Pond Siting Report

Florida Department of Transportation

District 2

SR 16 PD&E Study

(from International Golf Parkway to I-95)

St. Johns County, Florida

Financial Management Number: 210447-5

ETDM Number: 14535

July 2025

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

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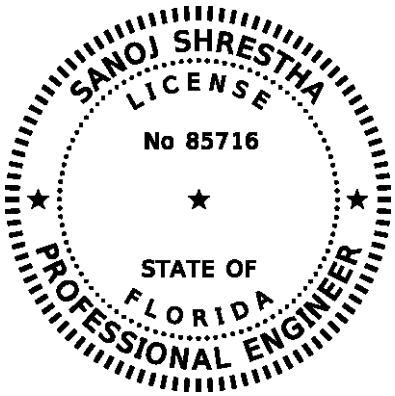

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RS&H, INC.
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1.0 Project Summary

1.1 Project Description

This Project Development and Environment (PD&E) Study involves a 5.9-mile segment of State Road (SR) 16 from International Golf Parkway (IGP) to I-95 in St. Johns County, Florida, near the City of St. Augustine. A map of the project limits is shown in **Figure 1.2.1**. Within the study limits, SR 16 is functionally classified as an urban principal arterial – other from IGP to South Francis Road and rural principal arterial – other from South Francis Road to I-95. Between IGP and the St. Augustine Outlet Mall, approximately 5.1 miles, SR 16 is a two-lane undivided roadway with sporadic turn lanes and no pedestrian or bicycle features. **Figure 1.1.1** shows the existing typical section for this segment. From the St. Augustine Outlet Mall to I-95, approximately 0.8 miles, SR 16 is generally a four-lane divided roadway with a sidewalk located on both sides of the road; however, there is a 0.3-mile stretch with no sidewalk from the start of the four-lane section to the southern entrance of the St. Augustine Outlet Mall. **Figure 1.1.2** shows the existing typical section for this segment.

Figure 1.1.1: Existing Typical Section

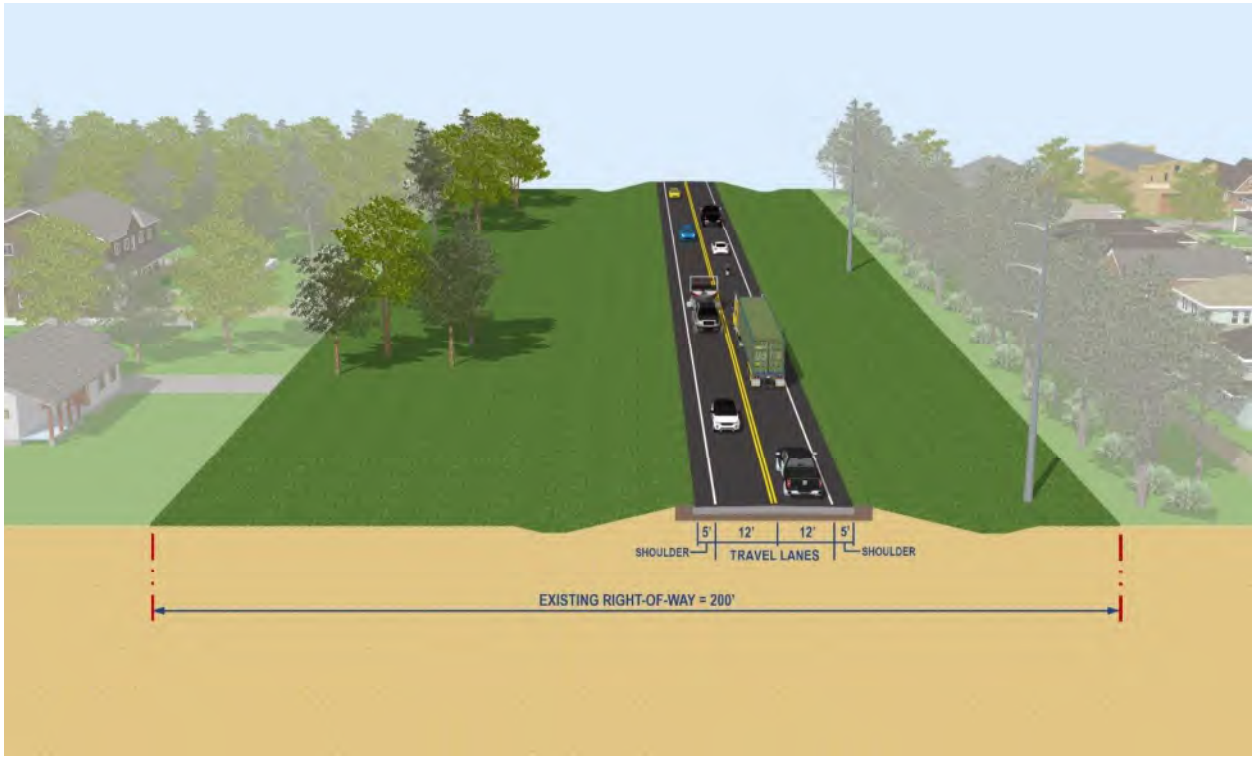


Figure 1.1.2: Existing Typical Section

This study will evaluate widening the existing two-lane rural undivided roadway to a four-lane divided rural roadway. In addition, multi-modal transportation improvements including continuous bicycle and pedestrian facilities will be evaluated. SR 16 has one existing bridge (bridge number 780064) over Turnbull Creek. The structural integrity and functionality of this bridge will be evaluated.

1.2 Purpose & Need

The purpose of this project is to improve traffic mobility, reduce congestion, and address safety on SR 16 from IGP to I-95.

The project is needed to address traffic congestion and safety concerns. A secondary need for the project is to accommodate planned developments.

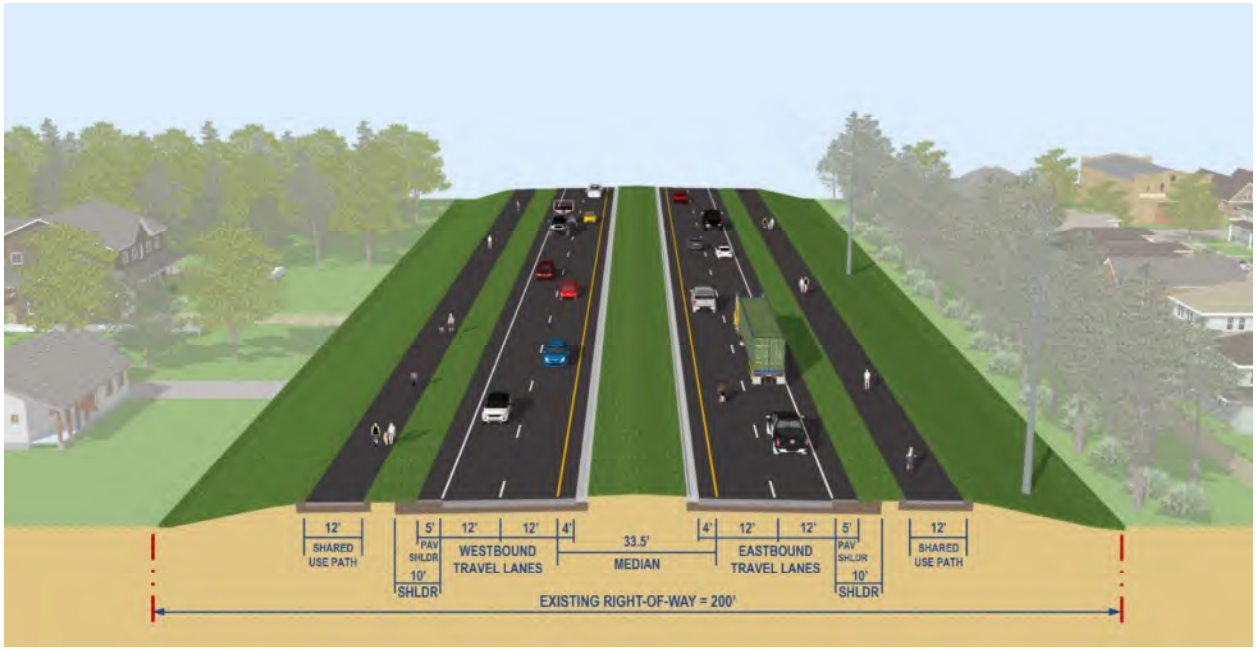
Figure 1.2.1: Project Location Map

1.3 Alternatives Analysis

SR 16 is divided into two segments: Segment 1: IGP to the St. Augustine Outlet Mall, and Segment 2: St. Augustine Outlet Mall to I-95. St. Johns County is upgrading the portion of SR 16 between IGP and the proposed CR 2209, approximately 0.75 miles. The proposed improvements described below will tie into the County's project.

Segment 1 will require milling, resurfacing, and widening to the existing SR 16 lanes (future eastbound lanes), along with constructing additional westbound lanes. The proposed typical section features a four-lane divided high-speed arterial with curb and gutter in the median and flush outside shoulders. The roadway consists of two 12-foot-wide lanes in each direction with a four-foot-wide paved inside shoulder and a 10-foot-wide outside shoulder (five-foot paved). The opposing lanes are divided by a 33.5-foot-wide raised grassed median (including the inside four-foot-wide shoulder width). A 12-foot-wide shared use path is proposed on both sides of SR 16. The existing right-of-way is approximately 200 feet, and no additional right-of-way is required to accommodate the proposed typical section. Figure 1.3.1 shows the proposed typical section for Segment 1.

Figure 1.3.1: Proposed Typical Section



The proposed design speed is 45 miles per hour (mph) from IGP to CR 2209, 55 mph from east of CR 2209 to west of the St. Augustine Outlet Mall, then from St. Augustine Outlet Mall to I-95 is 45 mph.

SR 16 is currently a two-lane undivided roadway, which is classified as non-restrictive, meaning there are no median openings. Upgrading Segment 1 to a four-lane divided facility will require the implementation of access management. The proposed access management classification is Class 3, which states directional median openings may be spaced at 1,320 feet and full median openings or signals may be spaced every 2,640 feet.

Segment 2 is already four lanes in the existing condition. Segment 2 is anticipated to meet the target LOS of D with proposed intersection improvements, so no additional capacity is recommended within this segment. The shared use paths from Segment 1 will be extended and will tie into the existing sidewalk. Safety and operational improvements are being evaluated within this segment of SR 16, including the improvements to the Toms Road intersection. The Toms Road intersection features a through-cut intersection to better direct vehicles through the intersection and reduce the risk of head-on and left-turn crashes. Segment 2 will maintain its access management classification of Class 3.

2.0 Existing Conditions

2.1 General Drainage Conditions

The project is located along the existing SR 16 roadway corridor between International Golf Parkway and I-95 within the limits of the Sixmile Creek basin contributing to the Lower St. Johns River basin. The majority of the corridor drains to Turnbull Creek, while the western portion drains to Mill Creek, both tributaries ultimately to Sixmile Creek. The area along the corridor is generally flat and consists of undeveloped and developed upland areas draining towards lower wetland areas. The existing SR 16 road base was generally constructed at grade and is slightly elevated above the surrounding areas. Stormwater runoff sheds from the roadway pavement, collects in a series of roadside ditches, and is conveyed to Turnbull Creek, which crosses the corridor near the center of the project limits. Areas at the western end of the project are conveyed towards the IGP intersection towards Mill Creek.

2.2 Drainage Basins

As mentioned above, most of the corridor drains to Turnbull Creek, a named tributary of Sixmile Creek, while the western portion drains to Mill Creek, also a named tributary of Sixmile Creek. The basin divide is just east of the Mura Bella Community based on the U.S. Geological Survey (USGS) LiDAR data. West of the basin divide, stormwater runoff is collected and conveyed in roadside stormwater ditches west toward IGP and ultimately reaches Mill Creek. East of the basin divide, stormwater runoff is collected and conveyed in roadside stormwater ditches directly into Turnbull Creek. At the eastern end of the project, stormwater runoff is collected and conveyed in roadside stormwater ditches to a channel that eventually outfalls at the northern limits of Turnbull Creek. Both Mill Creek and Sixmile Creek are considered open basins that eventually outfall into the St. Johns River and the Atlantic Ocean. Within the project limits, the existing roadway basins total approximately 105 acres in area measured along the SR 16 corridor from IGP to I-95.

2.3 Receiving Waterbodies

Turnbull Creek is part of the Sixmile Creek Water Body Identification (WBID# 2411). Sixmile Creek is a class 3F water body and is not a verified impaired basin through the Florida Department of

Environmental Protection (FDEP)'s Total Maximum Daily Load (TMDL) Program. Mill Creek (WBID# 2460) is also a class 3F water body; however, it is a verified impaired basin for Iron and Escherichia coli. The watershed of Moultrie Creek (WBID# 2493) borders SR 16 at the St Augustien Outlet Mall, but stormwater runoff from this project does not drain into Moultrie Creek.

2.4 Cross Drains

There are multiple existing culverts within the project limits. **Table 2-1: Summary of Existing Cross Drains** provides a summary of the existing culverts. See **Appendix H – Straight Line Diagrams** for more information regarding the existing structures along SR-16.

Table 2-1: Summary of Existing Cross Drains

Station	Mile Post	Cross Drain Size	Length (ft)	Stream Name
102+58.72	9.549	2 - 24"	102	Unnamed Tributary to Turnbull Creek
157+86.88	10.596	1 - 24"	82	Unnamed Tributary to Turnbull Creek
189+76.00	11.200	2 - 24"	86	Unnamed Tributary to Turnbull Creek
233+58.40	12.030	1 - 24"	94	Unnamed Tributary to Turnbull Creek
266+84.80	12.660	3 - 36"	86	Unnamed Tributary to Turnbull Creek
361+36.00	14.450	1 - 24"	106	Unnamed Tributary to Turnbull Creek
400+48.48	15.191	1 - 30"	121	Unnamed Tributary to Turnbull Creek

2.5 Previous Permit Information

Existing Environmental Resource Permits (ERP) were not found within the project limits for the SR 16 corridor. Three offsite permitted stormwater ponds which outfall into the roadside ditches along SR 16 were identified:

- Clyde E. Lassen Veterans Nursing Home (ERP# 84623-27)
- Grand Oaks community (ERP# 139022-5)
- Turning Point Christian Academy (ERP# 93623-3)

2.6 Base Flood Elevation

The base flood elevation of Turnbull Creek at the existing SR 16 bridge crossing has been identified as elevation 23.0′ from the FEMA Flood Insurance Study (12109CV001D). Upstream

from this crossing, Turnbull Creek flows parallel along the northside of the SR 16 corridor with base flood elevations ranging from 23.0' to 26.0'. Further east along the corridor, small pockets of floodplains feature base flood elevations of 27.5' (Park Wetland A) and 29.5' (Park Wetland B). See **Appendix B – FEMA FIRM Panels** for additional information.

2.7 Land Uses

The land uses along the corridor includes low-density commercial and residential developments, cropland and pastureland, and undeveloped forested areas. It should be noted that the land use data is based on classifications provided by the St. Johns Water Management District (SJRWMD) and reflects imagery from St. Johns County captured between December 2020 and March 2021; actual land uses may have changed since that time. Refer to **Appendix A – Figures** for the Land Use Map.

2.8 Existing Deficiencies

The roadside ditches along SR 16 were observed to be generally wet, and due to the flat terrain, contain stagnant runoff water throughout the year. Due to the presence of water and wet conditions, the ditches appear to be unmaintainable during the wettest times of the year. Trash and other debris collect where ditches are unmaintainable. Although the roadside ditches are generally wet, there have been no records of significant flooding or roadway overtopping. With the SR 16 road base constructed at existing grade, and due to the presence of flat areas with stagnant water conditions, the roadway base presents substandard clearances above the water table along the low segments of the corridor.

No scour or other erosion problems were observed at the bridge crossing over Turnbull Creek.

2.9 Soil Types

The United States Department of Agriculture (USDA) Natural Resources Conservation Services (NRCS) National Cooperative Soil Survey indicates that the project area consists of soils with a variety of different hydraulic groups, ranging from A, A/D, B, B/D, C, C/D, and D. Refer to **Appendix A – Figures**, for the Hydrologic Soils map. Most of the soils within the project limits

are classified as fine sand and assigned dual hydrologic group (A/D, B/D, or C/D) based on their drained or undrained condition.

2.10 Existing Stormwater Systems and Management Facilities

As previously mentioned, stormwater runoff collects within roadside ditches and is conveyed to Turnbull Creek and Mill Creek. No existing stormwater management facilities or permits were identified along this segment of SR 16, and therefore, the existing roadway pavement is considered untreated.

2.11 Existing Ground Contamination Concerns

A Contamination Screening Evaluation Report (CSER) was conducted in July 2024 and later supplemented by a Contamination Screening Evaluation Technical Memorandum (CSE TM) in March 2025, which specifically addressed Ponds 4B, 4C, and 5C. The majority of the proposed pond sites received a "No" or "Low" risk rating. Three pond sites received a "Medium" risk rating, pond sites 1A, 1B, and 5B. None received a "high" risk rating. The results of the contamination screening are included within **Appendix E – Pond Site Evaluation Matrix** and **Appendix G - Floodplain Compensation Evaluation Matrix.**

2.12 Existing Historical / Archaeological / Environmental Concerns

A Cultural Resource Assessment Survey (CRAS) was conducted by SEARCH in January 2024 and amended in March 2025. Additionally, a Natural Resources Evaluation (NRE) was performed by SES Environmental Resource Solutions in August 2024 and amended in April 2025. Both reports are included under separate covers. The CRAS found the proposed SR 16 improvements will have no effect on cultural resources listed or eligible for listing in the National Register of Historic Places (NRHP). The NRE found Pond Alternatives 2B and 6A fall within conservation easements, and potential effects to listed species will need further coordination with state and federal agencies. A bald eagle nest was found at Pond Site Alternative 2C. The pond shape was revised to avoid impacts within 330 feet of the nest. Effects on the nest will need further coordination with state and federal agencies. This activity will occur in association with the permitting process. The

findings from these reports will be used to assess the historical, archaeological, and environmental impact.

3.0 Proposed Drainage Conditions

3.1 Onsite Drainage Basins

The proposed onsite drainage divides generally matches the existing drainage divides with the addition of stormwater management ponds. Basin limits have been outlined on the proposed drainage maps included in **Appendix C – Drainage Maps**.

3.2 Offsite Stormwater Runoff

As mentioned previously, there are several existing ponds adjacent to the corridor that outfall into the SR 16 roadside ditches. In the proposed condition, a roadside ditch will be maintained. The proposed drainage system will be designed to accept these offsite outfalls and convey them to Turnbull Creek during the final design phase.

3.3 Water Quality / Water Quantity Requirements

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 the FDOT Design Manual. The entirety of the project is located within the regulatory authority of the St. Johns River Water Management District; therefore, an Environmental Resource Permit will be secured through this district.

3.3.1 SJRWMD Water Quality Criteria

For wet detention systems, the design treatment volume is the greater of the following: (a) one inch of runoff over the drainage area (b) 2.5 inches times the impervious area (excluding water bodies).

3.3.2 SJRWMD Water Quantity Criteria

(a) The post-development peak discharge rate must not exceed the pre-development peak rate of discharge for the mean annual 24-hour storm for systems serving both of the following: (1) New construction area greater than 50% impervious (excluding waterbodies)

(2) Projects for the construction of new developments that exceed the thresholds in paragraphs 62-330.020(2)(b) or (c), F.A.C.

(b) The post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year frequency, 24-hour duration storm for all areas of the District.

The 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. The waters are identified by their respective waterbody ID (WBID). This project discharges into WBID 2411, Sixmile Creek. Total Maximum Daily Load (TMDL) requirements have not been adopted for this WBID. This project is within the Lower St. Johns Basin Management Action Plan (BMAP). No Special Basin Criteria were identified for this area.

3.4 Floodplain Compensation Requirements

As discussed in the Location Hydraulics Report, the proposed project improvements will impact the adjacent floodplain. The floodplain impact volumes were calculated using the United States Geological Survey (USGS) LiDAR data and the mapped 100-year FEMA Floodplain. Refer to **Table 3-1** below for the floodplain impact volume estimated.

Table 3-1: Summary of Floodplain Impact Volumes

Area	Location	Volume (ac-ft)	Total Volume (ac-ft)
1	Pond Alternative 2A	4.06	23.77
	Pond Alternative 2B	2.45	
	Pond Alternative 3A	0.07	
	Pond Alternative 3B	2.54	
	Pond Alternative 3C	12.51*	
	Pond Alternative 4A	5.68	
	Roadway R/W at Turnbull	11.26*	
2	Roadway R/W West of Downs Corner Rd	1.84	1.84
3	Roadway R/W East of Downs Corner Rd	1.90	1.90

*Values used for Area 1 total volume based on roadway and preferred pond impacts.

Floodplain Compensation Areas (FPCAs) are proposed adjacent to Turnbull Creek adjacent to the SR 16 corridor. The FPCA volumes were estimated between seasonal high-water elevations and the lesser of the existing ground or 100-year floodplain elevation. Refer to **Table 3-2** below for the FPCA volumes estimated using this method. The floodplain impact and compensation areas are depicted in **Appendix F – Floodplain Impact and Compensation Maps**.

Table 3-2: Summary of Floodplain Compensation Areas

Area	FPC Alternative	Volume (ac-ft)	R/W Area (ac)
1	1A	33.40	15.79
	1B	34.17	11.82
	1C	39.29	9.60
	1D	32.68	8.64
2	2	1.90	2.78
3	3	1.95	1.58

During the final design phase, the roadway geometry will be optimized within the right-of-way to minimize the floodplain impact volume and will reduce the need for floodplain compensation. Additionally, stormwater management facilities should be designed to provide additional floodplain compensation, where possible. Refer to **Appendix G – Floodplain Compensation Site Evaluation Matrix** for a summary of the floodplain compensation alternatives analyses.

3.5 Proposed Drainage Improvements

The project proposes to reconstruct the existing two lanes, and to construct an additional two lanes in Segment 1. Stormwater runoff will be collected from the roadway surface via roadside ditches that will be conveyed to stormwater management facilities. Stormwater management facilities will feature control structures that will be designed to meet the required water quality and water quantity requirements and will ultimately convey treated runoff to Turnbull Creek.

Drainage requirements for improvement in Segment 2, St. Augustine Outlet Mall to I-95, were not evaluated. This segment will maintain the existing four lanes with minimal widening at the Toms Road interchange.

3.6 Proposed Stormwater Management Facilities

The proposed stormwater management facilities will be designed as wet detention facilities with the assumption that the seasonal high-water elevation (SHWE) is close to or at the existing ground elevation. Pond sites were selected adjacent to the corridor and within vacant parcels when possible. The normal water (NWL) elevation was set at the SHWE found in the USDA NRCS Web Soil Survey. The inside top of berm was set to 4 to 5 foot above the NWL, providing 4 feet of treatment and attenuation and 1 foot of freeboard. The rainfall depth for the 25-year 24-hour design storm was determined to be 8.60 inches using the National Oceanic and Atmospheric Administration (NOAA) Atlas 14. The USGS LiDAR terrain was used to calculate the pre-development time of concentration. With these assumptions, ponds were sized to meet treatment and attenuation requirements.

The time of concentration calculations, pond treatment calculations, and ICPR modeling are included in **Appendix D – Pond Sizing Calculations**

3.7 Bridge Structures

Today, there is a single bridge crossing over (Turnbull Creek, #780064) within the project limits. This bridge structure was constructed in 1962 and was later reconstructed in 1971. The bridge is approximately 111 feet long and spans over the limits of the Turnbull Creek FEMA Floodway. A new proposed bridge structure will be constructed for both the eastbound and westbound lanes and will fully span the Turnbull Creek floodway.

3.8 Utility Conflicts

Telephone, electric, water, sewer, and gas lines were identified to be within 250 feet of the corridor. Pond infrastructure will be designed to avoid these when possible during the design phase.

4.0 Stormwater Ponds

When possible, two off-site pond alternatives have been provided for each basin. They can be found in **Appendix C – Drainage Maps**.

All pond alternatives have been added to **Appendix E – Pond Site Evaluation Matrix** and relevant pond location information has been added to help determine which alternative is the most suitable choice. Several categories are described as low, moderate, or high impact areas. Each category was assigned the potential level of impact using the following criteria:

- Low - Pond alternatives that are more than 500 feet from an area of concern.
- Moderate - Pond alternatives that are within 500 feet of an area of concern.
- High - Pond alternatives that are within an area of concern.

See **Table 4.1** for the sources used in developing the Pond Site Evaluation Matrix.

Table 4.1: Pond Site Evaluation Matrix Sources

Matrix Category	Source(s)
Groundwater Condition	NRCS Soil Survey
Soil Condition	NRCS Soil Survey
Potential Hazardous Waste Contaminations	PD&E CSER Report, PD&E CSE TM Report
Potential Impacts to Protected Species	PD&E NRE Report
Potential Impacts to Cultural Resources	PD&E CRAS Report
Wetland Impacts	PD&E NRE Report
Potential Impacts to Utilities	Certified Power Plants, FGDL Electric Power Substations, Natural Gas Pipelines, FGDL Power Transmission Lines, Public Water Supply Plants, FGDL National Rail Network Railroads, Sabal Trail Transmission Natural Gas Pipelines, Transmission Lines, Wastewater Supply Plants
Existing Landscapes	SJRWMD Land Use Data
Adjoining Land Uses	SJRWMD Land Use Data
Aesthetic Effects	To be further considered during the design phase

Each pond alternative was also kept within the limits of one parcel, when possible. The alternatives were sited outside wetland limits when possible, but there are several cases where wetlands are impacted. Refer to **Appendix C – Drainage Maps** and **Appendix E – Pond Site Evaluation Matrix** for the locations. A discussion on how the preferred pond alternative was chosen is included in the Results.

5.0 Results

The analysis presented in this report identifies potential pond sites based on recent aerials and other preliminary data. Once the potential pond sites were narrowed down, a more detailed analysis was conducted utilizing the following parameters: right-of-way requirements, easement requirements, typical construction costs for a given pond site, hazardous materials, protected 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 – Pond Site Evaluation Matrix**.

Ponds 2C, 3C, 4C, and 5C were selected as the preferred alternative due to the minimal environmental impacts and cost savings. The owners of the respective parcels have reached out to the Department for a potential sale.

Pond alternatives for Basin 1, Ponds 1A, 1B, 1C, and 1D, were not considered as preferred ponds because of the potential impacts to residential and commercial parcels. Basin 1 was merged with Basin 2 for the drainage analysis. Ponds 2A, 2B, and 2C were increased in size to accommodate both Basins 1 and 2. Pond 2C was also increased in size to offset attenuation requirements for Basin 3, in case treatment credits are available for Basin 3. Ponds 2A and 2B were not chosen as preferred alternatives due to the potential frontage impact to the respective parcel along SR 16.

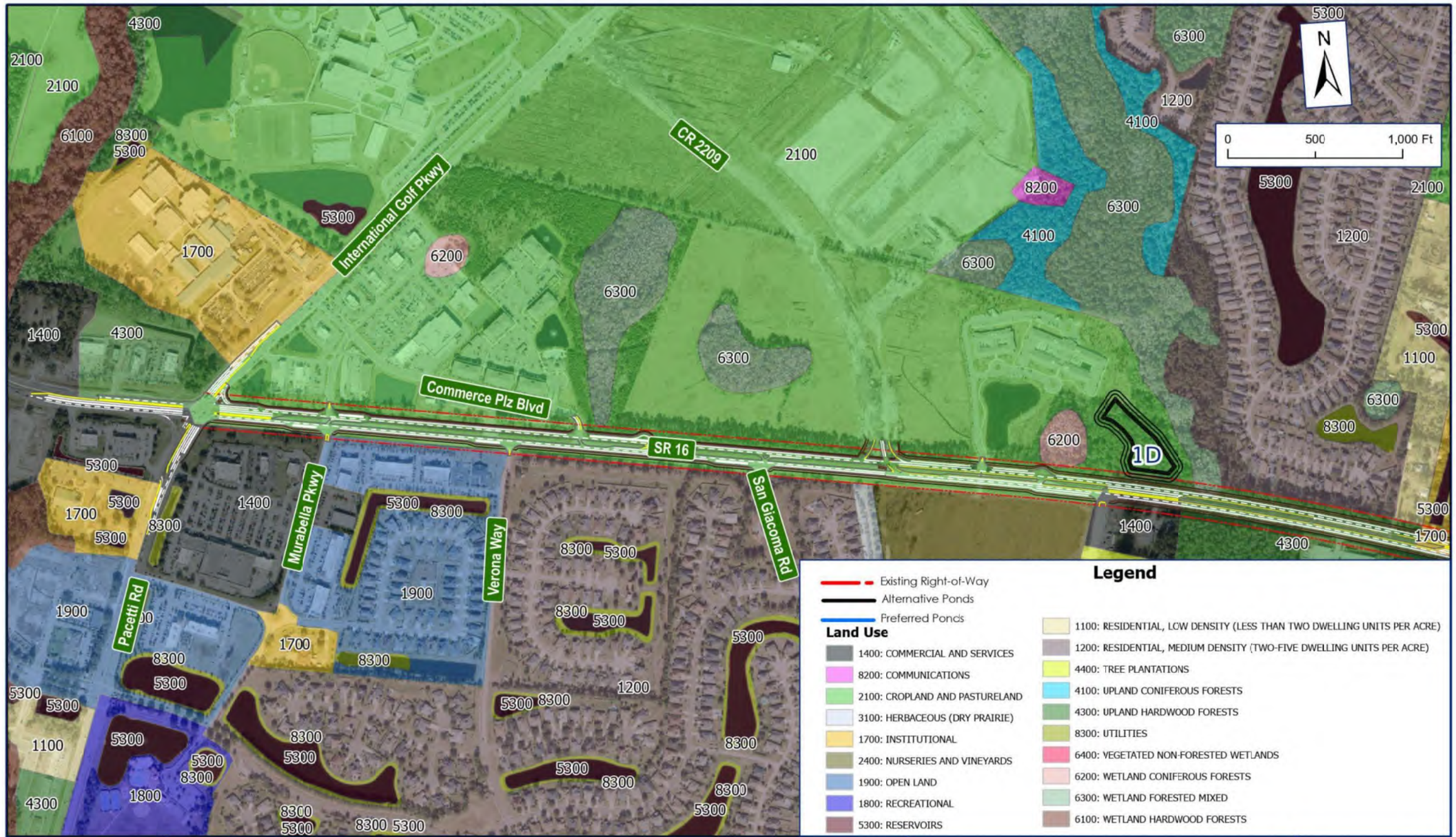
Vacant parcels were selected for pond sites for Basin 3, 4, 5, and 6. Pond 3C was selected as the preferred alternative over Ponds 3A and 3B because of the cost of the parcel and the owner's willingness to sell. Basin 6 was integrated with Basins 4 and 5 for the drainage analysis of Ponds 4C and 5C as a cost saving alternative. The cost and feasibility of conveying Basin 6 was also considered due to the significant distance from Basin 6 to Basins 4 and 5. There is a considerable elevation difference from Basins 5 and 6 to Basin 4, which should facilitate the conveyance of stormwater runoff. The cost for Ponds 4C and 5C was found to be less than the cost of individual ponds and conveyance systems for Basins 4, 5, and 6.

6.0 Conclusions

As part of this analysis, pond site alternatives were analyzed. The previous sections of this report and the evaluation matrix included in **Appendix E – Pond Site Evaluation Matrix** summarize the results of the analysis. Ponds 2C, 3C, 4C, and 5C were selected as the preferred alternatives.

The information contained herein is preliminary and will need to be refined once this project goes into final design. Additional analysis will be required as the design progresses and refined geotechnical and survey information is obtained.

Appendix A – Figures



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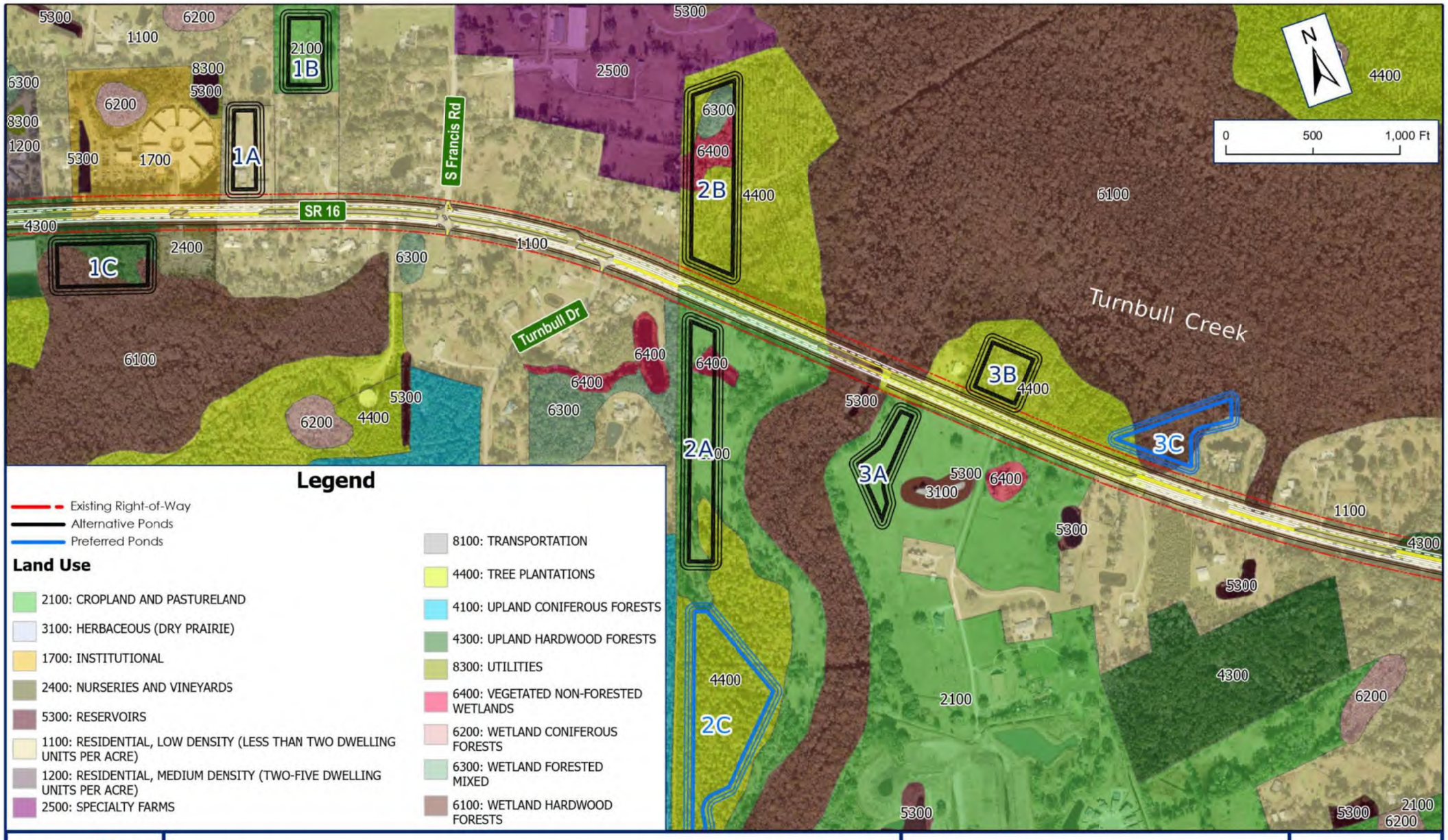

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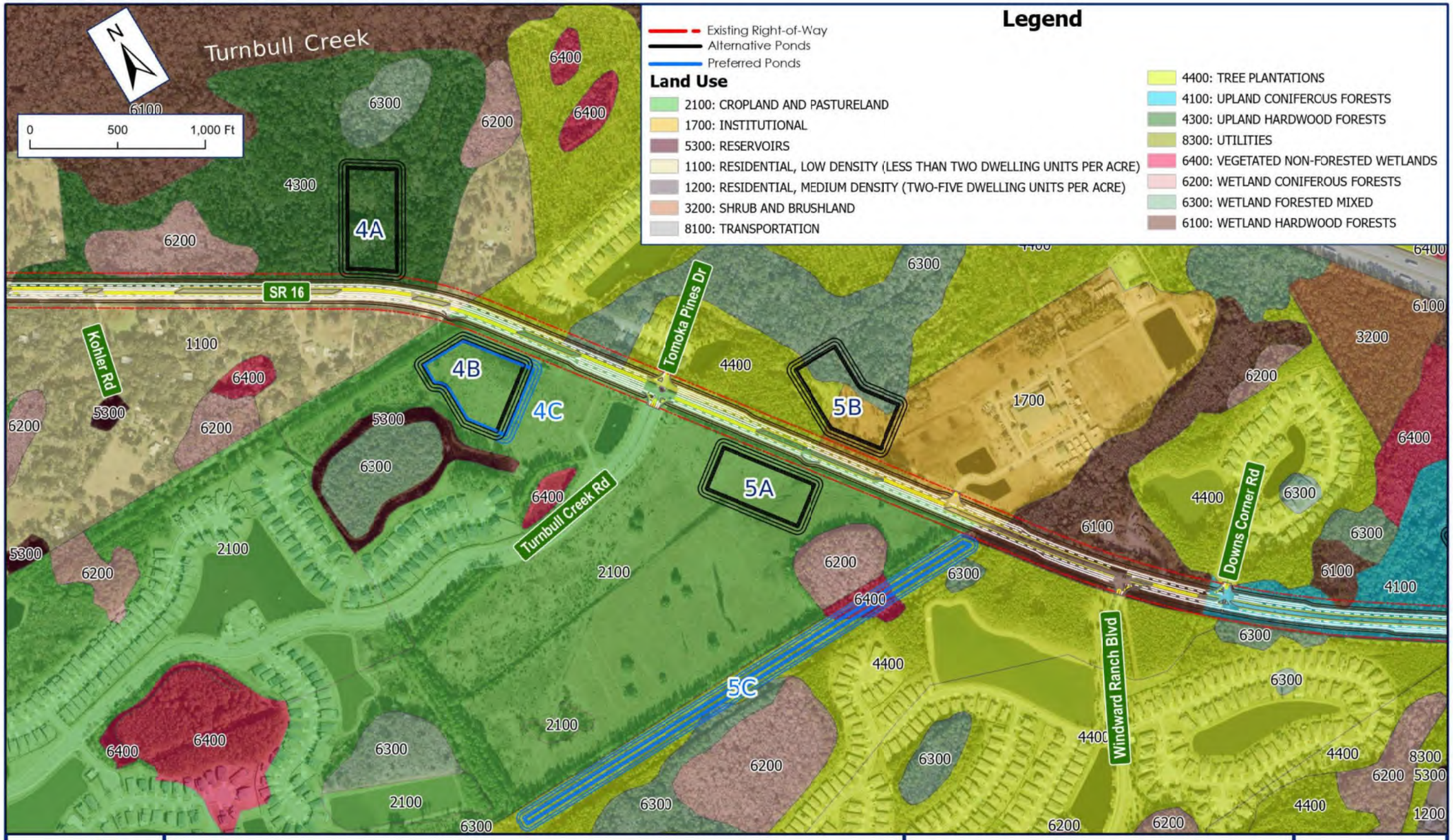

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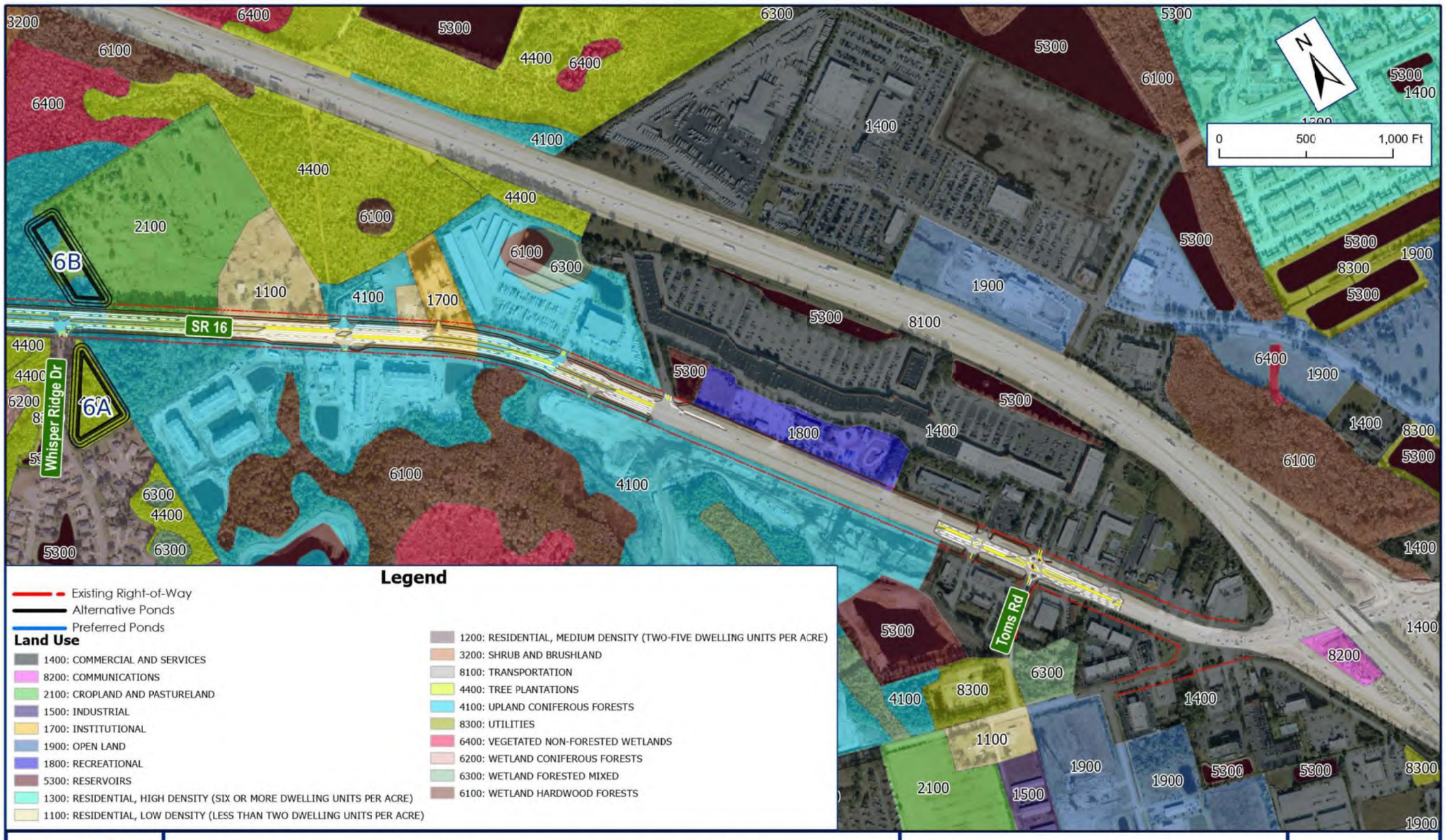

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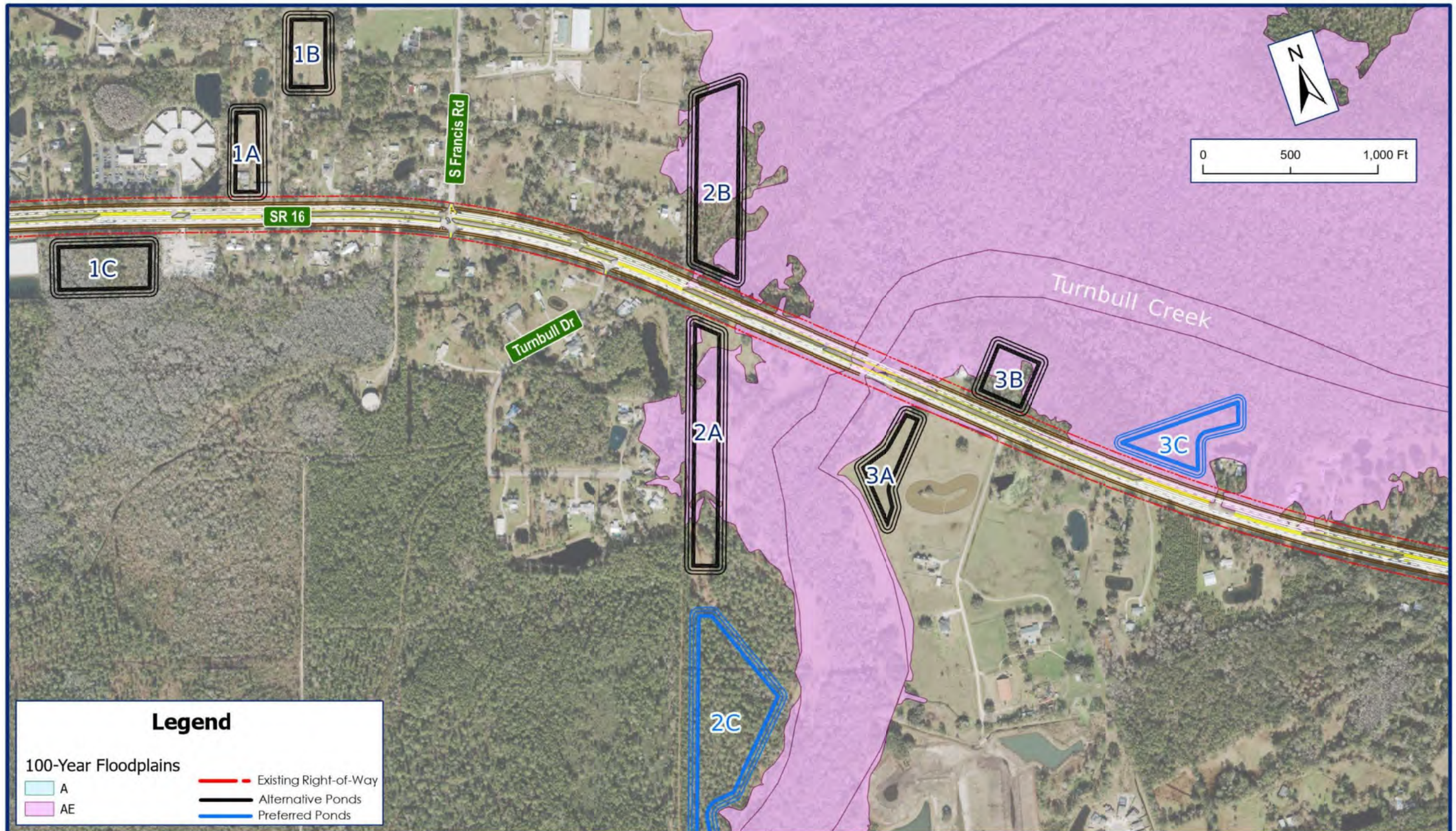
FDOT	**SR 16 from International Golf Parkway to I-95 PD&E Study** **FPID: 210447-5-32-01**	**Figure 2: FEMA Floodplains**	**Page No.** **1 of 4**



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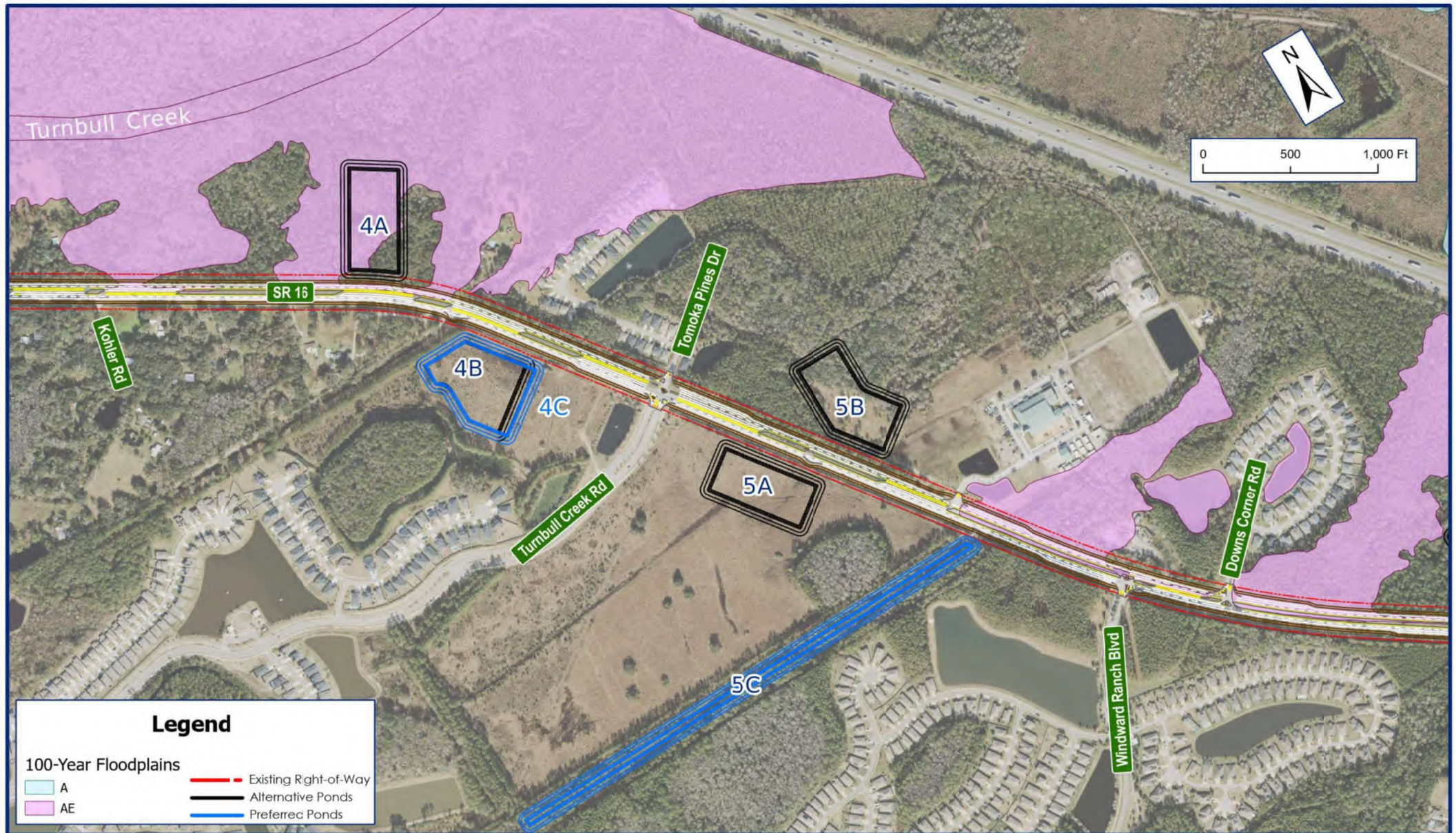

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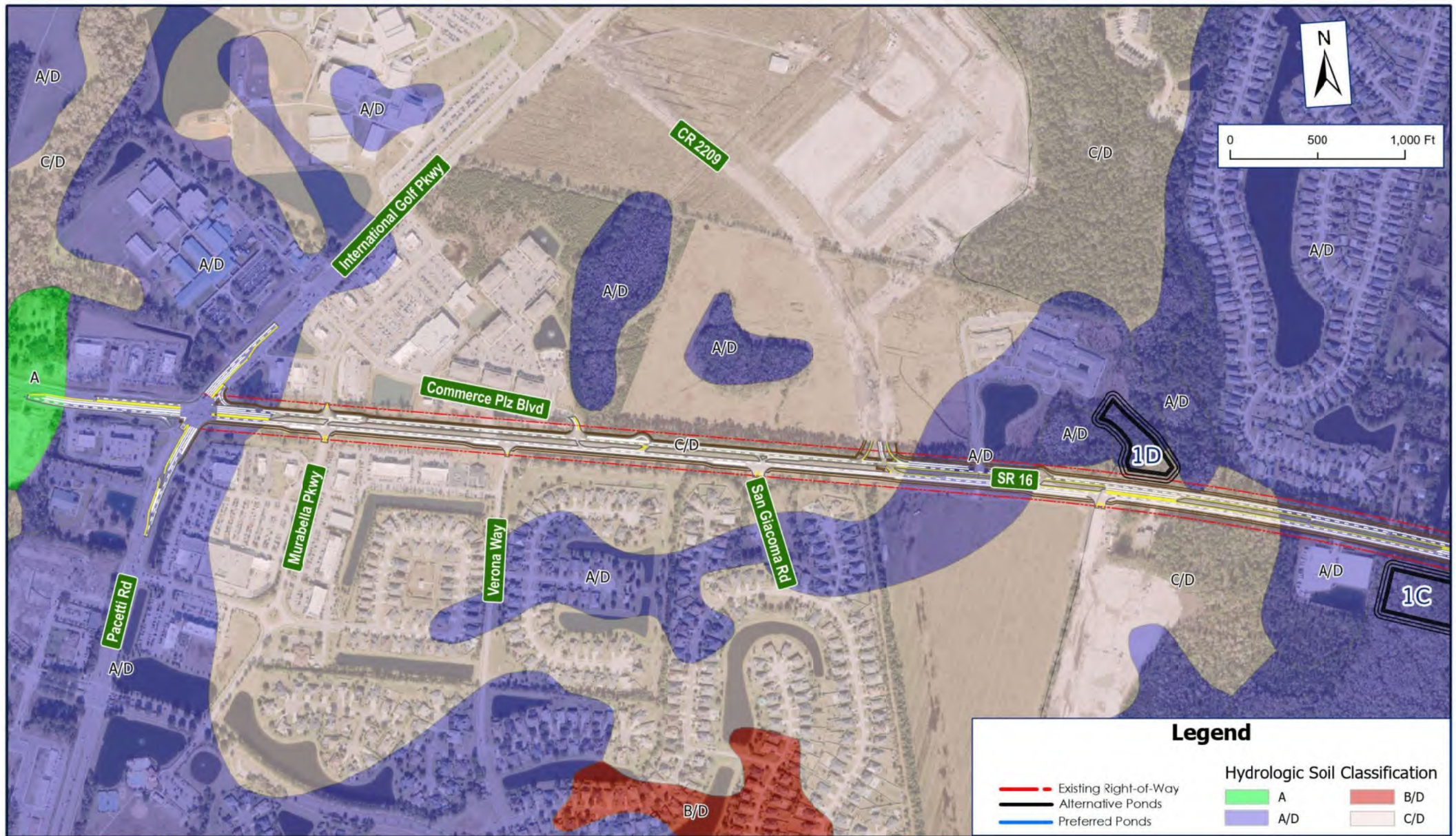
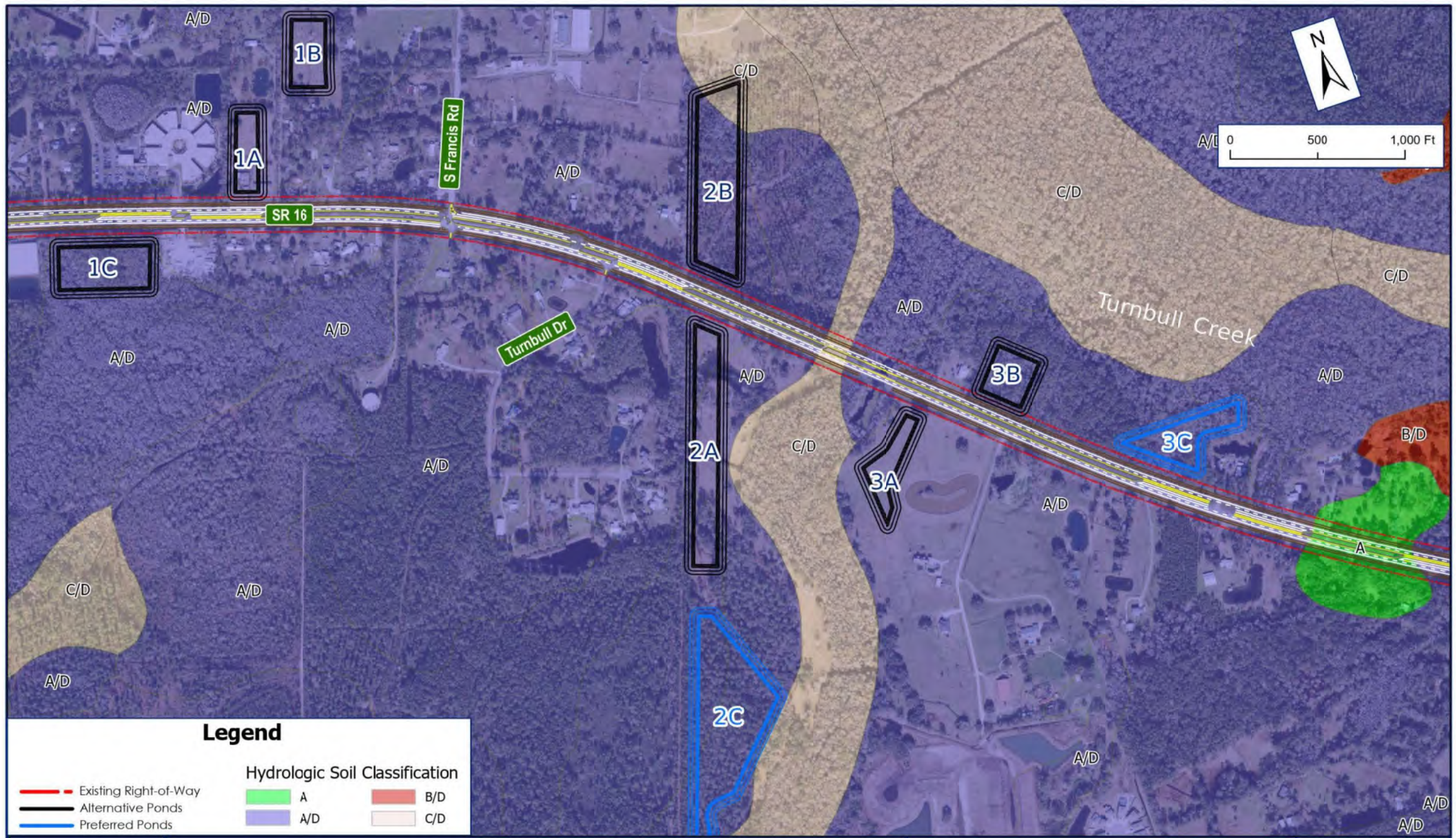
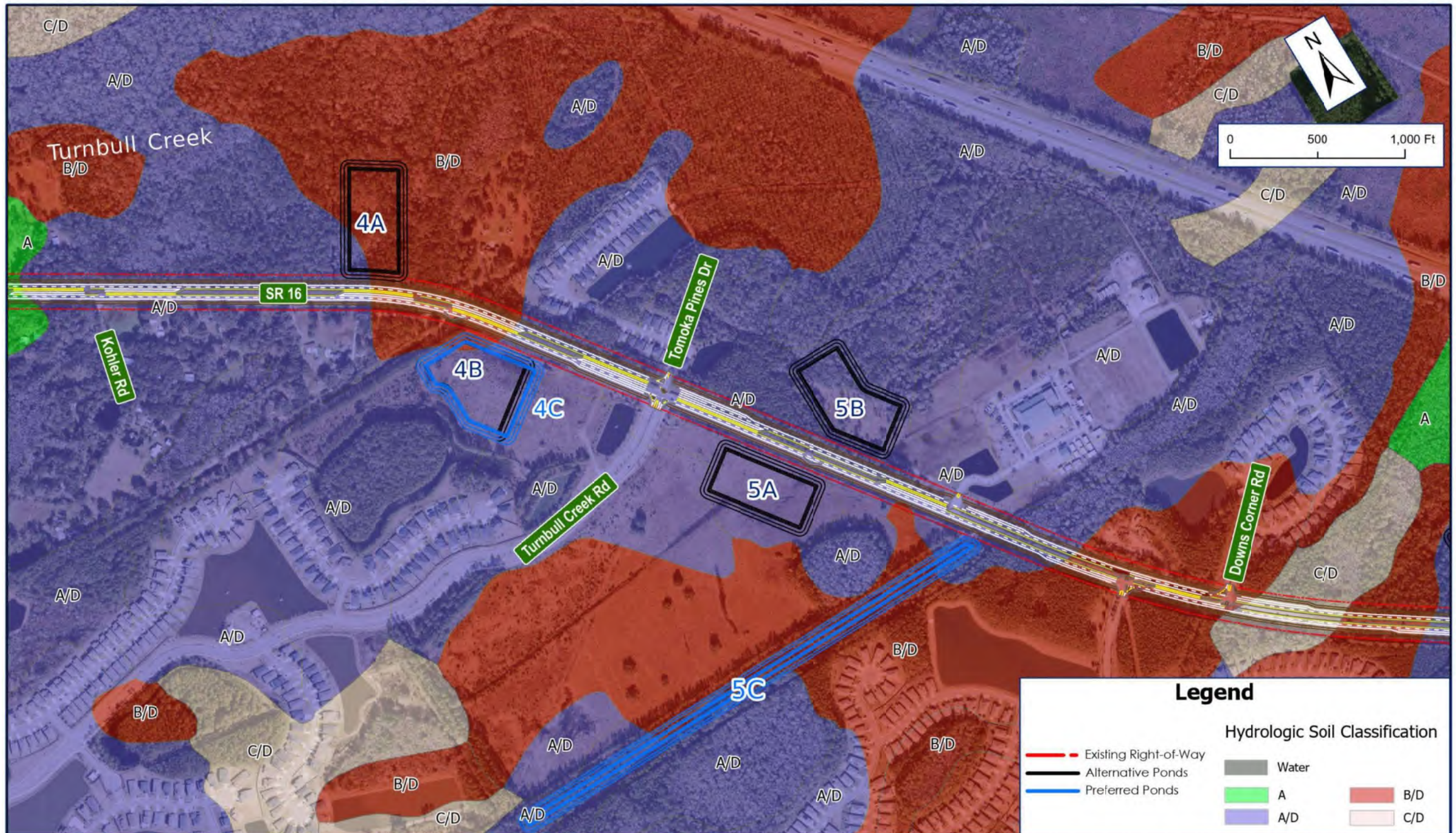


FDOT	**SR 16 from International Golf Parkway to I-95 PD&E Study** **FPID: 210447-5-32-01**	**Figure 3: Hydrologic Soils**	**Page No.** **1 of 4**



FDOT	**SR 16 from International Golf Parkway to I-95 PD&E Study** **FPID: 210447-5-32-01**	**Figure 3: Hydrologic Soils**	**Page No.** **2 of 4**



FDOT	**SR 16 from International Golf Parkway to I-95 PD&E Study** **FPID: 210447-5-32-01**	**Figure 3: Hydrologic Soils**	**Page No. 3 of 4**

FDOT	**SR 16 from International Golf Parkway to I-95 PD&E Study** **FPID: 210447-5-32-01**	**Figure 3: Hydrologic Soils**	**Page No. 4 of 4**

Appendix B – FEMA FIRM Panels

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes Zone X

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on the FIRM was provided in digital format by the St. Johns County GIS Department, dated 2009, 2013, and 2014; the U.S. Census Bureau, dated 2014; the U.S. Fish and Wildlife Service, dated 2015; the U.S. Department of Agriculture Farm Service Agency, dated 2013; and FEMA, dated 2011.

SCALE

Map Projection:
State Plane Transverse Mercator, Florida East Zone 0901;
North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

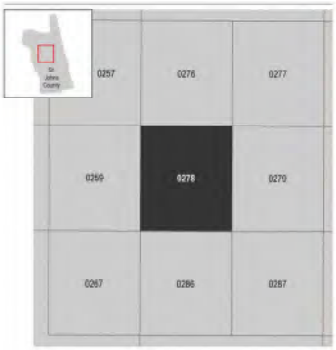
N

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

ST. JOHNS COUNTY, FLORIDA and Incorporated Areas

PANEL 278 OF 560

FEMA

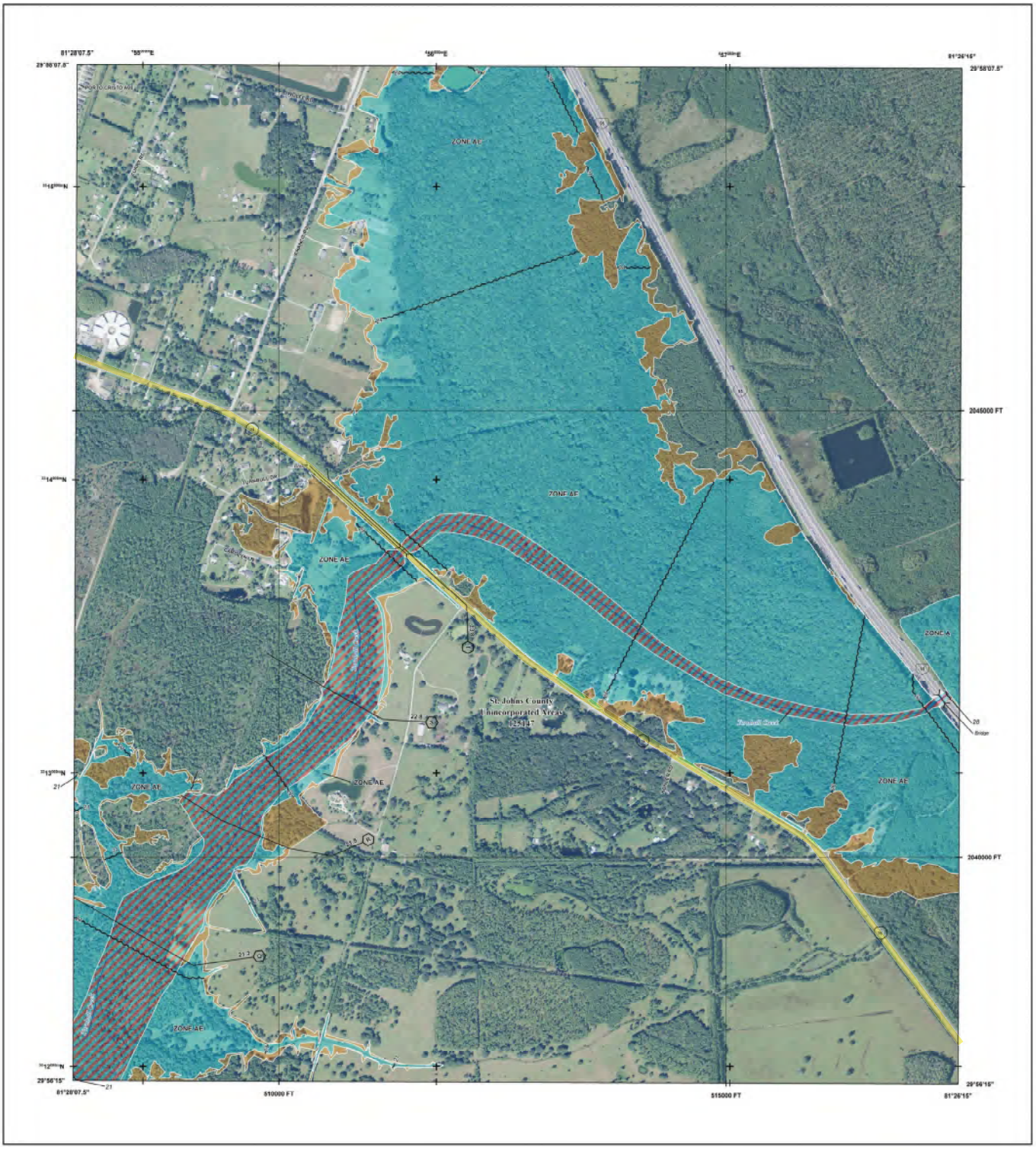
Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
ST. JOHNS COUNTY	125147	0278	J

VERSION NUMBER
2.3.3.2

MAP NUMBER
12109C0278J

MAP REVISED
DECEMBER 7, 2018



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- Cross Sections with 1% Annual Chance Water Surface Elevation (17.5 / 18.2)
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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SCALE

Map Projection:
State Plane Transverse Mercator, Florida East Zone 0901;
North American Datum 1983, Western Hemisphere; Vertical Datum: NAVD 88

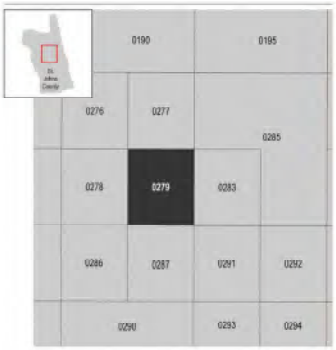
N

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

ST. JOHNS COUNTY, FLORIDA

and Incorporated Areas

PANEL 279 OF 560

FEMA

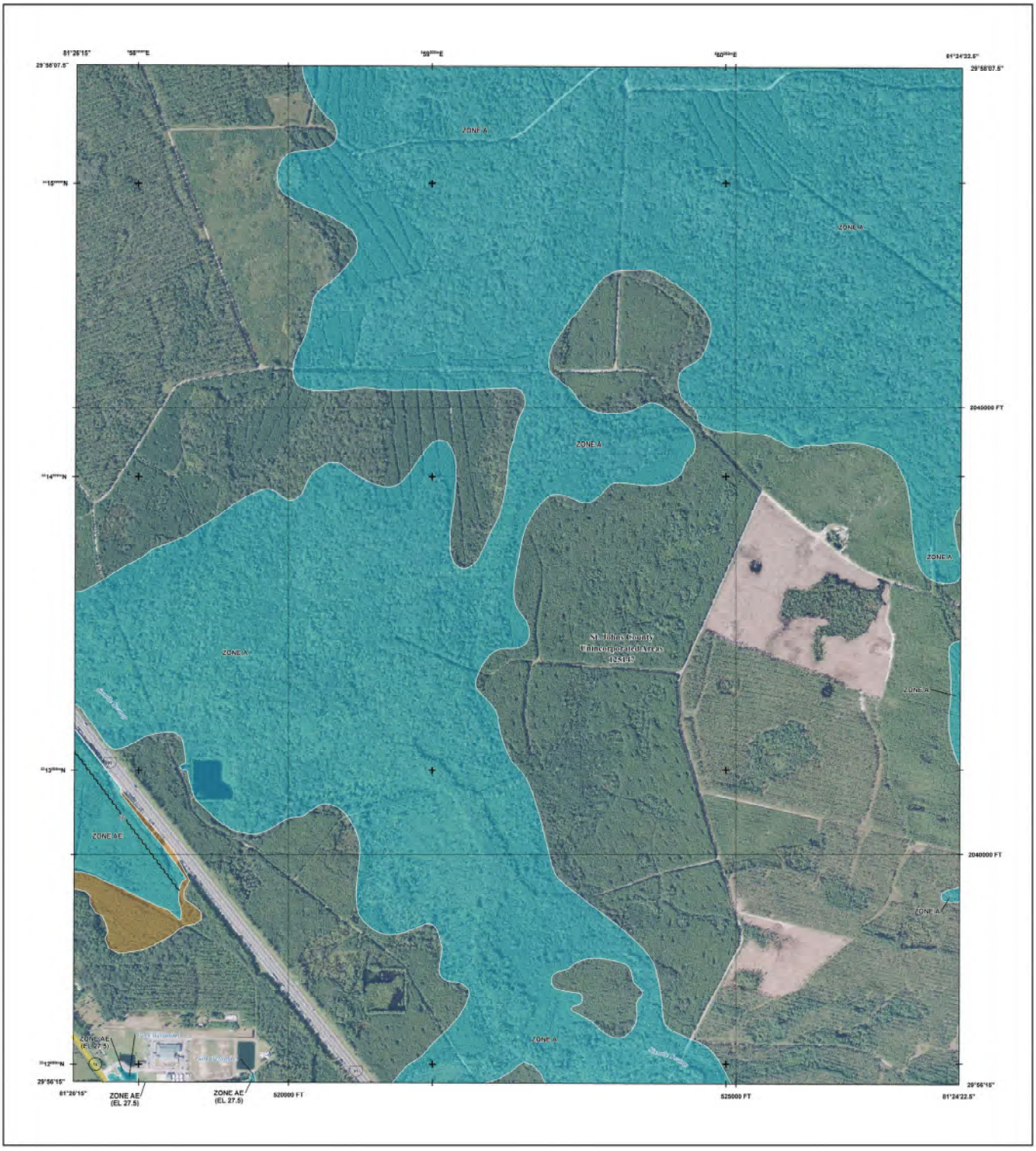
Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
ST. JOHNS COUNTY	125147	0279	J

VERSION NUMBER
2.3.3.2

MAP NUMBER
12109C0279J

MAP REVISED
DECEMBER 7, 2018



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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SCALE

Map Projection:
State Plane Transverse Mercator, Florida East Zone 0901;
North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

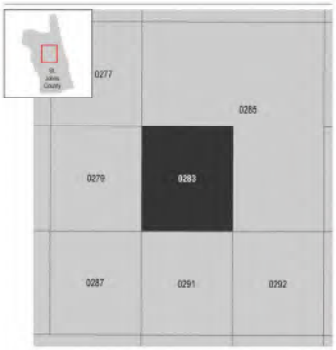
N

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

ST. JOHNS COUNTY, FLORIDA
and Incorporated Areas

PANEL 283 OF 560

FEMA

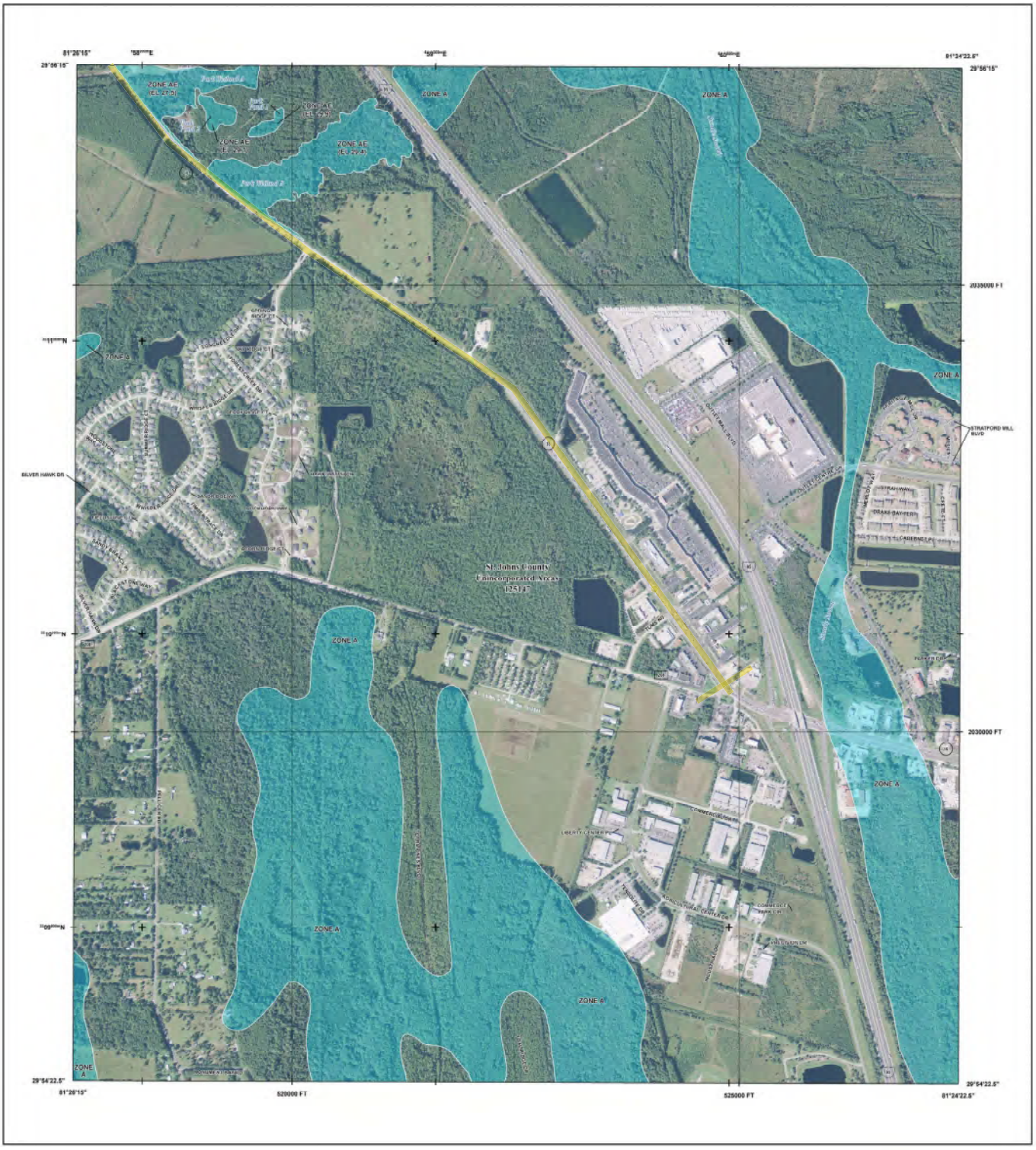
Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
ST. JOHNS COUNTY	125147	0283	J

VERSION NUMBER
2.3.3.2

MAP NUMBER
12109C0283J

MAP REVISED
DECEMBER 7, 2018



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

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HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 16.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

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SCALE

Map Projection:
State Plane Transverse Mercator, Florida East Zone 0901;
North American Datum 1983, Western Hemisphere; Vertical Datum: NAVD 88

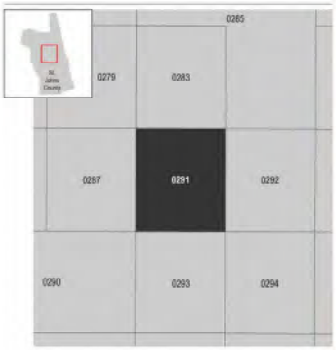
N

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

ST. JOHNS COUNTY, FLORIDA

and Incorporated Areas

PANEL 291 OF 560

FEMA

Panel Contains:

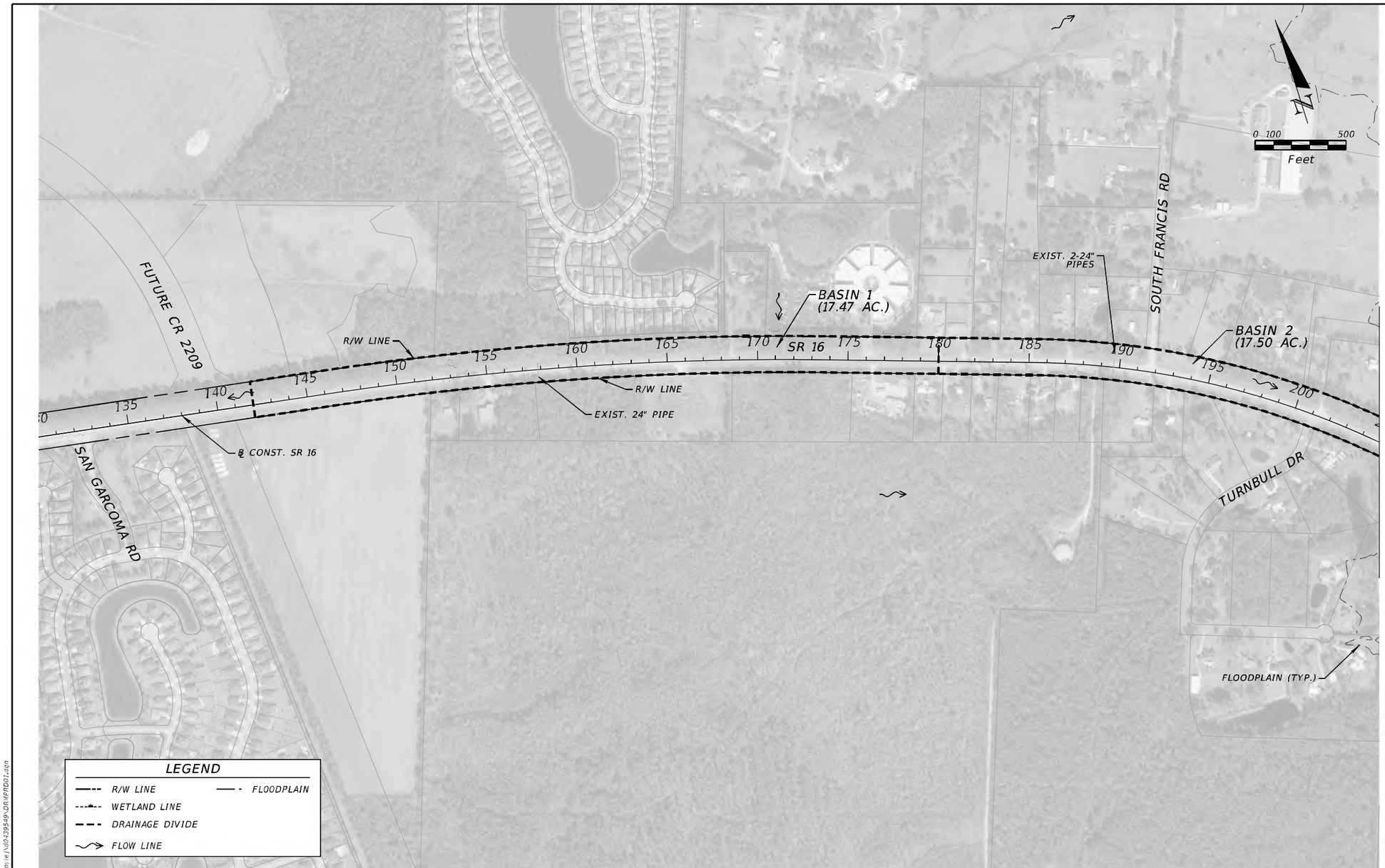
COMMUNITY	NUMBER	PANEL	SUFFIX
ST. JOHNS COUNTY	125147	0291	J

VERSION NUMBER
2.3.3.2

MAP NUMBER
12109C0291J

MAP REVISED
DECEMBER 7, 2018

Appendix C – Drainage Maps



MATCHLINE STA. 205+00.00

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

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PRE-DEVELOPMENT DRAINAGE MAP (1)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85715 RS&H, INC. 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 16	ST. JOHNS	21044753201		

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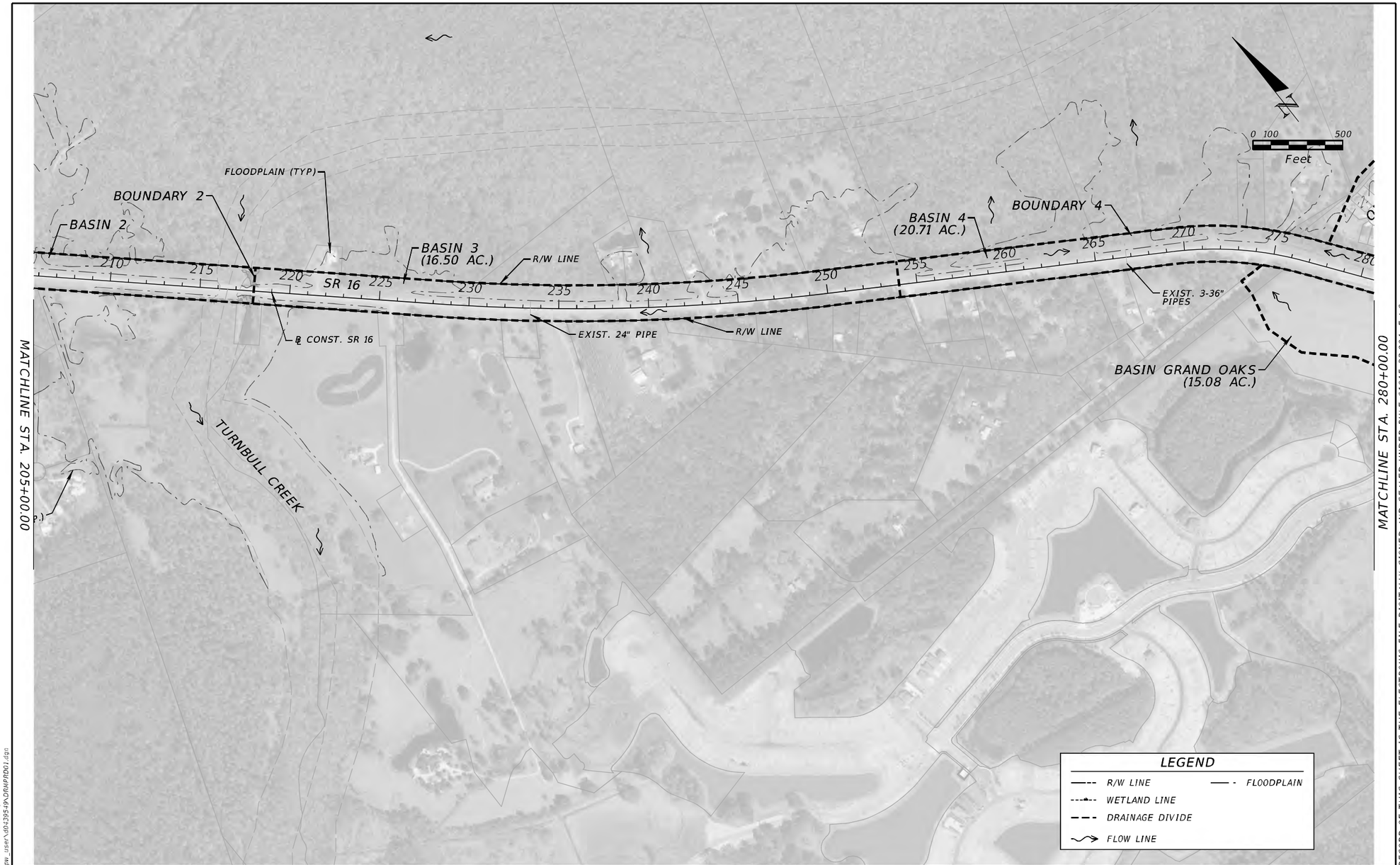
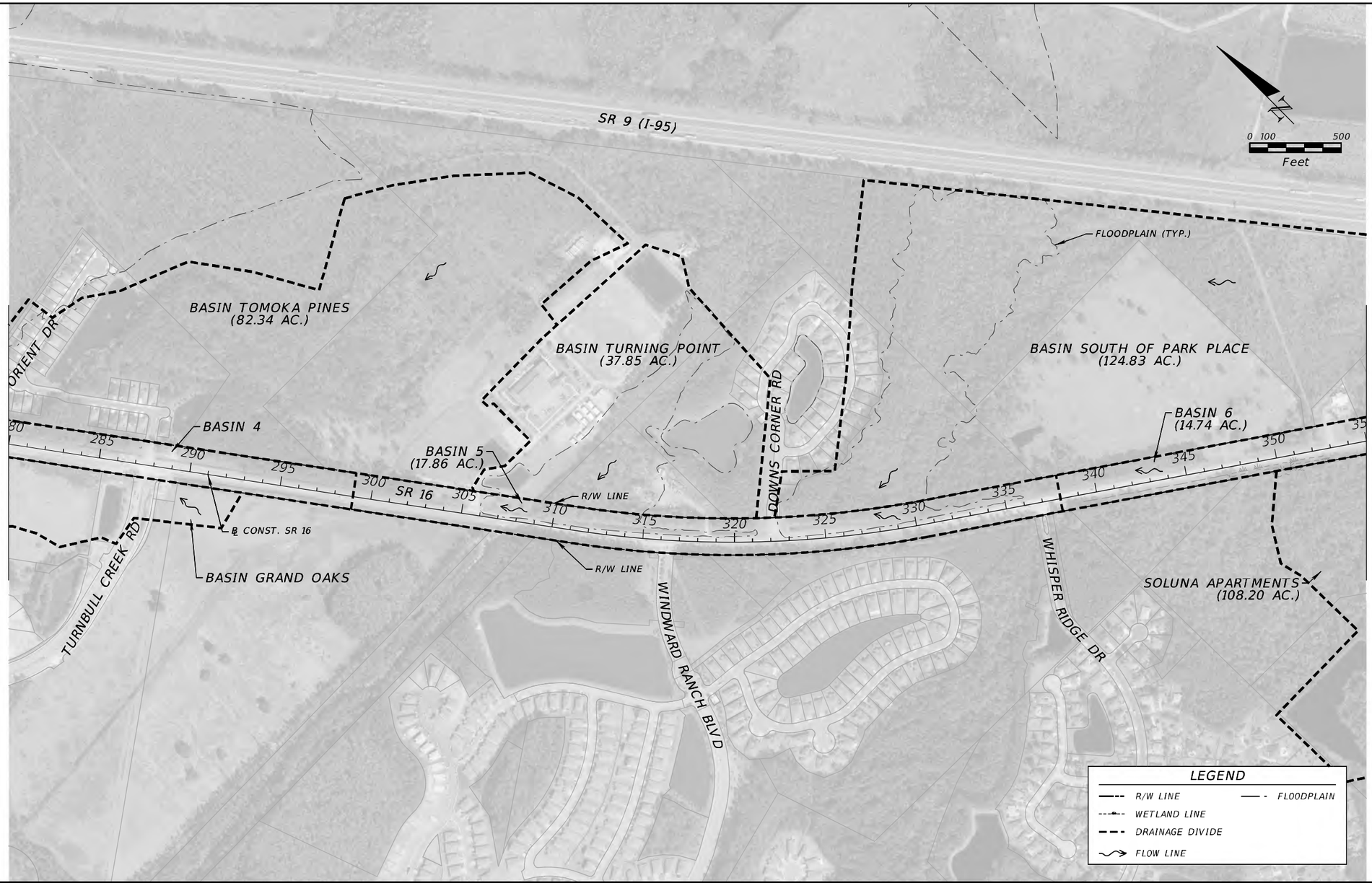


REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PRE-DEVELOPMENT DRAINAGE MAP (2)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85715 RS&H, INC. 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 16	ST. JOHNS	21044753201		



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PRE-DEVELOPMENT DRAINAGE MAP (3)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85715 RS&H, INC. 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
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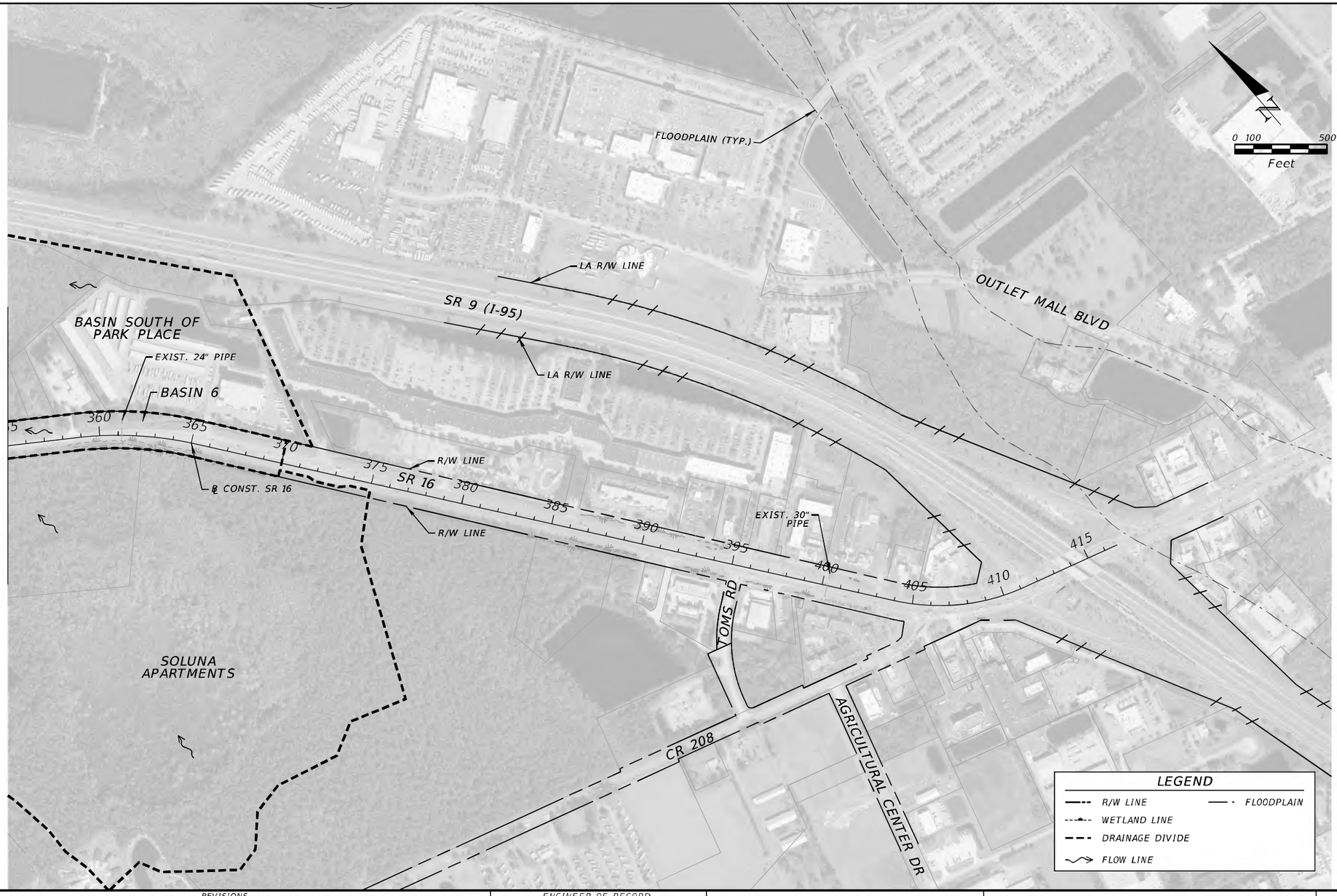

MATCHLINE STA. 355+00.00

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			PRE-DEVELOPMENT DRAINAGE MAP (4)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85715 RS&H, INC. 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 16	ST. JOHNS	21044753201		

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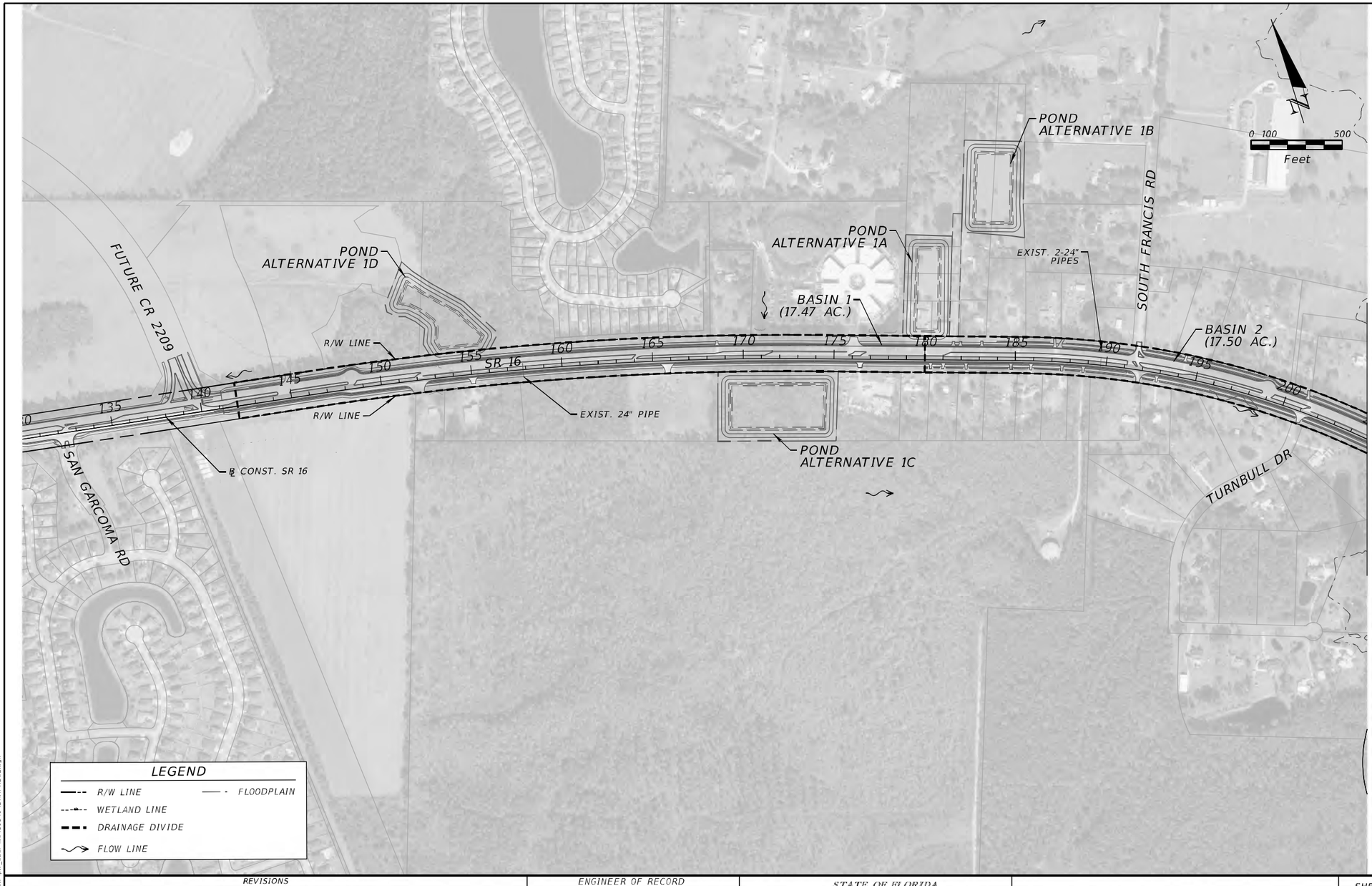
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



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					SR 16	ST. JOHNS	21044753201		

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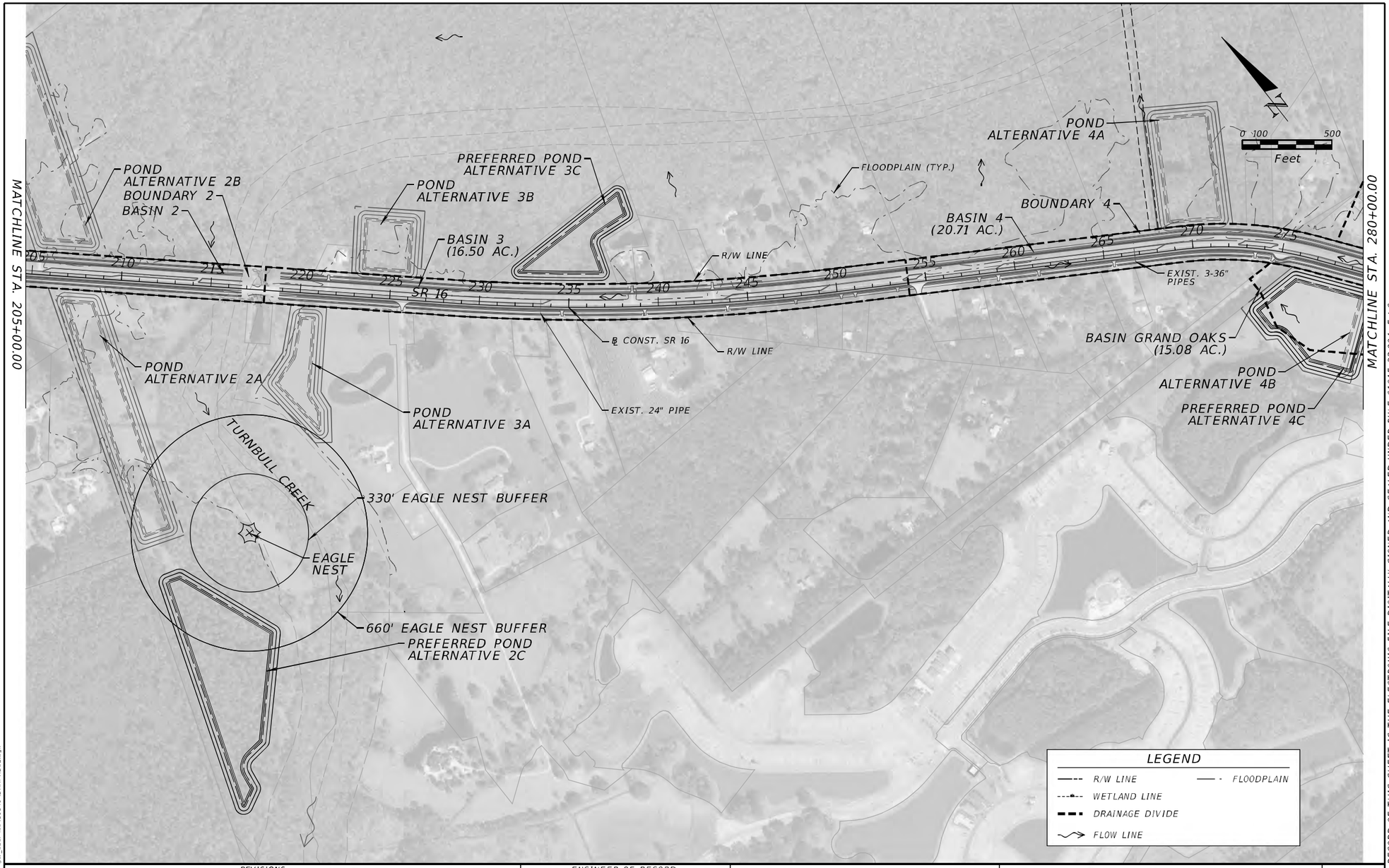

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEVELOPMENT DRAINAGE MAP (2)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85715 RS&H, INC 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 16	ST. JOHNS	21044753201		

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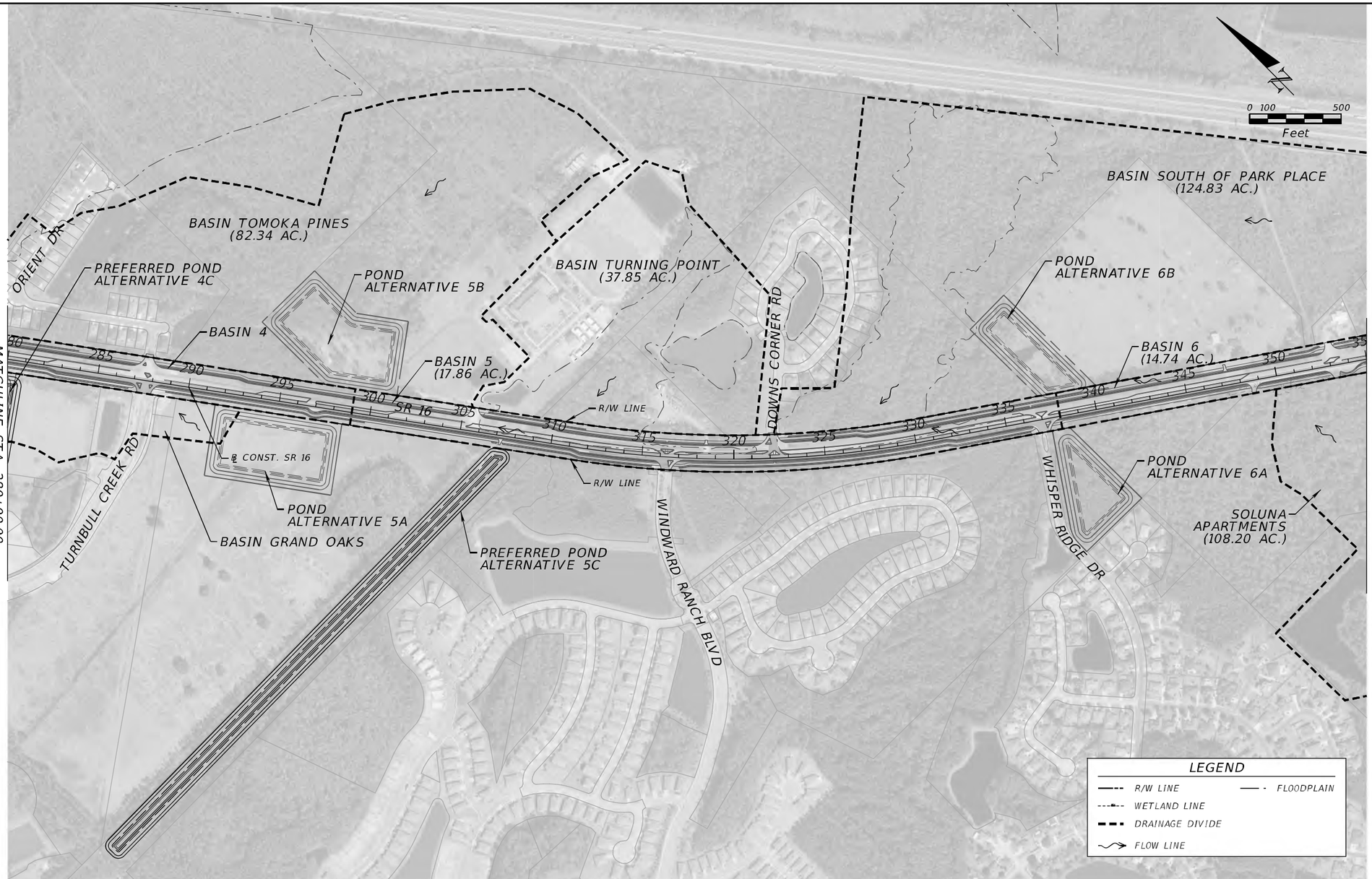
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			POST-DEVELOPMENT DRAINAGE MAP (3)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85715 RS&H, INC 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 16	ST. JOHNS	21044753201		

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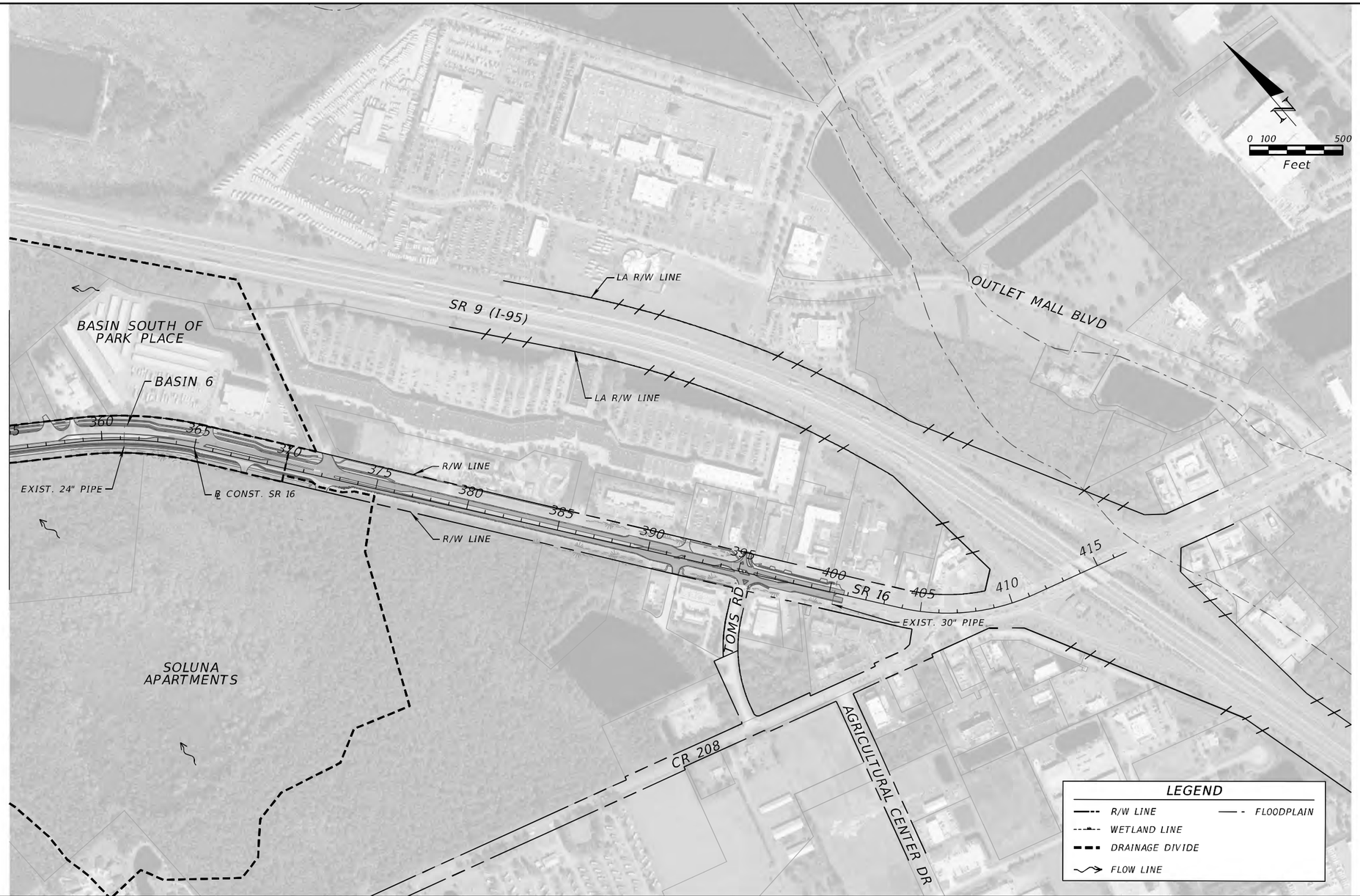
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

SANOJ SHRESTHA, P.E.
LICENSE NUMBER: 85715
RS&H, INC
10748 DEERWOOD PARK BLVD. SOUTH
JACKSONVILLE, FL 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 16	ST. JOHNS	21044753201

POST-DEVELOPMENT DRAINAGE MAP (4)

SHEET NO.

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

Appendix D – Pond Sizing Calculations

Time of Concentration Calculations

Treatment Calculations

Routing Calculations

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Pre-Basin 1 & 2
Condition: Pre-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	21	ft	28	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1	28.00	ft	27.00	ft		ft		ft		
Elevation 2, E_2	27.00	ft	25.00	ft		ft		ft		
Land Slope, $s = (E_1 - E_2) / L$	0.05	ft/ft	0.07	ft/ft		ft/ft		ft/ft		
$Tt = 0.007 * (n * L)^{0.8} / (P_2^{0.5} * s^{0.4})$	0.00	hr	0.07	hr		hr		hr		
	0.2	+	4.0	+		+		=	4.2	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description									
Flow Length, L		ft		ft		ft		ft	
Elevation 1, E_1		ft		ft		ft		ft	
Elevation 2, E_2		ft		ft		ft		ft	
Watercourse Slope, $s = (E_1 - E_2) / L$		ft/ft		ft/ft		ft/ft		ft/ft	
Average Velocity, V		ft/s		ft/s		ft/s		ft/s	
$T_t = L / (3600 * V)$		hr		hr		hr		hr	
		+		+		+		=	0.0 min

Open Channel Flow [TR-55 equation 3-4]

		CD								
		Channel								
Open Channel	Front Slope, s_1	6.00	:1		:1		:1		:1	
	Bottom width, B	5.00	ft		ft		ft		ft	
	Back Slope, s_2	4.00	:1		:1		:1		:1	
	Depth, H	0.74	ft		ft		ft		ft	
Pipe	Diameter, D		in		in		in		in	
Cross Sectional Flow Area, a		6.44	sq ft		sq ft		sq ft		sq ft	
Wetted Perimeter, P_w		12.55	ft		ft		ft		ft	
Hydraulic radius, $r = a / P_w$		0.51	ft		ft		ft		ft	
Flow Length, L		7300	ft		ft		ft		ft	
Elevation 1, E_1		25.00	ft		ft		ft		ft	
Elevation 2, E_2		18.50	ft		ft		ft		ft	
Channel Slope, $s = (E_1 - E_2) / L$		0.0009	ft/ft		ft/ft		ft/ft		ft/ft	
Manning's Roughness coeff., n		0.042								
Average Velocity, $V = 1.49 * r^{2/3} * s^{1/2} /$		0.68	ft/s		ft/s		ft/s		ft/s	
$T_t = L / (3600 * V)$		2.99	ft/s		ft/s		ft/s		ft/s	
		179.4	+		+		+		=	179.4 min

Total Time of Concentration

Watershed Tc = 184 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Post-Basin 1 & 2
Condition: Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	21	ft	28	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1	28.00	ft	27.00	ft		ft		ft		
Elevation 2, E_2	27.00	ft	25.00	ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.05	ft/ft	0.07	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.00	hr	0.07	hr		hr		hr		
	0.2	+	4.0	+		+		=	4.2	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description								
Flow Length, L		ft		ft		ft		ft
Elevation 1, E_1		ft		ft		ft		ft
Elevation 2, E_2		ft		ft		ft		ft
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft
Average Velocity, V		ft/s		ft/s		ft/s		ft/s
T_t = L / (3600 * V)		hr		hr		hr		hr
		+		+		+	=	0.0 min

Open Channel Flow [TR-55 equation 3-4]

		CD		DE		EF				
		Channel		Pipe		Pipe				
Open Channel	Front Slope, s_1	6.00	:1		:1		:1		:1	
	Bottom width, B	5.00	ft		ft		ft		ft	
	Back Slope, s_2	4.00	:1		:1		:1		:1	
	Depth, H	0.74	ft		ft		ft		ft	
Pipe	Diameter, D		in	42.0	in	48.0	in		in	
Cross Sectional Flow Area, a		6.44	sq ft	9.62	sq ft	12.57	sq ft		sq ft	
Wetted Perimeter, P_w		12.55	ft	11.00	ft	12.57	ft		ft	
Hydraulic radius, r = a / P_w		0.51	ft	0.88	ft	1.00	ft		ft	
Flow Length, L		3500	ft	1100	ft	2700	ft		ft	
Elevation 1, E_1		25.00	ft	21.00	ft	19.10	ft		ft	
Elevation 2, E_2		22.90	ft	19.10	ft	16.80	ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0006	ft/ft	0.0017	ft/ft	0.0009	ft/ft		ft/ft	
Manning's Roughness coeff., n		0.042		0.012		0.012				
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		0.56	ft/s	4.72	ft/s	3.62	ft/s		ft/s	
T_t = L / (3600 * V)		1.75	ft/s	0.06	ft/s	0.21	ft/s		ft/s	
		104.8	+	3.9	+	12.4	+	=	121.1	min

Total Time of Concentration

Watershed Tc = 125 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Pre-Basin 3
Condition: Pre-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	20	ft	35	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1	28.50	ft	27.80	ft		ft		ft		
Elevation 2, E_2	27.80	ft	22.00	ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.04	ft/ft	0.17	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * s$^{0.4}$)	0.00	hr	0.06	hr		hr		hr		
	0.2	+	3.4	+		+		=	3.6	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description									
Flow Length, L		ft		ft		ft		ft	
Elevation 1, E_1		ft		ft		ft		ft	
Elevation 2, E_2		ft		ft		ft		ft	
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft	
Average Velocity, V		ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		hr		hr		hr		hr	
		+		+		+		=	0.0	min

Open Channel Flow [TR-55 equation 3-4]

		CD								
		Channel								
Open Channel	Front Slope, s_1	6.00	:1		:1		:1		:1	
	Bottom width, B	5.00	ft		ft		ft		ft	
	Back Slope, s_2	4.00	:1		:1		:1		:1	
	Depth, H	0.93	ft		ft		ft		ft	
Pipe	Diameter, D		in		in		in		in	
Cross Sectional Flow Area, a		8.97	sq ft		sq ft		sq ft		sq ft	
Wetted Perimeter, P_w		14.49	ft		ft		ft		ft	
Hydraulic radius, r = a / P_w		0.62	ft		ft		ft		ft	
Flow Length, L		3570	ft		ft		ft		ft	
Elevation 1, E_1		22.00	ft		ft		ft		ft	
Elevation 2, E_2		19.00	ft		ft		ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0008	ft/ft		ft/ft		ft/ft		ft/ft	
Manning's Roughness coeff., n		0.042								
Average Velocity, V = 1.49 * r$^{2/3}$ * s$^{1/2}$ /		0.75	ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		1.33	ft/s		ft/s		ft/s		ft/s	
		79.6	+		+		+		=	79.6	min

Total Time of Concentration

Watershed Tc = 83 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Post-Basin 3
Condition: Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	21	ft	28	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1		ft		ft		ft		ft		
Elevation 2, E_2		ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.05	ft/ft	0.07	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.00	hr	0.07	hr		hr		hr		
	0.2	+	4.0	+		+		=	4.2	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description									
Flow Length, L		ft		ft		ft		ft	
Elevation 1, E_1		ft		ft		ft		ft	
Elevation 2, E_2		ft		ft		ft		ft	
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft	
Average Velocity, V		ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		hr		hr		hr		hr	
		+		+		+		=	0.0	min

Open Channel Flow [TR-55 equation 3-4]

		CD								
		Pipe								
Open Channel	Front Slope, s_1		:1		:1		:1		:1	
	Bottom width, B		ft		ft		ft		ft	
	Back Slope, s_2		:1		:1		:1		:1	
	Depth, H		ft		ft		ft		ft	
Pipe	Diameter, D	36	in		in		in		in	
Cross Sectional Flow Area, a		7.07	sq ft		sq ft		sq ft		sq ft	
Wetted Perimeter, P_w		9.42	ft		ft		ft		ft	
Hydraulic radius, r = a / P_w		0.75	ft		ft		ft		ft	
Flow Length, L		3570	ft		ft		ft		ft	
Elevation 1, E_1		22.00	ft		ft		ft		ft	
Elevation 2, E_2		19.00	ft		ft		ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0008	ft/ft		ft/ft		ft/ft		ft/ft	
Manning's Roughness coeff., n		0.012								
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		2.97	ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		0.33	ft/s		ft/s		ft/s		ft/s	
		20.0	+		+		+	=	20.0	min

Total Time of Concentration

Watershed Tc = 24 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Pre-Basin 4 & 5 & 6
Condition: Pre-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	20	ft	25	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1	45.90	ft	45.50	ft		ft		ft		
Elevation 2, E_2	45.50	ft	43.50	ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.02	ft/ft	0.08	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.00	hr	0.06	hr		hr		hr		
	0.3	+	3.5	+		+		=	3.8	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description									
Flow Length, L		ft		ft		ft		ft	
Elevation 1, E_1		ft		ft		ft		ft	
Elevation 2, E_2		ft		ft		ft		ft	
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft	
Average Velocity, V		ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		hr		hr		hr		hr	
		+		+		+		=	0.0 min

Open Channel Flow [TR-55 equation 3-4]

		CD		DE		EF				
		Channel		Channel		Channel				
Open Channel	Front Slope, s_1	6.00	:1	6.00	:1	6.00	:1		:1	
	Bottom width, B	5.00	ft	5.00	ft	5.00	ft		ft	
	Back Slope, s_2	4.00	:1	4.00	:1	4.00	:1		:1	
	Depth, H	0.84	ft	0.80	ft	0.72	ft		ft	
Pipe	Diameter, D		in		in		in		in	
Cross Sectional Flow Area, a		7.73	sq ft	7.20	sq ft	6.19	sq ft		sq ft	
Wetted Perimeter, P_w		13.57	ft	13.16	ft	12.35	ft		ft	
Hydraulic radius, r = a / P_w		0.57	ft	0.55	ft	0.50	ft		ft	
Flow Length, L		1500	ft	2000	ft	6500	ft		ft	
Elevation 1, E_1		43.50	ft	43.30	ft	31.00	ft		ft	
Elevation 2, E_2		43.30	ft	31.00	ft	21.00	ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0001	ft/ft	0.0062	ft/ft	0.0015	ft/ft		ft/ft	
Manning's Roughness coeff., n		0.042		0.042		0.042				
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		0.28	ft/s	1.86	ft/s	0.88	ft/s		ft/s	
T_t = L / (3600 * V)		1.48	ft/s	0.30	ft/s	2.06	ft/s		ft/s	
		88.8	+	17.9	+	123.3	+		=	230.1 min

Total Time of Concentration

Watershed Tc = 234 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Post-Basin 4
Condition: Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	21	ft	28	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1		ft		ft		ft		ft		
Elevation 2, E_2		ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.05	ft/ft	0.07	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.00	hr	0.07	hr		hr		hr		
	0.2	+	4.0	+		+		=	4.2	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description									
Flow Length, L		ft		ft		ft		ft	
Elevation 1, E_1		ft		ft		ft		ft	
Elevation 2, E_2		ft		ft		ft		ft	
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft	
Average Velocity, V		ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		hr		hr		hr		hr	
		+		+		+		=	0.0	min

Open Channel Flow [TR-55 equation 3-4]

		CD								
		Pipe								
Open Channel	Front Slope, s_1		:1		:1		:1		:1	
	Bottom width, B		ft		ft		ft		ft	
	Back Slope, s_2		:1		:1		:1		:1	
	Depth, H		ft		ft		ft		ft	
Pipe	Diameter, D	36	in		in		in		in	
Cross Sectional Flow Area, a		7.07	sq ft		sq ft		sq ft		sq ft	
Wetted Perimeter, P_w		9.42	ft		ft		ft		ft	
Hydraulic radius, r = a / P_w		0.75	ft		ft		ft		ft	
Flow Length, L		2250	ft		ft		ft		ft	
Elevation 1, E_1		22.00	ft		ft		ft		ft	
Elevation 2, E_2		20.00	ft		ft		ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0009	ft/ft		ft/ft		ft/ft		ft/ft	
Manning's Roughness coeff., n		0.012								
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		3.06	ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		0.20	ft/s		ft/s		ft/s		ft/s	
		12.3	+		+		+		=	12.3	min

Total Time of Concentration

Watershed Tc = 16 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Post-Basin 5
Condition: Pre-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	20	ft	25	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1		ft		ft		ft		ft		
Elevation 2, E_2		ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.02	ft/ft	0.08	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.00	hr	0.06	hr		hr		hr		
	0.3	+	3.5	+		+		=	3.8	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description								
Flow Length, L		ft		ft		ft		ft		
Elevation 1, E_1		ft		ft		ft		ft		
Elevation 2, E_2		ft		ft		ft		ft		
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft		
Average Velocity, V		ft/s		ft/s		ft/s		ft/s		
T_t = L / (3600 * V)		hr		hr		hr		hr		
		+		+		+		=	0.0	min

Open Channel Flow [TR-55 equation 3-4]

		CD							
		Pipe							
Open Channel	Front Slope, s_1		:1			:1		:1	
	Bottom width, B		ft			ft		ft	
	Back Slope, s_2		:1			:1		:1	
	Depth, H		ft			ft		ft	
Pipe	Diameter, D	60	in			in		in	
Cross Sectional Flow Area, a		19.63	sq ft			sq ft		sq ft	
Wetted Perimeter, P_w		15.71	ft			ft		ft	
Hydraulic radius, r = a / P_w		1.25	ft			ft		ft	
Flow Length, L		4000	ft			ft		ft	
Elevation 1, E_1		26.00	ft			ft		ft	
Elevation 2, E_2		23.00	ft			ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0008	ft/ft			ft/ft		ft/ft	
Manning's Roughness coeff., n		0.012							
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		3.95	ft/s			ft/s		ft/s	
T_t = L / (3600 * V)		0.28	ft/s			ft/s		ft/s	
		16.9	+			+		=	16.9	min

Total Time of Concentration

Watershed Tc = 21 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Post-Basin 6
Condition: Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	20	ft	25	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1	45.90	ft	45.50	ft		ft		ft		
Elevation 2, E_2	45.50	ft	43.50	ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.02	ft/ft	0.08	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * s$^{0.4}$)	0.00	hr	0.06	hr		hr		hr		
	0.3	+	3.5	+		+		=	3.8	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description								
Flow Length, L		ft		ft		ft		ft
Elevation 1, E_1		ft		ft		ft		ft
Elevation 2, E_2		ft		ft		ft		ft
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft
Average Velocity, V		ft/s		ft/s		ft/s		ft/s
T_t = L / (3600 * V)		hr		hr		hr		hr
		+		+		+	=	0.0 min

Open Channel Flow [TR-55 equation 3-4]

		CD		DE					
		Channel		Channel					
Open Channel	Front Slope, s_1	6.00	:1	6.00	:1		:1		:1
	Bottom width, B	5.00	ft	5.00	ft		ft		ft
	Back Slope, s_2	4.00	:1	4.00	:1		:1		:1
	Depth, H	0.84	ft	0.80	ft		ft		ft
Pipe	Diameter, D		in		in		in		in
Cross Sectional Flow Area, a		7.73	sq ft	7.20	sq ft		sq ft		sq ft
Wetted Perimeter, P_w		13.57	ft	13.16	ft		ft		ft
Hydraulic radius, r = a / P_w		0.57	ft	0.55	ft		ft		ft
Flow Length, L		1500	ft	2000	ft		ft		ft
Elevation 1, E_1		43.50	ft	43.30	ft		ft		ft
Elevation 2, E_2		43.30	ft	31.00	ft		ft		ft
Channel Slope, s = (E_1 - E_2) / L		0.0001	ft/ft	0.0062	ft/ft		ft/ft		ft/ft
Manning's Roughness coeff., n		0.042		0.042					
Average Velocity, V = 1.49 * r$^{2/3}$ * s$^{1/2}$ /		0.28	ft/s	1.86	ft/s		ft/s		ft/s
T_t = L / (3600 * V)		1.48	ft/s	0.30	ft/s		ft/s		ft/s
		88.8	+	17.9	+		+	=	106.8 min

Total Time of Concentration

Watershed Tc = 111 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Post-Basin 5 & 6
Condition: Pre-Development

Sheet Flow [TR-55 equation 3-3]

	AB		BC							
Surface Description	Smooth surfaces		Bermuda grass							
Manning's Roughness coeff., n	0.011		0.41							
Flow Length, L (should be <= 100 ft)	20	ft	25	ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in	4.52	in		in		in		
Elevation 1, E_1	45.90	ft	45.50	ft		ft		ft		
Elevation 2, E_2	45.50	ft	43.50	ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.02	ft/ft	0.08	ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.00	hr	0.06	hr		hr		hr		
	0.3	+	3.5	+		+		=	3.8	min

Shallow Concentrated Flow [TR-55 figure 3-1]

Surface Description									
Flow Length, L		ft		ft		ft		ft	
Elevation 1, E_1		ft		ft		ft		ft	
Elevation 2, E_2		ft		ft		ft		ft	
Watercourse Slope, s = (E_1 - E_2) / L		ft/ft		ft/ft		ft/ft		ft/ft	
Average Velocity, V		ft/s		ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		hr		hr		hr		hr	
		+		+		+		=	0.0 min

Open Channel Flow [TR-55 equation 3-4]

		CD		DE		EF				
		Channel		Channel		Pipe				
Open Channel	Front Slope, s_1	6.00	:1	6.00	:1		:1		:1	
	Bottom width, B	5.00	ft	5.00	ft		ft		ft	
	Back Slope, s_2	4.00	:1	4.00	:1		:1		:1	
	Depth, H	0.84	ft	0.80	ft		ft		ft	
Pipe	Diameter, D		in		in	60	in		in	
Cross Sectional Flow Area, a		7.73	sq ft	7.20	sq ft	19.63	sq ft		sq ft	
Wetted Perimeter, P_w		13.57	ft	13.16	ft	15.71	ft		ft	
Hydraulic radius, r = a / P_w		0.57	ft	0.55	ft	1.25	ft		ft	
Flow Length, L		1500	ft	2000	ft	4000	ft		ft	
Elevation 1, E_1		43.50	ft	43.30	ft	26.00	ft		ft	
Elevation 2, E_2		43.30	ft	31.00	ft	23.00	ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0001	ft/ft	0.0062	ft/ft	0.0008	ft/ft		ft/ft	
Manning's Roughness coeff., n		0.042		0.042		0.012				
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		0.28	ft/s	1.86	ft/s	3.95	ft/s		ft/s	
T_t = L / (3600 * V)		1.48	ft/s	0.30	ft/s	0.28	ft/s		ft/s	
		88.8	+	17.9	+	16.9	+		=	123.6 min

Total Time of Concentration

Watershed Tc = 127 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Grand Oaks
Condition: Pre- & Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB									
Surface Description	Dense grasses									
Manning's Roughness coeff., n	0.24									
Flow Length, L (should be <= 100 ft)	100	ft		ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in		in		in		in		
Elevation 1, E_1	26.82	ft		ft		ft		ft		
Elevation 2, E_2	25.97	ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.01	ft/ft		ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.28	hr		hr		hr		hr		
	16.9	+		+		+		=	16.9	min

Shallow Concentrated Flow [TR-55 figure 3-1]

	BC									
Surface Description	Unpaved									
Flow Length, L	842	ft		ft		ft		ft		
Elevation 1, E_1	26.82	ft		ft		ft		ft		
Elevation 2, E_2	23.91	ft		ft		ft		ft		
Watercourse Slope, s = (E_1 - E_2) / L	1.000	ft/ft		ft/ft		ft/ft		ft/ft		
Average Velocity, V	16.13	ft/s		ft/s		ft/s		ft/s		
T_t = L / (3600 * V)	0.01	hr		hr		hr		hr		
	0.9	+		+		+		=	0.9	min

Open Channel Flow [TR-55 equation 3-4]

		CD									
		Channel									
Open Channel	Front Slope, s_1	6.00	:1		:1		:1		:1		
	Bottom width, B	5.00	ft		ft		ft		ft		
	Back Slope, s_2	4.00	:1		:1		:1		:1		
	Depth, H	1.00	ft		ft		ft		ft		
Pipe	Diameter, D		in		in		in		in		
Cross Sectional Flow Area, a		10.00	sq ft		sq ft		sq ft		sq ft		
Wetted Perimeter, P_w		15.21	ft		ft		ft		ft		
Hydraulic radius, r = a / P_w		0.66	ft		ft		ft		ft		
Flow Length, L		1189	ft		ft		ft		ft		
Elevation 1, E_1		23.91	ft		ft		ft		ft		
Elevation 2, E_2		22.23	ft		ft		ft		ft		
Channel Slope, s = (E_1 - E_2) / L		0.0014	ft/ft		ft/ft		ft/ft		ft/ft		
Manning's Roughness coeff., n		0.042									
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		1.01	ft/s		ft/s		ft/s		ft/s		
T_t = L / (3600 * V)		0.33	ft/s		ft/s		ft/s		ft/s		
		19.7	+		+		+		=	19.7	min

Total Time of Concentration

Watershed Tc to Boundry 4 = 37 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Tomoka Pines
Condition: Pre- & Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB									
Surface Description	Woods Dense underbrush									
Manning's Roughness coeff., n	0.8									
Flow Length, L (should be <= 100 ft)	100	ft		ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in		in		in		in		
Elevation 1, E_1	28.48	ft		ft		ft		ft		
Elevation 2, E_2	28.30	ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.00	ft/ft		ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	1.37	hr		hr		hr		hr		
	82.4	+		+		+		=	82.4	min

Shallow Concentrated Flow [TR-55 figure 3-1]

	BC									
Surface Description	Unpaved									
Flow Length, L	3412	ft		ft		ft		ft		
Elevation 1, E_1	28.30	ft		ft		ft		ft		
Elevation 2, E_2	25.80	ft		ft		ft		ft		
Watercourse Slope, s = (E_1 - E_2) / L	0.001	ft/ft		ft/ft		ft/ft		ft/ft		
Average Velocity, V	0.44	ft/s		ft/s		ft/s		ft/s		
T_t = L / (3600 * V)	2.17	hr		hr		hr		hr		
	130.2	+		+		+		=	130.2	min

Open Channel Flow [TR-55 equation 3-4]

		CD		DE						
		Channel		Channel						
Open Channel	Front Slope, s_1	10.00	:1	6.00	:1		:1		:1	
	Bottom width, B	125.00	ft	5.00	ft		ft		ft	
	Back Slope, s_2	10.00	:1	4.00	:1		:1		:1	
	Depth, H	0.50	ft	1.00	ft		ft		ft	
Pipe	Diameter, D		in		in		in		in	
Cross Sectional Flow Area, a		65.00	sq ft	10.00	sq ft		sq ft		sq ft	
Wetted Perimeter, P_w		135.05	ft	15.21	ft		ft		ft	
Hydraulic radius, r = a / P_w		0.48	ft	0.66	1		ft		ft	
Flow Length, L		432	ft	1189	ft		ft		ft	
Elevation 1, E_1		25.80	ft	25.22	ft		ft		ft	
Elevation 2, E_2		25.22	ft	22.23	ft		ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0013	ft/ft	0.0025	ft/ft		ft/ft		ft/ft	
Manning's Roughness coeff., n		0.100		0.042						
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		0.34	ft/s	1.35	ft/s		ft/s		ft/s	
T_t = L / (3600 * V)		0.36	ft/s	0.25	ft/s		ft/s		ft/s	
		21.5	+	14.7	+		+	=	36.2	min

Total Time of Concentration

Watershed Tc to Boundry 4 = 249 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Turning Point
Condition: Pre- & Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB									
Surface Description	Woods Dense underbrush									
Manning's Roughness coeff., n	0.8									
Flow Length, L (should be <= 100 ft)	100	ft		ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in		in		in		in		
Elevation 1, E_1	29.41	ft		ft		ft		ft		
Elevation 2, E_2	29.18	ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.00	ft/ft		ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	1.25	hr		hr		hr		hr		
	74.7	+		+		+		=	74.7	min

Shallow Concentrated Flow [TR-55 figure 3-1]

	BC									
Surface Description	Unpaved									
Flow Length, L	645	ft		ft		ft		ft		
Elevation 1, E_1	29.18	ft		ft		ft		ft		
Elevation 2, E_2	26.44	ft		ft		ft		ft		
Watercourse Slope, s = (E_1 - E_2) / L	0.004	ft/ft		ft/ft		ft/ft		ft/ft		
Average Velocity, V	1.05	ft/s		ft/s		ft/s		ft/s		
T_t = L / (3600 * V)	0.17	hr		hr		hr		hr		
	10.2	+		+		+		=	10.2	min

Open Channel Flow [TR-55 equation 3-4]

		CD		DE		EF				
		Channel		Channel		Channel				
Open Channel	Front Slope, s_1	10.00	:1	6.00	:1	6.00	:1		:1	
	Bottom width, B	125.00	ft	5.00	ft	5.00	ft		ft	
	Back Slope, s_2	10.00	:1	4.00	:1	4.00	:1		:1	
	Depth, H	0.50	ft	1.00	ft	1.00	ft		ft	
Pipe	Diameter, D		in		in		in		in	
Cross Sectional Flow Area, a		65.00	sq ft	10.00	sq ft	10.00	sq ft		sq ft	
Wetted Perimeter, P_w		135.05	ft	15.21	ft	15.21	ft		ft	
Hydraulic radius, r = a / P_w		0.48	ft	0.66	ft	0.66	ft		ft	
Flow Length, L		633	ft	3037	ft	1189	ft		ft	
Elevation 1, E_1		26.44	ft	25.69	ft	24.03	ft		ft	
Elevation 2, E_2		25.98	ft	24.03	ft	22.23	ft		ft	
Channel Slope, s = (E_1 - E_2) / L		0.0007	ft/ft	0.0005	ft/ft	0.0015	ft/ft		ft/ft	
Manning's Roughness coeff., n		0.100		0.042		0.042				
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		0.25	ft/s	0.63	ft/s	1.04	ft/s		ft/s	
T_t = L / (3600 * V)		0.71	ft/s	1.34	ft/s	0.32	ft/s		ft/s	
		42.8	+	80.7	+	19.0	+		=	142.4 min

Total Time of Concentration

Watershed Tc to Boundry 4 = 227 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: South of Park Place
Condition: Pre- & Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB									
Surface Description	Woods Dense underbrush									
Manning's Roughness coeff., n	0.8									
Flow Length, L (should be <= 100 ft)	100	ft		ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in		in		in		in		
Elevation 1, E_1	46.52	ft		ft		ft		ft		
Elevation 2, E_2	46.39	ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.00	ft/ft		ft/ft		ft/ft		ft/ft		
Tt = 0.007 * (n * L)$^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	1.56	hr		hr		hr		hr		
	93.9	+		+		+		=	93.9	min

Shallow Concentrated Flow [TR-55 figure 3-1]

	BC		CD							
Surface Description	Unpaved		Unpaved							
Flow Length, L	1949	ft	960	ft		ft		ft		
Elevation 1, E_1	46.39	ft	43.46	ft		ft		ft		
Elevation 2, E_2	43.46	ft	31.26	ft		ft		ft		
Watercourse Slope, s = (E_1 - E_2) / L	0.002	ft/ft	0.013	ft/ft		ft/ft		ft/ft		
Average Velocity, V	0.63	ft/s	1.82	ft/s		ft/s		ft/s		
T_t = L / (3600 * V)	0.87	hr	0.15	hr		hr		hr		
	51.9	+	8.8	+		+		=	60.7	min

Open Channel Flow [TR-55 equation 3-4]

		DE		EF		FG		GH		
		Channel		Channel		Channel		Channel		
Open Channel	Front Slope, s_1	10.00	:1	6.00	:1	6.00	:1	6.00	:1	
	Bottom width, B	125.00	ft	5.00	ft	5.00	ft	5.00	ft	
	Back Slope, s_2	10.00	:1	4.00	:1	4.00	:1	4.00	:1	
	Depth, H	0.50	ft	1.00	ft	1.00	ft	1.00	ft	
Pipe	Diameter, D		in		in		in		in	
Cross Sectional Flow Area, a		65.00	sq ft	10.00	sq ft	10.00	sq ft	10.00	sq ft	
Wetted Perimeter, P_w		135.05	ft	15.21	ft	15.21	ft	15.21	ft	
Hydraulic radius, r = a / P_w		0.48	ft	0.66	ft	0.66	ft	0.66	ft	
Flow Length, L		2037	ft	1793	ft	3037	ft	1189	ft	
Elevation 1, E_1		31.26	ft	27.31	ft	25.69	ft	24.03	ft	
Elevation 2, E_2		28.02	ft	25.69	ft	24.03	ft	22.23	ft	
Channel Slope, s = (E_1 - E_2) / L		0.0016	ft/ft	0.0009	ft/ft	0.0005	ft/ft	0.0015	ft/ft	
Manning's Roughness coeff., n		0.100		0.042		0.042		0.042		
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		0.36	ft/s	0.81	ft/s	0.63	ft/s	1.04	ft/s	
T_t = L / (3600 * V)		1.55	ft/s	0.62	ft/s	1.34	ft/s	0.32	ft/s	
		93.0	+	37.1	+	80.7	+	19.0	=	229.8 min

Total Time of Concentration

Watershed Tc to Boundry 4 = 384 min

SR 16

Comp. By:	SS
Date:	1/15/2025
Chk. By:	VV
Job No:	21044753201

Time of Concentration Calculations

Basin No: Soluna Apartments
Condition: Pre- & Post-Development

Sheet Flow [TR-55 equation 3-3]

	AB									
Surface Description	Woods Dense underbrush									
Manning's Roughness coeff., n	0.8									
Flow Length, L (should be <= 100 ft)	100	ft		ft		ft		ft		
Two-yr, 24-hr rainfall, P_2	4.52	in		in		in		in		
Elevation 1, E_1	47.74	ft		ft		ft		ft		
Elevation 2, E_2	46.44	ft		ft		ft		ft		
Land Slope, s = (E_1 - E_2) / L	0.01	ft/ft		ft/ft		ft/ft		ft/ft		
Tt = 0.007 * $(n * L)^{0.8}$ / ($P_2^{0.5}$ * $s^{0.4}$)	0.62	hr		hr		hr		hr		
	37.4	+		+		+		=	37.4	min

Shallow Concentrated Flow [TR-55 figure 3-1]

	BC		CD							
Surface Description	Unpaved		Unpaved							
Flow Length, L	303	ft	2423	ft		ft		ft		
Elevation 1, E_1	46.44	ft	42.74	ft		ft		ft		
Elevation 2, E_2	42.74	ft	42.32	ft		ft		ft		
Watercourse Slope, s = (E_1 - E_2) / L	0.012	ft/ft	0.000	ft/ft		ft/ft		ft/ft		
Average Velocity, V	1.78	ft/s	0.21	ft/s		ft/s		ft/s		
T_t = L / (3600 * V)	0.05	hr	3.17	hr		hr		hr		
	2.8	+	190.1	+		+		=	192.9	min

Open Channel Flow [TR-55 equation 3-4]

		CD								
		Channel		Channel		Channel		Channel		
Open Channel	Front Slope, s_1	6.00	:1	6.00	:1	6.00	:1	6.00	:1	
	Bottom width, B	5.00	ft	5.00	ft	5.00	ft	5.00	ft	
	Back Slope, s_2	4.00	:1	4.00	:1	4.00	:1	4.00	:1	
	Depth, H	1.00	ft	1.00	ft	1.00	ft	1.00	ft	
Pipe	Diameter, D		in		in		in		in	
Cross Sectional Flow Area, a		10.00	sq ft	10.00	sq ft	10.00	sq ft	10.00	sq ft	
Wetted Perimeter, P_w		15.21	ft	15.21	ft	15.21	ft	15.21	ft	
Hydraulic radius, r = a / P_w		0.66	ft	0.66	ft	0.66	ft	0.66	ft	
Flow Length, L		3457	ft	1793	ft	3037	ft	1189	ft	
Elevation 1, E_1		42.32	ft	27.31	ft	25.69	ft	24.03	ft	
Elevation 2, E_2		27.31	ft	25.69	ft	24.03	ft	22.23	ft	
Channel Slope, s = (E_1 - E_2) / L		0.0043	ft/ft	0.0009	ft/ft	0.0005	ft/ft	0.0015	ft/ft	
Manning's Roughness coeff., n		0.042		0.042		0.042		0.042		
Average Velocity, V = 1.49 * $r^{2/3}$ * $s^{1/2}$ /		1.77	ft/s	0.81	ft/s	0.63	ft/s	1.04	ft/s	
T_t = L / (3600 * V)		0.54	ft/s	0.62	ft/s	1.34	ft/s	0.32	ft/s	
		32.6	+	37.1	+	80.7	+	19.0	=	169.3 min

Total Time of Concentration

Watershed Tc to Boundry 4 = 400 min

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 2A & 2B
OFW: FALSE
ICPR Scenario: POST

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	41.21	3.43	0.00	3.43	
(Criteria B) 2.5" over Impervious Area	18.31	3.81	0.00	3.81	
Required Treatment Volume [max(A, B)]				**3.81**	**ac-ft**

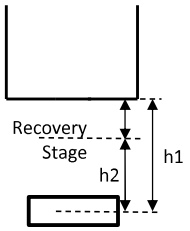
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft)	
				Total	Treatment
Berm Front		28.00	6.24	52.64	27.63
Treatment Weir	**Provided**	**24.00**	5.10	29.96	**4.95**
	Required	23.78	5.03	28.82	**3.81**
Orifice Invert / NWL		23.00	4.81	25.01	0.00
Break		21.00	4.26	15.94	-
Bottom		17.00	3.71	0.00	-
Sump Top		17.00	3.71	0.00	-
Sump Bottom		17.00	3.71	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.88	ft
Recovery	Elevation	23.62	ft
	Required Vol.	**1.91**	**ac-ft**
	Design Vol.	**1.91**	**ac-ft**
	Head, h_2	0.50	ft
Mean Value	Head, h_m	0.69	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	10.00	**in**
	Area, A	0.21	ft^2
	Centerline Elev.	23.13	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.83	cfs
Time to Recover Volume		**27.78**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	4.81	4.81	
Impervious		0.95	18.31	17.39	
Pervious Open Space		0.20	18.09	3.62	
Total			41.21	25.82	
Weighted Runoff Coefficient, c				0.63	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**8.57**	**ac-ft**
	Provided			**25.01**	**ac-ft**
Mean Depth				**5.20**	**ft**

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 2C
OFW: FALSE
ICPR Scenario: POST 2

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	47.51	3.96	0.00	3.96	
(Criteria B) 2.5" over Impervious Area	18.31	3.81	0.00	3.81	
Required Treatment Volume [max(A, B)]				**3.96**	**ac-ft**

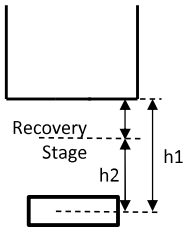
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft)	
				Total	Treatment
Berm Front		25.50	9.54	61.82	35.28
Treatment Weir	**Provided**	**22.00**	8.28	30.63	**4.10**
	Required	21.98	8.27	30.50	**3.96**
Orifice Invert / NWL		21.50	8.10	26.54	0.00
Break		19.50	7.54	10.90	-
Bottom		18.00	6.99	0.00	-
Sump Top		18.00	6.99	0.00	-
Sump Bottom		18.00	6.99	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.38	ft
Recovery	Elevation	21.76	ft
	Required Vol.	**1.98**	**ac-ft**
	Design Vol.	**1.98**	**ac-ft**
	Head, h_2	0.13	ft
Mean Value	Head, h_m	0.25	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	18.00	**in**
	Area, A	0.38	ft^2
	Centerline Elev.	21.63	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.91	cfs
Time to Recover Volume		**26.28**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	8.10	8.10	
Impervious		0.95	18.31	17.39	
Pervious Open Space		0.20	21.10	4.22	
Total			47.51	29.71	
Weighted Runoff Coefficient, c				0.63	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**9.86**	**ac-ft**
	Provided			**26.54**	**ac-ft**
Mean Depth				**3.28**	**ft**

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 3A, 3B, 3C
OFW: FALSE
ICPR Scenario: POST

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	18.97	1.58	0.00	1.58	
(Criteria B) 2.5" over Impervious Area	9.13	1.90	0.00	1.90	
Required Treatment Volume [max(A, B)]				**1.90**	**ac-ft**

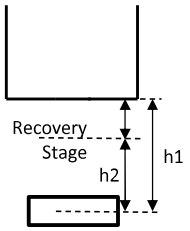
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft)	
				Total	Treatment
Berm Front		29.00	2.47	20.66	10.88
Treatment Weir	**Provided**	**25.00**	2.00	11.72	**1.94**
	Required	24.98	2.00	11.68	**1.90**
Orifice Invert / NWL		24.00	1.88	9.78	0.00
Break		22.00	1.66	6.24	-
Bottom		18.00	1.46	0.00	-
Sump Top		18.00	1.46	0.00	-
Sump Bottom		18.00	1.46	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.88	ft
Recovery	Elevation	24.52	ft
	Required Vol.	**0.95**	**ac-ft**
	Design Vol.	**0.95**	**ac-ft**
	Head, h_2	0.39	ft
Mean Value	Head, h_m	0.63	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	6.00	**in**
	Area, A	0.13	ft^2
	Centerline Elev.	24.13	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.48	cfs
Time to Recover Volume		**24.02**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	1.88	1.88	
Impervious		0.95	9.13	8.67	
Pervious Open Space		0.20	7.96	1.59	
Total			18.97	12.15	
Weighted Runoff Coefficient, c				0.64	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**4.03**	**ac-ft**
	Provided			**9.78**	**ac-ft**
Mean Depth				**5.20**	**ft**

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 4A & 4B
OFW: FALSE
ICPR Scenario: POST

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	25.57	2.13	0.00	2.13	
(Criteria B) 2.5" over Impervious Area	11.39	2.37	0.00	2.37	
Required Treatment Volume [max(A, B)]				**2.37**	**ac-ft**

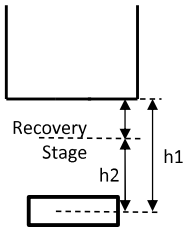
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft)	
				Total	Treatment
Berm Front		29.50	4.86	41.48	21.60
Treatment Weir	**Provided**	**25.25**	3.94	22.77	**2.90**
	Required	25.12	3.91	22.25	**2.37**
Orifice Invert / NWL		24.50	3.78	19.88	0.00
Break		22.50	3.38	12.72	-
Bottom		18.50	2.99	0.00	-
Sump Top		18.50	2.99	0.00	-
Sump Bottom		18.50	2.99	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.63	ft
Recovery	Elevation	24.95	ft
	Required Vol.	**1.19**	**ac-ft**
	Design Vol.	**1.19**	**ac-ft**
	Head, h_2	0.32	ft
Mean Value	Head, h_m	0.47	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	8.00	**in**
	Area, A	0.17	ft^2
	Centerline Elev.	24.63	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.55	cfs
Time to Recover Volume		**26.00**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	3.78	3.78	
Impervious		0.95	11.39	10.82	
Pervious Open Space		0.20	10.40	2.08	
Total			25.57	16.68	
Weighted Runoff Coefficient, c				0.65	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**5.53**	**ac-ft**
	Provided			**19.88**	**ac-ft**
Mean Depth				**5.26**	**ft**

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 4C
OFW: FALSE
ICPR Scenario: POST 2

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	31.00	2.58	0.00	2.58	
(Criteria B) 2.5" over Impervious Area	14.72	3.07	0.00	3.07	
Required Treatment Volume [max(A, B)]				**3.07**	**ac-ft**

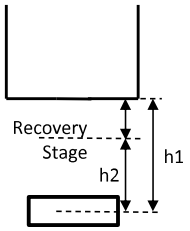
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft) Total	Volume (ac-ft) Treatment
Berm Front		29.50	5.50	50.92	25.35
Treatment Weir	**Provided**	**25.20**	4.76	28.86	**3.29**
	Required	25.15	4.75	28.64	**3.07**
Orifice Invert / NWL		24.50	4.64	25.57	0.00
Break		22.50	4.31	16.62	-
Bottom		18.50	4.00	0.00	-
Sump Top		18.50	4.00	0.00	-
Sump Bottom		18.50	4.00	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.57	ft
Recovery	Elevation	24.88	ft
	Required Vol.	**1.53**	**ac-ft**
	Design Vol.	**1.53**	**ac-ft**
	Head, h_2	0.25	ft
Mean Value	Head, h_m	0.41	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	10.00	**in**
	Area, A	0.21	ft^2
	Centerline Elev.	24.63	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.64	cfs
Time to Recover Volume		**28.78**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	4.64	4.64	
Impervious		0.95	14.72	13.98	
Pervious Open Space		0.20	11.64	2.33	
Total			31.00	20.95	
Weighted Runoff Coefficient, c				0.68	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**6.95**	**ac-ft**
	Provided			**25.57**	**ac-ft**
Mean Depth				**5.51**	**ft**

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 5A & 5B
OFW: FALSE
ICPR Scenario: POST

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	22.08	1.84	0.00	1.84	
(Criteria B) 2.5" over Impervious Area	10.17	2.12	0.00	2.12	
Required Treatment Volume [max(A, B)]				**2.12**	**ac-ft**

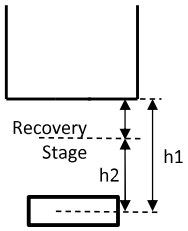
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft) Total	Volume (ac-ft) Treatment
Berm Front		30.00	4.22	29.66	17.63
Treatment Weir	**Provided**	**25.75**	3.04	14.23	**2.20**
	Required	25.72	3.03	14.15	**2.12**
Orifice Invert / NWL		25.00	2.84	12.03	0.00
Break		23.00	2.30	6.90	-
Bottom		19.00	1.16	0.00	-
Sump Top		19.00	1.16	0.00	-
Sump Bottom		19.00	1.16	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.63	ft
Recovery	Elevation	25.40	ft
	Required Vol.	**1.06**	**ac-ft**
	Design Vol.	**1.06**	**ac-ft**
	Head, h_2	0.27	ft
Mean Value	Head, h_m	0.45	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	7.00	**in**
	Area, A	0.15	ft^2
	Centerline Elev.	25.13	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.47	cfs
Time to Recover Volume		**27.27**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	2.84	2.84	
Impervious		0.95	10.17	9.66	
Pervious Open Space		0.20	9.07	1.81	
Total			22.08	14.31	
Weighted Runoff Coefficient, c				0.65	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**4.75**	**ac-ft**
	Provided			**12.03**	**ac-ft**
Mean Depth				**4.24**	**ft**

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 5C
OFW: FALSE
ICPR Scenario: POST 2

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	39.09	3.26	0.00	3.26	
(Criteria B) 2.5" over Impervious Area	18.78	3.91	0.00	3.91	
Required Treatment Volume [max(A, B)]				**3.91**	**ac-ft**

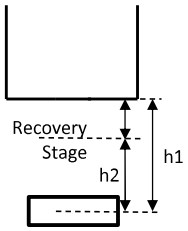
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft) Total	Volume (ac-ft) Treatment
Berm Front		30.00	6.49	39.59	25.38
Treatment Weir	**Provided**	**26.00**	4.23	18.15	**3.94**
	Required	25.99	4.22	18.12	**3.91**
Orifice Invert / NWL		25.00	3.66	14.21	0.00
Break		23.00	2.55	8.00	-
Bottom		19.00	1.45	0.00	-
Sump Top		19.00	1.45	0.00	-
Sump Bottom		19.00	1.45	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.88	ft
Recovery	Elevation	25.52	ft
	Required Vol.	**1.96**	**ac-ft**
	Design Vol.	**1.96**	**ac-ft**
	Head, h_2	0.40	ft
Mean Value	Head, h_m	0.64	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	12.00	**in**
	Area, A	0.25	ft^2
	Centerline Elev.	25.13	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.96	cfs
Time to Recover Volume		**24.66**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	3.66	3.66	
Impervious		0.95	18.78	17.84	
Pervious Open Space		0.20	16.65	3.33	
Total			39.09	24.83	
Weighted Runoff Coefficient, c				0.64	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**8.24**	**ac-ft**
	Provided			**14.21**	**ac-ft**
Mean Depth				**3.88**	**ft**

SR 16	Comp. By:	SS
	Date:	1/15/2025
	Chk. By:	VV
	Job No:	21044753201

Wet Detention Design Calculations (SJRWMD)

Pond Name: POND 6A & 6B
OFW: FALSE
ICPR Scenario: POST

Required Treatment Volume

	Area (ac)	Runoff (ac-ft)	OFW Req. (ac-ft)	Total Runoff (ac-ft)	
(Criteria A) 1" over Total Area*	17.04	1.42	0.00	1.42	
(Criteria B) 2.5" over Impervious Area	8.58	1.79	0.00	1.79	
Required Treatment Volume [max(A, B)]				**1.79**	**ac-ft**

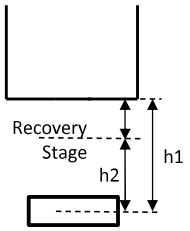
*Total area includes roadway and pond area.

Wet Detention Pond Geometry

		Elevation (ft)	Area (ac)	Volume (ac-ft)	
				Total	Treatment
Berm Front		39.00	2.30	18.58	9.98
Treatment Weir	**Provided**	**35.10**	1.82	10.53	**1.93**
	Required	35.02	1.81	10.39	**1.79**
Orifice Invert / NWL		34.00	1.69	8.60	0.00
Break		32.00	1.47	5.44	-
Bottom		28.00	1.25	0.00	-
Sump Top		28.00	1.25	0.00	-
Sump Bottom		28.00	1.25	0.00	-

Recovery Analysis

Treatment	Head, h_1	0.98	ft
Recovery	Elevation	34.60	ft
	Required Vol.	**0.89**	**ac-ft**
	Design Vol.	**0.89**	**ac-ft**
	Head, h_2	0.48	ft
Mean Value	Head, h_m	0.73	ft
Orifice	**Count, n**	1	
	Height	3.00	**in**
	Width	4.00	**in**
	Area, A	0.08	ft^2
	Centerline Elev.	34.13	ft
	Flow = $(0.6*A*(2*32.2*h_m)^{0.5})*n$	0.34	cfs
Time to Recover Volume		**31.63**	**hr**



Permanent Pool

		C	Area (ac)	C * Area	
Water		1.00	1.69	1.69	
Impervious		0.95	8.58	8.15	
Pervious Open Space		0.20	6.77	1.35	
Total			17.04	11.20	
Weighted Runoff Coefficient, c				0.66	
Residence Time, t				14	days
Wet Season Duration, d				153	days
Wet Season Rainfall, r				29.00	in
Permanent Pool	**Required = (Area*c*r*(t/d))/12*1.5**			**3.71**	**ac-ft**
	Provided			**8.60**	**ac-ft**
Mean Depth				**5.09**	**ft**

Node Max Conditions [Post]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Boundary 2	25 YR 24 HR	22.92	22.92	0.0000	29.48	0.00	0
Boundary 4	25 YR 24 HR	22.92	22.92	0.0000	163.43	0.00	0
Pond 2A/2B	25 YR 24 HR	27.00	25.98	0.0010	71.85	21.64	246650
Pond 3A/3B/3C	25 YR 24 HR	28.00	27.71	0.0010	90.05	8.29	100979
Pond 4A/4B	25 YR 24 HR	28.50	27.70	0.0010	180.95	121.48	194724
Pond 5A/5B	25 YR 24 HR	29.00	28.16	-0.0010	130.50	118.71	161748
Pond 6A/6B	25 YR 24 HR	38.00	37.26	0.0010	49.94	49.10	90964

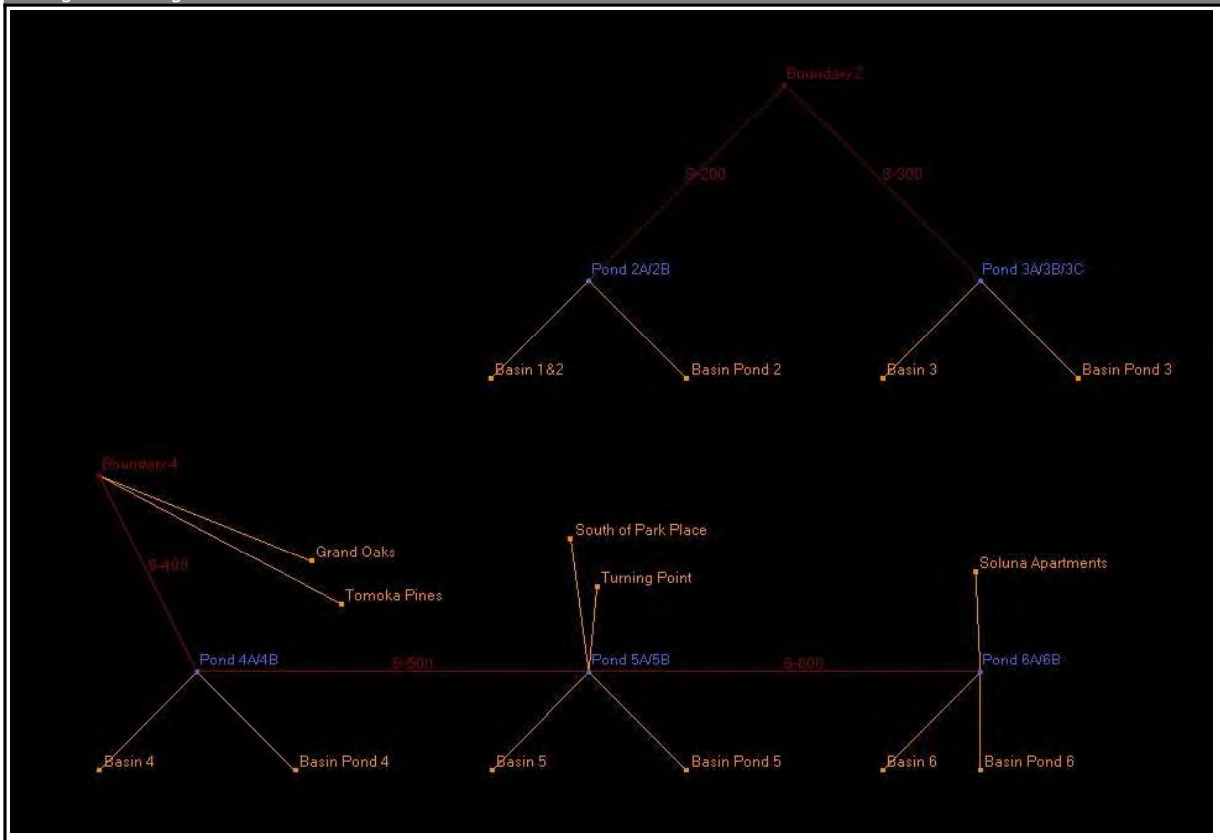
Node Max Conditions [Post 2]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Boundary 2	25 YR 24 HR	21.40	21.40	0.0000	66.95	0.00	0
Boundary 4	25 YR 24 HR	22.92	22.92	0.0000	181.41	0.00	0
Pond 2C	25 YR 24 HR	24.50	24.02	0.0010	76.42	7.37	392276
Pond 4C	25 YR 24 HR	28.50	27.46	0.0010	161.34	4.39	224266
Pond 5C	25 YR 24 HR	29.00	28.22	0.0010	178.02	173.50	238703

Node Max Conditions [Pre]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
Pre-Boundary 2	25 YR4 HR Pre	22.92	22.92	0.0000	71.62	0.00	0
Pre-Boundary 4	25 YR4 HR Pre	22.92	22.92	0.0000	221.82	0.00	0

Background Image: Post



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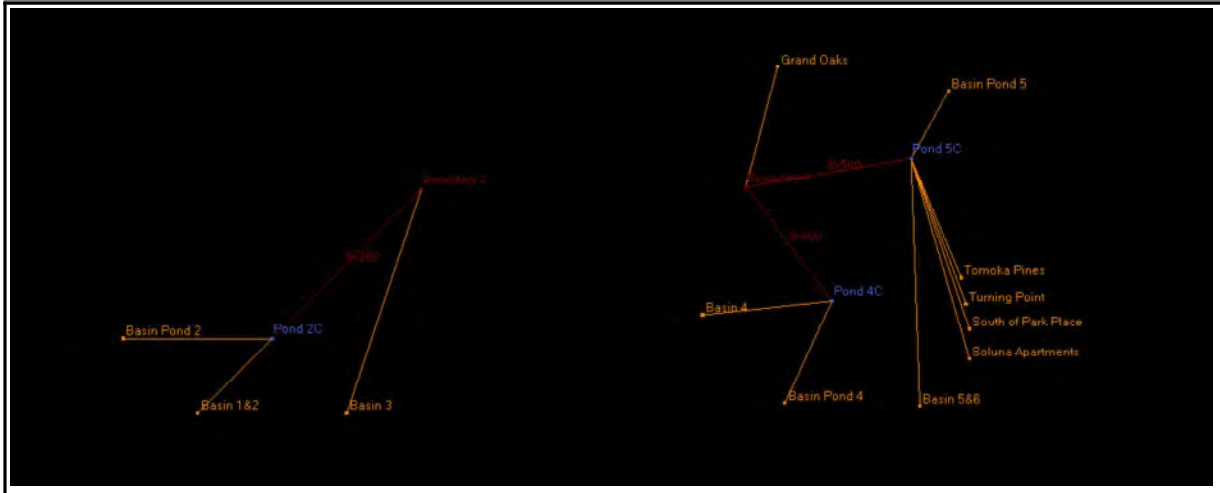

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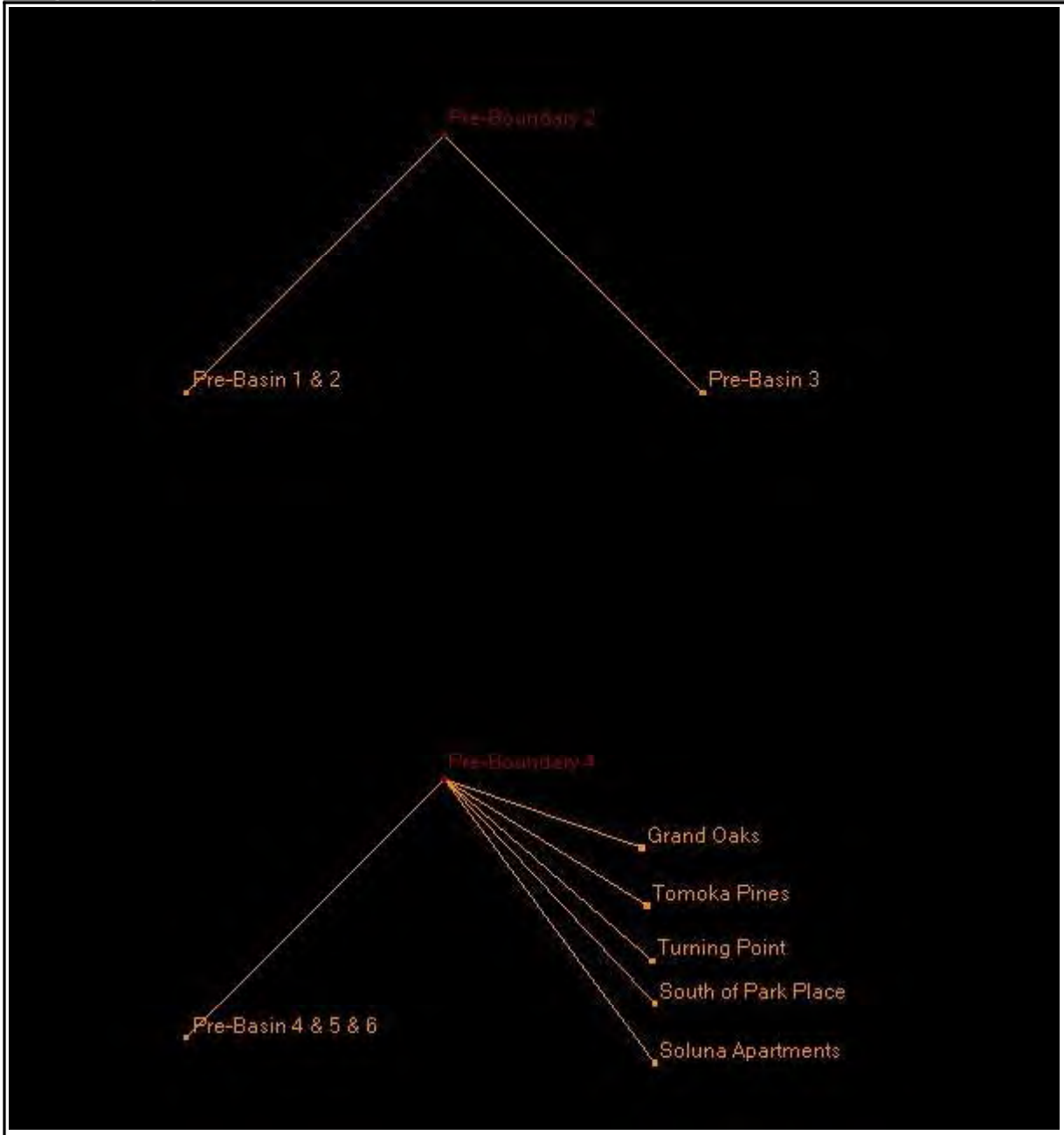


Manual Basin: Basin 1&2

Scenario:	Post
Node:	Pond 2A/2B
Hydrograph Method:	NRCS Unit Hydrograph

Infiltration Method: Curve Number
Time of Concentration: 125.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 34.9700 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
16.6600	Pervious	D			
18.3100	Impervious	-			

Comment:

Manual Basin: Basin 3

Scenario: Post
Node: Pond 3A/3B/3C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 24.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 16.5000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
7.3700	Pervious	D			
9.1300	Impervious	-			

Comment:

Manual Basin: Basin 4

Scenario: Post
Node: Pond 4A/4B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 16.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 20.7100 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
9.3200	Pervious	D			
11.3900	Impervious	-			

Comment:

Manual Basin: Basin 5

Scenario: Post
Node: Pond 5A/5B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 21.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 17.8600 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
7.6900	Pervious	D			
10.1700	Impervious	-			

Comment:

Manual Basin: Basin 6

Scenario: Post
Node: Pond 6A/6B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 111.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 14.7400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
6.1600	Pervious	D			
8.5800	Impervious	-			

Comment:

Manual Basin: Basin Pond 2

Scenario: Post
Node: Pond 2A/2B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 6.2400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
4.8100	Water	-			
1.4300	Pervious	D			

Comment:

Manual Basin: Basin Pond 3

Scenario: Post
Node: Pond 3A/3B/3C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 2.4700 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
1.8800	Water	-			
0.5900	Pervious	D			

Comment:

Manual Basin: Basin Pond 4

Scenario: Post
Node: Pond 4A/4B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484

Peaking Factor: 484.0
Area: 4.8600 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
3.7800	Water	-			
1.0800	Pervious	D			

Comment:

Manual Basin: Basin Pond 5

Scenario: Post
Node: Pond 5A/5B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 4.2200 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
2.8400	Water	-			
1.3800	Pervious	D			

Comment:

Manual Basin: Basin Pond 6

Scenario: Post
Node: Pond 6A/6B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 2.3000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
1.6900	Water	-			
0.6100	Pervious	D			

Comment:

Manual Basin: Grand Oaks

Scenario: Post
Node: Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 37.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 15.0800 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
0.0100	URBAN AND BUILT-UP B/D	B/D			
13.8500	AGRICULTURE A/D	A/D			
1.2200	AGRICULTURE B/D	B/D			

Comment:

Manual Basin: Soluna Apartments

Scenario: Post
Node: Pond 6A/6B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 400.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 108.2000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
0.0400	URBAN AND BUILT-UP A/D	A/D			
0.0100	URBAN AND BUILT-UP B/D	B/D			
22.8800	UPLAND FORESTS A/D	A/D			
29.9500	UPLAND FORESTS B/D	B/D			
3.0100	Water	-			
0.3000	Water	-			
42.1600	WETLANDS A/D	A/D			
9.7500	WETLANDS B/D	B/D			
0.0600	TRANSPORTATION, COMMUNICATION	A/D			

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
	AND UTILITIES A/D				
0.0400	TRANSPORTATION, COMMUNICATION AND UTILITIES B/D	B/D			

Comment:

Manual Basin: South of Park Place

Scenario: Post
Node: Pond 5A/5B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 384.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 124.8300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
9.7500	URBAN AND BUILT-UP A/D	A/D			
1.4200	URBAN AND BUILT-UP B/D	B/D			
22.7200	AGRICULTURE A/D	A/D			
0.0000	AGRICULTURE B/D	B/D			
0.0100	RANGELAND A	A			
2.7100	RANGELAND A/D	A/D			
2.8300	RANGELAND B/D	B/D			
1.5000	UPLAND FORESTS A	A			
31.9400	UPLAND FORESTS A/D	A/D			
24.6500	UPLAND FORESTS B/D	B/D			
2.8600	UPLAND FORESTS C/D	C/D			
7.8400	WETLANDS A	A			
4.8200	WETLANDS A/D	A/D			
5.5900	WETLANDS B/D	B/D			
5.7000	WETLANDS C/D	C/D			
0.3400	TRANSPORTATION, COMMUNICATION AND UTILITIES A/D	A/D			
0.1500	TRANSPORTATION,	B/D			

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
	COMMUNICATION AND UTILITIES B/D				

Comment:

Manual Basin: Tomoka Pines

Scenario: Post
Node: Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 249.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 82.3400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
17.2700	URBAN AND BUILT-UP A/D	A/D			
38.7700	UPLAND FORESTS A/D	A/D			
2.5100	UPLAND FORESTS B/D	B/D			
23.3200	WETLANDS A/D	A/D			
0.4700	WETLANDS B/D	B/D			

Comment:

Manual Basin: Turning Point

Scenario: Post
Node: Pond 5A/5B
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 227.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 37.8500 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
16.8200	URBAN AND	A/D			

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
	BUILT-UP A/D				
4.6900	UPLAND FORESTS A/D	A/D			
4.7200	UPLAND FORESTS B/D	B/D			
8.1000	WETLANDS A/D	A/D			
3.5200	WETLANDS B/D	B/D			

Comment:

Manual Basin: Basin 1&2

Scenario: Post 2
Node: Pond 2C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 125.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 34.9700 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
16.6600	Pervious	D			
18.3100	Impervious	-			

Comment:

Manual Basin: Basin 3

Scenario: Post 2
Node: Boundary 2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 24.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 13.5000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
6.0300	Pervious	D			
7.4700	Impervious	-			

Comment: Moved 3 acres from basin 3 to basin 4 to meet pre-post flow at boundary 2.

Manual Basin: Basin 4

Scenario: Post 2
Node: Pond 4C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 16.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 23.7100 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
10.6600	Pervious	D			
13.0500	Impervious	-			

Comment: Moved 3 acres from basin 3 to basin 4 to meet pre-post flow at boundary 2.

Manual Basin: Basin 5&6

Scenario: Post 2
Node: Pond 5C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 127.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 32.6000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
13.8200	Pervious	D			
18.7800	Impervious	-			

Comment:

Manual Basin: Basin Pond 2

Scenario: Post 2
Node: Pond 2C

Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 9.5400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
8.1000	Water	-			
1.4400	Pervious	D			

Comment:

Manual Basin: Basin Pond 4

Scenario: Post 2
Node: Pond 4C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 5.5000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
4.6400	Water	-			
0.8600	Pervious	D			

Comment:

Manual Basin: Basin Pond 5

Scenario: Post 2
Node: Pond 5C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 10.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 6.4900 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient	Reference ET

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
3.6600	Water	-			
2.8300	Pervious	D			

Comment:

Manual Basin: Grand Oaks

Scenario: Post 2
Node: Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 37.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 15.0800 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
0.0100	URBAN AND BUILT-UP B/D	B/D			
13.8500	AGRICULTURE A/D	A/D			
1.2200	AGRICULTURE B/D	B/D			

Comment:

Manual Basin: Soluna Apartments

Scenario: Post 2
Node: Pond 5C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 400.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 108.2000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
0.0400	URBAN AND BUILT-UP A/D	A/D			
0.0100	URBAN AND BUILT-UP B/D	B/D			
22.8800	UPLAND FORESTS	A/D			

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
	A/D				
29.9500	UPLAND FORESTS B/D	B/D			
3.0100	Water	-			
0.3000	Water	-			
42.1600	WETLANDS A/D	A/D			
9.7500	WETLANDS B/D	B/D			
0.0600	TRANSPORTATION, COMMUNICATION AND UTILITIES A/D	A/D			
0.0400	TRANSPORTATION, COMMUNICATION AND UTILITIES B/D	B/D			

Comment:

Manual Basin: South of Park Place

Scenario: Post 2
Node: Pond 5C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 384.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 124.8300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
9.7500	URBAN AND BUILT-UP A/D	A/D			
1.4200	URBAN AND BUILT-UP B/D	B/D			
22.7200	AGRICULTURE A/D	A/D			
0.0000	AGRICULTURE B/D	B/D			
0.0100	RANGELAND A	A			
2.7100	RANGELAND A/D	A/D			
2.8300	RANGELAND B/D	B/D			
1.5000	UPLAND FORESTS A	A			
31.9400	UPLAND FORESTS A/D	A/D			
24.6500	UPLAND FORESTS B/D	B/D			
2.8600	UPLAND FORESTS	C/D			

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
	C/D				
7.8400	WETLANDS A	A			
4.8200	WETLANDS A/D	A/D			
5.5900	WETLANDS B/D	B/D			
5.7000	WETLANDS C/D	C/D			
0.3400	TRANSPORTATION, COMMUNICATION AND UTILITIES A/D	A/D			
0.1500	TRANSPORTATION, COMMUNICATION AND UTILITIES B/D	B/D			

Comment:

Manual Basin: Tomoka Pines

Scenario: Post 2
Node: Pond 5C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 249.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 82.3400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
17.2700	URBAN AND BUILT-UP A/D	A/D			
38.7700	UPLAND FORESTS A/D	A/D			
2.5100	UPLAND FORESTS B/D	B/D			
23.3200	WETLANDS A/D	A/D			
0.4700	WETLANDS B/D	B/D			

Comment:

Manual Basin: Turning Point

Scenario: Post 2
Node: Pond 5C
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number

Time of Concentration: 227.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 37.8500 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
16.8200	URBAN AND BUILT-UP A/D	A/D			
4.6900	UPLAND FORESTS A/D	A/D			
4.7200	UPLAND FORESTS B/D	B/D			
8.1000	WETLANDS A/D	A/D			
3.5200	WETLANDS B/D	B/D			

Comment:

Manual Basin: Grand Oaks

Scenario: Pre
Node: Pre-Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 65.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 15.0800 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
0.0100	URBAN AND BUILT-UP B/D	B/D			
13.8500	AGRICULTURE A/D	A/D			
1.2200	AGRICULTURE B/D	B/D			

Comment:

Manual Basin: Pre-Basin 1 & 2

Scenario: Pre
Node: Pre-Boundary 2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 184.0000 min

Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 34.9700 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
27.1700	Pervious	D			
7.8000	Impervious	-			

Comment:

Manual Basin: Pre-Basin 3

Scenario: Pre
Node: Pre-Boundary 2
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 83.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 16.5000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
13.2300	Pervious	D			
3.2700	Impervious	-			

Comment:

Manual Basin: Pre-Basin 4 & 5 & 6

Scenario: Pre
Node: Pre-Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 234.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH484
Peaking Factor: 484.0
Area: 53.3200 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
40.5300	Pervious	D			
12.7900	Impervious	-			

Comment:

Manual Basin: Soluna Apartments

Scenario: Pre
Node: Pre-Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 400.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 108.2000 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
0.0400	URBAN AND BUILT-UP A/D	A/D			
0.0100	URBAN AND BUILT-UP B/D	B/D			
22.8800	UPLAND FORESTS A/D	A/D			
29.9500	UPLAND FORESTS B/D	B/D			
3.0100	Water	-			
0.3000	Water	-			
42.1600	WETLANDS A/D	A/D			
9.7500	WETLANDS B/D	B/D			
0.0600	TRANSPORTATION, COMMUNICATION AND UTILITIES A/D	A/D			
0.0400	TRANSPORTATION, COMMUNICATION AND UTILITIES B/D	B/D			

Comment:

Manual Basin: South of Park Place

Scenario: Pre
Node: Pre-Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 384.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr

Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 124.8300 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
9.7500	URBAN AND BUILT-UP A/D	A/D			
1.4200	URBAN AND BUILT-UP B/D	B/D			
22.7200	AGRICULTURE A/D	A/D			
0.0000	AGRICULTURE B/D	B/D			
0.0100	RANGELAND A	A			
2.7100	RANGELAND A/D	A/D			
2.8300	RANGELAND B/D	B/D			
1.5000	UPLAND FORESTS A	A			
31.9400	UPLAND FORESTS A/D	A/D			
24.6500	UPLAND FORESTS B/D	B/D			
2.8600	UPLAND FORESTS C/D	C/D			
7.8400	WETLANDS A	A			
4.8200	WETLANDS A/D	A/D			
5.5900	WETLANDS B/D	B/D			
5.7000	WETLANDS C/D	C/D			
0.3400	TRANSPORTATION, COMMUNICATION AND UTILITIES A/D	A/D			
0.1500	TRANSPORTATION, COMMUNICATION AND UTILITIES B/D	B/D			

Comment:

Manual Basin: Tomoka Pines

Scenario: Pre
Node: Pre-Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 249.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 82.3400 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient	Reference ET

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
17.2700	URBAN AND BUILT-UP A/D	A/D			
38.7700	UPLAND FORESTS A/D	A/D			
2.5100	UPLAND FORESTS B/D	B/D			
23.3200	WETLANDS A/D	A/D			
0.4700	WETLANDS B/D	B/D			

Comment:

Manual Basin: Turning Point

Scenario: Pre
Node: Pre-Boundary 4
Hydrograph Method: NRCS Unit Hydrograph
Infiltration Method: Curve Number
Time of Concentration: 227.0000 min
Max Allowable Q: 0.00 cfs
Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 37.8500 ac

Area [ac]	Land Cover Zone	Soil Zone	Rainfall Name	Crop Coefficient Zone	Reference ET Station
16.8200	URBAN AND BUILT-UP A/D	A/D			
4.6900	UPLAND FORESTS A/D	A/D			
4.7200	UPLAND FORESTS B/D	B/D			
8.1000	WETLANDS A/D	A/D			
3.5200	WETLANDS B/D	B/D			

Comment:

Node: Boundary 2

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 22.92 ft
Warning Stage: 22.92 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	22.92
0	0	0	30.0000	22.92

Comment: 25-yr Stage Extrapolated from FEMA FIS 12109CV004D 50 and 10yr

Node: Boundary 4

Scenario: Post
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 22.92 ft
Warning Stage: 22.92 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	22.92
0	0	0	30.0000	22.92

Comment: 25-yr Stage Extrapolated from FEMA FIS 12109CV004D 50 and 10yr

Node: Pond 2A/2B

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 23.00 ft
Warning Stage: 27.00 ft

Stage [ft]	Area [ac]	Area [ft2]
28.00	6.2400	271814
23.00	4.8100	209524
21.00	4.2600	185566
17.00	3.7100	161608

Comment:

Node: Pond 3A/3B/3C

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 24.00 ft
Warning Stage: 28.00 ft

Stage [ft]	Area [ac]	Area [ft2]
29.00	2.4700	107593
24.00	1.8800	81893
22.00	1.6600	72310
18.00	1.4600	63598

Comment:

Node: Pond 4A/4B

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 24.50 ft
Warning Stage: 28.50 ft

Stage [ft]	Area [ac]	Area [ft2]
29.50	4.8600	211702
24.50	3.7800	164657
22.50	3.3800	147233
18.50	2.9900	130244

Comment:

Node: Pond 5A/5B

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 25.00 ft
Warning Stage: 29.00 ft

Stage [ft]	Area [ac]	Area [ft2]
30.00	4.2200	183823
25.00	2.8400	123710
23.00	2.3000	100188
19.00	1.1600	50530

Comment:

Node: Pond 6A/6B

Scenario: Post
Type: Stage/Area
Base Flow: 0.00 cfs

Initial Stage: 34.00 ft
Warning Stage: 38.00 ft

Stage [ft]	Area [ac]	Area [ft2]
39.00	2.3000	100188
34.00	1.6900	73616
32.00	1.4700	64033
28.00	1.2500	54450

Comment:

Node: Boundary 2

Scenario: Post 2
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 21.40 ft
Warning Stage: 21.40 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	21.40
0	0	0	30.0000	21.40

Comment: 25-yr Stage Extrapolated from FEMA FIS 12109CV004D 50 and 10yr

Node: Boundary 4

Scenario: Post 2
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 22.92 ft
Warning Stage: 22.92 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	22.92
0	0	0	30.0000	22.92

Comment: 25-yr Stage Extrapolated from FEMA FIS 12109CV004D 50 and 10yr

Node: Pond 2C

Scenario: Post 2
Type: Stage/Area

Base Flow: 0.00 cfs
Initial Stage: 21.50 ft
Warning Stage: 24.50 ft

Stage [ft]	Area [ac]	Area [ft2]
25.50	9.5400	415562
21.50	8.1000	352836
19.50	7.5400	328442
18.00	6.9900	304484

Comment:

Node: Pond 4C

Scenario: Post 2
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 24.50 ft
Warning Stage: 28.50 ft

Stage [ft]	Area [ac]	Area [ft2]
29.50	5.5000	239580
24.50	4.6400	202118
22.50	4.3100	187744
18.50	4.0000	174240

Comment:

Node: Pond 5C

Scenario: Post 2
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 25.00 ft
Warning Stage: 29.00 ft

Stage [ft]	Area [ac]	Area [ft2]
30.00	6.4900	282704
25.00	3.6600	159430
23.00	2.5500	111078
19.00	1.4500	63162

Comment:

Node: Pre-Boundary 2

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 22.92 ft
Warning Stage: 22.92 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	22.92
0	0	0	30.0000	22.92

Comment: 25-yr Stage Extrapolated from FEMA FIS 12109CV004D 50 and 10yr

Node: Pre-Boundary 4

Scenario: Pre
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 22.92 ft
Warning Stage: 22.92 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	22.92
0	0	0	30.0000	22.92

Comment: 25-yr Stage Extrapolated from FEMA FIS 12109CV004D 50 and 10yr

Drop Structure Link: S-200

Scenario: Post
From Node: Pond 2A/2B
To Node: Boundary 2
Link Count: 1
Flow Direction: Both
Solution: Combine
Increments: 0
Pipe Count: 1
Damping: 0.0000 ft
Length: 618.00 ft
FHWA Code: 0
Entr Loss Coef: 0.00
Exit Loss Coef: 0.00
Bend Loss Coef: 0.00
Bend Location: 0.00 dec
Energy Switch: Energy

Upstream Pipe		Downstream Pipe	
Invert:	20.00 ft	Invert:	19.00 ft
Manning's N:	0.0120	Manning's N:	0.0120
Geometry: Circular		Geometry: Circular	
Max Depth:	3.00 ft	Max Depth:	3.00 ft
Bottom Clip			
Default:	0.00 ft	Default:	0.00 ft
Op Table:		Op Table:	
Ref Node:		Ref Node:	
Manning's N:	0.0000	Manning's N:	0.0000
Top Clip			
Default:	0.00 ft	Default:	0.00 ft
Op Table:		Op Table:	
Ref Node:		Ref Node:	
Manning's N:	0.0000	Manning's N:	0.0000

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	23.00 ft	Op Table:	
Control Elevation:	23.00 ft	Ref Node:	
Max Depth:	0.25 ft	Discharge Coefficients	
Max Width:	0.83 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	24.00 ft	Op Table:	
Control Elevation:	24.00 ft	Ref Node:	
Max Depth:	3.00 ft	Discharge Coefficients	
Max Width:	2.25 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	3	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	27.00 ft	Op Table:	
Control Elevation:	27.00 ft	Ref Node:	
Max Depth:	3.08 ft	Discharge Coefficients	
Max Width:	4.08 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: S-300		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	21.00 ft	Invert:	19.00 ft
From Node:	Pond 3A/3B/3C	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	Boundary 2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	516.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	24.00 ft	Op Table:	
Control Elevation:	24.00 ft	Ref Node:	
Max Depth:	0.25 ft	Discharge Coefficients	
Max Width:	0.50 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	25.00 ft	Op Table:	
Control Elevation:	25.00 ft	Ref Node:	
Max Depth:	3.00 ft	Discharge Coefficients	

Max Width:	0.50 ft		
Fillet:	0.00 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	3	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	28.00 ft	Op Table:	
Control Elevation:	28.00 ft	Ref Node:	
Max Depth:	3.08 ft	Discharge Coefficients	
Max Width:	4.08 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: S-400		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	21.50 ft	Invert:	21.00 ft
From Node:	Pond 4A/4B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	Boundary 4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	327.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft

Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	24.50 ft
Control Elevation:	24.50 ft
Max Depth:	0.25 ft
Max Width:	0.67 ft
Fillet:	0.00 ft

Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component

Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	25.25 ft
Control Elevation:	25.25 ft
Max Depth:	3.25 ft
Max Width:	10.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component

Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	28.50 ft
Control Elevation:	28.50 ft
Max Depth:	3.08 ft
Max Width:	4.08 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: S-500		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	22.00 ft	Invert:	20.00 ft
From Node:	Pond 5A/5B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	Pond 4A/4B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	5	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	2839.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	25.00 ft	Ref Node:	
Control Elevation:	25.00 ft	Discharge Coefficients	
Max Depth:	0.25 ft	Weir Default:	3.200
Max Width:	0.58 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	25.75 ft	Ref Node:	
Control Elevation:	25.75 ft	Discharge Coefficients	
Max Depth:	3.25 ft	Weir Default:	3.200
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	3	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	29.00 ft	Ref Node:	
Control Elevation:	29.00 ft	**Discharge Coefficients**	
Max Depth:	3.08 ft	Weir Default:	3.200
Max Width:	4.08 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: S-600		Upstream Pipe		Downstream Pipe	
Scenario:	Post	Invert:	31.00 ft	Invert:	22.00 ft
From Node:	Pond 6A/6B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	Pond 5A/5B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	**Bottom Clip**			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	3606.00 ft	**Top Clip**			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	34.00 ft	Ref Node:	
Control Elevation:	34.00 ft		

Max Depth:	0.25 ft
Max Width:	0.33 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component	
Weir:	2
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	35.10 ft
Control Elevation:	35.10 ft
Max Depth:	2.90 ft
Max Width:	4.75 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Weir Component	
Weir:	3
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Horizontal
Geometry Type:	Rectangular
Invert:	38.00 ft
Control Elevation:	38.00 ft
Max Depth:	3.08 ft
Max Width:	4.08 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: S-200	
Scenario:	Post 2
From Node:	Pond 2C
To Node:	Boundary 2
Link Count:	1

Upstream Pipe	
Invert:	17.50 ft
Manning's N:	0.0120
Geometry: Circular	
Max Depth:	5.00 ft

Downstream Pipe	
Invert:	17.00 ft
Manning's N:	0.0120
Geometry: Circular	
Max Depth:	5.00 ft

Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	196.41 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	22.00 ft	Op Table:	
Control Elevation:	22.00 ft	Ref Node:	
Max Depth:	2.50 ft	Discharge Coefficients	
Max Width:	0.50 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	2	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Horizontal	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	24.50 ft	Op Table:	
Control Elevation:	24.50 ft	Ref Node:	
Max Depth:	3.08 ft	Discharge Coefficients	
Max Width:	4.08 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component			
Weir:	3	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	

Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	21.50 ft
Control Elevation:	21.50 ft
Max Depth:	0.25 ft
Max Width:	1.50 ft
Fillet:	0.00 ft

Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: S-400	
Scenario:	Post 2
From Node:	Pond 4C
To Node:	Boundary 4
Link Count:	1
Flow Direction:	Both
Solution:	Combine
Increments:	0
Pipe Count:	1
Damping:	0.0000 ft
Length:	500.00 ft
FHWA Code:	0
Entr Loss Coef:	0.00
Exit Loss Coef:	0.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Upstream Pipe	
Invert:	21.50 ft
Manning's N:	0.0120
Geometry: Circular	
Max Depth:	5.00 ft
Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Downstream Pipe	
Invert:	21.00 ft
Manning's N:	0.0120
Geometry: Circular	
Max Depth:	5.00 ft
Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	1
Weir Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	24.50 ft
Control Elevation:	24.50 ft
Max Depth:	0.25 ft
Max Width:	0.83 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600

Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	25.20 ft	Ref Node:	
Control Elevation:	25.20 ft	**Discharge Coefficients**	
Max Depth:	3.30 ft	Weir Default:	3.200
Max Width:	0.25 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	3	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	**Top Clip**	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	28.50 ft	Ref Node:	
Control Elevation:	28.50 ft	**Discharge Coefficients**	
Max Depth:	3.08 ft	Weir Default:	3.200
Max Width:	4.08 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Drop Structure Link: S-500		Upstream Pipe		Downstream Pipe	
Scenario:	Post 2	Invert:	22.50 ft	Invert:	21.50 ft
From Node:	Pond 5C	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	Boundary 4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	5.00 ft	Max Depth:	5.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	2	Ref Node:		Ref Node:	

Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	1400.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	25.00 ft	Ref Node:	
Control Elevation:	25.00 ft	Discharge Coefficients	
Max Depth:	0.25 ft	Weir Default:	3.200
Max Width:	1.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	2	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	26.00 ft	Ref Node:	
Control Elevation:	26.00 ft	Discharge Coefficients	
Max Depth:	3.00 ft	Weir Default:	3.200
Max Width:	18.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Weir Component		Bottom Clip	
Weir:	3	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Horizontal	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	29.00 ft		

Control Elevation: 29.00 ft
Max Depth: 3.08 ft
Max Width: 4.08 ft
Fillet: 0.00 ft

Ref Node:

Discharge Coefficients

Weir Default: 3.200
Weir Table:
Orifice Default: 0.600
Orifice Table:

Weir Comment:

Drop Structure Comment:

Simulation: 25 YR 24 HR

Scenario: Post
Run Date/Time: 1/15/2025 12:02:12 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:	
Reference ET Folder:	
Unit Hydrograph Folder:	

Lookup Tables

Boundary Stage Set:	
Extern Hydrograph Set:	
Curve Number Set:	CURVE NUMBER
Green-Ampt Set:	
Vertical Layers Set:	
Impervious Set:	IMPERVIOUS
Roughness Set:	
Crop Coef Set:	
Fillable Porosity Set:	
Conductivity Set:	
Leakage Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6	ET for Manual Basins:	False
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FLMOD
		Rainfall Amount:	8.60 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 25 YR 24 HR

Scenario:	Post 2
Run Date/Time:	N/A
Program Version:	N/A

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000

End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: CURVE NUMBER
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: IMPERVIOUS
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain: Global

		Opt:	
Max dZ:	1.0000 ft	OF Region Rain Opt:	Global
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~FLMOD
		Rainfall Amount:	8.60 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
Dflt Damping (2D):	0.0050 ft	Dflt Damping (1D):	0.0050 ft
Min Node Srf Area (2D):	100 ft2	Min Node Srf Area (1D):	100 ft2
Energy Switch (2D):	Energy	Energy Switch (1D):	Energy

Comment:

Simulation: 25 YR4 HR Pre

Scenario: Pre
Run Date/Time: N/A
Program Version: N/A

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	30.0000

	Hydrology [sec]	Surface Hydraulics [sec]	Groundwater [sec]
Min Calculation Time:	60.0000	0.1000	900.0000
Max Calculation Time:		30.0000	

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Groundwater

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	60.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Reference ET Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set: CURVE NUMBER
Green-Ampt Set:
Vertical Layers Set:
Impervious Set: IMPERVIOUS
Roughness Set:
Crop Coef Set:
Fillable Porosity Set:
Conductivity Set:
Leakage Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic
Dflt Damping (2D): 0.0050 ft
Min Node Srf Area (2D): 100 ft2
Energy Switch (2D): Energy

IA Recovery Time: 24.0000 hr
ET for Manual Basins: False
Smp/Man Basin Rain Opt: Global
OF Region Rain Opt: Global
Rainfall Name: ~FLMOD
Rainfall Amount: 8.60 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Curve Number: CURVE NUMBER [Set]

Land Cover Zone	Soil Zone	Curve Number [dec]
AGRICULTURE A/D	A/D	80.0
AGRICULTURE B/D	B/D	80.0
Coniferous Plantations	D	79.0
Impervious	-	100.0
Pasture	D	89.0

Land Cover Zone	Soil Zone	Curve Number [dec]
Pervious	D	80.0
RANGELAND A	A	35.0
RANGELAND A/D	A/D	77.0
RANGELAND B/D	B/D	77.0
TRANSPORTATION, COMMUNICATION AND UTILITIES A/D	A/D	93.0
TRANSPORTATION, COMMUNICATION AND UTILITIES B/D	B/D	93.0
UPLAND FORESTS A	A	36.0
UPLAND FORESTS A/D	A/D	79.0
UPLAND FORESTS B/D	B/D	79.0
UPLAND FORESTS C/D	C/D	79.0
URBAN AND BUILT-UP A/D	A/D	82.0
URBAN AND BUILT-UP B/D	B/D	82.0
WETLANDS A	A	48.0
WETLANDS A/D	A/D	83.0
WETLANDS B/D	B/D	83.0
WETLANDS C/D	C/D	83.0
Water	-	100.0

Impervious: IMPERVIOUS [Set]

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
AGRICULTURE A/D	0.00	0.00	0.00	0.000	0.000
AGRICULTURE B/D	0.00	0.00	0.00	0.000	0.000
Coniferous Plantations	0.00	0.00	0.00	0.000	0.000
Impervious	0.00	0.00	0.00	0.000	0.000
Pasture	0.00	0.00	0.00	0.000	0.000
Pervious	0.00	0.00	0.00	0.000	0.000
RANGELAND A	0.00	0.00	0.00	0.000	0.000
RANGELAND A/D	0.00	0.00	0.00	0.000	0.000
RANGELAND B/D	0.00	0.00	0.00	0.000	0.000
TRANSPORTATION, COMMUNICATION AND UTILITIES A/D	0.00	0.00	0.00	0.000	0.000
TRANSPORTATION, COMMUNICATION AND UTILITIES B/D	0.00	0.00	0.00	0.000	0.000
UPLAND FORESTS A	0.00	0.00	0.00	0.000	0.000
UPLAND FORESTS	0.00	0.00	0.00	0.000	0.000

Land Cover Zone	% Impervious	% DCIA	% Direct	Ia Impervious [in]	Ia Pervious [in]
A/D					
UPLAND FORESTS B/D	0.00	0.00	0.00	0.000	0.000
UPLAND FORESTS C/D	0.00	0.00	0.00	0.000	0.000
URBAN AND BUILT-UP A/D	0.00	0.00	0.00	0.000	0.000
URBAN AND BUILT-UP B/D	0.00	0.00	0.00	0.000	0.000
WETLANDS A	0.00	0.00	0.00	0.000	0.000
WETLANDS A/D	0.00	0.00	0.00	0.000	0.000
WETLANDS B/D	0.00	0.00	0.00	0.000	0.000
WETLANDS C/D	0.00	0.00	0.00	0.000	0.000
Water	0.00	0.00	0.00	0.000	0.000

Appendix E – Pond Site Evaluation Matrix

Alternate Pond Site Evaluation Matrix
Project Description: SR 16 From International Golf Parkway to I-95 PD&E Study
FPID Number: 210447-5-32-01

Basin Number	**1**				**1+2**		
Pond Alternative	1A	1B	1C	1D	2A	2B	2C
Additional Right of Way Needed (acres)	3.26	3.99	5.78	3.59	9.36	10.07	18.60
Required Water Quality Volume (ac-ft)	2.03				3.81		
Required Water Quantity Volume (ac-ft)	9.13				35.28		
Groundwater Condition (ft) (Estimated Depth of SHWT)	1.00	0.00	0.50	0.75	1.00	1.00	1.00
Soil Condition (Hydrologic Soil Group)	A/D	A/D	A/D	A/D & C/D	A/D	A/D & C/D	A/D
Potential Hazardous Waste Contaminations	Medium	Medium	Low	Low	No	No	No
Potential Impacts to Protected Species	Low	Low	Low	Low	Moderate	Low	Low
Potential Impacts to Cultural Resources	No	No	No	No	No	No	No
Wetland Impacts (acres)	-	-	5.03	1.41	1.07	1.17	0.00
Potential Impacts to Utilities	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low
Existing Landscapes (Land Use of Parcel with Pond)	Residential, Low Density (Less than two dwelling units per acre)	Cropland and Pastureland	Wetland Hardwood Forests/Upland Hardwood Forests	Cropland and Pastureland	Vegetated Non-Forested Wetlands/Cropland and Pastureland/Tree Plantations	Tree Plantations/Vegetated Non-Forested Wetlands/Wetlands Forested Mixed/Conservation Easement	Tree Plantations
Adjoining Land uses (Land Use of Parcels Next to Pond Parcel)	Trans/Utilities/Institutional/Residential, Low Density (Less than two dwelling units per acre)	Cropland and Pastureland/Residential, Low Density (Less than two dwelling units per acre)	Trans/Nurseries and Vineyards/Upland Hardwood Forests/Wetland Hardwood Forests	Trans/Wetland Coniferous Forests/Wetland Forested Mixed/Cropland and Pastureland	Trans/Cropland and Pastureland/Wetland Hardwood Forests	Trans/Wetland Hardwood Forests/Tree Plantations	Trans/Cropland and Pastureland/Wetland Hardwood Forests
Right of Way Costs	$3,127,542	$2,966,938	$2,559,048	$2,278,775	$4,335,575	$2,679,250	$5,036,951
Construction Costs Including Earthwork	$4,764,743				$3,557,654		$6,199,165
Preferred Pond Alternative	No	No	No	No	No	No	Yes

Alternate Pond Site Evaluation Matrix
Project Description: SR 16 From International Golf Parkway to I-95 PD&E Study
FPID Number: 210447-5-32-01

Basin Number	**3**			**4**			**5**		**5+6**	**6**	
Pond Alternative	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B
Additional Right of Way Needed (acres)	4.11	3.31	5.18	6.55	6.75	7.45	6.30	6.78	8.14	3.80	3.69
Required Water Quality Volume (ac-ft)	1.90			2.37		2.66	2.12		3.79	1.79	
Required Water Quantity Volume (ac-ft)	10.88			14.40		25.35	11.75		25.38	9.98	
Groundwater Condition (ft) (Estimated Depth of SHWT)	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.00	1.00	1.00	1.00
Soil Condition (Hydrologic Soil Group)	A/D	A/D	A/D	A/D & B/D	A/D	A/D	A/D & B/D	A/D	A/D & B/D	A/D	A/D
Potential Hazardous Waste Contaminations	No	No	No	No	Low	Low	No	Medium	No	No	No
Potential Impacts to Protected Species	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Potential Impacts to Cultural Resources	No	No	No	No	No	No	No	No	No	No	No
Wetland Impacts (acres)	-	2.17	4.50	0.51	0.57	0.58	3.14	1.14	2.76	0.82	2.54
Potential Impacts to Utilities	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Existing Landscapes (Land Use of Parcel with Pond)	Cropland and Pastureland	Tree Plantations	Wetland Hardwood Forests/Tree Plantations	Upland Hardwood Forests	Cropland and Pastureland	Cropland and Pastureland	Cropland and Pastureland	Tree Plantations/Wetland Forested Mixed/Institutional	Tree Plantations/ Commercial and Services	Tree Plantations/Commercial and Services/ Conservation Easement	Upland Coniferous Forests/Cropland and Pastureland
Adjoining Land uses (Land Use of Parcels Next to Pond Parcel)	Trans/Cropland and Pastureland/Reservoirs	Trans/Wetland Hardwood Forests	Trans/Wetland Hardwood Forests	Trans/Upland Hardwood Forests/Tree Plantations/Residential, Low Density	Trans/Cropland and Pastureland	Trans/Cropland and Pastureland	Trans/Cropland and Pastureland	Trans/Tree Plantations/Wetland Forested Mixed	Trans/Tree Plantations/Wetland Forested Mixed/Wetland Coniferous Forest	Trans/Residential, Medium Density (Two-Five dwelling units per acre)/Upland Coniferous Forests	Trans/Cropland and Pastureland/Upland Coniferous Forests
Right of Way Costs	$2,755,465	$924,524	$993,770	$5,057,969	$5,144,666	$6,062,591	$5,894,039	$4,166,765	$3,130,715	$2,669,581	$2,233,367
Construction Costs Including Earthwork	$1,483,104			$2,288,543		$2,974,389	$5,120,881		$6,054,293	$4,085,783	
Preferred Pond Alternative	No	No	Yes	No	No	Yes	No	No	Yes	No	No

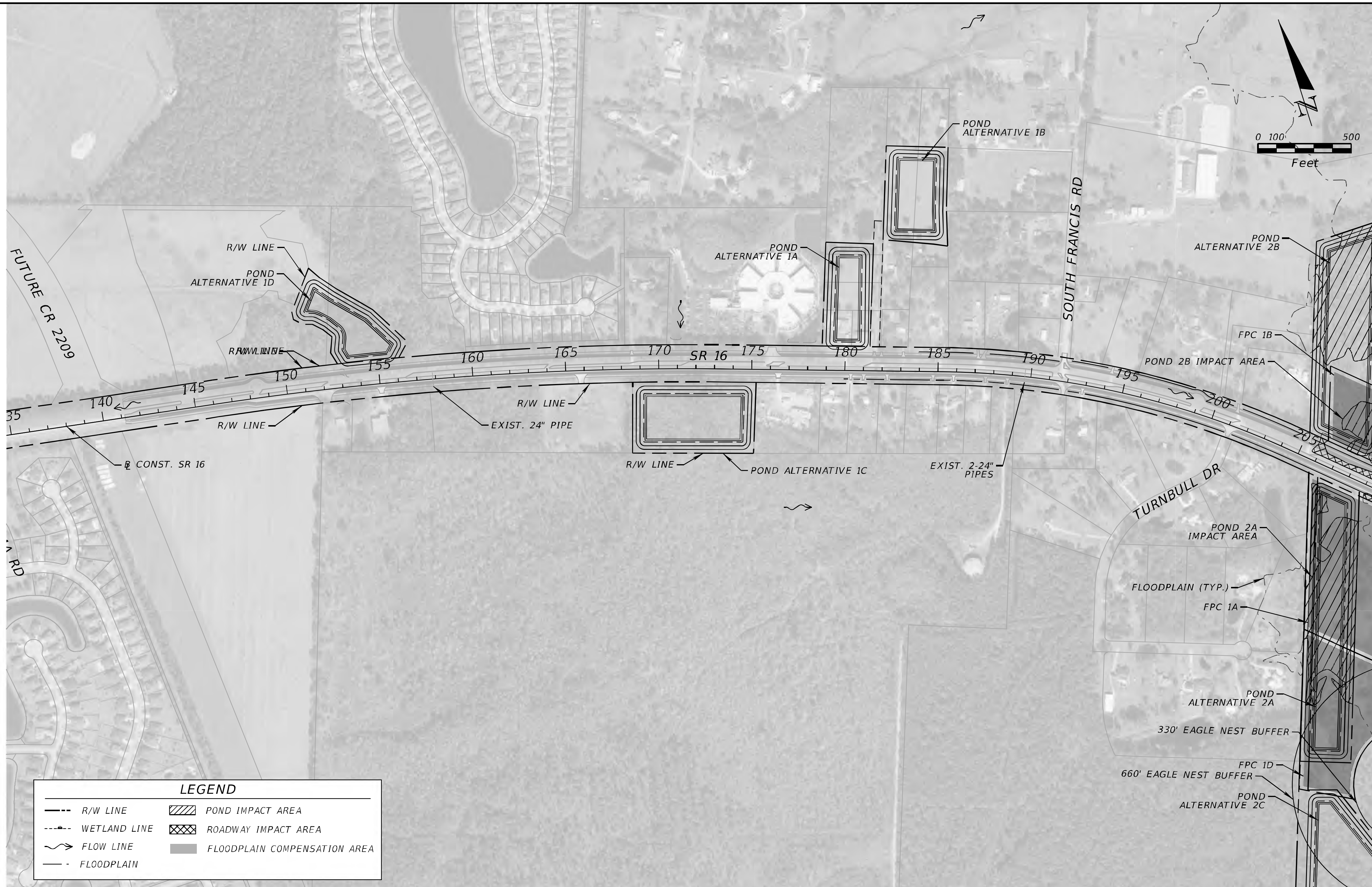
Pond Site	POND 1A,1B,1C,1D	POND 2A & 2B	POND 2C	POND 3A, 3B, 3C	POND 4A & 4B
Total Site Area (ac)	3.27	9.36	18.60	4.11	4.98
Site Perimeter (ft)	1622	3554	7357	1993	2001
Area at NWL (ac)	1.53	4.81	8.10	1.88	3.78
Average Exist. Ground Elevation (ft)	27.53	22.82	24.08	24.29	24.98
Pond Area at Exist Ground (ac)	1.59	4.76	9.03	1.91	3.88
Pipe Length (ft)	3171.00	618.00	618.00	516.00	327.00

Pay Item	Description	Unit Price	Quantity	Quantity Cost	Quantity	Quantity Cost	Quantity	Quantity Cost	Quantity	Quantity Cost	Quantity	Quantity Cost
104-10-3	SEDIMENT BARRIER (LF)	$2.95	1622	$4,784.90	3554	$10,484.30	7357	$21,703.15	1993	$5,879.35	2001	$5,902.95
110-1-1	CLEARING & GRUBBING (AC)	$92,616.02	3.27	$302,854.39	9.36	$866,885.95	18.60	$1,722,657.97	4.11	$380,651.84	4.98	$461,227.78
120-1	REGULAR EXCAVATION (CY)	$30.73	13717.62	$421,542.47	38937.75	$1,196,557.11	78462.29	$2,411,146.23	16659.21	$511,937.50	35001.70	$1,075,602.14
425-1-549	INLETS, DT BOT, TYPE D, MODIFY (EA)	$10,462.42	1	$10,462.42	1	$10,462.42	1	$10,462.42	1	$10,462.42	3	$31,387.26
425-2-71	MANHOLES, J-7, <10' (EA)	$10,893.82	8	$87,150.56	2	$21,787.64	2	$21,787.64	2	$21,787.64	1	$10,893.82
430-175-136	PIPE CULVERT, OPT MATERIAL, ROUND, 36"S/CD (LF)	$313.45	3171	$993,949.95	618	$193,712.10	0	$0.00	516	$161,740.20	0	$0.00
430-175-160	PIPE CULVERT, OPT MATERIAL, ROUND, 60"S/CD (LF)	$641.51	3171	$2,034,228.21	618	$396,453.18	618	$396,453.18	0	$0.00	327	$209,773.77
530-3-4	RIPRAP, RUBBLE, F&I, DITCH LINING (TN)	$253.75	5.0	$1,268.75	5.0	$1,268.75	5.0	$1,268.75	5.0	$1,268.75	5.0	$1,268.75
550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD (LF)	$34.70	1622	$56,283.40	3554	$123,323.80	7357	$255,287.90	1993	$69,157.10	2001	$69,434.70
550-60-234	FENCE GATE, TYPE B, SLIDING/CANTILEVER, 18.1-20.0' OPENING (EA) (statewide)	$5,037.99	1	$5,037.99	1	$5,037.99	1	$5,037.99	1	$5,037.99	1	$5,037.99
570-1-2	PERFORMANCE TURF, SOD (SY)	$6.30	8422	$53,056.08	22022	$138,738.60	50820	$320,166.00	10793	$67,997.16	5808	$36,590.40
Subtotal				$3,970,619.11		$2,964,711.84		$5,165,971.23		$1,235,919.96		$1,907,119.56
Contingency 20%				$794,123.82		$592,942.37		$1,033,194.25		$247,183.99		$381,423.91
Total				$4,764,742.93		$3,557,654.20		$6,199,165.48		$1,483,103.95		$2,288,543.48

Pond Site	POND 4C	POND 5A & 5B	POND 5C	POND 6A & 6B
Total Site Area (ac)	7.45	4.98	8.14	3.69
Site Perimeter (ft)	2296	2526	6431	1806
Area at NWL (ac)	4.64	2.84	3.66	1.69
Average Exist. Ground Elevation (ft)	24.98	26.35	26.89	34.68
Pond Area at Exist Ground (ac)	4.72	3.21	4.73	1.77
Pipe Length (ft)	327.00	2839.00	2839.00	3606.00

Pay Item	Description	Unit Price	Quantity	Quantity Cost	Quantity	Quantity Cost	Quantity	Quantity Cost	Quantity	Quantity Cost
104-10-3	SEDIMENT BARRIER (LF)	$2.95	2296	$6,773.20	2526	$7,451.70	6431	$18,971.45	1806	$5,327.70
110-1-1	CLEARING & GRUBBING (AC)	$92,616.02	7.45	$689,989.35	4.98	$461,227.78	8.14	$753,894.40	3.69	$341,753.11
120-1	REGULAR EXCAVATION (CY)	$30.73	44878.12	$1,379,104.52	26007.98	$799,225.16	35716.46	$1,097,566.95	15770.64	$484,631.66
425-1-549	INLETS, DT BOT, TYPE D, MODIFY (EA)	$10,462.42	1	$10,462.42	4	$41,849.68	1	$10,462.42	2	$20,924.84
425-2-71	MANHOLES, J-7, <10' (EA)	$10,893.82	1	$10,893.82	8	$87,150.56	8	$87,150.56	10	$108,938.20
430-175-136	PIPE CULVERT, OPT MATERIAL, ROUND, 36"S/CD (LF)	$313.45	0	$0.00	2839	$889,884.55	2839	$889,884.55	0	$0.00
430-175-160	PIPE CULVERT, OPT MATERIAL, ROUND, 60"S/CD (LF)	$641.51	327	$209,773.77	2839	$1,821,246.89	2839	$1,821,246.89	3606	$2,313,285.06
530-3-4	RIPRAP, RUBBLE, F&I, DITCH LINING (TN)	$253.75	5.0	$1,268.75	5.0	$1,268.75	5.0	$1,268.75	5.0	$1,268.75
550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD (LF)	$34.70	2296	$79,671.20	2526	$87,652.20	6431	$223,155.70	1806	$62,668.20
550-60-234	FENCE GATE, TYPE B, SLIDING/CANTILEVER, 18.1-20.0' OPENING (EA) (statewide)	$5,037.99	1	$5,037.99	1	$5,037.99	1	$5,037.99	1	$5,037.99
570-1-2	PERFORMANCE TURF, SOD (SY)	$6.30	13600	$85,682.52	10382	$65,405.34	21683	$136,604.16	9680	$60,984.00
Subtotal				$2,478,657.54		$4,267,400.60		$5,045,243.82		$3,404,819.51
Contingency 20%				$495,731.51		$853,480.12		$1,009,048.76		$680,963.90
Total				$2,974,389.05		$5,120,880.72		$6,054,292.58		$4,085,783.41

Appendix F – Floodplain Impact and Compensation Maps



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			FLOODPLAIN IMPACT AND COMPENSATION MAP (1)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85716 RS&H, INC. 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 16	ST. JOHNS	21044753201		

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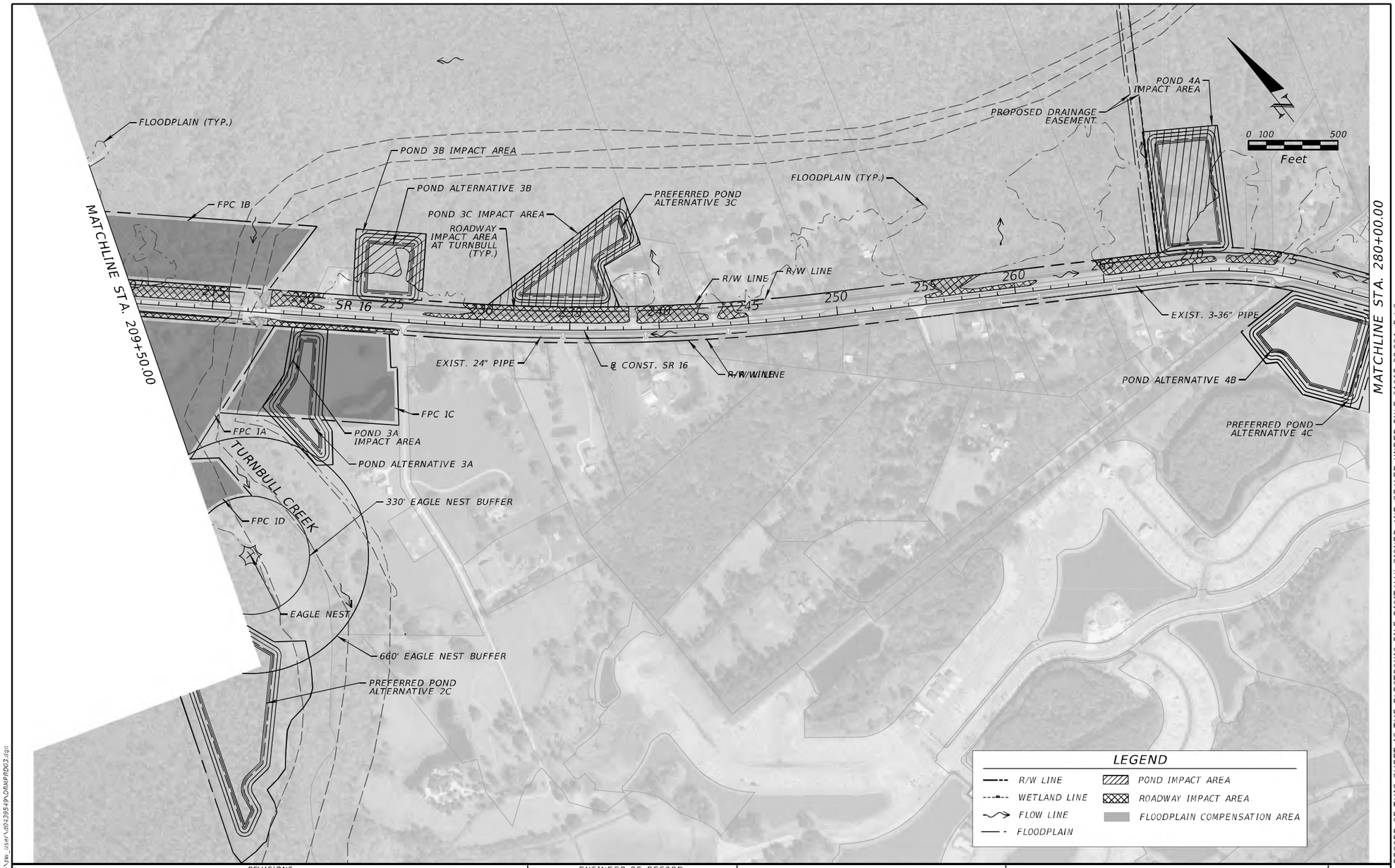
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			FLOODPLAIN IMPACT AND COMPENSATION MAP (2)	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	SANOJ SHRESTHA, P.E. LICENSE NUMBER: 85716 RS&H, INC. 10748 DEERWOOD PARK BLVD. SOUTH JACKSONVILLE, FL 32256	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
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MATCHLINE STA. 280+00.00

MATCHLINE STA. 355+00.00

ORIENT DR

TURNBULL CREEK RD

DOWNS CORNER RD

WHISPER RIDGE DR

WINDWARD RANCH BLVD

SR 16

285 290 295 300 305 310 315 320 325 330 335 340 345 350

POND ALTERNATIVE 5B

FLOODPLAIN (TYP.)

R/W LINE

FPC 2

FPC 3

PREFERRED POND ALTERNATIVE 4C

℄ CONST. SR 16

POND ALTERNATIVE 5A

ROADWAY IMPACT AREA WEST OF DOWNS CORNER RD

PREFERRED POND ALTERNATIVE 5C

POND ALTERNATIVE 6B

ROADWAY IMPACT AREA EAST OF DOWNS CORNER RD

POND ALTERNATIVE 6A

N

0 100 500

Feet

LEGEND

R/W LINE	POND IMPACT AREA
WETLAND LINE	ROADWAY IMPACT AREA
FLOW LINE	FLOODPLAIN COMPENSATION AREA
FLOODPLAIN	

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

SANOJ SHRESTHA, P.E.
LICENSE NUMBER: 85716
RS&H, INC.
10748 DEERWOOD PARK BLVD. SOUTH
JACKSONVILLE, FL 32256

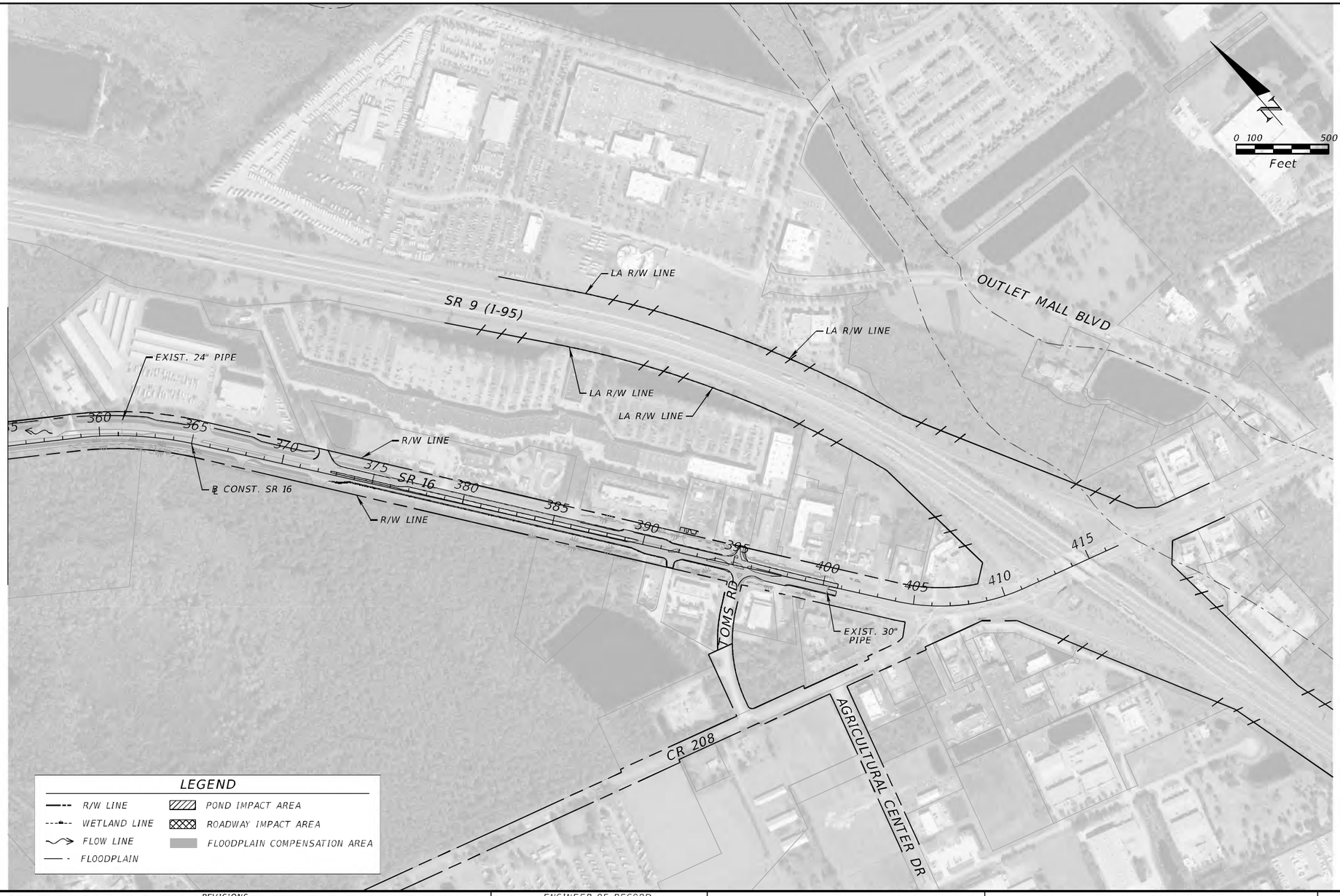
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 16	ST. JOHNS	21044753201

FLOODPLAIN IMPACT AND COMPENSATION MAP (3)

SHEET NO.

MATCHLINE STA. 355+00.00



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

SANOJ SHRESTHA, P.E.
LICENSE NUMBER: 85716
RS&H, INC.
10748 DEERWOOD PARK BLVD. SOUTH
JACKSONVILLE, FL 32256

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 16	ST. JOHNS	21044753201

FLOODPLAIN IMPACT AND COMPENSATION MAP (4)

SHEET NO.

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Appendix G – Floodplain Compensation Site Evaluation Matrix

Alternate FPC Site Evaluation Matrix
Project Description: SR 16 From International Golf Parkway to I-95 PD&E Study
FPID Number: 210447-5

Impact Location	Turnbull Creek				West of Downs Corner Rd	East of Downs Corner Rd
FPC Alternative	1A	1B	1C	1D	2	3
FPC Additonal Right of Way Needed (acres)	15.79	11.82	9.60	8.64	2.78	1.58
Estimated Right of Way Costs	$9,762,516	$3,283,813	$6,482,559	$5,341,871	$1,779,200	$1,011,200
Hazardous Materials	No	No	No	No	Low	Low
Utilities Impacts	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Maintenance	Roadside Access	Roadside Access	Roadside Access	Easement Required	Roadside Access	Roadside Access
Cultural Resources Impacts	Low	Low	Low	Low	Low	Low
FEMA Flood Zone	AE	AE	AE	AE	AE	AE
FEMA Flood Zone Impacts (acres)	23.2				2.59	2.37
Wetland Impacts (acres)	3.84	5.04	1.04	0.74	0.54	0.27
Habitat Impacts	Moderate	High	High	Moderate	High	High
Other Environmental Impacts (parks/springs)	Low	Low	Low	Low	Low	Low
Number of Property Owners	1	1	1	1	1	1
Land Use Zoning	Cropland and Pastureland/ Vegetated Non-Forested Wetlands	Tree Plantations/ Reservoirs	Cropland and Pastureland/ Reservoirs	Cropland and Pastureland/Tree Plantations	Wetland Hardwood Forests	Wetland Hardwood Forests/Upland Coniferous Forests
Advantages	Roadside Access, Parcel is for sale	Roadside Access	Roadside Access	Parcel is for sale.	Roadside Access, Undeveloped Parcel	Roadside Access, Undeveloped Parcel
Disadvantages, etc.	Located in SR-16 Frontage	Located in Conservation Easement, Located in SR-16 Frontage	Residental Parcel	Easement requried for maintenance access	Located in SR-16 Frontage	Located in SR-16 Frontage
Preferred FPC Alternative	No	No	No	Yes	Yes	Yes

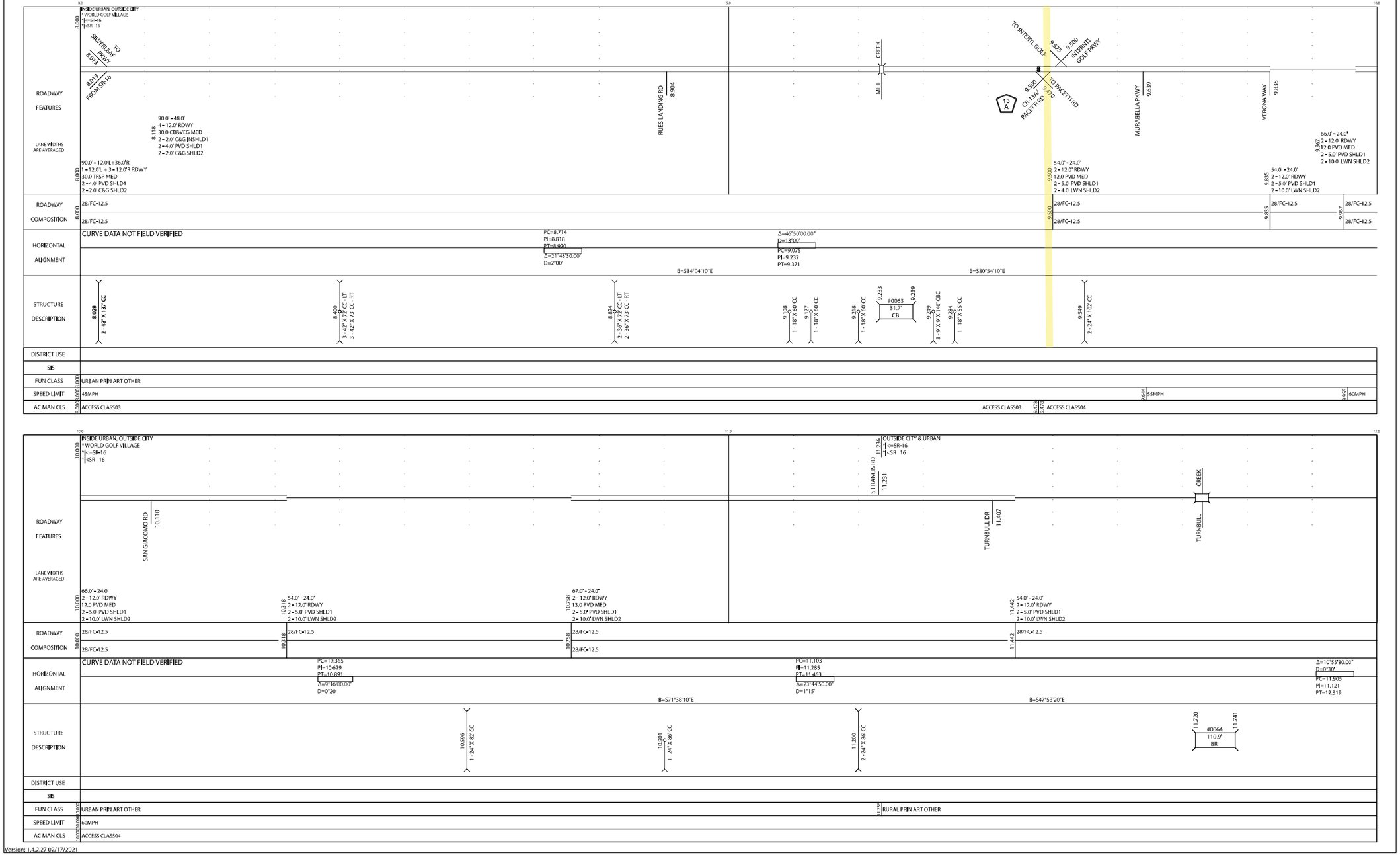
Appendix H – Straight Line Diagrams

	S YR/INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	10/13/2020	10/21/2020	6.312	6.312	01/28/2021 FDOT	02/17/2021 METRIC
BY	PECS	PECS				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 16	ST. JOHNS	02	78060000	3 OF 6



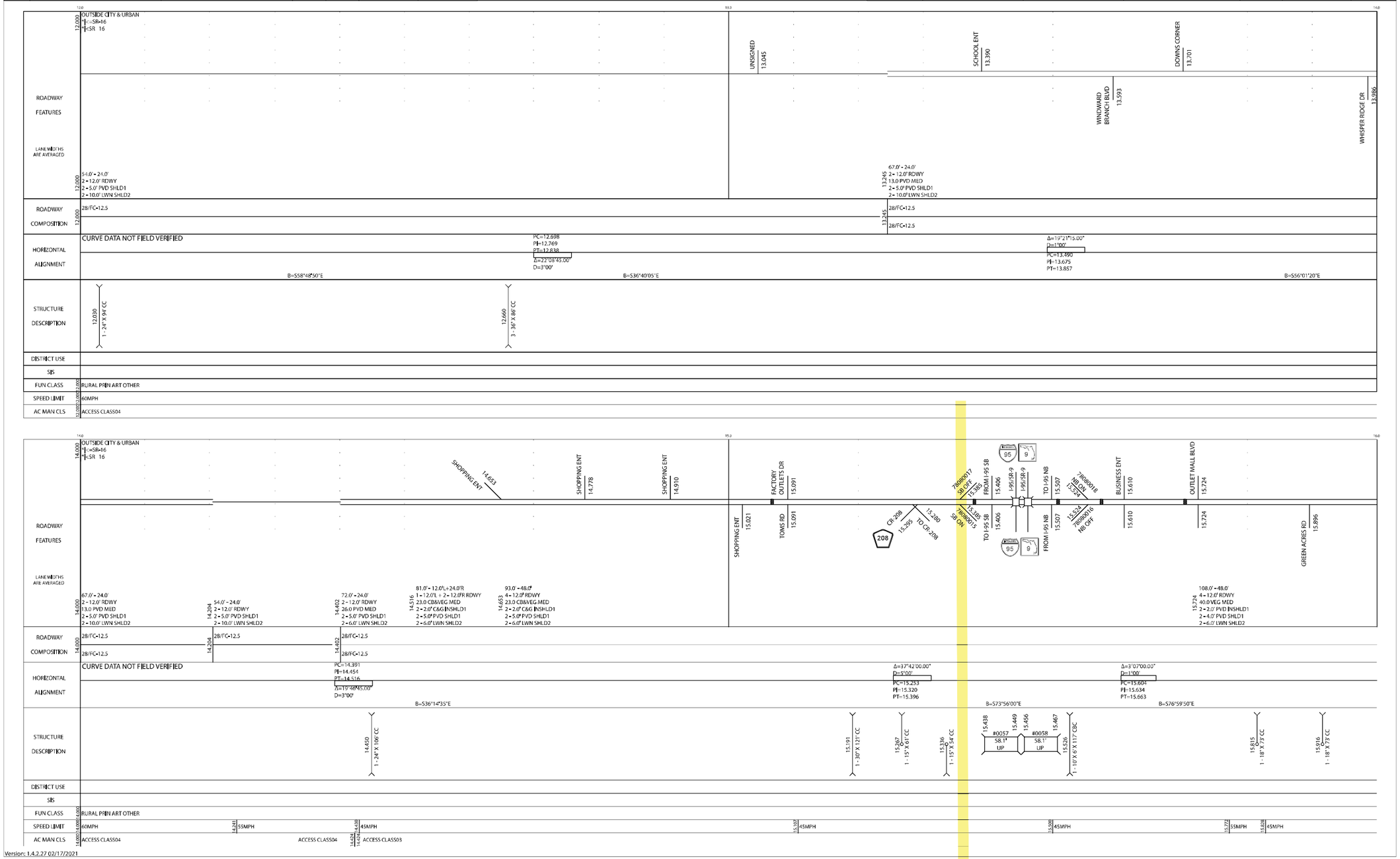
Version: 1.4.2.27 02/17/2021

	S YR/NV	SLD REV	BMP	EMP	INV	SLD REV
DATE	10/13/2020	10/21/2020	6.312	6.312	01/28/2021 FDOT	02/17/2021 METRIC
BY	PECS	PECS				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 16	ST. JOHNS	02	78060000	4 OF 6



Version: 1.4.2.27 02/17/2021

	S YR/INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	10/13/2020	10/21/2020	6.312	6.312	01/28/2021 FDOT	02/17/2021 METRIC
BY	PECS	PECS				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 16	ST. JOHNS	02	78060000	5 OF 6

16.0 — 17.0 — 18.0 — 19.0 — 20.0

16.000 OUTSIDE CITY & URBAN
* I<=SR=16
* I<SR 16

17.797 INSIDE URBAN, OUTSIDE CITY
* ST. AUGUSTINE
* I<=SR=16
* I<SR 16

ROADWAY FEATURES

INMAN RD 16.003
HARVEST LN 16.003
OLD TOWN PKWY 16.208
FORTNER RD 16.410
RACE TRACK RD 16.790
ZYGMONT CT 16.849
STRATTON BLVD 16.981
INDUSTRY CENTER RD 17.145
UNSIGNED 17.322
PLEASURE LN 17.392
UNSIGNED 17.492
CIRCLE DR E 17.517
17.809 FOUR MILE RD
UNSIGNED 17.918

LANE WIDTHS ARE AVERAGED

16.000 108.0' - 48.0'
4 - 12.0' RDWY
40.0 VEG MED
2 - 2.0' PVD INSHLD1
2 - 4.0' PVD SHLD1
2 - 6.0' LWN SHLD2

ROADWAY COMPOSITION

16.000 28/FC-12.5
28/FC-12.5

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED
Δ=25°09'00.00"
D=2°00'
PC=16.537
PI=16.658
PT=16.776
B=N77°51'10"E
PC=16.994
PI=17.052
PT=17.110
Δ=12°16'00.00"
D=2°00'
B=S89°52'50"E
Δ=18°02'30.00"
D=2°00'
PC=17.494
PI=17.580
PT=17.665
B=N72°04'40"E
PC=17.819
PI=17.904
PT=17.985
Δ=17°34'00.00"
D=2°00'
B=N89°41'40"E

STRUCTURE DESCRIPTION

16.029 1 - 18'X 72' CC
16.213 1 - 18'X 72' CC
16.573 1 - 18'X 72' CC
16.658 2 - 9'X 3'X 75' CBC - LT
2 - 9'X 3'X 75' CBC - RT
16.795 1 - 18'X 72' CC
16.998 1 - 18'X 73' CC
17.362 1 - 18'X 72' CC
17.459 1 - 18'X 73' CC
17.463 1 - 7'X 4'X 75' CBC - LT
1 - 7'X 4'X 75' CBC - RT
17.738 1 - 6'X 3'X 75' CBC - LT
1 - 6'X 3'X 75' CBC - RT
17.950 1 - 18'X 82' CC
17.979 1 - 5'X 4'X 180' CBC

DISTRICT USE

SIS

FUN CLASS
16.000 RURAL PRIN ART OTHER
17.797 URBAN PRIN ART OTHER

SPEED LIMIT
16.000 45MPH
16.478 55MPH

AC MAN CLS
16.000 ACCESS CLASS03

18.000 INSIDE URBAN, OUTSIDE CITY
* ST. AUGUSTINE
* I<=SR=16
* I<SR 16

SELOY DR 18.009
GLIMPSE OF GLORY RD 18.167
DAWSON AVE 18.233
LONG RD 18.440
WOODLAWN RD 18.579
VILLAGE CROSSING CT 18.728
N TENTH ST 18.817
N NINTH ST 18.873
N EIGHTH ST 18.932
N SEVENTH ST 18.983
N SIXTH ST 19.034
N FIFTH ST 19.087
N FOURTH ST 19.143
N THIRD ST 19.192
N SECOND ST 19.249
N FIRST ST 19.303
LORD ST 19.372
COLLINS AVE 19.421
USINA ST 19.552
ARTHUR ST 19.635
HILL ST 19.720
VARELLA AVE 19.806
EL REY AVE 19.927

ROADWAY FEATURES

SHOPPING ENT 18.396
KENTON MORRISON RD 18.579
COLLEGE DR 18.873
ROYAL ST AGUSTIA PKW 19.143
SHOPPING ENT 19.372
S COLLINS AVE 19.421
SCHALLER RD 19.488
19.552
DAIRY AVE 19.603
19.635
19.720
19.806
FORTUNA AVE 19.844

LANE WIDTHS ARE AVERAGED

18.000 108.0' - 48.0'
4 - 12.0' RDWY
40.0 VEG MED
2 - 2.0' PVD INSHLD1
2 - 4.0' PVD SHLD1
2 - 6.0' LWN SHLD2

19.421 64.0' - 48.0'
4 - 12.0' RDWY
12.0 PAVED TURN LANE (TWLTL/TURN) MED
2 - 2.0' C&G SHLD1

ROADWAY COMPOSITION

18.000 28/FC-12.5
28/FC-12.5

19.421 08/FC-0
08/FC-0

HORIZONTAL ALIGNMENT

CURVE DATA NOT FIELD VERIFIED
Δ=0°52'00.00"
PI=18.749
B=N88°49'40"E
PC=19.231
PI=19.308
PT=19.386
Δ=8°04'00.00"
D=1°00'
Δ=7°22'00.00"
D=2°00'
PC=19.538
PI=19.573
PT=19.608
B=N89°31'40"E
PC=19.743
PI=19.794
PT=19.844
Δ=15°54'00.00"
D=3°00'

STRUCTURE DESCRIPTION

18.176 1 - 18'X 72' CC
18.348 1 - 18'X 73' CC
18.516 1 - 18'X 84' CC
18.652 1 - 6'X 6'X 149' CBC
18.727 1 - 18'X 73' CC
18.884 1 - 18'X 73' CC
18.935 1 - 18'X 73' CC
18.988 1 - 18'X 73' CC
19.049 1 - 18'X 73' CC
19.097 1 - 18'X 73' CC
19.150 1 - 18'X 73' CC
19.200 1 - 18'X 73' CC
19.250 1 - 18'X 73' CC
19.313 1 - 8'X 4'X 130' CBC
19.339 1 - 18'X 73' CC

DISTRICT USE

SIS

FUN CLASS
18.000 URBAN PRIN ART OTHER

SPEED LIMIT
18.000 55MPH
18.471 55MPH
19.345 45MPH

AC MAN CLS
18.000 ACCESS CLASS03
19.345 ACCESS CLASS03
19.421 ACCESS CLASS06

Version: 1.4.2.27 02/17/2021