Pond Siting and Location Hydraulics Report

Project Development and Environment (PD&E) Study

Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192 (MP 238.5-242.5)

Osceola County, FL
FPID No. 441224-1-22-01

Prepared for:

Florida's Turnpike Enterprise
P.O. Box 613069
MP 263, Bldg. 5315
Ocoee, Florida 34761-3069

Prepared by:

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789

January 2020

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PROFESSIONAL ENGINEER CERTIFICATION

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

PROJECT: Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192 (MP 238.5-242.5)
Financial Project ID: 441224-1-22-01
Osceola County, Florida

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

The Balmoral Group
165 Lincoln Ave
Winter Park, Florida 32789
Telephone: (407) 629-2185
Certificate of Authorization No. **26123**

This report provides the results of the analysis of the existing drainage conditions and the analysis required for the determination of the recommended locations for the proposed stormwater management facilities. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of hydrologic analysis and hydraulic engineering as applied through professional judgment and experience.

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

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

on the date indicated here.

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

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Executive Summary

The Balmoral Group has subcontracted with Dewberry to provide Project Development and Environment (PD&E) drainage analysis services for Florida's Turnpike Enterprise (FTE) for the widening of the Turnpike mainline from south of Kissimmee Park Road to US 192. This report supports the PD&E study by analyzing the requirements for stormwater management facilities and determining whether, or not, such facilities can be accommodated within the existing right of way. In areas where this is not possible, an approximate offsite stormwater management facility footprint is estimated.

In addition to the pond siting analysis, the purpose of this document is to address base floodplain encroachments resulting from the roadway improvements evaluated in the PD&E study. Under Executive Order 11988 "Floodplain Management", USDOT Order 5650.2, "Floodplain Management Protection", and Federal-Aid Policy Guide 23 CFR 650A, floodplains must be protected. These regulations intend to avoid or minimize highway encroachments within the 100-year (base) floodplains and to avoid supporting land use development, which is incompatible with floodplain values.

The project begins south of Kissimmee Park Road (MP 238.5) and ends at US 192 (MP 242.5). Along the project corridor, the existing 4-lane typical will be widened to 8-lanes, resulting in a total impervious area width of 154 feet. The total length of the alignment is approximately 4.0 miles and includes Sections 5, 8, 9, 16, and 22 in Township 26 and Range 30 and Section 32 in Township 25 and Range 30 in Osceola County. A portion of the project is within the City of St. Cloud jurisdiction. The entire project is within the South Florida Water Management District (SFWMD) jurisdiction.

The two build alternatives being evaluated as part of this PD&E study include the mainline widening and:

- Alternative 1 – Modification of the existing Kissimmee Park Road Interchange to improve operation, and;
- Alternative 2 – Proposed new diverging diamond interchange at New Nolte Road and removal of the existing ramps at the Kissimmee Park Road. **This is the preferred alternative.**

The drainage approach includes evaluating 3-alternative stormwater management facility (SMF) locations within each basin including an onsite linear pond option. Offsite ponds are assumed to be wet detention ponds and onsite linear ponds are assumed to be dry detention ponds. The mainline project is subdivided into Basins 1 thru 5 and 100 for the mainline widening and slip ramps, and the two alternative interchange concepts consist of their own basins (200, 300, 301, 302 and 303).

Treatment volume was estimated based on the amount of the additional impervious area. There is no direct discharge to impaired water bodies or Outstanding Florida Waters so standard treatment criteria are met. Attenuation volume was estimated based on the SCS methodology. Floodplain impact volume was estimated as cup for cup compensation to be included in the stormwater pond. The pond size was calculated by stacking the treatment volume, attenuation volume, and floodplain compensation volume.

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An additional 20% was added to the pond size to account for tie-down grading and landscape requirements.

Potential pond sites employed the best available data. Much of the undeveloped adjacent property along the project corridor have Development of Regional Impact (DRI) Studies for the future development of the surrounding area. This was considered to the greatest extent possible when siting pond locations.

The project employs the U.S. State Plane (Florida Eastern Zone, feet, 1983) horizontal datum and the North American Vertical Datum of 1988 (NAVD) (feet). Corpscon version 6.0, developed by the US Army Corps of Engineers, was used to estimate the conversion factor of -0.99 feet to convert NGVD to NAVD (i.e. 10.00 feet NGVD = 9.01 feet NAVD).

Table 0- Preferred Pond Sites for Alternative 2 (Preferred Alternative)

Pond Site	Onsite/Offsite/Remnant Parcel	Type	Wetland Impacts (ac)	Contamination Risk	Floodplain Impact (ac)	Cultural or Archaeological Resources Impacts	Number of Property Owners	Pond Area (ac)	Total Costs (R/W & Construction)	Pond Exhibit Name
1-1	On	Dry Detention	0.21	Low	0.97	Low	0	4.6	$ 110,000.00	Alt. 2 Basin 1 Option 1
Existing	On	Wet Detention	0	Low	0	Low	0	N/A	$ -	Alt. 2 Basin 2 Option 1
100-1	Off	Wet Detention	0.21	Low	0	Low	1	2.3	$ 993,372.00	Alt. 2 Basin 100 Option 1
300-2A, 300-2B, 300-2C	R	Wet Detention	1.64	Low	0	Low	2	8.7	$ 2,822,704.00	Alt. 2 Basin 300 Option 2
3-3	On	Dry Detention	0.70	Low	0	Low	0	4.7	$ 132,700.00	Alt. 2 Basin 3 Option 3
4-3	On	Dry Detention	0	Low	0	Low	0	2.9	$ 39,100.00	Alt. 2 Basin 4 Option 3
5-3	On	Dry Detention	2.29	Low	0	Low	0	5.7	$ 83,200.00	Alt. 2 Basin 5 Option 3

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1.0 INTRODUCTION

The Balmoral Group has subcontracted with Dewberry to provide Project Development and Environment (PD&E) drainage analysis services for Florida's Turnpike Enterprise (FTE) for the widening of the Turnpike mainline from south of Kissimmee Park Road to US 192. This report supports the PD&E study by analyzing the requirements for stormwater management facilities and determining whether, or not, such facilities can be accommodated within the existing right of way. In areas where this is not possible, an approximate offsite stormwater management facility footprint is estimated.

In addition to the pond siting analysis, the purpose of this document is to address base floodplain encroachments resulting from the roadway improvements evaluated in the PD&E study. Under Executive Order 11988 "Floodplain Management", USDOT Order 5650.2, "Floodplain Management Protection", and Federal-Aid Policy Guide 23 CFR 650A, floodplains must be protected. These regulations intend to avoid or minimize highway encroachments within the 100-year (base) floodplains and to avoid supporting land use development, which is incompatible with floodplain values.

2.0 PROJECT DESCRIPTION

The project begins south of Kissimmee Park Road (MP 238.5) and ends at US 192 (MP 242.5). Along the project corridor, the existing 4-lane typical will be widened to 8-lanes, resulting in a total impervious area width of 154 feet. The total length of the alignment is approximately 4.0 miles and includes Sections 5, 8, 9, 16, and 22 in Township 26 and Range 30; and Section 32 in Township 25 and Range 30 in Osceola County. A portion of the project is within the City of St. Cloud jurisdiction. The entire project is within the South Florida Water Management District (SFWMD) jurisdiction. Refer to **Plate 1 and Plate 2** for the Location Map and USGS Map.

The project employs the U.S. State Plane (Florida Eastern Zone, feet, 1983) horizontal datum and the North American Vertical Datum of 1988 (NAVD) (feet). Corpscon version 6.0, developed by the US Army Corps of Engineers, was used to estimate the conversion factor of -0.99 feet to convert NGVD to NAVD (i.e. 10.00 feet NGVD = 9.01 feet NAVD).

At this time, a portion of this project is anticipated to be let via the Design-Build process for the preferred interchange. The tentative letting of this effort is anticipated to be in early 2022.

The Turnpike (SR 91) mainline typical section for the project is a proposed 8-lane widening within the median. This typical section extends the full length of the project (MP 238.5 to 242.5). The typical consists of four 12-foot lanes, 12-foot outside paved shoulders, 12-foot inside paved shoulders and a 2-foot median barrier wall. In this analysis, the pond sizing is based on an express lane concept which included a four-foot buffer; therefore, the total width of impervious area along the mainline is 154 feet for pond sizing; however, it is understood that during design the required pond volume may be reduced due the constructed impervious width being 4-feet less (150 feet total width). Refer to **Plate 3** for the proposed 8-Lane Typical Section.

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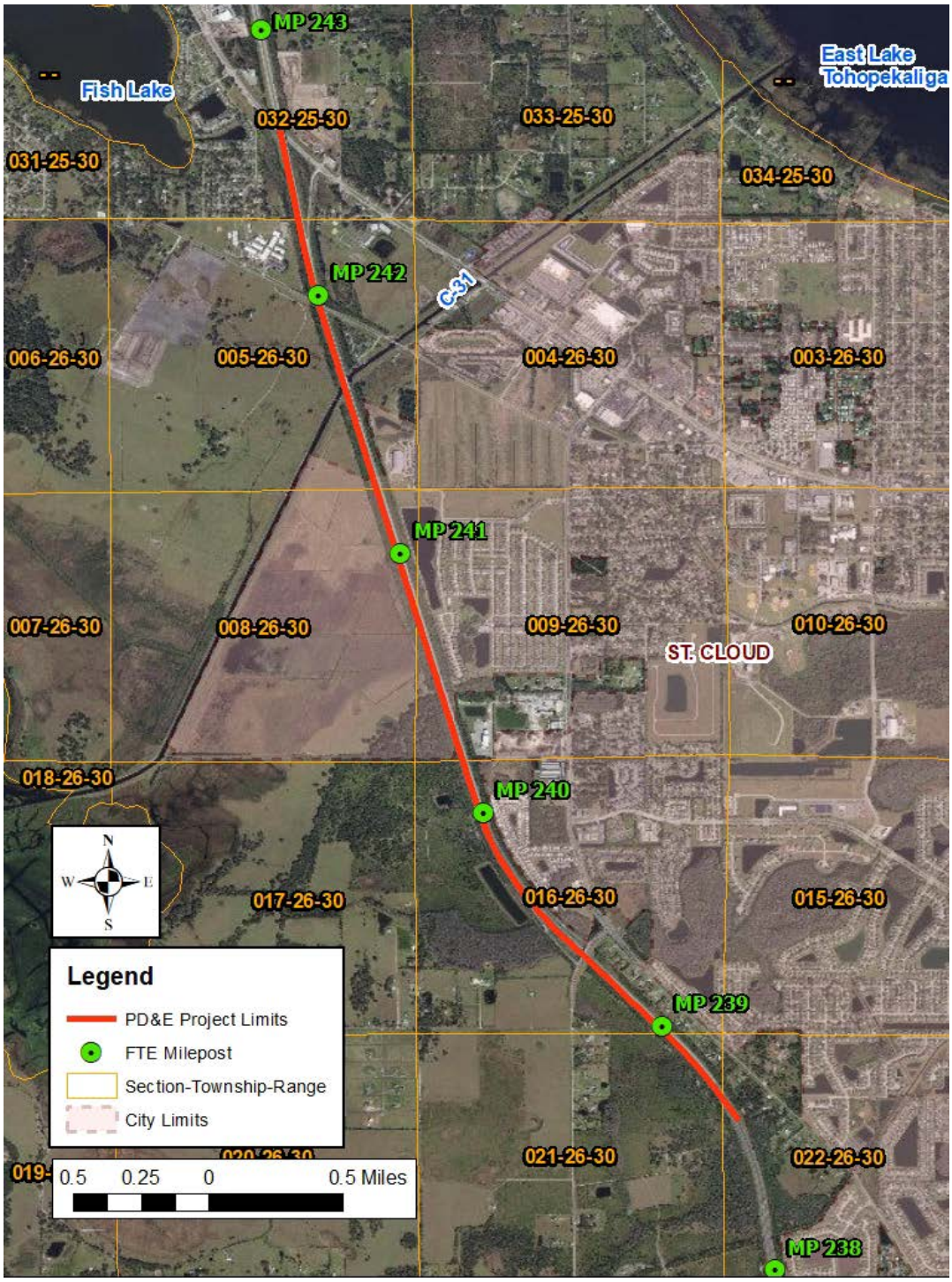

Plate 1 - Location Map[1]

[1] Base Map References include Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

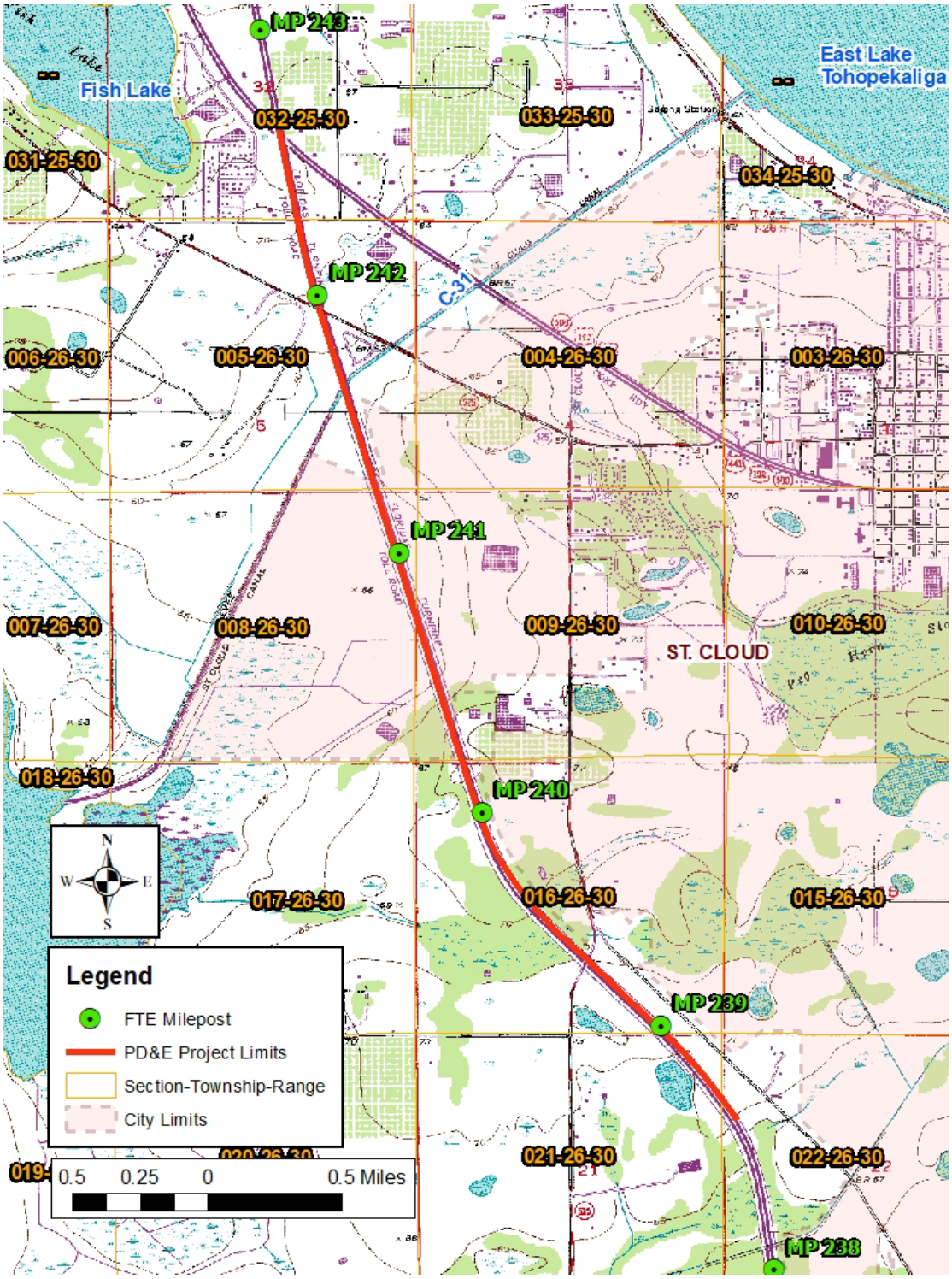

Plate 2 - USGS Map[2]

[2] Base Map References include USGS Quad Map 3511 and 3411

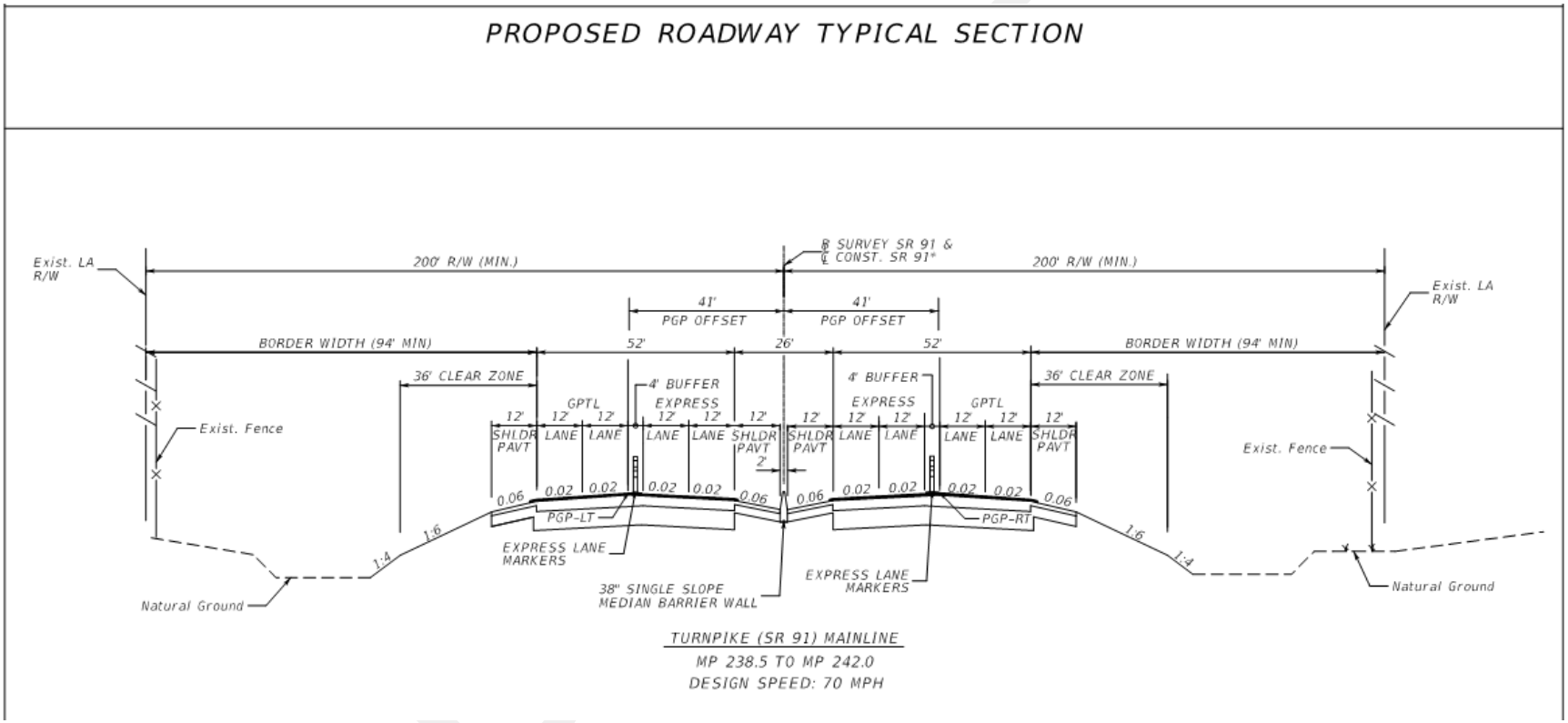

Plate 3 - Turnpike Widening 8-Lane Typical Section

3.0 Data Collection

The following sources were evaluated and utilized, as appropriate to develop the necessary information required to complete this document.

- NRCS Soil Information for Osceola Counties, NRCS (FGDL 2017)
- 2015 Osceola County LiDAR
- Existing Roadway Plans
  - FPID No. 411237-1-52-01 – SR 91-Kissimmee Park Road Interchange
  - FPID No. 239682-1-52-01 SR 500 over St. Cloud Canal
- SFWMD ERP Permits
- FTE Drainage Connection Permits (Posted 12/4/2018)
- FDEP WBID and OFW Shapefiles (available on FDEP Map Direct)
- National Wetland Inventory Shapefiles
- Osceola County Property Appraisers Parcel Data and Florida Department of Revenue Property Department (2017)
- Turnpike Supplement to the FDOT Drainage Manual (January 2019)
- FDOT Drainage Manual (January 2019)
- FDOT Drainage Design Guide (January 2019)
- SFWMD ERP Applicant's Handbook Volume II (May 2016)
- PD&E Study reports:
  - Contamination Screening Evaluation Report, November 2019.
  - Cultural Resource Assessment Study, November 2019.
  - Natural Resources Evaluation, November 2019.

Field visits were performed by The Balmoral Group on January 23, 2019 and December 12, 2019.

4.0 Design Criteria

State of Florida Department of Transportation

The State of Florida Department of Transportation requires stormwater management systems to comply with the following regulatory requirements:

- Section 334.044(15), Florida Statute, Chapter 14-86, Florida Administrative Code (for closed basins or areas subject to historical flooding)
- Section 373.4596, Florida Statutes
- Chapter 62-25, Florida Administrative Code
- Chapter 62-40, Florida Administrative Code
- National Pollutant Discharge Elimination System

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South Florida Water Management District (SFWMD)

This project is considered to be within the SFWMD. Projects within Osceola County are reviewed by the Orlando Service Center. The SFWMD will regulate and control stormwater discharge and impacts on surface waters for this project.

A pre-application meeting with SFWMD was held on November 1, 2019 to confirm pond design methodology and permit application requirements. Minutes from this meeting are included in **Appendix F**.

There is an existing permit for the Kissimmee Park Road/Turnpike Interchange (SFWMD Permit 49-01481-P, Application 041008-30, Issued March 2005) which was modified in November 2005 (Application 050816-6). There is no other existing permit along the mainline within the project limits.

Proposed developments along Kissimmee Park Road, Old Canoe Creek Road, and West New Nolte Road are within three stormwater management facility basins, which are within separate Environmental Resource Permits as described within **Table 1**.

Table 1 – Permit Summary of Existing Ponds on Off-System Roadways

Existing Treated Roadway	Basin Area	Pond Name	ERP/Application No.
Old Canoe Creek Road and Kissimmee Park Road	15.43 ac (Roadway) 2.78 ac (Offsite) 11.77 ac (School field tract)	Pond 300 & 301	Kissimmee Park Road Widening SFWMD Permit 49-01399-P, Application 050816-6
Old Canoe Creek Road	16.55 acres (Roadway)	South Pond	Anthem Park SFWMD Permit 49-01443-P, Application 040323-11,
West New Nolte Road	12.47 acres (Roadway)	PA-10	West New Nolte Road Rehab SFWMD Permit 49-0504-S, Application 040604-10

Existing permit documentation is included in **Appendix F**.

Water Quality

To meet the water quality treatment requirements, either dry detention systems within the right-of-way or wet detention facilities as an offsite pond site were utilized. These facilities provide treatment of new impervious area as well as compensatory treatment for the existing impervious area not previously receiving treatment.

Each pond option is sized to meet SFWMD treatment volume criteria of 2.5-inches of runoff over the additional impervious area. The wet detention facilities are required to detain 100% of the treatment volume criteria, and dry detention systems are required to provide 75% of the treatment volume criteria (Section 4.2.1(a) - SFWMD ERP Applicant's Handbook Volume II).

There are no direct discharges to an Outstanding Florida Water or to a water body that has been identified as impaired by FDEP (refer to FDEP section below); therefore, no additional treatment volume is required.

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A dry detention area by definition shall have a bottom elevation at least one foot above the control elevation of the area, which is the lowest elevation at which water can be released through the control device (Section 2.1 – SFWMD ERP Applicant's Handbook Volume II).

Water Quantity

Water quantity criteria are demonstrated by providing storage for the additional post-development volume generated when compared to the pre-development volume generated. During design, routings will be performed to demonstrate that the post-development peak discharge rate is not greater than the pre-development discharge rate.

Per Section 3.3 of the 2016 SFWMD Environmental Resource Permit Applicant's Handbook Volume II, unless otherwise specified by previous Agency permits or criteria, a storm event of 3-day duration and 25-year return frequency shall be used in computing offsite discharge rates. Applicants are advised that local drainage districts or local governments may require more stringent design storm criteria. For this project, the local government criteria from Osceola County are assumed to govern. All project basins are open basins. The 10-year/72-hour storm event for Osceola County will be used to establish attenuation criteria for the proposed ponds, which is similar to the criteria used in the previous permits within the corridor.

Right-Of-Way Permit

The proposed roadway improvements cross the SFWMD right-of-way of the C-31 Canal (St. Cloud Canal). Any improvements within this area will require a Right-of-Way Permit from SFWMD which includes consultation with the United States Army Corps of Engineers under Section 408 of the federal Civil Works Program for any impacts to the canal. The C-31 is within the Kissimmee River Basin and is subject to the following criteria per the SFWMD Right-of-Way Criteria Manual for Use of Works or Lands of the District:

- Horizontal: 1) Center Span - 25 feet clear bent spacing, measured perpendicular to channel.

  2) Approach Spans - 20 feet between faces of bents.

- Vertical: 6 feet above the seasonal high optimum water control elevation or 2 feet above the design water surface elevation, whichever produces the higher low member elevation.

Osceola County & City of St. Cloud

Osceola County and the City of St. Cloud are stakeholders in this project. Initial meetings have been conducted to discuss proposed improvements. Additional coordination will continue in the design phase to discuss the impacts and potential modifications to the existing ponds along Old Canoe Creek Road and West New Nolte Road.

Florida Department of Environmental Protection (FDEP)

National Pollutant Discharge Elimination System (NPDES)

The United States Environmental Protection Agency (EPA) requires permits for stormwater discharge in association with the National Pollutant Discharge Elimination System (NPDES) and the EPA Clean Water

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Act. As the project impacts will be greater than one acre, an NPDES permit will be required. The application requirements include a stormwater pollution prevention plan indicating both structural and non-structural controls to be implemented. The FDEP is the NPDES permitting authority for the State of Florida. The FDEP is responsible for reviewing and issuing permits as well as performing compliance and enforcement activities under the NPDES.

FDEP also maintains the State's "Verified List' of impaired waterbodies. This list includes waterbodies that have been assessed and determined to be impaired by FDEP due to pollutant discharges. The entire project limits are within the St. Cloud Canal watershed (WBID 3173B), which is not listed as a verified impaired waterbody. Therefore, no additional treatment or nutrient loading calculations are required.

Lake Okeechobee Basin Management Action Plan (BMAP)

The Lake Okeechobee BMAP was established in December 2014 for the implementation of the Total Maximum Daily Loads for Total Phosphorous by the FDEP in Lake Okeechobee. While the project limits are within the 4,600 square mile Lake Okeechobee watershed, there is no direct discharge from the project limits to the impaired waterbody, located over 80 miles south of the project limits. Therefore, no additional treatment or nutrient loading calculations are required.

For any anticipated permitting requirements, specifically for wetland and other surface water impacts as well as wildlife impacts, please refer to the Natural Resources Evaluation Report.

5.0 Environmental Look Around

In the initial meeting, Osceola County mentioned being open to joint use and regional pond options. An Environmental Look Around desktop review was performed to evaluate any regional opportunities. Due to the availability of remnant parcels and area within the existing right-of-way to accommodate the stormwater requirements, the necessity for regional options on behalf of FTE is low. However, there is still a great need for partnership with adjacent stakeholders.

The majority of the undeveloped land west of the FTE right-of-way is included within the Cross Prairie DRI. Adjacent to Kissimmee Park Road, a DRI proposed pond was identified near the interchange improvements associated with Alternative 1; however, as this is not the preferred alternative, this opportunity was not further explored. West of the New Nolte extension, there is an existing borrow pit within the DRI limits that is not currently identified as a proposed DRI pond. This site is included as a potential pond site and sized to accommodate only the proposed improvements. Further coordination on this site will occur during the design phase.

Coordination with Osceola County and potentially existing home owner associations will occur during the design phase once the extent of improvements along Old Canoe Creek and Nolte Road is determined as well as the modifications which will be required for the existing ponds.

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6.0 Existing and Proposed Conditions

6.1 Existing Drainage Conditions

The entire project limits are within the St. Cloud Canal watershed where runoff generally flows towards the C-31 (St. Cloud Canal) and then southwesterly from East Lake Tohopekaliga to Lake Tohopekaliga. East Lake Tohopekaliga is controlled by Structure S-59 before discharging southwest into the C-31, and Lake Tohopekaliga is controlled by Structure S-61 before discharging south. These lakes are part of the headwaters of the Kissimmee River. Refer to **Plate 4.**

There are offsite areas that flow to the limited access right-of-way. These are documented in the Turnpike Drainage Connection Permits listed:

- TP-92-DC-070-94- Teka Village
- TP-92-DC-058-4 – Anthem Park Subdivision MP 241 – discharge to FTE through three structures
- TP-92-DC-042-16 – Tohoqua MP 242

Note TP-92-DC-109-04 – Keystone Point Phase 3 at MP 241.5 had permitted discharge to the FTE right-of-way, but this permit was not constructed and has expired so it is not considered within this analysis.

The St. Cloud Canal watershed (WBID 3173B) is not listed as a verified impaired waterbody. The project limits also do not direct discharge to any Outstanding Florida Waterbodies. All basins through the project limits are considered open and have a positive outfall.

Throughout the corridor, the soil type is generally Type A/D with portions of Type B/D between US 192 and Neptune Road. Refer to **Plate 5** which illustrates the different soil types within the project limits.

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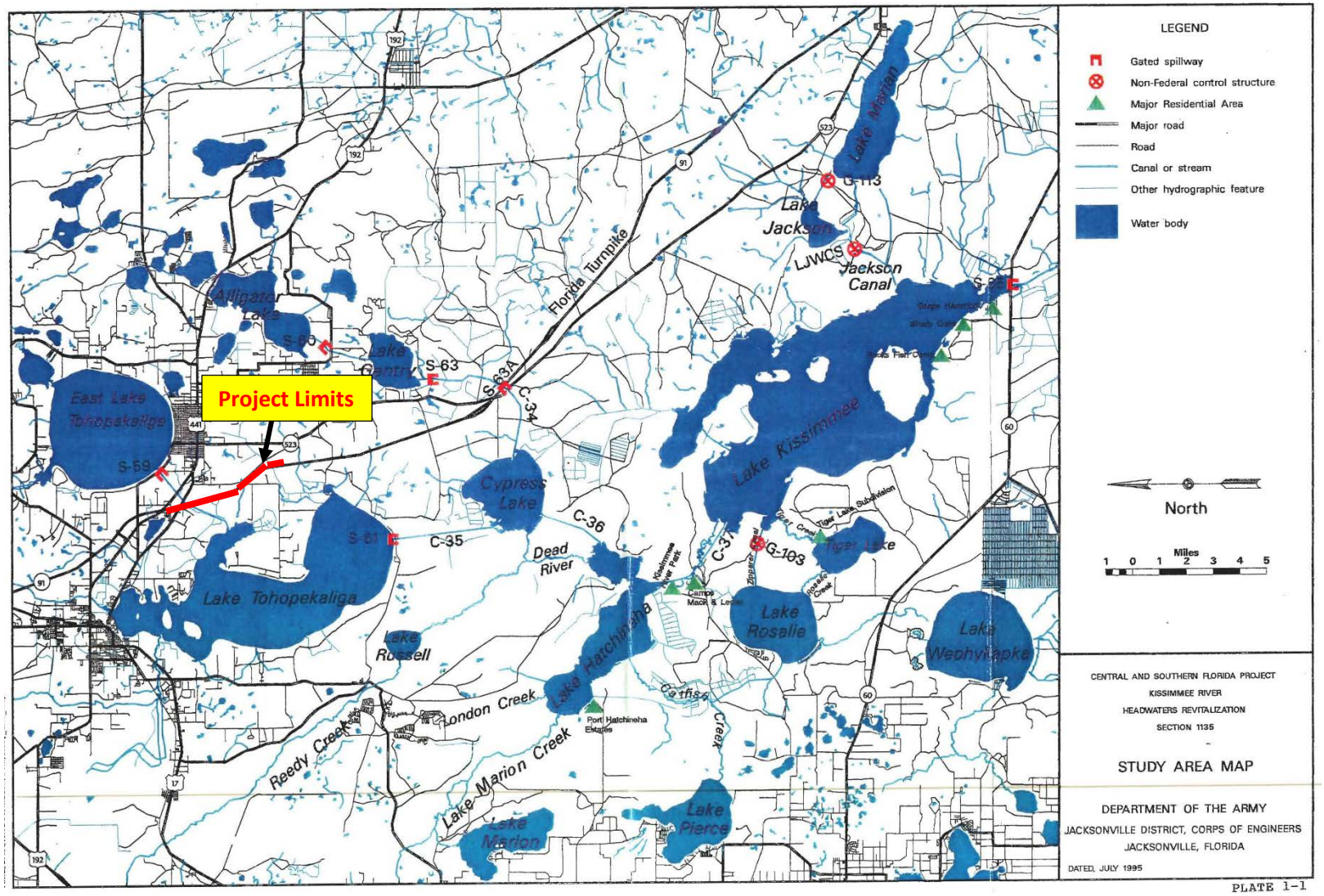

Plate 4 - Kissimmee Chain of Lakes (Plate 1-1 from Kissimmee River Headwaters Revitalization Project)

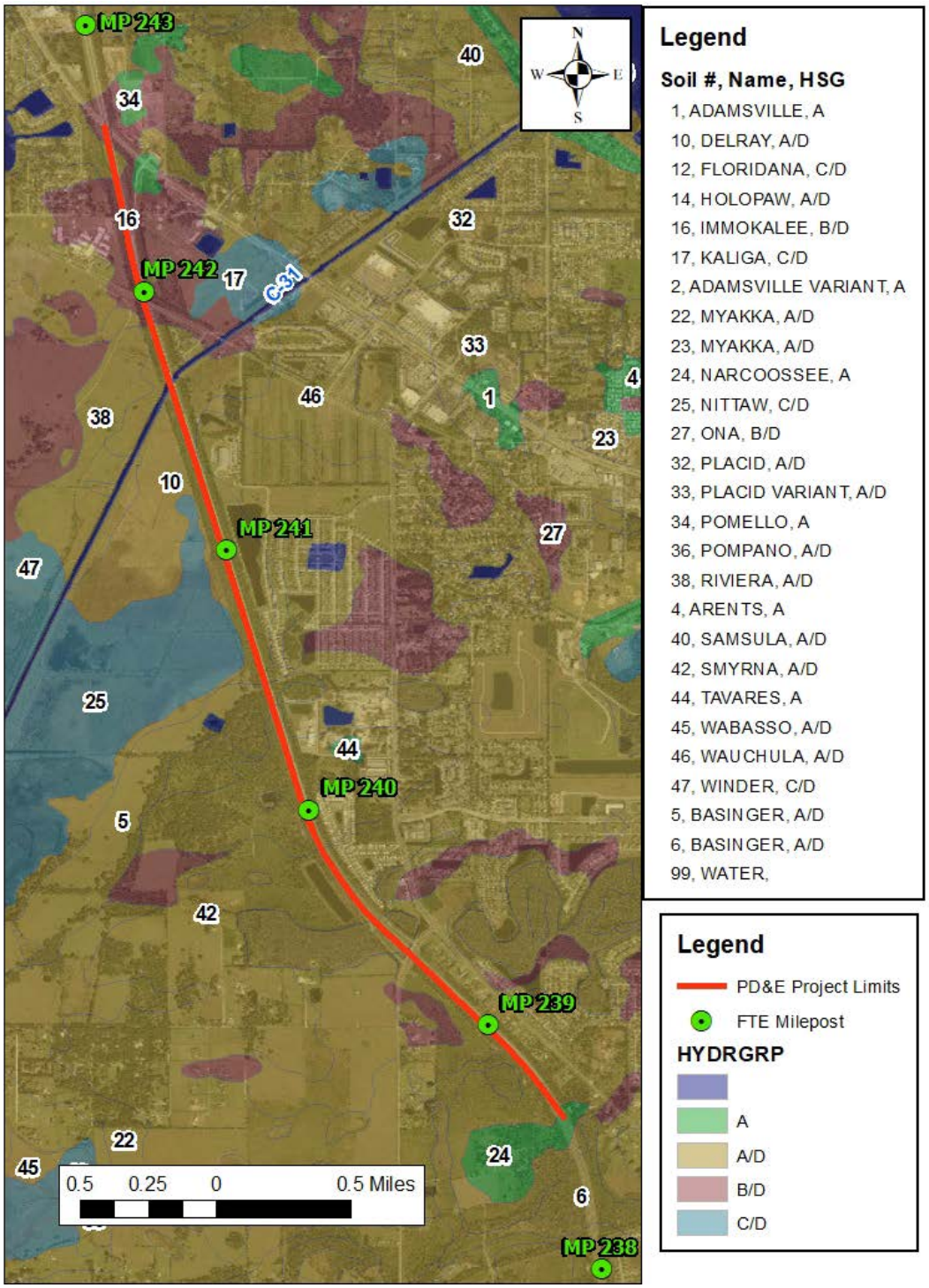

Plate 5 - Soil Map (Source: NRCS for Osceola County, 2017)[3]

[3] Base Map References include Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

There are four (4) major basins along the corridor which are defined based on their outfall location and are listed below. Refer to **Plate 11** for their general location.

Basin 1 – WPA Canal Basin (MP 238.5 to MP 239.4)

Basin 1 extends from the beginning of the project limits (MP 238.5) to the Kissimmee Park Road overpass (MP 239.4). There are no permitted stormwater management facilities and no existing cross drains within this basin. Existing onsite runoff flows into roadside swales which are ultimately conveyed south to the WPA Canal, which crosses the Turnpike at MP 238.1. WPA Canal flows east to west and discharges into Lake Tohopekaliga.

Basin 2 – Kissimmee Park Road Interchange basin (MP 239.4 to MP 240)

Basin 2 extends from the Kissimmee Park Road overpass (MP 239.4) to MP 240 and includes a significant amount of offsite area with a total area of approximately 400 acres, which was delineated as part of the Kissimmee Park Road Interchange (FPID No. 441224-1-52-01) design effort.

There is an existing stormwater management facility for this basin permitted under the Kissimmee Park Road/Turnpike Interchange (SFWMD Permit 49-01481-P, Application 041008-30, Issued March 2005) which was modified on November 2005 (Application 050816-6). Under this permit, the existing FTE wet detention pond located at MP 239.7 adjacent to the southbound mainline was constructed. The existing pond provides treatment, attenuation, and floodplain compensation storage.

There are two cross drains within this basin. CD-1 is a double 7' x 4' box culvert that conveys a majority of the offsite flow to the adjacent wetlands to the west. CD-2 is a 42-inch steel pipe which conveys offsite runoff into a floodplain settling basin between the existing pond and roadway mainline, and is then conveyed into the existing pond. Refer to **Plate 6** and **Plate 7** for CD-1 and **Plate 8** for CD-2.

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Plate 6- CD-1 (Double 7' x 4' CBC) at MP 239.5 (Taken 1/23/2019)

Plate 7- Downstream wetlands of CD-1 (Taken 1/23/2019)

Plate 8- CD-2 (42-inch steel pipe) at MP 239.7 (Taken 1/23/2019)

Basin 3 – South C-31 Basin (MP 240 to MP 241.6)

Basin 3 extends from MP 240 to the C-31 Bridge and primarily consists of onsite runoff. There are no permitted stormwater management facilities within this basin. CD-3 is located at MP 240.7 and is a 36-inch pipe that acts as an equalizer pipe between roadside ditches. Refer to **Plate 9**. Existing roadside ditches convey onsite runoff to the north prior to discharge into the C-31 Canal. Offsite properties along the northbound side discharge to these roadside ditches as well.

CD-4 is the existing C-31 Canal (St. Cloud Canal) bridge. The C-31 Canal flows southwesterly from East Lake Tohopekaliga to Lake Tohopekaliga.

Plate 9- CD-3 (36-inch RCP) at MP 240.7 (Taken 1/23/2019)

Basin 4 – North C-31 Basin (MP 241.6 to 242.5)

Basin 4 extends from the C-31 Bridge (MP 241.6) to US 192 (MP 242.5) and primarily consists of onsite runoff. There are no permitted stormwater management facilities within this basin. CD-5 is located at MP 242 and is a double 36-inch pipe that conveys runoff from the west to the east just north of the Neptune Road overpass. Refer to **Plate 10**. Existing roadside ditches convey onsite runoff to the south prior to discharge into the C-31 Canal.

Plate 10 - CD-5 (Double 36-inch RCP) at MP 242 (Taken 1/23/2019)

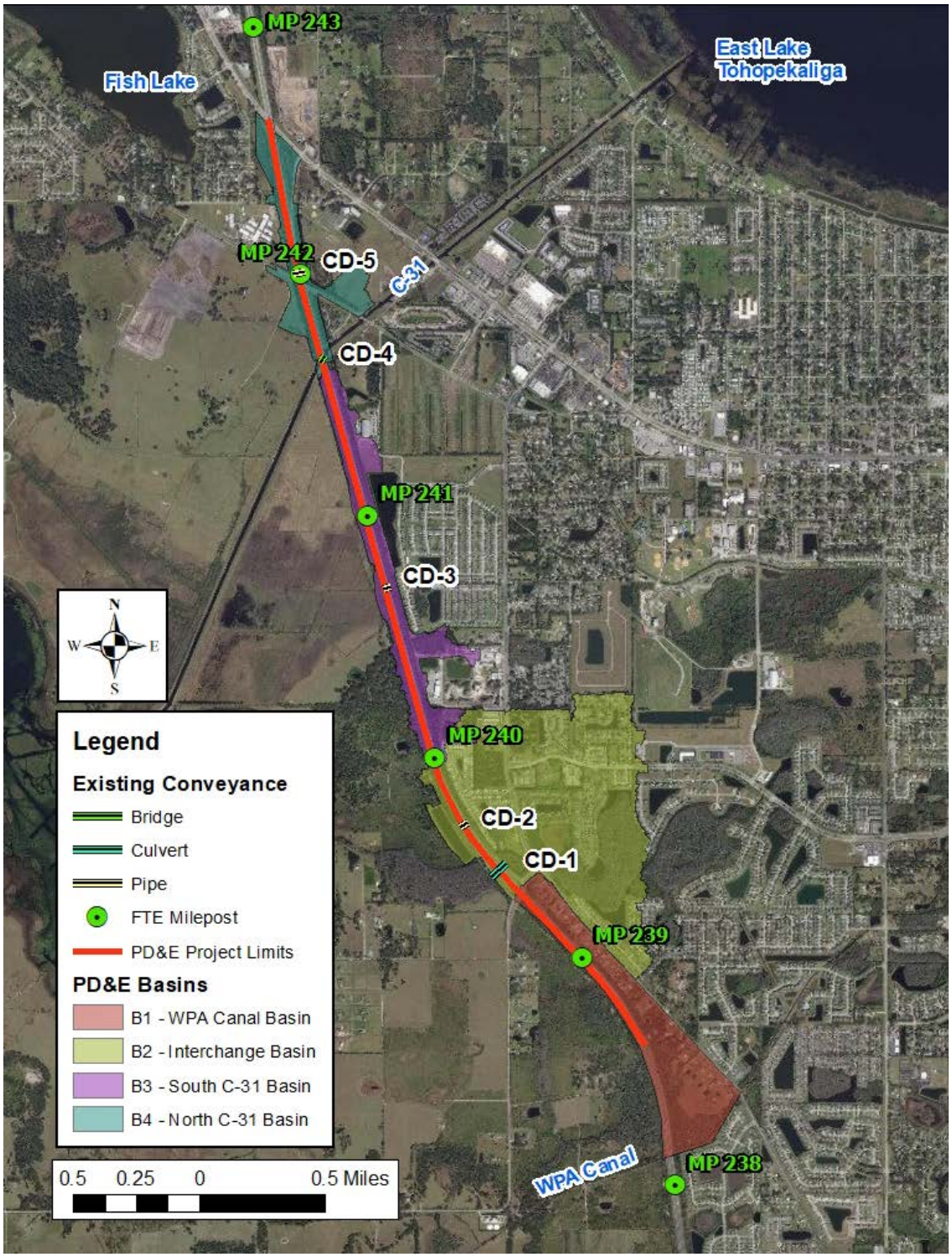

Plate 11- Existing Cross Drain and Basin Map[4]

[4] Base Map References include Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

6.2 Proposed Drainage Conditions

The two build alternatives being evaluated as part of this PD&E study both include the mainline widening and:

- Alternative 1 – Modification of the existing Kissimmee Park Road Interchange to improve operation, and;
- Alternative 2 – Proposed new diverging diamond interchange at New Nolte Road and removal of the existing ramps at the Kissimmee Park Road.

Within each alternative, there are six (6) major proposed basins along the Turnpike mainline, five (5) along the mainline and one (1) for the interchange alterative. To accommodate off-system improvements at the interchanges, there is one (1) basin (Basin 100) that is in both Alternative 1 and 2 and three (3) proposed basins along Old Canoe Creek Road and West New Nolte Road that are impacted by Alternative 2. The basins are defined based on their outfall location and follow a pattern similar to the existing condition.

Three pond options were evaluated within each mainline basin, two offsite wet detention options and one dry detention swale within the Turnpike right-of-way. Wet detention facilities assume a normal water level (NWL) set at an assumed estimated seasonal high-water elevation (SHWL), and dry detention facilities have a swale bottom set 1-foot above the assumed SHWL. The assumed SHWL is set to 1-foot above the groundwater encountered (GWE) from roadway boring investigations performed by Geotechnical and Environmental Consultants in May 2019.

It is assumed for each basin that proposed onsite runoff will by collected by median barrier wall inlets and shoulder gutter inlets and conveyed via a closed system to roadside ditches or directly discharge to roadside ditches. These systems will route runoff for treatment and attenuation to the proposed facility. Compensatory treatment will be provided for existing untreated pavement while allowing a portion of proposed pavement to directly discharge to roadside ditches which convey runoff to the ultimate outfall location. Existing drainage patterns will be maintained. Offsite areas currently discharging to the right-of-way will not be blocked by proposed systems.

Base clearance evaluation is reviewed within each basin for each pond option to provide 3-feet above the base clearance water elevation (BCWE), which is considered to be at the weir elevation for roadside treatment swales or the 24-hour design high water elevation for the offsite wet detention ponds. Since routing has not been performed for this PD&E study, the BCWE for the wet detention facilities is assumed to be the design high water elevation of the pond, for which the offsite option was sized. The assumption of 1-foot pavement depth is used to determine an estimated minimum low edge of pavement (edge of travel lane) within each basin. These assumptions are considered conservative for the purposes of this PD&E study.

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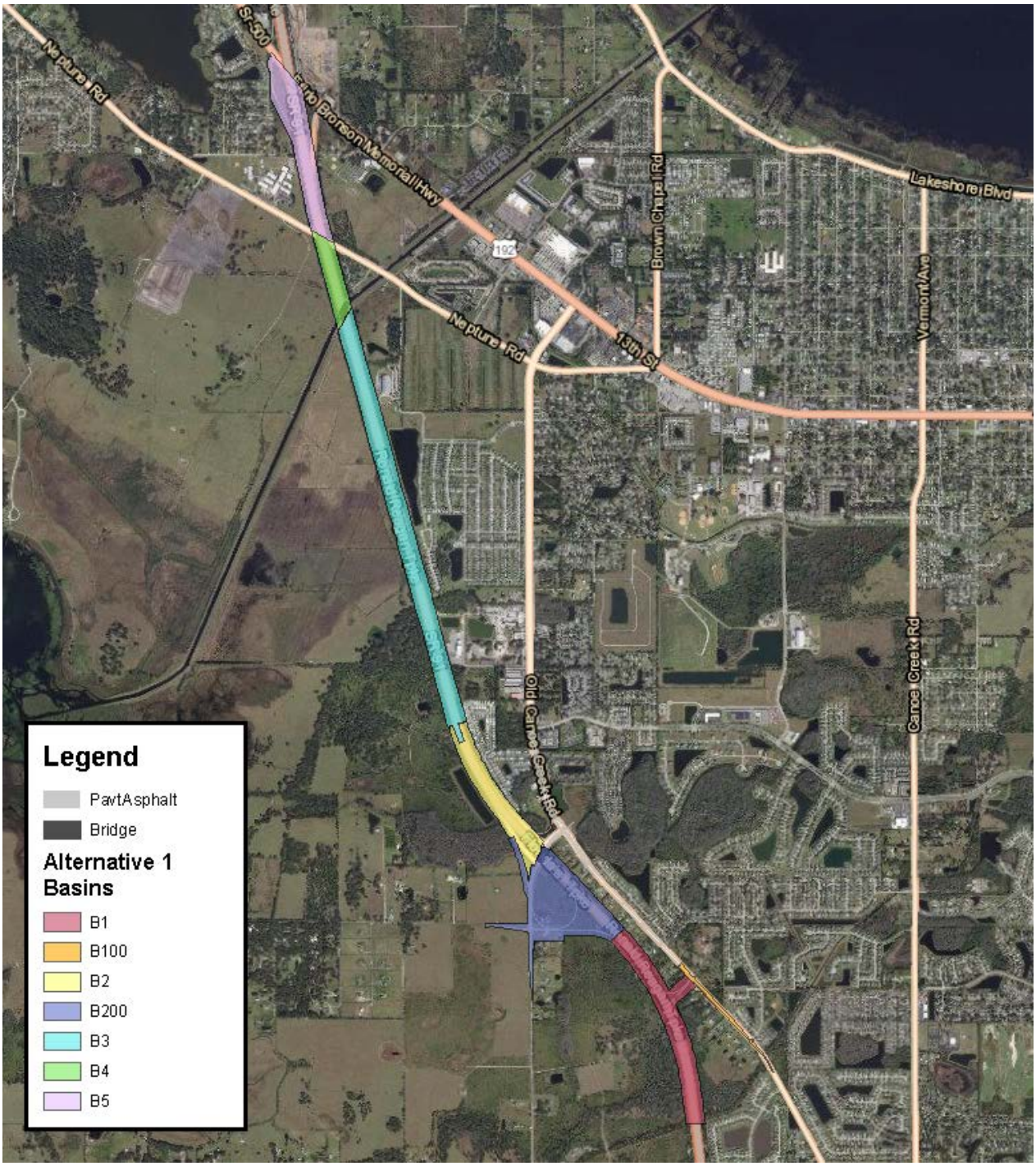

Plate 12 - Alternative 1 Overall Basin Map[5]

[5] Base Map References include Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

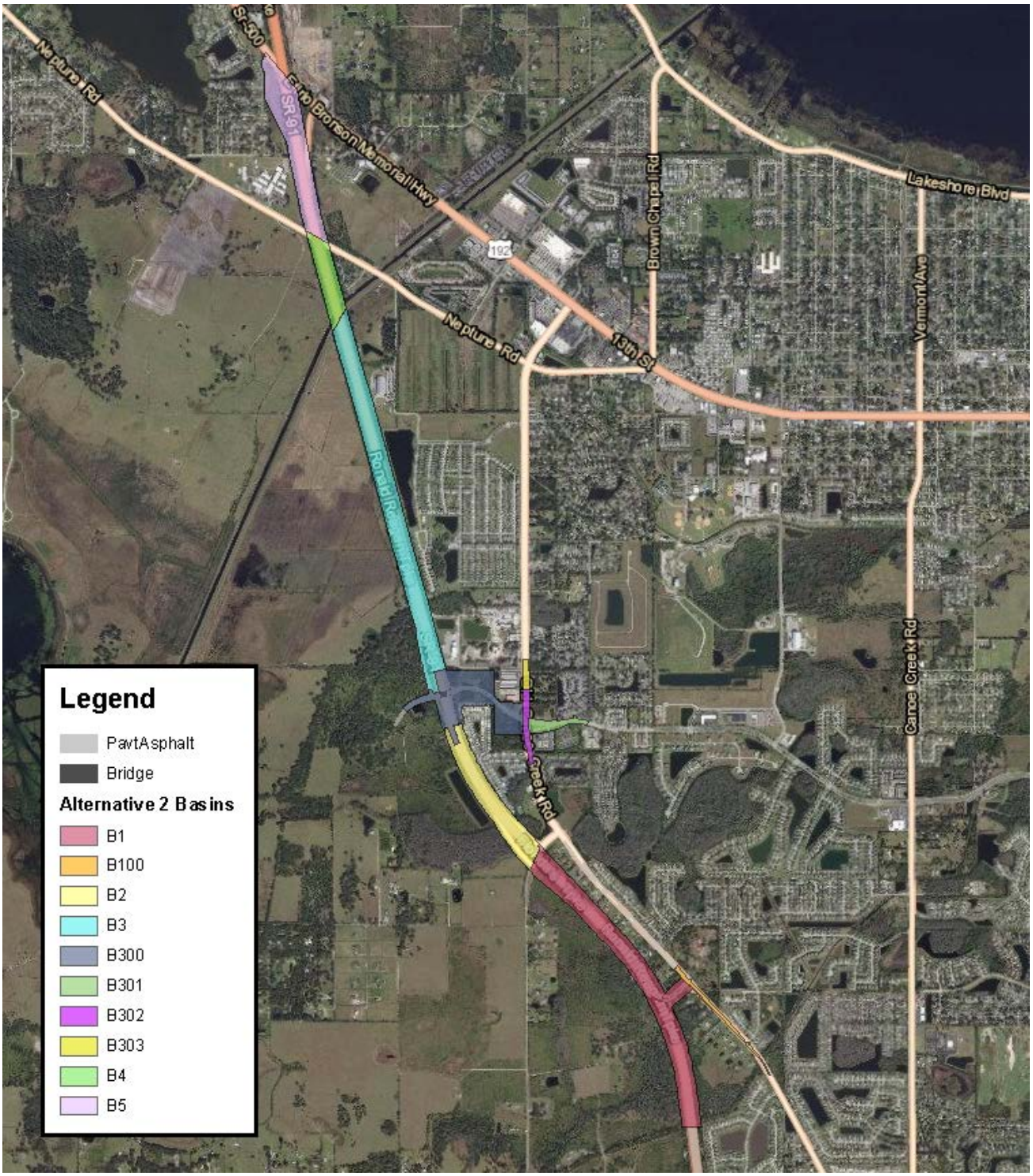

Plate 13 - Alternative 2 Overall Basin Map[6]

[6] Base Map References include Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Basin 1 – WPA Canal Basin

Basin 1 extends from the WPA Canal to the Kissimmee Park Road interchange. For Alternative 1, the basin limits extend from Station 4455+00 (MP 238.2) to Station 4498+00 (MP 238.7), ending at Alternative 1 proposed Kissimmee Park Road Interchange Realignment, Basin 200. For Alternative 2, the basin limits extend from Station 4455+00 (MP 238.2) to Station 4521+20 (MP 239.4) at Kissimmee Park Road.

Alternative 1 has a total onsite basin area of 43.65 acres with 8.41 acres of existing impervious and 17.92 acres of proposed impervious. The required treatment volume is 1.98 ac-ft for wet detention facility options and 1.49 ac-ft for the dry detention option. It is anticipated that compensatory treatment will be provided for 9.51 acres of additional impervious area within this basin. The new impervious area creates an additional 3.69 ac-ft of runoff to be attenuated in the stormwater management facility.

Soil borings were performed along the corridor north of Station 4500+00 (MP 239), which is 200-ft north of this basin's extents for Alternative 1. The assumed SHWL within this basin is set to the nearest roadway boring, LG-1, of 66.8 ft-NAVD. The base clearance estimate establishes the minimum low edge of pavement at 73.9 ft-NAVD for the wet detention facility and 72.6 ft-NAVD for the dry detention facility. The existing low edge of pavement (edge of travel lane) within this basin is 69.6-ft NAVD, which does not provide the full 3-feet of base clearance from the SHWL along the mainline.

Alternative 2 has a total onsite basin area of 66.88 acres with 13.63 acres of existing impervious and 26.90 acres of proposed impervious. The required treatment volume is 2.76 ac-ft for wet detention facility options and 2.07 ac-ft for the dry detention option. It is anticipated that compensatory treatment will be provided for 13.26 acres of additional impervious area within this basin. The new impervious area creates an additional 7.13 ac-ft of runoff to be attenuated in the stormwater management facility.

Soil borings were performed along the corridor beginning at Station 4500+00. An estimated SHWL of 67.0 ft-NAVD from borings LG-1 and LG-3 (borings within the existing ditches) for the dry detention facility and an assumed SHWL of 66.8 ft-NAVD is used for the wet detention pond options, which are south of the geotechnical investigation limits. The base clearance estimate establishes the minimum low edge of pavement at 74.4 ft-NAVD for the wet detention facility option and 72.6 ft-NAVD for the dry detention facility. The existing low edge of pavement is 69.6 ft-NAVD, which does not provide the full 3-feet of base clearance from the SHWL along the mainline.

Pond options for Basin 1 for both Alternative 1 and Alternative 2 provide treatment and attenuation beginning at the WPA Canal; however, floodplain impacts associated with roadway encroachment into the WPA Canal floodplain are not included. Floodplain impacts within this basin are primarily associated with any proposed improvements associated with the WPA Canal crossing (which is a FEMA Regulated floodway). The PD&E limits for this project are north of this crossing and do not include any improvements at the WPA Canal crossing or impacts to the Floodway. The FEMA delineated floodplain shape north of the canal does not match the established BFE when overlaid on the LiDAR. The existing SR 91 is higher

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than the BFE. With an inside widening, no floodplain impacts associated with mainline are anticipated and therefore not included in the pond sizing.

Basin 2 –Existing Kissimmee Park Road Interchange Basin

For both Alternative 1 and Alternative 2, Basin 2 extends along the Turnpike mainline from Kissimmee Park Road (Station 4521+50 (MP 239.4)) to Station 4553+50 (MP 239.9). This follows the basin extents of the existing Turnpike and Kissimmee Park Road interchange pond.

It is anticipated that approximately 370 acres of offsite area east of the Turnpike will continue to flow to the limited access right-of-way and be conveyed to the wetlands west of the Turnpike via cross drains, CD-1 and CD-2, and roadside ditches.

Alternative 1 has a total onsite basin area of 30.81 acres with 9.05 acres of existing impervious and 12.87 acres of proposed impervious, which includes impervious area from auxiliary lanes associated with the proposed Kissimmee Park Road Realigned interchange. Proposed impervious area from the on- and off-ramps of the proposed interchange are not included in Basin 2, but are accounted for in Basin 200. The required treatment volume is 0.80 ac-ft for the wet detention facility option. This is in addition to the existing wet detention facility permitted required 0.86 ac-ft of treatment volume, totaling 1.66 ac-ft of treatment volume. The new impervious area creates an additional 2.08 ac-ft of runoff to be attenuated in the stormwater management facility. Floodplain impacts within this basin are associated with the interchange reconfiguration and are accommodated within the Basin 200 stormwater management facility.

Alternative 2 has a total onsite basin area of 30.71 acres with 9.28 acres of existing impervious and 12.46 acres of proposed impervious, which includes auxiliary lanes and ramps for the New Nolte Road interchange. The required treatment volume is 0.66 ac-ft for the wet detention facility option, which is assumed to be in addition to the existing wet detention facility permitted required 0.86 ac-ft of treatment volume, totaling 1.52 ac-ft of treatment volume. The new impervious area creates an additional 1.74 ac-ft of runoff to be attenuated in the stormwater management facility. Any floodplain impacts associated with the mainline widening would be mitigated by the storage created with the removal of the existing interchange ramps. This would be documented using cup for cup compensation during the design phase.

The existing interchange pond permitted normal water level (NWL) is at 66.7 ft-NAVD (67.7 ft-NGVD). The permitted design high water (DHW) is 67.4 ft-NAVD (68.4 ft-NGVD). The existing pond was permitted to provide an excess of 0.70 ac-ft of treatment volume, which covers the majority of additional impervious for either alternative. Modification to the control structure may be required to meet all criteria. Also, evaluation of the peak stage within the existing pond to accommodate the Turnpike widening is anticipated to be reviewed during the design phase. The permitted minimum road crown is 69.0 ft-NAVD (70.0 ft-NGVD) for this basin, from survey data the existing low edge of pavement within this basin is 72.1 ft-NAVD.

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Basin 3 – South C-31 Basin

Basin 3 extends along the Turnpike mainline south of the C-31 Canal. Basin 3 for Alternative 1 extends from the existing Kissimmee Road Interchange pond at Station 4553+50 (MP 239.9) to the C-31 Canal at Station 4640+00 (MP 241.6). For Alternative 2, Basin 3 extends from the New Nolte Road Interchange at Station 4565+00 (MP 240.2) to the C-31 Canal at Station 4640+00 (MP 241.6).

It is anticipated that the offsite areas east of the Turnpike mainline, which include discharge points from Neptune Elementary School and Anthem Park Subdivision stormwater management facilities, will continue to flow to the limited access right-of-way and be conveyed along the roadside ditch north to the C-31 Canal to mimic the existing condition.

Alternative 1 has a total onsite basin area of 80.83 acres with 17.63 acres of existing impervious and 30.74 acres of proposed impervious, which includes an auxiliary lane from the Kissimmee Park Road interchange realignment. The required treatment volume is 2.73 ac-ft for wet detention facility options and 2.05 ac-ft for the dry detention option. It is anticipated that compensatory treatment will be provided for 13.11 acres of impervious to accommodate the additional impervious area within the basin. The new impervious area creates an additional 7.05 ac-ft of runoff to be attenuated in the stormwater management facility.

Soil borings were performed along the corridor. The assumed SHWL at the location of the wet detention facilities near the C-31 Canal is 54.4 ft-NAVD, estimated from borings LG-28A and LG-29. The assumed SHWL at the location of the dry detention facility along the corridor of 56.3 ft-NAVD from borings LG-19, LG-21, LG-22A, LG-23, and LG-25 (borings within left and right the ditch systems). The base clearance estimate establishes the minimum low edge of pavement at 63.0 ft-NAVD for the wet detention facility option and 62.8 ft-NAVD for the dry detention facility option within this basin. The existing low edge of pavement is 63.0 ft-NAVD within the basin.

Alternative 2 has a total onsite basin area of 71.88 acres with 14.87 acres of existing impervious and 30.83 acres of proposed impervious, which includes ramps and auxiliary lanes from the New Nolte Road interchange. The required treatment volume is 3.32 ac-ft for wet detention facility options and 2.49 ac-ft for the dry detention option. It is anticipated that compensatory treatment will be provided for 15.96 acres of impervious to accommodate the additional impervious area within the basin. The new impervious area creates an additional 8.62 ac-ft of runoff to be attenuated in the stormwater management facility.

Soil borings were performed along the corridor. The assumed SHWL at the location of the wet detention facilities near the C-31 Canal is 54.4 ft-NAVD, estimated from borings LG-28A and LG-29. The assumed SHWL at the location of the dry detention facility along the corridor of 56.3 ft-NAVD from borings LG-19, LG-21, LG-22A, LG-23, and LG-25 (borings within left and right the ditch systems). The base clearance estimate establishes the minimum low edge of pavement at 61.6 ft-NAVD for the wet detention facility option and 62.5 ft-NAVD for the dry detention facility option within this basin. The existing low edge of pavement is 63.0 ft-NAVD within the basin.

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Basin 4 – C-31 to Neptune Road Basin

Basin 4 extends along the mainline from the C-31 Canal at Station 4640+00 (MP 241.6) to Neptune Road and Florida trail crossing at Station 4658+00 (MP 242.0) for both Alternative 1 and Alternative 2.

For Alternative 1 and Alternative 2, the total onsite basin area is 16.22 acres with 3.67 acres of existing impervious and 6.51 acres of proposed impervious. The required treatment volume is 0.59 ac-ft for wet detention facility options and 0.44 ac-ft for the dry detention option. It is anticipated that compensatory treatment will be provided for 2.84 acres of additional impervious area. The new impervious area creates an additional 1.53 ac-ft of runoff to be attenuated in the stormwater management facility.

Soil borings were performed along the corridor. An estimated SHWL along the corridor of 54.9 ft-NAVD from boring LG-31. The base clearance estimate establishes the minimum low edge of pavement at 61.9 ft-NAVD for the wet detention facility option and 60.5 ft-NAVD for the dry detention facility option within this basin. The existing low edge of pavement is 62.9 ft-NAVD within the basin.

Basin 5 –Neptune Road to US 192/441 Basin (MP 242.0 to MP 242.5)

Basin 5 extends along the mainline from Neptune Road and Florida trail crossing at Station 4658+00 (MP 242.0) to US 192/US 441 (Elrlo Bronson Memorial Highway) at Station 4691+00 for both Alternative 1 and Alternative 2.

For Alternative 1 and Alternative 2, the total onsite basin area is 38.84 acres with 7.28 acres of existing impervious and 16.32 acres of proposed impervious. The required treatment volume is 1.88 ac-ft for wet detention facility options and 1.41 ac-ft for the dry detention option. It is anticipated that compensatory treatment will be provided for 9.05 acres of additional impervious area. The new impervious area creates an additional 4.86 ac-ft of runoff to be attenuated in the stormwater management facility.

Soil borings were performed along the corridor. An estimated SHWL along the corridor of 59.0 ft-NAVD from boring LG-33 is used for the wet detention facilities, and 60.1 ft-NAVD SHWL along the corridor from boring LG-33, LG-34A, and LG-37 is used for the dry detention facility. The base clearance estimate establishes the minimum low edge of pavement at 66.1 ft-NAVD for the wet detention facility option and 65.5 ft-NAVD for the dry detention facility option within this basin. The Turnpike mainline low edge of pavement within this basin is 63.0 ft-NAVD, which does not provide the full 3-feet of base clearance from the SHWL along the mainline.

Basin 100 – Old Canoe Creek Road at the Proposed Turnpike Slip Ramps

Slip Ramps for Old Canoe Creek Road at Station 4481+00 are proposed for both Alternative 1 and Alternative 2. Auxiliary lanes and some widening along Old Canoe Creek Road are required to accommodate these new ramps. These improvements will impact approximately 1,500 feet along Old Canoe Creek Road. Two offsite pond options were reviewed to accommodate the treatment and attenuation of the new impervious along Old Canoe Creek Road; however, floodplain impacts to the WPA Canal were not included. It is anticipated that floodplain impacts will be analyzed and accommodated with any improvements to the Old Canoe Creek Road crossing over the WPA Canal.

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For both Alternative 1 and Alternative 2, the total onsite basin area is 3.96 acres with 1.93 acres of existing impervious and 3.45 acres of proposed impervious. The required treatment volume is 0.32 ac-ft for the wet detention facility options. It is anticipated that compensatory treatment will be provided for 1.52 acres of additional impervious area. The new impervious area creates an additional 0.87 ac-ft of runoff to be attenuated in the stormwater management facility.

Basin 200 – Proposed Reconfiguration of Kissimmee Park Road Interchange Basin

Alternative 1 proposes to provide a reconfiguration of the existing Kissimmee Park road Interchange. This new interchange is evaluated as Basin 200. Basin 200 extends along the mainline for the extents of the proposed interchange realignment for Kissimmee Park Road from Station 4498+00 (MP 238.7) to Station 4521+50 (MP 239.4).

It is anticipated that approximately 11.5 acres of residential offsite area east of the Turnpike mainline will continue to flow to the limited access right-of-way and be conveyed along the roadside ditches south to the WPA Canal to mimic the existing condition.

Due to anticipated floodplain impacts for the interchange reconfiguration, the stormwater management facilities will provide floodplain compensation and will discharge to the wetland west of the Turnpike mainline at Station 4527+00. To provide sufficient volume within the infield area, Pond 200-1A, the floodplain compensation height for the pond options is the height between the eastern wetland 100-year peak stage and the estimated SHWL at the infield pond area, with an assumed 1-foot of hydraulic head loss to accommodate routing of the stormwater across the Turnpike. The infield pond area could not contain the entire floodplain compensation volume associated with the interchange, so an offsite pond option, 200-1B, was sized to accommodate the remaining floodplain compensation volume. It is assumed that both of these pond sites will be wet detention facilities.

Basin 200 has a total onsite basin area of 66.47 acres with an 8.67-acre infield pond area, 10.07 acres of existing impervious, and 25.70 acres of proposed impervious. The required treatment volume is 3.26 ac-ft for a wet detention facility option. It is anticipated that compensatory treatment will be provided for the 15.63 acres of additional impervious area. The new impervious area creates an additional 8.31 ac-ft of runoff, and the infield pond area is estimated to general an additional 2.97 ac-ft of runoff to be attenuated in the stormwater management facility. The proposed interchange is estimated to create 23.5 ac-ft of floodplain impacts.

Soil borings were performed along the corridor. An estimated SHWL of 67.0 ft-NAVD from borings LG-1, LG-3, LG-4. The base clearance estimate establishes the minimum low edge of pavement at 75.0 ft-NAVD for this basin.

Basin 300 – West New Nolte Road Interchange

Alternative 2 proposes a new interchange with West New Nolte Road and removing the existing interchange at Kissimmee Park Road. The interchange involves extending the limited access right-of-way to Old Canoe Creek Road, realigning West New Nolte Road, and providing auxiliary lanes to Old Canoe

Creek Road. Old Canoe Creek Road and West New Nolte Road are treated within existing permitted stormwater management facilities. Basin 300 encompasses the limited access right-of-way extents for the proposed interchange, extending along the mainline from Station 4553+50 (MP 239.9) to Station 4565+00 (MP 240.2) and includes approximately 600-feet west of the Turnpike and 1,500-feet east.

There is existing offsite runoff from adjacent residential area along the southeast of the proposed interchange that is anticipated to continue to flow into Turnpike's roadside ditch and be conveyed north to the C-31 Canal to mimic the existing condition. Proposed pond options within this basin include the remnant parcels of the new interchange and an offsite pond option at an existing borrow pit. Outfall for these pond options includes discharge into the Turnpike right-of-way outfall ditch that collects other offsite areas and flows north to the C-31 Canal.

Basin 300 total area is 19.36 acres with 2.76 acres of existing impervious and 10.15 acres of proposed impervious. The required treatment volume is 1.54 ac-ft for wet detention facility options and 1.15 ac-ft for the dry detention option. It is anticipated that compensatory treatment will be provided for 7.39 acres of impervious to accommodate the additional impervious area within the basin. The new impervious area creates an additional 3.99 ac-ft of runoff to be attenuated in the stormwater management facility.

Soil borings were performed along the corridor. The assumed SHWL at the east pond options is 63.9 ft-NAVD, estimated from borings LG-21, LG-13, LG-14, and LG-15, and the SHWL at the west pond options is 65.9 ft-NAVD estimated from borings LG-12A and LG-12. The base clearance estimate establishes the minimum low edge of pavement at 71.0 ft-NAVD for the eastern wet detention facility option and 73.0 ft-NAVD for the western wet detention facility option within this basin. The existing low edge of pavement is 68.2 ft-NAVD within the basin, which does not provide the full 3-feet of base clearance from the SHWL along the mainline.

Basin 301 – West New Nolte Road Realignment

The section of West New Nolte Road that is proposed to be realigned to accommodate the Alternative 2 proposed interchange is currently treated within Pond PA-10 under ERP 49-00504-S, Application No. 040604-10. Improvements extend from Old Canoe Creek Road to the west of Pine Chase Circle. Basin 301 has a project basin area of 5.04 acres with 3.38 acres of existing impervious and 2.88 acres of proposed impervious, resulting in a reduction of impervious area. With the reduction in impervious area, there is no additional treatment or attenuation volume required within the existing pond, PA-10.

Basin 302 – Old Canoe Creek Road at West New Nolte Road

The section of Old Canoe Creek Road is proposed to be widened to accommodate auxiliary lanes for the Alternative 2 proposed interchange and is currently treated within Ponds 300 and 301 under ERP 49-01399-P, Application No. 050816-6. These existing ponds are located at the existing intersection of Old Canoe Creek Road and Kissimmee Park Road. Basin 302 project area is 4.26 acres with 3.50 acres of existing impervious and 3.82 acres of proposed impervious. The required treatment volume is 0.32 ac-ft for a wet detention facility for the additional impervious area, creating a total 3.65 ac-ft from the permitted condition. The existing pond is permitted as providing 3.58 ac-ft of treatment volume.

Additionally, the new impervious area creates an additional 0.19 ac-ft of runoff to be attenuated in the stormwater management facility. It is anticipated that the design phase will evaluate the modifications required for the existing pond to provide sufficient treatment and attenuation for the proposed developments.

Basin 303 – Old Canoe Creek Road North of West New Nolte Road

This section of Old Canoe Creek Road is proposed to be widened to accommodate auxiliary lanes for the Alternative 2 proposed interchange, and is currently treated within the South Pond under ERP 49-01443-P, Application No. 040323-11. The existing pond is located within the Anthem Park Subdivision. Basin 303 project area is 1.46 acres with 1.08 acres of existing impervious and 1.15 acres of proposed impervious. The required treatment volume is 0.01 ac-ft for a wet detention facility for the additional impervious area. Additionally, the new impervious area creates an additional 0.04 ac-ft of runoff to be attenuated in the stormwater management facility. The existing pond is permitted to have an excess of 0.34 ac-ft of treatment volume, which is more than the additional treatment and attenuation volume required by the project.

7.0 Floodplain and Environmental Information

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Osceola County, community panel number 12097C0252G and 12097C0090G, dated June 18, 2013, indicates a portion of the project area is located in the 100-year floodplain (see **Plate 14**). Therefore, there will be floodplain involvement with federally defined floodplains. There are no regulated floodways within the project limits.

The project corridor crosses two FEMA floodplains: 1) Zone AE at the C-31 St. Cloud Canal, and 2) Zone A at CD-1, just north of the Kissimmee Park Road interchange.

SR 91 over C-31 Bridge Hydraulics Discussion

The project proposes to widen the dual bridges at the C-31 (St. Cloud) Canal. Refer to **Plate 15** for the conceptual proposed typical for the bridge crossing.

A study of available information was performed to determine if the existing bridge could accommodate the bridge widening while still maintaining the necessary vertical (drift and navigation) clearances. As the C-31 Canal is owned and maintained by SFWMD, the review includes the determination of SFWMD criteria for this crossing. The following information was utilized:

- As-Built Bridge Plans (Project No. 2, Structure No. 10.5-5, dated 1/2/62) at Florida Turnpike and C-31 Canal
- FPID No. 239682-1-52-01 (SR 500 & C-31 Canal), Osceola County, Bridge Hydraulics Recommendations Sheet (BHRS), dated 2014
- SFWMD Canals in South Florida, Appendix A
- SFWMD ROW Criteria Manual

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- SFWMD DBHYDRO Information
- FEMA Flood Insurance Study (FIS) & FEMA FIRM Panel 12097C0090G (Dated 6/18/2013)

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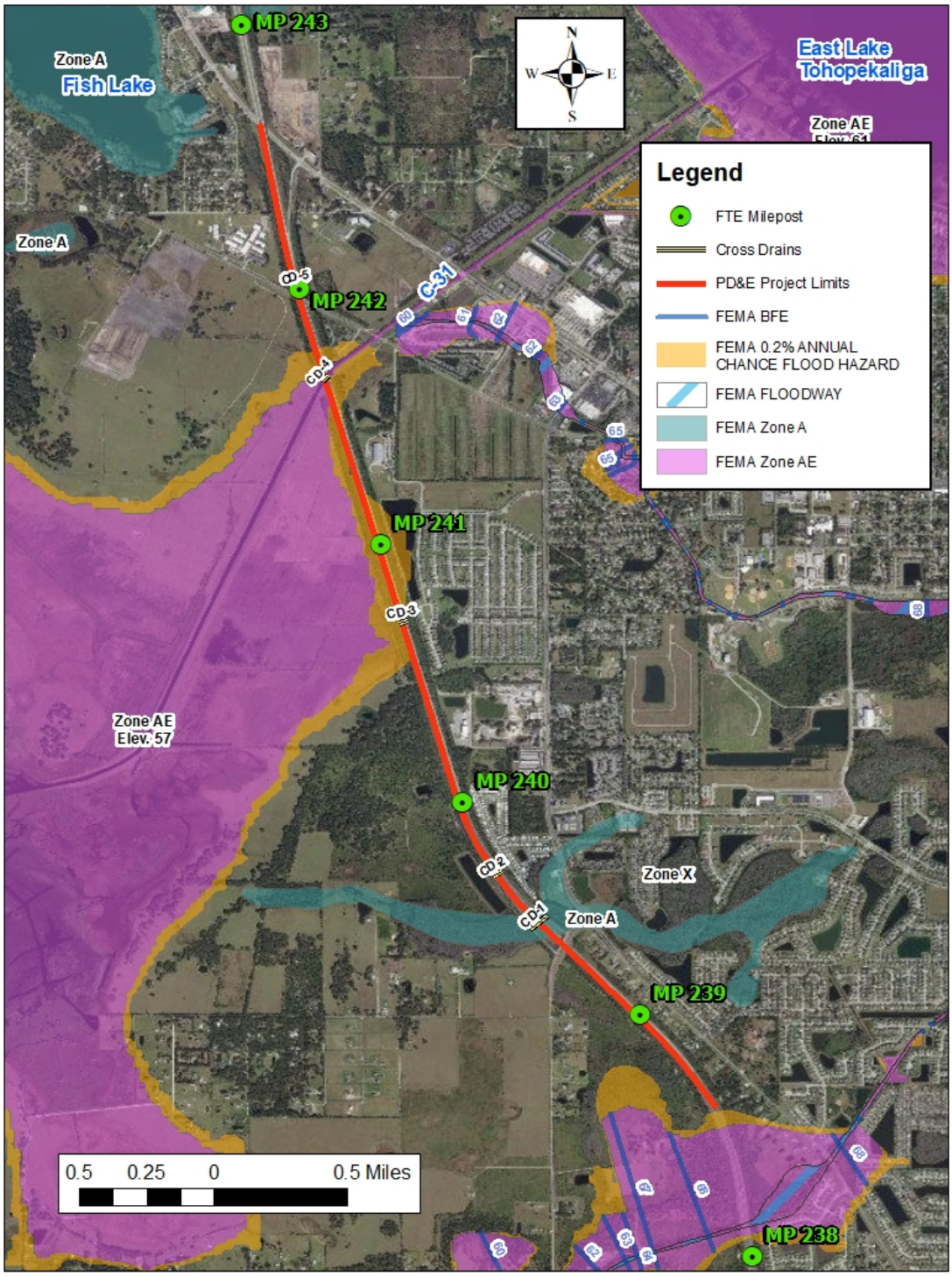

Plate 14 - FEMA Floodplains (FEMA Database, 2018)[7]

[7] Base Map References include Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

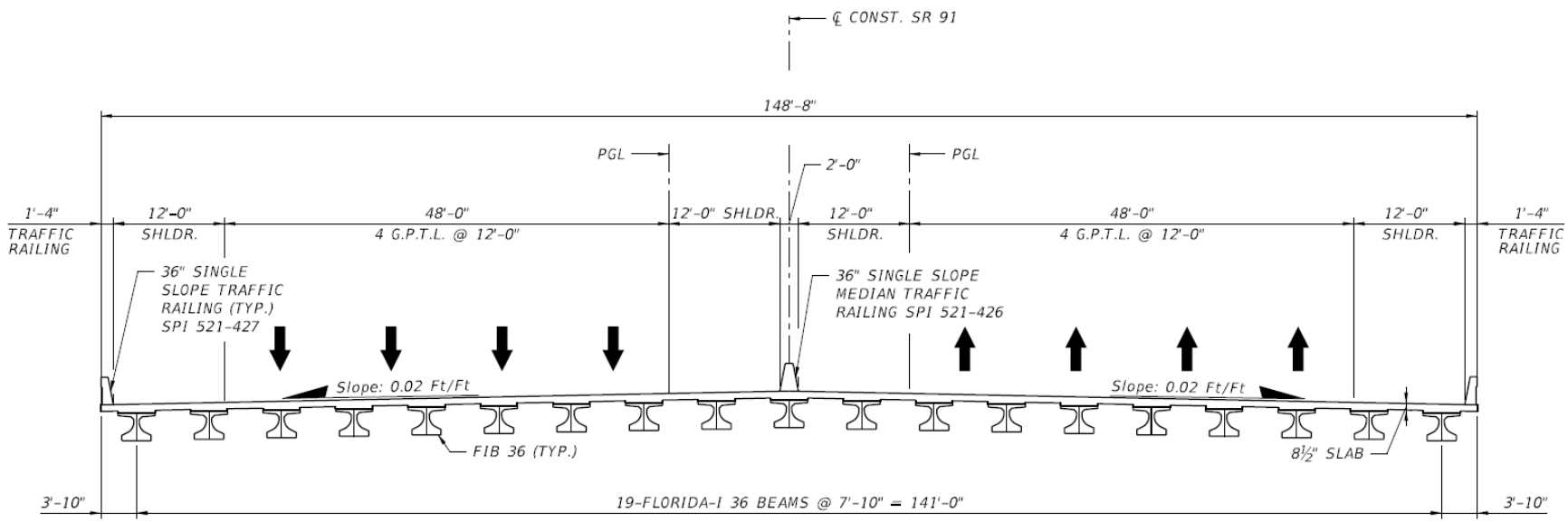

Plate 15- Conceptual Proposed Typical for the C-31 Bridge Crossing

From the As-Built 1962 Bridge Plans for the C-31 Canal, the existing low member elevation of 65.03 feet NAVD was determined. The recently designed (2014) SR 500 Bridge at the C-31 Canal is located just upstream, and was used for comparison purposes. The BHRS indicates that the SR 500 Bridge will provide 12.0 feet of navigation clearance and 10.0 feet of drift clearance. The Bridge Plans show a vertical clearance of 8 feet above the berm to be provided for a future trail under the bridge. There are no known plans to provide a future trail in the location of the Turnpike Bridge at C-31 Canal; therefore, it is assumed that the vertical clearance for trail clearance will not be required at the FTE Bridge. Refer to **Table 2** and **Table 3**.

Structure S-59 is an upstream water control structure located on the C-31 Canal between the outlet at East Lake Tohopekaliga and the entrance to Lake Tohopekaliga. Appendix A of the SFWMD "Canals in South Florida" document provides design stage information on the upstream S-59 water control structure which was used to determine vertical clearances. SFWMD's DBHYDRO is an environmental database that is the source of historical and up-to-date hydrologic data (i.e. stage and discharge at SFWMD structures). This database was used to download maximum, minimum and historical stages (2009 to 2019) from structure S-59 information The FEMA FIS and FEMA FIRMs were also obtained. This information was then checked to ensure the validity of the design information. The SFWMD criterion for the crossing was obtained from the SFWMD ROW Criteria Manual.

As the SFWMD Structure S-59 design stage (TW) information was closely comparable to the SR 500 Bridge 50-year DHW and more conservative than the high-water stage shown on the 1962 Bridge Plans, the DHW for the FTE Bridge widening was assumed to match the Structure S-59 design stage (TW) information with a DHW of 55.93 feet NAVD and a normal high water (NHW) of 54.33 feet NAVD. In addition, the FEMA base flood (100-year) elevation is 57.0 feet NAVD downstream of Structure S-59 which seems reasonable in comparison.

The outcome of the analysis determined that the existing bridge provides more drift and navigation clearance than is required at this location. The SFWMD and FDOT require 2 feet of drift clearance above the DHW and 6 feet of navigation clearance above the seasonal high optimum elevation or NHW, whichever produces a higher low member. The FDOT requires the DHW to be based upon a 50-year hydraulic storm event to determine drift clearance. The DHW of 55.93 feet NAVD was deemed suitable as it closely compares to the SR 500 upstream bridge 50 Year DHW of 56.00 feet NAVD. The existing bridge provides 9.1 feet and 10.7 feet of drift and navigation clearance, respectively. Therefore, the existing bridge provides 4.7 feet more vertical (navigation) clearance than is required. With the proposed widening of 44 feet, a reduction of 0.88 feet in vertical clearance is anticipated. It appears that the existing bridge can be widened and will provide more clearance than is required.

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Table 2- Summary of Elevations for Bridge Hydraulics Review

Design Parameters	FL Turnpike Bridge Over C-31 Canal from 1962 Bridge Plans		SR 500 Bridge Design (for Comparison) Over C-31 Canal from 2014 Bridge Plans	Structure S-59 at C-31 Canal from SFWMD Canals of S. Florida Manual	
	Elevation (ft-NGVD)	Elevation (ft-NAVD)	Elevation (ft-NAVD)	Elevation (ft-NGVD)	Elevation (ft-NAVD)
Low Member	66.00	65.03	66.00	--	--
DHW	55.90	54.93	56.00	56.90	55.93
NHW	--	--	54.00	55.30	54.33
FEMA BFE	--	57.00	57.00	--	57.00

Note: For the SR 500 Bridge, this would be a 50-year event DHW according to FDOT criteria. The FTP Bridge DHW event is unknown.

Table 3- Summary of Clearances for Bridge Hydraulics Review

Bridges over C-31 Canal	Drift Clearance Provided (from DHW to LM) (ft)	Drift Clearance Required (from DHW to LM) (ft)	Vertical Clearance Provided (NWL to LM) (ft)	Vertical Clearance Required (NWL to LM) (ft)
FL Turnpike	9.10	2.00	10.70	6.00
SR 500 (for comparison)	10.00	2.00	12.00	12.00*

Note: It appears that SR 500 Bridge required a larger vertical clearance than FL Turnpike Bridge due to a future trail using bridge berm. Required Vertical Clearance for FL Turnpike Bridge from SFWMD ROW & FDOT Criteria.*

CD-1 Floodplain Encroachment

Impacts to the FEMA Zone A floodplain at CD-1 were estimated using modeling of the existing 100-year peak stage elevations with ICPR3 within the facility of the project area. The methodology is described in **Section 8.0 Stormwater Ponds Volume Calculations**.

No adverse impacts are anticipated to the floodplain, as required by the SFWMD permitting process. The SFWMD requires replacement of floodplain storage lost as a result of encroachments. In addition, the SFWMD and FDOT design criteria for conveyance systems (e.g. culverts) allow no significant increase in flood stages.

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8.0 Stormwater Ponds

Methodology

The required pond volume for the proposed improvements is calculated by the following:

$$\begin{aligned} &Total\ Pond\ Volume\ Required \\ &\qquad = Required\ Treatment\ Volume + Required\ Attenuation\ Volume \\ &\qquad + Floodplain\ Impact\ Volume\ (if\ included) \end{aligned}$$

The treatment volume includes the first flush runoff volume from the proposed developed site to be detained and treated before discharging downstream. The attenuation volume includes the storage of the additional excess runoff caused by the proposed development by minimizing the peak flowrate from the site to mimic pre-development conditions so as not to adversely impact offsite properties. The floodplain impact volume includes the impact to the storage between the seasonal high-water table and the 100-year BFE due to the proposed development.

Within this PD&E effort, it is assumed that each of the pond volume parameters is "stacked" instead of taking credit for any possible volume overlapping; this provides a conservative estimate which can be further evaluated during the final design phase. The methodology used to determine these parameters for calculating pond volumes are described within the following sections.

Refer to **Appendix C** for pond sizing calculations.

Treatment Volume

For the PD&E study, all proposed offsite ponds are assumed to be wet detention facilities, and onsite roadside swale options are assumed to be dry detention facilities. It assumed that further evaluation of pond types will be accomplished during the final design phase.

Required treatment volume for wet detention facilities is calculated based on 2.5-inches over the additional impervious area, and dry detention facilities require 75% of the calculated treatment volume for wet detention facilities.

Attenuation Volume

The Osceola County storm frequency of 10-year/72-hour event is used as the basis of runoff volume to be detained to meet a pre-post flow rate criterion. This storm frequency is used in surrounding permitted existing ponds with a design rainfall ranging from 7.5-inches to 7.8 inches. A design rainfall depth of 8.0-inches is used for this analysis.

Table 4 - Surrounding Permitted Attenuation Volume Design Rainfall Volumes

Permitted Existing Pond	Application No.	Design Rainfall
Kissimmee Park Road/Turnpike Interchange	ERP 49-01481-P, App. 041008-30	7.8-inches (10yr-72hr)
West New Nolte Road Rehab	ERP 49-00504-S, App. 040604-10	7.5-inches (10yr-72hr)
Kissimmee Park Road Widening	ERP 49-01399-P, App. 050816-6	7.7-inches (10yr-72hr)

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The Soil Conservation Service (SCS) Runoff Curve Number (CN) Method was used to determine the total runoff generation for the pre-development and post-development conditions. Survey data, where available, was used to digitize the existing roadway impervious area; the remainder of the area was assumed to have good drained soils (Type A) to determine the CN for the pre-development condition. The Turnpike Widening Concept Roadway Designs for each alternative were digitized to determine the difference in land use along the proposed corridors.

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

$$S = \frac{1000}{CN} - 10$$

$$Volume = Runoff * Basin\ Area$$

$$Attenuation\ Volume\ =\ Post\ Development\ Volume\ -\ Pre\ Development\ Volume$$

Attenuation at pond sites only includes the area at the normal water level for wet detention facilities or the pond bottom area for the dry detention facilities to determine the additional runoff generated at the pond site. It is assumed that the remainder of the pond area post-CN matches the pre-development CN, thereby not generating additional runoff. The pond options are sized to accommodate attenuation volume generated by both the additional impervious along the roadway as well as the pond option site.

Floodplain Compensation Volume

Floodplain impacts were evaluated at FEMA Floodplain locations along the roadway and offsite pond options. Floodplain impacts at offsite pond options near the WPA Canal and C-31 Canal, which are Zone AE floodplains and have an established Base Flood Elevation (BFE), were calculated based on the area of the FEMA floodplain impacted by the site by the height difference of either the SHWL or existing ground elevation, whichever was greater.

$$\begin{aligned} &Zone\ AE\ Floodplain\ Impact\ Volume \\ &\quad = FEMA\ Floodplain\ Area * (FEMA\ BFE \\ &\quad - \ Greater\ of\ SHWL\ or\ Existing\ Ground\ Elevation \end{aligned}$$

It is assumed that the Turnpike Widening at the C-31 Canal for both roadway alternatives will not create fill within the canal's berms. The established FEMA BFE is contained within the canal's berms; therefore, no impacts were included at this crossing. Floodplain impacts associated with Turnpike widening within the WPA Canal Floodplain is beyond the scope of this project and were not evaluated.

The project corridor crosses a FEMA Floodplain Zone A at the existing Kissimmee Park Road interchange. Alternative 1 proposes to provide a new interchange at this floodplain. An ICPR3 model was developed to determine the existing peak stages of the wetlands to the east and west of the project area. It was assumed that the floodplains would only be impacted within the limits of construction of the proposed

interchange, not the full Turnpike right-of-way. Roadway profiles are not available at this stage in the process; therefore, the existing distance between the edge of the travel lane and roadway side slope tie-in was used to estimate the anticipated limits of construction at the new interchange. It was also assumed that infield areas between the mainline and proposed ramps would create a loss of storage.

Table 5 - Assumptions used for FEMA Zone A Floodplain Impacted Area

Road Type	Estimated Limit of Construction Distance
Turnpike Mainline	60 feet
On/Off Ramps	35 feet
Side Street Auxiliary Lane	20 feet

The floodplain impact volume within the interchange was evaluated between the 100-yr/24-hr peak stage from the ICPR3 model and the seasonal high-water level, which is assumed to be the permitted normal water elevation at the existing interchange pond. A GIS Cut-Fill tool was used, which calculates the volume between the existing ground DEM and a known elevation within the limits of the construction boundary. This method assumes a "glass wall" at the edge of the impact boundary.

$$Zone\ A\ Floodplain\ Impacts = Cut\ Fill\ Volume\ at\ 100yr\ Peak\ Stage\ - Cut\ Fill\ Volume\ at\ SHWL$$

As the preferred alternative, Alternative 2 proposes to remove the existing ramps at this interchange; therefore, there is an opportunity for additional storage with the removal of the ramp embankments. This storage will be documented during the design phase.

Refer to **Appendix C** for floodplain impacts at the pond sites and **Appendix D** for the floodplain impacts at the Alternative 1 interchange.

Pond Sizing Assumptions

Pond sizes were calculated with the assumed pond geometry of a square shape. Offsite wet detention facilities have an assumed 1:4 side slope, 20-foot maintenance berm, and a minimum normal water level (NWL) area of 0.5 acres. Onsite dry detention facilities have an assumed 1:6 front slope, 1:4 back slope, and a 10-foot maintenance berm. All pond options were sized to provide 1-foot of freeboard and 20% additional pond area factor for landscaping and tie-in slopes.

Treatment volume depths for wet detention ponds treating public facilities within the project area range from 0.2-feet to 1.5-feet. For this project, it is assumed that the minimum treatment depth of 0.75-feet for wet detention facilities and 0.5-feet for dry detention facilities. These assumptions provide an average design high water depth of 3.2 to 3.5 feet for wet detention facilities and 2.7 to 2.9 feet for dry detention facilities.

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Pond Siting Considerations

Adjacent property along the project corridor have Development of Regional Impact (DRI) Studies for the future development of the surrounding area. Where possible, offsite ponds were sited in locations that considered proposed locations of future roads and surrounding development's pond sites. **Plate 16** shows offsite pond options in relation to the Cross Prairie Parkway DRI plan.

Refer to **Appendix E** for other sources utilized to site pond locations from the desktop evaluation.

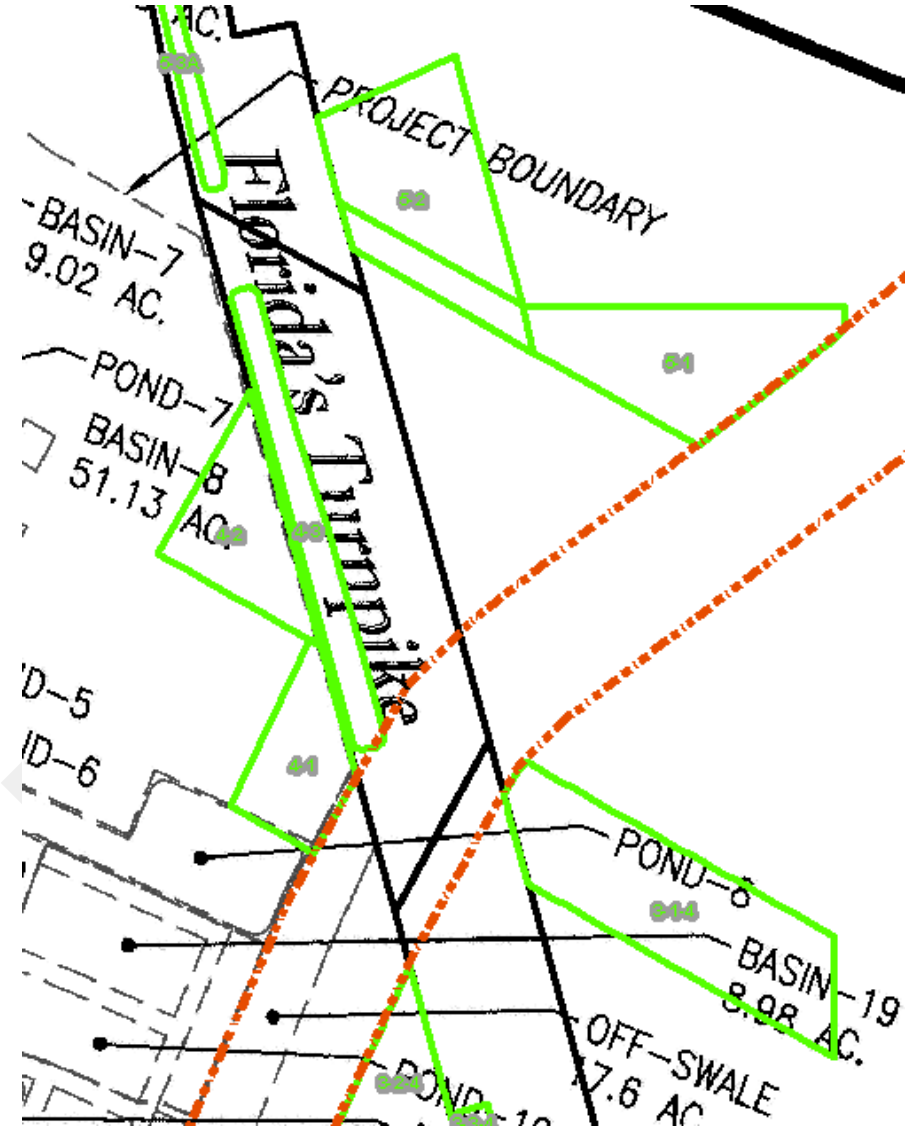

Plate 16 - Cross Prairie Parkway DRI Plans with Turnpike's Offsite Pond Options

Pond Summary

Refer to **Table 6** and **Table 7** for the Pond Option Summary which details the treatment, attenuation, and floodplain volumes and the resulting required pond volume for each basin.

Table 6 - Alternative 1 Pond Option Summary

Basin	Pond Name Prefix	Type of Treatment	Floodplain Compensation Vol				Linear SMF Geometry				FDOT Existing Parcel
			Attn. Vol	Trt. Vol	Floodplain Impact Volume	Total Vol	Trt. Depth	Attn. Depth	DHW Depth	Req'd Pond Area	
			(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ft)	(ft)	(ft)	(ac)	
1	1-2	Wet Detention	6.60	1.98	--	8.58	0.75	2.35	3.10	4.6	☐
	1-3				0.14	8.72				4.7	☐
	1-1	Dry Retention	6.50	1.49	--	7.99	0.60	2.45	3.05	4.1	☑
100	100-1	Wet Detention	1.16	0.32	--	1.48	0.75	2.25	3.00	1.3	☐
	100-2										☐
200	200-1A	Wet Detention	11.28	3.26	12.00	26.53	2.22	2.10	4.32	8.6	☐
	200-1B		2.85		11.50	14.35	2.22	0.60	2.82	7.9	☐
2	Existing Pond	Wet Detention	2.08	1.66	--	3.74	--	--	--	--	☐
3	3-1	Wet Detention	8.31	2.73	--	11.04	1.20	3.30	4.50	4.3	☐
	3-2				0.39	11.43			4.60		☐
	3-3	Dry Retention	8.57	2.05	--	10.62	0.75	2.85	3.60	4.6	☑
4	4-1	Wet Detention	1.97	0.59	--	2.57	0.75	2.25	3.00	1.8	☐
	4-2										☐
	4-3	Dry Retention	2.03	0.44	--	2.47	0.50	2.05	2.55	1.7	☑
5	5-1	Wet Detention	6.27	1.88	--	8.16	0.75	2.35	3.10	4.4	☐
	5-2										☑
	5-3	Dry Retention	6.45	1.41	--	7.87	0.50	2.15	2.65	4.5	☑

Table 7 - Alternative 2 Pond Option Summary

Basin	Pond Name Prefix	Type of Treatment	Floodplain Compensation Vol				Linear SMF Geometry				FDOT Existing Parcel
			Attn. Vol	Trt. Vol	Floodplain Impact Volume	Total Vol	Trt. Depth	Attn. Depth	DHW Depth	Req'd Pond Area	
			(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ft)	(ft)	(ft)	(ac)	
1	1-1	Dry Retention	9.08	2.07	--	11.15	0.60	2.45	3.05	5.5	☑
	1-2	Wet Detention	8.86	2.76	--	11.62	0.90	2.70	3.60	5.3	☐
	1-3				0.14	11.76					☐
100	100-1	Wet Detention	1.16	0.32	--	1.48	0.75	2.25	3.00	1.3	☐
	100-2										☐
2	Existing Pond	Wet Detention	1.74	1.52	--	3.26	--	--	--	--	☐
300	300-1	Wet Detention	5.15	1.54	--	6.69	0.75	2.35	3.10	3.7	☐
	300-2										☐
	300-3										☐
301	Existing Pond	Wet Detention	0.00	3.62	--	3.62	--	--	--	--	☐
302	Existing Pond		0.19	3.65	--	3.83	--	--	--	--	☐
303	Existing Pond		0.04	6.63	--	6.68	--	--	--	--	☐
3	3-1	Wet Detention	11.11	3.32	--	14.44	0.75	2.40	3.15	7.1	☐
	3-2				0.79	15.23			3.25	7.2	☐
	3-3	Dry Retention	11.43	2.49	--	13.93	0.50	2.20	2.70	7.4	☑
4	4-1	Wet Detention	1.97	0.59	--	2.57	0.75	2.25	3.00	1.8	☐
	4-2										☐
	4-3	Dry Retention	2.03	0.44	--	2.47	0.50	2.05	2.55	1.7	☑
5	5-1	Wet Detention	6.27	1.88	--	8.16	0.75	2.35	3.10	4.4	☐
	5-2										☑
	5-3	Dry Retention	6.45	1.41	--	7.87	0.50	2.15	2.65	4.5	☑

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9.0 Results

The following Pond Evaluation results are a product of the hydraulic calculations, desktop assessment of the aforementioned pond sites as well as site specific evaluation of the sites from other design team members for natural resources, contamination, and cultural resources impacts. Construction costs were estimated by The Balmoral Group and are provided in **Appendix G**. Right-of-way costs were provided by FTE and are provided in **Appendix G**.

This project will have no adverse impact on the area's water quality. Stormwater treatment of the additional impervious areas will be treated as required by the SFWMD Environmental Resource Permit (ERP).

Table 8 and **Table 9** provide a summary of the pond options for each roadway alternative. Since Alternative 2 is the preferred alternative, only pond sites for Alternative 2 are recommended.

In general, where on-site linear ponds could be accommodated within the existing mainline right-of-way, these were identified as the recommended ponds sites. This applied to Basin 1, Basin 2, Basin 3, Basin 4, and Basin 5. The FTE existing pond will continue to serve Basin 2.

For the ponds associated with the interchange, Basin 300, remnant parcels were selected as the recommended pond sites. It is anticipated that runoff from roadway portions outside of the limited access right-of-way will require separate ponds, which will not be maintained by FTE. Option 2 was selected as it provided multiple sites with at least one site (Pond 300-2C) near the intersection of West New Nolte and Old Canoe Creek Road. Option 2 provides the flexibility to create multiple pond sites at locations that are assumed to work hydraulically with the existing grades of Old Canoe Creek and West New Nolte.

For Basin 100, Pond 100-1 was selected given the substantial lower overall cost as compared to Pond 100-2.

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Table 8- Alternative 1 Pond Evaluation Matrix

Pond Site	Onsite/Offsite/Remnant Parcel	Type	Wetland Impacts (ac)	Contamination Risk	Floodplain Impact (ac)	Cultural\Archaeological Resources Impacts	Number of Property Owners	Pond R/W Area (ac)	Total Costs (R/W & Construction)	Pond Exhibit Name
1-1-1	On	Dry Detention	0.21	Low	0.97	Low	0	4.6	$ 1,194,555.00	Alt. 1 Basin 1 Option 1
1-2-1	Off	Wet Detention	0.91	Low	0	Low	1	5.1	$ 2,993,548.00	Alt. 1 Basin 1 Option 2
1-3-1	Off	Wet Detention	1.23	Low	0.07	Low	2	5.7	$ 84,200.00	Alt. 1 Basin 1 Option 3
Existing	On	Wet Detention	0.00	Low	0	Low	0	N/A	$ -	Alt. 1 Basin 2 Option 1
100-1	Off	Wet Detention	0.21	Low	0	Low	1	2.3	$ 993,372.00	Alt. 1 Basin 100 Option 1
100-2	Off	Wet Detention	0	Low	0	Low	1	1.9	$ 2,386,151.00	Alt. 1 Basin 100 Option 2
200-1A	R	Wet Detention	1.64	Low	0	Low	0	8.7	$ 915,300.00	Alt. 1 Basin 200 Option 1
200-1B	Off	Wet Detention	0	Low	0	Low	2	9.2	$ 2,460,530.00	Alt. 1 Basin 200 Option 1
3-1-1	Off	Wet Detention	0.80	Low	0	Low	3	4.5	$ 1,643,938.00	Alt. 1 Basin 3 Option 1
3-2-1	Off	Wet Detention	1.02	Low	3.9	Low	3	4.5	$ 1,367,355.00	Alt. 1 Basin 3 Option 2
3-3-1	On	Dry Detention	0.70	Low	0	Low	0	4.7	$ 105,700.00	Alt. 1 Basin 3 Option 3
4-1	Off	Wet Detention	0	Low	0.51	Low	2	2.8	$ 839,250.00	Alt. 1 Basin 4 Option 1
4-2	Off	Wet Detention	0	Low	0	Low	1	3.5	$ 748,147.00	Alt. 1 Basin 4 Option 2
4-3	On	Dry Detention	0	Low	0	Low	0	2.9	$ 39,100.00	Alt. 1 Basin 4 Option 3
5-1	Off	Wet Detention	0.03	Medium	0	Low	2	6.9	$ 1,617,983.00	Alt. 1 Basin 5 Option 1
5-2	Off	Wet Detention	0.00	Low	0	Low	1	6.5	$ 392,600.00	Alt. 1 Basin 5 Option 2
5-3A	On	Dry Detention	0	Low	0	Low	0	1.7		Alt. 1 Basin 5 Option 3
5-3B	On	Dry Detention	0.53	Low	0	Low	0	1.0	$ 83,200.00	Alt. 1 Basin 5 Option 3
5-3C	On	Dry Detention	1.76	Low	0	Low	0	3.0		Alt. 1 Basin 5 Option 3

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Table 9- Alternative 2 Pond Evaluation Matrix

Pond Site	Recommended Rank	Onsite/Offsite/ Remnant Parcel	Type	Wetland Impacts (ac)	Contamination Risk	Floodplain Impact (ac)	Cultural\ Archaeological Resources Impacts	Number of Property Owners	Pond R/W Area (ac)	Total Costs (R/W & Construction)	Pond Exhibit No.
1-1-2	X	On	Dry Detention	0.32	Low	0	Low	0	5.8	$ 110,000.00	Alt. 2 Basin 1 Option 1
1-2-2		Off	Wet Detention	1.23	Low	0	Low	1	5.6	$ 1,412,458.00	Alt. 2 Basin 1 Option 2
1-3-2		Off	Wet Detention	1.53	Low	0.07	Low	2	5.7	$ 3,072,648.00	Alt. 2 Basin 1 Option 3
Existing	X	On	Wet Detention	0.00	Low	0	Low	0	N/A	$ -	Alt. 2 Basin 2 Option 1
100-1	X	Off	Wet Detention	0.21	Low	0	Low	1	2.3	$ 993,372.00	Alt. 2 Basin 100 Option 1
100-2		Off	Wet Detention	0	Low	0	Low	1	1.9	$ 2,386,151.00	Alt. 2 Basin 100 Option 2
300-1		R	Wet Detention	0	Medium	0	Low	1	7.5	$ 2,574,732.00	Alt. 2 Basin 300 Option 1
300-2A	X	R	Wet Detention	0	Medium	0	Low	2	2.9	$ 2,822,704.00	Alt. 2 Basin 300 Option 2
300-2B	X	R	Wet Detention	0.28	Low	0	Low		1.2		Alt. 2 Basin 300 Option 2
300-2C	X	R	Wet Detention	0	Low	0	Low		1.6		Alt. 2 Basin 300 Option 2
300-3		Off	Wet Detention	1.39	Low	0	Low	1	4.7	$ 1,109,451.00	Alt. 2 Basin 300 Option 3
3-1-2		Off	Wet Detention	0.30	Low	0	Low	4	7.7	$ 2,690,420.00	Alt. 2 Basin 3 Option 1
3-2-2		Off	Wet Detention	1.48	Medium	3.9	Low	4	9.7	$ 2,058,089.00	Alt. 2 Basin 3 Option 2
3-3-2	X	On	Dry Detention	1.22	Low	0	Low	0	8.1	$ 132,700.00	Alt. 2 Basin 3 Option 3
4-1		Off	Wet Detention	0	Low	0.51	Low	2	2.8	$ 839,250.00	Alt. 2 Basin 4 Option 1
4-2		Off	Wet Detention	0	Low	0	Low	1	3.5	$ 748,147.00	Alt. 2 Basin 4 Option 2
4-3	X	On	Dry Detention	0	Low	0	Low	0	2.9	$ 39,100.00	Alt. 2 Basin 4 Option 3
5-1		Off	Wet Detention	0.03	Medium	0	Low	2	6.9	$ 1,617,983.00	Alt. 2 Basin 5 Option 1
5-2		Off	Wet Detention	0.00	Low	0	Low	1	6.5	$ 392,600.00	Alt. 2 Basin 5 Option 2
5-3A	X	On	Dry Detention	0	Low	0	Low	0	1.7	$ 83,200.00	Alt. 2 Basin 5 Option 3
5-3B	X	On	Dry Detention	0.53	Low	0	Low	0	1.0		Alt. 2 Basin 5 Option 3
5-3C	X	On	Dry Detention	1.76	Low	0	Low	0	3.0		Alt. 2 Basin 5 Option 3

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10.0 Conclusions

The above-mentioned ponds are recommended for the final design of the stormwater management facilities for the widening of SR 91 from Kissimmee Park Road to US 192 (MP 238.5-242.5). These ponds are necessary to meet the required drainage design criteria for the project.

This project will have no adverse impact on the area's water quality. Stormwater treatment of the additional impervious areas will be treated as required by the SFWMD Environmental Resource Permit (ERP).

There is no change in flood "Risk" or floodplain impacts associated with this project. The drainage features will be designed according to the FDOT Drainage Manual, Topic No. 625-040-002.

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11.0 References

11.1 Contamination Screening Evaluation Report for PD&E Study Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192 (MP 238.5 to MP 242.5), November 2019.

11.2 Cultural Resource Assessment Study for PD&E Study Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192 (MP 238.5 to MP 242.5), November 2019.

11.3 FDEP Basin Management Action Plan for the Implementation of Total Maximum Daily Loads for Total Phosphorous by the FDEP in Lake Okeechobee, December 2014.

11.4 FDOT Design Manual, January 2019.

11.5 FDOT Drainage Manual, January 2019.

11.6 FDOT Drainage Design Guide, January 2019.

11.7 FEMA Flood Insurance Study for Osceola County, Florida and FIRM Panels; 12097C0090G and 12097C0252G; June 18, 2013.

11.8 Natural Resources Evaluation for PD&E Study Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192 (MP 238.5 to MP 242.5), November 2019.

11.9 Florida Department of Revenue. Parcel data, 2017.

11.10 SFWMD ERP Applicant's Handbook Volume II, May 22, 2016

11.11 SFWMD Right-of-Way Criteria Manual for Use of Works or Lands of the District, August 12, 2013.

11.12 Technical Release 55 (TR-55): Urban Hydrology for Small Watershed, Natural Resources Conservation Service, June 1986.

11.13 Turnpike Supplement to the FDOT Drainage Manual, January 2019.

11.14 United States Army Corps of Engineers, Jacksonville District, Central, and Southern Florida Project - *Kissimmee River Headwaters Revitalization Project – Integrated Project Modification Report and Supplement to the Final Environmental Impact Statement*, January 1996

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Appendix A

Drainage Maps

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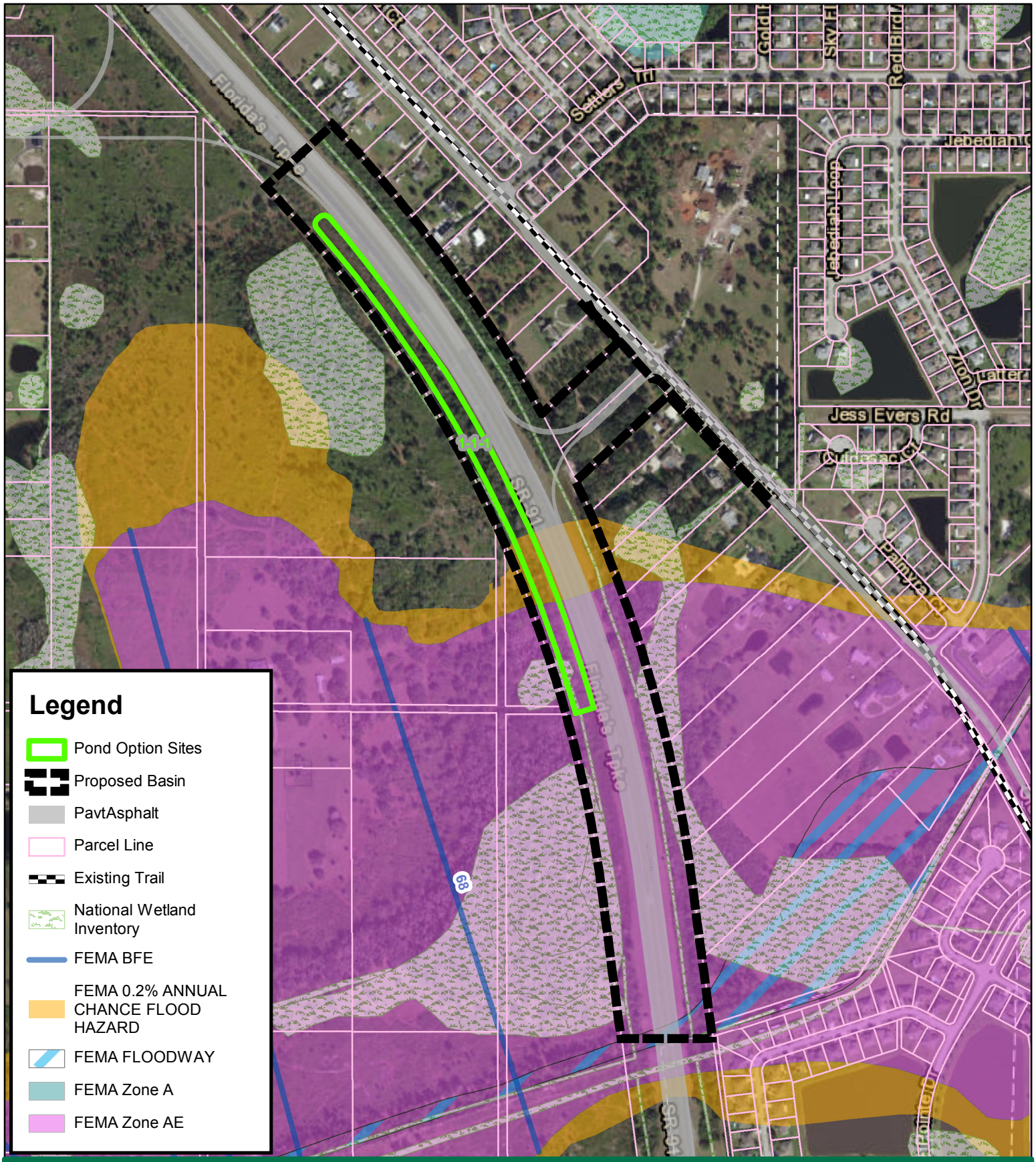


FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

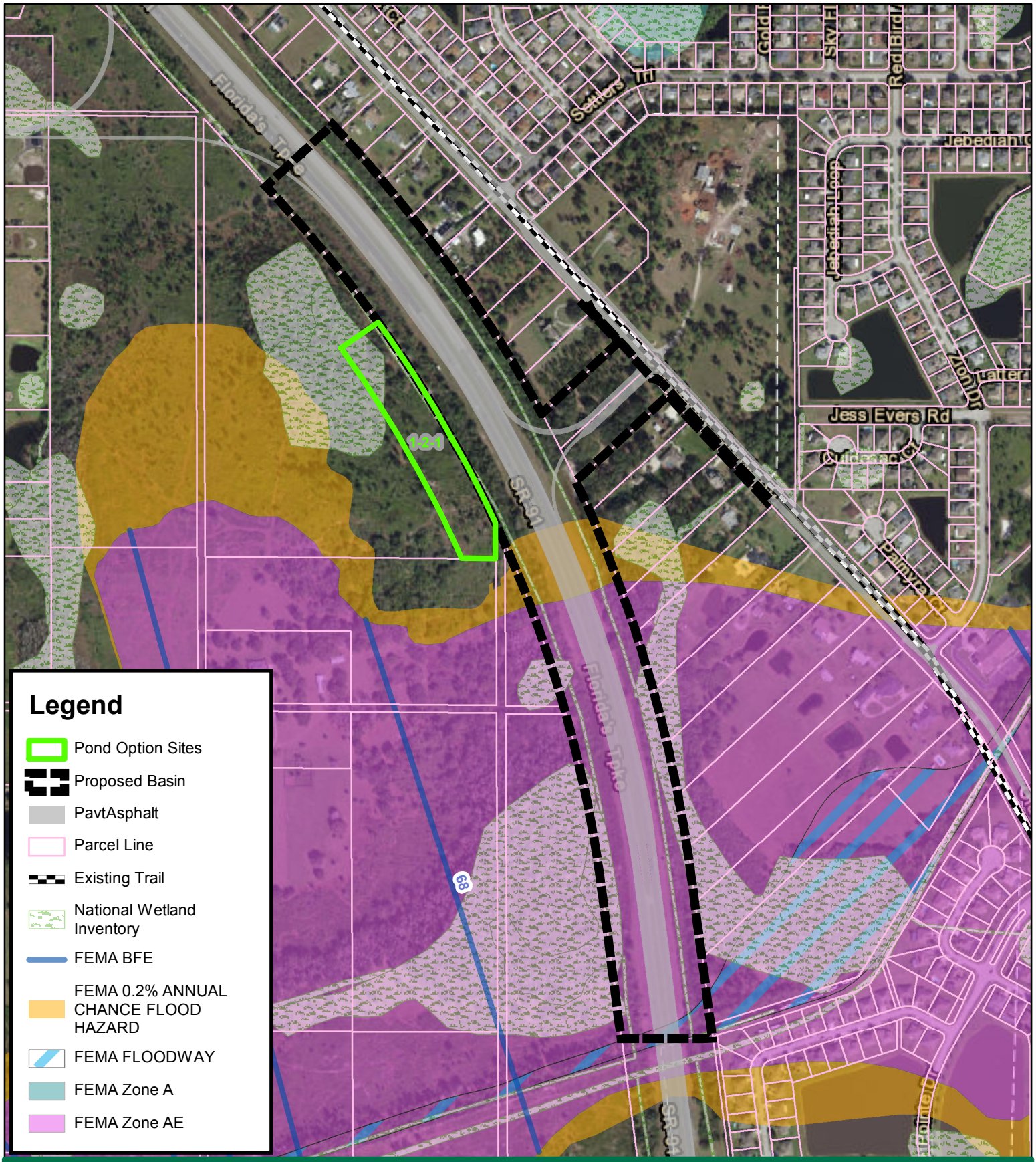
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 1
Option 1

0 250 500 1,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

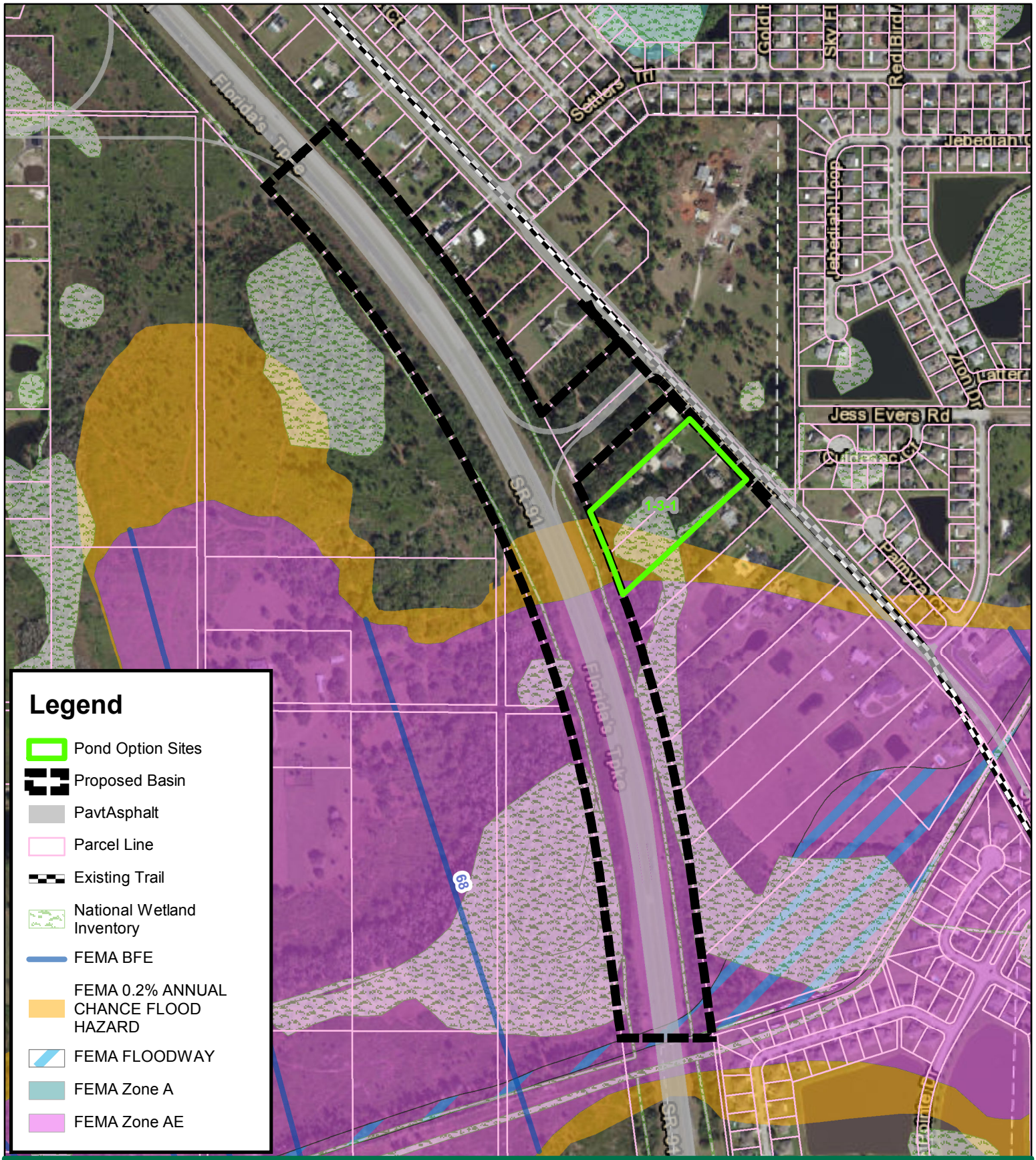
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 1
Option 2

0 250 500 1,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

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Alternative 1
Basin 1
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0 250 500 1,000 Feet

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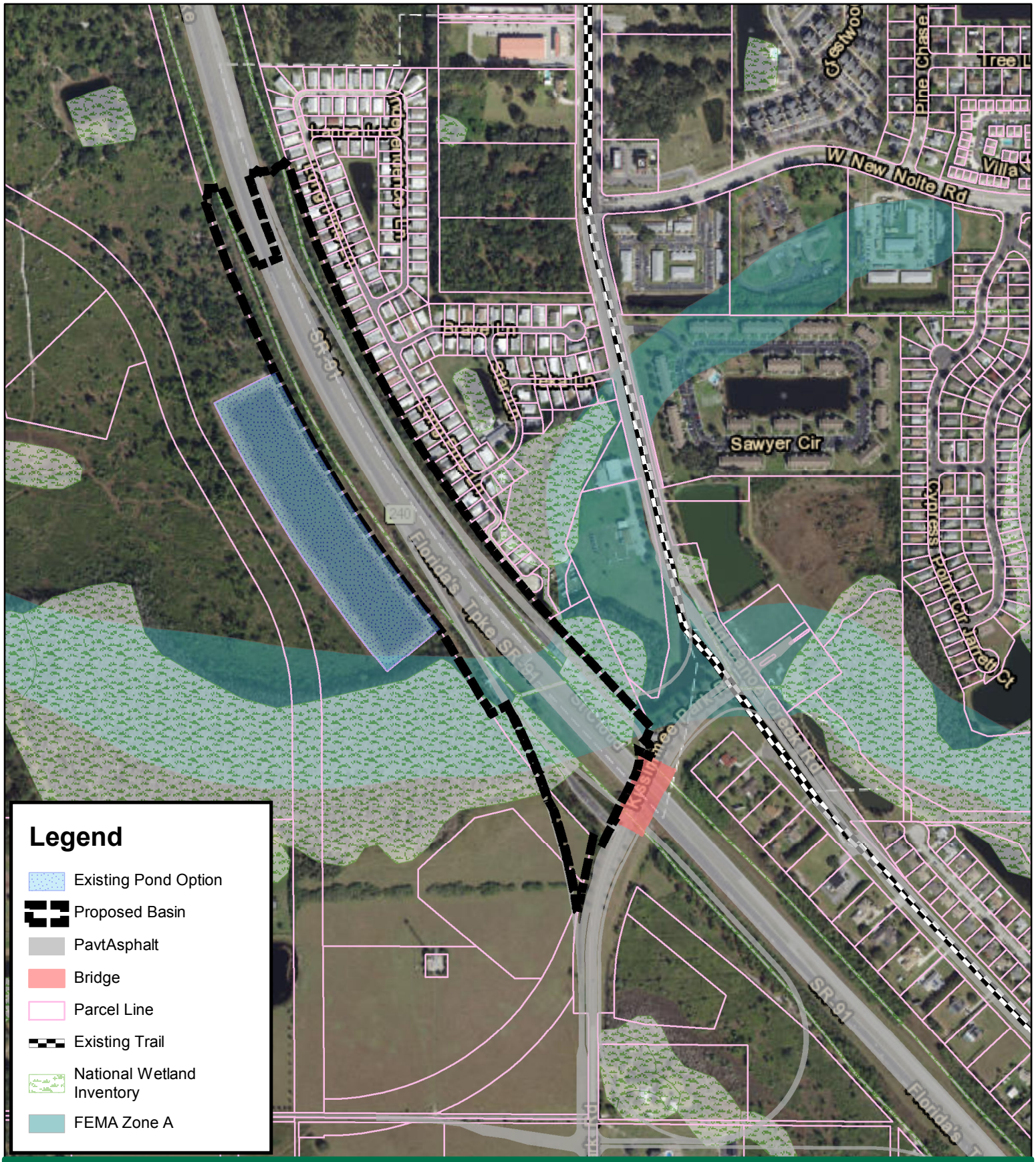


FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

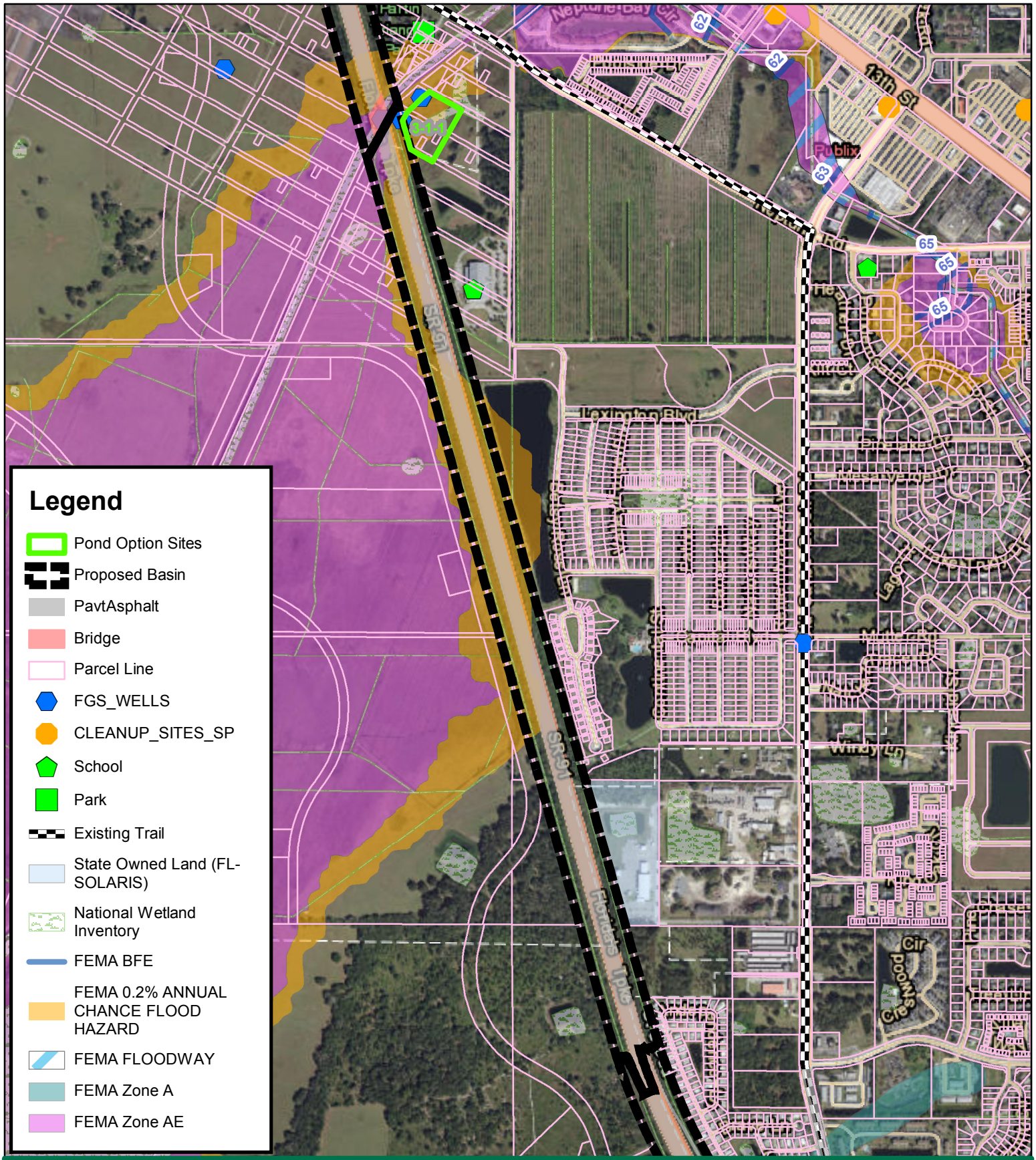
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 2
Option 1

0 250 500 1,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

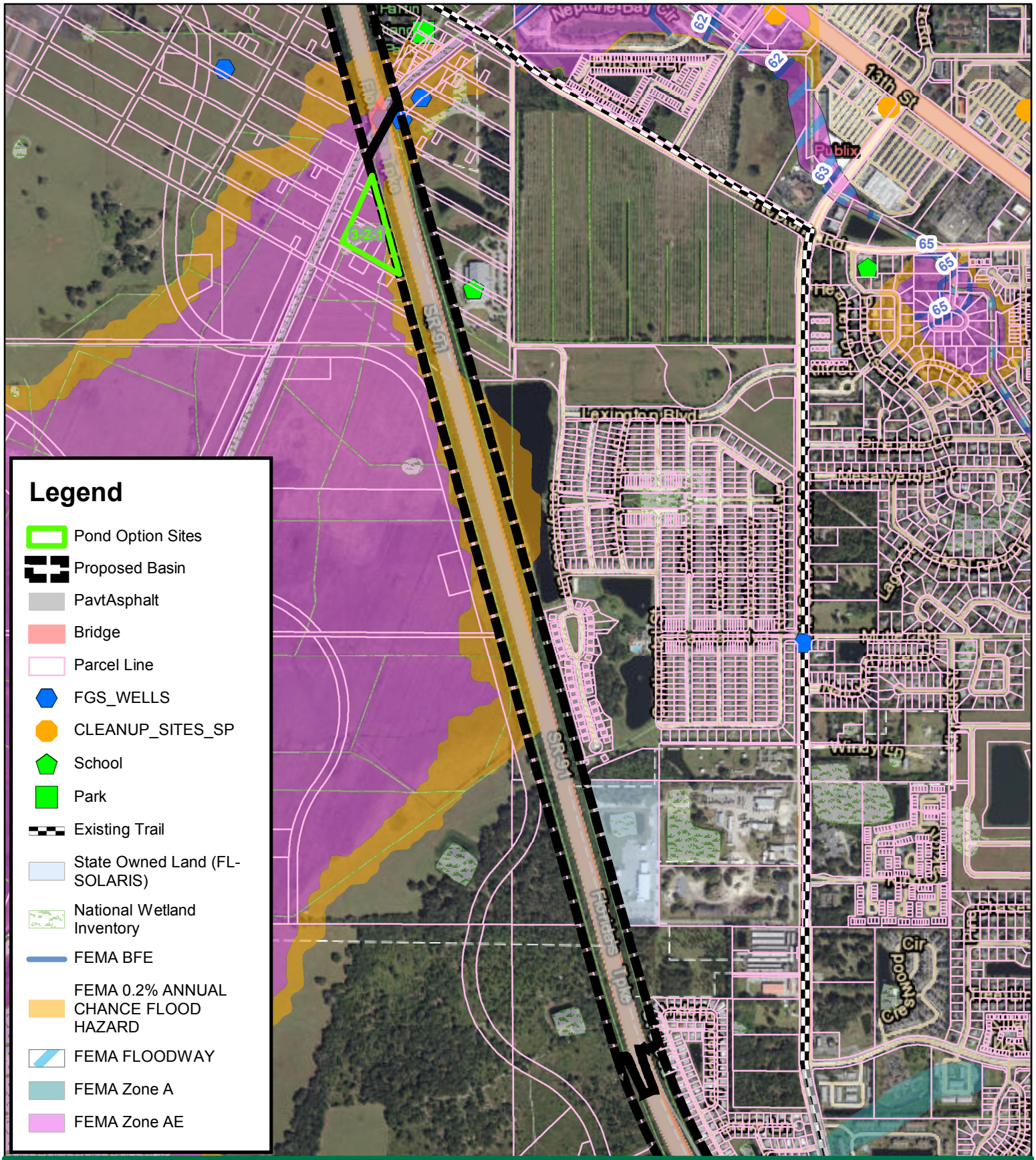
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 3
Option 1

0 500 1,000 2,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

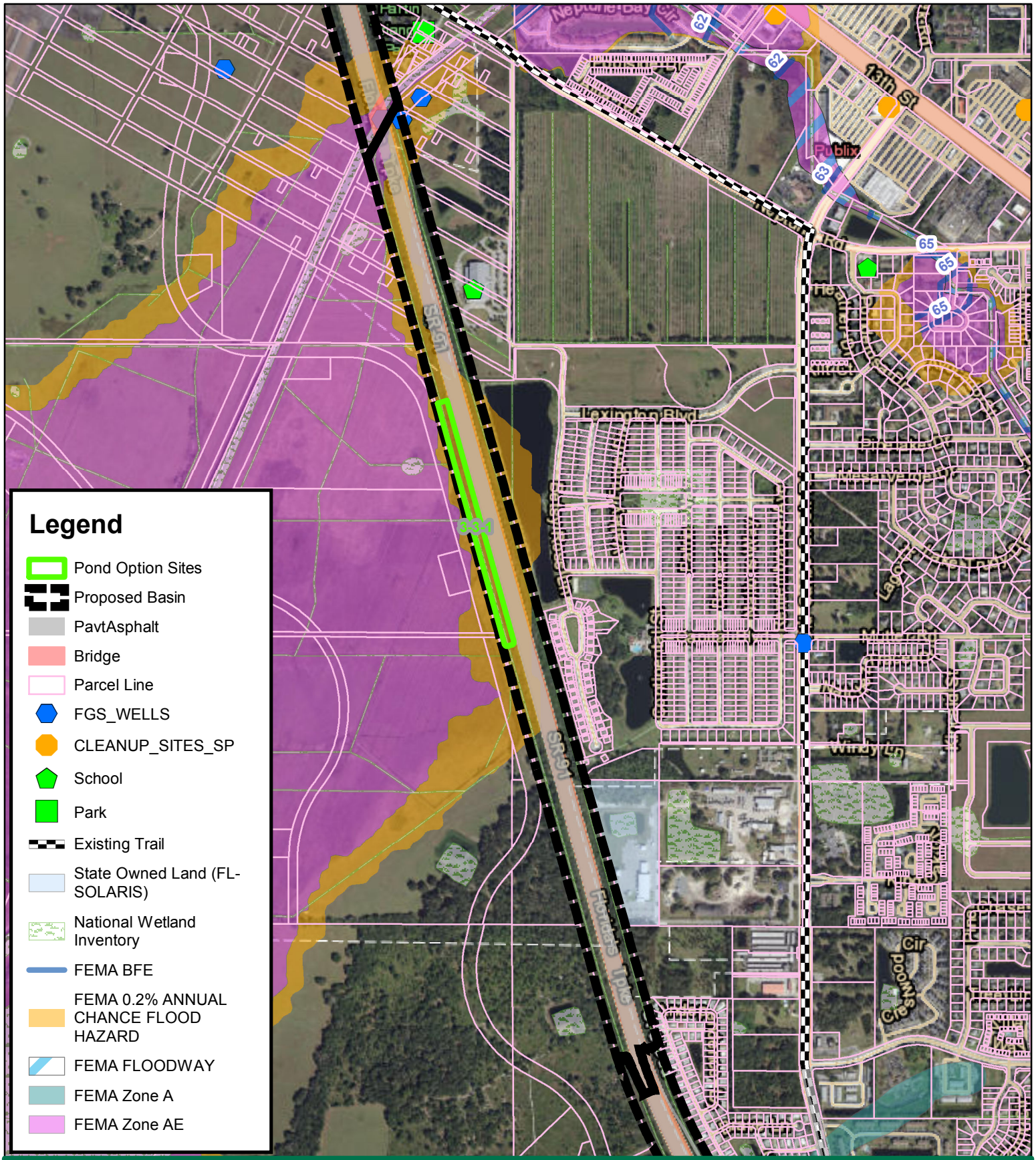
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 3
Option 2

0 500 1,000 2,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

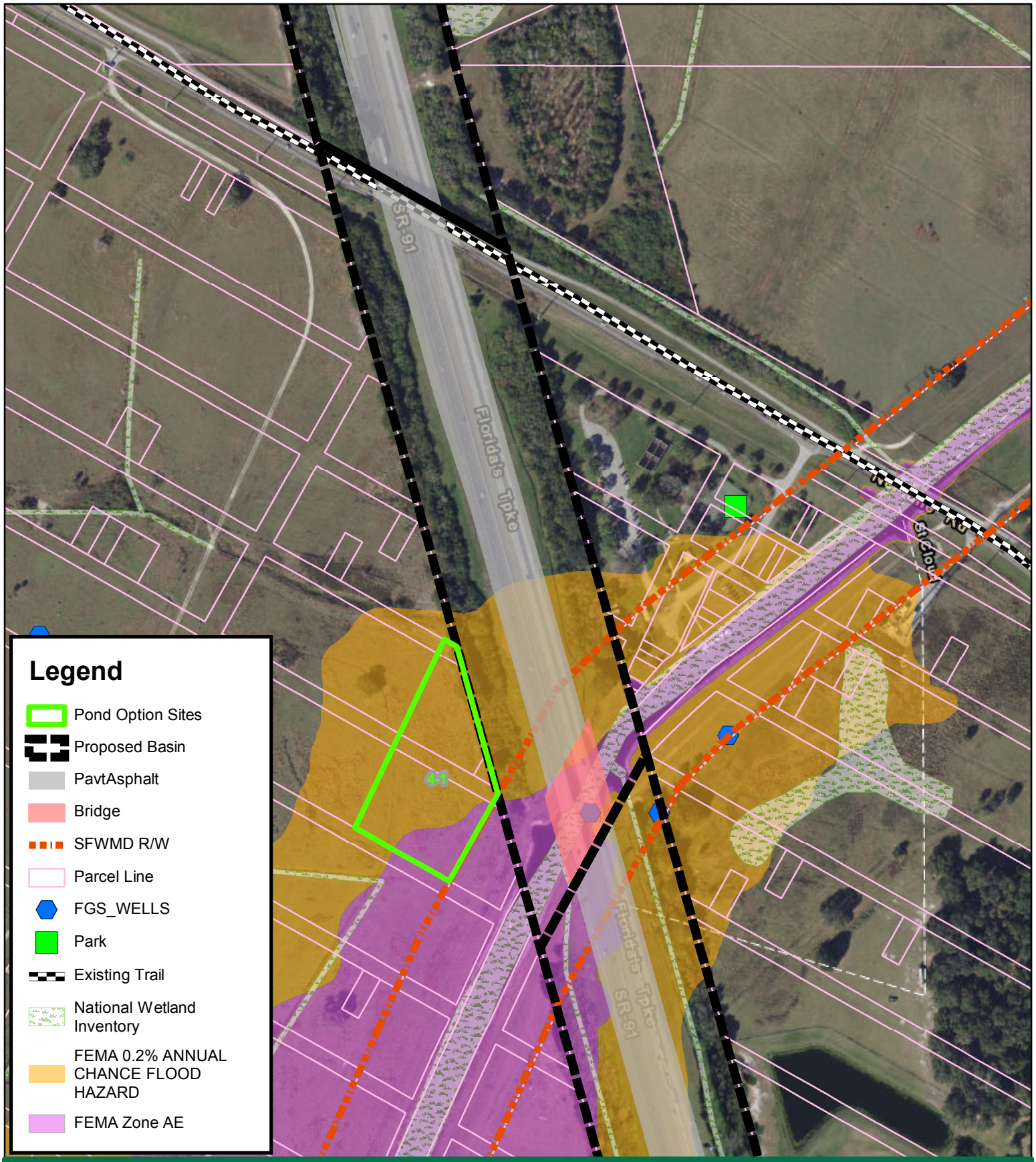
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 3
Option 3

0 500 1,000 2,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

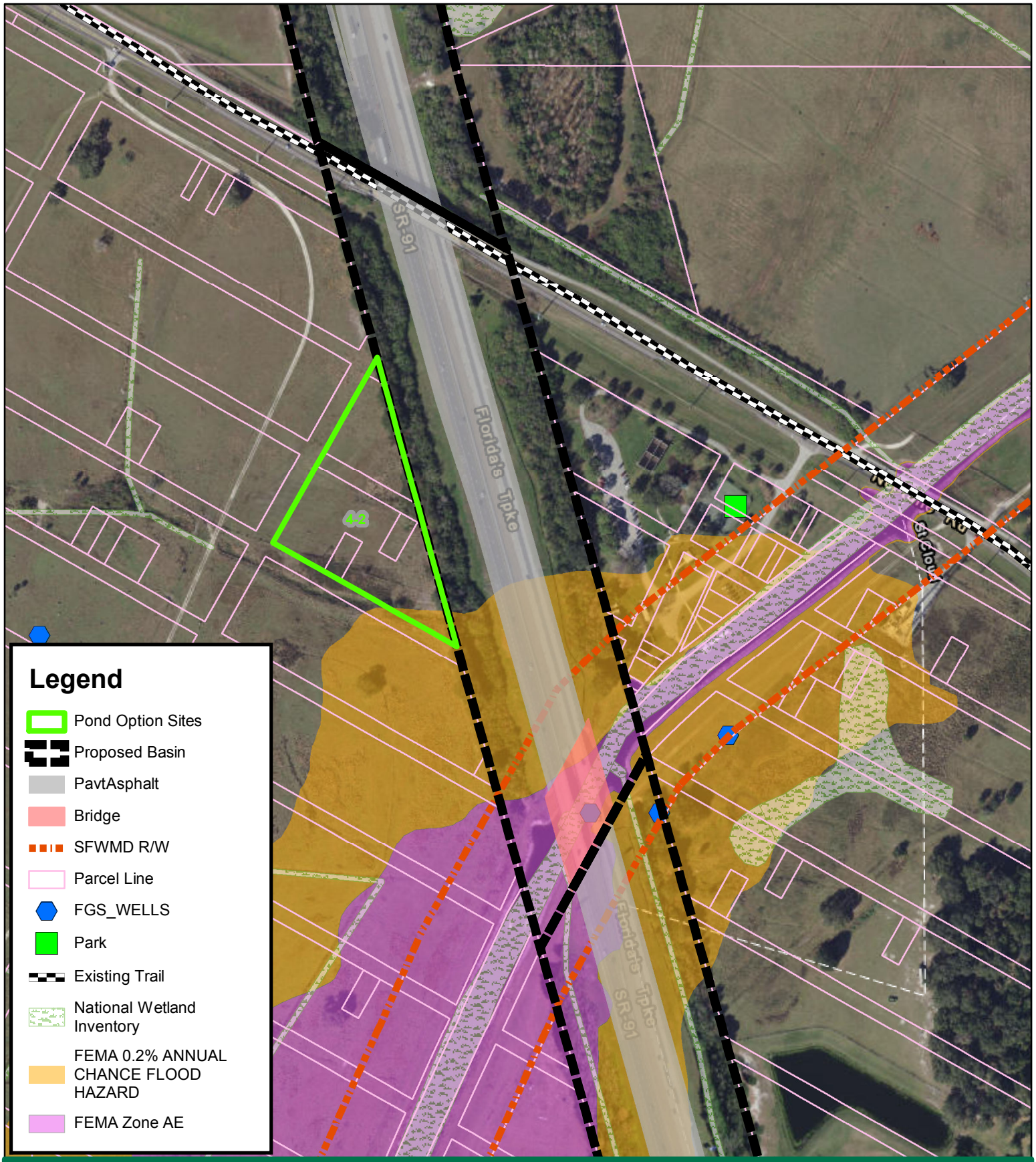
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 4
Option 1

0 150 300 600 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

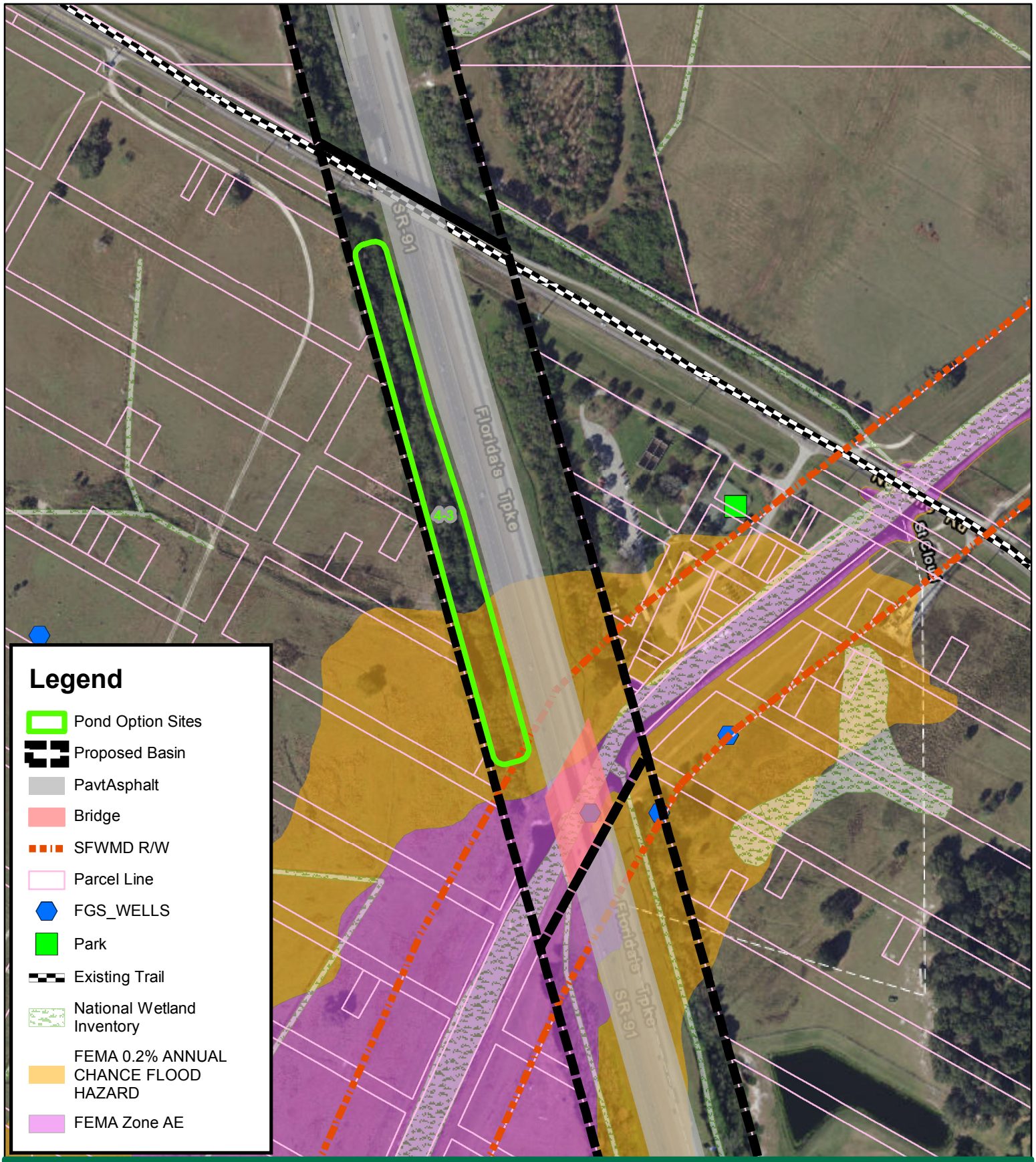
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 4
Option 2

0 150 300 600 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

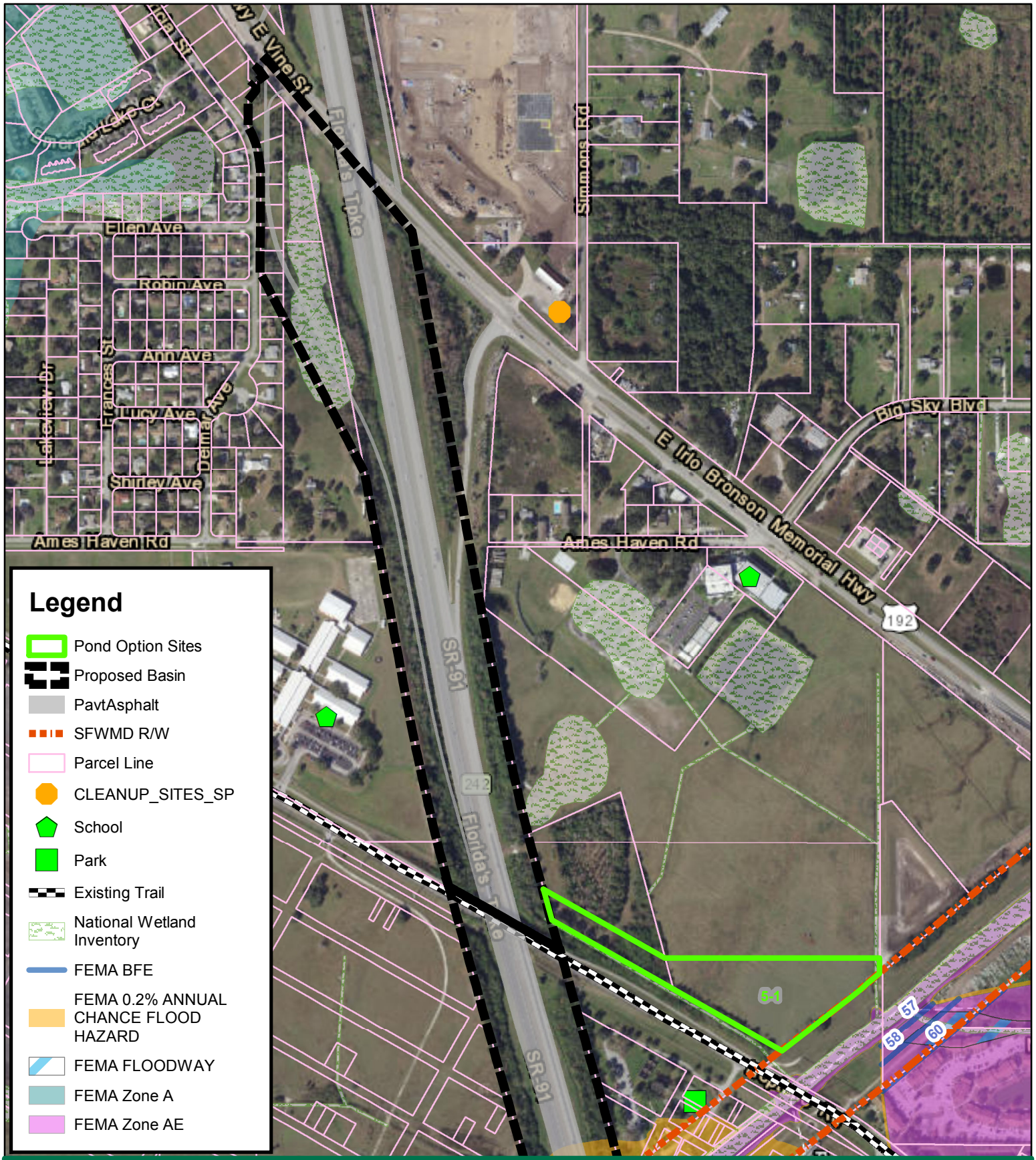
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 4
Option 3

0 150 300 600 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

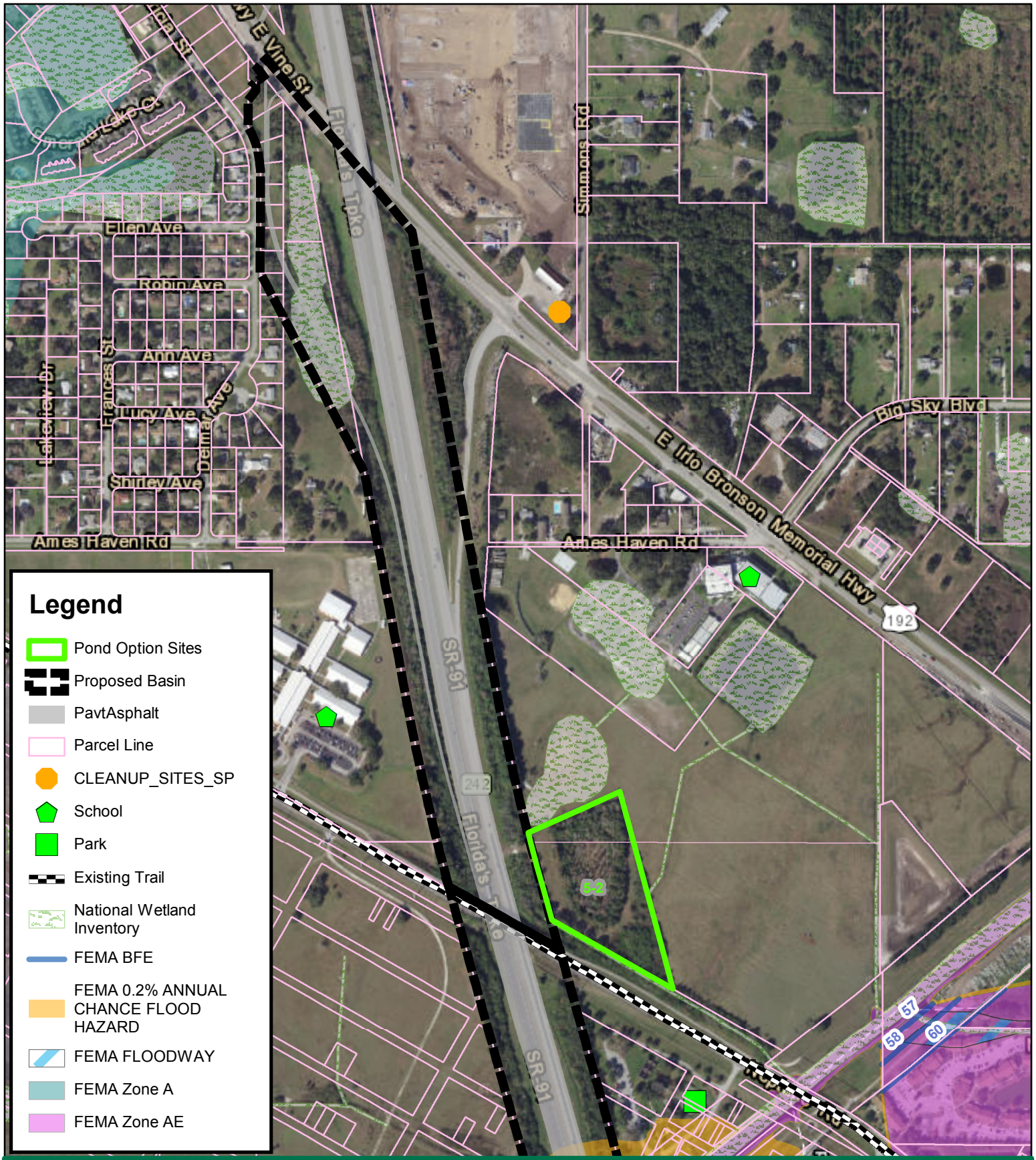
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 5
Option 1

0 250 500 1,000 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

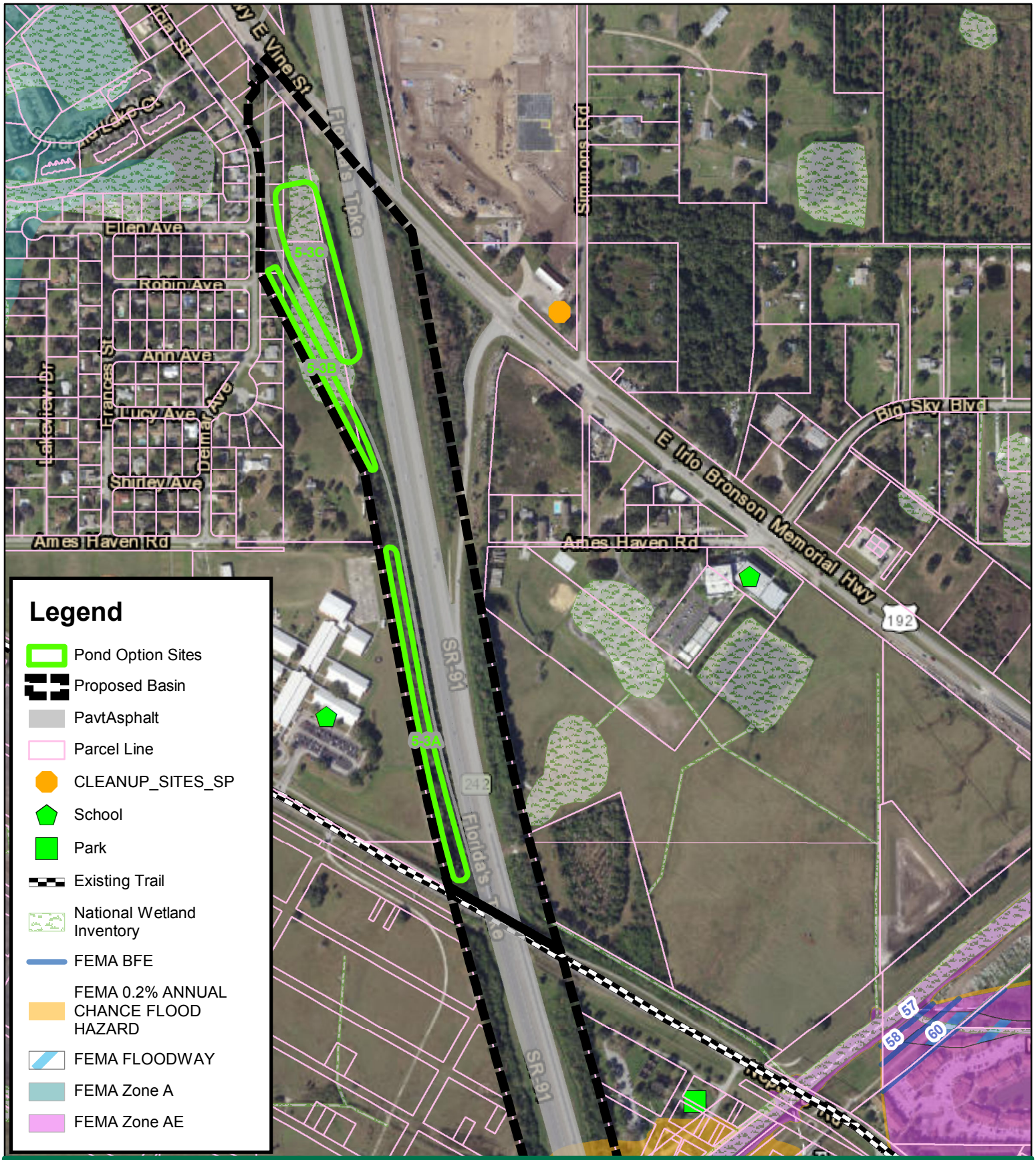
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 5
Option 2

0 250 500 1,000 Feet

N



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FROM SOUTH OFKISSIMMEE PARK ROAD TO US 192
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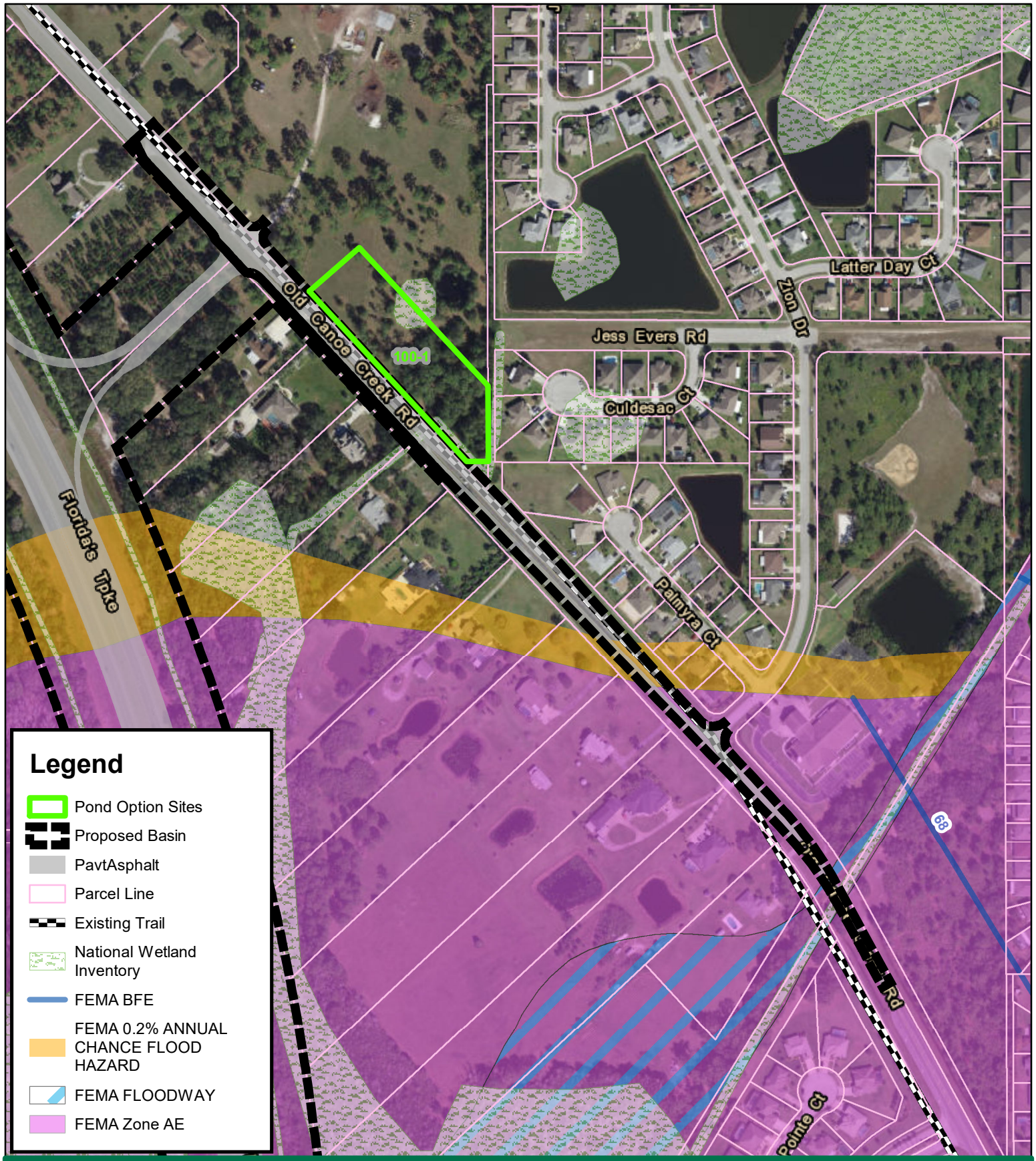
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 5
Option 3

0 250 500 1,000 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

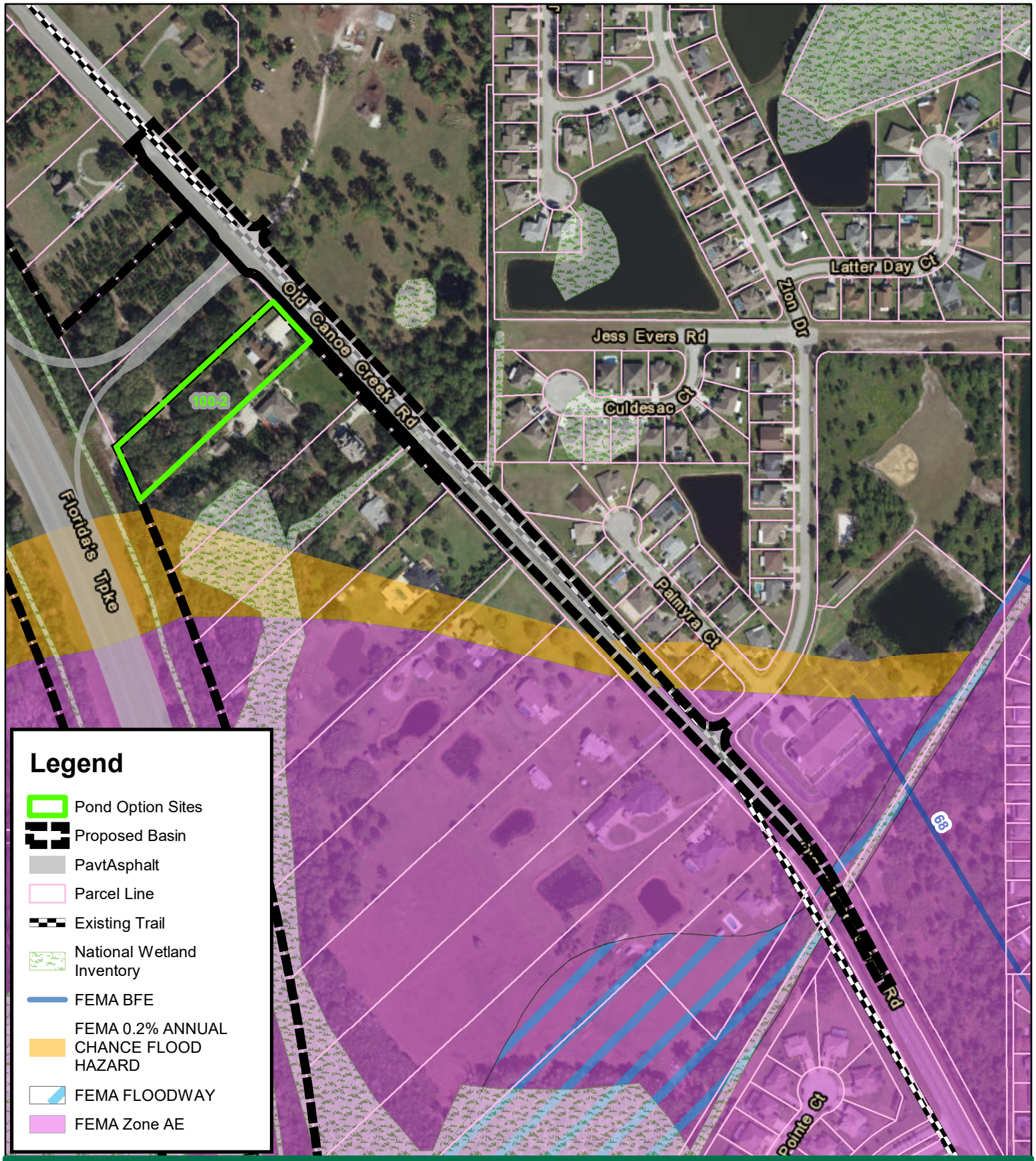
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 100
Option 1

0 150 300 600 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

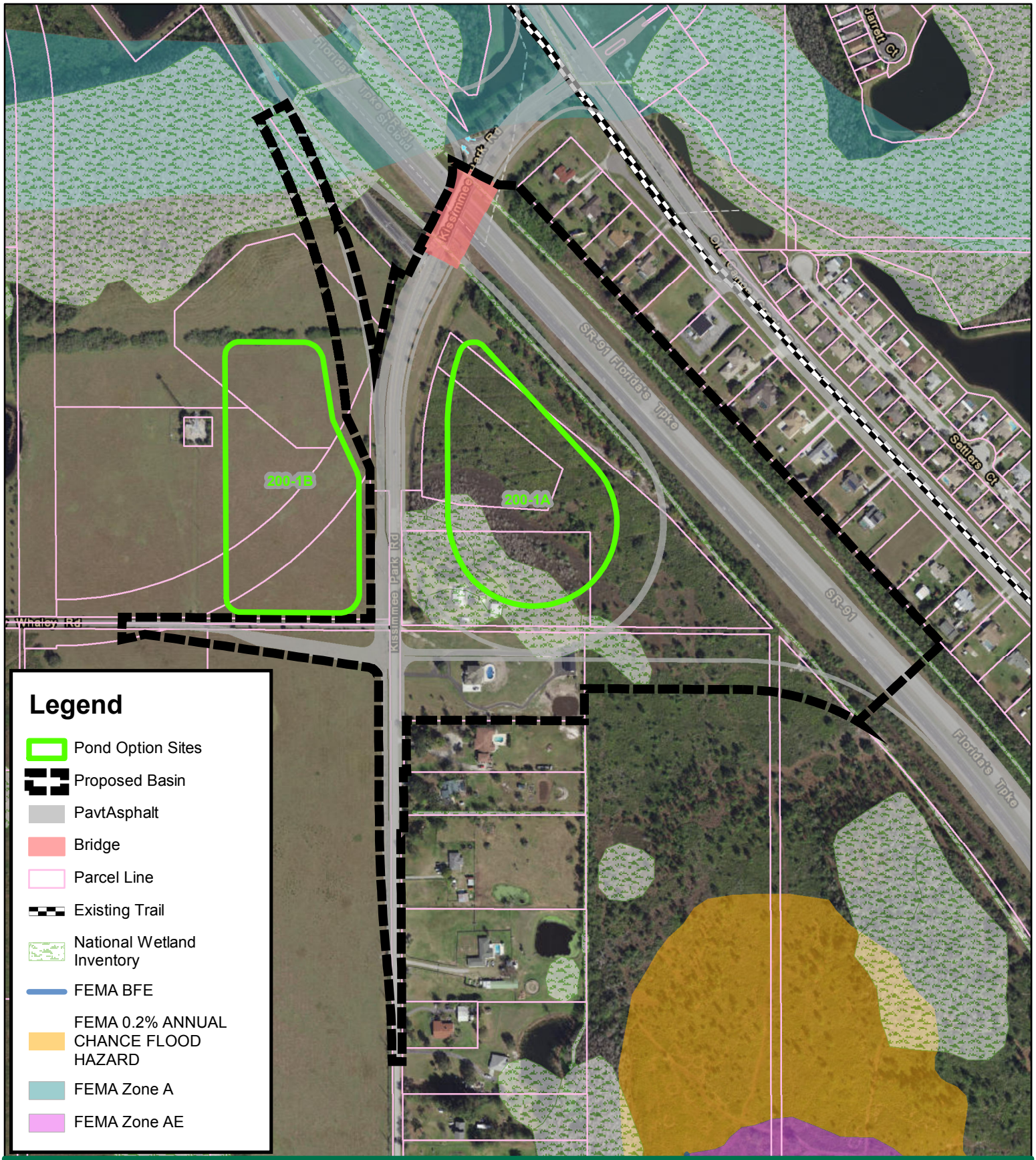
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 100
Option 2

0 150 300 600 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OFKISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

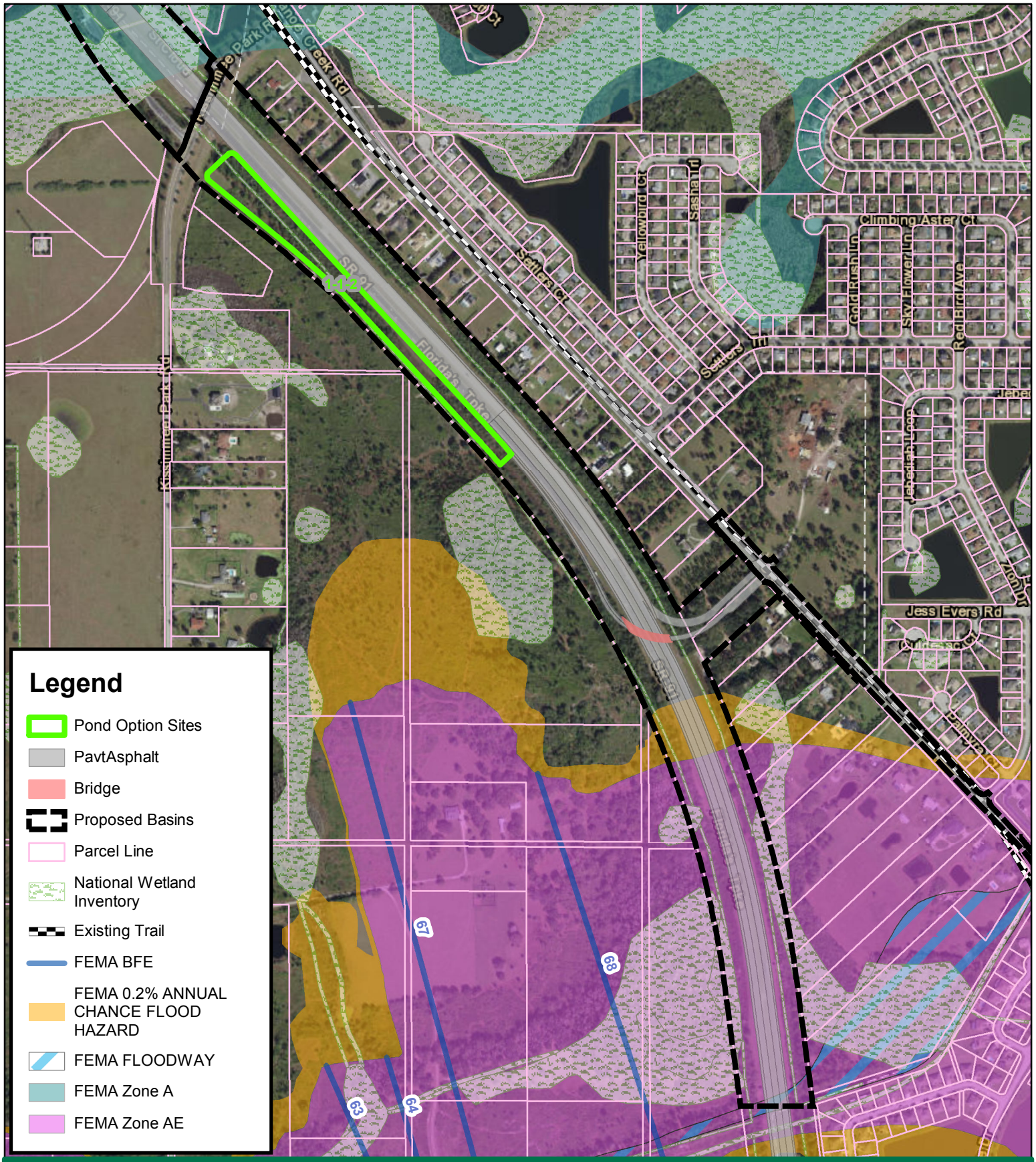
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1
Basin 200
Option 1

0 200 400 800 Feet

N



FLROIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

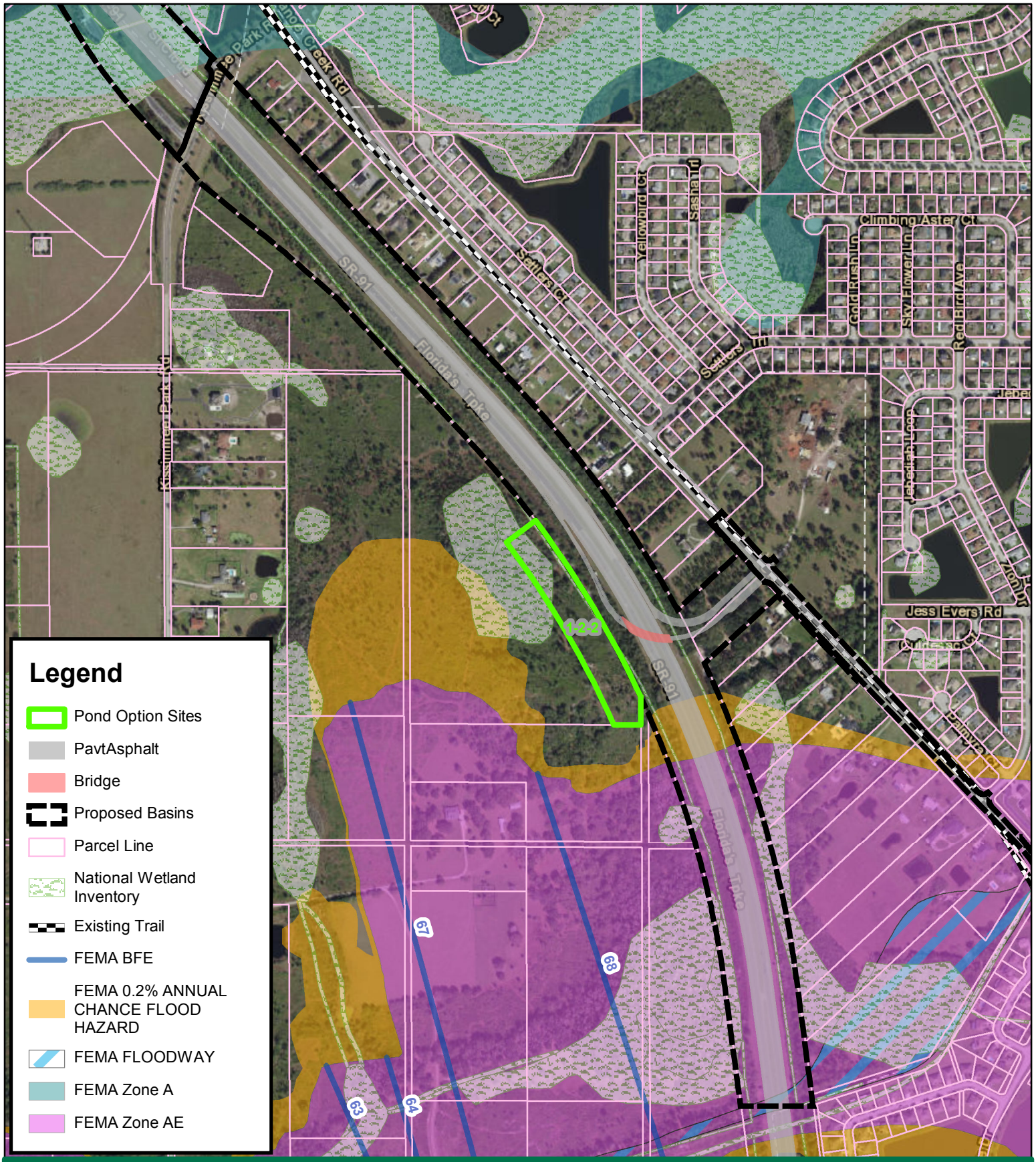
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 1
Option 1

0 320 640 1,280 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

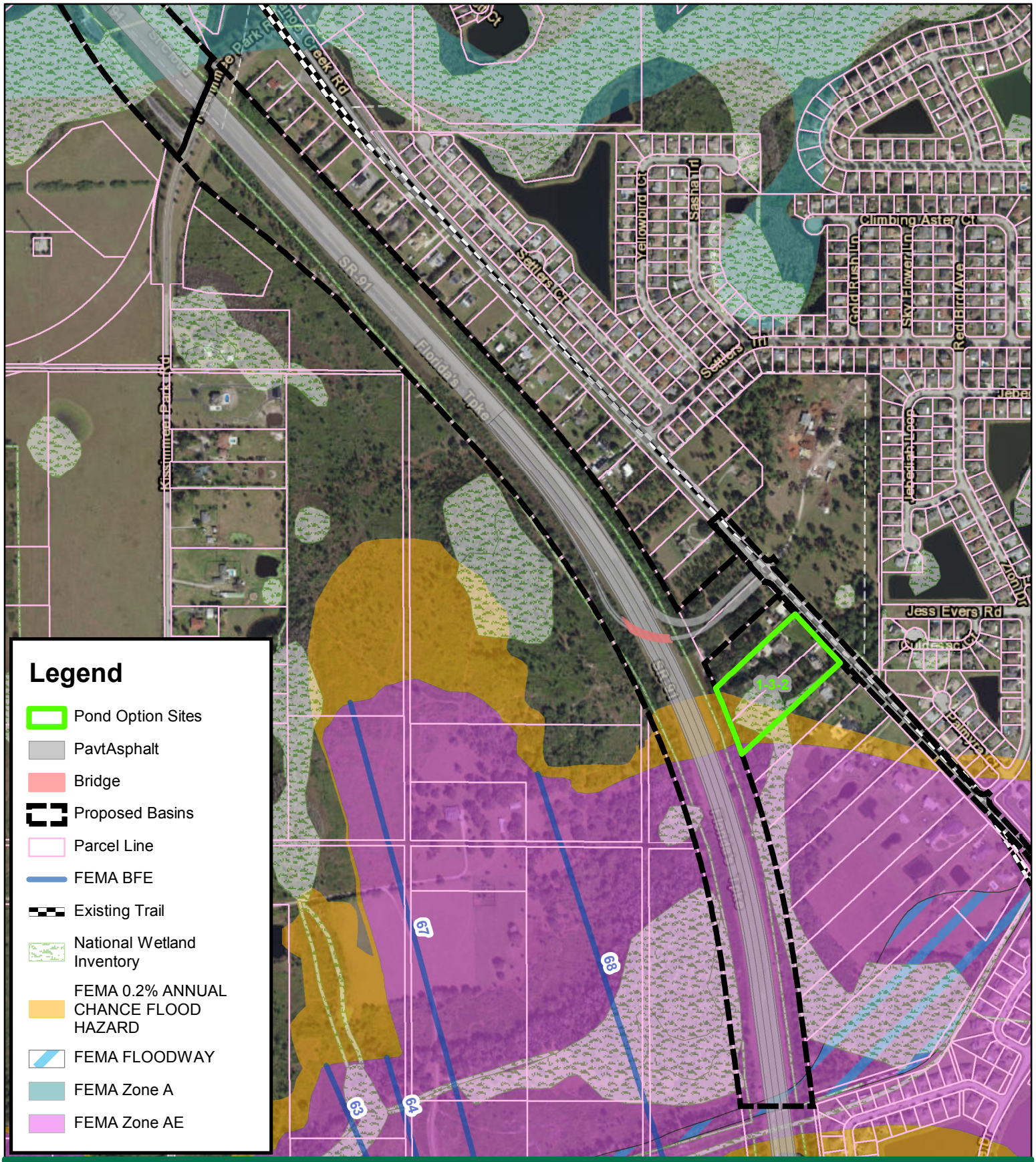
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 1
Option 2

0 320 640 1,280 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

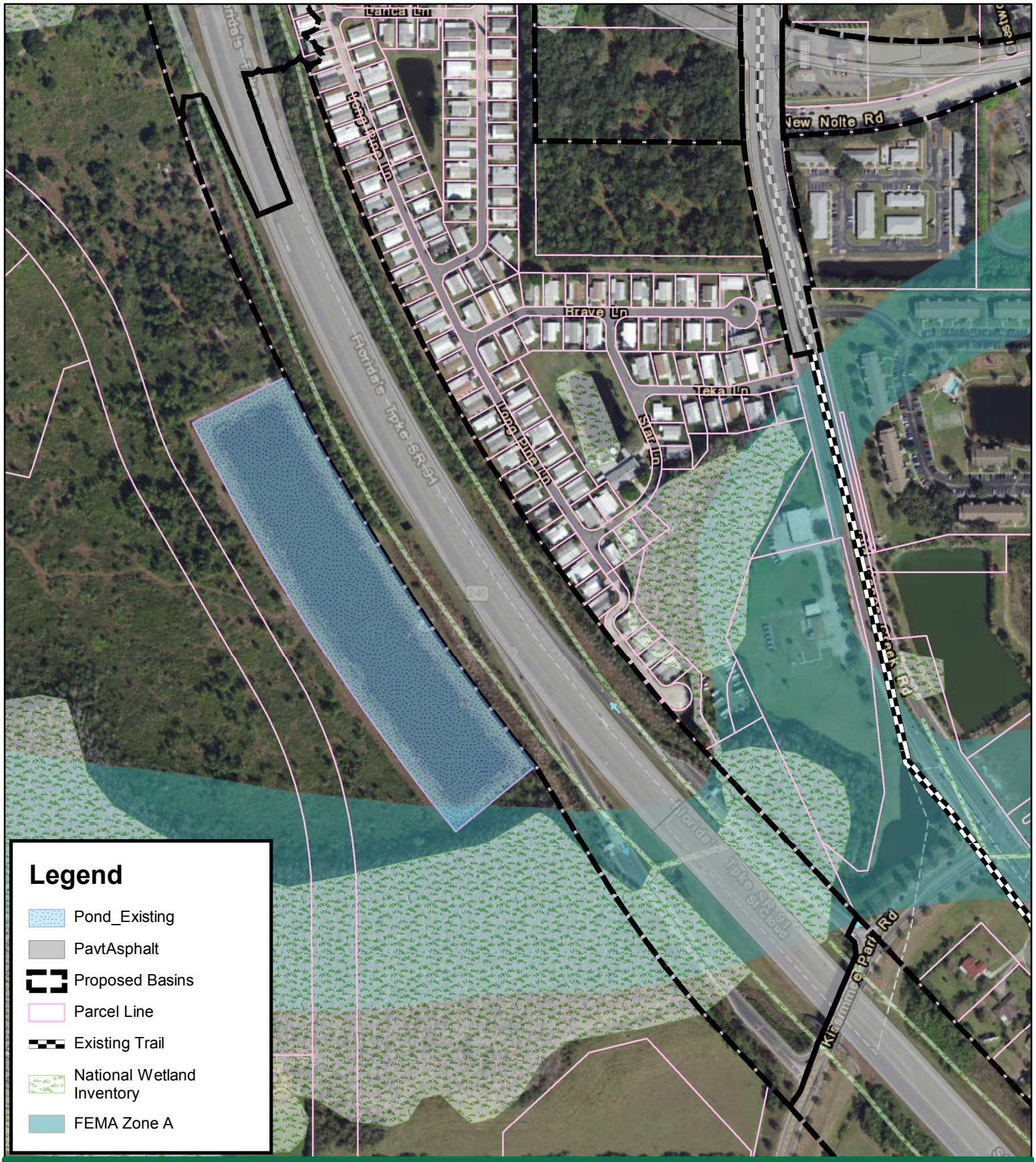
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 1
Option 3

0 320 640 1,280 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
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OSCEOLA COUNTY, FLORIDA
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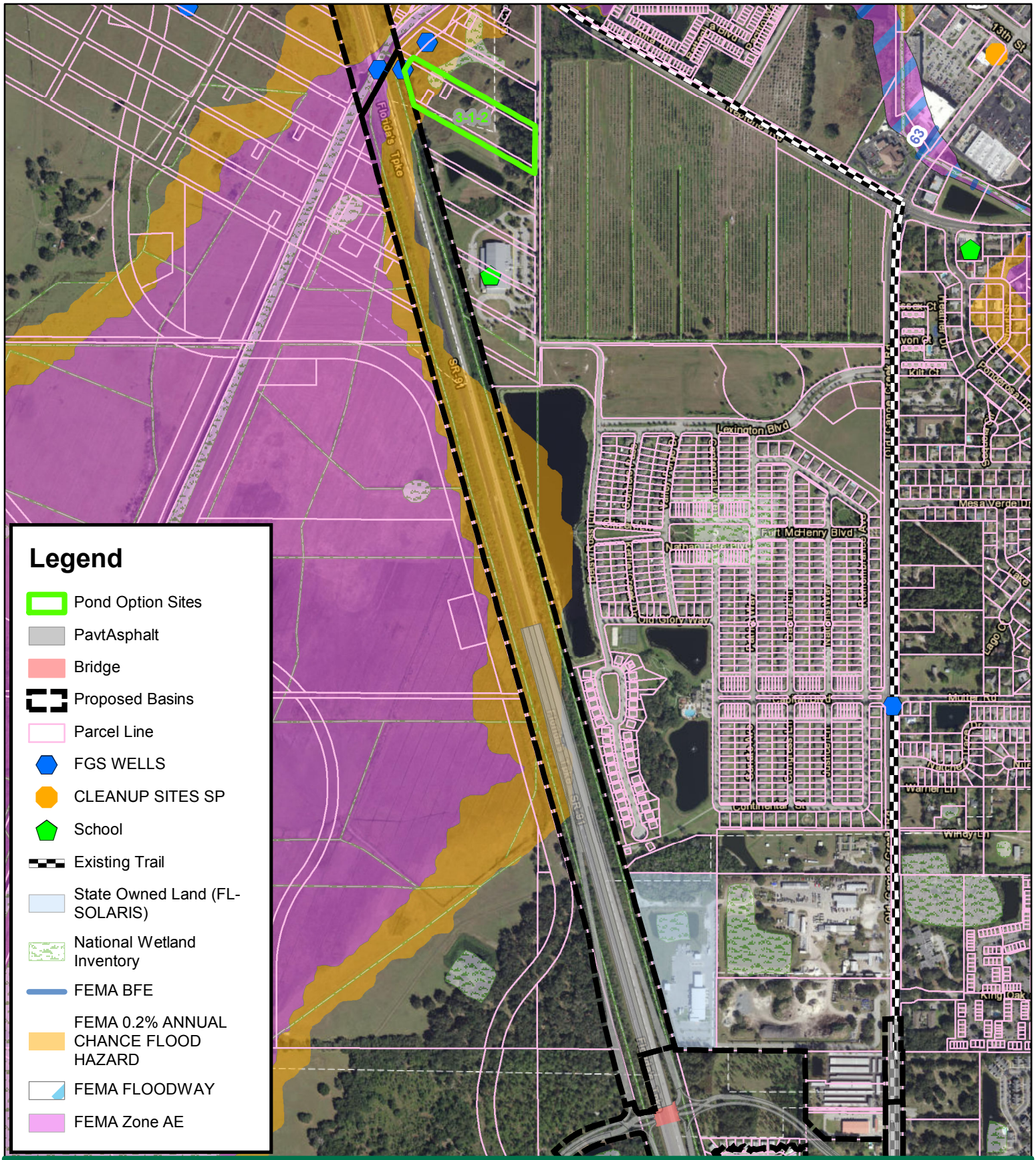
PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 2
Option 1

0 165 330 660 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

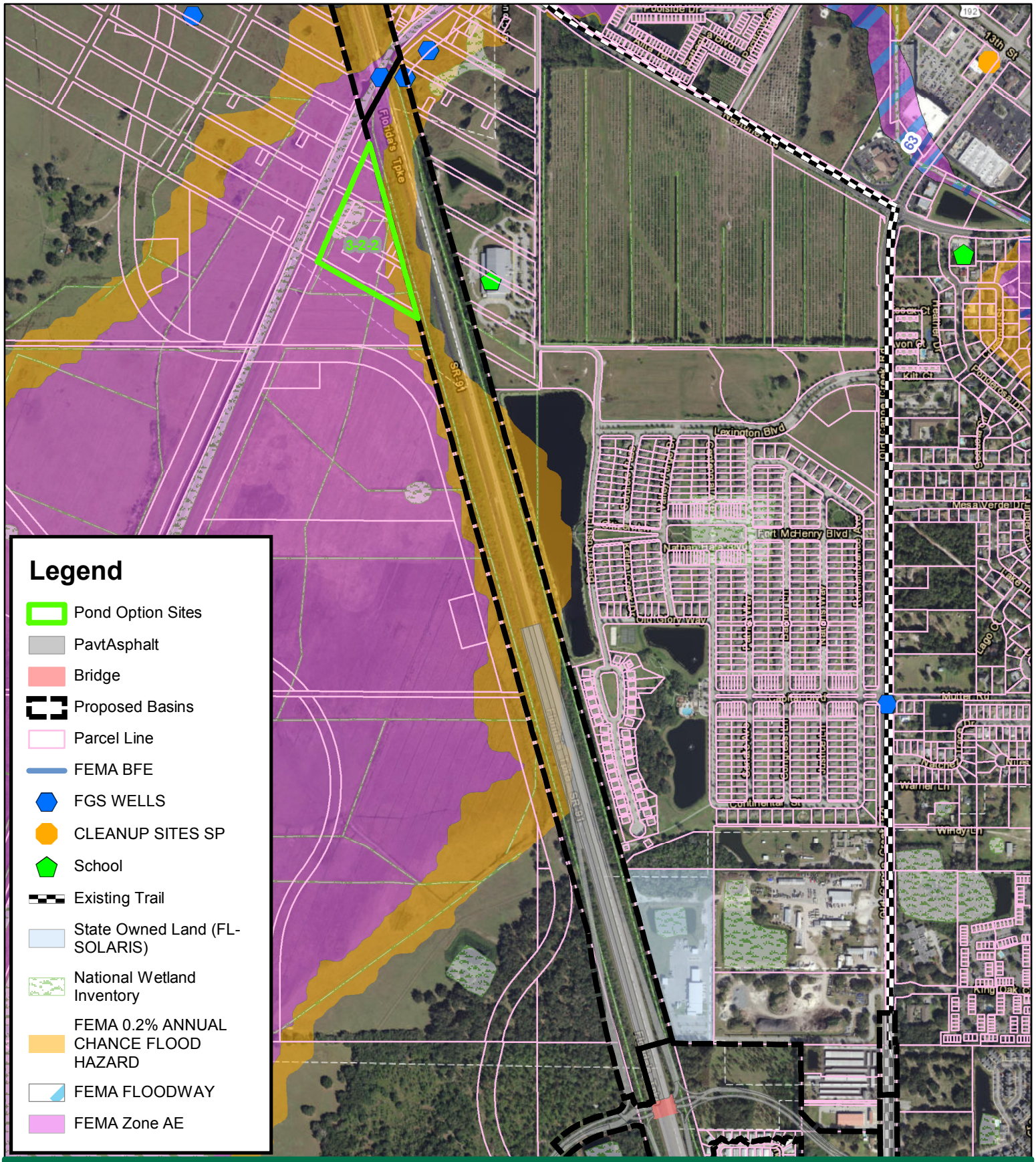
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 3
Option 1

0 425 850 1,700 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

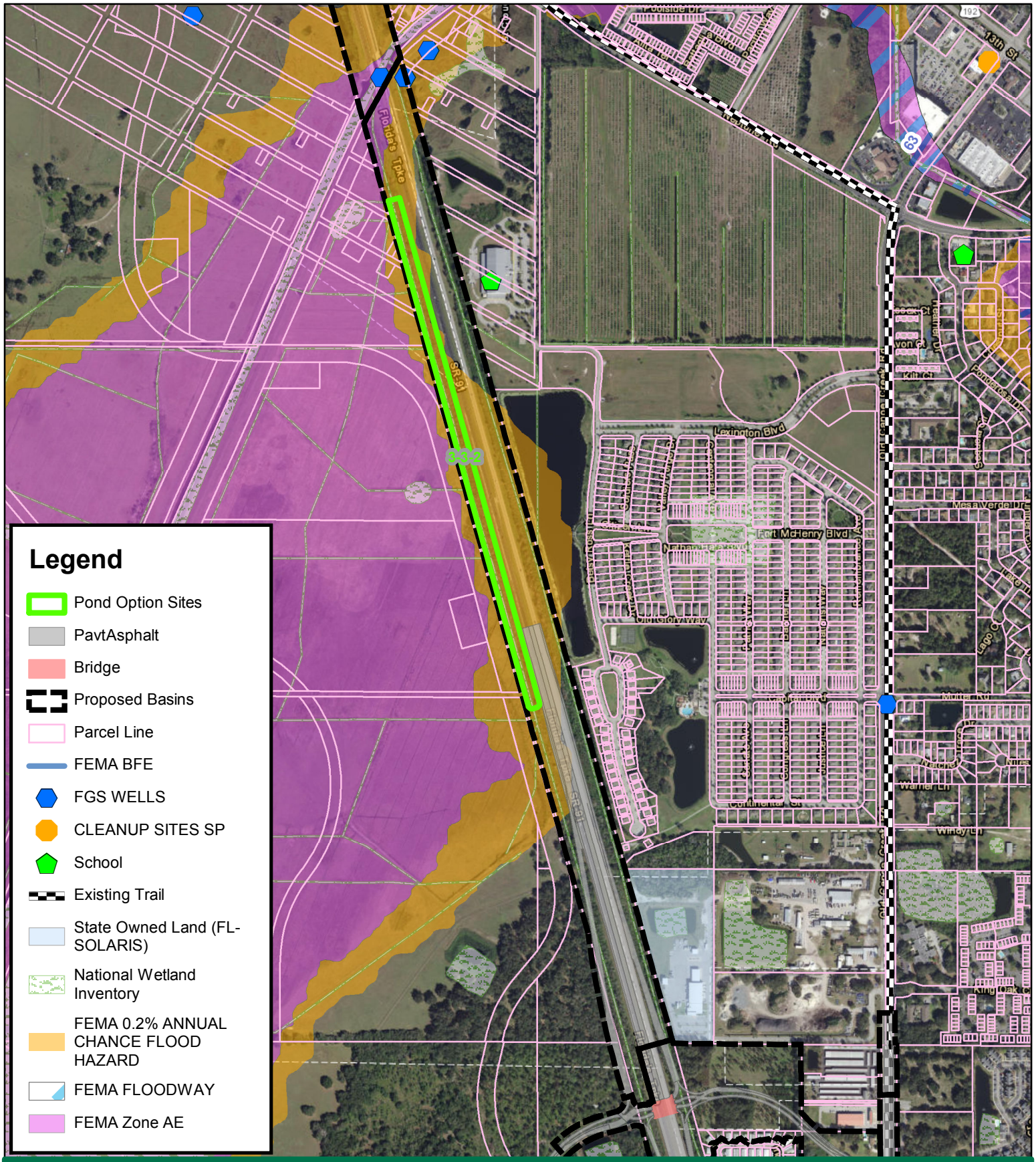
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 3
Option 2

0 435 870 1,740 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

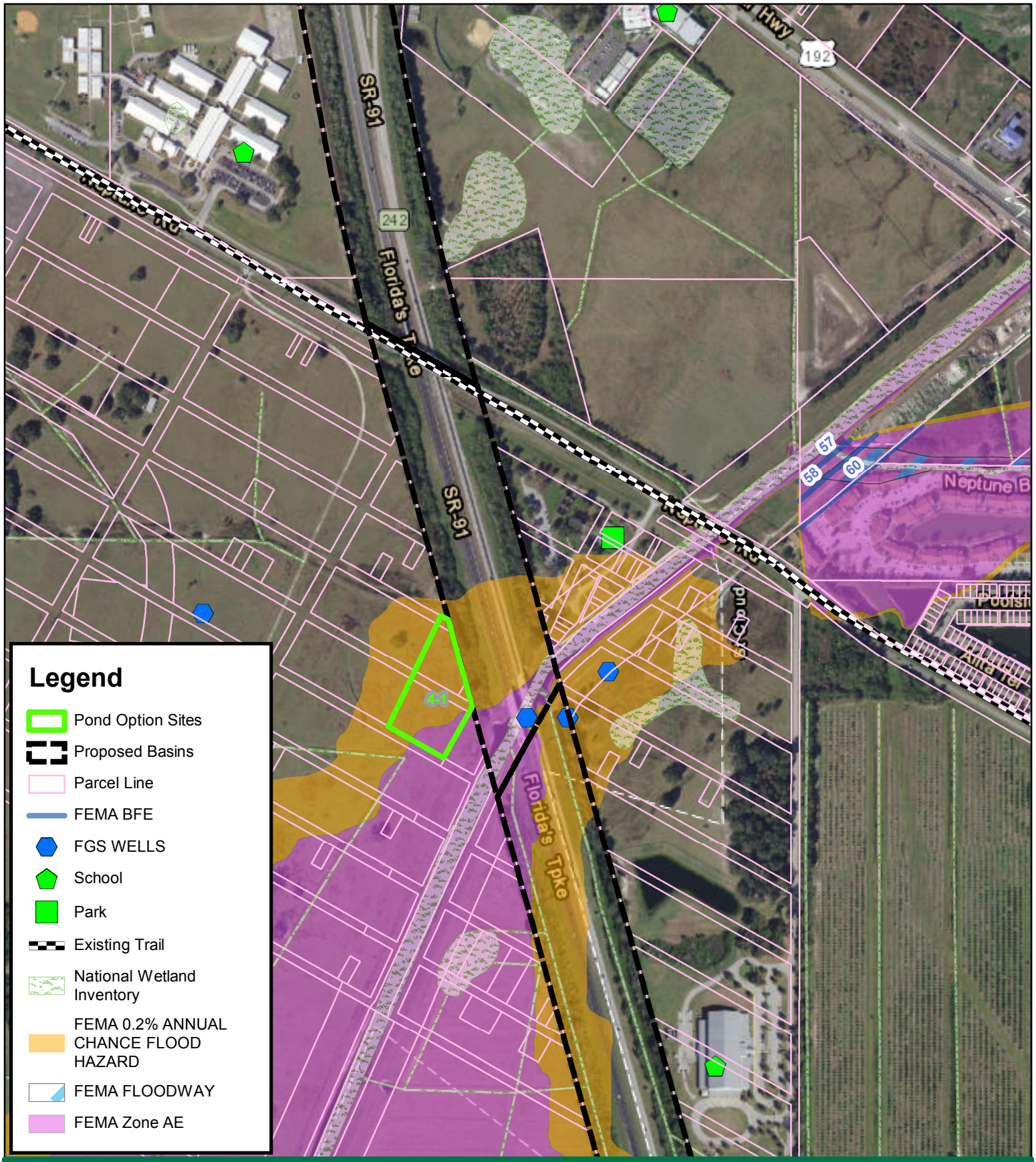
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 3
Option 3

0 435 870 1,740 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
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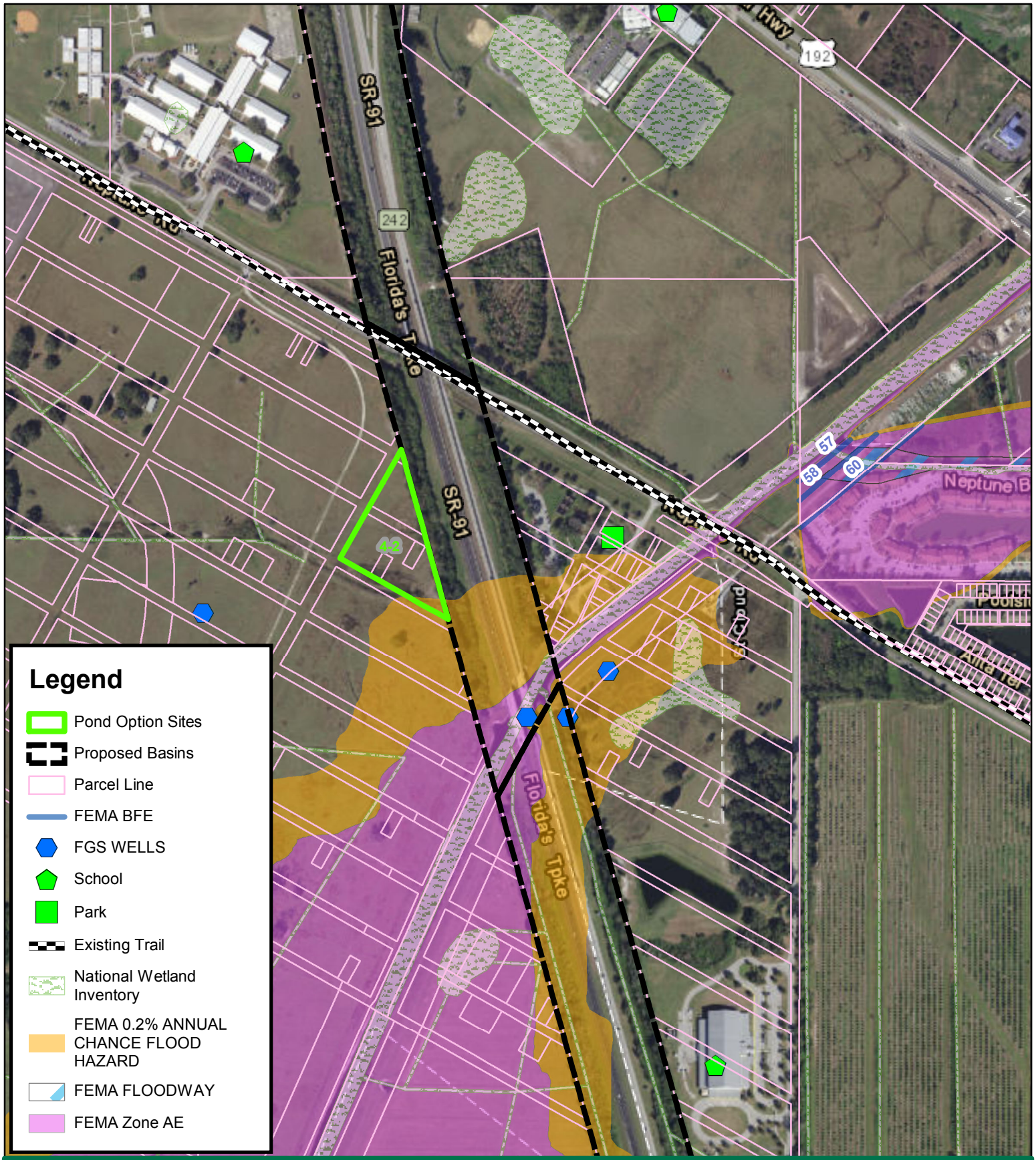
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 4
Option 1

0 250 500 1,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

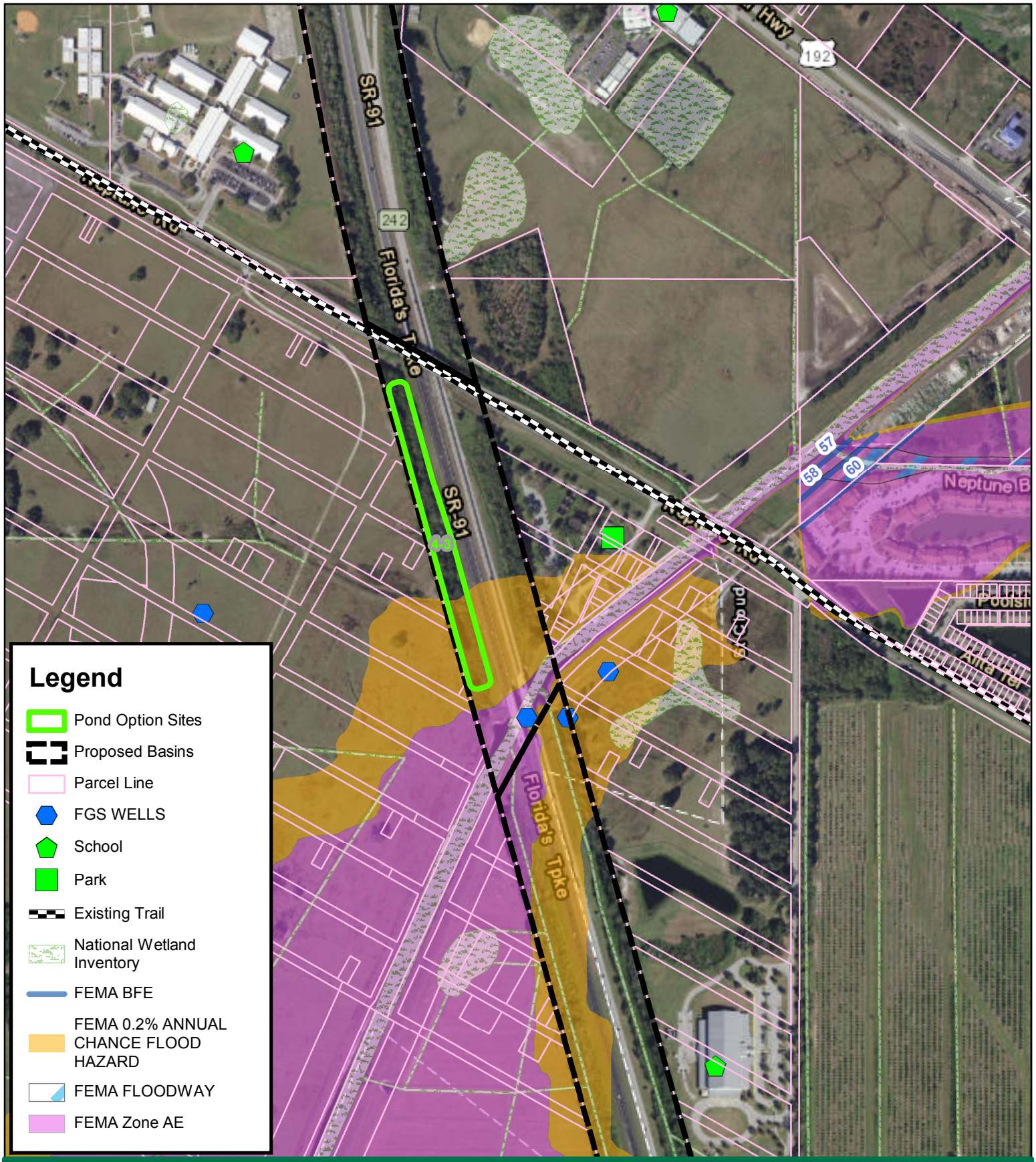
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 4
Option 2

0 250 500 1,000 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

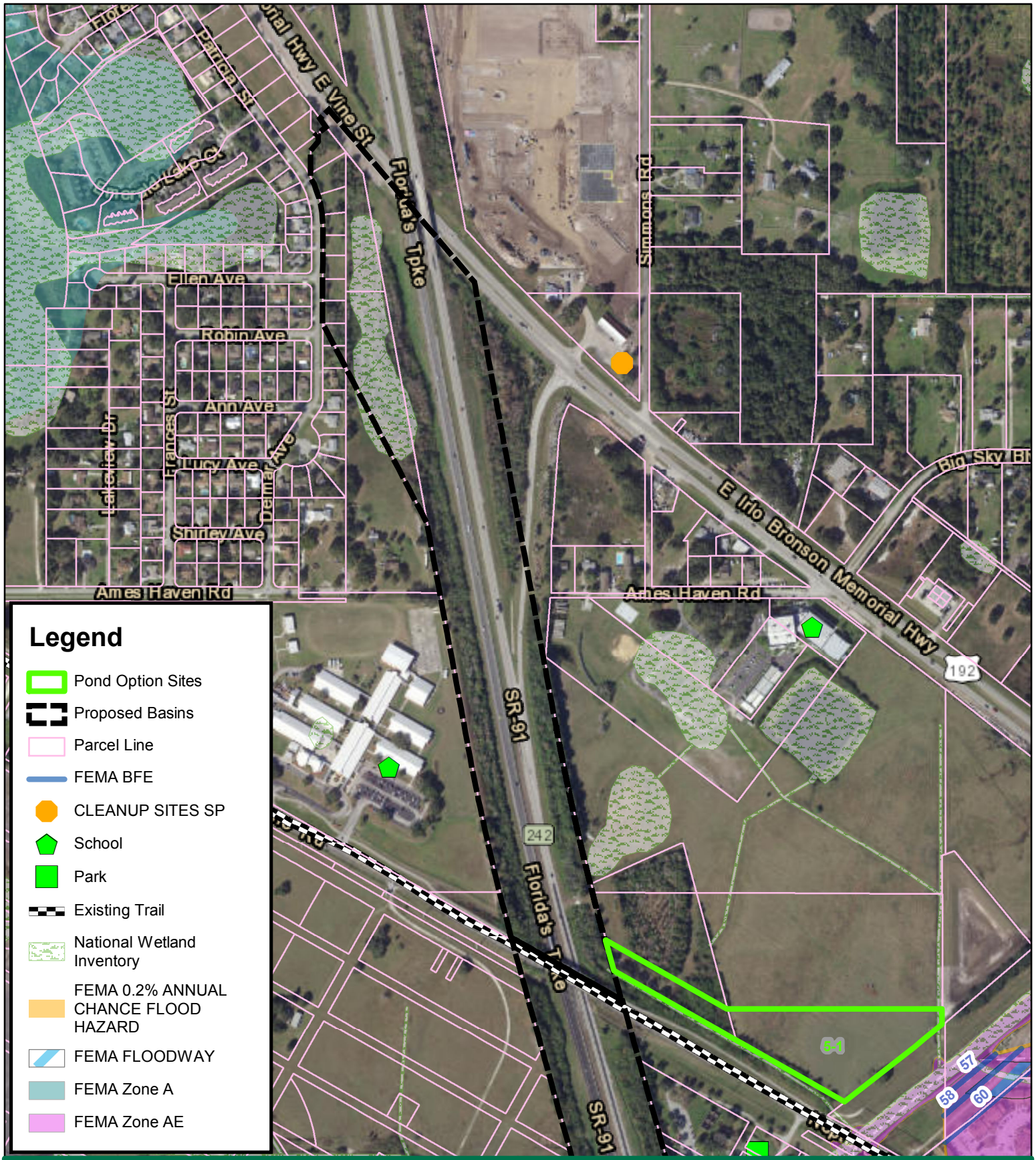
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 4
Option 3

0 250 500 1,000 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

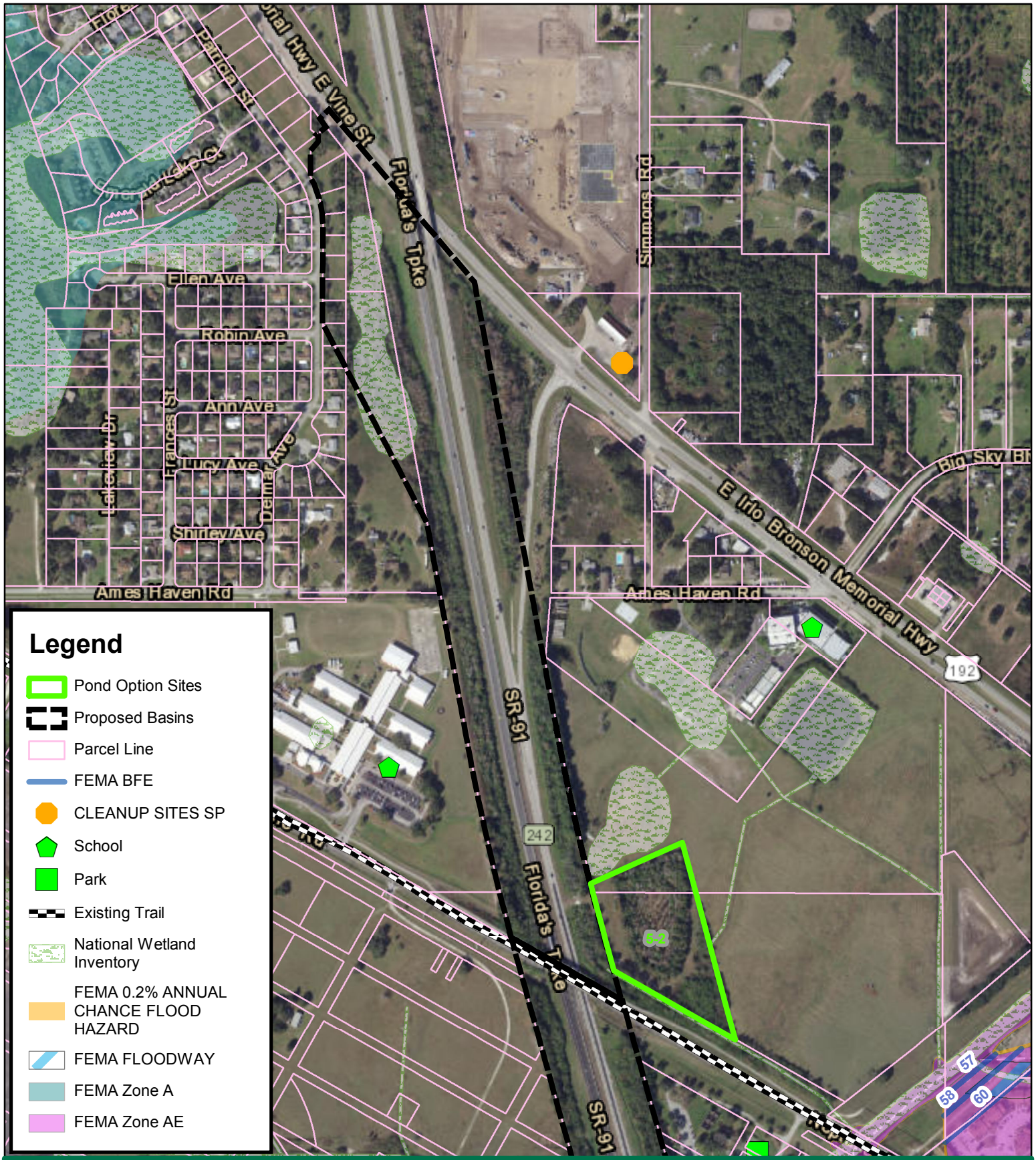
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 5
Option 1

0 250 500 1,000 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
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OSCEOLA COUNTY, FLORIDA
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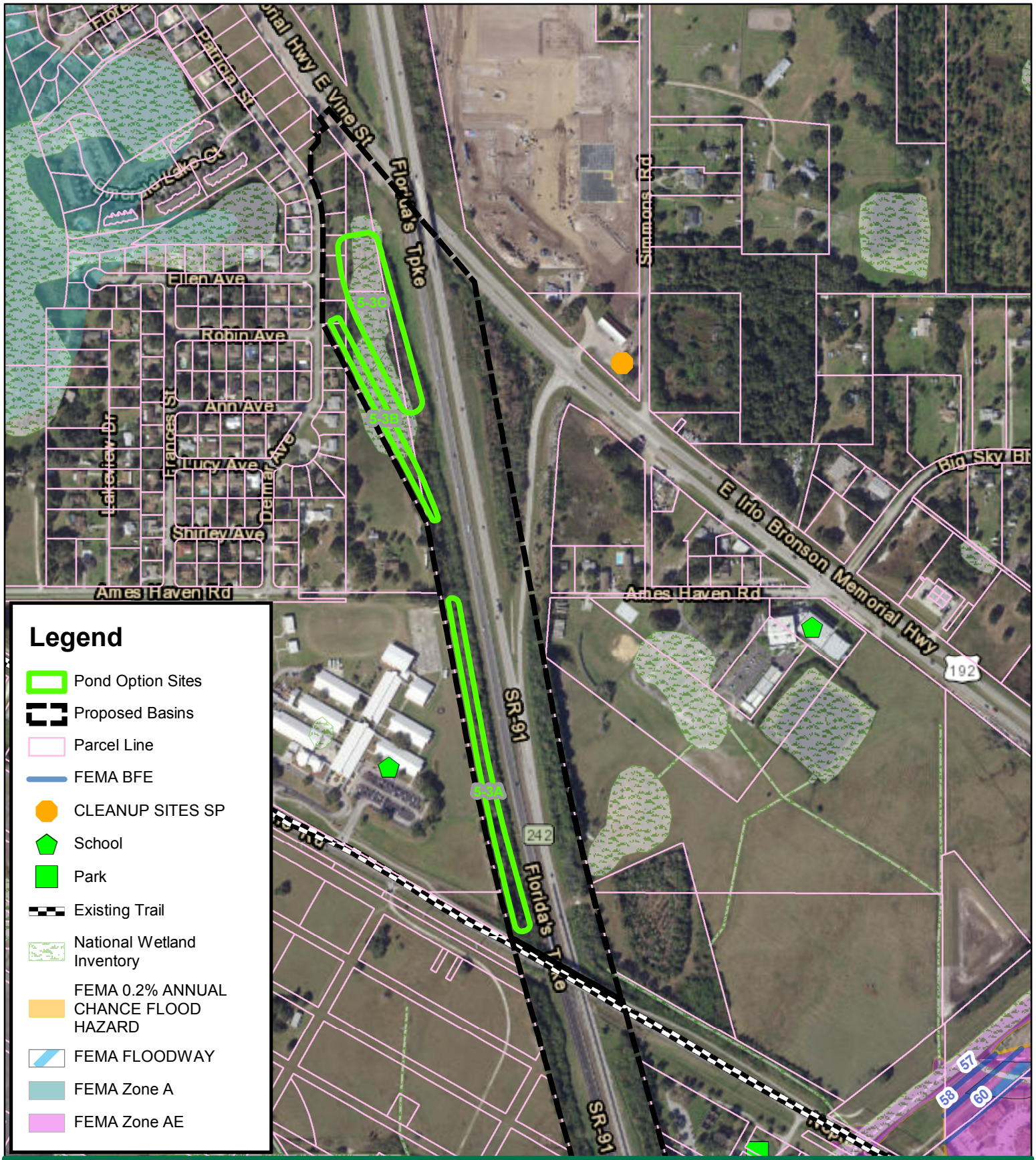
PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 5
Option 2

0 250 500 1,000 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
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OSCEOLA COUNTY, FLORIDA
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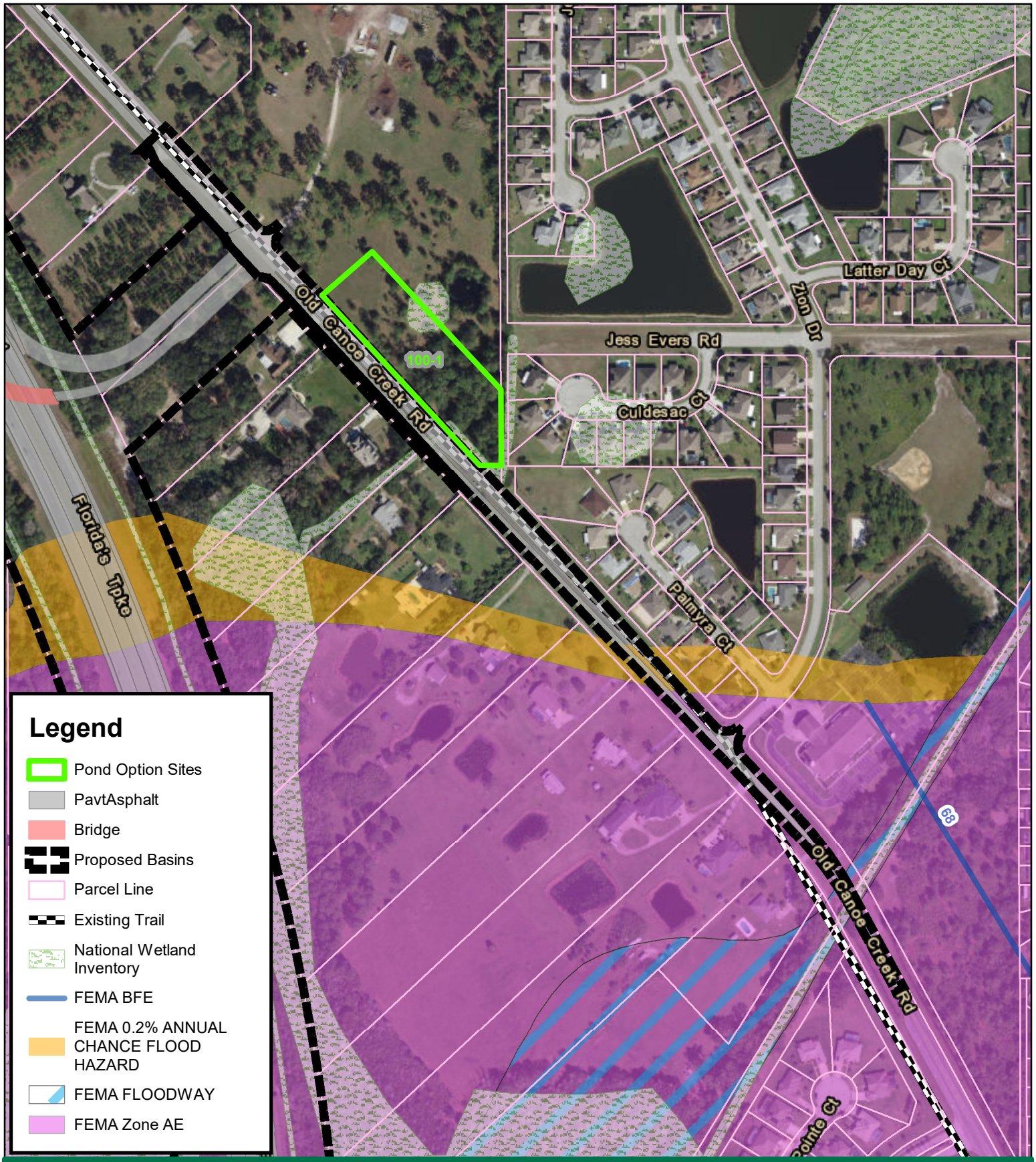
PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 5
Option 3

0 250 500 1,000 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

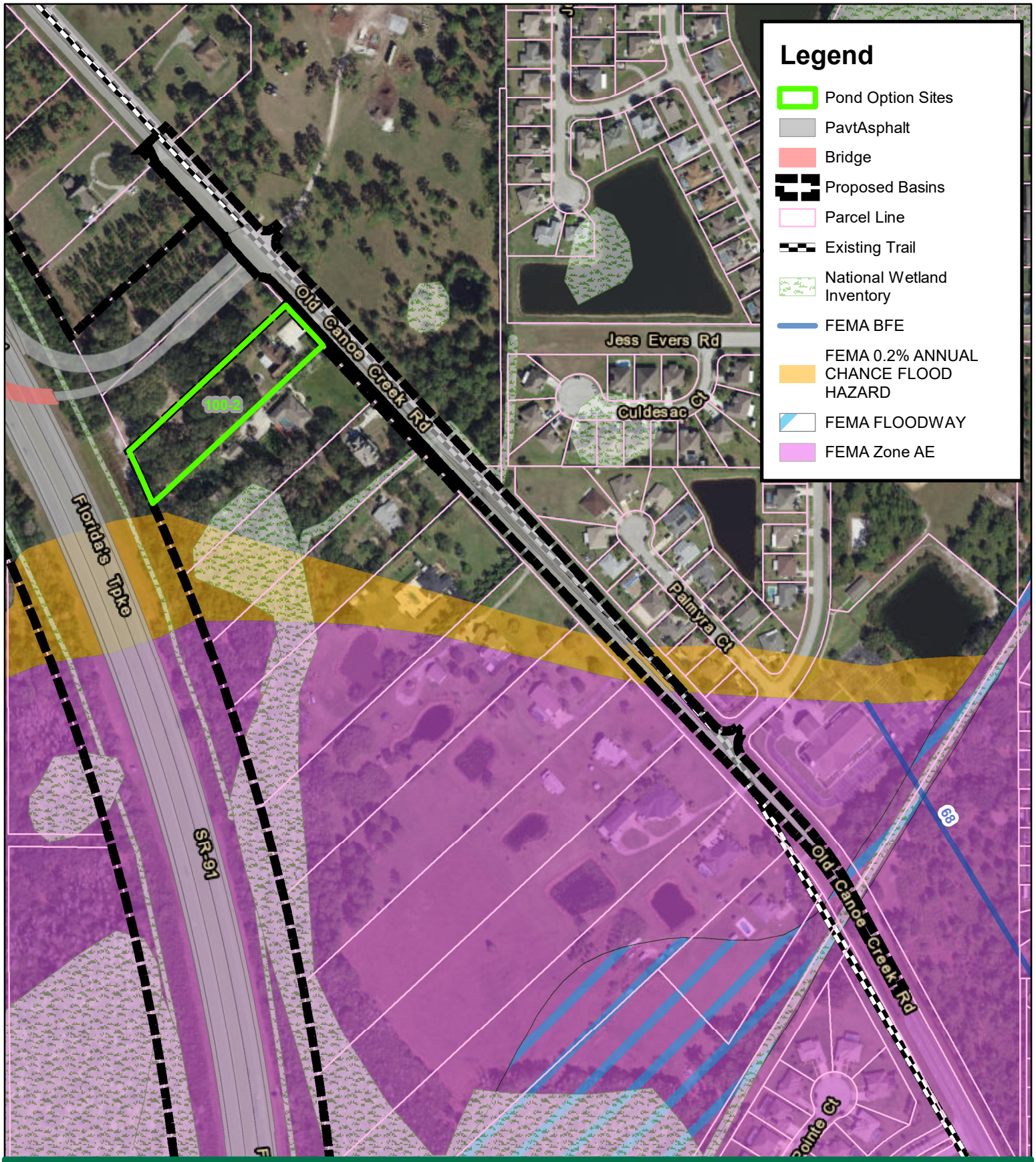
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 100
Option 1

0 145 290 580 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
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OSCEOLA COUNTY, FLORIDA
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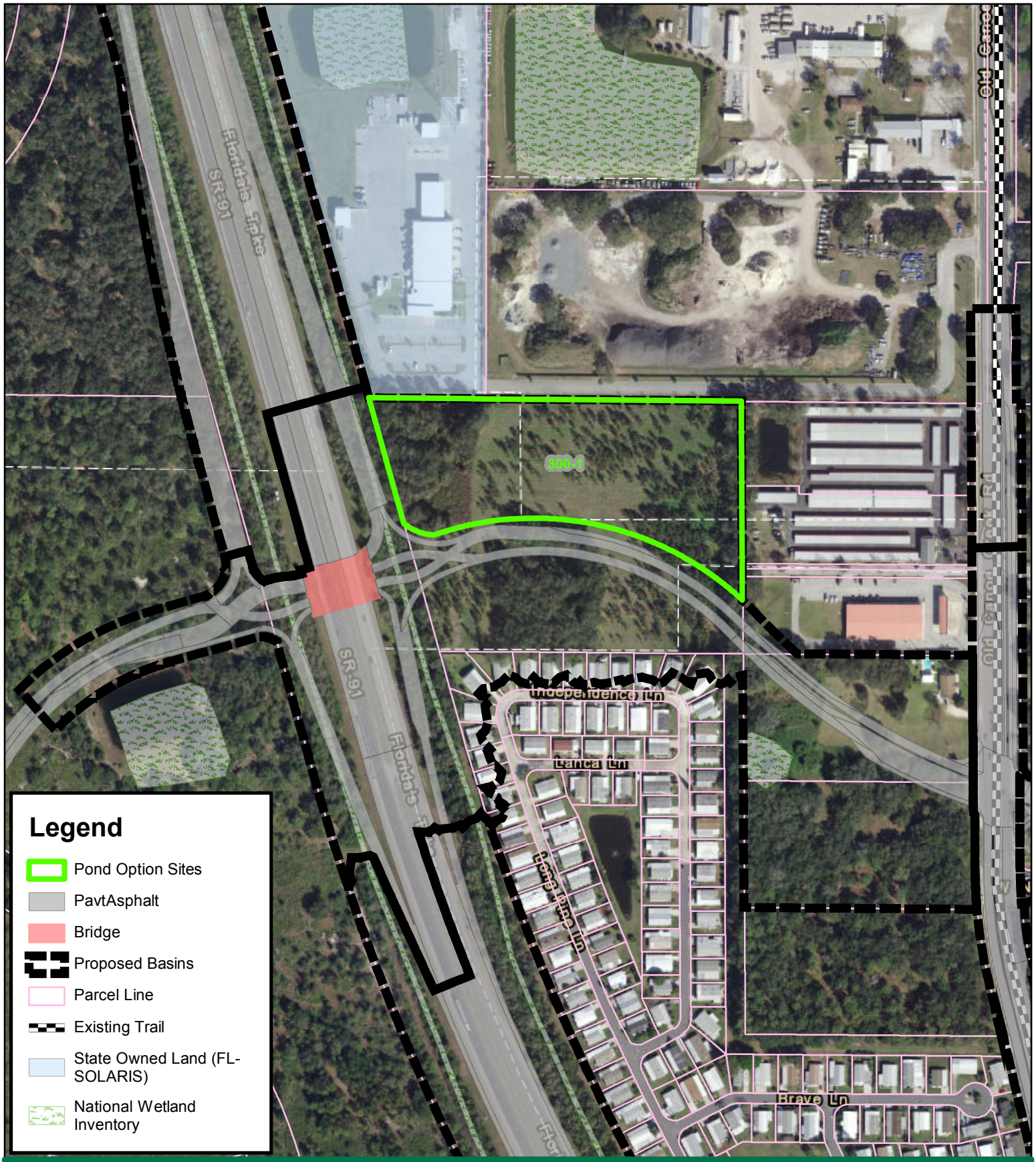
PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 100
Option 2

0 145 290 580 Feet

N



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FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

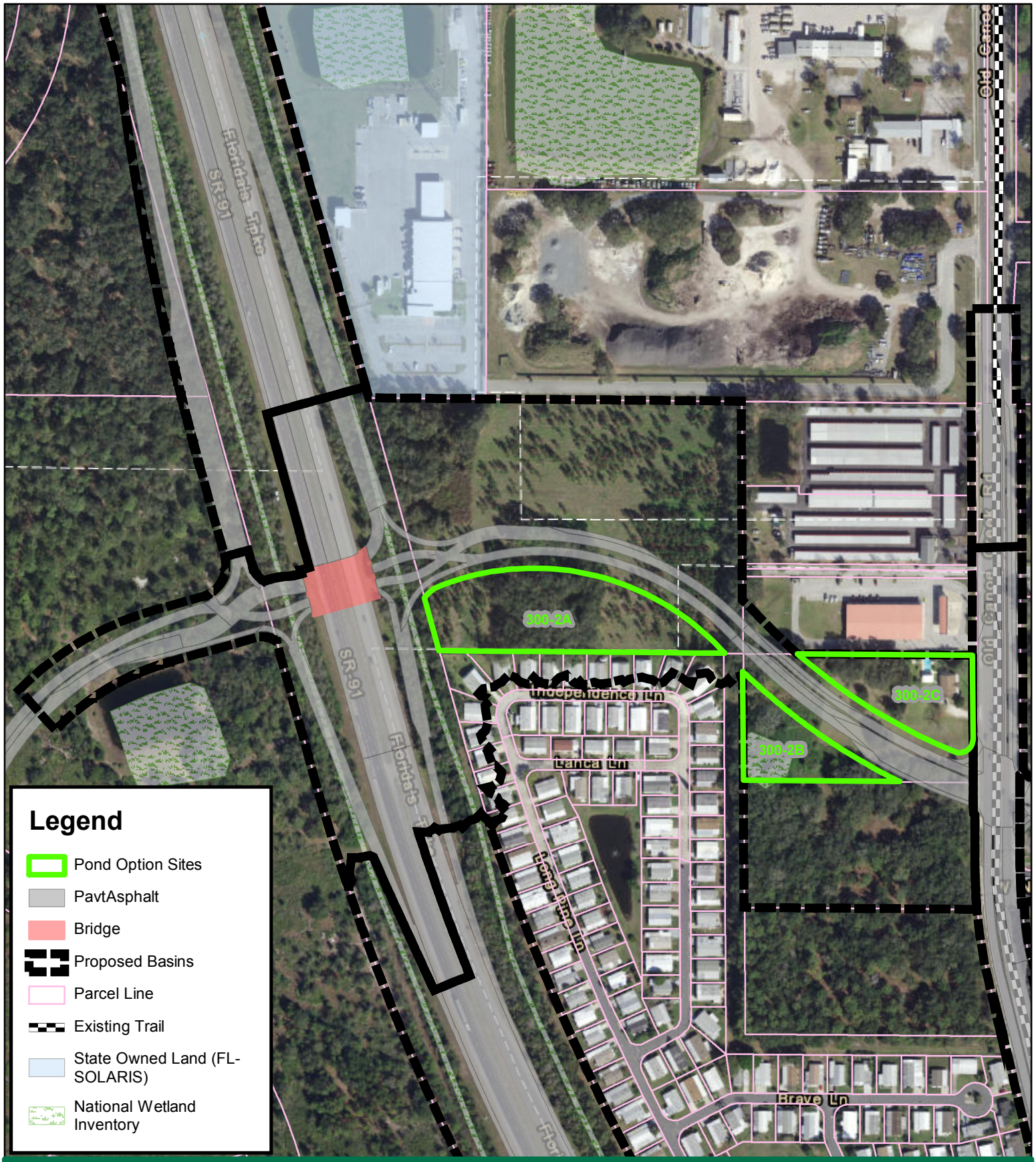
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 300
Option 1

0 150 300 600 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

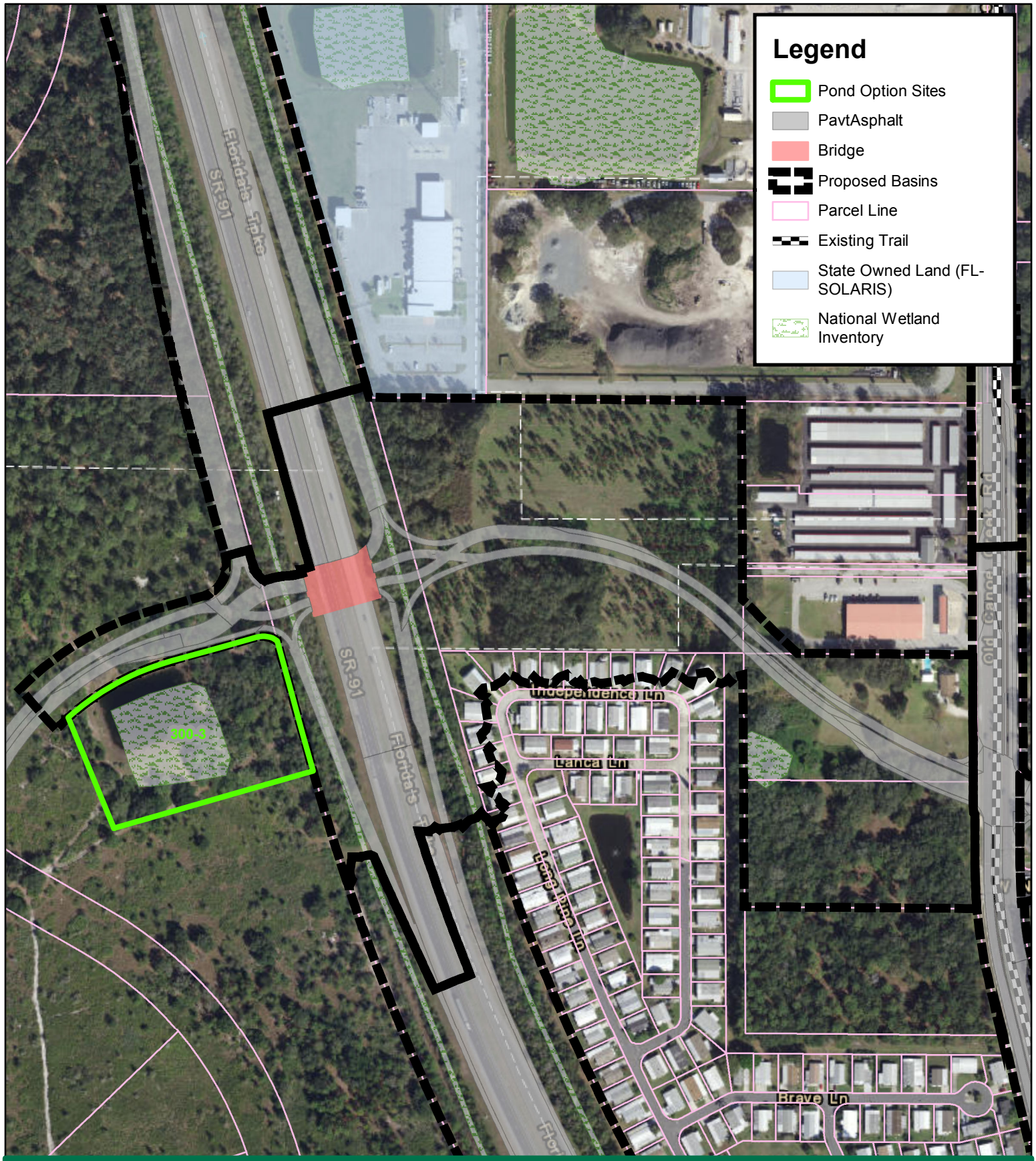
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 300
Option 2

0 150 300 600 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
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OSCEOLA COUNTY, FLORIDA
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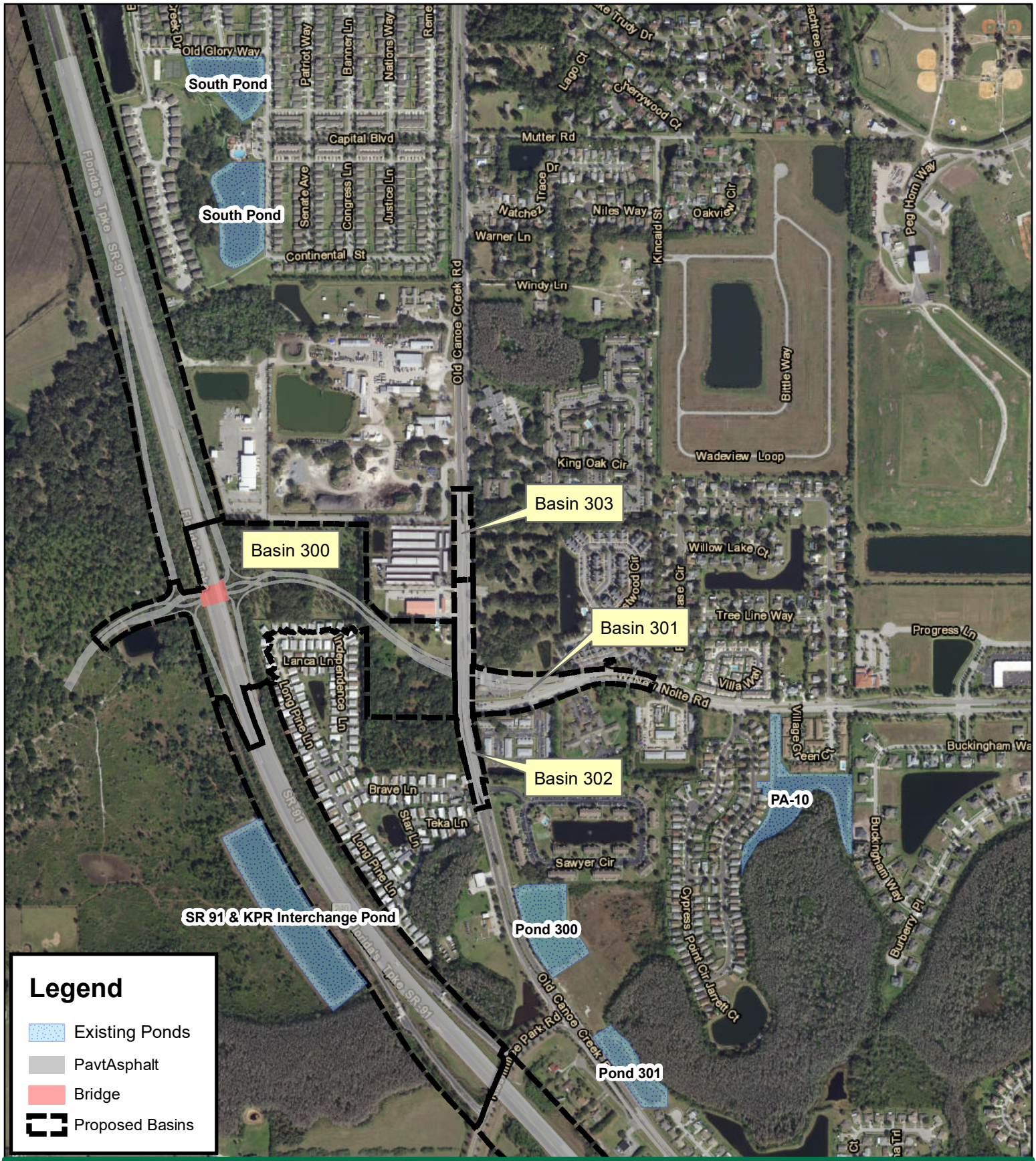
PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 2
Basin 300
Option 3

0 150 300 600 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Existing Pond Options

0 390 780 1,560 Feet

N

Appendix B

Pre-Development Calculations

DRAFT

Project: FTE Widening from S. Kissimmee Park Rd to US 192
FPID: 441224-1-22-01
County: Osceola

Designer: KAP Date: 7/30/2019
Reviewer: JAN Checked: 8/23/2019

Pre-Development Curve Number Calculations
Onsite Basins: Alternative 1

Basin	Location		Length	Total Area	Impervious Area	Curve Number	Pervious Area	Land Use	Soil Type	Curve Number	Weighted	Description
	Begin	End	(ft)	(ac)	(ac)	(CN)	(ac)	Description		(CN)	CN	
1	4455+00.00	4498+00.00	4300	43.65	8.41	98	35.24	Grass (Poor)	A	39	50.37	
100	BEGIN OCCR SOUTH	END OCCR SOUTH	2970	3.96	1.93	98	2.03	Grass (Poor)	A	39	67.79	OCCR at South Ramps
200	4498+00.00	4521+50.00	N/A	66.47	10.07	98	56.40	Grass (Poor)	A	39	47.94	Kissimmee Park Road Interchange
2	4521+50.00	4553+50.00	3200	30.81	9.05	98	21.75	Grass (Poor)	A	39	56.34	
3	4553+50.00	4640+00.00	8650	80.83	17.63	98	63.20	Grass (Poor)	A	39	51.87	
4	4640+00.00	4658+00.00	1800	16.22	3.67	98	12.55	Grass (Poor)	A	39	52.35	
5	4658+00.00	4697+00.00	3900	38.84	7.28	98	31.56	Grass (Poor)	A	39	50.05	

Note: Basin 200 excludes the 8.7-ac infield pond area from CN Calculations

DRAFT

Project: FTE Widening from S. Kissimmee Park Rd to US 192
FPID: 441224-1-22-01
County: Osceola

Designer: KAP Date: 7/30/2019
Reviewer: JAN Checked: 8/22/2019

Pre-Development Curve Number Calculations
Onsite Basins: Alternative 2

Basin	Location		Length	Total Area	Impervious Area	Curve Number	Pervious Area	Land Use	Soil Type	Curve Number	Weighted	Description
	Begin	End	(ft)	(ac)	(ac)	(CN)	(ac)	Description		(CN)	CN	
1	4455+00.00	4521+20.00	6620	66.88	13.63	98	53.25	Grass (Good)	A	39	51.03	
100	BEGIN OCCR SOUTH	END OCCR SOUTH	2970	3.96	1.93	98	2.03	Grass (Good)	A	39	67.79	OCCR at South Ramps
2	4521+20.00	4553+50.00	3230	30.71	9.28	98	21.43	Grass (Good)	A	39	56.83	
300	4553+50.00	4565+00.00	3152	19.36	2.76	98	16.60	Grass (Good)	A	39	47.41	W New Nolte Interchange
301	OCCR	END NN	1298	5.04	3.38	98	1.66	Grass (Good)	A	39	78.57	W New Nolte East of OCCR
302	BEGIN OCCR	OCCR 2	1570	4.26	3.5	98	0.76	Grass (Good)	A	39	87.47	OCCR at West New Nolte
303	OCCR 2	END OCCR	620	1.46	1.08	98	0.38	Grass (Good)	A	39	82.64	OCCR Northernmost Basin
3	4565+00.00	4640+00.00	7500	71.88	14.87	98	57.01	Grass (Good)	A	39	51.21	
4	4640+00.00	4658+00.00	1800	16.22	3.67	98	12.55	Grass (Good)	A	39	52.35	
5	4658+00.00	4697+00.00	3900	38.84	7.28	98	31.56	Grass (Good)	A	39	50.05	

DRAFT

Appendix C

Post-Development Calculations

DRAFT

Project: FTE Widening from S. Kissimmee Park Rd to US 192
FPID: 441224-1-22-01
County: Osceola

Designer: KAP Date: 7/23/2019
Reviewer: JAN Checked: 8/23/2019

Post-Development Curve Number Calculations
Onsite Basins: Alternative 1

Basin	Station BL Survey		Length	Total Area	Mainline Impervious Width	Total Impervious Area	Curve Number	Pervious Area	Land Use	Soil Type	Curve Number	Weighted	Description
	Begin	End	(ft)	(ac)	(ft)	(ac)	(CN)	(ac)	Description		(CN)	CN	
1	4455+00.00	4498+00.00	4300	43.65	154	17.92	98	25.73	Grass (Poor)	A	39	63.23	
100	BEGIN OCCR SOUTH	END OCCR SOUTH	2970	3.96	N/A	3.45	98	0.51	Grass (Poor)	A	39	90.47	SR 91 South Ramps (right)
200	4498+00.00	4521+50.00	N/A	66.47	N/A	25.70	98	40.77	Grass (Poor)	A	39	61.81	SR 91 South Ramps (right)
2	4521+50.00	4553+50.00	3200	30.81	154	12.87	98	17.94	Grass (Poor)	A	39	63.65	
3	4553+50.00	4640+00.00	8650	80.83	154	30.74	98	50.09	Grass (Poor)	A	39	61.44	
4	4640+00.00	4658+00.00	1800	16.22	154	6.51	98	9.71	Grass (Poor)	A	39	62.69	
5	4658+00.00	4697+00.00	3900	38.84	154	16.32	98	22.52	Grass (Poor)	A	39	63.80	

Note: Basin 200 excludes the 8.7-ac infield pond area from CN Calculations

DRAFT

Project:	FTE Widening from S. Kissimmee Park Rd to US 192	Designer:	KAP	Date:	8/22/2019
FPID:	441224-1-22-01	Reviewer:	JAN	Checked:	8/22/2019
County:	Osceola				

Treatment Volume Calculations
Alterantive 1

Basin	Basin Limits		Impervious Area			Treatment Volume (ac-ft)				
	Begin	End	Existing (ac)	Proposed (ac)	Additional (ac)	Previously Permitted Required	Treatment for Additional Impervious* (2.5" over Add'l Imperv.)	Pond Type**	Required Treatment for Additional Impervious by Pond Type	Total Required
1	4455+00.00	4498+00.00	8.41	17.92	9.51		1.98	1	1.98	1.98
								2	1.49	1.49
								3	0.99	0.99
100	BEGIN OCCR SOUTH	END OCCR SOUTH	1.93	3.45	1.52		0.32	1	0.32	0.32
								2	0.24	0.24
								3	0.16	0.16
200	4498+00.00	4521+50.00	10.07	25.70	15.63		3.26	1	3.26	3.26
								2	2.44	2.44
								3	1.63	1.63
2	4521+50.00	4553+50.00	9.05	12.87	3.82	0.86	0.80	1	0.80	1.66
								2	0.60	1.46
								3	0.40	1.26
3	4553+50.00	4640+00.00	17.63	30.74	13.11		2.73	1	2.73	2.73
								2	2.05	2.05
								3	1.37	1.37
4	4640+00.00	4658+00.00	3.67	6.51	2.84		0.59	1	0.59	0.59
								2	0.44	0.44
								3	0.30	0.30
5	4658+00.00	4697+00.00	7.28	16.32	9.05		1.88	1	1.88	1.88
								2	1.41	1.41
								3	0.94	0.94
Total			**58.04**	**113.52**	**55.48**	**0.86**	**11.56**			

**Calculations do not take credit for reduction in impervious area*
***Pond Type: 1 = Wet Detention, 2= Dry Detention; 3= Retention*

DRAFT

Project:	FTE Widening from S. Kissimmee Park Rd to US 192	Designer:	KAP	Date:	7/23/2019
FPID:	441224-1-22-01	Reviewer:	JAN	Checked:	8/22/2019
County:	Osceola				

Attenuation Volume Calculations
Alternative 1

Basin	Basin Limits		Basin Area*	Existing Runoff Volume				Proposed Runoff Volume				Attenuation Volume**
	Begin	End	(ac)	Existing CN	S	Runoff (in)	Runoff (ac-ft)	Proposed CN	S	Runoff (in)	Runoff (ac-ft)	(ac-ft)
1	4455+00.00	4498+00.00	43.65	50.37	9.85	2.29	8.3	63.23	5.82	3.69	13.4	5.11
1, Wet Detention	0.75-ft TV Height	342-ft TV Length	2.60	39	15.64	1.16	0.3	100	0.00	8.00	1.7	1.48
1, Dry Detention	0.60-ft TV Height	332-ft TV Length	2.44	39	15.64	1.16	0.2	100	0.00	8.00	1.6	1.39
100	BEGIN OCCR SOUTH	END OCCR SOUTH	3.96	67.79	4.75	4.21	1.4	90.47	1.05	6.86	2.3	0.87
100, Wet Detention	0.75-ft TV Height	154-ft TV Length	0.50	39	15.64	1.16	0.0	100	0.00	8.00	0.3	0.29
200	4498+00.00	4521+50.00	66.47	47.94	10.86	2.04	11.3	61.81	6.18	3.54	19.6	8.31
200, Wet Detention Infield	2.22-ft TV Height	494-ft TV Length	5.21	39	15.64	1.16	0.5	100	0.00	8.00	3.5	2.97
200, Wet Detention FPC	2.22-ft TV Height	484-ft TV Length	4.99	39	15.64	1.16	0.5	100	0.00	8.00	3.3	2.85
2	4521+50.00	4553+50.00	30.81	56.34	7.75	2.93	7.5	63.65	5.71	3.74	9.6	2.08
3	4553+50.00	4640+00.00	80.83	51.87	9.28	2.45	16.5	61.44	6.28	3.49	23.5	7.05
3, Wet Detention	1.20-ft TV Height	320-ft TV Length	2.21	39	15.64	1.16	0.2	100	0.00	8.00	1.5	1.26
3, Dry Detention	0.75-ft TV Height	349-ft TV Length	2.68	39	15.64	1.16	0.3	100	0.00	8.00	1.8	1.53
4	4640+00.00	4658+00.00	16.22	52.35	9.10	2.50	3.4	62.69	5.95	3.63	4.9	1.53
4, Wet Detention	0.75-ft TV Height	188-ft TV Length	0.77	39	15.64	1.16	0.1	100	0.00	8.00	0.5	0.44
4, Dry Detention	0.50-ft TV Height	199-ft TV Length	0.87	39	15.64	1.16	0.1	100	0.00	8.00	0.6	0.50
5	4658+00.00	4697+00.00	38.84	50.05	9.98	2.26	7.3	63.80	5.68	3.76	12.2	4.86
5, Wet Detention	0.75-ft TV Height	334-ft TV Length	2.47	39	15.64	1.16	0.2	100	0.00	8.00	1.6	1.41
5, Dry Detention	0.50-ft TV Height	353-ft TV Length	2.79	39	15.64	1.16	0.3	100	0.00	8.00	1.9	1.59

**Pond Option Basins only included area at NWL for Wet Detention pond options and the pond bottom for Dry Detention pond options*
***Calculations do not take credit for reduction in runoff volume*

Rainfall Amount = 8.00 inches (10-year/72-hour storm (Osceola))

Project:	FTE Widening from S. Kissimmee Park Rd to US 192	Designer:	KAP	Date:	7/23/2019
FPID:	441224-1-22-01	Reviewer:	JAN	Checked:	1/13/2020
County:	Osceola				

Floodplain Impacts Volume Calculations

Alternative 1

Additional Impacts due to Pond Site

Pond	FEMA Flood Zone	FEMA BFE (ft-NAVD)	Area of FEMA Floodplain Impacted by Pond Site (acres)	SHWL (Assumed 1-ft above GWE along Rdwy Borings) (ft-NAVD)	Average Ground Elevation (DEM) (ft-NAVD)	Floodplain Height (ft)	Floodplain Impact by Pond Site* (ac-ft)
1-3-1	AE	68	0.07	--	66	2	0.14
3-2-1	AE	57	3.90	55.6	56.9	0.1	0.39

** Floodplain Impact = Area of FEMA Floodplain x (FEMA BFE - Greater of SHWL or Ground Elev)*

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Project: FTE Widening from S. Kissimmee Park Rd to US 192
FPID: 441224-1-22-01
County: Osceola

Designer: KAP
Reviewer: JAN

Date: 7/23/2019
Checked: 8/22/2019

Pond Sizing Calculations
Alternative 1

Basin	Pond Name Prefix	Type of Treatment	Required Treatment Volume*	Required Attenuation Volume**	Floodplain Impact Volume**	Required Volume	Treatment Volume Depth	L at TV	Treatment Volume Check***	Attenuation Volume Depth	L at Atten. Vol.	Attenuation Volume Check	Additional Factor for Landscaping & Grading Tie in	Assumed DHW Depth	L & W at Outside Top of Berm	Required Pond Area
			(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ft)	(ft)	(ac-ft)	(ft)	(ft)	(ac-ft)	(%)	(ft)	(ft)	(ac)
1	1-2	Wet Detention	1.98	6.60		8.58	0.75	342	1.98	2.35	361	6.67	20%	3.10	408	4.6
	1-3	Wet Detention			0.14	8.72							20%	3.10	411	4.7
	1-1	Dry Detention	1.49	6.50		7.99	0.60	332	1.49	2.45	356	6.65	20%	3.05	384	4.1
100	100-1	Wet Detention	0.32	1.16		1.48	0.75	154	0.39	2.25	172	1.37	20%	3.00	220	1.3
	100-2	Wet Detention														
200	200-1A	Wet Detention	3.26	11.28	12.0	26.53	2.22	494	12.00	2.10	511	12.16	20%	4.32	559	8.6
	200-1B	Wet Detention	--	2.85	11.5	14.35	2.22	484	11.51	0.60	488	3.25	20%	2.82	537	7.9
2	Existing Pond	Wet Detention	1.66	2.08		3.74	--	--	--	--	--	--	--	--	--	--
3	3-1	Wet Detention	2.73	8.31		11.04	1.20	320	2.73	3.30	346	8.39	20%	4.50	393	4.3
	3-2	Wet Detention			0.39	11.43							20%	4.60	396	4.3
	3-3	Dry Detention	2.05	8.57		10.62	0.75	349	2.05	2.85	377	8.62	20%	3.60	407	4.6
4	4-1	Wet Detention	0.59	1.97		2.57	0.75	188	0.59	2.25	206	2.01	20%	3.00	254	1.8
	4-2	Wet Detention														
	4-3	Dry Detention	0.44	2.03		2.47	0.50	199	0.44	2.05	220	2.06	20%	2.55	249	1.7
5	5-1	Wet Detention	1.88	6.27		8.16	0.75	334	1.88	2.35	353	6.36	20%	3.10	399	4.4
	5-2	Wet Detention														
	5-3	Dry Detention	1.41	6.45		7.87	0.50	353	1.41	2.15	375	6.55	20%	2.65	403	4.5

** Required Treatment Volume includes any permitted treatment volume and the additional volume required by this project due to additional impervious area for any existing pond options*
*** Includes volume associated with this Turnpike Widening Project and its associated pond option sites only.*
**** May differ from required due to minimum Normal Water Level area of 0.5-acre criteria for wet detention facilities*

Project: FTE Widening from S. Kissimmee Pa
FPID: 441224-1-22-01
County: Osceola

Pond Sizing Calculations
Alternative 1

Basin	Pond Name Prefix	Type of Treatment	SHWL from average of borings or exist. pond permit	Minimum Base Elevation Near Ponds (3-ft above DHW for wet detention ponds and 3-ft above the TV for dry detention treatment swales)	Minimum Low Edge of Pavement Elevation (Assumed 1 FT Above Base Elevation)	Existing Low Edge of Pavement Elevation	Comment
			FT NAVD 88	FT NAVD 88	ft-NAVD	ft-NAVD	
1	1-2	Wet Detention	66.8	72.9	73.9	69.6	DON'T REALLY HAVE A SHWL IN THE THIS AREA BFE = 68 NEAR CANAL
	1-3	Wet Detention	66.8	72.9	73.9		EXIST. ROADWAY ELEVATIONS AROUND 69-70, DITCH EL AROUND 61-64
	1-1	Dry Detention	66.8	71.6	72.6		ORIFICE AT 67, BOTTOM AT 68
100	100-1	Wet Detention					
	100-2	Wet Detention					
200	200-1A	Wet Detention	67.0	74.3	75.3	72.1	Assumes floodplain compensation and treatment volume are combined. Treatment volume depth is the height between 100-yr peak stage in east wetland (N4) and estimated SHWL with assumed 1-ft HGL loss for routing across Turnpike mainline.
	200-1B	Wet Detention	67.0	72.8	73.8		Treatment volume depth is the height between 100-yr peak stage in east wetland (N4) and estimated SHWL with assumed 1-ft HGL loss for routing across Turnpike mainline. This pond provides attentuation for pond site only.
2	Existing Pond	Wet Detention	66.7			72.1	Exist. Interchange Pond, ERP 49-01481-P, App. 041008-30 1.53 ac-ft treatment vol. provided
3	3-1	Wet Detention	54.4	61.9	62.9	63.0	Have to cross school outfall, school property? wetlands
	3-2	Wet Detention	54.4	62.0	63.0		floodplains;
	3-3	Dry Detention	56.3	61.8	62.8		ORIFICE AT 55.8, BOTTOM AT 57, TOP AT 60
4	4-1	Wet Detention	54.9	60.9	61.9	62.9	back up to DRI pond
	4-2	Wet Detention	54.9	60.9	61.9		
	4-3	Dry Detention	54.9	59.5	60.5		ORIFICE AT 54.9, BOTTOM AT 56 TOP AT 59
5	5-1	Wet Detention	59.0	65.1	66.1	63.0	Access to pond through FDOT ROW
	5-2	Wet Detention	59.0	65.1	66.1		FDOT ROW, Wetlands at the site
	5-3	Dry Detention	60.1	65.5	66.5		ORIFICE AT 60, BOTTOM AT 61 TOP AT 64

Project:	FTE Widening from S. Kissimmee Park Rd to US 192	Designer:	ALE	Date:	8/22/2019
FPID:	441224-1-22-01	Reviewer:	JAN	Checked:	8/22/2019
County:	Osceola				

Pond Sites Provided

Alternative 1

Pond Option	Required Area (AC)	Pond Site	Provided Area (AC)	Total Provided Area	Surplus Area	
1-1	4.1	1-1-1	4.6	4.6	0.5	*Within ROW*
1-2	4.6	1-2-1	5.1	5.1	0.5	
1-3	4.7	1-3-1	5.7	5.7	1.0	
100-1	1.3	100-1	2.3	2.3	1.0	
100-2	1.3	100-2	1.9	1.9	0.6	
200-1A	8.6	200-1A	8.7	8.7	0.1	*Infield*
200-1B	7.9	200-1B	9.2	9.2	1.3	*FPC*
3-1	4.3	3-1-1	4.5	4.5	0.2	
3-2	4.3	3-2-1	4.5	4.5	0.2	
3-3	4.6	3-3-1	4.7	4.7	0.1	*Within ROW*
4-1	1.8	4-1	2.8	2.8	1.0	
4-2	1.8	4-2	3.5	3.5	1.7	
4-3	1.7	4-3	2.9	2.9	1.2	*Within ROW*
5-1	4.4	5-1	6.9	6.9	2.5	*(Includes Easement)*
5-2	4.4	5-2	6.5	6.5	2.1	*FDOT Parcel*
5-3	4.5	5-3A	1.7	5.7	1.2	*Within ROW*
		5-3B	1.0			*Within ROW*
		5-3C	3.0			*Within ROW*

DRAFT

Project: FTE Widening from S. Kissimmee Park Rd to US 192
FPID: 441224-1-22-01
County: Osceola

Designer: KAP Date: 7/23/2019
Reviewer: JAN Checked: 8/22/2019

Post-Development Curve Number Calculations
Onsite Basins: Alternative 2

Basin	Location		Length	Total Area	Mainline Impervious Width	Total Impervious Area	Curve Number	Pervious Area	Land Use	Soil Type	Curve Number	Weighted	Description
	Begin	End	(ft)	(ac)	(ft)	(ac)	(CN)	(ac)	Description		(CN)	CN	
1	4455+00.00	4521+20.00	6620	66.88	154	26.90	98	39.98	Grass (Good)	A	39	62.73	
100	BEGIN OCCR SOUTH	END OCCR SOUTH	2970	3.96	N/A	3.45	98	0.51	Grass (Good)	A	39	90.47	SR 91 South Ramps (right)
2	4521+20.00	4553+50.00	3230	30.71	154	12.46	98	18.25	Grass (Good)	A	39	62.94	
300	4553+50.00	4565+00.00	3152	19.36	N/A	10.15	98	9.21	Grass (Good)	A	39	69.93	SR 91 North of W New Nolte Road (right)
301	OCCR	END NN	1298	5.04	N/A	2.88	98	2.16	Grass (Good)	A	39	72.71	SR 91 North of W New Nolte Road (right)
302	BEGIN OCCR	OCCR 2	1570	4.26	N/A	3.82	98	0.44	Grass (Good)	A	39	91.91	SR 91 North of W New Nolte Road (right)
303	OCCR 2	END OCCR	620	1.46	N/A	1.15	98	0.31	Grass (Good)	A	39	85.47	OCCR Northernmost Basin
3	4565+00.00	4640+00.00	7500	71.88	154	30.83	98	41.05	Grass (Good)	A	39	64.31	
4	4640+00.00	4658+00.00	1800	16.22	154	6.51	98	9.71	Grass (Good)	A	39	62.69	
5	4658+00.00	4697+00.00	3900	38.84	154	16.32	98	22.52	Grass (Good)	A	39	63.80	

DRAFT

Project:	FTE Widening from S. Kissimmee Park Rd to US 192	Designer:	KAP	Date:	8/22/2019
FPID:	441224-1-22-01	Reviewer:	JAN	Checked:	8/22/2019
County:	Osceola				

Treatment Volume Calculations

Alternative 2

Basin	Basin Limits		Impervious Area			Treatment Volume (ac-ft)				
			Existing	Proposed	Additional					
	Begin	End	(ac)	(ac)	(ac)	Previously Permitted Required	Treatment for Additional Impervious* (2.5" over Add'l Imperv.)	Pond Type**	Required Treatment for Additional Impervious by Pond Type	Total Required
1	4455+00.00	4521+20.00	13.63	26.90	13.26		2.76	1	2.76	2.76
								2	2.07	2.07
								3	1.38	1.38
100	BEGIN OCCR SOUTH	END OCCR SOUTH	1.93	3.45	1.52		0.32	1	0.32	0.32
								2	0.24	0.24
								3	0.16	0.16
2	4521+20.00	4553+50.00	9.28	12.46	3.18	0.86	0.66	1	0.66	1.52
								2	0.50	1.36
								3	0.33	1.19
300	4553+50.00	4565+00.00	2.76	10.15	7.39		1.54	1	1.54	1.54
								2	1.15	1.15
								3	0.77	0.77
301	OCCR	END NN	3.38	2.88	-0.50	3.62	0.00	1	0.00	3.62
								2	0.00	3.62
								3	0.00	3.62
302	BEGIN OCCR	OCCR 2	3.50	3.82	0.32	3.58	0.07	1	0.07	3.65
								2	0.05	3.63
								3	0.03	3.61
303	OCCR 2	END OCCR	1.08	1.15	0.07	6.62	0.01	1	0.01	6.63
								2	0.01	6.63
								3	0.01	6.63
3	4565+00.00	4640+00.00	14.87	30.83	15.96		3.32	1	3.32	3.32
								2	2.49	2.49
								3	1.66	1.66
4	4640+00.00	4658+00.00	3.67	6.51	2.84		0.59	1	0.59	0.59
								2	0.44	0.44
								3	0.30	0.30
5	4658+00.00	4697+00.00	7.28	16.32	9.05		1.88	1	1.88	1.88
								2	1.41	1.41
								3	0.94	0.94

**Calculations do not take credit for reduction in impervious area*

***Pond Type: 1 = Wet Detention, 2= Dry Detention; 3= Retention*

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Project:	FTE Widening from S. Kissimmee Park Rd to US 192	Designer:	KAP	Date:	7/23/2019
FPID:	441224-1-22-01	Reviewer:	JAN	Checked:	8/22/2019
County:	Osceola				

Attenuation Volume Calculations

Alternative 2

Basin	Basin Limits		Basin Area*	Existing Runoff Volume				Proposed Runoff Volume				Attenuation Volume**
	Begin	End	(ac)	Existing CN	S	Runoff (in)	Runoff (ac-ft)	Proposed CN	S	Runoff (in)	Runoff (ac-ft)	(ac-ft)
1	4455+00.00	4521+20.00	66.88	51.03	9.60	2.36	13.14	62.73	5.94	3.64	20.28	7.13
1, Wet Detention	0.90-ft TV Height	369-ft TV Length	3.02	39	15.64	1.16	0.29	100	0.00	8.00	2.01	1.72
1, Dry Detention	0.60-ft TV Height	391-ft TV Length	3.41	39	15.64	1.16	0.33	100	0.00	8.00	2.27	1.94
100	BEGIN OCCR SOUTH	END OCCR SOUTH	3.96	67.79	4.75	4.21	1.39	90.47	1.05	6.86	2.26	0.87
100, Wet Detention	0.75-ft TV Height	154-ft TV Length	0.50	39	15.64	1.16	0.05	100	0.00	8.00	0.33	0.29
2	4521+20.00	4553+50.00	30.71	56.83	7.60	2.98	7.63	62.94	5.89	3.66	9.37	1.74
300	4553+50.00	4565+00.00	19.36	47.41	11.09	1.98	3.20	69.93	4.30	4.46	7.19	3.99
300, Wet Detention	0.75-ft TV Height	302-ft TV Length	2.02	39	15.64	1.16	0.19	100	0.00	8.00	1.35	1.15
301	OCCR	END NN	5.04	78.57	2.73	5.46	2.29	72.71	3.75	4.78	2.01	0.00
302	BEGIN OCCR	OCCR 2	4.26	87.47	1.43	6.51	2.31	91.91	0.88	7.03	2.50	0.19
303	OCCR 2	END OCCR	1.46	82.64	2.10	5.94	0.72	85.47	1.70	6.27	0.76	0.04
3	4565+00.00	4640+00.00	71.88	51.21	9.53	2.38	14.24	64.31	5.55	3.82	22.86	8.62
3, Wet Detention	0.75-ft TV Height	442-ft TV Length	4.38	39	15.64	1.16	0.42	100	0.00	8.00	2.92	2.50
3, Dry Detention	0.50-ft TV Height	469-ft TV Length	4.94	39	15.64	1.16	0.48	100	0.00	8.00	3.29	2.82
4	4640+00.00	4658+00.00	16.22	52.35	9.10	2.50	3.38	62.69	5.95	3.63	4.91	1.53
4, Wet Detention	0.75-ft TV Height	188-ft TV Length	0.77	39	15.64	1.16	0.07	100	0.00	8.00	0.51	0.44
4, Dry Detention	0.50-ft TV Height	199-ft TV Length	0.87	39	15.64	1.16	0.08	100	0.00	8.00	0.58	0.50
5	4658+00.00	4697+00.00	38.84	50.05	9.98	2.26	7.30	63.80	5.68	3.76	12.16	4.86
5, Wet Detention	0.75-ft TV Height	334-ft TV Length	2.47	39	15.64	1.16	0.24	100	0.00	8.00	1.65	1.41
5, Dry Detention	0.50-ft TV Height	353-ft TV Length	2.79	39	15.64	1.16	0.27	100	0.00	8.00	1.86	1.59

**Pond Option Basins only included area at NWL for Wet Detention pond options and the pond bottom for Dry Detention pond options*

***Calculations do not take credit for reduction in runoff volume*

Rainfall Amount = 8.00 inches (10-year/72-hour storm (Osceola))

Project:	FTE Widening from S. Kissimmee Park Rd to US 192	Designer:	KAP	Date:	7/23/2019
FPID:	441224-1-22-01	Reviewer:	JAN	Checked:	1/13/2020
County:	Osceola				

Floodplain Impacts Volume Calculations

Alternative 2

Additional Impacts due to Pond Site

Pond	FEMA Flood Zone	FEMA BFE (ft-NAVD)	Area of FEMA Floodplain Impacted by Pond Site (acres)	SHWL (Assumed 1-ft above GWE along Rdwy Borings) (ft-NAVD)	Average Ground Elevation (DEM) (ft-NAVD)	Floodplain Height (ft)	Floodplain Impact by Pond Site* (ac-ft)
1-3-4	AE	68	0.07	--	66	2	0.14
3-2-4	AE	57	7.83	55.6	56.9	0.1	0.79

** Floodplain Impact = Area of FEMA Floodplain x (FEMA BFE - Greater of SHWL or Ground Elev)*

DRAFT

Project: FTE Widening from S. Kissimmee Park Rd to US 192
FPID: 441224-1-22-01
County: Osceola

Designer: ALE
Reviewer: JAN

Date: 8/23/2019
Checked: 8/23/2019

Pond Sizing Calculations

Alternative 2

Basin	Pond Name Prefix	Type of Treatment	Required Treatment Volume*	Required Attenuation Volume	Floodplain Impact Volume**	Required Volume	Treatment Volume Depth	L at TV	Treatment Volume Check***	Attenuation Volume Depth	L at Atten. Vol.	Attenuation Volume Check	Additional Factor for Landscaping & Grading Tie in	Assumed DHW Depth	L & W at Outside Top of Berm	Required Pond Area
			(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)	(ft)	(ft)	(ac-ft)	(ft)	(ft)	(ac-ft)	(%)	(ft)	(ft)	(ac)
1	1-1	Dry Detention	2.07	9.08		11.15	0.60	391	2.07	2.45	415	9.14	20%	3.05	445	5.5
	1-2	Wet Detention	2.76	8.86		11.62	0.90	369	2.76	2.70	391	8.96	20%	3.60	438	5.3
	1-3	Wet Detention			0.14	11.76							20%	3.60	440	5.3
100	100-1	Wet Detention	0.32	1.16		1.48	0.75	154	0.39	2.25	172	1.37	20%	3.00	220	1.3
	100-2	Wet Detention														
2	Existing Pond	Wet Detention	1.52	1.74		3.26	--	--	--	--	--	--	--	N/A	N/A	N/A
300	300-1	Wet Detention	1.54	5.15		6.69	0.75	302	1.54	2.35	321	5.23	20%	3.10	367	3.7
	300-2	Wet Detention														
	300-3	Wet Detention														
301	Existing Pond	Wet Detention	3.62	0.00		3.62	--	--	--	--	--	--	--	N/A	N/A	N/A
302	Existing Pond	Wet Detention	3.65	0.19		3.83	--	--	--	--	--	--	--	N/A	N/A	N/A
303	Existing Pond	Wet Detention	6.63	0.04		6.68	--	--	--	--	--	--	--	N/A	N/A	N/A
3	3-1	Wet Detention	3.32	11.11		14.44	0.75	442	3.32	2.40	462	11.26	20%	3.15	508	7.1
	3-2	Wet Detention			0.79	15.23							20%	3.25	513	7.2
	3-3	Dry Detention	2.49	11.43		13.93	0.50	469	2.49	2.20	491	11.61	20%	2.70	518	7.4
4	4-1	Wet Detention	0.59	1.97		2.57	0.75	188	0.59	2.25	206	2.01	20%	3.00	254	1.8
	4-2	Wet Detention														
	4-3	Dry Detention	0.44	2.03		2.47	0.50	199	0.44	2.05	220	2.06	20%	2.55	249	1.7
5	5-1	Wet Detention	1.88	6.27		8.16	0.75	334	1.88	2.35	353	6.36	20%	3.10	399	4.4
	5-2	Wet Detention														
	5-3	Dry Detention	1.41	6.45		7.87	0.50	353	1.41	2.15	375	6.55	20%	2.65	403	4.5

** Required Treatment Volume includes any permitted treatment volume and the additional volume required by this project due to additional impervious area for any existing pond options*

*** Includes volume associated with this Turnpike Widening Project and its associated pond option sites only.*

**** May differ from required due to minimum Normal Water Level area of 0.5-acre criteria for wet detention facilities*

Project: FTE Widening from S. Kissimmee
FPID: 441224-1-22-01
County: Osceola

Pond Sizing Calculations
Alternative 2

Basin	Pond Name Prefix	Type of Treatment	SHWL from average of borings or exist. pond permit	Minimum Base Elevation Near Ponds (3-ft above DHW for wet detention ponds and 3-ft above the TV for dry detention treatment swales)	Minimum Low Edge of Pavement Elevation Near Ponds (Assumes 1 FT Above Min. Base Elev.)	Existing Low Edge of Pavement Elevation	Comment
			ft-NAVD	ft-NAVD	ft-NAVD	ft-NAVD	
1	1-1	Dry Detention	67.0	71.6	72.6	69.6	ORIFICE AT 67, BOTTOM AT 68
	1-2	Wet Detention	66.8	73.4	74.4		DRI & wetlands
	1-3	Wet Detention	66.8	73.4	74.4		floodplains & wetlands
100	100-1	Wet Detention					
	100-2	Wet Detention					
2	Existing Pond	Wet Detention	66.7			72.1	Exist. Interchange Pond, ERP 49-01481-P, App. 041008-30 1.53 ac-ft treatment vol. provided, 7.21 ac-ft floodplain comp. provided
300	300-1	Wet Detention	63.9	70.0	71.0	68.2	
	300-2	Wet Detention	63.9	70.0	71.0		
	300-3	Wet Detention	65.9	72.0	73.0		
301	Existing Pond	Wet Detention					Exist. Pond PA-10, ERP 49-00504-S West New Nolte Road Rehab; No increase to the permitted required volume since this project creates a reduction in impervious area.
302	Existing Pond	Wet Detention					Exist. Ponds 300 and 301 Permit 49-01399 KPR wide (2005) Provided = 3.58 ac-ft, Will require a modification to the CS
303	Existing Pond	Wet Detention					South Pond from 49-01443-P Anthem Park, Already treats 16.55 acres along Kissimmee Park Road (2.01 ac-ft treatment volume), 6.96 ac-ft Provided
3	3-1	Wet Detention	54.4	60.5	61.5	63.0	Have to cross the major offsite outfall ditch
	3-2	Wet Detention	54.4	60.6	61.6		
	3-3	Dry Detention	56.3	61.5	62.5		ORIFICE AT 56.3, BOTTOM AT 58
4	4-1	Wet Detention	54.9	60.9	61.9	62.9	back up to DRI pond
	4-2	Wet Detention	54.9	60.9	61.9		
	4-3	Dry Detention	54.9	59.5	60.5		ORIFICE AT 54.9, BOTTOM AT 56
5	5-1	Wet Detention	59.0	65.1	66.1	63.0	access to pond through fdot row
	5-2	Wet Detention	59.0	65.1	66.1		fdot row- wetlands
	5-3	Dry Detention	60.1	65.5	66.5		ORIFICE AT 60.1, BOTTOM AT 62

Project: FTE Widening from S. Kissimmee Park Rd to US 192 Designer: ALE Date: 8/22/2019
FPID: 441224-1-22-01 Reviewer: JAN Checked: 8/22/2019
County: Osceola

Pond Sites Provided
Alternative 2

Pond Option	Required Area (AC)	Pond Site	Provided Area (AC)	Total Provided Area	Surplus Space	
1-1	5.5	1-1-2	5.8	5.8	0.3	*Within ROW*
1-2	5.3	1-2-2	5.6	5.6	0.3	
1-3	5.3	1-3-2	5.7	5.7	0.4	
100-1	1.3	100-1	2.3	2.3	1.0	
100-2	1.3	100-2	1.9	1.9	0.6	
3-1	7.1	3-1-2	7.7	7.7	0.6	
3-2	7.2	3-2-2	9.0	9.0	1.8	
3-3	7.4	3-3-2	8.1	8.1	0.7	*Within ROW*
300-1	3.7	300-1	7.5	7.5	3.8	*Remnant Parcel*
300-2	3.7	300-2A	2.9	5.7	2.0	*Remnant Parcel*
		300-1B	1.2			*Remnant Parcel*
		300-2C	1.6			*Remnant Parcel*
300-3	3.7	300-3	4.7	4.7	1.0	
4-1	1.8	4-1	2.8	2.8	1.0	
4-2	1.8	4-2	3.5	3.5	1.7	
4-3	1.7	4-3	2.9	2.9	1.2	*Within ROW*
5-1	4.4	5-1	6.9	6.9	2.5	*(Includes Easement)*
5-2	4.4	5-2	6.5	6.5	2.1	*FDOT Parcel*
5-3	4.5	5-3A	1.7	5.7	1.2	*Within ROW*
		5-3B	1.0			*Within ROW*
		5-3C	3.0			*Within ROW*

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Appendix D

Floodplain Encroachment Calculations

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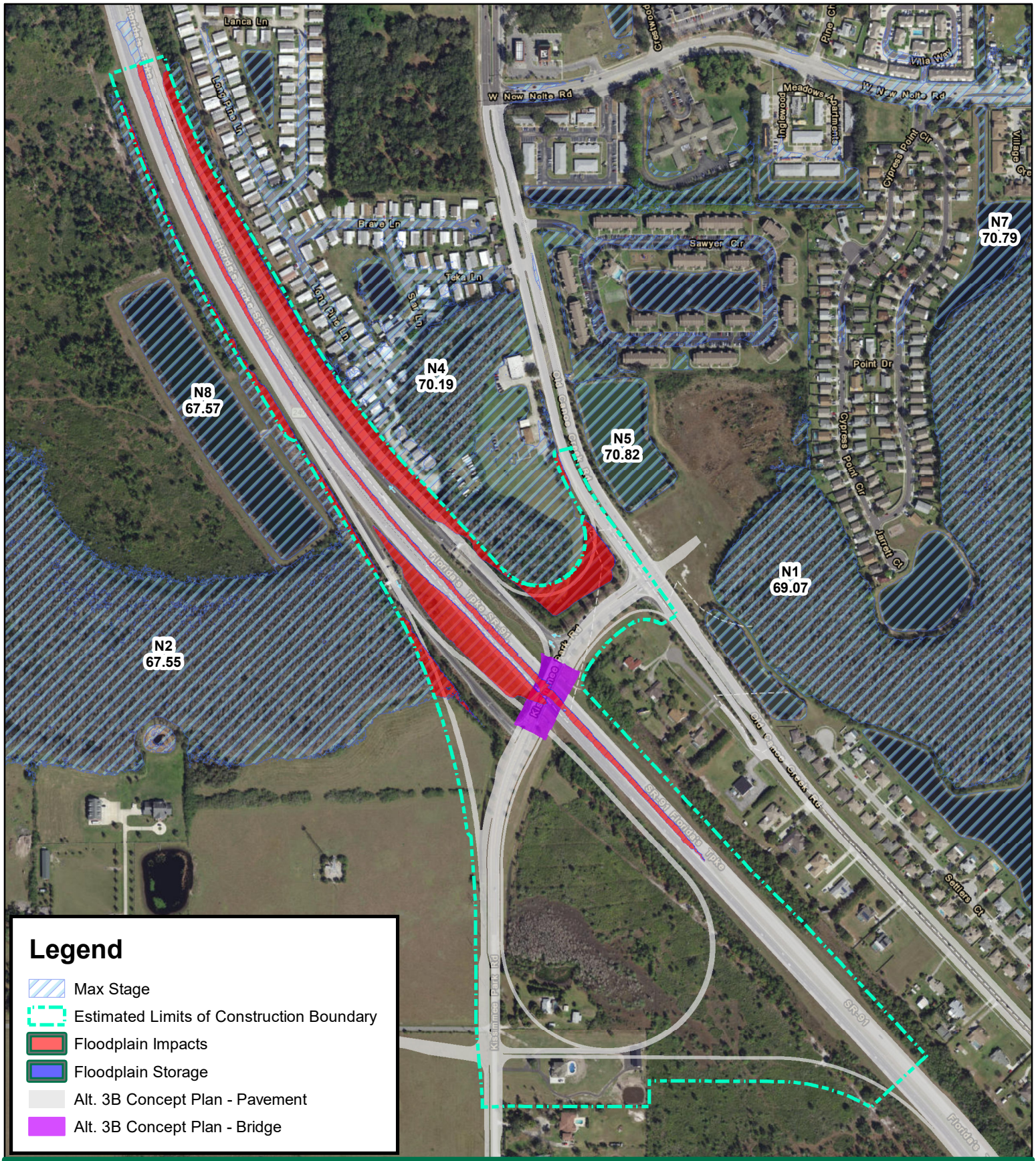


FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

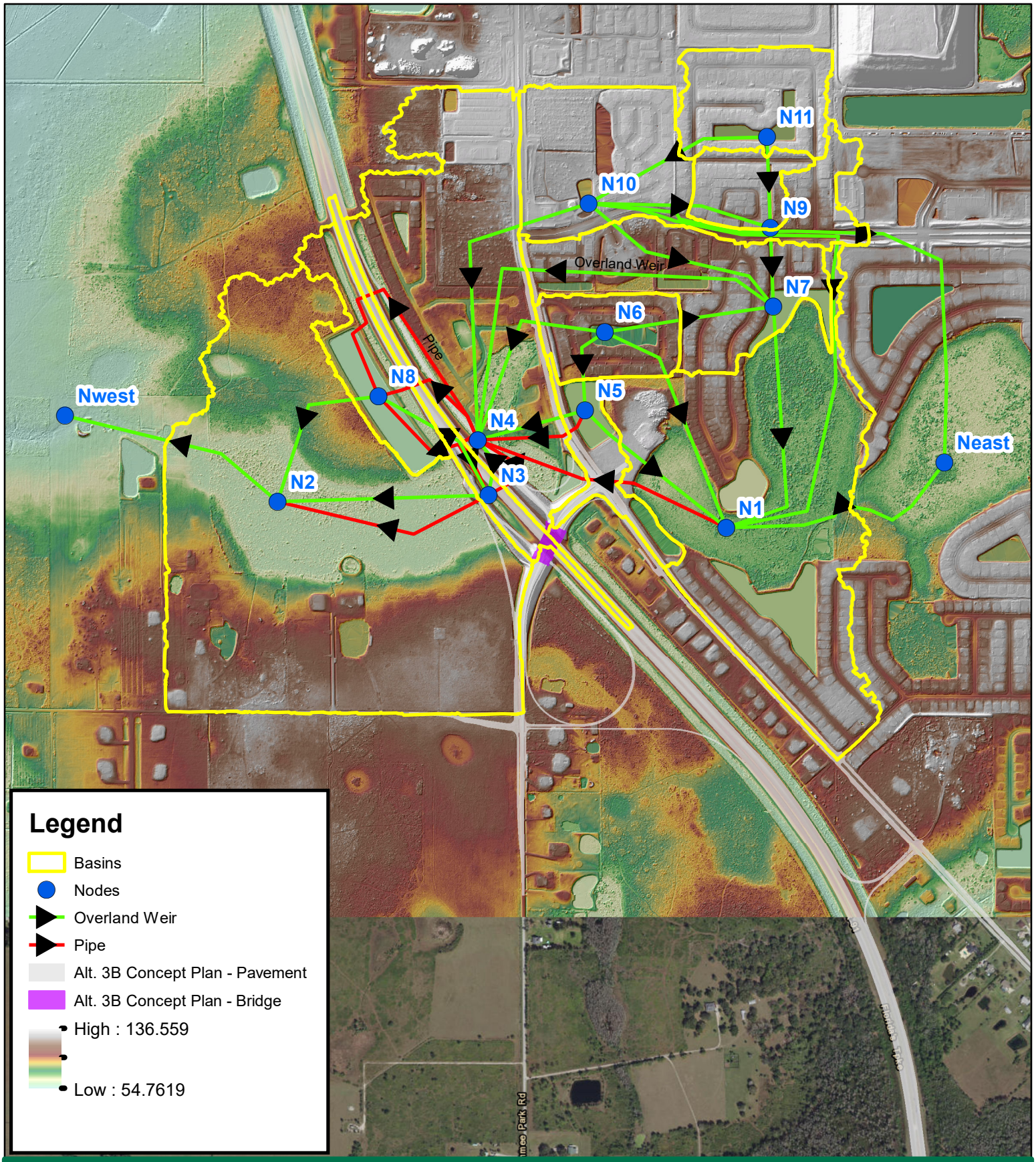
OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1 Interchange Floodplain Impacts

0 245 490 980 Feet

N



FLORIDA'S TURNPIKE (SR 91)

FROM SOUTH OF KISSIMMEE PARK ROAD TO US 192
(MP 238.5 - 242.5)

OSCEOLA COUNTY, FLORIDA
FPID NO. 441224-1-22-01

PREPARED BY:
The Balmoral Group
165 Lincoln Avenue
Winter Park, Florida 32789

Alternative 1 Interchange Floodplain Impacts

0 485 970 1,940 Feet

N

Turnpike Widening
From Kissimmee Park Road to US 192
Existing Conditions Model at CD-1

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
N1	BASE	100YR24HR	14.49	69.07	69.29	-1.9355	2714887	12.39	696.06	14.49	119.59
N10	BASE	100YR24HR	12.19	72.15	69.24	0.0002	347254	12.08	252.81	12.19	226.45
N11	BASE	100YR24HR	15.86	72.63	69.08	0.0006	167400	12.25	70.86	15.86	6.60
N2	BASE	100YR24HR	13.22	67.55	70.00	-0.1058	2449869	12.25	601.80	13.22	231.81
N3	BASE	100YR24HR	24.99	72.47	70.00	-0.7210	247333	12.00	60.91	0.00	0.00
N4	BASE	100YR24HR	60.00	70.19	70.50	-0.1912	1405809	12.17	336.42	0.00	0.00
N5	BASE	100YR24HR	60.00	70.82	70.50	-1.9442	226516	12.00	73.03	0.00	0.00
N6	BASE	100YR24HR	13.34	71.24	70.79	-2.2768	294123	12.17	79.43	13.34	19.59
N7	BASE	100YR24HR	12.51	70.79	70.00	-2.4491	375081	12.18	411.21	12.51	317.80
N8	BASE	100YR24HR	13.90	67.57	71.05	0.0002	465061	12.42	57.74	14.46	26.68
N9	BASE	100YR24HR	12.19	72.16	71.05	-2.5419	83600	12.00	14.50	0.00	0.00
Neast	BASE	100YR24HR	0.00	62.00	62.10	0.0000	0	14.49	119.59	0.00	0.00
Nwest	BASE	100YR24HR	60.00	1.67	0.00	0.0001	2787840	13.22	231.81	0.00	0.00

DRAFT

```
==========================================================================================
==== Basins ==============================================================================
==========================================================================================

         Name: N1                      Node: N1                     Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Flmod               Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 25.57
              Area(ac): 115.608                  Time Shift(hrs): 0.00
           Curve Number: 89.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


------------------------------------------------------------------------------------------
         Name: N10                     Node: N10                    Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Flmod               Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 13.89
              Area(ac): 50.383                   Time Shift(hrs): 0.00
           Curve Number: 89.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


------------------------------------------------------------------------------------------
         Name: N11                     Node: N11                    Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Flmod               Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 25.57
              Area(ac): 24.800                   Time Shift(hrs): 0.00
           Curve Number: 70.68             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


------------------------------------------------------------------------------------------
         Name: N2                      Node: N2                     Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Flmod               Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 32.09
              Area(ac): 185.280                  Time Shift(hrs): 0.00
           Curve Number: 89.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


------------------------------------------------------------------------------------------
         Name: N3                      Node: N3                     Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Flmod               Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
              Area(ac): 11.025                   Time Shift(hrs): 0.00
           Curve Number: 87.92             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


------------------------------------------------------------------------------------------
         Name: N4                      Node: N4                     Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                   Peaking Factor: 256.0
          Rainfall File: Flmod               Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 25.98
              Area(ac): 90.653                   Time Shift(hrs): 0.00
           Curve Number: 89.00             Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


------------------------------------------------------------------------------------------
         Name: N5                      Node: N5                     Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN
```

```
        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Flmod                Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                  Time of Conc(min): 10.00
               Area(ac): 13.091                   Time Shift(hrs): 0.00
           Curve Number: 89.00               Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
         Name: N6                       Node: N6                      Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Flmod                Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                  Time of Conc(min): 19.16
               Area(ac): 18.476                   Time Shift(hrs): 0.00
           Curve Number: 89.00               Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
         Name: N7                       Node: N7                      Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Flmod                Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                  Time of Conc(min): 22.03
               Area(ac): 42.659                   Time Shift(hrs): 0.00
           Curve Number: 70.68               Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
         Name: N8                       Node: N8                      Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Flmod                Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                  Time of Conc(min): 40.96
               Area(ac): 19.915                   Time Shift(hrs): 0.00
           Curve Number: 89.00               Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


-------------------------------------------------------------------------------------------------
         Name: N9                       Node: N9                      Status: Onsite
        Group: BASE                     Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                    Peaking Factor: 256.0
          Rainfall File: Flmod                Storm Duration(hrs): 30.00
    Rainfall Amount(in): 0.000                  Time of Conc(min): 16.36
               Area(ac): 12.193                   Time Shift(hrs): 0.00
           Curve Number: 89.00               Max Allowable Q(cfs): 999999.000
                DCIA(%): 0.00


=================================================================================================
==== Nodes ======================================================================================
=================================================================================================

      Name: N1                  Base Flow(cfs): 0.000          Init Stage(ft): 64.290
     Group: BASE                                               Warn Stage(ft): 69.290
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------
         66.226          0.0001
         66.476          0.0040
         66.976          3.3528
         67.476         27.1717
         67.976         48.2864
         68.476         57.6248
         68.976         61.8084
         69.476         64.6859
         69.976         67.7065
         70.476         70.6864
         70.976         74.6391
         71.476         80.8312
         71.976         87.8534
```

72.476	95.3059
72.976	103.5016
73.476	109.9067
73.976	111.9655
74.476	113.2059
74.976	113.9348
75.476	114.1506
75.976	114.4632
76.476	114.8307
76.976	115.1253
77.476	115.2858
77.976	115.3957
78.476	115.4652
78.976	115.5554
79.476	115.6084
79.856	115.6107

Name: N10 Base Flow(cfs): 0.000 Init Stage(ft): 69.239
Group: BASE Warn Stage(ft): 69.239
Type: Stage/Area

Stage(ft)	Area(ac)
69.239	0.0001
69.489	0.4181
69.989	0.4802
70.489	1.2324
70.989	3.1459
71.489	4.7876
71.989	6.8205
72.489	10.3403
72.989	14.7964
73.489	20.1099
73.989	23.6884
74.489	28.8173
74.989	35.6082
75.489	41.1117
75.989	45.8996
76.489	49.1315
76.989	49.9231
77.489	50.1502
77.989	50.2920
78.489	50.3187
78.989	50.3352
79.489	50.3821
79.989	50.3838
80.508	50.3854

Name: N11 Base Flow(cfs): 0.000 Init Stage(ft): 69.076
Group: BASE Warn Stage(ft): 69.076
Type: Stage/Area

Stage(ft)	Area(ac)
69.076	2.2584
69.326	2.3502
69.826	2.4270
70.326	2.4910
70.826	2.5522
71.326	2.6201
71.826	2.8108
72.326	3.3739
72.826	4.1474
73.326	5.3369
73.826	7.0114
74.326	9.6192
74.826	13.8702
75.326	16.9869
75.826	19.4597
76.326	22.5598
76.826	24.5865
77.401	24.8057

Name: N2 Base Flow(cfs): 0.000 Init Stage(ft): 65.000
Group: BASE Warn Stage(ft): 70.000
Type: Stage/Area

DRAFT

Stage(ft)	Area(ac)
65.106	0.0001
65.356	0.0020
65.856	0.1030
66.356	31.4908
66.856	45.7315
67.356	53.3580
67.856	60.7406
68.356	71.0061
68.856	80.1829
69.356	90.1059
69.856	99.6179
70.356	111.4189
70.856	124.7594
71.356	135.4517
71.856	148.1894
72.356	169.9195
72.856	182.2387
73.356	183.6342
73.856	183.9588
74.356	184.0757
74.856	184.1341
75.356	184.1826
75.856	184.2370
76.356	184.2929
76.856	184.3477
77.356	184.4201
77.856	184.5239
78.356	184.5895
78.856	184.6407
79.356	184.6828
79.856	184.7166
80.356	184.7478
80.856	184.7780
81.356	184.8079
81.856	184.8344
82.356	184.8627
82.856	184.8865
83.356	184.9110
83.856	184.9317
84.356	184.9551
84.856	184.9756
85.356	184.9961
85.856	185.0149
86.356	185.0344
86.856	185.0512
87.356	185.0666
87.856	185.0828
88.356	185.0967
88.856	185.1103
89.356	185.1245
89.856	185.1377
90.356	185.1507
90.856	185.1633
91.356	185.1795
91.856	185.2003
92.356	185.2228
92.856	185.2514
93.479	185.2789

Name: N3 Base Flow(cfs): 0.000 Init Stage(ft): 65.370
Group: BASE Warn Stage(ft): 70.000
Type: Stage/Area

Stage(ft)	Area(ac)
66.091	0.0001
66.341	0.0406
66.841	0.1343
67.341	0.2974
67.841	0.4667
68.341	0.6237
68.841	0.7726
69.341	0.9145
69.841	1.0590
70.341	1.2081
70.841	1.3771
71.341	1.7629
71.841	3.0601
72.341	5.1276
72.841	7.2769
73.341	8.3221

DRAFT

73.841	9.1205
74.341	9.3859
74.841	9.5424
75.341	9.6407
75.841	9.7211
76.341	9.7991
76.841	9.8780
77.341	9.9664
77.841	10.0416
78.341	10.0937
78.841	10.1420
79.341	10.1880
79.841	10.2283
80.341	10.2637
80.841	10.2967
81.341	10.3287
81.841	10.3587
82.341	10.3867
82.841	10.4154
83.341	10.4426
83.841	10.4709
84.341	10.4969
84.841	10.5226
85.341	10.5491
85.841	10.5719
86.341	10.5967
86.841	10.6220
87.341	10.6470
87.841	10.6729
88.341	10.6966
88.841	10.7197
89.341	10.7419
89.841	10.7662
90.341	10.7923
90.841	10.8210
91.341	10.8536
91.841	10.8834
92.341	10.9161
92.841	10.9527
93.341	10.9771
93.841	10.9913
94.341	11.0038
94.841	11.0120
95.341	11.0189
95.841	11.0233
96.377	11.0288

Name: N4 Base Flow(cfs): 0.000 Init Stage(ft): 65.500
Group: BASE Warn Stage(ft): 70.500
Type: Stage/Area

Stage(ft)	Area(ac)
65.691	0.0001
65.941	0.0161
66.441	3.0924
66.941	7.3241
67.441	12.3196
67.941	15.2422
68.441	17.8149
68.941	20.7993
69.441	24.1977
69.941	29.2985
70.441	35.3131
70.941	41.7723
71.441	49.2543
71.941	62.0808
72.441	72.8049
72.941	77.0380
73.441	78.6372
73.941	79.6466
74.441	80.2627
74.941	80.7504
75.441	81.2444
75.941	82.5783
76.441	84.4648
76.941	87.5277
77.441	88.9403
77.941	89.1588
78.441	89.2302
78.941	89.3129
79.441	89.3822
79.941	89.4393

DRAFT

80.441	89.4978
80.941	89.5542
81.441	89.6027
81.941	89.6493
82.441	89.6958
82.941	89.7423
83.441	89.7849
83.941	89.8311
84.441	89.8746
84.941	89.9205
85.441	89.9644
85.941	90.0055
86.441	90.0456
86.941	90.0844
87.441	90.1284
87.941	90.1676
88.441	90.2049
88.941	90.2435
89.441	90.2808
89.941	90.3165
90.441	90.3540
90.941	90.3920
91.441	90.4316
91.941	90.4712
92.441	90.5183
92.941	90.5634
93.441	90.6145
93.941	90.6398
94.441	90.6439
94.941	90.6454
95.374	90.6485

Name: N5 Base Flow(cfs): 0.000 Init Stage(ft): 65.500
Group: BASE Warn Stage(ft): 70.500
Type: Stage/Area

Stage(ft)	Area(ac)
67.444	2.9244
67.694	3.5844
68.194	4.3893
68.694	4.5053
69.194	4.6469
69.694	4.8008
70.194	4.9588
70.694	5.1313
71.194	5.4104
71.694	6.0915
72.194	7.3465
72.694	8.3332
73.194	9.2375
73.694	9.9653
74.194	10.6613
74.694	11.7334
75.194	12.0008
75.694	12.0762
76.194	12.1268
76.694	12.1544
77.194	12.1775
77.694	12.2003
78.194	12.2214
78.694	12.2422
79.194	12.2630
79.694	12.2828
80.194	12.3027
80.694	12.3228
81.194	12.3413
81.694	12.3603
82.194	12.3775
82.694	12.3955
83.194	12.4142
83.694	12.4316
84.194	12.4499
84.694	12.4664
85.194	12.4836
85.694	12.5004
86.194	12.5195
86.694	12.5386
87.194	12.5595
87.694	12.5816
88.194	12.6062
88.694	12.6301
89.194	12.6545

DRAFT

89.694	12.6804
90.194	12.7068
90.694	12.7332
91.194	12.7606
91.694	12.7888
92.194	12.8205
92.694	12.8578
93.194	12.9131
93.694	12.9815
94.194	13.0385
94.694	13.0685
95.241	13.0896

Name: N6 Base Flow(cfs): 0.000 Init Stage(ft): 65.790
Group: BASE Warn Stage(ft): 70.790
Type: Stage/Area

Stage(ft)	Area(ac)
68.067	0.0001
68.317	1.6351
68.817	1.9256
69.317	2.0090
69.817	2.0822
70.317	2.7629
70.817	4.5558
71.317	7.1426
71.817	10.5415
72.317	16.6483
72.817	18.0419
73.317	18.2461
73.817	18.3526
74.317	18.4325
74.933	18.4762

Name: N7 Base Flow(cfs): 0.000 Init Stage(ft): 65.000
Group: BASE Warn Stage(ft): 70.000
Type: Stage/Area

Stage(ft)	Area(ac)
67.449	2.4904
67.699	2.6199
68.199	2.8310
68.699	3.5981
69.199	5.0208
69.699	5.8858
70.199	6.6604
70.699	8.1134
71.199	10.8091
71.699	16.6233
72.199	23.8553
72.699	32.3839
73.199	40.6049
73.699	42.6151
74.199	42.6563
74.645	42.6574

Name: N8 Base Flow(cfs): 0.000 Init Stage(ft): 66.050
Group: BASE Warn Stage(ft): 71.050
Type: Stage/Area

Stage(ft)	Area(ac)
65.467	0.0001
65.717	0.0001
66.217	7.5905
66.717	9.4225
67.217	10.3056
67.717	10.8240
68.217	11.3133
68.717	11.8374
69.217	13.3196
69.717	14.0876
70.217	15.1862
70.717	16.9031
71.217	18.0597

DRAFT

71.717	18.4147
72.217	18.6694
72.717	18.9479
73.217	19.3972
73.717	19.8008
74.217	19.8518
74.717	19.8851
75.217	19.9093
75.679	19.9155

Name: N9 Base Flow(cfs): 0.000 Init Stage(ft): 66.050
Group: BASE Warn Stage(ft): 71.050
Type: Stage/Area

Stage(ft)	Area(ac)
68.592	0.0001
68.842	0.0155
69.342	0.1065
69.842	0.1621
70.342	0.2059
70.842	0.2429
71.342	0.3076
71.842	0.9242
72.342	2.4865
72.842	3.9106
73.342	6.1933
73.842	7.7957
74.342	8.5480
74.842	9.5192
75.342	10.3273
75.842	11.7803
76.342	12.1707
76.770	12.1942

Name: Neast Base Flow(cfs): 0.000 Init Stage(ft): 62.000
Group: BASE Warn Stage(ft): 62.100
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	62.000
9999.00	62.000

Name: Nwest Base Flow(cfs): 0.000 Init Stage(ft): 0.000
Group: BASE Warn Stage(ft): 0.000
Type: Stage/Area

Stage(ft)	Area(ac)
0.000	64.0000
9999.000	64.0000

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==== Cross Sections ==========
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Name: O_N10_N1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	73.275	0.012000
10.000	73.339	0.012000
20.000	73.403	0.012000
30.000	73.467	0.012000
40.000	73.184	0.012000
50.000	73.066	0.012000
60.000	73.052	0.012000
70.000	73.124	0.012000
80.000	73.098	0.012000
90.000	72.989	0.012000
100.000	72.908	0.012000
110.000	72.870	0.012000
120.000	72.587	0.012000

130.000	73.047	0.012000
140.000	73.196	0.012000
150.000	74.536	0.012000
160.000	77.160	0.012000
170.000	78.024	0.012000
180.000	78.497	0.012000
190.000	78.621	0.012000
200.000	77.550	0.012000
210.000	77.276	0.012000
220.000	78.367	0.012000
230.000	78.702	0.012000

Name: O_N10_N4 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	78.240	0.012000
10.000	78.695	0.012000
20.000	78.752	0.012000
30.000	78.798	0.012000
40.000	78.654	0.012000
50.000	78.853	0.012000
60.000	78.793	0.012000
70.000	78.776	0.012000
80.000	78.834	0.012000
90.000	78.684	0.012000
100.000	78.026	0.012000
110.000	78.539	0.012000
120.000	78.374	0.012000
130.000	78.398	0.012000
140.000	78.551	0.012000
150.000	78.589	0.012000
160.000	78.555	0.012000
170.000	78.562	0.012000
180.000	78.466	0.012000
190.000	78.537	0.012000
200.000	78.436	0.012000
210.000	78.261	0.012000
220.000	78.120	0.012000
230.000	78.015	0.012000
240.000	78.315	0.012000
250.000	78.301	0.012000
260.000	78.044	0.012000
270.000	77.939	0.012000
280.000	77.812	0.012000
290.000	78.289	0.012000
300.000	78.190	0.012000
310.000	78.141	0.012000
320.000	77.977	0.012000
330.000	77.458	0.012000
340.000	76.988	0.012000
350.000	76.868	0.012000
360.000	76.791	0.012000
370.000	76.704	0.012000
380.000	76.664	0.012000
390.000	76.638	0.012000
400.000	76.602	0.012000
410.000	76.544	0.012000
420.000	76.514	0.012000
430.000	76.627	0.012000
440.000	76.507	0.012000
450.000	76.516	0.012000
460.000	77.043	0.012000
470.000	76.532	0.012000
480.000	77.535	0.012000
490.000	77.452	0.012000
500.000	76.267	0.012000
510.000	76.497	0.012000
520.000	77.378	0.012000
530.000	77.137	0.012000
540.000	77.095	0.012000
550.000	76.857	0.012000
560.000	77.074	0.012000
570.000	77.247	0.012000
580.000	75.958	0.012000
590.000	76.823	0.012000
600.000	76.924	0.012000
610.000	76.725	0.012000
620.000	76.861	0.012000
630.000	76.941	0.012000
640.000	76.859	0.012000
650.000	76.784	0.012000

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660.000	76.586	0.012000
670.000	76.629	0.012000
680.000	76.335	0.012000
690.000	76.327	0.012000
700.000	76.257	0.012000
710.000	76.286	0.012000
720.000	76.341	0.012000
730.000	76.532	0.012000
740.000	76.202	0.012000
750.000	76.230	0.012000
760.000	76.377	0.012000
770.000	76.259	0.012000
780.000	76.023	0.012000
790.000	76.102	0.012000
800.000	76.135	0.012000
810.000	75.958	0.012000
820.000	75.887	0.012000
830.000	75.870	0.012000
840.000	75.755	0.012000
850.000	75.717	0.012000
860.000	75.687	0.012000
870.000	75.567	0.012000
880.000	74.976	0.012000
890.000	75.124	0.012000
900.000	75.778	0.012000
910.000	75.658	0.012000
920.000	75.574	0.012000
930.000	75.511	0.012000
940.000	74.687	0.012000
950.000	75.361	0.012000
960.000	75.432	0.012000
970.000	75.342	0.012000
980.000	75.353	0.012000
990.000	75.298	0.012000
1000.000	75.102	0.012000
1010.000	74.998	0.012000
1020.000	75.108	0.012000
1030.000	75.064	0.012000
1040.000	75.018	0.012000
1050.000	74.918	0.012000
1060.000	75.024	0.012000
1070.000	74.929	0.012000
1080.000	74.831	0.012000
1090.000	74.766	0.012000
1100.000	74.706	0.012000
1110.000	74.677	0.012000
1120.000	73.858	0.012000
1130.000	73.815	0.012000
1140.000	73.850	0.012000
1150.000	73.814	0.012000
1160.000	73.830	0.012000
1170.000	73.847	0.012000
1180.000	73.839	0.012000
1190.000	73.807	0.012000

Name: O_N10_N7 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	73.275	0.012000
10.000	73.212	0.012000
20.000	73.165	0.012000
30.000	73.341	0.012000
40.000	73.080	0.012000
50.000	72.695	0.012000
60.000	72.559	0.012000
70.000	72.430	0.012000
80.000	72.586	0.012000
90.000	72.542	0.012000
100.000	72.586	0.012000
110.000	72.704	0.012000
120.000	72.870	0.012000
130.000	73.182	0.012000
140.000	73.434	0.012000
150.000	73.210	0.012000
160.000	73.187	0.012000
170.000	73.162	0.012000
180.000	73.128	0.012000
190.000	73.243	0.012000
200.000	73.142	0.012000
210.000	73.147	0.012000
220.000	72.994	0.012000

DRAFT

230.000	73.181	0.012000
240.000	73.327	0.012000
250.000	73.223	0.012000
260.000	73.183	0.012000
270.000	73.222	0.012000
280.000	73.187	0.012000
290.000	73.166	0.012000
300.000	73.331	0.012000
310.000	73.281	0.012000
320.000	73.164	0.012000
330.000	73.163	0.012000
340.000	73.220	0.012000
350.000	73.068	0.012000
360.000	73.038	0.012000
370.000	73.077	0.012000
380.000	72.952	0.012000
390.000	72.995	0.012000
400.000	73.127	0.012000
410.000	73.162	0.012000
420.000	73.076	0.012000
430.000	72.948	0.012000
440.000	72.721	0.012000
450.000	72.013	0.012000
460.000	71.582	0.012000
470.000	71.676	0.012000
480.000	71.673	0.012000
490.000	71.645	0.012000
500.000	71.616	0.012000
510.000	71.684	0.012000
520.000	71.605	0.012000
530.000	71.552	0.012000
540.000	71.556	0.012000
550.000	71.578	0.012000
560.000	71.521	0.012000
570.000	71.415	0.012000
580.000	72.508	0.012000
590.000	71.985	0.012000
600.000	72.052	0.012000
610.000	72.206	0.012000
620.000	72.315	0.012000
630.000	72.643	0.012000
640.000	72.694	0.012000
650.000	72.660	0.012000
660.000	72.625	0.012000
670.000	72.571	0.012000
680.000	72.701	0.012000
690.000	72.611	0.012000
700.000	72.548	0.012000
710.000	72.553	0.012000
720.000	72.527	0.012000
730.000	72.556	0.012000
740.000	72.449	0.012000
750.000	72.471	0.012000
760.000	72.451	0.012000
770.000	72.376	0.012000
780.000	72.313	0.012000
790.000	72.226	0.012000
800.000	72.256	0.012000
810.000	72.135	0.012000
820.000	72.254	0.012000
830.000	72.451	0.012000
840.000	73.657	0.012000
850.000	72.440	0.012000
860.000	72.319	0.012000
870.000	72.283	0.012000
880.000	72.313	0.012000
890.000	71.866	0.012000
900.000	71.950	0.012000
910.000	71.936	0.012000
920.000	71.892	0.012000
930.000	72.029	0.012000
940.000	71.896	0.012000
950.000	72.236	0.012000
960.000	72.061	0.012000
970.000	72.019	0.012000
980.000	72.098	0.012000
990.000	71.960	0.012000
1000.000	71.952	0.012000
1010.000	72.164	0.012000
1020.000	71.624	0.012000
1030.000	71.736	0.012000
1040.000	71.915	0.012000
1050.000	71.911	0.012000
1060.000	71.695	0.012000
1070.000	71.501	0.012000
1080.000	71.603	0.012000

DRAFT

1090.000	71.693	0.012000
1100.000	71.698	0.012000
1110.000	71.721	0.012000
1120.000	71.700	0.012000
1130.000	71.701	0.012000
1140.000	71.740	0.012000
1150.000	71.806	0.012000
1160.000	71.859	0.012000
1170.000	71.760	0.012000
1180.000	71.870	0.012000
1190.000	71.990	0.012000
1200.000	72.138	0.012000
1210.000	71.883	0.012000
1220.000	71.983	0.012000
1230.000	72.184	0.012000
1240.000	71.935	0.012000
1250.000	72.150	0.012000
1260.000	72.145	0.012000
1270.000	72.476	0.012000
1280.000	72.182	0.012000
1290.000	72.495	0.012000
1300.000	72.423	0.012000
1310.000	72.565	0.012000
1320.000	72.558	0.012000
1330.000	72.838	0.012000
1340.000	72.882	0.012000
1350.000	72.460	0.012000
1360.000	72.514	0.012000
1370.000	72.600	0.012000
1380.000	72.601	0.012000
1390.000	72.566	0.012000
1400.000	72.525	0.012000
1410.000	72.500	0.012000
1420.000	72.974	0.012000
1430.000	73.072	0.012000
1440.000	73.183	0.012000
1450.000	73.040	0.012000
1460.000	72.991	0.012000
1470.000	73.055	0.012000
1480.000	73.052	0.012000
1490.000	73.114	0.012000
1500.000	73.401	0.012000
1510.000	73.291	0.012000
1520.000	73.064	0.012000
1530.000	73.299	0.012000
1540.000	73.253	0.012000
1550.000	72.976	0.012000
1560.000	72.987	0.012000
1570.000	72.806	0.012000
1580.000	72.674	0.012000
1590.000	72.735	0.012000
1600.000	72.932	0.012000
1610.000	73.005	0.012000
1620.000	72.916	0.012000
1630.000	72.843	0.012000
1640.000	73.107	0.012000
1650.000	72.895	0.012000
1660.000	73.232	0.012000
1670.000	72.940	0.012000
1680.000	73.449	0.012000
1690.000	73.311	0.012000
1700.000	73.406	0.012000
1710.000	73.829	0.012000
1720.000	73.312	0.012000
1730.000	73.387	0.012000
1740.000	73.314	0.012000
1750.000	73.300	0.012000
1760.000	73.358	0.012000
1770.000	73.322	0.012000
1780.000	73.305	0.012000
1790.000	73.297	0.012000
1800.000	73.190	0.012000
1810.000	73.117	0.012000
1820.000	73.024	0.012000
1830.000	72.974	0.012000
1840.000	72.980	0.012000
1850.000	73.363	0.012000
1860.000	73.254	0.012000
1870.000	73.448	0.012000
1880.000	73.610	0.012000
1890.000	73.245	0.012000
1900.000	73.281	0.012000
1910.000	73.039	0.012000
1920.000	73.149	0.012000
1930.000	73.245	0.012000
1940.000	73.414	0.012000

DRAFT

1950.000	73.169	0.012000
1960.000	73.397	0.012000
1970.000	73.518	0.012000
1980.000	73.291	0.012000
1990.000	73.464	0.012000
2000.000	73.701	0.012000
2010.000	73.449	0.012000
2020.000	73.360	0.012000
2030.000	73.351	0.012000
2040.000	73.370	0.012000
2050.000	72.875	0.012000
2060.000	72.912	0.012000
2070.000	73.084	0.012000
2080.000	73.571	0.012000
2090.000	73.321	0.012000
2100.000	73.413	0.012000
2110.000	73.342	0.012000
2120.000	73.009	0.012000
2130.000	73.075	0.012000
2140.000	73.066	0.012000
2150.000	73.339	0.012000
2160.000	73.193	0.012000
2170.000	73.243	0.012000
2180.000	73.770	0.012000
2190.000	73.477	0.012000
2200.000	73.815	0.012000
2210.000	73.568	0.012000
2220.000	73.611	0.012000
2230.000	73.456	0.012000
2240.000	73.392	0.012000
2250.000	73.369	0.012000
2260.000	73.450	0.012000
2270.000	73.480	0.012000
2280.000	73.445	0.012000
2290.000	73.442	0.012000
2300.000	73.547	0.012000
2310.000	73.040	0.012000
2320.000	72.991	0.012000
2330.000	72.989	0.012000
2340.000	73.001	0.012000
2350.000	72.989	0.012000
2360.000	72.926	0.012000
2370.000	72.886	0.012000
2380.000	72.845	0.012000
2390.000	72.876	0.012000
2400.000	73.418	0.012000
2410.000	73.533	0.012000
2420.000	73.657	0.012000
2430.000	73.732	0.012000
2440.000	73.673	0.012000
2450.000	73.646	0.012000
2460.000	73.613	0.012000
2470.000	73.579	0.012000
2480.000	73.537	0.012000
2490.000	73.396	0.012000
2500.000	73.420	0.012000
2510.000	73.416	0.012000
2520.000	73.674	0.012000
2530.000	73.535	0.012000
2540.000	73.525	0.012000
2550.000	73.638	0.012000
2560.000	73.447	0.012000
2570.000	73.620	0.012000
2580.000	73.458	0.012000
2590.000	73.281	0.012000
2600.000	73.627	0.012000
2610.000	73.193	0.012000
2620.000	73.126	0.012000
2630.000	73.259	0.012000
2640.000	73.006	0.012000
2650.000	73.246	0.012000
2660.000	73.084	0.012000
2670.000	73.431	0.012000
2680.000	73.362	0.012000
2690.000	73.225	0.012000
2700.000	73.353	0.012000
2710.000	73.293	0.012000
2720.000	73.552	0.012000
2730.000	73.520	0.012000
2740.000	73.548	0.012000
2750.000	73.513	0.012000
2760.000	73.459	0.012000
2770.000	73.501	0.012000
2780.000	73.439	0.012000
2790.000	73.088	0.012000
2800.000	73.022	0.012000

DRAFT

2810.000	72.245	0.012000
2820.000	72.258	0.012000
2830.000	72.315	0.012000
2840.000	72.492	0.012000
2850.000	72.525	0.012000
2860.000	72.662	0.012000
2870.000	72.921	0.012000
2880.000	72.642	0.012000
2890.000	72.610	0.012000
2900.000	72.687	0.012000
2910.000	72.857	0.012000
2920.000	73.030	0.012000
2930.000	73.264	0.012000
2940.000	73.470	0.012000
2950.000	73.624	0.012000
2960.000	73.807	0.012000

Name: O_N10_N9 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	72.679	0.012000
10.000	72.717	0.012000
20.000	72.749	0.012000
30.000	72.788	0.012000
40.000	72.792	0.012000
50.000	72.774	0.012000
60.000	72.853	0.012000
70.000	72.909	0.012000
80.000	72.914	0.012000
90.000	72.982	0.012000
100.000	73.135	0.012000
110.000	73.119	0.012000
120.000	73.159	0.012000
130.000	73.174	0.012000
140.000	73.226	0.012000
150.000	73.210	0.012000
160.000	73.254	0.012000
170.000	73.276	0.012000
180.000	73.263	0.012000
190.000	73.232	0.012000
200.000	73.216	0.012000
210.000	73.218	0.012000
220.000	73.244	0.012000
230.000	73.239	0.012000
240.000	73.173	0.012000
250.000	73.149	0.012000
260.000	73.165	0.012000
270.000	73.130	0.012000
280.000	73.102	0.012000
290.000	73.104	0.012000
300.000	73.036	0.012000
310.000	72.987	0.012000
320.000	72.909	0.012000
330.000	72.918	0.012000
340.000	72.873	0.012000
350.000	72.839	0.012000
360.000	72.870	0.012000
370.000	72.844	0.012000
380.000	72.837	0.012000
390.000	72.784	0.012000
400.000	72.754	0.012000
410.000	72.788	0.012000
420.000	72.720	0.012000
430.000	72.701	0.012000
440.000	72.650	0.012000
450.000	72.632	0.012000
460.000	72.477	0.012000
470.000	72.550	0.012000
480.000	72.513	0.012000
490.000	72.493	0.012000
500.000	72.465	0.012000
510.000	72.714	0.012000
520.000	72.686	0.012000
530.000	72.682	0.012000
540.000	72.539	0.012000
550.000	72.552	0.012000
560.000	72.555	0.012000
570.000	72.663	0.012000
580.000	72.549	0.012000
590.000	72.589	0.012000
600.000	72.582	0.012000

DRAFT

610.000	72.526	0.012000
620.000	72.582	0.012000
630.000	72.581	0.012000
640.000	72.607	0.012000
650.000	72.468	0.012000
660.000	72.336	0.012000
670.000	72.305	0.012000
680.000	72.249	0.012000
690.000	72.298	0.012000
700.000	72.202	0.012000
710.000	72.143	0.012000
720.000	72.114	0.012000
730.000	72.005	0.012000
740.000	71.925	0.012000
750.000	71.961	0.012000
760.000	71.958	0.012000
770.000	71.822	0.012000
780.000	71.816	0.012000
790.000	71.915	0.012000
800.000	71.931	0.012000
810.000	71.881	0.012000
820.000	71.935	0.012000
830.000	71.885	0.012000
840.000	71.787	0.012000
850.000	71.853	0.012000
860.000	71.881	0.012000
870.000	71.849	0.012000
880.000	71.887	0.012000
890.000	71.817	0.012000
900.000	71.801	0.012000
910.000	71.771	0.012000
920.000	71.746	0.012000
930.000	71.771	0.012000
940.000	71.745	0.012000
950.000	71.820	0.012000
960.000	71.775	0.012000
970.000	71.815	0.012000
980.000	71.991	0.012000
990.000	71.934	0.012000
1000.000	72.087	0.012000
1010.000	71.920	0.012000
1020.000	71.886	0.012000
1030.000	71.814	0.012000
1040.000	71.771	0.012000
1050.000	71.791	0.012000
1060.000	71.624	0.012000
1070.000	71.832	0.012000
1080.000	71.771	0.012000
1090.000	71.785	0.012000
1100.000	71.853	0.012000
1110.000	71.901	0.012000
1120.000	71.864	0.012000
1130.000	71.974	0.012000
1140.000	71.725	0.012000
1150.000	71.691	0.012000
1160.000	71.647	0.012000
1170.000	71.855	0.012000
1180.000	71.871	0.012000
1190.000	71.766	0.012000
1200.000	71.730	0.012000
1210.000	71.662	0.012000
1220.000	71.683	0.012000
1230.000	71.862	0.012000
1240.000	71.834	0.012000
1250.000	71.629	0.012000
1260.000	71.832	0.012000
1270.000	71.825	0.012000
1280.000	71.891	0.012000
1290.000	71.972	0.012000
1300.000	72.089	0.012000
1310.000	72.156	0.012000
1320.000	72.360	0.012000
1330.000	72.548	0.012000
1340.000	72.675	0.012000
1350.000	72.948	0.012000
1360.000	73.112	0.012000
1370.000	74.418	0.012000
1380.000	74.631	0.012000
1390.000	75.171	0.012000
1400.000	75.573	0.012000
1410.000	75.717	0.012000
1420.000	75.868	0.012000
1430.000	75.850	0.012000
1440.000	74.239	0.012000
1450.000	73.626	0.012000
1460.000	72.441	0.012000

DRAFT

1470.000	72.338	0.012000
1480.000	72.367	0.012000
1490.000	72.436	0.012000
1500.000	72.485	0.012000
1510.000	72.453	0.012000
1520.000	72.340	0.012000
1530.000	72.543	0.012000
1540.000	72.542	0.012000
1550.000	72.477	0.012000
1560.000	72.568	0.012000
1570.000	72.548	0.012000
1580.000	72.554	0.012000
1590.000	72.615	0.012000
1600.000	72.547	0.012000
1610.000	72.672	0.012000
1620.000	72.693	0.012000
1630.000	72.946	0.012000
1640.000	73.124	0.012000
1650.000	72.958	0.012000
1660.000	72.929	0.012000
1670.000	72.950	0.012000
1680.000	72.968	0.012000
1690.000	72.896	0.012000
1700.000	72.909	0.012000
1710.000	72.912	0.012000
1720.000	73.036	0.012000
1730.000	73.042	0.012000
1740.000	73.110	0.012000
1750.000	73.353	0.012000
1760.000	73.485	0.012000
1770.000	73.858	0.012000
1780.000	74.715	0.012000
1790.000	75.354	0.012000
1800.000	75.383	0.012000
1810.000	75.537	0.012000
1820.000	75.784	0.012000
1830.000	75.920	0.012000
1840.000	75.824	0.012000
1850.000	75.863	0.012000
1860.000	75.877	0.012000
1870.000	75.871	0.012000
1880.000	75.911	0.012000
1890.000	75.904	0.012000
1900.000	75.943	0.012000
1910.000	76.005	0.012000
1920.000	76.112	0.012000
1930.000	75.897	0.012000
1940.000	76.088	0.012000
1950.000	76.080	0.012000
1960.000	75.974	0.012000
1970.000	75.883	0.012000
1980.000	76.052	0.012000
1990.000	75.923	0.012000
2000.000	75.937	0.012000
2010.000	76.073	0.012000
2020.000	75.739	0.012000
2030.000	75.402	0.012000
2040.000	75.324	0.012000
2050.000	75.404	0.012000
2060.000	75.469	0.012000
2070.000	75.578	0.012000
2080.000	75.590	0.012000
2090.000	76.011	0.012000
2100.000	75.628	0.012000
2110.000	75.287	0.012000
2120.000	74.940	0.012000
2130.000	74.274	0.012000
2140.000	73.609	0.012000
2150.000	73.103	0.012000
2160.000	72.527	0.012000
2170.000	72.706	0.012000
2180.000	72.704	0.012000
2190.000	72.697	0.012000
2200.000	72.706	0.012000
2210.000	72.730	0.012000
2220.000	72.686	0.012000

Name: O_N10_Neast Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	76.737	0.012000

DRAFT

10.000	76.550	0.012000
20.000	75.973	0.012000
30.000	75.407	0.012000
40.000	75.424	0.012000
50.000	75.267	0.012000
60.000	75.391	0.012000
70.000	75.587	0.012000
80.000	75.604	0.012000
90.000	75.663	0.012000
100.000	75.654	0.012000
110.000	75.733	0.012000
120.000	75.849	0.012000
130.000	75.399	0.012000
140.000	75.851	0.012000
150.000	75.775	0.012000
160.000	75.233	0.012000
170.000	74.991	0.012000
180.000	74.727	0.012000
190.000	74.699	0.012000
200.000	74.768	0.012000
210.000	74.731	0.012000
220.000	74.811	0.012000
230.000	74.530	0.012000
240.000	74.536	0.012000
250.000	74.554	0.012000
260.000	74.734	0.012000
270.000	74.414	0.012000
280.000	74.409	0.012000
290.000	74.382	0.012000
300.000	74.468	0.012000
310.000	74.284	0.012000
320.000	74.223	0.012000
330.000	74.032	0.012000
340.000	73.937	0.012000
350.000	73.904	0.012000
360.000	73.864	0.012000
370.000	73.942	0.012000
380.000	73.963	0.012000
390.000	74.017	0.012000
400.000	74.033	0.012000
410.000	73.955	0.012000
420.000	73.906	0.012000
430.000	73.792	0.012000
440.000	73.548	0.012000
450.000	73.513	0.012000
460.000	73.597	0.012000
470.000	73.703	0.012000
480.000	73.575	0.012000
490.000	73.428	0.012000
500.000	73.456	0.012000
510.000	73.614	0.012000
520.000	73.434	0.012000
530.000	73.397	0.012000
540.000	73.217	0.012000
550.000	73.396	0.012000
560.000	73.463	0.012000
570.000	73.651	0.012000
580.000	73.698	0.012000
590.000	73.757	0.012000
600.000	73.732	0.012000
610.000	73.752	0.012000
620.000	74.043	0.012000
630.000	73.898	0.012000
640.000	73.602	0.012000
650.000	73.725	0.012000
660.000	73.895	0.012000
670.000	73.905	0.012000
680.000	73.681	0.012000
690.000	73.721	0.012000
700.000	73.776	0.012000
710.000	73.696	0.012000
720.000	73.709	0.012000
730.000	73.761	0.012000
740.000	73.892	0.012000
750.000	73.992	0.012000
760.000	73.645	0.012000
770.000	74.331	0.012000
780.000	74.828	0.012000
790.000	74.992	0.012000
800.000	74.763	0.012000
810.000	74.361	0.012000
820.000	74.264	0.012000
830.000	74.258	0.012000
840.000	74.260	0.012000
850.000	74.342	0.012000
860.000	74.376	0.012000

DRAFT

870.000	74.386	0.012000
880.000	74.376	0.012000
890.000	74.481	0.012000
900.000	74.808	0.012000
910.000	75.048	0.012000
920.000	75.156	0.012000
930.000	74.948	0.012000
940.000	74.364	0.012000
950.000	74.338	0.012000
960.000	74.249	0.012000
970.000	74.174	0.012000
980.000	74.133	0.012000
990.000	74.474	0.012000
1000.000	74.395	0.012000
1010.000	74.353	0.012000
1020.000	74.252	0.012000
1030.000	74.390	0.012000
1040.000	74.491	0.012000
1050.000	74.426	0.012000
1060.000	74.334	0.012000
1070.000	74.422	0.012000
1080.000	74.860	0.012000
1090.000	74.937	0.012000
1100.000	74.974	0.012000
1110.000	74.936	0.012000
1120.000	74.848	0.012000
1130.000	74.828	0.012000
1140.000	74.978	0.012000
1150.000	75.117	0.012000
1160.000	75.919	0.012000
1170.000	75.128	0.012000
1180.000	75.219	0.012000
1190.000	75.341	0.012000
1200.000	75.342	0.012000
1210.000	75.355	0.012000
1220.000	75.373	0.012000
1230.000	75.342	0.012000
1240.000	75.387	0.012000
1250.000	75.435	0.012000
1260.000	75.460	0.012000
1270.000	75.484	0.012000
1280.000	75.429	0.012000
1290.000	75.538	0.012000
1300.000	75.589	0.012000
1310.000	75.712	0.012000
1320.000	75.822	0.012000
1330.000	75.736	0.012000
1340.000	75.706	0.012000
1350.000	75.390	0.012000
1360.000	75.754	0.012000
1370.000	75.621	0.012000
1380.000	75.517	0.012000
1390.000	75.536	0.012000
1400.000	75.509	0.012000
1410.000	75.486	0.012000
1420.000	75.421	0.012000
1430.000	75.511	0.012000
1440.000	75.465	0.012000
1450.000	75.312	0.012000
1460.000	74.629	0.012000
1470.000	74.826	0.012000
1480.000	74.866	0.012000
1490.000	75.216	0.012000
1500.000	76.487	0.012000
1510.000	75.665	0.012000
1520.000	75.299	0.012000
1530.000	75.093	0.012000
1540.000	74.856	0.012000
1550.000	74.827	0.012000
1560.000	74.918	0.012000
1570.000	74.727	0.012000
1580.000	74.950	0.012000
1590.000	75.060	0.012000
1600.000	75.265	0.012000
1610.000	75.323	0.012000
1620.000	75.434	0.012000
1630.000	77.187	0.012000
1640.000	73.874	0.012000
1650.000	72.348	0.012000
1660.000	72.513	0.012000
1670.000	72.745	0.012000
1680.000	74.434	0.012000
1690.000	79.535	0.012000
1700.000	80.703	0.012000
1710.000	80.110	0.012000
1720.000	74.779	0.012000

DRAFT

1730.000	72.830	0.012000
1740.000	72.557	0.012000
1750.000	72.470	0.012000
1760.000	74.186	0.012000
1770.000	77.611	0.012000
1780.000	77.298	0.012000
1790.000	75.368	0.012000
1800.000	77.140	0.012000
1810.000	75.680	0.012000
1820.000	75.515	0.012000
1830.000	75.761	0.012000
1840.000	75.550	0.012000
1850.000	75.157	0.012000
1860.000	75.244	0.012000
1870.000	75.183	0.012000
1880.000	75.150	0.012000
1890.000	75.159	0.012000
1900.000	75.392	0.012000
1910.000	75.868	0.012000
1920.000	76.265	0.012000
1930.000	77.234	0.012000
1940.000	77.872	0.012000
1950.000	77.818	0.012000
1960.000	78.066	0.012000
1970.000	78.040	0.012000
1980.000	78.145	0.012000
1990.000	78.157	0.012000
2000.000	78.942	0.012000
2010.000	78.982	0.012000
2020.000	78.150	0.012000
2030.000	78.063	0.012000
2040.000	78.024	0.012000
2050.000	78.063	0.012000
2060.000	77.980	0.012000
2070.000	77.742	0.012000
2080.000	77.491	0.012000
2090.000	77.239	0.012000
2100.000	77.759	0.012000
2110.000	77.723	0.012000
2120.000	77.692	0.012000
2130.000	77.690	0.012000
2140.000	77.766	0.012000
2150.000	77.127	0.012000
2160.000	76.930	0.012000
2170.000	76.487	0.012000
2180.000	76.402	0.012000
2190.000	76.391	0.012000
2200.000	76.402	0.012000
2210.000	76.727	0.012000
2220.000	76.427	0.012000
2230.000	76.121	0.012000
2240.000	76.145	0.012000
2250.000	76.224	0.012000
2260.000	76.350	0.012000
2270.000	76.238	0.012000
2280.000	76.227	0.012000
2290.000	76.207	0.012000
2300.000	75.987	0.012000
2310.000	76.146	0.012000
2320.000	76.135	0.012000
2330.000	76.127	0.012000
2340.000	76.370	0.012000
2350.000	76.110	0.012000
2360.000	75.924	0.012000
2370.000	76.038	0.012000
2380.000	76.695	0.012000
2390.000	76.083	0.012000
2400.000	76.170	0.012000
2410.000	76.314	0.012000
2420.000	76.215	0.012000
2430.000	76.376	0.012000
2440.000	76.014	0.012000
2450.000	75.804	0.012000
2460.000	76.492	0.012000
2470.000	76.402	0.012000
2480.000	76.188	0.012000
2490.000	75.995	0.012000
2500.000	76.207	0.012000
2510.000	76.472	0.012000
2520.000	76.037	0.012000
2530.000	75.960	0.012000
2540.000	75.906	0.012000
2550.000	75.694	0.012000
2560.000	75.633	0.012000
2570.000	75.922	0.012000
2580.000	75.776	0.012000

DRAFT

2590.000	75.854	0.012000
2600.000	75.932	0.012000
2610.000	75.658	0.012000
2620.000	75.751	0.012000
2630.000	75.625	0.012000
2640.000	75.702	0.012000
2650.000	75.509	0.012000
2660.000	75.825	0.012000
2670.000	75.696	0.012000
2680.000	75.625	0.012000
2690.000	75.603	0.012000
2700.000	75.892	0.012000
2710.000	75.459	0.012000
2720.000	75.308	0.012000
2730.000	75.068	0.012000
2740.000	75.078	0.012000
2750.000	75.211	0.012000
2760.000	75.350	0.012000
2770.000	75.190	0.012000
2780.000	74.849	0.012000
2790.000	75.096	0.012000
2800.000	75.248	0.012000
2810.000	75.456	0.012000
2820.000	75.559	0.012000
2830.000	75.660	0.012000
2840.000	75.211	0.012000
2850.000	75.262	0.012000
2860.000	74.879	0.012000
2870.000	74.694	0.012000
2880.000	74.713	0.012000
2890.000	74.494	0.012000
2900.000	74.590	0.012000
2910.000	74.581	0.012000
2920.000	74.677	0.012000
2930.000	75.487	0.012000
2940.000	74.926	0.012000
2950.000	74.652	0.012000
2960.000	74.697	0.012000
2970.000	74.764	0.012000
2980.000	74.875	0.012000
2990.000	74.712	0.012000
3000.000	74.640	0.012000
3010.000	74.732	0.012000
3020.000	74.928	0.012000
3030.000	74.980	0.012000
3040.000	74.710	0.012000
3050.000	74.828	0.012000
3060.000	74.936	0.012000
3070.000	74.844	0.012000
3080.000	75.096	0.012000
3090.000	75.356	0.012000
3100.000	74.877	0.012000
3110.000	74.746	0.012000
3120.000	74.718	0.012000
3130.000	74.763	0.012000
3140.000	74.999	0.012000
3150.000	74.730	0.012000
3160.000	75.223	0.012000
3170.000	74.744	0.012000
3180.000	74.525	0.012000
3190.000	74.471	0.012000
3200.000	74.515	0.012000
3210.000	74.561	0.012000
3220.000	74.569	0.012000
3230.000	74.605	0.012000
3240.000	74.571	0.012000
3250.000	74.666	0.012000
3260.000	74.836	0.012000
3270.000	75.471	0.012000
3280.000	75.156	0.012000
3290.000	74.609	0.012000
3300.000	74.449	0.012000
3310.000	74.534	0.012000
3320.000	74.536	0.012000
3330.000	74.364	0.012000
3340.000	74.606	0.012000
3350.000	74.567	0.012000
3360.000	74.882	0.012000
3370.000	74.835	0.012000
3380.000	74.750	0.012000
3390.000	74.819	0.012000
3400.000	75.348	0.012000
3410.000	74.456	0.012000
3420.000	74.621	0.012000
3430.000	75.104	0.012000
3440.000	75.026	0.012000

DRAFT

3450.000	75.104	0.012000
3460.000	75.667	0.012000
3470.000	75.972	0.012000
3480.000	76.347	0.012000
3490.000	76.392	0.012000
3500.000	76.357	0.012000
3510.000	76.414	0.012000
3520.000	76.752	0.012000
3530.000	76.915	0.012000
3540.000	76.538	0.012000
3550.000	76.911	0.012000
3560.000	77.018	0.012000
3570.000	76.757	0.012000
3580.000	77.171	0.012000
3590.000	76.624	0.012000
3600.000	76.851	0.012000
3610.000	77.080	0.012000
3620.000	77.063	0.012000
3630.000	76.768	0.012000
3640.000	76.698	0.012000
3650.000	76.611	0.012000
3660.000	76.544	0.012000
3670.000	76.775	0.012000
3680.000	77.009	0.012000

Name: O_N11_N10 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	72.679	0.012000
10.000	72.488	0.012000
20.000	73.291	0.012000
30.000	73.644	0.012000
40.000	74.381	0.012000
50.000	74.840	0.012000
60.000	75.431	0.012000
70.000	76.245	0.012000
80.000	75.840	0.012000
90.000	76.062	0.012000
100.000	76.553	0.012000
110.000	76.514	0.012000
120.000	76.401	0.012000
130.000	76.482	0.012000
140.000	76.483	0.012000
150.000	76.476	0.012000
160.000	76.351	0.012000
170.000	76.390	0.012000
180.000	76.593	0.012000
190.000	76.437	0.012000
200.000	76.457	0.012000
210.000	76.576	0.012000
220.000	76.689	0.012000
230.000	76.840	0.012000
240.000	76.879	0.012000
250.000	76.827	0.012000
260.000	76.819	0.012000
270.000	76.782	0.012000
280.000	76.538	0.012000
290.000	76.811	0.012000
300.000	76.887	0.012000
310.000	76.968	0.012000
320.000	76.935	0.012000
330.000	76.953	0.012000
340.000	76.835	0.012000
350.000	76.888	0.012000
360.000	77.098	0.012000
370.000	77.062	0.012000
380.000	76.913	0.012000
390.000	77.056	0.012000
400.000	76.945	0.012000
410.000	77.042	0.012000
420.000	76.781	0.012000
430.000	75.939	0.012000
440.000	76.817	0.012000
450.000	77.264	0.012000
460.000	76.800	0.012000
470.000	76.970	0.012000
480.000	76.840	0.012000
490.000	76.788	0.012000
500.000	76.785	0.012000
510.000	76.920	0.012000
520.000	77.141	0.012000

DRAFT

530.000	76.684	0.012000
540.000	76.767	0.012000
550.000	77.047	0.012000
560.000	77.035	0.012000
570.000	76.964	0.012000
580.000	77.086	0.012000
590.000	76.891	0.012000
600.000	76.681	0.012000
610.000	76.915	0.012000
620.000	76.781	0.012000
630.000	76.645	0.012000
640.000	76.783	0.012000
650.000	76.694	0.012000
660.000	76.631	0.012000
670.000	76.774	0.012000
680.000	76.746	0.012000
690.000	76.713	0.012000
700.000	76.613	0.012000
710.000	76.455	0.012000
720.000	76.903	0.012000
730.000	76.614	0.012000
740.000	76.544	0.012000
750.000	76.732	0.012000
760.000	76.724	0.012000
770.000	76.726	0.012000
780.000	76.775	0.012000
790.000	76.839	0.012000
800.000	76.580	0.012000
810.000	76.714	0.012000
820.000	76.611	0.012000
830.000	76.615	0.012000
840.000	76.580	0.012000
850.000	76.546	0.012000
860.000	76.542	0.012000
870.000	76.128	0.012000
880.000	76.090	0.012000
890.000	76.242	0.012000
900.000	76.401	0.012000
910.000	76.325	0.012000
920.000	76.233	0.012000
930.000	75.916	0.012000
940.000	74.603	0.012000
950.000	73.514	0.012000
960.000	72.620	0.012000
970.000	72.503	0.012000
980.000	72.680	0.012000
990.000	72.686	0.012000

Name: O_N11_N9 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	72.686	0.012000
10.000	72.511	0.012000
20.000	72.672	0.012000
30.000	73.034	0.012000
40.000	73.426	0.012000
50.000	74.884	0.012000
60.000	75.651	0.012000
70.000	76.516	0.012000
80.000	76.577	0.012000
90.000	76.602	0.012000
100.000	76.487	0.012000
110.000	76.365	0.012000
120.000	76.413	0.012000
130.000	76.321	0.012000
140.000	76.250	0.012000
150.000	76.414	0.012000
160.000	76.185	0.012000
170.000	76.244	0.012000
180.000	76.235	0.012000
190.000	76.516	0.012000
200.000	76.435	0.012000
210.000	76.413	0.012000
220.000	76.441	0.012000
230.000	76.428	0.012000
240.000	76.673	0.012000
250.000	76.387	0.012000
260.000	76.215	0.012000
270.000	76.357	0.012000
280.000	76.373	0.012000
290.000	76.337	0.012000

DRAFT

300.000	76.364	0.012000
310.000	76.247	0.012000
320.000	76.072	0.012000
330.000	75.884	0.012000
340.000	75.784	0.012000
350.000	75.799	0.012000
360.000	76.068	0.012000
370.000	76.070	0.012000
380.000	76.005	0.012000
390.000	75.917	0.012000
400.000	75.932	0.012000
410.000	75.941	0.012000
420.000	75.965	0.012000
430.000	75.839	0.012000
440.000	75.970	0.012000
450.000	75.647	0.012000
460.000	75.038	0.012000
470.000	74.642	0.012000
480.000	73.181	0.012000
490.000	73.362	0.012000
500.000	73.426	0.012000
510.000	74.438	0.012000
520.000	75.283	0.012000
530.000	75.481	0.012000
540.000	75.710	0.012000
550.000	75.942	0.012000
560.000	76.143	0.012000
570.000	76.134	0.012000
580.000	76.134	0.012000
590.000	76.133	0.012000
600.000	76.197	0.012000
610.000	76.500	0.012000
620.000	76.268	0.012000
630.000	76.242	0.012000
640.000	76.284	0.012000
650.000	76.416	0.012000
660.000	76.709	0.012000
670.000	76.445	0.012000
680.000	76.137	0.012000
690.000	76.296	0.012000
700.000	76.267	0.012000
710.000	76.179	0.012000
720.000	76.059	0.012000
730.000	76.257	0.012000
740.000	76.224	0.012000
750.000	76.457	0.012000
760.000	76.568	0.012000
770.000	76.451	0.012000
780.000	76.297	0.012000
790.000	76.306	0.012000
800.000	76.220	0.012000
810.000	76.153	0.012000
820.000	76.219	0.012000
830.000	76.407	0.012000
840.000	76.765	0.012000
850.000	76.511	0.012000
860.000	76.473	0.012000
870.000	76.629	0.012000
880.000	76.663	0.012000
890.000	76.671	0.012000
900.000	76.658	0.012000
910.000	76.531	0.012000
920.000	76.456	0.012000
930.000	76.228	0.012000
940.000	76.138	0.012000
950.000	76.375	0.012000
960.000	76.189	0.012000
970.000	75.957	0.012000
980.000	75.949	0.012000
990.000	76.032	0.012000
1000.000	76.062	0.012000
1010.000	76.181	0.012000
1020.000	76.040	0.012000
1030.000	75.926	0.012000
1040.000	76.056	0.012000
1050.000	76.137	0.012000
1060.000	76.182	0.012000
1070.000	76.185	0.012000
1080.000	76.341	0.012000
1090.000	76.295	0.012000
1100.000	76.116	0.012000
1110.000	76.247	0.012000
1120.000	76.216	0.012000
1130.000	76.272	0.012000
1140.000	76.310	0.012000
1150.000	76.307	0.012000

DRAFT

1160.000	76.283	0.012000
1170.000	76.227	0.012000
1180.000	76.207	0.012000
1190.000	75.864	0.012000
1200.000	75.525	0.012000
1210.000	75.013	0.012000
1220.000	74.380	0.012000
1230.000	73.929	0.012000
1240.000	73.090	0.012000
1250.000	72.789	0.012000
1260.000	72.247	0.012000
1270.000	72.573	0.012000
1280.000	72.661	0.012000
1290.000	72.679	0.012000

Name: O_N1_Neast Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	78.702	0.012000
10.000	76.955	0.012000
20.000	75.714	0.012000
30.000	75.356	0.012000
40.000	74.758	0.012000
60.000	73.938	0.012000
70.000	73.831	0.012000
90.000	73.799	0.012000
100.000	73.866	0.012000
110.000	73.789	0.012000
130.000	73.776	0.012000
140.000	73.838	0.012000
150.000	73.755	0.012000
160.000	73.814	0.012000
170.000	73.658	0.012000
210.000	73.670	0.012000
230.000	73.552	0.012000
240.000	73.548	0.012000
260.000	73.414	0.012000
270.000	73.491	0.012000
280.000	73.420	0.012000
300.000	73.574	0.012000
310.000	73.511	0.012000
320.000	73.579	0.012000
330.000	73.491	0.012000
360.000	73.679	0.012000
420.000	73.516	0.012000
450.000	73.575	0.012000
460.000	73.454	0.012000
490.000	73.419	0.012000
500.000	73.266	0.012000
510.000	73.355	0.012000
520.000	73.285	0.012000
530.000	73.348	0.012000
540.000	73.279	0.012000
560.000	73.312	0.012000
570.000	73.447	0.012000
590.000	73.309	0.012000
600.000	73.369	0.012000
630.000	73.103	0.012000
650.000	73.333	0.012000
740.000	73.113	0.012000
750.000	73.190	0.012000
760.000	73.095	0.012000
780.000	73.092	0.012000
790.000	73.216	0.012000
810.000	72.978	0.012000
820.000	73.315	0.012000
830.000	73.154	0.012000
840.000	73.352	0.012000
860.000	73.421	0.012000
880.000	73.189	0.012000
900.000	73.197	0.012000
920.000	73.418	0.012000
930.000	73.463	0.012000
960.000	73.416	0.012000
970.000	73.524	0.012000
980.000	73.516	0.012000
1000.000	73.685	0.012000
1020.000	73.746	0.012000
1050.000	73.650	0.012000
1060.000	73.736	0.012000
1070.000	74.469	0.012000

DRAFT

1080.000	73.830	0.012000
1090.000	74.164	0.012000
1100.000	74.636	0.012000
1110.000	74.709	0.012000
1130.000	74.700	0.012000
1140.000	74.806	0.012000
1150.000	74.706	0.012000
1160.000	74.763	0.012000
1190.000	74.572	0.012000
1200.000	74.603	0.012000
1210.000	74.367	0.012000
1220.000	74.265	0.012000
1230.000	74.361	0.012000
1240.000	73.880	0.012000
1250.000	73.692	0.012000
1270.000	74.036	0.012000
1280.000	73.955	0.012000
1300.000	74.015	0.012000
1350.000	73.856	0.012000
1380.000	74.050	0.012000
1390.000	73.968	0.012000
1400.000	73.539	0.012000
1410.000	73.437	0.012000
1420.000	73.608	0.012000
1460.000	73.708	0.012000
1470.000	73.821	0.012000
1490.000	73.909	0.012000
1510.000	73.816	0.012000
1530.000	73.638	0.012000
1540.000	73.684	0.012000
1550.000	73.418	0.012000
1560.000	72.847	0.012000
1580.000	73.367	0.012000
1590.000	73.457	0.012000
1610.000	73.348	0.012000
1620.000	73.561	0.012000
1630.000	73.555	0.012000
1650.000	73.309	0.012000
1670.000	73.307	0.012000
1680.000	73.144	0.012000
1690.000	72.727	0.012000
1710.000	72.530	0.012000
1720.000	72.783	0.012000
1740.000	72.918	0.012000
1750.000	73.099	0.012000
1790.000	73.022	0.012000
1800.000	73.057	0.012000
1810.000	72.935	0.012000
1830.000	72.920	0.012000
1850.000	72.816	0.012000
1870.000	72.306	0.012000
1890.000	72.127	0.012000
1900.000	72.270	0.012000
1910.000	71.922	0.012000
1920.000	72.229	0.012000
1930.000	72.103	0.012000
1950.000	72.222	0.012000
1960.000	72.157	0.012000
1980.000	72.293	0.012000
2000.000	72.164	0.012000
2010.000	72.334	0.012000
2040.000	72.296	0.012000
2080.000	72.599	0.012000
2090.000	72.532	0.012000
2120.000	72.650	0.012000
2140.000	72.606	0.012000
2150.000	72.843	0.012000
2160.000	72.722	0.012000
2170.000	72.935	0.012000
2190.000	73.071	0.012000
2220.000	73.388	0.012000
2240.000	73.342	0.012000
2250.000	73.542	0.012000
2270.000	73.579	0.012000
2290.000	73.751	0.012000
2310.000	74.080	0.012000
2320.000	74.063	0.012000
2340.000	74.139	0.012000
2360.000	73.967	0.012000
2380.000	73.863	0.012000
2400.000	73.598	0.012000
2410.000	73.595	0.012000
2420.000	73.417	0.012000
2440.000	72.680	0.012000
2450.000	71.448	0.012000
2460.000	69.756	0.012000

DRAFT

2470.000	69.012	0.012000
2480.000	69.475	0.012000
2490.000	68.927	0.012000
2500.000	69.254	0.012000
2510.000	68.936	0.012000
2520.000	69.048	0.012000
2530.000	68.909	0.012000
2540.000	69.685	0.012000
2550.000	68.961	0.012000
2560.000	68.687	0.012000
2570.000	68.622	0.012000
2590.000	69.085	0.012000
2600.000	69.235	0.012000
2610.000	69.691	0.012000
2620.000	69.182	0.012000
2630.000	68.795	0.012000
2650.000	69.280	0.012000
2660.000	68.943	0.012000
2670.000	68.941	0.012000
2680.000	69.195	0.012000
2690.000	68.532	0.012000
2700.000	68.822	0.012000
2710.000	68.268	0.012000
2730.000	68.835	0.012000
2750.000	68.223	0.012000
2760.000	68.313	0.012000
2770.000	68.547	0.012000
2780.000	69.332	0.012000
2790.000	69.082	0.012000
2800.000	69.015	0.012000
2810.000	69.423	0.012000
2820.000	69.520	0.012000
2830.000	69.067	0.012000
2840.000	69.065	0.012000
2850.000	68.908	0.012000
2860.000	69.723	0.012000
2870.000	69.479	0.012000
2880.000	69.409	0.012000
2890.000	69.498	0.012000
2910.000	69.865	0.012000
2920.000	69.244	0.012000
2930.000	69.274	0.012000
2940.000	69.134	0.012000
2960.000	69.150	0.012000
2970.000	69.405	0.012000
2990.000	69.004	0.012000
3000.000	69.047	0.012000
3010.000	69.307	0.012000
3020.000	69.201	0.012000
3040.000	69.678	0.012000
3060.000	69.140	0.012000
3080.000	69.396	0.012000
3100.000	69.153	0.012000
3110.000	69.477	0.012000
3120.000	69.315	0.012000
3130.000	69.855	0.012000
3140.000	69.913	0.012000
3160.000	69.415	0.012000
3170.000	69.906	0.012000
3180.000	69.835	0.012000
3190.000	69.559	0.012000
3200.000	69.707	0.012000
3210.000	69.485	0.012000
3220.000	69.651	0.012000
3240.000	69.716	0.012000
3250.000	69.433	0.012000
3270.000	69.491	0.012000
3280.000	69.370	0.012000
3300.000	69.360	0.012000
3310.000	69.821	0.012000
3320.000	69.439	0.012000
3330.000	68.824	0.012000
3340.000	69.298	0.012000
3350.000	69.605	0.012000
3360.000	69.116	0.012000
3370.000	69.604	0.012000
3380.000	69.680	0.012000
3390.000	69.621	0.012000
3400.000	69.774	0.012000
3420.000	69.695	0.012000
3430.000	69.871	0.012000
3440.000	70.315	0.012000
3450.000	70.164	0.012000
3460.000	69.833	0.012000
3470.000	69.703	0.012000
3480.000	69.727	0.012000

DRAFT

3490.000	70.632	0.012000
3500.000	70.486	0.012000
3510.000	69.987	0.012000
3530.000	70.126	0.012000
3540.000	69.803	0.012000
3550.000	70.039	0.012000
3560.000	70.537	0.012000
3580.000	70.263	0.012000
3600.000	70.147	0.012000
3620.000	70.477	0.012000
3630.000	70.298	0.012000
3640.000	71.166	0.012000
3650.000	71.915	0.012000
3660.000	73.001	0.012000
3670.000	73.032	0.012000
3680.000	73.269	0.012000
3700.000	73.173	0.012000
3750.000	73.238	0.012000
3760.000	73.106	0.012000
3790.000	73.787	0.012000
3810.000	73.429	0.012000
3820.000	73.551	0.012000
3830.000	73.183	0.012000
3840.000	72.994	0.012000
3850.000	73.402	0.012000
3870.000	73.683	0.012000
3880.000	73.687	0.012000
3900.000	73.207	0.012000
3920.000	72.630	0.012000
3930.000	72.062	0.012000
3940.000	71.766	0.012000
3970.000	71.894	0.012000
3980.000	71.755	0.012000
4000.000	72.250	0.012000
4010.000	72.688	0.012000
4020.000	73.309	0.012000
4040.000	73.177	0.012000
4060.000	73.336	0.012000
4090.000	73.281	0.012000
4110.000	73.435	0.012000
4120.000	73.057	0.012000
4130.000	73.123	0.012000
4140.000	73.391	0.012000
4160.000	73.754	0.012000
4180.000	73.877	0.012000
4210.000	73.878	0.012000
4220.000	73.776	0.012000
4240.000	73.717	0.012000
4250.000	73.610	0.012000
4270.000	73.509	0.012000
4280.000	73.290	0.012000
4300.000	73.475	0.012000
4310.000	73.309	0.012000
4350.000	73.334	0.012000
4370.000	73.216	0.012000
4380.000	73.224	0.012000
4390.000	73.429	0.012000
4410.000	73.334	0.012000
4450.000	73.349	0.012000
4460.000	73.314	0.012000
4470.000	73.122	0.012000
4490.000	73.536	0.012000
4510.000	73.596	0.012000
4520.000	73.401	0.012000
4540.000	73.530	0.012000
4550.000	73.377	0.012000
4560.000	73.430	0.012000
4570.000	73.330	0.012000
4580.000	73.461	0.012000
4590.000	73.354	0.012000
4600.000	73.504	0.012000
4620.000	73.498	0.012000
4630.000	73.665	0.012000
4650.000	73.677	0.012000
4670.000	73.619	0.012000
4680.000	73.247	0.012000
4690.000	73.572	0.012000
4710.000	73.373	0.012000
4730.000	73.473	0.012000
4740.000	73.711	0.012000
4760.000	73.421	0.012000
4770.000	73.805	0.012000
4780.000	73.740	0.012000
4790.000	73.860	0.012000
4800.000	73.520	0.012000
4810.000	73.348	0.012000

DRAFT

4820.000	73.464	0.012000
4840.000	73.361	0.012000
4850.000	73.643	0.012000
4870.000	73.642	0.012000
4880.000	73.413	0.012000
4900.000	73.325	0.012000
4910.000	73.460	0.012000
4920.000	73.721	0.012000
4930.000	73.651	0.012000
4940.000	73.783	0.012000
4960.000	73.709	0.012000
4980.000	73.462	0.012000
4990.000	73.609	0.012000
5000.000	73.541	0.012000
5010.000	74.103	0.012000
5020.000	74.494	0.012000
5040.000	73.515	0.012000
5050.000	73.934	0.012000
5060.000	74.545	0.012000
5070.000	73.755	0.012000
5080.000	73.468	0.012000
5100.000	73.364	0.012000
5120.000	73.583	0.012000
5130.000	73.506	0.012000
5140.000	73.729	0.012000
5170.000	73.507	0.012000
5190.000	73.774	0.012000
5210.000	73.862	0.012000
5240.000	73.652	0.012000
5260.000	73.729	0.012000
5270.000	73.839	0.012000
5280.000	73.537	0.012000
5330.000	73.946	0.012000
5370.000	73.848	0.012000
5390.000	73.853	0.012000
5400.000	73.602	0.012000
5410.000	73.714	0.012000
5420.000	73.637	0.012000
5430.000	73.801	0.012000
5440.000	73.696	0.012000
5450.000	73.807	0.012000
5480.000	73.866	0.012000
5500.000	73.771	0.012000
5510.000	73.575	0.012000
5530.000	73.623	0.012000
5540.000	73.778	0.012000
5550.000	73.757	0.012000
5580.000	73.961	0.012000
5590.000	73.866	0.012000
5600.000	73.318	0.012000
5620.000	72.361	0.012000
5630.000	72.078	0.012000
5640.000	72.091	0.012000
5650.000	71.642	0.012000
5660.000	71.924	0.012000
5690.000	72.119	0.012000
5730.000	71.818	0.012000
5790.000	71.751	0.012000
5810.000	71.707	0.012000
5830.000	71.459	0.012000
5840.000	72.174	0.012000
5850.000	72.359	0.012000
5860.000	72.393	0.012000
5880.000	72.651	0.012000
5890.000	72.392	0.012000
5900.000	72.982	0.012000
5910.000	72.695	0.012000
5920.000	73.312	0.012000
5930.000	72.775	0.012000
5940.000	72.711	0.012000
5950.000	72.203	0.012000
5960.000	71.584	0.012000
5980.000	71.671	0.012000
6000.000	71.589	0.012000
6010.000	72.436	0.012000
6030.000	73.294	0.012000
6040.000	73.273	0.012000
6050.000	73.053	0.012000
6060.000	73.249	0.012000
6070.000	73.327	0.012000
6080.000	73.221	0.012000
6090.000	73.369	0.012000
6100.000	73.120	0.012000
6110.000	73.317	0.012000
6120.000	72.892	0.012000
6130.000	71.976	0.012000

DRAFT

6140.000	72.035	0.012000
6160.000	71.875	0.012000
6180.000	72.094	0.012000
6200.000	72.081	0.012000
6220.000	71.986	0.012000
6240.000	72.010	0.012000
6280.000	71.927	0.012000
6290.000	71.859	0.012000
6310.000	71.882	0.012000
6340.000	71.814	0.012000
6380.000	71.682	0.012000
6400.000	71.566	0.012000
6430.000	71.603	0.012000
6450.000	71.535	0.012000
6460.000	71.579	0.012000
6480.000	71.506	0.012000
6490.000	71.537	0.012000
6510.000	71.428	0.012000
6530.000	71.545	0.012000
6610.000	71.543	0.012000
6630.000	71.610	0.012000
6670.000	71.530	0.012000
6700.000	71.550	0.012000
6710.000	71.497	0.012000
6730.000	71.582	0.012000
6740.000	71.457	0.012000
6760.000	71.542	0.012000
6780.000	71.529	0.012000
6790.000	71.608	0.012000
6830.000	71.654	0.012000
6850.000	71.591	0.012000
6880.000	71.591	0.012000
6900.000	71.694	0.012000
6910.000	71.686	0.012000
6920.000	71.813	0.012000
6940.000	71.696	0.012000
6950.000	71.783	0.012000
7000.000	71.631	0.012000
7020.000	71.737	0.012000
7060.000	71.700	0.012000
7080.000	71.819	0.012000
7090.000	71.808	0.012000
7110.000	71.895	0.012000
7120.000	71.871	0.012000
7140.000	72.027	0.012000
7150.000	71.927	0.012000
7160.000	72.045	0.012000
7170.000	71.981	0.012000
7230.000	72.003	0.012000
7250.000	72.071	0.012000
7270.000	72.062	0.012000
7290.000	72.114	0.012000
7320.000	72.079	0.012000
7340.000	71.999	0.012000
7350.000	72.025	0.012000
7400.000	71.868	0.012000
7420.000	71.921	0.012000
7430.000	71.870	0.012000
7470.000	71.824	0.012000
7520.000	71.898	0.012000
7540.000	71.845	0.012000
7580.000	71.803	0.012000
7620.000	71.791	0.012000
7630.000	71.841	0.012000
7680.000	71.786	0.012000
7690.000	71.715	0.012000
7700.000	71.763	0.012000
7720.000	71.663	0.012000
7750.000	71.676	0.012000
7780.000	71.804	0.012000
7810.000	71.848	0.012000
7830.000	71.776	0.012000
7850.000	71.829	0.012000
7870.000	71.976	0.012000
7930.000	71.931	0.012000
7950.000	71.840	0.012000
7970.000	71.927	0.012000
7990.000	71.932	0.012000
8010.000	71.869	0.012000
8030.000	71.749	0.012000
8040.000	71.612	0.012000
8080.000	71.508	0.012000
8100.000	71.561	0.012000
8110.000	71.464	0.012000
8130.000	71.419	0.012000
8160.000	71.608	0.012000

DRAFT

8230.000	71.760	0.012000
8270.000	72.069	0.012000
8300.000	72.191	0.012000
8330.000	72.436	0.012000
8350.000	72.503	0.012000
8390.000	72.562	0.012000

Name: O_N2_Nwest Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	93.880	0.012000
30.000	93.174	0.012000
50.000	93.414	0.012000
60.000	93.109	0.012000
70.000	93.018	0.012000
80.000	92.453	0.012000
90.000	92.315	0.012000
100.000	91.734	0.012000
120.000	91.563	0.012000
140.000	90.538	0.012000
160.000	89.714	0.012000
170.000	89.153	0.012000
190.000	88.797	0.012000
200.000	88.478	0.012000
220.000	87.589	0.012000
230.000	87.406	0.012000
250.000	86.632	0.012000
270.000	86.131	0.012000
290.000	85.063	0.012000
300.000	85.100	0.012000
310.000	84.625	0.012000
330.000	83.867	0.012000
340.000	83.257	0.012000
360.000	83.219	0.012000
380.000	82.609	0.012000
390.000	82.217	0.012000
410.000	81.852	0.012000
420.000	81.293	0.012000
430.000	81.259	0.012000
450.000	80.554	0.012000
470.000	80.273	0.012000
490.000	79.739	0.012000
510.000	79.300	0.012000
520.000	78.744	0.012000
540.000	78.725	0.012000
580.000	77.943	0.012000
630.000	76.883	0.012000
650.000	76.270	0.012000
680.000	75.646	0.012000
700.000	75.082	0.012000
730.000	74.767	0.012000
740.000	74.547	0.012000
770.000	74.189	0.012000
780.000	73.956	0.012000
800.000	73.684	0.012000
820.000	73.543	0.012000
830.000	73.638	0.012000
840.000	73.494	0.012000
850.000	73.139	0.012000
860.000	73.015	0.012000
900.000	73.210	0.012000
950.000	73.245	0.012000
990.000	73.218	0.012000
1070.000	73.391	0.012000
1100.000	73.398	0.012000
1130.000	73.301	0.012000
1150.000	73.351	0.012000
1250.000	73.197	0.012000
1260.000	73.240	0.012000
1310.000	73.262	0.012000
1330.000	73.021	0.012000
1340.000	72.704	0.012000
1350.000	72.807	0.012000
1370.000	72.705	0.012000
1420.000	72.758	0.012000
1440.000	72.695	0.012000
1470.000	72.764	0.012000
1530.000	72.746	0.012000
1580.000	72.817	0.012000
1610.000	72.791	0.012000
1700.000	72.526	0.012000

DRAFT

1740.000	72.638	0.012000
1770.000	72.792	0.012000
1780.000	72.581	0.012000
1800.000	72.678	0.012000
1850.000	72.531	0.012000
1860.000	72.796	0.012000
1880.000	72.989	0.012000
1910.000	72.996	0.012000
1930.000	73.095	0.012000
1950.000	73.100	0.012000
1960.000	72.981	0.012000
2020.000	73.039	0.012000
2050.000	73.196	0.012000
2070.000	73.242	0.012000
2100.000	73.227	0.012000
2140.000	73.055	0.012000
2180.000	73.156	0.012000
2250.000	73.040	0.012000
2260.000	72.780	0.012000
2320.000	72.709	0.012000
2330.000	72.603	0.012000
2340.000	72.146	0.012000
2350.000	72.031	0.012000
2360.000	72.971	0.012000
2370.000	73.183	0.012000
2410.000	73.134	0.012000
2420.000	73.172	0.012000
2430.000	73.024	0.012000
2450.000	73.150	0.012000
2470.000	73.151	0.012000
2520.000	73.393	0.012000
2540.000	73.373	0.012000
2560.000	73.170	0.012000
2570.000	73.215	0.012000
2590.000	73.105	0.012000
2620.000	73.124	0.012000
2640.000	73.055	0.012000
2680.000	73.173	0.012000
2710.000	73.188	0.012000
2720.000	73.055	0.012000
2750.000	73.047	0.012000
2760.000	73.299	0.012000
2770.000	73.200	0.012000
2790.000	73.303	0.012000
2830.000	73.235	0.012000
2850.000	73.077	0.012000
2870.000	73.084	0.012000
2920.000	73.250	0.012000
2950.000	73.170	0.012000
2980.000	73.236	0.012000
3000.000	73.125	0.012000
3010.000	73.261	0.012000
3050.000	73.307	0.012000
3060.000	73.231	0.012000
3100.000	73.323	0.012000
3110.000	73.435	0.012000
3130.000	73.486	0.012000
3160.000	73.452	0.012000
3180.000	73.285	0.012000
3210.000	73.222	0.012000
3250.000	73.267	0.012000
3300.000	73.264	0.012000
3330.000	73.156	0.012000
3360.000	73.186	0.012000
3370.000	73.117	0.012000
3390.000	73.217	0.012000
3420.000	73.277	0.012000
3450.000	73.225	0.012000
3490.000	73.239	0.012000
3570.000	73.365	0.012000
3580.000	73.293	0.012000
3620.000	73.315	0.012000
3630.000	73.272	0.012000
3660.000	73.464	0.012000
3700.000	73.531	0.012000
3750.000	73.481	0.012000
3810.000	73.620	0.012000
3870.000	73.502	0.012000
3890.000	73.395	0.012000
3900.000	73.471	0.012000
3910.000	73.348	0.012000
3920.000	73.503	0.012000
3930.000	73.255	0.012000
3940.000	73.415	0.012000
3980.000	73.315	0.012000
4000.000	73.200	0.012000

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4010.000	73.268	0.012000
4020.000	73.160	0.012000
4070.000	73.147	0.012000
4080.000	73.228	0.012000
4100.000	73.148	0.012000
4140.000	72.888	0.012000
4160.000	72.845	0.012000
4190.000	72.868	0.012000
4220.000	72.775	0.012000
4270.000	72.560	0.012000
4310.000	72.472	0.012000
4330.000	72.359	0.012000
4360.000	72.377	0.012000
4380.000	72.315	0.012000
4410.000	72.306	0.012000
4440.000	72.000	0.012000
4460.000	72.034	0.012000
4470.000	71.944	0.012000
4490.000	72.096	0.012000
4550.000	72.152	0.012000
4570.000	72.319	0.012000
4590.000	72.357	0.012000
4630.000	72.187	0.012000
4650.000	72.182	0.012000
4660.000	72.014	0.012000
4670.000	72.151	0.012000
4690.000	72.119	0.012000
4700.000	72.253	0.012000
4720.000	72.144	0.012000
4770.000	72.232	0.012000
4800.000	71.994	0.012000
4850.000	72.202	0.012000
4880.000	72.572	0.012000
4910.000	72.560	0.012000
4920.000	72.703	0.012000
4950.000	72.521	0.012000
4980.000	72.672	0.012000
5000.000	72.531	0.012000
5020.000	72.646	0.012000
5070.000	72.494	0.012000
5080.000	72.705	0.012000
5090.000	72.635	0.012000
5110.000	72.276	0.012000
5120.000	72.595	0.012000
5150.000	72.602	0.012000
5170.000	72.441	0.012000
5190.000	72.531	0.012000
5230.000	72.341	0.012000
5240.000	72.394	0.012000
5250.000	72.004	0.012000
5290.000	71.858	0.012000
5310.000	71.935	0.012000
5320.000	71.767	0.012000
5340.000	71.804	0.012000
5350.000	71.665	0.012000
5380.000	71.557	0.012000
5400.000	71.303	0.012000
5420.000	71.317	0.012000
5440.000	71.094	0.012000
5470.000	71.130	0.012000
5480.000	71.262	0.012000
5520.000	71.240	0.012000
5540.000	71.017	0.012000
5560.000	71.248	0.012000
5580.000	71.136	0.012000
5590.000	70.952	0.012000
5610.000	71.094	0.012000
5640.000	71.104	0.012000
5660.000	71.031	0.012000
5670.000	71.085	0.012000
5680.000	70.950	0.012000
5700.000	71.346	0.012000
5730.000	71.209	0.012000
5740.000	70.991	0.012000
5770.000	71.005	0.012000
5790.000	70.807	0.012000
5810.000	70.764	0.012000
5820.000	70.511	0.012000
5850.000	70.491	0.012000
5860.000	70.352	0.012000
5870.000	70.395	0.012000
5890.000	70.128	0.012000
5900.000	70.178	0.012000
5930.000	69.951	0.012000
5950.000	69.907	0.012000
5990.000	69.547	0.012000

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6020.000	69.531	0.012000
6030.000	69.407	0.012000
6040.000	69.592	0.012000
6080.000	69.296	0.012000
6110.000	68.974	0.012000
6130.000	68.963	0.012000
6140.000	68.834	0.012000
6160.000	68.874	0.012000
6180.000	68.724	0.012000
6230.000	68.496	0.012000
6240.000	68.393	0.012000
6250.000	68.517	0.012000
6270.000	68.277	0.012000
6290.000	68.339	0.012000
6300.000	68.144	0.012000
6330.000	68.202	0.012000
6340.000	68.306	0.012000
6350.000	68.126	0.012000
6380.000	67.970	0.012000
6410.000	68.070	0.012000
6460.000	67.876	0.012000
6480.000	67.984	0.012000
6490.000	67.950	0.012000
6500.000	68.181	0.012000
6510.000	68.081	0.012000
6530.000	68.051	0.012000
6540.000	68.161	0.012000
6560.000	68.137	0.012000
6570.000	67.867	0.012000
6620.000	68.008	0.012000
6640.000	67.964	0.012000
6650.000	67.807	0.012000
6670.000	67.772	0.012000
6690.000	67.543	0.012000
6710.000	67.670	0.012000
6720.000	67.524	0.012000
6750.000	67.756	0.012000
6760.000	67.957	0.012000
6800.000	68.319	0.012000
6810.000	68.098	0.012000
6820.000	69.092	0.012000
6830.000	69.084	0.012000
6850.000	68.200	0.012000
6860.000	68.179	0.012000
6900.000	67.522	0.012000
6910.000	67.475	0.012000
6920.000	67.227	0.012000
6930.000	67.388	0.012000
6960.000	67.319	0.012000
6970.000	67.436	0.012000
6990.000	67.333	0.012000
7000.000	67.046	0.012000
7030.000	66.915	0.012000
7050.000	66.990	0.012000
7100.000	66.971	0.012000
7150.000	67.165	0.012000
7160.000	67.363	0.012000
7190.000	67.354	0.012000
7220.000	67.175	0.012000
7260.000	67.303	0.012000
7270.000	67.253	0.012000
7290.000	67.447	0.012000
7320.000	67.643	0.012000
7340.000	67.699	0.012000
7370.000	67.596	0.012000
7400.000	67.692	0.012000
7410.000	67.617	0.012000
7420.000	67.826	0.012000
7440.000	67.813	0.012000
7450.000	68.124	0.012000
7460.000	68.006	0.012000
7470.000	68.342	0.012000
7480.000	68.078	0.012000
7490.000	68.111	0.012000
7510.000	68.477	0.012000
7520.000	68.841	0.012000
7530.000	68.308	0.012000
7540.000	68.299	0.012000
7550.000	68.636	0.012000
7560.000	68.660	0.012000
7570.000	68.984	0.012000
7590.000	68.655	0.012000
7610.000	68.870	0.012000
7630.000	68.936	0.012000
7640.000	69.449	0.012000
7650.000	68.927	0.012000

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7660.000	69.134	0.012000
7680.000	69.241	0.012000
7690.000	68.945	0.012000
7710.000	68.969	0.012000
7720.000	68.861	0.012000
7730.000	68.988	0.012000
7740.000	68.856	0.012000
7760.000	69.071	0.012000
7770.000	68.906	0.012000
7780.000	69.090	0.012000
7800.000	68.917	0.012000
7810.000	69.529	0.012000
7820.000	68.848	0.012000
7830.000	69.287	0.012000
7840.000	68.833	0.012000
7860.000	68.792	0.012000
7890.000	69.022	0.012000
7910.000	68.464	0.012000
7930.000	69.210	0.012000
7950.000	68.520	0.012000
7960.000	68.685	0.012000
7980.000	68.788	0.012000
8010.000	68.555	0.012000
8020.000	68.659	0.012000
8060.000	68.645	0.012000
8090.000	68.460	0.012000
8100.000	68.785	0.012000
8110.000	68.633	0.012000
8120.000	68.913	0.012000
8130.000	68.777	0.012000
8140.000	69.086	0.012000
8150.000	69.156	0.012000
8160.000	68.880	0.012000
8180.000	68.811	0.012000
8190.000	68.919	0.012000
8200.000	68.788	0.012000
8210.000	69.289	0.012000
8220.000	68.936	0.012000
8240.000	69.225	0.012000
8260.000	69.386	0.012000
8270.000	69.127	0.012000
8280.000	69.374	0.012000
8300.000	69.183	0.012000
8310.000	69.612	0.012000
8320.000	70.227	0.012000
8330.000	70.598	0.012000
8340.000	69.771	0.012000
8350.000	70.115	0.012000
8360.000	69.658	0.012000
8370.000	69.531	0.012000
8380.000	69.785	0.012000
8390.000	69.806	0.012000
8400.000	70.814	0.012000
8410.000	70.030	0.012000
8430.000	70.116	0.012000
8440.000	69.965	0.012000
8460.000	69.857	0.012000
8480.000	70.252	0.012000
8490.000	69.925	0.012000
8520.000	70.136	0.012000
8530.000	70.534	0.012000
8540.000	70.217	0.012000
8550.000	70.443	0.012000
8580.000	70.472	0.012000
8590.000	70.151	0.012000
8630.000	70.306	0.012000
8640.000	70.490	0.012000
8660.000	70.431	0.012000
8670.000	70.757	0.012000
8690.000	71.039	0.012000
8700.000	70.696	0.012000
8710.000	70.531	0.012000
8730.000	70.853	0.012000
8740.000	71.138	0.012000
8750.000	70.779	0.012000
8760.000	70.732	0.012000
8770.000	70.983	0.012000
8780.000	70.840	0.012000
8790.000	71.435	0.012000
8800.000	70.750	0.012000
8810.000	70.347	0.012000
8820.000	70.703	0.012000
8840.000	70.868	0.012000
8850.000	71.119	0.012000
8860.000	70.962	0.012000
8870.000	70.618	0.012000

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8880.000	70.617	0.012000
8890.000	70.928	0.012000
8900.000	70.969	0.012000
8910.000	70.673	0.012000
8920.000	70.898	0.012000
8930.000	70.603	0.012000
8940.000	70.705	0.012000
8950.000	71.164	0.012000
8960.000	70.843	0.012000
8970.000	71.185	0.012000
8990.000	70.475	0.012000
9000.000	71.055	0.012000
9020.000	71.096	0.012000
9030.000	70.778	0.012000
9040.000	70.994	0.012000
9050.000	70.900	0.012000
9060.000	71.058	0.012000
9080.000	70.867	0.012000
9100.000	71.369	0.012000
9110.000	71.162	0.012000
9120.000	71.327	0.012000
9130.000	70.919	0.012000
9150.000	70.826	0.012000
9160.000	70.981	0.012000
9170.000	70.833	0.012000
9180.000	70.935	0.012000
9190.000	70.819	0.012000
9210.000	70.883	0.012000
9220.000	70.751	0.012000
9230.000	70.851	0.012000
9240.000	70.654	0.012000
9250.000	70.950	0.012000
9260.000	70.848	0.012000
9270.000	70.939	0.012000
9280.000	70.639	0.012000
9290.000	71.042	0.012000
9300.000	70.683	0.012000
9310.000	71.009	0.012000
9330.000	70.876	0.012000
9350.000	71.014	0.012000
9380.000	71.031	0.012000
9390.000	71.207	0.012000
9400.000	70.843	0.012000
9410.000	71.276	0.012000
9430.000	70.830	0.012000
9440.000	70.752	0.012000
9460.000	71.185	0.012000
9470.000	70.575	0.012000
9480.000	71.177	0.012000
9490.000	70.916	0.012000
9500.000	71.236	0.012000
9510.000	71.189	0.012000
9520.000	71.312	0.012000
9540.000	70.981	0.012000
9550.000	71.107	0.012000
9560.000	71.046	0.012000
9580.000	70.669	0.012000
9590.000	70.730	0.012000
9600.000	71.089	0.012000
9620.000	70.838	0.012000
9630.000	71.063	0.012000
9640.000	71.033	0.012000
9650.000	71.325	0.012000
9660.000	71.297	0.012000
9670.000	71.056	0.012000
9680.000	71.214	0.012000
9690.000	70.794	0.012000
9700.000	70.724	0.012000
9710.000	71.028	0.012000
9730.000	71.015	0.012000
9740.000	71.142	0.012000
9750.000	70.943	0.012000
9780.000	71.134	0.012000
9790.000	71.005	0.012000
9830.000	71.059	0.012000
9840.000	71.527	0.012000
9850.000	71.154	0.012000
9870.000	71.658	0.012000
9890.000	71.785	0.012000
9900.000	71.374	0.012000
9910.000	71.138	0.012000
9930.000	71.224	0.012000
9940.000	71.686	0.012000
9950.000	71.178	0.012000

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Name: O_N3_N2 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	75.792	0.012000
10.000	75.577	0.012000
20.000	75.733	0.012000
30.000	75.799	0.012000
40.000	75.838	0.012000
50.000	75.938	0.012000
60.000	75.973	0.012000
70.000	76.199	0.012000
80.000	76.239	0.012000
90.000	76.393	0.012000
100.000	76.308	0.012000
110.000	76.399	0.012000
120.000	76.572	0.012000
130.000	76.424	0.012000
140.000	76.414	0.012000
150.000	76.557	0.012000
160.000	76.619	0.012000
170.000	76.677	0.012000
180.000	76.778	0.012000
190.000	77.017	0.012000
200.000	76.957	0.012000
210.000	77.329	0.012000
220.000	77.244	0.012000
230.000	77.191	0.012000
240.000	77.564	0.012000
250.000	77.668	0.012000
260.000	77.774	0.012000
270.000	77.898	0.012000
280.000	77.896	0.012000
290.000	78.124	0.012000
300.000	78.089	0.012000
310.000	78.134	0.012000
320.000	78.116	0.012000
330.000	78.146	0.012000
340.000	78.180	0.012000
350.000	78.207	0.012000
360.000	78.283	0.012000
370.000	78.348	0.012000
380.000	78.490	0.012000
390.000	78.610	0.012000
400.000	78.738	0.012000
410.000	78.856	0.012000
420.000	79.078	0.012000
430.000	79.220	0.012000
440.000	79.413	0.012000
450.000	79.361	0.012000
460.000	79.520	0.012000
470.000	79.597	0.012000
480.000	79.752	0.012000
490.000	79.931	0.012000
500.000	80.064	0.012000
510.000	80.182	0.012000
520.000	80.347	0.012000
530.000	80.492	0.012000
540.000	80.706	0.012000
550.000	80.883	0.012000
560.000	80.999	0.012000
570.000	81.175	0.012000
580.000	81.450	0.012000
590.000	81.576	0.012000
600.000	81.758	0.012000
610.000	81.951	0.012000
620.000	82.272	0.012000
630.000	82.463	0.012000
640.000	82.674	0.012000
650.000	82.871	0.012000
660.000	83.172	0.012000
670.000	83.271	0.012000
680.000	83.543	0.012000
690.000	83.880	0.012000
700.000	83.972	0.012000
710.000	84.334	0.012000
720.000	84.590	0.012000
730.000	84.825	0.012000
740.000	85.088	0.012000
750.000	85.264	0.012000
760.000	85.553	0.012000
770.000	85.877	0.012000
780.000	86.042	0.012000

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790.000	86.259	0.012000
800.000	86.538	0.012000
810.000	86.937	0.012000
820.000	87.049	0.012000
830.000	87.120	0.012000
840.000	87.661	0.012000
850.000	88.080	0.012000
860.000	88.200	0.012000
870.000	88.412	0.012000
880.000	88.579	0.012000
890.000	88.854	0.012000
900.000	89.097	0.012000
910.000	89.312	0.012000
920.000	89.671	0.012000
930.000	89.862	0.012000
940.000	90.317	0.012000
950.000	90.498	0.012000
960.000	90.696	0.012000
970.000	90.897	0.012000
980.000	91.018	0.012000
990.000	91.236	0.012000
1000.000	91.368	0.012000
1010.000	91.510	0.012000
1020.000	91.658	0.012000
1030.000	91.778	0.012000
1040.000	91.963	0.012000
1050.000	92.111	0.012000
1060.000	92.310	0.012000
1070.000	92.459	0.012000
1080.000	92.608	0.012000
1090.000	92.716	0.012000
1100.000	92.788	0.012000
1110.000	92.907	0.012000
1120.000	92.994	0.012000
1130.000	93.138	0.012000
1140.000	93.204	0.012000
1150.000	93.301	0.012000
1160.000	93.334	0.012000
1170.000	93.430	0.012000
1180.000	93.645	0.012000
1190.000	93.880	0.012000

Name: O_N3_N8 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	73.523	0.012000
10.000	73.689	0.012000
20.000	73.640	0.012000
30.000	73.667	0.012000
40.000	73.638	0.012000
50.000	73.676	0.012000
60.000	73.726	0.012000
70.000	73.665	0.012000
80.000	73.694	0.012000
90.000	73.686	0.012000
100.000	73.731	0.012000
110.000	73.823	0.012000
120.000	73.788	0.012000
130.000	73.789	0.012000
140.000	73.767	0.012000
150.000	73.883	0.012000
160.000	73.810	0.012000
170.000	73.703	0.012000
180.000	73.740	0.012000
190.000	73.759	0.012000
200.000	73.810	0.012000
210.000	73.714	0.012000
220.000	73.705	0.012000
230.000	73.789	0.012000
240.000	73.798	0.012000
250.000	73.744	0.012000
260.000	73.664	0.012000
270.000	73.768	0.012000
280.000	73.699	0.012000
290.000	73.643	0.012000
300.000	73.711	0.012000
310.000	73.707	0.012000
320.000	73.608	0.012000
330.000	73.667	0.012000
340.000	73.633	0.012000
350.000	73.632	0.012000

DRAFT

360.000	73.652	0.012000
370.000	73.622	0.012000
380.000	73.690	0.012000
390.000	73.715	0.012000
400.000	73.636	0.012000
410.000	73.755	0.012000
420.000	73.696	0.012000
430.000	73.704	0.012000
440.000	73.880	0.012000
450.000	73.783	0.012000
460.000	73.635	0.012000
470.000	73.726	0.012000
480.000	73.806	0.012000
490.000	73.668	0.012000
500.000	73.601	0.012000
510.000	73.694	0.012000
520.000	73.729	0.012000
530.000	73.712	0.012000
540.000	73.647	0.012000
550.000	73.730	0.012000
560.000	73.885	0.012000
570.000	73.728	0.012000
580.000	73.670	0.012000
590.000	73.720	0.012000
600.000	73.783	0.012000
610.000	73.679	0.012000
620.000	73.727	0.012000
630.000	73.678	0.012000
640.000	73.672	0.012000
650.000	73.773	0.012000
660.000	73.791	0.012000
670.000	73.981	0.012000
680.000	73.758	0.012000
690.000	73.854	0.012000
700.000	73.768	0.012000
710.000	73.787	0.012000
720.000	73.742	0.012000
730.000	73.763	0.012000
740.000	73.754	0.012000
750.000	73.839	0.012000
760.000	73.975	0.012000
770.000	73.815	0.012000
780.000	73.826	0.012000
790.000	73.766	0.012000
800.000	73.795	0.012000
810.000	73.750	0.012000
820.000	73.783	0.012000
830.000	73.767	0.012000
840.000	73.792	0.012000
850.000	73.747	0.012000
860.000	73.792	0.012000
870.000	73.776	0.012000
880.000	73.797	0.012000
890.000	73.815	0.012000
900.000	73.775	0.012000
910.000	73.789	0.012000
920.000	73.791	0.012000
930.000	73.791	0.012000
940.000	73.848	0.012000
950.000	73.780	0.012000
960.000	73.771	0.012000
970.000	73.760	0.012000
980.000	73.770	0.012000
990.000	73.841	0.012000
1000.000	73.760	0.012000
1010.000	73.951	0.012000
1020.000	73.880	0.012000
1030.000	73.738	0.012000
1040.000	73.785	0.012000
1050.000	73.741	0.012000
1060.000	73.755	0.012000
1070.000	73.728	0.012000
1080.000	73.709	0.012000
1090.000	73.808	0.012000
1100.000	73.764	0.012000
1110.000	73.793	0.012000
1120.000	73.816	0.012000
1130.000	73.739	0.012000
1140.000	73.801	0.012000
1150.000	73.729	0.012000
1160.000	73.685	0.012000
1170.000	73.656	0.012000
1180.000	73.789	0.012000
1190.000	73.667	0.012000
1200.000	73.798	0.012000
1210.000	73.901	0.012000

DRAFT

1220.000	73.832	0.012000
1230.000	73.771	0.012000
1240.000	73.701	0.012000
1250.000	73.711	0.012000
1260.000	73.721	0.012000
1270.000	73.873	0.012000
1280.000	73.706	0.012000
1290.000	73.726	0.012000
1300.000	73.849	0.012000
1310.000	73.855	0.012000
1320.000	73.906	0.012000
1330.000	73.783	0.012000
1340.000	73.950	0.012000
1350.000	73.948	0.012000
1360.000	73.902	0.012000
1370.000	73.874	0.012000
1380.000	73.892	0.012000
1390.000	73.662	0.012000
1400.000	73.730	0.012000
1410.000	73.745	0.012000
1420.000	73.849	0.012000
1430.000	73.769	0.012000
1440.000	73.839	0.012000
1450.000	73.895	0.012000
1460.000	73.943	0.012000
1470.000	73.825	0.012000
1480.000	73.914	0.012000
1490.000	73.994	0.012000
1500.000	74.033	0.012000
1510.000	73.920	0.012000
1520.000	73.873	0.012000
1530.000	74.044	0.012000
1540.000	74.085	0.012000
1550.000	73.877	0.012000
1560.000	73.939	0.012000
1570.000	74.131	0.012000
1580.000	74.052	0.012000
1590.000	74.192	0.012000
1600.000	74.162	0.012000
1610.000	74.184	0.012000
1620.000	74.112	0.012000
1630.000	74.147	0.012000
1640.000	74.027	0.012000
1650.000	74.024	0.012000
1660.000	74.170	0.012000
1670.000	74.032	0.012000
1680.000	74.075	0.012000
1690.000	74.046	0.012000
1700.000	74.264	0.012000
1710.000	74.127	0.012000
1720.000	74.258	0.012000
1730.000	74.343	0.012000
1740.000	74.336	0.012000
1750.000	74.206	0.012000
1760.000	74.196	0.012000
1770.000	74.367	0.012000
1780.000	74.372	0.012000
1790.000	74.227	0.012000
1800.000	74.337	0.012000
1810.000	74.421	0.012000
1820.000	74.480	0.012000
1830.000	74.503	0.012000
1840.000	74.495	0.012000
1850.000	74.469	0.012000
1860.000	74.416	0.012000
1870.000	74.472	0.012000
1880.000	74.529	0.012000
1890.000	74.544	0.012000
1900.000	74.571	0.012000
1910.000	74.568	0.012000
1920.000	74.625	0.012000
1930.000	74.628	0.012000
1940.000	74.666	0.012000
1950.000	74.530	0.012000
1960.000	74.758	0.012000
1970.000	74.583	0.012000
1980.000	74.821	0.012000
1990.000	74.975	0.012000
2000.000	74.783	0.012000
2010.000	74.887	0.012000
2020.000	74.942	0.012000
2030.000	74.690	0.012000
2040.000	74.836	0.012000
2050.000	74.708	0.012000
2060.000	74.943	0.012000
2070.000	74.942	0.012000

DRAFT

2080.000	75.092	0.012000
2090.000	74.796	0.012000
2100.000	74.960	0.012000
2110.000	74.854	0.012000
2120.000	75.109	0.012000
2130.000	74.980	0.012000
2140.000	74.932	0.012000
2150.000	75.244	0.012000
2160.000	75.022	0.012000
2170.000	75.052	0.012000
2180.000	75.145	0.012000
2190.000	75.177	0.012000
2200.000	75.194	0.012000
2210.000	75.409	0.012000
2220.000	75.497	0.012000
2230.000	75.389	0.012000
2240.000	75.792	0.012000
2250.000	75.792	0.012000

Name: O_N4_N3 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	72.795	0.012000
10.000	72.798	0.012000
20.000	72.792	0.012000
30.000	72.778	0.012000
40.000	72.796	0.012000
50.000	72.806	0.012000
60.000	72.768	0.012000
70.000	72.767	0.012000
80.000	72.736	0.012000
90.000	72.735	0.012000
100.000	72.728	0.012000
110.000	72.770	0.012000
120.000	72.735	0.012000
130.000	72.725	0.012000
140.000	72.747	0.012000
150.000	72.840	0.012000
160.000	72.859	0.012000
170.000	72.866	0.012000
180.000	72.850	0.012000
190.000	72.882	0.012000
200.000	72.876	0.012000
210.000	72.880	0.012000
220.000	72.808	0.012000
230.000	72.897	0.012000
240.000	72.873	0.012000
250.000	72.864	0.012000
260.000	72.861	0.012000
270.000	72.844	0.012000
280.000	72.848	0.012000
290.000	72.835	0.012000
300.000	72.878	0.012000
310.000	72.840	0.012000
320.000	72.775	0.012000
330.000	72.853	0.012000
340.000	72.806	0.012000
350.000	72.846	0.012000
360.000	72.784	0.012000
370.000	72.722	0.012000
380.000	72.884	0.012000
390.000	72.834	0.012000
400.000	72.795	0.012000
410.000	72.832	0.012000
420.000	72.796	0.012000
430.000	72.839	0.012000
440.000	72.744	0.012000
450.000	72.729	0.012000
460.000	72.635	0.012000
470.000	72.719	0.012000
480.000	72.725	0.012000
490.000	72.782	0.012000
500.000	72.685	0.012000
510.000	72.708	0.012000
520.000	72.703	0.012000
530.000	72.744	0.012000
540.000	72.766	0.012000
550.000	72.753	0.012000
560.000	72.723	0.012000
570.000	72.754	0.012000
580.000	72.760	0.012000

DRAFT

590.000	72.747	0.012000
600.000	72.746	0.012000
610.000	72.761	0.012000
620.000	72.776	0.012000
630.000	72.734	0.012000
640.000	72.802	0.012000
650.000	72.797	0.012000
660.000	72.849	0.012000
670.000	72.788	0.012000
680.000	72.802	0.012000
690.000	72.836	0.012000
700.000	72.882	0.012000
710.000	72.882	0.012000
720.000	72.850	0.012000
730.000	72.811	0.012000
740.000	72.858	0.012000
750.000	72.822	0.012000
760.000	72.822	0.012000
770.000	72.786	0.012000
780.000	72.774	0.012000
790.000	72.797	0.012000
800.000	72.825	0.012000
810.000	72.793	0.012000
820.000	72.826	0.012000
830.000	72.810	0.012000
840.000	72.831	0.012000
850.000	72.690	0.012000
860.000	72.841	0.012000
870.000	72.837	0.012000
880.000	72.886	0.012000
890.000	72.887	0.012000
900.000	72.873	0.012000
910.000	72.961	0.012000
920.000	72.953	0.012000
930.000	72.884	0.012000
940.000	72.943	0.012000
950.000	73.023	0.012000
960.000	72.945	0.012000
970.000	72.907	0.012000
980.000	72.911	0.012000
990.000	72.923	0.012000
1000.000	72.944	0.012000
1010.000	72.961	0.012000
1020.000	72.955	0.012000
1030.000	72.964	0.012000
1040.000	72.857	0.012000
1050.000	72.842	0.012000
1060.000	72.890	0.012000
1070.000	72.962	0.012000
1080.000	72.953	0.012000
1090.000	72.922	0.012000
1100.000	72.898	0.012000
1110.000	72.952	0.012000
1120.000	73.024	0.012000
1130.000	73.000	0.012000
1140.000	72.977	0.012000
1150.000	73.026	0.012000
1160.000	73.037	0.012000
1170.000	72.916	0.012000
1180.000	72.967	0.012000
1190.000	73.054	0.012000
1200.000	73.036	0.012000
1210.000	72.996	0.012000
1220.000	73.085	0.012000
1230.000	73.044	0.012000
1240.000	72.940	0.012000
1250.000	72.986	0.012000
1260.000	73.065	0.012000
1270.000	72.950	0.012000
1280.000	72.961	0.012000
1290.000	73.002	0.012000
1300.000	72.894	0.012000
1310.000	72.820	0.012000
1320.000	72.749	0.012000
1330.000	72.795	0.012000
1340.000	72.812	0.012000
1350.000	72.792	0.012000
1360.000	72.754	0.012000
1370.000	72.849	0.012000
1380.000	72.754	0.012000
1390.000	72.777	0.012000
1400.000	72.854	0.012000
1410.000	72.856	0.012000
1420.000	72.777	0.012000
1430.000	72.831	0.012000
1440.000	72.830	0.012000

DRAFT

1450.000	72.855	0.012000
1460.000	72.930	0.012000
1470.000	72.848	0.012000
1480.000	72.853	0.012000
1490.000	72.840	0.012000
1500.000	72.934	0.012000
1510.000	72.781	0.012000
1520.000	72.865	0.012000
1530.000	72.933	0.012000
1540.000	72.874	0.012000
1550.000	72.777	0.012000
1560.000	72.775	0.012000
1570.000	72.868	0.012000
1580.000	72.832	0.012000
1590.000	72.863	0.012000
1600.000	72.888	0.012000
1610.000	72.884	0.012000
1620.000	72.897	0.012000
1630.000	72.865	0.012000
1640.000	72.896	0.012000
1650.000	72.847	0.012000
1660.000	72.873	0.012000
1670.000	72.887	0.012000
1680.000	72.822	0.012000
1690.000	72.820	0.012000
1700.000	72.794	0.012000
1710.000	72.771	0.012000
1720.000	72.734	0.012000
1730.000	72.778	0.012000
1740.000	72.785	0.012000
1750.000	72.722	0.012000
1760.000	72.810	0.012000
1770.000	72.819	0.012000
1780.000	72.837	0.012000
1790.000	72.886	0.012000
1800.000	72.799	0.012000
1810.000	72.855	0.012000
1820.000	72.823	0.012000
1830.000	72.850	0.012000
1840.000	72.945	0.012000
1850.000	72.966	0.012000
1860.000	72.876	0.012000
1870.000	72.894	0.012000
1880.000	72.809	0.012000
1890.000	72.897	0.012000
1900.000	72.932	0.012000
1910.000	72.916	0.012000
1920.000	72.916	0.012000
1930.000	72.939	0.012000
1940.000	72.917	0.012000
1950.000	72.911	0.012000
1960.000	72.949	0.012000
1970.000	72.994	0.012000
1980.000	72.881	0.012000
1990.000	72.954	0.012000
2000.000	72.858	0.012000
2010.000	72.884	0.012000
2020.000	72.888	0.012000
2030.000	72.913	0.012000
2040.000	72.888	0.012000
2050.000	72.887	0.012000
2060.000	72.868	0.012000
2070.000	72.867	0.012000
2080.000	72.876	0.012000
2090.000	72.864	0.012000
2100.000	72.845	0.012000
2110.000	72.818	0.012000
2120.000	72.813	0.012000
2130.000	72.834	0.012000
2140.000	72.833	0.012000
2150.000	72.753	0.012000
2160.000	72.788	0.012000
2170.000	72.712	0.012000
2180.000	72.808	0.012000
2190.000	72.824	0.012000
2200.000	72.837	0.012000
2210.000	72.872	0.012000
2220.000	72.909	0.012000
2230.000	72.878	0.012000
2240.000	72.935	0.012000
2250.000	72.855	0.012000
2260.000	72.823	0.012000
2270.000	72.867	0.012000
2280.000	72.842	0.012000
2290.000	72.866	0.012000
2300.000	72.836	0.012000

DRAFT

2310.000	72.850	0.012000
2320.000	72.862	0.012000
2330.000	72.755	0.012000
2340.000	72.759	0.012000
2350.000	72.835	0.012000
2360.000	72.826	0.012000
2370.000	72.857	0.012000
2380.000	72.809	0.012000
2390.000	72.773	0.012000
2400.000	72.764	0.012000
2410.000	72.807	0.012000
2420.000	72.799	0.012000
2430.000	72.766	0.012000
2440.000	72.777	0.012000
2450.000	72.857	0.012000
2460.000	72.836	0.012000
2470.000	72.748	0.012000
2480.000	72.849	0.012000
2490.000	72.902	0.012000
2500.000	72.836	0.012000
2510.000	72.767	0.012000
2520.000	72.815	0.012000
2530.000	72.849	0.012000
2540.000	72.810	0.012000
2550.000	72.830	0.012000
2560.000	72.810	0.012000
2570.000	72.889	0.012000
2580.000	72.880	0.012000
2590.000	72.959	0.012000
2600.000	72.955	0.012000
2610.000	72.891	0.012000
2620.000	72.888	0.012000
2630.000	72.946	0.012000
2640.000	72.850	0.012000
2650.000	72.890	0.012000
2660.000	72.909	0.012000
2670.000	72.856	0.012000
2680.000	72.915	0.012000
2690.000	72.906	0.012000
2700.000	72.826	0.012000
2710.000	72.943	0.012000
2720.000	72.917	0.012000
2730.000	72.862	0.012000
2740.000	72.909	0.012000
2750.000	72.996	0.012000
2760.000	72.924	0.012000
2770.000	72.869	0.012000
2780.000	72.879	0.012000
2790.000	72.798	0.012000
2800.000	72.788	0.012000
2810.000	72.758	0.012000
2820.000	72.779	0.012000
2830.000	72.846	0.012000
2840.000	72.877	0.012000
2850.000	72.840	0.012000
2860.000	72.850	0.012000
2870.000	72.863	0.012000
2880.000	72.906	0.012000
2890.000	72.906	0.012000
2900.000	72.839	0.012000
2910.000	72.893	0.012000
2920.000	72.868	0.012000
2930.000	72.920	0.012000
2940.000	72.885	0.012000
2950.000	72.856	0.012000
2960.000	72.914	0.012000
2970.000	72.863	0.012000
2980.000	72.851	0.012000
2990.000	72.794	0.012000
3000.000	72.780	0.012000
3010.000	72.837	0.012000
3020.000	72.869	0.012000
3030.000	72.814	0.012000
3040.000	72.794	0.012000
3050.000	72.741	0.012000
3060.000	72.761	0.012000
3070.000	72.763	0.012000
3080.000	72.731	0.012000
3090.000	72.796	0.012000
3100.000	72.740	0.012000
3110.000	72.670	0.012000
3120.000	72.668	0.012000
3130.000	72.660	0.012000
3140.000	72.701	0.012000
3150.000	72.674	0.012000
3160.000	72.633	0.012000

DRAFT

3170.000	72.651	0.012000
3180.000	72.644	0.012000
3190.000	72.688	0.012000
3200.000	72.661	0.012000
3210.000	72.608	0.012000
3220.000	72.572	0.012000
3230.000	72.463	0.012000

Name: O_N5_N1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	72.562	0.012000
10.000	72.375	0.012000
20.000	72.202	0.012000
30.000	72.027	0.012000
40.000	72.207	0.012000
50.000	72.084	0.012000
60.000	72.567	0.012000
70.000	73.236	0.012000
80.000	73.341	0.012000
90.000	73.335	0.012000
100.000	73.422	0.012000
110.000	73.541	0.012000
120.000	73.646	0.012000
130.000	73.617	0.012000
140.000	73.609	0.012000
150.000	73.546	0.012000
160.000	73.461	0.012000
170.000	73.038	0.012000
180.000	72.473	0.012000
190.000	72.290	0.012000
200.000	72.142	0.012000
210.000	72.007	0.012000
220.000	71.762	0.012000
230.000	71.713	0.012000
240.000	71.734	0.012000
250.000	71.699	0.012000
260.000	71.678	0.012000
270.000	71.583	0.012000
280.000	71.681	0.012000
290.000	71.685	0.012000
300.000	71.810	0.012000
310.000	71.623	0.012000
320.000	71.512	0.012000
330.000	71.452	0.012000
340.000	71.476	0.012000
350.000	71.427	0.012000
360.000	71.450	0.012000
370.000	71.433	0.012000
380.000	71.507	0.012000
390.000	71.711	0.012000
400.000	71.514	0.012000
410.000	71.415	0.012000
420.000	71.308	0.012000
430.000	71.345	0.012000
440.000	71.334	0.012000
450.000	71.402	0.012000
460.000	71.467	0.012000
470.000	71.545	0.012000
480.000	71.562	0.012000
490.000	71.583	0.012000
500.000	71.543	0.012000
510.000	71.501	0.012000
520.000	71.345	0.012000
530.000	71.239	0.012000
540.000	71.201	0.012000
550.000	71.214	0.012000
560.000	71.261	0.012000
570.000	71.276	0.012000
580.000	71.423	0.012000
590.000	71.399	0.012000
600.000	71.499	0.012000
610.000	71.528	0.012000
620.000	71.595	0.012000
630.000	71.602	0.012000
640.000	71.573	0.012000
650.000	71.701	0.012000
660.000	71.666	0.012000
670.000	71.603	0.012000
680.000	71.602	0.012000
690.000	71.269	0.012000

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700.000	71.503	0.012000
710.000	71.505	0.012000
720.000	71.441	0.012000
730.000	71.164	0.012000
740.000	71.405	0.012000
750.000	71.366	0.012000
760.000	71.338	0.012000
770.000	71.303	0.012000
780.000	71.355	0.012000
790.000	71.396	0.012000
800.000	71.439	0.012000
810.000	71.363	0.012000
820.000	71.279	0.012000
830.000	71.257	0.012000
840.000	71.365	0.012000
850.000	71.312	0.012000
860.000	71.405	0.012000
870.000	71.433	0.012000
880.000	72.051	0.012000
890.000	71.987	0.012000
900.000	72.130	0.012000
910.000	72.500	0.012000
920.000	72.962	0.012000
930.000	73.019	0.012000
940.000	73.218	0.012000
950.000	73.598	0.012000
960.000	73.742	0.012000
970.000	73.898	0.012000
980.000	73.995	0.012000
990.000	74.240	0.012000
1000.000	74.803	0.012000
1010.000	74.729	0.012000
1020.000	74.563	0.012000
1030.000	74.784	0.012000
1040.000	74.799	0.012000
1050.000	74.614	0.012000
1060.000	74.940	0.012000
1070.000	74.913	0.012000
1080.000	74.740	0.012000
1090.000	74.680	0.012000
1100.000	74.767	0.012000
1110.000	74.675	0.012000
1120.000	74.852	0.012000
1130.000	74.780	0.012000
1140.000	74.752	0.012000
1150.000	74.815	0.012000
1160.000	74.953	0.012000
1170.000	75.003	0.012000
1180.000	74.955	0.012000
1190.000	75.010	0.012000
1200.000	74.988	0.012000
1210.000	75.036	0.012000
1220.000	75.028	0.012000
1230.000	74.946	0.012000
1240.000	75.009	0.012000
1250.000	75.078	0.012000
1260.000	75.068	0.012000
1270.000	75.028	0.012000
1280.000	74.943	0.012000
1290.000	74.950	0.012000
1300.000	75.103	0.012000
1310.000	74.970	0.012000
1320.000	74.993	0.012000
1330.000	75.024	0.012000
1340.000	75.022	0.012000
1350.000	75.047	0.012000
1360.000	75.083	0.012000
1370.000	75.076	0.012000
1380.000	75.090	0.012000
1390.000	75.126	0.012000
1400.000	75.014	0.012000
1410.000	75.189	0.012000
1420.000	75.035	0.012000
1430.000	75.121	0.012000
1440.000	75.116	0.012000
1450.000	74.980	0.012000
1460.000	74.973	0.012000
1470.000	75.039	0.012000
1480.000	75.006	0.012000
1490.000	74.932	0.012000
1500.000	74.865	0.012000
1510.000	74.756	0.012000
1520.000	74.766	0.012000
1530.000	74.751	0.012000
1540.000	74.704	0.012000
1550.000	74.681	0.012000

DRAFT

1560.000	74.596	0.012000
1570.000	74.525	0.012000
1580.000	74.377	0.012000
1590.000	74.328	0.012000
1600.000	74.271	0.012000
1610.000	74.299	0.012000
1620.000	74.154	0.012000
1630.000	74.095	0.012000
1640.000	73.840	0.012000
1650.000	73.718	0.012000
1660.000	73.569	0.012000
1670.000	73.359	0.012000
1680.000	73.185	0.012000
1690.000	72.882	0.012000
1700.000	72.249	0.012000
1710.000	72.119	0.012000
1720.000	72.125	0.012000
1730.000	71.958	0.012000
1740.000	71.901	0.012000
1750.000	71.685	0.012000
1760.000	71.673	0.012000
1770.000	71.575	0.012000
1780.000	71.504	0.012000
1790.000	71.607	0.012000
1800.000	71.684	0.012000
1810.000	71.653	0.012000
1820.000	71.606	0.012000
1830.000	71.775	0.012000
1840.000	71.502	0.012000
1850.000	71.451	0.012000
1860.000	71.449	0.012000
1870.000	71.363	0.012000
1880.000	71.426	0.012000
1890.000	71.463	0.012000
1900.000	71.500	0.012000
1910.000	71.437	0.012000
1920.000	71.537	0.012000
1930.000	71.660	0.012000
1940.000	71.676	0.012000
1950.000	71.654	0.012000
1960.000	71.684	0.012000
1970.000	71.625	0.012000
1980.000	71.627	0.012000
1990.000	71.640	0.012000
2000.000	71.707	0.012000
2010.000	71.642	0.012000
2020.000	71.727	0.012000
2030.000	71.682	0.012000
2040.000	71.665	0.012000
2050.000	71.728	0.012000
2060.000	71.679	0.012000
2070.000	71.668	0.012000
2080.000	71.712	0.012000
2090.000	71.668	0.012000
2100.000	71.545	0.012000
2110.000	71.444	0.012000
2120.000	71.291	0.012000
2130.000	71.276	0.012000
2140.000	71.163	0.012000
2150.000	71.180	0.012000
2160.000	71.272	0.012000
2170.000	71.403	0.012000
2180.000	71.618	0.012000
2190.000	71.722	0.012000
2200.000	71.852	0.012000
2210.000	72.059	0.012000
2220.000	72.206	0.012000
2230.000	72.137	0.012000
2240.000	72.221	0.012000

Name: O_N5_N4 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	73.547	0.012000
10.000	73.889	0.012000
20.000	73.695	0.012000
30.000	73.564	0.012000
40.000	73.770	0.012000
50.000	73.671	0.012000
60.000	72.736	0.012000
70.000	72.720	0.012000

DRAFT

80.000	72.658	0.012000
90.000	72.588	0.012000
100.000	72.546	0.012000
110.000	72.491	0.012000
120.000	72.421	0.012000
130.000	72.387	0.012000
140.000	72.397	0.012000
150.000	72.396	0.012000
160.000	72.385	0.012000
170.000	72.327	0.012000
180.000	72.300	0.012000
190.000	72.239	0.012000
200.000	72.223	0.012000
210.000	72.773	0.012000
220.000	72.981	0.012000
230.000	73.065	0.012000
240.000	73.048	0.012000
250.000	73.264	0.012000
260.000	72.986	0.012000
270.000	73.085	0.012000
280.000	73.053	0.012000
290.000	73.087	0.012000
300.000	73.216	0.012000
310.000	73.334	0.012000
320.000	73.433	0.012000
330.000	73.462	0.012000
340.000	73.423	0.012000
350.000	73.574	0.012000
360.000	73.649	0.012000
370.000	73.684	0.012000
380.000	73.670	0.012000
390.000	73.588	0.012000
400.000	73.728	0.012000
410.000	73.656	0.012000
420.000	73.643	0.012000
430.000	73.710	0.012000
440.000	73.600	0.012000
450.000	73.479	0.012000
460.000	73.522	0.012000
470.000	73.542	0.012000
480.000	73.551	0.012000
490.000	73.467	0.012000
500.000	73.717	0.012000
510.000	73.507	0.012000
520.000	73.392	0.012000
530.000	73.414	0.012000
540.000	73.237	0.012000
550.000	73.470	0.012000
560.000	73.511	0.012000
570.000	73.510	0.012000
580.000	73.416	0.012000
590.000	73.622	0.012000
600.000	73.453	0.012000
610.000	73.718	0.012000
620.000	73.686	0.012000
630.000	73.824	0.012000
640.000	74.056	0.012000
650.000	74.108	0.012000
660.000	73.879	0.012000
670.000	74.101	0.012000
680.000	74.037	0.012000
690.000	73.877	0.012000
700.000	74.080	0.012000
710.000	74.266	0.012000
720.000	74.121	0.012000
730.000	73.400	0.012000
740.000	73.448	0.012000
750.000	73.631	0.012000
760.000	73.838	0.012000
770.000	74.644	0.012000
780.000	74.834	0.012000
790.000	74.721	0.012000
800.000	74.704	0.012000
810.000	74.681	0.012000
820.000	74.634	0.012000
830.000	74.595	0.012000
840.000	74.537	0.012000
850.000	74.509	0.012000
860.000	74.320	0.012000
870.000	74.384	0.012000
880.000	74.099	0.012000
890.000	73.987	0.012000
900.000	73.873	0.012000
910.000	73.794	0.012000
920.000	73.657	0.012000
930.000	73.545	0.012000

DRAFT

940.000	73.477	0.012000
950.000	73.587	0.012000
960.000	73.365	0.012000
970.000	73.619	0.012000
980.000	73.572	0.012000
990.000	73.373	0.012000
1000.000	73.282	0.012000
1010.000	73.395	0.012000
1020.000	73.424	0.012000
1030.000	73.437	0.012000
1040.000	73.572	0.012000
1050.000	73.563	0.012000
1060.000	73.656	0.012000
1070.000	73.559	0.012000
1080.000	73.789	0.012000
1090.000	73.889	0.012000
1100.000	73.780	0.012000
1110.000	74.627	0.012000
1120.000	74.877	0.012000
1130.000	75.303	0.012000
1140.000	74.862	0.012000
1150.000	75.318	0.012000
1160.000	75.208	0.012000
1170.000	75.964	0.012000
1180.000	75.923	0.012000
1190.000	75.805	0.012000
1200.000	76.116	0.012000
1210.000	76.200	0.012000
1220.000	76.429	0.012000
1230.000	76.656	0.012000
1240.000	77.156	0.012000
1250.000	77.672	0.012000
1260.000	78.102	0.012000
1270.000	78.788	0.012000
1280.000	79.222	0.012000
1290.000	79.961	0.012000
1300.000	80.520	0.012000
1310.000	81.265	0.012000
1320.000	81.913	0.012000
1330.000	82.705	0.012000
1340.000	83.308	0.012000
1350.000	84.247	0.012000
1360.000	84.407	0.012000
1370.000	85.231	0.012000
1380.000	86.077	0.012000
1390.000	86.583	0.012000
1400.000	87.312	0.012000
1410.000	87.794	0.012000
1420.000	88.105	0.012000
1430.000	88.812	0.012000
1440.000	89.087	0.012000
1450.000	89.545	0.012000
1460.000	89.860	0.012000
1470.000	90.080	0.012000
1480.000	90.467	0.012000
1490.000	90.998	0.012000
1500.000	91.357	0.012000
1510.000	91.774	0.012000
1520.000	92.144	0.012000
1530.000	92.638	0.012000
1540.000	93.039	0.012000
1550.000	93.098	0.012000
1560.000	93.452	0.012000
1570.000	93.715	0.012000
1580.000	93.640	0.012000
1590.000	93.745	0.012000
1600.000	93.751	0.012000
1610.000	93.327	0.012000
1620.000	93.571	0.012000
1630.000	93.714	0.012000
1640.000	93.990	0.012000
1650.000	94.025	0.012000
1660.000	94.192	0.012000
1670.000	94.393	0.012000
1680.000	94.561	0.012000
1690.000	94.639	0.012000
1700.000	94.873	0.012000
1710.000	95.034	0.012000
1720.000	95.293	0.012000
1730.000	95.444	0.012000
1740.000	95.591	0.012000

Name: O_N6_N1 Group: BASE
Encroachment: No

DRAFT

Station(ft)	Elevation(ft)	Manning's N
0.000	72.180	0.012000
10.000	71.868	0.012000
20.000	72.087	0.012000
30.000	72.068	0.012000
40.000	71.960	0.012000
50.000	71.920	0.012000
60.000	72.015	0.012000
70.000	72.026	0.012000
80.000	72.066	0.012000
90.000	71.955	0.012000
100.000	71.936	0.012000
110.000	71.900	0.012000
120.000	71.987	0.012000
130.000	71.931	0.012000
140.000	71.904	0.012000
150.000	71.931	0.012000
160.000	71.782	0.012000
170.000	71.611	0.012000
180.000	71.542	0.012000
190.000	71.663	0.012000
200.000	71.631	0.012000
210.000	71.646	0.012000
220.000	71.535	0.012000
230.000	71.639	0.012000
240.000	71.648	0.012000
250.000	71.721	0.012000
260.000	71.667	0.012000
270.000	71.613	0.012000
280.000	71.431	0.012000
290.000	71.443	0.012000
300.000	71.579	0.012000
310.000	71.566	0.012000
320.000	71.554	0.012000
330.000	71.518	0.012000
340.000	71.518	0.012000
350.000	71.562	0.012000
360.000	71.556	0.012000
370.000	71.448	0.012000
380.000	71.572	0.012000
390.000	71.546	0.012000
400.000	71.538	0.012000
410.000	71.616	0.012000
420.000	71.620	0.012000
430.000	71.655	0.012000
440.000	71.698	0.012000
450.000	71.642	0.012000
460.000	71.705	0.012000
470.000	71.763	0.012000
480.000	71.771	0.012000
490.000	71.716	0.012000
500.000	71.828	0.012000
510.000	71.896	0.012000
520.000	71.787	0.012000
530.000	71.766	0.012000
540.000	71.914	0.012000
550.000	71.857	0.012000
560.000	71.871	0.012000
570.000	71.960	0.012000
580.000	71.860	0.012000
590.000	71.903	0.012000
600.000	72.030	0.012000
610.000	72.044	0.012000
620.000	71.950	0.012000
630.000	72.259	0.012000
640.000	72.280	0.012000
650.000	72.121	0.012000
660.000	72.075	0.012000
670.000	72.095	0.012000
680.000	72.163	0.012000
690.000	72.137	0.012000
700.000	72.221	0.012000

Name: O_N6_N4 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	73.395	0.012000
10.000	72.920	0.012000

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20.000	73.055	0.012000
30.000	73.058	0.012000
40.000	73.116	0.012000
50.000	73.045	0.012000
60.000	73.018	0.012000
70.000	72.978	0.012000
80.000	72.966	0.012000
90.000	72.954	0.012000
100.000	72.817	0.012000
110.000	72.933	0.012000
120.000	72.519	0.012000
130.000	71.947	0.012000
140.000	71.921	0.012000
150.000	71.877	0.012000
160.000	71.911	0.012000
170.000	71.896	0.012000
180.000	71.857	0.012000
190.000	71.771	0.012000
200.000	71.738	0.012000
210.000	71.785	0.012000
220.000	72.192	0.012000
230.000	72.254	0.012000
240.000	72.278	0.012000
250.000	72.314	0.012000
260.000	72.520	0.012000
270.000	72.347	0.012000
280.000	72.347	0.012000
290.000	72.577	0.012000
300.000	72.635	0.012000
310.000	72.684	0.012000
320.000	72.726	0.012000
330.000	72.814	0.012000
340.000	72.826	0.012000
350.000	72.507	0.012000
360.000	73.008	0.012000
370.000	73.068	0.012000
380.000	73.210	0.012000
390.000	73.312	0.012000
400.000	73.127	0.012000
410.000	73.170	0.012000
420.000	73.372	0.012000
430.000	73.313	0.012000
440.000	73.677	0.012000
450.000	73.487	0.012000
460.000	73.547	0.012000

Name: O_N6_N5 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	72.221	0.012000
10.000	72.279	0.012000
20.000	72.026	0.012000
30.000	71.863	0.012000
40.000	71.813	0.012000
50.000	71.742	0.012000
60.000	71.751	0.012000
70.000	71.745	0.012000
80.000	71.758	0.012000
90.000	71.519	0.012000
100.000	71.597	0.012000
110.000	71.557	0.012000
120.000	71.479	0.012000
130.000	71.531	0.012000
140.000	71.485	0.012000
150.000	71.333	0.012000
160.000	71.388	0.012000
170.000	71.470	0.012000
180.000	71.356	0.012000
190.000	71.205	0.012000
200.000	71.114	0.012000
210.000	71.216	0.012000
220.000	71.343	0.012000
230.000	71.237	0.012000
240.000	71.141	0.012000
250.000	71.013	0.012000
260.000	71.047	0.012000
270.000	70.971	0.012000
280.000	71.000	0.012000
290.000	71.052	0.012000
300.000	71.224	0.012000
310.000	71.367	0.012000

DRAFT

320.000	71.437	0.012000
330.000	72.157	0.012000
340.000	71.930	0.012000
350.000	71.981	0.012000
360.000	72.011	0.012000
370.000	71.932	0.012000
380.000	71.946	0.012000
390.000	72.045	0.012000
400.000	72.028	0.012000
410.000	72.045	0.012000
420.000	72.068	0.012000
430.000	72.124	0.012000
440.000	72.144	0.012000
450.000	72.186	0.012000
460.000	72.214	0.012000
470.000	72.232	0.012000
480.000	72.273	0.012000
490.000	72.240	0.012000
500.000	72.260	0.012000
510.000	72.314	0.012000
520.000	72.351	0.012000
530.000	72.407	0.012000
540.000	72.423	0.012000
550.000	72.423	0.012000
560.000	72.407	0.012000
570.000	72.486	0.012000
580.000	72.486	0.012000
590.000	72.579	0.012000
600.000	72.584	0.012000
610.000	72.630	0.012000
620.000	72.607	0.012000
630.000	72.123	0.012000
640.000	72.371	0.012000
650.000	72.600	0.012000
660.000	72.826	0.012000
670.000	73.547	0.012000

Name: O_N6_N7 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	73.395	0.012000
10.000	73.000	0.012000
20.000	71.999	0.012000
30.000	71.855	0.012000
40.000	71.604	0.012000
50.000	71.579	0.012000
60.000	71.530	0.012000
70.000	71.562	0.012000
80.000	71.550	0.012000
90.000	71.751	0.012000
100.000	71.950	0.012000
110.000	72.110	0.012000
120.000	73.320	0.012000
130.000	74.111	0.012000
140.000	72.217	0.012000
150.000	72.341	0.012000
160.000	71.944	0.012000
170.000	72.131	0.012000
180.000	72.622	0.012000
190.000	72.578	0.012000
200.000	72.403	0.012000
210.000	72.392	0.012000
220.000	72.288	0.012000
230.000	72.326	0.012000
240.000	72.115	0.012000
250.000	72.019	0.012000
260.000	71.915	0.012000
270.000	71.720	0.012000
280.000	71.718	0.012000
290.000	71.582	0.012000
300.000	71.541	0.012000
310.000	71.598	0.012000
320.000	71.740	0.012000
330.000	71.800	0.012000
340.000	71.826	0.012000
350.000	71.654	0.012000
360.000	71.155	0.012000
370.000	71.534	0.012000
380.000	71.462	0.012000
390.000	71.500	0.012000
400.000	71.461	0.012000

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410.000	71.498	0.012000
420.000	71.642	0.012000
430.000	71.710	0.012000
440.000	71.831	0.012000
450.000	71.827	0.012000
460.000	71.687	0.012000
470.000	71.744	0.012000
480.000	71.693	0.012000
490.000	71.692	0.012000
500.000	71.534	0.012000
510.000	71.522	0.012000
520.000	71.649	0.012000
530.000	71.851	0.012000
540.000	71.844	0.012000
550.000	71.828	0.012000
560.000	71.941	0.012000
570.000	71.823	0.012000
580.000	71.688	0.012000
590.000	71.633	0.012000
600.000	71.258	0.012000
610.000	71.275	0.012000
620.000	71.173	0.012000
630.000	71.333	0.012000
640.000	71.485	0.012000
650.000	71.081	0.012000
660.000	71.316	0.012000
670.000	71.506	0.012000
680.000	71.090	0.012000
690.000	71.150	0.012000
700.000	71.158	0.012000
710.000	71.278	0.012000
720.000	71.093	0.012000
730.000	71.492	0.012000
740.000	71.546	0.012000
750.000	71.415	0.012000
760.000	71.641	0.012000
770.000	71.720	0.012000
780.000	71.524	0.012000
790.000	71.796	0.012000
800.000	71.805	0.012000
810.000	71.970	0.012000
820.000	71.894	0.012000
830.000	71.910	0.012000
840.000	72.057	0.012000
850.000	72.048	0.012000
860.000	71.940	0.012000
870.000	71.919	0.012000
880.000	71.926	0.012000
890.000	71.853	0.012000
900.000	72.013	0.012000
910.000	71.993	0.012000
920.000	71.947	0.012000
930.000	72.087	0.012000
940.000	72.134	0.012000
950.000	72.070	0.012000
960.000	72.078	0.012000
970.000	72.016	0.012000
980.000	71.997	0.012000
990.000	72.053	0.012000
1000.000	71.846	0.012000
1010.000	72.078	0.012000
1020.000	72.028	0.012000
1030.000	71.913	0.012000
1040.000	71.809	0.012000
1050.000	71.681	0.012000
1060.000	71.900	0.012000
1070.000	71.987	0.012000
1080.000	71.940	0.012000
1090.000	72.325	0.012000
1100.000	72.113	0.012000
1110.000	72.251	0.012000
1120.000	72.196	0.012000
1130.000	72.599	0.012000
1140.000	72.539	0.012000
1150.000	72.136	0.012000
1160.000	72.491	0.012000
1170.000	72.611	0.012000
1180.000	72.541	0.012000
1190.000	72.583	0.012000
1200.000	72.659	0.012000
1210.000	72.790	0.012000
1220.000	72.819	0.012000
1230.000	72.933	0.012000
1240.000	73.001	0.012000
1250.000	73.340	0.012000
1260.000	73.230	0.012000

DRAFT

1270.000	73.272	0.012000
1280.000	73.315	0.012000
1290.000	73.490	0.012000
1300.000	73.542	0.012000
1310.000	73.603	0.012000
1320.000	73.655	0.012000
1330.000	73.663	0.012000
1340.000	73.651	0.012000
1350.000	73.529	0.012000
1360.000	73.487	0.012000
1370.000	73.502	0.012000
1380.000	73.475	0.012000
1390.000	73.448	0.012000
1400.000	73.244	0.012000
1410.000	73.306	0.012000
1420.000	73.405	0.012000
1430.000	73.124	0.012000
1440.000	73.029	0.012000
1450.000	73.221	0.012000
1460.000	72.948	0.012000
1470.000	72.948	0.012000
1480.000	72.796	0.012000
1490.000	72.741	0.012000
1500.000	72.894	0.012000
1510.000	72.922	0.012000
1520.000	72.875	0.012000
1530.000	72.963	0.012000
1540.000	73.030	0.012000
1550.000	73.106	0.012000
1560.000	73.145	0.012000
1570.000	73.210	0.012000
1580.000	73.125	0.012000
1590.000	73.199	0.012000
1600.000	73.321	0.012000
1610.000	73.262	0.012000
1620.000	73.413	0.012000
1630.000	73.337	0.012000
1640.000	73.209	0.012000
1650.000	73.190	0.012000
1660.000	73.073	0.012000
1670.000	73.065	0.012000
1680.000	73.084	0.012000
1690.000	72.979	0.012000
1700.000	73.065	0.012000
1710.000	72.866	0.012000
1720.000	72.774	0.012000
1730.000	72.629	0.012000
1740.000	72.782	0.012000
1750.000	72.698	0.012000
1760.000	72.650	0.012000
1770.000	72.733	0.012000
1780.000	72.666	0.012000
1790.000	72.786	0.012000
1800.000	72.644	0.012000
1810.000	72.603	0.012000
1820.000	72.460	0.012000
1830.000	72.374	0.012000
1840.000	72.285	0.012000
1850.000	72.388	0.012000
1860.000	72.412	0.012000
1870.000	72.281	0.012000
1880.000	72.276	0.012000
1890.000	72.264	0.012000
1900.000	72.188	0.012000
1910.000	72.202	0.012000
1920.000	72.244	0.012000
1930.000	72.233	0.012000
1940.000	72.266	0.012000
1950.000	72.219	0.012000
1960.000	72.182	0.012000
1970.000	72.180	0.012000

Name: O_N7_N1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	72.180	0.012000
10.000	72.295	0.012000
20.000	72.050	0.012000
30.000	71.933	0.012000
40.000	71.653	0.012000
50.000	71.272	0.012000

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60.000	70.554	0.012000
70.000	71.531	0.012000
80.000	72.230	0.012000
90.000	72.435	0.012000
100.000	72.566	0.012000
110.000	72.581	0.012000
120.000	72.572	0.012000
130.000	72.502	0.012000
140.000	72.530	0.012000
150.000	72.829	0.012000
160.000	73.035	0.012000
170.000	72.828	0.012000
180.000	72.608	0.012000
190.000	72.183	0.012000
200.000	71.940	0.012000
210.000	71.853	0.012000
220.000	71.657	0.012000
230.000	71.954	0.012000
240.000	71.980	0.012000
250.000	71.990	0.012000
260.000	71.996	0.012000
270.000	72.004	0.012000
280.000	72.000	0.012000
290.000	72.042	0.012000
300.000	72.042	0.012000
310.000	72.042	0.012000
320.000	72.079	0.012000
330.000	72.124	0.012000
340.000	72.173	0.012000
350.000	72.128	0.012000
360.000	72.107	0.012000
370.000	72.085	0.012000
380.000	72.076	0.012000
390.000	72.104	0.012000
400.000	72.096	0.012000
410.000	72.056	0.012000
420.000	72.025	0.012000
430.000	71.976	0.012000
440.000	71.909	0.012000
450.000	71.884	0.012000
460.000	71.832	0.012000
470.000	71.849	0.012000
480.000	71.869	0.012000
490.000	71.672	0.012000
500.000	71.806	0.012000
510.000	72.187	0.012000
520.000	72.549	0.012000
530.000	72.863	0.012000
540.000	73.173	0.012000
550.000	73.038	0.012000
560.000	72.681	0.012000
570.000	72.523	0.012000
580.000	72.568	0.012000
590.000	72.500	0.012000
600.000	72.590	0.012000
610.000	72.645	0.012000
620.000	72.589	0.012000
630.000	72.790	0.012000
640.000	72.711	0.012000
650.000	72.625	0.012000
660.000	72.543	0.012000
670.000	72.490	0.012000
680.000	72.335	0.012000
690.000	72.685	0.012000
700.000	72.780	0.012000
710.000	72.665	0.012000
720.000	72.553	0.012000
730.000	72.704	0.012000
740.000	72.266	0.012000
750.000	71.720	0.012000
760.000	71.391	0.012000
770.000	71.438	0.012000
780.000	71.132	0.012000
790.000	71.339	0.012000
800.000	71.435	0.012000
810.000	70.933	0.012000
820.000	71.153	0.012000
830.000	71.099	0.012000
840.000	71.353	0.012000
850.000	71.266	0.012000
860.000	71.415	0.012000
870.000	71.843	0.012000
880.000	71.768	0.012000
890.000	71.826	0.012000
900.000	71.769	0.012000
910.000	71.576	0.012000

DRAFT

920.000	71.321	0.012000
930.000	71.180	0.012000
940.000	71.042	0.012000
950.000	70.970	0.012000
960.000	70.920	0.012000
970.000	70.931	0.012000
980.000	70.856	0.012000
990.000	70.746	0.012000
1000.000	70.771	0.012000
1010.000	70.693	0.012000
1020.000	70.644	0.012000
1030.000	70.790	0.012000
1040.000	71.064	0.012000
1050.000	71.098	0.012000
1060.000	71.268	0.012000
1070.000	71.321	0.012000
1080.000	71.106	0.012000
1090.000	71.067	0.012000
1100.000	71.235	0.012000
1110.000	71.248	0.012000
1120.000	71.504	0.012000
1130.000	71.647	0.012000
1140.000	71.318	0.012000
1150.000	69.491	0.012000
1160.000	68.999	0.012000
1170.000	68.968	0.012000
1180.000	69.167	0.012000
1190.000	69.314	0.012000
1200.000	69.537	0.012000
1210.000	71.388	0.012000
1220.000	71.459	0.012000
1230.000	71.404	0.012000
1240.000	71.424	0.012000
1250.000	71.297	0.012000
1260.000	71.335	0.012000
1270.000	71.217	0.012000
1280.000	71.217	0.012000
1290.000	71.244	0.012000
1300.000	71.215	0.012000
1310.000	71.640	0.012000
1320.000	71.519	0.012000
1330.000	71.271	0.012000
1340.000	71.427	0.012000
1350.000	71.484	0.012000
1360.000	71.747	0.012000
1370.000	71.554	0.012000
1380.000	71.227	0.012000
1390.000	71.309	0.012000
1400.000	71.293	0.012000
1410.000	71.336	0.012000
1420.000	71.671	0.012000
1430.000	72.525	0.012000
1440.000	71.669	0.012000
1450.000	71.858	0.012000
1460.000	71.538	0.012000
1470.000	71.998	0.012000
1480.000	71.615	0.012000
1490.000	71.998	0.012000
1500.000	72.403	0.012000
1510.000	72.869	0.012000
1520.000	72.214	0.012000
1530.000	72.512	0.012000
1540.000	72.244	0.012000
1550.000	72.063	0.012000
1560.000	71.903	0.012000
1570.000	71.539	0.012000
1580.000	71.500	0.012000
1590.000	71.577	0.012000
1600.000	71.155	0.012000
1610.000	71.060	0.012000
1620.000	71.274	0.012000
1630.000	71.210	0.012000
1640.000	71.445	0.012000
1650.000	71.622	0.012000
1660.000	71.813	0.012000
1670.000	72.027	0.012000
1680.000	72.030	0.012000
1690.000	71.904	0.012000
1700.000	71.867	0.012000
1710.000	72.102	0.012000
1720.000	71.955	0.012000
1730.000	72.327	0.012000
1740.000	71.648	0.012000
1750.000	71.817	0.012000
1760.000	71.937	0.012000
1770.000	71.733	0.012000

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1780.000	71.720	0.012000
1790.000	71.911	0.012000
1800.000	71.492	0.012000
1810.000	71.574	0.012000
1820.000	71.568	0.012000
1830.000	71.674	0.012000
1840.000	72.183	0.012000
1850.000	71.912	0.012000
1860.000	71.542	0.012000
1870.000	71.615	0.012000
1880.000	71.793	0.012000
1890.000	71.659	0.012000
1900.000	71.767	0.012000
1910.000	71.604	0.012000
1920.000	71.574	0.012000
1930.000	71.463	0.012000
1940.000	71.521	0.012000
1950.000	71.442	0.012000
1960.000	71.433	0.012000
1970.000	71.117	0.012000
1980.000	71.174	0.012000
1990.000	71.076	0.012000
2000.000	71.210	0.012000
2010.000	71.299	0.012000
2020.000	70.916	0.012000
2030.000	70.860	0.012000
2040.000	70.632	0.012000
2050.000	70.323	0.012000
2060.000	70.345	0.012000
2070.000	70.695	0.012000
2080.000	70.718	0.012000
2090.000	70.528	0.012000
2100.000	70.577	0.012000
2110.000	70.751	0.012000
2120.000	70.701	0.012000
2130.000	70.658	0.012000
2140.000	70.737	0.012000
2150.000	70.783	0.012000
2160.000	71.078	0.012000
2170.000	71.073	0.012000
2180.000	71.156	0.012000
2190.000	71.087	0.012000
2200.000	70.450	0.012000
2210.000	70.991	0.012000
2220.000	70.553	0.012000
2230.000	70.998	0.012000
2240.000	71.128	0.012000
2250.000	71.379	0.012000
2260.000	71.433	0.012000
2270.000	71.351	0.012000
2280.000	71.432	0.012000
2290.000	71.601	0.012000
2300.000	71.594	0.012000
2310.000	71.566	0.012000
2320.000	71.827	0.012000
2330.000	71.975	0.012000
2340.000	71.692	0.012000
2350.000	71.517	0.012000
2360.000	71.414	0.012000
2370.000	71.547	0.012000
2380.000	71.746	0.012000
2390.000	71.742	0.012000
2400.000	71.796	0.012000
2410.000	71.855	0.012000
2420.000	71.970	0.012000
2430.000	71.931	0.012000
2440.000	71.714	0.012000
2450.000	71.748	0.012000
2460.000	71.851	0.012000
2470.000	71.800	0.012000
2480.000	71.445	0.012000
2490.000	71.375	0.012000
2500.000	71.392	0.012000
2510.000	71.551	0.012000
2520.000	71.574	0.012000
2530.000	71.520	0.012000
2540.000	71.329	0.012000
2550.000	71.640	0.012000
2560.000	71.576	0.012000
2570.000	71.433	0.012000
2580.000	71.295	0.012000
2590.000	71.531	0.012000
2600.000	71.906	0.012000
2610.000	72.250	0.012000
2620.000	72.889	0.012000
2630.000	72.920	0.012000

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2640.000	73.176	0.012000
2650.000	73.321	0.012000
2660.000	73.318	0.012000
2670.000	73.348	0.012000
2680.000	73.311	0.012000
2690.000	73.382	0.012000
2700.000	73.141	0.012000
2710.000	73.075	0.012000
2720.000	72.871	0.012000
2730.000	72.779	0.012000
2740.000	72.999	0.012000
2750.000	73.212	0.012000
2760.000	73.233	0.012000
2770.000	73.323	0.012000
2780.000	73.380	0.012000
2790.000	73.285	0.012000
2800.000	73.348	0.012000
2810.000	73.363	0.012000
2820.000	73.625	0.012000
2830.000	73.830	0.012000
2840.000	73.450	0.012000
2850.000	73.549	0.012000
2860.000	73.478	0.012000
2870.000	73.406	0.012000
2880.000	73.456	0.012000
2890.000	73.630	0.012000
2900.000	73.653	0.012000
2910.000	73.376	0.012000
2920.000	73.312	0.012000
2930.000	73.323	0.012000
2940.000	73.257	0.012000
2950.000	73.163	0.012000
2960.000	73.208	0.012000
2970.000	73.265	0.012000
2980.000	73.275	0.012000

Name: O_N7_N4 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	73.807	0.012000
10.000	73.688	0.012000
20.000	73.591	0.012000
30.000	73.547	0.012000
40.000	73.514	0.012000
50.000	73.550	0.012000
60.000	73.564	0.012000
70.000	73.990	0.012000
80.000	73.499	0.012000
90.000	74.239	0.012000
100.000	74.225	0.012000
110.000	74.127	0.012000
120.000	74.030	0.012000
130.000	73.823	0.012000
140.000	73.894	0.012000
150.000	73.884	0.012000
160.000	74.022	0.012000
170.000	73.849	0.012000
180.000	73.810	0.012000
190.000	73.829	0.012000
200.000	73.748	0.012000
210.000	73.695	0.012000
220.000	73.563	0.012000
230.000	73.781	0.012000
240.000	73.915	0.012000
250.000	73.839	0.012000
260.000	73.785	0.012000
270.000	73.606	0.012000
280.000	73.194	0.012000
290.000	72.873	0.012000
300.000	73.170	0.012000
310.000	73.035	0.012000
320.000	72.804	0.012000
330.000	72.879	0.012000
340.000	73.063	0.012000
350.000	72.896	0.012000
360.000	72.823	0.012000
370.000	72.613	0.012000
380.000	72.916	0.012000
390.000	72.776	0.012000
400.000	72.582	0.012000
410.000	72.562	0.012000

DRAFT

420.000	72.473	0.012000
430.000	72.381	0.012000
440.000	72.666	0.012000
450.000	72.602	0.012000
460.000	72.259	0.012000
470.000	72.356	0.012000
480.000	71.570	0.012000
490.000	72.318	0.012000
500.000	72.653	0.012000
510.000	71.690	0.012000
520.000	71.760	0.012000
530.000	71.904	0.012000
540.000	71.960	0.012000
550.000	71.992	0.012000
560.000	72.087	0.012000
570.000	73.184	0.012000
580.000	73.151	0.012000
590.000	72.909	0.012000
600.000	73.102	0.012000
610.000	73.395	0.012000

Name: O_N8_N2 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	75.792	0.012000
10.000	73.256	0.012000
20.000	69.998	0.012000
30.000	66.860	0.012000
40.000	66.771	0.012000
50.000	67.273	0.012000
60.000	66.912	0.012000
70.000	67.063	0.012000
80.000	66.743	0.012000
90.000	68.347	0.012000
100.000	68.004	0.012000
110.000	67.763	0.012000
120.000	68.542	0.012000
130.000	68.916	0.012000
140.000	69.287	0.012000
150.000	68.986	0.012000
160.000	68.970	0.012000
170.000	69.104	0.012000
180.000	69.077	0.012000
190.000	69.155	0.012000
200.000	69.162	0.012000
210.000	69.190	0.012000
220.000	69.177	0.012000
230.000	69.241	0.012000
240.000	69.153	0.012000
250.000	69.154	0.012000
260.000	69.159	0.012000
270.000	69.156	0.012000
280.000	69.241	0.012000
290.000	69.239	0.012000
300.000	69.196	0.012000
310.000	69.164	0.012000
320.000	69.202	0.012000
330.000	69.201	0.012000
340.000	69.242	0.012000
350.000	69.173	0.012000
360.000	69.251	0.012000
370.000	69.305	0.012000
380.000	69.197	0.012000
390.000	69.184	0.012000
400.000	69.139	0.012000
410.000	69.207	0.012000
420.000	69.206	0.012000
430.000	69.244	0.012000
440.000	69.261	0.012000
450.000	69.252	0.012000
460.000	69.292	0.012000
470.000	69.110	0.012000
480.000	69.106	0.012000
490.000	69.153	0.012000
500.000	69.223	0.012000
510.000	69.138	0.012000
520.000	69.222	0.012000
530.000	69.242	0.012000
540.000	69.268	0.012000
550.000	69.189	0.012000
560.000	69.258	0.012000

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570.000	69.267	0.012000
580.000	69.408	0.012000
590.000	69.381	0.012000
600.000	69.441	0.012000
610.000	69.402	0.012000
620.000	69.531	0.012000
630.000	69.570	0.012000
640.000	69.455	0.012000
650.000	69.459	0.012000
660.000	69.264	0.012000
670.000	69.327	0.012000
680.000	69.382	0.012000
690.000	69.428	0.012000
700.000	69.433	0.012000
710.000	69.452	0.012000
720.000	69.443	0.012000
730.000	69.509	0.012000
740.000	69.445	0.012000
750.000	69.696	0.012000
760.000	69.627	0.012000
770.000	69.657	0.012000
780.000	69.645	0.012000
790.000	69.798	0.012000
800.000	69.743	0.012000
810.000	69.775	0.012000
820.000	71.322	0.012000
830.000	70.577	0.012000
840.000	70.877	0.012000
850.000	70.794	0.012000
860.000	70.735	0.012000
870.000	70.549	0.012000
880.000	70.907	0.012000
890.000	70.859	0.012000
900.000	71.051	0.012000
910.000	70.843	0.012000
920.000	70.754	0.012000
930.000	70.870	0.012000
940.000	70.905	0.012000
950.000	71.505	0.012000
960.000	71.926	0.012000
970.000	71.512	0.012000
980.000	71.437	0.012000
990.000	71.613	0.012000
1000.000	71.640	0.012000
1010.000	71.986	0.012000
1020.000	72.660	0.012000
1030.000	71.988	0.012000
1040.000	71.700	0.012000
1050.000	71.207	0.012000
1060.000	71.571	0.012000
1070.000	71.429	0.012000
1080.000	71.714	0.012000
1090.000	71.942	0.012000
1100.000	72.286	0.012000
1110.000	71.433	0.012000
1120.000	71.568	0.012000
1130.000	71.560	0.012000
1140.000	71.551	0.012000
1150.000	71.220	0.012000
1160.000	71.357	0.012000
1170.000	70.920	0.012000
1180.000	71.482	0.012000
1190.000	71.629	0.012000
1200.000	71.240	0.012000
1210.000	71.614	0.012000
1220.000	71.292	0.012000
1230.000	71.518	0.012000
1240.000	71.405	0.012000
1250.000	71.142	0.012000
1260.000	71.457	0.012000
1270.000	71.487	0.012000
1280.000	71.200	0.012000
1290.000	71.030	0.012000
1300.000	71.184	0.012000
1310.000	70.714	0.012000
1320.000	71.090	0.012000
1330.000	71.709	0.012000
1340.000	70.084	0.012000
1350.000	70.507	0.012000
1360.000	70.295	0.012000
1370.000	70.592	0.012000
1380.000	71.057	0.012000
1390.000	71.537	0.012000
1400.000	70.006	0.012000
1410.000	70.707	0.012000
1420.000	70.570	0.012000

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1430.000	70.515	0.012000
1440.000	70.252	0.012000
1450.000	69.885	0.012000
1460.000	70.160	0.012000
1470.000	70.297	0.012000
1480.000	70.787	0.012000
1490.000	69.548	0.012000
1500.000	70.216	0.012000
1510.000	70.193	0.012000
1520.000	70.000	0.012000
1530.000	70.082	0.012000
1540.000	69.932	0.012000
1550.000	69.794	0.012000
1560.000	69.693	0.012000
1570.000	69.711	0.012000
1580.000	70.176	0.012000
1590.000	70.795	0.012000
1600.000	70.769	0.012000
1610.000	71.543	0.012000
1620.000	69.786	0.012000
1630.000	69.943	0.012000
1640.000	70.470	0.012000
1650.000	70.066	0.012000
1660.000	70.155	0.012000
1670.000	70.656	0.012000
1680.000	70.329	0.012000
1690.000	70.108	0.012000
1700.000	70.352	0.012000
1710.000	70.199	0.012000
1720.000	70.868	0.012000
1730.000	70.842	0.012000
1740.000	70.527	0.012000
1750.000	70.526	0.012000
1760.000	71.260	0.012000
1770.000	70.969	0.012000
1780.000	70.519	0.012000
1790.000	70.322	0.012000
1800.000	70.222	0.012000
1810.000	70.622	0.012000
1820.000	70.690	0.012000
1830.000	70.602	0.012000
1840.000	70.463	0.012000
1850.000	70.379	0.012000
1860.000	70.541	0.012000
1870.000	71.104	0.012000
1880.000	70.873	0.012000
1890.000	70.647	0.012000
1900.000	70.908	0.012000
1910.000	70.601	0.012000
1920.000	70.792	0.012000
1930.000	70.842	0.012000
1940.000	70.780	0.012000
1950.000	70.697	0.012000
1960.000	70.529	0.012000
1970.000	70.741	0.012000
1980.000	70.746	0.012000
1990.000	70.315	0.012000
2000.000	70.784	0.012000
2010.000	70.604	0.012000
2020.000	70.565	0.012000
2030.000	71.002	0.012000
2040.000	71.094	0.012000
2050.000	71.109	0.012000
2060.000	70.146	0.012000
2070.000	70.705	0.012000
2080.000	70.406	0.012000
2090.000	70.395	0.012000
2100.000	70.295	0.012000
2110.000	71.049	0.012000
2120.000	70.863	0.012000
2130.000	70.354	0.012000
2140.000	70.594	0.012000
2150.000	70.454	0.012000
2160.000	70.719	0.012000
2170.000	70.628	0.012000
2180.000	70.423	0.012000
2190.000	70.587	0.012000
2200.000	70.663	0.012000
2210.000	70.345	0.012000
2220.000	70.496	0.012000
2230.000	70.440	0.012000
2240.000	70.825	0.012000
2250.000	70.381	0.012000
2260.000	70.281	0.012000
2270.000	70.390	0.012000
2280.000	70.281	0.012000

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2290.000	70.775	0.012000
2300.000	70.635	0.012000
2310.000	70.691	0.012000
2320.000	70.383	0.012000
2330.000	70.817	0.012000
2340.000	70.441	0.012000
2350.000	70.491	0.012000
2360.000	70.759	0.012000
2370.000	70.644	0.012000
2380.000	70.856	0.012000
2390.000	70.765	0.012000
2400.000	71.067	0.012000
2410.000	71.333	0.012000
2420.000	71.546	0.012000
2430.000	70.815	0.012000
2440.000	71.727	0.012000
2450.000	71.644	0.012000
2460.000	71.869	0.012000
2470.000	71.553	0.012000
2480.000	71.298	0.012000
2490.000	71.394	0.012000
2500.000	70.873	0.012000
2510.000	71.106	0.012000
2520.000	71.422	0.012000
2530.000	71.606	0.012000
2540.000	71.848	0.012000
2550.000	71.758	0.012000
2560.000	71.535	0.012000
2570.000	71.871	0.012000
2580.000	71.055	0.012000
2590.000	70.897	0.012000
2600.000	71.278	0.012000
2610.000	71.013	0.012000
2620.000	71.190	0.012000
2630.000	71.213	0.012000
2640.000	71.195	0.012000
2650.000	70.748	0.012000
2660.000	71.196	0.012000
2670.000	71.267	0.012000
2680.000	71.256	0.012000
2690.000	70.976	0.012000
2700.000	70.881	0.012000
2710.000	70.821	0.012000
2720.000	70.799	0.012000
2730.000	70.909	0.012000
2740.000	70.686	0.012000
2750.000	71.176	0.012000
2760.000	70.904	0.012000
2770.000	70.960	0.012000
2780.000	70.966	0.012000
2790.000	70.827	0.012000
2800.000	70.944	0.012000
2810.000	70.977	0.012000
2820.000	70.922	0.012000
2830.000	71.004	0.012000
2840.000	70.874	0.012000
2850.000	71.078	0.012000
2860.000	71.188	0.012000
2870.000	71.254	0.012000
2880.000	70.573	0.012000
2890.000	70.646	0.012000
2900.000	71.029	0.012000
2910.000	70.865	0.012000
2920.000	70.724	0.012000
2930.000	70.631	0.012000
2940.000	71.084	0.012000
2950.000	70.750	0.012000
2960.000	70.734	0.012000
2970.000	70.871	0.012000
2980.000	70.638	0.012000
2990.000	71.591	0.012000
3000.000	71.134	0.012000
3010.000	70.935	0.012000
3020.000	70.983	0.012000
3030.000	70.778	0.012000
3040.000	70.957	0.012000
3050.000	70.797	0.012000
3060.000	70.913	0.012000
3070.000	70.923	0.012000
3080.000	71.036	0.012000
3090.000	70.551	0.012000
3100.000	70.723	0.012000
3110.000	70.966	0.012000
3120.000	71.043	0.012000
3130.000	71.239	0.012000
3140.000	70.718	0.012000

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3150.000	70.807	0.012000
3160.000	70.840	0.012000
3170.000	71.164	0.012000
3180.000	70.846	0.012000
3190.000	70.665	0.012000
3200.000	70.979	0.012000
3210.000	70.935	0.012000
3220.000	71.180	0.012000
3230.000	70.897	0.012000
3240.000	70.915	0.012000
3250.000	70.989	0.012000
3260.000	71.029	0.012000
3270.000	71.199	0.012000
3280.000	71.087	0.012000
3290.000	71.302	0.012000
3300.000	71.187	0.012000
3310.000	70.820	0.012000
3320.000	70.966	0.012000
3330.000	71.177	0.012000
3340.000	71.203	0.012000
3350.000	71.268	0.012000
3360.000	70.999	0.012000
3370.000	70.896	0.012000
3380.000	71.214	0.012000
3390.000	71.177	0.012000
3400.000	71.644	0.012000
3410.000	71.723	0.012000
3420.000	71.728	0.012000
3430.000	71.391	0.012000
3440.000	71.254	0.012000
3450.000	71.032	0.012000
3460.000	71.354	0.012000
3470.000	71.178	0.012000

Name: O_N8_N3 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	69.626	0.012000
10.000	68.123	0.012000
20.000	68.855	0.012000
30.000	69.084	0.012000
40.000	69.235	0.012000
50.000	69.225	0.012000
60.000	69.264	0.012000

==========
==== Weirs ==========
==========

Name: O_N10_N1 From Node: N10
Group: BASE To Node: N1
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: O_N10_N1
Invert(ft): 72.587
Control Elevation(ft): 72.587
Struct Opening Dim(ft): 9999.00
TABLE
Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 2.600
Orifice Discharge Coef: 0.600

Name: O_N10_N4 From Node: N10
Group: BASE To Node: N4
Flow: Both Count: 1
Type: Vertical: Fread Geometry: Irregular

XSec: O_N10_N4
Invert(ft): 73.807
Control Elevation(ft): 73.807
Struct Opening Dim(ft): 9999.00
TABLE
Bottom Clip(ft): 0.000
Top Clip(ft): 0.000
Weir Discharge Coef: 2.600
Orifice Discharge Coef: 0.600

```
-----------------------------------------------------------------------------------------------
        Name: O_N10_N7            From Node: N10
       Group: BASE                  To Node: N7
        Flow: Both                    Count: 1
        Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N10_N7
                 Invert(ft): 71.415
      Control Elevation(ft): 71.415
     Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
        Weir Discharge Coef: 2.600
     Orifice Discharge Coef: 0.600


-----------------------------------------------------------------------------------------------
        Name: O_N10_N9            From Node: N10
       Group: BASE                  To Node: N9
        Flow: Both                    Count: 1
        Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N10_N9
                 Invert(ft): 71.624
      Control Elevation(ft): 71.624
     Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
        Weir Discharge Coef: 2.600
     Orifice Discharge Coef: 0.600


-----------------------------------------------------------------------------------------------
        Name: O_N10_Neast         From Node: N10
       Group: BASE                  To Node: Neast
        Flow: Both                    Count: 1
        Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N10_Neast
                 Invert(ft): 72.348
      Control Elevation(ft): 72.348
     Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
        Weir Discharge Coef: 2.600
     Orifice Discharge Coef: 0.600


-----------------------------------------------------------------------------------------------
        Name: O_N11_N10           From Node: N11
       Group: BASE                  To Node: N10
        Flow: Both                    Count: 1
        Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N11_N10
                 Invert(ft): 72.489
      Control Elevation(ft): 72.489
     Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
        Weir Discharge Coef: 2.600
     Orifice Discharge Coef: 0.600


-----------------------------------------------------------------------------------------------
        Name: O_N11_N9            From Node: N11
       Group: BASE                  To Node: N9
        Flow: Both                    Count: 1
        Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N11_N9
                 Invert(ft): 72.247
      Control Elevation(ft): 72.247
     Struct Opening Dim(ft): 9999.00
                                          TABLE
```

```
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N1_Neast          From Node: N1
        Group: BASE                  To Node: Neast
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N1_Neast
                 Invert(ft): 68.223
       Control Elevation(ft): 68.223
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N2_Nwest          From Node: N2
        Group: BASE                  To Node: Nwest
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N2_Nwest
                 Invert(ft): 66.915
       Control Elevation(ft): 66.915
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N3_N2             From Node: N3
        Group: BASE                  To Node: N2
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N3_N2
                 Invert(ft): 75.577
       Control Elevation(ft): 75.577
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N3_N8             From Node: N3
        Group: BASE                  To Node: N8
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N3_N8
                 Invert(ft): 73.523
       Control Elevation(ft): 73.523
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N4_N3             From Node: N4
        Group: BASE                  To Node: N3
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N4_N3
```

```
                 Invert(ft): 72.463
       Control Elevation(ft): 72.463
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N5_N1             From Node: N5
        Group: BASE                  To Node: N1
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                       XSec: O_N5_N1
                 Invert(ft): 71.163
       Control Elevation(ft): 71.163
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N5_N4             From Node: N5
        Group: BASE                  To Node: N4
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                       XSec: O_N5_N4
                 Invert(ft): 72.223
       Control Elevation(ft): 72.223
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N6_N1             From Node: N6
        Group: BASE                  To Node: N1
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                       XSec: O_N6_N1
                 Invert(ft): 71.431
       Control Elevation(ft): 71.431
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N6_N4             From Node: N6
        Group: BASE                  To Node: N4
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                       XSec: O_N6_N4
                 Invert(ft): 71.738
       Control Elevation(ft): 71.738
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N6_N5             From Node: N6
        Group: BASE                  To Node: N5
```

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```
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N6_N5
                  Invert(ft): 70.971
       Control Elevation(ft): 70.971
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N6_N7             From Node: N6
        Group: BASE                  To Node: N7
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N6_N7
                  Invert(ft): 71.081
       Control Elevation(ft): 71.081
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N7_N1             From Node: N7
        Group: BASE                  To Node: N1
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N7_N1
                  Invert(ft): 68.968
       Control Elevation(ft): 68.968
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N7_N4             From Node: N7
        Group: BASE                  To Node: N4
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N7_N4
                  Invert(ft): 71.570
       Control Elevation(ft): 71.570
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600



-----------------------------------------------------------------------------------------------
         Name: O_N8_N2             From Node: N8
        Group: BASE                  To Node: N2
         Flow: Both                    Count: 1
         Type: Vertical: Fread      Geometry: Irregular

                        XSec: O_N8_N2
                  Invert(ft): 66.743
       Control Elevation(ft): 66.743
      Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
         Weir Discharge Coef: 2.600
      Orifice Discharge Coef: 0.600
```

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```
==========================================================================================
==== Hydrology Simulations ===============================================================
==========================================================================================

         Name: 100YR24H
     Filename: T:\00114.00\zTBG\drainage\Calcs\ICPR_CD-1\100YR24H.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 10.00

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

==========================================================================================
==== Routing Simulations =================================================================
==========================================================================================

         Name: 100YR24HR           Hydrology Sim: 100YR24H
     Filename: T:\00114.00\zTBG\drainage\Calcs\ICPR_CD-1\100YR24HR.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 60.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 1.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
60.000          5.000

Group           Run
--------------- -----
BASE            Yes
```

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Appendix E

Pond Site Evaluation Description and Photos

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An alternative comparison analysis has been performed which consists of a description of each Stormwater Management Facility (SMF) location along with an analysis of the following parameters for each site. Portions of the analysis of these parameters is based on a desktop review of the best available data. The sources of any data used in the review of that parameter is listed and where available a date is provided.

Wetland Impacts: Pertains to impacts to wetland areas as identified in the USGS National Wetland Inventory, 2017 database. For this PD&E study, a Natural Resources Evaluation for PD&E Study Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192 (MP 238.5 to MP 242.5), November 2019, was performed and discusses the associated wetland impacts for the project in further detail.

Wildlife Habitat Impacts: Pertains to impacts to wetland areas, FEMA effective floodplains, and to habitats for threatened, endangered, or significant wildlife species. For this PD&E study, a Natural Resources Evaluation for PD&E Study Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192 (MP 238.5 to MP 242.5), November 2019, was performed and discusses the associated wetland impacts for the project in further detail.

Contamination Risk: Pertains to the presence of hazardous materials or petroleum contamination on or near the site location. (DEP Cleanup Sites, Petroleum Contamination Monitoring (PCTS) Discharges, State Funded Cleanup Sites (2014), FDEP Waste Cleanup Inactive Sites (2016), FDEP Waste Cleanup Open Sites (2016)). For this PD&E evaluation, the Contamination Screening Evaluation Report (November 2019) for the project was used to designate the High, Medium, and Low rankings.

Floodplain Impacts: Pond sites were selected in order to avoid further floodplain impacts. The area of impact is listed in the evaluation matrix demonstrates the pond option footprint impact to the FEMA dFIRM Flood Hazard Dataset, 2017.

Cultural or Archaeological Resources Impacts: Addresses impacts to prehistoric/historic archaeological or historic structures for each site. (National Register of Historic Places of Interest 2016 Database). For this PD&E evaluation, the Cultural Resource Assessment Study (CRAS) (November 2019) for the project was referenced. Based on the background and field work, no archaeological sites, prehistoris or historic were found our out of the 12 sites identified as historic resources, only one appears eligible for listing in the NRHP and this is the C-31 Canal. Overall, the proposed project undertaking for will not result in the removal or destruction of anything significant (CRAS, 2019.) Low was used for the pond sites in accordance with the findings in the CRAS.

Permitability: Addresses impacts to permitting efforts to local, state, and federal agencies. Since this is consistent for all the alternatives, this was not included in the evaluation matrix. (DEP Outstanding Florida Waters, Florida TMDLs (2018), Verified Impaired WBIDs (2018))

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Ownership/Number of Property Owners: Addresses the impacts to property owner(s) and identifies the number of impacted persons/entities. Florida Department of Revenue Property Department (2017) and Osceola Property Appraiser Website.

Access/Maintainability: Adequate area needed for regular cleaning, sediment removal, mowing and other required maintenance. This includes evaluation if a drainage easement would be required. This was evaluated based on the proximity of the site to existing right-of-way.

Cost: Economics associated with right-of-way acquisition and pond construction costs.

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Basin 1

Pond 1-1-1, Pond 1-2-1, and Pond 1-2-2, along SR 91, looking south

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Pond 1-3-1 & Pond 1-3-2, along Old Canoe Creek, looking southwest

Pond 1-3-1 and Pond 1-3-2, along SR 91, looking southeast

Basin 3

Pond 3-1-1 and Pond 3-1-2, along SR 91, looking east

Pond 3-2-1, Pond 3-2-2, and Pond 3-3-2, along SR 91, looking west

Basin 4

Pond 4-1, along SR 91, looking northwest

Pond 4-2, along SR 91, looking west

Pond 4-3, along SR 91 mainline, looking south

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Basin 5

Pond 5-1 and Pond 5-2, along SR 91, looking east

Pond 5-3, along SR 91, looking northwest

Basin 100

Pond 100-1, along Old Canoe Creek Road, looking northeast

Pond 100-2, along Old Canoe Creek Road, looking southwest

Pond 100-2, along SR 91, looking northeast

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Basin 200

Pond 200-1A, along Kissimmee Park Road, looking east

Pond 200-1B, along Kissimmee Park Road, looking west

Basin 300

Pond 300-1, along SR 91, looking east

Pond 300-1, along SFWMD entrance drive, looking south

Adjacent parcel stormwater pond discharge into Pond 300-1 site

Pond 300-2A, along SR 91, looking east

Pond 300-2B and Pond 300-2C, along Old Canoe Creek Road, looking south

Pond 300-2B and Pond 300-2C, along Old Canoe Creek Road, looking southwest

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Pond 300-3, along SR 91, looking west

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Existing Ponds

PA-10, inflow from West New Nolte Road, looking north

PA-10, wet detention pond, discharge to wetlands

South Pond, Discharge to SR 91 right-of-way

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Appendix F

Correspondence\Meeting Minutes, and Excerpts from Previous Permits and Studies

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WIDEN FLORIDA'S TURNPIKE
FROM KISSIMMEE PARK ROAD TO US 192
FPID NO. 441224-1
MEETING MINUTES

Date: Friday, November 1, 2019

Time: 9:30 AM to 10:10 AM

Location: SFWMD Orlando Service Center

Purpose: PD&E Pre-application meeting

Name	Organization
Annemarie Hammond	FTE/ EMO Permit Coordinator
Allyson Burke	FTE/ Environmental
Erin Yao, PE	FTE/ Drainage Engineer
Adriana Kirwan, PE	FTE / Drainage
Jennifer Nunn, PE	Balmoral/Drainage
Nicole Gough	Dewberry / Environmental
Mark Daron, PE	SFWMD
Marc Ady	SFWMD
Rich Walker *(by phone)*	SFWMD (Property Review)

Summary of Discussion

I. Introductions
   a) See Sign in sheet

II. Project Overview
   a) Jennifer Nunn provided a brief introduction of the project limits and status of the project.

III. Property Review Comments
   a) Richard Walker stated that if the Department does not own the entire project area, a letter of intent to purchase will need to be submitted with the permit application. This will become a condition of the permit.

IV. Watershed / Basins
   a) St. Cloud Canal Basin
   b) No Discharge to OFWs
   c) No Direct Discharge Impaired Waters

V. Existing Stormwater Permits
   a) SFWMD Permit 49-01481-P - Kissimmee Park Road/Turnpike Interchange (Issued in 3/2005, modified in Nov. 2005)
   b) SFWMD Permit 49-01443-P, Application 040323-11 - Anthem Park
   c) SFWMD Permit 49-0504-S, Application 040604-10 - West New Nolte Road Rehab
      i. It was noted that Osceola County will likely be a co-applicant to modifications to the Anthem Park and West New Nolte Road Rehab permits.

ii. Drainage modifications may be under one major modification with Administrative Modifications to the two County permits to document changes in acreage/ stormwater treatment capacity and other minor changes.
iii. Design level details will factor in to permitting as well as specifications on Operation and Maintenance of modified stormwater management systems.

VI. Existing Drainage Patterns
a) Open Basins

VII. Stormwater Treatment
a) Wet Detention (Open Basin / Positive Outfall) (Offsite Options)
i. Greater of 1" of runoff from the contributing area or 2.5" times the additional impervious or any existing treated impervious area.
b) Dry Detention (within R/W)
i. 75% of wet detention criteria
c) Compensating Treatment.
i. Mark Daron reiterated the difference between compensating treatment and overtreatment and that overtreatment is not an accepted BMP.

VIII. Stormwater Attenuation
a) Open Basin / Positive Outfall
b) Pre vs Post Peak Discharge
i. 25 Year – 72 Hour – not applicable (SFWMD)
ii. 10 Year – 72 Hour (Osceola County) – governs - Mark Daron confirmed

IX. 100 Year FEMA Floodplain Encroachment Compensation
a) Floodplain Compensation
i. Cup-for-cup – (100-year/24-hour storm)
ii. For C-31 (St. Cloud) Canal Crossing – design must not exceed the maximum allowable headloss through the structure, 0.1 foot (one-tenth foot).
b) Jennifer Nunn described the floodplain map and potential for floodplain credit when the existing ramps at Kissimmee Park Road are removed.

X. Environmental
a) Wetlands and Other Surface Waters
i. Other Surface Waters – relocated during proposed drainage design
ii. Mitigation – Available Mitigation Banks; Per 373.4137, FS
b) Delineation schedule – Summer/Fall 2020
i. Agency review of delineated wetlands will likely be during permitting, but will consider an Informal or Formal Wetland Determination if needed.
c) C-31 (St. Cloud) Canal – Section 408 Approval Process during ERP Permitting
i. Dewberry requested guidance on contacts
ii. It was encouraged to begin this coordination early.
iii. Dewberry was provided with a list of ROW staff with SFWMD
1. See attached
d) Marc Ady asked about Conservation Easements along the corridor.
i. New guidance for any requests for Conservation Easement releases need to be approved by the Governing Board after demonstration that every avoidable alternative has been addressed.

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XI. Schedule
   a) Currently in PD&E phase
   b) Anticipated ERP submittal August 2020
   c) SFWMD recommended another pre-application meeting closer to ERP submittal

XII. Action Items
   a) none

We believe the foregoing record to be an accurate summary of the meeting and related decisions. We would appreciate notification of exceptions or corrections to these Minutes within five (5) days of receipt. Without notification, we will consider these minutes to be a record of fact.

Copied: Attendees, Study Team

Respectfully,
Nicole Gough

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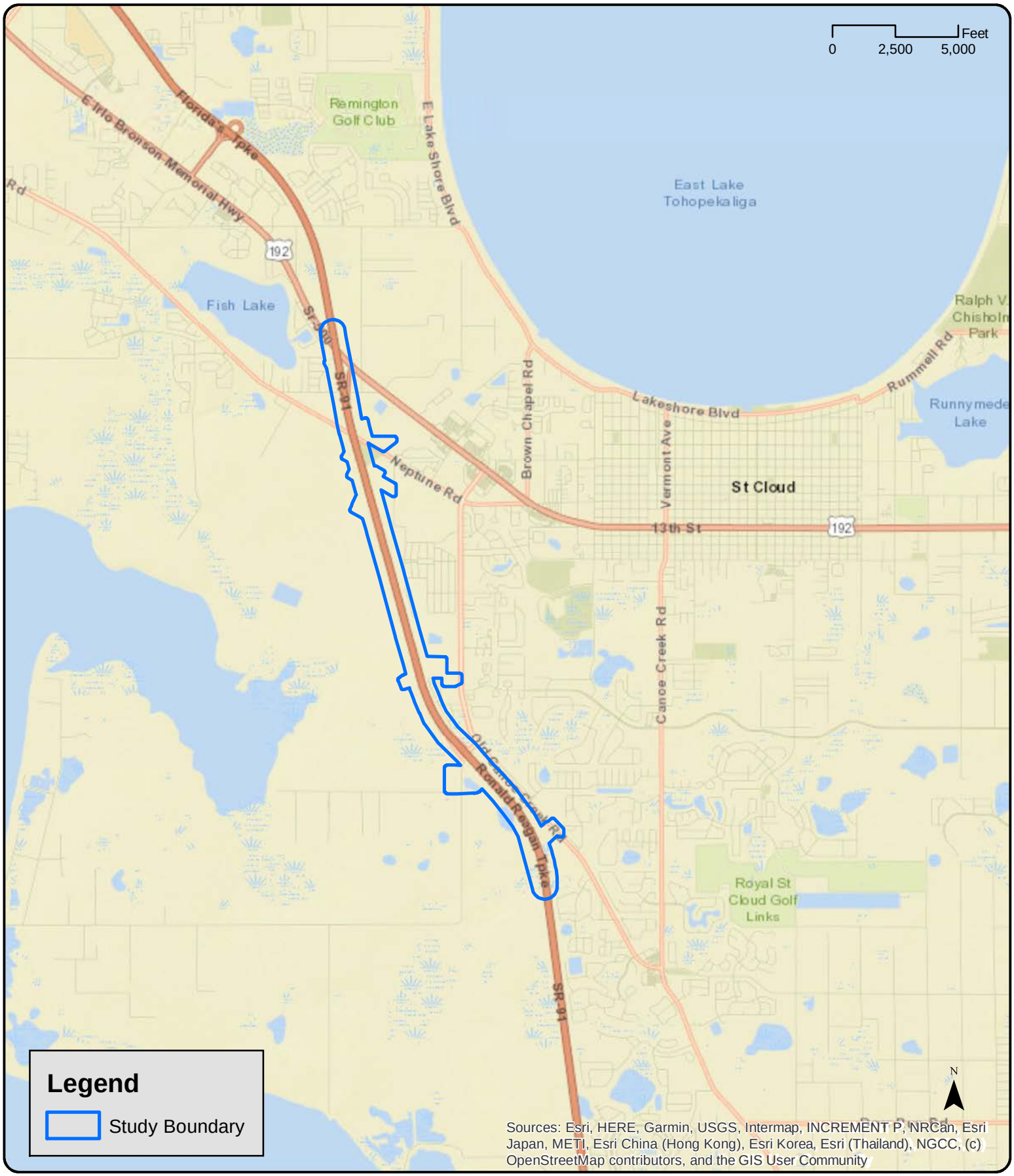
FPID 441224-1-22-01
PD&E for Florida's Turnpike (SR 91) from South of Kissimmee Park Road to US 192
(MP 238.5 to MP 242.5)
Osceola County, Florida

Meeting Location: SFWMD Orlando Service Center
Meeting Subject: SFWMD Pre-Application Meeting
Meeting Date: Friday November 1, 2019 9:30 A.M.

Name	✓	Organization	Phone	Email
Annemarie Hammond	✓	FTE/ EMO Permit Coordinator	407-264-3293	Annemarie.Hammond@dot.state.fl.us
Allyson Burke	✓	FTE/ Environmental	407-264-3062	Allyson.Burke@dot.state.fl.us
Erin Yao, PE	✓	FTE/ Drainage Engineer	407-264-3479	Erin.Yao@dot.state.fl.us
Adrianna Kirwan, PE	✓	FTE / Drainage	407-264-3080	Adriana.Kirwan@dot.state.fl.us
Jennifer Nunn, PE	✓	Balmoral / Drainage	407-629-2185	jnunn@balmoralgroup.us
Nicole Gough, PWS	✓	Dewberry / Environmental	321-354-9727	ngough@dewberry.com
Mark Daron, PE	✓	SFWMD	407-858-6100 x3805	mdaron@sfwmd.gov
Marc Ady	✓	SFWMD	407-858-6100 x3803	mady@SFWMD.gov
Rich Walker	phone	SFWMD Property Review		



Regional Location Map

Project Development and Environment (PD&E) Study
Widening Florida's Turnpike (SR 91)

from South of Kissimmee Park Road to US 192 in Osceola County

Financial Project ID No.: 441224-1-22-01

Aerial Map

Project Development and Environment (PD&E) Study
Widening Florida's Turnpike (SR 91)

from South of Kissimmee Park Road to US 192 in Osceola County

Financial Project ID No.: 441224-1-22-01

T. Waterhouse
4/220

Last Date For Agency Action: 09-MAR-2005

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Kissimmee Park Road/Turnpike Interchange

Permit No.: 49-01481-P

Application No.: 041008-30

Application Type: Environmental Resource (New Construction/Operation)

Location: Osceola County, S16/T26S/R30E

Permittee : Florida Dept Of Transportation - Florida'S Turnpike

Operating Entity : Florida Dept Of Transportation - Florida'S Turnpike

Project Area: 44.8 acres

Project Land Use: Highway

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Subject to Governing Board Approval

Drainage Basin: LAKE TOHOPEKALIGA

Receiving Body: Lake Tohopekaliga

Class: CLASS III

Special Drainage District: NA

Total Acres Wetland Onsite:	6.15	
Total Acres Wetland Preserved Onsite:		
Total Acres Impacted Onsite :	5.23	
Total Acres Presv/Mit Compensation Onsite:		
Offsite Mitigation Credits-Mit.Bank:	8.60	Reedy Creek Mitigation Bank

Conservation Easement To District : No

Sovereign Submerged Lands: No

PROJECT PURPOSE:

This application is a request for an Environmental Resource Permit to authorize construction and operation of a surface water management system to serve 44.80 acres of a highway project known as Kissimmee Park Road/Turnpike Interchange. Staff recommends approval with conditions.

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The site is located at the intersection of Kissimmee Park Road and the Florida Turnpike Interchange in Osceola County.

There are permitted offsite surface water management facilities adjacent to the project area serving a portion of the present bridge. The site contains an interchange consisting of a bridge, floodplain zones, and wetlands.

The existing interchange occurs immediately next to and partially within a cypress slough system that extends across the turnpike immediately north of the interchange. The original construction of the existing roadways and interchange has caused the conversion of some of the previous cypress system to shrub/brush and other parts to deep canals. An active Bald Eagle nest lies immediately west of the Turnpike and the proposed northern-most re-surfacing activities fall within the secondary protection zone.

PROPOSED PROJECT:

Construction proposed consists of the surface water management system serving the improvements to the Kissimmee Park Road/Turnpike Interchange.

The project consists of the construction of a half-diamond interchange with a pair of ramps for a southbound exit and northbound entrance to the Turnpike from Kissimmee Park Road.

The water management system will consist of a combination of curb and shoulder gutter inlets, realignment of existing ditches, and extensions and additions of cross drains which collect and convey project runoff to a proposed wet detention pond for required treatment and attenuation. The proposed pond will also provide floodplain compensation for the project.

A new bridge for Kissimmee Park Road is proposed to replace the existing bridge going over the Florida Turnpike. With the new bridge, Kissimmee Park Road will be realigned on the east side of the project where it will tie into the widening of Kissimmee Park Road and Old Canoe Creek Road (Application #040130-38, Permit #49-01399-P) and whose surface water management system was designed to accommodate 2.78 acres of runoff from the interchange bridge proposed by this project. In the above mentioned permit, water quality treatment was provided for the 2.78 acres of interchange area up to 80 percent impervious coverage and attenuation.

In the design of the proposed surface water management system, water quality and attenuation was provided for 2.5 inches of runoff over the total new impervious area only proposed by this project; hence, this project is being permitted pursuant to the net water quality improvements provisions. Water quality certification has been waived for this project due to the proposed treatment and attenuation of the new impervious areas only (see Special Conditions).

Direct treatment and attenuation of all newly-added impervious area was not possible due to the locations of those areas with respect to the treatment pond. To compensate for the areas that could not be directly routed to the proposed stormwater management facility, an equal portion of the Turnpike Mainline was directed to the pond for treatment and attenuation. This will be accomplished by two inlets proposed in the median as the Turnpike Mainline is superelevated and drains to the median within the proposed project area.

The applicant submitted calculations demonstrating that there would be no adverse impacts to floodplain base flood elevations due to the cross drain extensions by the addition of new cross drains.

LAND USE:

Construction:
Project:

	This Phase	Total Project	
Impervious	22.20	22.20	acres
Pervious	11.80	11.80	acres
Water Mgnt Acreage	9.00	9.00	acres
Wetland	1.80	1.80	acres
Total:	**44.80**	**44.80**	

WATER QUANTITY :

Discharge Rate :

As shown in the table below, the proposed project discharge is within the allowable limit for the area.

Discharge Storm Frequency : 10 YEAR-3 DAY Design Rainfall : 7.8 inches

Basin	Allow Disch (cfs)	Method Of Determination	Peak Disch (cfs)	Peak Stage (ft, NGVD)
POND	62	Pre Vs Post	48.4	68.4

Road Design :

As shown in the following table and the attached exhibits, minimum road center lines have been set at or above the calculated design storm flood elevation.

Road Storm Frequency : 10 YEAR-3 DAY Design Rainfall: 7.8 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Road Crown (ft, NGVD)
POND	68.4	70

Flood Plain/Compensating Storage:

Per the site analysis performed by the applicant of existing conditions in the area, the 100-year base flood elevations are as such for this project's area: Eastern floodplain is at 70.0 feet NGVD, Center floodplain is at 69.33 feet NGVD and the Western floodplain is at 68.43 feet NGVD. The floodplain compensatory storage area, namely the proposed pond lies within the Western floodplain region.

Displaced Volume	Compensating Volume	100-Year Stage Elevation
6.16 ac-ft	7.21 ac-ft	68.43 ft-NGVI

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NGVD)	WSWT Ctrl Elev (ft, NGVD)	Method Of Determination
POND	44.80	67.7	67.70	Wet Season Soil Borings

Receiving Body :

Receiving Body :

Basin	Str.#	Receiving Body
Pond	POND DRO	Turnpike Ditch to Neighboring Wetland

Discharge Structures: Note: The units for all the elevation values of structures are (ft, NGVD)

Culverts:

Basin	Str#	Count	Type	Width	Length	Dia.
POND	POND DROP	1	Reinforced Concrete Pipe		81'	18"

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev.
POND	POND DROP	1	Inlet	37"	49"		68.1

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev.
POND	POND DROP	1	Trapezoidal	39.2'	2.1'			67.9 (crest)

Water Quality Structures: Note: The units for all the elevation values of structures are (ft, NGVD)

Bleeders:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev.
POND	POND DROP	2	V-Notch	49"	4.8"			157.83 deg.	67.7

WATER QUALITY:

Water quality has been provided for 2.5 inches times the percent impervious area for the new impervious areas only proposed by this project. The proposed stormwater management facility is located in an area where it is not physically possible to accept runoff directly from all of the newly-added impervious areas. However, to offset this limitation, an equal portion of the Turnpike mainline will be accepted into the stormwater management facility.

Basin	Treatment Method		Vol Req.d (ac-ft)	Vol Prov'd (ac-ft)
POND	Treatment	Wet Detention	.86	1.53

WETLANDS:

Wetland Description:

The old turnpike right-of-way crosses a narrow constriction of a cypress slough that lies in a southeast to northwest orientation. The past construction of the existing road included not only the direct impacts associated with the footprint of the road, but also topping of cypress leaving shrub/brush systems and the construction of deep canal conveyances within the former wetland footprint. The disturbance to the wetland by these activities established an opening for the invasion of exotic and nuisance species. Culverts under the existing roadway were established to maintain the south-east to north west flow patterns, and are being extended at this time as well for the same purpose.

Wetland Impacts:

The proposed ramp and widening activities will result in either direct (5.23 acres- 1.5ac forested, 3.73ac. shrub/brush) or secondary impacts (0.92ac.) to a total of 6.15 acres of cypress and shrub and brush wetland impacts. All of the impacts are occuring within the existing right-of-way. Efforts to reduce or eliminate wetland impacts were achieved with the construction of the interchange at an existing intersection and restricting impacts to areas within the existing right-of-way. The project design includes an erosion control plan to prevent erosional impacts to surface waters, wetlands or offsite areas.

Mitigation Proposal:

As a DOT project, the mitigation for the Kissimmee Park Road/ Turnpike Interchange would have normally been provided under the FDOT Mitigation Bill Section 373.4173 F.S. (the PLAN) (Senate Bill 1986). But, due to timing constraints, the project was delisted last year. As a term of the delisting it was agreed that the mitigation provided by DOT would be consistent with that previously determined under the PLAN. In accordance with the PLAN 1.50 acres of direct impacts and 0.92 acres of secondary impacts to cypress wetlands at the PLAN ratio of 2:1 will be offset with 4.84 mitigation bank credits. The impacts to shrub wetlands totaling 3.73 acres will be offset at a ratio of 1:1 for a total of 3.73 credits. The credits will be purchased from the Reedy Creek Mitigation Bank (SFWMD ERP #53-00002-M). A portion of the wetlands impacted are not forested but all of the credits purchased will be freshwater forested credits. Although these wetlands may be categorized as "herbaceous" many of the plants are woody and the original habitat was most likely cypress swamp.

This application involves activities within the Lake Tohopekaliga basin, but the entire Turnpike "project" crosses many basins in its route from Miami to Okahumpka; including the Reedy Creek basin. As implied by the name, the Reedy Creek Mitigation Bank falls within the Reedy Creek basin. In accordance with 373.4136(6)(6)(D).2 of the Florida Statutes linear projects may mitigate for impacts outside of the impact basin without causing an unacceptable cumulative impact to the basin resources. Should similar projects within the same drainage basin propose equivalent impacts and mitigation no unacceptable cumulative impacts would be expected to occur.

Wetland Inventory :

CONSTRUCTION MOD -Kissimmee Park Road/Turnpike Interchange

Site Id	Site Type	Pre-Development				Post-Development						
		Pre Fluccs	AA Type	Acreage (Acres)	Current Wo Pres	With Project	Time Lag (Yrs)	Risk Factor	Pres. Adj. Factor	Post Fluccs	Adj Delta	Functional Gain / Loss
w-1	ON	621	Secondary	.45							.000	.000
w-2	ON	621	Secondary	.47							.000	.000
w1	ON	621	Direct	.58							.000	.000
w1	ON	646	Direct	2.04							.000	.000
w2	ON	621	Direct	.92							.000	.000
w2	ON	646	Direct	1.69							.000	.000
			Total:	6.15								.00

Fluccs Code **Description**

Fluccs Code	Description
100	Urban And Residential
621	Cypress
646	Wetland Scrubs

Wetland Inventory :

MITBANK REEDY CREEK MITIGATION BANK

Pre-Development	Post-Development
	Mitigation Bank Cr Used
Fresh Water Forested	8.60
Total:	**8.60**

Endangered Species:

Activities between stations 4546 and 4551 occur within the secondary protection zone of an active Bald Eagle Nest (ID #OS098). An Eagle management plan has been accepted by the Florida Fish and Wildlife Conservation Commission. The plan includes avoiding construction activities within the protection zones between October and May or the standard monitoring should construction be unavoidable within that nesting season period. No other wetland-dependent endangered/threatened species or species of special concern were observed onsite, and submitted information indicates that potential use of the site by other such species is minimal. This permit does not relieve the applicant from complying with all applicable rules and any other agencies' requirements regarding the Bald Eagle nest, or, if in the future, any other endangered/threatened species or species of special concern are discovered on the site.

Species	Potential Occurence	Use Types
Bald Eagle	Nest Is Off-Site	Nesting

CERTIFICATION AND MAINTENANCE OF THE WATER MANAGEMENT SYSTEM:

It is suggested that the permittee retain the services of a Professional Engineer registered in the State of Florida for periodic observation of construction of the surface water management (SWM) system. This will facilitate the completion of construction completion certification Form #0881 which is required pursuant to Section 10 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, and Rule 40E-4361(2), Florida Administrative Code (F.A.C.).

Pursuant to Chapter 40E-4 F.A.C., this permit may not be converted from the construction phase to the operation phase until certification of the SWM system is submitted to and accepted by this District. Rule 40E-4.321(7) F.A.C. states that failure to complete construction of the SWM system and obtain operation

phase approval from the District within the permit duration shall require a new permit authorization unless a permit extension is granted.

For SWM systems permitted with an operating entity who is different from the permittee, it should be noted that until the permit is transferred to the operating entity pursuant to Rule 40E-1.6107, F.A.C., the permittee is liable for compliance with the terms of this permit.

The permittee is advised that the efficiency of a SWM system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. Maintenance of the SWM system is required to protect the public health, safety and the natural resources of the state. Therefore, the permittee must have periodic inspections of the SWM system performed to ensure performance for flood protection and water quality purposes. If deficiencies are found, it is the responsibility of the permittee to correct these deficiencies in a timely manner.

RELATED CONCERNS:

Water Use Permit Status:

The applicant has indicated that dewatering is not anticipated and there is no irrigation for the construction of this project.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation, unless the work qualifies for a No-Notice Short-Term Dewatering permit pursuant to Chapter 40E-20.302(3) or is exempt pursuant to Section 40E-2.051, FAC.

Right-Of-Way Permit Status:

A Right-of-Way Permit is not required for this project.

DRI Status:

This project is not a DRI.

Historical/Archeological Resources:

No information has been received that indicates the presence of archaeological or historical resources or that the proposed activities could cause adverse impacts to archaeological or historical resources.

Third Party Interest:

No third party has contacted the District with concerns about this application.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF RECOMMENDATION:

The Staff recommends that the following be issued :

Construction and operation of a surface water management system to serve 44.8 acres of a highway project known as Kissimmee Park Road/Turnpike Interchange.

Based on the information provided, District rules have been adhered to.

Staff recommendation is for approval subject to the attached General and Special Conditions.

STAFF REVIEW:

NATURAL RESOURCE MANAGEMENT DIVISION APPROVAL

ENVIRONMENTAL EVALUATION

Susan C. Elfers

SUPERVISOR

Marc S. Ady

DIVISION DIRECTOR :

for Robert G. Robbins

DATE: 3/3/05

SURFACE WATER MANAGEMENT DIVISION APPROVAL

ENGINEERING EVALUATION

ANNETTE V BURKETT

SUPERVISOR

Edward W. Yaun, P.E.

DIVISION DIRECTOR :

Anthony M. Waterhouse, P.E.

DATE: 3/2/05

GENERAL CONDITIONS

1. All activities authorized by this permit 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 and Part IV, Chapter 373. F.S.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.

5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.

6. Within 30 days after completion of construction of the permitted activity, the permitee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.

7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to be in compliance with the permitted plans and specifications; and the entity

GENERAL CONDITIONS

approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.

10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

11. 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 40E-4 or Chapter 40E-40, F.A.C..

12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.

14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the permit.

GENERAL CONDITIONS

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.

16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

17. 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.

18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.

19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

SPECIAL CONDITIONS

1. The construction phase of this permit shall expire on March 9, 2010.

2. Operation of the surface water management system shall be the responsibility of FLORIDA DEPARTMENT OF TRANSPORTATION - FLORIDA'S TURNPIKE ENTERPRISE.

3. Discharge Facilities:

   Structure: POND DROP

   1-39.2' W X 2.1' H TRAPEZOIDAL weir with crest at elev. 67.9' NGVD.
   2-49" W X 4.8" H X 157.83 deg. V-NOTCHES with invert at elev. 67.7' NGVD.
   81 LF of 18" dia. REINFORCED CONCRETE PIPE culvert.
   1-37" W X 49" L drop inlet with crest at elev. 68.1' NGVD.

   Receiving body : Turnpike Ditch to Neighboring Wetland
   Control elev : 67.7 feet NGVD.

4. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.

5. Measures shall be taken during construction to insure that sedimentation and/or turbidity violations do not occur in the receiving water.

6. The District reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.

7. Lake side slopes shall be no steeper than 4:1 (horizontal:vertical) to a depth of two feet below the control elevation. Side slopes shall be nurtured or planted from 2 feet below to 1 foot above control elevation to insure vegetative growth, unless shown on the plans.

8. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.

9. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

10. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.

11. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse water resource related impacts will not be caused by the completed permit activity. Should any adverse impacts caused by the completed surface water management system occur, the District will require the permittee to provide appropriate mitigation to the District or other impacted party. The District will require the permittee to modify the surface water management system, if necessary, to eliminate the cause of the adverse impacts.

12. Prior to commencement of construction in wetlands and in accordance with the work schedule attached as an exhibit, the permittee shall submit documentation from the South Florida Water Management District stating that 8.6 freshwater forested mitigation bank credits have been deducted from the ledger for the Reedy Creek Mitigation Bank (ERP #53-00002-M)

13. The permittee shall comply with the provisions of the eagle management plan approved for the site as shown in the attached exhibits. In accordance with the plan, potential nuisance activities such as land clearing, blasting, excavation and burning shall be conducted from May 16 - September 30 in order to

SPECIAL CONDITIONS

avoid the critical bald eagle nesting periods which take place from October 1 - May 15. No clearing or major grading shall be conducted during the nesting season and all construction activities shall be coordinated with the Florida Fish and Wildlife Conservation Commission.

13. Silt fencing shall be installed at the limits of construction to protect all of the preserve areas from silt and sediment deposition during the construction of the project. A floating turbidity barrier shall be installed during the construction of the final discharge structure into the adjacent canal/water body. The silt fencing and the turbidity barrier shall be installed in accordance with "Florida Land Development Manual" Chapter 6 "Stormwater and Erosion and Sediment Control Best Management Practices for Developing Areas". The sediment controls shall be installed prior to the commencement of any clearing or construction and the installation must be inspected by the District's Environmental Resource Compliance staff. The silt fencing and turbidity barriers shall remain in place and be maintained in good functional condition until all adjacent construction activities have been completed and all fill slopes have been stabilized. Upon completion of the project and the stabilization of the fill, the permittee shall contact the District's Environmental Resource Compliance staff to inspect the site and approve the removal of the silt fencing and turbidity barriers.

14. The District reserves the right to require remedial measures to be taken by the permittee if monitoring or other information demonstrates that adverse impacts to onsite or offsite wetlands, upland conservation areas or buffers, or other surface waters have occurred due to project related activities.

15. The authorization for construction of the surface water management system is issued pursuant to the water quality net improvement provisions referenced in Rule Section 40E-4.303(1), Florida Administrative Code; therefore, the state water quality certification is waived.

16. Activities associated with the implementation of the mitigation, monitoring and maintenance plan(s) shall be completed in accordance with the work schedule attached as Exhibit No. 17. Any deviation from these time frames will require prior approval from the District's Environmental Resource Compliance staff. Such requests must be made in writing and shall include (1) reason for the change, (2) proposed start/finish and/or completion dates; and (3) progress report on the status of the project development or mitigation effort.

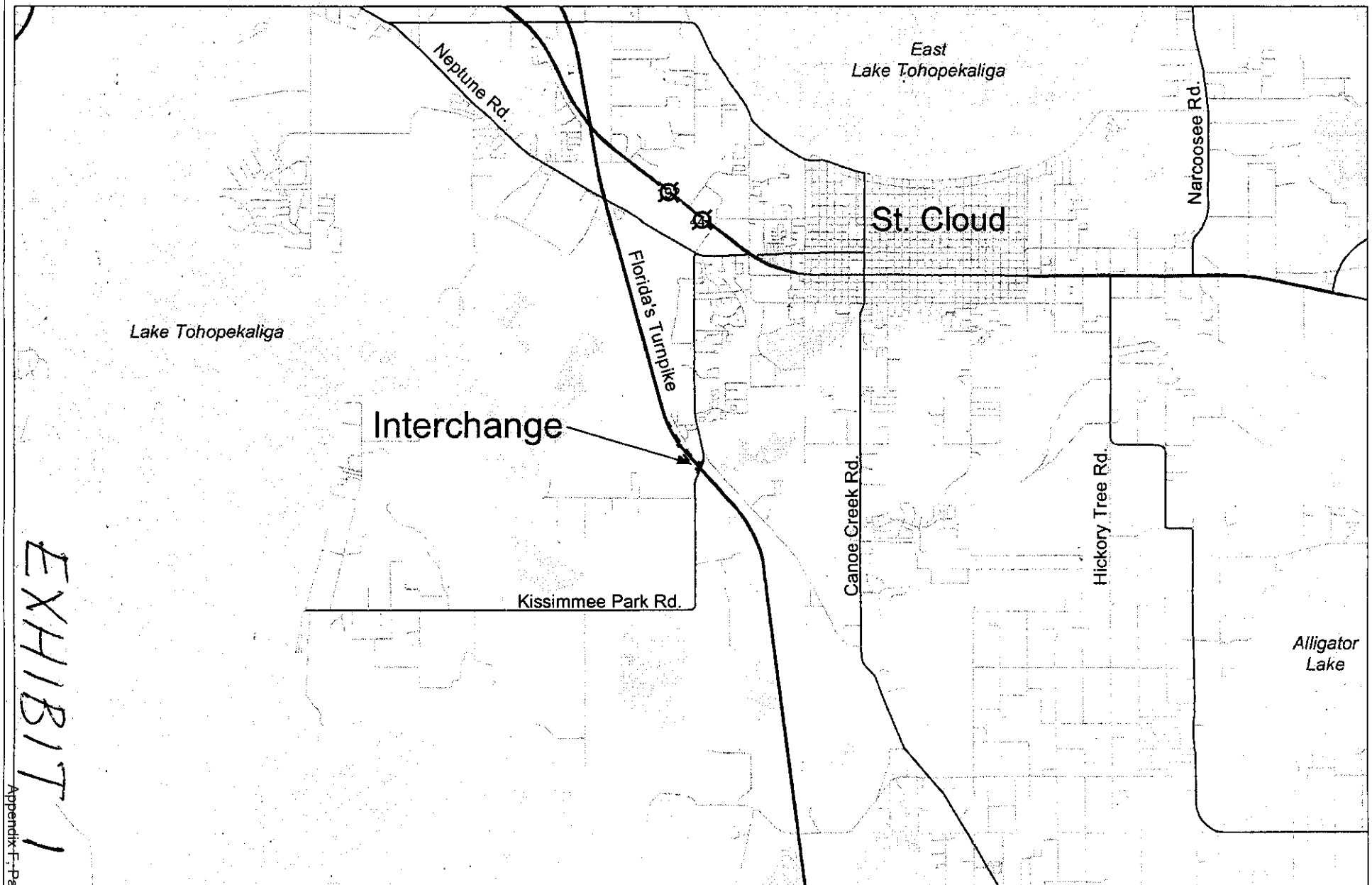


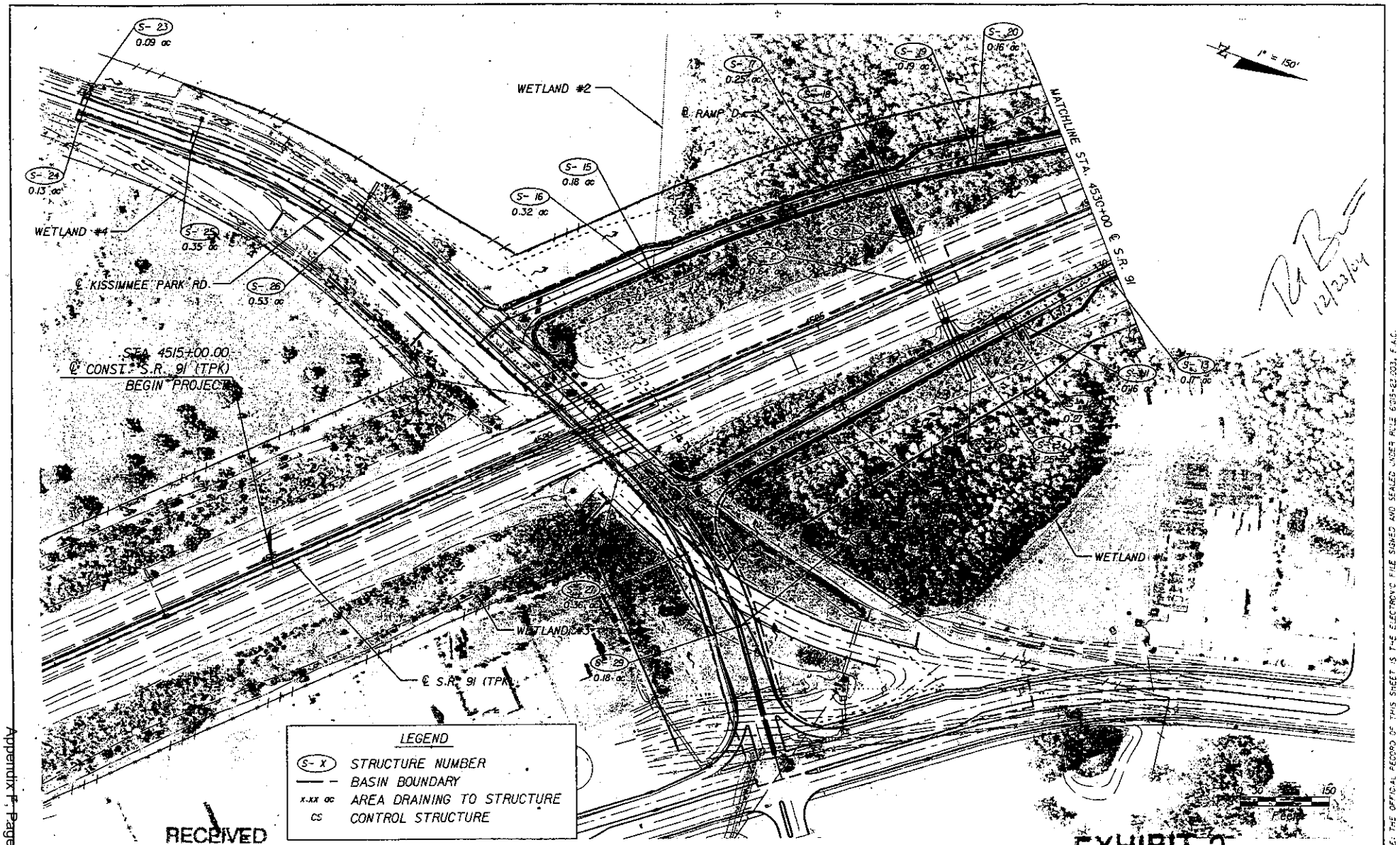
EXHIBIT 1

BOWYER SINGLETON & ASSOCIATES, INCORPORATED
ENGINEERING • PLANNING • SURVEYING • ENVIRONMENTAL
(407) 843-5120 www.bsaorl.com

Kissimmee Park Road Interchange
Osceola County, Florida
Location Map
Exhibit 1

0 2,000 4,000 6,000 8,000
Feet

Data Source: Florida Geographic Data Library



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ORLANDO SERVICE CENTER

DATE	BY	REVISIONS DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number : 7862
Robert G. Butterfield, P.E., License No. 44637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	OSCEOLA	411237-1-52-01

INTERCHANGE DRAINAGE MAP

SHEET NO. 4

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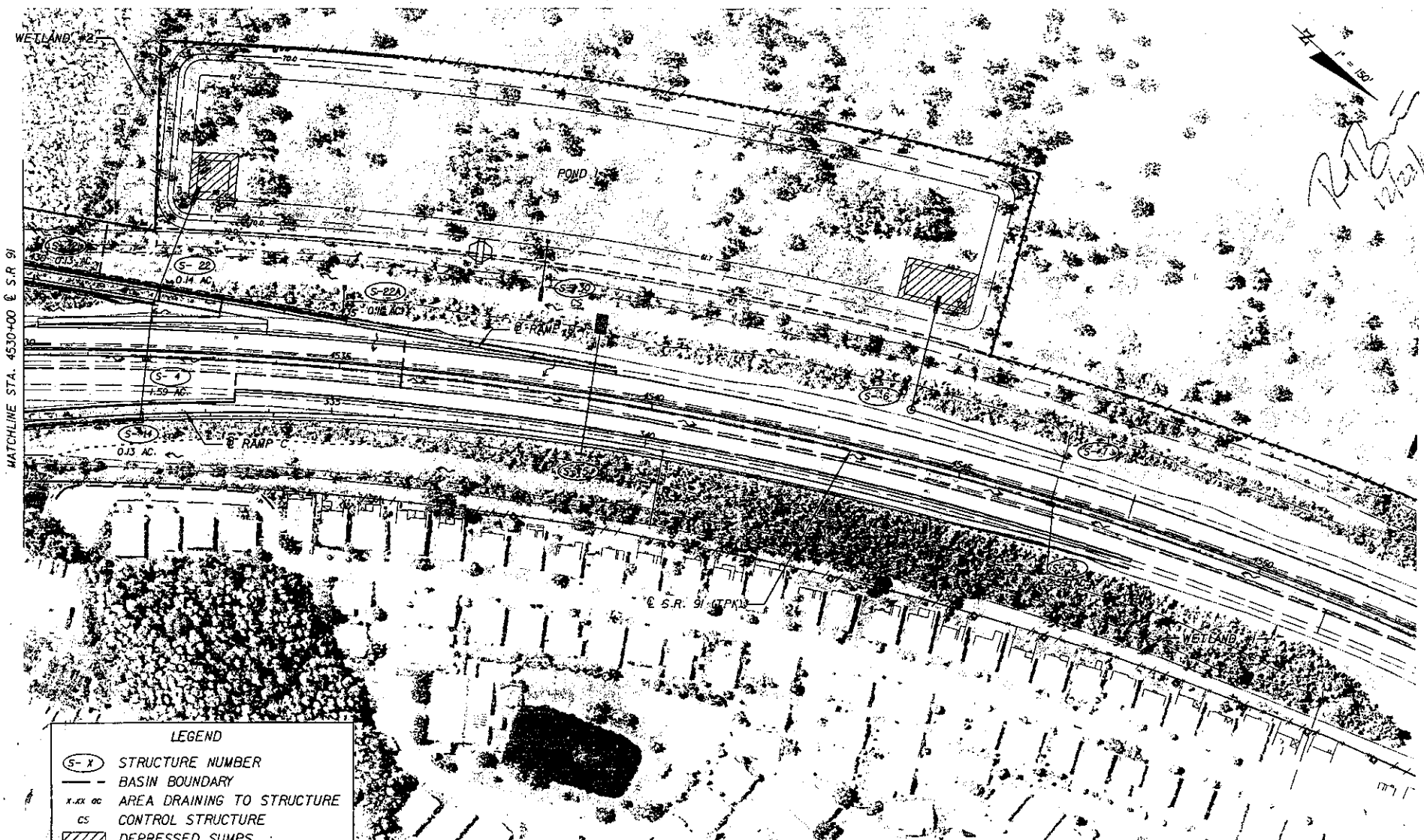

EXHIBIT 3

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CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number . 7862
Robert G Butterfield, P.E., License No 44637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	OSCEOLA	411237-1-52-0

INTERCHANGE DRAINAGE MAP

SHEET NO. 5

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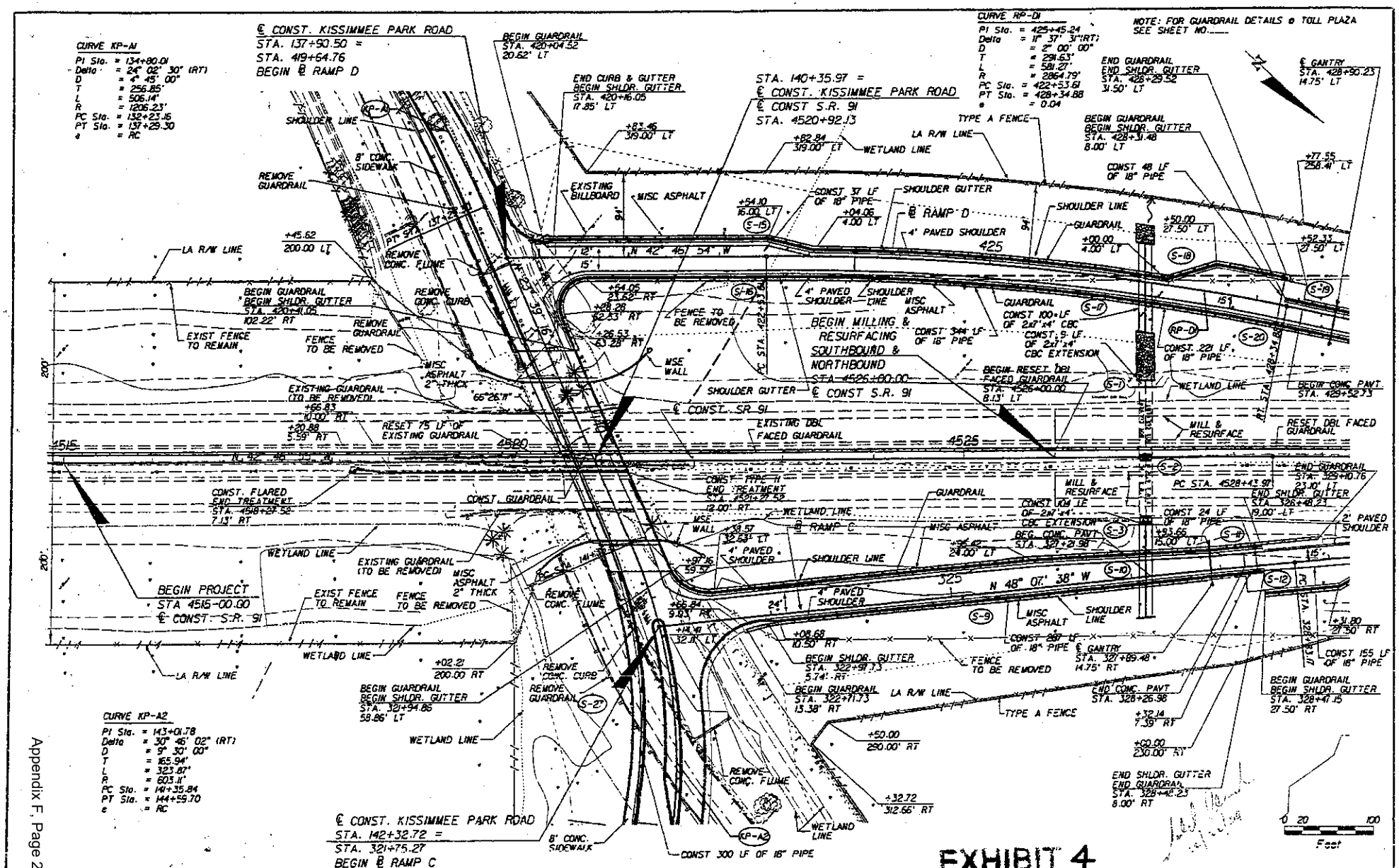

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE · ORLANDO, FLORIDA 32801
FBPR CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN E. KNUDSEN P.E. NO. 41062

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	411237-1-52-01

PLAN SHEET
FLORIDA'S TURNPIKE

SHEET NO.

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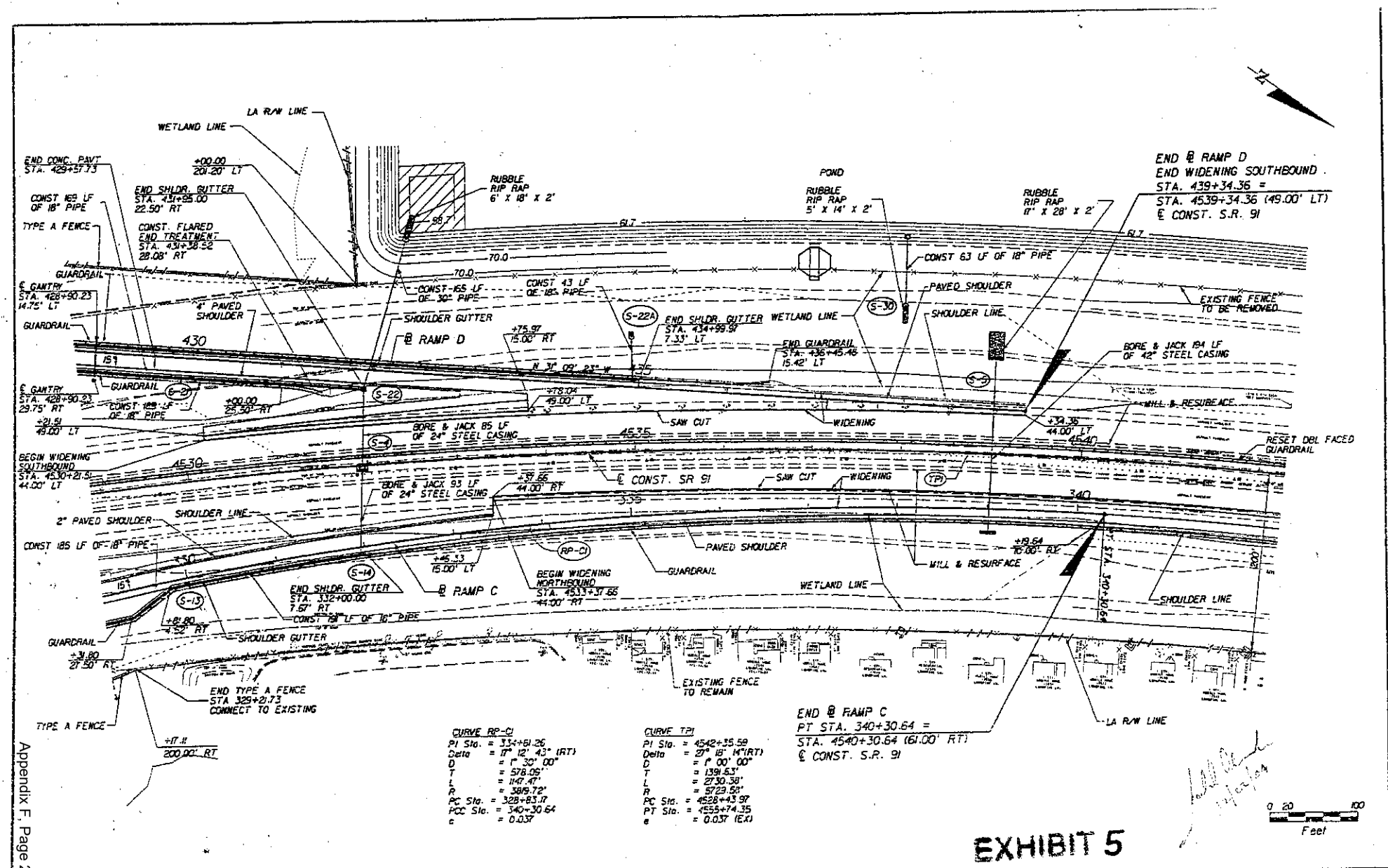

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PC Sta. = 328+83.17
PCC Sta. = 340+30.64
e = 0.037

CURVE TP1
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Delta = 27° 16' 14" (RT)
D = 1° 00' 00"
T = 1391.63'
L = 2730.38'
R = 5729.58'
PC Sta. = 4528+43.97
PT Sta. = 4555+74.35
e = 0.037 (EX)

EXHIBIT 5

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE - ORLANDO, FLORIDA 32801
FBPR CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN F. KNUDSEN P.E. NO. 41052

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	411237-1-52-01

PLAN SHEET
FLORIDA'S TURNPIKE

SHEET NO. 16

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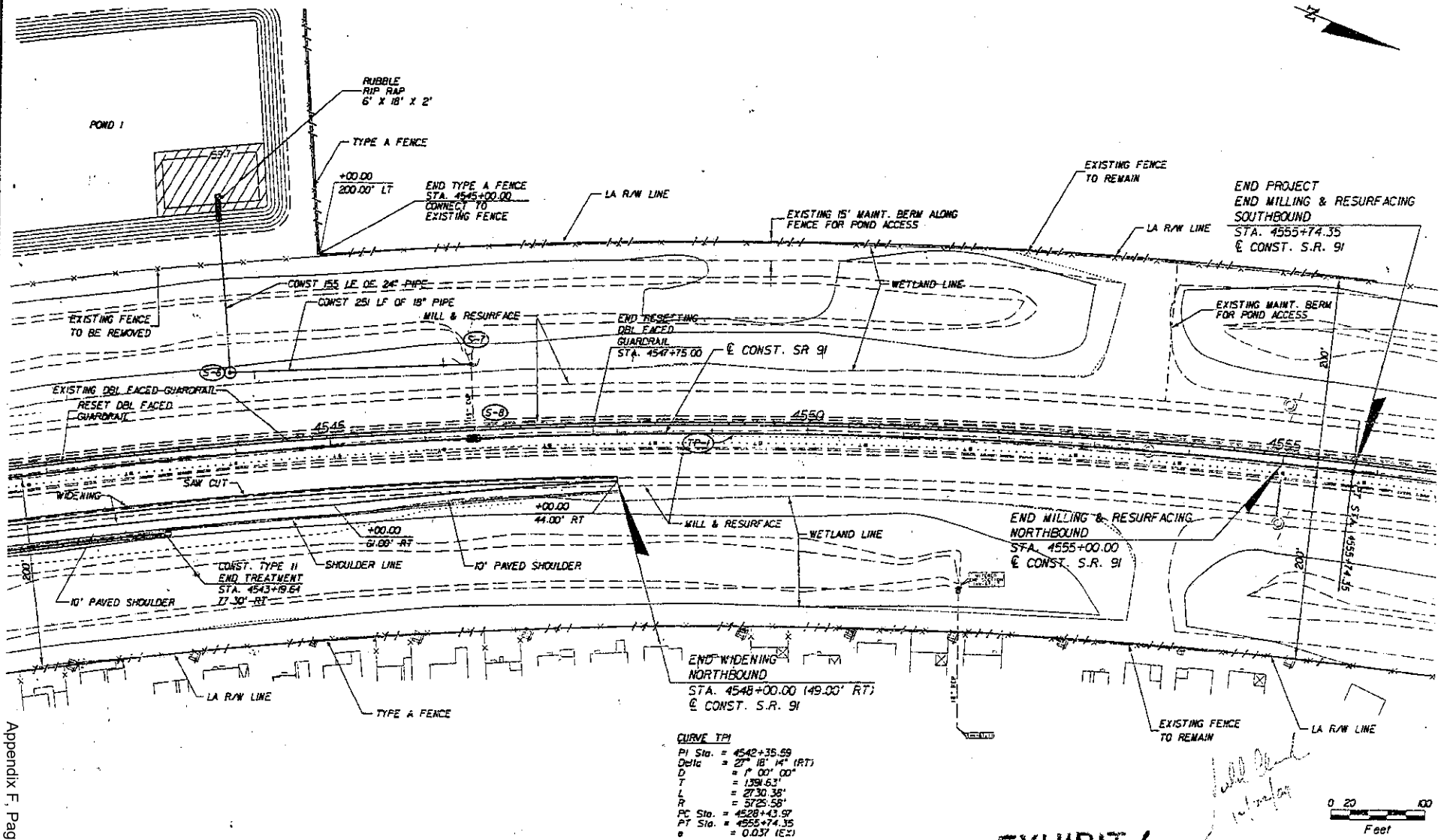

CURVE TPI

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Delta = 27° 18' 14" (RT)
D = 1° 00' 00"
T = 1391.63'
L = 2730.38'
R = 5725.58'
PC Sta. = 4528+43.97
PT Sta. = 4555+74.35
e = 0.037 (E)

EXHIBIT 6

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE - ORLANDO, FLORIDA 32801
FBPA CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN E. KNUDSEN P.E. NO. 41062

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	OSCEOLA	411237-1-52-01

PLAN SHEET
FLORIDA'S TURNPIKE

SHEET NO.

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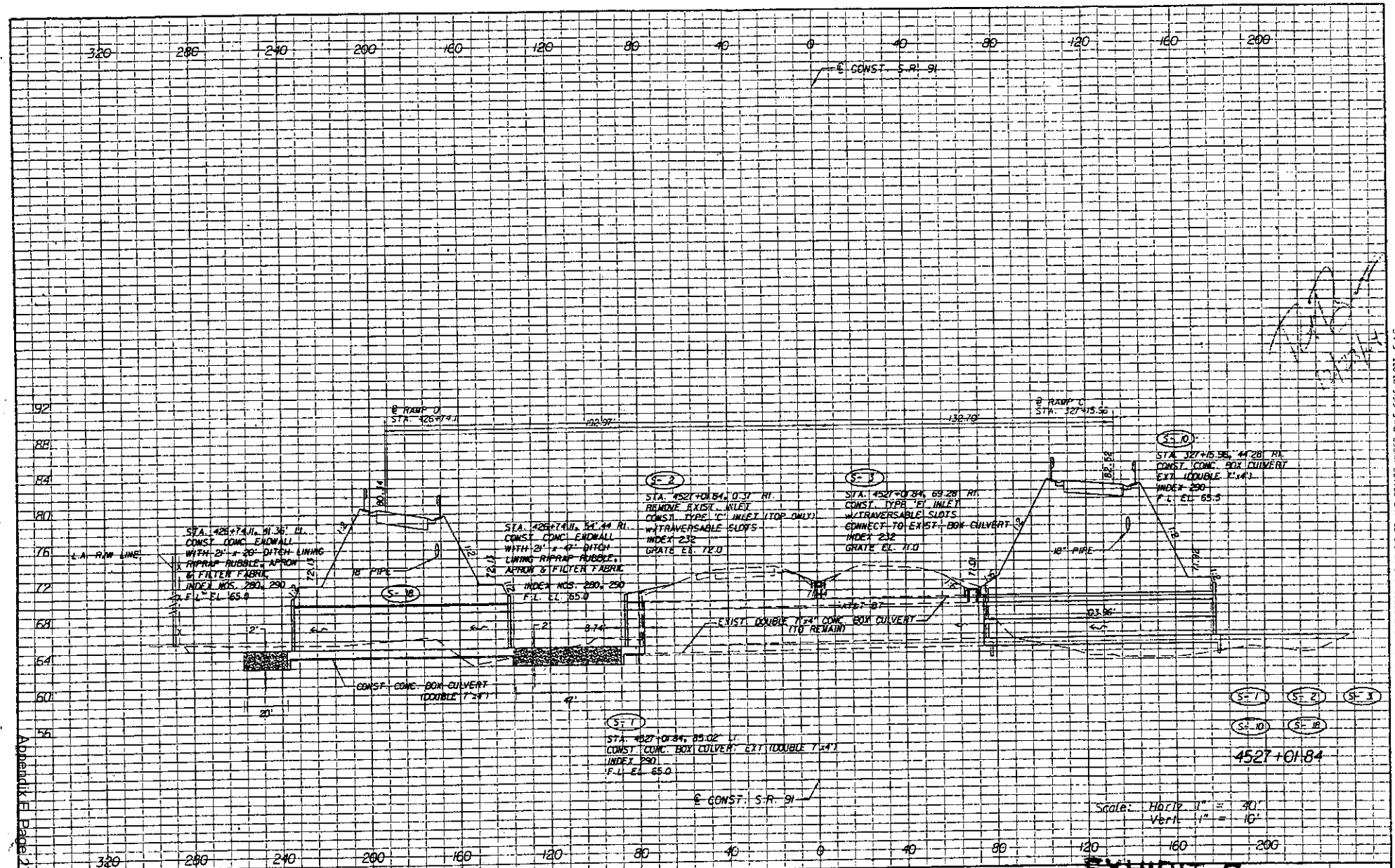

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REVISIONS					
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CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number : 7862
Robert Butterfield, P.E., License No. 44637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

EXHIBIT 7
DRAINAGE STRUCTURES
FLORIDA'S TURNPIKE

SHEET NO. 38

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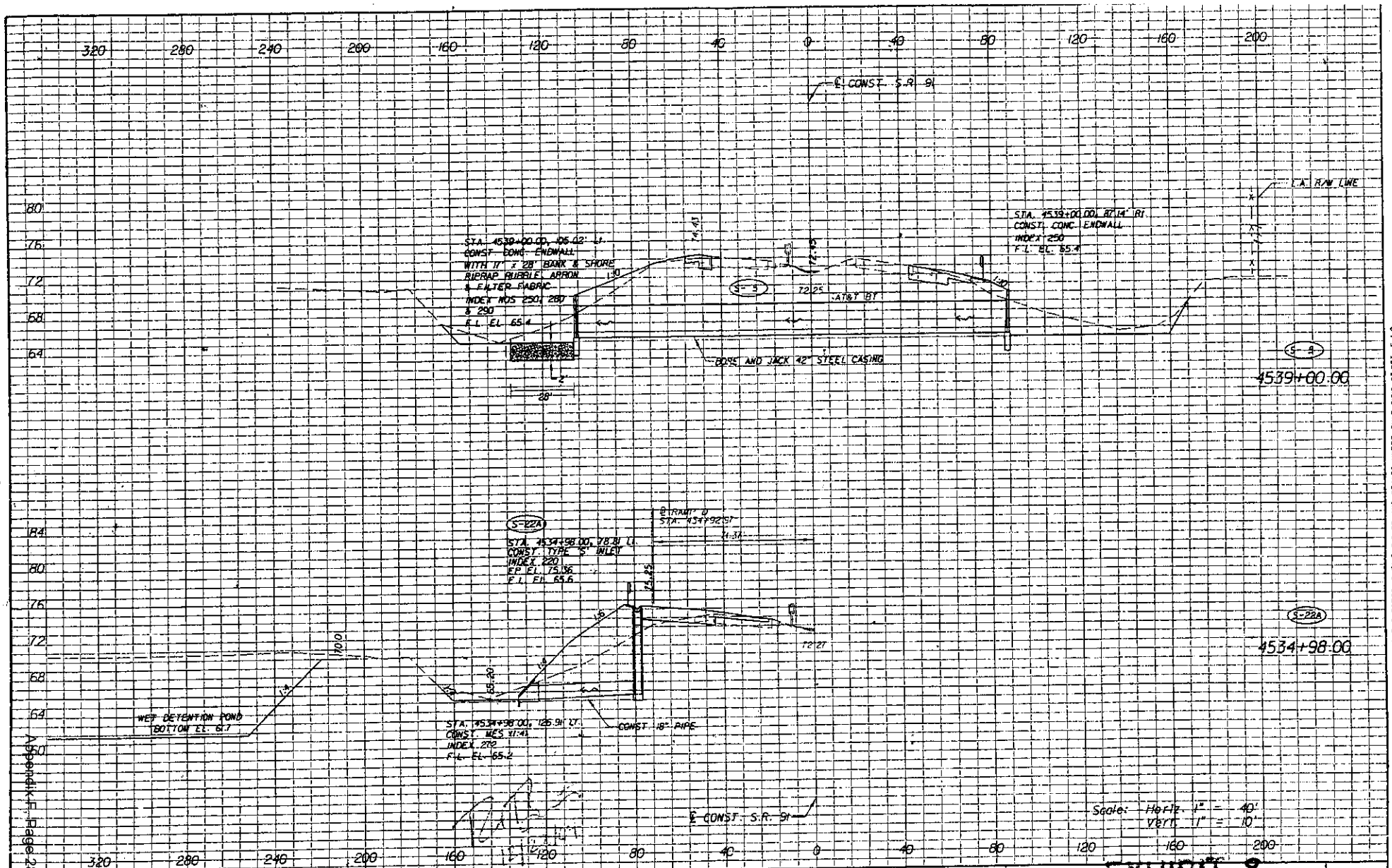

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number : 7862
Robert Butterfield, P.E., License No. 44637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID.
S.R. 91	OSCEOLA	411237-1-52-01

EXHIBIT 8

DRAINAGE STRUCTURES
FLORIDA'S TURNPIKE

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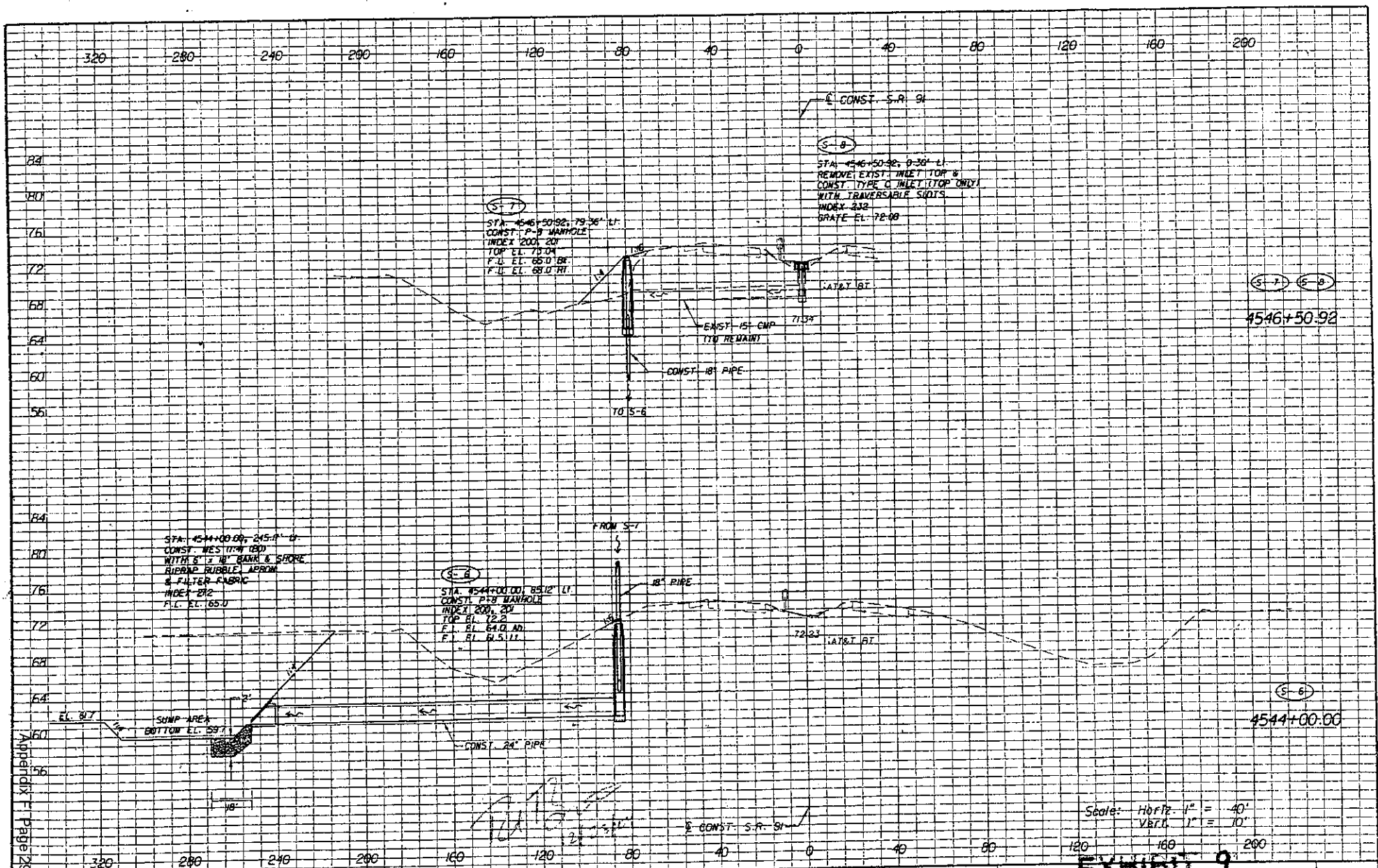

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number : 7802
Robert Butterfield, P.E., License No. 44837

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

Exhibit 9

DRAINAGE STRUCTURES
FLORIDA'S TURNPIKE

SHEET NO. 41

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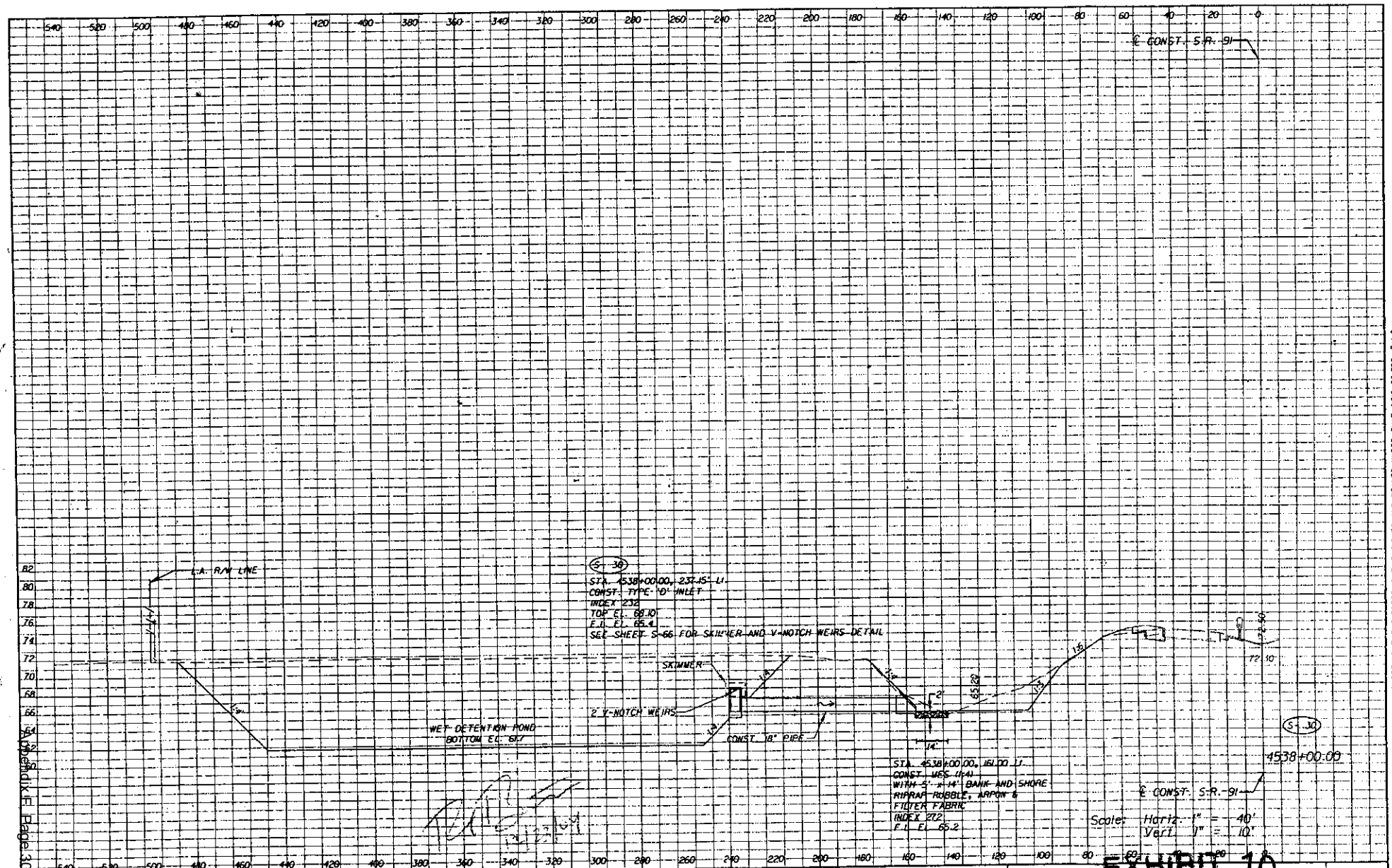

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number : 7862
Robert Butterfield, P.E., License No. 44637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

EXHIBIT 10

DRAINAGE STRUCTURES
FLORIDA'S TURNPIKE

SHEET NO. 53

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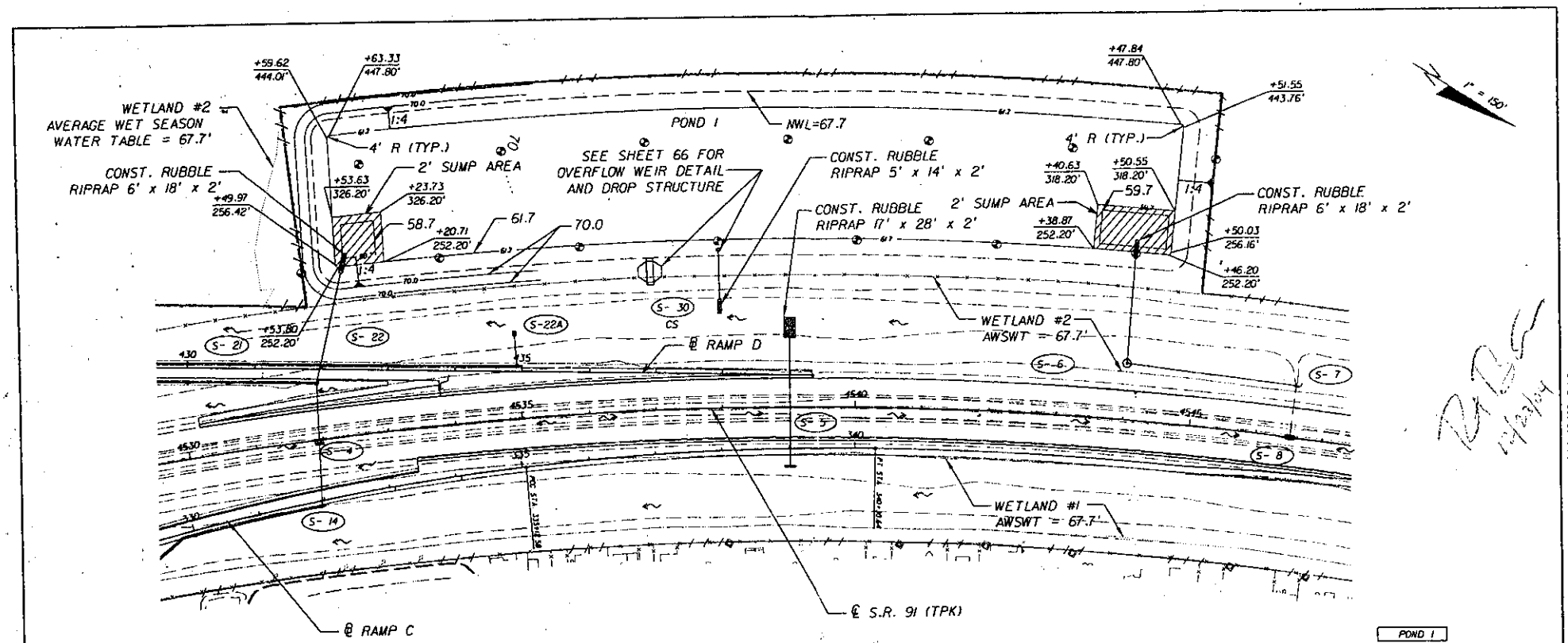

EXHIBIT 11

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number : 7662
Robert G. Butterfield, P.E., License No. 44637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	OSCEOLA	411237-1-52-01

POND DETAILS

SHEET NO. 54

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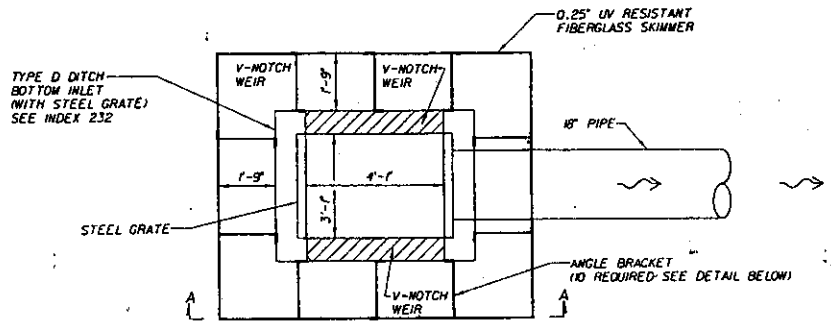
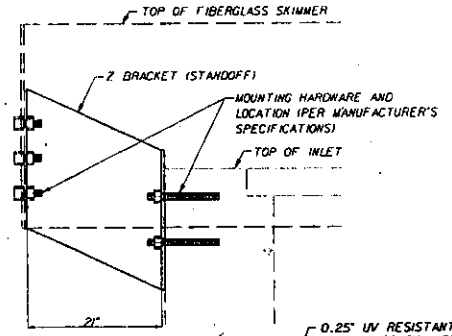
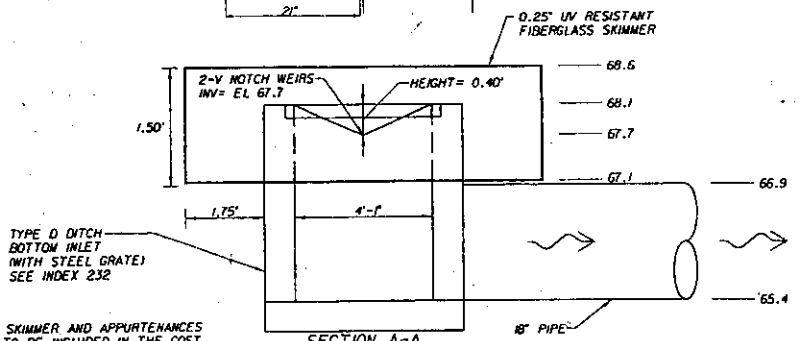
STRUCTURE S-30 SKIMMER DETAIL



PLAN VIEW
N.T.S.

ANGLE BRACKET DETAIL
N.T.S.

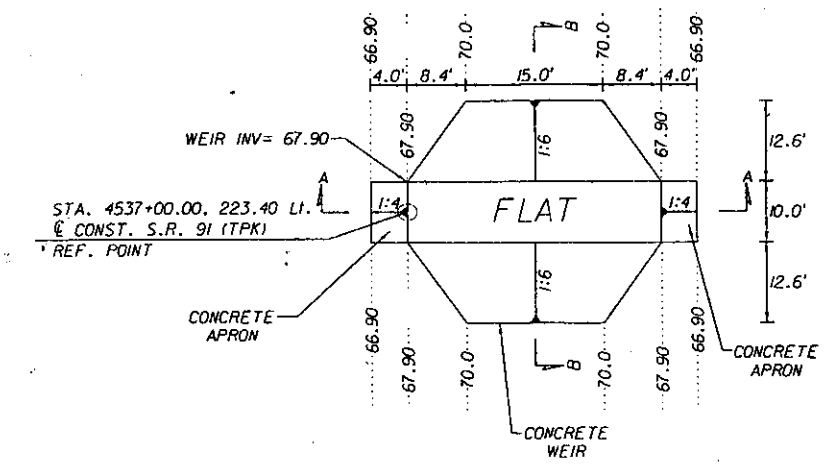




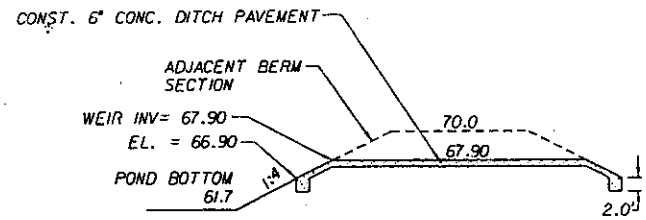
NOTE: SKIMMER AND APPURTENANCES TO BE INCLUDED IN THE COST OF THE INLET

SECTION A-A
N.T.S.

POND OVERFLOW WEIR



PLAN VIEW
N.T.S



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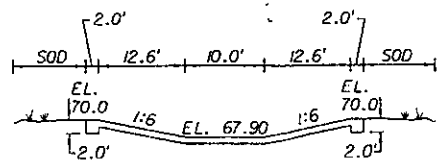

SECTION B-B
N.T.S

EXHIBIT 12

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3417
Certificate of Authorization Number : 7862
Robert Butterfield, P.E., License No. 44637

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	OSCEOLA	411237-1-52-01

DRAINAGE DETAILS

SHEET NO. 106

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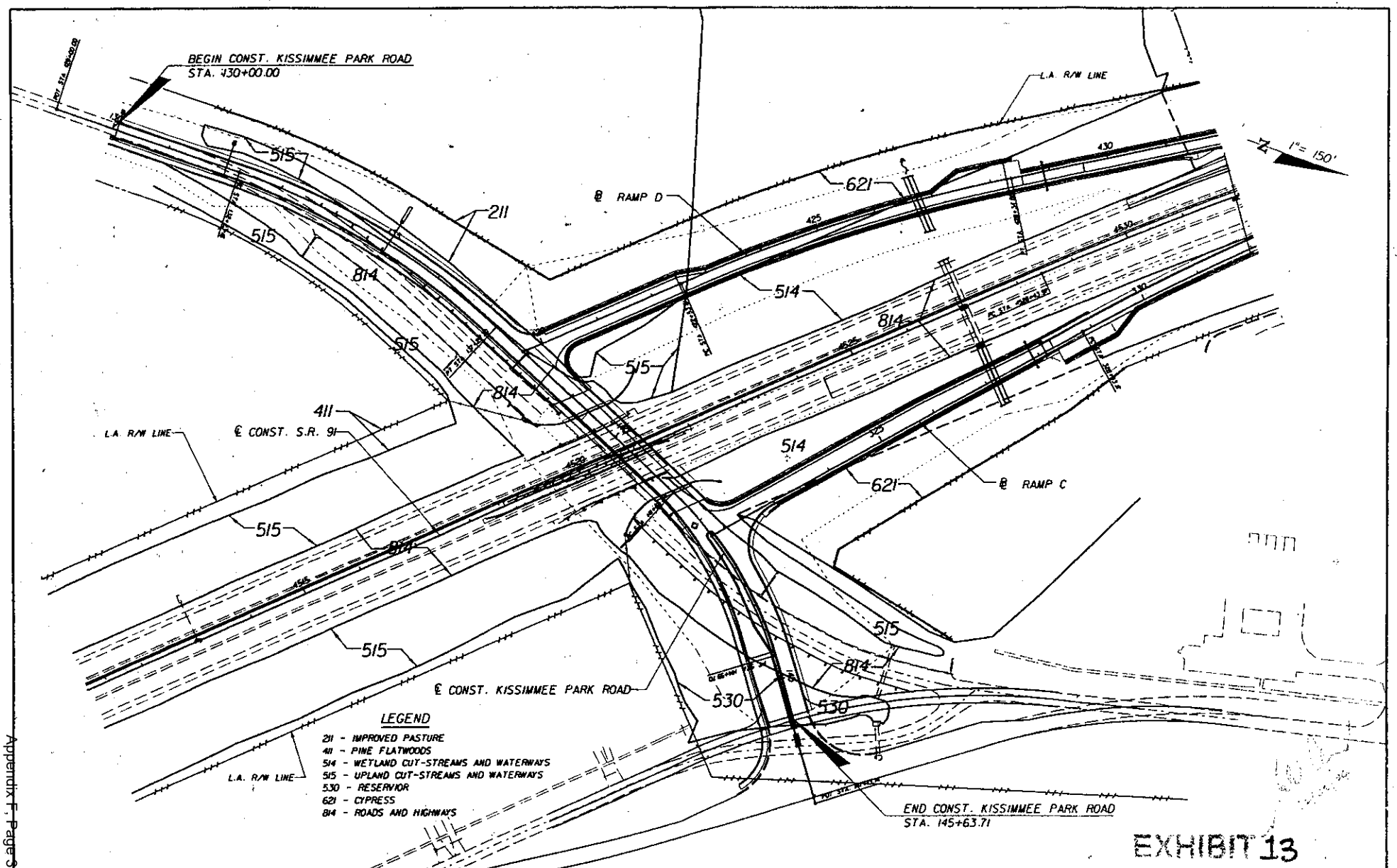


EXHIBIT 13

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE - ORLANDO, FLORIDA 32801
FBPR CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN E. SAUDSCH P.E. NO. 41062

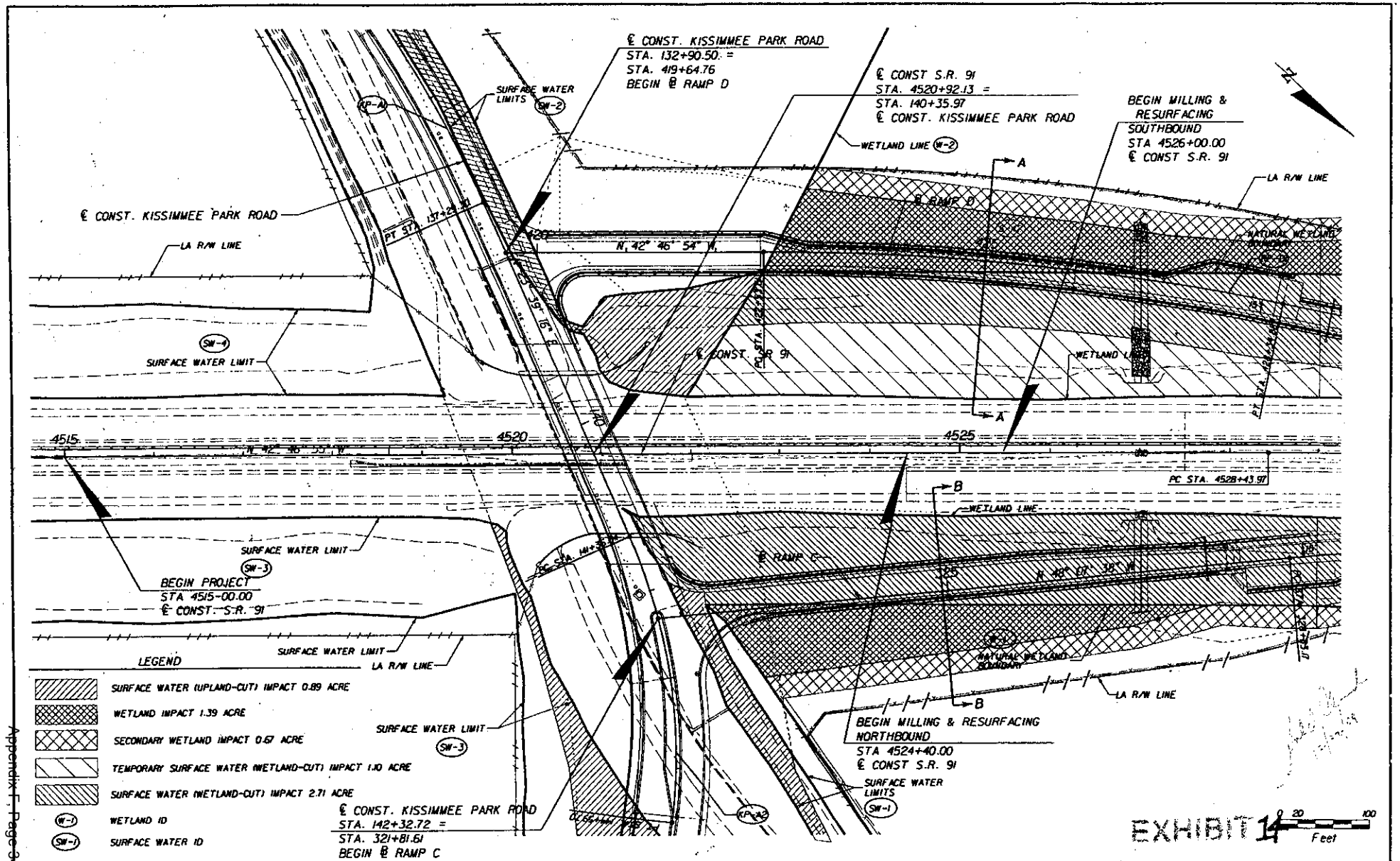
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

WETLAND SKETCHES
FLUCFCS MAP

SHEET NO. 116

USER: MARILYN HARTMAN 8/29/2004 03:58:12 PM E:\Transportation Jobs\411237\wetsketches29.dgn



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE - ORLANDO, FLORIDA 32801
FBPR CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN E. KNUDSEN P.E. NO. 141062

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

WETLAND SKETCHES
FLORIDA'S TURNPIKE

SHEET NO. 118

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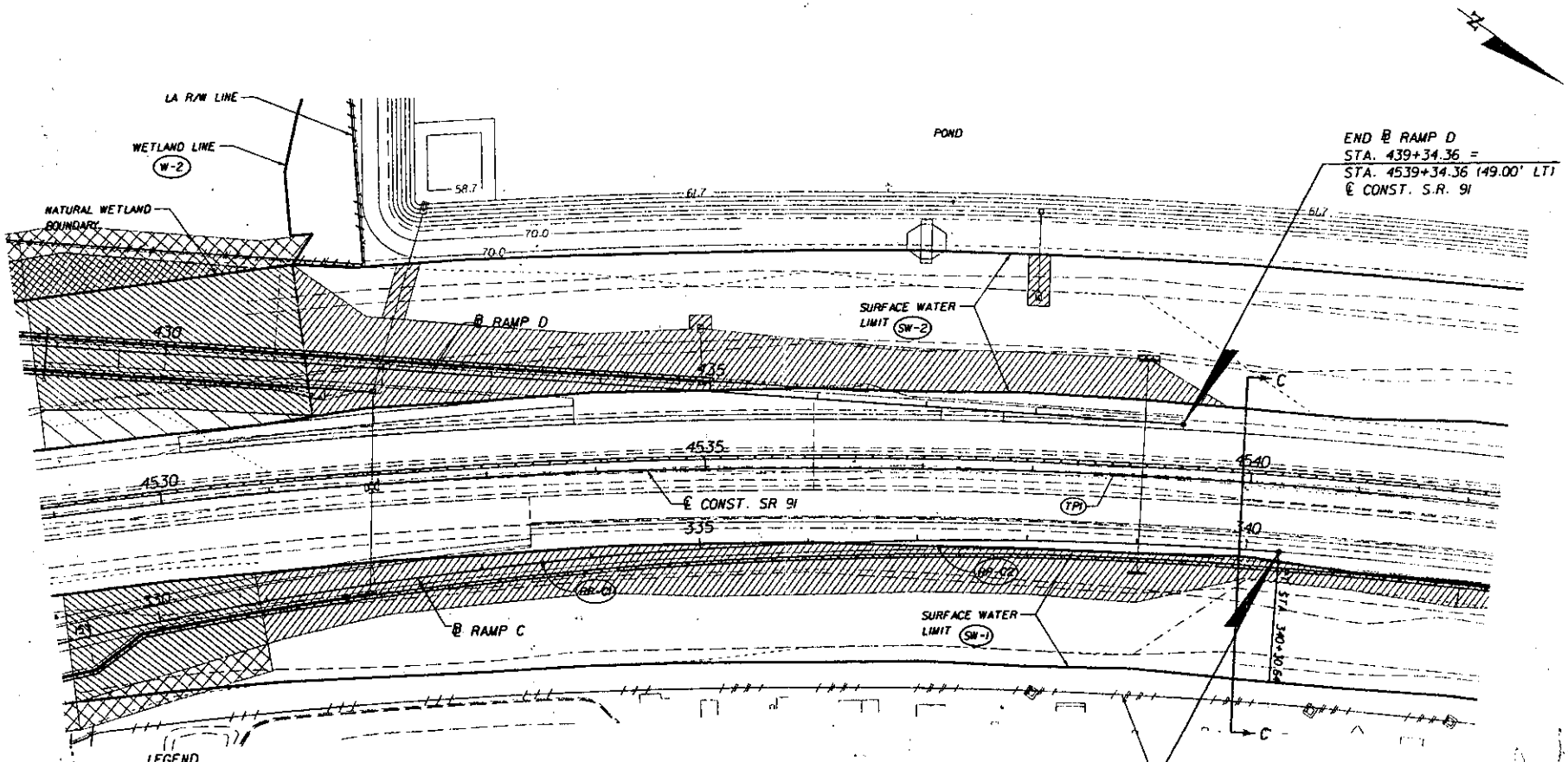

LEGEND

- SURFACE WATER (UPLAND-CUT) IMPACT 2.07 ACRE
- WETLAND IMPACTS 0.11 AC
- SECONDARY WETLAND IMPACTS 0.25 AC
- SURFACE WATER (WETLAND-CUT) IMPACT 1.02 ACRE
- TEMPORARY SURFACE WATER IMPACT 0.19 ACRE
- W-1 WETLAND ID
- SW-1 SURFACE WATER ID

EXHIBIT 15

0 20 100 Feet

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE - ORLANDO, FLORIDA 32801
FBPR CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN E. KNUDSEN P.E. NO. 41062

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

WETLAND SKETCHES
FLORIDA'S TURNPIKE

SHEET NO. 119

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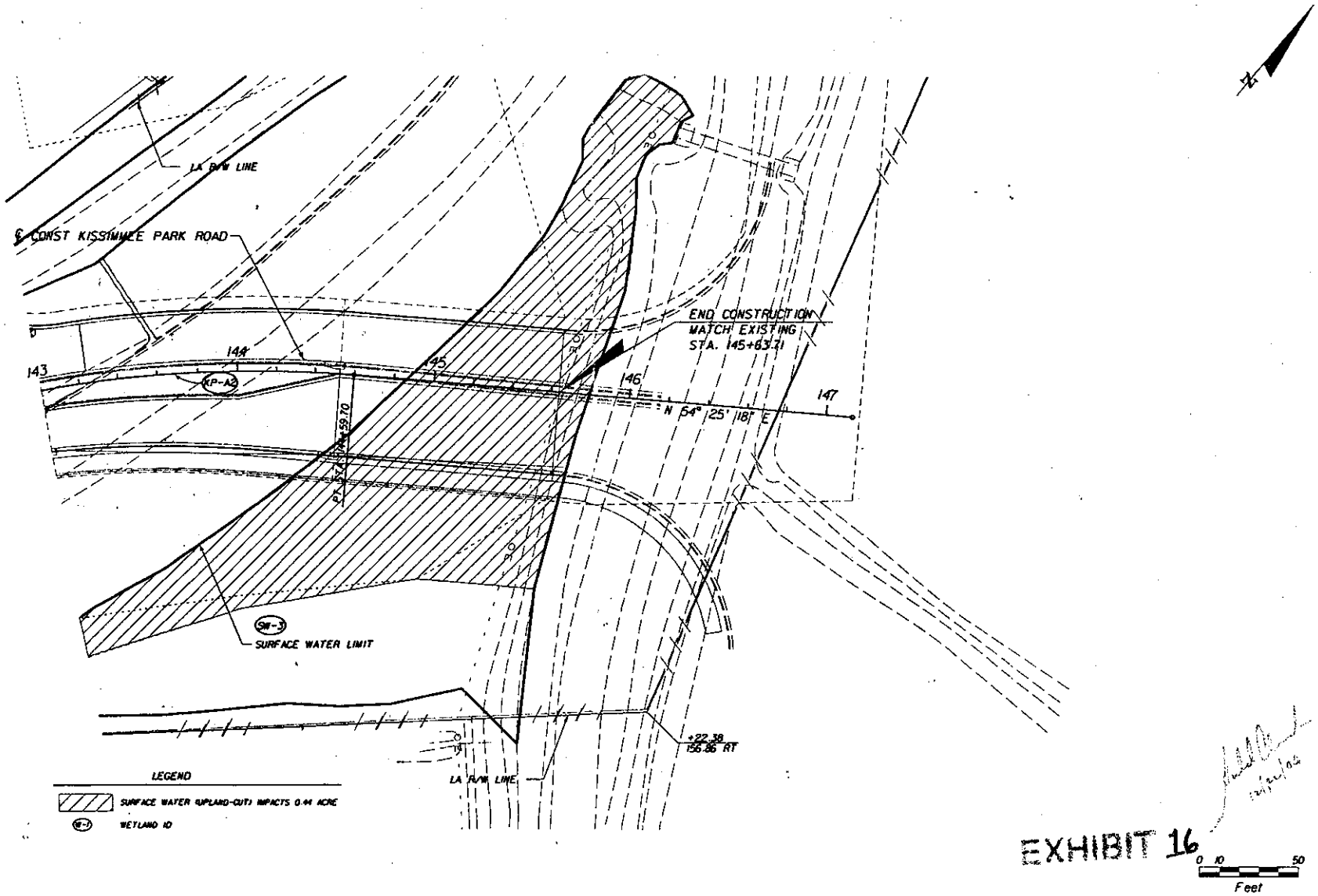

EXHIBIT 16

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE - ORLANDO, FLORIDA 32801
FBPR CERTIFICATE OF AUTHORIZATION NO. 1224
ENGINEER OF RECORD: KEVIN E. MAUDSEN P.E. NO. 41062

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

WETLAND SKETCHES
KISSIMMEE PARK ROAD

SHEET NO. 122

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South Florida Water Management District

Work Schedule Requirements

Application No : 041008-30

Mitigation Plan ID: KISSIMMEE PARK RD/TU

Activity	Due Date
SUBMITTAL OF MITIGATION BANK DOCUMENTATION	11-MAY-2005

EXHIBIT 17 A

Exhibit No :

Reedy Creek
MITIGATION BANK

March 2, 2005

Mr. Fred Gaines
FDOT Turnpike Enterprise
Milepost 263.0, Florida's Turnpike
Building 5315
Ocoee, Florida 34761-3069

VIA Facsimile: 407-822-5821

Subject: **Reservation of Credits for Kissimmee Park Road Interchange**
SFWMD # 041008-30
USACOE # To Be Determined
Osceola County, Florida
RCMB # F&S 093

Dear Mr. Gaines:

I am writing in reference to the Florida Turnpike Enterprise's need for mitigation credits for the above referenced project. This letter confirms that Reedy Creek Mitigation Bank under SFWMD permit number 53-0002-M; and U.S. Army Corps federal permit number 199507852 (IP-ME) has 8.6 Freshwater, Forested State and Federal wetland credits reserved for the above referenced project, in Osceola County.

Once the permit has been issued and final payment has been received we will apply for transfer of the credits from Reedy Creek Mitigation Bank to the project's permit number.

Please contact me if you have any questions or need additional information.

Sincerely,

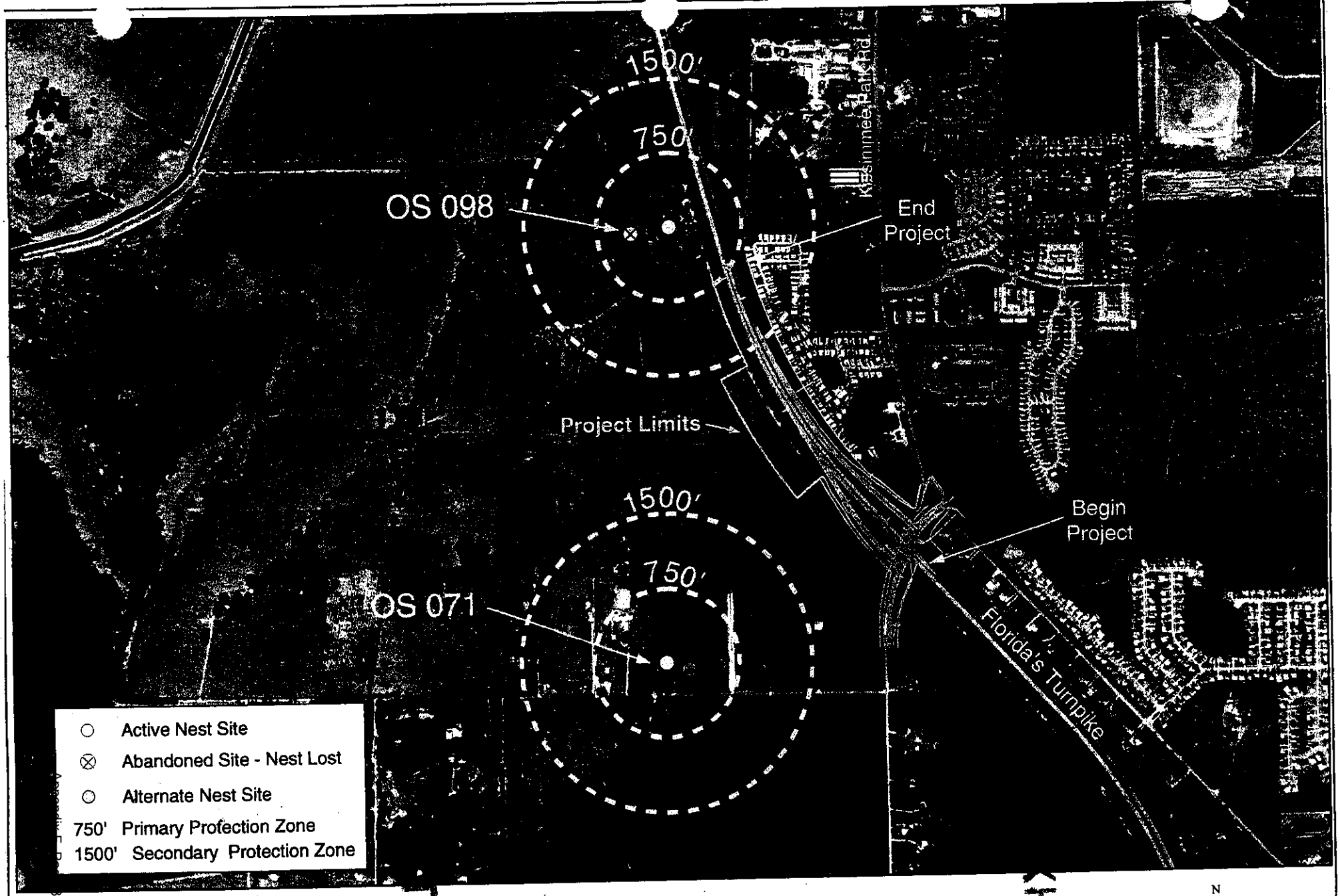
Kathy Odom

Kathy Odom

C: **Susan Elfers VIA Facsimile 407-858-6121**
Lidia Cartaya
Renate Kauppert

634 EAST HIGHWAY 50, SUITE 336, CLERMONT FLORIDA 34711 • 407-719-3194 • FAX 407-650-3340

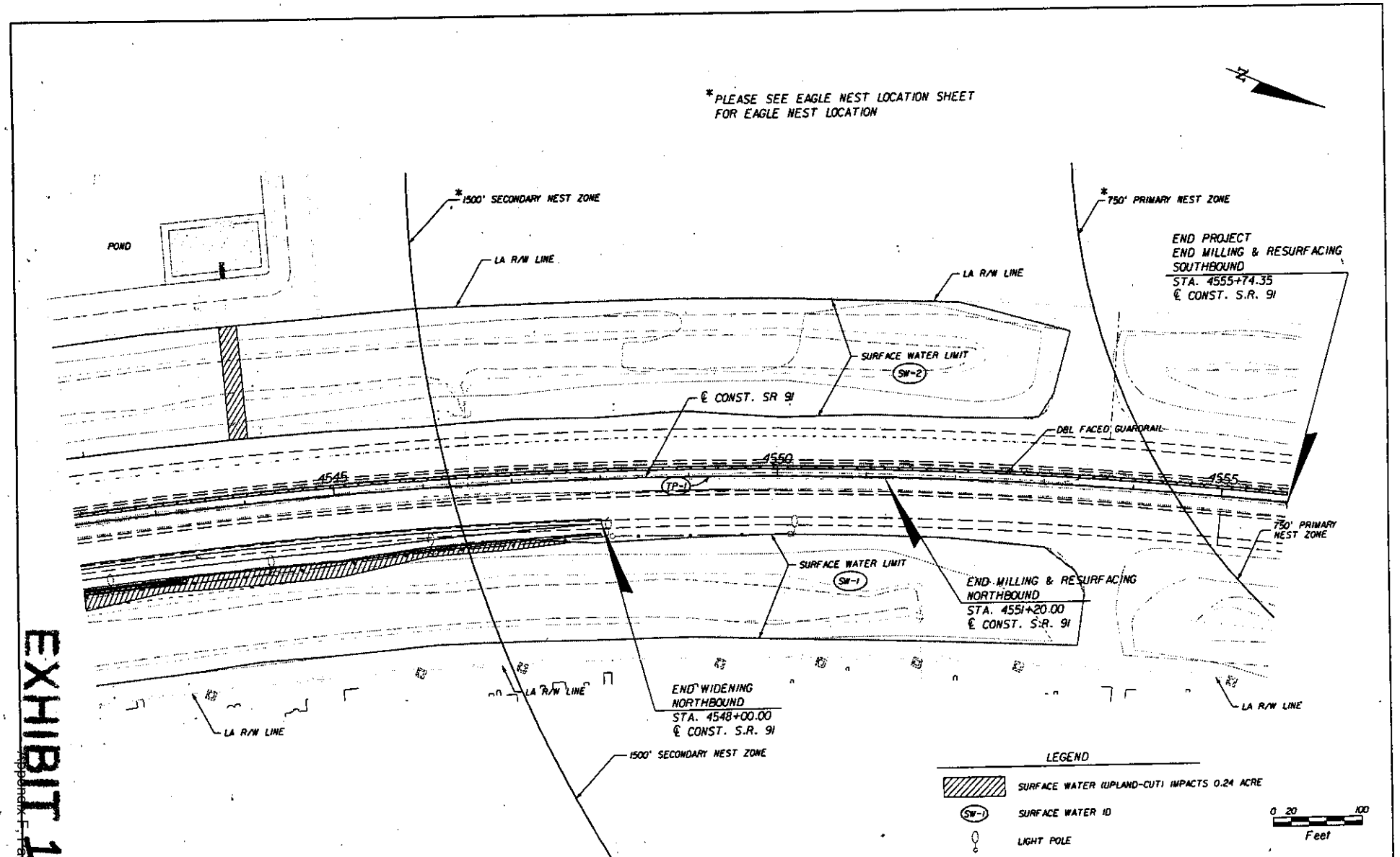
EXHIBIT 17B



BOWYER SINGLETON & ASSOCIATES, INCORPORATED
ENGINEERING • PLANNING • SURVEYING • ENVIRONMENTAL
(407) 843-5120 www.bsaorl.com

Kissimmee Park Road Interchange
Osceola County, Florida
Eagle Nest Location Map
Exhibit 5

EXHIBIT 18



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE - ORLANDO, FLORIDA 32801
FBPR CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN C. GAUDSEN P.E. NO. 41063

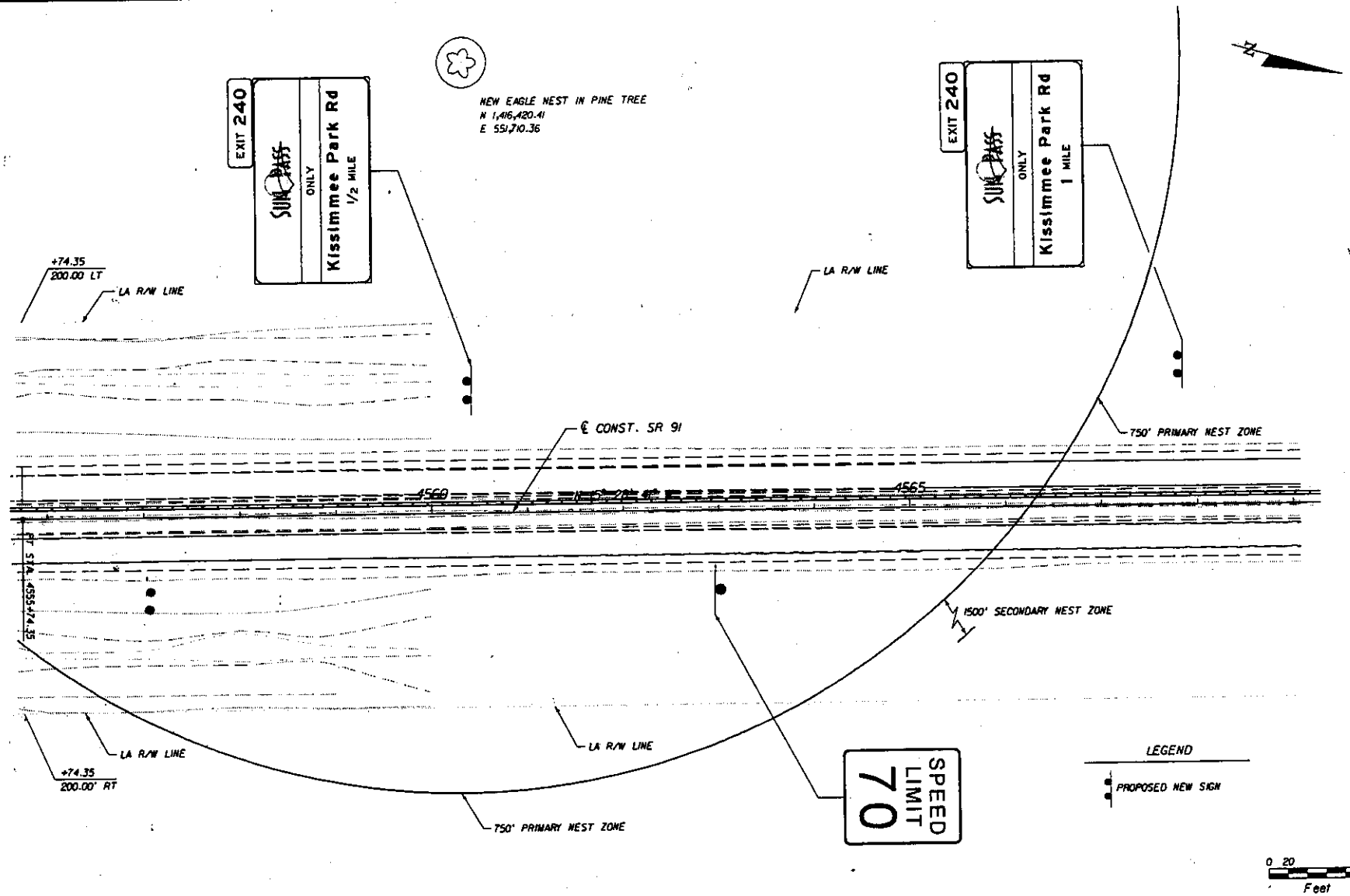
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

WETLAND SKETCHES
FLORIDA'S TURNPIKE

SHEET NO. 1

EXHIBIT 19
Appendix F, Page 40 of 95



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

BOWYER-SINGLETON & ASSOCIATES, INCORPORATED
520 S. MAGNOLIA AVENUE · ORLANDO, FLORIDA 32801
FBPE CERTIFICATE OF AUTHORIZATION NO. 1221
ENGINEER OF RECORD: KEVIN C. KNUDSEN, P.E. NO. 41062

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	OSCEOLA	411237-1-52-01

EAGLE NEST LOCATION
FLORIDA'S TURNPIKE

SHEET NO. 2

EXHIBIT 20

BALD EAGLE MONITORING GUIDELINES

Prepared For

United States Fish and Wildlife Service

September 2002

EXHIBIT 21 A

PREFACE

These monitoring guidelines are published and issued by the U.S. Fish and Wildlife Service=s Jacksonville, Panama City and Vero Beach Field Offices in Florida. A number of Federal and State laws and/or regulations prohibit, cumulatively, such acts as harassing, harming, disturbing, molesting, pursuing, etc. bald eagles, or destroying their nests. The purpose of these guidelines is to provide agency personnel and others in Florida a scientific standard for documenting and evaluating bald eagle response to human development activities, which may indicate an alteration of otherwise normal nesting behavior and which may lead to nest abandonment and/or death. These guidelines are supplemental to the *Habitat Management Guidelines for the Bald Eagle in the Southeast Region*, and similarly are advisory in nature. The monitoring guidelines do not replace the habitat management guidelines.

The development of this document is a collaborative effort by Federal, State and private biologists who have extensive experience in the research and management of bald eagles in the Southeastern United States. J. Steve Godley[1] prepared the initial draft and all attachments, while Tom H. Logan[2] served as editor and coordinator of technical and editorial reviews of subsequent drafts. Stephen A. Nesbitt[2], John H. White[2], Don Palmer[3], Candace Martino[3], Annie Dziergowski[3], Jeff Weller[3] and Linda Ferrell[3], provided technical and editorial comments that were invaluable to the completion and technical quality of these guidelines.

1 Biological Research Associates
2 Florida Fish and Wildlife Conservation Commission
3 U.S. Fish and Wildlife Service

EXHIBIT 21B

BALD EAGLE MONITORING GUIDELINES

A. Introduction:

Approximately 10 percent of Florida's 1,133 known occupied bald eagle territories (Nesbitt et al. 2002) occur in suburban settings, defined as nests with > 50 percent of the natural habitat within 1, 500 feet of the nest tree having been altered by some form of human development (Millsap et al. 2001, Nesbitt personal communications). Eagles in these settings either continue to nest, or sometimes establish new nests at other sites that are in proximity to human development (Millsap et al. 2001). No significant differences in territory occupancy, nesting success (occupied territories that fledge young) or productivity (number of young fledged), have been detected between eagle pairs nesting in these suburban versus more rural settings, so long as a 750-foot primary protection zone around the nest tree has been maintained in an undisturbed (i.e., current) state (Nesbitt et al. 1993, Millsap et al. 2001). However, the tolerance of individual eagle pairs to human disturbance, defined as a change in eagle behavior that is induced by any human activity (Fraser 1985) or habitat alteration, may vary widely. Accordingly, the U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC) typically require biological monitoring of the nesting territory if new human development, specifically residential and/or commercial construction, is proposed to occur within 1,500 feet of the nest tree and during the nesting season (October 1 - May 15, USFWS 1987).

These bald eagle monitoring guidelines have been developed to provide agency personnel and others a scientific standard for evaluating eagle responses to human development activities, which may indicate an alteration of otherwise normal nesting behavior. The monitoring guidelines (1) identify specific behavioral responses of adult and young eagles that may warrant cessation of development activities, (2) quantifies development activities which may indicate that harm or harassment of eagles has occurred, such that otherwise normal behavior has been altered, (3) proposes the type and level of monitoring necessary to detect a change in normal behavior and (4) develops a procedure for reporting the observations to the USFWS/FWC and for halting or modifying construction activities, if necessary.

The probability that a pair of bald eagles will abandon their nest increases with the intensity and proximity of development activities to their nest, and decreases with the time and energy the adult eagles have invested in the eggs or young and to what extent the adult birds may habituate to human activities. This is based upon the ecological parental investment theory (e.g., Trivers 1972, Wilson 1975, Dawkins 1977) and practical experience gained from observing bald eagle/human interactions over the past two decades in Florida (e.g., Wood 1992, Nesbitt et al. 1993, Wood and Collopy 1995, Millsap et al. 2001). Accordingly, the intensity of monitoring and concern for abandonment to occur is highest prior to egg laying, the closer and more intense development activities occur to the nest tree and for nesting territories in more rural environments.

All infrastructure development within 1,500 feet of the nest tree should, as a general rule, be completed during the non-nesting season (USFWS 1987). Infrastructure construction includes all land and lot clearing; fill work; construction of roads, drainage, sewer and storm water facilities; and installation of water, electricity and other utilities. However, it often is not possible to complete construction of infrastructure, individual residential homes or commercial developments during the non-nesting season. The purpose of these guidelines is to address those circumstances.

EXHIBIT 21C

B. Monitoring Requirements:

Biologists formally educated in wildlife ecology and well experienced in recognizing specific patterns and changes of eagle behavior and capable of recording those observations in a scientific manner must conduct all monitoring. Continuity of monitoring, data collection and reporting is best maintained if one person conducts all monitoring for a specific project site. Close coordination is essential if more than one monitor is required. Monitoring should be conducted from a location that provides a clear vantage point of the nest and the surroundings (including construction activities), yet far enough from the nest (e.g., > 750 feet where possible) to not cause disturbance to the eagles. Monitoring from closer locations could cause disturbance and should be avoided. Conducting the monitoring from inside a parked vehicle or from a portable blind can further minimize observer disturbance. Monitoring should be conducted using both binoculars and a high-powered spotting scope during periods when construction is occurring during the nesting season (generally October 1 – May 15) and within 1,500 feet of the nest tree.

The purpose of monitoring is to detect any abnormal behavior of the adult eagles or their chicks that may be elicited in response to development activities occurring within 1,500 feet of the nest tree and that potentially could result in abandonment of the nest and/or territory. We recommend that procedures be established for suspension of work activities which may be responsible for such abnormal behavior and that any such suspension be reported immediately to the USFWS (appropriate Field Office) and FWC (Endangered Species Coordinator) for consultation regarding appropriate actions to halt or modify any activities which potentially may increase risk to nesting eagles. Nesting behavior and response of individual eagle pairs to human activities may vary, but nesting chronology and otherwise normal behavior are relatively fixed and predictable. Buehler (2000) and references cited therein provides an excellent summary of the biology and nesting behavior of bald eagles.

Monitoring should begin no later than October 1 and continue through fledging, if construction is anticipated or planned to occur within 1,500 feet of the nest tree and during the nesting season. Fledging is considered to have occurred at that age when young of the year have achieved the ability to sustain flight (see Section C.2 for details).

- Initial monitoring of eagles on nesting territories should be conducted a minimum of one day per-week for four hours each day starting ½ hour before sunrise to document when eagles return to the territory and resume nesting behavior (i.e., nest reconstruction or construction). Some birds may initially return to the territory during afternoons. This may be detected by including some afternoon monitoring and/or checking under nest trees for droppings or other evidence of presence during mid-day.

- Nesting eagles should be monitored a minimum of three days each week and four hours each day (beginning at 1/2 hour before sunrise) from onset of nesting behavior through four weeks post-hatching.

- Monitoring frequency may be reduced to one day each week (four hours beginning 1/2 hour before sunrise) begining five weeks post-hatching and continue until fledging occurs or May 15, whichever occurs first.

- Additional monitoring may be appropriate should special circumstances arise (see Section C.6 for details).

- The monitoring and construction plans for any nesting territory may be re-evaluated for modifications during any year, if eagles have not been observed using the territory by February 1 of that year or if great horned owls (*Bubo virginianus*) have assumed occupancy of the nest.

EXHIBIT 21D

- Single-family homes typically require a minimum of 5 months for completion of construction, and all major stages of construction (described below), except truss placement, occur over multiple days. Monitoring should be timed to include truss placement.

- The monitor should use a site plan of the project to prepare weekly maps on which to document the specific construction activities that are occurring within 1,500 feet of the nest tree. Recorded construction activities should include, but not be limited to, the stage of construction of each home (i.e., fill placement, slab pouring, sidewall construction, truss placement, roofing, external finish work, internal finish work and landscaping).

- All observations of construction and eagle behavior must be recorded using the attached data sheet (Figure 1).

The following nest cycle activities must be documented and monitored for comparison with normal nesting behavior (see Section C for details) and for detecting and evaluating behavior that may be indicative of disturbance and/or pending risk:

1. Temporal patterns of nest attendance by the adults.
2. Observations of courtship, mating and nest building/maintenance.
3. Incubation and brooding behavior.
4. Feeding, growth and care of the eaglet(s).
5. Flight patterns to and from the nest tree.
6. Fledging of the eaglet(s).

All behavioral data and construction activities must be recorded within 15 minute intervals to facilitate analysis as a basis for detecting and evaluating behavior which may indicate pending risk. Figure 2 summarizes the typical nesting chronology of bald eagles in Florida. Please note that egg laying typically occurs during mid-December in Florida, but may vary by year, pair and latitude, and can extend from October through April, with most late nesters likely representing second breeding attempts (Buehler 2000). Figure 3 provides a typical pattern of nest attendance and phenology of a pair of eagles in Sarasota County, Florida, monitored over a three-year period during one 4-hour observation period each week from October through May.

Nesting behavior which may be interpreted as abnormal, a response to construction activities and/or indicative of pending risk may include, but not be limited to: 1) adults raising or standing up over the nest, 2) increased time spent away from the nest by the adults that is not associated with normal nesting phenology, 3) changes in flight patterns or perch tree use, 4) distress calls, 5) flushing behavior from the nest tree or perch trees, 6) changes in the feeding schedule of the eaglet(s) and 7) premature fledging of the eaglet(s). Descriptions of specific behaviors that would warrant concern and may be indicative of pending risk are described below. Please note that many such behaviors occasionally result from factors other than human disturbance, such as death of an adult, sterility or immaturity (i.e., one member of the pair not in definitive plumage), entrance of a foreign adult eagle or great horned owls into the territory, inadequate food supply for the number of eaglets present, etc. Therefore, it is very important that observations of any abnormal behavior be reported immediately to assure proper interpretation and appropriate courses of action (see Section D for details).

EXHIBIT 21E

C. Definitions of Human Disturbance:

1. Adults Raising or Standing Up Over the Nest

Eagles often assume an alert posture in response to a disturbance event. This behavior also may be accompanied by distress calls and ultimately result in flushing behavior (Fraser et al. 1985, Buehler et al. 1991, McGerigal et al. 1991). Incubating adults may react to a disturbance by rising from their incubation posture and standing over their eggs. They also may step off the eggs and stand on the side of the nest. They may or may not vocalize in conjunction with this behavior. Such standing behavior may be seen prior to flying and as an indication that the bird may flush from the nest in response to a disturbance. The bird also may settle back down into incubation posture without flying, once the disturbance has passed or the bird has decided the disturbance is not a sufficient threat to warrant flushing from the nest. This behavior (whether the adult flushes or not) does indicate that the disturbance is great enough to interfere with normal behavior and is of concern. This posture could be confused with stretching or egg turning which are normal parts of incubation behavior. It will be the responsibility of the monitoring biologist to accurately judge whether a bird is exhibiting normal behavior or is reacting to disturbance.

2. Increased Time Spent Away From the Nest Tree

Figure 3 provides a representative example of normal baseline nest attendance by at least one adult eagle during the nesting season. Please note that attendance may be sporadic early in the nesting season, but increases dramatically immediately prior to egg-laying. At least one adult is present almost 100% of the time during the 35-day incubation period and the first 2-3 weeks post-hatching (Fraser 1981, Wallin 1982). Females average about 1/5 larger in size than males, and the sexes are distinguishable when the pair is together. The female does the majority of the incubation and early nestling attendance, although the male participates in both activities. One adult (usually female) broods constantly during inclement (i.e., cool or rainy) weather, and will shade the young to avoid heat stress until a chick(s) is approximately 4 weeks of age (Jenkins 1989, Herrick 1924). Nest attendance declines sharply after 5-6 weeks, and the adults often roost and loaf away from the nest.

Nest attendance would be considered abnormal if: 1) at least one adult is not present during two consecutive, 4-hour (minimum) monitoring days prior to egg laying or 2) both adults are absent for more than two consecutive 15-minute periods during incubation, early brooding or inclement weather prior to 4 weeks post-hatch.

3. Changes in Flight Patterns

Florida eagles generally nest in proximity to water, and flight paths to and from the nest often are relatively direct to their feeding areas. Flight information should include recording the direction of each flight to and from the nest in the eight cardinal directions. Simple chi-square or other non-parametric statistics can be used to test if flight patterns are random, directed towards foraging areas or away from on-going construction.

4. Distress Calls

Verner and Lehman (1982) describe three distinctive calls of nesting birds that are typical responses to human approaches: 1) a "chatter call" described as consisting of 3-4 introductory notes separated by short gasps of silence (<1s) followed by a rapid sequence of descending notes, usually 6-9 notes in sequence (*kwit kwit kwit kwit kee-*

EXHIBIT 21F

kee-kee-kee-kee), 2) a "peal" consisting of a high-pitched, prolonged, gull-like cry, often repeated 3-5 times and 3) a "wails" call that is seldom given (Beuhler 2000) . Variants of these calls may also be given in response to an intruding adult eagle or other raptors, such as great horned owls, and the chatter call also is often given upon approach to the nest tree by a member of the pair, independent of human disturbance.

Any distress call must be investigated to determine cause, and any construction or associated human activity that may be responsible for the distress call, must be halted or modified immediately.

5. Flushing Behavior

Adult eagles may flush from the nest tree, particularly if humans are on foot (Fraser et al. 1985, Beuhler et al. 1991, Grubb and King 1991, McGarigal et al. 1991, Grubb et al. 1992). Risk increases with the duration and frequency of events. The sensitivity of eagles to human disturbance varies between individuals and across populations, as measured by experimental flushing studies (e.g., Stalmaster and Newman 1978, Knight and Knight 1984, Fraser et al. 1985, Buehler et al. 1991, McGarigal et al. 1991). Unfortunately, no similar studies have been conducted in Florida. The response of individual eagles may range from temporary agitation (alert posture) to flushing from the nest or perch tree, to permanent displacement. Humans in vehicles generally elicit a much lower response than those on foot. Additionally, eagles that nest in proximity to existing human activities may habituate and be more tolerant to forms of human activity than they may have previously experienced.

Flushing behavior is more typically in response to human approach to the nest on foot; therefore, it is imperative that the monitor attempt to stop all such approaches. Any construction activities that appear to have caused flushing should be halted immediately.

6. Changes in Feeding Schedule of the Eaglet(s)

Although both sexes secure food and feed the young, the male provides most of the food in the first two weeks, while the female tends the young in the nest (Wallen 1982, Gerrard and Bortolotti 1988). The female often delivers as much prey as the male after 3-4 weeks. Adults typically bring the food to the nest and tear off small pieces to feed the young. Eaglets are able to tear off food and feed themselves at approximately 6 weeks of age, although the adults often dismember larger prey (Palmer et al. 1988). Adults typically deliver food 2-8 times per day (mean = 4), and the early morning period accounts for proportionately more food deliveries (Herrick 1924). Food delivery rates also typically decrease as eaglets mature and or eaglet numbers decline with normal attrition. Therefore, deliveries may not be observed during some monitoring periods for older broods. Additional monitoring may be appropriate, should this phenomenon be observed in conjunction with other behavioral indicators of stress. The nutritional requirements of eaglets have not been reported in the literature (Buehler 2000), but free ranging adult bald eagles in Washington at 5°C need to consume about 77.3 g/kg per day (425.5 kJ/kg per day), slightly less than 10% of their body weight per day (Stalmaster and Gessaman 1984). Nestlings may use food that accumulates at the nest for more than one day, unless fresh food is provided (Herrick 1993). Both adults and chicks are capable of storing food in their crop, then digesting the food over time.

Mean brood size for successful nests in Florida bald eagles is 1.55 young per brood, with 3 young not uncommon (Nesbitt et al. 2002). One egg is laid per day, although often not always on successive days. Hatching is asynchronous and differential growth between the sexes can lead to differential mass among siblings, facilitating competition and fratricide (Bortollotti 1986). Sibling competition and mortality is greatest early in the nestling period, when size differences are greatest. The largest chick typically gets the majority of food in clutches with more

EXHIBIT 21G

than one chick. Brood reduction from starvation of the youngest chick may occur in broods of any size, unless food is abundant (Gerrard and Bortollotti 1988).

It is important to quantify, to the extent possible, the size and type of prey brought to the nest during all observation periods. These data may be useful for determining if the eaglet(s) is receiving adequate food and if construction may be interfering with food delivery schedules.

7. Premature Fledging of the Eaglet(s)

Eaglets typically fledge at approximately 11 weeks of age in Florida (Wood 1992), but nest departure can occur at 8-14 weeks (Buehler 2000). The eaglets usually begin to move about the nest and branches of the nest tree at least 2 weeks before fledging, flapping and developing muscle strength, flight coordination and landing ability in preparation for their first flight from the nest tree. These eaglets are referred to as "branchers." Fledging typically is considered to have occurred when the eaglets have begun to make extended flights from the nest to adjacent trees, have begun to soar and/or are seen flying around the territory with the parents. It is not uncommon for up to half of initial nest departures to be unsuccessful, with the eaglet falling to and remaining on the ground for days or weeks before regaining flight ability; in most cases, the parents will continue to feed these young (Kussman 1977, Fraser 1981). Successful fledging, for purposes of these guidelines, is defined as the time at which the eaglet(s) has near fully developed primaries; is capable of strong, coordinated, independent flight; and would not glide to the ground if flushed.

Care must be taken to confirm that any premature fledging is, in fact, human related, since premature fledging is a common occurrence that may be independent of human activity.

D. Reporting Requirements:

The monitor will send monitoring reports by facsimile or e-mail to the USFWS (appropriate Field Office) and the FWC (Endangered Species Coordinator, Tallahassee) on a weekly basis when construction is occurring within 1,500 feet of the nest tree and during the nesting season. The monitor has the obligation to immediately report any suspension of work activities and/or any documented abnormal behavior, as defined in Section C above, to the USFWS and FWC and the developer/home builder. The USFWS and FWC will coordinate a review of the reported behavior and circumstances associated with any suspension of work activities to make a verbal determination whether construction should resume or be modified, or if monitoring frequency should be increased, followed up by a written recommendation.

EXHIBIT 21H

E. Literature Cited:

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FIGURE 1 - BALD EAGLE MONITORING DATA SHEET

Nest #: Start Time:

Date: End Time:

Tree Species[1]:		# Adult Present		# Young Present	

GENERAL ACTIVITY OBSERVED			
? COURTSHIP	? BREEDING	? NEST REPAIR	? ADULTS FEEDING YOUNG
? INCUBATION	? ADULT FEEDING	? BROODING	? TERRITORIAL DEFENSE

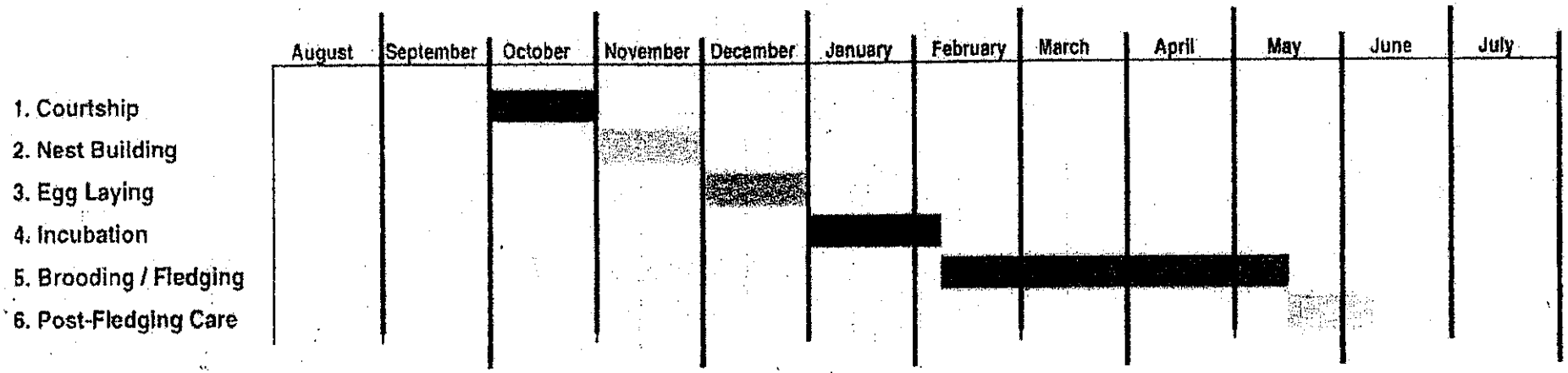
TIME	DETAILED OBSERVATION: (DRAW MAJOR TERRITORY FLIGHTS ON ATTACHED MAP WITH TIME)					
	Weather Conditions[2]	T:	W:	C:	P:	
	Weather Conditions[2]	T:	W:	C:	P:	
	Weather Conditions[2]	T:	W:	C:		

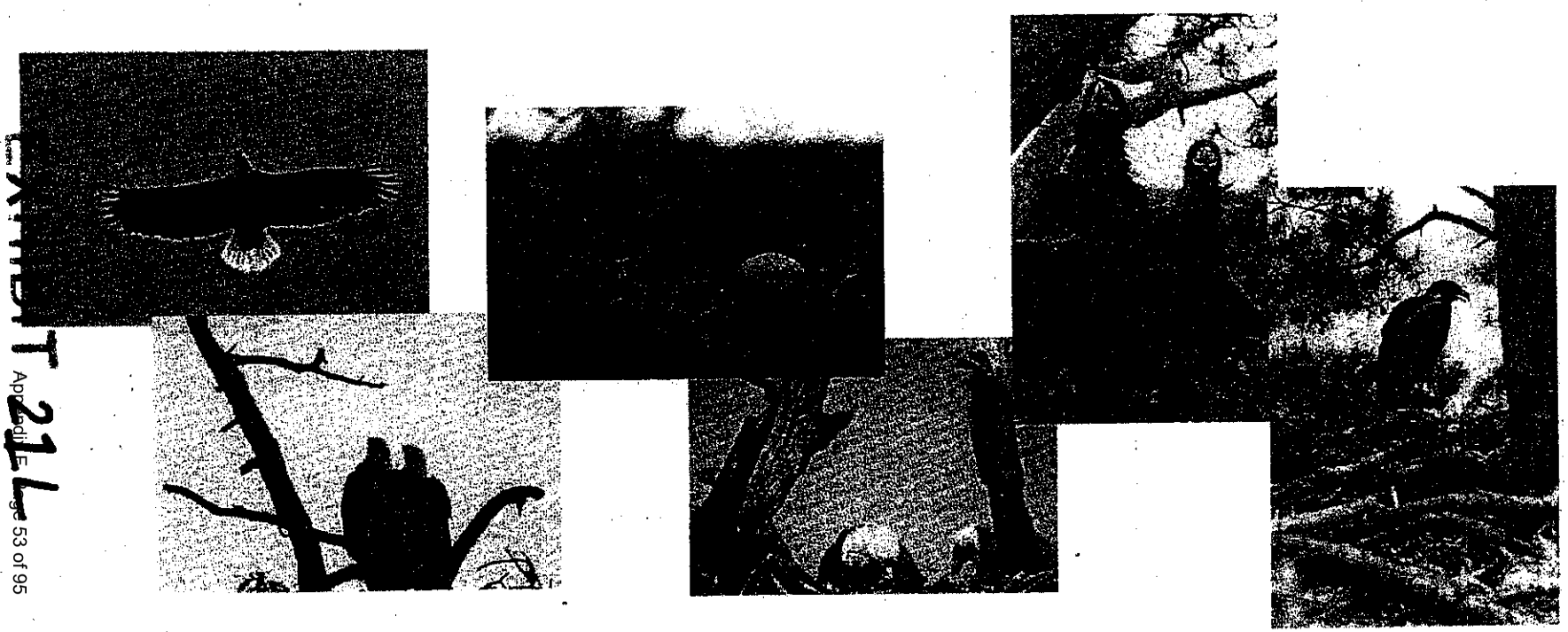
Construction Notes: (See attached Site Plan)
FP=Fill Placement
SP=Slab Pouring
SC=Sidewall Construction
TP=Truss Placement
R=Roofing
EW=External Finish Work
IW=Internal Finish Work
Infrastructure (describe in detail)

[1]Tree Species: L = live, D = Dead
[2]Weather Conditions:
T=Temperature (□F); W=Wind; C=Cloud Cover (%); P=Precipitation

Nesting Chronology of Bald Eagles in Florida (typical)

Figure 2



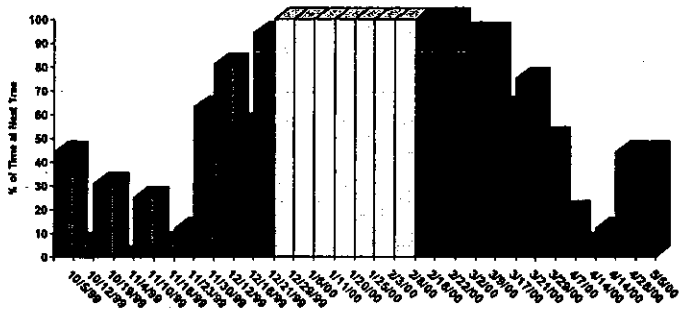


Photographs courtesy of Tony Steffer

Figure 3: NEST ATTENDANCE BY AT LEAST ONE ADULT EAGLE DURING 15-MINUTE INCREMENTS OF 4-HOUR OBSERVATIONAL PERIODS

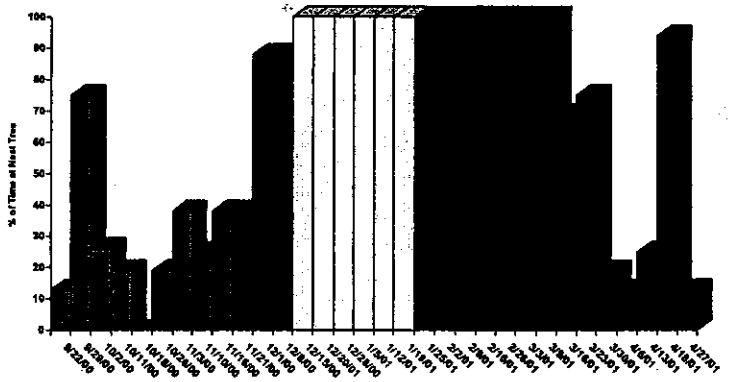
1999 - 2000 NESTING SEASON

	WITHIN 750' PRIMARY ZONE	WITHIN 1500' SECONDARY ZONE
EXISTING HOMES	0	8
HOMES UNDER CONSTRUCTION DURING NESTING SEASON	0	26



2000 - 2001 NESTING SEASON

	WITHIN 750' PRIMARY ZONE	WITHIN 1500' SECONDARY ZONE
EXISTING HOMES	0	34
HOMES UNDER CONSTRUCTION DURING NESTING SEASON	0	8



2001 - 2002 NESTING SEASON

	WITHIN 750' PRIMARY ZONE	WITHIN 1500' SECONDARY ZONE
EXISTING HOMES	0	42
HOMES UNDER CONSTRUCTION DURING NESTING SEASON	17	61

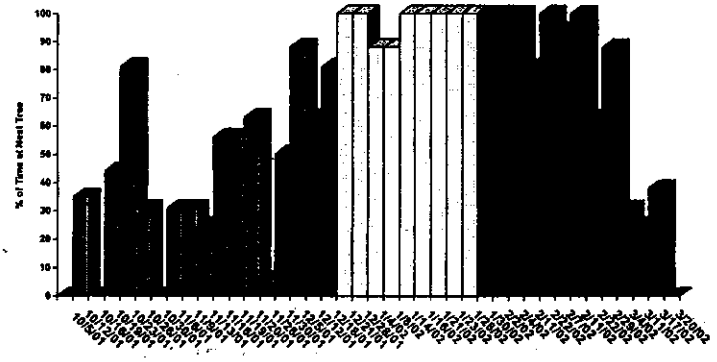


EXHIBIT 21M

STAFF REPORT DISTRIBUTION LIST

KISSIMMEE PARK ROAD/TURNPIKE INTERCHANGE

Application No: 041008-30

Permit No: 49-01481-P

INTERNAL DISTRIBUTION

X ANNETTE V BURKETT - 2250
X Susan C. Elfers - 2250
X Edward W. Yaun, P.E. - 2250
X Marc S. Ady - 2250
X A. Lee - 2250
X A. Waterhouse - 4220
X ERC Engineering - 2250
X ERC Environmental - 2250
X J. Golden - 4210
X Permit File
X R. Robbins - 4250

GOVERNING BOARD MEMBERS

- Mr. Harkley R. Thornton
- Mr. Kevin McCarty
- Mr. Lennart Lindahl
- Mr. Michael Collins
- Mr. Nicolas Gutierrez, Jr.
- Ms. Irela Bague
- Ms. Pamela Brooks-Thomas

EXTERNAL DISTRIBUTION

X Permittee - Florida Dept Of Transportation - Florida'S Turnpike Enterprise
X Agent - Florida Dept Of Transportation - Florida'S Turnpike Enterprise
X Engr Consultant - Bowyer-Singleton And Associates Inc

GOVERNMENT AGENCIES

X Dan Sullivan - Species Section
X Div of Recreation and Park - District 6 - FDEP
X Florida Fish & Wildlife Conservation Commission - Imperiled Species Mgmt Section
X Osceola County Engineer
X Toho Water Authority Brian Wheeler, P.E.
X US Army Corps of Engineers - Merritt Island Reg Office - CESAJ-RD-AM

OTHER INTERESTED PARTIES

X Sierra Club - Central Florida Group P.O. Box 941692
X Water Management Institute - Michael N. Vanatta

EXHIBIT 22

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE
STANDARD GENERAL PERMIT NO. 49-01399-P
DATE ISSUED: November 7, 2005

Form #0941
08/95

PERMITTEE: OSCEOLA COUNTY
1 COURTHOUSE SQUARE
KISSIMMEE, FL 34741

SCHOOLFIELD PROPERTIES INC
101 PARK PLACE BLVD
KISSIMMEE, FL 34741

PROJECT DESCRIPTION: Modification for construction and operation of a surface water management system to serve a 15.43 acre roadway project known as Kissimmee Park Road Modification and mass grading of the 11.77 acre Schoolfield tract.

PROJECT LOCATION: OSCEOLA COUNTY, SEC 4,9,16 TWP 26S RGE 30E

PERMIT DURATION: See Special Condition No:1. See attached Rule 40E-4.321, Florida Administrative Code.

This is to notify you of the District's agency action concerning Notice of Intent for Permit Application No. 050816-6, dated August 16, 2005. This action is taken pursuant to Rule 40E-1.603 and Chapter 40E-40 , Florida Administrative Code (F.A.C.).

Based on the information provided, District rules have been adhered to and an Environmental Resource General Permit is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120, Florida Statutes, administrative hearing.
2. the attached 19 General Conditions (See Pages : 2 - 4 of 6),
3. the attached 14 Special Conditions (See Pages : 5 - 6 of 6) and
4. the attached 7 Exhibit(s).

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights," we will assume that you concur with the District's action.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the Permittee (and the persons listed in the attached distribution list) no later than 5:00 p.m. on this 7th day of November, 2005, in accordance with Section 120.60(3), Florida Statutes.

BY: _____
Thomas P. Genovese
Service Center Director
Orlando Service Center

Certified mail number 7004 2510 0004 8282 0951, 0968

40E-4.321 Duration of Permits

(1) Unless revoked or otherwise modified the duration of an environmental resource permit issued under this chapter or Chapter 40E-40, F.A.C. is as follows:

(a) For a conceptual approval, two years from the date of issuance or the date specified as a condition of the permit, unless within that period an application for an individual or standard general permit is filed for any portion of the project. If an application for an environmental resource permit is filed, then the conceptual approval remains valid until final action is taken on the environmental resource permit application. If the application is granted, then the conceptual approval is valid for an additional two years from the date of issuance of the permit. Conceptual approvals which have no individual or standard general environmental resource permit applications filed for a period of two years shall expire automatically at the end of the two year period.

(b) For a conceptual approval filed concurrently with a development of regional impact (DRI) application for development approval (ADA) and a local government comprehensive plan amendment, the duration of the conceptual approval shall be two years from whichever one of the following occurs at the latest date:

1. the effective date of the local government's comprehensive plan amendment.
2. the effective date of the local government development order.
3. the date on which the District issues the conceptual approval, or
4. the latest date of the resolution of any Chapter 120.57, F.A.C., administrative proceeding or other legal appeals.

(c) For an individual or standard general environmental resource permit, five years from the date of issuance or such amount of time as made a condition of the permit.

(d) For a noticed general permit issued pursuant to Chapter 40-E-400, F.A.C., five years from the date the notice of intent to use the permit is provided to the District.

(2)(a) Unless prescribed by special permit condition, permits expire automatically according to the timeframes indicated in this rule. If application for extension is made in writing pursuant to subsection (3), the permit shall remain in full force and effect until:

1. the Governing Board takes action on an application for extension of an individual permit, or
2. staff takes action on an application for extension of a standard general permit.

(b) Installation of the project outfall structure shall not constitute a vesting of the permit.

(3) The permit extension shall be issued provided that a permittee files a written request with the District showing good cause prior to the expiration of the permit. For the purpose of this rule, good cause shall mean a set of extenuating circumstances outside of the control of the permittee. Requests for extensions, which shall include documentation of the extenuating circumstances and how they have delayed this project, will not be accepted more than 180 days prior to the expiration date.

(4) Substantial modifications to Conceptual Approvals will extend the duration of the Conceptual Approval for two years from the date of issuance of the modification. For the purposes of this section, the term "substantial modification" shall mean a modification which is reasonably expected to lead to substantially different water resource or environmental impacts which require a detailed review.

(5) Substantial modifications to individual or standard general environmental resource permits issued pursuant to a permit application extend the duration of the permit for three years from the date of issuance of the modification. Individual or standard general environmental resource permit modifications do not extend the duration of a conceptual approval.

(6) Permit modifications issued pursuant to subsection 40E-4.331(2)(b), F.A.C. (letter modifications) do not extend the duration of a permit.

(7) Failure to complete construction or alteration of the surface water management system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization in order to continue construction unless a permit extension is granted.

Specific authority 373.044, 373.113 F.S. Law Implemented 373.413, 373.416, 373.419, 373.426 F.S. History—New 9-3-81, Amended 1-31-82, 12-1-82, Formerly 16K-4.07(4), Amended 7-1-86, 4/20/94, 10-3-95

GENERAL CONDITIONS

1. All activities authorized by this permit 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 and Part IV, Chapter 373. F.S.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.

5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.

6. Within 30 days after completion of construction of the permitted activity, the permitee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.

7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to be in compliance with the permitted plans and specifications; and the entity approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and

GENERAL CONDITIONS

maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions

10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

11. 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 40E-4 or Chapter 40E-40, F.A.C..

12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.

14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the permit.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.

16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of

GENERAL CONDITIONS

ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

17. 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.

18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.

19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

SPECIAL CONDITIONS

1. The construction phase of this permit shall expire on November 7, 2010.

2. Operation of the surface water management system shall be the responsibility of OSCEOLA COUNTY.

3. Discharge Facilities:

   Structure: 1

   1-16" W X 26.6" H SHARP CRESTED weir with crest at elev. 69.42' NGVD.
   1-3" dia. CIRCULAR ORIFICE with invert at elev. 68.5' NGVD.
   68 LF of 24" dia. REINFORCED CONCRETE PIPE culvert.
   1-3.33' W X 4.42' L drop inlet with crest at elev. 71.42' NGVD.

   Receiving body : Existing ditch
   Control elev : 68.5 feet NGVD.

4. Lake side slopes shall be no steeper than 4:1 (horizontal:vertical) to a depth of two feet below the control elevation. Side slopes shall be nurtured or planted from 2 feet below to 1 foot above control elevation to insure vegetative growth, unless shown on the plans.

5. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.

6. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

7. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.

8. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse water resource related impacts will not be caused by the completed permit activity. Should any adverse impacts caused by the completed surface water management system occur, the District will require the permittee to provide appropriate mitigation to the District or other impacted party. The District will require the permittee to modify the surface water management system, if necessary, to eliminate the cause of the adverse impacts.

9. Minimum road crown elevation: Basin: Basin 300, 301 Mod. - 70.50 feet NGVD.

10. All special conditions and exhibits previously stipulated by permit number 49-01399-P remain in effect unless otherwise revised and shall apply to this modification.

11. Grass seed, sod or mulch shall be installed and maintained on exposed areas within 48 hours of completing final grade, and at other times as necessary, to prevent erosion, sedimentation or turbid discharge into adjacent waters and /or wetlands.

12. Prior to any future construction on the off-site area and the Schoolfield tract, the property owner(s) shall apply for and receive a permit. As part of the permit application, the applicant for that property shall provide documentation verifying that the proposed construction is consistent with the design of the master surface water management system, including the land use and site grading assumptions.

13. Silt fencing shall be installed at the limits of construction to protect all of the preserve areas from silt and sediment deposition during the construction of the project. A floating turbidity barrier shall be installed during the construction of the final discharge structure into the adjacent canal/water body. The silt fencing and the turbidity barrier shall be installed in accordance with "Florida Land Development Manual" Chapter

SPECIAL CONDITIONS

6 "Stormwater and Erosion and Sediment Control Best Management Practices for Developing Areas". The sediment controls shall be installed prior to the commencement of any clearing or construction and the installation must be inspected by the District's Environmental Resource Compliance staff. The silt fencing and turbidity barriers shall remain in place and be maintained in good functional condition until all adjacent construction activities have been completed and all fill slopes have been stabilized. Upon completion of the project and the stabilization of the fill, the permittee shall contact the District's Environmental Resource Compliance staff to inspect the site and approve the removal of the silt fencing and turbidity barriers.

14. The District reserves the right to require remedial measures to be taken by the permittee if monitoring or other information demonstrates that adverse impacts to onsite or offsite wetlands, upland conservation areas or buffers, or other surface waters have occurred due to project related activities.

NOTICE OF RIGHTS

Section 120.569(1), Fla. Stat. (1999), requires that "each notice shall inform the recipient of any administrative hearing or judicial review that is available under this section, s. 120.57, or s. 120.68; shall indicate the procedure which must be followed to obtain the hearing or judicial review, and shall state the time limits which apply." Please note that this Notice of Rights is not intended to provide legal advice. Not all the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

Petition for Administrative Proceedings

1. A person whose substantial interests are affected by the South Florida Water Management District's (SFWMD) action has the right to request an administrative hearing on that action. The affected person may request either a formal or an informal hearing, as set forth below. A point of entry into administrative proceedings is governed by Rules 28-106.111 and 40E-1.511, Fla. Admin. Code, (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109), as set forth below. Petitions are deemed filed upon receipt of the original documents by the SFWMD Clerk.

a. Formal Administrative Hearing: If a genuine issue(s) of material fact is in dispute, the affected person seeking a formal hearing on a SFWMD decision which does or may determine their substantial interests shall file a petition for hearing pursuant to Sections 120.569 and 120.57(1), Fla. Stat. or for mediation pursuant to Section 120.573, Fla. Stat. within 21 days, except as provided in subsections c. and d. below, of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-106.201(2), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

b. Informal Administrative Hearing: If there are no issues of material fact in dispute, the affected person seeking an informal hearing on a SFWMD decision which does or may determine their substantial interests shall file a petition for hearing pursuant to Sections 120.569 and 120.57(2), Fla. Stat. or for mediation pursuant to Section 120.573, Fla. Stat. within 21 days, except as provided in subsections c. and d. below, of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-106.301(2), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

c. Administrative Complaint and Order: If a Respondent objects to a SFWMD Administrative Complaint and Order, pursuant to Section 373.119, Fla. Stat. (1997), the person named in the Administrative Complaint and Order may file a petition for a hearing no later than 14 days after the date such order is served. Petitions must substantially comply with the requirements of either subsection a. or b. above.

d. State Lands Environmental Resource Permit: Pursuant to Section 373.427, Fla. Stat., and Rule 40E-1.511(3), Fla. Admin. Code (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109(2)(c)), a petition objecting to the SFWMD's agency action regarding consolidated applications for Environmental Resource Permits and Use of Sovereign Submerged Lands (SLERPs), must be filed within 14 days of the notice of consolidated intent to grant or deny the SLERP. Petitions must substantially comply with the requirements of either subsection a. or b. above.

e. Emergency Authorization and Order: A person whose substantial interests are affected by a SFWMD Emergency Authorization and Order, has a right to file a petition under Sections 120.569, 120.57(1), and 120.57(2), Fla. Stat., as provided in subsections a. and b. above. However, the person, or the agent of the person responsible for causing or contributing to the emergency conditions shall take whatever action necessary to cause immediate compliance with the terms of the Emergency Authorization and Order.

f. Order for Emergency Action: A person whose substantial interests are affected by a SFWMD Order for Emergency Action has a right to file a petition pursuant to Rules 28-107.005 and 40E-1.611, Fla. Admin. Code, copies of which are attached to this Notice of Rights, and Section 373.119(3), Fla. Stat., for a hearing on the Order. Any subsequent agency action or proposed agency action to initiate a formal revocation proceeding shall be separately noticed pursuant to section g. below.

g. Permit Suspension, Revocation, Annulment, and Withdrawal: If the SFWMD issues an administrative complaint to suspend, revoke, annul, or withdraw a permit, the permittee may request a hearing to be conducted in accordance with Sections 120.569 and 120.57, Fla. Stat., within 21 days of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-107.004(3), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

2. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the SFWMD's final action may be different from the position taken by it previously. Persons whose substantial interests may be affected by

any such final decision of the SFWMD shall have, pursuant to Rule 40E-1.511(2), Fla. Admin. Code (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109(2)(c)), an additional 21 days from the date of receipt of notice of said decision to request an administrative hearing. However, the scope of the administrative hearing shall be limited to the substantial deviation.

3. Pursuant to Rule 40E-1.511(4), Fla. Admin. Code, substantially affected persons entitled to a hearing pursuant to Section 120.57(1), Fla. Stat., may waive their right to such a hearing and request an informal hearing before the Governing Board pursuant to Section 120.57(2), Fla. Stat., which may be granted at the option of the Governing Board.

4. Pursuant to Rule 28-106.111(3), Fla. Admin. Code, persons may file with the SFWMD a request for extension of time for filing a petition. The SFWMD, for good cause shown, may grant the extension. The request for extension must contain a certificate that the petitioner has consulted with all other parties, if any, concerning the extension and that the SFWMD and all other parties agree to the extension.

CIRCUIT COURT

5. Pursuant to Section 373.617, Fla. Stat., any substantially affected person who claims that final agency action of the SFWMD relating to permit decisions constitutes an unconstitutional taking of property without just compensation may seek judicial review of the action in circuit court by filing a civil action in the circuit court in the judicial circuit in which the affected property is located within 90 days of the rendering of the SFWMD's final agency action.

6. Pursuant to Section 403.412, Fla. Stat., any citizen of Florida may bring an action for injunctive relief against the SFWMD to compel the SFWMD to enforce the laws of Chapter 373, Fla. Stat., and Title 40E, Fla. Admin. Code. The complaining party must file with the SFWMD Clerk a verified complaint setting forth the facts upon which the complaint is based and the manner in which the complaining party is affected. If the SFWMD does not take appropriate action on the complaint within 30 days of receipt, the complaining party may then file a civil suit for injunctive relief in the 15th Judicial Circuit in and for Palm Beach County or circuit court in the county where the cause of action allegedly occurred.

7. Pursuant to Section 373.433, Fla. Stat., a private citizen of Florida may file suit in circuit court to require the abatement of any stormwater management system, dam, impoundment, reservoir, appurtenant work or works that violate the provisions of Chapter 373, Fla. Stat.

DISTRICT COURT OF APPEAL

8. Pursuant to Section 120.68, Fla. Stat., a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal pursuant to Florida Rule of Appellate Procedure 9.110 in the Fourth District Court of Appeal or in the appellate district where a party resides and filing a second copy of the notice with the SFWMD Clerk within 30 days of rendering of the final SFWMD action.

LAND AND WATER ADJUDICATORY COMMISSION

9. A party to a "proceeding below" may seek review by the Land and Water Adjudicatory Commission (FLAWAC) of SFWMD's final agency action to determine if such action is consistent with the provisions and purposes of Chapter 373, Fla. Stat. Pursuant to Section 373.114, Fla. Stat., and Rules 42-2.013 and 42-2.0132, Fla. Admin. Code, a request for review of (a) an order or rule of the SFWMD must be filed with FLAWAC within 20 days after rendition of the order or adoption of the rule sought to be reviewed; (b) an order of the Department of Environmental Protection (DEP) requiring amendment or repeal of a SFWMD rule must be filed with FLAWAC within 30 days of rendition of the DEP's order, and (c) a SFWMD order entered pursuant to a formal administrative hearing under Section 120.57(1), Fla. Stat., must be filed no later than 20 days after rendition of the SFWMD's final order. Simultaneous with filing, a copy of the request for review must be served on the DEP Secretary, any person named in the SFWMD or DEP final order, and all parties to the proceeding below. A copy of Rule 42-2.013, Fla. Admin. Code is attached to this Notice of Rights.

PRIVATE PROPERTY RIGHTS PROTECTION ACT

10. A property owner who alleges a specific action of the SFWMD has inordinately burdened an existing use of the real property, or a vested right to a specific use of the real property, may file a claim in the circuit court where the real property is located within 1 year of the SFWMD action pursuant to the procedures set forth in Subsection 70.001(4)(a), Fla. Stat.

LAND USE AND ENVIRONMENTAL DISPUTE RESOLUTION

11. A property owner who alleges that a SFWMD development order (as that term is defined in Section 70.51(2)(a), Fla. Stat. to include permits) or SFWMD enforcement action is unreasonable, or unfairly burdens the use of the real property, may file a request for relief with the SFWMD within 30 days of receipt of the SFWMD's order or notice of agency action pursuant to the procedures set forth in Subsections 70.51(4) and (6), Fla. Stat.

MEDIATION

12. A person whose substantial interests are, or may be, affected by the SFWMD's action may choose mediation as an alternative remedy under Section 120.573, Fla. Stat. Pursuant to Rule 28-106.111(2), Fla. Admin. Code, the petition for mediation shall be filed within 21 days of either written notice through mail or posting or

publication of notice that the SFWMD has or intends to take final agency action. Choosing mediation will not affect the right to an administrative hearing if mediation does not result in settlement.

Pursuant to Rule 28-106.402, Fla. Admin. Code, the contents of the petition for mediation shall contain the following information:

(1) the name, address, and telephone number of the person requesting mediation and that person's representative, if any;

(2) a statement of the preliminary agency action;

(3) an explanation of how the person's substantial interests will be affected by the agency determination; and

(4) a statement of relief sought.

As provided in Section 120.573, Fla. Stat. (1997), the timely agreement of all the parties to mediate will toll the time limitations imposed by Sections 120.569 and 120.57, Fla. Stat., for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within 60 days of the execution of the agreement. If mediation results in settlement of the dispute, the SFWMD must enter a final order incorporating the agreement of the parties. Persons whose substantial interest will be affected by such a modified agency decision have a right to petition for hearing within 21 days of receipt of the final order in accordance with the requirements of Sections 120.569 and 120.57, Fla. Stat., and SFWMD Rule 28-106.201(2), Fla. Admin. Code. If mediation terminates without settlement of the dispute, the SFWMD shall notify all parties in writing that the administrative hearing process under Sections 120.569 and 120.57, Fla. Stat., remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action.

VARIANCES AND WAIVERS

13. A person who is subject to regulation pursuant to a SFWMD rule and believes the application of that rule will create a substantial hardship or will violate principles of fairness (as those terms are defined in Subsection 120.542(2), Fla. Stat.) and can demonstrate that the purpose of the underlying statute will be or has been achieved by other means, may file a petition with the SFWMD Clerk requesting a variance from or waiver of the SFWMD rule. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have concerning the SFWMD's action. Pursuant to Rule 28-104.002(2), Fla. Admin. Code, the petition must include the following information:

(a) the caption shall read:
Petition for (Variance from) or (Waiver of) Rule (Citation)

(b) The name, address, telephone number and any facsimile number of the petitioner;

(c) The name, address telephone number and any facsimile number of the attorney or qualified representative of the petitioner, (if any);

(d) the applicable rule or portion of the rule;

(e) the citation to the statue the rule is implementing;

(f) the type of action requested;

(g) the specific facts that demonstrate a substantial hardship or violation of principals of fairness that would justify a waiver or variance for the petitioner;

(h) the reason why the variance or the waiver requested would serve the purposes of the underlying statute; and

(i) a statement of whether the variance or waiver is permanent or temporary, If the variance or waiver is temporary, the petition shall include the dates indicating the duration of the requested variance or waiver.

A person requesting an emergency variance from or waiver of a SFWMD rule must clearly so state in the caption of the petition. In addition to the requirements of Section 120.542(5), Fla. Stat. pursuant to Rule 28-104.004(2), Fla. Admin. Code, the petition must also include:

a) the specific facts that make the situation an emergency; and

b) the specific facts to show that the petitioner will suffer immediate adverse effect unless the variance or waiver is issued by the SFWMD more expeditiously than the applicable timeframes set forth in Section 120.542, Fla. Stat.

WAIVER OF RIGHTS

14. Failure to observe the relevant time frames prescribed above will constitute a waiver of such right.

28-106.201 INITIATION OF PROCEEDINGS
(INVOLVING DISPUTED ISSUES OF MATERIAL FACT)

(2) All petitions filed under these rules shall contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding, and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and

(f) A demand for relief.

28-106.301 INITIATION OF PROCEEDINGS
(NOT INVOLVING DISPUTED ISSUES OF MATERIAL FACT)

(2) All petitions filed under these rules shall contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding, and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and

(e) A demand for relief.

28-107.004 SUSPENSION, REVOCATION, ANNULMENT, OR WITHDRAWAL

(3) Requests for hearing filed in accordance with this rule shall include:

(a) The name and address of the party making the request, for purposes of service;

(b) A statement that the party is requesting a hearing involving disputed issues of material fact, or a hearing not involving disputed issues of material fact; and

(c) A reference to the notice, order to show cause, administrative complaint, or other communication that the party has received from the agency.

42-2.013 REQUEST FOR REVIEW PURSUANT TO SECTION 373.114 OR 373.217

(1) In any proceeding arising under Chapter 373, F.S., review by the Florida Land and Water Adjudicatory Commission may be initiated by the Department or a party by filing a request for such review with the Secretary of the Commission and serving a copy on any person named in the rule or order, and on all parties to the proceeding which resulted in the order sought to be reviewed. A certificate of service showing completion of service as required by this subsection shall be a requirement for a determination of sufficiency under Rule 42-2.0132. Failure to file the request with the Commission within the time period provided in Rule 42-2.0132 shall result in dismissal of the request for review.

(2) The request for review shall identify the rule or order requested to be reviewed, the proceeding in which the rule or order was entered and the nature of the rule or order. A copy of the rule or order sought to be reviewed shall be attached. The request for review shall state with particularity:

(a) How the order or rule conflicts with the requirements, provisions and purposes of Chapter 373, F.S., or rules duly adopted thereunder;

(b) How the rule or order sought to be reviewed affects the interests of the party seeking review;

(c) The oral or written statement, sworn or unsworn, which was submitted to the agency concerning the matter to be reviewed and the date and location of the statement, if the individual or entity requesting the review has not participated in a proceeding previously instituted pursuant to Chapter 120, F.S., on the order for which review is sought;

(d) If review of an order is being sought, whether and how the activity authorized by the order would substantially affect natural resources of statewide or regional significance, or whether the order raises issues of policy, statutory interpretation, or rule interpretation that have regional or statewide significance from a standpoint of agency precedent, and all the factual bases in the record which the petitioner claims support such determination(s); and

(e) The action requested to be taken by the Commission as a result of the review, whether to rescind or modify the order, or remand the proceeding to the water management district for further action, or to require the water management district to initiate rulemaking to adopt, amend or repeal a rule.

28-107.005 EMERGENCY ACTION

(1) If the agency finds that immediate serious danger to the public health, safety, or welfare requires emergency action, the agency shall summarily suspend, limit, or restrict a license.

(2) the 14-day notice requirement of Section 120.569(2)(b), F. S., does not apply and shall not be construed to prevent a hearing at the earliest time practicable upon request of an aggrieved party.

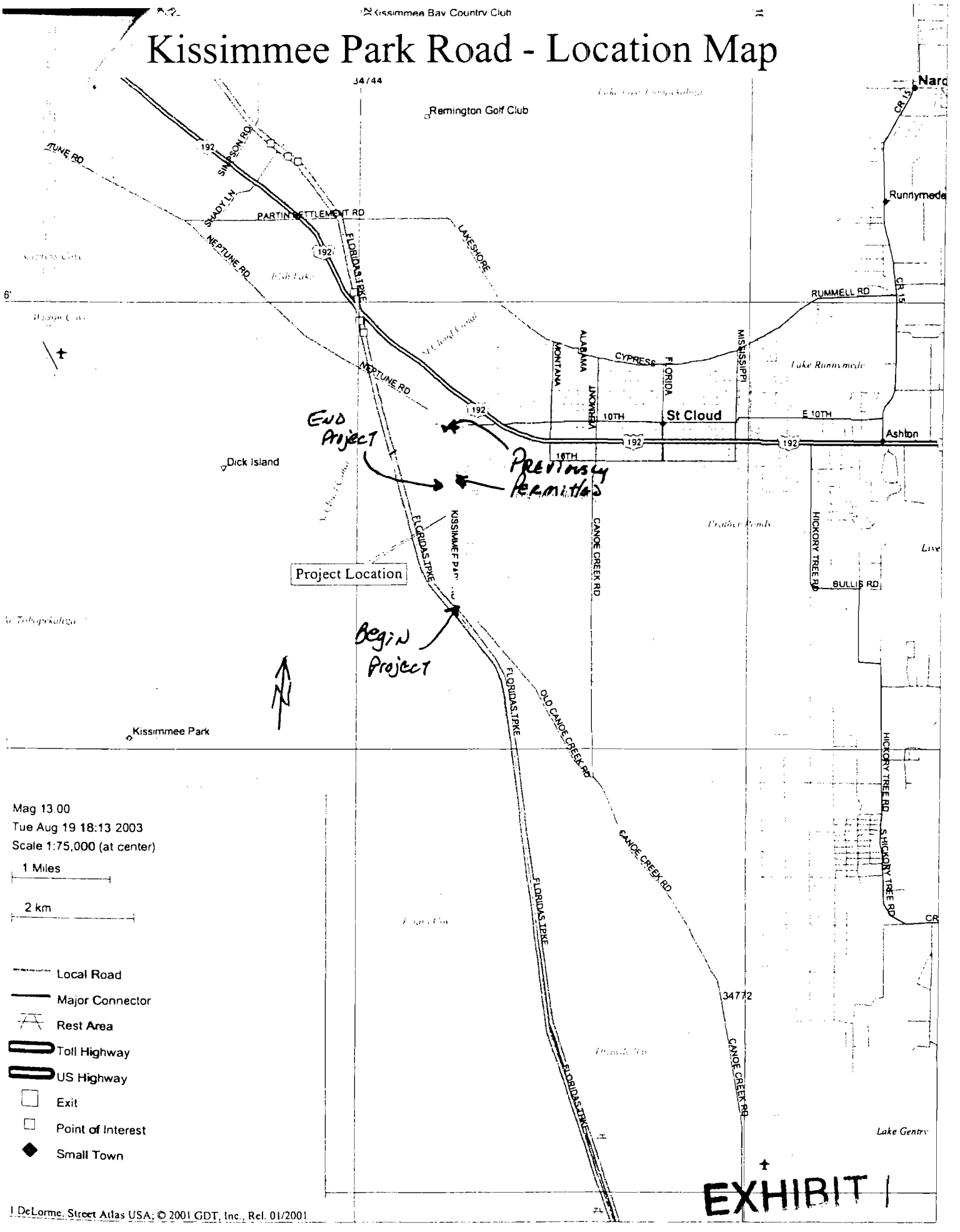
(3) Unless otherwise provided by law, within 20 days after emergency action taken pursuant to paragraph (1) of this rule, the agency shall initiate a formal suspension or revocation proceeding in compliance with Sections 120.569, 120.57. and 120.60, F.S.

40E-1.611 EMERGENCY ACTION

(1) An emergency exists when immediate action is necessary to protect public health, safety or welfare; the health of animals, fish or aquatic life; the works of the District; a public water supply, or recreational, commercial, industrial, agricultural or other reasonable uses of land and water resources.

(2) The Executive Director may employ the resources of the District to take whatever remedial action necessary to alleviate the emergency condition without the issuance of an emergency order, or in the event an emergency order has been issued, after the expiration of the requisite time for compliance with that order.

Kissimmee Park Road - Location Map



Last Date For Agency Action: 13-NOV-2005

GENERAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Kissimmee Park Road Widening

Permit No.: 49-01399-P

Application No.: 050816-6

Application Type: Environmental Resource (General Permit Modification)

Location: Osceola County, S4,9,16/T26S/R30E

Permittee : Osceola County
Schoolfield Properties Inc

Operating Entity : Osceola County

Project Area: 27.2 acres

Project Land Use: Highway

Drainage Basin: LAKE TOHOPEKALIGA

Receiving Body: Existing ditch **Class:** CLASS III

Special Drainage District: NA

Conservation Easement To District : No
Sovereign Submerged Lands: No

PROJECT PURPOSE:

Modification of an Environmental Resource Permit to authorize construction and operation of a surface water management system to serve a 15.43 acre roadway project known as Kissimmee Park Road Modification and mass grading of the 11.77 acre Schoolfield tract. Staff recommends approval with conditions.

EXHIBIT 2a

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The site is located south of US 192 between Neptune Road and Florida's Turnpike.

There are permitted surface water management facilities serving the project area. The site contains the existing roadway, swales and ditches. Residential and rural development, undeveloped uplands, and wetlands lie adjacent to the site. No net adverse impacts to wetlands, wildlife, or surface waters are anticipated as the result of the proposed activities.

PROPOSED PROJECT:

Construction proposed consists of the surface water management system for the road widening project and mass grading of the Schoolfied tract. The water management system consists of inlets and culverts directing runoff to wet detention ponds.

This modification affects only Basin 300, 301 of the road project. The Basin area for the roadway has increased from 15.39 to 15.43 acres, Pond 300 has been relocated from the west side of the road to the east side, and the total pond area has increased from 2.18 acres to 4.29 acres. Also additional areas are being treated in the pond; these include 2.78 acres for off-site Basin OCC-7, assumed at 80 percent impervious coverage; the 11.77 acre Schoolfield tract, with 8.78 acres assumed at 60 percent and 2.99 acres assumed at 80 percent impervious coverage, for a total contributing drainage area of 40.4 acres. The off-site drainage area and the Schoolfield tract will require a separate permit applications at the time of construction. Construction on the Schoolfield is limited to the 3.7 acre pond tract in a drainage easment and mass grading on the 11.77 acre remaining parcel at this time. (See Special Conditions)

The control structure remains as previously permitted.

The county and Mr. Schoolfield are co-applicants as construction will be taking place on both properties.

LAND USE:

The land use information includes the 11.77 acre Schoolfield tract as pervious area at this time.

Construction:
Project:

	This Phase	Total Project	
Pavement	8.21	8.21	acres
Pervious	14.70	14.70	acres
Water Mgnt Acreage	4.29	4.29	acres
Total:	**27.20**	**27.20**	

WATER QUANTITY :

Discharge Rate :

As shown in the table below, the proposed project discharge is within the allowable limit for the area.

Discharge Storm Frequency : 10 YEAR-3 DAY Design Rainfall : 7.7 inches

Basin	Allow Disch (cfs)	Method Of Determination	Peak Disch (cfs)	Peak Stage (ft, NGVD)
Basin 300, 301 Mod.	18	Previously Permitted	12.6	71.5

Road Design :

Road Storm Frequency : 10 YEAR-1 DAY Design Rainfall: 5.2 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Road Crown (ft, NGVD)
Basin 300, 301 Mod.	70.4	70.5

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NGVD)	WSWT Ctrl Elev (ft, NGVD)	Method Of Determination
Basin 300, 301 Mod.	40.40	68.5	68.50	Previously Permitted

Receiving Body :

Basin	Str.#	Receiving Body
Basin 300, 301 Mod.	1	Existing ditch

Discharge Structures: Note: The units for all the elevation values of structures are (ft, NGVD)

Culverts:

Basin	Str#	Count	Type	Width	Length	Dia.
Basin 300, 301 Mod.	1	1	Reinforced Concrete Pipe		68'	24"

Inlets:

Basin	Str#	Count	Type	Width	Length	Dia.	Crest Elev.
Basin 300, 301 Mod.	1	1	Inlet	3.33'	4.42'		71.42

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev.
Basin 300, 301 Mod.	1	1	Sharp Crested	16"	26.6'			69.42 (crest)

Water Quality Structures: Note: The units for all the elevation values of structures are (ft, NGVD)

Bleeders:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev.
Basin 300, 301 Mod.	1	1	Circular Orifice				3"		68.5

WATER QUALITY :

No adverse water quality impacts are anticipated as a result of the proposed project. Water quality treatment for 2.5 inches over the new impervious area, 80 percent impervious coverage from a 2.78 acre off-site Basin identified as OCC-7, and off-site areas of 8.78 acres at 60 percent and 2.99 acres at 80 percent impervious coverage is provided in the wet detention ponds.

EXHIBIT 2c

Basin	Treatment Method		Vol Req.d (ac-ft)	Vol Prov'd (ac-ft)
Basin 300, 301 Mod. Treatment	Wet Detention	4.29 acres	3.58	3.58

CERTIFICATION AND MAINTENANCE OF THE WATER MANAGEMENT SYSTEM:

It is suggested that the permittee retain the services of a Professional Engineer registered in the State of Florida for periodic observation of construction of the surface water management (SWM) system. This will facilitate the completion of construction completion certification Form #0881 which is required pursuant to Section 10 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, and Rule 40E-4361(2), Florida Administrative Code (F.A.C.).

Pursuant to Chapter 40E-4 F.A.C., this permit may not be converted from the construction phase to the operation phase until certification of the SWM system is submitted to and accepted by this District. Rule 40E-4.321(7) F.A.C. states that failure to complete construction of the SWM system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization unless a permit extension is granted.

For SWM systems permitted with an operating entity who is different from the permittee, it should be noted that until the permit is transferred to the operating entity pursuant to Rule 40E-1.6107, F.A.C., the permittee is liable for compliance with the terms of this permit.

The permittee is advised that the efficiency of a SWM system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. Maintenance of the SWM system is required to protect the public health, safety and the natural resources of the state. Therefore, the permittee must have periodic inspections of the SWM system performed to ensure performance for flood protection and water quality purposes. If deficiencies are found, it is the responsibility of the permittee to correct these deficiencies in a timely manner.

EXHIBIT 2d

RELATED CONCERNS:

Water Use Permit Status:

The applicant has indicated that no irrigation water use is proposed for the project.

The applicant has indicated that dewatering is required for construction of this project. No construction dewatering shall commence until a dewatering permit from the District is obtained in accordance with General Condition 13.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation, unless the work qualifies for a No-Notice Short-Term Dewatering permit pursuant to Chapter 40E-20.302(3) or is exempt pursuant to Section 40E-2.051, FAC.

Historical/Archeological Resources:

No information has been received that indicates the presence of archaeological or historical resources or that the proposed activities could cause adverse impacts to archaeological or historical resources.

DCA/CZM Consistency Review:

The District has not received a finding of inconsistency from the Florida Department of Environmental Protection or other commenting agencies regarding the provisions of the federal Coastal Zone Management Plan.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF REVIEW:

DIVISION APPROVAL:

NATURAL RESOURCE MANAGEMENT:

Marc S. Ady

DATE: 11/3/05

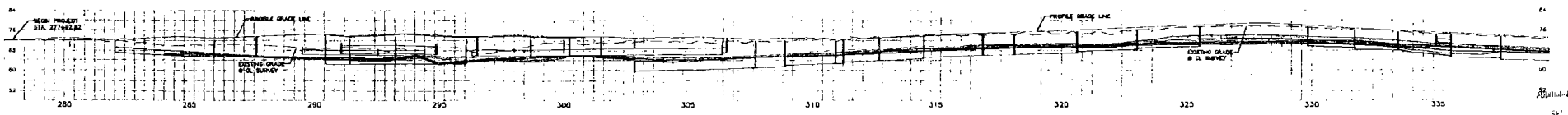
SURFACE WATER MANAGEMENT:

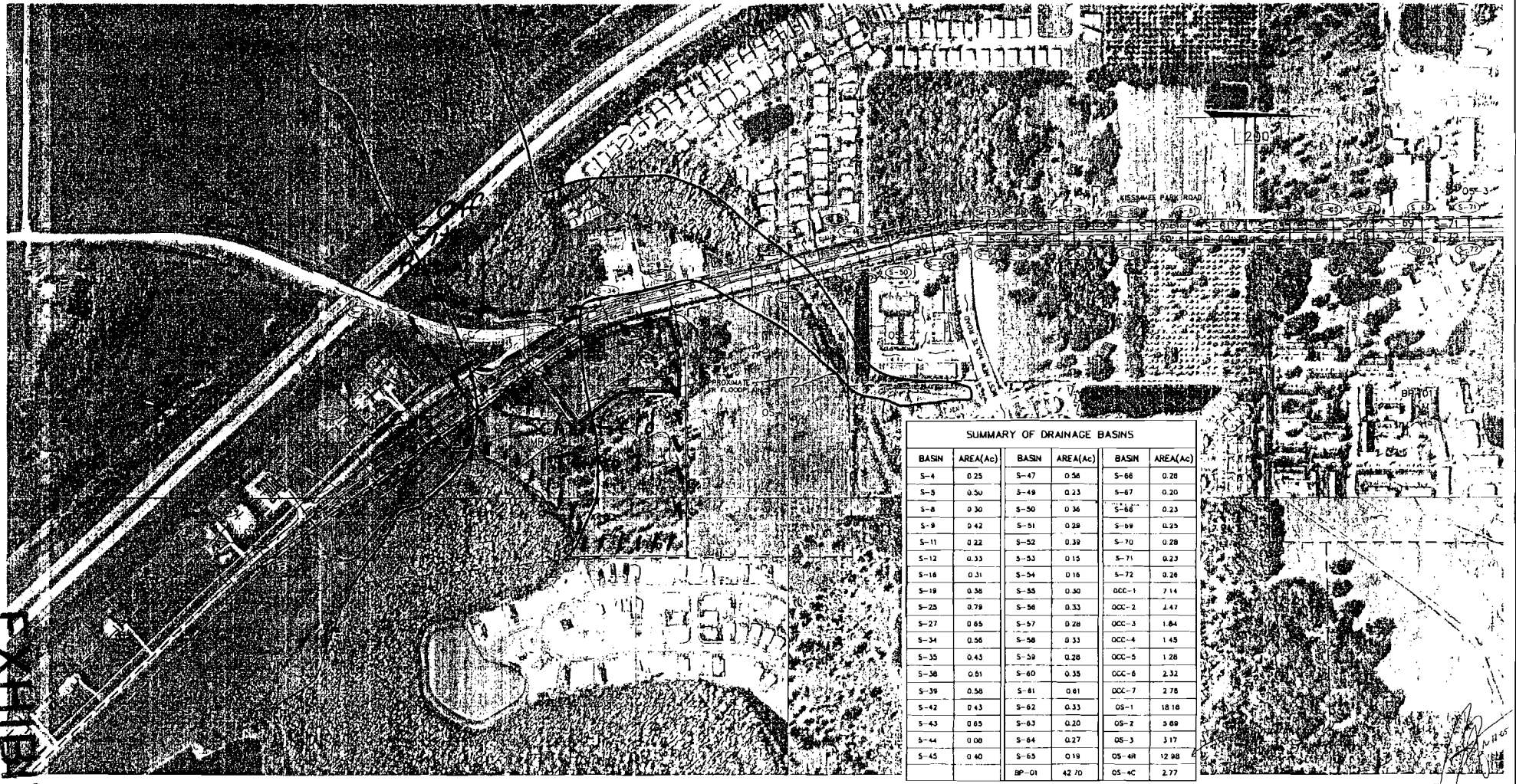
Edward W. Yaun, P.E.

DATE: 11/3/05

EXHIBIT 2e

HWA# 1070	SHEET NO. 4





SUMMARY OF DRAINAGE BASINS

BASIN	AREA(Ac)	BASIN	AREA(Ac)	BASIN	AREA(Ac)
S-4	0.25	S-47	0.56	S-66	0.28
S-5	0.50	S-49	0.23	S-67	0.20
S-8	0.30	S-50	0.36	S-68	0.23
S-9	0.42	S-51	0.28	S-69	0.25
S-11	0.22	S-52	0.39	S-70	0.28
S-12	0.33	S-53	0.15	S-71	0.23
S-16	0.31	S-54	0.16	S-72	0.26
S-19	0.36	S-55	0.30	OCC-1	7.14
S-25	0.79	S-56	0.33	OCC-2	2.47
S-27	0.65	S-57	0.28	OCC-3	1.84
S-34	0.56	S-58	0.33	OCC-4	1.45
S-35	0.43	S-59	0.28	OCC-5	1.28
S-38	0.51	S-60	0.35	OCC-6	2.32
S-39	0.58	S-61	0.61	OCC-7	2.78
S-42	0.43	S-62	0.33	OS-1	18.16
S-43	0.65	S-63	0.20	OS-2	5.69
S-44	0.08	S-64	0.27	OS-3	3.17
S-45	0.40	S-65	0.19	OS-4R	12.98
		BP-01	42.70	OS-4C	2.77

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

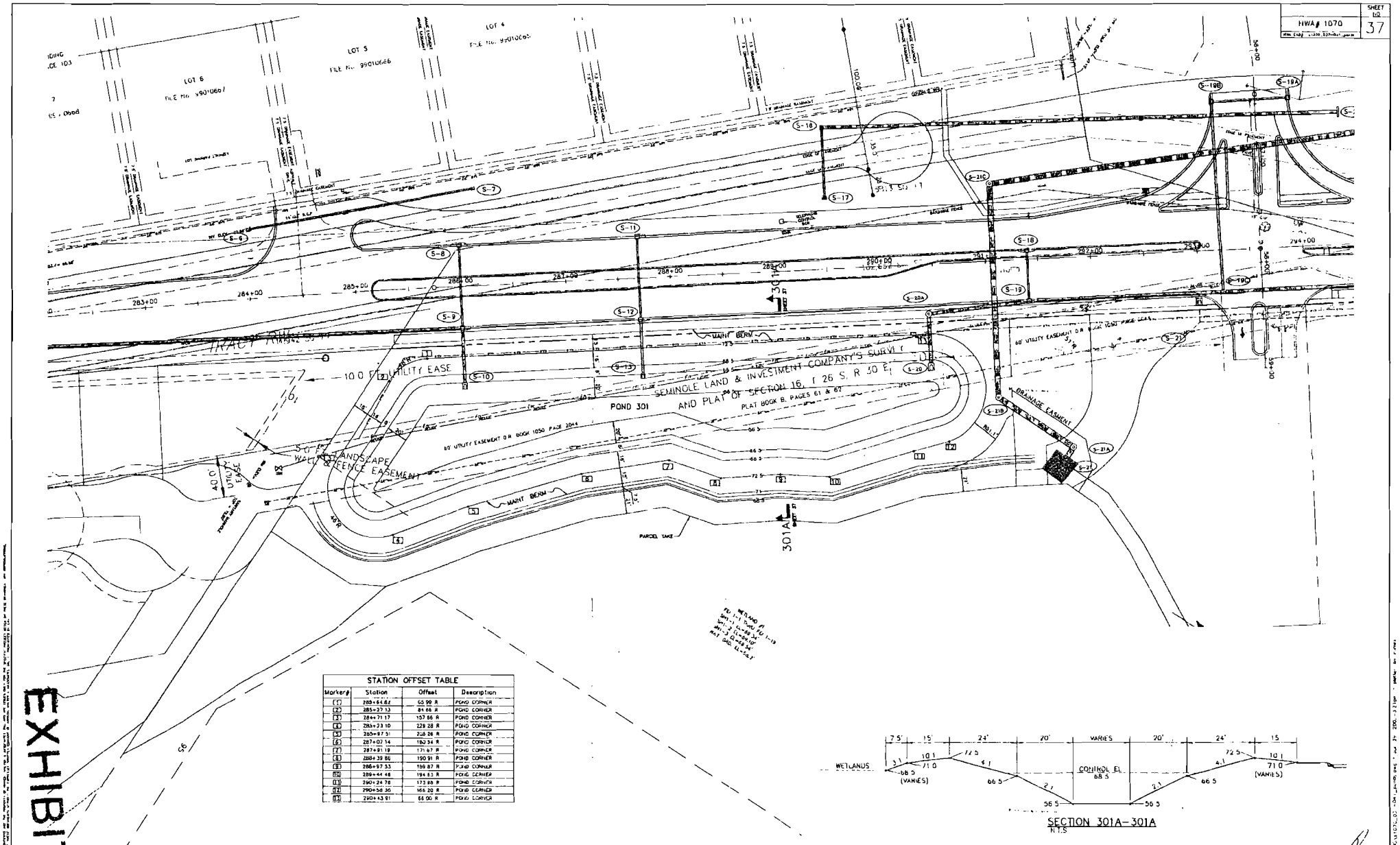
	NAME	DATE		NAME	DATE
DESIGNED BY	SH	04/02	DRAWN BY	JP	04/02
CHECKED BY	XXX	XX/XX	CHECKED BY	XXX	XX/XX
SUPERVISED BY	SHAWN HINDLE, P.E.				

OSCEOLA COUNTY
FLORIDA

HWA

KISSIMMEE PARK ROAD

POST DRAINAGE MAP



STATION OFFSET TABLE			
Marker#	Station	Offset	Description
1	283+64.62	65.99 R	POND CORNER
2	285+27.13	84.66 R	POND CORNER
3	284+71.17	157.66 R	POND CORNER
4	285+23.10	229.28 R	POND CORNER
5	285+97.51	208.26 R	POND CORNER
6	287+07.14	180.34 R	POND CORNER
7	287+91.19	171.67 R	POND CORNER
8	288+39.86	190.91 R	POND CORNER
9	288+97.53	169.87 R	POND CORNER
10	289+44.48	194.83 R	POND CORNER
11	290+24.78	173.98 R	POND CORNER
12	290+58.30	166.20 R	POND CORNER
13	290+43.91	66.00 R	POND CORNER

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

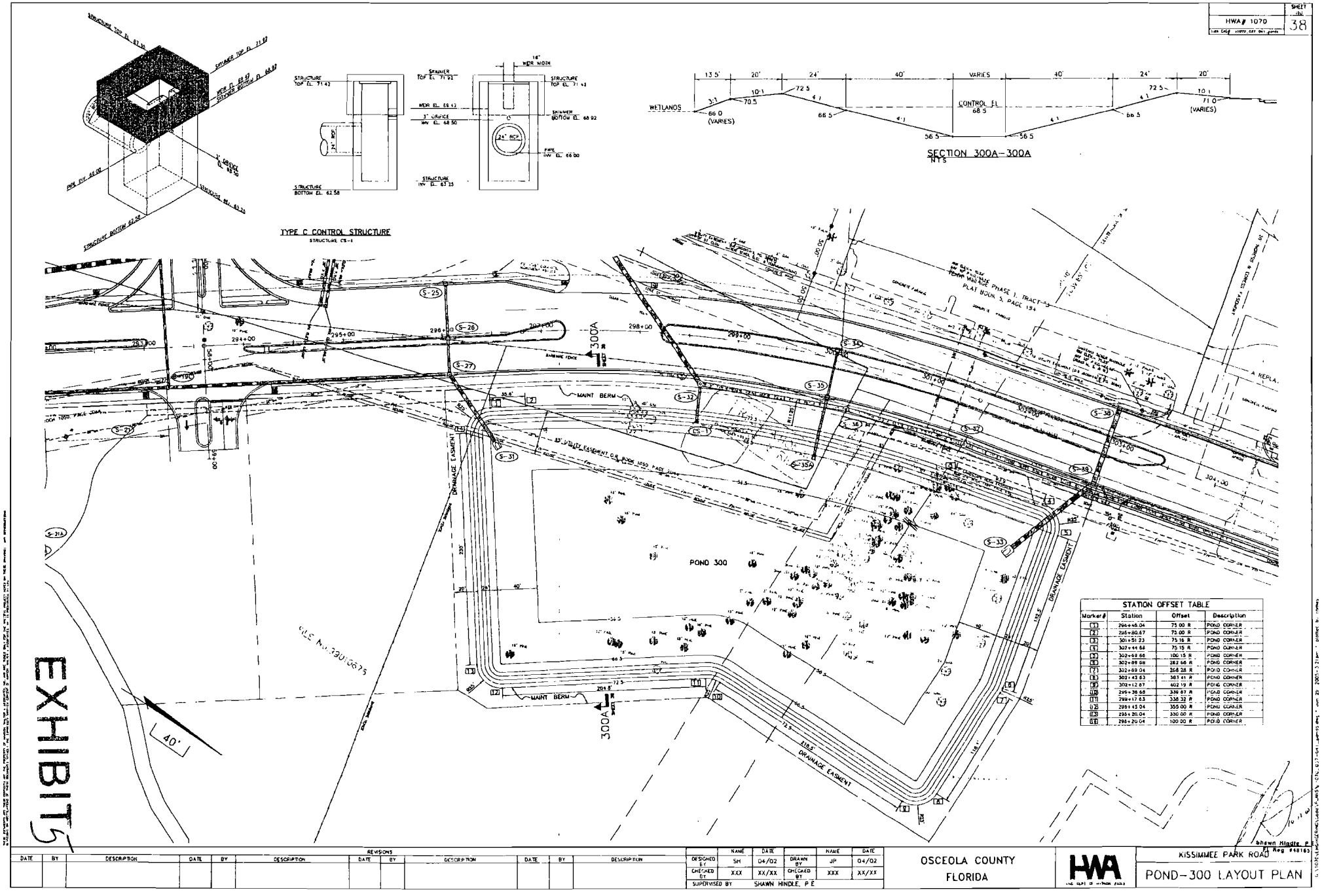
	NAME	DATE		NAME	DATE
DESIGNED BY	SH	04/02	DRAWN BY	JP	04/02
CHECKED BY	XXX	XX/XX	CHECKED BY	XXX	XX/XX
SUPERVISED BY	SHAWN HINDLE, P.E.				

OSCEOLA COUNTY
FLORIDA

HWA

KISSIMMEE PARK ROAD

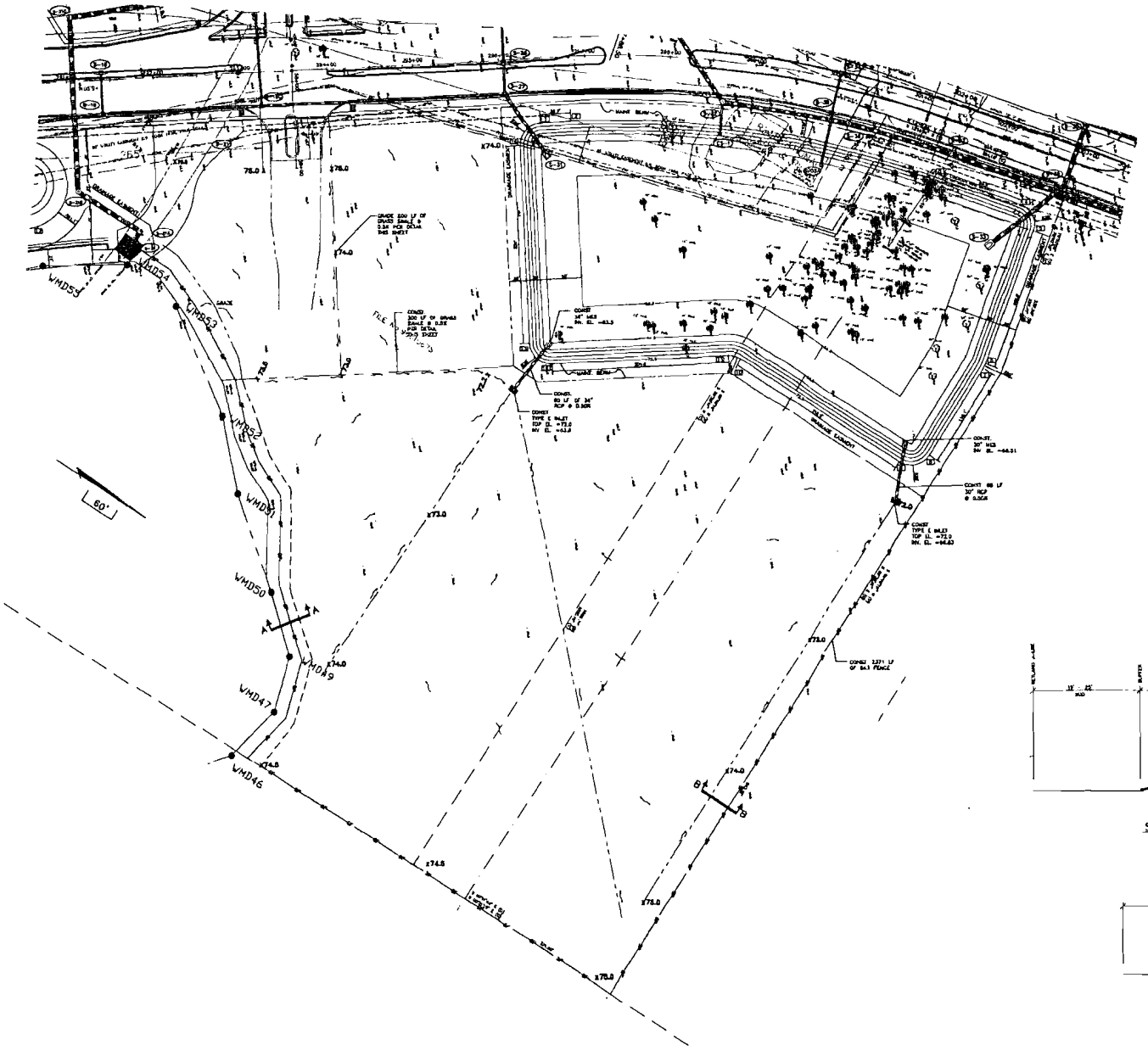
POND-301 LAYOUT PLAN

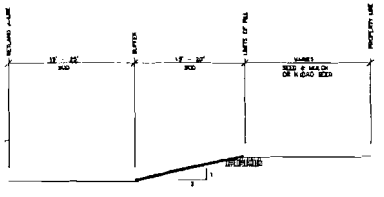


STATION OFFSET TABLE

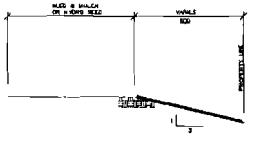
Marker#	Station	Offset	Description
1	296+46.04	75.00 R	POND CORNER
2	295+80.67	75.00 R	POND CORNER
3	301+51.23	75.16 R	POND CORNER
4	302+44.66	75.15 R	POND CORNER
5	302+69.66	100.15 R	POND CORNER
6	302+89.68	282.66 R	POND CORNER
7	302+69.04	268.28 R	POND CORNER
8	302+42.63	383.41 R	POND CORNER
9	302+12.67	402.19 R	POND CORNER
10	299+36.68	339.67 R	POND CORNER
11	299+17.63	338.32 R	POND CORNER
12	298+45.04	355.00 R	POND CORNER
13	298+20.04	330.00 R	POND CORNER
14	298+20.04	100.00 R	POND CORNER

HWA # 1070	SHEET NO 1





SECTION A-A



SECTION B-B

SEP 1 3 2005

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

	NAME	DATE		NAME	DATE
DESIGNED BY	SH	9/08/05	DRAWN BY	HSA	9/08/05
CHECKED BY	XXX	XX/XX	CHECKED BY	XXX	XX/XX
SUPERVISED BY	SHAWN HINDLE, P.E				

OSCEOLA COUNTY
FLORIDA

HWA
LAND DEVELOPMENT CONSULTANTS

KISSIMMEE PARK ROAD
POND 300 MASS GRADING PLAN
SHEET: 1 OF 1

Shawn Hindle P.E
FL Reg #48165

STAFF REPORT DISTRIBUTION LIST

KISSIMMEE PARK ROAD WIDENING

Application No: 050816-6

Permit No: 49-01399-P

INTERNAL DISTRIBUTION

X Alan L. Leavens - 2250
X Susan C. Elfers - 2250
X Edward W. Yaun, P.E. - 2250
X Marc S. Ady - 2250
X A. Lee - 2250
X ERC Engineering - 2250
X ERC Environmental - 2250
X M. Soto-4240
X Permit File

EXTERNAL DISTRIBUTION

X Permittee - Osceola County
X Permittee - Schoolfield Properties Inc
X Engr Consultant - Hanson Walter & Associates Inc

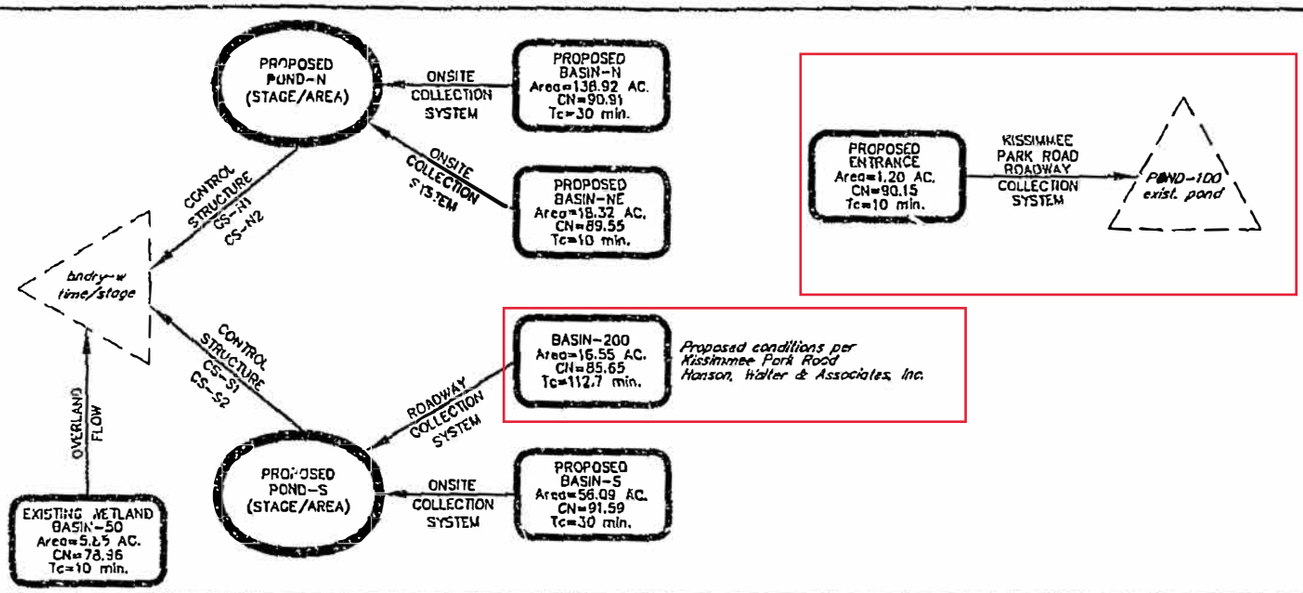
GOVERNMENT AGENCIES

X Div of Recreation and Park - District 6 - FDEP
X Florida Fish & Wildlife Conservation Commission - Imperiled Species Mgmt Section
X Osceola County Engineer
X US Army Corps of Engineers - Merritt Island Reg Office - CESAJ-RD-AM

OTHER INTERESTED PARTIES

X Sierra Club - Central Florida Group P.O. Box 941692
X Water Management Institute - Michael N. Vanatta

EXHIBIT 7



NODE REACH LEGEND

BASIN-N	THE NORTH BASIN (PHASE-2 CONSTRUCTION) IS COMPRISED OF A MIXTURE OF SINGLE FAMILY RESIDENTIAL AND MULTIFAMILY UNITS WITH SUPPORTING ROADWAYS, SIDEWALKS, OPEN SPACES AND STORMWATER FACILITIES. STORMWATER WATER QUALITY AND RATE ATTENUATION IS DISCHARGED TO THE EASTERLY RIGHT-OF-WAY FOR THE FLORIOA TURNPIKE.
BASIN-NE	THE NORTHEAST BASIN (PHASE-2 CONSTRUCTION) IS COMPRISED OF AN ENTRANCE ROADWAY SYSTEM AND TWO MULTIFAMILY DEVELOPMENTS WITH SUPPORTING PARKING LOTS, SIDEWALKS, OPEN SPACES AND STORMWATER FACILITIES. STORMWATER WATER QUALITY AND RATE ATTENUATION IS DISCHARGED TO THE EASTERLY RIGHT-OF-WAY FOR THE FLORIDA TURNPIKE.
BASIN-S	THE SOUTH BASIN (PHASE-1 CONSTRUCTION) IS COMPRISED OF A MIXTURE OF SINGLE FAMILY RESIDENTIAL AND MULTIFAMILY UNITS WITH SUPPORTING ROADWAYS, SIDEWALKS, OPEN SPACES AND STORMWATER FACILITIES. THE SOUTH POND ALSO PROVIDES WATER QUALITY TREATMENT AND RATE ATTENUATION FOR THE KISSIMMEE PARK ROAD IMPROVEMENTS AS PREPARED BY HANSON WALTER & ASSOCIATES, INC. DISCHARGE FROM THE SOUTH POND IS DISCHARGED TO THE EASTERLY RIGHT-OF-WAY FOR THE FLORIDA TURNPIKE.
PROPOSED ENTRANCE	PORTION OF THE PROPOSED ENTRANCE DRIVE FROM KISSIMMEE PARK ROAD ENTERING THE DEVELOPMENT AT THE NORTHEAST CORNER. THIS AREA IS INCLUDED IN THE BASIN FOR THE DRAINAGE FACILITY POND LOCATED AT THE NORTHEAST CORNER OF KISSIMMEE PARK ROAD AND NEPTUNE ROAD (POND-100 AS PERMITTED BY HANSON, WALTER & ASSOCIATES, INC.)
BASIN-50	EXISTING WETLAND DRAINING DIRECTLY TO THE EAST RIGHT-OF-WAY FOR THE FLORID TURNPIKE.
POND-100	EXISTING POND-100 LOCATED AT THE NORTHEAST CORNER OF KISSIMMEE PARK ROAD AND NEPTUNE ROAD AS DESIGNED AND PERMITTED BY HANSON, WALTER & ASSOCIATES, INC.
BASIN200	KISSIMMEE PARK ROAD DRAINAGE AS PER HANSON, WALTER & ASSOCIATES, INC. PROPOSED IMPROVEMENTS
BNDRY-NE	BOUNDARY NODE TAILWATER CONDITION TIME / STAGE MODEL
BNDRY-W	BOUNDARY NODE TAILWATER CONDITION TIME / STAGE MODEL

REVISED - MAY, 2004

NODE REACH DIAGRAM
PROPOSED CONDITIONS

Miller Einhouse Rymer & Boyd
- Community Planning
- Project Management
- Civil Engineering
- Landscape Architecture

CERT. OF AUTH. #00006087

230 East Monument Ave., Suite B
Kissimmee, Florida 34741

Phone: (407) 343-8192
Fax: (407) 343-1994
www.MERandB.com

ANTHEM PARK
CITY OF ST.CLOUD, FLORIDA
PREPARED FOR: D.R. HORTON

DATE: March, 2004
SCALE: NONE
PROJECT NO.: 130.111
EXHIBIT **H**

PROJECT NAME: DR HORTON @ EARL PARTIN PROPERTY
PROJECT NUMBER: 130.111
FILENAME: 130111-STORM7-PROPOSED-3.xls

18-Mar-04
09:12 AM

DEVELOPED CONDITIONS - (SOUTH BASIN)

BASIN		NUMBER OF UNITS	AREA (ft^2)	CN	PRODUCT CN x A	C	PRODUCT C x A
HOUSE PAD	3,737	189	706,293	98.00	69,210,714	0.95	670,978
DRIVEWAYS (UNITS)	(16'x20')	189	60,480	98.00	5,927,040	0.95	57,456
SIDWALKS			73,444	98.00	7,197,512	0.95	69,772
ROADWAYS			234,186	98.00	22,950,228	0.95	222,477
TOWNHOMES			201,168	98.00	19,714,464	0.30	60,350
MULTIFAMILY				98.00	0	0.30	0
RIGHT-OF-WAY			524,609	80.00	41,968,720	0.30	157,383
PERVIOUS			374,624	80.00	29,969,936	0.30	112,387
WET PONDS			268,346	100.00	26,834,600	1.00	268,346
TOTAL			2,443,150 s.f. 56.09 ac.		223,779,214		1,619,149

CN' =	91.59	C =	0.66

QUALITY VOLUME REQUIREMENTS

1 INCH over BASIN 4.67 AC.FT. <<=== GREATER VOLUME

2.5 INCH over PERCENT IMPERVIOUS

Total Basin =	56.09	A.C.
Roof =	20.83	A.C.
Ponds =	6.16	A.C.
Pervious =	20.64	A.C.
Asphalt =	5.38	A.C.
% Impervious =	18%	
VOLUME =	1.92	AC.FT.

REQUIRED VOLUME = 4.67 AC.FT.
203,596 C.F. ← SOUTH BASIN

Prepared by:
MILLER, EINHOUSE, RYMER and BOYD

PROJECT NAME: KISSIMMEE PARK ROAD
PROJECT No.: 130.111
FILE NAME: *130111-kissimmee-park-rd-only-summarys.xls*

3/18/2004
3:29 PM

Summary for BASIN-200 (Proposed Conditions)

Total Impervious (exist.roadway & sidewalk features) =	7.18	acres
Total Pervious (remaining r.o.w. pervious) =	3.25	acres
Open Space *(14.12 ac Open Space - OS-5A from Post Drainage Map)* =	6.12	acres
Model basin area totals =	**16.55**	**acres**

Breakout summary information per Kissimmee Park Road for BASIN-200

			CN Values per report	Product Area X CN
Sta. 3[illegible]00 to 36[illegible]2 x 110' R.O.W. =	454,520	s.f.		
Kissimmee Park Road R.O.W. =	10.43	acres		
Exist.roadway impervious =	2.28	acres	98	223.44
Proposed roadway improvements *(new impervious)* =	4.90	acres	98	480.20
Exist.roadway pervious *(remaining after improvements)* =	3.25	acres	69	224.25
Open Space *(14.12 ac Open Space - O.S.-5A from Post Drainage Map)* =	6.12	acres	80	489.60

Exist. Road =	10.43	ac.	88.96
Open Space =	6.12	ac.	80.00

Weighted CN =	**85.65**

Note:
The Curve Number (CN) value for proposed pond should be 100 for wate
69 for the existing hydrologic soils group. As a result, this
model shall take into consideration the adjussted CN value
for roadway Basin-200.

Kissimmee Park Road Right-of-Way Quality Volume Computations

Quality volume is 2.5 inches (0.208 ft) of stormwater runoff over the percent impervious multiplied by the overall basin area.

Impervious area =	7.18	acres
R.O.W. basin area =	10.43	acres
R.O.W. % impervious (imp. area / basin area) =	68.8	%
Quality Volume =	.50	ac.ft.

Kissimmee Park Road Quality Volume Computations

Quality volume is 1 inch (0.083 ft) of stormwater runoff over the entire basin area.

Open Space basin area =	6.12	acres
1" over open space basin area =	22,216	c.f.
1" over open space basin area =	0.51	ac.ft.
Quality Volume =	0.51	ac.ft.

Greater water quality volume =	2.01	ac.ft.

← KISSIMMEE PARK ROAD WATER QUALITY VOLUME

Prepared by:
Miller, Einhouse, Rymer and Boyd

PROJECT NAME: DR HORTON @ EARL PARTIN PROPERTY
PROJECT NUMBER: 130.111
FILENAME: 130111-STORM7-PROPOSED-3.xls

18-Mar-04
09:12 AM

STAGE-STORAGE & STAGE-DISCHARGE
DEVELOPED CONDITIONS - (SOUTH BASIN)

REQUIRED WATER QUALITY VOLUME
4.67 AC.FT.
203,596 C.F.

REQUIRED WATER QUALITY VOLUME (Kissimmee Park Rd.)
2.01 AC.FT.
87,556 C.F.

6.68 AC.FT.
291,151 C.F.

← TOTAL WATER QUALITY VOLUME

					DEFAULT VALUES	
64.00	165,103	103,243				
69.00	203,368	130,379	0.10			
ELEV	z AREA (ft^2)	POND AREA (ft^2)	TOTAL AREA (ft^2)	TOTAL AREA (acres)	'V' INC. VOL. (ft^3)	'V' INC. VOL. (acft)
64.00	165,103	103,243	268,346	6.1604	0	-
64.10	165,868	103,786	269,654	6.1904	26,900	0.618
64.20	166,634	104,328	270,962	6.2204	53,931	1.238
64.30	167,399	104,871	272,270	6.2505	81,092	1.862
64.40	168,164	105,414	273,578	6.2805	108,385	2.488
64.50	168,930	105,957	274,886	6.3105	135,808	3.118
64.60	169,695	106,499	276,194	6.3405	163,362	3.750
64.70	170,460	107,042	277,502	6.3706	191,047	4.386
64.80	171,225	107,585	278,810	6.4006	218,862	5.024
64.90	171,991	108,127	280,118	6.4306	246,809	5.666
65.00	172,756	108,670	281,426	6.4607	274,886	6.311
65.10	173,521	109,213	282,734	6.4907	303,094	6.958
65.20	174,287	109,756	284,042	6.5207	331,433	7.609
65.30	175,052	110,298	285,350	6.5507	359,903	8.262
65.40	175,817	110,841	286,658	6.5808	388,503	8.919
65.50	176,582	111,384	287,966	6.6108	417,234	9.578
65.60	177,348	111,927	289,274	6.6408	446,096	10.241
65.70	178,113	112,469	290,582	6.6709	475,089	10.907
65.80	178,878	113,012	291,890	6.7009	504,213	11.575
65.90	179,644	113,555	293,198	6.7309	533,467	12.247
66.00	180,409	114,097	294,506	6.7609	562,852	12.921
66.10	181,174	114,640	295,814	6.7910	592,368	13.599
66.20	181,940	115,183	297,122	6.8210	622,015	14.280
66.30	182,705	115,726	298,430	6.8510	651,793	14.963
66.40	183,470	116,268	299,738	6.8810	681,701	15.650
66.50	184,235	116,811	301,046	6.9111	711,741	16.339
66.60	185,001	117,354	302,355	6.9411	741,911	17.032
66.70	185,766	117,896	303,663	6.9711	772,212	17.728
66.80	186,531	118,439	304,971	7.0012	802,643	18.426
66.90	187,297	118,982	306,279	7.0312	833,206	19.128
67.00	188,062	119,525	307,587	7.0612	863,899	19.832
67.10	188,827	120,067	308,895	7.0912	894,723	20.540
67.20	189,593	120,610	310,203	7.1213	925,678	21.251
67.30	190,358	121,153	311,511	7.1513	956,763	21.964
67.40	191,123	121,695	312,819	7.1813	987,980	22.681
67.50	191,888	122,238	314,127	7.2114	1,019,327	23.401
67.60	192,654	122,781	315,435	7.2414	1,050,805	24.123
67.70	193,419	123,324	316,743	7.2714	1,082,414	24.849
67.80	194,184	123,866	318,051	7.3014	1,114,154	25.577
67.90	194,950	124,409	319,359	7.3315	1,146,024	26.309
68.00	195,715	124,952	320,667	7.3615	1,178,026	27.044
68.10	196,480	125,495	321,975	7.3915	1,210,158	27.781
68.20	197,246	126,037	323,283	7.4216	1,242,421	28.522
68.30	198,011	126,580	324,591	7.4516	1,274,814	29.266
68.40	198,776	127,123	325,899	7.4816	1,307,339	30.012
68.50	199,541	127,665	327,207	7.5116	1,339,994	30.762
68.60	200,307	128,208	328,515	7.5417	1,372,780	31.515
68.70	201,072	128,751	329,823	7.5717	1,405,697	32.270
68.80	201,837	129,294	331,131	7.6017	1,438,745	33.029
68.90	202,603	129,836	332,439	7.6317	1,471,923	33.791
69.00	203,368	130,379	333,747	7.6618	1,505,232	34.555

← QUALITY WEIR ELEV.

Prepared by:
MILLER, EINHOUSE, RYMER and BOYD

SCANNED 09/17/2005 JC

Last Date For Agency Action: 08-MAY-2005

GENERAL SURFACE WATER MANAGEMENT STAFF REPORT

Project Name: West New Nolte Road Rehab

Permit No.: 49-00504-S

Application No.: 040604-10

Application Type: Surface Water Management (General Permit Modification)

Location: Osceola County, S16/T26S/R30E

Permittee : Osceola County
Cypress Point Homeowners Association

Operating Entity : Cypress Point Homeowners Association

Project Area: 12.47 acres

Project Land Use: Highway

Drainage Basin: LAKE TOHOPEKALIGA

Receiving Body: Wetland-8W via Pond PA10 **Class:** CLASS III

Special Drainage District: NA

Conservation Easement To District : No

Sovereign Submerged Lands: No

PROJECT PURPOSE:

Modification of a Surface Water Management General Permit to authorize construction and operation of a surface water management system to serve 12.47 acres of a roadway project known as West New Nolte Road Rehab. Staff recommends approval with conditions.

EXHIBIT 2A

SCANNED 09/17/2009 JC

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The site is located between Kissimmee Park Road and Pine Chase Circle within the Steven's Plantation in Osceola County.

There are permitted surface water management facilities within the project area. The site from within the limits of the roadway right-of-way contain the existing two-lane roadway with corresponding swales.

The project is proposed to occur within the existing road right-of-way that lies in single- and multi- family residential neighborhoods of the town. There are no wetlands or other surface waters located within or affected by the proposed project.

PROPOSED PROJECT:

Construction proposed consists of the surface water management system serving the improvements to the West New Nolte Road Rehab.

This road is an existing two-lane roadway with swales. The improvements consist of widening the roadway to a 4-lane divided roadway with an enclosed drainage system to match and tie into the typical section of West New Nolte Road within the Steven's Plantation.

The water management system will consist of curb inlets and the corresponding culverts to collect and convey project runoff to Pond PA10 located in the Cypress Point Phase II Subdivision. The applicant has submitted calculations and analyses to show that the peak stage for the 100-year 72-hour storm within Pond PA10 increased by less than 0.1 foot due to the added impervious area directed to the pond for treatment. The existing pond has sufficient capacity to provide adequate water quality treatment and attenuation for the proposed project as well as the 121.45-acre contributory drainage basin.

Documentation has been submitted showing that the Cypress Point Homeowner's Association acknowledges that Pond PA10 will provide treatment and attenuation for the widening of the West New Nolte Road.

The Cypress Point Homeowner's Association will be the responsible party for the operation and maintenance of Pond PA10. Operation and maintenance of the roadway secondary system will be the responsibility of Osceola County.

LAND USE:

Construction:
Project:

	This Phase	
Impervious	6.00	acres
Pervious	6.47	acres
Total:	**12.47**	

WATER QUANTITY :

Peak discharge was computed with respect to a 121.45-acre contributory drainage basin area discharging into Pond PA10 within the Cypress Point Phase II Subdivision.

SCANNED 09/17/2009 JC

Discharge Rate :

As shown in the table below, the proposed project discharge is within the allowable limit for the area.

Discharge Storm Frequency : 10 YEAR-3 DAY Design Rainfall : 7.5 inches

Basin	Allow Disch (cfs)	Method Of Determination	Peak Disch (cfs)	Peak Stage (ft, NGVD)
West New Nolte Road	133	Previously Permitted	126.18	70.81

Finished Floors :

Building Storm Frequency : 100 YEAR-3 DAY Design Rainfall : 12 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Finished Floors (ft, NGVD)	FEMA Elevation (ft, NGVD)
West New Nolte Road	71.23	71.23	N/A

Road Design :

As shown in the following table and the attached exhibits, minimum road center lines have been set at or above the calculated design storm flood elevation.

Road Storm Frequency : 10 YEAR-1 DAY Design Rainfall: 5 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Road Crown (ft, NGVD)
West New Nolte Road	70.43	70.43

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NGVD)	WSWT Ctrl Elev (ft, NGVD)	Method Of Determination
West New Nolte Road	12.47	68.5	68.50	Previously Permitted

WATER QUALITY :

No adverse water quality impacts are anticipated as a result of the proposed project. The master surface water management pond PA10 located in the Cypress Point Phase II Subdivision provides the required treatment and attenuation for the project area.

Basin	Treatment Method			Vol Req.d (ac-ft)	Vol Prov'd (ac-ft)
West New Nolte Road	Treatment	Wet Detention	2.5 acres	3.62	3.89

CERTIFICATION AND MAINTENANCE OF THE WATER MANAGEMENT SYSTEM:

It is suggested that the permittee retain the services of a Professional Engineer registered in the State of Florida for periodic observation of construction of the surface water management (SWM) system. This will facilitate the completion of construction completion certification Form #0881 which is required pursuant to Section 10 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, and Rule 40E-4361(2), Florida Administrative Code (F.A.C.).

EXHIBIT 2C

SCANNED 09/17/2008 JC

Pursuant to Chapter 40E-4 F.A.C., this permit may not be converted from the construction phase to the operation phase until certification of the SWM system is submitted to and accepted by this District. Rule 40E-4.321(7) F.A.C. states that failure to complete construction of the SWM system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization unless a permit extension is granted.

For SWM systems permitted with an operating entity who is different from the permittee, it should be noted that until the permit is transferred to the operating entity pursuant to Rule 40E-1.6107, F.A.C., the permittee is liable for compliance with the terms of this permit.

The permittee is advised that the efficiency of a SWM system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. Maintenance of the SWM system is required to protect the public health, safety and the natural resources of the state. Therefore, the permittee must have periodic inspections of the SWM system performed to ensure performance for flood protection and water quality purposes. If deficiencies are found, it is the responsibility of the permittee to correct these deficiencies in a timely manner.

SCANNED 09/17/2009 JC

RELATED CONCERNS:

Water Use Permit Status:

The applicant has indicated that dewatering is not required for construction of this project.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation, unless the work qualifies for a No-Notice Short-Term Dewatering permit pursuant to Chapter 40E-20.302(3) or is exempt pursuant to Section 40E-2.051, FAC.

Historical/Archeological Resources:

No information has been received that indicates the presence of archaeological or historical resources or that the proposed activities could cause adverse impacts to archaeological or historical resources.

DCA/CZM Consistency Review:

The District has not received a finding of inconsistency from the Florida Department of Environmental Protection or other commenting agencies regarding the provisions of the federal Coastal Zone Management Plan.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF REVIEW:

DIVISION APPROVAL:

SURFACE WATER MANAGEMENT:

Edward W. Yaun, P.E. DATE: 5/4/05

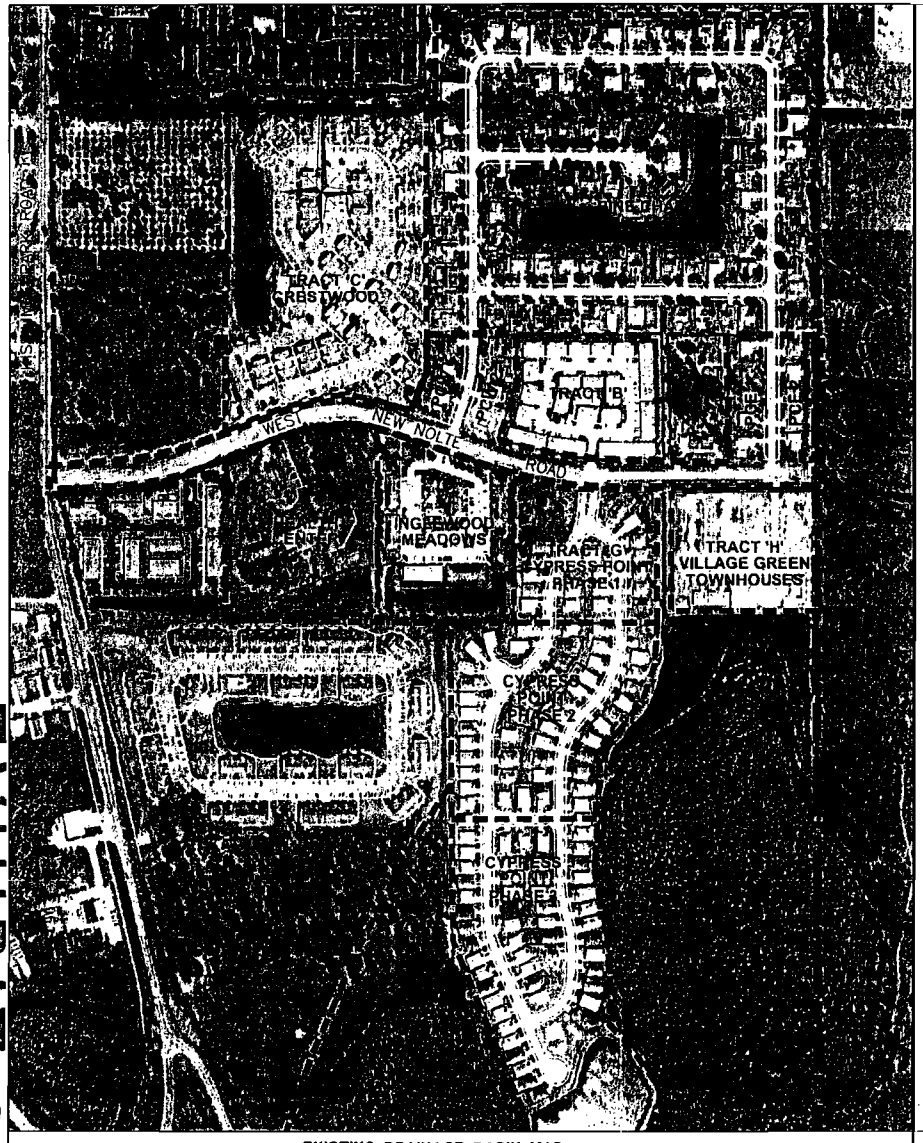
NATURAL RESOURCE MANAGEMENT:

Marc S. Ady DATE: 5/4/05

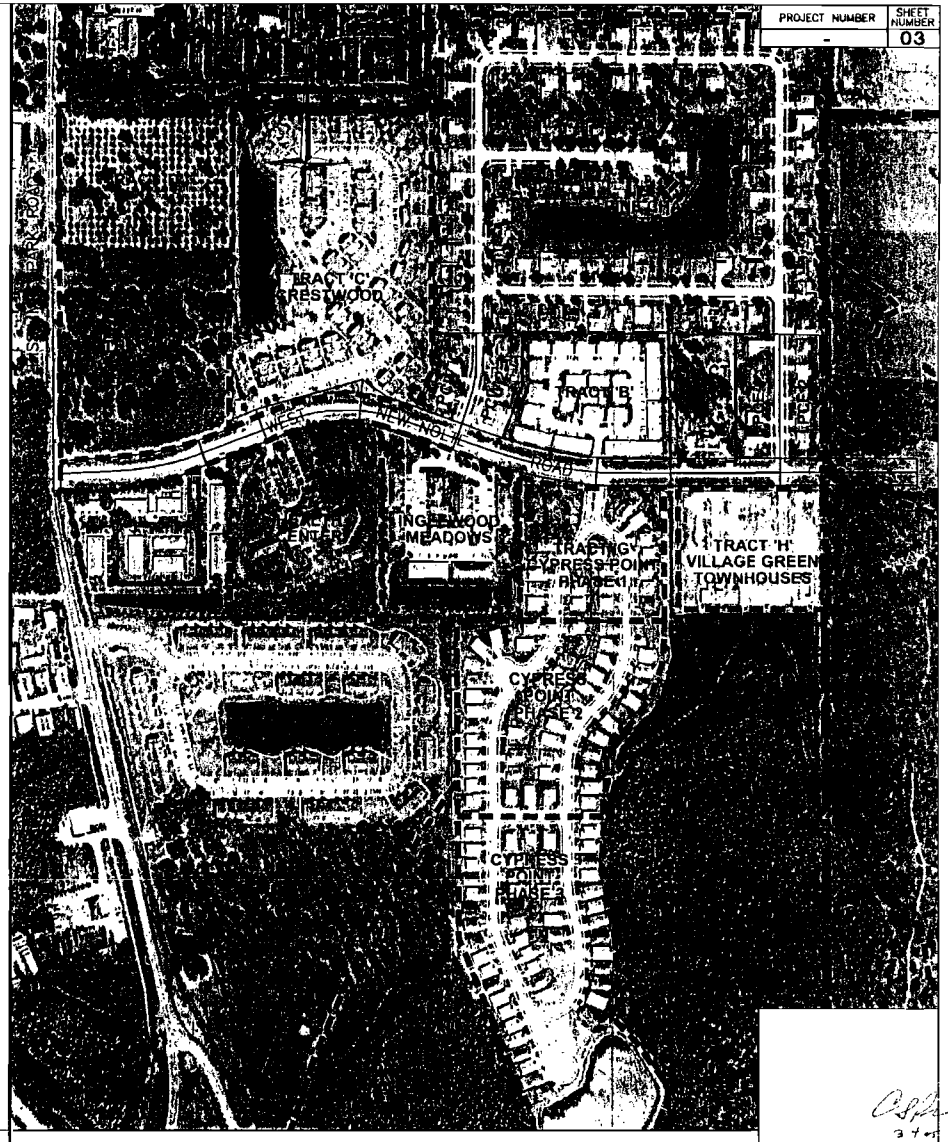
EXHIBIT 2E

SCANNED 09/17/2009 JC

PROJECT NUMBER	SHEET NUMBER
-	03



EXISTING DRAINAGE BASIN MAP
SCALE: 1"=200'



PROPOSED DRAINAGE BASIN MAP
SCALE: 1"=200'

REVISIONS					
DATE	BY	DESCRIPTIONS	DATE	BY	DESCRIPTIONS
3/26/04	MW	REVISED RHPA BASIN LINES			

	NAME		NAME
DESIGNED BY		DRAWN BY	MCGUIN
CHECKED BY		CHECKED BY	
		DATE:	

CITY OF SAINT CLOUD

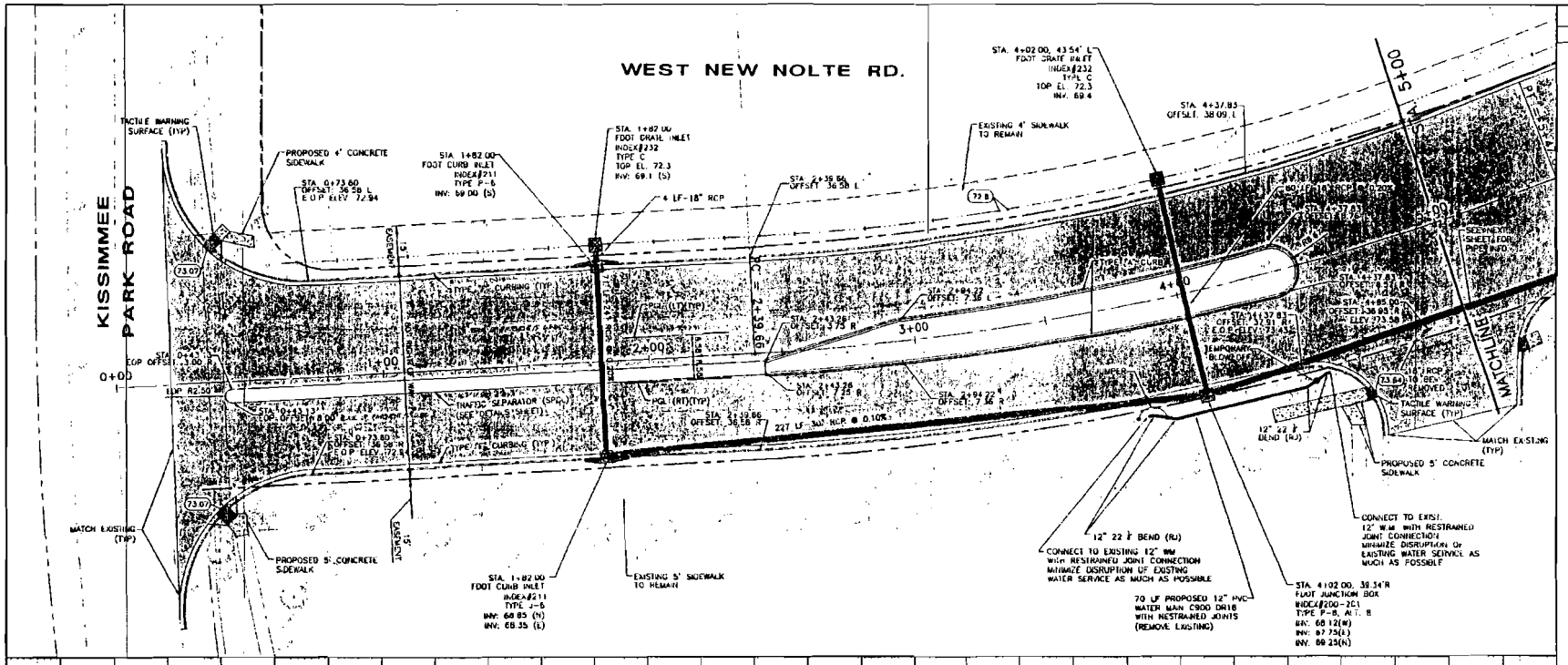
DUFRESNE-HENRY
FLORIDA CERTIFICATE
No. 6075

DRAINAGE BASIN MAP
WEST NEW NOLTE ROAD REHAB

EXHIBIT 3

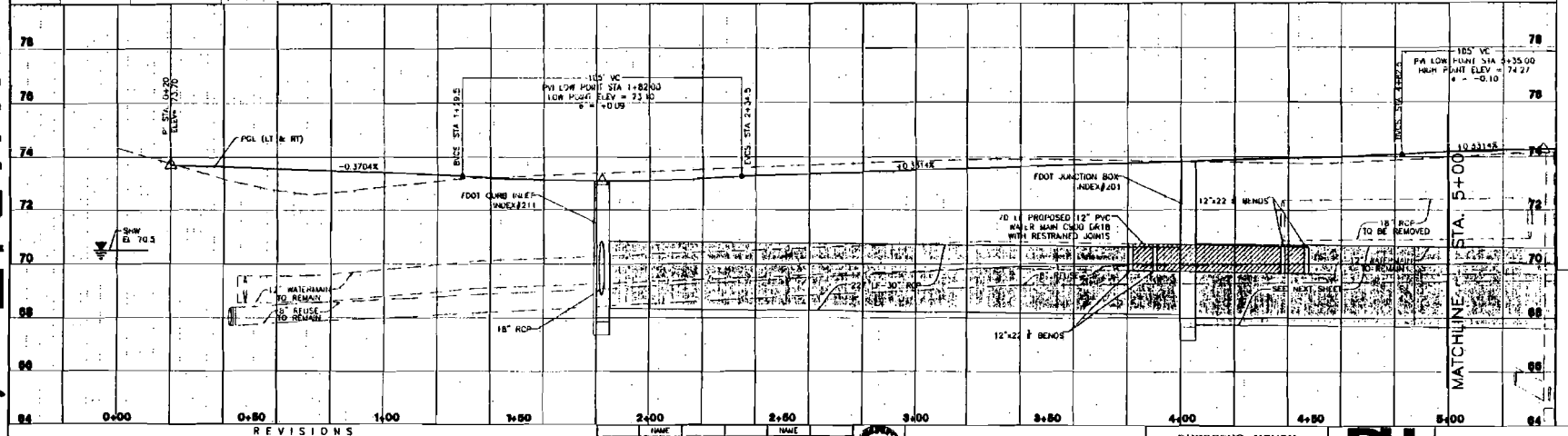
SCANNED 09/17/2009 JC

PROJECT NUMBER	SHEET NUMBER
-	07



DIMENSIONS, CURVE RADII, AND STATIONS INFORMATION ARE REFERENCED TO BACK OF CURB OR EDGE OF PAVEMENT WHEN NO CURB IS PRESENT UNLESS OTHERWISE NOTED.

SEE CROSS SECTIONS SHEET FOR ROADWAY CROSS-SLOPE INFORMATION



REVISIONS					
DATE	BY	DESCRIPTIONS	DATE	BY	DESCRIPTIONS
11-08-01	DB	CHANGED PIPE SIZES, INDEX, TRAFFIC SEPARATOR, STORM STRUCTURES			

	NAME		NAME
DESIGNED BY		DRAWN BY	W.DOEN
CHECKED BY		CHECKED BY	
DATE			

CITY OF SAINT CLOUD

DUFRESNE HENRY
FLORIDA CERTIFICATE
No. 6075

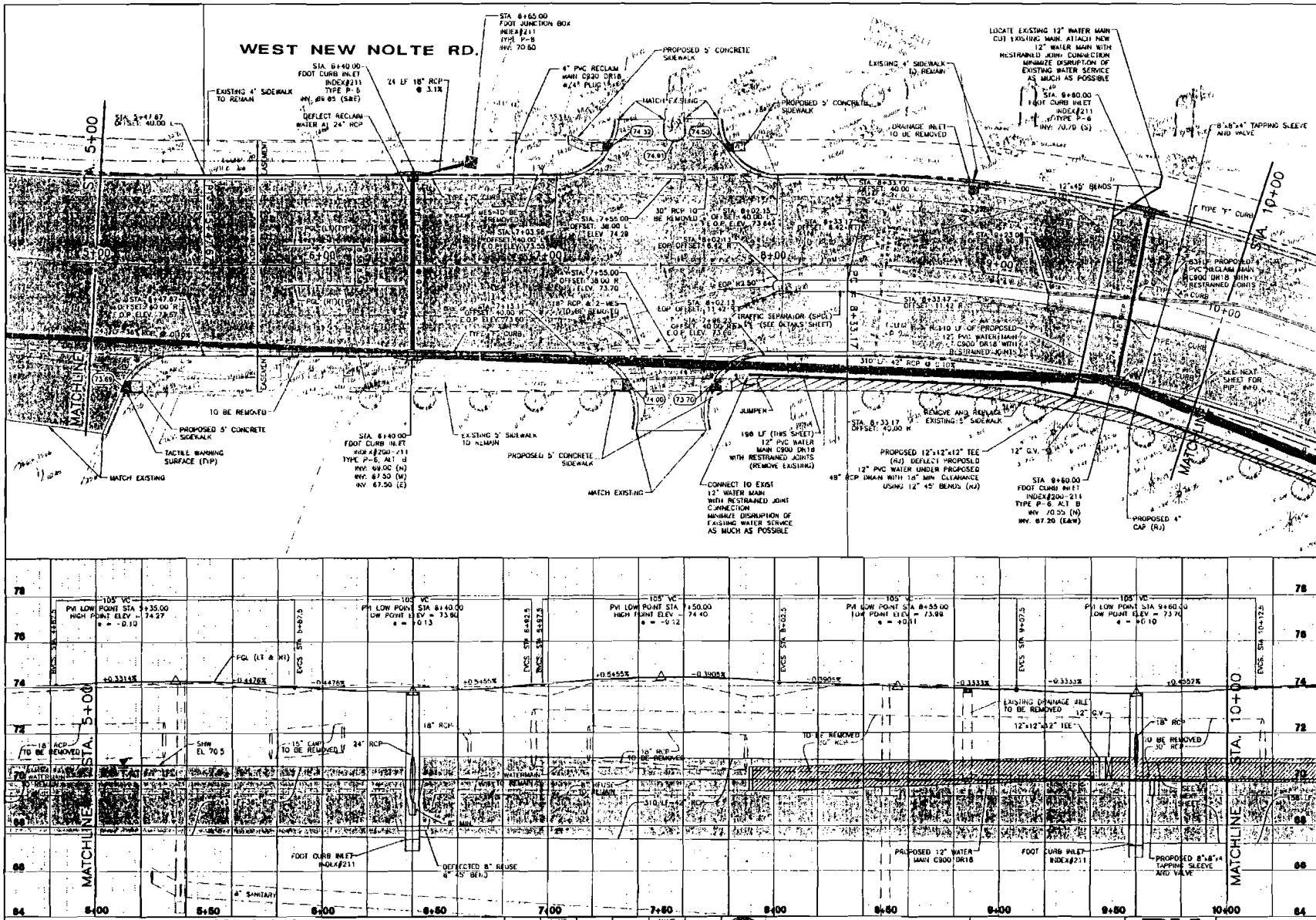
PLAN AND PROFILE
WEST NEW NOLTE ROAD REHAB

3-Y-5

EXHIBIT 4

SCANNED 09/17/2009 JC

PROJECT NUMBER	SHEET NUMBER
-	08



DIMENSIONS, CURVE RADII AND STATIONS INFORMATION ARE REFERENCED TO BACK OF CURB OR EDGE OF PAVEMENT WHEN NO CURB IS PRESENT, UNLESS OTHERWISE NOTED

SEE CROSS SECTIONS SHEET FOR ROADWAY CROSS-SLOPE INFORMATION

CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT TREES ADJACENT TO CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTIONS	DATE	BY	DESCRIPTIONS
10-08-04	GB	CHANGED PIPE SIZES, ADDED TRAFFIC SEPARATOR, STORM STRUCTURES			

	NAME		NAME
DESIGNED BY		DRAWN BY	M COEN
CHECKED BY		CHECKED BY	

DATE:

CITY OF SAINT CLOUD

DUFRESNE-HENRY FLORIDA CERTIFICATE No. 6075

DH Dufresne-Henry

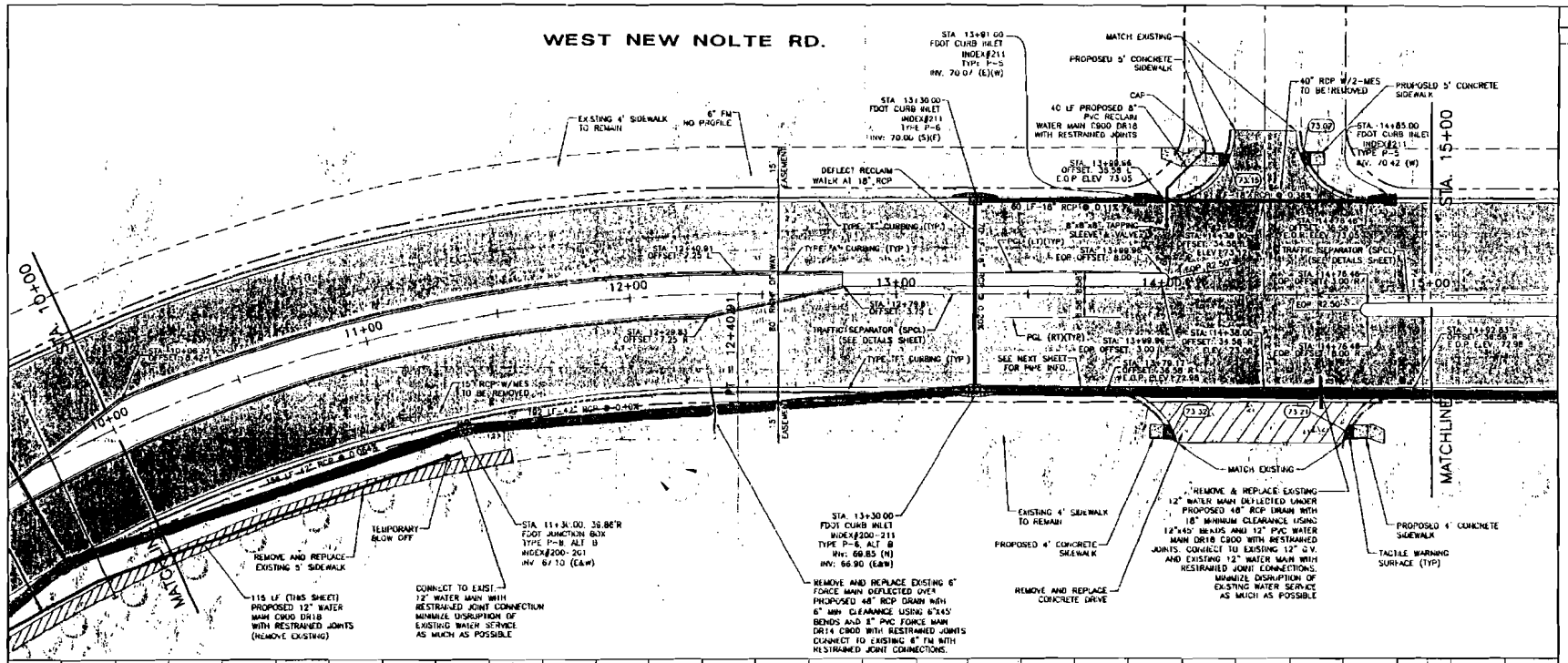
PLAN AND PROFILE WEST NEW NOLTE ROAD REHAB

EXHIBIT 5

SCANNED 09/17/2009 JC

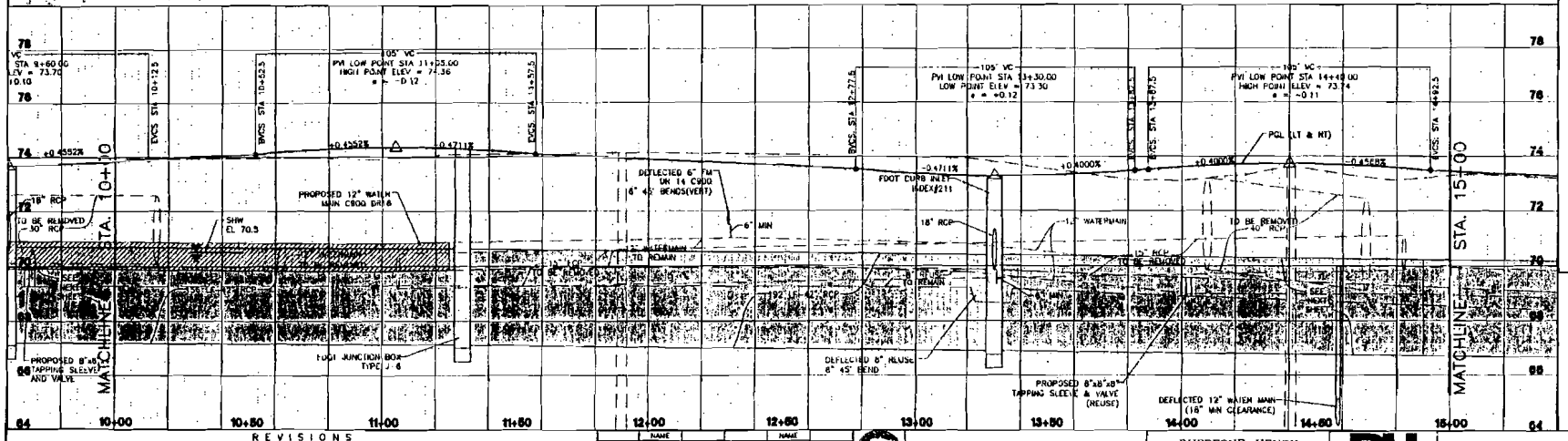
PROJECT NUMBER	SHEET NUMBER
-	09

WEST NEW NOLTE RD.



DIMENSIONS, CURVE RADII, AND STATIONS INFORMATION ARE REFERENCED TO BACK OF CURB OR EDGE OF PAVEMENT WHEN NO CURB IS PRESENT, UNLESS OTHERWISE NOTED

SEE CROSS SECTIONS SHEET FOR ROADWAY CROSS-SLOPE INFORMATION.



REVISIONS					
DATE	BY	DESCRIPTIONS	DATE	BY	DESCRIPTIONS
10-08-04	GB	CHANGED PIPE SIZES, ADDED TRAFFIC SEPARATOR, BRWM STRUCTURE			

	NAME		NAME
DESIGNED BY		DRAWN BY	M.CLAN
CO-EORED BY		CHECKED BY	
DATE:			

CITY OF SAINT CLOUD

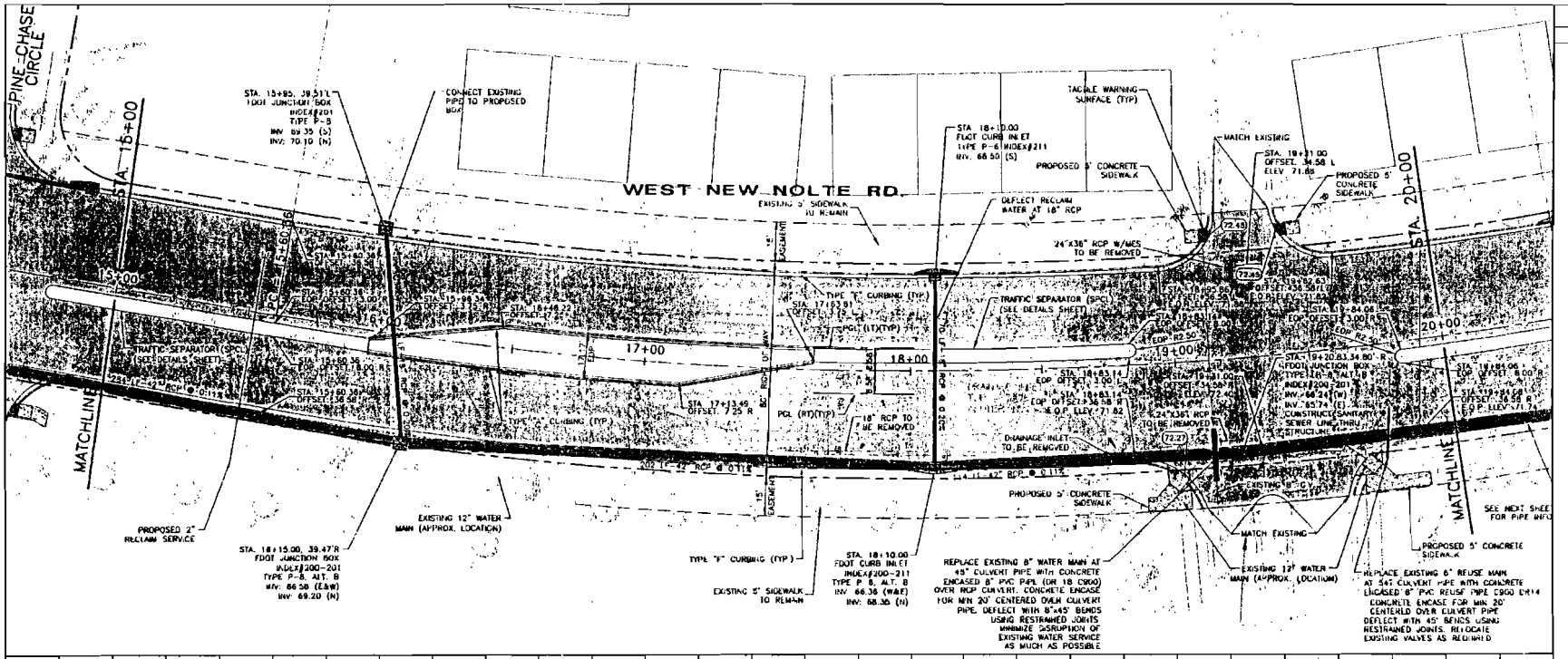
DUFRESNE-HENRY FLORIDA CERTIFICATE No. 8075

PLAN AND PROFILE
WEST NEW NOLTE ROAD REHAB

EXHIBIT 6

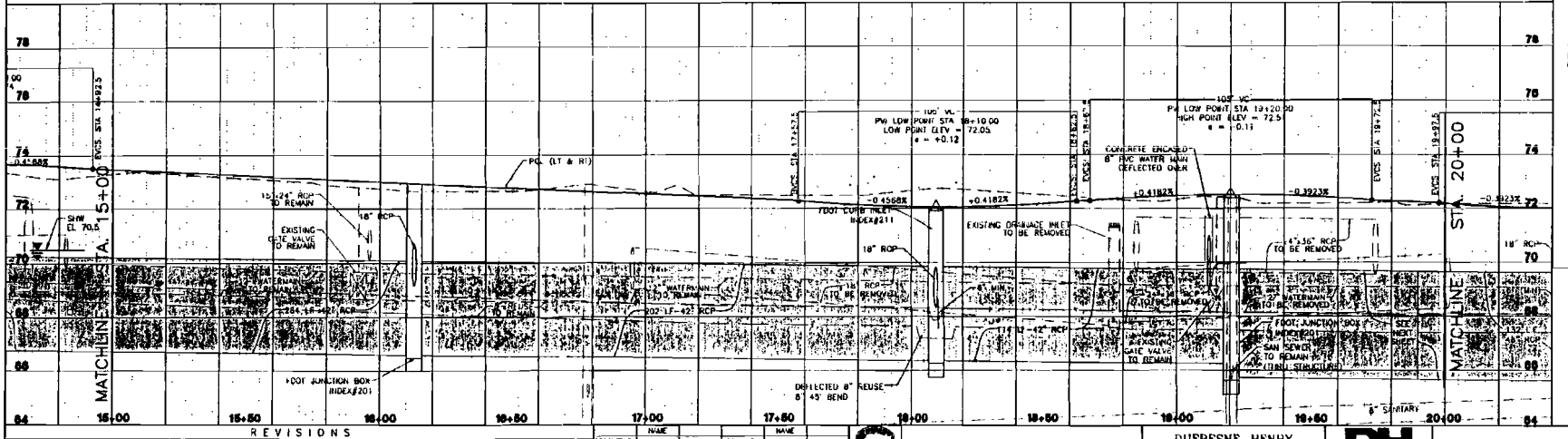
SCANNED 09/17/2009 JC

PROJECT NUMBER	SHEET NUMBER
-	10



DIMENSIONS, CURVE RADII, AND STATIONS INFORMATION ARE REFERENCED TO BACK OF CURB OR EDGE OF PAVEMENT WHEN NO CURB IS PRESENT, UNLESS OTHERWISE NOTED

SEE CROSS SECTIONS SHEET FOR ROADWAY CROSS-SLOPE INFORMATION



REVISIONS					
DATE	BY	DESCRIPTIONS	DATE	BY	DESCRIPTIONS

DESIGNED BY / CHECKED BY / DRAWN BY / CHECKED BY / DATE

CITY OF SAINT CLOUD

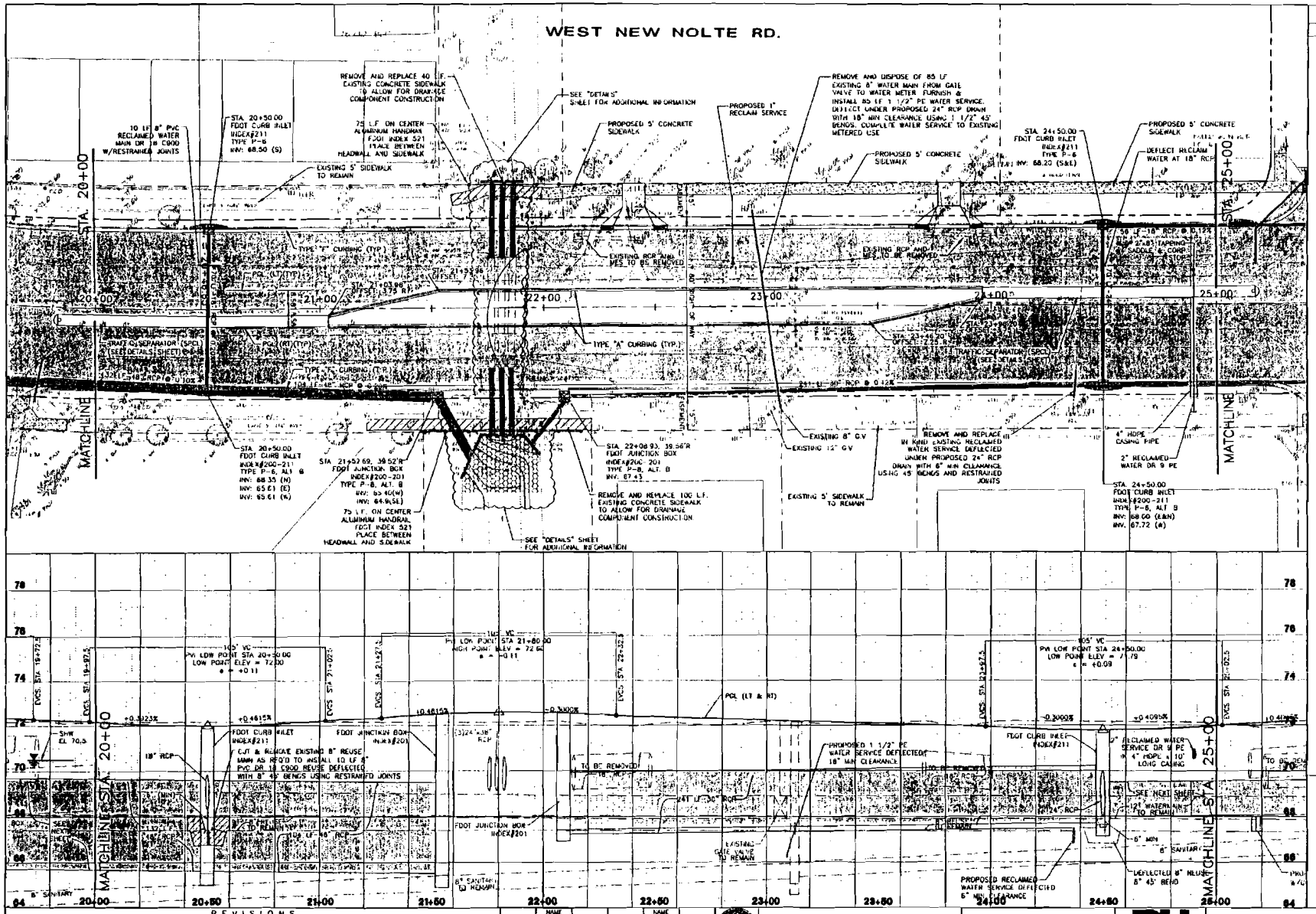
DUFRESNE-HENRY
FLORIDA CERTIFICATE
No. 6075

PLAN AND PROFILE
WEST NEW NOLTE ROAD REHAB

EXHIBIT 7

SCANNED 09/17/2009 JC

PROJECT NUMBER	SHEET NUMBER
-	11



DIMENSIONS, CURVE RADII, AND STATIONS INFORMATION ARE REFERENCED TO BACK OF CURB OR EDGE OF PAVEMENT WHEN NO CURB IS PRESENT UNLESS OTHERWISE NOTED

SEE CROSS SECTIONS SHEET FOR ROADWAY CROSS-SLOPE INFORMATION

REVISIONS			
	ADDED 2" REUSE SERVICE AT STA 24+90		
12-06-04	CHANGED PIPE SIZES, ADDED TRAFFIC SEPARATOR, STORM STRUCTURE		
DATE	BY	DESCRIPTIONS	DATE / BY / DESCRIPTIONS

DESIGNED BY / CHECKED BY — NAME
DRAWN BY M.QUEN — CHECKED BY — NAME
DATE:

CITY OF SAINT CLOUD

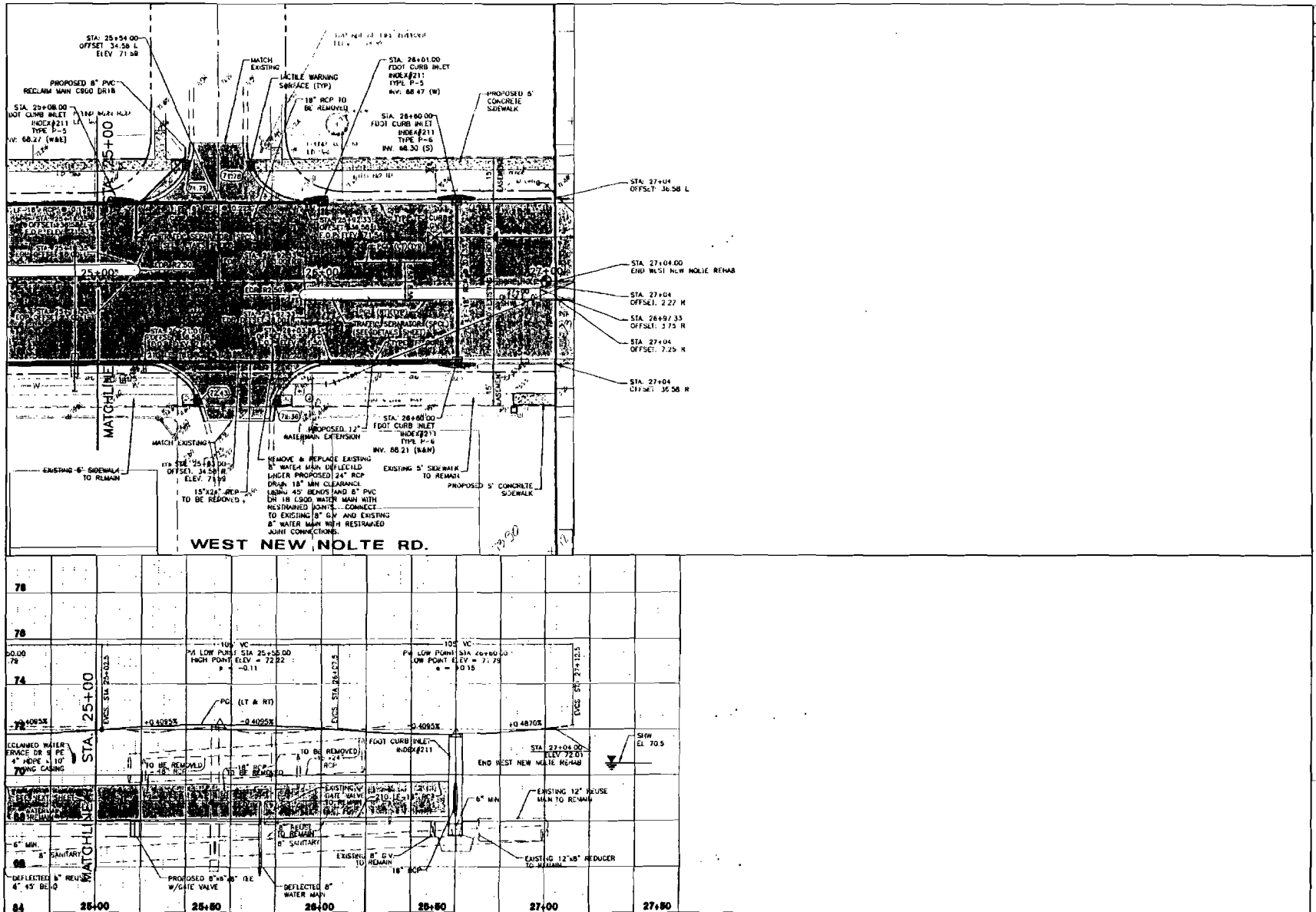
DUFRESNE-HENRY FLORIDA CERTIFICATE No. 6075

PLAN AND PROFILE WEST NEW NOLTE ROAD REHAB

EXHIBIT 8

SCANNED 09/17/2009 JC

PROJECT NUMBER	SHEET NUMBER
-	12



N

SCALE: 1" = 20' H

DIMENSIONS, CURVE RADII, AND STATIONS INFORMATION ARE REFERENCED TO BACK OF CURB OR EDGE OF PAVEMENT WHEN NO CURB IS PRESENT UNLESS OTHERWISE NOTED

SEE CROSS SECTIONS SHEET FOR ROADWAY CROSS SLOPE INFORMATION.

REVISIONS

DATE	BY	DESCRIPTIONS	DATE	BY	DESCRIPTIONS
10-08-04	GB	CHANGED PIPE SIZES, ADDED TRAFFIC SEPARATOR, STORM STRUCTURES			

	NAME		NAME
DESIGNED BY		DRAWN BY	M.COEN
CHECKED BY		CHECKED BY	
DATE:			

CITY OF SAINT CLOUD

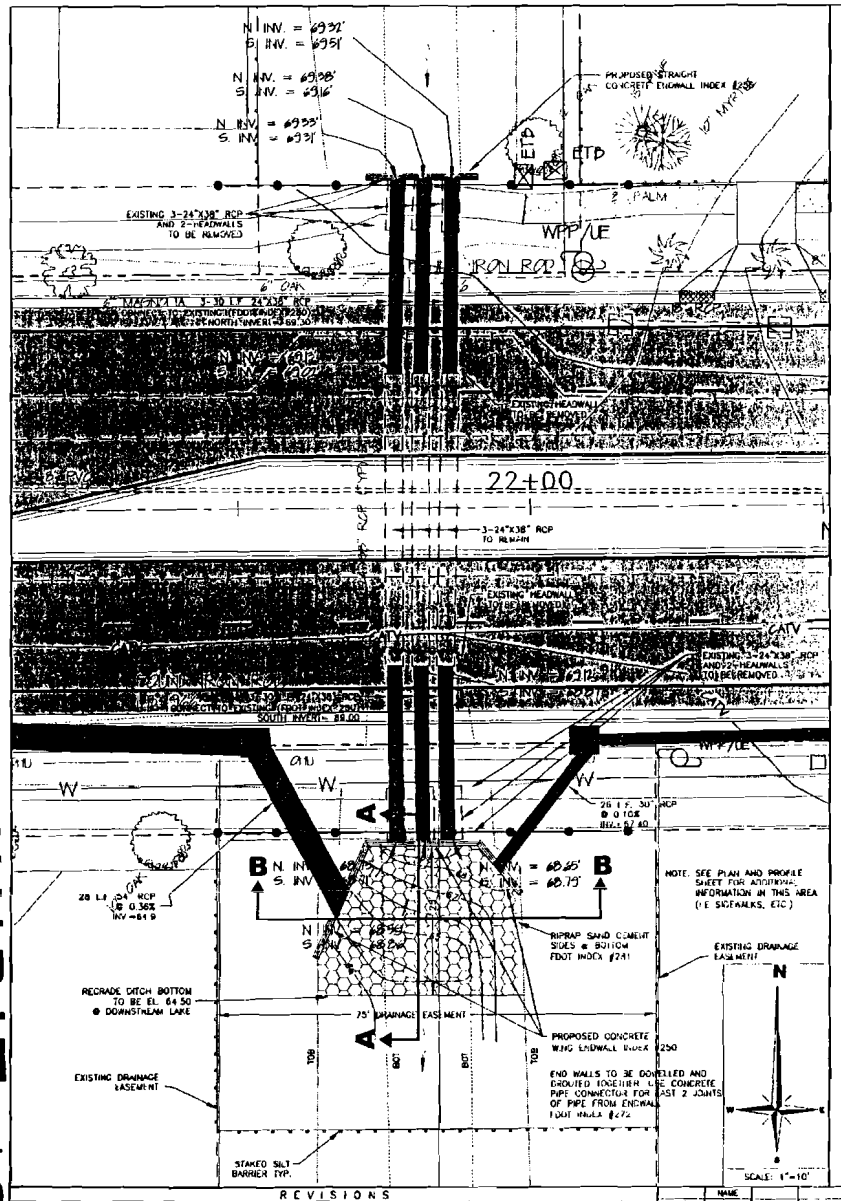
DUFRESNE-HENRY FLORIDA CERTIFICATE No. 6075

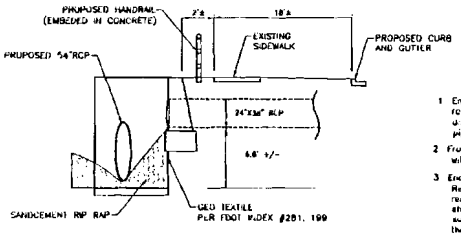
PLAN AND PROFILE WEST NEW NOLTE ROAD REHAB

EXHIBIT 9

SCANNED 09/17/2009 JC

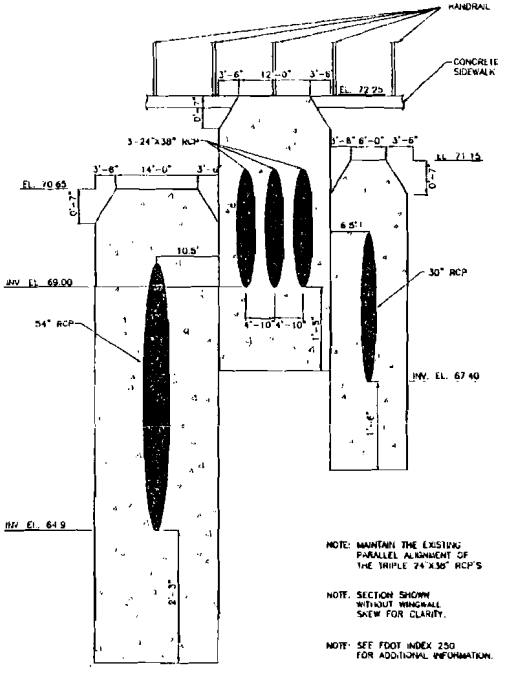
PROJECT NUMBER	SHEET NUMBER
-	20





SECTION A-A

N.T.S.



SECTION B-B

SCALE: 1"=10' HOR. 1"=1' VER.

GENERAL NOTES

1. Endwall dimensions, locations and positions are for round and elliptical concrete pipe and for round and pipe-arch corrugated metal pipe. Round concrete pipe shown.
2. Front slope and ditch transitions shall be in accordance with Index No. 280.
3. Endwalls may be cast in place or precast concrete. Reinforcing steel shall be Grades 40 or 60. Additional reinforcement necessary for handling precast units shall be determined by the Contractor or the supplier. Cost of reinforcement shall be included in the contract unit price for concrete, (endwalls).
4. All exposed corners and edges of concrete are to be chamfered ¾".
5. Concrete meeting the requirements of ASTM C-478 (4000 psi) may be used in lieu of Class ~ concrete in precast items manufactured in plants which are under the Standard Operating Procedures for the inspection of precast drainage products.
6. On outfall ditches with side slopes flatter than 1, provide 20' transitions from the endwall to the flatter side slopes, right of way permitting.
7. For sodding around endwalls see Index No. 281.
8. Payment for concrete quantities for endwalls skewed to the pipe shall be made on the following basis:

Endwall Skew To Pipe	Use Tabulated Value
0' to 5'	0'
6' to 15'	15'
16' to 30'	30'
31' or over	45'

9. Pipe length plan quantities shall be based on the pipe end locations shown in the standard location control end view, or lengths based on special endwall locations called for in the plans.
10. Payment for pipe in pipe culverts shall be based on plan quantities, adjusted for endwall locations subsequently established by the Engineer.
11. Endwalls to be paid for under the contract unit price for Class ~ Concrete (Endwalls), CY.

C.S.H. 3-4-05

REVISIONS					
DATE	BY	DESCRIPTIONS	DATE	BY	DESCRIPTIONS

DESIGNED BY / CHECKED BY — NAME — DRAWN BY / CHECKED BY — NAME M. COEN — DATE:

CITY OF SAINT CLOUD

DUFRESNE-HENRY FLORIDA CERTIFICATE No. 6075

DH Dufresne-Henry

DETAILS
WEST NEW NOLTE ROAD REHAB

EXHIBIT 10

SCANNED 09/17/2009 JC

STAFF REPORT DISTRIBUTION LIST

WEST NEW NOLTE ROAD REHAB

Application No: 040604-10

Permit No: 49-00504-S

INTERNAL DISTRIBUTION

X ANNETTE V BURKETT - 2250
X Susan C. Elfers - 2250
X Edward W. Yaun, P.E. - 2250
X Marc S. Ady - 2250
X A. Lee - 2250
X ERC Engineering - 2250
X ERC Environmental - 2250
X M. Soto-4240
X Permit File

EXTERNAL DISTRIBUTION

X Permittee - Osceola County
X Permittee - Cypress Point Homeowners Association
X Agent - Dufresne-Henry
X Applicant - Stevens Plantation Cdd
X Engr Consultant - Ron Howse Professional Associates

GOVERNMENT AGENCIES

X Div of Recreation and Park - District 6 - FDEP
X Florida Fish & Wildlife Conservation Commission - Imperiled Species Mgmt Section
X Osceola County Engineer
X US Army Corps of Engineers - Merritt Island Reg Office - CESAJ-RD-AM

OTHER INTERESTED PARTIES

X Sierra Club - Central Florida Group P.O. Box 941692
X Water Management Institute - Michael N. Vanatta

EXHIBIT 11

Alternative 1

Pond Construction Cost Estimates

DRAFT

Alternative 2

Pond Construction Cost Estimates

DRAFT

Pond Right-of-Way Cost Estimates

DRAFT

Project: FTE Widening from S. Kissimmee Park Rd to US 192 Designer: ALE Date: 12/27/2019
FPID: 441224-1-22-01 Reviewer: JAN Checked: 12/27/2019
County: Osceola
Alternative 1

Pond Name	Type	Estimated Pond Construction Cost	Estimated Pond R/W Cost	Total Cost
1-2	Wet Detention	$ 349,500.00	$ 845,055.00	$ 1,194,555.00
1-3	Wet Detention	$ 421,200.00	$ 2,572,348.00	$ 2,993,548.00
1-1	Dry Detention	$ 84,200.00	$ -	$ 84,200.00
100-1	Wet Detention	$ 96,600.00	$ 896,772.00	$ 993,372.00
100-2	Wet Detention	$ 96,600.00	$ 2,289,551.00	$ 2,386,151.00
200-1A	Wet Detention	$ 915,300.00	$ -	$ 915,300.00
200-1B	Wet Detention	$ 766,400.00	$ 1,694,130.00	$ 2,460,530.00
3-1	Wet Detention	$ 395,200.00	$ 1,248,738.00	$ 1,643,938.00
3-2	Wet Detention	$ 401,400.00	$ 965,955.00	$ 1,367,355.00
3-3	Dry Detention	$ 105,700.00	$ -	$ 105,700.00
4-1	Wet Detention	$ 137,600.00	$ 701,650.00	$ 839,250.00
4-2	Wet Detention	$ 137,600.00	$ 610,547.00	$ 748,147.00
4-3	Dry Detention	$ 39,100.00	$ -	$ 39,100.00
5-1	Wet Detention	$ 392,600.00	$ 1,225,383.00	$ 1,617,983.00
5-2	Wet Detention	$ 392,600.00	$ -	$ 392,600.00
5-3	Dry Detention	$ 83,200.00	$ -	$ 83,200.00

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 1-1 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	12,892	$ 4.22	$ 54,405.81
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 70,119.37
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 14,023.87	$ 14,023.87
				Grand Total:	$ 84,143.25

$ 84,200

Note:

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

Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 1-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,224	$ 1.89	$ 2,313.36
0110 1 1	Clearing and Grubbing	AC	4.60	$ 12,540.00	$ 57,684.00
0120 1	Regular Excavation	CY	40,597	$ 4.22	$ 171,317.75
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	8,885	$ 1.33	$ 11,817.35
				Sub-Total:	$ 258,846.01
0101 1	Mobilization - Assume 15%	LS	1	$ 38,826.90	$ 38,826.90
0999 25	Initial Contingency - Assume 20%	LS	1	$ 51,769.20	$ 51,769.20
				Grand Total:	$ 349,442.12

$ 349,500

Note:

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

Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 1-3	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,233	$ 1.89	$ 2,330.37
0110 1 1	Clearing and Grubbing	AC	4.70	$ 12,540.00	$ 58,938.00
0120 1	Regular Excavation	CY	52,518	$ 4.22	$ 221,627.16
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	10,039	$ 1.33	$ 13,352.13
				Sub-Total:	$ 311,961.22
0101 1	Mobilization - Assume 15%	LS	1	$ 46,794.18	$ 46,794.18
0999 25	Initial Contingency - Assume 20%	LS	1	$ 62,392.24	$ 62,392.24
				Grand Total:	$ 421,147.65

$ 421,200

Note:

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

Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 100-1 & 100-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	660	$ 1.89	$ 1,247.40
0110 1 1	Clearing and Grubbing	AC	1.30	$ 12,540.00	$ 16,302.00
0120 1	Regular Excavation	CY	7,848	$ 4.22	$ 33,119.22
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	3,858	$ 1.33	$ 5,131.44
				Sub-Total:	$ 71,513.61
0101 1	Mobilization - Assume 15%	LS	1	$ 10,727.04	$ 10,727.04
0999 25	Initial Contingency - Assume 20%	LS	1	$ 14,302.72	$ 14,302.72
				Grand Total:	$ 96,543.38
					$ 96,600

Note:

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

Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 200-1A Wet Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,677	$ 1.89	$ 3,169.53
0110 1 1	Clearing and Grubbing	AC	8.61	$ 12,540.00	$ 107,969.40
0120 1	Regular Excavation	CY	125,406	$ 4.22	$ 529,213.62
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	16,454	$ 1.33	$ 21,883.22
				Sub-Total:	$ 677,949.33
0101 1	Mobilization - Assume 15%	LS	1	$ 101,692.40	$ 101,692.40
0999 25	Initial Contingency - Assume 20%	LS	1	$ 135,589.87	$ 135,589.87
				Grand Total:	$ 915,231.60

$ 915,300

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 200-1B Wet Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,611	$ 1.89	$ 3,044.79
0110 1 1	Clearing and Grubbing	AC	7.94	$ 12,540.00	$ 99,567.60
0120 1	Regular Excavation	CY	101,984	$ 4.22	$ 430,372.35
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	14,258	$ 1.33	$ 18,963.58
				Sub-Total:	$ 567,661.88
0101 1	Mobilization - Assume 15%	LS	1	$ 85,149.28	$ 85,149.28
0999 25	Initial Contingency - Assume 20%	LS	1	$ 113,532.38	$ 113,532.38
				Grand Total:	$ 766,343.54

$ 766,400

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 3-1	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,179	$ 1.89	$ 2,228.31
0110 1 1	Clearing and Grubbing	AC	4.30	$ 12,540.00	$ 53,922.00
0120 1	Regular Excavation	CY	49,108	$ 4.22	$ 207,236.10
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	10,203	$ 1.33	$ 13,569.99
				Sub-Total:	$ 292,669.96
0101 1	Mobilization - Assume 15%	LS	1	$ 43,900.49	$ 43,900.49
0999 25	Initial Contingency - Assume 20%	LS	1	$ 58,533.99	$ 58,533.99
				Grand Total:	$ 395,104.45

$ 395,200

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 3-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,188	$ 1.89	$ 2,245.32
0110 1 1	Clearing and Grubbing	AC	4.30	$ 12,540.00	$ 53,922.00
0120 1	Regular Excavation	CY	50,250	$ 4.22	$ 212,054.29
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	10,051	$ 1.33	$ 13,368.36
				Sub-Total:	$ 297,303.53
0101 1	Mobilization - Assume 15%	LS	1	$ 44,595.53	$ 44,595.53
0999 25	Initial Contingency - Assume 20%	LS	1	$ 59,460.71	$ 59,460.71
				Grand Total:	$ 401,359.77

$ 401,400

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 3-3 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	17,139	$ 4.22	$ 72,325.71
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 88,039.27
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 17,607.85	$ 17,607.85
				Grand Total:	$ 105,647.12

$ 105,700

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 4-1 & 4-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	762	$ 1.89	$ 1,440.18
0110 1 1	Clearing and Grubbing	AC	1.80	$ 12,540.00	$ 22,572.00
0120 1	Regular Excavation	CY	13,144	$ 4.22	$ 55,466.32
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	5,032	$ 1.33	$ 6,691.97
				Sub-Total:	$ 101,884.03
0101 1	Mobilization - Assume 15%	LS	1	$ 15,282.60	$ 15,282.60
0999 25	Initial Contingency - Assume 20%	LS	1	$ 20,376.81	$ 20,376.81
				Grand Total:	$ 137,543.44

$ 137,600

Note:

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

Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 4-3 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	3,992	$ 4.22	$ 16,847.70
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 32,561.26
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 6,512.25	$ 6,512.25
				Grand Total:	$ 39,073.52

$ 39,100

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 5-1 & 5-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,197	$ 1.89	$ 2,262.33
0110 1 1	Clearing and Grubbing	AC	4.40	$ 12,540.00	$ 55,176.00
0120 1	Regular Excavation	CY	48,582	$ 4.22	$ 205,014.14
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	9,473	$ 1.33	$ 12,599.17
				Sub-Total:	$ 290,765.20
0101 1	Mobilization - Assume 15%	LS	1	$ 43,614.78	$ 43,614.78
0999 25	Initial Contingency - Assume 20%	LS	1	$ 58,153.04	$ 58,153.04
				Grand Total:	$ 392,533.03

$ 392,600

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 1)**					
Pond 5-3 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	12,694	$ 4.22	$ 53,568.16
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 69,281.72
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 13,856.34	$ 13,856.34
				Grand Total:	$ 83,138.07

$ 83,200

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

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Project: FTE Widening from S. Kissimmee Park Rd to US 192 Designer: ALE Date: 12/27/2019
FPID: 441224-1-22-01 Reviewer: JAN Checked: 12/27/2019
County: Osceola
Alternative 2

Pond Name	Type	Estimated Pond Construction Cost	Estimated Pond R/W Cost	Total Cost
1-1	Dry Detention	$ 110,000.00	$ -	$ 110,000.00
1-2	Wet Detention	$ 494,900.00	$ 917,558.00	$ 1,412,458.00
1-3	Wet Detention	$ 500,300.00	$ 2,572,348.00	$ 3,072,648.00
100-1	Wet Detention	$ 96,600.00	$ 896,772.00	$ 993,372.00
100-2	Wet Detention	$ 96,600.00	$ 2,289,551.00	$ 2,386,151.00
300-1	Wet Detention	$ 322,400.00	$ 2,252,332.00	$ 2,574,732.00
300-2	Wet Detention	$ 322,400.00	$ 2,500,304.00	$ 2,822,704.00
300-3	Wet Detention	$ 322,400.00	$ 787,051.00	$ 1,109,451.00
3-1	Wet Detention	$ 686,900.00	$ 2,003,520.00	$ 2,690,420.00
3-2	Wet Detention	$ 704,100.00	$ 1,353,989.00	$ 2,058,089.00
3-3	Dry Detention	$ 132,700.00	$ -	$ 132,700.00
4-1	Wet Detention	$ 137,600.00	$ 701,650.00	$ 839,250.00
4-2	Wet Detention	$ 137,600.00	$ 610,547.00	$ 748,147.00
4-3	Dry Detention	$ 39,100.00	$ -	$ 39,100.00
5-1	Wet Detention	$ 392,600.00	$ 1,225,383.00	$ 1,617,983.00
5-2	Wet Detention	$ 392,600.00	$ -	$ 392,600.00
5-3	Dry Detention	$ 83,200.00	$ -	$ 83,200.00

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 1-1 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	17,989	$ 4.22	$ 75,913.22
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 91,626.78
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 18,325.36	$ 18,325.36
				Grand Total:	$ 109,952.14

$ 110,000

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 1-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,314	$ 1.89	$ 2,483.46
0110 1 1	Clearing and Grubbing	AC	5.28	$ 12,540.00	$ 66,211.20
0120 1	Regular Excavation	CY	63,366	$ 4.22	$ 267,404.95
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	11,059	$ 1.33	$ 14,708.52
				Sub-Total:	$ 366,521.70
0101 1	Mobilization - Assume 15%	LS	1	$ 54,978.25	$ 54,978.25
0999 25	Initial Contingency - Assume 20%	LS	1	$ 73,304.34	$ 73,304.34
				Grand Total:	$ 494,804.29

$ 494,900

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

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Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 1-3	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,320	$ 1.89	$ 2,494.80
0110 1 1	Clearing and Grubbing	AC	5.33	$ 12,540.00	$ 66,838.20
0120 1	Regular Excavation	CY	64,151	$ 4.22	$ 270,715.31
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	11,140	$ 1.33	$ 14,816.28
				Sub-Total:	$ 370,578.15
0101 1	Mobilization - Assume 15%	LS	1	$ 55,586.72	$ 55,586.72
0999 25	Initial Contingency - Assume 20%	LS	1	$ 74,115.63	$ 74,115.63
				Grand Total:	$ 500,280.51

$ 500,300

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

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Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

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Initial Contingency is assumed to be 20% of the total construction costs.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 100-1 & 100-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	660	$ 1.89	$ 1,247.40
0110 1 1	Clearing and Grubbing	AC	1.30	$ 12,540.00	$ 16,302.00
0120 1	Regular Excavation	CY	7,848	$ 4.22	$ 33,119.22
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	3,858	$ 1.33	$ 5,131.44
				Sub-Total:	$ 71,513.61
0101 1	Mobilization - Assume 15%	LS	1	$ 10,727.04	$ 10,727.04
0999 25	Initial Contingency - Assume 20%	LS	1	$ 14,302.72	$ 14,302.72
				Grand Total:	$ 96,543.38
					$ 96,600

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

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Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

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Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

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Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 300-1 , 300-2, & 300-3 Wet Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,101	$ 1.89	$ 2,080.89
0110 1 1	Clearing and Grubbing	AC	3.70	$ 12,540.00	$ 46,398.00
0120 1	Regular Excavation	CY	38,749	$ 4.22	$ 163,522.53
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	8,291	$ 1.33	$ 11,026.94
				Sub-Total:	$ 238,741.91
0101 1	Mobilization - Assume 15%	LS	1	$ 35,811.29	$ 35,811.29
0999 25	Initial Contingency - Assume 20%	LS	1	$ 47,748.38	$ 47,748.38
				Grand Total:	$ 322,301.58

$ 322,400

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

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Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 3-1	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,524	$ 1.89	$ 2,880.36
0110 1 1	Clearing and Grubbing	AC	7.11	$ 12,540.00	$ 89,159.40
0120 1	Regular Excavation	CY	90,811	$ 4.22	$ 383,222.09
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	13,407	$ 1.33	$ 17,830.95
				Sub-Total:	$ 508,806.36
0101 1	Mobilization - Assume 15%	LS	1	$ 76,320.95	$ 76,320.95
0999 25	Initial Contingency - Assume 20%	LS	1	$ 101,761.27	$ 101,761.27
				Grand Total:	$ 686,888.58

$ 686,900

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

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Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

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Initial Contingency is assumed to be 20% of the total construction costs.

DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 3-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,539	$ 1.89	$ 2,908.71
0110 1 1	Clearing and Grubbing	AC	7.20	$ 12,540.00	$ 90,288.00
0120 1	Regular Excavation	CY	93,537	$ 4.22	$ 394,727.61
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	13,435	$ 1.33	$ 17,867.96
				Sub-Total:	$ 521,505.84
0101 1	Mobilization - Assume 15%	LS	1	$ 78,225.88	$ 78,225.88
0999 25	Initial Contingency - Assume 20%	LS	1	$ 104,301.17	$ 104,301.17
				Grand Total:	$ 704,032.88
					$ 704,100

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

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Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

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DRAFT

Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 3-3 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	22,466	$ 4.22	$ 94,807.15
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 110,520.71
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 22,104.14	$ 22,104.14
				Grand Total:	$ 132,624.85

$ 132,700

Note:

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

Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 4-1 & 4-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	762	$ 1.89	$ 1,440.18
0110 1 1	Clearing and Grubbing	AC	1.80	$ 12,540.00	$ 22,572.00
0120 1	Regular Excavation	CY	13,144	$ 4.22	$ 55,466.32
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	5,032	$ 1.33	$ 6,691.97
				Sub-Total:	$ 101,884.03
0101 1	Mobilization - Assume 15%	LS	1	$ 15,282.60	$ 15,282.60
0999 25	Initial Contingency - Assume 20%	LS	1	$ 20,376.81	$ 20,376.81
				Grand Total:	$ 137,543.44

$ 137,600

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Storm sewer conveyance system costs estimates are for additional conveyance to and from the pond option, outside of roadside ditch grading.

Mobilization is assumed to be 15% of the total construction cost for offsite options only.

Initial Contingency is assumed to be 20% of the total construction costs.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 4-3 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	3,992	$ 4.22	$ 16,847.70
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 32,561.26
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 6,512.25	$ 6,512.25
				Grand Total:	$ 39,073.52

$ 39,100

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

Sediment Barrier is the additional fencing required for the pond. For offsite options adjacent to the R/W, considered three sides of the pond; For offsite options not adjacent, considered entire pond perimeter. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Clearing & Grubbing is assumed to be the entire required pond area for offsite options. For onsite options, this is assumed to be included in the overall roadway cost estimate.

Excavation is based off of the total required volume plus the permanent pool volume for wet ponds and only the total volume required for dry ponds.

Performance turf is based off of the total pond area minus the NWL area for wet ponds. For onsite options, this is assumed to be included in the overall roadway cost estimate.

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 5-1 & 5-2	Wet Detention				
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier	LF	1,197	$ 1.89	$ 2,262.33
0110 1 1	Clearing and Grubbing	AC	4.40	$ 12,540.00	$ 55,176.00
0120 1	Regular Excavation	CY	48,582	$ 4.22	$ 205,014.14
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	9,473	$ 1.33	$ 12,599.17
				Sub-Total:	$ 290,765.20
0101 1	Mobilization - Assume 15%	LS	1	$ 43,614.78	$ 43,614.78
0999 25	Initial Contingency - Assume 20%	LS	1	$ 58,153.04	$ 58,153.04
				Grand Total:	$ 392,533.03

$ 392,600

Note:

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Quantity Estimate Notes:

Unit Prices from FDOT 12 month Statewide Moving Average from 12/2/2018 to 12/2/2019

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Estimated Cost for Construction Services

FTE Widening from S. Kissimmee Park Rd to US 192 (FPID: 441224-1-22-01) **(Alternative 2)**					
Pond 5-3 Dry Detention					
Item	Description	Unit	Quantity	Unit Price	Amount
	General Conditions				
0104 10 3	Sediment Barrier - Assume Included in Roadway Estimate	LF	0	$ 1.89	$ -
0110 1 1	Clearing and Grubbing	AC	0.00	$ 12,540.00	$ -
0120 1	Regular Excavation	CY	12,694	$ 4.22	$ 53,568.16
0425 1549	Inlets, Ditch Bottom, Type D, Modify	EA	1	$ 6,062.14	$ 6,062.14
0430175136	Pipe Culvert, Optional Material, Round, 36" S/CD	LF	50	$ 128.88	$ 6,444.00
0430982138	Mitered End Section, Optional Material, Round, 36" CD	EA	1	$ 3,207.42	$ 3,207.42
0570 1 1	Performance Turf	SY	0	$ 1.33	$ -
				Sub-Total:	$ 69,281.72
0101 1	Mobilization - Assume Included in Roadway Estimate	LS	1	$ -	$ -
0999 25	Initial Contingency - Assume 20%	LS	1	$ 13,856.34	$ 13,856.34
				Grand Total:	$ 83,138.07

$ 83,200

Note:

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Quantity Estimate Notes:

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DRAFT

Florida Department of Transportation

RON DESANTIS
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

KEVIN THIBAULT, P.E.
SECRETARY

MEMORANDUM

TO:	Jazlyn Heywood, P.E.		
CC:	Nicole Sorg; Karen Schaack; Henry Ellis; Chad Marcus; Jorge Moreno; Tyler McConnell		
FROM:	Barbara Strouse		
SUBJECT:	STATE ROAD:	91	
	FPID:	441224-1	
	COUNTY:	Osceola	
	DESCRIPTION:	PD&E for Widen TPK from Kissimmee Park Rd to US 192	
	COMMON NAME:	Kissimmee Park Road	
DATE:	December 23, 2019	ESTIMATE ID:	2020-008

Below are the cost estimate totals for 441224-1 Kissimmee Park Road, prepared by Nick Chop with CBRE, developed in accordance with the Florida Department of Transportation's Guidance Document 2 (Right of Way Cost Estimates). **The totals are cost estimates and not appraisals.** All multipliers and factors employed were developed in conjunction with other districts and FTE Right of Way personnel. **This memo was amended by request of PD&E PM Jazlyn Heywood, P.E. to show pond estimate totals on page 2.**

SUMMARY OF COSTS

Alt 1 Ponds	See Page 2
Alt 2 Ponds	See Page 2

The cost estimates have confidence levels C; indicating Below-Average confidence.

Please contact me if you have any questions.

Attachments:
ROW Phase 4x Totals (page 2)

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Alt 1 Ponds

Ponds	ROW Estimate Total
1-2-1	$845,055
1-3-1	$2,572,348
100-1	$896,772
100-2	$2,289,551
200-1B	$1,694,130
3-1-1	$1,248,738
3-2-1	$965,955
4-1	$701,650
4-2	$610,547
5-1	$1,225,383
5-2	DOT parcels

Alt 2 Ponds

Ponds	ROW Estimate Total
1-2-2	$917,558
1-3-2	$2,572,348
100-1	$896,772
100-2	$2,289,551
300-1	$2,252,332
300-2A	$679,677
300-2B	$833,269
300-2C	$987,358
300-3	$787,051
3-1-2	$2,003,520
3-2-2	$1,353,989
4-1	$701,650
4-2	$610,547
5-1	$1,225,383
5-2	DOT parcels

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