

Pond Siting Report

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

from South of SR 408 to SR 50 (MP 263 to 273)

Orange County, Florida

Financial Project ID (FPID) No. 444007-1-22-01

ETDM No.: 14378



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DRAFT

January 2023

Pond Siting Report

Turnpike (SR 91) Widening PD&E Study from S of SR 408 to SR 50 (MP 263 – 273)

Florida's Turnpike Enterprise

Financial Project ID 444007-1-22-01

POND SITING REPORT
PD&E Study Widen TPK (SR 91) from South of SR 408 to SR 50 (MP 263 to 273)
Florida's Turnpike Enterprise
Financial Project ID 444007-1-22-01
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This Pond Siting Report is based solely upon the information made available to or gathered by RS&H. RS&H does not assume responsibility for conditions, which did not come to knowledge, or conditions not recognized as unacceptable at the time this report was prepared. RS&H has performed these drainage calculations and recommendations in a manner consistent with sound practices and that level of care and skill normally exercised by members of the profession operating under similar circumstances.

This document and the information contained within have been prepared solely for the use of Florida's Turnpike Enterprise.

This report consists of the following parts:

Sections 1 through 11
Appendices A through F

I, Jeffrey S. Glenn, hereby certify that this report, as listed above, is true and correct, represents the described work and is in accordance with the requirements of this project.



This item has been digitally signed and sealed by

on the date adjacent to the seal.

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EXECUTIVE SUMMARY

The Florida Turnpike Enterprise (FTE), part of the Florida Department of Transportation (FDOT) is evaluating alternatives to widen Florida's Turnpike (State Road (SR) 91) from south of SR 408 to SR 50, a distance of approximately 10 miles, and along SR 408 from the Florida's Turnpike interchange to east of the Old Winter Garden Road overpass. The project is located in Orange County, Florida within the municipalities of Oakland, Winter Garden, and Ocoee. The vertical datum used for this project is the North American Vertical Datum of 1988 (NAVD88). Florida's Turnpike currently has eight to twelve lanes (four travel lanes and up to two auxiliary lanes in each direction) within the study limits. The roadway is functionally classified as an Urban Principal Arterial – Freeway and Expressway and has a posted speed limit of 70 miles per hour (mph). The access management classification from south of milepost 263 to milepost 273 is Class 1 and the corridor does not have a context classification. The purpose of the project is to reduce congestion and improve mobility on Florida's Turnpike mainline to accommodate current and future traffic volumes generated by growth in Orange County and the adjacent counties.

The analysis presented in this report identified three potential stormwater management alternatives within each of the sixteen basins which were defined within the project limits. The preferred alternative for each basin and anticipated right of way needs associated with the preferred alternatives are outlined in Table 1. The evaluation matrix which contains the details of the analysis has been provided in Appendix E. It should be noted that the information contained herein is preliminary and will need to be refined once this project enters the design phase. As outlined in the report which follows, there is excess treatment and attenuation provided within the currently permitted stormwater management systems that should be accounted for when developing the stormwater management design during the design phase. There are also areas within the existing right of way which could be utilized for stormwater management systems that should also be investigated during the design phase.

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Table 1: Preferred Pond Alternatives and Anticipated Right of Way

Basin	Preferred Alternative	Anticipated Right of Way Requirements (acres)
5	3	0
6	2	3.31
7 & 8	3	0
9	2	4.04
10	1	0
11	3	0
12	1	3.95
A	1	3.35
B	1	0
C	2	2.30
D	3	0
E	Accommodated in Adjacent Project	0
SR 408	2	2.36
SR 429N	1	2.31
SR 429S	3	0.67
DSR50N	3	0

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SECTION 1.0 – INTRODUCTION

The Florida Turnpike Enterprise (FTE), part of the Florida Department of Transportation (FDOT) is evaluating alternatives to widen Florida's Turnpike (State Road (SR) 91) from south of SR 408 to SR 50, a distance of approximately 10 miles, and along SR 408 from the Florida's Turnpike interchange to east of the Old Winter Garden Road overpass. As part of the study, all existing interchanges within the project limits and the need for a new interchange will be evaluated. The purpose of the project is to reduce congestion and improve mobility on Florida's Turnpike mainline from south of SR 408 to SR 50 to accommodate current and future traffic volumes generated by growth in Orange County and adjacent counties. An additional goal of the project is to enhance safety and improve emergency evacuation times.

The need for this project is to improve current and future peak period traffic operations and enhance safety due to the weaving and merging concerns between SR 408 and SR 429, a segment which currently has a very high weaving movement with 45% of traffic from SR 408 exiting at SR 429, and 32% of Florida's Turnpike overall traffic exiting at SR 429. The close proximity (1.3 miles) of these system-to-system interchanges causes merging and weaving conflicts. The proposed improvements will improve the travel time reliability and enhance emergency response and evacuation times.

SECTION 2.0 – PROJECT DESCRIPTION

The project is located in Orange County, Florida within the municipalities of Oakland, Winter Garden, and Ocoee. The limits of the improvements are located between milepost 263 and 273. The project location map, Figure 1, shows the limits of the study area. The vertical datum used for this project is the North American Vertical Datum of 1988 (NAVD88). Some existing plans reference the National Geodetic Vertical Datum of 1929 (NGVD29). Where applicable, elevations are converted using the following vertical datum conversion formula:

$$NAVD88 + 0.89' = NGVD29$$

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Figure 1: Project Location Map



Florida's Turnpike currently has eight to twelve lanes (four travel lanes and up to two auxiliary lanes in each direction) within the study limits. The roadway is functionally classified as an Urban Principal Arterial – Freeway and Expressway and has a posted speed limit of 70 miles per hour (mph). The access management classification from south of milepost 263 to milepost 273 is Class 1 and the corridor does not have a context classification.

Early planning efforts conducted by FTE concluded that major operational, safety, and capacity improvements are needed along Florida's Turnpike to improve current and future peak period traffic operations along the mainline at the major interchanges with SR 408, SR 429, and SR 50 to reduce the potential for traffic incidents and accommodate travel at acceptable levels of service. This PD&E Study will evaluate the widening of the Florida's Turnpike while also including milling and resurfacing, bridge construction, and interchange improvements. Interchanges with

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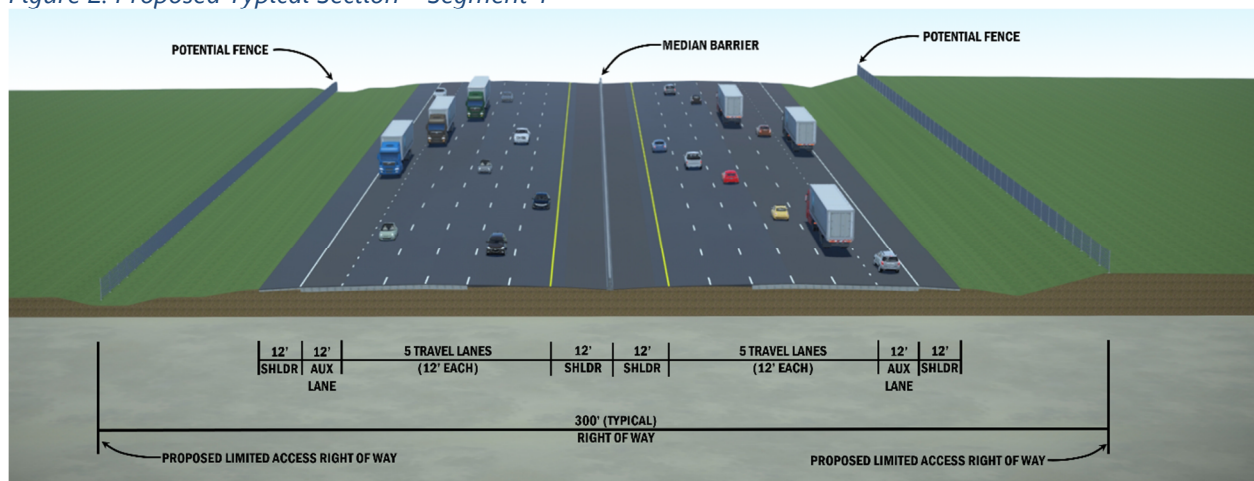
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proposed improvements or modifications on Florida's Turnpike include SR 408, SR 429, SR 50 (Ocoee / Winter Garden), SR 50 (Clermont / Oakland), and a new interchange at Avalon Road will be evaluated. The project is subdivided into three mainline segments and five interchanges:

- Mainline:
 - MP 263 to SR 408;
 - SR 408 to SR 429; and
 - SR 429 to SR 50.
- Interchanges:
 - SR 50 (Ocoee / Winter Garden) Connector;
 - SR 408;
 - SR 429; and
 - SR 50 (Clermont / Oakland).

The Build Alternatives for Florida's Turnpike mainline are subdivided into three segments. The segment of Florida's Turnpike from mile post 263 to SR 408 involves adding a total of two lanes in each direction for a total of five travel lanes and one auxiliary lane in each direction. Figure 2 shows the proposed typical section for this portion of the mainline.

Figure 2: Proposed Typical Section – Segment 1



The second segment, from SR 408 to SR 429, includes a collector-distributor (CD) system consisting of a separate roadway facility that will parallel the mainline lanes of Florida's Turnpike.

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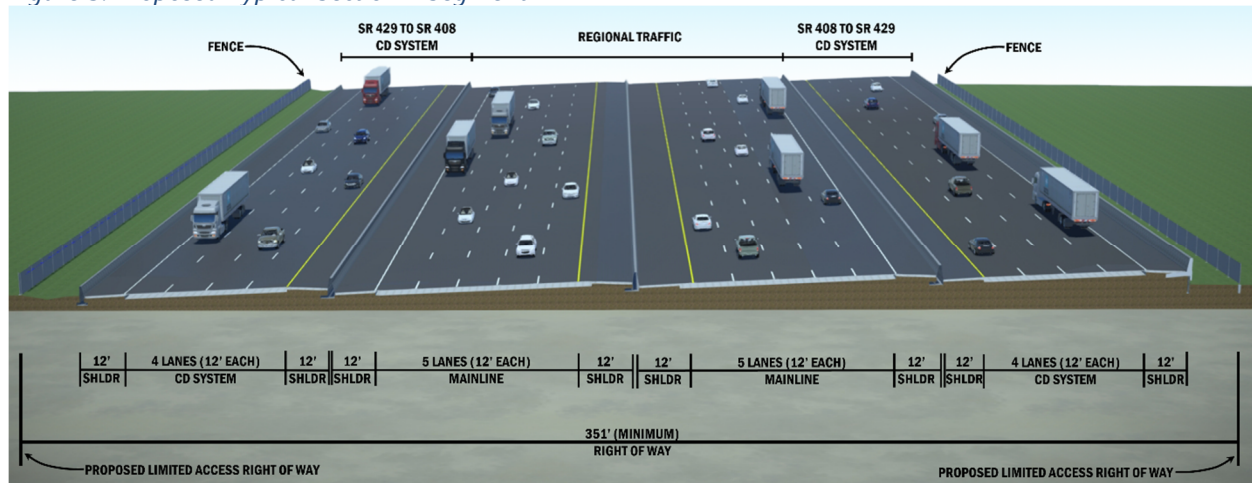
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The purpose of the separate system is to move the weaving movements associated with the interchanges from the high-speed mainline, thereby improving traffic operations and safety. Traffic traveling to either SR 408 or SR 429 will use the CD system comprised of four additional lanes in each direction. These lanes will be barrier separated from the regular mainline travel lanes. In addition, the mainline will be widened to five lanes in each direction to serve the regional traffic passing through this segment. Figure 3 shows the proposed typical section for the second segment

Figure 3: Proposed Typical Section – Segment 2



The final segment of the study, from SR 429 to SR 50, consists of adding one through lane in each direction, for a total of five travel lanes in each direction. Figure 4 shows the proposed typical section for the third segment.

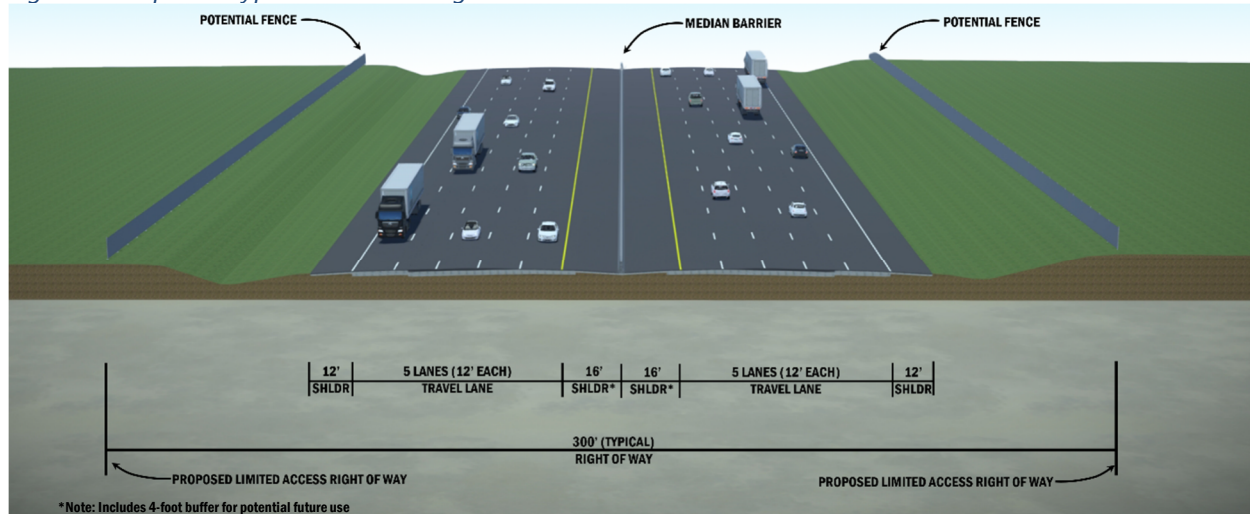
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Figure 4: Proposed Typical Section – Segment 3



Early phases of alternative development consisted of designing sketch alternatives for each of the interchanges. The sketch alternatives were examined, refined, and ultimately assessed based on functionality, safety, traffic improvements, cost, and right of way. The sketch alternatives carried forward were then transformed to the Tier 2 alternatives that were introduced at the Alternatives Public Information Meeting in August 2021.

SECTION 3.0 – DATA COLLECTION

A pre-application meeting was held with SJRWMD staff on June 30, 2021, to discuss permitting requirements for the project. Meeting minutes from this pre-application meeting have been provided in Appendix F. Since the easternmost limits of project improvements are located within the jurisdiction of SFWMD, project information was also forwarded to SFWMD on September 28, 2021. Email correspondence with SFWMD has also been included in Appendix F. In order to locate and size the stormwater management facilities the following sources were utilized:

- LIDAR Data-(SJRWMD 2010)
- Aerial Imagery-FDOT APLUS (Orange County, 2019; Lake County 2020)
- USDA NRCS Web Soil Survey (2021)
- FEMA Flood Insurance Rate Maps (12095C0215F, 12095C0200F, 12095C0220F, 12095C0240F)
- Parks-Florida Geographic Data Library 2019
- Conservation Easements and Wetlands- SJRWMD 2014 (Updated 2019), SFWMD 2016 (Updated 2020)

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SECTION 4.0 – DESIGN CRITERIA

4.1 Rules & Regulations / Regulatory Agency Coordination

Project improvements will be designed to meet the regulatory requirements of the applicable water management districts, the requirements outlined in the FDOT Drainage Manual, and the requirements of FTE. The majority of the project is located within the jurisdiction of the SJRWMD with the area east of Lake Olivia located within the Jurisdiction of the SFWMD. It is likely that SJRWMD will be the lead agency and an Environmental Resource Permit will be secured through SJRWMD since the majority of the project falls within their jurisdiction. An inter-agency agreement will be required between the two water management districts and project improvements will need to follow the more stringent of the SFWMD and SJRWMD criteria. It is anticipated that a Section 404 Dredge and Fill Permit will be required. A NPDES permit will also be required from FDEP. Since gopher tortoise burrows were identified during a desktop review of GIS data, it is anticipated that a gopher tortoise relocation permit will be required. As previously noted in Section 3.0, a pre-application meeting was held with SJRWMD on June 30, 2021. Minutes from this meeting have been included in Appendix F.

4.1.1 Water Quality Criteria

South Florida Water Management District (SFWMD)

- **Wet detention:** volume shall be provided for 2.5 inches times the increase in impervious area.
- **Dry Retention:** retention volume shall be provided equal to 50 percent of the above amounts computed for wet detention. Retention volume included in flood protection calculations requires a guarantee of long-term operation and maintenance of system bleed-down ability.
- **Dry Detention:** volume shall be provided equal to 75 percent of the above amounts computed for wet detention.

St. Johns River Water Management District (SJRWMD)

- **Wet detention:** Detention volume shall be provided for the first inch of total runoff from the developed project, or 2.5 inches of the runoff from impervious area, whichever is greater.
- **Dry Retention:** Retention volume shall be provided for both:
 - a. The first half-inch of total runoff from the developed project, or 1.25 inches of the runoff from impervious area, whichever is greater. (Offline Treatment)
 - b. An additional half-inch of total runoff from the developed project. (Online Treatment)

- **Dry Detention:** Detention volume shall be provided offline for the first inch of total runoff from the developed project, or 2.5 inches of the runoff from impervious area, whichever is greater.

The retention system must provide the capacity for the appropriate treatment volume within 72 hours following a storm event assuming average antecedent moisture conditions. A factor of safety of 2 must be applied by either dividing the permeability rates or recovery time in half (36 hours).

4.1.2 Water Quantity Criteria

SFWMD

For open basins, the post-development peak discharge rate must not exceed the pre-development peak discharge rate during the 25-year, 72-hour storm. For closed basins, the post-development peak discharge volume must not exceed the pre-development peak discharge rate and volume during the 100-year, 72-hour storm.

SJRWMD

For open basins, the post-development peak discharge rate must not exceed the pre-development peak discharge rate during the 25-year, 24-hour storm. Additionally, if the percent impervious is greater than 50%, the post-development peak discharge rate must not exceed the pre-development peak discharge rate during the Mean Annual, 24-hour storm. For closed basins, the post-development peak discharge volume must not exceed the pre-development peak discharge rate and volume during the 25-year, 96-hour storm.

FDOT

Per FDOT requirements, the above noted SFWMD and SJRWMD requirements are to be followed in open basins. FDOT does, however, require that the constraints found in Chapter 14-86 of the Florida Administrative Code be utilized for design purposes in basins that are closed and where there are flooding concerns. For the purposes of this report, the volumetric difference associated with the 100-year 10 day storm has been utilized for pond sizing in closed basins and basins with a history of flooding concerns.

4.2 Project-Specific Criteria

This project does not discharge to Outstanding Florida Waters. The project does, however, traverse multiple basins where a basin management action plan has been established and other locations where special basin criteria have been established. A summary of these special requirements is noted in the sections that follow.

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4.2.1 TMDL Requirements

FDEP maintains the Statewide Comprehensive List of Impaired Waters, which contains waterbody-parameter combinations that have been verified as impaired based on criteria and assessment methodologies. Although WBID's 2872C, 2873 and 2873C are not currently on the Statewide Verified List of Impaired Waters they are on the Statewide Comprehensive Study List (2872C and 2873 for dissolved oxygen and 2873C for Biology). WBID 2835D is also on the Study List for Biology. Figure 5 details the basin divides for each WBID, and Table 1 outlines the impairments associated with these WBID's. It should be noted that there are nutrient removal requirements associated with the basin management action plans for WBID's which may not be listed as impaired for nutrients in the Statewide Verified List.

Table 2: Statewide Water Quality Assessments

Waterbody Name	WBID	Class	Status
Ocoee Drain	3002M	III	Not impaired
Lake Olivia	3002K	III	Not impaired
Beulah Slough	2872	III	Not impaired
Lake Pearl	2872B	III	Not impaired
Lake Lilly	2872C	III	Not impaired
Johns Lake	2873C	III	Not impaired
Johns Lake Outlet	2873	III	Not impaired
Lake Apopka	2835D	III	Impaired (Pesticides in Fish Tissue)
Lake Apopka Outlet	2835B	III	Not impaired
Shingle Creek Headwaters	3169G1	IIIF	Not impaired
Leftover Reedy Creek	31702	IIIF	Not impaired

4.2.2 Basin Management Action Plans (BMAPs)

This project traverses the following BMAPs: Lake Okeechobee, Middle St. Johns River, and the Upper Ocklawaha River. Phosphorus is a nutrient of concern for all three of these BMAPs while nitrogen is also a nutrient of concern for the Middle St John River. The Lake Okeechobee BMAP encompasses the limits of Basin 5 whereas the Middle St Johns River and Upper Ocklawaha River BMAP extend from the eastern limits of Basin 7 to the western end of the project. There is an area located directly east of the SR 429 interchange (sub-basin 11A and 11B) that is not part of the Upper Ocklawaha River BMAP. The limits of the BMAPs have been outlined on Figure 4

provided in Appendix A. A summary of the BMAP's and parameters associated with each BMAP has been provided in Table 2.

Table 3: Basin Management Action Plans

Basin Management Action Plan	Date	Parameters
Lake Okeechobee	January 2020	TP
Middle St. Johns River	August 2012	NO3/TP/DO
Upper Ocklawaha River Basin	August 2007	TP

4.2.3 Special Basin Criteria

Lake Apopka Hydrologic Basin

Surface water management system located within the Lake Apopka Hydrologic Basin shall demonstrate one of the following:

1. That the system provides stormwater treatment equivalent to or greater than any of the applicable stormwater treatment options contained in **Table 4: Lake Apopka Hydrologic Basin Stormwater Treatment Requirements** for the removal of total phosphorus
2. The post-development total phosphorus load discharged from the project area will not exceed the pre-development total phosphorus load discharged from the project area
3. The system will not discharge water to Lake Apopka or its tributaries for the 100-year, 24-hour storm event.

Table 4: Lake Apopka Hydrologic Basin Stormwater Treatment Requirements

Land Use Category	Hydrologic Soil Group	Req'd Dry Retention Volume	Req'd Wet Detention Volume (14-day Min. Residence Time)
Highway (Max. 50% Impervious)	A	4.00"	2.00"
	B	3.00"	1.50"
	C	2.50"	1.25"
	D	2.25"	1.00"
Highway (Max. 75% Impervious)	A	4.00"	2.75"
	B	3.75"	2.25"
	C	2.75"	1.75"
	D	2.25"	1.25"

Ocklawaha River Hydrologic Basin

Systems in the Ocklawaha River Hydrologic Basin must meet the following criteria:

1. The system shall meet applicable discharge criteria for 10-year and 25-year frequency storms. On-site storage and outlet capacity should be designed for the 25-year storm. Outlet capacity design should be checked and further refined, if necessary, for the 10-year storm.
2. For systems utilizing pumped discharges, the post-development discharge volume during the four-day period beginning the third day of the four-day duration storm may not exceed the pre-development discharge during the same period.

Wekiva Recharge Protection Basin

Surface water management systems located within the Wekiva Recharge Protection Basin shall demonstrate that the system provides for retention storage of three inches of runoff from all impervious areas proposed to be constructed on soils defined as a Type "A" Soils as defined by the Natural Resources Conservation Service (NRCS) Soil Survey.

Wekiva River Hydrologic Basin

Within the Wekiva River Hydrologic Basin, a system may not cause a net reduction in flood storage within the 100-year floodplain of a stream or other watercourse which has a drainage area upstream of more than one square mile and which has a direct hydrologic connection to the Wekiva or Little Wekiva Rivers or Black Water Creek.

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SECTION 5.0 – ENVIRONMENTAL LOOK AROUND

A meeting was held with SJRWMD on June 30, 2021, to discuss potential joint use and regional opportunities. SFWMD was also contacted on September 28, 2021, to inquiry about potential joint use opportunities. No specific opportunities were identified during or after these meetings. The meeting minutes for the meeting held with SJRWMD and the email correspondence with the SFWMD have been included in Appendix F.

SECTION 6.0 – EXISTING & PROPOSED CONDITIONS

6.1 Existing Drainage Conditions

The majority of project Improvements are located within the SJRWMD with the two most easterly basins located within the jurisdiction of SFWMD. Sixteen major basins have been identified within the limits of the study area. Sub-basins have also been defined to correlate with currently permitted conditions within the project limits. Basin divides and sub-basin divides have been developed from existing permit information which has been supplemented with LIDAR data. Nomenclature for basin and sub-basin divides was set up to align with existing permit information as much as possible. Basin and sub-basin divides have been detailed on the existing basin maps included in Appendix A.

The project traverses both open and closed basins. It is worth noting that the area from the SR 429 interchange to the SR 50 interchange was previously permitted utilizing the closed basin design storm. This area drains to either John's Lake or one of its tributaries. During the research phase of this study, literature was found describing this basin as an open basin. This was confirmed during the pre-application meeting held with SJRWMD. As such, the ponds which discharge within the John's Lake Basin were sized utilizing open basin criteria. Discussions regarding this topic have been included with the SJRWMD pre-application meeting minutes provided in Appendix F.

There are several drainage connection permits found within the corridor. These connection permits have been listed in Table 5 below with the corresponding milepost for reference. Additionally, the receiving waterbody, whether the basin is open or closed, and any special basin criteria is outlined in Table 6. Although project improvements will not discharge directly to any Outstanding Florida Waters, the project traverse's multiple special basin which were previously discussed in Section 4.1.5. FDEP has defined nine WBID's that encompass the study area. Figure 5 depicts the study area as it relates to the location of these WBID's. Table 2 also outlines which impairment relates to each WBID. Specific characteristics related to each basin and sub-basin are outlined in the following sections.

Table 5: Drainage Connection Permits

Name	Permit Number	Mile Post
Savana Holdings	N/A (Pre-2009)	263.0
Apopka Vineland Road	TP-75-DC-001-02	264.5
Tuscany Ridge	TP-75-DC-003-00	264.7
Wesmere Property	TP-75-DC-081-04	267.0
Inspiration Town Center and Luxury Homes	TP-75-DC-098-18	267.5
The Fountains of Trivoli Phase 1	TP-75-DC-092-12	267.6
Marshall Farms Business Center	TP-75-DC-049-10	267.8
Boat RV and Auto Storage	TP-75-DC-131-08	269.0
Daniel's Road	TP-75-DC-045-04	270.0
Tucker Ranch	TP-75-DC-082-05	272.0
Independence RV	TP-75-DC-066-06 (Expired)	272.5

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Table 6: Project Basin Summary

Name	Type	Receiving Waterbody	Special Basin(s)
BASIN 5	Closed	Turkey Lake	None
BASIN 6	Closed	Lake Olivia	None
BASIN 7&8	Closed	Ocoee Drain (MP 265)	Wekiva River Hydrologic Basin
BASIN 9	Closed	Lake Pearl / Lake Lilly	, Lake Apopka Hydrologic Basin, Wekiva River Hydrologic Basin
BASIN 10	Open	Johns Lake	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN 11	Closed	Lake Lotta	Wekiva Recharge Protection Basin
BASIN 12	Open	Johns Lake	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN A	Open	Johns Lake	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN B	Open	Johns Lake	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN C	Open	Johns Lake	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN D	Closed	N/A	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN E	Open	Lake Apopka Outlet	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN SR 408	Closed	Lake Fischer	None
BASIN SR 429N	Closed	Lake Lotto	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN SR 429S	Open	Johns Lake	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin
BASIN DSR50N	Open	John's Lake	Wekiva Recharge Protection Basin, Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin

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Table 7: Existing Pond Summary

Name	Basin/ Sub-Basin	Treatment Method	Permit
EXIST. POND 5	5	Dry Retention	48-01443-P, 48-01004-P
EXIST. POND 6	6	Wet Retention	48-01443-P
EXIST. POND SB20	7A	Dry Retention	20358-12
EXIST. POND NB20	7B	Dry Retention	20358-12
EXIST. POND NB25	7C	Dry Retention	20358-12
EXIST. POND A2	7E	Dry Retention	20358-12, 20358-16
EXIST. POND 9(7)	7F	Dry Retention	20358-12, 20358-16
EXIST. POND NB30	7D	Dry Retention	20358-12
EXIST. POND NB35	NB35	Dry Retention	20358-12
EXIST. POND NB40	NB40	Dry Retention	20358-12
EXIST. POND NB45	NB45	Dry Retention	20358-12
EXIST. POND 7	8	Wet Detention	20358-5, 20358-16
EXIST. POND 8	8A	Dry Retention	
EXIST. POND 9	9	Wet Detention	20358-16
EXIST. POND TP-5	10A	Wet Detention	20358-16
EXIST. POND TP-6	10B	Wet Detention	20358-16
EXIST. POND TP-1 & EXIST. POND TP-2	10C	Wet Detention	20358-16
EXIST. POND TP-9	10D	Wet Detention	20358-16
EXIST. POND TP-3 & EXIST. POND TP-4	11A	Wet Detention	20358-16
EXIST. SWALE 12A	12	Dry Retention	20358-16
EXIST. SWALE 12B	12	Dry Retention	20358-16
EXIST. SWALE A-1	A	Dry Retention	20358-17
EXIST. SWALE A-3	A	Dry Retention	20358-17
EXIST. SWALE A-4	A	Dry Retention	20358-17
EXIST. SWALE A-5	A	Dry Retention	20358-17
EXIST. POND B	B	Wet Detention	20358-17
EXIST. POND C	C	Wet Detention	20358-17
EXIST. POND C-1A	C	Dry Retention	20358-17
EXIST. POND D-10	D	Dry Retention	20358-17
EXIST. POND D-20	D	Dry Retention	20358-17
EXIST. POND D-30	D	Dry Retention	20358-17
EXIST. POND D-40	D	Dry Retention	20358-17
EXIST. POND D-50	D	Dry Retention	20358-17
EXIST. POND D-60	D	Dry Retention	20358-17
EXIST. POND D-70	D	Dry Retention	20358-17
EXIST. POND D-80	D	Dry Retention	20358-17
EXIST. POND E-1	E	Dry Retention	20358-17
EXIST. POND E-2	E	Dry Retention	20358-17
EXIST. POND E-3	E	Dry Retention	20358-17
EXIST. POND 4C	SR 408	Dry Retention	4-095-0199AGM4
EXIST. POND G	DSR50N	Dry/ Wet Detention	45313-4
EXIST. POND CITGO A	DSR50N	Dry/ Wet Detention	45313-4
EXIST. POND CITGO B	DSR50N	Dry/ Wet Detention	45313-4
EXIST. POND H	DSR50N	Dry/ Wet Detention	45313-4

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6.1.1 Basin 5

Basin 5 is located from just west of Hiwassee Road (Station 2000+00) to a ridge at the Turkey Lake Service Plaza (Station 2061+00). Basin 5 is a closed basin which is located within the boundaries of SFWMD. This basin ultimately drains to Turkey Lake. There are three existing FTE ponds located within Basin 5: two at the Turkey Lake Service Plaza and one at Station 2001+00 Lt (Pond 5). Per the permit documentation, the two ponds located at the service plaza were designed such that they would overflow to Pond 5. Pond 5 was originally permitted as a wet retention pond with recovery achieved by a bleed down orifice. As part of this permit, there were two outfalls that discharged from Pond 5: one discharges to Turkey Lake located to the east and one discharges to the existing wetland located northwest of Pond 5. Basin 5 was permitted under SFWMD Permit No. 48-01443-P. Modifications to Pond 5 were permitted as part of SFWMD Permit No. 48-01004-P.

6.1.2 Basin 6

Basin 6 is located between a ridge at the Turkey Lake Service Plaza (Station 2065+00) and Gotha Road (Station 2130+00). Basin 6 drains to Lake Oliva which is a closed basin. However, per the permit documentation, Lake Oliva does have drainage wells which are utilized to control the water level of the lake. Basin 6 has been divided into three Sub-basins: Sub-basin 6, Sub-basin 6D and Sub-basin 6E. The drainage divides for these three Sub-basins were taken from the documentation included as part of FPID No. 406148-1 which was permitted under SFWMD Permit No. 48-01443-P. Information regarding each of these sub-basins is provided in the following subsections.

Sub-basin 6

In the existing condition, runoff from the northbound and southbound travel lanes from the southern extents of this basin is conveyed to a wetland/ low area on the eastside of the Turnpike directly north of Apopka-Vineland Road (Station 2100+00). The northern limits of Sub-basin 6 is located at the northern edge of this wetland/ low area. This wetland/ low area was converted to a wetland stormwater management pond as part of FPID No. 406148-1 which was identified as Pond 6 in SFWMD Permit No. 48-01443-P. In the existing condition, Pond 6 outfalls to Sub-basin 6D which ultimately discharges to Lake Oliva. Relevant excerpts from SFWMD Permit No. 48-01443-P have been included in Appendix F.

Since Sub-basin 6 drains to Lake Oliva which is considered a closed basin, Pond 6 was designed to provide attenuation for the FDOT 100-year 240-hour storm event. Although Lake Oliva is considered a landlocked basin, Lake Oliva does have two drainage wells utilized to control the water elevation per the information noted in SFWMD Permit No. 48-01443-P. In addition to providing attenuation for the 100-year 240-hour storm event, Pond 6 was designed such that

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treatment requirements were exceeded. Per the permit documentation, there is an additional 4.19 acres of pavement treated in Pond 6 above that which was required. The calculations which detail this excess treatment have been included in Appendix F.

Sub-basin 6D

Sub-basin 6D encompasses the northbound lanes from directly north of Pond 6 (Station 2105+00) to Gotha Road (Station 2140+00). In the existing condition, Sub-basin 6D drains to Sub-basin 6E through a 30 inch cross drain. Sub-basin 6E drains to Lake Olivia via natural channel. No attenuation or treatment is provided within sub-basin 6D in the existing condition. Compensatory treatment and attenuation were instead provided in Pond 6 for this sub-basin.

Sub-basin 6E

Sub-basin 6E encompasses the southbound lanes from directly north of Pond 6 (Station 2110+00) to Gotha Road (Station 2132+65). Sub-basin 6E drains to Lake Olivia via natural channel. No attenuation or treatment is provided within Sub-basin 6E in the existing condition. Compensatory treatment and attenuation were instead provided in Pond 6 for this sub-basin.

6.1.3 Basin 7&8 (MP 265 Lake Basin)

This basin is a compilation of the sub-basins located between Gotha Road (Station 2140+00) and the northern extents of the SR 408 interchange (Station 2190+00). The drainage divides for these sub-basins were taken from the documentation included as part of FPID No. 406102-1 and FPID No. 406148-1. These projects were permitted under SJRWMD Permit No. 20358-12 and SJRWMD Permit No. 20358-16 respectively. Information regarding each of these sub-basins is provided in the following subsections.

Sub-basin 7

Sub-basin 7 extends from Gotha Road (Station 2140+00) to Hempel Avenue (Station 2161+25) and encompasses both the northbound and southbound lanes. In the existing condition, this basin drains to the north and ultimately discharges to MP 265 Lake which is considered a closed basin. MP 265 Lake is located within the Gotha Lakes Watershed. None of the pavement within Sub-basin 7 is currently treated as compensatory treatment was provided in the SR 408 interchange basins. Attenuation for Sub-basin 7 was also provided in the SR 408 interchange sub-basins.

SR 408 Interchange Sub-basins (7A, 7B, 7C, 7D, 7E, 7F, 8, 8A, NB35, NB40, NB45)

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The SR 408 Interchange sub-basins extend from Hempel Avenue (Station 2161+25) to the northern extents of the SR 408 interchange ramps (Station 2191+32). In the existing condition, the majority of the SR 408 interchange drains to the south through the Turnpike conveyance system and ultimately outfalls to MP 265 Lake which is considered a closed basin. As such, permitted attenuation was designed to account for the FDOT critical duration storm events as well as the SJRWMD 25-year 96-hour storm. Per the information found in SJRWMD Permit No. 20358-16, the stormwater management facilities were designed to accommodate Wekiva River Recharge Basin requirements (3 inches over the additional impervious area over a soils). It should be noted that, per the current SJRWMD maps, this area is not currently located within the Wekiva River Recharge Basin.

Nine existing ponds are located within the SR 408 Interchange sub-basins. In the existing condition, there are five ponds that do not have surface discharge to MP 265 Lake. Linear Ponds NB 30 and NB 35 discharge to the low area located directly northeast of Ramp 505 (Station 2180+00 Rt). Linear Ponds NB 40 and NB 45 discharge to the closed basin to the west of the interchange and Pond 7 does not have surface discharge for the design storm event. Per the information found in existing permit documentation, all but Pond 7 was constructed under FPID No. 406102-1 (SJRWMD Permit No. 20358-12). Pond 7 was constructed as part of State Project Number 75008-6450-501 in 1989. For Pond 7, the drainage area discharging to this pond was reduced by 0.99 acres in the permit modification associated with SJRWMD Permit No. 20358-16, thus reducing the runoff volume for the 25-year 96 hour storm by 0.36 acre-feet. Outside of the change to the contributing area, no modifications to Pond 7 were noted in SJRWMD Permit No. 20358-16. The only discharge associated with the design storm event for Pond 7 was either through infiltration or through an underdrain system.

The ponds permitted as part of SJRWMD Permit No. 20358-12 were designed to accommodate the future widening constructed under SJRWMD Permit No. 20358-16. Per SJRWMD Permit No. 20358-12 this basin provided 13.07 acre-feet of water quality volume whereas 1.99 acre-feet was required. SJRWMD Permit No. 20358-12 also noted that 14.32 acre feet of total storage volume was provided whereas 14.14 acre feet of storage volume was required. SJRWMD Permit No. 20358-16 generally noted the total impervious area and contributing runoff volume was less than the original design parameters. Additional information regarding pond type and sub-basin location of these facilities are outlined in Table 7 above. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.4 Basin 9

Basin 9 is located Between the SR 408 Interchange ramps (Station 2191+00) and Maguire Road (Station 2245+90). The drainage divides for Basin 9 were taken from the documentation

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included as part of FPID No. 406148-1 which was permitted under SJRWMD Permit No. 20358-16. Runoff within Basin 9 discharges to either Lake Lilly or Lake Pearl and then ultimately a drainage well. It was noted in the permit documentation associated with SJRWMD Permit No. 20358-16 that the stages in Lake Lilly and Lake Pearl have a significant impact on the Basin 9 drainage system located within the right of way upstream. It was also mentioned in this same permit documentation that a dual ditch system was installed along the western side of the Turnpike in the vicinity of Station 3065+00 for approximately 300 feet to separate onsite runoff from offsite runoff. Since the ultimate outfall for Basin 9 is considered a closed basin, Basin 9 is required to meet the criteria associated with the FDOT critical duration storm events. Pond 9 was constructed as part of FPID No. 406148-1 to provide water quality, attenuation for the 25-year 96 hour storm, floodplain compensation storage and account for the increase in runoff volume associated with the 100-year 24 hour storm for Basin 9. Per the information provided in SJRWMD Permit No. 20358-16, 4.38 acre-feet was the required treatment volume for Basin 9 while 4.56 acre-feet was the treatment volume which was provided. It was also noted that excess attenuation volume and floodplain compensation volume was provided as the runoff volume for the SJRWMD 25-year 96 hour storm was decreased from 24.1 acre-feet in the existing condition to 8.0 acre-feet in the proposed condition while 8.71 acre-feet of excess floodplain compensation storage was provided. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.5 Basin 10

This basin is a compilation of the sub-basins located between Maguire Road (Station 2191+00) and the bridge that crosses over Beulah Road (Station 2335+97) excluding those associated with Basin 11. The drainage divides for Basin 10 were taken from the documentation included as part of FPID No. 406148-1 which was permitted under SJRWMD Permit No. 20358-16.

Implementation of these divides has resulted in defining five sub-basins within Basin 10: 10A, 10B, 10C, 10D, and 10E. Relevant information for each of these sub-basins is provided in the following paragraphs.

Basin 10 is located within the Johns Lake Basin which is currently considered an open basin. Runoff from Basin 10 discharges through a wetland system that connects to Black Lake which ultimately outfalls to Johns Lake. Per the existing permit documentation offsite runoff does not drain into Turnpike Right of way within Basin 10. In the existing condition, runoff from a majority of the sub-basins flow to the seven permitted stormwater management ponds. The location, type and permit documentation associated with each pond is outlined in Table 7 above. It should be noted that sub-basin 10E was not treated per the information found in SJRWMD Permit No. 20358-16. Compensatory treatment was instead provided for this sub-basin.

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The existing stormwater management features located within the limits of Basin 10 were designed such that excess treatment and attenuation were provided. For Sub-basins 10A, 10B, 10C, 10D, and 10E, 44.49 acres of pavement required treatment while 48.33 acres of pavement were treated. Additionally, 28.97 acre-feet of treatment volume was provided where 10.07 acre-feet of treatment volume was required for these sub-basins. As far as excess attenuation volume, the runoff volume leaving the sub-basins noted above was decreased from 94.52 acre-feet to 93.67 acre feet in the post development condition for the 25-year 96 hour storm. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.6 Basin 11

This basin is a compilation of the sub-basins located between Maguire Road (Station 2191+00) and SR 429 (Station 2298+00) excluding those associated with Basin 10. The drainage divides for Basin 11 were taken from the documentation included as part of FPID No. 406148-1 which was permitted under SJRWMD Permit No. 20358-16. Implementation of these divides has resulted in defining three sub-basins within Basin 11: 11A, 11B, and 11C. Runoff from Basin 11 discharges to the northeast ultimately flowing to Lake Lotta which is a closed basin. Per the existing permit documentation offsite runoff does not drain into Turnpike Right of Way within Basin 11.

There are two existing ponds located within Basin 11: TP-3 and TP-4. These two existing ponds are interconnected wet detention ponds. The location, type and permit documentation associated with each pond is outlined in Table 7 above. For Sub-basins 11A and 11B, 6.68 acres of impervious area was treated whereas only 5.14 acres of pavement required treatment. Sub-basins 11A and 11B also provided 2.24 acre-feet of treatment volume whereas only 1.39 acre-feet was required. Additionally, the runoff volume leaving sub-basin 11A and 11B was reduced from 20.05 acre-feet to 18.28 acre-feet in the post development condition for the 25-year 96 hour storm per the permit documentation. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.7 Basin 12

Basin 12 runs from the Beulah Road bridge (Station 2335+97) to directly west of the double 6-foot wide by 6 foot high box culvert (Station 2355+00) that conveys runoff to the south into the wetland system located upstream of Black Lake. Ultimately, runoff from Black Lake flows into Johns Lake which, per the pre-application meeting held with SJRWMD as part of this project, is considered an open basin. Runoff from Basin 12 discharges to the box culvert located at the northern limits of the basin. The permitted stormwater management facilities were designed to ensure the post development runoff volume does not exceed the pre development runoff volume for the SJRWMD 25-year 96 hour storm event.

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The stormwater management features located within Basin 12 along with the associated roadway improvements were implemented as part of FPID No. 406148-1 which was permitted under SJRWMD Permit No. 20358-16. Two dry retention swales with underdrains were constructed as part of FPID No. 406148-1. Swale 12A was constructed adjacent to the westbound lanes and Swale 12B was constructed adjacent to the eastbound lanes. For the purpose of the analysis contained herein, sub-basins were defined based on the drainage areas to these linear ponds and the untreated pavement located to the north. Per the permit documentation, compensatory treatment was provided for the untreated pavement located at the northern end of Basin 12 in Swale 12A and Swale 12B. As designed, the combination of Swale 12A and 12B provided excess water quality volume storage and treated more than the required amount of impervious area. The combination of these two swales treats 0.14 acre of impervious area above that which was required and provided 0.07 acre-feet of excess water quality storage volume. In addition, the runoff volume for the 25-year 96 hour storm that discharged from Basin 12 decreased from 22.26 acre-feet to 22.09 acre-feet in the post development condition. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.8 Basin A

Basin A is located between the boundary set for Basin 12 directly west of the double 6-foot wide by 6-foot high box culvert (Station 2355+00) and Daniels Road (Station 2379+34). Runoff from Basin A discharges offsite at the double 6-foot wide by 6-foot high box culvert located directly east of Basin A. Downstream of this box culvert runoff discharges through a series of wetlands into Black Lake. Ultimately, runoff from Black Lake outfalls into Johns Lake which is currently defined by SJRWMD as an open basin. Improvements within Basin A were constructed under FPID No 406146-1 which was permitted under SJRWMD Permit No. 20358-17.

Four dry retention swales with underdrains were constructed as part of FPID No. 406146-1 within Basin A. Swale A-1 and Swale A-4 were constructed adjacent to the westbound lanes and Swale A-3 and Swale A-5 were constructed adjacent to the eastbound lanes. For the purposes of the analysis contained herein, sub-basins were defined based on the drainage areas to these linear ponds and the untreated pavement that drains to the median collection system. Per the permit documentation, compensatory treatment was provided for the untreated pavement that drains to the median collection system. As designed, the combination of the four linear ponds constructed within Basin A provided excess water quality volume storage. The combination of these four swales provided 0.54 acre-feet of excess water quality storage volume. The 25-year 24 hour flowrate was reduced from 44.46 cfs to 36.36 cfs in the post development condition for Basin A. Since Basin A is also located within the Ocklawaha River Hydrologic Basin, it was designed such that the 10 year flowrate was not increased. In the pre development condition

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the 10-year flowrate is 37.75 cfs while the 10-year post development flowrate is 28.78 cfs. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.9 Basin B

Basin B is located between Daniels Road (Station 2379+34) and Avalon Road (Station 2458+24). Basin B was divided into six sub-basins to better represent the flow patterns that currently exist within Basin B. Improvements within Basin B were constructed under FPID No 406146-1 which was permitted under SJRWMD Permit No. 20358-17. Runoff for the majority of Basin B drains to the south via a combination of roadside swales and a closed collection system to the area adjacent to the 4-foot x 8-foot box culvert located at Station 2425+00. Runoff will leave the right of way flowing to the south at this box culvert discharging into a series of wetlands which flow into Black Lake and ultimately into Johns Lake. No attenuation or treatment was provided for the sub-basin located east of this box culvert. There are also sub-basins at Winter Garden Vineland Road and the western extents of Basin B that discharge directly offsite with no treatment or attenuation provided. No offsite area from the sub-basins at Winter Garden Vineland Road and the western extents of Basin B drain to Pond B which was constructed at the western extents of Basin B (Station 2455+00) to provide treatment and attenuation for Sub-basin B-2 whose boundaries run between the 4-foot x 8-foot box culvert to the basin limits at Station 2458+24. Pond B was also designed to provide compensatory treatment for the other sub-basins located within Basin B. The ultimate outfall for Pond B is the box culvert located at Station 2425+00.

Pond B was designed such that it would meet open basin criteria for attenuation. Per SJRWMD Permit No. 20358-17, the pre development flowrate for the 25-year 24 hour storm is 177.84 cfs while the post development flowrate for this same storm event is 165.83 cfs. Since Basin B is located within the Ocklawaha River Hydrologic Basin, Pond B was also designed to meet the 10-year discharge criteria with the 10-year pre development peak discharge equal to 148.60 cfs and the 10-year post development discharge equal to 134.59 cfs. Excess treatment volume was provided within Basin B as the required treatment volume is 2.32 acre-feet while the treatment volume provided was 2.35 acre-feet. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.10 Basin C

Basin C is located between Avalon Road (Station 2458+24) and the SR 50 interchange (Station 2545+00). Improvements within Basin C were constructed under FPID No 406146-1 which was permitted under SJRWMD Permit No. 20358-17. Runoff for Basin C discharges to Johns Lake which is currently considered an open basin by SJRWMD. Basin C was divided into four sub-basins to coincide with the existing permit documentation to assist with differentiating the areas

that flow to the two ponds located within Basin C from the untreated sub-basins. Aside from a small area at the western limits of the basin identified as Sub-basin C-1A, the westbound lanes are untreated. Sub-basin C-1A drains to a small dry retention pond adjacent to the off ramp that has been identified as Pond C-1A on the basin maps provided in Appendix A. The westbound lanes from Avalon Road to Station 2477+00 drain to a 5.5' x 5' box culvert located at Station 2477+00 where runoff is conveyed to wetlands located to the south of the Turnpike mainline and ultimately to Johns Lake. Runoff for the rest of the westbound lanes within Basin C drain to a 10' x 10.5' box culvert located at Station 2507+00 where runoff is then conveyed to the same series of wetlands located on the north side of Johns Lake. All of the eastbound lanes within Basin C will drain to Pond C. It was noted in the modeling included with the permit documentation that Sub-basin C-20E does not drain to a permitted pond, however, the plans included with the permit documentation indicate that sub-basin C-20E does indeed drain to Pond C. Runoff from Pond C outfalls to the wetlands located on the north side of Johns Lake. It should be noted that the existing permit documentation identified a significant area of floodplain impacts in the low areas in the vicinity of Pond C. The area directly south of Pond C is a permitted floodplain compensation site constructed as part of FPID No 406146-1.

Pond C and Pond C-1A were designed to meet open basin criteria for attenuation. Pond C was designed as a wet detention pond whereas Pond C-1A was designed as a dry retention pond. Per SJRWMD Permit No. 20358-17, the pre development flowrate for the 25-year 24 hour storm is 197.93 cfs while the post development flowrate for this same storm event is 187.41 cfs. Since Basin C is also located within the Ocklawaha River Hydrologic Basin, Pond C was designed to meet the 10-year discharge criteria with the 10-year pre development peak discharge equal to 164.28 cfs and the 10-year post development discharge equal to 149.98 cfs. Excess treatment volume was also provided within Basin C as the required treatment volume is 4.82 acre-feet while the treatment volume provided is 5.07 acre-feet. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.11 Basin D

Basin D extends from the eastern limits of the SR 50 interchange (Station 2545+00) to the western side of the SR 50 interchange (Station 2568+40). Improvements within Basin D were constructed under FPID No 406146-1 which was permitted under SJRWMD Permit No. 20358-17. Prior to the improvements associated with FPID No. 406146-1 the majority of Basin D drained to a sinkhole located northwest of the interchange. Per the information found in SJRWMD Permit No. 20358-17, Basin D is comprised of a series of closed basins. The section of the mainline and ramps associated with the SR 50 Interchange (Sub-basins D-10, D-20, D-30, D-40, D-50, D-70, and D-80) drain to an interconnected system of ponds designed to retain runoff for both the 25-year 96 hour storm and the 100-year 24 hour storm. This interconnected pond

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system has an emergency overflow storm drain network that discharges from Pond D-40 to the east to the box culvert located along the west side of Pond C. Downstream of this box culvert, runoff will flow through a series of wetlands into Johns Lake. Pond D-60 was not designed with an overflow system. Details for the ponds located within the SR 50 interchange sub-basins have been provided in Table 7.

As a result of the interchange reconfiguration that occurred when FPID No. 406146-1 was permitted, treatment requirements were calculated based on the total impervious area within Basin D to ensure treatment requirements were met. Excess treatment volume was provided within Basin D as the required treatment volume is 1.86 acre-feet while the treatment volume provided was 8.37 acre-feet. Excess attenuation storage is available within the existing interchange ponds as more than 1 foot of freeboard has been provided in all ponds except for D-20 and D-60. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.12 Basin E

Basin E extends from the western side of the SR 50 interchange (Station 2568+40) to a few hundred feet east of the Turnpike bridge over J W Jones Road (Station 2584+18). Improvements within Basin E were constructed under FPID No. 406146-1 which was permitted under SJRWMD Permit No. 20358-17. Basin E has been divided into four sub-basins to reflect this permit documentation. Sub-basin E-4 encompasses the eastbound lanes and the most westerly section of the westbound lanes. All sub-basins within Basin E drain to the cross drain located directly west of Pond E-3. At this point, runoff proceeds to flow north to Lake Apopka. Basin E is considered an open basin. Sub-basin E-4 is untreated as it does not drain to a permitted stormwater management facility. The westbound lanes drain to a series of linear dry retention ponds with underdrains (Ponds E-1, E-2, and E-3) connected in series which account for the remaining sub-basins within Basin E. Although not yet constructed, a permit for additional improvements within Basin E was recently obtained by the Turnpike. These improvements fall under SJRWMD Permit No. 41869-6 and will be constructed under FPID No 435784-1 & 435785-1. This permit will cover all improvements proposed as part of this study within Basin E. Relevant excerpts from the permit documentation have been included in Appendix F.

6.1.13 Basin SR 408

Basin SR 408 extends from the Turnpike/SR 408 interchange to the northern limits of work along SR 408 which is located directly north of Old Winter Garden Road. There is a large dry retention pond located northeast of the Hempel Avenue crossing of SR 408 which was permitted as part of the western extension of the East West Expressway prior to 1990 under SJRWMD Permit No. 4-095-0199AGM4. This dry retention pond was identified as Pond 4 in the permit

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documentation and has been noted as Pond 10 (FL) in the pond sizing calculations. The boring information included as part of the western extension of the East-West Expressway note an average groundwater table significantly below the pond bottom. It should be noted that side bank underdrain was proposed for this pond per the plan set included with the permit documentation. The amount of treatment and attenuation provided in existing Pond 4 was not readily apparent from permit documentation. The majority of the basin drains to Fischer Lake which is in the Gotha Lakes Watershed. Fischer Lake is considered a closed basin. There is a section of improvements located north of Old Winter Garden Road which is located within the Lake Lotta Basin which is also considered a closed basin. Relevant excerpts from permit documentation have been included in Appendix F.

6.1.14 Basin SR 429N

Basin SR 429N has been defined as the area along SR 429 north of SR 50. There are two Turnpike ponds (TP-7 and TP-8) located within Basin SR 429N and one Central Florida Expressway (CFX) Pond (Pond A) located within Basin SR 429N. The southern section of what has been defined as Basin SR 429N drains into Black Lake which is a tributary of Johns Lake. As noted previously, Johns Lake is considered an open basin. The northern section of Basin SR 429N drain to Lake Lotta which is considered a closed basin. The design assumptions related to the pond siting analysis regarding the two separate outfalls is discussed in Section 6.2 of this report. Per the drainage documentation associated with CFX Project No. 429-152, TP-7 has 0.07 acre-ft, TP-8 has 0.56 acre-ft and Pond A has 0.45 acre-ft of excess water quality volume provided. Per this same drainage documentation, the decrease in peak discharge rate is as follows with the storm events referenced in the report provided in parenthesis: Pond TP-7 18.14 cfs (pre storm 25-yr 24 hr, post storm 25-yr 96 hr), Pond TP-8 22.59 cfs (pre storm 25-yr 24 hr, post storm 100-yr 24 hr) and Pond A 12.62 cfs (pre storm 25-yr 96 hr, post storm 25-yr 96 hr). Relevant excerpts from permit documentation have been included in Appendix F.

6.1.15 Basin SR 429S

Basin SR 429S encompasses the improvements located south of Warrior Road which is the first cross road located south of the SR 429 interchange. There is one county pond (County Pond No. 1) and one CFX pond (Pond 2) located within this basin. Basin SR 429S drains into Black Lake which is a tributary of John's Lake. This basin is currently considered an open basin by SJRWMD. Per the drainage documentation associated with CFX Project No. 429-152, Pond 2 has 0.16 acre-ft of excess water quality volume provided. Per this same drainage documentation, the decrease in peak discharge rate is 29.36 cfs for the 25-year 24 hour design storm. Relevant excerpts from permit documentation have been included in Appendix F.

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6.1.16 Basin DSR50N

Basin DSR50N encompasses the improvements located south of Remington Road which is the first cross road south of the SR 50 interchange. This area drains to John's Lake which is currently considered an open basin by SJRWMD. There are three existing FDOT ponds (Pond Citgo A, Pond CITGO B, and Pond H) located within Basin DSR50N and one existing FDOT Pond located directly west of the project limits (Pond G). Roadway improvements for this area were permitted under SJRWMD Permit No. 45313-4. Per the permit documentation, the ponds in this area were designed to function as dry ponds for the smaller storm events. For the closed basin storm event, the ponds were designed such that the stage of the ponds will rise above the bleeder elevation but not extend above the weir elevation. Relevant excerpts from permit documentation have been included in Appendix F.

6.2 Proposed Drainage Conditions

The majority of project Improvements are located within the SJRWMD with the two most easterly basins located within the jurisdiction of SFWMD. Sixteen major basins have been identified within the limits of the study area which have been outlined on the proposed drainage maps included in Appendix A. Sub-basins have also been defined on the existing drainage maps to correlate with currently permitted conditions within the project limits. Basin divides and sub-basin divides have been developed from existing permit information which has been supplemented with LIDAR data. Nomenclature for the basin and sub-basin divides was set up to align with existing permit information as much as possible. It is anticipated that only minor changes to the basin divides will occur in the proposed condition with the vast majority of the changes controlled by the layout of the conveyance system which will occur during the design phase. As such, the post development drainage areas were set to match the pre development drainage areas in the calculations. Additional analysis will be required during the design phase once the design of the conveyance system has been incorporated into the project.

The criteria utilized for the pond sizing calculations in each basin has been outlined in the subsequent paragraphs. Impacts to existing stormwater management facilities were also included in the analysis of volumetric requirements for each pond alternative. Existing permit data in conjunction with aerial information was utilized to determine the extent of these impacts. For the interchanges, the most conservative alternative was utilized to calculate the volumetric requirements and the impacts to the existing stormwater management facilities. Additionally, the most conservative treatment sizing criteria was applied to all alternatives within a given basin. Pond sizing calculations and calculations detailing the impacts to the existing ponds for each basin have been included in Appendix B. According to the NRCS Soil Survey the vast majority of project traverses hydrologic soil group A which typically exhibit good drawdown capabilities. It should be noted that site specific soils information will be needed during the

design phase to determine the viability of the proposed dry retention ponds. A soils map has been included in Appendix A.

6.2.1 Basin 5

Basin 5 is located from just west of Hiwassee Road (Station 2000+00) to a ridge at the Turkey Lake Service Plaza (Station 2061+00). Basin 5 is a closed basin which ultimately drains to Turkey Lake. There are three existing FTE ponds located within Basin 5: two at the Turkey Lake Service Plaza and one at Station 2001+00 Lt (Pond 5). Per the permit documentation, the two ponds located at the service were designed such that they would overflow to Pond 5. Since, per the recent Turnpike project (FPID No. 441309-1; SFWMD Permit No. 48-01004-P), there is approximately 105 acre-feet of excess capacity within Pond 5, it was one of the three pond site alternatives considered (Pond Alternative 3). Although FPID No. 441309-1 indicates there is 105 acre-feet of excess storage capacity within Pond 5, the analysis provided within this pond siting report and other documents associated with this project conservatively assume that this 105 acre-feet is not available. It is assumed the storage requirements for this basin will be accommodated by expanding Pond 5 within the existing right of way. During the design phase of this project drawdown calculations will be needed to ensure the pond recovers within the required time frames. Excerpts from FPID No. 441309-1 are included in Appendix F.

Since Basin 5 is located within a closed basin, the sizing for all three alternatives was developed utilizing the 100-year 10-day storm event. The required water quality volume for this basin was calculated assuming 2.5 inches over the increase in impervious area. The footprints of Pond Alternative 1 and Pond Alternative 2 were developed assuming they would be constructed as dry retention facilities. The hydraulic grade line (HGL) as it relates to the low edge of pavement was checked for all offsite alternatives to ensure the HGL requirements could be met. It should be noted that all of the runoff from the eastern limits of the improvements within Basin 5 cannot be conveyed to Pond Alternative 1 because of the elevation differential between the pond site and the eastern limits of improvements. In order for Pond Alternative 1 to meet stormwater management requirements, some of the existing pavement on the western end of the basin treated in existing Pond 5 (Station 2005+00 Lt) will need to be diverted to this pond alternative and an equivalent amount of proposed pavement on the eastern end of the basin will need to be sent to existing Pond 5. It is assumed the amount of existing pavement needed to offset the increase in impervious area will be approximately 2 acres. The exact amount will need to be determined during the design phase once the design for the conveyance system has been developed. Preliminary HGL and pond sizing calculations have been included in Appendix B.

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6.2.2 Basin 6

Basin 6 is located between a ridge at the Turkey Lake Service Plaza (Station 2065+00) and Gotha Road (Station 2130+00). Basin 6 drains to Lake Oliva which is a closed basin. However, per the permit documentation, Lake Oliva does have drainage wells which are utilized to control the water level of the lake. In addition to providing attenuation for the 100-year 240-hour storm event, Pond 6 was designed such that the treatment requirements were exceeded.

Since Basin 6 is located within a closed basin, the sizing for all three alternatives was developed utilizing the 100-year 10-day storm event. The required water quality volume for this basin was calculated assuming 2.5 inches over the increase in impervious area. The footprint of Pond Alternative 2 was developed assuming it would be constructed as a wet detention pond. The footprints of Pond Alternative 1 and Pond Alternative 3 were developed assuming these ponds would be constructed as dry retention facilities. The HGL as it relates to the low edge of pavement was checked for all offsite alternatives to ensure the HGL clearance requirements could be met. For Pond Alternatives 2 and 3 the proposed pavement from the western limits of the basin cannot be sent to the ponds because of the elevation differential between the pond sites and the western edge of the basin. In order to meet treatment requirements, an equivalent amount of existing pavement would either need to be sent to these pond sites or compensatory treatment would have to be provided elsewhere in the basin. Per the existing permit documentation (Permit No. 060217-13), Pond 6 treated 4.19 acres of pavement above what was required in order to obtain that permit. Excerpts outlining the treatment from the Permit No. 060217-13 have been provided in Appendix F. Since the permit noted treatment of 4.19 acres above the requirements, an equivalent amount of additional pavement at the western end of the basin could be subtracted from the amount of pavement required to be sent to Pond Alternatives 2 and 3. The edge of pavement elevation was checked at this location to ensure that runoff could physically be conveyed to Pond Alternatives 2 and 3. It should be noted that the sizing of Pond Alternatives 2 and 3 were conservatively based on the total treatment volume required for the basin. This will allow for potential modifications during the design phase to divert more runoff to these sites if needed to make the conveyance system more efficient.

Per the existing permit documentation associated with FPID No. 440293-1 (Permit No. 48-103150-P) improvements proposed as part of this project have the ability to treat 9.60 acres of additional pavement within the service plaza stormwater management system. If during the design phase the hydraulics indicate runoff from the additional untreated impervious area can be conveyed to these ponds, this would reduce the storage needed for the improvements outlined as part of this pond siting report. Excerpts from the permit documentation associated with FPID No. 440293-1 are included in Appendix F.

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The elevations at the Pond Alternative 1 site will also make conveying runoff from sections of the basin to this alternative problematic. Based on the preliminary HGL calculations provided in Appendix B, the section of the basin in the vicinity of the low area located at Station 2118+00 cannot be conveyed to Pond Alternative 1. For these calculations it was assumed the excess treatment of the 4.91 acres of pavement provided in Permit No. 060217-13 will offset the pavement adjacent to the low area at Station 2118+00 that cannot be sent to the pond site.

6.2.3 Basin 7&8 (MP 265 Lake Basin)

This basin is a compilation of the sub-basins located between Gotha Road (Station 2140+00) and the northern extents of the SR 408 interchange (Station 2190+00). The drainage divides for this basin were taken from the documentation included as part of FPID No. 406102-1 and FPID No. 406148-1. The majority of this basin discharges to MP 265 Lake which is part of the Gotha Lakes Watershed and is considered a closed basin. In the existing condition, there are five ponds that do not have surface discharge to the MP 265 Lake. Linear ponds NB 30 and NB 35 discharge to the low area directly northeast of Ramp 505 (Station 2180+00 Rt). Linear ponds NB 40 and NB 45 discharge to the closed basin to the west of the interchange and Pond 7 does not have surface discharge for the design storm event. Since these five ponds do not have defined surface outfalls to the MP 265 Lake low area in the existing condition, it was assumed the volumes associated with these ponds and the improvements within their respective sub-basins would not be accommodated in the Basin 7&8 offsite pond alternatives, but these volumes would instead be accommodated in the interchange for all alternatives. Since separate sizing requirements were utilized for the interchange alternative when compared with the two offsite alternatives, two sets of sizing calculations have been provided in Appendix B. The Basin 7&8 calculations include all sub-basins which were utilized for the sizing of the interchange pond cells (identified as Alternative 3 in the evaluation matrix). The MP 265 sizing calculations excludes those sub-basins which will not discharge to the low area. Once the conveyance system is developed during the design phase of this project, distribution of runoff between the interchange pond cells will need to be allocated such that surface flow parameters are met.

Since Basin 7&8 is located within a closed basin, the sizing for all three alternatives was developed utilizing the 100-year 10-day storm event. The required water quality volume for this basin was calculated assuming 2.5 inches over the increase in impervious area. The footprint of the interchange pond alternative and Pond Alternative 1 were developed assuming they would be constructed as dry retention ponds. The footprint of Pond Alternative 2 was developed assuming the pond would be constructed as a wet detention facility. The HGL as it relates to the low edge of pavement was checked for all offsite alternatives to ensure the HGL requirements could be met. As noted in the paragraphs below, the area at the east end of the basin cannot be conveyed to the pond sites for the interchange alternative and Pond Alternative 1.

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Pond Alternative 2 was checked utilizing compensatory treatment of existing pavement located directly east of Hempel Avenue. There is an increase of 3.41 acres in the amount of pavement in sub-basin 7 that will need to be offset by either treating pavement that is currently untreated or proposed pavement in order to meet treatment requirements. It was determined that pavement to the west of Station 5893+25 would need to be sent to Pond Alternative 2 from sub-basin 7 in order to meet treatment requirements. As such, the low edge of pavement and HGL was checked at this station to ensure that runoff from this area could be sent to the pond.

In order for the interchange pond alternative and Pond Alternative 1 to meet permitting requirements, treatment for the proposed pavement east of the Hempel Avenue Bridge will need to be provided elsewhere. Vertical constraints will not allow for enough runoff for the area east of the Hempel Avenue bridge to be conveyed to either the interchange pond alternative or the Pond Alternative 1 site. As noted previously, the increase in pavement within Basin 7 for the area east of the Hempel Avenue bridge is 3.41 acres. In order to meet treatment requirements for the pavement that cannot be treated in the alternative 1 site, it is proposed that linear stormwater management facilities be provided adjacent to the Turnpike mainline directly east of the Hempel Avenue Bridge. Calculations detailing how treatment requirements can be met utilizing linear stormwater management facilities for the area east of Hempel Avenue have been included in Appendix B on the Alternative 1 pond sizing sheet. In addition to the linear stormwater management facilities, treatment requirements for the area east of Hempel Avenue could also be met in the Basin 6 Alternative 1 site or a portion of the Pond Alternative 2 site. The HGL for Pond Alternative 1 was checked at the station directly west of the Hempel Avenue Bridge.

6.2.4 Basin 9

Basin 9 is located Between the SR 408 Interchange ramps (Station 2191+00) and Maguire Road (Station 2245+90). Runoff within Basin 9 discharges to either Lake Lilly or Lake Pearl which are located at the low area of a closed basin. It should be noted that there are existing drainage wells located in the vicinity of Lake Lilly and Lake Pearl. Since the ultimate outfall for Basin 9 is considered a closed basin, the Basin 9 pond alternatives were sized utilizing the pre/ post volumetric difference for the 100-year 10-day storm event. The required water quality volume for this basin was calculated assuming 2.5 inches over the increase in impervious area. The footprint of Pond Alternative 1 and Pond Alternative 2 were developed assuming they would be constructed as expansions of the adjacent existing wet pond. The footprint of Pond Alternative 3 was also developed assuming the pond would be constructed as a wet detention facility. It should be noted that based on seasonal high water information from the permit for the adjacent development, a pond liner would be required in order to allow the pond to meet HGL requirements for the drainage area upstream. The HGL as it relates to the low edge of

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pavement was also checked for all three pond alternatives. These preliminary calculations show the HGL requirements can be met for these three alternatives. HGL calculations have been included in Appendix B.

As noted in the existing conditions section for Basin 9, excess treatment volume, attenuation volume and floodplain compensation were provided in existing Pond 9. Although some of this volume could be utilized for proposed improvements, given the existing pond would require design level calculations to verify how much could be accommodated (water quality storage volume would have to be significantly expanded in the existing pond) it was conservatively assumed that all pond alternatives would be sized utilizing the total volumes associated with the proposed improvements.

6.2.5 Basin 10

This basin is a compilation of the sub-basins located between Maguire Road (Station 2191+00) and the bridge that crosses over Beulah Road (Station 2335+97) excluding those sub-basins associated with Basin 11. The drainage divides for Basin 11 included on the proposed drainage maps included in Appendix A have been shown in a different color to differentiate the two basins. Basin 10 is located within the Johns Lake Basin which is currently considered an open basin by SJRWMD. Runoff from Basin 10 discharges through a wetland system that connects to Black Lake which ultimately outfalls to Johns Lake. Per the existing permit documentation, offsite runoff does not drain into Turnpike Right of way within Basin 10.

Since the ultimate outfall for Basin 10 is considered an open basin, all Basin 10 pond alternatives were sized utilizing the pre/ post volumetric difference for the 25-year 24 hour storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprint of all three pond alternatives within Basin 10 were developed assuming they would be constructed as wet detention ponds. The HGL was checked for both offsite pond alternatives. The western extents of Basin 10 cannot be sent to either Pond Alternative 2 or Pond Alternative 3 because the vertical differential between the pond sites and the western limits of Basin 10 will not allow for the HGL requirements to be met for this area. However, 3.84 acres of pavement were treated above that which was required per the previous permit (SJRWMD Permit No. 20358-16), so it was assumed for the purposes of these calculations that the western extents of Basin 10 will not be sent to Pond Alternative 2 or Pond Alternative 3. It should be noted that based on seasonal high water information from the permit for the adjacent development, a pond liner would be required in order for the HGL requirements for Pond Alternative 3 to be met. HGL calculations have been included in Appendix B.

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As noted in the existing conditions section for Basin 10, excess treatment volume, attenuation volume and floodplain compensation were provided per the permit documentation. Although some of this volume could be utilized for proposed improvements, it was conservatively assumed that all pond alternatives would be sized utilizing the total volumes associated with the proposed improvements unless noted otherwise.

6.2.6 Basin 11

This basin is a compilation of the sub-basins located between Maguire Road (Station 2191+00) and SR 429 (Station 2298+00) excluding those associated with Basin 10. Runoff from Basin 11 discharges to the northeast ultimately flowing to Lake Lotta which is a closed basin. Per the existing permit documentation offsite runoff does not drain into Turnpike Right of Way within Basin 11. Since the ultimate outfall for Basin 11 is considered a closed basin, all Basin 11 pond alternatives were sized utilizing the pre/ post volumetric difference for the 100-year 10 day storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprint of all 3 pond alternatives were developed assuming they would be constructed as wet detention ponds. The interchange pond alternative (identified as Alternative 3 in the evaluation matrix) assumed the remaining footprint of Pond TP-3 and TP-4 would be expanded to accommodate project requirements. The HGL as it relates to the low edge of pavement was checked for both offsite pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. As noted in the existing conditions section for basin 11, excess treatment and attenuation were provided for the permitted condition. This excess storage is not enough to allow for permitting requirements to be met without significant modifications to the existing ponds.

6.2.7 Basin 12

Basin 12 runs from the Beulah Road bridge (Station 2335+97) to directly west of the double 6-foot wide by 6 foot high box culvert (Station 2355+00) that conveys runoff to the south into the wetland system located upstream of Black Lake. Ultimately, runoff from Black Lake flows into Johns Lake which, per the pre-application meeting held with SJRWMD as part of this project, is considered an open basin. Since the ultimate outfall for Basin 12 is considered an open basin, all Basin 12 pond alternatives were sized utilizing the pre/ post volumetric difference for the 25-year 24 hour storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprint of all 3 of the pond alternatives were developed assuming they would be constructed as wet detention ponds. The HGL as it relates to the low edge of

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pavement was checked for all pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. As noted in the existing conditions section for basin 12, a marginal amount of excess treatment and attenuation was provided in the existing configuration. This excess storage is not enough to allow for permitting requirements to be met within the remnants of the existing ponds.

6.2.8 Basin A

Basin A is located between the boundary set for Basin 12 directly west of the double 6-foot wide by 6-foot high box culvert (Station 2355+00) and Daniels Road (Station 2379+34). Runoff from Basin A discharges offsite at the double 6-foot wide by 6-foot high box culvert located directly east of Basin A. Downstream of this box culvert runoff discharges through a series of wetlands into Black Lake. Ultimately, runoff from Black Lake outfalls into Johns Lake which is currently defined by SJRWMD as an open basin. Since the ultimate outfall for Basin A is considered an open basin, all Basin A pond alternatives were sized utilizing the pre/ post volumetric difference for the 25-year 24 hour storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprint of all 3 of the pond alternatives were developed assuming they would be constructed as wet detention ponds. The HGL as it relates to the low edge of pavement was checked for all pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. The four linear ponds constructed within Basin A provided excess water quality volume storage. The combination of these four swales provided 0.54 acre-feet of excess water quality storage. The 25-year 24 hour flowrate was reduced from 44.46 cfs to 36.36 cfs in the post development condition for Basin A.

6.2.9 Basin B

Basin B is located between Daniels Road (Station 2379+34) and Avalon Road (Station 2458+24). Runoff for the majority of Basin B drains to the south via a combination of roadside swales and a closed collection system to the area adjacent to the 4-foot x 8-foot box culvert located at Station 2425+00. Runoff will leave the right of way flowing to the south at this box culvert discharging into a series of wetlands which flow into Black Lake and ultimately into Johns Lake. No attenuation or treatment was provided for the sub-basin located east of this box culvert. There are also sub-basins at Winter Garden Vineland Road and the western extents of Basin B that discharge directly offsite with no treatment or attenuation provided. Since the ultimate outfall for Basin B is considered an open basin, all Basin B Pond alternatives were sized utilizing the pre/ post volumetric difference for the 25-year 24 hour storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of

these two values utilized in the pond sizing calculations. The footprint of all 3 of the pond alternatives were developed assuming they would be constructed as wet detention ponds. The HGL as it relates to the low edge of pavement was checked for all pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. Per SJRWMD Permit No. 20358-17, the pre development flowrate for the 25-year 24 hour storm is 177.84 cfs while the post development flowrate for this same storm event is 165.83 cfs. Excess treatment volume was provided within Basin B as the required treatment volume is 2.32 acre-feet while the treatment volume provided was 2.35 acre-feet.

6.2.10 Basin C

Basin C is located between Avalon Road (Station 2458+24) and the SR 50 interchange (Station 2545+00). Runoff for Basin C discharges to Johns Lake which is currently considered an open basin by SJRWMD. The westbound lanes from Avalon Road to Station 2477+00 drain to a 5.5' x 5' box culvert located at Station 2477+00 where runoff is conveyed to wetlands located to the south of the Turnpike mainline and ultimately to Johns Lake. Runoff for the rest of the westbound lanes within Basin C drain to a 10' x 10.5' box culvert located at Station 2507+00 where runoff is then conveyed to the same series of wetlands located on the north side of Johns Lake. Since the ultimate outfall for Basin C is considered an open basin, all Basin C pond alternatives were sized utilizing the pre/ post volumetric difference for the 25-year 24 hour storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprint of all 3 of the pond alternatives were developed assuming they would be constructed as wet detention ponds. The HGL as it relates to the low edge of pavement was checked for all pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. Per SJRWMD Permit No. 20358-17, the pre development flowrate for the 25-year 24 hour storm is 197.93 cfs while the post development flowrate for this same storm event is 187.41 cfs. Excess treatment volume was also provided within Basin C as the required treatment volume is 4.82 acre-feet while the treatment volume provided is 5.07 acre-feet. Relevant excerpts from permit documentation have been included in Appendix F.

6.2.11 Basin D

Basin D extends from the eastern limits of the SR 50 interchange (Station 2545+00) to the western side of the SR 50 interchange (Station 2568+40). Prior to the improvements associated with FPID No. 406146-1 the majority of Basin D drained to a sinkhole located northwest of the interchange. This interconnected pond system at the SR 50 interchange was designed such that they did not discharge for the 25-year 96 hour storm. Since the existing stormwater management system was designed utilizing closed basin criteria and prior to the improvements

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constructed at the interchange runoff discharged to a sinkhole located directly northwest of the interchange, the pond alternatives were sized utilizing the pre/ post volumetric difference for the 100-year 10 day storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprint of all 3 of the pond alternatives were developed assuming they would be constructed as dry retention ponds. The HGL as it relates to the low edge of pavement was checked for all offsite pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. Excess treatment volume was provided within Basin D as the required treatment volume is 1.86 acre-feet while the treatment volume provided was 8.37 acre-feet. Excess attenuation storage is available within the existing interchange ponds as more than 1 foot of freeboard has been provided in all existing ponds except for D-20 and D-60.

6.2.12 Basin E

Basin E extends from the western side of the SR 50 interchange (Station 2568+40) to a few hundred feet east of the Turnpike bridge over J W Jones Road (Station 2584+18). Basin E drains to the cross drain located directly west of Pond E-3. At this point, runoff proceeds to flow north to Lake Apopka. Since the improvements proposed within Basin E were accounted for under SJRWMD Permit No. 41869-6, no pond alternatives are needed within this basin. Relevant excerpts from the permit documentation have been included in Appendix F.

6.2.13 Basin SR 408

Basin SR 408 extends from the Turnpike/SR 408 interchange to the northern limits of work along SR 408 located directly north of Old Winter Garden Road. The majority of the basin drains to Fischer Lake which is in the Gotha Lakes Watershed and is considered a closed basin. The northern limits of this basin drain to Lake Lotta which is also considered a closed basin. Since the outfalls for Basin SR 408 are located within closed basins, all Basin SR 408 pond alternatives were sized utilizing the pre/ post volumetric difference for the 100-year 10-day storm event. The required water quality volume for this basin was determined assuming 2.5 inches over the increase in impervious area. Since there is a marginal amount of pavement located at the northern end of the basin which does not drain to Lake Fischer, it is assumed the conveyance system and drainage divides will be adjusted during the design phase so as to shift enough runoff back to the pond alternative which will then drain to Lake Fischer. This shift will allow for the attenuation and water quality requirements to be met at the northern end of the basin without providing a stormwater management facility for the area that drains to Lake Lotta.

The footprint of Pond Alternative 1 was developed assuming it would be constructed as wet detention pond. Given the seasonal high water elevation taken from the adjacent permit is elevated it is anticipated that a liner will be required for this site. Pond Alternative 2 is an expansion of an existing dry retention pond. The footprint of Pond alternative 3 was also developed assuming it would be constructed as a dry retention facility. The HGL as it relates to the low edge of pavement was checked for all pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. The amount of treatment and attenuation provided in existing Pond 4 was not readily apparent from the existing permit documentation.

6.2.14 Basin SR 429N

Basin SR 429N has been defined as the area along SR 429 north of SR 50. The southern section of what has been defined as Basin SR 429N drains into Black Lake which is a tributary of Johns Lake. As noted previously, Johns Lake is considered an open basin. The northern section of Basin SR 429N drain to Lake Lotta which is considered a closed basin. Although this basin spans two separate outfalls, it has been assumed that during the design phase the drainage divides can be shifted such the pond sites will discharge within one basin and the drainage area will be reduced for the other outfall such that attenuation and treatment requirements can be met for this outfall by the reduction in drainage area. Since one of the outfalls within Basin SR 429N drains to a closed basin and the other drains to an open basin, the more conservative closed basin design criteria (100-year 10 day storm) was utilized to size the stormwater management facilities. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprint of all 3 of the pond alternatives were developed assuming they would be constructed as wet detention ponds. The HGL as it relates to the low edge of pavement was checked for all pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. Per the drainage documentation associated with CFX Project No. 429-152, TP-7 has 0.07 acre-ft, TP-8 has 0.56 acre-ft and Pond A has 0.45 acre-ft of excess water quality volume provided. Per this same drainage documentation, the decrease in peak discharge rate is as follows with the storm events referenced in the report provided in parenthesis: Pond TP-7 18.14 cfs (pre storm 25-yr 24 hr, post storm 25-yr 96 hr), Pond TP-8 22.59 cfs (pre storm 25-yr 24 hr, post storm 100-yr 24 hr) and Pond A 12.62 cfs (pre storm 25-yr 96 hr, post storm 25-yr 96 hr).

6.2.15 Basin SR 429S

Basin SR 429S encompasses the improvements located south of Warrior Road which is the first cross road located south of the SR 429 interchange. Basin SR 429S drains into Black Lake which

is a tributary of John's Lake. Since this Basin is currently considered an open basin, all Basin SR 429S pond alternatives were sized utilizing the pre/ post volumetric difference for the 25-year 24 hour storm event. The required water quality volume for this basin was checked assuming 2.5 inches over the increase in impervious area and 3 inches over the impervious area constructed over Type A soils with the higher of these two values utilized in the pond sizing calculations. The footprints of all three pond alternatives were developed assuming they would be constructed as wet detention ponds. The HGL as it relates to the low edge of pavement was checked for all pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B. Per the drainage documentation associated with CFX Project No. 429-152, Existing Pond 2 has 0.16 acre-ft of excess water quality volume provided. Per this same drainage documentation, the decrease in peak discharge rate is 29.36 cfs for the 25-year 24 hour design storm at the outfall of Existing Pond 2.

6.2.16 Basin DSR50N

Basin DSR50N encompasses the improvements located south of Remington Road which is the first cross road south of the SR 50 interchange. This area drains to John's Lake which is currently considered an open basin by SJRWMD. The existing ponds within this basin were permitted utilizing closed basin criteria. Per the permit documentation, the ponds in this area were designed to function as dry ponds for the smaller storm events. For the closed basin storm event, the ponds were designed such that the stage of the ponds will rise above the bleeder elevation but not extend above the weir elevation. It was assumed that both Pond Alternative 1 and Pond Alternative 2 would be wet detention ponds. The pond sizing for all alternatives is based off the volumetric difference for the 25-year 24 hour storm event. Since the improvements are all located within the Wekiva Recharge Protection Basin and all improvements are to be constructed over Type A soils, 3-inches over the increase in impervious area was used to compute the water quality volume requirements for this basin. The HGL as it relates to the low edge of pavement was checked for both offsite pond alternatives to ensure the HGL requirements could be met. These calculations have been included in Appendix B.

Since the required volumes for Basin DSR50N were relatively small (0.71 acre-ft total required water quality volume and attenuation volume), for the third alternative it was assumed the required volumes could be accommodated within the existing FDOT Ponds located adjacent to SR 50. The as-built plans from FPID No. 238429-4-52-01 show there is 0.65 acre-ft of static volume that can be accommodated while still meeting freeboard in Pond G and 0.08 acre-ft of static volume available in Pond CITGO B. The as-built plans which show the locations of Pond G and Pond CITGO B have been included in Appendix F.

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6.2.17 Accommodating Special Basin Criteria

As part of the analysis associated with this pond siting report, it was determined that the project specific special basin criteria outlined in Section 4.2 should be checked to ensure these criteria can be met as this project moves into the design phase. The following paragraphs elaborate on how the criteria outlined in Section 4.2 can be met.

BMAPs

As previously noted in Section 4.2.2, this project traverses the following BMAPs: Lake Okeechobee, Middle St. Johns River, and the Upper Ocklawaha River. Phosphorus is a nutrient of concern for all three of these BMAPs while nitrogen is also a nutrient of concern for the Middle St John River. The Lake Okeechobee BMAP extends through the limits of Basin 5 whereas the Middle St Johns River and Upper Ocklawaha River BMAP extend from the eastern limits of Basin 7 to the western end of the project. There is an area located directly east of the SR 429 interchange that is not part of the Upper Ocklawaha River BMAP. The limits of the BMAPs have been outlined on Figure 4 provided in Appendix A.

Since volumetric sizing calculations typically utilized as part of a pond siting analysis are not set up to address nutrient removal requirements, a high level analysis utilizing the BMP Trains program was developed to show the post development loadings from the nutrients of concern were less than the pre-development loadings for the nutrients of concerns. Additionally, variables related to the conveyance are not typically known during the pond siting phase so additional assumptions were made to account for these unknowns. Although phosphorus loadings can typically be addressed in traditional wet ponds, nitrogen removal cannot without some form of pre-treatment. Given this information, it was determined that the analysis would consist of identifying locations where a typical FDOT ditch section could be located within the right of way with shallow ditch blocks added to provide additional nutrient removal benefits. Areas where, based on the available information, it did not appear that an open conveyance system could be utilized (like the area between SR 408 and SR 429) the linear treatment systems were excluded and runoff was either sent to a downstream pond or conservatively sent directly to the outlet in the model without any treatment. Since Basin 5 is located within a separate BMAP it was analyzed independent of the area located west of Basin 7. The area west of Basin 7 was looked at collectively over the entire BMAP. Some proposed stormwater management facilities were conservatively excluded from the analysis as the intent was to show at a high level that nutrient removal requirements could be met. Additionally, since dry retention ponds can typically meet both nitrogen and phosphorus removal requirements without any pretreatment and all pond alternatives within Basin D are dry retention ponds It was assumed that nutrient removal requirements for Basin D would be met, and this basin was excluded from the analysis.

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According to the results of the high level analysis described in the preceding paragraphs, nutrient removal requirements can be met for all project improvements. The results of this analysis are provided in Appendix C. It should be noted that during the pond siting phase information typically needed to perform a nutrient analysis is either not available or incomplete. These calculations should be revisited during the design phase when a better understanding of design parameters is available.

Wekiva Recharge Protection Basin and Wekiva River Hydrologic Basin

As noted in previous sections of the report, project improvements located west of Maguire Road (excluding those located within Basin 11) are located within the Wekiva Recharge Protection Basin. For those basins located within the Wekiva Recharge Protection Basin it was assumed the larger of either 2.5-inches over the increase in all impervious area or 3-inches over the impervious area to be constructed over Type A soils would be utilized to compute the required volumes. Since all pond alternatives considered were not dry retention facilities, additional calculations were provided assuming ditch blocks would be placed in the conveyance ditches located west of the SR 429 interchange. It should be noted that since all pond alternatives within Basin D are dry retention facilities it was assumed the requirements within Basin D would be met within the preferred pond alternative. Calculations for these linear stormwater management features have been included in Appendix C. Since there are no direct surface hydrologic connections to either the Wekiva River, Little Wekiva River or Black Creek within the project limits, calculations to show the requirements of the Wekiva River Hydrologic Basin are not warranted.

Lake Apopka Hydrologic Basin and Ocklawaha River Hydrologic Basin

As noted in previous sections of the report, project improvements located west of Maguire Road (excluding those located within Basin 11) are located within both the Ocklawaha River Hydrologic Basin and the Lake Apopka Hydrologic Basin. In order to meet the requirements of the Lake Apopka Hydrologic Basin one of the options that has been outlined by SJRWMD is to provide calculations which demonstrate the phosphorus loadings within the area of concern have not been increased as a result of the proposed improvements. The calculations that have been provided to illustrate the BMAP requirements can be met also demonstrate the phosphorus loading requirements associated with the Lake Apopka Hydrologic Basin can be met. For the Ocklawaha River Hydrologic Basin requirements, the volumetric pond sizing calculations utilizing the 25-year storm conservatively show the pre/ post discharge requirements for both the 10-year and 25-year storm events can be met during the design phase of this project.

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SECTION 7.0 – FLOODPLAIN & ENVIRONMENT INFORMATION

Project Improvements will impact the adjacent floodplain. A detailed analysis of the impacts resulting from roadway improvements and compensation for these impacts has been included in the location hydraulic report included under separate cover with this submittal. Impacts resulting from proposed pond alternatives located within the floodplain and compensation for these impacts have been quantified on the pond sizing spreadsheets located in Appendix B. Compensation for construction of the ponds within the floodplain has been provided adjacent to the pond sites and the parcel size was expanded as needed to accommodate these impacts. The limits of the floodplain have been outlined on the drainage maps and Figure 3 included in Appendix A. The location of the floodplain compensation sites has also been included on the drainage maps provided in Appendix A.

SECTION 8.0 – STORMWATER PONDS

As previously noted in Section 6, there is excess storage provided in existing ponds throughout the corridor. Unless otherwise noted in the write-up or calculations each basin has three pond alternatives independent of the excess storage available in the existing ponds. Seasonal high water elevations were determined from the best available information which was typically either as-built information or permit documentation. The source of the seasonal high water elevations has been noted on the pond sizing spreadsheets included in Appendix B. Where feasible existing FDOT parcels were considered for pond alternatives. The location of the FDOT owned parcels have been called out on the proposed drainage maps provided in Appendix A. The required treatment and attenuation volumes are included on the pond sizing calculation sheets provided in Appendix B. The most conservative interchange alignment was utilized for determining storage requirements. Impacts to existing ponds was also factored into the analysis. The impacted volumes were combined with the required treatment and attenuation volumes as noted on the calculations provided in Appendix B. It has been assumed for sizing of the proposed wet ponds located within the SR 429 interchange that some type of barrier would be provided between the motoring public and the pond site. As noted in Section 5 of this report, no joint use or regional opportunities were identified as part of the environmental look around process. There are, however, ponds within the corridor owned by either FDOT District 5 or CFX that could accommodate some of the storage requirements. These existing ponds have been either noted in Section 6 or in the paragraphs below. A brief synopsis of the concerns and outstanding features related to each pond alternative is also provided in the paragraphs that follow and the evaluation matrix has been included in Appendix E. The location of all pond alternatives has been shown on the proposed drainage maps included in Appendix A.

8.1.1 Basin 5

Pond Alternative 1 and 2 were designed as dry retention ponds. Pond Alternative 1 will require an easement for conveyance and maintenance access. Pond Alternative 2 was located within the limits of Bill Fredrick Park. Pond Alternative 3 is an expansion of an existing Turnpike Pond which will not require the purchase of any additional right of way. None of the alternatives within Basin 5 will impact floodplains or wetlands.

8.1.2 Basin 6

Pond Alternatives 1 and 3 were designed as dry retention ponds. Pond Alternative 3 is a partial take of a parcel owned by AT&T. Pond Alternative 1 is a partial take of a property that will impact the access driveway to the property. The location of Pond Alternative 1 was positioned on the property such that the access driveway could be relocated to the north. Pond Alternative 2 is a partial take of a property that is not located adjacent to Turnpike Right of Way. An easement has been provided off Westover Roberts Road for conveyance and maintenance to this pond alternative. Other locations for this easement were considered, however, this location was the least impactful to the properties adjacent to Pond Alternative 2. None of the alternatives within Basin 6 will impact wetlands and Pond Alternatives 2 and 3 will not impact the floodplain. Although Pond Alternative 1 will impact the floodplain, these impacts will be negligible and can be accommodated on the proposed site.

8.1.3 Basin 7&8

Pond Alternative 1 and Pond Alternative 3 (Interchange Alternative) were designed as dry retention facilities. Pond Alternative 2 was designed as a wet detention pond. Since Pond Alternative 2 is located away from the Turnpike Right of Way access to the site will need to be accomplished by obtaining access through the right of way of some local roads. Neither Pond Alternative 1 or Pond Alternative 3 can treat enough pavement at their respective sites to meet water quality volume requirements as the elevation differential between these pond sites and the area east of Hempel Avenue is too pronounced to allow for a functional pond. Either linear stormwater management facilities within the existing right of way east of Hempel Avenue, utilizing the Basin 6 Alternative 1 site or part of the Basin 7&8 Alternative 2 site will be needed in order to meet treatment requirements. Calculations outlining how and where the linear stormwater management facilities would be provided are included on the Pond Alternative 1 sizing sheet provided in Appendix B. Additional discussion regarding these vertical constraints has also been provided in Section 6 of this report. It should be noted that the basins that currently do not discharge to MP 265 Lake will need to be accommodated in the interchange for all offsite alternatives and some pond locations within the interchange may require shielding in order to meet clear zone requirements.

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8.1.4 Basin 9

Pond Alternative 1 and Pond Alternative 2 were both designed as expansions of an existing Turnpike wet pond. Both of these pond sites are located adjacent to the low area of a closed basin. Both pond alternatives will impact the floodplain with compensation provided adjacent to each pond alternative. It is noteworthy to mention that development plans were submitted to the City of Ocoee during the fall of 2021 for the area encompassed by the Alternative 1 site. Alternative 2 is located within a conservation easement. Pond Alternative 3 site is also a designed to be a wet pond, however, based on the seasonal high water elevation of an adjacent development a pond liner will be required at this site. Alternative 3 is located on a large parcel that it shares with Basin 10 Alternative 3. This parcel is located away from Turnpike Right of Way so runoff will need to be conveyed within the right of way of a local road. Since this site is located approximately 3500 feet away from the low area of the basin, the hydraulics of the conveyance system to and from the site will be challenging. There are 0.6 acres of wetland impacts at Alternative 2 site.

8.1.5 Basin 10

Pond Alternative 1 (Interchange Alternative) and Pond Alternative 2 were designed as wet detention ponds. The Pond Alternative 3 site is also a designed to be a wet pond, however, based on the seasonal high water elevation of an adjacent development a pond liner will be required at this site. Alternative 3 is located on a large parcel that it shares with Basin 9 Alternative 3. This parcel is located away from Turnpike Right of Way so runoff will need to be conveyed within the right of way of a local road. Since this site is located away from the higher elevations adjacent to the interchange and runoff will have to be conveyed back towards the interchange to the outfall location, the hydraulics of the conveyance system to and from the site will be challenging. As an alternative, runoff discharging from the Pond 3 site could be sent to the outfall by conveying runoff to the west along Tomyon Boulevard. There are wetland impacts associated with the Alternative 1 and Alternative 2 sites. There will also be a negligible amount of floodplain impacts at the Alternative 2 site which can be compensated for on the remainder of the parcel. It is noteworthy to mention this site is located on a tract slated for development by the City of Ocoee.

8.1.6 Basin 11

Pond Alternative 1 and Pond Alternative 2 were designed as wet detention ponds. Pond Alternative 3 (Interchange Alternative) was designed as either new independent wet detention cells or an expansion of existing Turnpike Ponds TP-3 and TP-4. Since the volume associated with Pond TP-3 which is not impacted is minimal it was conservatively assumed that the entire pond is no longer functional. However, if one of the offsite alternatives were to be chosen as

the preferred alternative this remnant volume as well as additional area within the interchange would need to be utilized in addition to the storage associated with offsite alternatives in order to meet stormwater management requirements. It should be noted that the control elevation for Pond TP-4 is 4.5 feet higher than the control elevation for an adjacent existing FDOT District 5 pond which is located 200 feet to the east. With this significantly lower control elevation at the adjacent FDOT District 5 pond, the control elevation of the wet ponds associated with the interchange alternative were lowered to elevation 112.6 from 117.1 so as to correspond to the control elevation of the District 5 pond. In order to utilize this control elevation, it should be confirmed during the design phase that this lower control elevation will either not impact the remnant wetland located on the adjacent parcel or that these impacts are accounted for. Pond Alternative 1 is located on two existing FDOT parcels. Pond alternative 1 will impact 1.2 acres of wetlands whereas the Alternative 1 site impacts 0.5 acres, and the Alternative 3 site will not impact wetlands. The Basin 11 sites do not impact any floodplains.

8.1.7 Basin 12

All three pond alternatives within Basin 12 were designed as wet detention facilities. Sites 2 and 3 are located within the 330-foot buffer of an eagle's nest. Site 1 is located within the 660-foot buffer of this same eagle's nest. The majority of sites 1 and 3 are located within the limits of the floodplain and have significant wetland impacts. Site 2 was positioned on the parcel such that impacts to wetlands are avoided and impacts to the floodplain are negligible. Although Site 2 is shown as a complete take of the parcel, over 1.3 acres of the parcel are undisturbed including all structures so there may be an opportunity to perform a partial take of this parcel. The right of way for a local road will need to be crossed to reach all three sites. Site 1 and Site 3 are located within the limits of a conservation easement.

8.1.8 Basin A

All three pond alternatives within Basin A were designed as wet detention facilities. Site 2 and site 3 have been improved with structures located on these sites. To obtain access to all 3 sites the conveyance system will have to cross a local road. There are floodplain impacts and minimal wetland impacts at Site 3. It should also be noted that Site 3 is located within the 660 foot buffer of an eagle's nest.

8.1.9 Basin B

All three pond alternatives within Basin B were designed as wet detention facilities. Alternative 1 is an expansion of an existing Turnpike Pond which is located on an existing Turnpike parcel. There are no wetlands or floodplains on the alternative 1 site. There are 3.7 acres of wetlands impacted at the Alternative 2 site and 0.5 acres of wetlands impacted at the Alternative 3 site. The alternative 2 site is located entirely within the floodplain with compensation provided

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adjacent to the pond. The area needed for Alternative 2 encompasses two parcels. Alternative 3 is located away from Turnpike Right of Way and would need to be accessed through the right of way of an adjacent local road. Since Alternative 3 is located approximately 3000 feet from the low area and ultimate outfall for Basin B, the pond site is significantly larger in order to account for the hydraulics of the conveyance system.

8.1.10 Basin C

All three pond alternatives within Basin C were designed as wet detention facilities. Pond Alternative 1 is located entirely within the floodplain and has significant wetland impacts. Floodplain compensation will be provided adjacent to Pond Alternative 1. Pond Alternative 1 is also located within the limits of Tucker Ranch Recreation and Nature Complex. Although the site of Pond Alternative 3 is entirely within the limits of the floodplain shape provided by FEMA, LIDAR data indicates the elevations associated with this site are almost entirely outside the limits of the floodplain. Since it is unclear how much of the site is actually below the 100-year floodplain elevation it was not chosen as the preferred alternative. Additional ground survey should be performed during the design phase to determine the viability of the Alternative 3 Site. Pond Alternative 2 is located outside the limits of the floodplain and does not impact wetlands.

8.1.11 Basin D

All three pond alternatives within Basin D were designed as dry retention ponds. Pond Alternative 1 and Pond Alternative 2 were both rated medium for hazardous material potential. The interchange alternative has been identified as Pond Alternative 3 in the evaluation matrix. There are no wetland impacts or floodplain impacts at any of the Basin D pond alternative sites.

8.1.12 Basin E

Since the improvements proposed within Basin E were accounted for under SJRWMD Permit No. 41869-6, no pond alternatives are needed within this basin. Relevant excerpts from the permit documentation have been included in Appendix F.

8.1.13 Basin SR 408

Pond Alternative 2 and Pond Alternative 3 were designed as dry retention ponds. The Pond Alternative 1 site was designed as a wet detention pond, however, based on the seasonal high water elevation of an adjacent development a pond liner will be required at this site. Pond Alternative 2 was designed as an expansion of an existing dry retention pond constructed as part of the extension of the East-West Expressway. Pond Alternative 3 is a partial take of the Camp Ithiel Church and Retreat Center property which is a developed parcel located directly east of Hempel Avenue. As there is no direct access to Pond Alternative 3 from Turnpike Right of Way, the conveyance will need to be placed within the Hempel Avenue Right of Way. There

are negligible impacts to the floodplain at Pond Alternative 2 that can be compensated for adjacent to the pond grading.

8.1.14 Basin SR 429N

All three Pond Alternatives within Basin SR 429N were designed as wet detention ponds. All of these pond sites are located adjacent to the SR 429 Right of Way. Pond Alternative 2 has 1.7 acres of wetland impacts whereas the other two alternative do not impact any wetlands. Pond Alternative 1 and Alternative 3 have been rated medium for potential contamination whereas Alternative 1 was rated low. None of the alternatives are located within the floodplain. All three alternatives are partial takes of larger parcels. It should be noted that improvements within this basin are such that the stormwater management requirements can most likely be accommodated within the existing ponds with minor modifications during the design phase.

8.1.15 Basin SR 429S

All three Pond Alternatives within Basin SR 429S were designed as wet detention ponds. All of these pond sites are located adjacent to the SR 429 Right of Way. Pond Alternative 3 is an expansion of an existing CFX Pond. Alternative 1 and Alternative 2 are located within Warrior Park. Alternative 3 impacts 0.24 acres of wetlands. It should be noted that improvements within this basin are such that the stormwater management requirements can most likely be accommodated within the existing ponds with minor modifications during the design phase

8.1.16 Basin DSR50N

Pond Alternative 1 and Pond Alternative 2 were designed as wet detention ponds. Both Alternative 1 and Alternative 2 were ranked medium for potential contamination. For conveyance access to Alternative 1, storm drain piping will need to be installed within the right of way of a local road. For Pond Alternative 3 it was assumed the required volumes could be accommodated within the existing FDOT Ponds located adjacent to SR 50. The as-built plans from FPID No. 238429-4-52-01 show there is 0.65 acre-ft of static volume that can be accommodated while still meeting freeboard in Pond G and 0.08 acre-ft of static volume available in Pond CITGO B.

SECTION 9.0 – RESULTS

The analysis presented in this report identified potential pond sites based on recent aerials and other preliminary data. Once the potential pond sites were narrowed down to three alternatives, a more detailed analysis was conducted utilizing the following parameters: right of way requirements, easement requirements, atypical construction costs for a given pond site, potential contamination, threatened endangered & significant species, maintenance, cultural resources, wetland impacts, floodplain impacts and impacts to other relevant features as noted

in the pond site evaluation matrix provided in Appendix E. In conjunction with this analysis, a Contamination Screening Evaluation Report, Natural Resource Evaluation, and a Cultural Resource Assessment Survey were prepared and are provided under separate cover with this submittal. The preferred alternative for each basin and anticipated right of way needs associated with the preferred alternatives are outlined in Table 8. The evaluation matrix which contains the details of the analysis has been provided in Appendix E.

Table 8: Preferred Pond Alternatives and Anticipated Right of Way

Basin	Preferred Alternative	Anticipated Right of Way Requirements (acres)
5	3	0
6	2	3.31
7 & 8	3	0
9	2	4.04
10	1	0
11	3	0
12	1	3.95
A	1	3.35
B	1	0
C	2	2.30
D	3	0
E	Accommodated in Adjacent Project	0
SR 408	2	2.36
SR 429N	1	2.31
SR 429S	3	0.67
DSR50N	3	0

SECTION 10.0 – CONCLUSIONS

As part of this analysis, pond site alternatives were analyzed for sixteen basins. The previous sections of this report and the evaluation matrix included in Appendix E summarize the results of the analysis. A preferred alternative was selected based off of this analysis with the selection and estimated right of way needs summarized in Table 8 provided in the previous section. It should be noted that the information contained herein is preliminary and will need to be refined once this project enters the design phase. As outlined in previous sections of this report, there is excess treatment and attenuation provided within the currently permitted stormwater management system that should be accounted for during the design phase. There are also

areas within the existing right of way which could also be utilized for stormwater management that should also be investigated during the design phase.

SECTION 11.0 – REFERENCES

(2023). *FDOT Drainage Design Guide*.

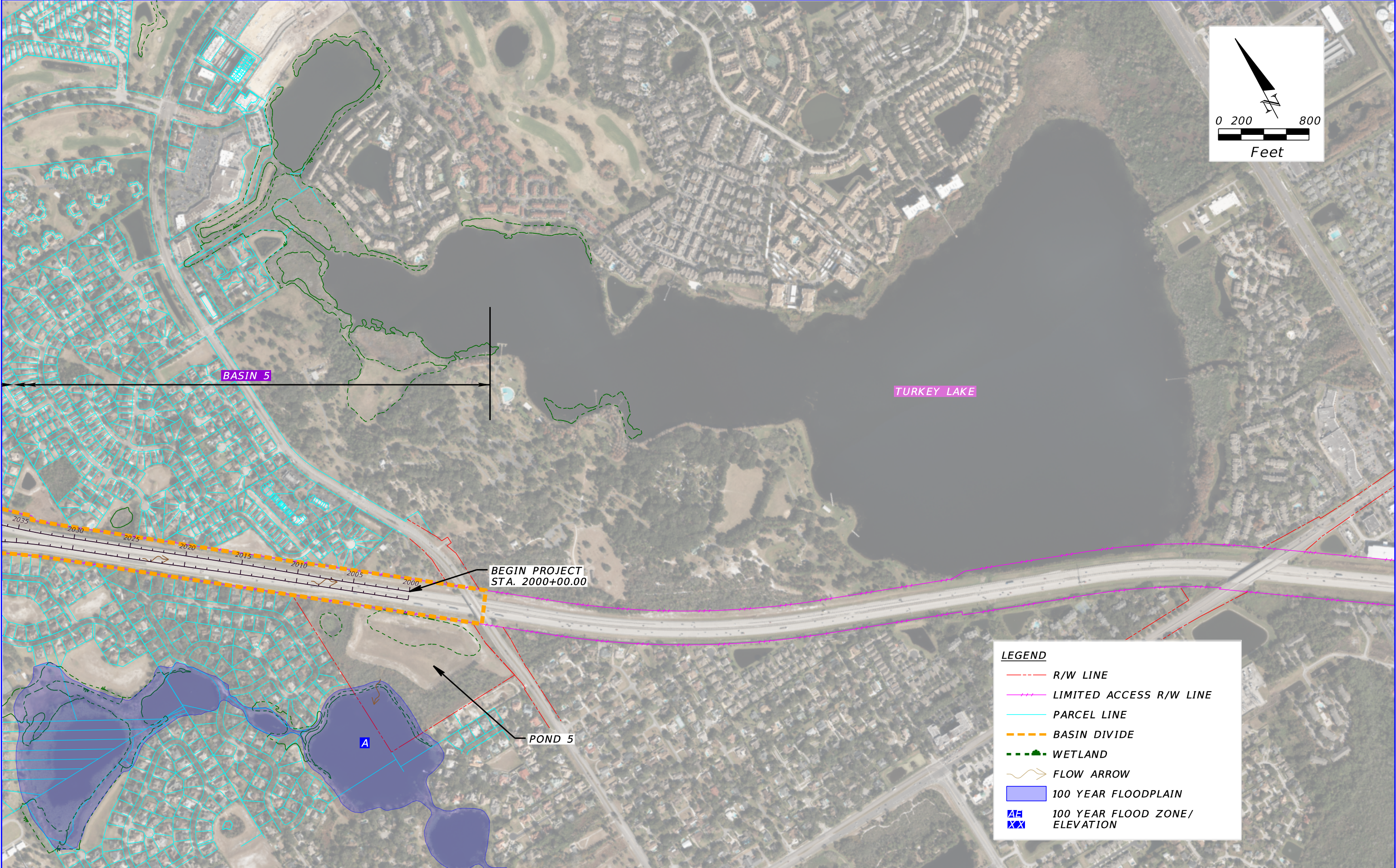
(2023). *FDOT Drainage Manual*.

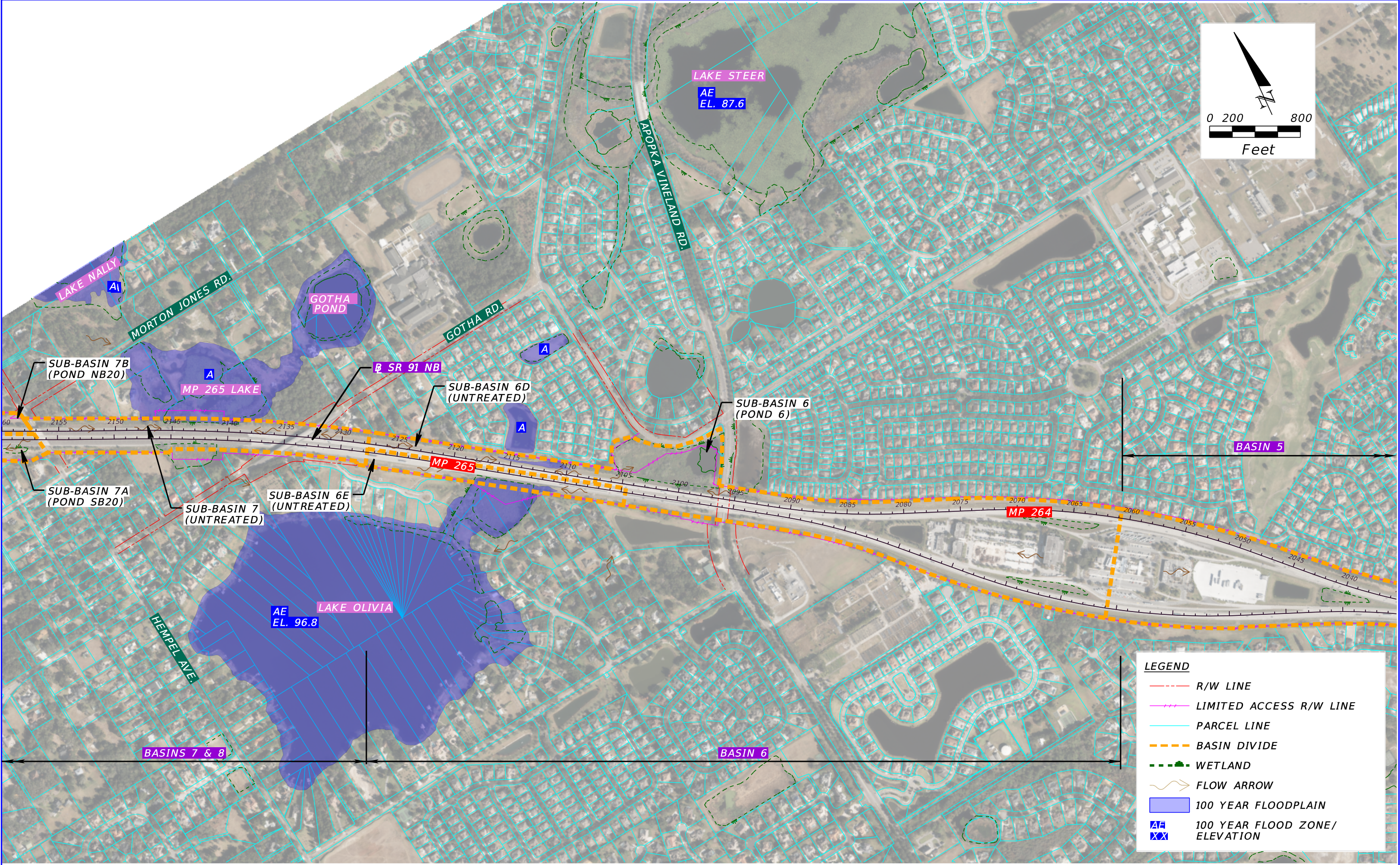
(2018). *ERP Applicant's Handbook Volume I*.

(2018). *SJRWMD ERP Applicant's Handbook Volume II*.

(2016). *SFWMD ERP Applicant's Handbook Volume II*.

APPENDIX A – DRAINAGE MAPS AND FIGURES





TURNPIKE (SR 91) WIDENING
FROM SOUTH OF SR 408 TO SR 50

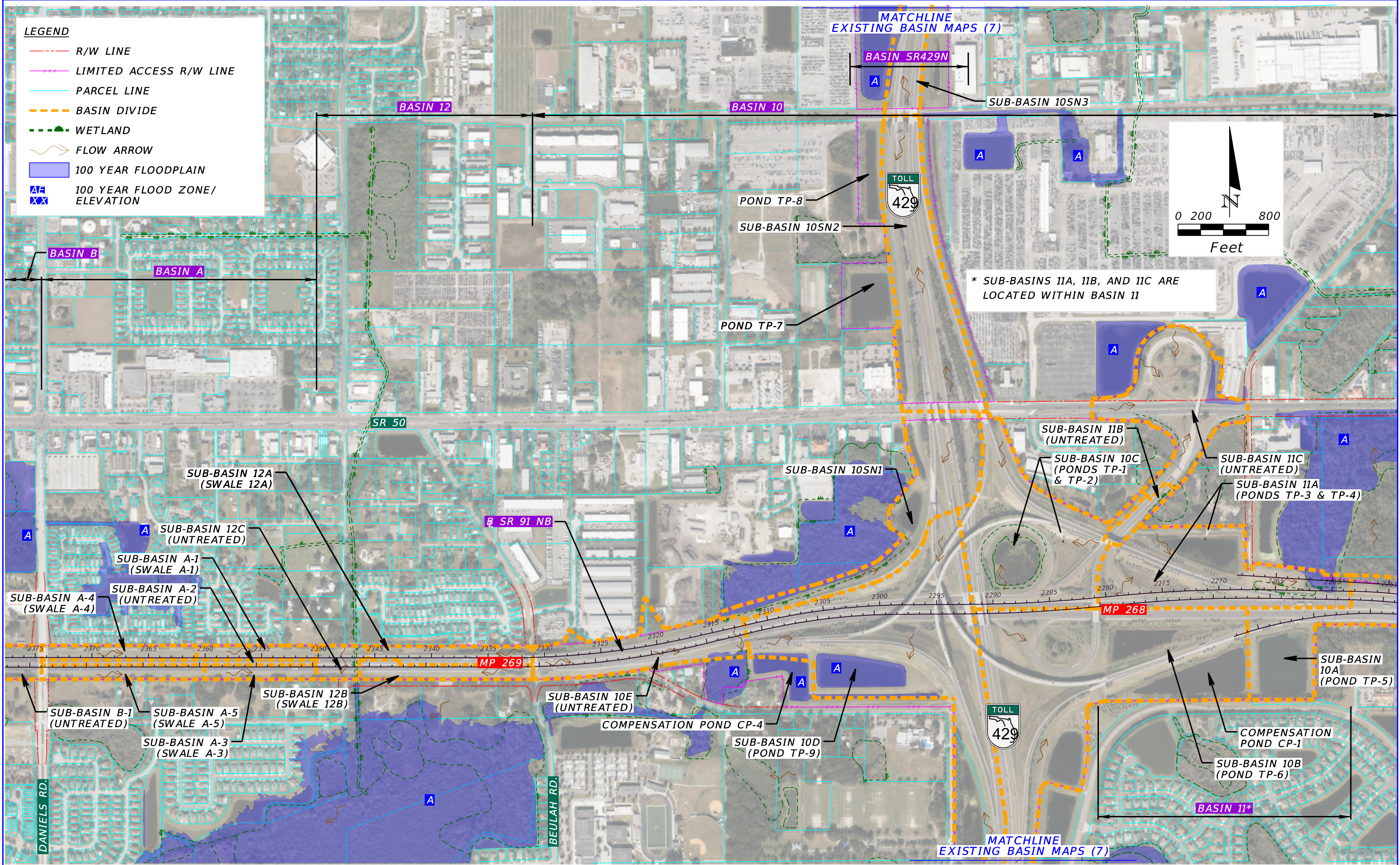
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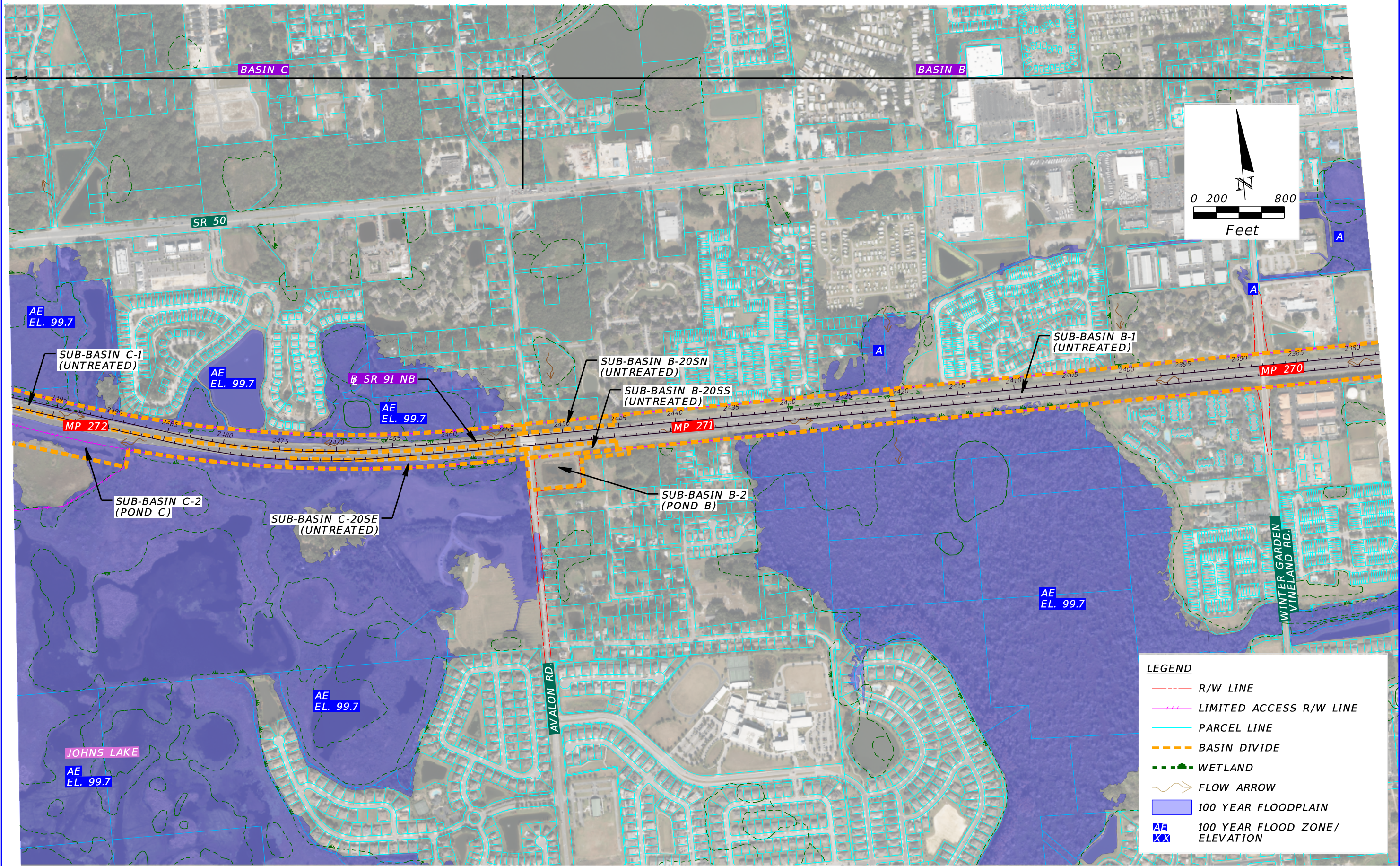
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ORANGE	444007-1-22-01

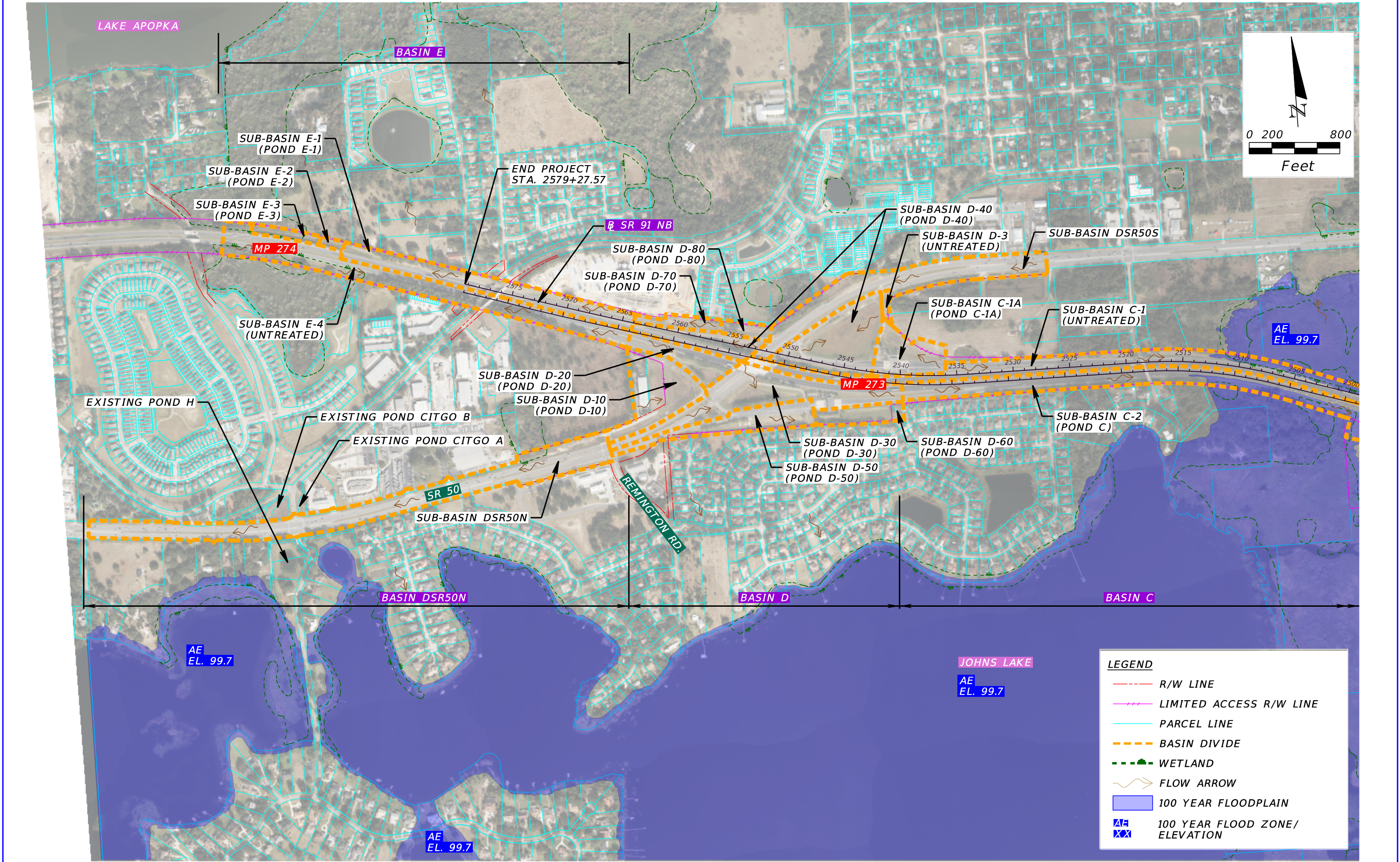
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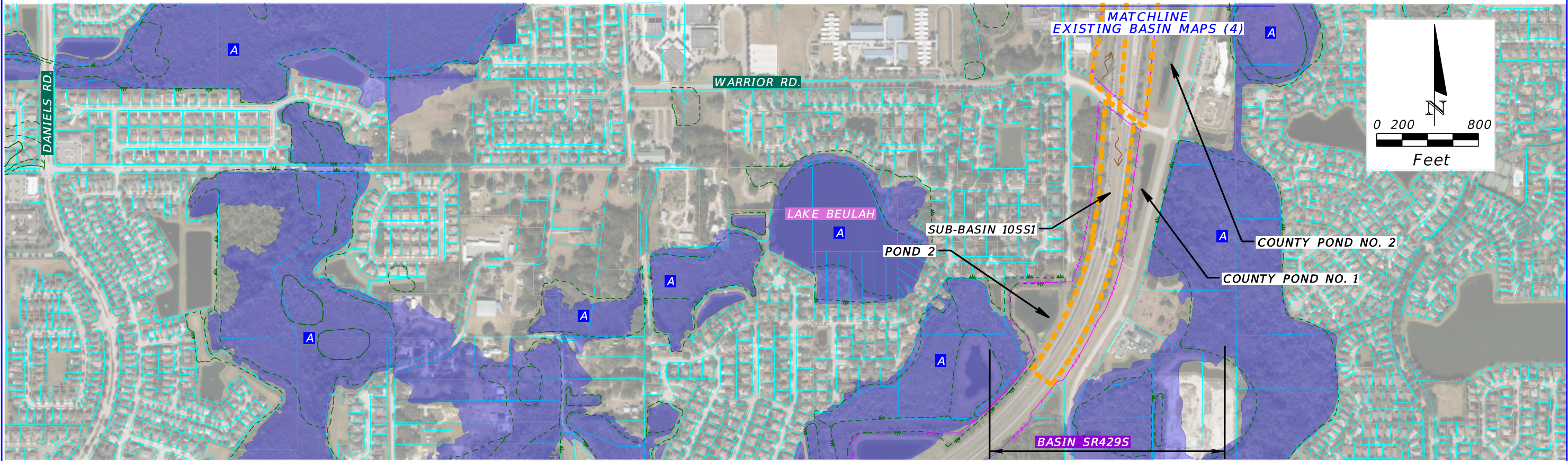
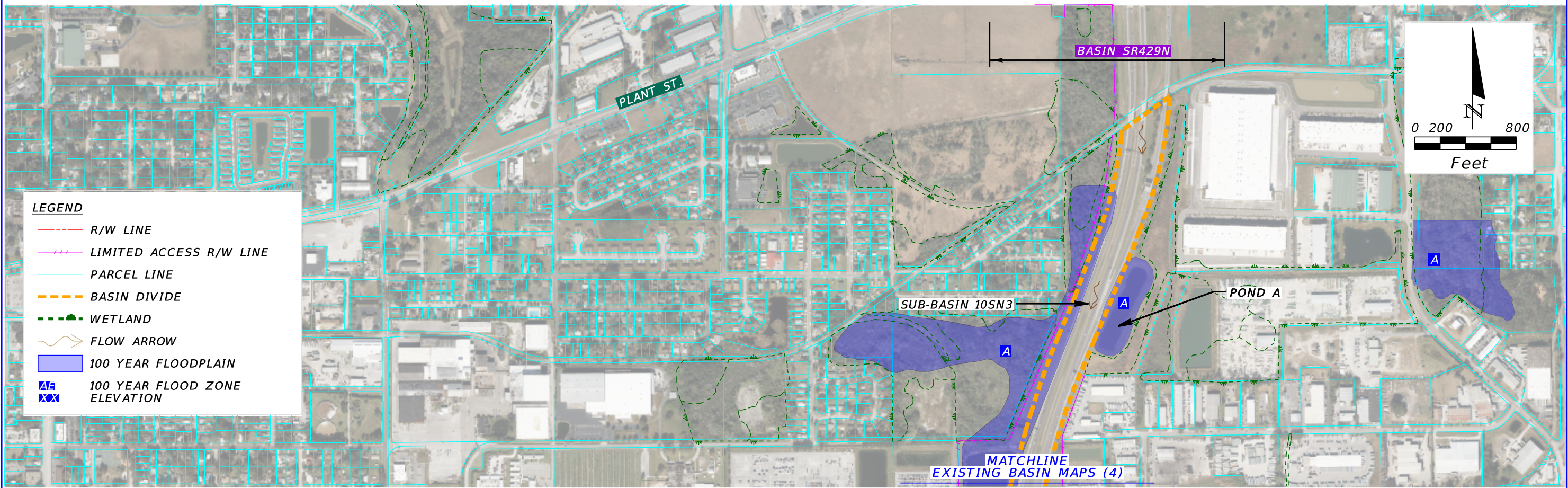
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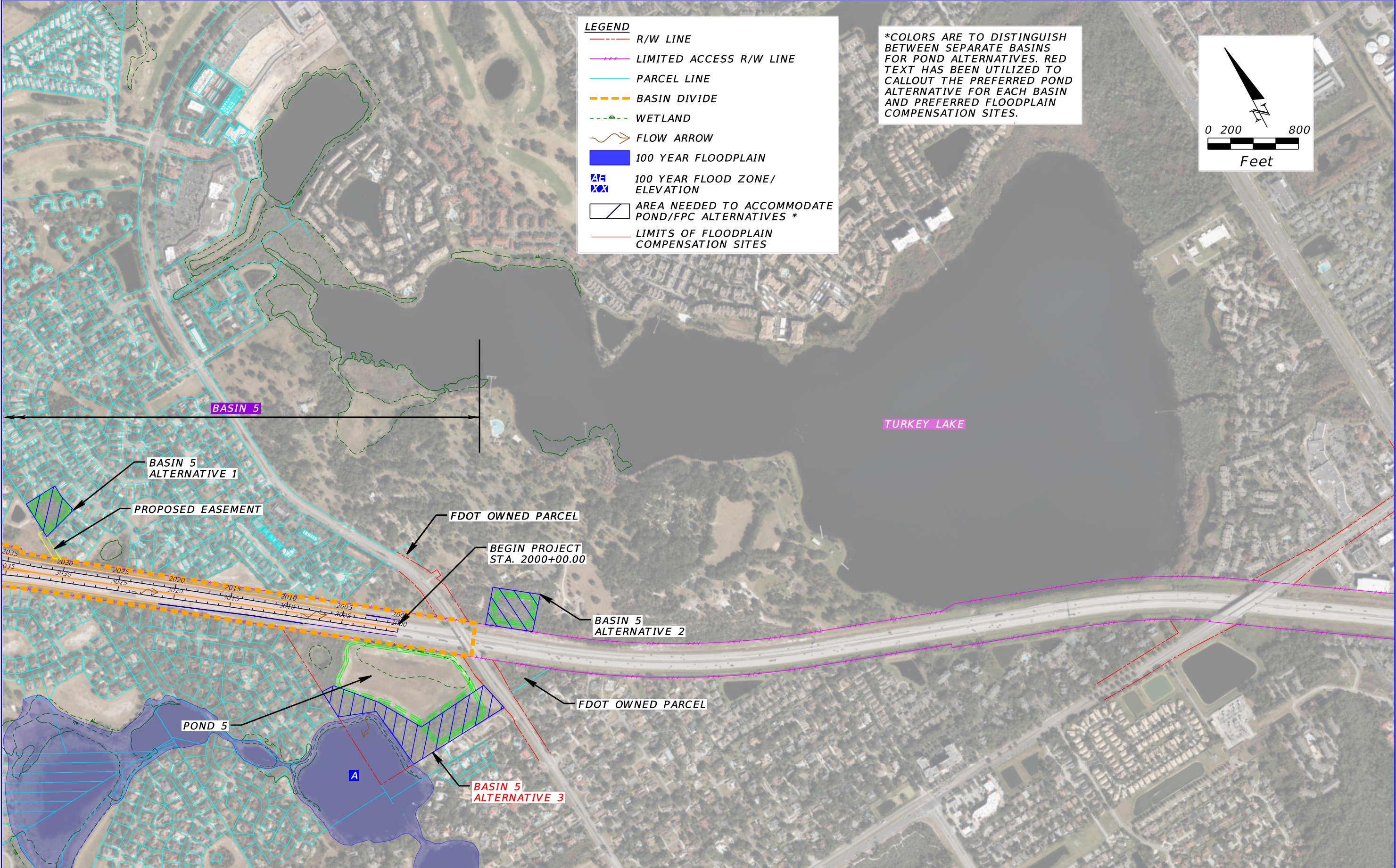
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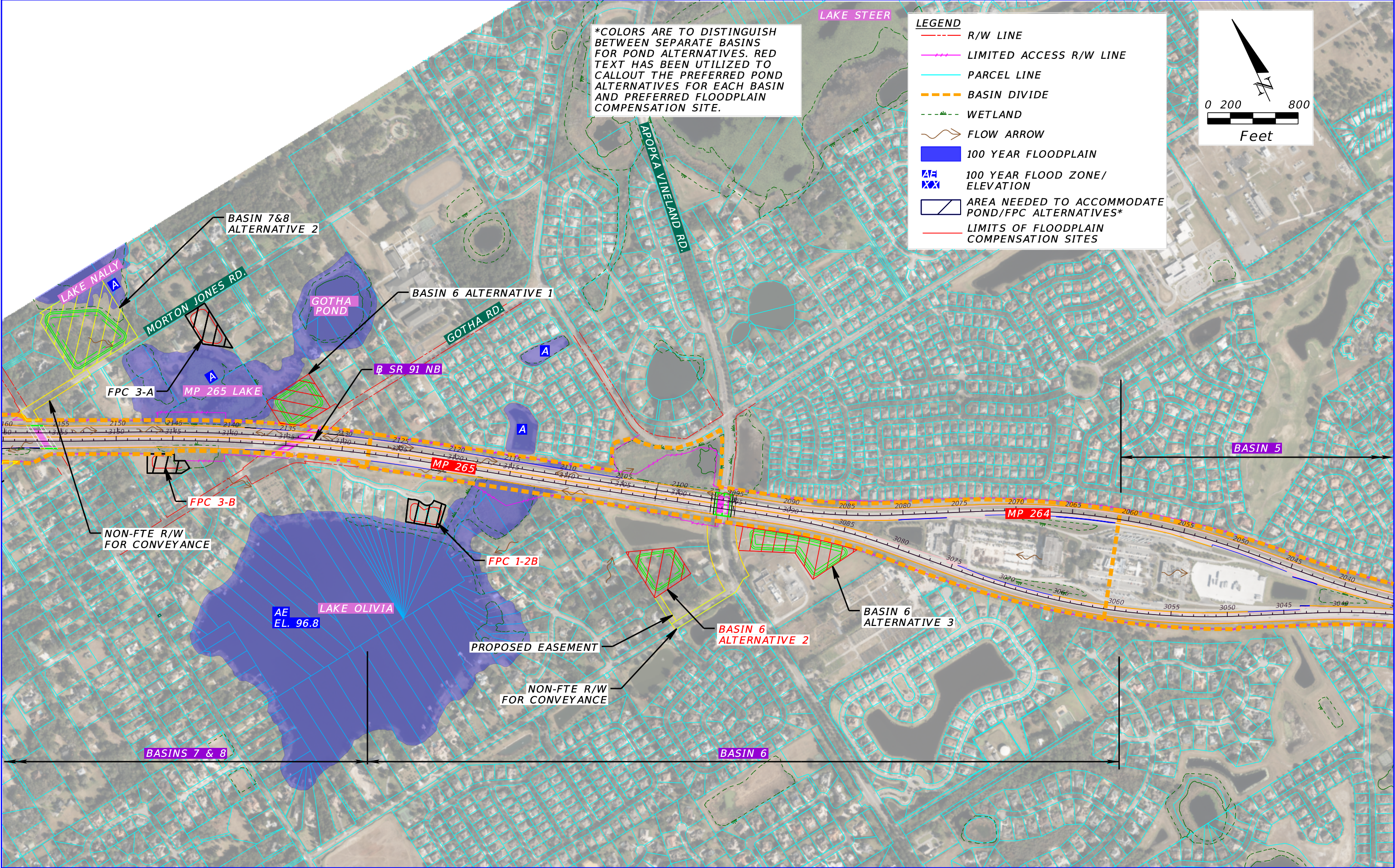


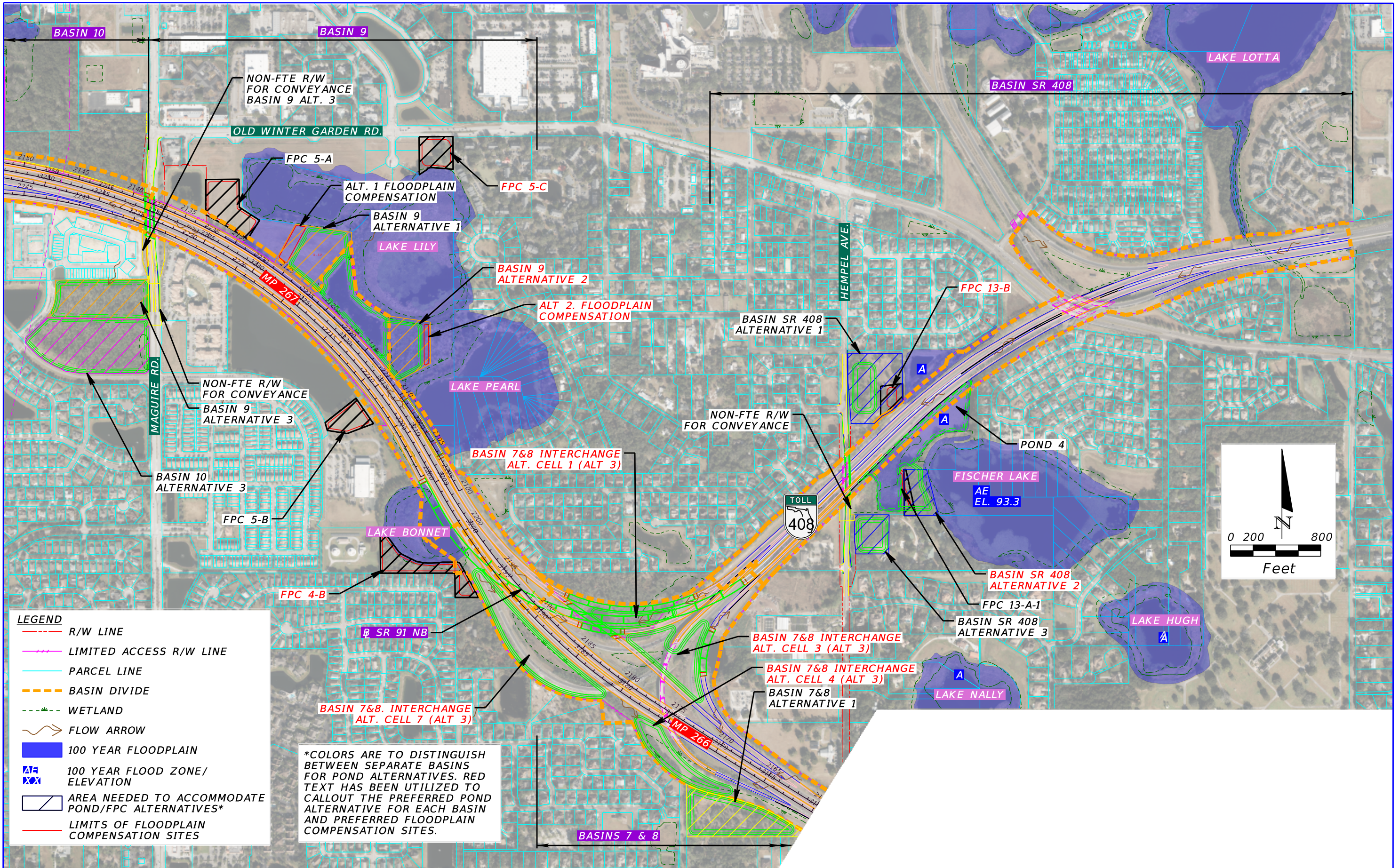


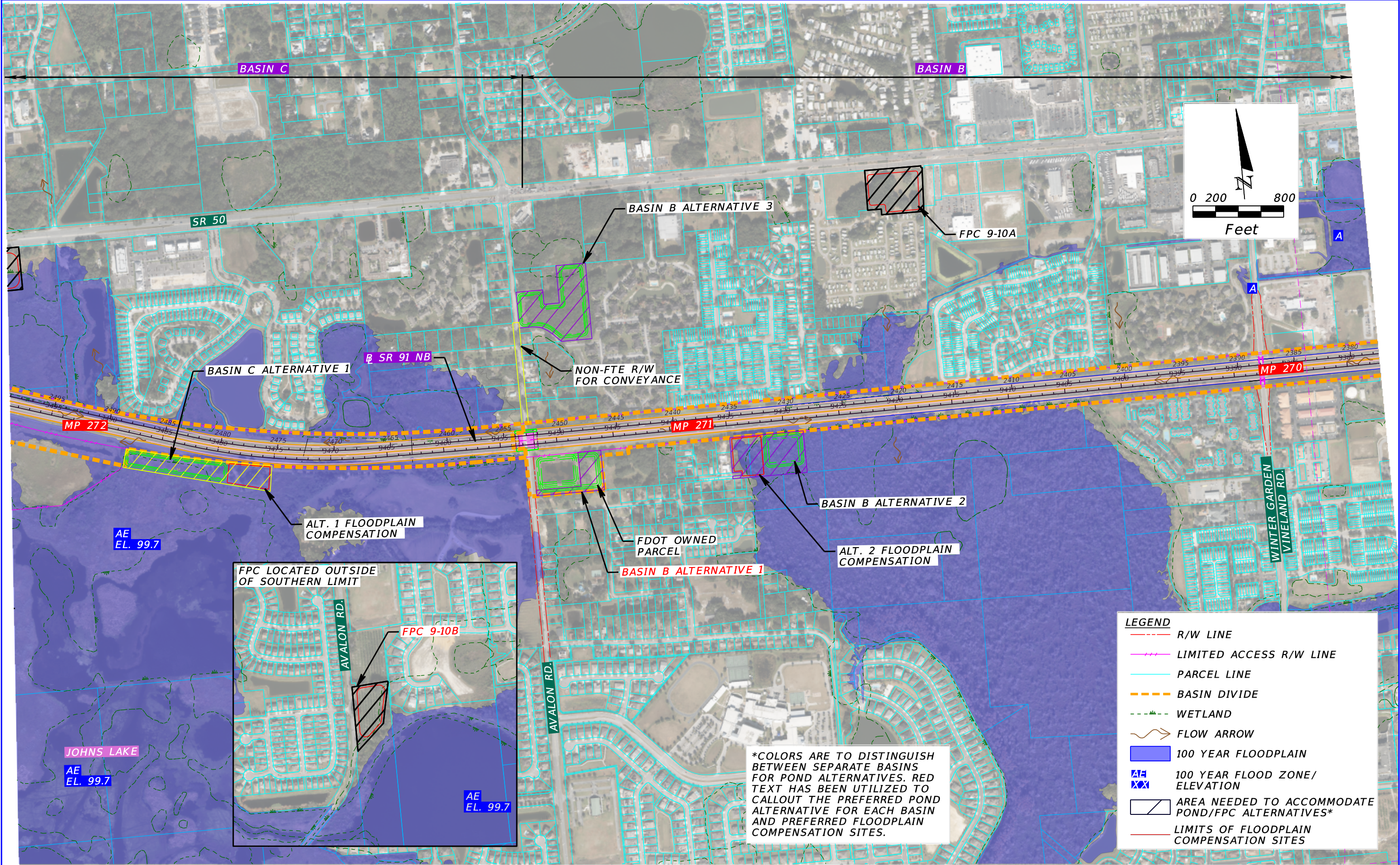


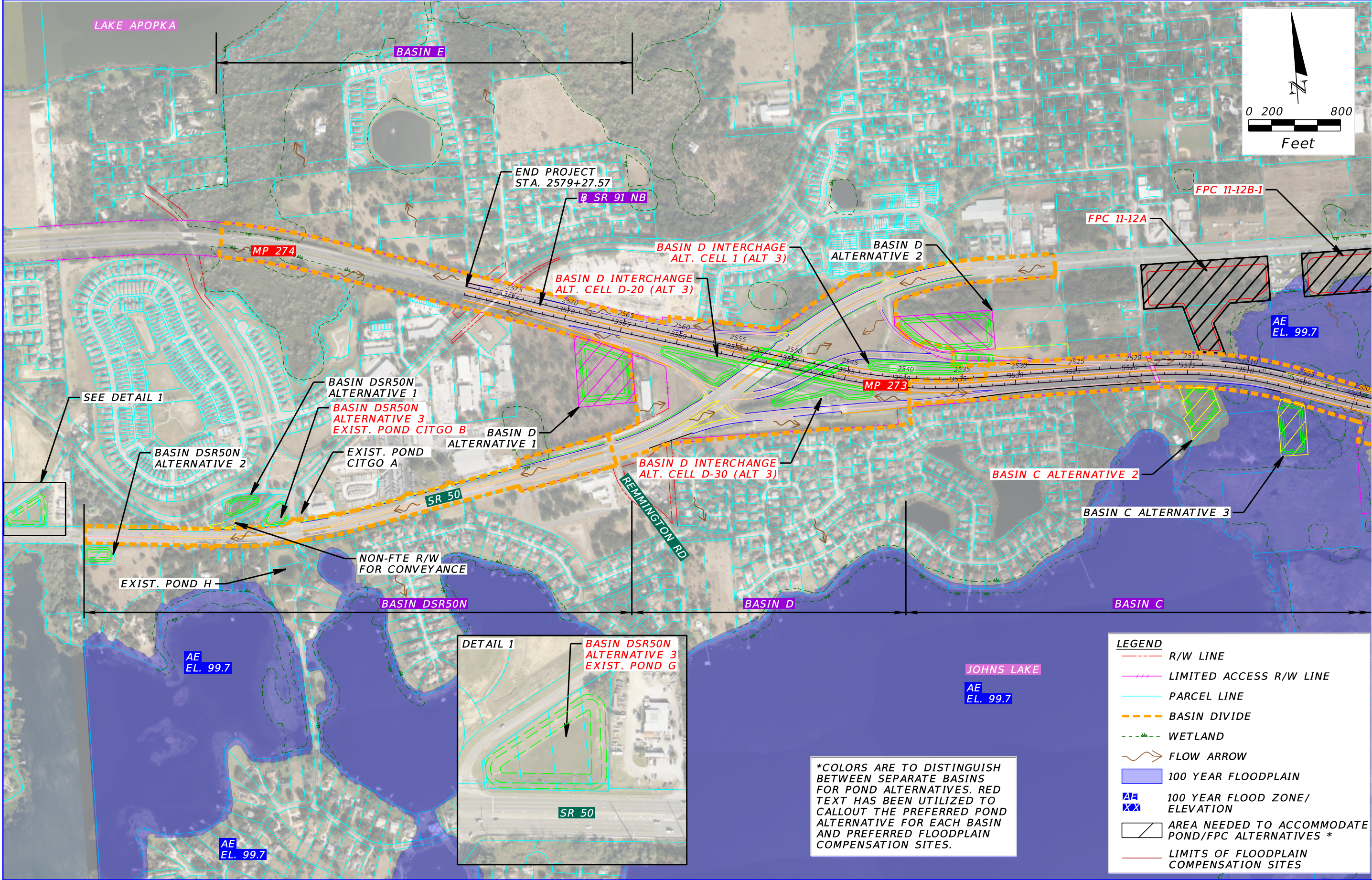


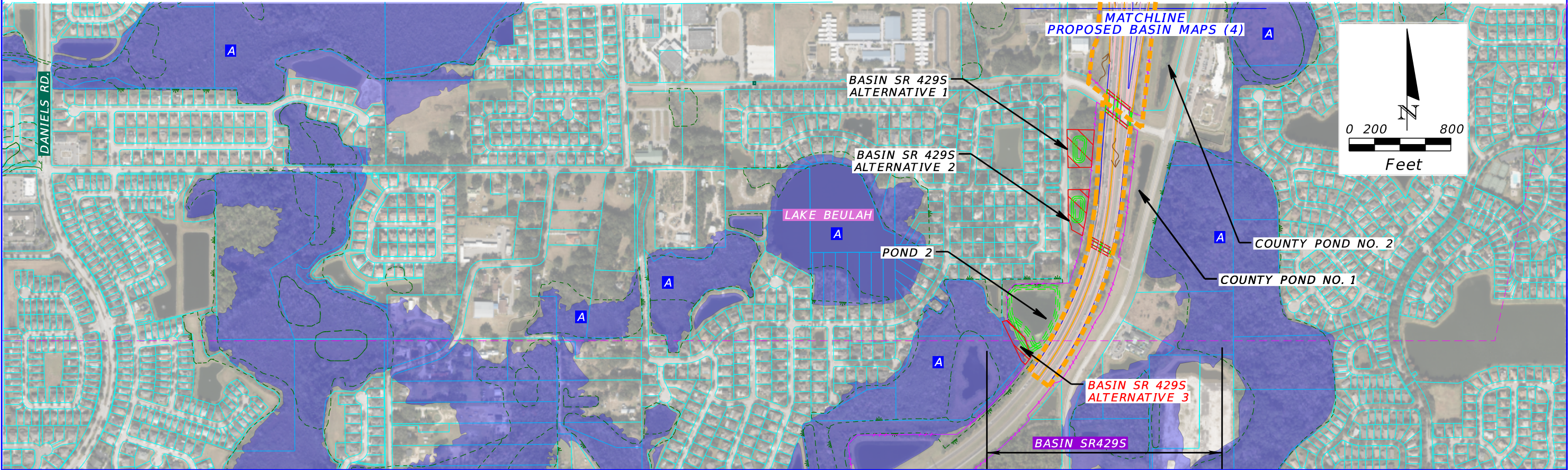
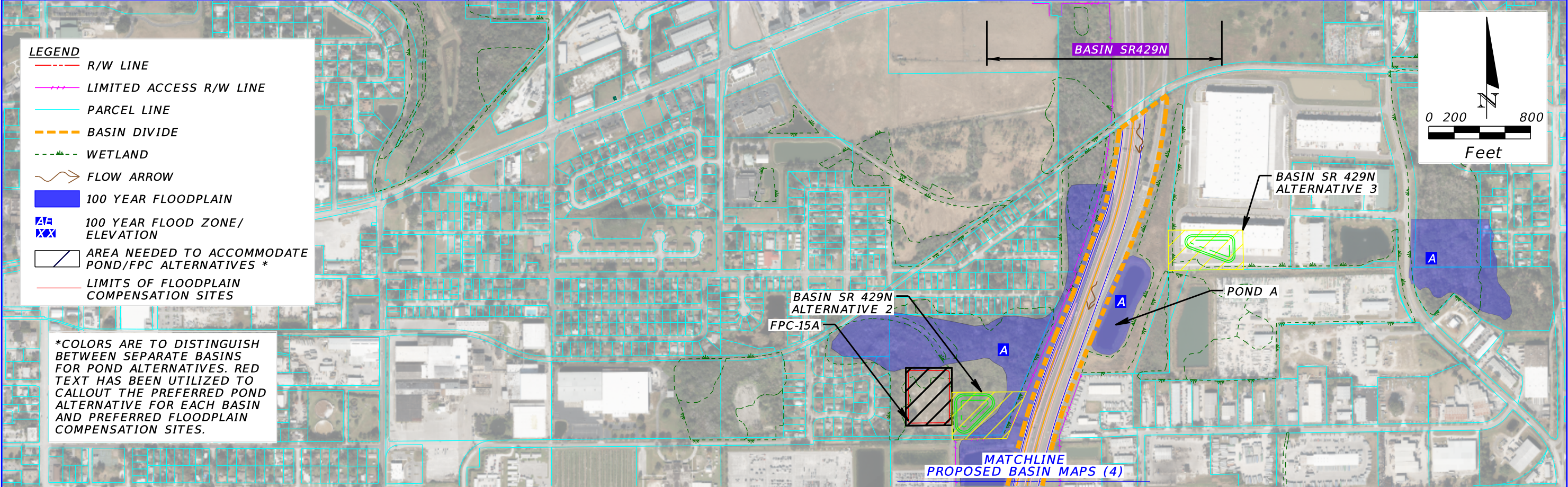


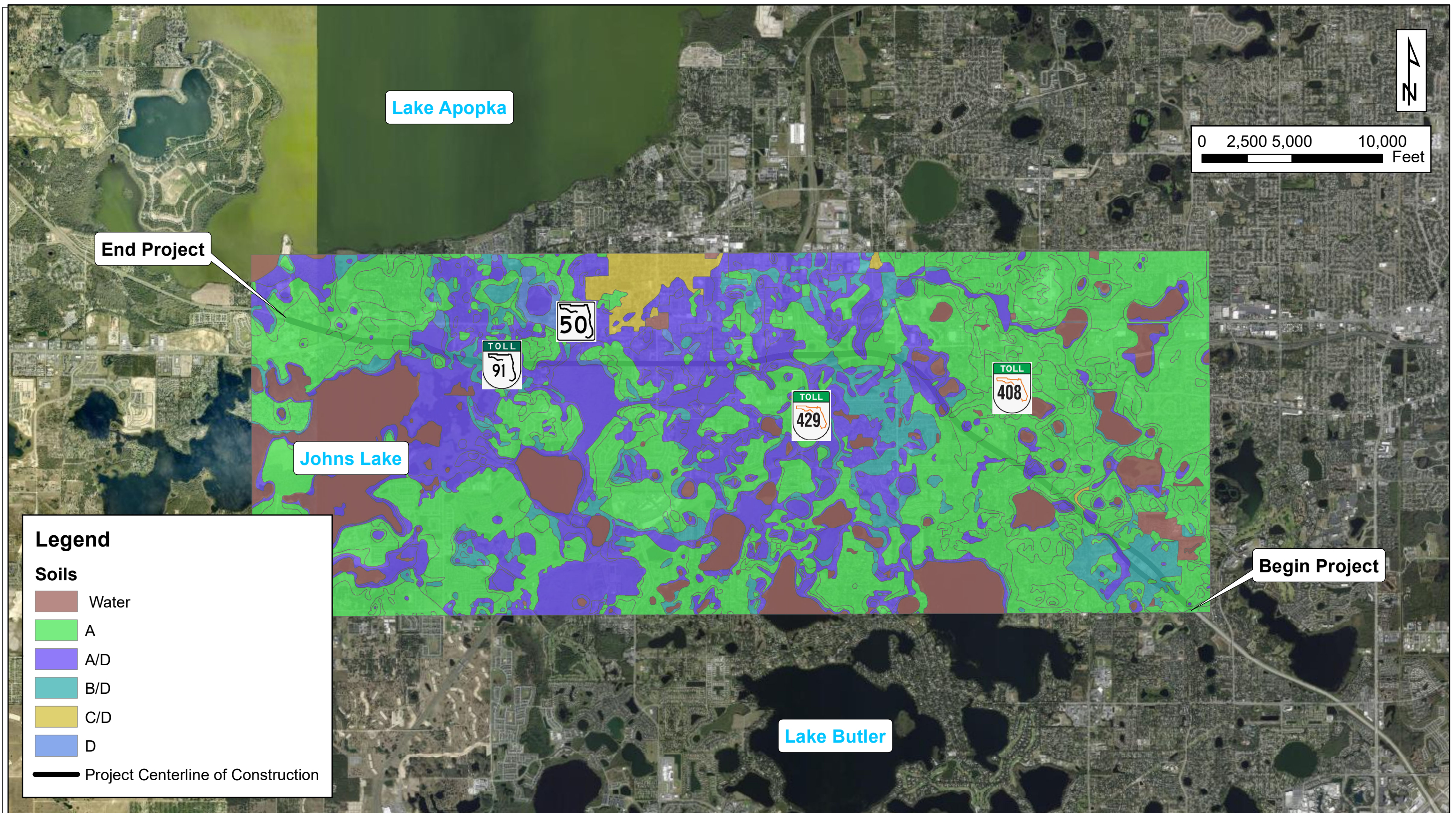












Turnpike (SR 91) Widening Project Development and Environment (PD&E) Study

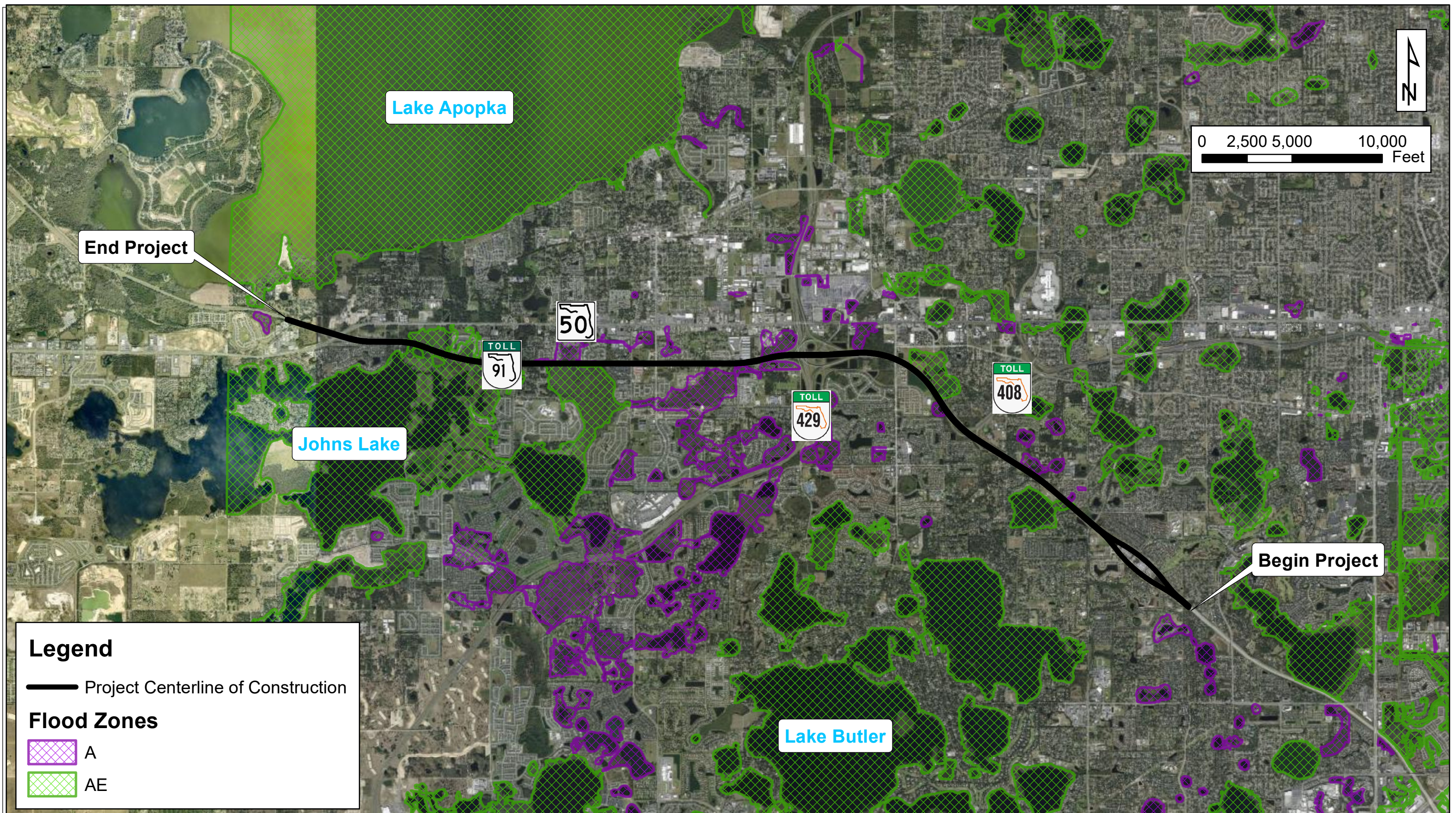
from South of SR 408 to SR 50 (MP 263 to 273)

Orange County, Florida

Financial Project ID (FPID) No. 444007-1-22-01

ETDM No.:14378

Figure A: Soils Map



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

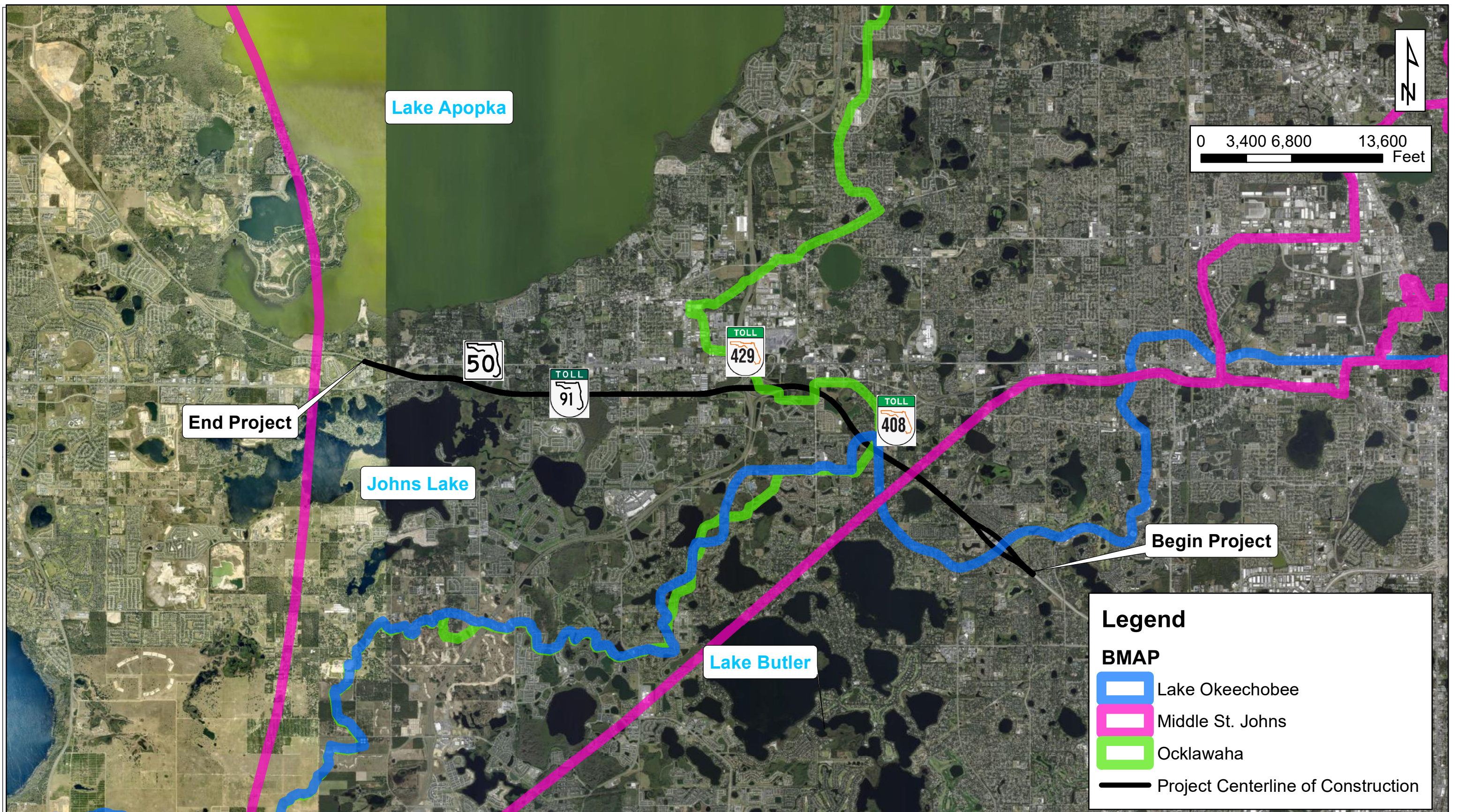
from South of SR 408 to SR 50 (MP 263 to 273)

Orange County, Florida

Financial Project ID (FPID) No. 444007-1-22-01

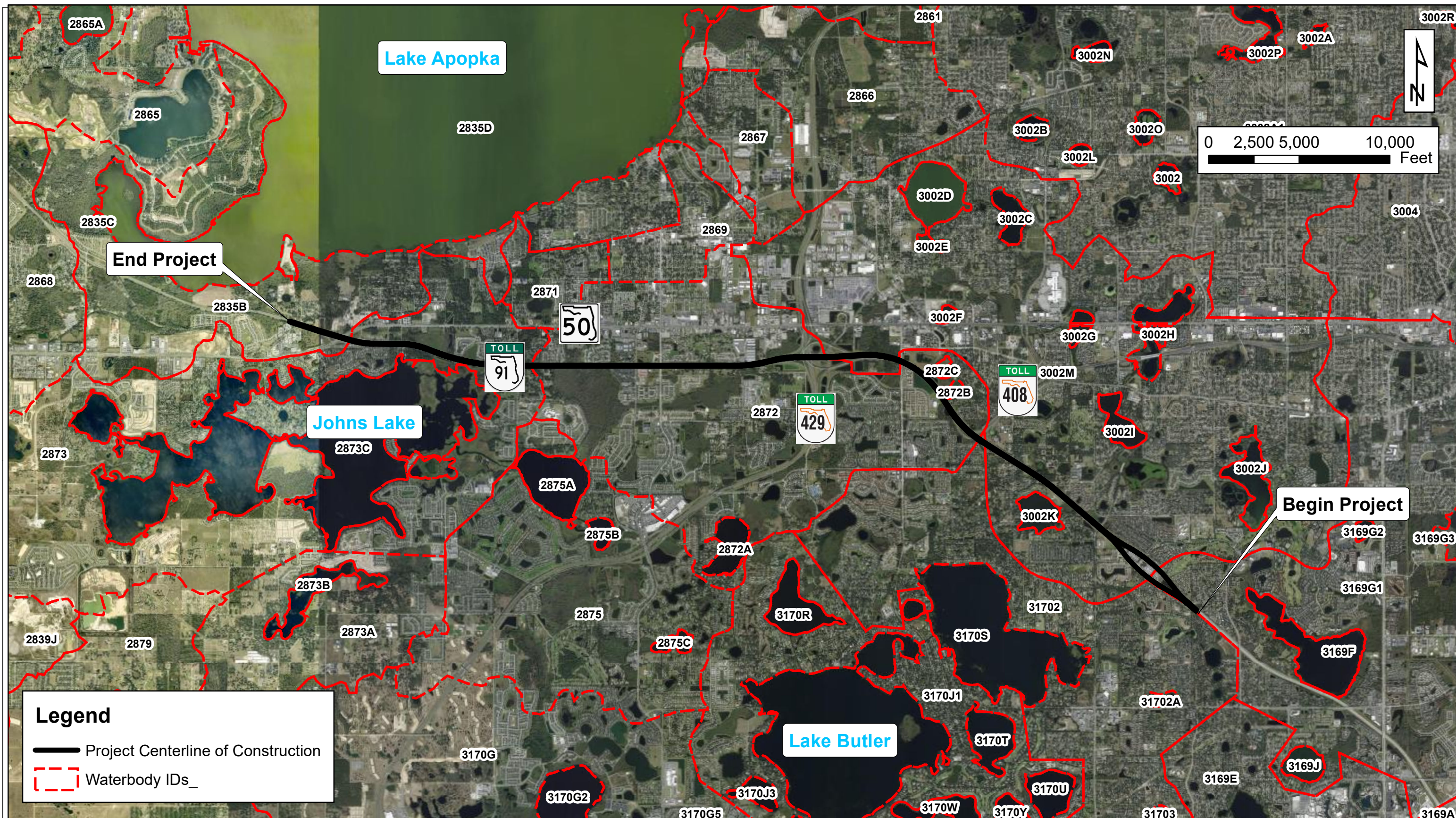
ETDM No.:14378

Figure B: FEMA FIRM Map



Turnpike (SR 91) Widening Project Development and Environment (PD&E) Study
 from South of SR 408 to SR 50 (MP 263 to 273)
 Orange County, Florida
 Financial Project ID (FPID) No. 444007-1-22-01
 ETDM No.:14378

Figure C: Best Management Action Plan (BMAP)



Turnpike (SR 91) Widening Project Development and Environment (PD&E) Study
 from South of SR 408 to SR 50 (MP 263 to 273)
 Orange County, Florida
 Financial Project ID (FPID) No. 444007-1-22-01
 ETDM No.:14378

Figure D: WBIDs

APPENDIX B –POND SIZING CALCULATIONS

BASIN 5

BASIN 5

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : LER
Checked by : JAF

Total Volumetric Requirements for Basin 5

Treatment Volume Required for Additional Impervious Area: 1.43 acre-ft
Treatment Volume Impacted: 0.00 acre-ft
Total Treatment Volume Required: 1.43 acre-ft

Attenuation Volume Required for Additional Impervious Area: 4.13 acre-ft
Attenuation Volume Impacted: 0.00 acre-ft
Attenuation Volume Required: 4.13 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/01/2022

Basin 5 Pond Alternative 1, Station 2040+00 LT

Dry Retention Calculations

Existing Ground at Pond site =	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information). 154.00
ELEV EXST EOP @ Low Point =	NAVD 88 from as-built plans 406148-1-52-01 Cross Section 2740+00 (see note 2 below) 143.00
Elev SHW =	NAVD 88 from SFWMD permit 010221-15 MetroWest Part of Tract 25. 142.00
Treatment Volume Required	1.43 AC-FT.
Attenuation Volume Required	4.13 AC-FT.
Pond Area Based on treatment volume	0.90 AC
Assume 1 foot of pond freeboard	1.00 FT.
Treatment Depth	1.60 FT.
Total Attenuation Depth based on Pond Area	4.61 FT.
Total Depth from SHWL to Top of Berm	7.21 FT.
Elev Pond Bottom=	147.0
Top of Berm Elevation given a total depth =	154.2
Unit Length Based on L/W = 2	279 FT.
Unit Width Based on L/W = 2	140 FT.
Maintenance Berm Width of 15-ft	30 FT.
Grade Adjustment Width Assumed 1:2	1 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	58 FT.
Total Pond Length (including maintenance berm and adjustments)	368 FT.
Total Pond Width (including maintenance berm and adjustments)	228 FT.
Preliminary Property Size Required	1.93 AC.
Preliminary Property Size Required with 10% Contingency	2.12 AC.
Property Size Provided	2.16 AC.

Notes:

1. NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29
2. The elevation associated with the property identified with this alternative will not allow for all of the increase in impervious area to be sent to this site. In order to meet stormwater management requirements, some of the existing pavement on the western end of the basin treated in existing Pond 5 (Station 2005+00 Lt) Will need to be diverted to this pond alternative and an equivalent amount of proposed pavement on the eastern end of the basin will need to be sent to existing Pond 5.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LR
Checked by: JAF
Date: 02/01/2022

Basin 5	Pre-Development Condition		Post Development Condition	
Total Area, acre	70.79	CN	70.79	CN
Pond Area, ac	3.25	100	3.25	100
Impervious Area, ac	36.27	98	43.15	98
Pervious Area, ac	31.27	50	24.39	50
CN	76.8		81.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.02		2.27	
Runoff Depth (Q), in	12.87		13.57	
Runoff Volume, acre-ft	75.92		80.04	
Volume Differential, acre-ft	4.13			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			1.43	
Total Volume Required, acre-ft	5.56			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 12/07/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 5

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	15.95 ac	A	39	622.05	Open Spaces, Lawns/Good Condition
Pervious Area	15.32 ac	B	61	934.52	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	36.27 ac		98	3554.46	Roadway Pavement
Wetted Pond Area	3.25 ac		100	325.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	70.79 ac			5436.03	76.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.29 ac	A	39	479.31	Open Spaces, Lawns/Good Condition
Pervious Area	12.10 ac	B	61	738.10	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	43.15 ac		98	4228.70	Roadway Pavement
Wetted Pond Area	3.25 ac		100	325.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	70.79 ac			5771.11	81.5 = Weighted CN



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LR
Checked by: JAF
Date: 02/01/2022

Basin 5 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.84	CN	1.84	CN
CN	45.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	12.22		15.64	
Runoff Depth (Q), in	7.13		5.81	
Runoff Volume, acre-ft	1.09		0.89	
Volume Differential, acre-ft	0.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/01/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 5 Alternative 1 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.84 ac	A	45	82.80	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.84 ac			82.80	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.84 ac	A	39	71.76	Pond
Total Area	1.84 ac			71.76	39.0 = Weighted CN

BASIN 5

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : LER
Checked by : JAF

Total Volumetric Requirements for Basin 5

Treatment Volume Required for Additional Impervious Area:	1.43 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.43 acre-ft

Attenuation Volume Required for Additional Impervious Area:	4.13 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	4.13 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/01/2022

**Basin 5 Pond Alternative 2, Northeast Corner of
SR 91 and South Hiawasse Road**

Dry Retention Calculations

Existing Ground at Pond site =	139.00	NAVD 88 estimated from cross sections as-built plans 406148-1-52-01 and LIDAR.
ELEV EXST EOP @ Low Point =	143.00	NAVD 88 from as-built plans 406148-1-52-01 Cross Section 2740+00
Elev SHW =	130.50	NAVD 88 from as-built plans 406148-1-52-01 Cross Section 2725+00
Treatment Volume Required	1.43 AC-FT.	
Attenuation Volume Required	4.13 AC-FT.	
Pond Area Based on treatment volume	1.43 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	1.00 FT.	
Total Attenuation Depth based on Pond Area	2.88 FT.	
Total Depth from SHWL to Top of Berm	4.88 FT.	
Elev Pond Bottom=	134.0	
Top of Berm Elevation given a total depth =	138.9	
Unit Length Based on L/W = 2	353 FT.	
Unit Width Based on L/W = 2	177 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	0 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	39 FT.	
Total Pond Length (including maintenance berm and adjustments)	423 FT.	
Total Pond Width (including maintenance berm and adjustments)	246 FT.	
Preliminary Property Size Required	2.39 AC.	
Preliminary Property Size Required with 10% Contingency	2.63 AC.	
Property Size Provided	3.25 AC.	

Note: NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LR
Checked by: JAF
Date: 02/01/2022

Basin 5	Pre-Development Condition		Post Development Condition	
Total Area, acre	70.79	CN	70.79	CN
Pond Area, ac	3.25	100	3.25	100
Impervious Area, ac	36.27	98	43.15	98
Pervious Area, ac	31.27	50	24.39	50
CN	76.8		81.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.02		2.27	
Runoff Depth (Q), in	12.87		13.57	
Runoff Volume, acre-ft	75.92		80.04	
Volume Differential, acre-ft	4.13			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			1.43	
Total Volume Required, acre-ft	5.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LR
Checked by: JAF
Date: 02/01/2022

Basin 5 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.32	CN	2.32	CN
CN	45.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	12.22		15.64	
Runoff Depth (Q), in	7.13		5.81	
Runoff Volume, acre-ft	1.38		1.12	
Volume Differential, acre-ft	0.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 12/07/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 5

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	15.95 ac	A	39	622.05	Open Spaces, Lawns/Good Condition
Pervious Area	15.32 ac	B	61	934.52	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	36.27 ac		98	3554.46	Roadway Pavement
Wetted Pond Area	3.25 ac		100	325.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	70.79 ac			5436.03	76.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.29 ac	A	39	479.31	Open Spaces, Lawns/Good Condition
Pervious Area	12.10 ac	B	61	738.10	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	43.15 ac		98	4228.70	Roadway Pavement
Wetted Pond Area	3.25 ac		100	325.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	70.79 ac			5771.11	81.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/01/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 5 Alternative 2 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.32 ac	A	45	104.40	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.32 ac			104.40	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.32 ac	A	39	90.48	Pond
Total Area	2.32 ac			90.48	39.0 = Weighted CN

BASIN 5

ALTERNATIVE 3

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : LER
Checked by : JAF

Total Volumetric Requirements for Basin 5

Treatment Volume Required for Additional Impervious Area: 1.43 acre-ft
Treatment Volume Impacted: 0.00 acre-ft
Total Treatment Volume Required: 1.43 acre-ft

Attenuation Volume Required for Additional Impervious Area: 6.11 acre-ft
Attenuation Volume Impacted: 0.00 acre-ft
Attenuation Volume Required: 6.11 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/01/2022

Basin 5 Pond Alternative 3, Station 2005+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	144.00	NAVD 88 estimated from 406148-1 as-built plans.
ELEV EXST EOP @ Low Point =	144.20	STA. 3005+00.00 SR 91 SB NAVD 88 from as-built plans 406148-1-52-01 Cross Section 2740+00
Elev SHW =	137.00	NAVD 88 from as-built plans 406148-1-52-01 sheet 170
Treatment Volume Required	1.43	AC-FT.
Attenuation Volume Required	6.11	AC-FT.
Pond Area Based on treatment volume	2.39	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	0.60	FT.
Total Attenuation Depth based on Pond Area	2.56	FT.
Total Depth from SHWL to Top of Berm	4.16	FT.
Elev SHW=	137.0	
Top of Berm Elevation given a total depth =	141.2	
Unit Length Based on L/W = 2	456	FT.
Unit Width Based on L/W = 2	228	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	11	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	33	FT.
Total Pond Length (including maintenance berm and adjustments)	531	FT.
Total Pond Width (including maintenance berm and adjustments)	303	FT.
Preliminary Property Size Required	3.69	AC.
Preliminary Property Size Required with 10% Contingency	4.06	AC.
Property Size Provided	8.47	AC.

Notes:

1. NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29
2. It is assumed that this alternative will be an expansion of the adjacent pond. The calculations provided above conservatively show the required volumes can be fit on the land adjacent to the existing pond.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LR
Checked by: JAF
Date: 02/01/2022

Basin 5	Pre-Development Condition		Post Development Condition	
Total Area, acre	70.79	CN	70.79	CN
Pond Area, ac	3.25	100	3.25	100
Impervious Area, ac	36.27	98	43.15	98
Pervious Area, ac	31.27	50	24.39	50
CN	76.8		81.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.02		2.27	
Runoff Depth (Q), in	12.87		13.57	
Runoff Volume, acre-ft	75.92		80.04	
Volume Differential, acre-ft	4.13			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			1.43	
Total Volume Required, acre-ft	5.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LR
Checked by: JAF
Date: 02/01/2022

Basin 5 Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	16.28	CN	16.28	CN
CN	79.2		89.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	2.63		1.16	
Runoff Depth (Q), in	13.23		14.69	
Runoff Volume, acre-ft	17.95		19.93	
Volume Differential, acre-ft	1.98			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	1.98			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 12/07/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 5

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	15.95 ac	A	39	622.05	Open Spaces, Lawns/Good Condition
Pervious Area	15.32 ac	B	61	934.52	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	36.27 ac		98	3554.46	Roadway Pavement
Wetted Pond Area	3.25 ac		100	325.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	70.79 ac			5436.03	76.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.29 ac	A	39	479.31	Open Spaces, Lawns/Good Condition
Pervious Area	12.10 ac	B	61	738.10	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	43.15 ac		98	4228.70	Roadway Pavement
Wetted Pond Area	3.25 ac		100	325.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	70.79 ac			5771.11	81.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/01/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 5 Alternative 3 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.09 ac	A	39	120.51	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	10.73 ac		100	1073.00	Pond
Dry Pond Area	2.46 ac	A	39	95.94	Pond
Total Area	16.28 ac			1289.45	79.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	13.51 ac		100	1351.00	Pond
Dry Pond Area	2.77 ac	A	39	108.03	Pond
Total Area	16.28 ac			1459.03	89.6 = Weighted CN

Note: Thin stand of trees in area where pond is being expanded was conservatively assumed to have a CN of 39 in pre condition.

BASIN 6

BASIN 6

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 6

Treatment Volume Required for Additional Impervious Area:	1.57 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.57 acre-ft
Attenuation Volume Required for Additional Impervious Area:	5.02 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	5.02 acre-ft

Notes:

1) The proposed pavement from the western limits of the basin cannot be sent to the ponds because of the elevation differential between the pond sites and the western edge of the basin. Since the previous permit treated 8.46 ac. Above what was required, the location of the low edge of pavement was adjusted to a point where an equivalent amount of additional pavement at the western edge of the basin was allowed to bypass the pond site.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/01/2022

Basin 6 Pond Alternative 1, Station 2140+00 RT

Dry Retention Calculations

Existing Ground at Pond site = 111.61 NAVD 88 (GIS from LiDAR. Converted from NGVD 29)
STA. 2112+00.00 baseline SR 91. NAVD 88 from final As-Builts 406148-1-52-01 Plans Cross Section 2846+00.00 (See Note 1).
ELEV EXST EOP @ Low Point = 104.40
Elev SHW = 93.10 NAVD 88 set at initial stage of adjacent Mills Pond as outlined on page 3-4 of Gotha Lakes Watershed Management Plan Update Report.

Treatment Volume Required 1.57 AC-FT.
Attenuation Volume Required 5.02 AC-FT.
Pond Area Based on treatment volume 1.21 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 1.30 FT.
Total Attenuation Depth based on Pond Area 4.16 FT.
Total Depth from SHWL to Top of Berm 6.46 FT.

Elev Pond Bottom= 96.0
Top of Berm Elevation given a total depth = 102.46

Unit Length Based on L/W = 2 324 FT.
Unit Width Based on L/W = 2 162 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 37 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 52 FT.
Total Pond Length (including maintenance berm and adjustments) 443 FT.
Total Pond Width (including maintenance berm and adjustments) 280 FT.

Preliminary Property Size Required 2.85 AC.
Preliminary Property Size Required with 10% Contingency 3.13 AC.

Property Size Provided 3.37 AC.

Notes:

1) The low edge of pavement elevation provided above assumes the area adjacent to the low point at Station 2118+00 will not be sent to this pond alternative (approx. Station 2121+00 to 2112+00). The pavement that was treated in excess of that which was required (4.19 acres) from the previous permit will offset the pavement adjacent to this low area that will bypass the proposed pond alternative if needed when the less conservative design calculations have been developed.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 6 Station 2105+00
Basin: 6

Pond Footprint:	5.31 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	5.31 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.89 ft (from permit)
Attenuation Depth:	2.11 ft (from permit excludes treatment depth)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6	Pre-Development Condition		Post Development Condition	
Total Area, acre	62.88	CN	62.88	CN
Pond Area, ac	5.81	100	5.81	100
Impervious Area, ac	30.67	98	35.65	98
Pervious Area, ac	26.40	47	21.42	47
CN	76.9		80.8	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.00		2.38	
Runoff Depth (Q), in	12.89		13.46	
Runoff Volume, acre-ft	67.55		70.55	
Volume Differential, acre-ft	3.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			1.04	
Total Volume Required, acre-ft	4.04			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6D	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.99	CN	6.99	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.32	98	4.64	98
Pervious Area, ac	3.67	39	2.35	39
CN	67.0		78.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.92		2.79	
Runoff Depth (Q), in	11.31		13.08	
Runoff Volume, acre-ft	6.59		7.62	
Volume Differential, acre-ft	1.03			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.28	
Total Volume Required, acre-ft	1.30			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6E	Pre-Development Condition		Post Development Condition	
Total Area, acre	9.05	CN	9.05	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	4.04	98	5.27	98
Pervious Area, ac	5.01	39	3.78	39
CN	65.3		73.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.31		3.63	
Runoff Depth (Q), in	11.02		12.34	
Runoff Volume, acre-ft	8.31		9.31	
Volume Differential, acre-ft	0.99			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.26	
Total Volume Required, acre-ft	1.25			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.23	CN	2.23	CN
CN	45.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	12.22		15.64	
Runoff Depth (Q), in	7.13		5.81	
Runoff Volume, acre-ft	1.32		1.08	
Volume Differential, acre-ft	0.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 6

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.45 ac	A	39	251.55	Open Spaces, Lawns/Good Condition
Pervious Area	9.00 ac	B	61	549.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.67 ac	C	74	49.58	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	30.67 ac		98	3005.66	Roadway Pavement
Wetted Pond Area	5.81 ac		100	581.00	Pond
Dry Pond Area	10.28 ac	A	39	400.92	Pond
Total Area	62.88 ac			4837.71	76.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.97 ac	A	39	154.83	Open Spaces, Lawns/Good Condition
Pervious Area	5.04 ac	B	61	307.44	Open Spaces, Lawns/Good Condition
Pervious Area	1.71 ac	C	74	126.54	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	35.65 ac		98	3493.70	Roadway Pavement
Wetted Pond Area	5.81 ac		100	581.00	Pond
Dry Pond Area	10.70 ac	A	39	417.30	Pond
Total Area	62.88 ac			5080.81	80.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 6D

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.67 ac	A	39	143.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.32 ac		98	325.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.99 ac			468.49	67.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.35 ac	A	39	91.65	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.64 ac		98	454.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.99 ac			546.37	78.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 6E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.01 ac	A	39	195.39	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.04 ac		98	395.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.05 ac			591.31	65.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.78 ac	A	39	147.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.27 ac		98	516.46	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.05 ac			663.88	73.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 6 Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.23 ac	A	45	100.35	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.23 ac			100.35	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.23 ac	A	39	86.97	Pond
Total Area	2.23 ac			86.97	39.0 = Weighted CN

BASIN 6

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 6

Treatment Volume Required for Additional Impervious Area:	1.57 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.57 acre-ft
Attenuation Volume Required for Additional Impervious Area:	6.22 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	6.22 acre-ft

Notes:

1) The proposed pavement from the western limits of the basin cannot be sent to the ponds because of the elevation differential between the pond sites and the western edge of the basin. Since the previous permit treated 8.46 ac. Above what was required, the location of the low edge of pavement was adjusted to a point where an equivalent amount of additional pavement at the western edge of the basin was allowed to bypass the pond site.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 08/06/2021

Basin 6 Pond Alternative 2, Station 2105+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	120.00	NAVD 88 from permit 070611-32 Westover Ridge Subdivision.
ELEV EXST EOP @ Low Point =	148.00	STA. 2093+00.00 baseline SR 91 NAVD 88 As-Builts 406148-1-52-01 Cross Section 2058+00. (See Note 1)
Elev SHW =	105.11	Converted from NGVD 29 from permit 070611-32. From drainage report.
Treatment Volume Required	1.57	AC-FT.
Attenuation Volume Required	6.22	AC-FT.
Pond Area Based on treatment volume	1.21	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.30	FT.
Total Attenuation Depth based on Pond Area	5.15	FT.
Total Depth from SHWL to Top of Berm	7.45	FT.
Elev SHW=	105.1	
Top of Berm Elevation given a total depth =	112.6	
Unit Length Based on L/W = 2	324	FT.
Unit Width Based on L/W = 2	162	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	30	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	60	FT.
Total Pond Length (including maintenance berm and adjustments)	444	FT.
Total Pond Width (including maintenance berm and adjustments)	281	FT.
Preliminary Property Size Required	2.87	AC.
Preliminary Property Size Required with 10% Contingency	3.15	AC.
Property Size Provided	3.31	AC.

Notes:

1) The proposed pavement from the western limits of the basin cannot be sent to the ponds because of the elevation differential between the pond sites and the western edge of the basin. Since the previous permit treated 4.19 ac. above what was required, the location of the low edge of pavement was adjusted to a point where an equivalent amount of additional pavement at the western edge of the basin was allowed to bypass the pond site.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 6 Station 2105+00 Lt/Rt
Basin: 6

Pond Footprint:	5.31 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	5.31 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.89 ft (from permit)
Attenuation Depth:	2.11 ft (from permit excludes treatment depth)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6	Pre-Development Condition		Post Development Condition	
Total Area, acre	62.88	CN	62.88	CN
Pond Area, ac	5.81	100	5.81	100
Impervious Area, ac	30.67	98	35.65	98
Pervious Area, ac	26.40	47	21.42	47
CN	76.9		80.8	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.00		2.38	
Runoff Depth (Q), in	12.89		13.46	
Runoff Volume, acre-ft	67.55		70.55	
Volume Differential, acre-ft	3.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			1.04	
Total Volume Required, acre-ft	4.04			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6D	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.99	CN	6.99	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.32	98	4.64	98
Pervious Area, ac	3.67	39	2.35	39
CN	67.0		78.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.92		2.79	
Runoff Depth (Q), in	11.31		13.08	
Runoff Volume, acre-ft	6.59		7.62	
Volume Differential, acre-ft	1.03			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.28	
Total Volume Required, acre-ft	1.30			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6E	Pre-Development Condition		Post Development Condition	
Total Area, acre	9.05	CN	9.05	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	4.04	98	5.27	98
Pervious Area, ac	5.01	39	3.78	39
CN	65.3		73.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.31		3.63	
Runoff Depth (Q), in	11.02		12.34	
Runoff Volume, acre-ft	8.31		9.31	
Volume Differential, acre-ft	0.99			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.26	
Total Volume Required, acre-ft	1.25			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.30	CN	2.30	CN
CN	40.5		73.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	14.67		3.56	
Runoff Depth (Q), in	6.15		12.40	
Runoff Volume, acre-ft	1.18		2.38	
Volume Differential, acre-ft	1.20			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	1.20			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 6

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.45 ac	A	39	251.55	Open Spaces, Lawns/Good Condition
Pervious Area	9.00 ac	B	61	549.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.67 ac	C	74	49.58	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	30.67 ac		98	3005.66	Roadway Pavement
Wetted Pond Area	5.81 ac		100	581.00	Pond
Dry Pond Area	10.28 ac	A	39	400.92	Pond
Total Area	62.88 ac			4837.71	76.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.97 ac	A	39	154.83	Open Spaces, Lawns/Good Condition
Pervious Area	5.04 ac	B	61	307.44	Open Spaces, Lawns/Good Condition
Pervious Area	1.71 ac	C	74	126.54	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	35.65 ac		98	3493.70	Roadway Pavement
Wetted Pond Area	5.81 ac		100	581.00	Pond
Dry Pond Area	10.70 ac	A	39	417.30	Pond
Total Area	62.88 ac			5080.81	80.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 6D

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.67 ac	A	39	143.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.32 ac		98	325.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.99 ac			468.49	67.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.35 ac	A	39	91.65	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.64 ac		98	454.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.99 ac			546.37	78.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 6E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.01 ac	A	39	195.39	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.04 ac		98	395.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.05 ac			591.31	65.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.78 ac	A	39	147.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.27 ac		98	516.46	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.05 ac			663.88	73.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/01/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 6 Alternative 2 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.14 ac	A	39	83.46	Open Spaces, Lawns/Good Condition
Pervious Area	0.16 ac	B	61	9.76	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.30 ac			93.22	40.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.11 ac	B	61	6.71	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.27 ac		100	127.00	Pond
Dry Pond Area	0.92 ac	A	39	35.88	Pond
Total Area	2.30 ac			169.59	73.7 = Weighted CN

Note: Thin stand of trees on the pond site in the pre calcs were conservatively assumed to have a CN of 39.

BASIN 6

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 6

Treatment Volume Required for Additional Impervious Area:	1.57 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.57 acre-ft
Attenuation Volume Required for Additional Impervious Area:	5.02 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	5.02 acre-ft

Notes:

1) The proposed pavement from the western limits of the basin cannot be sent to the ponds because of the elevation differential between the pond sites and the western edge of the basin. Since the previous permit treated 8.46 ac. Above what was required, the location of the low edge of pavement was adjusted to a point where an equivalent amount of additional pavement at the western edge of the basin was allowed to bypass the pond site.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 08/06/2021

Basin 6 Pond Alternative 3, Station 2096+00 LT

Dry Retention Calculations

Existing Ground at Pond site =	145.00	NAVD 88 (GIS from LiDAR. Converted from NGVD 29)
ELEV EXST EOP @ Low Point =	148.00	STA. 2093+00.00 baseline SR 91 NAVD 88 As-Builts 406148-1-52-01 Cross Section 2058+00. (See Note 1)
Elev SHW =	135.00	Average SHW determined from alternative 2 and Turkey Lake Service Plaza Pond
Treatment Volume Required	1.57	AC-FT.
Attenuation Volume Required	5.02	AC-FT.
Pond Area Based on treatment volume	1.57	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.00	FT.
Total Attenuation Depth based on Pond Area	3.20	FT.
Total Depth from SHWL to Top of Berm	5.20	FT.
Elev Pond Bottom=	140.0	
Top of Berm Elevation given a total depth =	145.2	
Unit Length Based on L/W = 2	370	FT.
Unit Width Based on L/W = 2	185	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	1	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	42	FT.
Total Pond Length (including maintenance berm and adjustments)	442	FT.
Total Pond Width (including maintenance berm and adjustments)	257	FT.
Preliminary Property Size Required	2.61	AC.
Preliminary Property Size Required with 10% Contingency	2.87	AC.
MINIMUM PROPERTY SIZE FOR TREATMENT & ATTENUATION	4.86	AC.

Notes:

1) The proposed pavement from the western limits of the basin cannot be sent to the ponds because of the elevation differential between the pond sites and the western edge of the basin. Since the previous permit treated 4.19 ac. above what was required, the location of the low edge of pavement was adjusted to a point where an equivalent amount of additional pavement at the western edge of the basin was allowed to bypass the pond site.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 6 Station 2105+00 Lt/Rt
Basin: 6

Pond Footprint:	5.31 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	5.31 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.89 ft (from permit)
Attenuation Depth:	2.11 ft (from permit excludes treatment depth)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6	Pre-Development Condition		Post Development Condition	
Total Area, acre	62.88	CN	62.88	CN
Pond Area, ac	5.81	100	5.81	100
Impervious Area, ac	30.67	98	35.65	98
Pervious Area, ac	26.40	47	21.42	47
CN	76.9		80.8	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.00		2.38	
Runoff Depth (Q), in	12.89		13.46	
Runoff Volume, acre-ft	67.55		70.55	
Volume Differential, acre-ft	3.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			1.04	
Total Volume Required, acre-ft	4.04			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6D	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.99	CN	6.99	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.32	98	4.64	98
Pervious Area, ac	3.67	39	2.35	39
CN	67.0		78.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.92		2.79	
Runoff Depth (Q), in	11.31		13.08	
Runoff Volume, acre-ft	6.59		7.62	
Volume Differential, acre-ft	1.03			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.28	
Total Volume Required, acre-ft	1.30			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6E	Pre-Development Condition		Post Development Condition	
Total Area, acre	9.05	CN	9.05	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	4.04	98	5.27	98
Pervious Area, ac	5.01	39	3.78	39
CN	65.3		73.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.31		3.63	
Runoff Depth (Q), in	11.02		12.34	
Runoff Volume, acre-ft	8.31		9.31	
Volume Differential, acre-ft	0.99			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.26	
Total Volume Required, acre-ft	1.25			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 6 Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.52	CN	3.52	CN
CN	47.1		47.1	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	11.25		11.25	
Runoff Depth (Q), in	7.56		7.56	
Runoff Volume, acre-ft	2.22		2.22	
Volume Differential, acre-ft	0.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 6

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.45 ac	A	39	251.55	Open Spaces, Lawns/Good Condition
Pervious Area	9.00 ac	B	61	549.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.67 ac	C	74	49.58	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	30.67 ac		98	3005.66	Roadway Pavement
Wetted Pond Area	5.81 ac		100	581.00	Pond
Dry Pond Area	10.28 ac	A	39	400.92	Pond
Total Area	62.88 ac			4837.71	76.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.97 ac	A	39	154.83	Open Spaces, Lawns/Good Condition
Pervious Area	5.04 ac	B	61	307.44	Open Spaces, Lawns/Good Condition
Pervious Area	1.71 ac	C	74	126.54	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	35.65 ac		98	3493.70	Roadway Pavement
Wetted Pond Area	5.81 ac		100	581.00	Pond
Dry Pond Area	10.70 ac	A	39	417.30	Pond
Total Area	62.88 ac			5080.81	80.8 = Weighted CN

Alternative 3 was added to Basin 6 due to proximity.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 6D

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.67 ac	A	39	143.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.32 ac		98	325.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.99 ac			468.49	67.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.35 ac	A	39	91.65	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.64 ac		98	454.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.99 ac			546.37	78.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 6E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.01 ac	A	39	195.39	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.04 ac		98	395.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.05 ac			591.31	65.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.78 ac	A	39	147.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.27 ac		98	516.46	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.05 ac			663.88	73.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 6 Alternative 3 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.23 ac	A	39	86.97	Open Spaces, Lawns/Good Condition
Pervious Area	1.29 ac	B	61	78.69	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.52 ac			165.66	47.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	1.29 ac	B	61	78.69	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.23 ac	A	39	86.97	Pond
Total Area	3.52 ac			165.66	47.1 = Weighted CN

BASIN 7 & 8

(Calculations for Sizing Basin 7 & 8 Interchange Pond Alternative Only)

For off-site pond alternative calculations see MP 265 section

BASIN 7 & 8

ALTERNATIVE 3



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/08/2022

TOTAL REQUIREMENTS FOR BASIN 7&8 & STORAGE AVAILABLE IN INTERCHANGE CELLS

Treatment Volume Required	5.10 AC-FT.
Attenuation Volume Required	33.02 AC-FT.

Treatment Volume Available	6.23 AC-FT.
Attenuation Volume Available	34.48 AC-FT.

Note: A breakdown of the treatment and attenuation volume available in each cell is provided on the subsequent sheets.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basins 7 & 8

Treatment Volume Required for Additional Impervious Area:	2.15 acre-ft
Treatment Volume Impacted:	2.95 acre-ft
Total Treatment Volume Required:	5.10 acre-ft

Attenuation Volume Required for Additional Impervious Area:	6.90 acre-ft
Attenuation Volume Impacted:	26.12 acre-ft
Attenuation Volume Required:	33.02 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/08/2022

STORAGE AVAILABLE SR 408 INTERCHANGE

Cell 1

Elev EOP @ Low Point =	141.15 FT.	See Note 1
Avg Elev Existing Ground at Pond Site =	135.00 FT.	See Note 2
Area at Toe of Roadway Fill Assuming No Pond=	2.20 AC	
Maintenance Berm Elevation (Outside)	139.50 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	138.00 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	4.50 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	18.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	37 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	137.0 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.5 AC	measured in CAD
Elevation of SHW	131.1 FT.	See Note 3
Elevation of Pond Bottom	134.0 FT.	See Note 4
Distance From Max DHW to Treatment Elev. (assumes 0.5' treatment depth)	2.5 FT.	Calculated Max Attenuation depth
Attenuation Depth Used	2.5 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	1.5 AC	
Wet Pond or Dry Pond	Dry	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	N/A AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	1.1 AC	
Dry Pond-Area at Treatment Elevation (assumed 0.5' depth)	1.1 AC	
Treatment Volume Available	0.54 AC-FT.	
Attenuation Volume Available	3.26 AC-FT.	

Notes:

- 1) EOP from Ramp 502 Station 216+00
- 2) Average existing ground from LiDAR
- 3) SHWT from plans 406102-1-52-01 Pond 9. Converted from NGVD 29 to NAVD 88
- 4) Pond Bottom set 1 foot above the SHWT



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/08/2022

STORAGE AVAILABLE SR 408 INTERCHANGE

Cell 3

Elev EOP @ Low Point =	140.16 FT.	See Note 1
Avg Elev Existing Ground at Pond Site =	140.00 FT.	See Note 2
Area at Toe of Roadway Fill Assuming No Pond=	3.00 AC	
Maintenance Berm Elevation (Outside)	140.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	138.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	0.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	0.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	19 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	137.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	5.2 AC	measured in CAD
Elevation of SHW	131.1 FT.	See Note 3
Elevation of Pond Bottom	134.0 FT.	See Note 4
Distance From Max DHW to Treatment Elev. (assumes 0.5' treatment depth)	3.0 FT.	Calculated Max Attenuation Depth
Attenuation Depth Used	2.5 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	4.4 AC	
Wet Pond or Dry Pond	Dry	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	N/A AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	3.6 AC	
Dry Pond-Area at Treatment Elevation (assumed 0.5' depth)	3.8 AC	
Treatment Volume Available	1.85 AC-FT.	
Attenuation Volume Available	10.20 AC-FT.	

Notes:

- 1) EOP from Ramp 505 Station 515+00
- 2) Average existing ground from LiDAR
- 3) SHWT from plans 406102-1-52-01 Pond 9. Converted from NGVD 29 to NAVD 88
- 4) Pond Bottom set 1 foot above the SHWT



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/08/2022

STORAGE AVAILABLE SR 408 INTERCHANGE

Cell 7

Elev Exist EOP @ Low Point =	139.49 FT.	See Note 1
Avg Elev Existing Ground at Pond Site =	140.00 FT.	See Note 2
Area at Toe of Roadway Fill Assuming No Pond=	4.00 AC	
Maintenance Berm Elevation (Outside)	139.50 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	138.00 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	0.50 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	2.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	21 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	137.0 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	7.0 AC	measured in CAD
Elevation of SHW	133.0 FT.	See Note 3
Elevation of Pond Bottom	134.0 FT.	See Note 4
Distance From Max DHW to Treatment Elev. (assumes 0.5' treatment depth)	2.5 FT.	Calculated Max Attenuation Depth
Attenuation Depth Used	2.5 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	7.0 AC	
Wet Pond or Dry Pond	Dry	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	N/A AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	6.1 AC	
Dry Pond-Area at Treatment Elevation (assumed 0.5' depth)	6.3 AC	
Treatment Volume Available	3.10 AC-FT.	
Attenuation Volume Available	16.65 AC-FT.	

Notes:

- 1) Exist EOP from SR 91 SB Station 3181+00
- 2) Average existing ground from LiDAR
- 3) SHWT from plans 406102-1-52-01 Pond NB 45. Converted from NGVD 29 to NAVD 88
- 4) Pond Bottom set 1 foot above the SHWT



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 408 INTERCHANGE

Cell 4

Elev Exist EOP @ Low Point =	131.30 FT.	See Note 1
Avg Elev Existing Ground at Pond Site =	138.00 FT.	See Note 2
Area at Toe of Roadway Fill Assuming No Pond=	4.00 AC	
Maintenance Berm Elevation (Outside)	136.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	134.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	2.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	8.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	27 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	133.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	3.7 AC	measured in CAD
Elevation of SHW	124.1 FT.	See Note 3
Elevation of Pond Bottom	127.0 FT.	
Distance From Max DHW to Treatment Elev. (assumes 0.5' treatment depth)	6.0 FT.	Calculated Max Attenuation Depth
Attenuation Depth Used	2.5 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	2.0 AC	
Wet Pond or Dry Pond	Dry	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	N/A AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	1.4 AC	
Dry Pond-Area at Treatment Elevation (assumed 0.5' depth)	1.5 AC	
Treatment Volume Available	0.74 AC-FT.	
Attenuation Volume Available	4.36 AC-FT.	

Notes:

- 1) Exist EOP from SR 91 SB Station 3174+00
- 2) Average existing ground from LiDAR
- 3) SHWT from plans 406102-1-52-01 Pond A2. Converted from NGVD 29 to NAVD 88



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond SB20 Station 2166+00 Lt
Basin: 7 & 8

Pond Footprint:	1.14 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.14 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.18 ft
Attenuation Depth:	1.76 ft
Total Depth:	1.94 ft (from as-builts/ permit)
Permitted Treatment Volume	0.21 acre-ft (from as-builts/ permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



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Impacts to Existing Ponds
Pond NB20 Station 2165+00 Rt
Basin: 7 & 8

Pond Footprint:	0.34 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.34 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.26 ft
Attenuation Depth:	2.81 ft
Total Depth:	3.07 ft (from as-builts/ permit)
Permitted Treatment Volume	0.09 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Checked by : JAF

Impacts to Existing Ponds
Pond NB25 Station 2174+00 Rt
Basin: 7 & 8

Pond Footprint:	1.67 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	1.67 acres
Treatment Depth:	0.22 ft
Attenuation Depth:	2.16 ft
Total Depth:	2.38 ft (from as-builts/ permit)
Permitted Treatment Volume	0.37 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.37 acre-ft
Estimated Attenuation Volume Impacted:	3.60 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 9(7) Station 2183+00 Rt
Basin: 7 & 8

Pond Footprint:	2.3 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	2.3 acres
Treatment Depth:	0.45 ft
Attenuation Depth:	2.54 ft
Total Depth:	2.99 ft (from as-builts/ permit)
Permitted Treatment Volume	1.04 acre-ft (from as-builts/ permit)

Estimated Treatment Volume: Impacted: 1.04 acre-ft

Estimated Attenuation Volume Impacted: 5.84 acre-ft

Notes: For the purposes of these calculations, it was assumed that this pond would need to be reconfigured as none of the footprint was considered salvageable.



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Date : 02/11/2021
Designed by : MRG
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Impacts to Existing Ponds
Pond NB30 Station 2181+00 Rt
Basin: 7 & 8

Pond Footprint:	0.53 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.53 acres
Treatment Depth:	0.15 ft
Attenuation Depth:	2.85 ft
Total Depth:	3.00 ft (from as-builts/ permit)
Permitted Treatment Volume	0.08 acre-ft (calculated from exst impervious area)
Estimated Treatment Volume: Impacted:	0.08 acre-ft
Estimated Attenuation Volume Impacted:	1.51 acre-ft

Note: Useable area remains however, it is assumed this will be incorporated into an interchange pond alternative.



Project Name : SR 91 Widening from South of SR 408 to SR 50

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Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A2 Station 2177+00 Lt
Basin: 7 & 8

Pond Footprint:	0.78 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	40 %
Salvageable Footprint:	0.31 acres
Percentage of pond footprint impacted:	60 %
Pond footprint no longer useable:	0.47 acres
Treatment Depth:	0.77 ft
Attenuation Depth:	2.17 ft
Total Depth:	2.94 ft (from as-builts/ permit)
Permitted Treatment Volume	0.60 acre-ft (from as-builts/ permit)

Estimated Treatment Volume: Impacted: 0.36 acre-ft

Estimated Attenuation Volume Impacted: 1.02 acre-ft



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Impacts to Existing Ponds
Pond 7 Station 2193+00 Lt
Basin: 7 & 8

Pond Footprint:	1.02 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	1.02 acres
Treatment Depth:	0.56 ft
Attenuation Depth:	7.44 ft
Total Depth:	8.00 ft (from as-builts/ permit)
Permitted Treatment Volume	0.57 acre-ft (calculated from exst impervious area)
Estimated Treatment Volume: Impacted:	0.57 acre-ft
Estimated Attenuation Volume Impacted:	7.59 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds

Pond 8 Station 2186+00 Rt

Basin: 7 & 8

Pond Footprint:	0.6 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.60 acres
Treatment Depth:	0.18 ft
Attenuation Depth:	6.82 ft
Total Depth:	7.00 ft (from permit)
Permitted Treatment Volume	0.11 acre-ft (calculated from exst impervious area)
Estimated Treatment Volume: Impacted:	0.11 acre-ft
Estimated Attenuation Volume Impacted:	4.09 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Impacts to Existing Ponds
Pond NB35 Station 2184+00 Rt
Basin: 7 & 8

Pond Footprint:	1.26 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	0.63 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	0.63 acres
Treatment Depth:	0.38 ft
Attenuation Depth:	1.58 ft
Total Depth:	1.96 ft (from as-builts/ permit)
Permitted Treatment Volume	0.48 acre-ft (calculated from exst impervious area)
Estimated Treatment Volume: Impacted:	0.24 acre-ft
Estimated Attenuation Volume Impacted:	0.99 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Impacts to Existing Ponds
Pond NB40 Station 2185+00 Rt
Basin: 7 & 8

Pond Footprint:	0.5 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.50 acres
Treatment Depth:	0.26 ft
Attenuation Depth:	2.22 ft
Total Depth:	2.48 ft (from as-builts/ permit)
Permitted Treatment Volume	0.13 acre-ft (calculated from exst impervious area)

Estimated Treatment Volume: Impacted: 0.13 acre-ft

Estimated Attenuation Volume Impacted: 1.11 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond NB45 Station 2188+00 Rt
Basin: 7 & 8

Pond Footprint:	0.3 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.30 acres
Treatment Depth:	0.17 ft
Attenuation Depth:	1.25 ft
Total Depth:	1.42 ft (from as-builts/ permit)
Permitted Treatment Volume	0.05 acre-ft (calculated from exst impervious area)
Estimated Treatment Volume: Impacted:	0.05 acre-ft
Estimated Attenuation Volume Impacted:	0.38 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 7	Pre-Development Condition		Post Development Condition	
Total Area, acre	19.03	CN	19.03	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	10.46	98	13.87	98
Pervious Area, ac	8.57	39	5.16	39
CN	71.4		82.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.00		2.19	
Runoff Depth (Q), in	12.03		13.64	
Runoff Volume, acre-ft	19.08		21.63	
Volume Differential, acre-ft	2.54			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.71	
Total Volume Required, acre-ft	3.25			



Project Name: SR 91 Widening from SR 408 to SR 50
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Basin 7A	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.38	CN	4.38	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.58	98	1.64	98
Pervious Area, ac	2.80	39	2.74	39
CN	60.3		61.1	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.59		6.37	
Runoff Depth (Q), in	10.13		10.28	
Runoff Volume, acre-ft	3.70		3.75	
Volume Differential, acre-ft	0.05			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.01	
Total Volume Required, acre-ft	0.07			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 7B	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.54	CN	1.54	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.62	98	0.86	98
Pervious Area, ac	0.92	39	0.68	39
CN	62.8		71.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.94		3.90	
Runoff Depth (Q), in	10.58		12.12	
Runoff Volume, acre-ft	1.36		1.55	
Volume Differential, acre-ft	0.20			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.05	
Total Volume Required, acre-ft	0.25			



Project Name: SR 91 Widening from SR 408 to SR 50
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Checked by: JAF
Date: 02/03/2022

Basin 7C	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.31	CN	6.31	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.99	98	3.39	98
Pervious Area, ac	4.32	39	2.92	39
CN	57.6		70.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	7.36		4.14	
Runoff Depth (Q), in	9.64		11.92	
Runoff Volume, acre-ft	5.07		6.27	
Volume Differential, acre-ft	1.19			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.29	
Total Volume Required, acre-ft	1.49			



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Date: 02/03/2022

Basin 7D	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.78	CN	2.78	CN
Pond Area, ac	0.55	100	0.55	100
Impervious Area, ac	0.37	98	0.49	98
Pervious Area, ac	1.86	39	1.74	39
CN	58.9		61.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.97		6.27	
Runoff Depth (Q), in	9.89		10.35	
Runoff Volume, acre-ft	2.29		2.40	
Volume Differential, acre-ft	0.11			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.03	
Total Volume Required, acre-ft	0.13			



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Basin 7E	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.12	CN	12.12	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.11	98	3.74	98
Pervious Area, ac	9.01	40	8.38	39
CN	55.0		57.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	8.19		7.48	
Runoff Depth (Q), in	9.15		9.57	
Runoff Volume, acre-ft	9.24		9.66	
Volume Differential, acre-ft	0.43			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.13	
Total Volume Required, acre-ft	0.56			



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Basin 7F	Pre-Development Condition		Post Development Condition	
Total Area, acre	9.78	CN	9.78	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	4.57	98	5.08	98
Pervious Area, ac	5.21	39	4.70	39
CN	66.6		69.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.02		4.36	
Runoff Depth (Q), in	11.23		11.74	
Runoff Volume, acre-ft	9.16		9.57	
Volume Differential, acre-ft	0.42			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.11	
Total Volume Required, acre-ft	0.52			



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Basin 7G	Pre-Development Condition		Post Development Condition	
Total Area, acre	9.31	CN	9.31	CN
Pond Area, ac	1.41	100	0.21	100
Impervious Area, ac	1.85	98	5.70	98
Pervious Area, ac	6.05	39	3.40	39
CN	60.0		76.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.68		3.07	
Runoff Depth (Q), in	10.08		12.82	
Runoff Volume, acre-ft	7.82		9.95	
Volume Differential, acre-ft	2.13			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.80	
Total Volume Required, acre-ft	2.93			



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Basin 8	Pre-Development Condition		Post Development Condition	
Total Area, acre	13.75	CN	13.75	CN
Pond Area, ac	3.15	100	2.90	100
Impervious Area, ac	2.73	98	2.58	98
Pervious Area, ac	7.87	39	8.27	39
CN	64.7		62.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.46		5.89	
Runoff Depth (Q), in	10.91		10.61	
Runoff Volume, acre-ft	12.50		12.15	
Volume Differential, acre-ft	-0.35			
Treatment Volume				
2.5-in. (1ft./12 in.) x Add'l Impervious Area (ac.) = acre-ft			-0.03	
Total Volume Required, acre-ft	-0.38			



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Basin 8A	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.68	CN	2.68	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.55	98	0.30	98
Pervious Area, ac	2.13	39	2.38	80
CN	51.1		45.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	9.57		11.93	
Runoff Depth (Q), in	8.39		7.26	
Runoff Volume, acre-ft	1.87		1.62	
Volume Differential, acre-ft	-0.25			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			-0.05	
Total Volume Required, acre-ft	-0.31			



Project Name: SR 91 Widening from SR 408 to SR 50

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Prepared by: MRG

Checked by: JAF

Date: 02/03/2022

Basin NB35	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.78	CN	4.78	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.29	98	1.90	98
Pervious Area, ac	2.49	39	2.88	39
CN	67.3		62.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.87		6.01	
Runoff Depth (Q), in	11.35		10.52	
Runoff Volume, acre-ft	4.52		4.19	
Volume Differential, acre-ft			-0.33	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			-0.08	
Total Volume Required, acre-ft			-0.41	



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Checked by: JAF

Date: 02/03/2022

Basin NB40	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.87	CN	2.87	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.64	98	1.57	98
Pervious Area, ac	2.23	39	1.30	80
CN	52.2		71.3	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	9.17		4.03	
Runoff Depth (Q), in	8.60		12.01	
Runoff Volume, acre-ft	2.06		2.87	
Volume Differential, acre-ft			0.82	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.19	
Total Volume Required, acre-ft			1.01	



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Prepared by: MRG
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Basin NB45	Pre-Development Condition		Post Development Condition	
Total Area, acre	0.69	CN	0.69	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.24	98	0.18	98
Pervious Area, ac	0.45	39	0.51	80
CN	59.5		54.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.80		8.39	
Runoff Depth (Q), in	10.00		9.03	
Runoff Volume, acre-ft	0.57		0.52	
Volume Differential, acre-ft			-0.06	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			-0.01	
Total Volume Required, acre-ft			-0.07	



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.57 ac	A	39	334.23	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.46 ac		98	1025.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.03 ac			1359.31	71.4 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.16 ac	A	39	201.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.87 ac		98	1359.26	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.03 ac			1560.50	82.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.66 ac	A	39	64.74	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.58 ac		98	154.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.14 ac	A	39	44.46	Pond
Total Area	4.38 ac			264.04	60.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.60 ac	A	39	62.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.64 ac		98	160.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.14 ac	A	39	44.46	Pond
Total Area	4.38 ac			267.58	61.1 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.58 ac	A	39	22.62	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.62 ac		98	60.76	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.34 ac	A	39	13.26	Pond
Total Area	1.54 ac			96.64	62.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.34 ac	A	39	13.26	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.86 ac		98	84.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.34 ac	A	39	13.26	Pond
Total Area	1.54 ac			110.80	71.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.99 ac		98	195.02	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.32 ac	A	39	168.48	Pond
Total Area	6.31 ac			363.50	57.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.39 ac		98	332.22	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.92 ac	A	39	113.88	Pond
Total Area	6.31 ac			446.10	70.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7D

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.33 ac	A	39	51.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.37 ac		98	36.26	Roadway Pavement
Wetted Pond Area	0.55 ac		100	55.00	Pond
Dry Pond Area	0.53 ac	A	39	20.67	Pond
Total Area	2.78 ac			163.80	58.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.40 ac	A	39	54.60	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.49 ac		98	48.02	Roadway Pavement
Wetted Pond Area	0.55 ac		100	55.00	Pond
Dry Pond Area	0.34 ac	A	39	13.26	Pond
Total Area	2.78 ac			170.88	61.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 04/20/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.15 ac	A	39	122.85	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	1.70 ac	A	45	76.50	Woods, Thin Stand
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.11 ac		98	304.78	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.16 ac	A	39	162.24	Pond
Total Area	12.12 ac			666.37	55.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.78 ac	A	39	30.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.74 ac		98	366.52	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	7.60 ac	A	39	296.40	Pond
Total Area	12.12 ac			693.34	57.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7F

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.97 ac	A	39	37.83	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.57 ac		98	447.86	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.24 ac	A	39	165.36	Pond
Total Area	9.78 ac			651.05	66.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.02 ac	A	39	39.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.08 ac		98	497.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	3.68 ac	A	39	143.52	Pond
Total Area	9.78 ac			681.14	69.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7G

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.05 ac	A	39	235.95	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.85 ac		98	181.30	Roadway Pavement
Wetted Pond Area	1.41 ac		100	141.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.31 ac			558.25	60.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.40 ac	A	39	132.60	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.70 ac		98	558.60	Roadway Pavement
Wetted Pond Area	0.21 ac		100	21.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	9.31 ac			712.20	76.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 8

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.71 ac	A	39	144.69	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.73 ac		98	267.54	Roadway Pavement
Wetted Pond Area	3.15 ac		100	315.00	Pond
Dry Pond Area	4.16 ac	A	39	162.24	Pond
Total Area	13.75 ac			889.47	64.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.77 ac	A	39	147.03	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.58 ac		98	252.84	Roadway Pavement
Wetted Pond Area	2.90 ac		100	290.00	Pond
Dry Pond Area	4.50 ac	A	39	175.50	Pond
Total Area	13.75 ac			865.37	62.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 8A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.55 ac		98	53.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.13 ac	A	39	83.07	Pond
Total Area	2.68 ac			136.97	51.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.38 ac	A	39	92.82	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.30 ac		98	29.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.68 ac			122.22	45.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin NB35

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.44 ac	A	39	17.16	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.29 ac		98	224.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.05 ac	A	39	79.95	Pond
Total Area	4.78 ac			321.53	67.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.17 ac	A	39	84.63	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.90 ac		98	186.20	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.71 ac	A	39	27.69	Pond
Total Area	4.78 ac			298.52	62.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin NB40

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.64 ac		98	62.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.23 ac	A	39	86.97	Pond
Total Area	2.87 ac			149.69	52.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.12 ac	A	39	43.68	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.57 ac		98	153.86	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.18 ac	A	39	7.02	Pond
Total Area	2.87 ac			204.56	71.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin NB45

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.24 ac		98	23.52	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.45 ac	A	39	17.55	Pond
Total Area	0.69 ac			41.07	59.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.42 ac	A	39	16.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.18 ac		98	17.64	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.09 ac	A	39	3.51	Pond
Total Area	0.69 ac			37.53	54.4 = Weighted CN

BASIN MP 265

(Calculations in this section are for the Basin 7&8 off-site alternatives. Note some calculations in this section are duplicates of the Basin 7&8 calculations for ease of reference)

BASIN MP 265

ALTERNATIVE 1

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for MP 265 Basin

Treatment Volume Required for Additional Impervious Area:	1.25 acre-ft
Treatment Volume Impacted:	1.88 acre-ft
Total Treatment Volume Required:	3.13 acre-ft

Attenuation Volume Required for Additional Impervious Area:	4.59 acre-ft
Attenuation Volume Impacted:	14.55 acre-ft
Attenuation Volume Required:	19.13 acre-ft

Note: The required volumes assumes that the impacted volumes associated with Ponds NB30, NB35, NB40, NB45, and Pond 7 along with the improvements within their associated sub-basin will be accommodated within the interchange.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/20/2022

MP 265 Pond Alternative 1, Station 2170+00 Lt

Dry Retention Calculations

Existing Ground at Pond site = 128.11 NAVD88 (Estimated from LiDAR and converted from NGVD29)
ELEV EXST EOP @ Low Point = 103.06 NAVD88 Station 5885+00 from as-built plans 406102-1 see note 2 below
ELEV EXST EOP @ Sta 5901+00 = 130.00 NAVD88 Station 5901+00 from as-built plans 406102-1 see note 2 below
Elev SHW = 115.11 NAVD88 SHWT from plans 406102-1-52-01 Final As-Builts

Treatment Volume Required 3.13 AC-FT.
Attenuation Volume Required 19.13 AC-FT.
Pond Area Based on treatment volume 3.40 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.92 FT.
Total Attenuation Depth based on Pond Area 5.6 FT.
Total Depth from SHWL to Top of Berm 7.54 FT.

Elev Pond Bottom= 122.0
Top of Berm Elevation given a total depth = 129.5

Unit Length Based on L/W = 2 544 FT.
Unit Width Based on L/W = 2 272 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 6 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 60.35 FT.
Total Pond Length (including maintenance berm and adjustments) 640.51 FT.
Total Pond Width (including maintenance berm and adjustments) 368.30 FT.

Preliminary Property Size Required 5.42 AC.
Preliminary Property Size Required with 10% Contingency 5.96 AC.

Property Size Provided 6.87 AC.

Notes:

1. NAVD88= NGVD29-0.89' GIS data converted from NGVD29 to NAVD88

2. There is an increase of 3.41 acres in the amount of pavement in sub-basin 7 that will need to be offset by treating pavement in another location in order to meet treatment requirements. It was determined that both existing and proposed pavement to the west of Hempel Ave would need to be treated at another location. The calculations below indicate there is area adjacent to the mainline that can be utilized. Additionally, Basin 6 Alternative 1 could be utilized to meet treatment requires for this area.

Calculations to show how water quality requirements can be met for area east of Hempel Ave.

approximate length available for linear pond (RT)	1800 ft	assumed Station 2152+75-2161+75, 2134+00-2143+00
storage depth	1 ft	
bottom width	10 ft	
side slopes	4	assume 1 foot vertical per value indicated
ditch block spacing	300 ft	
approximate length ditch block occupy	15 ft	
length available for storage	1740	
Volume Available	24360 CF	

approximate length available for linear pond (LT)	1000	assumed Station 2150+00-2160+00
storage depth	1 ft	
bottom width	10 ft	
side slopes	4	assume 1 foot vertical per value indicated
ditch block spacing	300 ft	
approximate length ditch block occupy	15 ft	
length available for storage	970	
Volume Available	13580 CF	

Total Volume Available to meet WQv east of Hempel Ave 0.87 acre-ft
Total Volume Required for Sub-basin 7 0.71 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond SB20 Station 2166+00 Lt
Basin: MP 265

Pond Footprint:	1.14 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.14 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.18 ft
Attenuation Depth:	1.76 ft
Total Depth:	1.94 ft (from as-builts/ permit)
Permitted Treatment Volume	0.21 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



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Impacts to Existing Ponds
Pond NB20 Station 2165+00 Rt
Basin: MP 265

Pond Footprint:	0.34 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.34 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.26 ft
Attenuation Depth:	2.81 ft
Total Depth:	3.07 ft (from as-builts/ permit)
Permitted Treatment Volume	0.09 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



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Impacts to Existing Ponds
Pond NB25 Station 2174+00 Rt
Basin: MP 265

Pond Footprint:	1.67 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	1.67 acres
Treatment Depth:	0.22 ft
Attenuation Depth:	2.16 ft
Total Depth:	2.38 ft (from as-builts/ permit)
Permitted Treatment Volume	0.37 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.37 acre-ft
Estimated Attenuation Volume Impacted:	3.60 acre-ft



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Impacts to Existing Ponds
Pond 8 Station 2186+00 Rt
Basin: MP 265

Pond Footprint:	0.6 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.60 acres
Treatment Depth:	0.18 ft
Attenuation Depth:	6.82 ft
Total Depth:	7.00 ft (from permit)
Permitted Treatment Volume	0.11 acre-ft (calculated from exst impervious area)
Estimated Treatment Volume: Impacted:	0.11 acre-ft
Estimated Attenuation Volume Impacted:	4.09 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

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Checked by : JAF

Impacts to Existing Ponds
Pond A2 Station 2177+00 Lt
Basin: MP 265

Pond Footprint:	0.78 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	40 %
Salvageable Footprint:	0.31 acres
Percentage of pond footprint impacted:	60 %
Pond footprint no longer useable:	0.47 acres
Treatment Depth:	0.77 ft
Attenuation Depth:	2.17 ft
Total Depth:	2.94 ft (from as-builts/ permit)
Permitted Treatment Volume	0.60 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.36 acre-ft
Estimated Attenuation Volume Impacted:	1.02 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

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Checked by : JAF

Impacts to Existing Ponds
Pond 9(7) Station 2183+00 Rt
Basin: MP 265

Pond Footprint:	2.3 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	2.3 acres
Treatment Depth:	0.45 ft
Attenuation Depth:	2.54 ft
Total Depth:	2.99 ft (from as-builts/ permit)
Permitted Treatment Volume	1.04 acre-ft (from as-builts/ permit)

Estimated Treatment Volume: Impacted: 1.04 acre-ft

Estimated Attenuation Volume Impacted: 5.84 acre-ft

Notes: For the purposes of these calculations, it was assumed that this pond would need to be reconfigured as none of the footprint was considered salvageable.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 7	Pre-Development Condition		Post Development Condition	
Total Area, acre	19.03	CN	19.03	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	10.46	98	13.87	98
Pervious Area, ac	8.57	39	5.16	39
CN	71.4		82.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.00		2.19	
Runoff Depth (Q), in	12.03		13.64	
Runoff Volume, acre-ft	19.08		21.63	
Volume Differential, acre-ft	2.54			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.71	
Total Volume Required, acre-ft	3.25			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 7A	Pre-Development Condition		Post Development Condition	
Total Area, acre	10.15	CN	10.15	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.58	98	1.64	98
Pervious Area, ac	8.57	39	8.51	39
CN	48.2		48.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	10.75		10.60	
Runoff Depth (Q), in	7.80		7.87	
Runoff Volume, acre-ft	6.59		6.65	
Volume Differential, acre-ft	0.06			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.01	
Total Volume Required, acre-ft	0.07			



Project Name: SR 91 Widening from SR 408 to SR 50
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Basin 7B	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.54	CN	1.54	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.62	98	0.86	98
Pervious Area, ac	0.92	39	0.68	39
CN	62.8		71.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.94		3.90	
Runoff Depth (Q), in	10.58		12.12	
Runoff Volume, acre-ft	1.36		1.55	
Volume Differential, acre-ft	0.20			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.05	
Total Volume Required, acre-ft	0.25			



Project Name: SR 91 Widening from SR 408 to SR 50
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Basin 7C	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.31	CN	6.31	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.99	98	3.39	98
Pervious Area, ac	4.32	39	2.92	39
CN	57.6		70.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	7.36		4.14	
Runoff Depth (Q), in	9.64		11.92	
Runoff Volume, acre-ft	5.07		6.27	
Volume Differential, acre-ft	1.19			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.29	
Total Volume Required, acre-ft	1.49			



Project Name: SR 91 Widening from SR 408 to SR 50
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Basin 7E	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.12	CN	12.12	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.11	98	3.74	98
Pervious Area, ac	9.01	40	8.38	39
CN	55.0		57.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	8.19		7.48	
Runoff Depth (Q), in	9.15		9.57	
Runoff Volume, acre-ft	9.24		9.66	
Volume Differential, acre-ft	0.43			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.13	
Total Volume Required, acre-ft	0.56			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

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Date: 02/01/2022

Basin 7F	Pre-Development Condition		Post Development Condition	
Total Area, acre	9.78	CN	9.78	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	4.57	98	5.08	98
Pervious Area, ac	5.21	39	4.70	39
CN	66.6		69.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.02		4.36	
Runoff Depth (Q), in	11.23		11.74	
Runoff Volume, acre-ft	9.16		9.57	
Volume Differential, acre-ft	0.42			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.11	
Total Volume Required, acre-ft	0.52			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/01/2022

Basin 8A	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.68	CN	2.68	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.55	98	0.30	98
Pervious Area, ac	2.13	39	2.38	39
CN	51.1		45.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	9.57		11.93	
Runoff Depth (Q), in	8.39		7.26	
Runoff Volume, acre-ft	1.87		1.62	
Volume Differential, acre-ft			-0.25	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			-0.05	
Total Volume Required, acre-ft			-0.31	



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
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Date: 02/01/2022

Basin 7 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.77	CN	5.77	CN
CN	39.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		15.64	
Runoff Depth (Q), in	5.81		5.81	
Runoff Volume, acre-ft	2.79		2.79	
Volume Differential, acre-ft	0.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.57 ac	A	39	334.23	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.46 ac		98	1025.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.03 ac			1359.31	71.4 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.16 ac	A	39	201.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.87 ac		98	1359.26	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.03 ac			1560.50	82.0 = Weighted CN



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Curve Number Calculations Basin 7A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.43 ac	A	39	289.77	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.58 ac		98	154.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.14 ac	A	39	44.46	Pond
Total Area	10.15 ac			489.07	48.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.60 ac	A	39	62.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.64 ac		98	160.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	6.91 ac	A	39	269.49	Pond
Total Area	10.15 ac			492.61	48.5 = Weighted CN



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Curve Number Calculations Basin 7B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.58 ac	A	39	22.62	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.62 ac		98	60.76	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.34 ac	A	39	13.26	Pond
Total Area	1.54 ac			96.64	62.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.34 ac	A	39	13.26	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.86 ac		98	84.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.34 ac	A	39	13.26	Pond
Total Area	1.54 ac			110.80	71.9 = Weighted CN



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Checked by : JAF

Curve Number Calculations Basin 7C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.99 ac		98	195.02	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.32 ac	A	39	168.48	Pond
Total Area	6.31 ac			363.50	57.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.39 ac		98	332.22	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.92 ac	A	39	113.88	Pond
Total Area	6.31 ac			446.10	70.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 04/20/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.15 ac	A	39	122.85	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	1.70 ac	A	45	76.50	Woods, Thin Stand
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.11 ac		98	304.78	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.16 ac	A	39	162.24	Pond
Total Area	12.12 ac			666.37	55.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.78 ac	A	39	30.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.74 ac		98	366.52	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	7.60 ac	A	39	296.40	Pond
Total Area	12.12 ac			693.34	57.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7F

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.97 ac	A	39	37.83	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.57 ac		98	447.86	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.24 ac	A	39	165.36	Pond
Total Area	9.78 ac			651.05	66.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.02 ac	A	39	39.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.08 ac		98	497.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	3.68 ac	A	39	143.52	Pond
Total Area	9.78 ac			681.14	69.6 = Weighted CN



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Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 8

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.71 ac	A	39	144.69	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.73 ac		98	267.54	Roadway Pavement
Wetted Pond Area	3.15 ac		100	315.00	Pond
Dry Pond Area	4.16 ac	A	39	162.24	Pond
Total Area	13.75 ac			889.47	64.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.77 ac	A	39	147.03	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.58 ac		98	252.84	Roadway Pavement
Wetted Pond Area	2.90 ac		100	290.00	Pond
Dry Pond Area	4.50 ac	A	39	175.50	Pond
Total Area	13.75 ac			865.37	62.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 8A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.55 ac		98	53.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.13 ac	A	39	83.07	Pond
Total Area	2.68 ac			136.97	51.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.38 ac	A	39	92.82	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.30 ac		98	29.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.68 ac			122.22	45.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/01/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7&8 Alternative 1 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.77 ac	A	39	225.03	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.77 ac			225.03	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	5.77 ac	A	39	225.03	Pond
Total Area	5.77 ac			225.03	39.0 = Weighted CN

BASIN MP 265

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for MP 265 Basin

Treatment Volume Required for Additional Impervious Area:	1.25 acre-ft
Treatment Volume Impacted:	1.88 acre-ft
Total Treatment Volume Required:	3.13 acre-ft
Attenuation Volume Required for Additional Impervious Area:	7.98 acre-ft
Attenuation Volume Impacted:	14.55 acre-ft
Attenuation Volume Required:	22.52 acre-ft

Note: The required volumes assumes that the impacted volumes associated with Ponds NB30, NB35, NB40, NB45, and Pond 7 along with the improvements within their associated sub-basin will be accommodated within the interchange.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/20/2022

MP 265 Pond Alternative 2, Station 2160+00 Rt

Wet Detention Calculations

Existing Ground at Pond site =	106.11 NAVD88 (Estimated from LiDAR and converted from NGVD29)
ELEV EXST EOP @ Low Point =	103.06 NAVD88 Station 5885+00 from as-built plans 406102-1 Sheets 9 & 32 see note 2 below
ELEV EXST EOP @ Sta 5893+25 =	117.10 STA. 2155+00.00 SR 91 NB NAVD88 Station 5893+25 from as-built plans 406102-1. See note 2 below
Elev SHW =	89.49 NAVD88 SHWT is NHWE as presented in Table 2-1 in the Gotha Lakes Watershed Management Plan Update Final Report
Treatment Volume Required	3.13 AC-FT.
Attenuation Volume Required	22.52 AC-FT.
Pond Area Based on treatment volume	3.48 AC
Assume 1 foot of pond freeboard	1.00 FT.
Treatment Depth	0.90 FT.
Total Attenuation Depth based on Pond Area	6.5 FT.
Total Depth from SHWL to Top of Berm	8.38 FT.
Elev SHW=	89.5
Top of Berm Elevation given a total depth =	97.9
Unit Length Based on L/W = 2	550 FT.
Unit Width Based on L/W = 2	275 FT.
Maintenance Berm Width of 15-ft	30 FT.
Grade Adjustment Width Assumed 1:2	33 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	67.01 FT.
Total Pond Length (including maintenance berm and adjustments)	680.42 FT.
Total Pond Width (including maintenance berm and adjustments)	405.20 FT.
Preliminary Property Size Required	6.33 AC.
Preliminary Property Size Required with 10% Contingency	6.96 AC.
Property Size Provided	9.64 AC.

Notes:

1. NAVD88= NGVD29-0.89' GIS data converted from NGVD29 to NAVD88
2. There is an increase of 3.41 acres in the amount of pavement in sub-basin 7 that will need to be offset by either treating pavement that is currently untreated or proposed pavement in order to meet treatment requirements. It was determined that pavement to the west of Station 5893+25 would need to be sent to the pond alternative from sub-basin 7 in order to meet treatment requirements. As such, the low edge of pavement was checked at this Station to ensure that runoff from this area could be sent to the pond.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond SB20 Station 2166+00 Lt
Basin: MP 265

Pond Footprint:	1.14 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.14 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.18 ft
Attenuation Depth:	1.76 ft
Total Depth:	1.94 ft (from as-builts/ permit)
Permitted Treatment Volume	0.21 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond NB20 Station 2165+00 Rt
Basin: MP 265

Pond Footprint:	0.34 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.34 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.26 ft
Attenuation Depth:	2.81 ft
Total Depth:	3.07 ft (from as-builts/ permit)
Permitted Treatment Volume	0.09 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond NB25 Station 2174+00 Rt
Basin: MP 265

Pond Footprint:	1.67 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	1.67 acres
Treatment Depth:	0.22 ft
Attenuation Depth:	2.16 ft
Total Depth:	2.38 ft (from as-builts/ permit)
Permitted Treatment Volume	0.37 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.37 acre-ft
Estimated Attenuation Volume Impacted:	3.60 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 8 Station 2186+00 Rt
Basin: MP 265

Pond Footprint:	0.6 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.60 acres
Treatment Depth:	0.18 ft
Attenuation Depth:	6.82 ft
Total Depth:	7.00 ft (from permit)
Permitted Treatment Volume	0.11 acre-ft (calculated from exst impervious area)
Estimated Treatment Volume: Impacted:	0.11 acre-ft
Estimated Attenuation Volume Impacted:	4.09 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A2 Station 2177+00 Lt
Basin: MP 265

Pond Footprint:	0.78 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	40 %
Salvageable Footprint:	0.31 acres
Percentage of pond footprint impacted:	60 %
Pond footprint no longer useable:	0.47 acres
Treatment Depth:	0.77 ft
Attenuation Depth:	2.17 ft
Total Depth:	2.94 ft (from as-builts/ permit)
Permitted Treatment Volume	0.60 acre-ft (from as-builts/ permit)
Estimated Treatment Volume: Impacted:	0.36 acre-ft
Estimated Attenuation Volume Impacted:	1.02 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 9(7) Station 2183+00 Rt
Basin: MP 265

Pond Footprint:	2.3 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	2.3 acres
Treatment Depth:	0.45 ft
Attenuation Depth:	2.54 ft
Total Depth:	2.99 ft (from as-builts/ permit)
Permitted Treatment Volume	1.04 acre-ft (from as-builts/ permit)

Estimated Treatment Volume: Impacted: 1.04 acre-ft

Estimated Attenuation Volume Impacted: 5.84 acre-ft

Notes: For the purposes of these calculations, it was assumed that this pond would need to be reconfigured as none of the footprint was considered salvageable.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/02/2022

Basin 7	Pre-Development Condition		Post Development Condition	
Total Area, acre	19.03	CN	19.03	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	10.46	98	13.87	98
Pervious Area, ac	8.57	39	5.16	39
CN	71.4		82.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.00		2.19	
Runoff Depth (Q), in	12.03		13.64	
Runoff Volume, acre-ft	19.08		21.63	
Volume Differential, acre-ft	2.54			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.71	
Total Volume Required, acre-ft	3.25			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/02/2022

Basin 7A	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.38	CN	4.38	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.58	98	1.64	98
Pervious Area, ac	2.80	39	2.74	39
CN	60.3		61.1	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.59		6.37	
Runoff Depth (Q), in	10.13		10.28	
Runoff Volume, acre-ft	3.70		3.75	
Volume Differential, acre-ft	0.05			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.01	
Total Volume Required, acre-ft	0.07			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/02/2022

Basin 7B	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.54	CN	1.54	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.62	98	0.86	98
Pervious Area, ac	0.92	39	0.68	39
CN	62.8		71.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.94		3.90	
Runoff Depth (Q), in	10.58		12.12	
Runoff Volume, acre-ft	1.36		1.55	
Volume Differential, acre-ft	0.20			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.05	
Total Volume Required, acre-ft	0.25			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/02/2022

Basin 7C	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.31	CN	6.31	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.99	98	3.39	98
Pervious Area, ac	4.32	39	2.92	39
CN	57.6		70.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	7.36		4.14	
Runoff Depth (Q), in	9.64		11.92	
Runoff Volume, acre-ft	5.07		6.27	
Volume Differential, acre-ft	1.19			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.29	
Total Volume Required, acre-ft	1.49			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG

Checked by: JAF

Date: 02/02/2022

Basin 7E	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.12	CN	12.12	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.11	98	3.74	98
Pervious Area, ac	9.01	40	8.38	39
CN	55.0		57.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	8.19		7.48	
Runoff Depth (Q), in	9.15		9.57	
Runoff Volume, acre-ft	9.24		9.66	
Volume Differential, acre-ft	0.43			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.13	
Total Volume Required, acre-ft	0.56			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/02/2022

Basin 7F	Pre-Development Condition		Post Development Condition	
Total Area, acre	9.78	CN	9.78	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	4.57	98	5.08	98
Pervious Area, ac	5.21	39	4.70	39
CN	66.6		69.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.02		4.36	
Runoff Depth (Q), in	11.23		11.74	
Runoff Volume, acre-ft	9.16		9.57	
Volume Differential, acre-ft	0.42			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.11	
Total Volume Required, acre-ft	0.52			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/02/2022

Basin 8A	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.68	CN	2.68	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.55	98	0.30	98
Pervious Area, ac	2.13	39	2.38	39
CN	51.1		45.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	9.57		11.93	
Runoff Depth (Q), in	8.39		7.26	
Runoff Volume, acre-ft	1.87		1.62	
Volume Differential, acre-ft			-0.25	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			-0.05	
Total Volume Required, acre-ft			-0.31	



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/02/2022

Basin 7&8 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.50	CN	5.50	CN
CN	39.0		79.1	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		2.63	
Runoff Depth (Q), in	5.81		13.22	
Runoff Volume, acre-ft	2.66		6.06	
Volume Differential, acre-ft			3.40	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft			3.40	



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/02/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.57 ac	A	39	334.23	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.46 ac		98	1025.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.03 ac			1359.31	71.4 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.16 ac	A	39	201.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.87 ac		98	1359.26	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.03 ac			1560.50	82.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Checked by : JAF

Curve Number Calculations Basin 7A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.66 ac	A	39	64.74	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.58 ac		98	154.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.14 ac	A	39	44.46	Pond
Total Area	4.38 ac			264.04	60.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.60 ac	A	39	62.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.64 ac		98	160.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.14 ac	A	39	44.46	Pond
Total Area	4.38 ac			267.58	61.1 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Checked by : JAF

Curve Number Calculations Basin 7B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.58 ac	A	39	22.62	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.62 ac		98	60.76	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.34 ac	A	39	13.26	Pond
Total Area	1.54 ac			96.64	62.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.34 ac	A	39	13.26	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.86 ac		98	84.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.34 ac	A	39	13.26	Pond
Total Area	1.54 ac			110.80	71.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.99 ac		98	195.02	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.32 ac	A	39	168.48	Pond
Total Area	6.31 ac			363.50	57.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.39 ac		98	332.22	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.92 ac	A	39	113.88	Pond
Total Area	6.31 ac			446.10	70.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 7E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.15 ac	A	39	122.85	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	1.70 ac	A	45	76.50	Woods, Thin Stand
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.11 ac		98	304.78	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.16 ac	A	39	162.24	Pond
Total Area	12.12 ac			666.37	55.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.78 ac	A	39	30.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.74 ac		98	366.52	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	7.60 ac	A	39	296.40	Pond
Total Area	12.12 ac			693.34	57.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7F

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.97 ac	A	39	37.83	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.57 ac		98	447.86	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.24 ac	A	39	165.36	Pond
Total Area	9.78 ac			651.05	66.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.02 ac	A	39	39.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.08 ac		98	497.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	3.68 ac	A	39	143.52	Pond
Total Area	9.78 ac			681.14	69.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 8

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.71 ac	A	39	144.69	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.73 ac		98	267.54	Roadway Pavement
Wetted Pond Area	3.15 ac		100	315.00	Pond
Dry Pond Area	4.16 ac	A	39	162.24	Pond
Total Area	13.75 ac			889.47	64.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.77 ac	A	39	147.03	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.58 ac		98	252.84	Roadway Pavement
Wetted Pond Area	2.90 ac		100	290.00	Pond
Dry Pond Area	4.50 ac	A	39	175.50	Pond
Total Area	13.75 ac			865.37	62.9 = Weighted CN

|



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 8A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.55 ac		98	53.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.13 ac	A	39	83.07	Pond
Total Area	2.68 ac			136.97	51.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.38 ac	A	39	92.82	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.30 ac		98	29.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.68 ac			122.22	45.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/02/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 7 Alternative 2 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.50 ac	A	39	214.50	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.50 ac			214.50	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	3.62 ac		100	362.00	Pond
Dry Pond Area	1.88 ac	A	39	73.32	Pond
Total Area	5.50 ac			435.32	79.1 = Weighted CN

BASIN 9

BASIN 9

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 100/21/22
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 9

Treatment Volume Required for Additional Impervious Area:	2.00 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	2.00 acre-ft
Attenuation Volume Required for Additional Impervious Area:	9.66 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	9.66 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 10/21/2022

Basin 9 Pond Alternative 1, Station 2235+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	119.11 NAVD 88 (LIDAR converted from NGVD 29)
ELEV EXST EOP @ Low Point =	122.00 STA 2225+00.00 SR 91 NBNAVD 88 from permit plans (20358-16) for Turnpike widening Station 2965+00
Elev SHW =	116.5 NAVD 88 (NWL from plans 406148-1-52-01) from Permit 20358-16 for Pond 9.
Treatment Volume Required	2.00 AC-FT.
Attenuation Volume Required	9.66 AC-FT.
Pond Area Based on treatment volume	2.71 AC
Assume 1 foot of pond freeboard	1.00 FT.
Treatment Depth	0.74 FT.
Total Attenuation Depth based on Pond Area	3.6 FT.
Total Depth from SHWL to Top of Berm	5.31 FT.
Elev SHW=	116.5
Top of Berm Elevation given a total depth =	121.81
Unit Length Based on L/W = 2	495 FT.
Unit Width Based on L/W = 2	243 FT.
Maintenance Berm Width of 15-ft	30 FT.
Grade Adjustment Width Assumed 1:2	11 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	42.49 FT.
Total Pond Length (including maintenance berm and adjustments)	568.79 FT.
Total Pond Width (including maintenance berm and adjustments)	326.046 FT.
Preliminary Property Size Required to accommodate Pond Footprint	4.26 AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	4.68 AC.
Length of Pond Berm Located within the Floodplain	1200 FT.
100-year Floodplain Elevation	121.40 FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL	2.29 FT.
Embankment Cross Sectional area located within floodplain	62.87 SF.
Floodplain impacts resulting from pond embankment	1.73 AC-FT
Average depth of floodplain compensation located adjacent to pond site	2.50 FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impacts	0.69 AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	0.76 AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation	5.45 AC.
Property Size Provided	5.50 AC.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 9 Station 2226+00 Rt
Basin: 9

Pond Footprint:	3.75 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.75 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.21 ft (from permit)
Attenuation Depth:	3.46 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 10/21/2022

Basin 9	Pre-Development Condition		Post Development Condition	
Total Area, acre	47.71	CN	47.71	CN
Pond Area, ac	5.61	100	5.04	100
Impervious Area, ac	22.16	98	31.77	98
Pervious Area, ac	19.94	40	10.90	41
CN	74.0		85.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.52		1.74	
Runoff Depth (Q), in	12.44		14.09	
Runoff Volume, acre-ft	49.45		56.01	
Volume Differential, acre-ft	6.56			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			2.00	
Total Volume Required, acre-ft	8.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.30	CN	4.30	CN
CN	39.0		88.1	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		1.35	
Runoff Depth (Q), in	5.81		14.48	
Runoff Volume, acre-ft	2.08		5.19	
Volume Differential, acre-ft	3.11			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	3.11			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.26 ac	A	39	556.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.16 ac		98	2171.68	Roadway Pavement
Wetted Pond Area	5.61 ac		100	561.00	Pond
Dry Pond Area	4.79 ac	A	39	186.81	Pond
Total Area	47.71 ac			3529.92	74.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.98 ac	B	61	59.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	31.77 ac		98	3113.46	Roadway Pavement
Wetted Pond Area	5.04 ac		100	504.00	Pond
Dry Pond Area	2.68 ac	A	39	104.52	Pond
Total Area	47.71 ac			4064.12	85.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9 Alternative 1 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.30 ac	A	39	167.70	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	4.30 ac			167.70	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	3.46 ac		100	346.00	Pond
Dry Pond Area	0.84 ac	A	39	32.76	Pond
Total Area	4.30 ac			378.76	88.1 = Weighted CN

BASIN 9

ALTERNATIVE 2



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/03/2022

Basin 9 Pond Alternative 2, Station 2220+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	121.11 NAVD 88 (LiDAR converted from NGVD 29) STA 2225+00.00 design baseline SR 91
ELEV EXST EOP @ Low Point =	122.00 NBNAVD 88 from permit plans (20358-16) for Turnpike widening Station 2965+00
Elev SHW =	116.5 NAVD 88 (NWL from plans 406148-1-52-01) from Permit 20358-16 for Pond 9.
Treatment Volume Required	2.00 AC-FT.
Attenuation Volume Required	9.07 AC-FT.
Pond Area Based on treatment volume	2.00 AC
Assume 1 foot of pond freeboard	1.00 FT.
Treatment Depth	1.00 FT.
Total Attenuation Depth based on Pond Area	4.5 FT.
Total Depth from SHWL to Top of Berm	6.53 FT.
Elev SHW=	116.5
Top of Berm Elevation given a total depth =	123.0
Unit Length Based on L/W = 2	418 FT.
Unit Width Based on L/W = 2	209 FT.
Maintenance Berm Width of 15-ft	30 FT.
Grade Adjustment Width Assumed 1:2	8 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	52.24 FT.
Total Pond Length (including maintenance berm and adjustments)	507.56 FT.
Total Pond Width (including maintenance berm and adjustments)	298.7429 FT.
Preliminary Property Size Required to accommodate Pond Footprint	3.48 AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	3.83 AC.
Length of Pond Berm Located within the Floodplain	1400 FT.
100-year Floodplain Elevation	121.40 FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL	0.29 FT.
Embankment Cross Sectional area located within floodplain	8.47 SF.
Floodplain impacts resulting from pond embankment	0.27 AC-FT
Average depth of floodplain compensation located adjacent to pond site	2.00 FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impacts	0.14 AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	0.15 AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation	3.98 AC.
Property Size Provided	4.04 AC.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 9

Treatment Volume Required for Additional Impervious Area: 2.00 acre-ft

Treatment Volume Impacted: 0.00 acre-ft

Total Treatment Volume Required: 2.00 acre-ft

Attenuation Volume Required for Additional Impervious Area: 9.07 acre-ft

Attenuation Volume Impacted: 0.00 acre-ft

Attenuation Volume Required: 9.07 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 9 Station 2226+00 Rt
Basin: 9

Pond Footprint:	3.75 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.75 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.21 ft (from permit)
Attenuation Depth:	3.46 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9	Pre-Development Condition		Post Development Condition	
Total Area, acre	47.71	CN	47.71	CN
Pond Area, ac	5.61	100	5.04	100
Impervious Area, ac	22.16	98	31.77	98
Pervious Area, ac	19.94	40	10.90	41
CN	74.0		85.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.52		1.74	
Runoff Depth (Q), in	12.44		14.09	
Runoff Volume, acre-ft	49.45		56.01	
Volume Differential, acre-ft	6.56			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			2.00	
Total Volume Required, acre-ft	8.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.44	CN	3.44	CN
CN	39.0		88.8	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		1.26	
Runoff Depth (Q), in	5.81		14.58	
Runoff Volume, acre-ft	1.67		4.18	
Volume Differential, acre-ft	2.51			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	2.51			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 10/21/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 9
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.26 ac	A	39	556.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.16 ac		98	2171.68	Roadway Pavement
Wetted Pond Area	5.61 ac		100	561.00	Pond
Dry Pond Area	4.79 ac	A	39	186.81	Pond
Total Area	47.71 ac			3529.92	74.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.98 ac	B	61	59.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	31.77 ac		98	3113.46	Roadway Pavement
Wetted Pond Area	5.04 ac		100	504.00	Pond
Dry Pond Area	2.68 ac	A	39	104.52	Pond
Total Area	47.71 ac			4064.12	85.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9 Alternative 2 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.44 ac	A	39	134.16	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.44 ac			134.16	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	2.81 ac		100	281.00	Pond
Dry Pond Area	0.63 ac	A	39	24.57	Pond
Total Area	3.44 ac			305.57	88.8 = Weighted CN

BASIN 9

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 10/21/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 9 Alternative 3

Treatment Volume Required for Additional Impervious Area:	2.00 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	2.00 acre-ft

Attenuation Volume Required for Additional Impervious Area:	10.23 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	10.23 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 10/21/2022

Basin 9 Pond Alternative 3, Station 2245+00 LT

Wet Detention Calculations

Existing Ground at Pond site = 125.00 NAVD 88 (LiDAR converted from NGVD 29)
NAVD 88 from permit plans (20358-16) for Turnpike widening
ELEV EXST EOP @ Low Point = 122.00 Station 2965+00. Equates to station 2225+00 from design
baseline
Elev SHW = 123.25 Average groundwater elevation from The Westermere Cove
Apartments Drainage Report. Average elevation determined
from section "Groundwater" pg 5.
Control Elevation Utilized= 116.5 It is assumed that a pond liner will be needed to maintain this
elevation

Treatment Volume Required 2.00 AC-FT.
Attenuation Volume Required 10.23 AC-FT.
Pond Area Based on treatment volume 2.50 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.80 FT.
Total Attenuation Depth based on Pond Area 4.1 FT.
Total Depth from SHWL to Top of Berm 5.89 FT.

Elev Control= 116.5 a pond liner is needed in order to obtain this elevation
Top of Berm Elevation given a total depth = 122.4

Unit Length Based on L/W = 2 467 FT.
Unit Width Based on L/W = 2 233 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 10 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 47.11 FT.
Total Pond Length (including maintenance berm and adjustments) 554.49 FT.
Total Pond Width (including maintenance berm and adjustments) 321.02 FT.

Preliminary Property Size Required 4.09 AC.
Preliminary Property Size Required with 10% Contingency 4.49 AC.

Property Size Provided 17.36 AC. (See Note 1)

Notes:

1. The property size provided noted above is for the entire parcel which is shared with Basin 10 Alternative 3. If the parcel was to be shared with Basin 10 Alternative 3 the estimated size available for Basin 9 Alternative 3 is 6.67 acres.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds

Pond 9 Station 2226+00 Rt

Basin: 9

Pond Footprint:	3.75 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.75 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.21 ft (from permit)
Attenuation Depth:	3.46 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9	Pre-Development Condition		Post Development Condition	
Total Area, acre	47.71	CN	47.71	CN
Pond Area, ac	5.61	100	5.04	100
Impervious Area, ac	22.16	98	31.77	98
Pervious Area, ac	19.94	40	10.90	41
CN	74.0		85.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.52		1.74	
Runoff Depth (Q), in	12.44		14.09	
Runoff Volume, acre-ft	49.45		56.01	
Volume Differential, acre-ft	6.56			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			2.00	
Total Volume Required, acre-ft	8.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9 Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.34	CN	6.34	CN
CN	45.0		85.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	12.22		1.74	
Runoff Depth (Q), in	7.13		14.09	
Runoff Volume, acre-ft	3.77		7.44	
Volume Differential, acre-ft	3.68			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	3.68			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.26 ac	A	39	556.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.16 ac		98	2171.68	Roadway Pavement
Wetted Pond Area	5.61 ac		100	561.00	Pond
Dry Pond Area	4.79 ac	A	39	186.81	Pond
Total Area	47.71 ac			3529.92	74.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.98 ac	B	61	59.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	31.77 ac		98	3113.46	Roadway Pavement
Wetted Pond Area	5.04 ac		100	504.00	Pond
Dry Pond Area	2.68 ac	A	39	104.52	Pond
Total Area	47.71 ac			4064.12	85.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9 Alternative 3 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.34 ac	A	45	285.30	Trees, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.34 ac			285.30	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	4.80 ac		100	480.00	Pond
Dry Pond Area	1.54 ac	A	39	60.06	Pond
Total Area	6.34 ac			540.06	85.2 = Weighted CN

BASIN 10

BASIN 10

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Total Volumetric Requirements for Basin 10 Alternative 1

Treatment Volume Required for Additional Impervious Area:	3.82 acre-ft
Treatment Volume Impacted:	7.51 acre-ft
Total Treatment Volume Required:	11.33 acre-ft

Attenuation Volume Required for Additional Impervious Area:	9.65 acre-ft
Attenuation Volume Impacted:	16.17 acre-ft
Attenuation Volume Required:	25.83 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/14/2022

TOTAL REQUIREMENTS FOR BASIN 10 & STORAGE AVAILABLE IN INTERCHANGE CELLS

Treatment Volume Required	11.33 AC-FT.
Attenuation Volume Required	25.83 AC-FT.
Treatment Volume Available	12.58 AC-FT.
Attenuation Volume Available	33.78 AC-FT.

Note: A breakdown of the treatment and attenuation volume available in each cell is provided on the subsequent sheets.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE

location of interchange cell: TP-7

Elev Exist EOP @ Low Point =	121.20 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	117.50 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	3.00 AC	
Maintenance Berm Elevation (Outside)	121.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	119.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	3.50 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	14.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	33 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	118.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	2.2 AC	measured in CAD
Elevation of NWL	115.6 FT.	NWL (See Note 1)
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	1.9 FT.	Max attenuation Depth
Attenuation Depth Used	1.9 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	1.9 AC.	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	1.6 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	1.7 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	1.69 AC-FT.	
Attenuation Volume Available	3.46 AC-FT.	

Notes:

- 1) NWL was determined from project 429-152. NWL determine from the average of TP-1 and Pond 4.
- 2) Exist. EOP from SR50CON_SB profile STA. 1420+45.00
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE

location of interchange cell: TP-8

Elev Exist EOP @ Low Point =	127.00 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	124.00 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	4.00 AC	
Maintenance Berm Elevation (Outside)	125.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	123.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	1.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	4.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	23 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	122.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	2.5 AC	measured in CAD
Elevation of NWL	113.6 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	7.9 FT.	Max attenuation Depth Must be less than Max DHW to Treatment Elev.
Attenuation Depth Used	5.0 FT.	
Area at Attenuation Depth	0.9 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	0.6 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	0.6 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	0.60 AC-FT.	
Attenuation Volume Available	3.90 AC-FT.	

Notes:

1) NWL was determined from As-Builts 75320-3460-600 for Pond TP-1, PDF pg 35. Plans are NGVD. Conversion to NAVD is NAVD 88=NGVD 29-0.89'

2) Exist. EOP elevation from loop ramp adjacent to existing pond TP-

3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE
location of interchange cell: TP-9.2

Elev Exist EOP @ Low Point =	118.30 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	115.00 FT.	See Note 1
Area at Toe of Roadway Fill Assuming No Pond=	3.00 AC	
Maintenance Berm Elevation (Outside)	117.00 FT.	
Maintenance Berm Elevation (Inside 1:15 slope)	116.00 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	2.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	8.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	27 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	115.0 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.0 AC	measured in CAD
Elevation of NWL	112.0 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	2.0 FT.	Max attenuation Depth
Attenuation Depth Used	2.0 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	0.9 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	0.6 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	0.7 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	0.65 AC-FT.	
Attenuation Volume Available	1.60 AC-FT.	

Notes:

1) NWL was determined from As-Builts 75320-3460-600 for Pond TP-9, PDF pg 42.
Plans are NGVD. Conversion to NAVD is NAVD 88=NGVD 29-0.89'

2) Exist. EOP elevation determined from existing SR 91 SB Station 3297+00. Datum NAVD 88.

3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE

location of interchange cell: TP-9

Elev Exist EOP @ Low Point =	115.20 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	119.00 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	4.00 AC	
Maintenance Berm Elevation (Outside)	118.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	116.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	1.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	4.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	23 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	115.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.7 AC	measured in CAD
Elevation of NWL	111.1 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	3.4 FT.	Max attenuation Depth
Attenuation Depth Used	2.0 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	6.7 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	6.2 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	5.9 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	6.05 AC-FT.	
Attenuation Volume Available	12.60 AC-FT.	

Notes:

- 1) NWL was determined from As-Builts 75320-3460-600 for Pond TP-2.
- 2) Exist. EOP elevation determined from existing SR 91 NB.Station 3313+00.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE

location of interchange cell: Pond 8

Elev Exist EOP @ Low Point =	133.00 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	119.00 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	2.00 AC	
Maintenance Berm Elevation (Outside)	122.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	120.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	3.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	12.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	31 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	119.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.7 AC	measured in CAD
Elevation of NWL	115.6 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	2.9 FT.	Max attenuation Depth
Attenuation Depth Used	2.9 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	1.8 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	1.3 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	1.4 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	1.35 AC-FT.	
Attenuation Volume Available	4.57 AC-FT.	

Notes:

- 1) NWL was determined from As-Builts 75320-3460-600 for Pond CP-2, PDF pg 36. Plans are NGVD. Conversion to NAVD is NAVD 88=NGVD 29-0.89'
- 2) Exist. EOP elevation determined from existing Ramp 313. Datum NAVD 88.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE

location of interchange cell: Pond 600-2

Elev Exist EOP @ Low Point =	133.00 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	118.00 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	2.00 AC	
Maintenance Berm Elevation (Outside)	125.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	123.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	7.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	28.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	47 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	122.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	2.9 AC	measured in CAD
Elevation of NWL	117.6 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	3.9 FT.	Max attenuation Depth
Attenuation Depth Used	3.0 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	2.8 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	2.2 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	2.3 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	2.25 AC-FT.	
Attenuation Volume Available	7.65 AC-FT.	

Notes:

- 1) The NWL of Pond 4 was utilized for the NWL of this pond as it located directly adjacent to the proposed configuration.
- 2) Exist. EOP elevation determined from existing Ramp 313. Datum NAVD 88.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Ponds TP-1 and TP-2 Station 2292+50 Rt
Basin: 10

Pond Footprint:	5.21 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	5.21 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.05 ft (from as-builts)
Attenuation Depth:	2.3 ft (stage from permit weir elev from as-builts)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-5 Station 2260+00 Lt/Rt
Basin: 10

Pond Footprint:	5.34 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	85 %
Salvageable Footprint:	4.539 acres
Percentage of pond footprint impacted:	15 %
Pond footprint no longer useable:	0.801 acres
Treatment Depth:	1.76 ft (from permit)
Attenuation Depth:	2.21 ft (from permit)

Estimated Treatment Volume: Impacted: 1.41 acre-ft

Estimated Attenuation Volume Impacted: 1.77 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-6 Station 2290+00 Lt
Basin: 10

Pond Footprint:	3.02 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	80 %
Salvageable Footprint:	2.42 acres
Percentage of pond footprint impacted:	20 %
Pond footprint no longer useable:	0.60 acres
Treatment Depth:	1.79 ft (from as-built plans)
Attenuation Depth:	0.74 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 1.08 acre-ft

Estimated Attenuation Volume Impacted: 0.45 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-9 Station 2308+00 Lt/Rt
Basin: 10

Pond Footprint:	3.63 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	3.63 acres
Treatment Depth:	1.02 ft (from as-built plans)
Attenuation Depth:	3.57 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 3.70 acre-ft

Estimated Attenuation Volume Impacted: 12.96 acre-ft

Note: Existing pond volumes that remain have been accounted for in proposed design. Assuming that 100% of the pond is impacted is conservative as it was determined that when looking at the interchange as a whole the worst case alternative did not impact Pond TP-9. The offsite alternatives continue to utilize this assumption.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 3 Station 2297+00 Lt
Basin: 10

Pond Footprint:	3.7 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	3.33 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.37 acres
Treatment Depth:	1.80 ft (from CFX drainage documentation page 266 Project No. 429-152)
Attenuation Depth:	1.34 ft (from CFX plans sheet 10 Project No. 429-152)

Estimated Treatment Volume: Impacted: 0.67 acre-ft

Estimated Attenuation Volume Impacted: 0.50 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 4 Station 2289+00 Lt
Basin: 10

Pond Footprint:	2.7 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	70 %
Salvageable Footprint:	1.89 acres
Percentage of pond footprint impacted:	30 %
Pond footprint no longer useable:	0.81 acres
Treatment Depth:	0.80 ft (from CFX drainage documentation page 272 Project No. 429-152)
Attenuation Depth:	0.62 ft (from CFX plans sheet 10 Project No. 429-152)

Estimated Treatment Volume: Impacted: 0.65 acre-ft

Estimated Attenuation Volume Impacted: 0.50 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10A	Pre-Development Condition		Post Development Condition	
Total Area, acre	28.18	CN	28.18	CN
Pond Area, ac	5.34	100	5.34	100
Impervious Area, ac	10.52	98	15.03	98
All Pervious Area, ac	12.32	41	7.81	42
Pervious Area A soils only, ac	11.12	39	6.92	39
CN	73.5		82.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.60		2.09	
Runoff Depth (Q), in	4.42		5.46	
Runoff Volume, acre-ft	10.38		12.82	
Volume Differential, acre-ft	2.44			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			1.05	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.94	
Total Volume Required, acre-ft	3.49			

The larger of these two values was utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10B	Pre-Development Condition		Post Development Condition	
Total Area, acre	67.59	CN	67.59	CN
Pond Area, ac	11.27	100	10.13	100
Impervious Area, ac	18.08	98	22.18	98
All Pervious Area, ac	38.24	45	35.28	45
Pervious Area A soils only, ac	28.21	39	25.94	39
CN	68.2		70.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.66		4.18	
Runoff Depth (Q), in	3.83		4.09	
Runoff Volume, acre-ft	21.60		23.03	
Volume Differential, acre-ft		1.44		
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.57	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.85	
Total Volume Required, acre-ft		2.29		

The larger of these two values was utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10C	Pre-Development Condition		Post Development Condition	
Total Area, acre	32.19	CN	32.19	CN
Pond Area, ac	5.22	100	4.87	100
Impervious Area, ac	9.87	98	10.09	98
Pervious Area, ac	17.10	39	17.23	39
CN	67.0		66.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.93		4.99	
Runoff Depth (Q), in	3.70		3.67	
Runoff Volume, acre-ft	9.93		9.85	
Volume Differential, acre-ft	-0.08			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.06	
Total Volume Required, acre-ft	-0.02			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10D	Pre-Development Condition		Post Development Condition	
Total Area, acre	63.33	CN	63.33	CN
Pond Area, ac	4.11	100	5.57	100
Impervious Area, ac	20.73	98	24.38	98
Pervious Area, ac	38.49	39	33.38	43
CN	62.3		69.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.06		4.50	
Runoff Depth (Q), in	3.19		3.92	
Runoff Volume, acre-ft	16.86		20.67	
Volume Differential, acre-ft	3.81			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.91	
Total Volume Required, acre-ft	4.72			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10E	Pre-Development Condition		Post Development Condition	
Total Area, acre	15.04	CN	15.04	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.80	98	9.88	98
Pervious Area, ac	7.24	39	5.16	39
CN	69.6		77.8	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.37		2.86	
Runoff Depth (Q), in	3.99		4.89	
Runoff Volume, acre-ft	4.99		6.13	
Volume Differential, acre-ft	1.14			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.52	
Total Volume Required, acre-ft	1.66			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10SN1	Pre-Development Condition		Post Development Condition	
Total Area, acre	20.95	CN	20.95	CN
Pond Area, ac	1.35	100	1.35	100
Impervious Area, ac	5.93	98	7.66	98
Pervious Area, ac	13.67	39	11.94	39
CN	59.6		64.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.77		5.50	
Runoff Depth (Q), in	2.92		3.43	
Runoff Volume, acre-ft	5.09		5.99	
Volume Differential, acre-ft	0.90			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
Total Volume Required, acre-ft	1.33			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SN1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.51 ac	A	39	487.89	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.93 ac		98	581.14	Roadway Pavement
Wetted Pond Area	1.35 ac		100	135.00	Pond
Dry Pond Area	1.16 ac	A	39	45.24	Pond
Total Area	20.95 ac			1249.27	59.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.78 ac	A	39	420.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.66 ac		98	750.68	Roadway Pavement
Wetted Pond Area	1.35 ac		100	135.00	Pond
Dry Pond Area	1.16 ac	A	39	45.24	Pond
Total Area	20.95 ac			1351.34	64.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.06 ac	A	39	314.34	Open Spaces, Lawns/Good Condition
Pervious Area	1.20 ac	B	61	73.20	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.52 ac		98	1030.96	Roadway Pavement
Wetted Pond Area	5.34 ac		100	534.00	Pond
Dry Pond Area	3.06 ac	A	39	119.34	Pond
Total Area	28.18 ac			2071.84	73.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.41 ac	A	39	171.99	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.03 ac		98	1472.94	Roadway Pavement
Wetted Pond Area	5.34 ac		100	534.00	Pond
Dry Pond Area	2.51 ac	A	39	97.89	Pond
Total Area	28.18 ac			2331.11	82.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	21.32 ac	A	39	831.48	Open Spaces, Lawns/Good Condition
Pervious Area	10.03 ac	B	61	611.83	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.08 ac		98	1771.84	Roadway Pavement
Wetted Pond Area	11.27 ac		100	1127.00	Pond
Dry Pond Area	6.89 ac	A	39	268.71	Pond
Total Area	67.59 ac			4610.86	68.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	20.99 ac	A	39	818.61	Open Spaces, Lawns/Good Condition
Pervious Area	9.34 ac	B	61	569.74	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.18 ac		98	2173.64	Roadway Pavement
Wetted Pond Area	10.13 ac		100	1013.00	Pond
Dry Pond Area	4.95 ac	A	39	193.05	Pond
Total Area	67.59 ac			4768.04	70.5 = Weighted CN

Note:



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	11.67 ac	A	39	455.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.87 ac		98	967.26	Roadway Pavement
Wetted Pond Area	5.22 ac		100	522.00	Pond
Dry Pond Area	5.43 ac	A	39	211.77	Pond
Total Area	32.19 ac			2156.16	67.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.05 ac	A	39	547.95	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.09 ac		98	988.82	Roadway Pavement
Wetted Pond Area	4.87 ac		100	487.00	Pond
Dry Pond Area	3.18 ac	A	39	124.02	Pond
Total Area	32.19 ac			2147.79	66.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 04/14/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 10D

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	32.33 ac	A	39	1260.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	20.73 ac		98	2031.54	Roadway Pavement
Wetted Pond Area	4.11 ac		100	411.00	Pond
Dry Pond Area	6.16 ac	A	39	240.24	Pond
Total Area	63.33 ac			3943.65	62.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	25.58 ac	A	39	997.62	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.93 ac	D	80	234.40	Open Spaces, Lawns/Good Condition
Impervious Area	24.38 ac		98	2389.24	Roadway Pavement
Wetted Pond Area	5.57 ac		100	557.00	Pond
Dry Pond Area	4.87 ac	A	39	189.93	Pond
Total Area	63.33 ac			4368.19	69.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.80 ac		98	764.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	15.04 ac			1046.76	69.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.16 ac	A	39	201.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.88 ac		98	968.24	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	15.04 ac			1169.48	77.8 = Weighted CN

BASIN 10

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Total Volumetric Requirements for Basin 10 Alternative 2

Treatment Volume Required for Additional Impervious Area:	3.82 acre-ft
Treatment Volume Impacted:	3.80 acre-ft
Total Treatment Volume Required:	7.63 acre-ft

Attenuation Volume Required for Additional Impervious Area:	10.64 acre-ft
Attenuation Volume Impacted:	3.22 acre-ft
Attenuation Volume Required:	13.85 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/03/2022

Basin 10 Pond Alternative 2, Station 2260+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	120.00	NAVD 88 from LIDAR Data
ELEV EXST EOP @ Low Point =	118.20	NAVD 88 along mainline Station 3034+00 FPID No. 406148-1 (Permit No. 20358-16) This equates to Station 2250+00 from design baseline. (See note below)
Elev SHW =	111.5	Pond Control elevation from Permit No. 75943-1
Treatment Volume Required	7.63	AC-FT.
Attenuation Volume Required	13.85	AC-FT.
Pond Area Based on treatment volume	5.09	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.50	FT.
Total Attenuation Depth based on Pond Area	2.7	FT.
Total Depth from SHWL to Top of Berm	5.22	FT.
Elev SHW=	111.5	
Top of Berm Elevation given a total depth =	116.7	
Unit Length Based on L/W = 2	666	FT.
Unit Width Based on L/W = 2	333	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	13	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	41.79	FT.
Total Pond Length (including maintenance berm and adjustments)	750.55	FT.
Total Pond Width (including maintenance berm and adjustments)	417.72	FT.
Preliminary Property Size Required	7.20	AC.
Preliminary Property Size Required with 10% Contingency	7.92	AC.
Property Size Provided	11.14	AC.

Note: Since 3.84 acres of pavement was treated above that which was required per the previous permit (SJRWMD Permit No. 20358-16), the western extents of Basin 10 will not be sent to Pond Alternative 2 as the vertical differential will not allow for the HGL requirements to be met at the western end of Basin 10.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Ponds TP-1 and TP-2 Station 2292+50 Rt
Basin: 10

Pond Footprint:	5.21 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	5.21 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.05 ft (from as-builts)
Attenuation Depth:	2.3 ft (stage from permit weir elev from as-builts)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-5 Station 2260+00 Lt/Rt
Basin: 10

Pond Footprint:	5.34 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	85 %
Salvageable Footprint:	4.539 acres
Percentage of pond footprint impacted:	15 %
Pond footprint no longer useable:	0.801 acres
Treatment Depth:	1.76 ft (from permit)
Attenuation Depth:	2.21 ft (from permit)

Estimated Treatment Volume: Impacted: 1.41 acre-ft

Estimated Attenuation Volume Impacted: 1.77 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-6 Station 2290+00 Lt
Basin: 10

Pond Footprint:	3.02 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	80 %
Salvageable Footprint:	2.42 acres
Percentage of pond footprint impacted:	20 %
Pond footprint no longer useable:	0.60 acres
Treatment Depth:	1.79 ft (from as-built plans)
Attenuation Depth:	0.74 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 1.08 acre-ft

Estimated Attenuation Volume Impacted: 0.45 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-9 Station 2308+00 Lt/Rt
Basin: 10

Pond Footprint:	3.63 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.63 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0 acres
Treatment Depth:	1.02 ft (from as-built plans)
Attenuation Depth:	3.57 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds

Pond 3 Station 2297+00 Lt

Basin: 10

Pond Footprint:	3.7 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	3.33 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.37 acres
Treatment Depth:	1.80 ft (from CFX drainage documentation page 266 Project No. 429-152)
Attenuation Depth:	1.34 ft (from CFX plans sheet 10 Project No. 429-152)

Estimated Treatment Volume: Impacted: 0.67 acre-ft

Estimated Attenuation Volume Impacted: 0.50 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 4 Station 2289+00 Lt

Basin: 10

Pond Footprint:	2.7 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	70 %
Salvageable Footprint:	1.89 acres
Percentage of pond footprint impacted:	30 %
Pond footprint no longer useable:	0.81 acres
Treatment Depth:	0.80 ft (from CFX drainage documentation page 272 Project No. 429-152)
Attenuation Depth:	0.62 ft (from CFX plans sheet 10 Project No. 429-152)

Estimated Treatment Volume: Impacted: 0.65 acre-ft

Estimated Attenuation Volume Impacted: 0.50 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10A	Pre-Development Condition		Post Development Condition	
Total Area, acre	28.18	CN	28.18	CN
Pond Area, ac	5.34	100	5.34	100
Impervious Area, ac	10.52	98	15.03	98
All Pervious Area, ac	12.32	41	7.81	42
Pervious Area A soils only, ac	11.12	39	6.92	39
CN	73.5		82.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.60		2.09	
Runoff Depth (Q), in	4.42		5.46	
Runoff Volume, acre-ft	10.38		12.82	
Volume Differential, acre-ft	2.44			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			1.05	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.94	
Total Volume Required, acre-ft	3.49			

The larger of these two values was utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10B	Pre-Development Condition		Post Development Condition	
Total Area, acre	67.59	CN	67.59	CN
Pond Area, ac	11.27	100	10.13	100
Impervious Area, ac	18.08	98	22.18	98
All Pervious Area, ac	38.24	45	35.28	45
Pervious Area A soils only, ac	28.21	39	25.94	39
CN	68.2		70.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.66		4.18	
Runoff Depth (Q), in	3.83		4.09	
Runoff Volume, acre-ft	21.60		23.03	
Volume Differential, acre-ft	1.44			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.57	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.85	
Total Volume Required, acre-ft	2.29			

The larger of these two values was utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10C	Pre-Development Condition		Post Development Condition	
Total Area, acre	32.19	CN	32.19	CN
Pond Area, ac	5.22	100	4.87	100
Impervious Area, ac	9.87	98	10.09	98
Pervious Area, ac	17.10	39	17.23	39
CN	67.0		66.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.93		4.99	
Runoff Depth (Q), in	3.70		3.67	
Runoff Volume, acre-ft	9.93		9.85	
Volume Differential, acre-ft	-0.08			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.06	
Total Volume Required, acre-ft	-0.02			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10D	Pre-Development Condition		Post Development Condition	
Total Area, acre	63.33	CN	63.33	CN
Pond Area, ac	4.11	100	2.69	100
Impervious Area, ac	20.73	98	24.38	98
Pervious Area, ac	38.49	39	36.26	42
CN	62.3		66.2	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.06		5.11	
Runoff Depth (Q), in	3.19		3.62	
Runoff Volume, acre-ft	16.86		19.08	
Volume Differential, acre-ft	2.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.91	
Total Volume Required, acre-ft	3.13			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10E	Pre-Development Condition		Post Development Condition	
Total Area, acre	15.04	CN	15.04	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.80	98	9.88	98
Pervious Area, ac	7.24	39	5.16	39
CN	69.6		77.8	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.37		2.86	
Runoff Depth (Q), in	3.99		4.89	
Runoff Volume, acre-ft	4.99		6.13	
Volume Differential, acre-ft	1.14			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.52	
Total Volume Required, acre-ft	1.66			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10SN1	Pre-Development Condition		Post Development Condition	
Total Area, acre	20.95	CN	20.95	CN
Pond Area, ac	1.35	100	1.35	100
Impervious Area, ac	5.93	98	7.66	98
Pervious Area, ac	13.67	39	11.94	39
CN	59.6		64.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.77		5.50	
Runoff Depth (Q), in	2.92		3.43	
Runoff Volume, acre-ft	5.09		5.99	
Volume Differential, acre-ft	0.90			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
Total Volume Required, acre-ft	1.33			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	7.36	CN	7.36	CN
CN	51.5		89.9	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	9.43		1.13	
Runoff Depth (Q), in	2.09		6.29	
Runoff Volume, acre-ft	1.28		3.86	
Volume Differential, acre-ft	2.58			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	2.58			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
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Checked by : JAF

Curve Number Calculations Alternative 2 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.11 ac	A	45	274.95	Woods, Thin Strand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	1.25 ac	D	83	103.75	Woods, Thin Strand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	7.36 ac			378.70	51.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.74 ac	D	80	59.20	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	5.64 ac		100	564.00	Pond
Dry Pond Area	0.98 ac	A	39	38.22	Pond
Total Area	7.36 ac			661.42	89.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Curve Number Calculations Basin 10SN1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.51 ac	A	39	487.89	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.93 ac		98	581.14	Roadway Pavement
Wetted Pond Area	1.35 ac		100	135.00	Pond
Dry Pond Area	1.16 ac	A	39	45.24	Pond
Total Area	20.95 ac			1249.27	59.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.78 ac	A	39	420.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.66 ac		98	750.68	Roadway Pavement
Wetted Pond Area	1.35 ac		100	135.00	Pond
Dry Pond Area	1.16 ac	A	39	45.24	Pond
Total Area	20.95 ac			1351.34	64.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.06 ac	A	39	314.34	Open Spaces, Lawns/Good Condition
Pervious Area	1.20 ac	B	61	73.20	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.52 ac		98	1030.96	Roadway Pavement
Wetted Pond Area	5.34 ac		100	534.00	Pond
Dry Pond Area	3.06 ac	A	39	119.34	Pond
Total Area	28.18 ac			2071.84	73.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.41 ac	A	39	171.99	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.03 ac		98	1472.94	Roadway Pavement
Wetted Pond Area	5.34 ac		100	534.00	Pond
Dry Pond Area	2.51 ac	A	39	97.89	Pond
Total Area	28.18 ac			2331.11	82.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	21.32 ac	A	39	831.48	Open Spaces, Lawns/Good Condition
Pervious Area	10.03 ac	B	61	611.83	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.08 ac		98	1771.84	Roadway Pavement
Wetted Pond Area	11.27 ac		100	1127.00	Pond
Dry Pond Area	6.89 ac	A	39	268.71	Pond
Total Area	67.59 ac			4610.86	68.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	20.99 ac	A	39	818.61	Open Spaces, Lawns/Good Condition
Pervious Area	9.34 ac	B	61	569.74	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.18 ac		98	2173.64	Roadway Pavement
Wetted Pond Area	10.13 ac		100	1013.00	Pond
Dry Pond Area	4.95 ac	A	39	193.05	Pond
Total Area	67.59 ac			4768.04	70.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	11.67 ac	A	39	455.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.87 ac		98	967.26	Roadway Pavement
Wetted Pond Area	5.22 ac		100	522.00	Pond
Dry Pond Area	5.43 ac	A	39	211.77	Pond
Total Area	32.19 ac			2156.16	67.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.05 ac	A	39	547.95	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.09 ac		98	988.82	Roadway Pavement
Wetted Pond Area	4.87 ac		100	487.00	Pond
Dry Pond Area	3.18 ac	A	39	124.02	Pond
Total Area	32.19 ac			2147.79	66.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 10D

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	32.33 ac	A	39	1260.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	20.73 ac		98	2031.54	Roadway Pavement
Wetted Pond Area	4.11 ac		100	411.00	Pond
Dry Pond Area	6.16 ac	A	39	240.24	Pond
Total Area	63.33 ac			3943.65	62.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	30.33 ac	A	39	1182.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.93 ac	D	80	234.40	Open Spaces, Lawns/Good Condition
Impervious Area	24.38 ac		98	2389.24	Roadway Pavement
Wetted Pond Area	2.69 ac		100	269.00	Pond
Dry Pond Area	3.00 ac	A	39	117.00	Pond
Total Area	63.33 ac			4192.51	66.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations 10E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.80 ac		98	764.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	15.04 ac			1046.76	69.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.16 ac	A	39	201.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.88 ac		98	968.24	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	15.04 ac			1169.48	77.8 = Weighted CN

BASIN 10

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Total Volumetric Requirements for Basin 10 Alternative 3

Treatment Volume Required for Additional Impervious Area:	3.82 acre-ft
Treatment Volume Impacted:	3.80 acre-ft
Total Treatment Volume Required:	7.63 acre-ft

Attenuation Volume Required for Additional Impervious Area:	10.95 acre-ft
Attenuation Volume Impacted:	3.22 acre-ft
Attenuation Volume Required:	14.17 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/03/2022

Basin 10 Pond Alternative 3

Wet Detention Calculations

Existing Ground at Pond site =	125.00	NAVD 88 (LiDAR converted from NGVD 29) NAVD 88 along mainline Station 3022+00 FPID No. 406148-1 (Permit No. 20358-16) This equates to Station 2288+50 from design baseline. (See note 1 below)
ELEV EXST EOP @ Low Point =	121.00	
Elev SHW =	123.25	Average groundwater elevation from The Westermere Cove Apartments Drainage Report. Average elevation determined from section "Groundwater" pg 5.
Control Elevation Utilized=	116.0	This is the control elevation of Turnpike Pond TP-5. It is assumed that a pond liner will be needed to maintain this elevation.
Treatment Volume Required	7.63 AC-FT.	
Attenuation Volume Required	14.17 AC-FT.	
Pond Area Based on treatment volume	7.55 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	1.01 FT.	
Total Attenuation Depth based on Pond Area	1.9 FT.	
Total Depth from SHWL to Top of Berm	3.9 FT.	
Pond Control Elev =	116.0	a pond liner is needed in order to obtain this elevation
Top of Berm Elevation given a total depth =	119.89	
Unit Length Based on L/W = 2	811 FT.	
Unit Width Based on L/W = 2	406 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	20 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	31.09 FT.	
Total Pond Length (including maintenance berm and adjustments)	892.75 FT.	
Total Pond Width (including maintenance berm and adjustments)	487.1488 FT.	
Preliminary Property Size Required	9.98 AC.	
Preliminary Property Size Required with 10% Contingency	10.98 AC.	

Property Size Provided **17.50 AC.** (See note 2)

Notes:

1. Since 3.84 acres of pavement was treated above that which was required per the previous permit (SJRWMD Permit No. 20358-16), the western extents of Basin 10 will not be sent to Pond Alternative 3 as the vertical differential will not allow for the HGL requirements to be met at the western end of Basin 10. All other additional pavement areas above the 3.84 acres of pavement that was previously treated above the requirements will need to be treated in the interchange.

2. The property size provided noted above is for the entire parcel which is shared with Basin 9 Alternative 3. If the parcel was to be shared with Basin 9 Alternative 3 the size estimated for Basin 10 Alternative 3 is 10.83 acres which is larger than that which is required for Basin 10 Alternative 3 without the 10% contingency. If it was determined that both of these alternatives would be the preferred alternative, a more detailed analysis should be conducted to determine if the size is indeed adequate to accommodate both ponds. It should be noted that if these 2 alternatives were to share an internal maintenance berm the property size required for this alternative would be approximately 10.5 acres.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Ponds TP-1 and TP-2 Station 2292+50 Rt
Basin: 10

Pond Footprint:	5.21 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	5.21 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.05 ft (from as-builts)
Attenuation Depth:	2.3 ft (stage from permit weir elev from as-builts)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



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Impacts to Existing Ponds
Pond TP-5 Station 2260+00 Lt/Rt
Basin: 10

Pond Footprint:	5.34 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	85 %
Salvageable Footprint:	4.539 acres
Percentage of pond footprint impacted:	15 %
Pond footprint no longer useable:	0.801 acres
Treatment Depth:	1.76 ft (from permit)
Attenuation Depth:	2.21 ft (from permit)

Estimated Treatment Volume: Impacted: 1.41 acre-ft

Estimated Attenuation Volume Impacted: 1.77 acre-ft



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Impacts to Existing Ponds
Pond TP-6 Station 2290+00 Lt
Basin: 10

Pond Footprint:	3.02 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	80 %
Salvageable Footprint:	2.42 acres
Percentage of pond footprint impacted:	20 %
Pond footprint no longer useable:	0.60 acres
Treatment Depth:	1.79 ft (from as-built plans)
Attenuation Depth:	0.74 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 1.08 acre-ft

Estimated Attenuation Volume Impacted: 0.45 acre-ft



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Impacts to Existing Ponds
Pond TP-9 Station 2308+00 Lt/Rt
Basin: 10

Pond Footprint:	3.63 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.63 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0 acres
Treatment Depth:	1.02 ft (from as-built plans)
Attenuation Depth:	3.57 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



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Impacts to Existing Ponds
Pond 3 Station 2297+00 Lt

Basin: 10

Pond Footprint:	3.7 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	3.33 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.37 acres
Treatment Depth:	1.80 ft (from CFX drainage documentation page 266 Project No. 429-152)
Attenuation Depth:	1.34 ft (from CFX plans sheet 10 Project No. 429-152)

Estimated Treatment Volume: Impacted: 0.67 acre-ft

Estimated Attenuation Volume Impacted: 0.50 acre-ft



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Impacts to Existing Ponds
Pond 4 Station 2289+00 Lt

Basin: 10

Pond Footprint:	2.7 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	70 %
Salvageable Footprint:	1.89 acres
Percentage of pond footprint impacted:	30 %
Pond footprint no longer useable:	0.81 acres
Treatment Depth:	0.80 ft (from CFX drainage documentation page 272 Project No. 429-152)
Attenuation Depth:	0.62 ft (from CFX plans sheet 10 Project No. 429-152)

Estimated Treatment Volume: Impacted: 0.65 acre-ft

Estimated Attenuation Volume Impacted: 0.50 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 10A	Pre-Development Condition		Post Development Condition	
Total Area, acre	28.18	CN	28.18	CN
Pond Area, ac	5.34	100	5.34	100
Impervious Area, ac	10.52	98	15.03	98
All Pervious Area, ac	12.32	41	7.81	42
Pervious Area A soils only, ac	11.12	39	6.92	39
CN	73.5		82.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.60		2.09	
Runoff Depth (Q), in	4.42		5.46	
Runoff Volume, acre-ft	10.38		12.82	
Volume Differential, acre-ft	2.44			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			1.05	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.94	
Total Volume Required, acre-ft	3.49			

The larger of these two values was utilized to determine treatment volume requirements.



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Basin 10B	Pre-Development Condition		Post Development Condition	
Total Area, acre	67.59	CN	67.59	CN
Pond Area, ac	11.27	100	10.13	100
Impervious Area, ac	18.08	98	22.18	98
All Pervious Area, ac	38.24	45	35.28	45
Pervious Area A soils only, ac	28.21	39	25.94	39
CN	68.2		70.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.66		4.18	
Runoff Depth (Q), in	3.83		4.09	
Runoff Volume, acre-ft	21.60		23.03	
Volume Differential, acre-ft		1.44		
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.57	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.85	
Total Volume Required, acre-ft		2.29		

The larger of these two values was utilized to determine treatment volume requirements.



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Basin 10C	Pre-Development Condition		Post Development Condition	
Total Area, acre	32.19	CN	32.19	CN
Pond Area, ac	5.22	100	4.87	100
Impervious Area, ac	9.87	98	10.09	98
Pervious Area, ac	17.10	39	17.23	39
CN	67.0		66.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.93		4.99	
Runoff Depth (Q), in	3.70		3.67	
Runoff Volume, acre-ft	9.93		9.85	
Volume Differential, acre-ft	-0.08			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.06	
Total Volume Required, acre-ft	-0.02			



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Basin 10D	Pre-Development Condition		Post Development Condition	
Total Area, acre	63.33	CN	63.33	CN
Pond Area, ac	4.11	100	2.69	100
Impervious Area, ac	20.73	98	24.38	98
Pervious Area, ac	38.49	39	36.26	42
CN	62.3		66.2	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.06		5.11	
Runoff Depth (Q), in	3.19		3.62	
Runoff Volume, acre-ft	16.86		19.08	
Volume Differential, acre-ft	2.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.91	
Total Volume Required, acre-ft	3.13			



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Basin 10E	Pre-Development Condition		Post Development Condition	
Total Area, acre	15.04	CN	15.04	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.80	98	9.88	98
Pervious Area, ac	7.24	39	5.16	39
CN	69.6		77.8	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.37		2.86	
Runoff Depth (Q), in	3.99		4.89	
Runoff Volume, acre-ft	4.99		6.13	
Volume Differential, acre-ft	1.14			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.52	
Total Volume Required, acre-ft	1.66			



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Basin 10SN1	Pre-Development Condition		Post Development Condition	
Total Area, acre	20.95	CN	20.95	CN
Pond Area, ac	1.35	100	1.35	100
Impervious Area, ac	5.93	98	7.66	98
Pervious Area, ac	13.67	39	11.94	39
CN	59.6		64.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.77		5.50	
Runoff Depth (Q), in	2.92		3.43	
Runoff Volume, acre-ft	5.09		5.99	
Volume Differential, acre-ft	0.90			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
Total Volume Required, acre-ft	1.33			



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Basin 10 Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	10.47	CN	10.47	CN
CN	62.0		91.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.13		0.93	
Runoff Depth (Q), in	3.17		6.48	
Runoff Volume, acre-ft	2.76		5.65	
Volume Differential, acre-ft	2.89			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	2.89			



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Curve Number Calculations Basin 10SN1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.51 ac	A	39	487.89	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.93 ac		98	581.14	Roadway Pavement
Wetted Pond Area	1.35 ac		100	135.00	Pond
Dry Pond Area	1.16 ac	A	39	45.24	Pond
Total Area	20.95 ac			1249.27	59.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.78 ac	A	39	420.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.66 ac		98	750.68	Roadway Pavement
Wetted Pond Area	1.35 ac		100	135.00	Pond
Dry Pond Area	1.16 ac	A	39	45.24	Pond
Total Area	20.95 ac			1351.34	64.5 = Weighted CN



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Curve Number Calculations 10A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.06 ac	A	39	314.34	Open Spaces, Lawns/Good Condition
Pervious Area	1.20 ac	B	61	73.20	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.52 ac		98	1030.96	Roadway Pavement
Wetted Pond Area	5.34 ac		100	534.00	Pond
Dry Pond Area	3.06 ac	A	39	119.34	Pond
Total Area	28.18 ac			2071.84	73.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.41 ac	A	39	171.99	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.03 ac		98	1472.94	Roadway Pavement
Wetted Pond Area	5.34 ac		100	534.00	Pond
Dry Pond Area	2.51 ac	A	39	97.89	Pond
Total Area	28.18 ac			2331.11	82.7 = Weighted CN



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Curve Number Calculations 10B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	21.32 ac	A	39	831.48	Open Spaces, Lawns/Good Condition
Pervious Area	10.03 ac	B	61	611.83	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.08 ac		98	1771.84	Roadway Pavement
Wetted Pond Area	11.27 ac		100	1127.00	Pond
Dry Pond Area	6.89 ac	A	39	268.71	Pond
Total Area	67.59 ac			4610.86	68.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	20.99 ac	A	39	818.61	Open Spaces, Lawns/Good Condition
Pervious Area	9.34 ac	B	61	569.74	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.18 ac		98	2173.64	Roadway Pavement
Wetted Pond Area	10.13 ac		100	1013.00	Pond
Dry Pond Area	4.95 ac	A	39	193.05	Pond
Total Area	67.59 ac			4768.04	70.5 = Weighted CN



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Curve Number Calculations 10C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	11.67 ac	A	39	455.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.87 ac		98	967.26	Roadway Pavement
Wetted Pond Area	5.22 ac		100	522.00	Pond
Dry Pond Area	5.43 ac	A	39	211.77	Pond
Total Area	32.19 ac			2156.16	67.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.05 ac	A	39	547.95	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	10.09 ac		98	988.82	Roadway Pavement
Wetted Pond Area	4.87 ac		100	487.00	Pond
Dry Pond Area	3.18 ac	A	39	124.02	Pond
Total Area	32.19 ac			2147.79	66.7 = Weighted CN



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Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 10D

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	32.33 ac	A	39	1260.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	20.73 ac		98	2031.54	Roadway Pavement
Wetted Pond Area	4.11 ac		100	411.00	Pond
Dry Pond Area	6.16 ac	A	39	240.24	Pond
Total Area	63.33 ac			3943.65	62.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	30.33 ac	A	39	1182.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.93 ac	D	80	234.40	Open Spaces, Lawns/Good Condition
Impervious Area	24.38 ac		98	2389.24	Roadway Pavement
Wetted Pond Area	2.69 ac		100	269.00	Pond
Dry Pond Area	3.00 ac	A	39	117.00	Pond
Total Area	63.33 ac			4192.51	66.2 = Weighted CN



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Curve Number Calculations 10E

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.80 ac		98	764.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	15.04 ac			1046.76	69.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.16 ac	A	39	201.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.88 ac		98	968.24	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	15.04 ac			1169.48	77.8 = Weighted CN



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Designed by : MRG
Checked by : JAF

Curve Number Calculations Alternative 3 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.99 ac	A	45	89.55	Trees, Thin Stand
Pervious Area	8.48 ac	B	66	559.68	Trees, Thin Stand
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	10.47 ac			649.23	62.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.92 ac	B	61	56.12	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	8.68 ac		100	868.00	Pond
Dry Pond Area	0.87 ac	A	39	33.93	Pond
Total Area	10.47 ac			958.05	91.5 = Weighted CN

BASIN 11

BASIN 11

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 11 Alternative 1

Treatment Volume Required for Additional Impervious Area:	1.36 acre-ft
Treatment Volume Impacted:	0.36 acre-ft
Total Treatment Volume Required:	1.72 acre-ft

Attenuation Volume Required for Additional Impervious Area:	5.50 acre-ft
Attenuation Volume Impacted:	2.26 acre-ft
Attenuation Volume Required:	7.76 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/13/2022

Basin 11 Pond Alternative 1, Station 2283+00 RT

Wet Detention Calculations

Existing Ground at Pond site = 117.00 NAVD 88 (Converted from LiDAR NGVD 1929)
ELEV EXST EOP @ Low Point = 122.00 NAVD 88 from plans 406148-3-52-01
Elev SHW = 115.7 SHWT from Geotech Report Permit 115245-2.
Seasonal high 24 inches to 40 inches below the ground.

Treatment Volume Required 1.72 AC-FT.
Attenuation Volume Required 7.76 AC-FT.
Pond Area Based on treatment volume 1.55 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 1.11 FT.
Total Attenuation Depth based on Pond Area 5.0 FT.
Total Depth from SHWL to Top of Berm 7.13 FT.

Elev SHW= 115.7
Top of Berm Elevation given a total depth = 122.8

Unit Length Based on L/W = 2 367 FT.
Unit Width Based on L/W = 2 183 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 23 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 57.05 FT.
Total Pond Length (including maintenance berm and adjustments) 477.36 FT.
Total Pond Width (including maintenance berm and adjustments) 293.87 FT.

Preliminary Property Size Required 3.22 AC.
Preliminary Property Size Required with 10% Contingency 3.54 AC.

Property Size Provided 3.54 AC.

Note: If this alternative is selected it is assumed the low areas within the basin including those associated with Ramp 303 will be sent to the remnant ponds located within the interchange.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 04/13/2022

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-3 Station 2280+00 Rt
Basin: 11

Pond Footprint:	1.33 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	60 %
Salvageable Footprint:	0.80 acres
Percentage of pond footprint impacted:	40 %
Pond footprint no longer useable:	0.53 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.16 acre-ft

Estimated Attenuation Volume Impacted: 1.01 acre-ft

Note: Although the majority of the storage will be eliminated it was assumed that remanent volume associated with existing Pond TP-3 could be expanded to account for the shortfall noted above. See interchange alternative calculations for verification of this assumption.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond TP-4 Station 2276+00 Rt
Basin: 11

Pond Footprint:	4.4 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	85 %
Salvageable Footprint:	3.74 acres
Percentage of pond footprint impacted:	15 %
Pond footprint no longer useable:	0.66 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.20 acre-ft

Estimated Attenuation Volume Impacted: 1.25 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11A	Pre-Development Condition		Post Development Condition	
Total Area, acre	27.49	CN	27.49	CN
Pond Area, ac	5.78	100	5.75	100
Impervious Area, ac	7.11	98	12.24	98
Pervious Area, ac	14.60	39	9.50	39
CN	67.1		78.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.91		2.82	
Runoff Depth (Q), in	11.32		13.06	
Runoff Volume, acre-ft	25.93		29.91	
Volume Differential, acre-ft	3.97			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			1.28	
Total Volume Required, acre-ft	5.26			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11B	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.18	CN	2.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.23	98	1.51	98
All Pervious Area, ac	0.95	51	0.67	51
Pervious Area A soils only, ac	0.42	39	0.30	39
CN	77.6		83.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	2.88		1.96	
Runoff Depth (Q), in	13.00		13.87	
Runoff Volume, acre-ft	2.36		2.52	
Volume Differential, acre-ft	0.16			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.03	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.06	
Total Volume Required, acre-ft	0.22			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11C	Pre-Development Condition		Post Development Condition	
Total Area, acre	20.56	CN	20.56	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.23	98	7.30	98
Pervious Area, ac	13.33	39	13.26	39
CN	59.7		59.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.74		6.68	
Runoff Depth (Q), in	10.04		10.07	
Runoff Volume, acre-ft	17.20		17.26	
Volume Differential, acre-ft	0.06			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.02	
Total Volume Required, acre-ft	0.08			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.85	CN	2.85	CN
CN	41.3		70.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	14.22		4.28	
Runoff Depth (Q), in	6.32		11.81	
Runoff Volume, acre-ft	1.50		2.80	
Volume Differential, acre-ft	1.30			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	1.30			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.74 ac	A	39	223.86	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.11 ac		98	696.78	Roadway Pavement
Wetted Pond Area	5.78 ac		100	578.00	Pond
Dry Pond Area	8.86 ac	A	39	345.54	Pond
Total Area	27.49 ac			1844.18	67.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.56 ac	A	39	138.84	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	12.12 ac		98	1187.76	Roadway Pavement
Wetted Pond Area	5.75 ac		100	575.00	Pond
Dry Pond Area	6.06 ac	A	39	236.34	Pond
Total Area	27.49 ac			2137.94	77.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.42 ac	A	39	16.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.53 ac	B	61	32.33	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.23 ac		98	120.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			169.25	77.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.30 ac	A	39	11.70	Open Spaces, Lawns/Good Condition
Pervious Area	0.37 ac	B	61	22.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			182.25	83.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 11C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.33 ac	A	39	519.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.23 ac		98	708.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1228.41	59.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.26 ac	A	39	517.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.30 ac		98	715.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1232.54	59.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Alternative 1 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.76 ac	A	39	68.64	Open Spaces, Lawns/Good Condition
Pervious Area	1.09 ac	A	45	49.05	Wood, Thin Stand
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.85 ac			117.69	41.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.45 ac		100	145.00	Pond
Dry Pond Area	1.40 ac	A	39	54.60	Pond
Total Area	2.85 ac			199.60	70.0 = Weighted CN

BASIN 11

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 11 Alternative 2

Treatment Volume Required for Additional Impervious Area:	1.36 acre-ft
Treatment Volume Impacted:	0.36 acre-ft
Total Treatment Volume Required:	1.72 acre-ft

Attenuation Volume Required for Additional Impervious Area:	6.14 acre-ft
Attenuation Volume Impacted:	2.26 acre-ft
Attenuation Volume Required:	8.40 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/13/2022

Basin 11 Pond Alternative 2, Station 2284+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	119.00	NAVD 88 (Converted from LiDAR NGVD 1929)
ELEV EXST EOP @ Low Point =	122.00	NAVD 88 from plans 406148-3-52-01
Elev SHW =	115.7	SHWT from Geotech Report Permit 115245-2. Seasonal high 24 inches to 40 inches below the ground.
Treatment Volume Required	1.72	AC-FT.
Attenuation Volume Required	8.40	AC-FT.
Pond Area Based on treatment volume	2.29	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	0.75	FT.
Total Attenuation Depth based on Pond Area	3.7	FT.
Total Depth from SHWL to Top of Berm	5.42	FT.
Elev SHW=	115.7	
Top of Berm Elevation given a total depth =	121.1	
Unit Length Based on L/W = 2	446	FT.
Unit Width Based on L/W = 2	223	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	8	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	43.39	FT.
Total Pond Length (including maintenance berm and adjustments)	528.34	FT.
Total Pond Width (including maintenance berm and adjustments)	305.11	FT.
Preliminary Property Size Required	3.70	AC.
Preliminary Property Size Required with 10% Contingency	4.07	AC.
Property Size Provided	4.45	AC.

Note: If this alternative is selected it is assumed the low areas within the basin including those associated with Ramp 303 will be sent to the remnant ponds located within the interchange.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 04/13/2022

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-3 Station 2280+00 Rt
Basin: 11

Pond Footprint:	1.33 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	60 %
Salvageable Footprint:	0.80 acres
Percentage of pond footprint impacted:	40 %
Pond footprint no longer useable:	0.53 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.16 acre-ft

Estimated Attenuation Volume Impacted: 1.01 acre-ft

Note: Although the majority of the storage will be eliminated it was assumed that remanent volume associated with existing Pond TP-3 could be expanded to account for the shortfall noted above. See interchange alternative calculations for verification of this assumption.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond TP-4 Station 2276+00 Rt
Basin: 11

Pond Footprint:	4.4 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	85 %
Salvageable Footprint:	3.74 acres
Percentage of pond footprint impacted:	15 %
Pond footprint no longer useable:	0.66 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.20 acre-ft

Estimated Attenuation Volume Impacted: 1.25 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11A	Pre-Development Condition		Post Development Condition	
Total Area, acre	27.49	CN	27.49	CN
Pond Area, ac	5.78	100	5.75	100
Impervious Area, ac	7.11	98	12.24	98
Pervious Area, ac	14.60	39	9.50	39
CN	67.1		78.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.91		2.82	
Runoff Depth (Q), in	11.32		13.06	
Runoff Volume, acre-ft	25.93		29.91	
Volume Differential, acre-ft	3.97			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			1.28	
Total Volume Required, acre-ft	5.26			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11B	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.18	CN	2.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.23	98	1.51	98
All Pervious Area, ac	0.95	51	0.67	51
Pervious Area A soils only, ac	0.42	39	0.30	39
CN	77.6		83.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	2.88		1.96	
Runoff Depth (Q), in	13.00		13.87	
Runoff Volume, acre-ft	2.36		2.52	
Volume Differential, acre-ft	0.16			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.03	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.06	
Total Volume Required, acre-ft	0.22			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11C	Pre-Development Condition		Post Development Condition	
Total Area, acre	20.56	CN	20.56	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.23	98	7.30	98
Pervious Area, ac	13.33	39	13.26	39
CN	59.7		59.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.74		6.68	
Runoff Depth (Q), in	10.04		10.07	
Runoff Volume, acre-ft	17.20		17.26	
Volume Differential, acre-ft	0.06			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.02	
Total Volume Required, acre-ft	0.08			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.74 ac	A	39	223.86	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.11 ac		98	696.78	Roadway Pavement
Wetted Pond Area	5.78 ac		100	578.00	Pond
Dry Pond Area	8.86 ac	A	39	345.54	Pond
Total Area	27.49 ac			1844.18	67.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.56 ac	A	39	138.84	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	12.12 ac		98	1187.76	Roadway Pavement
Wetted Pond Area	5.75 ac		100	575.00	Pond
Dry Pond Area	6.06 ac	A	39	236.34	Pond
Total Area	27.49 ac			2137.94	77.8 = Weighted CN



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.42	CN	3.42	CN
CN	41.6		79.1	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	14.03		2.64	
Runoff Depth (Q), in	6.39		13.22	
Runoff Volume, acre-ft	1.82		3.77	
Volume Differential, acre-ft	1.95			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	1.95			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.42 ac	A	39	16.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.53 ac	B	61	32.33	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.23 ac		98	120.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			169.25	77.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.30 ac	A	39	11.70	Open Spaces, Lawns/Good Condition
Pervious Area	0.37 ac	B	61	22.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			182.25	83.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 11C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.33 ac	A	39	519.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.23 ac		98	708.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1228.41	59.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.26 ac	A	39	517.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.30 ac		98	715.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1232.54	59.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 11 Alternative 2 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.93 ac	A	39	75.27	Open Spaces, Lawns/Good Condition
Pervious Area	1.49 ac	A	45	67.05	Woods, Thin Stand
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.42 ac			142.32	41.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	2.25 ac		100	225.00	Pond
Dry Pond Area	1.17 ac	A	39	45.63	Pond
Total Area	3.42 ac			270.63	79.1 = Weighted CN

BASIN 11

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 11 Alternative 3

Treatment Volume Required for Additional Impervious Area:	1.36 acre-ft
Treatment Volume Impacted:	0.36 acre-ft
Total Treatment Volume Required:	1.72 acre-ft

Attenuation Volume Required for Additional Impervious Area:	4.19 acre-ft
Attenuation Volume Impacted:	2.26 acre-ft
Attenuation Volume Required:	6.46 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/13/2022

TOTAL REQUIREMENTS FOR BASIN 11 & STORAGE AVAILABLE IN INTERCHANGE CELLS

Treatment Volume Required	1.72 AC-FT.
Attenuation Volume Required	6.46 AC-FT.
 Treatment Volume Available in all cells (see subsequent sheets)	 3.09 AC-FT.
Attenuation Volume Available	7.90 AC-FT.

Note: A breakdown of the treatment and attenuation volume available in each cell is provided on the subsequent sheets.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE
location of interchange cell: TP-3.1

Elev Exist EOP @ Low Point =	119.50 FT.	
Avg Elev Existing Ground at Pond Site =	121.11 FT.	
Area at Toe of Roadway Fill Assuming No Pond=	1.00 AC	
Maintenance Berm Elevation (Outside)	119.50 FT.	
Maintenance Berm Elevation (Inside)	119.00 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	1.61 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	6.44 FT.	
Maintenance Berm Width	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	25 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	118.0 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	0.90 AC	measured in CAD
Elevation of NWL	112.6 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	4.4 FT.	Max attenuation Depth
Attenuation Depth Used	2.0 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	0.70 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	0.54 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	0.48 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	0.51 AC-FT.	
Attenuation Volume Available	1.18 AC-FT.	

Notes:

- 1) NWL was taken from adjacent District 5 Pond FPID No. 239535-3.
- 2) Exist. EOP elevation determined from Ramp 303 Station 315+60 . Datum NAVD 88.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE
location of interchange cell: TP-3.2 Expansion

Elev Exist EOP @ Low Point =	120.00 FT.	
Avg Elev Existing Ground at Pond Site =	122.00 FT.	
Area at Toe of Roadway Fill Assuming No Pond=	1.20 AC	
Maintenance Berm Elevation (Outside)	120.00 FT.	
Maintenance Berm Elevation (Inside)	118.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	2.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	8.00 FT.	
Maintenance Berm Width	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	27 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	117.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.1 AC	measured in CAD
Elevation of NWL	112.6 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	3.9 FT.	Max attenuation Depth
Attenuation Depth Used	2.0 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	0.7 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	0.55 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	0.48 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	0.52 AC-FT.	
Attenuation Volume Available	1.16 AC-FT.	

Notes:

- 1) NWL was taken from adjacent District 5 Pond FPID No. 239535-3.
- 2) Exist. EOP elevation determined from Ramp 303 Station 315+60 . Datum NAVD 88.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/13/2022

STORAGE AVAILABLE SR 429 INTERCHANGE
location of interchange cell: TP-4 Expansion

Elev Exist EOP @ Low Point =	119.50 FT.	
Avg Elev Existing Ground at Pond Site =	121.10 FT.	
Area at Toe of Roadway Fill Assuming No Pond=	4.00 AC	
Maintenance Berm Elevation (Outside)	121.10 FT.	
Maintenance Berm Elevation (Inside)	120.10 FT.	From Permit
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	0.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	0.00 FT.	
Maintenance Berm Width	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	19 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	119.1 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	4.40 AC	measured in CAD
Elevation of NWL	112.6 FT.	NWL
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	5.5 FT.	Max attenuation Depth
Attenuation Depth Used	3.5 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	4.0 AC	
Wet Pond or Dry Pond	Wet	
Wet Pond-Area at NWL (assume 1:4 slope from Maint Berm)	3.10 AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	3.30 AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	N/A AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Treatment Volume Available	3.20 AC-FT.	
Attenuation Volume Available	12.78 AC-FT.	
Treatment Volume provided per current permit (see Note 4)	1.14 AC-FT.	
Attenuation Volume provided per current permit (see Note 4)	7.22 AC-FT.	
Total Treatment Volume Available for proposed improvements	2.06 AC-FT.	
Total Attenuation Volume Available for proposed improvements	5.56 AC-FT.	

Notes:

- 1) NWL was taken from adjacent District 5 Pond FPID No. 239535-3.
- 2) Exist. EOP elevation determined from Ramp 303 Station 315+60 . Datum NAVD 88.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89
- 4) The treatment and attenuation depths from the permit were multiplied by a conservative footprint to account for areas where the proposed footprint overlaps he existing permitted storage. This value is in addition to the impacts resulting from the horizontal encroachment of roadway features.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-3 Station 2280+00 Rt
Basin: 11

Pond Footprint:	1.33 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	60 %
Salvageable Footprint:	0.80 acres
Percentage of pond footprint impacted:	40 %
Pond footprint no longer useable:	0.53 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.16 acre-ft

Estimated Attenuation Volume Impacted: 1.01 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond TP-4 Station 2276+00 Rt
Basin: 11

Pond Footprint:	4.4 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	85 %
Salvageable Footprint:	3.74 acres
Percentage of pond footprint impacted:	15 %
Pond footprint no longer useable:	0.66 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.20 acre-ft

Estimated Attenuation Volume Impacted: 1.25 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11A	Pre-Development Condition		Post Development Condition	
Total Area, acre	27.49	CN	27.49	CN
Pond Area, ac	5.78	100	5.75	100
Impervious Area, ac	7.11	98	12.24	98
Pervious Area, ac	14.60	39	9.50	39
CN	67.1		78.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.91		2.82	
Runoff Depth (Q), in	11.32		13.06	
Runoff Volume, acre-ft	25.93		29.91	
Volume Differential, acre-ft	3.97			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			1.28	
Total Volume Required, acre-ft	5.26			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11B	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.18	CN	2.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.23	98	1.51	98
All Pervious Area, ac	0.95	51	0.67	51
Pervious Area A soils only, ac	0.42	39	0.30	39
CN	77.6		83.6	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	2.88		1.96	
Runoff Depth (Q), in	13.00		13.87	
Runoff Volume, acre-ft	2.36		2.52	
Volume Differential, acre-ft	0.16			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.03	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.06	
Total Volume Required, acre-ft	0.22			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11C	Pre-Development Condition		Post Development Condition	
Total Area, acre	20.56	CN	20.56	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.23	98	7.30	98
Pervious Area, ac	13.33	39	13.26	39
CN	59.7		59.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.74		6.68	
Runoff Depth (Q), in	10.04		10.07	
Runoff Volume, acre-ft	17.20		17.26	
Volume Differential, acre-ft	0.06			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.02	
Total Volume Required, acre-ft	0.08			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.74 ac	A	39	223.86	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.11 ac		98	696.78	Roadway Pavement
Wetted Pond Area	5.78 ac		100	578.00	Pond
Dry Pond Area	8.86 ac	A	39	345.54	Pond
Total Area	27.49 ac			1844.18	67.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.56 ac	A	39	138.84	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	12.12 ac		98	1187.76	Roadway Pavement
Wetted Pond Area	7.74 ac		100	774.00	Pond
Dry Pond Area	4.07 ac	A	39	158.73	Pond
Total Area	27.49 ac			2259.33	82.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.42 ac	A	39	16.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.53 ac	B	61	32.33	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.23 ac		98	120.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			169.25	77.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.30 ac	A	39	11.70	Open Spaces, Lawns/Good Condition
Pervious Area	0.37 ac	B	61	22.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			182.25	83.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 11C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.33 ac	A	39	519.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.23 ac		98	708.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1228.41	59.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.26 ac	A	39	517.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.30 ac		98	715.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1232.54	59.9 = Weighted CN

BASIN 12

BASIN 12

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 12 Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.77 acre-ft
Treatment Volume Impacted:	0.91 acre-ft
Total Treatment Volume Required:	1.68 acre-ft

Attenuation Volume Required for Additional Impervious Area:	2.00 acre-ft
Attenuation Volume Impacted:	1.46 acre-ft
Attenuation Volume Required:	3.46 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

**Basin 12 Pond Alternative 1
Station 2349+00 LT**

Wet Detention Calculations

Existing Ground at Pond site =	105.10 NAVD 88 (Converted from LiDAR NGVD 1929)
ELEV EXST EOP @ Low Point =	110.00 NAVD 88 from plans 406146-1-52-01 cross section 3090+00.00. Equates to 2345+00 from design baseline
Elev SHW =	103.20 SHW in NAVD 88 from Permit 138556-1 for downstream wetland
Treatment Volume Required	1.68 AC-FT.
Attenuation Volume Required	3.46 AC-FT.
Pond Area Based on treatment volume	1.16 AC
Assume 1 foot of pond freeboard	1.00 FT.
Treatment Depth	1.45 FT.
Total Attenuation Depth based on Pond Area	2.98 FT.
Total Depth from SHWL to Top of Berm	5.43 FT.
Elev SHW=	103.2
Top of Berm Elevation given a total depth =	108.6
Unit Length Based on L/W = 2	318 FT.
Unit Width Based on L/W = 2	159 FT.
Maintenance Berm Width of 15-ft	30 FT.
Grade Adjustment Width Assumed 1:2	14 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	43.46 FT.
Total Pond Length (including maintenance berm and adjustments)	405.49 FT.
Total Pond Width (including maintenance berm and adjustments)	246.54 FT.
Preliminary Property Size Required to accommodate Pond Footprint	2.29 AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	2.52 AC.
Length of Pond Berm Located within the Floodplain	1172 FT.
100-year Floodplain Elevation	107.50 FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL	2.40 FT.
Embankment Cross Sectional area located within floodplain	80.77 SF.
Floodplain impacts resulting from pond embankment	2.17 AC-FT
Average depth of floodplain compensation located adjacent to pond site	2.00 FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impact	1.09 AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	1.20 AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation	3.72 AC.
Property Size Provided	3.95 AC.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 12A Station 2345+00 Rt
Basin: 12

Pond Footprint: 0.62 acres
Is pond salvageable: no
If pond is salvageable what percentage remains functional: 0 %
Salvageable Footprint: 0.00 acres
Percentage of pond footprint impacted: 100 %
Pond footprint no longer useable: 0.62 acres
Treatment Depth: 1.02 ft (from as-builts)
Attenuation Depth: 1.72 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.63 acre-ft

Estimated Attenuation Volume Impacted: 1.07 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 12B Station 2346+00 Lt
Basin: 12

Pond Footprint:	0.77 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	0.39 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	0.39 acres
Treatment Depth:	0.72 ft (from as-built plans)
Attenuation Depth:	1.03 ft (from as-built plans & permit)

Estimated Treatment Volume: Impacted: 0.28 acre-ft

Estimated Attenuation Volume Impacted: 0.40 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12A	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.53	CN	5.53	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.02	98	4.36	98
Pervious Area, ac	2.51	39	1.17	39
CN	71.2		85.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.04		1.69	
Runoff Depth (Q), in	4.16		5.78	
Runoff Volume, acre-ft	1.92		2.66	
Volume Differential, acre-ft	0.75			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.34	
Total Volume Required, acre-ft	1.08			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12B	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.78	CN	4.78	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.15	98	3.46	98
Pervious Area, ac	2.63	39	1.32	39
CN	65.5		81.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	5.26		2.24	
Runoff Depth (Q), in	3.54		5.34	
Runoff Volume, acre-ft	1.41		2.13	
Volume Differential, acre-ft	0.72			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.33	
Total Volume Required, acre-ft	1.04			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12C	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.80	CN	2.80	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.38	98	1.82	98
Pervious Area, ac	1.42	39	0.98	39
CN	68.1		77.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.69		2.93	
Runoff Depth (Q), in	3.82		4.85	
Runoff Volume, acre-ft	0.89		1.13	
Volume Differential, acre-ft	0.24			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.11	
Total Volume Required, acre-ft	0.35			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 12 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.00	CN	2.00	CN
CN	71.8		87.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.93		1.46	
Runoff Depth (Q), in	4.23		5.99	
Runoff Volume, acre-ft	0.70		1.00	
Volume Differential, acre-ft	0.29			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.29			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.02 ac		98	295.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.51 ac	A	39	97.89	Pond
Total Area	5.53 ac			393.85	71.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.36 ac		98	427.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.17 ac	A	39	45.63	Pond
Total Area	5.53 ac			472.91	85.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.15 ac		98	210.70	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.63 ac	A	39	102.57	Pond
Total Area	4.78 ac			313.27	65.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.46 ac		98	339.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.32 ac	A	39	51.48	Pond
Total Area	4.78 ac			390.56	81.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.42 ac	A	39	55.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.38 ac		98	135.24	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.80 ac			190.62	68.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.98 ac	A	39	38.22	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.82 ac		98	178.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.80 ac			216.58	77.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12 Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.59 ac	A	45	26.55	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	1.41 ac	D	83	117.03	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.00 ac			143.58	71.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.63 ac	D	80	50.40	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.16 ac		100	116.00	Pond
Dry Pond Area	0.21 ac	A	39	8.19	Pond
Total Area	2.00 ac			174.59	87.3 = Weighted CN

BASIN 12

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 12 Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.77 acre-ft
Treatment Volume Impacted:	0.91 acre-ft
Total Treatment Volume Required:	1.68 acre-ft

Attenuation Volume Required for Additional Impervious Area:	2.30 acre-ft
Attenuation Volume Impacted:	1.46 acre-ft
Attenuation Volume Required:	3.77 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

**Basin 12 Pond Alternative 2
Station 2342+00 LT**

Wet Detention Calculations

Existing Ground at Pond site =	108.00	NAVD 88 (Converted from LiDAR NGVD 1929)
ELEV EXST EOP @ Low Point =	110.00	NAVD 88 from plans 406146-1-52-01 cross section 3090+00.00. Equates to 2345+00 from design baseline
Elev SHW =	103.2	SHW in NAVD 88 from Permit 138556-1 for downstream wetland
Treatment Volume Required		1.68 AC-FT.
Attenuation Volume Required		3.77 AC-FT.
Pond Area Based on treatment volume		1.20 AC
Assume 1 foot of pond freeboard		1.00 FT.
Treatment Depth		1.40 FT.
Total Attenuation Depth based on Pond Area		3.14 FT.
Total Depth from SHWL to Top of Berm		5.54 FT.
Elev SHW=		103.2
Top of Berm Elevation given a total depth =		108.70
Unit Length Based on L/W = 2		324 FT.
Unit Width Based on L/W = 2		162 FT.
Maintenance Berm Width of 15-ft		30 FT.
Grade Adjustment Width Assumed 1:2		3 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth		44.29 FT.
Total Pond Length (including maintenance berm and adjustments)		400.60 FT.
Total Pond Width (including maintenance berm and adjustments)		238.84 FT.
Preliminary Property Size Required to accommodate Pond Footprint		2.20 AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency		2.42 AC.
Property Size Provided		4.34 AC.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 12A Station 2345+00 Rt
Basin: 12

Pond Footprint: 0.62 acres
Is pond salvageable: no
If pond is salvageable what percentage remains functional: 0 %
Salvageable Footprint: 0.00 acres
Percentage of pond footprint impacted: 100 %
Pond footprint no longer useable: 0.62 acres
Treatment Depth: 1.02 ft (from as-builts)
Attenuation Depth: 1.72 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.63 acre-ft

Estimated Attenuation Volume Impacted: 1.07 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 12B Station 2346+00 Lt
Basin: 12

Pond Footprint:	0.77 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	0.39 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	0.39 acres
Treatment Depth:	0.72 ft (from as-built plans)
Attenuation Depth:	1.03 ft (from as-built plans & permit)

Estimated Treatment Volume: Impacted: 0.28 acre-ft

Estimated Attenuation Volume Impacted: 0.40 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12A	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.53	CN	5.53	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.02	98	4.36	98
Pervious Area, ac	2.51	39	1.17	39
CN	71.2		85.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.04		1.69	
Runoff Depth (Q), in	4.16		5.78	
Runoff Volume, acre-ft	1.92		2.66	
Volume Differential, acre-ft	0.75			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.34	
Total Volume Required, acre-ft	1.08			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG

Checked by: JAF

Date: 02/04/2022

Basin 12B	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.78	CN	4.78	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.15	98	3.46	98
Pervious Area, ac	2.63	39	1.32	39
CN	65.5		81.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	5.26		2.24	
Runoff Depth (Q), in	3.54		5.34	
Runoff Volume, acre-ft	1.41		2.13	
Volume Differential, acre-ft	0.72			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.33	
Total Volume Required, acre-ft	1.04			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12C	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.80	CN	2.80	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.38	98	1.82	98
Pervious Area, ac	1.42	39	0.98	39
CN	68.1		77.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.69		2.93	
Runoff Depth (Q), in	3.82		4.85	
Runoff Volume, acre-ft	0.89		1.13	
Volume Differential, acre-ft	0.24			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.11	
Total Volume Required, acre-ft	0.35			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.10	CN	2.10	CN
CN	39.0		73.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	15.64		3.65	
Runoff Depth (Q), in	0.95		4.39	
Runoff Volume, acre-ft	0.17		0.77	
Volume Differential, acre-ft	0.60			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.60			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.02 ac		98	295.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.51 ac	A	39	97.89	Pond
Total Area	5.53 ac			393.85	71.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.36 ac		98	427.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.17 ac	A	39	45.63	Pond
Total Area	5.53 ac			472.91	85.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.15 ac		98	210.70	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.63 ac	A	39	102.57	Pond
Total Area	4.78 ac			313.27	65.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.46 ac		98	339.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.32 ac	A	39	51.48	Pond
Total Area	4.78 ac			390.56	81.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.42 ac	A	39	55.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.38 ac		98	135.24	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.80 ac			190.62	68.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.98 ac	A	39	38.22	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.82 ac		98	178.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.80 ac			216.58	77.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12 Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.10 ac	A	39	81.90	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.10 ac			81.90	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.18 ac		100	118.00	Pond
Dry Pond Area	0.92 ac	A	39	35.88	Pond
Total Area	2.10 ac			153.88	73.3 = Weighted CN

BASIN 12

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/05/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 12 Alternative 3

Treatment Volume Required for Additional Impervious Area:	0.77 acre-ft
Treatment Volume Impacted:	0.91 acre-ft
Total Treatment Volume Required:	1.68 acre-ft

Attenuation Volume Required for Additional Impervious Area:	2.10 acre-ft
Attenuation Volume Impacted:	1.46 acre-ft
Attenuation Volume Required:	3.57 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 08/29/2021

**Basin 12 Pond Alternative 3
Station 2337+00 LT**

Wet Detention Calculations

Existing Ground at Pond site =	105.10	NAVD 88 (Converted from LiDAR NGVD 1929)
ELEV EXST EOP @ Low Point =	109.00	NAVD 88 from plans 406146-1-52-01 cross section 3090+00.00. Equates to 2345+00 from design baseline
Elev SHW =	103.2	SHW in NAVD 88 from Permit 138556-1 for downstream wetland
Treatment Volume Required		1.68 AC-FT.
Attenuation Volume Required		3.57 AC-FT.
Pond Area Based on treatment volume		1.68 AC
Assume 1 foot of pond freeboard		1.00 FT.
Treatment Depth		1.00 FT.
Total Attenuation Depth based on Pond Area		2.12 FT.
Total Depth from SHWL to Top of Berm		4.12 FT.
Elev SHW=		103.2
Top of Berm Elevation given a total depth =		107.3
Unit Length Based on L/W = 2		383 FT.
Unit Width Based on L/W = 2		191 FT.
Maintenance Berm Width of 15-ft		30 FT.
Grade Adjustment Width Assumed 1:2		9 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth		32.96 FT.
Total Pond Length (including maintenance berm and adjustments)		454.50 FT.
Total Pond Width (including maintenance berm and adjustments)		263.09 FT.
Preliminary Property Size Required		2.75 AC.
Preliminary Property Size Required with 10% Contingency		3.02 AC.
Length of Pond Berm Located within the Floodplain		1340 FT.
100-year Floodplain Elevation		107.50 FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL		2.18 FT.
Embankment Cross Sectional area located within floodplain		51.72 SF.
Floodplain impacts resulting from pond embankment		1.59 AC-FT
Average depth of floodplain compensation located adjacent to pond site		3.50 FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impact		0.45 AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency		0.50 AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation		3.52 AC.
Property Size Provided		3.89 AC.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 12A Station 2345+00 Rt
Basin: 12

Pond Footprint: 0.62 acres
Is pond salvageable: no
If pond is salvageable what percentage remains functional: 0 %
Salvageable Footprint: 0.00 acres
Percentage of pond footprint impacted: 100 %
Pond footprint no longer useable: 0.62 acres
Treatment Depth: 1.02 ft (from as-builts)
Attenuation Depth: 1.72 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.63 acre-ft

Estimated Attenuation Volume Impacted: 1.07 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 12B Station 2346+00 Lt
Basin: 12

Pond Footprint:	0.77 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	0.39 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	0.39 acres
Treatment Depth:	0.72 ft (from as-built plans)
Attenuation Depth:	1.03 ft (from as-built plans & permit)

Estimated Treatment Volume: Impacted: 0.28 acre-ft

Estimated Attenuation Volume Impacted: 0.40 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12A	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.53	CN	5.53	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.02	98	4.36	98
Pervious Area, ac	2.51	39	1.17	39
CN	71.2		85.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.04		1.69	
Runoff Depth (Q), in	4.16		5.78	
Runoff Volume, acre-ft	1.92		2.66	
Volume Differential, acre-ft	0.75			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.34	
Total Volume Required, acre-ft	1.08			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12B	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.78	CN	4.78	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.15	98	3.46	98
Pervious Area, ac	2.63	39	1.32	39
CN	65.5		81.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	5.26		2.24	
Runoff Depth (Q), in	3.54		5.34	
Runoff Volume, acre-ft	1.41		2.13	
Volume Differential, acre-ft	0.72			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.33	
Total Volume Required, acre-ft	1.04			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin 12C	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.80	CN	2.80	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.38	98	1.82	98
Pervious Area, ac	1.42	39	0.98	39
CN	68.1		77.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.69		2.93	
Runoff Depth (Q), in	3.82		4.85	
Runoff Volume, acre-ft	0.89		1.13	
Volume Differential, acre-ft	0.24			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.11	
Total Volume Required, acre-ft	0.35			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 12 Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.70	CN	2.70	CN
CN	77.0		92.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.99		0.82	
Runoff Depth (Q), in	4.81		6.59	
Runoff Volume, acre-ft	1.08		1.48	
Volume Differential, acre-ft	0.40			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.40			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.02 ac		98	295.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.51 ac	A	39	97.89	Pond
Total Area	5.53 ac			393.85	71.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	4.36 ac		98	427.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.17 ac	A	39	45.63	Pond
Total Area	5.53 ac			472.91	85.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.15 ac		98	210.70	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.63 ac	A	39	102.57	Pond
Total Area	4.78 ac			313.27	65.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.46 ac		98	339.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.32 ac	A	39	51.48	Pond
Total Area	4.78 ac			390.56	81.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.42 ac	A	39	55.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.38 ac		98	135.24	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.80 ac			190.62	68.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.98 ac	A	39	38.22	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.82 ac		98	178.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.80 ac			216.58	77.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 12 Alternative 3 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.70 ac	D	77	207.90	Woods, Good Cover
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.70 ac			207.90	77.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.68 ac		100	168.00	Pond
Dry Pond Area	1.02 ac	D	80	81.60	Pond
Total Area	2.70 ac			249.60	92.4 = Weighted CN

BASIN A

BASIN A

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin A Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.53 acre-ft
Treatment Volume Impacted:	1.63 acre-ft
Total Treatment Volume Required:	2.16 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.90 acre-ft
Attenuation Volume Impacted:	3.19 acre-ft
Attenuation Volume Required:	5.09 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

Basin A Pond Alternative 1, Station 2363+50 LT

Wet Detention Calculations

Existing Ground at Pond site =	111.11	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	111.00	From plans 406146-1-52-01 permit 20358-17 cross Section 3100+00. Equates to 2365+00 design baseline NAVD 88
Elev SHW =	103.2	SHW in NAVD 88 from Permit 138556-1 for downstream wetland where pond alternative will outfall (Station 2351+50)
Treatment Volume Required	2.16	AC-FT.
Attenuation Volume Required	5.09	AC-FT.
Pond Area Based on treatment volume	1.44	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.50	FT.
Total Attenuation Depth based on Pond Area	3.5	FT.
Total Depth from SHWL to Top of Berm	6.04	FT.
Elev SHW=	103.2	
Top of Berm Elevation given a total depth =	109.2	
Unit Length Based on L/W = 2	354	FT.
Unit Width Based on L/W = 2	177	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	8	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	48.29	FT.
Total Pond Length (including maintenance berm and adjustments)	440.14	FT.
Total Pond Width (including maintenance berm and adjustments)	263.04	FT.
Preliminary Property Size Required	2.66	AC.
Preliminary Property Size Required with 10% Contingency	2.92	AC.
Property Size Provided	3.35	AC.

Note: NAVD88 + 0.89= NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-1 Station 2361+00 Rt
Basin: A

Pond Footprint:	0.81 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.81 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.18 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.41 acre-ft

Estimated Attenuation Volume Impacted: 0.96 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond A-3 Station 2361+00 Lt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.02 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.74 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-4 Station 2373+00 Rt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.92 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.67 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date :

Designed by : MRG

Checked by :

Impacts to Existing Ponds
Pond A-5 Station 2361+50 Lt
Basin: A

Pond Footprint:	0.99 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.99 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.83 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.50 acre-ft

Estimated Attenuation Volume Impacted: 0.82 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A1	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.04	CN	3.04	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.14	98	1.65	98
Pervious Area, ac	1.90	39	1.39	39
CN	61.1		71.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.36		4.08	
Runoff Depth (Q), in	3.07		4.14	
Runoff Volume, acre-ft	0.78		1.05	
Volume Differential, acre-ft	0.27			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.40			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A2	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.79	CN	2.79	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.79	98	2.79	98
Pervious Area, ac	0.00	39	0.00	39
CN	98.0		98.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	0.20		0.20	
Runoff Depth (Q), in	7.25		7.25	
Runoff Volume, acre-ft	1.69		1.69	
Volume Differential, acre-ft	0.00			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A3	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.84	CN	2.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.06	98	1.48	98
Pervious Area, ac	1.78	39	1.36	39
CN	61.0		69.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.39		4.34	
Runoff Depth (Q), in	3.06		4.00	
Runoff Volume, acre-ft	0.72		0.95	
Volume Differential, acre-ft	0.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.11	
Total Volume Required, acre-ft	0.33			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A4	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.93	CN	3.93	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.48	98	2.05	98
Pervious Area, ac	2.45	39	1.88	39
CN	61.2		69.8	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.33		4.33	
Runoff Depth (Q), in	3.08		4.00	
Runoff Volume, acre-ft	1.01		1.31	
Volume Differential, acre-ft	0.30			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.14	
Total Volume Required, acre-ft	0.44			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A5	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.13	CN	4.13	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.54	98	2.16	98
Pervious Area, ac	2.59	39	1.97	39
CN	61.0		69.9	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.39		4.31	
Runoff Depth (Q), in	3.06		4.01	
Runoff Volume, acre-ft	1.05		1.38	
Volume Differential, acre-ft	0.33			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.16	
Total Volume Required, acre-ft	0.48			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.49	CN	2.49	CN
CN	39.0		76.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	15.64		3.16	
Runoff Depth (Q), in	0.95		4.70	
Runoff Volume, acre-ft	0.20		0.97	
Volume Differential, acre-ft	0.78			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.78			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.14 ac		98	111.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.90 ac	A	39	74.10	Pond
Total Area	3.04 ac			185.82	61.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.65 ac		98	161.70	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.39 ac	A	39	54.21	Pond
Total Area	3.04 ac			215.91	71.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A3

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.06 ac		98	103.88	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.78 ac	A	39	69.42	Pond
Total Area	2.84 ac			173.30	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.36 ac	A	39	53.04	Pond
Total Area	2.84 ac			198.08	69.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A4

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.45 ac	A	39	95.55	Pond
Total Area	3.93 ac			240.59	61.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.05 ac		98	200.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.88 ac	A	39	73.32	Pond
Total Area	3.93 ac			274.22	69.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A5

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.54 ac		98	150.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.59 ac	A	39	101.01	Pond
Total Area	4.13 ac			251.93	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.16 ac		98	211.68	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.97 ac	A	39	76.83	Pond
Total Area	4.13 ac			288.51	69.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/05/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.49 ac	A	39	97.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.49 ac			97.11	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.51 ac		100	151.00	Pond
Dry Pond Area	0.98 ac	A	39	38.22	Pond
Total Area	2.49 ac			189.22	76.0 = Weighted CN

BASIN A

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/04/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin A Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.53 acre-ft
Treatment Volume Impacted:	1.63 acre-ft
Total Treatment Volume Required:	2.16 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.87 acre-ft
Attenuation Volume Impacted:	3.19 acre-ft
Attenuation Volume Required:	5.06 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/05/2022

Basin A Pond Alternative 2, Station 2363+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	110.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	111.00	From plans 406146-1-52-01 permit 20358-17 cross Section 3100+00. Equates to 2365+00 design baseline NAVD 88
Elev Pond Control =	103.20	SHW in NAVD 88 from Permit 138556-1 for downstream wetland where pond alternative will outfall (Station 2351+50) is 103.2
Treatment Volume Required	2.16 AC-FT.	
Attenuation Volume Required	5.06 AC-FT.	
Pond Area Based on treatment volume	1.35 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	1.60 FT.	
Total Attenuation Depth based on Pond Area	3.7 FT.	
Total Depth from SHWL to Top of Berm	6.35 FT.	
Elev SHW=	103.2	
Top of Berm Elevation given a total depth =	109.5	
Unit Length Based on L/W = 2	343 FT.	
Unit Width Based on L/W = 2	171 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	2 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	50.80 FT.	
Total Pond Length (including maintenance berm and adjustments)	425.54 FT.	
Total Pond Width (including maintenance berm and adjustments)	254.07 FT.	
Preliminary Property Size Required	2.48 AC.	
Preliminary Property Size Required with 10% Contingency	2.73 AC.	
Property Size Provided	2.74 AC.	

Note: NAVD88 + 0.89= NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-1 Station 2361+00 Rt
Basin: A

Pond Footprint:	0.81 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.81 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.18 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.41 acre-ft

Estimated Attenuation Volume Impacted: 0.96 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond A-3 Station 2361+00 Lt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.02 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.74 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-4 Station 2373+00 Rt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.92 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.67 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date :

Designed by : MRG

Checked by :

Impacts to Existing Ponds
Pond A-5 Station 2361+50 Lt
Basin: A

Pond Footprint:	0.99 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.99 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.83 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.50 acre-ft

Estimated Attenuation Volume Impacted: 0.82 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A1	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.04	CN	3.04	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.14	98	1.65	98
Pervious Area, ac	1.90	39	1.39	39
CN	61.1		71.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.36		4.08	
Runoff Depth (Q), in	3.07		4.14	
Runoff Volume, acre-ft	0.78		1.05	
Volume Differential, acre-ft	0.27			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.40			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A2	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.79	CN	2.79	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.79	98	2.79	98
Pervious Area, ac	0.00	39	0.00	39
CN	98.0		98.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	0.20		0.20	
Runoff Depth (Q), in	7.25		7.25	
Runoff Volume, acre-ft	1.69		1.69	
Volume Differential, acre-ft	0.00			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A3	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.84	CN	2.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.06	98	1.48	98
Pervious Area, ac	1.78	39	1.36	39
CN	61.0		69.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.39		4.34	
Runoff Depth (Q), in	3.06		4.00	
Runoff Volume, acre-ft	0.72		0.95	
Volume Differential, acre-ft	0.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.11	
Total Volume Required, acre-ft	0.33			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A4	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.93	CN	3.93	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.48	98	2.05	98
Pervious Area, ac	2.45	39	1.88	39
CN	61.2		69.8	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.33		4.33	
Runoff Depth (Q), in	3.08		4.00	
Runoff Volume, acre-ft	1.01		1.31	
Volume Differential, acre-ft	0.30			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.14	
Total Volume Required, acre-ft	0.44			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A5	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.13	CN	4.13	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.54	98	2.16	98
Pervious Area, ac	2.59	39	1.97	39
CN	61.0		69.9	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.39		4.31	
Runoff Depth (Q), in	3.06		4.01	
Runoff Volume, acre-ft	1.05		1.38	
Volume Differential, acre-ft	0.33			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.16	
Total Volume Required, acre-ft	0.48			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.39	CN	2.39	CN
CN	39.0		76.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	15.64		3.16	
Runoff Depth (Q), in	0.95		4.70	
Runoff Volume, acre-ft	0.19		0.94	
Volume Differential, acre-ft	0.75			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.75			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.14 ac		98	111.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.90 ac	A	39	74.10	Pond
Total Area	3.04 ac			185.82	61.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.65 ac		98	161.70	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.39 ac	A	39	54.21	Pond
Total Area	3.04 ac			215.91	71.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A3

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.06 ac		98	103.88	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.78 ac	A	39	69.42	Pond
Total Area	2.84 ac			173.30	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.36 ac	A	39	53.04	Pond
Total Area	2.84 ac			198.08	69.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A4

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.45 ac	A	39	95.55	Pond
Total Area	3.93 ac			240.59	61.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.05 ac		98	200.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.88 ac	A	39	73.32	Pond
Total Area	3.93 ac			274.22	69.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A5

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.54 ac		98	150.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.59 ac	A	39	101.01	Pond
Total Area	4.13 ac			251.93	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.16 ac		98	211.68	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.97 ac	A	39	76.83	Pond
Total Area	4.13 ac			288.51	69.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/05/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.39 ac	A	39	93.21	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.39 ac			93.21	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.45 ac		100	145.00	Pond
Dry Pond Area	0.94 ac	A	39	36.66	Pond
Total Area	2.39 ac			181.66	76.0 = Weighted CN

BASIN A

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/04/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin A Alternative 3

Treatment Volume Required for Additional Impervious Area:	0.53 acre-ft
Treatment Volume Impacted:	1.63 acre-ft
Total Treatment Volume Required:	2.16 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.88 acre-ft
Attenuation Volume Impacted:	3.19 acre-ft
Attenuation Volume Required:	5.07 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

Basin A Pond Alternative 3, Station 2363+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	109.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	111.00	From plans 406146-1-52-01 permit 20358-17 cross Section 3100+00. Equates to 2365+00 design baseline NAVD 88
Elev Pond Control =	103.20	SHW in NAVD 88 from Permit 138556-1 for downstream wetland where pond alternative will outfall (Station 2351+50) is 103.2
Treatment Volume Required	2.16	AC-FT.
Attenuation Volume Required	5.07	AC-FT.
Pond Area Based on treatment volume	1.44	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.50	FT.
Total Attenuation Depth based on Pond Area	3.5	FT.
Total Depth from SHWL to Top of Berm	6.02	FT.
Elev SHW=	103.2	
Top of Berm Elevation given a total depth =	109.2	
Unit Length Based on L/W = 2	354	FT.
Unit Width Based on L/W = 2	177	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	1	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	48.17	FT.
Total Pond Length (including maintenance berm and adjustments)	433.25	FT.
Total Pond Width (including maintenance berm and adjustments)	256.1553	FT.
Preliminary Property Size Required to accommodate Pond Footprint	2.55	AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	2.80	AC.
Length of Pond Berm Located within the Floodplain	650	FT.
100-year Floodplain Elevation	107.50	FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL	1.50	FT. conservatively uses existing ground (EI 106) on low side of property in equation
Embankment Cross Sectional area located within floodplain	52.16	SF.
Floodplain impacts resulting from pond embankment	0.78	AC-FT
Average depth of floodplain compensation located adjacent to pond site	3.00	FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impacts	0.26	AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	0.29	AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation	3.09	AC.
Property Size Provided	3.83	AC.

Note: NAVD88 + 0.89= NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-1 Station 2361+00 Rt
Basin: A

Pond Footprint:	0.81 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.81 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.18 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.41 acre-ft

Estimated Attenuation Volume Impacted: 0.96 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond A-3 Station 2361+00 Lt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.02 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.74 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-4 Station 2373+00 Rt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.92 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.67 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date :

Designed by : MRG

Checked by :

Impacts to Existing Ponds
Pond A-5 Station 2361+50 Lt
Basin: A

Pond Footprint:	0.99 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.99 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.83 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.50 acre-ft

Estimated Attenuation Volume Impacted: 0.82 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A1	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.04	CN	3.04	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.14	98	1.65	98
Pervious Area, ac	1.90	39	1.39	39
CN	61.1		71.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.36		4.08	
Runoff Depth (Q), in	3.07		4.14	
Runoff Volume, acre-ft	0.78		1.05	
Volume Differential, acre-ft	0.27			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.40			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A2	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.79	CN	2.79	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.79	98	2.79	98
Pervious Area, ac	0.00	39	0.00	39
CN	98.0		98.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	0.20		0.20	
Runoff Depth (Q), in	7.25		7.25	
Runoff Volume, acre-ft	1.69		1.69	
Volume Differential, acre-ft	0.00			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A3	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.84	CN	2.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.06	98	1.48	98
Pervious Area, ac	1.78	39	1.36	39
CN	61.0		69.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.39		4.34	
Runoff Depth (Q), in	3.06		4.00	
Runoff Volume, acre-ft	0.72		0.95	
Volume Differential, acre-ft	0.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.11	
Total Volume Required, acre-ft	0.33			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A4	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.93	CN	3.93	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.48	98	2.05	98
Pervious Area, ac	2.45	39	1.88	39
CN	61.2		69.8	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.33		4.33	
Runoff Depth (Q), in	3.08		4.00	
Runoff Volume, acre-ft	1.01		1.31	
Volume Differential, acre-ft	0.30			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.14	
Total Volume Required, acre-ft	0.44			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A5	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.13	CN	4.13	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.54	98	2.16	98
Pervious Area, ac	2.59	39	1.97	39
CN	61.0		69.9	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	6.39		4.31	
Runoff Depth (Q), in	3.06		4.01	
Runoff Volume, acre-ft	1.05		1.38	
Volume Differential, acre-ft	0.33			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.16	
Total Volume Required, acre-ft	0.48			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.46	CN	2.46	CN
CN	39.0		75.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	15.64		3.25	
Runoff Depth (Q), in	0.95		4.63	
Runoff Volume, acre-ft	0.19		0.95	
Volume Differential, acre-ft	0.76			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.76			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.14 ac		98	111.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.90 ac	A	39	74.10	Pond
Total Area	3.04 ac			185.82	61.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.65 ac		98	161.70	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.39 ac	A	39	54.21	Pond
Total Area	3.04 ac			215.91	71.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A3

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.06 ac		98	103.88	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.78 ac	A	39	69.42	Pond
Total Area	2.84 ac			173.30	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.36 ac	A	39	53.04	Pond
Total Area	2.84 ac			198.08	69.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A4

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.45 ac	A	39	95.55	Pond
Total Area	3.93 ac			240.59	61.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.05 ac		98	200.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.88 ac	A	39	73.32	Pond
Total Area	3.93 ac			274.22	69.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A5

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.54 ac		98	150.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.59 ac	A	39	101.01	Pond
Total Area	4.13 ac			251.93	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.16 ac		98	211.68	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.97 ac	A	39	76.83	Pond
Total Area	4.13 ac			288.51	69.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/05/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A Alternative 3 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.46 ac	A	39	95.94	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.46 ac			95.94	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.47 ac		100	147.00	Pond
Dry Pond Area	0.99 ac	A	39	38.61	Pond
Total Area	2.46 ac			185.61	75.5 = Weighted CN

BASIN B

BASIN B

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin B Alternative 1

Treatment Volume Required for Additional Impervious Area:	1.60 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.60 acre-ft

Attenuation Volume Required for Additional Impervious Area:	4.16 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	4.16 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

Basin B Pond Alternative 1, Station 2450+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	103.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	104.80	NAVD 88 from plans 406146-1-52-01. Permit 20358-17. Cross Section 3167+00.00. Equates to station 2440+00 design baseline.
Elev SHW =	98.4	SHWT from plans 406146-1-52-01. Permit 20358-17. SHWT taken from Pond B.
Treatment Volume Required	1.60	AC-FT.
Attenuation Volume Required	4.16	AC-FT.
Pond Area Based on treatment volume	1.60	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.00	FT.
Total Attenuation Depth based on Pond Area	2.6	FT.
Total Depth from SHWL to Top of Berm	4.60	FT.
Elev SHW=	98.4	
Top of Berm Elevation given a total depth =	103.0	
Unit Length Based on L/W = 2	373	FT.
Unit Width Based on L/W = 2	187	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	0	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	36.78	FT.
Total Pond Length (including maintenance berm and adjustments)	440.29	FT.
Total Pond Width (including maintenance berm and adjustments)	253.54	FT.
Preliminary Property Size Required without elimination of berm on two sides	2.56	AC.
Preliminary Property Size Required if berm required eliminated on two sides	1.78	AC. (see note below)
Preliminary Property Size Required with 10% Contingency	1.96	AC.
Property Size Provided	2.08	AC.

Note: Since this is an expansion of an existing pond the berm requirements along two sides within the footprint of the existing pond were subtracted from the required property size.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond B Station 2444+00 Lt/Rt
Basin: B

Pond Footprint:	1.24 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.24 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from permit)
Attenuation Depth:	0.98 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin B1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.92	CN	31.92	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	15.76	98	19.21	98
All Pervious Area, ac	16.16	47	12.71	47
Pervious Area A soils only, ac	13.00	39	10.28	39
CN	72.2		77.6	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.85		2.88	
Runoff Depth (Q), in	4.27		4.88	
Runoff Volume, acre-ft	11.36		12.98	
Volume Differential, acre-ft	1.62			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.68	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.72	
Total Volume Required, acre-ft	2.34			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin B2	Pre-Development Condition		Post Development Condition	
Total Area, acre	23.42	CN	23.42	CN
Pond Area, ac	1.24	100	1.78	100
Impervious Area, ac	11.51	98	13.74	98
Pervious Area, ac	10.67	39	7.90	39
CN	71.2		78.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.04		2.78	
Runoff Depth (Q), in	4.16		4.95	
Runoff Volume, acre-ft	8.13		9.66	
Volume Differential, acre-ft	1.53			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.56	
Total Volume Required, acre-ft	2.09			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin B-20SN	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.05	98	0.82	98
Pervious Area, ac	1.40	39	0.63	39
CN	41.0		72.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	14.37		3.82	
Runoff Depth (Q), in	1.12		4.29	
Runoff Volume, acre-ft	0.14		0.52	
Volume Differential, acre-ft	0.38			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.19	
Total Volume Required, acre-ft	0.58			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin B-20SS	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.14	98	0.67	98
Pervious Area, ac	1.31	39	0.78	39
CN	44.7		66.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	12.37		5.09	
Runoff Depth (Q), in	1.45		3.62	
Runoff Volume, acre-ft	0.17		0.44	
Volume Differential, acre-ft	0.26			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.40			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin B Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.51	CN	1.51	CN
CN	39.0		68.1	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	15.64		4.69	
Runoff Depth (Q), in	0.95		3.82	
Runoff Volume, acre-ft	0.12		0.48	
Volume Differential, acre-ft	0.36			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.36			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.00 ac	A	39	507.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	3.16 ac	D	80	252.80	Open Spaces, Lawns/Good Condition
Impervious Area	15.76 ac		98	1544.48	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2304.28	72.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.28 ac	A	39	400.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.43 ac	D	80	194.40	Open Spaces, Lawns/Good Condition
Impervious Area	19.21 ac		98	1882.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2477.90	77.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.67 ac	A	39	416.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	11.51 ac		98	1127.98	Roadway Pavement
Wetted Pond Area	1.24 ac		100	124.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1668.11	71.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.90 ac	A	39	308.10	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.74 ac		98	1346.52	Roadway Pavement
Wetted Pond Area	1.78 ac		100	178.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1832.62	78.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B-20SN

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.40 ac	A	39	54.60	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.05 ac		98	4.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			59.50	41.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.63 ac	A	39	24.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.82 ac		98	80.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			104.93	72.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations B-20SS

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.31 ac	A	39	51.09	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.14 ac		98	13.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			64.81	44.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.78 ac	A	39	30.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.67 ac		98	65.66	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			96.08	66.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/04/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.51 ac	A	39	58.89	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.51 ac			58.89	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.72 ac		100	72.00	Pond
Dry Pond Area	0.79 ac	A	39	30.81	Pond
Total Area	1.51 ac			102.81	68.1 = Weighted CN

Note: Pond area located within Sub-Basin B-2 which has been converted from dry pond area to wet pond area was not included on this sheet but was instead accounted for on the B-2 CN sheet.

BASIN B

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin B Alternative 2

Treatment Volume Required for Additional Impervious Area:	1.60 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.60 acre-ft

Attenuation Volume Required for Additional Impervious Area:	3.70 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	3.70 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 08/06/2021

Basin B Pond Alternative 2, Station 2435+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	97.11	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	104.80	NAVD 88 from plans 406146-1-52-01. Permit 20358-17. Cross Section 3167+00.00. Equates to station 2440+00 design baseline.
Elev SHW =	97.60	SHWT from permit 27042-1.
Treatment Volume Required	1.60	AC-FT.
Attenuation Volume Required	3.70	AC-FT.
Pond Area Based on treatment volume	1.07	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.50	FT.
Total Attenuation Depth based on Pond Area	3.5	FT.
Total Depth from SHWL to Top of Berm	5.96	FT.
Elev SHW=	97.6	
Top of Berm Elevation given a total depth =	103.6	
Unit Length Based on L/W = 2	305	FT.
Unit Width Based on L/W = 2	152	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	26	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	47.72	FT.
Total Pond Length (including maintenance berm and adjustments)	408.50	FT.
Total Pond Width (including maintenance berm and adjustments)	256.0199	FT.
Preliminary Property Size Required to accommodate Pond Footprint	2.40	AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	2.64	AC.
Length of Pond Berm Located within the Floodplain	1035.00	FT.
100-year Floodplain Elevation	99.70	FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL	2.10	FT.
Embankment Cross Sectional area located within floodplain	114.07	SF.
Floodplain impacts resulting from pond embankment	2.71	AC-FT
Average depth of floodplain compensation located adjacent to pond site	1.50	FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impacts	1.81	AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	1.99	AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation	4.63	AC.
Property Size Provided	5.43	AC.

Note: NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond B Station 2444+00 Lt/Rt
Basin: B

Pond Footprint:	1.24 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.24 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from permit)
Attenuation Depth:	0.98 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.92	CN	31.92	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	15.76	98	19.21	98
All Pervious Area, ac	16.16	47	12.71	47
Pervious Area A soils only, ac	13.00	39	10.28	39
CN	72.2		77.6	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.85		2.88	
Runoff Depth (Q), in	4.27		4.88	
Runoff Volume, acre-ft	11.36		12.98	
Volume Differential, acre-ft	1.62			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.68	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.72	
Total Volume Required, acre-ft	2.34			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B2	Pre-Development Condition		Post Development Condition	
Total Area, acre	23.42	CN	23.42	CN
Pond Area, ac	1.24	100	1.08	100
Impervious Area, ac	11.51	98	13.74	98
Pervious Area, ac	10.67	39	8.60	39
CN	71.2		76.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.04		3.08	
Runoff Depth (Q), in	4.16		4.74	
Runoff Volume, acre-ft	8.13		9.26	
Volume Differential, acre-ft	1.13			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.56	
Total Volume Required, acre-ft	1.69			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B-20SN	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.05	98	0.82	98
Pervious Area, ac	1.40	39	0.63	39
CN	41.0		72.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	14.37		3.82	
Runoff Depth (Q), in	1.12		4.29	
Runoff Volume, acre-ft	0.14		0.52	
Volume Differential, acre-ft	0.38			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.19	
Total Volume Required, acre-ft	0.58			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B-20SS	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.14	98	0.67	98
Pervious Area, ac	1.31	39	0.78	39
CN	44.7		66.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	12.37		5.09	
Runoff Depth (Q), in	1.45		3.62	
Runoff Volume, acre-ft	0.17		0.44	
Volume Differential, acre-ft	0.26			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.40			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin B Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.16	CN	2.16	CN
CN	77.0		91.6	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.99		0.92	
Runoff Depth (Q), in	4.81		6.49	
Runoff Volume, acre-ft	0.87		1.17	
Volume Differential, acre-ft	0.30			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.30			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.00 ac	A	39	507.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	3.16 ac	D	80	252.80	Open Spaces, Lawns/Good Condition
Impervious Area	15.76 ac		98	1544.48	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2304.28	72.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.28 ac	A	39	400.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.43 ac	D	80	194.40	Open Spaces, Lawns/Good Condition
Impervious Area	19.21 ac		98	1882.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2477.90	77.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.67 ac	A	39	416.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	11.51 ac		98	1127.98	Roadway Pavement
Wetted Pond Area	1.24 ac		100	124.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1668.11	71.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.60 ac	A	39	335.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.74 ac		98	1346.52	Roadway Pavement
Wetted Pond Area	1.08 ac		100	108.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1789.92	76.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B-20SN

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.40 ac	A	39	54.60	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.05 ac		98	4.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			59.50	41.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.63 ac	A	39	24.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.82 ac		98	80.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			104.93	72.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations B-20SS

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.31 ac	A	39	51.09	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.14 ac		98	13.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			64.81	44.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.78 ac	A	39	30.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.67 ac		98	65.66	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			96.08	66.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	45	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.16 ac	D	77	166.32	Woods, Good Cover
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.16 ac			166.32	77.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.91 ac	D	80	72.80	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.25 ac		100	125.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.16 ac			197.80	91.6 = Weighted CN

BASIN B

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/04/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin B Alternative 3

Treatment Volume Required for Additional Impervious Area:	1.60 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.60 acre-ft

Attenuation Volume Required for Additional Impervious Area:	5.13 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	5.13 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

Basin B Pond Alternative 3, Station 2455+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	112.11	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	104.80	NAVD 88 from plans 406146-1-52-01. Permit 20358-17. Cross Section 3167+00.00. Equates to station 2440+00 design baseline.
Elev SHW =	100.0	SHWT from plans West Pointe Villas Pond C. Permit 63298-1
Treatment Volume Required	1.60	AC-FT.
Attenuation Volume Required	5.13	AC-FT.
Pond Area Based on treatment volume	3.91	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	0.41	FT.
Total Attenuation Depth based on Pond Area	1.3	FT.
Total Depth from SHWL to Top of Berm	2.72	FT.
Elev SHW=	100.0	
Top of Berm Elevation given a total depth =	102.7	
Unit Length Based on L/W = 2	583	FT.
Unit Width Based on L/W = 2	292	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	38	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	21.80	FT.
Total Pond Length (including maintenance berm and adjustments)	672.65	FT.
Total Pond Width (including maintenance berm and adjustments)	380.99	FT.
Preliminary Property Size Required	5.88	AC.
Preliminary Property Size Required with 10% Contingency	6.47	AC.
Property Size Provided	6.61	AC.

Note: NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond B Station 2444+00 Lt/Rt
Basin: B

Pond Footprint:	1.24 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.24 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from permit)
Attenuation Depth:	0.98 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.92	CN	31.92	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	15.76	98	19.21	98
All Pervious Area, ac	16.16	47	12.71	47
Pervious Area A soils only, ac	13.00	39	10.28	39
CN	72.2		77.6	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.85		2.88	
Runoff Depth (Q), in	4.27		4.88	
Runoff Volume, acre-ft	11.36		12.98	
Volume Differential, acre-ft	1.62			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.68	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.72	
Total Volume Required, acre-ft	2.34			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B2	Pre-Development Condition		Post Development Condition	
Total Area, acre	23.42	CN	23.42	CN
Pond Area, ac	1.24	100	1.08	100
Impervious Area, ac	11.51	98	13.74	98
Pervious Area, ac	10.67	39	8.60	39
CN	71.2		76.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.04		3.08	
Runoff Depth (Q), in	4.16		4.74	
Runoff Volume, acre-ft	8.13		9.26	
Volume Differential, acre-ft	1.13			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.56	
Total Volume Required, acre-ft	1.69			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B-20SN	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.05	98	0.82	98
Pervious Area, ac	1.40	39	0.63	39
CN	41.0		72.4	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	14.37		3.82	
Runoff Depth (Q), in	1.12		4.29	
Runoff Volume, acre-ft	0.14		0.52	
Volume Differential, acre-ft	0.38			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.19	
Total Volume Required, acre-ft	0.58			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B-20SS	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.14	98	0.67	98
Pervious Area, ac	1.31	39	0.78	39
CN	44.7		66.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	12.37		5.09	
Runoff Depth (Q), in	1.45		3.62	
Runoff Volume, acre-ft	0.17		0.44	
Volume Differential, acre-ft	0.26			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.40			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.28	CN	5.28	CN
CN	48.6		85.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	10.58		1.72	
Runoff Depth (Q), in	1.81		5.76	
Runoff Volume, acre-ft	0.80		2.54	
Volume Differential, acre-ft	1.74			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	1.74			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.00 ac	A	39	507.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	3.16 ac	D	80	252.80	Open Spaces, Lawns/Good Condition
Impervious Area	15.76 ac		98	1544.48	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2304.28	72.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.28 ac	A	39	400.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.43 ac	D	80	194.40	Open Spaces, Lawns/Good Condition
Impervious Area	19.21 ac		98	1882.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2477.90	77.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.67 ac	A	39	416.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	11.51 ac		98	1127.98	Roadway Pavement
Wetted Pond Area	1.24 ac		100	124.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1668.11	71.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.60 ac	A	39	335.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.74 ac		98	1346.52	Roadway Pavement
Wetted Pond Area	1.08 ac		100	108.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1789.92	76.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B-20SN

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.40 ac	A	39	54.60	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.05 ac		98	4.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			59.50	41.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.63 ac	A	39	24.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.82 ac		98	80.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			104.93	72.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations B-20SS

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.31 ac	A	39	51.09	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.14 ac		98	13.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			64.81	44.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.78 ac	A	39	30.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.67 ac		98	65.66	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			96.08	66.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B Alternative 3 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.78 ac	A	45	215.10	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.50 ac	D	83	41.50	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.28 ac			256.60	48.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.21 ac	D	80	16.80	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	3.87 ac		100	387.00	Pond
Dry Pond Area	1.20 ac	A	39	46.80	Pond
Total Area	5.28 ac			450.60	85.3 = Weighted CN

BASIN C

BASIN C

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin C Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.75 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.75 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.85 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	1.85 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Check by: JAF
Date: 02/07/2022

**Basin C Pond Alternative 1
Station 2487+00 LT**

Wet Detention Calculations

Existing Ground at Pond site =	96.00	Existing ground at Pond C. Plans 406146-1-52-01. Permit 20358-17. PDF Pg 131
ELEV EXST EOP @ Low Point =	101.00	NAVD 88 from Cross section 3250+00.00 plans 406146-1-52-01, Permit 20358-17.
Elev SHW =	96.80	NAVD 88. SHW from Pond C. Plans 406146-1-52-01. Permit 20358-17.
Treatment Volume Required		0.75 AC-FT.
Attenuation Volume Required		1.85 AC-FT.
Pond Area Based on treatment volume		1.66 AC
Assume 1 foot of pond freeboard		1.00 FT.
Treatment Depth		0.45 FT.
Total Attenuation Depth based on Pond Area		1.1 FT.
Total Depth from SHWL to Top of Berm		2.57 FT.
Elev SHW=	96.8	
Top of Berm Elevation given a total depth =	99.4	
Unit Length Based on L/W = 2	380 FT.	
Unit Width Based on L/W = 2	190 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	13 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	20.54 FT.	
Total Pond Length (including maintenance berm and adjustments)	444.00 FT.	
Total Pond Width (including maintenance berm and adjustments)	254.01 FT.	
Preliminary Property Size Required to accommodate Pond Footprint	2.59 AC.	
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	2.85 AC.	
Length of Pond Berm Located within the Floodplain	990.00 FT.	
100-year Floodplain Elevation	99.70 FT.	
highest of either est. SHWT or Exist Ground per floodplain impact clacs for impact location 13 in the LHR	95.00 FT.	
Average Depth from the lower of either the floodplain elevation or top of berm to higer of existing ground or SHWL	3.37 FT.	
Embankment Cross Sectional area located within floodplain	95.87 SF.	
Floodplain impacts resulting from pond embankment	2.18 AC-FT	
Average depth of floodplain compensation located adjacent to pond site	1.75 FT.	
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impacts	1.25 AC.	
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	1.37 AC.	
Preliminary property size to accommodate Pond Footprint and Floodplain Compensation	4.22 AC.	
Property Size Provided	5.55 AC.	



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond C Station 2502+00 Lt
Basin: C

Pond Footprint:	2.67 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	2.67 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from as-built plans)
Attenuation Depth:	1.22 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.18	CN	31.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	18.98	98	21.04	98
Pervious Area, ac	12.20	50	10.14	51
Pervious Area A soils only, ac	6.36	39	4.63	39
CN	79.0		82.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.65		2.09	
Runoff Depth (Q), in	5.04		5.46	
Runoff Volume, acre-ft	13.09		14.18	
Volume Differential, acre-ft	1.09			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
Total Volume Required, acre-ft	1.52			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C2	Pre-Development Condition		Post Development Condition	
Total Area, acre	29.71	CN	29.71	CN
Pond Area, ac	2.67	100	2.67	100
Impervious Area, ac	16.14	98	16.37	98
All Pervious Area, ac	10.90	46	10.67	45
Pervious Area A soils only, ac	7.22	39	7.95	39
CN	79.3		79.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.62		2.66	
Runoff Depth (Q), in	5.06		5.04	
Runoff Volume, acre-ft	12.54		12.47	
Volume Differential, acre-ft	-0.07			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.18	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.05	
Total Volume Required, acre-ft	-0.02			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C-20SE	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.84	CN	3.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.22	98	1.51	98
All Pervious Area, ac	3.62	56	2.33	55
Pervious Area A soils only, ac	0.87	39	0.67	39
CN	58.1		71.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	7.20		3.94	
Runoff Depth (Q), in	2.76		4.22	
Runoff Volume, acre-ft	0.88		1.35	
Volume Differential, acre-ft	0.47			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.05	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.27	
Total Volume Required, acre-ft	0.73			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.92	CN	2.92	CN
CN	73.3		86.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	3.65		1.54	
Runoff Depth (Q), in	4.39		5.91	
Runoff Volume, acre-ft	1.07		1.44	
Volume Differential, acre-ft	0.37			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.37			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.36 ac	A	39	248.04	Open Spaces, Lawns/Good Condition
Pervious Area	5.84 ac	B	61	356.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.98 ac		98	1860.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2464.32	79.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.63 ac	A	39	180.57	Open Spaces, Lawns/Good Condition
Pervious Area	5.51 ac	B	61	336.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	21.04 ac		98	2061.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2578.60	82.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.92 ac	A	39	152.88	Open Spaces, Lawns/Good Condition
Pervious Area	3.68 ac	B	61	224.48	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.14 ac		98	1581.72	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2354.78	79.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.65 ac	A	39	181.35	Open Spaces, Lawns/Good Condition
Pervious Area	2.72 ac	B	61	165.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.37 ac		98	1604.26	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2347.23	79.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C-20SE

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.87 ac	A	39	33.93	Open Spaces, Lawns/Good Condition
Pervious Area	2.75 ac	B	61	167.75	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.22 ac		98	21.56	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			223.24	58.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.67 ac	A	39	26.13	Open Spaces, Lawns/Good Condition
Pervious Area	1.66 ac	B	61	101.26	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			275.37	71.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin C Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.19 ac	A	39	7.41	Open Spaces, Lawns/Good Condition
Pervious Area	0.91 ac	B	61	55.51	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	1.82 ac	D	83	151.06	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.92 ac			213.98	73.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.44 ac	B	61	26.84	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.51 ac	D	80	40.80	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.78 ac		100	178.00	Pond
Dry Pond Area	0.19 ac	A	39	7.41	Pond
Total Area	2.92 ac			253.05	86.7 = Weighted CN

BASIN C

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin C Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.75 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.75 acre-ft

Attenuation Volume Required for Additional Impervious Area:	2.15 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	2.15 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/07/2022

Basin C Pond Alternative 2, Station 2519+00 LT

Wet Detention Calculations

Existing Ground at Pond site = 103.11 NAVD 88 (converted from NGVD 29)
ELEV EXST EOP @ Low Point = 102.40 NAVD 88 from Cross section 3213+00.00 plans 406146-1-52-01, Permit 20358-17. Equates to STA 2505+00.00
Elev SHW = 97.20 NAVD 88 from Cross section 3250+00.00 plans 406146-1-52-01, Permit 20358-17.

Treatment Volume Required 0.75 AC-FT.
Attenuation Volume Required 2.15 AC-FT.
Pond Area Based on treatment volume 1.07 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.70 FT.
Total Attenuation Depth based on Pond Area 2.0 FT.
Total Depth from SHWL to Top of Berm 3.72 FT.

Elev SHW= 97.2
Top of Berm Elevation given a total depth = 100.9

Unit Length Based on L/W = 2 305 FT.
Unit Width Based on L/W = 2 152 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 9 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 29.76 FT.
Total Pond Length (including maintenance berm and adjustments) 373.19 FT.
Total Pond Width (including maintenance berm and adjustments) 220.86 FT.

Preliminary Property Size Required 1.89 AC.
Preliminary Property Size Required with 10% Contingency 2.08 AC.

Property Size Provided 2.30 AC.

Note: NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond C Station 2502+00 Lt
Basin: C

Pond Footprint:	2.67 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	2.67 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from as-built plans)
Attenuation Depth:	1.22 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.18	CN	31.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	18.98	98	21.04	98
Pervious Area, ac	12.20	50	10.14	51
Pervious Area A soils only, ac	6.36	39	4.63	39
CN	79.0		82.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.65		2.09	
Runoff Depth (Q), in	5.04		5.46	
Runoff Volume, acre-ft	13.09		14.18	
Volume Differential, acre-ft	1.09			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
Total Volume Required, acre-ft	1.52			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C2	Pre-Development Condition		Post Development Condition	
Total Area, acre	29.71	CN	29.71	CN
Pond Area, ac	2.67	100	2.67	100
Impervious Area, ac	16.14	98	16.37	98
All Pervious Area, ac	10.90	46	10.67	45
Pervious Area A soils only, ac	7.22	39	7.95	39
CN	79.3		79.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.62		2.66	
Runoff Depth (Q), in	5.06		5.04	
Runoff Volume, acre-ft	12.54		12.47	
Volume Differential, acre-ft	-0.07			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.18	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.05	
Total Volume Required, acre-ft	-0.02			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C-20SE	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.84	CN	3.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.22	98	1.51	98
All Pervious Area, ac	3.62	56	2.33	55
Pervious Area A soils only, ac	0.87	39	0.67	39
CN	58.1		71.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	7.20		3.94	
Runoff Depth (Q), in	2.76		4.22	
Runoff Volume, acre-ft	0.88		1.35	
Volume Differential, acre-ft	0.47			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.05	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.27	
Total Volume Required, acre-ft	0.73			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.67	CN	1.67	CN
CN	25.0		77.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	30.00		2.87	
Runoff Depth (Q), in	0.07		4.89	
Runoff Volume, acre-ft	0.01		0.68	
Volume Differential, acre-ft	0.67			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.67			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.36 ac	A	39	248.04	Open Spaces, Lawns/Good Condition
Pervious Area	5.84 ac	B	61	356.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.98 ac		98	1860.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2464.32	79.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.63 ac	A	39	180.57	Open Spaces, Lawns/Good Condition
Pervious Area	5.51 ac	B	61	336.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	21.04 ac		98	2061.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2578.60	82.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.92 ac	A	39	152.88	Open Spaces, Lawns/Good Condition
Pervious Area	3.68 ac	B	61	224.48	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.14 ac		98	1581.72	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2354.78	79.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.65 ac	A	39	181.35	Open Spaces, Lawns/Good Condition
Pervious Area	2.72 ac	B	61	165.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.37 ac		98	1604.26	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2347.23	79.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C-20SE

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.87 ac	A	39	33.93	Open Spaces, Lawns/Good Condition
Pervious Area	2.75 ac	B	61	167.75	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.22 ac		98	21.56	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			223.24	58.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.67 ac	A	39	26.13	Open Spaces, Lawns/Good Condition
Pervious Area	1.66 ac	B	61	101.26	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			275.37	71.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin C Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.67 ac	A	25	41.75	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.67 ac			41.75	25.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.06 ac		100	106.00	Pond
Dry Pond Area	0.61 ac	A	39	23.79	Pond
Total Area	1.67 ac			129.79	77.7 = Weighted CN

BASIN C

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin C Alternative 3

Treatment Volume Required for Additional Impervious Area:	0.75 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.75 acre-ft

Attenuation Volume Required for Additional Impervious Area:	2.11 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	2.11 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/08/2022

Basin C Pond Alternative 3, Station 2510+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	101.00	Existing ground at Pond C. Plans 406146-1-52-01. Permit 20358-17. PDF Pg 131
ELEV EXST EOP @ Low Point =	102.40	NAVD 88 from Cross section 3213+00.00 plans 406146-1-52-01, Permit 20358-17. Equates to STA 2505+00.00
Elev SHW =	96.80	NAVD 88. SHW from Pond C. Plans 406146-1-52-01. Permit 20358-17.
Treatment Volume Required	0.75 AC-FT.	
Attenuation Volume Required	2.11 AC-FT.	
Pond Area Based on treatment volume	1.07 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	0.70 FT.	
Total Attenuation Depth based on Pond Area	2.0 FT.	
Total Depth from SHWL to Top of Berm	3.68 FT.	
Elev SHW=	96.8	
Top of Berm Elevation given a total depth =	100.5	
Unit Length Based on L/W = 2	305 FT.	
Unit Width Based on L/W = 2	152 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	2 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	29.43 FT.	
Total Pond Length (including maintenance berm and adjustments)	366.18 FT.	
Total Pond Width (including maintenance berm and adjustments)	213.85 FT.	
Preliminary Property Size Required	1.80 AC.	
Preliminary Property Size Required with 10% Contingency	1.98 AC.	
Property Size Provided	2.49 AC.	



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond C Station 2502+00 Lt
Basin: C

Pond Footprint:	2.67 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	2.67 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from as-built plans)
Attenuation Depth:	1.22 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.18	CN	31.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	18.98	98	21.04	98
Pervious Area, ac	12.20	50	10.14	51
Pervious Area A soils only, ac	6.36	39	4.63	39
CN	79.0		82.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.65		2.09	
Runoff Depth (Q), in	5.04		5.46	
Runoff Volume, acre-ft	13.09		14.18	
Volume Differential, acre-ft	1.09			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
Total Volume Required, acre-ft	1.52			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C2	Pre-Development Condition		Post Development Condition	
Total Area, acre	29.71	CN	29.71	CN
Pond Area, ac	2.67	100	2.67	100
Impervious Area, ac	16.14	98	16.37	98
All Pervious Area, ac	10.90	46	10.67	45
Pervious Area A soils only, ac	7.22	39	7.95	39
CN	79.3		79.0	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.62		2.66	
Runoff Depth (Q), in	5.06		5.04	
Runoff Volume, acre-ft	12.54		12.47	
Volume Differential, acre-ft	-0.07			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.18	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.05	
Total Volume Required, acre-ft	-0.02			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C-20SE	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.84	CN	3.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.22	98	1.51	98
All Pervious Area, ac	3.62	56	2.33	55
Pervious Area A soils only, ac	0.87	39	0.67	39
CN	58.1		71.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	7.20		3.94	
Runoff Depth (Q), in	2.76		4.22	
Runoff Volume, acre-ft	0.88		1.35	
Volume Differential, acre-ft	0.47			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.05	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.27	
Total Volume Required, acre-ft	0.73			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.79	CN	1.79	CN
CN	46.2		85.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	11.64		1.69	
Runoff Depth (Q), in	1.59		5.78	
Runoff Volume, acre-ft	0.24		0.86	
Volume Differential, acre-ft	0.63			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.63			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.36 ac	A	39	248.04	Open Spaces, Lawns/Good Condition
Pervious Area	5.84 ac	B	61	356.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.98 ac		98	1860.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2464.32	79.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.63 ac	A	39	180.57	Open Spaces, Lawns/Good Condition
Pervious Area	5.51 ac	B	61	336.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	21.04 ac		98	2061.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2578.60	82.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.92 ac	A	39	152.88	Open Spaces, Lawns/Good Condition
Pervious Area	3.68 ac	B	61	224.48	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.14 ac		98	1581.72	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2354.78	79.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.65 ac	A	39	181.35	Open Spaces, Lawns/Good Condition
Pervious Area	2.72 ac	B	61	165.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.37 ac		98	1604.26	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2347.23	79.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C-20SE

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.87 ac	A	39	33.93	Open Spaces, Lawns/Good Condition
Pervious Area	2.75 ac	B	61	167.75	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.22 ac		98	21.56	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			223.24	58.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.67 ac	A	39	26.13	Open Spaces, Lawns/Good Condition
Pervious Area	1.66 ac	B	61	101.26	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			275.37	71.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin C Alternative 3 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.06 ac	A	25	26.50	Woods, Good Cover
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.73 ac	D	77	56.21	Woods, Good Cover
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.79 ac			82.71	46.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.35 ac	D	80	28.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.13 ac		100	113.00	Pond
Dry Pond Area	0.31 ac	A	39	12.09	Pond
Total Area	1.79 ac			153.09	85.5 = Weighted CN

BASIN D

BASIN D

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/08/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin D Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.38 acre-ft
Treatment Volume Impacted:	1.22 acre-ft
Total Treatment Volume Required:	1.60 acre-ft

Attenuation Volume Required for Additional Impervious Area:	0.88 acre-ft
Attenuation Volume Impacted:	14.20 acre-ft
Attenuation Volume Required:	15.07 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 08/06/2021

Basin D Pond Alternative 1, Station 2571+00 LT

Dry Retention Calculations

Existing Ground at Pond site = 142.11 NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point = 130.00 NAVD 88 from 406146-1-52-01 Plans Turnpike Mainline Widening From Beluah Road to SR 50. Permit 20358-17 Cross Section 3279+00.00. Equates to station 2555+00.00 design baseline
Elev SHW = 115 NAVD 88 from 406146-1-52-01 Plans Turnpike Mainline Widening From Beluah Road to SR 50. Permit 20358-17 Cross Section 3300+00.00

Treatment Volume Required 1.60 AC-FT.
Attenuation Volume Required 15.07 AC-FT.
Pond Area Based on treatment volume 2.47 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.65 FT.
Total Attenuation Depth based on Pond Area 6.1 FT.
Total Available Depth from pond bottom to Top of Berm 7.76 FT.

Elev Pond Bottom= 120.0
Top of Berm Elevation given a total depth = 127.8

Unit Length Based on L/W = 2 464 FT.
Unit Width Based on L/W = 2 232 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 57 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 62.05 FT.
Total Pond Length (including maintenance berm and adjustments) 613.20 FT.
Total Pond Width (including maintenance berm and adjustments) 381.33 FT.

Preliminary Property Size Required 5.37 AC.
Preliminary Property Size Required with 10% Contingency 5.90 AC.

Property Size Provided 6.00 AC.

Notes:

- 1) NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29
- 2) Given the sandy nature of the soils and the typically high infiltration rates for the interchange ponds from Permit 20358-17 a maximum treatment depth of 2' was conservatively utilized for the Basin D calculations.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond C-1A Station 2545+00 Rt
Basin: D

Pond Footprint:	0.87 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	0.44 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	0.44 acres
Treatment Depth:	1.00 ft (from permit)
Attenuation Depth:	0.59 ft (from permit)
Estimated Treatment Volume: Impacted:	0.44 acre-ft
Estimated Attenuation Volume Impacted:	0.26 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond D-10 Station 2567+00 Lt
Basin: D

Pond Footprint:	0.59 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.59 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.24
Attenuation Depth:	5.13
Total Depth:	5.37 ft (distance between DHW and weir from permit)
Permitted Treatment Volume:	0.14 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Date : 02/11/2021
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Checked by : JAF

Impacts to Existing Ponds
Pond D-20 Station 2564+00 Lt
Basin: D

Pond Footprint:	0.21 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	0.19 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.02 acres
Treatment Depth:	1.05
Attenuation Depth:	3.39
Total Depth:	4.44 ft (distance between DHW and weir from permit)
Permitted Treatment Volume:	0.22 ac-ft (from permit)
Estimated Treatment Volume: Impacted:	0.02 acre-ft
Estimated Attenuation Volume Impacted:	0.07 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-30 Station 2555+00 Lt
Basin: D

Pond Footprint:	0.62 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.62 acres
Treatment Depth:	0.37 ft
Attenuation Depth:	3.98 ft
Total Depth:	4.35 ft (from permit)
Permitted Treatment Volume:	0.23 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.23 acre-ft

Estimated Attenuation Volume Impacted: 2.47 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
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Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-40 Station 2558+00 Rt
Basin: D

Pond Footprint:	3.88 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	1.94 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	1.94 acres
Treatment Depth:	0.24 ft
Attenuation Depth:	5.39 ft
Total Depth:	5.63 ft (from as-builts & permit)
Permitted Treatment Volume:	0.93 ac-ft
Estimated Treatment Volume: Impacted:	0.47 acre-ft
Estimated Attenuation Volume Impacted:	10.46 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond D-50 Station 2559+00 Lt
Basin: D

Pond Footprint:	1.03 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.03 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.20 ft
Attenuation Depth:	2.07 ft
Total Depth:	2.27 ft (from permit)
Permitted Treatment Volume:	0.21 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-60 Station 2549+00 Lt
Basin: D

Pond Footprint:	0.69 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.69 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.07 ft
Attenuation Depth:	1.13 ft
Total Depth:	1.20 ft (from as-builts & permit)
Permitted Treatment Volume:	0.05 ac-ft (calculated from exist. Impervious area)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Checked by : JAF

Impacts to Existing Ponds
Pond D-70 Station 2565+00 Rt
Basin: D

Pond Footprint:	0.24 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.24 acres
Treatment Depth:	0.17 ft
Attenuation Depth:	1.44 ft
Total Depth:	1.61 ft (from as-builts & permit)
Permitted Treatment Volume:	0.04 ac-ft (from permit)
Estimated Treatment Volume: Impacted:	0.04 acre-ft
Estimated Attenuation Volume Impacted:	0.35 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Checked by : JAF

Impacts to Existing Ponds
Pond D-80 Station 2560+00 Rt
Basin: D

Pond Footprint:	0.39 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.39 acres
Treatment Depth:	0.08 ft
Attenuation Depth:	1.53 ft
Total Depth:	1.61 ft (from as-builts & permit)
Permitted Treatment Volume:	0.03 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.03 acre-ft

Estimated Attenuation Volume Impacted: 0.60 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C1A	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.94	CN	4.94	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.83	98	1.86	98
Pervious Area, ac	3.11	39	3.08	39
CN	60.9		61.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.43		6.34	
Runoff Depth (Q), in	10.24		10.30	
Runoff Volume, acre-ft	4.21		4.24	
Volume Differential, acre-ft	0.03			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.01	
Total Volume Required, acre-ft	0.03			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
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Basin D10	Pre-Development Condition		Post Development Condition	
Total Area, acre	7.88	CN	7.88	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.52	98	2.37	98
Pervious Area, ac	5.36	39	5.51	39
CN	57.9		56.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	7.28		7.62	
Runoff Depth (Q), in	9.69		9.48	
Runoff Volume, acre-ft	6.36		6.23	
Volume Differential, acre-ft	-0.14			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.04	
Total Volume Required, acre-ft	-0.18			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
Checked by: JAF
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Basin D20	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.12	CN	4.12	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.83	98	1.26	98
Pervious Area, ac	2.29	39	2.86	39
CN	65.2		57.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.34		7.53	
Runoff Depth (Q), in	11.00		9.54	
Runoff Volume, acre-ft	3.78		3.27	
Volume Differential, acre-ft	-0.50			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.14	
Total Volume Required, acre-ft	-0.64			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D30	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.73	CN	12.73	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.46	98	5.83	98
Pervious Area, ac	5.27	39	6.90	39
CN	73.6		66.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.59		5.15	
Runoff Depth (Q), in	12.37		11.14	
Runoff Volume, acre-ft	13.13		11.82	
Volume Differential, acre-ft	-1.31			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.41	
Total Volume Required, acre-ft	-1.72			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D40	Pre-Development Condition		Post Development Condition	
Total Area, acre	13.74	CN	13.74	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.84	98	7.06	98
Pervious Area, ac	9.90	39	6.68	39
CN	55.5		69.3	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	8.02		4.43	
Runoff Depth (Q), in	9.24		11.69	
Runoff Volume, acre-ft	10.58		13.39	
Volume Differential, acre-ft	2.80			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.81	
Total Volume Required, acre-ft	3.61			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D50	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.84	CN	5.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.10	98	1.39	98
Pervious Area, ac	3.74	39	4.45	39
CN	60.2		53.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.61		8.85	
Runoff Depth (Q), in	10.12		8.77	
Runoff Volume, acre-ft	4.93		4.27	
Volume Differential, acre-ft	-0.66			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.18	
Total Volume Required, acre-ft	-0.83			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D60	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.80	CN	2.80	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.21	98	0.09	98
Pervious Area, ac	2.59	39	2.71	39
CN	43.4		40.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	13.03		14.45	
Runoff Depth (Q), in	6.79		6.24	
Runoff Volume, acre-ft	1.58		1.45	
Volume Differential, acre-ft	-0.13			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.03	
Total Volume Required, acre-ft	-0.16			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D70	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.68	CN	1.68	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.29	98	0.52	98
Pervious Area, ac	1.39	39	1.16	39
CN	49.2		57.3	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	10.33		7.46	
Runoff Depth (Q), in	8.00		9.58	
Runoff Volume, acre-ft	1.12		1.34	
Volume Differential, acre-ft	0.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.06	
Total Volume Required, acre-ft	0.28			



Project Name: SR 91 Widening from SR 408 to SR 50
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Checked by: JAF
Date: 02/07/2022

Basin D80	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.29	CN	1.29	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.21	98	0.58	98
Pervious Area, ac	1.08	39	0.71	39
CN	48.6		65.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	10.57		5.26	
Runoff Depth (Q), in	7.88		11.06	
Runoff Volume, acre-ft	0.85		1.19	
Volume Differential, acre-ft	0.34			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.09	
Total Volume Required, acre-ft	0.43			



Project Name: SR 91 Widening from SR 408 to SR 50
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Date: 02/07/2022

Basin DSR50S	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.91	CN	12.91	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.45	98	7.31	98
Pervious Area, ac	6.46	39	5.60	39
CN	68.5		72.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.60		3.81	
Runoff Depth (Q), in	11.55		12.19	
Runoff Volume, acre-ft	12.43		13.11	
Volume Differential, acre-ft	0.69			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.22	
Total Volume Required, acre-ft	0.90			



Project Name: SR 91 Widening from SR 408 to SR 50
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Basin D Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.22	CN	4.22	CN
CN	45.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	12.22		15.64	
Runoff Depth (Q), in	7.13		5.81	
Runoff Volume, acre-ft	2.51		2.04	
Volume Differential, acre-ft	-0.46			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	-0.46			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
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Checked by : JAF

Curve Number Calculations C1A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.70 ac	A	39	27.30	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.83 ac		98	179.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.41 ac	A	39	93.99	Pond
Total Area	4.94 ac			300.63	60.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.60 ac	A	39	62.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.86 ac		98	182.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.48 ac	A	39	57.72	Pond
Total Area	4.94 ac			302.40	61.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D10

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.52 ac		98	246.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	5.32 ac	A	39	207.48	Pond
Total Area	7.88 ac			456.00	57.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.37 ac		98	232.26	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	5.47 ac	A	39	213.33	Pond
Total Area	7.88 ac			447.15	56.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D20

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.83 ac		98	179.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.29 ac	A	39	89.31	Pond
Total Area	4.12 ac			268.65	65.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.09 ac	A	39	81.51	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.26 ac		98	123.48	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.77 ac	A	39	30.03	Pond
Total Area	4.12 ac			235.02	57.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D30

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.55 ac	A	39	99.45	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.46 ac		98	731.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.72 ac	A	39	106.08	Pond
Total Area	12.73 ac			936.61	73.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.35 ac	A	39	169.65	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.83 ac		98	571.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.55 ac	A	39	99.45	Pond
Total Area	12.73 ac			840.44	66.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D40

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.80 ac	A	39	148.20	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.84 ac		98	376.32	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	6.10 ac	A	39	237.90	Pond
Total Area	13.74 ac			762.42	55.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.58 ac	A	39	22.62	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.06 ac		98	691.88	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	6.10 ac	A	39	237.90	Pond
Total Area	13.74 ac			952.40	69.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D50

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.74 ac	A	39	145.86	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.10 ac		98	205.80	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.84 ac			351.66	60.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.45 ac	A	39	173.55	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.39 ac		98	136.22	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.84 ac			309.77	53.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D60

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.21 ac		98	20.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.59 ac	A	39	101.01	Pond
Total Area	2.80 ac			121.59	43.4 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.09 ac		98	8.82	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.71 ac	A	39	105.69	Pond
Total Area	2.80 ac			114.51	40.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D70

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.29 ac		98	28.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.39 ac	A	39	54.21	Pond
Total Area	1.68 ac			82.63	49.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.26 ac	A	39	10.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.52 ac		98	50.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.90 ac	A	39	35.10	Pond
Total Area	1.68 ac			96.20	57.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D80

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.21 ac		98	20.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.04 ac	A	39	40.56	Pond
Total Area	1.29 ac			62.70	48.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.21 ac	A	39	8.19	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.58 ac		98	56.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.50 ac	A	39	19.50	Pond
Total Area	1.29 ac			84.53	65.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations DSR50S

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.46 ac	A	39	251.94	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.45 ac		98	632.10	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.91 ac			884.04	68.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.60 ac	A	39	218.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.31 ac		98	716.38	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.91 ac			934.78	72.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin D Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.22 ac	A	45	189.90	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	4.22 ac			189.90	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.22 ac	A	39	164.58	Pond
Total Area	4.22 ac			164.58	39.0 = Weighted CN

BASIN D

ALTERNATIVE 2

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/08/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin D Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.38 acre-ft
Treatment Volume Impacted:	1.22 acre-ft
Total Treatment Volume Required:	1.60 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.34 acre-ft
Attenuation Volume Impacted:	14.20 acre-ft
Attenuation Volume Required:	15.54 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/08/2022

Basin D Pond Alternative 2, Station 2540+00 RT

Dry Retention Calculations

Existing Ground at Pond site =	123.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	130.00	NAVD 88 from 406146-1-52-01 Plans Turnpike Mainline Widening From Beluah Road to SR 50. Permit 20358-17 Cross Section 3279+00.00. Equates to station 2555+00.00 design baseline
Elev SHW =	112	SHWT from plans 406146-1-52-01, Permit 20358-17 pg GR-6. Average of borings for Pond D-40
Treatment Volume Required	1.60 AC-FT.	
Attenuation Volume Required	15.54 AC-FT.	
Pond Area Based on treatment volume	3.21 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	0.50 FT.	
Total Attenuation Depth based on Pond Area	4.8 FT.	
Total Depth from SHWL to Top of Berm	6.34 FT.	
Elev Pond Bottom=	117.0	
Top of Berm Elevation given a total depth =	123.3	
Unit Length Based on L/W = 2	529 FT.	
Unit Width Based on L/W = 2	264 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	1 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	50.73 FT.	
Total Pond Length (including maintenance berm and adjustments)	610.84 FT.	
Total Pond Width (including maintenance berm and adjustments)	346.47 FT.	
Preliminary Property Size Required	4.86 AC.	
Preliminary Property Size Required with 10% Contingency	5.34 AC.	
Property Size Provided	5.73 AC.	

Notes:

- 1) NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29
- 2) Given the sandy nature of the soils and the typically high infiltration rates for the interchange ponds from Permit 20358-17 a maximum treatment depth of 2' was conservatively utilized for the Basin D calculations.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond C-1A Station 2545+00 Rt
Basin: D

Pond Footprint:	0.87 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	0.44 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	0.44 acres
Treatment Depth:	1.00 ft (from permit)
Attenuation Depth:	0.59 ft (from permit)
Estimated Treatment Volume: Impacted:	0.44 acre-ft
Estimated Attenuation Volume Impacted:	0.26 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond D-10 Station 2567+00 Lt
Basin: D

Pond Footprint:	0.59 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.59 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.24
Attenuation Depth:	5.13
Total Depth:	5.37 ft (distance between DHW and weir from permit)
Permitted Treatment Volume:	0.14 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-20 Station 2564+00 Lt
Basin: D

Pond Footprint:	0.21 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	0.19 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.02 acres
Treatment Depth:	1.05
Attenuation Depth:	3.39
Total Depth:	4.44 ft (distance between DHW and weir from permit)
Permitted Treatment Volume:	0.22 ac-ft (from permit)
Estimated Treatment Volume: Impacted:	0.02 acre-ft
Estimated Attenuation Volume Impacted:	0.07 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-30 Station 2555+00 Lt
Basin: D

Pond Footprint:	0.62 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.62 acres
Treatment Depth:	0.37 ft
Attenuation Depth:	3.98 ft
Total Depth:	4.35 ft (from permit)
Permitted Treatment Volume:	0.23 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.23 acre-ft

Estimated Attenuation Volume Impacted: 2.47 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-40 Station 2558+00 Rt
Basin: D

Pond Footprint:	3.88 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	1.94 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	1.94 acres
Treatment Depth:	0.24 ft
Attenuation Depth:	5.39 ft
Total Depth:	5.63 ft (from as-builts & permit)
Permitted Treatment Volume:	0.93 ac-ft
Estimated Treatment Volume: Impacted:	0.47 acre-ft
Estimated Attenuation Volume Impacted:	10.46 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond D-50 Station 2559+00 Lt
Basin: D

Pond Footprint:	1.03 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.03 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.20 ft
Attenuation Depth:	2.07 ft
Total Depth:	2.27 ft (from permit)
Permitted Treatment Volume:	0.21 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-60 Station 2549+00 Lt
Basin: D

Pond Footprint:	0.69 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.69 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.07 ft
Attenuation Depth:	1.13 ft
Total Depth:	1.20 ft (from as-builts & permit)
Permitted Treatment Volume:	0.05 ac-ft (calculated from exist. Impervious area)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-70 Station 2565+00 Rt
Basin: D

Pond Footprint:	0.24 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.24 acres
Treatment Depth:	0.17 ft
Attenuation Depth:	1.44 ft
Total Depth:	1.61 ft (from as-builts & permit)
Permitted Treatment Volume:	0.04 ac-ft (from permit)
Estimated Treatment Volume: Impacted:	0.04 acre-ft
Estimated Attenuation Volume Impacted:	0.35 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Impacts to Existing Ponds
Pond D-80 Station 2560+00 Rt
Basin: D

Pond Footprint:	0.39 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.39 acres
Treatment Depth:	0.08 ft
Attenuation Depth:	1.53 ft
Total Depth:	1.61 ft (from as-builts & permit)
Permitted Treatment Volume:	0.03 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.03 acre-ft

Estimated Attenuation Volume Impacted: 0.60 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C1A	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.94	CN	4.94	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.83	98	1.86	98
Pervious Area, ac	3.11	39	3.08	39
CN	60.9		61.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.43		6.34	
Runoff Depth (Q), in	10.24		10.30	
Runoff Volume, acre-ft	4.21		4.24	
Volume Differential, acre-ft	0.03			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.01	
Total Volume Required, acre-ft	0.03			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D10	Pre-Development Condition		Post Development Condition	
Total Area, acre	7.88	CN	7.88	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.52	98	2.37	98
Pervious Area, ac	5.36	39	5.51	39
CN	57.9		56.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	7.28		7.62	
Runoff Depth (Q), in	9.69		9.48	
Runoff Volume, acre-ft	6.36		6.23	
Volume Differential, acre-ft	-0.14			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.04	
Total Volume Required, acre-ft	-0.18			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D20	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.12	CN	4.12	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.83	98	1.26	98
Pervious Area, ac	2.29	39	2.86	39
CN	65.2		57.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.34		7.53	
Runoff Depth (Q), in	11.00		9.54	
Runoff Volume, acre-ft	3.78		3.27	
Volume Differential, acre-ft	-0.50			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.14	
Total Volume Required, acre-ft	-0.64			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D30	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.73	CN	12.73	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.46	98	5.83	98
Pervious Area, ac	5.27	39	6.90	39
CN	73.6		66.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.59		5.15	
Runoff Depth (Q), in	12.37		11.14	
Runoff Volume, acre-ft	13.13		11.82	
Volume Differential, acre-ft	-1.31			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.41	
Total Volume Required, acre-ft	-1.72			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
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Date: 02/07/2022

Basin D40	Pre-Development Condition		Post Development Condition	
Total Area, acre	13.74	CN	13.74	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.84	98	7.06	98
Pervious Area, ac	9.90	39	6.68	39
CN	55.5		69.3	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	8.02		4.43	
Runoff Depth (Q), in	9.24		11.69	
Runoff Volume, acre-ft	10.58		13.39	
Volume Differential, acre-ft	2.80			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.81	
Total Volume Required, acre-ft	3.61			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
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Basin D50	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.84	CN	5.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.10	98	1.39	98
Pervious Area, ac	3.74	39	4.45	39
CN	60.2		53.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.61		8.85	
Runoff Depth (Q), in	10.12		8.77	
Runoff Volume, acre-ft	4.93		4.27	
Volume Differential, acre-ft	-0.66			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.18	
Total Volume Required, acre-ft	-0.83			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

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Basin D60	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.80	CN	2.80	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.21	98	0.09	98
Pervious Area, ac	2.59	39	2.71	39
CN	43.4		40.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	13.03		14.45	
Runoff Depth (Q), in	6.79		6.24	
Runoff Volume, acre-ft	1.58		1.45	
Volume Differential, acre-ft	-0.13			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.03	
Total Volume Required, acre-ft	-0.16			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

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Basin D70	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.68	CN	1.68	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.29	98	0.52	98
Pervious Area, ac	1.39	39	1.16	39
CN	49.2		57.3	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	10.33		7.46	
Runoff Depth (Q), in	8.00		9.58	
Runoff Volume, acre-ft	1.12		1.34	
Volume Differential, acre-ft	0.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.06	
Total Volume Required, acre-ft	0.28			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
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Basin D80	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.29	CN	1.29	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.21	98	0.58	98
Pervious Area, ac	1.08	39	0.71	39
CN	48.6		65.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	10.57		5.26	
Runoff Depth (Q), in	7.88		11.06	
Runoff Volume, acre-ft	0.85		1.19	
Volume Differential, acre-ft	0.34			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.09	
Total Volume Required, acre-ft	0.43			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
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Date: 02/07/2022

Basin DSR50S	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.91	CN	12.91	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.45	98	7.31	98
Pervious Area, ac	6.46	39	5.60	39
CN	68.5		72.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.60		3.81	
Runoff Depth (Q), in	11.55		12.19	
Runoff Volume, acre-ft	12.43		13.11	
Volume Differential, acre-ft	0.69			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.22	
Total Volume Required, acre-ft	0.90			



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Basin D Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.56	CN	4.56	CN
CN	39.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		15.64	
Runoff Depth (Q), in	5.81		5.81	
Runoff Volume, acre-ft	2.21		2.21	
Volume Differential, acre-ft	0.00			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Curve Number Calculations C1A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.70 ac	A	39	27.30	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.83 ac		98	179.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.41 ac	A	39	93.99	Pond
Total Area	4.94 ac			300.63	60.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.60 ac	A	39	62.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.86 ac		98	182.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.48 ac	A	39	57.72	Pond
Total Area	4.94 ac			302.40	61.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
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Designed by : MRG
Checked by : JAF

Curve Number Calculations D10

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.52 ac		98	246.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	5.32 ac	A	39	207.48	Pond
Total Area	7.88 ac			456.00	57.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.37 ac		98	232.26	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	5.47 ac	A	39	213.33	Pond
Total Area	7.88 ac			447.15	56.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Checked by : JAF

Curve Number Calculations D20

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.83 ac		98	179.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.29 ac	A	39	89.31	Pond
Total Area	4.12 ac			268.65	65.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.09 ac	A	39	81.51	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.26 ac		98	123.48	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.77 ac	A	39	30.03	Pond
Total Area	4.12 ac			235.02	57.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Checked by : JAF

Curve Number Calculations D30

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.55 ac	A	39	99.45	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.46 ac		98	731.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.72 ac	A	39	106.08	Pond
Total Area	12.73 ac			936.61	73.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.35 ac	A	39	169.65	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.83 ac		98	571.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.55 ac	A	39	99.45	Pond
Total Area	12.73 ac			840.44	66.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D40

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.80 ac	A	39	148.20	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.84 ac		98	376.32	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	6.10 ac	A	39	237.90	Pond
Total Area	13.74 ac			762.42	55.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.58 ac	A	39	22.62	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.06 ac		98	691.88	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	6.10 ac	A	39	237.90	Pond
Total Area	13.74 ac			952.40	69.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D50

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.74 ac	A	39	145.86	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.10 ac		98	205.80	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.84 ac			351.66	60.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.45 ac	A	39	173.55	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.39 ac		98	136.22	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.84 ac			309.77	53.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D60

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.21 ac		98	20.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.59 ac	A	39	101.01	Pond
Total Area	2.80 ac			121.59	43.4 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.09 ac		98	8.82	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.71 ac	A	39	105.69	Pond
Total Area	2.80 ac			114.51	40.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D70

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.29 ac		98	28.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.39 ac	A	39	54.21	Pond
Total Area	1.68 ac			82.63	49.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.26 ac	A	39	10.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.52 ac		98	50.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.90 ac	A	39	35.10	Pond
Total Area	1.68 ac			96.20	57.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D80

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.21 ac		98	20.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.04 ac	A	39	40.56	Pond
Total Area	1.29 ac			62.70	48.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.21 ac	A	39	8.19	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.58 ac		98	56.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.50 ac	A	39	19.50	Pond
Total Area	1.29 ac			84.53	65.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations DSR50S

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.46 ac	A	39	251.94	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.45 ac		98	632.10	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.91 ac			884.04	68.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.60 ac	A	39	218.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.31 ac		98	716.38	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.91 ac			934.78	72.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin D Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.56 ac	A	39	177.84	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	4.56 ac			177.84	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	4.56 ac	A	39	177.84	Pond
Total Area	4.56 ac			177.84	39.0 = Weighted CN

Note: In the pre-development CN calculations, the agricultural land and woods which cover the pond site was conservatively set to a CN value of 39.

BASIN D

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/08/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin D Alternative 3

Treatment Volume Required for Additional Impervious Area:	0.38 acre-ft
Treatment Volume Impacted:	1.22 acre-ft
Total Treatment Volume Required:	1.60 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.34 acre-ft
Attenuation Volume Impacted:	14.20 acre-ft
Attenuation Volume Required:	15.54 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 10/18/2022

TOTAL REQUIREMENTS FOR BASIN D & STORAGE AVAILABLE IN INTERCHANGE CELLS

Treatment Volume Required	1.60 AC-FT.
Attenuation Volume Required	15.54 AC-FT.

Treatment Volume Available	2.30 AC-FT.
Attenuation Volume Available	15.57 AC-FT.

Note: A breakdown of the treatment and attenuation volume available in each cell is provided on the subsequent sheets.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/11/2022

STORAGE AVAILABLE SR 50 INTERCHANGE

location of interchange cell: Pond 1

Elev Exist EOP @ Low Point =	126.00 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	121.11 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	1.00 AC	
Maintenance Berm Elevation (Outside)	128.00 FT.	See Note 4
Maintenance Berm Elevation (Inside 1:10 slope)	127.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	6.89 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	27.56 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	47 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	126.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.39 AC	measured in CAD
Elevation of SHW	116.5 FT.	
Elevation of Pond Bottom	122.5 FT.	
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	3.0 FT.	Max attenuation Depth
Attenuation Depth Used	3 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	1.2 AC	
Wet Pond or Dry Pond	Dry	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	N/A AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	0.6 AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	0.7 AC	
Treatment Volume Available	0.67 AC-FT.	
Attenuation Volume Available	2.91 AC-FT.	

Notes:

- 1) SHWT was determined from the adjacent Pond D-40.
- 2) Elevation estimated from proposed Ramp 204 Station 416+00.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89
- 4) It is assume the maintenance berm will follow the elevation of the adjacent ramp (Sta 416+00 PGL=126.6, Sta 425+00 PGL=130.4. In areas where the maintenance berm is not located adjacent to the ramp an elevation of 128.0 was assumed for the outside of the maintenance berm.



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 10/18/2022

STORAGE AVAILABLE SR 50 INTERCHANGE

location of interchange cell: Pond D-30

Elev Exist EOP @ Low Point =	132.80 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	129.00 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	1.00 AC	
Maintenance Berm Elevation (Outside)	133.00 FT.	
Maintenance Berm Elevation	132.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	4.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	16.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	35 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	131.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.58 AC	measured in CAD
Elevation of SHW	118.5 FT.	
Elevation of Pond Bottom	126.5 FT.	
Distance From Max DHW to Treatment Elev. (assumes 0.5' treatment depth)	4.5 FT.	Max attenuation Depth
Attenuation Depth Used	4.5 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	1.6 AC	
Wet Pond or Dry Pond	Dry	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	N/A AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	0.8 AC	
Dry Pond-Area at Treatment Elevation (assumed 0.5' depth)	0.9 AC	
Treatment Volume Available	0.42 AC-FT.	
Attenuation Volume Available	5.58 AC-FT.	

Notes:

- 1) SHWT was determined from the existing Pond D-30.
- 2) Elevation EOP from proposed Ramp 204 Station 430+50.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/11/2022

STORAGE AVAILABLE SR 50 INTERCHANGE
location of interchange cell: Pond D-20 Expansion

Elev Exist EOP @ Low Point =	135.90 FT.	See Note 2
Avg Elev Existing Ground at Pond Site =	130.00 FT.	See Note 3
Area at Toe of Roadway Fill Assuming No Pond=	2.00 AC	
Maintenance Berm Elevation (Outside)	138.00 FT.	
Maintenance Berm Elevation (Inside 1:10 slope)	136.50 FT.	
Vertical Distance from Exist Ground Elev. to Maint. Berm Elev. (Outside)	8.00 FT.	
Side slope from Exist Ground to Maint Berm (1:X)	4.00	
Horizontal Adjustment for Elev. Differential between Maint. Berm & Exist Ground	32.00 FT.	
Maintenance Berm Width of 15-ft	15 FT.	
Offset to Max DHW (assume 1 foot of freeboard & 1:4 slope)	4 FT.	
Total Offset Each Side to Get From Roadway Toe of Fill to Max DHW	51 FT.	
Elevation of Max DHW (assumes 1 foot of freeboard)	135.5 FT.	
Area at Max DHW (assumes 1 foot of freeboard)	1.85 AC	measured in CAD
Elevation of SHW	115.0 FT.	
Elevation of Pond Bottom	130.0 FT.	
Distance From Max DHW to Treatment Elev. (assumes 1' treatment depth)	4.5 FT.	Max attenuation Depth
Attenuation Depth Used	4.5 FT.	Must be less than Max DHW to Treatment Elev.
Area at Attenuation Depth	1.9 AC	
Wet Pond or Dry Pond	Dry	
Wet Pond-Area at SHW (assume 1:4 slope from Maint Berm)	N/A AC	
Wet Pond-Area at Treatment Elevation (assumed 1' depth)	N/A AC	
Dry Pond-Area at Pond Bottom (assume 1:4 slope from Maint Berm)	1.1 AC	
Dry Pond-Area at Treatment Elevation (assumed 1' depth)	1.3 AC	
Treatment Volume Available	1.21 AC-FT.	
Attenuation Volume Available	7.08 AC-FT.	

Notes:

- 1) SHWT was determined from the adjacent Pond D-20. From plans 406146-1-52-01
- 2) Elevation estimated from PGL along Ramp 202.
- 3) Existing ground elevation determined from GIS in NGVD 29. Converted from NGVD 29 to NAVD 88. NAVD 88= NGVD29-0.89
- 4) Attenuation Depth of existing Pond D20 is 4.44 feet.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond C-1A Station 2545+00 Rt
Basin: D

Pond Footprint:	0.87 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	0.44 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	0.44 acres
Treatment Depth:	1.00 ft (from permit)
Attenuation Depth:	0.59 ft (from permit)
Estimated Treatment Volume: Impacted:	0.44 acre-ft
Estimated Attenuation Volume Impacted:	0.26 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond D-10 Station 2567+00 Lt
Basin: D

Pond Footprint:	0.59 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.59 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.24
Attenuation Depth:	5.13
Total Depth:	5.37 ft (distance between DHW and weir from permit)
Permitted Treatment Volume:	0.14 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-20 Station 2564+00 Lt
Basin: D

Pond Footprint:	0.21 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	0.19 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.02 acres
Treatment Depth:	1.05
Attenuation Depth:	3.39
Total Depth:	4.44 ft (distance between DHW and pond bottom from permit)
Permitted Treatment Volume:	0.22 ac-ft (from permit)
Estimated Treatment Volume: Impacted:	0.02 acre-ft
Estimated Attenuation Volume Impacted:	0.07 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Date : 02/11/2021
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Checked by : JAF

Impacts to Existing Ponds
Pond D-30 Station 2555+00 Lt
Basin: D

Pond Footprint:	0.62 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.62 acres
Treatment Depth:	0.37 ft
Attenuation Depth:	3.98 ft
Total Depth:	4.35 ft (from permit)
Permitted Treatment Volume:	0.23 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.23 acre-ft

Estimated Attenuation Volume Impacted: 2.47 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-40 Station 2558+00 Rt
Basin: D

Pond Footprint:	3.88 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	50 %
Salvageable Footprint:	1.94 acres
Percentage of pond footprint impacted:	50 %
Pond footprint no longer useable:	1.94 acres
Treatment Depth:	0.24 ft
Attenuation Depth:	5.39 ft
Total Depth:	5.63 ft (from as-builts & permit)
Permitted Treatment Volume:	0.93 ac-ft
Estimated Treatment Volume: Impacted:	0.47 acre-ft
Estimated Attenuation Volume Impacted:	10.46 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond D-50 Station 2559+00 Lt
Basin: D

Pond Footprint:	1.03 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.03 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.20 ft
Attenuation Depth:	2.07 ft
Total Depth:	2.27 ft (from permit)
Permitted Treatment Volume:	0.21 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-60 Station 2549+00 Lt
Basin: D

Pond Footprint:	0.69 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	0.69 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	0.07 ft
Attenuation Depth:	1.13 ft
Total Depth:	1.20 ft (from as-builts & permit)
Permitted Treatment Volume:	0.05 ac-ft (calculated from exist. Impervious area)
Estimated Treatment Volume: Impacted:	0.00 acre-ft
Estimated Attenuation Volume Impacted:	0.00 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-70 Station 2565+00 Rt
Basin: D

Pond Footprint:	0.24 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.24 acres
Treatment Depth:	0.17 ft
Attenuation Depth:	1.44 ft
Total Depth:	1.61 ft (from as-builts & permit)
Permitted Treatment Volume:	0.04 ac-ft (from permit)
Estimated Treatment Volume: Impacted:	0.04 acre-ft
Estimated Attenuation Volume Impacted:	0.35 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
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Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond D-80 Station 2560+00 Rt
Basin: D

Pond Footprint:	0.39 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.39 acres
Treatment Depth:	0.08 ft
Attenuation Depth:	1.53 ft
Total Depth:	1.61 ft (from as-builts & permit)
Permitted Treatment Volume:	0.03 ac-ft (from permit)

Estimated Treatment Volume: Impacted: 0.03 acre-ft

Estimated Attenuation Volume Impacted: 0.60 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C1A	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.94	CN	4.94	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.83	98	1.86	98
Pervious Area, ac	3.11	39	3.08	39
CN	60.9		61.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.43		6.34	
Runoff Depth (Q), in	10.24		10.30	
Runoff Volume, acre-ft	4.21		4.24	
Volume Differential, acre-ft	0.03			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.01	
Total Volume Required, acre-ft	0.03			



Project Name: SR 91 Widening from SR 408 to SR 50
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Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D10	Pre-Development Condition		Post Development Condition	
Total Area, acre	7.88	CN	7.88	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.52	98	2.37	98
Pervious Area, ac	5.36	39	5.51	39
CN	57.9		56.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	7.28		7.62	
Runoff Depth (Q), in	9.69		9.48	
Runoff Volume, acre-ft	6.36		6.23	
Volume Differential, acre-ft	-0.14			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.04	
Total Volume Required, acre-ft	-0.18			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D20	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.12	CN	4.12	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.83	98	1.26	98
Pervious Area, ac	2.29	39	2.86	39
CN	65.2		57.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	5.34		7.53	
Runoff Depth (Q), in	11.00		9.54	
Runoff Volume, acre-ft	3.78		3.27	
Volume Differential, acre-ft	-0.50			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.14	
Total Volume Required, acre-ft	-0.64			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D30	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.73	CN	12.73	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.46	98	5.83	98
Pervious Area, ac	5.27	39	6.90	39
CN	73.6		66.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	3.59		5.15	
Runoff Depth (Q), in	12.37		11.14	
Runoff Volume, acre-ft	13.13		11.82	
Volume Differential, acre-ft	-1.31			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.41	
Total Volume Required, acre-ft	-1.72			



Project Name: SR 91 Widening from SR 408 to SR 50
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Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D40	Pre-Development Condition		Post Development Condition	
Total Area, acre	13.74	CN	13.74	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	3.84	98	7.06	98
Pervious Area, ac	9.90	39	6.68	39
CN	55.5		69.3	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	8.02		4.43	
Runoff Depth (Q), in	9.24		11.69	
Runoff Volume, acre-ft	10.58		13.39	
Volume Differential, acre-ft	2.80			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.81	
Total Volume Required, acre-ft	3.61			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D50	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.84	CN	5.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.10	98	1.39	98
Pervious Area, ac	3.74	39	4.45	39
CN	60.2		53.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.61		8.85	
Runoff Depth (Q), in	10.12		8.77	
Runoff Volume, acre-ft	4.93		4.27	
Volume Differential, acre-ft	-0.66			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.18	
Total Volume Required, acre-ft	-0.83			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D60	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.80	CN	2.80	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.21	98	0.09	98
Pervious Area, ac	2.59	39	2.71	39
CN	43.4		40.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	13.03		14.45	
Runoff Depth (Q), in	6.79		6.24	
Runoff Volume, acre-ft	1.58		1.45	
Volume Differential, acre-ft	-0.13			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.03	
Total Volume Required, acre-ft	-0.16			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D70	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.68	CN	1.68	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.29	98	0.52	98
Pervious Area, ac	1.39	39	1.16	39
CN	49.2		57.3	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	10.33		7.46	
Runoff Depth (Q), in	8.00		9.58	
Runoff Volume, acre-ft	1.12		1.34	
Volume Differential, acre-ft	0.22			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.06	
Total Volume Required, acre-ft	0.28			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin D80	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.29	CN	1.29	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.21	98	0.58	98
Pervious Area, ac	1.08	39	0.71	39
CN	48.6		65.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	10.57		5.26	
Runoff Depth (Q), in	7.88		11.06	
Runoff Volume, acre-ft	0.85		1.19	
Volume Differential, acre-ft	0.34			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.09	
Total Volume Required, acre-ft	0.43			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin DSR50S	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.91	CN	12.91	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.45	98	7.31	98
Pervious Area, ac	6.46	39	5.60	39
CN	68.5		72.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.60		3.81	
Runoff Depth (Q), in	11.55		12.19	
Runoff Volume, acre-ft	12.43		13.11	
Volume Differential, acre-ft	0.69			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.22	
Total Volume Required, acre-ft	0.90			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C1A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.70 ac	A	39	27.30	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.83 ac		98	179.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.41 ac	A	39	93.99	Pond
Total Area	4.94 ac			300.63	60.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.60 ac	A	39	62.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.86 ac		98	182.28	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.48 ac	A	39	57.72	Pond
Total Area	4.94 ac			302.40	61.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D10

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.52 ac		98	246.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	5.32 ac	A	39	207.48	Pond
Total Area	7.88 ac			456.00	57.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.37 ac		98	232.26	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	5.47 ac	A	39	213.33	Pond
Total Area	7.88 ac			447.15	56.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D20

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.83 ac		98	179.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.29 ac	A	39	89.31	Pond
Total Area	4.12 ac			268.65	65.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.09 ac	A	39	81.51	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.26 ac		98	123.48	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.77 ac	A	39	30.03	Pond
Total Area	4.12 ac			235.02	57.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D30

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.55 ac	A	39	99.45	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.46 ac		98	731.08	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.72 ac	A	39	106.08	Pond
Total Area	12.73 ac			936.61	73.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.35 ac	A	39	169.65	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	5.83 ac		98	571.34	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.55 ac	A	39	99.45	Pond
Total Area	12.73 ac			840.44	66.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D40

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.80 ac	A	39	148.20	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	3.84 ac		98	376.32	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	6.10 ac	A	39	237.90	Pond
Total Area	13.74 ac			762.42	55.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.58 ac	A	39	22.62	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.06 ac		98	691.88	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	6.10 ac	A	39	237.90	Pond
Total Area	13.74 ac			952.40	69.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D50

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.74 ac	A	39	145.86	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.10 ac		98	205.80	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.84 ac			351.66	60.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.45 ac	A	39	173.55	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.39 ac		98	136.22	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.84 ac			309.77	53.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D60

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.21 ac		98	20.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.59 ac	A	39	101.01	Pond
Total Area	2.80 ac			121.59	43.4 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.09 ac		98	8.82	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.71 ac	A	39	105.69	Pond
Total Area	2.80 ac			114.51	40.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D70

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.29 ac		98	28.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.39 ac	A	39	54.21	Pond
Total Area	1.68 ac			82.63	49.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.26 ac	A	39	10.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.52 ac		98	50.96	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.90 ac	A	39	35.10	Pond
Total Area	1.68 ac			96.20	57.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations D80

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.04 ac	A	39	1.56	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.21 ac		98	20.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.04 ac	A	39	40.56	Pond
Total Area	1.29 ac			62.70	48.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.21 ac	A	39	8.19	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.58 ac		98	56.84	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.50 ac	A	39	19.50	Pond
Total Area	1.29 ac			84.53	65.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations DSR50S

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.46 ac	A	39	251.94	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.45 ac		98	632.10	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.91 ac			884.04	68.5 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.60 ac	A	39	218.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.31 ac		98	716.38	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.91 ac			934.78	72.4 = Weighted CN

BASIN SR 408

BASIN SR 408

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/08/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR 408 Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.81 acre-ft
Treatment Volume Impacted:	0.42 acre-ft
Total Treatment Volume Required:	1.22 acre-ft

Attenuation Volume Required for Additional Impervious Area:	4.29 acre-ft
Attenuation Volume Impacted:	1.25 acre-ft
Attenuation Volume Required:	5.53 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/10/2022

Basin SR 408 Pond Alternative 1, Station 2181+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	126.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	108.00	Estimated from LIDAR in low area adjacent to existing dry retention pond No. 10 from SJRWMD Permit No. 4-095-0199AGM4.
Elev SHW =	108.00	NAVD 88 from Boring No. 109 SJRWMD Permit No. 4-095-0199AGM4).
Control Elevation Utilized=	99.00	It is assumed that a pond liner will be needed to maintain this elevation
Treatment Volume Required	1.22 AC-FT.	
Attenuation Volume Required	5.53 AC-FT.	
Pond Area Based on treatment volume	0.94 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	1.30 FT.	
Total Attenuation Depth based on Pond Area	5.9 FT.	
Total Depth from SHWL to Top of Berm	8.18 FT.	
Elev SHW=	99.0	a pond liner is needed in order to obtain this elev.
Top of Berm Elevation given a total depth =	107.2	
Unit Length Based on L/W = 2	286 FT.	
Unit Width Based on L/W = 2	143 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	75 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	65.41 FT.	
Total Pond Length (including maintenance berm and adjustments)	457.15 FT.	
Total Pond Width (including maintenance berm and adjustments)	313.928 FT.	
Preliminary Property Size Required	3.29 AC.	
with 10% contingency to account for preliminary nature of calcs	3.62 AC.	
Property Size Provided	6.18 AC.	(entire parcel which also encompasses FPC Alt.)

Notes: 1. NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 10 (FL) Station 2185+00 Rt
Basin: SR 408

Pond Footprint:	4.16 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	3.74 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.42 acres
Treatment Depth:	1.00 ft (estimated)
Attenuation Depth:	3.00 ft (total depth was 4' from exst plans)

Estimated Treatment Volume: Impacted: 0.42 acre-ft

Estimated Attenuation Volume Impacted: 1.25 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/08/2022

Basin 10FL	Pre-Development Condition		Post Development Condition	
Total Area, acre	19.18	CN	19.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.77	98	9.50	98
Pervious Area, ac	12.41	39	9.68	39
CN	59.8		68.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.72		4.66	
Runoff Depth (Q), in	10.05		11.51	
Runoff Volume, acre-ft	16.07		18.40	
Volume Differential, acre-ft			2.33	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.57	
Total Volume Required, acre-ft			2.90	



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/08/2022

Basin 10FLN	Pre-Development Condition		Post Development Condition	
Total Area, acre	37.36	CN	37.36	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	13.94	98	15.09	98
Pervious Area, ac	23.42	39	22.27	39
CN	61.0		62.8	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.39		5.92	
Runoff Depth (Q), in	10.27		10.59	
Runoff Volume, acre-ft	31.96		32.97	
Volume Differential, acre-ft	1.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.24	
Total Volume Required, acre-ft	1.24			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/08/2022

Basin SR 408 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.11	CN	2.11	CN
CN	39.0		66.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		5.05	
Runoff Depth (Q), in	5.81		11.22	
Runoff Volume, acre-ft	1.02		1.97	
Volume Differential, acre-ft	0.95			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.95			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10FLN

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	23.42 ac	A	39	913.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.94 ac		98	1366.12	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	37.36 ac			2279.50	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	22.27 ac	A	39	868.53	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.09 ac		98	1478.82	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	37.36 ac			2347.35	62.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10FL

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.41 ac	A	39	483.99	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.77 ac		98	663.46	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.18 ac			1147.45	59.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	9.68 ac	A	39	377.52	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.50 ac		98	931.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.18 ac			1308.52	68.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 408 Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.11 ac	A	39	82.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.11 ac			82.29	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.95 ac		100	95.00	Pond
Dry Pond Area	1.16 ac	A	39	45.24	Pond
Total Area	2.11 ac			140.24	66.5 = Weighted CN

BASIN SR 408

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/08/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR 408 Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.81 acre-ft
Treatment Volume Impacted:	0.42 acre-ft
Total Treatment Volume Required:	1.22 acre-ft

Attenuation Volume Required for Additional Impervious Area:	3.91 acre-ft
Attenuation Volume Impacted:	1.25 acre-ft
Attenuation Volume Required:	5.16 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/08/2022

Basin SR 408 Pond Alternative 2, Station 2172+00 RT

Dry Retention Calculations

Existing Ground at Pond site =	105.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	108.00	Estimated from LIDAR in low area adjacent to existing dry retention pond No. 10 from SJRWMD Permit No. 4-095-0199AGM4.
Elev SHW =	86.95	NAVD 88 set at NHWE of adjacent Lake Fischer as outlined on page 2-5 of Gotha Lakes Watershed Management Plan Update Report.
Treatment Volume Required	1.22 AC-FT.	
Attenuation Volume Required	5.16 AC-FT.	
Pond Area Based on treatment volume	0.82 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	1.50 FT.	
Total Attenuation Depth based on Pond Area	6.3 FT.	
Total Depth from SHWL to Top of Berm	8.82 FT.	
Elev Pond Bottom=	99.0	matches bottom of adjacent dry retention pond
Top of Berm Elevation given a total depth =	107.8	
Unit Length Based on L/W = 2	267 FT.	
Unit Width Based on L/W = 2	133 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	11 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	70.53 FT.	
Total Pond Length (including maintenance berm and adjustments)	378.46 FT.	
Total Pond Width (including maintenance berm and adjustments)	245.13 FT.	
Preliminary Property Size Required	2.13 AC.	
with 10% contingency to account for preliminary nature of calcs	2.34 AC.	
Property Size Provided	2.36 AC.	

Notes:

1. NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29
2. Calculations provided above conservatively assume a maintenance berm is needed to around the entire limits of pond expansion.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 10 (FL) Station 2185+00 Rt
Basin: SR 408

Pond Footprint:	4.16 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	3.74 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.42 acres
Treatment Depth:	1.00 ft (estimated)
Attenuation Depth:	3.00 ft (total depth was 4' from exst plans)

Estimated Treatment Volume: Impacted: 0.42 acre-ft

Estimated Attenuation Volume Impacted: 1.25 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10FL	Pre-Development Condition		Post Development Condition	
Total Area, acre	19.18	CN	19.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.77	98	9.50	98
Pervious Area, ac	12.41	39	9.68	39
CN	59.8		68.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.72		4.66	
Runoff Depth (Q), in	10.05		11.51	
Runoff Volume, acre-ft	16.07		18.40	
Volume Differential, acre-ft			2.33	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.57	
Total Volume Required, acre-ft			2.90	



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10FLN	Pre-Development Condition		Post Development Condition	
Total Area, acre	37.36	CN	37.36	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	13.94	98	15.09	98
Pervious Area, ac	23.42	39	22.27	39
CN	61.0		62.8	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.39		5.92	
Runoff Depth (Q), in	10.27		10.59	
Runoff Volume, acre-ft	31.96		32.97	
Volume Differential, acre-ft			1.00	
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.24	
Total Volume Required, acre-ft			1.24	



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin SR 408 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.07	CN	2.07	CN
CN	25.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	30.00		15.64	
Runoff Depth (Q), in	2.50		5.81	
Runoff Volume, acre-ft	0.43		1.00	
Volume Differential, acre-ft	0.57			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.57			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10FLN

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	23.42 ac	A	39	913.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.94 ac		98	1366.12	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	37.36 ac			2279.50	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	22.27 ac	A	39	868.53	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.09 ac		98	1478.82	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	37.36 ac			2347.35	62.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10FL

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.41 ac	A	39	483.99	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.77 ac		98	663.46	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.18 ac			1147.45	59.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	9.68 ac	A	39	377.52	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.50 ac		98	931.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.18 ac			1308.52	68.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 408 Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.07 ac	A	25	51.75	Woods, Good Cover
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.07 ac			51.75	25.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.07 ac	A	39	80.73	Pond
Total Area	2.07 ac			80.73	39.0 = Weighted CN

BASIN SR 408

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/08/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR 408 Alternative 3

Treatment Volume Required for Additional Impervious Area:	0.81 acre-ft
Treatment Volume Impacted:	0.42 acre-ft
Total Treatment Volume Required:	1.22 acre-ft

Attenuation Volume Required for Additional Impervious Area:	3.13 acre-ft
Attenuation Volume Impacted:	1.25 acre-ft
Attenuation Volume Required:	4.38 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/10/2022

Basin SR 408 Pond Alternative 3, Station 2173+50 RT

Dry Retention Calculations

Existing Ground at Pond site =	108.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	108.00	Estimated from LIDAR in low area adjacent to existing dry retention pond No. 10 from SJRWMD Permit No. 4-095-0199AGM4.
Elev SHW =	97.00	NAVD 88 from Boring No. 110 SJRWMD Permit No. 4-095-0199AGM4).
Treatment Volume Required	1.22 AC-FT.	
Attenuation Volume Required	4.38 AC-FT.	
Pond Area Based on treatment volume	0.94 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	1.30 FT.	
Total Attenuation Depth based on Pond Area	4.7 FT.	
Total Depth from SHWL to Top of Berm	6.95 FT.	
Elev Pond Bottom=	100.0	
Top of Berm Elevation given a total depth =	107.0	
Unit Length Based on L/W = 2	286 FT.	
Unit Width Based on L/W = 2	143 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	4 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	55.62 FT.	
Total Pond Length (including maintenance berm and adjustments)	376.25 FT.	
Total Pond Width (including maintenance berm and adjustments)	233.03 FT.	
Preliminary Property Size Required	2.01 AC.	
with 10% contingency to account for preliminary nature of calcs	2.21 AC.	
Property Size Provided	2.42 AC.	

Note: NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond 10 (FL) Station 2185+00 Rt
Basin: SR 408

Pond Footprint:	4.16 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	90 %
Salvageable Footprint:	3.74 acres
Percentage of pond footprint impacted:	10 %
Pond footprint no longer useable:	0.42 acres
Treatment Depth:	1.00 ft (estimated)
Attenuation Depth:	3.00 ft (total depth was 4' from exst plans)

Estimated Treatment Volume: Impacted: 0.42 acre-ft

Estimated Attenuation Volume Impacted: 1.25 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/08/2022

Basin 10FL	Pre-Development Condition		Post Development Condition	
Total Area, acre	19.18	CN	19.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.77	98	9.50	98
Pervious Area, ac	12.41	39	9.68	39
CN	59.8		68.2	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.72		4.66	
Runoff Depth (Q), in	10.05		11.51	
Runoff Volume, acre-ft	16.07		18.40	
Volume Differential, acre-ft	2.33			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.57	
Total Volume Required, acre-ft	2.90			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/08/2022

Basin 10FLN	Pre-Development Condition		Post Development Condition	
Total Area, acre	37.36	CN	37.36	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	13.94	98	15.09	98
Pervious Area, ac	23.42	39	22.27	39
CN	61.0		62.8	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	6.39		5.92	
Runoff Depth (Q), in	10.27		10.59	
Runoff Volume, acre-ft	31.96		32.97	
Volume Differential, acre-ft	1.00			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.24	
Total Volume Required, acre-ft	1.24			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/08/2022

Basin SR 408 Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.85	CN	1.85	CN
CN	45.0		39.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	12.22		15.64	
Runoff Depth (Q), in	7.13		5.81	
Runoff Volume, acre-ft	1.10		0.90	
Volume Differential, acre-ft	-0.20			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	-0.20			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10FLN

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	23.42 ac	A	39	913.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.94 ac		98	1366.12	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	37.36 ac			2279.50	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	22.27 ac	A	39	868.53	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.09 ac		98	1478.82	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	37.36 ac			2347.35	62.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10FL

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.41 ac	A	39	483.99	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.77 ac		98	663.46	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.18 ac			1147.45	59.8 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	9.68 ac	A	39	377.52	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	9.50 ac		98	931.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	19.18 ac			1308.52	68.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/08/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 408 Alternative 3 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.85 ac	A	45	83.25	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.85 ac			83.25	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.85 ac	A	39	72.15	Pond
Total Area	1.85 ac			72.15	39.0 = Weighted CN

BASIN SR429N

BASIN SR429N

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR 429 North Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.54 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.54 acre-ft

Attenuation Volume Required for Additional Impervious Area:	3.01 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	3.01 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER

Checked by: JAF

Date: 02/10/2022

Basin SR429N Pond Alternative 1, Station 2305+00 RT

Wet Detention Calculations

Existing Ground at Pond site = 124.00 Elevation from LIDAR data
ELEV EXST EOP @ Low Point = 125.50 Elevation from Cross Section 161+00.00 CFX Project 429-152
Elev SHW = 118.70 NWL was used from Pond TP-7 CFX Project 429-152.

Treatment Volume Required 0.54 AC-FT.
Attenuation Volume Required 3.01 AC-FT.
Pond Area Based on treatment volume 0.90 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.60 FT.
Total Attenuation Depth based on Pond Area 3.4 FT.
Total Depth from SHWL to Top of Berm 4.96 FT.

Elev SHW= 118.7
Top of Berm Elevation given a total depth = 123.7

Unit Length Based on L/W = 2 279 FT.
Unit Width Based on L/W = 2 140 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 1 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 39.69 FT.
Total Pond Length (including maintenance berm and adjustments) 350.41 FT.
Total Pond Width (including maintenance berm and adjustments) 210.73 FT.

Preliminary Property Size Required 1.70 AC.
Preliminary Property Size Required with 10% Contingency 1.86 AC.

Property Size Provided 2.31 AC.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10SN2	Pre-Development Condition		Post Development Condition	
Total Area, acre	29.84	CN	29.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	15.68	98	17.70	98
All Pervious Area, ac	14.16	41	12.14	41
Pervious Area A soils only, ac	12.67	39	10.93	39
CN	71.1		74.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.06		3.35	
Runoff Depth (Q), in	11.98		12.58	
Runoff Volume, acre-ft	29.79		31.28	
Volume Differential, acre-ft	1.49			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.44	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.42	
Total Volume Required, acre-ft	1.92			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10SN3	Pre-Development Condition		Post Development Condition	
Total Area, acre	26.95	CN	26.95	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	17.53	98	18.63	98
All Pervious Area, ac	9.42	43	8.32	41
Pervious Area A soils only, ac	7.90	39	7.49	39
CN	78.6		80.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	2.72		2.43	
Runoff Depth (Q), in	13.14		13.41	
Runoff Volume, acre-ft	29.52		30.13	
Volume Differential, acre-ft	0.61			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.10	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.23	
Total Volume Required, acre-ft	0.84			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin SR 429 North Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.67	CN	1.67	CN
CN	39.0		73.7	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		3.57	
Runoff Depth (Q), in	5.81		12.39	
Runoff Volume, acre-ft	0.81		1.72	
Volume Differential, acre-ft	0.92			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.92			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SN2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.67 ac	A	39	494.13	Open Spaces, Lawns/Good Condition
Pervious Area	1.49 ac	B	61	90.89	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.68 ac		98	1536.64	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	29.84 ac			2121.66	71.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.93 ac	A	39	426.27	Open Spaces, Lawns/Good Condition
Pervious Area	1.21 ac	B	61	73.81	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	17.70 ac		98	1734.60	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	29.84 ac			2234.68	74.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SN3

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.90 ac	A	39	308.10	Open Spaces, Lawns/Good Condition
Pervious Area	1.52 ac	B	61	92.72	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	17.53 ac		98	1717.94	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	26.95 ac			2118.76	78.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.49 ac	A	39	292.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.83 ac	B	61	50.63	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.63 ac		98	1825.74	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	26.95 ac			2168.48	80.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 429 North Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.67 ac	A	39	65.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.67 ac			65.13	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.95 ac		100	95.00	Pond
Dry Pond Area	0.72 ac	A	39	28.08	Pond
Total Area	1.67 ac			123.08	73.7 = Weighted CN

BASIN SR429N

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR 429 North Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.54 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.54 acre-ft

Attenuation Volume Required for Additional Impervious Area:	4.33 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	4.33 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/10/2022

Basin SR429N Pond Alternative 2, Station 2302+00 RT

Wet Detention Calculations

Existing Ground at Pond site = 122.00 Elevation from LIDAR data
ELEV EXST EOP @ Low Point = 125.50 Elevation from Cross Section 161+00.00 CFX
Project 429-152
Elev SHW = 116.10 NWL was used from Pond CP-5 from CFX
Project 429-152.

Treatment Volume Required 0.54 AC-FT.
Attenuation Volume Required 4.33 AC-FT.
Pond Area Based on treatment volume 0.63 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.85 FT.
Total Attenuation Depth based on Pond Area 6.9 FT.
Total Depth from SHWL to Top of Berm 8.70 FT.

Elev SHW= 116.1 NAVD
Top of Berm Elevation given a total depth = 124.8 NAVD

Unit Length Based on L/W = 2 235 FT.
Unit Width Based on L/W = 2 117 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 11 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 69.62 FT.
Total Pond Length (including maintenance berm and adjustments) 345.55 FT.
Total Pond Width (including maintenance berm and adjustments) 228.19 FT.

Preliminary Property Size Required 1.81 AC.
Preliminary Property Size Required with 10% Contingency 1.99 AC.

Property Size Provided 4.3 AC.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10SN2	Pre-Development Condition		Post Development Condition	
Total Area, acre	29.84	CN	29.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	15.68	98	17.70	98
All Pervious Area, ac	14.16	41	12.14	41
Pervious Area A soils only, ac	12.67	39	10.93	39
CN	71.1		74.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.06		3.35	
Runoff Depth (Q), in	11.98		12.58	
Runoff Volume, acre-ft	29.79		31.28	
Volume Differential, acre-ft	1.49			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.44	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.42	
Total Volume Required, acre-ft	1.92			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10SN3	<i>Pre-Development Condition</i>		<i>Post Development Condition</i>	
Total Area, acre	26.95	CN	26.95	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	17.53	98	18.63	98
All Pervious Area, ac	9.42	43	8.32	41
Pervious Area A soils only, ac	7.90	39	7.49	39
CN	78.6		80.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	2.72		2.43	
Runoff Depth (Q), in	13.14		13.41	
Runoff Volume, acre-ft	29.52		30.13	
Volume Differential, acre-ft	0.61			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.10	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.23	
Total Volume Required, acre-ft	0.84			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin SR 429 North Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.50	CN	1.50	CN
CN	25.0		65.4	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	30.00		5.28	
Runoff Depth (Q), in	2.50		11.04	
Runoff Volume, acre-ft	0.31		1.38	
Volume Differential, acre-ft	1.07			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	1.07			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SN2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.67 ac	A	39	494.13	Open Spaces, Lawns/Good Condition
Pervious Area	1.49 ac	B	61	90.89	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.68 ac		98	1536.64	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	29.84 ac			2121.66	71.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.93 ac	A	39	426.27	Open Spaces, Lawns/Good Condition
Pervious Area	1.21 ac	B	61	73.81	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	17.70 ac		98	1734.60	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	29.84 ac			2234.68	74.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SN3

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.90 ac	A	39	308.10	Open Spaces, Lawns/Good Condition
Pervious Area	1.52 ac	B	61	92.72	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	17.53 ac		98	1717.94	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	26.95 ac			2118.76	78.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.49 ac	A	39	292.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.83 ac	B	61	50.63	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.63 ac		98	1825.74	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	26.95 ac			2168.48	80.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 429 North Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.50 ac	A	25	37.50	Woods, Good Cover
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.50 ac			37.50	25.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.65 ac		100	65.00	Pond
Dry Pond Area	0.85 ac	A	39	33.15	Pond
Total Area	1.50 ac			98.15	65.4 = Weighted CN

BASIN SR429N

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR 429 North Alternative 3

Treatment Volume Required for Additional Impervious Area:	0.54 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.54 acre-ft

Attenuation Volume Required for Additional Impervious Area:	2.66 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	2.66 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/10/2022

Basin SR429N Pond Alternative 3, Station 2284+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	121.00	Elevation from LIDAR data
ELEV EXST EOP @ Low Point =	138.00	Elevation from Cross Section 130+00.00 from CFX Project 429-152
Elev SHW =	116.10	NWL was taken from Pond A CFX Project 429-152.
Treatment Volume Required	0.54	AC-FT.
Attenuation Volume Required	2.66	AC-FT.
Pond Area Based on treatment volume	0.54	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	1.00	FT.
Total Attenuation Depth based on Pond Area	4.9	FT.
Total Depth from SHWL to Top of Berm	6.94	FT.
Elev SHW=	116.1	NAVD
Top of Berm Elevation given a total depth =	123.0	NAVD
Unit Length Based on L/W = 2	216	FT.
Unit Width Based on L/W = 2	108	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	8	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	55.52	FT.
Total Pond Length (including maintenance berm and adjustments)	310.08	FT.
Total Pond Width (including maintenance berm and adjustments)	201.88	FT.
Preliminary Property Size Required	1.44	AC.
Preliminary Property Size Required with 10% Contingency	1.58	AC.
Property Size Provided	4.22	AC.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10SN2	Pre-Development Condition		Post Development Condition	
Total Area, acre	29.84	CN	29.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	15.68	98	17.70	98
All Pervious Area, ac	14.16	41	12.14	41
Pervious Area A soils only, ac	12.67	39	10.93	39
CN	71.1		74.9	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	4.06		3.35	
Runoff Depth (Q), in	11.98		12.58	
Runoff Volume, acre-ft	29.79		31.28	
Volume Differential, acre-ft	1.49			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.44	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.42	
Total Volume Required, acre-ft	1.92			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin 10SN3	<i>Pre-Development Condition</i>		<i>Post Development Condition</i>	
Total Area, acre	26.95	CN	26.95	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	17.53	98	18.63	98
All Pervious Area, ac	9.42	43	8.32	41
Pervious Area A soils only, ac	7.90	39	7.49	39
CN	78.6		80.5	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	2.72		2.43	
Runoff Depth (Q), in	13.14		13.41	
Runoff Volume, acre-ft	29.52		30.13	
Volume Differential, acre-ft	0.61			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.10	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.23	
Total Volume Required, acre-ft	0.84			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/10/2022

Basin SR 429 North Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.40	CN	1.40	CN
CN	39.0		63.0	
Attenuation Volume-100yr240hr				
Precipitation	16.00		16.00	
Potential Maximum Retention (S)	15.64		5.88	
Runoff Depth (Q), in	5.81		10.61	
Runoff Volume, acre-ft	0.68		1.24	
Volume Differential, acre-ft	0.56			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.56			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SN2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	12.67 ac	A	39	494.13	Open Spaces, Lawns/Good Condition
Pervious Area	1.49 ac	B	61	90.89	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	15.68 ac		98	1536.64	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	29.84 ac			2121.66	71.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.93 ac	A	39	426.27	Open Spaces, Lawns/Good Condition
Pervious Area	1.21 ac	B	61	73.81	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	17.70 ac		98	1734.60	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	29.84 ac			2234.68	74.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SN3

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.90 ac	A	39	308.10	Open Spaces, Lawns/Good Condition
Pervious Area	1.52 ac	B	61	92.72	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	17.53 ac		98	1717.94	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	26.95 ac			2118.76	78.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.49 ac	A	39	292.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.83 ac	B	61	50.63	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.63 ac		98	1825.74	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	26.95 ac			2168.48	80.5 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/10/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 429 North Alternative 3 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.40 ac	A	39	54.60	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.40 ac			54.60	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.55 ac		100	55.00	Pond
Dry Pond Area	0.85 ac	A	39	33.15	Pond
Total Area	1.40 ac			88.15	63.0 = Weighted CN

BASIN SR429S

BASIN SR429S

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR429 South Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.09 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.09 acre-ft

Attenuation Volume Required for Additional Impervious Area:	0.26 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	0.26 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/11/2022

Basin SR429S Pond Alternative 1, Station 2297+50 LT

Wet Detention Calculations

Existing Ground at Pond site = 125.00 Existing ground taken from LIDAR
ELEV EXST EOP @ Low Point = 125.50 EOP taken from cross section 1130+00.00.
Project 429-152
Elev SHW = 120.70 NAVD 88. Elevation from cross section
1141+00.00. Project 429-152

Treatment Volume Required 0.09 AC-FT.
Attenuation Volume Required 0.26 AC-FT.
Pond Area Based on treatment volume 0.13 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.70 FT.
Total Attenuation Depth based on Pond Area 2.0 FT.
Total Depth from SHWL to Top of Berm 3.69 FT.

Elev SHW= 120.7
Top of Berm Elevation given a total depth = 124.4

Unit Length Based on L/W = 2 107 FT.
Unit Width Based on L/W = 2 54 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 2 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 29.51 FT.
Total Pond Length (including maintenance berm and adjustments) 169.25 FT.
Total Pond Width (including maintenance berm and adjustments) 115.6016 FT.

Preliminary Property Size Required 0.45 AC.
Preliminary Property Size Required with 10% Contingency 0.49 AC.

Property Size Provided 1.37 AC.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2021

Basin 10SS1	Pre-Development Condition		Post Development Condition	
Total Area, acre	10.62	CN	10.62	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.97	98	8.34	98
Pervious Area, ac	2.65	39	2.28	39
CN	83.3		85.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.01		1.72	
Runoff Depth (Q), in	5.52		5.76	
Runoff Volume, acre-ft	4.89		5.10	
Volume Differential, acre-ft	0.21			
Treatment Volume				
3-in. (1ft/12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.09	
Total Volume Required, acre-ft	0.30			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/08/2022

Basin SR 429 South Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	0.45	CN	0.45	CN
CN	45.0		59.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	12.22		6.85	
Runoff Depth (Q), in	1.47		2.89	
Runoff Volume, acre-ft	0.06		0.11	
Volume Differential, acre-ft			0.05	
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft			0.05	



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SS1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.65 ac	A	39	103.35	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.97 ac		98	781.06	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	10.62 ac			884.41	83.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.28 ac	A	39	88.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	8.34 ac		98	817.32	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	10.62 ac			906.24	85.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 429 South Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.45 ac	A	45	20.25	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	0.45 ac			20.25	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.15 ac		100	15.00	Pond
Dry Pond Area	0.30 ac	A	39	11.70	Pond
Total Area	0.45 ac			26.70	59.3 = Weighted CN

BASIN SR429S

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR429 South Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.09 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.09 acre-ft

Attenuation Volume Required for Additional Impervious Area:	0.26 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	0.26 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/11/2022

Basin SR429S Pond Alternative 2, Station 2298+00 LT

Wet Detention Calculations

Existing Ground at Pond site = 124.00 Existing ground taken from LIDAR
ELEV EXST EOP @ Low Point = 125.50 EOP taken from cross section 1130+00.00.
Project 429-152
Elev SHW = 120.70 NAVD 88. Elevation from cross section
1141+00.00. Project 429-152

Treatment Volume Required 0.09 AC-FT.
Attenuation Volume Required 0.26 AC-FT.
Pond Area Based on treatment volume 0.13 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.70 FT.
Total Attenuation Depth based on Pond Area 2.0 FT.
Total Depth from SHWL to Top of Berm 3.67 FT.

Elev SHW= 120.7
Top of Berm Elevation given a total depth = 124.4

Unit Length Based on L/W = 2 107 FT.
Unit Width Based on L/W = 2 54 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 1 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 29.33 FT.
Total Pond Length (including maintenance berm and adjustments) 168.10 FT.
Total Pond Width (including maintenance berm and adjustments) 114.4476 FT.

Preliminary Property Size Required 0.44 AC.
Preliminary Property Size Required with 10% Contingency 0.49 AC.

Property Size Provided 1.08 AC.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin 10SS1	Pre-Development Condition		Post Development Condition	
Total Area, acre	10.62	CN	10.62	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.97	98	8.34	98
Pervious Area, ac	2.65	39	2.28	39
CN	83.3		85.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.01		1.72	
Runoff Depth (Q), in	5.52		5.76	
Runoff Volume, acre-ft	4.89		5.10	
Volume Differential, acre-ft	0.21			
Treatment Volume				
3-in. (1ft/12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.09	
Total Volume Required, acre-ft	0.30			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin SR 429 South Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	0.50	CN	0.50	CN
CN	45.0		57.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	12.22		7.45	
Runoff Depth (Q), in	1.47		2.68	
Runoff Volume, acre-ft	0.06		0.11	
Volume Differential, acre-ft			0.05	
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft			0.05	



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SS1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.65 ac	A	39	103.35	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.97 ac		98	781.06	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	10.62 ac			884.41	83.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.28 ac	A	39	88.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	8.34 ac		98	817.32	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	10.62 ac			906.24	85.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 429 South Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.50 ac	A	45	22.50	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	0.50 ac			22.50	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.15 ac		100	15.00	Pond
Dry Pond Area	0.35 ac	A	39	13.65	Pond
Total Area	0.50 ac			28.65	57.3 = Weighted CN

BASIN SR429S

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin SR429 South Alternative 3

Treatment Volume Required for Additional Impervious Area:	0.09 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.09 acre-ft

Attenuation Volume Required for Additional Impervious Area:	0.39 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	0.39 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 09/02/2021

Basin SR 429S Pond Alternative 3, Station 2303+00 LT

Wet Detention Calculations

Existing Ground at Pond site = 117.00 NAVD 88 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point = 125.50 EOP taken from cross section 1130+00.00. Project 429-152
Elev SHW = 117.60 NAVD 88. Control elevation of adjacent pond utilized (CFX Project 429-152-Pond 2)

Treatment Volume Required 0.09 AC-FT.
Attenuation Volume Required 0.39 AC-FT.
Pond Area Based on treatment volume 0.19 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.50 FT.
Total Attenuation Depth based on Pond Area 2.1 FT.
Total Depth from SHWL to Top of Berm 3.61 FT.

Elev SHW= 117.6
Top of Berm Elevation given a total depth = 121.2

Unit Length Based on L/W = 2 127 FT.
Unit Width Based on L/W = 2 63 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 17 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 28.89 FT.
Total Pond Length (including maintenance berm and adjustments) 202.68 FT.
Total Pond Width (including maintenance berm and adjustments) 139.2054 FT.

Preliminary Property Size Required 0.65 AC.
Preliminary Property Size Required with 10% Contingency 0.71 AC.
Preliminary Property Size Required with elimination of berm on 2 sides (pond expansion) 0.57 AC.

Property Size Provided 0.67 AC.

Note: The property size required with the removal of the berm on two sides conservatively does not take into account a reduction for the footprint of the side slopes.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin 10SS1	Pre-Development Condition		Post Development Condition	
Total Area, acre	10.62	CN	10.62	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.97	98	8.34	98
Pervious Area, ac	2.65	39	2.28	39
CN	83.3		85.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	2.01		1.72	
Runoff Depth (Q), in	5.52		5.76	
Runoff Volume, acre-ft	4.89		5.10	
Volume Differential, acre-ft	0.21			
Treatment Volume				
3-in. (1ft/12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.09	
Total Volume Required, acre-ft	0.30			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin SR 429 South Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	0.64	CN	0.64	CN
CN	35.7		70.5	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	18.00		4.19	
Runoff Depth (Q), in	0.69		4.08	
Runoff Volume, acre-ft	0.04		0.22	
Volume Differential, acre-ft			0.18	
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft			0.18	



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 10SS1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.65 ac	A	39	103.35	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.97 ac		98	781.06	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	10.62 ac			884.41	83.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.28 ac	A	39	88.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	8.34 ac		98	817.32	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	10.62 ac			906.24	85.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin SR 429 South Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.15 ac	A	25	3.75	Woods, Good Cover
Pervious Area	0.49 ac	A	39	19.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	0.64 ac			22.86	35.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.33 ac		100	33.00	Pond
Dry Pond Area	0.31 ac	A	39	12.09	Pond
Total Area	0.64 ac			45.09	70.5 = Weighted CN

Note: All area was conservatively assumed to be woods with good cover in the pre-development condition.

BASIN DSR50N

BASIN DSR50N

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin DSR50N Alternative 1

Treatment Volume Required for Additional Impervious Area:	0.21 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.21 acre-ft

Attenuation Volume Required for Additional Impervious Area:	0.66 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	0.66 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/11/2022

Basin DSR50N Pond Alternative 1

Wet Detention Calculations

Existing Ground at Pond site =	116.00	Existing ground at Pond G from plans 23429-4-52-01
ELEV EXST EOP @ Low Point =	115.00	NAVD 88 from Station 418+00 23429-4 plans (approx Station 608+00 current SR 50 design baseline)
Elev SHW =	109.10	GWEL from adjacent Pond CITGO. From plans 23429-4-52-01 Sheet 195.
Treatment Volume Required	0.21	AC-FT.
Attenuation Volume Required	0.66	AC-FT.
Pond Area Based on treatment volume	0.28	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	0.75	FT.
Total Attenuation Depth based on Pond Area	2.4	FT.
Total Depth from SHWL to Top of Berm	4.12	FT.
Elev SHW=	109.1	
Top of Berm Elevation given a total depth =	113.2	
Unit Length Based on L/W = 2	155	FT.
Unit Width Based on L/W = 2	78	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	11	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	32.95	FT.
Total Pond Length (including maintenance berm and adjustments)	229.32	FT.
Total Pond Width (including maintenance berm and adjustments)	151.70	FT.
Preliminary Property Size Required	0.80	AC.
Preliminary Property Size Required with 10% Contingency	0.88	AC.
Property Size Provided	1.39	AC.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin DSR50N	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.73	CN	12.73	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.45	98	7.28	98
Pervious Area, ac	6.28	39	5.45	39
CN	68.9		72.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.52		3.75	
Runoff Depth (Q), in	3.91		4.33	
Runoff Volume, acre-ft	4.15		4.60	
Volume Differential, acre-ft	0.45			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.21	
Total Volume Required, acre-ft	0.66			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin D SR50N Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	0.80	CN	0.80	CN
CN	25.0		61.9	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	30.00		6.16	
Runoff Depth (Q), in	0.07		3.15	
Runoff Volume, acre-ft	0.00		0.21	
Volume Differential, acre-ft			0.21	
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft			0.21	



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations DSR50N

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.28 ac	A	39	244.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.45 ac		98	632.10	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.73 ac			877.02	68.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.45 ac	A	39	212.55	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.28 ac		98	713.44	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.73 ac			925.99	72.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin DSR50N Alternative 1 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.80 ac	A	25	20.00	Woods, Good Cover
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	0.80 ac			20.00	25.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.30 ac		100	30.00	Pond
Dry Pond Area	0.50 ac	A	39	19.50	Pond
Total Area	0.80 ac			49.50	61.9 = Weighted CN

BASIN DSR50N

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin DSR50N Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.21 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.21 acre-ft

Attenuation Volume Required for Additional Impervious Area:	0.55 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	0.55 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/11/2022

Basin DSR50N Pond Alternative 2

Wet Detention Calculations

Existing Ground at Pond site = 121.00 Estimated from Lidar Data
ELEV EXST EOP @ Low Point = 116.00 NAVD 88 from Station 433+50 23429-4 plans (approx Station 616+50 current SR 50 design baseline)
Pond Control Elev = 110.00 Pond G control elevation from plans 238429-4-52-01 Sheet 193 is 102.60.

Treatment Volume Required 0.21 AC-FT.
Attenuation Volume Required 0.55 AC-FT.
Pond Area Based on treatment volume 0.17 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 1.20 FT.
Total Attenuation Depth based on Pond Area 3.2 FT.
Total Depth from SHWL to Top of Berm 5.36 FT.

Elev SHW= 110.0
Top of Berm Elevation given a total depth = 115.4

Unit Length Based on L/W = 2 123 FT.
Unit Width Based on L/W = 2 61 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 23 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 42.88 FT.
Total Pond Length (including maintenance berm and adjustments) 218.18 FT.
Total Pond Width (including maintenance berm and adjustments) 156.81 FT.

Preliminary Property Size Required 0.79 AC.
Preliminary Property Size Required with 10% Contingency 0.86 AC.

Property Size Provided 1.06 AC.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin DSR50N	Pre-Development Condition		Post Development Condition	
Total Area, acre	12.73	CN	12.73	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	6.45	98	7.28	98
Pervious Area, ac	6.28	39	5.45	39
CN	68.9		72.7	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	4.52		3.75	
Runoff Depth (Q), in	3.91		4.33	
Runoff Volume, acre-ft	4.15		4.60	
Volume Differential, acre-ft	0.45			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.21	
Total Volume Required, acre-ft	0.66			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/11/2022

Basin DSR50N Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	0.60	CN	0.60	CN
CN	39.0		59.3	
Attenuation Volume-25yr24hr				
Precipitation	7.49		7.49	
Potential Maximum Retention (S)	15.64		6.85	
Runoff Depth (Q), in	0.95		2.89	
Runoff Volume, acre-ft	0.05		0.14	
Volume Differential, acre-ft			0.10	
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft			0.10	



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations DSR50N

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.28 ac	A	39	244.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	6.45 ac		98	632.10	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.73 ac			877.02	68.9 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.45 ac	A	39	212.55	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.28 ac		98	713.44	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	12.73 ac			925.99	72.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin DSR50N Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.60 ac	A	39	23.40	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	0.60 ac			23.40	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	B	61	0.00	Pond
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.20 ac		100	20.00	Pond
Dry Pond Area	0.40 ac	A	39	15.60	Pond
Total Area	0.60 ac			35.60	59.3 = Weighted CN

HGL CALCS

Basin 5

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/1/2022

Basin 5 - Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2010+00 Length (L) = 3000
End Station 2035+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 1.5

Low Point in Gutter (ft): 143
Clearance (ft): 1
Est. Energy Losses: 1.5

Maximum Allowable Pond Stage Per HGL Calculations = 153.21 ft

Pond Stage Per Model Results for 100yr240hr Storm = 148.36 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/1/2022

Basin 5 - Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2000+00 Length (L) = 1200
End Station 2010+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 0.6

Low Point in Gutter (ft): 143
Clearance (ft): 1
Est. Energy Losses: 0.6

Maximum Allowable Pond Stage Per HGL Calculations = 141.40 ft

Pond Stage Per Model Results for 100yr240hr Storm = 137.88 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/1/2022

Basin 5 - Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2010+00 Length (L) = 300
End Station 2010+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 0.15

Low Point in Gutter (ft): 144
Clearance (ft): 1
Est. Energy Losses: 0.15

Maximum Allowable Pond Stage Per HGL Calculations = 142.85 ft

Pond Stage Per Model Results for 100yr240hr Storm = 140.16 ft

Basin 6

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/1/2022

Basin 6 - Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2112+00 Length (L) = 2800
End Station 2140+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 1.4

Low Point in Gutter (ft): 104.4
Clearance (ft): 1
Est. Energy Losses: 1.4

Maximum Allowable Pond Stage Per HGL Calculations = 102.00 ft

Pond Stage Per Model Results for 100yr240hr Storm = 101.5 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/1/2022

Basin 6 - Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2145+00 Length (L) = 2700
End Station 2140+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 1.35

Low Point in Gutter (ft): 148
Clearance (ft): 1
Est. Energy Losses: 1.35

Maximum Allowable Pond Stage Per HGL Calculations = 145.65 ft

Pond Stage Per Model Results for 100yr240hr Storm = 111.6 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/1/2022

Basin 6 - Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2093+00 Length (L) = 500
End Station 3090+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 0.25

Low Point in Gutter (ft): 148
Clearance (ft): 1
Est. Energy Losses: 0.25

Maximum Allowable Pond Stage Per HGL Calculations = 146.75 ft

Pond Stage Per Model Results for 100yr240hr Storm = 144.2 ft

Basin MP 265 (Basin 7&8)

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 4/20/2022

Basin MP 265 - Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2065+00 Length (L) = 500
End Station 2040+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.25**

Low Point in Gutter (ft): 130
Clearance (ft): 1
Est. Energy Losses: 0.25

Maximum Allowable Pond Stage Per HGL Calculations = **128.75 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **128.5 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 4/20/2022

Basin MP 265 - Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2160+00 Length (L) = 1394
End Station 2155+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.697**

Low Point in Gutter (ft): 117.1
Clearance (ft): 1
Est. Energy Losses: 0.697

Maximum Allowable Pond Stage Per HGL Calculations = **115.40 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **96.9 ft**

Basin 9

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 10/21/2022

Basin 9- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2235+00 Length (L) = 500
End Station 2225+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.25**

Low Point in Gutter (ft): 122
Clearance (ft): 1
Est. Energy Losses: 0.25

Maximum Allowable Pond Stage Per HGL Calculations = **120.75 ft**

Pond Stage Per Model Results for 10yr24hr Storm = **119.48 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 10/21/2022

Basin 9 - Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2225+00 Length (L) = 500
End Station 2200+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.25**

Low Point in Gutter (ft): 122
Clearance (ft): 1
Est. Energy Losses: 0.25

Maximum Allowable Pond Stage Per HGL Calculations = **120.75 ft**

Pond Stage Per Model Results for 10yr24hr Storm = **120.39 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 10/21/2022

Basin 9 - Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station Maguire Road Length (L) = 2000
End Station Maguire Road slope % = 0.05

Est. Energy Losses = L x slope = 1

Low Point in Gutter (ft): 122
Clearance (ft): 1
Est. Energy Losses: 1

Maximum Allowable Pond Stage Per HGL Calculations = 120.00 ft

Pond Stage Per Model Results for 10yr24hr Storm = 119.87 ft

Basin 10

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/3/2022

Basin 10- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2245+00 Length (L) = 1500
End Station 2260+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.75**

Low Point in Gutter (ft): 117.8
Clearance (ft): 1
Est. Energy Losses: 0.75

Maximum Allowable Pond Stage Per HGL Calculations = **116.05 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **115.72 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/3/2022

Basin 10- Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station Maguire Road Length (L) = 2000
End Station Maguire Road slope % = 0.05

Est. Energy Losses = L x slope = 1

Low Point in Gutter (ft): 121
Clearance (ft): 1
Est. Energy Losses: 1

Maximum Allowable Pond Stage Per HGL Calculations = 119.00 ft

Pond Stage Per Model Results for 25yr24hr Storm = 118.89 ft

Basin 11

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/3/2022

Basin 11- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station Length (L) = 100
End Station slope % = 0.05

Est. Energy Losses = L x slope = **0.05**

Low Point in Gutter (ft): 122
Clearance (ft): 1
Est. Energy Losses: 0.05

Maximum Allowable Pond Stage Per HGL Calculations = 120.95 ft

Pond Stage Per Model Results for 10yr24hr Storm = 120.3 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/3/2022

Basin 11- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station Length (L) = 500
End Station slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.25**

Low Point in Gutter (ft): 122
Clearance (ft): 1
Est. Energy Losses: 0.25

Maximum Allowable Pond Stage Per HGL Calculations = **120.75 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **120.1 ft**

Basin 12

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/3/2022

Basin 12- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 3345+00 Length (L) = 800
End Station 3340+00 slope % = 0.05

Est. Energy Losses = L x slope = 0.4

Low Point in Gutter (ft): 109.12
Clearance (ft): 1
Est. Energy Losses: 0.4

Maximum Allowable Pond Stage Per HGL Calculations = 107.72 ft

Pond Stage Per Model Results for 25yr24hr Storm = 107.63 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/3/2022

Basin 12- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 3345+00 Length (L) = 500
End Station 3340+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.25**

Low Point in Gutter (ft): 109.88
Clearance (ft): 1
Est. Energy Losses: 0.25

Maximum Allowable Pond Stage Per HGL Calculations = **108.63 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **107.70 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/3/2022

Basin 12- Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 3345+00 Length (L) = 1500
End Station 3340+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.75**

Low Point in Gutter (ft): **108.12**
Clearance (ft): 1
Est. Energy Losses: 0.75

Maximum Allowable Pond Stage Per HGL Calculations = **106.37 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **106.28 ft**

Basin A

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/4/2022

Basin A- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 3345+00 Length (L) = 1000
End Station 3340+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.5**

Low Point in Gutter (ft): **110.12**

Clearance (ft): 1

Est. Energy Losses: 0.5

Maximum Allowable Pond Stage Per HGL Calculations = **108.62 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **108.20 ft**

Notes:

Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/4/2022

Basin A- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 3375+00 Length (L) = 1500
End Station 3360+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.75**

Low Point in Gutter (ft): 110.12
Clearance (ft): 1
Est. Energy Losses: 0.75

Maximum Allowable Pond Stage Per HGL Calculations = **108.37 ft**

Pond Stage Per Model Results for 10yr24hr Storm = **108.3 ft**

Notes:

Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/4/2022

Basin A- Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 3375+00 Length (L) = 1500
End Station 3360+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.75**

Low Point in Gutter (ft): **110.12**
Clearance (ft): 1
Est. Energy Losses: 0.75

Maximum Allowable Pond Stage Per HGL Calculations = **108.37 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **108.22 ft**

Notes:

Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative

Basin B

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/4/2022

Basin B- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 1800
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.9**

Low Point in Gutter (ft): 104
Clearance (ft): 1
Est. Energy Losses: 0.9

Maximum Allowable Pond Stage Per HGL Calculations = **102.10 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **102.00 ft**

Notes:

Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/4/2022

Basin B- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 800
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.4**

Low Point in Gutter (ft): 104
Clearance (ft): 1
Est. Energy Losses: 0.4

Maximum Allowable Pond Stage Per HGL Calculations = **102.60 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **102.56 ft**

Notes:

Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/4/2022

Basin B- Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 2900
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **1.45**

Low Point in Gutter (ft): 104
Clearance (ft): 1
Est. Energy Losses: 1.45

Maximum Allowable Pond Stage Per HGL Calculations = **101.55 ft**

Pond Stage Per Model Results for 10yr24hr Storm = **101.53 ft**

Notes:

Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative

Basin C

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/7/2022

Basin C- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2517+50 Length (L) = 2700
End Station 2493+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **1.35**

Low Point in Gutter (ft): 100.9
Clearance (ft): 1
Est. Energy Losses: 1.35

Maximum Allowable Pond Stage Per HGL Calculations = **98.55 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **98.37 ft**

Notes:

Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/7/2022

Basin C- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2494+00 Length (L) = 2750
End Station 2518+50 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **1.375**

Low Point in Gutter (ft): **102.12**
Clearance (ft): 1
Est. Energy Losses: 1.375

Maximum Allowable Pond Stage Per HGL Calculations = **99.75 ft**

Pond Stage Per Model Results for 10yr24hr Storm = **99.60 ft**

Notes:

1. Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative.
2. The above calculations assume that untreated pavement within subbasin C-1 (6 acres) between Stations 2494+00 and 2530+00 will be treated to compensate for the additional impervious proposed between Stations 2458+00 and 2494+00 (2 acres).

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/7/2022

Basin C- Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2494+00 Length (L) = 2000
End Station 2510+00 slope % = 0.05

Est. Energy Losses = L x slope =

Low Point in Gutter (ft): 102.12
Clearance (ft): 1
Est. Energy Losses: 1

Maximum Allowable Pond Stage Per HGL Calculations =

Pond Stage Per Model Results for 25yr24hr Storm =

Notes:

1. Low point in gutter is the new gutter elevation based on the widening for the 10 lane alternative.
2. The above calculations assume that untreated pavement within subbasin C-1 (6 acres) between Stations 2494+00 and 2530+00 will be treated to compensate for the additional impervious proposed between Stations 2458+00 and 2494+00 (2 acres).

Basin D

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/7/2022

Basin D- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2570+00 Length (L) = 3400
End Station 2541+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 1.7

Low Point in Gutter (ft): 131.48
Clearance (ft): 1
Est. Energy Losses: 1.7

Maximum Allowable Pond Stage Per HGL Calculations = 128.78 ft

Pond Stage Per Model Results for 100yr240hr Storm = 126.76 ft

Notes:

Low point in gutter is the estimated gutter elevation per the preliminary profile for the PPFI alternative for the SR 50 interchange.

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/7/2022

Basin D- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 2569+00 Length (L) = 3500
End Station 2540+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **1.75**

Low Point in Gutter (ft): 142.00
Clearance (ft): 1
Est. Energy Losses: 1.75

Maximum Allowable Pond Stage Per HGL Calculations = **139.25 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **122.34 ft**

Notes:

Low point in gutter is the estimated gutter elevation per the preliminary profile for the PPFI alternative for the SR 50 interchange.

Basin SR 408

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/8/2022

Basin SR 408 - Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 600
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.3**

Low Point in Gutter (ft): 108.0
Clearance (ft): 1
Est. Energy Losses: 0.3

Maximum Allowable Pond Stage Per HGL Calculations = **106.70 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **106.18 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/8/2022

Basin SR 408 - Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 300
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.15**

Low Point in Gutter (ft): 108
Clearance (ft): 1
Est. Energy Losses: 0.15

Maximum Allowable Pond Stage Per HGL Calculations = **106.85 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **106.82 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/8/2022

Basin SR 408 - Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 800
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.4**

Low Point in Gutter (ft): 108
Clearance (ft): 1
Est. Energy Losses: 0.4

Maximum Allowable Pond Stage Per HGL Calculations = **106.60 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **105.95 ft**

Basin 429N

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/10/2022

Basin 429N - Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 2800
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 1.4

Low Point in Gutter (ft): 125.5
Clearance (ft): 1
Est. Energy Losses: 1.4

Maximum Allowable Pond Stage Per HGL Calculations = 123.10 ft

Pond Stage Per Model Results for 100yr240hr Storm = 122.66 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/10/2022

Basin 429N - Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 161+00 Length (L) = 300
End Station 158+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.15**

Low Point in Gutter (ft): 125.5
Clearance (ft): 1
Est. Energy Losses: 0.15

Maximum Allowable Pond Stage Per HGL Calculations = **124.35 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **123.80 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/10/2022

Basin 429N - Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Start Station 130+00 Length (L) = 4500
End Station 175+00 slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **2.25**

Low Point in Gutter (ft): 125.5
Clearance (ft): 1
Est. Energy Losses: 2.25

Maximum Allowable Pond Stage Per HGL Calculations = **122.25 ft**

Pond Stage Per Model Results for 100yr240hr Storm = **122.04 ft**

Basin 429S

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/11/2022

Basin 429S - Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 400
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 0.2

Low Point in Gutter (ft): 125.0
Clearance (ft): 1
Est. Energy Losses: 0.2

Maximum Allowable Pond Stage Per HGL Calculations = 123.80 ft

Pond Stage Per Model Results for 25yr24hr Storm = 123.39 ft

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/11/2022

Basin 429S - Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 1000
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.5**

Low Point in Gutter (ft): 125.0
Clearance (ft): 1
Est. Energy Losses: 0.5

Maximum Allowable Pond Stage Per HGL Calculations = **123.62 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **123.37 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/11/2022

Basin 429S - Pond Alternative 3
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 500
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.25**

Low Point in Gutter (ft): 125.0
Clearance (ft): 1
Est. Energy Losses: 0.25

Maximum Allowable Pond Stage Per HGL Calculations = **123.75 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **120.21 ft**

Basin DR50N

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/11/2022

Basin DSR50N- Pond Alternative 1
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 600
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ **0.3**

Low Point in Gutter (ft): 114.0
Clearance (ft): 1
Est. Energy Losses: 0.3

Maximum Allowable Pond Stage Per HGL Calculations = **112.70 ft**

Pond Stage Per Model Results for 25yr24hr Storm = **112.22 ft**

Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: HGL check

Prepared by: LER
Checked by: JAF
Date: 11/18/2021
Revised: 2/11/2022

Basin DSR50N- Pond Alternative 2
Hydraulic Grade Line Check

ESTIMATE ENERGY LOSSES

Length (L) = 670
slope % = 0.05

Est. Energy Losses = $L \times \text{slope} =$ 0.335

Low Point in Gutter (ft): 116.0
Clearance (ft): 1
Est. Energy Losses: 0.335

Maximum Allowable Pond Stage Per HGL Calculations = 114.67 ft

Pond Stage Per Model Results for 25yr24hr Storm = 114.36 ft

The pond sizing calculations in the following subsection of this Appendix are provided for locations where the preliminary hydraulic grade line calculations utilizing the pond design storm indicate additional analysis applying the design storm for the conveyance system was warranted.

BASIN 9

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 100/21/22
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 9

Treatment Volume Required for Additional Impervious Area:	2.00 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	2.00 acre-ft
Attenuation Volume Required for Additional Impervious Area:	6.07 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	6.07 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 10/21/2022

Basin 9 Pond Alternative 1, Station 2235+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	119.11	NAVD 88 (LIDAR converted from NGVD 29)
ELEV EXST EOP @ Low Point =	122.00	STA 2225+00.00 SR 91 NBNAVD 88 from permit plans (20358-16) for Turnpike widening Station 2965+00
Elev SHW =	116.5	NAVD 88 (NWL from plans 406148-1-52-01) from Permit 20358-16 for Pond 9.
Treatment Volume Required	2.00	AC-FT.
Attenuation Volume Required	6.07	AC-FT.
Pond Area Based on treatment volume	2.71	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	0.74	FT.
Total Attenuation Depth based on Pond Area	2.2	FT.
Total Depth from SHWL to Top of Berm	3.98	FT.
Elev SHW=	116.5	
Top of Berm Elevation given a total depth =	120.48	
Unit Length Based on L/W = 2	485	FT.
Unit Width Based on L/W = 2	243	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	5	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	31.88	FT.
Total Pond Length (including maintenance berm and adjustments)	552.87	FT.
Total Pond Width (including maintenance berm and adjustments)	310.1245	FT.
Preliminary Property Size Required to accommodate Pond Footprint	3.94	AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	4.33	AC.
Length of Pond Berm Located within the Floodplain	1200	FT.
100-year Floodplain Elevation	121.40	FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL	1.37	FT.
Embankment Cross Sectional area located within floodplain	28.18	SF.
Floodplain impacts resulting from pond embankment	0.78	AC-FT
Average depth of floodplain compensation located adjacent to pond site	2.50	FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impacts	0.31	AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	0.34	AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation	4.67	AC.
Property Size Provided	5.50	AC.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 9 Station 2226+00 Rt
Basin: 9

Pond Footprint:	3.75 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.75 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.21 ft (from permit)
Attenuation Depth:	3.46 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 10/21/2022

Basin 9	Pre-Development Condition		Post Development Condition	
Total Area, acre	47.71	CN	47.71	CN
Pond Area, ac	5.61	100	5.04	100
Impervious Area, ac	22.16	98	31.77	98
Pervious Area, ac	19.94	40	10.90	41
CN	74.0		85.2	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	3.52		1.74	
Runoff Depth (Q), in	3.24		4.39	
Runoff Volume, acre-ft	12.89		17.45	
Volume Differential, acre-ft	4.56			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			2.00	
Total Volume Required, acre-ft	6.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.30	CN	4.30	CN
CN	39.0		88.1	
Attenuation Volume-100yr240hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	15.64		1.35	
Runoff Depth (Q), in	0.47		4.70	
Runoff Volume, acre-ft	0.17		1.69	
Volume Differential, acre-ft	1.52			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	1.52			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.26 ac	A	39	556.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.16 ac		98	2171.68	Roadway Pavement
Wetted Pond Area	5.61 ac		100	561.00	Pond
Dry Pond Area	4.79 ac	A	39	186.81	Pond
Total Area	47.71 ac			3529.92	74.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.98 ac	B	61	59.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	31.77 ac		98	3113.46	Roadway Pavement
Wetted Pond Area	5.04 ac		100	504.00	Pond
Dry Pond Area	2.68 ac	A	39	104.52	Pond
Total Area	47.71 ac			4064.12	85.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9 Alternative 1 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.30 ac	A	39	167.70	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	4.30 ac			167.70	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	3.46 ac		100	346.00	Pond
Dry Pond Area	0.84 ac	A	39	32.76	Pond
Total Area	4.30 ac			378.76	88.1 = Weighted CN

BASIN 9

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 9 Alt-2 10yr storm

Treatment Volume Required for Additional Impervious Area:	2.00 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	2.00 acre-ft

Attenuation Volume Required for Additional Impervious Area:	5.79 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	5.79 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/03/2022

Basin 9 Pond Alternative 2, Station 2220+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	121.11 NAVD 88 (LiDAR converted from NGVD 29)
ELEV EXST EOP @ Low Point =	122.00 STA 2225+00.00 design baseline SR 91 NBNAVD 88 from permit plans (20358-16) for Turnpike widening Station 2965+00
Elev SHW =	116.5 NAVD 88 (NWL from plans 406148-1-52-01) from Permit 20358-16 for Pond 9.
Treatment Volume Required	2.00 AC-FT.
Attenuation Volume Required	5.79 AC-FT.
Pond Area Based on treatment volume	2.00 AC
Assume 1 foot of pond freeboard	1.00 FT.
Treatment Depth	1.00 FT.
Total Attenuation Depth based on Pond Area	2.9 FT.
Total Depth from SHWL to Top of Berm	4.89 FT.
Elev SHW=	116.5
Top of Berm Elevation given a total depth =	121.39
Unit Length Based on L/W = 2	418 FT.
Unit Width Based on L/W = 2	209 FT.
Maintenance Berm Width of 15-ft	30 FT.
Grade Adjustment Width Assumed 1:2	1 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	39.15 FT.
Total Pond Length (including maintenance berm and adjustments)	487.92 FT.
Total Pond Width (including maintenance berm and adjustments)	279.1015 FT.
Preliminary Property Size Required to accommodate Pond Footprint	3.13 AC.
Preliminary Property Size Required to accommodate Pond Footprint with 10% Contingency	3.44 AC.
Length of Pond Berm Located within the Floodplain	1400 FT.
100-year Floodplain Elevation	121.40 FT.
Average Depth from the lower of either the floodplain elevation or top of berm to higher of existing ground or SHWL	0.28 FT.
Embankment Cross Sectional area located within floodplain	4.57 SF.
Floodplain impacts resulting from pond embankment	0.15 AC-FT
Average depth of floodplain compensation located adjacent to pond site	2.00 FT.
Preliminary property size to accommodate footprint of floodplain compensation resulting from pond impacts	0.07 AC.
Preliminary property size to accommodate footprint of floodplain compensation site with 10% contingency	0.08 AC.
Property Size Required to accommodate Pond Footprint and Floodplain Compensation	3.52 AC.
Property Size Provided	4.04 AC.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds

Pond 9 Station 2226+00 Rt

Basin: 9

Pond Footprint:	3.75 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.75 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.21 ft (from permit)
Attenuation Depth:	3.46 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9	Pre-Development Condition		Post Development Condition	
Total Area, acre	47.71	CN	47.71	CN
Pond Area, ac	5.61	100	5.04	100
Impervious Area, ac	22.16	98	31.77	98
Pervious Area, ac	19.94	40	10.90	41
CN	74.0		85.2	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	3.52		1.74	
Runoff Depth (Q), in	3.24		4.39	
Runoff Volume, acre-ft	12.89		17.45	
Volume Differential, acre-ft	4.56			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			2.00	
Total Volume Required, acre-ft	6.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 9 Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.44	CN	3.44	CN
CN	39.0		88.8	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	15.64		1.26	
Runoff Depth (Q), in	0.47		4.78	
Runoff Volume, acre-ft	0.13		1.37	
Volume Differential, acre-ft	1.24			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	1.24			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.26 ac	A	39	556.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.16 ac		98	2171.68	Roadway Pavement
Wetted Pond Area	5.61 ac		100	561.00	Pond
Dry Pond Area	4.79 ac	A	39	186.81	Pond
Total Area	47.71 ac			3529.92	74.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.98 ac	B	61	59.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	31.77 ac		98	3113.46	Roadway Pavement
Wetted Pond Area	5.04 ac		100	504.00	Pond
Dry Pond Area	2.68 ac	A	39	104.52	Pond
Total Area	47.71 ac			4064.12	85.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9 Alternative 2 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.44 ac	A	39	134.16	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.44 ac			134.16	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	2.81 ac		100	281.00	Pond
Dry Pond Area	0.63 ac	A	39	24.57	Pond
Total Area	3.44 ac			305.57	88.8 = Weighted CN

BASIN 9

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 10/21/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 9 Alt-3 10yr storm

Treatment Volume Required for Additional Impervious Area: 2.00 acre-ft

Treatment Volume Impacted: 0.00 acre-ft

Total Treatment Volume Required: 2.00 acre-ft

Attenuation Volume Required for Additional Impervious Area: 6.44 acre-ft

Attenuation Volume Impacted: 0.00 acre-ft

Attenuation Volume Required: 6.44 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 10/21/2022

Basin 9 Pond Alternative 3, Station 2245+00 LT

Wet Detention Calculations

Existing Ground at Pond site = 125.00 NAVD 88 (LiDAR converted from NGVD 29)
NAVD 88 from permit plans (20358-16) for Turnpike widening
ELEV EXST EOP @ Low Point = 122.00 Station 2965+00. Equates to station 2225+00 from design
baseline
Elev SHW = 123.25 Average groundwater elevation from The Westermere Cove
Apartments Drainage Report. Average elevation determined
from section "Groundwater" pg 5.
Control Elevation Utilized= 116.5 It is assumed that a pond liner will be needed to maintain this
elevation

Treatment Volume Required 2.00 AC-FT.
Attenuation Volume Required 6.44 AC-FT.
Pond Area Based on treatment volume 2.50 AC
Assume 1 foot of pond freeboard 1.00 FT.
Treatment Depth 0.80 FT.
Total Attenuation Depth based on Pond Area 2.6 FT.
Total Depth from SHWL to Top of Berm 4.37 FT.

Elev Control= 116.5 a pond liner is needed in order to obtain this elevation
Top of Berm Elevation given a total depth = 120.87

Unit Length Based on L/W = 2 467 FT.
Unit Width Based on L/W = 2 233 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 17 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 34.97 FT.
Total Pond Length (including maintenance berm and adjustments) 548.42 FT.
Total Pond Width (including maintenance berm and adjustments) 314.9525 FT.

Preliminary Property Size Required 3.97 AC.
Preliminary Property Size Required with 10% Contingency 4.36 AC.

Property Size Provided 17.36 AC. (See Note 1)

Notes:

1. The property size provided noted above is for the entire parcel which is shared with Basin 10 Alternative 3. If the parcel was to be shared with Basin 10 Alternative 3 the estimated size available for Basin 9 Alternative 3 is 6.67 acres.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond 9 Station 2226+00 Rt
Basin: 9

Pond Footprint:	3.75 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	3.75 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.21 ft (from permit)
Attenuation Depth:	3.46 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 10/21/2022

Basin 9	Pre-Development Condition		Post Development Condition	
Total Area, acre	47.71	CN	47.71	CN
Pond Area, ac	5.61	100	5.04	100
Impervious Area, ac	22.16	98	31.77	98
Pervious Area, ac	19.94	40	10.90	41
CN	74.0		85.2	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	3.52		1.74	
Runoff Depth (Q), in	3.24		4.39	
Runoff Volume, acre-ft	12.89		17.45	
Volume Differential, acre-ft	4.56			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			2.00	
Total Volume Required, acre-ft	6.56			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 10/21/2022

Basin 9 Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	6.34	CN	6.34	CN
CN	45.0		85.2	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	12.22		1.74	
Runoff Depth (Q), in	0.83		4.39	
Runoff Volume, acre-ft	0.44		2.32	
Volume Differential, acre-ft	1.88			
Treatment Volume				
2.5-in. (1ft./12 in.) x Increase in Impervious Area (ac.) = acre-ft			0.00	
Total Volume Required, acre-ft	1.88			



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 10/21/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	14.26 ac	A	39	556.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.89 ac	B	61	54.29	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	22.16 ac		98	2171.68	Roadway Pavement
Wetted Pond Area	5.61 ac		100	561.00	Pond
Dry Pond Area	4.79 ac	A	39	186.81	Pond
Total Area	47.71 ac			3529.92	74.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	7.24 ac	A	39	282.36	Open Spaces, Lawns/Good Condition
Pervious Area	0.98 ac	B	61	59.78	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	31.77 ac		98	3113.46	Roadway Pavement
Wetted Pond Area	5.04 ac		100	504.00	Pond
Dry Pond Area	2.68 ac	A	39	104.52	Pond
Total Area	47.71 ac			4064.12	85.2 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 9 Alternative 3 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.34 ac	A	45	285.30	Trees, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	6.34 ac			285.30	45.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	4.80 ac		100	480.00	Pond
Dry Pond Area	1.54 ac	A	39	60.06	Pond
Total Area	6.34 ac			540.06	85.2 = Weighted CN

BASIN 11

ALTERNATIVE 1



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin 11 Alt-1 10yr storm

Treatment Volume Required for Additional Impervious Area:	1.36 acre-ft
Treatment Volume Impacted:	0.36 acre-ft
Total Treatment Volume Required:	1.72 acre-ft

Attenuation Volume Required for Additional Impervious Area:	3.09 acre-ft
Attenuation Volume Impacted:	2.26 acre-ft
Attenuation Volume Required:	5.36 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 04/13/2022

Basin 11 Pond Alternative 1, Station 2283+00 RT

Wet Detention Calculations

Existing Ground at Pond site = 117.00 NAVD 88 (Converted from LiDAR NGVD 1929)
ELEV EXST EOP @ Low Point = 122.00 NAVD 88 from plans 406148-3-52-01
Elev SHW = 115.7 SHWT from Geotech Report Permit 115245-2.
Seasonal high 24 inches to 40 inches below the ground.

Treatment Volume Required 1.72 AC-FT.
Attenuation Volume Required 5.36 AC-FT.
Pond Area Based on treatment volume 1.55 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 1.11 FT.
Total Attenuation Depth based on Pond Area 3.5 FT.
Total Depth from SHWL to Top of Berm 5.57 FT.

Elev SHW= 115.7
Top of Berm Elevation given a total depth = 121.3

Unit Length Based on L/W = 2 367 FT.
Unit Width Based on L/W = 2 183 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 17 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 44.60 FT.
Total Pond Length (including maintenance berm and adjustments) 458.68 FT.
Total Pond Width (including maintenance berm and adjustments) 275.19 FT.

Preliminary Property Size Required 2.90 AC.
Preliminary Property Size Required with 10% Contingency 3.19 AC.

Property Size Provided 3.54 AC.

Note: If this alternative is selected it is assumed the low areas within the basin including those associated with Ramp 303 will be sent to the remnant ponds located within the interchange.



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond TP-3 Station 2280+00 Rt
Basin: 11

Pond Footprint:	1.33 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	60 %
Salvageable Footprint:	0.80 acres
Percentage of pond footprint impacted:	40 %
Pond footprint no longer useable:	0.53 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.16 acre-ft

Estimated Attenuation Volume Impacted: 1.01 acre-ft

Note: Although the majority of the storage will be eliminated it was assumed that remanent volume associated with existing Pond TP-3 could be expanded to account for the shortfall noted above. See interchange alternative calculations for verification of this assumption.



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond TP-4 Station 2276+00 Rt
Basin: 11

Pond Footprint:	4.4 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	85 %
Salvageable Footprint:	3.74 acres
Percentage of pond footprint impacted:	15 %
Pond footprint no longer useable:	0.66 acres
Treatment Depth:	0.30 ft (from as-builts)
Attenuation Depth:	1.90 ft (from as-builts)

Estimated Treatment Volume: Impacted: 0.20 acre-ft

Estimated Attenuation Volume Impacted: 1.25 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11A	Pre-Development Condition		Post Development Condition	
Total Area, acre	27.49	CN	27.49	CN
Pond Area, ac	5.78	100	5.75	100
Impervious Area, ac	7.11	98	12.24	98
Pervious Area, ac	14.60	39	9.50	39
CN	67.1		78.0	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	4.91		2.82	
Runoff Depth (Q), in	2.59		3.64	
Runoff Volume, acre-ft	5.94		8.35	
Volume Differential, acre-ft	2.41			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			1.28	
Total Volume Required, acre-ft	3.69			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11B	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.18	CN	2.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.23	98	1.51	98
All Pervious Area, ac	0.95	51	0.67	51
Pervious Area A soils only, ac	0.42	39	0.30	39
CN	77.6		83.6	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	2.88		1.96	
Runoff Depth (Q), in	3.60		4.22	
Runoff Volume, acre-ft	0.65		0.77	
Volume Differential, acre-ft	0.11			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.03	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.06	
Total Volume Required, acre-ft	0.17			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11C	Pre-Development Condition		Post Development Condition	
Total Area, acre	20.56	CN	20.56	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	7.23	98	7.30	98
Pervious Area, ac	13.33	39	13.26	39
CN	59.7		59.9	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	6.74		6.68	
Runoff Depth (Q), in	1.95		1.96	
Runoff Volume, acre-ft	3.33		3.36	
Volume Differential, acre-ft	0.03			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.02	
Total Volume Required, acre-ft	0.05			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/03/2022

Basin 11 Alt 1 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.85	CN	2.85	CN
CN	41.3		70.0	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	14.22		4.28	
Runoff Depth (Q), in	0.60		2.86	
Runoff Volume, acre-ft	0.14		0.68	
Volume Differential, acre-ft	0.54			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.54			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11A

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	5.74 ac	A	39	223.86	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.11 ac		98	696.78	Roadway Pavement
Wetted Pond Area	5.78 ac		100	578.00	Pond
Dry Pond Area	8.86 ac	A	39	345.54	Pond
Total Area	27.49 ac			1844.18	67.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.56 ac	A	39	138.84	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	12.12 ac		98	1187.76	Roadway Pavement
Wetted Pond Area	5.75 ac		100	575.00	Pond
Dry Pond Area	6.06 ac	A	39	236.34	Pond
Total Area	27.49 ac			2137.94	77.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin 11B

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.42 ac	A	39	16.38	Open Spaces, Lawns/Good Condition
Pervious Area	0.53 ac	B	61	32.33	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.23 ac		98	120.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			169.25	77.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.30 ac	A	39	11.70	Open Spaces, Lawns/Good Condition
Pervious Area	0.37 ac	B	61	22.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.18 ac			182.25	83.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Curve Number Calculations Basin 11C

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.33 ac	A	39	519.87	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.23 ac		98	708.54	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1228.41	59.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.26 ac	A	39	517.14	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	7.30 ac		98	715.40	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	20.56 ac			1232.54	59.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/03/2022

Designed by : MRG

Checked by : JAF

Curve Number Calculations Alternative 1 Pond Site

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.76 ac	A	39	68.64	Open Spaces, Lawns/Good Condition
Pervious Area	1.09 ac	A	45	49.05	Wood, Thin Stand
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.85 ac			117.69	41.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.45 ac		100	145.00	Pond
Dry Pond Area	1.40 ac	A	39	54.60	Pond
Total Area	2.85 ac			199.60	70.0 = Weighted CN

BASIN A

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/04/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin A Alternative 2 10-yr

Treatment Volume Required for Additional Impervious Area:	0.53 acre-ft
Treatment Volume Impacted:	1.63 acre-ft
Total Treatment Volume Required:	2.16 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.53 acre-ft
Attenuation Volume Impacted:	3.19 acre-ft
Attenuation Volume Required:	4.72 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

Basin A Pond Alternative 2, Station 2363+00 LT

Wet Detention Calculations

Existing Ground at Pond site =	110.00	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	111.00	From plans 406146-1-52-01 permit 20358-17 cross Section 3100+00. Equates to 2365+00 design baseline NAVD 88
Elev Pond Control =	103.20	SHW in NAVD 88 from Permit 138556-1 for downstream wetland where pond alternative will outfall (Station 2351+50) is 103.2
Treatment Volume Required	2.16 AC-FT.	
Attenuation Volume Required	4.72 AC-FT.	
Pond Area Based on treatment volume	1.35 AC	
Assume 1 foot of pond freeboard	1.00 FT.	
Treatment Depth	1.60 FT.	
Total Attenuation Depth based on Pond Area	3.5 FT.	
Total Depth from SHWL to Top of Berm	6.10 FT.	
Elev SHW=	103.2	
Top of Berm Elevation given a total depth =	109.3	
Unit Length Based on L/W = 2	343 FT.	
Unit Width Based on L/W = 2	171 FT.	
Maintenance Berm Width of 15-ft	30 FT.	
Grade Adjustment Width Assumed 1:2	3 FT.	
Horizontal Distance Based on a 1:4 Slope and total Depth	48.79 FT.	
Total Pond Length (including maintenance berm and adjustments)	424.54 FT.	
Total Pond Width (including maintenance berm and adjustments)	253.07 FT.	
Preliminary Property Size Required	2.47 AC.	
Preliminary Property Size Required with 10% Contingency	2.71 AC.	
Property Size Provided	2.74 AC.	

Note: NAVD88 + 0.89= NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-1 Station 2361+00 Rt
Basin: A

Pond Footprint:	0.81 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.81 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.18 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.41 acre-ft

Estimated Attenuation Volume Impacted: 0.96 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond A-3 Station 2361+00 Lt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	1.02 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.74 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date : 02/11/2021

Designed by : MRG

Checked by : JAF

Impacts to Existing Ponds
Pond A-4 Station 2373+00 Rt
Basin: A

Pond Footprint:	0.73 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.73 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.92 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.37 acre-ft

Estimated Attenuation Volume Impacted: 0.67 acre-ft



Project Name : SR 91 Widening from South of SR 408 to SR 50

Project Number : 444007-1-22-01

Date :

Designed by : MRG

Checked by :

Impacts to Existing Ponds
Pond A-5 Station 2361+50 Lt
Basin: A

Pond Footprint:	0.99 acres
Is pond salvageable:	no
If pond is salvageable what percentage remains functional:	0 %
Salvageable Footprint:	0.00 acres
Percentage of pond footprint impacted:	100 %
Pond footprint no longer useable:	0.99 acres
Treatment Depth:	0.50 ft (from permit)
Attenuation Depth:	0.83 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.50 acre-ft

Estimated Attenuation Volume Impacted: 0.82 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A1	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.04	CN	3.04	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.14	98	1.65	98
Pervious Area, ac	1.90	39	1.39	39
CN	61.1		71.0	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	6.36		4.08	
Runoff Depth (Q), in	2.06		2.96	
Runoff Volume, acre-ft	0.52		0.75	
Volume Differential, acre-ft	0.23			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.35			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A2	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.79	CN	2.79	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	2.79	98	2.79	98
Pervious Area, ac	0.00	39	0.00	39
CN	98.0		98.0	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	0.20		0.20	
Runoff Depth (Q), in	5.83		5.83	
Runoff Volume, acre-ft	1.36		1.36	
Volume Differential, acre-ft	0.00			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.00			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A3	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.84	CN	2.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.06	98	1.48	98
Pervious Area, ac	1.78	39	1.36	39
CN	61.0		69.7	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	6.39		4.34	
Runoff Depth (Q), in	2.05		2.84	
Runoff Volume, acre-ft	0.49		0.67	
Volume Differential, acre-ft	0.19			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.11	
Total Volume Required, acre-ft	0.29			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A4	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.93	CN	3.93	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.48	98	2.05	98
Pervious Area, ac	2.45	39	1.88	39
CN	61.2		69.8	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	6.33		4.33	
Runoff Depth (Q), in	2.07		2.84	
Runoff Volume, acre-ft	0.68		0.93	
Volume Differential, acre-ft	0.25			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.14	
Total Volume Required, acre-ft	0.39			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A5	Pre-Development Condition		Post Development Condition	
Total Area, acre	4.13	CN	4.13	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	1.54	98	2.16	98
Pervious Area, ac	2.59	39	1.97	39
CN	61.0		69.9	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	6.39		4.31	
Runoff Depth (Q), in	2.05		2.85	
Runoff Volume, acre-ft	0.71		0.98	
Volume Differential, acre-ft	0.27			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.16	
Total Volume Required, acre-ft	0.43			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin A Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	2.39	CN	2.39	CN
CN	39.0		76.0	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	15.64		3.16	
Runoff Depth (Q), in	0.47		3.44	
Runoff Volume, acre-ft	0.09		0.69	
Volume Differential, acre-ft	0.59			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.59			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.14 ac		98	111.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.90 ac	A	39	74.10	Pond
Total Area	3.04 ac			185.82	61.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.65 ac		98	161.70	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.39 ac	A	39	54.21	Pond
Total Area	3.04 ac			215.91	71.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.79 ac		98	273.42	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.79 ac			273.42	98.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A3

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.06 ac		98	103.88	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.78 ac	A	39	69.42	Pond
Total Area	2.84 ac			173.30	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.36 ac	A	39	53.04	Pond
Total Area	2.84 ac			198.08	69.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A4

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.48 ac		98	145.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.45 ac	A	39	95.55	Pond
Total Area	3.93 ac			240.59	61.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.05 ac		98	200.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.88 ac	A	39	73.32	Pond
Total Area	3.93 ac			274.22	69.8 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A5

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.54 ac		98	150.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	2.59 ac	A	39	101.01	Pond
Total Area	4.13 ac			251.93	61.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	2.16 ac		98	211.68	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	1.97 ac	A	39	76.83	Pond
Total Area	4.13 ac			288.51	69.9 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/05/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin A Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	2.39 ac	A	39	93.21	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	2.39 ac			93.21	39.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.45 ac		100	145.00	Pond
Dry Pond Area	0.94 ac	A	39	36.66	Pond
Total Area	2.39 ac			181.66	76.0 = Weighted CN

BASIN B

ALTERNATIVE 3



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/04/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin B Alt-3 10yr storm

Treatment Volume Required for Additional Impervious Area:	1.60 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	1.60 acre-ft

Attenuation Volume Required for Additional Impervious Area:	4.38 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	4.38 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/04/2022

Basin B Pond Alternative 3, Station 2455+00 RT

Wet Detention Calculations

Existing Ground at Pond site =	112.11	NAVD 88 converted from NGVD 29 (Estimated From GIS Topographic Information)
ELEV EXST EOP @ Low Point =	104.80	NAVD 88 from plans 406146-1-52-01. Permit 20358-17. Cross Section 3167+00.00. Equates to station 2440+00 design baseline.
Elev SHW =	100.0	SHWT from plans West Pointe Villas Pond C. Permit 63298-1
Treatment Volume Required	1.60	AC-FT.
Attenuation Volume Required	4.38	AC-FT.
Pond Area Based on treatment volume	3.91	AC
Assume 1 foot of pond freeboard	1.00	FT.
Treatment Depth	0.41	FT.
Total Attenuation Depth based on Pond Area	1.1	FT.
Total Depth from SHWL to Top of Berm	2.53	FT.
Elev SHW=	100.0	
Top of Berm Elevation given a total depth =	102.53	
Unit Length Based on L/W = 2	583	FT.
Unit Width Based on L/W = 2	292	FT.
Maintenance Berm Width of 15-ft	30	FT.
Grade Adjustment Width Assumed 1:2	38	FT.
Horizontal Distance Based on a 1:4 Slope and total Depth	20.26	FT.
Total Pond Length (including maintenance berm and adjustments)	671.88	FT.
Total Pond Width (including maintenance berm and adjustments)	380.22	FT.
Preliminary Property Size Required	5.86	AC.
Preliminary Property Size Required with 10% Contingency	6.45	AC.
Property Size Provided	6.60	AC.

Note: NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond B Station 2444+00 Lt/Rt
Basin: B

Pond Footprint:	1.24 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	1.24 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from permit)
Attenuation Depth:	0.98 ft (from permit)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.92	CN	31.92	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	15.76	98	19.21	98
All Pervious Area, ac	16.16	47	12.71	47
Pervious Area A soils only, ac	13.00	39	10.28	39
CN	72.2		77.6	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	3.85		2.88	
Runoff Depth (Q), in	3.07		3.60	
Runoff Volume, acre-ft	8.16		9.58	
Volume Differential, acre-ft	1.42			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.68	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.72	
Total Volume Required, acre-ft	2.14			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B2	Pre-Development Condition		Post Development Condition	
Total Area, acre	23.42	CN	23.42	CN
Pond Area, ac	1.24	100	1.08	100
Impervious Area, ac	11.51	98	13.74	98
Pervious Area, ac	10.67	39	8.60	39
CN	71.2		76.4	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	4.04		3.08	
Runoff Depth (Q), in	2.98		3.48	
Runoff Volume, acre-ft	5.81		6.80	
Volume Differential, acre-ft	0.99			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.56	
Total Volume Required, acre-ft	1.55			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B-20SN	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.05	98	0.82	98
Pervious Area, ac	1.40	39	0.63	39
CN	41.0		72.4	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	14.37		3.82	
Runoff Depth (Q), in	0.58		3.09	
Runoff Volume, acre-ft	0.07		0.37	
Volume Differential, acre-ft	0.30			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.19	
Total Volume Required, acre-ft	0.50			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B-20SS	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.45	CN	1.45	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.14	98	0.67	98
Pervious Area, ac	1.31	39	0.78	39
CN	44.7		66.3	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	12.37		5.09	
Runoff Depth (Q), in	0.81		2.52	
Runoff Volume, acre-ft	0.10		0.30	
Volume Differential, acre-ft	0.21			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.13	
Total Volume Required, acre-ft	0.34			



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/04/2022

Basin B Alt 3 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	5.28	CN	5.28	CN
CN	48.6		85.3	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	10.58		1.72	
Runoff Depth (Q), in	1.08		4.41	
Runoff Volume, acre-ft	0.47		1.94	
Volume Differential, acre-ft	1.46			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	1.46			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	13.00 ac	A	39	507.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	3.16 ac	D	80	252.80	Open Spaces, Lawns/Good Condition
Impervious Area	15.76 ac		98	1544.48	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2304.28	72.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.28 ac	A	39	400.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	2.43 ac	D	80	194.40	Open Spaces, Lawns/Good Condition
Impervious Area	19.21 ac		98	1882.58	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.92 ac			2477.90	77.6 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	10.67 ac	A	39	416.13	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	11.51 ac		98	1127.98	Roadway Pavement
Wetted Pond Area	1.24 ac		100	124.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1668.11	71.2 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	8.60 ac	A	39	335.40	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	13.74 ac		98	1346.52	Roadway Pavement
Wetted Pond Area	1.08 ac		100	108.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	23.42 ac			1789.92	76.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B-20SN

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.40 ac	A	39	54.60	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.05 ac		98	4.90	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			59.50	41.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.63 ac	A	39	24.57	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.82 ac		98	80.36	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			104.93	72.4 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations B-20SS

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.31 ac	A	39	51.09	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.14 ac		98	13.72	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			64.81	44.7 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.78 ac	A	39	30.42	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.67 ac		98	65.66	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.45 ac			96.08	66.3 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/03/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin B Alternative 3 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.78 ac	A	45	215.10	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.50 ac	D	83	41.50	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	5.28 ac			256.60	48.6 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.21 ac	D	80	16.80	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	3.87 ac		100	387.00	Pond
Dry Pond Area	1.20 ac	A	39	46.80	Pond
Total Area	5.28 ac			450.60	85.3 = Weighted CN

BASIN C

ALTERNATIVE 2



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Total Volumetric Requirements for Basin C Alternative 2

Treatment Volume Required for Additional Impervious Area:	0.75 acre-ft
Treatment Volume Impacted:	0.00 acre-ft
Total Treatment Volume Required:	0.75 acre-ft

Attenuation Volume Required for Additional Impervious Area:	1.81 acre-ft
Attenuation Volume Impacted:	0.00 acre-ft
Attenuation Volume Required:	1.81 acre-ft



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 02/07/2022

Basin C Pond Alternative 2, Station 2519+00 LT

Wet Detention Calculations 10-year storm

Existing Ground at Pond site = 103.11 NAVD 88 (converted from NGVD 29)
ELEV EXST EOP @ Low Point = 102.40 NAVD 88 from Cross section 3213+00.00 plans 406146-1-52-01, Permit 20358-17. Equates to STA 2505+00.00
Elev SHW = 97.20 NAVD 88 from Cross section 3250+00.00 plans 406146-1-52-01, Permit 20358-17.

Treatment Volume Required 0.75 AC-FT.
Attenuation Volume Required 1.81 AC-FT.
Pond Area Based on treatment volume 1.07 AC
Assume 1 foot of pond freeboard 1.00 FT.

Treatment Depth 0.70 FT.
Total Attenuation Depth based on Pond Area 1.7 FT.
Total Depth from SHWL to Top of Berm 3.40 FT.

Elev SHW= 97.2
Top of Berm Elevation given a total depth = 100.60

Unit Length Based on L/W = 2 305 FT.
Unit Width Based on L/W = 2 152 FT.
Maintenance Berm Width of 15-ft 30 FT.
Grade Adjustment Width Assumed 1:2 10 FT.
Horizontal Distance Based on a 1:4 Slope and total Depth 27.20 FT.
Total Pond Length (including maintenance berm and adjustments) 371.91 FT.
Total Pond Width (including maintenance berm and adjustments) 219.57 FT.

Preliminary Property Size Required 1.87 AC.
Preliminary Property Size Required with 10% Contingency 2.06 AC.

Property Size Provided 2.30 AC.

Note: NAVD88 + 0.89 = NGVD29 (Approximate). All GIS data increased by 0.89-feet to convert to NGVD29



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Impacts to Existing Ponds
Pond C Station 2502+00 Lt
Basin: C

Pond Footprint:	2.67 acres
Is pond salvageable:	yes
If pond is salvageable what percentage remains functional:	100 %
Salvageable Footprint:	2.67 acres
Percentage of pond footprint impacted:	0 %
Pond footprint no longer useable:	0.00 acres
Treatment Depth:	1.50 ft (from as-built plans)
Attenuation Depth:	1.22 ft (from as-built plans)

Estimated Treatment Volume: Impacted: 0.00 acre-ft

Estimated Attenuation Volume Impacted: 0.00 acre-ft



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C1	Pre-Development Condition		Post Development Condition	
Total Area, acre	31.18	CN	31.18	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	18.98	98	21.04	98
Pervious Area, ac	12.20	50	10.14	51
Pervious Area A soils only, ac	6.36	39	4.63	39
CN	79.0		82.7	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	2.65		2.09	
Runoff Depth (Q), in	3.75		4.12	
Runoff Volume, acre-ft	9.73		10.72	
Volume Differential, acre-ft	0.98			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
2.5-in. (1ft./12 in.) x Increase in all Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.43	
Total Volume Required, acre-ft	1.42			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C2	Pre-Development Condition		Post Development Condition	
Total Area, acre	29.71	CN	29.71	CN
Pond Area, ac	2.67	100	2.67	100
Impervious Area, ac	16.14	98	16.37	98
All Pervious Area, ac	10.90	46	10.67	45
Pervious Area A soils only, ac	7.22	39	7.95	39
CN	79.3		79.0	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	2.62		2.66	
Runoff Depth (Q), in	3.77		3.74	
Runoff Volume, acre-ft	9.33		9.27	
Volume Differential, acre-ft	-0.06			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			-0.18	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.05	
Total Volume Required, acre-ft	-0.02			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C-20SE	Pre-Development Condition		Post Development Condition	
Total Area, acre	3.84	CN	3.84	CN
Pond Area, ac	0.00	100	0.00	100
Impervious Area, ac	0.22	98	1.51	98
All Pervious Area, ac	3.62	56	2.33	55
Pervious Area A soils only, ac	0.87	39	0.67	39
CN	58.1		71.7	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	7.20		3.94	
Runoff Depth (Q), in	1.81		3.02	
Runoff Volume, acre-ft	0.58		0.97	
Volume Differential, acre-ft	0.39			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.05	
2.5-in. (1ft./12 in.) x Total Increase in Impervious Area (ac.) = acre-ft			0.27	
Total Volume Required, acre-ft	0.66			

The larger of these two values were utilized to determine treatment volume requirements.



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: MRG
Checked by: JAF
Date: 02/07/2022

Basin C Alt 2 Pond Site	Pre-Development Condition		Post Development Condition	
Total Area, acre	1.67	CN	1.67	CN
CN	25.0		77.7	
Attenuation Volume-10yr24hr				
Precipitation	6.07		6.07	
Potential Maximum Retention (S)	30.00		2.87	
Runoff Depth (Q), in	0.00		3.61	
Runoff Volume, acre-ft	0.00		0.50	
Volume Differential, acre-ft	0.50			
Treatment Volume				
3-in. (1ft./12 in.) x Increase in Impervious Area (ac.) constructed over Type "A" soils = acre-ft			0.00	
Total Volume Required, acre-ft	0.50			



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C1

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	6.36 ac	A	39	248.04	Open Spaces, Lawns/Good Condition
Pervious Area	5.84 ac	B	61	356.24	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	18.98 ac		98	1860.04	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2464.32	79.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.63 ac	A	39	180.57	Open Spaces, Lawns/Good Condition
Pervious Area	5.51 ac	B	61	336.11	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	21.04 ac		98	2061.92	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	31.18 ac			2578.60	82.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C2

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	3.92 ac	A	39	152.88	Open Spaces, Lawns/Good Condition
Pervious Area	3.68 ac	B	61	224.48	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.14 ac		98	1581.72	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2354.78	79.3 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	4.65 ac	A	39	181.35	Open Spaces, Lawns/Good Condition
Pervious Area	2.72 ac	B	61	165.92	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	16.37 ac		98	1604.26	Roadway Pavement
Wetted Pond Area	2.67 ac		100	267.00	Pond
Dry Pond Area	3.30 ac	A	39	128.70	Pond
Total Area	29.71 ac			2347.23	79.0 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/11/2021
Designed by : MRG
Checked by : JAF

Curve Number Calculations C-20SE

Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.87 ac	A	39	33.93	Open Spaces, Lawns/Good Condition
Pervious Area	2.75 ac	B	61	167.75	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	0.22 ac		98	21.56	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			223.24	58.1 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.67 ac	A	39	26.13	Open Spaces, Lawns/Good Condition
Pervious Area	1.66 ac	B	61	101.26	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	80	0.00	Open Spaces, Lawns/Good Condition
Impervious Area	1.51 ac		98	147.98	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	3.84 ac			275.37	71.7 = Weighted CN



Project Name : SR 91 Widening from South of SR 408 to SR 50
Project Number : 444007-1-22-01
Date : 02/07/2022
Designed by : MRG
Checked by : JAF

Curve Number Calculations Basin C Alternative 2 Pond Site
Pre

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	1.67 ac	A	25	41.75	Woods, Thin Stand
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	D	83	0.00	Woods, Thin Stand
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	0.00 ac		100	0.00	Pond
Dry Pond Area	0.00 ac	A	39	0.00	Pond
Total Area	1.67 ac			41.75	25.0 = Weighted CN

Post

Description	Area (A)	Soil Group	Curve No. (CN)	CN x A	Cover type & hydrologic cond.
Pervious Area	0.00 ac	A	39	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	B	61	0.00	Open Spaces, Lawns/Good Condition
Pervious Area	0.00 ac	C	74	0.00	Open Spaces, Lawns/Good Condition
Dry Pond Area	0.00 ac	D	80	0.00	Pond
Impervious Area	0.00 ac		98	0.00	Roadway Pavement
Wetted Pond Area	1.06 ac		100	106.00	Pond
Dry Pond Area	0.61 ac	A	39	23.79	Pond
Total Area	1.67 ac			129.79	77.7 = Weighted CN

APPENDIX C – BMAP AND WEKIVA RECHARGE BASIN CALCULATIONS

Summary Treatment Report Version: 4.3.3

Project: Turnpike Widening
From SR 408 to SR 50

Analysis Type: Net
Improvement

Date: 11/29/2021

BMP Types:

Catchment 1 - (Basin 5)

Routing Summary

Catchment 1 Routed to Outlet

Swale

Based on % removal values to
the nearest percent

Total nitrogen target removal met? Yes

Total phosphorus target removal met? Yes

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	10.79 kg/yr	
Total N post load	47.95 kg/yr	
Target N load reduction	77 %	
Target N discharge load	10.79 kg/yr	
Percent N load reduction	86 %	
Provided N discharge load	6.72 kg/yr	14.81 lb/yr
Provided N load removed	41.23 kg/yr	90.92 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	1.42 kg/yr	
Total P post load	6.309 kg/yr	
Target P load reduction	77 %	
Target P discharge load	1.42 kg/yr	
Percent P load reduction	86 %	
Provided P discharge load	.884 kg/yr	1.95 lb/yr
Provided P load removed	5.425 kg/yr	11.963 lb/yr

Complete Report (not including cost) Ver 4.3.3

Project: Turnpike Widening From SR 408 to SR 50
Date: 11/29/2021 11:52:01 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 5
Rainfall Zone	Florida Zone 2
Annual Mean Rainfall	50.00

Pre-Condition Landuse Information

Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	21.00
Rational Coefficient (0-1)	0.07
Non DCIA Curve Number	72.00
DCIA Percent (0-100)	0.00
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	5.758
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	10.790
Phosphorus Loading (kg/yr)	1.420

Post-Condition Landuse Information

Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	21.00
Rational Coefficient (0-1)	0.29
Non DCIA Curve Number	81.00
DCIA Percent (0-100)	25.00
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.520

Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	25.585
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	47.950
Phosphorus Loading (kg/yr)	6.309

Catchment Number: 1 Name: Basin 5

Project: Turnpike Widening From SR 408 to SR 50

Date: 11/29/2021

Swale Design

Swale Top Width for Flood Conditions - W (ft)	13.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	1,500.000
Average Impervious Length (ft)	1,500.000
Average Impervious Width (ft)	96.000
Average Pervious Width (ft)	54.000
Swale Slope (foot drop/foot length) - S	0.020
Mannings N	0.060
Soil Infiltration Rate (in/hr)	12.000
Side Slope of Swale horizontal/vertical - Z	4.000
Average Height of Swale Block - H	1.000
Length of Berm Upstream of Crest - L_b	10.000
Runoff Area (acres)	5.165
Number of Swale Blocks	15

Watershed Characteristics

Catchment Area (acres)	21.00
Contributing Area (acres)	21.000
Non-DCIA Curve Number	81.00
DCIA Percent	25.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	77
Provided TN Treatment Efficiency (%)	86

Required TP Treatment Efficiency (%) 77
Provided TP Treatment Efficiency (%) 86

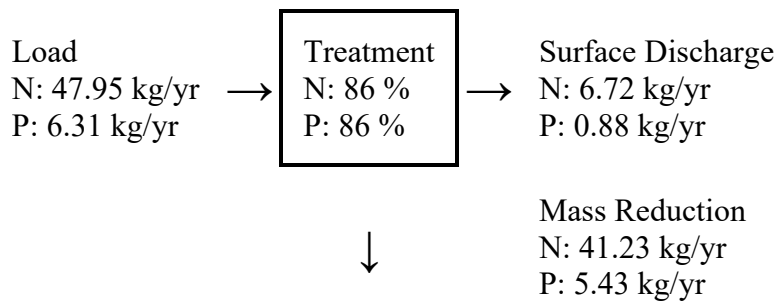
Media Mix Information

Type of Media Mix Not Specified
Media N Reduction (%)
Media P Reduction (%)

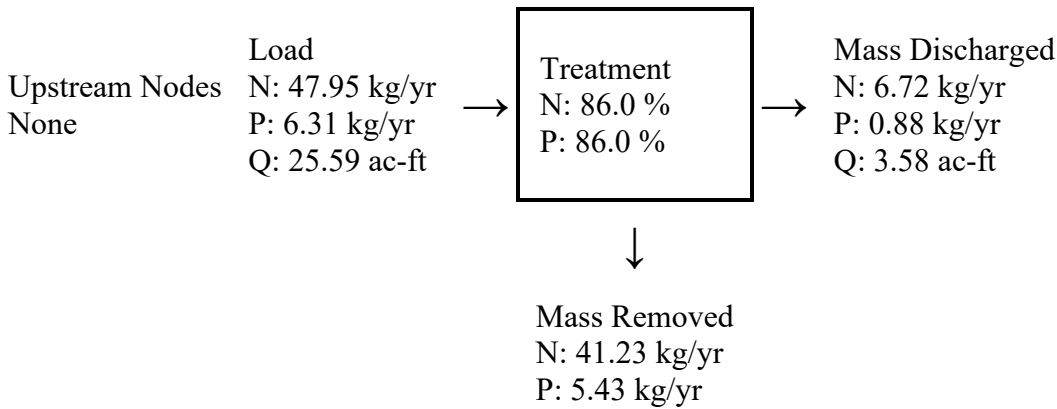
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 7.520
TN Mass Load (kg/yr) 41.233
TN Concentration (mg/L) 0.000
TP Mass Load (kg/yr) 5.425
TP Concentration (mg/L) 0.000

Load Diagram for Swale (stand-alone)



Load Diagram for Swale (As Used In Routing)



Summary Treatment Report Version: 4.3.3

Project: FTE Widening From
SR 408 to SR 50-Basin 7-west

Analysis Type: Net

Improvement

BMP Types:

Catchment 1 - (Sta 2132+50
to 2162+00 North Side) Swale

Catchment 2 - (Sta 2132+50
to 2162+00 South Side) Swale

Catchment 3 - (MP 265)

Wet Detention

Date:11/29/2021

Catchment 4 - (SR 408)

Wet Detention

Catchment 5 - (Basin 9)

Wet Detention

Catchment 6 - (Basin 11)

Wet Detention

Catchment 7 - (Basin 10)

Wet Detention

Catchment 8 - (Basins 12 _
A-C North Side) Swale

Catchment 9 - (Basins 12 _
A-C South Side) Swale

Catchment 10 - (Basin E
North Side) Swale

Catchment 11 - (Basin E
South Side) Wet Detention

Catchment 12 - (Basin
DSR50N) None

Catchment 13 - (Basin SR
429N) None

Catchment 14 - (Basin SR
429S) None

Based on % removal values to
the nearest percent

Routing Summary

Catchment 1 Routed to Outlet

Catchment 2 Routed to Outlet

Catchment 3 Routed to Outlet

Catchment 4 Routed to Outlet

Catchment 5 Routed to Outlet

Catchment 6 Routed to Outlet

Catchment 7 Routed to Outlet

Catchment 8 Routed to Outlet

Catchment 9 Routed to Outlet

Catchment 10 Routed to Outlet

Catchment 11 Routed to Outlet

Catchment 12 Routed to Outlet

Catchment 13 Routed to Outlet

Catchment 14 Routed to Outlet

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	904.96 kg/yr	
Total N post load	1371.82 kg/yr	
Target N load reduction	34 %	
Target N discharge load	904.96 kg/yr	
Percent N load reduction	42 %	
Provided N discharge load	790.34 kg/yr	1742.7 lb/yr
Provided N load removed	581.48 kg/yr	1282.17 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	119.074 kg/yr	
Total P post load	180.503 kg/yr	
Target P load reduction	34 %	
Target P discharge load	119.074 kg/yr	
Percent P load reduction	64 %	
Provided P discharge load	64.147 kg/yr	141.45 lb/yr
Provided P load removed	116.356 kg/yr	256.564 lb/yr

[illegible]

Nitrogen Loading (kg/yr)	3.823	3.823	8.364	12.186	274.061	77.069	347.045	23.614	23.614	2.132	2.132	80.422	35.034	11.644
Phosphorus Loading (kg/yr)	0.503	0.503	1.100	1.603	36.061	10.141	45.664	3.107	3.107	0.281	0.281	10.582	4.610	1.532
Post-Condition Landuse Information														
Landuse	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200	Highway: TN=1.520 TP=0.200
Area (acres)	10.20	10.20	51.64	56.54	47.71	44.48	200.73	72.00	72.00	6.50	6.50	12.73	56.79	10.62
Rational Coefficient (0-1)	0.09	0.45	0.03	0.04	0.75	0.43	0.43	0.11	0.11	0.18	0.46	0.81	0.10	0.16
Non DCIA Curve Number	77.00	77.00	62.00	64.70	90.00	66.90	67.80	80.00	80.00	79.00	79.00	73.00	78.00	85.00
DCIA Percent (0-100)	0.00	50.00	0.00	0.00	90.00	50.00	50.00	0.00	0.00	10.00	50.00	100.00	0.00	0.00
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00	5.75	24.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.520	1.520	1.520	1.520	1.520	1.520	1.520	1.520	1.520	1.520	1.520	1.520	1.520	1.520
Phosphorus EMC (mg/l)	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
Runoff Volume (ac-ft/yr)	3.902	19.142	7.488	9.725	149.690	69.175	315.902	33.300	33.300	4.745	12.372	42.911	23.237	7.080
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	7.312	35.875	14.033	18.226	280.543	129.645	592.050	62.410	62.410	8.893	23.186	80.422	43.549	13.269
Phosphorus Loading (kg/yr)	0.962	4.720	1.846	2.398	36.914	17.059	77.901	8.212	8.212	1.170	3.051	10.582	5.730	1.746

Catchment Number: 1 Name: Sta 2132+50 to 2162+00 North Side

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Swale Design

Swale Top Width for Flood Conditions - W (ft)	13.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	2,900.000
Average Impervious Length (ft)	2,900.000
Average Impervious Width (ft)	96.000
Average Pervious Width (ft)	54.000
Swale Slope (foot drop/foot length) - S	0.028
Mannings N	0.060
Soil Infiltration Rate (in/hr)	12.000
Side Slope of Swale horizontal/vertical - Z	4.000
Average Height of Swale Block - H	1.000
Length of Berm Upstream of Crest - L_b	10.000
Runoff Area (acres)	9.986
Number of Swale Blocks	29

Watershed Characteristics

Catchment Area (acres)	10.20
Contributing Area (acres)	10.200
Non-DCIA Curve Number	77.00
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	48
Provided TN Treatment Efficiency (%)	85
Required TP Treatment Efficiency (%)	48
Provided TP Treatment Efficiency (%)	85

Media Mix Information

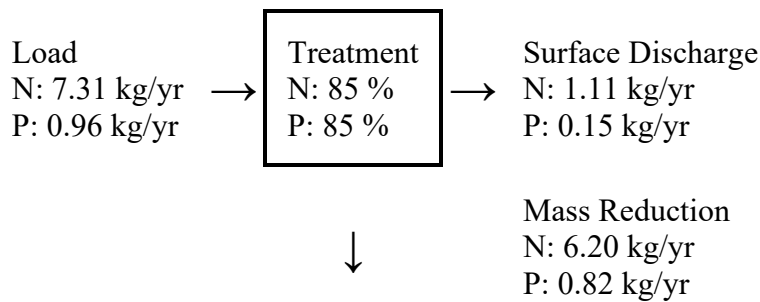
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

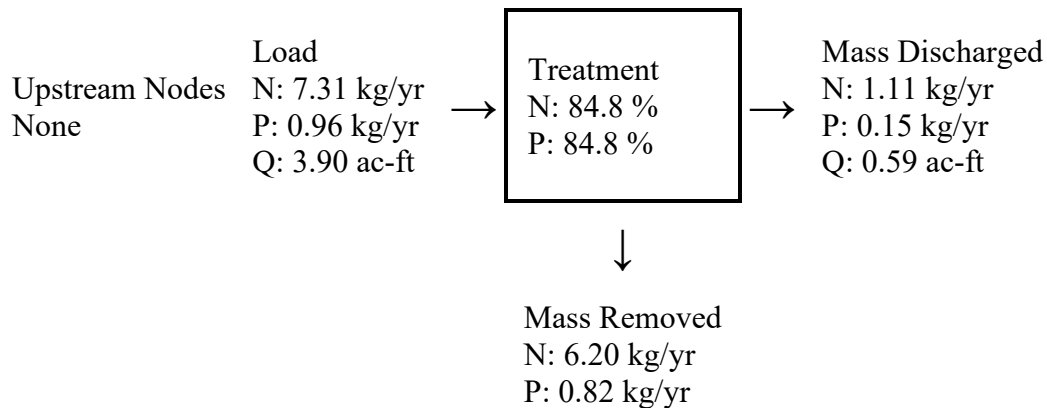
Treatment Rate (MG/yr)	1.136
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TN Mass Load (kg/yr) 6.198
TN Concentration (mg/L) 0.000
TP Mass Load (kg/yr) 0.815
TP Concentration (mg/L) 0.000

Load Diagram for Swale (stand-alone)



Load Diagram for Swale (As Used In Routing)



Catchment Number: 2 Name: Sta 2132+50 to 2162+00 South Side

Project: FTE Widening From SR 408 to SR 50-Basin 7-west
Date: 11/29/2021

Swale Design

Swale Top Width for Flood Conditions - W (ft)	13.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	1,000.000
Average Impervious Length (ft)	1,000.000
Average Impervious Width (ft)	96.000
Average Pervious Width (ft)	54.000
Swale Slope (foot drop/foot length) - S	0.028
Mannings N	0.060
Soil Infiltration Rate (in/hr)	12.000
Side Slope of Swale horizontal/vertical - Z	4.000
Average Height of Swale Block - H	1.000
Length of Berm Upstream of Crest - L_b	10.000
Runoff Area (acres)	3.444
Number of Swale Blocks	10

Watershed Characteristics

Catchment Area (acres)	10.20
Contributing Area (acres)	10.200
Non-DCIA Curve Number	77.00
DCIA Percent	50.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	89
Provided TN Treatment Efficiency (%)	84
Required TP Treatment Efficiency (%)	89
Provided TP Treatment Efficiency (%)	84

Media Mix Information

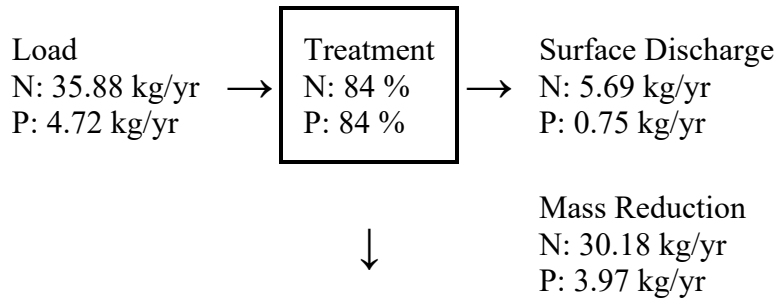
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

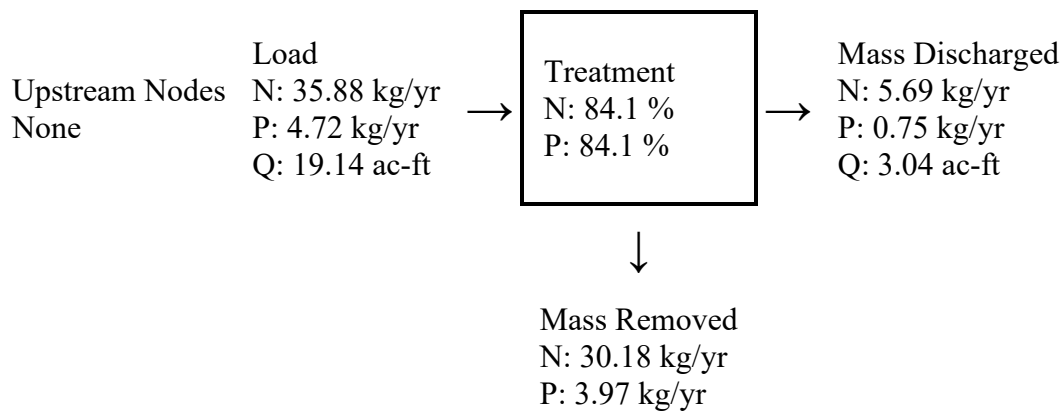
Treatment Rate (MG/yr)	5.545
TN Mass Load (kg/yr)	30.182

TN Concentration (mg/L) 0.000
TP Mass Load (kg/yr) 3.971
TP Concentration (mg/L) 0.000

Load Diagram for Swale (stand-alone)



Load Diagram for Swale (As Used In Routing)



Catchment Number: 3 Name: MP 265

Project: FTE Widening From SR 408 to SR 50-Basin 7-west
Date: 11/29/2021

Wet Detention Design

Permanent Pool Volume (ac-ft) 21.800
Permanent Pool Volume (ac-ft) for 31 days residence 0.636

Annual Residence Time (days)	1063
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	51.64
Contributing Area (acres)	51.640
Non-DCIA Curve Number	62.00
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	40
Provided TN Treatment Efficiency (%)	44
Required TP Treatment Efficiency (%)	40
Provided TP Treatment Efficiency (%)	95

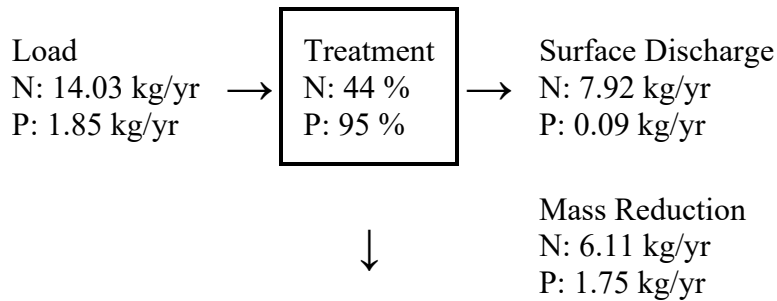
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

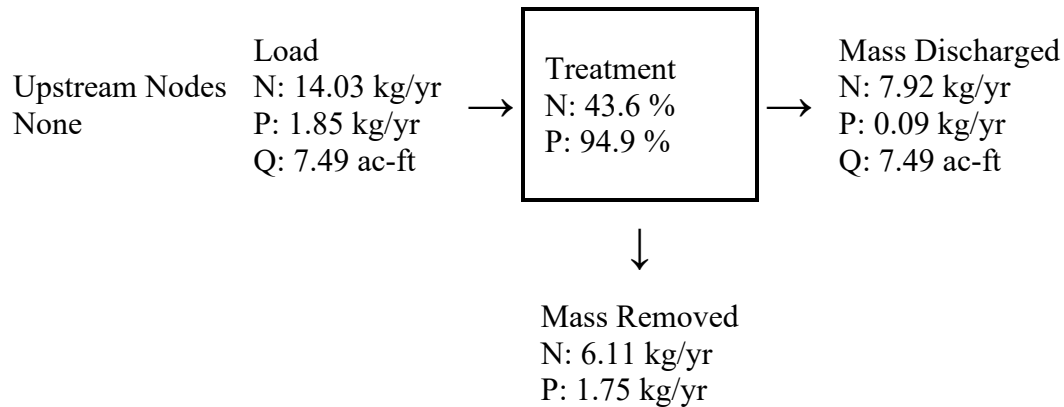
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 4 Name: SR 408

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Wet Detention Design

Permanent Pool Volume (ac-ft)	6.120
Permanent Pool Volume (ac-ft) for 31 days residence	0.826
Annual Residence Time (days)	230
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	56.54
Contributing Area (acres)	56.540
Non-DCIA Curve Number	64.70
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	33
Provided TN Treatment Efficiency (%)	43
Required TP Treatment Efficiency (%)	33
Provided TP Treatment Efficiency (%)	81

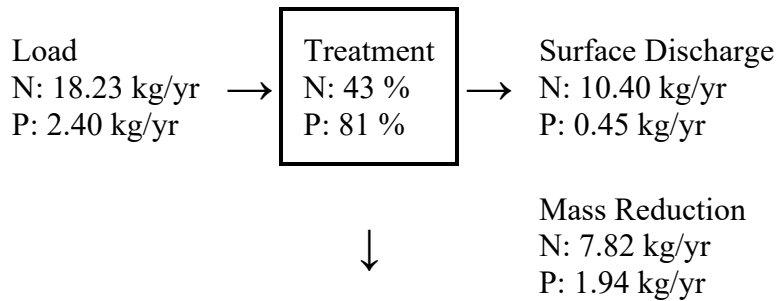
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

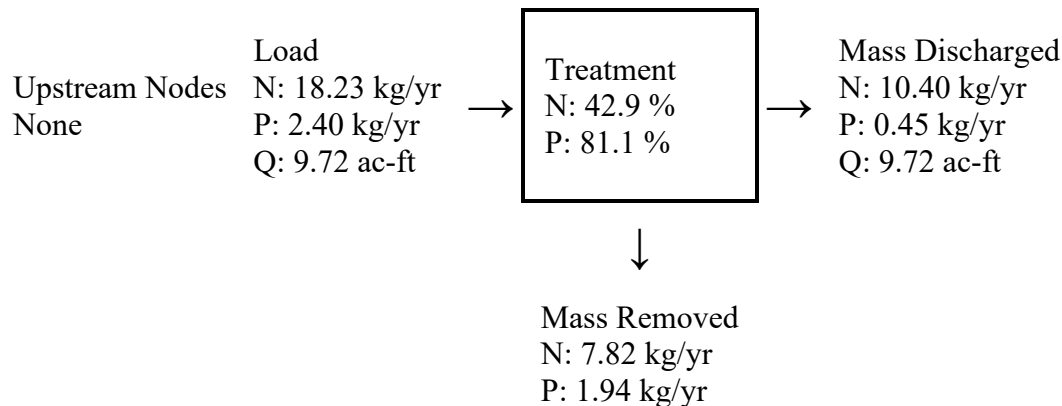
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 5 Name: Basin 9

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Wet Detention Design

Permanent Pool Volume (ac-ft)	16.800
Permanent Pool Volume (ac-ft) for 31 days residence	12.713
Annual Residence Time (days)	41
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres) 47.71
Contributing Area (acres) 47.710
Non-DCIA Curve Number 90.00
DCIA Percent 90.00
Rainfall Zone Florida Zone 2
Rainfall (in) 50.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 2
Provided TN Treatment Efficiency (%) 40
Required TP Treatment Efficiency (%) 2
Provided TP Treatment Efficiency (%) 67

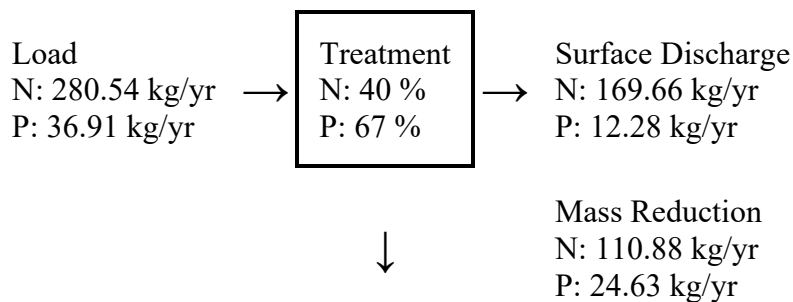
Media Mix Information

Type of Media Mix Not Specified
Media N Reduction (%)
Media P Reduction (%)

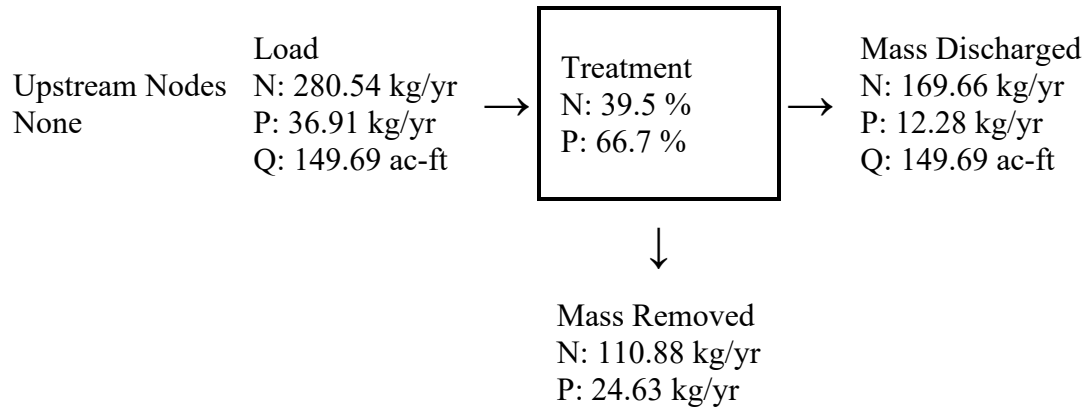
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
TN Mass Load (kg/yr) 0.000
TN Concentration (mg/L) 0.000
TP Mass Load (kg/yr) 0.000
TP Concentration (mg/L) 0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 6 Name: Basin 11

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Wet Detention Design

Permanent Pool Volume (ac-ft)	11.400
Permanent Pool Volume (ac-ft) for 31 days residence	5.875
Annual Residence Time (days)	60
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	44.48
Contributing Area (acres)	38.730
Non-DCIA Curve Number	66.90
DCIA Percent	50.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	41
Provided TN Treatment Efficiency (%)	41
Required TP Treatment Efficiency (%)	41

Provided TP Treatment Efficiency (%) 70

Media Mix Information

Type of Media Mix Not Specified

Media N Reduction (%)

Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000

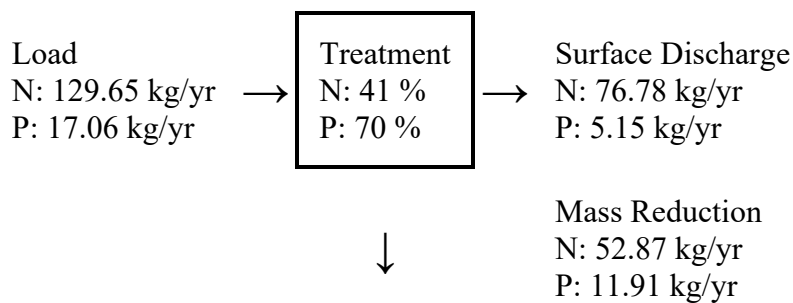
TN Mass Load (kg/yr) 0.000

TN Concentration (mg/L) 0.000

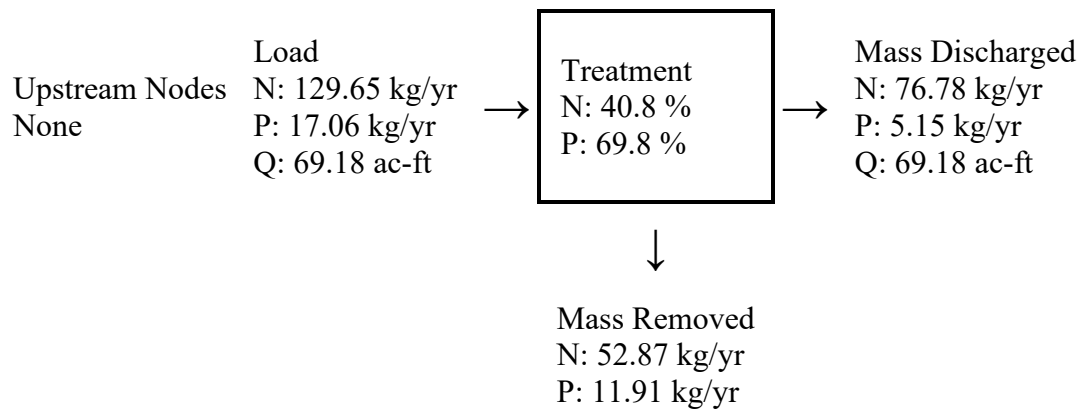
TP Mass Load (kg/yr) 0.000

TP Concentration (mg/L) 0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 7 Name: Basin 10

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Wet Detention Design

Permanent Pool Volume (ac-ft)	45.540
Permanent Pool Volume (ac-ft) for 31 days residence	26.830
Annual Residence Time (days)	53
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	200.73
Contributing Area (acres)	176.350
Non-DCIA Curve Number	67.80
DCIA Percent	50.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	41
Provided TN Treatment Efficiency (%)	40
Required TP Treatment Efficiency (%)	41
Provided TP Treatment Efficiency (%)	69

Media Mix Information

Type of Media Mix Not Specified

Media N Reduction (%)

Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000

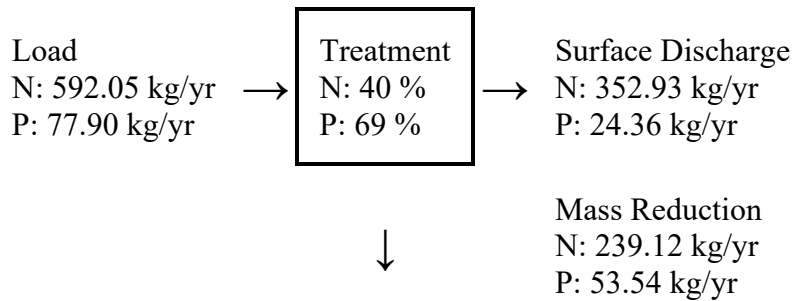
TN Mass Load (kg/yr) 0.000

TN Concentration (mg/L) 0.000

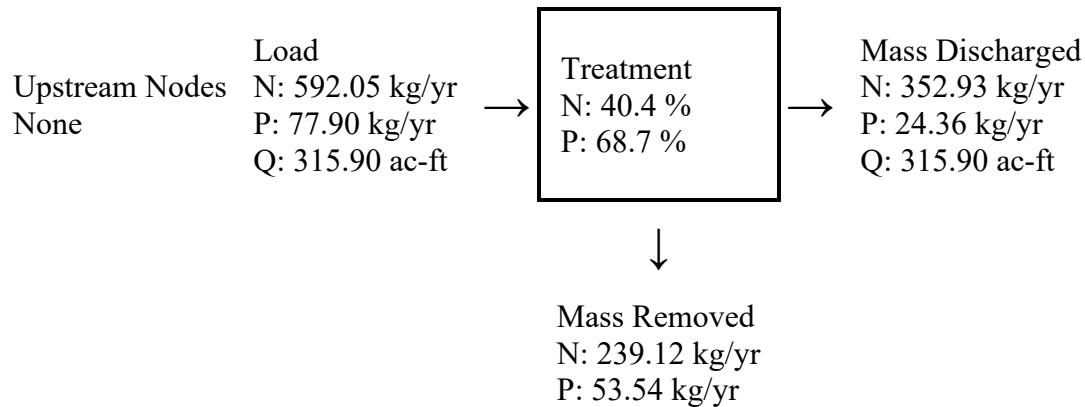
TP Mass Load (kg/yr) 0.000

TP Concentration (mg/L) 0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 8 Name: Basins 12 _ A-C North Side

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Swale Design

Swale Top Width for Flood Conditions - W (ft)	13.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	15,000.000
Average Impervious Length (ft)	15,000.000
Average Impervious Width (ft)	101.000
Average Pervious Width (ft)	49.000
Swale Slope (foot drop/foot length) - S	0.022

Mannings N	0.060
Soil Infiltration Rate (in/hr)	12.000
Side Slope of Swale horizontal/vertical - Z	4.000
Average Height of Swale Block - H	1.000
Length of Berm Upstream of Crest - L_b	10.000
Runoff Area (acres)	51.653
Number of Swale Blocks	150

Watershed Characteristics

Catchment Area (acres)	72.00
Contributing Area (acres)	72.000
Non-DCIA Curve Number	80.00
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	62
Provided TN Treatment Efficiency (%)	89
Required TP Treatment Efficiency (%)	62
Provided TP Treatment Efficiency (%)	89

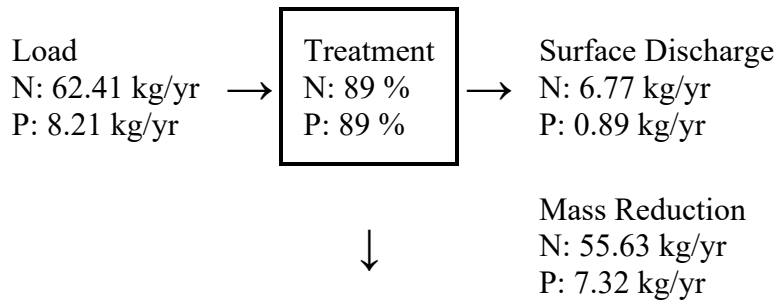
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

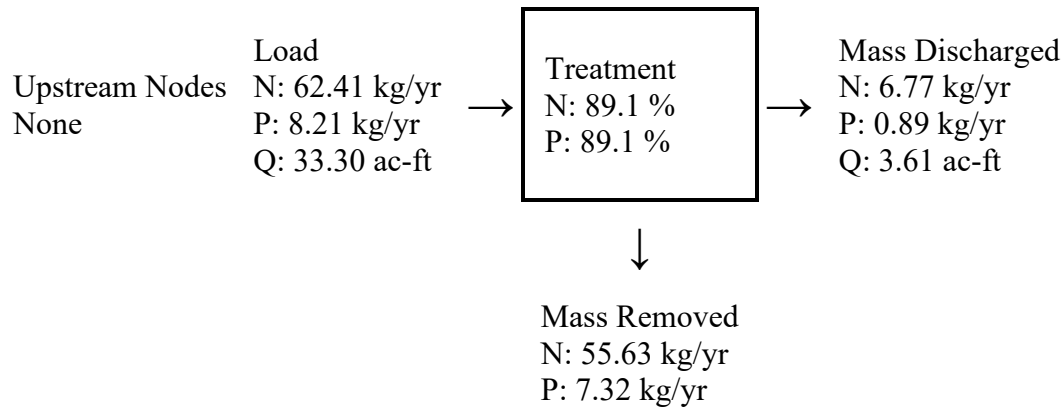
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	10.027
TN Mass Load (kg/yr)	55.635
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	7.320
TP Concentration (mg/L)	0.000

Load Diagram for Swale (stand-alone)



Load Diagram for Swale (As Used In Routing)



Catchment Number: 9 Name: Basins 12 _ A-C South Side

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Swale Design

Swale Top Width for Flood Conditions - W (ft)	13.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	15,000.000
Average Impervious Length (ft)	15,000.000
Average Impervious Width (ft)	101.000
Average Pervious Width (ft)	49.000
Swale Slope (foot drop/foot length) - S	0.022

Mannings N	0.060
Soil Infiltration Rate (in/hr)	12.000
Side Slope of Swale horizontal/vertical - Z	4.000
Average Height of Swale Block - H	1.000
Length of Berm Upstream of Crest - L_b	10.000
Runoff Area (acres)	51.653
Number of Swale Blocks	150

Watershed Characteristics

Catchment Area (acres)	72.00
Contributing Area (acres)	72.000
Non-DCIA Curve Number	80.00
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	62
Provided TN Treatment Efficiency (%)	89
Required TP Treatment Efficiency (%)	62
Provided TP Treatment Efficiency (%)	89

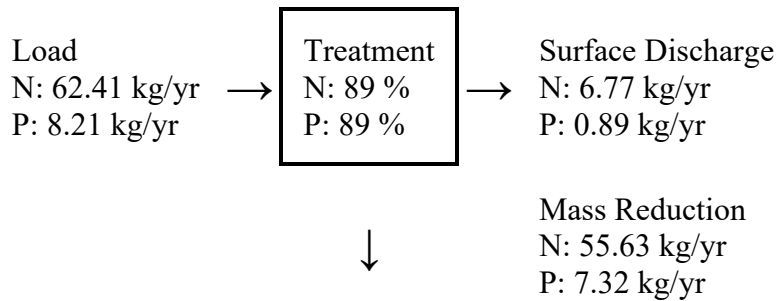
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

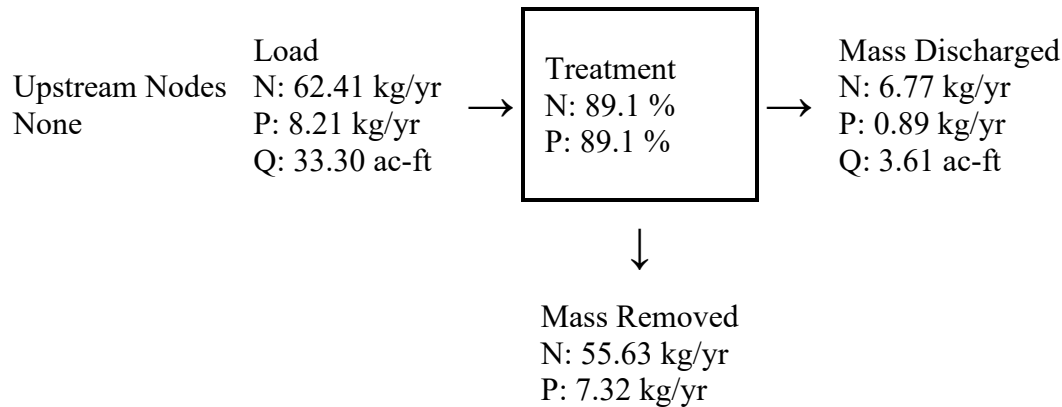
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	10.027
TN Mass Load (kg/yr)	55.635
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	7.320
TP Concentration (mg/L)	0.000

Load Diagram for Swale (stand-alone)



Load Diagram for Swale (As Used In Routing)



Catchment Number: 10 Name: Basin E North Side

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Swale Design

Swale Top Width for Flood Conditions - W (ft)	13.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	1,300.000
Average Impervious Length (ft)	1,300.000
Average Impervious Width (ft)	100.000
Average Pervious Width (ft)	50.000
Swale Slope (foot drop/foot length) - S	0.022

Mannings N	0.060
Soil Infiltration Rate (in/hr)	12.000
Side Slope of Swale horizontal/vertical - Z	4.000
Average Height of Swale Block - H	1.000
Length of Berm Upstream of Crest - L_b	10.000
Runoff Area (acres)	4.477
Number of Swale Blocks	13

Watershed Characteristics

Catchment Area (acres)	6.50
Contributing Area (acres)	6.500
Non-DCIA Curve Number	79.00
DCIA Percent	10.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	76
Provided TN Treatment Efficiency (%)	84
Required TP Treatment Efficiency (%)	76
Provided TP Treatment Efficiency (%)	84

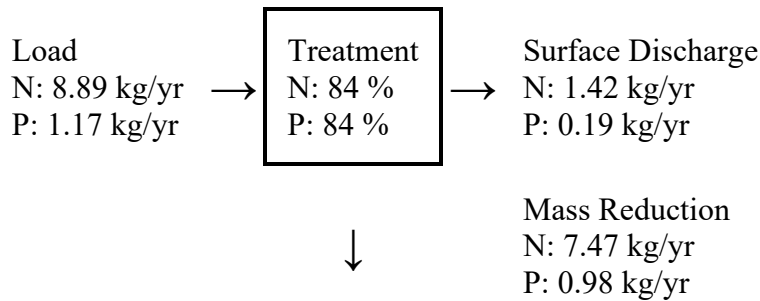
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

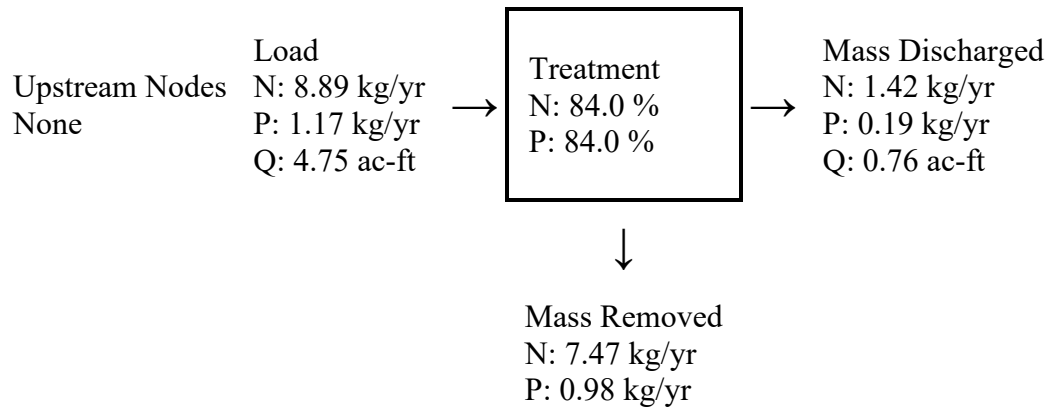
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	1.373
TN Mass Load (kg/yr)	7.470
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.983
TP Concentration (mg/L)	0.000

Load Diagram for Swale (stand-alone)



Load Diagram for Swale (As Used In Routing)



Catchment Number: 11 Name: Basin E South Side

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

Wet Detention Design

Permanent Pool Volume (ac-ft) 2.400

Permanent Pool Volume (ac-ft) for 31 days residence 1.051

Annual Residence Time (days) 71

Littoral Zone Efficiency Credit

Wetland Efficiency Credit

Watershed Characteristics

Catchment Area (acres) 6.50
Contributing Area (acres) 6.500
Non-DCIA Curve Number 79.00
DCIA Percent 50.00
Rainfall Zone Florida Zone 2
Rainfall (in) 50.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 91
Provided TN Treatment Efficiency (%) 41
Required TP Treatment Efficiency (%) 91
Provided TP Treatment Efficiency (%) 71

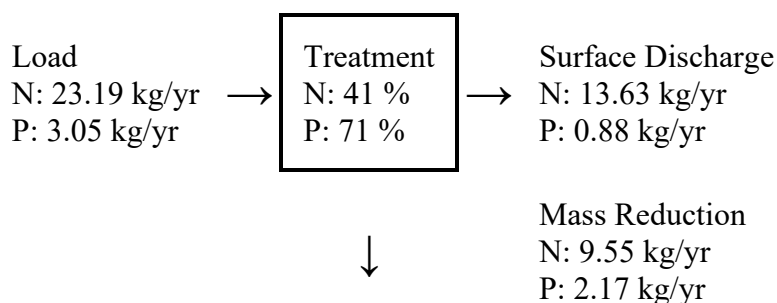
Media Mix Information

Type of Media Mix Not Specified
Media N Reduction (%)
Media P Reduction (%)

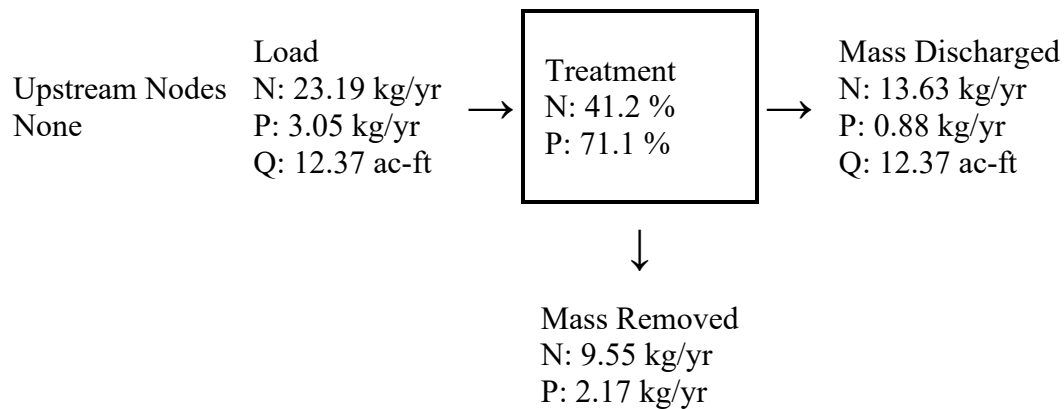
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
TN Mass Load (kg/yr) 0.000
TN Concentration (mg/L) 0.000
TP Mass Load (kg/yr) 0.000
TP Concentration (mg/L) 0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Catchment Number: 12 Name: Basin DSR50N

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

None Design

Watershed Characteristics

Catchment Area (acres)	12.73
Contributing Area (acres)	12.730
Non-DCIA Curve Number	73.00
DCIA Percent	100.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	
Provided TN Treatment Efficiency (%)	
Required TP Treatment Efficiency (%)	
Provided TP Treatment Efficiency (%)	

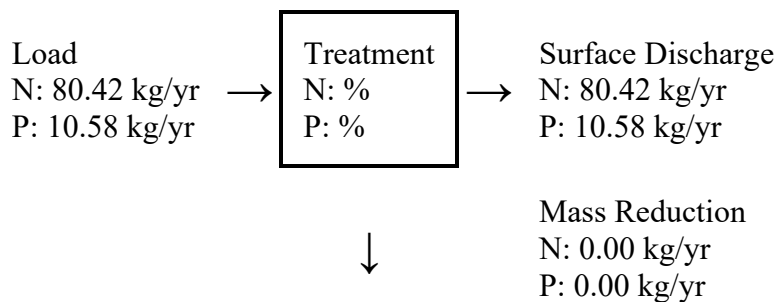
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	0.000
Media P Reduction (%)	0.000

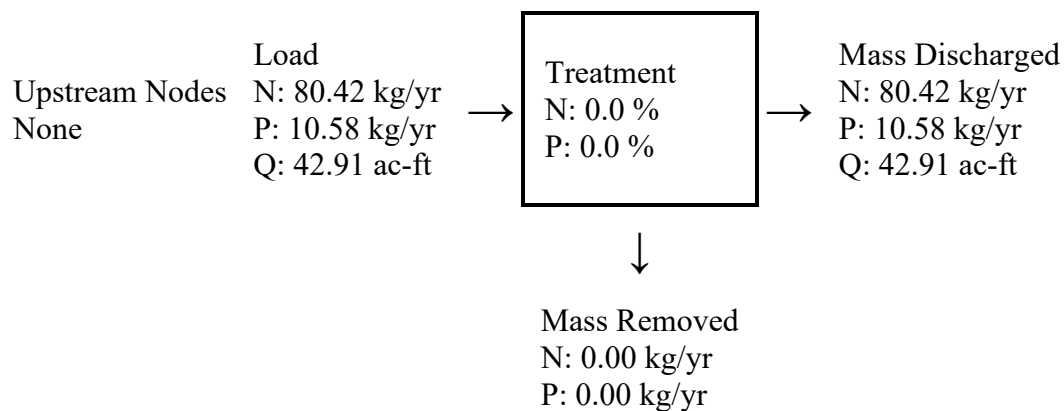
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000
TN Mass Load (kg/yr) 0.000
TN Concentration (mg/L) 0.000
TP Mass Load (kg/yr) 0.000
TP Concentration (mg/L) 0.000

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)



Catchment Number: 13 Name: Basin SR 429N

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

None Design

Watershed Characteristics

Catchment Area (acres)	56.79
Contributing Area (acres)	56.790
Non-DCIA Curve Number	78.00
DCIA Percent	0.00
Rainfall Zone	Florida Zone 2
Rainfall (in)	50.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	20
Provided TN Treatment Efficiency (%)	
Required TP Treatment Efficiency (%)	20
Provided TP Treatment Efficiency (%)	

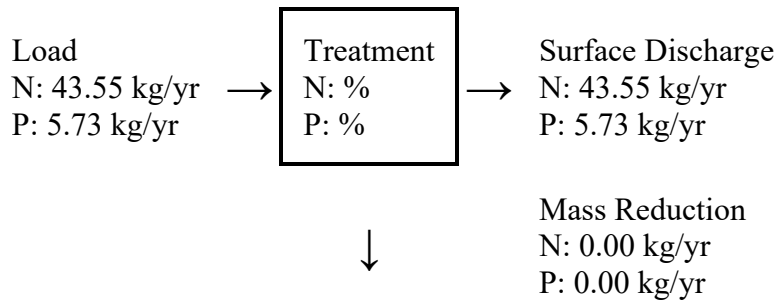
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	0.000
Media P Reduction (%)	0.000

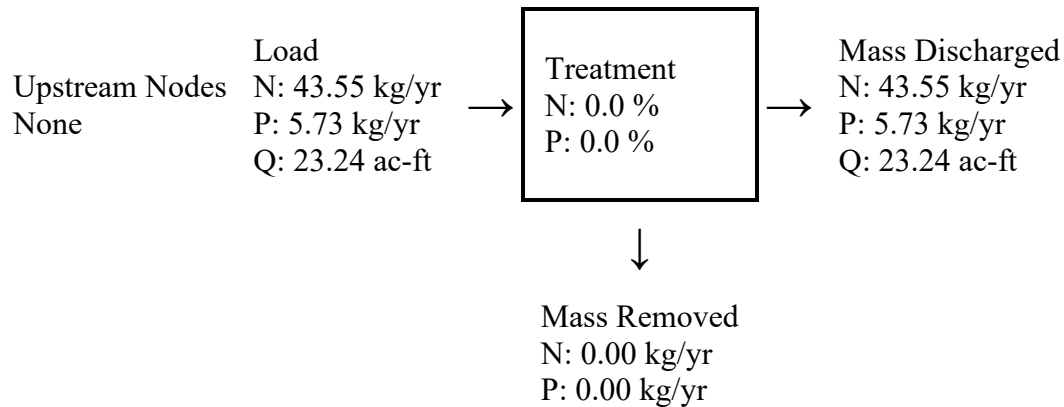
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)



Catchment Number: 14 Name: Basin SR 429S

Project: FTE Widening From SR 408 to SR 50-Basin 7-west

Date: 11/29/2021

None Design

Watershed Characteristics

Catchment Area (acres) 10.62
Contributing Area (acres) 10.620
Non-DCIA Curve Number 85.00
DCIA Percent 0.00
Rainfall Zone Florida Zone 2

Rainfall (in) 50.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 12

Provided TN Treatment Efficiency (%)

Required TP Treatment Efficiency (%) 12

Provided TP Treatment Efficiency (%)

Media Mix Information

Type of Media Mix Not Specified

Media N Reduction (%) 0.000

Media P Reduction (%) 0.000

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000

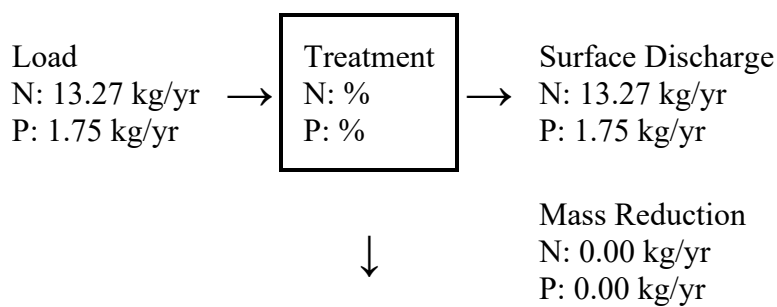
TN Mass Load (kg/yr) 0.000

TN Concentration (mg/L) 0.000

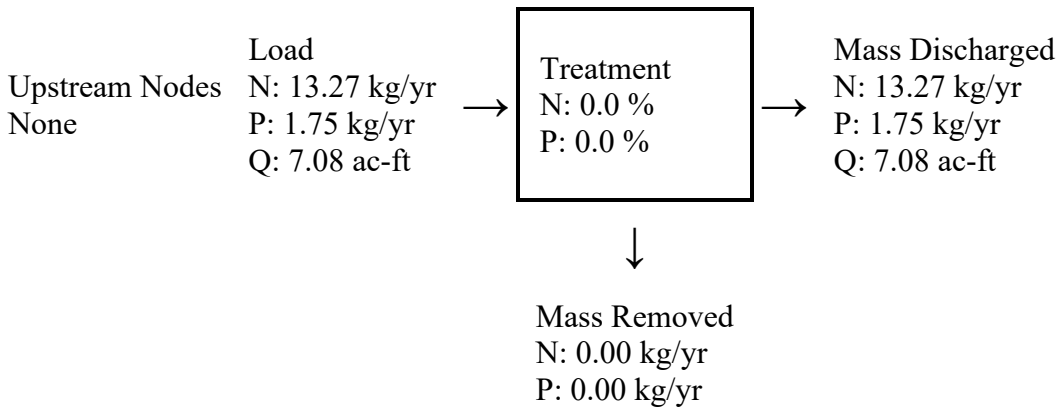
TP Mass Load (kg/yr) 0.000

TP Concentration (mg/L) 0.000

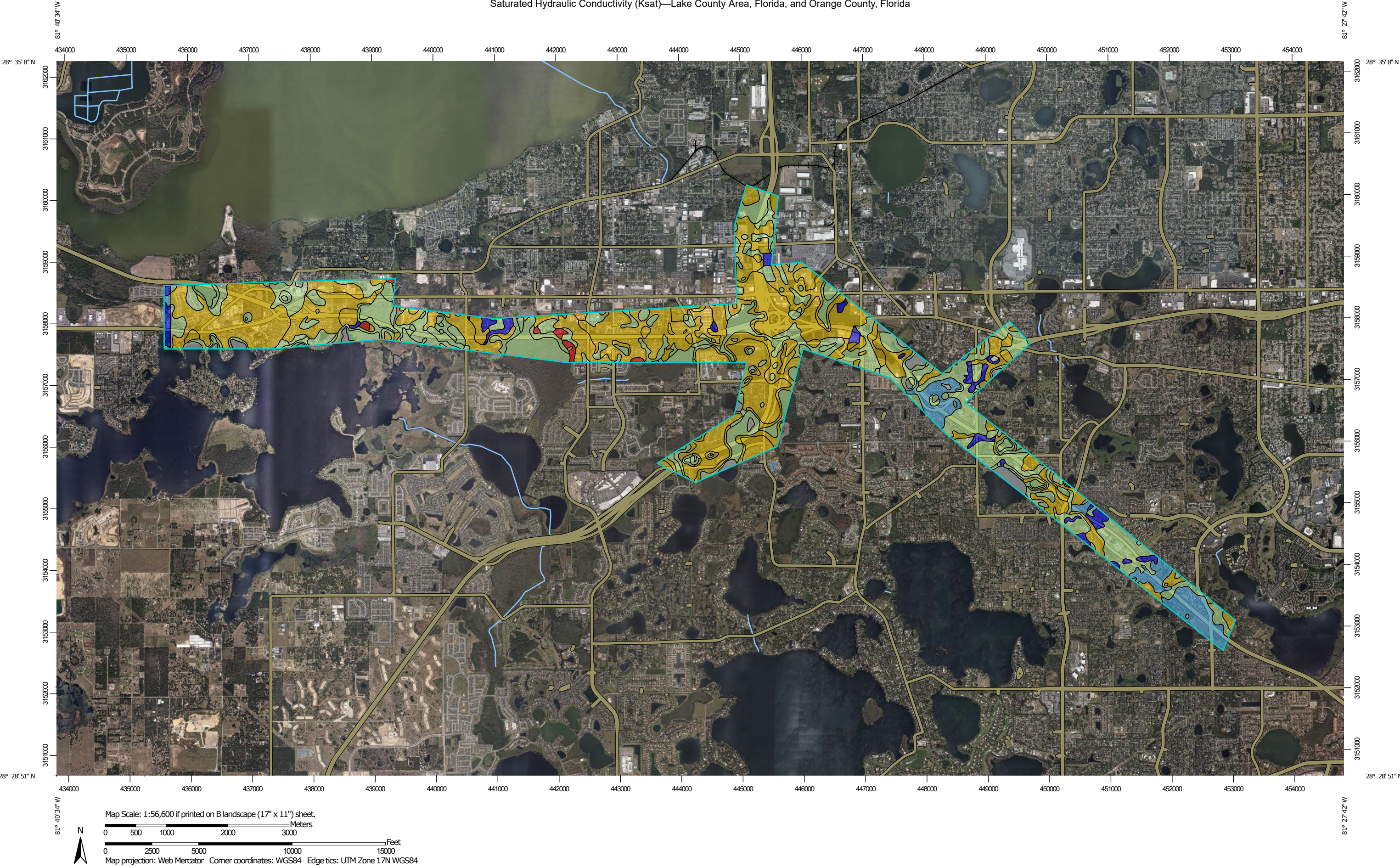
Load Diagram for None (stand-alone)



Load Diagram for None (As Used In Routing)



Saturated Hydraulic Conductivity (Ksat)—Lake County Area, Florida, and Orange County, Florida









MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)

Soils







Soil Rating Polygons

 ≤ 78.0000
 > 78.0000 and ≤ 91.7400
 > 91.7400 and ≤ 92.0000
 > 92.0000 and ≤ 141.0000
 > 141.0000 and ≤ 247.0700
 Not rated or not available


Soil Rating Lines

 ≤ 78.0000
 > 78.0000 and ≤ 91.7400
 > 91.7400 and ≤ 92.0000
 > 92.0000 and ≤ 141.0000
 > 141.0000 and ≤ 247.0700
 Not rated or not available






Soil Rating Points

 ≤ 78.0000
 > 78.0000 and ≤ 91.7400
 > 91.7400 and ≤ 92.0000
 > 92.0000 and ≤ 141.0000
 > 141.0000 and ≤ 247.0700
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lake County Area, Florida
 Survey Area Data: Version 21, Aug 27, 2021

Soil Survey Area: Orange County, Florida
 Survey Area Data: Version 18, Aug 27, 2021

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 19, 2020—Apr 13, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
8	Candler sand, 0 to 5 percent slopes	141.0000	4.6	0.1%
9	Candler sand, 5 to 12 percent slopes	247.0000	21.3	0.5%
99	Water		2.1	0.0%
Subtotals for Soil Survey Area			28.0	0.6%
Totals for Area of Interest			4,658.9	100.0%

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
1	Arents, nearly level	247.0000	15.0	0.3%
2	Archbold fine sand, 0 to 5 percent slopes	141.0000	248.2	5.3%
3	Basinger fine sand, frequently ponded, 0 to 1 percent slopes	92.0000	239.9	5.1%
4	Candler fine sand, 0 to 5 percent slopes	91.7400	441.0	9.5%
5	Candler fine sand, 5 to 12 percent slopes	92.0000	113.5	2.4%
6	Candler-Apopka fine sands, 5 to 12 percent slopes	92.0000	58.7	1.3%
17	Floridana mucky fine sand, frequently ponded, 0 to 1 percent slopes	92.0000	3.8	0.1%
20	Immokalee fine sand	92.0000	202.4	4.3%
22	Lochloosa fine sand	78.0000	27.5	0.6%
26	Ona fine sand, 0 to 2 percent slopes	92.0000	166.7	3.6%
27	Ona-Urban land complex	92.0000	2.0	0.0%
28	Florahome fine sand, 0 to 5 percent slopes	92.0000	2.1	0.0%
33	Pits		3.1	0.1%
34	Pomello fine sand, 0 to 5 percent slopes	247.0700	107.6	2.3%
37	St. Johns fine sand	92.0000	132.7	2.8%

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
39	St. Lucie-Urban land complex, 0 to 5 percent slopes	141.0000	0.1	0.0%
40	Samsula muck, frequently ponded, 0 to 1 percent slopes	92.0000	78.8	1.7%
41	Samsula-Hontoon-Basinger association, depressional	92.0000	91.2	2.0%
42	Sanibel muck	92.0000	273.5	5.9%
43	Seffner fine sand, 0 to 2 percent slopes	91.7400	22.8	0.5%
44	Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes	91.7400	839.1	18.0%
45	Smyrna fine sand-Urban land complex, 0 to 2 percent slopes	91.7400	16.3	0.3%
46	Tavares fine sand, 0 to 5 percent slopes	92.0000	403.8	8.7%
47	Tavares-Millhopper fine sands, 0 to 5 percent slopes	91.7400	258.1	5.5%
48	Tavares fine sand-Urban land complex, 0 to 5 percent slopes	91.7400	2.1	0.0%
51	Wabasso fine sand, 0 to 2 percent slopes	91.7400	12.4	0.3%
53	Wauberg fine sand	92.0000	40.5	0.9%
54	Zolfo fine sand, 0 to 2 percent slopes	91.7400	732.5	15.7%
55	Zolfo-Urban land complex	92.0000	3.7	0.1%
99	Water		91.7	2.0%
Subtotals for Soil Survey Area			4,630.6	99.4%
Totals for Area of Interest			4,658.9	100.0%

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 11/11/2021

Wekiva Recharge Basin Calculations

Criteria 3-in. (1ft./12.) x Increase in Impervious Area (ac.)

Basin	Required Volume (ac-ft)	Total Required Volume (ac-ft)	Wekiva Recharge Volume Provided Treatment Volume
12A	0.34	3.18	6.18
12B	0.33		
12C	0.11		
A1	0.13		
A2	0.00		
A3	0.11		
A4	0.14		
A5	0.16		
B1	0.68		
B2	0.56		
B20SN	0.19		
B20SS	0.13		
C1	0.43		
C2	-0.18		
C20SE	0.05		
E4	1.04	1.19	0.26
E1	0.15		



Project Name: SR 91 Widening from SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 11/11/2021

Wekiva Recharge Basin Calculations

Criteria

3-in. (1ft./12.) x Increase in Impervious Area (ac.)

Basin	Required Volume (ac-ft)	Total Required Volume (ac-ft)	Wekiva Recharge Volume Provided Treatment Volume (ac-ft)
C1A	0.01	0.60	0.60
D10	-0.04		
D20	-0.14		
D30	-0.41		
D40	0.81		
D50	-0.18		
D60	-0.03		
D70	0.06		
D80	0.09		
DSR50N	0.21		
DSR50S	0.22		



Project Name: SR 91 Widening from South of SR 408 to SR 50
Project Number: 444007-1-22-01
Task Description: Estimation of ROW Requirements

Prepared by: LER
Checked by: JAF
Date: 11/22/2021

Wekiva Recharge Calcs

approximate length availbe for linear pond (RT)	30000 ft	Basin 12 & A-C
storage depth	1 ft	
bottom width	5 ft	
side slopes	4 assume 1 foot vertical per value indicated	
ditch block spacing	300 ft	
approximate length ditch block occupy	15 ft	
length available for storage	29940	
Volume Available	269460 CF	

approximate length availbe for linear pond (LT)	1300	Basin E
storage depth	1 ft	
bottom width	5 ft	
side slopes	4 assume 1 foot vertical per value indicated	
ditch block spacing	300 ft	
approximate length ditch block occupy	15 ft	
length available for storage	1270	
Volume Available	11430 CF	

APPENDIX D – EARTHWORK QUANTITIES

Basin 5 Alternative 1	
Pond Excavation	
Existing Ground (ft.)	154
Pond Bottom (ft.)	147
Total Depth (ft.)	7
Pond Bottom Area (sq. ft.)	38441
Maint. Berm Area-Inside Contour (sq. ft.)	64587
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	63805
Average Area (sq. ft.)	51123
Excavation Volume (cu. Ft.)	357862
Maintenance Berm Elev. (ft.)	154.2
Excavation or Fill	Fill
Depth (ft.)	-0.2
Total Pond Earthwork (CF)	357862
Total Pond Earthwork (CY)	13254
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$132,938.99

Note: Minimal fill associated with pond berm was excluded from calculation.

Basin 5 Alternative 2	
Pond Excavation	
Existing Ground (ft.)	139
Pond Bottom (ft.)	134
Total Depth (ft.)	5
Pond Bottom Area (sq. ft.)	62298
Maint. Berm Area-Inside Contour (sq. ft.)	83483
Average Area (sq. ft.)	72891
Excavation Volume (cu. Ft.)	364453
Maintenance Berm Elev. (ft.)	138.9
Excavation or Fill	Excavation
Depth (ft.)	0.1
Area of Maintenance Berm-Outside Contour (sq.ft)	101081
Area of Maintenance Berm (difference between inside & outside contour (sq.ft)	17598
Width Needed for Tie Down Slope	0.20
Area within Tie Down Slope (sq.ft)	245
1/2 of Area within Tie Down Slope (sq.ft)	122
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	1772
Total Pond Earthwork (CF)	366225
Total Pond Earthwork (CY)	13564
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$136,045.63

Basin 5 Alternative 3	
Pond Excavation	
Existing Ground (ft.)	144
Pond Bottom (ft.)	131
Total Depth (ft.)	13
Pond Bottom Area (sq. ft.)	108441
Maint. Berm Area-Inside Contour (sq. ft.)	126300
Average Area (sq. ft.)	117371
Excavation Volume (cu. Ft.)	1525817
Maintenance Berm Elev. (ft.)	141.2
Excavation or Fill	Excavation
Depth (ft.)	2.8
Area of Maintenance Berm (difference between inside & outside contour (sq.ft)	22200
Width Needed for Tie Down Slope	5.60
Area within Tie Down Slope (sq.ft)	6215
1/2 of Area within Tie Down Slope (sq.ft)	3108
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	70861
Total Pond Earthwork (CF)	1596678
Total Pond Earthwork (CY)	59136
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$593,136.12

Basin 6 Alternative 1	
Pond Excavation	
Existing Ground (ft.)	111.6
Pond Bottom (ft.)	96
Total Depth (ft.)	15.6
Pond Bottom Area (sq. ft.)	53213
Maint. Berm Area-Inside Contour (sq. ft.)	80038
Average Area (sq. ft.)	66626
Excavation Volume (cu. Ft.)	1039358
Maintenance Berm Elev. (ft.)	102.6
Excavation or Fill	Excavation
Depth (ft.)	9
Area of Maintenance Berm-Outside Contour (sq.ft)	97169
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	17131
Width Needed for Tie Down Slope	18.00
Area within Tie Down Slope (sq.ft)	22422
1/2 of Area within Tie Down Slope (sq.ft)	11211
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	255078
Total Pond Earthwork (CF)	1294436
Total Pond Earthwork (CY)	47942
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$480,858.93

Basin 6 Alternative 2	
Pond Excavation	
Existing Ground (ft.)	120
Pond Bottom (ft.)	99.1
Total Depth (ft.)	20.9
Pond Bottom Area (sq. ft.)	34746
Maint. Berm Area-Inside Contour (sq. ft.)	82731
Average Area (sq. ft.)	58739
Excavation Volume (cu. Ft.)	1227635
Maintenance Berm Elev. (ft.)	112.6
Excavation or Fill	Excavation
Depth (ft.)	7.4
Area of Maintenance Berm-Outside Contour (sq.ft)	100132
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	17401
Width Needed for Tie Down Slope	14.80
Area within Tie Down Slope (sq.ft)	18554
1/2 of Area within Tie Down Slope (sq.ft)	9277
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	197417
Total Pond Earthwork (CF)	1425052
Total Pond Earthwork (CY)	52780
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$529,380.49

Basin 6 Alternative 3	
Pond Excavation	
Existing Ground (ft.)	145
Pond Bottom (ft.)	140
Total Depth (ft.)	5
Pond Bottom Area (sq. ft.)	72553
Maint. Berm Area-Inside Contour (sq. ft.)	122866
Average Area (sq. ft.)	97710
Excavation Volume (cu. Ft.)	488548
Maintenance Berm Elev. (ft.)	145.2
Excavation or Fill	Fill
Depth (ft.)	-0.2
Total Pond Earthwork (CF)	488548
Total Pond Earthwork (CY)	18094
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$181,486.35

Note: Minimal fill associated with pond berm was excluded from calculation.

Basin 7 Alternative 1	
Pond Excavation	
Existing Ground (ft.)	128.1
Pond Bottom (ft.)	122
Total Depth (ft.)	6.1
Pond Bottom Area (sq. ft.)	153726
Maint. Berm Area-Inside Contour (sq. ft.)	216801
Average Area (sq. ft.)	185264
Excavation Volume (cu. Ft.)	1130107
Maintenance Berm Elev. (ft.)	129.5
Excavation or Fill	Fill
Depth (ft.)	-1.4
Total Pond Earthwork (CF)	1130107
Total Pond Earthwork (CY)	41856
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$419,813.95

Notes: 1. Minimal fill associated with pond berm was excluded from calculation.

Basin 7 Alternative 2	
Pond Excavation	
Existing Ground (ft.)	106.1
Pond Bottom (ft.)	83.5
Total Depth (ft.)	22.6
Pond Bottom Area (sq. ft.)	115239
Maint. Berm Area-Inside Contour (sq. ft.)	209502
Average Area (sq. ft.)	162371
Excavation Volume (cu. Ft.)	3669573
Maintenance Berm Elev. (ft.)	97.9
Excavation or Fill	Excavation
Depth (ft.)	8.2
Area of Maintenance Berm-Outside Contour (sq.ft)	237525
Area of Maintenance Berm (difference between inside & outside contour (sq.ft)	28023
Width Needed for Tie Down Slope	16.40
Area within Tie Down Slope (sq.ft)	32256
1/2 of Area within Tie Down Slope (sq.ft)	16128
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	362038
Total Pond Earthwork (CF)	4031612
Total Pond Earthwork (CY)	149319
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$1,497,669.01

Note: Values above do not include the required interchange storage noted elsewhere in the calculations.

Basin 7 Alternative 3 Pond 1	
Pond Excavation	
Existing Ground (ft.)	135
Pond Bottom (ft.)	134
Total Depth (ft.)	1
Pond Bottom Area (sq. ft.)	45511
Area Where Side Slope Intersects Exst Ground (sq. ft.)	51438
Average Area (sq. ft.)	48475
Excavation Volume (cu. Ft.)	48475
Maintenance Berm Elev. (ft.)	138.75
Excavation or Fill	Fill
Depth (ft.)	3.75
Area of Maintenance Berm-Inside Contour (sq.ft)	69821
Area of Maintenance Berm-Outside Contour (sq.ft)	94073
Area of Maintenance Berm (difference between inside & outside contour (sq.ft)	24252
Width Needed for Tie Down Slope	7.50
Area within Interior Side Slope (sq.ft)	18383
1/2 of Area within Interior Side Slope (sq.ft)	9192
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	125413
Total Pond Earthwork (CF)	173888
Total Pond Earthwork (CY)	6440
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$64,596.03

Total Earthwork cost for all Alt 3 Pond Cells= \$1,440,273.22

Basin 7 Alternative 3 Pond 3	
Pond Excavation	
Existing Ground (ft.)	140
Pond Bottom (ft.)	134
Total Depth (ft.)	6
Pond Bottom Area (sq. ft.)	158373
Maint. Berm Area-Inside Contour (sq. ft.)	20668
Average Area (sq. ft.)	89521
Excavation Volume (cu. Ft.)	537123
Maintenance Berm Elev. (ft.)	139.25
Excavation or Fill	Excavation
Depth (ft.)	0.75
Area of Maintenance Berm-Outside Contour (sq.ft)	248468
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	227800
Volume Within Maint Berm (cu. ft.)	170850
Total Pond Earthwork (CF)	707973
Total Pond Earthwork (CY)	26221
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$262,998.86

Basin 7 Alternative 3 Pond 4	
Pond Excavation	
Existing Ground (ft.)	138
Pond Bottom (ft.)	127
Total Depth (ft.)	11
Pond Bottom Area (sq. ft.)	62488
Maint. Berm Area-Inside Contour (sq. ft.)	128319
Average Area (sq. ft.)	95404
Excavation Volume (cu. Ft.)	1049439
Maintenance Berm Elev. (ft.)	135.25
Excavation or Fill	Excavation
Depth (ft.)	2.75
Area of Maintenance Berm-Outside Contour (sq.ft)	163153
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	34834
Width Needed for Tie Down Slope	5.50
Area within Tie Down Slope (sq.ft)	13127
1/2 of Area within Tie Down Slope (sq.ft)	6564
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	113843
Total Pond Earthwork (CF)	1163282
Total Pond Earthwork (CY)	43085
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$432,137.58

Basin 7 Alternative 3 Pond 7	
Pond Excavation	
Existing Ground (ft.)	140
Pond Bottom (ft.)	134
Total Depth (ft.)	6
Pond Bottom Area (sq. ft.)	267158
Maint. Berm Area-Inside Contour (sq. ft.)	320314
Average Area (sq. ft.)	293736
Excavation Volume (cu. Ft.)	1762416
Maintenance Berm Elev. (ft.)	138.75
Excavation or Fill	Excavation
Depth (ft.)	1.25
Area of Maintenance Berm-Outside Contour (sq.ft)	371609
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	51295
Width Needed for Tie Down Slope	2.50
Area within Tie Down Slope (sq.ft)	8687
1/2 of Area within Tie Down Slope (sq.ft)	4344
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	69548
Total Pond Earthwork (CF)	1831964
Total Pond Earthwork (CY)	67851
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$680,540.75

Basin 11 Alternative 3 Pond TP-3.1	
Pond Excavation	
Existing Ground (ft.)	121.11
Pond Bottom (ft.)	106.6
Total Depth (ft.)	14.51
Pond Bottom Area (sq. ft.)	5869
Maint. Berm Area-Inside Contour (sq. ft.)	42742
Average Area (sq. ft.)	24306
Excavation Volume (cu. Ft.)	352673
Maintenance Berm Elev. (ft.)	119.25
Excavation or Fill	Excavation
Depth (ft.)	1.86
Area of Maintenance Berm-Outside Contour (sq.ft)	57550
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	14808
Width Needed for Tie Down Slope	3.72
Area within Tie Down Slope (sq.ft)	3891
1/2 of Area within Tie Down Slope (sq.ft)	1946
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	31162
Total Pond Earthwork (CF)	383834
Total Pond Earthwork (CY)	14216
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$142,587.34

Total Earthwork cost for all Alt 3 Pond Cells= \$346,147.91

Basin 11 Alternative 3 Pond TP-3.2	
Pond Excavation	
Existing Ground (ft.)	122
Pond Bottom (ft.)	106.6
Total Depth (ft.)	15.4
Pond Bottom Area (sq. ft.)	7124
Maint. Berm Area-Inside Contour (sq. ft.)	39226
Average Area (sq. ft.)	23175
Excavation Volume (cu. Ft.)	356895
Maintenance Berm Elev. (ft.)	119.25
Excavation or Fill	Excavation
Depth (ft.)	2.75
Area of Maintenance Berm-Outside Contour (sq.ft)	52654
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	13428
Width Needed for Tie Down Slope	5.50
Area within Tie Down Slope (sq.ft)	5277
1/2 of Area within Tie Down Slope (sq.ft)	2639
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	44183
Total Pond Earthwork (CF)	401078
Total Pond Earthwork (CY)	14855
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$148,993.00

Basin 11 Alternative 3 Pond TP-4	
Pond Excavation	
Existing Ground (ft.)	121.1
Pond Bottom (ft.)	106.6
Total Depth (ft.)	14.5
Pond Bottom Area (sq. ft.)	106852
Maint. Berm Area-Inside Contour (sq. ft.)	227680
Average Area (sq. ft.)	0
Excavation Volume (cu. Ft.)	0
Maintenance Berm Elev. (ft.)	120.6
Excavation or Fill	Excavation
Depth (ft.)	0.5
Area of Maintenance Berm-Outside Contour (sq.ft)	263914
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	36234
Width Needed for Tie Down Slope	1.00
Area within Tie Down Slope (sq.ft)	515099
1/2 of Area within Tie Down Slope (sq.ft)	257550
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	146892
Total Pond Earthwork (CF)	146892
Total Pond Earthwork (CY)	5440
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$54,567.56

Basin SR 429N Alternative 1	
Pond Excavation	
Existing Ground (ft.)	124
Pond Bottom (ft.)	112.7
Total Depth (ft.)	11.3
Pond Bottom Area (sq. ft.)	23220
Maint. Berm Area-Inside Contour (sq. ft.)	58327
Average Area (sq. ft.)	40774
Excavation Volume (cu. Ft.)	460741
Maintenance Berm Elev. (ft.)	123.7
Excavation or Fill	Excavation
Depth (ft.)	0.3
Area of Maintenance Berm-Outside Contour (sq.ft)	72821
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	14494
Width Needed for Tie Down Slope	0.60
Area within Tie Down Slope (sq.ft)	609
1/2 of Area within Tie Down Slope (sq.ft)	305
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	4440
Total Pond Earthwork (CF)	465180
Total Pond Earthwork (CY)	17229
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$172,805.79

Basin SR429N Alternative 2	
Pond Excavation	
Existing Ground (ft.)	122
Pond Bottom (ft.)	110.1
Total Depth (ft.)	11.9
Pond Bottom Area (sq. ft.)	12326
Maint. Berm Area-Inside Contour (sq. ft.)	55796
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	45832
Average Area (sq. ft.)	29079
Excavation Volume (cu. Ft.)	346040
Maintenance Berm Elev. (ft.)	124.8
Area of Maintenance Berm-Outside Contour (sq.ft)	70373
Excavation or Fill	Fill
Depth (ft.)	2.8
Width Needed for Tie Down Slope	5.60
Area within Tie Down Slope (sq.ft)	5805
1/2 of Area within Tie Down Slope (sq.ft)	2903
Volume Within Maint Berm (cu. ft.)	62892
Total Pond Earthwork (CF)	408932
Total Pond Earthwork (CY)	15146
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$151,910.78

Basin SR429N Alternative 3	
Pond Excavation	
Existing Ground (ft.)	121
Pond Bottom (ft.)	110.1
Total Depth (ft.)	10.9
Pond Bottom Area (sq. ft.)	12663
Maint. Berm Area-Inside Contour (sq. ft.)	47839
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	40479
Average Area (sq. ft.)	26571
Excavation Volume (cu. Ft.)	289624
Maintenance Berm Elev. (ft.)	123
Area of Maintenance Berm-Outside Contour (sq.ft)	62721
Excavation or Fill	Fill
Depth (ft.)	2
Width Needed for Tie Down Slope	4.00
Area within Tie Down Slope (sq.ft)	4208
1/2 of Area within Tie Down Slope (sq.ft)	2104
Volume Within Maint Berm (cu. ft.)	41332
Total Pond Earthwork (CF)	330956
Total Pond Earthwork (CY)	12258
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$122,943.99

Basin SR 429S Alternative 1	
Pond Excavation	
Existing Ground (ft.)	125
Pond Bottom (ft.)	118.4
Total Depth (ft.)	6.6
Pond Bottom Area (sq. ft.)	2000
Maint. Berm Area-Inside Contour (sq. ft.)	11827
Average Area (sq. ft.)	6914
Excavation Volume (cu. Ft.)	45629
Maintenance Berm Elev. (ft.)	124.4
Excavation or Fill	Excavation
Depth (ft.)	0.6
Area of Maintenance Berm-Outside Contour (sq.ft)	19370
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	7543
Width Needed for Tie Down Slope	1.20
Area within Tie Down Slope (sq.ft)	665
1/2 of Area within Tie Down Slope (sq.ft)	333
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	4725
Total Pond Earthwork (CF)	50354
Total Pond Earthwork (CY)	1865
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$18,705.73

Basin SR429S Alternative 2	
Pond Excavation	
Existing Ground (ft.)	124
Pond Bottom (ft.)	114.7
Total Depth (ft.)	9.3
Pond Bottom Area (sq. ft.)	846
Maint. Berm Area-Inside Contour (sq. ft.)	11790
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	11070
Average Area (sq. ft.)	5958
Excavation Volume (cu. Ft.)	55409
Maintenance Berm Elev. (ft.)	124.4
Area of Maintenance Berm-Outside Contour (sq.ft)	19326
Excavation or Fill	Fill
Depth (ft.)	0.4
Width Needed for Tie Down Slope	0.80
Area within Tie Down Slope (sq.ft)	442
1/2 of Area within Tie Down Slope (sq.ft)	221
Volume Within Maint Berm (cu. ft.)	3247
Total Pond Earthwork (CF)	58656
Total Pond Earthwork (CY)	2172
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$21,789.69

Basin SR429S Alternative 3	
Pond Excavation	
Existing Ground (ft.)	117
Pond Bottom (ft.)	111.6
Total Depth (ft.)	5.4
Pond Bottom Area (sq. ft.)	14135
Maint. Berm Area-Inside Contour (sq. ft.)	16610
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	15269
Average Area (sq. ft.)	14702
Excavation Volume (cu. Ft.)	79391
Maintenance Berm Elev. (ft.)	121.2
Area of Maintenance Berm-Outside Contour (sq.ft)	17501
Excavation or Fill	Fill
Depth (ft.)	4.2
Width Needed for Tie Down Slope	8.40
Area within Tie Down Slope (sq.ft)	4140
1/2 of Area within Tie Down Slope (sq.ft)	2070
Volume Within Maint Berm and side slope footprint (cu.	15252
Total Pond Earthwork (CF)	94643
Total Pond Earthwork (CY)	3505
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$35,158.16

Basin 12 Alternative 1	
Pond Excavation	
Existing Ground (ft.)	105.1
Pond Bottom (ft.)	97.2
Total Depth (ft.)	7.9
Pond Bottom Area (sq. ft.)	31412
Maint. Berm Area-Inside Contour (sq. ft.)	71372
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	57649
Average Area (sq. ft.)	44531
Excavation Volume (cu. Ft.)	351791
Maintenance Berm Elev. (ft.)	108.6
Area of Maintenance Berm-Outside Contour (sq.ft)	87441
Excavation or Fill	Fill
Depth (ft.)	3.5
Width Needed for Tie Down Slope	7.00
Area within Tie Down Slope (sq.ft)	7982
1/2 of Area within Tie Down Slope (sq.ft)	3991
Volume Within Maint Berm (cu. ft.)	94225
Total Pond Earthwork (CF)	446016
Total Earthwork from adj floodplain comp site (CF)	94525
Total Pond Earthwork (CY)	20020
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$200,801.05

Basin 12 Alternative 2	
Pond Excavation	
Existing Ground (ft.)	108
Pond Bottom (ft.)	97.2
Total Depth (ft.)	10.8
Pond Bottom Area (sq. ft.)	32169
Maint. Berm Area-Inside Contour (sq. ft.)	74247
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	71156
Average Area (sq. ft.)	51663
Excavation Volume (cu. Ft.)	557955
Maintenance Berm Elev. (ft.)	108.7
Area of Maintenance Berm-Outside Contour (sq.ft)	91642
Excavation or Fill	Fill
Depth (ft.)	0.7
Width Needed for Tie Down Slope	1.40
Area within Tie Down Slope (sq.ft)	1695
1/2 of Area within Tie Down Slope (sq.ft)	848
Volume Within Maint Berm (cu. ft.)	13852
Total Pond Earthwork (CF)	571807
Total Pond Earthwork (CY)	21178
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$212,415.56

Basin 12 Alternative 3	
Pond Excavation	
Existing Ground (ft.)	105.1
Pond Bottom (ft.)	97.2
Total Depth (ft.)	7.9
Pond Bottom Area (sq. ft.)	53939
Maint. Berm Area-Inside Contour (sq. ft.)	98315
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	87759
Average Area (sq. ft.)	70849
Excavation Volume (cu. Ft.)	559707
Maintenance Berm Elev. (ft.)	107.3
Area of Maintenance Berm-Outside Contour (sq.ft)	117430
Excavation or Fill	Fill
Depth (ft.)	2.2
Width Needed for Tie Down Slope	4.40
Area within Tie Down Slope (sq.ft)	5875
1/2 of Area within Tie Down Slope (sq.ft)	2938
Volume Within Maint Berm (cu. ft.)	60127
Total Pond Earthwork (CF)	619834
Total Earthwork from adj floodplain comp site (CF)	69260
Total Pond Earthwork (CY)	25522
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$255,985.73

Basin A Alternative 1	
Pond Excavation	
Existing Ground (ft.)	111.1
Pond Bottom (ft.)	97.2
Total Depth (ft.)	13.9
Pond Bottom Area (sq. ft.)	35275
Maint. Berm Area-Inside Contour (sq. ft.)	90030
Average Area (sq. ft.)	62653
Excavation Volume (cu. Ft.)	870870
Maintenance Berm Elev. (ft.)	109.2
Excavation or Fill	Excavation
Depth (ft.)	1.9
Area of Maintenance Berm-Outside Contour (sq.ft)	108281
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	18251
Width Needed for Tie Down Slope	3.80
Area within Tie Down Slope (sq.ft)	4848
1/2 of Area within Tie Down Slope (sq.ft)	2424
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	39282
Total Pond Earthwork (CF)	910152
Total Pond Earthwork (CY)	33709
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$338,104.71

Basin A Alternative 2	
Pond Excavation	
Existing Ground (ft.)	110
Pond Bottom (ft.)	97.2
Total Depth (ft.)	12.8
Pond Bottom Area (sq. ft.)	37248
Maint. Berm Area-Inside Contour (sq. ft.)	86562
Average Area (sq. ft.)	61905
Excavation Volume (cu. Ft.)	792384
Maintenance Berm Elev. (ft.)	109.5
Excavation or Fill	Excavation
Depth (ft.)	0.5
Area of Maintenance Berm-Outside Contour (sq.ft)	104241
Area of Maintenance Berm (difference between inside & outside contour (sq.ft)	17679
Width Needed for Tie Down Slope	1.00
Area within Tie Down Slope (sq.ft)	1230
1/2 of Area within Tie Down Slope (sq.ft)	615
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	9147
Total Pond Earthwork (CF)	801531
Total Pond Earthwork (CY)	29686
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$297,753.92

Basin A Alternative 3	
Pond Excavation	
Existing Ground (ft.)	109
Pond Bottom (ft.)	97.2
Total Depth (ft.)	11.8
Pond Bottom Area (sq. ft.)	40866
Maint. Berm Area-Inside Contour (sq. ft.)	88744
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	87810
Average Area (sq. ft.)	64338
Excavation Volume (cu. Ft.)	759188
Maintenance Berm Elev. (ft.)	109.2
Area of Maintenance Berm-Outside Contour (sq.ft)	106961
Excavation or Fill	Fill
Depth (ft.)	0.2
Width Needed for Tie Down Slope	0.40
Area within Tie Down Slope (sq.ft)	505
1/2 of Area within Tie Down Slope (sq.ft)	253
Volume Within Maint Berm (cu. ft.)	3787
Total Pond Earthwork (CF)	762976
Total Earthwork from adj floodplain comp site (CF)	33977
Total Pond Earthwork (CY)	29517
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$296,053.17

Basin B Alternative 1	
Pond Excavation	
Existing Ground (ft.)	103
Pond Bottom (ft.)	92.4
Total Depth (ft.)	10.6
Pond Bottom Area (sq. ft.)	51900
Maint. Berm Area-Inside Contour (sq. ft.)	71004
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	71004
Average Area (sq. ft.)	61452
Excavation Volume (cu. Ft.)	651391
Maintenance Berm Elev. (ft.)	103
Excavation or Fill	Fill
Depth (ft.)	0
Total Pond Earthwork (CF)	651391
Total Pond Earthwork (CY)	24126
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$241,979.77

Basin B Alternative 2	
Pond Excavation	
Existing Ground (ft.)	97.1
Pond Bottom (ft.)	91.6
Total Depth (ft.)	5.5
Pond Bottom Area (sq. ft.)	33444
Maint. Berm Area-Inside Contour (sq. ft.)	77413
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	51663
Average Area (sq. ft.)	42554
Excavation Volume (cu. Ft.)	234044
Maintenance Berm Elev. (ft.)	103.6
Area of Maintenance Berm-Outside Contour (sq.ft)	94210
Excavation or Fill	Fill
Depth (ft.)	6.5
Width Needed for Tie Down Slope	13.00
Area within Tie Down Slope (sq.ft)	15700
1/2 of Area within Tie Down Slope (sq.ft)	7850
Volume Within Maint Berm (cu. ft.)	243893
Total Pond Earthwork (CF)	477937
Total Earthwork from adj floodplain comp site (CF)	118048
Total Pond Earthwork (CY)	22074
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$221,397.48

Basin B Alternative 3	
Pond Excavation	
Existing Ground (ft.)	112.1
Pond Bottom (ft.)	94
Total Depth (ft.)	18.1
Pond Bottom Area (sq. ft.)	39200
Maint. Berm Area-Inside Contour (sq. ft.)	168686
Average Area (sq. ft.)	103943
Excavation Volume (cu. Ft.)	1881368
Maintenance Berm Elev. (ft.)	109.5
Excavation or Fill	Excavation
Depth (ft.)	2.6
Area of Maintenance Berm-Outside Contour (sq.ft)	229981
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	61295
Width Needed for Tie Down Slope	5.20
Area within Tie Down Slope (sq.ft)	13048
1/2 of Area within Tie Down Slope (sq.ft)	6524
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	176329
Total Pond Earthwork (CF)	2057698
Total Pond Earthwork (CY)	76211
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$764,396.59

Basin C Alternative 1	
Pond Excavation	
Existing Ground (ft.)	96
Pond Bottom (ft.)	90.8
Total Depth (ft.)	5.2
Pond Bottom Area (sq. ft.)	33444
Maint. Berm Area-Inside Contour (sq. ft.)	77413
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	51663
Average Area (sq. ft.)	42554
Excavation Volume (cu. Ft.)	221278
Maintenance Berm Elev. (ft.)	99.4
Area of Maintenance Berm-Outside Contour (sq.ft)	94210
Excavation or Fill	Fill
Depth (ft.)	3.4
Width Needed for Tie Down Slope	6.80
Area within Tie Down Slope (sq.ft)	15700
1/2 of Area within Tie Down Slope (sq.ft)	7850
Volume Within Maint Berm (cu. ft.)	127575
Total Pond Earthwork (CF)	348853
Total Earthwork from adj floodplain comp site (CF)	118048
Total Pond Earthwork (CY)	17293
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$173,445.08

Basin C Alternative 2	
Pond Excavation	
Existing Ground (ft.)	96
Pond Bottom (ft.)	90.8
Total Depth (ft.)	5.2
Pond Bottom Area (sq. ft.)	35319
Maint. Berm Area-Inside Contour (sq. ft.)	97599
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	72321
Average Area (sq. ft.)	53820
Excavation Volume (cu. Ft.)	279864
Maintenance Berm Elev. (ft.)	99.4
Area of Maintenance Berm-Outside Contour (sq.ft)	127338
Excavation or Fill	Fill
Depth (ft.)	3.4
Width Needed for Tie Down Slope	6.80
Area within Tie Down Slope (sq.ft)	13881
1/2 of Area within Tie Down Slope (sq.ft)	6941
Volume Within Maint Berm (cu. ft.)	167683
Total Pond Earthwork (CF)	447547
Total Earthwork from adj floodplain comp site (CF)	94961
Total Pond Earthwork (CY)	20093
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$201,531.64

Basin C Alternative 3	
Pond Excavation	
Existing Ground (ft.)	101
Pond Bottom (ft.)	90.8
Total Depth (ft.)	10.2
Pond Bottom Area (sq. ft.)	28196
Maint. Berm Area-Inside Contour (sq. ft.)	64319
Average Area (sq. ft.)	46258
Excavation Volume (cu. Ft.)	471827
Maintenance Berm Elev. (ft.)	100.5
Excavation or Fill	Excavation
Depth (ft.)	0.5
Area of Maintenance Berm-Outside Contour (sq.ft)	80832
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	16513
Width Needed for Tie Down Slope	1.00
Area within Tie Down Slope (sq.ft)	2308
1/2 of Area within Tie Down Slope (sq.ft)	1154
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	8834
Total Pond Earthwork (CF)	480660
Total Pond Earthwork (CY)	17802
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$178,556.29

Basin D Alternative 1	
Pond Excavation	
Existing Ground (ft.)	142.1
Pond Bottom (ft.)	120
Total Depth (ft.)	22.1
Pond Bottom Area (sq. ft.)	112299
Maint. Berm Area-Inside Contour (sq. ft.)	159417
Average Area (sq. ft.)	135858
Excavation Volume (cu. Ft.)	3002462
Maintenance Berm Elev. (ft.)	127.8
Excavation or Fill	Excavation
Depth (ft.)	14.3
Area of Maintenance Berm-Outside Contour (sq.ft)	183760
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	24343
Width Needed for Tie Down Slope	28.60
Area within Tie Down Slope (sq.ft)	50330
1/2 of Area within Tie Down Slope (sq.ft)	25165
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	707964
Total Pond Earthwork (CF)	3710426
Total Pond Earthwork (CY)	137423
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$1,378,354.62

Basin D Alternative 2	
Pond Excavation	
Existing Ground (ft.)	123
Pond Bottom (ft.)	117
Total Depth (ft.)	6
Pond Bottom Area (sq. ft.)	124669
Maint. Berm Area-Inside Contour (sq. ft.)	169866
Average Area (sq. ft.)	147268
Excavation Volume (cu. Ft.)	883605
Maintenance Berm Elev. (ft.)	123.3
Excavation or Fill	Fill
Depth (ft.)	0.3
Area of Maintenance Berm-Outside Contour (sq.ft)	198502
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	28636
Width Needed for Tie Down Slope	0.60
Area within Tie Down Slope (sq.ft)	1174
1/2 of Area within Tie Down Slope (sq.ft)	587
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	8767
Total Pond Earthwork (CF)	892372
Total Pond Earthwork (CY)	33051
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$331,499.64

Basin D Alternative 3 Pond D-20	
Pond Excavation	
Existing Ground (ft.)	130
Pond Bottom (ft.)	130
Total Depth (ft.)	0
Pond Bottom Area (sq. ft.)	49327
Area Where Side Slope Intersects Exst Ground (sq. ft.)	49327
Average Area (sq. ft.)	49327
Excavation Volume (cu. Ft.)	0
Maintenance Berm Elev. (ft.)	137.25
Excavation or Fill	Fill
Depth (ft.)	7.25
Area of Maintenance Berm-Inside Contour (sq.ft)	86549
Area of Maintenance Berm-Outside Contour (sq.ft)	109950
Area of Maintenance Berm (difference between inside & outside contour (sq.ft)	23401
Width Needed for Tie Down Slope	0.00
Area within Interior Side Slope (sq.ft)	37222
1/2 of Area within Interior Side Slope (sq.ft)	18611
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	304587
Total Pond Earthwork (CF)	304587
Total Pond Earthwork (CY)	11281
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$113,148.43

Total Earthwork cost for all Alt 3 Pond Cells= \$330,767.95

Basin D Alternative 3 Pond D-30	
Pond Excavation	
Existing Ground (ft.)	129
Pond Bottom (ft.)	126.5
Total Depth (ft.)	2.5
Pond Bottom Area (sq. ft.)	33787
Area Where Side Slope Intersects Exst Ground (sq. ft.)	50967
Average Area (sq. ft.)	42377
Excavation Volume (cu. Ft.)	105943
Maintenance Berm Elev. (ft.)	132.75
Excavation or Fill	Fill
Depth (ft.)	3.75
Area of Maintenance Berm-Inside Contour (sq.ft)	76074
Area of Maintenance Berm-Outside Contour (sq.ft)	104341
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	28267
Width Needed for Tie Down Slope	0.00
Area within Interior Side Slope (sq.ft)	25107
1/2 of Area within Interior Side Slope (sq.ft)	12554
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	153077
Total Pond Earthwork (CF)	259019
Total Pond Earthwork (CY)	9593
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$96,220.90

Basin D Alternative 3 Pond 1	
Pond Excavation	
Existing Ground (ft.)	121.1
Pond Bottom (ft.)	122.5
Total Depth (ft.)	1.4
Pond Bottom Area (sq. ft.)	25549
Average Area (sq. ft.)	25549
Fill Volume (cu. Ft.)	35769
Maintenance Berm Elev. (ft.)	127.75
Excavation or Fill	Fill
Depth (ft.)	6.65
Area of Maintenance Berm-Inside Contour (sq.ft)	59240
Area of Maintenance Berm-Outside Contour (sq.ft)	86158
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	26918
Width Needed for Tie Down Slope	0.00
Area within Interior Side Slope (sq.ft)	33691
1/2 of Area within Interior Side Slope (sq.ft)	16846
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	291027
Total Pond Earthwork (CF)	326796
Total Pond Earthwork (CY)	12104
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$121,398.62

Basin SR 408 Alternative 1	
Pond Excavation	
Existing Ground (ft.)	126
Pond Bottom (ft.)	93
Total Depth (ft.)	33
Pond Bottom Area (sq. ft.)	21330
Maint. Berm Area-Inside Contour (sq. ft.)	74309
Average Area (sq. ft.)	47820
Excavation Volume (cu. Ft.)	1578044
Maintenance Berm Elev. (ft.)	107.2
Excavation or Fill	Excavation
Depth (ft.)	18.8
Area of Maintenance Berm-Outside Contour (sq.ft)	91704
Area of Maintenance Berm (difference between inside & outside contour (sq.ft)	17395
Width Needed for Tie Down Slope	37.60
Area within Tie Down Slope (sq.ft)	49819
1/2 of Area within Tie Down Slope (sq.ft)	24910
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	795325
Total Pond Earthwork (CF)	2373368
Total Pond Earthwork (CY)	87903
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$881,662.30

Basin SR408 Alternative 2	
Pond Excavation	
Existing Ground (ft.)	105
Pond Bottom (ft.)	99
Total Depth (ft.)	6
Pond Bottom Area (sq. ft.)	74083
Maint. Berm Area-Inside Contour (sq. ft.)	79530
Area at Point where Side Slope Ties into the Existing Ground (sq. ft.)	78030
Average Area (sq. ft.)	76057
Excavation Volume (cu. Ft.)	456339
Maintenance Berm Elev. (ft.)	107.8
Area of Maintenance Berm-Outside Contour (sq.ft)	85276
Excavation or Fill	Fill
Depth (ft.)	2.8
Width Needed for Tie Down Slope	5.60
Area within Tie Down Slope (sq.ft)	7200
1/2 of Area within Tie Down Slope (sq.ft)	3600
Volume Within Maint Berm (cu. ft.)	28269
Total Pond Earthwork (CF)	484608
Total Pond Earthwork (CY)	17948
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$180,022.82

Basin SR 408 Alternative 3	
Pond Excavation	
Existing Ground (ft.)	108
Pond Bottom (ft.)	100
Total Depth (ft.)	8
Pond Bottom Area (sq. ft.)	40927
Maint. Berm Area-Inside Contour (sq. ft.)	65567
Average Area (sq. ft.)	53247
Excavation Volume (cu. Ft.)	425976
Maintenance Berm Elev. (ft.)	107
Excavation or Fill	Excavation
Depth (ft.)	1
Area of Maintenance Berm-Outside Contour (sq.ft)	80793
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	15226
Width Needed for Tie Down Slope	2.00
Area within Tie Down Slope (sq.ft)	12290
1/2 of Area within Tie Down Slope (sq.ft)	6145
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	21371
Total Pond Earthwork (CF)	447347
Total Pond Earthwork (CY)	16568
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$166,181.13

Basin DSR50N Alternative 1	
Pond Excavation	
Existing Ground (ft.)	116
Pond Bottom (ft.)	103.1
Total Depth (ft.)	12.9
Pond Bottom Area (sq. ft.)	2146
Maint. Berm Area-Inside Contour (sq. ft.)	22728
Average Area (sq. ft.)	12437
Excavation Volume (cu. Ft.)	160437
Maintenance Berm Elev. (ft.)	113.2
Excavation or Fill	Excavation
Depth (ft.)	2.8
Area of Maintenance Berm-Outside Contour (sq.ft)	33298
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	10570
Width Needed for Tie Down Slope	5.60
Area within Tie Down Slope (sq.ft)	4308
1/2 of Area within Tie Down Slope (sq.ft)	2154
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	35627
Total Pond Earthwork (CF)	196065
Total Pond Earthwork (CY)	7262
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$72,834.33

Basin DSR50N Alternative 2	
Pond Excavation	
Existing Ground (ft.)	121
Pond Bottom (ft.)	104
Total Depth (ft.)	17
Pond Bottom Area (sq. ft.)	2146
Maint. Berm Area-Inside Contour (sq. ft.)	22728
Average Area (sq. ft.)	12437
Excavation Volume (cu. Ft.)	211429
Maintenance Berm Elev. (ft.)	115.4
Excavation or Fill	Excavation
Depth (ft.)	5.6
Area of Maintenance Berm-Outside Contour (sq.ft)	33298
Area of Maintenance Berm (difference between insde & outside contour (sq.ft)	10570
Width Needed for Tie Down Slope	11.20
Area within Tie Down Slope (sq.ft)	4308
1/2 of Area within Tie Down Slope (sq.ft)	2154
Volume Within Maint Berm & Tie Down Slope (cu. ft.)	71254
Total Pond Earthwork (CF)	282683
Total Pond Earthwork (CY)	10470
Earthwork Cost per CY	\$10.03
Earthwork Cost	\$105,011.65



Florida Department of Transportation
Item Average Unit Cost
From 2021/10/01 to 2022/09/30
Statewide

Contract Type: CC
Displaying: VALID ITEMS WITH HITS
From: 0102 1 To: 9999999

Item	No. of Conts	Weighted Average	Total Amount	Total Quantity	Unit Meas	Obs?	Description
0108 1	76	\$14,580.59	\$1,312,253.50	90.000	EA	N	MONITOR EXISTING STRUCTURES- INSPECTION AND SETTLEMENT MONITORING
0108 2	49	\$17,803.72	\$1,068,223.45	60.000	EA	N	MONITOR EXISTING STRUCTURES- VIBRATION MONITORING
0108 3	4	\$9,036.32	\$54,217.94	6.000	EA	N	MONITOR EXISTING STRUCTURES- GROUNDWATER MONITORING
0110 1 1	265	\$28,466.89	\$60,565,300.72	2,127.570	AC	N	CLEARING & GRUBBING
0110 1100	1	\$40,000.00	\$270,400.00	6.760	AC	N	CLEARING, MULCHING, AND GRINDING, PROJECT 444045-1-52-01
0110 2 2	18	\$43,231.03	\$648,897.69	15.010	AC	N	SELECTIVE CLEARING AND GRUBBING, AREAS WITH TREES TO REMAIN
0110 3	28	\$44.11	\$9,894,097.81	224,315.000	SF	N	REMOVAL OF EXISTING STRUCTURES/BRIDGES
0110 4 10	239	\$31.17	\$12,884,352.05	413,404.000	SY	N	REMOVAL OF EXISTING CONCRETE
0110 5	1	\$4,920.00	\$24,600.00	5.000	EA	N	PLUGGING WATER WELLS, ARTESIAN
0110 6	1	\$15,000.00	\$15,000.00	1.000	EA	N	PLUGGING WATER WELLS, NON-ARTESIAN
0110 7 1	61	\$253.34	\$186,968.36	738.000	EA	N	MAILBOX, F&I SINGLE
0110 12 1	1	\$7,500.00	\$195,000.00	26.000	SY	N	HYDRODEMOLITION, REMOVAL OF DECK SURFACE
0110 21	41	\$8.07	\$925,390.34	114,701.000	LF	N	TREE PROTECTION BARRIER
0110 22	36	\$787.78	\$772,807.67	981.000	EA	N	TREE ROOT AND BRANCH PRUNING
0110 23	19	\$579.48	\$316,397.16	546.000	EA	N	TREE REMOVAL
0110 71 1	2	\$317.08	\$207,055.00	653.000	LF	N	BRIDGE FENDER SYSTEM, REMOVAL & DISPOSAL
0110 73	3	\$393.68	\$1,489,285.00	3,783.000	LF	N	REMOVE EXISTING BULKHEAD
0110 82	3	\$3,270.48	\$138,668.50	42.400	MB	N	REMOVE & DISPOSE OF STRUCTURAL TIMBER
0110 84	1	\$400,000.00	\$400,000.00	1.000	LS	N	TRANSPORT EXISTING MATERIAL FOR REEF ESTABLISHMENT
0120 1	182	\$10.03	\$33,603,092.46	3,349,200.100	CY	N	REGULAR EXCAVATION

APPENDIX E – POND SITE EVALUATION MATRIX

Alternate Pond Site Evaluation
Project Description: Turnpike Widening from South of SR 408 to SR 50
FPID Number: 444007-1-22-01

Basin	5			6			7&8		
Pond Alternative	1	2	3	1	2	3	1	2	3
Pond Right of Way Needed ¹ (acres)	2.16	3.25	0.00	3.37	3.31	4.86	6.87	9.65	n/a
Easement Area Needed ² (acres)	0.32	0.00	0.00	0.00	1.70	0.00	0.00	0.76	n/a
	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs
Additional Pipe Length ³	718	0	0	3043	3246	0	0	1870	0
Cost of Additional Pipe Length ³	\$257,762	\$0	\$0	\$819,236	\$570,549	\$0	\$0	\$328,690	\$0
Earthwork Costs	\$132,939	\$136,046	\$593,136	\$480,859	\$529,381	\$181,486	\$419,814	\$1,497,669	\$1,440,273
Special Construction Costs (pond liners cost \$2 per SF)									
Total Construction Costs	\$390,701	\$136,046	\$593,136	\$1,300,095	\$1,099,930	\$181,486	\$419,814	\$1,826,359	\$1,440,273
Right of Way Costs	\$236,200	\$656,300	n/a	\$2,571,100	\$2,162,300	\$2,165,800	\$2,986,300	\$6,496,500	n/a
Potential Contamination	Low	Low	Low	Med	Med	Low	Med	Med	Low
Utilities	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known
Threatened, Endangered or Significant Species	Low	Low	Low	Low	Low	Low	Low	Low	Low
Maintenance	Low	Low	Low	Low	Low	Low	Low	Low	Low
Cultural Resources	Low	Low	Low	Low	Low	Low	Low/ Med	Low	Low
Aesthetics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wetland Impacts (acres)	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	0.01	No Impacts
Comments							CRAS-Obscured Site		Interchange Alternative
Advantages									
Disadvantages, etc		3.25 acre impacts to park		impacts access drive to remainder of property					
Preferred Pond Alternative			Preferred		Preferred				Preferred

Alternate Pond Site Evaluation
Project Description: Turnpike Widening from South of SR 408 to SR 50
FPID Number: 444007-1-22-01

Basin	9			10			11		
Pond Alternative	1	2	3	1	2	3	1	2	3
Pond Right of Way Needed ¹ (acres)	5.50	4.04	6.88	n/a	11.14	10.63	3.54	4.45	n/a
Easement Area Needed ² (acres)	0.00	0.00	0.48	n/a	0.00	0.90	0.00	0.00	n/a
	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs
Additional Pipe Length ³	0	0	5018	0	0	1682	2676	980	0
Cost of Additional Pipe Length ³	\$0	\$0	\$1,350,946	\$0	\$0	\$452,828	\$470,361	\$172,255	\$0
Earthwork Costs	\$498,458	\$475,133	\$1,095,560	\$1,951,721	\$1,351,952	\$2,134,394	\$252,500	\$373,027	\$346,148
Special Construction Costs (pond liners cost \$2 per SF)			\$570,544			\$934,148			
Total Construction Costs	\$498,458	\$475,133	\$3,017,050	\$1,951,721	\$1,351,952	\$3,521,370	\$722,861	\$545,282	\$346,148
Right of Way Costs	\$13,139,261	\$141,988	\$6,146,500	n/a	\$16,140,400	\$9,543,800	\$4,338,200	\$5,788,300	n/a
Potential Contamination	Low	Med	Low	Low	Med	Low	Low	Low	Low
Utilities	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known
Threatened, Endangered or Significant Species	Low	Low	Low	Low	Low	Low	Low	Low	Low
Maintenance	Low	Low	Low	Low	Low	Low	Low	Low	Low
Cultural Resources	Low	Low	Low	Low	Low	Low	Low	Low	Low
Aesthetics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wetland Impacts (acres)	0.01	0.61	No Impacts	No Impacts	1.31	0.43	1.19	0.47	No Impacts (see Note 4)
Comments				Interchange Alternative					Interchange Alternative
Advantages	adjacent to low area of closed basin	adjacent to low area of closed basin					located on existing FDOT Parcels		
Disadvantages, etc	development plans have been submitted	5.12 acre impacts to conservation easement			area slated for development by City of Ocoee				
Preferred Pond Alternative		Preferred		Preferred					Preferred

Alternate Pond Site Evaluation
Project Description: Turnpike Widening from South of SR 408 to SR 50
FPID Number: 444007-1-22-01

Basin	12			A			B		
Pond Alternative	1	2	3	1	2	3	1	2	3
Pond Right of Way Needed ¹ (acres)	3.95	4.34	3.89	3.35	2.74	3.83	n/a	5.43	6.61
Easement Area Needed ² (acres)	0.45	0.10	0.39	0.00	0.00	0.10	0.00	0.00	0.99
	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs
Additional Pipe Length ³	0	0	908	0	0	0	0	0	3142
Cost of Additional Pipe Length ³	\$0	\$0	\$159,599	\$0	\$0	\$0	\$0	\$0	\$552,269
Earthwork Costs	\$200,801	\$212,416	\$255,986	\$338,105	\$297,754	\$296,053	\$241,980	\$221,398	\$764,397
Special Construction Costs (pond liners cost \$2 per SF)									
Total Construction Costs	\$200,801	\$212,416	\$415,585	\$338,105	\$297,754	\$296,053	\$241,980	\$221,398	\$1,316,666
Right of Way Costs	\$165,300	\$2,298,800	\$165,300	\$3,309,500	\$1,453,200	\$7,378,600	n/a	\$646,800	\$2,890,100
Potential Contamination	Low	Low	Low	Low	Low	Low	Low	Low	Low
Utilities	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known
Threatened, Endangered or Significant Species	Low/ Med	Med/ High	Med/ High	Low	Low	Low/ Med	Low	Low	Low
Maintenance	Low	Low	Low	Low	Low	Low	Low	Low	Low
Cultural Resources	Low	Low/ Med	Low	Low	Low	Low	Low	Low	Low
Aesthetics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wetland Impacts (acres)	2.09	No Impacts	3.65	No Impacts	No Impacts	0.14	No Impacts	3.72	0.48
Comments		CRAS-site not currently eligible for register							
Advantages									
Disadvantages, etc	3.95 acre impacts to conservation easement	developed property	3.88 acre impacts to conservation easement		developed property	developed property		located on two parcels	
Preferred Pond Alternative	Preferred			Preferred			Preferred		

Alternate Pond Site Evaluation
Project Description: Turnpike Widening from South of SR 408 to SR 50
FPID Number: 444007-1-22-01

Basin	C			D			SR 408		
Pond Alternative	1	2	3	1	2	3	1	2	3
Pond Right of Way Needed ¹ (acres)	5.55	2.30	2.49	6.00	5.73	n/a	6.18	2.36	2.42
Easement Area Needed ² (acres)	0.00	0.00	0.00	0.00	0.00	n/a	0.00	0.00	0.25
	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs
Additional Pipe Length ³	0	0	0	0	0	0	0	0	802
Cost of Additional Pipe Length ³	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$140,968
Earthwork Costs	\$173,445	\$201,532	\$178,556	\$1,378,354	\$331,500	\$377,655	\$881,662	\$180,023	\$166,181
Special Construction Costs (pond liners cost \$2 per SF)							\$196,380		
Total Construction Costs	\$173,445	\$201,532	\$178,556	\$1,378,354	\$331,500	\$330,768	\$1,078,042	\$180,023	\$307,149
Right of Way Costs	\$553,200	\$669,300	\$304,700	\$10,159,300	\$4,919,900	n/a	\$3,244,900	\$296,400	\$4,432,500
Potential Contamination	Low	Low	Low	Med	Med	Low	Med	Med	Low
Utilities	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known
Threatened, Endangered or Significant Species	Low	Low	Low	Low	Low	Low	Low	Low	Low
Maintenance	Low	Low	Low	Low	Low	Low	Low	Low	Low
Cultural Resources	Low/ Med	Low	Low	Low	Low	Low	Low/ Med	Low	Low
Aesthetics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wetland Impacts (acres)	2.13	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts	No Impacts
Comments	CRAS-site not currently eligible for register		within limits of the floodplain			Interchange Alternative	CRAS-Obscured Site		
Advantages									
Disadvantages, etc	5.52 acre impacts to park								developed property
Preferred Pond Alternative		Preferred				Preferred		Preferred	

Alternate Pond Site Evaluation
Project Description: Turnpike Widening from South of SR 408 to SR 50
FPID Number: 444007-1-22-01

Basin	SR 429N			SR 429S			DSR50N		
Pond Alternative	1	2	3	1	2	3	1	2	3
Pond Right of Way Needed ¹ (acres)	2.31	4.30	4.22	1.37	1.08	0.67	1.39	1.06	n/a
Easement Area Needed ² (acres)	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	n/a
	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs	Comments Costs
Additional Pipe Length ³	0	0	1058	0	0	0	456	0	n/a
Cost of Additional Pipe Length ³	\$0	\$0	\$185,965	\$0	\$0	\$181,043	\$80,151	\$0	n/a
Earthwork Costs	\$172,806	\$151,911	\$122,944	\$18,706	\$21,790	\$35,158	\$72,834	\$105,012	n/a
Special Construction Costs (pond liners cost \$2 per SF)									n/a
Total Construction Costs	\$172,806	\$151,911	\$308,909	\$18,706	\$21,790	\$216,201	\$152,985	\$105,012	\$0
Right of Way Costs	\$1,981,500	\$2,676,600	\$30,585,300	\$222,600	\$200,100	\$0	\$889,300	\$2,113,600	n/a
Potential Contamination	Low	Med	Med	Low	Med	Med	Med	Med	n/a
Utilities	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known	n/a
Threatened, Endangered or Significant Species	Low	Low	Low	Low	Low	Low	Low	Low	n/a
Maintenance	Low	Low	Low	Low	Low	Low	Low	Low	n/a
Cultural Resources	Low	Low	Low	Low	Low	Low	Low	Low	n/a
Aesthetics	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wetland Impacts (acres)	No Impacts	1.69	No Impacts	No Impacts	No Impacts	0.24	No Impacts	No Impacts	No Impacts
Comments			This site was developed during the the analysis						Requirements met in existing ponds
Advantages									
Disadvantages, etc				1.33 acre impacts to park	1.07 acre impacts to park				
Preferred Pond Alternative	Preferred					Preferred			Preferred

1. In some cases the right of way needed is significantly larger than the required pond size because the remaining parcel was considered unusable. R/W needed for Basin 9 & 10 Alt 3 assumes strip for tie down slope with adjacent alternative not constructed.
2. Easement area assumes a 50' wide easement for all pond sites that are not adjacent to Turnpike Right of Way including those pond sites located adjacent to other Public Right of Ways.
3. Additional pipe length only includes the pipe length that is atypical when compared with the other alternatives. This would include the piping needed to convey runoff to a pond site that is not adjacent to the right of way.
4. For the Basin 11 Interchange Alternative, there is a remnant wetland located on an adjacent parcel that could be impacted by the pond control elevation utilized. This should be checked during the design phase and appropriate mitigation/ pond adjustments should be provided as needed.
5. Right of way costs are preliminary and in some instances have been adjusted from initial estimates based on project refinements (e.g. Basin 9 Alt. 1 & Alt. 2, 429N Alt. 1). Final Right of Way costs will be included with future submittals.

APPENDIX F – CORRESPONDENCE, MEETING MINUTES, AND EXCERPTS FROM PREVIOUS PERMITS AND STUDIES



Florida Department of Transportation

RON DESANTIS
GOVERNOR

Florida's Turnpike Enterprise
P.O. Box 613069, Ocoee, FL 34761
407-532-3999

KEVIN J. THIBAUT, P.E.
SECRETARY

**FDOT, Florida's Turnpike Enterprise/SJRWMD Pre-Application Meeting Notes
FPID No. 444007-1-22-01- Turnpike Widening from South of SR 408 to SR 50 PD&E
Orange County
SJRWMD Compliance Item # 1424958**

Date: Wednesday, June 30, 2021 via WebEx

Attendees:

Tracy Miller, SJRWMD
Lee Kissick, SJRWMD
Sandy Joiner, SJRWMD
Annemarie Hammond, FTE
Erin Yao, FTE
Rax Jung, FTE
Henry Pinzon, FTE
Tiffany Crosby, Atkins/FTE

AK

Adriana Kirwan, HNTB/FTE
Chris Daily, RS&H
James Fike, RS&H
Nathan Silva, RS&H
Jeff Glenn, RS&H
Lauren Rhodes, RS&H
Jen Rehrl, PGA
Tim Polk, PGA

Introduction

Florida's Turnpike Enterprise (FTE) has contracted with RS&H to develop a project development and engineering (PD&E) study for the widening of the Turnpike from south of SR 408 to SR 50 in Orange County, Florida. The St. Johns River Water Management District (SJRWMD) pre-application meeting is necessary per FTE Scope requirements for confirming the stormwater management design approach and determining the permitting requirements specific to the project.

These meeting minutes reflect pertinent discussions that took place during the meeting and will serve as a guide for developing design decisions.

Overview & Schedule

FTE briefly introduced the project. RS&H proceeded to describe the project's roadway improvements, drainage limits and project schedule.

- It is anticipated that a preferred alternative will be presented to the public in early 2022 with the PD&E study wrapping up in the spring of that same year. Although this project is not currently funded for design or construction, FTE considers it a priority project.
- FTE is proposing to widen the Turnpike for approximately 10 miles from the Turkey Lake Service Plaza to just west of the SR 50 interchange. In the existing condition, the Turnpike is 4 lanes in each direction east of SR 408 and west of SR 429 while the area between SR 408 and SR 429 currently has 6-lanes in each direction. In the proposed condition, it is anticipated that the area east of SR 408 will be widened so there are 6-lanes in each direction, while the area west of the SR 429 interchange will be widened such that there are 5-lanes in each

direction. In addition to these improvements, it is anticipated that a barrier separated collector distributor system will be installed between the SR 408 and SR 429 interchanges which will include a total of 9-lanes in each direction.

- The project traverses both the SJRWMD and the South Florida Water Management District (SFWMD). The boundary between these two water management districts is in the vicinity of Lake Olivia, with SJRWMD located to the west of Lake Olivia and SFWMD located to the east of Lake Olivia. Since most of the project is located within the SJRWMD, FTE would like to permit the entire project through the SJRWMD. It was noted that an interagency agreement would be required between SJRWMD and SFWMD to permit the entire project through one water management district. The portion of the project located within the SFWMD would also need to follow the more stringent of the SFWMD and SJRWMD criteria. SJRWMD indicated that it was likely that the entire project could be permitted through the SJRWMD, however, more design details were needed to confirm this.

Proposed Drainage Design

- RS&H indicated that most of the project will traverse closed basins with the only open basin located at the western extents of the project which will drain to Lake Apopka. RS&H noted that there was some ambiguity in the information found regarding the Johns Lake Basin as some of the literature seemed to indicate that it is an open basin while other information researched indicated that the Johns Lake Basin is a closed basin. SJRWMD noted that since Johns Lake discharges for the 10-year storm they consider it an open basin.
- The SJRWMD Special Basins were discussed. RS&H noted the following special basins within the project limits: Lake Apopka Hydrologic Basin, Ocklawaha River Hydrologic Basin, Wekiva River Hydrologic Basin, and the Wekiva Recharge Protection Basin. SJRWMD noted that this list was inclusive of all the special basins within the project corridor.
- RS&H noted that there were no WBID'S on the verified list impaired for nutrients. There are, however, basin management action plans (BMAP's) established within the corridor for the Implementation of Total Maximum Daily Loads for Total Phosphorus and Total Nitrogen by the Florida Department of Environmental Protection.
- The floodplains that traverse the project were discussed. It is anticipated that volumetric compensation will be provided for all floodplain impacts.
- RS&H noted that the approach for providing water quality will be consistent with the methodologies followed on previous FTE projects. Treatment will be provided for all additional impervious area and any previously permitted areas that are impacted as a result of project improvements. Where applicable, special basin criteria will also be met.
- Attenuation criteria was discussed. In areas where the project traverses closed basins the more stringent criteria required for closed basins will be met. All other locations will meet the criteria associated with open basins in the absence of any special basin criteria.

Environmental

- RS&H staff noted that a Natural Resources Evaluation will be produced during the PD&E.
- RS&H staff noted that there are multiple private wetland mitigation banks located within the basins to accommodate wetland impacts.
- SJRWMD staff noted that there are three Conservation Easements adjacent to the project area- in the area of Lake Pearl, in the northeast quadrant of the SR 408 Interchange and northwest corner of 429 interchange. SJRWMD staff also noted that it is possible to apply for a release from these easements during the permitting phase. Generally, additional mitigation would be required.
- SJRWMD staff noted two eagle nests located adjacent to the Turnpike. Following the meeting, RS&H staff identified three documented nests adjacent to the Turnpike (OR018, OR039 and OR052).
- FTE staff asked if SJRWMD staff saw any fatal flaws with the environmental permitting. SJRWMD staff noted no fatal flaws.

Environmental Look Around

- Potential joint use ponds and regional ponds were discussed. SJRWMD was not aware of any joint use ponds or regional ponds within the vicinity of the project.

Fike, James

From: Yao, Erin <Erin.Yao@dot.state.fl.us>
Sent: Tuesday, September 28, 2021 3:07 PM
To: Fike, James
Subject: FW: 444007-1 PDE Study, Environmental Look-Around
Attachments: FPID 444007 Turnpike Project Location Map_S_SR408_to_SR50.pdf

FYI

Erin T Yao, PE, CFM
Florida's Turnpike Enterprise
District Drainage Engineer

P.O.Box 613069
MP 263, Blg 5315
Ocoee, Florida 34761-3069

☎: Direct: (407) 264-3479
☎: Cell: (407) 756-7063
✉: erin.yao@dot.state.fl.us

From: Yao, Erin
Sent: Tuesday, September 28, 2021 3:04 PM
To: rlott@sfwmd.gov
Cc: Crosby, Tiffany <Tiffany.Crosby@dot.state.fl.us>; Heywood, Jazlyn <Jazlyn.Heywood@dot.state.fl.us>; Hammond, Annemarie <Annemarie.Hammond@dot.state.fl.us>; Kirwan, Adriana <Adriana.Kirwan@dot.state.fl.us>; Silva, Nathan <Nathan.Silva@rsandh.com>
Subject: 444007-1 PDE Study, Environmental Look-Around

Hello Mr. Lott,

Turnpike is currently completing a Project Development and Environment (PD&E) Study for project FPID 444007-1 Widen Turnpike from South of SR 408 to SR 50 located in Orange County (see attached project location map). The project limits extend within both SFWMD and SJRWMD's jurisdiction. Based on recent coordination with SJRWMD, it is likely they will request to be the lead agency during the permitting effort since approximately 90% of the project is within their district. However, SFWMD is still an important stakeholder for this project. As part of the study, Turnpike is coordinating with regional stakeholders to explore watershed-wide stormwater needs and alternative permitting approaches and is requesting information on any known current or future needs that may be suited for this project. Please feel free to contact me if you need additional information to complete this request.

Thanks,

Erin T Yao, PE, CFM
Florida's Turnpike Enterprise
District Drainage Engineer

P.O.Box 613069
MP 263, Blg 5315

Ocoee, Florida 34761-3069

☎: Direct: (407) 264-3479

☎: Cell: (407) 756-7063

✉: erin.yao@dot.state.fl.us

BASIN 5

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

Drainage Design Documentation

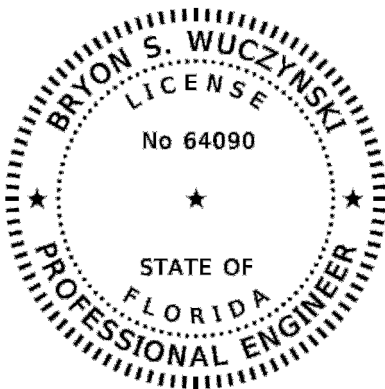
As part of:

Tandem Truck Staging Lot at the Turkey Lake Service Plaza

Financial Project ID 441309-1

Prepared For:

Florida's Turnpike Enterprise



THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

ON THE DATE ADJACENT TO THE SEAL.

*PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED
SIGNED AND SEALED AND THE SIGNATURE MUST BE
VERIFIED ON ANY ELECTRONIC DOCUMENTS.*

*Bryon Wuczynski, P.E.
Florida P.E. License No. 64090
STV Incorporated
5200 Belfort Road, Suite 400
Jacksonville, FL 32256
C.A. No. 390*

May 2019

treat runoff directly from a portion of the Turnpike mainline pavement as it does in the existing condition, and also maintain its existing outfall to the north ditch.

To try to remedy the base clearance issue, the normal water level for Pond 3A was reevaluated. The lowering of the normal water level was discussed with the South Florida Water Management District (SFWMD) in a pre-application meeting held on July 19, 2018. The SFWMD expressed concern for lowering ground water levels at the right-of-way line, and will require demonstration that no drawdown affects occur outside the Turnpike right-of-way. This information was relayed to Terracon, the Geotechnical sub-consultant, and they performed a reevaluation. Soil borings (designated BB-1 to BB-12) were performed to the outside of the modified Pond 3A and on both sides of existing swales located to the outside of the Turnpike mainline travel lanes to evaluate groundwater levels between the pond area and the right-of-way. An average normal seasonal high groundwater elevation of 168.5 feet was estimated based on the borings. Terracon anticipates that lowering the water control elevation to 168.5 feet will have little to no impact to the groundwater level at the right-of-way. The Geotechnical Report is included in this report as **Appendix G**.

As mentioned previously in the existing conditions section, Pond 5 is currently designed as a wet detention facility. The control elevation (normal water level) is set to 137.0 feet, and the pond bottom elevation is set to 125.0 feet. However, this pond is functioning very well as a dry retention facility. During construction, dewatering was not needed and it was noted that the pond did not hold water during the entire duration of the construction project. Additionally, historical aerial imagery has been reviewed and this pond is completely dry in almost every image viewed. The only water seen was not ponded water, but wet soil at the bottom of the pond. This information was relayed to Terracon, the Geotechnical sub-consultant for this project. Terracon then conducted a field investigation and performed 17 soil borings. The estimated seasonal high groundwater table elevation is 2 feet below the pond bottom (elevation 123.0), and the permeability rates are excellent for dry retention. The finding of the borings performed by Terracon are included in the Geotechnical Report which is included in this report as **Appendix G**.

A change of Pond 5 from a wet detention facility to a dry retention facility provides the following benefits to FTE:

1. Provides approximately 105 acre-ft of additional volume (existing volume from permitted control elevation to existing pond bottom elevation)
2. Freeboard requirement is met and brought into compliance with current criteria
3. The analysis shows that Pond 5 does not need to be expanded at all to meet recovery and pond volume requirements

It was mentioned previously that Pond 5 has a secondary discharge structure at its northwest end that was designed to route a portion of the Pond 5 discharge to an existing wetland area to the northwest of the pond. Since Pond 5 has actually been functioning as a dry pond, this secondary discharge structure has not been



STV Incorporated
Consulting Engineers
5200 Belfort Road, Suite 400
Jacksonville, FL 32256 (904)730-9777

JOB #: 441309-1
JOB NAME: Turkey Lake
CALC'D BY: Daniel Shultz
CHECK'D BY: Bryon Wuczynski

Treatment Volume

Determine the design treatment volume:

0.5" inch over the drainage area = 3.73 ac-ft, or

Roof Area = 1.03 ac

Site area for pervious/impervious calculations = 87.55 ac

Impervious area for water quality pervious/impervious calculations = 44.97 ac

Percentage of imperviousness = 0.51 ac/ac

Depth to be treated for 1.25" = 0.64 in

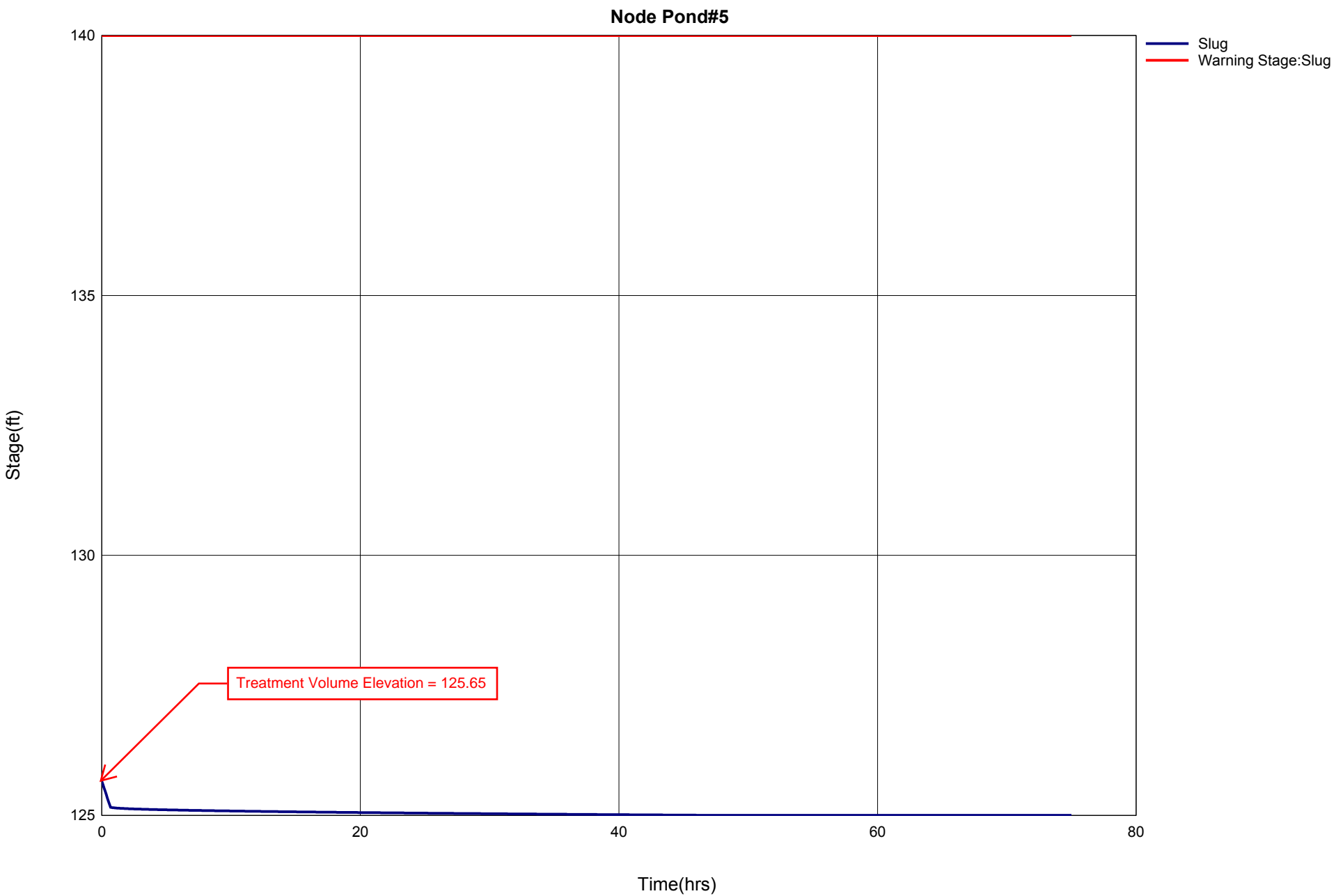
1.25" over the impervious area = 4.74 ac-ft

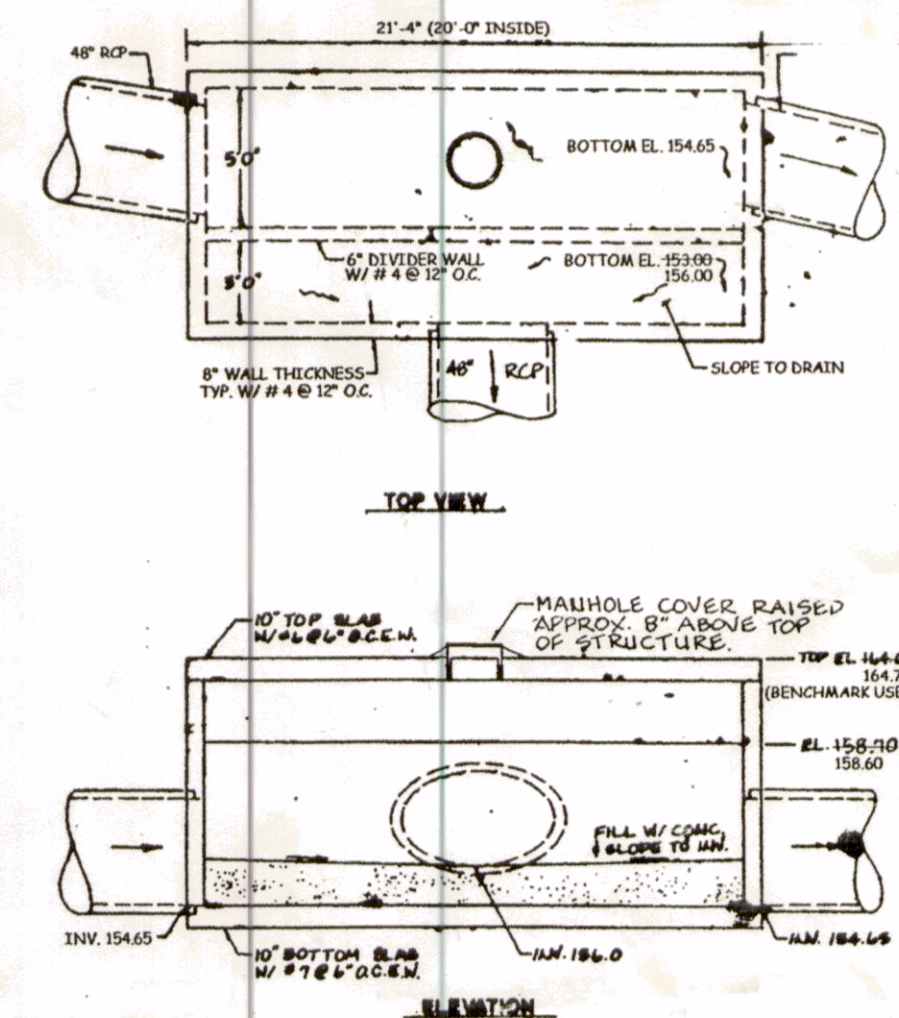
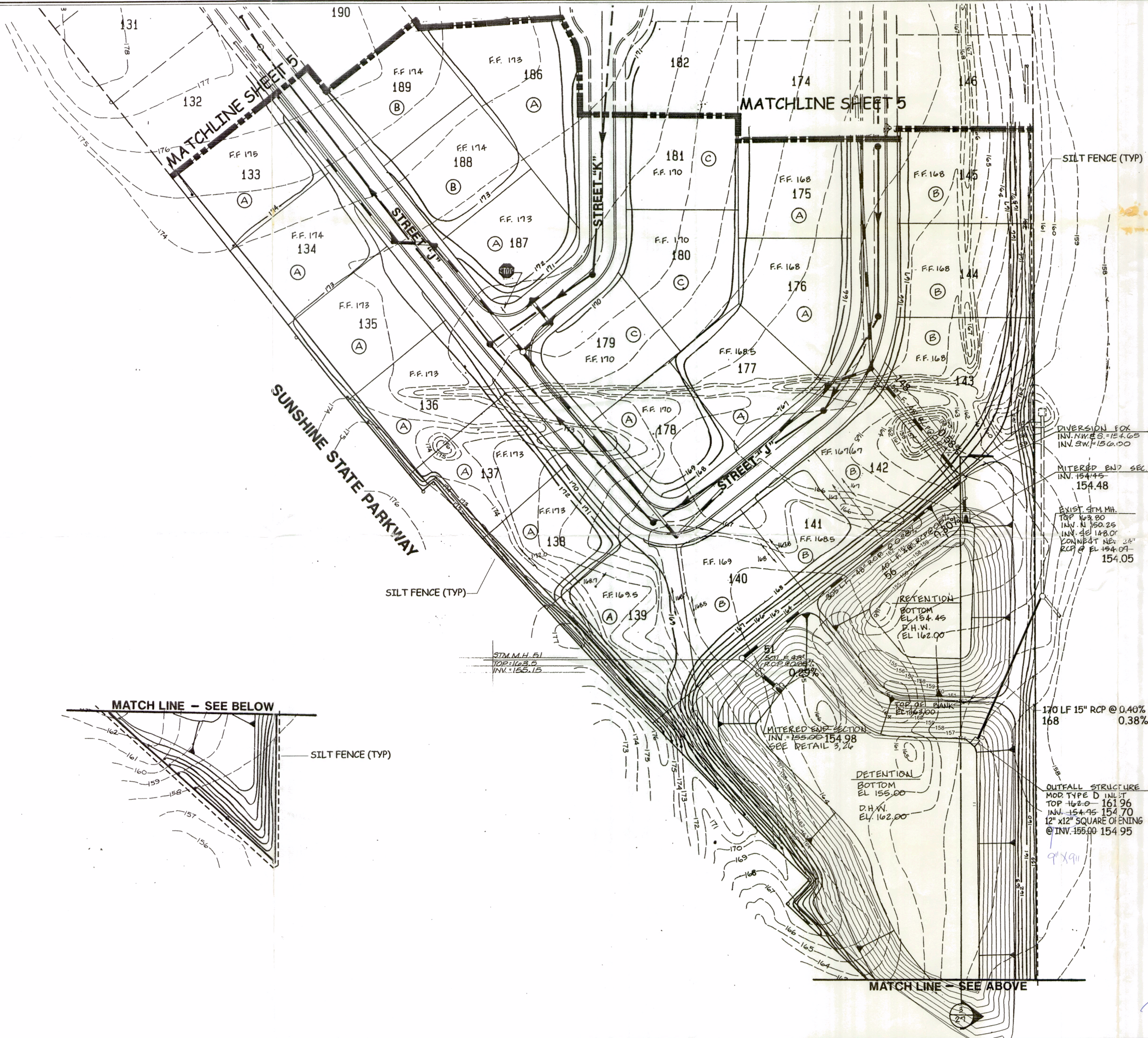
Greater of the two = 4.74 ac-ft, 1.25 inches over the impervious area controls

Determine the provided treatment volume:

	Elevation (ft)	Area (ac)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)
Outside TOB	143.50	12.74	30.13	179.65
Inside TOB	141.00	11.36	144.70	149.52
TV Elevation	125.65	7.49	4.82	4.82
Bottom	125.00	7.33	0	0

Provided treatment volume = 4.82 ac-ft, treatment volume requirement met





DIVERSION STRUCTURE (SOUTH POND)

AS-BUILTS

ELEVATIONS BASED ON LOCAL DATUM

CERTIFICATION:

I HEREBY CERTIFY THAT THE ATTACHED AS-BUILT SURVEY IS BASED ON A FIELD SURVEY MADE BY C.C.L. CONSULTANTS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND THAT IT MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA STATE BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS, PURSUANT TO SECTION 61G17-6, FLORIDA ADMINISTRATIVE CODE.

FOR THE FIRM
C.C.L. CONSULTANTS, INC.

DAVID M. BRUNO
PROFESSIONAL SURVEYOR AND MAPPER No. 5670 STATE OF FLORIDA

MAY 02 2002

ORLANDO SERVICE CENTER

CCL CONSULTANTS, INC.
ENGINEERS SURVEYORS PLANNERS
LANDSCAPE ARCHITECTS ENVIRONMENTAL CONSULTANTS

3000 WATLAND CENTER PARKWAY
SUITE 200
ORLANDO, FL 32757
(407) 660-1100
FAX (407) 660-1101
WWW.CCLCONSULTANTS.COM

FLORIDA ENGINEERING BUSINESS
NO. 2966

DRAWN RAC
DESIGNED REB
CHECKED
DATE 5/20/89

**METROWEST
PART OF TRACT 25
GRADING & DRAINAGE PLAN "E"
CITY OF ORLANDO, FLORIDA**

SCALE

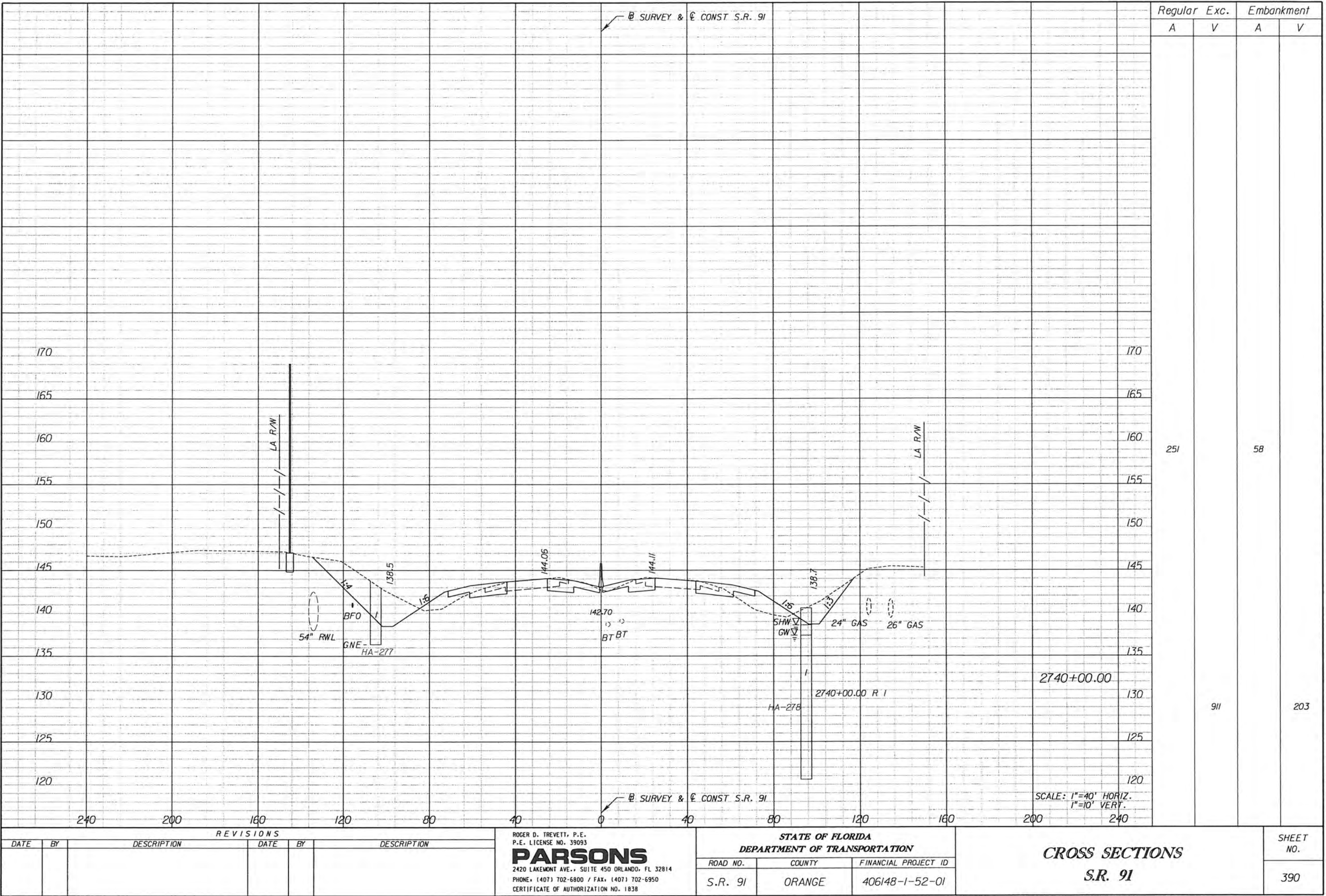
1" = 50'

PROJECT NO.

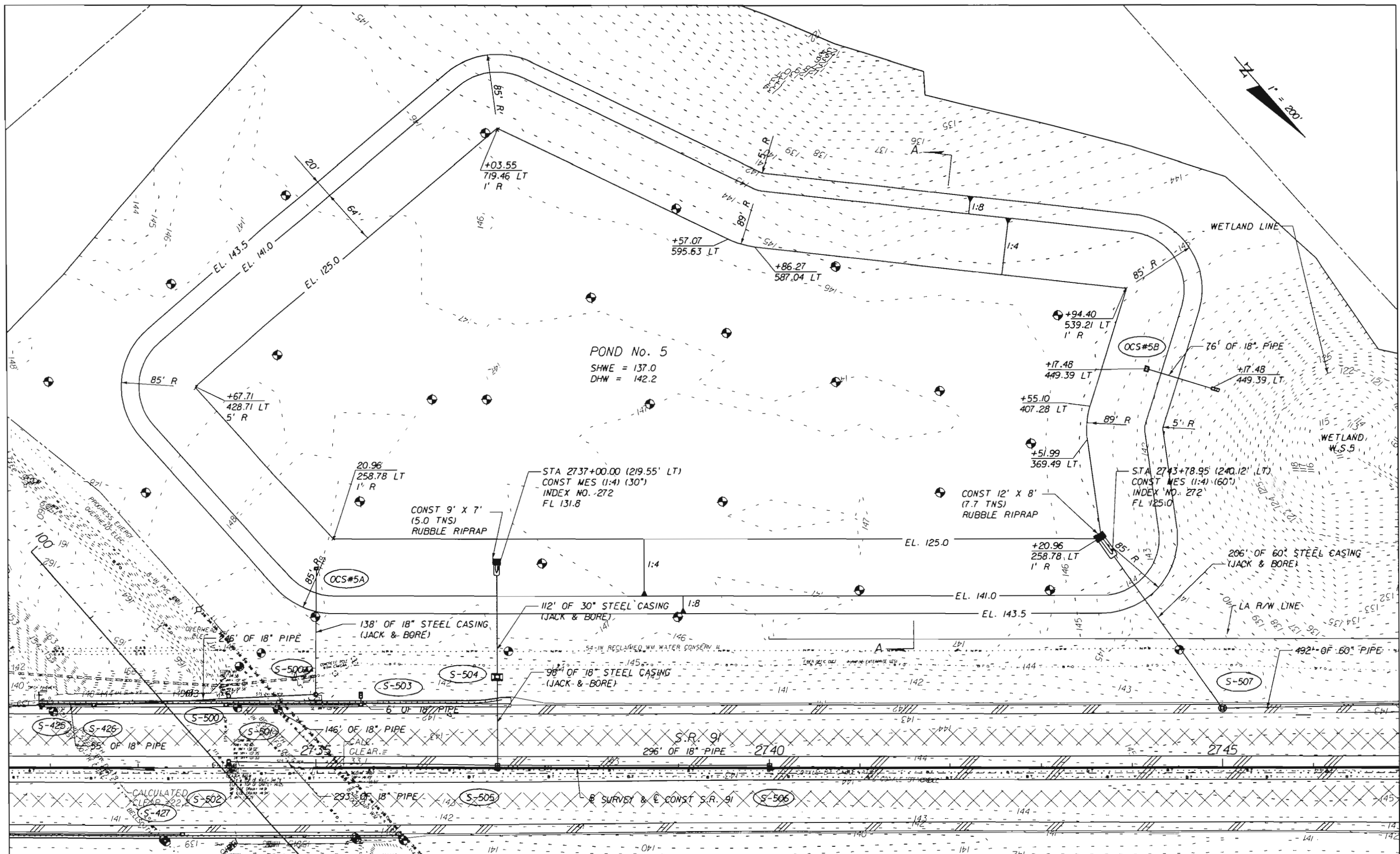
7677-00

SHEET

6 OF 13



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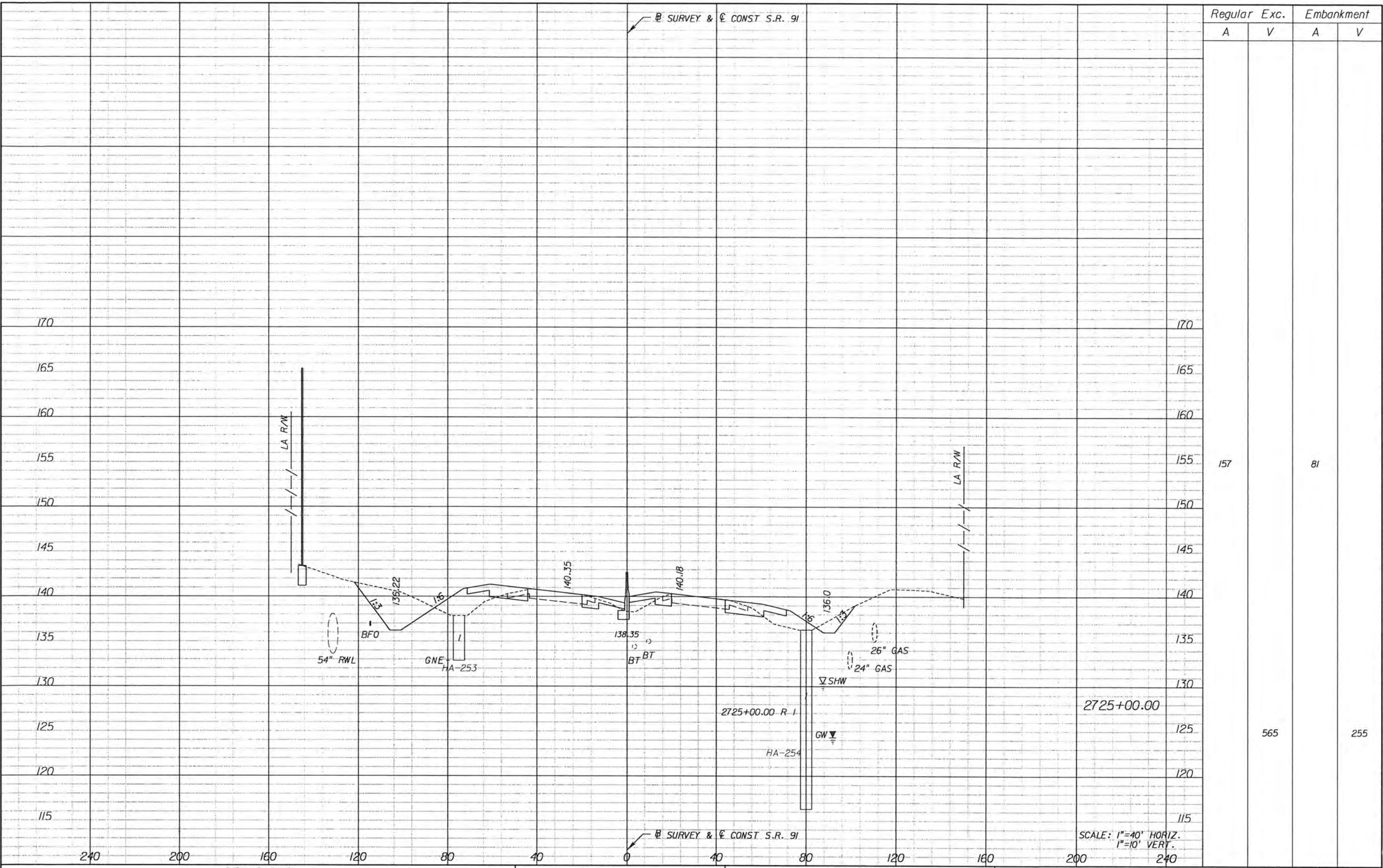
REVISIONS			
DATE	BY	DESCRIPTION	

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	ORANGE	406148-1-52-01

POND 5 DETAIL SHEET	
SHEET NO.	170

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REVISIONS						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			CROSS SECTIONS S.R. 91		SHEET NO. 379
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION						
						ROAD NO.	COUNTY	FINANCIAL PROJECT ID			
						S.R. 91	ORANGE	406148-1-52-01			

ROGER D. TREVETT, P.E.
P.E. LICENSE NO. 39093
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2420 LAKEMONT AVE., SUITE 450 ORLANDO, FL 32814
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CERTIFICATE OF AUTHORIZATION NO. 1838

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PARSONS
ENGINEERS AND PLANNERS

SUBJECT: Turnpike Mainline Widening
Basin No. 5 Post-Development Basin Calc.
MADE BY: EJK
CHECKED BY:

JOB # 646167
DATE: 05/25/05
DATE:

P:\646167\4081481\Wdrainageleng_data\Basin 5 Final.xls

Basin No. 5

Water Quality Volume (WQV) Required

Basin No. 5 is located in an open basin in Orange County within the boundaries of the SFWMD. Use the SFWMD criteria; therefore the greater of: 1.0" of runoff from the entire contributing area or 2.5" multiplied by the percentage of impervious area for wet retention systems. See Basis of Review, Section 5.2.1 of the SFWMD ERP Manual.

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

$$R = 1 \text{ in.}$$
$$A = 62.89 \text{ ac.}$$

$$\text{therefore, } WQV = 5.24 \text{ ac.-ft.}$$

or

$$WQV = \frac{R \text{ (in.)} * \% \text{Imp.} * A \text{ (ac.)}}{(12 \text{ in. / ft.})(100)}$$

$$R = 2.5 \text{ in.}$$
$$A = 62.89 \text{ ac.}$$
$$\% \text{ Imp.} = 33.03$$

$$\text{therefore, } WQV = 4.33 \text{ ac.-ft.}$$

Note: For Roadway widening projects, SFWMD requires only that the new DCIA be treated, therefore the required treatment volume will be the difference between the new DCIA (20.77 acres) and the existing DCIA (10.82 acres).

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

$$R = 2.5 \text{ in.}$$
$$A = 9.95 \text{ ac.} \quad (\text{New DCIA})$$

$$\text{therefore use: } WQV = 2.07 \text{ ac.-ft.}$$

Water Quality Volume Provided for this Project:

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

$$R = 1 \text{ in.}$$
$$A = 62.89 \text{ ac.}$$

$$\text{therefore use: } WQV = 5.24 \text{ ac.-ft.}$$

BASIN 6

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

Permit Modification Memorandum

ENVIRONMENTAL RESOURCE PERMIT SUBMITTAL

Financial Project Number: 440293-1-52-01

Florida's Turnpike Mainline (SR 91)

Resurfacing and Safety Improvements

MP 259.9 to MP 265.3

Orange County (75470)



Turnpike Design Engineer: Patrick Muench, P.E.

GEC Project Manager: Brandon Bobo, P.E.

Prepared By:

Metric Engineering, Inc.

525 Technology Park, Suite 153

Lake Mary, FL 32746

Certification of Authorization No. 2294

Vendor No. F-59-1685550

April 2022

C. Brian Fuller, P.E.

State of Florida, Professional Engineer License No. 49524

This item has been digitally signed and sealed by:

On the date indicated here.

WATER QUALITY CALCULATIONS

Water Management District Pollution Abatement Volume Requirement

Agency:	SFWMD
Post Development Total Area (ac) =	N/A
Post Development Impervious Area Added (ac) ² =	-3.58

Table 1. Water Quality Volume

Dry Retention Pollution Abatement Volume Required ⁽¹⁾	Ac-Ft
2.5" of Runoff Over Added Impervious Area =	-0.75

(1) Represents excess treatment capacity now present in the receiving pond.

(2) The Post Development Impervious Area Accomodated (ac) was determined based on the storage volume provided:

Pavement Design => 6" pervious concrete; 12" reservoir of 57 stone

Pervious Pavement = (0.5 ft thickness of concrete pervious pavement) * (20% voids) = 0.1 ft storage

Reservior = (1 ft thickness of #57 rock) * (25% voids) = 0.25 ft storage

Treatment Volume Provided = (0.1 ft pervious pavement storage + 0.25 reservior storage) * (3.58 ac of pervious pavement)

Ac-Ft of storage provided 1.25

Wet Detention (On-Line System) Criteria - 2.50" over added impervious area. (Based on the SFWMD's treatment volume requirements found in the 2016 ERP Applicant's Handbook Volume II.)

Table 2. Water Quality Treatment

Description	Volume Provided ac-ft
Treatment Provided (Excess)	0.75
Treatment Provided (Pervious Pavement System)	1.25

Table 3. Equivalent Lane Miles (Provided Treatment)

Impervious Area (acres)	3.60
Impervious Area ² (acres)	6.00
Lane Miles ³ (miles)	6.60

Excess Pond Capacity

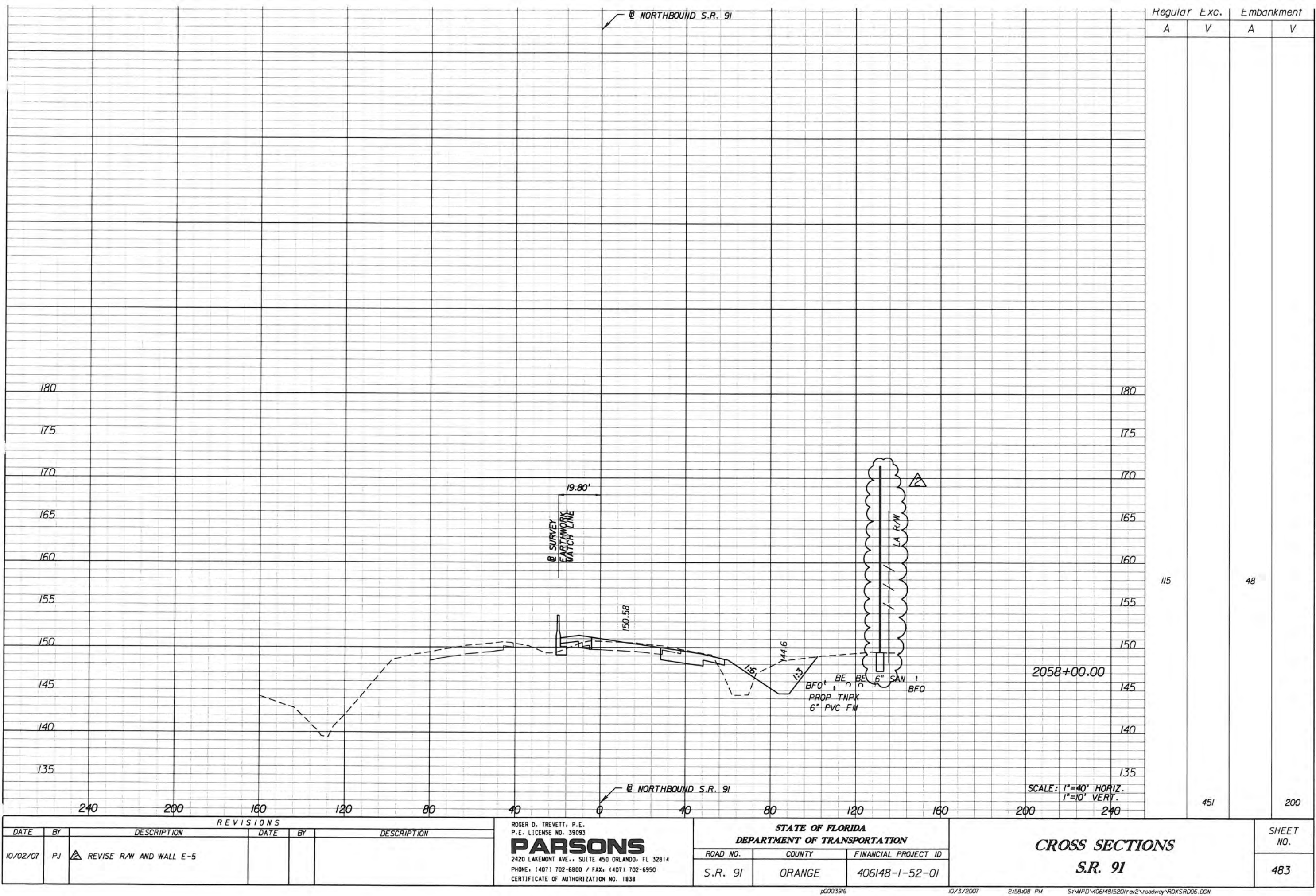
Pervious Pavement System

(3) Converted Post Development Impervious Area Added (ac) into Lane Miles:

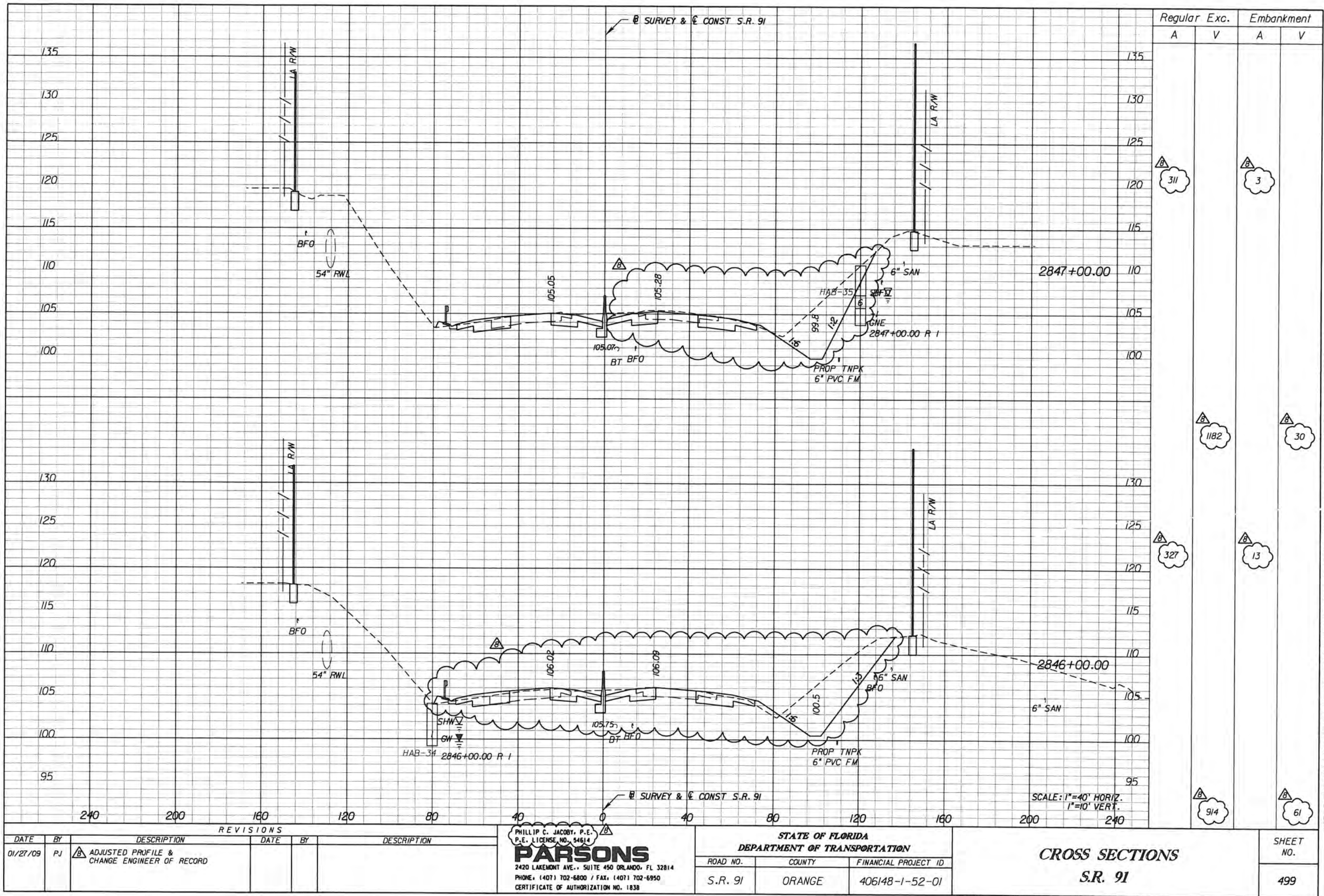
Assume: 12' lane width

Lane Miles = (Area in ac * 43560 ft²/ac) * (1 lane / 12ft) * (mi / 5280ft) = Equivalent lane miles

TREATMENT
VOLUME
CALCULATIONS
FROM DRAINAGE
DESIGN
DOCUMENTATION
SUBMITTED WITH
ORIGINAL PERMIT
APPLICAITON.



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Regular		Exc.		Embankment	
A	V	A	V	A	V
311		3		30	
1182		30		13	
327		13		9/4	61

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DATE 01/27/09 BY PJ		REVISIONS		DESCRIPTION		PHILLIP C. JACOBY, P.E. P.E. LICENSE NO. 54614 PARSONS 2420 LAKEMONT AVE., SUITE 450 ORLANDO, FL 32814 PHONE: (407) 702-6800 / FAX: (407) 702-6950 CERTIFICATE OF AUTHORIZATION NO. 1838		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			CROSS SECTIONS S.R. 91			SHEET NO. 499	
								ROAD NO. S.R. 91			COUNTY ORANGE			FINANCIAL PROJECT ID 406148-1-52-01	

Westover Ridge Subdivision (06020340)

PROJECT SUMMARY

Consul-Tech Development Services, Inc. provides the following calculations for the proposed stormwater system to serve the project titled "Westover Ridge Subdivision". The subject site is located at 9051 Westover Roberts Road (intersection Westover Roberts Road and S. Apopka Vineland) within Section 04, Township 23 South, Range 28 East in Orange County, Florida, designated as parcel # 04-23-28-0000-00-010.

The site is approximately 6.66 acres and is currently undeveloped with trees, fair grass and a small portion of wetlands located along the central portion of the property. Stormwater runoff generated by the site is collected in the wetlands and eventually discharged into a stormwater inlet structure located on the north-east portion of the site. The topography is varied across the site. In the south portion of the property, the topography slopes from both the west and east towards a depression area in the center area. The topography slopes from the north to the south. The elevations vary from +112 feet in the wetlands to +145 feet along the roadway with a relief of about 33 feet across the property.

The proposed project consists of 6 residential lots with an interior roadway located within the 50 ft right-of-way. A retention pond and collection system will be constructed to convey runoff generated during a storm event. The project site does not have a positive outfall, therefore, according to Orange County requirement, the site needs to be designed to retain a 100-year/24-hour storm event and the pond shall be designed to decant a 100-year/24-hour storm event by natural seepage or positive bleed down within fourteen (14) days. SFWMD says "unless otherwise specified by previous district permits criteria, a storm event of 3 day duration and 25 year return frequency shall be used in computing off-site discharge rates. Applicants are advised that local drainage districts or local governments may require more stringent design storm criteria."

Investigations from the geotechnical engineer suggest that the estimated seasonal high water table on the pond area is at 106 ft NGVD. We have established the bottom of the Pond at elevation 115 ft and it was sized to provide the volume necessary to meet the Water Management District and County requirements as defined above.

Design assumptions were made to study the pond volume recovery time. This information was obtained from the Soil Survey of Orange County (USGS), Florida by the United States Department of Agriculture. Per the USGS book, soils in the pond area consist of Tavares Series. This soil series is reported to have permeability higher than 6 in/hr. The pond design was based on an assumed horizontal conductivity of 10 ft/day with a factor of safety of 2, which provides very safe and accurate results.

PARSONS

ENGINEERS AND PLANNERS

SUBJECT: Turnpike Mainline Widening

Basin No. 6 Post-Development Basin Calc.

JOB # 646167

MADE BY: EJK

DATE: 11/18/05

CHECKED BY:

DATE:

Basin No. 6

P:\646167\4061481\drainage\eng_data\Basin_6_Final.xls

Water Quality Volume (WQV) Required

Basin No. 6 is located in a closed basin in Orange County within the boundaries of the SFWMD. Use the SFWMD criteria; therefore the greater of: 1.0" of runoff from the entire contributing area or 2.5" multiplied by the percentage of impervious area for wet detention systems. See Basis of Review, Section 5.2.1 of the SFWMD ERP Manual.

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

$$\begin{array}{ll} R = & 1 \text{ in.} \\ A = & 49.51 \text{ ac.} \end{array}$$

$$\text{therefore, } WQV = 4.13 \text{ ac.-ft.}$$

or

$$WQV = \frac{R \text{ (in.)} * \% \text{ Imp.} * A \text{ (ac.)}}{(12 \text{ in. / ft.})(100)}$$

$$\begin{array}{ll} R = & 2.5 \text{ in.} \\ A = & 49.51 \text{ ac.} \\ \% \text{ Imp.} = & 39.87 \end{array}$$

$$\text{therefore, } WQV = 4.11 \text{ ac.-ft.}$$

Note: For Roadway widening projects, SFWMD requires only that the new DCIA be treated, therefore the required treatment volume will be the difference between the new DCIA (19.74 acres) and the existing DCIA (11.28 acres).

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

$$\begin{array}{ll} R = & 2.5 \text{ in.} \\ A = & 8.46 \text{ ac.} \end{array} \quad \text{(New DCIA)}$$

therefore use:

$$WQV = 1.76 \text{ ac.-ft.}$$

Water Quality Volume Provided for this Project:

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

$$\begin{array}{ll} R = & 2.5 \text{ in.} \\ A = & 12.65 \text{ ac.} \end{array} \quad \text{(Impervious Area Treated Includes Basin 6A, 6B, & 6C Onsite DCIA)}$$

therefore use:

$$WQV = 2.64 \text{ ac.-ft.}$$

Water Quantity (Attenuation) Volume Required

From the Pre-Development Hydrograph:

$$100 \text{ Year 240 hour Storm Runoff Volume} = 2572901 \text{ cf}$$

From the Post-Development Hydrograph:

$$100 \text{ Year 240 hour Storm Runoff Volume} = 2767133 \text{ cf}$$

therefore use:

$$194232 \text{ cf} \quad 4.46 \text{ ac.-ft.}$$

PARSONS

ENGINEERS AND PLANNERS

SUBJECT: Turnpike Mainline Widening

Basin No. 6 Post-Development Basin Calc.

JOB # 646167

MADE BY: EJK

DATE: 11/18/05

CHECKED BY:

DATE:

Pond No. 6

P:\646167\4061481\drainage\eng_data\Basin_6_Final.xls

Seasonal High Water Elevation (SHW): 100.00 NAVD.

BASIN NO. 6 STAGE / STORAGE RELATIONSHIP (NODE#6B-N)

Stage	Area	Average Area	Storage	Accum. Storage
100.00	6.00		0.00	0.00
101.00	6.34	6.17	6.17	6.17
102.00	6.68	6.51	6.51	12.68
103.00	7.04	6.86	6.86	19.54
104.00	7.37	7.21	7.21	26.75

Water Quality Volume (WQV) Provided

WQV = 4.46 ac.-ft.

WATER QUALITY ELEVATION

Stage	Storage (ac-ft)
100	0
101	6.17

Therefore, from linear interpolation, minimum water quality elevation = 100.72 NAVD
to provide 4.46 ac-ft of required attenuation volume.

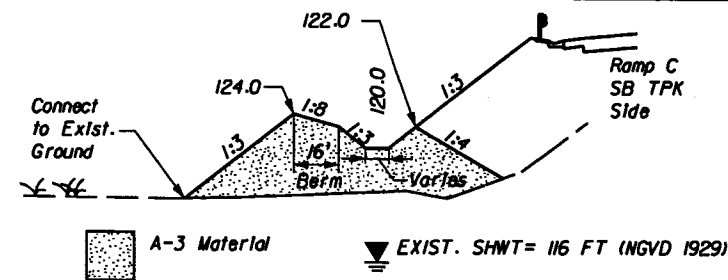
Set weir overflow elevation at 100.73 to provide 4.49 ac-ft of attenuation Volume
which will treat all of the impervious area (12.65 acres existing and new) w/in the R/W
outside of the Turkey Lake Service Plaza, that drains directly to the existing low
area.



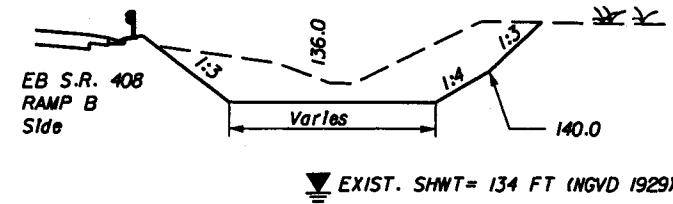
BASIN 7 & 8

Drainage Design Documentation

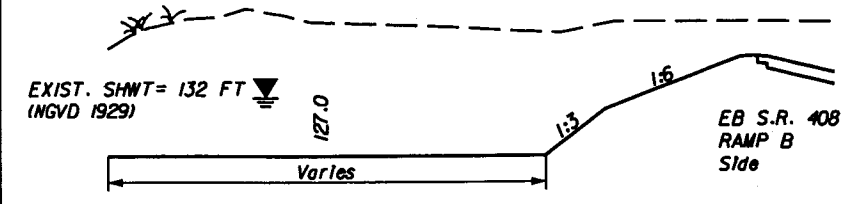
SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



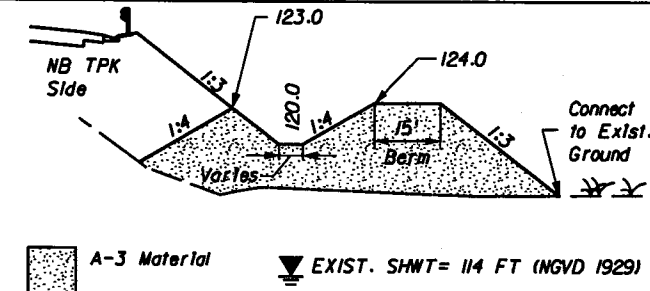
TYPICAL SECTION POND SB 20
N.T.S.



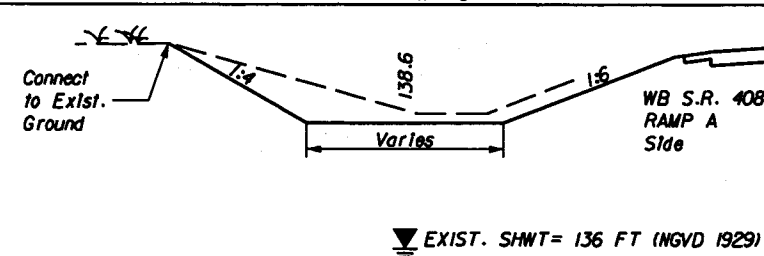
TYPICAL SECTION POND NB 35
N.T.S.



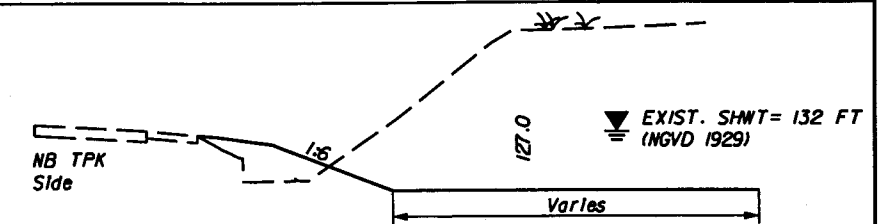
TYPICAL SECTION POND 9 (RAMP B)
N.T.S.



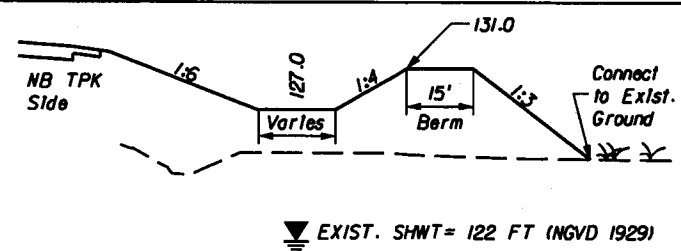
TYPICAL SECTION POND NB 20
N.T.S.



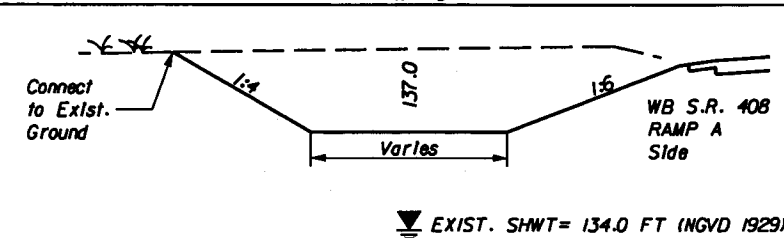
TYPICAL SECTION POND NB 40
N.T.S.



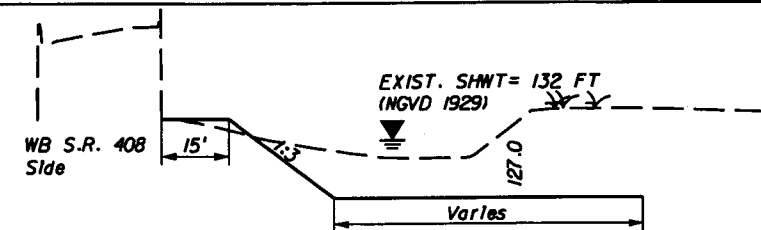
TYPICAL SECTION POND 9 (TPK MAINLINE)
N.T.S.



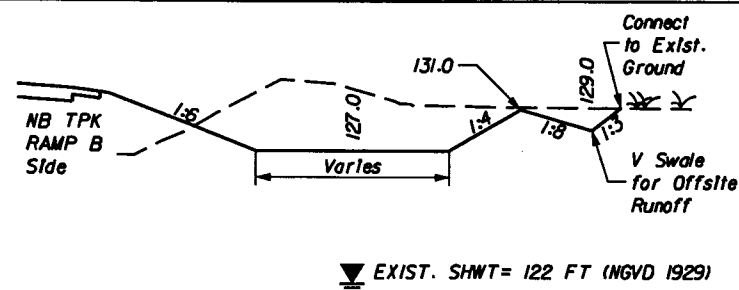
TYPICAL SECTION POND NB 25 STA. 5906+00.00 TO STA. 5907+00.00
N.T.S.



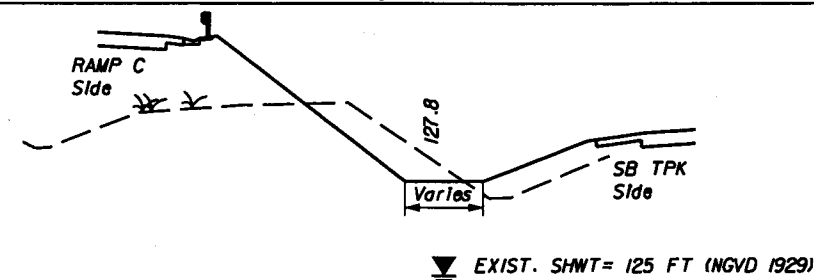
TYPICAL SECTION POND NB 45
N.T.S.



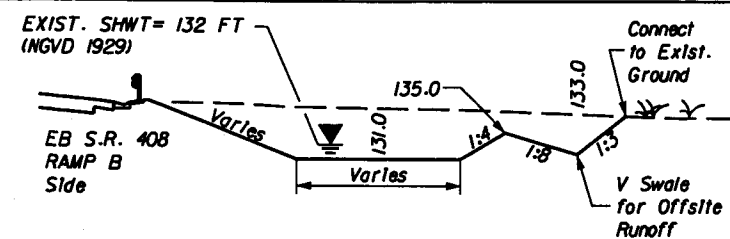
TYPICAL SECTION POND 9 (S.R. 408)
N.T.S.



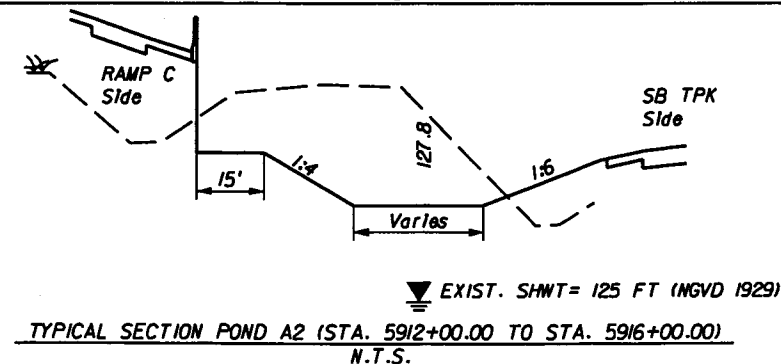
TYPICAL SECTION POND NB 25 (STA. 5908+00.00 TO STA. 2916+00.00 ON RAMP B)
N.T.S.



TYPICAL SECTION POND A2 (STA. 5910+62.60 TO STA. 5912+00.00)
N.T.S.



TYPICAL SECTION POND NB 30
N.T.S.



TYPICAL SECTION POND A2 (STA. 5912+00.00 TO STA. 5916+00.00)
N.T.S.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3417
Certificate of Authorization Number: 7862
Sherman C. Klaus II, P.E. License No. 58262

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ORANGE	406102-1-52-01

TYPICAL SECTION RETENTION AREAS

SHEET
NO.
96

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3.1 Basin No. 7

Turnpike Mainline Station 2867+50 to Station 2930+00

Basin No. 7 begins just south of the Gotha Road bridge and continues to the Turnpike's interchange with SR 408 (East –West Expressway). Basin No. 7 consists of 59.38 acres of the MP 265 Lake basin, which is a closed basin. The MP 265 Lake is a depressional area located on the east side of the Turnpike downstream of Cross Drain (C-10), a 4' x 4' CBC at Station 2884+30. The onsite stormwater runoff in Basin No. 7 is either collected by median and shoulder gutter inlets and conveyed through a storm sewer to the retention areas and ditches or stormwater runoff from the travel lanes flows directly into the roadside retention areas.

The stormwater management system in Basin No. 7 was constructed as part of the SR 408 Interchange modification project and is located north of the Hempel Avenue bridge. The stormwater management system will provide direct water quality treatment for runoff north of Hempel Avenue and compensate the treatment and increase of runoff volume in the 100-year, 10-day storm for the portion of the Turnpike Mainline south of Hempel Avenue. The existing stormwater management system in this basin that facilitates the Turnpike widening includes two retention ponds (Pond A2 and Pond 9) and three roadside retention swales (SB20, NB20, and NB25). The stormwater management system was designed for the eight-laning of the Turnpike Mainline in Basin No. 7. The widening of the mainline will cause minor alterations to existing Pond 9, and will result in a reduction of 0.2 ac-ft to the storage capacity of the pond. This reduction is acceptable given that the existing stormwater management facilities for Basin 7 provide a storage surplus of 2.57 ac-ft.

Floodplain compensation in Basin No. 7 is provided in an excavated area located at the edge of the floodplain on the left (west) side of the Turnpike near Station 2880+00. When the permit application for the SR 408 Interchange improvements was submitted to SJRWMD, the method to provide compensation for floodplain impacts was to over-excavate the adjacent roadside ditch on the left side of the roadway. Upon further utility coordination after the permit submittal, it was determined that the ditch over-excavation could not occur due to a conflict with the existing 54-inch Conserv II reclaimed water line. Therefore, floodplain compensation was relocated to the excavated area in the vicinity of Station 2880+00 (Lt.). This area provides 0.23 ac.-ft. of floodplain compensation, which exceeds the 0.20 ac.-ft. of impacts caused by the SR 408 Interchange improvements. A detail of the floodplain compensation area is provided in Section 2.1 of this report.

Basin No. 7, as permitted under the SR 408 Interchange project (SJRWMD Permit No. 4-095-20358-12), included 24.37 acres of impervious area and contributed 81.53 acre-feet of runoff volume. The permitted stormwater management facilities provide a total storage volume of 17.26 acre-feet of storage. The stormwater management calculations for Basin No. 7 in this report demonstrate that the proposed Turnpike Mainline widening within the basin comply with the stormwater management design of the SR 408 Interchange Modification project. The final configuration of the Turnpike will yield of total impervious area of 23.32 acres and contribute a runoff volume of 79.17 acre-feet, which is less than the original design parameters and comply with the SJRWMD Environmental Resource Permit for the SR 408 Interchange Modification. A

summary of the basin parameters is presented below with supporting documentation for the proposed basin parameters presented in this section.

Water Quality Treatment Summary:
SJRWMD Wekiva Basin Recharge Treatment

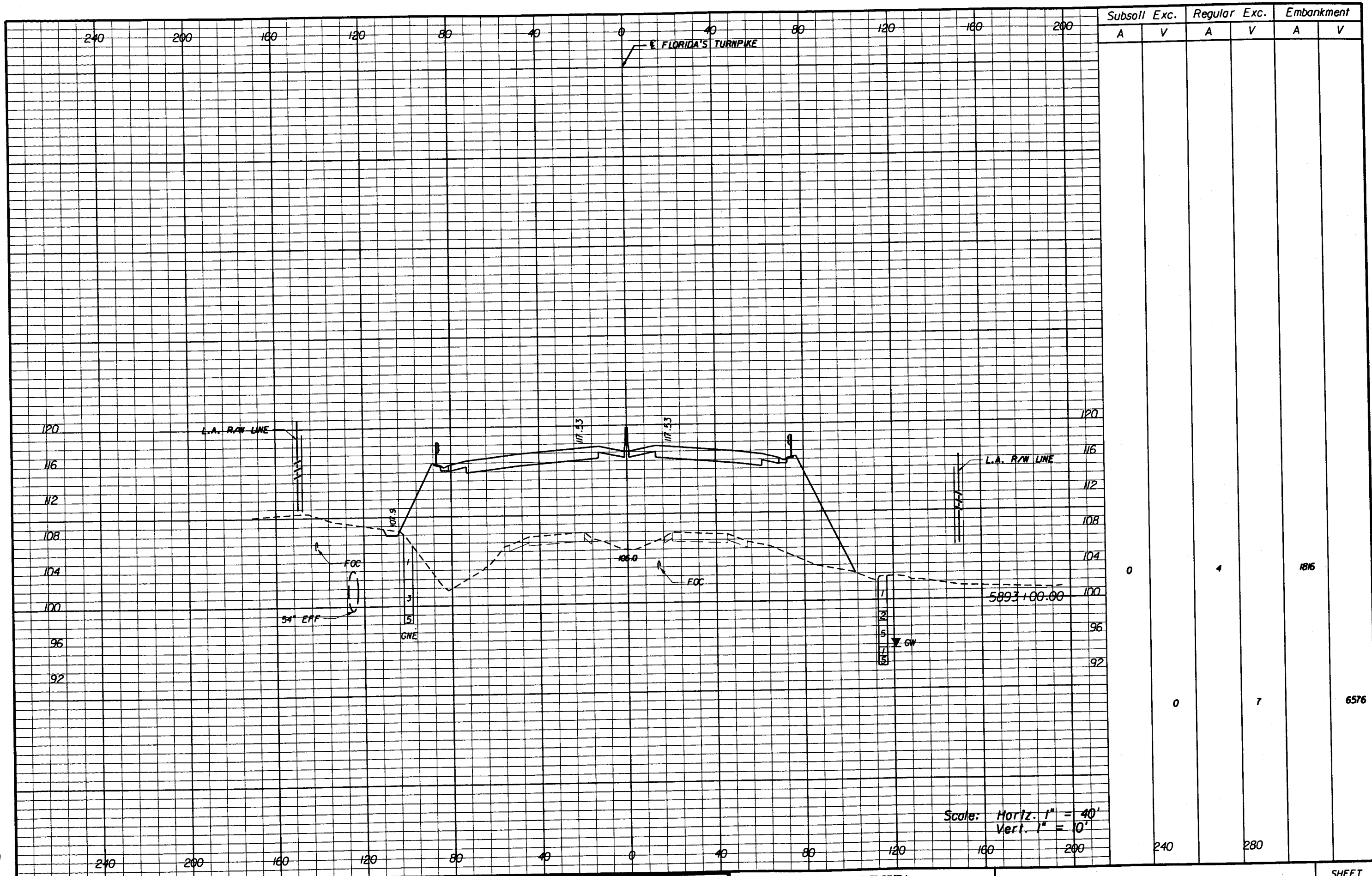
Volume Required: 3 inches over impervious area (23.32 acres) = 5.83 acre-feet
Volume Provided: 14.88 acre-feet

Water Quantity Summary:
Pre-Post 100-year/10-day storm

Pre-Development Runoff Volume = 66.84 acre-feet
Post-Development Discharge Volume = $79.17 - 14.88 - 2.94 = 61.35$ acre-feet

100-Year Floodplain Compensation Summary:

Floodplain Volume Displaced = 0.20 acre-feet
Floodplain Volume Compensation = 0.23 acre-feet



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
0		4		1816	
240		280		6576	

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
7/6/04	DCC	ADDED BARRIER WALL & GUARDRAIL			

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

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	ORANGE	406102-1-52-01

CROSS SECTIONS		SHEET NO.
		114

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Table 2-1 Lake Elevation Data from Orange County

Lake Name	Max Recorded Stage ¹ (ft, NAVD)	NHWE ² (ft, NAVD)
Lake Fischer	92.76	86.95
Lake Hugh	85.25	75.76
Lake Nally	96.54	89.49
Mills Pond	98.58	N/A
Gotha Pond	95.79	85.49

1 – The maximum recorded lake levels were obtained from the available lake level readings obtained from Orange County. The maximum stages were recorded on the following dates: Lake Fischer (11/03/2005), Lake Hugh (02/2006), Lake Nally (11/08/2019), Mills Pond (08/02/2005) and Gotha Pond (09/01/2005).

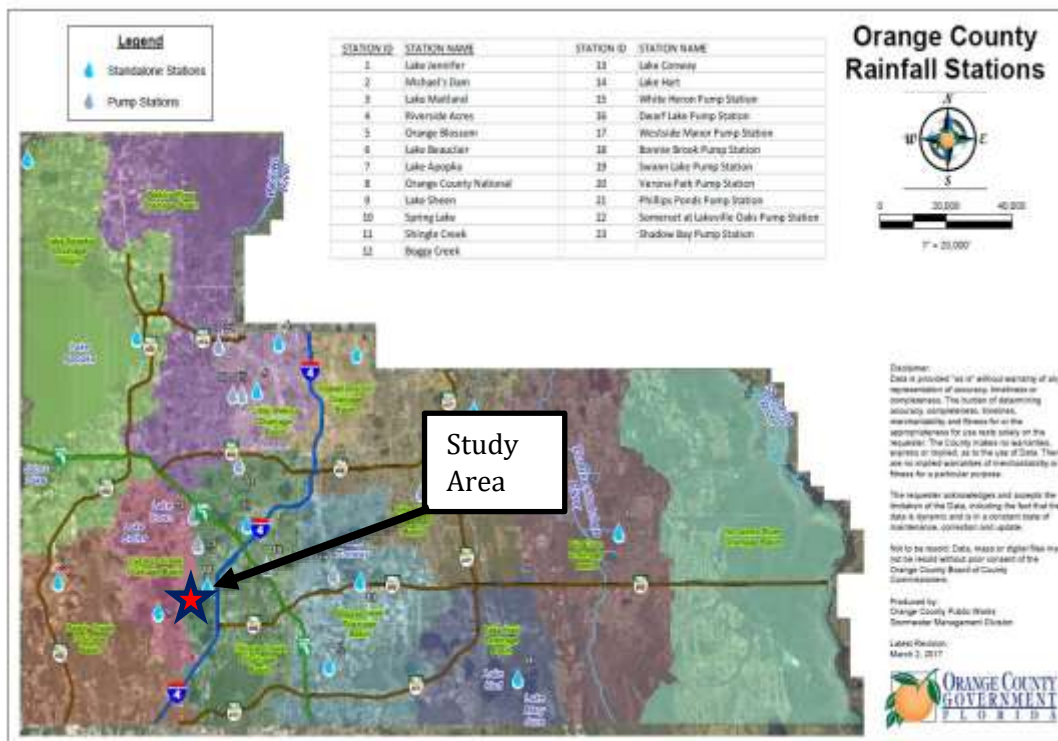
2 – Normal High-Water Elevation established by Orange County.

The Gotha Lakes Reuse Evaluation reports a maximum stage of 82.25 ft, NAVD that occurred in February 2006. The Lake Nally peak stage was recorded at elevation 96.54 ft, NAVD on November 8, 2019 while the Lake Fact Sheet indicated this elevation at 95.16 ft, NAVD (dated November 30, 2005). There are also miscellaneous lake level readings that were taken by the Orange County Survey Section and were reviewed and included in the existing conditions analysis.

Figures 2-2, 2-3 and 2-4 provide historical lake level information and rainfall collected by Orange County for Lake Fischer, Lake Nally and Gotha Pond and Mills Pond, respectively.

2.1.4 Historical Rainfall Data

Rainfall data were obtained from the Orange County Stormwater Management Division for the following stations: Station 5 – Lake Orlando, Station 7 – Lake Apopka, Station 8 – OC National, Station 9 – Lake Sheen, Station 11 – Shingle Creek, and Station 21 – Phillips Pond Pump Station.

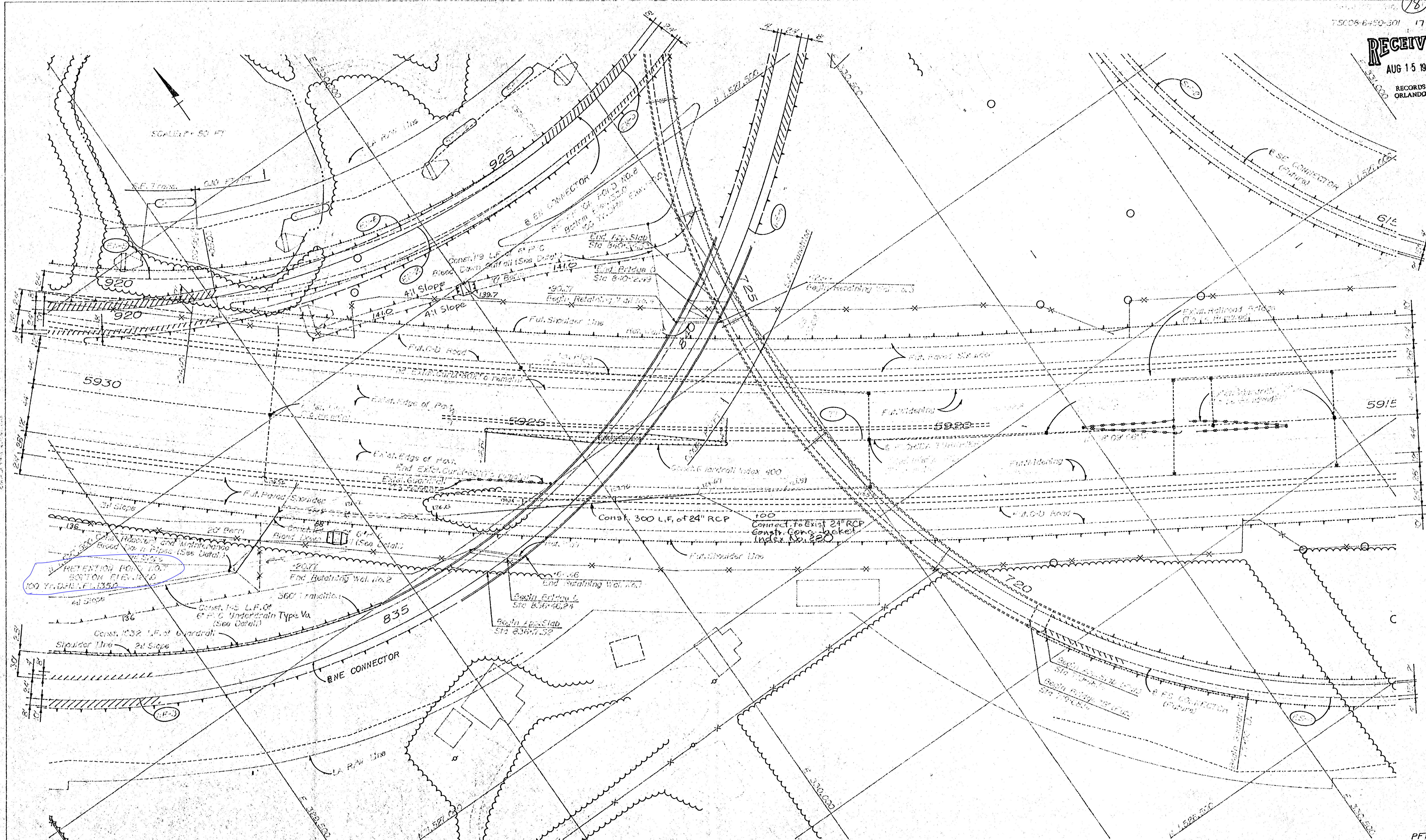


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ORLANDO

RECORDS
ORLANDO

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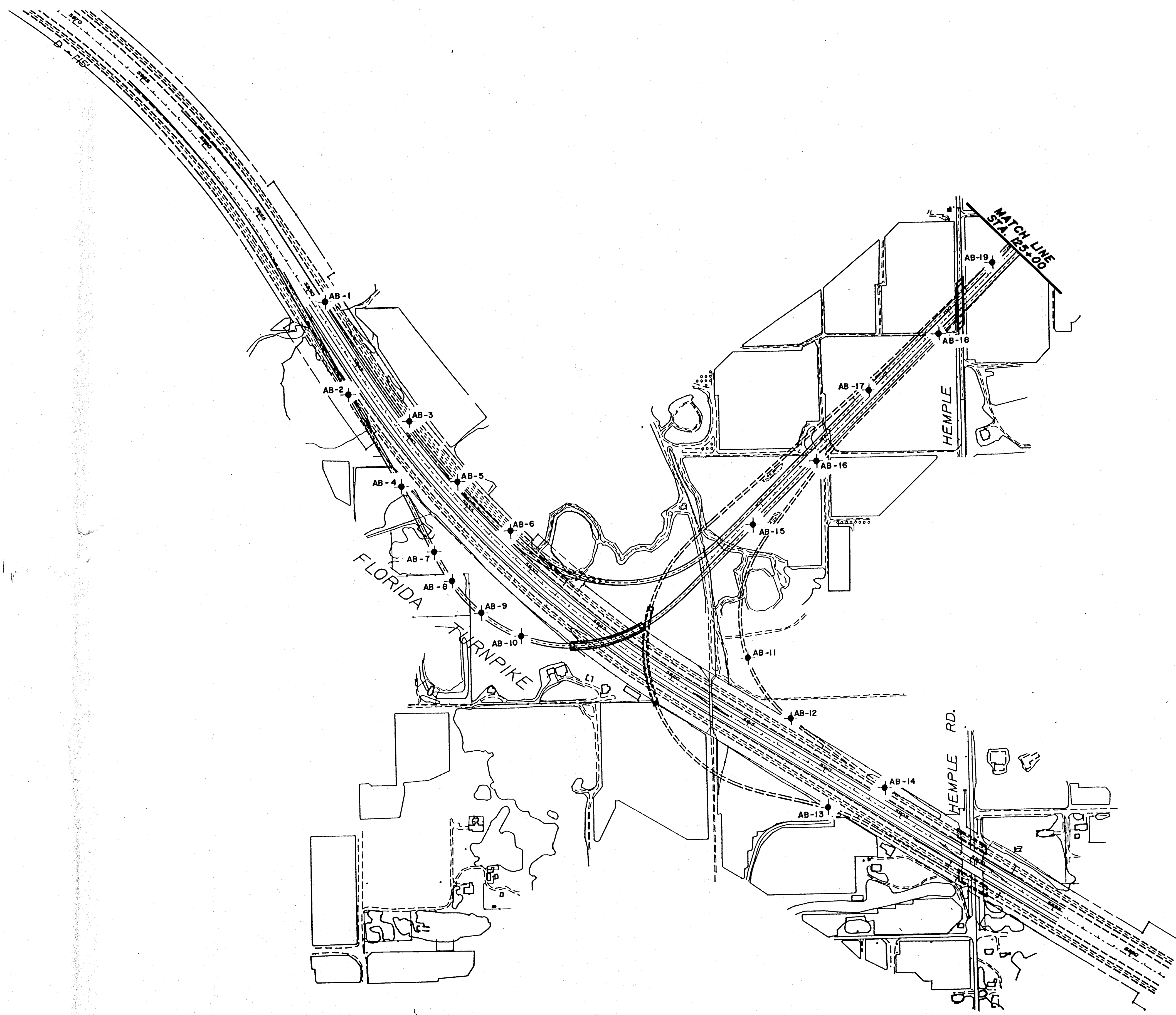
DATE	TIME	DATE	TIME	DATE	TIME
1-29-67	6.5	10-67	6.5	S.M.O.	
1-30-67	6.5	10-67	6.5	G.B.	
RECORDED BY: Duncan L. Jones, P.E.					



FLORIDA TURNPIKE CONNECTORS

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BFT 4
28-JUL-1988

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PRELIMINARY

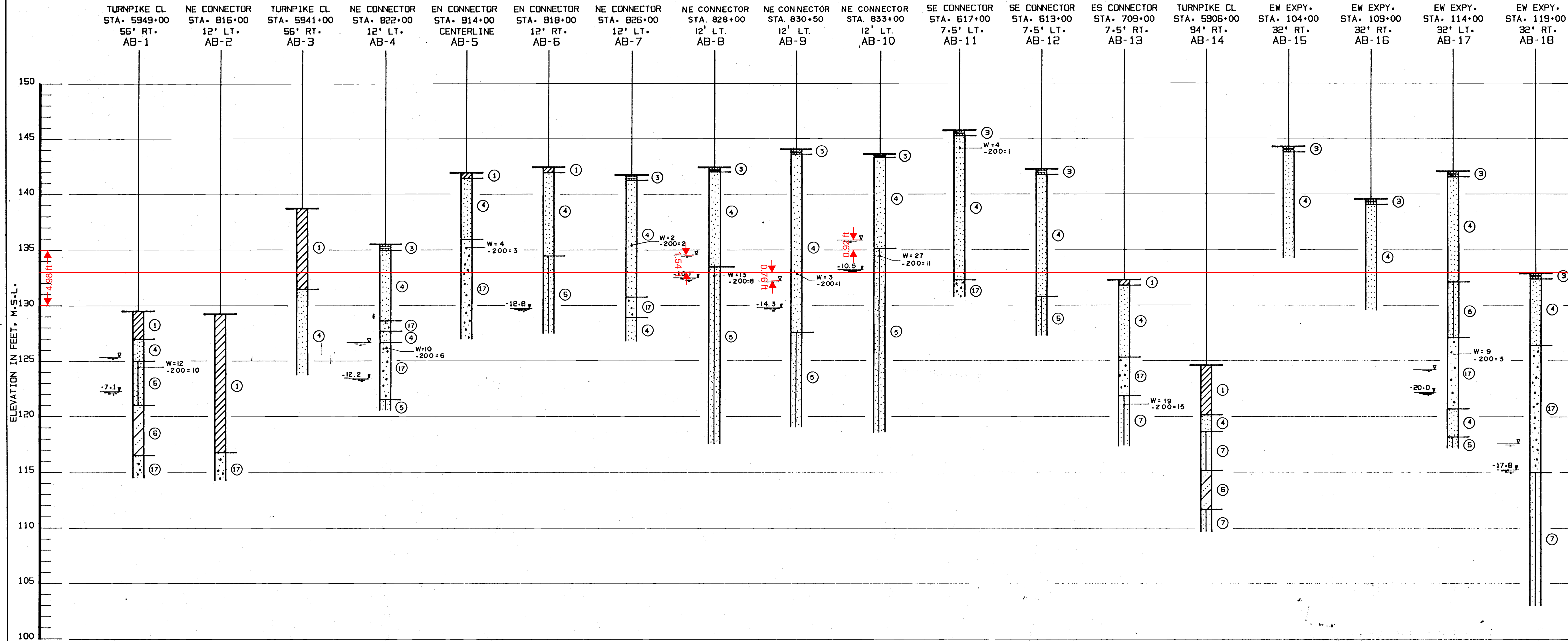
REVISIONS										DESIGNED BY		NAME	DATE	DRAWN BY		NAME	DATE	WESTERLY EXTENSION/TURNTPIKE CONNECTOR OF EAST-WEST EXPRESSWAY BORING LOCATION PLAN AB-1 THRU AB-19	
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY			
SUPERVISED BY RLG												SEJ, II		DWB		ORLANDO-ORANGE COUNTY EXPRESSWAY AUTHORITY			

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ORLANDO

PROJECT NO. 8008-6450-501
SHEET NO. 45

LEGEND

- ① LIGHT BROWN TO GREYISH-BROWN, OCCASIONAL ORANGISH-BROWN, FINE SAND AND ROCK (FILL) (SP), (A-3)
- ② DARK GREY SANDY PEAT TO FIBROUS PEAT (PT), (A-8)
- ③ GREY TO DARK GREYISH-BROWN FINE SAND WITH SMALL ROOTS (TOPSOIL) (SP), (A-3)
- ④ LIGHT BROWN TO YELLOWISH-BROWN, OCCASIONAL GREYISH-BROWN, FINE SAND (SP), (A-3)
- ⑤ REDDISH-BROWN TO DARK REDDISH-BROWN SLIGHTLY SILTY TO SILTY FINE SAND, OCCASIONAL SLIGHT CEMENTATION (SP-SM), (SM), (A-3), (A-2-4)
- ⑥ LIGHT GREYISH-BROWN TO GREYISH-BROWN, OCCASIONALLY ORANGISH-BROWN AND GREENISH-GREY, SLIGHTLY CLAYEY TO CLAYEY FINE SAND (SP-SC), (SC), (A-2-4), (A-2-6)
- ⑦ LIGHT BROWN TO LIGHT GREYISH-BROWN, OCCASIONAL ORANGISH-BROWN, SLIGHTLY SILTY TO SILTY FINE SAND (SP-SM), (SM), (A-3), (A-2-4)
- ⑧ LIGHT GREY TO GREYISH-BROWN, OCCASIONALLY GREENISH-GREY AND ORANGISH-BROWN, SANDY CLAY TO SILTY CLAY (CL), (CH), (A-6), (A-7-6)
- ⑨ DARK REDDISH-BROWN ORGANIC TO HIGHLY ORGANIC PLASTIC SANDY SILT TO PLASTIC SILT (OH), (A-7-5)
- ⑩ GREENISH-GREY TO DARK GREENISH-GREY SLIGHTLY CLAYEY TO CLAYEY FINE SAND WITH PHOSPHATES, TRACES OF INDURATED SILT (SP-SC), (SC), (A-2-4), (A-2-6)
- ⑪ LIGHT GREENISH-GREY SLIGHTLY SILTY TO SILTY FINE SAND, TRACES OF PHOSPHATES (SP-SM), (SM), (A-3), (A-2-4)
- ⑫ LIGHT BROWN TO ORANGISH-BROWN SILT, TRACES OF PHOSPHATES AND CALCAREOUS SILT (ML), (A-4)
- ⑬ LIGHT BROWN TO GREENISH-GREY SANDY SILT TO INDURATED SILT, TRACES OF PHOSPHATES AND CALCAREOUS SILT (ML), (A-4)
- ⑭ DARK GREEN SANDY CLAY, TRACES OF PHOSPHATE, OCCASIONAL BROKEN SHELL (CL), (CH), (A-6), (A-7-5)
- ⑮ DARK REDDISH-BROWN ORGANICALLY STAINED CLAY (CH), (A-7-6)
- ⑯ LIGHT BROWN LIMESTONE AND INDURATED LIME SILTS
- ⑰ BROWN TO DARK REDDISH-BROWN FINE SAND (SP), (A-3)
- ⑱ DARK REDDISH-BROWN TO BLACK ORGANIC TO HIGHLY ORGANIC FINE SAND TO SILTY FINE SAND (SP), (SM), (A-3), (A-4)
- ⑲ DARK REDDISH-BROWN TO BLACK HIGHLY ORGANIC CONSOLIDATED PLASTIC SILT WITH SAND TO CONSOLIDATED PLASTIC SILT (OH), (A-7-5)
- ⑳ LIGHT BROWN SILTY CLAY (CH), (A-7-6)
- ㉑ LIGHT GREY TO LIGHT GREENISH-GREY CONSOLIDATED SILTS/CLAYS WITH PHOSPHATES (CL/ML), (A-4)
- ㉒ GREYISH-BROWN CLAYEY FINE SAND (FILL) (SC)
- ㉓ GREENISH-GREY CLAY (FILL) (CL), (A-7-5)
- (SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
- (A-3) A.A.S.H.T.O. SOIL CLASSIFICATION GROUP SYMBOL
- 4.5' DEPTH TO GROUNDWATER LEVEL IN FEET: JANUARY 13-18, 1988 & MARCH 10, 1988
- W NATURAL MOISTURE CONTENT IN PERCENT
- 200 FINES PASSING #200 SIEVE IN PERCENT



REVISIONS										DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE
										CHECKED BY			CHECKED BY		
										SUPERVISED BY	RLG				

ORLANDO-ORANGE COUNTY EXPRESSWAY AUTHORITY

WESTERLY EXTENSION/TURNPIKE CONNECTOR OF EAST-WEST EXPRESSWAY

SOIL PROFILES

AB-1 THRU AB-18

JBA NO. 85-02510-2

SHEET NO. 3

BASIN 9

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

Please see Page 8 of this report for a summary table.

Soils

The soils as reported in the SCS Soil Survey Report for Orange County, Florida can be found in Appendix A of this report. The site consists of following soil types:

Soil Types			
Map Symbol	Soil Name	Hydrologic Group	High Water Table Depth (ft)
3	Basinger Fine Sand, Depressional	D	+2.0 - 1.0
26	Ona Fine Sand	B/D	0.0 - 1.0
37	St. John's Fine Sand	B/D	0.0 - 1.0
42	Sanibel Muck	B/D	+1.0 - 1.0
43	Seffner Fine Sand	C	1.5 - 3.5
44	Smyrna Fine Sand	B/D	0.0 - 1.0
46	Tavares Fine Sand, 0 to 5 percent slopes	A	3.5 - 6.0
54	Zolfo Fine Sand	C	2.0 - 3.5

Subsurface soil and groundwater level investigations were performed by Yovaish Engineering Sciences, Inc. (YES) and are provided under separate cover.

Groundwater

Yovaish Engineering Sciences, Inc. has provided all groundwater analysis and recommendations. The existing groundwater was measured ranging in elevation from 121.0 to 125.5 feet. The estimated seasonal high groundwater varies across the site ranging in elevation from approximately 121.5 to 128.0 feet.

Please refer to the detailed geotechnical report provided by Yovaish Engineering Sciences, Inc. under separate cover.

Recharge

The site is not located within a recharge area.

Flood Zone

Flood plain information was obtained from the Flood Insurance Rate Map (FIRM); map #12095C0220 E effective date December 10, 2000. The entirety of the site is located within a Zone X Unshaded; Areas determined to be outside the 500-year flood plain.

Please see Appendix A for the FEMA Flood Map and Legend.

Water Quantity Summary:

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 24.1 acre-feet

Post-Development Volume Discharged = 8.0 acre-feet

Peak Discharge Summary:

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 80.5 cfs

Post-Development Peak Discharge = 54.9 cfs

Pond Flood Stage Summary:

25-Year/96-Hour storm

Top of Berm Elevation = 122.0 ft.

Design High Water Elevation = 121.1 ft.

100-Year Floodplain Compensation Summary (see Section 4):

Floodplain Volume Displaced = 13.03 acre-feet

Floodplain Volume Compensation = 21.74 acre-feet

3.3 Basin No. 9

Turnpike Mainline Station 2930+00 to Station 2980+10

Basin No. 9 originates at Station 2930+00 near the western end of the SR 408 interchange with the Turnpike and continues to the Maguire Road bridge over the Turnpike mainline near Station 2980+10 and includes portions of Ramps A and D of the SR 408 interchange. Runoff discharges from Basin No. 9 into Lake Pearl and Lake Lilly and eventually into a drainage well. The Lake Pearl and Lake Lilly watershed is considered a closed basin.

A significant factor that affects Basin No. 9 is the tailwater stages in Lake Lilly and Lake Pearl. The FEMA 100-year flood elevation has been published at elevation 122.3 feet, NGVD, which converts to elevation 121.4 feet, NAVD. Based on this data, the southbound lanes of the Turnpike will be reconstructed at a higher elevation to keep above the 100-year flood elevation, especially since the Turnpike serves as an emergency evacuation route.

Flood stages for the tailwater in the 25-year/24-hour, 25-year/96-hour, and 100-year/24-hour storms were estimated for this project by routing the lake system with a simplistic ICPR model using the known hydrologic characteristics of the lake system watershed and the known hydraulic properties of the drainage well serving the system based on the Lake Lilly/Lake Pearl study for the City of Ocoee by Devo Seereeram, Ph.D., P.E. The ICPR routing used the high end of the normal range of lake water levels at elevation 116.0', NAVD as the starting water level and routed the lake basin as a single node. The resulting time-stage curves are included in Appendix C. The routing determined a peak lake stage for the 25-year/24-hour storm at elevation 119.6', NAVD occurring at hour 36, or about 12 hours after the 24-hour storm. The peak stage determined in the 100-year, 24-hour tailwater routing was about one foot lower than the FEMA 100-year storm, which could be attributed to the starting lake water level used in the routing being different than from the FEMA study.

Onsite drainage facilities in Basin No. 9 will be designed to convey runoff from most of the Turnpike pavement to proposed Pond 9. Basin No. 9 will have a drainage area of 32.90 acres. Drainage facilities will consist of median barrier wall inlets, shoulder gutter inlets, and storm sewer to collect and convey the stormwater runoff. Some onsite runoff collection by roadside ditches along the Turnpike will be used on the right side from the high point at Station 2929+00 to about Station 2944+00 and on the left side from Station 2946+00 to 2949+00, where dual ditches will be used to separate onsite runoff from offsite runoff.

In Basin No. 9, most of the Turnpike pavement is superelevated as the alignment runs through two horizontal curves. Superelevated pavement in the curves will drain to the paved median, where runoff will be collected by inlets and conveyed by storm sewer pipes to Pond 9. Along Lake Pearl, on the right side of the alignment, a retaining wall will be constructed and a storm sewer will be needed to collect runoff from shoulder gutter inlets and to convey onsite runoff in the roadside ditch from the south past the wall to Pond 9.

Along the southbound lanes past Station 2950+72 to Maguire Road bridge, the widening of the Turnpike to a 12-lane section within the 300-foot wide right-of-way will not allow sufficient

space to construct dual ditches. The project will need to prevent commingling by collecting runoff from the southbound pavement with a shoulder gutter while using the remaining roadside ditch to collect and convey off-site runoff. Due to the fairly flat longitudinal slope of the Turnpike through part of this basin, special drainage considerations will be needed for drainage in shoulder gutter and the paved median.

Pond 9, a wet detention pond, is proposed to serve Basin No. 9. The property where Pond 9 will be located has had some preliminary backfilling and floodplain compensation provided for a future industrial park. The design of the stormwater management system will provide water quality treatment, compensate for displaced 100-year floodplain volume, and attenuate the volume discharged during the 25-year/96-hour storm and the peak flow during the 25-year/24-hour storm. The 25-year/24-hour peak stage in Pond 9 is designed to maintain one foot of freeboard below the shoulder gutter elevation of the Turnpike. Pond 9 holds a volume in excess of the pre/post volume difference at the 25-year/96-hour tailwater flood stage and Pond 9 compensates the 100-year floodplain volume in excess of the net impacts along the highway plus the increase of 100-year/24-hour storm runoff volume.

The proposed control water level in Pond 9 is set at elevation 116.5' (NAVD). The proposed control water level is based on the average groundwater level from soil borings taken at the pond site. The average water table elevations at the pond site is higher than the range of lake level elevations recorded monthly for Lake Pearl and Lake Lilly by the Orange County Stormwater Department. The pond site had soil borings performed that encountered the water table around elevation 115' and the geotechnical engineer had estimated a seasonal high water table elevation in the range of 119' to 120'. The average water table elevation is around elevation 116.5', NAVD. Lake water surface elevations in Lake Pearl have normally ranged from elevation 114.5' to 116.0', NAVD during the past the past five years. During the summer of 2004, a water elevation of 117.5', NAVD was recorded in Lake Pearl following three hurricanes in central Florida. The proposed control water level in Pond 9 is about 0.5' above the higher end of the range of water elevations normally observed in the Lake Pearl/Lake Lilly system.

The proposed control structure will consist of two (2) modified FDOT Type G inlets each having two (2) 52" wide slots at elevation 117.6'. Control of the normal water level will be provided by a 6" and a 4" diameter orifices set at elevation 116.5'. The control structures will be connected to dual 36" pipes that will discharge in the vicinity of cross drain C-15 into Lake Pearl.

The basin parameters and peak discharge rate and volume are presented below:

Water Quality Treatment Summary:

Volume Required: 2.5 inches over impervious area = 4.16 acre-feet
Volume Provided: 4.56 acre-feet at elevation 117.60' NAVD

Water Quantity Summary:

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 24.1 acre-feet

Post-Development Volume Discharged = 8.0 acre-feet

Peak Discharge Summary:

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 80.5 cfs

Post-Development Peak Discharge = 54.9 cfs

Pond Flood Stage Summary:

25-Year/96-Hour storm

Top of Berm Elevation = 122.0 ft.

Design High Water Elevation = 121.1 ft.

100-Year Floodplain Compensation Summary (see Section 4):

Floodplain Volume Displaced = 13.03 acre-feet

Floodplain Volume Compensation = 21.74 acre-feet



PROJECT: Turnpike Mainline Widening
 SUBJECT: Stormwater Calculations

Summary of Calculations

Water Management District	Required Treatment Volume Criteria	Source	2.5" times Impervious Area in Basin 9 (ac-ft)	Pre-Post Runoff Volume Difference (ac-ft)
SJRWMD	2.5 inches of runoff over new impervious area	Applicants Handbook: Regulation of Stormwater Management Systems Chapter 40C-42. (Section 14.2)	4.16	4.33

Wet Detention Volume for Proposed Stormwater Management Facility = **4.16 ac-ft**

Stage Storage Calculations

Pond 9

Stage (ft)	Area (sq-ft)	Area (ac)	Incremental Depth (ft)	Incremental Volume (ac-ft)	Cumulative Volume (ac-ft)	Treatment Volume = Elevation	117.51 ft
116.5	164533	3.78	-	-	0.00		
120.0	196389	4.51	3.5	14.50	14.50		
122.0	234303	5.38	2.0	9.89	24.39	4.16 ac-ft	

Wet Detention Volume for Proposed Stormwater Management Facility = **4.56 ac-ft** at EL. 117.60 ft

Post-Development 25yr / 24hr Discharge Rate= **1.30 cfs**

Post 25yr/ 96 hr Volume Discharged = **8.8 ac-ft**

100-Year Floodplain Volume Available (@ Elev. 121.4') = **21.42 ac-ft**

Post-Development 25yr / 96hr Stage Elevation= **121.7 ft**

Top of Berm Elevation = **122.0 ft**

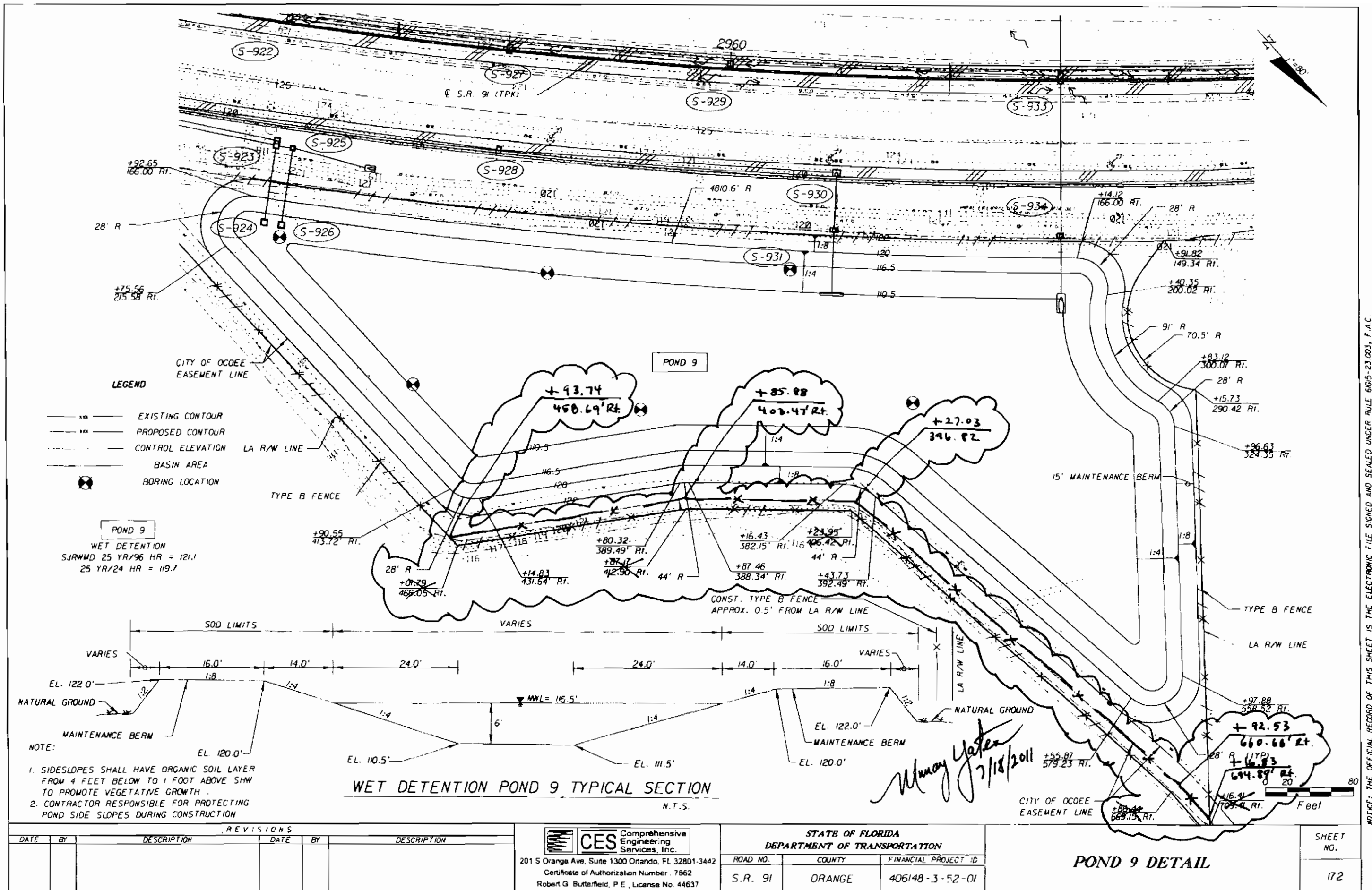


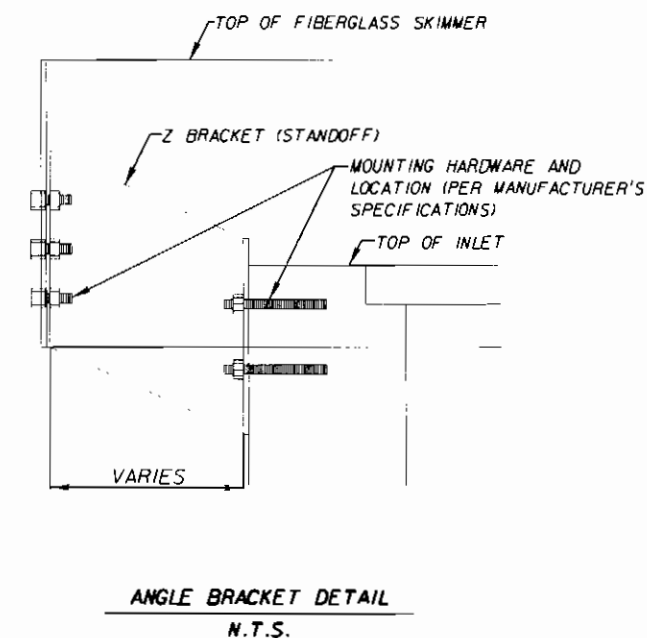
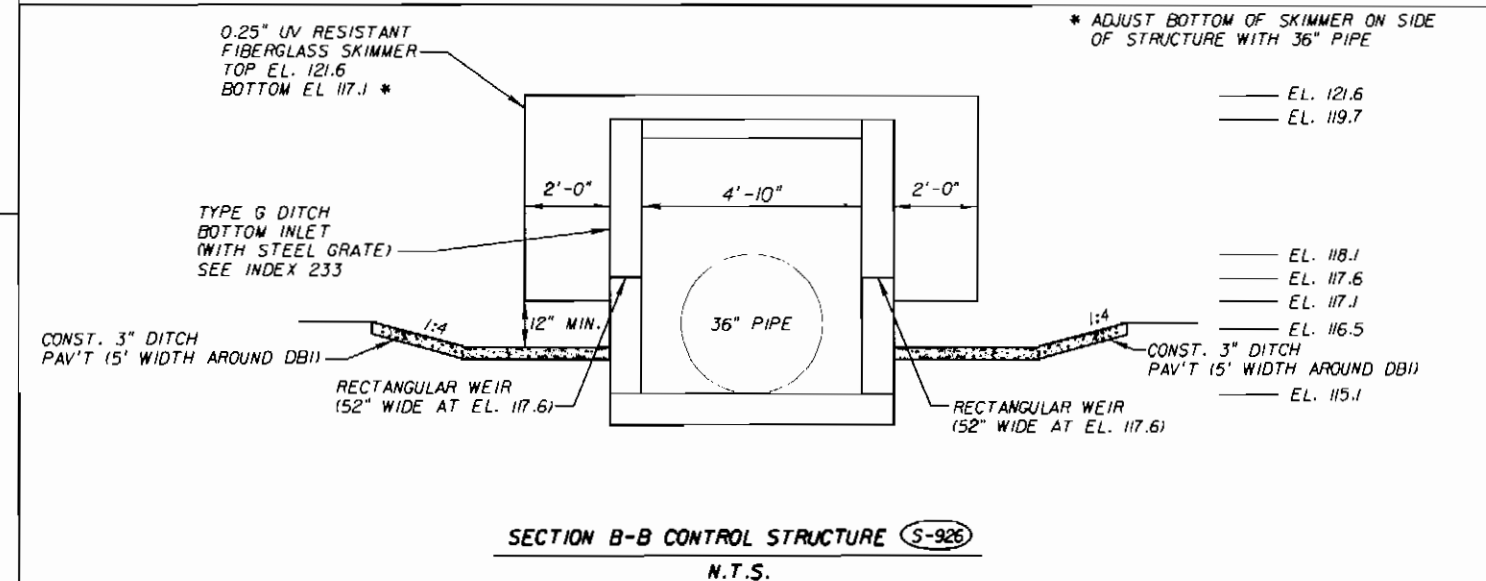
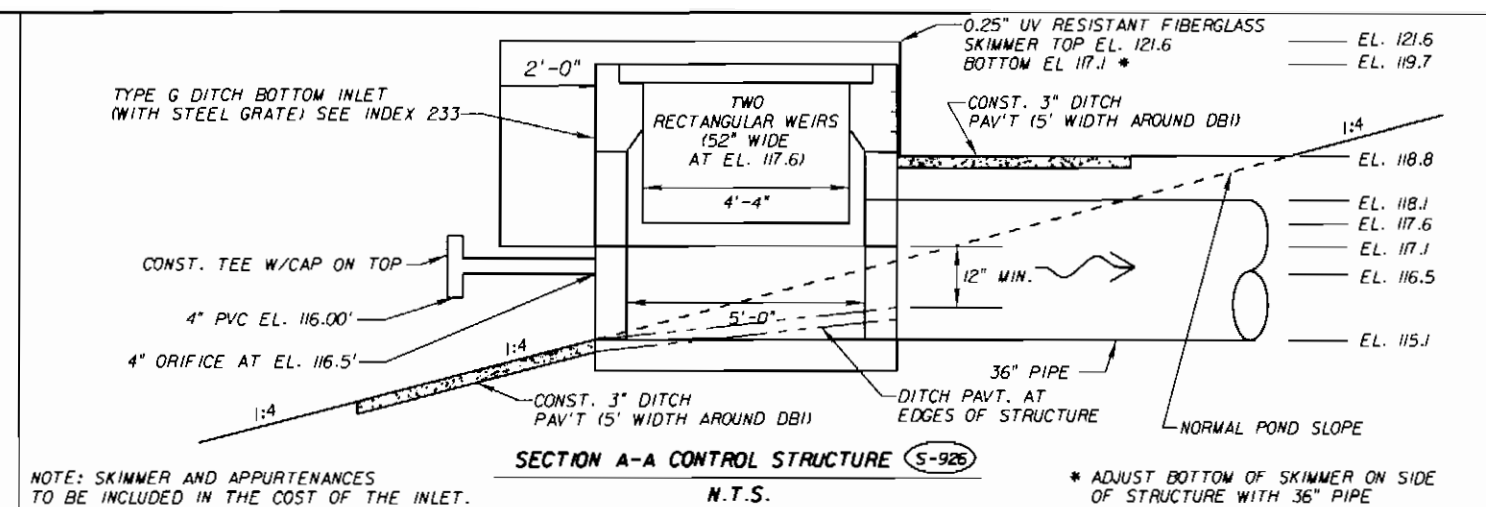
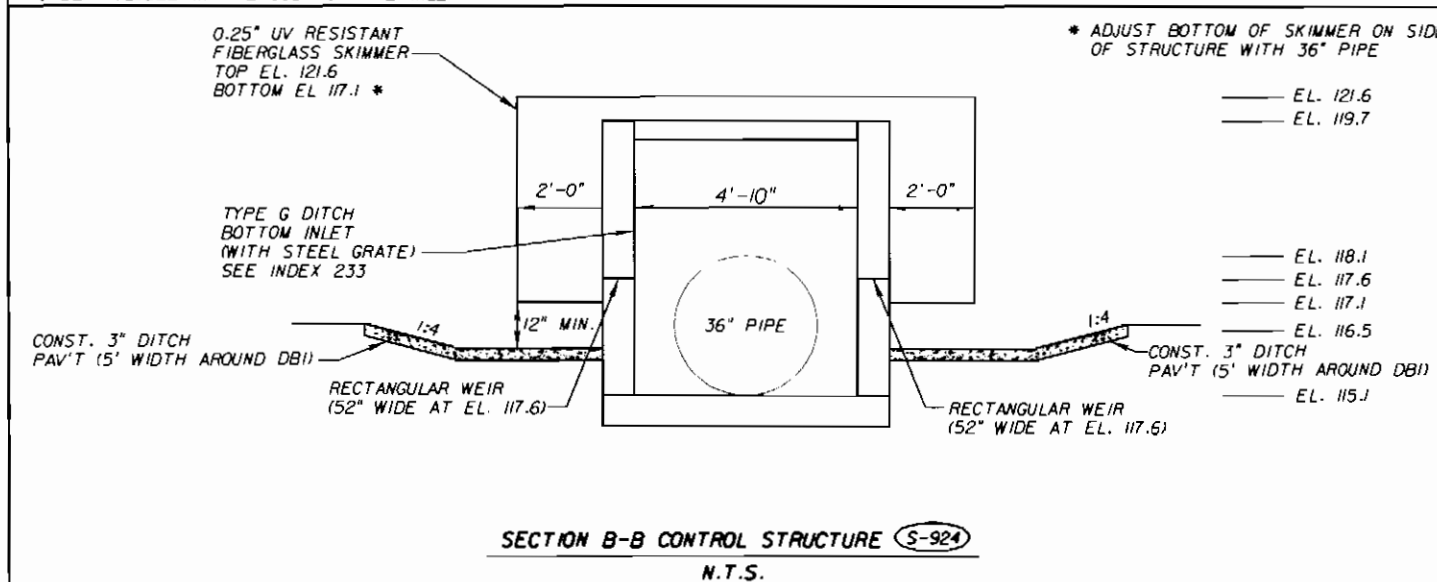
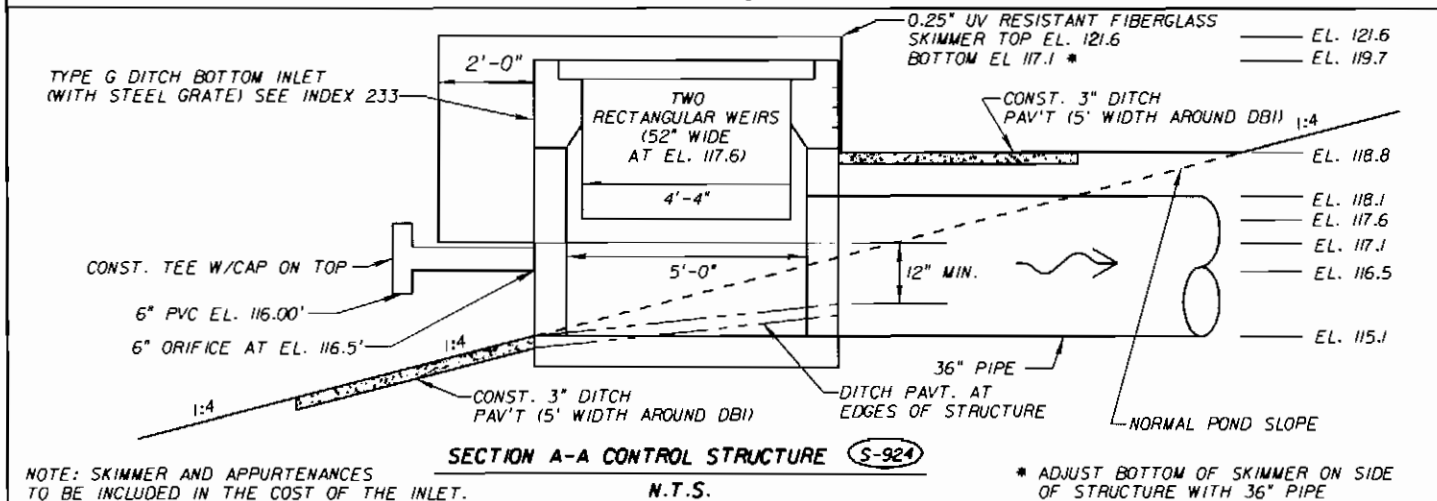
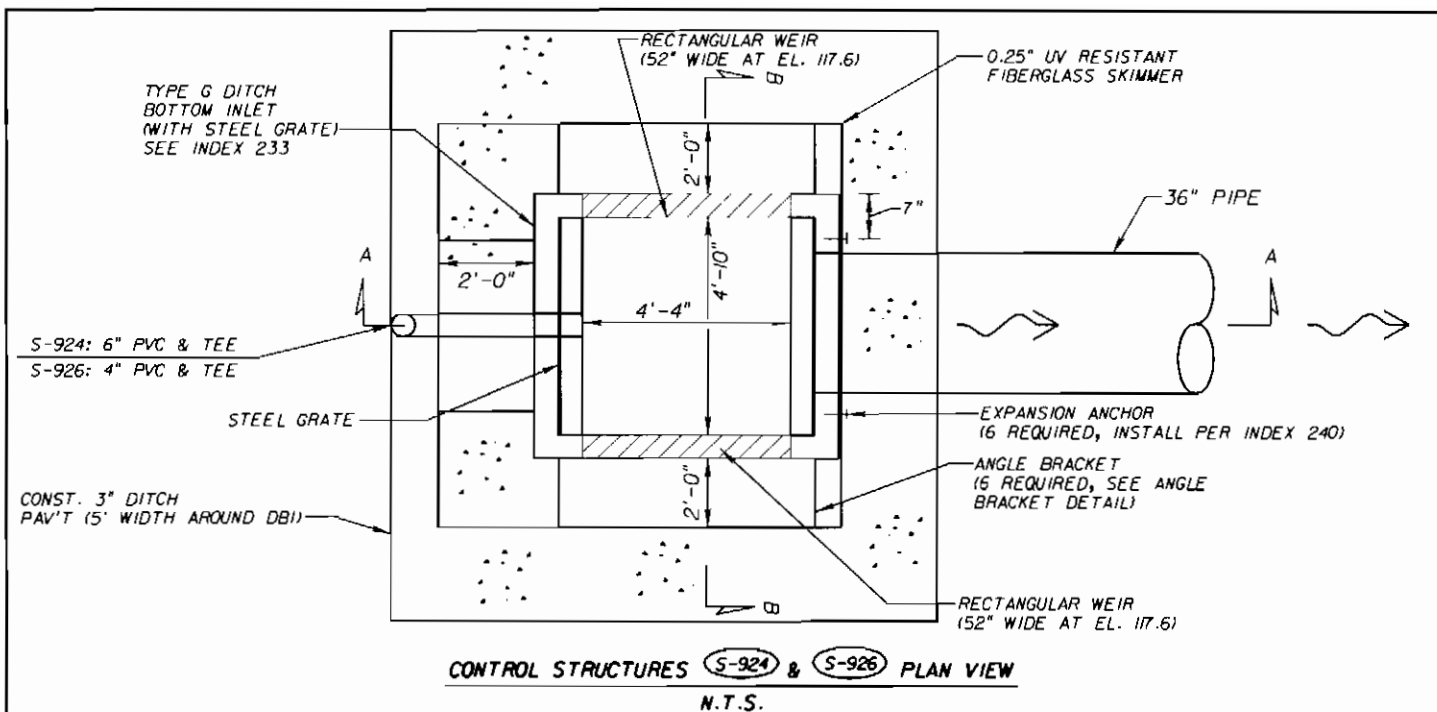
PROJECT: Turnpike Mainline Widening
SUBJECT: Drawdown Calculations

Water Management District	Required Drawdown Volume Criteria	Source	One-half the Required Treatment Volume Pond 9 (ac-ft)
SJRWMD	One-half the required treatment volume between 24 and 30 hours.	Applicants Handbook: Regulation of Stormwater Management Systems Chapter 40C-42. (Section 14.3)	2.08

Pond 9 = 2.08 ac-ft at hour 24.2

3-22





REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

CES Comprehensive Engineering Services, Inc.
201 S Orange Ave, Suite 1300 Orlando, FL 32801-3442
Certificate of Authorization Number : 7852
Robert G. Butterfield, P.E., License No. 44637

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 91	ORANGE	406148-3-52-01

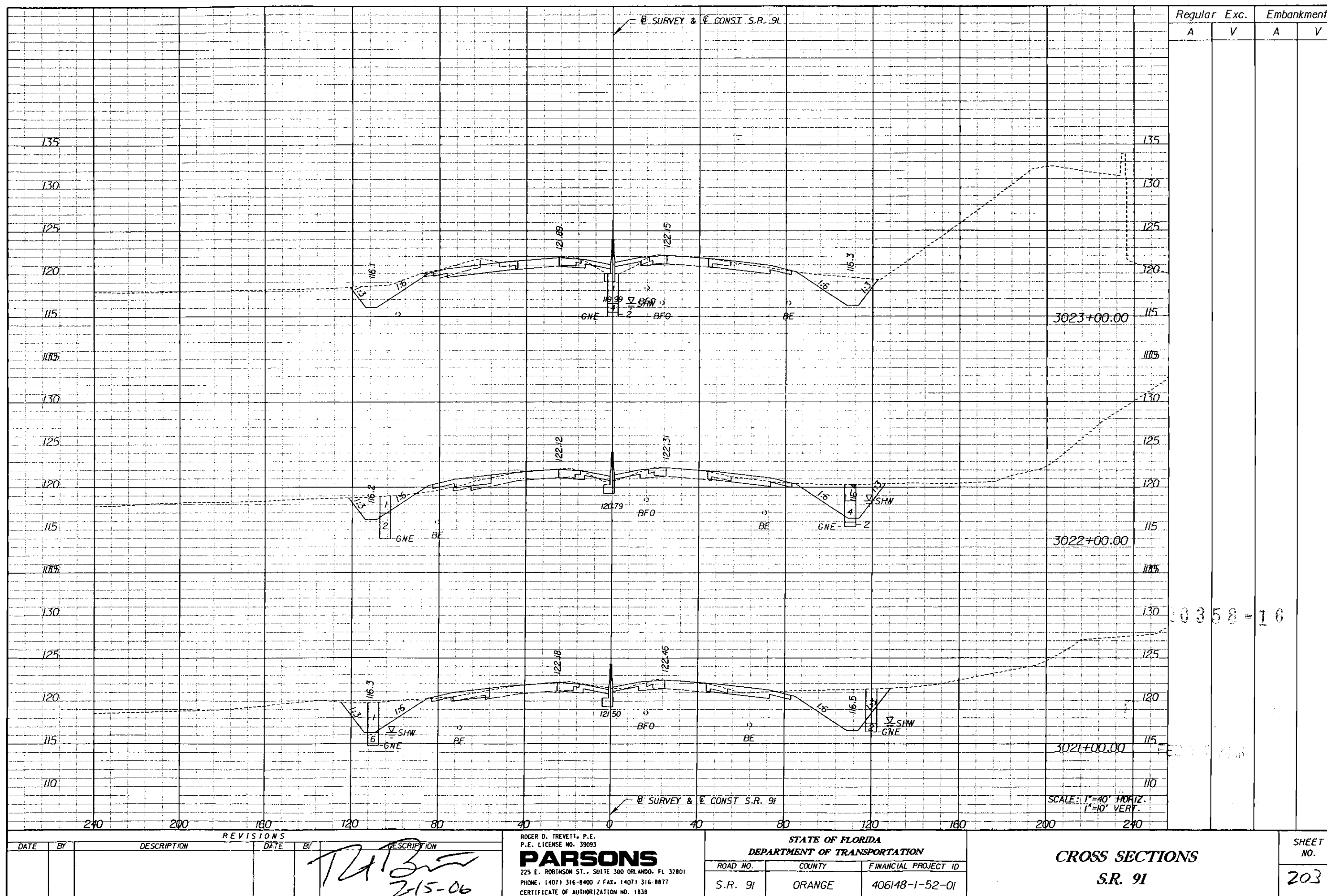
DRAINAGE DETAILS POND 9		SHEET NO.
		173

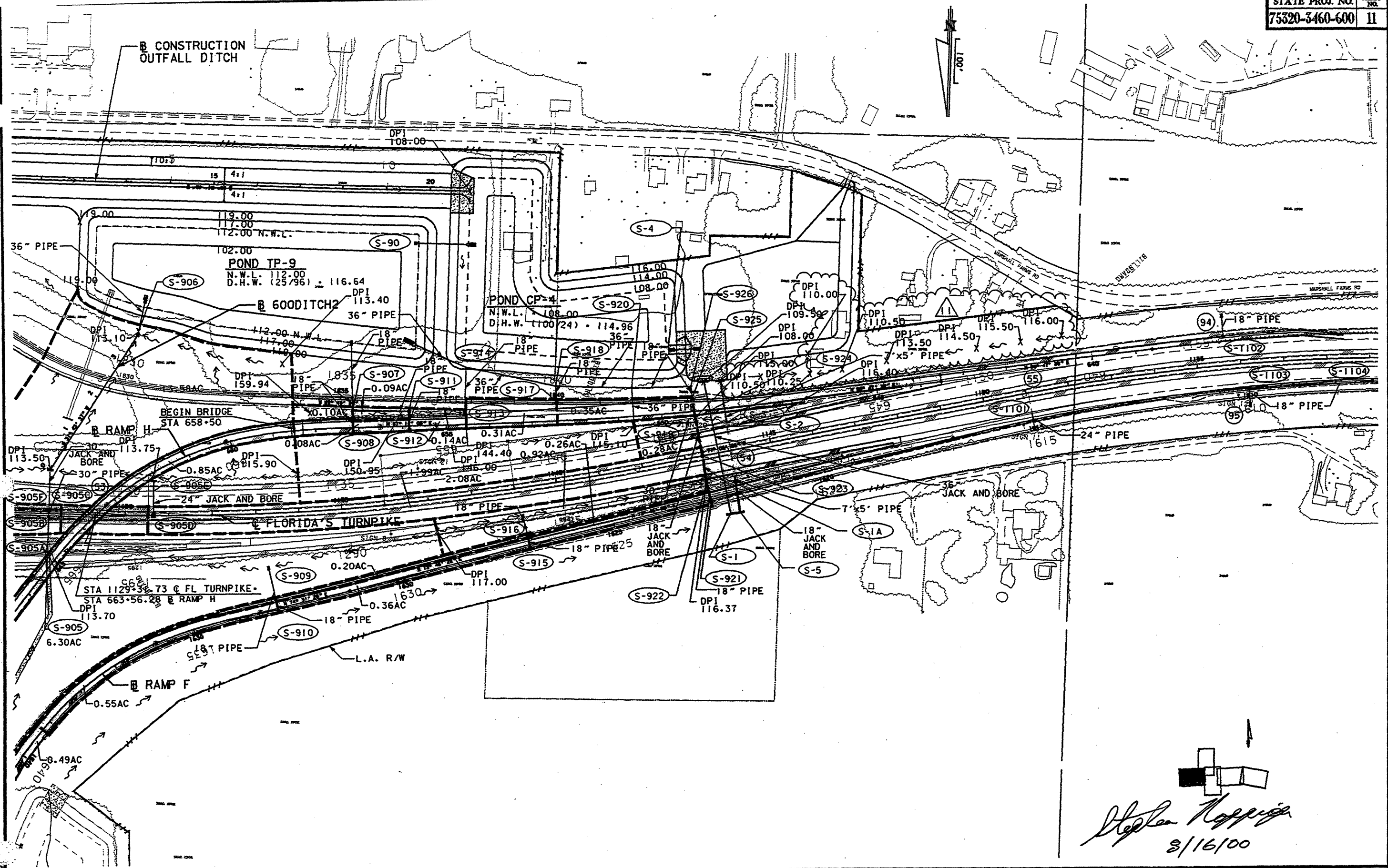
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 6005-23.003, F.A.C.

BASIN 10

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01





Stephen Koppig
8/16/00

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
8-14-00	CCB	ADD CONVEYANCE ADJ. TO T.P.			

BASIN NO. 10 (OVERALL)Phosphorous Loading

Lake Apopka Hydrological Basin

Pre-Development Phosphorous Discharge = 49.17 kg/yr

Post-Development Phosphorous Discharge = 48.77 kg/yr

Water Quality Summary

Compensating Treatment

Total Impervious Area = 56.73 acres

Previously Untreated Turnpike Impervious Area = 12.24 acres

Total New Impervious Area = $56.73 - 12.24 = 44.49$ acres (Turnpike Mainline & SR 429)Total Impervious Area Treated = 48.33 acres (>44.49 acres, ok)

Volume Required: 2.5 inches over Impervious Area (48.33 acres) = 10.07 acre-feet

Volume Provided: 28.97 acre-feet

(Compare to 2.5 inches over Total Impervious Area (56.73 ac.) = 11.82 acre-feet)

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 94.52 acre-feet

Post-Development Discharge Volume = 93.67 acre-feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 277.9 cfs

Post-Development Peak Discharge = 93.5 cfs

Water Quantity Summary (Flow Rate):

Pre-Post 10-Year/24-Hour storm

Pre-Development Peak Discharge = 213.2 cfs

Post-Development Peak Discharge = 62.4 cfs

BASIN NO. 10A (POND TP-5)Water Quality Treatment Summary:

Wet Detention Criteria

Volume Required: 2.5 inches over impervious area = 2.21 acre-feet

Volume Provided: 10.67 acre-feet

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 9.26 acre-feet

Post-Development Discharge Volume = 8.30 acre-feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 33.0 cfs

Post-Development Peak Discharge = 16.0 cfs

Water Quantity Summary (Flow Rate):

Pre-Post 10-Year/24-Hour storm

Pre-Development Peak Discharge = 25.4 cfs

Post-Development Peak Discharge = 0.6 cfs

Pond Flood Stage Summary:

25-Year/96-Hour storm

Top of Bank Elevation = 119.1 ft.

Design High Water Elevation = 117.3 ft.

BASIN NO. 10B (POND TP-6)Water Quality Treatment Summary:

Wet Detention Criteria

Volume Required: 2.5 inches over impervious area = 1.96 acre-feet

Volume Provided: 8.06 acre-feet

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 9.24 acre-feet

Post-Development Discharge Volume = 11.70 acre-feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 31.8 cfs

Post-Development Peak Discharge = 16.9 cfs

Water Quantity Summary (Flow Rate):

Pre-Post 10-Year/24-Hour storm

Pre-Development Peak Discharge = 24.8 cfs

Post –Development Peak Discharge = 2.0 cfs

Pond Flood Stage Summary:

25-Year/96-Hour storm

Top of Berm Elevation = 120.6 ft.

Design High Water Elevation = 119.6 ft.

BASIN NO. 10C (PONDS TP-1 and TP-2)

Water Quality Treatment Summary:

Wet Detention Criteria

Volume Required: 1.0 inch of runoff = 3.28 acre-feet

Volume Provided: 5.98 acre-feet

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 30.05 acre-feet

Post-Development Discharge Volume = 27.30 acre-feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 104.6 cfs

Post –Development Peak Discharge = 22.2 cfs

Water Quantity Summary (Flow Rate):

Pre-Post 10-Year/24-Hour storm

Pre-Development Peak Discharge = 79.7 cfs

Post –Development Peak Discharge = 13.0 cfs

Pond Flood Stage Summary:

25-Year/96-Hour storm

Top of Berm Elevation = 118.1 ft.

Design High Water Elevation = 117.0 ft.

BASIN NO. 10D (POND TP-9)

Water Quality Treatment Summary:

Wet Detention Criteria

Volume Required: 1.0 inch of runoff = 3.53 acre-feet

Volume Provided: 4.26 acre-feet

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 33.18 acre-feet

Post-Development Discharge Volume = 32.20 acre-feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 83.4 cfs

Post -Development Peak Discharge = 35.2 cfs

Water Quantity Summary (Flow Rate):

Pre-Post 10-Year/24-Hour storm

Pre-Development Peak Discharge = 64.0 cfs

Post -Development Peak Discharge = 24.8 cfs

Pond Flood Stage Summary:

25-Year/96-Hour storm

Top of Berm Elevation = 118.1 ft.

Design High Water Elevation = 116.1 ft.

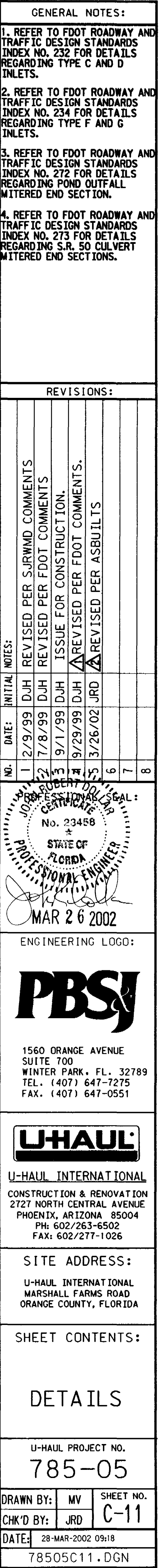
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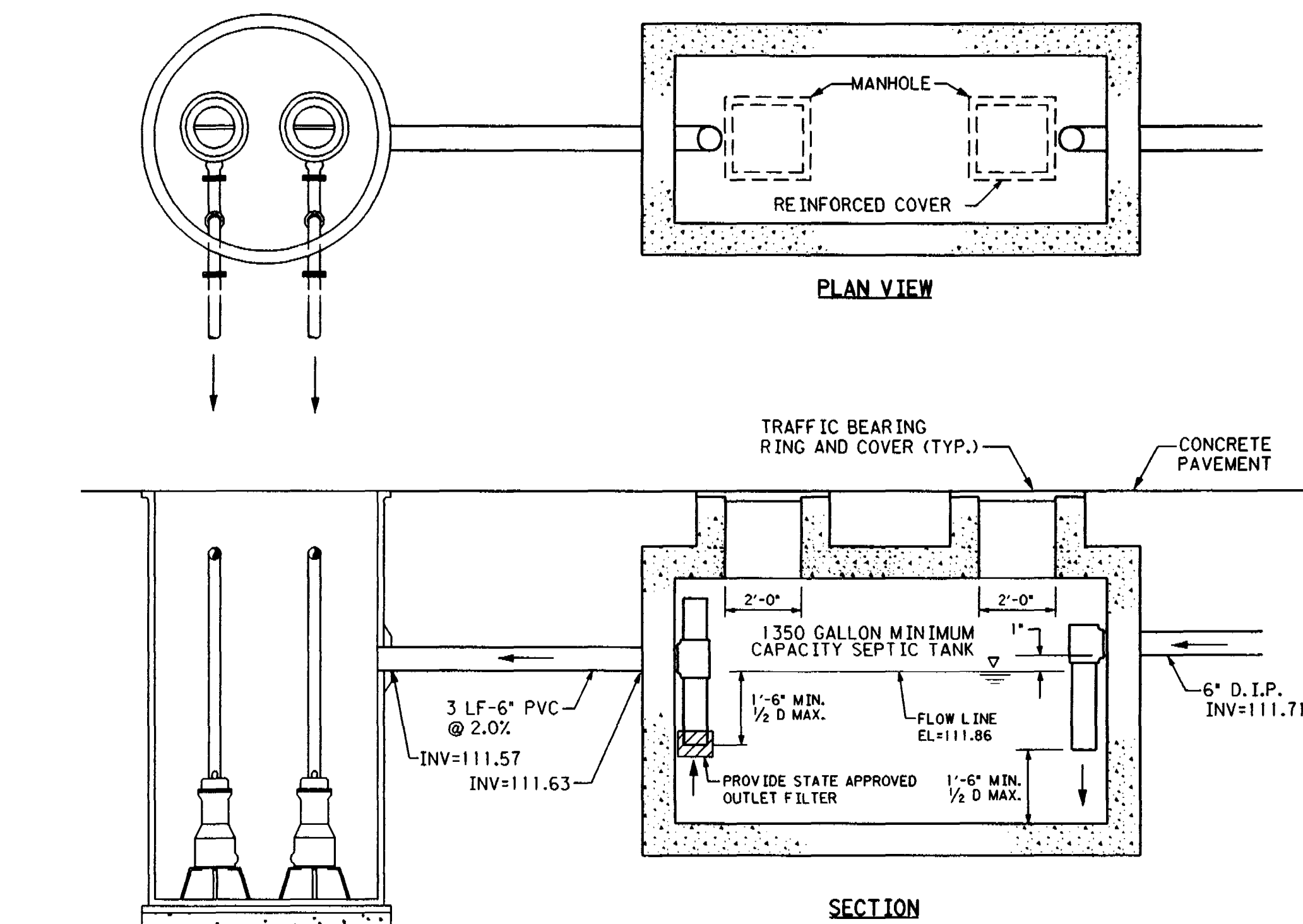
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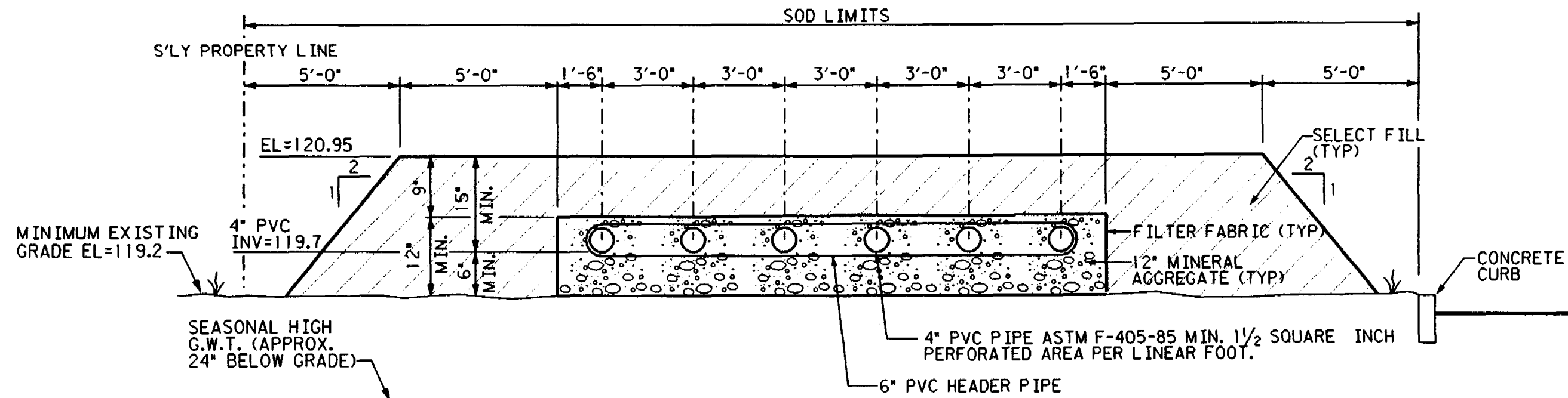
Oversized Drawings

1723



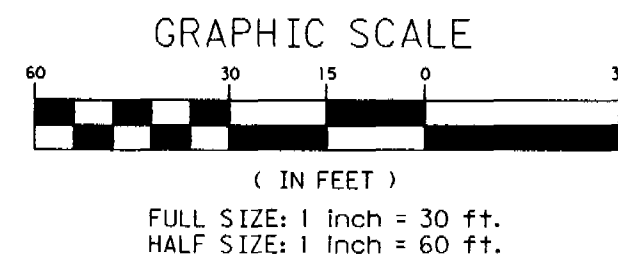


PUMP STATION AND SEPTIC TANK DETAIL
SCALE: N.T.S.



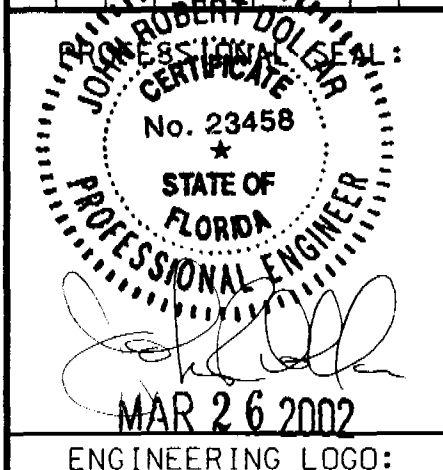
SEPTIC DRAINFIELD DETAIL
SCALE: N.T.S.

- NOTES FOR ONSITE SEWAGE DISPOSAL SYSTEM**
- CONTRACTOR IS RESPONSIBLE FOR PROVIDING AN ONSITE SEWAGE DISPOSAL SYSTEM THAT COMPLEIES WITH STANDARDS PUBLISHED IN F.A.C. CHAPTER 100-6, DATED MAY 14, 1996, OR AS AMENDED.
 - SEPTIC TANK DESIGN AND CONSTRUCTION SHALL COMPLY WITH SUBSECTIONS 100-6.048 AND 100-6.055, 100-6.056 AND 100-6.063.
 - DRAINFIELD SYSTEM CONSTRUCTION SHALL COMPLY WITH SUBSECTION 100-6.056, OR AS APPROVED BY HRS/ORANGE COUNTY HEALTH DEPARTMENT.
 - ALL WORK TO BE COMPLETED BY CONTRACTOR LICENSED BY ORANGE COUNTY HEALTH DEPARTMENT.
 - CONTRACTOR IS REQUIRED TO OBTAIN A STATE OF FLORIDA DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICE HRS-M FORM 4015 SEPTIC TANK PERMIT PRIOR TO CONSTRUCTION OR INSTALLATION OF SEPTIC TANK SYSTEM.
 - CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS TO COMPLETE ON-SITE INDIVIDUAL WASTEWATER TREATMENT SYSTEM.
 - INSTALLATION IS SHOWN IN OUTLINE FORM. CONTRACTOR IS TO INSTALL ALL FITTINGS AND INCIDENTALS TO COMPLETE FACILITY.
 - SEPTIC TANK/DRAINFIELD SIZING:
FLOW SUMMARY: FOUR EMPLOYEES = 60 GALLONS PER DAY
1 GPD PER UNIT UP TO 200 UNITS = 200 GALLONS PER DAY
1 GPD PER 2 UNITS AFTER 200 = 274 GALLONS PER DAY
TOTAL = 534 GALLONS PER DAY
- SEPTIC TANK SIZE = 1350 GAL MINIMUM EFFECTIVE CAPACITY
DRAINFIELD SIZE (ABSORPTION BED) = 534 / 0.65 = 822 S.F.
PROVIDED ABSORPTION BED MEASURES 45.7'x18.0'=822.6 S.F.



THIS IS A RECORD DRAWING BY PBS&J BASED ON INFORMATION PROVIDED BY THE CONTRACTOR.
NOTES INFORMATION PROVIDED BY THE CONTRACTOR THAT SUPERSEDES ORIGINAL DESIGN. IF NO ADDITIONAL DATA IS SHOWN, THE CONTRACTOR IS REPRESENTING THAT THE CONSTRUCTION IS IN SUBSTANTIAL COMPLIANCE WITH THE DESIGN.
THESE DOCUMENTS HAVE BEEN PREPARED BY PBS&J AND ARE NOT VALID FOR USE WITHOUT THE RAISED ENGINEER'S SEAL AND ORIGINAL SIGNATURE.

REVISIONS:			
NO.	DATE	INITIALS	NOTES
1	4/19/99	DJH	REVISED PER ORANGE COUNTY COMMENTS.
2	5/19/99	DJH	REVISED PER ORANGE COUNTY COMMENTS.
3	7/19/99	DJH	REVISED PER ORANGE COUNTY COMMENTS.
4	9/1/99	DJH	ISSUE FOR CONSTRUCTION
5	9/29/99	DJH	REVISED PER FOOT COMMENTS.
6	3/26/02	JRD	REVISED PER ASBUILTS
7			
8			



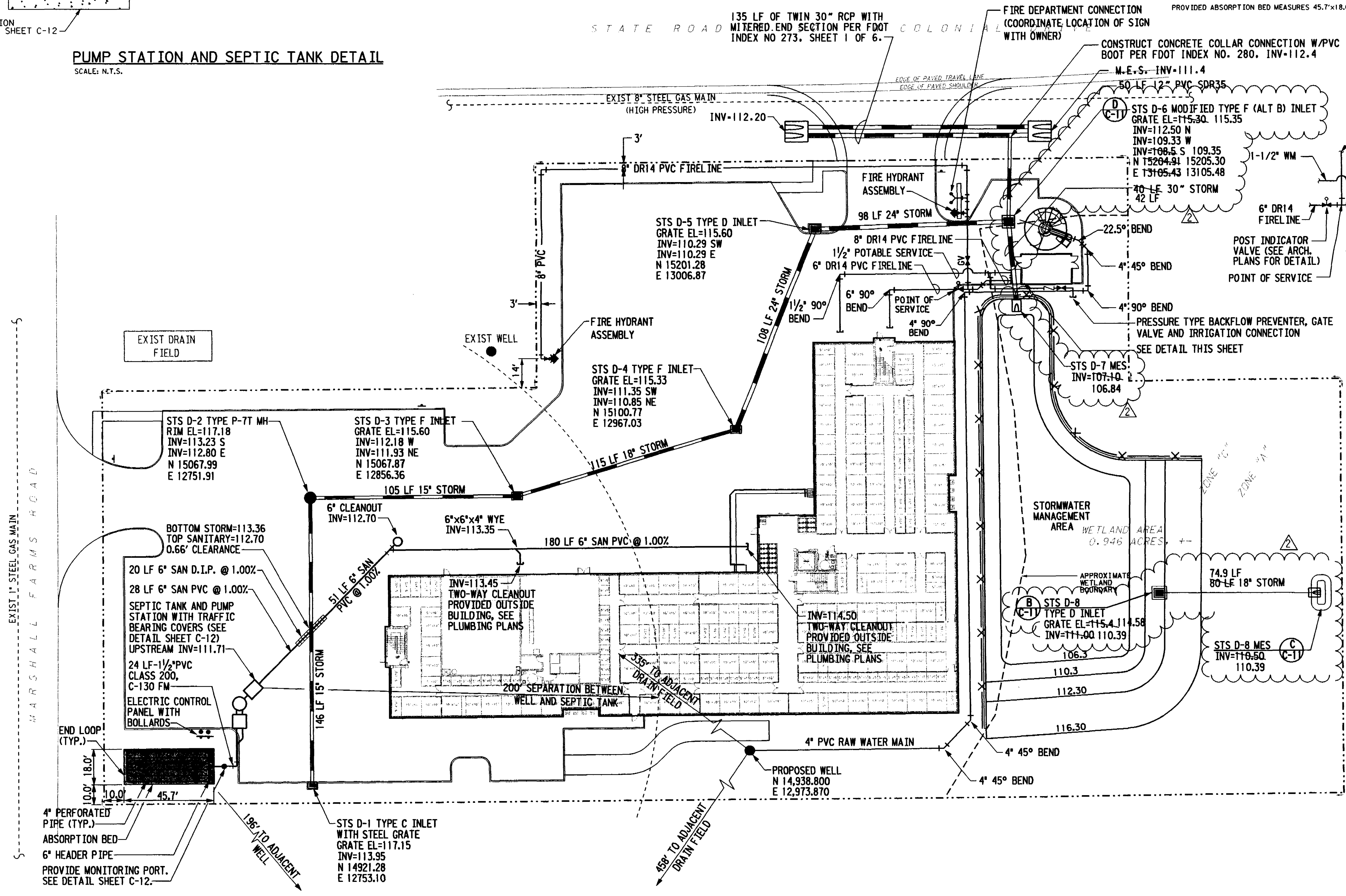
PBS&J
1560 ORANGE AVENUE
SUITE 700
WINTER PARK, FL. 32789
TEL. (407) 647-7275
FAX. (407) 647-0551

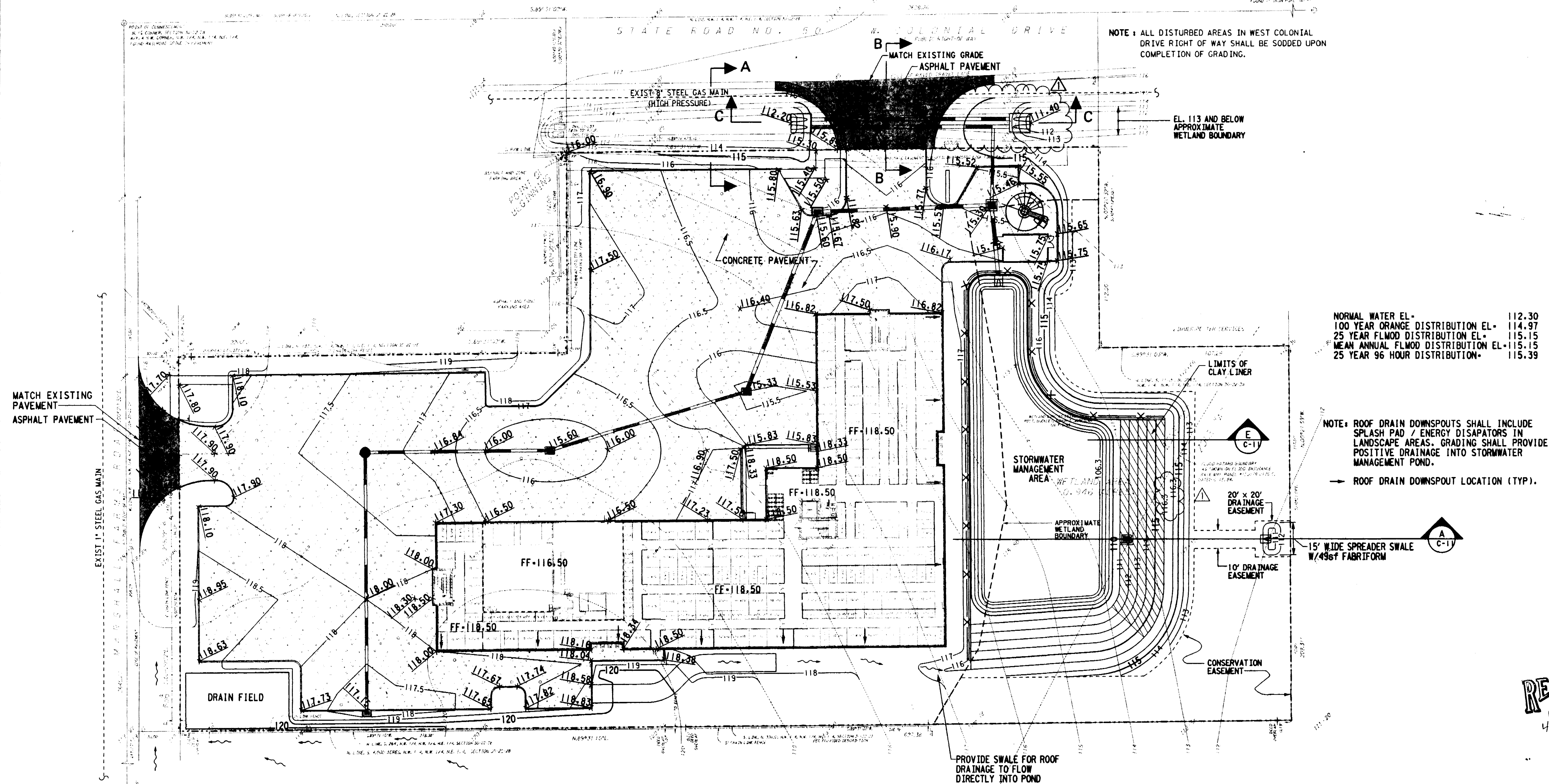
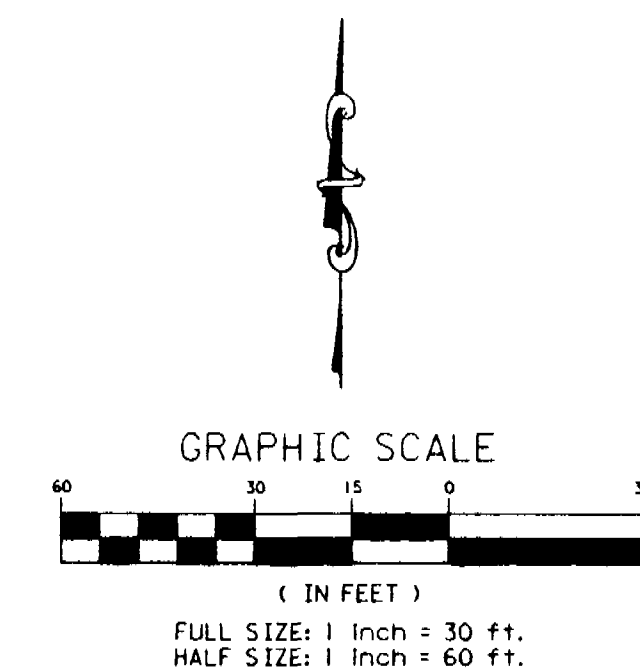
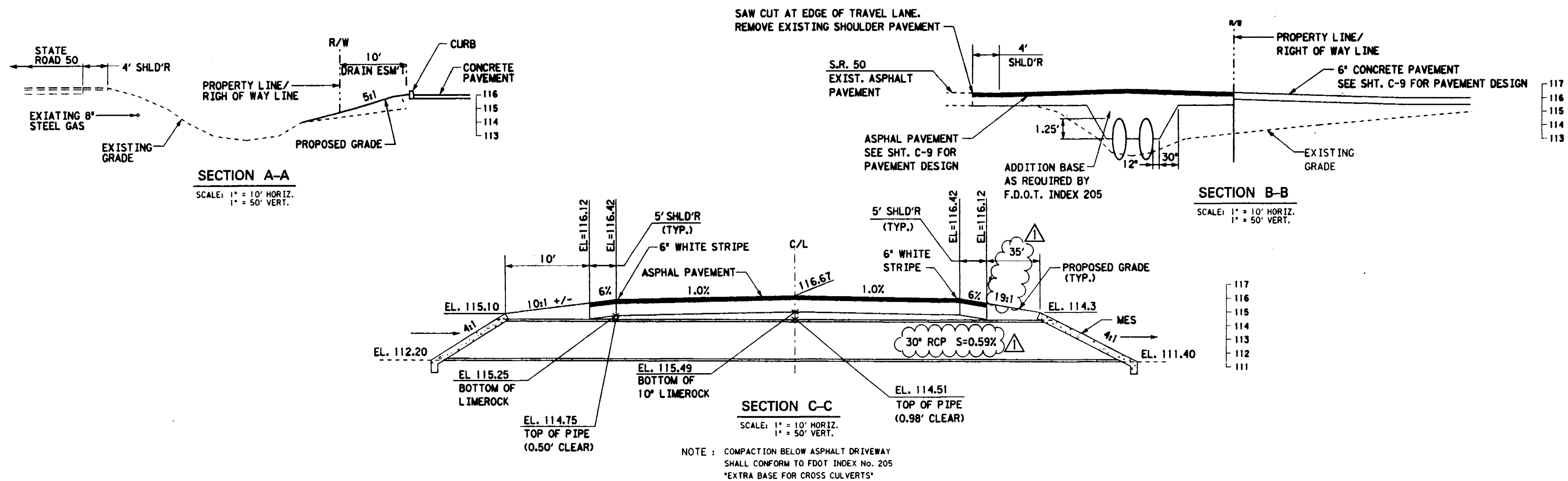
U-HAUL
U-HAUL INTERNATIONAL
CONSTRUCTION & RENOVATION
2727 NORTH CENTRAL AVENUE
PHOENIX, ARIZONA 85004
PH: 602/263-6502
FAX: 602/277-1026

SITE ADDRESS:
U-HAUL INTERNATIONAL
MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

SHEET CONTENTS:
UNDERGROUND
UTILITIES
PLAN

U-HAUL PROJECT NO.
785-05
DRAWN BY: MV **SHEET NO.** C-7
CHK'D BY: JRD
DATE: 28-MAR-2002 09:18
78505C7.DGN





NORMAL WATER EL. 112.30
100 YEAR ORANGE DISTRIBUTION EL. 114.97
25 YEAR FLWOD DISTRIBUTION EL. 115.15
MEAN ANNUAL FLWOD DISTRIBUTION EL. 115.15
25 YEAR 96 HOUR DISTRIBUTION EL. 115.39

NOTE: ROOF DRAIN DOWNSPOUTS SHALL INCLUDE SPLASH PAD / ENERGY DISSIPATORS IN LANDSCAPE AREAS. GRADING SHALL PROVIDE POSITIVE DRAINAGE INTO STORMWATER MANAGEMENT POND.

→ ROOF DRAIN DOWNSPOUT LOCATION (TYP.).

RECEIVED
NOV 09 1999
40-095-0971 A-BRP
ORLANDO
S.W. ROAD

- GENERAL NOTES:**
1. BEARINGS SHOWN HEREON ARE BASED ON OFFICIAL RECORDS VOLUME 8109, PAGE 433 AND ARE REFERENCED TO ITS SOUTHERLY LINE AS N 88° 49' 00" E.
 2. SOURCE BENCH MARK: RAILROAD SPIKE IN 30' OAK AT (D.O.T. SECTION NO. 72160-2556) STATION 170+85. 95' WEST OF CENTERLINE OF SAN JOSE BLVD. AT THE INTERSECTION OF MANDARIN ROAD ELEVATION (18.18) NGVD
 3. SEE SHEETS C-9 FOR DETAILS REGARDING GRAVITY WALLS, CURBING, SIDEWALKS, BOLLARDS AND CONCRETE AND ASPHALT PAVEMENT.

REVISIONS:

NO.	DATE	INITIAL	NOTES
1	2-9-99	DJH	REV PER SURVAD COMMENTS.
2	4-22-99	DJH	REVISED PER F.D.O.T. COMMENTS.
3	5-19-99	DJH	REVISED PER ORANGE COUNTY COMMENTS.
4	5-21-99	DJH	REVISED PER F.D.O.T. COMMENTS.
5	7-8-99	DJH	REVISED PER F.D.O.T. COMMENTS.
6	7-12-99	DJH	REV PER ORANGE CO HEALTH DEPARTMENT COMMENTS.
7	9/1/99	DJH	ISSUE FOR CONSTRUCTION
8	9/29/99	DJH	REVISED PER FOOT COMMENTS

PROFESSIONAL SEAL:
[Signature]

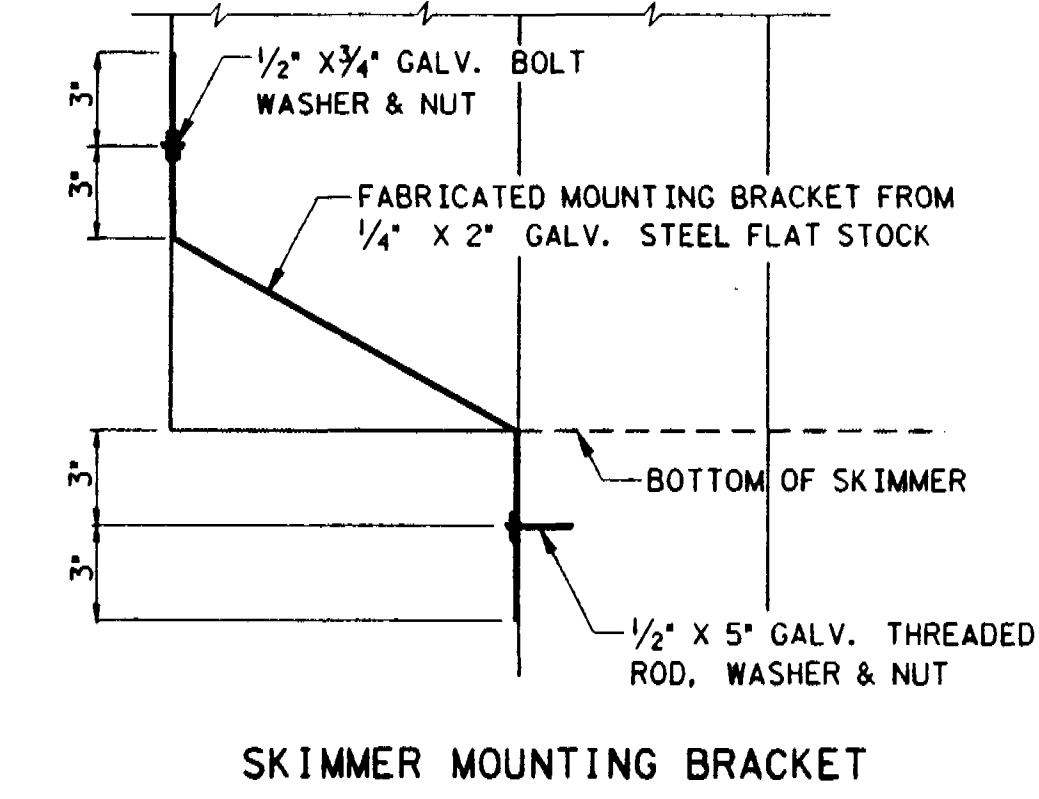
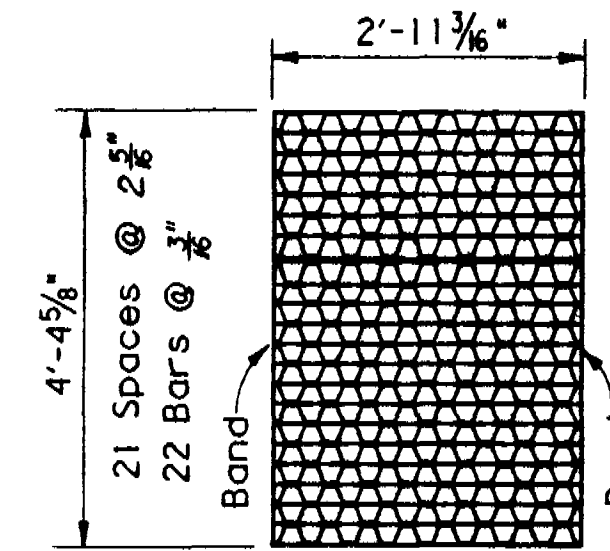
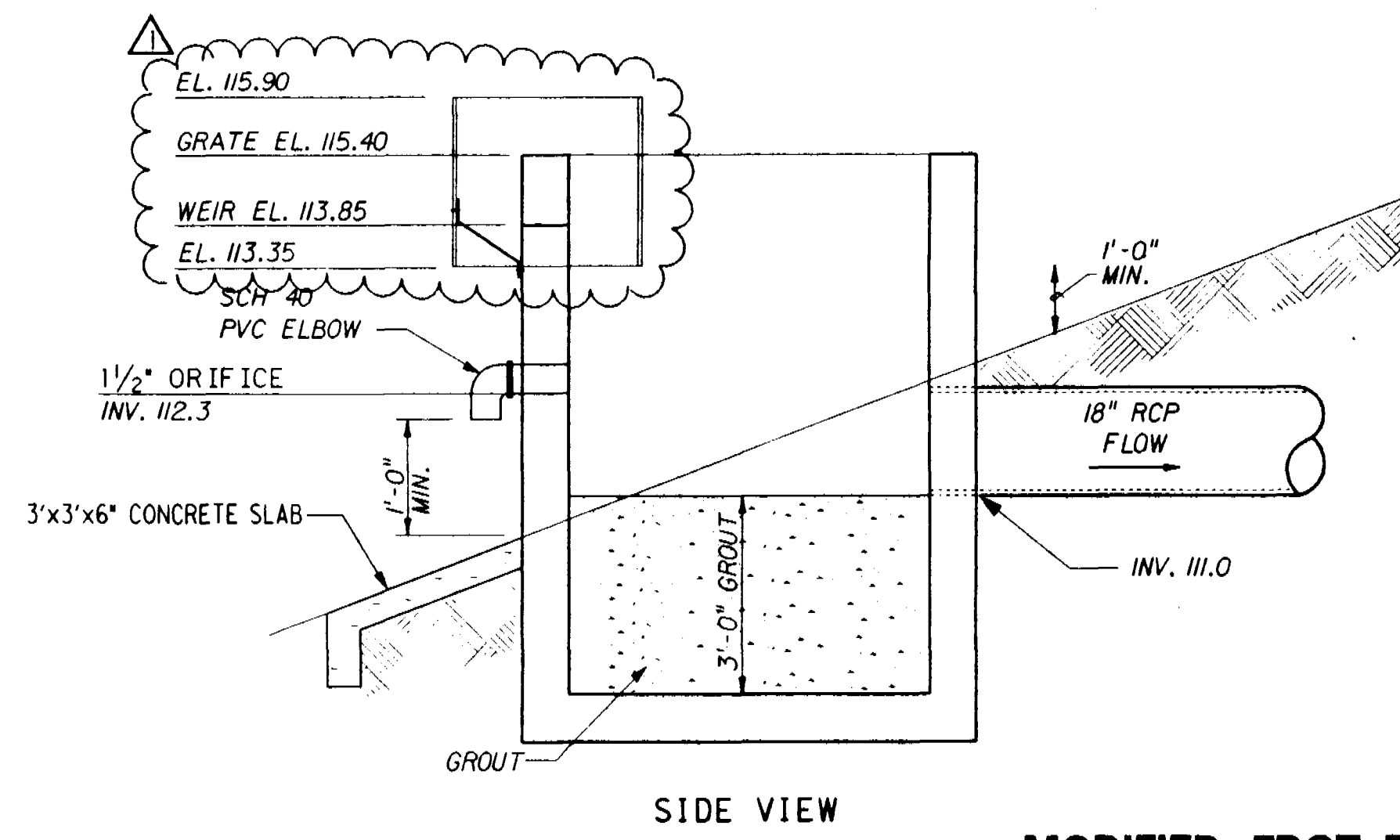
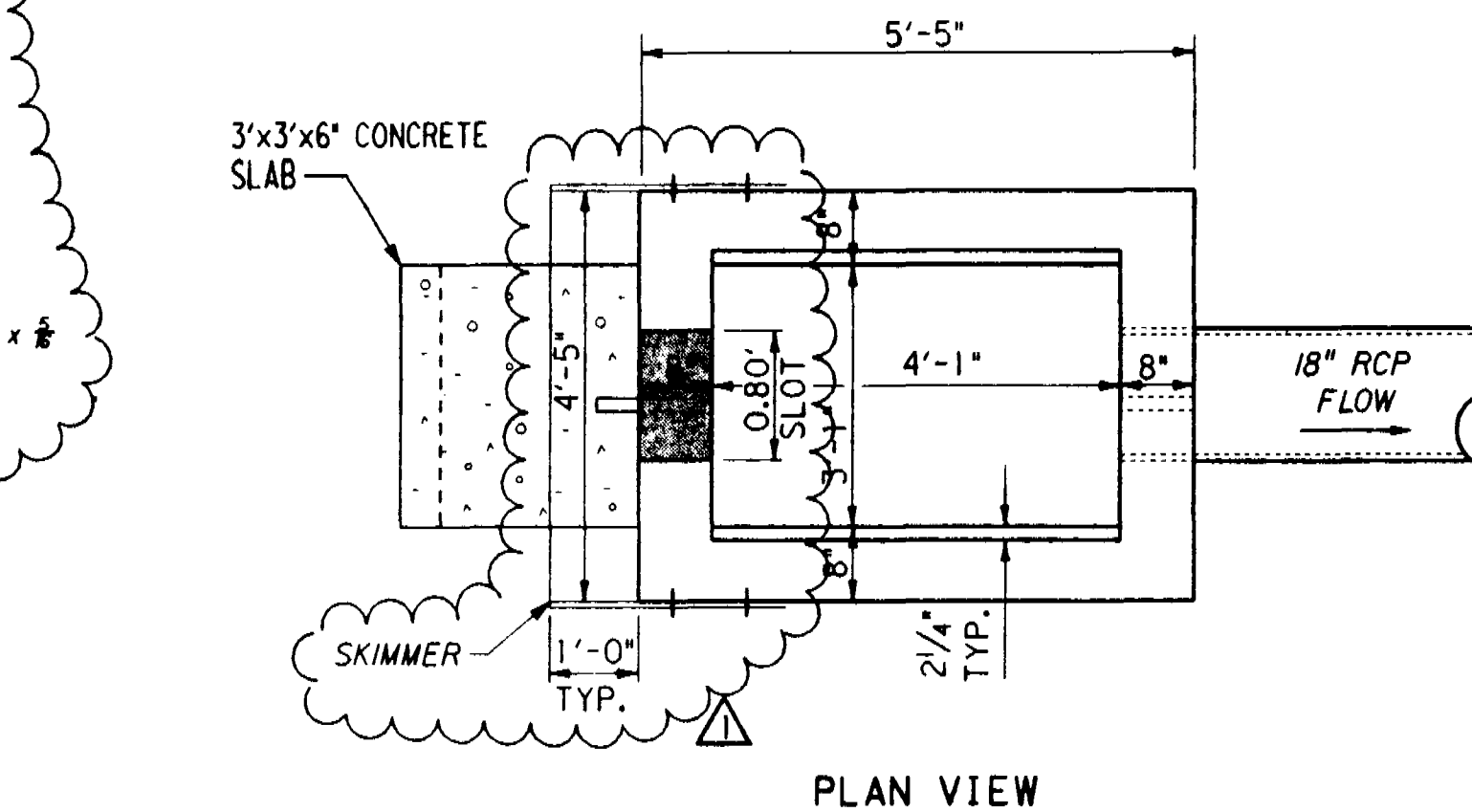
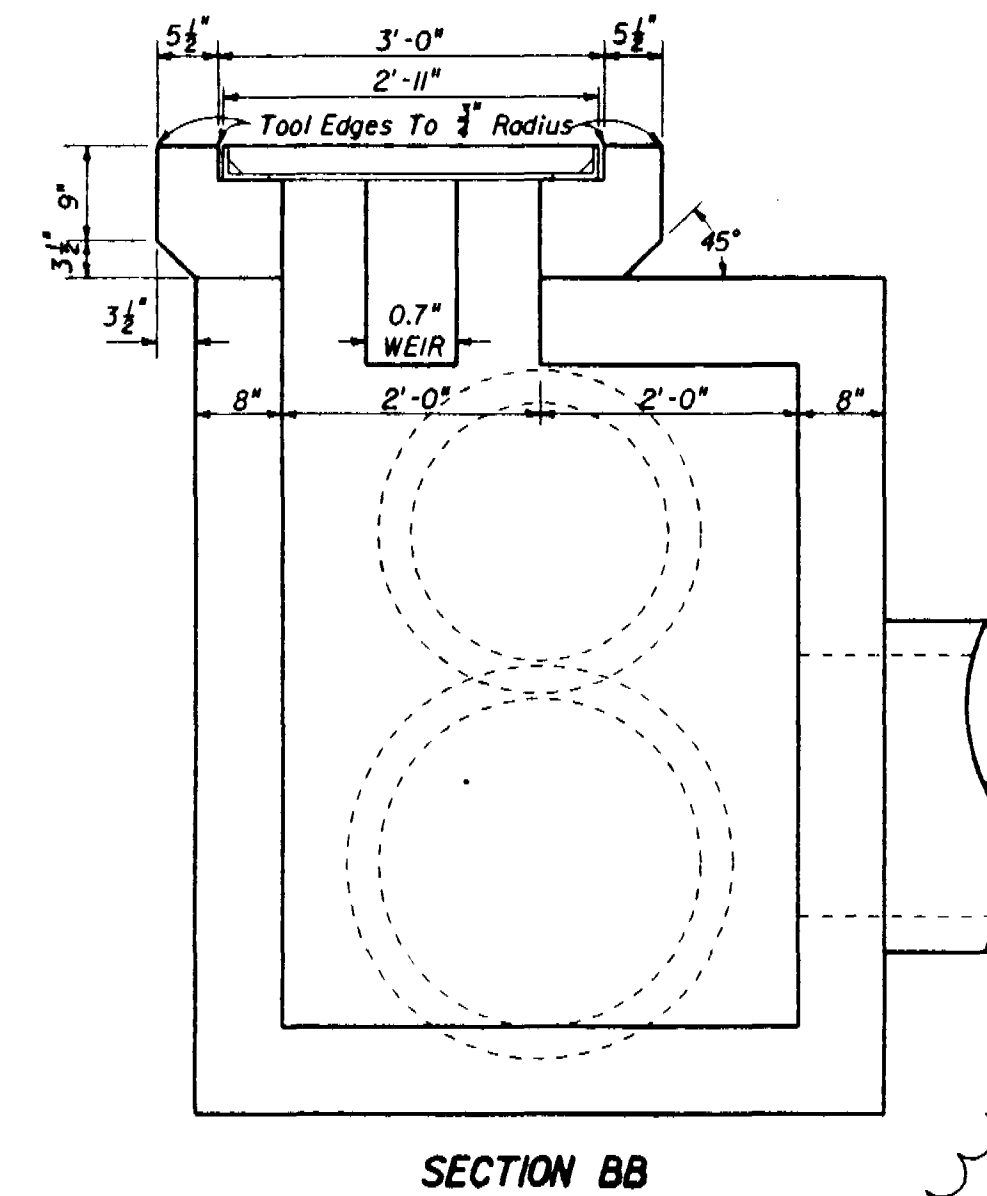
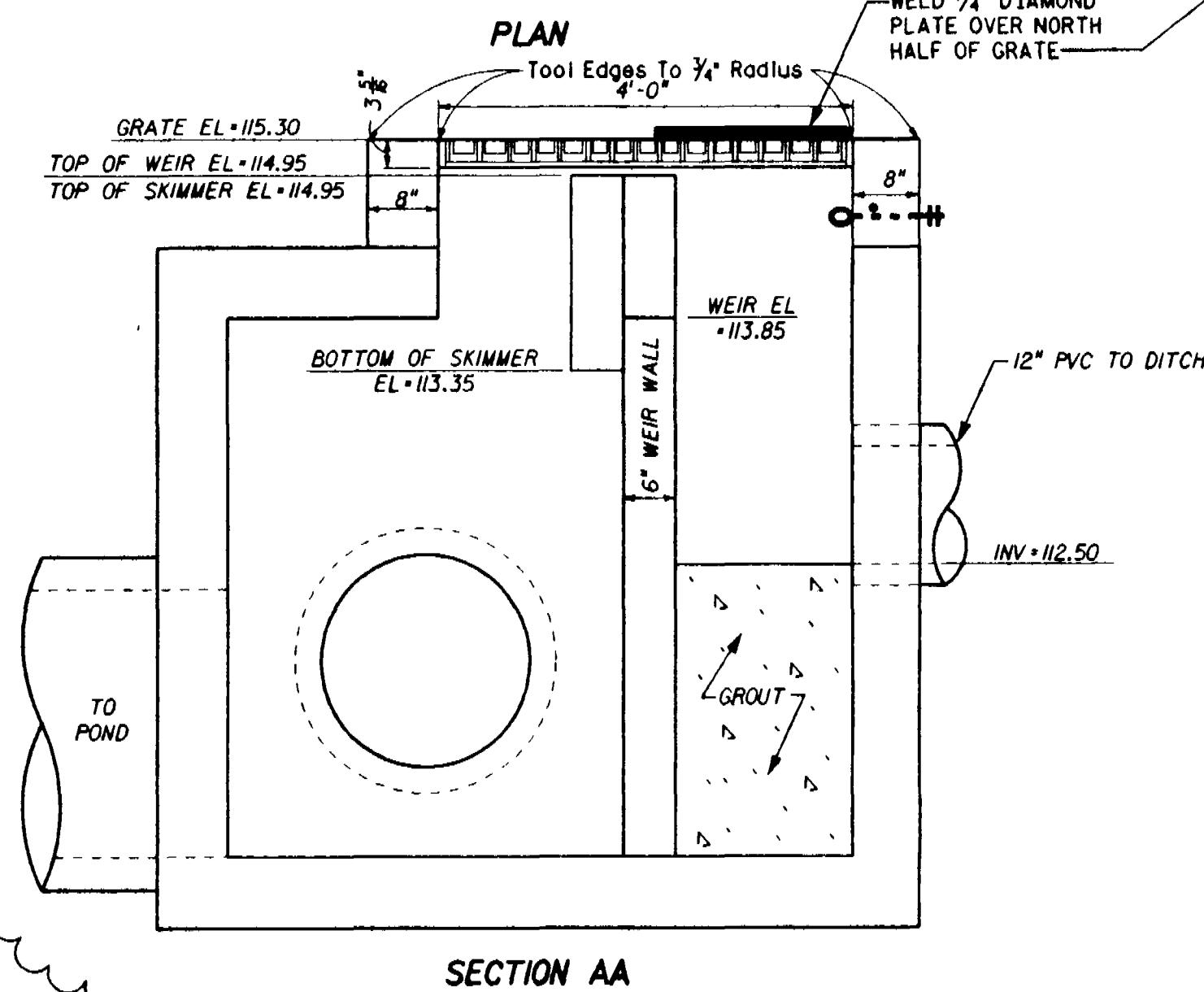
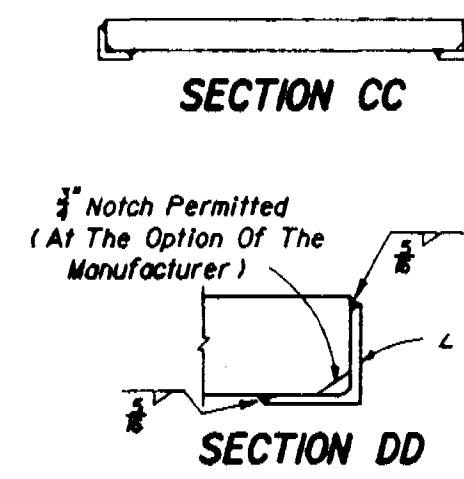
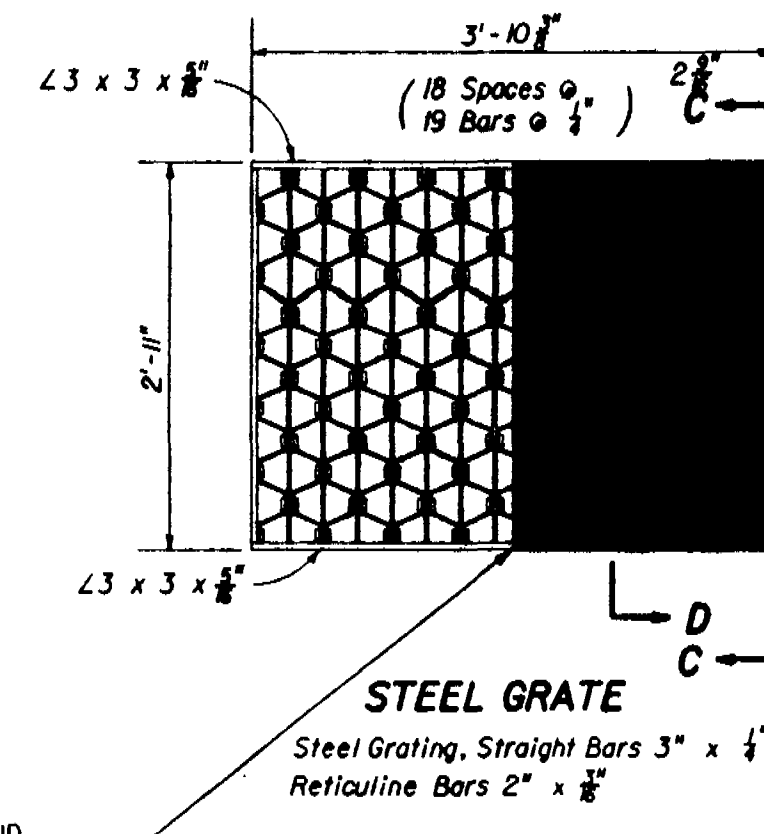
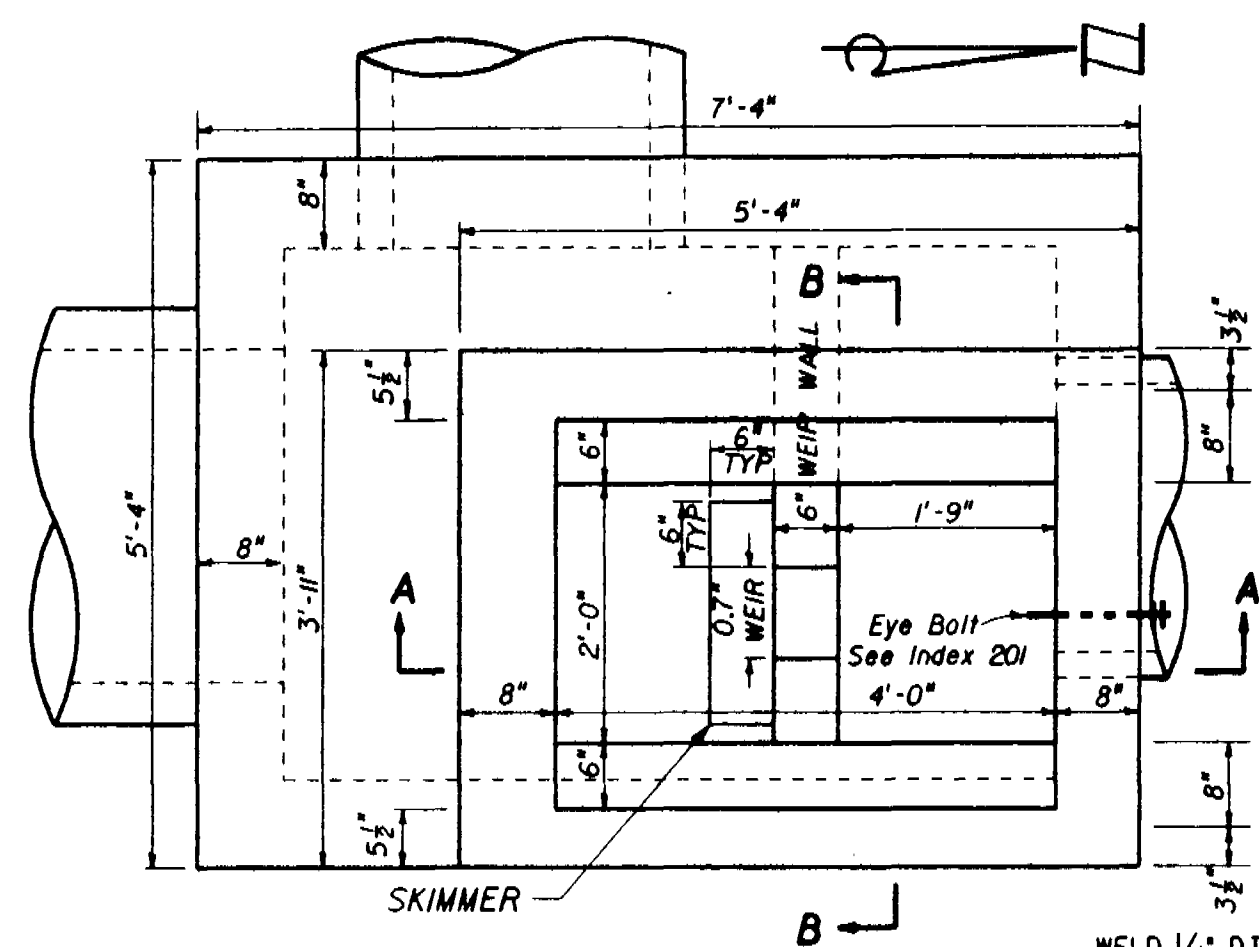
ENGINEERING LOGO:
PBSI
1560 ORANGE AVENUE
SUITE 700
WINTER PARK, FL. 32789
TEL. (407) 647-7275
FAX. (407) 647-0551

U-HAUL
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CONSTRUCTION & RENOVATION
2727 NORTH CENTRAL AVENUE
PHOENIX, ARIZONA 85004
PH: 602/263-6502
FAX: 602/277-1026

SITE ADDRESS:
U-HAUL INTERNATIONAL
MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

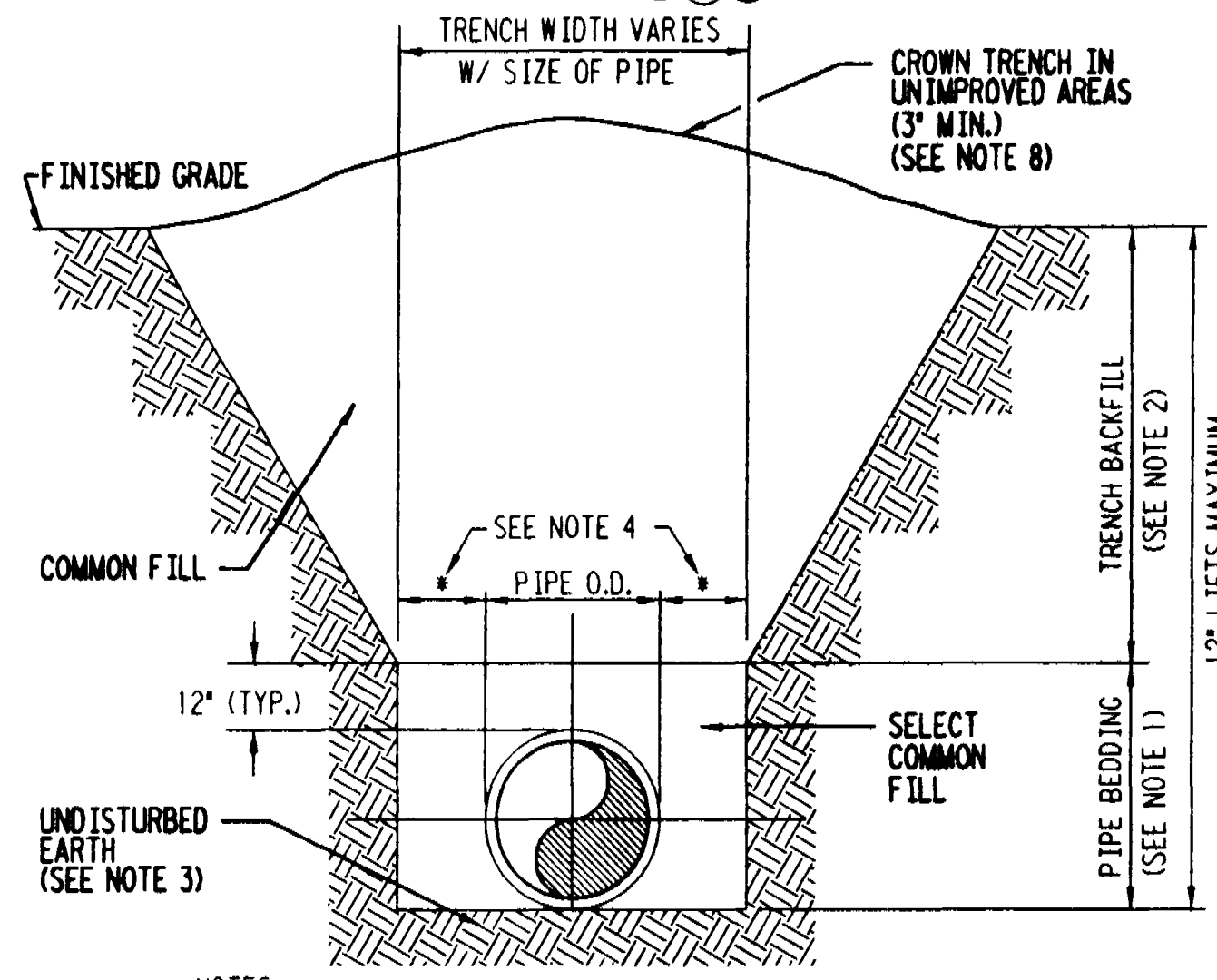
SHEET CONTENTS:
PAVING AND GRADING PLAN

U-HAUL PROJECT NO.
785-05
DRAWN BY: MV
CHK'D BY: JRD
DATE: 14-OCT-1999
7850F



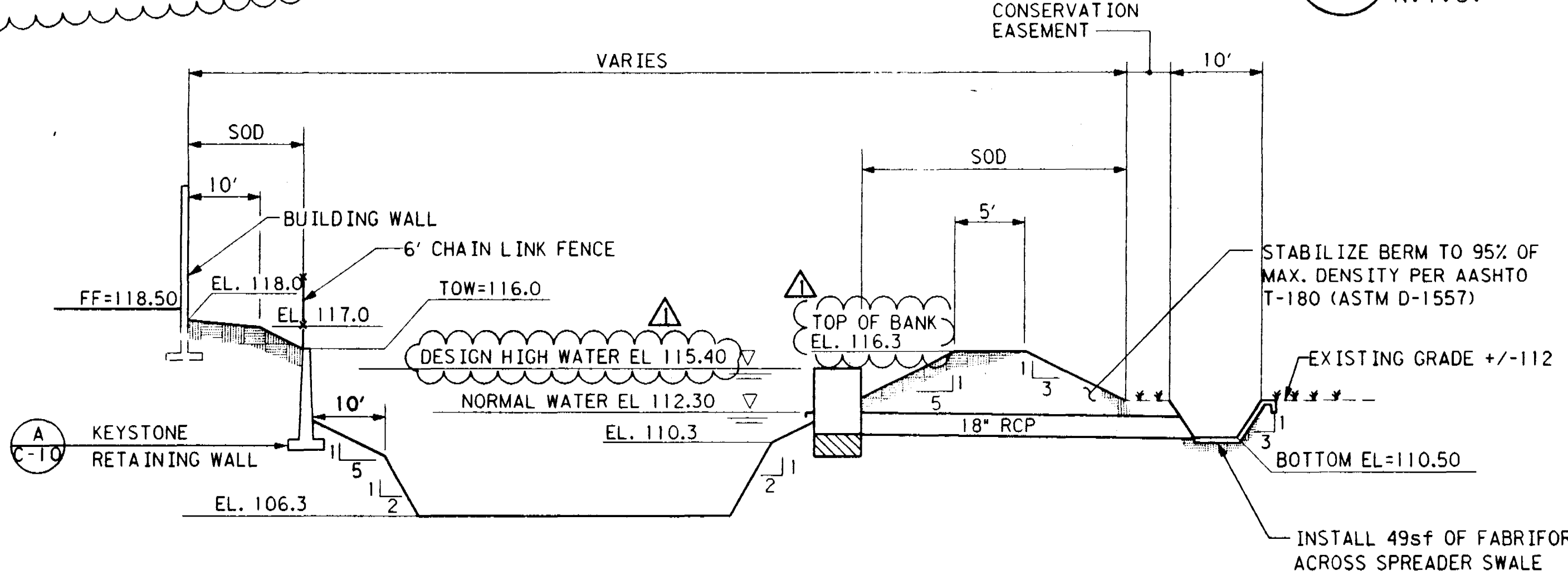
**MODIFIED TYPE F INLET NO. D-6
W/4'x6' ALTERNATE B BOTTOM**
C-11 N.T.S.

**MODIFIED FDOT TYPE D INLET (INDEX 232)
OVERFLOW STRUCTURE**
B C-11 N.T.S.

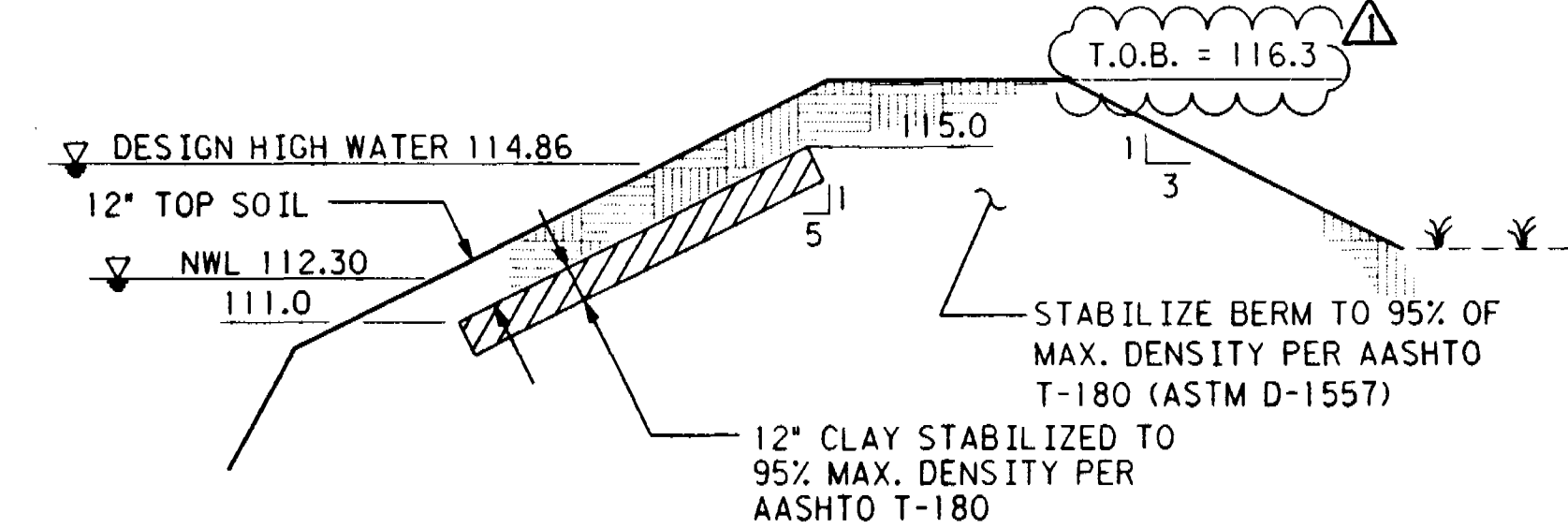


- NOTES:
- PIPE BEDDING: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
 - TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
 - PIPE BEDDING UTILIZING SELECT COMMON FILL OR BEDDING ROCK IN ACCORDANCE WITH TYPE A BEDDING AND TRENCHING DETAIL MAY BE REQUIRED AS DIRECTED BY THE COUNTY.
 - (*) 15" MAX. FOR PIPE DIAMETER LESS THAN 24", AND 24" MAX. FOR PIPE DIAMETER 24" AND LARGER.
 - WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
 - ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
 - REFER TO SECTION 32.5 OF THE MANUAL FOR SHEETING AND BRACING IN EXCAVATIONS.
 - FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN ORANGE COUNTY RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.

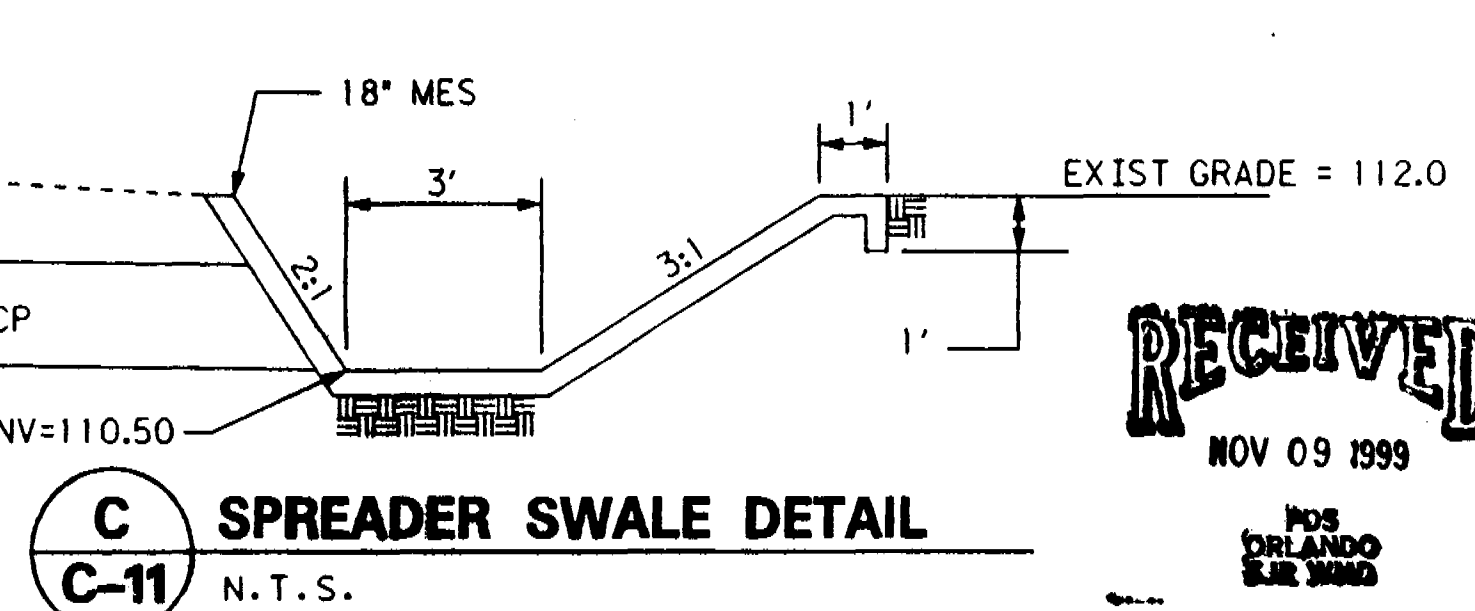
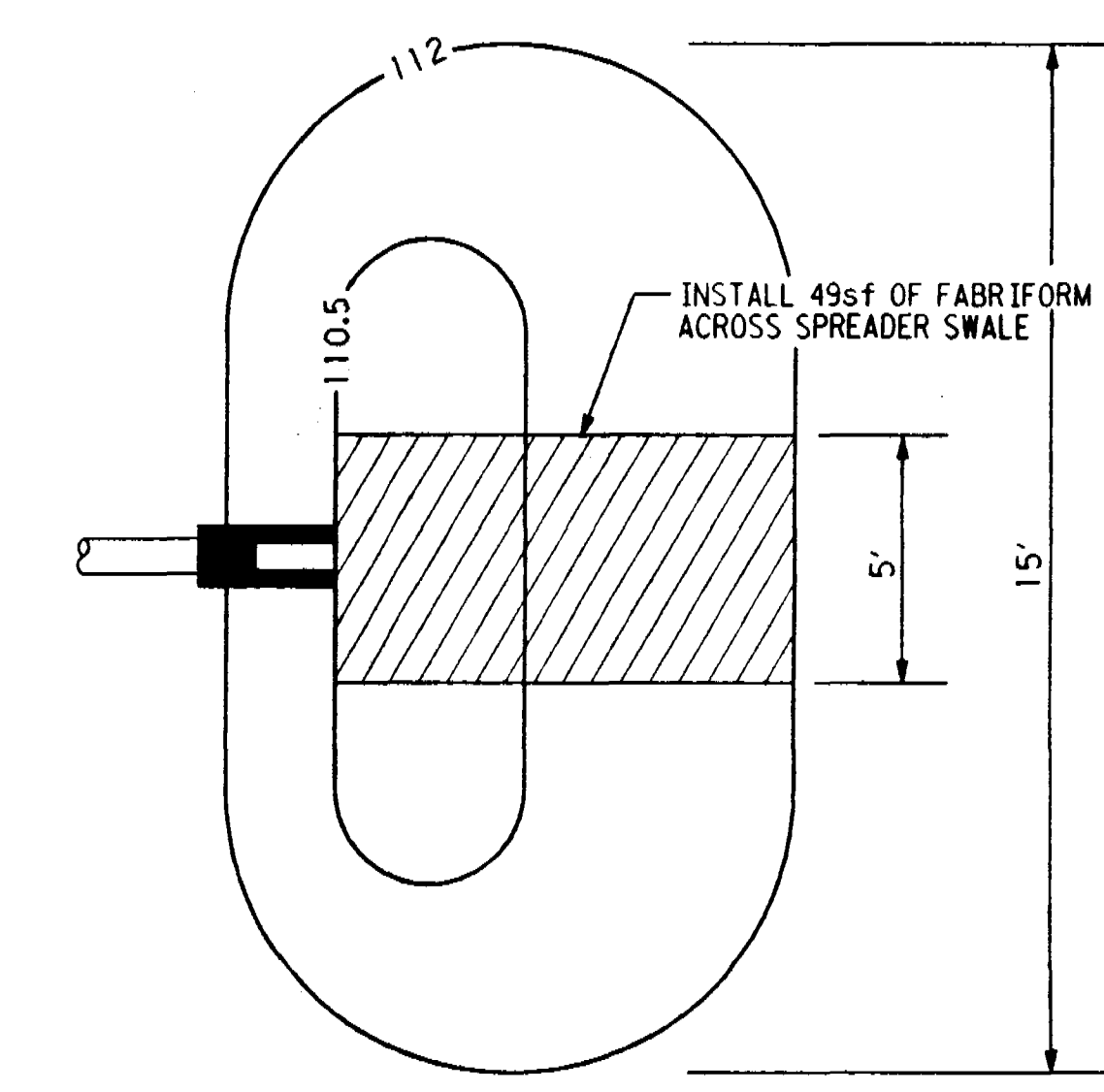
TYPE B BEDDING AND TRENCHING DETAIL



STORMWATER MANAGEMENT AREA DETAIL
A C-11 N.T.S.



CLAY LINER
E C-11 N.T.S.



SPREADER SWALE DETAIL
C C-11 N.T.S.

RECEIVED
NOV 09 1999
POS
ORLANDO
FLA 32809

- GENERAL NOTES:
- REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 232 FOR DETAILS REGARDING TYPE C AND D INLETS.
 - REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 234 FOR DETAILS REGARDING TYPE F AND G INLETS.
 - REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 272 FOR DETAILS REGARDING POND OUTFALL MITERED END SECTION.
 - REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 273 FOR DETAILS REGARDING S.R. 50 CULVERT MITERED END SECTIONS.

REVISIONS:							
NO.	DATE	INITIAL	NOTES	REVISIONS	REVISIONS	REVISIONS	REVISIONS
1	12/9/99	DJH	REVISED PER SURVMD COMMENTS				
2	7/8/99	DJH	REVISED PER FDOT COMMENTS				
3	1/1/99	DJH	ISSUE FOR CONSTRUCTION				
4	9/29/99	DJH	REVISED PER FDOT COMMENTS				
5							
6							
7							
8							

PROFESSIONAL SEAL:

ENGINEERING LOGO:

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1560 ORANGE AVENUE
SUITE 200
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FAX. (407) 647-0551

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SITE ADDRESS:
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MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

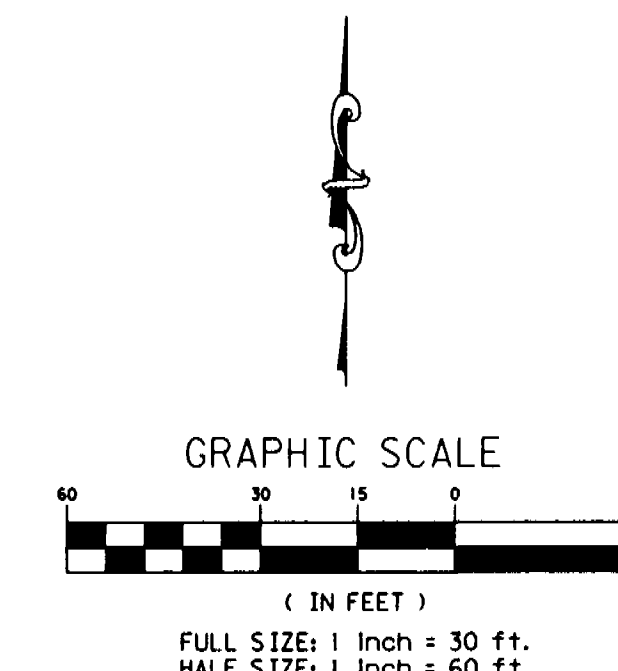
SHEET CONTENTS:

DETAILS

U-HAUL PROJECT NO.
785-05

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CHK'D BY: JRD C-11

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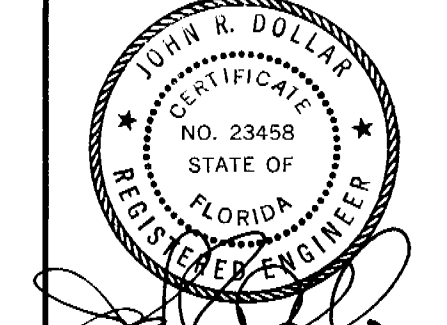


- GENERAL NOTES:
1. BEARINGS SHOWN HEREON ARE BASED ON OFFICIAL RECORDS VOLUME 8109, PAGE 433 AND ARE REFERENCED TO ITS SOUTHERLY LINE AS N 88° 49' 00" E.
 2. SOURCE BENCH MARK: RAILROAD SPIKE IN 30" OAK AT D.O.T. SECTION NO. 72160-2556, STATION 170+85, 95' WEST OF CENTERLINE OF SAN JOSE BLVD. AT THE INTERSECTION OF MANDARIN ROAD ELEVATION (18.18) NGVD
 3. SEE SHEETS C-9 FOR DETAILS REGARDING GRAVITY WALLS, CURBING, SIDEWALKS, BOLLARDS AND CONCRETE AND ASPHALT PAVEMENT.

REVISIONS:

NO.	DATE	INITIAL	NOTES
1	2-9-99	DJH	REV PER SURVAD COMMENTS.
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PROFESSIONAL SEAL:



ENGINEERING LOGO:
MAR 10 1999



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2727 NORTH CENTRAL AVENUE
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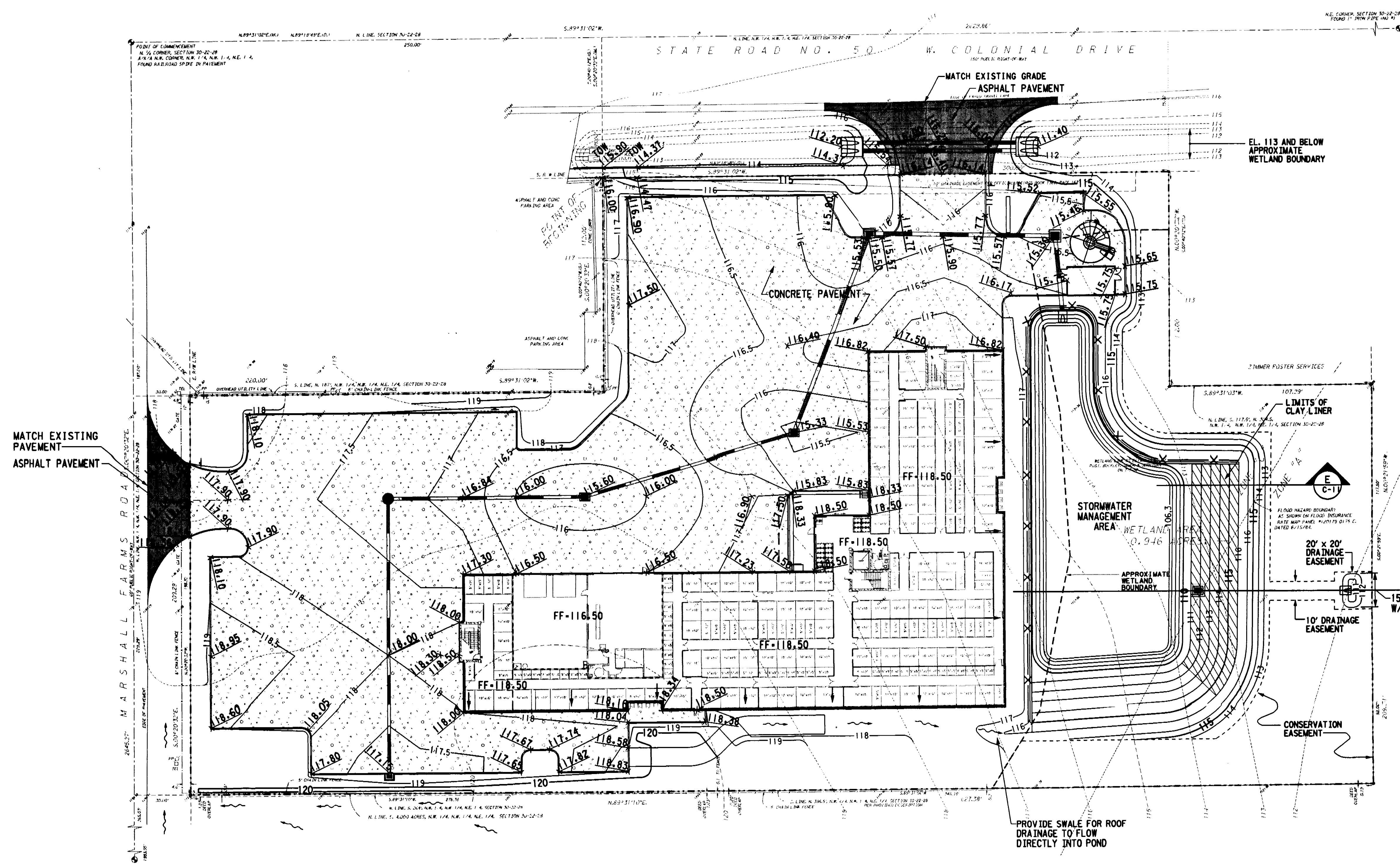
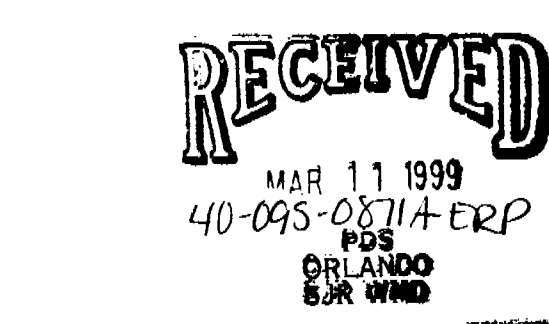
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MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

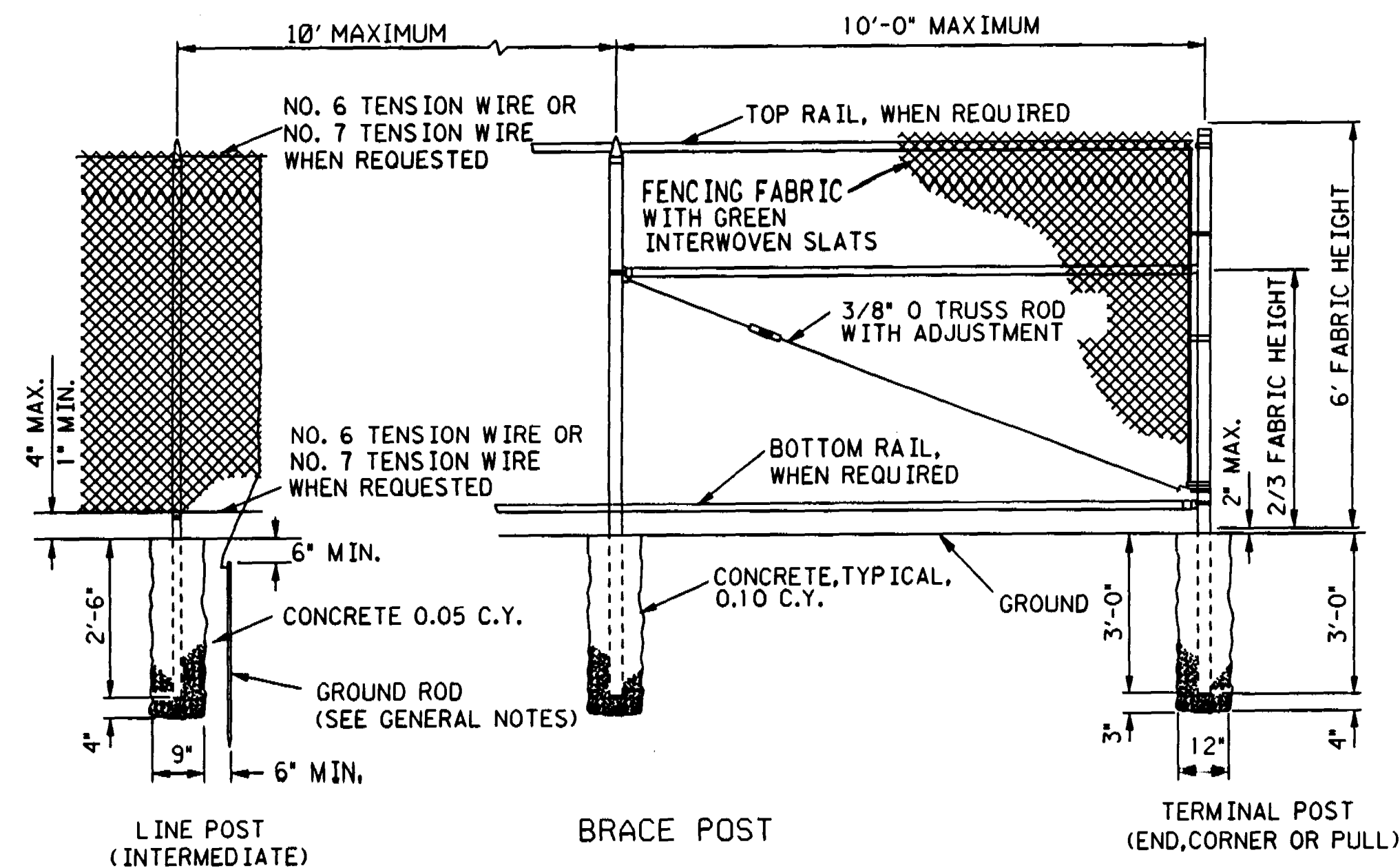
SHEET CONTENTS:
PAVING AND
GRADING
PLAN

U-HAUL PROJECT NO.
785-05

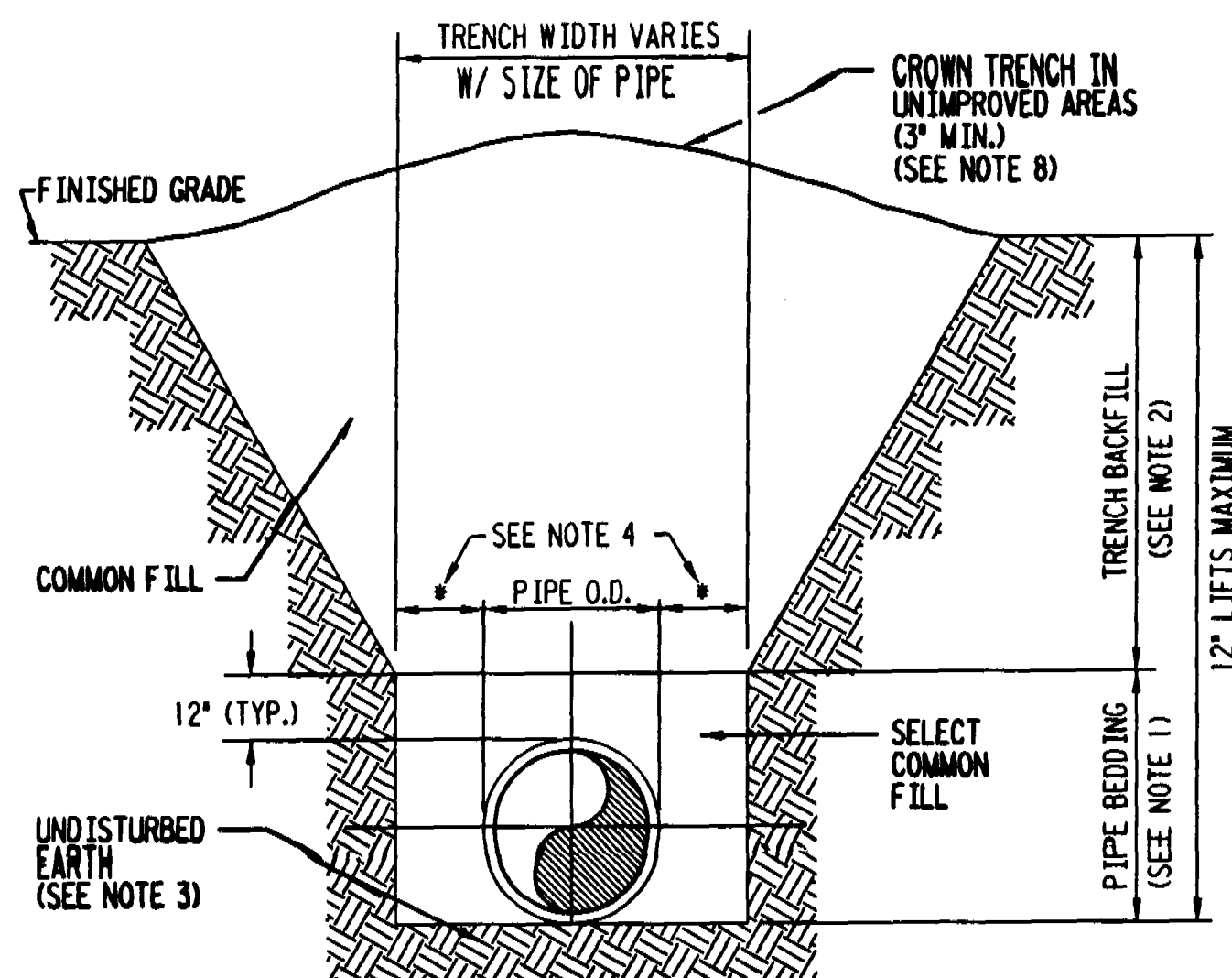
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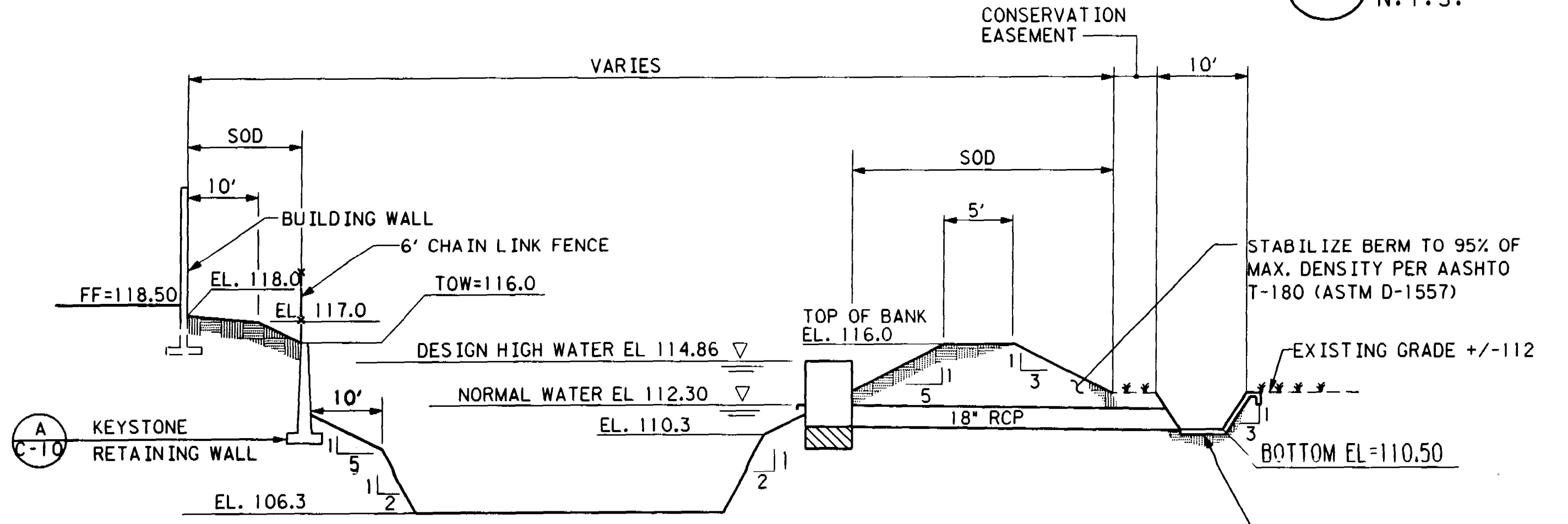


D CHAINLINK FENCE DETAIL
C-11 N.T.S.

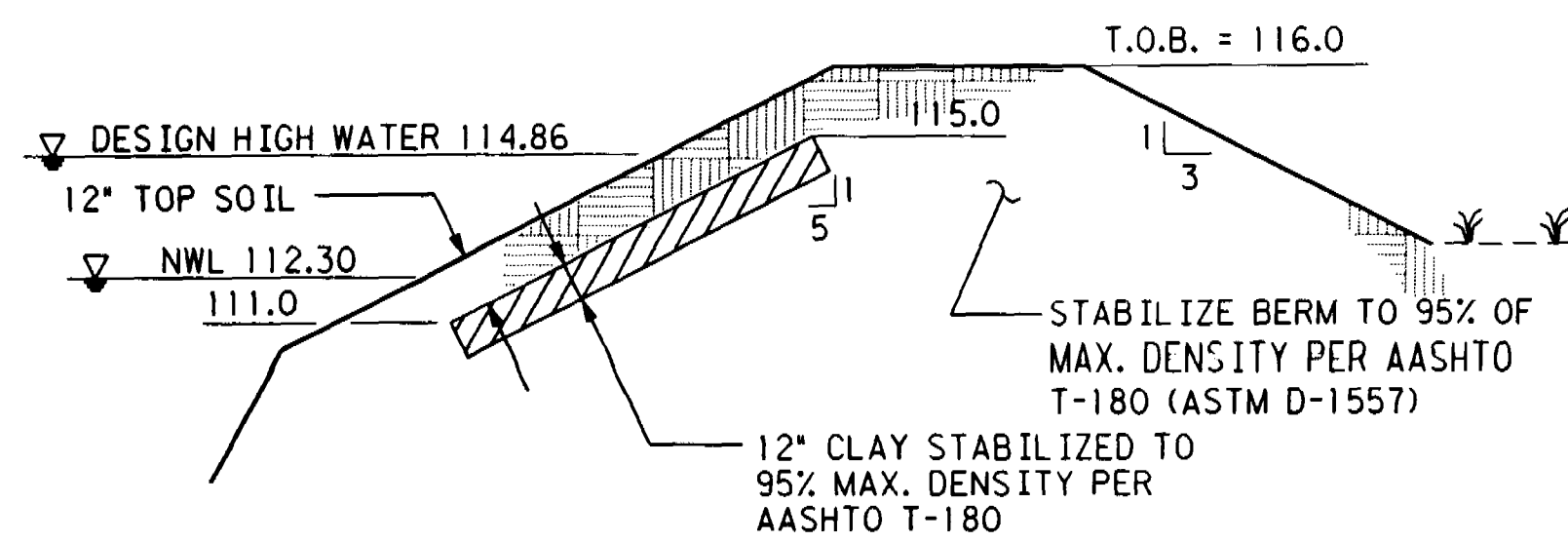


- NOTES:
1. PIPE BEDDING: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
 2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
 3. PIPE BEDDING UTILIZING SELECT COMMON FILL OR BEDDING ROCK IN ACCORDANCE WITH TYPE A BEDDING AND TRENCHING DETAIL MAY BE REQUIRED AS DIRECTED BY THE COUNTY.
 4. (•): 15\"/>
 5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
 6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
 7. REFER TO SECTION 32.5 OF THE MANUAL FOR SHEETING AND BRACING IN EXCAVATIONS.
 8. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN ORANGE COUNTY RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.

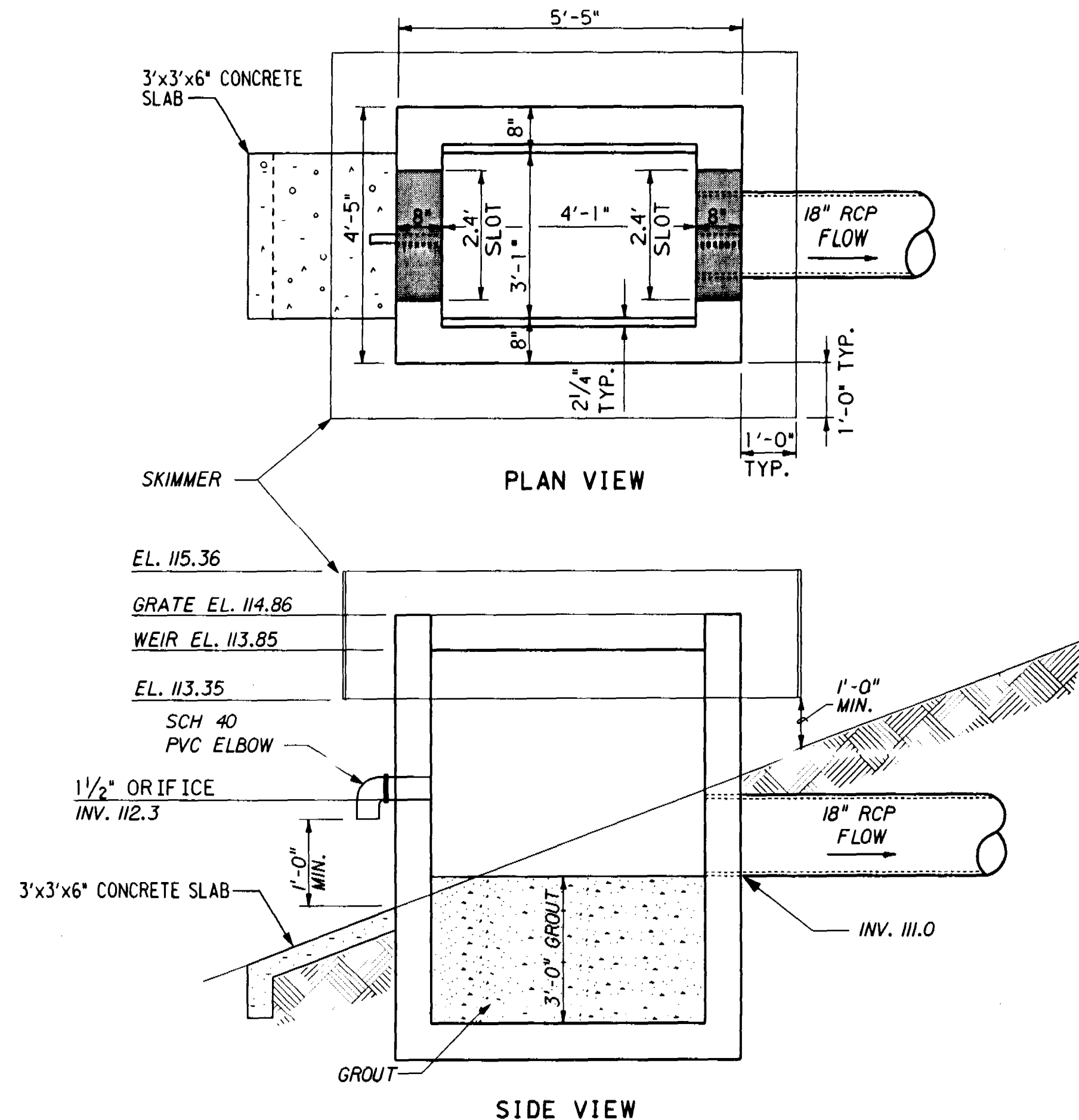
TYPE B BEDDING AND TRENCHING DETAIL



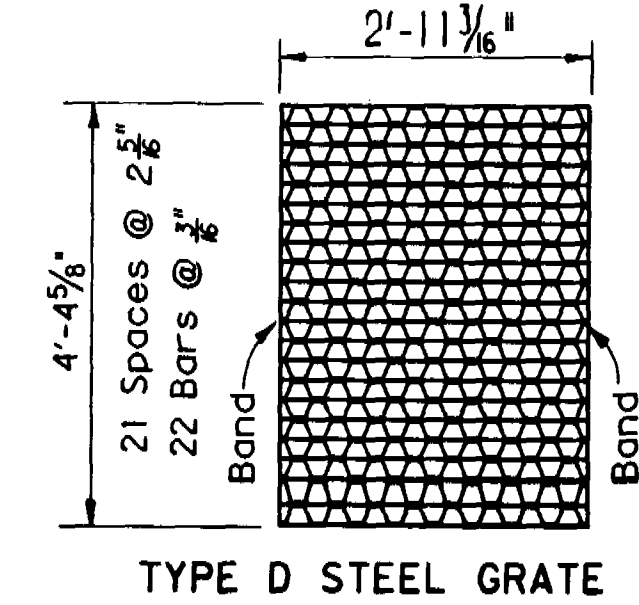
A STORMWATER MANAGEMENT AREA DETAIL
C-11 N.T.S.



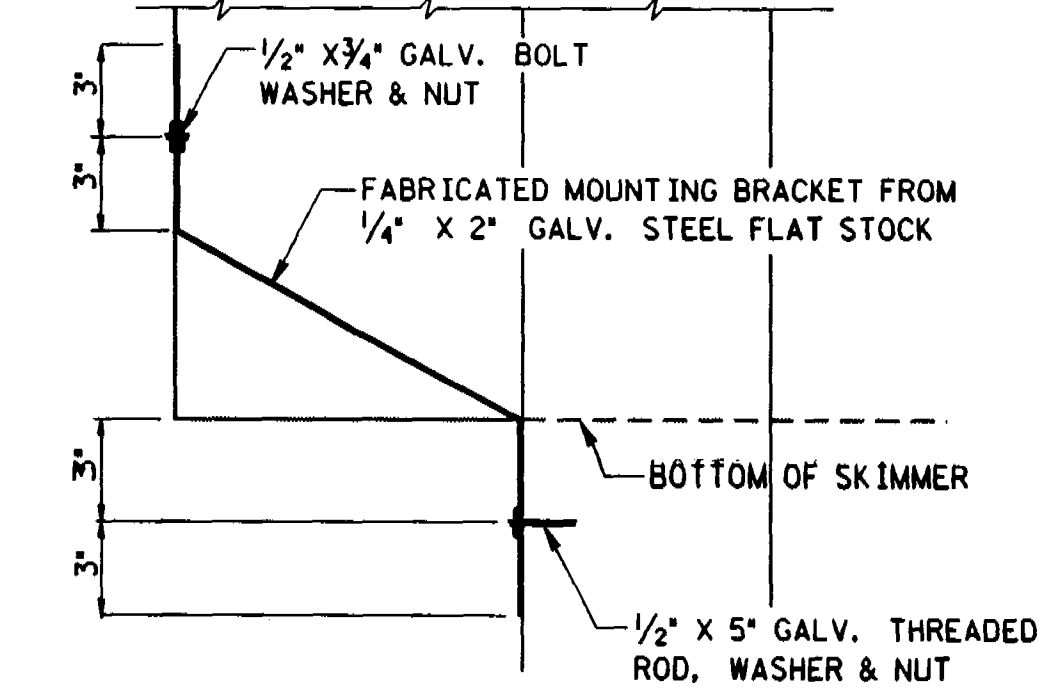
E CLAY LINER
C-11 N.T.S.



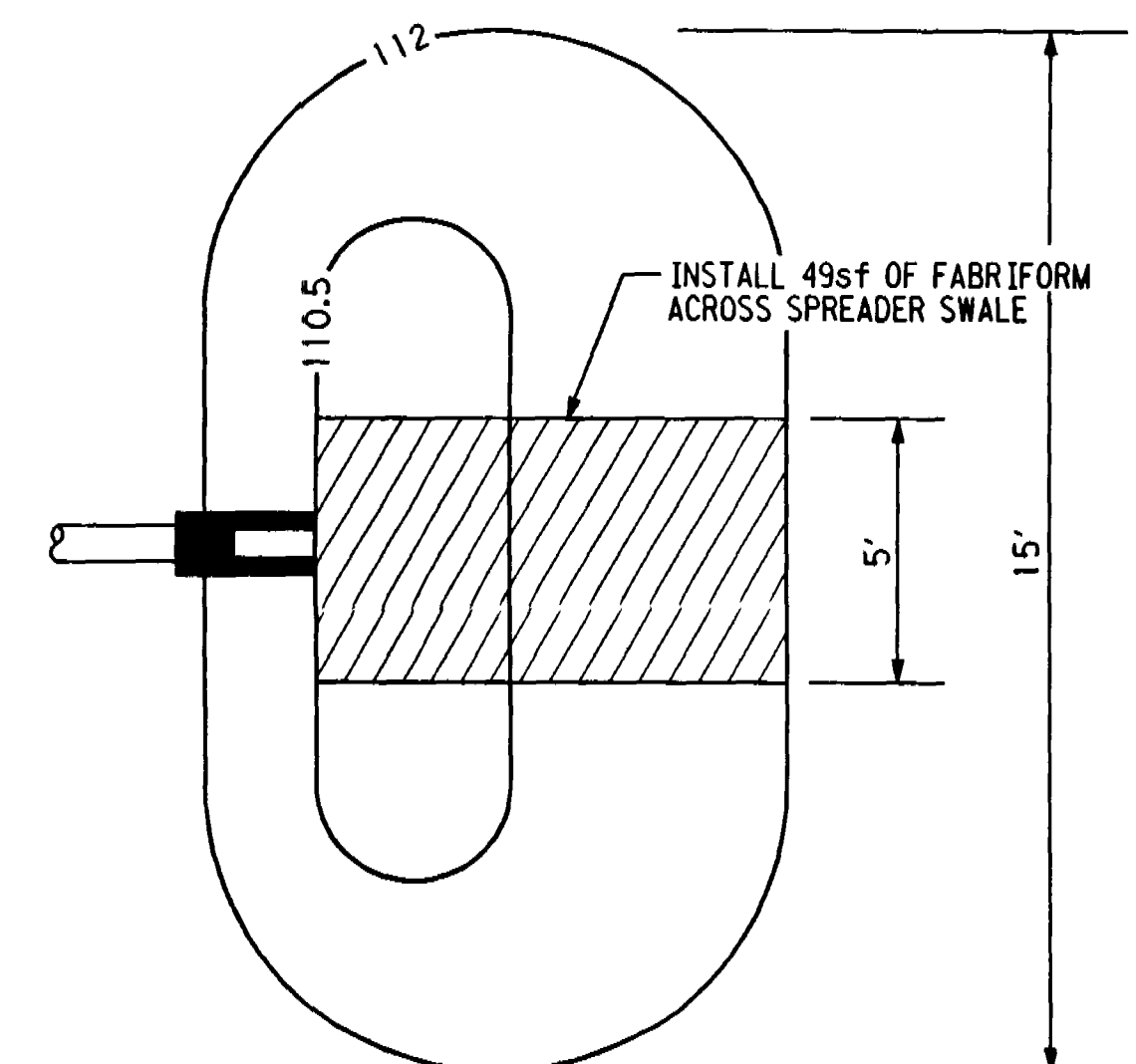
B MODIFIED FDOT TYPE D INLET (INDEX 232) OVERFLOW STRUCTURE
C-11 N.T.S.



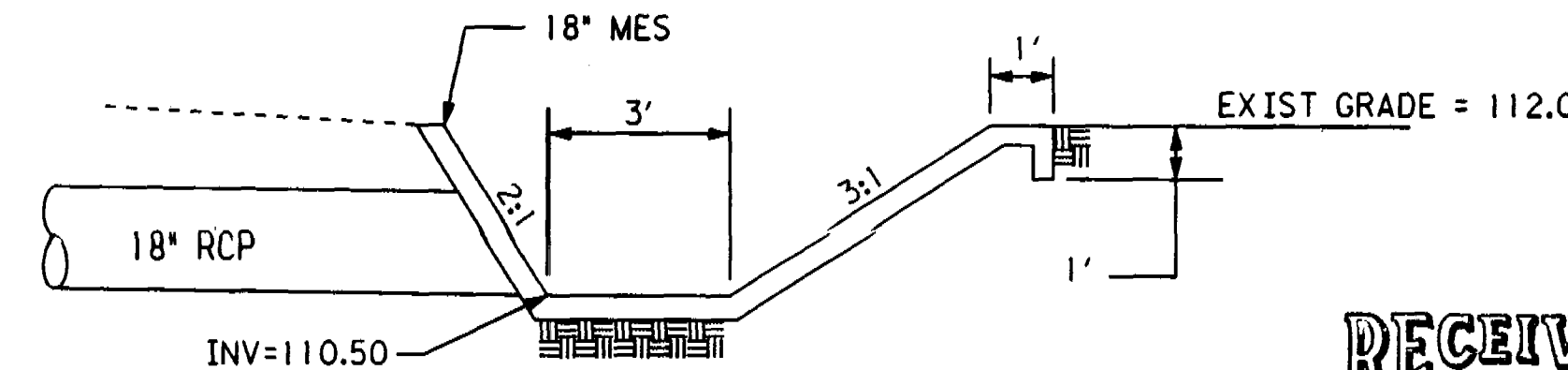
TYPE D STEEL GRATE
Straight Bars 2\"/>



SKIMMER MOUNTING BRACKET



C SPREADER SWALE DETAIL
C-11 N.T.S.



RECEIVED
MAR 11 1999
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PDS
ORLANDO
SJR WMD

- GENERAL NOTES:
1. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 232 FOR DETAILS REGARDING TYPE C AND D INLETS.
 2. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 234 FOR DETAILS REGARDING TYPE F AND G INLETS.
 3. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 272 FOR DETAILS REGARDING POND OUTFALL MITERED END SECTION.
 4. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 273 FOR DETAILS REGARDING S.R. 50 CULVERT MITERED END SECTIONS.

REVISIONS:							
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ORANGE COUNTY, FLORIDA

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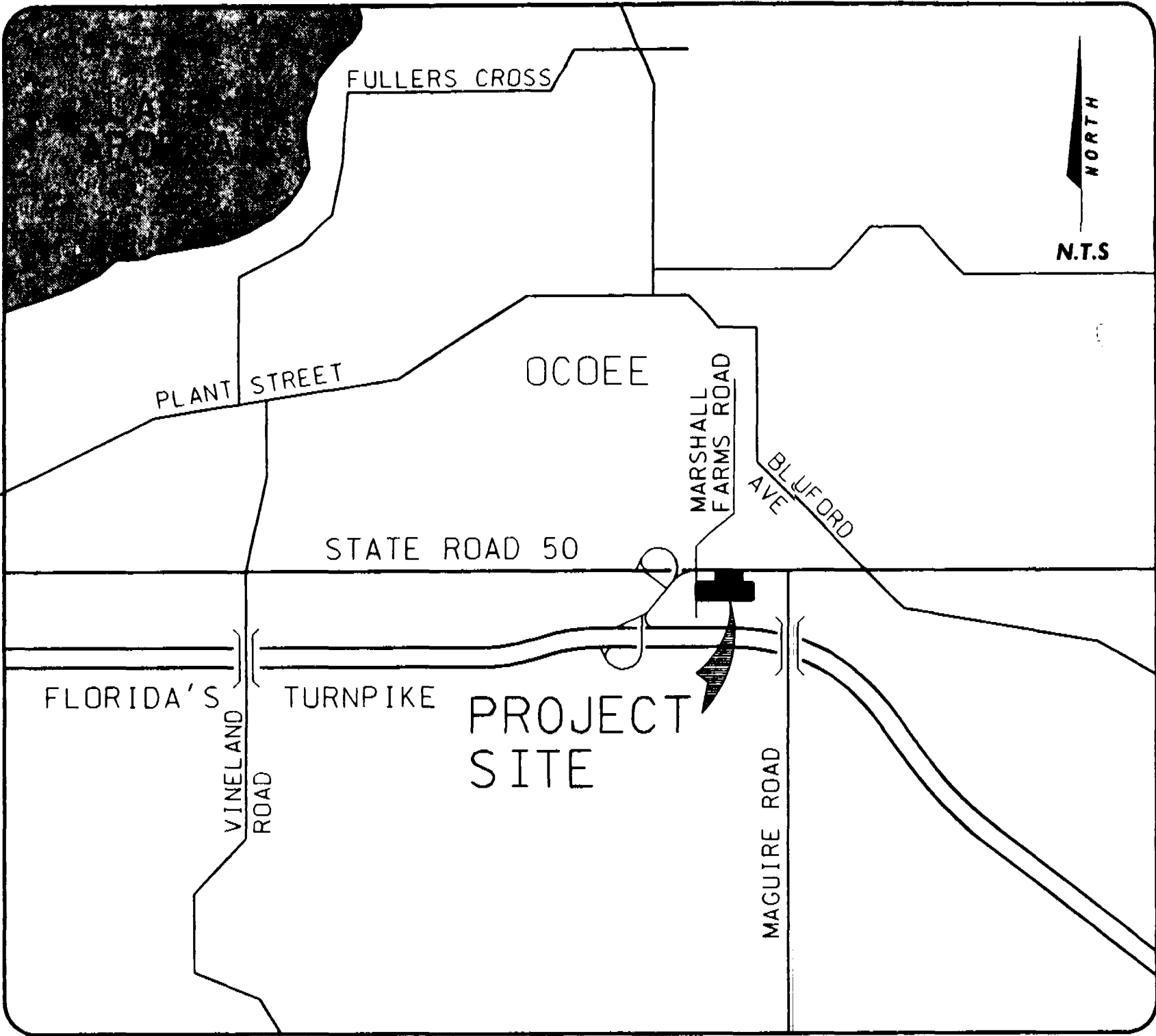
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SHEET NO. C-11

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U-HAUL INTERNATIONAL
ORANGE COUNTY, FLORIDA
SR 50 AND MARSHALL FARMS ROAD
SITE DEVELOPMENT PLANS



LOCATION MAP



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Civil Engineer :



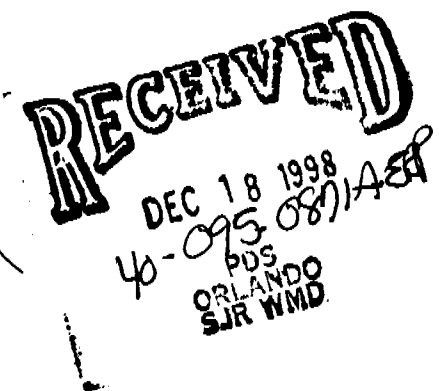
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DRAWING INDEX

DWG NO.	DESCRIPTION
	COVER SHEET
C-1	GENERAL NOTES
C-2	TOPOGRAPHIC SURVEY
C-3	EROSION CONTROL PLAN
C-4	DEMOLITION PLAN (NOT INCLUDED)
C-5	SITE PLAN
C-6	PAVING AND GRADING PLAN
C-7	UNDERGROUND UTILITIES PLAN
C-8	COORDINATE DATA PLAN (NOT INCLUDED)
C-9	DETAILS (NOT INCLUDED)
C-10	DETAILS (NOT INCLUDED)
C-11	DETAILS
C-12	DETAILS (NOT INCLUDED)
L-1	LANDSCAPE PLAN (NOT INCLUDED)
L-2	LANDSCAPE DETAILS (NOT INCLUDED)
L-3	IRRIGATION PLAN (NOT INCLUDED)
L-4	IRRIGATION DETAILS (NOT INCLUDED)

DECEMBER 18, 1998

SJRWMD SUBMITTAL



IMENSIONS SHOW ARE MEASURED TO/ FROM THE FACE OF CURB, PROPERTY LINE, PROPERTY CORNER, FACE OF BUILDING OR GEOMETRIC BASELINE.

ALL MATERIALS, INSTALLATION, AND TESTING SHALL BE IN ACCORDANCE WITH ORANGE COUNTY AND FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. WHERE THE SPECIFICATIONS CONFLICT, THE MAXIMUM REQUIREMENTS OF EITHER SPECIFICATION SHALL APPLY.

ALL TRAFFIC SIGNS AND STRIPING SHALL BE IN ACCORDANCE WITH THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

HANDICAPPED PARKING STALL SHALL BE PAINTED WITH APPROVED HANDICAP BLUE PAINT, PER LOCAL, STATE, AND FEDERAL REGULATIONS.

INFORMATION REGARDING EXISTING CONDITIONS PROVIDED IN THESE DRAWINGS IS GIVEN SOLELY TO ASSIST THE CONTRACTOR IN ASSESSING THE NATURE AND EXTENT OF CONDITIONS WHICH MAY BE ENCOUNTERED DURING THE COURSE OF THE WORK. ALL CONTRACTORS ARE DIRECTED AND ENCOURAGED TO CONDUCT WHATEVER INVESTIGATIONS THEY MAY DEEM NECESSARY, PRIOR TO BIDDING. SO THAT THEY MAY ARRIVE AT THEIR OWN CONCLUSIONS REGARDING THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED, AND UPON WHICH THEIR BIDS WILL BE BASED.

CONTRACTOR SHALL VERIFY ALL EXISTING GRADES ON SITE BEFORE BEGINNING WORK. THE OWNER'S REPRESENTATIVE SHALL BE NOTIFIED IMMEDIATELY OF ANY MAJOR DIFFERENCES BETWEEN CONTRACTOR'S DATA AND DRAWINGS.

CONTRACTOR SHALL CONSULT PROJECT SPECIFICATIONS SECTION TO DETERMINE WHICH PERMITS ARE REQUIRED AND WHICH PERMITS, IF ANY, ARE TO BE ACQUIRED BY THE CONTRACTOR.

CONTRACTOR SHALL COMPLY WITH ALL PERMIT CONDITIONS DURING CONSTRUCTION.

PRIOR TO COMMENCEMENT, CONTRACTOR SHALL PROVIDE THE OWNER'S REPRESENTATIVE WITH A CONSTRUCTION SCHEDULE FOR VARIOUS SITE WORK ELEMENTS SO THAT PERIODIC SITE VISITS MAY BE COORDINATED TO ENSURE TIMELY CERTIFICATION OF COMPLETION TO AGENCIES.

ALL WORK SHALL BE OPEN TO AND SUBJECT TO INSPECTION BY AUTHORIZED PERSONNEL OF LOCAL, STATE, AND FEDERAL REGULATORY AGENCIES, UTILITY COMPANIES, AND THE OWNER'S REPRESENTATIVE.

ALL WORK SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS CONTAINED HEREIN AND/OR OTHERWISE REQUIRED BY APPLICABLE FEDERAL, STATE AND LOCAL CODES, ORDINANCES, AND REGULATIONS. IN THE EVENT OF A CONFLICT BETWEEN THE REQUIREMENTS, THE MOST STRINGENT SHALL APPLY AS DETERMINED BY THE OWNER'S REPRESENTATIVE.

ALL FLORIDA DEPARTMENT OF TRANSPORTATION INDEXES REFER TO THE 1994 EDITION OF THE ROADWAY AND TRAFFIC DESIGN STANDARDS.

CONTRACTOR SHALL FURNISH THE OWNER'S REPRESENTATIVE WITH ACCURATE RECORD DRAWINGS SHOWING AS-CONSTRUCTED HORIZONTAL AND VERTICAL DIMENSIONS OF THE WORK. THE RECORD DRAWING SHALL BE CERTIFIED BY THE CONTRACTOR AS CORRECT. ALL REVISED INFORMATION SHALL BE CROSSED THROUGH AND NEW DATA ADDED.

AFTER COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PERFORM SITE CLEAN-UP OPERATIONS FOR REMOVAL OF ALL TRASH, DEBRIS, EXCESS MATERIAL, AND EQUIPMENT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PRESENT THE PROJECT SITE CLEAN AND IN GOOD ORDER AT THE TIME OF FINAL ACCEPTANCE.

THE CONTRACTOR SHALL EXERCISE EVERY PRECAUTION AND MEANS TO PREVENT AND CONTROL DUST DURING ALL OPERATIONS FROM BECOMING A NUISANCE TO ADJUTING PROPERTY OWNERS.

ACCESS TO ADJACENT STREETS AND PROPERTIES SHALL NOT BE OBSTRUCTED BY STORED CONSTRUCTION MATERIALS OR CONSTRUCTION METHODS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BARRICADES, TRAFFIC CONTROL, PROTECTION OF ALL FINISHED WORK, INCLUDING SIDEWALKS, CURB AND GUTTER, DRIVEWAY APRONS AND WATER METERS.

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY STOP BARS, STOP SIGNS, AND ANY STREET SIGNS.

THE USE OF ADJACENT PRIVATE PROPERTY OR PUBLIC RIGHT-OF-WAY TO STORE MATERIALS IS PROHIBITED. FURTHER, NO DEBRIS OR CONSTRUCTION MATERIALS ARE TO BE DISCARDED ON RIGHT-OF-WAY, ADJACENT PROPERTIES, WETLAND AREAS, LAKES, ETC.

THERE WILL BE NO IMPACT TO OR VEGETATION REMOVAL FROM THE WETLAND AREA ADJACENT TO THE PROPERTY, UNLESS APPROPRIATE AGENCY PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.

ALL SANITARY SEWER, WATER MAINS, AND DRAINAGE SYSTEMS, INCLUDING RETENTION PONDS LOCATED OUTSIDE THE RIGHT-OF-WAY, ARE TO BE OWNED AND MAINTAINED BY THE PROPERTY OWNER.

PROJECT SIGN SHALL COMPLY WITH THE LATEST ORANGE COUNTY SIGN ORDINANCE.

1. UTILITIES WILL BE PROVIDED BY:

WATER :	PRIVATE WELL
WASTEWATER :	SEPTIC TANK AND DRAIN FIELD
ELECTRIC :	FLORIDA POWER
TELEPHONE :	BELL SOUTH
FIRE PROTECTION :	ON-SITE STORAGE TANK AND FIRE SPRINKLERS
2. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES AND VERIFYING LOCATION OF THEIR FACILITIES PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE SPECIAL CARE IN WORKING AROUND AND NEAR ALL EXISTING UTILITIES THAT ARE ENCOUNTERED DURING CONSTRUCTION, PROTECTING THEM WHERE NECESSARY SO THAT THEY WILL GIVE UNINTERRUPTED SERVICE. THE CONTRACTOR SHALL BE RESPONSIBLE TO THE OWNERS FOR ALL DAMAGES TO SAID UTILITIES. DURING THE COURSE OF CONSTRUCTION BY THE CONTRACTOR, WHEN IT IS NECESSARY TO HAVE UTILITIES RELOCATED OR ADJUSTED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING AND COORDINATING THIS WORK WITH THE UTILITY COMPANIES.
3. WHEN WATER AND SEWER LINES CROSS WITH LESS THAN 18" VERTICAL SEPARATION THE WATER MAIN SHALL BE REPLACED WITH DUCTILE IRON PIPE FOR A DISTANCE OF 10' MIN. EITHER SIDE OF THE CROSSING. A LATERAL SEPARATION OF 10' SHALL BE MAINTAINED BETWEEN WATER AND SEWER LINES AT ALL TIMES, UNLESS THE WATER MAIN IS CONSTRUCTED OF DUCTILE IRON PIPE.
4. DISINFECTION, FLUSHING AND PRESSURE TESTING SHALL BE COMPLETED IN ACCORDANCE WITH FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, ORANGE COUNTY HEALTH DEPARTMENT STANDARDS, AWWA-C651 AND AWWA-C600 SPECIFICATIONS. ALL REPAIRS OR TESTING REQUIRED TO COMPLETE THIS WORK SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.
5. WATER MAINS, UNLESS CALLED OUT AS DIP, 4 INCHES THROUGH 12 INCHES SHALL BE PVC C-900, DR-18. POTABLE WATER SERVICE LINE (1.5" - 2") SHALL BE SCHEDULE 40 PVC.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN A COPY OF THE F.D.E.P. WATER AND SEWER PERMITS ON SITE AT ALL TIMES AND PERFORM BACTERIOLOGICAL TESTING (B.T.) AFTER DISINFECTION IN ACCORDANCE WITH THE F.D.E.P. WATER PERMITS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT A SET OF AS-BUILT WATER AND SEWER DRAWINGS TO THE ENGINEER. THE CONTRACTOR MUST PROVIDE AS-BUILT WATER SYSTEM DRAWINGS PRIOR TO CONDUCTING B.T. TESTS. B.T. TEST RESULTS MUST BE FORWARDED TO THE ENGINEER NO LATER THAN 5 DAYS AFTER THE TEST. B.T. TEST MUST BE PERFORMED ON TWO CONSECUTIVE DAYS.
7. ALL PVC PIPE MUST BEAR THE NSF LOGO FOR POTABLE WATER USE.
8. HYDROSTATIC TESTS CONSISTING OF PRESSURE TEST AND LEAKAGE TEST SHALL BE CONDUCTED IN ACCORDANCE AWWA M23 FOR PVC PIPES.
9. WHEN WATER MAINS CROSS OTHER PIPES OR STRUCTURES WITH LESS THAN 18" OF CLEARANCE OR WITH LESS THAN 3' OF COVER, USE CLASS 51 D.I.P. MINIMUM.
0. TRENCHES SHALL BE BRACED OR SHORED AS REQUIRED. WIDTH OF TRENCH SHALL BE OUTSIDE DIAMETER OF PIPE BELL PLUS TWENTY FOUR INCHES (24") MAXIMUM.
1. A PRE-CONSTRUCTION CONFERENCE SHALL BE SCHEDULED PRIOR TO CONSTRUCTION. CALL OWNER'S REPRESENTATIVE TO ARRANGE DATE & TIME. SHOP DRAWINGS SHALL BE RETURNED AT TIME OF PRE-CON.
2. ALL WATER MAINS SHALL HAVE A MINIMUM OF 36" COVER FROM FINISHED GRADE. WATER MAINS ARE DESIGNED TO FINISHED GRADE AND SHALL BE PROTECTED FROM DAMAGE UNTIL WORK IS COMPLETED.
3. ON-SITE WATER DISTRIBUTION SYSTEM AND WASTEWATER COLLECTION SYSTEM WILL BE PRIVATELY OWNED AND MAINTAINED.

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO BEST MANAGEMENT PRACTICES AND THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.
2. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN, CONSTRUCTION. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTATION OF SILT OFF THE SITE. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE ENGINEER AND THE AGENCIES 10 DAYS PRIOR TO COMMENCING WORK.
3. SILT SCREENS AND TURBIDITY BARRIERS MUST REMAIN IN PLACE AND IN GOOD CONDITION AT ALL LOCATIONS SHOWN IN PLANS OR AS REQUIRED UNTIL THE CONTRACT IS COMPLETED AND SOILS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED.
4. PROVIDE FILTER FABRIC UNDER THE GRATE OF ALL INLETS AFTER INITIAL COMPLETION OF THE DRAINAGE STRUCTURES. MAINTAIN THESE MEASURES DAILY (WHICH MAY INCLUDE FULL REPLACEMENT AT THE DISCRETION OF THE OWNER) TO MINIMIZE SILT ACCUMULATION IN THE STORM DRAINAGE SYSTEM DURING CONSTRUCTION.
5. SEEDING, MULCHING, AND SODDING OF CRITICAL AREAS SHALL BE DONE AS SOON AS PRACTICAL, OR AS NECESSARY TO CONTROL EROSION.
6. STOCKPILES OF FILL MATERIAL AND TOPSOIL MUST BE SITUATED SO AS NOT TO OBSTRUCT NATURAL DRAINAGE OR CAUSE OFF-SITE ENVIRONMENTAL DAMAGE.
7. ANY OFF-SITE AREAS DISTURBED DURING CONSTRUCTION SHALL BE REGRADED, GRASSED, AND RESTORED TO PRECONSTRUCTION CONDITION OR BETTER.

1. ON-SITE STORMWATER MANAGEMENT AND DRAINAGE SYSTEM WILL BE PRIVATELY OWNED AND MAINTAINED.
2. ALL DRAINAGE PIPE SHALL BE REINFORCED CONCRETE PIPE CLASS III (ASTM C-76), OR CLASS IV AT LOCATIONS WITH LESS THAN 2-FT OF COVER TO ROAD SURFACE, UNLESS OTHERWISE NOTED.



1. SPECIAL ATTENTION SHALL BE GIVEN BY THE CONTRACTOR TO SAVING, PROTECTING, AND PRESERVING ANY EXISTING TREES, SHRUBS OR OTHER VEGETATION SO DESIGNATED BY THE OWNER. SELECTIVE CLEARING AND/OR GRUBBING SHALL BE PERFORMED IN LOCATIONS INDICATED ON THE PLANS AND OTHER AREAS SPECIFIED BY THE OWNER AT NO ADDITIONAL COST TO THE OWNER. THE OWNER OR THE OWNER'S REPRESENTATIVE WILL SELECT AND MARK, OR OTHERWISE DESIGNATE, TREES, ORNAMENTALS OR OTHER VEGETATION TO BE PRESERVED. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL INSTALL AN APPROVED ENVIRO FENCE AROUND DESIGNATED VEGETATION FOR A MINIMUM OF 10 FEET BEYOND THE DRIP LINE OF THE TREES, ORNAMENTALS, OR OTHER VEGETATION TO BE PRESERVED. CLEARING LIMITS MUST BE APPROVED BY THE OWNER PRIOR TO BEGINNING CLEARING OPERATIONS. ALL ACTIVITIES MUST COMPLY WITH THE ORANGE COUNTY LANDSCAPING AND ARBOR REGULATIONS.

1. CONTRACTOR SHALL CONFORM TO ALL REGULATIONS AND PROCEDURES ESTABLISHED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) AS OUTLINED IN THE LATEST EDITION OF THE "FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS". CONSTRUCTION SIGNS AND BARRICADES SHALL CONFORM TO REQUIREMENTS OF STANDARD INDEX 600 AND THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (M.U.T.C.D.).
2. EXISTING SIGNING AND PAVEMENT MARKINGS THAT CONFLICT WITH CONSTRUCTION SIGNING AND MARKINGS SHALL BE REMOVED OR COVERED.
3. CONSTRUCTION SIGNING SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION, AND SIGNS SHALL BE MAINTAINED DURING CONSTRUCTION IN ACCORDANCE WITH M.U.T.C.D.
4. CONTRACTOR SHALL MAINTAIN ADEQUATE DRAINAGE TO PREVENT FLOODING OR STORMWATER RUNOFF TO EXISTING ROADWAY OR ROADSIDE AREAS DURING CONSTRUCTION.
5. FOR ADDITIONAL SIGN INFORMATION, INCLUDING SIZES, REFER TO THE STANDARD HIGHWAY SIGNS MANUAL AS SPECIFIED IN THE M.U.T.C.D.
6. DROPOFFS ADJACENT TO EXISTING PAVEMENT GREATER THAN 3-INCHES WILL NOT BE ALLOWED IN AN INACTIVE WORK ZONE. SEE FDOT STANDARD INDEX 600 SHEET 5 OF 10 FOR PAVEMENT DROPOFF RESTRICTIONS AND WARNING DEVICES.
7. CONTRACTOR SHALL NOT IMPEDE NORMAL TRAFFIC FLOW ON ADJACENT ROADWAYS FOR UNUSUALLY LONG PERIODS OF TIME; AND SHALL NOTIFY THE FDOT IN ADVANCE OF ANY UNUSUAL ROADWAY CROSSING WITH HEAVY EQUIPMENT.

REVISIONS:

NO.	DATE:	INITIAL	NOTES:
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DEC 18 1998

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MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

GENERAL
NOTES

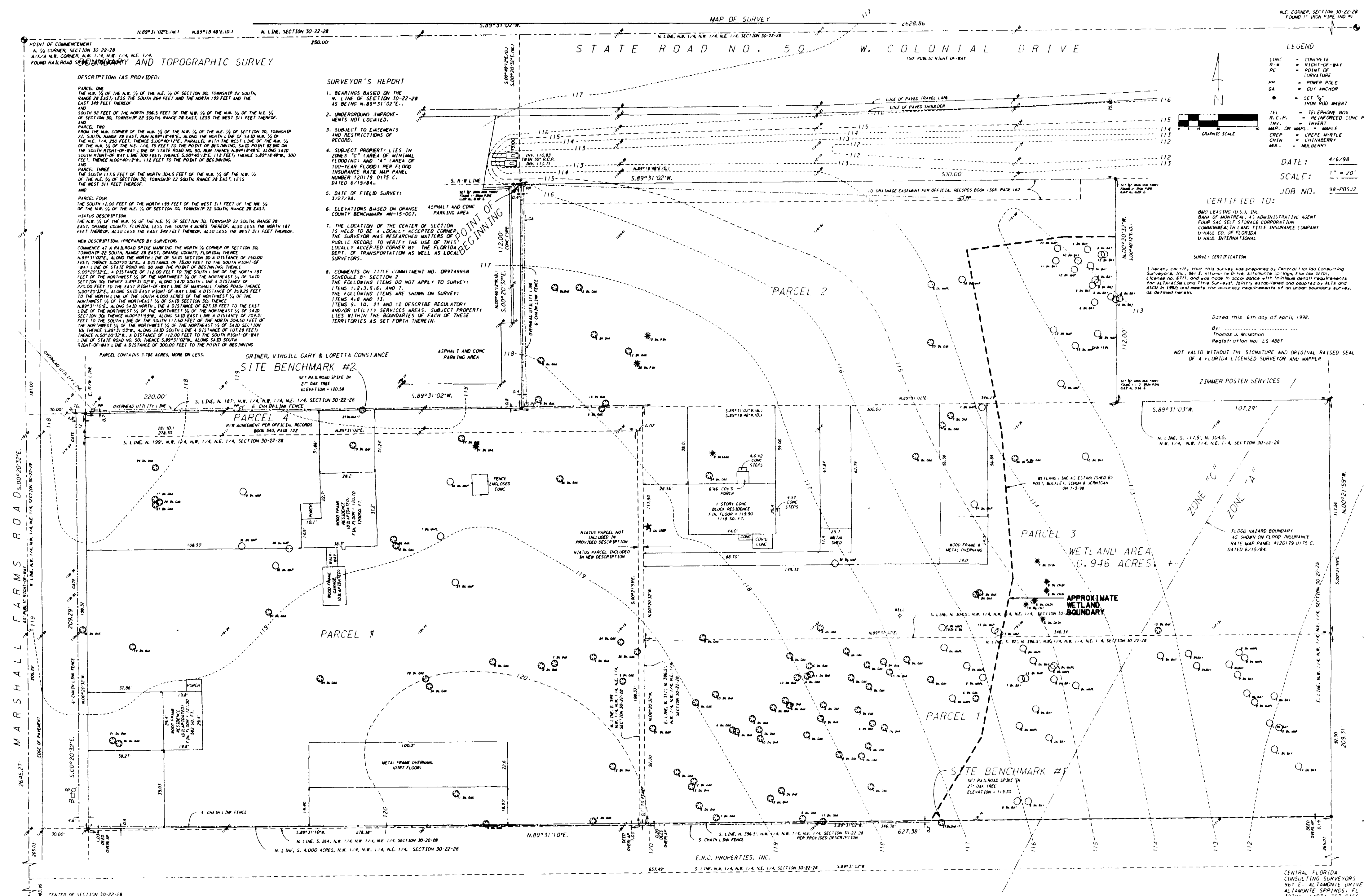
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DATE: 16-DEC-1998 16:16

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SURVEY PREPARED BY:
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FOR INFORMATION
PURPOSES ONLY

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GENERAL NOTES:
1. BEARINGS SHOWN HEREON ARE BASED ON OFFICIAL RECORDS VOLUME 8109, PAGE 433 AND ARE REFERENCED TO ITS SOUTHERLY LINE AS N 88°49'00" E.
2. SOURCE BENCH MARK: RAILROAD SPIKE IN 30" OAK AT (D.O.T.) SECTION NO. 72160-2556, STATION 170+85, 95' WEST OF CENTERLINE OF SAN JOSE BLVD. AT THE INTERSECTION OF MANDARIN ROAD ELEVATION (18.18) NGVD

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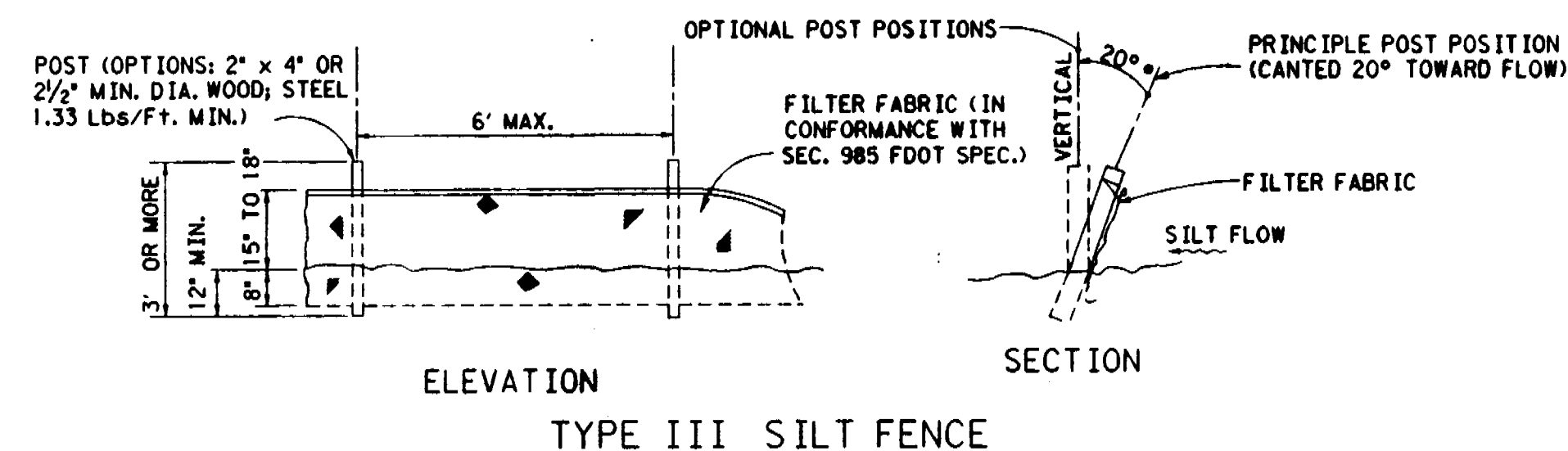
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PH: 602/263-8502
FAX: 602/277-1026

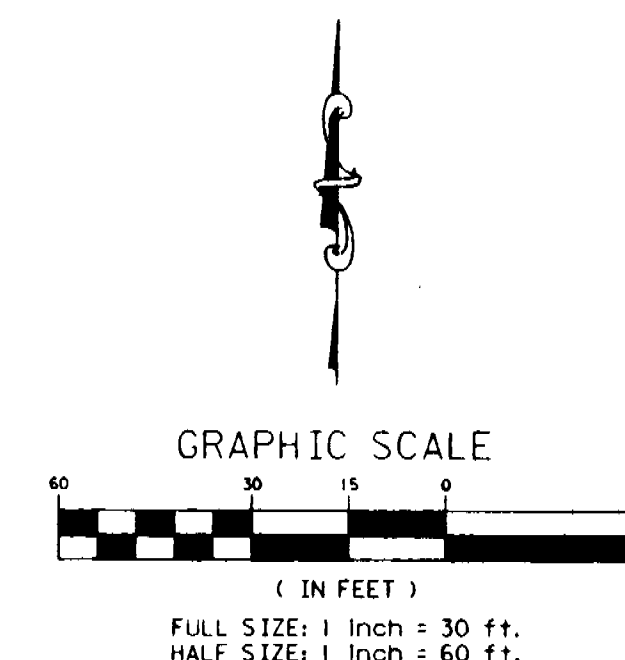
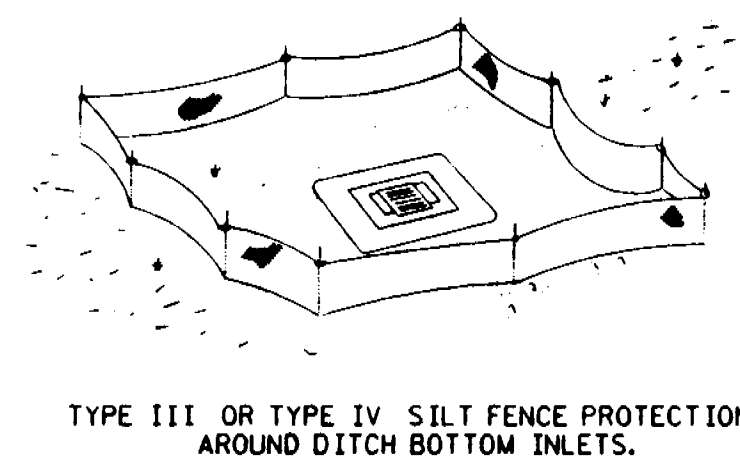
SITE ADDRESS:
U-HAUL INTERNATIONAL
MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

SHEET CONTENTS:
TOPOGRAPHIC
SURVEY

U-HAUL PROJECT NO.
785-05
DRAWN BY: MV SHEET NO.
CHK'D BY: JRD **C-2**
DATE: 16-DEC-1998 16:30
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NOTE: SPACING FOR TYPE III FENCE TO BE IN ACCORDANCE WITH CHART I, PLATE D-906 AND DITCH INSTALLATIONS AT DRAINAGE STRUCTURES ABOVE.

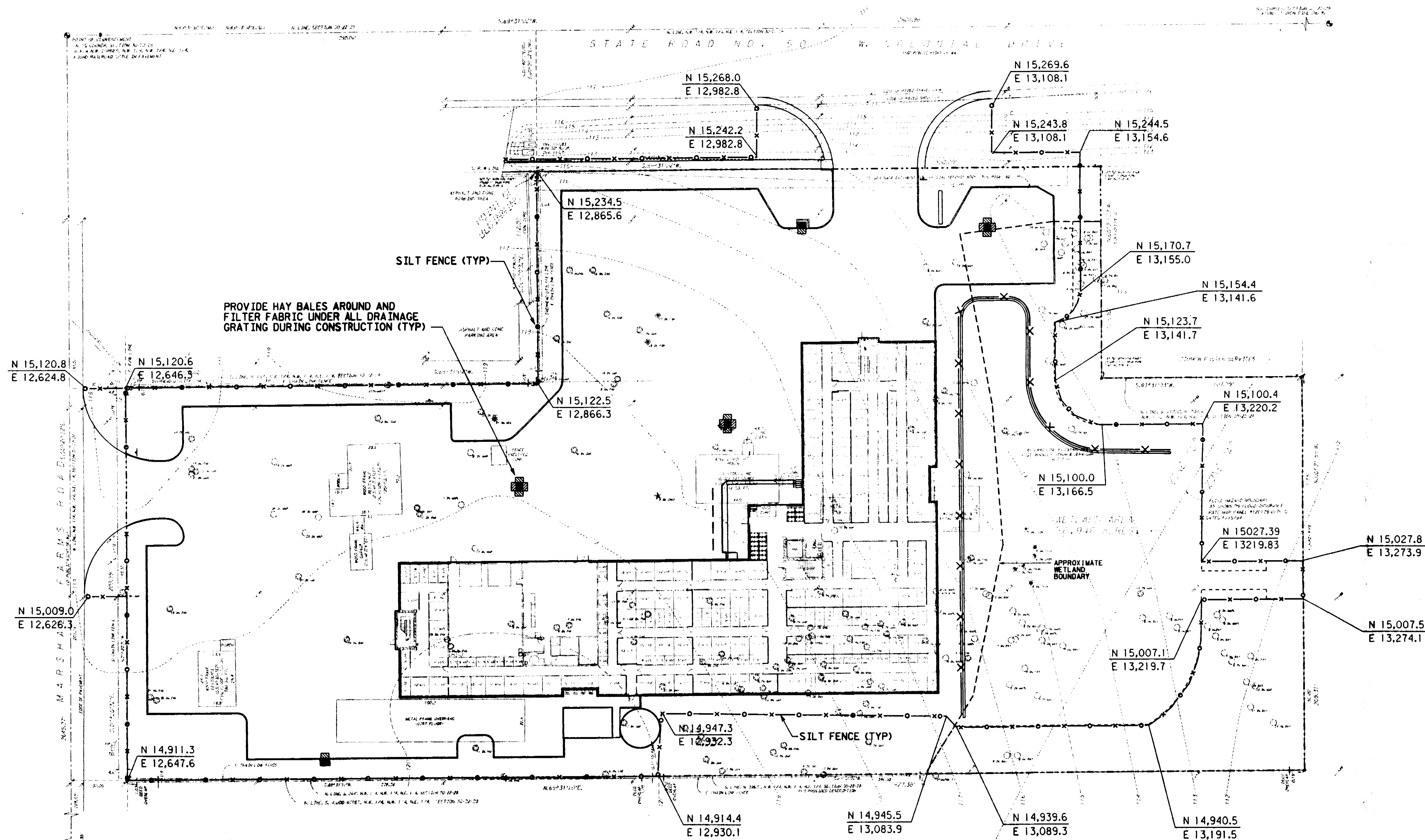


DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

SILT FENCE APPLICATIONS

SILT FENCE DETAILS

NTS



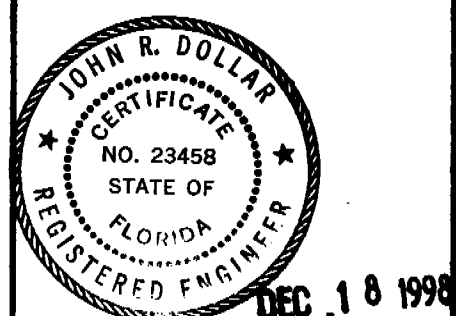
GENERAL NOTES:

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- SOURCE BENCH MARK: RAILROAD SPIKE IN 30" OAK AT (D.O.T. SECTION NO. 72160-2556), STATION 170+95, 95' WEST OF CENTERLINE OF SAN JOSE BLVD. AT THE INTERSECTION OF MANDARIN ROAD ELEVATION (18.18) NGVD

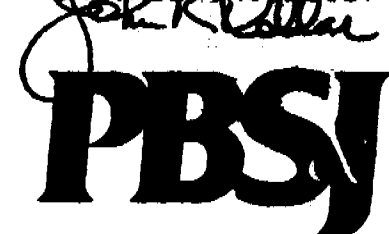
REVISIONS:

NO.	DATE	INITIALS	NOTES
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PROFESSIONAL SEAL:



ENGINEERING FIRM:



1560 ORANGE AVENUE
SUITE 700
WINTER PARK, FL. 32789
TEL. (407) 647-7275
FAX. (407) 647-0551



U-HAUL INTERNATIONAL
CONSTRUCTION & RENOVATION
2727 NORTH CENTRAL AVENUE
PHOENIX, ARIZONA 85004
PH: 602/263-6502
FAX: 602/277-1026

SITE ADDRESS:

U-HAUL INTERNATIONAL
MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

SHEET CONTENTS:

EROSION
CONTROL
PLAN

U-HAUL PROJECT NO.

785-05

DRAWN BY: MV SHEET NO.

CHK'D BY: JRD C-3

DATE: 16-DEC-1998 16:30

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DESCRIPTION: (AS PROVIDED)

NEW DESCRIPTION: (PREPARED BY SURVEYOR)

PARCEL CONTAINS A TOTAL OF 3.786 ACRES, MORE OR LESS
OF WHICH 0.946 ACRES IS WETLAND AREA.

1. BEARINGS BASED ON THE
N. LINE OF SECTION 30-22-28
AS BEING N. 89° 31' 02" E..

- OWNER/DEVELOPER:**
U-HAUL INTERNATIONAL
CONSTRUCTION & RENOVATION
2727 NORTH CENTRAL AVENUE
PHOENIX, ARIZONA 85004
TEL. (602) 263-6502
FAX. (602) 277-1026

ARCHITECT:
ARCHICON, INC.
3707 NORTH 7th STREET
SUITE 200
PHOENIX, AZ. 85014
TEL. (602) 222-4266
FAX (602) 279-4086

ENGINEER:
PBSJ, Inc.
1560 NORTH ORANGE AVENUE
WINTER PARK, FLORIDA 32789
TEL. (407) 647-7275
FAX. (407) 647-0551
JOHN R. DOLLAR, P.E.

LANDSCAPE ARCHITECT:
PBSJ, Inc.
1560 NORTH ORANGE AVENUE
WINTER PARK, FLORIDA 32789
TEL. (407) 647-7275
FAX. (407) 647-0551
BRUCE BRODSKY.

SURVEYOR:
CENTRAL FLORIDA CONSULTING SURVEYORS
961 EAST ALTAMONTE DRIVE
ALTAMONTE SPRINGS, FLORIDA 32701
TEL. (407) 767-0166

ROOM SIZE	QUANTITY	SQ FEET	%
5 x 5	158	3,950	7.3
5 x 10	214	10,700	19.6
10 x 10	322	32,200	59.1
10 x 15	47	7,050	12.9
5 x 15	8	600	1.1
TOTALS:	749	54,500	100

FLOOD MAP INFORMATION
EXAMINATION OF FLOOD INSURANCE RATE MAP
COMMUNITY NO. 120179, PANEL 0175 C, DATED
6-15-84, INDICATES THAT THE PROPERTY SHOWN
AND DESCRIBED HEREON LIES WITHIN ZONE "C".

GOVERNING MUNICIPALITY: ORANGE COUNTY, FLORIDA

PROPERTY ZONING: C-3

MINIMUM FRONT BUILDING SETBACK: 25.00'
MINIMUM SETBACK PROVIDED: 89.57'

MINIMUM SIDE BUILDING SETBACK: 5'. 25' ADJ TO RESIDENTIAL. 15' ADJ TO STREET
MINIMUM SETBACK PROVIDED: 194.93' EAST
MINIMUM SETBACK PROVIDED: 143.32' WEST

MINIMUM REAR BUILDING SETBACK: 15.0'
MINIMUM SETBACK PROVIDED: 15.0'

MAXIMUM HEIGHT RESTRICTION: 75.00'
PROPOSED HEIGHT: 35.33' (3 FLOORS)

LOT ACREAGE: 164,902 SF. 3.79 AC. 100.00%
BUILDING FOOTPRINT AREA: 30,479 SF. 0.70 AC. 18.47%
PAVEMENT AREA: 65,249 SF. 1.50 AC. 39.58%
STORMWATER MANAGEMENT AREA (NWE): 13,762 SF. 0.32 AC. 8.44%
PERVIOUS AREA: 55,412 SF. 1.27 AC. 33.51%

ON-SITE WETLAND AREA: 41,213 SF. 0.95 AC. 100.00%
ON-SITE WETLANDS IMPACTED: 23,263 SF. 0.53 AC. 55.79%
OFF-SITE WETLANDS IMPACTED: 1,325 SF. 0.03 AC.
CONSERVATION EASEMENT AREA 17,931 SF. 0.41 AC

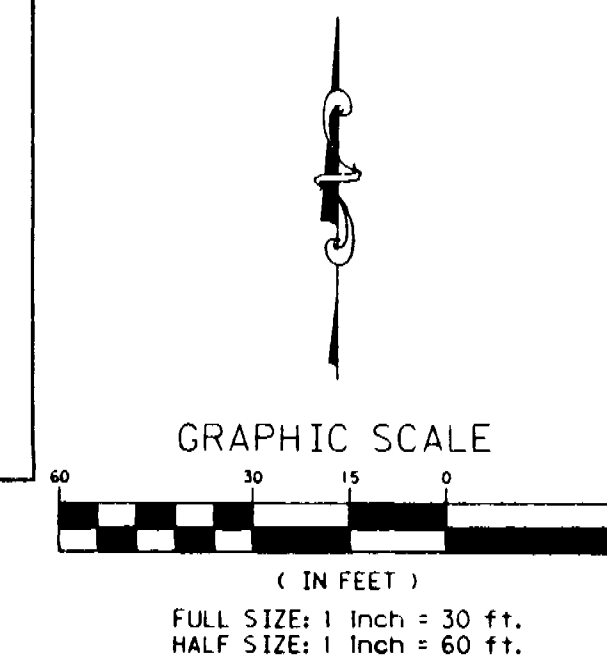
MAXIMUM ALLOWABLE F.A.R.: 3.00
PROVIDED F.A.R.: 0.54

PARKING REQUIREMENTS: STORAGE PORTION - 6 SPACES
RETAIL PORTION - 7 (1 SPACE PER 300 SF OF RETAIL)

REQUIRED SPACES: 13 SPACES
PROVIDED SPACES: 14 10' WIDE DISPLAY SPACES
14 9' WIDE CUSTOMER SPACES
1 12' WIDE HC SPACE

PROVIDED LOADING: 7 LOADING SPACES

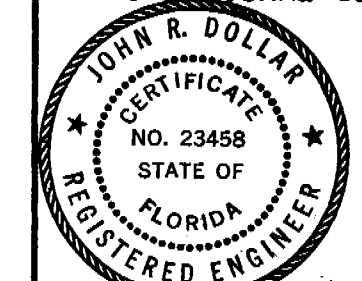
--- POTENTIAL JURISDICTIONAL WETLANDS



1. SEE SHEETS C-9 FOR DETAILS REGARDING GRAVITY WALLS, CURBING, SIDEWALKS, BOLLARDS AND CONCRETE AND ASPHALT PAVEMENT.
2. SEE SHEET C-10 FOR PAVEMENT STRIPING AND HANDICAP SIGN DETAILS.

NO.	DATE:	INITIAL	NOTES:
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PROFESSIONAL SEAL:



PBSJ

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SITE ADDRESS:
U-HAUL INTERNATIONAL
MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

SHEET CONTENTS:

SITE PLAN.

U-HAUL PROJECT NO.
785-05

DRAWN BY:	MV	SHEET NO. C-5
CHK'D BY:	JRD	
DATE:	17-DEC-1998 23:25	

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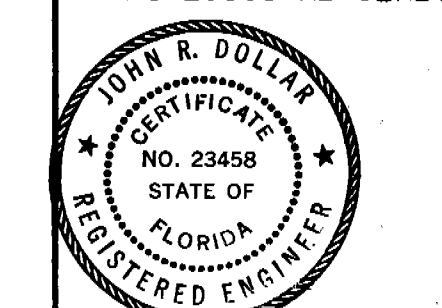
GENERAL NOTES:

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2. SOURCE BENCH MARK: RAILROAD SPIKE IN 30" OAK AT (D.O.T. SECTION NO. 72160-2556), STATION 170+85.95' WEST OF CENTERLINE OF SAN JOSE BLVD. AT THE INTERSECTION OF MANDARIN ROAD ELEVATION (18.18) NGVD
3. SEE SHEETS C-9 FOR DETAILS REGARDING GRAVITY WALLS, CURBING, SIDEWALKS, BOLLARDS AND CONCRETE AND ASPHALT PAVEMENT.

REVISIONS:

NO.	1	2	3	4	5	6	7	8
DATE:								
INITIALS:								

PROFESSIONAL SEAL:



JOHN R. DOLLAR
REGISTERED ENGINEER
NO. 23458
STATE OF FLORIDA



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SITE ADDRESS:

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MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

SHEET CONTENTS:

PAVING AND
GRADING
PLAN

U-HAUL PROJECT NO.

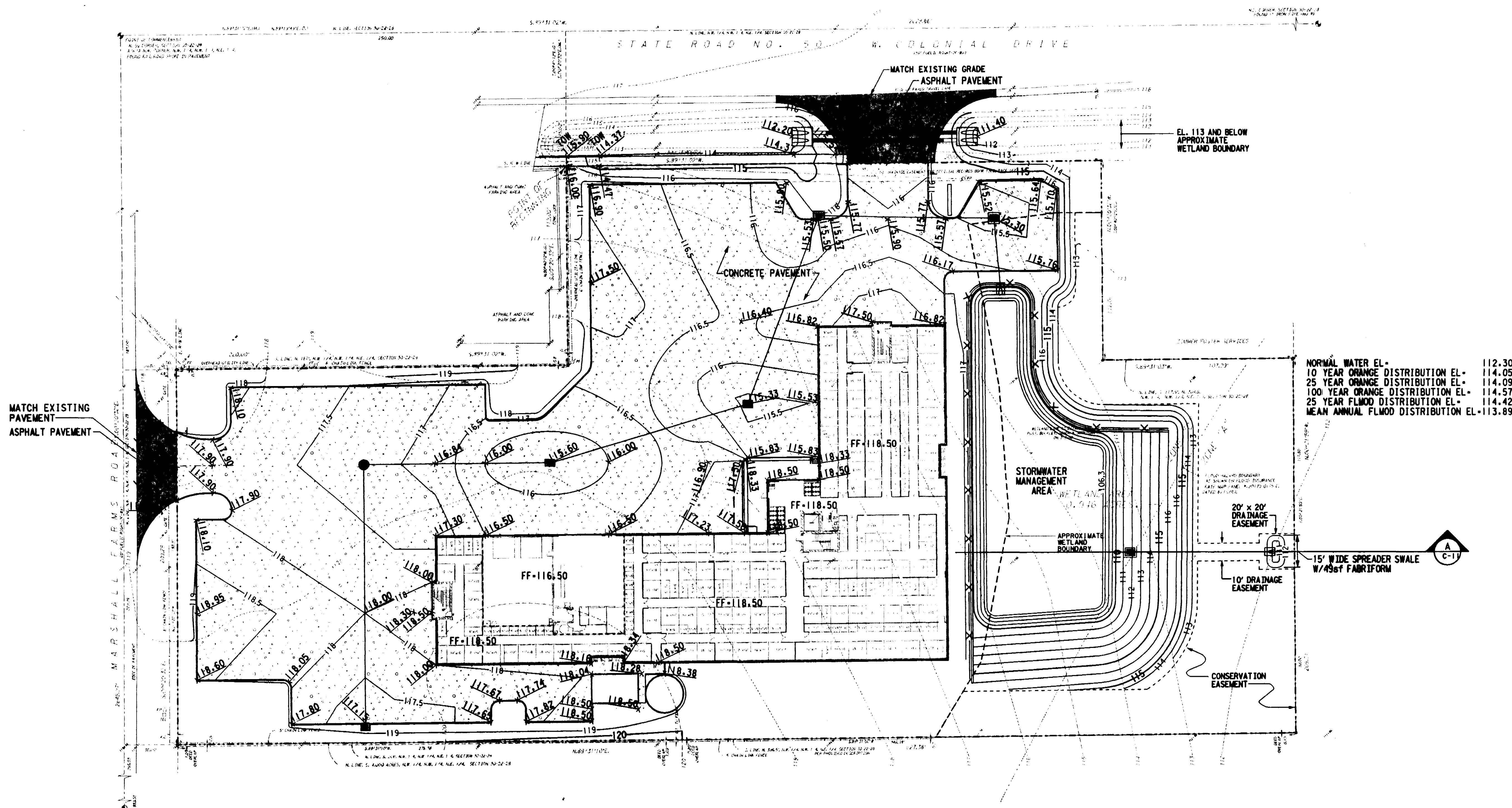
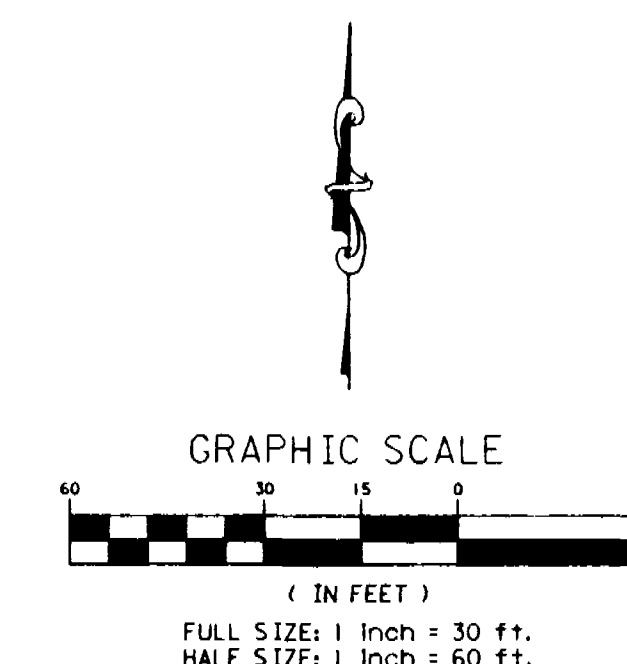
785-05

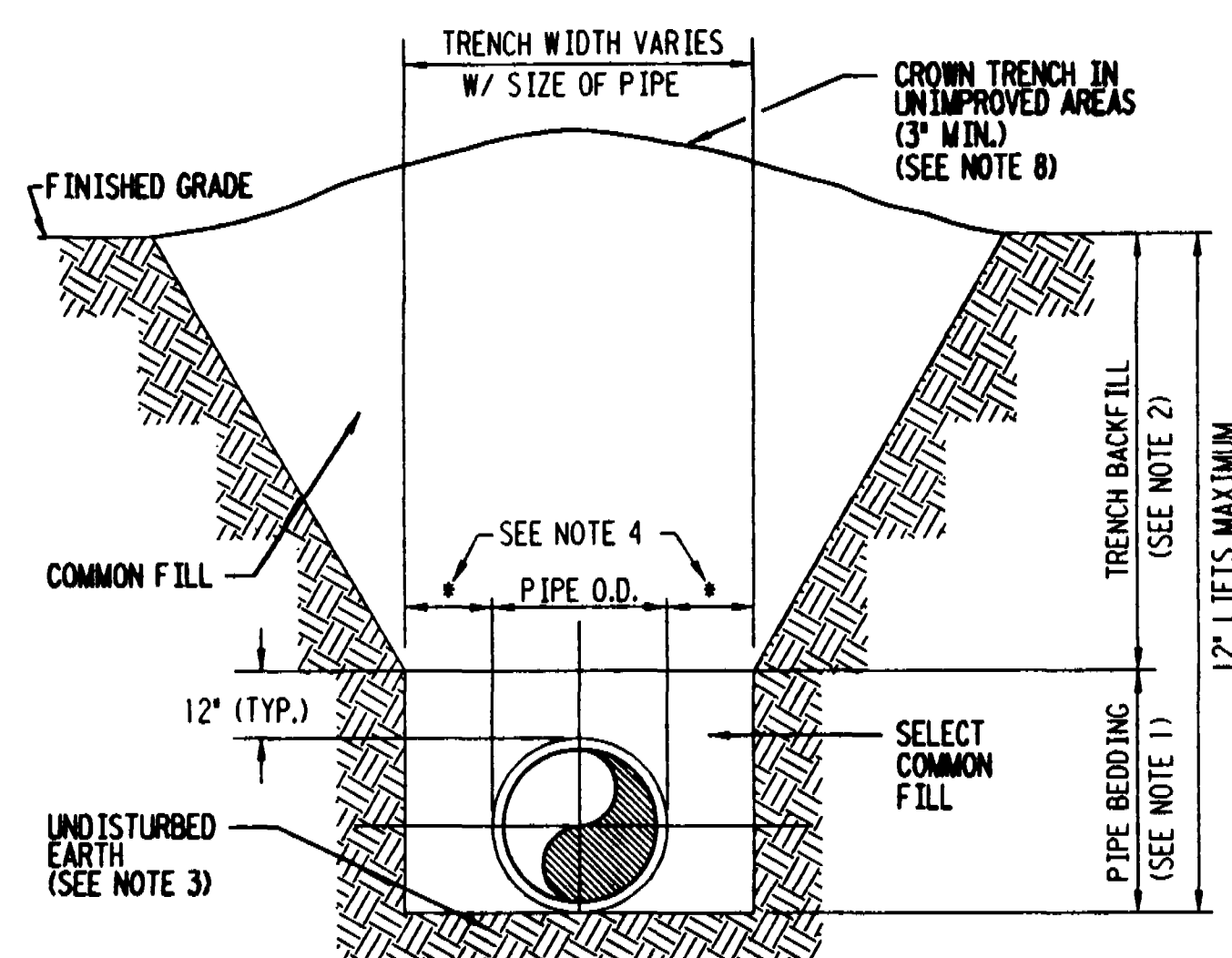
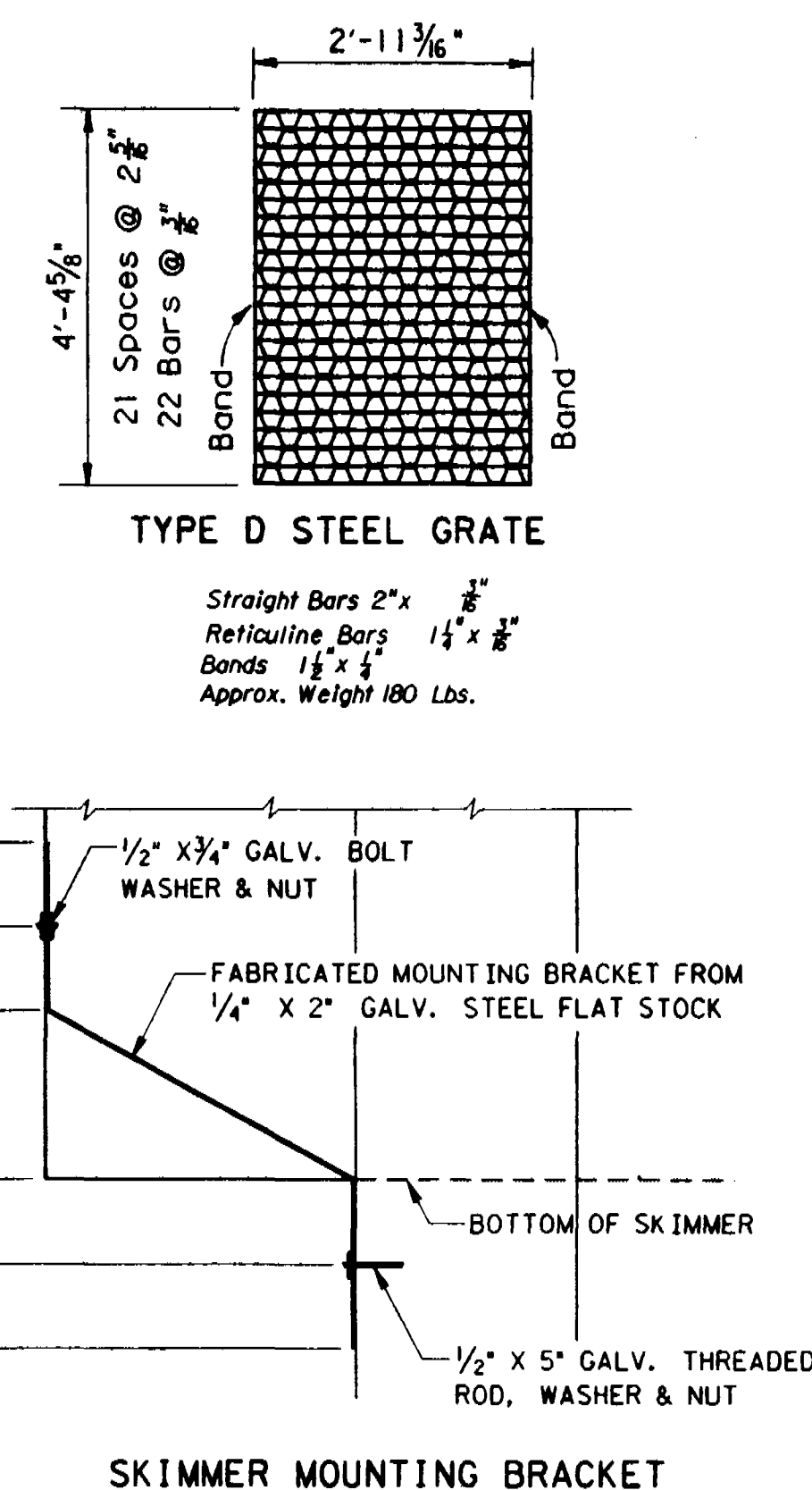
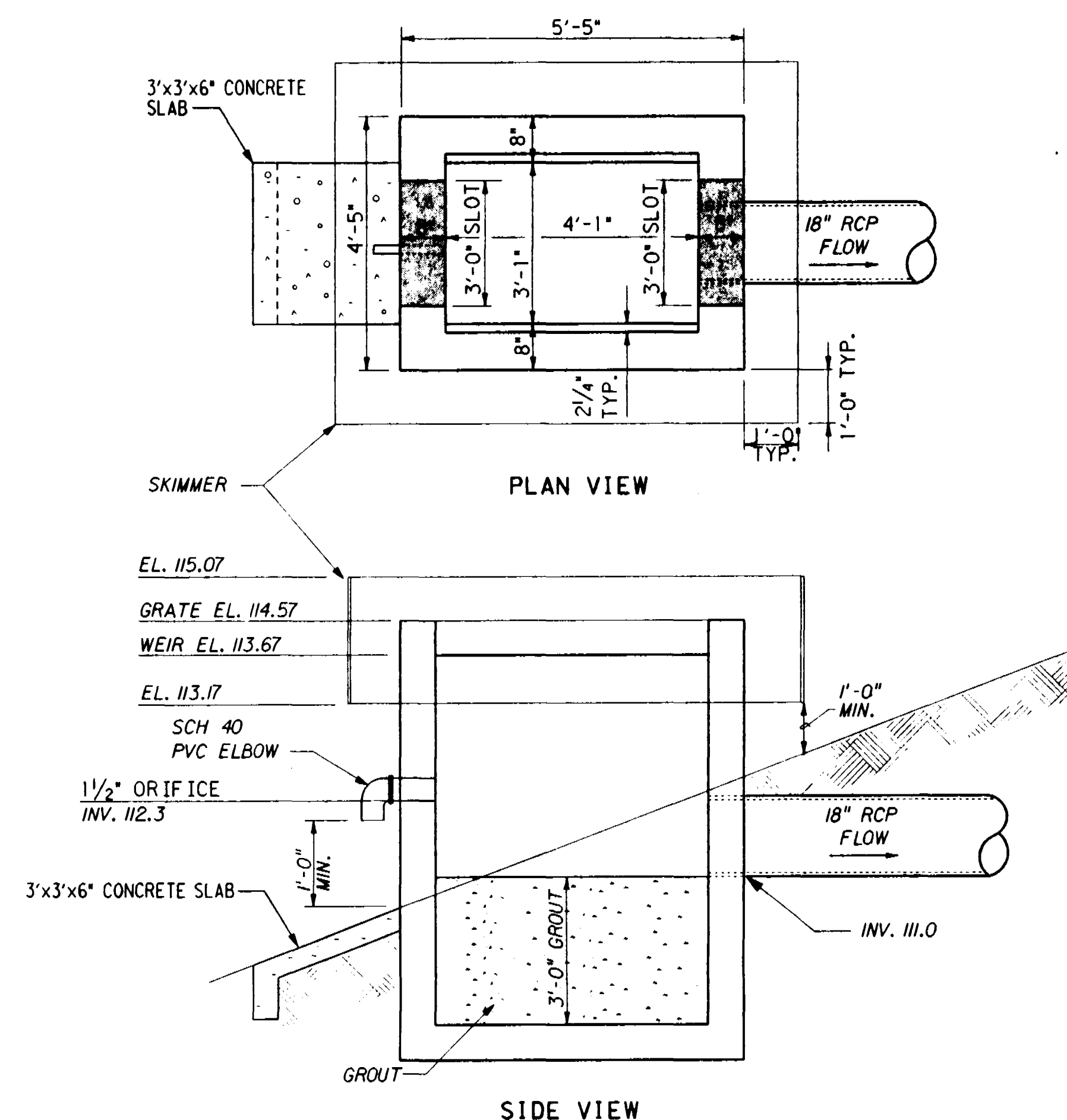
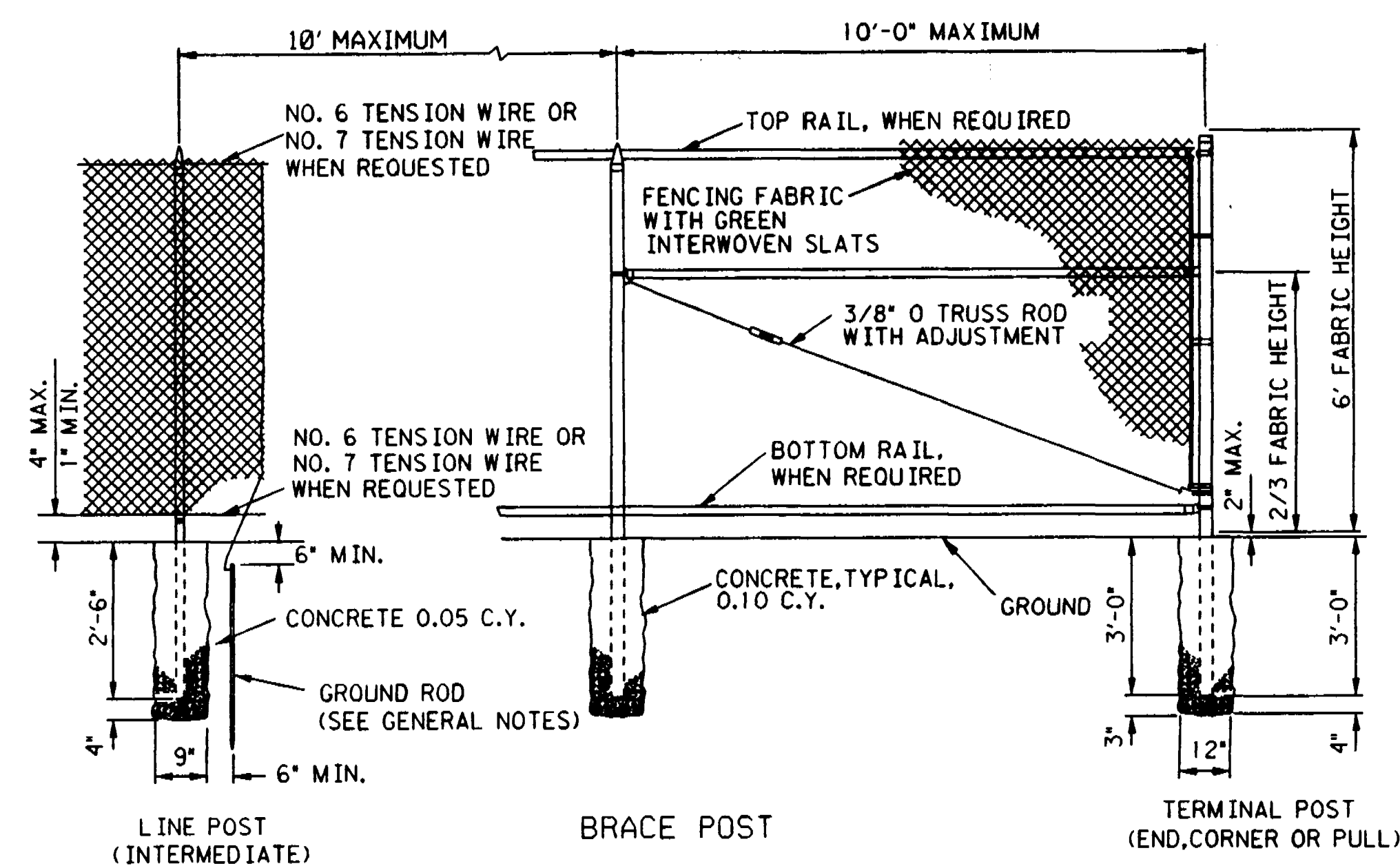
DRAWN BY: MV SHEET NO.

CHK'D BY: JRD C-6

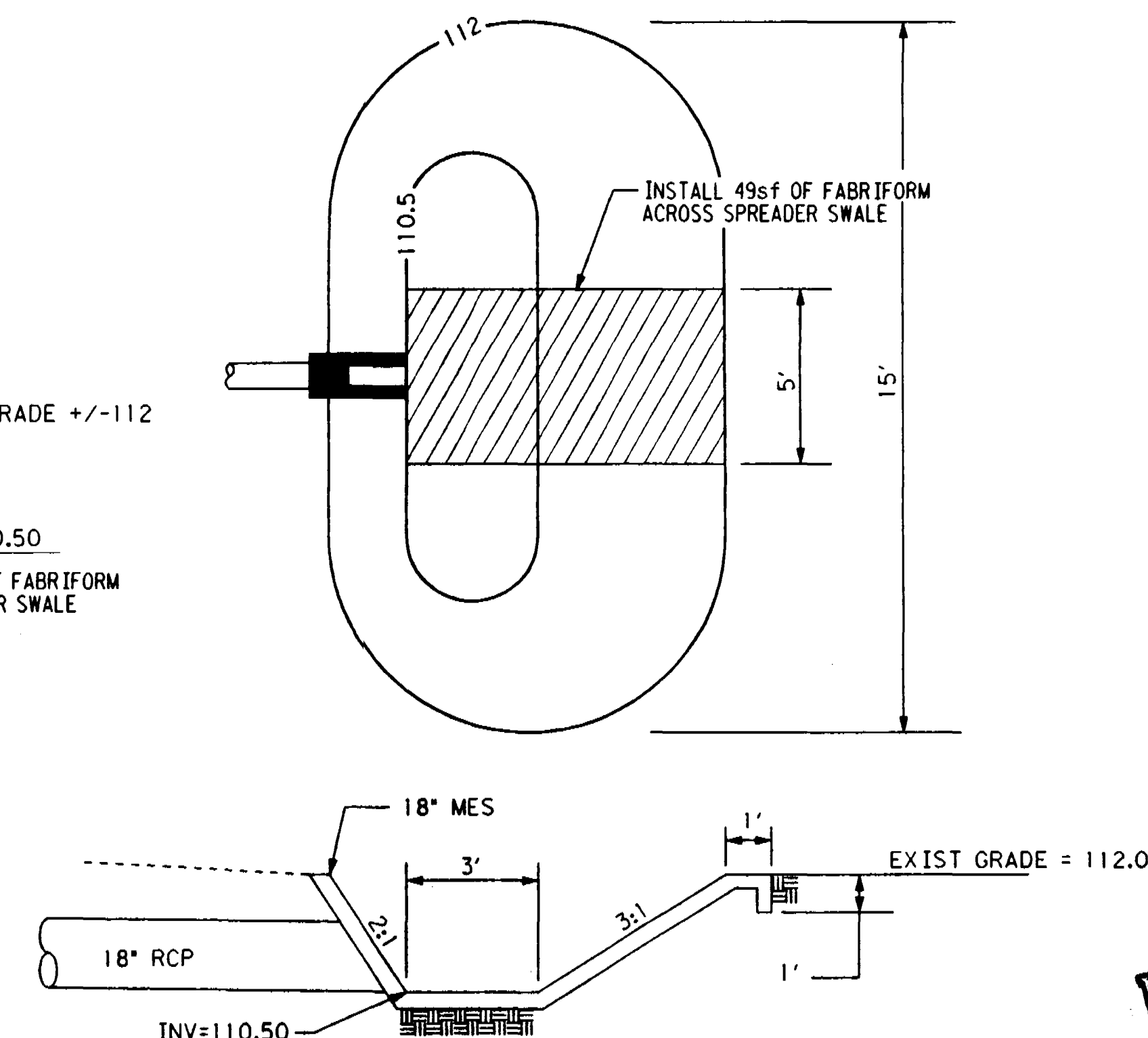
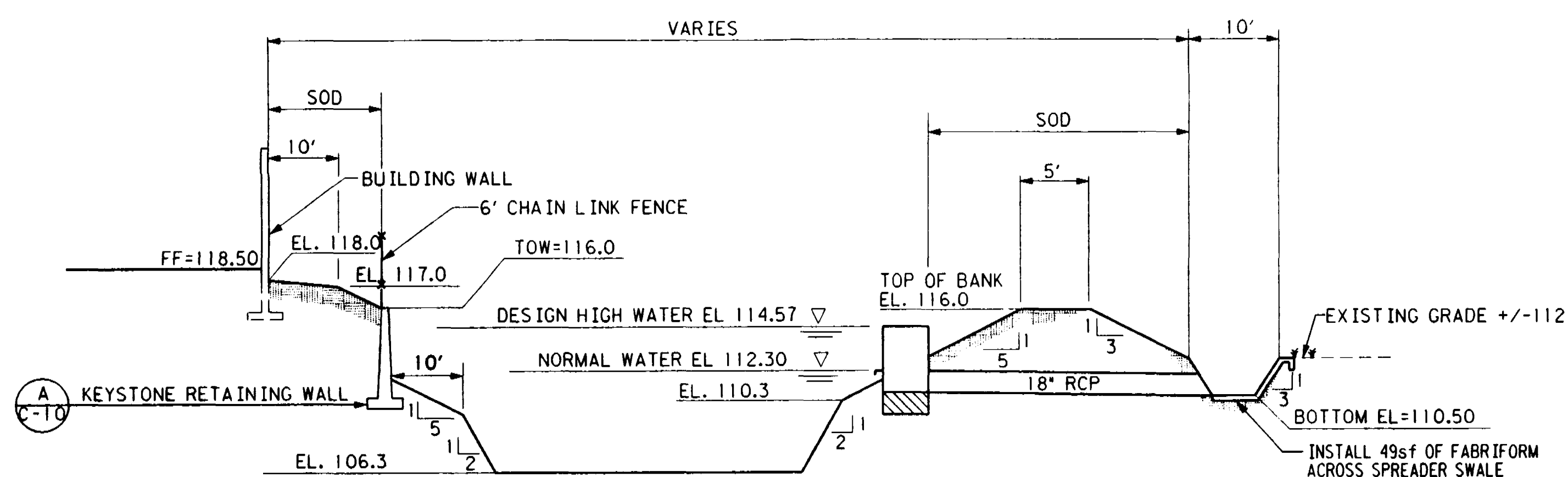
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- NOTES:
1. PIPE BEDDING: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
3. PIPE BEDDING UTILIZING SELECT COMMON FILL OR BEDDING ROCK IN ACCORDANCE WITH TYPE A BEDDING AND TRENCHING DETAIL MAY BE REQUIRED AS DIRECTED BY THE COUNTY.
4. (a): 15" MAX. FOR PIPE DIAMETER LESS THAN 24", AND 24" MAX. FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
7. REFER TO SECTION 32.5 OF THE MANUAL FOR SHEETING AND BRACING IN EXCAVATIONS.
8. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN ORANGE COUNTY RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.



GENERAL NOTES:

1. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 232 FOR DETAILS REGARDING TYPE C AND D INLETS.

2. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 234 FOR DETAILS REGARDING TYPE F AND G INLETS.

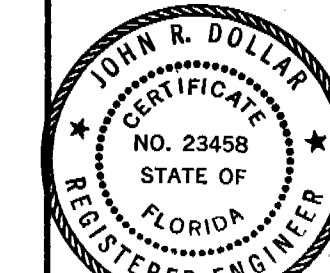
3. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 272 FOR DETAILS REGARDING POND OUTFALL LIMITED END SECTION.

4. REFER TO FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS INDEX NO. 273 FOR DETAILS REGARDING S.R. 50 CULVERT MITTERED END SECTIONS.

REVISIONS:

NO.	DATE:	INITIAL	NOTES:
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PROFESSIONAL SEAL:



DEC 18 1998

NEER NO. 100:

PBSJ

1560 ORANGE AVENUE
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U-HAUL INTERNATIONAL
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FAX: 602/277-1026

SITE ADDRESS:

U-HAUL INTERNATIONAL
MARSHALL FARMS ROAD
ORANGE COUNTY, FLORIDA

SHEET CONTENTS:

LIVE A ILS

18 1998-11
PROJECT NO

DRAWN BY	MM	SHEET NO.
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DRAWN BY:	MM	SHEET NO:	C-11
CHECKED BY:	MM		

CHK'D BY:	JRD	C 11
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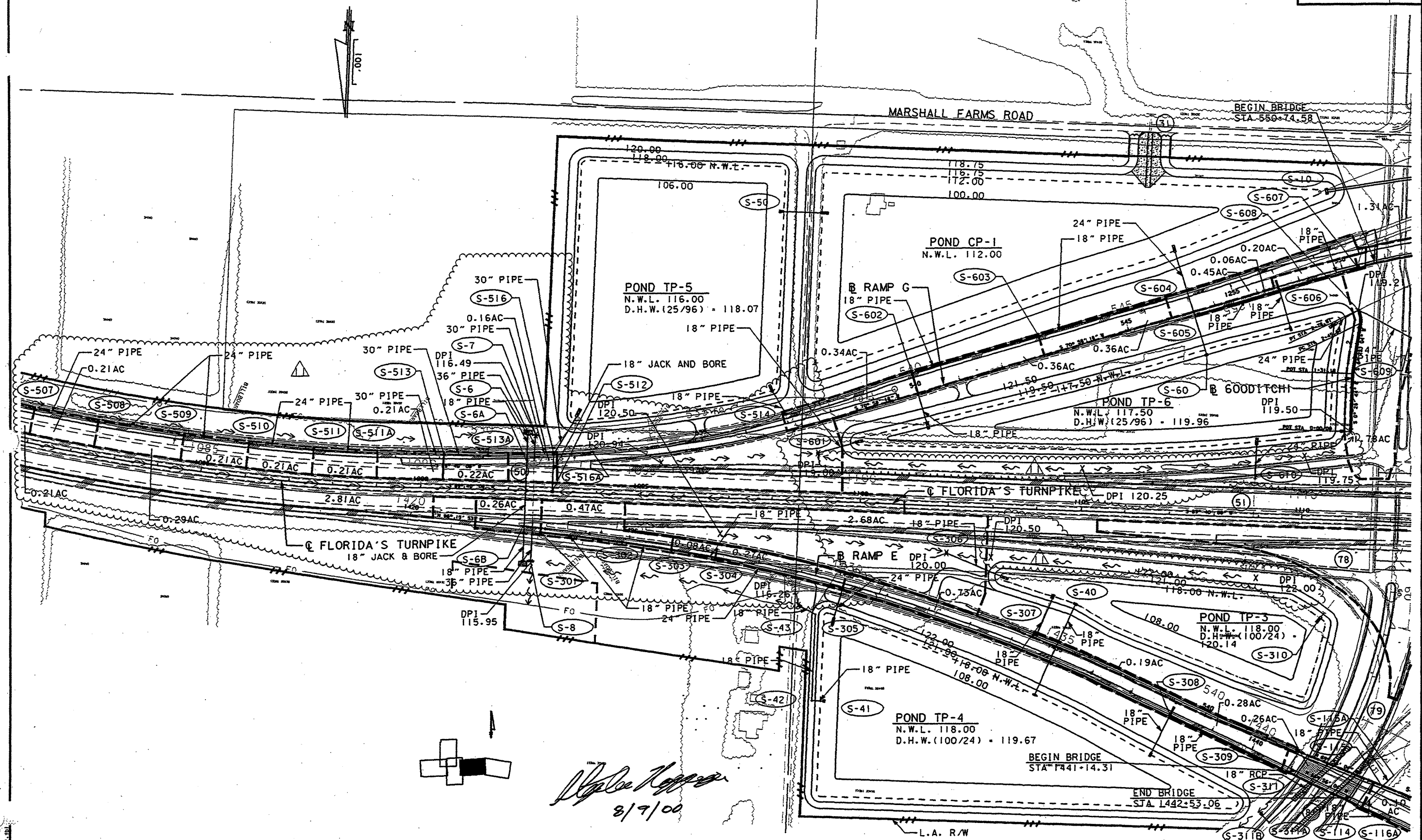
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BASIN 11

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



D. J. [unclear]
8/9/00

7-12-00 CCB
 REVISED DRAINAGE
 FOR AUX. LANES

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
7-12-00	CCB	REVISED DRAINAGE FOR AUX. LANES			



URS Greiner

SUPPLEMENTARY DRAINAGE MAP
FLORIDA'S TURNPIKE

REVIEW OF SOIL SURVEY MAPS

Based on the 1989 Soil Survey for Orange County, Florida, as prepared by the U.S. Department of Agriculture Soil Conservation Service, the site is located in an area mapped primarily as "Smyrna fine sand" soil series. The southwest portion of the site, however, is mapped as the "Zolfo fine sand" soil series.

The "Smyrna fine sand" soil series consists of nearly level, poorly drained soil on broad flatwoods. The soil permeability of the "Smyrna fine sand" soil series is moderate to rapid. According to the Soil Survey, the seasonal high water table for the "Smyrna fine sand" soil series is typically within 10 inches of the natural ground surface.

The "Zolfo fine sand" soil series consists of nearly level, somewhat poorly drained soil in broad, slightly higher positions adjacent to the flatwoods. The soil permeability of the "Zolfo fine sand" soil series is moderate to rapid. According to the Soil Survey, the seasonal high water table for the "Zolfo fine sand" soil series is typically at a depth of 24 to 40 inches below the natural ground surface.

FIELD EXPLORATION PROGRAM

The field exploration program included performing 4 Standard Penetration Test (SPT) borings and 5 auger borings. The SPT borings were performed in the areas of the site where buildings are proposed. The SPT borings were drilled to depths of 15 and 30 feet below the ground surface using the methodology outlined in ASTM D-1586. A summary of this field procedure is included in the Appendix. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory in sealed sample jars.

The auger borings were performed in the proposed paved entrance road alignment and the stormwater pond. They were drilled using a truck-mounted, 4-inch diameter, continuous flight auger to depths of 7 and 20 feet below the ground surface. A summary of this field procedure is included in the Appendix. Representative soil samples were recovered from the auger borings and transported to our laboratory for further analysis.

The groundwater level at each of the boring locations was measured upon completion of drilling. The borings were then backfilled with soil cuttings.

The approximate locations of the borings are schematically illustrated on aerial photograph of the site obtained from Google Earth shown on Figure 2. These locations were determined in the field by tape measurements from existing site features and should be considered accurate only to the degree implied by the method of measurement used.

LABORATORY PROGRAM

Representative soil samples obtained during our field sampling operation were packaged and transferred to our laboratory for further visual examination and classification. The soil samples were visually classified in general accordance with the Unified Soil Classification System (ASTM

3.5 Basin No. 11

Turnpike Mainline Station 2997+00 to Station 3019+92 (Right Side Only) and SR 50 Connector Ramps

Basin No. 11 originates at Station 2997+00 near the northbound Turnpike exit to SR 429 and continues to Station 3019+92 at the SR 50 Connector bridge over the Turnpike. This drainage basin also includes a portion of the SR 50 Connector Ramp located north of the Turnpike. This basin has two existing interconnected wet detention ponds, Ponds TP-3 and TP-4, that were designed in 1998 by URS Greiner, Inc. (ERP Permit No. ERP48-0125086-001EI) to meet SJRWMD criteria when the permit was issued by the FDEP on April 10, 1998.

The drainage area associated with the SR 429 interchange and the Turnpike will be identified as Basin No. 11A, while the area associated with the SR 50 Connector will be identified as Basin No. 11B. In Basin No. 11A, runoff from the northbound Turnpike lanes and Ramp K will be collected in a roadside swale that is connected to Pond TP-3. This drainage basin also includes onsite runoff from Ramp H, which is the northbound Turnpike exit ramp to SR 429. Runoff in Basin No. 11B will be collected from the SR 50 Connector ramp either by roadside ditches and conveyed to the existing ditch along the east side of the SR 50 Connector. Basin No. 11B will remain untreated and new impervious area in this basin will be compensated in the existing ponds (Ponds TP-3 and TP-4) within Basin No. 11A.

The shape of Pond TP-3 will be modified to match the alignment shift of Ramp K, the northbound Turnpike exit ramp to SR 50. The stormwater management system originally was designed to meet SJRWMD criteria at the time the permit was issued by the FDEP on April 10, 1998. The design criteria included water quality treatment and retention of the 100-year/24-hour runoff volume. The Turnpike widening project will need to comply with the pre-development conditions of the FDEP permit. In order to accomplish this, the outfall structure will be modified by reducing the width of the existing weir from 9" to 3". In addition, to meet the current drawdown criteria for wet detention, two additional 8" orifices will be required. It should be noted that this basin is not located in the Lake Apopka Hydrological Basin of the SJRWMD and does not need to address the total phosphorous discharge criteria.

Compensating water quality treatment is available from the impervious area associated with the original northbound lanes of the Turnpike in Basin No. 11 that existed before the SR 429 interchange was constructed and from the existing impervious area of the SR 50 Connector ramp. The existing northbound lanes of the Turnpike had an area of about 1.79 acres that is treated in Ponds TP-3 and TP-4 and claimed for compensating treatment.

Ponds TP-3 and TP-4 will continue to provide detention of the 100-year/24-hour runoff volume by raising the outfall structure. The total 25-year/96-hour post-development volume discharged will not exceed the pre-development volume discharged.

BASIN NO. 11 (OVERALL)Water Quality Treatment Summary:

Compensating Treatment

Total Impervious Area = 7.93 acres

Original Turnpike Impervious Area Presently Treated = 1.79 acres

Existing SR 50 Connector Impervious Area = 1.00 acres

Total New Impervious Area = $7.93 - 1.79 - 1.00 = 5.14$ acres

Total Impervious Area Treated = 6.68 acres (> 5.14 acres)

Volume Required: 2.5 inches over Impervious Area (6.68 acres) = 1.39 acre-feet

Volume Provided: 2.24 acre-feet

(Compare to 2.5 inches over Total Impervious Area (7.93 ac.) = 1.65 acre-feet)

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 20.05 acre-feet

Post-Development Discharge Volume = 18.28 acre-feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 75.9 cfs

Post -Development Peak Discharge = 20.9 cfs

BASIN NO. 11A (Ponds TP-3 and TP-4)Water Quality Treatment Summary:

Wet Detention Criteria

Volume Required: 1.0 inch of runoff = 1.91 acre-feet

Volume Provided: 2.24 acre-feet

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 17.43 acre-feet

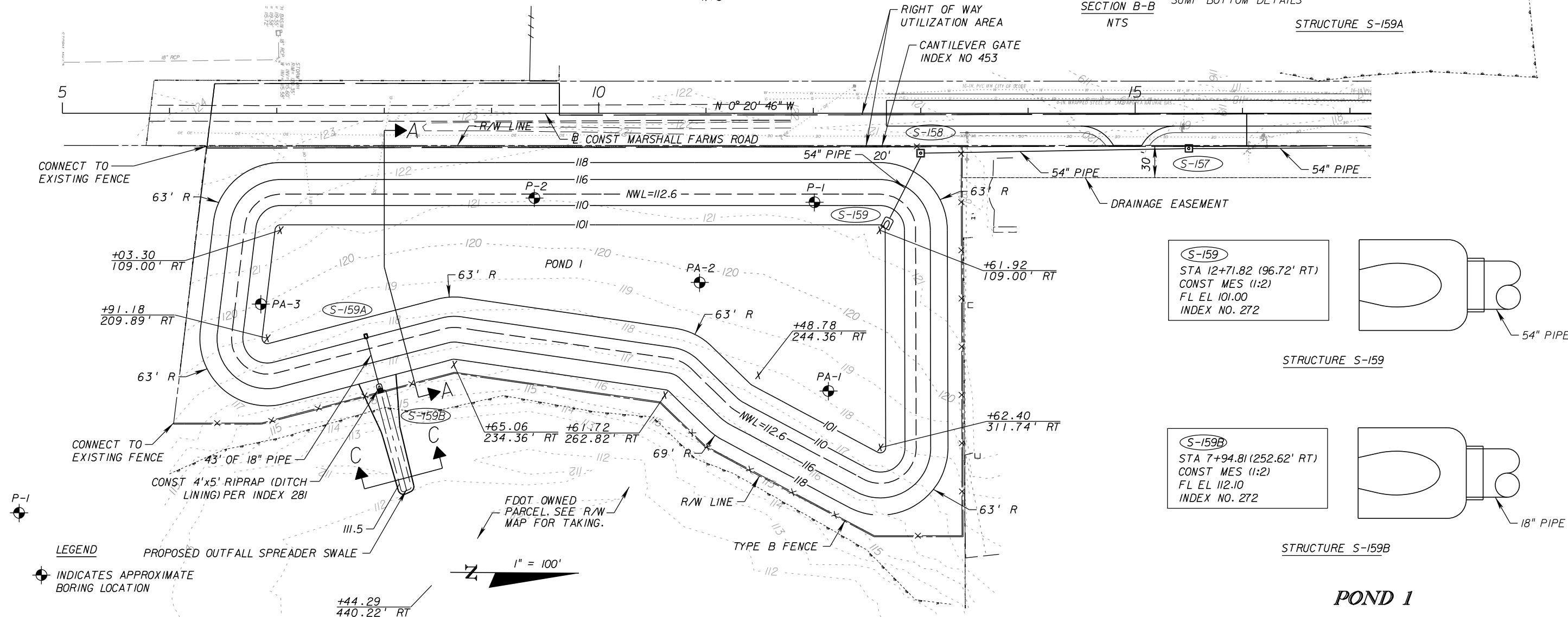
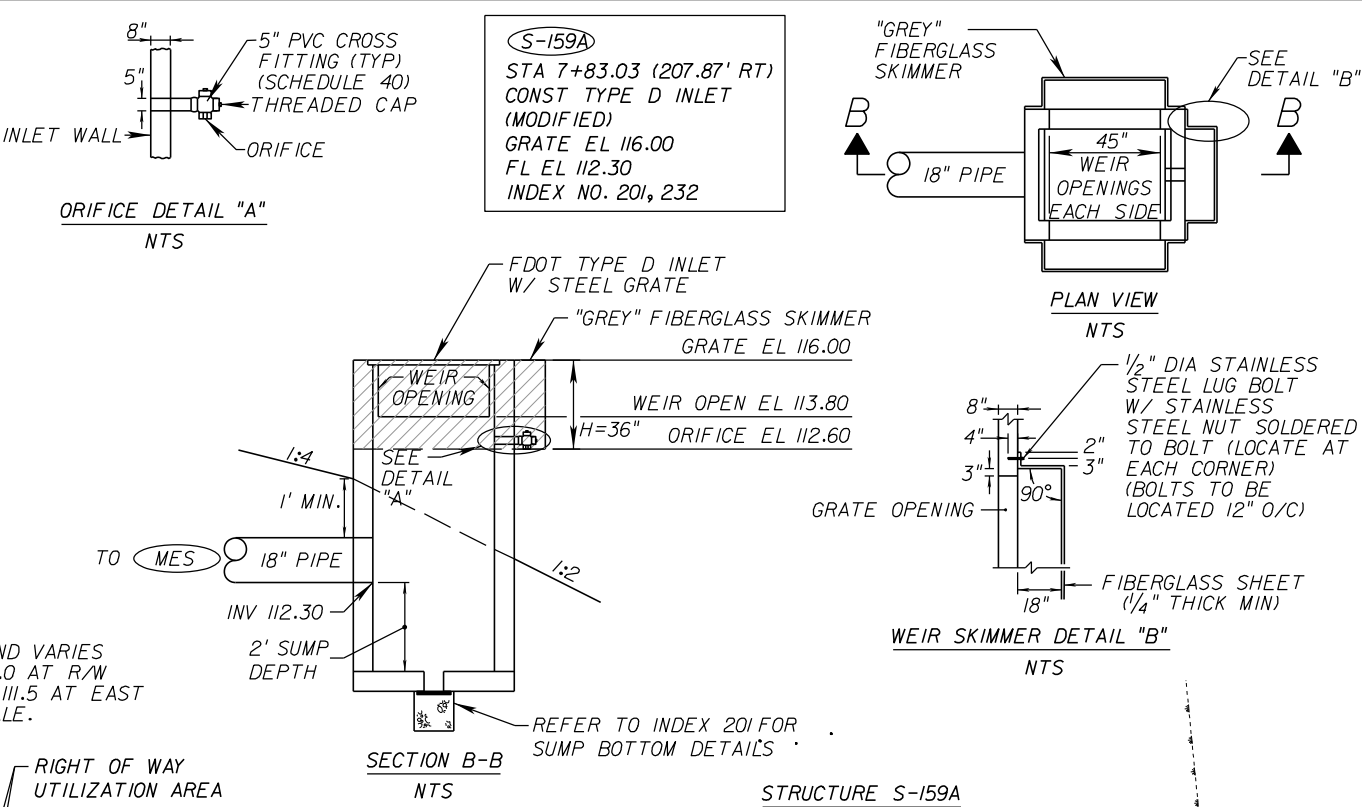
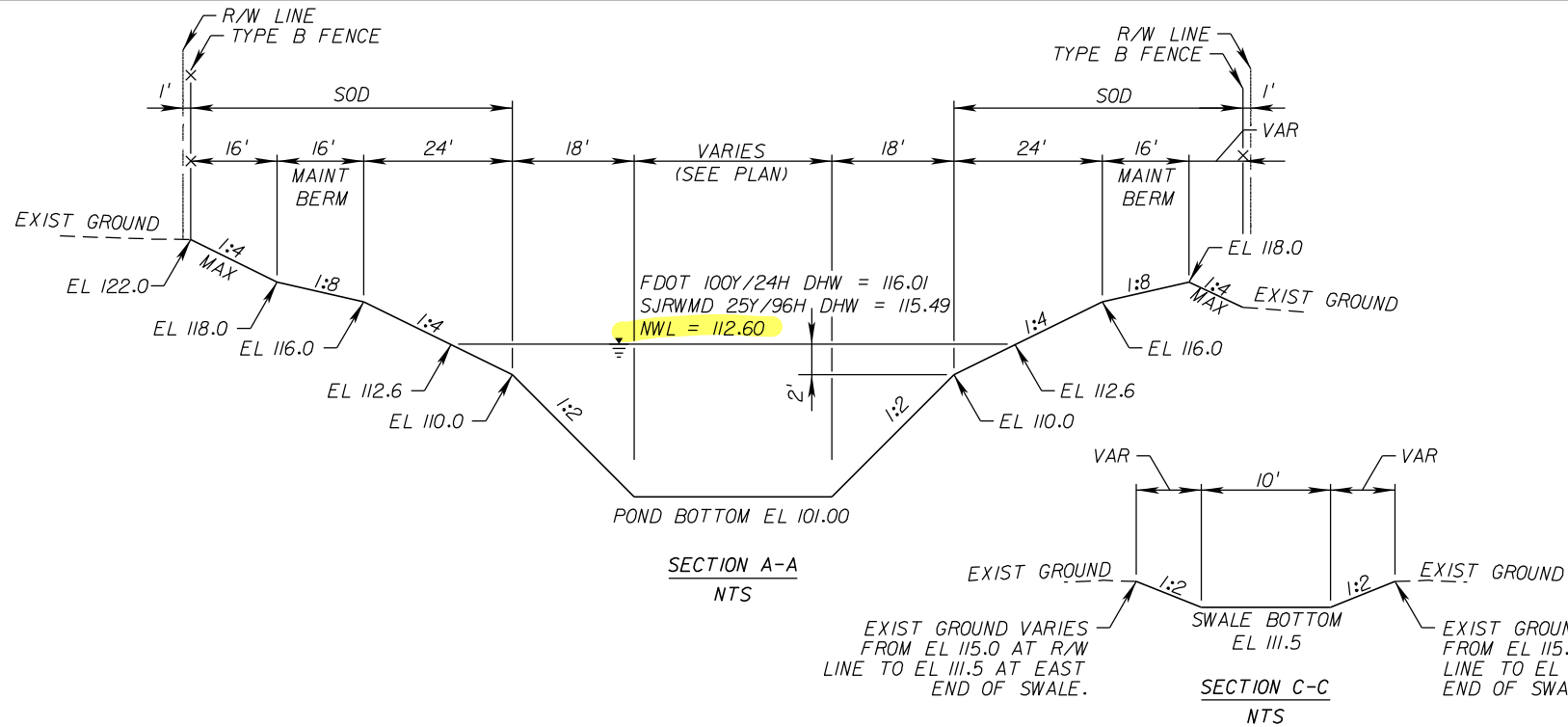
Post-Development Discharge Volume = 12.30 acre-feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 60.8 cfs

Post -Development Peak Discharge = 5.5 cfs



REVISIONS				JAMES A. MURRAY, P.E. P.E. LICENSE NUMBER 38754 AECOM TECHNICAL SERVICES, INC. 150 NORTH ORANGE AVENUE, SUITE 200 ORLANDO, FLORIDA 32801 CERTIFICATE OF AUTHORIZATION NO. 8115	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		SHEET NO. 213
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	
					50	ORANGE	
					FINANCIAL PROJECT ID 239535-3-52-01		

DETENTION POND DETAILS

BASIN 12

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

Phosphorous Loading

Lake Apopka Hydrological Basin

Pre-Development Phosphorous Discharge = 22.46 kg/yr

Post-Development Phosphorous Discharge = 15.26 kg/yr

Compensating Water Quality Treatment Summary:

New Impervious Area = 4.52 acres

Total Impervious Area Treated = 4.66 acres

Water Quality Treatment Summary:

On-line Dry Retention Criteria (SJRWMD)

SWALE 12A (RIGHT)

Impervious Area Treated = 2.66 acres

Volume Required: 0.49 acre-feet

Volume Provided: 0.53 acre-feet

SWALE 12B (LEFT)

Impervious Area Treated = 2.00 acres

Volume Required: 0.40 acre-feet

Volume Provided: 0.43 acre-feet

Underdrain Design

SWALE 12A (RIGHT)

Required Underdrain Length = 1292 feet

Provided Underdrain Length = 1394 feet

SWALE 12B (LEFT)

Required Underdrain Length = 1279 feet

Provided Underdrain Length = 1354 feet

Water Quantity Summary (Flow Rate):

Pre-Post 25-Year/24-Hour storm

Pre-Development Peak Discharge = 80.0 cfs

Post -Development Peak Discharge = 72.7 cfs

Water Quantity Summary (Flow Rate):

Pre-Post 10-Year/24-Hour storm

Pre-Development Peak Discharge = 63.0 cfs

Post -Development Peak Discharge = 59.7 cfs

Water Quantity Summary (Volume):

Pre-Post 25-Year/96-Hour storm

Pre-Development Runoff Volume = 22.26 acre-feet

Post –Development Runoff Volume = 22.09 acre-feet

Pond Flood Stage Summary:

25-Year/96-Hour storm

SWALE 12A (RIGHT)

Top of Berm Elevation = 112.0 ft.

Design High Water Elevation = 110.7 ft.

SWALE 12B (LEFT)

Top of Berm Elevation = 108.0 ft.

Design High Water Elevation = 106.8 ft.

Nutrient Loading. Since the project is located within the Lake Apopka basin, additional consideration was given to the nutrient loading from the site. The ponds are designed to remove phosphorous as to not exceed the predevelopment loading. See Appendices D & E for nutrient loading calculations.

Pre-Development		Post Development
5.24 kg/yr	>	4.18 kg-yr

Flood Attenuation. Both ponds are designed to attenuate the mean-annual/24-hour and 25-year/24-hour storm events. See Appendix F for drainage models.

Storm Events	Pre-Development		Post Development
Mean Annual/24-Hour	12.05 cfs	>	7.94 cfs
25-Year/24-Hour	29.82 cfs	>	29.65 cfs

Permanent Pool Volume. The required permanent pool volume to meet the 21 day residence time will be provided above the anoxic zone of each pond. The anoxic depth was calculated with the nutrient removal efficiency. See Appendix E for calculations.

Floodplain Compensation. The proposed project impacts the 100 year flood plain. The total volume impacted will be compensated for in proposed low lying areas along the upland buffer of the existing wetland to the south. See Appendix G for calculations.

Tail Water. The tail water for the project is the adjacent wetland to the south. A constant elevation of 103.16 ft NAVD 88 was assumed which is based on the determined seasonal high water elevation of the wetland.

Environmental Swales. The lots along the southern wetland (lots 15-20 and 29-35) will partially slope toward the wetlands. An environmental swale will treat the water prior to discharging to the wetland.

BASIN A

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

Project Description

Widen Turnpike from Beulah Road (MP 269.5) to State Road 50 (MP 274.2) within Sections 19, 26, 27, 28, 29 and 30, Township 22 South, Range 27 East. (See Section C for a Location Map and Section 6 for a Soils Map).

Note: This project is based on the NAVD '88 Datum that is approximately 0.89 feet below the equivalent NGVD '29 elevation (i.e. 95.00 NAVD '88 = 95.89 NGVD '29).

Purpose

This report documents the stormwater management design for the proposed roadway widening of the existing Turnpike facility from near Beulah Road north to County Road 438 Bridge including modifications to the SR 50 interchange for a total approximate distance of 4.7 miles.

The proposed project design consists of a widening the existing four-lane roadway to an eight-lane facility and designing the drainage and stormwater management systems to accommodate the eight-lane section. The additional lanes will be added to both the inside (median) and the outside of the existing roadway to fully accommodate the eight-lanes.

Existing Drainage Patterns

The proposed improvements are located entirely within the St. Johns River Water Management District (SJRWMD) boundaries. The project is located within the Lake Apopka drainage basin with portions of the project located within the Black Lake and Johns Lake sub-basins. A portion of the project near and including the State Road 50 interchange is located within a land-locked basin having no positive outfall.

The beginning of the project up to County Road (CR) 545 lies within the Black Lake sub-basin. Turnpike drainage from the begin project limits to Daniels Road flows back to a double 6' x 6' concrete box culvert located at Station 3085+40. This cross drain passes offsite flows from north of the Turnpike to wetlands south of the alignment that eventually flow into Black Lake. Turnpike drainage between Daniels Road and CR 545 and basin areas north of the Turnpike in this area flow through a double 8'x 4' concrete box culvert located at Station 3159+45 to wetlands to the south that also drain to Black Lake. The Turnpike lies within the Johns Lake drainage basin from CR 545 nearly to the State Road 50 interchange. A concrete box culvert (5'x 5.5') located at Station 3211+50 allows turnpike drainage and offsite areas to the north to flow to wetlands connected to Johns Lake.

Section 1 – Introduction

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A 10' x 10' concrete box culvert located at Station 3239+50 drains Johns Lake north as it flows through a wetland system and then under State Road 50 and ultimately outfalls to Lake Apopka. This portion of the turnpike system contains previously permitted stormwater treatment systems for improvements to the northbound off-ramp up to the ramp toll plazas and as part of the Fourth Street Bridge replacement project. These systems are designed to outfall into ditches along the Turnpike that flow to the Johns Lake outfall.

The SR 50 interchange area currently has two closed drainage basins. Portions of the mainline and northbound ramps (on & off) south of SR 50 drain to a dry retention pond near the existing northbound off ramp toll plaza. The pond outfalls to the treatment systems located along the outside edge of the existing northbound off-ramp which discharge to wetland systems between the Turnpike and SR 50. The runoff from SR 50 and a portion of the southbound ramps collects in the infield areas. The treated runoff discharges to a sinkhole located in the northwest quadrant of the interchange (off of the right-of-way).

Turnpike drainage beyond the SR 50 interchange is collected in roadside swales. The terrain slopes down from a ridge near the SR 50 interchange to a low wetland area near Jones Road. The roadside swales discharge to the wetland that drains north to Lake Apopka.

Research of the existing stormwater systems along the alignment was conducted to ensure that the proposed system would be able to meet the requirements of the existing permitted stormwater facilities along the roadway.

Table 1 - Existing Surface Water Permits

Project	SJRWMD Permit No.	Date
Florida Turnpike Interchange	42-095-45313-1	1990
Auxiliary Lane for Florida Turnpike Northbound Off Ramp	42-095-45313-2	2003
Florida's Turnpike On-Ramp at SR 50	42-095-454313-3	2004
Tuckers Ranch	4-095-95608-1	2005
Village Grove	4-095-19974-1 thru 4	1983-1987
Daniels Road North	40-095-71446-1	2001
Daniels Road Improvements – Phase II	40-095-71446-2	2003

Tailwater

The tailwaters used in the calculations for this project were developed using a combination of data from existing calculations when available, field observations and geotechnical analysis. For control elevations staining on existing drainage structures, a good indication of normal high water levels, was measured and compared to data from existing calculations. For tailwater elevations during the design storm events information

Section 1 – Introduction

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on models was obtained from the Orange County Stormwater Department for the latest available efforts for the various lakes and watershed areas located adjacent to the project alignment (Johns Lake Stormwater Management Master Plan, Orange County Contract No. Y9-810-MK, August 2002).

Basin A runoff flows in roadside/median ditches back to a box culvert at station 3085+40. The etching lines in the box culvert were measured in the field and indicate seasonal high sustained water levels in the area to be approximately 103.5' NAVD. This is 2' below the control elevation of the proposed treatment swales which allows them to function independently of the tailwater. Geotechnical investigations determined the seasonal high groundwater table in the area of swales to be perched due to a layer of clayey soils. The proposed design provides for excavation below the proposed bottom of the swale to undercut the clayey soils and replace with "Select" backfill and underdrains (See geotechnical report and construction plans for details).

The tailwater curves used for Basin B come from the Johns Lake SWMMP. The data points are picked from the node time series results for the wetlands (node JBL1005) south of the Turnpike for the 25-year 24-hour and the 10-year 24-hour storm events. The etching and staining lines on the box culvert located at station 3159+45 were measured in the field to establish seasonal high sustained water levels. The etching line on the box culvert is at 98.4' NAVD with staining up to 99.4' NAVD. These indicators and the estimated SHGWT elevations between 99.3' NAVD and 98.6 NAVD' at the pond site provided by the geotechnical engineer were used to set the pond control elevation at 99.0' NAVD.

The Basin C tailwater curves were also developed using node time series data from the Johns Lake SWMMP (node JJOHNS). Etching lines on the box culvert providing an outfall for Johns Lake (station 3239+60) indicate seasonal high sustained water levels of approximately 96.8' NAVD. The estimated SHGWT provided by the geotechnical engineers in the pond area range up to 97.1' NAVD. The control elevation for Pond C is set at 97.0' NAVD based on the above data.

Floodplain Impacts and Mitigation

The project impacts two 100-year floodplain areas as shown in the FEMA Floodplain Maps (See Section 4). Floodplain impacts are tabulated based on available cross-sections of the mainline between the normal or seasonal high water elevation and the FEMA-approved 100-year floodplain elevation. Floodplain compensation is provided within a separate floodplain compensation area that will be constructed to offset the fill placed within the floodplain (floodplain compensation pond is located south of Pond C between Sta. 3228+50 and Sta. 3238+00). Section 4 of this report contains detailed calculations of impacts and compensation for the overall project.

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Rules & Regulations/Regulatory Agency Coordination

STORMWATER MANAGEMENT CRITERIA

The stormwater management criteria for the project will be based on design criteria from the following entities: St. Johns River Water Management District (SJRWMD), Orange County, and Florida Department of Transportation (FDOT). In general, the stormwater collection systems for this project will include utilization of roadway swales and storm sewers with ditch bottom inlets, gutter inlets, barrier wall inlets, and curb inlets. The stormwater management's facilities will consist of primarily wet detention systems and linear swale systems to treat and attenuate the stormwater runoff. Off-site drainage systems will be maintained with cross-culverts, as appropriate, or routed through the Turnpike drainage system, if necessary.

Stormwater Pond Design

The major stormwater attenuation design criteria will require that post development discharge rates do not exceed predevelopment discharge rates for the 25-year 24-hour event. Land locked systems will be design to retain the 100-year 24-hour event and/or the 25-year 96-hour event. For this project, the SJRWMD will require treatment of 2.5 inches of runoff over the new impervious areas only. Pond control elevations are set based on one of the following criteria: existing pond control elevations (permitted systems), existing evidence of high water marks in drainage systems (staining on existing culverts), or geotechnical Seasonal High Groundwater Elevation (SHWE) estimates. A geotechnical report is included with this submittal.

- A. Water Quantity – For open basins ponds will be designed such that the post development peak rate of discharge from each pond/basin will not exceed the peak rate of discharge from the basin under predevelopment conditions for the 25-year, 24-hour storm event (P= 8.60 inches, Florida Modified Rainfall Distribution) and the 10-year 24-hour storm event (Ocklawaha River Basin P= 7.50 inches, Florida Modified Rainfall Distribution). For closed basins ponds will be designed to retain the runoff volume from the 25-year 96-hour storm event (P=11.7 inches, SJRWMD 96-hour Rainfall Distribution).
- B. Water Quality – Wet Detention Ponds will be designed to accommodate 2.5 inches of runoff from the new impervious areas only. Dry Retention facilities that discharge to open basins will also be designed to retain 2.5 inches of runoff from the new impervious area and recover within 72 hours following a storm event. Dry Retention facilities within landlocked basins will be designed to recover 1.25 inches of runoff from the impervious area within 72 hours. Additionally, at two pond locations, existing permitted facilities are incorporated into this project and the required treatment volumes from the previous projects are added to the new required volumes.

Section 1 – Introduction

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- C. Pond Layout - Ponds will be designed with side slopes of 1:4 down to the pond bottom. Maintenance berms will be designed at a minimum of 15-feet wide with a 1:8 (maximum) cross-slope. Back slopes of pond berms will vary however a maximum slope of 1:2 will typically be used.
- D. Pond Recovery Mechanism - Wet detention ponds will be designed so that outfall structures shall bleed-down one half of the required water quality volume between 24 and 30 hours following a storm event. Bleed down devices shall incorporate minimum dimensions no smaller than six square inches in cross sectional area, two inches wide, and 20 degrees for “V” notches. Retention areas shall be designed to recover water quality volumes within 72 hours. Land-locked basins will be evaluated for recovery within 14-days of the end of the storm event. If the entire volume is not recovered then an additional 25-year 96-hour storm event must be accommodated within the pond.
- E. Permanent Pool Depth – will be calculated based on the SJRWMD criteria for ponds without littoral shelf (21-day residence time)
- F. Peak Stage - Refer to DHW requirements in Open Channel Design section.
- G. Skimmer Requirements – Stormwater Management systems which either receive stormwater from areas with greater than 50 percent impervious surface or are a potential source of oil and grease contamination in concentrations that exceed applicable water quality standards shall include a baffle, skimmer, grease trap or other mechanism suitable for preventing oil and grease from leaving the stormwater management system in concentrations the would cause or contribute to violations of applicable water quality standards in the receiving waters.

The entire network of proposed stormwater management facilities has been modeled using the computer program AdICPR (version 3.1). Hydrographs have been computed using the SCS unit hydrograph method and the Florida Modified Rainfall Distribution. Peaking factors for new basins have been set at 323, however, where existing modeling information has been extracted from models developed by others; the existing peaking factors have been utilized and the hydrograph generation will match these existing models.

Curve numbers have been computed using appropriate values for land use and soil conditions from the SCS Technical Release 55 (TR-55). Times of concentration have been computed using SCS TR-55 methodology that includes the following flow regimes: overland flow (Manning’s kinematic solution) and shallow concentrated flow. Other flow regimes that are used include swale flow and piped flow for which travel velocities are assumed or computed.

Special Basin Criteria

Ocklawaha Basin

This project is located within the Ocklawaha River Hydrologic Basin. In addition to the design criteria previously discussed the stormwater system shall also meet applicable discharge criteria for the 10-year 24-hour frequency storm. On-site storage and outlet capacity should be designed for the 25-year 24-hour storm and outlet capacity should be checked and further refined, if necessary, for the 10-year storm. Also if the basin percentage of impervious exceeds 50% then the mean annual storm will have to be evaluated for the predevelopment and post development conditions.

Lake Apopka Basin

In addition, this project discharges stormwater into the Lake Apopka Drainage Basin. The special basin criteria requires post development phosphorus loading to be less than or equal to predevelopment loading. The methodology used by the SJRWMD indicates that the post development phosphorous loading rate for this project is based on a land use of highway (HWY) 75% (The impervious area is a maximum of 75% of the R/W area). The predevelopment land use category is HWY 50% (max. 50% impervious). See the Pollutant Loading worksheet in Section 5 (page 5-35) for a detailed analysis.

Wekiva Recharge Protection Basin

Portions of the project alignment are located within the recently created Wekiva recharge protection basin and as such would be required to meet the recently passed Wekiva Rule basin recharge criteria. However, the Turnpike feels there are several extenuating circumstances that make it a financial hardship as well as a physical hardship to meet the specific requirements of these new rules.

The first aspect is that the proposed project, as it currently is designed, has been in Planning and Design for over five years (started 2002). This is the time for a roadway to start the planning phase (PD&E) that produces the estimated right-of-way required for both the roadway widening and offsite properties needed to address stormwater criteria.

Once this phase is complete the project then moves into final design which is the phase this project is currently within. The final design process started in the summer of 2005 and has been proceeding until the present time. The final design effort built upon information developed within the PD&E study and is essentially complete at this time and before this new rule became effective. Therefore all of the planning, right-of-way estimating and final design was developed using the criteria in place over the design process timeline and did not address concerns related to this new rule. Attempting to go back and address the new rule could have a domino affect to the overall project schedule by requiring additional right-of-way that may trigger a PD&E re-evaluation, all of which will add additional time to the project schedule. Therefore, not only will there be added time to ensure that the proper procedures have been performed in order to officially

document the impacts of the new rule but this time would lead to additional costs and potential delays to the overall project schedule.

In addition there are several physical constraints that are part of the original Turnpike design/construction that we feel eliminate or render the proposed rule almost impossible to accommodate within the proposed design. Based on review of areas that the rule impacts there are three locations that a type A soil would have been located within the original design. These three locations (Sta. 3140+00 to 3145+00, Sta. 3253+80 to 3256+00 and Sta. 3303+00 to 3328+00) traversed pockets of Type A soils located within the project limits. However, the original project design (1962) provided for approximately 3-10 feet of excavation within the majority of these areas. This was constructed as such so that the existing grades (roadway and adjacent right-of-way) are all well below the previous existing grades within these Type A soils. This essentially eliminates the ability to provide any significant percolation in a gravity stormwater system. The only way to meet the rule would be to install a pumped system with a force main directed to a pond site located well above the existing roadway grade. The maintenance and construction costs for such a system we feel are not warranted under the given circumstances. As such, FDOT Florida's Turnpike Enterprise respectfully requests a variance from this criteria under Rule 40C-4.301 (Conditions for Issuance of Permits), based on the hardship conditions described above.

PREDEVELOPMENT ANALYSIS

Basin A

Basin A covers the existing Turnpike right-of-way from Begin Project to Daniels Road (Station 3088+80 to Station 3113+00). The existing roadway runoff drains to swales in this area. The swales flow back station past the beginning of the project to a cross culvert which flows south to Black Lake. The existing roadway was constructed within a cut section through this portion of the alignment. However the amount of offsite areas that discharge or sheet flow into the existing right-of-way is minimal. The prevailing soil types in this basin are Smyrna Fine Sand and Zolfo Fine Sand. Both are poorly drained on slopes ranging from 0 to 2 percent. There is no existing stormwater treatment in this basin.

Basin B

Basin B extends from Daniels Road to CR 545 (Station 3113+00 to Station 3191+80) and covers the existing Turnpike right-of-way. Runoff is collected in swales that drain towards headwalls at the CR 535 Bridge. Culverts carry the runoff through the bridge embankment and discharge to Turnpike swales past the bridge. The Turnpike is still within a cut section and the swales carry runoff north along the alignment. The swale

along the northbound side of the Turnpike discharges at the headwall of a cross culvert located at station 3159+45. The swale along the southbound lanes dissipates into wetlands at approximately station 3143+00. Between this point and approximately station 3171+00 runoff from the southbound lanes and portions of the median discharge directly to the wetlands. Swales continue to carry runoff back to the wetlands from the CR 545 Bridge. Approximately 800 feet before the bridge the runoff begins to flow towards CR 545 in roadway swales where it is collected and drained to the south to Johns Lake. Offsite areas located north of the roadway collect in wetlands adjacent to the alignment and flow through the cross culvert to wetlands on the south side. These wetlands drain to Black Lake. The soil types in this basin include Smyrna Fine Sand and Zolfo Fine Sand. Both are poorly drained on slopes ranging from 0 to 2 percent. As the alignment passes through the wetlands Samsula-Hontoon-Basinger Association, Depressional type soils with prevailing ponded water encountered outside the fill slopes. Poorly drained Basinger Fine Sand and Wauberg Fine Sand are found outside the Depressional soils. There is no existing stormwater treatment in this basin.

Basin C

Basin C covers the Turnpike right-of-way from CR 545 to the SR 50 interchange (Station 3191+80 to station 3274+45). The basin limits also include the ramps up to the existing toll plazas. This basin is divided into 12 sub-basins to assist in the predevelopment analysis. All of the sub-basins ultimately discharge to wetlands located on both sides of the mainline turnpike. The wetlands on both sides of the alignment are part of the Johns Lake floodplain. Sub-Basins 1A-URS, 1B-URS, 1C-URS, 2A-URS and 2B-URS are basins delineated in an existing permit for the Fourth Street Bridge improvements. These sub-basins cover areas from approximately station 3240+00 to approximately station 3259+50 on the northbound side and to approximately station 3279+85 on the southbound side including the on-ramp up to the existing toll plaza. This permit allows for treatment provided by ditch blocks within the Turnpike swales. Sub-Basins Ditch Block 1-6 cover areas previously permitted as part of the Northbound Off-ramp Auxiliary Lane project. The existing treatment is provided by a series of ditch blocks along the outside edge of the ramp between Fourth Street and the existing ramp toll plaza. These treatment areas discharge to wetland areas adjacent to the Turnpike associated with the Johns Lake outfall. As the Turnpike travels through the wetland areas in this basin the prevailing soils types are poorly drained Ona Fine Sand and St. Johns Fine Sand along with large areas of Sanibel Muck under ponded water outside the fill slopes. Once past the Johns Lake outfall as the Turnpike grade rises from the wetland areas moderately well drained Taveres-Millhopper Fine Sands and excessively drained Candler Fine Sands are encountered. For analysis purposes the URS stormwater models for both the Aux. Lane and 4th Street Bridge were used to develop the predevelopment discharge rates.

Basin D

Basin D covers the SR 50 interchange area (Mainline Station 3274+55 to Station 3303+00) with exception of the ramp areas included in Basin C. The interchange area

currently has two closed drainage basins. Some of the mainline and northbound ramps south of SR 50 drain to a dry retention pond near the existing toll plaza on the northbound off-ramp and are designed to retain the 25-year 96-hour storm. The pond also has an outfall structure designed with a weir above the required retention volume to act as an emergency outflow that discharges into Basin C. The runoff from SR 50 and a large portion of the southbound ramps collects in the infield areas. The treated runoff discharges to a sinkhole located in the northwest quadrant of the interchange. A project to construct a northbound on-ramp from SR 50 is permitted within this basin but the ramp construction will become part of the mainline widening project. The soil types in the interchange area include excessively drained Candler Fine Sands and well drained Taveres-Millhopper Fine Sands.

Basin E

Basin E covers the northbound lanes and right-of-way from the SR 50 interchange to the end project (Station 3303+00 to Station 3340+00). Runoff from the existing lanes is collected in swales that flow north to wetlands in the vicinity of Jones Road. These wetlands flow to Lake Apopka. The soils in this basin are typically well drained to excessively drained except for near the wetlands at the northern end of the basin. There is no existing permitted treatment in this basin. Predevelopment hydrology information is summarized in Table 6.

Table 6 – Predevelopment Hydrology

Basin	Area (ac)	CN	TC (min)	Mean Q _{pre} (cfs)	10-YR Q _{pre} (cfs)	25-YR Q _{pre} (cfs)	Outfall Descriptions
A	16.76	85	44	18.22	37.75	44.46	Wetlands in Black Lake System (TW_A)
B	49.56	86	59	46.69	95.40	112.13	Wetlands in Black Lake System (TW_B)
B-20SN	2.34	85	12	4.69	9.61	11.29	Avalon Ditch
B-20SS	4.52	82	12	8.35	17.65	20.9	Avalon Ditch
B-535N	0.74	85	120	0.42	0.87	1.03	Offsite Flow Path
B-535S	0.77	88	120	0.48	0.96	1.12	Offsite Flow Path
C	36.21	84	15.5	63.59	132.81	156.62	Wetlands in Johns Lake Floodplain (TW_C)
1A-URS	4.78	62.12	10	3.41	11.80	15.08	Wetlands in Johns Lake Floodplain (TW_C)
1B-URS	2.19	64.21	10	1.81	5.82	7.35	1A-URS
1C-URS	0.46	72.43	10	0.6	1.55	1.89	1B-URS
2A-URS	5.12	63.36	10	4.00	13.21	16.77	Wetlands in Johns Lake Floodplain (TW_C)
2B-URS	13.42	89	44	10.5	32.12	37.45	2A-URS
3-URS	0.39	76.04	10	0.62	1.45	1.75	Wetlands in Johns Lake Floodplain (TW_C)
4-URS	1.10	66.37	10	1.04	3.13	3.92	Wetlands in Johns Lake Floodplain (TW_C)
DITCH BLOCK 1	2.33	67.72	10	2.39	6.91	8.60	1C-URS
DITCH BLOCK 2	1.24	49	10	0.19	1.60	2.27	DB1
DITCH BLOCK 3	1.35	67.87	10	1.40	4.02	5.00	DB2
DITCH BLOCK 4	0.65	49	10	0.10	0.84	1.19	DB3
DITCH BLOCK 5	2.46	69.32	10	2.76	7.64	9.44	DB4
DITCH BLOCK 6	1.11	69.31	10	1.24	3.45	4.26	DB5
D-1	11.21	70.5	10	13.37	35.95	44.23	Pond 40 Outfalls across Aux. Ramp
D-2	34.47	62	21.1	17.20	61.71	79.65	Sinkhole
D-3	1.40	66	10	1.30	3.94	4.94	SR 50 Swale
E	10.57	56	33	2.50	11.70	15.63	Wetland
E-4	3.05	62	44.1	1.05	3.74	4.81	Wetland
OSB-3	13.33	80	54	10.69	24.31	29.10	Turnpike R/W to wetlands (TW_B)
OSB-4	4.44	79	22	5.54	12.68	15.21	Turnpike R/W to wetlands (TW_B)
PEC-A	4.28	96	15	5.18	20.45	26.31	Pond discharges to Turnpike R/W (TW_B)
PEC-B	7.04	74	14.4				
PEC-C	5.27	84	15				
PEC-D	0.46	98	15				

Nutrient Loading. Since the project is located within the Lake Apopka basin, additional consideration was given to the nutrient loading from the site. The ponds are designed to remove phosphorous as to not exceed the predevelopment loading. See Appendices D & E for nutrient loading calculations.

Pre-Development		Post Development
5.24 kg/yr	>	4.18 kg-yr

Flood Attenuation. Both ponds are designed to attenuate the mean-annual/24-hour and 25-year/24-hour storm events. See Appendix F for drainage models.

Storm Events	Pre-Development		Post Development
Mean Annual/24-Hour	12.05 cfs	>	7.94 cfs
25-Year/24-Hour	29.82 cfs	>	29.65 cfs

Permanent Pool Volume. The required permanent pool volume to meet the 21 day residence time will be provided above the anoxic zone of each pond. The anoxic depth was calculated with the nutrient removal efficiency. See Appendix E for calculations.

Floodplain Compensation. The proposed project impacts the 100 year flood plain. The total volume impacted will be compensated for in proposed low lying areas along the upland buffer of the existing wetland to the south. See Appendix G for calculations.

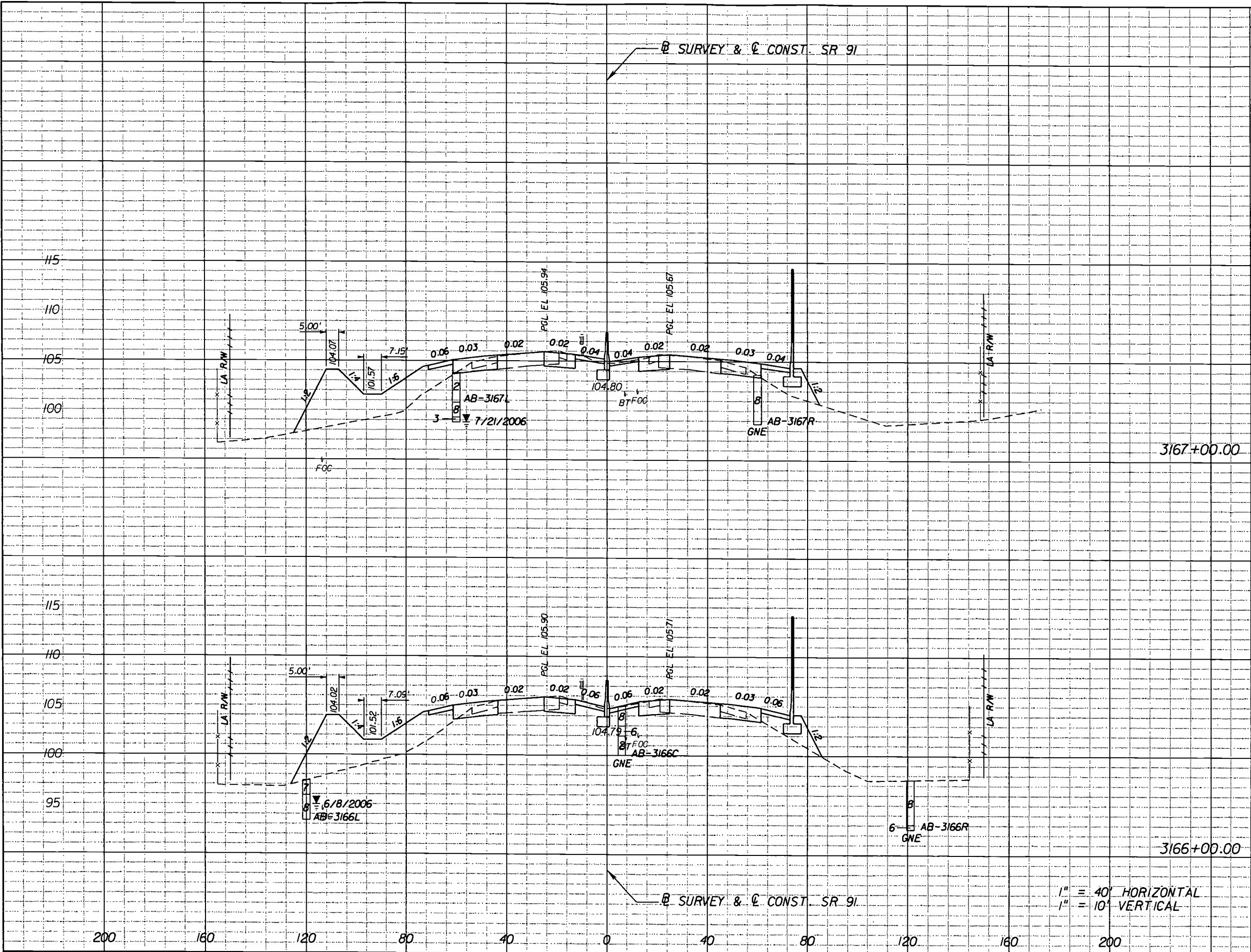
Tail Water. The tail water for the project is the adjacent wetland to the south. A constant elevation of 103.16 ft NAVD 88 was assumed which is based on the determined seasonal high water elevation of the wetland.

Environmental Swales. The lots along the southern wetland (lots 15-20 and 29-35) will partially slope toward the wetlands. An environmental swale will treat the water prior to discharging to the wetland.

BASIN B

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
			290		1203
		75		229	
			292		851
		83		230	

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

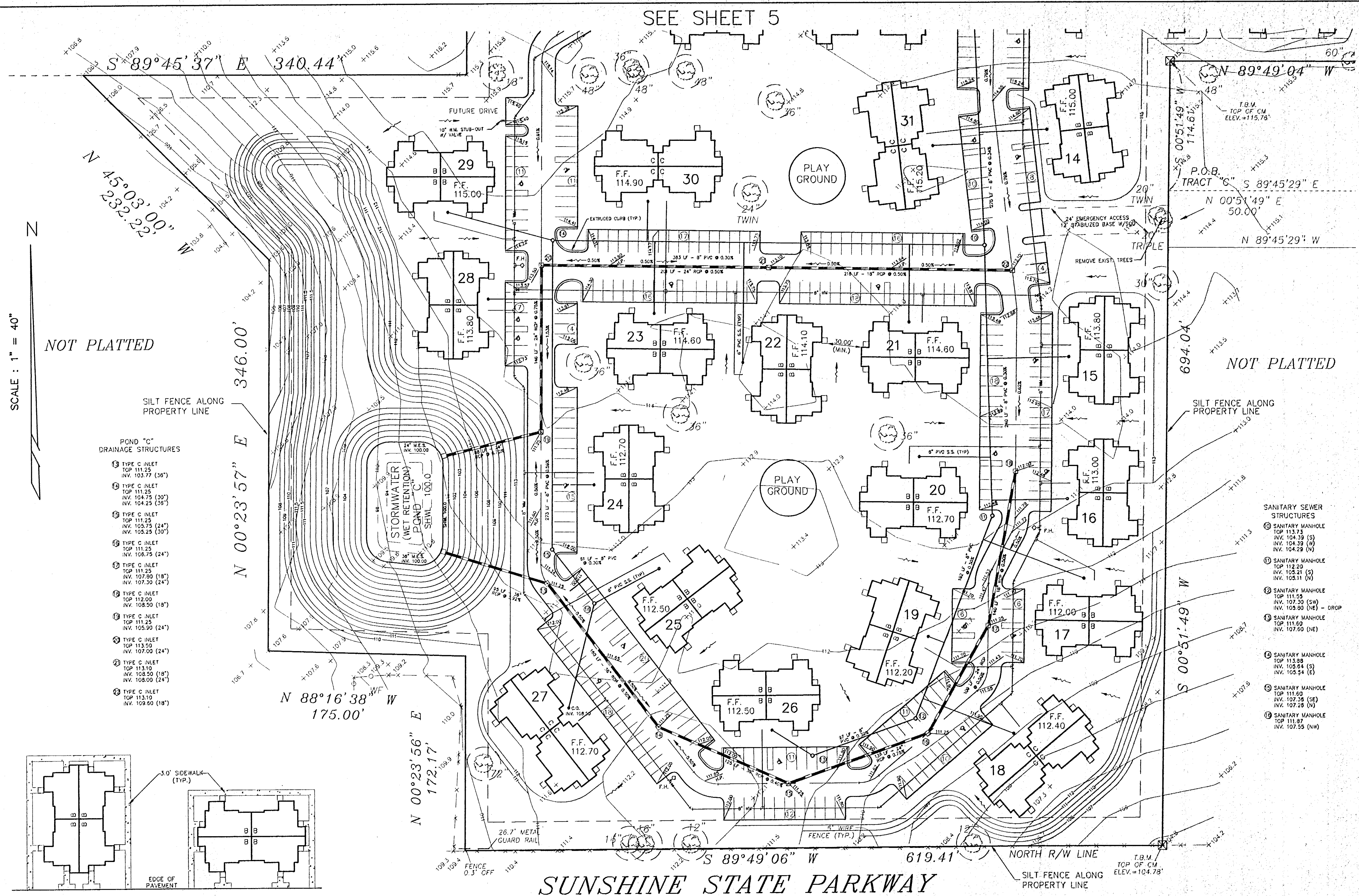
**DRMP**
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836
CERTIFICATE OF AUTHORIZATION NO. 2648
MARK D. PROCHAK, PE LICENSE NO. 43532

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	ORANGE	406146-1-52-01

CROSS SECTIONS

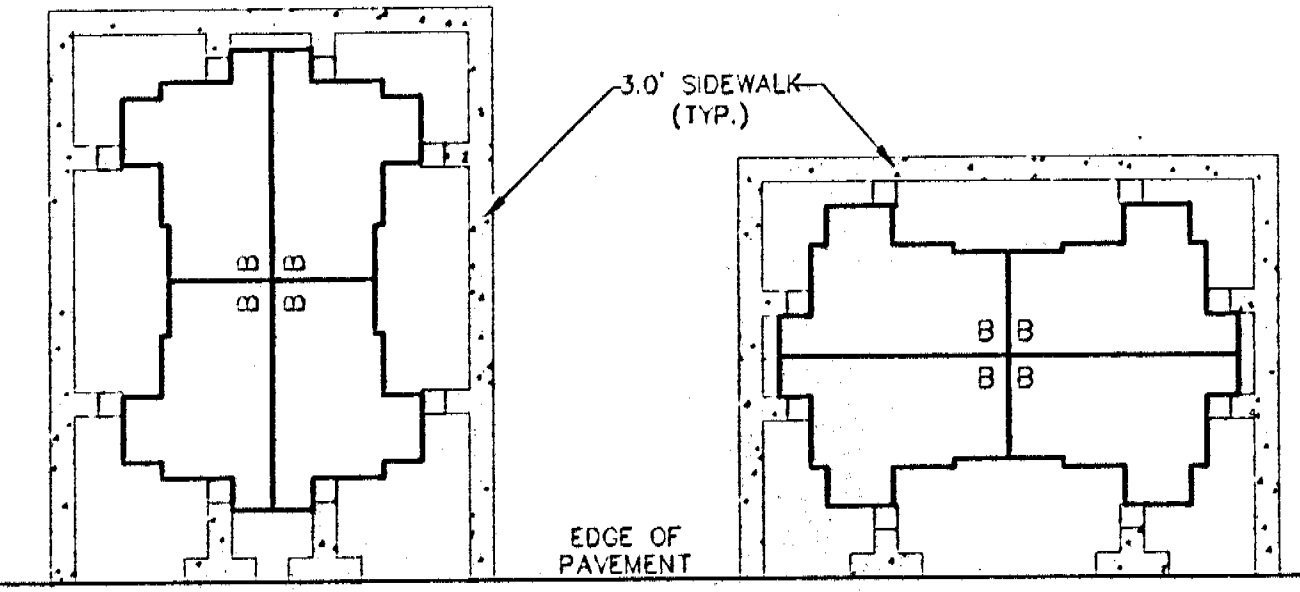
SHEET NO.
178

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.



- POND "C" DRAINAGE STRUCTURES
- 1 TYPE C INLET
TOP 111.25
INV. 103.77 (36")
 - 2 TYPE C INLET
TOP 111.25
INV. 104.75 (30")
INV. 104.25 (36")
 - 3 TYPE C INLET
TOP 111.25
INV. 105.75 (24")
INV. 105.25 (30")
 - 4 TYPE C INLET
TOP 111.25
INV. 106.75 (24")
 - 5 TYPE C INLET
TOP 111.25
INV. 107.80 (18")
INV. 107.30 (24")
 - 6 TYPE C INLET
TOP 112.00
INV. 108.50 (18")
 - 7 TYPE C INLET
TOP 111.25
INV. 105.90 (24")
 - 8 TYPE C INLET
TOP 113.50
INV. 107.00 (24")
 - 9 TYPE C INLET
TOP 113.10
INV. 108.50 (18")
INV. 108.00 (24")
 - 10 TYPE C INLET
TOP 113.10
INV. 109.50 (18")

- SANITARY SEWER STRUCTURES
- 11 SANITARY MANHOLE
TOP 113.75
INV. 104.39 (S)
INV. 104.39 (W)
INV. 104.29 (N)
 - 12 SANITARY MANHOLE
TOP 112.20
INV. 105.21 (S)
INV. 105.11 (N)
 - 13 SANITARY MANHOLE
TOP 111.55
INV. 107.30 (SW)
INV. 105.90 (NE) - DROP
 - 14 SANITARY MANHOLE
TOP 111.60
INV. 107.55 (SE)
INV. 107.25 (N)
 - 15 SANITARY MANHOLE
TOP 111.97
INV. 107.55 (NW)



TYPICAL SIDEWALK LAYOUT

NO.	DATE	REVISION	APP'D. BY
1	3-21-00	REVISED PER CITY OF WINTER GARDEN	
2	6-5-00	REVISED PER CITY OF WINTER GARDEN	

GEORGE GARRETT, P.E.
544 W. PAR STREET
ORLANDO, FLORIDA 32804
(407) 422-3262 FAX: (407) 422-2796

WEST POINTE VILLAS
WINTER GARDEN, FLORIDA

SITE PLAN 3

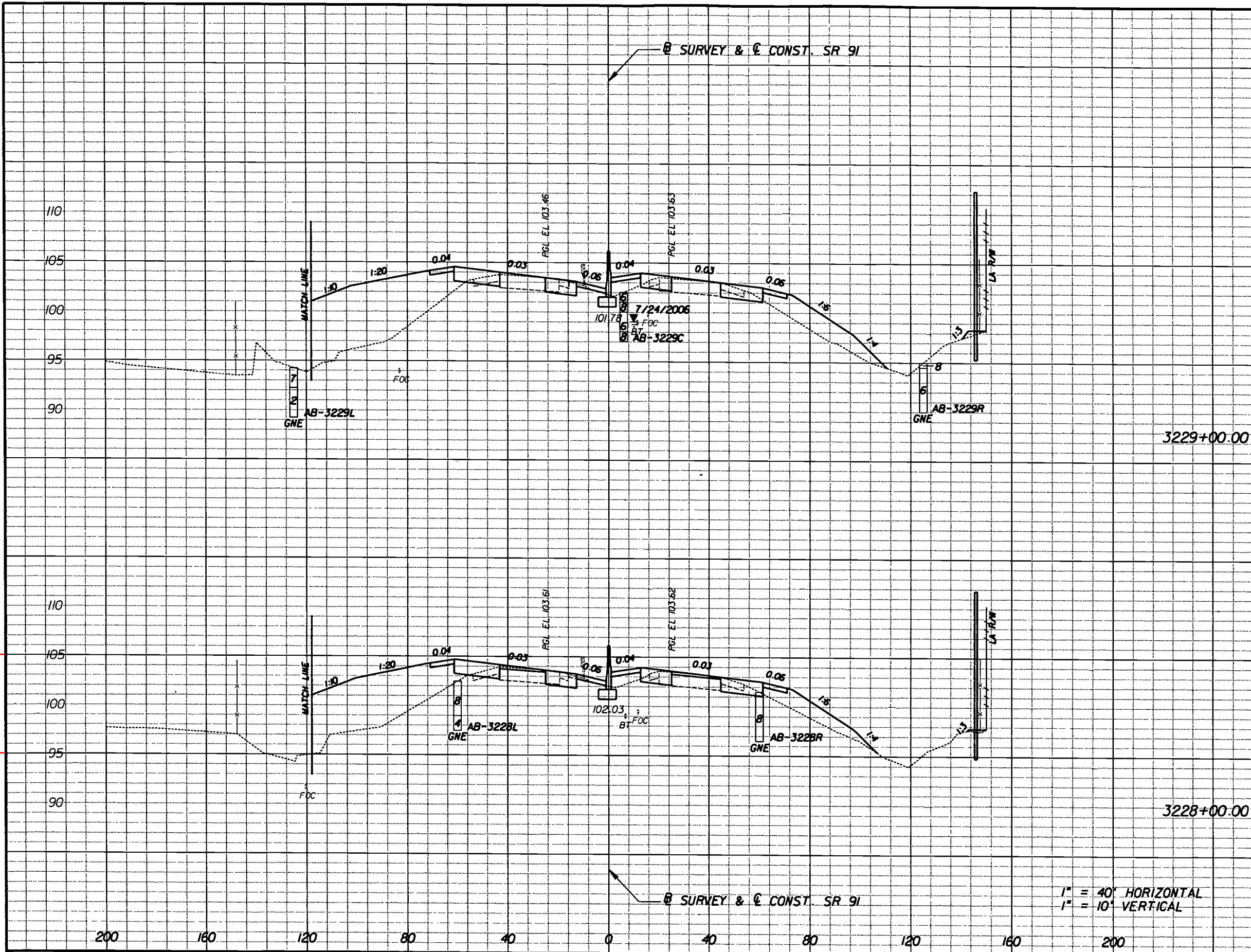
REGISTERED ENGINEER
STATE OF FLORIDA
#31956
DATE 6/30/00

SCALE 1" = 40'
JOB NO. 99-007
FILE SITEPLAN
DRAWN BY GG
DATE 1-3-2000
SHT 6 OF 18

BASIN C

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
			233		1626
		63		415	
			231		1386
		62		333	

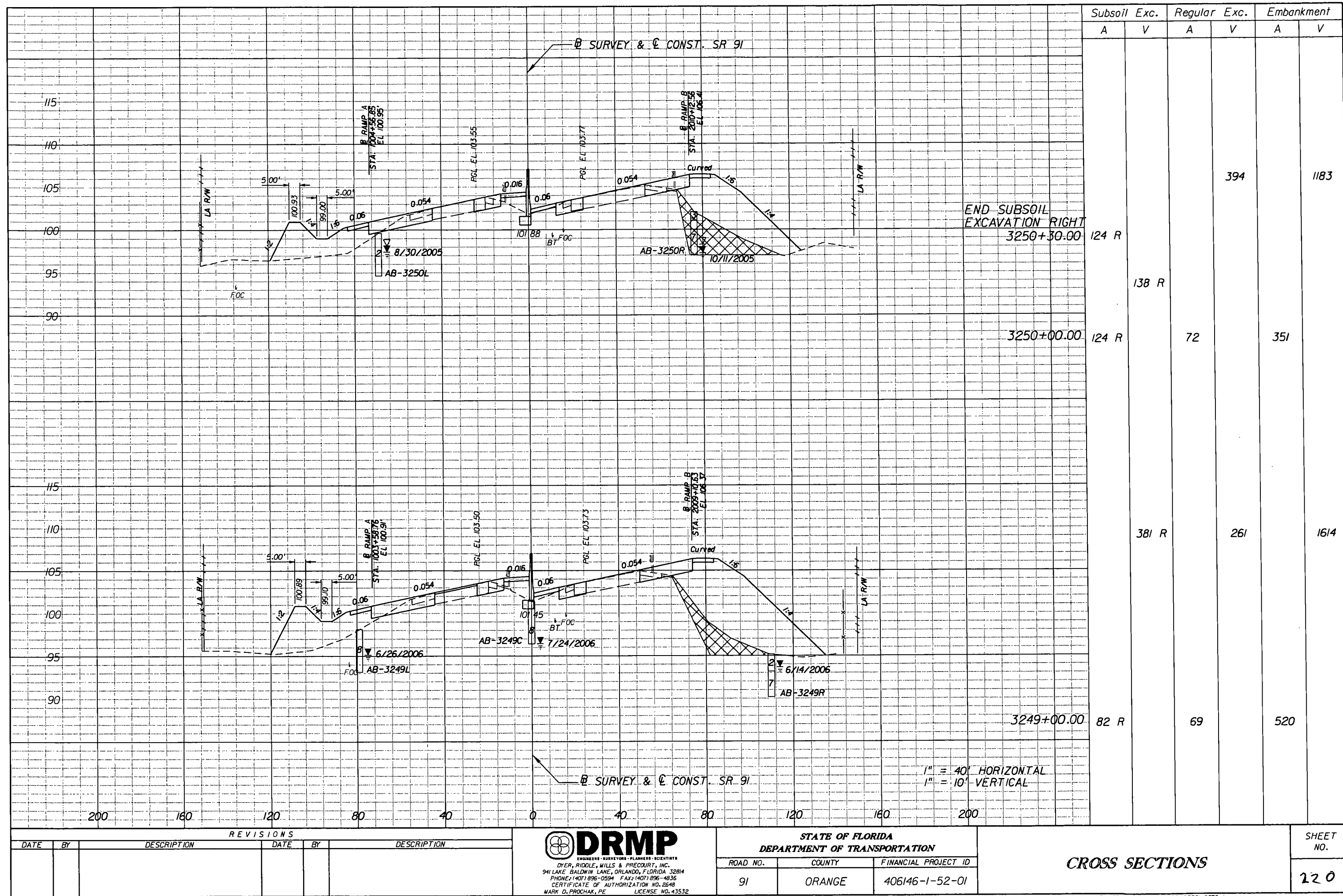
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DRMP
 ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
 DYER, RIDDLE, MILLS & PRECOURT, INC.
 941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
 PHONE: (407) 896-0554 FAX: (407) 896-4836
 CERTIFICATE OF AUTHORIZATION NO. 2648
 MARK D. PROCHAK, P.E. LICENSE NO. 43532

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	ORANGE	406146-1-52-01

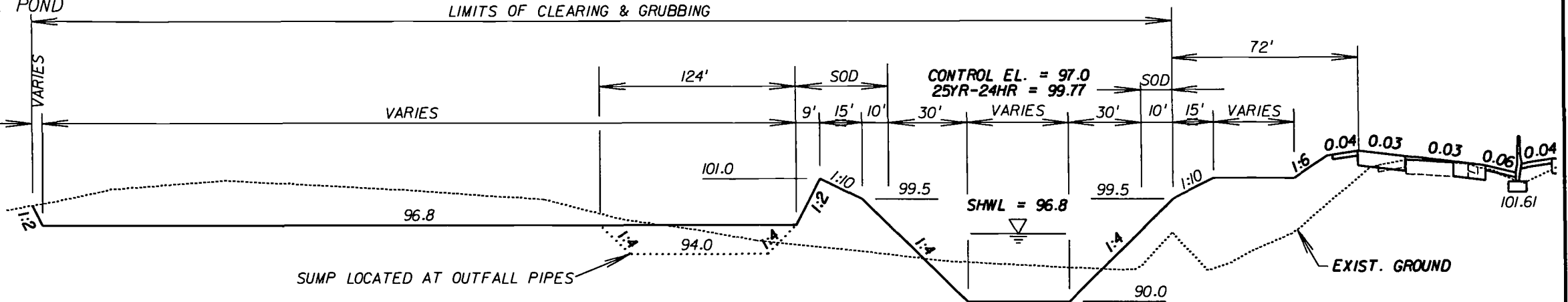
CROSS SECTIONS		SHEET NO.
		209

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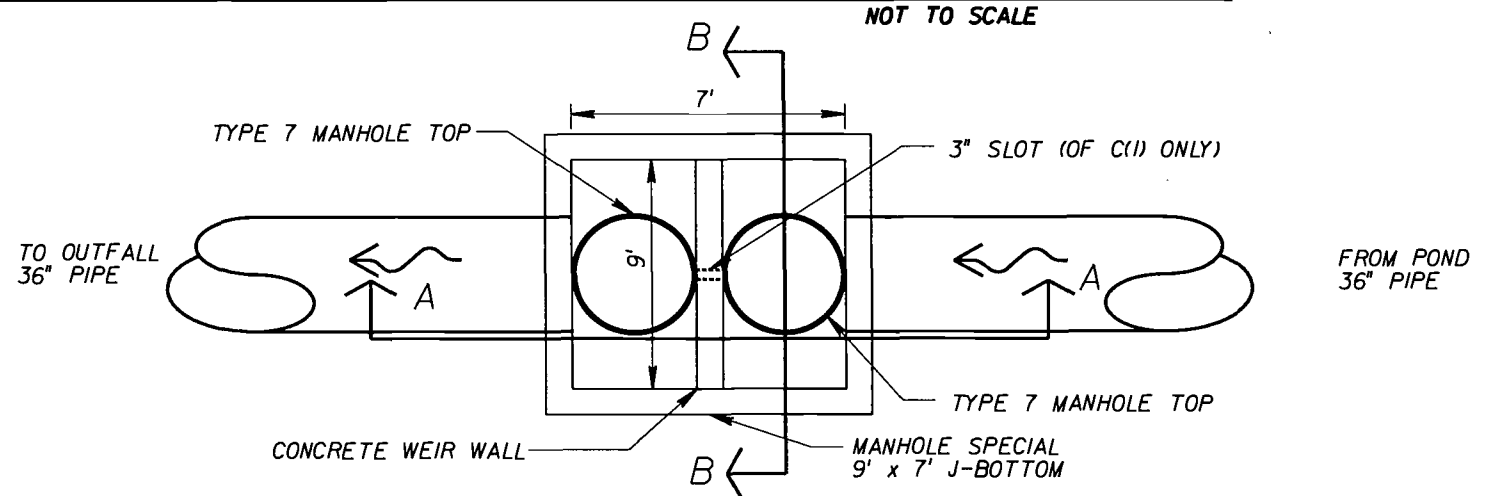


CONTROL POINTS - COMPENSATING STORAGE POND

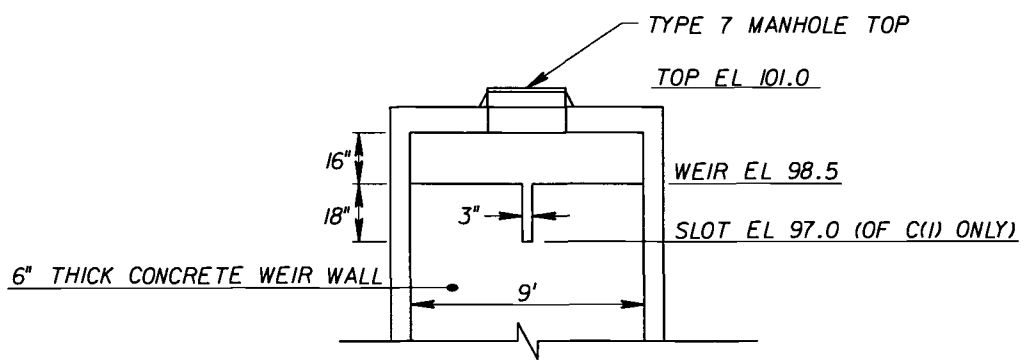
ID	STATION, OFFSET	RADIUS
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101	3+97.36, 184.71' LT	200'
102	7+02.87, 279.59' LT	100'
103	6+51.09, 70.95' LT	100'
104	7+85.36, 55.84' RT	N/A
105	7+39.42, 194.98' RT	91.5'
106	7+84.44, 263.83' RT	20'
107	7+30.98, 261.36' RT	20'
108	6+98.85, 271.13' RT	10'
109	4+53.91, 218.36' RT	212'
110	3+94.91, 367.18' RT	100'
111	3+13.00, 17.00 LT	3'
112	3+13.00, 17.00 RT	3'
113	4+13.00, 17.00 LT	3'
114	4+13.00, 17.00 RT	3'



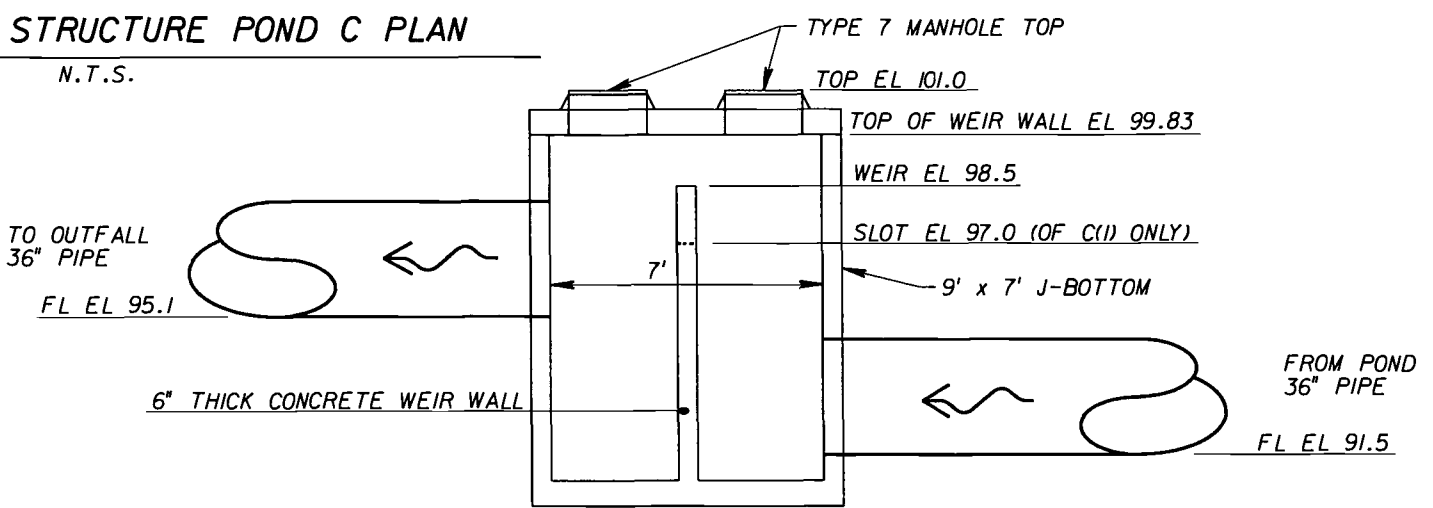
POND C AND COMPENSATING STORAGE POND TYPICAL SECTION



CONTROL STRUCTURE POND C PLAN
N.T.S.



CONTRTOL STRUCTURE POND C SECTION B-B
N.T.S.



CONRTOL STRUCTURE POND C SECTION A-A
N.T.S.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DRMP
ENGINEERS - SURVEYORS - PLANNERS - SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836
CERTIFICATE OF AUTHORIZATION NO. 2648
DONALD W. BROWN, PE LICENSE NO. 59272

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	ORANGE	406146-1-52-01

POND C DETAIL (2)

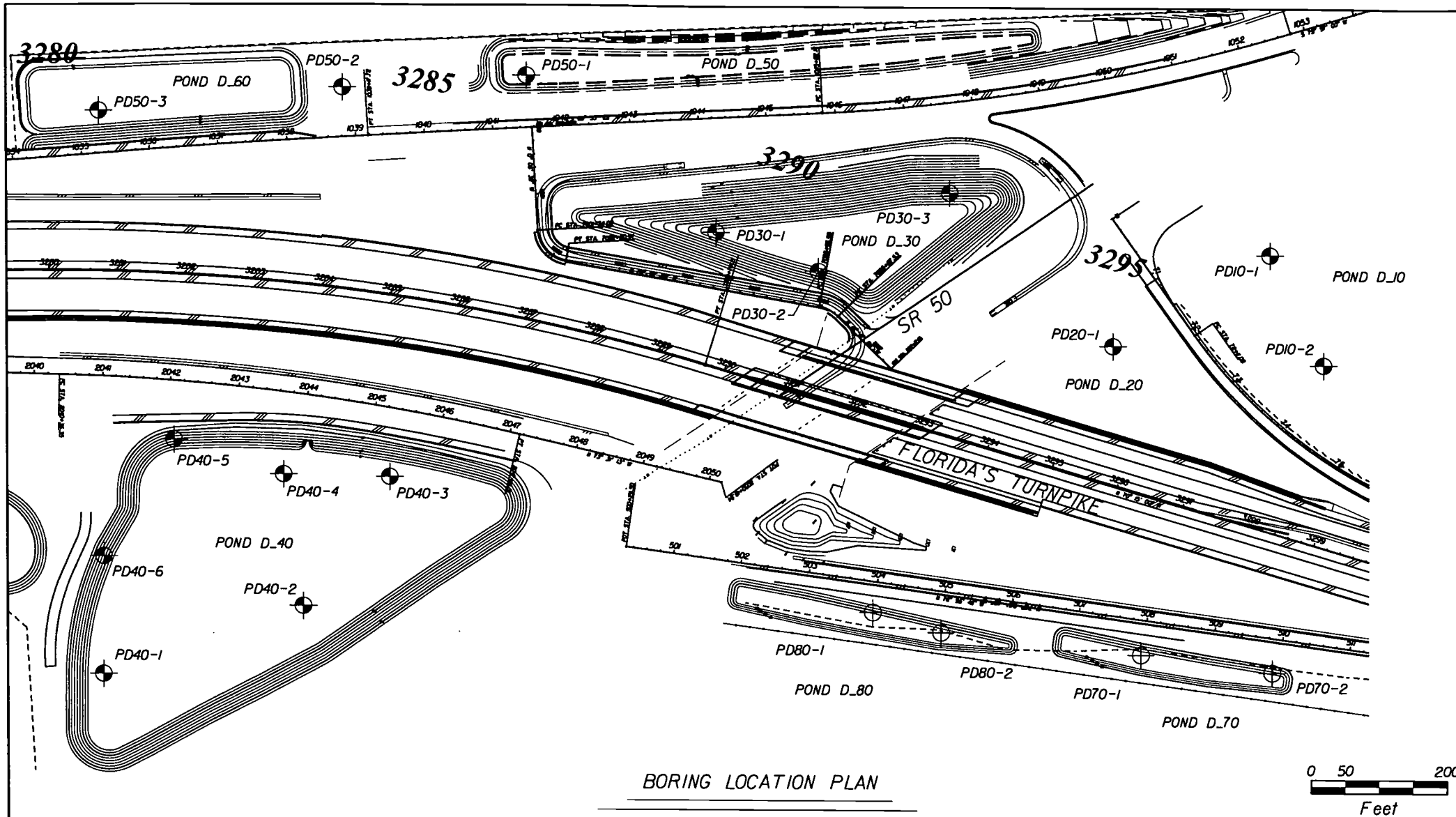
SHEET NO.
131

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BASIN D

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



BORING LOCATION PLAN

LEGEND

1. GRAY-BROWN TO ORANGE-BROWN FINE SAND TO SILTY FINE SAND, OCCASIONALLY WITH LIMEROCK FRAGMENTS AND ORGANICS (A-3/A-2-4)
2. GRAY-BROWN, ORANGE-BROWN TO YELLOW-BROWN FINE SAND TO SILTY FINE SAND, OCCASIONAL HARDPAN AND OCCASIONAL ORGANICS (A-3/A-2-4)
3. GRAY-BROWN, BROWN-ORANGE, PALE BROWN SILTY FINE SAND (A-2-4)
4. DARK-BROWN, BROWN, GRAY SILTY FINE SAND WITH SOME CLAY (A-2-4)
5. BROWN, GRAY AND YELLOW-BROWN SILTY TO CLAYEY FINE SAND (A-2-4/A-2-6)
6. PALE BROWN, GRAY TO BROWN, ORANGE-GRAY CLAYEY FINE SAND TO SANDY CLAY (A-6/A-7-6)
7. BROWN TO DARK BROWN ORGANIC SILTY FINE SAND (A-8)
8. GRAY-BROWN TO ORANGE-BROWN FINE SAND TO FINE SAND WITH SILT (A-3)
9. PALE BROWN, GRAY TO BROWN CLAYEY FINE SAND TO SILTY CLAY (A-7-6)
10. GRAY-BROWN FINE SAND WITH PAVING MATERIAL (A-3)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW

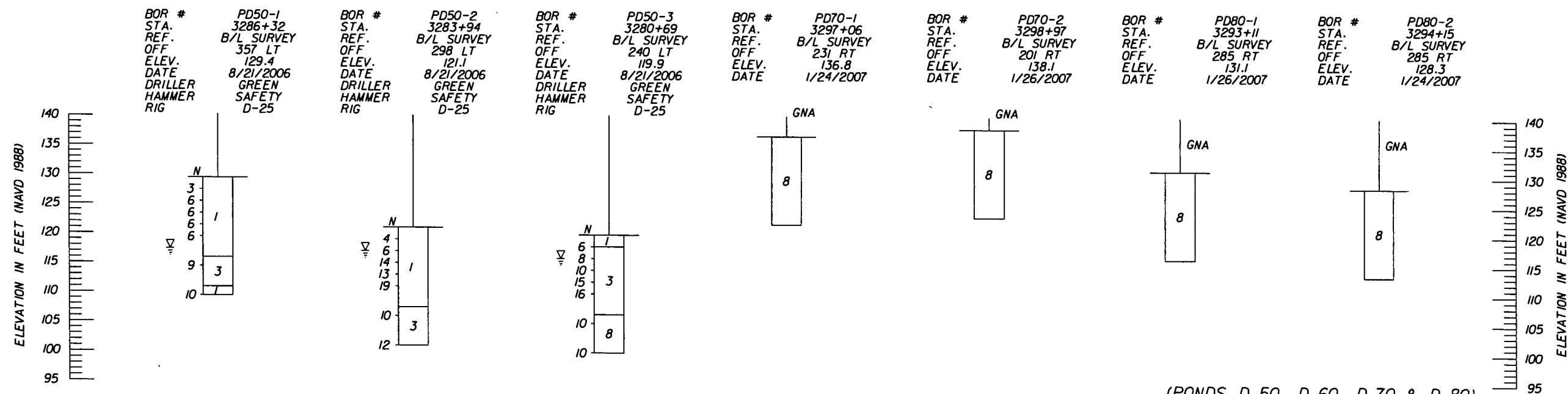
GROUNDWATER LEVEL

GNA GROUNDWATER NOT APPARENT

APPROXIMATE SPT BORING LOCATION

APPROXIMATE AUGER BORING LOCATION

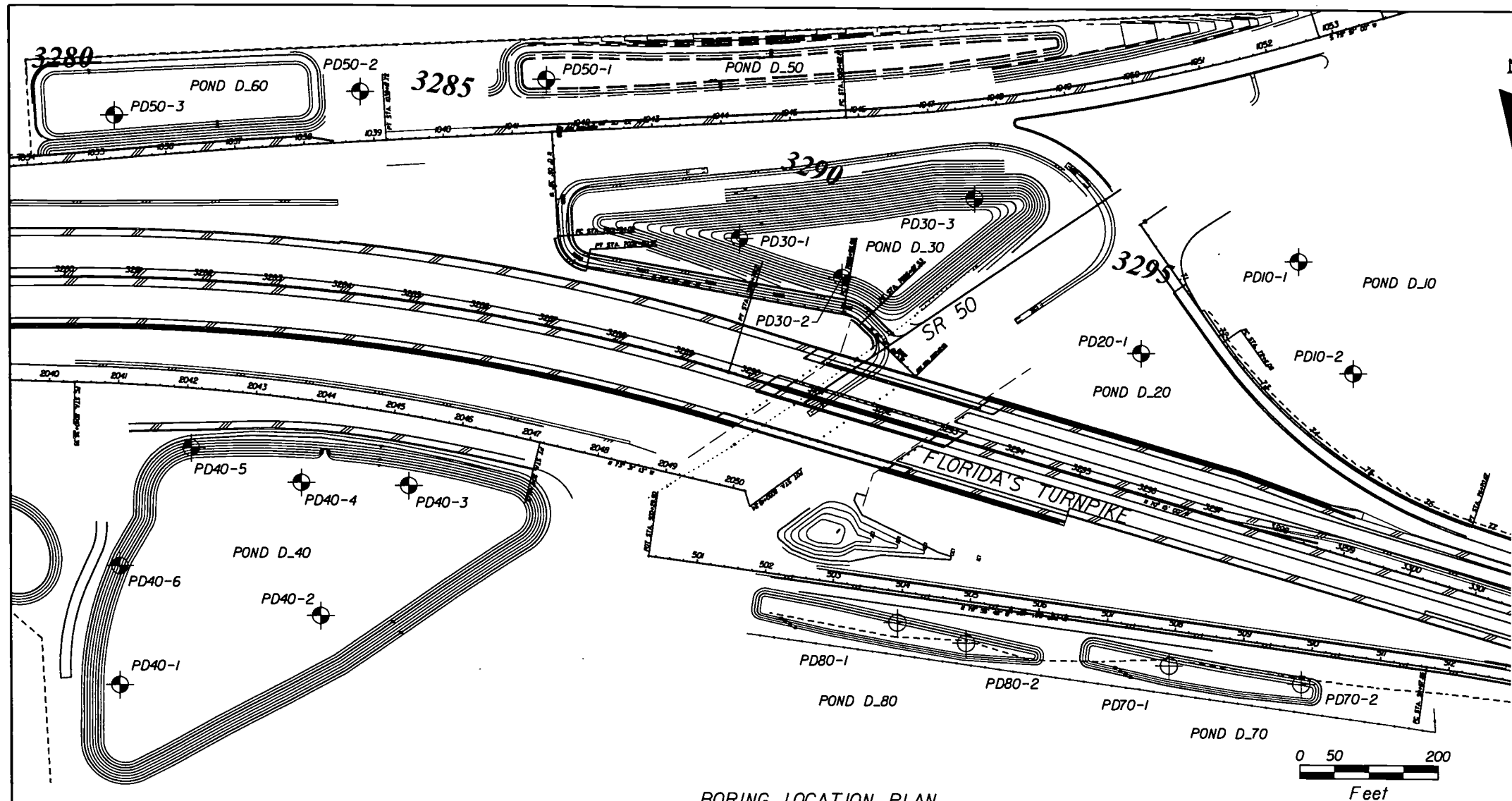
NAVD 1988 NORTH AMERICAN VERTICAL DATUM OF 1988



(PONDS D_50, D_60, D_70 & D_80)

REVISIONS						TIERRA Geotechnical and Materials Engineering 7805 Professional Place Tampa, Florida 33637 813-989-1354 FL Cert No. 6486 Engineer of Record: Larry P. Moore, P.E. No.: 47673	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POND BORING LOCATION PLAN AND SOIL PROFILES		SHEET NO. GR-7
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID			
							SR 9I	ORANGE	406146-1-52-01			

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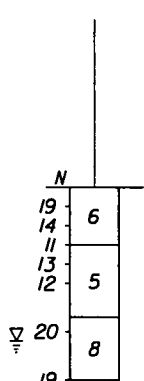
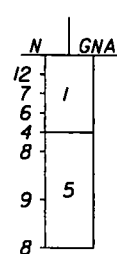
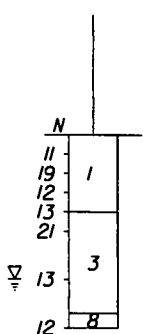
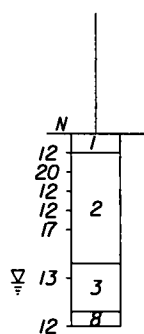
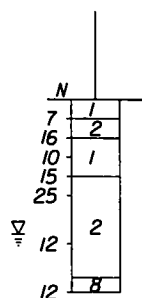
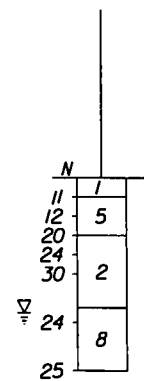


- LEGEND**
1. GRAY-BROWN TO ORANGE-BROWN FINE SAND TO SILTY FINE SAND, OCCASIONALLY WITH LIMEROCK FRAGMENTS AND ORGANICS (A-3/A-2-4)
 2. GRAY-BROWN, ORANGE-BROWN TO YELLOW-BROWN FINE SAND TO SILTY FINE SAND, OCCASIONAL HARDPAN AND OCCASIONAL ORGANICS (A-3/A-2-4)
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 6. PALE BROWN, GRAY TO BROWN, ORANGE-GRAY CLAYEY FINE SAND TO SANDY CLAY (A-6/A-7-6)
 7. BROWN TO DARK BROWN ORGANIC SILTY FINE SAND (A-8)
 8. GRAY-BROWN TO ORANGE-BROWN FINE SAND TO FINE SAND WITH SILT (A-3)
 9. PALE BROWN, GRAY TO BROWN CLAYEY FINE SAND TO SILTY CLAY (A-7-6)
 10. GRAY-BROWN FINE SAND WITH PAVING MATERIAL (A-3)
- A-3 AASHTO GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW
- ▽ GROUNDWATER LEVEL
GNA GROUNDWATER NOT APPARENT
- ⊙ APPROXIMATE SPT BORING LOCATION
⊕ APPROXIMATE AUGER BORING LOCATION
- NAVD 1988 NORTH AMERICAN VERTICAL DATUM OF 1988

BORING LOCATION PLAN

BOR #	PD40-1	BOR #	PD40-2	BOR #	PD40-3	BOR #	PD40-4	BOR #	PD40-5	BOR #	PD40-6
STA.	3280+92	STA.	3284+31	STA.	3285+41	STA.	3283+73	STA.	3281+96	STA.	3280+88
REF.	B/L SURVEY	REF.	B/L SURVEY	REF.	B/L SURVEY	REF.	B/L SURVEY	REF.	B/L SURVEY	REF.	B/L SURVEY
OFF	605 RT	OFF	480 RT	OFF	270 RT	OFF	287 RT	OFF	249 RT	OFF	428 RT
ELEV.	123.5	ELEV.	131.8	ELEV.	128.4	ELEV.	128.5	ELEV.	137	ELEV.	123.5
DATE	8/21/2006	DATE	8/21/2006	DATE	8/21/2006	DATE	8/21/2006	DATE	8/21/2006	DATE	8/21/2006
DRILLER	GREEN	DRILLER	GREEN	DRILLER	GREEN	DRILLER	GREEN	DRILLER	GREEN	DRILLER	GREEN
HAMMER	SAFETY	HAMMER	SAFETY	HAMMER	SAFETY	HAMMER	SAFETY	HAMMER	SAFETY	HAMMER	SAFETY
RIG	D-25	RIG	D-25	RIG	D-25	RIG	D-25	RIG	D-25	RIG	D-25

ELEVATION IN FEET (NAVD 1988)



ELEVATION IN FEET (NAVD 1988)

(POND D_40)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

TIERRA
Geotechnical and Materials Engineering
7805 Professional Place
Tampa, Florida 33637
813-989-1354
FL Cert No. 6486
Engineer of Record: Larry P. Moore, P.E. No.: 47673

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 91	ORANGE	406146-1-52-01

**POND BORING LOCATION
PLAN AND SOIL PROFILES**

SHEET
NO.
GR-6

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G5-23.003, F.A.C.

BASIN E

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

SECTION 3.0 – POST DEVELOPMENT ANALYSIS

Stormwater management facilities have been designed to accommodate the FTE drainage criteria and meet the permit regulations of the SJRWMD. The proposed drainage approach will use dry retention ponds as stormwater treatment facilities to take advantage of the excellent hydrologic soil conditions located throughout the alignment. There will be limited wetland impacts along the roadway alignment. Basins A, B, C and D are open basins within the Lake Apopka Hydrologic Basin and the surface water management systems are required to maintain the phosphorus load in the post development phosphorus discharge at or below the predevelopment phosphorus discharge rates. Basins E, F and G discharge to depressional areas/lakes within closed basins that do not discharge to Lake Apopka. (See Figure 5 – Impaired Water Bodies Map) Offsite areas generally flow away from roadway right-of-way except for Basin E and G.

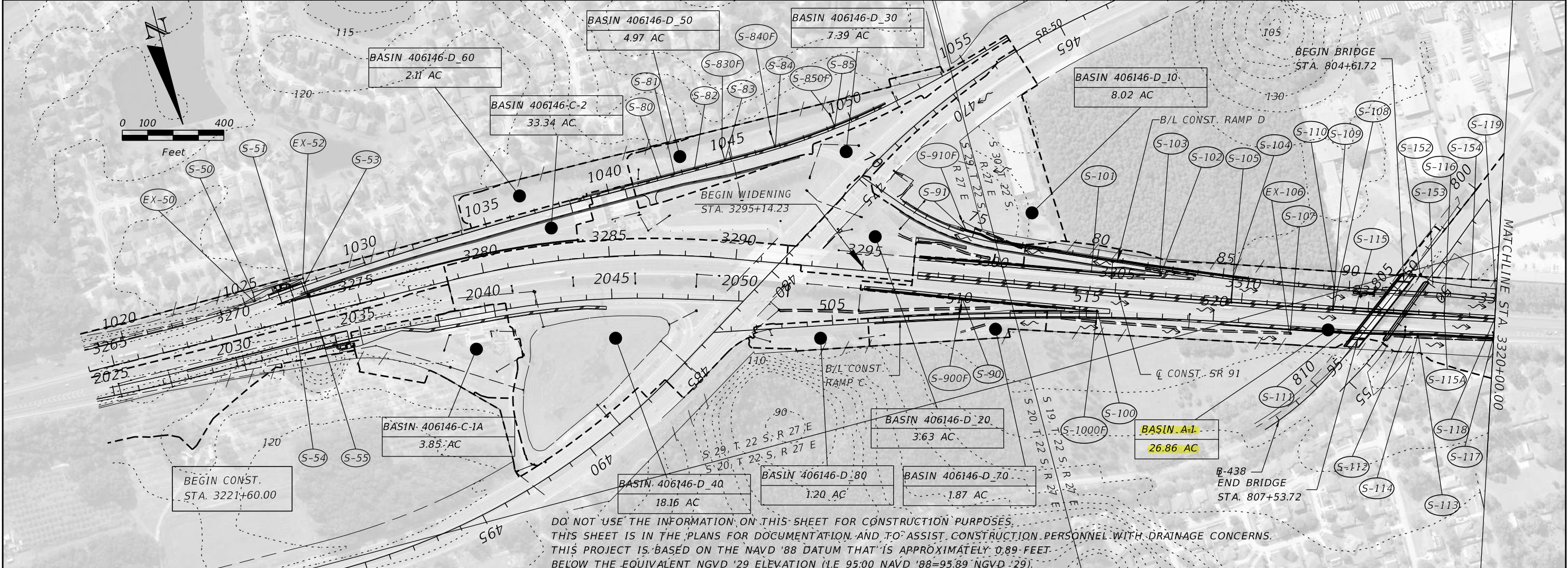
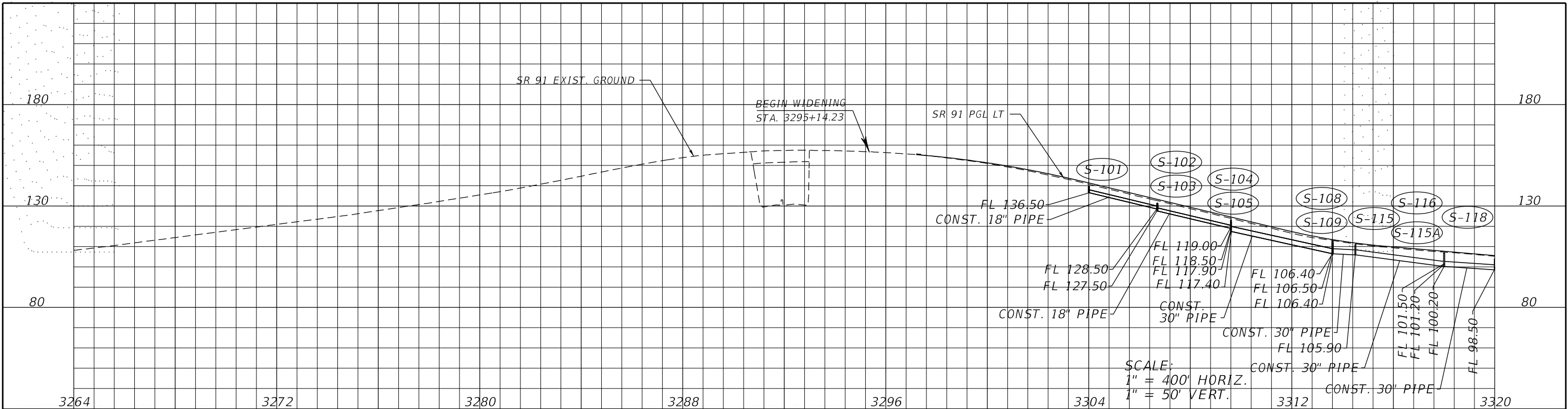
The proposed basin hydrology, runoff calculations, water quality calculations and pond stage-storage information are detailed in Appendix C. See Table 2 for summary of the basin details.

SR 50 Interchange

The SR 50 interchange existing ponds were previously permitted as part of a Florida Turnpike widening project (Permits #20358-17, 20358-19, 20358-21). Interchange basin areas and existing ponds were modified for the relocation of two toll plazas and two ramp realignments. The no additional impervious area was added to the SR 50 interchange pond systems and the total basins areas were reduced from permitted basin areas. Post development basin A-1 (Pond A) area was increased to include the additional impervious area from the roadway widening.

Basin A

Basin A consists of the roadway right-of-way area between stations 3297+00 to 3358+23 and 6365+29 to 6366+50. The stormwater runoff from sub basin A-4 from station 3331+00 to station 3338+50 (4'x6' CBC) will drain to the existing linear swales for treatment and attenuation as part of previously permitted Florida Turnpike widening project (Permit #20358-17, 20358-19, 20358-21). These existing linear swales discharge to adjacent wetlands via a control structure. Pond A will take in the roadway runoff from station 3297+00 to 3331+00 (sub basin A-1). A portion of existing impervious area within sub basin A-1 is treated and used to compensate for the new impervious area located north of the CBC. This northern area (sub basins A-2, A-3, A-4, A-5 and A-6) cannot be conveyed to the pond site due to physical constraints of the existing CBC. **Impervious area from future ingress/egress lanes have been incorporated in the hydrology and pond design.**



REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	FINANCIAL PROJECT ID		DRAINAGE MAP 1	SHEET NO. 11
DATE	DESCRIPTION	DATE	DESCRIPTION					
				ROAD NO.	COUNTY			
				SR 91	ORANGE LAKE	435784-1-52-01 435785-1-52-01		

GENE MCCLENDON, P.E.
P.E. LICENSE NUMBER 66603
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FL 32814
CERTIFICATE OF AUTHORIZATION: 2648

Turnpike Widening - SR 50 to Minneola

Appendix C - Post Development Hydrology

Basin A	Station	3295+00.00	to	3358+23.21	Basin Length =	6444.1
Description: To Pond A		6365+29.07	to	6366+50.00		

Curve Number**Sub Basin A-1 (Pond)**

Land Use	Hydrologic Condition	Soil Class	Area (acres)	CN	Product
Open Space	Good	B/D	0.05	80	4.15
Open Space Offsite	Good	A	3.40	39	132.79
Open Space	Good	B	6.69	61	408.13
Open Space - Pond	Good	A	2.77	39	107.99
Existing Impervious			10.12	98	991.81
Proposed Impervious			3.83	98	374.98
Total=			26.86		2019.85
CN=			75		

Time of Concentration**SHEET FLOW**

Length (ft)=	19	4	12
n=	0.011	0.011	0.15
US elevation=	141.39	140.79	140.55
DS elevation=	140.79	140.55	138.66
Slope (ft/ft)=	0.032	0.059	0.158
Intensity (2yr-24hr)=	4.75	4.75	4.75
Time of conc. (hr)=	0.004	0.001	0.011

CONCENTRATED FLOW

Length (ft)=	1000
US elevation=	138.66
DS elevation=	112.79
Slope (ft/ft)=	0.026
Paved or unpaved =	Unpaved
Velocity (ft/s)=	2.60
Time of conc. (hr)=	0.107

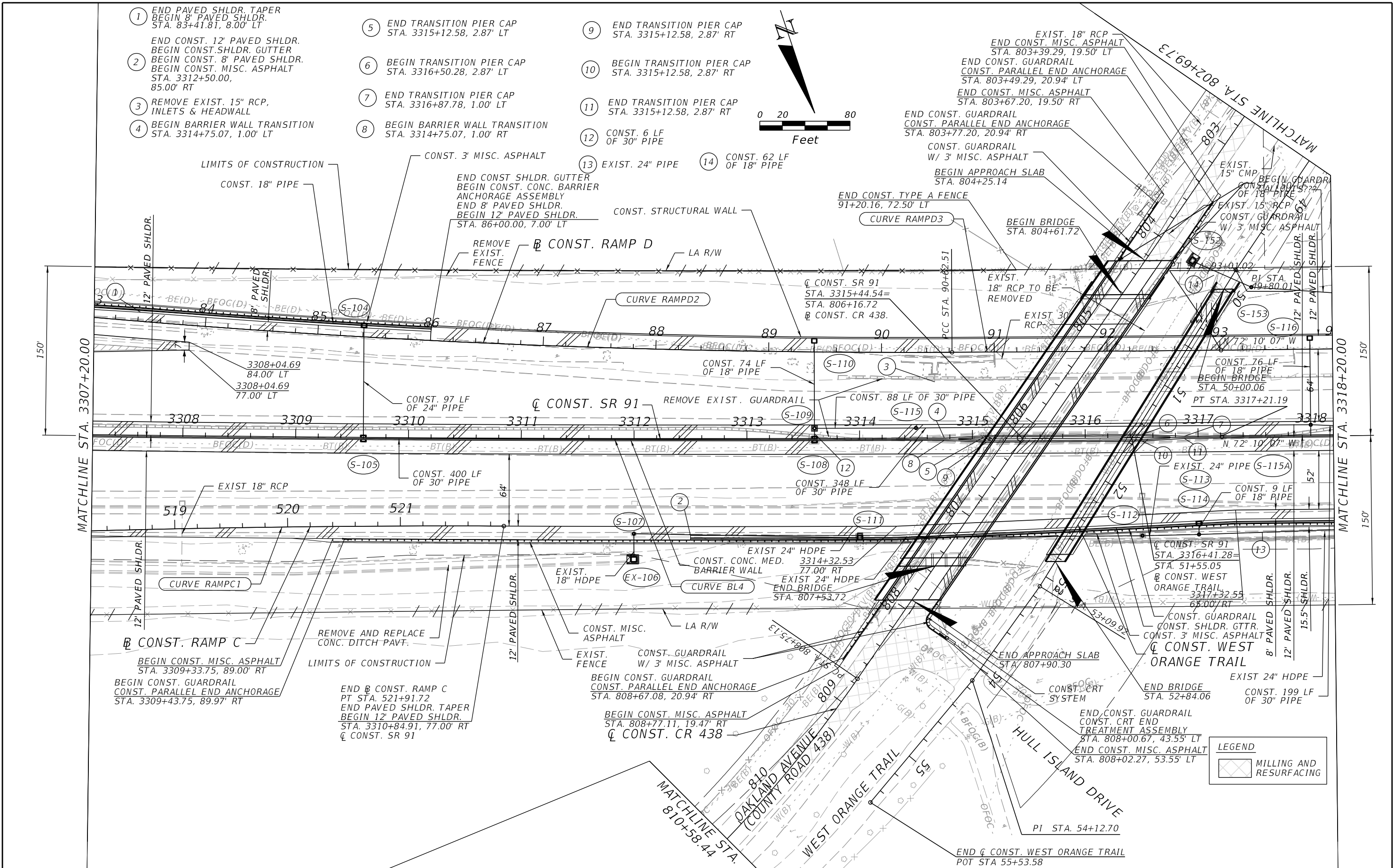
PIPE FLOW

Length (ft)=	1800
Velocity (ft/s)=	2.50 (assumed)
Time of conc. (hr)=	0.200

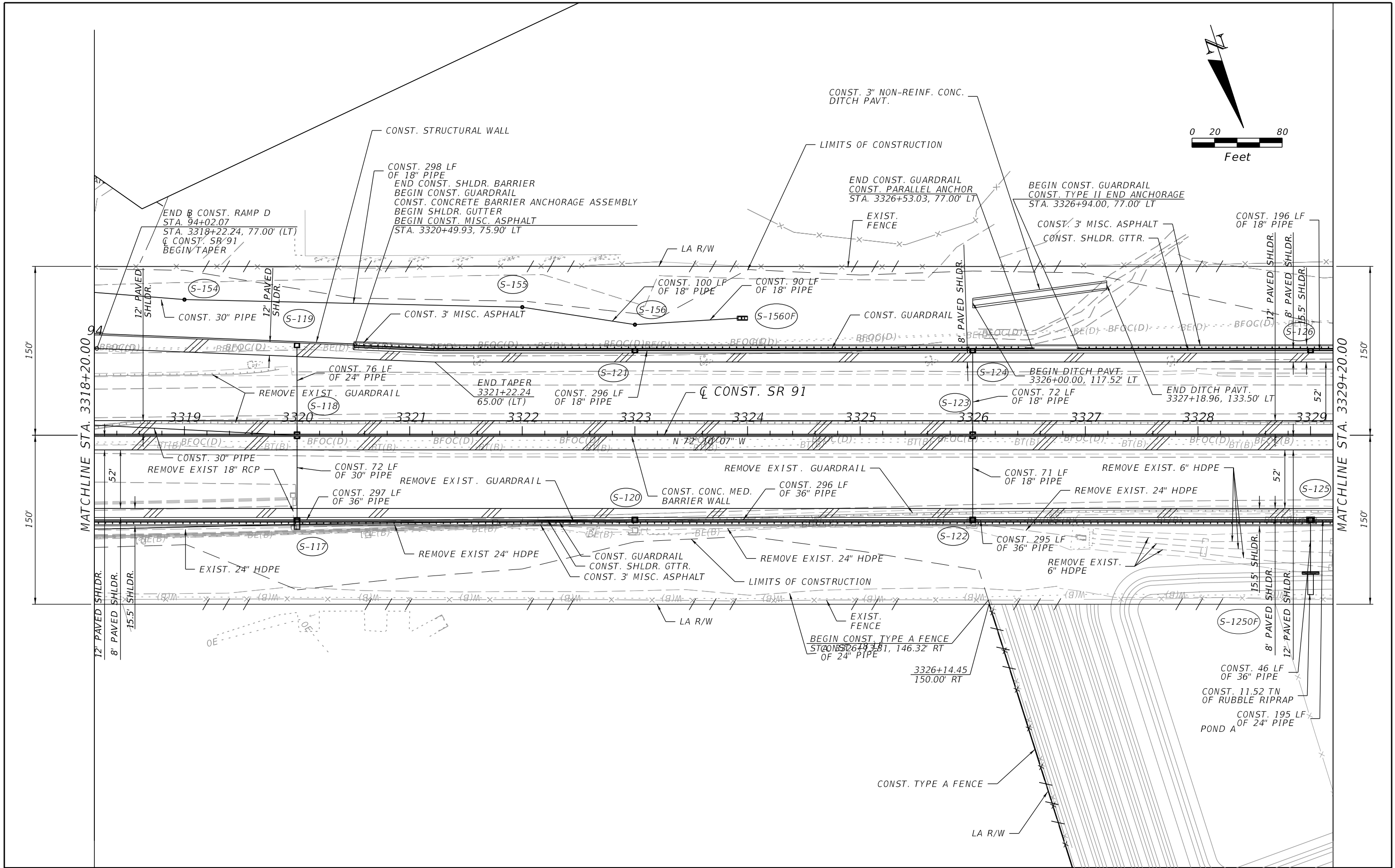
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19 min

Tc from Stormtabs = 22.4 min

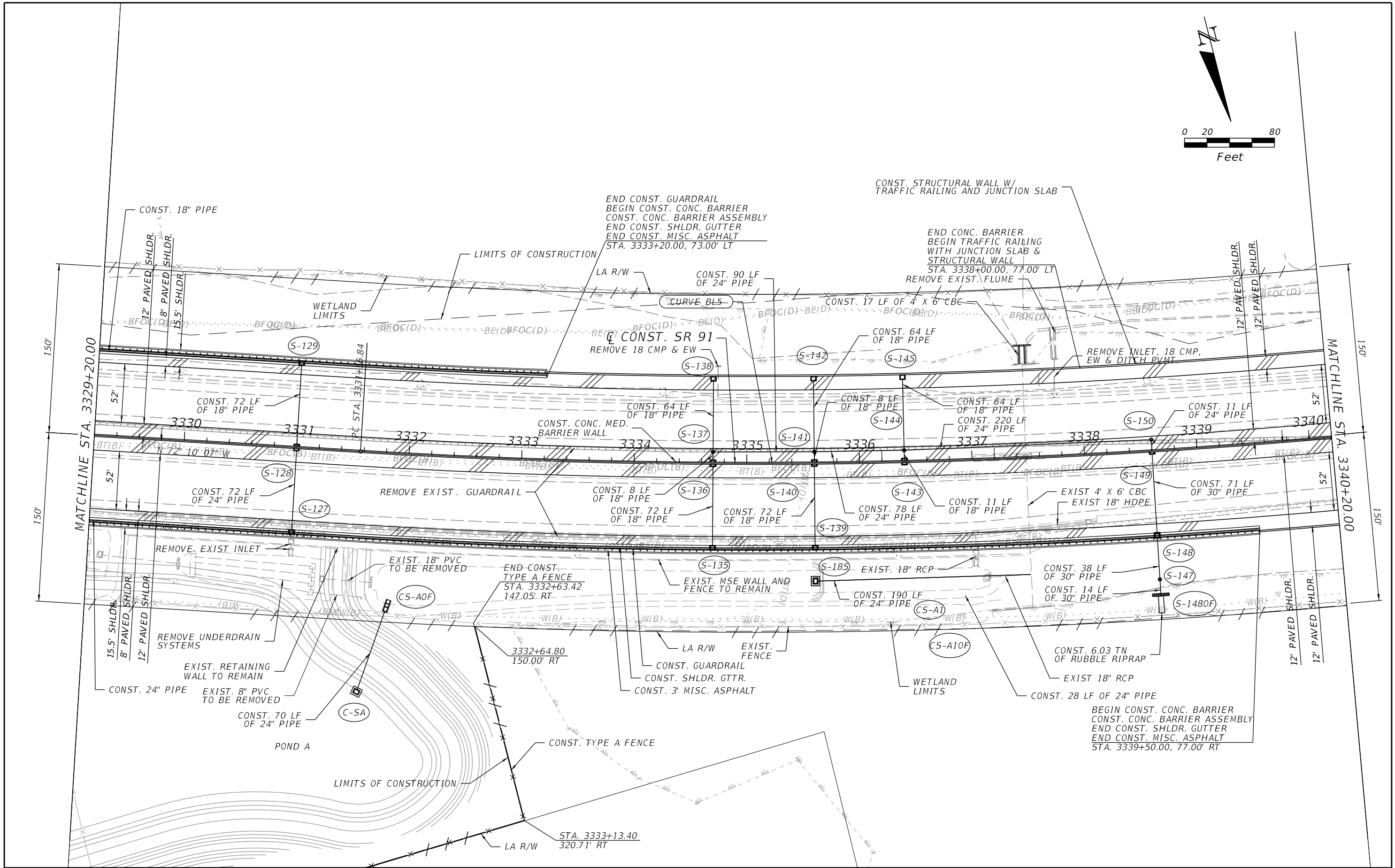
Tc = 22 min Use



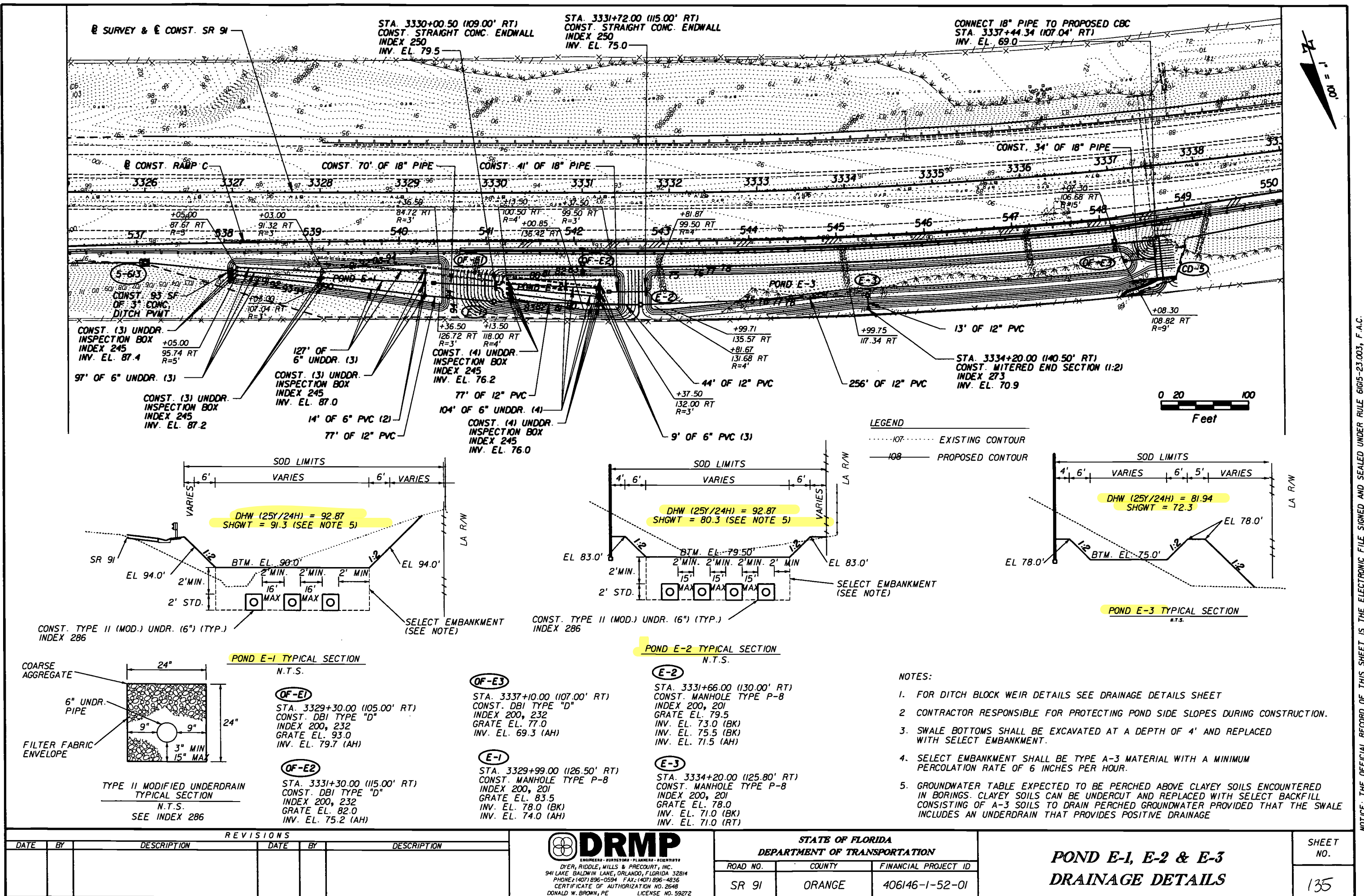
REVISIONS				MARK D. PROCHAK, P.E. P.E. LICENSE NUMBER 43532 DRMP, INC. 941 LAKE BALDWIN LANE ORLANDO, FL 32814 CERTIFICATE OF AUTHORIZATION: 2648	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLAN (9)	SHEET NO. 73
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 91	ORANGE LAKE	435784-1-52-01 435785-1-52-01		

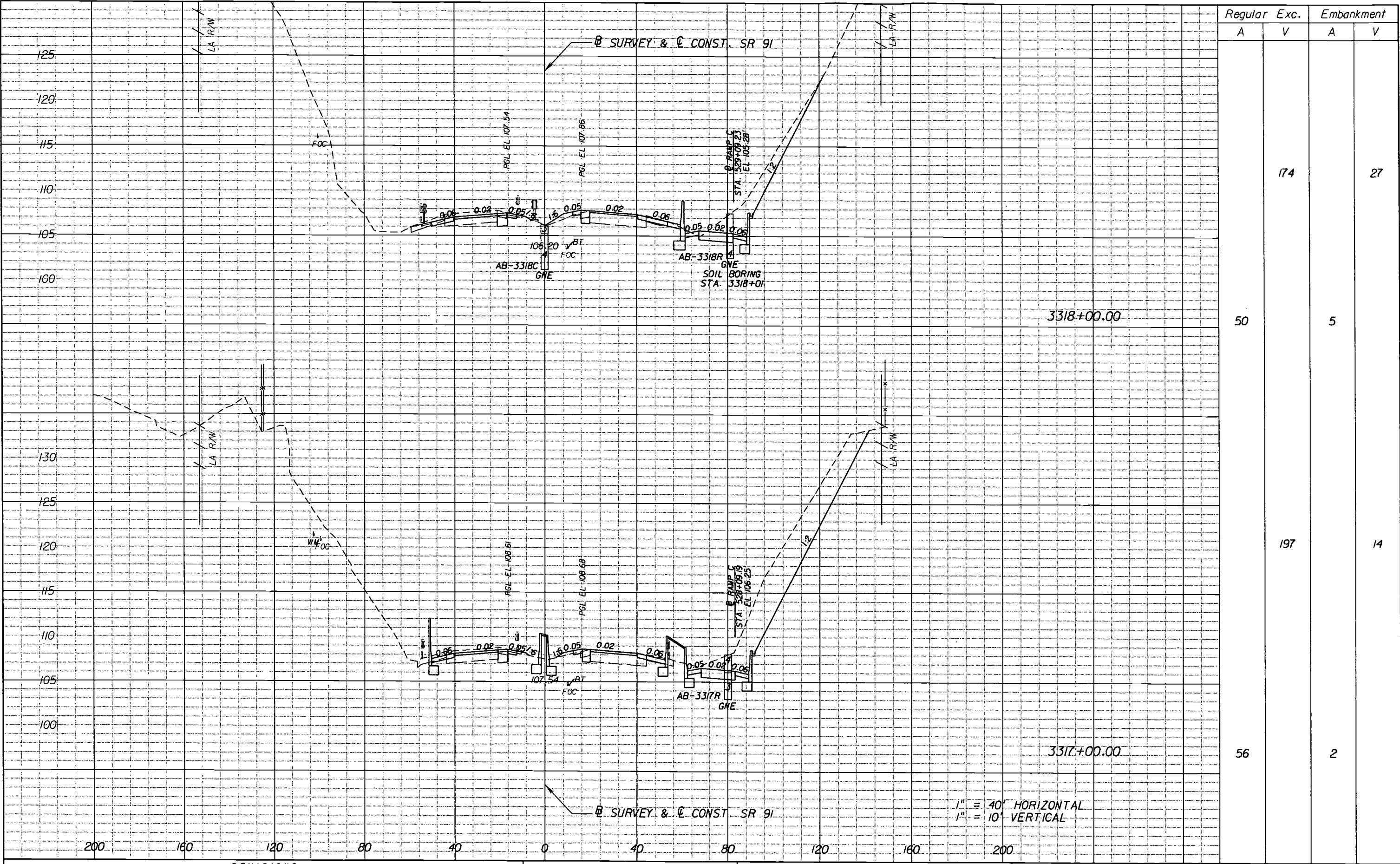


REVISIONS				MARK D. PROCHAK, P.E. P.E. LICENSE NUMBER 43532 DRMP, INC. 941 LAKE BALDWIN LANE ORLANDO, FL 32814 CERTIFICATE OF AUTHORIZATION: 2648	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLAN (10)	SHEET NO. 74
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 91	ORANGE LAKE	435784-1-52-01 435785-1-52-01		



jbearss 5/31/2019 3:01:43 PM T:\15-0389 000\43578415201\roadway\RDWY PLAN SHEETS\PLANRD13.dgn





Regular Exc. Embankment

A V A V

174 27

50 5

197 14

56 2

1" = 40' HORIZONTAL
1" = 10' VERTICAL

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

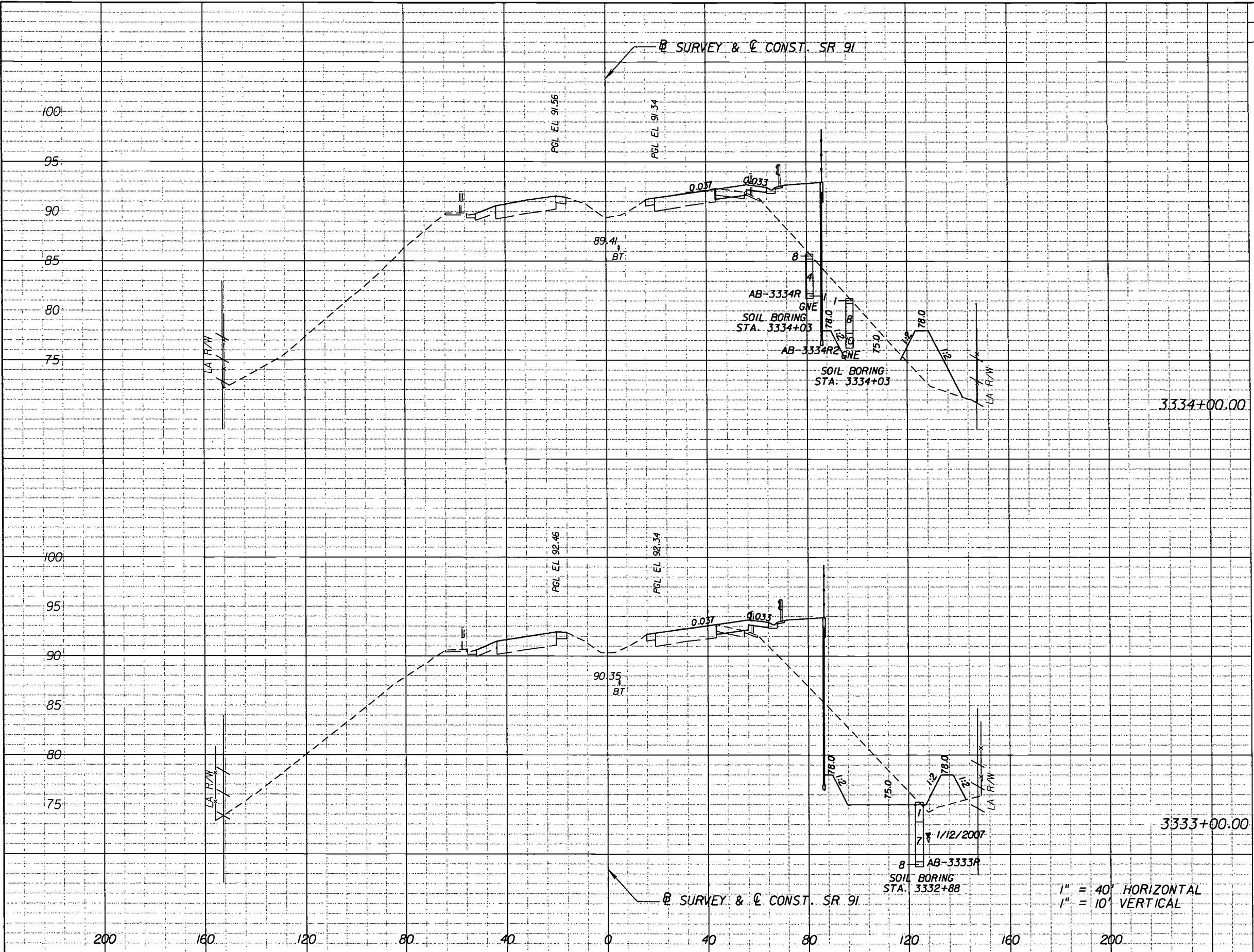
DRMP
ENGINEERS - SURVEYORS - PLANNERS - SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836
CERTIFICATE OF AUTHORIZATION NO. 2648
MARK D. PROCHAK, PE LICENSE NO. 43532

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	ORANGE	406146-1-52-01

CROSS SECTIONS

SHEET NO.
263

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Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
			434		783
		148		187	
			621		641
		188		159	
CROSS SECTIONS					
					SHEET NO.
					271

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DRMP
ENGINEERS - SURVEYORS - PLANNERS - SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836
CERTIFICATE OF AUTHORIZATION NO. 2648
MARK D. PROCHAK, P.E. LICENSE NO. 43532

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
91	ORANGE	406146-1-52-01

CROSS SECTIONS

SHEET NO.
271

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03/30/2007 08:54:49 AM P:\406146\5201\roadway\RD\SRD01_3342.dgn

BASIN SR 408

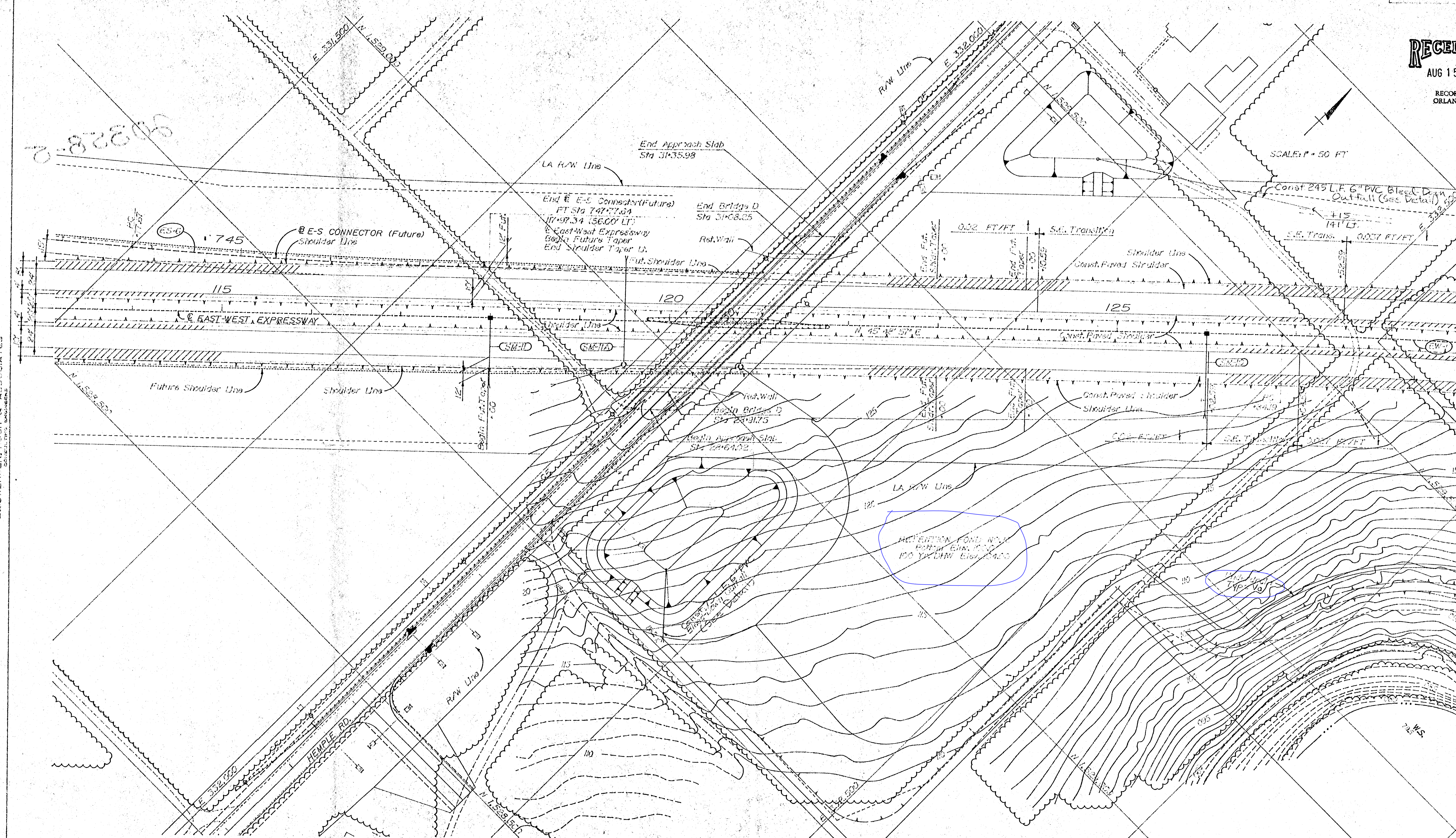
Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

RECEIVED
AUG 15 1988

RECORDS
ORLANDO

SCALE: 1" = 50 FT



BUSWENGER, HOOK & ASSOCIATES
CONSULTING ENGINEERS

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

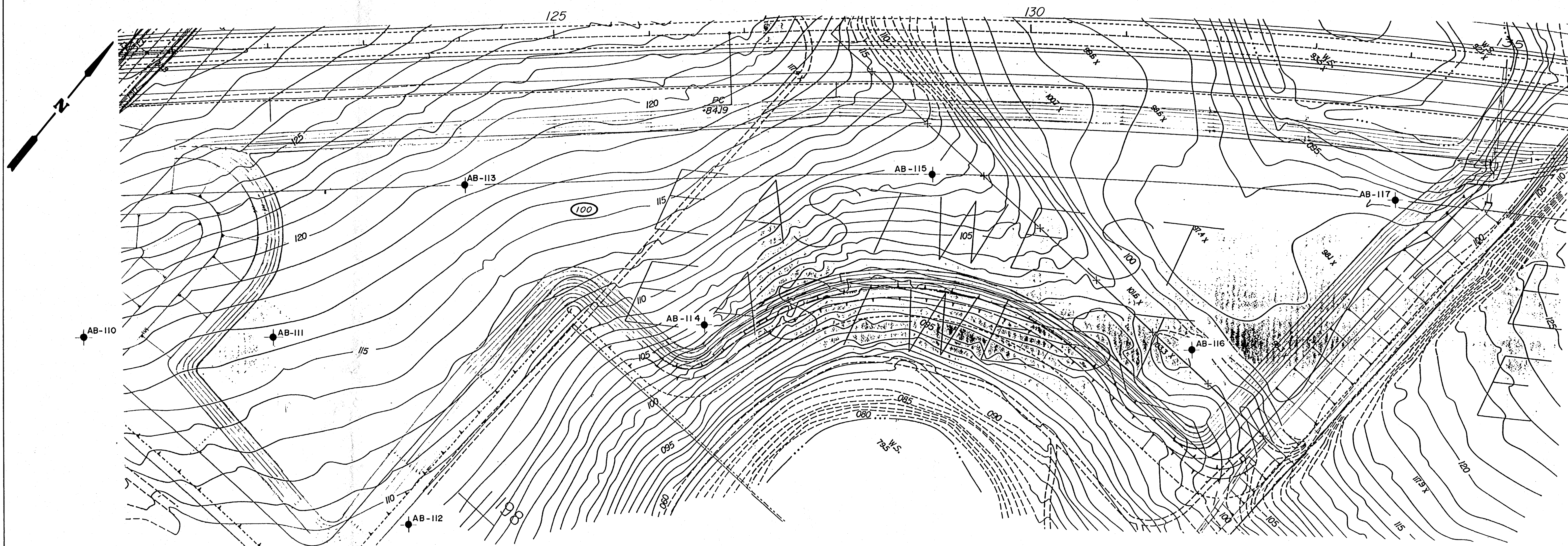
DESIGNED BY	G.B.	DATE	10-87	DRAWN BY	S.M.O.	DATE	
CHECKED BY	D.L.J.	DATE	10-87	CHECKED BY	G.B.	DATE	
SUPERVISED BY	DUNCAN L. JONES, P.E.	DATE					



EAST-WEST EXPRESSWAY
PLAN

CONT'D
FEW2
REV2
28-JUL-1988

RECEIVED
AUG 15 1988
RECORDS
ORLANDO

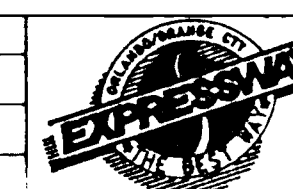


POND NO. 10

SCALE: 1" : 50'

[illegible]

	NAME	DATE		NAME	DATE
DESIGNED BY			DRAWN BY	SEJ, II	
CHECKED BY			CHECKED BY	DWB	
SUPERVISED BY RLG					



ORLANDO-ORANGE COUNTY
EXPRESSWAY AUTHORITY

WESTERLY EXTENSION/TURNTPIKE CONNECTOR OF EAST-WEST EXPRESSWAY

BORING LOCATION PLAN
AB-114 THROUGH AB-117
POND NO. 10

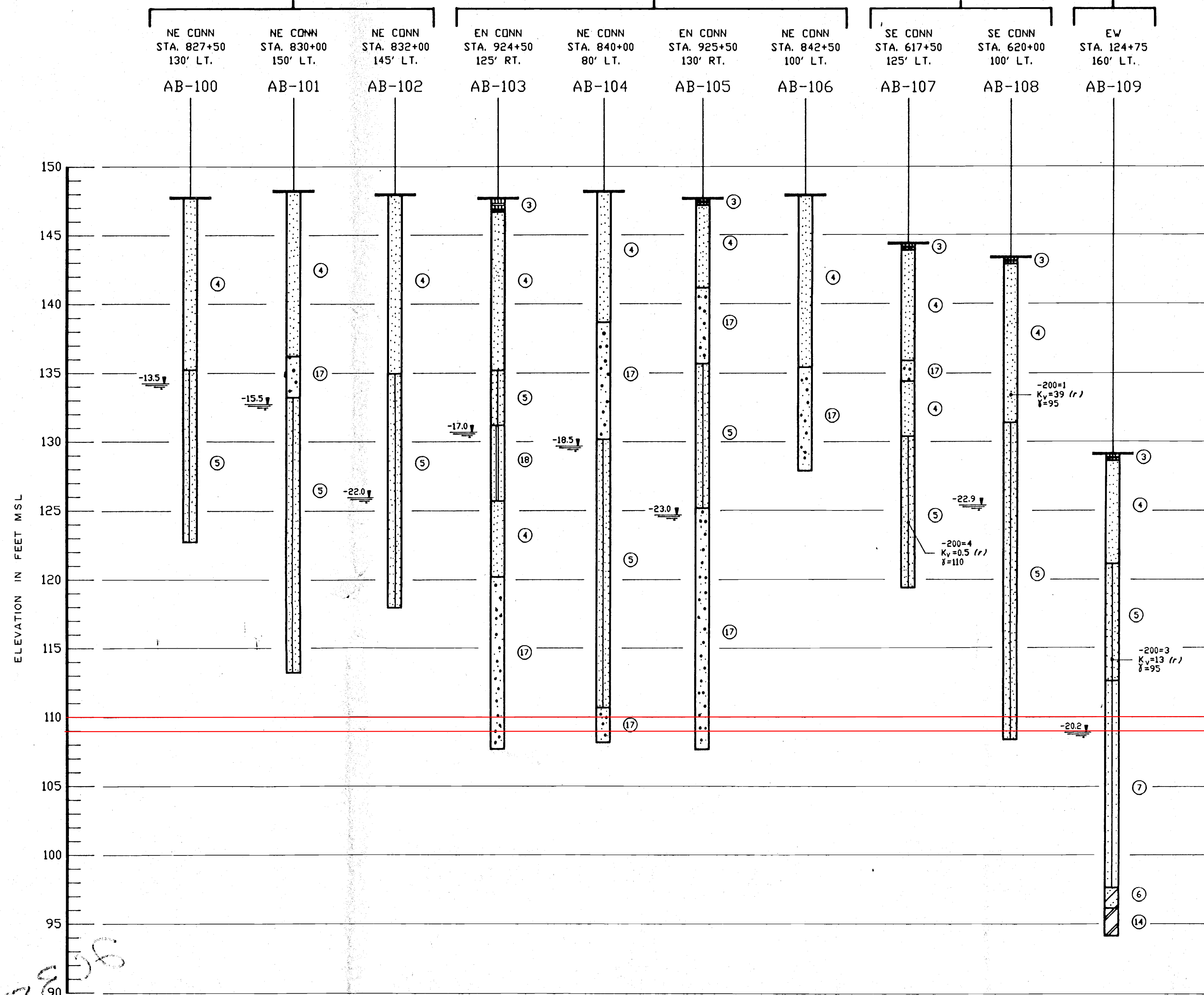
L E G E N D

PROJECT NO. 7502P-6150-501
SHEET NO. 58

RECEIVED
AUG 15 1988

RECORDS:
ORLANDO

- ① LIGHT BROWN TO GREYISH-BROWN, OCCASIONAL ORANGISH-BROWN, FINE SAND AND ROCK (FILL) (SP), (A-3)
- ② DARK GREY SANDY PEAT TO FIBROUS PEAT (PT), (A-8)
- ③ GREY TO DARK GREYISH-BROWN FINE SAND WITH SMALL ROOTS (TOPSOIL) (SP), (A-3)
- ④ LIGHT BROWN TO YELLOWISH-BROWN, OCCASIONAL GREYISH-BROWN, FINE SAND (SP), (A-3)
- ⑤ REDDISH-BROWN TO DARK REDDISH-BROWN SLIGHTLY SILTY TO SILTY FINE SAND, OCCASIONAL SLIGHT CEMENTATION (SP-SM), (SM), (A-3), (A-2-4)
- ⑥ LIGHT GREYISH-BROWN TO GREYISH-BROWN, OCCASIONALLY ORANGISH-BROWN AND GREENISH-GREY, SLIGHTLY CLAYEY TO CLAYEY FINE SAND (SP-SC), (SC), (A-2-4), (A-2-6)
- ⑦ LIGHT BROWN TO LIGHT GREYISH-BROWN, OCCASIONAL ORANGISH-BROWN, SLIGHTLY SILTY TO SILTY FINE SAND (SP-SM), (SM), (A-3), (A-2-4)
- ⑧ LIGHT GREY TO GREYISH-BROWN, OCCASIONALLY GREENISH-GREY AND ORANGISH-BROWN, SANDY CLAY TO SILTY CLAY (CL), (CH), (A-6), (A-7-6)
- ⑨ DARK REDDISH-BROWN ORGANIC TO HIGHLY ORGANIC PLASTIC SANDY SILT TO PLASTIC SILT (OH), (A-7-5)
- ⑩ GREENISH-GREY TO DARK GREENISH-GREY SLIGHTLY CLAYEY TO CLAYEY FINE SAND WITH PHOSPHATES, TRACES OF INDURATED SILT (SP-SC), (SC), (A-2-4), (A-2-6)
- ⑪ LIGHT GREENISH-GREY SLIGHTLY SILTY TO SILTY FINE SAND, TRACES OF PHOSPHATES (SP-SM), (SM), (A-3), (A-2-4)
- ⑫ LIGHT BROWN TO ORANGISH-BROWN SILT, TRACES OF PHOSPHATES AND CALCAREOUS SILT (ML), (A-4)
- ⑬ LIGHT BROWN TO GREENISH-GREY SANDY SILT TO INDURATED SILT, TRACES OF PHOSPHATES AND CALCAREOUS SILT (ML), (A-4)
- ⑭ DARK GREEN SANDY CLAY, TRACES OF PHOSPHATE, OCCASIONAL BROKEN SHELL (CL), (CH), (A-6), (A-7-5)
- ⑮ DARK REDDISH-BROWN ORGANICALLY STAINED CLAY (CH), (A-7-6)
- ⑯ LIGHT BROWN LIMESTONE AND INDURATED LIME SILTS
- ⑰ BROWN TO DARK REDDISH-BROWN FINE SAND (SP), (A-3)
- ⑱ DARK REDDISH-BROWN TO BLACK ORGANIC TO HIGHLY ORGANIC FINE SAND TO SILTY FINE SAND (SP), (SM), (A-3), (A-4)
- ⑲ DARK REDDISH-BROWN TO BLACK HIGHLY ORGANIC CONSOLIDATED PLASTIC SILT WITH SAND TO CONSOLIDATED PLASTIC SILT (OH), (A-7-5)
- ⑳ LIGHT BROWN SILTY CLAY (CH), (A-7-6)
- ㉑ LIGHT GREY TO LIGHT GREENISH-GREY CONSOLIDATED SILTS/CLAYS WITH PHOSPHATES (CL/ML), (A-4)
- ㉒ GREYISH-BROWN CLAYEY FINE SAND (FILL) (SC)
- ㉓ GREENISH-GREY CLAY (FILL) (CL), (A-7-5)
- (SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
- (A-3) A.A.S.H.T.O. SOIL CLASSIFICATION GROUP SYMBOL
- 4.5' DEPTH TO GROUNDWATER LEVEL IN FEET: APRIL 16 THROUGH JUNE 22, 1988
- 200 FINES PASSING #200 SIEVE IN PERCENT
- K_v VERTICAL COEFFICIENT OF PERMEABILITY IN FEET PER DAY
- K_v, r VERTICAL COEFFICIENT OF PERMEABILITY IN FEET PER DAY OBTAINED FROM REMOLDED SAMPLE
- γ MOIST UNIT WEIGHT IN PCF



REVISIONS							
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY

DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
CHECKED BY			CHECKED BY	SEJ, II	
				DWB	

SUPERVISED BY RLG



ORLANDO-ORANGE COUNTY
EXPRESSWAY AUTHORITY

WESTERLY EXTENSION/TURNPIKE CONNECTOR OF EAST-WEST EXPRESSWAY

SOIL PROFILES

Table 2-1 Lake Elevation Data from Orange County

Lake Name	Max Recorded Stage ¹ (ft, NAVD)	NHWE ² (ft, NAVD)
Lake Fischer	92.76	86.95
Lake Hugh	85.25	75.76
Lake Nally	96.54	89.49
Mills Pond	98.58	N/A
Gotha Pond	95.79	85.49

1 – The maximum recorded lake levels were obtained from the available lake level readings obtained from Orange County. The maximum stages were recorded on the following dates: Lake Fischer (11/03/2005), Lake Hugh (02/2006), Lake Nally (11/08/2019), Mills Pond (08/02/2005) and Gotha Pond (09/01/2005).

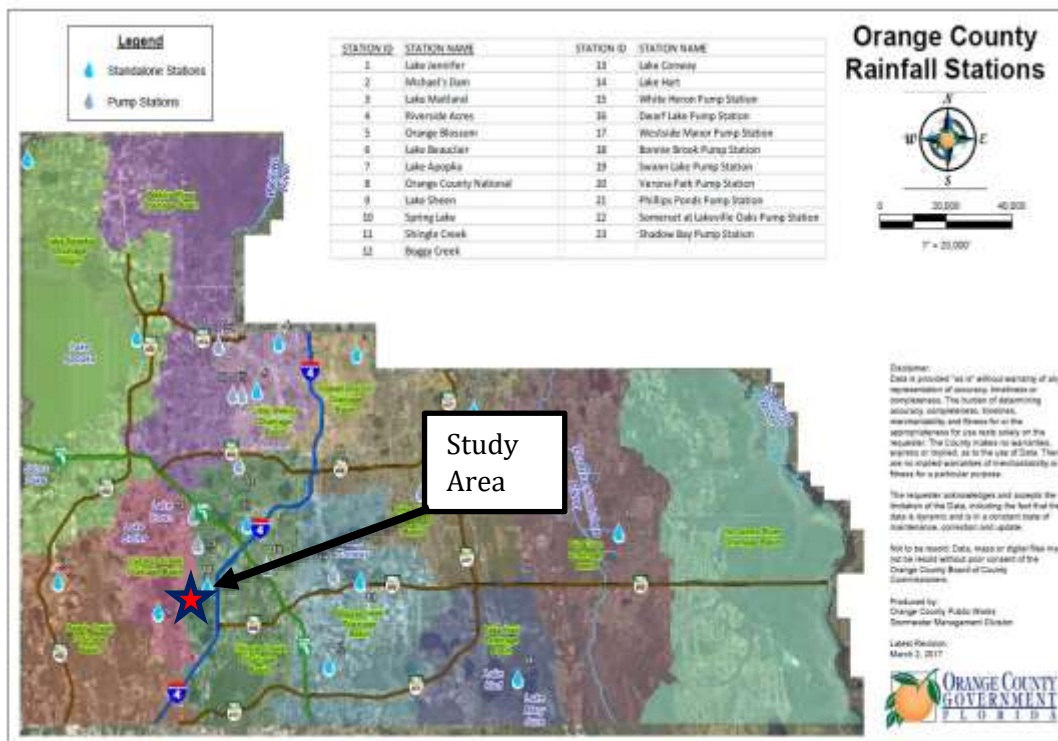
2 – Normal High-Water Elevation established by Orange County.

The Gotha Lakes Reuse Evaluation reports a maximum stage of 82.25 ft, NAVD that occurred in February 2006. The Lake Nally peak stage was recorded at elevation 96.54 ft, NAVD on November 8, 2019 while the Lake Fact Sheet indicated this elevation at 95.16 ft, NAVD (dated November 30, 2005). There are also miscellaneous lake level readings that were taken by the Orange County Survey Section and were reviewed and included in the existing conditions analysis.

Figures 2-2, 2-3 and 2-4 provide historical lake level information and rainfall collected by Orange County for Lake Fischer, Lake Nally and Gotha Pond and Mills Pond, respectively.

2.1.4 Historical Rainfall Data

Rainfall data were obtained from the Orange County Stormwater Management Division for the following stations: Station 5 – Lake Orlando, Station 7 – Lake Apopka, Station 8 – OC National, Station 9 – Lake Sheen, Station 11 – Shingle Creek, and Station 21 – Phillips Pond Pump Station.

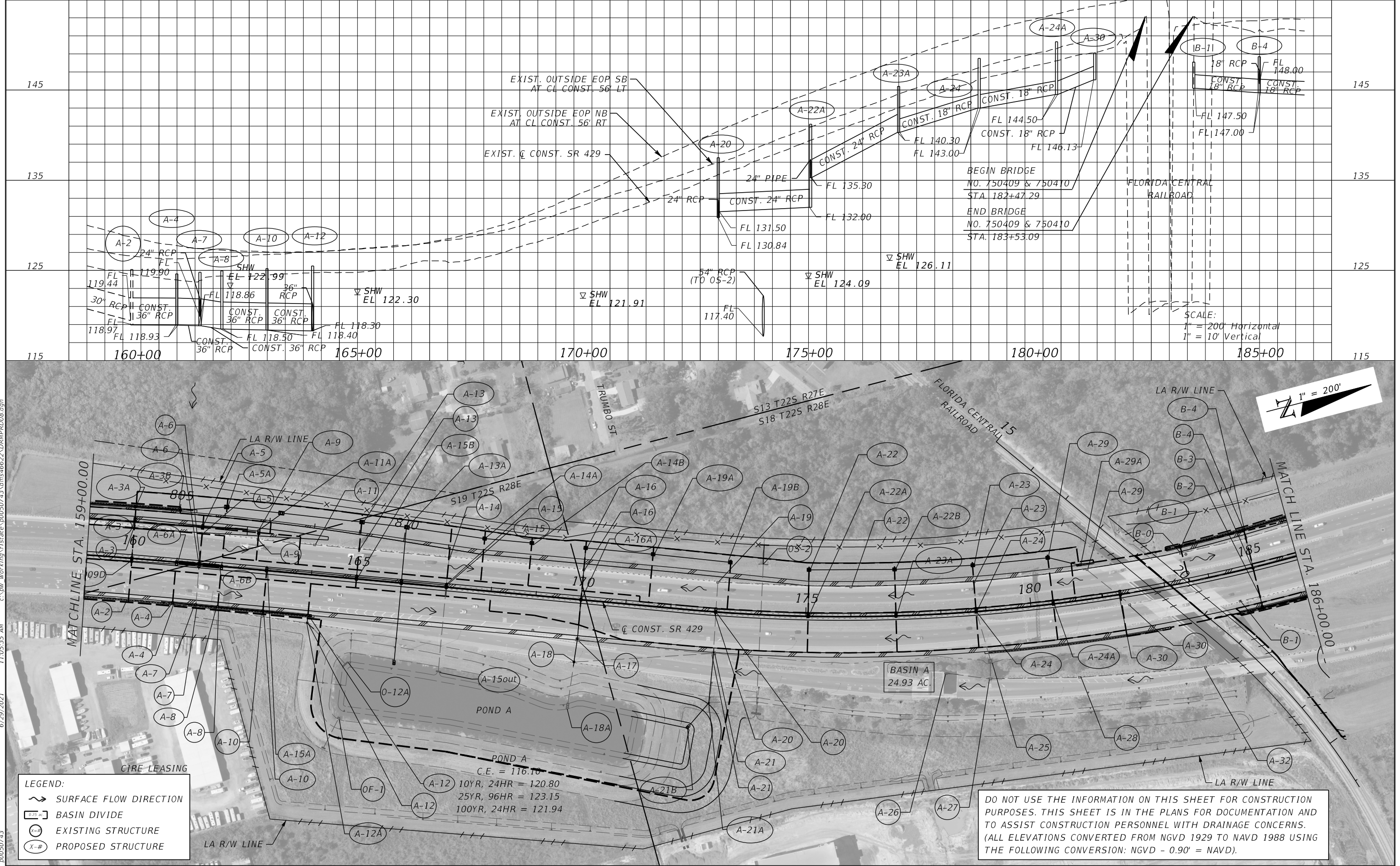


BASIN SR429N

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

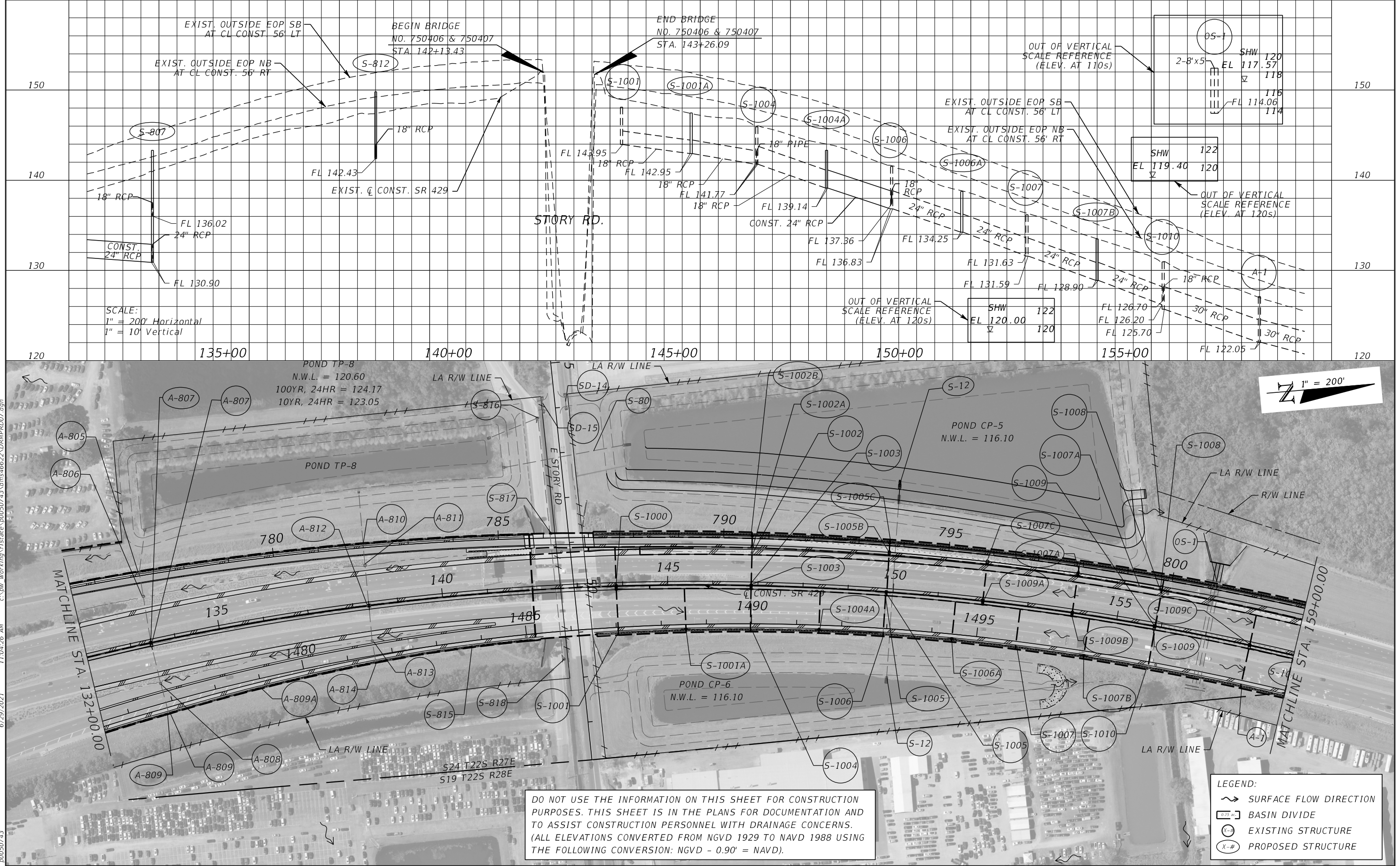
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11:05:35 AM
6/29/2021
p0050743



REVISIONS				EDWARD JAMES KORY, P.E. P.E. LICENSE NUMBER 53178 PARSONS TRANSPORTATION GROUP, INC. 201 EAST PINE STREET, SUITE 900 ORLANDO, FL 32801	SR 429 WIDENING FLORIDA'S TURNPIKE TO WEST ROAD		CENTRAL FLORIDA EXPRESSWAY AUTHORITY	DRAINAGE MAP (8)	SHEET NO. 014
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	PROJECT NO.			
					SR 429	429-152			

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

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6/29/2021
p0050743



REVISIONS				EDWARD JAMES KORY, P.E. P.E. LICENSE NUMBER 53178 PARSONS TRANSPORTATION GROUP, INC. 201 EAST PINE STREET, SUITE 900 ORLANDO, FL 32801	SR 429 WIDENING FLORIDA'S TURNPIKE TO WEST ROAD		CENTRAL FLORIDA EXPRESSWAY AUTHORITY	DRAINAGE MAP (7)		SHEET NO. 013
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	PROJECT NO.				
					SR 429	429-152				

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

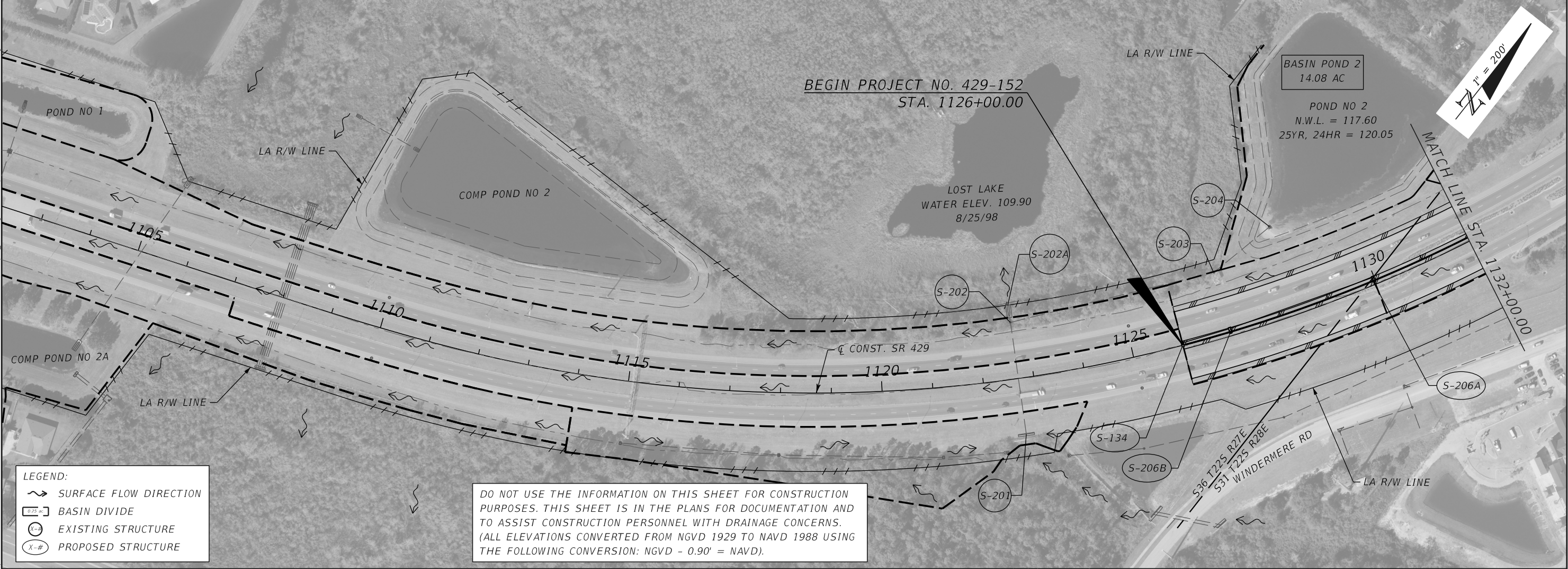
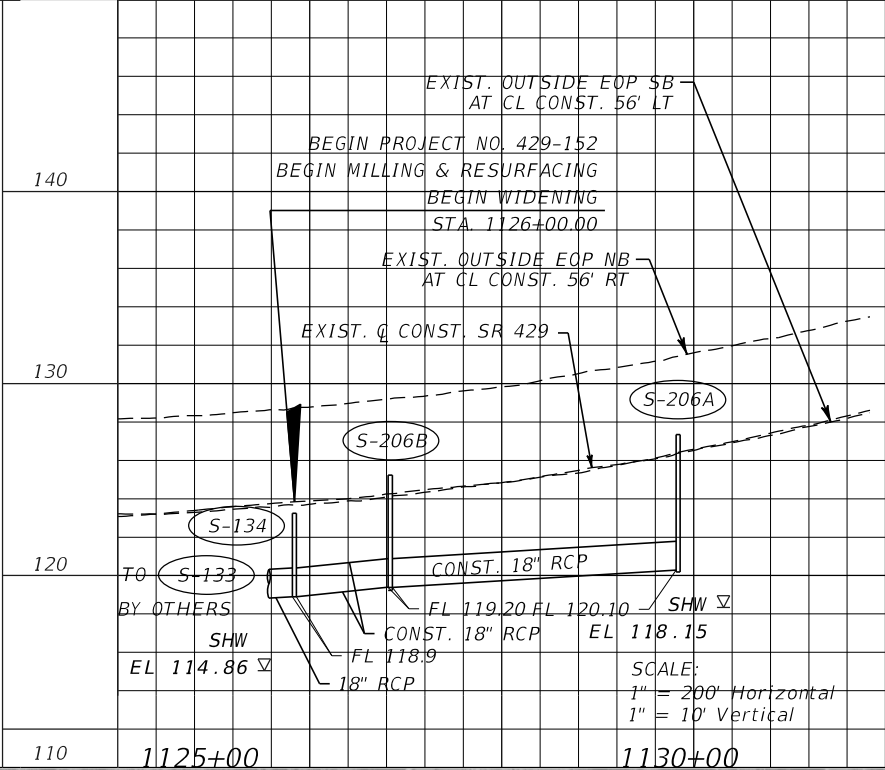
BASIN SR429S

Drainage Design Documentation

SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01

STRUCTURE NO.	STATION	DESIGN FLOOD		BASE FLOOD		OVERTOPPING FLOOD				GREATEST FLOOD			
		2% PROB	50 YR FREQ	1% PROB	100 YR FREQ								
		DISCHARGE	STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	PROB %	FREQ YR%	DISCHARGE	STAGE	PROB %	FREQ YR%
OS-1	157+00.00	160.00	117.57	175.00	117.75	N/A	N/A			238.00	118.43	0.2	500
OS-2	174+00.00	N/A	N/A	N/A	121.70	N/A	N/A			N/A	N/A	0.2	N/A
OS-3	59+67 (SR 438)	10.6	120.55	11.90	120.67	N/A	N/A			16.20	121.16	0.2	500
OS-10	279+00.00	10.70	102.49	12.10	102.73	N/A	N/A			16.40	103.83	0.2	500
OS-11	300+00.00	82.60	112.86	93.00	113.69	N/A	N/A			126.40	116.87	0.2	500
OS-13	309+00.00	22.70	122.50	25.50	122.61	N/A	N/A			43.40	123.24	0.2	500

NOTE: THE HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY, TO INDICATE THE FLOOD DISCHARGES AND WATER SURFACE ELEVATIONS WHICH MAY BE ANTICIPATED IN ANY GIVEN YEAR. THIS DATA WAS GENERATED USING HIGHLY VARIABLE FACTORS DETERMINED BY A STUDY OF THE WATERSHED. MANY JUDGEMENTS AND ASSUMPTIONS ARE REQUIRED TO ESTABLISH THESE FACTORS. THE RESULTANT HYDRAULIC DATA IS SENSITIVE TO CHANGES, PARTICULARLY OF ANTECEDENT CONDITIONS, URBANIZATION, CHANNELIZATION, AND LAND USE. USERS OF THIS DATA ARE CAUTIONED AGAINST THE ASSUMPTION OF PRECISION WHICH CAN NOT BE ATTAINED. DISCHARGES ARE IN CUBIC FEET PER SECOND (CFS) AND STAGES ARE IN FEET, NAVD 88.



LEGEND:

SURFACE FLOW DIRECTION

BASIN DIVIDE

EXISTING STRUCTURE

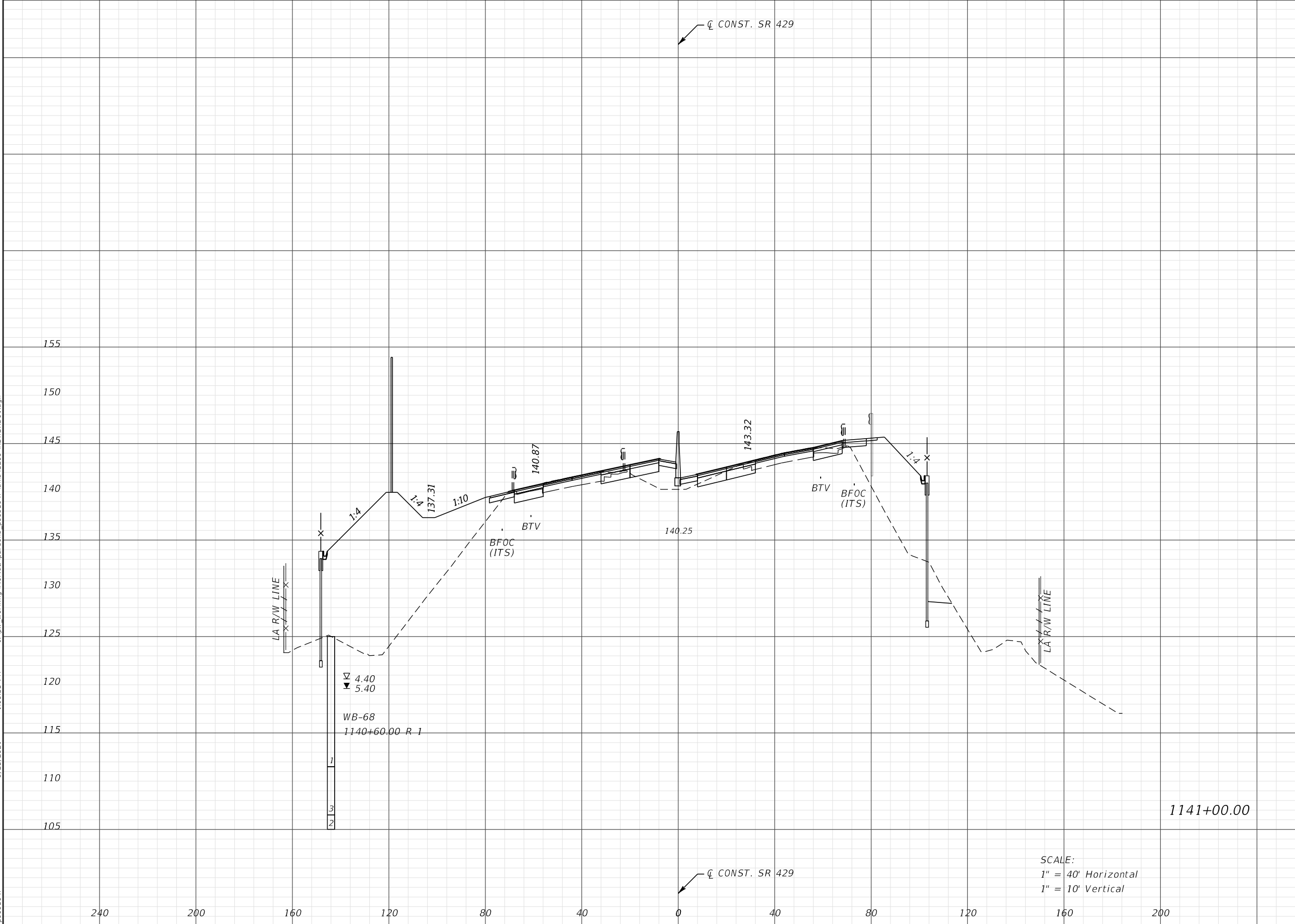
PROPOSED STRUCTURE

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS. (ALL ELEVATIONS CONVERTED FROM NGVD 1929 TO NAVD 1988 USING THE FOLLOWING CONVERSION: NGVD - 0.90' = NAVD).

REVISIONS				EDWARD JAMES KORY, P.E. P.E. LICENSE NUMBER 53178 PARSONS TRANSPORTATION GROUP, INC. 201 EAST PINE STREET, SUITE 900 ORLANDO, FL 32801	SR 429 WIDENING FLORIDA'S TURNPIKE TO WEST ROAD		DRAINAGE MAP (1)	SHEET NO. 007
DATE	DESCRIPTION	DATE	DESCRIPTION					

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

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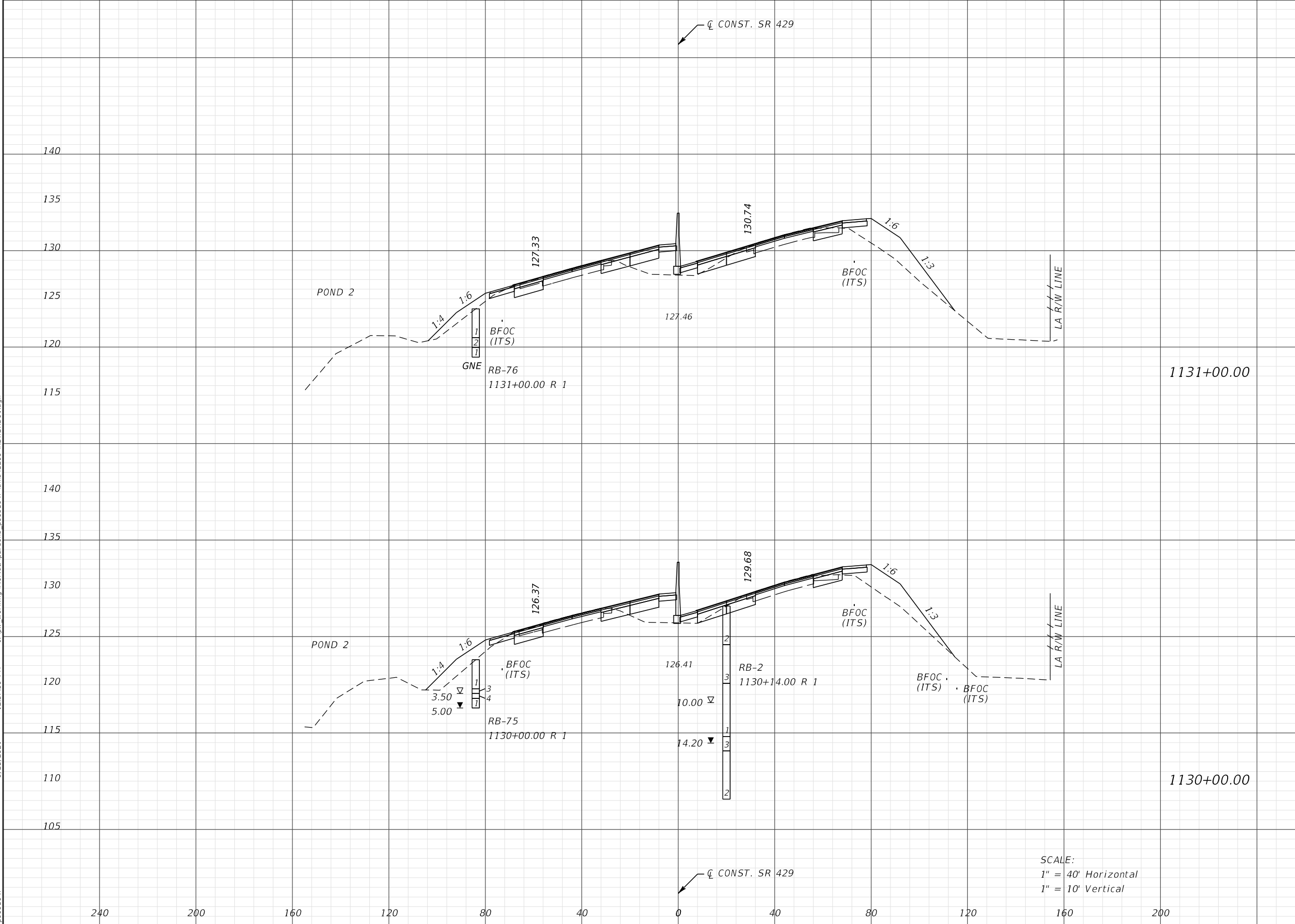


Regular	Exc.	Embankment	
		A	V
91	396	911	3185

REVISIONS				RONALD J. GARLAND, P.E. P.E. LICENSE NUMBER 60878 PARSONS TRANSPORTATION GROUP, INC. 201 EAST PINE STREET, SUITE 900 ORLANDO, FL 32801	SR 429 WIDENING FLORIDA'S TURNPIKE TO WEST ROAD		CENTRAL FLORIDA EXPRESSWAY AUTHORITY	<i>CROSS SECTIONS</i> <i>SR 429</i>		SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	PROJECT NO.				
					SR 429	429-152				466

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

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SCALE:
1" = 40' Horizontal
1" = 10' Vertical

Regular		Exc.	Embankment	
A		V	A	V
57		209	127	474
56		215	129	476

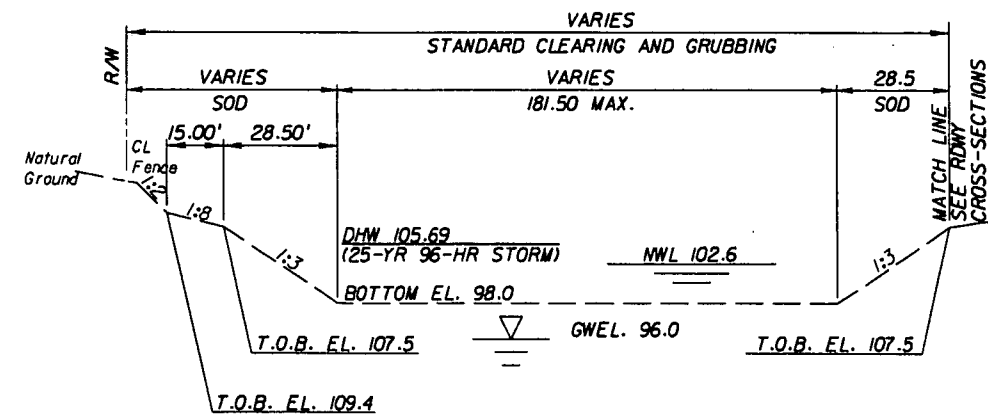
REVISIONS				RONALD J. GARLAND, P.E. P.E. LICENSE NUMBER 60878 PARSONS TRANSPORTATION GROUP, INC. 201 EAST PINE STREET, SUITE 900 ORLANDO, FL 32801	SR 429 WIDENING FLORIDA'S TURNPIKE TO WEST ROAD		<div>CENTRAL FLORIDA EXPRESSWAY AUTHORITY</div>	<div>CROSS SECTIONS</div> <div>SR 429</div>		SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	PROJECT NO.				459
					SR 429	429-152				

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

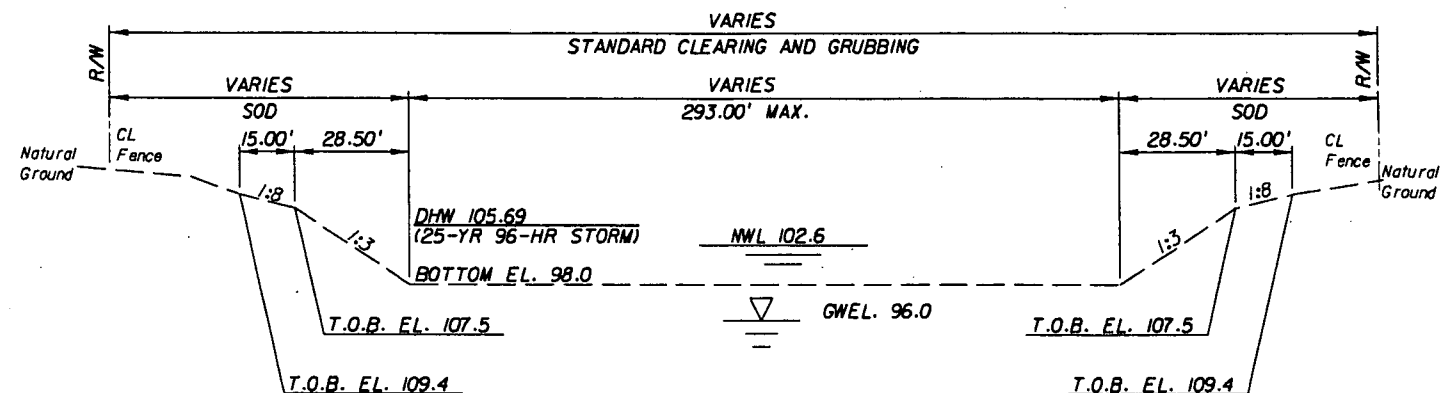
BASIN DSR50N

Drainage Design Documentation

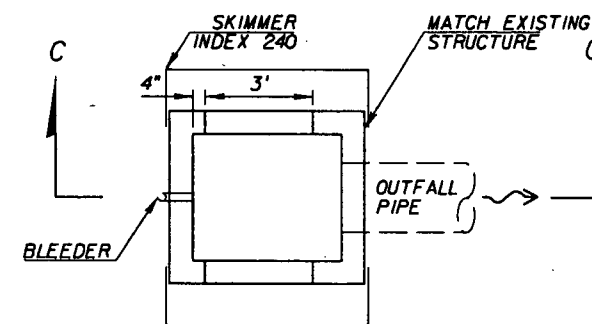
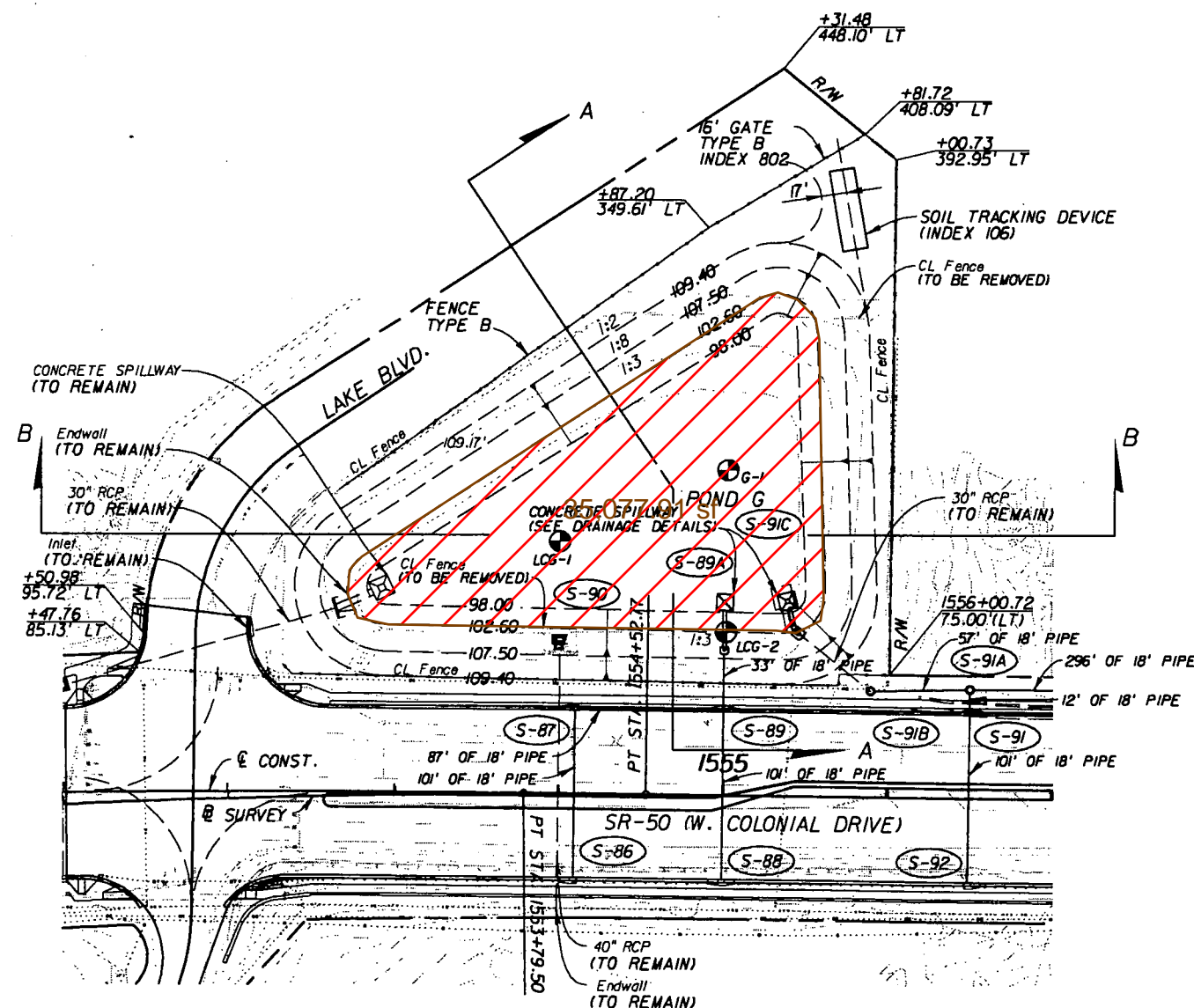
SR 44 at Kepler Road Intersection Improvements
Florida Department of Transportation District 5
Financial Project ID 431922-1-32-01



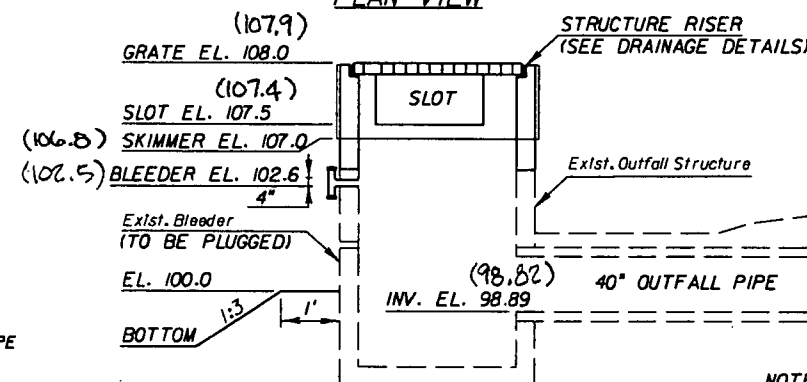
TYPICAL SECTION A-A
N.T.S.



TYPICAL SECTION B-B
N.T.S.



PLAN VIEW



SECTION C-C

S-90
STA. 1554+00.00 (93.58' LT.)
PARTIAL INLET TOP INDEX NO. 232
POND OUTFALL STRUCTURE
N.T.S.

DATA SHOWN IN () IS AS-BUILT DATA

JOHN F. CHENEY, PLS No. 4286
DRMP, INC.
101 N. WOODLAND BLVD., SUITE A-301
(386)785-0046

NOTE: AS-BUILT ELEVATIONS AS SHOWN HEREON
ARE BASED ON BM#30 AS PER PLAN SHEET No. 110
FDOT BRASS DISK IN CONC. MONUMENT STAMPED
"D5 PNC 7502J 034" STA. 424+09.64, 80.26' RT.
ELEV = 128.150

NOTES:

1. IT IS ASSUMED THIS POND WILL BE BUILT UNDER FPID 238429-8-52-01 (PLAZA COLLINA) PRIOR TO CONSTRUCTION.
2. THE EXISTING WET DETENTION AREA SHALL REMAIN AS IS.
3. CONTRACTOR SHALL RESTORE SODDING AFTER REMOVAL OF FLUMES AND CONSTRUCTION OF CONCRETE SPILLWAYS TO MATCH EXISTING.
4. CONTRACTOR SHALL MAINTAIN POND AREA DURING CONSTRUCTION. MAINTENANCE INCLUDES RE-GRADING AND RE-SODDING OF BERM.

POND NO. G
WET DETENTION AREA

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

ENGINEER OF RECORD:
ERNESTO A. FABREGAS, P.E. NO.: 53841
C3TS, PA
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
MIAMI (305) 445-2900 FLORIDA (800) 448-0227
CERTIFICATION OF AUTHORIZATION NO. 0005022

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-50	LAKE & ORANGE	238429-4-52-01

RETENTION/ DETENTION PONDS		SHEET NO.
		193

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G5-23.003, F.A.C.

Project Name: SR-50 From West of Hancock Road to East of Turnpike

Project Number: 2384294

Calculated by EF

Date 7/18/2006

Checked by _____

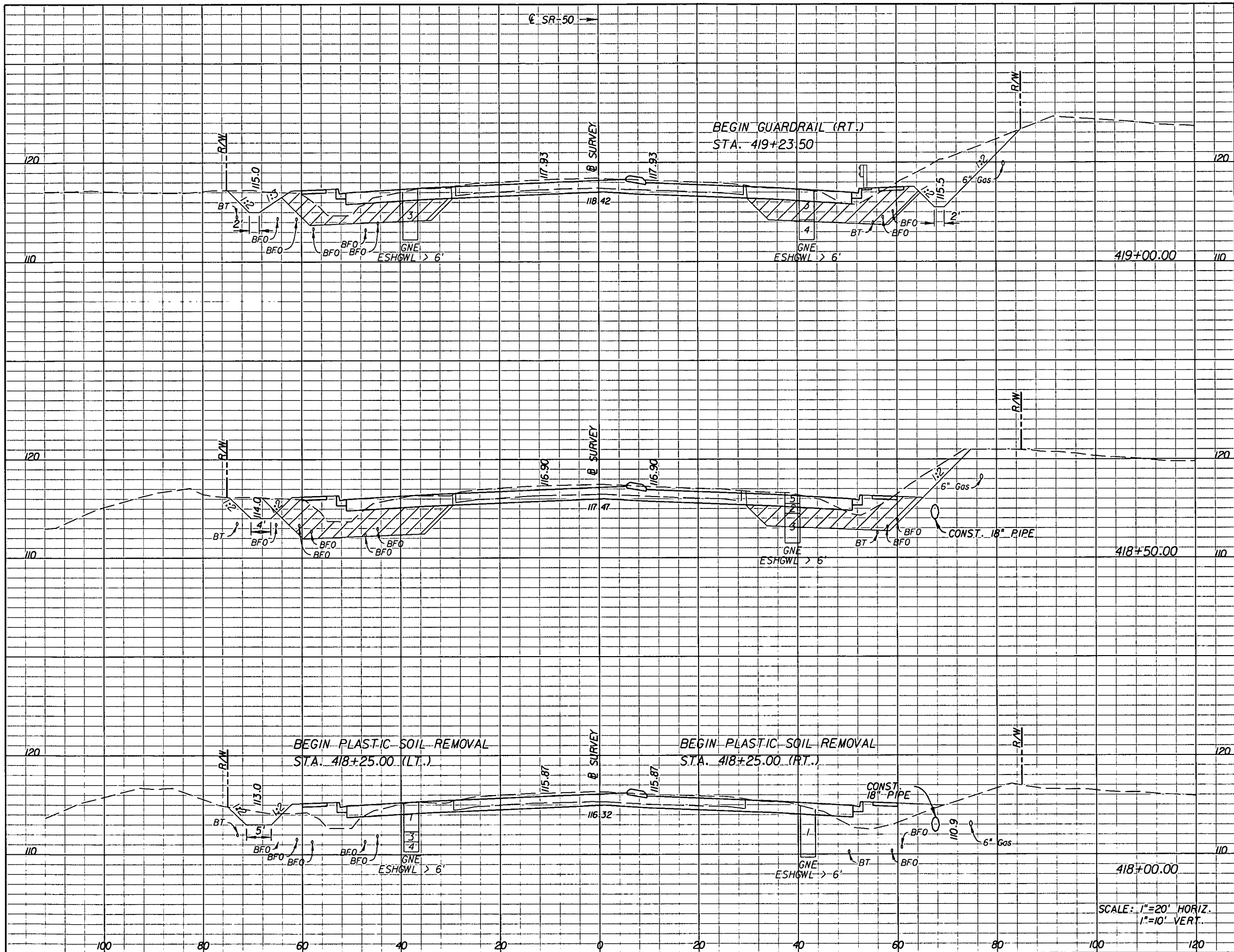
Date _____

EXHIBIT E (MODIFIED)

WATER QUALITY AND ATTENUATION

POND	TREAT- MENT	DRAINAGE AREA (Acres)	REQUIRED STORAGE		PROVIDED STORAGE					RESIDENCE VOLUME (Ac-ft)	TREATMENT PROVIDED (Inch)
			W.Q. (Ac-ft)	ATTEN. (Ac-ft)	CONTROL ELEVATION		STORAGE ELEVATION		VOLUME (Ac-ft)		
					ELEV.	AREA	ELEV.	AREA			
D	Dry	84.79	7.07	1.07	166.00	1.470	184.00	2.634	36.94	N/A	5.23
E _{mod.}	Wet	37.73	3.79	9.13	96.00	2.458	100.00	2.766	10.448	19.004	3.32
F	Wet	35.23	3.34	7.72	92.00	2.848	95.00	3.111	8.866	15.565	3.02
G _{mod.}	Wet	19.11	1.59	2.48	104.50	1.019	107.50	1.206	3.338	5.312	2.10
H	Wet	18.14	2.21	5.83	101.50	0.822	109.50	1.283	8.421	5.492	5.57
I	Dry	37.93	3.16	12.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A
J	Wet	13.43	1.16	3.41	115.50	2.526	117.00	2.671	3.898	3.680	3.48

- NOTES:**
- 1- The Drainage areas are the basin area contributing to each pond.
 - 2- Provided storage is the volume from the bleeder invert (Control Elevation) to the weir invert (Storage Elevation).
 - 3- The treatment provided is the Provided Storage divided by the Drainage Area.
 - 4- The Residence Volume is the storage capacity from pond bottom to bleeder invert.
 - 5- The runoff attenuation is based on the 25-year 96-hour Design Storm from SJRWMD for Land Locked Areas.
 - 6- Pond D is an existing Dry Retention Area To remain "as is".
 - 7- Pond I represents the Water Management Facilities within the Turnpike Interchange, designed under Turnpike's Projects.



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
128	253	203	410	148	293
146	135	240	390	168	197
0	0	182	279	45	94

SCALE: 1"=20' HORIZ.
1"=10' VERT.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

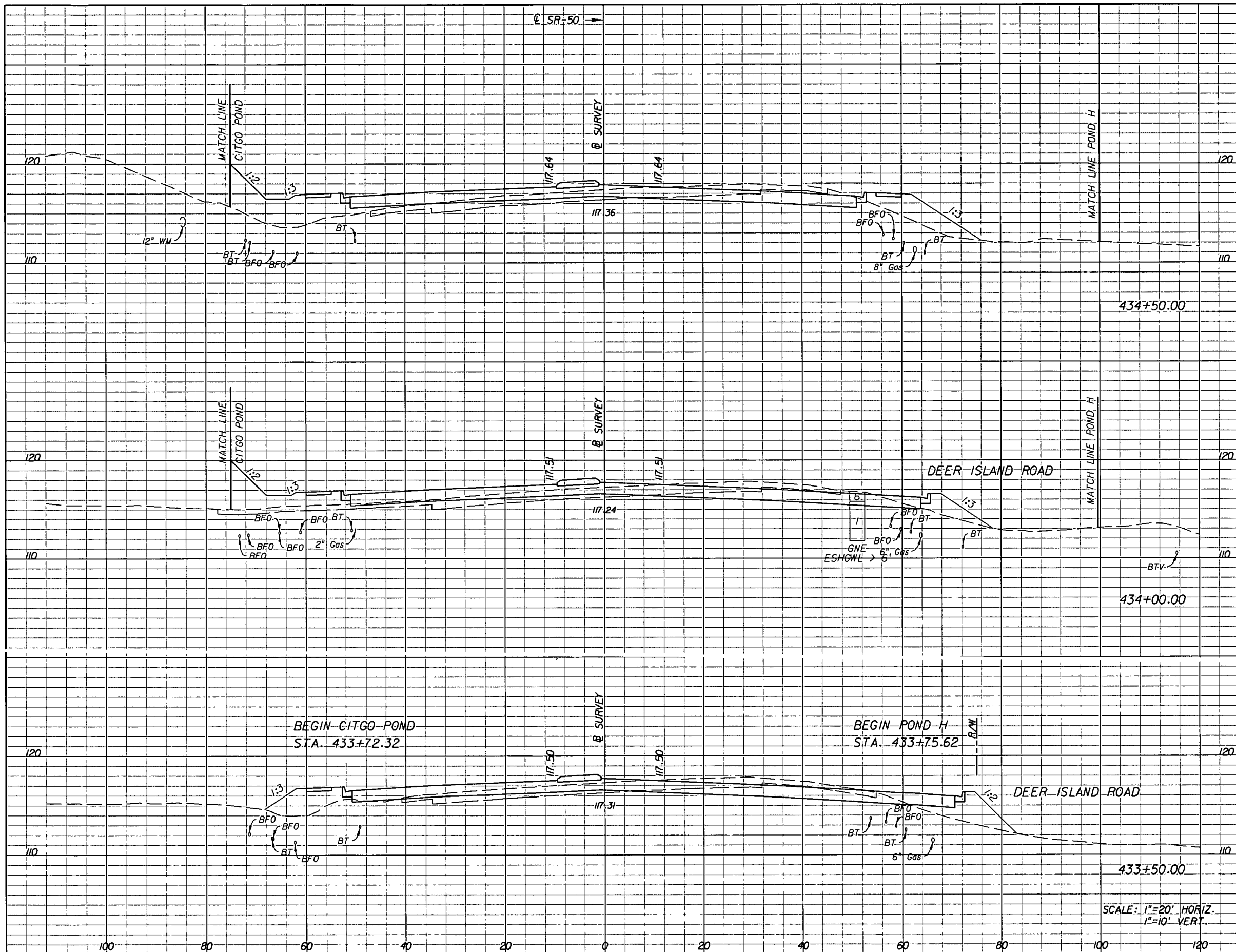
ENGINEER OF RECORD:
WALFRIDO J. PEVIDA, P.E. NO.: 51472
C3TS, PA
901 PONCE DE LEON BLVD., SUITE 900
CORAL GABLES, FLORIDA 33134
MIAMI (305) 445-2900 FLORIDA (800) 448-0227
CERTIFICATION OF AUTHORIZATION NO. 0005022

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-50	LAKE & ORANGE	238429-4-52-01

CROSS SECTIONS


SHEET NO.
333

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 6105-23.003, F.A.C.



Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V
0	0	91	179	119	175
0	0	103	193	70	119
0	0	106	194	59	140

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION


ENGINEER OF RECORD:
 WALFRIDO J. PEVIDA, P.E. NO.: 51472
 C3TS, PA
 901 PONCE DE LEON BLVD., SUITE 900
 CORAL GABLES, FLORIDA 33134
 MIAMI (305)-445-2900 FLORIDA (800)-448-0227
 CERTIFICATION OF AUTHORIZATION NO. 0005022

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR-50	LAKE & ORANGE	238429-4-52-01

CROSS SECTIONS
 SCALE: 1"=20' HORIZ.
 1"=10' VERT.

SHEET NO.
346

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G5-23.003, F.A.C.