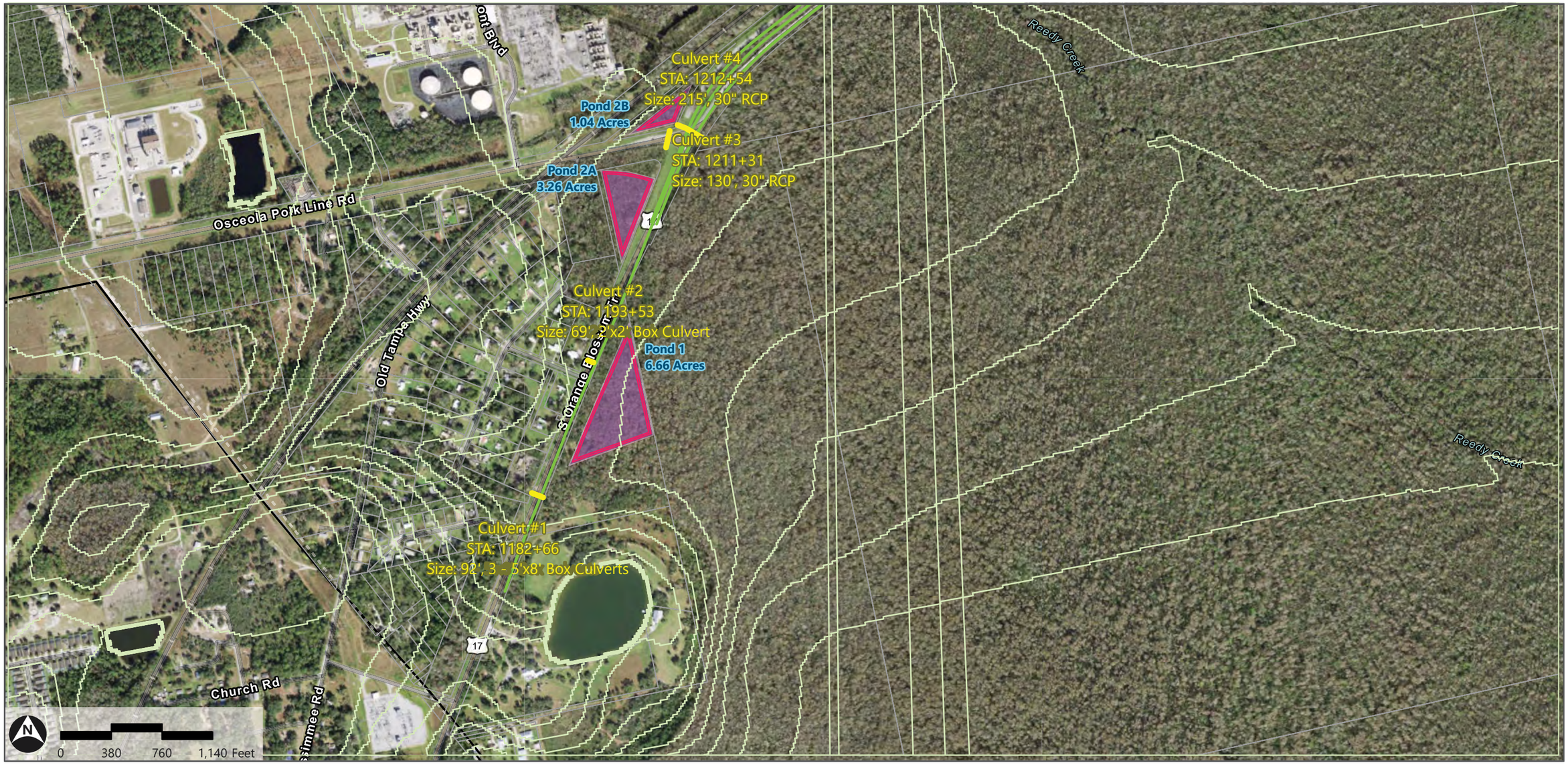
Joint use ponds are proposed for Basins 1 and 2. During the PD&E Study, FDOT coordinated with CFX regarding the use of joint use ponds where SR 538 and CR 532 meet US 17/92. CFX was anticipating to complete design by the end of 2022. See **Figure 14** for the location of the joint use ponds. Also, see **Appendix C** for the Joint Use Pond Summary Memorandum and follow up correspondence with FDOT.

N.T.S.

- Project Alignment
- County Boundary
- Berm
- Off-site Compensation Pond
- Pond Alternatives
- Joint Use Pond
- Floodplain Compensation Pond

Figure 13

Pond Alternatives
US17/92 from Ivy Mist Lane to Avenue A



N.T.S.

- Project Alignment
- County Boundary
- Berm
- Parcels 2023
- Pond
- Joint Use Pond
- Contour 2 ft

Figure 14

Basins 1 and 2 Pond Alternatives
US17/92 from Ivy Mist Lane to Avenue A

Phase III Drainage Design Report for CR 532 (CFX 538-235A) by others (dated June 2022) included the calculated required area for Pond 7 in Basin 7 to be 1.34 ac. This pond will be part of Pond 2A of this project.

Phase III Drainage Documentation for SR 538 (CFX 538-235) by others (dated January 2022) included the calculated required area for Pond 400 in Basin 400 to be 1.96 ac. This pond will be part of Pond 1 of this project.

Documentation of the above pond areas by others is included in **Appendix C**.

The summary of the pond areas Required and Provided in Basins 1 and 2 are as per **Table 4** and **Table 5**.

Table 4: Summary of Required Pond Areas in Basins 1 and 2

Required Pond Area for Basin 1 & 2 combined (ac.)	Pond 400 area (ac.) – by others	Pond 7 area (ac.) – by others	Total Pond Area required for Basin 1, Basin 2 combined, Pond 400 and Pond 7 (ac.)
6.9	1.96	1.34	10.2

Table 5: Summary of Provided Pond Areas in Basins 1 and 2

Provided area for Pond 1 (Joint Use) (ac.)	Provided area for Pond 2A (Joint Use) (ac.)	Provided area for Pond 2B (ac.)	Total Pond Area Provided for Basin 1 and 2 Ponds (ac)
6.66	3.29	1.04	10.99

3.12.2 Pond Alternatives

Three pond alternatives were each developed for Basins 3 and 4. Due to the nature of the soils, and the expected elevation of the water table, all three alternatives were assumed to be wet detention ponds.

Basin 3 is located west of Intercession City and includes a portion of Intercession City. The western limits of this basin drains east to Ready Creek, and the eastern portion of this basin drains to the Reedy Creek Swamp. See **Figure 15** for the proposed Basin 3 pond locations.

Basin 4 is located east of Intercession City and includes a portion of Intercession City. This basin drains to the Reedy Creek Swamp. See **Figure 16** for the proposed Basin 4 pond locations.

As a result of the analysis of pond alternatives, three proposed pond locations were idenfied for Basin 3 and 4 for the Preferred Alternative. Two potential pond locations were identified north of US 17/92, and one south of US 17/92. All three ponds are located east of Intercession City and will have floodplain impacts. Pond and floodplain calculations are located in **Appendix B5**.

3.12.3 Offsite Ponds

During the Environmental Look Around (ELA), which was held at the project site on July 29, 2021, the use of an offsite pond was discussed, as one option for additional compensation if needed. See **Appendix C** for the ELA meeting Summary Memorandum. As a result, an offsite pond was evaluated southeast of Intercession City. The offsite pond could serve as compensation as well as to provide treatment to the existing paved roads in the already developed residential area. Offsite compensation could be given to this area which is currently not treated and drains to the Reedy Creek Swamp. See **Figure 13** for the potential offsite pond location.

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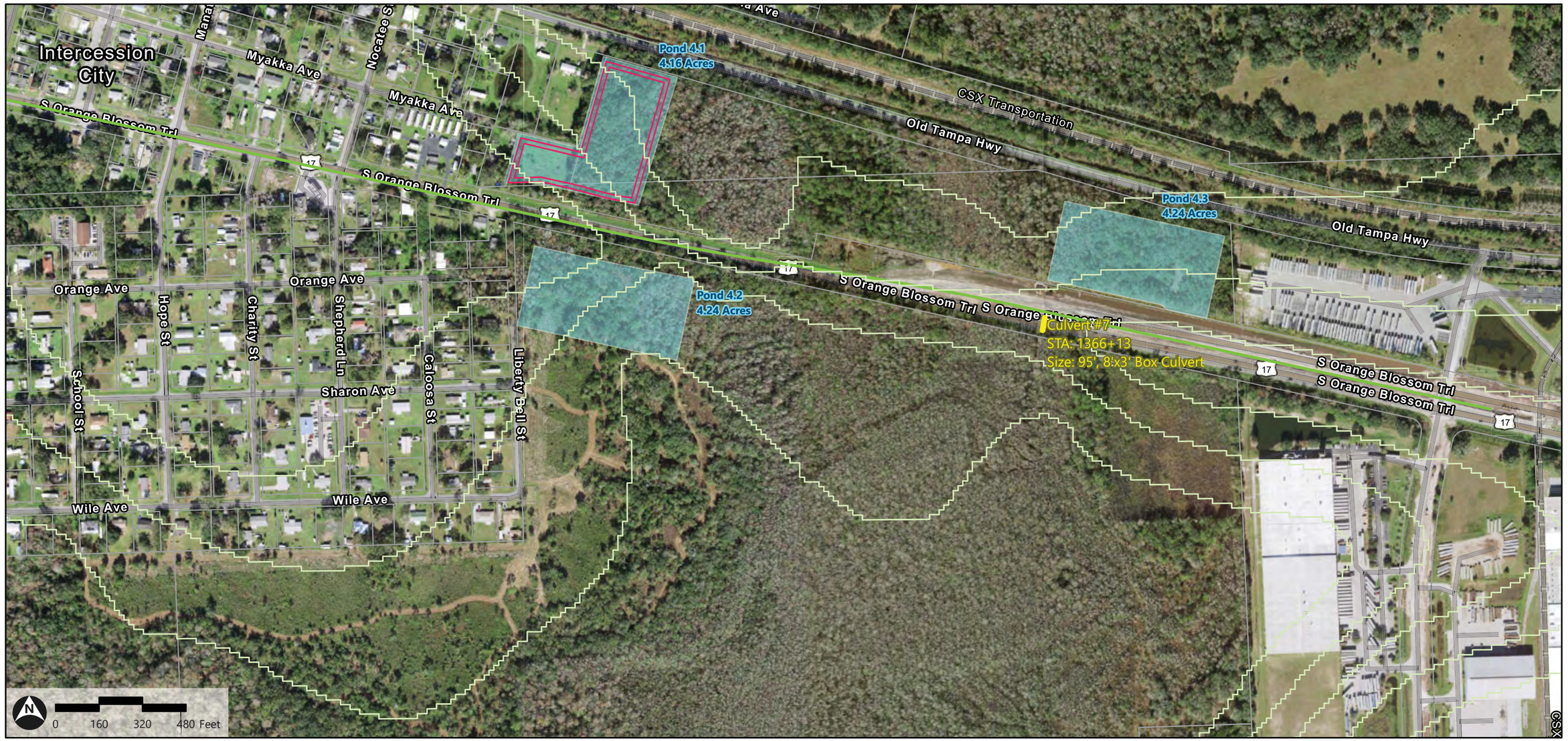
N.T.S.

- Project Alignment
- Pond
- County Boundary
- Berm
- Culvert
- Parcels 2023
- Contour 2 ft

Figure 15

Basins 3 Pond Alternatives
US17/92 from Ivy Mist Lane to Avenue A



N.T.S.

- Project Alignment
- Pond
- County Boundary
- Berm
- Culvert
- Parcels 2023
- Contour 2 ft

Figure 16

Basins 4 Pond Alternatives
US17/92 from Ivy Mist Lane to Avenue A

The site evaluated is located within existing SFWMD managed lands (Intercession City Tract) and is part of the Upper Reedy Creek Management Area. After evaluating the stormwater management needs, additional compensation for offsite treatment was not required and the offsite pond was eliminated from further consideration to avoid impacts to the existing conservation lands and associated recreation uses.

3.12.4 Floodplain Compensation Areas

The proposed roadway widening, and the proposed ponds include floodplain impacts. The volume of floodplain impacts were estimated and three potential floodplain compensation alternatives were identified to evaluate compensation for the floodplain impacts. Floodplain compensation area (FCA)1 (FCA1 in Table 5 and Figure 17) is primarily outside of the floodplain and FCA3 would require an easement. Therefore, FCA2 was chosen as the preferred location because it is the one with the the least amount of wetland and floodway impact among the areas located inside the floodplain. The floodplain compensation pond will allow flow to the existing railroad cross drains as the ponds are typically excavated without a berm to be connected to the floodplain. Floodplain calculations are located in **Appendix B5**. See **Figure 17** for the floodplain compensation alternatives. See **Table 7** for the evaluation of floodplain compensation alternatives.

3.12.5 Pond Evaluation

In selecting the type and sites for stormwater treatment facilities, costs, maintainability, constructability, and environmental impacts were considered. Given that the general direction of flow is north to south, the ponds alternatives on the north will outfall to the nearest wetland (Pond 3.1) or cross drain via pipe (Pond 4.1) so the drainage patterns to the south are maintained. **Table 6** summarizes the basin information and environmental impacts. See **Table 7** for the evaluation of floodplain compensation alternatives. A description of the ponds is as follows.

Basin 1 and 2

Early in the PD&E analysis, the option of a joint use pond was discussed between FDOT and CFX. Because the CFX projects (SR 538 and CR 532) will be constructed well before the widening of US 17/92 it was agreed that a joint use pond made the most sense for these two basins. Joint Use Ponds P1, P2A and Pond P2B (not a Joint Use Pond) are needed to meet the requirements of Basins 1 and 2 and the two ponds of the CFX projects. Existing cross drain 2 discharging point is located at the selected site for Pond 1. This cross drain will need to be rerouted around Pond 1 during the design stage. The cross drain will be extended and piped below the shared path parallel to Pond 1 till the point of discharge. No additional ROW is needed. Cross drains 3 and 4 are joined at a manhole and are not blocked by nearby Pond 2B. Easements will not be required. No historical and archeological involvement was identified. There are no impacts to utilities.

Basin 3

Pond 3.1 is the preferred pond site, with the least amount of wetland. Pond 3.2 has an environmental restriction because it is a conservation land, and Pond 3.3 requires the relocation of residences. Easements will not be required. No historical and archeological involvement was identified. There are no impacts to utilities. This pond is located at a higher elevation than the cross drain. Runoff will need to be conveyed to this pond using pipes.

Basin 4

Pond 4.1 is the preferred pond site, with nearly zero wetland impact and the least required parcel size. For Ponds 4.2 and 4.3 the future land use zoning is conservation land. Easements will not be required. No historical and archeological involvement was identified. There are no impacts to utilities. This pond is located at a higher elevation than the cross drain. Runoff will need to be conveyed to this pond using pipes.

The seasonal high ground water table (SHGWT) was obtained from the geotechnical report (Preliminary Soil Survey Report, June 2, 2021) and used in sizing the ponds. The geotechnical report used highwater marks of the wetlands provided by the environmental evaluations when establishing the SHGWT. Pond sizing calculations are shown in **Appendix B4**. Pond sizes in Table 6 and calculations in **Appendix B4** include the berm and tie down to existing ground. Ponds were also checked for permanent pool volume (PPV) and they will be able to accommodate the required volume and no additional ROW wil be needed. Calculations for PPV are shown in **Appendix B6**. The need of pond liners to prevent drying out the adjacent wetlands must be considered during the design stage.

3.12.6 Linear System Options

Linear ponds were not considered as an alternative to offsite stormwater ponds due to the limited ROW and the high-water table.

3.12.7 Proposed Conditions

The proposed road does not alter the existing drainage conditions. The drainage pattern is maintained with the existing swales and cross drains. Based on information in permit no. 49-00768-S for the existing ponds (see **Appendix D** for Previous Permit Information), the dry retention pond was approved for a water quality treatment volume of 0.14 acre foot (ac-ft) and the wet detention pond was approved for a water quality treatment volume of 0.63 ac-ft. During the design phase, these treatment volumes can be counted as credit against the required treatment volumes for the new impervious presented in **Appendix B3**.

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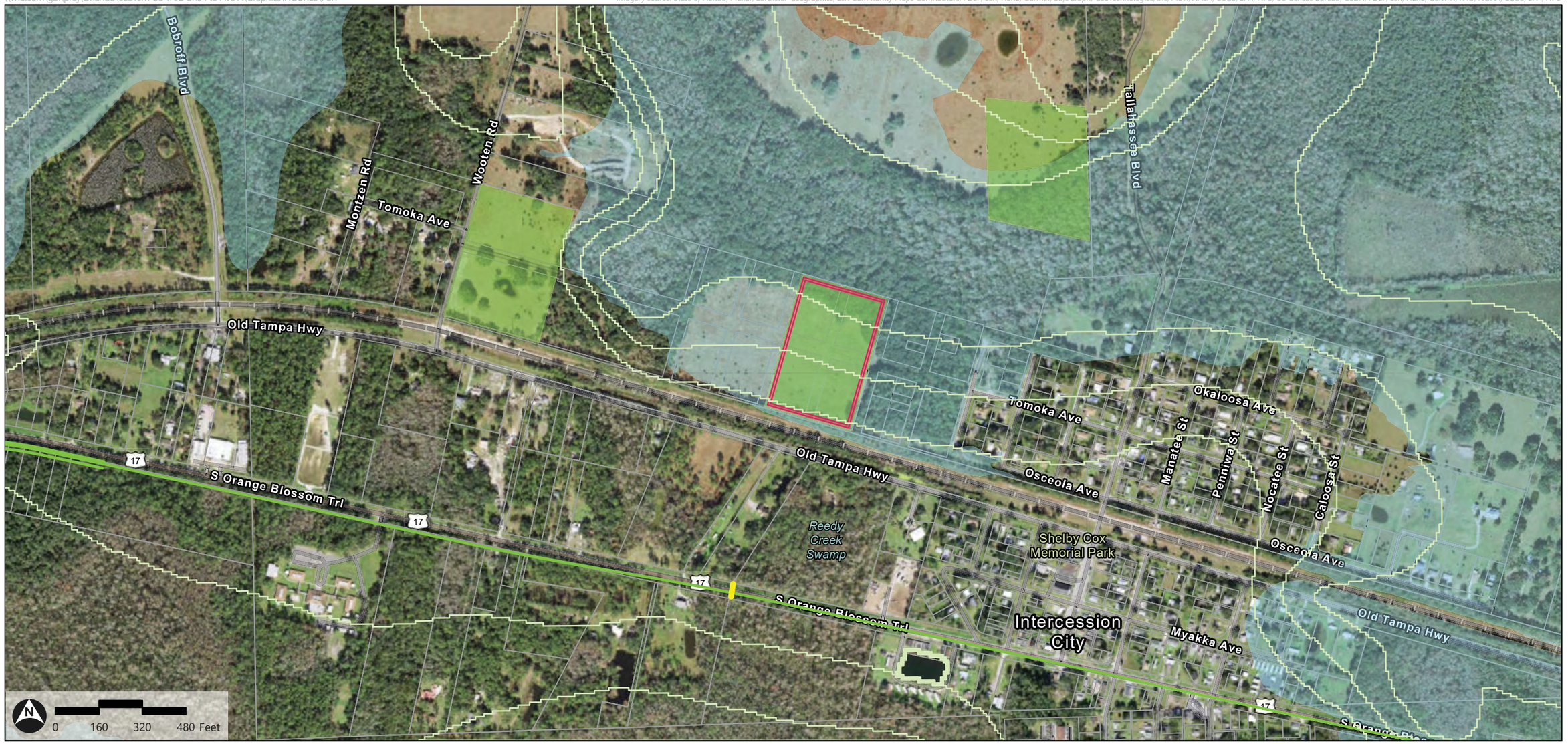
Imagery source: State of Florida, Maxar, Earthstar Geographics, Esri Community Maps Contributors, FDEP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS



N.T.S.

- Project Alignment
- Floodplain Compensation Pond
- County Boundary
- Berm
- Culvert
- Parcels 2023
- Contour 2 ft
- 100-Year Floodplain

Figure 17

Floodplain Compensation Areas
US17/92 from Ivy Mist Lane to Avenue A

Table 6: Pond Alternative Comparison Table

Pond	JU P1	JU P2A	P2B	3.1	3.2	3.3	4.1	4.2	4.3	OS 1
Drainage Basin Size (Ac)	22.02*	22.02*	22.02*	31.05	31.05	31.05	17.25	17.25	17.25	48.3
Pond Size (Ac)	6.66**	3.26**	1.04	7.62	7.73	7.42	4.16	4.24	4.24	20.73
Total Parcel Size Available (Ac)***	20.39	4.71	2.41	10.36	15.07	13.61	9.9	191.83	16.64	191.83
Wetland Impacts (Ac)	5.86	3.29	1.00	2.72	7.73	7.2	1.00	1.3	1.02	None
FEMA Floodplain Impacts (Ac)	None	None	None	None	None	None	3.87	3.38	4.24	5.15
Relocations	Yes	None	None	None	None	Yes	None	None	None	None
Contamination Potential	Low Risk	Low Risk	Low Risk	Medium Risk	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk
Easement Requirement	None	None	None	None	None	None	None	None	None	None
Historic/Archaeological Involvement	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement
Listed Species Habitat Potential	Caracara-H Bonnetted Bat-M Woodstork-M Sandhill Crane-M Gopher Tortoise-L	Woodstork-M Sandhill Crane-M Gopher Tortoise-L	Woodstork-M Sandhill Crane-M Gopher Tortoise-L	Caracara-H Woodstork-M Sandhill Crane-M Gopher Tortoise-H	Bonnetted Bat-M Woodstork-M Sandhill Crane-M	Woodstork-M Sandhill Crane-M Gopher Tortoise-L	Woodstork-L Sandhill Crane-L Gopher Tortoise-M	Caracara-H Bonnetted Bat-M Woodstork-M Sandhill Crane-M Gopher Tortoise-M	Plants-H Woodstork-M Sandhill Crane-M Gopher Tortoise-M	Caracara-H Scrub Jay-H Gopher Tortoise-M
Other Environmental Impacts	Poorly Drained Soils	Poorly Drained Soils	Poorly Drained Soils	Poorly Drained Soils	Conservation Poorly Drained Soils	Poorly Drained Soils	Poorly Drained Soils	Conservation Poorly Drained Soils	Conservation Poorly Drained Soils	Conservation Poorly Drained Soils
Utility Impacts	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement	No involvement	Low	No involvement
Current Land Use Zoning	Residential	Vacant Institutional	Vacant Institutional	Vacant Residential	Vacant Institutional	Vacant Residential	Vacant Residential	Institutional	Institutional	Institutional
Future Land Use Zoning	Low Density Residential	Poinciana	Institutional	Low Density Residential	Conservation	Low Density Residential	Low Density Residential	Conservation	Conservation	Conservation
Recommendation/Ranking	Recommend	Recommend	Recommend	Recommend			Recommend			

**Basin 1 and 2 combined*
***These two ponds are joint use ponds with CFX projects*
**** Only area required for pond will be used from the total parcel size available*

Table 7: Floodplain Compensation Areas

Pond		FCA1	FCA2	FCA3
Drainage Basin Size (Ac)		-	-	-
Compensation Area Size (Ac)		12.29	11.11	11.65
Total Parcel Size Required (Ac)		12.36	11.11	11.65
Wetland Impacts (Ac)		0.16	0.85	4.57
FEMA Floodplain Impacts (Ac)		0.04	1.11	6.13
Relocations		None	None	None
Contamination Potential		Medium Risk	Medium Risk	Medium Risk
Historic/Archaeological Involvement		No involvement	No involvement	No involvement
Listed Species Habitat Potential		Caracara-H Woodstork-M Sandhill Crane-M Gopher Tortoise-H	Caracara-H Woodstork-L Sandhill Crane-L Gopher Tortoise-H	Caracara-H Woodstork-M Sandhill Crane-M Scrub Jay-H Gopher Tortoise-H Sand Skink-H
Other Environmental Impacts		Poorly Drained Soils	Poorly Drained Soils	Poorly Drained Soils
Utility Impacts		No impacts	No impacts	No impacts
Current Land Use Zoning		Agricultural/Other	Agricultural	Agricultural
Future Land Use Zoning		Tourist Commercial	Tourist Commercial	Tourist Commercial
Recommendation/Ranking			Recommend	

4.0 Summary and Conclusions

In summary, the PD&E team completed a preliminary evaluation of stormwater options to accommodate the widening of US 17/92. All pond sites are designed to minimize environmental impacts. Impacts to wetlands and floodplains have been minimized. Additionally, floodplain impacts will be compensated for in floodplain compensation areas.

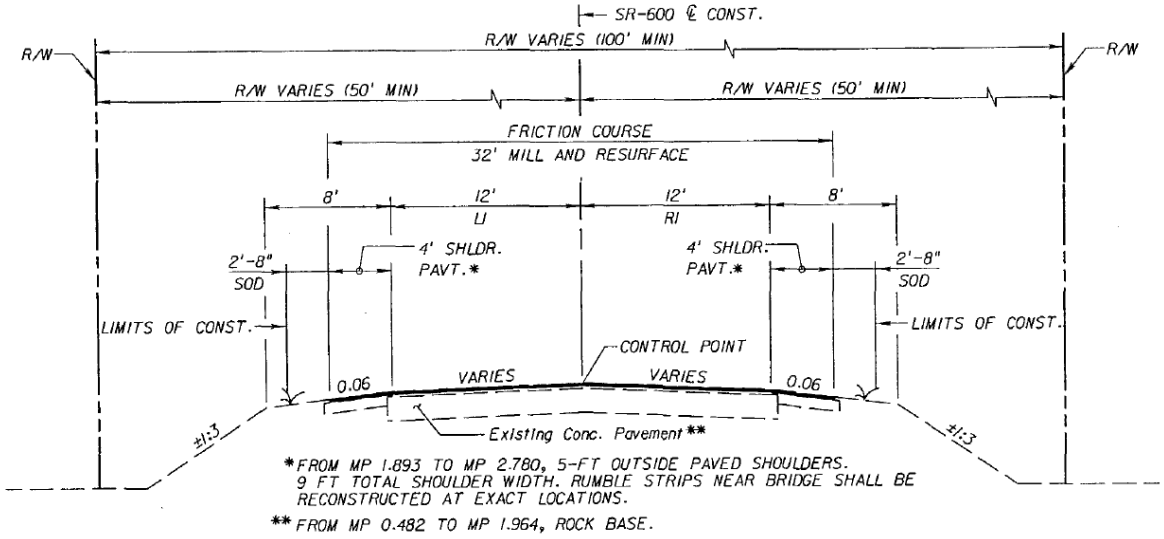
Basin 1 and 2
Early in the PD&E analysis, the option of a joint use pond was discussed between FDOT and CFX. Because the CFX project (where SR 538 and CR 532) will be constructed well before the widening of US 17/92 it was agreed that a joint use pond made the most sense for these two basins. Joint Use Ponds P1 and P2A are needed to meet the requirements of Basins 1 and 2 and the CFX projects. Easements will not be required. No historical and archeological involvement was identified. There is no involvement for utility coordination.

Basin 3
Pond 3.1 is the preferred pond site. Pond 3.2 is a conservation land, and Pond 3.3 requires relocations. Easements will not be required. No historical and archeological involvement was identified. There is no involvement for utility coordination.

Basin 4
Pond 4.1 is the preferred pond site. For Ponds 4.2 and 4.3 the future land use zoning is conservation land. Easements will not be required. No historical and archeological involvement was identified. For utility coordination is either low or there is no involvement.

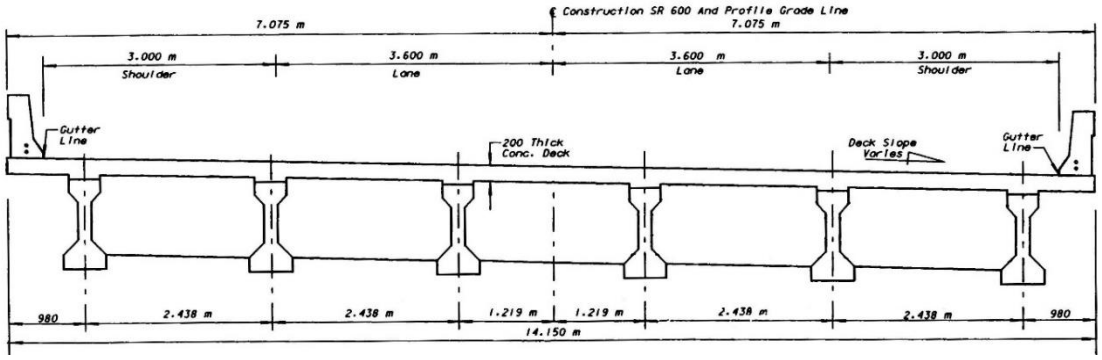
Appendix A – Existing Typical Sections

Typical Section #1



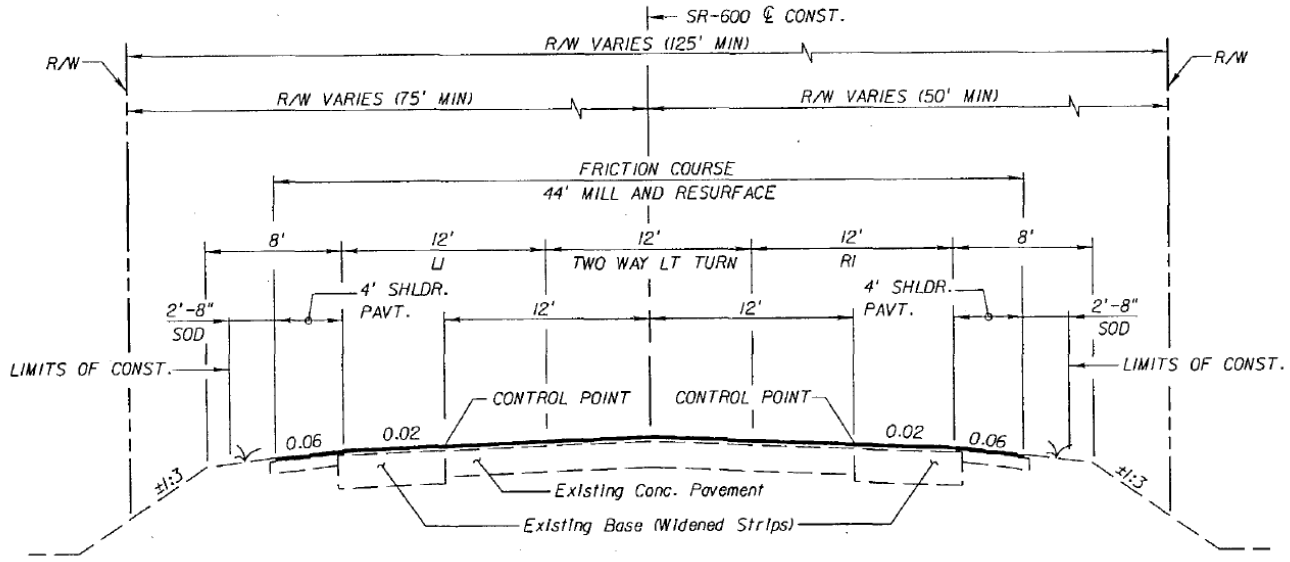
Roadway ID 92010000/92010100: M.P. 0.299 to M.P. 2.780 (excluding bridge)
Design Speed: 60 mph

Typical Section #2



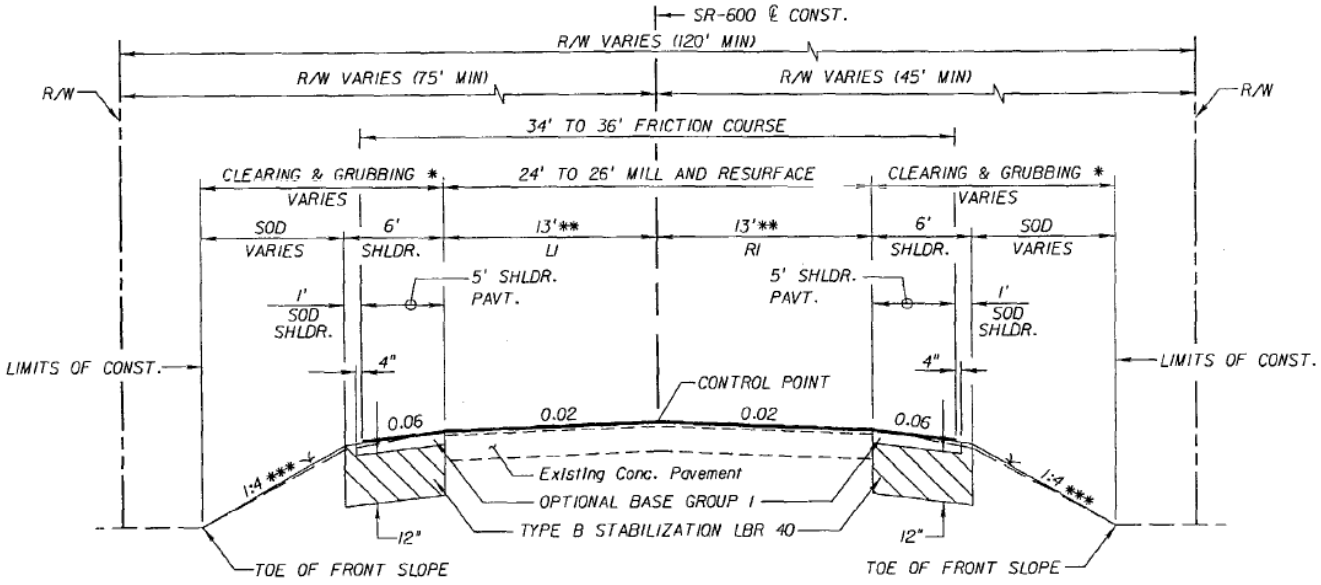
Roadway ID 92010100: M.P. 0.447 to M.P. 0.888 (bridge typical)
Design Speed: 60 mph

Typical Section #3



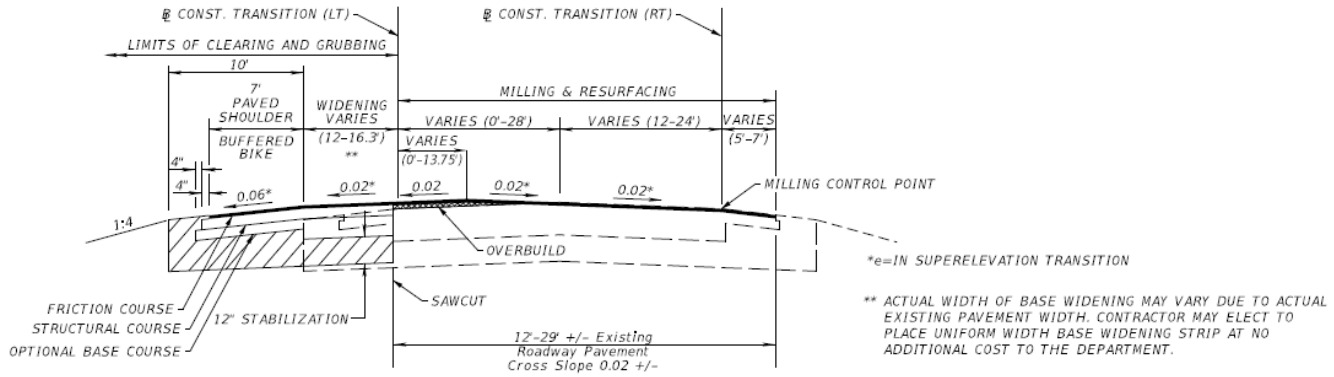
Roadway ID 92010000: M.P. 2.780 to M.P. 3.330
Design Speed: 50 mph

Typical Section #4



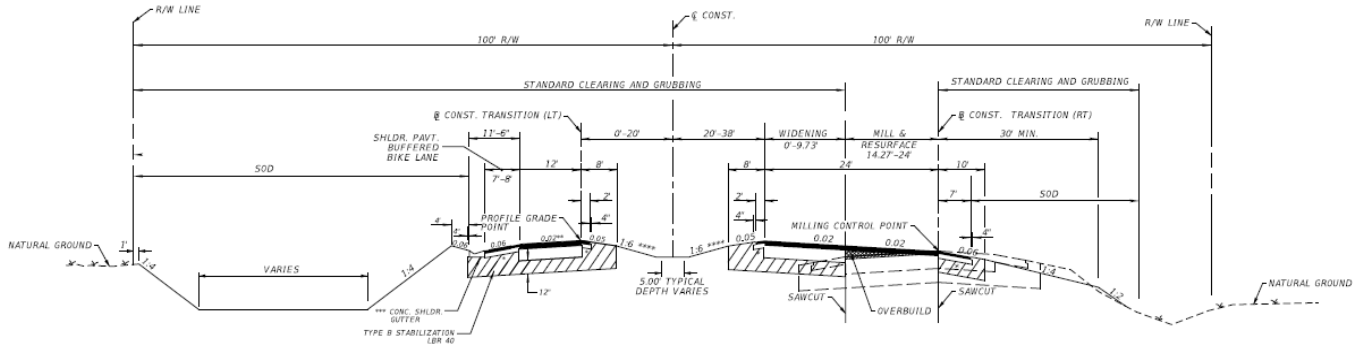
Roadway ID 92010000: M.P. 3.330 to M.P. 3.754
Design Speed: 60 mph

Typical Section #5



Roadway ID 92010000: M.P. 3.754 to M.P. 3.878
Design Speed: 55 mph

Typical Section #6



Roadway ID 92010000: M.P. 3.878 to M.P. 4.117
Design Speed: 55 mph

Appendix B1 – Curve Number Calculations

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 1 - 1177+00 to 1210+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Impervious Area	98			2.90	284.20
Type A	Open Space (Good)	39			4.09	159.51
Type D	Open Space (Good)	80			16.65	1332.00
Use only one CN source per line.				Totals =	23.64	1775.71

CN (weighted) = total product/total area = $\frac{1775.71}{23.64}$ = 75.11 Use CN = **75**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 1 - 1177+00 to 1210+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Impervious Area	98			6.33	620.71
Type A	Open Space (Good)	39			3.05	118.79
Type D	Open Space (Good)	80			14.26	1140.83
Use only one CN source per line.				Totals =	23.64	1880.33

CN (weighted) = total product/total area = $\frac{1880.33}{23.64}$ = 79.54 Use CN = **80**

Notes:
1. Post pervious area hydrologic group is calculated by using the same percentage as pre
For example: Pre Basin 1 soil is 12% Hydrologic Group A and 84% D
2. The impervious/pervious area is calculated based on a conservative typical section of a 22 ft grass median with 2 ft curb & gutter and 5 ft grass median each side, 2-11 ft travel lanes each side, no shoulders and 12 ft shared use path on each side. The basin width is assumed to be a minimum of 151 ft.

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 2 - 1210+00 to 1244+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Impervious Area	98			4.01	392.98
Type D	Open Space (Good)	80			15.03	1202.80
Use only one CN source per line.				Totals =	19.04	1595.78

CN (weighted) = total product/total area = $\frac{1595.78}{19.04}$ = 83.79 Use CN = **84**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 2 - 1210+00 to 1244+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Impervious Area	98			8.20	803.17
Type D	Open Space (Good)	80			10.85	867.95
Use only one CN source per line.				Totals =	19.04	1671.12

CN (weighted) = total product/total area = $\frac{1671.12}{19.04}$ = 87.75 Use CN = **88**

Notes:
1. Post pervious area hydrologic group is calculated by using the same percentage as pre
For example: Pre Basin 1 soil is 12% Hydrologic Group A and 84% D
2. The impervious/pervious area is calculated based on a conservative typical section of a 22 ft grass median with 2 ft curb & gutter and 5 ft grass median each side, 2-11 ft travel lanes each side, no shoulders and 12 ft shared use path on each side. The basin width is assumed to be a minimum of 151 ft.

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 3 - 1244+00 to 1333+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	CN [1] Fig 2-3	CN [1] Fig 2-4	Area ☑ acres ☐ mi^2 ☐ %	
Type D	Impervious Area	98			8.07	790.86
Type D	Open Space (Good)	80			37.70	3015.74
Use only one CN source per line.				Totals =	45.77	3806.60

CN (weighted) = total product/total area = $\frac{3806.60}{45.77}$ = 83.17 Use CN = **83**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 3 - 1244+00 to 1333+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi^2 ☐ %	
Type D	Impervious Area	98			18.18	1782.04
Type D	Open Space (Good)	80			27.58	2206.61
Use only one CN source per line.				Totals =	45.77	3988.65

CN (weighted) = total product/total area = $\frac{3988.65}{45.77}$ = 87.15 Use CN = **87**

Notes:
1. Post pervious area hydrologic group is calculated by using the same percentage as pre
For example: Pre Basin 1 soil is 12% Hydrologic Group A and 84% D
2. The impervious/pervious area is calculated based on a conservative typical section of a 22 ft grass median with 2 ft curb & gutter and 5 ft grass median each side, 2-11 ft travel lanes each side, no shoulders and 12 ft shared use path on each side. The basin width is assumed to be a minimum of 151 ft.

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 4 - 1333+00 to 1383+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	CN [1] Fig 2-3	CN [1] Fig 2-4	Area ☑ acres ☐ mi^2 ☐ %	
Type D	Impervious Area	98			4.17	408.66
Type D	Open Space (Good)	80			21.54	1723.33
Use only one CN source per line.				Totals =	25.71	2131.99

CN (weighted) = total product/total area = $\frac{2131.99}{25.71}$ = 82.92 Use CN = **83**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 4 - 1333+00 to 1383+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Impervious Area	98			10.22	1001.15
Type D	Open Space (Good)	80			15.50	1239.67
Use only one CN source per line.				Totals =	25.71	2240.82

CN (weighted) = total product/total area = $\frac{2240.82}{25.71}$ = 87.15 Use CN = **87**

Notes:
1. Post pervious area hydrologic group is calculated by using the same percentage as pre
For example: Pre Basin 1 soil is 12% Hydrologic Group A and 84% D
2. The impervious/pervious area is calculated based on a conservative typical section of a 22 ft grass median with 2 ft curb & gutter and 5 ft grass median each side, 2-11 ft travel lanes each side, no shoulders and 12 ft shared use path on each side. The basin width is assumed to be a minimum of 151 ft.

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 1- Pond 1

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Woods (Good)	77			3.10	238.70
Use only one CN source per line.				Totals =	3.10	238.70

CN (weighted) = total product/total area = $\frac{238.70}{3.10}$ = 77.00 Use CN = **77**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 1- Pond 1

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Area at Control	100			2.09	208.87
Type D	Woods (Good)	77			1.01	77.87
Use only one CN source per line.				Totals =	3.10	286.74

CN (weighted) = total product/total area = $\frac{286.74}{3.10}$ = 92.50 Use CN = **92**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 2- Pond 2

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	CN [1] Fig 2-3	CN [1] Fig 2-4	Area ☑ acres ☐ mi^2 ☐ %	
Type D	Woods (Good)	77			3.50	269.50
Use only one CN source per line.				Totals =	3.50	269.50

CN (weighted) = total product/total area = $\frac{269.50}{3.50}$ = 77.00 Use CN = **77**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 2- Pond 2

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Area at Control	100			2.33	232.82
Type D	Open Space (Good)	77			1.17	90.23
Use only one CN source per line.				Totals =	3.50	323.05

CN (weighted) = total product/total area = $\frac{323.05}{3.50}$ = 92.30 Use CN = **92**

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 3 Pond 1 2 and 3

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	CN [1] Fig 2-3	CN [1] Fig 2-4	Area ☑ acres ☐ mi^2 ☐ %	
Type D	Woods Grass Combination (Good)	79			6.25	493.75
Use only one CN source per line.				Totals =	6.25	493.75

CN (weighted) = total product/total area = $\frac{493.75}{6.25}$ = 79.00 Use CN = **79**

Note: Basin 3 Pond 1 was used as a conservative estimate because it is the largest pond.

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 3 Pond 1 2 and 3

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	CN [1] Fig 2-3	CN [1] Fig 2-4	Area ☑ acres ☐ mi^2 ☐ %	
Type D	Area at Control	100			4.71	471.04
Type D	Open Space (Good)	80			1.54	123.16
	Use only one CN source per line.			Totals =	6.25	594.21

CN (weighted) = total product/total area = $\frac{594.21}{6.25}$ = 95.07 Use CN = **95**

Note: Basin 3 Pond 1 was used as a conservative estimate because it is the largest pond.

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: (Present) Developed Basin 4 Pond 1 2 and 3

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Woods (Good)	77			3.60	277.20
Use only one CN source per line.				Totals =	3.60	277.20

CN (weighted) = total product/total area = $\frac{277.20}{3.60}$ = 77.00 Use CN = **77**

Note: Basin 4 Pond 3 was used as a conservative estimate because it (and Pond 2-same size) is larger than Pond 1

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023
County: Osceola **Checked by:** AE **Date:** 5/3/2023

Circle One: Present (Developed) Basin 4 Pond 1 2 and 3

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Area at Control	100			2.59	259.17
Type D	Open Space (Good)	80			1.01	80.66
Use only one CN source per line.				Totals =	3.60	339.83

CN (weighted) = total product/total area = $\frac{339.83}{3.60}$ = 94.40 Use CN = **94**

Note: Basin 4 Pond 3 was used as a conservative estimate because it (and Pond 2-same size) is larger than Pond 1

Appendix B2 – Water Quantity Calculations

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/3/2023

County: Osceola **Checked by:** AE **Date:** 5/3/2023

Pre vs. Post Runoff

PRE-DEVELOPED :

Basin	Basin Area (ac)	Pond Area (ac)	Total Area (ac)	CN	S=	Runoff (in)	
						P (in)	P (in)
						25-yr, 72-hr	100-yr, 72-hr
						10.5	12
1	23.64	3.10	26.74	75	3.27	7.39	8.80
Combined 1 & 2	42.68	6.60	49.28	79	2.70	7.83	9.27
2	19.04	3.50	22.54	83	2.09	8.35	9.81
3	45.77	6.25	52.02	83	2.10	8.35	9.81
4	25.71	3.60	29.31	82	2.17	8.28	9.74

POST-DEVELOPED :

Basin	Basin Area (ac)	Pond Area (ac)	Total Area (ac)	CN	S=	Runoff (in)	
						P (in)	P (in)
						25-yr, 72-hr	100-yr, 72-hr
						10.5	12
1	23.64	3.10	26.74	81	2.34	8.14	9.59
Combined 1 & 2	42.68	6.60	49.28	84	1.84	8.57	10.04
2	19.04	3.50	22.54	88	1.30	9.08	10.57
3	45.77	6.25	52.02	88	1.35	9.04	10.52
4	25.71	3.60	29.31	88	1.36	9.03	10.51

INCREASE RUNOFF :

DELTA RUNOFF ac-ft

$$= \frac{(\text{Runoff Post (in)} - \text{Runoff Pre (in)}) * A \text{ (ac)}}{12 \text{ (in/ft)}}$$

Basin	Storage Required (ac-ft)	
	P (in)	P (in)
	25-yr, 72-hr	100-yr, 72-hr
	10.5	12
1	1.67	1.75
Combined 1 & 2	3.03	3.16
2	1.37	1.41
3	3.00	3.09
4	1.82	1.88

Notes: 1. Some soils in this area are classified as Type A/D, B/D, C/D by NRCS. To be conservative, Type D soils are used.
2. DELTA RUNOFF ac-ft is the **Attenuation Storage Volume Required**.
3. PDS-based precipitation frequency estimates were obtained from the SFWMD Applicant's Handbook
PDS=Partial Duration Series
4. The pond that produced the most delta runoff for the basin was used in this calculation

Appendix B3 – Water Quality Calculations

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/1/2023
County: Osceola **Checked by:** AE **Date:** 5/1/2023

Basin Parameters

Basin	Station Range of Basin		Length of Basin	Area	Proposed Impervious Area	Existing Impervious Area	Net Increase Impervious Area
			(ft)	(ac)	(ac)	(ac)	(ac)
Basin 1	1179+00.00	1210+00.00	3100	23.64	6.33	2.90	3.43
Basin 2	1210+00.00	1244+00.00	3400	19.04	8.20	4.01	4.19
Basin 3	1244+00.00	1333+00.00	8900	45.77	18.18	8.07	10.11
Basin 4	1333+00.00	1383+00.00	5000	25.71	10.22	4.17	6.05

Water Quality Volume Required (SFWMD)

Basin	1" Runoff Over Basin	2.5" Runoff Over Impervious	Greater Volume Required (Wet Detention)	With Addn'l 50% Treatment Vol. Req. (Wet Detention)
	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
Basin 1	1.97	0.72	1.97	2.96
Basin 2	1.59	0.87	1.59	2.38
Basin 3	3.81	2.11	3.81	5.72
Basin 4	2.14	1.26	2.14	3.21

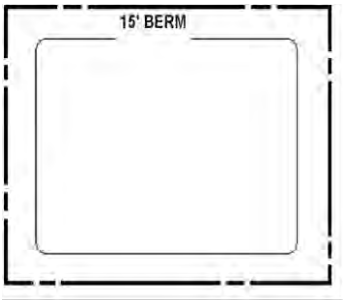
Assumptions/Notes:
1. Preliminary proposed typical section assumes a right-of-way width of 148-ft. 90-ft impervious and 58-ft pervious per foot of basin length is assumed.
2. Once final typical sections are designed this will need to be updated.
3. Existing Impervious was measured within the existing right-of-way and does not include side streets or driveways

Appendix B4 – Pond Sizing Calculations

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 1 and 2 Pond Combined

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 6.00 ac using a 15% S.F. -> **6.9 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 511 ft

Assuming a Rectangular (2:1) Pond: 361 ft by 723 ft

Existing ground @ pond site averages: 66.0 ft The Top Contour is: 69.0
The Bottom Contour is: 66.0

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 21 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	62.0	165839	3.81	16.46
	63.0	172419	3.96	12.57
	64.0	179127	4.11	8.54
	65.0	185963	4.27	4.35
Control Water Elevation:	66.0	192926	4.43	0.00
	67.0	200018	4.59	4.51
	68.0	207238	4.76	9.19
Berm Elevation:	69.0	214586	4.93	14.03

Water Quality Volume Required =	**5.34 ac-ft**	**@**	**67.2 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**3.03 ac-ft**	**@**	**66.7 ft**	**25YR/72HR**
100-Year Volume Required =	**3.16 ac-ft**	**@**	**66.7 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP B1= 69

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.16 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.67 ft ok

Is basin < than 10 ft?
Basin Dpth = 0.69 ft ok

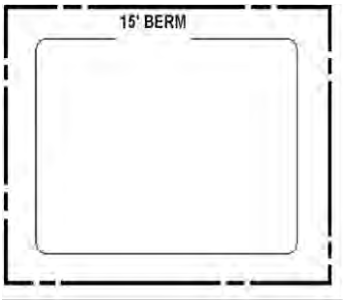
At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.8 ok
Attenuation Freeboard = 2.3 ok
Flood Protection Freeboard = 2.3 ok

Notes:
1. Basin 2 drainage will flow offsite without treatment and attenuation, but will be compensated for by providing treatment and attenuation for existing impervious area in Basin 1.
2. Water Quality Volume Requirement for this pond was calculated by adding the Water Quality volume of Basin 1 and Basin 2.
3. Attenuation Volume and 100-year volume requirements for this pond are the sum of Basin 1 and Basin 2 attenuation volume and 100-year volume, respectively.

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 1 Pond 1 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 3.10 ac using a 15% S.F. -> **3.6 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes. 3.7

Each side of the required R.O.W for a square pond is: 367 ft

Assuming a Rectangular (2:1) Pond: 260 ft by 520 ft

Existing ground @ pond site averages: 66.0 ft The Top Contour is: 68.2
The Bottom Contour is: 65.2

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 17.92 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	61.2	72702	1.67	7.50
	62.2	77080	1.77	5.78
	63.2	81586	1.87	3.96
	64.2	86220	1.98	2.03
Control Water Elevation:	65.2	90982	2.09	0.00
	66.2	95872	2.20	2.14
	67.2	100890	2.32	4.40
Berm Elevation:	68.2	106036	2.43	6.78

Water Quality Volume Required =	**2.96 ac-ft**	**@**	**66.6 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**1.67 ac-ft**	**@**	**66.0 ft**	**25YR/72HR**
100-Year Volume Required =	**1.75 ac-ft**	**@**	**66.0 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP B1= 69

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.33 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.76 ft ok

Is basin < than 10 ft?
Basin Dpth = 0.80 ft ok

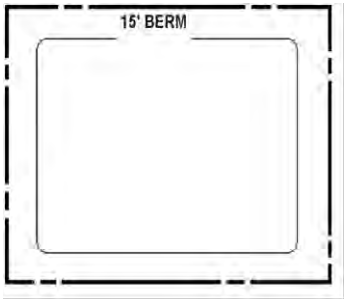
At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.7 ok
Attenuation Freeboard = 2.2 ok
Flood Protection Freeboard = 2.2 ok

Notes:
1. Basin 2 drainage will flow offsite without treatment and attenuation, but will be compensated for by providing treatment and attenuation for existing impervious area in Basin 1.
2. Water Quality Volume Requirement for this pond was calculated by adding the Water Quality volume of Basin 1 and Basin 2.
3. Attenuation Volume and 100-year volume requirements for this pond are the sum of Basin 1 and Basin 2 attenuation volume and 100-year volume, respectively.

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 2 Pond 2 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 3.50 ac using a 15% S.F. -> **4.0 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 390 ft

Assuming a Rectangular (2:1) Pond: 276 ft by 552 ft

Existing ground @ pond site averages: 66.0 ft The Top Contour is: 69.0
The Bottom Contour is: 66.0

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 21 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	62.0	82060	1.88	8.41
	63.0	86707	1.99	6.47
	64.0	91483	2.10	4.43
	65.0	96386	2.21	2.27
Control Water Elevation:	66.0	101418	2.33	0.00
	67.0	106577	2.45	2.39
	68.0	111864	2.57	4.89
Berm Elevation:	69.0	117280	2.69	7.53

Water Quality Volume Required =	**2.38 ac-ft**	**@**	**67.0 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**1.37 ac-ft**	**@**	**66.6 ft**	**25YR/72HR**
100-Year Volume Required =	**1.41 ac-ft**	**@**	**66.6 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP B1= 69

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 0.97 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.57 ft ok

Is basin < than 10 ft?
Basin Dpth = 0.59 ft ok

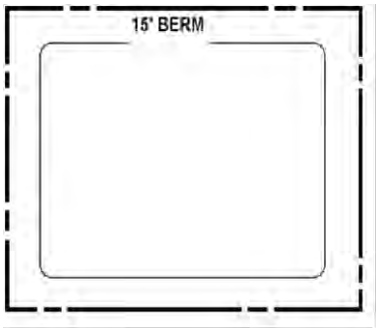
At least one foot of freeboard under High Berm?
Water Quality Freeboard = 2.0 ok
Attenuation Freeboard = 2.4 ok
Flood Protection Freeboard = 2.4 ok

Notes:
1. Basin 2 drainage will flow offsite without treatment and attenuation, but will be compensated for by providing treatment and attenuation for existing impervious area in Basin 1.
2. Water Quality Volume Requirement for this pond was calculated by adding the Water Quality volume of Basin 1 and Basin 2.
3. Attenuation Volume and 100-year volume requirements for this pond are the sum of Basin 1 and Basin 2 attenuation volume and 100-year volume, respectively.

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 3 Pond 1 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 6.25 ac using a 22% S.F. -> **7.6 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 522 ft

Assuming a Rectangular (2:1) Pond: 369 ft by 738 ft

Existing ground @ pond site averages: 67.0 ft

The Top Contour is: 69.6
The Bottom Contour is: 66.6

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 19.4 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	62.6	177,221	4.07	17.54
	63.6	184,020	4.22	13.40
	64.6	190,948	4.38	9.09
	65.6	198,003	4.55	4.63
Control Water Elevation:	66.6	205,187	4.71	0.00
	67.6	212,499	4.88	4.79
	68.6	219,938	5.05	9.76
Berm Elevation:	69.6	227,506	5.22	14.89

Water Quality Volume Required =	**5.72 ac-ft**	**@**	**67.8 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**3.00 ac-ft**	**@**	**67.2 ft**	**25YR/72HR**
100-Year Volume Required =	**3.09 ac-ft**	**@**	**67.2 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP = 76

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.17 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.62 ft ok

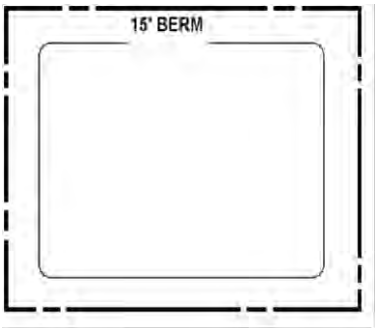
Is basin < than 10 ft?
Basin Dpth = 0.64 ft ok

At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.8 ok
Attenuation Freeboard = 2.4 ok
Flood Protection Freeboard = 2.4 ok

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 3 Pond 2 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 6.25 ac using a 15% S.F. -> **7.2 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 522 ft

Assuming a Rectangular (2:1) Pond: 369 ft by 738 ft

Existing ground @ pond site averages: 65.0 ft

The Top Contour is: 66.0
The Bottom Contour is: 63.0

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 13.12 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	59.0	187,953	4.31	18.57
	60.0	194,954	4.48	14.17
	61.0	202,082	4.64	9.61
	62.0	209,339	4.81	4.89
Control Water Elevation:	63.0	216,724	4.98	0.00
	64.0	224,236	5.15	5.06
	65.0	231,877	5.32	10.30
Berm Elevation:	66.0	239,645	5.50	15.71

Water Quality Volume Required =	**5.72 ac-ft**	**@**	**64.1 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**3.00 ac-ft**	**@**	**63.6 ft**	**25YR/72HR**
100-Year Volume Required =	**3.09 ac-ft**	**@**	**63.6 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP = 76

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.11 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.59 ft ok

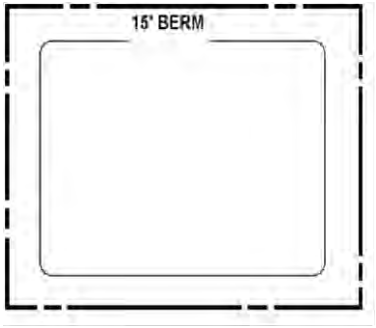
Is basin < than 10 ft?
Basin Dpth = 0.61 ft ok

At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.9 ok
Attenuation Freeboard = 2.4 ok
Flood Protection Freeboard = 2.4 ok

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 3 Pond 3 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 6.25 ac using a 15% S.F. -> **7.2 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 522 ft

Assuming a Rectangular (2:1) Pond: 369 ft by 738 ft

Existing ground @ pond site averages: 65.0 ft

The Top Contour is: 68.4
The Bottom Contour is: 65.4

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 22.52 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	61.4	172,006	3.95	17.05
	62.4	178,706	4.10	13.02
	63.4	185,533	4.26	8.84
	64.4	192,489	4.42	4.50
Control Water Elevation:	65.4	199,573	4.58	0.00
	66.4	206,785	4.75	4.66
	67.4	214,124	4.92	9.50
Berm Elevation:	68.4	221,592	5.09	14.50

Water Quality Volume Required =	**5.72 ac-ft**	**@**	**66.6 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**3.00 ac-ft**	**@**	**66.0 ft**	**25YR/72HR**
100-Year Volume Required =	**3.09 ac-ft**	**@**	**66.0 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP = 76

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.20 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.64 ft ok

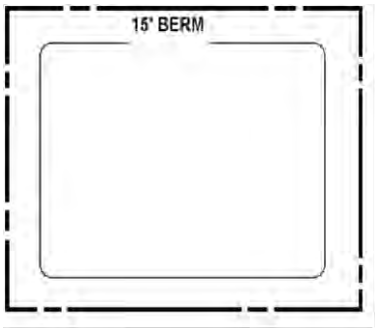
Is basin < than 10 ft?
Basin Dpth = 0.66 ft ok

At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.8 ok
Attenuation Freeboard = 2.4 ok
Flood Protection Freeboard = 2.3 ok

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 4 Pond 1 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 3.60 ac using a 15% S.F. -> **4.1 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 396 ft

Assuming a Rectangular (2:1) Pond: 280 ft by 560 ft

Existing ground @ pond site averages: 66.0 ft The Top Contour is: 66.8
The Bottom Contour is: 63.8

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 12 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	59.8	96100	2.21	9.77
	60.8	101124	2.32	7.50
	61.8	106276	2.44	5.12
	62.8	111556	2.56	2.62
Control Water Elevation:	63.8	116964	2.69	0.00
	64.8	122500	2.81	2.75
	65.8	128164	2.94	5.63
Berm Elevation:	66.8	133956	3.08	8.63

Water Quality Volume Required =	**3.21 ac-ft**	**@**	**64.9 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**1.82 ac-ft**	**@**	**64.4 ft**	**25YR/72HR**
100-Year Volume Required =	**1.88 ac-ft**	**@**	**64.4 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP = 76

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.14 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.66 ft ok

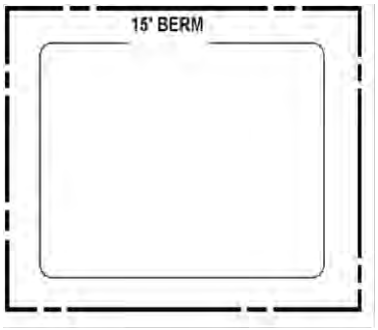
Is basin < than 10 ft?
Basin Dpth = 0.68 ft ok

At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.9 ok
Attenuation Freeboard = 2.3 ok
Flood Protection Freeboard = 2.3 ok

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 4 Pond 2 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 3.60 ac using a 15% S.F. -> **4.1 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 396 ft

Assuming a Rectangular (2:1) Pond: 280 ft by 560 ft

Existing ground @ pond site averages: 65.5 ft The Top Contour is: 66.8
The Bottom Contour is: 63.8

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 14 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	59.8	93636	2.15	9.53
	60.8	98596	2.26	7.32
	61.8	103684	2.38	5.00
	62.8	108900	2.50	2.56
Control Water Elevation:	63.8	114244	2.62	0.00
	64.8	119716	2.75	2.69
	65.8	125316	2.88	5.50
Berm Elevation:	66.8	131044	3.01	8.44

Water Quality Volume Required =	**3.21 ac-ft**	**@**	**64.9 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**1.82 ac-ft**	**@**	**64.4 ft**	**25YR/72HR**
100-Year Volume Required =	**1.88 ac-ft**	**@**	**64.4 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP = 76

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.17 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.67 ft ok

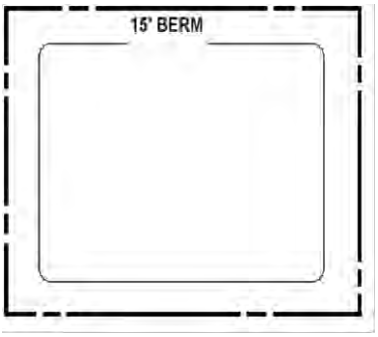
Is basin < than 10 ft?
Basin Dpth = 0.69 ft ok

At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.8 ok
Attenuation Freeboard = 2.3 ok
Flood Protection Freeboard = 2.3 ok

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/2/2023
County: Osceola **Checked by:** AE **Date:** 5/2/2023

Basin 4 Pond 3 Sizing

PRELIMINARY POND SIZE :



ASSUMED POND ROW = 3.60 ac using a 15% S.F. -> **4.1 ac**

Pond has a 15 ft maintenance berm and 4 : 1 max. side slopes.

Each side of the required R.O.W for a square pond is: 396 ft

Assuming a Rectangular (2:1) Pond: 280 ft by 560 ft

Existing ground @ pond site averages: 65.5 ft The Top Contour is: 67.0
The Bottom Contour is: 64.0

To tie the High Brm to exis. grnd. within ROW the berm buffer needs to be: 15 wide

STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary pond.

	STAGE ELEVATION (ft)	**SURFACE AREA** (sq-ft)	(ac)	**TOTAL STORAGE** (ac-ft)
Bottom Elevation:	60.0	92416	2.12	9.41
	61.0	97344	2.23	7.23
	62.0	102400	2.35	4.94
	63.0	107584	2.47	2.53
Control Water Elevation:	64.0	112896	2.59	0.00
	65.0	118336	2.72	2.65
	66.0	123904	2.84	5.43
Berm Elevation:	67.0	129600	2.98	8.34

Water Quality Volume Required =	**3.21 ac-ft**	**@**	**65.2 ft**	**Wet Detention Treatment**
Attenuation Volume Required =	**1.82 ac-ft**	**@**	**64.7 ft**	**25YR/72HR**
100-Year Volume Required =	**1.88 ac-ft**	**@**	**64.7 ft**	**100YR/72HR**

BASE CLEARANCE:

Lowest EOP = 76

CHECKS:

Is Wet treatment depth < than 1.5 ft?
Wet Trmt Dpth = 1.18 ft ok

Is Wet attenuation depth < than 4 ft?
Wet Attnt Dpth = 0.68 ft ok

Is basin < than 10 ft?
Basin Dpth = 0.70 ft ok

At least one foot of freeboard under High Berm?
Water Quality Freeboard = 1.8 ok
Attenuation Freeboard = 2.3 ok
Flood Protection Freeboard = 2.3 ok

Appendix B5 – Floodplain Compensation Calculations

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/15/2023

County: Osceola **Checked by:** AE **Date:** 5/15/2023

FLOODPLAIN ANALYSIS 1236+31.80 to 1236+97.10						
LOCATION	LENGTH	CROSS-SECTION FILL		AVG. FILL	FLOODPLAIN IMPACT	
STATION	(FT)	2 x SF	SF	SF	FT^3	ACRE-FT
1236+31.80		0.00	0.00			
	18.20			79.075	1439.16	0.03
1236+50.00		316.30	158.15			
	47.10			79.075	3724.43	0.09
1236+97.10		0.00	0.00			
					TOTAL	0.12

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/15/2023

County: Osceola **Checked by:** AE **Date:** 5/15/2023

FLOODPLAIN ANALYSIS 1343+61.90 to 1346+84.70						
LOCATION	**LENGTH**	**CROSS-SECTION FILL**		**AVG. FILL**	**FLOODPLAIN IMPACT**	
STATION	**(FT)**	**2 x SF**	**SF**	**SF**	**FT^3**	**ACRE-FT**
1343+61.90		0.00	0.00			
	38.10			0.655	24.96	0.00
1344+00.00		2.62	1.31			
	100.00			1.3775	137.75	0.00
1345+00.00		2.89	1.45			
	100.00			9.3725	937.25	0.02
1346+00.00		34.60	17.30			
	84.70			8.65	732.66	0.02
1346+84.70		0.00	0.00			
					TOTAL	**0.04**

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/15/2023

County: Osceola **Checked by:** AE **Date:** 5/15/2023

FLOODPLAIN ANALYSIS 1346+84.70 to 1380+76.80						
LOCATION	LENGTH	CROSS-SECTION FILL		AVG. FILL	FLOODPLAIN IMPACT	
STATION	(FT)	2 x SF	SF	SF	FT^3	ACRE-FT
1346+84.70		0.00	0.00			
	15.30			24.035	367.74	0.01
1347+00.00		96.14	48.07			
	100.00			46.9875	4698.75	0.11
1348+00.00		91.81	45.91			
	100.00			63.145	6314.50	0.14
1349+00.00		160.77	80.39			
	100.00			83.055	8305.50	0.19
1350+00.00		171.45	85.73			
	100.00			82.2025	8220.25	0.19
1351+00.00		157.36	78.68			
	100.00			95.3425	9534.25	0.22
1352+00.00		224.01	112.01			
	100.00			117.9525	11795.25	0.27
1353+00.00		247.80	123.90			
	100.00			130.7025	13070.25	0.30
1354+00.00		275.01	137.51			
	100.00			137.5025	13750.25	0.32
1355+00.00		275.00	137.50			
	100.00			130.4175	13041.75	0.30
1356+00.00		246.67	123.34			
	100.00			116.2325	11623.25	0.27
1357+00.00		218.26	109.13			
	100.00			102.9475	10294.75	0.24
1358+00.00		193.53	96.77			
	100.00			110.81	11081.00	0.25
1359+00.00		249.71	124.86			
	100.00			121.9275	12192.75	0.28
1360+00.00		238.00	119.00			
	100.00			125.215	12521.50	0.29
1361+00.00		262.86	131.43			
	100.00			129.275	12927.50	0.30
1362+00.00		254.24	127.12			
	100.00			128.715	12871.50	0.30
1363+00.00		260.62	130.31			
	100.00			133.59	13359.00	0.31
1364+00.00		273.74	136.87			
	100.00			136.99	13699.00	0.31
1365+00.00		274.22	137.11			
	100.00			180.135	18013.50	0.41
1366+00.00		446.32	223.16			
	100.00			176.355	17635.50	0.40
1367+00.00		259.10	129.55			

	100.00			124.5425	12454.25	0.29
1368+00.00		239.07	119.54			
	100.00			114.6575	11465.75	0.26
1369+00.00		219.56	109.78			
	100.00			101.9	10190.00	0.23
1370+00.00		188.04	94.02			
	100.00			90.0675	9006.75	0.21
1371+00.00		172.23	86.12			
	100.00			91.7575	9175.75	0.21
1372+00.00		194.80	97.40			
	100.00			89.535	8953.50	0.21
1373+00.00		163.34	81.67			
	100.00			97.1975	9719.75	0.22
1374+00.00		225.45	112.73			
	100.00			114.0975	11409.75	0.26
1375+00.00		230.94	115.47			
	100.00			109.21	10921.00	0.25
1376+00.00		205.90	102.95			
	100.00			100.5725	10057.25	0.23
1377+00.00		196.39	98.20			
	100.00			95.7475	9574.75	0.22
1378+00.00		186.60	93.30			
	100.00			100.3	10030.00	0.23
1379+00.00		214.60	107.30			
	100.00			106.845	10684.50	0.25
1380+00.00		212.78	106.39			
	76.80			53.195	4085.38	0.09
1380+76.80		0.00	0.00			
					TOTAL	**8.56**

Project: SR 600 (US 17-92) **Designed by:** AM **Date:** 5/15/2023

County: Polk/Osceola **Checked by:** AE **Date:** 5/15/2023

FLOODPLAIN ANALYSIS 1380+76.80 to 1385+00.00						
LOCATION	LENGTH	CROSS-SECTION FILL		AVG. FILL	FLOODPLAIN IMPACT	
STATION	(FT)	2 x SF	SF	SF	FT^3	ACRE-FT
1380+76.80		0.00	0.00			
	23.20			0	0.00	0.00
1381+00.00		0.00	0.00			
	100.00			42.9275	4292.75	0.10
1382+00.00		171.71	85.86			
	100.00			71.115	7111.50	0.16
1383+00.00		112.75	56.38			
	100.00			54.365	5436.50	0.12
1384+00.00		104.71	52.36			
	100.00			26.1775	2617.75	0.06
1385+00.00		0.00	0.00			
					TOTAL	0.45

Project: SR 600 (US 17-92) **Designed by:** OB **Date:** 5/15/2023
County: Polk/Osceola **Checked by:** MK **Date:** 5/15/2023

FLOODPLAIN ANALYSIS BASIN 4 POND 1				
NOTES	POND CONTOUR EL.	CONTOUR AREA	EL. DIFFERENCE	FLOODPLAIN IMPACT
	FT	ACRES	FT	ACRE-FT
BOTTOM	59.75	2.21		
			1.00	
	60.75	2.32		
			1.00	
	61.75	2.44		
			1.00	
	62.75	2.56		
			1.00	
CONTROL	63.75	2.69		
			1.00	
EXISTING GROUND	64.75	2.81		
			1.00	0.07
FLOODPLAIN EL.	65.75	2.94		
			1.00	0.13
BERM EL.	66.75	3.08		
			0.25	-0.06
1:4 TIE DOWN	67.00	3.33		
|			-1.00	0.09
v	66.00	3.51		
			TOTAL	**0.22**

Project:	SR 600 (US 17-92)	AM	**Designed by:**	5/15/2023	**Date:** 5/3/2023
County:	Polk/Osceola	AE	**Checked by:**	5/15/2023	**Date:** 5/3/2023

Floodplain Compensation Area 1

PRELIMINARY FLOODPLAIN COMPENSATION AREA :
STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary floodplain compensation area

Soil Type Smyrna Fine Sand, 0-2% Slopes

Depth to water Table 6"-18"

Floodplain Elevation (ft) = 66.0

Existing Ground Elevation (ft) = 65.0

SHWT Elevation (ft) = 64.0

	STAGE ELEVATION (ft)	SURFACE AREA (sq-ft)	SURFACE AREA (ac)	TOTAL STORAGE (ac-ft)
SHWT	64.0	529690	12.16	0.00
Berm	65.0	535352	12.29	12.23

Notes:
1. Floodplain Elevations from FEMA Floodplain Map
2. SHWT estimated from geotechnical report (Preliminary Soil Survey Report, June 2, 2021)
3. Slope between compensation contours estimated to be 1:4

Project:	SR 600 (US 17-92)	AM	**Designed by:**	5/15/2023	**Date:** 5/3/2023
County:	Polk/Osceola	AE	**Checked by:**	5/15/2023	**Date:** 5/3/2023

Floodplain Compensation Area 2

PRELIMINARY FLOODPLAIN COMPENSATION AREA :
STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary floodplain compensation area

Soil Type Ona Fine Sand, 0-2% Slopes

Depth to water Table 6"-18"

Floodplain Elevation (ft) = 67.0

Existing Ground Elevation (ft) = 65.0

SHWT Elevation (ft) = 64.0

	STAGE ELEVATION (ft)	SURFACE AREA (sq-ft)	SURFACE AREA (ac)	TOTAL STORAGE (ac-ft)
SHWT	64.0	478289	10.98	0.00
Berm	65.0	483952	11.11	11.05

Notes:
1. Floodplain Elevations from FEMA Floodplain Map
2. SHWT estimated from geotechnical report (Preliminary Soil Survey Report, June 2, 2021)
3. Slope between compensation contours estimated to be 1:4

Project:	SR 600 (US 17-92)	AM	**Designed by:**	5/15/2023	**Date:** 5/3/2023
County:	Polk/Osceola	AE	**Checked by:**	5/15/2023	**Date:** 5/3/2023

Floodplain Compensation Area 3

PRELIMINARY FLOODPLAIN COMPENSATION AREA :
STAGE-STORAGE RELATIONSHIP :

Below are the Stage - Storage calculations for the preliminary floodplain compensation area

Soil Type: Myakka/ Immokalee Fine Sand, 0-2% Slopes
Depth to water Table: 6"-18"
Floodplain Elevation (ft) = 67.0
Existing Ground Elevation (ft) = 65.0
SHWT Elevation (ft) = 64.0

	STAGE ELEVATION (ft)	SURFACE AREA (sq-ft)	SURFACE AREA (ac)	TOTAL STORAGE (ac-ft)
SHWT	64.0	501811	11.52	0.00
Berm	65.0	507474	11.65	11.59

Notes:
1. Floodplain Elevations from FEMA Floodplain Map
2. SHWT estimated from geotechnical report (Preliminary Soil Survey Report, June 2, 2021)
3. Slope between compensation contours estimated to be 1:4

Station Range	Floodplain Zone	Floodplain Elevation (ft)[1]	Lowest Existing PGL (ft)	Volume of Fill (ac-ft)
1236+31.80 to 1236+97.10	AE (Floodway)	67	66[2]	0.12
1236+97.10 to 1343+61.90	X	N/A	N/A	N/A
1343+61.90 to 1346+84.70	A	67	68[3]	0.04
1346+84.70 to 1380+76.80	A/AE	67/67	65	8.56
1380+76.80 to 1385+00.00	A	67	65	0.45
Basin 4 Pond 1	A	67	66	0.22
			TOTAL	9.40

Notes:

1. Zone A elevations are estimated from LiDAR Data
2. Existing ground elevation below existing bridge (extending bridge)
3. Although Lowest PGL is higher than floodplain, impact occurs in roadside swales

Appendix B6 – Permanent Pool Volume Calculations

Calculation of Permanent Pool Volume (PPV)

$$PPV\ (required) = \frac{A\ x\ C\ x\ R\ x\ RT}{WS\ x\ CF}$$

A =drainage area
C = runoff coefficient
R = wet season rainfall
RT = residence time
WS = no. of wet season days
CF = conversion factor

For Pond 3:

A =52.02 ac
C = 0.55
R = 31 in
RT = 21 days
WS =153 days
CF = 12 in/ft

$$PPV\ (required) = \frac{A\ x\ C\ x\ R\ x\ RT}{WS\ x\ CF} = \frac{52.02\ ac\ x\ 0.55\ x\ 31\ in\ x\ 21\ days}{153\ days\ x\ 12\ in/ft} = 10.14\ ac-ft$$

Total PPV provided for Pond 3 = 17.54 ac-ft > 10.14 ac-ft OK

For Pond 4:

A =29.31 ac
C = 0.55
R = 31 in
RT = 21 days
WS =153 days
CF = 12 in/ft

$$PPV\ (required) = \frac{A\ x\ C\ x\ R\ x\ RT}{WS\ x\ CF} = \frac{29.31\ ac\ x\ 0.55\ x\ 31\ in\ x\ 21\ days}{153\ days\ x\ 12\ in/ft} = 5.71\ ac-ft$$

Total PPV provided for Pond 4 = 9.77 ac-ft > 5.71 ac-ft OK

For Pond 1+2:

A =49.28 ac
C = 0.57
R = 31 in
RT = 21 days
WS =153 days
CF = 12 in/ft

$$PPV\ (required) = \frac{A\ x\ C\ x\ R\ x\ RT}{WS\ x\ CF} = \frac{49.28\ ac\ x\ 0.57\ x\ 31\ in\ x\ 21\ days}{153\ days\ x\ 12\ in/ft} = 9.95\ ac-ft$$

Total PPV provided for Pond 1+2 = 16.46 ac-ft > 9.95 ac-ft OK

Appendix C – Correspondence

SUMMARY MEMORANDUM

Meeting Date:	June 21, 2021 (Monday)	**Time**:	9:00 am –12:00 pm
Project:	US 17/92 Project Development & Environmental (PD&E) Study		
FPID:	437200-1-22-01		
Subject:	Environmental Look Around Meeting		

I. ATTENDEES

NAME	Agency
Ray Stangle	Osceola County
Linette Matheny	Osceola County
Josh DeVries	Osceola County
Susan Gosselin	Osceola County
Lorena Cucek	FDOT
Paul Yeargain	VHB
Cecily Mevorach	VHB
Kevin Freeman	VHB

II. INTRODUCTION / OBJECTIVE:

This in the field meeting was held to bring together different stakeholders to conduct an Environmental Look Around (ELA) for this Project. The purpose of an ELA is to discuss watershed-wide stormwater needs, regional treatment, and alternative permitting approaches. The ELA Team met on site and the study team provided an overview of the project and alternatives planned. Then talked through some of the preliminary pond area and other ponds planned by other adjacent projects.

III. DISCUSSION NOTES:

The following are notes of the open dialogue during the meeting:

- Intercession City has history been known to flood and the water generally flows south from Old Tampa Highway to US 17/92
- Osceola County staff suggest we talk with John Jeannin (JJ) the road and bridge director to get his thoughts on the Intercession City and the corridor
- There are a mixture of basins that flow through intercession City and it is subject to flooding in some areas. JJ will provide additional insight and information (see July 15 meeting below).
- The pond within the wetlands will be very hard to permit. The County recommended that we not propose new ponds along the corridor to avoid impacts to wetlands. Specifically, they commented on one of the ponds in Basin 1 (highlighted on the attached Exhibit).

- Osceola County staff provided two alternative suggestions for stormwater ponds:
    - Look at providing a pond outside of the corridor that could treat/attenuate other areas within the basin that currently do not have stormwater management facilities. This would compensate for the widening along 17-92. They agreed to review areas within the County and within the Reedy Creek Basin to provide recommendations.
    - Look at a stormwater pond/park in Intercession City that could treat/attenuate existing neighborhoods in lieu of a stormwater pond along the roadway. The location is shown on the attached Exhibit. The County indicated they would look to see if they have potential funds that could be used to construct a park associated with the pond. This would be a great benefit to the community.

IV. NEXT STEPS

- Discuss this project with JJ at Osceola County to get his thoughts
- Josh to check in with planning staff on latest status of BK Ranch
- Osceola County to provide input on the pond alternatives (meeting scheduled with County staff on July 15)

SUMMARY MEMORANDUM

Meeting Date:	July 29, 2021 (Thursday)	**Time**:	4:00 pm –5:00pm
Project:	US 17/92 Project Development & Environmental (PD&E) Study		
FPID:	437200-1-22-01		
Subject:	US 17/92 and CR 532/SR 538 Joint Use Pond Coordination Meeting		

I. ATTENDEES

NAME	Agency
Dana Chester	CFX
Edwards Spencer	Kimley-Horn
Greg Seidel	Balmoral Group
Laura Phillips	GAI Consultants
Mark Owen	GAI Consultants
Carnot Evans	CFX
Lorena Cucek	FDOT
Karen Snyder	FDOT
George Borchik	FDOT
Efren Rivera	FDOT
Ferrell Hicksson	FDOT
Paul Yeargain	VHB
Oscar Bermudez	VHB
Kevin Freeman	VHB

II. INTRODUCTION / OBJECTIVE:

This meeting was held to discuss the potential of joint use ponds for the SR 538 and CR 532 Project and the US 17/92 Project

III. DISCUSSION NOTES:

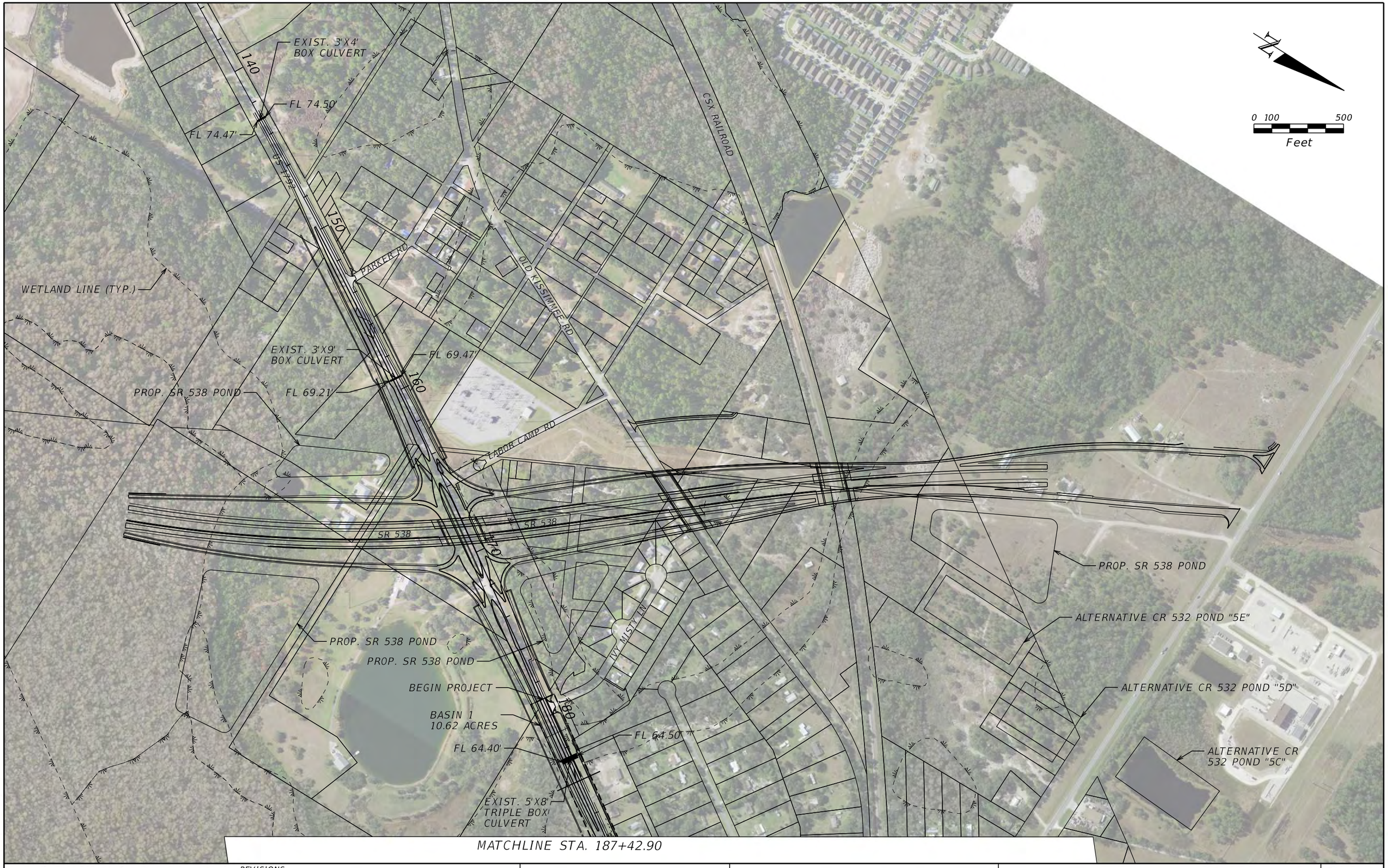
The following are notes of the open dialogue during the meeting:

- The SR 538 plans will be at 60% development Monday, August 1, 2021
- The CR 532 plans are expected to be at 30% in September of 2021.
- Ponds 6A (2 ponds) and Pond 7C will be used for CR 532 Project.
- The ponds identified for the SR 538 project are considered final ponds. The ponds for CR 532 are considered options and will be refined further.
- Pond 7C is slated to be a partial take at this time.
- Kevin explained that the CR 532 intersection with US 17/92 will be realigned and it may impact pond 7C.

- Pond south of STA 190 is for runoff from US 17/92 and will be turned over to FDOT once it has been constructed. It was noted that expanding this parcel makes sense since FDOT will maintain in the future.
- Kevin mentioned that at the ELA Osceola County expressed interest in a joint use pond.
- Lorena suggested it is best to approach the property owner once for a take. Will save money and aggravation to the property owner.
- It appears that Pond 7C and the Pond South of STA 190 are the best two options for joint use ponds.

IV. Action Items:

- Paul and Oscar will provide information regarding the size of the basin needed for the joint use ponds to CFX.
- Kevin will share the proposed layout after Lorena has reviewed and approved with CFX.



MATCHLINE STA. 187+42.90

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

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

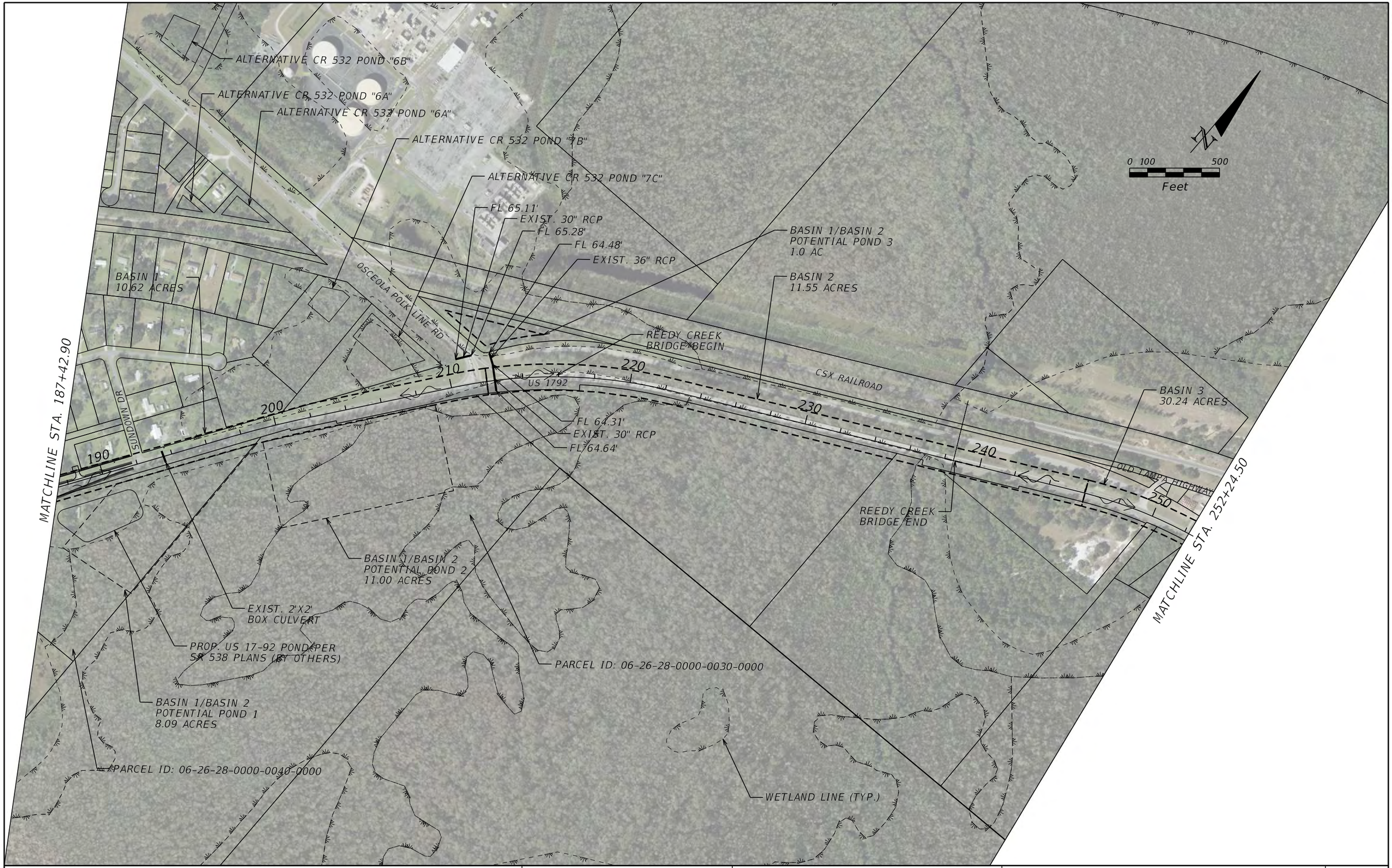
PAUL W. YEARGAIN, P.E.
P.E. LICENSE NUMBER 50682
VANASSE HANGEN BRUSTLIN, INC.
225 E. ROBINSON STREET
ORLANDO, FL 32801
CERTIFICATE OF AUTHORIZATION 3932

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 600	POLK OSCEOLA	437200-1-22-01

DRAINAGE MAP 01

SHEET NO. A1



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

PAUL W. YEARGAIN, P.E.
P.E. LICENSE NUMBER 50682
VANASSE HANGEN BRUSTLIN, INC.
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ORLANDO, FL 32801
CERTIFICATE OF AUTHORIZATION 3932

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 600	POLK OSCEOLA	437200-1-22-01

DRAINAGE MAP 02

SHEET NO. A2

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

Memorandum

To: Patrick McConaghy, PE
Senior Drainage Engineer
FDOT District 5

Date: August 4, 2021

Project #: 63316.11

From: Oscar Bermudez

Re: US 17/92 CR54 to Ave A -CFX Joint Use Pond

Joint Use Pond CFX and FDOT

CFX is currently designing the SR 538 and CR 532 (Osceola Polk Line Road) improvements. The western segment of the Referenced project (US 17/92 CR54 to Ave A) is located within the limits of the CFX project.

CFX and FDOT have discussed the feasibility of including joint use ponds along the corridor where there is overlap.

The US 17/92 CR54 to Ave A begins at STA 179+00 and the improvements from SR 538, along US 17/92, end at approximately STA 190+17.

The CFX improvements include a pond on the south side of US 17/92 located at approximately STA 190+00, that would solely serve their improvements on US 17/92. The pond is located on parcel 06-26-28-0000-0040-0000. It was noted that this pond will be handed over to FDOT in the future, since it serves US 17/92.

- Basin 1 of the US 17/92 CR54 to Ave A begins at STA 179+00 and ends at STA 212+00. The intent would be to include Basin 1 to a joint use pond located on parcel 06-26-28-0000-0040-0000.

The CFX improvements along CR 532, include a pond located at the northeast corner of the intersection of US 17/92 and CR 532. This pond will need to be adjusted because the geometry of CR 532 will be revised within the US 1792 improvements. The pond is located on parcel 06-26-28-0000-0030-0000.

- Basin 2 of the US 17/92 CR54 to Ave A begins at STA 212+00 and ends at STA 246+00. The majority of Basin 2 includes the bridge over Reedy Creek, and there is no land adjacent to the basin to serve as a pond site. Basin 2 would not be hydraulicly connected to the ponds, and offsite compensation would need to be credited. Therefore, the intent would be to include Basin 2 to a joint use pond located on parcel 06-26-28-0000-0030-0000, and parcel 06-26-28-0000-0040-0000 if needed.

Below are the volumes needed for each basin followed by our calculations.

	Basin Area (Ac)	Water Quality Volume (Ac-ft)	Net New Impervious Area (Ac)	Proposed CN
Basin 1	16.36	2.05	3.92	83
Basin 2	11.55	1.44	4.58	93

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** OB **Date:** 8/9/2021
County: Osceola **Checked by:** PY **Date:** 8/9/2021

Circle One: Present (Developed) Basin 1 - 179+00 to 212+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi²	
Type D	Impervious Area	98			6.82	668.18
Type A	Open Space (Good)	39			1.68	65.52
Type D	Open Space (Good)	80			7.87	629.24
Use only one CN source per line.				Totals =	16.36	1362.94

CN (weighted) = total product/total area = $\frac{1362.94}{16.36}$ = 83.29 Use CN = **83**

Notes:
1. Post pervious area hydrologic group is calculated by using the same percentage as pre
For example: Pre Basin 1 soil is 12% Hydrologic Group A and 84% D
2. The impervious/pervious area is calculated based on a conservative typical section of a 22 ft grass median with 2 ft curb & gutter and 4 ft paved median each side, 2 12 ft travel lanes each side, 7 ft paved shoulders with curb and gutter on each side, 6 ft sidewalks each side. The basin width is assumed to be a minimum of 148 ft.

WORKSHEET 2: Runoff curve number and runoff

Project: SR 600 (US 17-92) **Designed by:** OB **Date:** 8/9/2021
County: Osceola **Checked by:** PY **Date:** 8/9/2021

Circle One: Present (Developed) Basin 2 - 212+00 to 246+00

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition, percent impervious area ratio)	CN [1] Table 2-2	Fig 2-3	Fig 2-4	Area ☑ acres ☐ mi² ☐ %	
Type D	Impervious Area	98			8.59	841.41
Type D	Open Space (Good)	80			2.97	237.28
Use only one CN source per line.				Totals =	11.55	1078.70

CN (weighted) = total product/total area = $\frac{1078.70}{11.55}$ = 93.38 Use CN = **93**

Notes:
1. Post pervious area hydrologic group is calculated by using the same percentage as pre
For example: Pre Basin 1 soil is 12% Hydrologic Group A and 84% D
2. The impervious/pervious area is calculated based on a conservative typical section of a 22 ft grass median with 2 ft curb & gutter and 4 ft paved median each side, 2 12 ft travel lanes each side, 7 ft paved shoulders with curb and gutter on each side, 6 ft sidewalks each side. The basin width is assumed to be a minimum of 148 ft.

Project: SR 600 (US 17-92) **Designed by: OB** **Date:** 8/9/2021
County: Osceola **Checked by: PY** **Date:** 8/9/2021

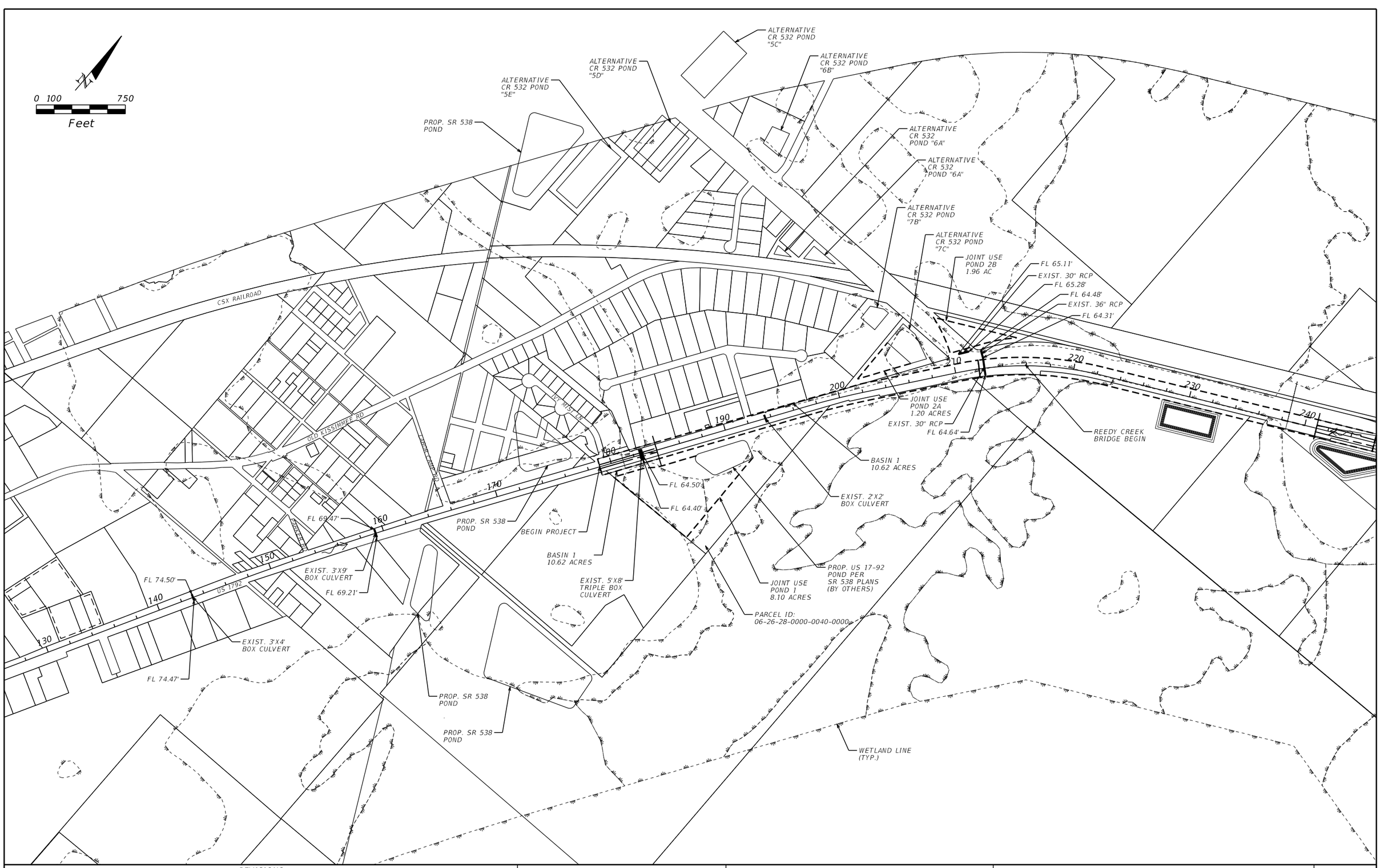
Basin Parameters

Basin	Station Range of Basin		Length of Basin	Area	Proposed Impervious Area	Existing Impervious Area	Net Increase Impervious Area
			(ft)	(ac)	(ac)	(ac)	(ac)
Basin 1	179+00.00	212+00.00	3300	16.36	6.82	2.90	3.92
Basin 2	212+00.00	246+00.00	3400	11.55	8.59	4.01	4.58

Water Quality Volume Required (SFWMD)

Basin	1" Runoff Over Basin	2.5" Runoff Over Impervious	Greater Volume Required (Wet Detention)	With Addn'l 50% Treatment Vol. Req. (Wet Detention)
	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
Basin 1	1.36	0.82	1.36	2.05
Basin 2	0.96	0.95	0.96	1.44

Assumptions/Notes:
1. Preliminary proposed typical section assumes a right-of-way width of 148-ft. 90-ft impervious and 58-ft pervious per foot of basin length is assumed.
2. Once final typical sections are designed this will need to be updated.
3. Existing Impervious was measured within the existing right-of-way and does not include side streets or driveways



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

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

PAUL W. YEARGAIN, P.E.
P.E. LICENSE NUMBER 50682
VANASSE HANGEN BRUSTLIN, INC.
225 E. ROBINSON STREET
ORLANDO, FL 32801
CERTIFICATE OF AUTHORIZATION 3932

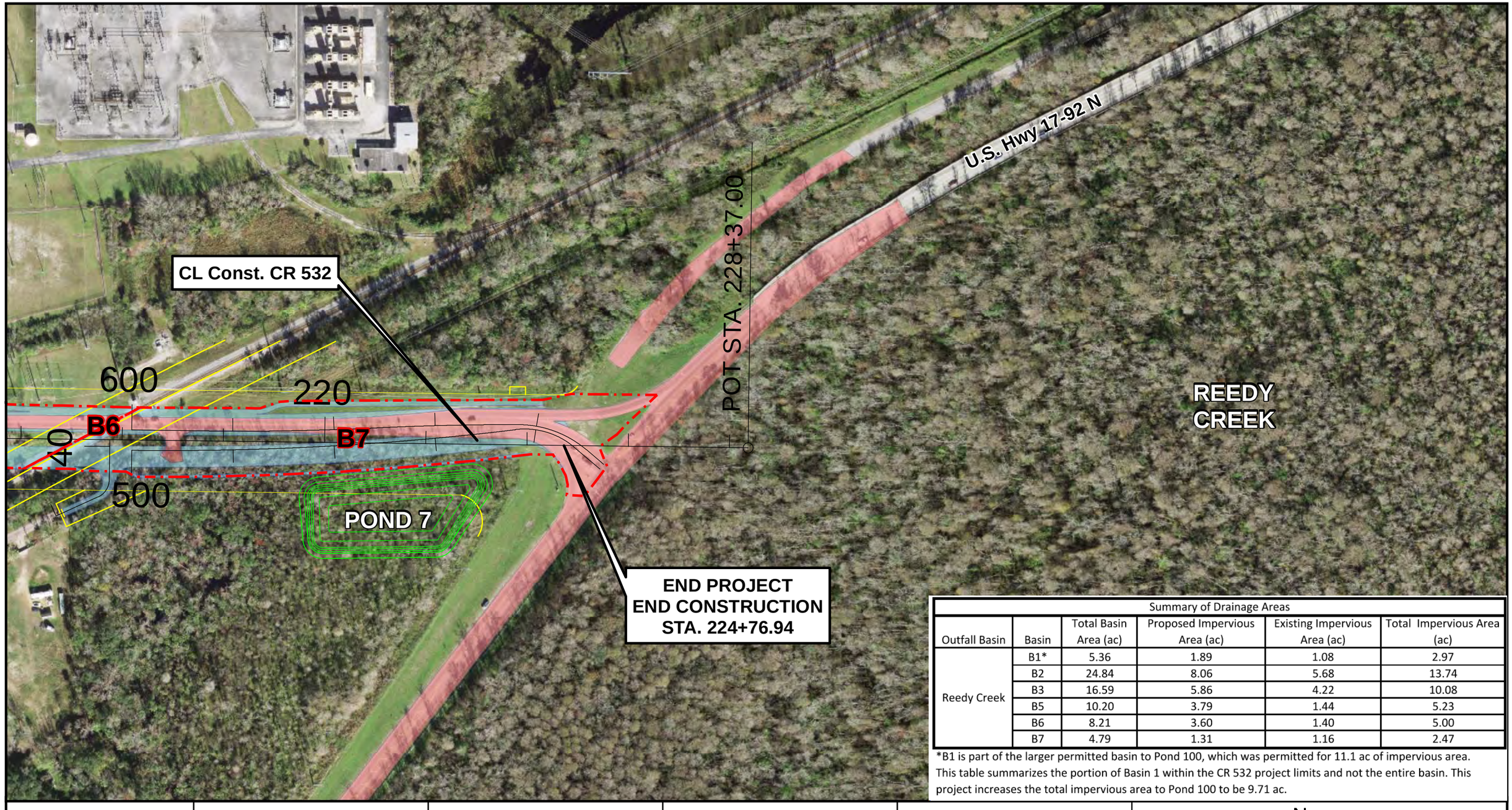
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 600	POLK OSCEOLA	437200-1-22-01

CFX JOINT USE POND

SHEET NO. 1

$USER$ $DATE$ $TIME$ $MODELNAME$ $FILE$



Summary of Drainage Areas					
Outfall Basin	Basin	Total Basin Area (ac)	Proposed Impervious Area (ac)	Existing Impervious Area (ac)	Total Impervious Area (ac)
Reedy Creek	B1*	5.36	1.89	1.08	2.97
	B2	24.84	8.06	5.68	13.74
	B3	16.59	5.86	4.22	10.08
	B5	10.20	3.79	1.44	5.23
	B6	8.21	3.60	1.40	5.00
	B7	4.79	1.31	1.16	2.47

*B1 is part of the larger permitted basin to Pond 100, which was permitted for 11.1 ac of impervious area. This table summarizes the portion of Basin 1 within the CR 532 project limits and not the entire basin. This project increases the total impervious area to Pond 100 to be 9.71 ac.

the balmoral group

Legend

- Roadway Basins
- Existing Impervious
- Proposed Impervious

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

FIGURE 6

Proposed Treatment Exhibit CR 532

N

0 200 400 Feet

VOLUME CALCULATIONS FOR PROPOSED CONDITION

Project:	CR532 Widening from Lake Wilson Road to US 17-92				
FPID:	538-235A	**Designer:**	MM	**Date:**	5/19/2022
County:	Osceola County	**Reviewer:**	JN	**Checked:**	5/19/2022

Wet Detention Online Pond Treatment Calculations:

Pond 7

Existing Impervious =	1.16 Ac	
Post Dev. Total Impervious Area =	2.47 Ac	
Net Additional Impervious =	1.31 Ac	
Total Drainage area =	4.79 Ac	
Drainage Area Excluding Pond =	3.45 Ac	
2.5" runoff from new impervious area =	0.27 Ac-Ft	*(Net Imperv. Area)*
1.0" runoff from drainage area =	0.40 Ac-Ft	*(Including Pond)*
Required Treatment Volume (T.V.) =	**0.40**	Ac-ft

Provided Treatment Volume Based on Contributing Basin

Total Impervious Area to Pond =	2.47 Ac	
Total Drainage Area =	4.79 Ac	
2.5" runoff from new impervious area =	0.52 Ac-Ft	*(Total Imperv. Area)*
1.0" runoff from drainage area =	0.40 Ac-Ft	*(Including Pond)*
Provided Treatment Volume (T.V.) =	**0.52**	Ac-ft

Storage Calculations: Wet Detention Pond 7

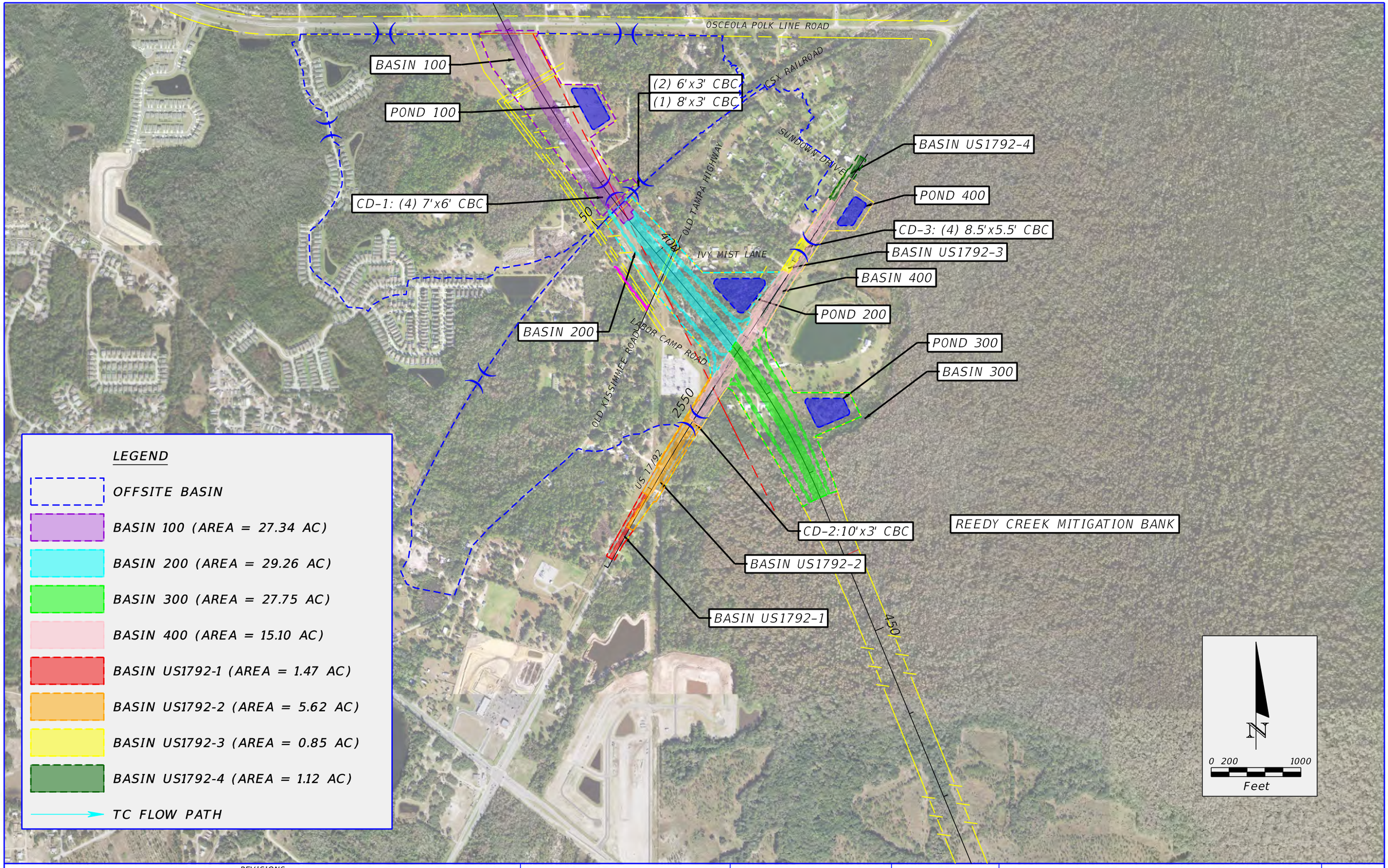
Elev	h	Area	Area	Inc. Volume	Cumulative Vol.	
---	ft	sf	ac	Ac-ft	Ac-ft	
71.5-70.0	--	--	1.34	--	--	
70.00	1.0	45,738	1.05	1.01	2.79	Inside Top of Berm
69.00	1.0	42,253	0.97	0.93	1.78	
68.00	1.0	38,768	0.89	0.85	0.85	
67.00	0.0	35,284	0.81	0.00	0.00	NWL

Overflow Weir Elevation (Top of Treatment Volume):

Elev. = 67.7 = **0.60** **Ac-Ft** Provided Treatment Volume

Profile Grade Line

Low Pt. STA	Side	PGL Elev	X Slope	Pav't Width (PGL Location to LEOT)	LEOP Elev
222+46.82	RT	71.46	2.0%	24.0	70.98



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

GAI CONSULTANTS, INC.
1301 RIVERPLACE BLVD. - SUITE 900
JACKSONVILLE, FL 32207
CERTIFICATE OF AUTHORIZATION 9951

SR 538 EXTENSION TO CR 532

ROAD NO.	COUNTY
SR 538	OSCEOLA

gai consultants

POST-DEVELOPMENT BASIN MAP

SHEET NO.

SR 538 (Poinciana Parkway) Extension
Segment 2
Osceola County, Florida

Calculated By: DV **Date:** 1/22/2022
Basin No. 400 **Checked By:** BS **Date:** 1/25/2022
Stage/Storage Calculations (Pond 400)

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
71.00	Outside Berm	1.96				7.02
			1.77	1.00	1.77	
70.00	Inside Berm	1.58				5.25
			1.51	1.70	2.57	
68.30	PAV/TV	1.44				2.68
			1.34	2.00	2.68	
66.30	(NWL)	1.24				0.00
			1.00			
64.00	(1:2 BREAK)	1.04				0.00
			1.00			
57.00	Pond Bottom	0.76	1.00			

Provided PAV = 2.68 **ac-ft.**

Bleed Down Volume within 24 hours
1/2" of the required detention volume = 0.5 in x Required Treatment Volume = 1.34 Ac-Ft