SR 400 (I-4) Project Development and Environment (PD&E) Study

FM No.: 432100-1-22-01

Pond Siting Report

Segment 2: State Road 400 (SR 400)/Interstate 4 (I-4) from West of SR 528 (Beachline Expressway) to West of SR 435 (Kirkman Road)

Orange County (75280), Florida

August, 2016

HNTB Corporation
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Professional Engineer Certificate

I hereby certify that I am a registered professional engineer in the State of Florida practicing with HNTB Corporation, Inc., a corporation authorized to operate as an engineering business, EB#6500, by the State of Florida, Department of Professional Regulation, Board of Professional Engineers, and that I have reviewed or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for SR 400 (I-4) Project Development and Environment Study for the Florida Department of Transportation in Volusia County, Florida.

This Pond Siting Report (PSR) includes a summary of data collection efforts, calculations, and an overall drainage review prepared for the conceptual analyses for the State Road 400 (SR 400)/Interstate 4 (I-4), from West of SR 528 (Beachline Expressway) to West of SR 435 (Kirkman Road) in Orange County.

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgments and experience. This document is for planning purposes only and is not to replace any effort required for final design.

SIGNATURE: _____

NAME: Sanam Rai, P. E.

FIRM: HNTB Corporation

P.E. No.: 69089

DATE: August 2016

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Executive Summary

The Florida Department of Transportation (FDOT) proposes to add two express lanes in each direction in the median along SR 400 (I-4). The project limits are from 0.5 miles south of SR 528 (Beachline Expressway) to SR 435 (Kirkman Road) in Orange County. The project is located within Sections 1, 2, 11 and 12 of Township 24 South, Range 28 East; and Sections 24, 25, 26, 35 and 36 of Township 23 South, Range 28 East and is approximately 3.9 miles long. The project datum is NAVD 88.

I-4 is classified as a major arterial road and is a hurricane evacuation route. The proposed improvements to I-4 include widening the existing six lane divided rural highway to a ten lane barrier separated highway. The existing roadway typical section has three 12-foot travel lanes with 10-foot shoulders in each direction. The existing right-of-way width varies but is typically 300 feet. Two mainline typical sections are proposed for I-4 Segment 2. The typical section from the begin project limits east of Central Florida Parkway to SR 528 includes a 44-foot rail envelope in the median within a minimum 300 foot right of way (6+4 with rail envelope). The typical section from SR 528 to west of SR 435 does not include the rail corridor and also has a proposed minimum 300 foot right of way (6+4 without rail envelope). Both typical sections have a design speed of 70 miles per hour (mph) and will include three 12-foot general use lanes with a 10-foot inside shoulder and a 12-foot outside shoulder (10-foot paved) and two 12-foot express lanes with a 4-foot inside shoulder and a 10-foot outside shoulder, in each direction. A barrier wall between adjacent shoulders will separate the express lanes from the general use lanes. Additionally, up to three auxiliary lanes in either direction of travel will be provided in some areas. Figure 1.2 and Figure 1.3 illustrate the proposed mainline typical sections for I-4 Segment 2.

While the overall typical section remains consistent throughout Segment 2, there are some areas along the I-4 BtU corridor that will have special sections. Special cross sections were developed to meet the needs of the project due to right of way constraints, existing utility easements or other design considerations along the corridor. These special sections may include C-D roads, braided ramp systems, elevated express lanes or elevated general use lanes. Additionally, the median width may vary in certain locations to accommodate changes in the horizontal alignment due to crossroad support structures or other design features. The special sections within the Segment 2 corridor include a C-D system between Central Florida Parkway and SR 528; the eastbound C-D Road is at grade and the westbound C-D Road is elevated. The eastbound C-D Road extends approximately 1.9 miles between SR 528 in Segment 2 and the Daryl Carter Parkway interchange located within Segment 1 of the I-4 BtU corridor. The westbound C-D Road extends approximately 5.9 miles between SR 528 in Segment 2 and the Osceola Parkway interchange located within Segment 1 of the I-4 BtU corridor.

The project will be divided into ten (10) drainage basins, which require seventeen (17) existing and proposed pond sites and four (4) future ponds by others* (located at the Kirkman Road Interchange) for the treatment and attenuation of project runoff. Twenty four (24) alternate pond sites were evaluated. It is the intent of this report to suggest and evaluate, in detail, potential pond sites for this purpose in order to ultimately determine the most advantageous location for each pond. The table below lists the recommended pond alternatives.

Table 1 - Summary of Recommended Pond Sites

Basin Name	Recommended Alternative
200	Pond 200B
201	Pond 201
202	Ponds 202A, 202B, 202C & 202D
203	Ponds 203A & 203B
204	Ponds 204A & 204B
205	Ponds 205C & 205D
206	Ponds 206, 206A & 206B
207	Pond 207
208	Pond 208
209	*Ponds F32, F33, F34 and F35

Table 1a – Summary of Pond Nomenclature*

Basin Name	Pond Alternative Name	Section 2 FEIS PD&E Stormwater Facilities	Existing / Permitted Stormwater Facilities	Reason For New Alternative
200	Pond 200A	Pond A-7	-	Relocated pond on the same parcel in order to avoid impacting the 100-year floodplain.
200	Pond 200B	Pond A-1	-	Relocated pond to a different parcel that would fit the required pond without impacting the 100-year floodplain.
201	Pond 201	Pond A-3	-	-
202	Pond 202A	Pond A-2	-	-
202	Pond 202B	-	-	Pond added within the R/W under bridges to accommodate the proposed alignment.
202	Pond 202C	Pond A-5	Pond 1 (I-4 Auxiliary Lanes, FPID No. 410732-1-52-01)	-
202	Pond 202D	Pond A-9	-	-
203	Pond 203A	Pond A-1-2	Pond 1D (SR 528 Widening, FPID No. 406090-1-52-01)	-
203	Pond 203B	-	Pond 1F (SR 528 Widening, FPID No. 406090-1-52-01)	Pond added within the R/W to accommodate the SR 528 widening, which has already been designed and permitted by others.
204	Pond 204A	Pond A-1-1	Pond 1C (SR 528 Widening, FPID No. 406090-1-52-01)	-
204	Pond 204B	-	Pond 1E (SR 528 Widening, FPID No. 406090-1-52-01)	Pond added within the R/W to accommodate the SR 528 widening, which has already been designed and permitted by others.
205	Pond 205A	Pond B-1	-	To avoid impacting the 100-year floodplain.
205	Pond 205B	Pond B-2	-	To avoid impacting the 100-year floodplain.
205	Pond 205C	New Pond Alternative	-	A modification of Pond 205-B.
205	Pond 205D	Pond B-2	-	-
206	Pond 206	Pond D-2	Retention Area (Sand Lake Road/I-4 Interchange, FPID No. 75280-3462)	-
206	Pond 206A	Pond C-2	-	Pond modified to accommodate proposed ramp alignment
206	Pond 206B	Pond D-3	-	Pond modified to accommodate proposed ramp alignment.
207	Pond 207	Existing Pond	Pond 100 (Republic Drive/ I-4 Interchange, FPID No.	-

Basin Name	Pond Alternative Name	Section 2 FEIS PD&E Stormwater Facilities	Existing / Permitted Stormwater Facilities	Reason For New Alternative
			75280-3410)	
208	Pond 208	Existing Pond	Pond 200 (Republic Drive/ I-4 Interchange, FPID No. 75280-3410)	-
209	Ponds F32, F33,F34 and F35	Ponds F32, F33, F34 and F35	Ponds F32, F33, F34 and F35 (I-4 Ultimate, FPID No. 432193-1-52-01)	-

*Existing ponds were renamed for naming consistency with the proposed basins.

1.0 Introduction

I-4 is an integral part of Central Florida's transportation system. The Interstate carries the greatest number of people and vehicles of any transportation facility in the region and serves many of the area's primary activity centers. When the Interstate opened in February 1965, it was designed to serve intrastate and interstate travel by providing a critical link between the east and west coasts of Central Florida. Although this role continues to be a crucial transportation function of I-4, the highway has evolved to one that serves many shorter trips. Today, the highway serves as the primary link between hotel/motel complexes and tourist attractions such as Walt Disney World, Universal Studios, Sea World, the International Drive Resort Area and downtown Orlando. In addition, since I-4 is the only north-south limited access facility that is centrally located between the predominant employment centers and the major suburbs to the north, it has become the primary commuting corridor in the Central Florida metropolitan area.

Tremendous growth in Central Florida over the past decades has made it difficult for the transportation system to accommodate travel demand. A significant amount of this growth is occurring within close proximity to I-4. In recent years, congestion on I-4 has extended well beyond normal peak hours and major crashes have closed the highway, resulting in traffic congestion throughout the metropolitan area. Congestion and delays on I-4 and the parallel arterial highways are now considered to be major transportation problems facing the region. The congestion on I-4 is further evidenced by the less than desirable levels of service on the Interstate as well as the crossroads.

Projections of future population and employment in the region indicate that travel demand will continue to increase well into the future. The ability to accommodate the new travel patterns resulting from growth must be provided to sustain the region's economy. Without the improvements, extremely congested conditions are expected to occur for extended periods of time in both the morning and evening peak periods. Due to these congested conditions, user travel times will continue to increase, the movement of goods through the urban area will be slower, and the deliveries of goods within the urban area will be forced to other times throughout the day.

The need for improvements to I-4 is illustrated by the important transportation roles I-4 serves to the Central Florida region and the State of Florida. If no improvements are made to the Interstate, a loss in mobility for the area's residents, visitors, and employees can be expected, resulting in a severe threat to the continued viability of the economy and the quality of life.

This reevaluation project involves revising the original design concept showing two (2) High Occupancy Vehicle (HOV) lanes to four (4) Express Lanes as recommended in the Environmental Impact Statement (EIS) for I-4 from SR 528 to SR 472. The Express Lanes are tolled lanes and will extend the full length of the project. The access to/from the tolled lanes will be evaluated as part of this effort to determine if changes are needed from the previously approved concept for access to/from the HOV Lanes. The original I-4 PD&E Studies involved physical separation between the HOV lanes and the general use lanes on I-4. Additionally, a demand management tool was proposed during the EIS phase of the project to control the use of the lanes by requiring a minimum number of occupants per vehicle in order to maintain an acceptable level of service (Level of Service D).

This reevaluation addresses revising the demand management tool to convert the HOV lanes to tolled Express Lanes. A variable pricing tolling plan is proposed. The tolls will vary by time of day and day of week to maintain acceptable levels of service in the Express Lanes. The tolls will be collected electronically through existing E-Pass, SunPass and other systems currently in place in the Orlando metropolitan area. The conversion to Express Lanes will maintain the same right of way limits as documented previously and will not change the impacts to the social, natural or physical environment.

A Systems Access Modification Report (SAMR) update is also being performed concurrent with the reevaluation.

2.0 Project Description

The Florida Department of Transportation (FDOT) is proposing to reconstruct and widen I-4 as part of the I-4 Ultimate concept. This involves the build-out of I-4 to its ultimate condition through Central Florida, including segments in Polk, Osceola, Orange, Seminole, and Volusia Counties. The concept design proposes the addition of two (2) new express lanes in each direction giving it a total of ten (10) dedicated lanes. The study area in this section from west of the SR 528 (Beachline Expressway) to SR 435 (Kirkman Drive) includes the interchanges at SR 528, SR 482 (Sand Lake Road), and Universal Boulevard, and provides for the required stormwater treatment with seventeen (17) pond sites along the corridor. The typical section will ensure that the design will be contained within the existing right-of-way with the exception of several offsite ponds. It is the intent of this report to suggest and evaluate, in detail, potential pond sites for this purpose in order to ultimately determine the most advantageous location for each pond.

The project is located within Sections 1, 2, 11 and 12 of Township 24 South, Range 28 East; and Sections 24, 25, 26, 35 and 36 of Township 23 South, Range 28 East and is approximately 3.9 miles long. The project datum is NAVD 88. The limits of the project are shown on the Project Location Map in Figure 1. A reproduction of the USGS quadrangle map for the project vicinity is shown in Figure 2.

I-4 is classified as a major arterial road and serves as a hurricane evacuation route. The proposed improvements to I-4 include widening the existing six lane divided rural highway to a ten lane barrier divided urban highway. The existing roadway typical section has three 12-foot travel lanes with 10-foot shoulders in each direction. The existing right-of-way width varies but is typically 300 feet. Two mainline typical sections are proposed for I-4 Segment 2. The typical section from the begin project limits east of Central Florida Parkway to SR 528 includes a 44-foot rail envelope in the median within a minimum 300 foot right of way (6+4 with rail envelope). The typical section from SR 528 to west of SR 435 does not include the rail corridor and also has a proposed minimum 300 foot right of way (6+4 without rail envelope). Both typical sections have a design speed of 70 miles per hour (mph) and will include three 12-foot general use lanes with a 10-foot inside shoulder and a 12-foot outside shoulder (10-foot paved) and two 12-foot express lanes with a 4-foot inside shoulder and a 10-foot outside shoulder, in each direction. A barrier wall between adjacent shoulders will separate the

express lanes from the general use lanes. Additionally, up to three auxiliary lanes in either direction of travel will be provided in some areas. Figure 1.2 and Figure 1.3 illustrate the proposed mainline typical sections for I-4 Segment 2.

While the overall typical section remains consistent throughout Segment 2, there are some areas along the I-4 BtU corridor that will have special sections. Special cross sections were developed to meet the needs of the project due to right of way constraints, existing utility easements or other design considerations along the corridor. These special sections may include C-D roads, braided ramp systems, elevated express lanes or elevated general use lanes. Additionally, the median width may vary in certain locations to accommodate changes in the horizontal alignment due to crossroad support structures or other design features. The special sections within the Segment 2 corridor include a C-D system between Central Florida Parkway and SR 528; the eastbound C-D Road is at grade and the westbound C-D Road is elevated. The eastbound C-D Road extends approximately 1.9 miles between SR 528 in Segment 2 and the Daryl Carter Parkway interchange located within Segment 1 of the I-4 BtU corridor. The westbound C-D Road extends approximately 5.9 miles between SR 528 in Segment 2 and the Osceola Parkway interchange located within Segment 1 of the I-4 BtU corridor.

Figure 1 – Project Location Map

Figure 2 – USGS Quadrangle Map

3.0 Design Criteria

The design of stormwater management facilities for this project is governed by the rules and criteria set forth by the South Florida Water Management District (SFWMD) and the FDOT. These criteria were drawn from the 2014 SFWMD Basis of Review for Environmental Resource (ERP BOR) and the 2015 FDOT Drainage Manual.

Water Quality and Pond Recovery

- Wet detention
  - Treatment – Greater of 1" over the basin or 2.5" over new impervious area (ERP BOR, Section 4.2.1), which includes projects that are full reconstruction (SFWMD meeting minutes)
  - Recovery – Maximum discharge of one-half the treatment volume in 24 hours (ERP BOR, Section 5.2.a)
- Dry retention
  - Treatment – 50% of the amounts for wet detention: Greater of 0.5" over the basin or 1.25" over impervious area (ERP BOR, Section 4.2.1)

Water Quantity

- Open Basin – Limits the post-development peak discharge rate to the pre-development peak discharge rate for the local government: 25-year / 24-hour storm event for Orange County. (ERP BOR, Section 3.2)
- Closed Basin (with an outfall) – The pond must be sized to limit the post-development peak discharge volume to the pre-development discharge volume for the 100-year / 10-day storm event. (FDOT, Section 5.2.1)
- Closed Basin (without an outfall) – The pond must be sized to hold the entire runoff from the post-development condition for the 100-year / 10-day storm event. (FDOT, Section 5.2.1)
- Per SFWMD, treatment is only required for new impervious areas.

Pond Design (FDOT, Section 5.4.4.2)

- Ponds shall be designed to provide a minimum 20-foot of horizontal clearance between the top edge of the normal pool elevation and the right-of-way line. Maintenance berms shall be at least 15-feet with a slope of 1:8 or flatter.
- Corners of ponds shall be rounded to provide an acceptable turning radius for maintenance equipment (30-foot minimum inside radius).
  At least 1-foot of freeboard is required above the maximum design stage of the pond below the front of the maintenance berm.

4.0 Existing Drainage Conditions

4.1 Land Uses

The existing land uses for the project area and the pond alternatives are agricultural, acreage not zoned for agriculture, residential, retail/office, public/semi-public, vacant nonresidential and vacant residential. Future land uses include commercial, high density residential, institutional, planned development and mixed use. The widening of I-4 does not alter the existing or future land uses in the area. The existing land uses are shown in Figure 3 and the proposed land uses are shown in Figure 4.

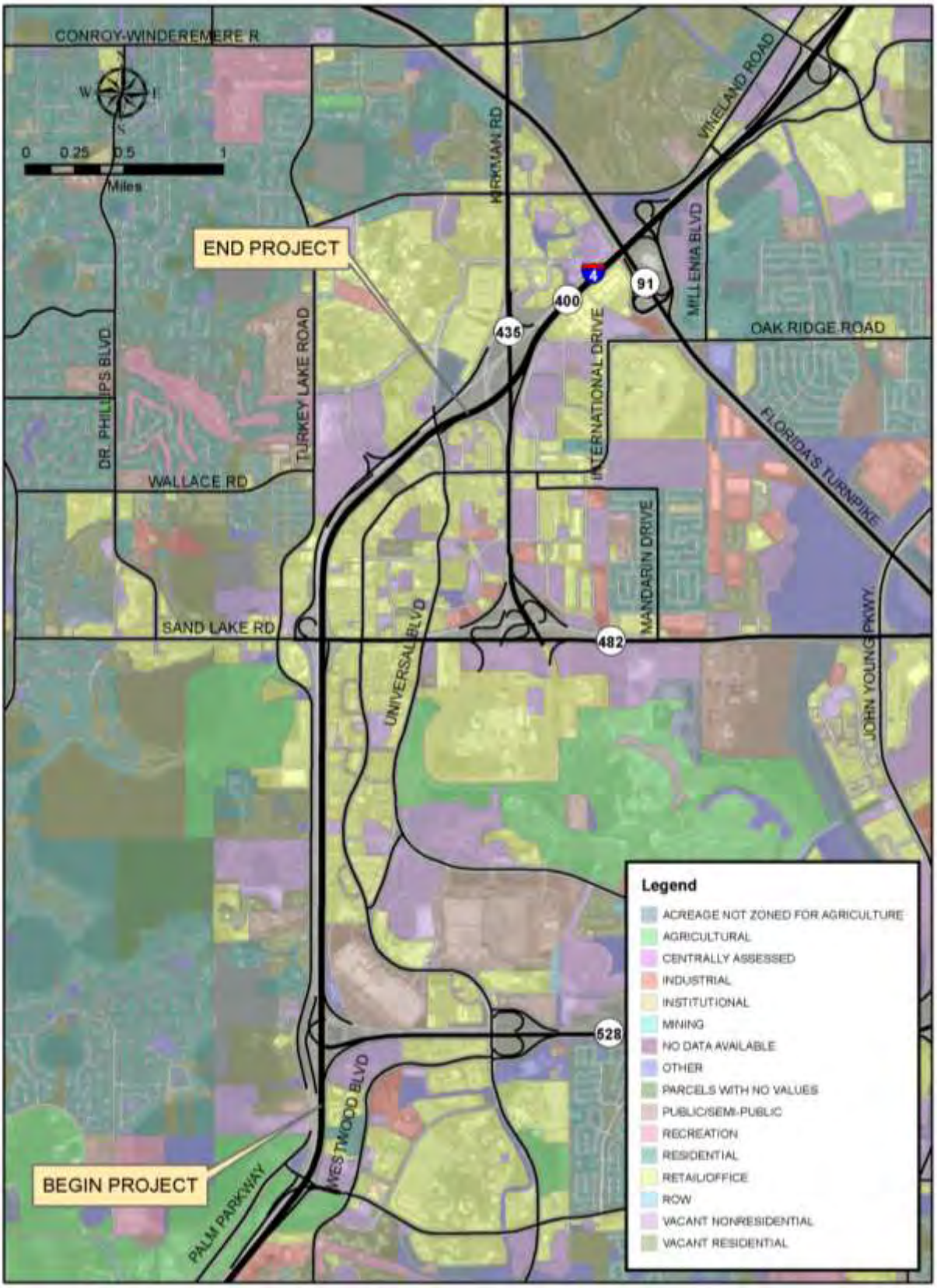


Figure 3 – Existing Land Use Map

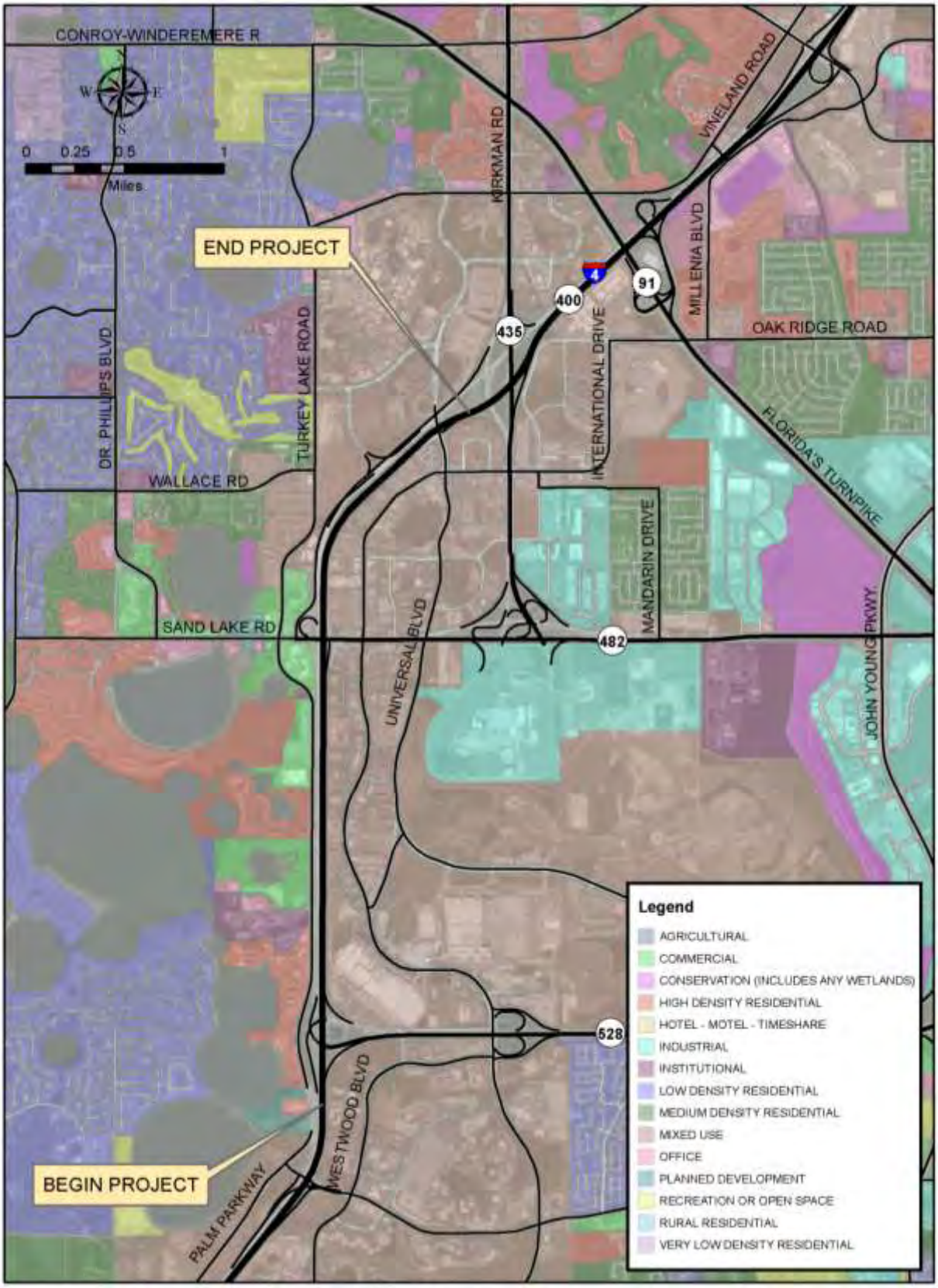


Figure 4 – Future Land Use Map

4.2 Soil Conditions

The Soil Survey of Orange County, Florida (1989), published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) has been reviewed for the project vicinity. There are eleven (11) mapped soil types located in the project area. Table 2 lists these soil types and their hydrologic soil group. The soil survey map for the project is illustrated in Figure 5.

Table 2 - NRCS Soil Survey Information

Soil Type	Hydrologic Soil Group
Archbold fine sands (2)	A
Basinger fine sands (3)	A/D
Candler-Apopka fine sands (6)	A
Immokalee fine sands (20)	B/D
Pomello fine sand (34)	A
Smyrna fine sand (44)	A/D
St. Johns fine sand (37)	B/D
St. Lucie fine sand (38)	A
Sanibel Muck (42)	A/D
Smyrna-Urban land complex (45)	A/D
Urban Land (50)	N/A

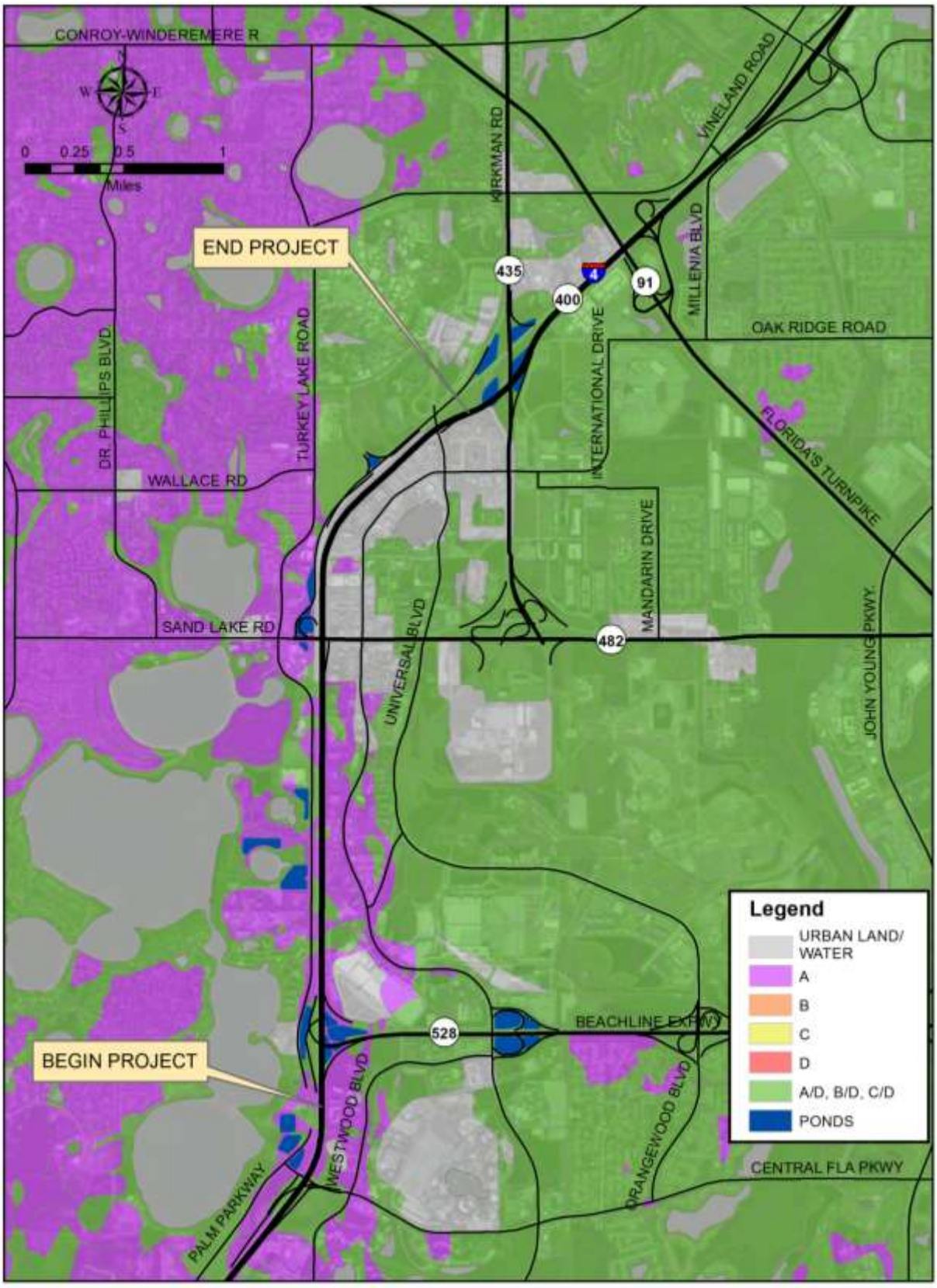


Figure 5 – Soil Survey Map

4.3 Existing Roadway Drainage Systems

The project corridor is located in the South Florida Water Management District. The project area is separated into ten (10) drainage basins. The basins consist of the pond sites and the full right-of-way of the roadway. All of the basins are open. The elevation difference between NGVD 29 and NAVD 88 is 0.89 ft, with NGVD 29 higher in elevation than NAVD 88. Most of the basins discharge to either Big Sand Lake or Little Sand Lake, which both outfall to Shingle Creek. Big Sand Lake is a verified impaired WBID (WBID No. 3169C), for high levels of Mercury. Shingle Creek is not considered an Outstanding Florida Water.

4.3.1 Basin 200

Basin 200 begins at the high point of the bridge at Central Florida Parkway at Station 1335+00 and continues north to Station 1352+00. The area from Station 1335+00 to 1345+48.48 is part of Segment 1. Compensating treatment for the two lanes that were added during the I-4 Auxiliary Lanes project (FPID No. 410732-1-52-01) was provided in dry treatment swales in another area of the original project. The stormwater runoff from the roadway is collected by roadside swales and discharges south to the Central Florida Parkway Canal at Station 1333+00, which flows west to Big Sand Lake and ultimately to Shingle Creek.

4.3.2 Basin 201

Basin 201 begins at Station 1352+00 and continues north to a highpoint at Station 1410+00. The stormwater runoff from the westbound roadway and ramps are collected by roadside swales and discharges untreated south to the Central Florida Parkway Canal at Station 1333+00, which flows west to Big Sand Lake and ultimately to Shingle Creek. The stormwater runoff from the eastbound lanes is collected by roadside swales and discharges to an existing pond (Pond 1 in Permit App. No. 020614-22). The existing plans were designed in NGVD 29. The existing pond is located east of I-4 from Station 1372+00 to 1377+00. The pond soils are classified in Hydrologic Soil Group A. The existing pond discharges south to the Central Florida Parkway Canal at Station 1333+00.

4.3.3 Basin 202

Basin 202 begins at Station 1352+00 and continues east past the high point of the ramps for SR 528 to Station 1410+00. The stormwater runoff from the westbound roadway and ramps are collected by roadside swales and discharges untreated south to the Central Florida Parkway Canal at Station 1333+00, which flows west to Big Sand Lake. The stormwater runoff from the eastbound lanes is collected by roadside swales and discharges to the existing pond (Pond 1 in Permit App. No. 020614-22). The existing plans were designed in NGVD 29. The existing pond is located east of I-4 from Station 1372+00 to 1377+00. The pond soils are classified in Hydrologic Soil Group A. The existing pond discharges south to the Central Florida Parkway Canal at Station 1333+00.

4.3.4 Basin 203

Basin 203 includes the eastbound roadway from SR 528 and the SR 528 ramps as well. The basin begins at the high point on SR 528 at Station 205+00 and continues east to the Newover Canal at Station 252+00. The stormwater runoff from the roadway is collected by roadside ditches and flows east where it discharges untreated to the cross drain at Station 252+00.

4.3.5 Basin 204

Basin 204 includes the westbound roadway from SR 528, SR 528 ramps, a portion of International Drive and Back of House Road. Back of House Road was intended as a temporary road that was built by Orange County to provide an entrance and exit for delivery trucks and shuttle buses. The basin begins at the high point on SR 528 at Station 205+00 and continues east to the Newover Canal at Station 252+00. The stormwater runoff from the roadway is collected by a series of ditches and storm sewer systems that discharge to an existing pond (Pond BOHR Pond in Permit App. No. 990909-15) north of SR 528 at Station 236+00. The pond soils are classified in Hydrologic Soil Groups A/D and B/D. The existing pond was designed as a wet detention pond and is located within FDOT right-of-way. The pond discharges to roadside ditches along SR 528 that flow east to the cross drain at Station 252+00.

4.3.6 Basin 205

Basin 205 begins at the high point at Station 1410+00 and continues north to the high point at Sand Lake Road at Station 1470+00. The stormwater runoff from the roadway on I-4 and the ramps to Sand Lake Road is collected by roadside ditches and cross drains that discharge untreated to the cross drains at Station 1434+46 and 1467+13. The cross drains flow west to smaller lakes that discharge to Big Sand Lake and ultimately to Shingle Creek.

4.3.7 Basin 206

Basin 206 begins at the high point at Sand Lake Road at Station 1470+00 and continues north to Station 1495+00. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the existing pond (Retention Area in Permit App. No. 03318-3). The existing plans were designed in NGVD 29. The existing pond is located in the northwest quadrant at the intersection with Sand Lake Road. The pond soil is classified in Hydrologic Soil Group A. The existing pond was designed as a dry retention pond. The pond discharges south to the cross drain at Station 1467+13, which discharges west to Little Sand Lake and ultimately to Shingle Creek.

4.3.8 Basin 207

Basin 207 begins at Station 1495+00 and continues north to Station 1505+00. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the existing pond (Pond 100 in Permit App. No. 950919-3). The existing pond is located north of Sand Lake Road and west of I-4 from Station 1490+00 to 1499+50. The pond soil is classified in Hydrologic Soil Group A. The existing pond was designed as a wet detention pond. This pond was constructed over a sinkhole. The pond discharges south to roadside ditches that flow to the cross drain at Station 1467+13, which discharges west to Little Sand Lake and ultimately to Shingle Creek.

4.3.9 Basin 208

Basin 208 begins at Station 1510+30 and continues north to Station 1535+51 and only encompasses the SR 435 (Kirkman Road) ramps. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the existing pond (Pond 200 in Permit App. No. 9509193). I-4 is not treated in the existing pond. The existing pond is located west of I-4 from Station 1529+00 to 1533+00. The pond soils are classified in Hydrologic Soil Group A/D. The existing pond was designed as a wet detention pond. The pond discharges east to the I-4 median swale, which ultimately drains to Shingle Creek.

4.3.10 Basin 209

Basin 209 begins at Station 1505+00 and continues north to the project terminus at Station 1535+34. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the future ponds (Ponds F-32, F-33, F-34 and F-35 in Permit App. No. 120703-15) identified in the I-4 Ultimate project. These future ponds are located at the SR 435 (Kirkman Road) Interchange, north of the project terminus. The ponds were designed as interconnected wet detention ponds. The ponds discharge to Shingle Creek.

4.4 Floodplains/Floodways

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRM) for Orange County. According to FEMA Map Nos. 12095C0405F AND 12095C0415F, none of the roadway or the existing ponds within Segment 2 are located in the 100-year floodplain. The FEMA Flood Insurance Rate Maps for the project is shown in Figure 6.

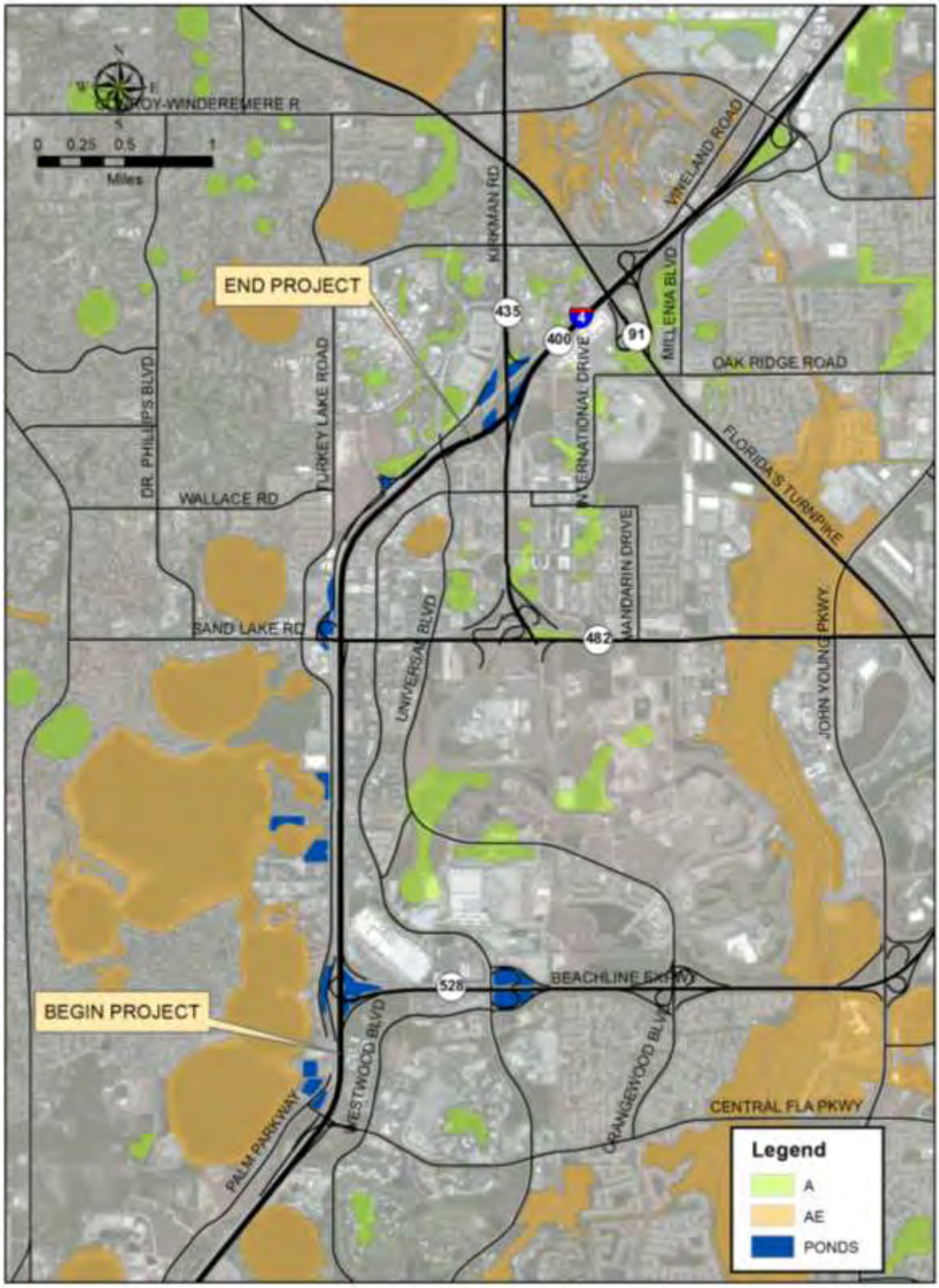


Figure 6 – FEMA Flood Insurance Map

5.0 Proposed Drainage Conditions/Stormwater Ponds

5.1 Overview

This project will make significant improvements to the water quality along the roadway corridor. The stormwater runoff from the new impervious areas will be treated in existing and proposed stormwater facilities. The stormwater runoff will be collected by storm sewer systems and roadside ditches. The water quality treatment and attenuation will be achieved through the expansion and construction of offsite ponds, some of which will require the acquisition of additional right-of-way.

The stormwater will be routed to existing and proposed stormwater ponds. There are a total of ten (10) basins within the project limits. In areas with poor soils and high water table, only wet detention ponds were considered. All of the basins are open. The ponds were sized based on the assumption that most of the offsite runoff would be drained through separate systems. For a majority of the ponds, the location of where the proposed basins begin and end is the same as the existing condition. The location of the outfall in the proposed condition is the same as the existing. None of the proposed ponds outfall to Outstanding Florida Waters; therefore, additional 50% treatment will not be required. None of the ponds outfall to a nutrient impaired water.

5.2 Methodology of Pond Determinators

Based on the available information, only the hydraulically feasible and environmentally permittable alternative pond sites are considered. Alternative pond sites are analyzed and evaluated for the following parameters:

- Hydrologic and hydraulic factors such as existing ground elevation, soil types, seasonal high water table (SHWT), stormwater conveyance feasibility, allowable hydraulic grade line (HGL), and basin outfalls.
- Cultural resource impacts
- Environmental resource impacts, including wetlands and threatened or endangered species
- Potential for hazardous materials and contamination
- Floodplain impacts
- Potential for impacts to major utilities
- Estimated right-of-way acquisition
- Property owner input (On properties where the property owner requested a meeting.)

5.3 Pond Alternatives

5.3.1 Basin 200

Basin 200 begins at the high point of the bridge at Central Florida Parkway at Station 1335+00 and continues north to Station 1352+00. The area from Station 1335+00 to 1345+48.48 is part of Segment 1. The basin consists of the pond site, the full right-of-way and the future rail bridges. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There are two alternatives for this basin.

5.3.1.1 Pond 200A

The first alternative is Pond 200A. This pond is a modified alternative from Section 2 FEIS PD&E (Pond A-7). The pond was relocated on the same parcel in order to avoid impacting the 100-year floodplain; the westerly side of the parcel was not used. Pond 200A is a proposed pond on the west side of the roadway from Station 1348+00 to 1353+00. The proposed pond will impact one parcel for a total right-of-way take of 6.01 acres. Due to the placement of the pond on the parcel, a large portion of the right-of-way take is in Big Sand Lake. The pond soil is classified in Hydrologic Soil Group A. Mapped sand skink soils are present over a large portion of this pond site; however, there are no known occurrences. Refer to the Endangered Species Biological Assessment (ESBA) for more information regarding the Sand Skink Survey. Several gopher tortoise burrows were found on this pond site and will need to be relocated. The pond will be designed as a wet detention pond. The pond will discharge to Big Sand Lake.

5.3.1.2 Pond 200B

The second alternative is Pond 200B. This pond was evaluated as a new pond alternative site. In the Section 2 FEIS PD&E, Pond A-1 was used as an alternative. Due to the impact Pond A-1 would cause to the 100-year floodplain, this pond site was not used. Pond 200B is a proposed pond on the west side of the roadway from Station 1340+00 to 1347+00. The proposed pond will impact one parcel for a total right-of-way take of 6.06 acres. The pond soils are classified in Hydrologic Soil Groups A, A/D and B/D. Mapped sand skink soils are present over portions of this pond site; however, there are no known occurrences. Refer to the ESBA for more information regarding the Sand Skink Survey. The pond will be designed as a wet detention pond. The pond will discharge south to Central Florida Parkway Canal at Station 1333+00, which flows west to Big Sand Lake. **Pond 200B is the recommended alternative for this basin.**

5.3.2 Basin 201

Basin 201 begins at Station 1352+00 and continues north to a highpoint at Station 1410+00. The basin consists of the pond site and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.2.1 Pond 201

Pond 201 is a proposed pond on the west side of the roadway from Station 1368+00 to 1382+00. This pond was an evaluated alternative in the Section 2 FEIS PD&E named Pond A-3. The pond was reconfigured to accommodate the proposed alignment. The proposed pond will collect the runoff from the westbound side of the roadway from Station 1352+00 to 1410+00. Pond 201 is located within the FDOT's existing right-of-way; therefore, no additional right-of-way is required for this pond. The pond soils are classified in Hydrologic Soil Groups A and A/D. Mapped sand skink soils are present over portions of this pond site; however, there are no known occurrences. Refer to the ESBA for more information regarding the Sand Skink Survey. The pond will be designed as a wet detention pond. The pond will discharge south to Central Florida Parkway Canal at Station 1333+00, which flows west to Big Sand Lake. **Pond 201 is the recommended alternative for this basin.**

5.3.3 Basin 202

Basin 202 begins at the high point of the ramps for SR 528 at Station 1352+00 and continues east to Station 1410+00. The basin consists of the pond sites, SR 528 interchange to Station 205+00, the full right-of-way and the future rail bridges. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds. There is only one alternative for this basin, which consists of four interconnected ponds.

5.3.3.1 Ponds 202A, 202B, 202C & 202D

Ponds 202A and 202B are proposed ponds on the east side of the roadway from Station 1366+00 to 1374+00. Pond 202A is a modified alternative from Section 2 FEIS PD&E (Pond A-2) and was reconfigured to accommodate the proposed alignment. Pond 202B is a new alternative that was added within the R/W under proposed bridges to accommodate for the proposed alignment. Pond 202C is an existing pond (Pond 1 in Permit App. No. 020614-22) that will need to be reconfigured to accommodate the new ramp alignment. Pond 202C was built under the I-4 Auxiliary Lanes project (FPID No. 410732-1-52-01) and the existing plans were designed in 1929 NGVD and is a modified alternative from Section 2 FEIS PD&E (Pond A-5). Pond 202D is a modified alternative from Section 2 FEIS PD&E (Pond A-9) and was reconfigured to accommodate the proposed alignment. Pond 202C is located from Station 1372+00 to 1376+00. Pond 202D is a proposed pond on the east side of the roadway from Station 1376+00 to 1380+00. The ponds will collect the runoff from the SR 528 ramps. The ponds are all located within the FDOT's existing right-of-way; therefore, no additional right-of-way is required for these ponds. The pond soils are classified in Hydrologic Soil Group A. Mapped sand skink soils are present over portions of this pond site; however, there are no known occurrences. Refer to the ESBA for more information regarding the Sand Skink Survey. The ponds will be designed as wet detention ponds that are interconnected by pipes. The ponds will discharge south to Central Florida Parkway Canal at Station 1333+00, which flows west to Big Sand Lake. **Ponds 202A, 202B, 202C & 202D are the recommended alternative for this basin.**

5.3.4 Basin 203

Basin 203 includes the eastbound roadway from SR 528 and the SR 528 ramps as well. The basin begins at the high point on SR 528 at Station 205+00 and continues east to the Newover Canal at Station 252+00. The runoff from the eastbound roadway that is east of Station 252+00 will continue to flow east to the future ponds (Ponds 2B and 2C in Permit App. No. 040702-13 for the SR 528 Beachline Widening project, FPID No. 406090-1-52-01). The basin consists of the pond sites, the full right-of-way and the future rail bridges. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds. There is only one alternative for this basin, which consists of two ponds connected by proposed pipes.

5.3.4.1 Ponds 203A & 203B

The proposed ponds are already permitted, but they have not been constructed yet. Pond 203A is a proposed pond (Pond 1D in Permit App. No. 040702-13) that will need to be reconfigured to accommodate the new ramp alignment. The pond was originally designed under the SR 528 Beachline Widening project (FPID No. 406090-1-52-01). This pond alternative was evaluated under Section 2 FEIS as Pond A-1-2 (See Table 1a). Pond 203A is located from Station 235+00 to 242+00 on the south side of SR 528. Pond 203B was evaluated as a new pond alternative site. Pond 203B is a proposed pond (Pond 1F in Permit App. No. 040702-13) that will need to be reconfigured to accommodate the new ramp alignment. The pond was originally designed under the SR 528

Beachline Widening project (State Project No. 406090-1-52-01). Pond 203B is located from Station 243+00 to 247+00 on the south side of SR 528. The ponds will collect the runoff from eastbound SR 528 and the SR 528 ramps. Ponds 203A and 203B are located within the FDOT's existing right-of-way; therefore, no additional right-of-way is required for these ponds. The pond soils are classified in Hydrologic Soil Group A/D and B/D. The ponds have been designed as wet detention ponds that are connected by a pipe. The ponds will discharge southeast to the cross drain at Station 252+00. **Ponds 203A & 203B are the recommended alternative for this basin.**

5.3.5 Basin 204

Basin 204 includes the westbound roadway from SR 528, SR 528 ramps, a portion of International Drive and Back of House Road. The basin begins at the high point on SR 528 at Station 205+00 and continues east to the Newover Canal at Station 252+00. The runoff from the westbound roadway that is east of Station 252+00 will continue to flow east to the future pond (Pond 2A in Permit App. No. 040702-13). The pond was designed under the SR 528 Beachline Widening project (FPID No. 406090-1-52-01). The basin consists of the pond sites, the full right-of-way and the future rail bridges. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds. There is only one alternative for this basin, which consists of two ponds connected by proposed pipes.

5.3.5.1 Ponds 204A & 204B

The proposed ponds are already permitted but they have not been constructed yet. Pond 204A is a proposed pond (Pond 1C in Permit App. No. 040702-13) that will need to be reconfigured to accommodate the new ramp alignment. The pond was designed under the SR 528 Beachline Widening project (FPID No. 406090-1-52-01). This pond alternative was evaluated under Section 2 FEIS as Pond A-1-1 (See Table 1a). Pond 204A is located from Station 235+00 to 241+00 on the north side of SR 528. Pond 204B was evaluated as a new pond alternative site. Pond 204B is a proposed pond (Pond 1E in Permit App. No. 040702-13) that will need to be reconfigured to accommodate the new ramp alignment. Pond 204B is located from Station 242+00 to 247+00 on the north side of SR 528. The ponds will collect the runoff from westbound SR 528 and the SR 528 ramps. Ponds 204A and 204B are located within the FDOT's existing right-of-way; therefore, no additional right-of-way is required for these ponds. The pond soils are classified in Hydrologic Soil Group A/D and B/D. The ponds have been designed as wet detention ponds that are connected by a pipe and will discharge northeast to the cross drain at Station 252+00. **Ponds 204A & 204B are the recommended alternative for this basin.**

5.3.6 Basin 205

Basin 205 has three alternatives. The first two alternatives begin at the high point at Station 1410+00 and continues north to the high point of Sand Lake Road at Station 1470+00. The basin consists of the pond site and the full right-of-way from I-4. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. The third alternative entails dividing Basin 205 into two sub-basins, 205C and 205D. Basin 205C begins at Station 1410+00 and continues north to Station 1434+50. The basin consists of the pond site and the full right-of-way. Basin 205D begins at Station 1434+50 and continues north to Station 1470+00. The basin consists of the pond and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and the storm sewer systems that discharge to the ponds.

5.3.6.1 Pond 205A

The first alternative is Pond 205A. Pond 205A is a proposed pond on the west side of the roadway from Station 1413+00 to 1417+50. Pond 205A was evaluated as a new pond alternative. Under Section 2 FEIS PD&E, Pond B-1 was considered an alternative. However, this pond was not considered for this evaluation due to the impacts to the 100-year floodplain. The proposed pond will impact two parcels. The first parcel would be a complete take of 5.45 acres and the second parcel would take 3.18 acres of the 64.53 acre parcel. The proposed pond was reconfigured to avoid impacting the existing billboard. The pond soils are classified in Hydrologic Soil Groups A and B/D. Mapped sand skink soils are present over portions of this pond site; however, there are no known occurrences. Refer to the ESBA for more information regarding the Sand Skink Survey. A ground water contamination plume has been identified under a portion of the pond site, which could impact the pond site. Therefore, the pond site has a medium risk assessment for contamination. The archeological potential is considered to be very low based on field investigations and shovel tests performed by SEARCH for the Cultural Resource Assessment Survey (CRAS) Report. The pond will be designed as a wet detention pond. The pond will discharge to the cross drain at Station 1434+50, which flows to a lake that discharges to Big Sand Lake. Due to the ground water contamination and impacts to two (2) parcels, this alternative is not recommended.

5.3.6.2 Pond 205B

The second alternative is Pond 205B. Pond 205B is a proposed pond on the west side of the roadway from Station 1424+00 to 1427+00 with a 50 foot drainage/access easement that shifts around the existing billboard. Pond 205B was evaluated as a new pond alternative. Under Section 2 FEIS PD&E, Pond B-2 was considered an alternative. However, this pond was not considered for this evaluation due to the impacts to the 100-year floodplain. The proposed pond will impact one parcel with a take of 12.34 acres of the 64.53 acre parcel. The pond soil is classified in Hydrologic Soil Group A. Mapped sand skink soils are present over portions of this pond site; however, there are no known occurrences. Refer to the ESBA for more information regarding the Sand Skink Survey. A ground water contamination plume has been identified under a portion of the pond site, which could impact the pond site. Therefore, the pond site has a medium risk assessment for contamination. The archeological potential is considered to be very low based on field investigations and shovel tests performed by SEARCH for the Cultural Resource Assessment Survey (CRAS) Report. The pond will be designed as a wet detention pond and will discharge to the cross drain at Station 1434+50, which flows to a lake that discharges to Big Sand Lake. Due to the ground water contamination, this alternative is not recommended.

5.3.6.3 Ponds 205C & 205D

The third alternative is Pond 205C and Pond 205D. Pond 205C is a proposed pond on the west side of the roadway from Station 1416+00 to 1420+00. Pond 205C was evaluated as a new pond alternative. Pond 205C is a modification of Pond 205A. The proposed pond will impact one parcel with a partial take of 4.91 acres of the 64.53 acre parcel. The pond soil is classified in Hydrologic Soil Group A, A/D and B/D. Mapped sand skink soils are present over portions of this pond site; however, there are no known occurrences. Refer to the ESBA for more information regarding the Sand Skink Survey. A ground water contamination plume has been identified under a portion of the pond site, which could impact the pond site. Therefore, the pond site has a medium risk assessment for contamination. The archeological potential is considered to be very low based on field investigations and shovel tests performed by SEARCH for the Cultural Resource Assessment Survey (CRAS) Report. Pond 205C will be designed as a wet detention pond and will discharge west of the pond to Boo Boo Lake. Pond 205D is located from Station 1432+00 to 1440+00 and

was evaluated under Section 2 FEIS PD&E as Pond B2 as a modified alternative. The proposed pond will impact ten parcels. Refer to Table 3 for parcel acquisition acreage. The pond soil is classified in Hydrologic Soil Group A and B/D. A ground water contamination plume has been identified under a portion of the pond site, which could impact the pond site. Therefore, the pond site has a medium risk assessment for contamination. The pond will be designed as a wet detention pond and will discharge to the cross drain at Station 1434+50, which flows to a lake that discharges to Big Sand Lake. **Ponds 205C & 205D are the recommended alternative for this basin.**

5.3.7 Basin 206

Basin 206 begins at the high point at Sand Lake Road at Station 1470+00 and continues north to Station 1495+00. The basin consists of an existing pond site, two proposed pond sites, the I-4 / Sand Lake Road Interchange, a portion of Sand Lake Road and the full right-of-way from I-4. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds. There is only one alternative for this basin.

5.3.7.1 Ponds 206, 206A & 206B

Pond 206 is an existing pond (Retention Area in Permit App. No. 03318-3). The pond was built under the Sand Lake Road/I-4 Interchange project (FPID No. 75280-3462). The existing plans were designed in 1929 NGVD. Ponds 206 is located in the northwest quadrant at the intersection with Sand Lake Road from Station 1481+00 to 1486+00. The pond was reconfigured to accommodate the new ramp alignment. Ponds 206A and 206B are proposed ponds added to accommodate the I-4 improvements. Pond 206A is located in the southwest quadrant at the intersection with Sand Lake Road from Station 1477+00 to 1480+00. Pond 206B is located in the northwest quadrant at the intersection with Sand Lake Road from Station 1486+00 to 1489+00. Under Section 2 FEIS PD&E, Ponds C-2 and D-2 were evaluated alternatives. Due to the high water table, the existing dry pond (Pond 206) was modified to a wet pond and Pond D-3 (Pond 206A) is a modified alternative. The ponds are located within the FDOT's existing right-of-way; therefore, no additional right-of-way is required. The pond soils are classified in Hydrologic Soil Group A. The ponds are designed as wet detention ponds due to the seasonal high elevation. Mapped sand skink soils are present over portions of this pond site; however, there are no known occurrences. Refer to the ESBA for more information regarding the Sand Skink Survey. The pond will continue to discharge south to the cross drain at Station 1467+13, which discharges west to Little Sand Lake. **Ponds 206, 206A and 206B are the recommended alternative for this basin.**

5.3.8 Basin 207

Basin 207 begins at Station 1495+00 and continues north to Station 1505+00. The basin consists of the pond site and the full right-of-way from I-4 and the southbound ramp for Sand Lake Road. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.8.1 Pond 207

Pond 207 is an existing pond (Pond 100 in Permit App. No. 950919-3) that does not need to be expanded or regraded. The pond was built under the I-4/Republic Drive project (State Project No. 75280-3410) and is located north of Sand Lake Road and west of I-4 Station from Station 1490+00 to 1500+00. The pond was under construction during the Section 2 FEIS PD&E. The pond soil is classified in Hydrologic Soil Group A. The pond is designed as a wet detention pond and has been

evaluated as a new pond alternative site. The pond will continue to discharge south to roadside ditches that flow to the cross drain at Station 1467+13, which discharges west to Little Sand Lake. **Pond 207 is the recommended alternative for this basin.**

5.3.9 Basin 208

Basin 208 begins at Station 1510+30 and continues north to Station 1535+51 and only encompasses the ramps. The basin consists of the pond site and the ramps west of I-4. I-4 is not treated in the existing pond. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.9.1 Pond 208

Pond 208 is an existing pond (Pond 200 in Permit App. No. 950919-3) that does not need to be expanded or regraded. The pond was built under the I-4/Republic Drive project (State Project No. 75280-3410). The pond was shown as an existing pond in the Section 2 FEIS PD&E. The pond is located west of I-4 from Station 1529+00 to 1533+00. The pond soils are classified in Hydrologic Soil Group A/D and the pond is designed as a wet detention pond. The pond will continue to discharge east to the I-4 median swale, which ultimately drains to Shingle Creek. **Pond 208 is the recommended alternative for this basin.**

5.3.10 Basin 209

Basin 209 begins at Station 1505+00 and continues north to the project terminus at Station 1535+34. The basin consists of the pond sites and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to future ponds (Ponds F32, F33, F34 and F35 in Permit App. No. 120703-15). There is only one alternative for this basin, which consists of the four future ponds under the I-4 Ultimate contract (FPID No. 432193-1-52-01). Ponds F32, F33, F34 and F35 were evaluated under Section 2 FEIS PD&E and were reconfigured to accommodate the proposed alignment. The I-4 Ultimate ponds will be constructed before the PD&E becomes a design project. The ponds are located at the Kirkman Road Interchange, north of the project terminus and were designed as interconnected wet detention ponds. The ponds discharge to Shingle Creek.

Table 3 – Pond Engineering Data & Analysis

Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	Lowest Edge of Roadway (ft)	Outfall Location	Roadway Drainage Area (ac)	Method of Treatment	Required Treatment & Attenuation Volume (ac-ft)	Provided Treatment & Attenuation Volume (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
200A	Station 1350+00 Parcel No. 11-24-28-0000-00-010	St. Lucie (A)	98.00	110.00	Central Florida Parkway Canal	19.64	Wet Detention	7.00	9.56	6.03	52.04
200B	Station 1343+00 Parcel No. 11-24-28-0000-00-004	Basinger (A/D), Immokalee (B/D) & St. Lucie (A)	96.00	110.00	Central Florida Parkway Canal	19.64	Wet Detention	8.34	9.51	6.40	18.64
201	Station 1375+00 FDOT Property	Immokalee (B/D) & Pomello (A)	106.00	110.00	Central Florida Parkway Canal	32.50	Wet Detention	9.95	9.95	N/A	N/A
202A, 202B, 202C & 202D	Station 1374+00 FDOT Property	Pomello & St. Lucie (A)	114.35	120.00	Central Florida Parkway Canal	47.76	Wet Detention	11.39	20.89	N/A	N/A
203A & 203B	Station 240+00 (SR 528) FDOT Property	Basinger (A/D), St. Johns (B/D) & Smyrna (A/D)	87.00	91.70	Cross Drain at Sta. 252+00	19.32	Wet Detention	4.10	6.86	N/A	N/A
204A & 204B	Station 240+00 (SR 528) FDOT Property	Basinger (A/D), St. Johns (B/D) & Smyrna (A/D)	88.00	91.70	Cross Drain at Sta. 252+00	20.13	Wet Detention	4.13	7.04	N/A	N/A
205A	Station 1416+00 Parcel No. 02-24-28-0000-00-009	St. Johns (B/D) & Tavares (A)	105.75	110.00	Cross Drain at Sta. 1434+46	62.26	Wet Detention	11.47	11.59	5.45	5.45
	Parcel No. 02-24-28-0000-00-005									2.84	64.53
205B	Station 1426+00 Parcel No. 02-24-28-0000-00-005	Candler-Apopka & Tavares (A)	101.00	110.00	Cross Drain at Sta. 1434+46	62.26	Wet Detention	11.13	11.99	12.29	64.53
205C	Station 1418+00 Parcel No. 02-24-28-0000-00-005	St. Johns (B/D) & Tavares (A)	105.75	110.00	Boo Boo Lake	18.88	Wet Detention	6.42	6.44	4.91	64.53
205D	Station 1436+00 Parcel No. 35-23-28-0000-00-029	Basinger (A/D) Smyrna-Smyrna (A/D) & Immokalee (B/D)	101.10	110.00	Cross Drain at Sta. 1434+46	27.42	Wet Detention	7.02	8.78	0.47	1.02
	Parcel No. 35-23-28-0000-00-028									0.32	0.82
	Parcel No. 35-23-28-0000-00-031									0.30	1.06
	Parcel No. 35-23-28-0000-00-027									0.31	0.54
	Parcel No. 35-23-28-0000-00-033									0.41	0.73
	Parcel No. 35-23-28-0000-00-039									0.43	0.70
	Parcel No. 35-23-28-0000-00-038									0.71	0.95

Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	Lowest Edge of Roadway (ft)	Outfall Location	Roadway Drainage Area (ac)	Method of Treatment	Required Treatment & Attenuation Volume (ac-ft)	Provided Treatment & Attenuation Volume (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
	Parcel No. 35-23-28-0000-00-037									0.79	1.05
	Parcel No. 35-23-28-0000-00-041									0.58	1.01
	Parcel No. 35-23-28-0000-00-025									0.39	2.04
206, 206A & 206B	Station 1484+00 FDOT Property	Pomello (A)	120.50	135.00	Cross Drain at Sta. 1467+13	35.84	Wet Detention	5.94	8.01	N/A	N/A
207	Station 1495+00 FDOT Property	Archbold (A)	126.60	130.00	Cross Drain at Sta. 1467+13	10.37	Wet Detention	2.34	5.63	N/A	N/A
208	Station 1531+00 FDOT Property	Smyrna (A/D)	107.10	113.00	I-4 Median Swale	8.31	Wet Detention	1.21	2.97	N/A	N/A

Table 4 – Pond Impact & Cost Analysis

Pond	Existing Land Use	Threatened or Endangered Species Impacts	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Floodplain Impacts (ac-ft)	Wetland & Surface water Impacts (ac)	Total Pond Cost	Rankings
200A	Vacant Nonresidential	High	Low	N	0.00	0.00	$24,975,416	2
200B	Agricultural	High	Low	N	0.00	0.66	$9,536,307	1
201	Public/Semi-Public	Moderate	Low	N	0.00	2.75	$798,609	1
202A	Public/Semi-Public	Moderate	Low	N	0.00	0.45	$1,445,764	1
202B		Low				0.00		
202C		High				0.00		
202D		Low				0.00		
203A & 203B	Public/Semi-Public	Moderate	Low	N	0.00	0.00	$22,860	1
204A & 204B	Public/Semi-Public	Moderate	Low	N	0.00	0.00	$22,860	1
205A	Vacant Residential	Moderate	Medium	N	0.00	0.00	$11,383,554	3
205B	Vacant Nonresidential	Moderate	Medium	N	0.00	0.00	$29,184,910	2
205C	Vacant Nonresidential	Moderate	Medium	N	0.00	0.00	$8,533,822	1
205D	Vacant Residential	Moderate	Medium	N	0.00	0.00	$8,196,224	1

206, 206A & 206B	Public/Semi-Public	Low	Low	N	0.00	0.00	$653,352	1
207	Public/Semi-Public	Moderate**	Low	N	0.00	N/A**	$0**	1
208	Public/Semi-Public	Moderate**	Low	N	0.00	N/A**	$0**	1

*These ponds are already permitted and the wetlands have been mitigated for in the existing permit. The ponds will be constructed with the SR 528 Widening Project. ** There are no proposed changes to this existing pond.

6.0 Conclusion

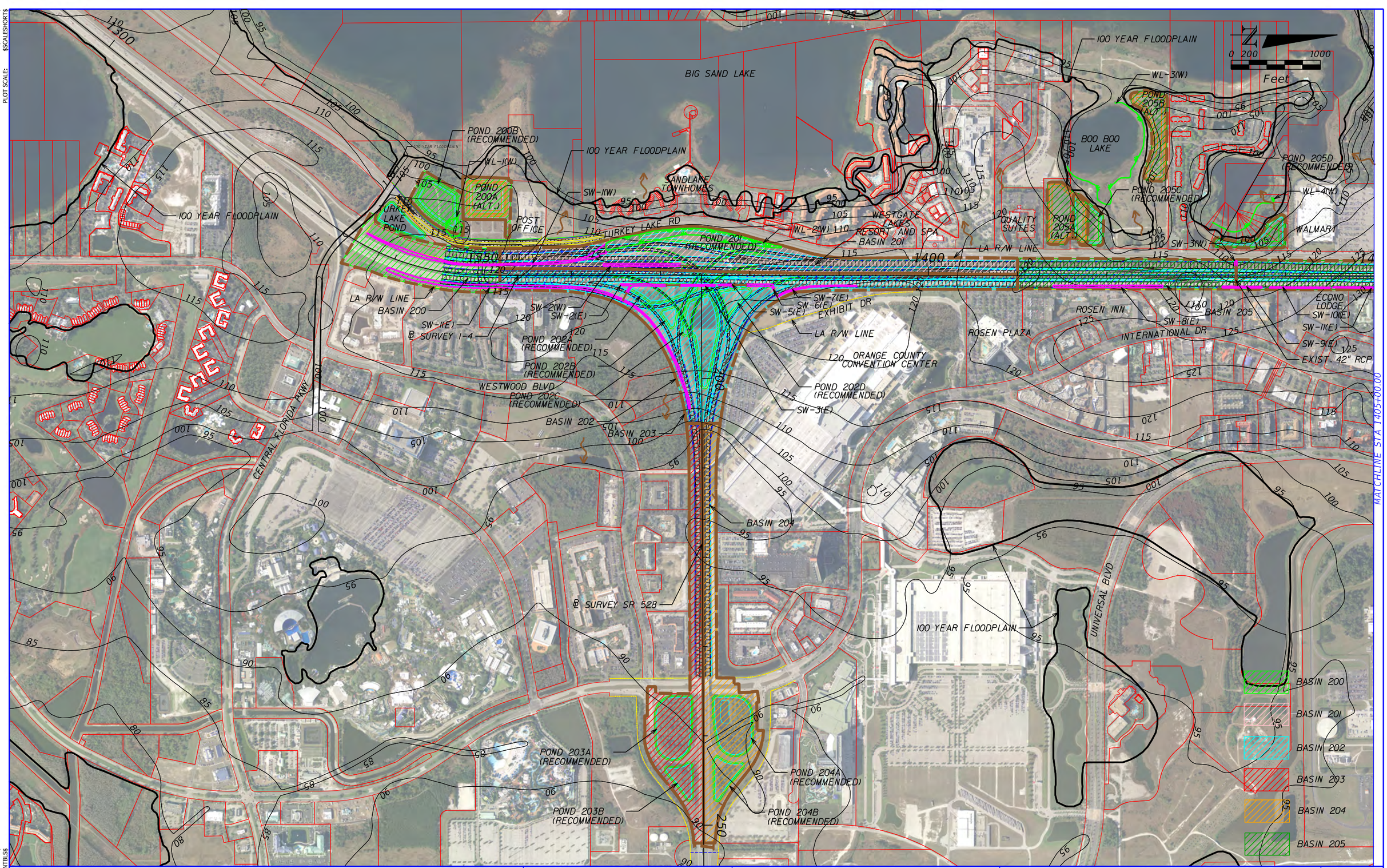
The Pond Alternative Matrices (Tables 3 and 4) show a summary of the engineering data and analysis, as well as, the impact and cost analysis. *The cost evaluation for the stormwater management facility alternatives in this report includes stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations and sodding. The associated parcel acquisition costs for each alternative evaluated include the estimated cost of land and any impacted improvements, administration costs and legal fees.* The recommended pond sites are shown in Table 1.

APPENDIX A –

DRAINAGE MAPS

drmprd202_OA
$SHEETSIZE$
$SCALESHORT$

MODEL:
SHEET SIZE:
PLOT SCALE:



$PLTDRVR$
$PENTBL$$

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

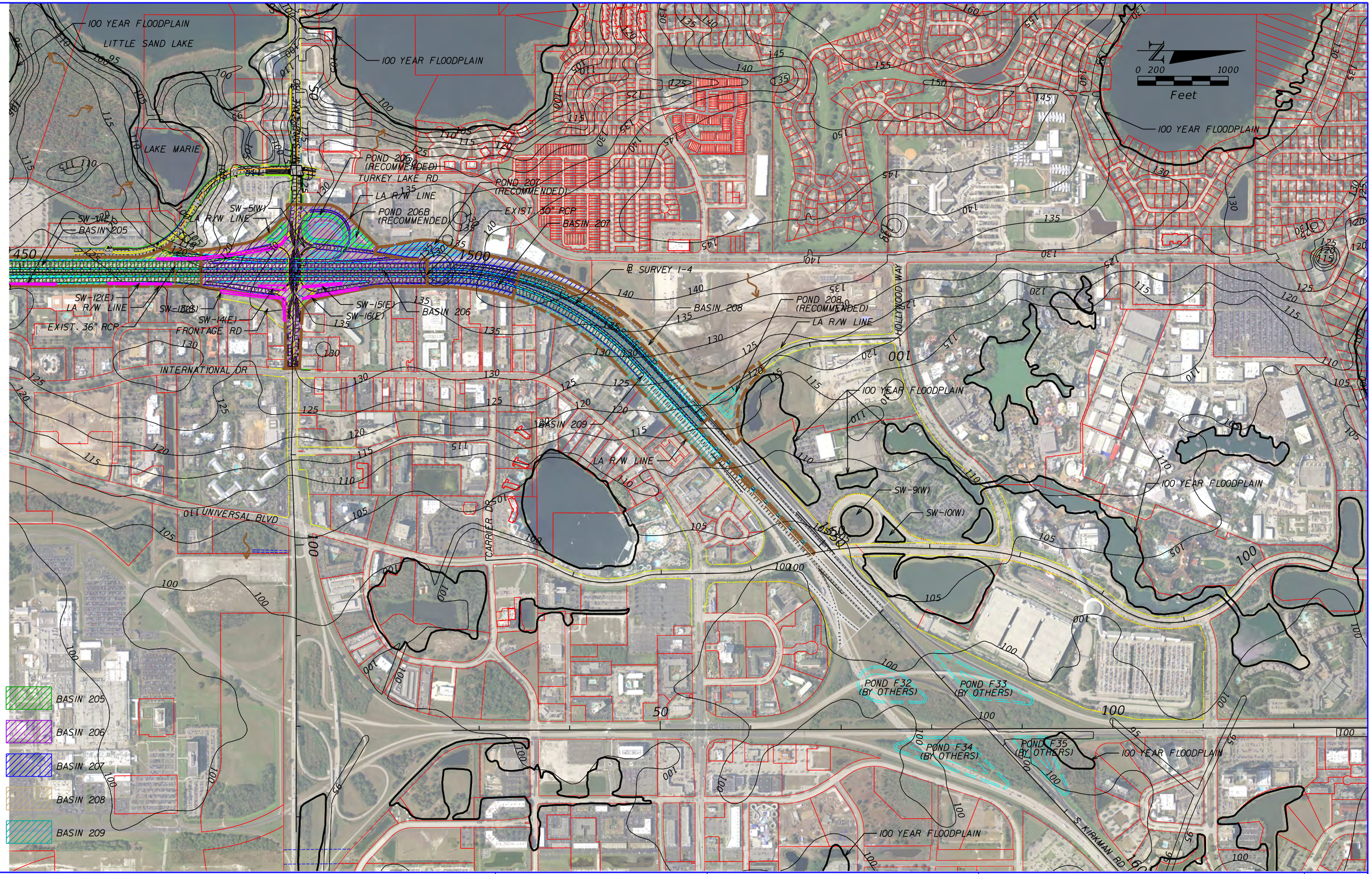
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
OVERALL DRAINAGE MAP
SECTION 2

SHEET NO.
A-1

lphillip 2/26/2015 8:20:12 AM \\LKMw00\pmwork3\Jobs\59219 - I4 SAMR\TECHPROD\432100122O1\Segment 2\drainage\DRMPRD202.dgn

MODEL: drmprd202_OB
SHEET SIZE: $SHEETSIZE$
PLOT SCALE: $SCALESHORT$



PRINT DRIVER: $PLTDRVR$
PEN TABLE: $PENTBL$

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407)805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
OVERALL DRAINAGE MAP
SECTION 2

SHEET NO. A-2

100 YEAR FLOODPLAIN
PROPOSED FDOT R/W LINE
100 YEAR FLOODPLAIN
POND 200A (ALTERNATE) 4.07 AC
PARCEL ID: 11-24-28-0000-00-004
AREA TAKING: 278,582 SF
POND 200B (RECOMMENDED) 4.27 AC
PARCEL ID: 11-24-28-0000-00-004
AREA TAKING: 26,643 SF
PARCEL ID: 11-24-28-0000-00-010
AREA TAKING: 262,516 SF
100 YEAR FLOODPLAIN
PROPOSED FDOT R/W LINE
POST OFFICE
PARCEL ID: 11-24-28-0000-00-010
AREA TAKING: 61,567 SF
PARCEL ID: 11-24-28-0000-00-013
AREA TAKING: 38,027 SF
PARCEL ID: 11-24-28-9249-00-010
AREA TAKING: 10,740 SF
PARCEL ID: 11-24-28-0000-00-014
AREA TAKING: 458 SF
TURKEY LAKE POND
EXISTING LA R/W LINE
WL-2(W)
TURKEY LAKE RD
POND 201 (RECOMMENDED) 5.08 AC
BASIN 201 32.50 AC I-4 WB CD SYSTEM
SANDLAKE VILLAGE
SAND LAKE TOWN HOMES
0 50 200 Feet
WL-1(W)
TUKEY LAKE ROAD POND
REFER TO SEGMENT 1 FOR EXTENSION
PROPOSED FDOT LA R/W LINE
PARCEL ID: TURKEY LAKE ROAD
AREA TAKING: 182,234 SF
PARCEL ID: 11-24-28-0000-00-022
AREA TAKING: 215 SF
I-4 WB CD SYSTEM
SR 528 WB TO I-4 WB GUL
I-4 WB TO CENTRAL FL
SW-2(W)
SR 528 WB TO I-4 WB EXPRESS LANE
I-4 WB GUL
I-4 WB EXPRESS LANE
SW-1(W)
I-4 EB EXPRESS LANE
I-4 EB EXPRESS LANE TO SR 528 EB
I-4 EB GUL
SW-2(E)
POND 202A (RECOMMENDED) 2.89 AC
I-4 EB GUL TO SR 528 EB
CENTRAL FLORIDA PARKWAY TO I-4 EB GUL
BEGIN SEGMENT 2
STA. 1345+48.48
MATCH FUTURE EXISTING CONDITIONS
BEGIN 22' CONCRETE NOISE WALL
REFER TO SEGMENT 1345+90.48 FOR EXPENSION
BASIN 200 19.64 AC
SW-1(E)
℄ EXIST I-4
END 22' CONCRETE NOISE WALL
STA. 1351+27.89
ORANGE COUNTY SHERIFF COMMUNITY CENTER
MONTEREY LAKE APARTMENTS
WESTWOOD CENTER
MANUFACTURERS LIFE INSURANCE CO.
MARRIOTT VACATION CLUB
BASIN 202 47.67 AC
SW-1(E)
BASIN 200
BASIN 201
BASIN 202
(SR 528 ALT 6 SHOWN)
MATCHLINE STA. 1369+00.00

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY DRAINAGE MAP SEGMENT 2

SHEET NO. A-3

MODEL:
SHEET SIZE: drmprd202
PLOT SCALE: 16.5x10.6 (in.) 1:200

MATCHLINE STA. 1369+00.00

SAND LAKE TOWN HOMES

100 YEAR FLOODPLAIN

EXISTING LA R/W LINE

WL-2(W)

BEGIN SR 528
FPID 432100-1-22-1
STA. 188+44.20

TURKEY LAKE RD

POND 201
(RECOMMENDED)
5.08 AC

BASIN 201
32.50 AC

I-4 WB CD SYSTEM

I-4 WB GDL SR 528 EB

PARKWAY

I-4 WB GUL

SW-2(W)

℄ EXIST SR 528

I-4 WB EXPRESS LANE

I-4 EB EXPRESS LANE

SW-5(E)

I-4 EB GUL

CENTRAL FLORIDA PARKWAY TO I-4 EB GUL

SW-3(E)

SW-2(E)

POND 202A
(RECOMMENDED)
2.89 AC

I-4 EB EXPRESS LANE TO SR 528 EB

SR 528 WB TO I-4 WB EXPRESS

SR 528 WB TO I-4 WB GUL

POND 202D
(RECOMMENDED)
1.71 AC

POND 202B
(RECOMMENDED)
0.84 AC

POND 202C
(RECOMMENDED)
6.11 AC

SR 528 WB TO I-4 EB GUL

I-4 EB GUL TO SR 528 EB

SW-1(E)

BASIN 202
47.76 AC

℄ EXIST I-4

SW-7(E)

EXHIBIT DR

EXISTING LA R/W LINE

ORANGE COUNTY
CONVENTION CENTER

WESTGATE LAKES
RESORT AND SPA

100 YEAR FLOODPLAIN

0 50 200
Feet

BASIN 201

BASIN 202

(SR 528 ALT 6 SHOWN)

MATCHLINE STA. 1399+00.00

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 2

SHEET NO.
A-4

PRINT DRIVER:
PEN TABLE: Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

MATCHLINE STA. 1399+00.00

MATCHLINE STA. 1429+00.00

100 YEAR FLOODPLAIN

DR. PHILLIPS HOSPITAL

WORLD CARE CENTER

DR. P. PHILLIPS HOSPITAL

WESTGATE LAKES

PARCEL ID: 02-24-28-0000-00-009
AREA TAKING: 237,294 SF
PROPOSED FDOT R/W LINE

QUEST DIAGNOSTIC

QUALITY SUITES

POND 205A (ALTERNATE) 6.23 AC

POND 205C (RECOMMENDED) 3.69 AC

POND 205B (ALTERNATE) 5.48 AC

WL-3(W)

BOO BOO LAKE
PARCEL ID: 02-24-28-0000-00-005
AREA TAKING: 123,811 SF

PROPOSED FDOT R/W LINE

0 50 200
Feet

100 YEAR FLOODPLAIN

PARCEL ID: 02-24-28-0000-00-005
AREA TAKING: 213,954 SF

PARCEL ID: 02-24-28-0000-00-005
AREA TAKING: 535,275 SF

81

82

EXISTING LA R/W LINE

BASIN 201
32.50 AC

TURKEY LAKE RD

BASIN 205
62.26 AC

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

SW-8(E)

℄ EXIST I-4

EXISTING LA R/W LINE

BASIN 202
47.76 AC

ROSEN PLAZA

ROSEN INN

AIR FLORIDA HELICOPTER CHARTERS

53

54

55

56

57

BASIN 201

BASIN 202

BASIN 205

INTERNATIONAL DR

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY DRAINAGE MAP SEGMENT 2

SHEET NO. A-5

drmprd204
16.5x10.6 (in.)
1:200
MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 1429+00.00

PARCEL ID: 35-23-28-0000-00-033
AREA TAKING: 17,757 SF
PARCEL ID: 35-23-28-0000-00-027
AREA TAKING: 13,449 SF
PARCEL ID: 35-23-28-0000-00-031
AREA TAKING: 13,171 SF
PARCEL ID: 35-23-28-0000-00-028
AREA TAKING: 13,929 SF
BIG SAND LAKE
WL-4(W)
PARCEL ID: 35-23-28-0000-00-039
AREA TAKING: 18,907 SF
PARCEL ID: 35-23-28-0000-00-038
AREA TAKING: 30,943 SF
PROPOSED FDOT R/W LINE
PARCEL ID: 35-23-28-0000-00-025
AREA TAKING: 17,163 SF
PARCEL ID: 35-23-28-0000-00-041
AREA TAKING: 25,305 SF
PARCEL ID: 35-23-28-0000-00-037
AREA TAKING: 34,342 SF
WALMART
N
0 50 200
Feet
TURKEY LAKE ROAD POND
POND 205D (RECOMMENDED)
3.02 AC
PHILLIPS VILLAGE
100 YEAR FLOODPLAIN
PARCEL ID: 35-23-28-0000-00-029
AREA TAKING: 20,656 SF
EXISTING LA R/W LINE
SW-3(W)
TURKEY LAKE RD
BASIN 205
62.26 AC
I-4 WB GUL
I-4 WB EXPRESS LANES
I-4 EB EXPRESS LANES
I-4 FR GUL
℄ EXIST I-4
SW-9(E)
SW-10(E)
SW-11(E)
EXISTING 42" RCP
EXISTING LA R/W LINE
DAVE AND BUSTERS
OLIVE GARDEN
EMBASSY SUITES
AVANTI RESORT
COURTYARD BY MARRIOTT
YMCA
GREAT WESTERN AQUATIC PLAZA
INTERNATIONAL DR
FRIENDLYS
BASIN 205

Note:
The existing drainge structures are for graphic purposes only.
Field survey is required to determine the actual stationing.

MATCHLINE STA. 1459+00.00

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY DRAINAGE MAP SEGMENT 2

SHEET NO. A-6

Color_FDOTPDF.pltcfg
FDOT_text-qkvw.tbl
PRINT DRIVER:
PEN TABLE:

MODEL: drmprd205
SHEET SIZE: 16.5x10.6 (in.)
PLOT SCALE: 1:200

MATCHLINE STA. 1459+00.00

MATCHLINE STA. 1489+00.00

100 YEAR FLOODPLAIN
LAKE MARIE
PARCEL ID: 35-23-28-0000-00-053
AREA TAKING: 3,598 SF
PARCEL ID: 35-23-28-7825-00-010
AREA TAKING: 185 SF
PARCEL ID: 35-23-28-7825-00-011
AREA TAKING: 1,324 SF
PARCEL ID: 35-23-28-0000-00-061
AREA TAKING: 67,540 SF
PHILLIPS VILLAGE
EXISTING LA R/W LINE
PARCEL ID: 35-23-28-7825-00-012
AREA TAKING: 3,072 SF
TURKEY LAKE RD
TURKEY LAKE POND
BASIN 205
62.26 AC
EXIST. R/W LINE
TURKEY LAKE RD
PARCEL ID: 35-23-28-7113-01-000
AREA TAKING: 2,018 SF
WHOLE FOODS
PARCEL ID: 35-23-28-7113-01-000
AREA TAKING: 2,018 SF
PHILLIPS CROSSING
℄ EXIST SAND LAKE RD
SAND LAKE ROAD
TO I-4 WB GUL
SW-4(W)
PROPOSED LA R/W LINE
BASIN 206
35.84 AC
POND 206A
(RECOMMENDED)
0.66 AC
POND 206
(RECOMMENDED)
3.12 AC
POND 206B
(RECOMMENDED)
0.85 AC
7-ELEVEN
WENDY'S
DRURY HOTEL
SAND LAKE ROAD WB
TO TURKEY LAKE ROAD SB
I-4 WB GUL TO
SAND LAKE ROAD
I-4 WB GUL TO
TURKEY LAKE ROAD SB
0 50 200
Feet
I-4 WB GUL
I-4 WB EXPRESS LANES
I-4 EB EXPRESS LANES
I-4 EB GUL
SW-12(E)
EXISTING 36" RCP
℄ EXIST (I-4
EXISTING LA R/W LINE
SW-13(E)
SW-14(E)
SW-15(E)
SW-16(E)
I-4 EB GUL TO
SAND LAKE ROAD
FRONTAGE ROAD
SAND LAKE ROAD
TO I-4 EB GUL
RADISSON
LAQUINTA INN
EMBASSY SUITES
COMFORT INN
ROSEN
MEDICAL
CENTER
JAMAICAN CT
STRIP CENTER
INTERNATIONAL DR
FOGO DE CHAO
BEST WESTERN
FRIDAYS SPORTS GRILL
& BARGAIN WORLD
GOLDEN CORRAL
BP GASS
STATION
WALGREENS
EXIST. R/W LINE
CHECKERS
SHELL/CIRCLE K
QUALITY INN
MCDONALDS
(SAND LAKE ROAD ALT 4 SHOWN)
BASIN 205
BASIN 206

Note:
The existing drainage structures ae for graphic purposes only.
Field survey is required to determine the actual stationing.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

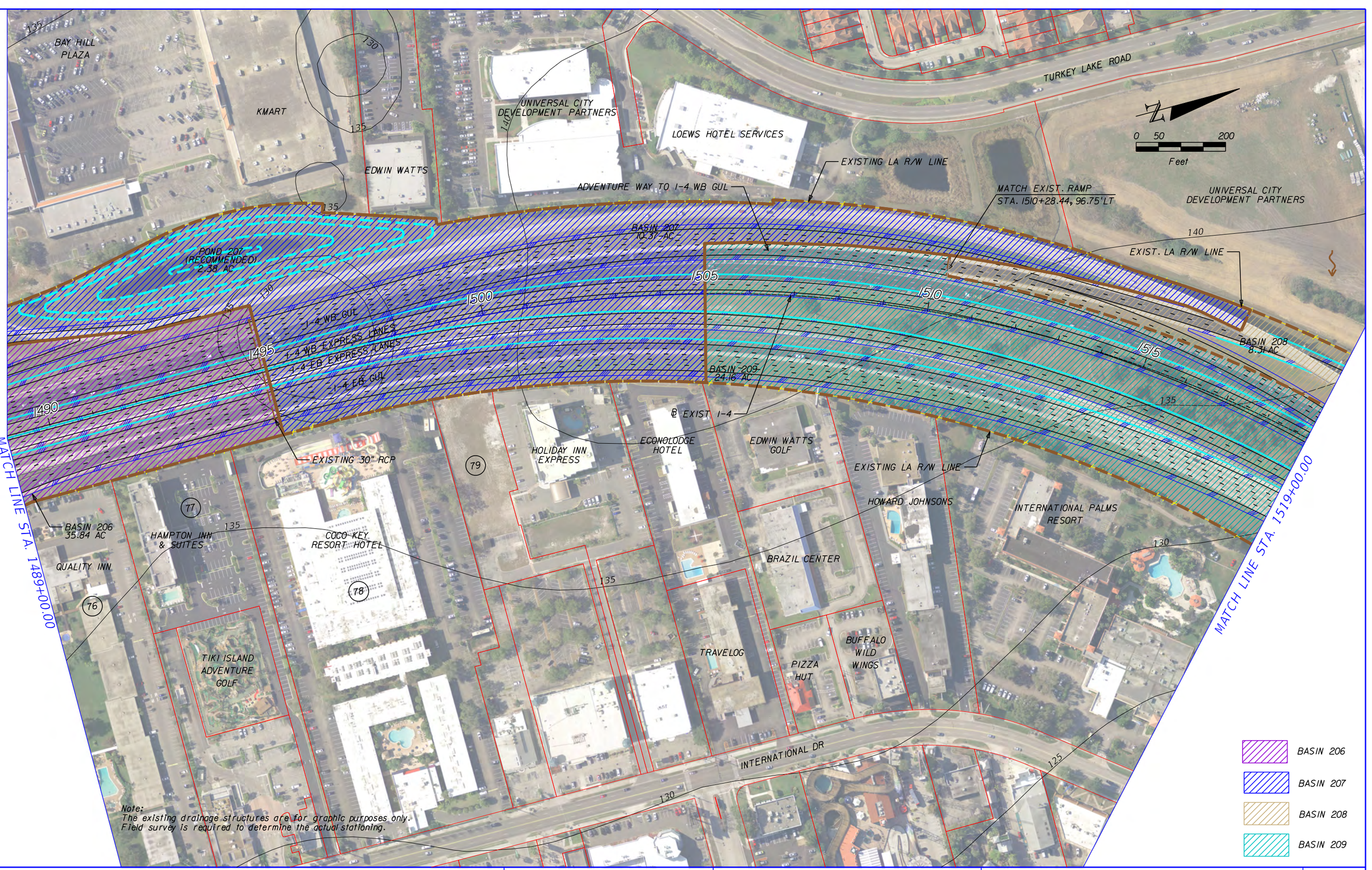
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 2

SHEET NO. A-7

PRINT DRIVER: Color_FDOTPDF.pltcfg
PEN TABLE: FDOT_text-qlow.tbl

drmprd206
16.5x10.6 (in.)
1:200
MODEL:
SHEET SIZE:
PLOT SCALE:



Note:
The existing drainage structures are for graphic purposes only.
Field survey is required to determine the actual stationing.

Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl
PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 2

SHEET NO.
A-8

lphillip 8/15/2016 2:52:05 PM \\LKMw00\pmwork3\Jobs\59219 - I4 SAMR\TECHPROD\43210012201\Segment 2\drainage\DRMPRD201.dgn

drmprd207
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 1519+00.00

MATCHLINE STA. 1549+00.00

UNIVERSAL CITY DEVELOPMENT PARTNERS

℄ EXIST ADVENTURE WAY

EXIST. R/W LINE

100 YEAR FLOODPLAIN

ROYAL PACIFIC RESORT

0 50 200
Feet

END SEGMENT 2 EB GUL
FPID 432100-1-22-1
BEGIN I-4 ULTIMATE EB GUL
FPID 242484-3-52-01
STA. 1523+00.00

POND 208
(RECOMMENDED)
1.52 AC

BASIN 208
8.31 AC

KIRKMAN SB RAMP TO I-4 WB GUL

END SEGMENT 2 WB EXPRESS LANES
FPID 432100-1-22-1
BEGIN I-4 ULTIMATE WB EXPRESS LANES
FPID 242484-3-52-01
STA. 1531+34.03

EXISTING LA R/W LINE

I-4 WB GUL

I-4 WB EXPRESS LANES

BASIN 209
24.16 AC

℄ EXIST I-4

I-4 EB EXPRESS LANES

I-4 EB GUL

I-4 EB GUL TO UNIVERSAL BLVD

EXISTING LA R/W LINE

INTERNATIONAL PALMS RESORT

ROSEN INN

THE METROPOLITAN EXPRESS

MONUMENTAL HOTEL

ORLANDO CONTINENTAL PLAZA HOTEL

GEORGE'S MUSIC

VISITORS CIRCLE

℄ EXIST UNIVERSAL BLVD

UNIVERSAL SHOPS

SKY VENTURE
SW-18(E)

GIFT SHOPS

KFC

WALGREENS

INTERNATIONAL DR

BASIN 208

BASIN 209

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY DRAINAGE MAP SEGMENT 2

SHEET NO.
A-9

Color_FDOTPDF.pltcfg
FDOT_text-qlow.tbl

PRINT DRIVER:
PEN TABLE:

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MODEL: drmprd208
SHEET SIZE: 16.5x10.6 (in.)
PLOT SCALE: 1:200

MATCHLINE STA. 1549+00.00

100 YEAR FLOOD PLAIN
℄ EXIST UNIVERSAL BLVD
100 YEAR FLOOD PLAIN
EXIST. R/W LINE
100 YEAR FLOOD PLAIN
100 YEAR FLOODPLAIN
0 50 200
Feet
UNIVERSAL STUDIOS
EXISTING LA R/W LINE
KIRKMAN SB RAMP TO I-4 WB GUL
LA R/W LINE PENDING FINAL AGREEMENT
END SEGMENT 2 EB EXPRESS LANES
FPID 432100-1-22-1
BEGIN I-4 ULTIMATE EB EXPRESS LANES
FPID 242484-3-52-01
STA. 1550+23.13
POND F33
BY OTHERS
1550 1555 1560 1565 1570 1575
I-4 WB GUL
I-4 WB EXPRESS LANES
I-4 WB
I-4 EB EXPRESS LANES
I-4 EB GUL
BASIN 209
℄ EXIST I-4
KIRKMAN SB
I-4 WB RAMP TO KIRKMAN SB
KIRKMAN NB
℄ EXIST KIRKMAN RD
END SEGMENT 2 WB GUL
FPID 432100-1-22-1
BEGIN I-4 ULTIMATE WB GUL
FPID 242484-3-52-01
STA. 1572+69.84 R 3
POND F34
BY OTHERS
POND F32
BY OTHERS
UNIVERSAL BLVD TO I-4 EB GUL
EXISTING LA R/W LINE
MOTEL 6
HOMEWOOD SUITES
BY HILTON
I-4 EB RAMP TO KIRKMAN NB
I-4 EB
KIRKMAN NB RAMP TO I-4 EB
GRAND NATIONAL DRIVE
BASIN 209

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY DRAINAGE MAP SEGMENT 2

SHEET NO. A-10

PRINT DRIVER: C:\dot_FDOTPDF.pltcfg
PEN TABLE: FDOT_text-sjkw.tbl

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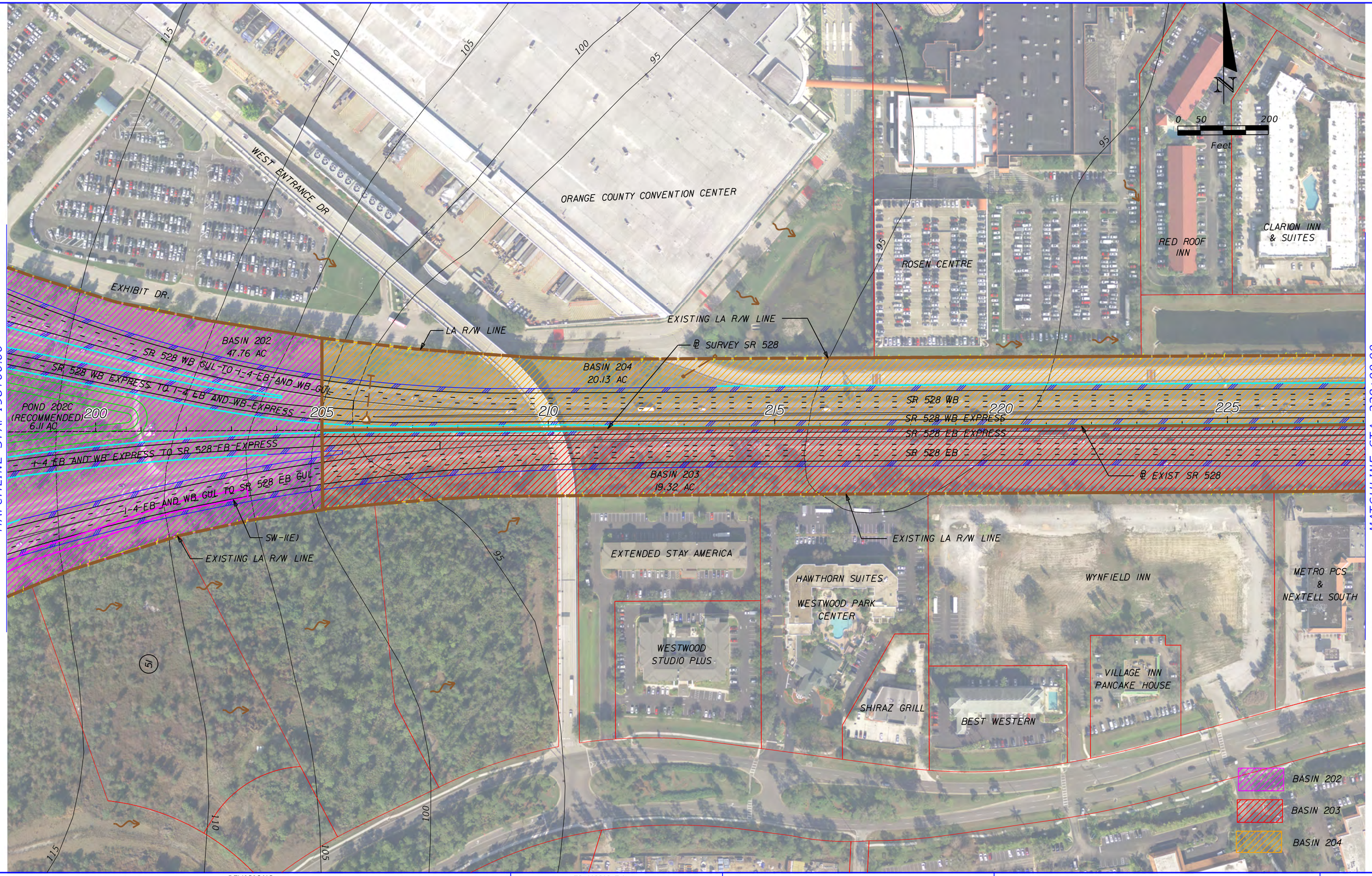
MATCHLINE STA. 198+00.00



MATCHLINE STA. 228+00.00

Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP (SR 528)
SEGMENT 2

SHEET NO.
A-11

SR-528-02
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

END I-4/BEACHLINE INTERCHANGE CONNECTION
FPID 432100-1-22-01
BEGIN TURNPIKE WIDENING
FPID 406090-5-52-01
STA 233+56.03

SEVEN ELEVEN

LA R/W LINE

INTERNATIONAL DR TO SR 528 WB GUL

PRELIMINARY TOLLING SIGN LOCATION

INTERNATIONAL DR TO SR 528 WB

SR 528 WB TO INTERNATIONAL DR

DAYS INN CIVIC CENTER

INTERNATIONAL DR

POND 204A (RECOMMENDED) 6.20 AC

POND 204B (RECOMMENDED) 2.41 AC

EXISTING LA R/W LINE

PRELIMINARY TOLLING SIGN LOCATION

BASIN 204 20.13 AC

230 235 240 245 250 255

SR 528 WB

SR 528 WB EXPRESS

SR 528 EB EXPRESS

SR 528 EB

BASIN 203 19.32 AC

EXISTING LA R/W LINE

℄ EXIST SR 528

POND 203A (RECOMMENDED) 6.40 AC

SR 528 EB TO INTERNATIONAL DR

POND 203B (RECOMMENDED) 1.98 AC

INTERNATIONAL DR TO SR 528 EB

INTERNATIONAL TOWN DISCOUNT CENTER

EXISTING LA R/W LINE

SR 528 EB GUL TO INTERNATIONAL DR

LA R/W LINE

BASIN 203

BASIN 204

90

N

0 50 200

Feet

MATCHLINE STA. 228+00.00

MATCHLINE STA. 258+00.00

Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP (SR 528)
SEGMENT 2

SHEET NO.
A-12

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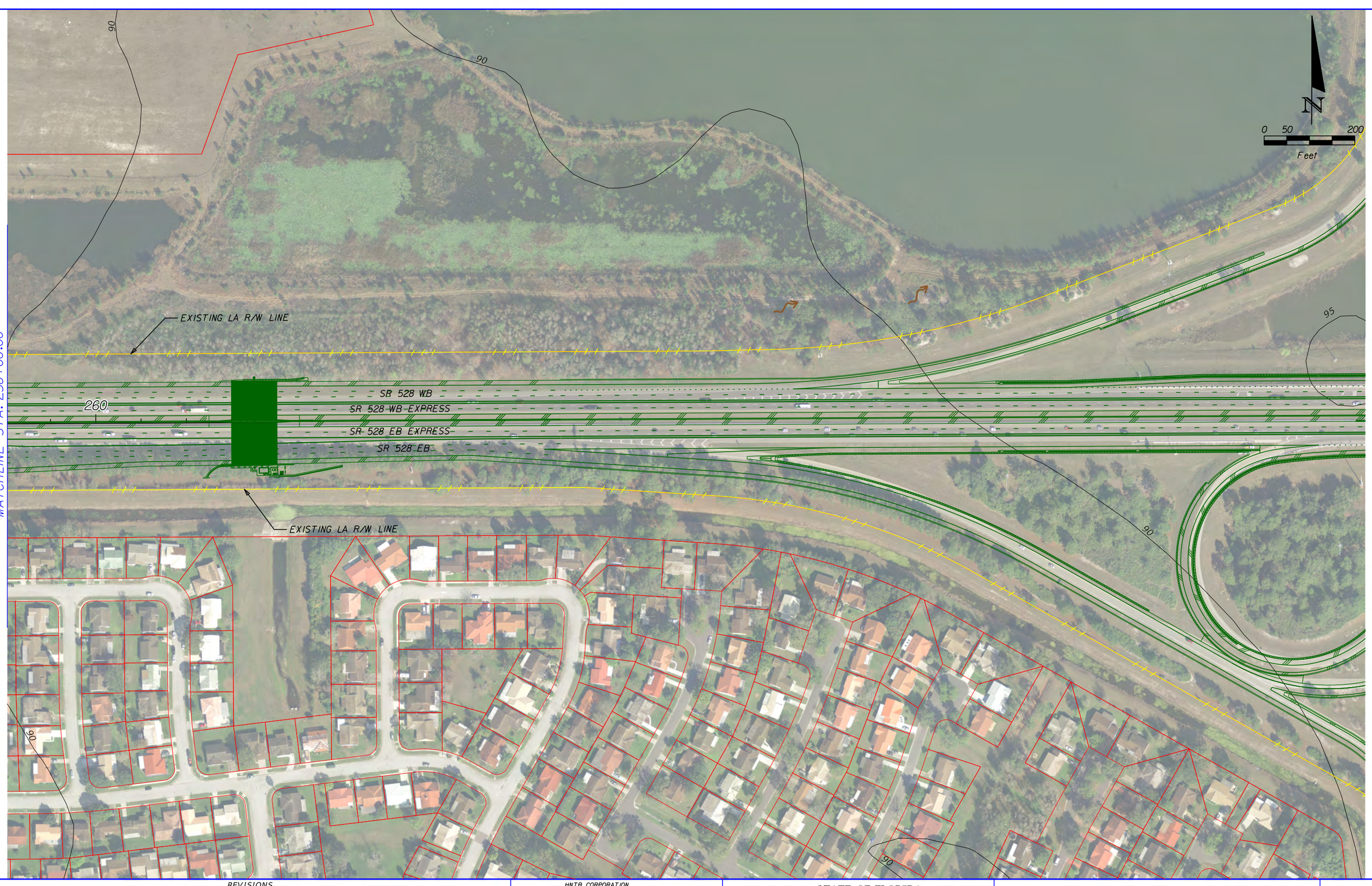
SR-528-03
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 258+00.00



Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP (SR 528)
SEGMENT 2

SHEET NO.
A-13

APPENDIX B –

BASIN CALCULATIONS

I-4 PD and E

Segment 2

8 May 2013

INPUT	OUTPUT
State Plane, NAD83	State Plane, NAD83
0901 - Florida East, U.S. Feet	0901 - Florida East, U.S. Feet
Vertical - NGVD29 (Vertcon94), U.S. Feet	Vertical - NAVD88, U.S. Feet

1	1/1
Northing/Y: 1485537.158	**Northing/Y:** 1485537.158
Easting/X: 505423.379	**Easting/X:** 505423.379
Elevation/Z: 0	**Elevation/Z:** -0.889
Convergence: -0 13 23.51713	**Convergence:** -0 13 23.51713
Scale Factor: 0.999967221	**Scale Factor:** 0.999967221
Combined Factor: 0.999971562	**Combined Factor:** 0.999971604

Grid Shift (U.S. ft.): X/Easting = 0.0, Y/Northing = 0.0

Remark:

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	23-Feb-15
checked by:	BJS	23-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 200
POND NAME: 200A

STATION LIMITS: From: 1335+00
To: 1352+00

Roadway Length: 1700 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
		Total Impervious Width:	117 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 4.57 ac
Pervious Roadway Area: 15.07 ac
Total Roadway Area: 19.64 ac

Pond Area:

Pervious Pond Area: 4.07 ac
Water Surface Area: 0.00 ac
Total Pond Area: 4.07 ac

Total Area:

Impervious Area: 4.57 ac
Pervious Area: 19.14 ac
Offsite Pervious Area (Pond): 4.45 ac
Water Surface Area: 0.00 ac
Total Area: 28.16 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.57 ac	447.5
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	13.92 ac	682.1
Open Land (Grass cover 50% - 75%)	B/D	84	9.67 ac	812.6
		Total:	28.16 ac	1942.2

CN = Total CN * Area / Total Area = **69.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 4.50 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **4.86 in**

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		date:
made by:	SR	23-Feb-15
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 200
POND NAME: 200A

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	20	240 ft
Inside Shoulder	4 ft	2	8 ft
Inside Shoulder	8 ft	2	16 ft
Inside Shoulder	6 ft	2	12 ft
Inside Shoulder	10 ft	4	40 ft
Outside Shoulder	12 ft	3	36 ft
	Total Impervious Width:		352 ft

Rail Impervious: 0.47 ac
Additional Impervious: 0.76 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 14.97 ac
Pervious Roadway Area: 4.67 ac
Total Roadway Area: 19.64 ac

Pond Area:

Pervious Pond Area: 1.08 ac
Water Surface Area: 2.99 ac
Total Pond Area: 4.07 ac

Total Area:

Impervious Area: 14.97 ac
Pervious Area: 5.75 ac
Offsite Pervious Area (Pond): 4.45 ac
Water Surface Area: 2.99 ac
Total Area: 28.16 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	14.97 ac	1466.8
Water Area	---	100	2.99 ac	299.0
Open Land (Grass cover 50% - 75%)	A	49	5.49 ac	269.2
Open Land (Grass cover 50% - 75%)	B/D	84	3.82 ac	320.7
Gravel (Future Rail)	A	76	0.89 ac	67.6
		Total:	28.16 ac	2423.4

CN = Total CN * Area / Total Area = **86.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.62 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.92 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	23-Feb-15
checked by:	BJS	23-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2**

BASIN NAME: 200
POND NAME: 200A

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 2.17 ac-ft (New Imp. = 14.97 ac - 4.57ac)
1" over Total Onsite Area = 1.98 ac-ft (Total Area - Offsite Area =28.16 ac - 4.45 ac)

Treatment V_{req} = Largest of Trt. Vol. = 2.17 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 4.86 in
Q_{post} = 6.92 in
ΔQ = 2.06 in

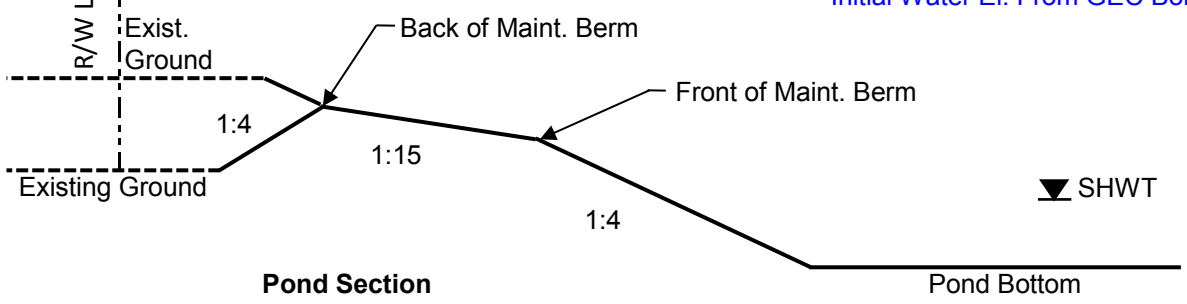
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 4.84 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 38.0 ft @ 1:4

Existing Ground Elevation = 110.0 ft
Initial Water Elevation* = 98.0 ft
Lowest EOP Elevation = 110.0 ft

* Initial Water El. From GEC Borings



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
103.00	Back of Maintenance Berm	4.07 ac			16.82 ac-ft
102.00	Front of Maintenance Berm	3.53 ac			13.02 ac-ft
101.00	---	3.39 ac			9.56 ac-ft
100.00	---	3.25 ac			6.24 ac-ft
98.00	Initial Water Elevation	2.99 ac			0.00 ac-ft
90.00	Pond Bottom	2.02 ac			

Required Treatment Volume: 2.17 ac-ft
Top El. Of Treatment Volume: 98.69
Required Treat. Vol. + Atten.: 7.00 ac-ft
Top El. Of Treat. Vol. + Atten.: 100.26

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 200
POND NAME: 200B

STATION LIMITS: From: 1335+00
To: 1352+00

Roadway Length: 1700 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
	Total Impervious Width:		117 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 4.57 ac
Pervious Roadway Area: 15.07 ac
Total Roadway Area: 19.64 ac

Pond Area:

Pervious Pond Area: 4.27 ac
Water Surface Area: 0.00 ac
Total Pond Area: 4.27 ac

Total Area:

Impervious Area: 4.57 ac
Pervious Area: 19.34 ac
Water Surface Area: 0.00 ac
Total Area: 23.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.57 ac	447.5
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	14.33 ac	702.3
Open Land (Grass cover 50% - 75%)	B/D	84	5.01 ac	420.9
		Total:	23.91 ac	1570.7

CN = Total CN * Area / Total Area = **65.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 5.22 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **4.47 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 200
POND NAME: 200B

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	20	240 ft
Inside Shoulder	4 ft	2	8 ft
Inside Shoulder	8 ft	2	16 ft
Inside Shoulder	6 ft	2	12 ft
Inside Shoulder	10 ft	4	40 ft
Outside Shoulder	12 ft	3	36 ft
	Total Impervious Width:		352 ft

Rail Impervious: 0.47 ac
Additional Impervious: 0.76 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 14.97 ac
Pervious Roadway Area: 4.67 ac
Total Roadway Area: 19.64 ac

Pond Area:

Pervious Pond Area: 1.31 ac
Water Surface Area: 2.96 ac
Total Pond Area: 4.27 ac

Total Area:

Impervious Area: 14.97 ac
Pervious Area: 5.98 ac
Water Surface Area: 2.96 ac
Total Area: 23.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	14.97 ac	1466.8
Water Area	---	100	2.96 ac	296.0
Open Land (Grass cover 50% - 75%)	A	49	3.94 ac	193.2
Open Land (Grass cover 50% - 75%)	B/D	84	1.57 ac	131.9
Gravel (Future Rail)	A	76	0.33 ac	25.1
Gravel (Future Rail)	D	91	0.14 ac	12.7
		Total:	23.91 ac	2125.7

CN = Total CN * Area / Total Area = **88.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.25 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.26 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 200
POND NAME: 200B

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 2.17 ac-ft (New Imp. = 14.97 ac - 4.57ac)
1" over Total Onsite Area = 1.99 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.17 ac-ft

Compensating Treatment Volume (Turkey Lake Pond) 0.17 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.34 ac-ft

Required Attenuation Volume:

Total Runoff:
Q_{pre} = 4.47 in
Q_{post} = 7.26 in
ΔQ = 2.80 in

Attenuation V_{req} = ΔQ/12 x Total Area = 5.57 ac-ft

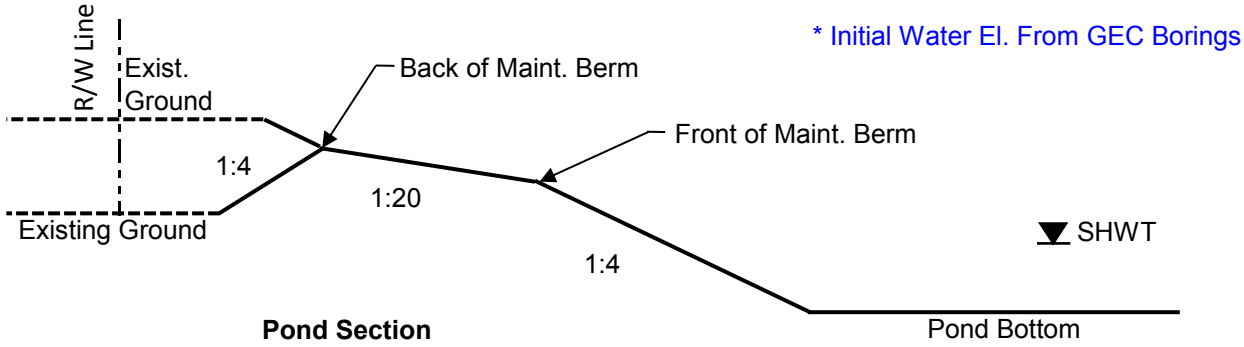
Compensating Storage Volume (Turkey Lake Pond) 0.43 ac-ft

Attenuation V_{req} = ΔQ/12 x Total Area = 6.00 ac-ft

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 46.0 ft @ 1:4

Existing Ground Elevation = 110.0 ft
Initial Water Elevation* = 96.0 ft
Lowest EOP Elevation = 110.0 ft

* Initial Water El. From GEC Borings



Pond Section

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 200
POND NAME: 200B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
101.00	Back of Maintenance Berm	4.27 ac			16.86 ac-ft
100.00	Front of Maintenance Berm	3.52 ac			12.96 ac-ft
99.00	---	3.38 ac			9.51 ac-ft
98.00	---	3.24 ac			6.20 ac-ft
96.00	Initial Water Elevation	2.96 ac			0.00 ac-ft
90.00	Pond Bottom	2.20 ac			

Required Treatment Volume: 2.34 ac-ft
Required Treat. Vol. + Atten.: 8.34 ac-ft

Top El. Of Treatment Volume: 96.75
Top El. Of Treat. Vol. + Atten.: 98.65

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Feb-15
checked by:	BJS	19-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 201
POND NAME: 201

STATION LIMITS: From: 1352+00 LT To: 1410+00 LT
Roadway Length: 5800 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	3	36 ft
Inside Shoulder	10 ft	1	10 ft
Inside Shoulder	4 ft	0	0 ft
Outside Shoulder	10 ft	1	10 ft
	Total Impervious Width:		56 ft

Additional Impervious: 1.09 ac
Additional Impervious: 1.13 ac

Impervious Roadway Area: 9.68 ac
Pervious Roadway Area: 22.57 ac
Total Roadway Area: 32.25 ac

Pond Area:

Pervious Pond Area: 5.33 ac
Water Surface Area: 0.00 ac
Total Pond Area: 5.33 ac

Total Area:

Impervious Area: 9.68 ac
Pervious Area: 27.90 ac
Water Surface Area: 0.00 ac
Total Area: 37.58 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.68 ac	948.3
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	16.74 ac	820.4
Open Land (Grass cover 50% - 75%)	B/D	84	11.16 ac	937.6
		Total:	37.58 ac	2706.2

CN = Total CN * Area / Total Area = **72.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.89 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.23 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Feb-15
checked by:	BJS	19-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 201
POND NAME: 201

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	5	60 ft
Inside Shoulder	10 ft	2	20 ft
Inside Shoulder	6 ft	2	12 ft
Outside Shoulder	10 ft	1	10 ft
		Total Impervious Width:	102 ft

Rail Impervious:	0.00 ac
Additional Impervious: (ramps, turn lanes, etc.)	12.76 ac
Impervious Roadway Area:	26.34 ac
Pervious Roadway Area:	5.91 ac
Total Roadway Area:	32.25 ac

Pond Area:

Pervious Pond Area:	2.41 ac
Water Surface Area:	2.92 ac
Total Pond Area:	5.33 ac

Total Area:

Impervious Area:	26.34 ac
Pervious Area:	8.32 ac
Water Surface Area:	2.92 ac
Total Area:	37.58 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	26.34 ac	2581.4
Water Area	---	100	2.92 ac	292.0
Open Land (Grass cover 50% - 75%)	A	49	4.99 ac	244.6
Open Land (Grass cover 50% - 75%)	B/D	84	3.33 ac	279.5
		Total:	37.58 ac	3397.5

CN = Total CN * Area / Total Area = **90.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.06 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.45 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Feb-15
checked by:	BJS	19-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 201
POND NAME: 201

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 3.47 ac-ft (New Imp. = 26.34 ac - 9.68ac)
1" over Total Area = 3.13 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.47 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 5.23 in
Q_{post} = 7.45 in
ΔQ = 2.22 in

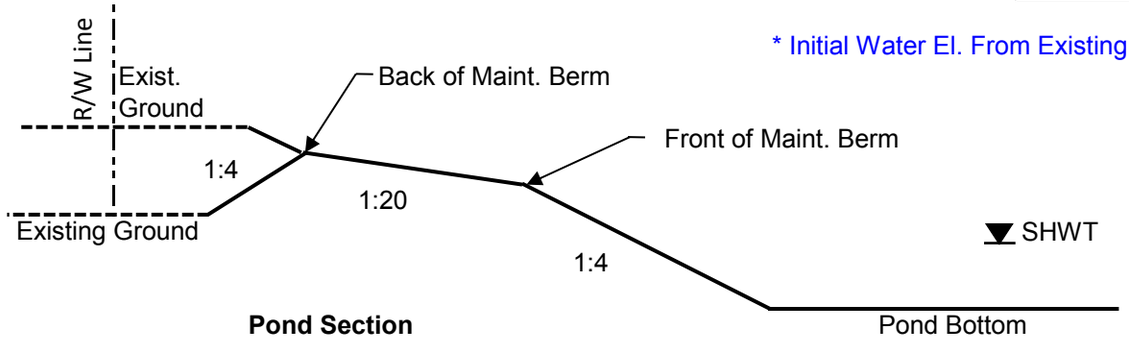
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 6.95 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 110.0 ft
Initial Water Elevation* = 106.00 ft
Lowest EOP Elevation = 111.0 ft

* Initial Water El. From Existing Permit



Pond Section

POND 201

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
111.00	Back of Maintenance Berm	5.33 ac			18.42 ac-ft
110.00	Front of Maintenance Berm	3.97 ac			13.77 ac-ft
109.00	---	3.70 ac			9.93 ac-ft
108.00	---	3.44 ac			6.36 ac-ft
106.00	Initial Water Elevation	2.92 ac			0.00 ac-ft
100.00	Pond Bottom	0.00 ac			

Required Treatment Volume: 3.47 ac-ft
Required Treat. Vol. + Atten.: 10.42 ac-ft

Top El. Of Treatment Volume: 107.09
Top El. Of Treat. Vol. + Atten.: 109.13

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Feb-15
checked by:	BJS	19-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2**

BASIN NAME: 202
POND NAME: 202 A,B,C,D (202C is Pond 1 in Permit App. No. 020614-22)

STATION LIMITS: From: 1352+00 RT Roadway Length: 5800 ft
To: 1410+00 RT R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	3	36 ft
Inside Shoulder	10 ft	1	10 ft
Inside Shoulder	4 ft	0	0 ft
Outside Shoulder	10 ft	1	10 ft
	Total Impervious Width:		56 ft

Additional Impervious: 9.51 ac
Additional Impervious: 0.00 ac

Impervious Roadway Area: 16.97 ac
Pervious Roadway Area: 30.79 ac
Total Roadway Area: 47.76 ac

Pond Area:

Pervious Pond Area: 9.25 ac
Water Surface Area: 2.30 ac (Exist. Wet Detention Pond 1)
Total Pond Area: 11.55 ac

Total Area:

Impervious Area: 16.97 ac
Pervious Area: 40.04 ac
Water Surface Area: 2.30 ac
Total Area: 59.31 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	16.97 ac	1662.7
Water Area	---	100	2.30 ac	230.0
Open Land (Grass cover 50% - 75%)	A	49	22.02 ac	1079.2
Open Land (Grass cover 50% - 75%)	B/D	84	18.02 ac	1513.6
		Total:	59.31 ac	4485.5

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

Runoff:

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

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.66 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
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checked by:	BJS	19-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2**

BASIN NAME: 202
POND NAME: 202 A,B,C,D (202C is Pond 1 in Permit App. No. 020614-22)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	5	60 ft
Inside Shoulder	10 ft	2	20 ft
Inside Shoulder	6 ft	2	12 ft
Outside Shoulder	10 ft	1	10 ft
	Total Impervious Width:		102 ft

Rail Impervious:	0.00 ac
Additional Impervious: (ramps, turn lanes, etc.)	20.91 ac
Impervious Roadway Area:	34.49 ac
Pervious Roadway Area:	13.27 ac
Total Roadway Area:	47.76 ac

Pond Area:

Pervious Pond Area:	4.32 ac
Water Surface Area:	7.23 ac
Total Pond Area:	11.55 ac

Total Area:

Impervious Area:	34.49 ac
Pervious Area:	17.59 ac
Water Surface Area:	7.23 ac
Total Area:	59.31 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	34.49 ac	3380.1
Water Area	---	100	7.23 ac	723.0
Open Land (Grass cover 50% - 75%)	A	49	9.67 ac	474.0
Open Land (Grass cover 50% - 75%)	B/D	84	7.91 ac	664.9
		Total:	59.31 ac	5242.0

CN = Total CN * Area / Total Area = **88.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.31 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.20 in**

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

HNTB Corporation
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checked by:	BJS	19-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 202
POND NAME: 202 A,B,C,D (202C is Pond 1 in Permit App. No. 020614-22)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 3.65 ac-ft (New Imp. = 34.49 ac - 16.97ac)
1" over Total Area = 4.94 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 4.94 ac-ft

Required Attenuation Volume:

Total Runoff:
Q_{pre} = 5.66 in
Q_{post} = 7.20 in
ΔQ = 1.54 in

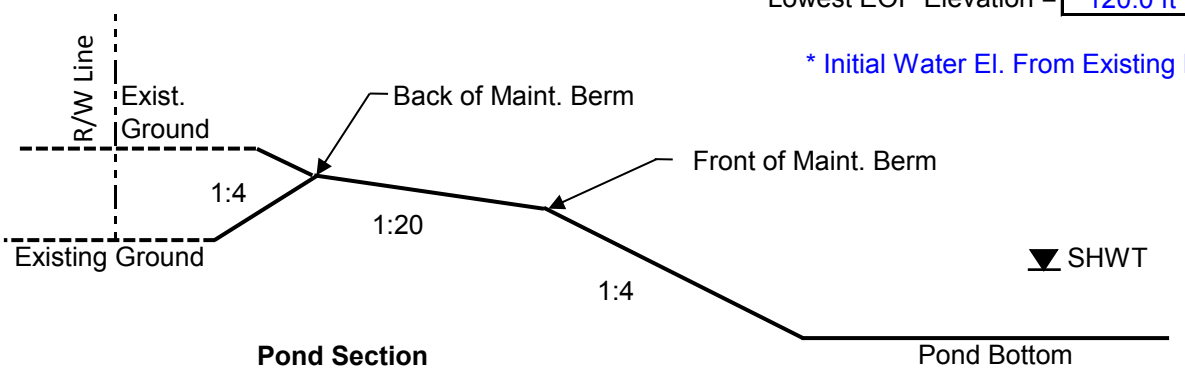
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 7.61 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 118.0 ft
Initial Water Elevation* = 114.35 ft
Lowest EOP Elevation = 120.0 ft

* Initial Water El. From Existing Permit



Pond Section

POND 202A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
119.00	Back of Maintenance Berm	2.89 ac			9.32 ac-ft
118.00	Front of Maintenance Berm	2.13 ac			6.81 ac-ft
117.00	---	1.98 ac			4.76 ac-ft
116.00	---	1.84 ac			2.85 ac-ft
114.35	Initial Water Elevation	1.61 ac			0.00 ac-ft
107.35	Pond Bottom	0.00 ac			

POND 202B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
119.00	Back of Maintenance Berm	0.84 ac			2.22 ac-ft
118.00	Front of Maintenance Berm	0.52 ac			1.54 ac-ft
117.00	---	0.46 ac			1.05 ac-ft
116.00	---	0.41 ac			0.61 ac-ft
114.35	Initial Water Elevation	0.33 ac			0.00 ac-ft
107.35	Pond Bottom	0.00 ac			

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Feb-15
checked by:	BJS	19-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 202
POND NAME: 202 A,B,C,D (202C is Pond 1 in Permit App. No. 020614-22)

POND 202C

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
119.00	Back of Maintenance Berm	6.11 ac			23.17 ac-ft
118.00	Front of Maintenance Berm	5.20 ac			17.52 ac-ft
117.00	---	4.98 ac			12.43 ac-ft
116.00	---	4.76 ac			7.56 ac-ft
114.35	Initial Water Elevation	4.40 ac			0.00 ac-ft
107.35	Pond Bottom	0.00 ac			

POND 202D

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
119.00	Back of Maintenance Berm	1.71 ac			5.28 ac-ft
118.00	Front of Maintenance Berm	1.21 ac			3.82 ac-ft
117.00	---	1.12 ac			2.66 ac-ft
116.00	---	1.03 ac			1.58 ac-ft
114.35	Initial Water Elevation	0.89 ac			0.00 ac-ft
107.35	Pond Bottom	0.00 ac			

POND 202A + 202B + 202C + 202D

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
119.00	Back of Maintenance Berm	11.55 ac			39.99 ac-ft
118.00	Front of Maintenance Berm	9.06 ac			29.69 ac-ft
117.00	---	8.54 ac			20.89 ac-ft
116.00	---	8.04 ac			12.60 ac-ft
114.35	Initial Water Elevation	7.23 ac			0.00 ac-ft
107.35	Pond Bottom	0.00 ac			

Required Treatment Volume: 4.94 ac-ft

Required Treat. Vol. + Atten.: 12.55 ac-ft

Top El. Of Treatment Volume: 115.00

Top El. Of Treat. Vol. + Atten.: 116.05

HNTB Corporation
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Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2 (SR 528)**

BASIN NAME: 203
POND NAME: 203A & 203B (203A is Pond 1D & 203B is Pond 1F in Permit App. No. 040702-13)

STATION LIMITS: From: 205+00 RT To: 252+00 RT
Roadway Length: 4700 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	10 ft	1	10 ft
Inside Shoulder	4 ft	0	0 ft
Outside Shoulder	10 ft	1	10 ft
	Total Impervious Width:		44 ft

Additional Impervious: 2.62 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 7.37 ac
Pervious Roadway Area: 11.95 ac
Total Roadway Area: 19.32 ac

Pond Area:

Pervious Pond Area: 8.38 ac
Water Surface Area: 0.00 ac
Total Pond Area: 8.38 ac

Total Area:

Impervious Area: 7.37 ac
Pervious Area: 20.33 ac
Water Surface Area: 0.00 ac
Total Area: 27.70 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	7.37 ac	722.0
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	B/D	84	20.33 ac	1707.9
		Total:	27.70 ac	2429.9

CN = Total CN * Area / Total Area = **87.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.40 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.12 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2 (SR 528)**

BASIN NAME: 203
POND NAME: 203A & 203B (203A is Pond 1D & 203B is Pond 1F in Permit App. No. 040702-13)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	5	60 ft
Inside Shoulder	12 ft	1	12 ft
Inside Shoulder	4 ft	1	4 ft
Outside Shoulder	12 ft	1	12 ft
	Total Impervious Width:		88 ft

Rail Impervious:	0.00 ac
Additional Impervious: (ramps, turn lanes, etc.)	2.96 ac
Impervious Roadway Area:	12.45 ac
Pervious Roadway Area:	6.87 ac
Total Roadway Area:	19.32 ac

Pond Area:

Pervious Pond Area:	1.66 ac
Water Surface Area:	6.72 ac
Total Pond Area:	8.38 ac

Total Area:

Impervious Area:	12.45 ac
Pervious Area:	8.53 ac
Water Surface Area:	6.72 ac
Total Area:	27.70 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	12.45 ac	1220.6
Water Area	---	100	6.72 ac	672.0
Open Land (Grass cover 50% - 75%)	B/D	84	8.53 ac	716.1
		Total:	27.70 ac	2608.7

CN = Total CN * Area / Total Area = **94.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.62 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.90 in**

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2 (SR 528)**

BASIN NAME: 203
POND NAME: 203A & 203B (203A is Pond 1D & 203B is Pond 1F in Permit App. No. 040702-13)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 1.06 ac-ft (New Imp. = 12.45 ac - 7.37ac)
1" over Total Area = 2.31 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.31 ac-ft

Required Attenuation Volume:

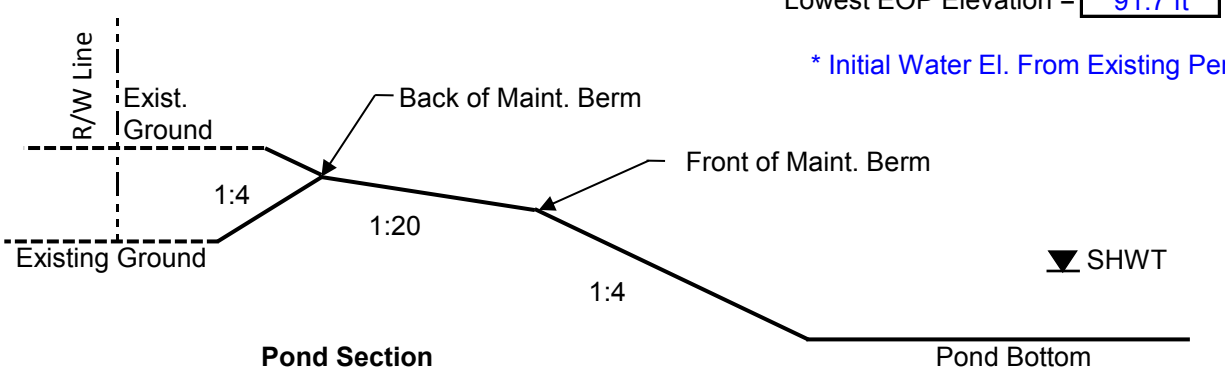
Total Runoff:
Q_{pre} = 7.12 in
Q_{post} = 7.90 in
ΔQ = 0.78 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 1.80 ac-ft

---

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	90.0 ft
Pond Tie-In Width =	10.0 ft	@ 1:4	Initial Water Elevation* =	87.0 ft
			Lowest EOP Elevation =	91.7 ft

* Initial Water El. From Existing Permit



Pond Section

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2 (SR 528)**

BASIN NAME: 203
POND NAME: 203A & 203B (203A is Pond 1D & 203B is Pond 1F in Permit App. No. 040702-13)

POND 203A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
90.00	Back of Maintenance Berm	6.40 ac			17.15 ac-ft
89.00	Front of Maintenance Berm	5.72 ac			11.09 ac-ft
88.00	---	5.54 ac			5.46 ac-ft
87.50	---	5.46 ac			2.71 ac-ft
87.00	Initial Water Elevation	5.37 ac			0.00 ac-ft
79.00	Pond Bottom	4.70 ac			

POND 203B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
90.00	Back of Maintenance Berm	1.98 ac			4.68 ac-ft
89.00	Front of Maintenance Berm	1.56 ac			2.91 ac-ft
88.00	---	1.45 ac			1.40 ac-ft
87.50	---	1.40 ac			0.69 ac-ft
87.00	Initial Water Elevation	1.35 ac			0.00 ac-ft
79.00	Pond Bottom	0.96 ac			

POND 203A + POND 203B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
90.00	Back of Maintenance Berm	8.38 ac			21.82 ac-ft
89.00	Front of Maintenance Berm	7.28 ac			13.99 ac-ft
88.00	---	6.99 ac			6.86 ac-ft
87.50	---	6.86 ac			3.40 ac-ft
87.00	Initial Water Elevation	6.72 ac			0.00 ac-ft
79.00	Pond Bottom	5.66 ac			

Required Treatment Volume:	2.31 ac-ft	Required Treat. Vol. + Atten.:	4.10 ac-ft
Top El. Of Treatment Volume:	87.34	Top El. Of Treat. Vol. + Atten.:	87.60

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2 (SR 528)

BASIN NAME: 204
POND NAME: 204A & 204B (204A is Pond 1C & 204B is Pond 1E in Permit App. No. 040702-13)

STATION LIMITS: From: 205+00 LT Roadway Length: 4700 ft
To: 252+00 LT R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	10 ft	1	10 ft
Inside Shoulder	4 ft	0	0 ft
Outside Shoulder	10 ft	1	10 ft
		Total Impervious Width:	44 ft

Additional Impervious: 4.12 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 8.87 ac
Pervious Roadway Area: 11.26 ac
Total Roadway Area: 20.13 ac

Pond Area:

Pervious Pond Area: 7.75 ac
Water Surface Area: 0.86 ac
Total Pond Area: 8.61 ac

Total Area:

Impervious Area: 8.87 ac
Pervious Area: 19.01 ac
Water Surface Area: 0.86 ac
Total Area: 28.74 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	8.87 ac	869.0
Water Area	---	100	0.86 ac	86.0
Open Land (Grass cover 50% - 75%)	B/D	84	19.01 ac	1597.1
		Total:	28.74 ac	2552.1

CN = Total CN * Area / Total Area = **88.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.26 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.25 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2 (SR 528)

BASIN NAME: 204
POND NAME: 204A & 204B (204A is Pond 1C & 204B is Pond 1E in Permit App. No. 040702-13)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	5	60 ft
Inside Shoulder	12 ft	1	12 ft
Inside Shoulder	4 ft	1	4 ft
Outside Shoulder	12 ft	1	12 ft
	Total Impervious Width:		88 ft

Rail Impervious:	0.00 ac
Additional Impervious: (ramps, turn lanes, etc.)	4.79 ac
Impervious Roadway Area:	14.28 ac
Pervious Roadway Area:	5.85 ac
Total Roadway Area:	20.13 ac

Pond Area:

Pervious Pond Area:	1.71 ac
Water Surface Area:	6.90 ac
Total Pond Area:	8.61 ac

Total Area:

Impervious Area:	14.28 ac
Pervious Area:	7.56 ac
Water Surface Area:	6.90 ac
Total Area:	28.74 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	14.28 ac	1399.9
Water Area	---	100	6.90 ac	690.0
Open Land (Grass cover 50% - 75%)	B/D	84	7.56 ac	634.6
		Total:	28.74 ac	2724.5

CN = Total CN * Area / Total Area = **94.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.55 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.98 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2 (SR 528)**

BASIN NAME: 204
POND NAME: 204A & 204B (204A is Pond 1C & 204B is Pond 1E in Permit App. No. 040702-13)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 1.13 ac-ft (New Imp. = 14.28 ac - 8.87ac)
1" over Total Area = 2.40 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.40 ac-ft

Required Attenuation Volume:

Total Runoff:
Q_{pre} = 7.25 in
Q_{post} = 7.98 in
ΔQ = 0.72 in

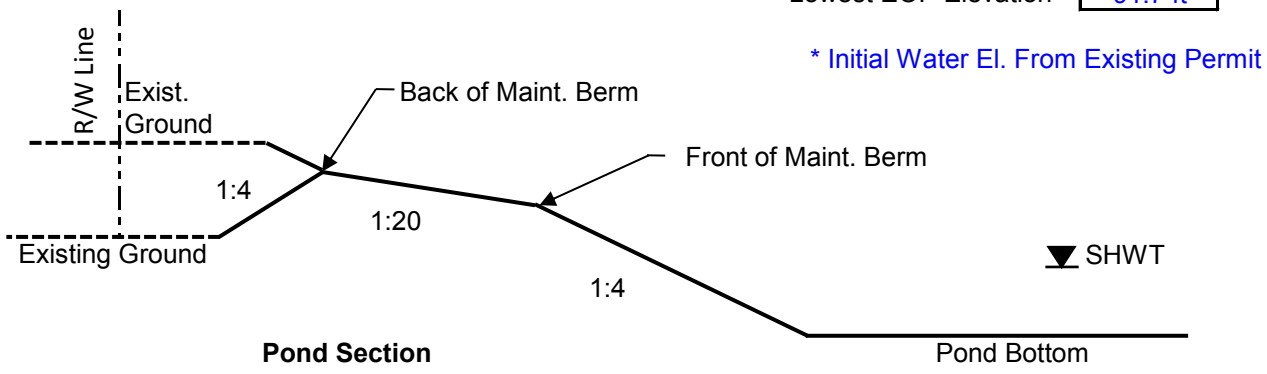
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 1.73 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 10.0 ft @ 1:4

Existing Ground Elevation = 91.0 ft
Initial Water Elevation* = 88.0 ft
Lowest EOP Elevation = 91.7 ft

* Initial Water El. From Existing Permit



Pond Section

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2 (SR 528)

BASIN NAME: 204
POND NAME: 204A & 204B (204A is Pond 1C & 204B is Pond 1E in Permit App. No. 040702-13)

POND 204A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
91.00	Back of Maintenance Berm	6.20 ac			16.63 ac-ft
90.00	Front of Maintenance Berm	5.55 ac			10.76 ac-ft
89.00	---	5.38 ac			5.29 ac-ft
88.50	---	5.29 ac			2.63 ac-ft
88.00	Initial Water Elevation	5.21 ac			0.00 ac-ft
79.00	Pond Bottom	4.48 ac			

POND 204B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
91.00	Back of Maintenance Berm	2.41 ac			5.79 ac-ft
90.00	Front of Maintenance Berm	1.93 ac			3.62 ac-ft
89.00	---	1.81 ac			1.75 ac-ft
88.50	---	1.75 ac			0.86 ac-ft
88.00	Initial Water Elevation	1.69 ac			0.00 ac-ft
79.00	Pond Bottom	1.19 ac			

POND 204A + POND 204B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
91.00	Back of Maintenance Berm	8.61 ac			22.42 ac-ft
90.00	Front of Maintenance Berm	7.48 ac			14.38 ac-ft
89.00	---	7.19 ac			7.04 ac-ft
88.50	---	7.04 ac			3.49 ac-ft
88.00	Initial Water Elevation	6.90 ac			0.00 ac-ft
79.00	Pond Bottom	5.67 ac			

Required Treatment Volume:	2.40 ac-ft	Required Treat. Vol. + Atten.:	4.13 ac-ft
Top El. Of Treatment Volume:	88.34	Top El. Of Treat. Vol. + Atten.:	88.59

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205A

STATION LIMITS: From: 1410+00
To: 1480+40

Roadway Length: 7040 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	8	96 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
	Total Impervious Width:		141 ft

Additional Impervious: 5.62 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 28.41 ac
Pervious Roadway Area: 33.85 ac
Total Roadway Area: 62.26 ac

Pond Area:

Pervious Pond Area: 6.23 ac
Water Surface Area: 0.00 ac
Total Pond Area: 6.23 ac

Total Area:

Impervious Area: 28.41 ac
Pervious Area: 40.08 ac
Water Surface Area: 0.00 ac
Total Area: 68.49 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	28.41 ac	2784.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	17.03 ac	834.5
Open Land (Grass cover 50% - 75%)	A/D	84	24.50 ac	2058.0
		Total:	69.94 ac	5676.7

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

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.32 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.33 in**

HNTB Corporation
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Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205A

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	12	144 ft
Wall	2 ft	3	6 ft
Shoulder	12 ft	4	48 ft
Shoulder	10 ft	4	40 ft
		Total Impervious Width:	238 ft

Additional Impervious (ramps, gores, turn lanes, etc.): 5.27 ac

Impervious Roadway Area: 43.73 ac
Pervious Roadway Area: 18.53 ac
Total Roadway Area: 62.26 ac

Pond Area:

Pervious Pond Area: 1.27 ac
Water Surface Area: 4.96 ac
Total Pond Area: 6.23 ac

Total Area:

Impervious Area: 43.73 ac
Pervious Area: 19.80 ac
Water Surface Area: 4.96 ac
Total Area: 68.49 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	43.73 ac	4286.0
Water Area	---	100	4.96 ac	496.0
Open Land (Grass cover 50% - 75%)	A	49	8.71 ac	426.8
Open Land (Grass cover 50% - 75%)	A/D	84	12.53 ac	1052.5
		Total:	69.93 ac	6261.3

CN = Total CN * Area / Total Area = **89.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.17 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.34 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205A

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 3.19 ac-ft (New Imp. = 43.73 ac - 28.41ac)
1" over Total Onsite Area = 5.71 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 5.71 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 6.33 in
Q_{post} = 7.34 in
ΔQ = 1.01 in

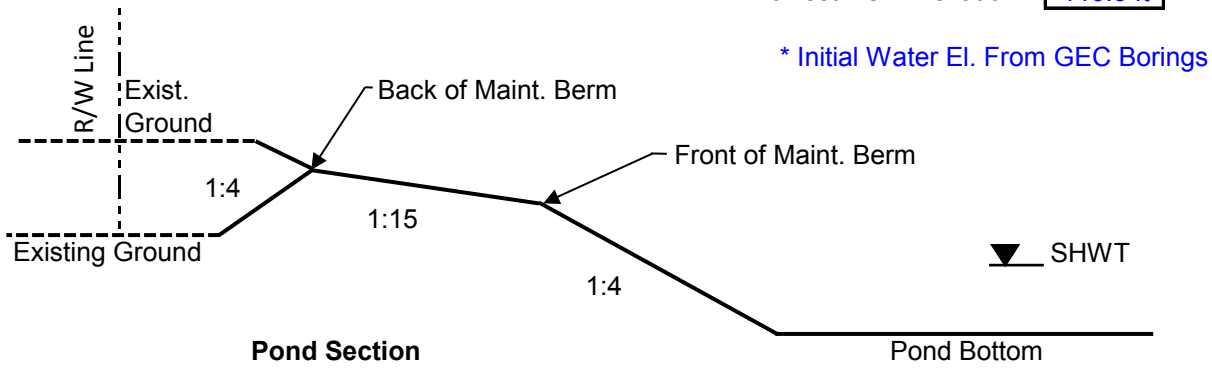
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 5.76 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 30.0 ft @ 1:4

Existing Ground Elevation = 110.0 ft
Initial Water Elevation* = 105.75 ft
Lowest EOP Elevation = 110.0 ft

* Initial Water El. From GEC Borings



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
110.00	Back of Maintenance Berm	6.23 ac			22.91 ac-ft
109.00	Front of Maintenance Berm	5.53 ac			17.03 ac-ft
108.00	---	5.35 ac			11.59 ac-ft
107.00	---	5.17 ac			6.33 ac-ft
105.75	Initial Water Elevation	4.96 ac			0.00 ac-ft
99.00	Pond Bottom	3.83 ac			

Required Treatment Volume: 5.71 ac-ft
Required Treat. Vol. + Atten.: 11.47 ac-ft

Top El. Of Treatment Volume: 106.88
Top El. Of Treat. Vol. + Atten.: 107.98

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205B

STATION LIMITS: From: 1410+00 To: 1480+40

Roadway Length: 7040 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	8	96 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
	Total Impervious Width:		141 ft

Additional Impervious: 5.62 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 28.41 ac
Pervious Roadway Area: 33.85 ac
Total Roadway Area: 62.26 ac

Pond Area:

Pervious Pond Area: 5.48 ac
Water Surface Area: 0.00 ac
Total Pond Area: 5.48 ac

Total Area:

Impervious Area: 28.41 ac
Pervious Area: 39.33 ac
Offsite Pervious Area (Pond): 1.20 ac
Water Surface Area: 0.00 ac
Total Area: 68.94 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	28.41 ac	2784.0
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	16.62 ac	814.3
Open Land (Grass cover 50% - 75%)	A/D	84	23.91 ac	2008.8
		Total:	68.94 ac	5607.0

CN = Total CN * Area / Total Area = **81.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.30 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.35 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205B

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	12	144 ft
Wall	2 ft	3	6 ft
Shoulder	12 ft	4	48 ft
Shoulder	10 ft	4	40 ft
		Total Impervious Width:	238 ft

Additional Impervious: (ramps, gores, turn lanes, etc.)	5.27 ac
Impervious Roadway Area:	43.73 ac
Pervious Roadway Area:	18.53 ac
Total Roadway Area:	62.26 ac

Pond Area:

Pervious Pond Area:	1.83 ac
Water Surface Area:	3.65 ac
Total Pond Area:	5.48 ac

Total Area:

Impervious Area:	43.73 ac
Pervious Area:	20.36 ac
Offsite Pervious Area (Pond):	1.20 ac
Water Surface Area:	3.65 ac
Total Area:	68.94 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	43.73 ac	4286.0
Water Area	---	100	3.65 ac	365.0
Open Land (Grass cover 50% - 75%)	A	49	8.84 ac	433.0
Open Land (Grass cover 50% - 75%)	A/D	84	12.72 ac	1068.3
		Total:	68.94 ac	6152.3

CN = Total CN * Area / Total Area = **89.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.21 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.31 in**

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		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205B

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area =	3.19 ac-ft	(New Imp. = 43.73 ac - 28.41ac)
1" over Total Onsite Area =	5.65 ac-ft	(Total Area - Offsite Area = 68.94 ac - 1.20 ac)

Treatment V_{req} = Largest of Trt. Vol. = 5.65 ac-ft

Required Attenuation Volume:

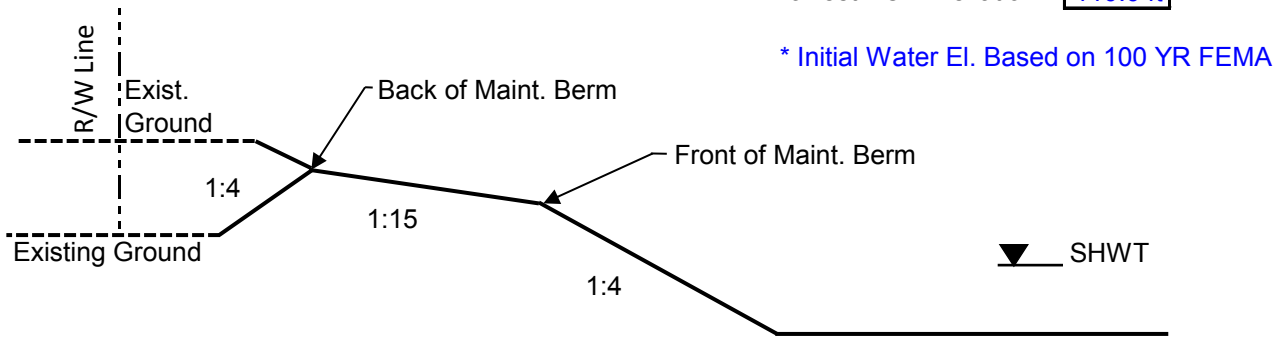
Total Runoff:

Q_{pre} =	6.35 in
Q_{post} =	7.31 in
ΔQ =	0.95 in

Attenuation V_{req} = ΔQ/12 x Total Area = 5.49 ac-ft

Maintenance Area Width =	15.0 ft	@ 1:15	
Pond Tie-In Width =	34.0 ft	@ 1:4	
Existing Ground Elevation =	100.0 ft		
Initial Water Elevation* =	101.0 ft		
Lowest EOP Elevation =	110.0 ft		

* Initial Water El. Based on 100 YR FEMA



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
106.00	Back of Maintenance Berm	5.48 ac			21.48 ac-ft
105.00	Front of Maintenance Berm	4.58 ac			16.45 ac-ft
104.00	---	4.34 ac			11.99 ac-ft
102.00	---	3.88 ac			3.77 ac-ft
101.00	Initial Water Elevation	3.65 ac			0.00 ac-ft
93.00	Pond Bottom	1.92 ac			

Required Treatment Volume:	5.65 ac-ft	Required Treat. Vol. + Atten.:	11.13 ac-ft
Top El. Of Treatment Volume:	102.50	Top El. Of Treat. Vol. + Atten.:	103.79

HNTB Corporation
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Lake Mary, FL 32746

		date:
made by:	LDP	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205C

STATION LIMITS: From: 1410+00
To: 1434+50

Roadway Length: 2450 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	8	96 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
	Total Impervious Width:		141 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 7.93 ac
Pervious Roadway Area: 10.95 ac
Total Roadway Area: 18.88 ac

Pond Area:

Pervious Pond Area: 3.69 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.69 ac

Total Area:

Impervious Area: 7.93 ac
Pervious Area: 14.64 ac
Water Surface Area: 0.00 ac
Total Area: 22.57 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	7.93 ac	777.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	10.10 ac	495.0
Open Land (Grass cover 50% - 75%)	A/D, B/D	84	4.54 ac	381.2
		Total:	22.57 ac	1653.4

CN = Total CN * Area / Total Area = **73.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.65 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.38 in**

HNTB Corporation
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Lake Mary, FL 32746

		date:
made by:	LDP	22-Feb-15
checked by:	BJS	22-Feb-15

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205C

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	16	192 ft
Wall	2 ft	3	6 ft
Shoulder	6 ft	2	12 ft
Shoulder	10 ft	6	60 ft
		Total Impervious Width:	270 ft

Additional Impervious: (ramps, gores, turn lanes, etc.)	1.80 ac
Impervious Roadway Area:	16.99 ac
Pervious Roadway Area:	1.89 ac
Total Roadway Area:	18.88 ac

Pond Area:

Pervious Pond Area:	0.98 ac
Water Surface Area:	2.71 ac
Total Pond Area:	3.69 ac

Total Area:

Impervious Area:	16.99 ac
Pervious Area:	2.87 ac
Water Surface Area:	2.71 ac
Total Area:	22.57 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	16.99 ac	1664.6
Water Area	---	100	2.71 ac	271.0
Open Land (Grass cover 50% - 75%)	A	49	2.07 ac	101.4
Open Land (Grass cover 50% - 75%)	A/D, B/D	84	0.80 ac	67.6
		Total:	22.57 ac	2104.6

CN = Total CN * Area / Total Area = **93.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.72 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.79 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	LDP	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205C

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 1.89 ac-ft (New Imp. = 16.99 ac - 7.93ac)
1" over Total Onsite Area = 1.88 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.89 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 5.38 in
Q_{post} = 7.79 in
ΔQ = 2.41 in

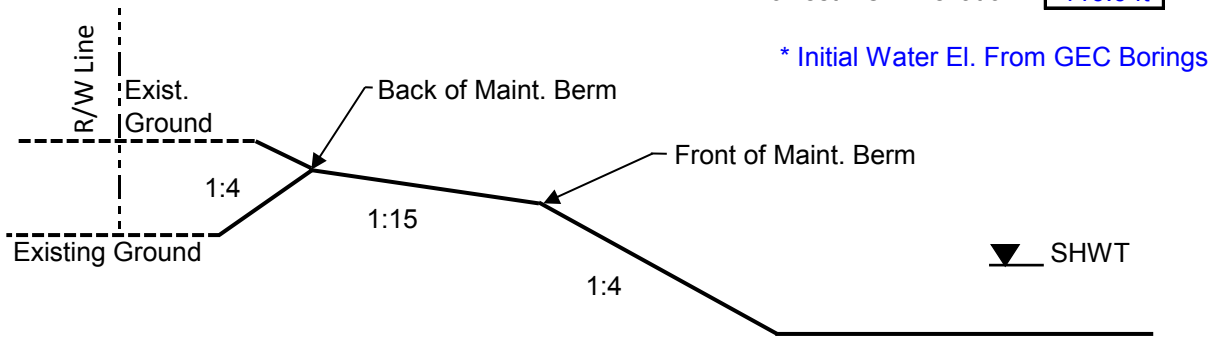
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 4.54 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 30.0 ft @ 1:4

Existing Ground Elevation = 115.0 ft
Initial Water Elevation* = 105.75 ft
Lowest EOP Elevation = 110.0 ft

* Initial Water El. From GEC Borings



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
110.00	Back of Maintenance Berm	3.69 ac			12.94 ac-ft
109.00	Front of Maintenance Berm	3.15 ac			9.52 ac-ft
108.00	---	3.01 ac			6.44 ac-ft
107.00	---	2.88 ac			3.49 ac-ft
105.75	Initial Water Elevation	2.71 ac			0.00 ac-ft
99.00	Pond Bottom	1.88 ac			

Required Treatment Volume: 1.89 ac-ft
Required Treat. Vol. + Atten.: 6.42 ac-ft

Top El. Of Treatment Volume: 106.42
Top El. Of Treat. Vol. + Atten.: 107.99

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610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	LDP	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205D

STATION LIMITS: From: 1434+50 To: 1470+00

Roadway Length: 3550 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	8	96 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
	Total Impervious Width:		141 ft

Additional Impervious: 0.40 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 11.89 ac
Pervious Roadway Area: 15.53 ac
Total Roadway Area: 27.42 ac

Pond Area:

Pervious Pond Area: 3.02 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.02 ac

Total Area:

Impervious Area: 11.89 ac
Pervious Area: 18.55 ac
Water Surface Area: 0.00 ac
Total Area: 30.44 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	11.89 ac	1165.3
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	14.47 ac	708.9
Open Land (Grass cover 50% - 75%)	A/D	84	4.08 ac	342.8
		Total:	30.44 ac	2217.0

CN = Total CN * Area / Total Area = **72.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.73 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.33 in**

HNTB Corporation
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Lake Mary, FL 32746

		date:
made by:	LDP	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2**

BASIN NAME: 205
POND NAME: 205D

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	14	168 ft
Wall	2 ft	6	12 ft
Shoulder	4 ft	2	8 ft
Shoulder	10 ft	6	60 ft
	Total Impervious Width:		248 ft

Additional Impervious: (ramps, gores, turn lanes, etc.)	1.34 ac
Impervious Roadway Area:	21.55 ac
Pervious Roadway Area:	5.87 ac
Total Roadway Area:	27.42 ac

Pond Area:

Pervious Pond Area:	1.93 ac
Water Surface Area:	1.09 ac
Total Pond Area:	3.02 ac

Total Area:

Impervious Area:	21.55 ac
Pervious Area:	7.80 ac
Water Surface Area:	1.09 ac
Total Area:	30.44 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	21.55 ac	2112.0
Water Area	---	100	1.09 ac	109.0
Open Land (Grass cover 50% - 75%)	A	49	6.08 ac	298.1
Open Land (Grass cover 50% - 75%)	A/D	84	1.72 ac	144.1
		Total:	30.44 ac	2663.2

CN = Total CN * Area / Total Area = **87.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.43 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.09 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	LDP	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 205
POND NAME: 205D

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 2.01 ac-ft (New Imp. = 21.55 ac - 11.89ac)
1" over Total Onsite Area = 2.54 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.54 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 5.33 in
Q_{post} = 7.09 in
ΔQ = 1.77 in

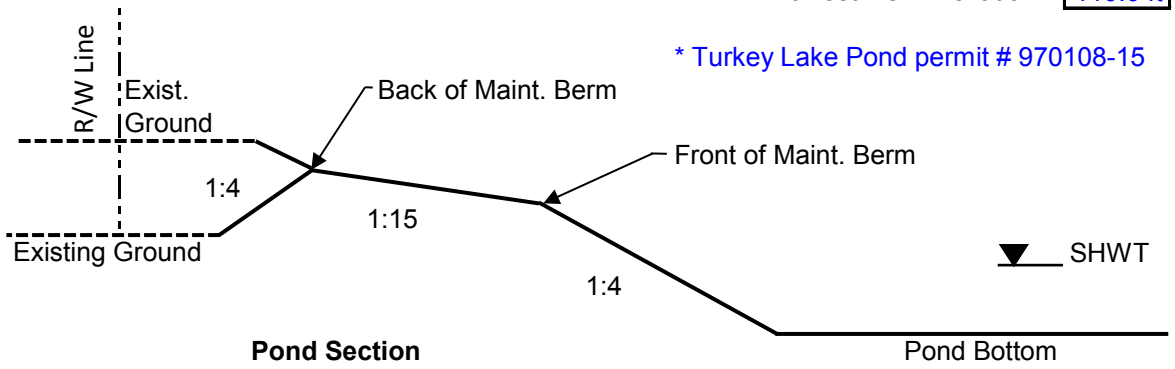
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 4.49 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 27.6 ft @ 1:4

Existing Ground Elevation = 113.0 ft
Initial Water Elevation* = 101.1 ft
Lowest EOP Elevation = 110.0 ft

* Turkey Lake Pond permit # 970108-15



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
108.60	Back of Maintenance Berm	3.02 ac			13.63 ac-ft
107.60	Front of Maintenance Berm	2.29 ac			10.97 ac-ft
106.60	---	2.10 ac			8.78 ac-ft
103.60	---	1.55 ac			3.30 ac-ft
101.10	Initial Water Elevation	1.09 ac			0.00 ac-ft
93.00	Pond Bottom	0.46 ac			

Required Treatment Volume: 2.54 ac-ft
Required Treat. Vol. + Atten.: 7.02 ac-ft

Top El. Of Treatment Volume: 103.02
Top El. Of Treat. Vol. + Atten.: 105.64

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610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 206
POND NAME: 206 (Retention Area in Permit App. No. 03318-3)

STATION LIMITS: From: 1470+00 To: 1495+00
Roadway Length: 2500 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
		Total Impervious Width:	117 ft

Additional Impervious: 10.61 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 17.32 ac
Pervious Roadway Area: 18.52 ac
Total Roadway Area: 35.84 ac

Pond Area:

Pervious Pond Area: 4.63 ac
Water Surface Area: 0.00 ac
Total Pond Area: 4.63 ac

Total Area:

Impervious Area: 17.32 ac
Pervious Area: 23.15 ac
Water Surface Area: 0.00 ac
Total Area: 40.47 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	17.32 ac	1697.8
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	4.63 ac	226.8
Open Land (Grass cover 50% - 75%)	A/D	84	18.52 ac	1555.4
		Total:	40.47 ac	3480.0

CN = Total CN * Area / Total Area = **86.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.63 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.91 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 206
POND NAME: 206 (Retention Area in Permit App. No. 03318-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	13	156 ft
Wall	2 ft	6	12 ft
Shoulder	4 ft	2	8 ft
Shoulder	10 ft	6	60 ft
		Total Impervious Width:	236 ft

Additional Impervious: (ramps, turn lanes, etc.)	12.73 ac
Impervious Roadway Area:	26.27 ac
Pervious Roadway Area:	9.57 ac
Total Roadway Area:	35.84 ac

Pond Area:

Pervious Pond Area:	1.69 ac
Water Surface Area:	2.94 ac
Total Pond Area:	4.63 ac

Total Area:

Impervious Area:	26.27 ac
Pervious Area:	11.26 ac
Water Surface Area:	2.94 ac
Total Area:	40.47 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	26.27 ac	2574.9
Water Area	---	100	2.94 ac	294.0
Open Land (Grass cover 50% - 75%)	A	49	2.25 ac	110.3
Open Land (Grass cover 50% - 75%)	A/D	84	9.00 ac	756.4
		Total:	40.47 ac	3735.6

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

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.83 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.67 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
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		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 2**

BASIN NAME: 206
POND NAME: 206 (Retention Area in Permit App. No. 03318-3)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 1.86 ac-ft (New Imp. = 26.27 ac - 17.32ac)
1" over Total Area = 3.37 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.37 ac-ft

Required Attenuation Volume:

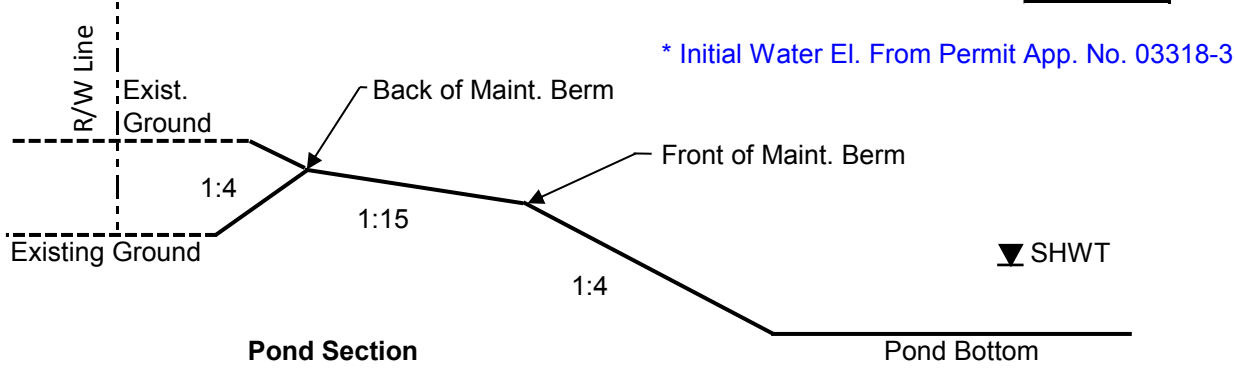
Total Runoff:
Q_{pre} = 6.91 in
Q_{post} = 7.67 in
ΔQ = 0.76 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 2.57 ac-ft

---

Maintenance Area Width =	15.0 ft	@ 1:15	
Pond Tie-In Width =	50.0 ft	@ 1:4	
Existing Ground Elevation =	135.0 ft		
Initial Water Elevation* =	120.5 ft		
Lowest EOP Elevation =	135.0 ft		

* Initial Water El. From Permit App. No. 03318-3



Pond Section

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Feb-15
checked by:	BJS	22-Feb-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 206
POND NAME: 206 (Retention Area in Permit App. No. 03318-3)

POND 206

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
125.00	Back of Maintenance Berm	3.12 ac			11.52 ac-ft
124.00	Front of Maintenance Berm	2.67 ac			8.63 ac-ft
123.00	---	2.55 ac			6.02 ac-ft
122.00	---	2.43 ac			3.53 ac-ft
120.50	Initial Water Elevation	2.27 ac			0.00 ac-ft
114.50	Pond Bottom	1.95 ac			

POND 206A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
125.00	Back of Maintenance Berm	0.66 ac			1.79 ac-ft
124.00	Front of Maintenance Berm	0.44 ac			1.24 ac-ft
123.00	---	0.39 ac			0.82 ac-ft
122.00	---	0.34 ac			0.46 ac-ft
120.50	Initial Water Elevation	0.27 ac			0.00 ac-ft
114.50	Pond Bottom	0.14 ac			

POND 206B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
125.00	Back of Maintenance Berm	0.85 ac			2.47 ac-ft
124.00	Front of Maintenance Berm	0.60 ac			1.74 ac-ft
123.00	---	0.54 ac			1.17 ac-ft
122.00	---	0.48 ac			0.66 ac-ft
120.50	Initial Water Elevation	0.40 ac			0.00 ac-ft
114.50	Pond Bottom	0.25 ac			

POND 206 + POND 206A + POND 206B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
125.00	Back of Maintenance Berm	4.63 ac			15.77 ac-ft
124.00	Front of Maintenance Berm	3.71 ac			11.60 ac-ft
123.00	---	3.48 ac			8.01 ac-ft
122.00	---	3.25 ac			4.64 ac-ft
120.50	Initial Water Elevation	2.94 ac			0.00 ac-ft
114.50	Pond Bottom	2.34 ac			

Required Treatment Volume: 3.37 ac-ft
Top El. Of Treatment Volume: 121.59

Required Treat. Vol. + Atten.: 5.94 ac-ft
Top El. Of Treat. Vol. + Atten.: 122.42

HNTB Corporation
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		date:
made by:	SR	19-Sep-13
checked by:	BJS	19-Sep-13
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 207
POND NAME: 207 (Pond 100 in Permit App. No. 950919-3)

STATION LIMITS: From: 1495+00 To: 1505+00
Roadway Length: 1000 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	8	96 ft
Guardrail	5 ft	1	5 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	10 ft	2	20 ft
	Total Impervious Width:		141 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 3.24 ac
Pervious Roadway Area: 7.13 ac
Total Roadway Area: 10.37 ac

Pond Area:

Pervious Pond Area: 3.59 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.59 ac

Total Area:

Impervious Area: 3.24 ac
Pervious Area: 10.72 ac
Water Surface Area: 0.00 ac
Total Area: 13.96 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	3.24 ac	317.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	3.22 ac	157.6
Open Land (Grass cover 50% - 75%)	A/D	84	7.51 ac	630.5
		Total:	13.96 ac	1105.4

CN = Total CN * Area / Total Area = **79.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.63 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.09 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Sep-13
checked by:	BJS	19-Sep-13
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 207
POND NAME: 207 (Pond 100 in Permit App. No. 950919-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	12	144 ft
Wall	2 ft	3	6 ft
Shoulder	12 ft	4	48 ft
Shoulder	10 ft	4	40 ft
	Total Impervious Width:		238 ft

Additional Impervious: 1.72 ac
(ramps, gores, turn lanes, etc.)

Impervious Roadway Area: 7.18 ac
Pervious Roadway Area: 3.19 ac
Total Roadway Area: 10.37 ac

Pond Area:

Pervious Pond Area: 2.81 ac
Water Surface Area: 0.78 ac
Total Pond Area: 3.59 ac

Total Area:

Impervious Area: 7.18 ac
Pervious Area: 6.00 ac
Water Surface Area: 0.78 ac
Total Area: 13.96 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	7.18 ac	704.0
Water Area	---	100	0.78 ac	78.0
Open Land (Grass cover 50% - 75%)	A	49	1.80 ac	88.1
Open Land (Grass cover 50% - 75%)	A/D	84	4.20 ac	352.6
		Total:	13.96 ac	1222.7

CN = Total CN * Area / Total Area = **87.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.42 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.11 in**

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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 207
POND NAME: 207 (Pond 100 in Permit App. No. 950919-3)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 0.82 ac-ft (New Imp. = 7.18 ac - 3.24ac)
1" over Total Area = 1.16 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.16 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 6.09 in
Q_{post} = 7.11 in
ΔQ = 1.02 in

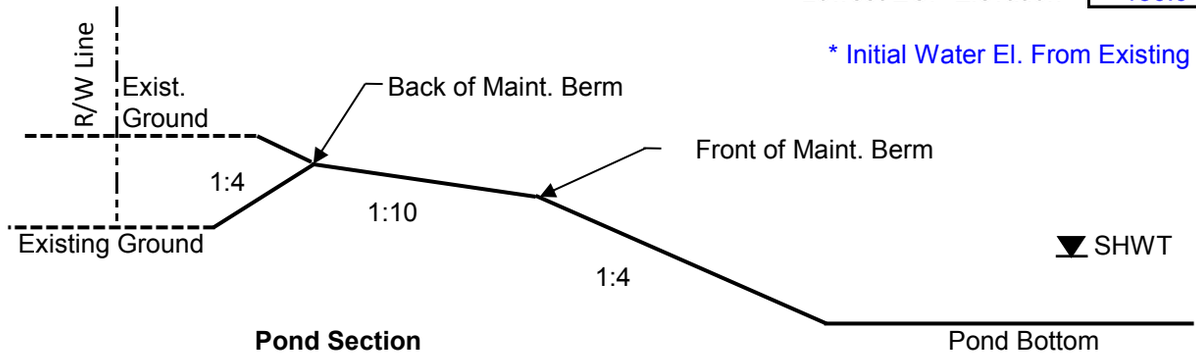
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 1.18 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:10
Pond Tie-In Width = 11.6 ft @ 1:4

Existing Ground Elevation = 135.0 ft
Initial Water Elevation* = 126.6 ft
Lowest EOP Elevation = 130.0 ft

* Initial Water El. From Existing Permit



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
134.60	Back of Maintenance Berm	2.38 ac			10.26 ac-ft
133.10	Front of Maintenance Berm	1.71 ac			7.19 ac-ft
132.10	---	1.41 ac			5.63 ac-ft
127.50	---	0.74 ac			0.68 ac-ft
126.60	Initial Water Elevation	0.78 ac			0.00 ac-ft
118.60	Pond Bottom	0.07 ac			

Required Treatment Volume: 1.16 ac-ft
Top El. Of Treatment Volume: 128.13
Required Treat. Vol. + Atten.: 2.34 ac-ft
Top El. Of Treat. Vol. + Atten.: 129.04

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Lake Mary, FL 32746

		date:
made by:	SR	19-Sep-13
checked by:	BJS	19-Sep-13
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 208
POND NAME: 208 (Pond 200 in Permit App. No. 950919-3)

STATION LIMITS: From: 1510+30 (Ramps Only) Roadway Length: 2521 ft
To: 1535+51 (Ramps Only) R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Guardrail	5 ft	0	0 ft
Inside Shoulder	10 ft	1	10 ft
Outside Shoulder	10 ft	1	10 ft
	Total Impervious Width:		44 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 2.55 ac
Pervious Roadway Area: 5.76 ac
Total Roadway Area: 8.31 ac

Pond Area:

Pervious Pond Area: 1.52 ac
Water Surface Area: 0.00 ac
Total Pond Area: 1.52 ac

Total Area:

Impervious Area: 2.55 ac
Pervious Area: 7.28 ac
Water Surface Area: 0.00 ac
Total Area: 9.83 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.55 ac	249.6
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A/D & B/D	84	7.28 ac	611.8
		Total:	9.83 ac	861.4

CN = Total CN * Area / Total Area = **87.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.41 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.11 in**

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610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Sep-13
checked by:	BJS	19-Sep-13
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 208
POND NAME: 208 (Pond 200 in Permit App. No. 950919-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Wall	5 ft	0	0 ft
Shoulder	10 ft	1	10 ft
Shoulder	10 ft	1	10 ft
		Total Impervious Width:	44 ft

Additional Impervious: (ramps, gores, turn lanes, etc.)	1.92 ac
Impervious Roadway Area:	4.47 ac
Pervious Roadway Area:	3.84 ac
Total Roadway Area:	8.31 ac

Pond Area:

Pervious Pond Area:	0.78 ac
Water Surface Area:	0.74 ac
Total Pond Area:	1.52 ac

Total Area:

Impervious Area:	4.47 ac
Pervious Area:	4.62 ac
Water Surface Area:	0.74 ac
Total Area:	9.83 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.47 ac	437.7
Water Area	---	100	0.74 ac	74.0
Open Land (Grass cover 50% - 75%)	A/D & B/D	84	4.62 ac	388.4
		Total:	9.83 ac	900.1

CN = Total CN * Area / Total Area = **91.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.92 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.59 in**

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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 208
POND NAME: 208 (Pond 200 in Permit App. No. 950919-3)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 0.40 ac-ft (New Imp. = 4.47 ac - 2.55ac)
1" over Total Area = 0.82 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 0.82 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 7.11 in
Q_{post} = 7.59 in
ΔQ = 0.48 in

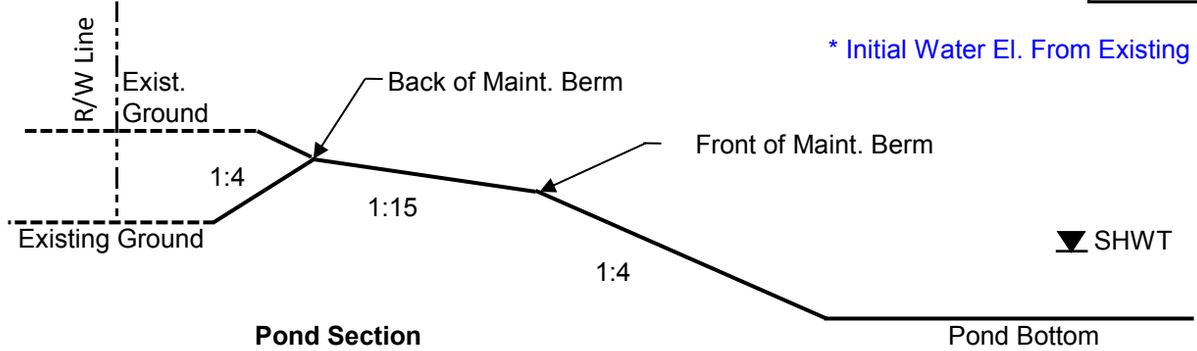
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 0.39 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 460.4 ft @ 1:4

Existing Ground Elevation = 120.0 ft
Initial Water Elevation* = 107.1 ft
Lowest EOP Elevation = 113.0 ft

* Initial Water El. From Existing Permit



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
112.60	Back of Maintenance Berm	1.52 ac			5.35 ac-ft
111.60	Front of Maintenance Berm	1.13 ac			4.03 ac-ft
110.60	---	0.98 ac			2.97 ac-ft
109.00	---	0.85 ac			1.51 ac-ft
107.10	Initial Water Elevation	0.74 ac			0.00 ac-ft
100.00	Pond Bottom	0.28 ac			

Required Treatment Volume: 0.82 ac-ft
Required Treat. Vol. + Atten.: 1.21 ac-ft
Top El. Of Treatment Volume: 108.13
Top El. Of Treat. Vol. + Atten.: 108.62

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		date:
made by:	SR	19-Sep-13
checked by:	BJS	19-Sep-13
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 209
POND NAME: F32, F33, F34, F35 (From Permit App. No. 120703-15)

STATION LIMITS: From: 1505+00 To: 1535+34
Roadway Length: 3034 ft
R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	7	84 ft
Inside Shoulder	10 ft	2	20 ft
Inside Shoulder	4 ft	0	0 ft
Outside Shoulder	10 ft	2	20 ft
	Total Impervious Width:		124 ft

Additional Impervious: 0.71 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 9.35 ac
Pervious Roadway Area: 14.81 ac
Total Roadway Area: 24.16 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.35 ac	916.0
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	B/D	84	14.81 ac	1244.3
		Total:	24.16 ac	2160.3

CN = Total CN * Area / Total Area = **89.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.18 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.33 in**

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		date:
made by:	SR	19-Sep-13
checked by:	BJS	19-Sep-13
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 209
POND NAME: F32, F33, F34, F35 (From Permit App. No. 120703-15)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	12	144 ft
Wall	2 ft	3	6 ft
Shoulder	12 ft	4	48 ft
Shoulder	10 ft	4	40 ft
	Total Impervious Width:		238 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 16.58 ac
Pervious Roadway Area: 7.58 ac
Total Roadway Area: 24.16 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	16.58 ac	1624.5
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	B/D	84	7.58 ac	637.0
		Total:	24.16 ac	2261.5

CN = Total CN * Area / Total Area = **93.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.68 in

Precipitation (P) = 8.6 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.83 in**

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610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	19-Sep-13
checked by:	BJS	19-Sep-13
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 2

BASIN NAME: 209
POND NAME: F32, F33, F34, F35 (From Permit App. No. 120703-15)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SFWMD

Required Treatment Volume:

2.5" over New Impervious Area = 1.51 ac-ft (New Imp. = 16.58 ac - 9.35ac)
1" over Total Area = 2.01 ac-ft

Treatment V_{req} = Largest of Trt. Volume = 2.01 ac-ft

Required Permitted Treatment Volume = 12.57 ac-ft

Total New Required Treatment Volume = 14.58 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 7.33 in
Q_{post} = 7.83 in
ΔQ = 0.50 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 1.02 ac-ft

Permitted Existing Attenuation Volume = 62.87 ac-ft

Permitted Proposed Attenuation Volume = 74.26 ac-ft

Required Permitted Attenuation Volume = 11.39 ac-ft

Total Required Attenuation Volume = 12.41 ac-ft

POND F32 + POND F33 + POND F34 + POND F35

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
102.00	Back of Maintenance Berm	25.92 ac			134.47 ac-ft
101.00	Front of Maintenance Berm	21.33 ac			110.84 ac-ft
96.00	Weir Elevation	17.02 ac			14.97 ac-ft
95.10	Initial Water Elevation	16.24 ac			0.00 ac-ft
86.00	Pond Bottom	9.45 ac			

Top El. Of Treatment Volume: 95.98

Permitted Weir Elevation: 96.00

Top El. Of Treatment + Attenuation Volume: 96.63

APPENDIX C –

CORRESPONDENCE

HNTB Corporation
The HNTB Companies
Engineers Architects Planners

610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

Telephone (407) 805-0355
Facsimile (407) 805-0227
www.hntb.com

MEETING MINUTES

Meeting Date/Time: June 6, 2013 / 2:00 PM

HNTB Project No. 59219

Meeting Name: I-4 SAMR SFWMD Pre-Application Meeting

Location: SFWMD, Orlando Service Center

Purpose: SFWMD Pre-App for I-4 Ultimate

Attending: Luis Diaz, HNTB
Heather Johnstone, HNTB
Mark Daron, SFWMD
Nicole Gough, SFWMD
Annette Burkett, SFWMD
Mike Drauer, Stantec
Hannah Hernandez, FDOT
Ferrell Hickson, FDOT
Beata Stys-Palasz, FDOT (phone)

The purpose of this meeting was to discuss the I-4 PD&E project and the drainage approach to the project. The following items were discussed:

- Project Overview:
  - 5 Sections and 5 Reports – 5)US 27 to Polk County Line, 1)Polk County Line to SR 528, 2)SR 528 to Kirkman Interchange, 3)SR 434 to SR46, and 4)SR 46 to SR 472
  - Sections 1, and 2 are located in SFWMD
  - Sections 3 and 4 are located in SJRWMD
  - Section 5 is located in SWFWMD
  - Design to be completed by end of 2014

- Project Team:
  - HNTB – Roadway, Structures, and Drainage
  - Stantec – Contamination, Air, Noise and Wildlife
  - 3 E Consultants – Wetlands
  - Southeastern Archaeology Research – Cultural Resources
  - GEC – Geotechnical

- Areas of Interest:
  - We asked if there were any flooding issues along the I-4 corridor that they know about. Mark stated that he was not aware of any flooding in the area.

- Commuter Rail was discussed. Heather explained that in other areas of the state, the rail was considered to be pervious or gravel. Mark said that gravel would be acceptable if the rail were to be built that way, but ultimately the curve number for the rail would be decided when the project is submitted for review.
- HNTB asked if the new Statewide Rule would have an impact on this project. Mark stated that for this project, there would not be a big impact. Phosphorus loading calculations will still be required in areas that are considered impaired. Nitrogen loading calculations are not required at this time.
- Ferrell asked if the ditch at Osceola Parkway could be realigned to allow a different configuration at the interchange. Mark stated that Reedy Creek Improvement District would need to be contacted.
- Mark stated that there is an easement through the lake near Whole Foods and Sand Lake Road that should be researched before designing the outfall for the ponds in this area.
- Mark said that there are several conservation easements along the I-4 corridor that could be verified on their website.
- Ferrell asked if there are any local agencies that would be interested on teaming up with the FDOT for a joint-use treatment project. Mark said to contact Bill Graf with SFWMD.

- Water Quality Criteria:
  - The water quality criteria have remained the same for wet detention ponds: 1" over the basin or 2.5" over impervious area.
  - The water quality criteria have also remained the same for dry retention ponds: 0.5" over the basin or 1.25" over impervious area.
  - Although the handbook states open basins should be designed for the 25yr/3dy event, SFWMD allows ponds to be designed for the storm event required by the county instead. For open basins within Orange County, the 25yr/24hr storm event is acceptable. For open basins within Osceola County, the 10yr/72hr event is acceptable.
  - It has not been determined yet if the FDOT is required to provide an extra 50% treatment for impaired waters.
  - SFWMD only requires the treatment of new impervious area, regardless of whether or not the roadway is reconstructed.

Should any revisions, additions or clarifications of these notes be required, please advise Heather Johnstone at hjohnstone@hntb.com .

APPENDIX D –

EXISTING PERMITS

Permit App. No. 020614-22

I-4 Auxiliary Lanes from SR 528 to Sand Lake Road

Last Date For Agency Action: August 13, 2002

GENERAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: I-4 Auxiliary Lanes

Permit No.: 48-01243-P

Application No.: 020614-22

Application Type: Environmental Resource (General Permit Modification)

Location: Orange County, S35,36/T23S/R28E
S1,2,11,12/T24S/R28E

Permittee : Florida Department Of Transportation District Five

Operating Entity : Florida Department Of Transportation

Project Area: 50.2 acres

Project Land Use: Highway

Drainage Basin: SHINGLE CREEK

Receiving Body: Existing roadside system

Class: CLASS III

Special Drainage District: NA

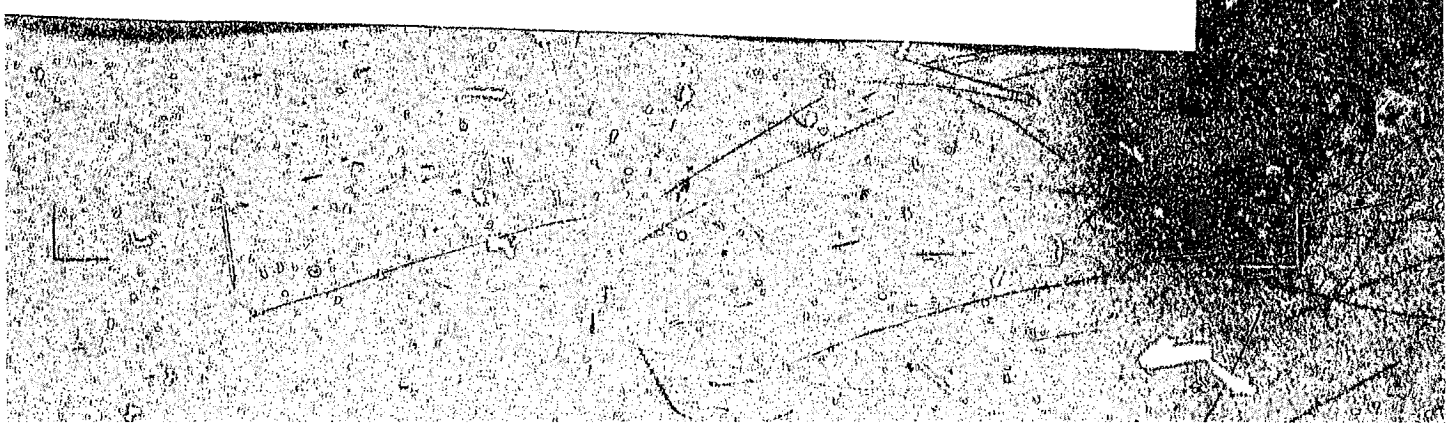
Conservation Easement To District : No

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 50.2 acres of highway project known as I-4 Auxiliary Lanes. Staff recommends approval with conditions.

EXHIBIT 2a



PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The site is located along the existing I-4 corridor between the BeeLine Expressway and Sand Lake Road.

There are no permitted surface water management facilities within the project area. The site contains the existing roadway and roadside swale and ditch system that pre-dates District permitting criteria.

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 two additional auxiliary lanes from the BeeLine Expressway to Sand Lake Road. The water management system consists of swales, inlets and culverts directing runoff to a wet detention pond. The total road project contains 50.2 acres of which 21.95 acres will be served by the water management system. The remaining 28.25 will continue to drain to the existing roadside swales and ditches. The pond receives runoff from 5.87 acres of new and existing impervious area. The project is adding a total of 3.7 acres of new impervious area. Therefore, even though not all the new impervious area can be directed to the pond, water quality treatment for greater than the new impervious area is being provided. Discharge is to Shingle Creek via the existing roadside swales and ditches.

LAND USE:

Construction:
Project:

	This Phase	Total Project	
Pavement	11.07	11.07	acres
Pervious	34.52	34.52	acres
Water Mgnt Acreage	4.61	4.61	acres
Total:	**50.20**	**50.20**	

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 : 25 YEAR-1 DAY Design Rainfall : 8.6 Inches

Basin	Allow Disch (cfs)	Method Of Determination	Peak Disch (cfs)	Peak Stage (ft, NGVD)
Auxiliary lanes	20.5	Pre Vs Post	18.1	116.4

Road Design :

EXHIBIT 2b

Road Storm Frequency : 25 YEAR-1 DAY Design Rainfall: 8.6 inches

Basin	Peak Stage (ft, NGVD)	Proposed Min. Road Crown (ft, NGVD)
Auxiliary lanes	116.4	119

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NGVD)	WSWT Ctrl Elev (ft, NGVD)	Method Of Determination
Auxiliary lanes	21.95	115.25/115.25	115.25	Wet Season Soil Borings

Receiving Body :

Basin	Str.#	Receiving Body
Auxiliary Lanes	1	Existing Road System

Discharge Structures:

Weirs:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Elev. (ft, NGVD)
Auxiliary lanes	1	1	Broad Crested	4'				115.75 (crest)

Water Quality Structures:

Bleeders:

Basin	Str#	Count	Type	Width	Height	Length	Dia.	Invert Angle	Invert Elev. (ft, NGVD)
Auxiliary lanes	1	1	Circular Orifice				3"		115.25

WATER QUALITY :

No adverse water quality impacts are anticipated as a result of the proposed project. Water quality treatment in excess of the first inch of runoff is provided in the wet detention pond for 5.87 acres of impervious area which is greater than the 3.7 acres of new impervious area to compensate for areas of the new impervious area that can not be drained to the detention pond.

Basin	Treatment Method			Vol Req.d (ac-ft)	Vol Prov'd (ac-ft)
Auxiliary lanes	Treatment	Wet Detention	4.61 acres	1.83	2.34

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 C ·de (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

EXHIBIT 2c

I-4 (SR 400) Auxiliary Lanes From SR 528 to Sand Lake Road Orange County, Florida

Drainage Design Report

FIN: 410732-1-52-01, 242444-2-52-01

Prepared for

Florida Department of Transportation - District 5
DeLand, Florida

June 2002

Prepared by

CH2MHILL

SECTION 3

Existing Drainage Characteristics

I-4 was constructed prior to any regulatory requirements to treat and attenuation runoff from development. Therefore, no stormwater management is provided for the existing condition throughout the limits of this project. Within the project limits three distinct basins exist and have been identified by the I-4 PD&E Study – Section 2. All three basins are part of the larger Shingle Creek watershed. Figure 4 shows the overall existing drainage patterns on the USGS Quadrangle as well as the basins.

Basin A

Basin A extends from the beginning of the project to Sta. 778+00. In the existing condition runoff drains via separate roadside ditches on the eastbound lanes and westbound sides to a canal just west of the Central Florida Parkway, which is a tributary of Shingle Creek. The runoff from this basin consists of existing roadway and infield areas within the FDOT right-of-way. There are no off-site contributing areas.

Basin B

Basin B extends from Sta. 778+00 to Sta. 824+50 In the existing condition runoff is conveyed to the existing cross culvert located at Sta. 807+28 The cross culvert discharges west to the an unnamed lake that discharges to the Central Florida Parkway canal via the Big Sand Lake system. (Note this lake is located just north of The Vinnings at Sand Lake Apartments. The runoff from this basin consists of existing roadway and median areas within the FDOT right-of-way. There are no offsite contributing areas.

Basin C

Basin C extends from Sta. 824+00 to Sand Lake Road. In the existing condition runoff is conveyed to the existing cross culvert located at Sta.839+95. The cross culvert discharges west to Little Sand Lake, which discharges to Big Sand Lake and the ultimate Shingle Creek outfall. The runoff from this basin consists of existing roadway and infield areas within the FDOT right-of-way as well as a small amount of offsite area in the vicinity of the Sand Lake

SECTION 4

Proposed Stormwater Management

The stormwater management for this project is best defined as an 'overall watershed improvement" approach. The overall watershed approach provides treatment for existing pavement that currently does not receive treatment in lieu of treating new pavement constructed as part of this project. Specifically, 3.7 acres of new impervious area will be constructed as part of this project. The proposed pond provides treatment and attenuation for 5.87 acres of impervious area (new and existing). In addition, partial swale treatment is provided to supplement the pond treatment. Figure 5 graphically depicts the stormwater management concept. The flow patterns and sub-basin divides will remain as they did in the existing condition.

Basin A

Basin A will continue to discharge to the roadside ditches to the Central Florida Parkway Canal.

The existing eastbound lanes, including the additional auxiliary lane, are conveyed into the proposed pond site by the existing ditches, storm sewer (on the fly-over ramps) and cross culverts. Pond discharge is to the existing conveyance ditch adjacent to I-4. The tailwater condition for the stormwater routing of the proposed condition is the same as the tailwater used for the existing condition.

Runoff from the existing westbound lanes (including the additional auxiliary lane and gore modification) is conveyed through the interchange untreated as in the existing condition.

Basin B

Basin B extends from station 778+00 through station 824+50. The runoff from this basin consists of existing roadway areas and the new auxiliary lanes within the FDOT right-of-way. There are no offsite contributing areas. Runoff, from both eastbound and westbound lanes, is collected and conveyed in roadside ditches that discharge to the unnamed lake adjacent to Big Sand Lake.

In addition, eastbound roadside ditches contain ditch blocks to provide some water quality treatment. The pond in Basin A provides excess treatment for the entire project. Therefore, the treatment volume provide within the ditch blocks has not been quantified. Discharge from the ditch is to the existing 42-inch concrete cross culvert at station 807+28.

Basin C

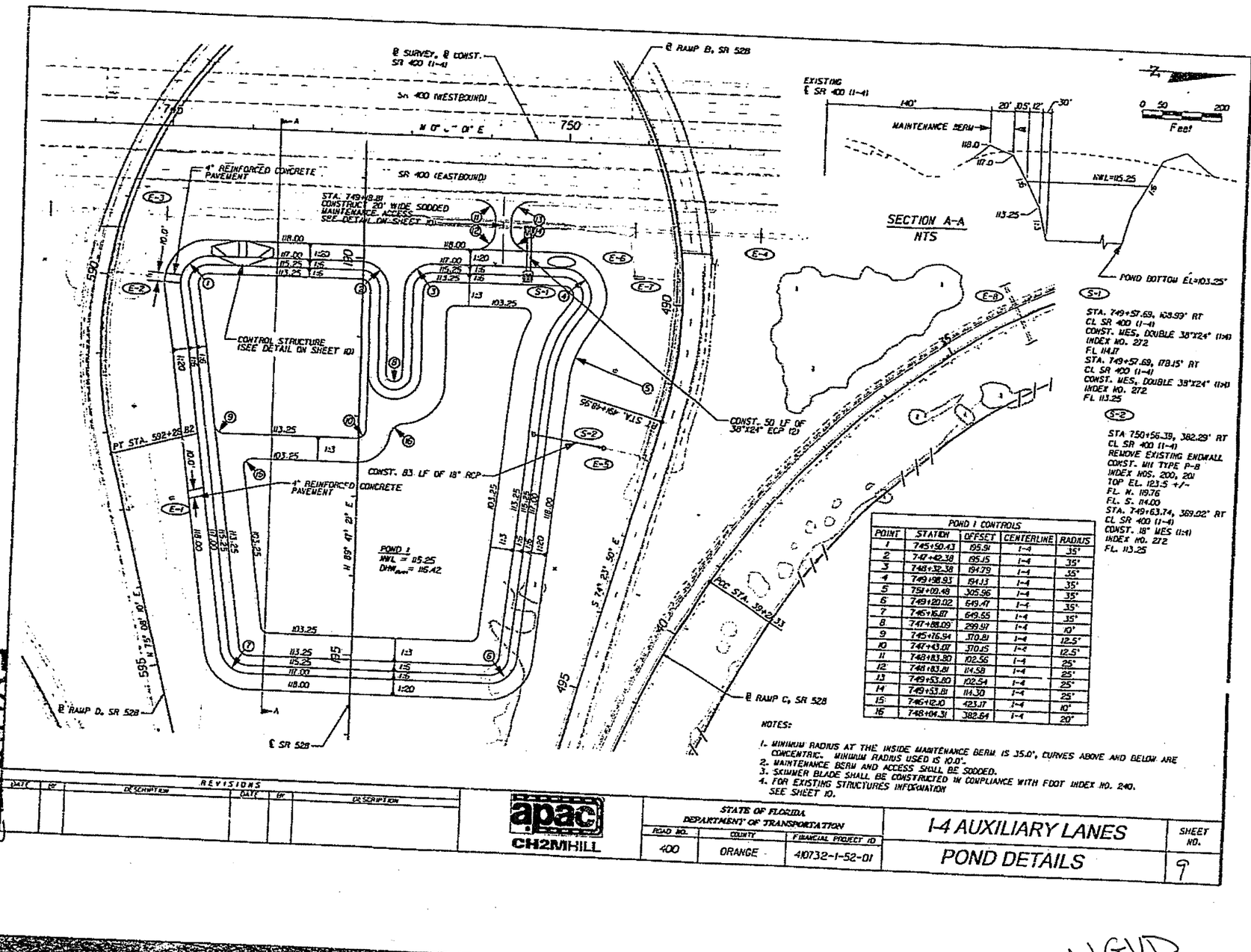
Basin C extends from station 824+00 through station 853+15, which is approximately the (centerline of Sand Lake Road). The runoff is conveyed via existing ditches and cross culverts to Little Sand Lake. The runoff from this basin consists of existing roadway and infield areas within the FDOT right-of-way, a small amount of offsite area in the vicinity of the Sand Lake Road interchange, and a new auxiliary lane pavement and gore modifications on the eastbound side. Runoff from the improvements is conveyed to the existing cross culvert.

Design Summary

The overall watershed approach meets the SFWMD rules because the entire project ultimately discharges to Shingle Creek. The proposed pond has been designed to comply with SFWMD and FDOT criteria, including F.A.C. 14-86. Compliance with all criteria includes the addition of an earthen barrier between the inflow to the pond and the control structure. This increases the travel distance to the outfall and minimizes short-circuiting of the system. Refer to Appendix D for the stormwater management facility calculations, which are summarized below:

SFWMD Attenuation Requirements:

Basin Name	Peak Discharge Existing (cfs)	Peak Discharge Proposed (cfs)	Comment
Basin A Routed	20.5	18.1	
Basins A, B, and C Not Routed	76.6	77.4	
Total	97.1	95.6	Proposed discharge less than existing



POND 1 CONTROLS

POINT	STATION	OFFSET	CENTERLINE	RADIUS
1	7+45+50.43	185.91	I-4	35'
2	7+47+42.38	185.15	I-4	35'
3	7+48+32.38	154.79	I-4	35'
4	7+49+98.93	154.13	I-4	35'
5	751+00.48	305.96	I-4	35'
6	7+49+20.02	649.47	I-4	35'
7	7+45+16.87	649.55	I-4	35'
8	7+47+88.09	299.97	I-4	10'
9	7+45+16.94	370.81	I-4	12.5'
10	7+47+43.07	370.15	I-4	12.5'
11	7+48+83.80	102.56	I-4	25'
12	7+48+83.81	114.58	I-4	25'
13	7+49+53.80	102.54	I-4	25'
14	7+49+53.81	114.30	I-4	25'
15	7+46+12.10	423.17	I-4	10'
16	7+48+04.31	382.64	I-4	20'

NOTES:
1. MINIMUM RADIUS AT THE INSIDE MAINTENANCE BERM IS 35.0', CURVES ABOVE AND BELOW ARE CONCENTRIC. MINIMUM RADIUS USED IS 10.0'.
2. MAINTENANCE BERM AND ACCESS SHALL BE SODDED.
3. SKIMMER BLADE SHALL BE CONSTRUCTED IN COMPLIANCE WITH FDOT INDEX NO. 280.
4. FOR EXISTING STRUCTURES INFORMATION SEE SHEET 10.

EXHIBIT

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

apac
CH2MHILL

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			I-4 AUXILIARY LANES	SHEET NO.
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	POND DETAILS	9
400	ORANGE	410732-1-52-01		

NGVD

Permit App. No. 040702-13

SR 528 Widening from I-4 to McCoy Road

the average depth from the average existing ground surface elevation over the footprint of the pond.

Table I-6 Pond Control Elevations

Pond	Control Elevation (ft, NAVD)	Source Elevation (ft, NAVD)	Primary Source
1C	88.0	87.50	Average Wet Season Elevation determined by Geotech.
1D	87.0	87.00	Average Wet Season Elevation determined by Geotech.
1E	88.0	87.50	Average Wet Season Elevation determined by Geotech.
1F	87.0	87.00	Average Wet Season Elevation determined by Geotech.
2A	85.0	85.09	Existing Pond Control Elevation
2B	85.0	85.09	Existing Nearby Pond Control Elevation
2C	85.0	85.09	Existing Nearby Pond Control Elevation
3A	85.0	85.09	Existing Nearby Pond Control Elevation
3B	85.0	85.09	Existing Nearby Pond Control Elevation
3C	84.0	83.88	High water mark on existing headwall
4A	81.0	N/A	Constraint of Connected Pond
5A	81.0	81.50	Average Wet Season Elevation determined by Geotech.
5B	81.0	N/A	Constraint of Connected Pond
5C	81.0	80.50	Average Wet Season Elevation determined by Geotech.
6A	89.50	89.00	High water mark on existing headwall
7C	89.90	89.40	Existing Nearby Pond Control Elevation
8A & 8B	91.00	89.55	High water mark on existing headwall (1100' away from ponds)
10B	89.60	89.60	Existing Nearby Pond Control Elevation
12A	89.60	89.60	Existing Nearby Pond Control Elevation
14B	93.09 (94.00 NGVD)	93.09 (94.00 NGVD)	Permitted SHWE for adjacent wetland

Post development hydrology information is summarized in Table I-7 below.

The starting and peak tailwater stage elevations for the pond analysis are summarized in Table I-8. For documentation of the sources and calculations for determining 10 year tailwater conditions refer to Section VI of this report.

Table I-8 – Tailwater Parameters for Stormwater Ponds (25 Year, 24 Hour Storm Event)

Ponds	Starting Tailwater Elevation (ft. NAVD)	Peak Tailwater Elevation (ft. NAVD)	Tailwater Description/Source
1E	81.09	85.50	Upstream stage result from CD-1 Analysis
1F	81.09	85.41	Downstream stage result from CD-1 Analysis
2A	75.79	84.50	Node 'Newover7' in CDM model (Jan 2000) for Universal Sand Lake Road Complex, Relocation of Ponds 9 & 10
2C	79.22	82.79	Interpolation between Node 'Shadow' (see above) and Node 'WBI' in model by Henderson and Bodwell (May 1990)
3C	79.22	82.79	Interpolation between Node 'Shadow' (see above) and Node 'WBI' in model by Henderson and Bodwell (May 1990)
3D (Det. Swale)	77.59	82.69	Node P1003 in Shingle Creek surface water model developed May 1997 by DRMP
3E (Det. Swale)	77.59	82.69	Node P1003 in Shingle Creek surface water model developed May 1997 by DRMP
4A	77.59	82.69	Node P1003 in Shingle Creek surface water model developed May 1997 by DRMP
4B	77.59	82.69	Node P1003 in Shingle Creek surface water model developed May 1997 by DRMP
6A	89.00	90.22	Node ZF-6 in Shingle Creek surface water model developed May 1997 by DRMP
7C	89.90	93.37	Results from drainage report of widening of Florida's Turnpike developed February 2003 by URS Corporation
8A & 8B	89.55	91.41	Node ZF-II in Shingle Creek surface water model developed May 1997 by DRMP
10B	86.60	93.5/96.5	Results from west branch Boggy Creek Stormwater Management Master Plan developed Dec. 1989 by Miller & Einhouse, Inc.
12A	86.6	93.5/96.5	Results from west branch Boggy Creek Stormwater Management Master Plan developed Dec. 1989 by Miller & Einhouse, Inc.
I4B	93.09	95.04	McCoy Commerce Center 100-year Flow Elevation Study prepared by Donald W. McIntosh and Associates 1995

Tailwater conditions for the culvert analyses are summarized in Table I-9. For documentation of the sources and calculations related to culvert tailwater conditions, refer to Sections V and VI of this report.

SCALE: 1" = 200'

S-11A
S-17
S-20
S-21
S-16
S-14
S-24B
0-1E
RAMP 'F'
S-36
S-24C
S-40
S-26A
S-26
S-39
S-41
S-42
S-31
S-32B
S-24
S-35
S-28
CD-1
RAMP 'G'
S-42A
S-10
S-33
S-53
S-32A
S-11
POND IC
CE=88.00
25Yr24Hr=89.69
POND IE
CE=88.00
25Yr24Hr=89.12
235
240
245
250
℄ CONSTRUCTION SR 528
S-12
POND IF
S-29
RAMP 'H'
S-52A
S-43
S-44
POND ID
CE=87.00
25Yr24Hr=88.27
S-30
S-52
S-27A
S-27B
S-50
S-27
S-24A
0-1F
S-51
S-12
S-13
INTERNATIONAL DR.
S-32
CE=87.00
25Yr24Hr=87.79
S-25A
S-22
S-23
S-19
S-18
S-25B
S-25
S-45
S-45A
S12,T24S,R28E
S7,T24S,R29E
RAMP 'E'

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DRMP
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
DYER, RIDDLE, WILLS & PRECOURT, INC.
1505 E. COLONIAL DRIVE, ORLANDO, FLORIDA 32803
PHONE: (407) 896-0594 FAX: (407) 896-4836
CERTIFICATE OF AUTHORIZATION NO. 2648
KEN KNIEL, PE LICENSE NO. 37300

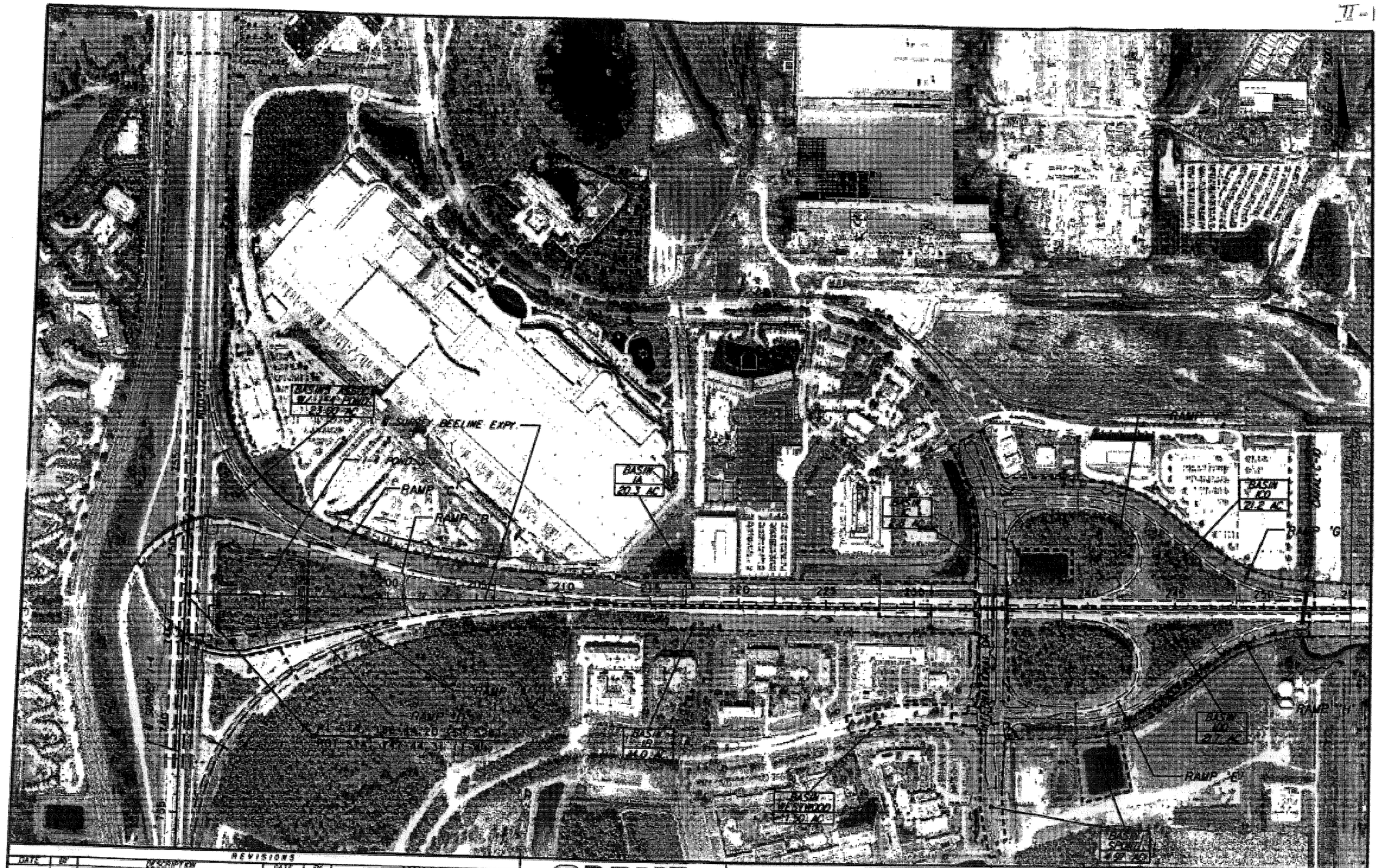
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R.528	ORANGE	406090-1-52-01

POST DEVELOPMENT INTERCHANGE DRAINAGE MAP

SHEET NO. 9

$DATE$ $TIME$ $FILE$



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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

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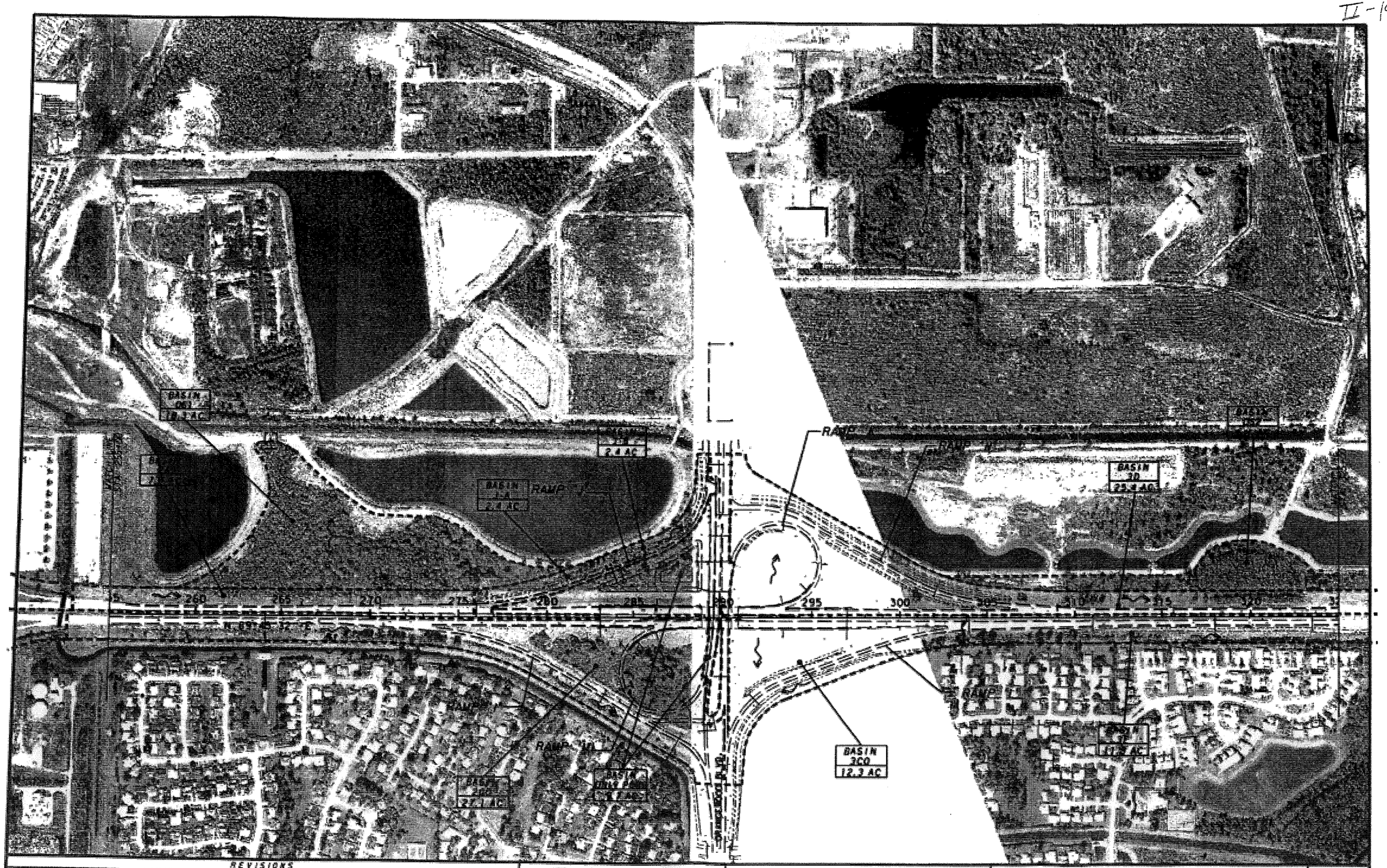
PREDEVELOPMENT DRAINAGE MAP

SHEET NO. II-13



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
		- - -

PREDEVELOPMENT DRAINAGE MAP

SHEET NO. II-14

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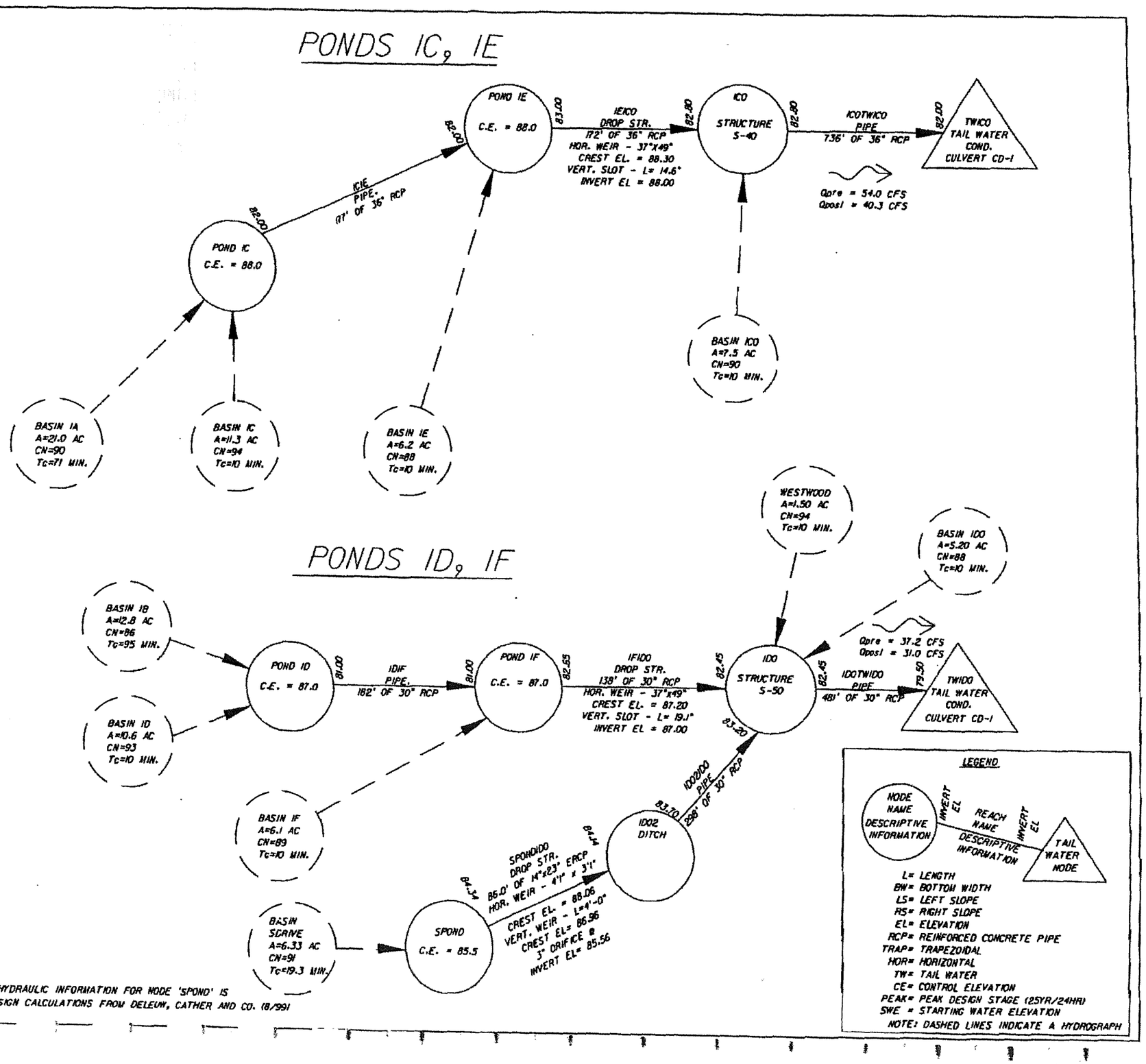
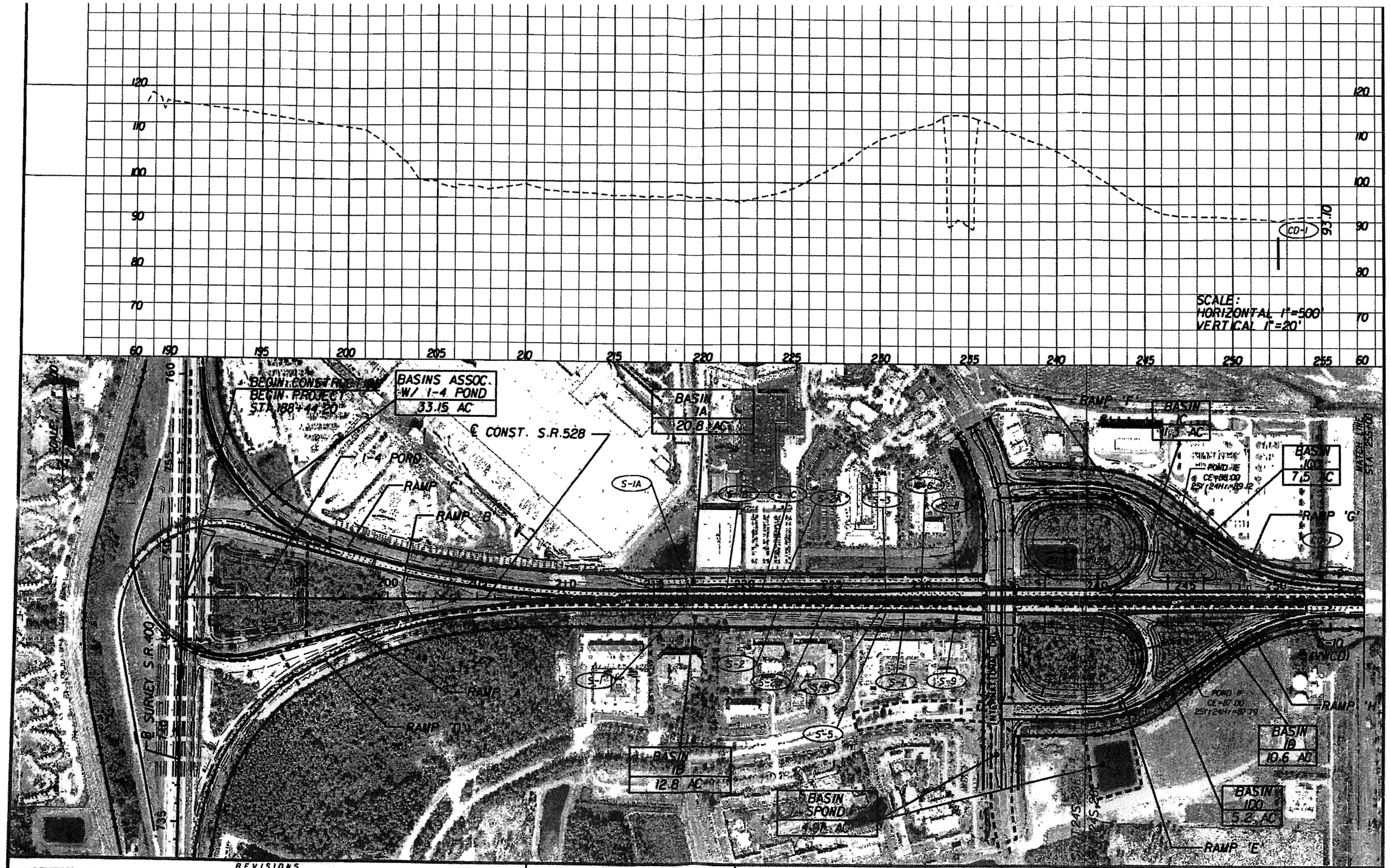
POST-DEVELOPMENT NODE-REACH DIAGRAMS

BEE LINE EXPY. WIDENING

FIGURE III-2



NOTE:
HYDROLOGY AND HYDRAULIC INFORMATION FOR NODE 'SPOND' IS TAKEN FROM DESIGN CALCULATIONS FROM DELEUW, CATHER AND CO. (8/99)



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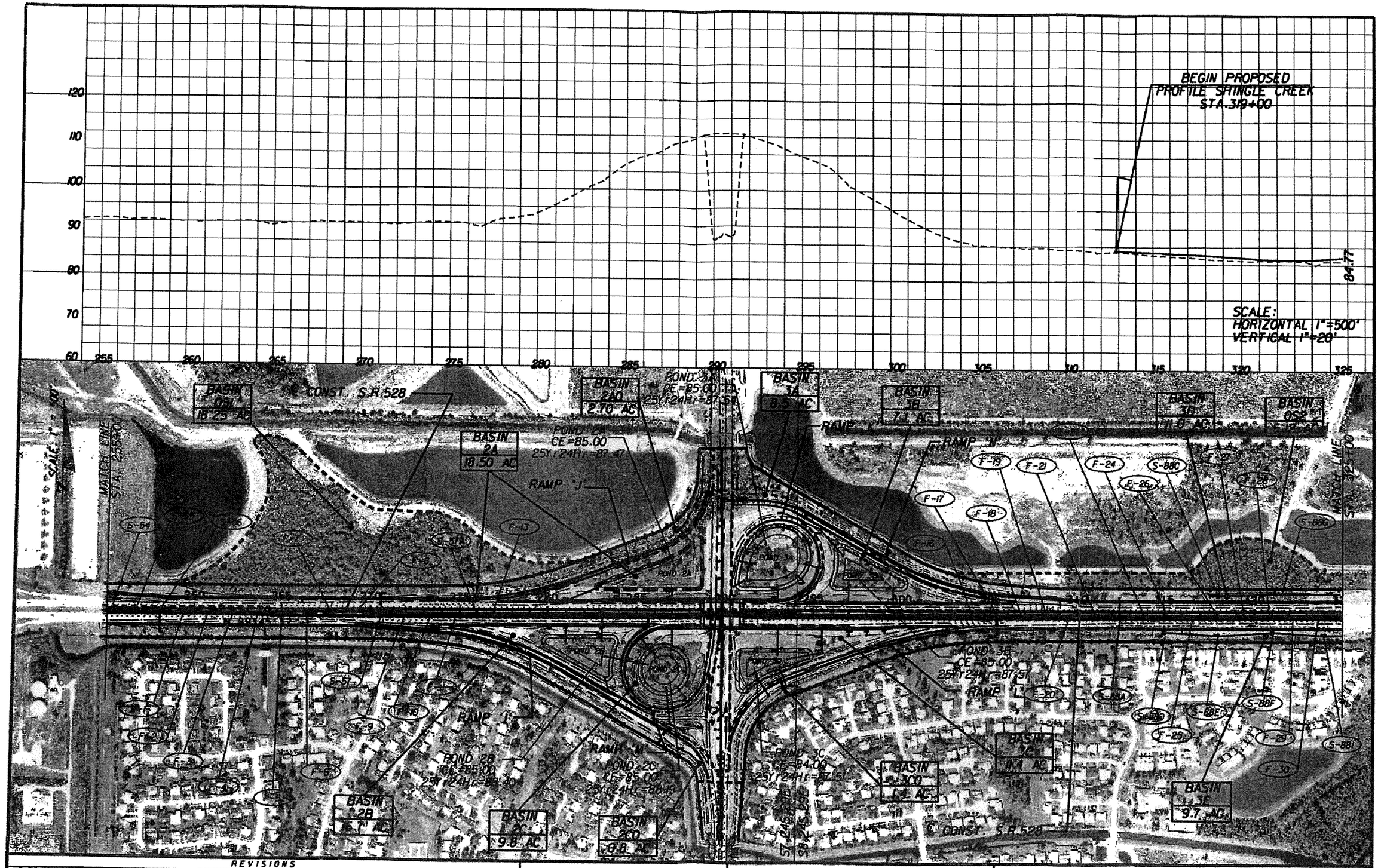
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R.528	ORANGE	406090-1-52-01

POST DEVELOPMENT DRAINAGE MAP

SHEET NO. II-13



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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R.528	ORANGE	406090-1-52-01

POST DEVELOPMENT DRAINAGE MAP

SHEET NO. III-14

Permit App. No. 03318-3

I-4 and Sand Lake Road Interchange

Project Description

The Project is located at the interchange of Sand Lake Road and Interstate-4 (I-4) in Orange County, Florida. The proposed construction will include modifying the existing tight diamond interchange configuration to a quarter cloverleaf, as well as widening the exit and entrance ramps. As a result of this Turkey Lake Road will be relocated approximately 500 feet west of its present location. Sand Lake Road is to be widened from the new intersection Turkey Lake Road east to the intersection of International Drive.

Approximately 1.6 miles of I-4 will be modified. It is a limited access facility that contains mostly open swale drainage with cross-culverts. The stormwater runoff from I-4 within the project limits presently discharges into several locations:

a) The majority of the runoff discharges into Little Sand Lake.

b) Small portion of the runoff contained within a depressed area located approximately 1500 L.F. north of the overpass on the west side of I-4.

c) Portions of the runoff, that are north and east of the overpass, run along swales and discharge into the system located along Sand Lake Road.

In summary, approximately 0.4 miles of Sand Lake Road will be modified. It currently functions as an urban arterial with both open swale and closed drainage systems. The systems are basically divided by I-4. To the west is predominately open swales that drain eventually to Little Sand Lake. To the east is primarily a closed system that drains east along Sand Lake Road and eventually to Shingle Creek.

The retention will provide for the added impervious area within the project site. Water will be held within a retention area located in the center of ramp "B". The volume will be drawn down by underdrains and discharged into the storm sewer system. A skimmer device will be attached to the outfall structure so that debris/pollutants are controlled. This system will not provide any attenuation post development hydrograph.

PROJECT: Reconstruction of the Sand Lake Road/I-4 Interchange

JOB NO.: DT-06

DATE: March 16, 1988

SUBJECT: I-4/Sand Lake Road Retention Calculations

As mentioned in the project description, the rainfall runoff from this project discharges to one of three places:

1. Little Sand Lake Road.
2. An existing depression.
3. Grassy swales east of the interchange, which run along Sand Lake Road.

Other than the travel time through the grassy swales, none of the additional impervious area will receive any water quality treatment except for the portion going to Little Sand Lake.

The portion of the runoff that is routed through the loop of Ramp "B" will receive water quality treatment. Fifteen (15) acres of the entire contributing area passes this area; the volume stored by a weir is greater than the runoff from the first inch of runoff for the added impervious area project wide. This is basically a trade-off for the other areas which receive no water quality treatment.

The retention area was designed by routing a Santa Barbara unit inflow hydrograph through an outfall structure that passes the water under Sand Lake Road, into a roadside ditch, and ultimately into Little Sand Lake. The 50 year 24 hour storm was used to analyze this outfall structure because the pipe passes under Sand Lake Road and Ramp "E". A 2-inch diameter P.V.C. orifice will be provided to ensure that water stored below the weir elevation is drawn down in the required time. Side drains will also be placed in the banks to minimize groundwater contributions to the pond. See calculations and plans enclosed.

PEC | **PROFESSIONAL ENGINEERING CONSULTANTS, INC.**
engineers planners surveyors
Suite 1560 Hartford Building 200 East Robinson Street Orlando, Florida 32801 305/422-8062

PROJECT: SANDLAKE RD. / I-4 INTERCHANGE JOB NO. DF-06
MADE BY: S.L.B. CHECKED BY: _____ DATE: MAR 88 SHEET _____ OF _____

BASIN CHARACTERISTICS

THE BASIN THAT CONTRIBUTES RUNOFF TO THE RETENTION AREA CONSISTS OF 15.51 ACRES OF IMPERVIOUS ROADWAY AREA AND AND GRASSY RIGHT OF WAY THAT WILL BE MAINTAINED AND IN GOOD CONDITION.

SCS CURVE NO. GRASSY AREA = 65
SCS CURVE NO. IMPERVIOUS = 98

WEIGHTED CN = 73

WITH APPROX 2% OF THE ARE DIRECTLY CONNECTED INTO THE RETENTION POND

THE TIME OF CONCENTRATION = 47 AMIN (STORM TABS)
= 0.79 HRS

THE DESIGN STORM WILL BE THE 50-yr. 24 HR STORM, ZONE 7 F.D.O.T. I.D.F. CURVES.

THE SANTA BARBARA UNIT HYDROGRAPH WILL BE USED WITH AN SCS TYPE II DISTRIBUTION.

STAGE STORAGE CALCULATIONS

Top El. 125.0
Bot. El. 122.5

Bot. Area 27077.0
Top Area 40245.0

Average area per 1/2 foot of elevation 2633.600

Elev. (FT.)	Area (SQ. FT.)	Storage (CUB. FT.)	Sum of Storage (CUB. FT.)	Sum of Storage (AC. FT.)
122.5	27077.0		0.0	0.000
		14196.9		
123.0	29710.6		14196.9	0.326
		15513.7		
123.5	32344.2		29710.6	0.682
		16830.5		
124.0	34977.8		46541.1	1.068
		18147.3		
124.5	37611.4		64688.4	1.485
		19464.1		
125.0	40245.0		84152.5	1.932

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PROJECT: SANDLAKE RD / INTERSTATE-4 JOB NO. DT-06
MADE BY: S.L.B. CHECKED BY: _____ DATE: MAR 88 SHEET 1 OF _____

BOTTOM AREA = 14923 FT² BOTTOM EL. 122.5
TOP AREA = 27077 FT² TOP EL 123.33
AVG. AREA PER 2" ELEV. = 2430.8

STAGE STORAGE CALCS. $V = \frac{1}{3}(A_1 + A_2 + \sqrt{A_1 \times A_2})h$ (CONICAL APPROXIMATION)

ELEV.	AREA (FT²)	VOL FT³	Σ VOL.
122.50	14923.0		0
		2740.9	
122.67	17353.8		2740.9
		2968.9	
122.83	19784.6		5709.8
		3568.0	
123.0	22215.4		9277.8
		3981.4	
123.17	24646.2		13259.2
		4136.3	
123.33	27077.0		17395.5 VOL. AVAIL.

VOLUME NEEDED

FOR WATER QUALITY CONTROL, THE RUNOFF FROM THE FIRST INCH OF RAINFALL WILL BE RETAINED FOR AN AREA EQUAL TO THE ADDED IMPERVIOUS AREA PROJECT WIDE. HOWEVER, THE WATER WILL NOT ALL BE ROUTED THROUGH THIS RETENTION, THIS AREA WILL BE A PROJECT WIDE FACILITY, KIND OF A TRADE OFF.

ADDED IMPERVIOUS AREA 4.31 AC.
IMPERVIOUS 'C' = 0.90 P = 1.0 IN

$$\text{VOLUME} = CPA = 0.90 \times 1.0_{IN} \times 4.31_{AC} \times \frac{1 FT}{12 IN} \times \frac{43560 FT^3}{1 AC}$$

VOLUME = 14081 FT³

VOLUME NEEDED < VOLUME AVAILABLE ∴ O.K.

SCANNED

Project : SAND LAKE RD. / I-4 INTERCHANGE
P.N. : DT-06
By : Professional Engineering Consultants, Inc.
David W. Haastra, P.E.
Date : March 1988

Subject : DETERMINATION OF POSITIVE BLEED DISCHARGE
(Version 08.11.87.DWH)

INPUT DATA:		
Invert Elevation	122.50	msl
Pipe Diameter	2	inches
Orifice Coefficient	0.60	
Weir Coefficient	3.10	
Volume to be Discharged	0.17	Ac-Ft

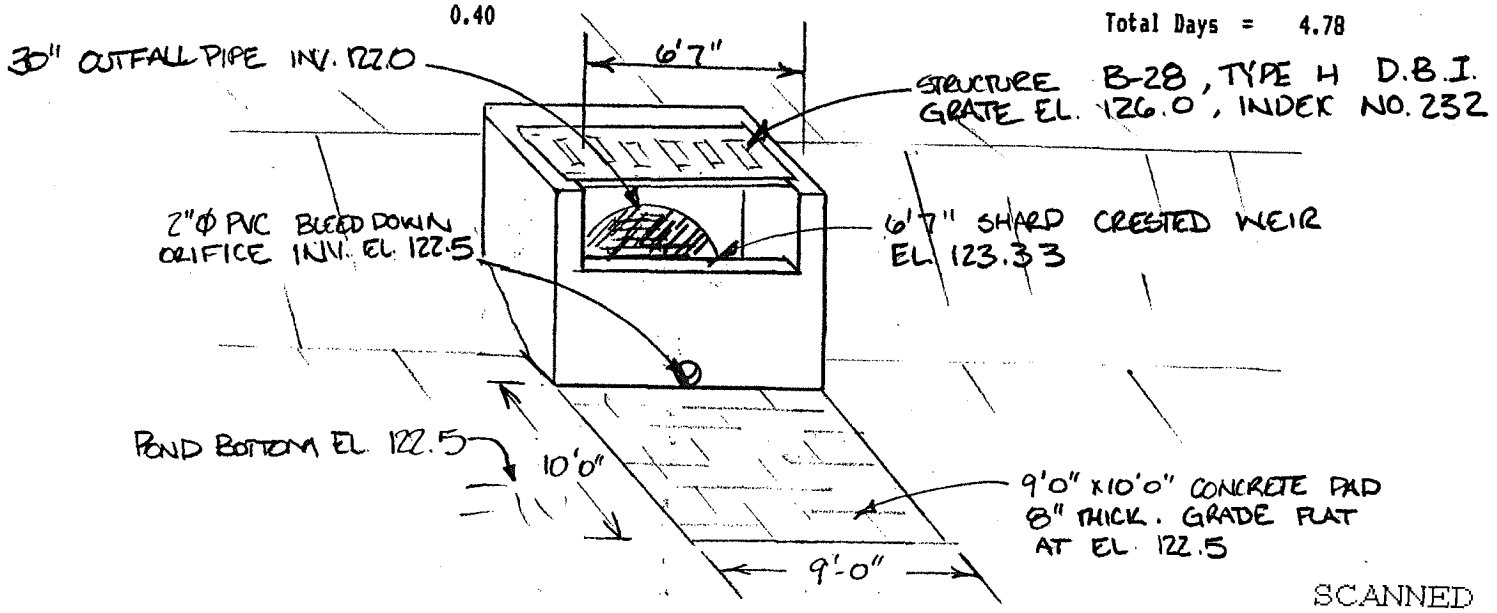
0.17

RESULTS:

Elevation (msl)	Head (ft)	Surface Area (sf)	Incr. Volume (cf)	Theta (degrees)	Top Width (ft)	Orifice Flow (cfs)	Weir Flow (cfs)	Design Discharge (cfs)	Incr. Time (hrs)	Total Time (hrs)
123.33	0.83	27,077		0.00	0.00	0.09	0.00	0.09		0.00
			4,309						13.98	
123.16	0.67	24,646		0.00	0.00	0.08	0.00	0.08		13.98
			3,903						14.65	
123.00	0.50	22,215		0.00	0.00	0.07	0.00	0.07		28.63
			3,498						16.15	
122.83	0.33	19,784		0.00	0.00	0.05	0.00	0.05		44.78
			3,093						20.74	
122.66	0.17	17,354		0.00	0.00	0.03	0.00	0.03		65.52
			2,687						49.23	
122.50	0.00	14,923		0.00	0.00	0.00	0.00	0.00		114.75

0.40

Total Days = 4.78



SCANNED

STATE PROJ. NO.	SHEET NO.
75280 - 3462	3

END L.A. R/W
STA. 21+17.50
℄ & ℄ S.L.R.

END L.A. R/W
STA. 21+17.50
℄ & ℄ S.L.R.

SCALE 1" = 100'

EXIST. R/W

℄ RAMP 'E'

℄ RAMP 'B'

℄ RAMP 'A'

℄ RAMP 'D'

℄ RAMP 'C'

INTERSTATE 4

SOUTHBOUND

NORTHBOUND

℄ & ℄ CONST.

℄ & ℄ SURVEY

SANDLAKE ROAD

℄ & ℄ CONST.

SEE DRAINAGE MAP

SEE DRAINAGE MAP

SEE DRAINAGE MAP

END L.A. R/W
STA. 35+45.03
℄ & ℄ S.L.R.

END L.A. R/W
STA. 35+58.30
℄ & ℄ S.L.R.

2.30 AC
1.16 AC
4.56 AC
3.01 AC
6.12 AC
.25 AC
.63 AC
.41 AC
.29 AC
.30 AC
.74 AC
.45 AC
.39 AC
1.39 AC
9.62 AC
.33 AC
.39 AC
.45 AC
.38 AC
.39 AC
.46 AC
.45 AC
2.27 AC
1.82 AC
1.54 AC
3.09 AC
4.48 AC
.89 AC
.42 AC
.43 AC
.38 AC
.47 AC
.47 AC
3.91 AC
1.93 AC
.36 AC
.13 AC
.23 AC
1.49 AC
.34 AC
2.69 AC
.73 AC
1.59 AC
.22 AC
1.09 AC
.72 AC
.93 AC
.69 AC
.79 AC

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

	NAME	DATE		NAME	DATE
DESIGNED BY			DRAWN BY		
CHECKED BY			CHECKED BY		
SUPERVISED BY					

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE

PEC / W.K. DAUGHERTY
ORLANDO · CLEARWATER · LAKE CITY

SUPPLEMENTARY DRAINAGE MAP INTERCHANGE AT I-4 & S.R. 482 (SAND LAKE RD.)

88-00029-S

Permit App. No. 950919-3

Republic Drive/I-4 Interchange

PROPOSED FACILITIES AND HOW PROPOSED FACILITIES WILL OPERATE IF NO FURTHER PERMITS ARE ISSUED

Item IV-3 and Item IV-4

The proposed surface water management system is divided into two (2) major drainage basins, maintaining historical flows ultimately into Little Sand Lake in the south (Basin 100) and into Shingle Creek in the northern basins (200 through 500). The project stormwater management system consists of a series of storm sewer, shoulder gutter, barrier wall, median and ditch bottom inlets to collect and convey stormwater runoff into each individual basin. To avoid impacting the wetlands around and within the Kirkman/I-4 interchange are a concept of trading off proposed pavement within the area with treatment of existing areas which received conceptual approval at our SFWMD pre-application meeting on May 31, 1995. A copy of the meeting minutes is included under agencies correspondence in the drainage report. All stormwater management facilities are designed as wet bottom ponds. With 4:1 side slopes for maximum utilization of available pond areas due to limited and high real estate costs. A brief description of the project basins is outlined below:

Basin 100:

Basin 100 is located in the south end of the project near the Sand Lake Road exit. The pond serving this basin will be constructed over an existing sinkhole. With approval from our geotechnical consultants, historical discharges were maintained from the sinkhole overflow to the existing structures within the Sand Lake road interchange. Runoff will continue ultimately outfalling through an existing pond into Little Sand Lake. The overall water quality within this basin will be improved by total management of project runoff.

Basin 200:

Basin 200 is located west of I-4 between ramps F and G on Universal property.

Basin 200 will accept and convey existing and proposed I-4 runoff through a series of barrier wall, median and shoulder gutter inlets into Pond 200. Pond 200 is designed as a wet bottom facility, controlled below the local SHW table. This is in agreement with the control elevations used on the Universal City Florida Resort Site Development Design (application number 941209-1). Pond 200 is designed to discharge through an existing I-4 median swale, historically draining into Wetland #6 and ultimately into Single Creek through a series of existing cross culverts, road side ditches and canals.

Basins 300 and 400:

Basins 300 and 400 are located East of I-4 north and south of the Republic Drive overpass. The ponds serving Basins 300 and 400 are equalized through a 36" RCP and are designed as wet ponds. Ponds 300 and 400 are designed to intercept stormwater runoff from the Republic Drive/International Drive intersection to I-4 and portions of surrounding I-4 connectors and existing pavement. The equalized ponds will be discharging into the eastern right-of-way swale towards Kirkman Road and ultimately into Shingle Creek. A closed outfall system within the referenced outfall ditch was utilized to lessen right-of-way impacts to surrounding commercial areas.

Basin 500:

Basin 500 is located west of I-4 at the Republic Drive overpass. Pond 500 is located within the loop created by Republic Drive/I-4 overpass on Universal property.

Basin 500 will collect and convey runoff from existing I-4, proposed connector roads, loop ramp and the Universal parking lot ramp through a series of barrier walls, shoulder gutters and ditch inlets into Pond 500.

STAGE STORAGE AND LAND COVER TABLE

Item IV-11

BASIN	AREA (ac)				
	TOTAL	ROADWAY		POND (including berm)	Remarks
		PAVED	PERVIOUS		
100	20.26	6.97	9.70	3.59	
200	13.24	6.50	4.19	2.55	
300	5.27	3.47	0.82	0.98	
400	3.76	2.63	0.07	1.06	
500	18.55	12.73	2.32	3.50	

Basin 100

STAGE	AREA (ac)	STORAGE (ac-ft)
127.50 NWL	0.78	0
128.30	0.89	0.67
134.00	1.71	8.08
135.50	2.38	11.15

Basin 200

STAGE	AREA (ac)	STORAGE (ac-ft)
108.00 NWL	0.74	0
109.70	0.89	1.39
112.50	1.13	4.22
113.50	1.52	5.55

See the Pond Design for Republic Dr./I-4 Interchange for discharge characteristics.

Basin 300

STAGE	AREA (ac)	STORAGE (ac-ft)
96.50 NWL	0.44	0
98.60	0.76	1.26
100.00	0.97	2.47
101.00		

Basin 400

STAGE	AREA (ac)	STORAGE (ac-ft)
96.50 NWL	0.57	0
98.50	0.83	1.40
100.00	1.02	2.79
100.50	1.17	3.34
101.00	1.38	3.98

DRAINAGE BASIN TABLE

Item IV-12

Basin Number	Impervious Area (ac) Exist	Impervious Area (ac) Prop.	Pervious Area (ac)	Pond Basin Area NWL	Pond Basin Area Perv.	Total Area (ac)	Required Treatment Volume (ac-ft)
100	5.84	1.13	9.70	0.78	2.81	20.26	0.24
200	2.98	3.52	4.19	0.74	1.81	13.24	0.73
300	1.27	2.20	0.82	0.30	0.68	5.27	0.46
400	1.00	1.63	0.07	0.27	0.79	3.76	0.34
500	2.32	10.41	2.32	1.34	2.16	18.55	2.17

Note: The drainage design has traded off treatment of new paved areas in the interchange for interception and treatment of existing I-4 pavement to avoid impacting wetland areas located in the interchange. A treatment area balance is shown on the table below:

Basin	Existing Impervious Area (Ac)	Proposed Impervious Area (Ac)	Total Intercepted Imp. Area (Ac)	Volume of Treatment Required (new area) (ac-ft)	Volume of Treatment Provided for Total Area (ac-ft)	Outfall
100	5.84	1.13	6.97	0.24	0.67	Sandlake
200	2.98	3.52	6.50	0.73	1.38	Shingle Creek
300	1.27	2.2-	3.64	0.46	1.40	Shingle Creek
400	1.00	1.63	2.70	0.34	joint facility	Shingle Creek
500	2.32	10.41	12.73	2.17	2.69	Shingle Creek
Kirkman/I-4 and offsite	59.93	6.01	65.70	1.25	N/A	Shingle Creek
Total	73.34	24.90	98.24	5.19	6.14	

BASIN 100

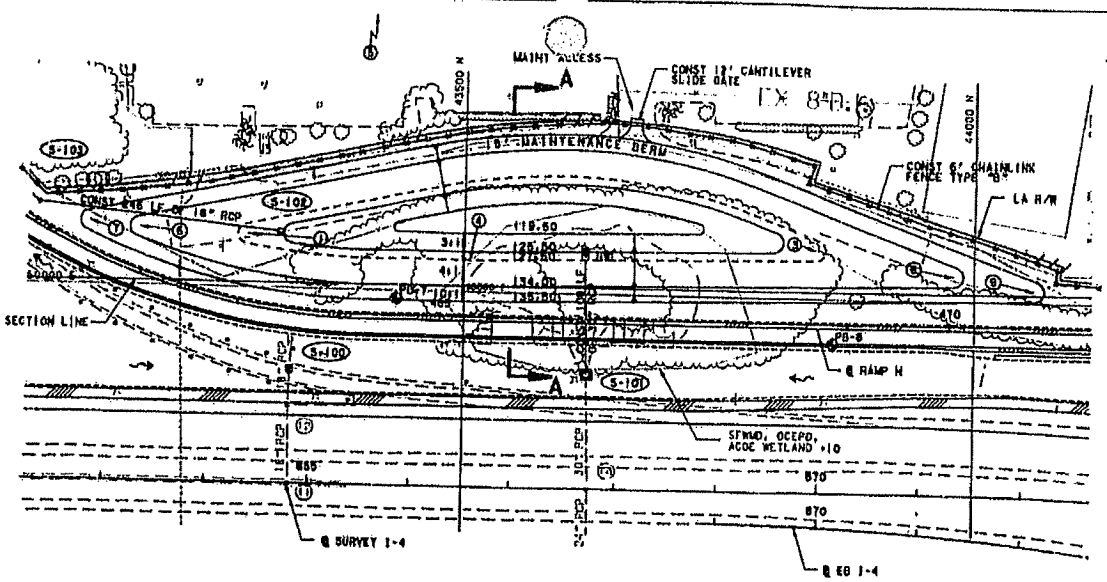
Basin 100 lies in the south end of the project and consists of ±16.15 ac of contributing area in existing conditions and 20.26 ac in post-development conditions primarily due to construction of Ramp H and the collection of additional existing pavement in the infield area bounded by Ramp H and the I-4 mainline. This was proposed to accommodate as much areas from the I-4 master plan for FDOT approval of our pond location. However, the PAV control will be based on new paved areas only. Pond 100 will be constructed adjacent to an existing sinkhole that deemed suitable for pond construction by our geotechnical consultant. The sinkhole has a normal water elevation of ±128.00 and overflows above elevation 133.00 into the roadside swale, drainage toward existing 18" RCP culvert into the loop-ramp infield area, ultimately draining into Little Sand Lake. A copy of the original plan is included for review.

Pre-development discharge from the basin for the 25-year/24-hour event was 8 cfs. Post-development discharge rate was 7.08 cfs from Pond 100 outfalling through the same outfall system. The pond design utilities a NWL of 127.50 and complies with the FDOT canal hazard safety offset criteria.

GREINER, INC.
WATER RESOURCES GROUP

Made by AEY Date: 8/21/15
Checked by CAB Date: 8/24/15

NGVD



POND 100
DHW = 133.27
DTW = 128.00
DLW = 127.50
SHW = 128.00

127.2

NOTES:

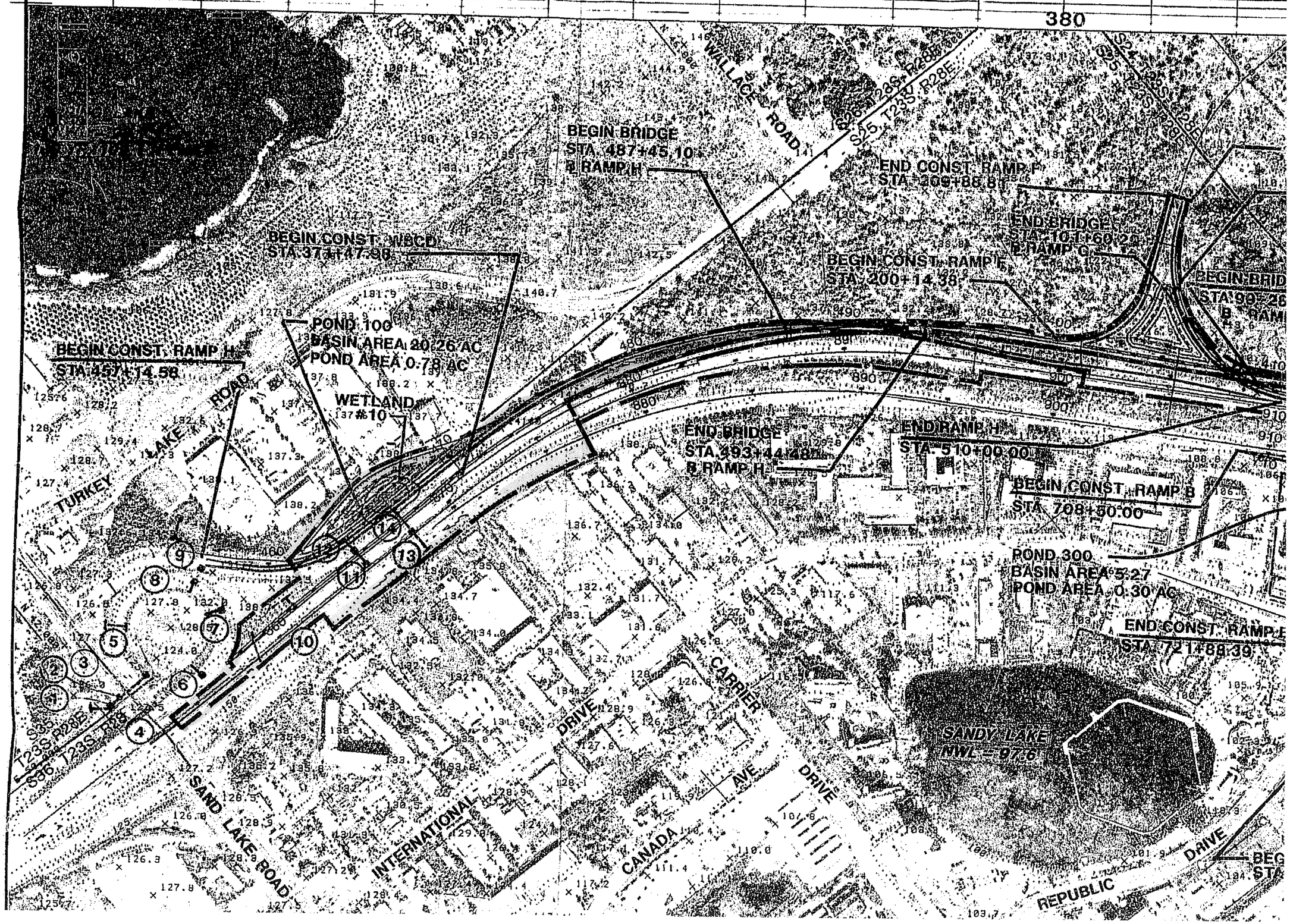
1. MINIMUM RADIUS FOR CURVES AT DESIGN LOW WATER (D.L.W.) EL. 127.50 IS 10 FEET. CURVES ABOVE D.L.W. ARE CONCENTRIC WITH THE EXCEPTION OF REFERENCE CURVE POINTS 1 AND 3
2. MINIMUM RADIUS FOR CURVES BELOW D.L.W. IS 5 FEET.
3. MAINTENANCE ACCESS AND MAINTENANCE BERM SHALL BE SODDED.
4. ALL OUTFALL CULVERTS SHALL BE REINFORCED CONCRETE PIPE, CLASS III.
5. MAINTENANCE BERM SURROUNDING ALL PONDS SHALL BE GRADED TO PROVIDE MINIMUM 1 FOOT COVER ABOVE CROWN OF PIPE WITHIN LIMITS OF MAINTENANCE BERM.
6. SKIMMER BLADE FROM ENVIRONMENTAL COMPOSITES OR EQUAL AND SHALL MEET PHYSICAL PROPERTIES AS OUTLINED IN THE TECHNICAL PROVISIONS.
7. SKIMMER BLADE, FASTENERS, ORIFICE, AND CONCRETE PAD, ETC. TO BE INCLUDED IN CONTRACT UNIT PRICE FOR CONTROL STRUCTURE.
8. 6" PVC CAP W/HOLE DRILLED TO 3" AND SOLVENT WELDED TO TEE PER MANUFACTURER'S RECOMMENDATIONS.
9. PROVIDE MIN 8" COVER OVER OUTFALL PIPE FROM CONTROL STRUCTURE TO MAINTENANCE BERM.

POND 100 REFERENCE POINTS

REFERENCE POINT	STATION	OFFSET	RADIUS	CONTOUR EL.
1	462+95.80	70.00' (LT)	10'	127.50'
2	466+15.63	417.34' (RT)	559'	127.50'
3	468+67.35	76.50' (LT)	10'	127.50'
4	465+29.10	60.00' (LT)	AHD. PT.	127.50'
5	464+25.63	650.00' (LT)	590'	127.50'
6	461+02.75	44.00' (LT)	10'	134.00'
7	461+33.05	29.00' (LT)	10'	135.50'
8	470+02.75	53.09' (LT)	10'	134.00'
9	470+80.80	39.59' (LT)	10'	135.50'

NOTE: ALL STATIONS AND OFFSETS ARE FROM ℄ RAMP H

SHEET POND 100 - DETAILS
PROJECT UNIVERSAL CITY FLORIDA
SHT

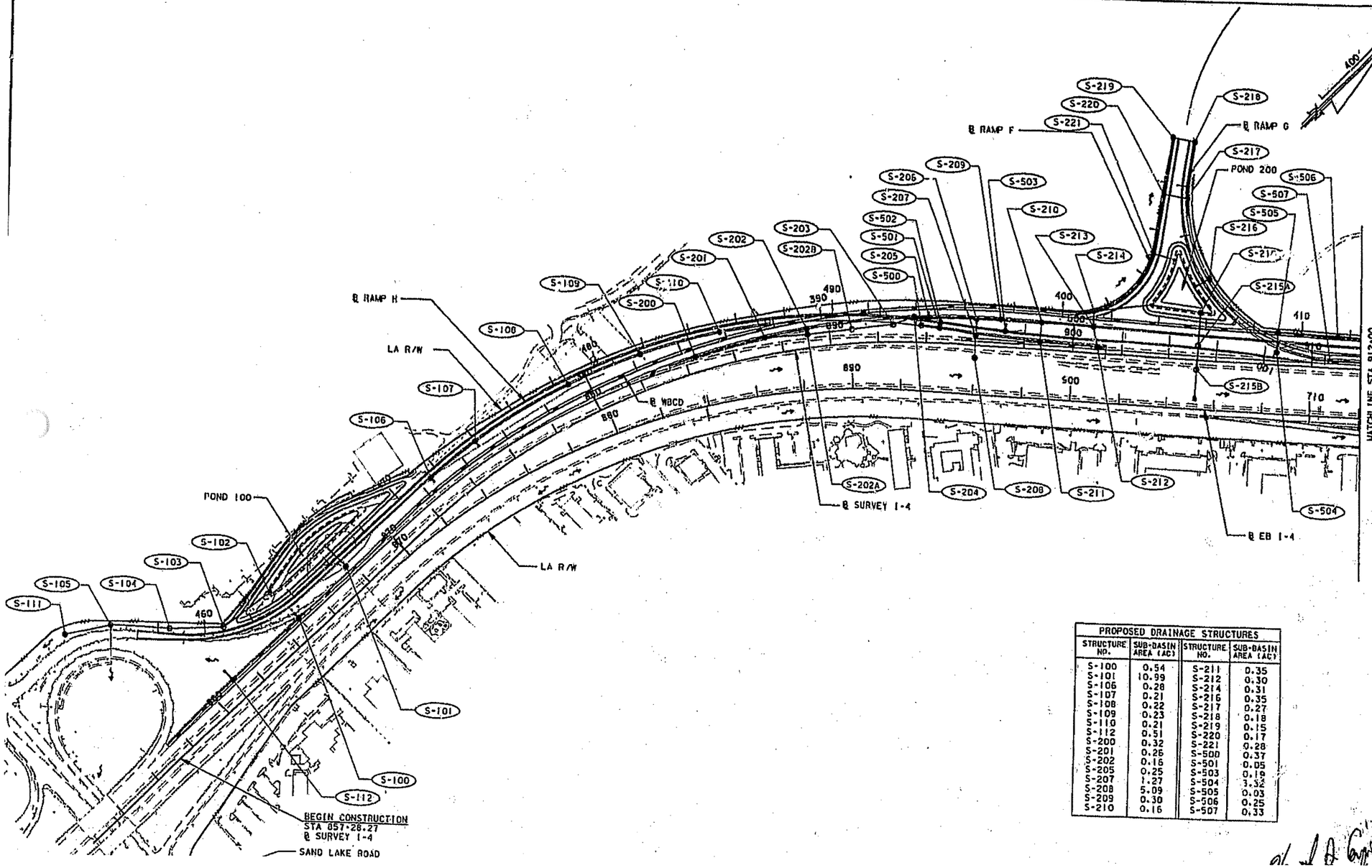

BEGIN BRIDGE
STA 487+45.10
B RAMP H
WALLACE ROAD
BEGIN CONST WBCD
STA 371+47.98
POND 100
BASIN AREA 20.26 AC
POND AREA 0.78 AC
WETLAND
#10
BEGIN CONST RAMP H
STA 457+14.58
LAKE
TURKEY
ROAD
S35, T23S, R28E
S36, T23S, R28E
SAND LAKE ROAD
INTERNATIONAL
DRIVE
CANADA
AVE.
CARRIER
DRIVE
END CONST RAMP F
STA 209+88.81
END BRIDGE
STA 10+60.28
B RAMP C
BEGIN CONST RAMP F
STA 200+14.38
END BRIDGE
STA 393+44.48
B RAMP H
END RAMP H
STA 510+00.00
BEGIN CONST RAMP B
STA 708+50.00
POND 300
BASIN AREA 5.27
POND AREA 0.30 AC
END CONST RAMP F
STA 721+88.39
SANDY LAKE
MWL = 977.6
REPUBLIC
DRIVE

BASIN 200
POND 200

Pond 200 is located west of I-4 between Ramps F and G on Universal's property. Basin 200 will accept and convey existing and proposed I-4 runoff through a series of barrier walls, median and shoulder gutter inlets(site) into Pond 200. Pond 200 is designed as a wet bottom pond and will discharge as historically into Shingle Creek through a series of roadside ditches and culverts. Basin 200 will manage runoff from a 13.24 ac basin consisting of 6.50 acres of paved area, including 2.98 acres of existing area which will be treated in lieu of new paved areas to be released within the interchange area. Pond 200 is designed to meet FDOT's canal hazard criteria. 4:1 side slopes and a 15' maintenance berm are used to optimize available pond storage within the pond.

GREINER, INC.
WATER RESOURCES GROUP

Made by CAR Date: 8/22/95
Checked by AEV Date: 8/24/95



PROPOSED DRAINAGE STRUCTURES			
STRUCTURE NO.	SUB-BASIN AREA (AC)	STRUCTURE NO.	SUB-BASIN AREA (AC)
S-100	0.54	S-211	0.35
S-101	10.99	S-212	0.30
S-106	0.28	S-214	0.31
S-107	0.21	S-216	0.35
S-108	0.22	S-217	0.27
S-109	0.23	S-218	0.18
S-110	0.21	S-219	0.15
S-112	0.51	S-220	0.17
S-200	0.32	S-221	0.28
S-201	0.26	S-500	0.37
S-202	0.16	S-501	0.05
S-205	0.25	S-503	0.19
S-207	1.27	S-504	3.52
S-208	5.09	S-505	0.03
S-209	0.30	S-506	0.25
S-210	0.16	S-507	0.33

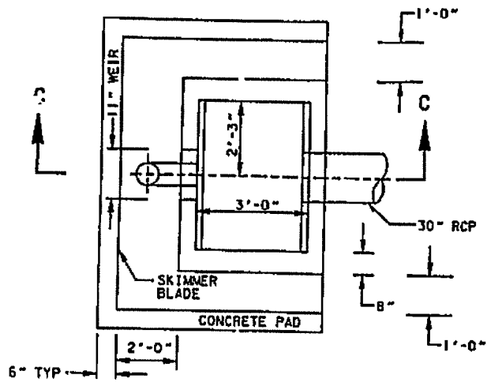
MCA RECREATION SERVICES PLANNING & DEVELOPMENT

5161 LANKERSHIM BLVD.
NO. HOLLYWOOD, CA 91601-3394
818-777-9000 FAX 777-1001

SUBCONSULTANTS
Greiner
Ivey, Harris & Wells, Inc.

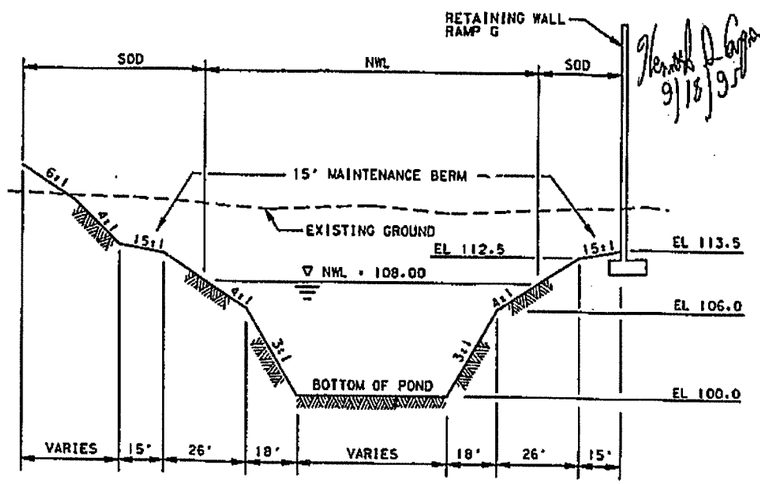
REV	DATE	DESCRIPTION
A		
A		
A		
A		
A		
A		

INTERCHANGE DRAINAGE MAP
UNIVERSAL CITY FLORIDA
UNIVERSAL STUDIOS, FLORIDA
ORLANDO, FL 32819
FAX (407) 363-8819

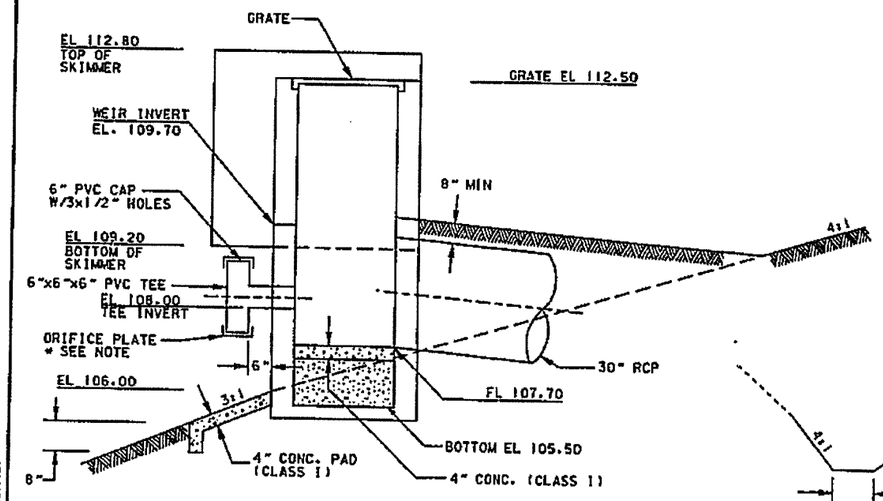


PLAN (S-215)
N.T.S.

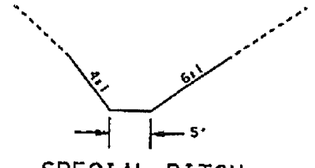
TYPE E DITCH BOTTOM INLET - MODIFIED
(FDOT INDEX 232 W/STEEL GRATE)



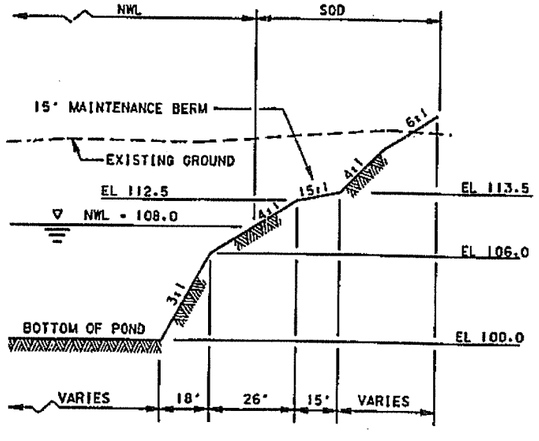
SECTION AA
N.T.S.



SECTION CC
N.T.S.



SPECIAL DITCH
TYPICAL CROSS SECTION



SECTION BB
N.T.S.

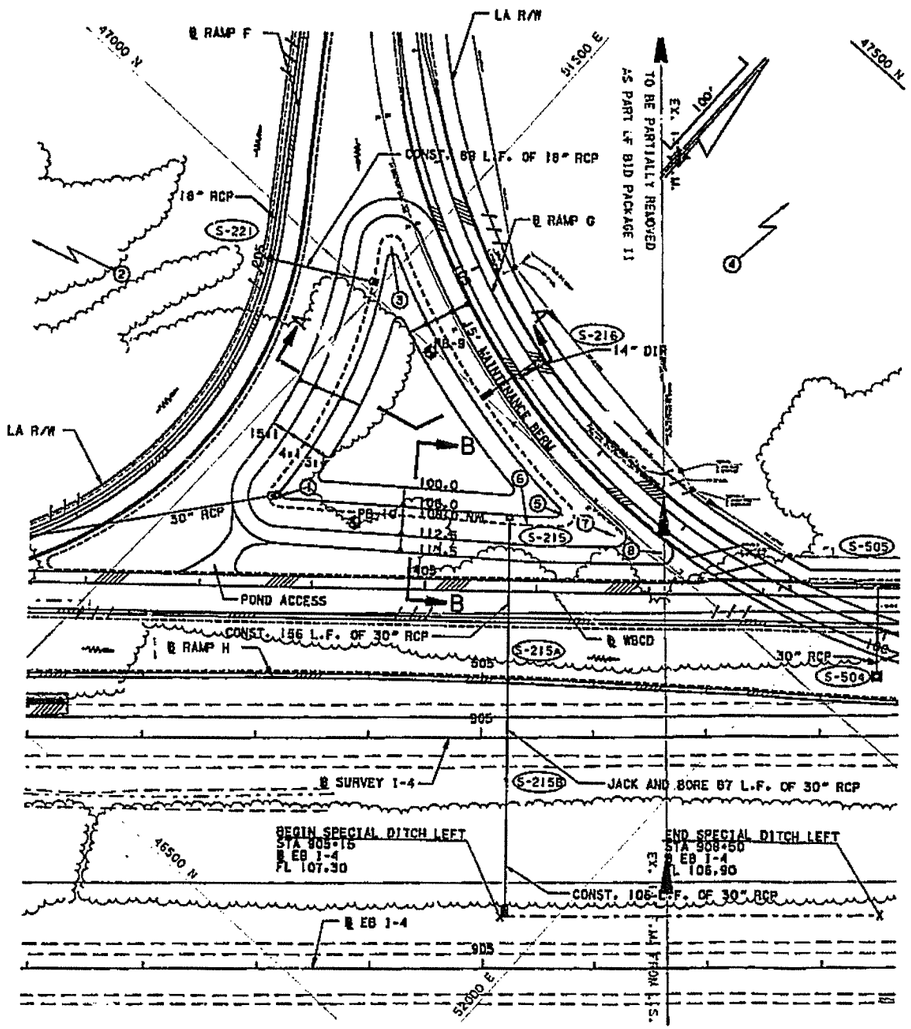
MCA RECREATION SERVICES PLANNING & DEVELOPMENT

SUBCONSULTANTS
Greiner
Greiner, Harris & Walls, Inc.

SHEET POND 200 - DETAILS
PROJECT UNIVERSAL CITY FLORIDA
UNIVERSAL STUDIOS, FLORIDA

DATE: AUGUST 1995
SHEET NO.
RP-4

48-00890-P
950919-3



NOTES:

1. MINIMUM RADIUS FOR CURVES AT DESIGN LOW WATER (D.L.W.) EL. 108.00 IS 10 FEET. CURVES ABOVE D.L.W. ARE CONCENTRIC WITH THE EXCEPTION OF REFERENCE CURVE 5.
2. MINIMUM RADIUS FOR CURVES BELOW D.L.W. IS 5 FEET.
3. AT THE CONTRACTOR'S OPTION THIS POND MAY BE EXCAVATED TO A MAXIMUM DEPTH OF 15 FEET BELOW THE D.L.W. ELEVATION 108.00 SHOWN HEREON TO OBTAIN SUITABLE FILL MATERIAL. NO CHANGES ARE ALLOWED IN SHAPE OR SLOPES ABOVE THE BOTTOM ELEVATION SHOWN HEREON. FINISH SLOPES OF ANY ADDITIONAL EXCAVATION SHALL NOT EXCEED 3:1.
4. MAINTENANCE ACCESS AND MAINTENANCE BERM SHALL BE SODDED.
5. ALL OUTFALL CULVERTS SHALL BE REINFORCED CONCRETE PIPE, CLASS III.
6. MAINTENANCE BERM SURROUNDING ALL PONDS SHALL BE GRADED TO PROVIDE MINIMUM 1 FOOT COVER ABOVE CROWN OF PIPE WITHIN LIMITS OF MAINTENANCE BERM.
7. SKIMMER BLADE FROM ENVIRONMENTAL COMPOSITES OR EQUAL AND SHALL MEET PHYSICAL PROPERTIES AS OUTLINED IN THE TECHNICAL SPECIAL PROVISIONS.
8. SKIMMER BLADE, FASTENERS, ORIFICE, AND CONCRETE PAD, ETC. TO BE INCLUDED IN CONTRACT UNIT PRICE FOR CONTROL STRUCTURE.
   - 6" PVC CAP W/HOLE DRILLED TO 3" AND SOLVENT WELDED TO TEE PER MANUFACTURER'S RECOMMENDATIONS.
9. PROVIDE MIN 8" COVER OVER OUTFALL PIPE FROM CONTROL STRUCTURE TO MAINTENANCE BERM

POND 200
DHW = 112.26
DTW = 109.60
DLW = 108.00
SHW = 112.00

POND 200 REFERENCE POINTS

REFERENCE POINT	STATION	OFFSET	RADIUS	CONTOUR EL.
1	403+70.24	82.17' (LT.)	10.00'	108.00'
2	400+14.22	364.55' (LT.)	444.41'	108.00'
3	404+65.14	308.36' (LT.)	10.00'	108.00'
4	411+17.51	569.29 (LT.)	692.62'	108.00'
5	406+23.16	70.00 (LT.)	10.00'	108.00'
6	405+91.78	60.00 (LT.)	ANG. PT.	108.00'
7	406+69.05	52.00 (LT.)	10.00'	112.50'
8	407+11.24	37.00 (LT.)	10.00'	113.50'

NOTE: ALL STATIONS AND OFFSETS ARE FROM ℄ WBCD.

Forwarded for Signature 9/18/95

MCA RECREATION SERVICES PLANNING DEVELOPMENT

SUBCONSULTANTS: Greiner

Ivey, Harris & Watts, Inc.

SHEET: POND 200 - DETAILS
PROJECT: UNIVERSAL STUDIOS, FLORIDA
1000 UNIVERSAL STUDIOS PLAZA ORLANDO, FL 32819 (407) 363-8000

DATE: AUGUST 1995
SCALE: 1"=100'
SHEET NO: RP-3

Thu Aug 31 19.. 16 1995
N:\0226\drain\peter03.dgn
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48-20890-P

Permit App. No. 990909-15

International Drive & Back of House Road

SPECIAL CONDITIONS

1. MINIMUM ROAD CROWN ELEVATION: BASIN: I-DRIVE SOUTH BASIN - 90.00 FEET NGVD.
BASIN: I-DRIVE NORTH BASIN - 92.60 FEET NGVD.

2. DISCHARGE FACILITIES:

BASIN: I-DRIVE SOUTH BASIN:

1-4' WIDE SHARP CRESTED WEIR WITH CREST AT ELEV. 87.9' NGVD.
1-.27' DIA. CIRCULAR ORIFICE WITH INVERT AT ELEV. 86.5' NGVD.
86 LF OF 1.92' WIDE X 1.17' HIGH ELLIPTICAL CULVERT.

RECEIVING BODY : EXISTING ROAD SYSTEM

CONTROL ELEV : 86.5 FEET NGVD. /86.5 FEET NGVD DRY SEASON.

BASIN: I-DRIVE NORTH BASIN:

2-4' WIDE SHARP CRESTED WEIRS WITH CREST AT ELEV. 90.5' NGVD.
1-.25' DIA. CIRCULAR ORIFICE WITH INVERT AT ELEV. 89.37' NGVD.
3-2' DIA. RCP CULVERTS EACH 74' LONG.

RECEIVING BODY : EXISTING ROAD SYSTEM

CONTROL ELEV : 89.37 FEET NGVD. /89.37 FEET NGVD DRY SEASON. = 88.47 NAVD

3. LAKE SIDE SLOPES SHALL BE NO STEEPER THAN 5:1 (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.

4. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

5. ALL SPECIAL CONDITIONS PREVIOUSLY STIPULATED BY PERMIT NUMBER 48-00055-S REMAIN IN EFFECT UNLESS OTHERWISE REVISED AND SHALL APPLY TO THIS MODIFICATION.

6. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF FUTURE PHASES, PAVING, GRADING, AND DRAINAGE PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR PERMIT MODIFICATIONS.

7. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF ORANGE COUNTY.

8. SILT SCREENS, HAY BALES OR OTHER SUCH SEDIMENT CONTROL MEASURES SHALL BE UTILIZED DURING CONSTRUCTION. THE SELECTED SEDIMENT CONTROL MEASURES SHALL BE INSTALLED LANDWARD OF THE UPLAND BUFFER ZONES AROUND ALL PROTECTED WETLANDS. ALL AREAS SHALL BE STABILIZED AND VEGETATED IMMEDIATELY AFTER CONSTRUCTION TO PREVENT EROSION INTO THE WETLANDS AND UPLAND BUFFER ZONES.

9. THE SFWMD RESERVES THE RIGHT TO REQUIRE REMEDIAL MEASURES TO BE TAKEN BY THE PERMITTEE IF WETLAND AND/OR UPLAND MONITORING OR OTHER INFORMATION DEMONSTRATES THAT ADVERSE IMPACTS TO PROTECTED, CONSERVED, INCORPORATED OR MITIGATED WETLANDS OR UPLANDS HAVE OCCURRED DUE TO PROJECT RELATED ACTIVITIES.

PROJECT: INTERNATIONAL DRIVE & BACK OF HOUSE ROAD

PERMIT SUMMARY SHEET

APPLICATION NUMBER: 990909-15

PERMIT MODIFICATION NO.: 48-00055-S

LOCATION: ORANGE COUNTY, S1,12/T24S/R28E

OWNER: ORANGE COUNTY BOARD OF COUNTY COMMISSIONERS
OWNER: FDOT TURNPIKE DISTRICT

ENGINEER: DE LEUW CATHER & COMPANY

PROJECT AREA: 16.03 ACRES **DRAINAGE AREA:** 38.69 ACRES

PROJECT USE: HIGHWAY

FACILITIES:

1. EXISTING: International Drive is an existing four lane roadway in this vicinity that drains to the existing master drainage system for Orlando Central Park. The area for the proposed Back of House access road is currently undeveloped uplands and wetlands adjacent to the Beeline Expressway.

2. PROPOSED: Construction proposed consists of adding two additional lanes to a 0.6 mile section of International Drive north and south of the Beeline Expressway. Also proposed is a two lane access road from International Drive to the service area of the Convention Center. The International Drive right-of-way is owned by Orange County. The access road to the Convention Center is located in the right-of-way for the Bee-line Expressway owned by Florida Department of Transportation. The water management system for both projects will be a system of inlets and culverts directing runoff to two new wet detention ponds which overflow to the existing master system and Shingle Creek. The project area contains 16.03 acres. The contributing drainage area, including portions of the Beeline Expressway, off-ramps and infield area, contains 22.66 acres.

PROJECT LEVEL:

DRAINAGE BASIN: SHINGLE CREEK

RECEIVING BODY: SHINGLE CREEK VIA EXISTING ROAD SYSTEM

LOCAL ROAD CRITERIA: 10YR-1DAY STORM

Exhibit 2-A

APPLICATION NUMBER: 990909-15

BASIN DESIGN FREQUENCY: 25YR-1DAY STORM

WATER QUALITY:

Water quality treatment in excess of 2.5 inches times the new pavement area is provided in two wet detention ponds. The ponds treat some portions of the existing roadway to make up for new pavement in transition areas that can not be directed to the ponds.

Basin	Method	Vol Req'd. (ac-ft)	Vol Prov'd (ac-ft)
I-DRIVE SOUTH BASIN	1.32 acres WET DETENTION	.70	2.40
I-DRIVE NORTH BASIN	1.02 acres WET DETENTION	.66	1.26

DISCHARGE RATE:
As shown in the table below, the proposed project discharge is within the allowable limit for the area. Discharge rates are based on existing conditions. Those portions of the Bee-line off ramps and infield area pre-date District permitting criteria and do not have any water management system. The existing master system for Orlando Central Park will provide additional attenuation prior to discharging to Shingle Creek.

Basin	Allow Disch (cfs)	Method of Determination	Design Disch (cfs)	Design Stage (ft. NGVD)
I-DRIVE SOUTH BASIN	5.5	PRE VS. POST	3.6	88.3
I-DRIVE NORTH BASIN	30	PRE VS. POST	27	91.59

ENVIRONMENTAL ASSESSMENT:

PROJECT SITE DESCRIPTION:

The site consists of existing roadways, ditches, pine flatwoods, and a small, highly degraded non-forested wetland. The project site is a portion of the International Drive and Convention Center area.

Exhibit 2-B

I. EXECUTIVE SUMMARY

As part of its Transportation Master Plan (1995) the Orange County Convention Center recommended the design and construction of the Back of House Road to provide an entrance and exit for delivery trucks and shuttle buses.

Back-of-House Road is an east west roadway connecting International Drive to the Convention Center's south access road in south Orange County.

The project is located entirely within northern Florida Department of Transportation (FDOT) limited access Right-of-Way for the Beeline Expressway per a permit agreement between Orange County and the FDOT dated February 24, 1998. This permit is of limited duration and expires on August 31, 2002 or upon completion of the International Drive/Kirkman Road Interchange with Beeline Expressway Modifications, whichever event occurs earlier.

In minimizing impacts to existing FDOT right-of-way, the Back of House Road will be constructed using an urban typical section with a closed drainage system. The drainage will be collected using curb inlets and conveyed east into a wet detention pond located within the FDOT Beeline infield. The stormsewer collection system will be designed to convey the fifty year design event, because the Beeline ditch has no outlet other than the storm drain system.

The pre-developed stormwater runoff is collected via a ditch located along the Beeline Expressway's northern r/w. It is then conveyed east under International Drive via crossdrain into a roadside ditch (along the south side of Ramp B) that outfalls into the Newover Canal.

The SFWMD has waived the Water Quantity (stormwater discharge rate) requirements for the International Drive Area north of the Beeline due to the fact that the rate is controlled

within the Newover Canal.

Meetings with the SFWMD have set the project Water Quality requirements at 2.5 inches over the new impervious area. However, additional treatment volume has been provided within the pond to treat the existing Beeline Expressway westbound travel lanes.

Barrier wall with glare foils will be installed between the roadway and the Beeline. This will serve as a physical as well as a visual restraint.

A sheet pile wall is needed adjacent to the Beeline overpass slope to provide the necessary right-in, right-out movement onto International Drive. All stormwater runoff blocked by the barrier and sheet pile walls will be collected and conveyed into the BOHR main system via ditch bottom inlets.

Existing inlets along the Beeline Expressway have been modified to connect to the BOHR mainline stormsewer system. Base flow calculations for the existing inlets have been derived and included within the mainline analysis.

Based on the FEMA Flood Insurance Rate Maps for Orange County, the project does not encroach upon the floodplain.

Two drainage related problems exist within the project corridor. The first deals with existing flooding within a flat ditch located along the Beeline expressway.

The second drainage related problem is associated with the adjacent property owners to the north. They are concerned that stormwater runoff from the Beeline is making its way into their 'L' shaped pond, reducing the ponds' design capacity.

Solutions to these problems have been addressed by designing the closed stormsewer system to collect the runoff generated from the Beeline and conveying it to the Bohrpond, located

within the interchange infield. The stormsewer is designed so that it can be renovated from a roadway "curb inlet" collection system into a "ditch" collection system.

Two Wetland areas are located within the project corridor. A poor quality, man-made drainage ditch occurring in the east section of project corridor has been delineated as Wetland 1. Wetland 2 is a poor quality, isolated forested mixed community and ditch located in the west side of the project corridor.

The Back of House Road pond and structures S-115, S-116, and S-214, will be constructed under the Orange County Convention Centers International Drive widening project No. Y6-825-MK.

A Summary of the pond data, water quantity, and water quality are provided in the following **Water Management Engineering Worksheet.**

III. EXISTING CONDITIONS

Roadway

Currently there is no existing roadway in the project corridor. The constructed roadway will connect to the reconstructed six-lane divided International Drive roadway.

Right-of-Way

The proposed project will be located entirely within Florida's Turnpike limited access right-of-way for the Beeline Expressway. The useable available existing right-of-way consists of the area located between the Beeline clear zone (10.9 meters from the edge of travel lane) and the limited access right-of-way line. This width varies along the project corridor from 16.8 meters, near international Drive, to 19.0 meters adjacent to the Convention Center.

Drainage

Portions of the Beeline expressway (station 21+40 to station 26+80) drains to a roadside ditch adjacent to the Beeline Expressway (see plans). Two shoulder gutter inlets are located along the Beeline overpass that outfall, via rcp and a U-type endwall, into the roadside ditch. Two ditch bottom inlets, located west of the overpass, capture and route stormwater runoff into the roadside ditch. The ditch flows east into the International Drive right-of-way, where it is conveyed via cross drains and roadside ditches into the Newover Canal.

Stormwater runoff from the western portion of the project corridor, from station 20+00 to station 21+40, flows to the west into an existing ditch/wetland area. This area is associated with a poor quality, isolated wetland (see Environmental Characteristics below). This wetland area has no outfall and therefore, has a history of flooding, both into the Beeline roadway and, under extreme rainfall events, onto the Orange County Convention Center property.

IV. Phase II DESIGN

Typical Section

The proposed typical section consists of two 3.6 meter lanes with 1.2 meter shoulders (this will allow extra room is case a truck breaks down). The cross slope will be 2% across the full width of the pavement in order to drain the entire roadway into one stormwater system, reducing the overall cost of the required closed drainage system.

Drainage Design

The typical roadway section will utilize urban drainage (curb inlets) throughout the project. The curb inlets collect the runoff generated from the Back of House Road. Stormwater generated from portions of the Beeline Expressway will be collected via ditch bottom inlets and conveyed into the BOHR main stormsewer system. The stormwater runoff will be conveyed east via pipe flow into a stormwater management facility located within the Beeline interchange ramp infield.

Two drainage related problems exist within the project corridor. The first deals with existing flooding within a flat ditch (wetland 2) located along the Beeline expressway, adjacent to the OCCC Parking Garage. This area has no outfall for the stormwater runoff, which causes the runoff to stage to levels that influence the Beeline roadway subbase and also the Orange County Convention Center property. This will be addressed by collecting the overflow from the ditch and conveying it through the Back of House Road stormsewer system into the stormwater management facility.

The second drainage related problem is associated with the adjacent property owners to the north. They are concerned that stormwater runoff from the Beeline is making its way into their 'L' shaped pond, reducing the ponds' design capacity. This dilemma will be addressed by collecting all the northern lanes and side slopes of the Beeline within the project corridor into the

Back of House Road closed conveyance system, and routing it to the stormwater management facility.

The stormwater management facility will consist of a wet detention system. The advantage of a Wet detention systems are that they are designed to slowly release collected stormwater runoff through an outlet structure. Wet detention systems are extremely effective in locations with moderate to high water table conditions, which is what we encountered. They also offer an effective alternative for the long term control of water levels in the pond, provide a predictable recovery of storage volumes within the pond. The wet detention system will outfall into the existing swale adjacent to the Beeline ramp, which connects to the a roadside ditch that outfalls into the Newover Canal.

Once the need for the Back of House Road has ended and the roadway removed, the stormwater management system may easily be modified from curb inlet tops to ditch bottom inlet tops. This will maintain the Beeline flooding solution and the 'L' shaped pond issue. Treatment volumes for the existing Beeline expressway will also be maintained within the pond.

DE LEUW, CATHER
ENGINEERS AND PLANNERS

SUBJECT: Back of House Road — **JOB #** 642446
Post-Developed Basin Calc.
MADE BY: MBS — **DATE:** 09/07/99
CHECKED BY: — **DATE:** 09/07/99

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Drainage Area (A)

The Back of House Basin consists of all the area within Florida's Turnpike northern R/W from the Beeline / International Drive Bridge to the Beeline I-4 Interchange, the pond area, and a small portion of International Drive that historically drained into the Beeline Expressway infield area.

TOTAL AREA (A) =	13.096 ha.	32.36 ac.	
NDCIA =	2.514 ha.	6.21 ac.	(existing rdwy & shwt area @ pond)
DCIA =	1.276 ha.	3.15 ac.	(bohr new imperv. & Beeline existing)
% DCIA =	((DCIA/A)*100%) =	9.7 %	
PERVIOUS =	9.306 ha.	23.00 ac.	

CURVE NUMBER (CN)

Soil Type - B	Open space - grass, fair condition	CN =	61	3.70 ac.
Soil Type - C	Open space - grass, fair condition	CN =	74	3.58 ac.
Soil Type - D	Open space - grass, fair condition	CN =	80	6.21 ac.
Soil Type - A	Woods, good condition	CN =	30	5.05 ac.
Soil Type - B	Woods, good condition	CN =	55	2.71 ac.
Soil Type - C	Woods, good condition	CN =	70	0.92 ac.
Soil Type - D	Woods, good condition	CN =	77	0.90 ac.
Impervious Area -	Existing Roadway & SHWT @ Pond	CN =	98	9.29 ac.
				32.36

CN = 72.1

TIME OF CONCENTRATION (Tc)

See Storm Sewer Hydraulics Tabulation Sheet

T(c) = 101.7 minutes

DE LEUW, CATHER
ENGINEERS AND PLANNERS

SUBJECT:	Back of House Road Water Quality Volume Calculations	**JOB #**	642446
MADE BY:	MBS	**DATE:**	09/07/99
CHECKED BY:		**DATE:**	09/07/99

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SEASONAL HIGH WATER ELEVATION (SHW)

SHW Bohr Pond = 27.24 m 89.4 ft

SHW elevations were established by existing ponds & Geotechnical Engineer.

South POND STAGE / STORAGE RELATIONSHIP => NODE Bohrpond

Stage		Area		Storage	Accum.Storage
(m., NGVD)	(ft., NGVD)	(ha.)	ac.	(ac.-ft.)	(ac.-ft.)
27.24	89.37	0.411	1.02	0.00	0.00
27.93	91.63	0.487	1.20	2.51	2.51
28.50	93.50	0.621	1.53	2.56	5.07

WATER QUALITY VOLUME (WQV)

The Pond is located in an open basin in Orange County and outfalls into a roadside ditch that conveys to the Newover Canal. Use SFWMD criteria (see correspondance) of treating the runoff generated from two and one-half (2.50) inches over the new impervious area.

Note: pond also treats existing Beeline roadway not treated in the pre-developed condition.

a) WQV = R(in.) *New Imp. Area* (1 ft/12 in) =

New Impervious = 3.15 ac.
R = 2.5 in. 0.66 ac.-ft. or 810.26 m3
Controls *Controls*

WATER QUALITY ELEVATION => Pond

Over flow weir to be set at a minimum elev. of 89.70 ft. (NGVD) or 27.341 m (NGVD)
to achieve Water Quality requirements.

See pond routings for actual overflow weir elevation, elevation may vary from above.

TAILWATER ELEVATIONS

Tailwater elevations of the receiving roadside ditch has been calculated using the flow (Q) generated by the routings (10yr, 25yr, 50 yr, 100yr) and using manning equation to find the corresponding normal depth of flow. Please see ditch calculations for Ramp B south.

CONTRACT. NO.	SHEET NO.
70-708	7

EXHIBIT 5

ORANGE COUNTY CONVENTION CENTER

END PROJECT STA 21+63.630

EXISTING WET POND

0.410 HA

0-11

0.496 HA

LANAIKAI COURT

S-123

0-10

0.122 HA

McDONALDS

0.787 HA

S-103 21+82.752

PC Sta 21+42.795

0.123 HA

S-122

0.151 HA

GOD EVANS REST.

OCCC PARKING

RAMP 'B' NORTH DITCH

0-9

0.176 HA

HAWAIIAN COURT

PT Sta 20+87.516

IHOP

S-121

0.163 HA

NORIKEL BASIN

0.545 HA

RAMP 'B'

0.691 HA

DAYS INN

S-120

0-12

0.090 HA

S-118

RAMP 'B' SOUTH DITCH

PC Sta 18+54.815

S-117

0.164 HA

EXISTING WET POND

OCS-2

0.131 HA

S-115

S-116

S-213

0.157 HA

NORIVE BASIN

BOHRPOND 0.347 HA (0.86 AC)

S1/T24S/R28E

S6/T24S/R29E

S12/T24S/R28E

S7/T24S/R29E

BEE LINE EXPRESSWAY

℄ BACK OF HOUSE ROAD

BEE LINE EXPRESSWAY 2.950 HA

2.097 HA

TO INTERSTATE 4

PCT Sta 43+00.008

PC Sta 43+85.304

PT Sta 43+96.332

S-113

S-114

0.295 HA

0.314 HA

0-8

S-111

S-112

0-5

STEAK & ALE

0.198 HA

0.736 HA

M-7

S-110

0.052 HA

0-4

RAMP 'A' NORTH DITCH

SHOPPING CENTER

BENNIGANS

0.103 HA

0.080 HA

0-6

WESTWOOD BLVD.

0.030 HA

RAMP 'A'

0.225 HA

0.799 HA

0.720 HA

0.161 HA

0.790 HA

OCS-1

0.095 HA

S-108

0-3

S-105

RAMP 'A' SOUTH DITCH

S-109

SHERATON WORLD

0.188 HA

0.154 HA

S-107

ORANGE COUNTY PROPERTY

SPOND 0.780 HA (1.93 Ag)

S-106

AT Sta 14+11.221

0.168 HA

0.157 HA

0.258 HA

S-104

ORANGE COUNTY DRIVEWAY

S-103

PC Sta 12+95.081

0.335 HA

INTERNATIONAL DRIVE

C4 CANAL

C4/C5 BASIN

C5 CANAL

S-102

0-2

0.157 HA

S-101

0-1

0.095 HA

BEGIN PROJECT STA. 11+77.310

LEGEND

(S-101) PROPOSED DRAINAGE STRUCTURES

(0-1) REPLACED EXISTING STRUCTURES OR CLOSED FLUME INLETS

① EXISTING DRAINAGE STRUCTURES

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

DeLEUW, CATHER & COMPANY

ENGINEERS LOS ANGELES

INTERNATIONAL DRIVE

DRAINAGE MAP

Permit App. No. 120703-15

I-4 / Kirkman Road Interchange

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The site is the I-4 (Interstate 4) corridor from west of South Kirkman Road to O.B.T. (Orange Blossom Trail, U.S. 441), for approximately 5.25 miles, in Orange County.

This project will tie into or impact numerous permitted surface water management facilities within the project area. The site contains a 6-lane highway with an inverted median, conveyance swales and roadside wetlands all within the roadway right-of-way.

This project proposes impacts to several acres of roadside wetlands and other surface waters within the roadway corridor. Wetlands within the project corridor are of low quality and will result in 31.90 acres of direct impacts to wetlands which will be mitigated through the purchase of 13.04 UMAM credits from the Reedy Creek Mitigation Bank.

PROPOSED PROJECT:

Construction proposed consists of the surface water management system serving the improvements to the Widening of I-4 from South Kirkman Road to South OBT.

The proposed improvements will consist of the widening of approximately 5.25 miles of Interstate 4 from a 6-lane to an 8-lane typical section configuration. This application was deemed a modification to Permit No. 48-01320-P - I-4 / John Young Parkway Interchange since this interchange is included in this project area and is being revised as part of this application.

The water management system will consist of roadside conveyance ditches to collect and convey project runoff to a wet detention pond for Basins E, F, H, J, K/L, and M or one dry detention pond for Basin I for the required water quality treatment and attenuation prior to discharge from the site and into Shingle Creek tributaries (for Basins E, F, H, I, J, and K/L) or Lake Catherine (Basin M). The project limits lie within the Shingle Creek Drainage Basin.

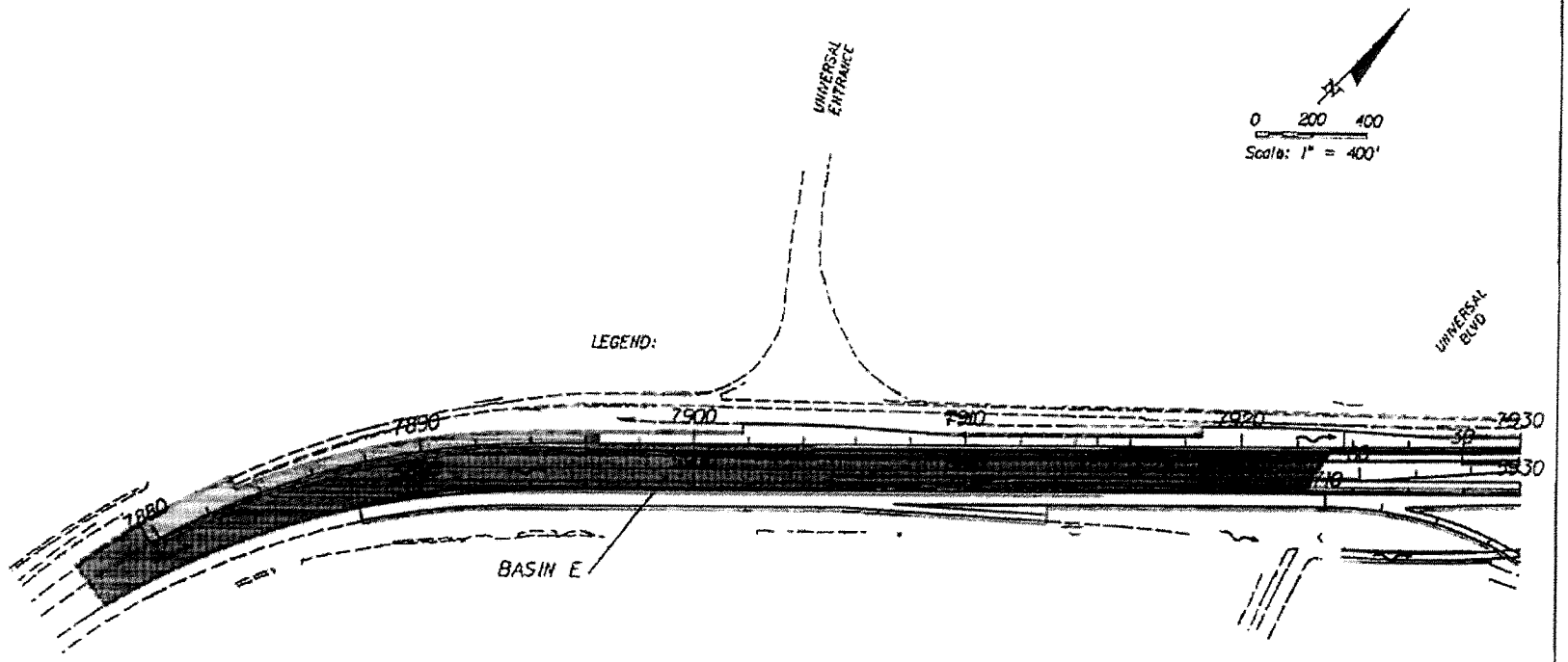
Basin E begins at Station 879+60, ends at 922+05 and discharges northeast to the I-4 roadside swales through the I-4/Universal Boulevard Interchange and on to Basin F ponds.

Basin F starts at Station 924+00, ends at 989+80 and discharges into the Ponds F-32, F-33, F-34 and F-35 within the I-4/Kirkman Road interchange. These ponds are proposed to be interconnected, wet detention ponds and will discharge via control structures in Ponds F-33 and F-34 into Shingle Creek tributaries.

Basin H begins at Station 989+80, ends at 1028+00 and discharges to the Basin H (Ponds H-3, H-4, H-5 and H-6A) within the I-4/Florida's Turnpike interchange. Pond H-6 will be an expansion of the existing storm water pond for the United Trucker's Association Parking Lot (which pre-dates permitting) and Pond H-7 will be a new pond to accommodate remaining and required water quality treatment and attenuation. All the ponds (wet detention) will be interconnected and will ultimately discharge into a Shingle Creek tributary via the control structure in Pond H-3.

Basin I extends from Station 1028+00 to Station 1048+50 and discharges to a dry detention pond (Pond I) prior to discharge directly into Shingle Creek. The I-4/Conroy Road Interchange Dry Ponds A and B4 will be impacted by the widening. Pond A will be reshaped and re-named Pond I and Pond B4 will be eliminated per the revised design.

Basin J starts at Station 1048+50 and ends at 1098+20 and discharges to the existing I-4/Conroy Road Interchange Ponds B2 and B3 prior to discharge directly into Shingle Creek. Per Permit No. 48-00652-S, the existing ponds contain adequate surplus storage to provide the required water quality treatment



LEGEND:

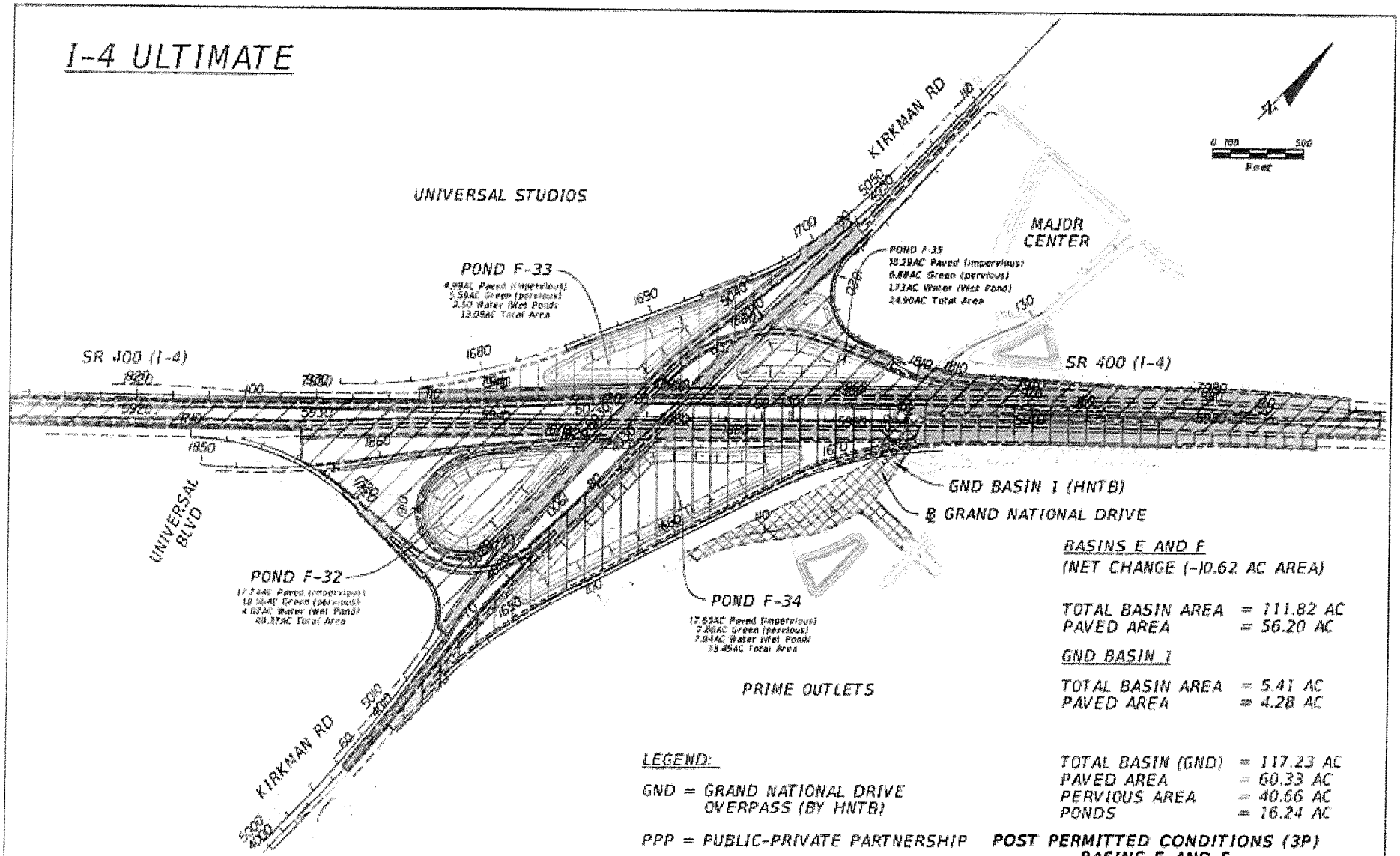
STORMWATER TREATED IN POND F

STORMWATER TREATED IN UNIVERSAL'S POND BY OTHERS

BASIN E
TOTAL BASIN AREA = 14.97 AC
PAVED AREA = 5.05 AC

I-4 (SR 400) DRAINAGE REPORT	POST-DEVELOPMENT BASIN E	FIGURE E

I-4 ULTIMATE



BASINS E AND F
(NET CHANGE (-)0.62 AC AREA)

TOTAL BASIN AREA	= 111.82 AC
PAVED AREA	= 56.20 AC

GND BASIN 1

TOTAL BASIN AREA	= 5.41 AC
PAVED AREA	= 4.28 AC

TOTAL BASIN (GND)	= 117.23 AC
PAVED AREA	= 60.33 AC
PERVIOUS AREA	= 40.66 AC
PONDS	= 16.24 AC

LEGEND:

GND = GRAND NATIONAL DRIVE OVERPASS (BY HNTB)

PPP = PUBLIC-PRIVATE PARTNERSHIP

POST PERMITTED CONDITIONS (3P)
BASINS E AND F

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Kimley-Horn and Associates, Inc.
Certificate of Authorization No. 696
James M. Sundquist, P.E.
P.E. License No. 35558
4350 South Congress Avenue, Suite 120
Delray Beach, Florida 33445

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	ORANGE	242484-3-52-01

I-4 (SR 400)
DRAINAGE REPORT

SHEET NO. 5

Table II (3P)
STORMWATER SUMMARY TABLE

	BASIN #	BASIN E/F				BASIN H						BASIN I	BASIN J		BASIN K/L	BASIN M
	POND ID	F-32	F-33	F-34	F-35	H-3	H-4	H-5	H-6	H-6A	H-7	I	B2	B3	Net reduction	Unchanged
POND DATA	POND BOTTOM EL (ft)	86.00				87.00	87.00	87.00	87.00	90.00	87.00	91.00	81.12	81.12	Permitted Under I-4/John Young Parkway Project	82.00
	NWL/CONTROL EL (ft)	95.10				94.56						91.00	87.12	87.12		89.52
	WEIR CREST EL (ft)	96.00				95.27						93.70	n/a	88.22		91.86
	10 YR / 24 Hr DHW EL (ft)	97.68	97.70	97.62	97.72	95.79	95.83	95.84	95.86	95.85	95.80	93.97	89.86	89.65		92.67
	3P Mods 10Y-24H DHW (ft)	97.68	97.70	97.62	97.71	95.81	95.86	95.87	95.89	95.88	95.83	94.19				
	25 YR / 24 Hr DHW EL (ft)	98.07	98.13	97.94	98.18	95.93	95.98	95.99	96.02	96.01	95.94	94.38	90.37	90.1		92.92
	3P Mods 25Y-24H DHW (ft)	98.07	98.13	97.94	98.18	95.97	96.02	96.04	96.07	96.05	95.99	94.71	91.29	90.91		93.52
	TOP OF BANK EL (ft)	102.00				99.00						97.50	92.00	91.00		98.00
	INSIDE BERM EL (ft)	101.00				98.00						96.00	94.00	90.00		97.00
	MIN EOP EL (+/-ft)	116.0	103.7	104.0	104.0	100.6	103.0	101.8	98.5	102.0	121.0	97.7	97.5	97.0	Elevated/Wall	Elevated/Wall
	STATION	943+0	946+0	955+0	960+0	98+0	1002+0	1010+0	296+0	998+0	91+0	1042+0	Ex 310+0	Ex 224+0	N/A	N/A
QUANTITY	PRE-POST 25-Year/24-Hr DISCHARGE RATES															
		EXISTING (cfs)	254.6			81.80						20.91	55.84		Permitted Under I-4/John Young Parkway Project	29.18
		PROPOSED (cfs)	66.9			74.45						22.83	29.32			25.08
		3P Prop (cfs)	66.90			75.43						24.64				
		Shingle Creek Outfall Basins H&I										Pre 102.71 Post 100.07				
QUALITY	METHOD OF TREATEMENT	Wet Detention.				Wet Deten.						Dry Deten.	Wet Deten		Permitted Under I-4/John Young Parkway Project permitted basin 65.93 ac. Post permitted basin (3P) 64.52 ac	Wet Deten.
	HISTORICAL DRAINAGE AREA (ac)	111.82				52.74						14.29	76.08			47.20
	PROP DRAINAGE AREA (ac)	117.23				52.74						16.42	76.13			47.20
	TREATMENT VOLUME (ac-ft)	12.73				5.45						1.84	10.04			6.70
	3P REQUIRED TREATMENT VOLUME (ac-ft)	12.57				5.89						2.00	9.90			
	PROV PERMITTED TREATMENT VOLUME (ac-ft)	14.97				6.55						2.34	10.78			6.70
	BLEEDER DEVICE TYPE	PVC- TEES				Rectangular Slot with V-Notch in Short Wall						Circ. Orifice	V-Notch			Circ. Orifice
	BLEEDER DIAMETER/ANGLE/LENGTH	Pond F-34: four 6" PVC				Pond H-3 :2-70-DEG						3-inch	Pond B3: 2-40-DEG			5-inch

4/3/2013