TOLL 414

FINAL

Pond Siting Report

State Road 414 Expressway Extension
Project Development and Environment Study
From US 441 to SR 434
Orange County and Seminole County, Florida

CFX Project Number: 414-227

Prepared for:
Central Florida Expressway Authority
4974 ORL Tower Road
Orlando, FL 32807

Submitted by:
Jacobs Engineering Group Inc.
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MAY 2022

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Jacobs Engineering Group Inc., a corporation, authorized to operate as an engineering business, Certificate of Authorization No. 2822, by the State of Florida, Department of Business and 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: Central Florida Expressway - State Road 414 Expressway Extension
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This Pond Siting Report includes a summary of data collection efforts and pond siting analyses prepared for conceptual analyses for Central Florida Expressway's State Road 414 Expressway Extension Project Development & Environment Study. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering 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

BFE	base flood elevation
BMAP	Basin Management Action Plan
CFX	Central Florida Expressway Authority
CN	curve number
ELA	Environmental Look Around
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HSG	Hydrologic Soil Group
I-4	Interstate 4
mph	mile(s) per hour
NAVD	North American Vertical Datum of 1988
NGVD	National Geodetic Vertical Datum of 1929
OFW	Outstanding Florida Water
PD&E	Project Development and Environment
PEIR	Project Environmental Impact Report
RHPZ	Riparian Habitat Protection Zone
ROW	right-of-way
SJRWMD	St. Johns River Water Management District
SR 414	State Road 414
SR 429	State Road 429
SR 434	State Road 434
TMDL	total maximum daily load
US 441	U.S. Highway 441
WBID	water body identification
WLA	waste load allocation

Executive Summary

The Central Florida Expressway Authority is conducting the State Road 414 Expressway Extension Project Development and Environment Study to evaluate alternatives for a proposed grade-separated expressway extension of the tolled SR 414 (John Land Apopka Expressway). The existing SR 414 Expressway provides regional connectivity from State Road 429 and U.S. Highway 441 in Apopka and extends south and east to SR 414 (Maitland Boulevard) just east of U.S. Highway 441. The study limits extend along the existing SR 414 (Maitland Boulevard) corridor from US 441 (Orange Blossom Trail) to State Road 434 (Forest City Road). The approximate 2.8-mile-long study corridor generally runs along the boundary of Orange County and Seminole County and is located within the cities of Maitland (Orange County) and Altamonte Springs (Seminole County).

The existing SR 414 (Maitland Boulevard) is a four-lane divided urban principal arterial with three major signalized intersections at Bear Lake Road/Rose Avenue, Eden Park Road and Magnolia Homes Road, and an unsignalized intersection at Gateway Drive between the grade-separated intersections of SR 414/US 441 and SR 414/ SR 434. A minor grade-separated overpass exists over the Little Wekiva Canal and an access road between the Lake Lotus Park and Ride lot and Lake Lotus Park.

The existing SR 414 roadway between US 441 to SR 434 is a suburban arterial typical section approximately centered within the existing minimum ROW of 118 feet and has a closed drainage system with Type F curb to the outside and grassy swales in the median. The typical roadway occurs between Bear Lake Road and Gateway Drive and consists of four 11-foot-wide lanes (two lanes in each direction), 4-foot-wide inside and outside shoulders and a 46-foot-wide median. All lanes slope to the outside with the inside lane at 0.02 feet per foot and the outside lane at 0.03 feet/foot, except where superelevated. Within this section are 5-foot-wide sidewalks adjacent to SR 414 on both sides. There is an 1,800-foot-long section between the US 441 Interchange and Bear Lake Road that uses the same footprint of existing pavement but is striped so that each side consists of one 14-foot-wide lane and one 12-foot-wide lane (two lanes in each direction), a 46-foot-wide median and 4-foot-wide inside shoulder but no outside shoulder. There is a 12-foot-wide shared use path on the north side from US 441 to Bear Lake Road. The western project limit within the US 441 Interchange includes approximately 1,700 feet from the bridge over US 441 to the end of a median barrier wall. This area transitions from a barrier-separated, closed 26-foot-wide median to tie into the suburban 46-foot-wide median described above. This rural typical section includes 12-foot-wide lanes, 12-foot-wide inside shoulders and 10- to 12-foot-wide outside shoulders. There is a sidewalk on the south side and a shared use path on the north side of SR 414 within this section. The eastern project limit includes approximately 2,500 feet between Gateway Drive and the end project at SR 434 and transitions from suburban to rural. This typical holds the 46-foot-wide median and includes 12-foot-wide lanes, 4-foot-wide paved inside shoulders and 8- to 10-foot-wide paved outside shoulders. There is no sidewalk on either side of SR 414 within this eastern section.

The PD&E Study is evaluating alternatives for a proposed grade-separated SR 414 Expressway Extension to provide system linkage between the western terminus of the SR 414 (John Land Apopka Expressway) and Interstate 4. The SR 414 Expressway Extension includes alternatives for a facility with up to two lanes in each direction from US 441 to SR 434. Project alternatives involve various configurations of grade-separated express lanes on SR 414 (Maitland Boulevard) to provide needed capacity between US 441 and SR 434 while maintaining the existing local access lanes. Alternatives considered include reversible, bi-directional and convertible express lanes along the project corridor to avoid right-of-way acquisition needs. The proposed improvements also include reconfiguring the existing at-grade SR 414

(Maitland Boulevard) to accommodate the SR 414 toll facility while maintaining two SR 414 local access lanes in each direction.

For this study, pond siting was based on the Preferred Alternative, using the Elevated Typical Section, which provides four 12-foot-wide express lanes (two per direction) separated by a median barrier wall with 12-foot-wide paved shoulders (refer to Figure 4-1). SR 414 will remain with 12-foot-wide and 11-foot-wide lanes (in both directions) with 7-foot-wide shoulders.

For this Pond Siting Report, drainage patterns were confirmed and 8 drainage basins were routed to 10 existing and proposed pond sites and 2 swales for the treatment and attenuation of stormwater runoff. Stormwater options were developed using the best available information in combination with field reviews and coordination. Because of the “No additional ROW” aspect of the study, existing permitted ponds within the study limits were evaluated first and then opportunities within the existing CFX and FDOT ROW were identified as potential new pond sites. Preliminary pond sizing was based on the required stormwater treatment and attenuation volumes per criteria set forth by SJRWMD, CFX and FDOT. Calculated permitted water quality and quantity volumes were researched and verified based on the current stormwater standards. Table ES-1 lists the recommended pond alternatives.

Table ES-1. Pond Recommendations Summary

Basin ID	Recommended Pond Alternative
A	Existing Pond A
6	Modified Existing Ponds 4A, 4B and 4C
B	Pond B1 and Pond B2
C	Modified Existing Pond C
D	Modified Existing Pond D
E	Modified Existing Pond E
F	Existing Pond F and Swale F
G	Swale G

1. Project Overview

1.1 Project Background and Description

The Central Florida Expressway Authority is conducting the State Road 414 Expressway Extension Project Development and Environment Study to evaluate alternatives for a proposed grade-separated expressway extension of the tolled SR 414 (John Land Apopka Expressway). The existing SR 414 Expressway provides regional connectivity from State Road 429 and U.S. Highway 441 in Apopka and extends south and east to SR 414 (Maitland Boulevard) just east of U.S. Highway 441. Figure 1-1 presents the Regional Location Map. The study limits extend along the existing SR 414 (Maitland Boulevard) corridor from US 441 (Orange Blossom Trail) to State Road 434 (Forest City Road). Figure 1-2 presents the Project Location Map. The approximate 2.8-mile-long study corridor generally runs along the boundary of Orange County and Seminole County and is located within the cities of Maitland (Orange County) and Altamonte Springs (Seminole County). Both CFX and the Florida Department of Transportation own portions of SR 414 within the project study limits. CFX owns and operates the SR 414 (John Land Apopka Expressway) from SR 429 to just east of US 441, and FDOT owns and operates SR 414 (Maitland Boulevard) from just east of US 441 to U.S. Highway 17/U.S. Highway 92. The existing SR 414 (Maitland Boulevard) is a four-lane divided urban principal arterial with three major signalized intersections at Bear Lake Road/Rose Avenue, Eden Park Road and Magnolia Homes Road, and an unsignalized intersection at Gateway Drive between the grade-separated intersections of SR 414/US 441 and SR 414/ SR 434. A minor grade-separated overpass exists over the Little Wekiva Canal and an access road between the Lake Lotus Park and Ride lot and Lake Lotus Park.

The PD&E Study is evaluating alternatives for a proposed grade-separated SR 414 Expressway Extension to provide system linkage between the western terminus of the SR 414 (John Land Apopka Expressway) and Interstate 4. The SR 414 Expressway Extension includes alternatives for a facility with up to two lanes in each direction from US 441 to SR 434. Project alternatives involve various configurations of grade-separated express lanes on SR 414 (Maitland Boulevard) to provide needed capacity between US 441 and SR 434 while maintaining the existing local access lanes. Alternatives considered include reversible, bi-directional and convertible express lanes along the project corridor to avoid right-of-way acquisition needs.

Prior to the PD&E Study, CFX completed the SR 414 Reversible Express Lanes Schematic Report that included an assessment of tolled, directional express lanes within the median of SR 414 (CFX 2019). The Report recommended a two-lane, reversible, grade-separated viaduct in the median of SR 414. The Report also found that a single lane bi-directional express lane would require a 75 percent wider bridge and was not considered viable.

The proposed improvements also include reconfiguring the existing at-grade SR 414 (Maitland Boulevard) to accommodate the SR 414 toll facility while maintaining two SR 414 local access lanes in each direction. The study will involve analysis of intersection improvements, bridge modifications at Lake Bosse and Little Wekiva Canal, stormwater management facilities, pedestrian and bicycle needs and access management modifications. The No-Build Alternative is a viable option throughout the study.

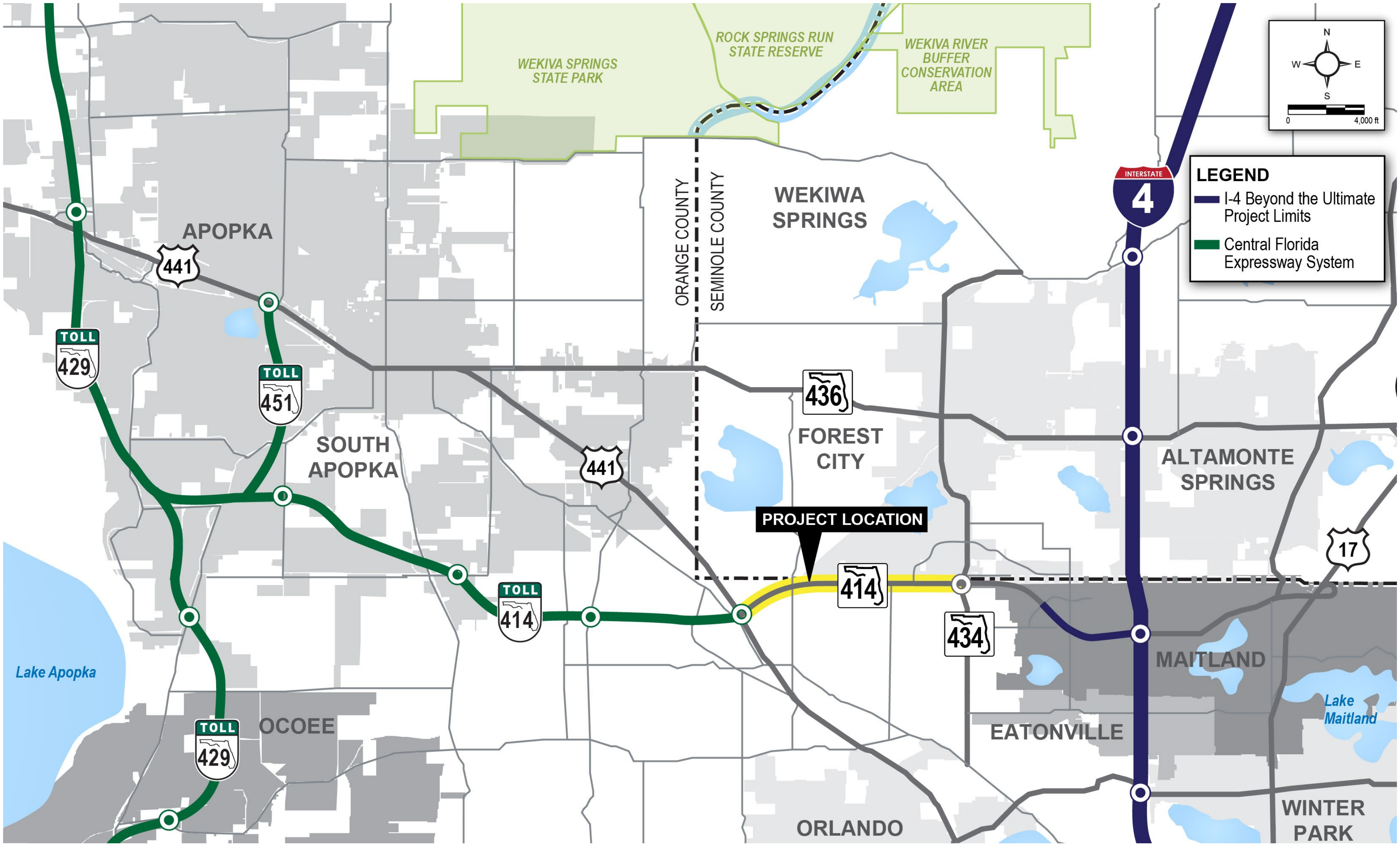


Figure 1-1. Regional Location Map

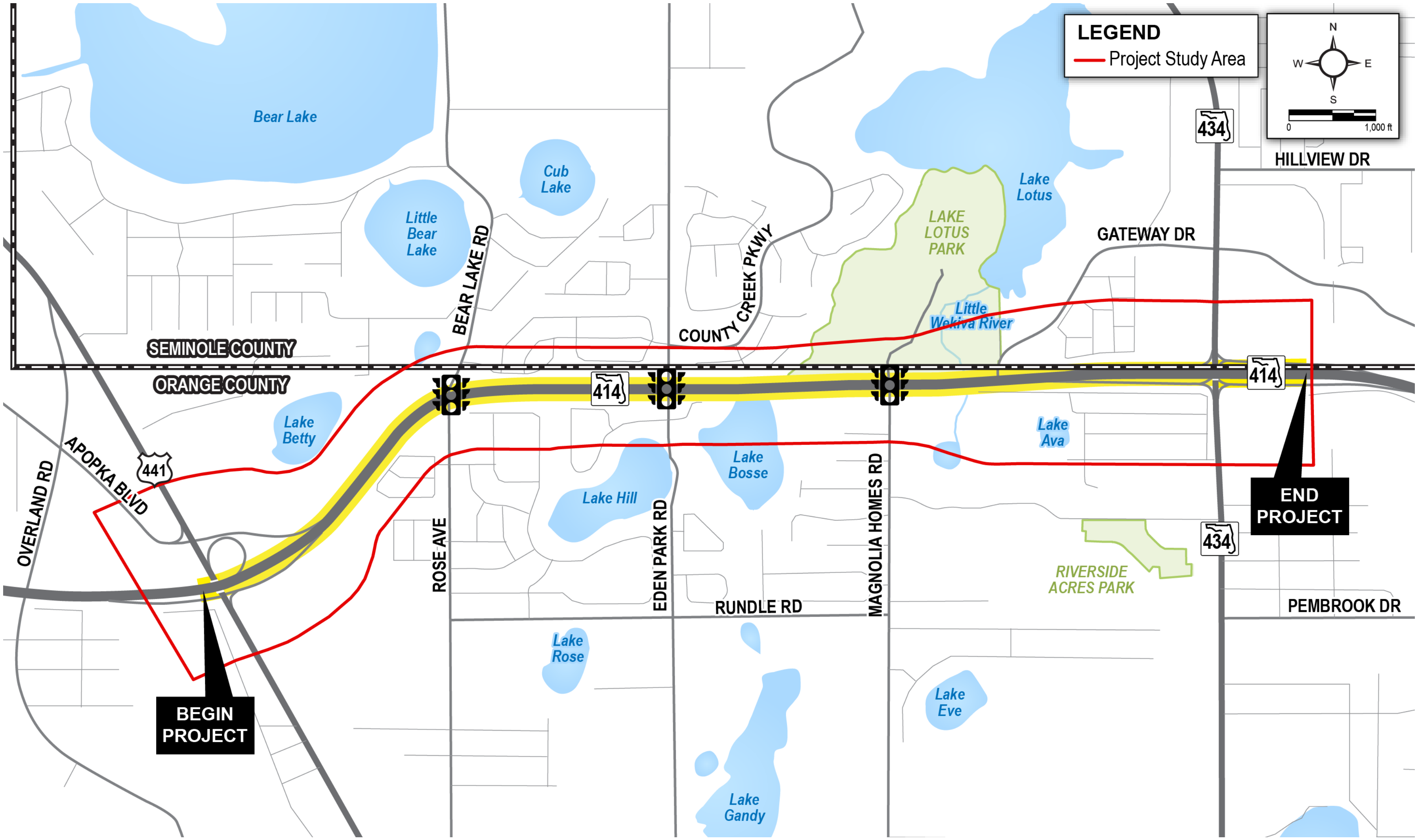


Figure 1-2. Project Location Map

1.2 Purpose and Need

The purpose of the SR 414 Expressway Extension PD&E Study is to provide needed capacity on SR 414 and improve system connectivity between SR 429 and I-4 to meet future traffic needs. The 2.8-mile-long project corridor of SR 414 is an arterial connecting two limited-access facilities. The proposed project will complete the limited-access gap between US 441 and SR 434 and provide limited-access regional connectivity between SR 429 and I-4. The proposed grade-separated SR 414 Expressway Extension will separate the through traffic from the local traffic, allowing for greater mobility and reduced congestion for both facilities. The proposed improvements are to 1) accommodate anticipated transportation demand, 2) improve safety, 3) improve system connectivity/linkage and 4) support multimodal opportunities.

1.3 Report Purpose

This Pond Siting Report identifies the project's drainage requirements and possible challenges that may affect drainage and will help determine the overall stormwater management approach. This report also includes a preliminary drainage analysis and data that will support drainage in the design phase for the SR 414 Expressway Extension project in Orange County and Seminole County.

All elevations used in calculations and maps within this document are based on the North American Vertical Datum of 1988 unless specified otherwise. Any supporting data based on the National Geodetic Vertical Datum of 1929 was converted using the following equation:

$$\text{NGVD} = \text{NAVD} + 0.97 \text{ feet}$$

1.4 Alternatives Considered

Alternatives were evaluated for environmental and operational constraints. An at-grade alternative within the median of SR 414 was eliminated because while it provided uninterrupted travel along SR 414, traffic from the local cross streets would not be able to cross Maitland Boulevard. Another alternative considered included an adjacent corridor to SR 414. However, because Maitland Boulevard is mostly developed, this alternative was not viable. Finally, an alternative that included individual overpasses at each of the existing intersections was also considered. However, because of the limited spacing between each intersection, this alternative was not feasible and was, therefore, eliminated.

Viable alternatives were developed and presented for public input at the Alternatives Public Workshop held on February 10, 2021. These viable alternatives included roadway concepts for the SR 414 Expressway Extension project, including the SR 414 toll lanes and the Maitland Boulevard local access lanes. The viable alternatives were updated after the Alternatives Public Meeting to reflect ongoing alternatives refinements that avoid and minimize environmental impacts.

1.4.1 Preferred Alternative

As a result of the alternatives analyses conducted for the project, a Preferred Alternative was identified for further analysis and public input. The Preferred Alternative involves an elevated SR 414 Expressway Extension toll facility to serve regional traffic and at-grade Maitland Boulevard local access lanes (non-tolled) from US 441 to SR 434. The proposed SR 414 Expressway Extension typical section for the Preferred Alternative includes the elevated SR 414 facility in the median, as four 12-foot-wide express lanes (two lanes per direction) separated by a median barrier wall. The Preferred Alternative also includes maintaining the existing Maitland Boulevard access lanes at-grade with two lanes per direction on either side and below the SR 414 Expressway Extension. The at-grade portion of the facility on Maitland Boulevard will maintain the existing pavement width (60 feet) but shifts and restripes the existing lanes to provide a 7-foot-wide buffered bike lane east of Bear Lake Road. Using these recommendations to minimize ROW and ongoing traffic analysis, the Preferred Alternative will be further evaluated as the study progresses. As part of the Preferred Alternative, operational improvements at intersections are anticipated to accommodate the elevated SR 414 Expressway Extension while maintaining local access at cross streets. In addition, impacts to environmental resources including social, cultural, natural and physical will be considered as the Preferred Alternative is further developed.

1.4.2 No-Build Alternative

The No-Build Alternative for the study area assumes previously programmed improvements are built including widening SR 414 to six lanes (at-grade with no elevated expressway) from US 441 to SR 434 as noted in MetroPlan Orlando's 2045 Metropolitan Transportation Plan Cost Feasible Plan, Adopted December 9, 2020. The No-Build Alternative is not funded in the FDOT 5-Year Work Program, adopted July 2020 and is no longer programmed. Consistency with local transportation plans to update this change will be coordinated during the PD&E Study. The previously programmed improvements to SR 414 do not meet the future traffic needs through the year 2045 nor the purpose and need for the project to accommodate future transportation demand or improve system connectivity. An at-grade widening of SR 414 to six lanes would result in precluding a four-lane expressway within the median (two lanes per direction) or require substantial ROW impacts. Similarly, at-grade widening of SR 414 to six lanes and a two-lane expressway within the median (one lane per direction) would result in ROW impacts and impact the ability to maximize the use of the existing median to accommodate infrastructure (such as utilities and drainage needs). Therefore, the No-Build Alternative is not the Preferred Alternative. However, the No-Build Alternative shall remain under consideration throughout the PD&E Study for public input and to provide a comparison to the Preferred Alternative.

2. Methodology

For this study, the calculated pond sizing will be evaluated using the regulatory requirements for stormwater treatment and attenuation based on the Preferred Alternative, using the Elevated Typical Section Option 4. In addition to CFX and FDOT design requirements, construction of stormwater facilities proposed in this document will require the issuance of an Environmental Resource Permit from the St. Johns River Water Management District and the Florida Department of Environmental Protection. This section outlines the requirements to meet water quality and quantity based on SJRWMD, CFX and FDOT stormwater regulations and describes the procedure followed to estimate stormwater options for this study. Other permits that do not have stormwater requirements but that are relevant to construction, wetlands, and habitat are discussed in the Project Environmental Impact Report.

2.1 Stormwater Pond Methodology

Stormwater options were developed using the best available information in combination with field reviews and coordination with SJRWMD, FDEP, Orange County, city of Altamonte Springs, CFX and FDOT. Because of the “No additional ROW” aspect of the study, existing permitted ponds within the study limits were evaluated first and then additional opportunities within the existing CFX and FDOT ROW were identified as potential new pond sites. Since this project will not require additional ROW for ponds, an alternatives matrix is not warranted for this evaluation. The following procedures were used to help develop the stormwater pond options:

- Researched and reviewed the permitted stormwater ponds within the study limits. Established onsite drainage basins divides based on the existing permitted basins boundaries. Proposed basin boundaries were maintained as close as possible.
- Based on SJRWMD, CFX and FDOT stormwater regulations as well as permitted conditions, the requirements to meet water quality (treatment) and water quantity (attenuation) criteria for the proposed roadway improvements were determined. Refer to Sections 2.5 and 2.6 for details of the requirements.
- Evaluated and maximized existing stormwater treatment ponds for potential to provide additional treatment and attenuation capacity. Adjustment to exist control structure and/or re-grading of pond contours, within existing ROW, were analyzed.
- Identified potential new pond site locations within existing CFX ROW as well as evaluated alternative treatment options, including an Environmental Look Around and optional regional stormwater treatment facilities.
- Solicited public input.
- Appendix A provides pre-development (permitted) and post-development stormwater calculations. Preliminary pond sizing was based on providing the required stormwater treatment and attenuation volumes, as well as the ability to provide the required storage volume to detain/retain the post-development/pre-development runoff volumes for the design storm event, while maintaining a 1 foot of freeboard within the ponds.
- Provided recommendations to satisfy current stormwater management criteria and minimize impacts.

This project does not directly discharge to any Outstanding Florida Water. Chapter 62-302 of the Florida Administrative Code defines an OFW as “waters designated by the Environmental Regulation Commission as worthy of special protection because of their natural attributes.”

The project is located within an area with Special Basin Criteria (Wekiva River Hydrologic Basin and Wekiva Recharge Protection Basin) that must be met for permit issuance and Riparian Habitat Protection Zone that affords additional protection to adjacent wetlands. For additional information regarding RHPZ, refer to the PEIR. Also, according to the permitted SJRWMD’s Technical Staff Reports (refer to Appendix B), the following statement was discovered, “Recharge Standard (11.3.1) – The project area contains some of the soil types that are defined as Most Effective Recharge Soils, although soils analyses have shown that the project area includes confining soil layers near the existing grade. Because of this, storage of the recharge volume is not applicable, although the proposed system includes a retention basin that will provide recharge to the aquifer.” Recharge standards will not be applicable for this study except at existing permitted retention basins.

All other waters traversed by SR 414 in the study area have been designated Class III waters.

2.2 Relevant Permit Manuals and Guidelines

Criteria used in the development of stormwater options were collected from applicable portions of the following:

- SJRWMD: Environmental Resource Permit Applicant’s Handbook, Volumes I and II (SJRWMD 2018)
- FDOT: Drainage Manual (FDOT 2021); Drainage Design Guide (FDOT 2021)
- FDEP: Basin Management Action Plan for Wekiva River, Rock Springs Run, and Little Wekiva Canal (June 2018)

2.3 Anticipated Permits

The following permits are anticipated for this project:

- National Pollutant Discharge Elimination System General Permit (FDEP)
- Section 404 Individual Permit (U.S. Army Corps of Engineers or FDEP)
- Environmental Resource Permit (Modifications) (SJRWMD and FDEP)

2.4 Permitting History

The following permits have been previously issued along the study corridor:

- SJRWMD: 20930-1 Maitland Boulevard (a.k.a. SR 414) Extension, March 1996
  - Seven ponds constructed. Pond(s) A–G
  - Mitigation Plan
    - Preservation of Parcels J and K (Lake Lotus Park)
    - Eliminate the Oranole Road Bridge over the Little Wekiva River
    - Pave the portion of Oranole Road east of the existing bridge and provide swale treatment of runoff

- SJRWMD: 20930-2 (SR 414) Maitland Boulevard Modification, January 1998
  - Construction of an interchange at the intersection of SR 414 and SR 434
  - Modifications to several permitted ponds:
    - Modify Pond G from a dry detention pond to a wet detention pond.
    - Pond B will now outfall to Pond A.
    - Pond D has been modified from a dry retention pond to wet detention pond with a liner.
    - Pond F has been modified from a filtration system to a wet detention pond.
- SJRWMD: 20930-3 Maitland Boulevard Access Road P Modification, April 1998
  - Reduction of 0.08 acres of encroachment into uplands within the RHPZ
  - Realignment results in an increase of 0.11 acres of impervious area
- FDEP: 48-0262296-001 SR 414 (Maitland Blvd.) Extension & SR 429 (Western Beltway) Realignment Section 414-211, Letter Modification, November 2006
  - Revised Dredge and Fill quantities for Wetland D
  - Modifications to Pond 4C
- SJRWMD: 20930-7 Transfer of O&M by Maitland West LLLP, September 2014
  - Pond G will be operated and maintained by Maitland West, LLLP
- SJRWMD: 20930-8 Transfer of O&M by Maitland West LLLP, September 2014
  - Pond G will be operated and maintained by Maitland West, LLLP
- SJRWMD: 20432-27 Maitland West Lot 3, March 2019
  - Filling of FDOT's existing wet detention Pond G and perimeter dry retention swale
  - Construction of a dry retention vault system, eight exfiltration trench systems and two interconnected dry retention ponds

2.5 Attenuation/Water Quantity Criteria

SJRWMD, CFX and FDOT have attenuation/water quantity requirements based on whether the basins have a surface discharge for a particular storm frequency and duration. In addition, specific conditions apply for special basins.

2.5.1 Open Basins

For open basins, the following criteria apply:

- SJRWMD: The post-development peak discharge rate must not exceed the pre-development peak rate of discharge for the mean annual, 24-hour duration storm.
- SJRWMD: The post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year, 24-hour duration storm.

2.5.2 Closed Basins

For closed basins, the following criteria apply:

- SJRWMD: The post-development volume of direct runoff must not exceed the pre-development volume of direct runoff for the 25-year, 96-hour duration storm. The difference in runoff volumes of the pre-development and post-development from the 25-year, 96-hour storm shall be detained and within systems designed to recover within 14 days following storm event.
- FDOT: The design of a retention/detention system that is of sufficient size to ensure that the post-development discharge volume does not exceed the pre-development discharge volume for the critical duration storm. The critical duration storm is defined as the storm event that creates the highest rate of net stormwater runoff (post-improvement runoff less pre-improvement runoff). The entire post-development runoff volume from the 100-year, 24-hour storm shall be available within 14 days after the rainfall event has ended. In addition, the retention volume must recover at a rate such that one-half of the treatment volume is available in 7 days, with the total treatment volume available in 30 days.

2.5.3 Special Basins

For Wekiva River Hydrologic Basin and Wekiva Recharge Protection Basin, the following criteria apply:

- Recharge standards, for Type A soils
    - As noted in Section 2.1, recharge standards will not be applicable for this study except at existing permitted retention basins
- Storage standards, no net reduction within 100-year floodplain
- Drawdown limits, within Water Quantity Protection Zone

For Springs Priority Focus Area of Wekiva Springs and Rocks Springs, the following criteria apply:

- Outstanding Florida Springs
- Wekiva Springs and Rock Springs BMAP
    - Best Management Practices for pollutant loading, no net increase in post-development

2.6 Treatment/Water Quality Criteria

SJRWMD has specific treatment/water quality criteria based on the method of stormwater management. The treatment is based on the classification of the receiving water, which are defined in Chapter 62-302, FAC, as:

- Class I: Potable water supplies
- Class II: Shellfish propagation or harvesting
- Class III: Fish consumption; recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife

The overall criteria are for discharge to Class III waters. However, additional treatment is specified for projects that discharge to Class I, Class II or OFW.

2.6.1 Discharge to Class III Waters (Wet Detention Systems)

For wet detention systems, the design treatment volume is the greater of the following:

- 1.0 inch of runoff over total basin area
- 2.5 inches of runoff over the impervious area (excluding water bodies)

2.6.2 Discharge to Class III Waters (Dry Retention Systems)

For dry retention systems, the design treatment volume is the greater of the following:

- Offline Dry Retention
  - 0.5 inches of runoff over total basin area
  - 1.25 inches of runoff from the impervious area (excluding water bodies)
- Online Dry Retention
  - Additional 0.5 inches of runoff from total basin area over the volume specified for offline treatment

Where Wekiva Recharge Protection Basin requirements apply, the design treatment volume is the following:

- Storage of 3 inches of runoff from all impervious areas proposed to be constructed on soils defined as a Type “A” Soils.
  - The system shall be capable of infiltrating this storage volume through natural percolation into the surrounding soils within 72 hours.
  - Offsite areas or regional systems may be used to satisfy this requirement. As an alternative, applicants may demonstrate that the post-development recharge capacity is equal to or greater than the pre-development recharge capacity.

2.7 Floodplains and Floodways Criteria

SJRWMD (2018) provides the following floodplain criteria:

> “Floodways and floodplains, and levels of flood flows or velocities of adjacent streams, impoundments or other water courses must not be altered to not adversely impact the off-site storage and conveyance capabilities of the water resource. It is presumed a system will meet this criterion if the following are met:
>
> (a) A system may not cause a net reduction in flood storage within a 10-year floodplain except for structures elevated on pilings or traversing works. Traversing works, works or other structures shall cause no more than a one-foot increase in the 100-year flood elevation immediately upstream and no more than one tenth of a foot increase in the 100-year flood elevation 500 feet upstream. A system will not cause a net reduction in flood storage within a 10-year floodplain if compensating storage is provided outside the 10-year floodplain.
>
> (b) A system may not cause a reduction in the flood conveyance capabilities provided by a floodway except for structure elevated on pilings or traversing works. Such works, or other structures shall

cause no more than a one-foot increase in the 100-year flood elevation immediately upstream and no more than one-tenth of a foot increase in the 100-year flood elevation 500 feet upstream.

(c) An applicant may only be permitted to contravene the requirements of (a) or (b) if the applicant gives reasonable assurance that were all other persons who could impact the surface water of any impoundment, stream, or other watercourse by floodplain encroachment to exceed (a) and (b) above to the same degree as the applicant proposes, the cumulative impacts would not contravene subparagraphs 62-330.301(1)(a)-(c), F.A.C."

Section 60.3(d)(3) of the National Flood Insurance Program regulations (44 CFR 60.3) states that a community shall "prohibit encroachments, including fill, new construction, substantial improvements and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practices that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base (1% chance storm) flood discharge." Orange County's Stormwater Management Department's Flood Protection Measures include regulation of development in the floodplains and floodways. Backwater and/or scour analysis are final design efforts and, therefore, are not part of this PD&E Study. Please refer to the *Location Hydraulics Report* (CFX 2022b) for further detail on floodplain and floodway impact evaluation for this PD&E Study.

2.8 Total Maximum Daily Load and Pollutant Loading Reduction Requirements

When designing stormwater systems that discharge to basins verified for nutrient impairment, state law requires the applicant to demonstrate that there will be no net increase of the pollutant of concern. To satisfy this requirement, SJRWMD requires a pre-development vs. post-development comparison of annual nutrient loading, using the Harper (2007) methodology, to demonstrate that the post-development annual loading is not greater than the pre-development loading for the pollutant of concern. The BMPTRAINS software, developed by the University of Central Florida Stormwater Academy (https://stormwater.ucf.edu/) is used to analyze best management practice nutrient removal from different land uses.

The majority of the study area is located within the Little Wekiva Canal Basin, which FDEP identifies as Water Body Identification Number 3004.

The BMAP for Wekiva River, Rock Springs Run, and Little Wekiva Canal lists the load reductions needed for Little Wekiva Canal (WBID 3004) to meet the TMDLs for the Wekiva River. The target parameter is total nitrogen with a 45.2 percent reduction goal (refer to Table 2-1).

Table 2-1. Nitrate and TN TMDLs in the Wekiva River, Rock Springs Run and Little Wekiva Canal

WBID No.	WBID Name	Parameter	TMDL Targe (mg/L)	TMDL (% Reduction)	WLA NPDES Wastewater (lbs/month)	WLA NPDES Stormwater (% Reduction)	LA (% Reduction)
2929A[a]	Blackwater Creek	Nitrate	0.286	52%	N/A	52%	52%
2956	Wekiva River (upstream)	Nitrate	0.286	68%	2,805	68%	68%
2956A	Wekiva River (downstream)	Nitrate	0.286	47%	N/A	47%	47%

Table 2-1. Nitrate and TN TMDLs in the Wekiva River, Rock Springs Run and Little Wekiva Canal

WBID No.	WBID Name	Parameter	TMDL Targe (mg/L)	TMDL (% Reduction)	WLA NPDES Wastewater (lbs/month)	WLA NPDES Stormwater (% Reduction)	LA (% Reduction)
2956C	Wekiva Spring	Nitrate	0.286	79%	N/A	79%	79%
--	Rock Spring	Nitrate	0.286	81%	N/A	81%	81%
2967	Rock Springs Run	Nitrate	0.286	63%	N/A	63%	63%
2987[a]	Little Wekiva River	Nitrate	0.286	59%	N/A	59%	59%
3004	Little Wekiva Canal	TN	--	45.2%	N/A	45.2%	45.2%

Source: Table 1.5 from the BMAP for Wekiva River, Rock Springs Run, and Little Wekiva Canal (FDEP 2015)

[a] Required reduction as calculated in Gao (2008)

Notes:

N/A = not applicable
WLA = waste load allocation
-- = empty/no data

2.9 Pond Configuration and Design Criteria

The following FDOT pond configuration criteria were factored into the pond design considerations for this PSR.

- Ponds shall be designed to provide a minimum 20 feet of horizontal clearance between the top edge of the normal pool elevation and the ROW line.
- Ponds shall have a minimum 15-foot-wide maintenance berm at a slope of 1V:8H or flatter.
- The average length-to-width ratio of the pond must be at least 2:1.
- The inside corners of the maintenance berm shall have a minimum radius of 30 feet to provide acceptable turning radius for maintenance vehicles.

As a safety factor for hydrologic inaccuracies, grading irregularities, control structure clogging and downstream stage uncertainties, at least 1 foot of freeboard is required above the maximum design stage of the pond. Typically, freeboard is the vertical distance between the maximum design stage elevation of the pond and the inside edge of the berm elevation; however, the permitted freeboard for some of the existing ponds was measured to the outside edge of berm elevation. If permitted in this manner, FDOT Drainage staff stated that it would still be acceptable for the preliminary pond sizing calculations.

The following design criteria will be required as part of the design phase:

2.9.1 Recovery Time/Drawdown

- **Wet Detention**: The outfall structure shall be designed to draw down one-half the required treatment volume within 24 and 30 hours after a storm event, but no more than one-half of this volume will be discharged during the first 24 hours.

- **Dry Retention**: The system must provide the recovery capacity for the required treatment volume within 72 hours after a storm event.

2.10 Aesthetics

FDOT has adopted a Highway Beautification Policy to include aesthetic considerations in the design aspects of highways. Per Section 5.4.4.2 of the *FDOT Drainage Manual*, aesthetic considerations are cited in as an integral part of sound pond design. The location, size, shape, side slopes, fencing and landscaping all affect the aesthetic quality of a pond. In general, irregular shapes, gradual slopes and no fence are more aesthetically pleasing and have less visual impact than rectangular shapes and steep slopes with a chain-link fence. For this reason, the *FDOT Drainage Manual* mandates that the default pond design should not include fencing and that fencing must be justified within the design documentation. Preservation of existing vegetation and inclusion of native and wetland vegetation can greatly improve the visual appearance of a pond. The shape, depth and side slopes will affect how much ROW is required for a pond. FDOT has determined that pond aesthetics is an acceptable design objective that would justify acquisition of additional ROW, including eminent domain acquisition, when appropriate. Discussion of visual impacts and aesthetic requirements for stormwater ponds with the FDOT Landscape Architect and Environmental Management Office project manager are ongoing. Design constraints (volumes, depths, littoral shelves, if applicable) must continue to be met while accommodating the aesthetic features.

3. Existing Conditions

3.1 Drainage and Hydrology

The project is located within the Little Wekiva River Watershed, which is within the jurisdiction of the SJRWMD. The study area contains several surface water bodies and lakes, such as Lake Bosse and the Little Wekiva Canal. The Little Wekiva Canal is an artificial canal system that flows primarily in a northerly direction into the Little Wekiva River. The Little Wekiva River is outside of the study area north of the Little Wekiva Canal (north of Lake Lotus). The existing SR 414 roadway is located within both open and closed basins, and stormwater runoff is treated in multiple permitted stormwater treatment ponds. Portions of the stormwater treatment ponds discharge to Lake Bosse and the Little Wekiva Canal, and the remainder discharges to existing wetlands.

The study corridor has two existing bridge crossings that traverse waters: FDOT Bridge No. 770075 (MP 37.5) over Lake Bosse, and FDOT Bridge No. 770074 (MP 37.8) over the Little Wekiva Canal. Drainage along the existing SR 414 is characterized by a series of roadside ditches and closed storm sewer collection system with curb and gutter to convey runoff to existing CFX and FDOT ponds. The existing CFX ponds along the study corridor include Ponds 4A, 4B and 4C, and the existing FDOT ponds include Ponds A, B, C, D, E, F and G (Pond G was transferred to another owner). Refer to Appendix C for Existing Drainage Map.

The majority of the study area is located within the Little Wekiva Canal Basin, which FDEP identifies as WBID No. 3004. The Little Wekiva Canal Basin is impaired for coliforms, biological oxygen demand and dissolved oxygen. There is an adopted FDEP Basin Management Action Plan for the Little Wekiva River Basin for reducing nitrates, total phosphorus and dissolved oxygen. Further, the study area falls within Wekiva Spring and Rock Springs, both of which are an Outstanding Florida Spring. The Wekiva Spring and Rock Springs have a pending BMAPs for the reduction of nitrates and total phosphorus. Because of the BMAPs, application of additional treatment volume and anti-degradation standards will be required. The study area is also located within the Wekiva River Hydrologic Basin and Wekiva Recharge Protection Basin and is subject to special treatment requirements.

3.2 Existing Typical Section

The existing SR 414 roadway between US 441 to SR 434 is a suburban arterial typical section approximately centered within the existing minimum ROW of 118 feet and has a closed drainage system with Type F curb to the outside and grassy swales in the median. The typical roadway occurs between Bear Lake Road and Gateway Drive and consists of four 11-foot-wide lanes (two lanes in each direction), 4-foot-wide inside and outside shoulders and a 46-foot-wide median. All lanes slope to the outside with the inside lane at 0.02 feet per foot and the outside lane at 0.03 feet/foot, except where superelevated. Within this section are 5-foot-wide sidewalks adjacent to SR 414 on both sides (refer to Figure 3-1). There is an 1,800-foot-long section between the US 441 Interchange and Bear Lake Road that uses the same footprint of existing pavement but is striped so that each side consists of one 14-foot-wide lane and one 12-foot-wide lane (two lanes in each direction), a 46-foot-wide median and 4-foot-wide inside shoulder but no outside shoulder. There is a 12-foot-wide shared use path on the north side from US 441 to Bear Lake Road.

The western project limit within the US 441 Interchange includes approximately 1,700 feet from the bridge over US 441 to the end of a median barrier wall. This area transitions from a barrier-separated, closed 26-foot-wide median to tie into the suburban 46-foot-wide median described above. This rural typical section includes 12-foot-wide lanes, 12-foot-wide inside shoulders and 10- to 12-foot-wide outside shoulders. There is a sidewalk on the south side and a shared use path on the north side of SR 414 within this section.

The eastern project limit includes approximately 2,500 feet between Gateway Drive and the end project at SR 434 and transitions from suburban to rural. This typical holds the 46-foot-wide median and includes 12-foot-wide lanes, 4-foot-wide paved inside shoulders and 8- to 10-foot-wide paved outside shoulders. There is no sidewalk on either side of SR 414 within this eastern section.

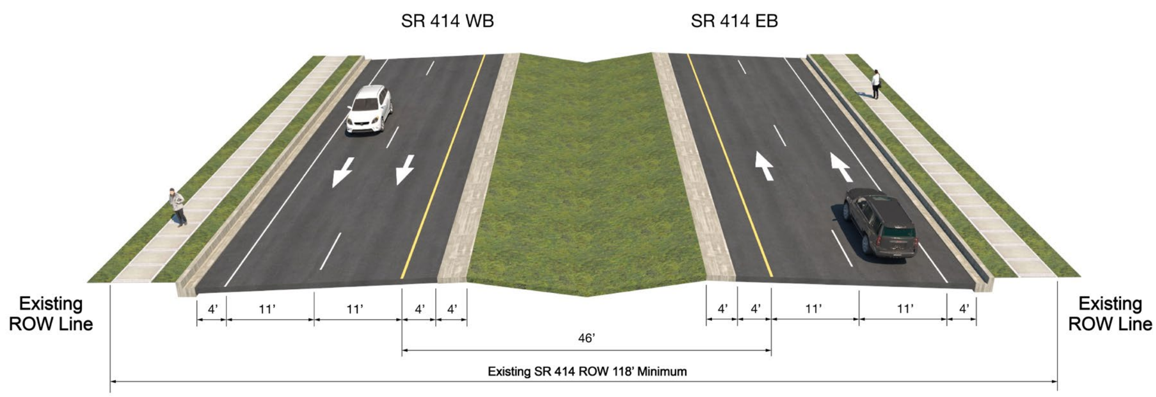


Figure 3-1. Existing Typical Section

3.3 Posted Speeds

Table 3-1 provides the existing posted speed limits along the existing SR 414 corridor.

Table 3-1. Existing (2020) Corridor Posted Speed Limits

Corridor	From	To	Posted Speed
SR 414 Maitland Boulevard	US 441 (SR 500)	Gateway Drive	50 mph
SR 414 Maitland Boulevard	Gateway Drive	East of SR 434	55 mph

3.4 Right-of-Way

The ROW for SR 414 through the project limits is a minimum 118-foot width. The ROW widens at the limits of the project study area to accommodate the interchange footprints including ponds and ramps. Portions of the ROW are fenced and designated as limited access as indicated by the existing plans. Several neighborhoods have existing noise walls installed along the ROW also restricting access from the neighboring communities. The primary access to the ROW for pedestrian routes is at or near the intersections.

3.5 Soils

The USDA Soil Map indicates the near-surface soils in upland areas are moderately well-drained sands (Type A) (A-3 and A-2-4; refer to Appendix C for Soils Map) with typical depths to groundwater between 3.5 and 6 feet deep. However, organic soil (muck) is present within wetlands, specifically at Lake Bosse, which contains muck deposits extending to extreme depths. The SR 414 Bridge at Lake Bosse is supported on open-ended pipe piles. Because of the soft muck at some foundation locations, the piles were driven to depths greater than 400 feet to achieve bearing.

3.6 Land Use

Adjacent land uses and cover types along SR 414 and adjacent to the study area consist of a diverse mixture of developed properties, natural and altered uplands, wetlands and surface water. During a site visit conducted in May 2020, these areas were assessed, with a focus on the natural vegetative communities for potential use by federal- and state-listed wildlife.

The *St. Johns River Water Management District Florida Land Use Cover Classification System (FLUCCS), 2014* along with field verification was used to classify the various land uses and land covers within the study area. Refer to Appendix C for the Existing Land Use map.

Developed areas include Residential (FLUCCS 1100, 1200, 1300), Commercial (FLUCCS 1400, 1490), Light Industrial (FLUCCS 1550), Heavy Industrial (FLUCCS 1560), Parks and Zoos (FLUCCS 1850) and Roads (FLUCCS 8140). Upland areas (vegetated) include Herbaceous Upland Non-forested (FLUCCS 3100), Upland Hardwood Forests (FLUCCS 4200) and Upland Mixed Coniferous/Hardwood (FLUCCS 4340).

Wetlands and surface waters include Streams and Waterways (FLUCCS 5100), Lakes (FLUCCS 5200), Reservoirs (FLUCCS 5300), Wetland Forested Mix (FLUCCS 6300), Freshwater Marshes (FLUCCS 6410), Emergent Aquatic Vegetation (FLUCCS 6440), Mixed Scrub-Shrub Wetland (FLUCCS 6460) and Surface Water Collection Basins (FLUCCS 8370).

3.7 Existing Cross Culverts

There are no existing cross culverts within the project limits. Refer to Straight Line Diagram in Appendix D.

3.8 Existing Bridges

3.8.1 Overview

There are three existing bridges within the project study area (refer to Table 3-2). Bridge No. 770074 carries eastbound and westbound SR 414 over Lake Bosse, Bridge No. 770075 carries eastbound and westbound SR 414 over Little Wekiva Canal and Bridge No. 770083 at the eastern project limit carries SR 414 over SR 434.

The SR 414 bridge over Lake Bosse was constructed in 2000 and is a six-span divided structure with two 11-foot-wide lanes in each direction, a 13.5-foot-wide inside shoulder in each direction next to the 19-foot-wide raised median, 12-foot-wide outside shoulders and a 5-foot-wide barrier-separated sidewalk in each direction.

The SR 414 bridge over Little Wekiva Canal was constructed in 2000 and is a single-span divided structure that has two 11-foot-wide lanes in each direction, a 13.5-foot-wide inside shoulder in each direction next to the 19-foot-wide raised median, 8-foot-wide outside shoulders and a 5-foot-wide, barrier-separated sidewalk in each direction. The bridge spans over the Little Wekiva Canal as well as a sidewalk and tram path from the parking lot to Lake Lotus Park.

The SR 414 bridge over SR 434 was constructed in 2000 and is a divided single-span structure that has two 12-foot-wide lanes, 10-foot-wide inside and outside shoulders in each direction and a 20-foot-wide raised median. The bridge spans over SR 434 and is part of a single-point urban interchange.

Table 3-2. Existing Bridge Structures

Roadway	Bridge Over	Bridge No.	Direction	Length (feet)	No. of Spans	Bridge Width (feet)	Superstructure Type
SR 414	Lake Bosse	770074	EB & WB	700	6	129	Prestressed Concrete and Steel Plate Girders
SR 414	Little Wekiva Canal	770075	EB & WB	68.9	1	121	Prestressed Concrete Beam
SR 414	SR 434	770083	EB & WB	246	1	118	Steel Plate Girders

3.8.2 Current Condition and Year of Construction

Table 3-3 describes the three existing bridge structures in the SR 414 corridor. Existing bridge information was obtained from a field review, available data, and plans. The sufficiency rating is derived from a formula that methodically evaluates factors that indicate the structure's ability to remain in service. A rating of 100 percent represents an entirely sufficient bridge and a rating of 0 percent represents an entirely deficient bridge. Standard practice indicates that structures with a sufficiency rating of 80 percent or less require some rehabilitation and those less than 50 percent require replacement. A complete listing of applicable criteria is provided in the *Bridge Analysis Technical Memorandum* (CFX 2022a).

All the three bridges listed in Table 3-3 are classified as having a structural sufficiency rating of 90 percent or higher and none are listed as functionally obsolete.

Table 3-3. Current Structure Condition and Year of Construction

Bridge Number	Mile Marker	Year Built/Widened	Route Carried	Intersecting Feature	Sufficiency Rating (%)	Health Index	Inspection Date
770074	MP 37.400 to 37.534	2000	SR 414	Lake Bosse	92.7	95.11	2019
770075	MP 37.805 to 37.818	2000	SR 414	Little Wekiva Canal	96.3	99.82	2019
770083	MP 38.359 to 38.406	2000	SR 414	SR 434	100	99.94	2018

3.9 Floodplains and Regulatory Floodways

The Federal Emergency Management Agency's Flood Insurance Rate Maps for Seminole County, Community Panel Numbers 12117C0145F and 12117C0140F, dated September 28, 2007, and Orange County Community Panel Numbers 12095C0140F and 12095C0145F, dated September 25, 2009, indicates that a portion of the project study area lies within the 100-year floodplain areas Zone AE and Zone A.

The Zone AE base flood elevation ranges from 63 to 65 feet and is in the vicinities of Lake Bosse and Little Wekiva Canal. Zone A, corresponding to an unnamed wetland, is located in the vicinity of the SR 414 and US 441 Interchange and has no base elevation but includes a 1 percent chance of flooding. Most of the study area lies in floodplain area Zone X, which is an area of minimal flood hazard. Refer to Appendix C for FEMA Floodplains Map.

Based on review of FEMA FIRM maps, there is one designated regulatory floodway located south of the Orange County-Seminole County border near the Lake Lotus Park parking lot and is identified in the FEMA Flood Insurance Study for Orange County (FEMA 2018) as the Little Wekiva River Regulatory Floodway. No impact to this regulatory floodway is expected as its limits end before the SR 414 ROW on the south side.

Several regional hydraulic models in addition to the FEMA Flood Insurance Study are available for the Little Wekiva Watershed including the Little Wekiva Watershed Model Refinement (referenced in CDM Smith and Pegasus Engineering 2016) and the Little Wekiva River Watershed Management Plan Final Report (CDM 2005).

SJRWMD required floodplain criteria includes a no net reduction of floodplain storage within the 10-year floodplain, and the storage standards for the Wekiva River Hydrologic Basin must be met. Refer to the *Location Hydraulics Report* (CFX 2022b) for additional information regarding impacts and compensation to floodplains.

3.10 Coordination with Local Agencies

Local agencies were contacted to coordinate on drainage/maintenance issues or potential improvements. Details are provided in the following text and in Appendix E, Correspondence.

3.10.1 Orange County

Orange County Environmental Protection Division is currently designing the Little Wekiva/Lake Lotus Stormwater Project for water quality improvements to meet the requirements of the Wekiva River, Rock Springs Run, and Little Wekiva Canal Basin Management Action Plan. A preliminary Environmental Look Around coordination meeting with Orange County was held on August 27, 2020 to discuss the potential of a partnership with the Lake Lotus Stormwater Project for potential stormwater treatment credit (refer to Appendix E for meeting minutes). Ongoing coordination should continue throughout the design phase of this project with Orange County and other stakeholders.

3.10.2 FDOT Maintenance, Oviedo Yard

Based on conversations with FDOT, there are several items regarding maintenance along SR 414. Ditches at the intersection of SR 414 and US 441 fail to drain completely. At the southeast intersection of SR 434 and SR 414 a wet retention ditch overflows during storm events into adjacent Pond G. Finally, trash and debris clog at the Little Wekiva Bridge at SR 414 (Danos, pers. comm. 2021). As a part of this project, there will be improvements to the US 441 ramps and ditches as well as improvements for erosion control protection at the Little Wekiva Bridge. The project team will consider alternatives that avoid increasing water elevations at the southeast corner of SR 434.

3.10.3 City of Altamonte Springs

Based on conversations with Altamonte Springs's city engineer (Blackadar, pers. comm. 2021), the following is noted:

> *If mitigation ideas is needed for the project, the City of Altamonte Springs has a potential project in Lake Lotus Park that would provide bank erosion control measures and would also involve dredging of the existing delta in the lake. This project has been discussed with FDEP and FWC in the recent past. Lake Lotus is monitored as part of the City's annual NPDES permit and it is essential that there will not be any negative impacts to the water quality of this water body as part of the construction of this project. The*

only roads that the City of Altamonte Springs maintains in the study area are Gateway Dr and the roadways within Lake Lotus Park. There are not any known issues on Gateway Dr near the study area that the City is aware of. Additionally, much of Lake Lotus Park is within a floodplain.

Mr. Blackadar also notes:

The City of Altamonte Springs has a 24 inch PVC reclaimed pipeline that exists in the median of SR 414 from just west of Eden Park Rd to the ramps at the US 441 interchange. This pipeline is not a typical utility in the FDOT right-of-way as it is part of the A-FIRST joint project with the City of Altamonte Springs and FDOT. The A-FIRST project provides permitted stormwater treatment for the I-4 Ultimate project and is therefore part of FDOT's stormwater infrastructure. This pipeline is an essential element of the I-4 Ultimate stormwater management system and necessary for FDOT to meet its stormwater permit requirements. During construction, the pipeline must stay in operation at all times.

If necessary, the reclaimed pipeline is proposed to be relocated prior to any construction activities within the median.

3.10.4 St. Johns River Water Management District

Coordination with SJRWMD took place on February 17, 2021. The project team met with Cammie Dewey of SJRWMD to discuss design criteria, recharge criteria, Outstanding Florida Waters criteria and Total Maximum Daily Load requirements. The project team discussed the staff comments contained within the Technical Staff Reports for SJRWMD permits 20930-1 and 20930-2 regarding Recharge Standards (11.3.1) (refer to Appendix B) and asked if the recharge criteria should be applied to all basins within the study limits. Cammie Dewey referred the project team to review the soils maps for Orange County in 1989 and Seminole County in 1990 to confirm the appropriate recharge areas within the study limits. Review of these maps confirmed that there is mixture of both Type A and Type A/D soils within the study limits of SR 414. The presence of Type A/D soils are located in the surroundings areas near Lake Bosse. Research of existing permits also showed that both existing ponds E and F were converted from dry ponds to wet ponds due to unfavorable soils conditions and the ability of the ponds to recover the required treatment volumes (refer to Appendix B). As a result of these findings, recharge standards will not be applicable for this study except at existing permitted retention basins. The project team also discussed TMDL requirements and if an Outstanding Florida Springs was considered the same as an Outstanding Florida Waters. Cammie Dewey stated that we should contact FDEP regarding the current TMDL requirements and noted that the Statewide Environmental Resource Permit (SWERP) rules are planned to be updated by the end of this year. Cammie Dewey also stated that she would check on the status of the Outstanding Florida Springs. Appendix E provides meeting minutes and summarizes discussion items.

3.10.5 Florida Department of Environmental Protection

Coordination with FDEP took place on March 4, 2021. The project team met with Leo Angelero and Daniel Shideler of FDEP to discuss Special Basin design criteria, recharge criteria, Outstanding Florida Waters criteria and Total Maximum Daily Load requirements. The project team inquired about the current BMAP for Wekiva Springs and Rock Springs and additional TMDL requirements for the study limits. FDEP stated that current BMAP will still apply for the Little Wekiva Canal (WBID 3004) and the FDEP's website and direct maps should be used to verify if any other pollutants need to be evaluated from the verified list of impaired waterbodies. FDEP's website was used to confirm that WBID 3004 was not on the verified list of impaired waterbodies and does not fall within the limits of any other TMDL requirements. During the discussion, FDEP also stated that an Outstanding Florida Springs is not considered the same as an Outstanding Florida Waters, therefore an additional 50% of required treatment volume, per basin, will not be required. The project team also asked about the upcoming changes to the SWERP and if the rules would apply to this study, FDEP responded by stating that only the current rules will be verified for compliance during the permit application phase. Any changes to the rules and design criteria should only be accounted for in the design and will be verified by FDEP once they have become implemented into the SWERP. Appendix E provides meeting minutes and summarizes discussion items.

3.10.6 Environmental Look Around

Preliminary ELA meetings occurred on 8/7/2020, 1/28/2021, 2/15/2021, 2/17/2021, and 3/4/2021 with Orange County, FDOT, City of Altamonte Springs, SJRWMD, and FDEP, respectively to explore watershed-wide stormwater needs and alternative permitting approaches. The preliminary ELA meetings explored the following types of opportunities:

1) SJRWMD/FDEP issues: wetland rehydration, water supply needs, minimum flows and levels, flooding, TMDL, acquisition of fill from FDEP/SJRWMD lands
2) City/County issues: stormwater re-use, flooding, discharge to golf courses or parks, National Pollutant Discharge Elimination System needs and water supply needs
3) FDOT project permitting: regional treatment, stormwater re-use, and joint use facilities

3.10.7 Contamination Screening

A desktop analysis of the study area was performed to identify and address any contaminated sites that possess a high degree of potential contamination involvement to the proposed project. The project elements that could be impacted by soil and/or groundwater contamination include:

a) Soil excavation for drainage improvements
b) Soil excavation for pavement construction
c) Soil excavation for mast arm signal pole foundations
d) Soil excavation for bridge foundation construction including pile caps and drilled shafts
e) Excavation dewatering

The contamination screening study area consists of all potentially contaminated sites within 500 feet, all non-landfill solid waste sites within 1,000 feet, and all solid waste landfills, Comprehensive Environmental Response, Compensation, and Liability Act or National Priorities List sites within 0.5 miles from the outside edge of the existing SR 414 ROW. FDEP Map Direct and OCULUS databases (FDEP 2020a and 2020b) were queried for facilities within the study area that would be considered a major project constraint. If a facility within the study area has the potential as a major project constraint, supplemental research was performed to determine the current regulatory status. The contamination screening desktop evaluation indicated 25 sites with potential risk of contamination impacts to the proposed project. Upon review of the databases, none of the sites identified was considered to be a major constraint to the project.

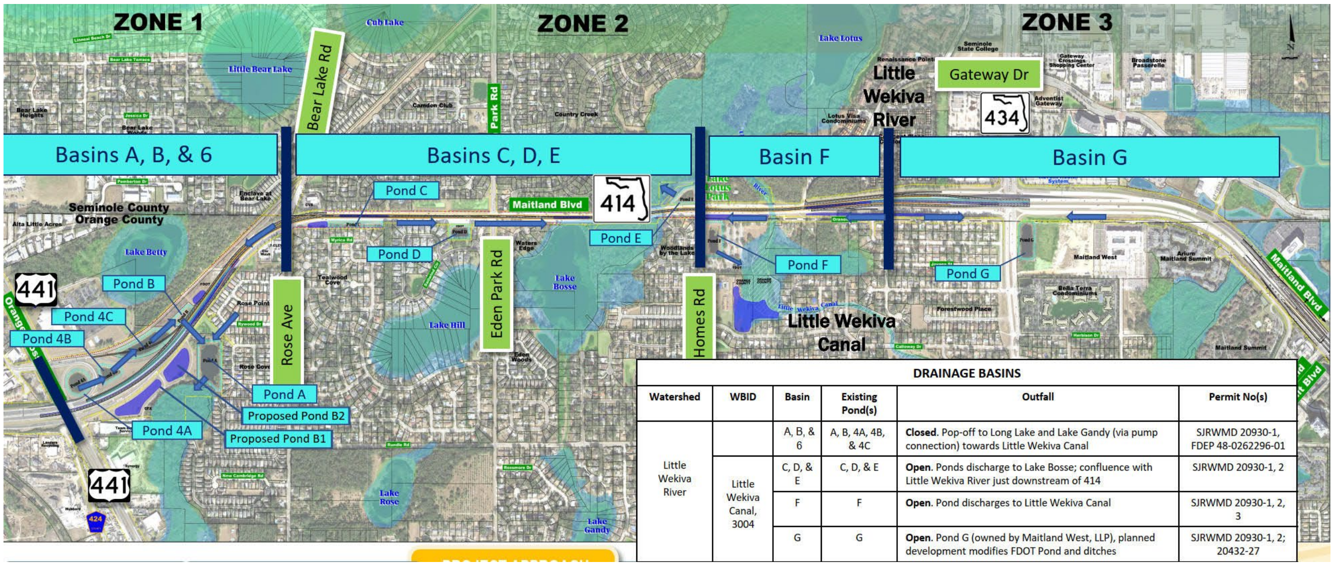
A Level I Contamination Screening Evaluation Report will be conducted during the PD&E Study once a Build Alternative is selected to further determine each site’s risk rating to the proposed project.

3.11 Field Investigation

A field investigation was conducted by Jacobs staff on February 2, 2021, to confirm existing conditions. Areas of concern for maintenance include the north end of the Little Wekiva Canal Bridge where there are signs of erosion. Future improvements for this bridge should include enhanced erosion control measures to prevent further erosion. Refer to Appendix D for selected field investigation photos.

3.12 Existing Drainage Basins

Figure 3-2 shows existing drainage basins in the study area. The text that follows provides further details on each basin.



DRAINAGE BASINS					
Watershed	WBID	Basin	Existing Pond(s)	Outfall	Permit No(s)
Little Wekiva River		A, B, & 6	A, B, 4A, 4B, & 4C	**Closed**. Pop-off to Long Lake and Lake Gandy (via pump connection) towards Little Wekiva Canal	SJRWMD 20930-1, FDEP 48-0262296-01
	Little Wekiva Canal, 3004	C, D, & E	C, D, & E	**Open**. Ponds discharge to Lake Bosse; confluence with Little Wekiva River just downstream of 414	SJRWMD 20930-1, 2
		F	F	**Open**. Pond discharges to Little Wekiva Canal	SJRWMD 20930-1, 2, 3
		G	G	**Open**. Pond G (owned by Maitland West, LLP), planned development modifies FDOT Pond and ditches	SJRWMD 20930-1, 2; 20432-27

Figure 3-2. Existing Basins

3.12.1 Basin A

The portion of SR 414 (Maitland Boulevard) within Basin A was previously permitted by SJRWMD Permit 4-095-0216. The site consisted of 45.3-acre industrial park. The existing wet detention pond (Pond A) had been constructed to function as a joint use pond, receiving runoff from the industrial park and the proposed Maitland Boulevard. Approximately 500 linear feet of Maitland Boulevard, located within Basin A, discharges into Pond A. This pond had also been designed to handle stormwater runoff from Rose Cove, a single family development. The original total permitted basin area was 53.5 acres. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details.

The latest modification to Basin/Pond A occurred in November 2006 when CFX submitted a Letter Modification to FDEP for the modification of Pond 4C that was designed and constructed to provide stormwater treatment and attenuation for the proposed interchange at SR 414 and US 441. Under that modification, the contributing runoff area discharging to Pond A was reduced from 53.5 acres to 31.81 acres. Because the overall runoff area from SR 414 was reduced, no additional calculations and/or modification were made to Pond A. Pond A discharges into a wetland area located along the south side of the pond before ultimately discharging into Long Lake. Orange County considers Long Lake an open basin, and SJRWMD considers it a closed basin.

3.12.2 Basin 6

Basin 6 was originally permitted with the SR 414 (Maitland Boulevard) Extension & SR 429 (Western Beltway) Realignment project, FDEP permit number 48-0262296-001. The original permit was modified in November 2006. The modifications made changes to the design of Pond 4C by increasing the surface area at the normal water level, pond berm elevation(s), pond bottom elevation, as well as revisions to the outfall control structure, OCS #4. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details. Basin 6 contains three sub-basins: 6A, 6B and 6C that provide stormwater treatment and attenuation for the proposed roadway improvement associated with the interchange at SR 414 and US 441 and portions of US 441, north of the interchange.

The basin boundary and contributing area(s) for Basin 6A consist of the off ramp from eastbound SR 414 to US 441, the on ramp from US 441 to eastbound SR 414, the loop ramp from US 441 to westbound SR 414 as well as portion of US 441 (mainly the northbound travel lanes, median and southbound inside shoulder), north of the interchange. The total permitted basin area for Basin 6A is 20 acres. Stormwater runoff from this basin is primarily collected and conveyed into wet detention Pond 4A via roadside ditches and ditch bottom inlets.

The basin boundary and contributing area(s) for Basin 6B consist of westbound SR 414 adjacent to the infield area associated with Pond 4B as well as portions of the off ramp from westbound SR 414 to US 441. The total permitted basin area for Basin 6B is 5.62 acres. Stormwater runoff from this basin drains directly into the infield area before discharging into wet detention Pond 4B.

The basin boundary and contributing area(s) for Basin 6C consist of eastbound SR 414 from the high point of the bridge over US 441 to approximately Station 1478+50, westbound SR 414 adjacent to Pond 4C as well as portions of the off ramp from westbound SR 414 to US 441. The total permitted basin area for Basin 6C is 10.44 acres. Stormwater runoff from this basin is collected and conveyed into wet detention Pond 4C via barrier wall inlets, curb-and-gutter inlets as well as direct discharge.

All three wet detention ponds (4A, 4B and 4C) are interconnected and were designed to outfall into Pond A before ultimately discharging to Long Lake. Research of the existing permit shows that because Orange County considers Long Lake an open basin and SJRWMD considers it a closed basin, the SJRWMD criteria were used to determine the required stormwater treatment and attenuation volume for Basin 6. The permitted water quantity volume was set to detain the post-development/pre-development runoff volume from the 25-year, 96-hour storm event.

3.12.3 Basin B

Basin B was originally permitted with the Maitland Boulevard (SR 414) Extension project during March 1996, SJRWMD permit 20930-1. This permit was modified with the (State Road 414) Maitland Boulevard Modification, SJRWMD permit 20930-2, during January 1998. The modification allowed/permitted dry retention Pond B to outfall into wet detention Pond A. In addition, the FDEP permit modification 48-0262296-001 (noted for Basin 6) reduced the total basin area for Basin B from 8.25 acres to 7.57 acres. The difference in area was diverted to discharge into wet detention Pond 4C. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details.

The basin boundary and contributing area(s) for Basin B consists of SR 414 from approximately Station 1478+50 to the intersection at Rose Avenue/Bear Lake Road, as well as a minor portion of Rose Avenue and Bear Lake Road. The total permitted basin area for Basin B is 7.57 acres. Stormwater runoff from this basin is collected and conveyed into dry retention Pond B via curb-and-gutter inlets and ditch bottom inlets located within the median ditch. Although Pond B outfalls into Pond A, which has been classified by SJRWMD to be located with a closed basin, the permitted retention/treatment volume for Pond B was calculated based on the greater of 1.5 inches over the total basin area or 3.0 inches over the impervious area. However, based on SJRWMD criteria for a closed basin, the actual volume appears to have been set to retain the post-development/pre-development runoff volume for the 25-year, 96-hour storm event and was field-verified.

3.12.4 Basin C

Basin C was originally permitted with the Maitland Boulevard (SR 414) Extension project during March 1996, SJRWMD permit 20930-1. The basin boundary and contributing area(s) for Basin C consists of SR 414 from the intersection at Rose Avenue/Bear Lake Road to approximately Station 1507+70, as well as a minor portion of Rose Avenue and Bear Lake Road. Basin C is an open basin with a total permitted basin area of 7.66 acres. Stormwater runoff from this basin is collected and conveyed into dry retention Pond C via curb-and-gutter inlets and ditch bottom inlets located within the median ditch. The permitted retention/treatment volume for Pond C was calculated based on the greater of 1.5 inches over the total basin area or 3.0 inches over the impervious area. Pond C outfalls into Pond D before ultimately discharging into Lake Bosse. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details.

3.12.5 Basin D

Basin D was originally permitted with the Maitland Boulevard (SR 414) Extension project during March 1996, SJRWMD permit 20930-1. This permit was modified with the (State Road 414) Maitland Boulevard Modification, SJRWMD permit 20930-2, during January 1998. The modification converted Pond D from a dry retention pond to a wet detention pond with a liner. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details.

The basin boundary and contributing area(s) for Basin D consists of SR 414 from approximately Station 1507+70 to the intersection at Eden Park Road, as well as a minor portion of Eden Park Road north of SR 414. Basin D is an open basin with a total permitted basin area of 5.44 acres. Stormwater runoff from this basin is collected and conveyed into wet detention Pond D via curb-and-gutter inlets and ditch bottom inlets located within the median ditch. The permitted treatment volume for Pond D was calculated based on the greater of 1.0 inch over the total basin area or 2.5 inches over the impervious area. Pond D discharges into Lake Bosse.

3.12.6 Basin E

Basin E was originally permitted with the Maitland Boulevard (SR 414) Extension project during March 1996, SJRWMD permit 20930-1. The basin boundary and contributing area(s) for Basin E consists of SR 414 from the intersection at Eden Park Road to the intersection at Magnolia Homes Road/Lake Lotus Park. In addition, a minor portion of Eden Park Road north of SR 414 as well as the Eden Park subdivision is included in the overall basin area. Basin E is an open basin with a total permitted basin area of 11.90 acres. Stormwater runoff from this basin is collected and conveyed into wet detention Pond E via curb-and-gutter inlets and ditch bottom inlets located within the median ditch. The initial calculated treatment volume for Pond E was calculated based on the greater of 1.0 inch over the total basin area or 3.0 inches over the impervious area. However, the weir crest elevation and resulting treatment volume was raised from 66.50 feet to 67.00 feet to satisfy detention requirements. Pond E discharges into a wetland system associated with Lake Bosse. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details.

3.12.7 Basin F

Basin F was originally permitted with the Maitland Boulevard (SR 414) Extension project during March 1996, SJRWMD permit 20930-1. This permit was modified with the (State Road 414) Maitland Boulevard Modification, SJRWMD permit 20930-2, during January 1998. The modification converted Pond F from a filtration system to a wet detention pond. Another minor modification occurred during April 1998 in which there were minor design changes made to Maitland Boulevard Access Road P, SJRWMD permit 20930-2. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details.

The basin boundary and contributing area(s) for Basin F consists of SR 414 from the intersection at Magnolia Homes Road/Lake Lotus Park to approximately Station 1578+00, as well as a minor portion of Gateway Drive (Access Road P). Basin F is an open basin with a total permitted basin area of 21.79 acres. Stormwater runoff from this basin is collected and conveyed into wet detention Pond F via curb-and-gutter inlets and ditch bottom inlets located within the median ditch. The original permitted treatment volume for “dry” Pond F was calculated based on the greater of 1.5 inches over the total basin area or 3.0 inches over the impervious area. After the first permit modification, when Pond F was converted to a wet detention pond, the required treatment volume was calculated based on 1.0 inch over the total basin area or 2.5 inches over the impervious area. Although this resulted in a lower required treatment volume, the original provided treatment volume of 3.03 acre-feet was maintained. During the last modification, the minor increase in the total impervious area did not result in any additional required treatment volume. Pond F discharges into the Little Wekiva Canal.

3.12.8 Basin G

Basin G was originally permitted with the Maitland Boulevard (SR 414) Extension project during March 1996, SJRWMD permit 20930-1. This permit was modified with the (State Road 414) Maitland Boulevard Modification, SJRWMD permit 20930-2, during January 1998. The first modification converted Pond G from a dry detention pond to a wet detention pond. Another permit modification occurred during the development of the Maitland West project, SJRWMD permit 20432-27, that converted the existing Pond G into a proposed perimeter ditch that would still provide stormwater treatment and attenuation for SR 414 as well as SR 434, as previously permitted. The final permit modification was made to turn over the operation and maintenance of the stormwater treatment facilities, formerly Pond G, from FDOT to the Maitland West LLLP, SJRWMD permit numbers 20930-7 and 20930-8. Refer to Appendix B (Existing Permits and Supporting Stormwater Calculations) for more details.

The basin boundary and contributing area(s) for Offsite Basin (Pond G) consists of SR 414 from approximately Station 1578+00 to approximately Station 1599+80, as well as SR 434 from just south of Whistlewood Drive to the intersection of SR 434 and Gateway Drive. Basin G is an open basin, and the total permitted basin area for Offsite Basin (Pond G) is 26.10 acres. Stormwater runoff from this basin is collected and conveyed into the perimeter ditch via barrier wall inlets, curb-and-gutter inlets and ditch bottom inlets located within the median ditch. Currently, the permitted treatment volume for the perimeter is calculated based on the greater of 1.0 inch over the total basin area or 2.5 inches over the impervious area. The perimeter ditch outfalls into an existing storm sewer system that conveys the discharge south along SR 434 before crossing SR 434 at Herbison Drive, before ultimately discharging into the Little Wekiva Canal.

4. Proposed Conditions

4.1 Proposed Drainage

The project will be divided into 8 drainage basins, which will require 10 existing and proposed pond sites and 1 swale for the treatment and attenuation of stormwater runoff. The drainage patterns in the proposed conditions will remain the same as existing conditions, with basins outfalling into the Little Wekiva River, Lake Bosse and adjacent wetlands. The proposed drainage system for the SR 414 mainline will convey stormwater via curb-and-gutter inlets and closed system into existing and proposed stormwater retention facilities for water quality treatment and attenuation before outfalling into the Little Wekiva River and Lake Bosse. The proposed drainage system for the new four-lane SR 414 Expressway Extension will consist of barrier wall inlets in a closed system similarly discharging into existing and proposed stormwater retention facilities for water quality treatment and attenuation before outfalling into tributaries and waterways of the Little Wekiva River and Lake Bosse.

4.2 Proposed Typical Section

The recommended proposed typical section for SR 414 Expressway Extension provides four 12-foot-wide express lanes (two per direction) separated by a median barrier wall with 12-foot-wide paved shoulders (refer to Figure 4-1). SR 414 will remain with 12-foot-wide and 11-foot-wide lanes (in both directions) with 7-foot-wide shoulders.

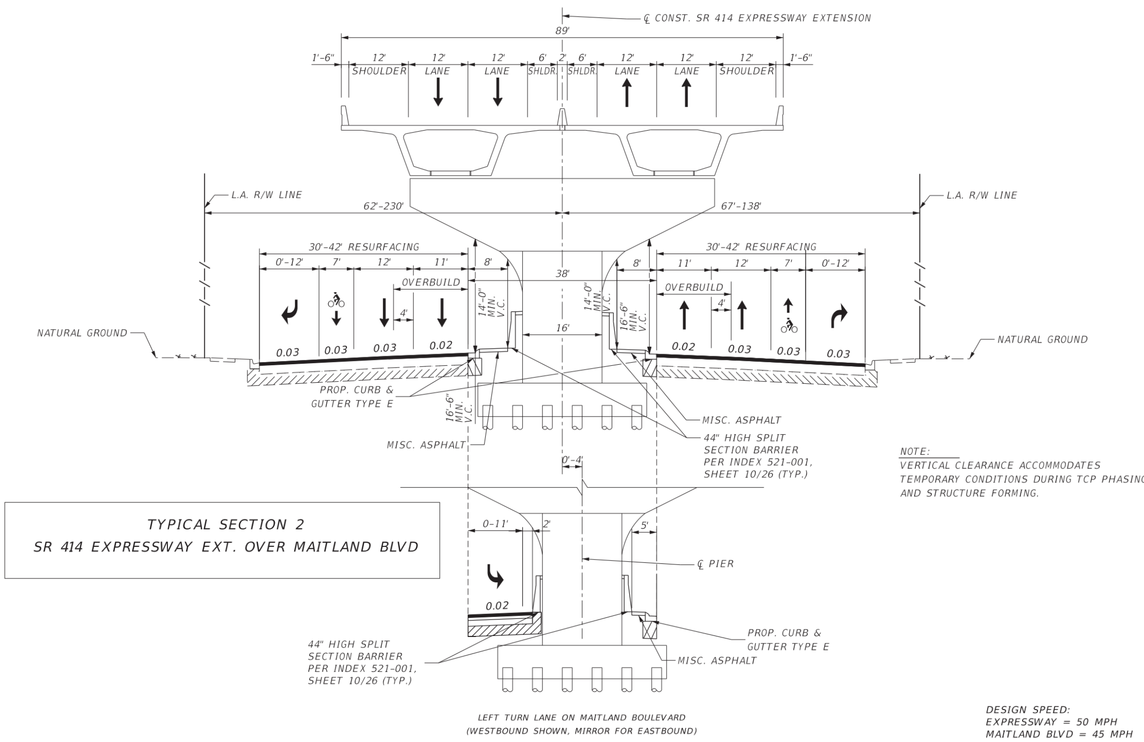


Figure 4-1. Proposed Typical Section

4.3 Proposed Drainage Basins

4.3.1 Basin A

As result of the proposed construction of Pond B1 and Pond B2, the overall basin area draining into existing Pond A will be reduced from 31.81 acres to 24.19 acres. Because the overall runoff area has been reduced, the existing permitted conditions of existing Pond A can be maintained and still provide the required treatment and attenuation volumes for the proposed roadway improvements. No modifications to existing Pond A are anticipated.

4.3.2 Basin 6

The existing drainage patterns and similar basin boundaries for Basin 6 will be maintained in the post-development conditions. However, because of the roadway improvements that include the reconstruction of the off ramp from westbound SR 414 to US 441 and tying the proposed roadway back into existing SR 414 prior to the bridge over US 441, both existing Pond 4B and Pond 4C will be impacted. As a result, both ponds will be reconfigured to maximize the available remaining space within the original footprint of the ponds. In addition, all pond berms within Basin 6 will be reduced to the allowable minimum width of 15 feet. The inside berm elevation(s) for Ponds 4A and 4B will be raised, and both the inside and outside berm elevations of Pond 4C will be raised. Also, with the new proposed off ramp alignment to US 441, the existing “wet” ditch between the current off ramp and Pond 4C should be eliminated. Most soils in Basin 6 are classified as Hydrologic Soil Group A and A/D, with the remainder classified as HSG C.

Preliminary pond sizing, which includes reshaping Pond 4B and Pond 4C and elevating the pond berms, indicates that the required stormwater treatment and attenuation for the proposed roadway improvements within Basin 6 can be achieved by the reconfigured three interconnected ponds (4A, 4B and 4C). The pre-liminary water quantity volume was determined by applying the same calculations as the permitted conditions. The post-development/pre-development runoff volume from the 25-year, 96-hour storm event will be detained with the ponds. The existing outfall pipe system that discharges into existing Pond A will also be maintained. Refer to Appendix A (Pre-Development and Post-Development Stormwater Calculations) for more details regarding basin areas, basin curve numbers, stage-storage and required treatment volumes calculations.

4.3.3 Basin B

The existing drainage patterns for Basin B will be maintained in the post-development conditions. However, because of the roadway improvements that include the re-alignment of SR 414, the reconstruction of the off ramp from westbound SR 414 to US 441 and the existing Duke Energy easement, the remaining existing Pond B area will no longer be sufficient to provide the required stormwater treatment and attenuation volumes for Basin B. Thus, interconnected Pond B1 and Pond B2 have been proposed on the south side of SR 414. Both ponds are in a vacant parcel owned by CFX. Most soils in Basin B are classified as HSG A and A/D, with the remainder classified as HSG B/D.

Preliminary pond sizing, which includes interconnected Pond B1 and Pond B2, indicate that the required stormwater treatment and attenuation for the proposed roadway improvements within Basin B can be achieved. The preliminary water quality volume calculations have been modified from the permitted conditions to account for the water quantity requirements that SJRWMD has for closed basins. The post-development/pre-development runoff volume from the 25-year, 96-hour storm event will be detained with the ponds. Both ponds will use the existing outfall pipe system that discharges into existing Pond A, before ultimately discharging into Long Lake. Refer to Appendix A (Pre-Development and Post-Development

Stormwater Calculations) for more details regarding basin areas, basin CNs, stage-storage and required treatment volumes calculations.

4.3.4 Basin C

The existing drainage patterns and similar basin boundaries for Basin C will be maintained in the post-development conditions. However, because of the roadway improvements that include the new impervious surface for the elevated roadway section, existing Pond C will be expanded to the west to maximize the available open space within the existing ROW to provide the additional required stormwater treatment and attenuation volumes. In addition, the inside berm elevation of Pond C has been raised to achieve the 1 foot of freeboard from the estimated design high water elevation. All soils in Basin C are classified as HSG A.

Preliminary pond sizing, with expanding Pond C within the existing ROW, indicates that the required storm-water treatment and attenuation for the proposed roadway improvements within Basin C can be achieved. The preliminary water quality volume was determined by applying the same calculations as the permitted conditions. However, 3.0 inches over the impervious area now controls the required treatment volume, as compared to the 1.5 inches over the total basin area used for the permitted conditions of Pond C. The existing outfall pipe system that discharges into existing Pond D should be used and maintained in the post-development conditions. Refer to Appendix A (Pre-Development and Post-Development Stormwater Calculations) for more details regarding basin areas, basin curve numbers, stage-storage and required treatment volumes calculations.

4.3.5 Basin D

The existing drainage patterns and basin boundaries for Basin D will be maintained in the post-development conditions. However, because of the roadway improvements that include the new impervious surface for the elevated roadway section, the total basin area increases from 5.44 acres to 5.51 acres in the post-development condition. All soils in Basin D are classified as HSG A. Preliminary pond sizing and evaluation of the excess treatment volume capacity within existing Pond D indicates that the additional required stormwater treatment and attenuation for the proposed roadway improvements within Basin D can be achieved without any modification to the permitted treatment and attenuation volume. However, to achieve the required 1 foot of pond freeboard (measured from the outside berm elevation, as permitted) the existing outside berm elevation will need to be raised from 92.00 feet to 92.25 feet (NGVD). This is based on the preliminary estimate of the design high water elevation. During the design phase, if the design high water elevation can be lowered, this pond modification will not be required. Refer to Appendix A (Pre-Development and Post-Development Stormwater Calculations) for more details regarding basin areas, basin curve numbers, stage-storage and required treatment volumes calculations.

4.3.6 Basin E

The existing drainage patterns and basin boundaries for Basin E will be maintained in the post-development conditions. However, because of the roadway improvements that include the new impervious surface for the elevated roadway section, the total impervious area increases from 7.28 acres to 7.82 acres in the post-development condition. All soils in Basin E are classified as HSG A. Preliminary pond sizing and evaluation of the excess treatment volume capacity within existing Pond E indicates that the additional required stormwater treatment and attenuation for the proposed roadway improvements within Basin E can be achieved without any modification to the permitted treatment and attenuation volume. However, to achieve the required permanent pool volume for the increase in area, the existing pond bottom will need to be lowered from 55 feet to 53 feet (NGVD). Refer to Appendix A (Pre-Development and Post-Development Stormwater

Calculations) for more details regarding basin areas, basin curve numbers, stage-storage and required treatment volumes.

4.3.7 Basin F

The existing drainage patterns and basin boundaries for Basin F will be maintained in the post-development conditions. However, because of the roadway improvements that include the new impervious surface for the elevated roadway section, the total impervious area increases from 10.75 acres to 11.95 acres in the post-development condition. All soils in Basin F are classified as HSG A. Preliminary pond sizing and evaluation of the excess treatment volume capacity within existing Pond F indicates that the additional required stormwater treatment and attenuation for the proposed roadway improvements within Basin F can be achieved without any modification to the existing pond. Refer to Appendix A (Pre-Development and Post-Development Stormwater Calculations) for more details regarding basin areas, basin curve numbers, stage-storage and required treatment volumes.

Swale F is also proposed within the limits of Basin F. Swale F has been preliminary sized to provide the required TMDL reduction necessary to meet the BMAP for the Little Wekiva Canal. Swale F in conjunction with existing Pond F will serve as a treatment train to provide a combined 80% removal efficiency for the total nitrogen loading from this basin. Swale F is located within the existing ROW adjacent to existing Pond F. Refer to Appendix F (TMDL Calculations) for more details regarding the design, stage-storage, and removal efficiency for the proposed treatment train.

4.3.8 Basin G

The existing drainage patterns and basin boundaries for Basin G will be maintained in the post-development conditions. However, because of the roadway improvements that include the new impervious surface for the elevated roadway section, the total impervious area increases from 17.12 acres to 17.83 acres in the post-development condition. All soils in Basin G are classified as HSG A. Preliminary pond sizing and evaluation of the excess treatment volume capacity within existing perimeter ditch indicates that the additional required stormwater treatment and attenuation for the proposed roadway improvements within Basin G can be achieved by raising the permitted weir elevation. However, because of CFX's and FDOT's concerns regarding the existing permitted stormwater management facilities as well as the high water elevations in the existing perimeter ditch, an alternative approach to provide the stormwater treatment and attenuation has been evaluated.

Proposed Swale G has been preliminarily sized to provide the required stormwater treatment for the net new impervious area (0.71 acres) within Basin G and will also be capable of attenuating the entire post-runoff minus pre-runoff volume. Swale G will be located in the northwest quadrant of the SR 414 and SR 434 interchange, between the westbound on ramp to SR 414 and the existing ROW. Approximately 1.57 acres from the overall Basin G area will be diverted into proposed swale G for stormwater treatment and attenuation. Swale G will outfall into the existing storm sewer system along SR 434, that outfall into the Maitland West perimeter ditch, before ultimately discharging into the Little Wekiva Canal. Refer to Appendix A (Pre-Development and Post-Development Stormwater Calculations) for more details regarding basin areas, basin curve numbers, stage-storage and required treatment volumes.

4.4 Environmental Look Around

In addition to the structural improvements to address known and predicted problems, regional detention systems for flood control and water quality treatment can be a viable mechanism for effective stormwater management associated with planned development activities. Some benefits include reduced capital costs, reduced maintenance costs, greater reliability, potentially better maintenance of systems and multi-purpose uses. Control of peak discharge for flood control, reduction in the total volume of discharge, groundwater recharge, erosion control, wetlands management, reduction of pollutant loads to receiving waters and/or optimized maintenance are also potential benefits of using a regional stormwater approach. Several opportunities for regional detention exist along the corridor.

4.4.1 Little Wekiva – Lake Lotus Stormwater Project

Coordination with Orange County, FDOT, City of Altamonte Springs, SJRWMD, and FDEP has occurred and should continue throughout the course of this study as well as during the design and permitting phases to identify Regional Pond opportunities that may provide additional stormwater credits that could be applied to this project. Refer to section 3.10.6 of this report and Appendix E for documentation and input from these efforts.

4.5 TMDL and Pollutant Loading Analysis

Preliminary TMDL and pollutant loading was performed using the BMP Trains 2020 Model, Version 4.3.2, to determine the pre-development vs. post-development pollutant loading for both nitrogen and phosphorus generated from stormwater runoff within the study limits. Calculations show that there will be a net decrease in TMDL for total nitrogen because of the proposed roadway and stormwater management improvements. It is also assumed that there will be a net decrease in phosphorus loading due to the removal efficiency for total nitrogen. Refer to Appendix F (TMDL Calculations) for more details. However, during the design phase of this project, continued coordination with the ELA and Lake Lotus Park stormwater regional pond should be explored for the potential of additional stormwater credit for the project corridor.

4.6 Proposed Cross Culverts

There are no proposed cross culverts within the project limits.

4.7 Proposed Bridge Structures

The SR 414 Expressway Extension project proposes to add an additional bridge over Lake Bosse, which will be an elevated bridge centered over the existing bridge.

4.7.1 SR 414 Over Lake Bosse

Existing SR 414 Over Lake Bosse bridge (Bridge No. 770074) was constructed in 2000 to span Lake Bosse, which includes a deep relic sinkhole that has been filled with organic material (peat/muck) over time. The bridge spans this feature using steel plate girders spanning 210 feet; the remaining spans of approximately 100 feet consist of 72-inch-wide Florida Bulb Tee Girders supporting an 8-inch-thick cast-in-place concrete deck. The substructure consists of five pile bents founded on 20inch-diameter pipe piles. The total bridge width is 129 feet with a raised median. The bridge typical included planned 5-foot-wide outside sidewalks, 8-foot-wide outside shoulders, 22-foot-wide median, one future 14-foot-wide lane and two 12-foot-wide lanes in each direction. Current existing lane configuration includes two 11-foot-wide lanes in each direction with the remaining deck striped off to accommodate future needs. According to the existing record plans' Bridge Hydraulic Recommendation sheet, the low member clearance is 3.15 feet above the 50-year design flood elevation of 63.81 feet (NGVD).

The proposed typical section for this crossing includes modification to the existing bridge by removing almost 40 feet of the structure in the median. This modification would leave the current lane configuration but would modify the inside striped shoulders and raised median to allow for viaduct piers in the median (refer to Figure 4-2 with the segmental option shown). The Lake Bosse is a non-navigable waterway for both recreational and commercial use, which allows for viaduct pier placement to avoid the existing piers. The locations of the proposed piers, as well as the existing piers, can be seen in Figure 4-2.

The alternatives for superstructure that include conventional I-beam construction (precast concrete or steel for longer spans) or segmental would require similar pier spacing given the need to span the relic sinkhole condition. The substructure will consist of hammer head piers with pile caps, as shown on Figure 4-3.

Given the environmental conditions at this site because of low pH, and a water crossing, piles would need to be concrete filled and steel reinforced. However, because the extremely aggressive condition results from pH, pipe piles with sacrificial thickness may be implemented to meet the FDOT requirement for the highly aggressive condition for steel.

Per the project's Preliminary Geotechnical Report (GEC 2020), the existing bridge geotechnical report also recommends, at a minimum, using full Pile Driving Analyzer at the piers that straddle the relic sinkhole, the 300-foot-long main span, to help avoid driving deeper than necessary in the bearing layer. The use of a higher resistance factor of 0.75 would allow a higher factored design load, reducing the number of piles. Table 4-1 lists preliminary capacities.

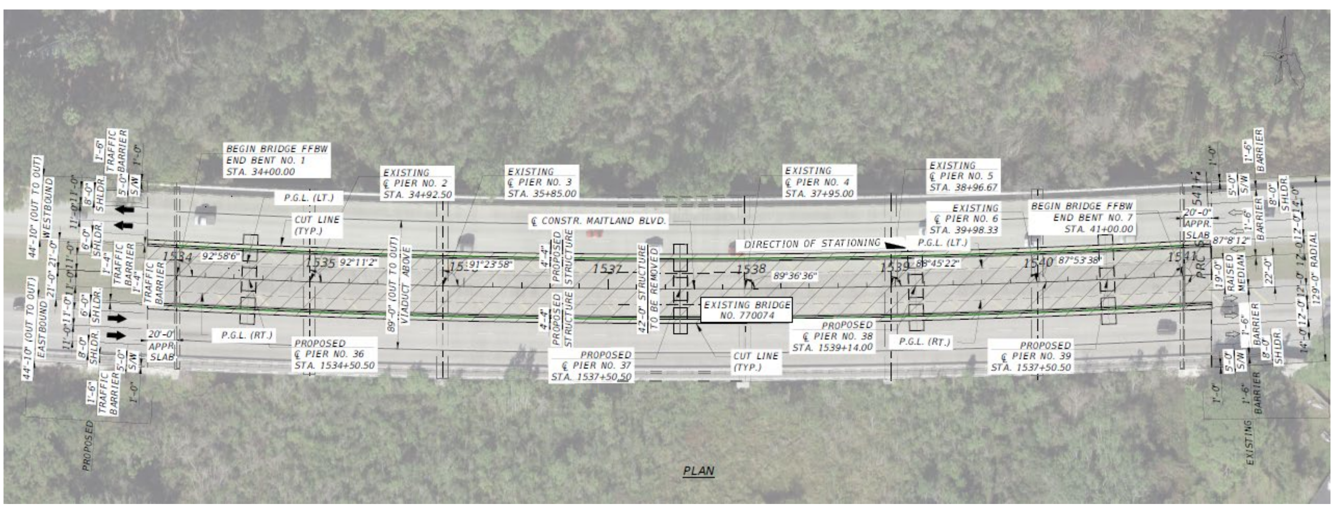


Figure 4-2. Locations of the Proposed and Existing Piers

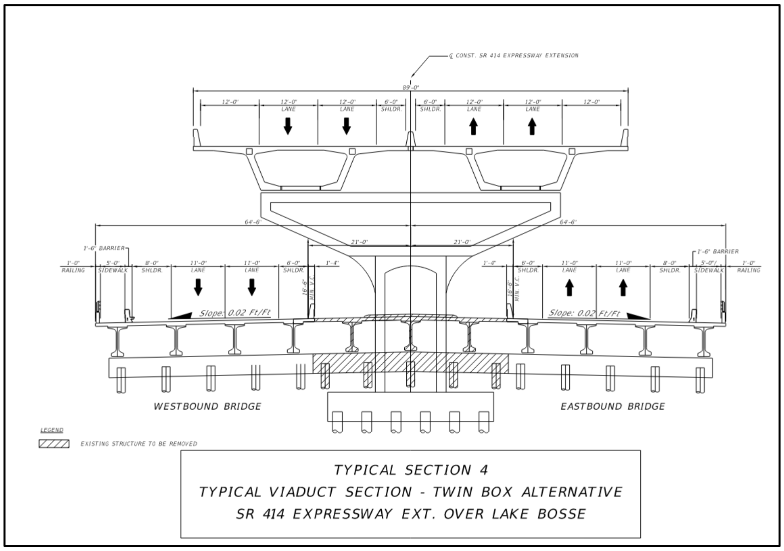


Figure 4-3. Proposed Bridge Typical Section

Table 4-1. Preliminary Capacities of Piles

Steel Pipe Pile Size	Preliminary NBR (tons)
20 inches	200
24 inches	250

4.7.2 SR 414 Over Little Wekiva River

The existing SR 414 Over Little Wekiva River bridge (Bridge No. 770075) was constructed in 2000 and consists of single-span AASHTO Type IV Prestressed Concrete Beams supporting an 8-inch-diameter cast-in-place concrete deck. The bridge is founded on 18-inch-diameter prestressed concrete pile supported end bents. Total deck width is 121 feet with two 5-foot-wide outside sidewalks, with original planned lanes of one 14-foot-wide lane and two 12-foot-wide lanes with a 4-foot-wide outside shoulders and a 22-foot-wide median. Current lane configuration includes two 11-foot-wide lanes in each direction with the remaining deck striped off to accommodate future needs. According to the existing record plans, the minimum low member vertical clearance is 4.81 feet above the 50-year high water level elevation of 66.8 feet NGVD.

The SR 414 Over Little Wekiva span is slightly less than 69 feet allowing both viaduct alternatives to span over the bridge, including the approach slabs, with no impacts to the river. Viaduct pier columns will be protected with inside barriers on each side following the roadway barrier. Refer to Figures 4-4 and 4-5 provide the plan view and section view, respectively.

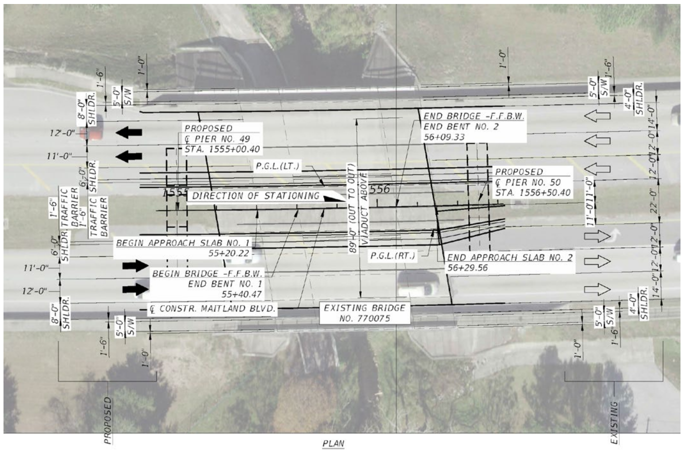


Figure 4-4. SR 414 Over Little Wekiva River Bridge (Plan View)

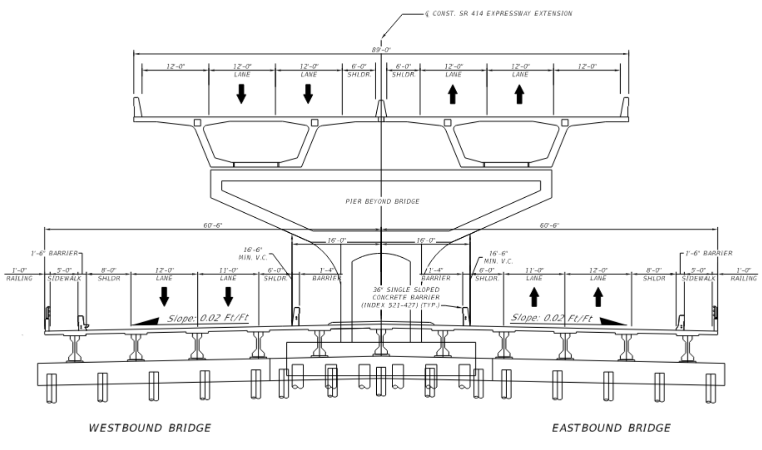


Figure 4-5. SR 414 Over Little Wekiva River Bridge (Section View)

4.8 Water Quality

This project will have no adverse impact to the area’s water quality. Stormwater treatment of the additional impervious areas will be treated as required by the SJRWMD and FDEP Environmental Resource Permits. A Water Quality Impact Evaluation checklist is provided in Appendix G.

5. Wetlands

Wetlands are found throughout the project area (refer to Appendix C), which is the NWI mapping of wetlands in the vicinity. Project biologists used current aerial photography to perform a desktop review of the NWI mapping and adjusted the boundaries of the surface water features that have been altered or displaced by development. Biologists field-verified the FLUCCS codes of the wetlands within and adjacent to the study area during field investigations in 2018. The width of the study area was defined as 500 feet beyond each side of the existing ROW, in addition to potential stormwater treatment pond locations along the project corridor. Once pond options were identified, the biologists briefly visited each pond option site to verify the upland FLUCCS codes and to assess the site's potential wildlife habitat.

More detailed discussions of wetlands, habitats and permit issues are provided in the *Natural Resources Evaluation* (CFX 2022c).

6. Recommendations and Conclusions

Stormwater options were developed using the best available information in combination with field reviews and coordination. Because of the “No additional ROW” aspect of the study, existing permitted ponds within the study limits were evaluated first and then opportunities within the existing CFX and FDOT ROW were identified as potential new pond sites.

Conversations and coordination with other agencies (FDOT, Orange County, City of Altamonte Springs and others) should continue throughout the course of this study as well as during the design and permitting phases to identify Regional Pond opportunities that may provide additional stormwater credits that could be applied to this project.

Preliminary pond sizing was based on the required stormwater treatment and attenuation volumes per criteria set forth by SJRWMD, CFX and FDOT. Calculated permitted water quality and quantity volumes were re-searched and verified based on the current stormwater standards. Any deficiencies were identified and corrected during the preliminary pond sizing calculations. Please refer to the SJRWMD Technical Staff Reports for permits 20930-1 and 2 20930-2 in Appendix B (Existing Permits and Supporting Stormwater Calculations).

In addition to providing the required water quality and quantity volumes, the preliminary pond sizing accounts for the pond’s volumetric ability to “store” the post-development minus the pre-development runoff volume from the design storm event in addition to the required/provided treatment volume elevation. The preliminary estimated design high water elevations shown for the ponds, located within a closed basin, were calculated by adding the existing attenuation volumes to the proposed attenuation volumes on top of the required treatment volume. The preliminary estimated design high water elevations shown for the ponds, located within an open basin, were calculated by adding the post-development minus the pre-development runoff volume on top of the permitted design high water volume. Preliminary pond sizing also accounts for maintaining 1 foot of freeboard within the pond. As directed by FDOT, the 1 foot of freeboard can be measured from the existing outside berm elevation, if the existing pond was permitted in that manner. Please refer to Appendix E.

Note that the recommendations were based on pond sizes and locations determined from preliminary calculations, reasonable engineering judgment and assumptions. Pond sizes and locations may change during the final design as more detailed information on estimated seasonal high water table elevations, wetland normal pool elevations, design level survey and final roadway profile design become available. Table 6-1 summarizes pond recommendations and Table 6-2 summarizes each basin.

Table 6-1. Pond Recommendations Summary

Basin ID	Recommended Pond Alternative
A	Existing Pond A
6	Modified Existing Ponds 4A, 4B and 4C
B	Pond B1 and Pond B2
C	Modified Existing Pond C
D	Modified Existing Pond D
E	Modified Existing Pond E
F	Existing Pond F and Swale F
G	Swale G

Table 6-2. Basin Summary Table

SR 414 PD&E Basin Summary Table															
Basin ID	Pond ID	Total Basin Area (AC)		Impervious Area (AC)		Treatment Volme (ac-ft)		PAV / Weir EL. (ft)		Pond Berm EL. (ft)		Pond DHW EL. (ft)		Pond Freeboard (ft)	
		Permitted	Proposed	Permitted	Proposed	Required	Provided	Permitted	Proposed	Permitted	Proposed	Permitted	Proposed (Est.)	Permitted	*Proposed
Basin A	A	31.81	24.19	3.71	2.92	2.90	3.16	-	-	-	-	-	-	-	-
Basin 6A	4A	20.00	20.15	11.49	11.62					96.50	98.50	95.66	96.18	0.84	2.32
Basin 6B	4B	5.62	6.37	1.60	2.05	5.40	5.66	93.45	93.97	96.50	98.50	95.63	96.15	0.87	2.35
Basin 6C	4C	10.44	8.99	5.00	5.02					95.00	98.00	95.60	96.12	-0.60	1.88
Basin B	B1 & B2	7.57	16.89	4.25	7.46	4.42	4.42	99.50	99.49	101.00	102.50	101.44	101.41	-0.44	1.09
Basin C	C	7.66	8.26	3.36	4.29	1.07	1.07	102.50	102.09	105.00	105.00	104.08	103.89	0.92	1.11
Basin D	D	5.44	5.51	3.70	3.78	0.79	0.81	88.30	88.30	92.00	92.25	90.98	91.06	1.02	1.19
Basin E	E	11.90	11.90	7.28	7.82	1.96	2.18	67.00	67.00	71.00	71.00	68.36	68.75	2.64	2.25
Basin F	F	21.79	21.79	10.75	11.95	2.49	3.03	66.50	66.50	74.50	74.50	67.45	68.01	7.05	6.49
Basin G	Ex. Ditch	26.10	26.10	17.12	17.83	3.12	3.12	85.09	85.09	-	-	-	-	-	-
	Swale G	-	1.57	-	0.71	0.18	0.18	-	87.96	-	90.00	-	89.30	-	0.70
	Total(s):	148.33	150.15	68.26	74.74	22.33	23.63								

Note(s): ***Basin(s) A, 6A, 6B, 6C, and B are located with a closed basin, treatment volume(s) were set to provide attentuation of the post-pre runoff volume(s) for the 25 yr /96 hr storm event (SJRWMD).***
****For proposed Ponds C and D, pond freeboard has been measured from outside berm elevation, as permitted.***

7. References

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Appendix A
Pre- and Post-Development Calculations

Basin A

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				DATE
BASIN DESIGNATION:	Basin A	MADE BY:		DTL	7/12/2021
BASIN ANALYSIS (PRE/POST):	PRE	CHECKED BY:		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond (Water Surface)			100	2.80	280.00
			TOTALS	**2.80**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Existing Building			98	1.35	132.30
Parking Space			98	1.57	153.86
New Access Road			98	0.79	
			TOTALS	**3.71**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
			TOTALS	**0.00**	
PERVIOUS AREAS					
Single Family Homes		A	61	12.45	759.45
Single Family Homes		B/D	87	0.37	32.19
Open Spaces (Good condition)		C	74	4.05	299.70
Open Spaces (Good condition)		A	49	6.49	318.01
Open Spaces (Good condition)		D	84	1.94	162.96
			TOTALS	**25.30**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from FDEP permit 48-0262296-001 , Rose Cove Industrial Park.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**12.79**	**TOTAL BASIN AREA**	**31.81**	**COMPOSITE CN**	**62.15**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

			BASED ON TOTAL DRAINAGE AREA		
			COMPOSITE CN		**67.23**
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	4.88	3.65	**9.68**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	4.88	7.64	**20.26**
Orange County	100 yr / 24 hr	10.60	4.88	6.39	**16.94**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin A	**MADE BY:**	DTL		7/12/2021
BASIN ANALYSIS (PRE/POST):	POST	**CHECKED BY:**	AFS		8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond (Water Surface)			100	2.80	280.00
			TOTALS	**2.80**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Existing Building			98	1.35	132.30
Parking Space			98	1.57	153.86
			TOTALS	**2.92**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
			TOTALS	**0.00**	
PERVIOUS AREAS					
Single Family Homes		A	61	12.45	759.45
Single Family Homes		B/D	87	0.37	32.19
Open Spaces (Good condition)		C	74	1.61	119.14
Open Spaces (Good condition)		A	49	4.04	197.96
			TOTALS	**18.47**	

ICPR DATA

* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**13.65**	**TOTAL BASIN AREA**	**24.19**	**COMPOSITE CN**	**60.03**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

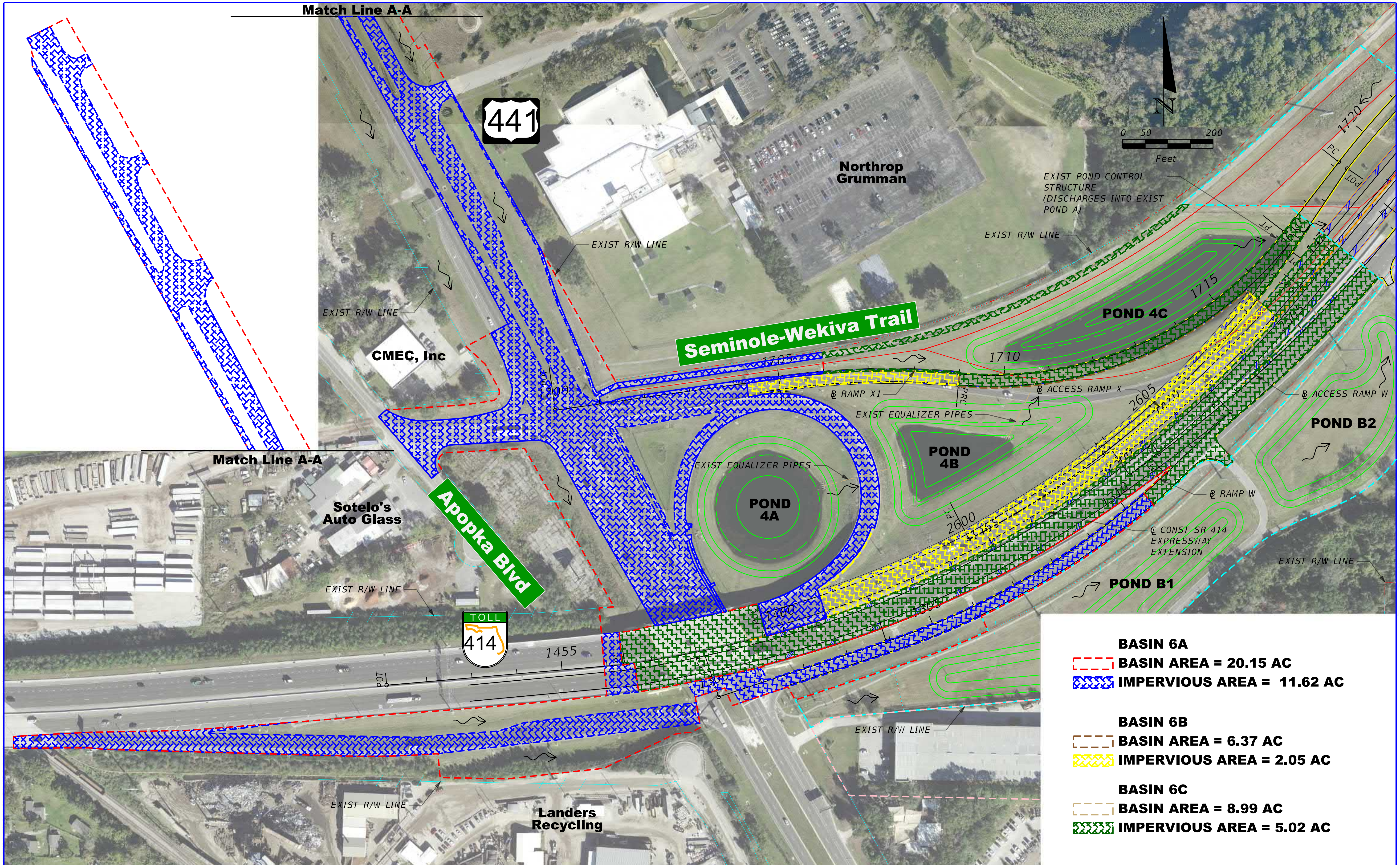
P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

			BASED ON TOTAL DRAINAGE AREA		
			COMPOSITE CN		**69.24**
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	4.44	3.87	**7.80**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	4.44	7.94	**16.00**
Orange County	100 yr / 24 hr	10.60	4.44	6.66	**13.43**

Basin 6



PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: DANH T. LEE, P.E.
P.E. LICENSE NO. 68228

JACOBS ENGINEERING GROUP INC.
200 S. ORANGE AVENUE, STE 900
ORLANDO, FL 32801; PHONE (407) 903-5001
CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.
EXPRESSWAY EXTENSION
US 441 TO SR 434

ROAD NO.	PROJECT NO.
SR 414	414-227

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DRAINAGE MAP
BASIN 6 POST DEVELOPMENT

SHEET NO.

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

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin 6A	**MADE BY:**	DTL	8/5/2021	
BASIN ANALYSIS (PRE/POST):	PRE	**CHECKED BY:**	AFS	8/16/2021	

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond Water Surface			100	1.01	101.00
			TOTALS	**1.01**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway (impervious)			98	6.90	676.20
			TOTALS	**6.90**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Roadway & sidewalks (impervious)			98	4.59	449.82
			TOTALS	**4.59**	
PERVIOUS AREAS					
Open Space (good condition)	Candler Fine Sand	A	39	0.63	24.57
Open Space (good condition)	Tavares-Millhopper	A	39	3.08	120.12
Open Space (good condition)	Tavares-Millhopper	A	39	0.64	24.96
Open Space (good condition)	Urban Land	A	39	3.15	122.85
			TOTALS	**7.50**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from Maitland Blvd. Ext SR 414-211, Basin 6A Post Development. FDEP permit 48-0262296-001.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**36.33**	**TOTAL BASIN AREA**	**20.00**	**COMPOSITE CN**	**61.40**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — **COMPOSITE CN** **75.98**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	3.16	4.61	**7.69**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	3.16	8.89	**14.82**
Orange County	100 yr / 24 hr	10.60	3.16	7.57	**12.61**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin 6B	**MADE BY:**		DTL	8/5/2021
BASIN ANALYSIS (PRE/POST):	PRE	**CHECKED BY:**		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond Water Surface			100	0.57	57.00
			TOTALS	**0.57**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
			TOTALS	**0.00**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Roadway (impervious)			98	1.60	156.80
			TOTALS	**1.60**	
PERVIOUS AREAS					
Open Space (good condition)	Candler Fine Sand	A	39	0.55	21.45
Open Space (good condition)	Tavares-Millhopper	A	39	1.66	64.74
Open Space (good condition)	Tavares-Millhopper	A	39	0.72	28.08
Open Space (good condition)	Basinger Depresssional	D	80	0.20	16.00
Open Space (good condition)	Seffner Fine Sand	C	74	0.32	23.68
			TOTALS	**3.45**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from Maitland Blvd. Ext SR 414-211, Basin 6B Post Development. FDEP permit 48-0262296-001.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**0.00**	**TOTAL BASIN AREA**	**5.62**	**COMPOSITE CN**	**61.53**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — **COMPOSITE CN** **65.44**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	5.28	3.46	**1.62**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	5.28	7.38	**3.46**
Orange County	100 yr / 24 hr	10.60	5.28	6.14	**2.88**

English Worksheet

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin 6C	**MADE BY:**		DTL	8/5/2021
BASIN ANALYSIS (PRE/POST):	PRE	**CHECKED BY:**		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond Water Surface			100	1.80	180.00
			TOTALS	**1.80**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway (impervious)			98	3.48	341.04
			TOTALS	**3.48**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Roadway & sidewalks (impervious)			98	1.52	148.96
			TOTALS	**1.52**	
PERVIOUS AREAS					
Open Space (good condition)	Tavares-Millhopper	A	39	2.64	102.96
Open Space (good condition)	Tavares-Millhopper	A	39	0.65	25.35
Open Space (good condition)	Basinger Depressional	D	80	0.20	16.00
Open Space (good condition)	Seffner Fine Sand	C	74	0.15	11.10
			TOTALS	**3.64**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from Maitland Blvd. Ext SR 414-211, Basin 6C Post Development. FDEP permit 48-0262296-001.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**40.28**	**TOTAL BASIN AREA**	**10.44**	**COMPOSITE CN**	**58.99**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

				BASED ON TOTAL DRAINAGE AREA	
				COMPOSITE CN	**79.06**
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	2.65	4.96	**4.31**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	2.65	9.32	**8.11**
Orange County	100 yr / 24 hr	10.60	2.65	7.97	**6.94**

filename: Basin 6_DCIA.xls
worksheet: BASIN 6C PRE CN

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin 6A	**MADE BY:**		DTL	8/5/2021
BASIN ANALYSIS (PRE/POST):	POST	**CHECKED BY:**		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond Water Surface			100	0.96	96.00
			TOTALS	**0.96**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway (impervious)			98	7.03	688.94
			TOTALS	**7.03**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Roadway & sidewalks (impervious)			98	4.59	449.82
			TOTALS	**4.59**	
PERVIOUS AREAS					
Open Space (good condition)	Candler Fine Sand (10%)	A	39	0.75	29.25
Open Space (good condition)	Tavares-Millhopper (50%)	A	39	3.79	147.81
Open Space (good condition)	Urban Land (40%)	A	39	3.03	118.17
			TOTALS	**7.57**	

ICPR DATA

* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**36.63**	**TOTAL BASIN AREA**	**20.15**	**COMPOSITE CN**	**61.27**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA

COMPOSITE CN **75.93**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	3.17	4.61	**7.74**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	3.17	8.89	**14.92**
Orange County	100 yr / 24 hr	10.60	3.17	7.56	**12.70**

PROJECT TITLE:	SR 414 PD&E			
PROJECT NUMBER:	414-227			**DATE**
BASIN DESIGNATION:	Basin 6B	**MADE BY:**	DTL	8/5/2021
BASIN ANALYSIS (PRE/POST):	POST	**CHECKED BY:**	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond Water Surface			100	0.85	85.00
			TOTALS	**0.85**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
			TOTALS	**0.00**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Roadway (impervious)			98	2.05	200.90
			TOTALS	**2.05**	
PERVIOUS AREAS					
Open Space (good condition)	Tavares-Millhopper (70%)	A	39	2.43	94.77
Open Space (good condition)	Candler Fine Sand (15%)	A	39	0.52	20.28
Open Space (good condition)	Basinger Depresssional (5%)	D	80	0.17	13.60
Open Space (good condition)	Seffner Fine Sand (10%)	C	74	0.35	25.90
			TOTALS	**3.47**	

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**0.00**	**TOTAL BASIN AREA**	**6.37**	**COMPOSITE CN**	**64.39**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S	------------------------------->	S = (1000 / CN) - 10	(inches)
2) DETERMINE RUNOFF - R	------------------------------->	R = (P - 0.2*S)^2 / (P + 0.8*S)	(inches)
		P = rainfall in inches	
3) DETERMINE RUNOFF VOLUME - V(R)	------------------------------->	V(R) = (R / 12)*BASIN AREA	(acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — **COMPOSITE CN** **69.14**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	4.46	3.86	**2.05**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	4.46	7.92	**4.21**
Orange County	100 yr / 24 hr	10.60	4.46	6.65	**3.53**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin 6C	**MADE BY:**		DTL	8/5/2021
BASIN ANALYSIS (PRE/POST):	POST	**CHECKED BY:**		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond Water Surface			100	0.77	77.00
			TOTALS	**0.77**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway (impervious)			98	4.75	465.50
			TOTALS	**4.75**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Roadway & sidewalks (impervious)			98	0.27	26.46
			TOTALS	**0.27**	
PERVIOUS AREAS					
Open Space (good condition)	Tavares-Millhopper (85%)	A	39	2.72	106.08
Open Space (good condition)	Basinger Depressional (10%)	D	80	0.32	25.60
Open Space (good condition)	Seffner Fine Sand (5%)	C	74	0.16	11.84
			TOTALS	**3.20**	

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**57.79**	**TOTAL BASIN AREA**	**8.99**	**COMPOSITE CN**	**48.99**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA

COMPOSITE CN **79.25**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	2.62	4.98	**3.73**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	2.62	9.34	**7.00**
Orange County	100 yr / 24 hr	10.60	2.62	8.00	**5.99**

MADE BY:	KB	DATE:	11/30/2020	JOB NO.	414-227
CHECKED BY:	DTL	DATE:	02/05/2021	SHEET NO.	
CALCULATIONS FOR SR 414 PD&E		POND:	4A	BASIN:	6A

Proposed Pond 4A
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
99.00	Out. Berm	1.76				8.57
			1.60	0.50	0.80	
98.50	In. Berm	1.44				7.77
			1.42	0.50	0.71	
98.00		1.40				7.06
			1.36	1.00	1.36	
97.00		1.32				5.70
			1.14	5.00	5.70	
92.00	NWL	0.96				
90.00		0.83				
81.00		0.37				
80.50	Bottom	0.35				
80.00		0.00				

MADE BY:	KB	DATE:	11/30/2020	JOB NO.	414-227
CHECKED BY:	DTL	DATE:	02/05/2021	SHEET NO.	
CALCULATIONS FOR SR 414 PD&E		POND:	4B	BASIN:	6B

Proposed Pond 4B
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
99.00	Out. Berm	1.94				8.51
			1.73	0.50	0.86	
98.50	In. Berm	1.51				7.65
			1.49	0.50	0.74	
98.00		1.46				6.91
			1.41	1.00	1.41	
97.00		1.35				5.50
			1.10	5.00	5.50	
92.00	NWL	0.85				
90.00		0.68				
81.00		0.36				
80.50		0.35				
80.00	Bottom	0.33				

MADE BY:	KB	DATE:	11/30/2020	JOB NO.	414-227
CHECKED BY:	DTL	DATE:	02/05/2021	SHEET NO.	
CALCULATIONS FOR SR 414 PD&E		POND:	4C	BASIN:	6C

Proposed Pond 4C
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
98.50	Out. Berm	2.03				7.75
			1.78	0.50	0.89	
98.00	In. Berm	1.52				6.87
			1.46	1.00	1.46	
97.00		1.39				5.41
			1.33	1.00	1.33	
96.00		1.27				4.08
			1.02	4.00	4.08	
92.00	NWL	0.77				
90.00		0.56				
81.00	Bottom	0.16				
80.50		0.00				
80.00		0.00				

MADE BY: KB — DATE: 11/30/2020 — JOB NO. 414-227
CHECKED BY: DTL — DATE: 02/05/2021 — SHEET NO.
CALCULATIONS FOR: SR 414 PD&E — POND: 4A, 4B, & 4C — BASIN: 6

Water Quality

Total Basin Area =	35.51	ac
Impervious Area =	18.69	ac

Wet Detention

A.	1.0	" Over Total Basin Area =	2.96	Ac-Ft
B.	2.5	" Over Impervious Area =	3.89	Ac-Ft
		Required PAV =	**3.89**	Ac-Ft

Water Quantity

E. Post Runoff Volume - Pre Runoff Volume (25yr/96hr storm) =	-0.26	Ac-Ft	SJRWMD (closed basin)
F. Post Runoff Volume (100yr/24hr storm) =	22.22	Ac-Ft	Orange County

Water Quality Volume (WQV) Required:
Ponds No. 4A, 4B and 4C are located in a closed basin in Orange County within the boundaries of the SJRWMD. As Orange County considers Long Lake an open basin and SJRWMD considers it a closed basin, SJRWMD criteria will be used.
***The Permitted WQV is set at 5.66 Ac-ft, based on Post-Pre runoff volume from 25 YR / 96 HR storm event.**
(Source : FDEP permit 48-0262296-001)

Preliminary deign shows a reduction in total basin area from 36.06 AC (pre) to total basin area of 35.51 AC (post) which results in -0.26 Ac-ft runoff from 25 YR /96 HR storm event.

As a preliminary / conservation analysis, the WQV will be maintained at the permitted volume, 5.66 Ac-ft.

Proposed Ponds 4A, 4B, and 4C Combined
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
99.00		3.70				25.39
			4.34	0.50	2.17	
98.50		4.98				23.22
			4.68	0.50	2.34	
98.00		4.38				20.88
			3.78	4.03	15.22	
93.97	Proposed	3.17				**5.66**
	PAV / Weir EL.		2.88	1.97	5.66	
92.00	NWL	2.58				
90.00		2.07				
81.00		0.89				
80.50		0.70				
80.00		0.33				

As a preliminary estimate, the following elevations were determined by adding the difference in weir elevations (proposed - permitted) to the permitted elevations for the following design storm events. Permitted weir elevation equals 93.45 ft (Source : FDEP permit 48-0262296-001).

	Estimated Tailwater Elev (10yr / 24 hr) =	**94.79**	**ft**
Pond 4A	**Estimated Design High Water Elev. (25yr /96 Hr) =**	**96.18**	**ft**
	Pond Freeboard =	**2.32**	**ft**
	Estimated Tailwater Elev (10yr / 24 hr) =	**94.75**	**ft**
Pond 4B	**Estimated Design High Water Elev. (25yr /96 Hr) =**	**96.15**	**ft**
	Pond Freeboard =	**2.35**	**ft**
	Estimated Tailwater Elev (10yr / 24 hr) =	**94.70**	**ft**
Pond 4C	**Estimated Design High Water Elev. (25yr /96 Hr) =**	**96.12**	**ft**
	Pond Freeboard =	**1.88**	**ft**

MADE BY:	DTL	DATE:	8/5/2021	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E			BASIN:	6

Permanent Pool Calculations

Basin Characteristics

Land Use	Area (ac)	Runoff Coeff.	Product
Roadway Paved Area	18.69	0.95	17.76
Roadway Pervious Area	14.24	0.20	2.85
Pond Area at NWL	2.58	1.00	2.58
Total	**35.51**		23.18

Composite C = **0.65**

Wet Season Normal Rainfall (P) = **31 in**

Min. Permanent Pool Vol = Area x Composite C x P x 14 / 153 / 12 = **5.48 ac-ft**
Min. Permanent Pool Vol. Req. if Littoral Zone is Not Provide= 1.5 x Min Perm Pool Vol. = **8.22 ac-ft**

Stage Storage Calc.

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
92.00	(NWL)	2.58				18.63
			2.33	2.00	4.65	
90.00		2.07				13.98
			1.48	9.00	13.32	
81.00		0.89				0.66
			0.80	0.50	0.40	
80.50		0.70				0.26
			0.52	0.50	0.26	
80.00		0.33				

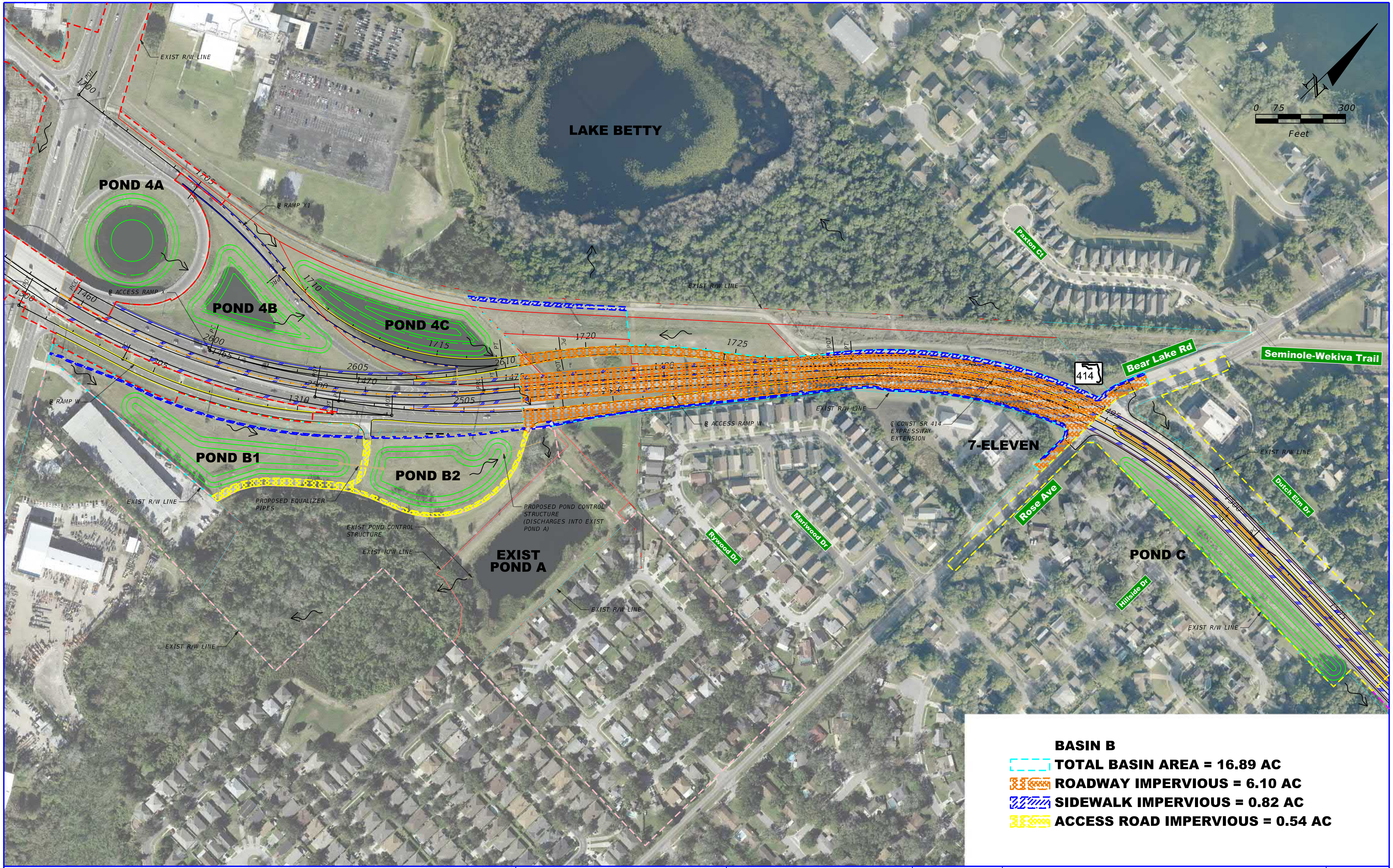
Permanent Pool Volume Provided = **18.63 ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided *153*12 / Area / C / P = **47.6 Days**

Note: An additional 50% permanent pool volume is provided in lieu of providing a littoral zone.

Mean Depth = Permanent Pool Volume / Area at NWL = **7.22 ft**

filename: Basin 6_DCIA.xls
worksheet: PERMANENT POOL CALC.

Basin B



PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: DANH T. LEE, P.E.
P.E. LICENSE NO. 68228

JACOBS ENGINEERING GROUP INC.
200 S. ORANGE AVENUE, STE 900
ORLANDO, FL 32801; PHONE (407) 903-5001
CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.
EXPRESSWAY EXTENSION
US 441 TO SR 434

ROAD NO.	PROJECT NO.
SR 414	414-227

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DRAINAGE MAP
BASIN B POST DEVELOPMENT

SHEET NO.

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

PROJECT TITLE:	SR 414 PD&E			
PROJECT NUMBER:	414-227			**DATE**
BASIN DESIGNATION:	Basin B	**MADE BY:**	DTL	8/4/2021
BASIN ANALYSIS (PRE/POST):	PRE	**CHECKED BY:**	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
			TOTALS	**0.00**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway (impervious)	Ba/Bc	A	98	2.90	284.20
Roadway (Rose Ave, Existing)	Ba/Bc	A	98	0.73	71.54
			TOTALS	**3.63**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Sidewalks Impervious	Sc	B/D	98	0.62	60.76
			TOTALS	**0.62**	
PERVIOUS AREAS					
Pond Area	Sc	B/D	61	2.16	131.76
Offsite Open Space	Sc	B/D	61	0.27	16.47
Roadway Open (Clean Fill)		A	39	0.89	34.71
			TOTALS	**3.32**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from SJRWMD permit 20930-1, Basin B Post Development and FDEP permit 48-0262296-001.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**47.95**	**TOTAL BASIN AREA**	**7.57**	**COMPOSITE CN**	**61.85**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — **COMPOSITE CN: 79.19**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	2.63	4.97	**3.14**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	2.63	9.34	**5.89**
Orange County	100 yr / 24 hr	10.60	2.63	7.99	**5.04**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				DATE
BASIN DESIGNATION:	Basin B		MADE BY:	DTL	8/4/2021
BASIN ANALYSIS (PRE/POST):	POST		CHECKED BY:	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
			TOTALS	**0.00**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Impervious (Paved parking, roads, etc.)			98	6.10	597.80
			TOTALS	**6.10**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Impervious (Sidewalk, Shared Use Paths, etc.)			98	0.82	80.36
Impervious (Access Road)			98	0.54	52.92
			TOTALS	**1.36**	
PERVIOUS AREAS					
Open Spaces (Good condition)	Tavares-Millhopper (55%)	A	39	5.19	202.41
Open Spaces (Good condition)	Tavares Fine Sand (45%)	A	39	4.24	165.36
			TOTALS	**9.43**	

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**36.12**	**TOTAL BASIN AREA**	**16.89**	**COMPOSITE CN**	**46.44**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA: **COMPOSITE CN** **65.06**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	5.37	3.42	**4.82**
SJRWMD Closed Basin	25 yr / 96 hr	12.00	5.37	7.33	**10.31**
Orange County	100 yr / 24 hr	10.60	5.37	6.09	**8.57**

MADE BY:	DTL	DATE:	8/4/2021	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E	POND:	B1 and B2	BASIN:	B

Water Quality

Total Basin Area = 16.89 ac
Impervious Area = 7.46 ac

Off-Line Dry Retention

A. 0.50 " Over Total Basin Area = 0.70 Ac-Ft
B. 1.25 " Over Impervious Area = 0.78 Ac-Ft
Required PAV for off-line retention = 0.78 Ac-Ft

On-Line Dry Retention

C. 0.50 " Over Total Basin Area + Required off-line PAV = **1.48** Ac-Ft

Wekiva Recharge

D. 3.00 " Over Impervious Area = **1.87** Ac-Ft

*Permitted PAV equals 1.5" x total basin area, which was greater than 3.0" x imp. area
Check : 1.5" x 16.89 ac = 2.11 ac-ft. PAV will be set to meet SJRWMD closed basin requirement.

Water Quantity

E. Post Runoff Volume - Pre Runoff Volume (25yr/96hr storm) = **4.42** Ac-Ft SJRWMD (closed basin)
F. Post Runoff Volume (100yr/24hr storm) = 8.57 Ac-Ft Orange County

* Basin B (Ponds B1 and B2) discharges into Pond A, before ultimately outfalling into Long Lake. Orange County considers Long Lake an open basin and SJRWMD considers it a closed basin, use SJRWMD criteria.

Pond B1 and Pond B2
Stage Storage Calculations

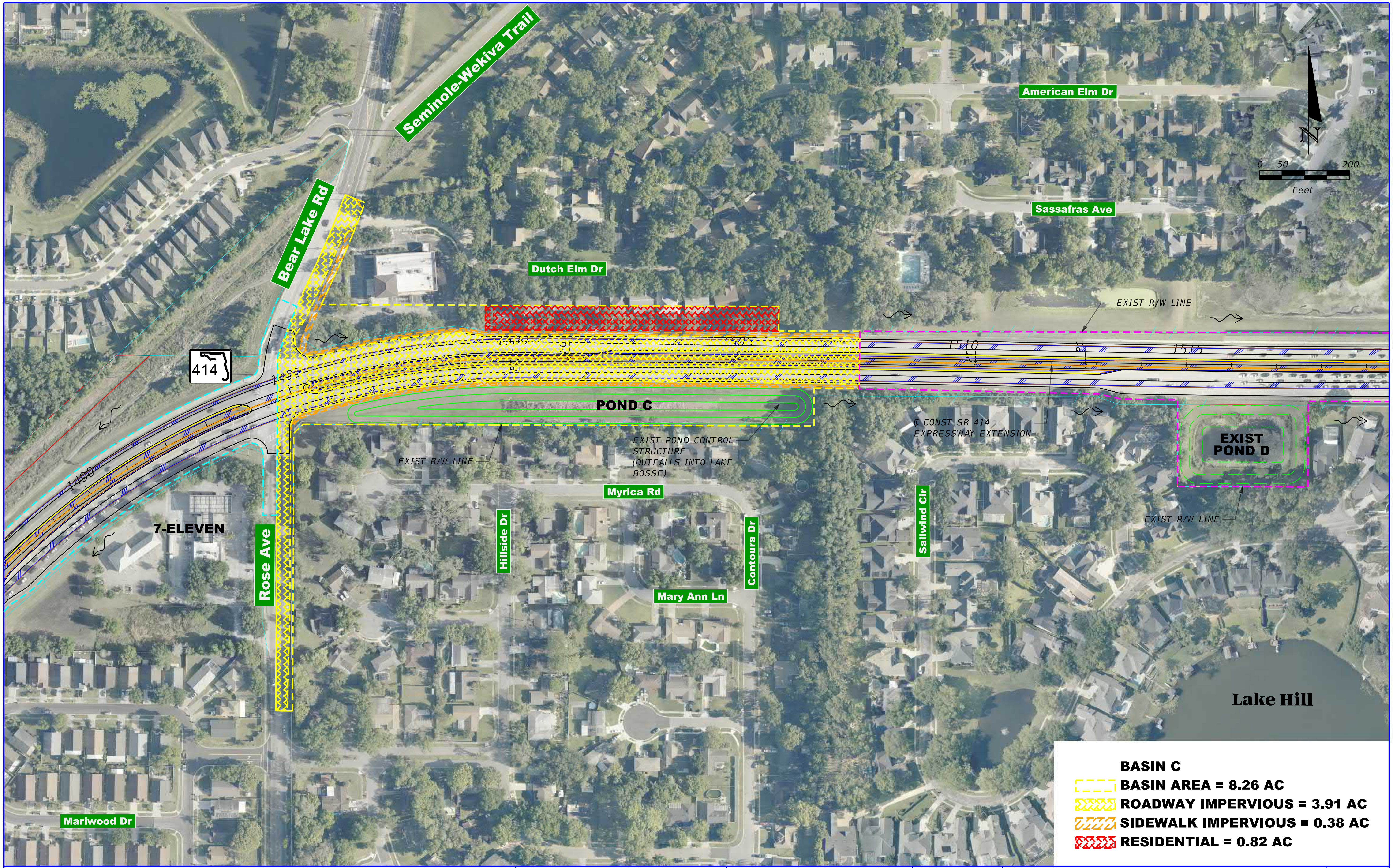
ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
103.00	Out. Berm	3.80				13.40
			3.55	0.25	0.89	
102.75		3.31				12.51
			3.06	0.25	0.76	
102.50	In. Berm	2.81				11.75
			2.67	1.10	2.93	
101.41	Estimated DHW	2.54				**8.82**
			2.40	1.14	2.72	
100.27	Estimated Tailwater	2.26				**6.10**
			2.22	0.27	0.60	
100.00		2.19				5.50
			2.13	0.51	1.08	
99.49	Required PAV	2.07				**4.42**
			2.01	0.49	0.99	
99.00		1.95				3.43
			1.85	0.84	1.55	
98.16	Recharge	1.75				**1.87**
			1.73	0.16	0.28	
98.00		1.71				1.60
			1.60	1.00	1.60	
97.00	Bottom	1.48				

Weir elevation will be set based on Required PAV

Estimated Tailwater Elev (10yr / 24 hr) = 100.27 ft
WQV PAV+(Post-Pre runoff volume) = **6.10** (ac-ft)

Estimated Design High Water Elev. (25yr /96 Hr) = 101.41 ft **Pond Freeboard = 1.09** ft
Required PAV+(Post-Pre runoff volume)+Permitted attentuation volume = **8.82** (ac-ft)

Basin C



PRELIMINARY - SUBJECT TO CHANGE	ENGINEER OF RECORD: DANH T. LEE, P.E. P.E. LICENSE NO. 68228 JACOBS ENGINEERING GROUP INC. 200 S. ORANGE AVENUE, STE 900 ORLANDO, FL 32801; PHONE (407) 903-5001 CERTIFICATE OF AUTHORIZATION No. 000072	SR 414 MAITLAND BLVD. EXPRESSWAY EXTENSION US 441 TO SR 434 ROAD NO.: SR 414 PROJECT NO.: 414-227	CENTRAL FLORIDA EXPRESSWAY AUTHORITY	DRAINAGE MAP BASIN C POST DEVELOPMENT	SHEET NO.

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

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin C		**MADE BY:**	DTL	7/12/2021
BASIN ANALYSIS (PRE/POST):	PRE		**CHECKED BY:**	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
			TOTALS	**0.00**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway Impervious	Ba / BfB	A	98	2.56	250.88
Roadway (Rose & Bear Lk) Impervious	Ba / BfB	A	98	0.42	41.16
			TOTALS	**2.98**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Sidewalks Impervious	Ba / BfB	A	98	0.38	37.24
Residential	BfB	A	57	0.82	46.74
			TOTALS	**1.20**	
PERVIOUS AREAS					
Pond Area	Ba	A	39	1.58	61.62
Roadway Open (Clean Fill)	Ba / BfB	A	39	0.63	24.57
Roadway (Rose & Bear Lk) Open	Ba / BfB	A	49	0.20	9.80
Offsite Open Space	Ba / BnB	A	39	1.07	41.73
			TOTALS	**3.48**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from SJRWMD permit 20930-1, Basin C Post Development.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**38.90**	**TOTAL BASIN AREA**	**7.66**	**COMPOSITE CN**	**47.37**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S	-------------------------------->	S = (1000 / CN) - 10	(inches)
2) DETERMINE RUNOFF - R	-------------------------------->	R = (P - 0.2*S)^2 / (P + 0.8*S)	(inches)
		P = rainfall in inches	
3) DETERMINE RUNOFF VOLUME - V(R)	-------------------------------->	V(R) = (R / 12)*BASIN AREA	(acres-feet)

CALCULATION TABLE

			BASED ON TOTAL DRAINAGE AREA		
			COMPOSITE CN		**67.07**
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	4.91	3.64	**2.32**
SJRWMD Open Basin	25 yr / 24 hr	8.60	4.91	4.63	**2.96**
Orange County	100 yr / 24 hr	10.60	4.91	6.37	**4.06**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				DATE
BASIN DESIGNATION:	Basin C		MADE BY:	DTL	7/13/2021
BASIN ANALYSIS (PRE/POST):	POST		CHECKED BY:	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
			TOTALS	0.00	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Impervious (Paved parking, roads, etc.)			98	3.49	342.02
Roadway (Rose & Bear Lk) Impervious			98	0.42	41.16
			TOTALS	3.91	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Impervious (Sidewalk, Shared Use Paths, etc.)			98	0.38	37.24
Residential (1/3 acre)	Tavares-Millhopper	A	57	0.82	46.74
			TOTALS	1.20	
PERVIOUS AREAS					
Open Spaces (Good condition)	Tavares-Millhopper (55%)	A	39	1.73	67.47
Open Spaces (Good condition)	Tavares Fine Sand (45%)	A	39	1.42	55.38
			TOTALS	3.15	

ICPR DATA

* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	47.34	TOTAL BASIN AREA	8.26	COMPOSITE CN	47.55

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

			BASED ON TOTAL DRAINAGE AREA		
			COMPOSITE CN		71.43
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	4.00	4.11	**2.83**
SJRWMD Open Basin	25 yr / 24 hr	8.60	4.00	5.16	**3.55**
Orange County	100 yr / 24 hr	10.60	4.00	6.96	**4.79**

filename: Basin C_DCIA.xls
worksheet: BASIN C POST CN

MADE BY:	KB		DATE:	12/21/2020	JOB NO.	414-227
CHECKED BY:	DTL		DATE:	02/08/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E		POND:	C	BASIN:	C

Water Quality

Total Basin Area = 8.26 ac
Impervious Area = 4.29 ac

Off-line Dry Retention

A. 0.50 " Over Total Basin Area = 0.34 Ac-Ft
B. 1.25 " Over Impervious Area = 0.45 Ac-Ft
Required PAV for off-line retention = 0.45 Ac-Ft

On-line Dry Retention

C. 0.50 " Over Total Basin Area + Required off-line PAV = **0.79** Ac-Ft

Wekiva Recharge

D. 3.00 " Over Impervious Area = **1.07** Ac-Ft

*Permitted PAV equals 1.5" x total basin area, which was greater than 3.0" x imp. area.
Check : 1.5" x 8.26 ac = 1.03 ac-ft; therefore, Recharge volume now controls.

Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
105.00	Out. Berm	1.76				4.12
			1.58	0.50	0.79	
104.50		1.40				3.33
			1.22	0.50	0.61	
104.00	In. Berm	1.04				2.72
			1.03	0.11	0.11	
103.89	Estimated DHW	1.02				**2.60**
			0.93	0.89	0.83	
103.00		0.85				1.77
			0.83	0.23	0.19	
102.77	Estimated Tailwater	0.81				**1.58**
			0.75	0.68	0.51	
102.09	Weir Elev. PAV	0.69				**1.07**
			0.68	0.09	0.06	
102.00		0.67				1.01
			0.59	0.94	0.56	
101.06		0.52				0.45
			0.51	0.06	0.03	
101.00		0.51				0.42
			0.42	1.00	0.42	
100.00	Bottom	0.33				

Weir elevation will be set based on Wekiva Recharge Volume

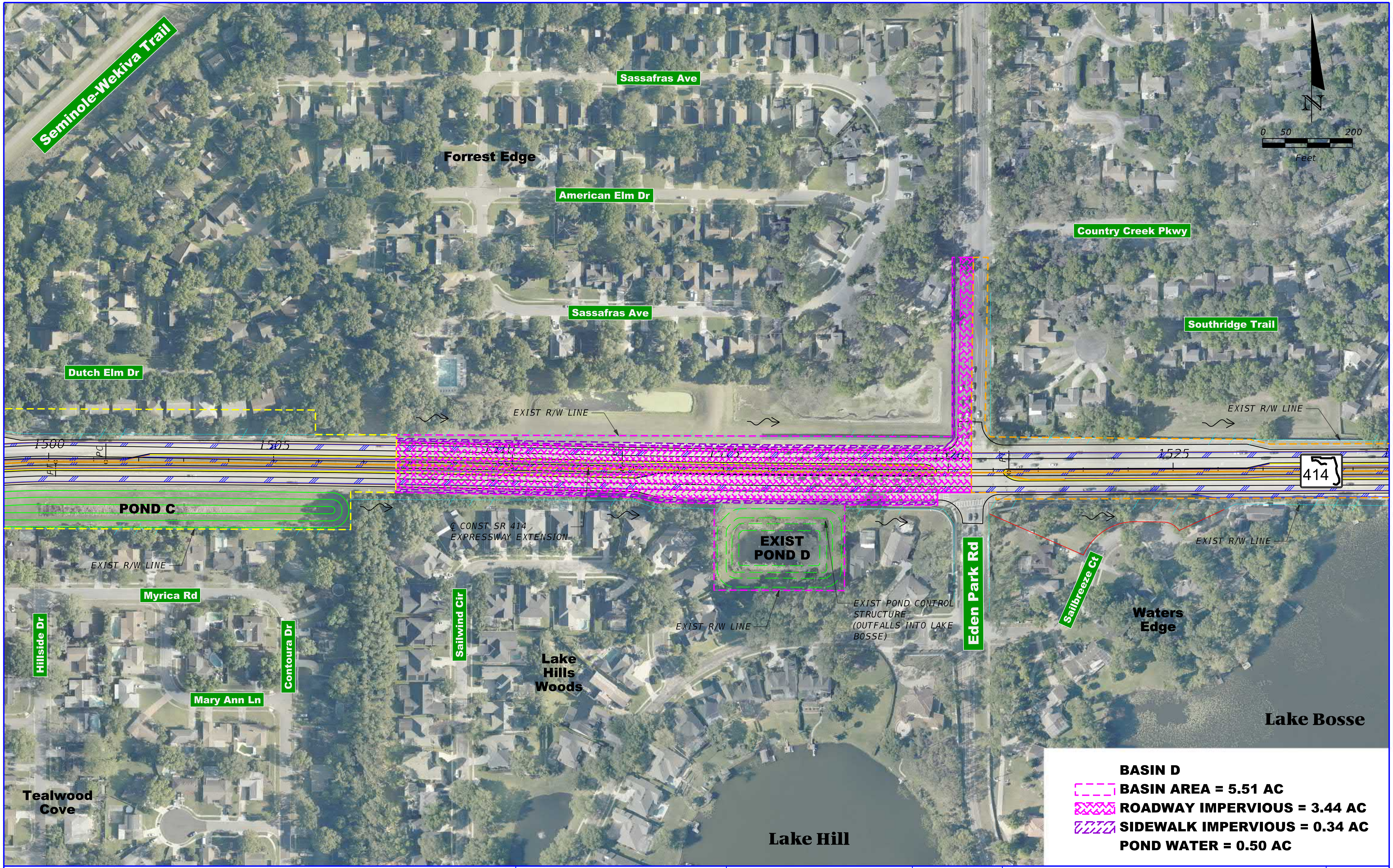
Estimated Tailwater Elev (10yr / 24 hr) = 102.77 ft
Provided PAV + (Post-Pre runoff volume) = **1.58** (ac-ft)

Estimated Design High Water Elev. (25yr /24 Hr) = 103.89 ft
Permitted DHW + (Post-Pre runoff volume) **2.60** (ac-ft)

Pond Freeboard = 1.11 ft
**measure from outside berm elevation, as permitted.*

filename: Basin C_DCIA.xls
worksheet: PROP POND C CALC.

Basin D



PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: DANH T. LEE, P.E.
P.E. LICENSE NO. 68228

JACOBS ENGINEERING GROUP INC.
200 S. ORANGE AVENUE, STE 900
ORLANDO, FL 32801; PHONE (407) 903-5001
CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.
EXPRESSWAY EXTENSION
US 441 TO SR 434

ROAD NO.	PROJECT NO.
SR 414	414-227

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DRAINAGE MAP
BASIN D POST DEVELOPMENT

SHEET NO.

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

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin D		**MADE BY:**	DTL	7/14/2021
BASIN ANALYSIS (PRE/POST):	PRE		**CHECKED BY:**	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond D - water			100	0.500	50.00
			TOTALS	**0.500**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Paved Roadway			98	3.359	329.18
			TOTALS	**3.359**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Sidewalks Impervious			98	0.340	33.32
			TOTALS	**0.340**	
PERVIOUS AREAS					
Open Space - good	Ba/BfB	A	39	1.238	48.28
			TOTALS	**1.238**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from SJRWMD permit 20930-2, Basin D (modified) Post Development.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**68.04**	**TOTAL BASIN AREA**	**5.437**	**COMPOSITE CN**	**51.71**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA

COMPOSITE CN **84.75**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	1.80	5.61	**2.54**
SJRWMD Open Basin	25 yr / 24 hr	8.60	1.80	6.76	**3.06**
Orange County	100 yr / 24 hr	10.60	1.80	8.71	**3.95**

filename: Basin D_DCIA.xls
worksheet: BASIN D PRE CN

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin D	**MADE BY:**		DTL	7/14/2021
BASIN ANALYSIS (PRE/POST):	POST	**CHECKED BY:**		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond D - water			100	0.50	50.00
			TOTALS	**0.50**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Impervious (Paved parking, roads, etc.)			98	3.44	337.12
			TOTALS	**3.44**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Impervious (Sidewalk, Shared Use Paths, etc.)			98	0.34	33.32
			TOTALS	**0.34**	
PERVIOUS AREAS					
Open Spaces (Good condition)	Tavares-Millhopper (55%)	A	39	0.68	26.52
Open Spaces (Good condition)	Tavares Fine Sand (45%)	A	39	0.55	21.45
			TOTALS	**1.23**	

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**68.66**	**TOTAL BASIN AREA**	**5.51**	**COMPOSITE CN**	**51.78**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

				BASED ON TOTAL DRAINAGE AREA	
				COMPOSITE CN	**85.01**
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	1.76	5.64	**2.59**
SJRWMD Open Basin	25 yr / 24 hr	8.60	1.76	6.79	**3.12**
Orange County	100 yr / 24 hr	10.60	1.76	8.74	**4.01**

MADE BY:	DTL		DATE:	11/14/2020	JOB NO.	414-227
CHECKED BY:	AFS		DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	414-227		POND:	D	BASIN:	D

Water Quality

Total Basin Area =	5.51	ac
Impervious Area =	3.78	ac

Wet Detention

A.	1.0	" Over Total Basin Area =	0.46	Ac-Ft
B.	2.5	" Over Impervious Area =	0.79	Ac-Ft
		Required PAV =	**0.79**	Ac-Ft

Permitted Pond D (SJRWMD permit 20930-2)
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
92.25	Out. Berm	1.065				3.89
			0.97	1.19	1.16	
91.06	Estimated DHW	0.880				2.73
			0.88	0.06	0.05	
91.00		0.871				2.68
			0.78	1.00	0.78	
90.00	In. Berm	0.695				1.90
			0.66	1.00	0.66	
89.00		0.630				1.24
			0.61	0.62	0.38	
88.38	Estimated Tailwater	0.591				**0.86**
			0.59	0.08	0.05	
88.30	Provided *PAV*	0.586				**0.81**
			0.58	0.30	0.17	
88.00		0.568				0.64
			0.54	1.00	0.54	
87.00		0.508				0.10
			0.50	0.20	0.10	
86.80	NWL	0.500				
			0.40	3.80	1.51	
83.00	Bottom	0.295				

Existing weir elevation still provides the Required PAV

Estimated Tailwater Elev (10yr / 24 hr) = **88.38** ft
Provided PAV + (Post-Pre runoff volume) = **0.86** (ac-ft)

Estimated Design High Water Elev. (25yr /24 Hr) = **91.06** ft
Permitted DHW + (Post-Pre runoff volume) **2.73** (ac-ft)

Pond Freeboard = **1.19** ft
**measure from outside berm elevation, as permitted.*

filename: Basin D_DCIA.xls
worksheet: PROP POND D CALC.

MADE BY:	DTL	DATE:	02/16/2021	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E			BASIN:	D

Permanent Pool Calculations

Basin Characteristics

Land Use	Area (ac)	Runoff Coeff.	Product
Roadway Paved Area	3.44	0.95	3.27
Roadway Pervious Area	1.23	0.20	0.25
Pond Area at NWL	0.50	1.00	0.50
Sidewalk Area	0.34	0.95	0.32
Total	**5.51**		4.34

Composite C = **0.79**

Wet Season Normal Rainfall (P) = **31 in**

Min. Permanent Pool Vol = Area x Composite C x P x 14 / 153 / 12 = **1.03 ac-ft**
Min. Permanent Pool Vol. Req. if Littoral Zone is Not Provide= 1.5 x Min Perm Pool Vol. = **1.54 ac-ft**

Stage Storage Calc.

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
92.25	Out. Berm	1.065				
90.00	In. Berm	0.695				
88.30	(PAV)	0.586				
86.80	(NWL)	0.500				1.51
			0.40	3.80	1.51	
83.00	Bottom	0.295				

Permanent Pool Volume Provided = **1.51 ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided *153*12 / Area / C / P = **20.6 Days**

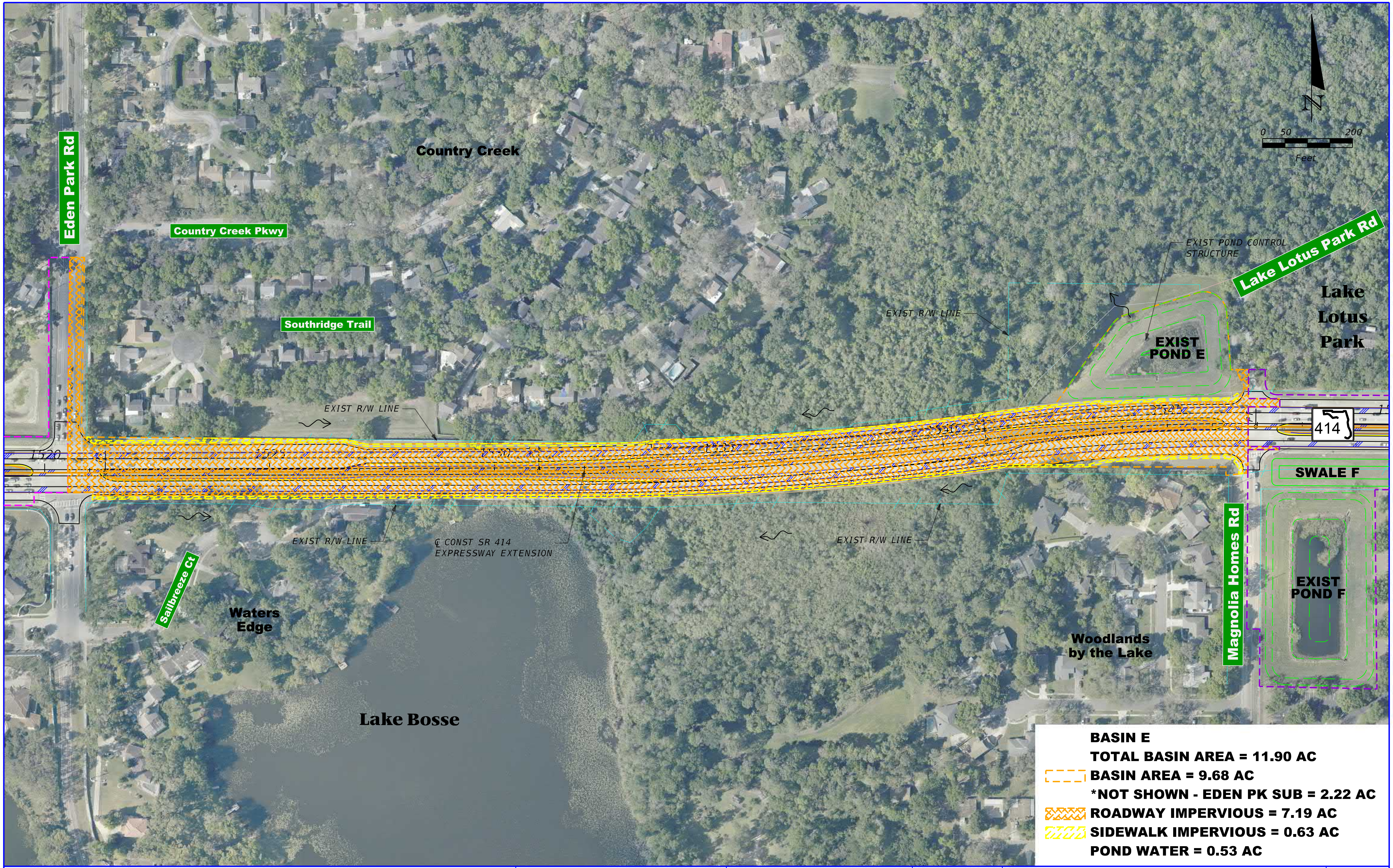
Note: A Littoral Zone is Required.

Mean Depth = Permanent Pool Volume / Area at NWL = **3.02 ft**

Existing pond constructed with pond liner. During the design phase, if a littoral zone is not preferred, changing the NWL elevation to 86.90 ft will provide a total permanent pool volume of 1.55 ac-ft.

filename: Basin D_DCIA.xls
worksheet: PERMANENT POOL CALC.

Basin E



PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: DANH T. LEE, P.E.
P.E. LICENSE NO. 68228

JACOBS ENGINEERING GROUP INC.
200 S. ORANGE AVENUE, STE 900
ORLANDO, FL 32801; PHONE (407) 903-5001
CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.
EXPRESSWAY EXTENSION
US 441 TO SR 434

ROAD NO.	PROJECT NO.
SR 414	414-227

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DRAINAGE MAP
BASIN E POST DEVELOPMENT

SHEET NO.

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

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin E	**MADE BY:**		DTL	7/14/2021
BASIN ANALYSIS (PRE/POST):	PRE	**CHECKED BY:**		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond E - Wet			100	0.530	53.00
			TOTALS	**0.530**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway			98	6.651	651.80
			TOTALS	**6.651**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Sidewalks Impervious			98	0.630	61.74
Eden Pk Sub		A	56	2.220	124.32
			TOTALS	**2.850**	
PERVIOUS AREAS					
Pond E - Dry		A	39	0.900	35.10
Open Space		A	39	0.964	37.60
			TOTALS	**1.864**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from SJRWMD permit 20930-1, Basin E Post Devleopment.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**58.52**	**TOTAL BASIN AREA**	**11.895**	**COMPOSITE CN**	**54.89**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

			BASED ON TOTAL DRAINAGE AREA		
			COMPOSITE CN		**81.00**
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	2.34	5.18	**5.13**
SJRWMD Open Basin	25 yr / 24 hr	8.60	2.34	6.31	**6.26**
Orange County	100 yr / 24 hr	10.60	2.34	8.23	**8.15**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin E		**MADE BY:**	DTL	7/14/2021
BASIN ANALYSIS (PRE/POST):	POST		**CHECKED BY:**	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond E NWL			100	0.53	53.00
			TOTALS	**0.53**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Impervious (Paved parking, roads, etc.)			98	7.19	704.62
			TOTALS	**7.19**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Impervious (Sidewalk, Shared Use Paths, etc.)			98	0.63	61.74
Eden Pk Sub		A	56	2.22	124.32
			TOTALS	**2.85**	
PERVIOUS AREAS					
Open Spaces (Good condition)		A	39	1.33	51.87
			TOTALS	**1.33**	

ICPR DATA

* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**63.24**	**TOTAL BASIN AREA**	**11.90**	**COMPOSITE CN**	**56.92**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — **COMPOSITE CN** **83.66**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	1.95	5.48	**5.44**
SJRWMD Open Basin	25 yr / 24 hr	8.60	1.95	6.63	**6.58**
Orange County	100 yr / 24 hr	10.60	1.95	8.57	**8.50**

MADE BY:	DTL	DATE:	02/13/221	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E	POND:	E	BASIN:	E

Water Quality

Total Basin Area = 11.90 ac
Impervious Area = 7.82 ac

Wet Detention

A. 1.0 " Over Total Basin Area = 0.99 Ac-Ft
B. 2.5 " Over Impervious Area = 1.63 Ac-Ft
Required PAV = **1.63** Ac-Ft

Wekiva Recharge

C. 3.0 " Over Impervious Area = **1.96** Ac-Ft

***Permitted Required PAV equals 3.0" x imp. area; however, weir crest was raised from 66.50' to 67.00' to satisfy detention requirements. Actual Treatment Volume = 2.18 Ac-ft.**

Permitted Pond E (SJRWMD permit 20930-1)
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
73.00	Out. Berm	1.42				7.89
			1.30	1.00	1.30	
72.00		1.18				6.59
			1.07	1.00	1.07	
71.00	In. Berm	0.95				5.52
			0.92	1.00	0.92	
70.00		0.89				4.60
			0.87	1.00	0.87	
69.00		0.84				3.74
			0.83	0.25	0.21	
68.75	Estimated DHW	0.83				**3.53**
			0.80	0.75	0.60	
68.00		0.78				2.93
			0.76	0.58	0.44	
67.42	Estimated Tailwater	0.75				**2.48**
			0.73	0.42	0.31	
67.00	Provided PAV	0.72				**2.18**
			0.69	1.00	0.69	
66.00		0.66				1.49
			0.64	1.00	0.64	
65.00		0.61				0.85
			0.58	1.00	0.58	
64.00		0.55				0.27
			0.54	0.50	0.27	
63.50	NWL	0.53				

Weir elevation will be set based on Permitted / Provided PAV

Estimated Tailwater Elev (10yr / 24 hr) = 67.42 ft
Required PAV + (Post-Pre runoff volume) = **2.48** (ac-ft)

Estimated Design High Water Elev. (25yr /24 Hr) = 68.75 ft **Pond Freeboard = 2.25** ft
Permitted DHW + (Post-Pre runoff volume) **3.53** (ac-ft)

filename: Basin E_DCIA.xls
worksheet: PROP POND E CALC.

MADE BY:	DTL	DATE:	02/16/2021	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E			BASIN:	E

Permanent Pool Calculations

Basin Characteristics

Land Use	Area (ac)	Runoff Coeff.	Product
Roadway Paved Area	7.19	0.95	6.83
Roadway Pervious Area	1.33	0.20	0.27
Eden Pk Sub	2.22	0.45	1.00
Pond Area at NWL	0.53	1.00	0.53
Sidewalk Area	0.63	0.95	0.60
Total	**11.90**		9.22

Composite C = **0.78**

Wet Season Normal Rainfall (P) = **31 in**

Min. Permanent Pool Vol = Area x Composite C x P x 14 / 153 / 12 = **2.18 ac-ft**
Min. Permanent Pool Vol. Req. if Littoral Zone is Not Provide = 1.5 x Min Perm Pool Vol. = **3.27 ac-ft**

Stage Storage Calc.

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
73.00	Out. Berm	1.42				
71.00	In. Berm	0.95				
67.00	(PAV)	0.72				
63.50	(NWL)	0.53				3.27
			0.31	10.50	3.27	
53.00	Bottom	0.09				

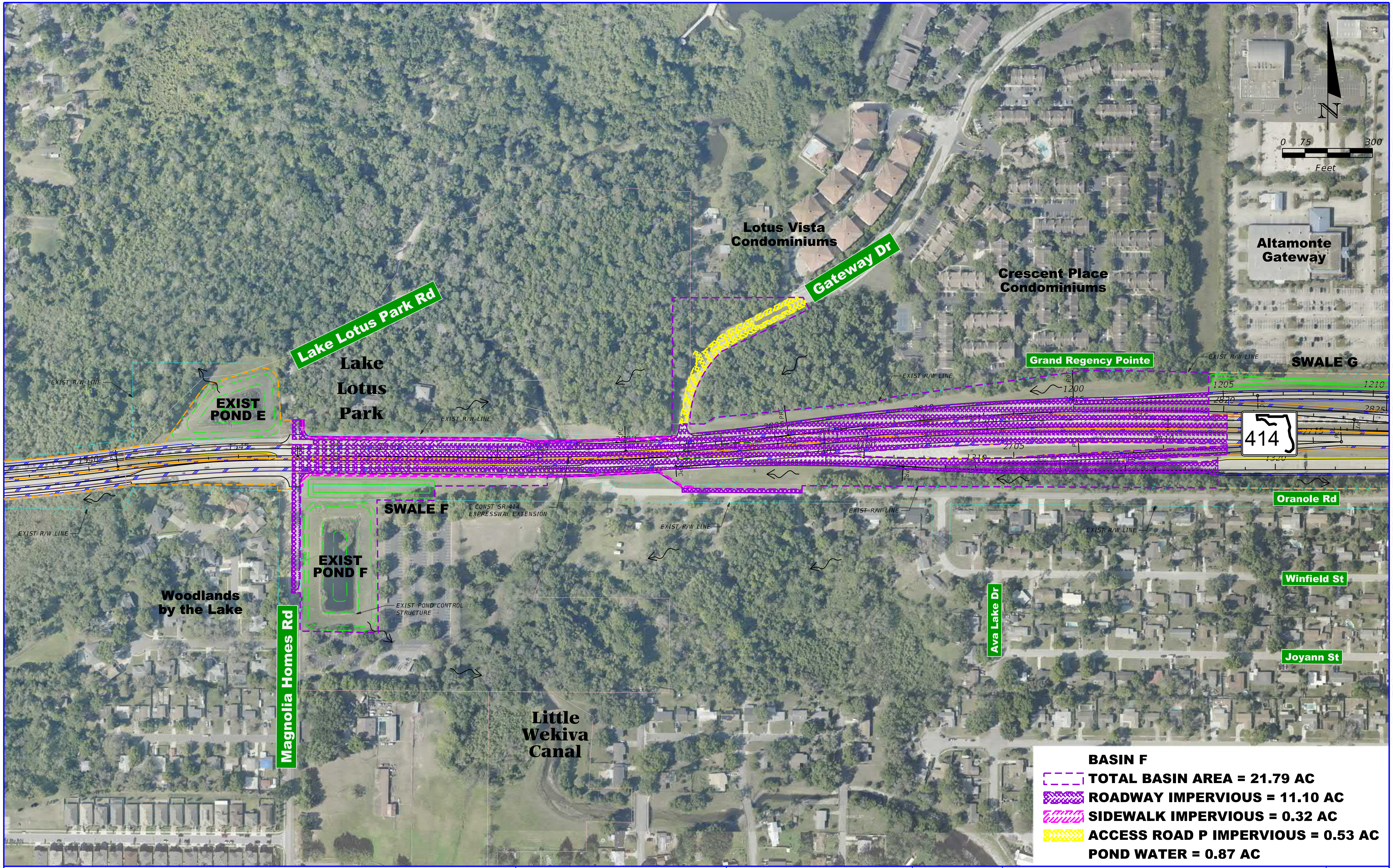
Permanent Pool Volume Provided = **3.27 ac-ft**
Resident Time Provided = Perm. Pool Vol. Provided *153*12 / Area / C / P = **21.0 Days**

Note: An additional 50% permanent pool volume is provided in lieu of providing a littoral zone.
(See 40C-42.026)

Mean Depth = Permanent Pool Volume / Area at NWL = **6.17 ft**

filename: Basin E_DCIA.xls
worksheet: PERMANENT POOL CALC.

Basin F



PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: DANH T. LEE, P.E.
P.E. LICENSE NO. 68228

JACOBS ENGINEERING GROUP INC.
200 S. ORANGE AVENUE, STE 900
ORLANDO, FL 32801; PHONE (407) 903-5001
CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.
EXPRESSWAY EXTENSION
US 441 TO SR 434

ROAD NO.	PROJECT NO.
SR 414	414-227

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DRAINAGE MAP
BASIN F POST DEVELOPMENT

SHEET NO.

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

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				**DATE**
BASIN DESIGNATION:	Basin F		**MADE BY:**	DTL	7/15/2021
BASIN ANALYSIS (PRE/POST):	PRE		**CHECKED BY:**	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond (Water Surface)			100	0.87	87.00
			TOTALS	**0.87**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Roadway (DRMP)			98	4.00	392.00
			TOTALS	**4.00**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Roadway (URS Greiner)	Pavement		98	5.90	578.20
Roadway (Access Road P)	Pavement		98	0.53	51.94
Sidewalks Impervious			98	0.32	31.36
			TOTALS	**6.75**	
PERVIOUS AREAS					
Open Space (URS Greiner)		A	39	4.99	194.61
Open Space (DRMP)		A	39	0.87	33.93
Open Space (Access Road P)		A	39	2.88	112.32
Pond (Open Space)		A	39	1.43	55.77
			TOTALS	**10.17**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from SJRWMD permit 20930-2 and -3, Basin F Post Devleopment.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**19.12**	**TOTAL BASIN AREA**	**21.79**	**COMPOSITE CN**	**62.54**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

			BASED ON TOTAL DRAINAGE AREA		
			COMPOSITE CN		**70.54**
Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	4.18	4.01	**7.29**
SJRWMD Open Basin	25 yr / 24 hr	8.60	4.18	5.05	**9.17**
Orange County	100 yr / 24 hr	10.60	4.18	6.84	**12.42**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				DATE
BASIN DESIGNATION:	Basin F	MADE BY:		DTL	7/15/2021
BASIN ANALYSIS (PRE/POST):	POST	CHECKED BY:		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
Pond (Water Surface)			100	0.87	87.00
			TOTALS	0.87	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Impervious (Paved parking, roads, etc.)			98	4.68	458.64
			TOTALS	4.68	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Impervious (Paved parking, roads, etc.)			98	6.42	629.16
Impervious (Sidewalk, Shared Use Paths, etc.)			98	0.32	31.36
Roadway (Access Road P)			98	0.53	51.94
			TOTALS	7.27	
PERVIOUS AREAS					
Open Spaces (Good condition)	Candler-Apopka (30%)	A	39	2.69	104.91
Open Spaces (Good condition)	Tavares-Millhopper (70%)	A	39	6.28	244.92
			TOTALS	8.97	

ICPR DATA

* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	22.37	TOTAL BASIN AREA	21.79	COMPOSITE CN	65.41

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — COMPOSITE CN 73.79

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	3.55	4.37	**7.93**
SJRWMD Open Basin	25 yr / 24 hr	8.60	3.55	5.44	**9.88**
Orange County	100 yr / 24 hr	10.60	3.55	7.28	**13.21**

MADE BY:	KB		DATE:	12/23/2020	JOB NO.	414-227
CHECKED BY:	DTL		DATE:	02/14/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E		POND:	F	BASIN:	F

Water Quality

Total Basin Area = 21.79 ac
Impervious Area = 11.95 ac

Wet Detention

A.	1.0	" Over Total Basin Area =	1.82	Ac-Ft
B.	2.5	" Over Impervious Area =	2.49	Ac-Ft
		Required PAV =	**2.49**	Ac-Ft

<u>* Required PAV is less than existing PAV provided (2.49 Ac-ft < 3.03 Ac-ft) *</u>

Permitted Pond F (SJRWMD permit 20930-2)
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
76.00	Out. Berm	2.30				18.33
			2.10	1.50	3.14	
74.50	In. Berm	1.89				15.19
			1.59	6.49	10.32	
68.01	Estimated DHW	1.29				**4.87**
			1.25	0.96	1.20	
67.05	Estimated Tailwater	1.20				**3.68**
			1.18	0.55	0.65	
66.50	PAV *permitted*	1.15				**3.03**
			1.01	3.00	3.03	
63.50	NWL	0.87				
			0.56	9.50	5.27	
54.00	Bottom	0.24				

Estimated Tailwater Elev (10yr / 24 hr) = 67.05 ft
Permitted PAV + (Post-Pre runoff volume) = **3.68** (ac-ft)

Pond Freeboard = 6.49 ft

Estimated Design High Water Elev. (25yr /24 Hr) = 68.01 ft
Permitted DHW + (Post-Pre runoff volume) **4.87** (ac-ft)

filename: Basin F_DCIA.xls
worksheet: PROP POND F CALC.

MADE BY:	DTL	DATE:	02/16/2021	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E			BASIN:	F

Permanent Pool Calculations

Basin Characteristics

Land Use	Area (ac)	Runoff Coeff.	Product
Roadway Paved Area	11.63	0.95	11.05
Roadway Pervious Area	8.97	0.20	1.79
Pond Area at NWL	0.87	1.00	0.87
Sidewalk Area	0.32	0.95	0.30
Total	**21.79**		14.02

Composite C = **0.64**

Wet Season Normal Rainfall (P) = **31 in**

Min. Permanent Pool Vol. = Area x Composite C x P x 14 / 153 / 12 = **3.31 ac-ft**

Min. Permanent Pool Vol. Req. if Littoral Zone is Not Provided = 1.5 x Min Perm Pool Vol. = **4.97 ac-ft**

Stage Storage Calc.

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
76.00	Out. Berm	2.30				
74.50	In. Berm	1.89				
66.50	(PAV)	1.15				
63.50	(NWL)	0.87				5.27
			0.56	9.50	5.27	
54.00	Bottom	0.24				

Permanent Pool Volume Provided = **5.27 ac-ft**

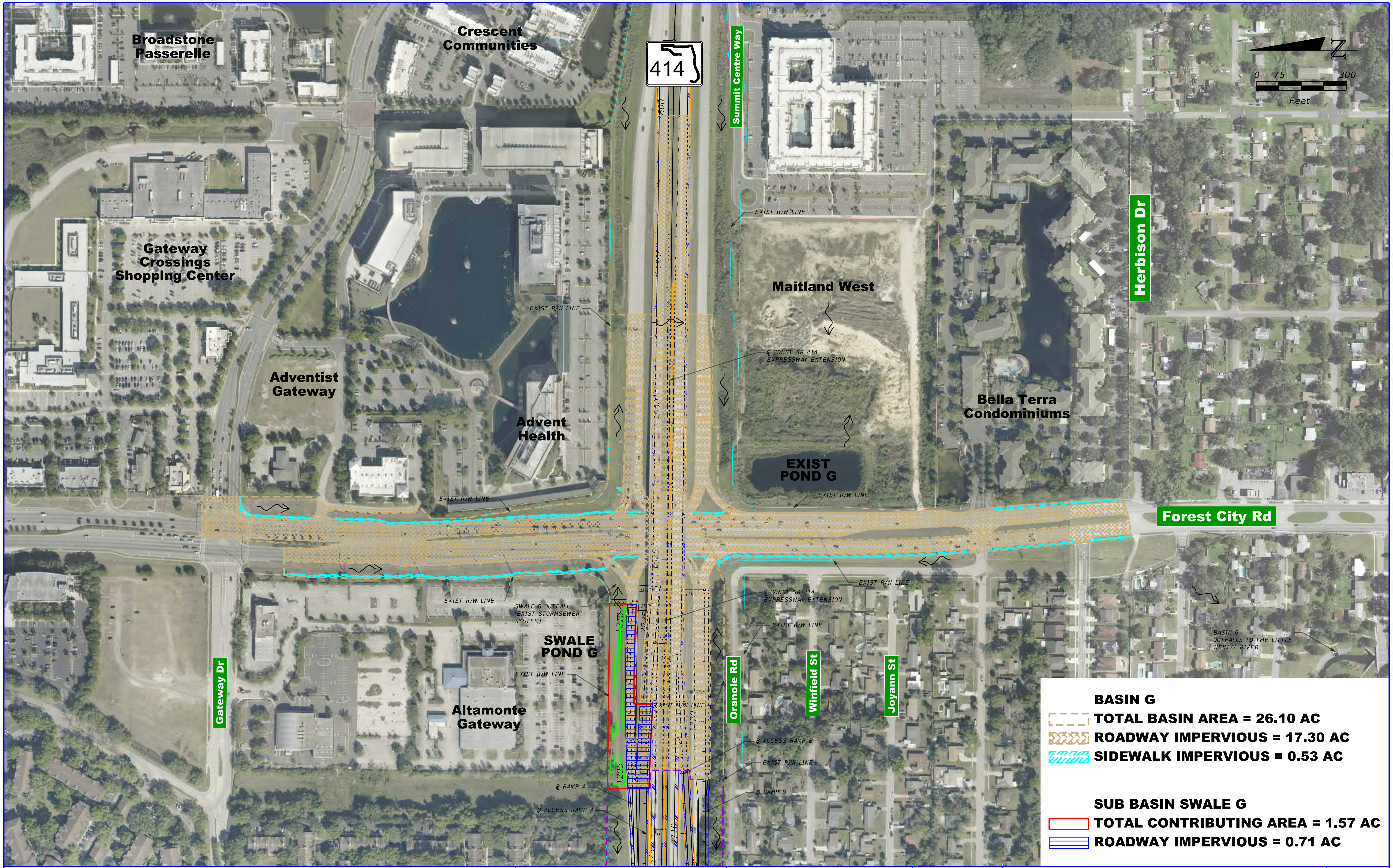
Resident Time Provided = Perm. Pool Vol. Provided *153*12 / Area / C / P = **22.3 Days**

Note: An additional 50% permanent pool volume is provided in lieu of providing a littoral zone. (See 40C-42.026)

Mean Depth = Permanent Pool Volume / Area at NWL = **6.06 ft**

filename: Basin F_DCIA.xls
worksheet: PERMANENT POOL CALC.

Basin G



PRELIMINARY - SUBJECT TO CHANGE

ENGINEER OF RECORD: DANH T. LEE, P.E.
P.E. LICENSE NO. 68228

JACOBS ENGINEERING GROUP INC.
200 S. ORANGE AVENUE, STE 900
ORLANDO, FL 32801; PHONE (407) 903-5001
CERTIFICATE OF AUTHORIZATION No. 000072

SR 414 MAITLAND BLVD.
EXPRESSWAY EXTENSION
US 441 TO SR 434

ROAD NO.	PROJECT NO.
SR 414	414-227

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

DRAINAGE MAP
BASIN G POST DEVELOPMENT

SHEET NO.

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

PROJECT TITLE:	SR 414 PD&E			
PROJECT NUMBER:	414-227			**DATE**
BASIN DESIGNATION:	Basin G	**MADE BY:**	DTL	7/21/2021
BASIN ANALYSIS (PRE/POST):	PRE	**CHECKED BY:**	AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
			TOTALS	**0.00**	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Impervious (Paved parking, roads, etc.)			98	8.24	807.52
			TOTALS	**8.24**	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Impervious (Paved parking, roads, etc.)			98	8.35	818.30
Impervious (Sidewalk, Shared Use Paths, etc.)			98	0.53	51.94
			TOTALS	**8.88**	
PERVIOUS AREAS					
Open Spaces (Good condition)		A	39	8.98	350.22
			TOTALS	**8.98**	

Note: Pre development conditions (basin sub areas and CNs) were obtained from SJRWMD permit 20432-27, Offsite Basin Pond G Post Devleopment.

ICPR DATA					
* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**31.57**	**TOTAL BASIN AREA**	**26.10**	**COMPOSITE CN**	**68.33**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — **COMPOSITE CN** **77.70**

Agency	**Design Storm Frequency**	**P (in)**	**S (in)**	**R (in)**	**V(R) (ac-ft)**
FDOT Storm Sewer	10 yr / 24 hr	7.40	2.87	4.81	**10.45**
SJRWMD Open Basin	25 yr / 24 hr	8.60	2.87	5.91	**12.86**
Orange County	100 yr / 24 hr	10.60	2.87	7.79	**16.95**

PROJECT TITLE:	SR 414 PD&E				
PROJECT NUMBER:	414-227				DATE
BASIN DESIGNATION:	Basin G	MADE BY:		DTL	7/21/2021
BASIN ANALYSIS (PRE/POST):	POST	CHECKED BY:		AFS	8/16/2021

SANTA BARBARA WORKSHEET

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA (ac)	PRODUCT
WATER SURFACE					
			TOTALS	0.00	
DIRECTLY CONNECTED IMPERVIOUS AREA (DCIA)					
Impervious (Paved parking, roads, etc.)			98	8.24	807.52
			TOTALS	8.24	
NON-DIRECTLY CONNECTED IMPERVIOUS AREA (NDCIA)					
Impervious (Paved parking, roads, etc.)			98	9.06	887.88
Impervious (Sidewalk, Shared Use Paths, etc.)			98	0.53	51.94
			TOTALS	9.59	
PERVIOUS AREAS					
Open Spaces (Good condition)		A	39	8.27	322.53
			TOTALS	8.27	

ICPR DATA

* BASED ON TOTAL DRAINAGE AREA - WATER SURFACE AREA		* BASED ON TOTAL DRAINAGE AREA		* BASED ON NDCIA AND PERVIOUS AREAS	
TOTAL % DCIA	**31.57**	**TOTAL BASIN AREA**	**26.10**	**COMPOSITE CN**	**70.68**

ESTIMATE OF RUNOFF VOLUME

PROCEDURE TO DETERMINE RUNOFF VOLUME IS BASED ON THE SCS EQUATION AND IS AS FOLLOWS:

1) DETERMINE SOIL STORAGE - S --------------------------------> S = (1000 / CN) - 10 (inches)

2) DETERMINE RUNOFF - R --------------------------------> R = (P - 0.2*S)^2 / (P + 0.8*S) (inches)

P = rainfall in inches

3) DETERMINE RUNOFF VOLUME - V(R) --------------------------------> V(R) = (R / 12)*BASIN AREA (acres-feet)

CALCULATION TABLE

BASED ON TOTAL DRAINAGE AREA — **COMPOSITE CN** **79.31**

Agency	Design Storm Frequency	P (in)	S (in)	R (in)	V(R) (ac-ft)
FDOT Storm Sewer	10 yr / 24 hr	7.40	2.61	4.99	**10.85**
SJRWMD Open Basin	25 yr / 24 hr	8.60	2.61	6.11	**13.28**
Orange County	100 yr / 24 hr	10.60	2.61	8.01	**17.41**

MADE BY:	DTL	DATE:	7/22/2021	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E	SWALE:	G	BASIN:	G

Water Quality

Total Basin Area = 1.57 ac
Net New Impervious Area = 0.71 ac

**** Swale G will provide treatment for only the net new impervious area for Basin G and will attentuate the entire post - pre runoff volume.***

Off-line Dry Retention

A. 0.50 " Over Total Basin Area = 0.07 Ac-Ft
B. 1.25 " Over Net New Impervious Area = 0.07 Ac-Ft
Required PAV for off-line retention = 0.07 Ac-Ft

On-line Dry Retention

C. 0.50 " Over Total Basin Area + Required off-line PAV = **0.14** Ac-Ft

Wekiva Recharge

D. 3.00 " Over Net New Impervious Area = **0.18** Ac-Ft

SWALE G
Stage Storage Calculations

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
90.00	Top	0.47				0.90
			0.43	0.70	0.30	
89.30	Estimated DHW	0.39				**0.60**
			0.39	0.08	0.03	
89.22	Estimated Tailwater	0.38				**0.57**
			0.31	1.26	0.39	
87.96	Weir Elev. PAV	0.24				**0.18**
			0.18	0.96	0.18	
87.00	Bottom	0.13				

Weir elevation will be set based on Wekiva Recharge Volume

Estimated Tailwater Elev (10yr / 24 hr) = 89.22 ft
Provided PAV + (Post-Pre runoff volume) = **0.57** (ac-ft)

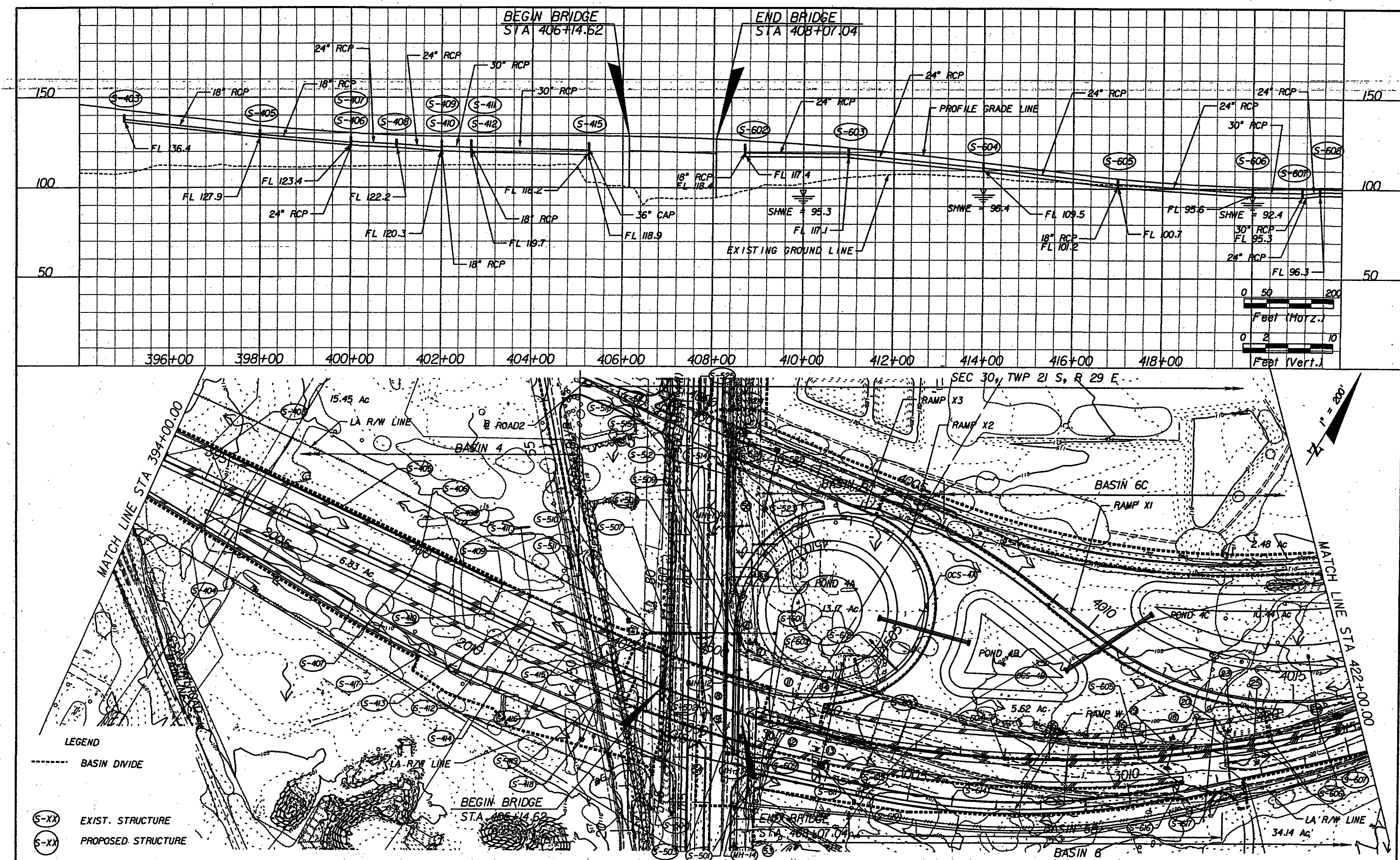
Estimated Design High Water Elev. (25yr /24 Hr) = 89.30 ft
Provided PAV + (Post-Pre runoff volume) = **0.60** (ac-ft)

Swale Freeboard = 0.70 ft
****use ditch (cut) minimum required freeboard of 0.5 ft***

filename: Basin G_DCIA.xls
worksheet: PROP SWALE G CALC.

Appendix B
Existing Permits and Supporting Stormwater Calculations

Existing Drainage Maps



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EDWARD J. KORY, P.E.
P.E. LICENSE NO. 53178

PARSONS
225 E. ROBINSON ST., SUITE 300 ORLANDO, FL 32801
PHONE: (407) 316-8400 / FAX: (407) 316-8877
CERTIFICATE OF AUTHORIZATION NO. 1838

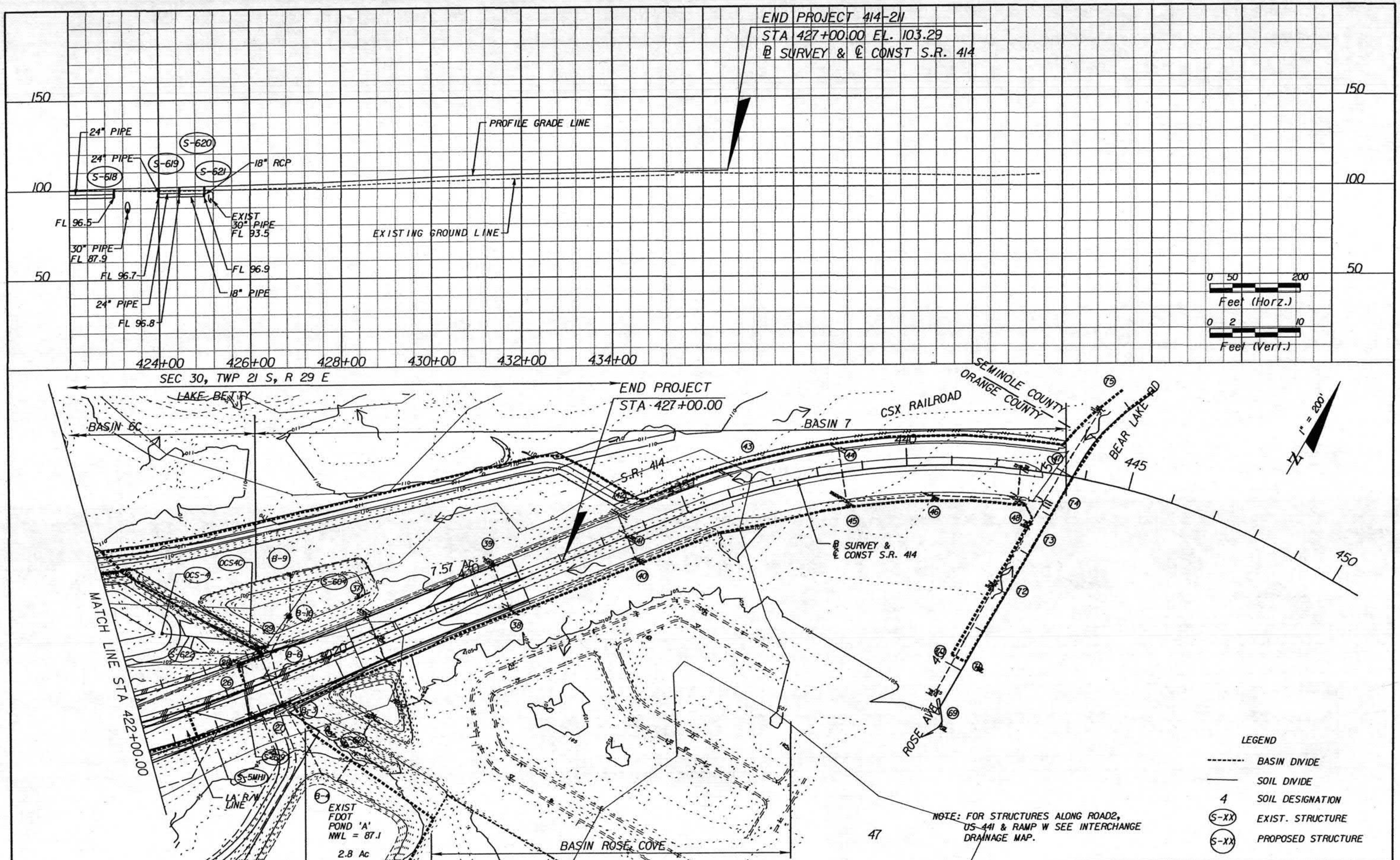
CONTRACT No. 414-211

EXPRESSWAY AUTHORITY

S.R. 414
DRAINAGE MAP

SHEET NO. 4

p0003916 1/15/2006 11:27:54 AM P:\646262\646262\drainage\drmprd03.dgn



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EDWARD J. KORY, P.E.
P.E. LICENSE NO. 53178
PARSONS
225 E. ROBINSON ST., SUITE 300 ORLANDO, FL 32801
PHONE: (407) 316-8400 / FAX: (407) 316-8877
CERTIFICATE OF AUTHORIZATION NO. 1838

CONTRACT No. 414-211

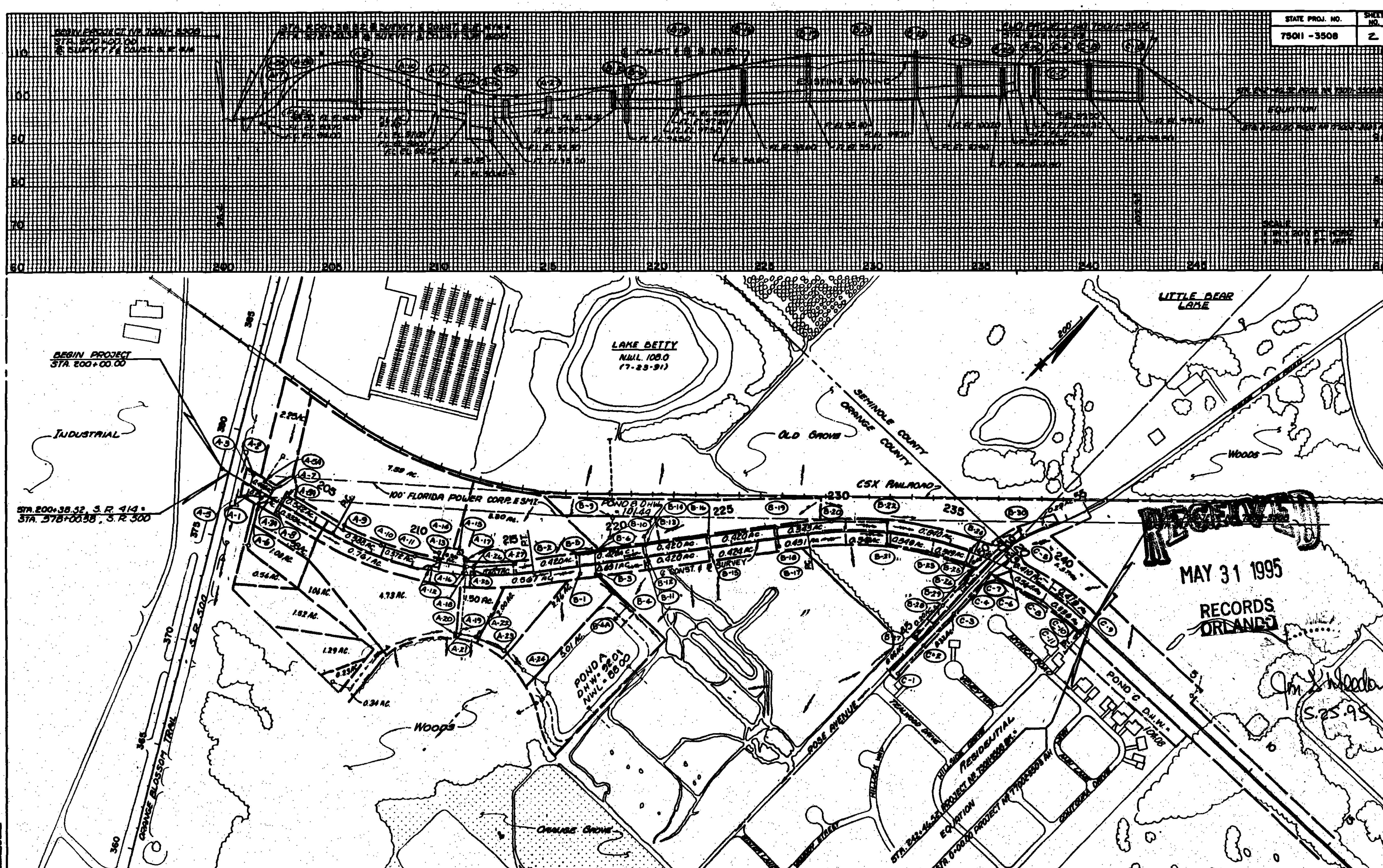
EXPRESSWAY AUTHORITY

S.R. 414 DRAINAGE MAP

SHEET NO. 5

p0003916 1/15/2006 11:28:24 AM P:\646262\646262\drainage\drmprd04.dgn

Source: FDEP permit 48-0262296-001



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

	NAME	DATE		NAME	DATE
DESIGNED BY	T.W.S.	2-91	DRAWN BY	L.S.R.	2-91
CHECKED BY	K.M.S.	9-91	CHECKED BY	J.S.M.	9-91
SUPERVISED BY	JON S. MEADOWS				

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY JON S. MEADOWS

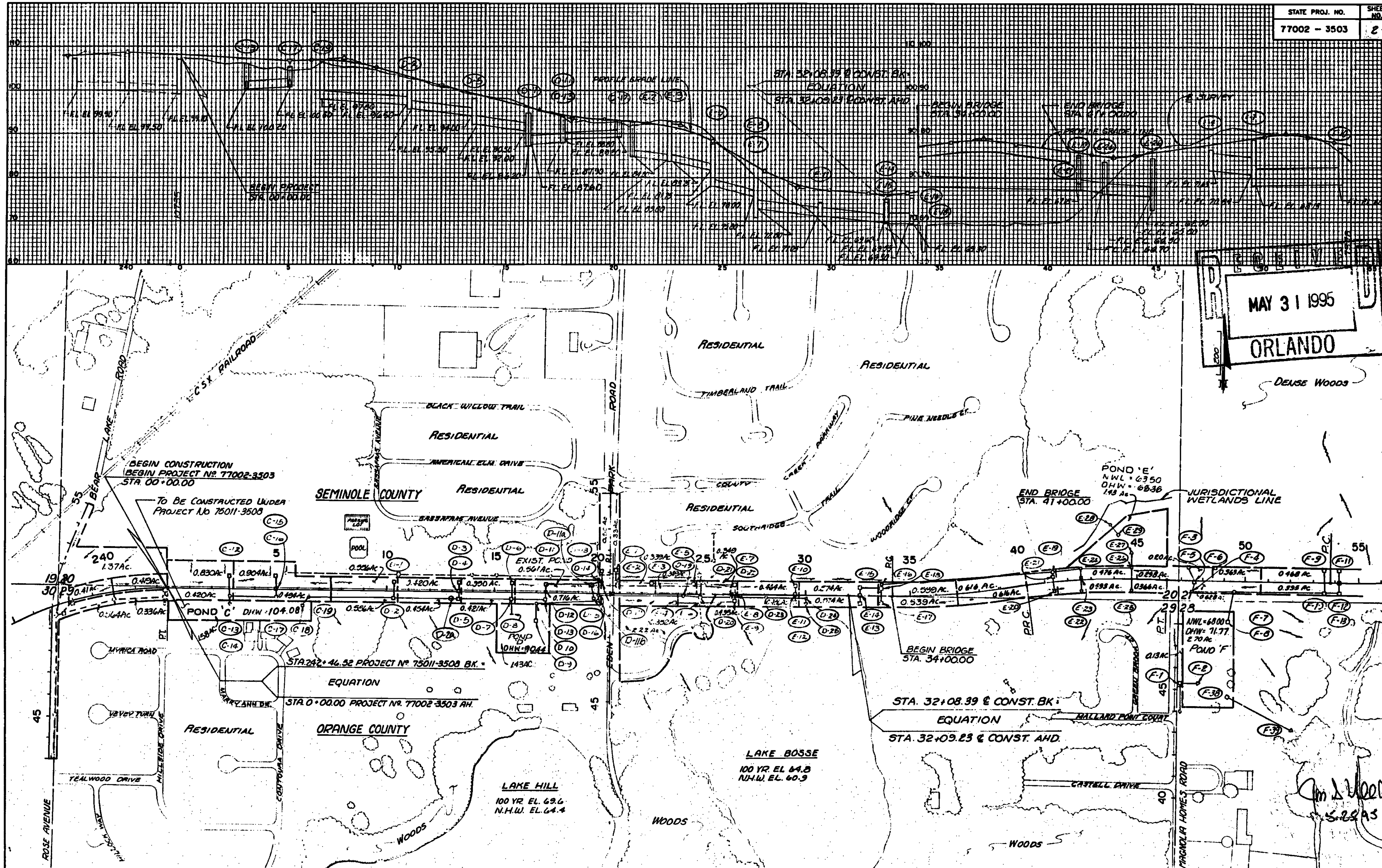
DATE

PREPARED BY:
DYER, RIDDLE, MILLS AND PRECOURT, INC.

DRAINAGE MAP

Jon S. Meadows
5-25-95

STATE PROJ. NO.	SHEET NO.
77002 - 3503	2



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

	NAME	DATE		NAME	DATE
DESIGNED BY	TWS	2-91	DRAWN BY	LJR	2-91
CHECKED BY	JSM	2-91	CHECKED BY	TWS	2-91
SUPERVISED BY	JON S. MEADOWS				

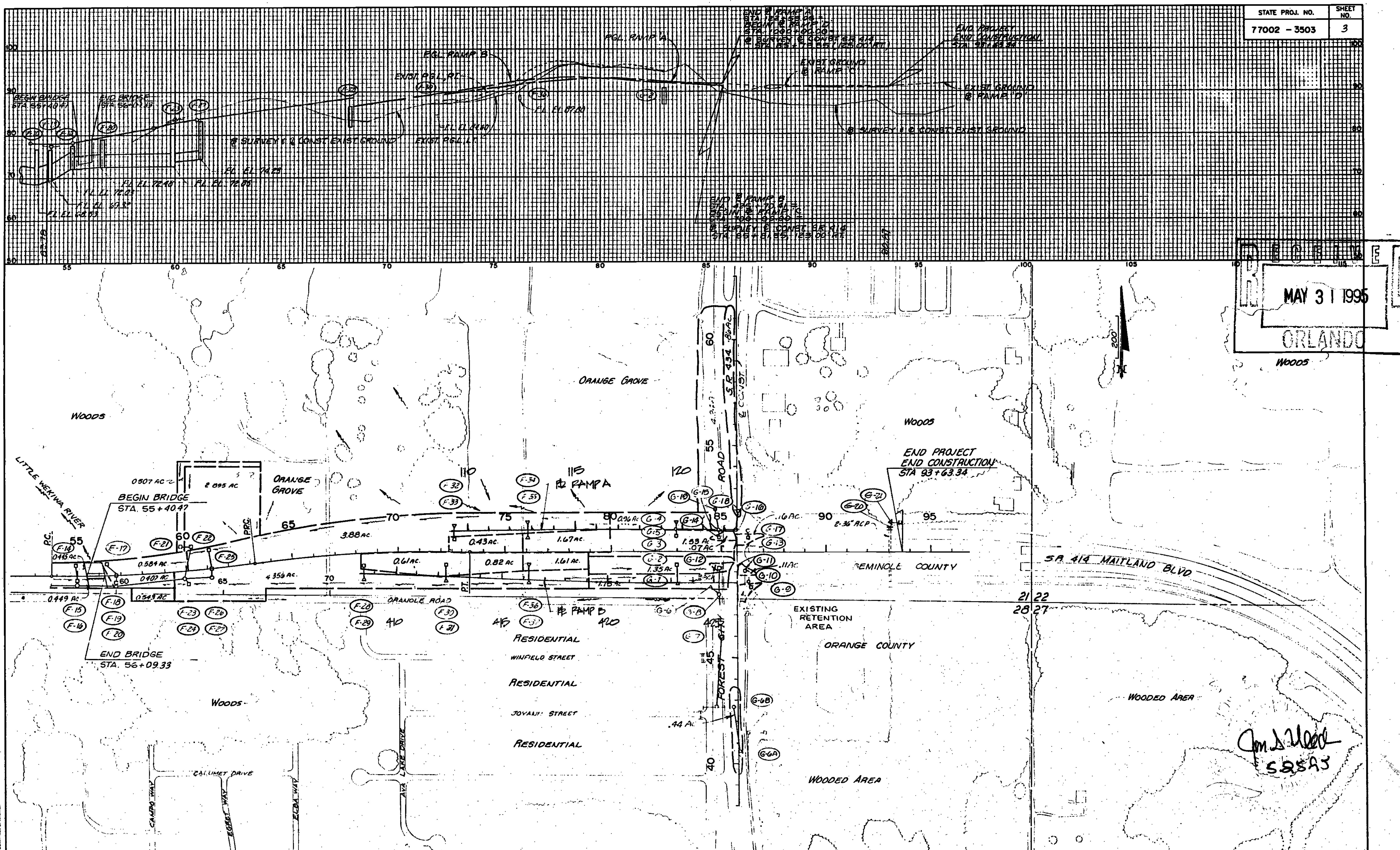
FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY JON S. MEADOWS

PREPARED BY: DYER, RIDDLE, MILLS AND PRECOURT, INC.

DRAINAGE MAP

Source: SJRWMD permit 20930-1



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

	NAME	DATE		NAME	DATE
DESIGNED BY	TWS	2-91	DRAWN BY	LJR	2-91
CHECKED BY	JSM	2-92	CHECKED BY	TWS	2-92
SUPERVISED BY	JON S. MEADOWS				

FLORIDA DEPARTMENT OF TRANSPORTATION

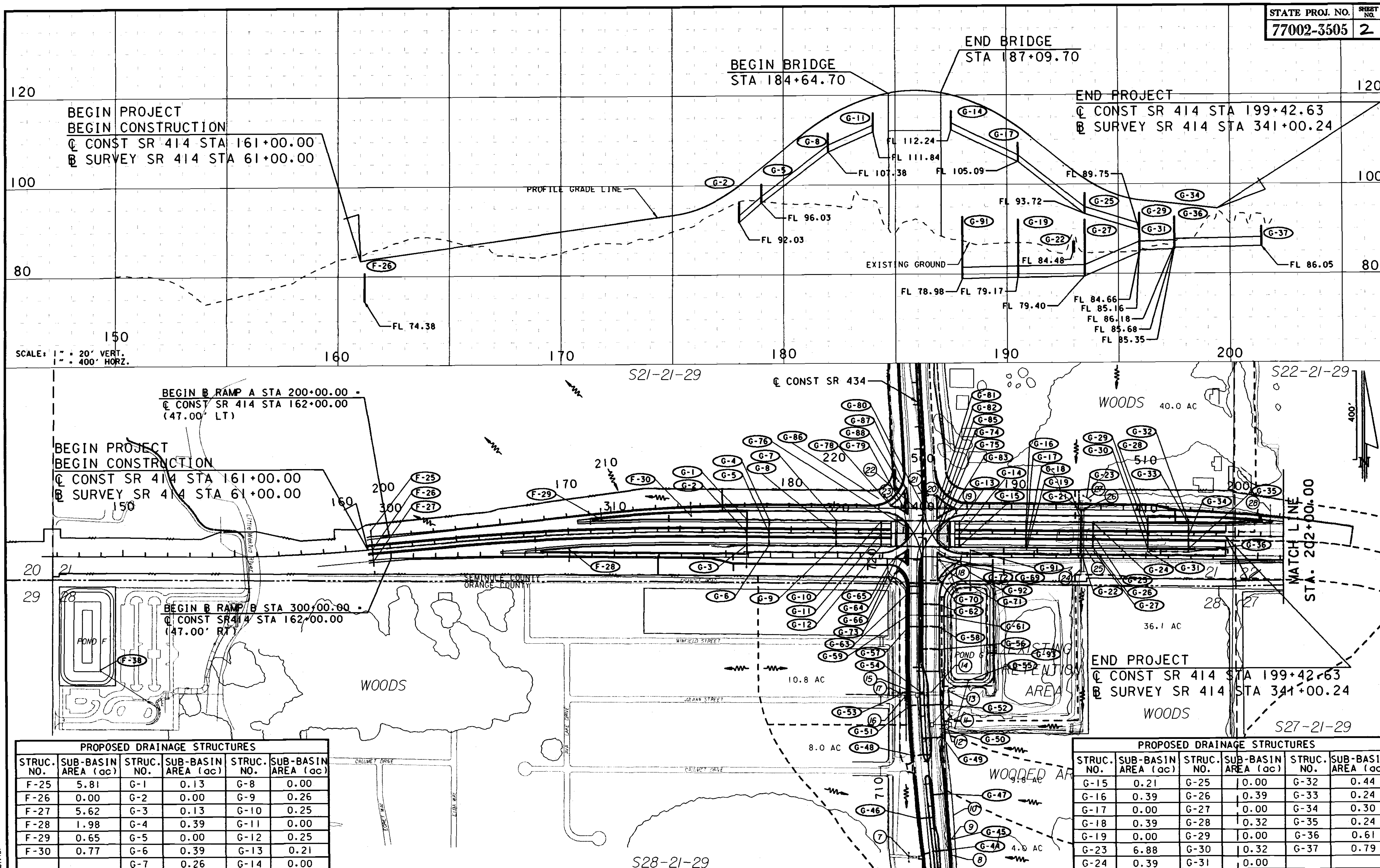
APPROVED BY JON S. MEADOWS

PREPARED BY: DYER, RIDDLE, MILLS AND PRECOURT, INC.

DRAINAGE MAP

Source: SJRWMD permit 20930-1

STATE PROJ. NO.	SHEET NO.
77002-3505	2



PROPOSED DRAINAGE STRUCTURES					
STRUC. NO.	SUB-BASIN AREA (ac)	STRUC. NO.	SUB-BASIN AREA (ac)	STRUC. NO.	SUB-BASIN AREA (ac)
F-25	5.81	G-1	0.13	G-8	0.00
F-26	0.00	G-2	0.00	G-9	0.26
F-27	5.62	G-3	0.13	G-10	0.25
F-28	1.98	G-4	0.39	G-11	0.00
F-29	0.65	G-5	0.00	G-12	0.25
F-30	0.77	G-6	0.39	G-13	0.21
		G-7	0.26	G-14	0.00

PROPOSED DRAINAGE STRUCTURES					
STRUC. NO.	SUB-BASIN AREA (ac)	STRUC. NO.	SUB-BASIN AREA (ac)	STRUC. NO.	SUB-BASIN AREA (ac)
G-15	0.21	G-25	0.00	G-32	0.44
G-16	0.39	G-26	0.39	G-33	0.24
G-17	0.00	G-27	0.00	G-34	0.30
G-18	0.39	G-28	0.32	G-35	0.24
G-19	0.00	G-29	0.00	G-36	0.61
G-23	6.88	G-30	0.32	G-37	0.79
G-24	0.39	G-31	0.00		

REVISIONS

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

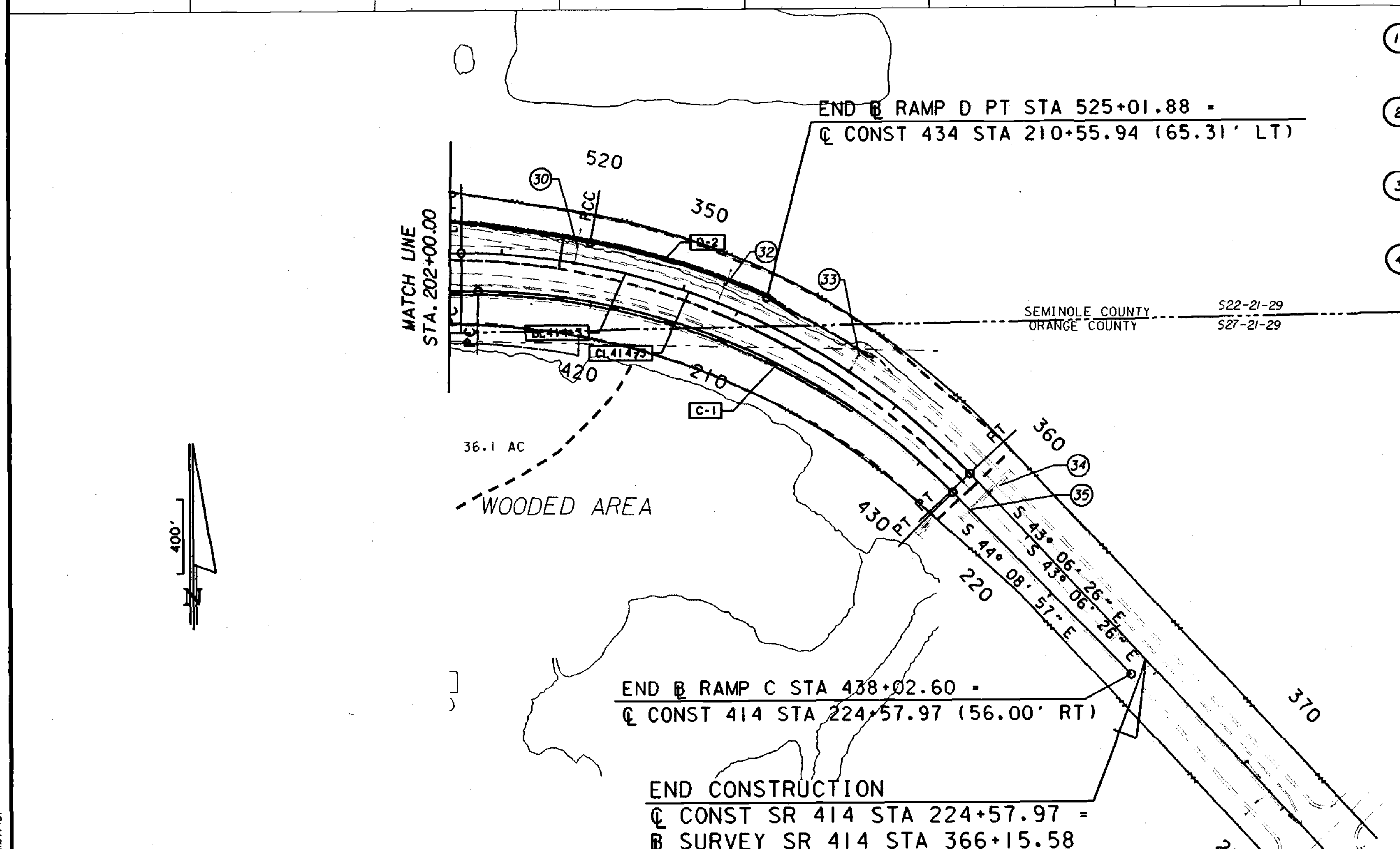
FLORIDA DEPARTMENT OF TRANSPORTATION

URS Greiner

DRAINAGE MAP

Source: SJRWMD permit 20930-2

STATE PROJ. NO. 77002-3505 | SHEET NO. 3



1. 15" RCP
NDA - INLET
NDA - DBI

2. 18" RCP
N.FL.79.87 -DBI
S.FL.80.37 -DBI

3. 42" X 60" CMP
W.FL.78.31 -DBI
E.FL.78.89 -DBI

4. 42" X 60" CMP
W.FL.77.93 -DBI
E.FL.78.43 -DBI

5. 42" X 60" CMP
W.FL.77.20 INLET
E.FL.77.98 - DBI

6. 30" RCP
N.FL.82.69 -DBI
S.FL.77.61 -DBI

7. 18" RCP
N.FL.84.93 -MES
S.FL.84.75 -MES

8. 48" RCP
N.FL.85.52 -MANHOLE
S.FL.79.50 -DBI

9. 18" RCP
W.FL.85.52 -MANHOLE
E.FL.80.99 -INLET

10. 48" RCP
N.FL.81.87 -MANHOLE
S.FL.85.54 -MANHOLE

11. 24 In RCP
W.FL.81.97 -MANHOLE
E.FL.84.87 -OUTFALL STR.

12. 48 In RCP
W.FL.81.87 -MANHOLE
E.FL.83.69 -OUTFALL STR.

13. 36 In RCP
W.FL.84.10 -INLET
E.FL.83.54 -MES

14. 36 In RCP
W.FL.84.05 -DBI
E.FL.84.16 -INLET

15. 18 In RCP
N.FL.84.13 -DBI
S.FL.83.77 -DBI

16. 24 In RCP
W.FL.84.32 -MES
E.FL.84.20 -DBI

17. 42" RCP
N.FL.82.53 -DBI
S.FL.82.21 -MES

18. 36" RCP
N.FL.84.20 -DBI
S.FL.82.81 -DBI

19. 24" RCP
N.FL.86.55 -ENDWALL
S.FL.84.41 -DBI

20. 30" RCP
W.FL.84.96 -DBI
E.FL.84.39 -DBI

21. 30" RCP
W.FL.85.39 -DBI
E.FL.84.97 -DBI

22. 30" RCP
N.FL.NDA -ENDWALL
E.FL.85.42 -DBI

23. 2-36" RCP
N.FL.84.65 -INLET
S.FL.82.63. -ENDWALL

24. 2-36" RCP
N.FL.83.90 -INLET
S.FL.84.62 -INLET

25. 2-36" RCP
N.FL.83.98 -ENDWALL
S.FL.84.00 -INLET

26. 24" RCP
N.FL.83.25 -MES
S.FL.84.64 -INLET

27. 18" RCP
N.FL.84.57 -ENDWALL
S.FL.90.46 -INLET

28. 18" RCP
NDA -INLET
NDA -MES

29. 18" RCP
N.FL.84.59 -MES
S.FL.85.68 -INLET

30. 18" RCP
NDA -INLET
NDA -MES

31. 18" RCP
N.FL.84.94 -MES
S.FL.85.43 -INLET

32. 18" RCP
N.FL.87.40 -DBI
S.FL.88.51 -DBI

33. 3-36" RCP
N.FL.87.18 -ENDWALL
S.FL.86.97 -INLET

34. 3-36" RCP
N.FL.87.02 -ENDWALL
S.FL.86.97 -INLET

35. 18" RCP
N.FL.91.50 -DBI
S.FL.91.84 -DBI

36. 18" RCP
N.FL.92.07 -DBI
S.FL.92.20 -DBI

37. 4-36" RCP
N.FL.86.82 -ENDWALL
S.FL.86.80 -ENDWALL

REVISIONS

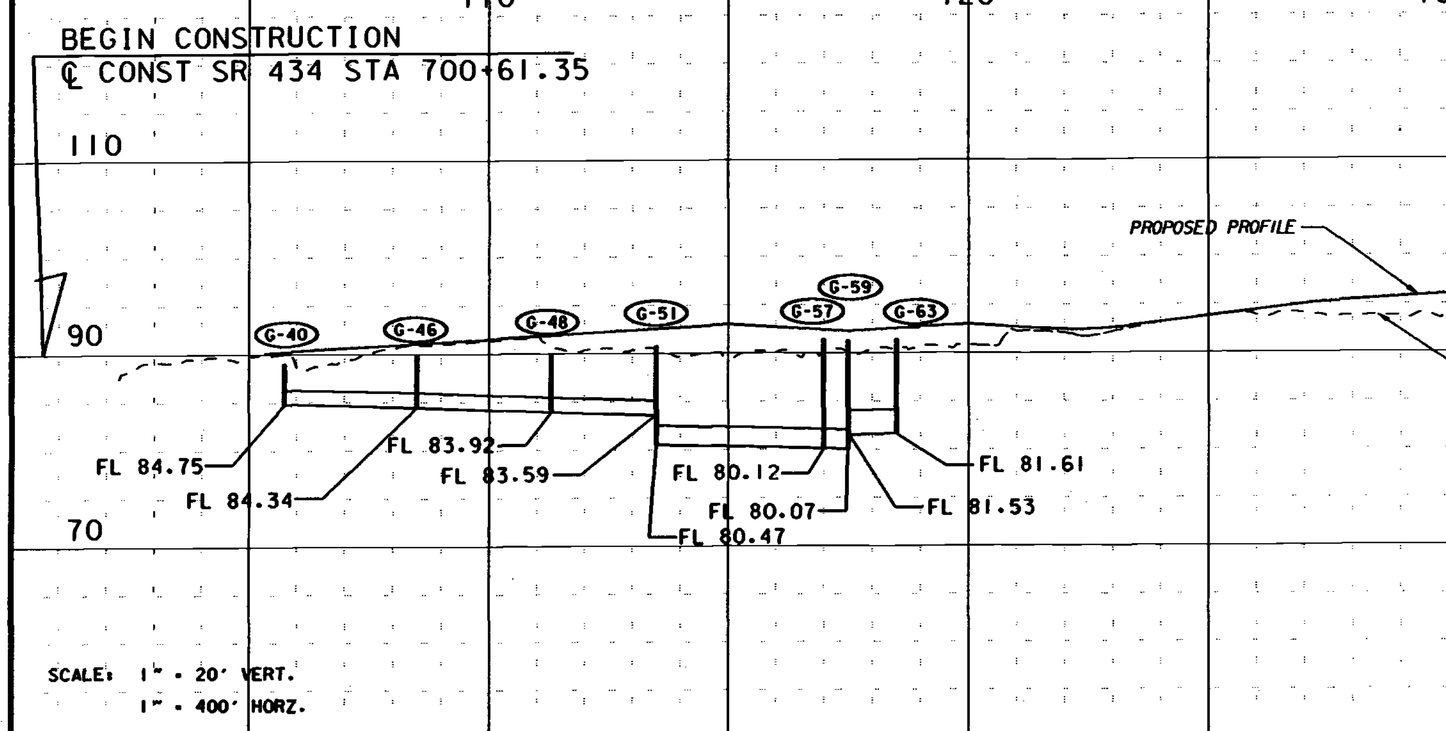
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

URS Greiner

DRAINAGE MAP

STATE PROJ. NO.	SHEET NO.
77002-3505	4



STRUCTURE NO.	STATION	DESIGN FLOOD		BASE FLOOD		OVERTOPPING FLOOD				GREATEST FLOOD			
		2% PROB	50 YR FREQ	1% PROB	100 YR FREQ								
		DISCHARGE	STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	PROB %	FREQ YR	DISCHARGE	STAGE	PROB %	FREQ YR
G-21	192+95.6	67.2	87.65	75.0	88.01					96.0	89.11	0.2	500

NOTE: The hydraulic data is shown for informational purposes only, to indicate the flood discharges and water surface elevations which may be anticipated in any given year. This data was generated using highly variable factors The resultant hydraulic data is sensitive to changes, particularly of antecedent conditions, urbanization, be attained. Discharges are in CF/S and stages are in ft, NGVD, 1929.

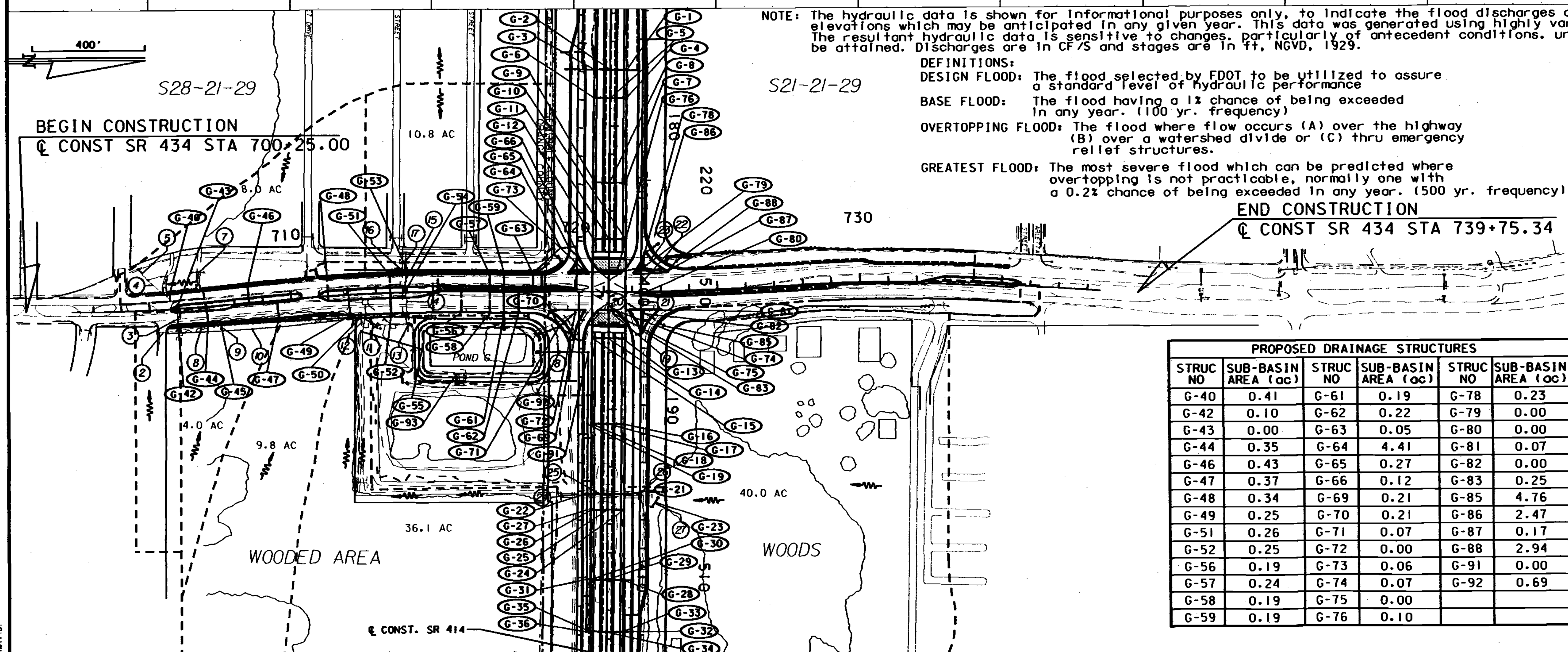
DEFINITIONS:

DESIGN FLOOD: The flood selected by FDOT to be utilized to assure a standard level of hydraulic performance

BASE FLOOD: The flood having a 1% chance of being exceeded in any year. (100 yr. frequency)

OVERTOPPING FLOOD: The flood where flow occurs (A) over the highway (B) over a watershed divide or (C) thru emergency relief structures.

GREATEST FLOOD: The most severe flood which can be predicted where overtopping is not practicable, normally one with a 0.2% chance of being exceeded in any year. (500 yr. frequency)



PROPOSED DRAINAGE STRUCTURES					
STRUC NO	SUB-BASIN AREA (ac)	STRUC NO	SUB-BASIN AREA (ac)	STRUC NO	SUB-BASIN AREA (ac)
G-40	0.41	G-61	0.19	G-78	0.23
G-42	0.10	G-62	0.22	G-79	0.00
G-43	0.00	G-63	0.05	G-80	0.00
G-44	0.35	G-64	4.41	G-81	0.07
G-46	0.43	G-65	0.27	G-82	0.00
G-47	0.37	G-66	0.12	G-83	0.25
G-48	0.34	G-69	0.21	G-85	4.76
G-49	0.25	G-70	0.21	G-86	2.47
G-51	0.26	G-71	0.07	G-87	0.17
G-52	0.25	G-72	0.00	G-88	2.94
G-56	0.19	G-73	0.06	G-91	0.00
G-57	0.24	G-74	0.07	G-92	0.69
G-58	0.19	G-75	0.00		
G-59	0.19	G-76	0.10		

REVISIONS

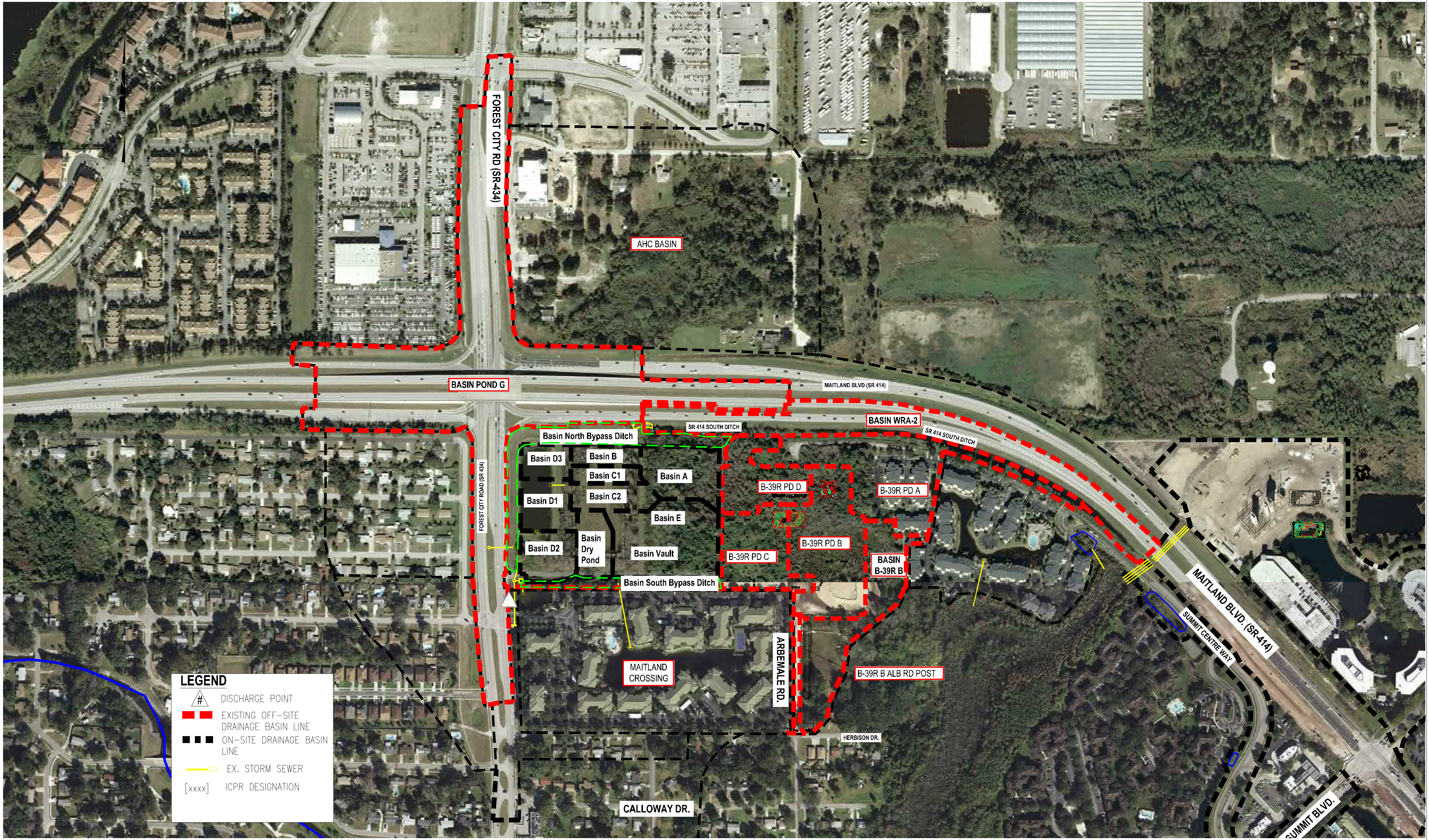
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

FLORIDA DEPARTMENT OF TRANSPORTATION

URS Greiner

DRAINAGE MAP

Source: SJRWMD permit 20930-2



REVISIONS			
REV	DATE	BY	DESCRIPTION

gai consultants
transforming ideas into reality®
618 South Street, Suite 700
Orlando, FL 32801
407.423.8398
Certificate of Authorization: EB9951

ANTHONY S. CALL, P.E. Lic. No. 67370

SCALE:	1" = 200' @ 11" x 17"
DATE:	9/11/18
DRAWN:	TZ
CHECKED:	TZ
APPROVED:	ASC

PROJECT NO. / DASH NO.
A120273.07

This drawing was produced with computer aided drafting technology and is supported by electronic drawing files. Do not revise this drawing via manual drafting methods.

POST-DEVELOPMENT BASIN MAP

MAITLAND WEST WRIGHT - PD
MAITLAND, FLORIDA

SHEET NO.
C0.02

Source: SJRWMD permit 20432-27

Basin A

DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS

MAITLAND BLVD

SH. NO.:	JOB NO.: 89-259.02
MADE BY: LLS	DATE: 1/13/92
CHECKED BY:	DATE:

INTRODUCTION.

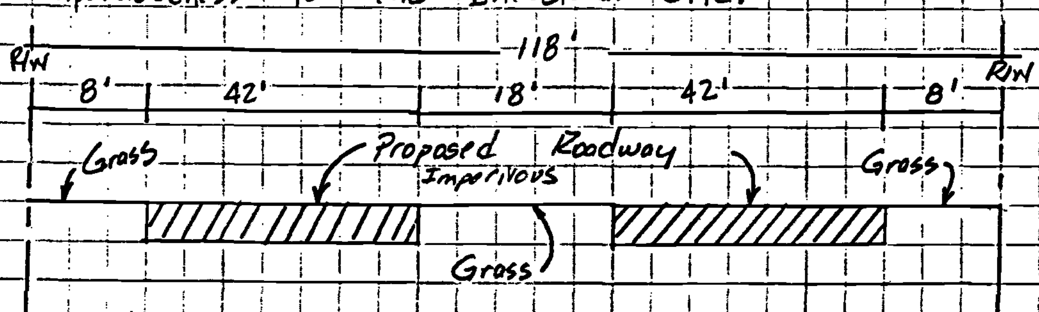
BASIN A

The proposed portion of Maitland Blvd within Basin A has perviously been permitted by the District (Permit # 4-095-0216). This site consists of a 45.3 acre Industrial Park. The existing pond has been constructed to function as a joint use pond, handling flow from the Industrial Park and the Proposed Maitland Blvd. This pond has been also designed to handle stormwater runoff from Rose Cove a planned single family development (Permit # 4-095-0217A).

Approximately 500 LF of the Proposed Maitland Blvd which is located within Basin A will discharge to the joint use pond. The remainder of roadway will discharge to POND B, which is located outside of Basin A.

It is our intent to show that the Proposed Maitland Blvd to be constructed within Basin A, is within compliance of Permit # 4-095-0216, issued by the District on May 12, 1987

The existing CN computations (See page) use a 72% impeviousness for the Industrial Site.



Proposed Typical

Proposed % impervious $= \frac{42+42}{118} \times 100 = 71.18\%$

Therefore the portion of Maitland Blvd proposed in Basin A (Industrial Park) shall have no impact to the existing Ret/Det pond, and is within compliance of Permit #4-095-0216)

No additional calculations have been done for Basin A or Pond A.

5-C4

Rose Cove + Rose Ind. Park

(PROJ. NAME)

CLC

bowyer-singleton & associates INCORPORATED (BY) 1/23/87

CONSULTING ENGINEERING · PLANNING · LAND SURVEYING · ORLANDO, FLORIDA (SHT. NO.)

COMPUTER ENTRY COLUMN

SUB-BASIN ANALYSIS

BASIN DESIGNATION: 101

TYPE EVALUATION, PRE/POST POST

BASIN SIZE (ACRES) = 53.5

RAINFALL DEPTH (INCHES); P = 8.6

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUN OFF CURVE); CN

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	PERCENT OR AREA	PRODUCT
Single family	Ba, Bc	A	61	13.6	829.6
Single family	Sc	A/D	87	0.4	34.8
* Industrial @ 72% imp	Ba, Bc, Lb	A	81	23.4	1895.4
* Industrial @ 72% imp	Ba, Sc	A/D	93	7.2	669.6
** Open space, good condition	Ba, Sc	A/D	80	6.1	488.0
Retention pond	–	–	100	2.8	280.0

WEIGHTED CN = $\frac{\Sigma \text{ PRODUCT}}{\Sigma \text{ AREA}/\%} = \frac{4197.4}{53.5}$ = CN = 78

* The proposed Maitland Blvd will be constructed within the 30.6 acres, that have been designed to have 72% imperviousness.

** Open space has been determined to be the pond area above the NWL, the 150' residence set back and all drainage easements onsite. The drainage easements which are ditches will remain dry under normal conditions.

(ACRE FT)

CONTINUED -

bowyer-singleton & associates
INCORPORATED
CONSULTING ENGINEERING - PLANNING - LAND SURVEYING
520 SOUTH MAGNOLIA AVENUE • ORLANDO, FLORIDA 32801
305/843-5120

PROJECT Cove Cove

JOB NO. 8520-2.1
MADE BY CLC
CHECKED BY
DATE 11/26/86 SHEET ___ OF ___
Rev 1/23/87

Retention Volume

Retention will be provided for the runoff from the first inch of rainfall or the first 0.5 inches of runoff, whichever is greater.

Single-family @ 38% imp., use 0.5"	14.0 acres (0.5/12) = 0.58 acre-ft
Open space @ 0% imp, use 0.5"	6.1 acres (0.5/12) = 0.25 acre-ft
Industrial @ 72% imp., use 0.72"	30.6 acres (0.72/12) = 1.84 acre-ft
Retention pond @ 100% imp, use 1.0"	2.8 acres (1.0/12) = 0.23 acre-ft
	Total Retention Volume = 2.90 acre-ft.
	Retention provided = 3.16 acre-ft

Basin(s) 6A, 6B, and 6C

Department of
Environmental Protection

Jeb Bush
Governor

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Colleen Castille
Secretary

NOTICE OF PERMIT

In the Matter of an
Application for Permit by:

Orlando Orange County Expressway Authority
525 South Magnolia Avenue
Orlando, Florida 32801

Attn: Joseph A. Berenis, P.E.
Deputy Executive Director

Orange County – ERP
SR 414 (Maitland Boulevard) Extension & SR 429 (Western Beltway) Realignment
DEP File Number: 48-0262296-001

Dear Mr. Berenis:

Enclosed is Permit Number ERP48-0262296-001-EI to construct a stormwater management system for the proposed construction of a toll road that will extend SR 414 (Maitland Boulevard) from US 441 to SR 429 (Western Beltway) and the proposed realignment of a portion of the Western Beltway. This project is located in Orange County, within Sections 1 and 12 of Township 21 South, Range 27 East; Sections 6, 7, 17 – 22, 25 – 27, and 30 of Township 21 South, Range 28 East; and Section 30 of Township 21 South, Range 29 East. This permit is issued pursuant to Section 373.118, 373.413, 373.416, and 373.426, *Florida Statutes* (F.S.) and Rules 40C-4, 40C-40, 40C-41, 40C-42, 62-312, and 62-343, *Florida Administrative Code* (F.A.C.).

Pursuant to Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing this application.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000; and by filing a copy of the notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this notice is filed with the Clerk of the Department.

Mediation under section 120.573 of the Florida Statutes is not available for this proceeding.

If there are any questions, please contact Debra Laisure, P.E., of the Submerged Lands and Environmental Resource Program by telephone (407/893-7874), fax (407/893-3075), or internet (Debra.Laisure@dep.state.fl.us).

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

For Vivian F. Garfein
Director, Central District

Date of Issue: December 15, 2006

VG:dh:dl:co

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to Section 120.52(7), F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.

Carol O'Keefe 12/15/06

Clerk Date

Enclosure: Permit No. ERP05-0262296-001-EI

Copies furnished to: David Dewey, P.E., SJRWMD (Altamonte Springs) (email)
Gary J.D. Elwer, P.E., PBS&J (email)

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on December 15, 2006 to the listed persons by Carol O'Keefe.

Rev. 4/91

Department of Environmental Protection

Central District
Jeb Bush, Governor | 3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767 | Colleen Castille, Secretary

PROJECT INFORMATION:
Permit Number: ERP48-0262296-001-EI
Expiration Date: November 3, 2011
County: Orange
Latitude: 28º 38' 2.31"N
Longitude: 81º 27' 9.06"W } US 441 & Maitland Boulevard
Township 21 South/Range 27 East/Sections 1 and 12
Township 21 South/Range 28 East/Sections 6, 7, 17 – 22, 25 – 27, and 30
Township 21 South/Range 29 East/Section 30
Project: SR 414 (Maitland Boulevard) Extension & SR 429 (Western Beltway) Realignment

PERMITTEE:
Orlando Orange County Expressway Authority
525 South Magnolia Avenue
Orlando, Florida 32801

Attn: Joseph A. Berenis, P.E.
Deputy Executive Director

Orange County - ERP
DEP File Number: 48-0262296-001

Dear Mr. Berenis:

This permit is issued under the provisions of Part IV of Chapter 373, *Florida Statutes* (F.S.) and Chapters 62.4, 62-302, 62-312, 62-330, 62-343, 62-101.040, 40C-4, 40C-40, 40C-41, and 40C-42, *Florida Administrative Code* (F.A.C.). The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Construct and Operate: a stormwater management system associated with the proposed construction of a toll road that will extend SR 414 (Maitland Boulevard) from US 441 to SR 429 (Western Beltway) and the proposed realignment of a portion of the Western Beltway. This project is located in Orange County, within Sections 1 and 12 of Township 21 South, Range 27 East; Sections 6, 7, 17 – 22, 25 – 27, and 30 of Township 21 South, Range 28 East; and Section 30 of Township 21 South, Range 29 East. The project is divided into four sections designated as 429-200, 429-201, 414-210, and 414-211. Section 429-200 proposes a new system-to-system interchange for the Western Beltway and the Maitland Boulevard Extension. Section 429-201 proposes the realignment of the Western Beltway. Section 414-210 proposes the portion of the Maitland Boulevard Extension from west of Clarcona-Occoee Road to just east of Hiawassee Road. Section 414-211 proposes a new interchange between the existing Maitland Boulevard and US 441. Stormwater runoff from the proposed roadway will be collected and routed through a system of culverts to the stormwater management system that will consist of 19 dry retention ponds and 8 wet detention ponds. The characteristics for these ponds are provided in the tables on pages 1a and 1b.

This permit also authorizes 15.23 acres of wetland impacts for the Maitland Boulevard Extension and 14.84 acres of wetlands impacts for the realignment of the Western Beltway from McKinney Road to Seidel Road.

Impacts to the regulated floodplain will be compensated for on a cup-for-cup basis.

SR 429-200 Pond Designation	Type of Pond	Bottom Elevation (NAVD)	Top of Bank or Inner Berm Elevation (NAVD)	Control Elevation, if applicable (NAVD)	Side Slopes
200-1	Dry Retention	98 ft	103 ft	N/A	Max 4:1 (H:V)
200-2	Dry Retention	100 ft	106 ft	N/A	Max 4:1 (H:V)
200-3	Dry Retention	94 ft	100 ft	N/A	Max 4:1 (H:V)
200-4	Dry Retention	85 ft	91 ft	N/A	Max 4:1 (H:V)
200-5	Dry Retention	88 ft	102 ft	N/A	Max 4:1 (H:V)
200-6	Dry Retention	95 ft	102 ft	N/A	Max 4:1 (H:V)

SR 429-201 Pond Designation	Type of Pond	Bottom Elevation (NAVD)	Top of Bank or Berm Elevation (NAVD)	Control Elevation, if applicable (NAVD)	Side Slopes
201-A	Dry Retention	71 ft	75 ft	72.10	Max 4:1 (H:V)
201-B	Dry Retention	71 ft	74 ft	71.75 ft	Max 4:1 (H:V)
201-C	Dry Retention	75 ft	81 ft	76.2 ft	Max 4:1 (H:V)
201-E	Dry Retention	110 ft	121 ft	N/A	Max 4:1 (H:V)

SR 414-210 Dry Retention Ponds (Elevations in feet NAVD)				
Pond Designation	Bottom Elevation	Top of Bank or Berm Elevation	Control Elevation, if applicable	Side Slopes
210-1A	90	97	N/A	Max 4:1 (H:V)
210-1B	78	85	N/A	Max 4:1 (H:V)
210-4	100	105	N/A	Max 4:1 (H:V)
210-5	95	99	N/A	Max 4:1 (H:V)
210-6[1]	65	83	N/A	Max 5:1 (H:V)
210-7[1]	55	83	N/A	Max 4:1 (H:V)
210-8	89	92	90.5	Max 4:1 (H:V)
210-9	107	110.5	N/A	Max 4:1 (H:V)
210-10	125	130	N/A	Max 4:1 (H:V)

[1]Ponds 210-6 and 210-7 are connected via two (2) 40-foot wide rock trenches.

SR 414-210 Wet Detention Ponds (Elevations in feet NAVD)				
Pond Designation	Bottom Elevation	Top of Bank or Berm Elevation	Control Elevation, if applicable	Side Slopes
210-2A	96	107	N/A	Max 2:1 (H:V)
210-2B	96	107	N/A	Max 2:1 (H:V)
210-3	98	109	N/A	Max 2:1 (H:V)

SR 414-211 Wet Detention Ponds (Elevations in feet NAVD)							
Pond Designation	Bottom Elevation	Top of Bank or Inner Berm Elevation	If applicable				Side Slopes
			Control Elevation	Weir Elevation	Overflow Elevation	Orifice Diameter (inches)	
211-1	114	127	123.03	124.93	126	4.75	Max 4:1 (H:V)
211-2	104	118.5	114.4	115.8	117.5	3.5	Max 4:1 (H:V)
211-4A[2]	80.5	99	N/A				Max 4:1 (H:V)
211-4B[2]	80	99	N/A				Max 2:1 (H:V)
211-4C	80	99	92	94.24	98	4.25	Max 2:1 (H:V)

[2]Pond 211-4A is connected to Pond 211-4B and Pond 211-4B is connected to Pond 211-4C via three (3) 30-inch pipes.

Figures 1 through 53 will be attached to, and become a part of, this permit.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violations of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

   (a) Have access to and copy any records that must be kept under conditions of the permit;

   (b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

   (c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any conditions or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

   (a) A description of and cause of noncompliance; and
   (b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

GENERAL CONDITIONS:

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Section 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Rule 62-4.120 and 62-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Certification of compliance with state Water Quality Standards (Section 401, PL 92-500)
( ) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

PERMIT ALTERATIONS

1. All construction, operation, and maintenance shall be as set forth in the plans, specifications and performance criteria contained in the Department's files and approved by this permit. Any alteration or modification to the stormwater system as permitted requires prior approval from the Department.

2. At least 48 hours prior to the commencement of construction activities authorized by this permit, the permittee shall submit to the Department a notice of commencement indicating the start time.

3. If any other regulatory agency should require revisions or modifications to the permitted project, the Department is to be notified of the revisions so that a determination can be made whether a permit modification is required.

4. Permittee must obtain a permit from the Department prior to beginning construction of subsequent phases or any other work associated with this project not specifically authorized by this permit.

SITE INSPECTION BY DEP STAFF

5. Department-authorized staff, upon proper identification, will have permission to enter, inspect, and observe the system to insure conformity with the plans and specifications approved by the permit. The plans are on file in the Central District Office of the Department of Environmental Protection.

WATER QUALITY

6. Turbidity must be controlled to prevent violations of water quality pursuant to Rule 62-302.530(70), *Florida Administrative Code*. Turbidity shall not exceed 29 Nephelometric Turbidity Units above natural background conditions. Turbidity barriers shall be correctly installed at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the proposed work. It is understood that "receiving waterbody" shall not be construed to mean the permittee's settling pond, dredge lake, or other parts of the permittee's closed water system. Turbidity barriers shall remain in place at all locations until construction is completed, soils are stabilized, and vegetation has been established.

   Upon final completion of the project and upon reasonable assurance that the project is no longer a potential turbidity source, the permittee will be responsible for the removal of the barriers.

INSPECTION REPORTS

7. Inspection reports for retention, underdrain, wet detention, swales, and wetland stormwater management systems shall be submitted to the Department two years after completion of construction and every two years thereafter on the enclosed form.

SPECIFIC CONDITIONS:

8. Copies of all turbidity monitoring reports shall be provided to the Department on a monthly basis. Reports shall be submitted to the letterhead address.

CONSTRUCTION DETAILS

9. The permittee shall require the contractor to review and to maintain in good condition at the construction site a copy of this permit complete with all conditions, attachments, exhibits, and permit modifications issued for this permit. The complete permit copy must be available for review upon request by Department representatives.

10. Before any offsite discharge from the stormwater management system occurs, the retention and detention storage must be excavated to rough grade prior to building construction or placement of impervious surface within the area served by those systems.

11. Adequate measures must be taken to prevent siltation of these treatment systems and control structures during construction or siltation must be removed prior to final grading and stabilization.

EROSION CONTROL MEASURES

12. Prior to and during construction, the permittee shall correctly implement and maintain all erosion and sediment control measures (best management practices) required to retain sediment on-site and to prevent violations of state water quality standards. The turbidity controls shall be maintained throughout the duration of the project, and shall be effective in preventing soil from the fill from eroding into the adjacent wetlands and surface waters. All practices must be in accordance with the guidelines and specifications in chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (FDEP 1988), which are hereby incorporated by reference, unless a project specific erosion and sediment control plan is approved as part of the permit, in which case the practices must be in accordance with the plan.

    At least 30 days prior to beginning construction on any part of this project, the permittee shall submit a copy of the erosion and sediment control plan to the Department's Central District office for review and comment.

    If site specific conditions require additional measures during any phase of construction or operation to prevent erosion or control sediment, beyond those specified in the erosion and sediment control plan, the permittee shall implement additional best management practices as necessary, in accordance with the specification in chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (FDEP 1988). The permittee shall correct any erosion or shoaling that causes adverse impacts to the water courses.

SPECIFIC CONDITIONS:

13. The following measures shall be taken to minimize erosion:

    A. Swales and dry ponds: sodding of all side slopes; seeding and mulching of flat-lying bottom areas;

    B. Berms and other disturbed flat-lying areas: seed and mulch.

    Stabilization measures shall be initiated for erosion and sediment control on disturbed areas as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days after the construction activity in that portion of the site has temporarily or permanently ceased.

14. All wetland areas or water bodies which are outside of the specific limits of construction authorized by this permit must be protected from erosion, siltation, scouring or excess turbidity and dewatering.

SUBMITTAL OF AS-BUILT PLANS

19. Within 30 days after completion of construction of the surface water management system, the permittee shall submit the enclosed form and two sets of record drawings of the project as actually constructed thereby notifying the Department that the facilities area ready for final inspection and approval. The permit will be converted from a construction permit to an operation permit once the project is determined to be incompliance with the permitted plans and with conditions provided in Rule 40C-42.028, F.A.C.

20. The location of at least one bench mark (and its corresponding elevation) per stormwater pond should be placed in the vicinity of each outfall structure and will be clearly shown on the as-built plans provided to the Department.

21. If the system is not functioning as designed and permitted, operational maintenance must be performed immediately to restore the system. If operational maintenance measures are insufficient to enable the system to meet the design and performance standards of this chapter, the permittee must either replace the system or construct an alternative design. A permit modification must be obtained from the Department prior to constructing such an alternate design pursuant to section 40C-4.331, F.A.C.

MAINTENANCE ACTIVITIES

22. The following maintenance activities shall be performed as needed on

    A. All permitted systems:
        1. Removal of trash and debris;
        2. Inspection of inlets and outlets;
        3. Removal of sediments when the storage volume or conveyance capacity of the stormwater management system is below design levels; and
        4. Stabilization and restoration of eroded areas.

    B. Retention, swale, and underdrain systems:

1. Mowing and removal of grass clippings;
2. Aeration, tilling, or replacement of topsoil; and
3. Re-establishment of vegetation on disturbed surfaces.

C. Wet detention systems:
1. Replanting of natural vegetation within the littoral zone; and
2. Control of nuisance and exotic vegetation.

DEWATERING

23. If dewatering is to occur during any phase of construction or thereafter and the surface water pump(s), wells or facilities are capable of withdrawing one million gallons of water per day or more or an average of 100,000 gallons per day for more than a year and discharge is to be off-site, a consumptive use permit (40C-2) will be required prior to any dewatering.

24. A plan for routing of discharge water must be submitted to the DEP Central District Office for approval prior to commencement of dewatering.

WETLANDS IMPACTS

25. This permit authorizes wetland impacts of 15.23 acres for the Maitland Blvd. Extension project and 14.84 acres for the realignment of SR 429 part C, McKinney Road to Seidel Road, within SJRWMD's jurisdiction. The limits of the work area shall adhere to the lengths, widths, and locations established in the attached drawing sheets.

26. The project shall comply with applicable state water quality standards, including:

A. 62-302.500 - minimum criteria for all surface waters at all places and at all times;

B. 62-302.500 - Surface waters: general criteria;

C. 62-302.400 - Class III Waters - Recreation, Propagation and maintenance of a healthy, well balanced population of Fish and Wildlife; and

D. 62-302.530(70) - Turbidity shall not exceed 29 Nephelometric Turbidity Units above background.

27. The limits of construction within the wetlands shall be delineated by a continuous plastic flagging tape and/or the double-anchored turbidity barriers/silt fencing. The permittee shall bear the responsibility of notifying all construction workers that the flagging and/or barriers represent the limits of all construction activities. The permittee shall bear the responsibility of keeping all construction workers and equipment out of the adjacent wetlands where work has not been permitted for impacts.

28. The issuance of this permit does not infer, nor guarantee, nor imply that future permits or modifications will be granted by this Department. This permit does not infer authorization from any other agency.

29. Mitigation for the proposed wetland impacts will include $2,018,240 in funding from the OOCEA (applicant) to SJRWMD(recipient) for projects developed by the Environmental Advisory Group (EAG) and SJRWMD, in accordance with the Central Florida Beltway Trust Fund payment as required under Section 338.250 F.S.

    Mitigation for the proposed wetland impacts will also include the purchase of 11.5 forested mitigation bank credits from the Wekiva River Mitigation Bank (recipient).

    Mitigation funding transfer verification for both the Beltway Trust Fund and Wekiva River Mitigation Bank credits, from the applicant to the recipient, shall be completed and submitted to the Department (Central District) prior to ANY construction commencement.

Executed in Orlando, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

For Vivian F. Garfein
Director, Central District

Date of Issue: December 15, 2006

STATE ROAD 414
MAITLAND BOULEVARD EXTENSION
PROJECT 414-211

EXPRESSWAY
AUTHORITY

48-0262296003

ORLANDO-ORANGE COUNTY EXPRESSWAY AUTHORITY

PERMIT MODIFICATION
ERP NO. 48-0262296-001-EI

Prepared by:

Received
NOV 22 2006
Central Dist. SLERP

PARSONS
2420 Lakemont Avenue, Suite 450
Orlando, Florida 32814
(407) 702-6800

11/06/06

NOVEMBER, 2006

PARSONS
2420 Lakemont Avenue, Suite 450, Orlando, Florida 32814, Telephone (407) 702-6800

November 17, 2006

Ms. Debra Laisure
Florida Department of Environmental Protection
Central District
3319 Maguire Boulevard, Suite 232
Orlando, FL 32803-3767

Subject: **SR 414 (Maitland Blvd. Extension & SR 429 (Western Beltway) Realignment**
Section 414-211
Letter of Modification to Environmental Resource Surface Water Management Permit
ERP No. 48-0262296-001-EI
Orange County

Dear Ms. Laisure:

The Orlando Orange County Expressway Authority would like to modify the permit application previously submitted for Section 414-211. There will be two changes to the original permit application.

The first changes pertains to the dredge and fill drawing previously submitted for Wetland D, which is located east of Overland Road between stations 377+50 to 383+50. In the dredge and fill drawing submitted, 2.35 acres of impacts to this wetland were quantified. Based on the final plans, fill will be added along either side of Overland Road. This will add an additional impact of 0.13 acres to this wetland.

The reason for this change is that Orange County has plans to widen Overland Road to four lanes in the future, therefore the OOCEA agreed to add the fill within the limited access right of way on both the east and west sides of Overland Road at the request of the County. From the OOCEA point of view, this will alleviate potential damage to the bridge foundations, pipes and columns being installed under this project due to any future construction activities. This will also give the contractor for this project additional area to construct the bridge crossing over Overland Road.

The revised dredge and fill drawing as well as the previously submitted dredge and fill drawing are attached to this letter. Also attached are the updated plan sheets in the vicinity of Overland Road.

The second change pertains to Pond 4C. The pond dimensions and outfall control structure, OCS #4 have been modified. The pond area has been increased from 1.11 acres at the normal water level (elevation 92.0 feet, NAVD) to 1.80 acres at the same elevation. The pond bottom has been raised from 80.0 feet, NAVD to 81.0 feet, NAVD. The pond berm in Pond 4C has been lowered by 1'-6". Therefore the top of the berm now is located at elevation 97.5 feet, NAVD and the bottom of the berm is at elevation 95.0 feet, NAVD.

The changes to OCS #4, include the following: (1) Control structure has been changed from a modified type 'D' ditch bottom inlet to a modified type 'E' ditch bottom inlet; (2) the bleed down orifice has been reduced from 4.25-inches to 3.90-inches; (3) the overflow weir has been changed from a vertical weir with a weir length of 49-inches to a horizontal weir; (4) The overflow weir from a vertical weir to a horizontal weir; (4) the weir elevation has been changed from elevation 94.24 feet, NAVD to elevation 93.45 feet, NAVD; and (5) since the revised outfall control structure has been modeled as a horizontal weir the top of this structure has been lowered from elevation 98.0 feet, NAVD to elevation 93.45 feet, NAVD.

The OOCEA has included the following: (1) the ICPR hydraulic model and the supporting documentation submitted under RAI No. 2 in August of this year; (2) the revised ICPR model and the supporting documentation; and (3) the new pond detail sheet and pond cross sections.

This change was initiated to insure that Ramp X1 could drain to Pond 4C. The elevation of the low point of this ramp is such that this change is required to provide positive drainage from this area to the pond and to insure that a base clearance criterion is met.

In addition to the changes in the pond model, it should be pointed out the volume held between the normal water level (orifice elevation) and the overflow weir has been reduced from 7.29 acre-feet to 5.66 acre-feet. In the calculations submitted under RAI No. 2 the required water quantity volume was calculated to be 5.84 acre-feet. The difference in the calculated water quantity volume previously submitted and that submitted under this permit modification is due to the inclusion of the pre- and post-development runoff volume from the ICPR Hydrograph for Basin 7 into this calculation. Basin 7 drains to existing FDOT Pond B which is hydraulically connected to FDOT Pond A via the same outfall system as Pond 4C. The proposed improvements will divert a portion of the area draining to FDOT Pond B to Pond 4C; therefore it was deemed appropriate to add this numbers into the calculation of the required water quantity volume for Ponds 4A, 4B and 4C.

These changes will have minimal affect on the volume and rate of discharge to the wetland located downstream of the project site. Please feel free to contact me if you require any further information.

Thank you for your time.

Sincerely,

Edward James Kory, P.E.
Senior Drainage Engineer

Cc: Glen Pressimone (PBS&J)
Gary Elwer (PBS&J)
Rodger Schmidt (Parsons)
Paul Markel (Parsons)
File

POND Nos. 4A, 4B and 4C

REVISED INFORMATION

Updated Stormwater Staff Report Summary (FDEP)

Source: FDEP permit 48-0262296-001

Stormwater Staff Report Summary (FDEP)

Applicant: Orlando-Orange County	**Project Name:** SR 414 (Maitland Boulevard Extension)	
Expressway Authority (OOCEA)	**Contract No. 414-211**	
525 S. Magnolia Ave. Orlando, FL 32801	**Pond No. 4A, 4B, and 4C (CLOSED BASIN)**	
(407) 425-8606	Application #	
County **Orange**	Type of Permit **ERP MSSW**	
Latitude **28 Deg 38 min 4.39 sec**	Other FDEP Permits	
Longitude **81 Deg 27 min 6.73 sec**	Modification:	
Section(s) 30/Township 21S/Range 29E	Water Management District: **SJRWMD**	
	Engineer of Record: **Parsons Transportation Group,** 225 East Robinson St., Suite 300	
Drainage Basin: **Closed Basin**	Orlando, FL 32801 (407) 316-8400 Contact: Rodger Schmidt	
Wetlands: n/a		
Wetlands within project boundaries? No		
Are Wetlands impacted by development?No		
When did the DEP approve the Jurisdiction line?	**n/a**	
Existing Wetlands (Within Right of Way)		Acres forested wetlands
		Acres herbaceous wetlands
		Acres total wetlands
Proposed Wetland Impacts:		Acres forested wetlands
		Acres herbaceous wetlands
		Acres total wetlands
Mitigation	**n/a**	
Existing Development: **Industrial Site and Existing SR 414**		
Proposed Development: **SR 414 Bridge Section over CSX Mainline Railroad Track at Station 390+50. Fill Section to Bridge over SR 500 (U.S. 441), Fill Section to Project End Construction Limit at**		

Applicant: Orlando-Orange County		**Project Name:** SR 414 (Maitland Boulevard Extension)
Expressway Authority (OOCEA)		**Contract No. 414-211**
525 S. Magnolia Ave. Orlando, FL 32801		**Pond No. 4A, 4B, and 4C (CLOSED BASIN)**
Station 431+00, Interchange at U.S. 441. Treatment and attenuation will be accomplished in three interconnected ponds (Pond Nos. 4A, 4B and 4C) which will function as one pond. This pond system will treat and attenuate stormwater runoff conveyed to it before discharging into an existing permitted pond (FDOT Pond A). The area draining to FDOT Pond A will be reduced, therefore this project not adversely impact this pond. FDOT Pond A drains to an existing wetland system located outside the project limits. Based on the existing permit, a second pond, FDOT Pond B, drains to FDOT Pond A. This project will not increase the stormwater runoff to FDOT Pond B. The three interconnected ponds will utilize the same outfall system that FDOT Pond B uses. Therefore FDOT Pond A and FDOT Pond B will be included in the ICPR Pond Routing model for this basin.		
PRE-DEVELOPMENT CONDITIONS		
Impervious Acreage: **30.15 ac.**		Pervious Acreage: **27.15 ac.**
0.00	Acres Buildings	Soils **A and B/D**
0.00	Acres Pavement	
2.80	Acres Water Surface	
31.80	Acres Miscellaneous	14 ac. (Single Family @ 38% Imp) + 30.6 ac. (Industrial
34.60	**Acres Total**	@ 72% Imp) + 4.45 ac (SR 414 – via FDOT Pond B)
DCIA **0 %**		Composite CN= **78.0**
Total Drainage Area: **61.75 Ac.**		Total time of Conc. **30.0 minutes**
SCS Peaking Factor: **UH 323**		Rainfall Distribution: **SJRWMD**
Rainfall Storm #1 **12.0 inches**		Rainfall Storm #2: **8.60 inches**
Design Storm #1 **25 year/ 96 hour**		Design Storm #2: **25 year/ 24 hour**
Allowable V: **2057102.3 cubic feet**		Allowable Q: **39.42 cfs**
Maximum V: **n/a**		Maximum Q: **n/a**
POST-DEVELOPMENT CONDITIONS		
Impervious Acreage: **31.97 ac.**		Pervious Acreage: **43.47 ac**

Applicant: Orlando-Orange County	**Project Name:** SR 414 (Maitland Boulevard Extension)
Expressway Authority (OOCEA)	**Contract No. 414-211**
525 S. Magnolia Ave. Orlando, FL 32801	**Pond No. 4A, 4B, and 4C (CLOSED BASIN)**

0.00	Acres Buildings	
18.09	Acres Pavement	DCIA to Ponds 4A, 4B, and 4C
6.18	Acres Water Surface	Ponds 4A, 4B, 4C and FDOT Pond A
7.70	Acres Miscellaneous	
31.97	**Acres Total**	

DCIA **26.65 %**	Composite CN **60.02**
Total Drainage Area: **75.44 Acres**	**Total time of Conc. 16.50 minutes**
SCS Peaking Factor: **UH 323**	Rainfall Distribution: **ORANGE**
Rainfall Storm #1 **12.0 inches**	Rainfall Storm #2: **8.60 inches**
Design Storm #1 **25 year/ 96 hour**	Design Storm #2: **25 year/ 24 hour**
Allowable V: **2057102.3 cubic feet**	Allowable Q: **39.42 cfs**
Maximum V: **2303771.6 cubic feet**	Maximum Q: **28.40 cfs**

WATER QUALITY VOLUME:

Type Facility	**Wet**		Retention		
36.06	acres *	1.0	in/12/ft	3.01	acre feet
18.09	acres *	2.5	in/12/ft	3.77	acre feet
			Greater of the two	3.77	acre feet

Receiving Water Class: **Class III**

Receiving Water Body: **Wetland downstream of FDOT Pond A**

Estimated Seasonal High Water Table: **96.96 Ft. NAVD**

Pond Information:

Control Elev./Area **92.0 Ft., NAVD/3.38 acres**	Bottom El. **80.5 Ft., NAVD (Pond 4A)**

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Applicant: Orlando-Orange County	**Project Name:** SR 414 (Maitland Boulevard Extension)
Expressway Authority (OOCEA)	**Contract No. 414-211**
525 S. Magnolia Ave. Orlando, FL 32801	**Pond No. 4A, 4B, and 4C (CLOSED BASIN)**
	Bottom El. **80.0 Ft., NAVD (Pond 4B) and 81.0 Ft., NAVD (Pond 4C)**
Berm/Top of Bank Elev. **99.0 Ft., NAVD (Ponds 4A and 4B); 97.5 Ft., NAVD (Pond 4C)**	Berm Width **20.0 ft @ 8:1**
Side Slopes **4:1 From Elev. 96.5 Ft., NAVD to Pond Bottom @ Elev 80.5 Ft., NAVD (Pond 4A);** **4:1 From El 96.5 Ft., NAVD to Elev. 90.0 Ft., NAVD (Pond 4B; amd 4:1 From El 95.0 Ft., NAVD to Elev. 90.0 Ft., NAVD (Pond 4C)** **2:1 From Elev. 90.0 Ft., NAVD to Pond Bottom @ Elev. 80.0 Ft., NAVD (Pond 4B); and 2:1 From Elev. 90.0 Ft., NAVD to Pond Bottom @ Elev. 81.0 Ft., NAVD (Pond 4C)**	

Stage/Storage

Elevation	Area/Volume
92.0	**3.38 acres/ 0 acre-feet**
95.0	**4.18 acres/ 11.66 acre-feet**
97.5	**4.43 acres/ 23.23 acre-feet**
Runoff Coefficient **0.65**	Drainage area: **36.06 acres**
# days wet season **122 days**	Mean Depth: **7.91 feet**
Precipitation **28.03 inches**	Residence Time Desired > or = **21 days**
Area at NWL **3.38 acres**	Perm Pool Vol. Provided: **26.74 acre-feet**
Perm. Pool Vol. Required: **9.44 acre-feet**	Wet Season Tailwater Elev.: **87.0 Ft., NAVD**
Discharge Structure (from plans)	Structure No. **OCS-4**

Applicant: Orlando-Orange County	**Project Name:** SR 414 (Maitland Boulevard Extension)
Expressway Authority (OOCEA)	**Contract No. 414-211**
525 S. Magnolia Ave. Orlando, FL 32801	**Pond No. 4A, 4B, and 4C (CLOSED BASIN)**

Orifice: Shape: **Circular** Dimensions(in): **3.90 inches** Invert elev.: **92.0 Ft., NAVD**

Weir: Type: **Horizontal** Length: **15 feet** Crest Elev. **93.45 Ft., NAVD**

Type of Inlet **E** Top of Structure **93.45 Ft., NAVD**

Skimmer Blade: Top Elev. **97.0 Ft., NAVD** Bottom Elev. **92.95 Ft., NAVD**

Outfall Pipe: Dimension/Length/Type (RCP,CMP,etc) **30 inch RCP, 188 LF**

Underdrain System: Type: Bottom Mounded Side Bank **Not Applicable**

Length Underdrain Size pipe Centerline Elev.

Data Input Filenames: Pre: **SR414-211 Basin6Pre.ICP** Post: **Basin6.ICP**

Miscellaneous Notes: **Pond No. 4A, 4B and 4C will treat and attenuate the storm water runoff from Basin No. 6A, 6B and 6C (36.06 acres) that will drain to this pond system. This pond system will drain to existing FDOT Pond A, utilizing the same outfall pipe that FDOT Pond B. The drainage area to FDOT Pond A will be reduce from 53.5 acres to 31.81 acres, with the remaining area being conveyed to Ponds 4A, 4B and 4C. The existing drainage area to FDOT Pond B will be reduced from 8.25 acres to 7.57 acres. This project will not increase the flood stages of existing ponds, FDOT Pond A or FDOT Pond B or the flow into the existing wetland downstream of FDOT Pond A.**

POND No. 4A, 4B and 4C

REVISED INFORMATION

Updated Post-Dev Basin Calc.
Updated Water Quality Volume Calc.
Updated Water Quality Storage Volume Calc.
Updated Orifice Calc.
Updated Permanent Pool Volume Calc.

PARSONS ENGINEERS AND PLANNERS	SUBJECT:	Maitland Blvd. Ext. SR 414-211 Basin No. 6A Post-Development Basin Calc.	JOB # 646262
	MADE BY:	EJK	DATE: 06/09/06
	CHECKED BY:		DATE:

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Mailand Boulevard Extension **BASIN NO. 6A**

Basin No. 6A consists of 20.00 acres draining to Pond 4A. 6.94 acres of the area being conveyed to Pond 4A previously drained to FDOT Pond A.

Total Area (A) =	20.00	acres
Water Surface =	1.01	acres
DCIA =	11.49	acres
% DCIA =	57.45	%
Pervious =	7.50	acres

Soils:	
Candler Fine Sand; 5 to 12% slopes;"A";(SCS Number 4); Area=	0.63 acres
Tavares-Millhopper Fine Sands; "A"; (SCS Number 46); Area =	3.08 acres
Tavares-Millhopper Fine Sands; "A"; (SCS Number 47); Area =	0.64 acres
Urban Land; (SCS Number 50); Area =	3.15 acres
	7.50 acres

Weighted Curve Number Calculation (CN)

Land Use	SCS Class	Area	CN	Product
Open Space, good condition	A	7.50	39	292.50
Water Surface		1.01	100	101.00
		8.51		393.50

Weighted CN = 46

Time of Concentration (Tc)

See Storm Sewer Tabulation Form for time of concentration

TOTAL TIME OF CONCENTRATION (Tc)

Tc = 13.8 minutes

2

PARSONS
ENGINEERS AND PLANNERS

SUBJECT:	Maitland Blvd. Ext. SR 414-211	JOB # 646262	
	Basin No. 6B Post-Development Basin Calc.		
MADE BY:	EJK	DATE:	06/08/06
CHECKED BY:		DATE:	

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5.62 acres

Mailand Boulevard Extension **BASIN NO. 6B**

Basin No. 6B consists of ~~5.66~~ acres draining to Pond 4B. The area draining to Pond 4B previously drained to FDOT Pond A.

Total Area (A) =	5.62	acres
Water Surface =	0.57	acres
DCIA =	1.60	acres
% DCIA =	28.47	%
Pervious =	3.45	acres

Soils:	Candler Fine Sand; 5 to 12% slopes;"A";(SCS Number 4); Area=	0.55 acres
	Tavares-Millhopper Fine Sands; "A"; (SCS Number 46); Area =	1.66 acres
	Tavares-Millhopper Fine Sands; "A"; (SCS Number 47); Area =	0.72 acres
	Basinger Fine Sands Depressional; "D"; (SCS Number 3); Area =	0.20
	Seffner Fine Sand;"C"; (SCS Number 43); Area=	0.32 acres
		3.45 acres

Weighted Curve Number Calculation (CN)

Land Use	SCS Class	Area	CN	Product
Open Space, good condition	A	2.93	39	114.27
Open Space, good condition	C	0.32	74	23.68
Open Space, good condition	D	0.20	80	16.00
Water Surface		0.57	100	57.00
		4.02		210.95

Weighted CN = 52

Time of Concentration (Tc)

See Storm Sewer Tabulation Form for time of concentration

TOTAL TIME OF CONCENTRATION (Tc)

Tc = 10.0 minutes

PARSONS *ENGINEERS AND PLANNERS*	**SUBJECT:**	Maitland Blvd. Ext. SR 414-211 Basin No. 6C Post-Development Basin Calc.	**JOB #** 646262
	MADE BY:	EJK	**DATE:** 09/19/06
	CHECKED BY:		**DATE:**

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Mailand Boulevard Extension **BASIN NO. 6C**

Basin No. 6C consists of 10.44 acres draining to Pond 4C. 8.99 acres of the area being conveyed to Pond 4C previously drained to FDOT Pond A and 0.68 acres drained to FDOT Pond B.

Total Area (A) =	10.44	acres
Water Surface =	1.80	acres
DCIA =	5.00	acres
% DCIA =	47.89	%
Pervious =	3.64	acres

Soils:	Tavares-Millhopper Fine Sands; "A"; (SCS Number 46); Area =	2.64 acres
	Tavares-Millhopper Fine Sands; "A"; (SCS Number 47); Area =	0.65 acres
	Basinger Fine Sands Depressional; "D"; (SCS Number 3); Area =	0.20 acres
	Seffner Fine Sand;"C"; (SCS Number 43); Area=	0.15
		3.64 acres

Weighted Curve Number Calculation (CN)

Land Use	SCS Class	Area	CN	Product
Open Space, good condition	A	3.29	39	128.31
Open Space, good condition	C	0.20	74	14.80
Open Space, good condition	D	0.15	80	12.00
Water Surface		1.80	100	180.00
		5.44		335.11
		Weighted CN =		**62**

Time of Concentration (Tc)

See Storm Sewer Tabulation Form for time of concentration

TOTAL TIME OF CONCENTRATION (Tc)

Tc = **13.7 minutes**

PARSONS ENGINEERS AND PLANNERS	**SUBJECT:**	Maitland Blvd. Ext. SR 414-211 Basin No. 6 Post-Development Basin Calc.	**JOB #** 646262
	MADE BY:	EJK	**DATE:** 06/09/06
	CHECKED BY:		**DATE:**

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Mailand Boulevard Extension **Rose Cove Industrial Park**

Basin No. 6 consists of 31.81 acres draining to FDOT Pond A. This is the remnant area of the permitted area, draining to this pond, from the Rose Cove Industrial Park Permit. Please see SJRWMD Permit # 4-095-0216A. The DCIA area includes includes 1.35 acres from the existing building, 1.57 acres of parking space, and 0.79 acres of new access road.

Total Area (A) =	31.81	acres
Water Surface =	2.80	acres
DCIA =	3.71	acres
% DCIA =	11.66	%
Pervious =	25.30	acres

Soils:	Candler Fine Sand; 5 to 12% slopes;"A";(SCS Number 4); Area=	3.07 acres
	Sanibel Muck;"B/D";(SCS Number 42); Area=	1.68 acres
	Seffner Fine Sand;"C"; (SCS Number 43); Area=	4.05 acres
	Tavares-Millhopper Fine Sands; "A"; (SCS Number 46); Area =	1.65 acres
	Tavares-Millhopper Fine Sands; "A"; (SCS Number 47); Area =	13.62 acres
	Basinger Fine Sands Depressional; "D"; (SCS Number 3); Area =	0.63 acres
	Urban Land; (SCS Number 50); Area =	0.6 acres
		25.30 acres

Weighted Curve Number Calculation (CN)

Land Use	SCS Class	Area	CN	Product
Single Family Homes	A	12.45	61	759.45
Single Family Homes	B/D	0.37	87	32.19
Open Space, fair condition	C	4.05	74	299.70
Open Space, fair condition	A	6.49	49	318.01
Open Space, fair condition	D	1.94	84	162.96
Water Surface	C	2.80	100	280.00
		28.10		1852.31

Weighted CN = 66

8

Time of Concentration (Tc)

Sheet flow overland for 300', than shallow concentrated flow to existing FDOT Pond 'A'

1) KINEMATIC WAVE (TR-55)

n =	0.13 (Range)	
L =	300 ft	
P2 =	4.8 in	
Change in elevation =	7.5 ft	(101' - 93.5')
S =	0.025 ft/ft	
T(1) =	((.007(nL)^.8)/(P2^.5*S^.4)) * (60 min/hour)	
T(1) =	**15.71 minutes**	

2) SHALLOW CONCENTRATED FLOW (TR-55)

L =	149 ft		
Change in elevation =	5.5 ft		(93.5' - 88')
S =	0.036912752 ft/ft		
Velocity (V) =	16.1345*(S)^0.5	V=	3.10 fps
T(2) =	(L/(V*60 min/hour))		
T(2) =	**0.80 minutes**		

TOTAL TIME OF CONCENTRATION (Tc)

Tc =	T(1) + T(2) + T(3)	**Tc =**	**16.5 minutes**

PARSONS *ENGINEERS AND PLANNERS*	**SUBJECT:** Maitland Blvd. Ext. SR 414-211 Ponds 4A, 4B, & 4C - Water Quality Volume		**JOB #** 646262
	MADE BY:	EJK	**DATE:** 09/19/06
	CHECKED BY:		**DATE:**

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Pond No. 4A, 4B, & 4C

Water Quality Volume (WQV) Required
Ponds No. 4A, 4B and 4C are located in an closed basin in Orange County within the boundaries of the SJRWMD. As Orange County considers Long Lake an open basin and SJRWMD considers it a closed basin, use the SJRWMD criteria; therefore the greater of: 1.0" of runoff from the entire contributing area, or 2.5" over the impervious area for a wet detention pond.

$$WQV = \frac{R\,(in.) * A\,(ac.)}{(12\ in./ft.)}$$

R = 1 in.
A = 36.06 ac.

therefore, WQV = 3.01 ac.-ft.

or

$$WQV = \frac{R\,(in.) * Imp\ A\,(ac.)}{(12\ in./ft.)}$$

R = 2.5 in.
A = 18.09 ac.

therefore, WQV = 3.77 ac.-ft.

Water Quantity (Attenuation) Volume Required

From the Pre-Development Hydrograph:

25 Year 96 hour Storm Runoff Volume = 2057102.31 cf

From the Post-Development Hydrograph:

25 Year 96 hour Storm Runoff Volume = 2303771.55 cf

therefore use: 246669.24 cf **5.66 ac.-ft.**

PARSONS *ENGINEERS AND PLANNERS*	**SUBJECT:** Maitland Blvd. Ext. SR 414-211 Pond No. 4A - Water Quality Storage Volume	**JOB #** 646262
	MADE BY: KJP	**DATE:** 08/02/06
	CHECKED BY:	**DATE:**

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Pond No. 4A

Pond Control Elevation: **92.00 NAVD.**

BASINS 4A, 4B and 4C STAGE / STORAGE RELATIONSHIP (POND#4A)

Stage	Area	Average Area	Storage	Accum. Storage
80.50	0.38		0.00	0.00
		0.70		
92.00	1.01		7.99	7.99
92.00	1.01		0.00	0.00
		1.18		
96.50	1.34		5.29	5.29
		1.55		
99.00	1.76		3.88	9.16

PARSONS
ENGINEERS AND PLANNERS

SUBJECT:	Maitland Blvd. Ext. SR 414-211 Pond No. 4B - Water Quality Storage Volume	JOB #	646262
MADE BY:	EJK	DATE:	08/02/06
CHECKED BY:		DATE:	

Pond No. 4B

P:\646262\ Drainage\Basin 5 rev 121205.xls

Pond Control Elevation: **92.00 NAVD.**

BASINS 4A, 4B and 4C STAGE / STORAGE RELATIONSHIP (POND#4B)

Stage	Area	Average Area	Storage	Accum. Storage
80.00	0.19		0.00	0.00
		0.32		
90.00	0.45		3.20	3.20
		0.51		
92.00	0.57		1.02	4.22
92.00	0.57		0.00	0.00
		0.73		
96.50	0.88		3.26	3.26
		1.08		
99.00	1.28		2.70	5.96

PARSONS ENGINEERS AND PLANNERS	SUBJECT: Maitland Blvd. Ext. SR 414-211	JOB # 646262
	Pond No. 4C - Water Quality Storage Volume	
	MADE BY: KJP	DATE: 11/02/06
	CHECKED BY:	DATE:

P:\646262\ Drainage\Basin 5 rev 121205.xls

Pond No. 4C

Pond Control Elevation: **92.00 NAVD.**

BASINS 4A, 4B and 4C STAGE / STORAGE RELATIONSHIP (POND#4C)

Stage	Area	Average Area	Storage	Accum. Storage
81.00	0.97		0.00	0.00
		1.25		
90.00	1.52		11.21	11.21
		1.66		
92.00	1.80		3.32	14.53
92.00	1.80		0.00	0.00
		1.99		
95.00	2.17		5.96	5.96
		2.54		
97.50	2.90		6.34	12.29

Water Quality Volume (WQV) Provided

Note: The Water Quantity (Attenuation) Volume is greater than the required Water Quality Treatment Volume,

therefore use: **WQV =** **5.66 ac.-ft.**

WATER QUALITY ELEVATION

Stage	Storage (ac-ft)
92.00	0
95.00	11.7

Therefore, from linear interpolation, minimum water quality elevation = **93.45** NAVD
to provide 5.66 ac-ft of water quality volume.

Set weir overflow elevation at 93.45 to provide 5.66 ac-ft of Water Quality Volume

PARSONS *ENGINEERS AND PLANNERS*	**SUBJECT:**	Maitland Blvd. Ext. SR 414-211 Ponds 4A, 4B, & 4C Permanent Pool Volume	**JOB #** 646262
	MADE BY:	EJK	**DATE:** 09/19/06
	CHECKED BY:		**DATE:**

P:\646262\ Drainage\Basin 5 rev 121205.xls

Pond Nos. 4A 4B, & 4C

CHECK MINIMUM PERMANENT WET POOL VOLUME

From Chapter 40C-42 of SJRWMD Applicants Handbook MSSW
Check minimum permanent wet pool volume.

Vr = 21 day residence volume (For non-littoral zone option)

Vr = ACPR(1/12)

A = 36.06 acres
C = Runoff coefficient = 0.65
P = Historic average wet season rainfall = 28.03 in/122 day
R = 21 day residence time

Composite C comp

DCIA =	18.09	ac (A1);	0.95
Pervious	14.59	ac (A2);	0.20
Water =	3.38	ac (A3);	1.00

Composite c =((A1 * c1) + (A2 * c2) + (A3 * c3))/ A
c = 0.65

therefore, Vr =A * (c) * (28.03/122) *21 *(1/12) = 9.44 ac-ft

Also, since the proposed volume below elevation 92.00 is 26.74 ac-ft;
this proposed design meets SJRWMD criteria.

CHECK MEAN DEPTH OF PERMANENT WET POOL VOLUME

Storage Volume Below the Control Elevation of 92.0 feet, NAVD is 26.74 acre-feet

Surface Area of Pond at Control Elevation of 92.0 feet, NAVD is 3.38 acres

Therefore the Mean Depth = 26.74 acre-feet/3.38 acres = 7.91 feet

Also, since the Mean Depth is greater than 2 feet and less than 8 feet, the proposed design meets SJRWMD criteria.

INCLUDE BACKGROUND SEEPAGE INTO REQUIRED PERMANENT POOL VOLUME

From Background Seepage Analysis (attached)

Pond 4A - 0.009 cfs; Pond 4B - 0.007 cfs; Pond 4C - 0.036 cfs

=> [(0.009 cfs + 0.007 cfs + 0.036 cfs) * (86400 sec / 1 day) * 21 day * (1 ac / 43560 sf)] = 2.17 ac-ft

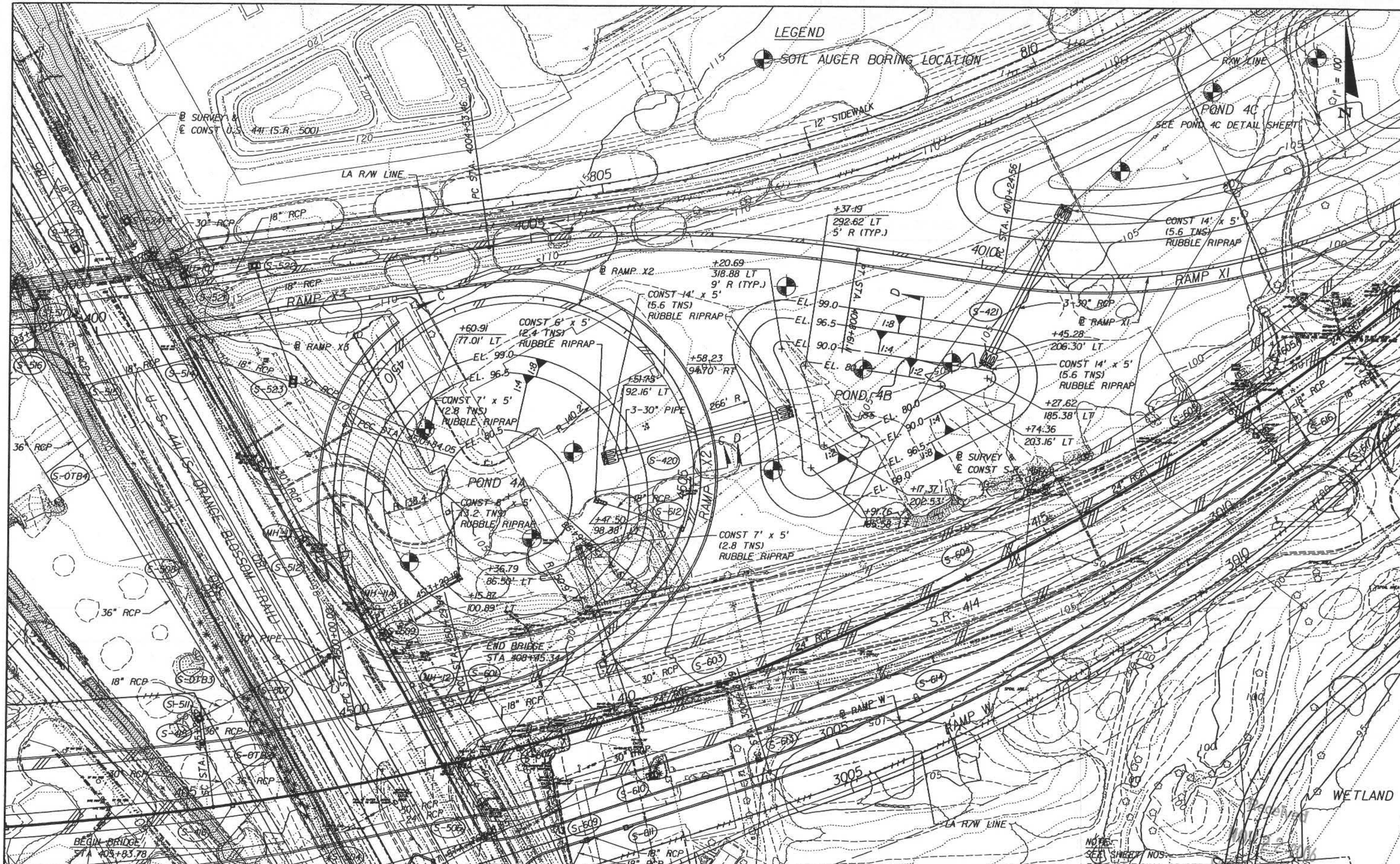
=> 2.17 ac-ft + 9.44 ac-ft = 11.61 ac-ft

Therefore, since the proposed volume below elevation 92.00 is 26.74 ac-ft;
this proposed design exceeds SJRWMD criteria when background seepage is added
to the 21 day residence time.

POND No. 4A, 4B and 4C

REVISED INFORMATION

Updated Pond Detail Sheets



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

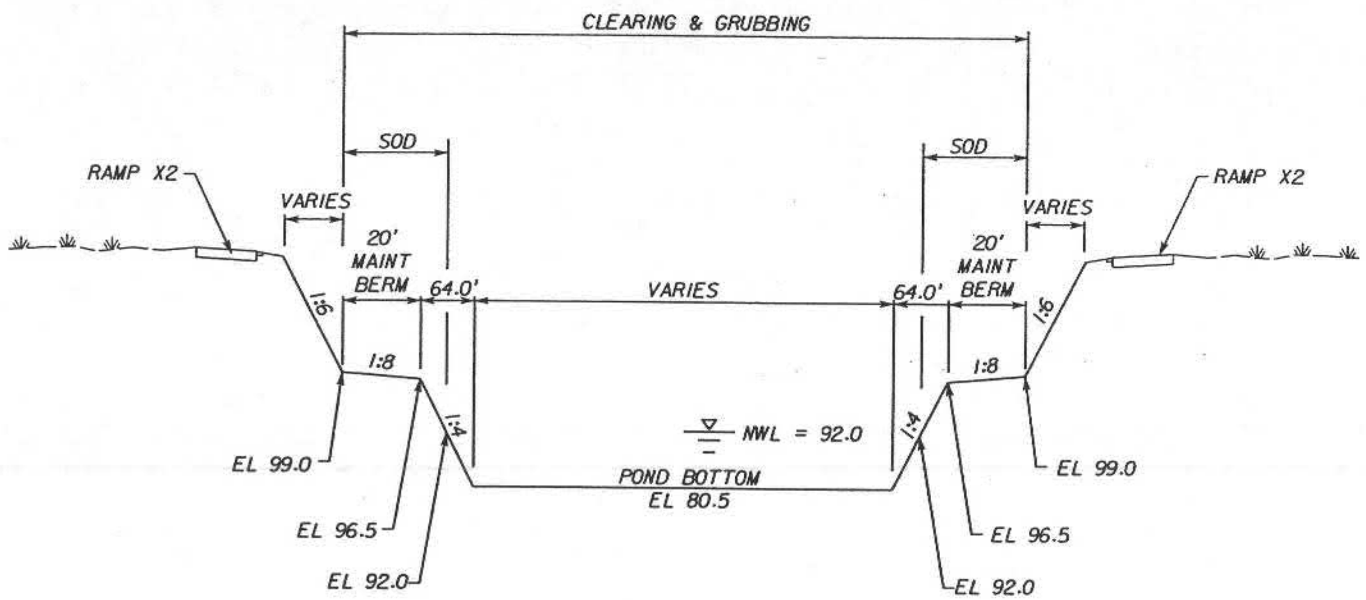
EDWARD J. KORT, P.E.
P.E. LICENSE NO. 53178
PARSONS
2420 LAKEMONT AVE., SUITE 450 ORLANDO, FL 32814
PHONE: (407) 702-6800 / FAX: (407) 702-6950
CERTIFICATE OF AUTHORIZATION NO. 1838

CONTRACT No. 414-211

EXPRESSWAY AUTHORITY

S.R. 414
POND Nos. 4A & 4B
DETAIL SHT

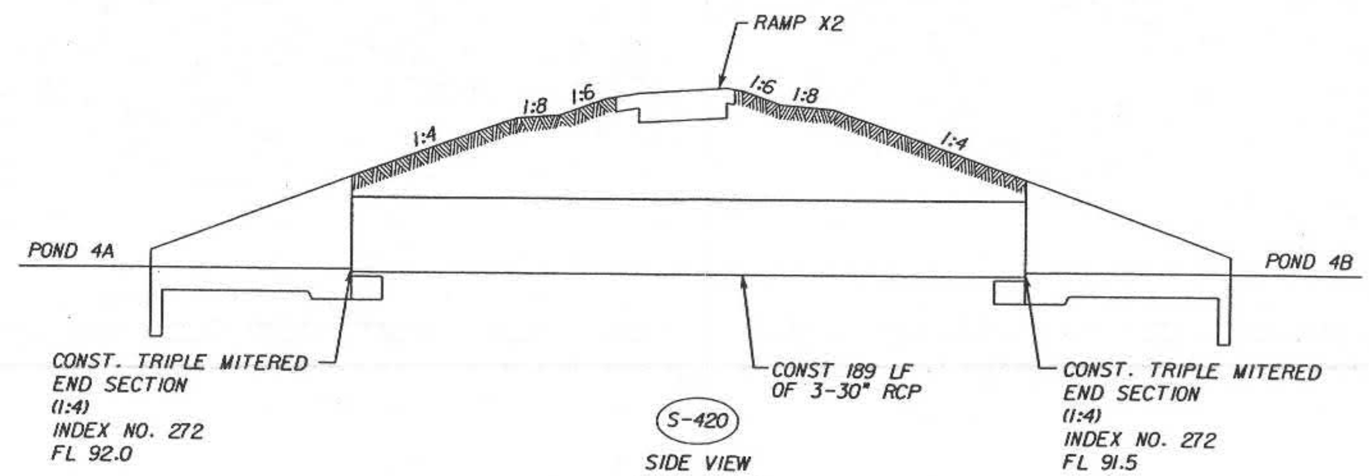
SHEET NO. 235



SECTION C-C
N.T.S.

STORM FREQ.	PEAK STAGE
10 YEAR/24 HOUR (STORMSEWER TAILWATER)	94.27
25 YEAR/96 HOUR (SJRWMD DESIGN STORM)	95.66

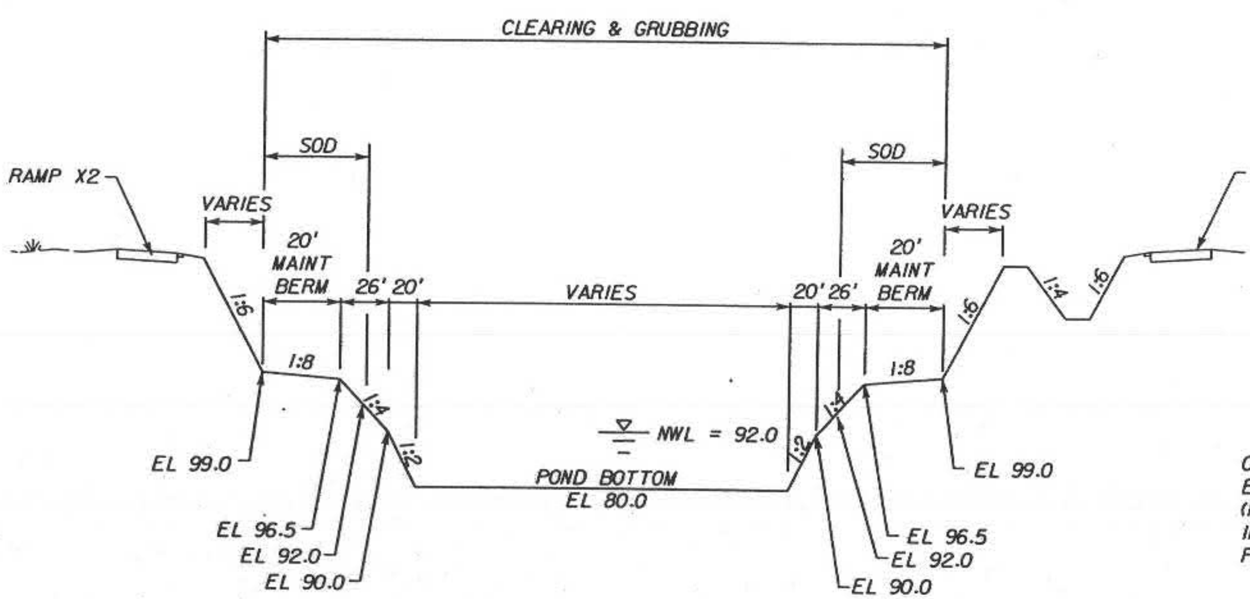
NOTE: 1' MINIMUM COVER OVER 3-30" OUTFALL PIPE.



SIDE VIEW
(N.T.S.)

NOTE: STATIONS AND OFFSETS FOR S-420 WITHIN POND 4A BASED ON BASELINE RAMP X2

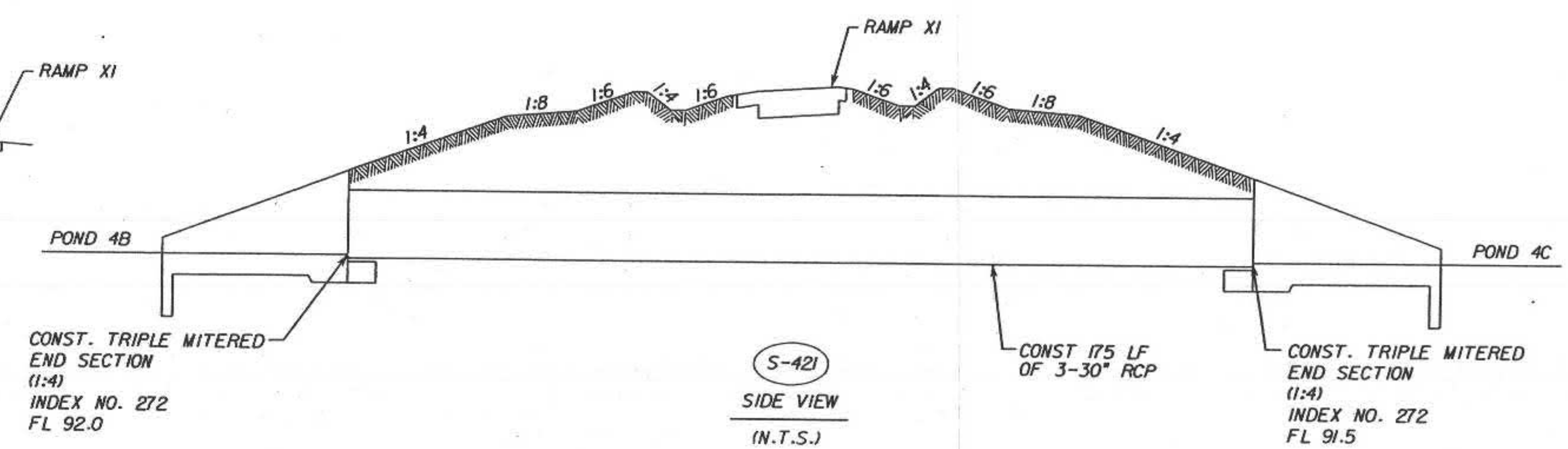
POND 4A



SECTION D-D
N.T.S.

STORM FREQ.	PEAK STAGE
10 YEAR/24 HOUR (STORMSEWER TAILWATER)	94.23
25 YEAR/96 HOUR (SJRWMD DESIGN STORM)	95.63

NOTE: 1' MINIMUM COVER OVER 3-30" OUTFALL PIPE.



SIDE VIEW
(N.T.S.)

POND 4B

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

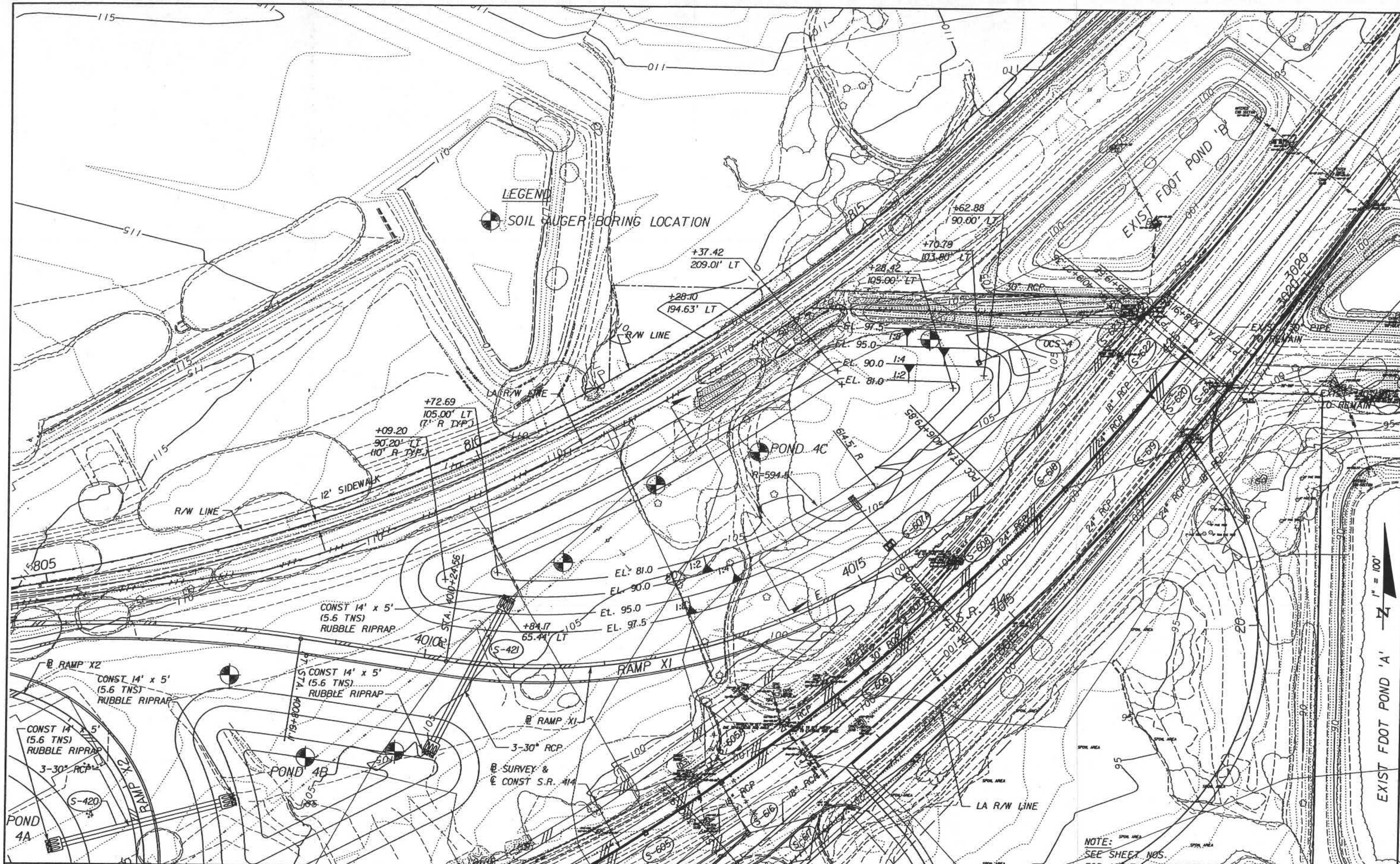
EDWARD J. KORY, P.E.
P.E. LICENSE NO. 53178
PARSONS
2420 LAKEMONT AVE., SUITE 450 ORLANDO, FL 32814
PHONE: (407) 702-6800 / FAX: (407) 702-6950
CERTIFICATE OF AUTHORIZATION NO. 1838

CONTRACT No. 414-211

EXPRESSWAY AUTHORITY

S.R. 414
PONDS 4A & 4B DETAILS

SHEET NO. 236



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EDWARD J. KORY, P.E.
P.E. LICENSE NO. 53178
PARSONS
2420 LAKEMONT AVE., SUITE 450 ORLANDO, FL 32814
PHONE: (407) 702-6800 / FAX: (407) 702-6950
CERTIFICATE OF AUTHORIZATION NO. 1838

CONTRACT No. 414-211

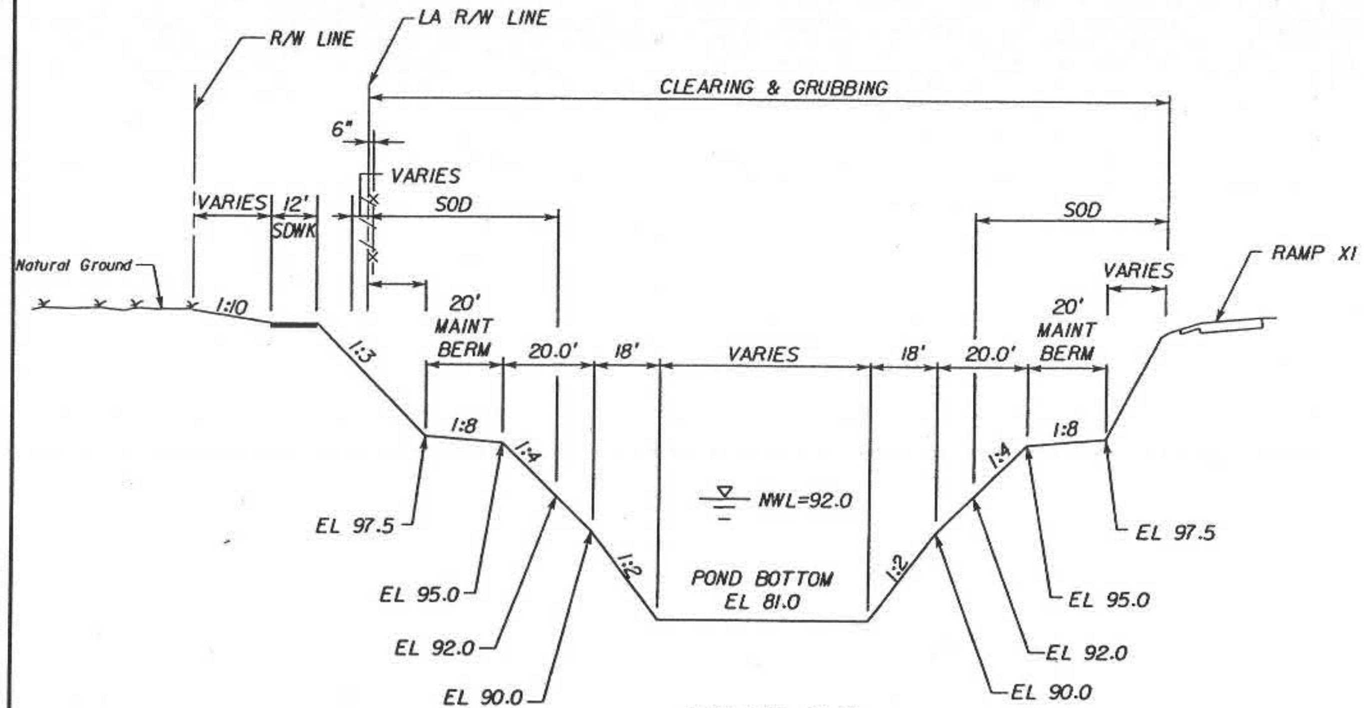
EXPRESSWAY AUTHORITY

S.R. 414
POND No. 4C DETAIL SHT

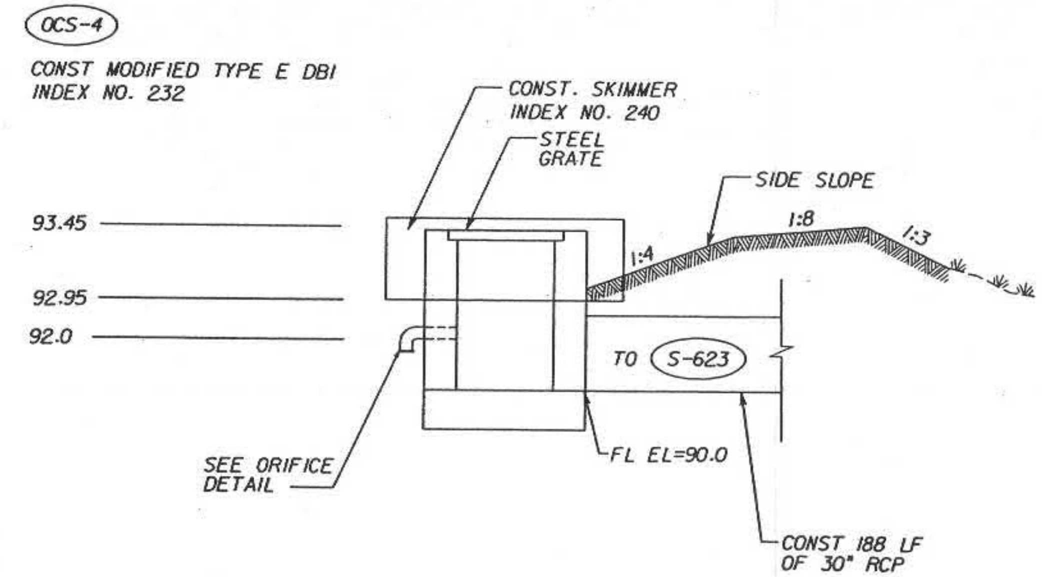
SHEET NO. 237

p0003916 9/28/2006 12:32:44 PM P:\646262\646262\drainage\pdplrd04c.dgn

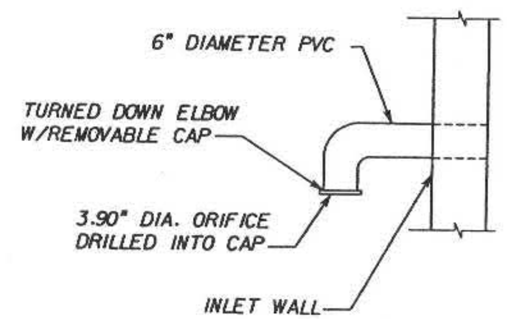
NOTE: 1' MINIMUM COVER OVER 30" OUTFALL PIPE.



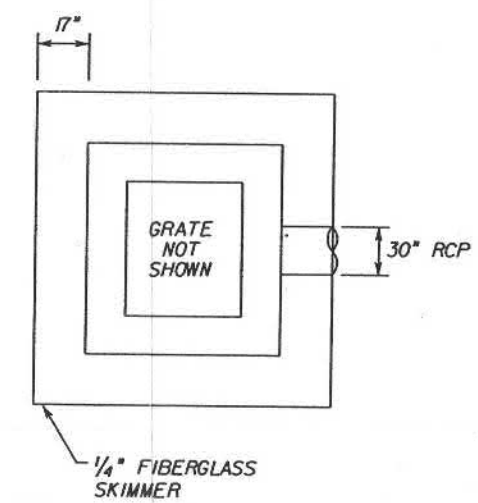
SECTION E-E
N.T.S.



SIDE VIEW
(N.T.S.)



ORIFICE DETAIL
(N.T.S.)



PLAN VIEW
(N.T.S.)

STORM FREQ.	PEAK STAGE
10 YEAR/24 HOUR (STORMSEWER TAILWATER)	94.18
25 YEAR/96 HOUR (SJRWMD DESIGN STORM)	95.60

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EDWARD J. KORY, P.E.
P.E. LICENSE NO. 53178
PARSONS
2420 LAKEMONT AVE., SUITE 450 ORLANDO, FL 32814
PHONE: (407) 702-6800 / FAX: (407) 702-6950
CERTIFICATE OF AUTHORIZATION NO. 1838

CONTRACT No. 414-211

EXPRESSWAY AUTHORITY

S.R. 414
POND 4C DETAILS

SHEET NO. 238

Basin B

DYER, RIDDLE, MILLS & PRECOURT, INC. ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS	SH. NO.:	JOB NO.: 89-259.20
Maitland Blvd.	MADE BY:	DATE:
	CHECKED BY:	DATE:

Basin B Post Development

Land Use	Symbol	Soil	Area	CN	Product
Pond Area	Sc	B/D	2.16 Ac	61	131.76
Offsite Open Space	Sc	B/D	0.51 Ac	61	31.11
Roadway (impervious)	Ba/Bc	A	1.82 Ac	98	178.36
Roadway (Rose Ave, Existing)	Ba/Bc	A	0.73 Ac	98	71.54
Roadway (impervious)	Sc	B/D	1.90 Ac	98	186.20
Roadway Open (Clean Fill)	—	A	1.13 Ac	39	44.07
			8.25 Ac		643.04

CN = 643.04 / 8.25 = 77.94

S = 1000 / 77.94 - 10 = 2.83

P_{10} = 7.4

P_{25} = 8.6

Q_{25} = 5.941 Vol. = 4.085 AF

Since a below bottom underdrain system will require an excessive amount of underdrain it would be more practical to utilize the traditional side bank filter to control the ground water table and recover the retention volume.

Retention Volume

1.5" of runoff or 3.0" of impervious area

1.5"(8.25ac)(1/12) = 1.03 ac-ft ✓

3.0"(3.72ac)(1/12) = 0.93 ac-ft

Retention Volume = 1.03 ac-ft

3-48

DYER, RIDDLE, MILLS & PRECOURT, INC. ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS	SH. NO.:	JOB NO.: 89-259.01
Maitland Blvd.	MADE BY: TWS	DATE:
	CHECKED BY:	DATE:

Basin B Pond Design

Stage Storage

EL.	Area	Volume
97	14,359	0
98	17,000	0.360 AF
99	19,790	0.784 AF
100	22,890	1.283 AF
101	26,214	1.863 AF
102	34,324	2.558 AF
103	42,433	3.439 AF

Ret Vol = 1.03 ac-ft

Ret EL = 99.49 ≈ 99.50

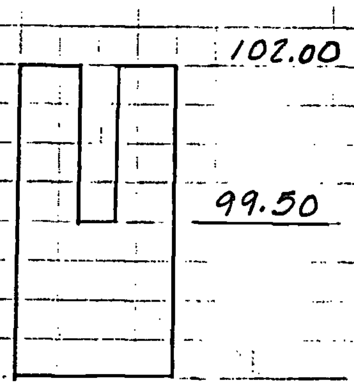
MAX PRE-DEVELOPMENT DISCHARGE = 9.16 cfs

Assume DHW = 102.00 which will allow for 1.0 ft of freeboard,

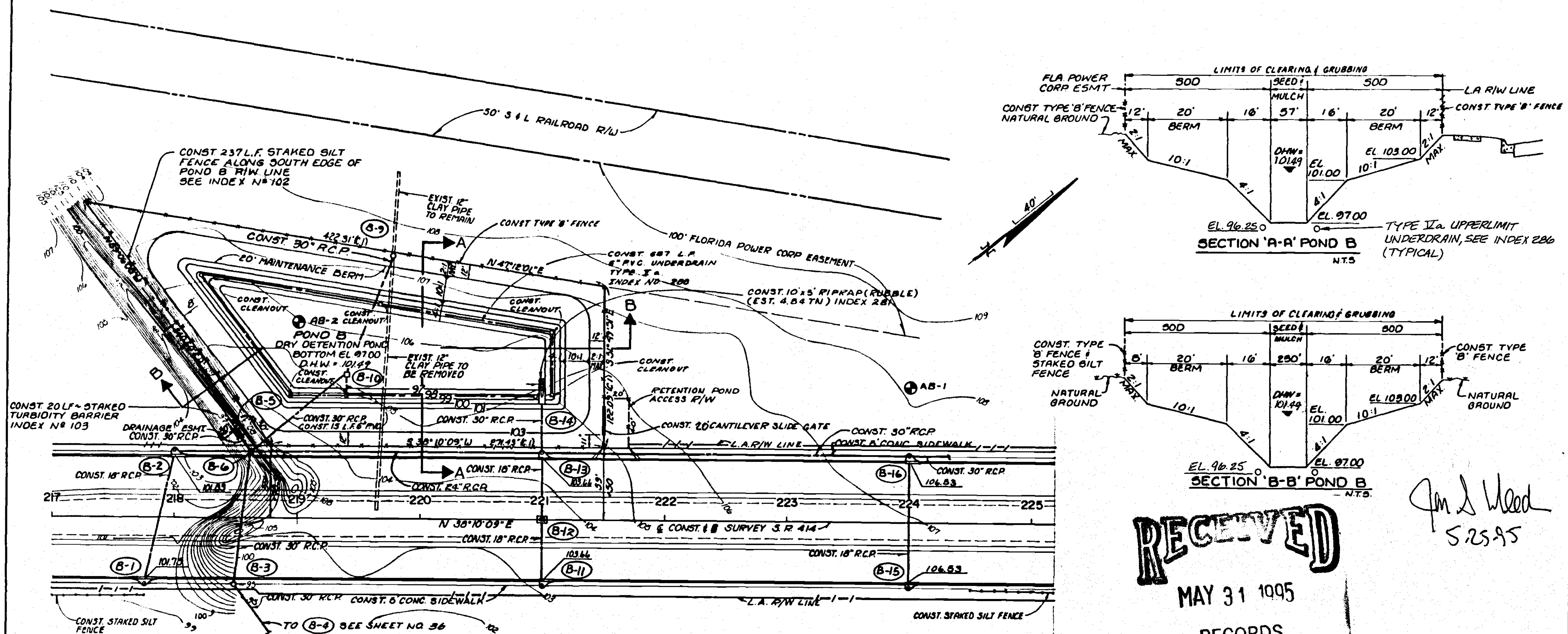
$$Q = CLH^{1.5}$$

$$9.16 = 3.13(L)(102.00 - 99.50)^{1.5}$$

$$L = 0.74 \approx \underline{0.70\ ft}$$



STATE PROJ. NO.	SHEET NO.
75011-3508	37



Jon S Mead
5.25.95

RECEIVED
MAY 31 1995
RECORDS
ORLANDO

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

REVISIONS

	NAME	DATE		NAME	DATE
DESIGNED BY	T.W.S.	3-91	DRAWN BY	L.J.P.	8-91
CHECKED BY	J.J.M.	10-91	CHECKED BY	T.W.S.	9-91

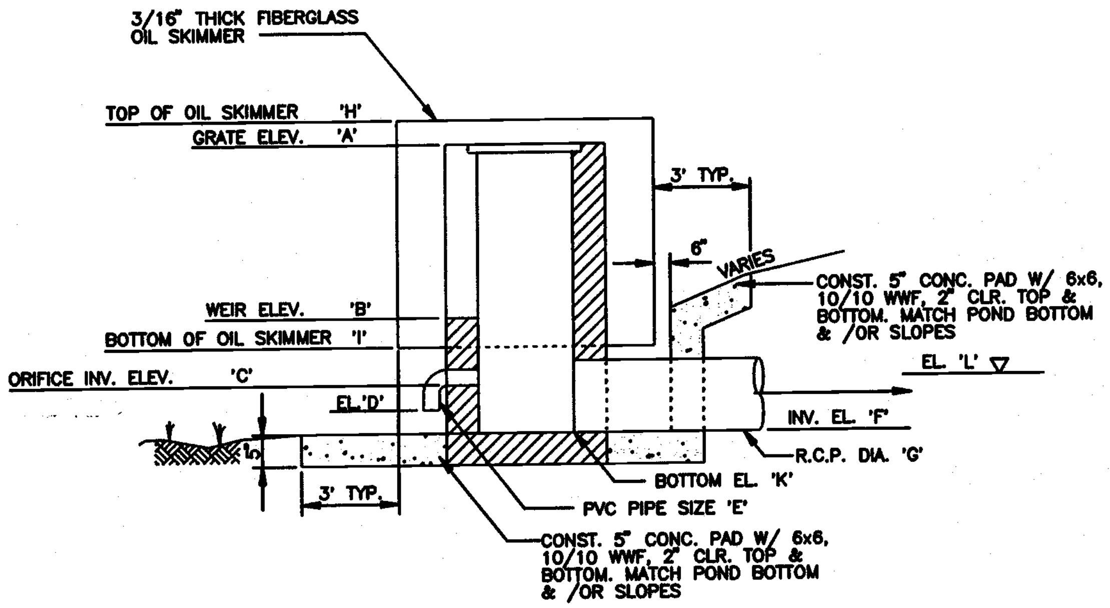
SUPERVISED BY JON S. MEADOWS

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY JON S. MEADOWS
DATE

Prepared By: Dyer, Riddle, Mills & Precourt, Inc.

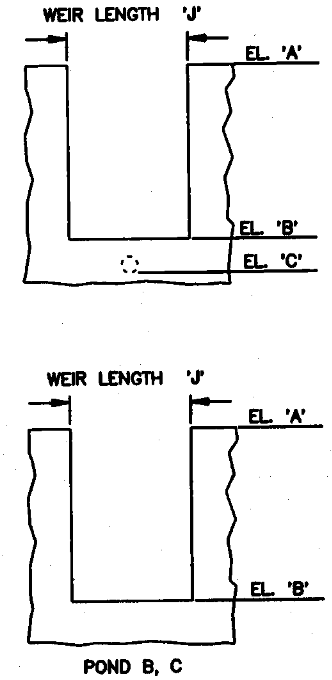
RETENTION POND B

Source: SJRWMD permit 20930-1



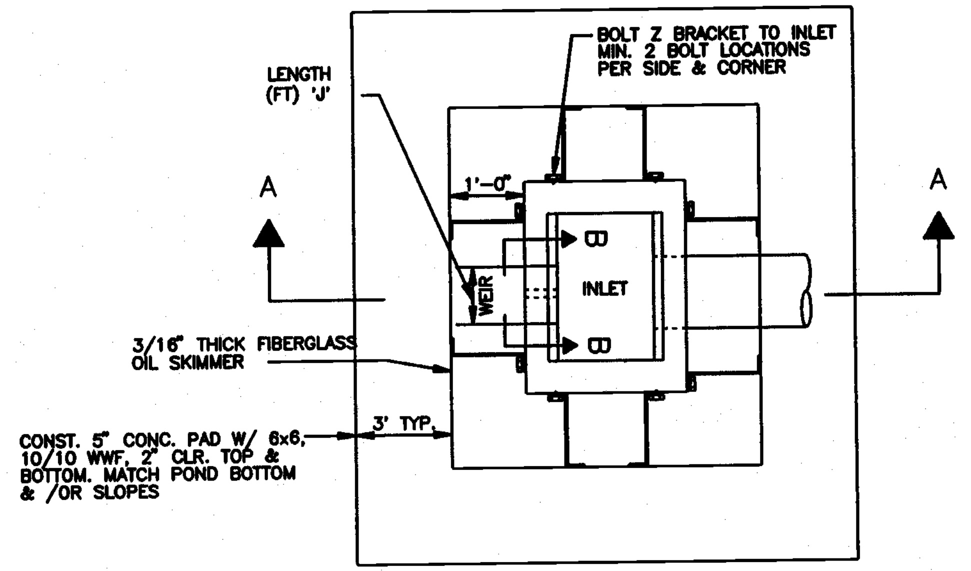
SECTION A – A

N.T.S.



SECTION B – B

N.T.S.



PLAN

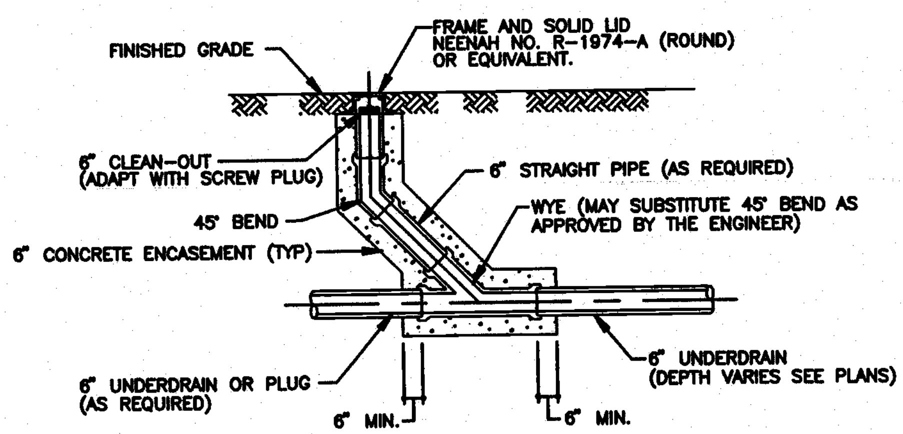
N.T.S.

OUTFALL STRUCTURES

N.T.S.

SEE STD INDEX NO. 232 FOR, STD DIMENSIONS

NOTE: FIBERGLASS SKIMMER AND CONCRETE PAD TO BE PAID AS PART OF OUT FALL STRUCTURE.



UNDERDRAIN CLEANOUT DETAIL

SEE PLAN & PROFILE SHEETS FOR LOCATIONS

POND	STRUCT #	STATION	OFFSET	INLET TYPE	A	B	C	D	E	F	G	H	I	J	K	L
B	B-10	219+40.00	118.00' LT.	'D'	102.00	99.50	–	–	–	92.00	30"	103.00	97.46	0.75	92.00	88.00

ELEVATION 'L' IS THE DESIGN TAILWATER ELEVATION

RECEIVED
Jon S Mead
5.25.95

MAY 31 1995
RECORDS
ORLANDO

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

	NAME	DATE		NAME	DATE
DESIGNED BY	T.W.S.	9/93	DRAWN BY	C.S.L.	9/93
CHECKED BY	J.S.M.	10/93	CHECKED BY	T.W.S.	10/93
SUPERVISED BY	JON S. MEADOWS				

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY JON S. MEADOWS
DATE

PREPARED BY:
DYER, RIDDLE, MILLS AND PRECOURT, INC.

DRAINAGE DETAILS

CADD - DRDETOC.DWG

Basin C

DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS

Maitland Blvd.

SH. NO.:	JOB NO.:	
MADE BY: TWS		DATE: 9-91
CHECKED BY:		DATE:

Basin C Post Development

Land Use	Symbol	Soil	Area	CN	Product
Pond Area	Ba/=	A	1.58 Ac	39	61.62
Offsite Open Space	Ba/BnB	A	1.07 Ac	39	41.73
Roadway Imp	Ba/BfB	A	2.94 Ac	98	288.12
Roadway (Rose & Bear Lk) Imp.	Ba/BfB	A	0.42 Ac	98	41.16
Roadway (Rose & Bear Lk) Open	Ba/BfB	A	0.20 Ac	49	9.80
Roadway Open (Clean Fill)	Ba/BfB	A	0.63 Ac	39	24.57
Residential	BfB	A	0.82 Ac	57	46.74
			7.66 Ac		513.74

CN = 513.74 / 7.66 = 67.07

S = 1000 / 67.07 − 10 = 4.91

P_{10} = 7.4 P_{25} = 8.6 P_{100} = 10.6

Q_{25} = 4.632 Vol.25 = 2.957 AF 1.814

Q_{100} = 6.367 Vol.100 = 4.065 AF

Retention Vol. = (1" + ½") over entire basin or
(3.0" + ½") over impervious area

1.5" x 7.66 x 1/12 = 0.96 ac-ft

3.0" x 3.36 x 1/12 = 0.84 ac-ft

Total Vol.25 = 2.957 AF Post Dev. Vol.
− 1.814 AF Pre-Dev. Vol.
+ 0.96 AF 1.5" Ret
2.10 AF Require Volume

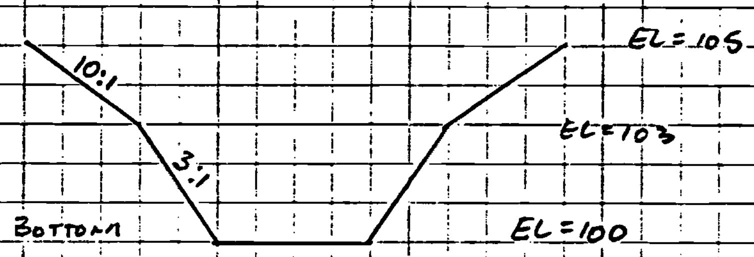
Post Dev. Tc = 16.46 min = 0.27 hrs See Storm sewer Calculations
For Basin C Str C-11

BASIN C POND C

Stage / Storage

EL (ft NGVD)	AREA (ft.²)	(Acres)	VOLUME (ac-ft)
100	11,622	0.27	0
101	15,704	0.36	0.32
102	19,786	0.45	0.72
103	23,868	0.55	1.22
104	38,248	0.88	1.94
105	53,428	1.23	2.99

Ret Volume = 0.96 ac-ft
Ret El = 102.48
≈ 102.50 ft NGVD



Pre-Dev 25yr/24hr discharge = 6.01 cfs

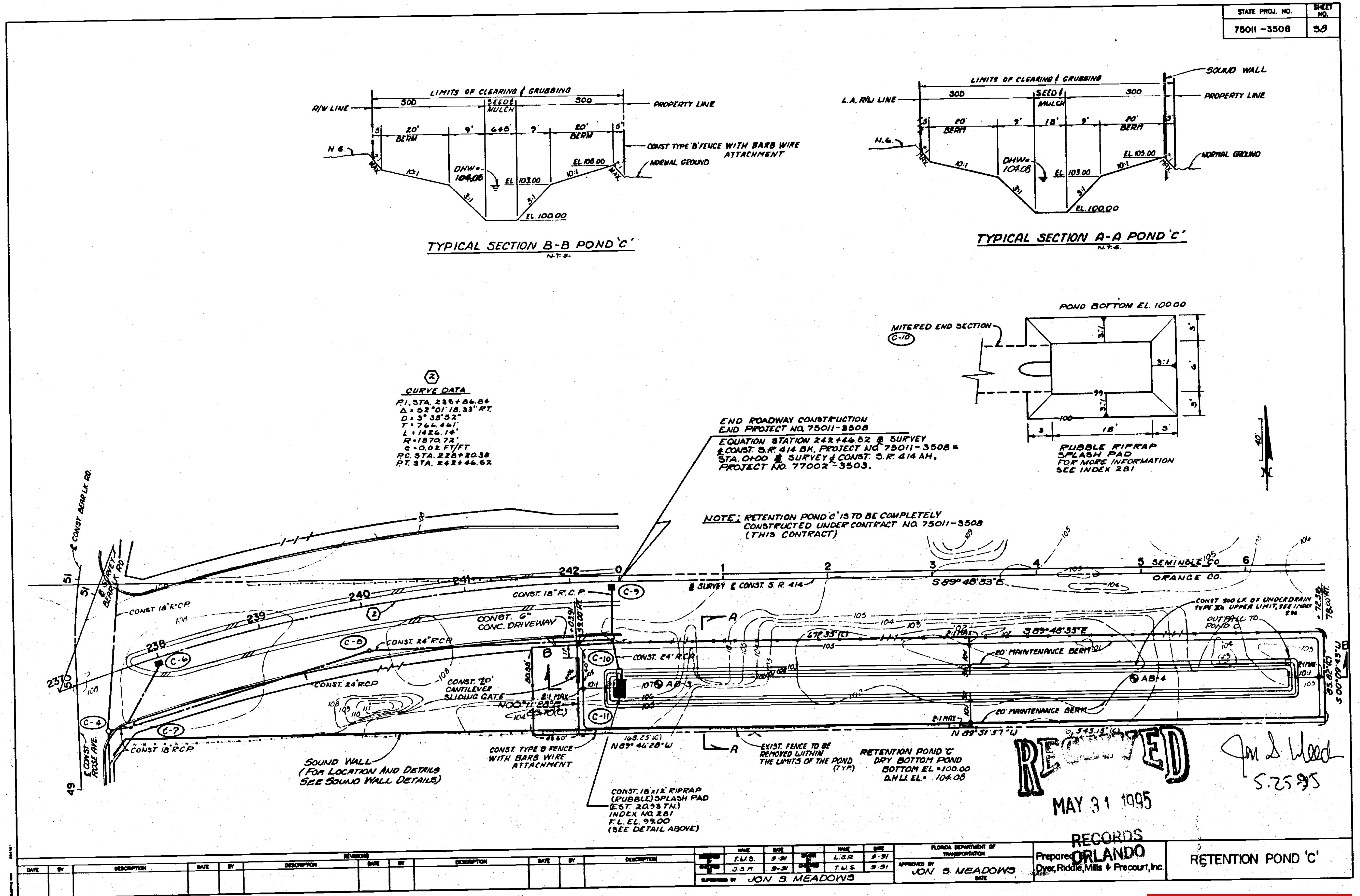
Assume DHW = 104 ft NGVD

Head = 104 - 102.5 = 1.5 ft

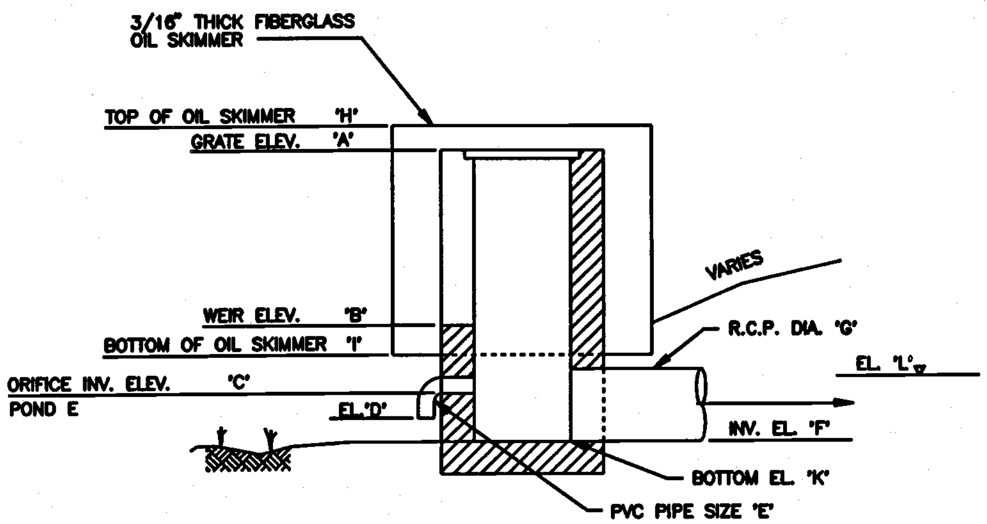
Weir length required to detain post-development runoff

$Q = CLH^{1.5}$

$L = \frac{Q}{CH^{1.5}} = \frac{6.01}{(3.13)(1.5)^{1.5}} = 1.05 \text{ ft} \approx 1.0 \text{ ft}$

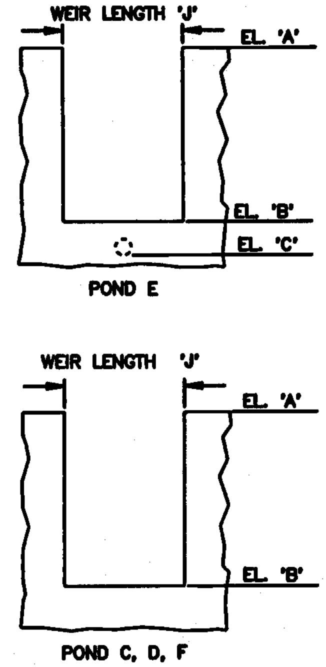


Source: SJRWMD permit 20930-1



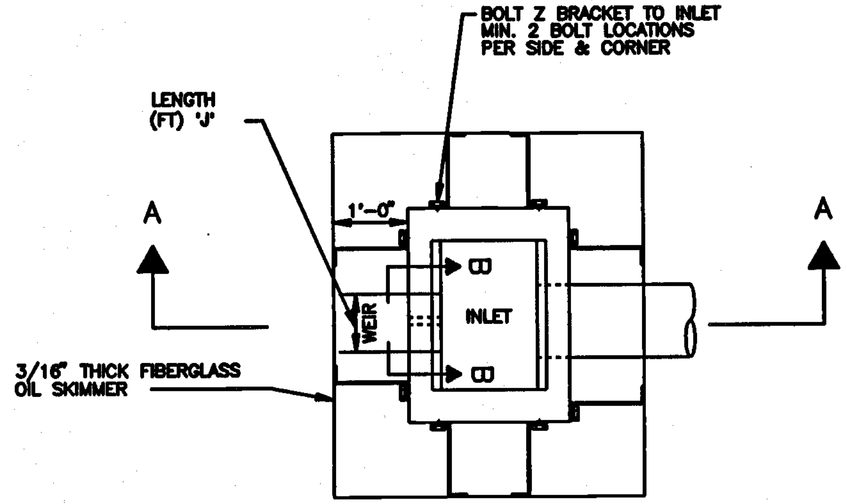
SECTION A – A

N.T.S.



SECTION B – B

N.T.S.



PLAN

N.T.S.

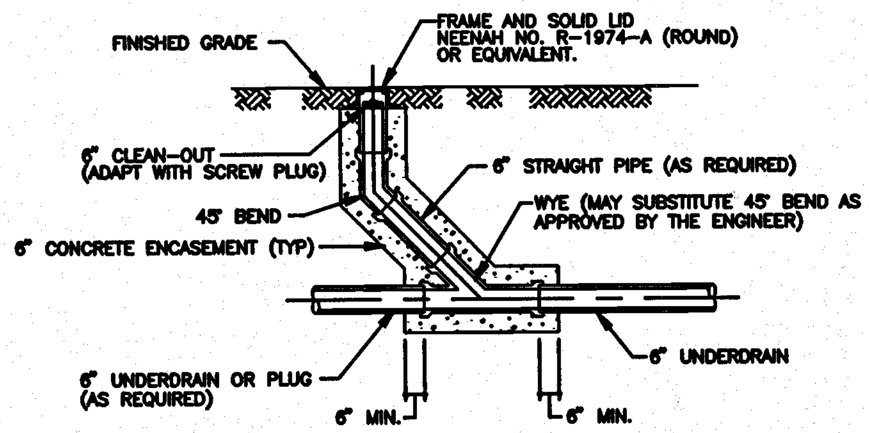
OUTFALL STRUCTURES

N.T.S.

SEE STD INDEX NO. 232 FOR, STD DIMENSIONS

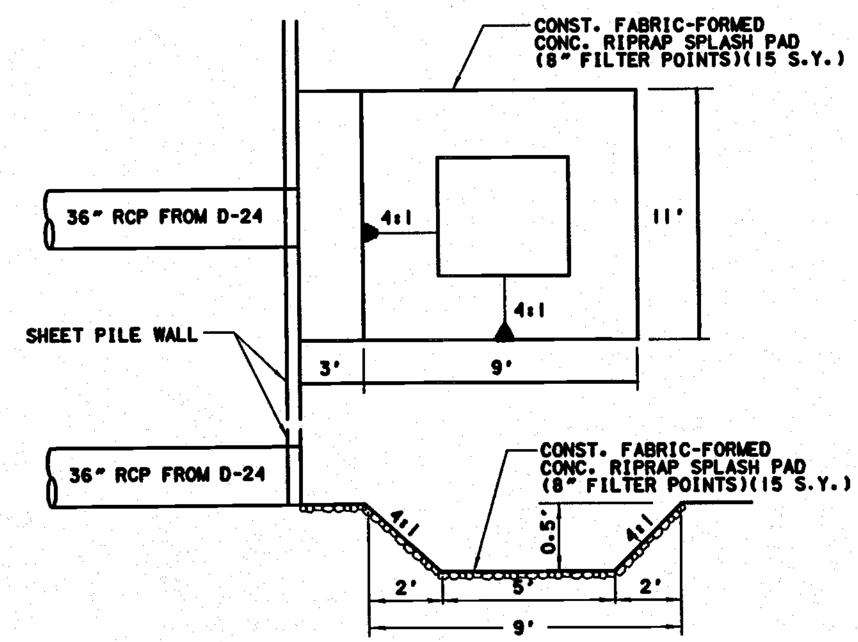
POND	STRUCT #	STATION	OFFSET	INLET TYPE	A	B	C	D	E	F	G	H	I	J	K	L
C	C–18	6+41.00	87.00' RT.	'D'	104.30	102.5	–	–	–	99.00	30"	104.80	102.00	1.50	99.00	87.70
D	D–9	17+00.00	106.00' RT.	'D'	90.70	87.70	–	–	–	85.00	30"	91.20	87.20	0.65	85.00	65.00
E	E–29	3+00 B/L A	129.12' RT.	'D'	68.60	67.00	63.50	63.00	3"	63.00	36"	69.10	65.50	2.00	63.00	64.00
F	F–38	48+44.50	716.10' RT.	'E'	72.00	70.40	–	–	–	64.00	42"	72.50	69.90	1.50	64.00	64.00

ELEVATION 'L' IS THE DESIGN TAILWATER ELEVATION



UNDERDRAIN CLEANOUT DETAIL

SEE PLAN & PROFILE SHEETS FOR LOCATIONS



RIPRAP SPLASH PAD DETAIL

N.T.S.

Jon S Meadows
5.25.95

Source: SJRWMD permit 20930-1

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

	NAME	DATE		NAME	DATE
DESIGNED BY	T.W.S.	9/93	DRAWN BY	C.S.L.	9/93
CHECKED BY	J.S.M.	10/93	CHECKED BY	T.W.S.	10/93
SUPERVISED BY	JON S. MEADOWS				

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY JON S. MEADOWS DATE

PREPARED BY: DYER, RIDDLE, MILLS AND PRECOURT, INC.

DRAINAGE DETAILS

CADD - 414DRDET.DWG

Basin D

PURPOSE

The purpose of this report is to document permit modifications to the construction plans for the proposed S.R. 414 (Maitland Boulevard) Project due to the redesign of Pond D in the Seminole County portion of the Project. Pond D was originally designed as a dry pond, but after recommendations from FDOT it was redesigned as a lined wet pond (see attached pond detail sheet). The reason behind this design change was the concern of groundwater seepage out of Pond D and to the south into the newly constructed Lake Hill Woods subdivision. This subdivision has been constructed after the original design of Maitland Boulevard. Due to the grading scheme used within the subdivision the FDOT and their consultants determined that there may be a potential future problem associated with Pond D. Therefore it was determined to line this pond which would avoid any future groundwater seepage problem associated with the FDOT.

The material presented in this report will support the application for modification of the existing permit issued by SJRWMD in 1995 (SJRWMD No. 4-095-0505AG-ERP) for the above referenced project.

Table 1 demonstrates the previous permit information as presented in the original drainage calculations for Basins C and D, and Table 2 presents the current information as calculated in this report for the 25-year 24-hr storm. Tables 3 and 4 provide similar information for the mean annual storm.

Table 1. Previous Permit Information Summary for the 25-year 24-hr Storm.

BASIN/ POND	AREA (acres)	PRE-DEVELOPMENT RUNOFF (cfs)	POST-DEVELOPMENT RUNOFF (cfs)	POND C STAGE (ft)	POND D STAGE (ft)
C & D	13.1	10.87	9.45	104.08	90.44

Table 2. Current Drainage Information Summary for the 25-year 24-hr Storm.

BASIN/ POND	AREA (acres)	PRE-DEVELOPMENT RUNOFF (cfs)	POST-DEVELOPMENT RUNOFF (cfs)	POND C STAGE (ft)	POND D STAGE (ft)
C & D	13.1	10.87	10.75	104.08	91.01

Table 3. Previous Permit Information Summary for the Mean Annual Storm.

BASIN/ POND	AREA (acres)	PRE-DEVELOPMENT RUNOFF (cfs)	POST-DEVELOPMENT RUNOFF (cfs)	POND C STAGE (ft)	POND D STAGE (ft)
C & D	13.1	1.34	1.25	102.85	88.41

Table 4. Current Drainage Information Summary for the Mean Annual Storm.

BASIN/ POND	AREA (acres)	PRE-DEVELOPMENT RUNOFF (cfs)	POST-DEVELOPMENT RUNOFF (cfs)	POND C STAGE (ft)	POND D STAGE (ft)
C & D	13.1	1.34	1.24	102.85	89.67

MODIFICATIONS DESCRIPTION

The proposed Pond D was redesigned as a wet detention pond. As a result of this change an outfall structure with a bleed-down orifice was provided to bleed down the required treatment volume. Calculations for required treatment volume, permanent pool volume, mean depth, as well as bleed down calculations are included in the following sections. The 25-year 24-hr discharge from Pond D was calculated to be 10.75 cfs which is less than the allowable discharge of 10.87 cfs. Routing calculations using adICPR are also included in the following sections.

HYDROLOGY

Basin D

Areas Total = 5.437 Acres R/W

Weighted CN

LAND USE	AREA (ac.) R/W	Soil Class.	CN	PRODUCT
Pond D - water	0.500	-	100	50
Paved Roadway	3.699	-	98	362.502
Open Space - good	1.238	A	39	48.282
TOTAL	5.437			460.784
			WEIGHTED CN =	84.7

aak/D:\89-0259\PERMIT.DOC

Time of Concentration

From Storm Sewer Tabs	Total Tc =	13.3	min
		0.22	hrs

Required Treatment Volume

Required Treatment Volume	(1" Runoff	5.44	acres) / 12	0.45	ac-ft, or
(2.5" x 68.03%	impervious x	5.44	acres) / 12	0.77	ac-ft

Set weir crest at elevation = 88.3
Treatment volume provided = 0.81 ac-ft

Stage / Storage

Stage (ft)	Area (ac.)	Storage (ac-ft)
86.8	0.500	0.00
87.0	0.508	0.10
88.0	0.568	0.64
88.3	0.586	0.81
89.0	0.630	1.24
90.0	0.695	1.90
91.0	0.871	2.68
92.0	1.065	3.65

Permanent Pool Volume

Volume Available - Pond D

Stage (ft)	Area (ac.)	Vol. (ac-ft)
83.0	0.295	0.00
86.8	0.500	1.51

Volume 1.51 ac-ft

Calculate weighted runoff coefficient:

Basin D

Land Use	Area (ac.)	C	Product
Pond & Imp.	4.20	0.95	3.99
Pervious	1.24	0.2	0.25
Total	5.44		4.24

Cw = 0.78

Source: SJRWMD permit 20930-2

Then calculate minimum required volume for 21-day residence times (no littoral zone):

Min. Vol. (21-day res.) = (total area * Cw * 31.2 in * 21/153)/12 in/ft = 1.51 OK

Mean Depth

Mean Depth = Volume of Pond at Orifice / Area of Pond at Orifice
Mean Depth = 1.51 / 0.50 = 3.02 (2 < 3.02 < 8.0 OK)

Orifice Drawdown Calculations

Based on Q = CA(2gh)^.5

Orifice Invert=	86.80	N.W.L.=	86.80
C=	0.60	Weir El.=	88.30
A (sq ft)=	0.02	Storage @	0.81
diameter	1.75	0.02 sq. ft	= Orifice Area

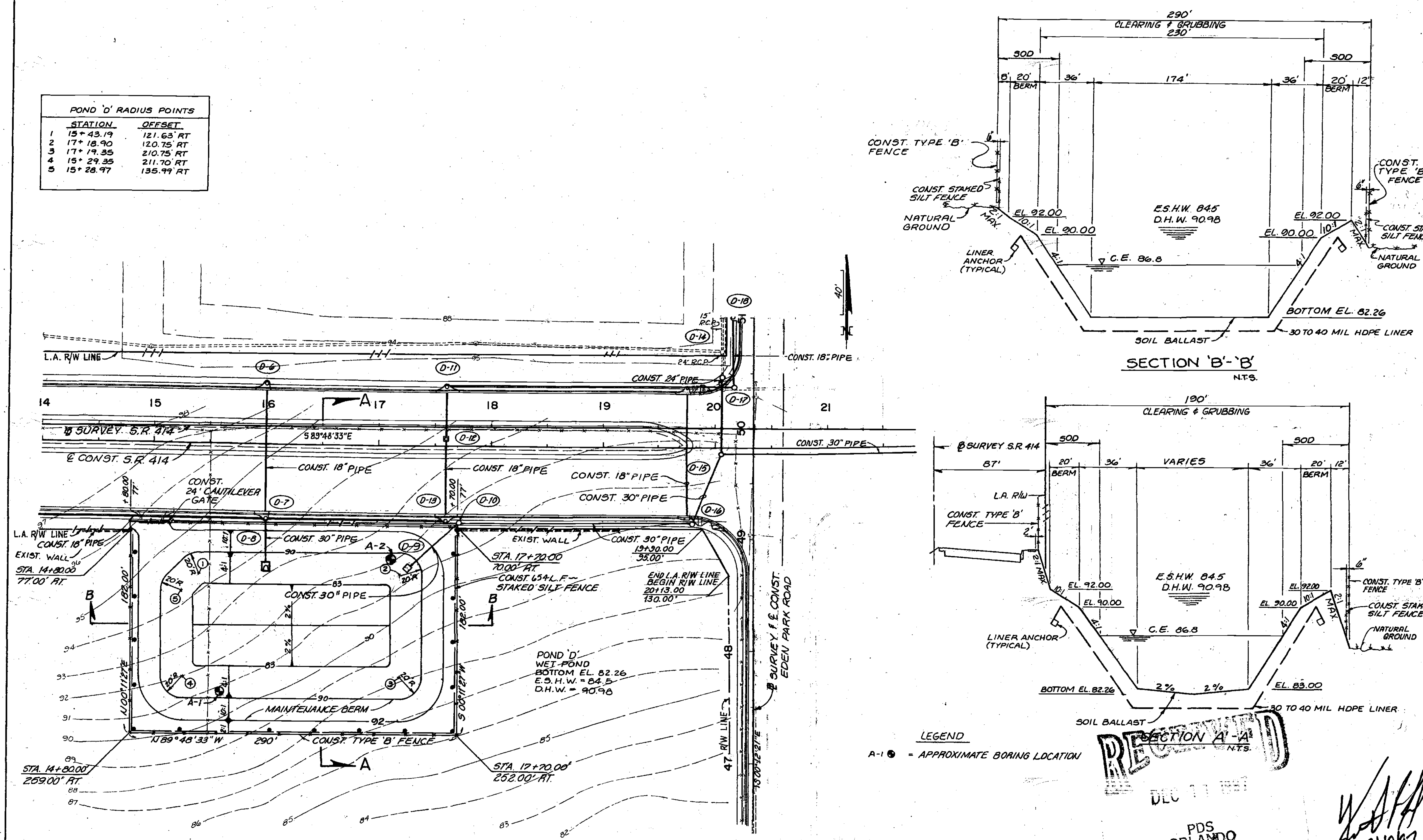
Elevation ft	Storage ac-ft	Storage ac-ft	Storage c.f.	Flow cfs	Time hours	Cum. Time hours
88.30	0.81					
		0.08	3528.36	0.10	10.21	
88.15	0.73					10.2
		0.08	3528.36	0.09	10.79	
88.00	0.65					21.0
		0.08	3528.36	0.09	11.49	
87.85	0.57					32.5
		0.08	3528.36	0.08	12.34	
87.70	0.49					44.8
		0.08	3528.36	0.07	13.42	
87.55	0.41					58.2
		0.08	3528.36	0.07	14.83	
87.40	0.33					73.1
		0.08	3528.36	0.06	16.82	
87.25	0.24					89.9
		0.08	3528.36	0.05	19.90	
87.10	0.16					109.8
		0.08	3528.36	0.04	25.69	
86.95	0.08					135.5
		0.08	3528.36	0.02	44.50	
86.80	0.00					180.0

48 < 58.2 < 60 OK

STATE PROJ. NO.	SHEET NO.
77002-3503	77

POND 'D' RADIUS POINTS

	STATION	OFFSET
1	15+43.19	121.63' RT
2	17+18.90	120.75' RT
3	17+19.35	210.75' RT
4	15+29.35	211.70' RT
5	15+28.97	135.99' RT



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PDS ORLANDO SJR WMD

12/10/97

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

	NAME	DATE		NAME	DATE
DESIGNED BY	T.W.S.	11-91	DRAWN BY	L.G.R.	11-91
CHECKED BY	K.M.S.	12-91	CHECKED BY	T.W.S.	11-91

SUPERVISED BY JON S. MEADOWS

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY JON S. MEADOWS

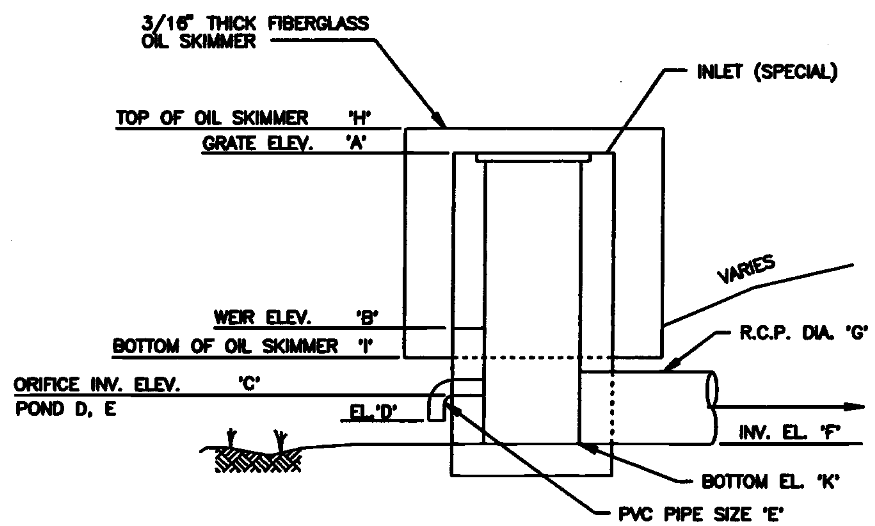
DATE

Prepared By: Dyer, Riddle, Mills & Precourt, Inc.

RETENTION POND 'D'
MAITLAND BLVD.

Source: SJRWMD permit 20930-2

STATE PROJECT NO.	SHEET NO.
77002-3503	80



SECTION A – A

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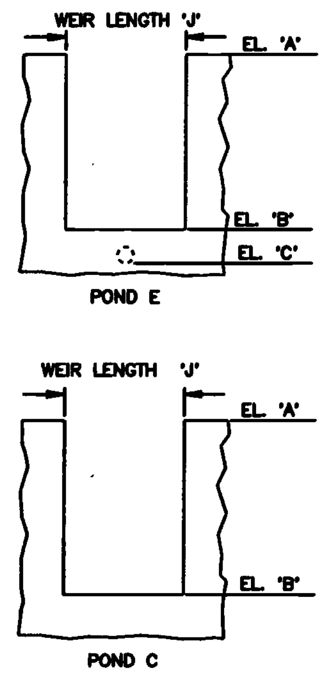

SECTION B – B

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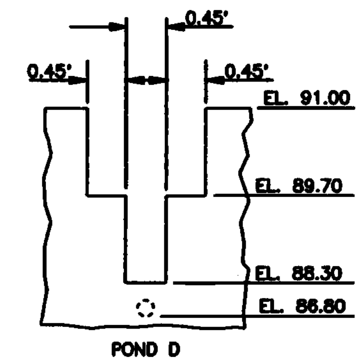

D–9 MODIFIED

SECTION B – B

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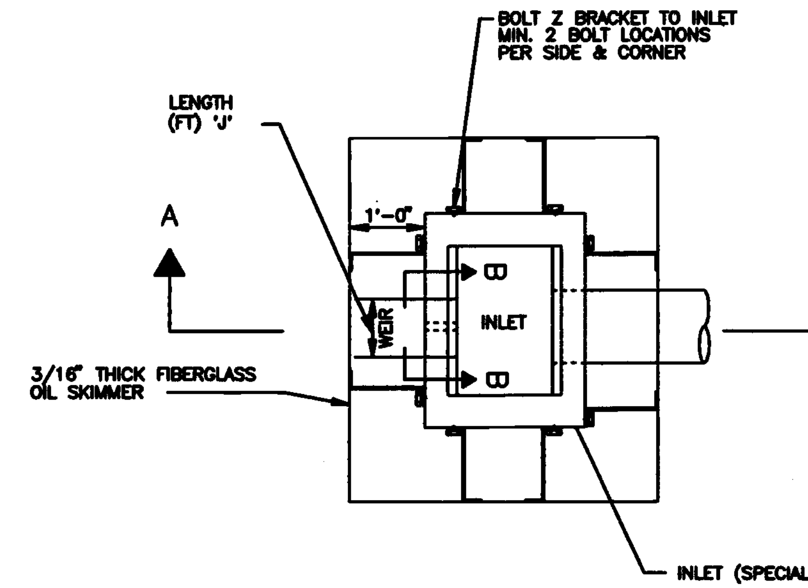


PLAN

N.T.S.

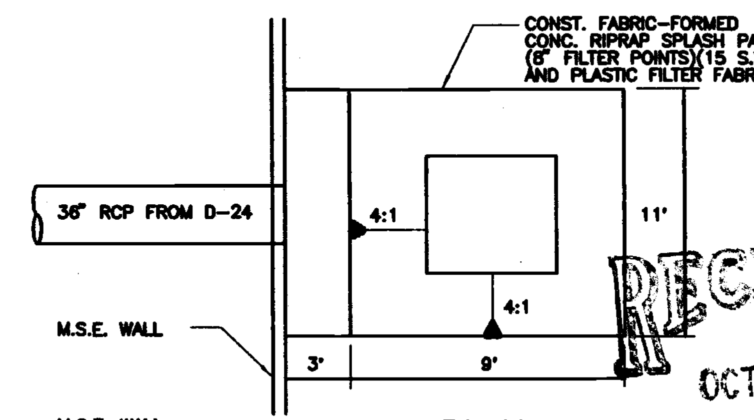
OUTFALL STRUCTURES

N.T.S.

SEE STD INDEX NO. 232 FOR, STD DIMENSIONS

COST OF FIBERGLASS SKIMMER TO BE INCLUDED IN PRICE OF INLET (SPECIAL)

POND	STRUCT #	STATION	OFFSET	INLET TYPE	A	B	C	D	E	F	G	H	I	J	K
C	C–18	6+41.00	87.00' RT.	'D'	104.50	102.5	–	–	–	99.25	30"	105.00	102.00	1.50	99.00
D	D–9	17+27.00	110.00' RT.	'D'	91.00	88.30	87.00	86.50	1.75"	85.00	30"	91.50	87.80	–	85.00
E	E–29	3+00 B/L A	129.12' RT.	'D'	69.00	67.00	63.50	63.00	3"	63.00	36"	69.50	65.50	2.00	63.00



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OCT 27 1997

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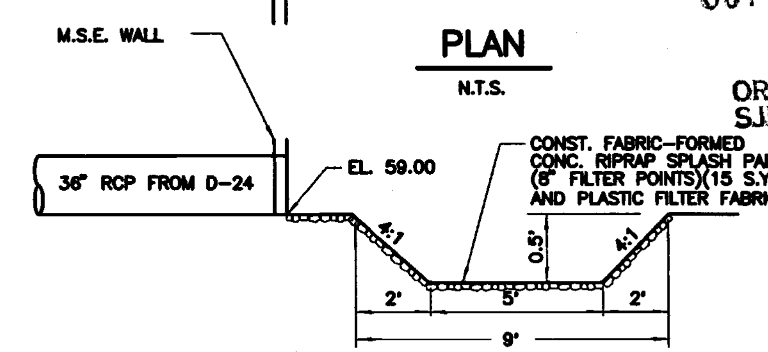
PDS ORLANDO SJR WMD

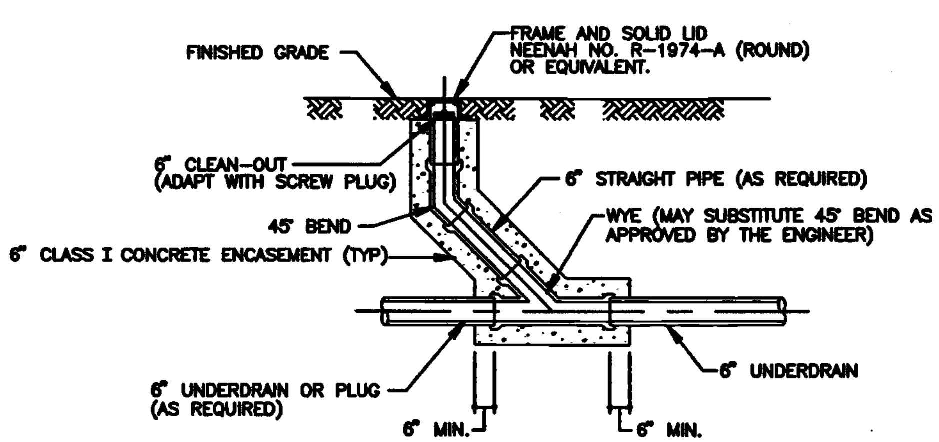


ELEVATION

N.T.S.

RIPRAP SPLASH PAD DETAIL

N.T.S.



UNDERDRAIN CLEANOUT DETAIL

SEE PLAN & PROFILE SHEETS FOR LOCATIONS

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

	NAME	DATE		NAME	DATE
DESIGNED BY	T.W.S.	9/93	DRAWN BY	C.S.L.	9/93
CHECKED BY	J.S.M.	10/93	CHECKED BY	T.W.S.	10/93
SUPERVISED BY	JON S. MEADOWS				

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY JON S. MEADOWS

DATE

PREPARED BY: DYER, RIDDLE, MILLS AND PRECOURT, INC.

DRAINAGE DETAILS

10/23/97

Basin E

5-22

DYER, RIDDLE, MILLS & PRECOURT, INC.	SH. NO.:	JOB NO.: 89-259.12
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS	MADE BY: TWS	DATE: 9-13-93
Maitland Blvd. POND E	CHECKED BY:	DATE:

POST DEVELOPMENT

LAND USE	SOIL CLASS	AREA	CN	PRODUCT
Eden Pk Sub	A	2.22	56	124.32
Roadway	-	7.281	98	713.538
Open Space	A	0.964	39	37.596
Pond Wet	-	0.53	98	51.94
Pond Dry	A	0.90	39	35.10
		11.895		962.494

CN = 962.494 / 11.895 = 80.916

S = 1000 / 80.916 - 10 = 2.358

Q = 6.301 P = 8.6 Vol = 6.245

Tc = 37.20 min

Source: SJRWMD permit 20930-1

5-56

DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS

Maitland Blvd. POND E

SH. NO.: | JOB NO.: 89-259.12
MADE BY: TWS | DATE: 9-13-93
CHECKED BY: | DATE:

POND E will be a wet detention Pond. Because no littoral shelf will be provided, the permanent pool volume will be increased by 50%.

Seasonal High Water Table Elev = 63.50

1. Treatment Volume

Retain the greater of 1.0" of runoff or 3.0" times impervious area

1" Runoff = (1.0")(11.895)(1/12) = 0.991 AcFt

3" x Imp = (3.0")(7.281)(1/12) = 1.820 AcFt

Treatment Volume = 1.820 AcFt

2. Control Structure

See below for raised weir crest elevation to satisfy detention requirements.

Stage Storage

Stage (FT)	Area (Ac)	Storage (AF)
63.5	0.53	0
64	0.55	0.27
65	0.61	0.85
66	0.66	1.48
67	0.72	2.17
68	0.78	2.92
69	0.84	3.73
70	0.89	4.60
71	0.95	5.52
72	1.18	6.58
73	1.42	7.88

$$\frac{1.820 - 1.48}{2.17 - 1.48} = \frac{EL - 65}{66 - 65} = 66.493 \quad \text{use } 66.50$$

Treatment Vol. EL. = 66.50

Source: SJRWMD permit 20930-1

DYER, RIDDLE, MILLS & PRECOURT, INC. ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS	SH. NO.:	JOB NO.: 89-259.12
Maitland Blvd. POND E	MADE BY: TWS	DATE: 9-13-93
	CHECKED BY:	DATE:

3. Permanent Pool Volume

Provide a 21 day residence time. 31" of rainfall during rainy Season

Run off coefficient = $\frac{(7.281 ac)(.9) + (3.444 Ac)(.2)}{11.895} = 0.61$

21 day Residence time during the rainy season = 21 days / 153 days

Minimum Permanent Pool Volume =

(11.895 ac)(0.61)(31")(21/153)(1/12) = 2.573 AF

Determine the Pond Volume Below Elev 63.5

Stage	Area	Storage
55	.11	0
56	.15	.13
57	.20	.30
58	.24	.52
59	.28	.78
60	.32	1.08
61	.39	1.44
62	.45	1.86
63	.50	2.34
63.5	.53	2.60

Adequate Storage Is Provided to Satisfy the permanent pool volume requirement.

4 Size The Control Structure

Weir Crest Elevation was raised from 66.50 to 67.00 to satisfy detention requirements.

Actual Treatment Volume = 2.17 AF

Recover half the treatment volume in 48-60 hrs after the storm event

Use an orifice based on:

DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS

Maitland Blvd. Pond E

SH. NO.: 5-5E	JOB NO.: 89-259.12
MADE BY: TWS	DATE: 9-13-93
CHECKED BY:	DATE:

4 Size Control Structure Continued

$A = Q / c(2gh)^{1/2}$

$Q = \frac{2.17\ AF \times 43560}{2} \times \frac{1}{48\ hrs} \times \frac{1\ hr}{3600\ sec} = 0.27\ cfs$

$h = \text{Avg head} = \frac{3.5 - 1.87}{2} = 2.69\ ft$

$C = 0.6$

$A = \frac{0.27}{(0.6)[2(32.2)(2.69)]^{1/2}} = 0.03\ ft^2$ or 2.3 in.

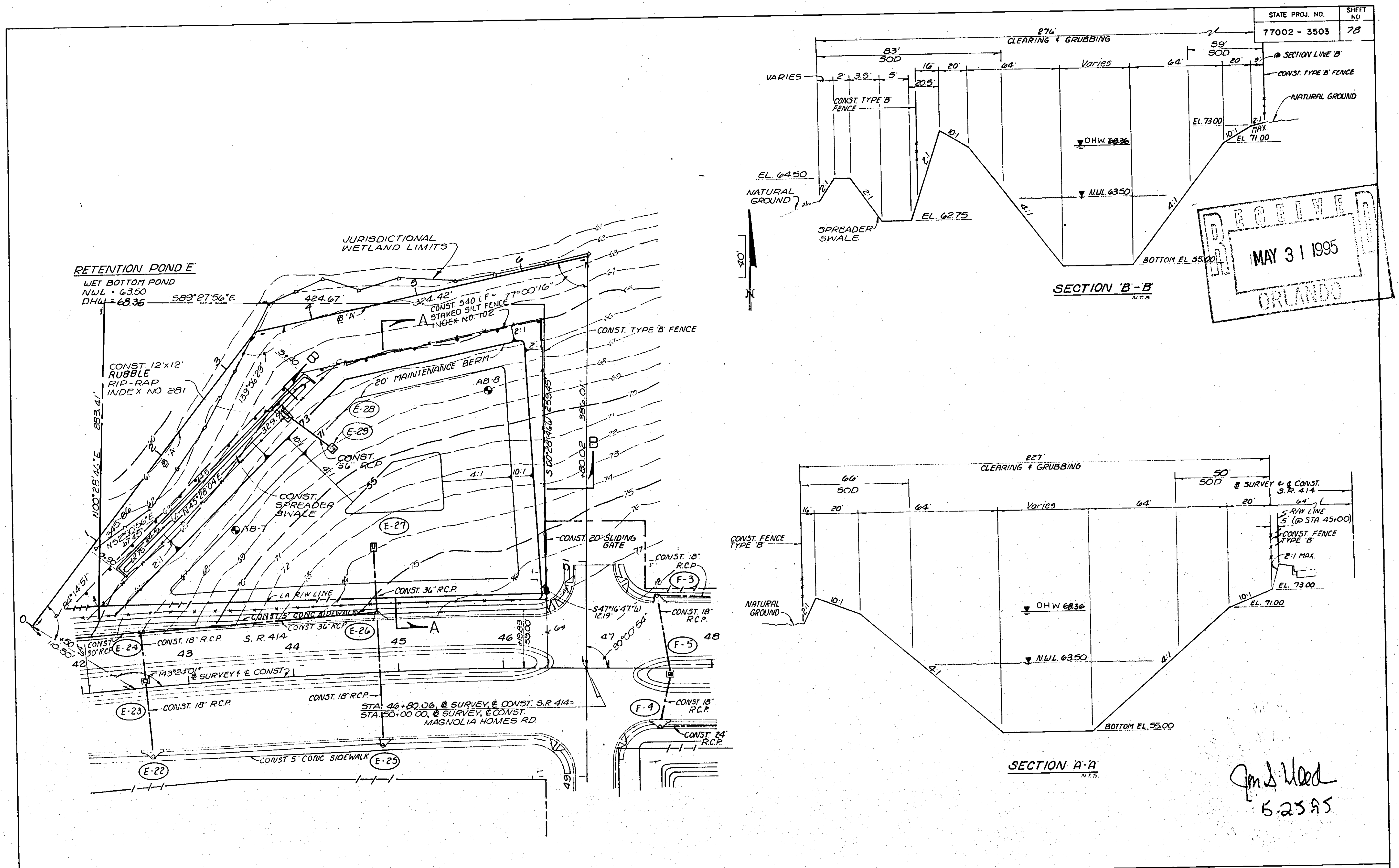
use a 3" orifice

5 Mean Depth of Pond

mean depth: $2.60^{AF} / 0.53\ A = 4.91\ ft$

This is consistent with the mean depth requirement

Source: SJRWMD permit 20930-1



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

REVISIONS

	NAME	DATE		NAME	DATE
DESIGNED BY	TWS	11/91	DRAWN BY	CBW	11/91
CHECKED BY	JSM		CHECKED BY	TWS	
SUPERVISED BY	JON S. MEADOWS				

FLORIDA DEPARTMENT OF TRANSPORTATION

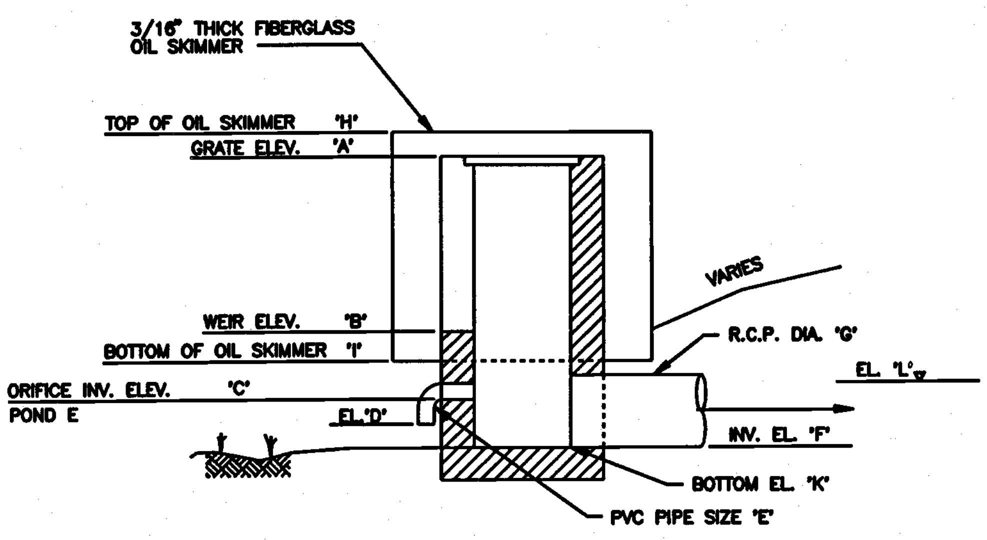
APPROVED BY JON S. MEADOWS

DATE

Prepared By:
Dyer, Riddle, Mills & Precourt, Inc.

RETENTION POND 'E'
MAITLAND BLVD.

Source: SJRWMD permit 20930-1



SECTION A – A

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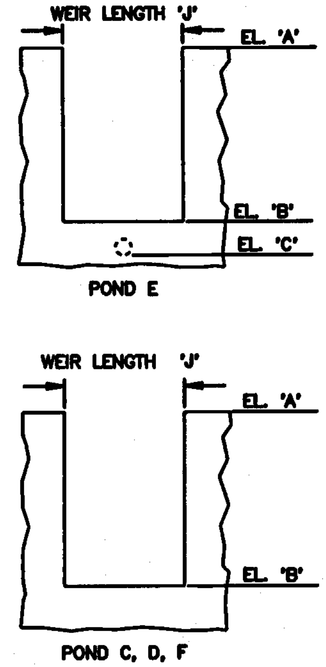

SECTION B – B

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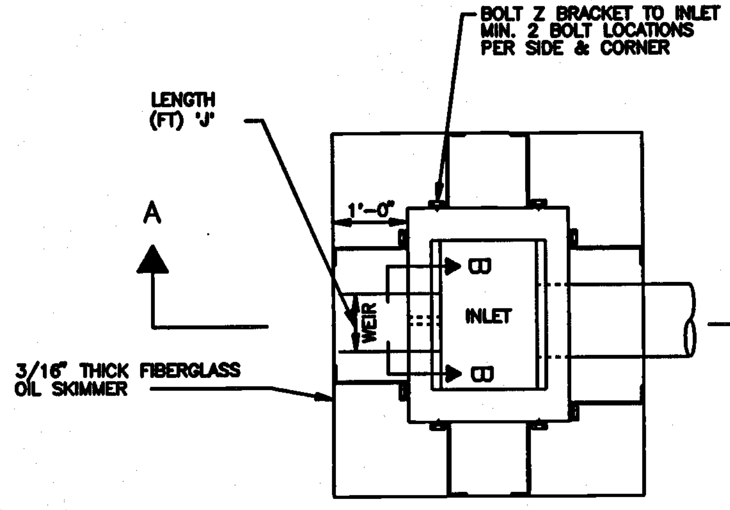


PLAN

N.T.S.

RECEIVED MAY 31 1995 ORLANDO

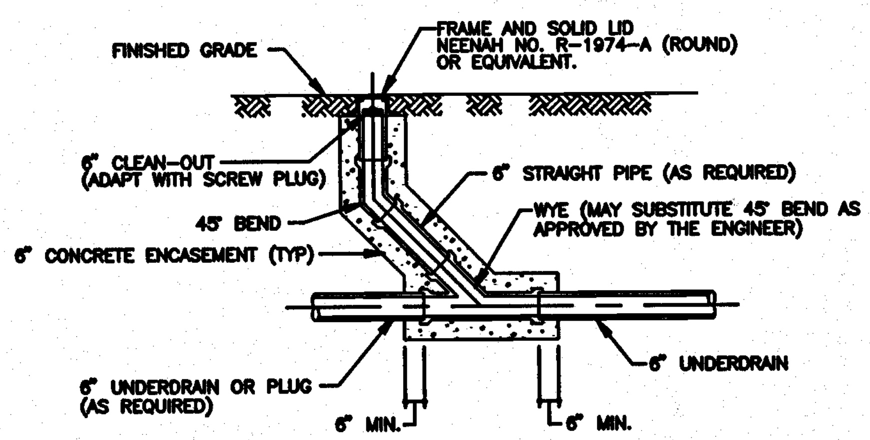
OUTFALL STRUCTURES

N.T.S.

SEE STD INDEX NO. 232 FOR, STD DIMENSIONS

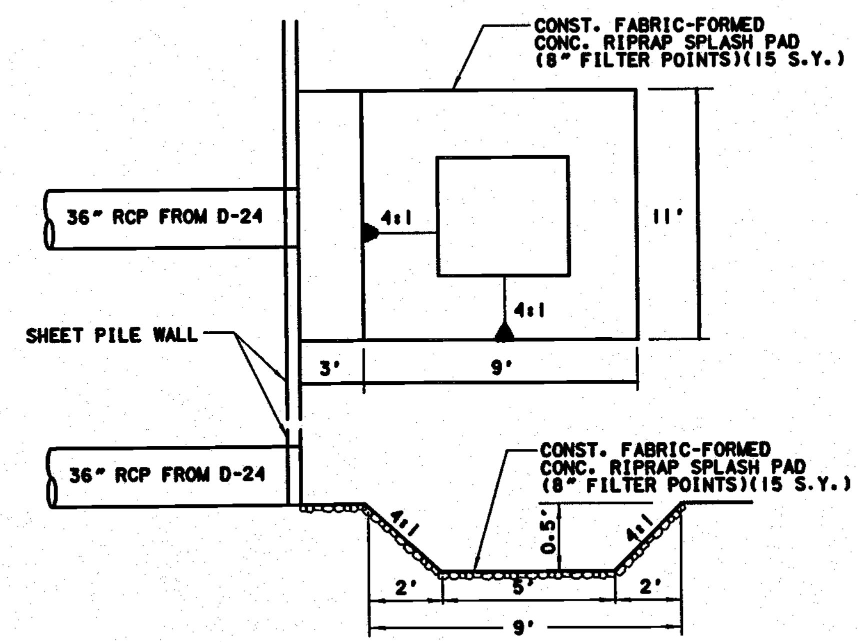
POND	STRUCT #	STATION	OFFSET	INLET TYPE	A	B	C	D	E	F	G	H	I	J	K	L
C	C–18	6+41.00	87.00' RT.	'D'	104.30	102.5	–	–	–	99.00	30"	104.80	102.00	1.50	99.00	87.70
D	D–9	17+00.00	106.00' RT.	'D'	90.70	87.70	–	–	–	85.00	30"	91.20	87.20	0.65	85.00	65.00
E	E–29	3+00 B/L A	129.12' RT.	'D'	68.60	67.00	63.50	63.00	3"	63.00	36"	69.10	65.50	2.00	63.00	64.00
F	F–38	48+44.50	716.10' RT.	'E'	72.00	70.40	–	–	–	64.00	42"	72.50	69.90	1.50	64.00	64.00

ELEVATION 'L' IS THE DESIGN TAILWATER ELEVATION



UNDERDRAIN CLEANOUT DETAIL

SEE PLAN & PROFILE SHEETS FOR LOCATIONS



RIPRAP SPLASH PAD DETAIL

N.T.S.

Jon S. Meadows 5.25.95

Source: SJRWMD permit 20930-1

CADD - 414DRDET.DWG

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

	NAME	DATE		NAME	DATE
DESIGNED BY	T.W.S.	9/93	DRAWN BY	C.S.L.	9/93
CHECKED BY	J.S.M.	10/93	CHECKED BY	T.W.S.	10/93
SUPERVISED BY	JON S. MEADOWS				

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY JON S. MEADOWS DATE

PREPARED BY: DYER, RIDDLE, MILLS AND PRECOURT, INC.

DRAINAGE DETAILS

Basin F

3-1F

DYER, RIDDLE, MILLS & PRECOURT, INC. ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS	SH. NO.:	JOB NO.: 77002-3503
MAITLAND BLVD. BASIN F	MADE BY: TWS	DATE: 9-23-93
	CHECKED BY:	DATE:

DESIGN SUMMARY

POND F

Dry Bottom Pond Bottom EL = 68.0
Top EL = 74.00
DHW EL = 72.03

Retention Volume = 3.006 AF

Min. Weir EL = 70.43

Actual Weir EL = 70.40

Weir Length = 1.50'

Retention Recovery: Side Bank Underdrains (6" Ø ADS)
INV. 65.74
Underdrain Length = 1035
Recovery Time 71.9 hours

3-3F

DYER, RIDDLE, MILLS & PRECOURT, INC. ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS	SH. NO.:	JOB NO.: 77002-3503
MAITLAND BLVD. BASIN F	MADE BY: TWS	DATE: 9-23-93
	CHECKED BY:	DATE:

POST DEVELOPMENT

CN

Land Use	Soils	Class.	Area	CN	Product
Roadway	—	—	10.145	98	994.210
Retention Pond	Bc	A	2.606	39	101.634
Open Space/Swales	Bb, Bc, Lb	A	11.293	39	440.427
			24.044		1536.271

CN = 1536.271 / 24.044 = 63.894

S = 1000 / 63.894 − 10 = 5.651

Tc = 41.87 min = 0.70 hours

25 yr./24 hr. storm = 8.6"/hr.

Q_{25} = 4.20" per fig 2-1 ; Q_{25} = 4.26" per Table 2.1

Vol_{25} = 8.536 AF = 24.04 Ac (4.26" ÷ 12"/1)

Source: SJRWMD permit 20930-1

3-4F

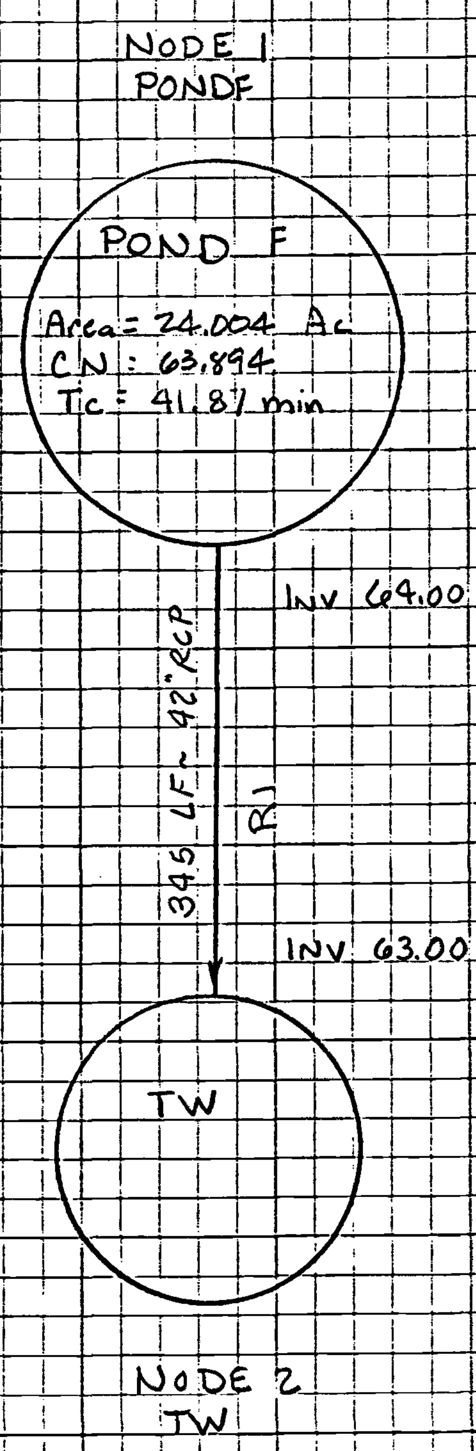
DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS

Maitland Blvd Basin F

SH. NO.:	JOB NO.: 77002-3503
MADE BY: TWS	DATE: 9-22-93
CHECKED BY:	DATE:

STAGE STORAGE

STAGE	AREA	STORAGE
68	1.117 Ac	0
69	1.210 Ac	1.164
70	1.303 Ac	2.421
71	1.396 Ac	3.771
72	1.489 Ac	5.214
73	1.582 Ac	6.750
74	2.106 Ac	8.595



Time	Stage
0	62
12	64
30	62

Source: SJRWMD permit 20930-1

3-5F

DYER, RIDDLE, MILLS & PRECOURT, INC. ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS	SH. NO.:	JOB NO.: 77002-3503
MAITLAND BLVD. BASIN F	MADE BY: TWS	DATE: 9-22-93
	CHECKED BY:	DATE:

POND F

Pond Bottom 68.00, Top 74.00

Estimated Seasonal High Water Table = 65.0

Pond will be a dry bottom pond

Retention Volume

Pond will utilize side bank underdrains to recover the retention volume.

Retention will be provided for the great of 1.5" of runoff or 3" time the impervious area.

1.5" of runoff

(1.5")(24.044)(1"/12) = 3.006 AF

3" Times Impervious Area

(3")(10.145)(1"/12) = 2.536 AF

Retention Volume = 3.006 AF

STAGE STORAGE

Stage	Area	Volume
68	1.117 Ac	0
69	1.210 Ac	1.164 AF
70	1.303 Ac	2.421 AF
71	1.396 Ac	3.771 AF
72	1.489 Ac	5.214 AF
73	1.582 Ac	6.750 AF
74	2.106 Ac	8.595 AF

$\frac{3.006 - 2.421}{3.771 - 2.421} = \frac{EL - 70}{71 - 70} = 70.43$

Use 70.40 as weir crest EL.

POND F

Modification

POST-DEVELOPMENT

ENGLISH WORKSHEET

URS GREINER INC: DRAINAGE CALCULATIONS				
PROJECT TITLE:	SR414 - MAITLAND BLVD.			
PROJECT NUMBER:	V100334.00	SCALE (1" = __)	N/A	DATE
BASIN DESIGNATION:	POND F	MADE BY:	MAJ	09-Oct-97
BASIN ANALYSIS (PRE/POST):	POST	CHECKED BY:		

SUB-BASIN ANALYSIS

1) BASIN / STUDY DATA

DETERMINE BASIN RUNOFF CURVE NUMBER - CN

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
Roadway (URS Greiner)	Pavement		98	5.90	578.20
Roadway (DRMP)	Pavement		98	4.32	423.36
~~Roadway (Access Road P)~~	~~Pavement~~		~~98~~	~~0.42~~	~~41.16~~
Open Space (URS Greiner)		A	39	4.99	194.61
Open Space (DRMP)		A	39	0.87	33.93
~~Open Space (Access Road P)~~		~~A~~	~~39~~	~~2.99~~	~~116.61~~
POND (Open Space)		A	39	1.43	55.77
POND (Water Surface)			100	0.87	87.00
			TOTALS	21.79	1530.64
			COMPOSITE CN		70.2

See 20930-3 for mod

ESTIMATE OF RUNOFF VOLUME

1) DETERMINE SOIL STORAGE - S

$S = (1000 / CN) - 10$ — SOIL STORAGE (inches) | S | 4.24

2) DETERMINE RUNOFF - R

$R = (P - 0.2*S)^2 / (P + 0.8*S)$ — RUNOFF (inches) | R | 0.21

3) DETERMINE RUNOFF VOLUME - V(R)

$V(R) = R / 12 * AREA$ — RUNOFF (Ac-ft) | V(R) | 0.38

PONDF.WK4

GREINER, INC. - ORLANDO

2-13

DRMP
DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS • SURVEYORS • PLANNERS

1977 to 1997 20th ANNIVERSARY

MEMORANDUM

DATE: 10/6/1997

TO: File #89-0259

FROM: Tony Kakoullis *Kakoullis*

SUBJECT: **S.R. 414 (Maitland Boulevard)**
W.P.I. No.: 5117676; S.P.N.: 77002-3503
Seminole County, Florida

Pond F will be re-designed to receive runoff from the Interchange at S.R. 434 (URS Greiner) and the DRMP Western Extension project. After reviewing the attached FAX from URS Greiner, DRMP has the following modifications regarding the area draining to Pond F from the DRMP project:

	Impervious - pavement (acres)	Pervious - grass (acres)
~~Access Road P (Inlets F-21 & F-22)~~	~~0.42~~	~~2.99~~
SR 414	4.09	0.87
F-24	0.12	0.06
Magnolia Homes Road	0.23	0
TOTAL	**4.86**	**3.92**

See 20930-3 for mod

END OF MEMORANDUM

cc. Michael A. Jacobs (URS Greiner)
Richard Bell (FDOT D5)
Lucius Cushman
Russ Mills
Ken Kniel

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OCT 13 1997
GREINER

aak/E:\89-0259\MEMO.DOC

Source: SJRWMD permit 20930-2

ENGLISH WORKSHEET

URS Greiner

MADE BY: MAJ DATE: 10/09/97 JOB NO. V100334.00
CHECKED BY: DATE: SHEET NO.
CALCULATIONS SR414 - MAITLAND BLVD. POND F

WET POND DESIGN

Water Quality

Total Basin Area = 21.79 Ac.
Paved Area = 10.64 Ac.
Pond Area at NWL = 0.87 Ac.

A. 1.0 " Over Total Basin Area = 1.82 Ac-Ft
B. 2.5 " Over New Paved Area = 2.22 Ac-Ft

Required PAV = 2.22 Ac-Ft

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
76.00	TOB	2.30				18.32
			2.10	1.50	3.14	
74.50	Maint Berm	1.89				15.18
			1.52	8.00	12.15	
66.50	(PAV)	1.15				3.03
			1.01	3.00	3.03	
63.50	(NWL)	0.87				0.00

Bleed Down Volume

1/2 the Pollution Abatement Volume = 1.51 Ac-FT

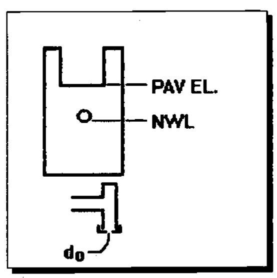
Bleed Down Calculations

ELEV. (ft)		AREA (ac.)	AVG AREA (ac.)	Delta D (ft)	Delta storage (ac-ft)
66.500	(PAV)	1.15			
			1.08	1.40	1.51
65.103	(at time t)	1.02			

Orifice Design

t = 1/2 PAV / (CF*C*A_o*(2*g*h)^0.5)

Diameter of orifice (d_o) =	3.0	in
Recovery time (t) =	52.5	hrs
Orifice coefficient (C) =	0.60	
1/2 Pollution Abatement Volume (PAV) =	65,934.00	ft^3
Depth from PAV Elev. to center of orifice (h_1) =	2.875	ft
Depth from Water Elev. at time t to center of orifice (h_2) =	1.478	ft
Average depth (h) = (h_1 + h_2) / 2 =	2.176	ft
Area of orifice (A_o) =	0.04909	ft^2
Gravitational constant (g) =	32.20	ftsec^2
Conversion Factor (CF) =	3,600	sec/hr



ENGLISH WORKSHEET

URS Greiner

MADE BY: maj DATE: 10/09/97 JOB NO.
CHECKED BY: DATE:
CALCULATIONS FOR: SR 414 (MAITLAND BLVD) POND: F

Permanent Pool Calculations

Basin Characteristics

Land Use	Area (ha)	Runoff Coe	Product
Roadway Paved Area	10.64	0.95	10.11
Roadway Pervious Area	8.85	0.20	1.77
Pond Pervious Area	1.43	0.20	0.29
Pond Area at NWL	0.87	1.00	0.87
Total	21.79		13.03

Composite C = 0.60

Wet Season Normal Rainfall (P) = 31 inches

Min. Permanent Pool V = Area x Composite C x P/12 x 14 / 153 x 10 = **3.08 acre feet**
Min. Permanent Pool V If Littoral Zone Not Provided = 1.5 x Min Perm Pool V **4.62 acre feet**

Stage Storage Calc.

ELEV. (M)	AREA (acres)	AVG AREA (acres)	Delta D (ft)	Delta storage (acre-ft.)	Sum Storage (acre-ft)
76.00	2.30				
74.50	1.89				
66.50 (PAV)	1.15				
63.50 (NWL)	0.87				5.27
		0.56	9.50	5.27	
54.00	0.24				

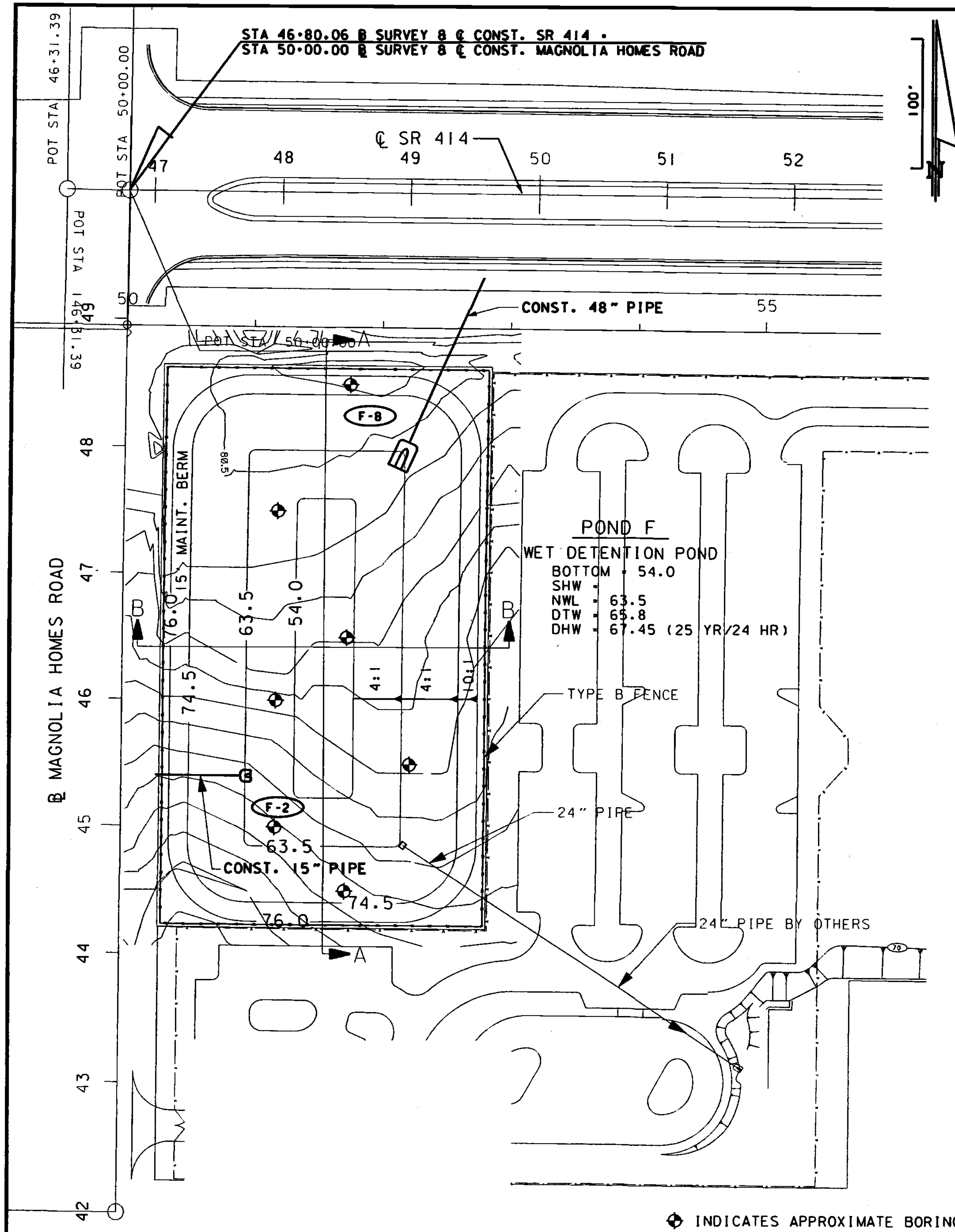
Permanent Pool Volume Provided = **5.27 acre-ft.**
Residence Time = Perm. Pool Vol. Provided *153 / Area / C / P = **28.7 Days**

Note: An additional 50% permanent pool volume is provided in lieu of providing a littoral zone. (See 40C-42.026)

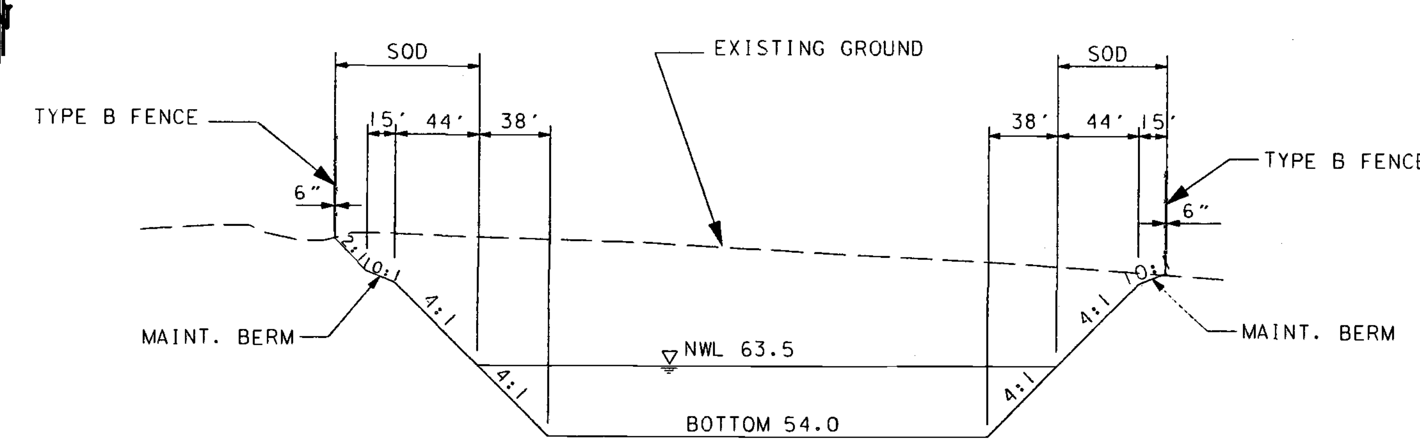
Mean Dept = Permanent Pool Volume / Area at NWL = **6.06 ft.**

Source: SJRWMD permit 20930-2

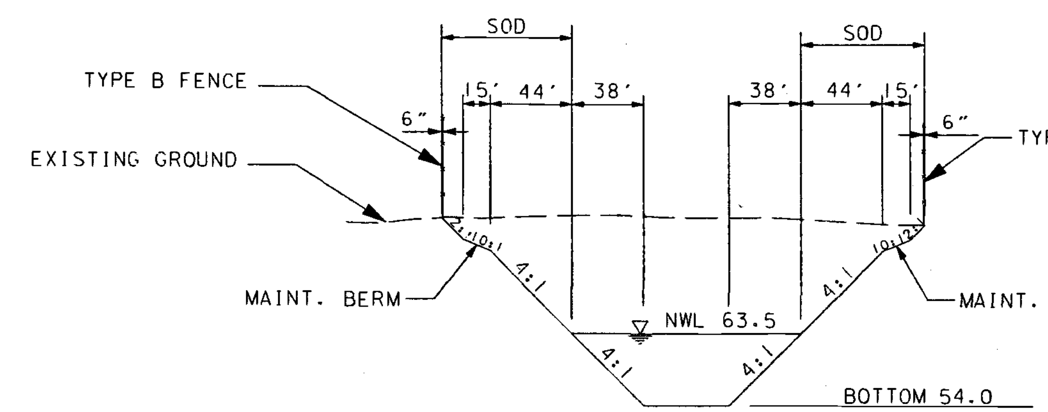
STATE PROJ. NO.	SHEET NO.
77002-3503	79



INDICATES APPROXIMATE BORING LOCATION



POND F
SECTION A-A
SCALE: 1"=25' VERT
1"=100' HORIZ



POND F
SECTION B-B
SCALE: 1"=25' VERT
1"=100' HORIZ

RECEIVED
OCT 27 1997
PDS
ORLANDO
SJR WMD

THIS SHEET IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. POND 'F' AND OUTFALL STRUCTURE ARE TO BE CONSTRUCTED UNDER S.P. 77002-3505

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

FLORIDA DEPARTMENT OF TRANSPORTATION

PREPARED BY: DRMP

POND F

10/23/97

Drainage and Wetland Impact Calculations

This application is a request to modify Permit 4-095-0505G-ERP due to the realignment of Access Road P under the requirements of 40C-4.331(2)(b). Permit 4-095-050G-ERP was issued in May of 1996 for the extension of Maitland Boulevard from US 441 to just east of SR 434. Access Road P is part of Pond F's drainage area, which has recently been modified to a wet pond under Permit Application 4-095-0505AGM-ERP. The following commentary will show that the realignment of Access Road "P" does not alter the permitted intent of the original design and of the modified Pond F redesign.

Environmental Impacts:

Original Impacts to RHPZ:	23,409 square feet or .54 acres
Proposed Impacts to RHPZ:	19,833 square feet or .46 acres

Realignment of Access Road P results in a 15% reduction of RHPZ impacts. Refer to enclosed Exhibits 1 and 2.

Water Quality Impacts:

Original Pavement Area:	18,295 square feet or .42 acres
Proposed New Pavement Area:	22,970 Square feet or .53 acres
Difference	3,828 square feet

The original requirements for Pond F's water quality were based on drainage area not impervious area. The addition of 0.088 acres of impervious area does not change this requirement.

1.5" of runoff over site:	3.006 ac-ft
3" times impervious (proposed)	2.56 ac-ft

The modification of Pond F to a wet pond under application 4-095-0505AGM-ERP altered the water quality requirements. The following demonstrates the proposed realignment does not violate the modified Pond F quality requirements. Pond F was designed based on impervious area.

2.5" times impervious (proposed)	2.24 ac-ft
Treatment volume provided	3.03 ac-ft

Source: SJRWMD permit 20930-3

Hydraulic Impacts:

The original pipe design between F-22 and F-23 resulted in a pipe diameter of 18". Original calculations determined that this pipe has a capacity of 9.3 cfs.

Original pipe flow	7.15 cfs
Proposed pipe flow	7.73 cfs

Basin G

POND G

PRE-DEVELOPMENT CONDITIONS

When SR 414 was extended from I-4 to SR 434, FDOT acquired a 10 acre parcel in the southeast quadrant of the SR 414 / SR 434 intersection for a stormwater pond. On March 12, 1985, SJRWMD issued Permit No. 4-117-0068 for this facility. Only 3 acres of the site were designated for the stormwater pond, with the remaining 7 acres consisting of wetlands. Although this wetland was mistakenly cleared and grubbed during construction, FDOT successfully restored the system by re-planting both hardwoods and herbaceous vegetation.

The existing stormwater pond accepts runoff from the existing SR 434 / SR 414 intersection. The pond outfalls into the wetland restoration area via a concrete weir at elevation 85.5. The wetland restoration area also receives runoff from the existing Eastbound lanes of SR 414 and a portion of the Monroe Manor subdivision west of SR 434. Water elevations in the wetland restoration area are controlled by an outfall structure in the southwest corner of the parcel.

Runoff from the existing Westbound lanes of SR 414 and 40 acres of offsite property north of SR 414 is conveyed under SR 414 by a double 36 inch cross drain at Sta. 193+00. This cross drain outfalls into a ditch around the perimeter of the wetland restoration area. The ditch is connected to the wetland restoration area outfall by an inlet, and the combined outfall is then piped south, crossing SR 434 at Herbison Drive. The pipe system continues west before outfalling directly into the Little Wekiva River.

POST-DEVELOPMENT CONDITIONS

Runoff from the existing Eastbound lanes of SR 414 (Ramp C), east of Sta. 403+00, will continue to drain into the wetland restoration area as it does in the existing condition.

Runoff from the existing Westbound lanes of SR 414 (Ramp D) will continue to drain into the double 36 inch cross drain under SR 414, along with runoff from the 40 acres of offsite property north of SR 414. The ditch around the perimeter of the wetland restoration area will not be affected by the improvements.

POND G DESIGN

Pond G is a wet detention system designed to meet SJRWMD Criteria by providing water quality treatment for 1 inch of runoff or 2.5 inches of runoff from the impervious area, whichever is greater.

Under existing conditions, the outfall structure in the southwest corner (referred to as a Pollution Control Device on 1985 FDOT plans) maintains the water level in Pond G and the wetland restoration area at elevation 85.0. However, in order to provide the necessary water quality and attenuation volumes for post-development conditions, the water elevation in Pond G must be lowered to elevation 82.5. To avoid lowering the water level in the adacent wetland, a sheet pile wall will be installed between Pond G and the wetland restoration area to prevent seepage through the berm.

Since a littoral zone has not been provided in Pond G, the permanent pool volume has been sized to provide a residence time of more than 21 days during the wet season (June - October).

The outfall structure has been designed such that the total post-development peak rate of discharge does not exceed the pre-development peak rate of discharge for both the mean annual / 24-hour and 25-year / 24-hour storms

Pond G also meets the Minimum Standards of FDOT Chapter 14-86, which requires attenuation of the post-development peak rate to the pre-development peak rate for all frequencies (2-year thru 10-day), for the critical duration.

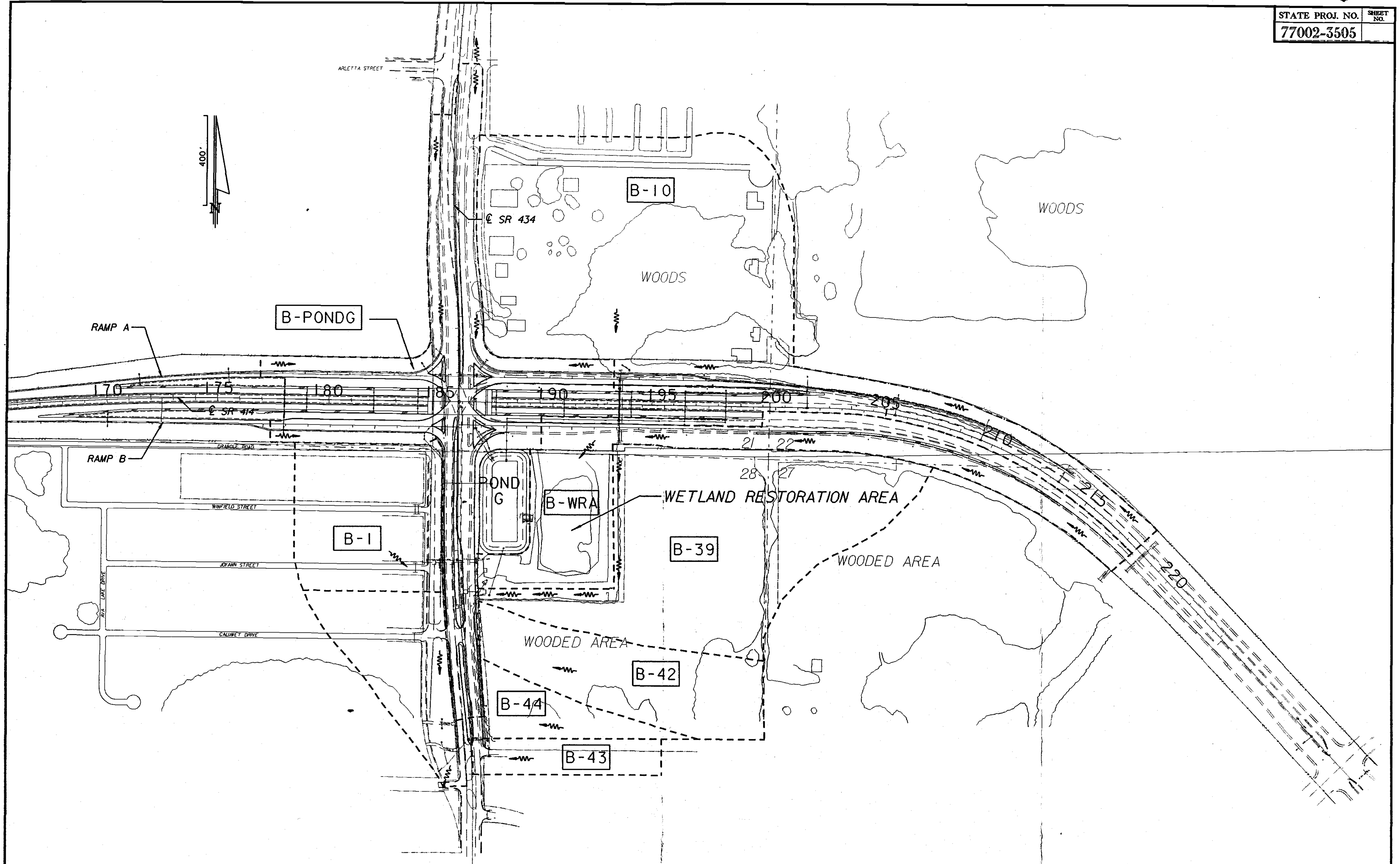
Source: SJRWMD permit 20930-2

POND G

POST-DEVELOPMENT

3-36

STATE PROJ. NO.	SHEET NO.
77002-3505	



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

REVISIONS

FLORIDA DEPARTMENT OF TRANSPORTATION

URS Greiner

POND G
Post-Development Basin

Source: SJRWMD permit 20930-2

URS GREINER INC: DRAINAGE CALCULATIONS				
PROJECT TITLE:	SR414 - MAITLAND BLVD.			
PROJECT NUMBER:	V100334.00	SCALE (1" = __)	N/A	DATE
BASIN DESIGNATION:	POND G	MADE BY:	RSS	19-Aug-97
BASIN ANALYSIS (PRE/POST):	POST	CHECKED BY:		

SUB-BASIN ANALYSIS

1) BASIN / STUDY DATA

PLANIMETERED BASIN AREA (in^2)

COMPUTED BASIN AREA (Ac)

RAINFALL (inches) - P

DETERMINE BASIN RUNOFF CURVE NUMBER - CN

LAND-USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
Open Space		A	39	10.05	391.95
POND (Water Surface)			100	1.48	148.00
Roadway (URS Greiner)	Pavement		98	17.12	1677.76
			TOTALS	28.65	2217.71

COMPOSITE CN	77.4

ESTIMATE OF RUNOFF VOLUME

1) DETERMINE SOIL STORAGE - S

S = (1000 / CN) - 10

SOIL STORAGE (inches)	S	2.92

2) DETERMINE RUNOFF - R

R = (P - 0.2*S)^2 / (P + 0.8*S)

RUNOFF (inches)	R	0.15

3) DETERMINE RUNOFF VOLUME - V(R)

V(R) = R / 12 * AREA

RUNOFF (Ac-ft)	V(R)	0.35

URS Greiner

MADE BY:	MAJ	DATE:	09/01/97	JOB NO.	V100334.00
CHECKED BY:		DATE:		SHEET NO.	
CALCULATION	SR414 - MAITLAND BLVD.			POND G	

WET POND DESIGN

Water Quality

Total Basin Area = 28.65 Ac.
Paved Area = 17.12 Ac.
Pond Area at NWL = 1.48 Ac.

A. 1.0 " Over Total Basin Area = 2.39 Ac-Ft
B. 2.5 " Over New Paved Area = 3.57 Ac-Ft

Required PAV = 3.57 Ac-Ft

ELEV (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
88.00	TOB	2.31				9.89
			2.10	1.50	3.15	
86.50	Maint Berm	1.89				6.74
			1.81	1.50	2.72	
85.00	(PAV)	1.74				4.02
			1.61	2.50	4.02	
82.50	(NWL)	1.48				0.00

Bleed Down Volume

1/2 the Pollution Abatement Volume = 2.01 Ac-FT

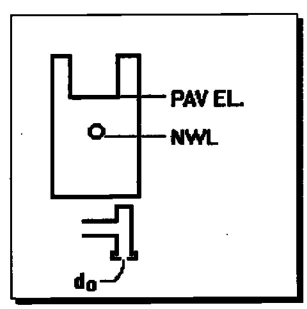
Bleed Down Calculations

ELEV (ft)		AREA (ac.)	AVG AREA (ac.)	Delta D (ft)	Delta storage (ft^3)
85.000	(PAV)	1.74			
			1.67	1.20	2.01
83.800	(at time t)	1.61			

<u>Orifice Design</u>

t = 1/2 PAV / (CF*C*A_o*(2*g*h)^0.5)

Diameter of orifice (d_o) =	3.5	in
Recovery time (t) =	57.1	hrs
Orifice coefficient (C) =	0.60	
1/2 Pollution Abatement Volume (PAV) =	87,562.41	ft^3
Depth from PAV Elev. to center of orifice (h_1) =	2.354	ft
Depth from Water Elev. at time t to center of orifice (h_2) =	1.154	ft
Average depth (h) = (h_1 + h_2) / 2 =	1.754	ft
Area of orifice (A_o) =	0.06681	ft^2
Gravitational constant (g) =	32.20	ftsec^2
Conversion Factor (CF) =	3,600	sec/hr



URS Greiner

MADE BY: maj DATE: 10/10/97 JOB NO.
CHECKED BY: DATE:
CALCULATIONS FOR: SR 414 (MAITLAND BLVD) POND: G

Permanent Pool Calculations

Basin Characteristics

Land Use	Area (ha)	Runoff Coef	Product
Roadway Paved Area	17.12	0.95	16.26
Roadway Pervious Area	10.05	0.20	2.01
Pond Pervious Area		0.20	0.00
Pond Area at NWL	1.48	1.00	1.48
Total	**28.65**		19.75

Composite C = **0.69**

Wet Season Normal Rainfall (P) = **31 inches**

Min. Permanent Pool V = Area x Composite C x P/12 x 14 / 153 x 10 = **4.67 acre feet**
Min. Permanent Pool V if Littoral Zone Not Provided = 1.5 x Min Perm Pool V **7.00 acre feet**

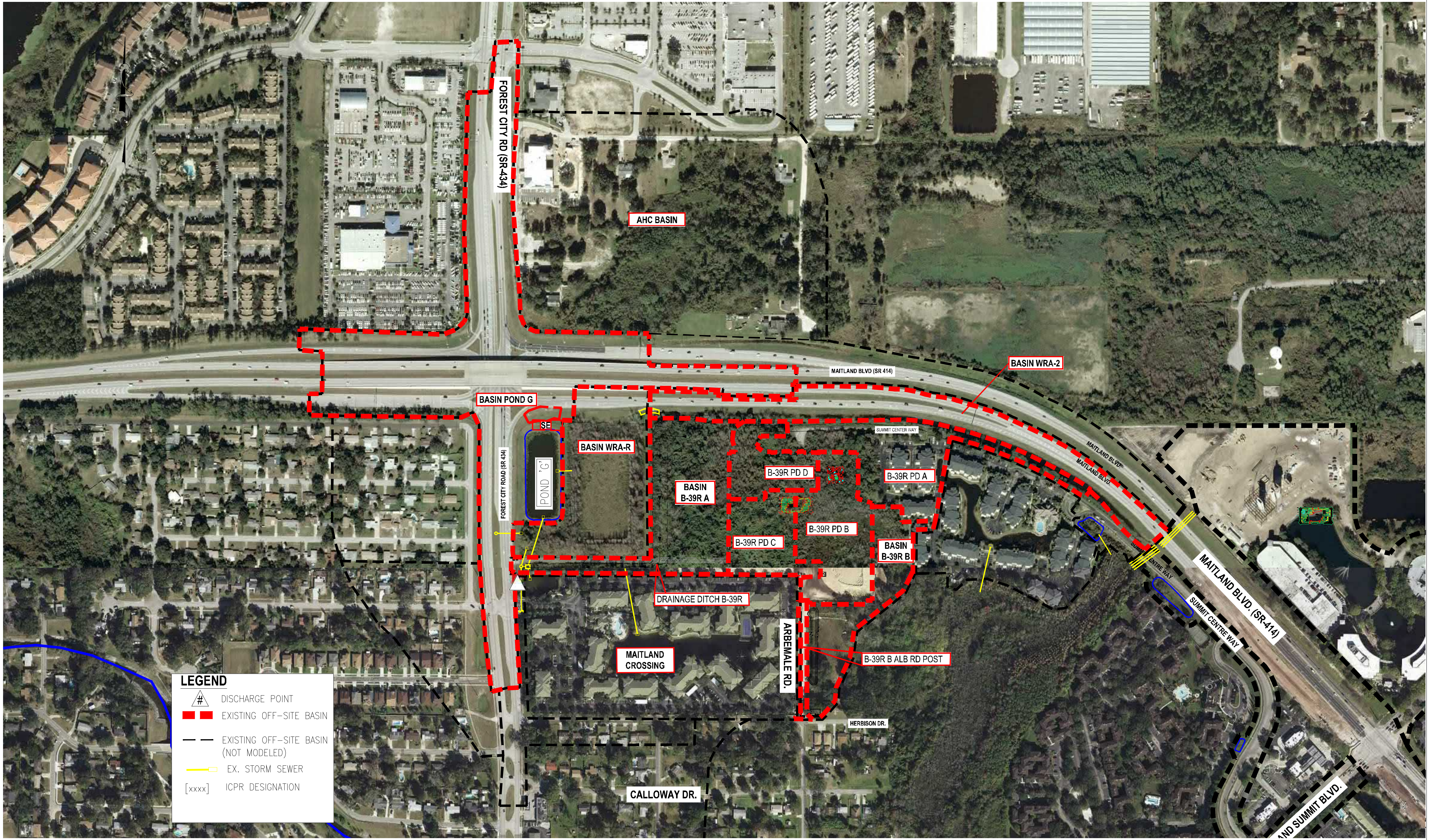
Stage Storage Calc.

ELEV. (M)	AREA (acres)	AVG AREA (acres)	Delta D (ft)	Delta storage (acre-ft.)	Sum Storage (acre-ft)
88.00	2.31				
86.50	1.89				
85.00 (PAV)	1.74				
82.50 (NWL)	1.48				7.20
		1.20	6.00	7.20	
76.50	0.92				

Permanent Pool Volume Provided = 7.20 acre-ft.
Residence Time = Perm. Pool Vol. Provided *153 / Area / C / P = **25.9 Days**

Note: An additional 50% permanent pool volume is provided in lieu of providing a littoral zone. (See 40C-42.026)

Mean Depth = Permanent Pool Volume / Area at NWL = **4.86 ft.**



REVISIONS			
REV	DATE	BY	DESCRIPTION

gai consultants
transforming ideas into reality®
618 South Street, Suite 700
Orlando, FL 32801
407.423.8398
Certificate of Authorization: EB9951

ANTHONY S. CALL, P.E. Lic. No. 67370

SCALE:	1" = 200' @ 11" x 17"
DATE:	9/10/18
DRAWN:	TZ
CHECKED:	TZ
APPROVED:	ASC

PROJECT NO. / DASH NO.
A120273.07

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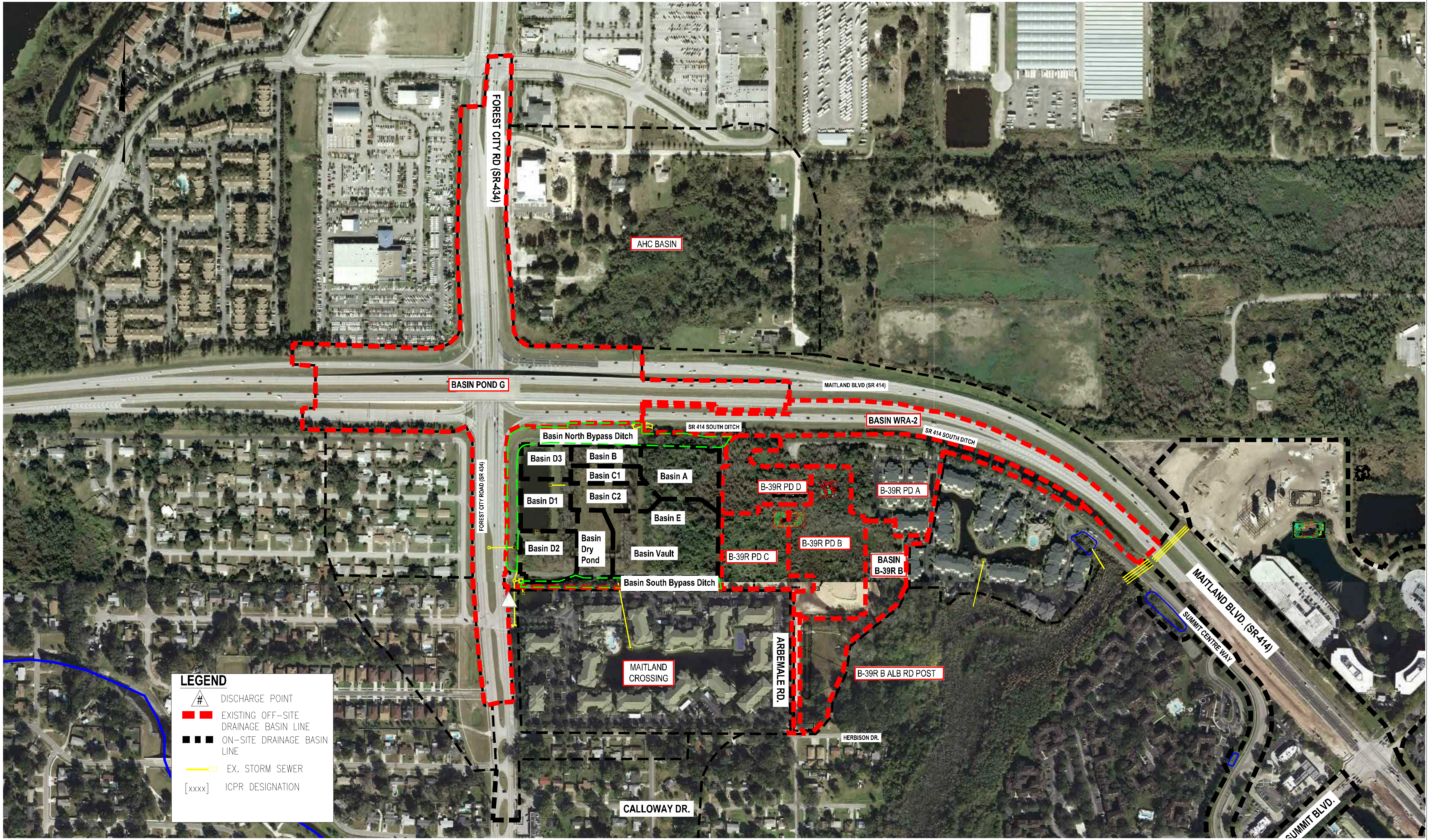
PRE-DEVELOPMENT BASIN MAP

MAITLAND WEST WRIGHT - PD
MAITLAND, FLORIDA

SHEET NO.
C0.01

Source: SJRWMD permit 20432-27



Z:\CONGEV\2012\A120273.07 - MAITLAND WEST - LOT 3\CAD\CIVIL\PLANSET - PD\A120273_07_PD_POST.DWG

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REV	DATE	BY	DESCRIPTION

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ANTHONY S. CALL, P.E. Lic. No. 67370

SCALE:	1" = 200' @ 11" x 17"
DATE:	9/11/18
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PROJECT NO. / DASH NO.
A120273.07

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POST-DEVELOPMENT BASIN MAP

MAITLAND WEST WRIGHT - PD
MAITLAND, FLORIDA

SHEET NO.
C0.02

Source: SJRWMD permit 20432-27

1.1 Stormwater overview

The development of approximately 12.53 acres located on the southeast corner of the intersection of State Road 414 (Maitland Boulevard) and State Road 434 (Forest City Road) for commercial use. The proposed development will contain several commercial lots which utilize in-ground stormwater infiltration, a perimeter ditch, and a standard dry pond. A ribbon road will connect State Road 434 to an existing north/south entry road as well as connection internal to the lot. This road will require a FDOT drainage permit.

1.2 Pre-development Basin Descriptions

In pre-development runoff from State Road 414 flows southward to a ditch located on the south side of 414, travels westward, then south bisecting the property to empty into an east/west ditch located along the south edge of the property. This ditch conveys the collected runoff westward to the eventual FDOT outfall at the southwest corner of the property. A pre-development basin map is provided in the Appendix of this report. The area is broken down into the major basins listed below.

Offsite Basin (Pond G)

This basin is approximately 28.65 total acres in size and is located offsite to the northwest of the property. Flow from this basin which includes runoff from State Road 414 and State Road 434 enters the property along the east side of State Road 434 into a north/south perimeter ditch and a 1.9 acre wet pond eventually continuing south to the ultimate outfall near the southwest corner of the property. This basin is further broken up into **Central Offsite Basin** and **South Offsite Basin** to better reflect the outfall onto the property.

Basin SE Corner

This small basin includes the southeast corner of the intersection of SR 414 and SR 434. It is approximately 0.209 acres in size. Flow from this basin is routed to Pond G.

Basin WRA-2

This basin is about 7.18 acres in size and includes a portion of SR-414 over pass, a portion of eastbound ramp from SR-434 to SR-414, and a portion of drainage ditch on south of Maitland Boulevard. All the runoff from WRA-2 sheet flows into the SR-414 ditch along the south side of State Road 414.

B-39R PD-A

Approximately 3.06 acres, this basin includes the whole Summit Center Way extension and portion of the existing apartment site east of the property. This includes the existing building, parking and access way. This basin drains into an existing exfiltration system and discharges into the SR 414 S-Ditch.

B-39R PD-B

This basin is 4.57 acres in size and includes a portion of an existing apartment site southeast of the property. The basin drains to existing exfiltration systems eventually outfalling into the previously described south ditch.

B-39R PD-C

The B-39R PD-C basin is 2.74 acres in size and includes a portion of the existing apartment site to the east of the property that includes the building, parking, and access way. This basin drains into an exfiltration system and eventually outfalls into the previously described south ditch.

B-39R PD-D

This basin is approximately 2.34 acres in size and located just north of the B-39R PD-C basin (and east of the property). It includes the roundabout portion of Summit Centre Way, a portion of the apartment site including the building, parking, and access way. This basin drains into an existing exfiltration system and eventually outfalls into the previously described south ditch.

B-39R A

B-39R A is 7.05 acres of the undisturbed central portion of the property. This basin sheet flows south into the southern ditch.

B-39R B

Is located offsite to the east of the existing apartment site. Flow from this basin does not enter the property and tis basin is shown for consistency with the previous reports only.

B-39R ALB RD PO

Is similar to the B-39R B basin as it is offsite, not connected to the property, and only shown for clarity.

Basin WRA-R

This basin is approximately 7.81 acres, located in the central part of the property and just east of the existing Pong G. It I undeveloped with a flow direction to the west and south to the southern ditch.

Basin AHC Gateway

This basin is located north of SR 414 and outfalls south across the road eventually reaching the south ROW of the road. It is approximately 26.36 acres in size.

Basin 4

This basin is located north of SR 414 and outfalls south across the road eventually reaching the south ROW of the road. It is approximately 1.01 acres in size.

Basin Maitland Crossing

This basin is located south of the proposed development. Runoff from this basin travels north into the south ditch eventually outfalling to the west. It is approximately 19.01 acres in size.

1.3 Post-development Basins

A Post-development map is provided in Appendix of the report. A brief discussion of the basins is provided below.

Offsite Basin (Pond G)

This basin is approximately 26.10 total acres in size and is located offsite to the northwest of the property. Flow from this basin which includes runoff from State Road 414 and State Road 434 enters the property along the east side of State Road 434 into a north/south perimeter ditch and a 1.9-acre wet pond eventually continuing south to the ultimate outfall near the southwest corner of the property. This basin is further broken up into **Central Offsite Basin** and **South Offsite Basin** to better reflect the outfall onto the property.

Basin SE Corner

This small basin includes the southeast corner of the intersection of SR 414 and SR 434. It is approximately 0.209 acres in size. Flow from this basin is routed to the Perimeter Ditch.

Basin WRA-2

This basin is about 7.18 acres in size and includes a portion of SR-414 over pass, a portion of eastbound ramp from SR-434 to SR-414, and a portion of drainage ditch on south of Maitland Boulevard. All the runoff from WRA-2 sheet flows into the SR-414 ditch along the south side of State Road 414.

B-39R PD-A

Approximately 1.392 acres (previously larger, this basin was split into B-39R PD-A and Summit Center Way [below]), this basin includes part of the Summit Center Way extension and portion of the existing apartment site east of the property. This includes the existing building, parking and access way. This basin drains into an existing exfiltration system and discharges into the SR 414 S-Ditch.

Summit Center Way

Approximately 1.668 acres, this basin includes part of the Summit Center Way extension and portion of the existing apartment site east of the property. This includes the existing building, parking and access way. This basin drains into an existing exfiltration system and discharges into the SR 414 S-Ditch.

B-39R PD-B

This basin is 4.57 acres in size and includes a portion of an existing apartment site southeast of the property. The basin drains to existing exfiltration systems eventually outfalling into the previously described south ditch.

B-39R PD-C

The B-39R PD-C basin is 2.74 acres in size and includes a portion of the existing apartment site to the east of the property that includes the building, parking, and access way. This basin drains into an exfiltration system and eventually outfalls into the previously described south ditch.

B-39R PD-D

This basin is approximately 2.34 acres in size and located just north of the B-39R PD-C basin (and east of the property). It includes the roundabout portion of Summit Centre Way, a portion of the apartment site including the building, parking, and access way. This basin drains into an existing exfiltration system and a proposed new system to the west.

B-39R B

Is located offsite to the east of the existing apartment site. Flow from this basin does not enter the property and tis basin is shown for consistency with the previous reports only.

B-39R ALB RD PO

Is similar to the B-39R B basin as it is offsite, not connected to the property, and only shown for clarity.

Basin Vault

This basin is approximately 2.31 acres (this basin is now combined with basin E since both outfall to the dry ponds, please see the revised basin map) which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to a vault system which eventually outfalls to the perimeter ditch and finally the southwest FDOT outfall.

Basin B

This basin is approximately 0.69 acres which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the perimeter ditch and finally the southwest FDOT outfall.

Basin C1

This basin is approximately 0.69 acres which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the southern ditch and finally the southwest FDOT outfall.

Basin C2

This basin is approximately 0.98 acres which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the southern ditch and finally the southwest FDOT outfall.

Basin D1

This basin is approximately 1.31 acres which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the perimeter ditch and finally the southwest FDOT outfall.

Basin D2

This basin is approximately 1.33 acres which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the perimeter ditch and finally the southwest FDOT outfall.

Basin D3

This basin is approximately 0.83 acres which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the perimeter ditch and finally the southwest FDOT outfall.

Basin A

This basin is approximately 1.91 acres which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the perimeter ditch and finally the southwest FDOT outfall.

Basin E

This basin is approximately 1.41 acres (this basin is now combined with basin Vault since both outfall to the dry ponds, please see the revised basin map) which will be developed into commercial property including a building with associated parking and drive areas. The basin will drain to an exfiltration system which eventually outfalls to the southern ditch and finally the southwest FDOT outfall.

Basin Dry Pond

This basin is approximately 1.08 acres which will be developed into a pond area including two dry ponds separated by a ribbon road. The basin will drain to the dry ponds which outfall to the southern ditch and finally the southwest FDOT outfall.

Basin North Bypass Ditch

This basin is approximately 3.44 acres and consists of a portion of the north perimeter ditch (south of SR 414). This area will not be developed and is 100% pervious. The basin will drain to a perimeter ditch eventually outfalling to the southern ditch and finally the southwest FDOT outfall.

Basin South Bypass Ditch

This basin contains approximately 1.42 acres of the southern ditch. This area will not be developed and is 100% pervious. Runoff from this basin continues west, and eventually outfalls to the southwest FDOT outfall.

Basin AHC Gateway

This basin is located north of SR 414 and outfalls south across the road eventually reaching the south ROW of the road. It is approximately 26.36 acres in size.

Basin 4

This basin is located north of SR 414 and outfalls south across the road eventually reaching the south ROW of the road. It is approximately 1.01 acres in size.

Basin Maitland Crossing

This basin is located south of the proposed development. Runoff from this basin travels north into the south ditch eventually outfalling to the west. It is approximately 19.01 acres in size.

2.1 Stormwater Management Plan

2.2 Water Quality and Attenuation and General Information

In general, all on-site basins flow to in-ground exfiltration or vault areas where the water quality and attenuation volumes are stored. All exfiltration/vault areas stage up and outfall to the perimeter ditch or southern ditch and eventually to the FDOT manhole connection near the southwest corner of the property. All post-development flow rates (and storm stages) are less than the pre-development rates for all storm scenarios modeled. These include flows and stages which outfall to the original FDOT outfall at the southwest corner of the site and to Maitland Boulevard (SR 414).

The FDOT stormwater pond labeled as "Pond G" in pre-development will be removed and all of the offsite (and any associated onsite) flows that previously went to the pond will be directed into the perimeter ditch. None of the offsite FDOT flows will be directed to exfiltration. All post-development flow rates are less than the pre-development rates for the storm scenarios modeled.

Water Quality is provided by utilizing the exfiltration/vault areas for the on-site runoff and a weir in the perimeter ditch to hold the treatment volume. The calculations for the treatment volume involve the use of overcompensation in some of the on-site exfiltration areas. By a method devised by the SJRWMD a theoretical efficiency curve was generated using 0%, 80%, and 95% removal efficiencies. This curve was found to attenuate around 96% efficiency (the theoretical maximum obtainable with overcompensation). This efficiency corresponded to the maximum efficiency available on-site.

A similar curve was developed for the off-site areas. The relationship (x%)*(off-site area) + (96%)*(on-site area) = (80%)*(total area) was used to determine the required efficiency for the off-site area, and therefore what would be held in the perimeter pond. This required efficiency was plotted on the off-site overcompensation curve and a corresponding volume was found mathematically.

GAI Consultants, Inc.
618 E. South St., Ste. 700
Orlando, FL 32801
Tel: 407.423.8398

gai consultants
transforming ideas into reality

CALCULATION SHEET

CLIENT/PROJECT Maitland West Perimeter Ditch — JOB NO. A120273.07
SUBJECT Treatment Volume Stage vs. Storage — SHEET NO. 1
DESIGNED BY Tim Ziegler — INITIALS TFZ — DATE February 26, 2019
CHECKED BY — INITIALS — DATE

Perimeter Ditch

TREATMENT VOLUME vs STAGE VS. STORAGE

Stage	Area (SF)	Area (AC)	Volume (CF)	Cumulative Vol (CF)	Cumulative Vol (AC-FT)
84.00	92,445	2.12	0	0	0.00
84.50	125,895	2.89	54,585	54,585	1.25
85.00	145,013	3.33	67,727	122,312	2.81
86.00	163,695	3.76	154,354	276,666	6.35
87.00	192,726	4.42	178,211	454,877	10.44
88.00	232,793	5.34	212,760	667,637	15.33
89.00	251,211	5.77	242,002	909,639	20.88
Required Treatment Vol. =			135,930	CF 3.12	ac*ft

Bottom

Weir El. = 85.09

Treatment Volume Provided = **135,930** **CF @** **85.09**

85.00		2.81
85.09		3.12
86.00		6.35

Source: SJRWMD permit 20432-27

TREATMENT VOLUME CALCULATIONS

POST-DEVELOPMENT ONSITE BASINS

Basin	Pond/exfiltration area NODE	Area (acres)	Pervious Area (acres)	Impervious Percentage %	CN	TC (minutes)	Online / Offline On/Off	TV for total area (retention) CF	TV for Imp area (retention) CF	Max TV Req. CF	Weir elev (feet)	Provided TV CF
Basin A	Pond A	1.91	0.21	89%	91	10	On	6,933	11,186	11,186.30	92.00	28,046
Basin B	Pond B	0.69	0.02	97%	91	10	On	2,505	4,276	4,275.91	92.00	18,987
Basin C1	Pond C1	0.69	0.04	95%	91	10	On	2,505	4,214	4,214.25	92.00	14,907
Basin C2	Pond C2	0.98	0.07	92%	91	10	On	3,557	5,891	5,891.49	92.00	14,907
Basin D1	Pond D1	1.31	0.17	87%	91	10	On	4,755	7,568	7,568.10	92.20	14,775
Basin D2	Pond D2	1.33	0.24	82%	91	10	On	4,828	7,342	7,342.31	92.00	19,242
Basin D3	Pond D3	0.83	0.15	82%	95	10	On	3,013	4,587	4,586.51	92.00	12,511
¥ Basin E	¥ Pond E	1.41	0.09	94%	69	10	On	5,134	8,589	8,588.94	91.30	32,856
Basin Dry Pond †††	Dry Pond	1.08	0.82	24%	69	10	On	3,931	3,159	3,931.29	90.70	††† 82,253
¥ Basin Vault	¥ Vault	2.31	0.22	91%	90	10	On	8,385	13,685	13,684.69	92.50	61,856

††† Basin Dry Pond provided TV is equal to west + east pond TV — 12.55

¥ Basins E and Vault are combined into one basin which outfalls into the dry pond — Pervious Total = 2.03 — 16% per — Total treatment volume required = 71,270 CF 1.64 ac*ft

Impervious Total = 10.52 — 84% imp — Total treatment volume provided = 71,270 CF 1.64 ac*ft

POST-DEVELOPMENT OFFSITE BASINS

Perimeter Ditch Basins	Pond/exfiltration area NODE	Area (acres)	Pervious Area (acres)	Impervious Percentage %	CN	TC (minutes)	Online / Offline On/Off	TV for total area (retention) CF	TV for Imp area (retention) CF	Max TV Req. CF	Weir elev (feet)	Provided TV CF
£ WRA-2	SR-414 S-DITCH	7.18	4.00	44%	88	10	On	26,063	27,461	27,461	85.09	see below
¥ Offsite Basin(s) **[17.66+ Cen+South]**	Ditch 2-3 Node	**26.10**	8.98	66%	77	25	On	94,743	125,054	125,054	85.09	see below
Bypass Ditch North (from	Ditch 1-2 Node	3.44	3.44	0%	39	10	On	0	0	0	85.09	N/A

€ Summit Center Way basin TV per previous permit. — 36.72 — 152,514 CF 3.501 ac*ft

¥ Includes Central and South Basins — Pervious Total = 16.42 — Provided by Overcompensation = 16,585 CF 0.381 ac*ft

All data per adjacent SJRWMD permit — Impervious Total = 20.30

Total treatment required in ditch after overcompensation = 135,930 CF 3.121 ac*ft

Total offsite treatment provided in perimeter ditch (see below) = **135,930** **CF** **3.121** ac*ft

South Bypass Ditch Basin	Pond/exfiltration area NODE	Area (acres)	Pervious Area (acres)	Impervious Percentage %	CN	TC (minutes)	Online / Offline On/Off	TV for total area CF	TV for Imp area CF	Max TV Req. CF	Weir elev (feet)	Provided TV CF
South Bypass Ditch	S Ditch W End	1.42	1.42	0%	39	10	On	0	0	0	81.50	N/A

Previously permitted †	Pond/exfiltration area NODE	Area (acres)	Pervious Area (acres)	Impervious Percentage %	CN	TC (minutes)	Online / Offline On/Off	TV for total area CF	TV for Imp area CF	Max TV Req.† CF	Provided TV† CF
B-39R PD A	B-39R PD A	3.06	1.00	67%	71	10	On	11,108	14,901	15,970	†
B-39R PD B	B-39R PD B	4.57	1.30	72%	91	10	On	16,589	23,132	27,120	†
B-39R PD C	B-39R PD C	2.74	1.70	38%	86	10	On	9,946	9,692	14,865	†
B-39R PD D	B-39R PD D	2.34	1.00	57%	90	10	On	8,494	10,327	11,495	†
B-39R B	B-39R B	4.94	4.20	15%	80	10	On	17,932	12,324	17,932	†
B-39R ALB RD PO	B-39R ALB RD PO	0.40	0.12	70%	93	10	On	1,452	1,997	1,997	†

Total = 118.00 Acres

Total offsite treatment required offsite basins = † = treatment volume supplied off-site

Total offsite treatment provided offsite basins = † = treatment volume supplied off-site

† = treatment volume supplied off-site

see adjacent SJRWMD permit

Source: SJRWMD permit 20432-27

OPERATION AND MAINTENANCE (O&M) PERMIT TRANSFER TECHNICAL STAFF REPORT
04-Sep-2014
APPLICATION #: 20930-8

O&M Entity: Florida Dept of Transportation
Karen A Snyder
719 S Woodland Blvd
Deland, FL 32720-6834
(386) 943-5434

Project Name: S.R. 414, Maitland Blvd., Extension

Authorization Statement:
This permit authorizes the operation and maintenance of the stormwater management system, with stormwater treatment by exfiltration trench, retention and wet detention, serving S.R. 414 Maitland Boulevard extension, from US 441 to SR 434, the interchange at the intersection of SR 414 and SR 434, and associated ponds (with the exception of Pond G and adjacent existing retention area), as permitted under sequences 1 and 2, by the Florida Department of Transportation. Pond G and the adjacent retention area will be operated and maintained by Maitland West, LLLP, per the sequence 7 permit. This project consists of 77.1 acres to be operated and maintained in accordance with plans received by the District on May 31, 1995, as revised by plans received by the District on August 25, 1995, and plans received by the District on October 27, 1997, as amended by Sheets 59, 77, and 80, received by the District on December 11, 1997

Recommendation: Approval
Reviewers: Bill Carlie; Kenneth Lewis; Cecilia Tyne

AS-BUILT INSPECTION DATE: 8/15/2014, 8/18/2014

FILED/RECORDED O & M DOCUMENTS SUBMITTED? Yes

PROJECT IN COMPLIANCE? Yes

STORMWATER TREATMENT TYPE: Exfiltration Trench, Wet Detention, Retention

OTHER COMMENTS: Sequence 8 is a conversion to the operation and maintenance phase and split permit ownership of sequences 1 and 2 for the Florida Department of Transportation. The Florida Department of Transportation will operate and maintain all that was permitted under sequences 1 and 2 except Pond G and the adjacent existing retention area, which will be operated and maintained by Maitland West, LLLP, per sequence 7 permit. Note: Comment on Project in Compliance Memo from District Engineer, Ken Lewis, concerning spreader swale construction to avoid erosion problems having been adequately addressed, satisfies Permit Condition 28. Upon completion of the permit transfer process, please close sequences 1 and 2.

Conditions

1. The operation and maintenance entity shall inspect the stormwater or surface water management system once within two years after the completion of construction and every two years thereafter to determine if the system is functioning as designed and permitted. The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by the District during normal business hours. If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report to the District, on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.

2. All activities shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit.

3. Activities approved by this permit shall be conducted in a manner which do not cause violations of state water quality standards.

4. Should any other regulatory agency require changes to the permitted system, the permittee shall provide written notification to the District of the changes prior implementation so that a determination can be made whether a permit modification is required.

5. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and chapter 40C-4 or chapter 40C-40, F.A.C.

6. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the activities authorized by the permit or any use of the permitted system.

7. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of the permitted system or the real property at which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of rule 40C-1.612, F.A.C. The permittee transferring the permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to such sale, conveyance or other transfer.

8. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.

9. This permit authorizes the operation and maintenance of the surface water management system in accordance with the plans received by the District on May 31, 1995, as revised by plans received by the District on August 25, 1995, and plans received by the District on October 27, 1997, as amended by Sheets 59, 77, and 80, received on December 11, 1997.

1 - Sequence 1 TSR

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT
TECHNICAL STAFF REPORT
March 18, 1996

Applicant: Florida Dep.of Transportation
Attn: J. William Strange, P.E.
719 South Woodland Boulevard
Deland Florida 32720

Agent: Dyer, Riddle, Mills and Precourt, Inc.
Attn: Jon Meadows, P.E.
1505 East Colonial Drive
Orlando Florida 32803

Attorney of Record: Florida Department of Transportation
Attn: George Lovett
719 South Woodland Boulevard
DeLand Florida 32720

County: Orange/Seminole **Project Name:** Maitland Boulevard (a.k.a. SR 414) Extension

Section: 19,20,21,28,29,30 **Township:** 21S **Range:** 29E
Acres Owned: 77.10 **Project Acreage:** 77.10

General Description OF APPLICATION NO. 4-095-0505AG-ERP :

This project includes the extension of Maitland Boulevard from SR 400 (US 441) to SR 434 (Forest City Road). The roadway is located within Orange and Seminole Counties, including a total of 2.6 miles. A total of seven ponds will be constructed as a part of the project.

Authority: chapter 373 F.S.; chapter 40C-4 F.A.C.

Existing Land Use: forested and herbaceous uplands and wetlands

Hydrologic Basin(s): Wekiva River Hydrologic Basin

Receiving Water Body(ies): Little Wekiva River Class: III

Easements/Restrictions: No

Operation and Maintenance Entity: Florida Department of Transportation

Staff Comments:

The Maitland Extension project extends from between Forest City Road (a.k.a. SR 431) to Orange Blossom Trail (a.k.a. SR 441). The proposed roadway extension is located within both Seminole and Orange Counties. The proposed roadway extension will include 2.6-miles of roadway length, four-lanes, an auxiliary turn lane, curb and gutter, and a total of 7 surface water management basins. The project area is within the Wekiva River Hydrologic Basin, south of SR 436.

Pursuant to section 11.3, A.H./MSSW, projects within specific areas of the Wekiva River Hydrologic Basin must meet basin-specific criteria. The six specific zones within the basin are listed below, as are their application to the Maitland Boulevard Extension project.

- **Recharge Standard** (11.3.1) - The project area contains some of the soil types that are defined as Most Effective Recharge Soils, although soils analyses have shown that the project area includes confining soil layers near the existing grade. Because of this, storage of the recharge volume is not applicable, although the proposed system includes a retention basin that will provide recharge to the aquifer.

- **Storage Standard** (11.3.2) - No net reduction in the 100-year flood storage is allowed. The applicant has demonstrated that compensating storage will be provided for any fill that will be placed within the 100-year floodplain.

- **Standard for Erosion and Sediment Control and Water Quality** (11.3.3) - The project area is not located within the Water Quality Protection Zone and therefore does not require the submittal of a plan based on section 18.2, A.H./MSSW. The applicant has provided reasonable assurance that the control of sediment transport will be addressed, in detail, prior to any construction.

- **Standard for Limiting Drawdown** (11.3.4) - The project area is located within the Water Quantity Protection Zone. The construction of the project will not cause ground water table drawdowns that would adversely affect the functions provided by the nearby wetlands.

- **Standard for Riparian Wildlife Habitat** (11.3.5) - A portion of the project contains portions of the Riparian Habitat Protection Zone (RHPZ).

Source: SJRWMD permit 20930-1

- **Local Government Notification for the Wekiva River Protection Area** (11.3.6) - The project area is not located within the Wekiva River Protection Area.

The proposed roadway extension will affect four wetland systems

Wetland One is a 0.21- acre portion of a maintained ditch, adjacent to Wetland Two. This ditch outfalls into a stormwater retention pond.

Wetland Two is a 0.17-acre portion of a larger (approximately 0.5 of an acre in size) isolated wetland system that is located south of the proposed alignment, east of SR 441. The vegetation within this wetland consists of pond pine and chain fern.

Wetland Three is the Lake Bosse flowway, located on the south side of the proposed Maitland Boulevard alignment. This system is contiguous to waters of the state and is vegetated with a monoculture of Carolina willow. The anticipated impacts within Wetland Three is 2.50 acres, The flowway is proposed to be bridged in order to minimize wetland impacts and minimize adverse impacts to wildlife movement and drainage patterns.

Wetland Four is the Little Wekiva River crossing. There is a approximately 1.7 acres of the RHPZ within the proposed project area. Of that 1.7 acres, 1.3 acres is the wetland component and 0.4 is the upland component. The uplands within the RHPZ consist of turkey oak, live oak, longleaf pine, and other mixed hardwoods. The 1.3 acres of wetlands in this area are associated with the Little Wekiva River. The river has been channelized within this section. South of Oranole Road, the riverbanks are vegetated with maidencane. North of Oranole Road, a mixed forested system exists adjacent to, and contiguous with, the stream channel. This area is vegetated with cypress, sweetgum, laurel oak, water oaks and a sparse ground cover. Vegetation within the river itself consists of wild taro, Carolina willow, buttonbush and paragrass.

Mitigation Plan

A total of 2.9 acres of wetlands and 1.7 acres of the RHPZ will be lost as a result of the propose roadway extension activities. The applicant has proposed a mitigation plan that includes three elements, which are as follows:

The Preservation of Parcels J and K

Parcels J and K are located north of Oranole Road, and straddle the Little Wekiva River (See Attachment B).

Parcel J is 4.48 acres in size; Upland 4.46; Wetland 0.02 of an acre. Parcel J is characterized by mixed upland and wetland forested communities. Dominant species include cypress, sweetgum, laurel oak. The wetlands cover the eastern and northern edge of the property and border the Little Wekiva River and the Lake Bosse floway, respectively. Upland communities are dominated by live oak, longleaf pine, turkey oak, and saw palmetto. This parcel is located almost entirely within the RHPZ (all but 0.5 of an acre). A service road for the park (0.45 of an acre) exists within the parcel.

At one time, a parking area was proposed by the City of Altamonte Springs within Parcel J. This parking lot was approved by the District on February 7,1995, as part of permit 4-117-0314GM. However, the City of Altamonte agreed to move the parking to south of Oranole Road. A permit modification (Permit Application 4-117-0314AGM2) that includes the relocation of the parking area has been submitted to the District by the City of Altamonte Springs.

Parcel K

Parcel K is located entirely within the RHPZ. Parcel K is vegetated by mixed upland hardwood trees. Dominant species include laurel oak, live oak, wild blackberry, and saw palmetto. The western edge of the parcel borders the Little Wekiva River channel. Total Area 10.62 acres; upland 10.55 acres; wetlands 0.07 acres.

Eliminate the Oranole Road Bridge over the Little Wekiva River

Oranole Road is a two-lane dirt road that runs parallel to the proposed project alignment. The road crosses the Little Wekiva River by means of a concrete bridge. The road slopes to the river from both the east and west. In its current condition, the road contributes large sediment loads and untreated runoff tot he river during large storm events. The bridge also restricts the channel in this area, increasing stream velocities during storm conditions. Sediment deposition is visible in Lake lotus, location downstream of Oranole Road. The applicant proposes to close the portion of Oranole Road west of the bridge, and remove the bridge itself.

Pave the portion of Oranole Road east of the existing bridge and provide swale treatment of Runoff

To reduce sediment contributions to the Little Wekiva River, the applicant proposes to pave the portion of the road that slopes to the river from the east and provide swale treatment along the shoulder of Oranole Road.

Water quality treatment and water quantity attenuation

The project area discharges surface water runoff to Lake Bosse, Lake Lotus, or to the Little Wekiva River. Lakes Bosse and Lotus are a part of the Little Wekiva River system so that the surface water runoff from the total project area ultimately is received by the Little Wekiva River.

The roadway extension includes a total of seven ponds to provide water quality treatment and water quantity attenuation. Three of the ponds will be located within Orange County and four will be within Seminole County. One pond in each of the counties will be shared with another project in the vicinity. Pond A (Orange County) will be shared with an industrial park (permit #4-095-0216) and Pond G (Seminole County) will be shared with an intersection improvement project (SR 414/SR 434; permit #4-117-0068G). The entire system will be operated and maintained by the Florida Department of Transportation.

The ponds that will be constructed with the roadway widening project include three filtration systems, one wet detention system, and one dry retention system.

The applicant has provided reasonable assurance that the proposed system is consistent with the design criteria and objectives of the District set forth in sections 10.3, A.H. and chapter 40C-42, F.A.C.

Bridges

The construction of the roadway extension will include two bridges. The bridges will traverse Lake Bosse and the Little Wekiva River. Turbidity monitoring will be required during any construction activities within the flowing streams of the systems. The Lake Bosse bridge will be 700-feet in length; the Little Wekiva River bridge will be just under 70-feet in length.

Floodplain impacts and compensation

The proposed project includes impacts to the floodplain of Lake Bosse and the Little Wekiva River. The proposed design includes compensating storage for any fill that will be placed within the 100-year floodplain. The compensating storage will be provided within areas excavated adjacent to the existing floodplain area. The applicant has provided reasonable assurance that the proposed design is consistent with the design criteria and objectives of sections 10.5 and 11.3, A.H.

Summary

Staff has evaluated the proposed mitigation plan to determine if the mitigative activities will compensate for the encroachments into the RHPZ and wetlands. Protection of Parcels J and K will provide perpetual protection of a section of the Little Wekiva corridor and the functions that this section of river provides to aquatic and wetland dependent species. The two parcels have been purchased and will be donated to the City of Altamonte Springs by the applicant. The two parcels, in concert with the abutting park, will be preserved as part of the existing nature park. Providing swale treatment and the paving of Oranole Road will improve the water quality conditions of the runoff to the river, reduce sediment loading, and relieve a structural constriction. The three activities included as part of the mitigation plan will adequately compensate for the proposed impacts into the wetlands and RHPZ.

With mitigation, the proposed project will have no unacceptable adverse secondary and cumulative impacts to wetlands, water quality, and upland habitat for aquatic and wetland dependent fish or wildlife "listed" as endangered, threatened, or of special concern. Staff has determined that the proposed project is consistent with the wetland review criteria in sections 12.2 - 12.3.8, A.H./MSSW,ERP, and the Riparian Wildlife Standard in section 11.3.5, A.H./MSSW, ERP.

Staff believes that the proposed project meets all applicable conditions for permit issuance pursuant to sections 40C-4.301 and 40C-4.302, F.A.C.

Wetland Inventory (acres)

Total Wetlands on Project Site:	4.18
Total Wetlands Preserved:	0.00
Total Wetlands Disturbed:	0.00
Total Wetlands Lost:	4.18
Total Wetlands Created as Mitigation:	0.00
Total Wetlands Enhanced or Restored as Mitigation:	0.00

Other Compensation: 15.1 acres
known as Parcels J and K will be preserved.

Recommendation: Approval

Conditions for Application Number 4-095-0505AG-ERP :

General ERP CONDITIONS (See Condition Sheet): 1-20

Special MSSW CONDITIONS(See Condition Sheet): 1,4,10,13,30

Tables: N/A

Source: SJRWMD permit 20930-1

Other Conditions:

1. The project must be constructed pursuant to the plans that were received by the District on May 31, 1995 and as revised by those received on August 25, 1995.

2. Prior to any construction, the permittee must record easement on the real property described herein, pursuant to section 704.06, F.S. The easement must prohibit all construction including clearing, dredging or filling except that which is specifically authorized by this permit within Parcels J and K (totaling 15.1 acres) as delineated on the approved plans. Said easement must contain provisions as set forth in paragraphs 1 (a) - (h) of section 704.06, F.S., as well as provisions that the easement may be enforced by the District and may not be amended without District approval. The draft easements must be submitted for District review and approval prior to recording and no later than 30 days from the date of issuance of this permit. The surveyors sketch of the area included in the legal description and an additional surveyors sketch of the easement area plotted on the appropriate USGS topographic map must be submitted with the draft easement. The easement must be recorded and the easement area boundaries must be permanently monumented on the project site prior to the sale of an lot or parcel, initiation of construction, or within 90 days of issuance of this permit, whichever occurs first.

   The permittee must provide the District with a certified copy of the final recorded easements showing the official records book and page number no later than 30 days after receipt of District approval of the draft easement.

3. As-built inspection reports must include surveyed verification that the spreader swales are constructed flat such that no erosion problems will occur at these sites.

4. At least 30 days prior to construction the permittee must submit to the District's Orlando Service Center the detailed Erosion and sediment containment plan, for staff's review and approval. This detailed erosion and sediment containment plan must include a proposed Turbidity monitoring plan for the bridge construction and removal activities in Lake Bosse and the Little Wekiva River, which specifies the sample location, sample collection frequency, description of sample chain of custody, water flow direction, and antecedent weather conditions. Verification of this information

Source: SJRWMD permit 20930-1

by District staff must occur prior to the commencement of construction within Lake Bosse or the Little Wekiva River.

5. The following turbidity monitoring conditions apply to the Little Wekiva River bridge construction and removal sites and the Lake Bosse bridge crossing. A minimum of 30 days prior to the commencement of construction within either of the waterbodies or wetland areas, the permittee must notify District staff - Orlando Service Center - to meet on-site and verify the locations for turbidity monitoring to take place.

   During the bridge construction activities, the permittee must monitor Turbidity at the locations verified by District staff. The locations will be based upon the flow conditions of the systems.

   The background sample must not be taken within any visible plume. Samples must be collected two times daily with a morning and afternoon sample at least four hours apart.

   Before removal of the turbidity barriers, the turbidity levels within the area surrounded by the turbidity barrier must be sampled to ensure no release of turbid water once the turbidity barriers are removed. The turbidity barrier may not be removed until the sample data indicates levels which do not exceed the State Water Quality Standards. This sample data must be included within the weekly Turbidity data report.

6. If at any time the downstream Turbidity level exceeds the State Water Quality Standards, then all measures required to reduce the Turbidity including stopping all construction activities, must be taken. The work, other than measures to reduce Turbidity, must not resume until the Turbidity has returned to acceptable levels. Any such violation must be reported immediately to the District's Orlando Service Center.

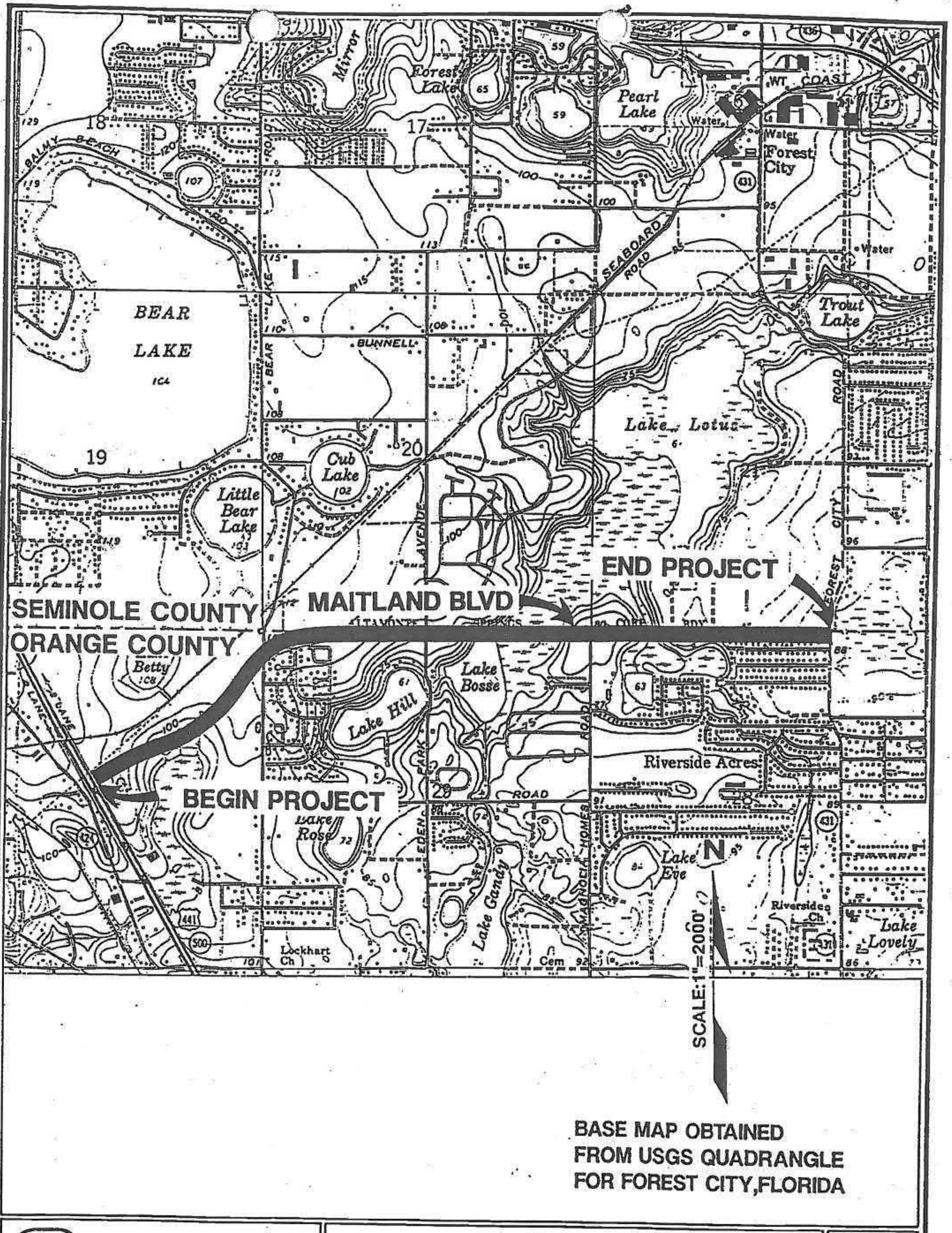
7. All Turbidity data must be submitted to the District's Orlando Service Center weekly. The data must contain the following information:

   - permit number;
   - date and time of sampling and analysis;
   - statement describing collection, handling, storage, and analysis methods;

- a map indicating the location of the samples taken;
- depth of sample;
- antecedent weather conditions; and,
- flow direction.

Reviewers: Brabham/Johnson/C. Dewey

Source: SJRWMD permit 20930-1

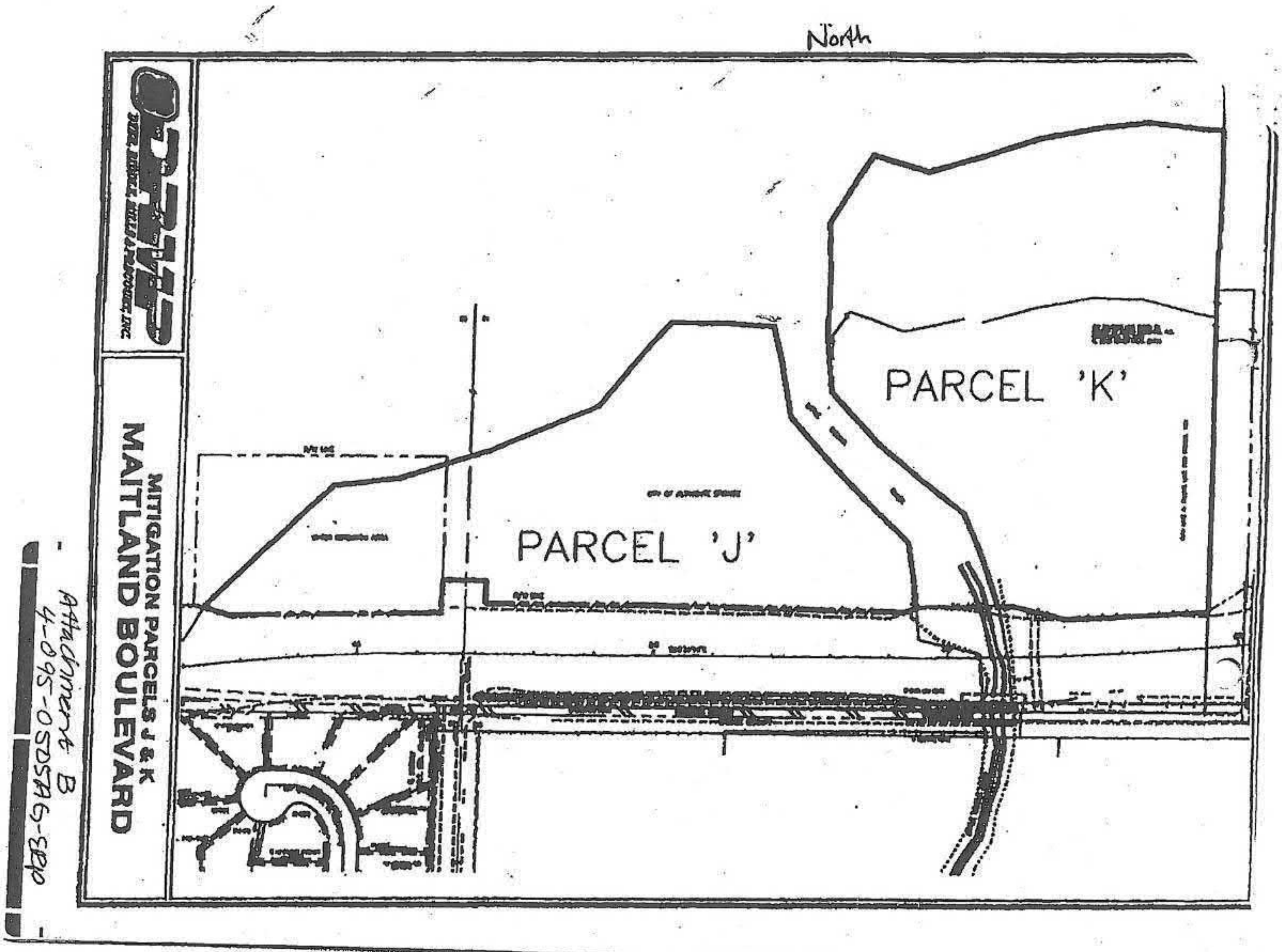


DYER, RIDDLE, MILLS AND PRECOURT, INC.
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS

LOCATION MAP

EXHIBIT
1

Attachment A 4-095-0805AG-ERP



Source: SJRWMD permit 20930-1

PERMIT APPLICATION APPRAISAL FORM- BIOLOGICAL REPORT

MSSW File [redacted]AG-ERP **WRM File Number:**

ENTERED 2-23-96 LK

Project Name: Maitland Extension **County:** Orange

Applicant:: FDOT

Waterbody: Little Wekiva River **Class:** I II III IV V

Outstanding Florida Waterbody (if applicable): OFW

Inspection by: Johnson, Malo, Hart, Frost, Egan, Wallins **Date of Inspection:** 1992-1996

WRM Project Description (to be used on TSR and permit)

Construction in waters of the State including the excavation of cubic yards of material from acres of and the placement of cubic yards of fill material in acres of for (complete if applicable): The project also includes construction of a stormwater management system to serve the acre project. The system consists of

Project History
[pre application meetings, related permits, previous/existing violations (if they exist)]

No known violations. The Maitland Extension project extends from between Forest City Road (a.k.a SR 431) to Orange Blossom Trail (a.k.a. SR 441). The proposed roadway extension is located within both Seminole and Orange Counties, and is within the Wekiva River Hydrologic Basin, south of SR 436. A portion of the project contains portions of the Riparian Habitat Protection Zone (RHPZ).

Construction Techniques and Turbidity Controls
(If dredging in waters is proposed describe the sediment characteristics)

The applicant has proposed silt fencing, hay bales, and/or turbidity screens to prevent the discharge of turbid water.

Site Biophysical Characteristics

Vegetative Community
[Community description both uplands and wetlands (assign each wetland and i.d. number for description purpose)
Community types, Condition of community, surrounding landuse]

The proposed roadway extension will affect four wetland systems:

Wetland One is a 0.21- acre portion of a maintained ditch, adjacent to Wetland Two. This ditch outfalls into a stormwater retention pond.

Wetland Two is a 0.17-acre portion of a larger (approximately 0.5 of an acre in size) isolated wetland system that is located south of the proposed alignment, east of SR 441. The vegetation within this wetland consists of pond pine and chain fern.

Wetland Three is the Lake Bosse flowway, located on the south side of the proposed Maitland Boulevard alignment. This system is contiguous to waters of the state and is vegetated with a monoculture of Carolina willow. The anticipated impacts within Wetland Three is 2.50 acres, The flowway is proposed to be bridged in order to minimize wetland impacts and minimize adverse impacts to wildlife movement and drainage patterns.

Wetland Four is the Little Wekiva River crossing. There is a approximately 1.7 acres of the RHPZ within the proposed project area. Of that 1.7 acres, 1.3 acres is the wetland component and 0.4 is the upland component. The uplands within the RHPZ consist of turkey oak, live oak, longleaf pine, and other mixed hardwoods. The 1.3 acres of wetlands in this area is associated with the Little Wekiva River. The river has been channelized within this section. South of Oranole Road, the riverbanks are vegetated with maidencane. North of Oranole Road, a mixed forested system exists adjacent to, and contiguous with, the stream channel. This area is vegetated with cypress, sweetgum, laurel oak, water oaks and a sparse ground cover. Vegetation within the river itself consists of wild taro, Carolina willow, buttonbush and paragrass.

Site Disturbances
(Degree and types of existing site disturbances, exotic/nuisance species)

The project site is surrounded by development on all sides for the most part. South of Oranole Road, the river has been channelized and mostly cleared to the bank's edge.

Hydrologic Characteristics
(current conditions, normal/historical conditions)

Normal. See description of Wetland Four for local disturbances.

Wildlife Use
[observed or reasonably anticipated (including T or E species), role of site in overall trophic structure of area including use by man]

There's a variety of wildlife anticipated in the project area.

Water Quality
[characterize existing quality, include suspected cause of current problems (if any exist)]

Heavy sediment deposition in area.

Wetland/Waterbody Impact Summary

Wetland Encroachments
(attach additional sheets if necessary)

Wetland I.D. 01 Size (acres) 0.21 Impact (acres/code) 0.21(fh) Isolated/W.O.S. wos Ditch (yes/no)
Yes Codominate species maintained

02	0.17	0.17(fw)	WOS	No	pond pine, chain fern
03	2.50	2.5(fw)	WOS	No	Carolina willow (Lake Bosse)
04	1.3	1.3(fw)	WOS	No	mixed harwoods (Little Wekiva River)

codes: FH, FW, SH, SW (from wetland inventory)

Open Water Encroachments

Site I.D.	Size (acres)	Impact (acres)	Isolated/W.O.S.	Ditch (yes/no)

Wetland Impact/Mitigation Proposal Summary

Mitigation Plan

A total of 2.88 acres of wetlands and 1.7 acres of the RHPZ will be lost as a result of the propose roadway extension activities. The applicant has proposed a mitigation plan that includes three elements, which are as follows:

The Preservation of Parcels J and K

Parcels J and K are located north of Oranole Road, and straddle the Little Wekiva River (See Attachment B).

Parcel J is 4.48 acres in size; Upland 4.46; Wetland 0.02 of an acre. Parcel J is characterized by mixed upland and wetland forested communities. Wetland communities comprise approximately 30 percent of the parcel. Dominant species include cypress, sweetgum, laurel oak. The wetlands cover the eastern and northern edge of the property and border the Little Wekiva River and the Lake Bosse flowway, respectively. Upland communities are dominated by live oak, longleaf pine, turkey oak, and saw palmetto. This parcel is located almost entirely within the RHPZ (all but 0.5 of an acre). A 0.45 of an acre park service road is located with J.

At one time, a parking area was proposed by the City of Altamonte Springs within Parcel J. This parking lot was approved by the District on February 7,1995, as part of permit 4-117-0314GM. However, the City of Altamonte agreed to move the parking to south of Oranole Road. A permit modification (Permit Application 4-117-0314AGM2) that includes the relocation of the parking area has been submitted to the District by the City of Altamonte Springs.

Source: SJRWMD permit 20930-1

Parcel K

Parcel K is located entirely within the RHPZ. Parcel K is vegetated by mixed upland hardwood trees. Dominant species include laurel oak, live oak, wild blackberry, and saw palmetto. The western edge of the parcel borders the Little Wekiva River channel. Total Area 10.62 acres; upland 10.55 acres; wetlands 0.07 acres.

Eliminate the Oranole Road Bridge over the Little Wekiva River

Oranole Road is a two-lane dirt road that runs parallel to the proposed project alignment. The road crosses the Little Wekiva River by means of a concrete bridge. The road slopes to the river from both the east and west. In its current condition, the road contributes large sediment loads and untreated runoff tot he river during large storm events. The bridge also restricts the channel in this area, increasing stream velocities during storm conditions. Sediment deposition is visible in Lake lotus, location downstream of Oranole Road. The applicant proposes to close the portion of Oranole Road west of the bridge, and remove the bridge itself.

Pave the portion of Oranole Road east of the existing bridge and provide swale treatment of Runoff

To reduce sediment contributions to the Little Wekiva River, the applicant proposes to pave the portion of the road that slopes to the river from the east and provide swale treatment along the shoulder of Oranole Road.

Summary

Protection of the two parcels will provide an effective buffer between the river and any future upland development. The two parcels have been purchased by the FDOT and will be donated to the City of Altamonte Springs. The park will be preserved as part of the existing nature park. Providing swale treatment and paving of the road will improve the water quality conditions of the runoff to the river and reduce sediment loading as well. The three activities included within the mitigation plan will adequately compensate for the proposed impacts into the wetlands and RHPZ.

The proposed project will have no unacceptable adverse secondary and cumulative impacts to wetlands, water quality, and upland habitat for aquatic and wetland dependent fish or wildlife "listed" as endangered, threatened, or of special concern. Staff has determined that the proposed project is consistent with the wetland review criteria in sections 12.2 - 12.3.8, A.H./MSSW,ERP, and the Riparian Wildlife Standard in section 11.3.5, A.H./MSSW, ERP.

MSSW WETLAND INVENTORY

PROJECT NAME: Maitland Boulevard Extension
PROJECT NUMBER: 4-095-0505AG-ERP

A:	TOTAL WETLAND ACREAGE:	4.18 ACRES(fh,fw)
B:	TOTAL WETLANDS "PRESERVED": (i.e.- not disturbed or lost)	0.00 ACRES
C:	TOTAL WETLANDS DISTURBED: (temporary, not lost)	0.00 ACRES
D:	TOTAL WETLANDS LOST:	4.18 Acres (fh,fw)
	1.WATERS OF THE STATE ACREAGE: (D/F, N/A)	4.18 ACRES (fh,fw)
	2.CONTIGUOUS TO WATERS ACREAGE:	0.00 ACRES
	3.ISOLATED ACREAGE:	0.00 ACRES
E.	TOTAL WETLANDS CREATED AS MITIGATION:	0.00 ACRES
F.	TOTAL WETLANDS ENHANCED AS MITIGATION:	0.00 ACRES

G. OTHER COMPENSATION: 15.1 ACRES of Parcels J and K will be preserved.

SUFFIX (FH),(FW), (SH), OR (SW) MUST BE APPENDED TO EACH ACREAGE VALUE.

REVIEWER: ELIZABETH R. JOHNSON
DATE: 14 Feb 1996

ORL-PDS
DHQ-PDS
TSR

Source: SJRWMD permit 20930-1

FIELD SITE INSPECTION REPORT FORM
SJRWMD
FROM: ELIZABETH R. JOHNSON

1. **PROJECT NUMBER:** 4-095-0505AG-ERP

2. **PROJECT NAME:** Maitland Boulevard Extension

3. **DATE OF REPORT FORM:** 12-20-95

4. **DATE OF INSPECTION:** 1991-1995

5. **PERSONS AT SITE MEETING:** Johnson, Malo, Hart, Frost, Egan, Wallins

6. **GENERAL OVERALL SITE DESCRIPTION** (I.E. UPLANDS AND WETLANDS):
Wetland One is a 0.21- acre portion of a maintained ditch, adjacent to Wetland Two. This ditch outfalls into a stormwater retention pond.

Wetland Two is 0.17 acres in size, and is located south of the proposed alignment, east of SR 441. The vegetation within this wetland consists of pond pine and chain fern.

Wetland Three is the Lake Bosse flowway, located on the south side of the proposed Maitland Boulevard alignment. This system is contiguous to waters of the state and is vegetated with a monoculture of Carolina willow. The anticipated impacts within Wetland Three is 2.50 acres, The flowway is proposed to be bridged to reduce wetland impacts and o not adversely afect wildlife movement and drainage patters.

Wetland Four is the Little Wekiva River crossing. There is a pproximately 1.7 acres of the RHPZ within the proposed proejct area. Of that 1.7 acres, 1.3 acres is the wetland component and 0.4 is the upland component. The uplands within the RHPZ consist of turkey oak, live oak, longleaf pine, and other mixed hardwoods. The 1.3 acres of wetlands in this area are associated with the Little Wekiva River. The river has been channelized within this section; south of Oranole Road, the riverbanks are vegetated with maidencane. North of Oranole Road, a mixed forested system exists adjacent to and contiguous with the stream channel. This area is vegetated with cypress, sweetgum, laurel oak, water oaks and a sparse ground cover. Vegetation within the river itself consists of wild taro, Carolina willow, buttonbush and paragrass.

A total of 5.6 acres of wetlands and 1.7 acres of the RHPZ will be lost as a result of the propose roadway extension acticities. The applicant has proposed a mitigation plan that includes three elements, which are as follows

7. DESCRIPTION OF WETLANDS(SEE DIAGRAM BELOW FOR I.D. NUMBER): N/A SEE ABOVE

8. **MINIMIZATIONS AND ALTERNATIVES DISCUSSED FOR REDUCING WETLAND IMPACTS:** YES NO NONE PROPOSED N/A

9. DISCUSS THE HYDROLOGIC REGIMES, SPECIFIC CHARACTERISTICS OF THE WETLANDS: N/A SEE ABOVE

ORL	MSSW	WRM
DHQ	MSSW	WRM
TSR	MSSW	WRM

2 - Sequence 2 TSR

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT
TECHNICAL STAFF REPORT
January 30, 1998

Applicant: Florida Department of Transportation
Attn: James Bassett, P.E.
719 South Woodland Boulevard
Deland Florida 32720

Agent: Mr. Michael Jacobs, P. E.
URS Greiner, Inc.
315 East Robinson Street, Suite 245
Orlando Florida 32801-1975

Consultant:

County: Orange/Seminole **Project Name:** (State Road 414) Maitland Boulevard Modification

Section: 21,22,27,28 **Township:** 21 S **Range:** 29 E

Acres Owned: 77.1 **Project Acreage:** 77.1

General Description of Application Number 4-095-0505AGM-ERP: This application is for the authorization to modify permit 4-095-0505G-ERP. The modification consists of two items; the construction of an interchange at the intersection of State Road (SR) 414, Maitland Blvd, and SR 434, and modifications to several permitted ponds.

Permit 4-095-0505G-ERP authorized the extension of Maitland Boulevard from SR 400 (US 441) to SR 434 (Forest City Road). The proposed roadway is located within Orange and Seminole Counties, and includes a total of 2.6 miles. A total of seven ponds were authorized as a part of the project.

Authority: Chapter 373 F.S.; Chapter 40C-4.041(2)(b)2,8, F.A.C.

Existing Land Use: existing roadway, grassed rights-of way, forested wetland, existing stormwater ponds

Hydrologic Basin(s): 4E

Receiving Water Body(ies): Little Wekiva River (4E) Class III

Easements/Restrictions: No

Operation and Maintenance Entity: FDOT

Staff Comments:

The SR 414 Maitland Boulevard Modification project is located in Orange County, and a small portion of the project extends into Seminole County. The proposed modifications are located within the Wekiva River Hydrologic Basin, south of SR 436. The activities proposed within this permit modification are not located within the Riparian Habitat Protection Zone (RHPZ). Four areas were delineated as being wetlands or other surface waters during the review of this application. Three are ponds that were constructed as a part of the original Maitland Blvd project (4-117-0068) and one is a wetland.

The permitting history of this roadway includes two permits (4-117-0068 and 4-095-0505G-ERP). Permit 4-117-0068 was issued March 12,1985 in order to construct a surface water treatment system for portions of SR 414 and SR 434. Permit 4-095-0505G-ERP was issued in May 1996 for the extension of Maitland Boulevard from US 441 to just east of SR 434 (Forest City Road), for a total of 2.6 miles. To date, no work has begun on this project. The pending permit modification does not propose changes to the alignment, wetland or RHPZ encroachments, or the mitigation plan approved as part of permit 4-095-0505G-ERP.

This modification is for authorization to construct a new interchange at Maitland Boulevard and SR 434, and to modify several ponds approved in the Maitland Boulevard Extension permit. Attachment B provides a location map for the proposed modifications and their relationship to the approved alignment of Maitland Boulevard.

The construction activities associated with the proposed interchange include:

- construction of a new four-lane divided roadway (Maitland Blvd.), including a bridge over SR 434.
- widening of portions of SR 434 located adjacent to the new interchange.
- widening and resurfacing of existing ramps C and D.
- constructing new ramps A and B .
- modifying surface water treatment system, Pond "G", authorized by permit 4-117-0068G from a dry detention pond to a wet-detention pond.

In order to implement these proposed modifications, the applicant must affect:

Wetland 5, Pond G and two smll ponds in the median of Maitland Boulevard. Wetland 5, (5.45) is vegetated with herbaceous and forested wetland vegetation. This wetland was previously restored by the FDOT after the area was inadvertently cleared as part of the construction of the original Pond G. Two permitted ponds

Source: SJRWMD permit 20930-2

are within Maitland Blvd. median, 0.11 ac and 0.52 ac in size, and Pond G, is 2.31-acre stormwater pond.

The applicant proposes to:

- construct a new pipe from Pond G that will cause 0.09-acre temporary impact to Wetland 5. This temporary disturbance will be allowed to naturally recolonize. Staff has determined that the temporary encroachments into Wetland 5 will not adversely affect the functions the wetlands provide to fish and wildlife.

- fill the two ponds within the Maitland Boulevard median. Pursuant to section 62-340.700, F.A.C., wetlands within the 0.11-acre pond were not delineated and the wetland review criteria were not applied. Pursuant to section 62-340.700, F.A.C., the wetlands within the 0.52-acre pond were delineated; however, only the permitting criterion relating to listed endangered and threatened species was applied. Staff has determined that filling the wetlands within the 0.52-acre pond will not adversely affect listed endangered and threatened species.

- recontour Pond G. Pursuant to section 62-340.700, F.A.C., the wetlands in the pond were delineated; however, only the permitting criterion relating to listed endangered and threatened species was applied. Staff has determined that the proposed project will not adversely affect endangered and threatened species.

- The applicant also has proposed to control the water level in the modified Pond G 2 feet lower than the seasonal high water elevation of Wetland 5. A sheet pile is proposed between Pond G and the wetland to insure that there will be no adverse impacts to the wetland as a result of the lowering of the control elevation of Pond G. Staff has recommended a permit condition to monitor water levels in the wetland to insure that no adverse impacts will occur.

  Ponds A, B, D, and F, which were authorized in the Maitland Boulevard extension permit issued May 1996 (4-095-0505G-ERP), will be modified:

- Pond "B" will now outfall to Pond "A" via a proposed 30-inch culvert.

- Pond "D" has been modified from a dry retention pond to a wet-detention pond with a liner.

- Pond "F" has been modified from a filtration system to a wet-detention pond.

There are no wetland or surface water encroachments associated with modifications to Ponds A, B, D, and F.

Source: SJRWMD permit 20930-2

The proposed project is not located within a floodplain area as established by FEMA. The system is designed in accordance with requirements for discharges to a Class III waterbody. The system will provide treatment and recovery of the required pollution abatement volume pursuant to Chapter 40C-42, F.A.C, and discharge rate attenuation or volumetric storage pursuant to Chapter 40C-4, F.A.C.

The proposed modifications associated with the interchange will have no unacceptable adverse secondary and cumulative impacts to wetlands, water quality, and upland habitat for aquatic and wetland dependent fish or wildlife "listed" as endangered, threatened, or of special concern. Staff has determined that the proposed project is consistent with the wetland review criteria in sections 12.2 - 12.3.8, A.H./MSSW, ERP.

Projects within specific areas of the Wekiva River Hydrologic Basin must meet basin-specific criteria, pursuant to section 11.3, A.H./MSSW. The six specific zones within the basin are listed below as well as their application to the proosed modifications to the Maitland Boulevard project, that are a subject of this applicatiohn:

- **Recharge Standard** (11.3.1) - The project area contains some of the soil types that are defined as Most Effective Recharge Soils, although soils analyses have shown that the project area includes confining soil layers near the existing grade. Because of this, storage of the recharge volume is not applicable, although the proposed system includes a retention basin that will provide recharge to the aquifer.

- **Storage Standard** (11.3.2) - No net reduction in the 100-year flood storage is allowed. The applicant has demonstrated that no fill will be placed within the established 100-year floodplain for the proposed modifications included in this application.

- **Standard for Erosion and Sediment Control and Water Quality** (11.3.3) - The project area is not located within the Water Quality Protection Zone and; therefore, does not require the submittal of a plan based on section 18.2, A.H./MSSW. The applicant has provided reasonable assurance that the control of sediment transport will be addressed, in detail, prior to any construction.

- **Standard for Limiting Drawdown** (11.3.4) - The project area is located within the Water Quantity Protection Zone. The construction of the project will not cause ground water table drawdowns that would adversely affect the functions provided by the nearby wetlands.

- **Standard for Riparian Wildlife Habitat** (11.3.5) - There are no portions of the Riparian Habitat Protection Zone (RHPZ) within the areas subject to the proposed modifications.

- **Local Government Notification for the Wekiva River Protection Area** (11.3.6) The project area is not located within the Wekiva River Protection Area.

Source: SJRWMD permit 20930-2

Staff believes that the proposed project meets all applicable conditions for permit issuance pursuant to sections 40C-4.301 and 40C-4.302, and 40C-41, F.A.C.

Wetland Inventory (acres)

Total Wetlands on Project Site:	8.28
Total Wetlands Preserved:	5.36
Total Wetlands Disturbed:	2.40
Total Wetlands Lost:	0.52
Total Wetlands Created as Mitigation:	0.00
Total Wetlands Enhanced or Restored as Mitigation:	0.00
Other Compensation:	0.00

Recommendation: Approval

Conditions for Application Number 4-095-0505AGM-ERP :

General ERP CONDITIONS (See Condition Sheet): 1-19

Special MSSW CONDITIONS(See Condition Sheet): 10,13, 15, 28

Tables: N/A

Other Conditions:

1. The proposed surface water management system must be constructed as per the plans received by the District on October 27, 1997, and as amended by sheet 59, 77, and 80 received on December 11, 1997.

2. The permittee must monitor Wetland 5 for five years from the date of commencement of the construction activities included in "Part A" of the plans received by the District. The permittee must furnish the District with monitoring reports (two copies) semiannually for Wetland 5. During the monitoring period, the monitoring reports must be submitted by the last day of February of each year for the preceding six month period ending on January 31 of that year, and by August 31 of each year for the preceding six month period ending on July 31 of that year. The monitoring reports must contain the following information:

    - surface water elevation referenced to N.G.V.D., or if surface water is not present, ground water referenced to N.G.V.D.; and,

- location of staff gauge(s) or piezometer (s), and
- date and time of measurements.

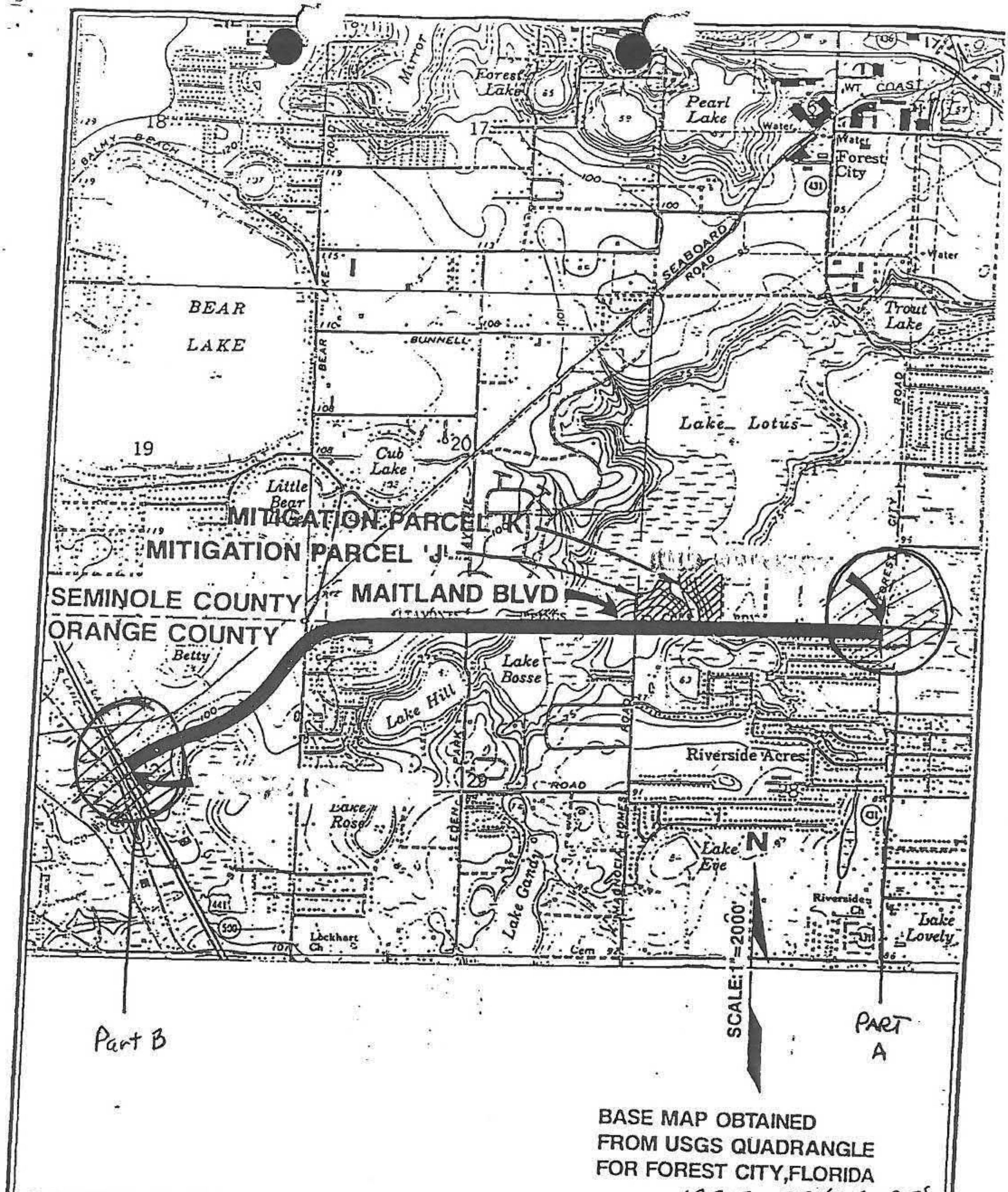
In addition, the permittee must provide four months of representative water elevation data (taken in the months of February, April, July and September) prior to any construction associated with the proposed modification to Pond G, identified in Part A of this permit. The baseline water elevation measurements must be collected two times each month (at the beginning and mid-point) of each of the identified months. Additionally, daily rainfall information must be collected and provided for each of the identified months. The daily rainfall data should be collected at the nearest station (at Riverside Acres or The Springs) to Pond G/Wetland 5. All of this information must be provided with the first monitoring report.

Monthly measurements of the wetland's water elevations (also taken at the beginning and mid-point of each month) and daily rainfall data must be must be taken monthly for five (5) years. This information should be submitted as part of District Form EN-55.

3. If it is determined based on the data submitted over the 5-year period that there is reduction of the wetland's hydroperiod of more than one quarter foot over the 5-year monitoring period, the permittee must obtain a permit modification which corrects the hydrologic impact to Wetland 5 or provides adequate mitigation for the loss of wetland functions.

4. All conditions of permit 4-095-0505G-ERP remain in place and valid.

Reviewers: R. Pakzadian / Johnson



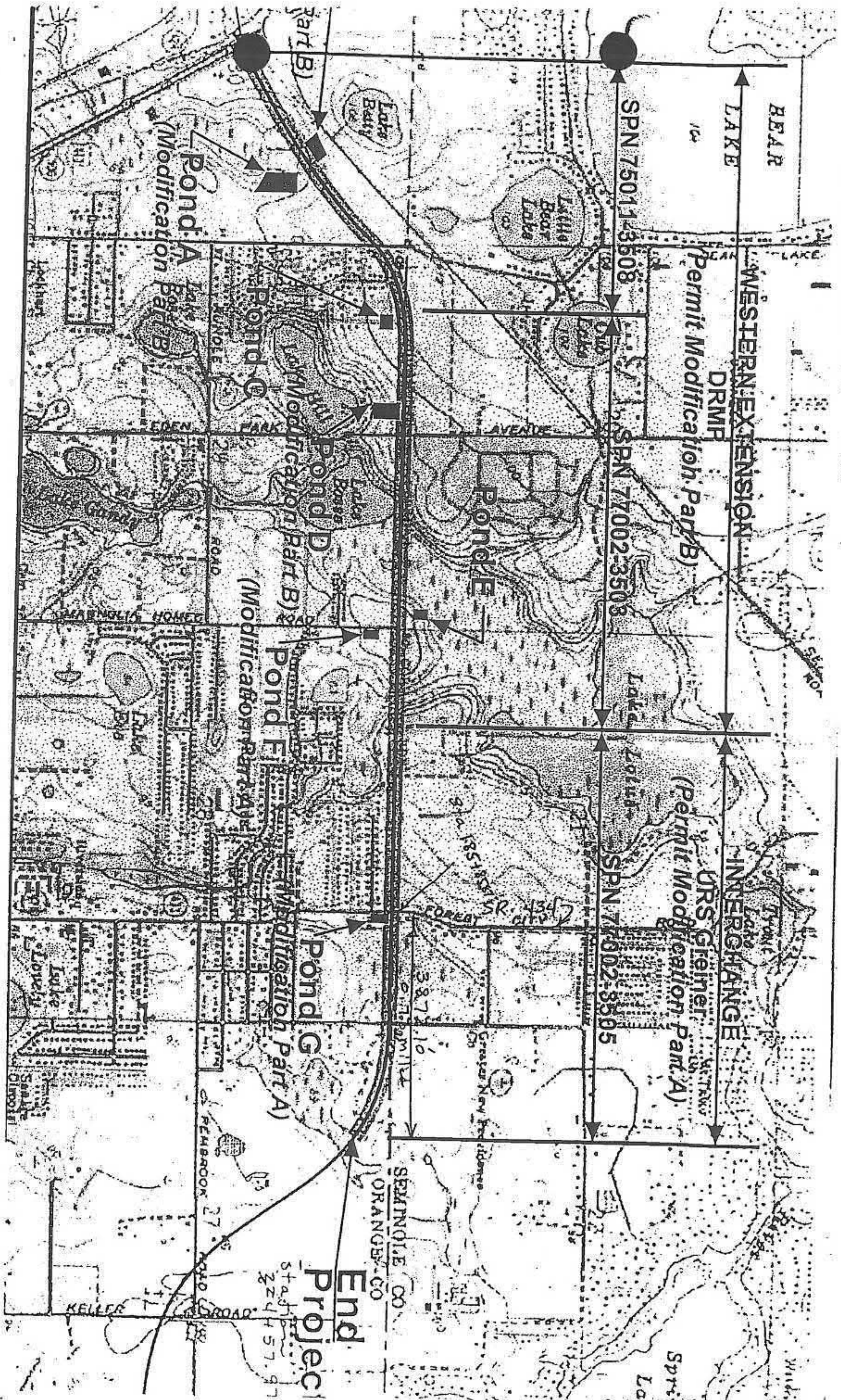
DYER, RIDDLE, MILLS AND PRECOURT, INC.
ENGINEERS • SURVEYORS • SCIENTISTS • PLANNERS

LOACTION MAP

EXHIBIT 1

Attachment A
4-095-0505AGM-ERP

Source: SJRWMD permit 20930-2



Attachment B 4-095-0505AGM-ERI

Source: SJRWMD permit 20930-2

PERMIT APPLICATION APPRAISAL FORM - BIOLOGICAL REPORT

ERP File Number: 4-095-0505AGM-ERP

Project Name: Maitland Boulevard Extension (SR 414) **County:** Orange

Applicant: FDOT

Waterbody: Little Wekiva River **Class:** III

Outstanding Florida Waterbody (if applicable): no

Inspection by: ERJ, Greiner, FDOT **Date of Inspection:** 1997/July

Attach photographs and site map indicating photo stations and directions of view. Attach sketches or notes on site plan if needed for clarification of descriptions.

ERP Project Description (to be used on TSR and permit)

- ☐ Construction and operation of a new system
- ☐ Alteration and operation of an existing system not previously permitted by the District
- ☒ Modification of a system previously permitted by the District (check one of the boxes below)
- ☐ Alteration and operation of an existing system; previous permit number:
- ☐ Construction and operation of additional phases of a system; previous permit number:

- ☐ Removal of a system
- ☐ Re-application for permit that has expired
- ☐ Abandonment of a system
- ☐ Extension of permit prior to expiration

Part A: the modification to construct the SR 414 (Maitland Boulevard) and SR 434 Interchange.

Part B: modification to the SR 414 Western Extension.

Project History:
(pre-application meetings; related permits; previous/existing violations(if they exist))

The State Road (SR) 414 Maitland Boulevard Extension project is located in east Orange County, at the intersection of SR 414 and SR 434 (See Attachment A). The project area is within the Wekiva River Hydrologic Basin, south of SR 436. The project is located with Seminole and Orange County. Permit 4-095-0505G-ERP was issued in May 1996 for the extension of Maitland Boulevard from SR 400 (US 441) to SR 434 (Forest City Road), for a total of 2.6 miles.

This permit application includes the following two modifications:

Part A: the modification to construct the SR 414 (Maitland Boulevard) and SR 434 Interchange.

Part B: modification to the SR 414 Western Extension.

Construction Techniques and Turbidity Controls:
(if dredging in waters is proposed, describe the sediment characteristics)

siltation fencing

SJRWMD (11/16/92)

Site Biophysical Characteristics

Vegetative Community:
(community description-both uplands and wetlands(assign each wetland an i.d. number for description purposed - see page 4 of form); community types; condition of community; surrounding land use)

Part A:

The project area contains a 5.45-acre wetland and 2.94 acres of permitted stomwater ponds. The following areas are located within the Part A project area:

- Wetland 5 (W5) is 5.45 acres. This wetland system is vegetated with herbaceous and forested wetland vegetation. This wetland was previously restored by the FDOT after the area was inadvertently cleared as part of the construction of the original Pond G.

- The two permitted ponds within the SR 414 median are 0.11 ac and 0.52 ac in size.

- Pond G is 2.31 acres in size.

The three pond areas were constructed as part of permit 4-117-0068, issued March 12,1985, serving portions of SR 414 and SR 434.

Part B:

There are no wetland or surface water encroachments associated with Part B.

Site Disturbances:
(degree and types of existing site disturbances; exotic/nuisance species)

the interchange area is in a heavy traveled area.

Hydrologic Characteristics:
(current conditions; normal/historical conditions)

normal

Wildlife Use:
(observed or reasonably anticipated (including T or E species); role of site in overall trophic structure of area, including use by man; attach macro-invertebrate assessment(if applies))

urban wildlife expected,

Water Quality:
(characterize existing quality, include suspected cause of current problems (if any exist))

normal

Wetland Impact/Mitigation Proposal Summary

The applicant proposes to:

- construct a new pipe from Pond G that will cause a 0.09 of an acre temporary impact to Wetland 5. The temporary disturbance area will be allowed to naturally recolonize. Staff has determined that mitigation is not needed for the temporary encroachments into Wetland 5.

- fill the two ponds within the SR 414 median. Pursuant to section 62-340.700, F.A.C., the wetlands in the 0.11-acre pond were not delineated and none of the wetland review criteria was applied to the project. Pursuant to section 62-340.700, F.A.C., the wetlands in the 0.52 -acre pond were delineated,

Source: SJRWMD permit 20930-2

however, only the permitting criteria relating to endangered and threatened species was applied. Staff has determined that the proposed project will not adversely affect endangered and threatened species.

- recontour Pond G. Pursuant to section 62-340.700, F.A.C., the wetlands in the pond were delineated, however, on the permitting criteria relating to endangered and threatened species was applied. Staff has determined that the proposed project will not adversely affect endangered and threatened species.

- The applicant has also proposed to control the water level in the new Pond G two feet lower then W5. A sheet pile is proposed between Pond G and W5 to insure that there will be adverse impacts to W5 as a result in the lowering of the control elevation of Pond G. Staff has recommended a permit condition to monitor water levels in W5 to insure that no adverse impacts will occur.

FIELD SITE INSPECTION REPORT FORM

SJRWMD

FROM: ELIZABETH R. JOHNSON

1. **PROJECT NUMBER: 4-095-0505AGM-ERP**

2. **PROJECT NAME: Sr 414 Maitland Boulevard**

3. **DATE OF REPORT FORM: 12-15-97**

4. **DATE OF INSPECTION:** 1997, July

5. **PERSONS AT SITE MEETING: Johnson, Jacobs, Greiner, Bassett,**

6. **GENERAL OVERALL SITE DESCRIPTION**(I.E. UPLANDS AND WETLANDS):

The project area contains a 5.45-acre wetland and 2.94 acres of permitted stomwater ponds. The following areas are located within the Part A project area:

- Wetland 5 (W5) is 5.45 acres. This wetland system is vegetated with herbaceous and forested wetland vegetation. This wetland was previously restored by the FDOT after the area was inadvertently cleared as part of the construction of the original Pond G.

- The two permitted ponds within the SR 414 median are 0.11 ac and 0.52 ac in size.

- Pond G is 2.31 acres in size.

The three pond areas were constructed as part of permit 4-117-0068, issued March 12,1985, serving portions of SR 414 and SR 434.

7. **MINIMIZATIONS AND ALTERNATIVES DISCUSSED FOR REDUCING WETLAND IMPACTS:** YES NO NONE PROPOSED N/A

8. DISCUSS THE HYDROLOGIC REGIMES, SPECIFIC CHARACTERISTICS OF THE WETLANDS: N/A SEE ABOVE

ORL MSSW WRM
DHQ MSSW WRM
TSR MSSW WRM

ERP Wetland Inventory

Project Name: SR 414 (Maitland Boulevard Extension)

Application Number: 4-095-0505AGM-ERP

	Off-Site	On-Site	FLUCFCS
A: Total Wetland Acreage:	0.00	8.28	617,534
B: Total Wetlands "Preserved" (i.e. not disturbed or lost):		7.76	617,534
C: Total Wetlands Disturbed (temporary, not lost):		2.40	""
D: Total Wetlands Lost:		0.52	534
1. Contiguous to Waters of the State:		0.00	
2. Isolated Wetlands:		0.52	534
a. Less than 0.5 acre:		0.00	
b. 0.5 acre or greater:		0.00	
c. 62-340.700 exempted:		0.52	534
E: Total Wetlands Created as Mitigation:		0.00	
F: Total Wetlands Enhanced as Mitigation:		0.00	
G: Other Compensation:		0.00	
1. Wetland Preservation:	0.00	0.00	
2. Upland Preservation:	0.00	0.00	
3. Upland Enhancement:	0.00	0.00	
4. Mitigation Banks (credits)	0.00		

The FLUCFCS code must be appended to the acreage values.

Comments:

Reviewer: Elizabeth Johnson/SJRWMD, Date: 11/24/97

Source: SJRWMD permit 20930-2

Source: SJRWMD permit 20930-2

WL & SW ID	WL & SW TYPE	WL & SW SIZE	WL & SW NOT IMPACTED	TEMPORARY WL & SW IMPACTS			PERMANENT WL & SW IMPACTS			MITIGATION ID
				WL & SW TYPE	IMPACT SIZE	IMPACT CODE	WL & SW TYPE	IMPACT SIZE	IMPACT CODE	
5	617 ~~Marsh~~	5.45Ac.	5.36 Ac.	617 ~~Marsh~~	0.092Ac.	D				
Pond G	534	2.31	0.00	534	2.31	D				
MedianB	534	0.52	0.00				534	0.52	F	—
PROJECT TOTALS:										

Comments:

CODES (multiple entries per cell not allowed):
Wetland Type: from an established wetland classification system (see Section E,111b.)
Impact Type: D=dredge; F=fill; H=change hydrology; S=shading; C=clearing; O=other
FORM NUMBER 40C-4.900(1)

Reviewer: Johnson

Maitland Blvd
4-095-0505 AGM-ERP

Appendix C
Maps

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

SR 414 Expressway Extension
Project Development and Environment (PD&E) Study

CFX Project No. 414-227

Base Map

- County Boundary
- Seminole Wekiva Trail
- Study Area
- Parcel Lines

0 1,000 Feet

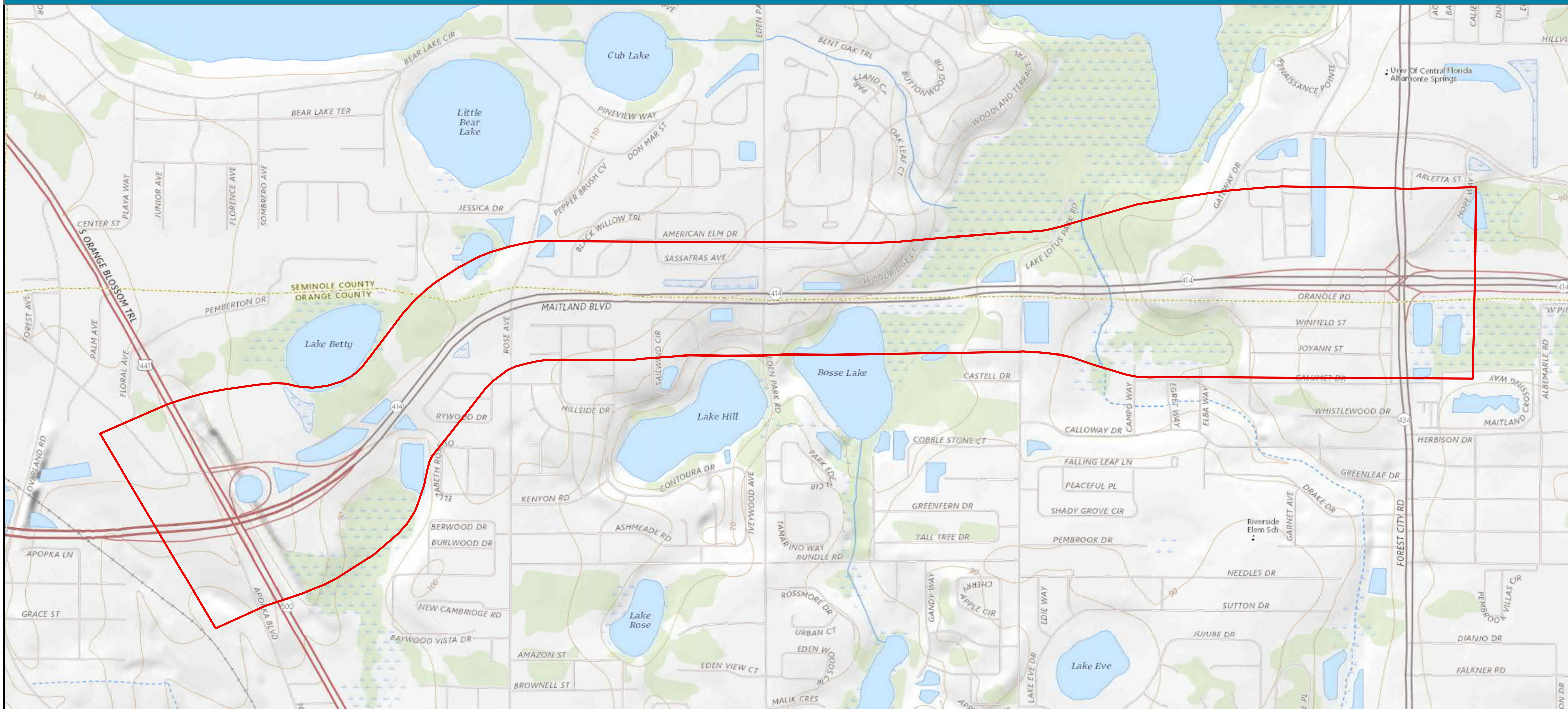
Data Sources: FDOT, LABINS, Seminole County, Orange County, FGDL, Rails-to-Trails Conservancy

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

SR 414 Expressway Extension
Project Development and Environment (PD&E) Study

CFX Project No. 414-227

USGS Topo



Legend

Study Area

0 1,000 Feet

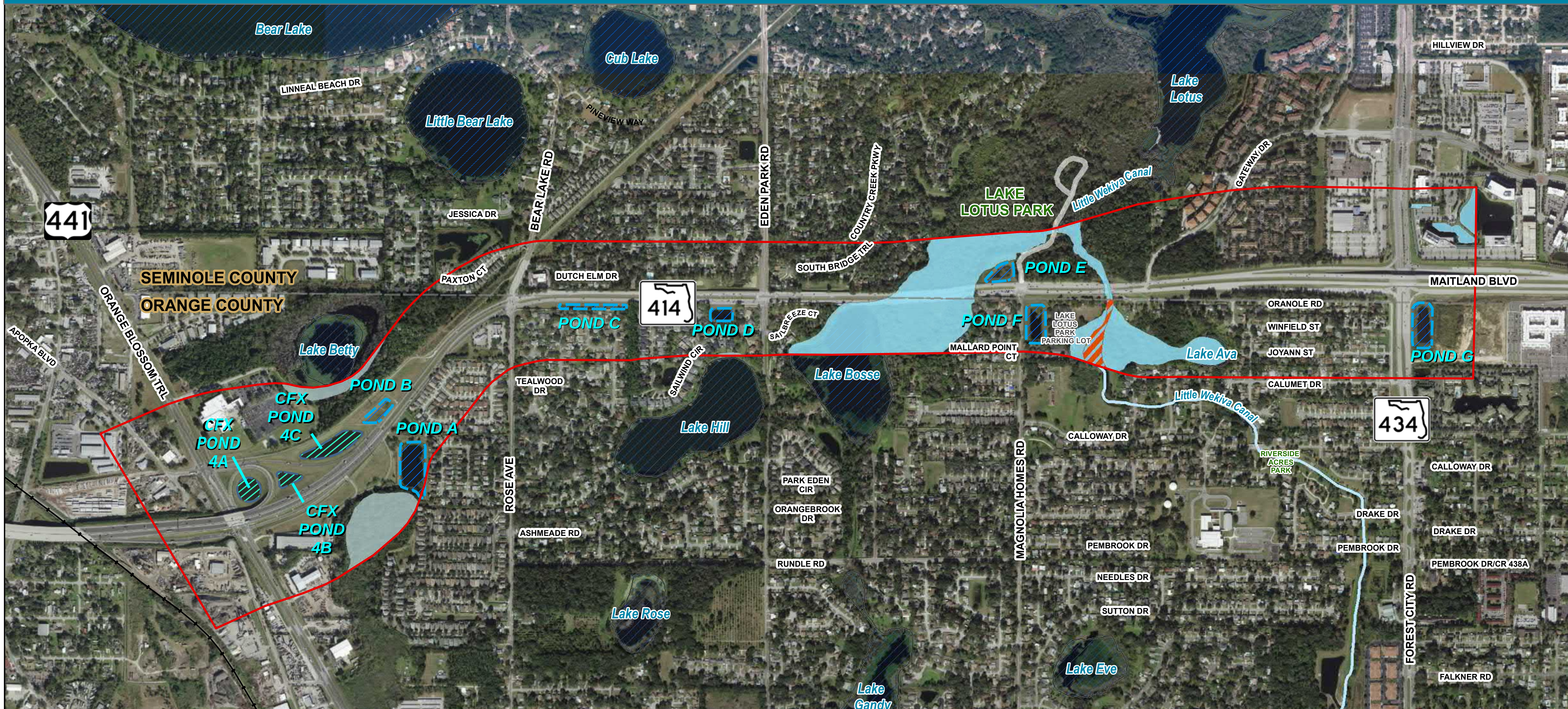
Data Sources:
USGS, ESRI

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

SR 414 Expressway Extension
Project Development and Environment (PD&E) Study

CFX Project No. 414-227

Existing Ponds and Floodplains Map



County Boundary

Rail

Study Area

Existing Lake

FDOT Ponds

CFX Ponds

Flood Hazard Areas - Flood Zones

A - Areas with a 1% annual chance of flooding (no base elevation)

AE - Areas where base flood elevations are provided

Regulatory Floodway

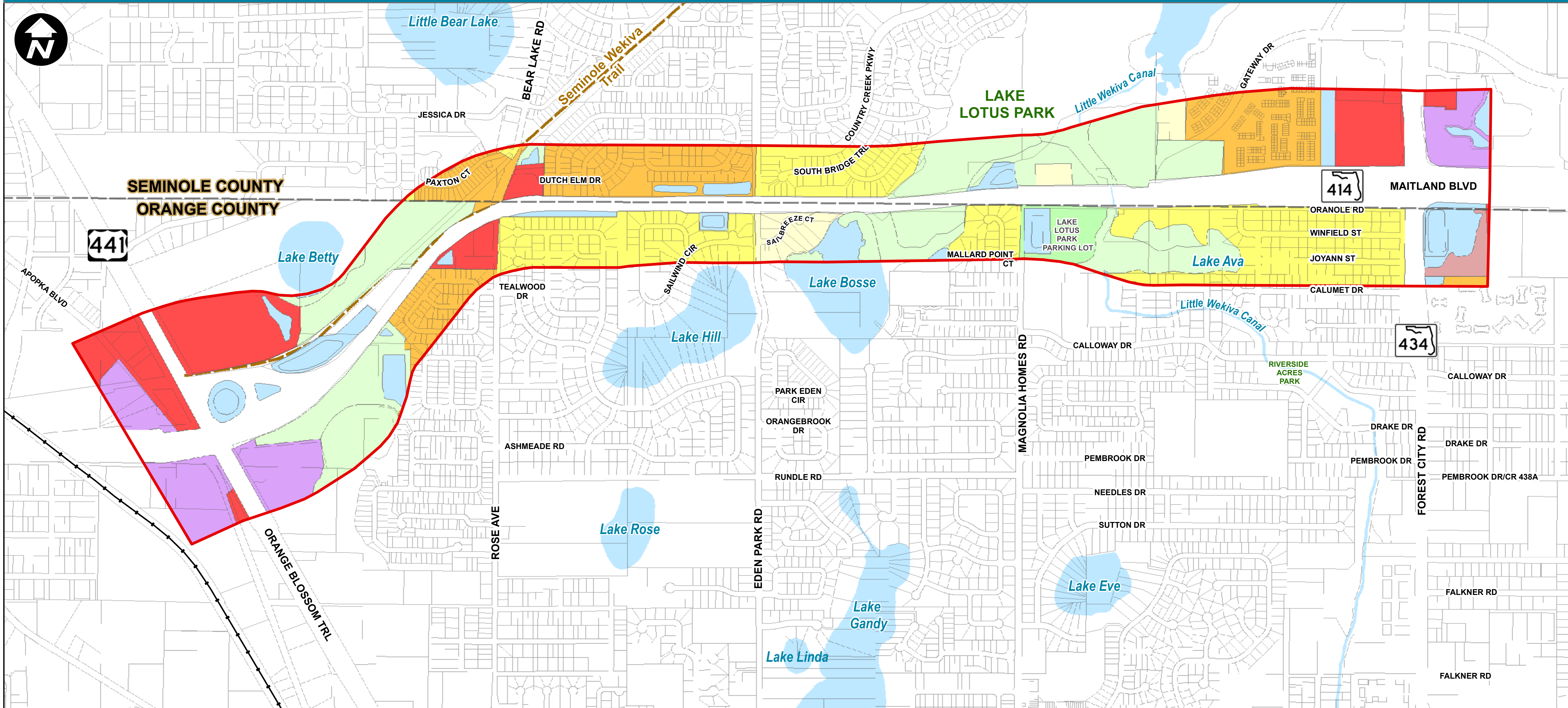
Data Sources: FDOT, Seminole County, Orange County, FGDL, ESRI Rails-to-Trails Conservancy, FEMA

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

SR 414 Expressway Extension
Project Development and Environment (PD&E) Study

CFX Project No. 414-227

Land Use/Land Cover



County Boundary
Seminole Wekiva Trail
Rail
Study Area
Parcel Lines

Existing Land Use

- Residential Low Density
- Residential Medium Density
- Residential High Density
- Commercial and Services
- Industrial
- Disturbed Land
- Wetland/Conservation
- Recreational
- Surface Water/Retention/Submerged

0 1,000 Feet

Data Sources: FDOT, Seminole County, Orange County, FGDL, Rails-to-Trails Conservancy, USFWS St. Johns River WMD

USDA Soils

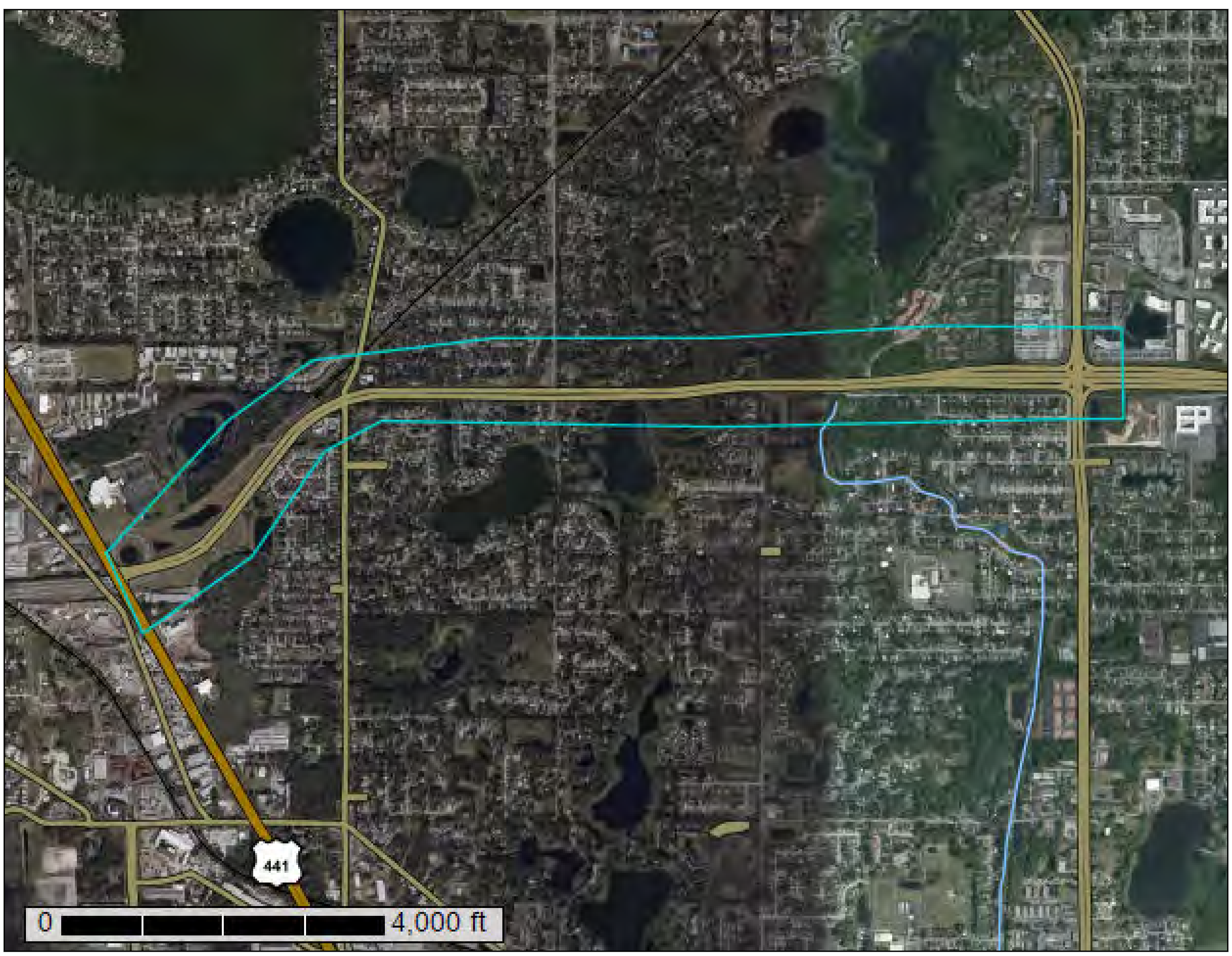
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

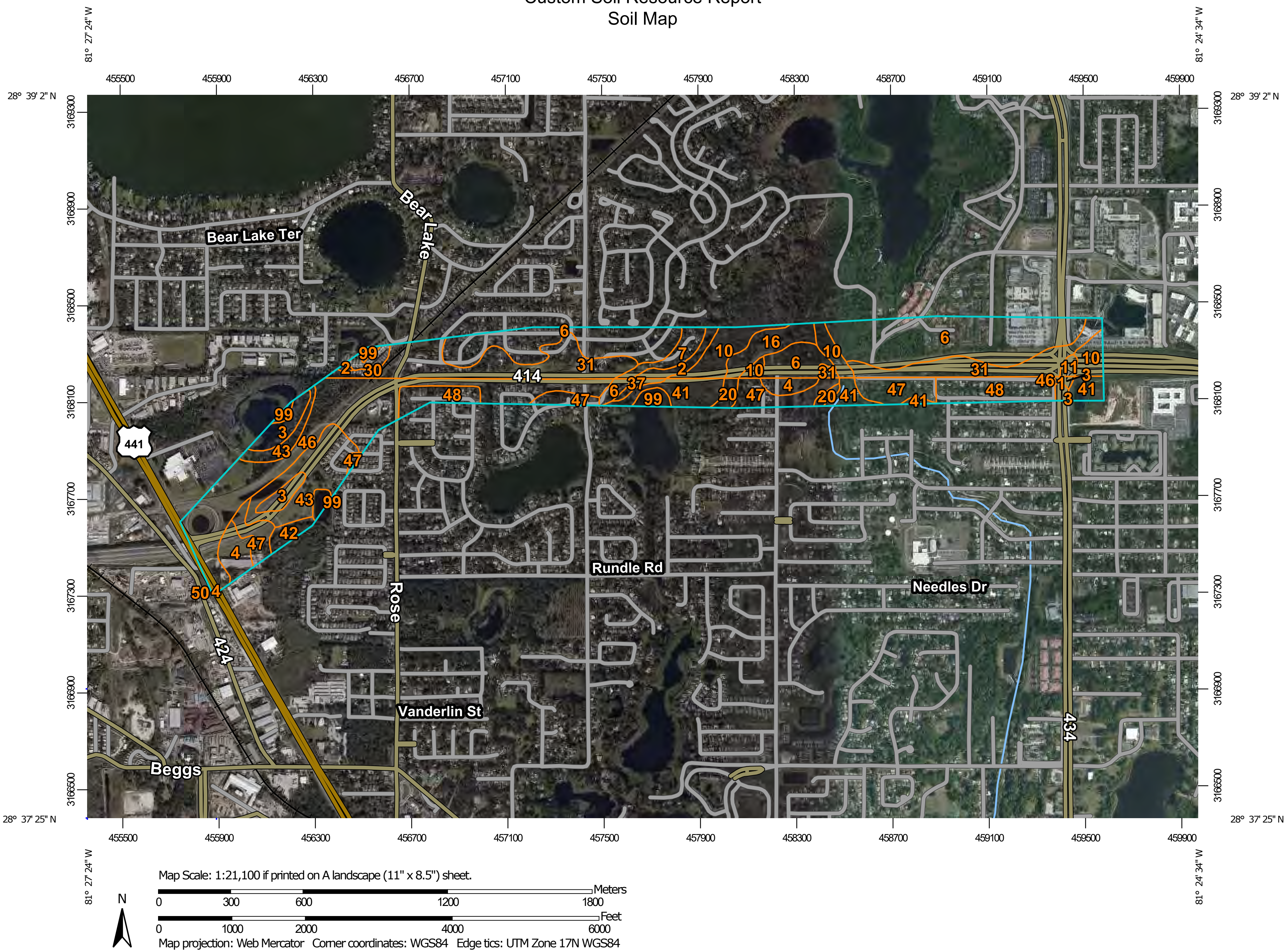
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Orange County, Florida, and Seminole County, Florida



April 22, 2020

Soil Map


81° 27' 24" W
81° 24' 34" W
28° 39' 2" N
28° 37' 25" N
455500
455900
456300
456700
457100
457500
457900
458300
458700
459100
459500
459900
3169300
3168900
3168500
3168100
3167700
3167300
3166900
3166500
Bear Lake Ter
Bear Lake
414
441
424
434
Rundle Rd
Needles Dr
Rose
Vanderlin St
Beggs
Map Scale: 1:21,100 if printed on A landscape (11" x 8.5") sheet.
Meters
0 300 600 1200 1800
Feet
0 1000 2000 4000 6000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

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

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

Soil Survey Area: Orange County, Florida
Survey Area Data: Version 16, Sep 17, 2019

Soil Survey Area: Seminole County, Florida
Survey Area Data: Version 18, Sep 17, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 22, 2018—Mar 11, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Arents, nearly level	0.9	0.3%
3	Basinger fine sand, frequently ponded, 0 to 1 percent slopes	9.0	2.6%
4	Candler fine sand, 0 to 5 percent slopes	9.3	2.7%
6	Candler-Apopka fine sands, 5 to 12 percent slopes	1.8	0.5%
20	Immokalee fine sand	3.1	0.9%
37	St. Johns fine sand	1.4	0.4%
41	Samsula-Hontoon-Basinger association, depressional	15.5	4.6%
42	Sanibel muck	3.2	0.9%
43	Seffner fine sand, 0 to 2 percent slopes	23.5	6.9%
46	Tavares fine sand, 0 to 5 percent slopes	57.4	16.8%
47	Tavares-Millhopper complex, 0 to 5 percent slopes	24.6	7.2%
48	Tavares fine sand-Urban land complex, 0 to 5 percent slopes	19.6	5.8%
50	Urban land, 0 to 2 percent slopes	0.0	0.0%
99	Water	4.6	1.4%
Subtotals for Soil Survey Area		**173.9**	**51.1%**
Totals for Area of Interest		**340.5**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Adamsville-Sparr fine sands	4.0	1.2%
6	Astatula-Apopka fine sands, 0 to 5 percent slopes	79.2	23.3%
7	Astatula-Apopka fine sands, 5 to 8 percent	5.3	1.6%
10	Basinger, Samsula, and Hontoon soils, depressional	17.8	5.2%
11	Basinger and Smyrna fine sands, depressional	1.2	0.4%
16	Immokalee sand, 0 to 2 percent slopes	8.6	2.5%
30	Seffner fine sand, 0 to 2 percent slopes	2.4	0.7%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
31	Tavares-Millhopper complex, 0 to 5 percent slopes	47.3	13.9%
99	Water	0.6	0.2%
Subtotals for Soil Survey Area		**166.5**	**48.9%**
Totals for Area of Interest		**340.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

FEMA FIRM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Florida East FIPS Zone 0901. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Seminole County, Florida. This information was photogrammetrically compiled at a scale of 1:12000 from aerial photography dated March 2004.

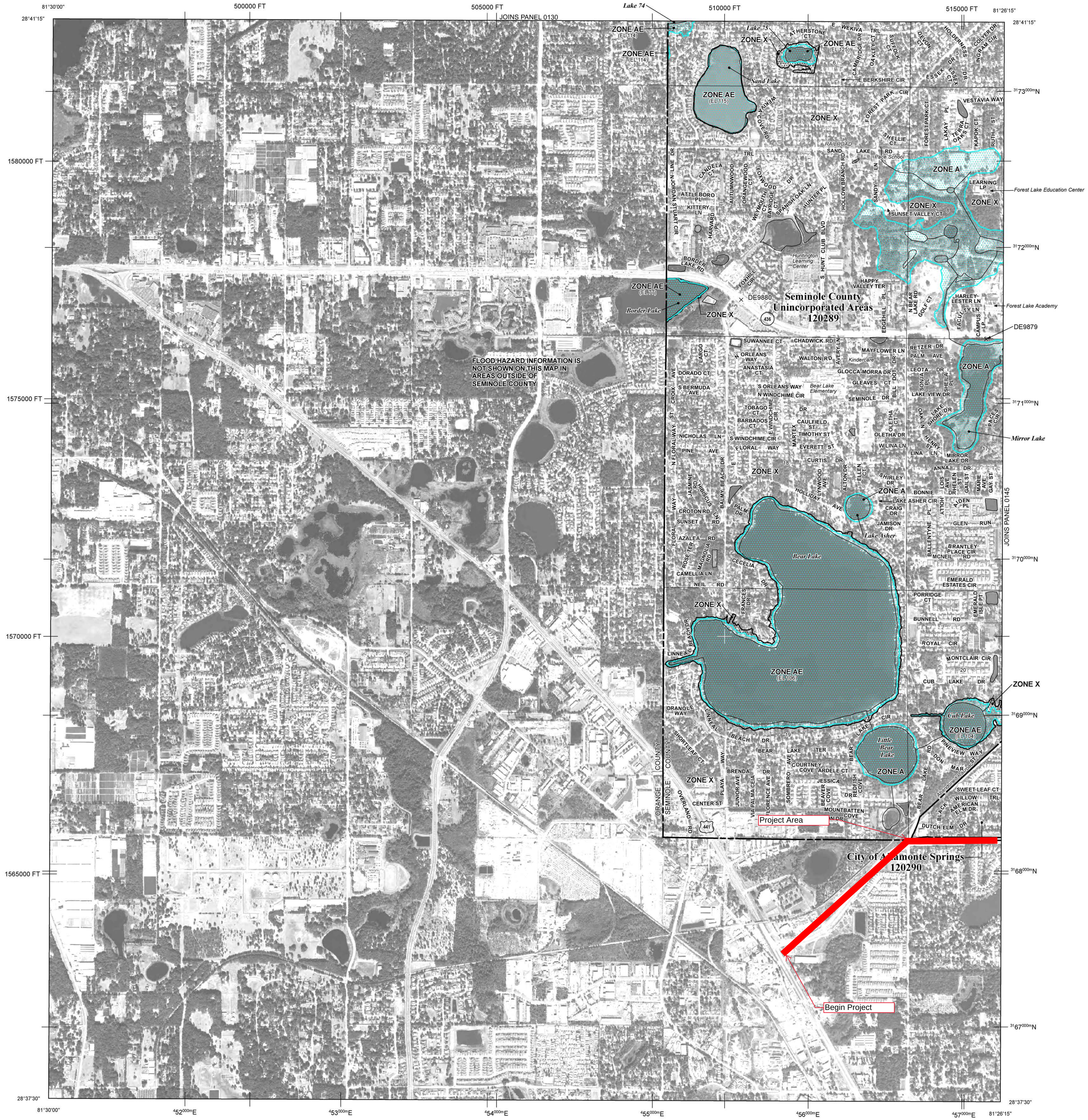
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - 23	Transect line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{42}75^{000m}$E	1000-meter Universal Transverse Mercator grid ticks, zone 17
6000000 FT	5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 901), Transverse Mercator projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
APRIL 17, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
SEPTEMBER 28, 2007 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add Base Flood Elevations and Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to change zone designations, to update map format, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

N

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0140F

FIRM

FLOOD INSURANCE RATE MAP

SEMINOLE COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 140 OF 330

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALTAMONTE SPRINGS, CITY OF	120290	0140	F
SEMINOLE COUNTY	120289	0140	F

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

MAP NUMBER
12117C0140F

MAP REVISED
SEPTEMBER 28, 2007

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Florida East FIPS Zone 0901. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Orange County, Florida.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

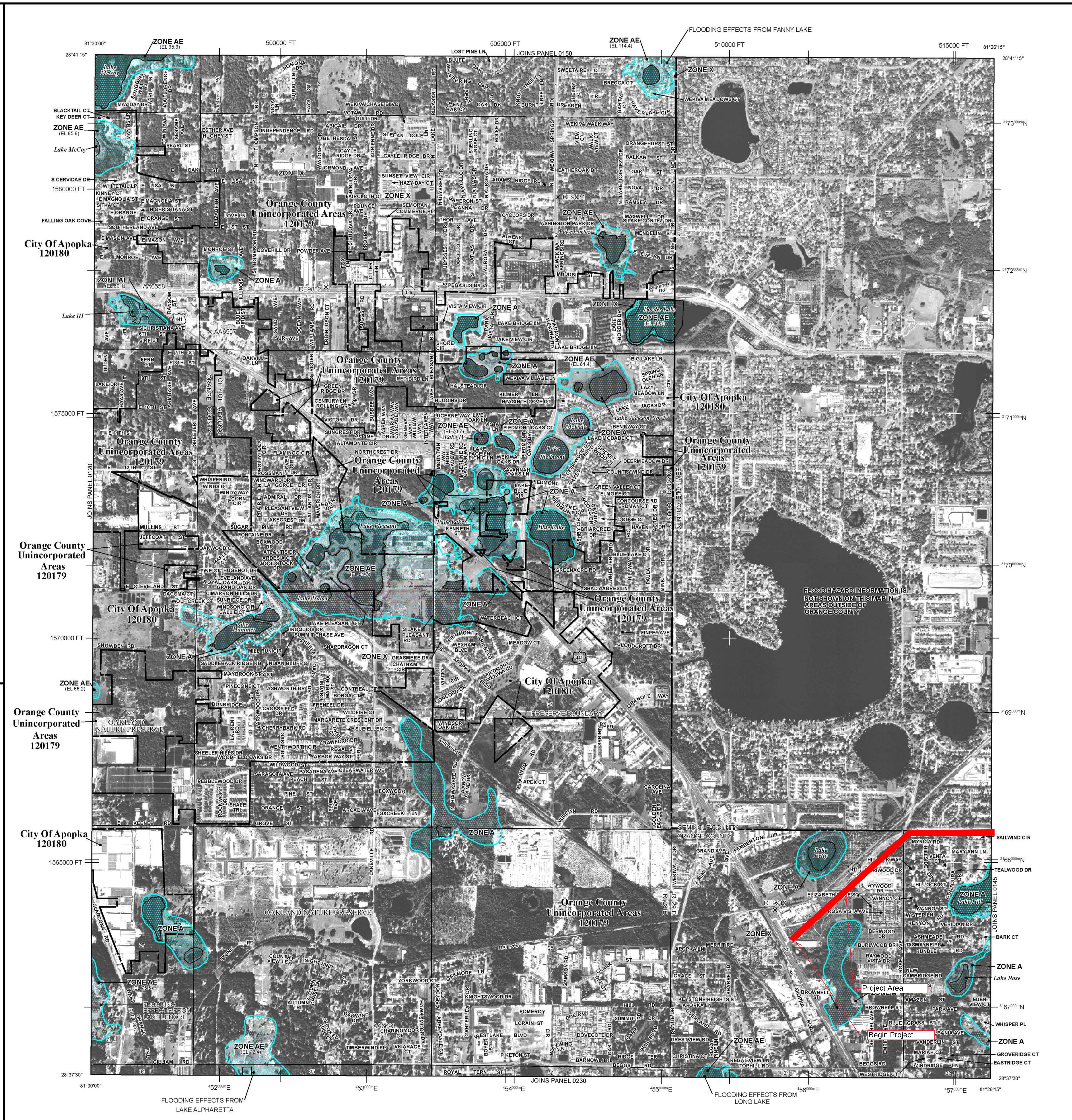
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

NGVD29 to NAVD88 Vertical Datum Conversion Table (feet)

Watershed Name	Minimum Conversion	Maximum Conversion	Average Conversion	Maximum Offset
Big Econlockhatchee River	-1.03	-1.15	-1.09	0.06
Boggy Creek	-0.91	-1.01	-0.96	0.05
Cypress Creek	-0.87	-0.91	-0.89	0.02
Howell Branch	-0.96	-1.05	-0.98	0.07
Lake Apopka	-0.87	-0.97	-0.91	0.06
Lake Hart	-0.97	-1.07	-1.02	0.05
Little Econlockhatchee River	-0.92	-1.07	-1.01	0.09
Little Wekiva River	-0.91	-1.02	-0.95	0.07
Reedy Creek	-0.86	-0.89	-0.88	0.02
Shingle Creek	-0.88	-0.95	-0.91	0.04
St. Johns River	-1.08	-1.33	-1.19	0.14
Wekiva River	-0.88	-1.01	-0.94	0.07



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A Cross section line

23 — 23 Transect line

97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

$^{42}75^{000m}$E — 1000-meter Universal Transverse Mercator grid ticks, zone 17

6000000 FT — 5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 901), Transverse Mercator projection

DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

● M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
DECEMBER 6, 2000

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
SEPTEMBER 25, 2009 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, and to incorporate previously issued Letters of Map Amendment.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0140F

FIRM
FLOOD INSURANCE RATE MAP
ORANGE COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 140 OF 750

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
APOPKA, CITY OF	120180	0140	F
ORANGE COUNTY	120179	0140	F

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

**MAP NUMBER
12095C0140F**

**MAP REVISED
SEPTEMBER 25, 2009**

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Florida East FIPS Zone 0901. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Seminole County, Florida. This information was photogrammetrically compiled at a scale of 1:12000 from aerial photography dated March 2004.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

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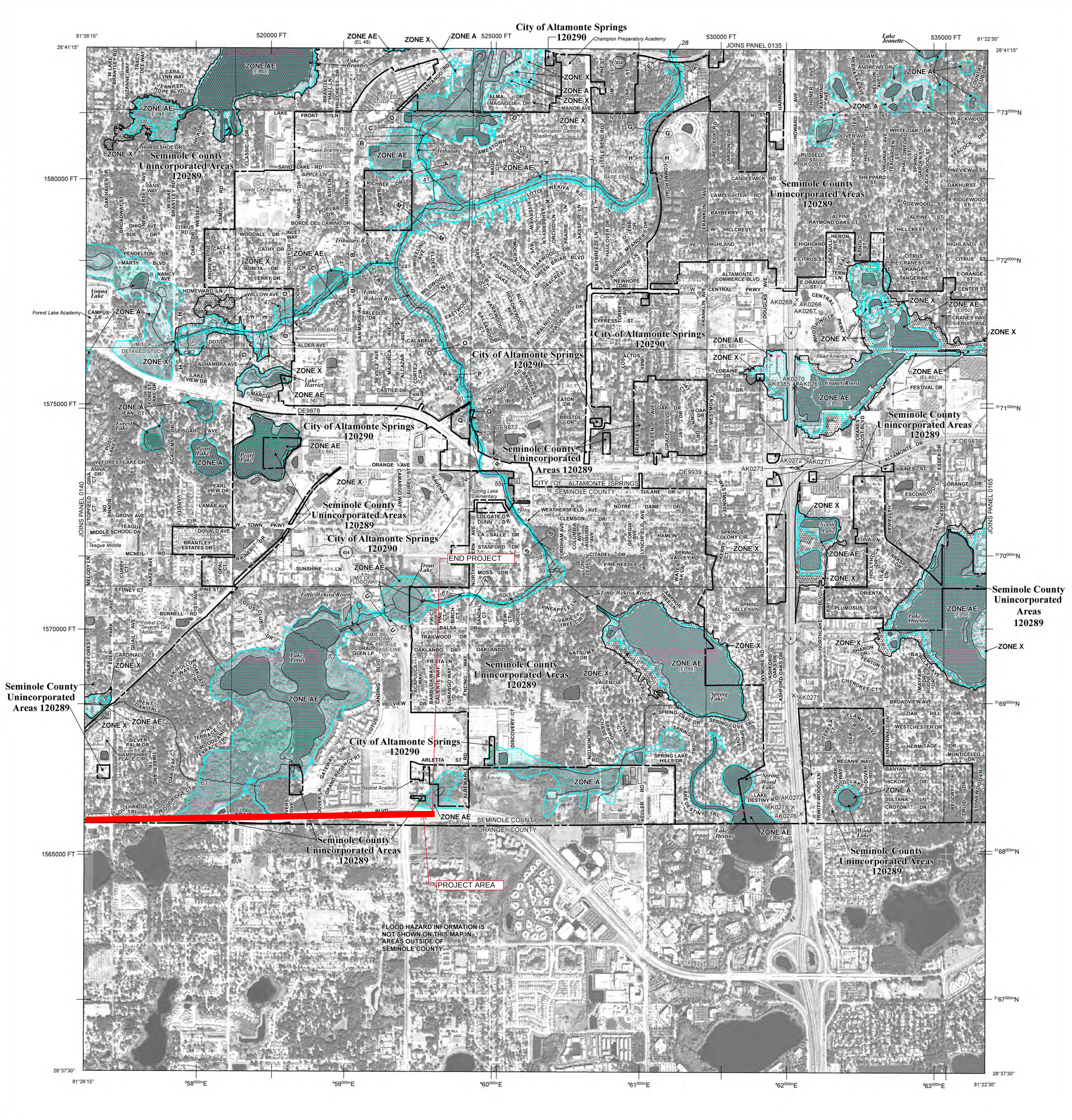

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

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ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
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513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A —— A	Cross section line
23 - - - - 23	Transect line
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6000000 FT	5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 901), Transverse Mercator projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
APRIL 17, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
SEPTEMBER 28, 2007 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add Base Flood Elevations and Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to change zone designations, to update map format, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

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MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0145F

FIRM

FLOOD INSURANCE RATE MAP

SEMINOLE COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 145 OF 330

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALTAMONTE SPRINGS, CITY OF	120290	0145	F
SEMINOLE COUNTY	120289	0145	F

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

MAP NUMBER
12117C0145F

MAP REVISED
SEPTEMBER 28, 2007

Federal Emergency Management Agency

NOTES TO USERS

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NGVD29 to NAVD88 Vertical Datum Conversion Table (feet)

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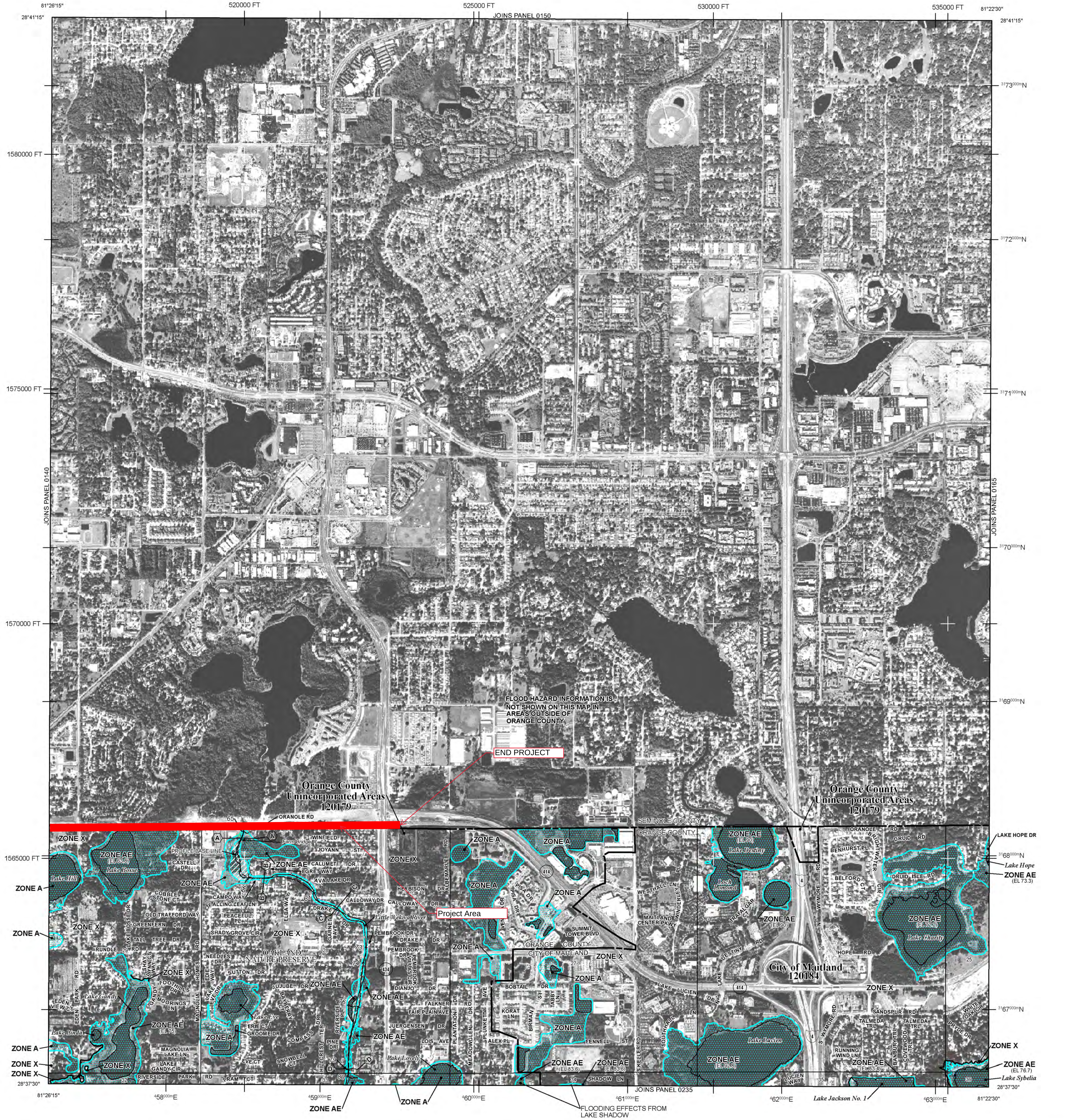
Boggy Creek	-0.91	-1.01	-0.96	0.05
Cypress Creek	-0.87	-0.91	-0.89	0.02
Howell Branch	-0.96	-1.05	-0.98	0.07
Lake Apopka	-0.87	-0.97	-0.91	0.06
Lake Hart	-0.97	-1.07	-1.02	0.05
Little Econlockhatchee River	-0.92	-1.07	-1.01	0.09
Little Wekiva River	-0.91	-1.02	-0.95	0.07
Reedy Creek	-0.86	-0.89	-0.88	0.02
Shingle Creek	-0.88	-0.95	-0.91	0.04
St. Johns River	-1.08	-1.33	-1.19	0.14
Wekiva River	-0.88	-1.01	-0.94	0.07



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A—A Cross section line

23- - -23 Transect line

97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

$^{42}75^{000m}$E — 1000-meter Universal Transverse Mercator grid ticks, zone 17

6000000 FT — 5000-foot grid values: Florida State Plane coordinate system, East Zone (FIPSZONE = 901), Transverse Mercator projection

DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)

● M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
DECEMBER 6, 2000

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
SEPTEMBER 25, 2009 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to delete Special Flood Hazard Areas, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, and to incorporate previously issued Letters of Map Amendment.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0145F

FIRM

FLOOD INSURANCE RATE MAP

ORANGE COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 145 OF 750

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MAITLAND, CITY OF	120184	0145	F
ORANGE COUNTY	120179	0145	F

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

MAP NUMBER
12095C0145F

MAP REVISED
SEPTEMBER 25, 2009

Federal Emergency Management Agency

Appendix D
Supporting Documentation

Datum Conversion

Questions concerning the VERTCON process may be mailed to NGS

Latitude: 28.640

Longitude: 081.429

NGVD 29 height: 100.00 ft

Datum shift(NAVD 88 minus NGVD 29): -0.971 feet

Converted to NAVD 88 height: 99.029 feet

Field Investigation

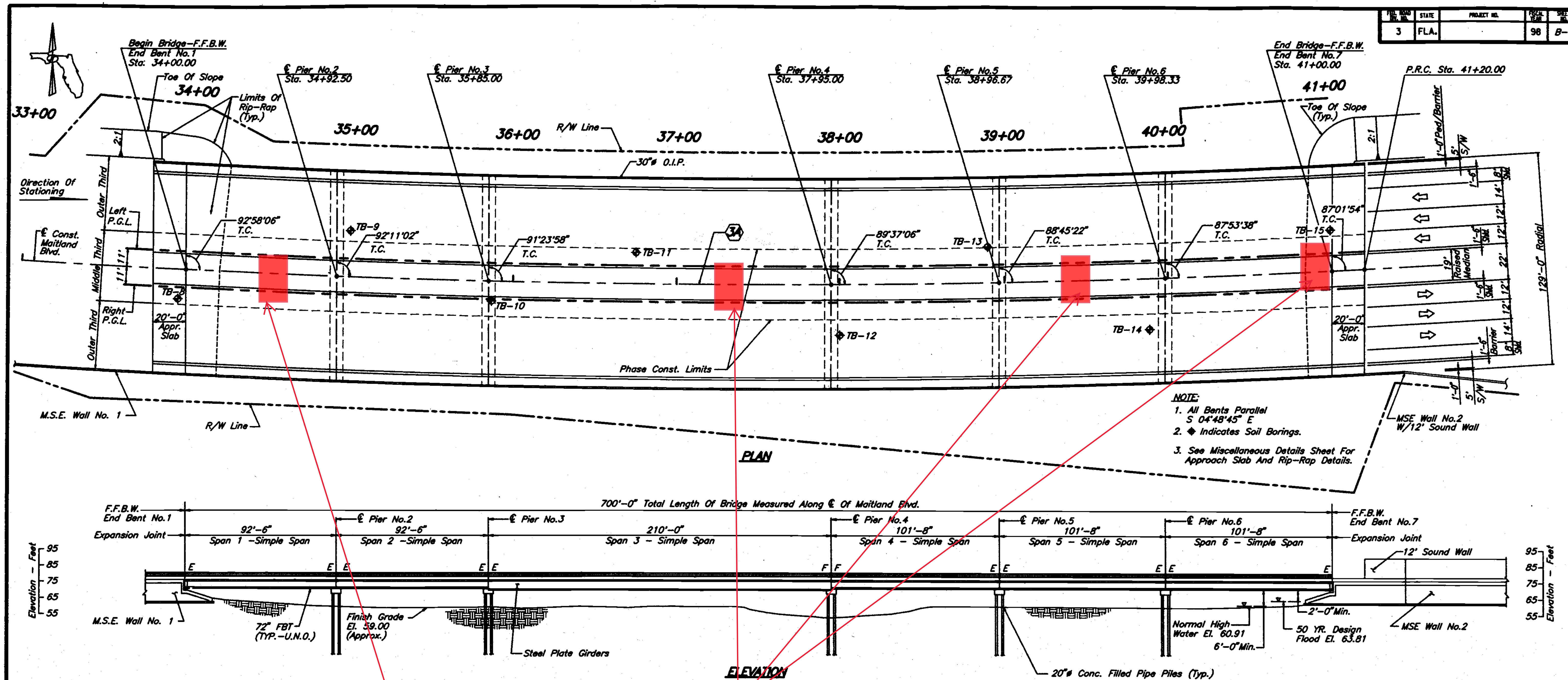
Field Investigation

February 2, 2021

Erosion shown at Little Wekiva Canal Bridge near Lake Lotus Park Entrance

Looking Downstream at north end of Lake Bosse Bridge

Conceptual Proposed Bridge Plans on Existing Bridge Plans at Maitland Boulevard over Lake Bosse



NOTE:
1. All Bents Parallel S 04°48'45" E
2. ◆ Indicates Soil Borings.
3. See Miscellaneous Details Sheet For Approach Slab And Rip-Rap Details.

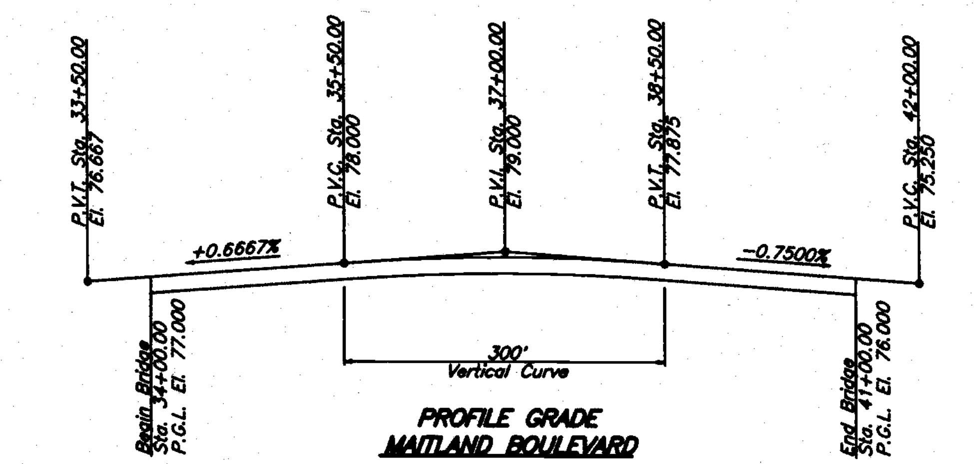
Approx. 4 proposed pier columns 16'x10' wide within the Lake Bosse flood plain. Area = 640 SF.

CURVE DATA 3A

Δ = 07°43'27" Lt.
D = 00°50'53"
T = 456.077'
L = 910.773'
R = 6755.800'
e = Normal/Crown
P.C. Sta. = 32+08.39 (Back)
32+09.23 (Ahead)
P.I. Sta. = 36+65.30
P.R.C. Sta. = 41+20.00

TRAFFIC DATA MAITLAND BLVD.

Est. 1998 2-Way ADT 34,818 EST
Est. 2008 2-Way ADT 37,952 EST
K = 9.0%
D = 55%
T = 5% (24 HR)
Design Speed = 45 MPH



PROFILE GRADE MAITLAND BOULEVARD

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.		98	B-1

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JLA	7/94
Checked by	MKA	7/94
Designed by	MKA	7/94
Checked by	PM	7/94
Approved by	Peeter Mannik, P.E.	

ENGINEER OF RECORD:
DYER, RIDDLE, MILLS AND PRECOURT, INC.
1505 EAST COLONIAL DRIVE
ORLANDO, FLORIDA 32803

LOGO:
DYER, RIDDLE, MILLS AND PRECOURT, INC.
ENGINEERS - SURVEYORS
1505 EAST COLONIAL DRIVE
ORLANDO, FLORIDA 32803

SEAL:

FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN OFFICE

ROAD NO.	COUNTY	PROJECT NO.
SR414	SEMINOLE	77002-3503

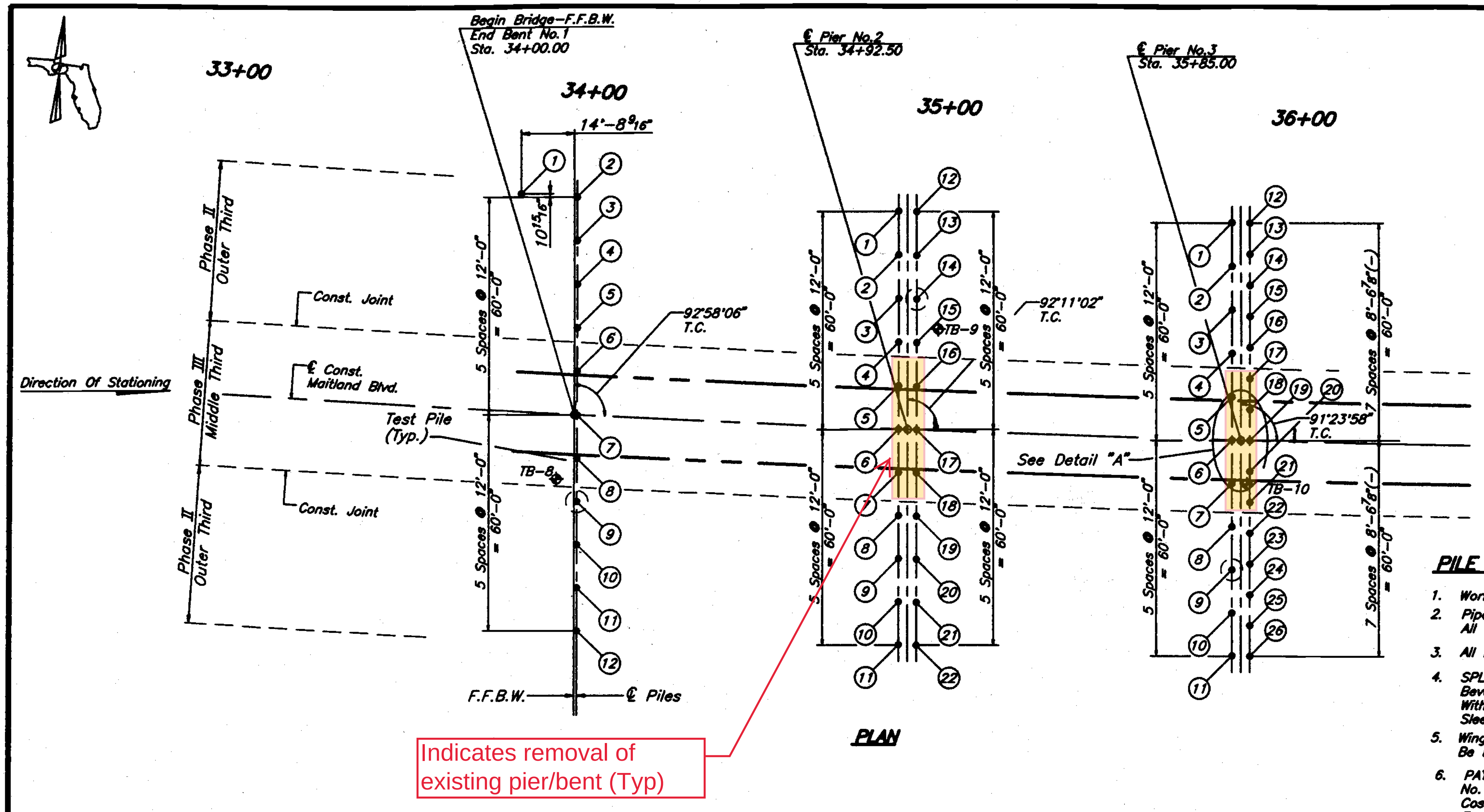
SHEET TITLE: GENERAL PLAN AND ELEVATION

PROJECT NAME: MAITLAND BOULEVARD OVER LAKE BOSSE
BRIDGE NO. 77002-3503

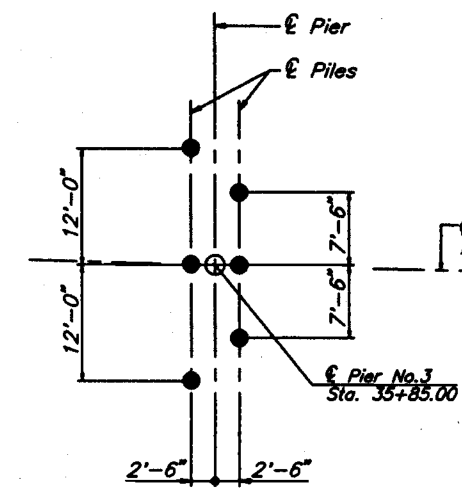
Drawing No.

Index No.

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.		98	B-10



PLAN



DETAIL "A"

Pier No. 3 Shown
Pier No. 4 Opposite Hand

LEGEND

- ① Pile Number
- ● Proposed Piles
- ◉ Test Pile
- ⌖ Test Boring

CURVE DATA

Δ = 07°43'27" Lt.
D = 00°50'53"
T = 456.077'
L = 910.773'
R = 6755.800'
e = NORMAL/CROWN
P.C. Sta. = 32+09.23 (Ahead)
P.R.C. Sta. = 41+20.00

PILE NOTES :

1. Work The Foundation Layout Sheet With Construction Sequence Sheet.
2. Pipe Piles Shall Be 20" Outside Diameter With A 0.5" Minimum Wall Thickness And Shall Be New And Straight. All Steel Shall Conform To ASTM A-252, Grade 2. Ends Of Pipe Sections Shall Be Perpindicular To The Longitudinal Axis.
3. All Locating Dimensions Are Measured To The F.F.B.W. Or C/L Of Pier (See Detail "A" And Detail "B")
4. SPLICES: The Ends Of All Pile Sections To Be Spliced Shall Be Beveled And Fully Butt-Welded As Shown On The Plans In Accordance With AWS/AASHTO Welding Code. All Splices Shall Be Watertight. Splice Sleeve Shall Conform To ASTM A-709 Grade 36 Steel.
5. Wingwall Piles Are To Be Driven To 40 Tons Minimum Bearing. Minimum Tip Elevation For Wingwall Piles Shall Be El. 30.0 @ Endbent No. 1 and El. 17.0 @ Endbent No. 7.
6. PAYMENT: Furnishing Steel Pipe piles Shall Be Paid For Per Linear Foot, Item No. 455-7-9 And Shall Include The Cost Of Concrete And Corrosion Protection. The Cost Of Driving piles Shall Be Paid For Per Linear Foot, Item No. 455-8-9. Payment For Splices Shall Be Included In The Contract unit Price Bid Item For Item No. 455-17-40. Payment Of Polyethylene Sheeting Shall Be Included Under The Pay Item No. 459-71.
7. All Piles Are Plumb.
8. Test Piles Shall Not Be Driven Until Approval Of The Engineer Is Obtained.
9. Drive One Test Pile In The Position Of A Permanent Plumb Pile At Each End Bent, And At Each Pier Drive. Drive The Test Pile 15 Feet Below The Anticipated Tip Elevtion. (See Pile Installation Table)
10. The Portion Of The Piles Within The MSE Embankment (Above Existing Grade) Shall Be Wrapped With Two Independent Sheets Of 6 Mil Polyethylene In Accordance With F.D.O.T. Supplemental Specification 459.
11. All Piles And Pile Driving Operations Shall Be In Accordance With F.D.O.T. Supplemental Specification Section 455 And Technical Special Provisions.
12. Piling Shall Be Filled With Class IV Concrete f'c=5,500 PSI. The Pipe Pile Shall Be Clean And Free Of Water Before Placing Concrete. Cost Of Furnishing And Placing Concrete Shall Be Included In The Contract Unit Price For Pile Driven.
13. CORRISION PROTECTION: The Outside Surface Of Piles Shall Be Shop Coated From a Point No Less Than 4' Below The Mud Line Up To The Point Where The Pile Enters The Cap. Piles Shall Be Shop Coated With A Two Coat System Consisting Of An Inorganic Zinc primer And a Single Coat Of High Build Coal Tar Epoxy With a Minimum Thickness Of 12 Mils. Both Coats Are To Be Applied In Accordance With The Manufacturer's Specifications And Section 560 And 561 Of The Standard Specifications.
14. PILE POINTS: All Steel Pipe Piles Shall Be Equipped With A 3/4" Steel End Plate Which Shall Be Shop Welded To Produce A Watertight Joint. Each Plate Shall Conform To ASTM A-709 Grade 36 Steel.
15. PILE CUT-OFF: Steel Pipe Piles Shall Be Cut Off At The Required Elevations Along A Plane Normal To The Axis Of The Pile. Methods Used In Cutting Off Piles Shall Meet With The Approval Of The Engineer.
16. MILL TEST REPORTS: Notarized Mill Test Report Shall Be Required For All Steel Pipe Piles.
17. SHOP DRAWINGS: The Contractor Shall Submit Shop Drawings For Steel Pipe Piles, End Plate And Splice Details For The Engineers Approval Prior To Fabrication.
18. Negative Skin Friction Allowances Exceed Potentioal Scour Effects.
19. Downdrag Forces = 13 Tons/Pile.

PILE CUT-OFF ELEVATIONS

PILE NO.	LOCATION		
	END BENT NO.1	PIER NO.2	PIER NO.3
1	66.60	66.20	64.70
2	66.60	66.40	65.00
3	66.80	66.70	65.20
4	67.10	66.90	65.50
5	67.30	67.20	65.70
6	67.60	67.40	66.00
7	67.80	67.20	65.70
8	67.60	66.90	65.50
9	67.30	66.70	65.20
10	67.10	66.40	65.00
11	66.80	66.20	64.70
12	66.60	66.20	64.70
13	–	66.40	64.90
14	–	66.70	65.10
15	–	66.90	65.20
16	–	67.20	65.40
17	–	67.40	65.60
18	–	67.20	65.80
19	–	66.90	66.00
20	–	66.70	65.80
21	–	66.40	65.60
22	–	66.20	65.40
23	–	–	65.30
24	–	–	65.10
25	–	–	64.90
26	–	–	64.70
27	–	–	–
28	–	–	–

PILE INSTALLATION TABLE

Pier Or Bent	Pile Size (In.)	Design Load (Tons)	Total Scour Resistance * (Tons)	Min. Tip Elevation (Ft.)	Scour Elevation (Ft.)	Required Preform Elevation (Ft.)	Required Jet Elevation (Ft.)	Net Scour Resistance ** (Tons)	Anticipated Tip Elevation
1	20	130	NA	+30	NA	NA	NA	NA	−25
2	20	130	NA	−140	NA	NA	NA	NA	−150
3	20	130	NA	−155	NA	NA	NA	NA	−180
4	20	130	NA	−115	NA	NA	NA	NA	−150
5	20	130	NA	−25	NA	NA	NA	NA	−160
6	20	130	NA	−75	NA	NA	NA	NA	−100
7	20	130	NA	17	NA	NA	NA	NA	−10

* Total Side Friction Resistance From Ground Line To The Scour Elevation. For This Project Anticipated Scour Is Minimal, Therefore Neglected.

** Net Side Friction Resistance From The Required Preformed Or Jetting Elevation To The Scour Elevation.

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JLA	9/94
Checked by	MKA	9/94
Designed by	MKA	9/94
Checked by	PM	9/94
Approved by	Peeter Mannik, P.E.	

ENGINEER OF RECORD:
DYER, RIDDLE, MILLS AND PRECOURT, INC.
1505 EAST COLONIAL DRIVE
ORLANDO, FLORIDA 32803

LOGO:
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ENGINEERS - SURVEYORS
1505 EAST COLONIAL DRIVE
ORLANDO, FLORIDA 32803

SEAL:

FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN OFFICE

ROAD NO.	COUNTY	PROJECT NO.
SR414	SEMINOLE	77002-3503

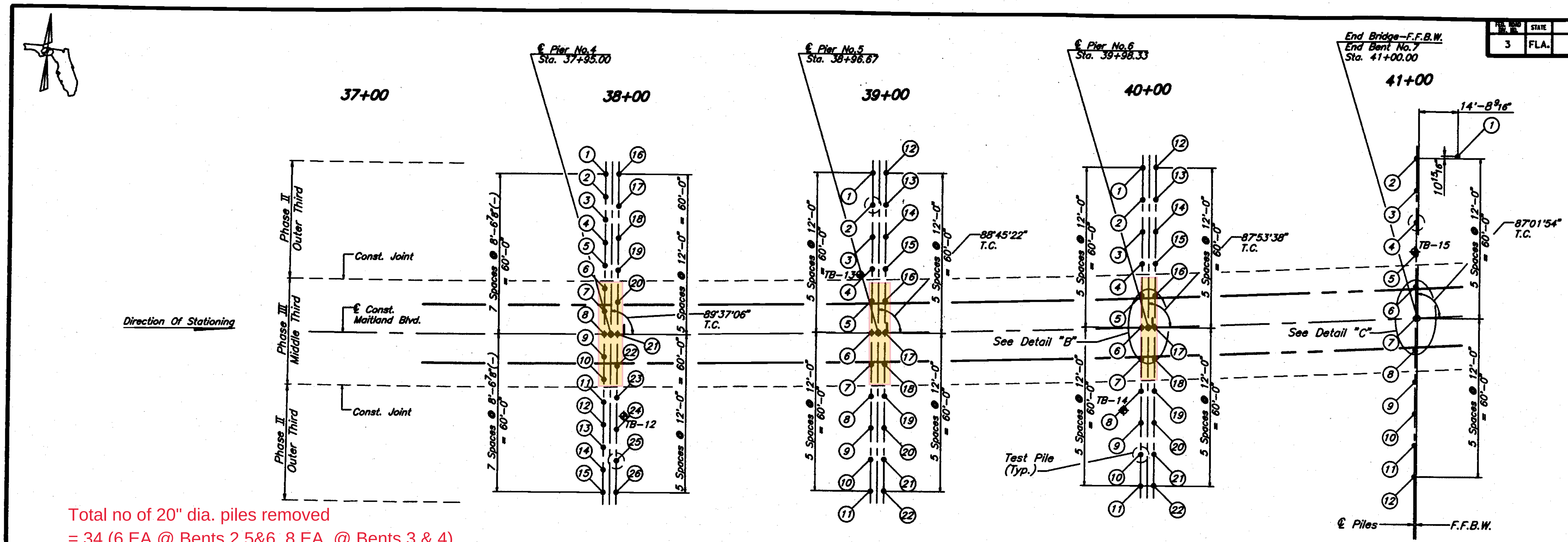
SHEET TITLE: FOUNDATION LAYOUT

Drawing No. 1 OF 2

PROJECT NAME: MAITLAND BOULEVARD OVER LAKE BOSSE

Index No.

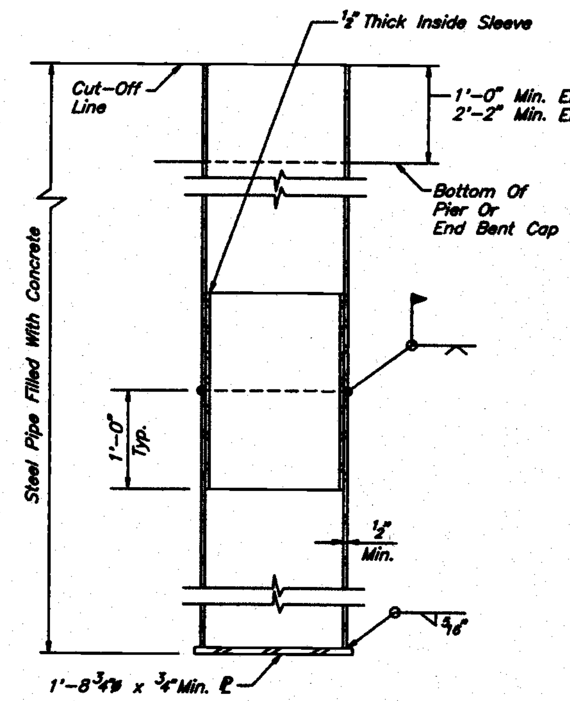
FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.		98	B-11



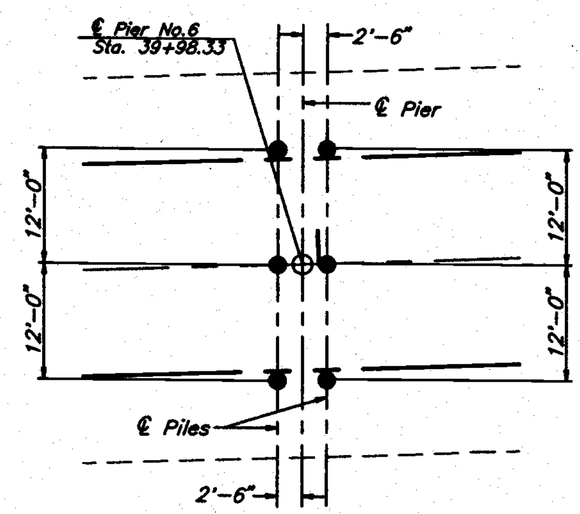
Total no of 20" dia. piles removed
= 34 (6 EA @ Bents 2,5&6. 8 EA. @ Bents 3 & 4)
Total area of piles removed= 74.2 SF

PLAN

PILE CUT-OFF ELEVATIONS				
PILE NO.	LOCATION			
	PIER NO.4	PIER NO.5	PIER NO.6	END BENT NO.7
1	64.70	66.00	65.20	65.50
2	64.90	66.30	65.50	65.50
3	65.10	66.50	65.70	65.70
4	65.30	66.80	66.00	66.00
5	65.40	67.00	66.20	66.20
6	65.60	67.20	66.50	66.50
7	65.80	67.00	66.20	66.70
8	66.00	66.80	66.00	66.50
9	65.80	66.50	65.80	66.30
10	65.60	66.30	65.50	66.00
11	65.40	66.00	65.30	65.80
12	65.30	66.00	65.20	65.50
13	65.10	66.30	65.50	–
14	64.90	66.50	65.70	–
15	64.70	66.80	66.00	–
16	64.70	67.00	66.20	–
17	65.00	67.20	66.50	–
18	65.20	67.00	66.20	–
19	65.50	66.80	66.00	–
20	65.70	66.50	65.80	–
21	66.00	66.30	65.50	–
22	65.70	66.00	65.30	–
23	65.50	–	–	–
24	65.20	–	–	–
25	65.00	–	–	–
26	64.70	–	–	–

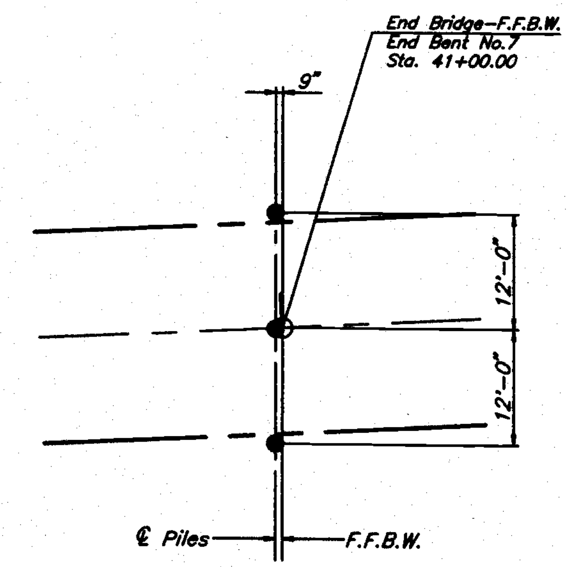


LONG SECTION OF STEEL PIPE PILE -20"ø



DETAIL "B"

Typ. @ Pier Nos. 2, 5 and 6



DETAIL "C"

End Bent No. 7 Shown
End Bent No. 1 Opp. Hand

CURVE DATA

Δ = 07°43'27" Lt.
D = 00°50'53"
T = 456.077'
L = 910.773'
R = 6755.800'
e = NORMAL/CROWN
P.C. Sta. = 32+09.23 (Ahead)
P.R.C. Sta. = 41+20.00

LEGEND

(1) Pile Number
● Proposed Piles
Test Pile
Test Boring

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JLA	9/94
Checked by	MKA	9/94
Designed by	MKA	9/94
Checked by	PM	9/94
Approved by	Peeter Mannik, P.E.	

ENGINEER OF RECORD:
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ENGINEERS - SURVEYORS
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SEAL:

FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN OFFICE

ROAD NO.	COUNTY	PROJECT NO.
SR414	SEMINOLE	77002-3503

SHEET TITLE: FOUNDATION LAYOUT

PROJECT NAME: MAITLAND BOULEVARD OVER LAKE BOSSE

Drawing No. 2 OF 2

Index No.

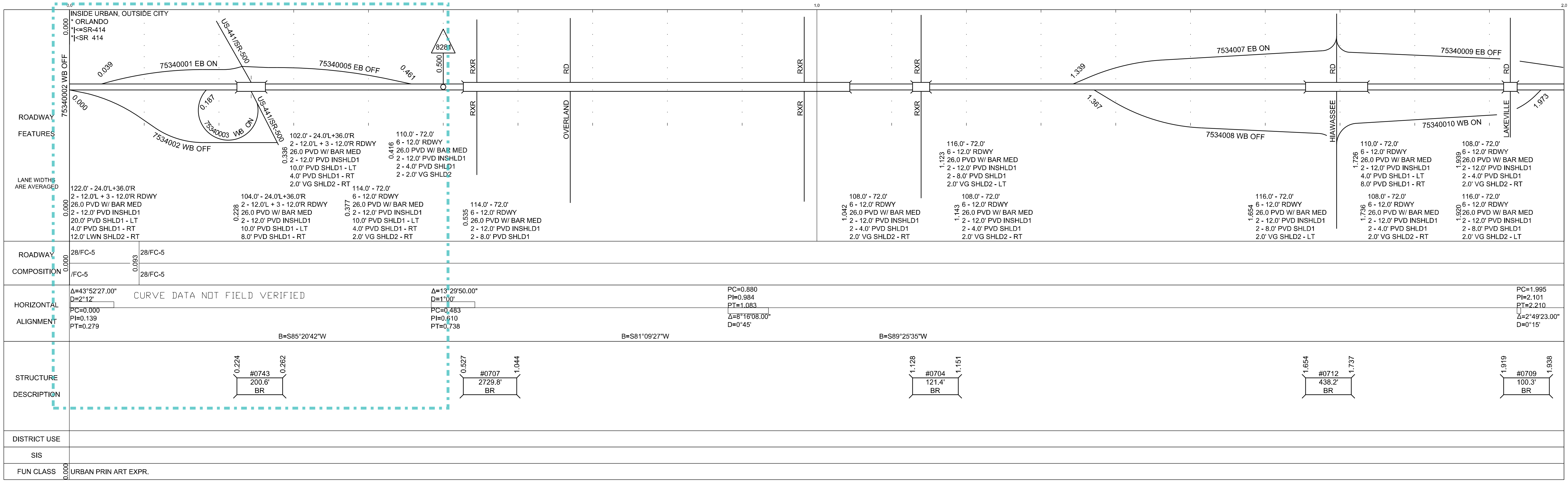
Straight Line Diagrams

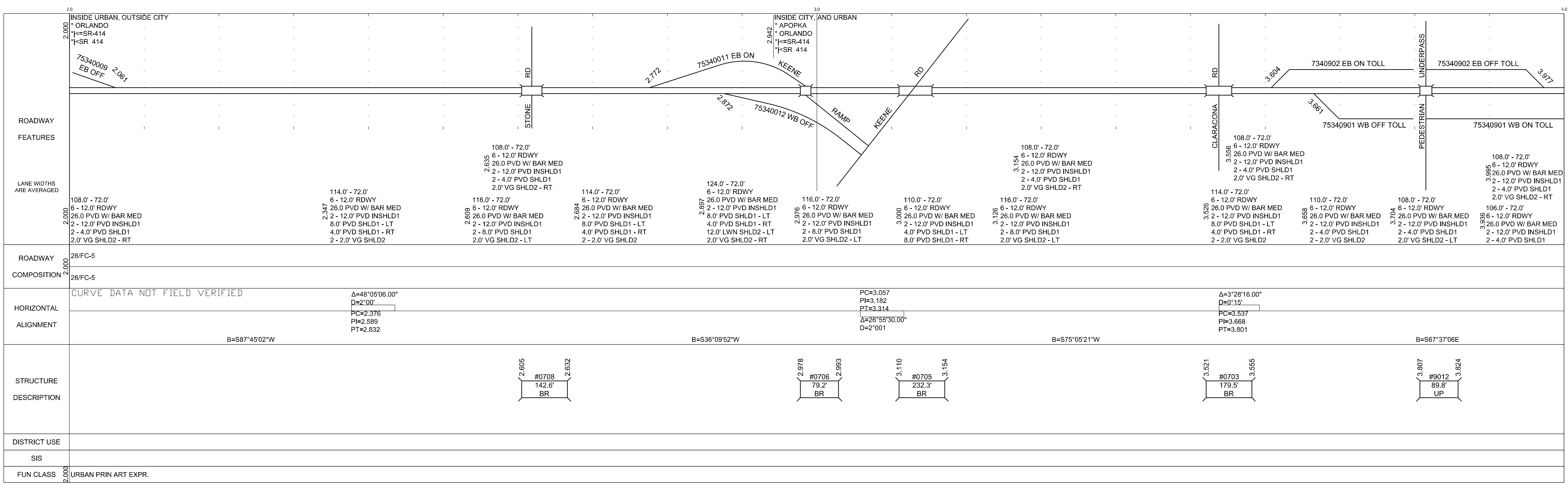
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	10/30/2019	12/5/2019				
BY	HNTB	HNTB				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 414/SR 429	ORANGE	05	75340000	1 OF 3





Version: 1.4.2.27 11/06/2019

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DATE	06/16/2014	07/02/2014	035.959	036.781		12/23/2014 MR
BY	Kim Auerbach	Michael Register				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
12		SR 414	ORANGE	05	75011002	1 OF 1

36.0

ROADWAY FEATURES LANE WIDTHS ARE AVERAGED	DELETED (MP 35.959 TO MP 36.206)	36.206 INSIDE URBAN, OUTSIDE CITY * ORLANDO *|<=MAITLAND BLVD *|<SR 414 75340002 WB OFF 36.206 Begin Project BEAR LK RD 36.655 ROSE AVE 36.655 36.206 98.0' - 48.0' 4 - 12.0' RDWY 46.0 VEG MED 2 - 4.0' PVD INSHLD1 2 - 2.0' C&G SHLD1	SEMINOLE CO LINE END MP: 036.781 NET ROADWAY ID LENGTH: 0.575 STATE MAINTAINED LENGTH: 0.575
ROADWAY COMPOSITION		36.206 28/FC-3 28/FC-3	
HORIZONTAL ALIGNMENT		Δ=38°38'32.00" CURVE DATA NOT FIELD VERIFIED D=4°01' PC=36.067 PI=36.162 PT=36.250 B=N38°10'09"E PC=36.486 PI=36.631 PT=36.756 Δ=52°01'18.33" D=3°39'	
STRUCTURE DESCRIPTION			
SIS			
FUN CLASS		36.206 URBAN PRIN ART OTHER	
SPEED LIMIT		36.206 50MPH	
AC MAN CLS		36.206 ACCESS CLASS03 … ACCESS CLASS03 36.781	
NHS		36.206 NHS/MAP-21 PRINCIPAL ARTERIALS … NHS/MAP-21 PRINCIPAL ARTERIALS 36.781	

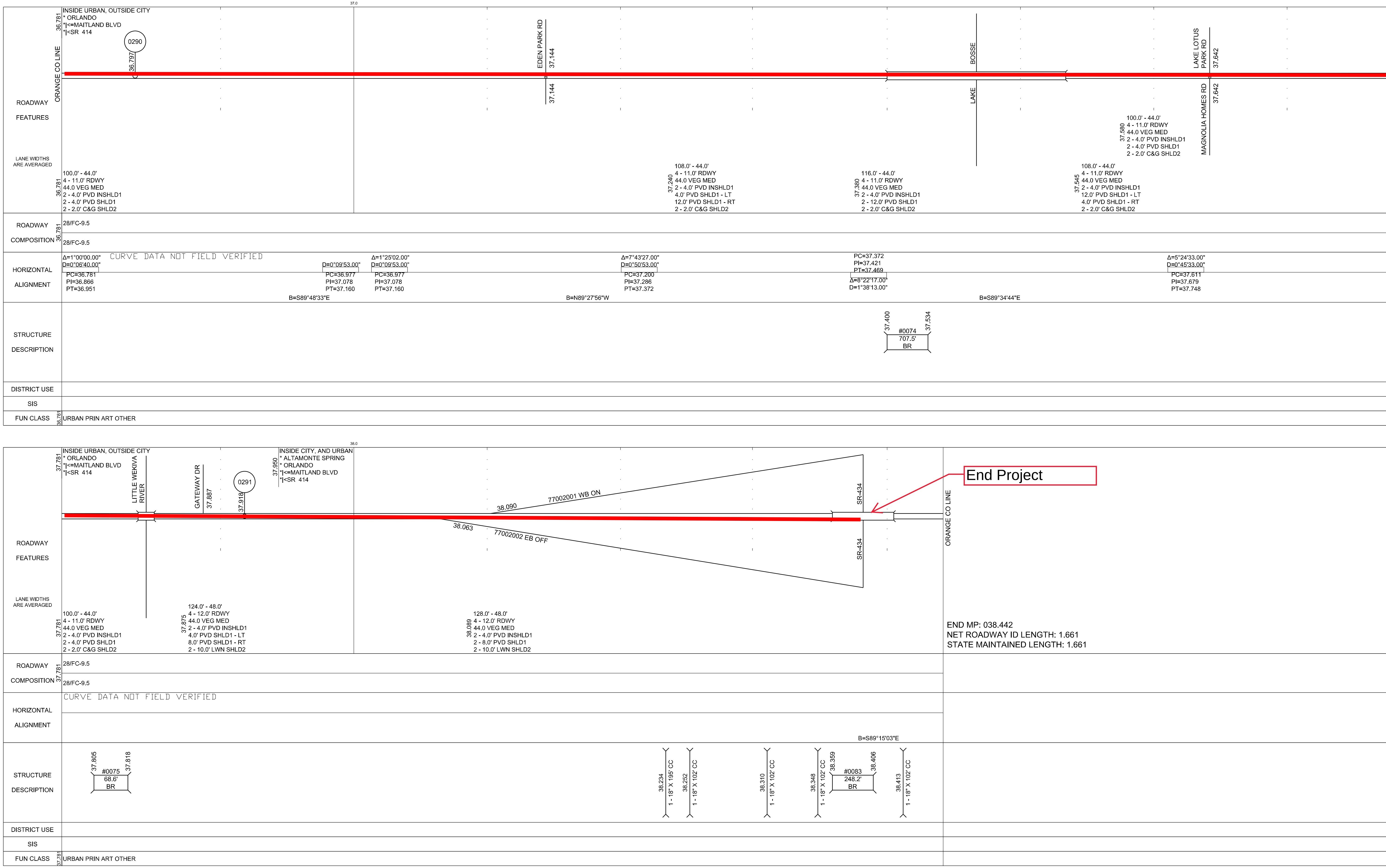
	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	01/09/2020	01/10/2020				
BY	HNTB	HNTB				

FLORIDA DEPARTMENT OF TRANSPORTATION

FDOT

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 414	SEMINOLE	05	77002000	1 OF 1



Version: 1.4.2.27 01/09/2020

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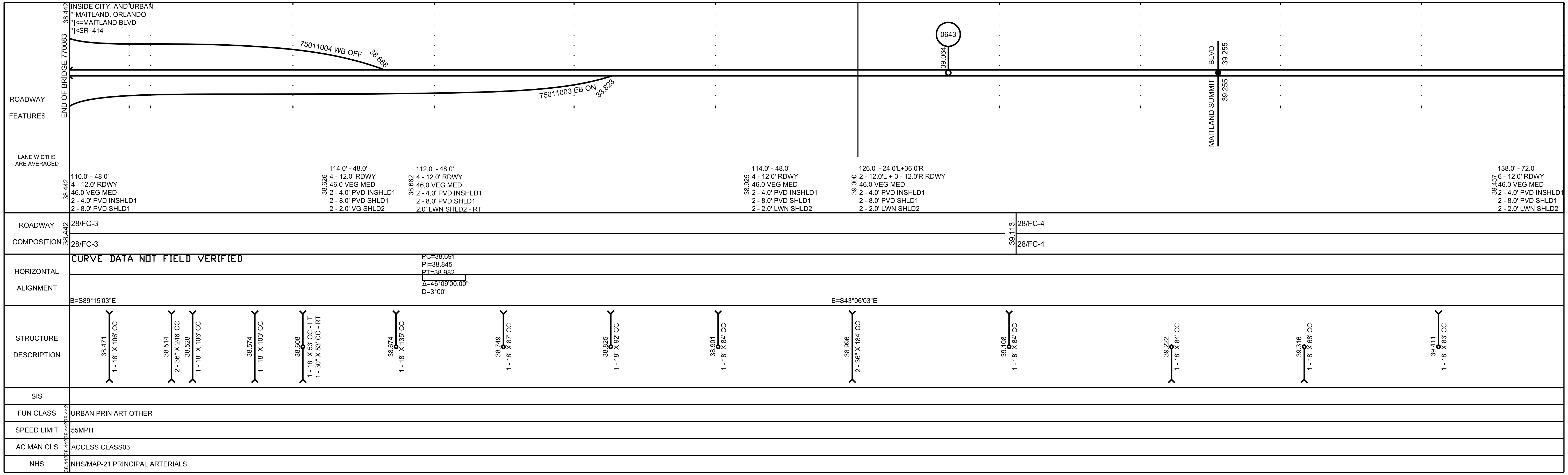
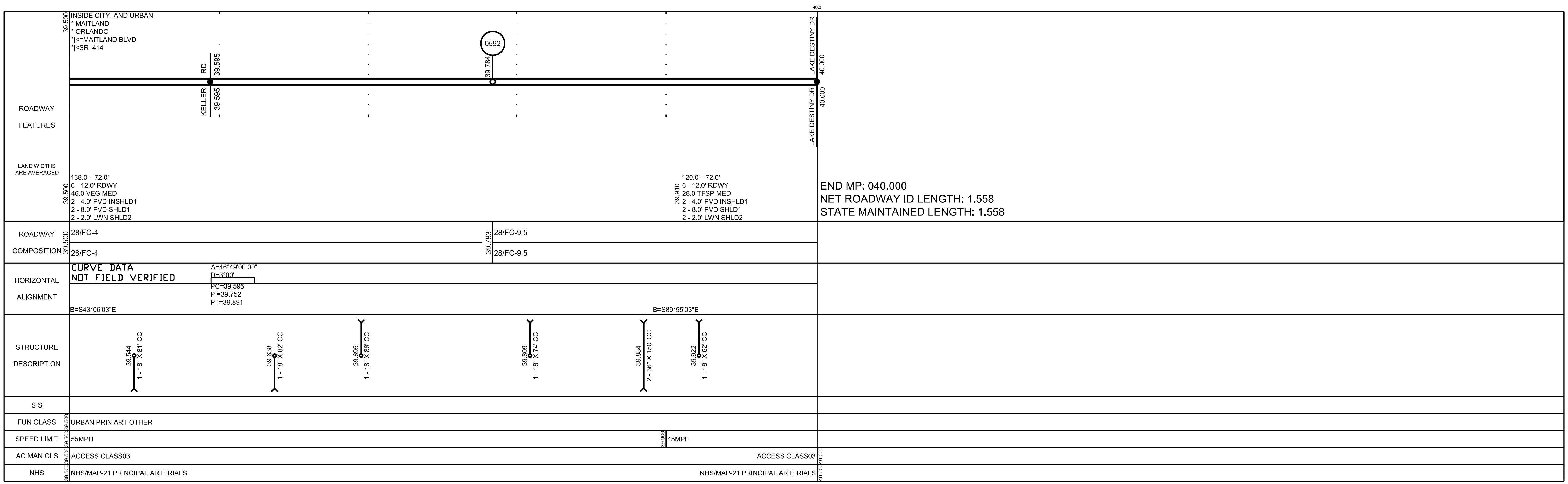
DATE	08/18/2014	08/26/2014	038.442	040.000		12/23/2014 MR
BY	Kim Auerbach	Michael Register				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 414	ORANGE	05	75011001	1 OF 1





Version: 1.4.2.24 11/22/2014

Appendix E
Correspondence

Meeting Minutes

200 S. Orange Ave, Suite 900
Orlando, FL 32801

www.jacobs.com

Subject	CFX Project No. 414-227 and Little Wekiva/Lake Lotus Stormwater Project - Coordination with Orange County EPD		
Project	SR 414 Maitland Blvd PDE		
Project No.	CFX Project No. 414-227	File	Lake Lotus Stormwater Project - Coordination with Orange County EPD.docx
Prepared by	Ricky Ly, PE	Phone No.	407-432-9563
Location	Online WebEx Meeting	Date/Time	August 27, 2020
Participants	Emily Lawson, Orange County Environmental Protection Division - Emily.Lawson@ocfl.net Julia Bortles, Orange County Environmental Protection Division - Julie.Bortles@ocfl.net Danh Lee, Jacobs – danh.lee@jacobs.com Ricky Ly, Jacobs – ricky.ly@jacobs.com		

Notes

Orange County

- Currently working on finalizing contract documents to start design

FDOT

- Orange County stated that FDOT has entered into discussions with the City of Altamonte Springs regarding the current use of the existing FDOT Pond F – Jacobs will confirm status with FDOT
- City of Altamonte Springs uses parking lot and pathway for tram to Lake Lotus Park underneath SR 414 adjacent to Little Wekiva River
- Orange County, FDOT, and City of Altamonte Springs working on an agreement regarding Lake Lotus Stormwater Treatment Facility
- FDOT Contacts
    - Leslie Primo, RW Acquisition
    - Karen Snyder, Drainage / PDE
- Jacobs to get together with FDOT regarding rights/compensation treatment credits

Orange County

- Asks about volume coming in to new pond from CFX SR 414 PDE project as it may effect their calculations
- Orange County currently working on agreement wording, will reach out to FDOT / CFX (Jacobs) to coordinate
- Credits Agreements
    - Orange County wants this project for BMAP Credits for the Little Wekiva River basin

  - o Calling it a percentage in case calculations are edited during design

Timeline / Schedule

- Orange County has an internal meeting next week, will get back next week to Jacobs

Action Items

- Jacobs to reach out to FDOT regarding agreements / credits
- Orange County to let Jacobs know about the schedule/timeline
- Jacobs to provide volume calculations for Orange County when available

SR 414 Expressway Extension PD&E Study
from US 441 to SR 434
Drainage discussion on Stormwater Design Criteria and Approach
Draft Meeting Summary

PREPARED BY:	Danh Lee, PE
MEETING DATE:	01/28/2021
MEETING TIME:	10:00 a.m. – 11:00 a.m.
LOCATION:	MS Teams Videoconference
ATTENDEES:	Ferrell Hickson (FDOT), Sunserea Dalton (Jacobs), Kristen Bridges (Jacobs), Clayton Lee (Dewberry) Carnot Evans (Dewberry)

I. **Project Overview**

   a. Last FDOT coordinate meeting was in December.
   b. Alternatives public workshop scheduled for the end of February.
   c. Barrier within the median will be continuous.
   d. Secondary drainage system, for the proposed elevated section, will be connected to the existing surface system.
      i. Existing pipe capacities will be evaluated during the design phase of the SR 414 project.

II. **Basin Stormwater Requirements**

   a. Water Management Districts are currently working on modifying the Statewide Environmental Resource Permit (SWERP) rules again.
      i. Targeted completion date may be by the end of this year.
   b. Recharge standards
      i. Verify if existing permits account for current recharge standards.
         1. Projects may have been permitted before standards were established.
      ii. Verify with SJRWMD if current approach to meet recharge standards are permittable.
         1. The current approach, for wet detention basins, is to provide 3 inches over DCIA that replaces any open grass areas (i.e. existing median and any grassed infield area at the Interchanges). Thus, post-development

recharge is equal to or greater than pre-development recharge.

2. If current approach is not acceptable, we may need to provide recharge, per Basin, to meet current standards.

c. Outstanding Florida Springs
   i. Based on previous discussion with SJRWMD, Outstanding Florida Springs is not considered an OFW, in which an additional 50% of treatment volume will be required. But we should still verify that with Cammie Dewey.
d. Closed Basins / Chapter 14-86 F.A.C.
   i. Preliminary pond sizing needs to account for 100 YR / 240 HR Design storm.
   ii. If volumetric analysis is not sufficient, ICPR modeling may be required during design phase.

III. **Stormwater Basins / Ponds**

a. Pond Design High Water Elevation / Freeboard
   i. FDOT is acceptable to using the outside berm elevation to measure the 1 ft of freeboard within the pond, only if the pond(s) is currently permitted as such.
b. Basin A / Pond 4A
   i. Need to consider the proposed improvements/trail projects in our study and during the design phase.
   ii. Trail improvements/connection is supposed to run south, along the east side of US 441.
   iii. The existing loop ramp radius is supposed to be tighten up to allow space for the trail improvements.
c. Pond B1
   i. Need to verify if there's an existing easement for the transmission poles. If so, the preference is to not have any proposed pond area within the easement.
d. Pond C / dry retention
   i. Verify if existing pond is "dry" or not. FDOT/CFX prefer dry retention. May need to elevate the pond bottom to maintain "dry" conditions.
e. Basin G / Maitland West
   i. The completion of the Maitland West project is currently on hold.
   ii. There have been some ponding issues due to the incompletion of a proposed, north to south, ditch that conveys runoff from our study limits to the ultimate outfall location. This issue has

recently been resolved by removal of excess dirt that may have been the cause of the ponding issues.

iii. Special attention should be provided for the design high water elevation of the proposed perimeter swale which will capture and provide stormwater treatment and attenuation for the runoff from our study limits. The adjacent existing edge of pavement elevation(s) along SR 434 and the EB on ramp to SR 414 are low and should be compared to the swale design stages.

iv. The site also contains karst area(s) and has been know for sinkhole activity. Additional soil borings should be considered for any roadway/bridge improvements within the study limits in the vicinity of this site.

v. Exfiltration trenches are not an option for stormwater treatment within this area. FDOT does not recommend any exfiltration trenches within any karst areas.

IV. **Bridges**

a. Lake Bosse

i. Hydraulic calculation will consider removal of the existing piers and the replacement of the proposed piers. Pre-post channel capacity comparison.

b. Little Wekiva

ii. The proposed structure will span entire limits of river crossing. Hydraulic calculation will verify vertical clearance requirements.

V. **FEMA 100 YR Floodplains**

a. SJRWMD requires consideration of the 10 YR floodplain impacts.

b. FEMA requires consideration of the 100 YR floodplain impacts.

c. De minimis approach.

c. Mitigation for the minimal impacts should consider:

i. “Scrape down” adjacent to existing Pond E.

ii. Reduced discharge (pre-post) from proposed stormwater treatment ponds.

VI. **ELA / Lake Lotus Park Regional Pond**

a. Orange County will acquire FDOT ROW for the proposed regional pond.

b. Existing Pond F will remain.

c. CFX needs to confirm use of Pond F for our proposed study limits with FDOT.

d. City of Altamonte Springs wants rights over existing parking lot and bus loop.

e. FDOT will maintain rights over Park and Ride, south of Pond F. The City will provide maintenance for this area.
f. FDOT will maintain an easement over any pipes and drainage structure associated with Pond F.
g. Orange County will have rights over the rest of the "green" areas.
h. The Park provides mitigation for existing SR 414 / Maitland Blvd. This should remain intact.
i. If a "joint-use" agreement is made for the regional pond, it should be between CFX and Orange County.
j. If the regional pond provides any stormwater treatment, attenuation, and/or recharge for our study limits then an easement should be acquired over the proposed pond.
k. Jacobs had a preliminary discussion with Orange County on August 27, 2020 regarding the regional pond. Orange County staff included Emily Lawson and Julia Bortles.
l. Jacobs should continue the discussion of the regional pond use and application with Leslie Primo (FDOT, RW Acquisition). Altamonte Springs and Orange County.

VII. **Maintenance**

a. FDOT would normally transfer the maintenance of stormwater ponds to CFX after completion of the design/construction for the study limits. The ponds will then be providing stormwater treatment for CFX's roadway improvements. However, maintenance agreements have not been discussed and these will need to continue if project progresses to design phase.
b. Maintenance agreement for roadway, existing versus proposed elevated sections, will need to be determined.

VIII. **Action Items**

Action Item	Due Date	Person Responsible	Completion Date	Notes
Jacobs to set up "pre app" with SJRWMD				
Jacobs to set up meeting with FDOT, Orange County and Altamonte Springs for Lake Lotus Park Regional Pond following SJRWMD meeting				

Ly, Ricky/ORL

From:	Brett Blackadar <BBlackadar@altamonte.org>
Sent:	Monday, February 15, 2021 11:55 AM
To:	Ly, Ricky/ORL
Cc:	Danielle Marshall; Deanna K. Teminsky; April Davis
Subject:	[EXTERNAL] RE: SR 414 from SR 441 to SR 434 in Maitland - Existing Maintenance / Drainage Issues - City of Altamonte Springs
Attachments:	RE: CFX SR 414 Expressway Extension PD&E Study PAG presentation

Ricky,

I am on the Project Advisory Group (PAG) for this study so you can direct any future correspondence to me.

I have attached the comments from 12/22/2020 that we had sent the project team regarding this study. The last two comments do address water quality/mitigation issues in the vicinity of Lake Lotus Park.

The only roads that we maintain in your study area are Gateway Dr and the roadways within Lake Lotus Park. There are not any know issues on Gateway Dr near the study area that we are aware of. As for Lake Lotus Park, much of the park is currently in the flood plain, which I am sure that you already are aware of.

Please let me know if you need anything else.

BRETT BLACKADAR, PE, PMP, PTOE P: (407) 571-8338
Division Director of Engineering/ F: (407) 571-8350
City Engineer
BBlackadar@altamonte.org

100 YEARS ALTAMONTE SPRINGS
950 Calabria Drive
Altamonte Springs, FL 32714
www.Altamonte.org

From: Ly, Ricky/ORL <Ricky.Ly@jacobs.com>
Sent: Monday, February 15, 2021 10:31 AM
To: Deanna K. Teminsky <DKTeminsky@altamonte.org>
Cc: Lee, Danh <Danh.Lee@jacobs.com>
Subject: SR 414 from SR 441 to SR 434 in Maitland - Existing Maintenance / Drainage Issues - City of Altamonte Springs

Good morning City of Altamonte Public Works,

I hope this e-mail finds you well. The Central Florida Expressway Authority is conducting the State Road 414 Expressway Extension Project Development and Environment Study to evaluate alternatives for a proposed grade-separated expressway extension of the tolled SR 414 (John Land Apopka Expressway).

The study limits extend along the existing SR 414 (Maitland Boulevard) corridor from US 441 (Orange Blossom Trail) to State Road 434 (Forest City Road). (See below figure for project study area location map).

We are reaching out to document any known drainage or maintenance issues in the vicinity that your office may have encountered or are aware of as part of the PDE study process. Your assistance and feedback in this effort is greatly appreciated – let us know if you have any questions – thank you!

Very truly yours,

Ricky Q. Ly, PE (FL) | Jacobs | Project Manager | Drainage
People and Places Solutions
407.432.9563 mobile | Ricky.Ly@jacobs.com
200 S. Orange Ave., Suite 900, Orlando FL 32801, United States
www.jacobs.com

SR 414 Expressway Extension PD&E Study
from US 441 to SR 434
Drainage discussion on Stormwater Design Criteria and Approach
Draft Meeting Summary

PREPARED BY:	Danh Lee, PE
MEETING DATE:	02/17/2021
MEETING TIME:	3:00 p.m. – 4:00 p.m.
LOCATION:	MS Teams Videoconference

Attendees:
Cammie Dewey, SJRWMD
Carnot Evans, CFX / Dewberry
Clayton Lee, CFX / Dewberry
Nicole Gough, CFX
Danh Lee, Jacobs
Sunserea Dalton, Jacobs
Jessica Dean, Jacobs
Ricky Ly, Jacobs

I. **Introductions**
   a. Meeting purpose: Follow up on items discussed during 1/28 FDOT drainage meeting and coordination with SJRWMD
   b. Sunserea Dalton provides a summary of the project and notes that Cammie Dewey is on the Project Advisory Group (PAG)

II. **Project Overview**
   a. Study Limits
      i. SR 414 from Interchange at US 441 to Interchange at SR 434
      ii. Typical Section
      iii. Important notes – Approach is to maximize existing ponds as there is no proposed ROW for this project

III. **Permitting**
   a. SWERP rule modification update
   b. Verification that existing permits include recharge standards

IV. **Drainage design criteria will adhere to the requirements set forth by**
   a. SJRWMD
   b. FDEP

c. CFX
d. FDOT
e. Orange County

V. **Follow-Items from 1/28 FDOT Drainage Meeting**

a. Verify approach to meet recharge standards
   i. Wet detention basins: Provide 3 inches over DCIA that replaces open grass areas
      1. Need to provide recharge per basin?
      2. Cammie Dewey notes that the soils maps provided by Orange County in 1989 and Seminole County in 1990 should be used to confirm recharge area. Danh to check soils map.
      3. Danh Lee notes that in the Jamal and Associates Geotechnical report that there is a confining layer in some areas where the water moves horizontally
b. Verify Outstanding Florida Springs Considerations
   i. Assume that Outstanding Florida Springs are not considered an OFW
   ii. Cammie Dewey to check on OFS status. Need to check with FDEP regarding infiltration vs surface runoff.
c. SJRWMD requirement for consideration of the 10 year floodplain impacts

VI. **Basin Stormwater Requirements**

a. Wekiva River Hydrologic Basin and Wekiva Recharge Protection Basin
   i. Recharge standards, for Type A soils
   ii. Storage standards, no net reduction within 100-year floodplain
   iii. Drawdown limits, within Water Quantity Protection Zone
b. Springs Priority Focus Area of Wekiva Springs and Rocks Springs
   ii. Outstanding Florida Springs
   iii. Wekiva Springs and Rock Springs BMAP
      1. BMP for pollutant loading analysis
      2. No net increase in post-development
c. Closed Basins
   i. 25 YR / 96 HR Design Storm
   ii. Chapter 14-86 F.A.C.
d. Open Basins
   i. 25 YR / 24 HR Design Storm

VII. **Stormwater Ponds Water Quality**

a. Dry Retention calculated by the greater of:

i. Off-Line Dry Retention
    1. 0.5 inch runoff from total basin area.
    2. 1.25 inches runoff from DCIA.

ii. On-Line Dry Retention
    1. Additional 0.5 inch runoff from total basin area over the volume specified for off-line treatment.

b. Wet Detention calculated by the greater of:
    i. 1.0 inch over total basin area.
    ii. 2.5 inches over DCIA.

c. Wekiva Recharge
    i. 3.0 inches over DCIA.

VIII. **Stormwater Ponds Water Quantity**

a. Closed Basins
    i. The entire post-development runoff volume from the 100 YR / 24 HR storm shall be retained (Orange County).
    ii. The difference in runoff volumes of the pre-development and post-development from the 25 YR / 96 HR storm shall be detained within 14 days following storm event (SJRWMD).
    iii. The entire post-development runoff volume from the 100 YR / 24 HR storm shall be available within 14 days after the rainfall event has ended.

b. Basin A and B are “closed” basins.

c. Cammie notes the orifice should be sized as small as possible to give receiving basin time to recover for closed basins.

IX. **Stormwater Ponds Recovery**

a. Dry Retention
    i. The total required treatment volume (PAV) shall be available within 72 hours after the rainfall event has ended.
    ii. Closed Basin
        1. ½ of PAV shall be available in 7 days (168 hours) and the entire PAV must be available in 30 days (720 hours).

b. Wet Detention
    i. Recovery of ½ PAV within 24 – 30 hours.

X. **Bridge**

a. Bosse Lake

i. Hydraulic calculation will consider removal of the existing piers and the replacement of the proposed piers. Pre-post channel capacity comparison.

b. Little Wekiva

ii. Proposed structure will span entire limits of crossing. Hydraulic calculation will verify vertical clearance requirements.

XI. **FEMA 100 YR Floodplains**

a. De minimis approach

b. Cup for cup

XII. **ELA**

a. Lake Lotus Park Regional Pond

XIII. **Other Discussion Items**

a. Basin G – plan is to stay away from existing Pond G and use proposed dry swales on north side of SR 414. Cammie Dewey concurs this is a good approach.

XIV. **Action Items**

Action Item	Due Date	Person Responsible	Completion Date	Notes
Check OFS Status	3/15/2021	Cammie Dewey, SJRWMD		
Check Soils Maps from Orange County / Seminole County	3/15/2021	Danh Lee, Jacobs		
Once treatment volumes are better quantified get back with SJRWMD on basin treatment approach in a few weeks	3/15/2021	Danh Lee, Jacobs		

Ly, Ricky/ORL

From: Danos, Mike <Mike.Danos@dot.state.fl.us>
Sent: Thursday, February 18, 2021 12:41 PM
To: Ly, Ricky/ORL
Cc: Lee, Danh; Fulton, James
Subject: [EXTERNAL] RE: SR 414 from SR 441 to SR 434 in Maitland - Existing Maintenance / Drainage Issues

Ricky,

The most significant drainage issue we've had in this area would be the trash and debris clogging the drainage at the bridge.
There are some other drainage weak points at each end of project. Ditches on US 441 are always wet and are a challenge to maintain. The wet retention ditch at SR 434 (southeast corner) handles a lot of water in the rainy season, spilling into the pond next to it, keeping that outfall flowing.

More general maintenance issues include the back slopes between the sidewalk and the subdivision walls located eastbound between Rose and US 441. I am also including the maintenance of the sound-walls and a mystery minor depression at middle of Rose and Maitland.

It was good talking with you today. It's been quite a while since you been with us here at Oviedo. Best regards stay well.

Mike Danos
FDOT Oviedo Operations
Maintenance Program Manager
(407) 278-2762 - Office
(407) 335-3900 - Cell

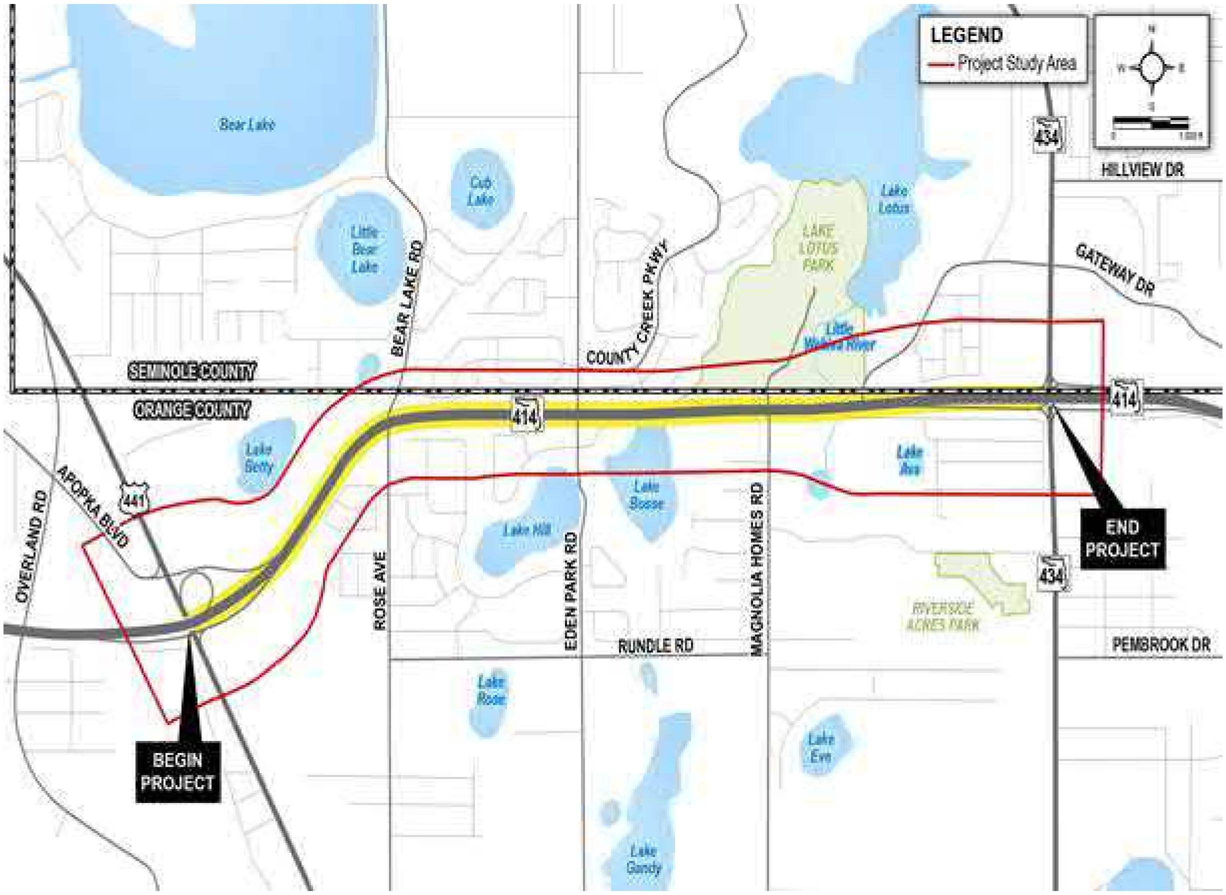
From: Ly, Ricky/ORL <Ricky.Ly@jacobs.com>
Sent: Monday, February 15, 2021 10:22 AM
To: Danos, Mike <Mike.Danos@dot.state.fl.us>
Cc: Lee, Danh <Danh.Lee@jacobs.com>
Subject: SR 414 from SR 441 to SR 434 in Maitland - Existing Maintenance / Drainage Issues

Good morning Mr. Mike Danos,

I hope this e-mail finds you well. The Central Florida Expressway Authority is conducting the State Road 414 Expressway Extension Project Development and Environment Study to evaluate alternatives for a proposed grade-separated expressway extension of the tolled SR 414 (John Land Apopka Expressway).

The study limits extend along the existing SR 414 (Maitland Boulevard) corridor from US 441 (Orange Blossom Trail) to State Road 434 (Forest City Road). (See below figure for project study area location map).

We are reaching out to document any known drainage or maintenance issues your office may have encountered or are aware of as part of the PDE study process. Your assistance and feedback in this effort is greatly appreciated – let us know if you have any questions – thank you!



Very truly yours,

Ricky Q. Ly, PE (FL) | Jacobs | Project Manager | Drainage
People and Places Solutions
407.432.9563 mobile | Ricky.Ly@jacobs.com
200 S. Orange Ave., Suite 900, Orlando FL 32801, United States
www.jacobs.com

SR 414 Expressway Extension PD&E Study
from US 441 to SR 434
Drainage discussion on FDEP Criteria
DRAFT Minutes

PREPARED BY: Ricky Ly, PE

MEETING DATE: 03/04/2021

MEETING TIME: 11:00 a.m. – 12:00 p.m.

LOCATION: MS Teams Videoconference

Attendees:
Leo Angelero, FDEP
Daniel Shideler, FDEP
Danh Lee, Jacobs
Ricky Ly, Jacobs

I. Introductions
   a. Meeting purpose: Discuss FDEP requirements for SR 414 PDE project corridor
   b. Danh Lee provides a screen share of the project location and scope – elevated SR 414 expressway extension

II. Project Overview
   a. Study Limits
      i. SR 414 from Interchange at US 441 to Interchange at SR 434
      ii. Typical Section
      iii. Important notes – Approach is to maximize existing ponds as there is no proposed ROW for this project

III. Special Basin Stormwater Requirements
   a. Wekiva River Hydrologic Basin and Wekiva Recharge Protection Basin
      i. Recharge standards, for Type A soils
      ii. Storage standards, no net reduction within 100-year floodplain
      iii. Drawdown limits, within Water Quantity Protection Zone
   b. BMAP - Springs Priority Focus Area of Wekiva Springs and Rocks Springs
      i. Outstanding Florida Springs
         1. Question – Is Outstanding Florida Springs the same as Outstanding Florida Waters and should 50% additional treatment be provided?

2. Use FDEP direct map to verify if SR 414 is outside of Outstanding Florida Waters and/or Springs
3. The map will shows where OFW and TMDL criteria should be applied
4. Due to the distance – you do not have to add for OFS and is not direct discharge – Leo
5. Surface Discharge vs Infiltration Discharge through the Soil?
   a. SJRWMD / Cammie Dewey said TMDL Loadings they are starting to look at ground discharge into aquifer, and it might be incorporated into new SWERP Rules – what is the opinion of FDEP on the requirements – look at surface discharge and infiltration through the soil TMDL?
   b. What is the requirement?
   c. If it is in the rules, go by the rules, if not then you are not required until it is written
   d. There are special basin requirements that fall in specific drainage basin areas and you have to meet
   e. There is another criteria specified to Wekiva that if you are in the area well drained then you have to demonstrate 3" of recovery on that soil – Wekiva Recharge Protection Basin – yes we are in this area
   f. We can only base design on current rules and will not know until end of year if there are going to be any additional changes

ii. Wekiva Springs and Rock Springs BMAP
1. BMP for pollutant loading analysis
2. No net increase in post-development
3. Need to meet treatment requirements if verified impaired – Leo Angelero
4. Danh – there is a BMAP with requirements – we will make sure our post loading is equal or less than the pre loading / existing condition (current condition preferred not the historic - Leo).
5. Danh – We use BMPTrains with existing ponds along corridor to route through and with proposed ponds to make sure post loading is less than or equal to the pre condition.

IV. FDEP Requirements
   a. Leo – recommends look at previous permits associated with Maitland Blvd and make sure any additional special requirements to follow that, make sure to follow TMDL requirements is followed, discussion regarding discharge into ground / soil / infiltration these rules are not in

place yet then if not in place then it should not be asked for but if you do this we will not say no. If not in the rule we will not be asking for it

b. Danh – is there a map or tentative map in which we can define where we will be in those boundaries for future requirements?
    a. Leo – no map yet that he knows of

a. Permitting History – only FDEP permit was for US 441 interchange which included three infield wet ponds - rest of ponds permitted by SJRWMD. Permitted in 1995/1996 – we are looking for original permit requirements and making sure we meet these.

b. TMDLs are in the BMAP
    i. We are taking care of TN and TP per reduction requirements
    ii. Any other nutrients need to be looked at?
        1. See layers to see what else is happening
        2. Check FDEP Map Direct for Verified Impaired requirements
    iii. Leo – CFX usually provides extra to meet FDEP requirements etc

V. Other Discussion Items

VI. Action Items

Action Item	Due Date	Person Responsible	Completion Date	Notes

Appendix F
TMDL Calculations

SR 414 PD&E Preliminary TMDL and Pollutant Loading Analysis

Basin ID	Pond Type	PRE- DEVELOPMENT				POST-DEVELOPMENT			
		Total Area (acres)	Non DCIA CN	Pre Nitrogen Loading (kg/yr)	Net Nitrogen Loading (kg/yr)	Total Area (acres)	Non DCIA CN	Post Nitrogen Loading (kg/yr)	Net Nitrogen Loading (kg/yr)
A	Wet Detention	29.01	62.15	30.431	18.259	21.39	60.03	22.871	13.723
6A	Wet Detention	18.99	61.40	46.792	28.075	19.19	61.27	47.603	28.562
6B	Wet Detention	5.05	61.53	1.328	0.797	5.52	64.39	1.747	1.048
6C	Wet Detention	8.64	58.99	23.154	13.892	8.22	48.99	30.421	18.253
B	Dry Retention	7.57	61.85	24.014	4.803	16.89	46.44	39.545	7.909
C	Dry Retention	7.66	47.37	19.298	3.860	8.26	47.55	25.136	5.027
D	Wet Detention	4.94	51.71	21.441	12.865	5.01	51.78	21.951	13.171
E	Wet Detention	11.37	54.89	42.832	25.699	11.37	56.92	46.277	27.766
F	Treatment Train	20.92	62.54	30.026	18.016	20.92	65.41	35.037	7.007
G	Exist Wet Ditch	21.60	68.33	59.384	35.630	21.60	70.68	60.519	36.311
Totals:		135.75		298.70	161.90	138.37		270.59	158.78

* Total Net Increase in Nitrogen Loading (kg/yr) = -3.12

Notes: Total areas for basins do not include the water surface areas.
Totals for Pre - Post loading shown were generated from stormwater runoff from a highway facility (TN = 1.52) per basin acreage, % DCIA, and Non DCIA CNs.
Totals Net loading assumes 40% removal efficiency for wet detention ponds and 80% removal efficiency for dry retention ponds, except for Basin F (see attached calculations for treatment train removal efficiency of 80%)
(Source: Evaluation of Current Stormwater Design Criteria within the State of Florida, June 2007 by Harvey Harper)

See attached calculations for Basin B and C showing 80% removal efficiency calculations for dry retention ponds.

MADE BY:	DTL	DATE:	8/13/2021	JOB NO.	414-227
CHECKED BY:	AFS	DATE:	8/16/2021	SHEET NO.	
CALCULATIONS FOR:	SR 414 PD&E	POND:	Swale F	BASIN:	F

TMDL reduction calculation to achieve 80% removal with wet detention and dry swale treatment train

(Source: Evaluation of Current Stormwater Design Criteria within the State of Florida, June 2007 by Harvey Harper)

Basin F post development conditons:

Total Basin Area	21.79	ac
CN =	65	
% DCIA =	22.4	
Resident Time Provided (*td*) =	22.3	days

Removal efficiency of Total Nitrogen in Wet Detention ponds as a function of residence time:

$$\text{Percent Removal} = \frac{43.75 \times td}{(4.38 + td)} = 36.5\%$$

Treatment Train Efficiency = Eff1 + (1 - Eff1) x Eff2

where: Eff1 = required efficiency of dry retention
Eff2 = efficiency of wet detention

0.8 = Eff1 + (1 - Eff1) x 0.365
Eff1 = 0.69 = 69.0%

The required dry retention volume is estimated from the tables in Appendix D (attached):

From Appendix D (Zone 2) the required removal efficiency of 69.0% is achieved with a dry retention depth between 0.25 and 0.5 inches.
By iterating between 0.25 inch (60.15%) and 0.5 inch (78.80%), the dry retention depth required to achieve 69% removal is 0.30 inch.

Therefore, the required treatment train will consist of:

a. 0.30 inch dry retention, followed by
b. Wet detention pond with a 22.3 day mean residence time

Dry Retention Swale F

A. 0.3 " Over Total Basin Area = **0.54** Ac-Ft

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
76.00	Top	0.58				1.66
			0.48	2.32	1.12	
73.68	Weir Elev.	0.39				**0.54**
			0.32	1.68	0.54	
72.00	Bottom	0.25				

POST-DEVELOPMENT						
Basin ID	Total Area (acres)	Non DCIA CN	% DCIA	Required Retention Depth for 80% Removal Efficiency (inches)	Required Treatment Volume for 80% Removal Efficiency (AC-FT)	Provided Treatment Volume (AC-FT)
B	16.89	46.4	36.1	0.64	0.90	4.42
C	8.26	47.6	47.3	0.76	0.52	1.07
G	1.57	70.7	31.6	0.80	0.10	0.18

Notes: The total area for Basin G accounts for the contributing area (including net new impervious) diverted to proposed Swale G which will result in a decrease in polluntant loading to the overall Basin G, proposed conditions.

Required retention depth to achieve 80% removal effiiciency is based on attached chart.
(Source: Evaluation of Current Stormwater Design Criteria within the State of Florida, June 2007 by Harvey Harper)

Mean Annual Mass Removal Efficiencies for 0.25-inches of Retention in Zone 2

NDCIA	Percent DCIA																			
CN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	94.4	90.4	83.0	75.1	68.0	61.9	56.6	52.1	48.3	44.9	42.0	39.4	37.2	35.1	33.3	31.7	30.2	28.8	27.6	26.4
35	91.8	88.8	82.0	74.5	67.6	61.5	56.4	51.9	48.1	44.8	41.9	39.4	37.1	35.1	33.3	31.7	30.2	28.8	27.6	26.4
40	88.2	86.6	80.6	73.5	66.9	61.1	56.0	51.7	47.9	44.7	41.8	39.3	37.1	35.0	33.2	31.6	30.2	28.8	27.6	26.4
45	83.9	83.8	78.7	72.3	66.1	60.4	55.6	51.4	47.7	44.5	41.7	39.2	37.0	35.0	33.2	31.6	30.1	28.8	27.6	26.4
50	78.8	80.4	76.4	70.7	64.9	59.6	55.0	50.9	47.3	44.2	41.5	39.0	36.8	34.9	33.1	31.5	30.1	28.8	27.6	26.4
55	73.2	76.4	73.6	68.7	63.5	58.6	54.2	50.3	46.9	43.9	41.2	38.8	36.7	34.8	33.0	31.5	30.1	28.7	27.5	26.4
60	67.4	71.8	70.2	66.3	61.7	57.3	53.2	49.6	46.3	43.4	40.8	38.6	36.5	34.6	32.9	31.4	30.0	28.7	27.5	26.4
65	61.4	66.7	66.3	63.4	59.5	55.6	51.9	48.6	45.5	42.9	40.4	38.2	36.2	34.4	32.8	31.3	29.9	28.7	27.5	26.4
70	55.7	61.1	61.8	59.8	56.8	53.5	50.4	47.3	44.6	42.1	39.8	37.7	35.9	34.1	32.6	31.1	29.8	28.6	27.5	26.4
75	50.1	55.2	56.5	55.6	53.5	50.9	48.3	45.7	43.3	41.1	39.0	37.1	35.4	33.8	32.3	30.9	29.7	28.5	27.4	26.4
80	45.0	49.1	50.7	50.6	49.4	47.6	45.6	43.6	41.6	39.7	37.9	36.2	34.7	33.2	31.9	30.7	29.5	28.4	27.4	26.4
85	40.3	43.2	44.5	44.8	44.3	43.4	42.1	40.7	39.2	37.8	36.3	35.0	33.7	32.5	31.3	30.2	29.2	28.2	27.3	26.4
90	36.0	37.5	38.3	38.6	38.5	38.1	37.5	36.7	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5	28.7	27.9	27.2	26.4
95	31.7	32.1	32.3	32.4	32.3	32.2	32.0	31.7	31.4	31.0	30.6	30.2	29.7	29.3	28.8	28.3	27.9	27.4	26.9	26.4
98	29.3	29.3	29.2	29.1	29.0	28.9	28.8	28.6	28.5	28.3	28.2	28.0	27.8	27.7	27.5	27.3	27.1	26.9	26.6	26.4

Mean Annual Mass Removal Efficiencies for 0.50-inches of Retention in Zone 2

NDCIA	Percent DCIA																			
CN	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	97.0	96.7	94.8	91.7	87.9	83.8	79.7	75.7	71.9	68.4	65.2	62.1	59.4	56.9	54.5	52.3	50.3	48.4	46.7	45.1
35	95.2	95.5	93.8	90.9	87.3	83.4	79.3	75.4	71.7	68.3	65.0	62.1	59.3	56.8	54.4	52.3	50.3	48.4	46.7	45.1
40	92.9	94.0	92.5	89.9	86.5	82.7	78.9	75.1	71.4	68.0	64.9	61.9	59.2	56.7	54.4	52.2	50.2	48.4	46.7	45.1
45	90.2	91.9	90.9	88.6	85.5	81.9	78.2	74.6	71.1	67.7	64.6	61.7	59.1	56.6	54.3	52.2	50.2	48.4	46.7	45.1
50	86.7	89.2	88.9	87.0	84.2	80.9	77.4	73.9	70.5	67.3	64.3	61.5	58.9	56.5	54.2	52.1	50.2	48.3	46.6	45.1
55	82.7	86.1	86.4	84.9	82.6	79.6	76.4	73.1	69.9	66.8	63.9	61.2	58.6	56.3	54.1	52.0	50.1	48.3	46.6	45.1
60	78.5	82.6	83.4	82.5	80.6	78.0	75.1	72.1	69.1	66.1	63.4	60.8	58.3	56.0	53.9	51.9	50.0	48.2	46.6	45.1
65	74.2	78.6	79.8	79.5	78.1	76.0	73.5	70.7	68.0	65.3	62.7	60.2	57.9	55.7	53.6	51.7	49.9	48.2	46.6	45.1
70	69.8	74.2	75.8	76.0	75.2	73.5	71.4	69.1	66.6	64.2	61.8	59.5	57.3	55.3	53.3	51.4	49.7	48.1	46.5	45.1
75	65.4	69.6	71.4	71.9	71.5	70.4	68.8	66.9	64.9	62.7	60.6	58.6	56.6	54.7	52.8	51.1	49.5	47.9	46.5	45.1
80	61.4	64.9	66.6	67.3	67.2	66.5	65.5	64.1	62.5	60.8	59.0	57.3	55.5	53.9	52.2	50.7	49.2	47.7	46.4	45.1
85	57.6	60.1	61.6	62.2	62.3	62.0	61.3	60.4	59.3	58.1	56.8	55.4	54.0	52.7	51.3	50.0	48.7	47.4	46.2	45.1
90	54.1	55.4	56.2	56.7	56.8	56.7	56.4	55.9	55.2	54.5	53.6	52.8	51.8	50.9	49.9	48.9	47.9	46.9	46.0	45.1
95	50.1	50.5	50.7	50.8	50.8	50.8	50.6	50.4	50.2	49.9	49.5	49.1	48.7	48.2	47.7	47.2	46.7	46.1	45.6	45.1
98	47.8	47.7	47.7	47.6	47.6	47.5	47.4	47.2	47.1	46.9	46.8	46.6	46.5	46.3	46.1	45.9	45.7	45.5	45.3	45.1

Source: *Evaluation of Current Stormwater Design Criteria within the State of Florida*, June 2007 by Harvey Harper

REQUIRED RETENTION DEPTHS TO ACHIEVE AN ANNUAL REMOVAL EFFICIENCY OF 80%

Central (Zone 2)

NDCIA CN	Percent DCIA																		
	10	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**
30	0.22	0.24	0.32	0.40	0.46	0.51	0.60	0.67	0.73	0.80	0.87	0.94	1.01	1.08	1.15	1.22	1.29	1.36	1.43
35	0.23	0.24	0.33	0.41	0.46	0.52	0.60	0.67	0.73	0.80	0.88	0.94	1.01	1.08	1.15	1.22	1.29	1.36	1.43
40	0.23	0.26	0.35	0.42	0.47	0.53	0.61	0.68	0.74	0.81	0.88	0.95	1.01	1.09	1.16	1.22	1.29	1.36	1.43
45	0.24	0.28	0.37	0.43	0.48	0.55	0.62	0.69	0.74	0.82	0.89	0.95	1.02	1.09	1.16	1.22	1.29	1.36	1.43
50	0.27	0.32	0.39	0.45	0.49	0.57	0.64	0.70	0.76	0.83	0.90	0.96	1.03	1.10	1.16	1.23	1.30	1.37	1.43
55	0.35	0.38	0.42	0.47	0.52	0.59	0.66	0.71	0.77	0.84	0.91	0.97	1.04	1.11	1.17	1.23	1.30	1.37	1.43
60	0.45	0.44	0.46	0.50	0.56	0.62	0.68	0.73	0.80	0.86	0.93	0.98	1.05	1.11	1.18	1.24	1.30	1.37	1.43
65	0.57	0.52	0.53	0.56	0.61	0.66	0.71	0.76	0.83	0.89	0.95	1.00	1.06	1.13	1.19	1.25	1.31	1.37	1.43
70	0.70	0.65	0.63	0.65	0.68	0.72	0.76	0.81	0.87	0.92	0.97	1.03	1.09	1.14	1.20	1.25	1.31	1.37	1.43
75	0.84	0.78	0.76	0.75	0.77	0.80	0.83	0.88	0.92	0.96	1.01	1.06	1.11	1.17	1.22	1.27	1.32	1.38	1.43
80	0.98	0.92	0.90	0.89	0.89	0.91	0.93	0.96	0.99	1.02	1.07	1.11	1.15	1.20	1.24	1.29	1.34	1.38	1.43
85	1.12	1.07	1.04	1.03	1.02	1.03	1.04	1.06	1.08	1.11	1.14	1.17	1.20	1.24	1.27	1.31	1.35	1.39	1.43
90	1.24	1.21	1.19	1.18	1.17	1.17	1.18	1.19	1.20	1.21	1.23	1.25	1.27	1.30	1.32	1.35	1.38	1.40	1.43
95	1.35	1.34	1.33	1.33	1.32	1.32	1.32	1.33	1.33	1.34	1.34	1.35	1.36	1.37	1.38	1.39	1.41	1.42	1.43
98	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.40	1.40	1.40	1.40	1.41	1.41	1.41	1.42	1.42	1.42	1.43	1.43

Source: *Evaluation of Current Stormwater Design Criteria within the State of Florida*, June 2007 by Harvey Harper

Project:

Date: 08/12/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin A / Pond A
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	29.01
Pre Rational Coefficient (0-1)	0.13
Pre Non DCIA Curve Number	62.15
Pre DCIA Percent (0-100)	12.80
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	16.237
Pre Nitrogen Loading (kg/yr)	30.431
Pre Phosphorus Loading (kg/yr)	4.004
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	21.39
Post Rational Coefficient (0-1)	0.14
Post Non DCIA Curve Number	60.03
Post DCIA Percent (0-100)	13.70
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	12.203
Post Nitrogen Loading (kg/yr)	22.871
Post Phosphorus Loading (kg/yr)	3.009

Project:

Date: 08/12/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin 6A / Pond 4A
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	18.99
Pre Rational Coefficient (0-1)	0.32
Pre Non DCIA Curve Number	61.40
Pre DCIA Percent (0-100)	36.33
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	24.967
Pre Nitrogen Loading (kg/yr)	46.792
Pre Phosphorus Loading (kg/yr)	6.157
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	19.19
Post Rational Coefficient (0-1)	0.32
Post Non DCIA Curve Number	61.27
Post DCIA Percent (0-100)	36.63
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	25.400
Post Nitrogen Loading (kg/yr)	47.603
Post Phosphorus Loading (kg/yr)	6.264

Project:

Date: 08/12/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin 6B / Pond 4B
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	5.05
Pre Rational Coefficient (0-1)	0.03
Pre Non DCIA Curve Number	61.53
Pre DCIA Percent (0-100)	0.00
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	0.709
Pre Nitrogen Loading (kg/yr)	1.328
Pre Phosphorus Loading (kg/yr)	0.175
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	5.52
Post Rational Coefficient (0-1)	0.04
Post Non DCIA Curve Number	64.39
Post DCIA Percent (0-100)	0.00
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	0.932
Post Nitrogen Loading (kg/yr)	1.747
Post Phosphorus Loading (kg/yr)	0.230

Project:

Date: 08/12/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin 6C / Pond 4C
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	8.64
Pre Rational Coefficient (0-1)	0.34
Pre Non DCIA Curve Number	58.99
Pre DCIA Percent (0-100)	40.28
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	12.354
Pre Nitrogen Loading (kg/yr)	23.154
Pre Phosphorus Loading (kg/yr)	3.047
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	8.22
Post Rational Coefficient (0-1)	0.47
Post Non DCIA Curve Number	48.99
Post DCIA Percent (0-100)	57.79
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	16.232
Post Nitrogen Loading (kg/yr)	30.421
Post Phosphorus Loading (kg/yr)	4.003

Project:

Date: 08/13/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin B / Pond B
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	7.57
Pre Rational Coefficient (0-1)	0.41
Pre Non DCIA Curve Number	61.85
Pre DCIA Percent (0-100)	47.95
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	12.813
Pre Nitrogen Loading (kg/yr)	24.014
Pre Phosphorus Loading (kg/yr)	3.160
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	16.89
Post Rational Coefficient (0-1)	0.30
Post Non DCIA Curve Number	46.44
Post DCIA Percent (0-100)	36.12
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	21.100
Post Nitrogen Loading (kg/yr)	39.545
Post Phosphorus Loading (kg/yr)	5.203

Project:

Date: 08/13/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin C / Pond C
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	7.66
Pre Rational Coefficient (0-1)	0.32
Pre Non DCIA Curve Number	47.37
Pre DCIA Percent (0-100)	38.90
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	10.297
Pre Nitrogen Loading (kg/yr)	19.298
Pre Phosphorus Loading (kg/yr)	2.539
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	8.26
Post Rational Coefficient (0-1)	0.39
Post Non DCIA Curve Number	47.55
Post DCIA Percent (0-100)	47.30
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	13.412
Post Nitrogen Loading (kg/yr)	25.136
Post Phosphorus Loading (kg/yr)	3.307

Project:

Date: 08/12/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin D / Pond D
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	4.94
Pre Rational Coefficient (0-1)	0.56
Pre Non DCIA Curve Number	51.71
Pre DCIA Percent (0-100)	68.04
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	11.440
Pre Nitrogen Loading (kg/yr)	21.441
Pre Phosphorus Loading (kg/yr)	2.821
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	5.01
Post Rational Coefficient (0-1)	0.56
Post Non DCIA Curve Number	51.78
Post DCIA Percent (0-100)	68.66
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	11.713
Post Nitrogen Loading (kg/yr)	21.951
Post Phosphorus Loading (kg/yr)	2.888

Project:

Date: 08/12/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin E / Pond E
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	11.37
Pre Rational Coefficient (0-1)	0.48
Pre Non DCIA Curve Number	54.89
Pre DCIA Percent (0-100)	58.52
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	22.854
Pre Nitrogen Loading (kg/yr)	42.832
Pre Phosphorus Loading (kg/yr)	5.636
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	11.37
Post Rational Coefficient (0-1)	0.52
Post Non DCIA Curve Number	56.92
Post DCIA Percent (0-100)	63.24
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	24.692
Post Nitrogen Loading (kg/yr)	46.277
Post Phosphorus Loading (kg/yr)	6.089

Project:

Date: 08/12/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin F / Pond F
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	20.92
Pre Rational Coefficient (0-1)	0.18
Pre Non DCIA Curve Number	62.54
Pre DCIA Percent (0-100)	19.12
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	16.021
Pre Nitrogen Loading (kg/yr)	30.026
Pre Phosphorus Loading (kg/yr)	3.951
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	20.92
Post Rational Coefficient (0-1)	0.21
Post Non DCIA Curve Number	65.41
Post DCIA Percent (0-100)	22.37
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	18.695
Post Nitrogen Loading (kg/yr)	35.037
Post Phosphorus Loading (kg/yr)	4.610

Project:

Date: 08/13/2021

Catchment Information

Analysis: BMP Analysis

Catchment Name	Basin G / Pond G
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall (in)	50.00
Pre-Condition Landuse Information	
Pre-Condition Landuse	Highway: TN=1.520 TP=0.200
Pre Condition Area (acres)	26.10
Pre Rational Coefficient (0-1)	0.29
Pre Non DCIA Curve Number	68.33
Pre DCIA Percent (0-100)	31.57
Pre Nitrogen EMC (mg/l)	1.520
Pre Phosphorus EMC (mg/l)	0.200
Pre Runoff Volume (ac-ft/yr)	31.686
Pre Nitrogen Loading (kg/yr)	59.384
Pre Phosphorus Loading (kg/yr)	7.814
Post-Condition Landuse Information	
Post-Condition Landuse	Highway: TN=1.520 TP=0.200
Post Condition Area (acres)	26.10
Post Rational Coefficient (0-1)	0.30
Post Non DCIA Curve Number	70.68
Post DCIA Percent (0-100)	31.57
Post Nitrogen EMC (mg/l)	1.520
Post Phosphorus EMC (mg/l)	0.200
Post Runoff Volume (ac-ft/yr)	32.291
Post Nitrogen Loading (kg/yr)	60.519
Post Phosphorus Loading (kg/yr)	7.963

Appendix G
Water Quality Impact Evaluation

WATER QUALITY IMPACT EVALUATION CHECKLIST

PART 1: PROJECT INFORMATION

Project Name:	State Road 414 Expressway Extension Project Development and Environment Study
County:	Orange and Seminole
FM Number:	CFX Project Number: 414-227
Federal Aid Project No:	-
Brief Project Description:	The Central Florida Expressway Authority is conducting the State Road 414 Expressway Extension Project Development and Environment Study to evaluate alternatives for a proposed grade-separated expressway extension of the tolled SR 414 (John Land Apopka Expressway). The study limits extend along the existing SR 414 (Maitland Boulevard) corridor from US 441 (Orange Blossom Trail) to State Road 434 (Forest City Road). The approximate 2.3-mile-long study corridor generally runs along the boundary of Orange County and Seminole County and is located within the cities of Maitland (Orange County) and Altamonte Springs (Seminole County).

PART 2: DETERMINATION OF WQIE SCOPE

Does project discharge to surface or ground water? ☒ Yes ☐ No

Does project alter the drainage system? ☒ Yes ☐ No

Is the project located within a permitted MS4? ☐ Yes ☒ No
Name: _____

If the answers to the questions above are no, complete the applicable sections of Part 3 and 4, and then check Box A in Part 5.

PART 3: PROJECT BASIN AND RECEIVING WATER CHARACTERISTICS

Surface Water
Receiving water names: Long Lake, Lake Bosse, Little Wekiva Canal

Water Management District: SJRWMD

Environmental Look Around meeting date: See Appendix E for preliminary ELA correspondence and dates.
Attach meeting minutes/notes to the checklist.

Water Control District Name(s) (list all that apply): _______________

Groundwater
Sole Source Aquifer (SSA)? ☐ Yes ☒ No
Name _______________

If yes, complete Part 5, D and complete SSA Checklist shown in Part 2, Chapter 11 of the PD&E Manual

Other Aquifer? ☒ Yes ☐ No
Name Floridan

Springs vents? ☐ Yes ☒ No
Name

Well head protection area? ☐ Yes ☒ No
Name
Groundwater recharge? ☒ Yes ☐ No
Name Wekiva Recharge Protection Basin

Notify District Drainage Engineer if karst conditions are expected or if a higher level of treatment may be needed due to a project being located within a WBID verified as Impaired in accordance with Chapter 62-303, F.A.C.

Date of notification: Click here to enter a date.

PART 4: WATER QUALITY CRITERIA

List all WBIDs and all parameters for which a WBID has been verified impaired, or has a TMDL in **Table 1**. This information should be updated during each re-evaluation as required.

Note: If BMAP or RAP has been identified in **Table 1**, **Table 2** must also be completed.
Attach notes or minutes from all coordination meetings identified in ***Table 2****.*

EST recommendations confirmed with agencies? ☐ Yes ☒ No

BMAP Stakeholders contacted? ☒ Yes ☐ No
FDEP, Orange County, and City of Altamonte Springs

TMDL program contacted? ☐ Yes ☒ No

RAP Stakeholders contacted? ☐ Yes ☒ No

Regional water quality projects identified in the ELA? ☒ Yes ☐ No

If yes, describe:
Lake Lotus Park

Potential direct effects associated with project construction and/or operation identified? ☐ Yes ☒ No
If yes, describe:

Discuss any other relevant information related to water quality including Regulatory Agency Water Quality Requirements.

The limits of the study area fall within the WBID 3004 (Little Wekiva Canal) which has a BMAP/TMDL for Total Nitrogen (TN). However, preliminary calculations indicate that there will be no net increase in TMDL for TN in the post development conditions.

PART 5: WQIE DOCUMENTATION

☐ A. No involvement with water quality
☐ B. No water quality regulatory requirements apply.
☒ C. Water quality regulatory requirements apply to this project (provide Evaluator's information below). Water quality and stormwater issues will be mitigated through compliance with the design requirements of authorized regulatory agencies.
☐ D. EPA Ground/Drinking Water Branch review required. ☐ Yes ☐ No
Concurrence received? ☐ Yes ☐ No
If Yes, Date of EPA Concurrence: Click here to enter a date..
Attach the concurrence letter

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

Evaluator Name (print): Danh Lee, P.E.	
Title:Senior Drainage Engineer	
Signature:	Date:8/10/2021

Table 1: Water Quality Criteria

Receiving Waterbody Name (list all that apply)	FDEP Group Number / Name	WBID(s) Numbers	Classification (I,II,III,IIIL,IV,V)	Special Designations*	NNC limits**	Verified Impaired (Y/N)	TMDL (Y/N)	Pollutants of concern	BMAP, RA Plan or SSAC
Little Wekiva Canal	-	3004	III	Other	N/A	No	Yes	TN	Wekiva Springs and Rock Springs

*** ONRW, OFW, Aquatic Preserve, Wild and Scenic River, Special Water, SWIM Area, Local Comp Plan, MS4 Area, Other**
**** Lakes, Spring vents, Streams, Estuaries**
Note: If BMAP or RAP has been identified in Table 1, Table 2 must also be completed.

Table 2: REGULATORY Agencies/Stakeholders Contacted

Receiving Water Name (list all that apply)	Contact and Title	Date Contacted	Follow-up Required (Y/N)	Comments
Little Wekiva Canal	Emily Lawson, Orange County EPD and Julia Bortles, Orange County EPD	8/27/2020	No	See Appendix E for Correspondence
	Ferrell Hickson, FDOT D5	1/28/2021	No	See Appendix E for Correspondence
	Brett Blackadar, City of Altamonte Springs	2/15/2021	No	See Appendix E for Correspondence
	Cammie Dewey, SJRWMD	2/17/2021	No	See Appendix E for Correspondence
	Leo Angelero, FDEP and Daniel Shideler, FDEP	3/4/2021	No	See Appendix E for Correspondence